

TI-P329-01

CTLS Issue 2

spirax

sarco

Colima Visco  
and Colima Viscorol  
Magnetic Level Indicators

Description

Colima Visco and Colima Viscorol magnetic level indicators have been designed for optical viewing of liquid levels in most industrial applications. They are also suitable for high pressure and high temperature applications and the range is complemented by having a pharmaceutical grade option available when requested. The indicators can be equipped with electrical contacts or with a potentiometer transmitter for full automation of process management, including pressurised tanks, vats, boilers, for the control of pumps, valves and alarm systems.

Mounting

The Colima Visco and Colima Viscorol magnetic level indicators are installed on the side of the tank (bypass system) or vertically on the top of the tank.

Available types

LL	Side/side mounted
LF	Side/base mounted
LT	Side/top mounted
TF	Top/base mounted
R	Top insertion only
GV	Side/side mounted. Specifically designed to control methane-gas odorant
GDV	

Options

Electrical bistable reed switch contacts, placed at the required levels, thus allowing control of several operating points with a single instrument.  
When equipped with a potentiometer transmitter, they allow continuous reading of liquid level.

Standards and certification

Colima Visco and Colima Viscorol magnetic level indicators comply with the following European Directives:

- PED 97/23/EC - up to Class IV.
- ATEX 94/9/EC (for electrical equipment only).
- 73/23 CEE (for electrical equipment only).
- Products intended for use in the Naval and Marine sectors are RINA and M.M.I (Italian navy) approved.

Indicator body sizes

Steel	25	Ø tube 25 - R type only
	50	Ø tube 48 - Maximum pressure 12 bar g
	60	Ø tube 60
	70	Ø tube 76
Plastic	70	Ø tube 76 - Maximum pressure 16 bar g



Colima Visco



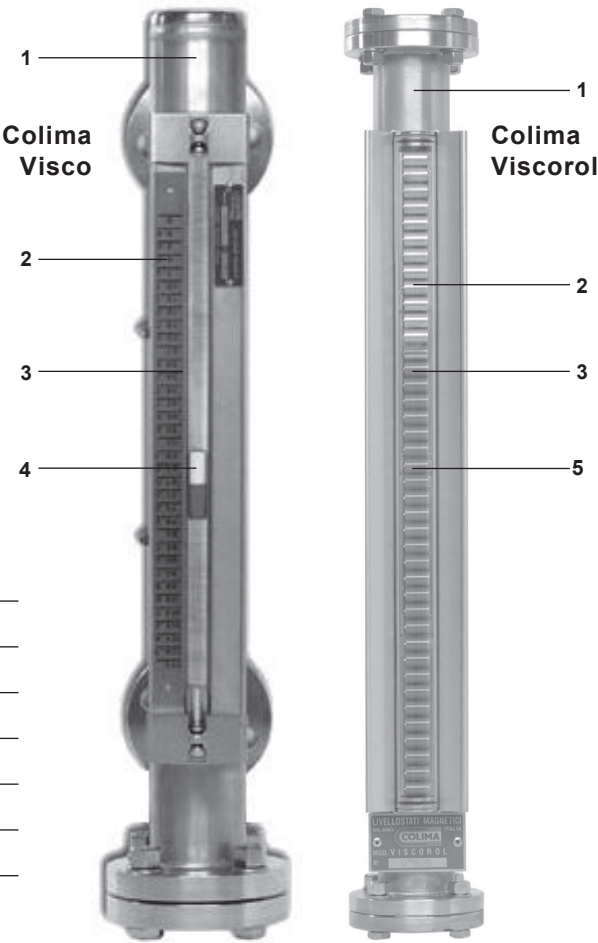
Colima Viscorol

Control systems  
Magnetic level indicators

Body sizes and end connections

Flanged: DN20, DN25, DN40, DN50, DN65 and DN80  
Screwed, socket weld and butt weld: ½", ¾", 1", 1½", 2", 2½" and 3"

Please note: See page 3 for the full data regarding the range of connections available.



Materials

No.	Part	Material
1	Indicator body	304/316L/316Ti/PVC/PP/PVDF
2	Scale	Graduated or neutral
3	Glass tube	Polycarbonate or Pyrex
4	Two colour indicator	Plastic or alnico
5	Two colour rollers	Plastic or aluminium
6	Float (not shown)	316L/316Ti/Titanio/Hastelloy PVC/PP/PVDF/Buna N

Design conditions

TMA	Maximum allowable temperature	Steel	-25 to+350 °C
		PVC	-20 to +70 °C
		PP	-20 to+105 °C
		PVDF	-20 to+130 °C
PMA	Maximum allowable pressure	Steel	< 125 bar g
		Plastic	< 16 bar g
Specific gravity of fluid		Steel and plastic	> 0.8 kg/l
		Buna N/Titanium	> 0.5 kg/l
Two-colour line marker material and rollers		Polycarbonate	T < 180 °C
		Aluminium	T < 350 °C

Body sizes and end connections

Flanged, screwed, socket weld and butt weld	DN20, DN25, DN40, DN50, DN65 and DN80 ½", ¾", 1", 1½", 2", 2½" and 3"
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Side process connections (types LL, LF, LT)

Please note that other screwed and flanged connections are available on request.

Flanged (FL) EN 1092 and ASME (ANSI)

EN 1092	UA	DN20	PN16
	UB	DN20	PN40
	UC	DN20	PN64
	UD	DN20	PN100
	UE	DN25	PN16
	UF	DN25	PN40
	UG	DN25	PN64
	UH	DN25	PN100
	UI	DN40	PN16
	UL	DN40	PN40
	UM	DN40	PN64
	UN	DN40	PN100
ASME	AA	¾"	Class 150
	AB	¾"	Class 300
	AC	¾"	Class 600
	AD	¾"	Class 1500
	AE	1"	Class 150
	AF	1"	Class 300
	AG	1"	Class 600
	AJ	1"	Class 1500
	AK	1½"	Class 150
	AH	1½"	Class 300
	AI	1½"	Class 600
	AL	1½"	Class 1500

Screwed (TH)

Gk M	GA	½"
	GB	¾"
	GC	1"
	GD	1½"
NPT-M	NA	½"
	NB	¾"
	NC	1"
	ND	1½"

Socket weld (SW) or Butt weld (BW)

SW	SA	½"
	SB	¾"
	SC	1"
	SD	1½"
BW	BA	½"
	BB	¾"
	BC	1"
	BD	1½"

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Top and bottom process connections (types TF, LF, LT)

Please note that other screwed and flanged connections are available on request.

Flanged (FL) EN 1092 and ASME (ANSI)

EN 1092	UA	DN50	PN16
	UB	DN50	PN40
	UC	DN50	PN64
	UD	DN50	PN100
	UE	DN65	PN16
	UF	DN65	PN40
	UG	DN65	PN64
	UH	DN65	PN100
	UI	DN80	PN16
	UL	DN80	PN40
	UM	DN80	PN64
	UN	DN80	PN100
ASME	AA	2"	Class 150
	AB	2"	Class 300
	AC	2"	Class 600
	AD	2"	Class 1500
	AE	2½"	Class 150
	AF	2½"	Class 300
	AG	2½"	Class 600
	AH	2½"	Class 1500
	AI	3"	Class 150
	AJ	3"	Class 300
	AK	3"	Class 600
	AL	3"	Class 1500

Screwed (TH) on the counterflange

Gk M	GA	½"
	GB	¾"
	GC	1"
NPT-M	NA	½"
	NB	¾"
	NC	1"

Socket weld (SW) or Butt weld (BW) on the counterflange

SW	SA	½"
	SB	¾"
	SC	1"
BW	BA	½"
	BB	¾"
	BC	1"

Connection type R

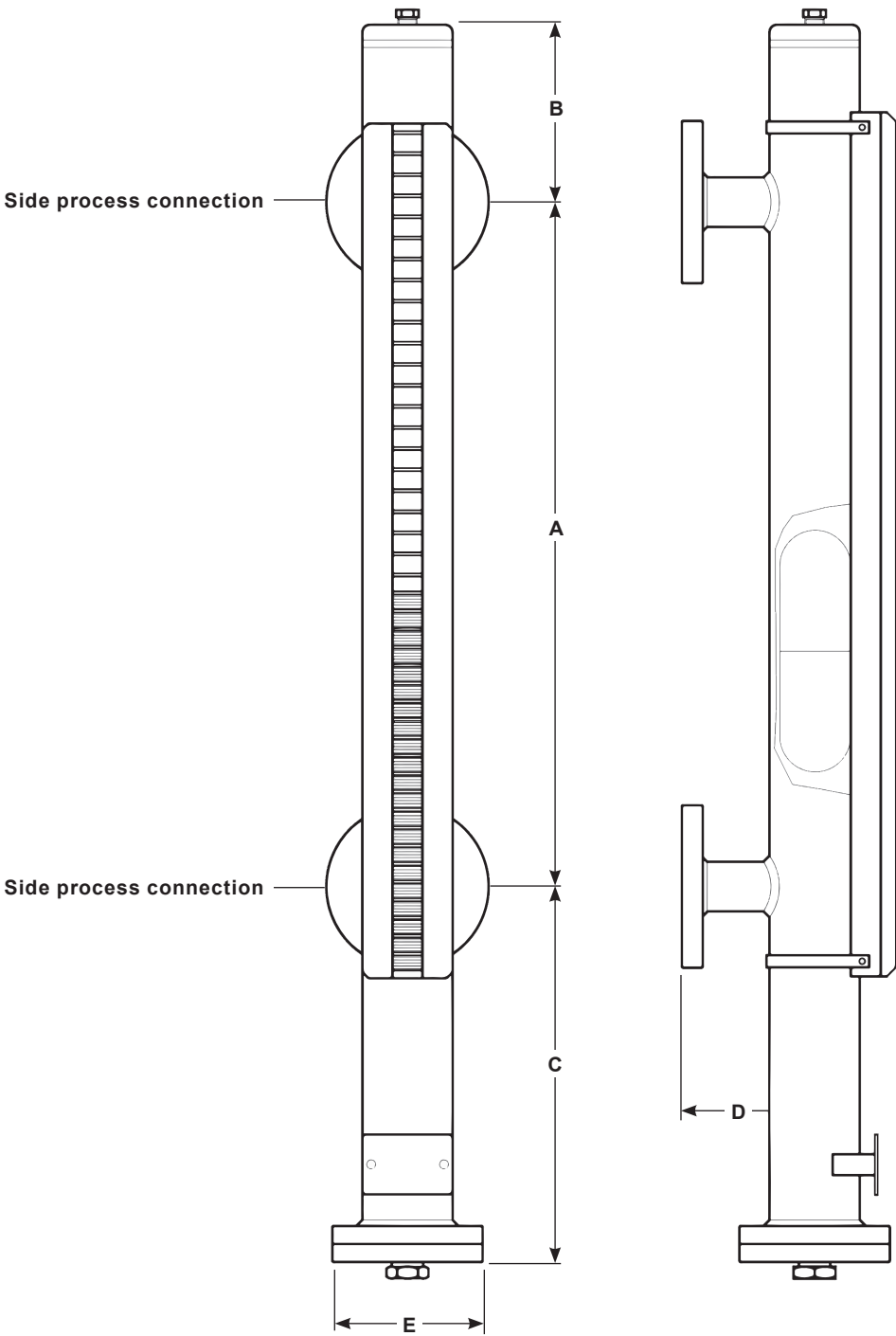
External diameter flange: minimum 100 mm

Control systems  
Magnetic level indicators

Dimensions/weights (approximate) in mm and kg

A	Minimum length	200
	Maximum length	5700
B	Minimum	100
C	Depending on fluid specific gravity and pressure	Starting from 250
D	Depending on fluid specific gravity and pressure	Starting from 80
E	Depending on fluid specific gravity and pressure	Starting from 85


Weights Dependent on dimension A



Accessories

Contacts

Bistable SPDT or DPDT contacts, fixed onto the guide system fitted outside of the indicator body.

Also available in explosion-proof type, ATEX  II 1/2 G EEx d IIC T6, T5 resp. T4 certified. Protection degree IP67.

Operation points are always field adjustable.

SPDT execution	
DPDT execution (two simultaneous SPDT contacts)	
Contact data	Reed switch contact
	Ermetically sealed in inert gas
	Tungsten, Rhodio coated.
	60 W/VA 1A 250 V ≅
	Shock and vibration resistance: 30 g 11 ms

Transmitter

Potentiometer transmitter with 5, 10, 20 mm resolution for the continuous evaluation of the liquid level inside the tank.

Valves

The indicators are supplied with a hole and ss plug or with a 1/4" drainage valve. A vent can also be supplied on request.

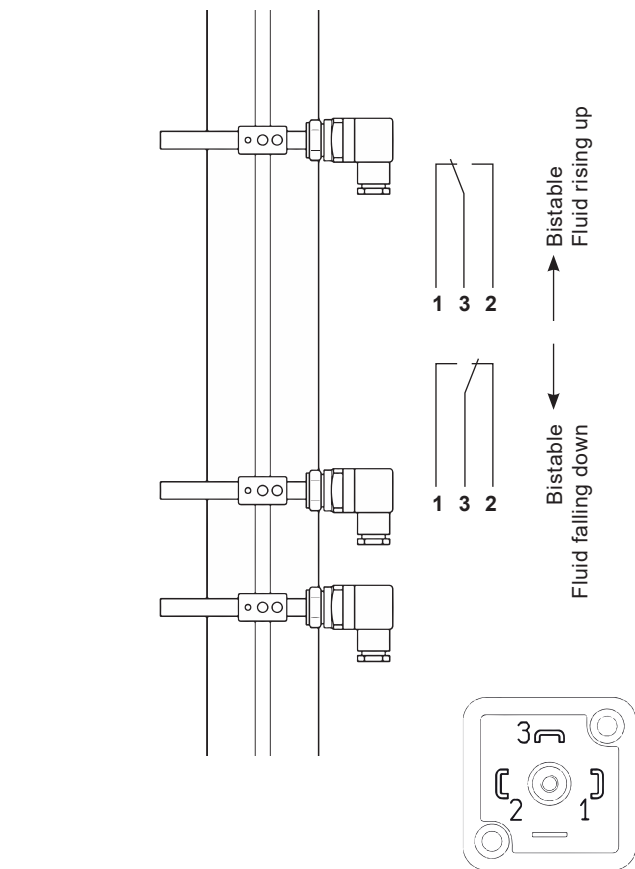
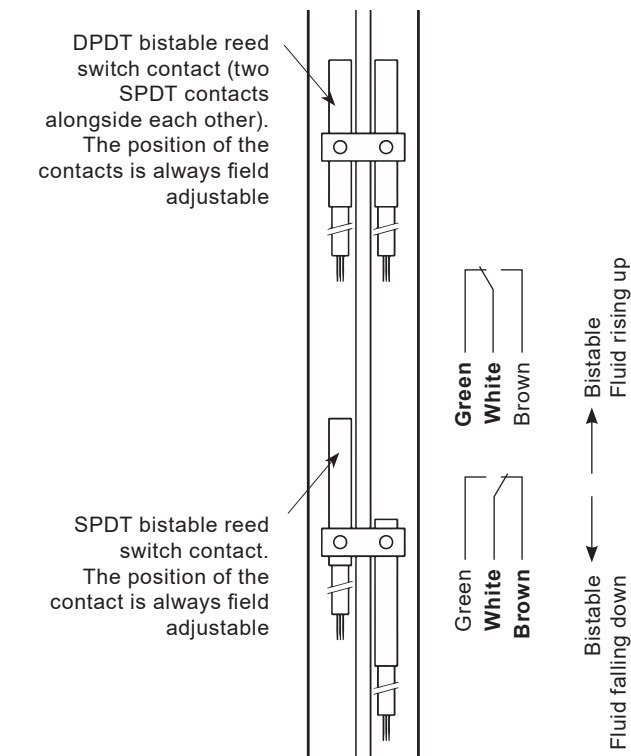
Isolation or check valves between the indicator attachments and the tank should be installed to aid maintenance work.

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Characteristics Colima Viscorol contact

Characteristics Colima Visco contact

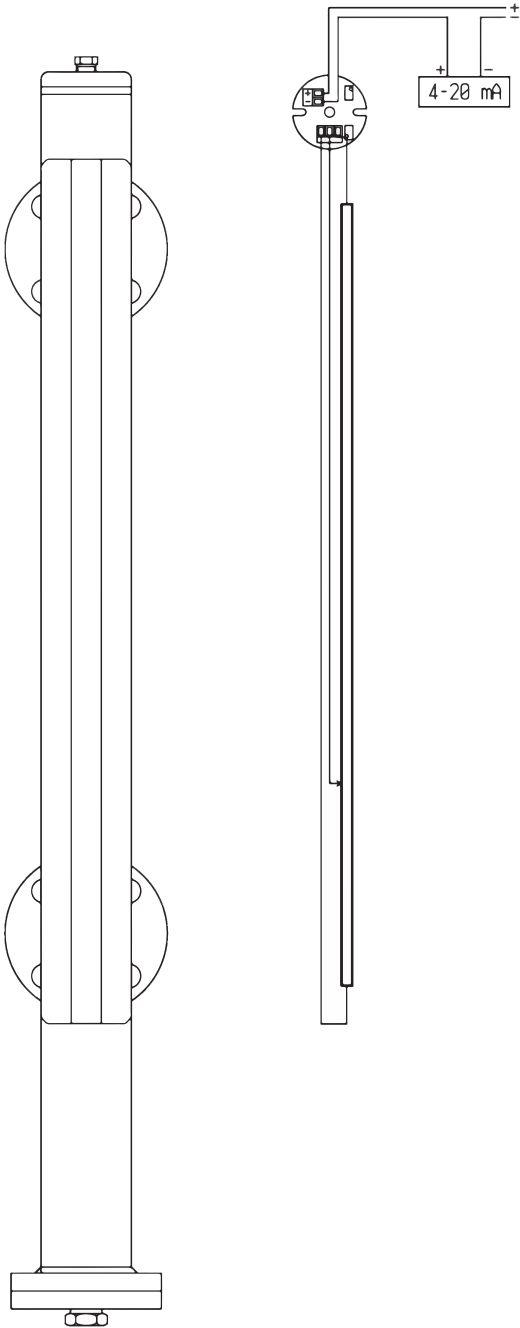


Control systems  
Magnetic level indicators

Potentiometer transmitter characteristics

A potentiometer is placed in the vertical weather-proof tube outside the level indicator.  
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.

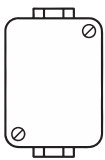
Reading resolution available	5 mm
	10 mm
	20 mm
Resistance input	1 k ÷ 100 k Ohm



Converter's housings

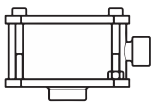
Housing for safe area

Weather-proof IP65, plastic.



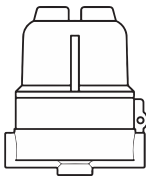
Housing for safe area, low/high temperature

Special type suitable to low temperatures or 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 entrances.



Housing for hazardous area, ATEX certified

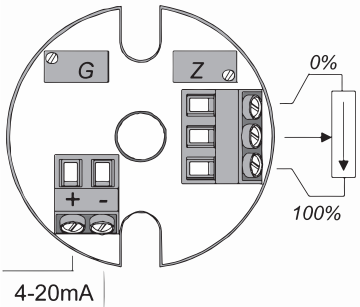
ATEX certified  $\text{Ex}$  II 1/2 G EEx d IIC T6, T5 resp. T4 for use in hazardous areas.  
In pressure die-cast aluminium with a polyamide paint.  
Protection degree IP67.  
Up to two cable entrances.



Converter types

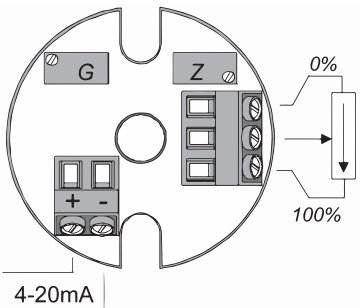
Converter for safe area

Field set using two trimmers [for the Z (zero) gauging and G (gain) gauging], without resorting to interconnecting systems.



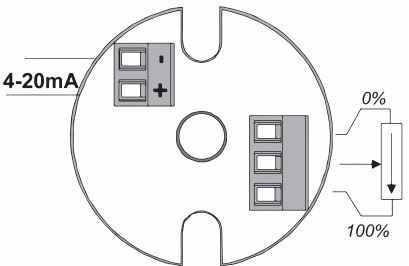
Converter for inbuilt safe area

Field set using two trimmers [for the Z (zero) gauging and G (gain) gauging], without resorting to interconnecting systems.



Converter Hart® protocol

Converter regulated with an interconnection cable.

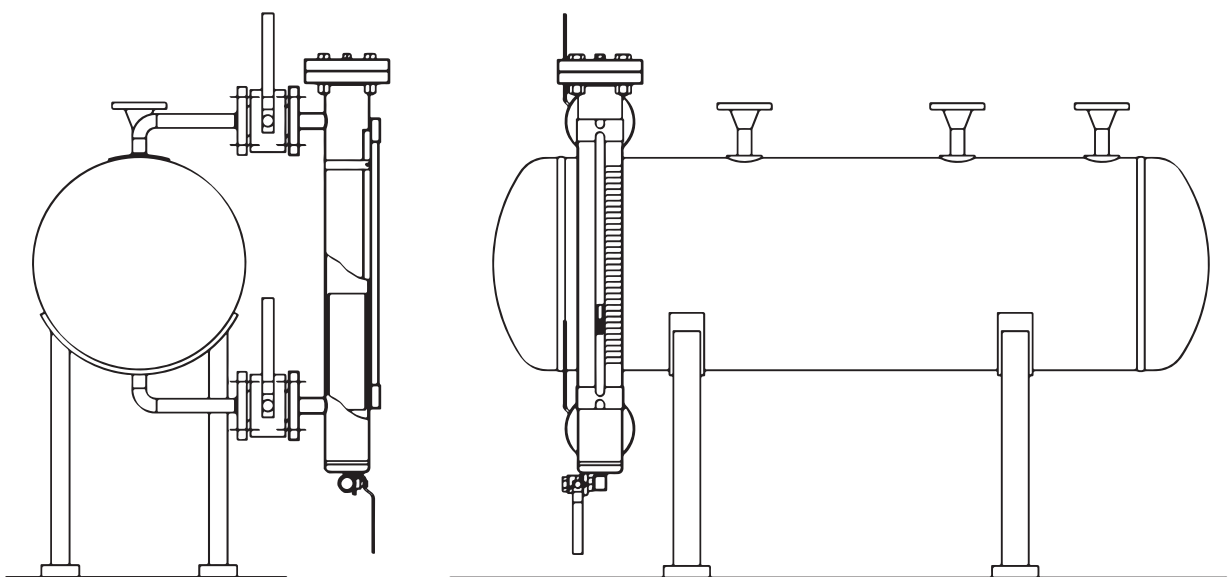
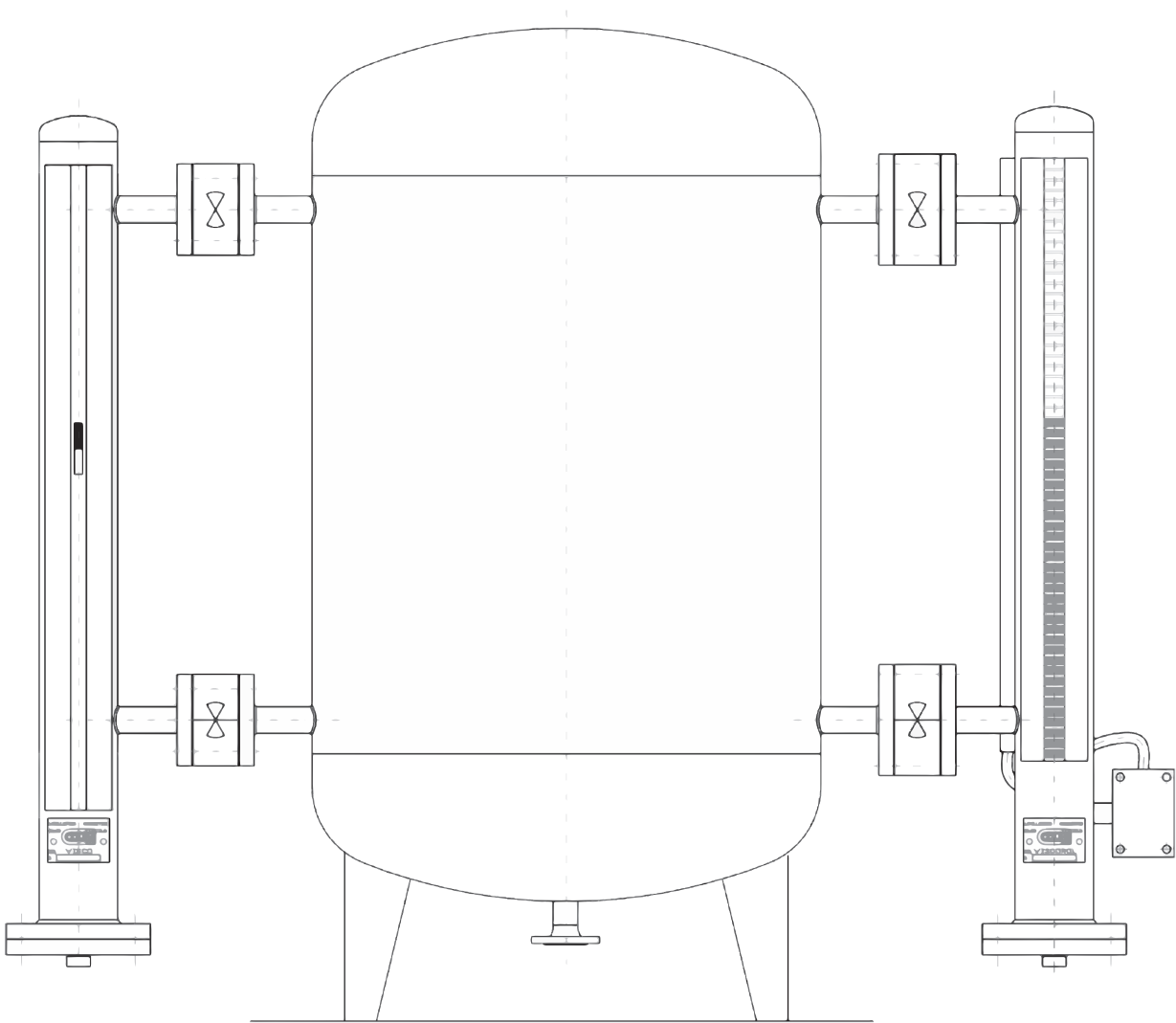


Resistance input	1 k ÷ 100 k Ohm
Current output	4÷20 mA

Control systems

Magnetic level indicators

Typical vessel installations





Product selection and order placement

Each unit is identified by a unique alphanumeric code that defines the manufacturing characteristics that best suites the application.

Range	Colima		Colima	
Model	V	Visco	V	
	R	Viscorol		
Type	LL	Side/side mounted	LL	
	LF	Side/base mounted		
	LT	Side/top mounted		
	TF	Top/base mounted		
	R	Top insertion only		
	GV	only Colima Visco type		
	GDV	only Colima Visco type		
Body diameter	Ø 25 (only R type)		60	
	Ø 50			
	Ø 60			
	Ø 70			
Indicator body material	Steel		2	
	1	304L stainless steel		
	2	316L stainless steel		
	3	316Ti stainless steel		
	Plastic			
	4	PVC		
	5	PP		
Centre-to-centre measurement	Insert required distance		700	
	Connection type	FL	Flanged	FL
		TH	Screwed	
SW		Socket weld		
BW		Butt weld		
Attachment rating	UA		UA	
Float material	A	316L stainless steel	A	
	B	316Ti stainless steel		
	C	Titanium		
	D	Hastelloy		
	E	PVC		
	F	PP		
	G	PVDF		
	H	Buna N		

To continue with 'Product selection and order placement' and see the 'Order example', please go to the next page

Control systems  
Magnetic level indicators

Product selection and order placement (continued)

Valves	A	Drain valve	VA
	B	Vent valve	
Electrical equipment contact	R1	Colima Viscorol SPDT contact	R1
	R2	Colima Viscorol DPDT contact	
	V1	Colima Visco SPDT contact	
	V2	Colima Visco DPDT contact	
Electrical equipment transmitter	T5	5 mm	T10-A-C3
	T10	10 mm	
	T20	20 mm	
	A	Housing for safe area	
	C	Housing for safe area, low/high temperature	
	B	Housing for hazardous area	
	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 Visco 

V

 - 

LL

 - 

60

 - 

2

 - 

700

 - 

FL

 - 

UA

 - 

A

 - 

VA

 - 

R1

 - 

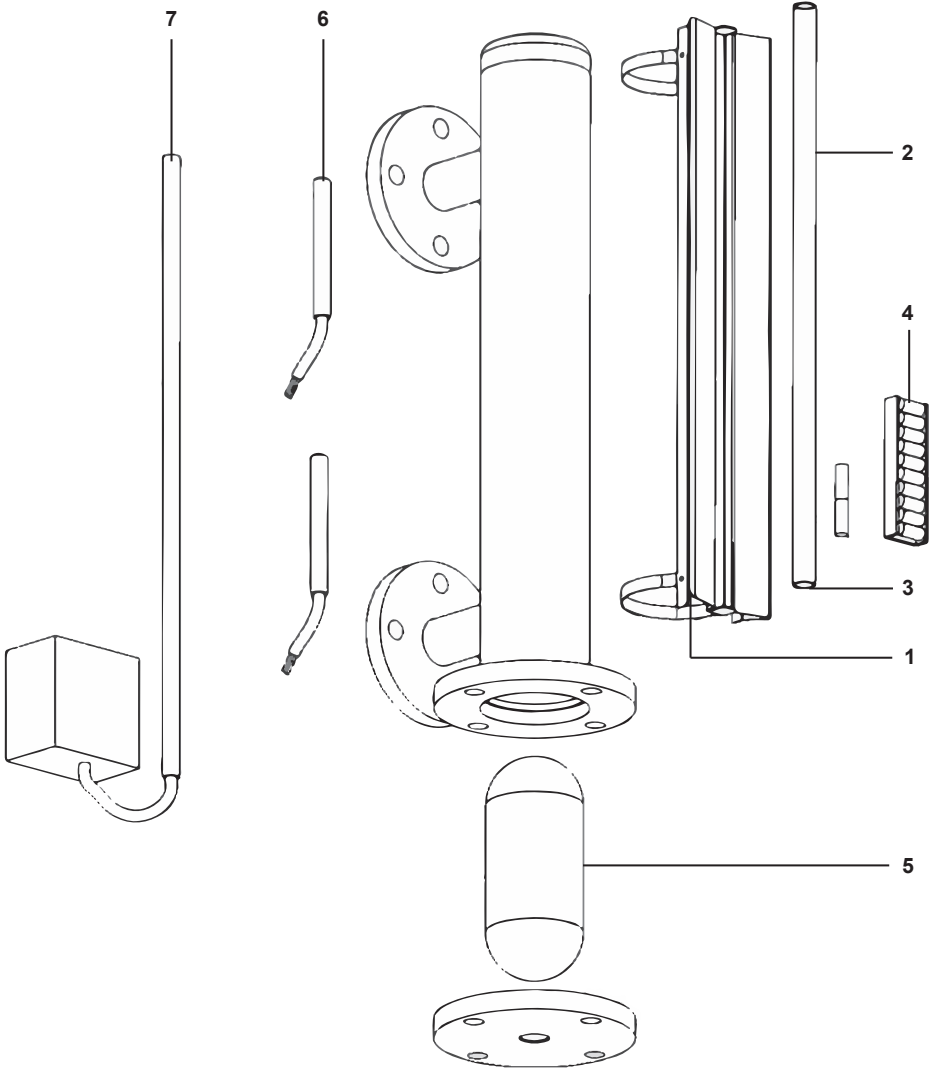
T10-A-C3

Spare parts

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

Available spares

Float	5
Tube with rollers/indicator	2, 3 and 4
Scale	1
Electric components	6 and 7



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 Float for a Spirax Sarco Colima Visco having the following serial number: .....





TI-S54-01  
CTLS Issue 1

# Colima Magnetic Level Indicator

## Viscorol-PH

### Description

Magnetic level indicator Viscorol-PH is designed to control and manage fluid's level in pharmaceutical or biotechnological applications. It works based on the communicating vessels principle.

It can be fitted with electrical contacts and/or transmitter for a complete automatic management of vessels, tanks, boilers and for the control of pumps, valves, alarm systems.

Viscorol PH is a certified product, which can be supplied complete with a specific documentation pack, to guarantee material's traceability, surface electropolishing and elastomers compliance to FDA standard.

### Mounting

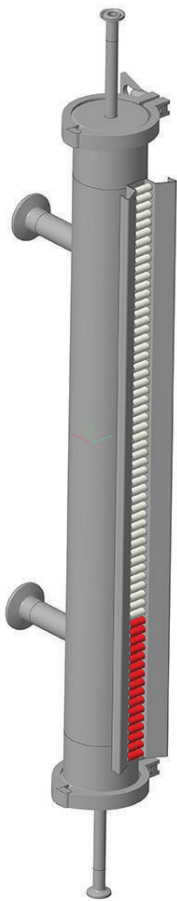
Magnetic level indicator Viscorol-PH can be fitted on the external side of vessels or tanks.

### Available layouts

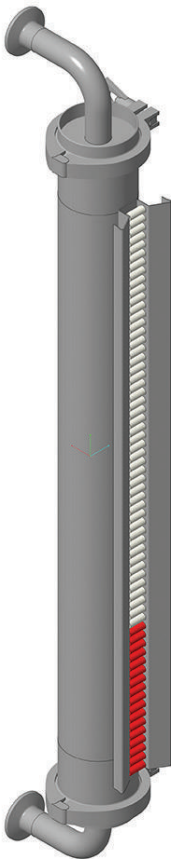
LL	SIDE-SIDE process connections to vessel
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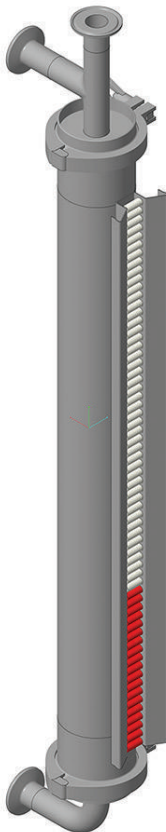
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**Fig. 1**  
SIDE-SIDE (connections A/B/C/D)  
Side-side connections, vent and drain  
end tubes



**Fig. 2**  
TOP/E-BOTTOM/E (connections A/B)  
Top Elbow-Bottom Elbow connections



**Fig. 3**  
TOP/T-BOTTOM/E (connections A/B/C)  
Top Tee-Bottom Elbow connections

Control systems  
Magnetic level indicators

Options

Magnetic level indicator Viscorol-PH can be equipped with electrical devices, becoming a complete instrument.

Fitted with electrical contacts reed switch bistable type, placed at the required threshold alarms, Viscorol-PH can control several intervention points with one single instrument only.

Equipped with a transmitter with 4-20mA output signals, Viscorol-PH can ensure the continuous remote reading of liquid's level.

Certification and Conformity Declarations

Magnetic level indicator Viscorol-PH complies with the following European Directives and Standards:

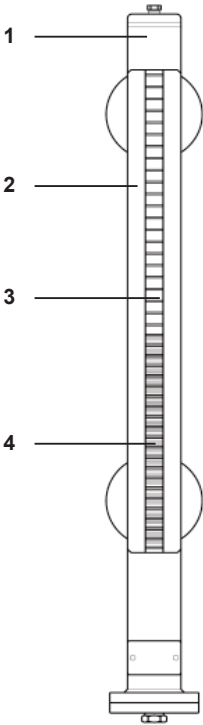
- PED 2014/68/EU (up to Class IV), plastic materials excluded
- 2014/30/UE Electromagnetic Compatibility
- 2014/35/UE Low Tension (for electrical components only).

Level indicator body's diameter

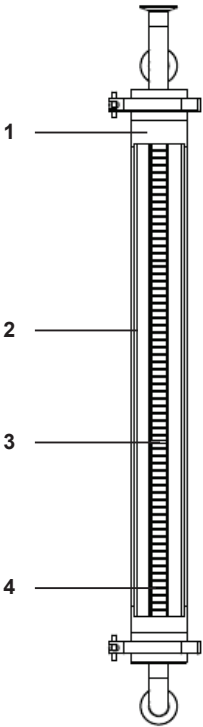
	60 tube Ø 60 mm
Stainless Steel material	70 tube Ø 76 mm

Material

No.	Part	Material
1	Vertical chamber	316L
2	Scale	Stainless Steel
3	Indicating scale tube	Polycarbonate
4	Bicolour rolling cylinders	Plastic
	Float (not shown)	316L



Colima  
Viscorol



Colima Viscorol  
PH

Maximum allowable conditions

TMA	Maximum allowable temperature	Ø 60-70	-25 +191.7 °C
		7 bar	191.7 °C
PMA	Maximum allowable pressure	10 bar	184.1 °C
Fluid Density		> 0,8 kg/l	

Process connections according to ASME-BPE, sizes

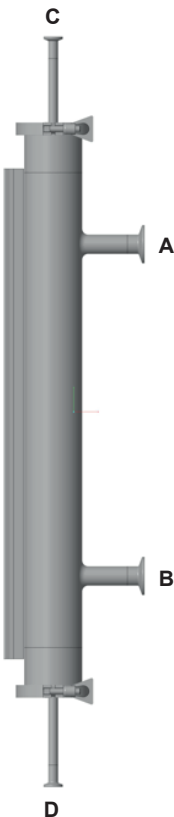


Fig. 1

SIDE-SIDE (connections A/B/C/D)  
Side-side connections, vent and drain  
end tubes

	Inlet/outlet	Vent	Drain
Item	A/B	C	D
Size	1/2"	1/2"	1/2"
	3/4"	3/4"	3/4"
	1"	1"	1"
	-	1 1/2"	1 1/2"



Fig. 2

TOP/E-BOTTOM/E (connections A/B)  
Top Elbow-Bottom Elbow connections

	Inlet/outlet
Item	A/B
Size	1/2"
	3/4"
	1"
	1 1/2"

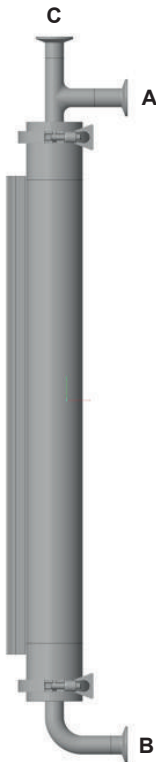


Fig. 3

TOP/T-BOTTOM/E (connections A/B/C)  
Top Tee-Bottom Elbow connections

	Inlet/outlet	Vent
Item	A/B	C
Size	1/2"	1/2"
	3/4"	3/4"
	1"	1"
	1 1/2"	1 1/2"

DIN connections available on request

Control systems  
Magnetic level indicators

Dimensions (approximate) in mm

	Minimum dimension	440
A	Maximum dimension (For longer dimensions, please apply to our Engineering)	2000
B	Minimum	100
C	Based on fluid's density and on design pressure	Minimum 100
D	Based on fluid's density and on design pressure	Minimum 80

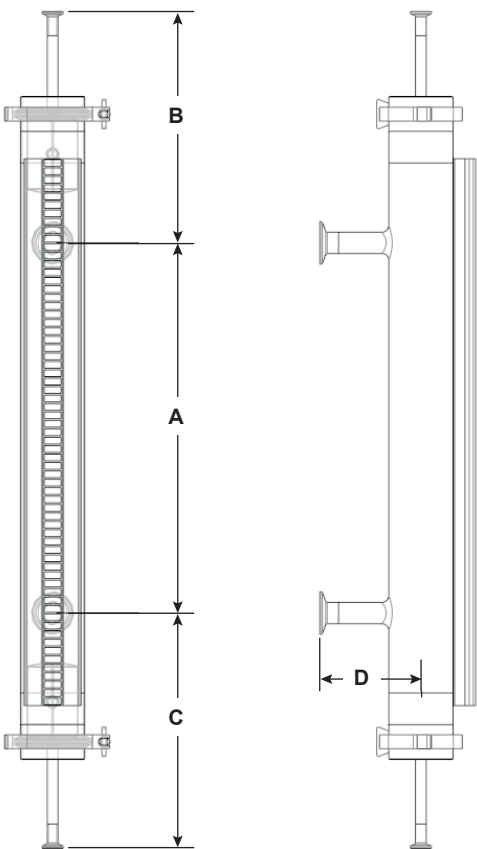


Fig. 1

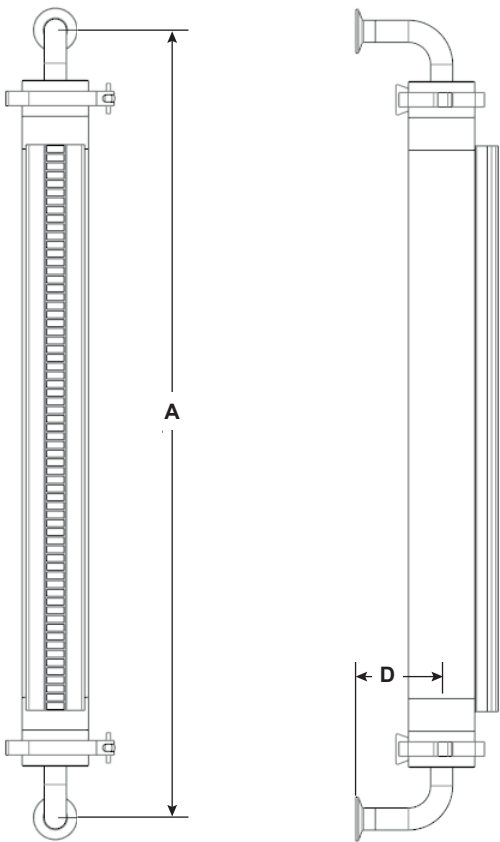


Fig. 2

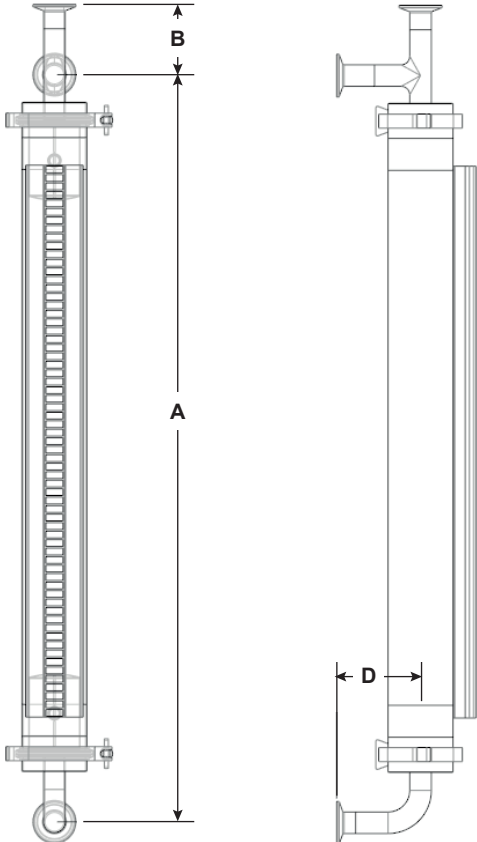


Fig. 3



Accessories

Contacts

Bistable SPDT contacts, fixed on the guide system fitted outside of level indicator body.  
Enclosure IP65.  
Operation points are always adjustable on site.

Contact data	Reed switch contact
	Ermetically sealed in inert gas
	Tungsten, Rhodio coated
	60 W/VA 1A 250 V
	Shock and vibration resistance : 30 g 11 ms

Transmitter

Each level indicator can be equipped with a transmitter, piezoresistive type with 5mm resolution for the direct level reading of the liquid contained into the vessel.

Handling

We recommend to handle with care subject accessories, in order to avoid any possible damage due to impact during installation and/ or handling.

Piezoresistive transmitter

A potentiometer (a printed circuit board with a reed chain contact/resistances, welded on it) is placed in a seal tight vertical tube, fitted outside level indicator.

The total resistance of a known value is measured at the end poles of the potentiometer.

The float, moving up and down into the level indicator's vertical chamber, according to the liquid's level, activates the potentiometer's reed chain, thanks to its magnetic field, by closing the signal locally.

The total resistance value is 100% at its maximum level and 0% at its minimum level.  
The end poles of the potentiometer are connected to a converter transforming level reading into 4-20mA output.

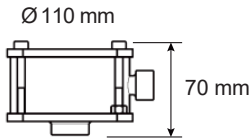
Transmitter's characteristics

Available reading resolutions (according to the involved distance between process connections)	5 mm
Output signal	4-20 mA
Max allowable temperature	-20 °C +100 °C

Converter's housing details

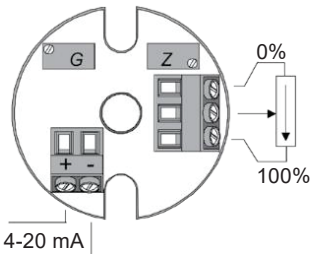
Housing

Fully in Stainless Steel material,  
Enclosure IP67  
Cable entries: M20.

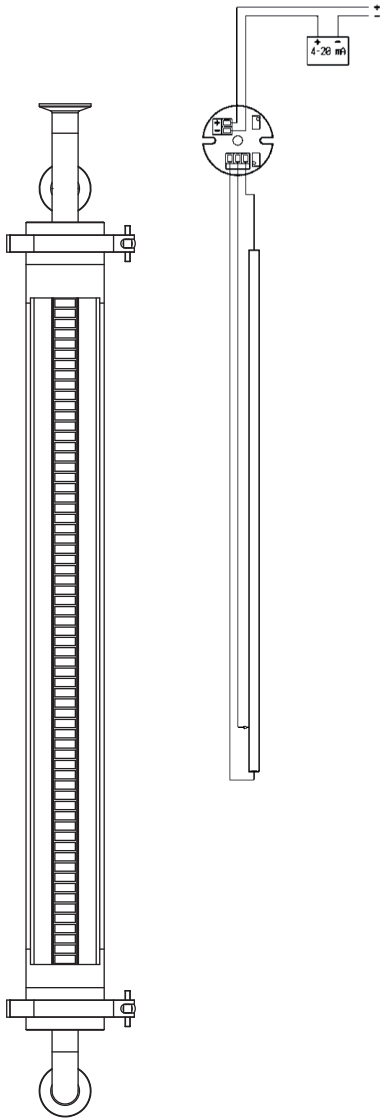


Converter

Adjustable on site model, equipped with two 10-turns trimmers for the Z (zero) setting and the G (gain) setting, without any interconnection system.

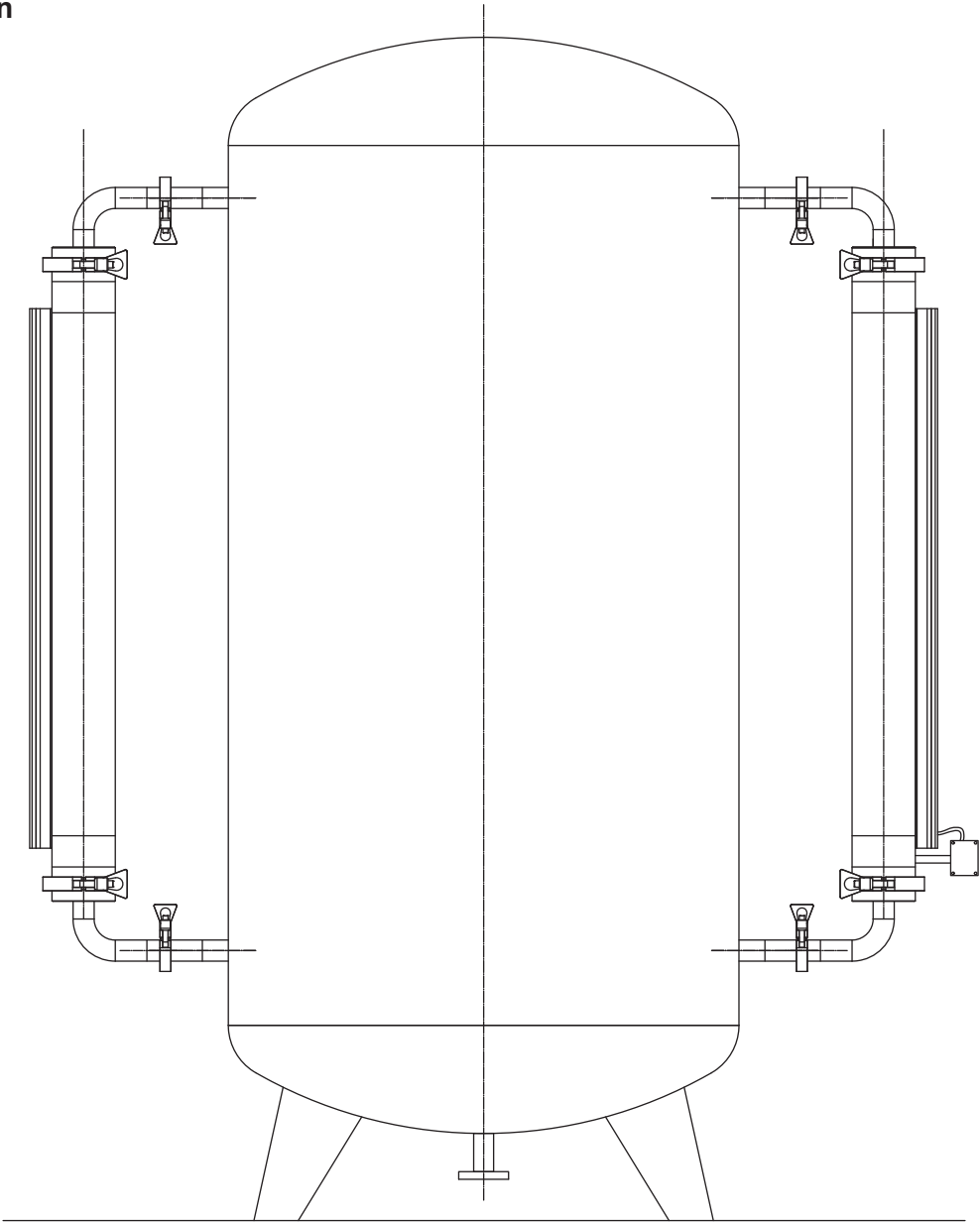


Resistance input	1 k ÷ 100 k Ohm
Output	4 ÷ 20 mA

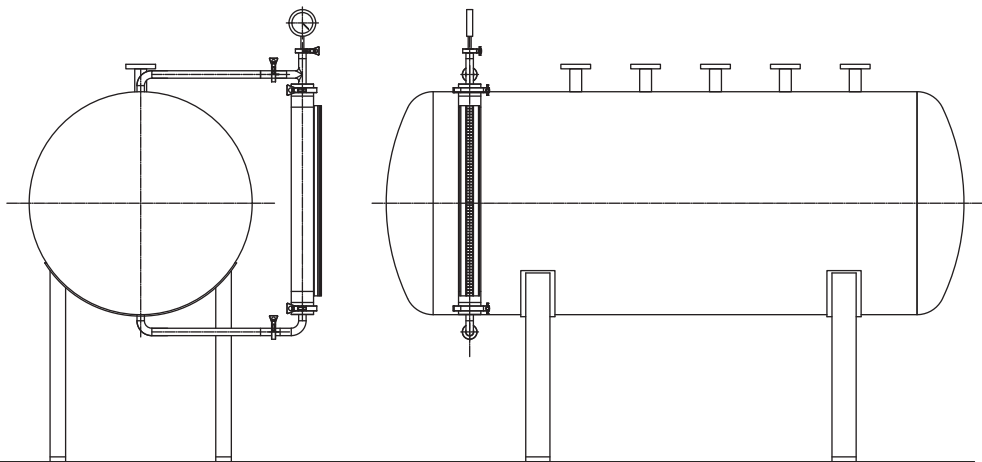


Control systems  
Magnetic level indicators  
Examples of installation

Example 1  
Vertical tank installation



Example 2  
Horizontal tank installation



Product selection and order placement

Each level indicator is identified by one only alphanumeric code defining the manufacturing characteristics that best suites the application.

Operating pressure =

Density =

Operating pressure =

Design pressure =

Fluid viscosity =

Design temperature =

Fluid type =

VISCOROL PH Level Indicator - selection guide

Level Indicator		Code			Code
Conformance	ASME	A	Drain connection - Type	not required	0
	60	6		clamp	4
Body Diameter	70	7	Drain connection - Size	not applicable	0
	AB	B		15	1
Layout	ABC	C		20	2
	ABCD	D		25	3
Process connection - Type	Clamp	4		40	4
	15	1	Drain connection - Rating	not applicable	0
Process connection - Size	20	2	Housing enclosure	IP65	1
	25	3	SPDT Contacts (2 pieces)	No	1
	40	4		Yes	2
Process connection - Rating	not applicable	0	Float	AISI 316	1
Vent connection - Type	not required	0	High Temperature	not applicable	1
	clamp	4	Center to center distance (mm)	distance between connections to be specified	
Vent connection - Size	not required	0			
	15	1			
	20	2			
	25	3			
Vent connection - Rating	40	4			
	not applicable	0			

Example: VISCOROL PH A 6 B 4 2 0 0 0 0 0 0 0 1 1 1

VISCOROL-PH-A-6-B-4-2-0-0-0-0-0-0-0-1-1-1-0

Description:  
Level indicator model VISCOROL-PH,  
Design according to ASME standard,  
Body diameter 60mm,  
Connections layout AB,  
Clamp process connections size 3/4",  
Without vent connection, without drain connection,  
Enclosure IP65  
Equipped with 2 pcs contacts SPDT type  
Float material AISI 316  
Center to center distance = ... (to be specified)

