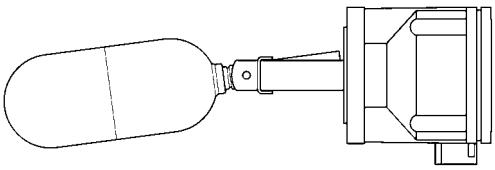
spirax sarco S.r.l.
Via per Cinisello, 18 - Nova Milanese (MB – Italy)

DOCUMENTATION BOOK

CLIENTE/*CUSTOMER*	**DESMET BALLESTRA SPA**
ORDINE/ *ORDER*	**121271**
NS. RIF./*OUR REF*.	**612517**

Colima Mec
Magnetic Level Switches
Installation and Maintenance Instructions



1. Safety information

Safe operation of these products can only be guaranteed if they are properly installed, commissioned, used and maintained by qualified personnel (see Section 1.11) in compliance with the operating instructions. General installation and safety instructions for pipeline and plant construction, as well as the proper use of tools and safety equipment must also be complied with.

1.1 Intended use

Referring to the Installation and Maintenance Instructions, name-plate and Technical Information Sheet, check that the product is suitable for the intended use/application.
The products comply with the requirements of the European Pressure Equipment Directives: ATEX 94 / 9 / CE and 97 / 23 / EC falling within category 'SEP'. It should be noted that products within this category are required by the Directive not to carry the CE mark.

Products intended for use in the Naval and Marine sectors are RINA, and M.M.I (Italian navy) approved.

i) The products have been specifically designed for use on steam, compressed air and inert industrial gases which are in Group 2 of the above mentioned Pressure Equipment Directive. The products' use on other fluids may be possible but, if this is contemplated, Spirax Sarco should be contacted to confirm the suitability of the product for the application being considered.

ii) Check material suitability, pressure and temperature and their maximum and minimum values. If the maximum operating limits of the product are lower than those of the system in which it is being fitted, or if malfunction of the product could result in a dangerous overpressure or overtemperature occurrence, ensure a safety device is included in the system to prevent such over-limit situations.

iii) Determine the correct installation situation and direction of fluid flow.

iv) Spirax Sarco products are not intended to withstand external stresses that may be induced by any system to which they are fitted. It is the responsibility of the installer to consider these stresses and take adequate precautions to minimise them.

v) Remove protection covers from all connections and protective film from all name-plates, where appropriate, before installation on steam or other high temperature applications.

1.2 Access

Ensure safe access and if necessary a safe working platform (suitably guarded) before attempting to work on the product. Arrange suitable lifting gear if required.

1.3 Lighting

Ensure adequate lighting, particularly where detailed or intricate work is required.

1.4 Hazardous liquids or gases in the pipeline

Consider what is in the pipeline or what may have been in the pipeline at some previous time. Consider: flammable materials, substances hazardous to health, extremes of temperature.

1.5 Hazardous environment around the product

Consider: explosion risk areas, lack of oxygen (e.g. tanks, pits), dangerous gases, extremes of temperature, hot surfaces, fire hazard (e.g. during welding), excessive noise, moving machinery.

1.6 The system

Consider the effect on the complete system of the work proposed. Will any proposed action (e.g. closing isolation valves, electrical isolation) put any other part of the system or any personnel at risk?
Dangers might include isolation of vents or protective devices or the rendering ineffective of controls or alarms. Ensure isolation valves are turned on and off in a gradual way to avoid system shocks.

1.7 Pressure systems

Ensure that any pressure is isolated and safely vented to atmospheric pressure. Consider double isolation (double block and bleed) and the locking or labelling of closed valves. Do not assume that the system has depressurised even when the pressure gauge indicates zero.

1.8 Temperature

Allow time for temperature to normalise after isolation to avoid danger of burns and consider whether protective clothing (inlcuding safety glasses) is required.

1.9 Tools and consumables

Before starting work ensure that you have suitable tools and/or consumables available. Use only genuine Spirax Sarco replacement parts.

1.10 Protective clothing

Consider whether you and/or others in the vicinity require any protective clothing to protect against the hazards of, for example, chemicals, high/low temperature, radiation, noise, falling objects, and dangers to eyes and face.

1.11 Permits to work

All work must be carried out or be supervised by a suitably competent person. Installation and operating personnel should be trained in the correct use of the product according to the Installation and Maintenance Instructions. Where a formal 'permit to work' system is in force it must be complied with. Where there is no such system, it is recommended that a responsible person should know what work is going on and, where necessary, arrange to have an assistant whose primary responsibility is safety. Post 'warning notices' if necessary.

1.12 Handling

Manual handling of large and/or heavy products may present a risk of injury. Lifting, pushing, pulling, carrying or supporting a load by bodily force can cause injury particularly to the back. You are advised to assess the risks taking into account the task, the individual, the load and the working environment and use the appropriate handling method depending on the circumstances of the work being done.

1.13 Residual hazards

In normal use the external surface of the product may be very hot. If used at the maximum permitted operating conditions the surface temperature of some products may reach temperatures of 350°C. Many products are not self-draining. Take due care when dismantling or removing the product from an installation (refer to 'Maintenance instructions').

1.14 Freezing

Provision must be made to protect products which are not self-draining against frost damage in environments where they may be exposed to temperatures below freezing point.

1.15 Disposal

This product is recyclable. No ecological hazard is anticipated with the disposal of this product providing due care is taken.

1.16 Returning products

Customers and stockists are reminded that under EC Health, Safety and Environment Law, when returning products to Spirax Sarco they must provide information on any hazards and the precautions to be taken due to contamination residues or mechanical damage which may present a health, safety or environmental risk. This information must be provided in writing including Health and Safety data sheets relating to any substances identified as hazardous or potentially hazardous.

2. General product information

2.1 Description

The Colima MEC magnetic-activated level switch is designed to control the liquid levels in most industrial applications. When installed at the foreseen point of operation, they work as ON / OFF switches 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 units can be used, depending on the number of operation points required.

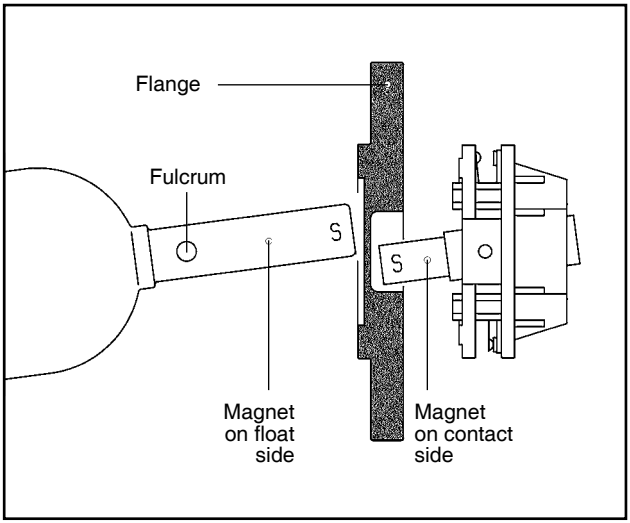
Mounting - Colima MEC magnetic level switch is side mounted directly in the tank. It can also be installed horizontally or vertically directly in the tank, or externally in a special chamber outside the tank. A square flange is specific for the naval industry.

Standards and certification - The Colima MEC magnetic level switch complies with the following European Directives:

- ATEX 94 / 9 / EC
- European Pressure Equipment Directive PED 97 / 23 / EC
- Products intended for use in the Naval and Marine sectors are RINA, and M.M.I (Italian navy) approved.

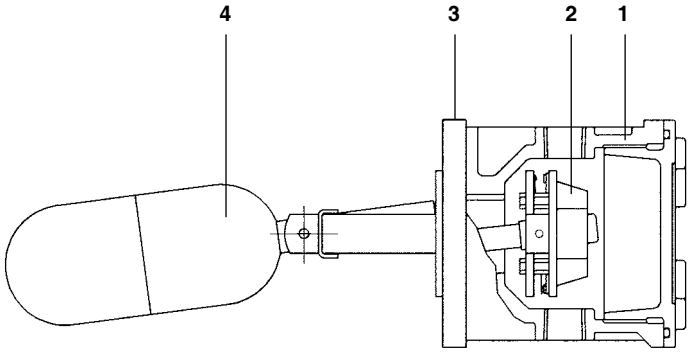
2.1.1 Operation

The level switch is 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.
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.



2.2 Materials

No.	Part	Material
1	Housing	Aluminium Rilsan coated / Stainless steel
2	Contact	SPDT / DPDT
3	Flange	304 / 316L / PVC / PP / PVDF Lowest applicable nominal diameter 50 mm (2") with nominal pressure related to design needs.
4	Float	04 / 316L / Monel / Hastelloy / PVC / PP / PVDF
5	Chamber (not shown)	A105 / 304 / 316L



2.3 Design conditions

TMA	Maximum allowable temperature	Steel		-20°C to + 150°C
			with cooling extension	-20°C to + 350°C
		Plastic	PVC	-20°C to + 70°C
			PP	-20°C to + 105°C
			PVDF	-20°C to + 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°

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

Models:

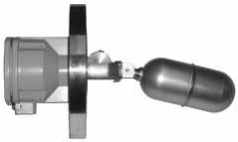
MEC A

Standard type for general purpose, used in most industrial applications.
Horizontal mounting.
One operation point.
In the picture, the 100% stainless steel versions are suitable for low temperatures, for installation in high saline concentration environments and for use in the food industry.

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 and S.
Horizontal or vertical mounting.
One operation point.

MEC CP



Type suitable for controlling liquid with specific gravity ≥ 0.5 kg / l.
Horizontal mounting.
Float with counterweight.
One operation point.

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°.

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°.

MEC AV

Specific type for high vibration with reed switch contact.
Frequencies 5 - 100 Hz.
Horizontal mounting.
One operation point.

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.

MEC C

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

MEC PN

Pneumatic type, suitable in applications where there is no electrical supply.
Stainless steel body with three way valve.
Horizontal or vertical mounting.
One operation point.

MEC

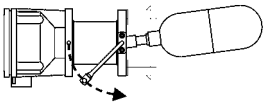
Type recommended in applications containing foam, inclusions and viscous fluids, where conditions require that the fulcrum point is not in touch with the process liquid.
Vertical mounting.
One operation point.
Stem length depending upon application.

MEC S

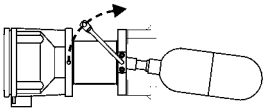
Type recommended in applications containing foam, inclusions and viscous fluids, where conditions require that the fulcrum point is not in touch with the process liquid.
Horizontal mounting.
One operation point.
Stem length depending upon application.

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.



MEC MINI

Small dimension type.
Horizontal or vertical mounting.
One operation point.
IP54 and IP67
protection degree.

3. Installation and Maintenance

Note: Before actioning any installation or maintenance work observe the 'Safety information' in Section 1.

Refering to the Installation and Maintenance Instructions, name-plate and Technical Information Sheet, check that the product is suitable for the intended installation.

Check: materials, pressure and temperature to ensure compatibility of the product with the required application.

Remove protective covers from all connections and the protective film from the name-plate.

3.1 Assembly

The Colima MEC magnetic level switches are delivered packed.

Caution before installation disassemble the lower flange and remove the float from its package + **Confirm** the presence of supplied gaskets.

3.1.1 Fit the level switch in the tank paying attention to avoid any damage at float. Any damage of the float can interfere with the correct operation of the unit.

3.1.2 Place the supplied gasket between the flanges.

3.1.3 Fix the flanges with bolts. Firmly secure the fixing by tightening the flange bolts.

3.1.4 Ensure that there is nothing stopping the correct operation of the float.

3.1.5 Open the unit housing and connect the wiring at the terminal board. The housing has two cable entry points: G ½" F, Explosion-proof Gk ½" F, ½" NPT F, M20 x 1.5, PG 13.5

Caution: Always ensure that correct earthing of the equipment is carried out. Specific points are set inside and outside the housing.

Explosion-proof housing operating limits

Technical data	Class I: simple protective-earth connection requirements

Employment data for potentially explosive atmospheres

Ambient temperature limits	-20°C to +50°C	
Marking	Ⓔx II 1/2 G EEx d IIC, T5 resp. T4	
Temperature class	T5	T4
Permitted temperature variation range	-20°C to +76°C	-20°C to +104°C
Suitability for the area of: 0, 1, 2, GAS Group II (Directive 99/92/CE)		

Warning:

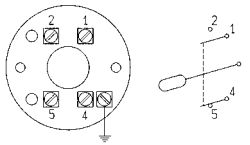
1. Do not make any modification to the housing. Any alterations or modifications to the product will invalidate any warranties, explosion proof characteristics and any CE marking.

2. Install at the inlet of the housing a suitable fixing or locking device with filling material. The absence of these components will result in the loss of responsibility of the manufacturer.

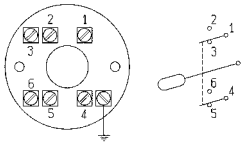
3. These products should only be used for what they are designed for. Anything outside of the stipulated application range may be subject to unforeseen and dangerous circumstances and full responsibility will be with the installer.

3.1.6 Wiring: to connect SPDT o DPDT standard contact.

SPDT

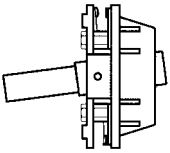


DPDT (two simultaneouns SPDT contacts)



Electrical contact characteristics

Standard



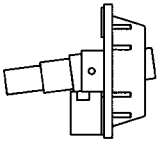
Standard microswitch recommened for general purpose.
Goldplated contacts in open air.

Conctact coating:

Galvanic in gold	standard 2 µ
	special 5 µ

V	~ A	=	Load
220	**3**	**2**	Resistive
	1.5	**0.5**	Inductive
30	**6**	**3**	Resistive
	3	**1.5**	Inductive

Weather-proof

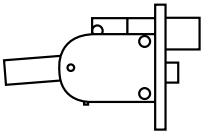


Weather-proof microswitch. Goldplated contacts. IP66

Nominal current	minimum 10 mA
	maximum 400 mA
Nominal voltage	minimum 5 V
	maximum 30 V

V	~ A	=	Load
220	**7**	**0.5**	Resistive
	5	**0.03**	Inductive
30	**7**	**7**	Resistive
	5	**5**	Inductive

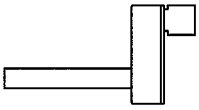
For oxidising environments



Microswitch indicated for oxidising or corrosive environments.
Goldplated contacts ermetically sealed in inert gas.

V	~ A	=	Load
220	**1**	**-**	Resistive
	-	**0.4**	Inductive
30	**3**	**-**	Resistive
	-	**1.5**	Inductive

For high vibrations



Reed switch contact indicated for high vibrations, resists from 5 to 100 Hz.
30 g 11 ms.
Goldplated contacts ermetically sealed in inert gas.

Interruption power	**60 W / VA**
Switchable current	**1 A**
Switchable voltage	**250 V ≅**

3.2 Disassembly

Before disassembly of the level switch disconnect or isolate any electricity supply or circuit and depressurize the tank.

Warning: do not disassemble the level switch before the tank has been emptied.

3.2.1 Open housing. For E Ex-d housings wait at least five minutes before opening.

3.2.2 Disconnect the electric circuit cables. Close the housing.

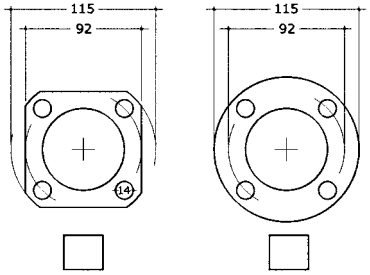
3.2.3 Unscrew the connection bolts.

3.2.4 Extract the level switch from the tank paying attention to avoid any damage to the float.

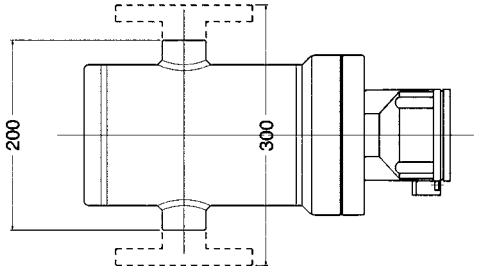
Periodical inspections are necessary to guarantee complete efficiency of the unit. A regular maintenance programme starting from its initial installation is recommended. The suggested precautions are important to obtain the best operating conditions of the level control.
The instrument does not require preventive maintenance, however it is recommended that from time-to-time a check of the liquid fluidity is actioned to avoid any suspensions or deposits that can influence wetted parts. Also check that the float moves freely.

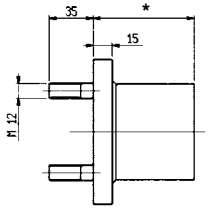
Mounting accessories

Counterflanges
(Other sizes are available on request)



Chamber for installation outside the tank





Depth of nippers

*

All types
80 mm

D and DV only
35 mm

Minimum distance between connections

Flange
300 mm

Output
200 mm

4. Spare parts

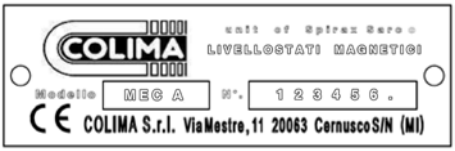
The available spare parts are detailed below. No other parts are supplied as spares.

Available spares

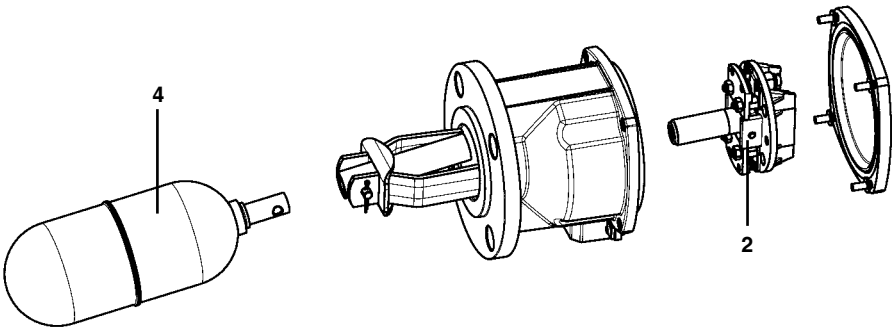
Contact	**2**
Float	**4**

How to order spares

Always order spares by using the description given in the column headed 'Available spares' and state the size and serial number of the unit which is indicated on the name-plate:



Example: 1 off Float for a Spirax Sarco Colima MEC A having DN50 flanged ASME 150 RF connections - Serial number 123456.



REPAIRS
Please contact your nearest Spirax Sarco Branch Office or Agent, or directly to:
Spirax Sarco S.r.l.
Via per Cinisello, 18 - 20834 Nova Milanese (MB)
Tel.: +39 0362 49 17.1
Fax: +39 0362 49 17 307

LOSS OF GUARANTEE
Total or partial disregard of the above instructions involves loss of any rights to guarantee.

Spirax-Sarco s.r.l. - Via per Cinisello, 18 - 20834 Nova Milanese (MB) - Tel.: +39 0362 49 17.1 - Fax +39 0362 49 17 307

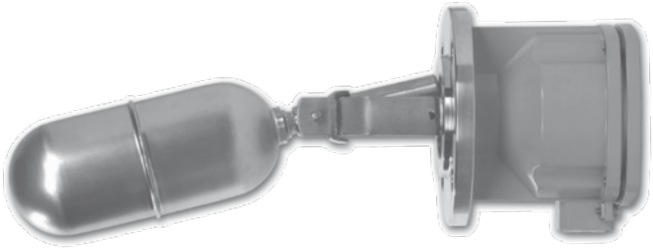
spirax sarco

TI-P324-01
CH Issue 1

Colima MEC Series
Magnetic Level Switches

Description

Magnetic activated level switches for controlling liquid levels in most industrial applications. When they have been installed at the point of operation, 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.
The level switches can be equipped with electrical contacts, reed or micro switches along with various forms of protective housings to suit most environmental and safety conditions.

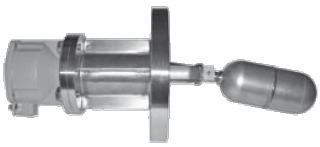
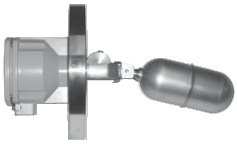


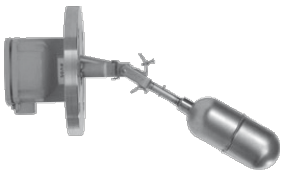
MEC type A
with round flange and weather-proof housing

Standards and certifications

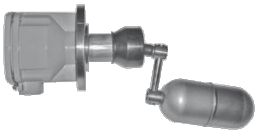
This product fully complies with the requirements of the European Directive ATEX 94/9/EC, PED 97/23/EC.
RINA and M.M.I approved.

Available types

MEC 	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 	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 	Type suitable for controlling liquid with specific gravity ≥ 0.5 kg/l. Horizontal mounting. Float with counterweight. One operation point.	**CP**

MEC 	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 	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 	Specific type for high vibration with reed switch contact. Frequencies 5÷100 Hz. Horizontal mounting. One operation point.	**AV**

MEC



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

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

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

PN

MEC

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

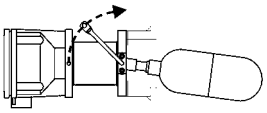
MEC

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.

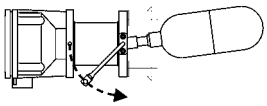
S

MEC

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.

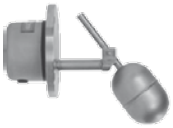


Example of manual operation checking, to be carried out in the field



T

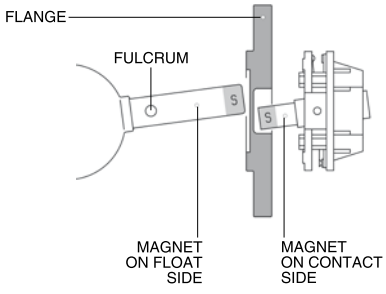
MEC MINI



Small dimension type.
Horizontal or vertical mounting.
One operation point.
IP54 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.

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		

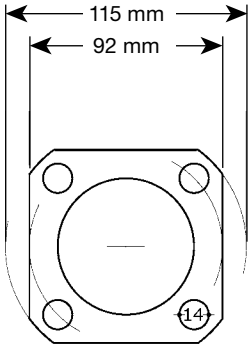
Float diameters

Steel	Ø 48	48	≥ DN50 - 2" ASME	Ø 63	63	≥ DN 65 - 2½" ASME
Plastic	Ø 50	50	≥ DN50 - 2" ASME	Ø 60	60	≥ DN 65 - 2½" ASME

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

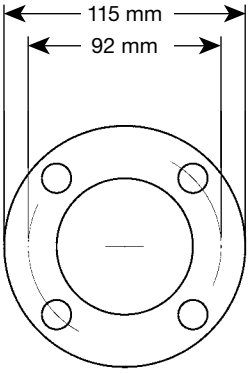
Process connections

Naval industry flange



SQ

Colima's standard



ST

UNI and ASME (ANSI) flanges

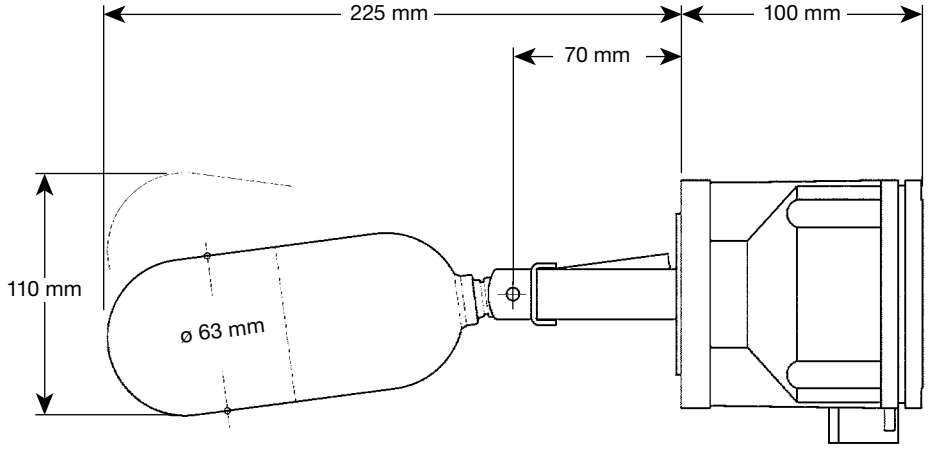
UNI	PN6	PN10 / PN16		PN40	PN64
DN50	UA	UB		UC	UD
DN65	UE	UF		UG	UH
DN80	UI	UL	UM	UN	UO
DN100	UP	UQ		UR	US

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

Flanges are available in other sizes on request.

Design conditions

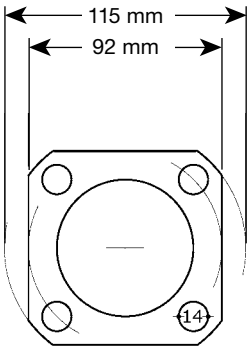
TMA - Maximum allowable temperature	Steel		-20 to +150°C
		with cooling extension	-20 to +350°C
	Plastic	PVC	-20 to +70°C
		PP	-20 to +105°C
		PVDF	-20 to +130°C
PMA - Maximum allowable pressure	Steel	Colima's flange	< 16 bar g
		flange sized according to rating	< 100 bar g
	Plastic		6 bar g
Fluid specific gravity			≥ 0.8 kg/l
		only CP type	≥ 0.5 kg/l
Differential			fixed 15 mm
		only D and DV types	± 40°



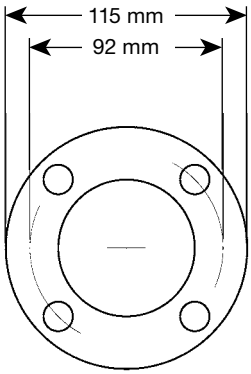
MEC type A with round flange and weatherproof housing

Mounting accessories

Counterflange (on request, also in other sizes)

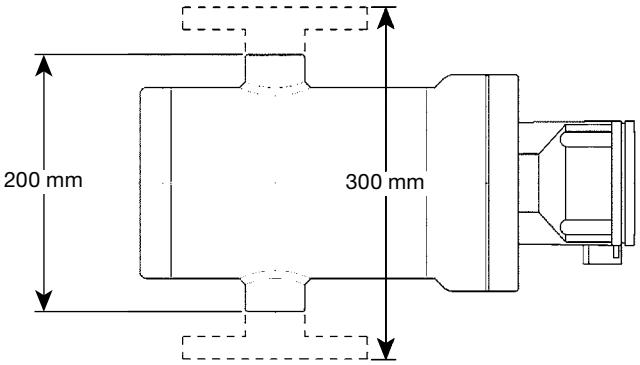


CSQ



CST

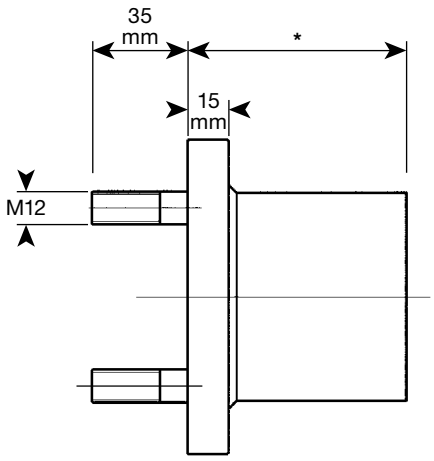
Chamber for installation outside the tank



Minimum distance between connections

Flange
300 mm

Output
200 mm



Dimensions

*

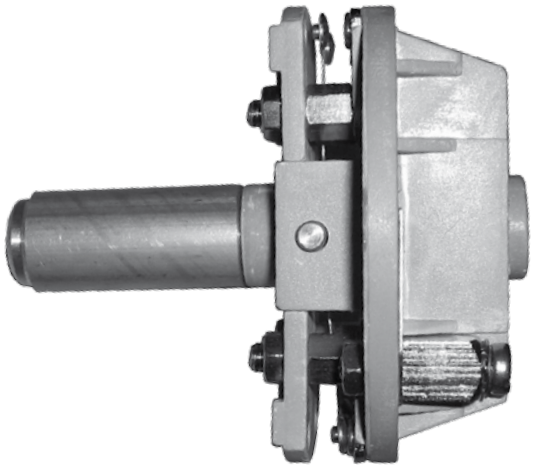
All types
80 mm

D and DV only
35 mm

Colima electrical equipment and housings for Colima MEC series magnetic level switches

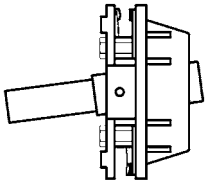
Description

The electrical equipment on the MEC series level switches comprises a support, including two contact holders, one fixed and one oscillating. Both parts are in polyester resin and high-insulation dielectric material with mould-resistant characteristics.
The oscillating element includes a magnet whose south pole points towards the flange that separates the electrical equipment from the liquid contained in the tank. According to the buoyancy provided by the liquid in the tank the float works by pivoting a sealed cartridge containing a magnet, with south polarity on the end towards the flange. As the two magnets on the two oscillating devices repel each other, they are never in line on the same axis. Consequently, the status of the electrical equipment switches from the normally open (NO) to normally closed (NC) position or vice versa.



Electrical contact characteristics

Standard



Standard microswitch recommended for general purpose.
Gold plated contacts in open air.

Contact coating:

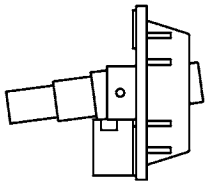
Galvanic in gold	Standard 2 µ
	Special 5 µ

Mechanical life > 10^6
Electrical life > 10^4

A

V	~ A	= A	Load
220	3.0	2.0	Resistive
	1.5	0.5	Inductive
30	6.0	3.0	Resistive
	3.0	1.5	Inductive

Weatherproof



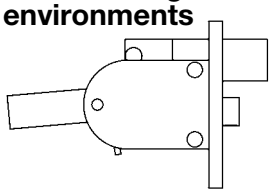
Weatherproof microswitch.
Goldplated contacts.
IP66

Nominal current	Minimum 10 mA
	Maximum 400 mA
Nominal voltage	Minimum 5 V
	Maximum 30 V

B

V	~ A	= A	Load
220	7	0.5	Resistive
	5	0.03	Inductive
30	7	7.0	Resistive
	5	5.0	Inductive

For oxidising environments

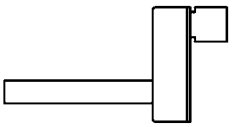


Microswitch indicated for oxidising or corrosive environments.
Goldplated contacts ermetically sealed in inert gas.

C

V	~ A	= A	Load
220	1	-	Resistive
	-	0.4	Inductive
30	3	-	Resistive
	-	1.5	Inductive

For high vibrations

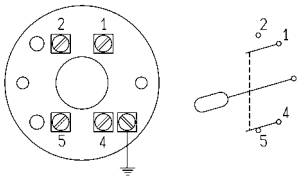


Reed switch contact indicated for high vibrations, resists from 5 to 100 Hz.
30g 11ms.
Goldplated contacts ermetically sealed in inert gas.

D

Interruption power	**60 W/VA**
Switchable current	**1 A**
Switchable voltage	**250 V** ≅

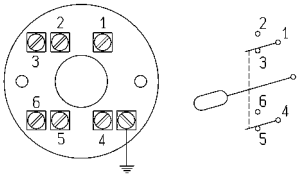
SPDT execution



1

DPDT execution

(two simultaneous SPDT contacts)



2

Housings

The MEC series magnetic level switch housings are available in various forms to meet all possible application needs and are suitable for most environmental and safety conditions.
They are available in the weatherproof version for general use and the explosion-proof version for use in hazardous areas.

Weatherproof housing

Type for general purpose, used in most industrial applications.
In pressure die-cast aluminium and protected with polyamide paint.
Protection degree IP67.
One cable entry point.

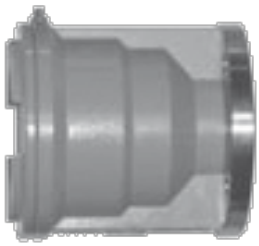
1

Weatherproof housing

Special type adapted for low temperatures, installation in high concentration saline environments and for use in the food industry.
Entirely in stainless steel.
Protection degree IP67.
On request IP68.
Up to two cable entry points.

2

Explosion-proof housing



ATEX certified
Ⓔx II 1/2 G EEx d IIC T5 resp. T4 for use in hazardous areas.
In pressure die-cast aluminium with a polyamide paint coat.
Protection degree IP67.
Up to two cable entry points.

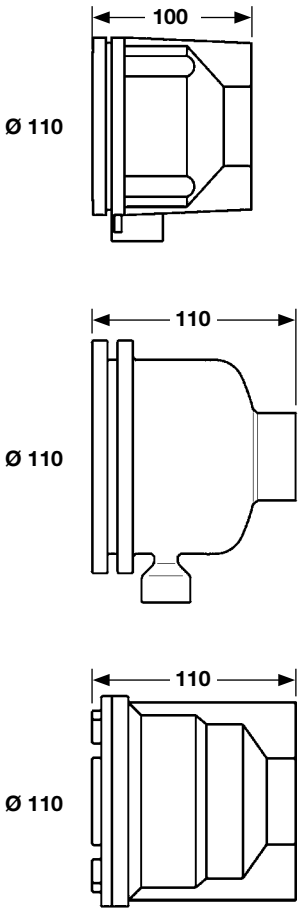
3

Electrical connections

The housings allow for two cable entry points which are available as follows:

Standard	G ½" F	**A**
Explosion-proof	Gk ½" F	**B**
On request	½" NPT F	**C**
	M 20 x1.5	**D**
	PG 13.5	**E**

Dimensions (approximate) in mm



Product selection and order placement

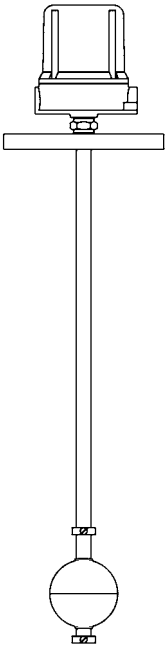
Each unit is identified by a unique alphanumeric code that defines the manufacturing characteristics that best suites the application. Please confirm the following information before commencement of the product configuration.

Process pressure = _____ Process temperature = _____
Design pressure = _____ Design temperature = _____
Fluid type = _____
Specific gravity of fluid = _____
Viscosity of fluid = _____

Range	Colima		Colima
Model	**M**	MEC	**M**
Type	**A**	Standard	**A**
	AT	With cooling extension	
	CP	Liquids with specific gravity > 0.5 kg/l	
	D	Adjustable differential range in 2 directions	
	DV	Adjustable differential range in 1 direction, vertical mount	
	AV	High vibration application	
	M	With protection bellows	
	O	Vertical on sunken tanks, high or low level	
	PN	Pneumatic output	
	L	Vertical foam and specialist applications	
	S	Horizontal foam and specialist applications	
	T	With field verification device	
	MM	Miniature type	
Flange	**F**	Flanged	**F**
Flange material	**1**	304 stainless steel	**1**
	2	316 stainless steel	
	3	PVC	
	4	PP	
	5	PVDF	
Flange rating	Refer to page 3		**UA**
Float	**A**	304 stainless steel	**B**
	B	316 stainless steel	
	C	Monel	
	D	Hastelloy	
	E	PVC	
	F	PP	
	G	PVDF	
Float diameter	**48**	Ø 48 steel (>DN50 - 2" ASME)	**48**
	63	Ø 63 steel (>DN65 - 2½" ASME)	
	50	Ø 50 plastic (>DN50 - 2" ASME)	
	60	Ø 60 plastic (>DN65 - 2½" ASME)	
Housing	**1**	IP67 General purpose	**1**
	2	IP67 Stainless steel	
	3	ATEX certified	
Electrical connections	**1**	G ½"F	**1**
	2	Gk ½"F	
	3	½"NPT F	
	4	M20 x 1.5	
	5	PG 13.5	
Electrical equipment	**A1**	Standard SPDT	**A1**
	A2	Standard DPDT	
	B1	Weather proof SPDT	
	B2	Weather proof DPDT	
	C1	Ermetically sealed SPDT	
	C2	Ermetically sealed DPDT	
	D1	High vibrations SPDT	

How to order example: 1 off Spirax Sarco Colima M-A-F-1-UA-B-48-1-1-A1

Colima Tor
Magnetic Level Switches
Installation and Maintenance Instructions



1. Safety information

Safe operation of these products can only be guaranteed if they are properly installed, commissioned, used and maintained by qualified personnel (see Section 1.11) in compliance with the operating instructions. General installation and safety instructions for pipeline and plant construction, as well as the proper use of tools and safety equipment must also be complied with.

1.1 Intended use

Referring to the Installation and Maintenance Instructions, name-plate and Technical Information Sheet, check that the product is suitable for the intended use/application.
The products comply with the requirements of the European Pressure Equipment Directives: ATEX 94 / 9 / CE and 97 / 23 / EC falling within category 'SEP'. It should be noted that products within this category are required by the Directive not to carry the CE mark.

Products intended for use in the Naval and Marine sectors are RINA, and M.M.I (Italian navy) approved.

i) The products have been specifically designed for use on steam, compressed air and inert industrial gases which are in Group 2 of the above mentioned Pressure Equipment Directive. The products' use on other fluids may be possible but, if this is contemplated, Spirax Sarco should be contacted to confirm the suitability of the product for the application being considered.

ii) Check material suitability, pressure and temperature and their maximum and minimum values. If the maximum operating limits of the product are lower than those of the system in which it is being fitted, or if malfunction of the product could result in a dangerous overpressure or overtemperature occurrence, ensure a safety device is included in the system to prevent such over-limit situations.

iii) Determine the correct installation situation and direction of fluid flow.

iv) Spirax Sarco products are not intended to withstand external stresses that may be induced by any system to which they are fitted. It is the responsibility of the installer to consider these stresses and take adequate precautions to minimise them.

v) Remove protection covers from all connections and protective film from all name-plates, where appropriate, before installation on steam or other high temperature applications.

1.2 Access

Ensure safe access and if necessary a safe working platform (suitably guarded) before attempting to work on the product. Arrange suitable lifting gear if required.

1.3 Lighting

Ensure adequate lighting, particularly where detailed or intricate work is required.

1.4 Hazardous liquids or gases in the pipeline

Consider what is in the pipeline or what may have been in the pipeline at some previous time. Consider: flammable materials, substances hazardous to health, extremes of temperature.

1.5 Hazardous environment around the product

Consider: explosion risk areas, lack of oxygen (e.g. tanks, pits), dangerous gases, extremes of temperature, hot surfaces, fire hazard (e.g. during welding), excessive noise, moving machinery.

1.6 The system

Consider the effect on the complete system of the work proposed. Will any proposed action (e.g. closing isolation valves, electrical isolation) put any other part of the system or any personnel at risk?
Dangers might include isolation of vents or protective devices or the rendering ineffective of controls or alarms. Ensure isolation valves are turned on and off in a gradual way to avoid system shocks.

1.7 Pressure systems

Ensure that any pressure is isolated and safely vented to atmospheric pressure. Consider double isolation (double block and bleed) and the locking or labelling of closed valves. Do not assume that the system has depressurised even when the pressure gauge indicates zero.

1.8 Temperature

Allow time for temperature to normalise after isolation to avoid danger of burns and consider whether protective clothing (inlcuding safety glasses) is required.

1.9 Tools and consumables

Before starting work ensure that you have suitable tools and/or consumables available. Use only genuine Spirax Sarco replacement parts.

1.10 Protective clothing

Consider whether you and/or others in the vicinity require any protective clothing to protect against the hazards of, for example, chemicals, high/low temperature, radiation, noise, falling objects, and dangers to eyes and face.

1.11 Permits to work

All work must be carried out or be supervised by a suitably competent person. Installation and operating personnel should be trained in the correct use of the product according to the Installation and Maintenance Instructions. Where a formal 'permit to work' system is in force it must be complied with. Where there is no such system, it is recommended that a responsible person should know what work is going on and, where necessary, arrange to have an assistant whose primary responsibility is safety. Post 'warning notices' if necessary.

1.12 Handling

Manual handling of large and/or heavy products may present a risk of injury. Lifting, pushing, pulling, carrying or supporting a load by bodily force can cause injury particularly to the back. You are advised to assess the risks taking into account the task, the individual, the load and the working environment and use the appropriate handling method depending on the circumstances of the work being done.

1.13 Residual hazards

In normal use the external surface of the product may be very hot. If used at the maximum permitted operating conditions the surface temperature of some products may reach temperatures of 350°C. Many products are not self-draining. Take due care when dismantling or removing the product from an installation (refer to 'Maintenance instructions').

1.14 Freezing

Provision must be made to protect products which are not self-draining against frost damage in environments where they may be exposed to temperatures below freezing point.

1.15 Disposal

This product is recyclable. No ecological hazard is anticipated with the disposal of this product providing due care is taken.

1.16 Returning products

Customers and stockists are reminded that under EC Health, Safety and Environment Law, when returning products to Spirax Sarco they must provide information on any hazards and the precautions to be taken due to contamination residues or mechanical damage which may present a health, safety or environmental risk. This information must be provided in writing including Health and Safety data sheets relating to any substances identified as hazardous or potentially hazardous.

2. General product information

2.1 Description

The Colima TOR magnetic-activated level switch is designed to control the liquid levels in most industrial applications. The unit comprise of a rigid rod for vertical installation that is 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 unit can be used with up to six switching points or with a potentiometer transmitter for a continuous reading of the level.

Mounting - The Colima TOR magnetic level switch is designed for top mounting directly to the tank. It can be installed vertically directly into the tank, or externally into a chamber connected to the tank.

Standards and certification - The Colima TOR magnetic level switch complies with the following European Directives:

- ATEX 94 / 9 / EC
- European Pressure Equipment Directive 97 / 23 / EC
- Products intended for use in the Naval and Marine sectors are RINA, and M.M.I (Italian navy) approved.

2.1.1 Operation

The level switch is secured to the tank by means of a flange or a thread. 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

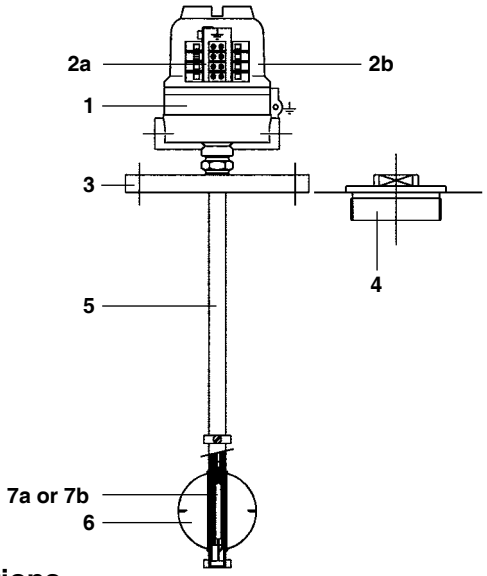
One or more float(s), free to slide along the guide tube depending on the liquid level inside the tank, acting magnetically on contacts placed at the operation point, switching their status from NO to NC or vice versa.
The switching of the electrical contact is quick and reliable.
Switching points are 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.

2.2 Materials

No.	Part	Material
1	Housing	Aluminium Rilsan coated / Stainless steel
2a	Terminal board	Melamina
2b	4 - 20 mA output converter	Plastic
3/4	Flange or thread	304 / 316L / PVC / PP / PVDF Lowest applicable nominal diameter 50 mm (2") with nominal pressure related to design needs.
5	Tube and wetted parts	316L / PVC / PP / PVDF
6	Float	316L / Titanium / Monel / Hastelloy / PVC / PP / PVDF / BunaN
7a	Contact	SPDT or DPDT ermetically sealed, golden plated
7b	Transmitter chain (not shown)	SPDT ermetically sealed, golden plated
8	Chamber (not shown)	A105 / 304 / 316L



2.3 Design conditions

TMA	Maximum allowable temperature	Steel		-110°C to +200°C
		Buna N		-20°C to + 80°C
		Plastic	PVC	-20°C to + 70°C
			PP	-20°C to +105°C
			PVDF	-20°C to +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

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

Rod length
Minimum length 100 mm
Maximum length 5 000 mm

Models:

TOR A

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

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 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.

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.

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.

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, which allows control of up to six switching points with a single instrument. Equipped with a potentiometer transmitter allowing continuous reading of liquid level.

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, which allows control of up to six switching points with a single instrument . Equipped with a potentiometer transmitter allowing continuous reading of liquid level.

3. Installation and Maintenance

Note: Before actioning any installation or maintenance work observe the 'Safety information' in Section 1.

Refering to the Installation and Maintenance Instructions, name-plate and Technical Information Sheet, check that the product is suitable for the intended installation.

Check: materials, pressure and temperature to ensure compatibility of the product with the required application.

Remove protective covers from all connections and the protective film from the name-plate.

3.1 Assembly

The Colima TOR magnetic level switches are delivered packed.

Caution before installation disassemble the lower flange and remove the float from its package + **Confirm** the presence of supplied gaskets.

3.1.1 Fit the level switch in the tank paying attention to avoid any damage to the float. Any damage of the float can interfere with the correct operation of the unit.

3.1.2 Place the supplied gaskets between the flanges or thread.

3.1.3 **Flange mount:**
Place the supplied gasket between the flanges.
Fix the flanges with bolts. Firmly secure the fixing by tightening the flange bolts.

Thread mount:
Place the gasket in situ and use PTFE tape on the thread of the joint.
Firmly secure the fixing by tightening with a spanner.

3.1.4 Ensure that there is nothing stopping the correct operation of the float.

3.1.5 Open the unit housing and connect the wiring at the terminal board.
The housing has two cable entry points:
G ½" F, Explosion-proof Gk ½" F, ½" NPT F, M 20 x1.5, PG 13.5

Caution: Always ensure that correct earthing of the equipment is carried out. Specific points are set inside and outside the housing.

Explosion-proof housing operating limits

Technical data	Class I: simple protective-earth connection requirements

Employment data for potentially explosive atmospheres

Ambient temperature limits	-20°C to +50°C	
Marking	Ⓔx II 1/2 G EEx d IIC T6, T5 resp. T4	
Temperature class	T6	T4
Permitted temperature variation range	-20°C to +40°C	-20°C to +80°C
Suitability for the area of: 0, 1, 2, GAS Group II (Directive 99/92/CE)		

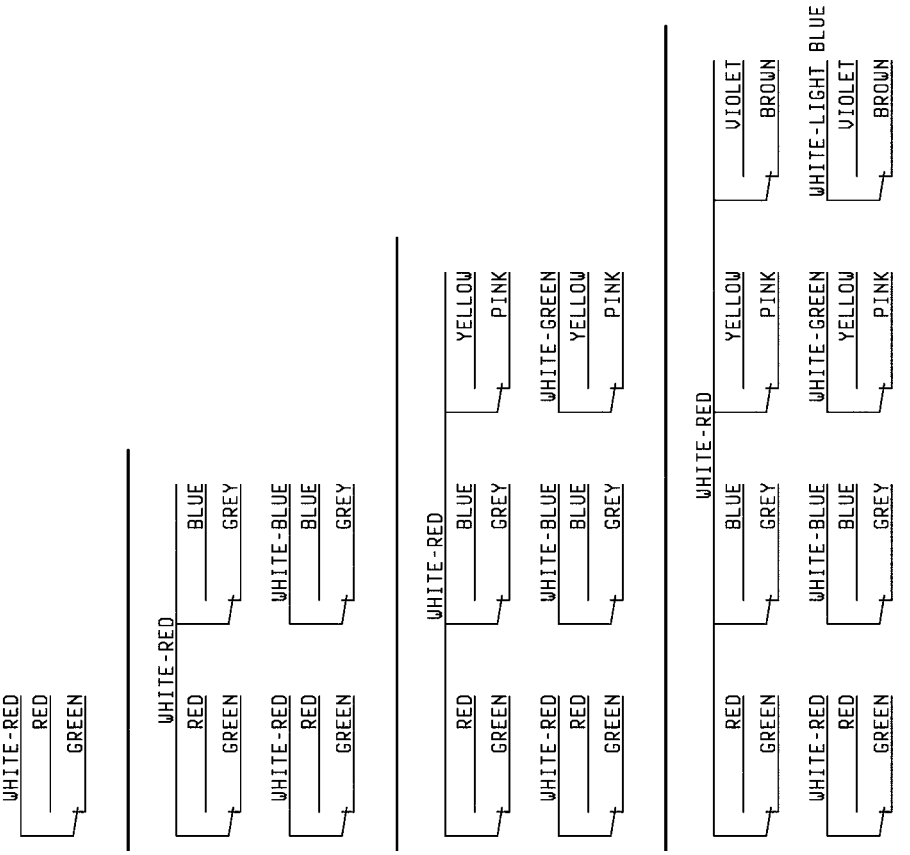
Warning:

1. Do not make any modification to the housing. Any alterations or modifications to the product will invalidate any warranties, explosion proof characteristics and any CE marking.

2. Install at the inlet of the housing a suitable fixing or locking device with filling material. The absence of these components will result in the loss of responsibility by the manufacturer.

3. These products should only be used for the purpose they were designed for. Anything outside of the stipulated application range may be subject to unforeseen and dangerous circumstances and full responsibility will be with the installer.

3.1.6 Wiring: to connect the SPDT or DPDT contact.



4. Contacts

Contact 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 =

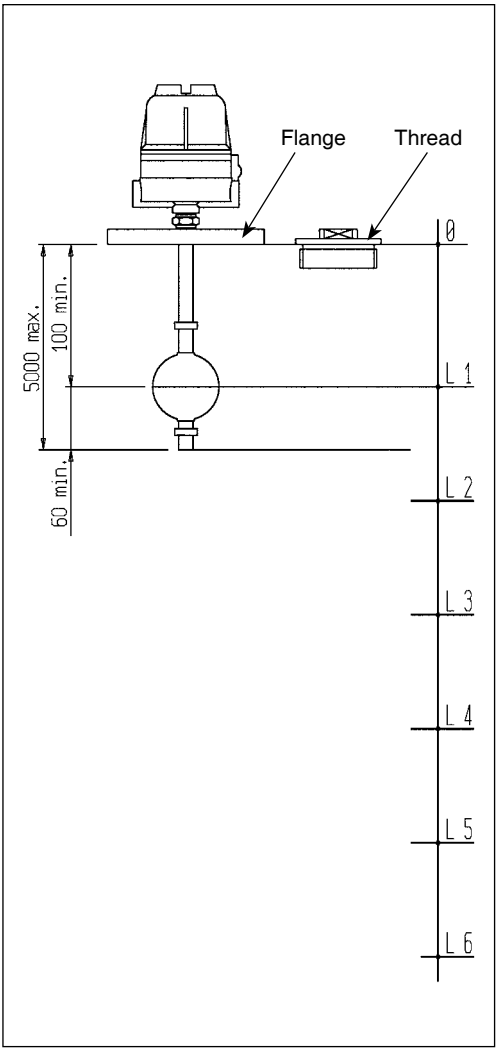
4.1 Maximum number of contacts per instrument

The terminal board inside the housing can connect a maximum number of 18 cables.

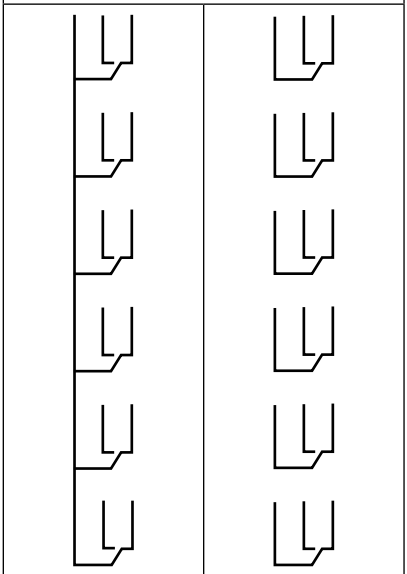
Each contact has the following number of wires:
3 wires in SPDT contacts
6 wires in DPDT contacts

The various possible combinations of contacts must be taken into account - Example of how many contacts can be installed in one instrument:

6 SPDT
or
2 SPDT + 2 DPDT
or
4 SPDT + 1 DPDT etc.

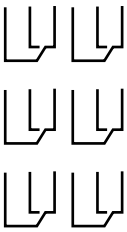


SPDT execution



Contacts in series | Independant contacts

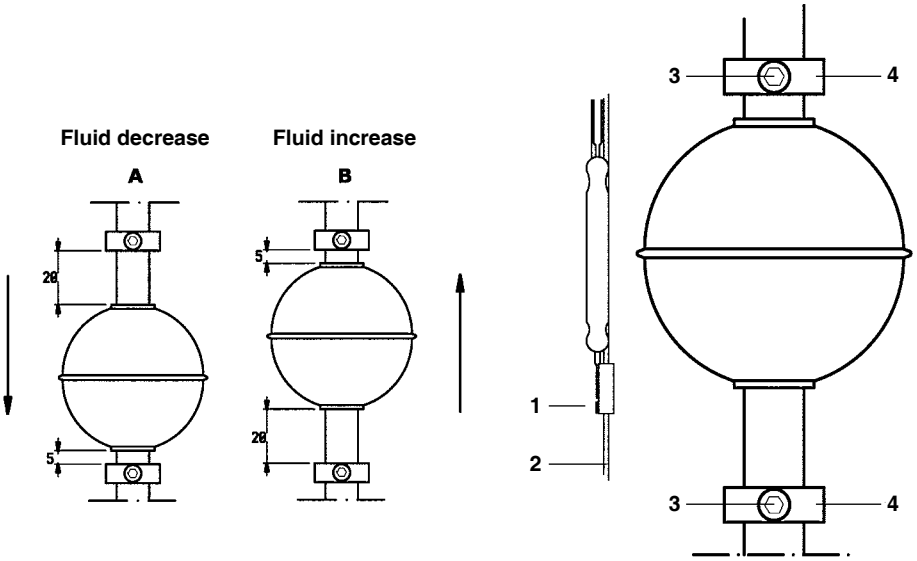
DPDT execution
(two simultaneous SPDT contacts)



Independant contacts

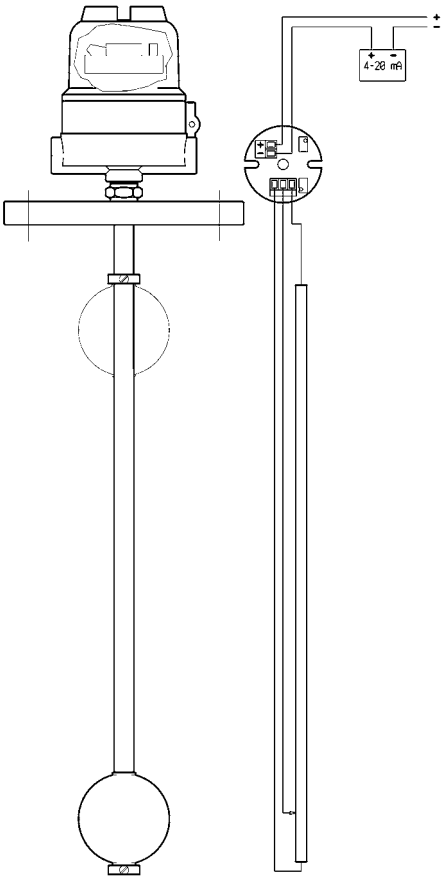
4.2 How to adjust switching point:

1. Disconnect all of the electrical connections.
2. Remove the unit from the tank and lay it carefully on a flat surface.
3. Use a spanner to unscrew the housing screws. Open the housing.
4. Disconnect the wires from the terminal board and unscrew the metallic plate located over the terminal board, undo the rest using a spanner.
5. Slowly remove the wires and fiberglass support. **Caution** be careful not to break the reed switch contacts.
6. Unscrew the contacts screws (**1**). Sliding the fiberglass support (**2**) move the reed switch contact to the new switching point.
7. Firmly fix the screws into the new position.
8. Re-insert fiberglass support and wires inside the tube and tighten all parts.
9. Now move the float position. Unscrew the ring screw (**3** and **4**). Check new switching point by moving the float up to the new position making sure to leave a gap of between 5 mm and 20 mm following the float direction (see **A** and **B**).
10. Double check the new switching position by moving the float to the switching point.
11. Connect the wires to the terminal board.
12. Close the housing.



5.1 Potentiometer transmitter characteristics

A potentiometer, a device comprising a printed circuit board on which a reed /resistance chain is welded, is placed inside the float's vertical guide tube.
The total resistance of a known value is measured at the ends of this potentiometer.
The float, following the liquid level trend, activates the potentiometer's reed contact chain through its own magnetic field, locally closing the signal.
The total value of the resistance, is measured 100% at its maximum level and 0% at its minimum level.
The end poles of the potentiometer are connected to a converter that transforms the input value into Ohm and the output into mA.
Reading resolution available: 5, 10, 20 mm
Resistance input 1 k ÷ 100 k Ohm.



The Ohm-mA signal converters are inside the housing. Three types of converter are available:

1 Converter for safe zone

2 Converter for inbuilt safety zone, ATEX certified.

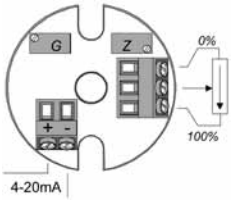
3 Converter suitable for HART® protocol

Resistance input 1 k ÷ 100 k Ohm
Current output 4 ÷ 20 mA

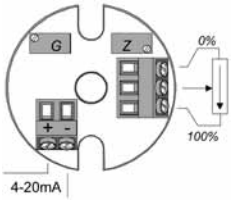
Type **1** and **2** converters can be field set using two trimmers [for the Z (zero) gauging and G (Gain) gauging], without resorting to interconnecting systems.

The type **3** converter must be regulated with an interconnection cable.

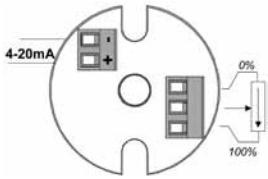
Converter for safe zone



Converter for inbuilt safety zone



Converter suitable for HART® protocol



5.2 Disassembly

Before disassembly of the level switch disconnect or isolate any electricity supply or circuit and depressurize the tank.
Warning: do not disassemble the level switch before the tank has been emptied.

5.2.1 Open housing. For E Ex-d housings wait at least five minutes before open.

5.2.2 Disconnect electric circuit cables. Close housing.

5.2.3 Unscrew connection bolts.

5.2.4 Extract level switch from the tank paying attention to avoid any damage to the float.

Periodical inspections are necessary to guarantee complete efficiency of the unit. A regular maintenance programme starting from its initial installation is recommended. The suggested precautions are important to obtain the best operating conditions of the level control.
The instrument does not require preventive maintenance, however it is recommended that from time-to-time a check of the liquid fluidity is actioned to avoid any suspensions or deposits that can influence wetted parts. Also check that the float moves freely.

6. Spare parts

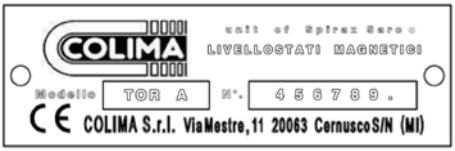
The available spare parts are detailed below. No other parts are supplied as spares.

Available spares

Float	**6**
Contact	**7a**
Transmitter	**7b**
Converter	**2a**

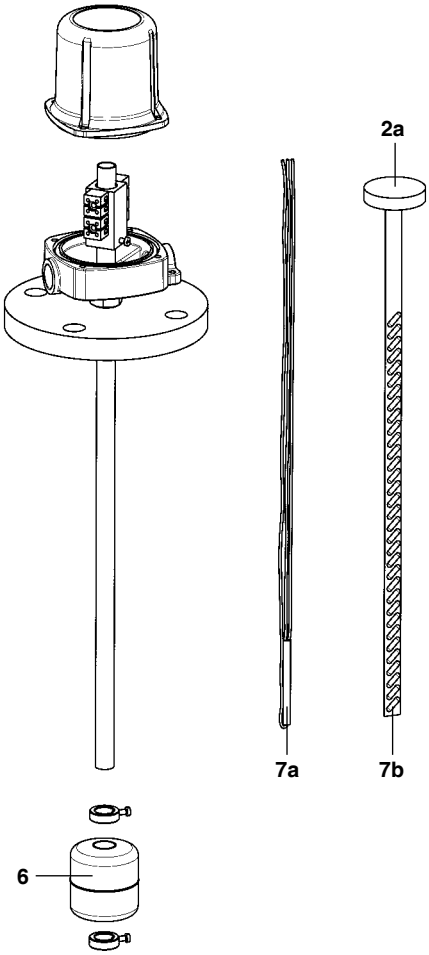
How to order spares

Always order spares by using the description given in the column headed 'Available spares' and state the size and serial number of the unit which is indicated on the name-plate:



Example:

1 off Float for a Spirax Sarco Colima TOR A having DN50 flanged PN6 (AISI 304 stainless steel) connections - Serial number 456789.



REPAIRS
Please contact your nearest Spirax Sarco Branch Office or Agent, or directly to:
Spirax Sarco S.r.l.
Via per Cinisello, 18 - 20834 Nova Milanese (MB)
Tel.: +39 0362 49 17.1
Fax: +39 0362 49 17 307

LOSS OF GUARANTEE
Total or partial disregard of the above instructions involves loss of any rights to guarantee.

Spirax-Sarco s.r.l. - Via per Cinisello, 18 - 20834 Nova Milanese (MB) - Tel.: +39 0362 49 17.1 - Fax +39 0362 49 17 307

Cert. No. LRQ 0963008

ISO 9001

TI-P324-02
CH Issue 1

Colima 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.

Type **TOR A** made entirely of stainless steel, with weatherproof housing and thread connection.

Regulations and certifications

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

Available types

TOR

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

A

TOR

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

B

TOR

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

PC

TOR

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

PP

TOR

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

PF

TOR

The compact type **CD** is recommended for applications in hydraulic control units. It can also be used with liquids with low specific weight such as hydrocarbons and mineral oils. The floats are made of stainless steel or BUNA N, the other wetted parts are made of stainless steel.
The compact type **CD** 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 weatherproof execution.
For hazardous areas in explosion-proof execution ATEX ⟨Ex⟩ II 1/2 G EEx d IIC T6, T5 resp. T4 certified.
Only for TOR CD DIN IP64 connector.

Electrical equipment

SPST SPDT
DPDT (two simultaneous SPDT contacts)

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.

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 normally open (NO) to normally closed (NC) position 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	Ø44	**44**	Flanges ≥ DN50 - 2" ASME (ANSI)	Ø55	**55**	Flanges ≥ DN65 - 2½" ASME (ANSI)
				Ø72	**72**	Flanges ≥ DN80 - 3" ASME (ANSI)
Buna N	Ø44	**44**	Flanges ≥ DN50 - 2" ASME (ANSI)	Ø58	**58**	Flanges ≥ DN65 - 2½" ASME (ANSI)
Plastic	Ø70	**70**	Flanges ≥ DN80 - 3" ASME (ANSI)			

Float diameters to be used with threaded type

Steel	Ø44	**44**	Thread ≥ G 1½" M (NPT notn applicable)	Ø55	**55**	Thread ≥ G 2" M (NPT non applicable)
				Ø72	**72**	Thread ≥ G 3" M
Buna N	Ø30	**30**	Thread ≥ G 1" M	Ø58	**58**	Thread ≥ G 2½" M
	Ø44	**44**	Thread ≥ G 1½" M			
Plastic	Ø70	**70**	Thread ≥ G 2½" M			

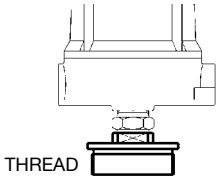
Note: the size of the float is subject to fluid specific gravity; the sizes shown are for standard floats. Other sizes can be made on request.

Process connections

UNI and ASME (ANSI) flanges **FL**

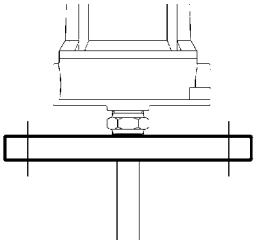
UNI	PN6	PN10/PN16		PN40	PN64
DN50	UA	UB		UC	UD
DN65	UE	UF		UG	UH
DN80	UI	UL	UM	UN	UO
DN100	UP	UQ		UR	US
DN125	UT	UU		UV	UZ

ASME	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
1"	F
1½"	FA
2"	FB
2½"	FC
3"	FD
4"	FE

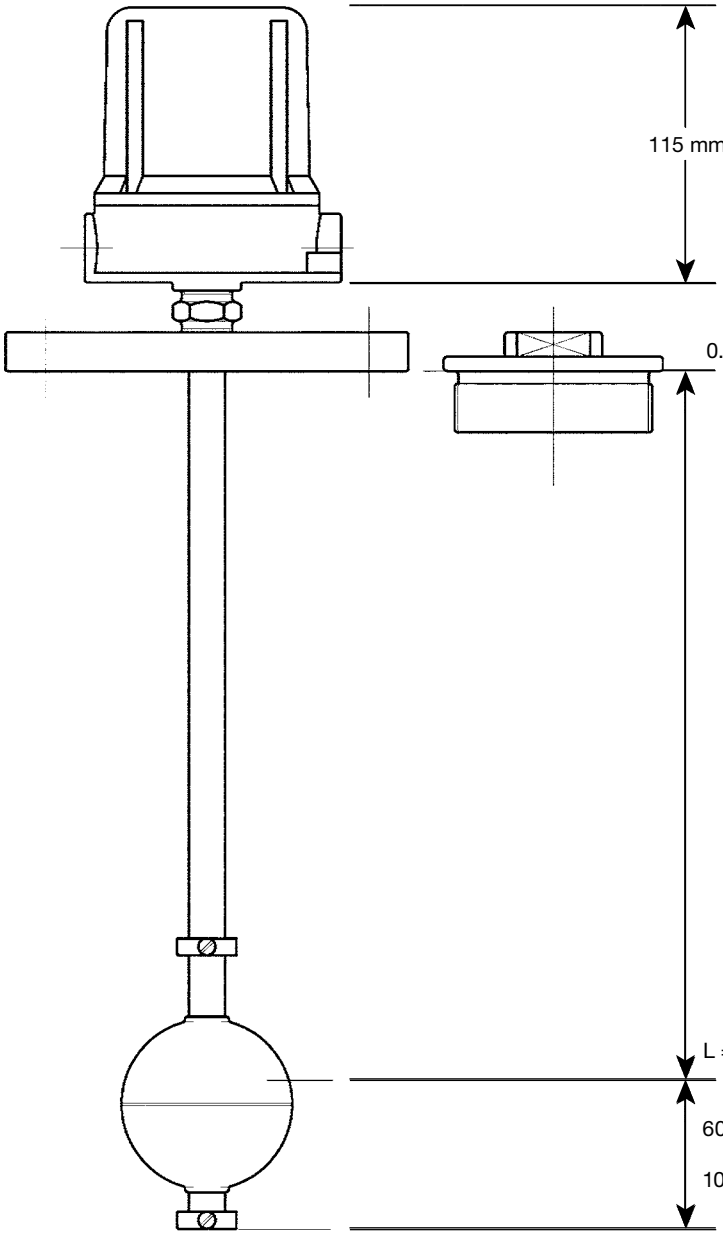


Flanges and threads are available in other sizes on request.

Design conditions

TMA - Maximum allowable temperature	Steel		-110 to +200°C
	Buna N		-20 to +80°C
	Plastic	PVC	-20 to +70°C
		PP	-20 to +105°C
		PVDF	-20 to +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 weatherproof housing, steel float and a reed switch contact

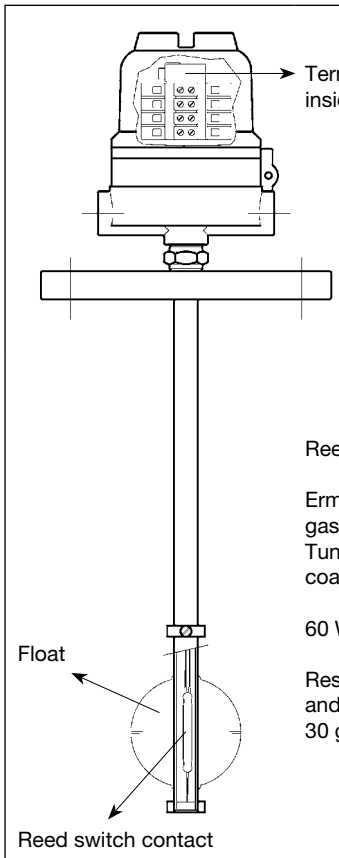


Colima electrical equipment and housings for Colima TOR series magnetic level switches

Description

The electrical equipment in TOR series magnetic level switches comprises one or more reed switch contacts, fitted inside a sealed stainless steel tube.
Wires are welded to the contacts connected to the terminal board inside the housing.
Contacts are activated by floats that slide along the tube. The floats contain a magnetic system that, when the level of liquid rises or falls, switch the state of each contact quickly and reliably.
The position of the contacts at the required switching points are set in the factory but is always field adjustable.

Reed switch contact characteristics



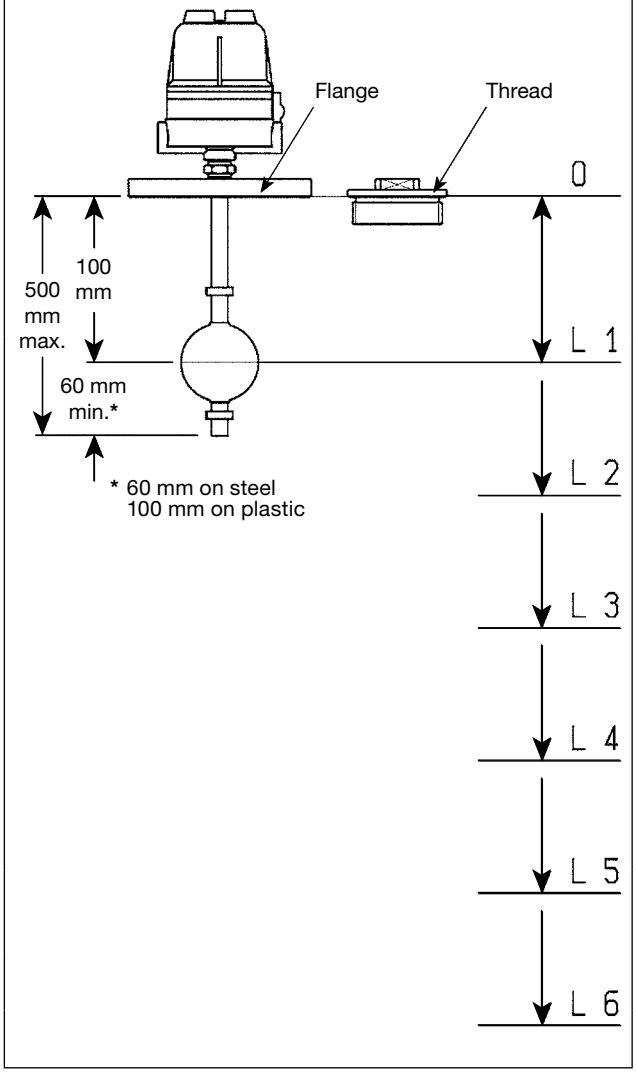
Reed switch contact.

Ermetically sealed in inert gas.
Tungsten with Rhodium coating.

60 W/VA 1 A 250 V ≅

Resistance to shock and vibrations.
30 g 11 ms

A



SPDT execution	**1**
DPDT execution (two simultaneous SPDT contacts)	**2**

Wiring diagram

Maximum number of contacts per instrument

The terminal board inside the housing can connect a maximum number of 18 cables.

Each contact has the following number of wires:

- **3** wires in **SPDT** contacts
- **6** wires in **DPDT** contacts

The various possible combinations of contacts must be taken into account:

(Example of how many contacts can be installed in one instrument:

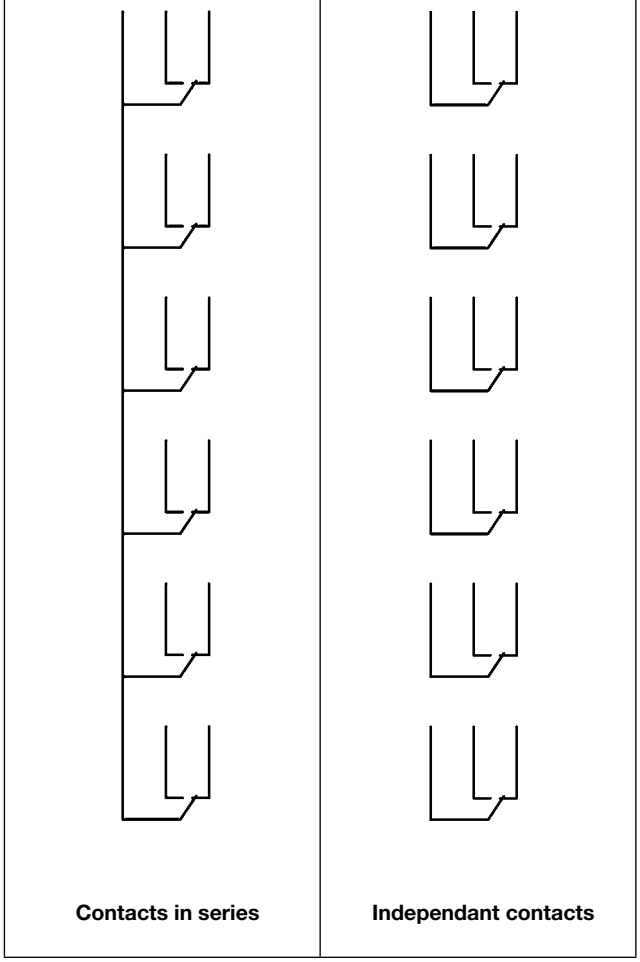
6 SPDT or

2 SPDT + 2 DPDT or

5 SPDT or

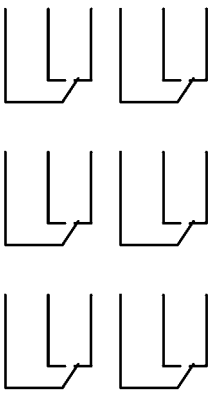
4 SPDT + 1 DPDT etc.).

SPDT execution



Contacts in series | **Independant contacts**

DPDT execution (two simultaneous SPDT contacts)



Independant contacts

Potentiometer transmitter characteristics

A potentiometer, a device comprising a printed circuit board on which a reed/resistance chain is welded, is placed inside the float's vertical guide tube.

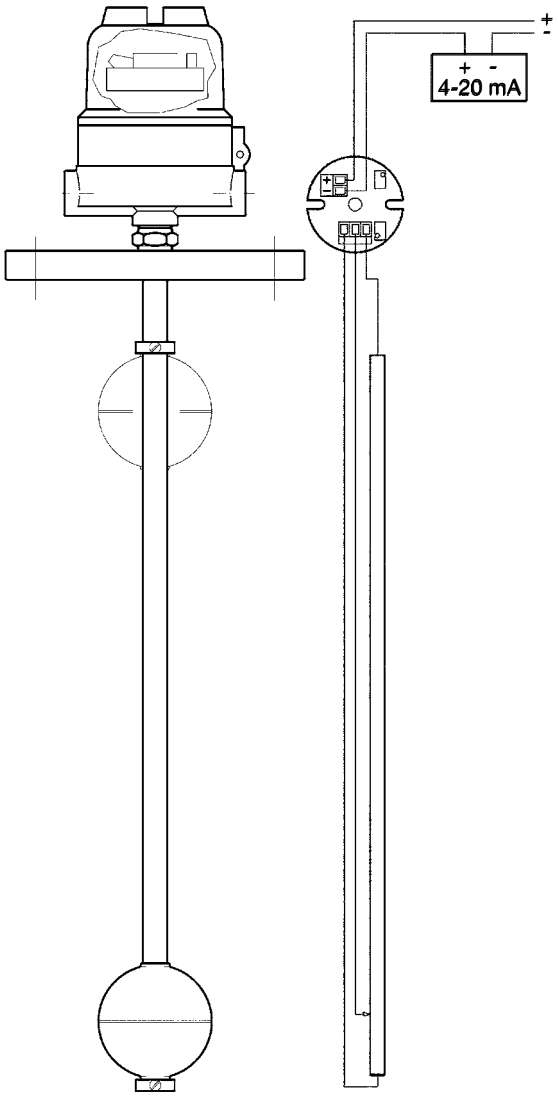
The total resistance of a known value is measured at the ends of this potentiometer.

The float, following the liquid level trend, activates the potentiometer's reed contact chain through its own magnetic field, locally closing the signal.

The total value of the resistance, is measured 100% at its maximum level and 0% at its minimum level.

The end poles of the potentiometer are connected to a converter that transforms the input value into Ohm and the output into mA.

Reading resolution available: 5, 10, 20 mm
Resistance input 1 k ÷ 100 k Ohm.



T

Converter characteristics

The Ohm-mA signal converters are inside the housing.

Three types of converter are available:

- Converter for safe zone
- Converter for inbuilt safety zone, ATEX certified.
- Converter suitable for HART® protocol

Resistance input 1 k ÷ 100 k Ohm

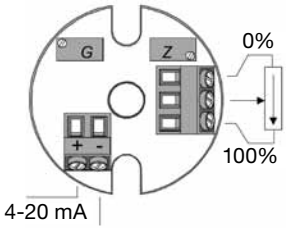
Current output 4÷20 mA

Type 1 and 2 converters can be field set using two trimmers [for the Z (zero) gauging and G (Gain) gauging], without resorting to interconnecting systems.

The type 3 converter must be regulated with an interconnection cable.

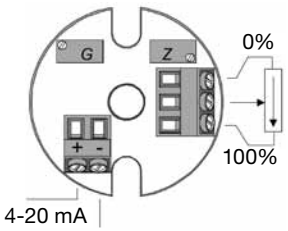
C

Converter for safe zone



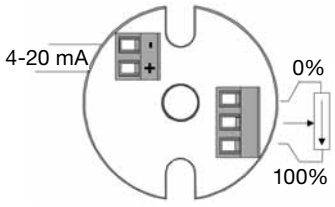
1

Converter for inbuilt safety zone



2

Converter for HART® protocol



3

The TOR series magnetic level switch housings are available in various forms to meet all possible application needs and are suited to most environmental and safety conditions.
They are available in the normal version for general use and the explosion-proof version for use in hazardous areas.

Weatherproof housing

Type **1** is designed for use on general purpose industrial applications.
Manufactured using pressure die-cast aluminium and protected with polyamide paint.
Protection degree IP67.
Up to two cable entrances.

1

Weatherproof housing

The type **2** has been designed for lower temperature applications, installation in high concentration saline environments and for use in the food industry.
Manufactured entirely in stainless steel.
Protection degree IP67.
On request IP68.
Up to two cable entrances.

2

Explosion-proof housing

The type 3 has an explosion-proof housing - ATEX certified ⟨Ex⟩ II 1/2 G EEx d IIC T6, T5 resp. T4 for use in hazardous areas.
Manufactured using pressure die-cast aluminium with a polyamide paint.
Protection degree IP67.
Up to two cable entrances.

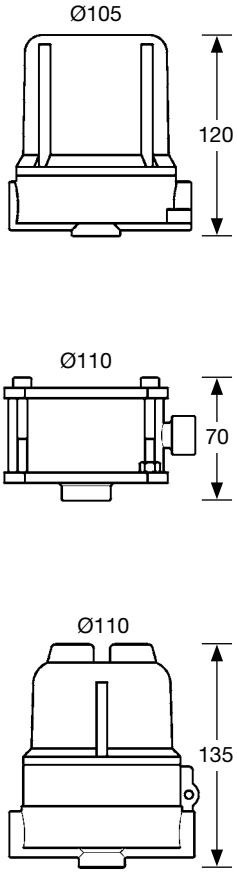
3

Electrical connections

The housings allow for two cable entry points which are available as follows:

Standard	G ½" F	**A**
Explosion-proof	Gk ½" F	**B**
On request	½" NPT F	**C**
	M20 x 1.5	**D**
	PG 13.5	**E**

Dimensions (approximate) in mm



Product selection and order placement

Each unit is identified by a unique alphanumeric code that defines the manufacturing characteristics that best suites the application. Please confirm the following information before commencement of the product configuration.

Process pressure = _____ Process temperature = _____

Design pressure = _____ Design temperature = _____

Fluid type = _____

Specific gravity of fluid = _____

Viscosity of fluid = _____

Range		Colima		Colima
Model	**T**	TOR		**T**
Type	**A**	Wetted parts stainless steel		**A**
	B	Wetted parts stailess steel, float BUNA N		
	PC	Wetted parts PVC		
	PP	Wetted parts PP		
	PF	Wetted parts PVDF		
	CD	Miniature type without housing, DIN connector with plug		
Rod lenght	**Insert lenght** (100 to 5000 mm)			
	CD Model (100 to 1500 mm)			
Option	**T**	Anti-turbulence tube		**T**
Housing	**1**	IP67 General purpose		**1**
*	**2**	IP67 Stainless steel (2 SPDT max) *economic version		
	3	ATEX certified (ATEX 94 / 9 / EC)		
Electrical connections	**1**	G ½" F		**1**
	2	Gk ½" F		
	3	½" NPT F		
	4	M20 x 1.5		
	5	PG 13.5		
Connections	**F**	Flanged connection		**F**
	T	Thread connection		
Flange or thread material	**1**	A 105 stainless steel		**2**
	2	304 stainless steel		
	3	316L stainless steel		
	4	PVC		
	5	PP		
	6	PVDF		
Flange or thread rating	Refer to page 3			**UA**
Float material	**A**	316 stainless steel	(-25°C to 350°C)	**B**
	B	Titanium	(-25°C to 350°C)	
	C	Monel	(-25°C to 350°C)	
	D	Hastelloy	(-25°C to 350°C)	
	E	PVC	(-20°C to 70°C)	
	F	PP	(-20°C to 105°C)	
	G	PVDF	(-20°C to 130°C)	
	H	BUNA N	(-20°C to 80°C)	
Float diameter	**44**	Ø 44 steel (>DN50 - 2" ASME)		**72**
	55	Ø 55 steel (>DN65 - 2½" ASME)		
	72	Ø 72 steel (>DN80 - 3" ASME)		
	44	Ø 44 Buna N (>DN50 - 2" ASME)		
	58	Ø 58 Buna N (>DN65 - 2½" ASME)		
	55	Ø 55 plastic (>DN65 - 2½" ASME)		
	70	Ø 70 plastic (>DN80 - 3" ASME)		
Float number	from 1 up to 6			**2**
Electrical equipment switches	**1**	SPDT		**2**
	2	DPDT		
SPDT contact number	from 1 up to 6			
DPDT contact number	from 1 up to 3			
Electrical equipment transmitter	**T5**	5 mm		**T10-C3**
	T10	10 mm		
	T20	20 mm		
	C3	Converter for safe area		
	C4	Converter for in built safe area		
	C5	Converter Hart® protocol		

How to order example: 1 off Spirax Sarco Colima T-A-T-1-1-F-2-UA-B-72-2-2-T10-C3.

Certificate n.
LRC 180457

spirax sarco

ATTESTATO DI CONFORMITA' ALL'ORDINAZIONE

CERTIFICATE OF COMPLIANCE WITH ORDER

ATTESTATION DE CONFORMITE' A' LA COMMANDE

EN 10204 2.1

N. **80953**

PAG./sh. **1**

data/data **15/11/12**

CLIENTE *cutomer/client* **DESMET BALLESTRA OLEO SPA** **POMEZIA ROMA**

ORDINE *order/commande* **121271** DATA/date **29/05/12**

NOSTRA CONFERMA *our order/notre commande* : **612517** DATA/date **05/06/12**

POS. *Item*	DESCRIZIONE *Description*	Ns.commessa Our job	MATRICOLA/TARGA *Serial n./tag - repare*	Q.TA' *q.ty/nombre*
1	MEC A INTERRUTTORE DI LIVELLO	775499		1
2	MEC A INTERRUTTORE DI LIVELLO	775500		1
3	MEC A INTERRUTTORE DI LIVELLO	775501		1
4	MEC A INTERRUTTORE DI LIVELLO	775502		1
5	LIVELLOSTATO MAGN.TOR A	775503		1
6	LIVELLOSTATO MEC A	775504		1
7	LIVELLOSTATO MEC A	775505		1

CERTIFICHIAMO CHE LA FORNITURA E' STATA COLLAUDATA ED E' CONFORME AGLI ACCORDI DI ACCETTAZIONE DELL'ORDINE.

WE HEREBY CERTIFY THAT THE MATERIAL DESCRIBED ABOVE HAS BEEN TESTED AND COMPLIES WITH T HE TERMS OF THE ORDER.

NOUS CERTIFIONS QUE LA LIVRAISON ETAIT VERIFIEE ET EST CONFORME AUX STIPULATION DE L'ACCEPTION DE LA COMMANDE.

SPIRAX SARCO SRL

COLLAUDO
INSPECTION TEST

201207/1013
M-COL 02
09/06

Cliente / Customer	**DESMET BALLESTRA SPA-VIA PIERO PORTALUPPI 17-20138 MILANO**
Ordine / Order	**120271**
Commessa / Job	**775503**
Ns.conferma/Confirmation	**549412**

LIVELLOSTATO MAGNETICO SERIE	**MAGNETIC LEVEL SWITCH**
TOR A	**TOR A**

☒ QUANTITA' 1

☒ *QUANTITY 1*

☒ 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*
120862

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

Allegati / *Attached*

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

QUESTO CERTIFICATO E' VALIDO PER
THIS CERTIFICATE IS VALID FOR
CLIENTE DESMET BALLESTRA SPA
CUSTOMER
ORDINE 120271
ORDER
Spirax Sarco s.r.l. - NOVA MIL. (MB) - ITALY

Data / *Date* 30/07/2012

Firma / *Signature*

COLIMA S.r.l.

COLIMA LIVELLOSTATI MAGNETICI MILANO ITALIA	**DICHIARAZIONE DI CONFORMITÀ** **CE**	**DCE n°** 702858 **Data** 17/07/2012

COLIMA S.r.l.

Via Mestre, 11 – 20063 Cernusco sul Naviglio – Milano – Italia

dichiara che il prodotto:

LIVELLOSTATI MAGNETICI serie **TOR A**

Ns. matricole n. **122676**

- è stato realizzato in conformità con quanto previsto dalle seguenti Direttive Comunitarie e dalla relativa Legislazione Nazionale di recepimento:

2006/95/CE

e successive modifiche

- e che sono state applicate le seguenti Norme armonizzate:

CEI EN 60947-1

CEI EN 60947-5-1

CEI EN 61180-1

CEI EN 60529

QUESTO CERTIFICATO E' VALIDO PER
THIS CERTIFICATE IS VALID FOR
CLIENTE DESMET BALLESTRA SPA
CUSTOMER
ORDINE 121271
ORDER
Spirax Sarco s.r.l. - NOVA MIL. (MB) - ITALY

COLIMA S.r.l.

COLIMA LIVELLOSTATI MAGNETICI MILANO ITALIA	**COMPLIANCE DECLARATION** **CE**	**DCE n°** 702858 **Date** 17/07/2012

COLIMA S.r.l.

Via Mestre, 11 20063 Cernusco sul Naviglio - Milano - Italia

declares that the product:

MAGNETIC LEVEL SWITCHES type **TOR A**
Serial numbers **122676**

- complies with the requirements forseen by the following European Directives and by relevant National Laws:

2006/95/CE
and following updates

- and that the following european standards have been applied:

CEI EN 60947-1

CEI EN 60947-5-1

CEI EN 61180-1

CEI EN 60529

QUESTO CERTIFICATO E' VALIDO PER
THIS CERTIFICATE IS VALID FOR
CLIENTE DESMET BALLESTRA SPA
CUSTOMER
ORDINE 121271
ORDER
Spirax Sarco s.r.l. - NOVA MIL... (MI) - ...

COLIMA S.r.l.

COLLAUDO
INSPECTION TEST

201207/1012
M-COL 02

Cliente / Customer	**DESMET BALLESTRA SPA-VIA PIERO PORTALUPPI 17-20138 MILANO**
Ordine / Order	**120271**
Commessa / Job	**775500/501/502-775499**
Ns.conferma/Confirmation	**549412**

LIVELLOSTATO MAGNETICO SERIE	**MAGNETIC LEVEL SWITCH**
MEC A	**MEC A**

☒ QUANTITA' 4

☒ *QUANTITY 4*

☒ 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*
122741÷743/122651

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

Allegati / *Attached*

Tag Cliente / *Customer's tags*

LSL62.8,LSH63.1-LSL63.1-LSH62.8

QUESTO CERTIFICATO E' VALIDO PER
THIS CERTIFICATE IS VALID FOR
CLIENTE DESMET BALLESTRA
CUSTOMER S PA
ORDINE 121271
ORDER
Spirax Sarco s.r.l. - NOVA MIL. (MB) - ITALY

Data / *Date* 30/07/2012

Firma / *Signature*

COLIMA S.r.l.

COLIMA LIVELLOSTATI MAGNETICI MILANO ITALIA	**DICHIARAZIONE DI CONFORMITÀ** **CE**	**DCE n°** 702858 **Data** 17/07/2012

COLIMA S.r.l.

Via Mestre, 11 20063 Cernusco sul Naviglio – Milano – Italia

dichiara che il prodotto:

LIVELLOSTATO MAGNETICO serie **MEC A**

Ns. matricola n. **122741÷743/122651**

- è stato realizzato in conformità con quanto previsto dalle seguenti Direttive Comunitarie e dalla relativa Legislazione Nazionale di recepimento:

2006/95/CE

e successive modifiche

- e che sono state applicate le seguenti Norme armonizzate:

CEI EN 60947-1

CEI EN 60947-5-1

CEI EN 61180-1

CEI EN 60529

QUESTO CERTIFICATO E' VALIDO PER
THIS CERTIFICATE IS VALID FOR
CLIENTE DESMET BALLESTRA SPA
CUSTOMER
ORDINE 121271
ORDER
Spirax Sarco s.r.l. - NOVA MIL. (MB) -

COLIMA S.r.l.

LIVELLOSTATI MAGNETICI MILANO ITALIA	**COMPLIANCE DECLARATION** **CE**	**DCE n°** 702858 **Date** 17/07//2012

COLIMA S.r.l.

Via Mestre, 11 20063 Cernusco sul Naviglio - Milano - Italia

declares that the product:

MAGNETIC LEVEL SWITCH type **MEC A**

Our Serial number **122741÷743/122651**

- complies with the requirements forseen by the following European Directives and by relevant National Laws:

2006/95/CE

and following updates

- and that the following european standards have been applied:

CEI EN 60947-1

CEI EN 60947-5-1

CEI EN 61180-1

CEI EN 60529

QUESTO CERTIFICATO E' VALIDO PER
THIS CERTIFICATE IS VALID FOR
CLIENTE DESMET BALLESTRA SPA
CUSTOMER
ORDINE 12.12.71
ORDER
Spirax Sarco s.r.l. - NOVA MIL. (MB) - IT...

COLIMA S.r.l.

COLLAUDO
INSPECTION TEST

201207/1011
M-COL 02

Cliente / Customer	**DESMET BALLESTRA SPA-VIA PIERO PORTALUPPI 17-20138 MILANO**
Ordine / Order	**120271**
Commessa / Job	**775504/05**
Ns.conferma/Confirmation	**549412**

LIVELLOSTATO MAGNETICO SERIE	**MAGNETIC LEVEL SWITCH**
MEC A	**MEC A**

☒ QUANTITA' 2

☒ *QUANTITY 2*

☒ 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*
122744÷745

Tag Cliente / *Customer's tags*
LSH64.1-LSL64.1

QUESTO CERTIFICATO E' VALIDO PER
THIS CERTIFICATE IS VALID FOR
CLIENTE DESMET BALLESTRA
CUSTOMER S.P.A.
ORDINE 121271
ORDER

Allegati / *Attached*

Data / *Date* 30/07/2012

Firma / *Signature*

COLIMA S.r.l.

COLIMA LIVELLOSTATI MAGNETICI MILANO ITALIA	**DICHIARAZIONE DI CONFORMITÀ** **CE**	**DCE n°** 702858 **Data** 17/07/2012

COLIMA S.r.l.

Via Mestre, 11 20063 Cernusco sul Naviglio – Milano – Italia

dichiara che il prodotto:

LIVELLOSTATO MAGNETICO serie **MEC A**

Ns. matricola n. **122744÷745**

- è stato realizzato in conformità con quanto previsto dalle seguenti Direttive Comunitarie e dalla relativa Legislazione Nazionale di recepimento:

2006/95/CE

e successive modifiche

- e che sono state applicate le seguenti Norme armonizzate:

CEI EN 60947-1

CEI EN 60947-5-1

CEI EN 61180-1

CEI EN 60529

QUESTO CERTIFICATO E' VALIDO PER
THIS CERTIFICATE IS VALID FOR
CLIENTE DESMET BALLESTRA
CUSTOMER S PA
ORDINE 12-12-1-1
ORDER
Spirax Sarco s.r.l. - NOVA MIL. (MB) - ITALY

COLIMA S.r.l.

LIVELLOSTATI MAGNETICI MILANO ITALIA	**COMPLIANCE DECLARATION** **CE**	**DCE n°** 702858 **Date** 17/07//2012

COLIMA S.r.l.

Via Mestre, 11 20063 Cernusco sul Naviglio - Milano - Italia

declares that the product:

MAGNETIC LEVEL SWITCH type **MEC A**

Our Serial number **122744÷745**

- complies with the requirements forseen by the following European Directives and by relevant National Laws:

2006/95/CE

and following updates

- and that the following european standards have been applied:

CEI EN 60947-1

CEI EN 60947-5-1

CEI EN 61180-1

CEI EN 60529

QUESTO CERTIFICATO E' VALIDO PER
THIS CERTIFICATE IS VALID FOR
CLIENTE DESMET BALLESTRA SPA
CUSTOMER
ORDINE 121271
ORDER
Spirax Sarco s.r.l. - NOVA MIL. (MB) - ITALY

COLIMA S.r.l.