



TI-P329-01-E  
 CTLS Issue 6 - 2024

# Colima Visco and Colima Viscorol Magnetic Level Indicators

## Description

Colima VISCO and VISCOROL magnetic level indicators are designed for the direct reading of liquid levels in many industrial applications, even for high pressure and/or temperature. Their working is based on the principle of communicating vessels and on the principle of attraction between North pole and South pole of two or more permanent magnets. The indicators can be equipped with electrical contacts or with a potentiometer transmitter for full automation of process management, including pressurised tanks, vessels, boilers, for the control of pumps, valves and alarm systems.

## Mounting

The Colima Visco and Colima Viscorol magnetic level indicators can be installed externally side-side to the vessel or vertically into the vessel.

## Available models

LL	Side / side mounting
LF	Side / bottom mounting
LT	Top / side mounting
TF	Axial mounting
R	Top connection mounting
GV	Side / side mounting
GDV	Special design to control methane-gas odorant

## Options

Electrical bistable reed switch contacts, fixed at the required thresholds, thus allowing control of several operating points with a single instrument only.

When equipped with a potentiometer transmitter, VISCO and VISCOROL level indicator allows the continuous reading of liquid level.

## Standards and certification

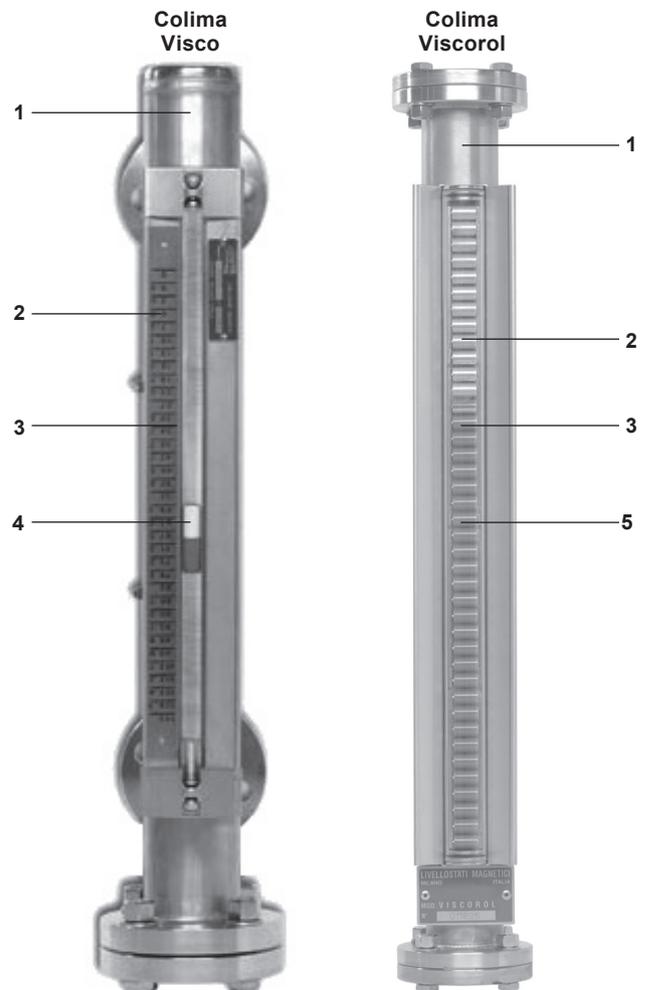
Colima Visco and Colima Viscorol magnetic level indicators comply with the following regulations and European Directives:

- PED 2014/68/EU - up to Class IV (plastic materials excluded)
- ATEX 2014/34/EU (for explosion proof area's application)
- 2014/30/EU Electromagnetic compatibility
- 2014/35/EU Low tension, for electrical components only
- DNV, RINA, LRS and M.M.I. for naval/marine sectors
- Conformity declaration EC1935
- Conformity declaration DM174

**Remark:** any request of inspection and/or certification shall be defined in phase of order.

## Vertical chamber diameter

<b>Steel</b>	25	Ø tube 25 - R type only (Mounting on the top of the tank)
	40	Ø tubo 40 -Maximum pressure 6 bar g
	50	Ø tube 48 - Maximum pressure 12 bar g
	60	Ø tube 60
	70	Ø tube 76
<b>Plastic</b>	70	Ø tube 76 - Maximum pressure 6 bar g



## Materials

	P/N	Material
1	Vertical chamber	304 / 316L / 316Ti / PVC / PP / PVDF 316 Ti no R25 and Viscorol 40
2	Scale	Neutral or graduated with the exception of R25 and 40
3	Glass tube	Polycarbonate or Pyrex
4	Bicolour indicator	Plastic or Alnico
5	Bicolour rolling cylinders	Plastic or Aluminium
6	Float (not shown)	316L / 316Ti / Titanium / Hastelloy PVC / PP / PVDF

**Models:**



**Colima Visco and Colima Viscorol LL**

Side / side connections to vessel.  
All wetted parts made of Stainless Steel or Plastic material.



**Colima Visco and Colima Viscorol LF**

Side / bottom connections.  
All wetted parts made of Stainless Steel or Plastic material.



**Colima Visco and Colima Viscorol LT**

Top / side connections.  
All wetted parts made of Stainless Steel or Plastic.



**Colima Visco and Colima Viscorol TF**

Axial connections.  
All wetted parts made of Stainless Steel or Plastic..



**Colima Visco and Colima Viscorol R**

Top connection with immersed float.  
Recommended model for tanks or vessels in areas difficult to access  
and in case of particularly viscous fluids, covering fluids, sludges.  
All wetted parts made of Stainless Steel or Plastic material.



**Colima Visco GV and GDV**

Side / side connections.  
All wetted parts made of Stainless Steel.  
Specifically designed to control methane-gas odorant.

## Horizontal process connections types (LL, LF, LT)

Flanged (FL) EN and ASME (ANSI)

EN	UW	DN15	PN 16
	UX	DN15	PN 40
	UY	DN15	PN 64
	UZ	DN15	PN 100
	UA	DN 20	PN 16
	UB	DN 20	PN 40
	UC	DN 20	PN 64
	UD	DN 20	PN 100
	UE	DN 25	PN 16
	UF	DN 25	PN 40
	UG	DN 25	PN 64
	UH	DN 25	PN 100
	UI	DN 40	PN 16
	UL	DN 40	PN 40
	UM	DN 40	PN 64
	UN	DN 40	PN 100

ASME / ANSI	AW	1/2"	Class 150
	AX	1/2"	Class 300
	AY	1/2"	Class 600
	AZ	1/2"	Class 1500
	AA	3/4"	Class 150
	AB	3/4"	Class 300
	AC	3/4"	Class 600
	AD	3/4"	Class 1500
	AE	1"	Class 150
	AF	1"	Class 300
	AG	1"	Class 600
	AJ	1"	Class 1500
	AK	1 1/2"	Class 150
	AH	1 1/2"	Class 300
	AI	1 1/2"	Class 600
	AL	1 1/2"	Class 1500

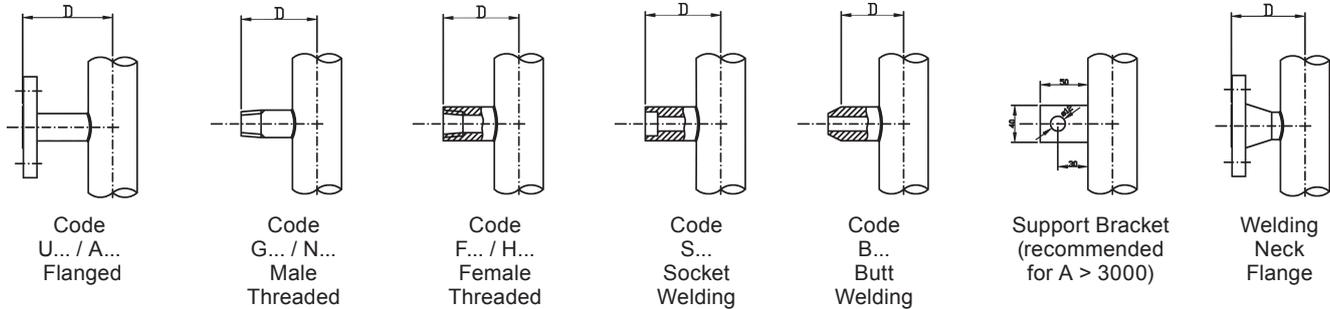
Any other screwed and flanged connections available on request.

### Screwed (TH)

GK-M	GA	1/2"	GK-F	FA
	GB	3/4"		FB
	GC	1"		FC
	GD	1 1/2"		FD
NPT-M	NA	1/2"	NPT-F	HA
	NB	3/4"		HB
	NC	1"		HC
	ND	1 1/2"		HD

### Socket weld (SW) or Butt weld (BW)

SW	SA	1/2"
	SB	3/4"
	SC	1"
	SD	1 1/2"
BW	BA	1/2"
	BB	3/4"
	BC	1"
	BD	1 1/2"



D = 110 mm for T ≤ 180°C  
D = 150 mm for T ≥ 180°C

D dimension depending upon the type and the dimension of the W.N. connecting flange, as well as upon the vertical chamber's diameter.

## Vertical process connections types (TF, LF, LT)

Flanged (FL) EN and ASME (ANSI)

EN	UW	DN15	PN 16
	UX	DN15	PN 40
	UY	DN15	PN 64
	UZ	DN15	PN 100
	UA	DN 20	PN 16
	UB	DN 20	PN 40
	UC	DN 20	PN 64
	UD	DN 20	PN 100
	UE	DN 25	PN 16
	UF	DN 25	PN 40
	UG	DN 25	PN 64
	UH	DN 25	PN 100
	UI	DN 40	PN 16
	UL	DN 40	PN 40
	UM	DN 40	PN 64
	UN	DN 40	PN 100

ASME / ANSI	AW	1/2"	Class 150
	AX	1/2"	Class 300
	AY	1/2"	Class 600
	AZ	1/2"	Class 1500
	AA	3/4"	Class 150
	AB	3/4"	Class 300
	AC	3/4"	Class 600
	AD	3/4"	Class 1500
	AE	1"	Class 150
	AF	1"	Class 300
	AG	1"	Class 600
	AJ	1"	Class 1500
	AK	1 1/2"	Class 150
	AH	1 1/2"	Class 300
	AI	1 1/2"	Class 600
	AL	1 1/2"	Class 1500

### Screwed

GK-M	GA	1/2"	GK-F	FA	1/2"
	GB	3/4"		FB	3/4"
	GC	1"		FC	1"
NPT-M	NA	1/2"	NPT-F	HA	1/2"
	NB	3/4"		HB	3/4"
	NC	1"		HC	1"

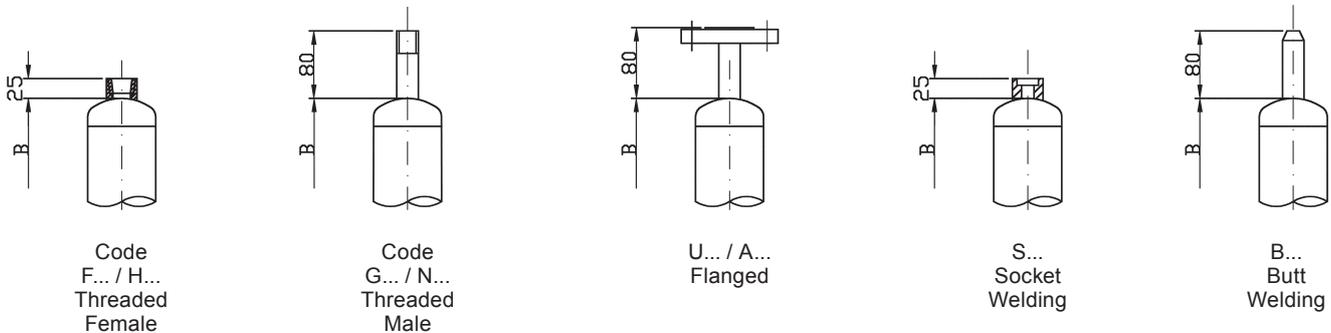
### Socket Weld

SW	SA	1/2"
	SB	3/4"
	SC	1"
BW	BA	1/2"
	BB	3/4"
	BC	1"

Any other screwed or flanged connections available on request.

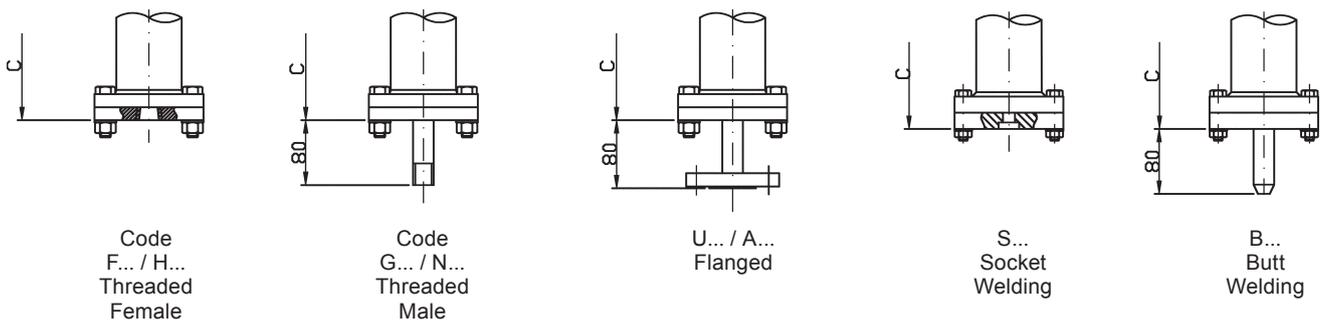
## Vertical chamber top cap for level indicator

with axial process connections (TF) or top-side (LT) process connections

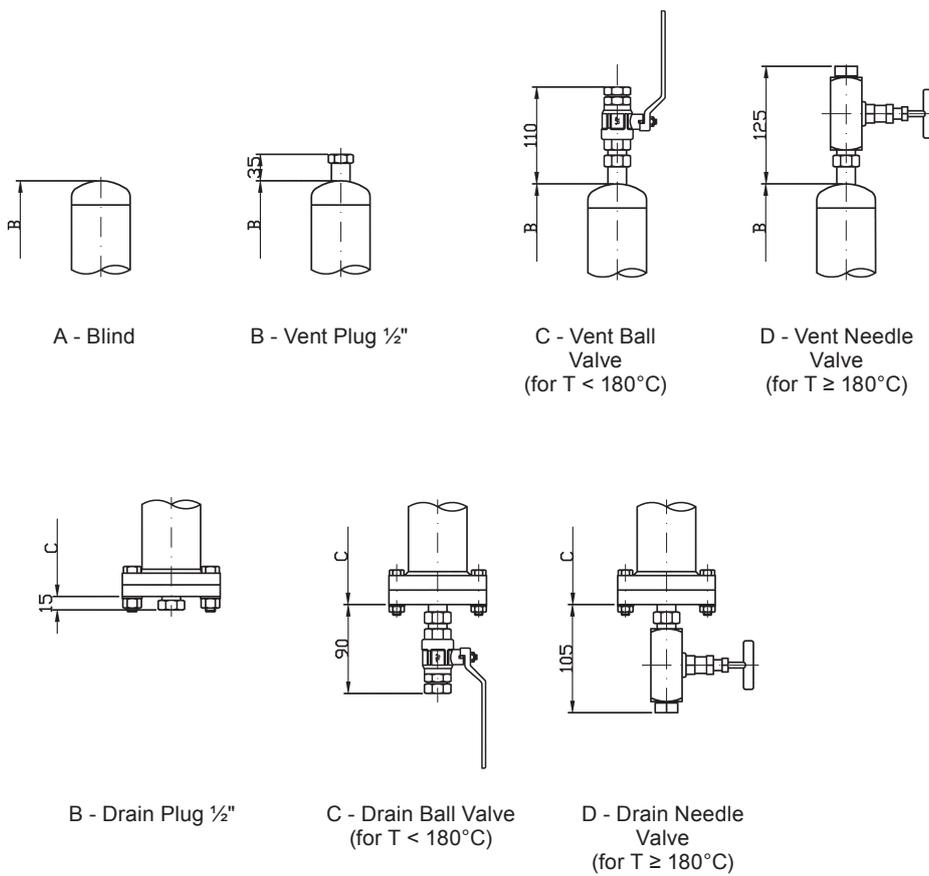


## Vertical chamber bottom connection for level indicator

with axial process connections (TF) or top-side (LT) process connections

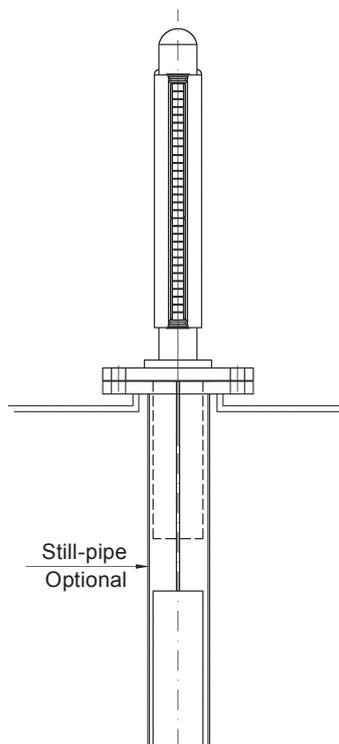


Vent and drain connection types



Type R connection = Top mounting for Viscorol Ø 25-50-60

External flange diameter: 100 mm minimum

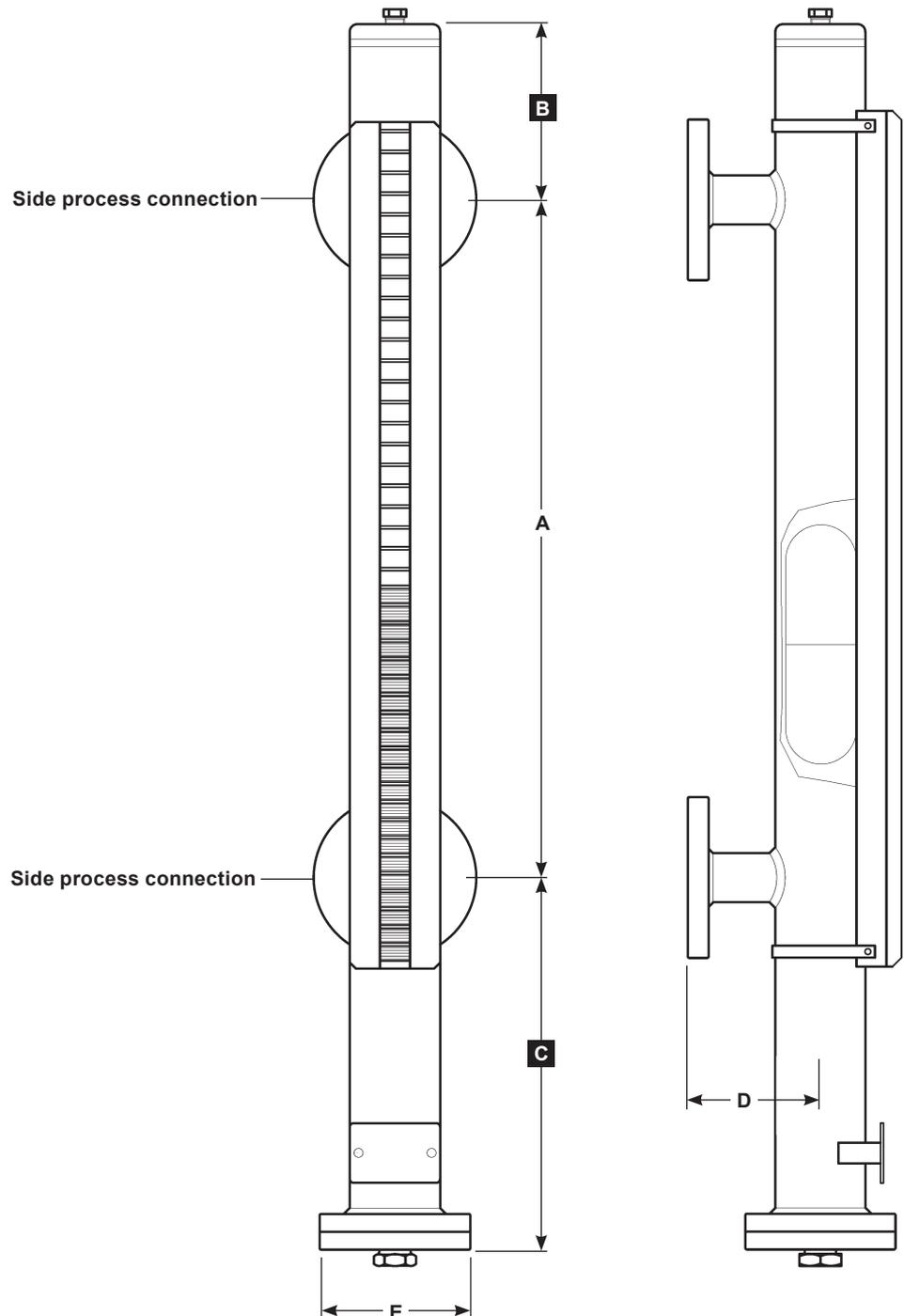


**Design conditions**

TMA - Maximum allowable temperature	Steel	Ø 40	-25 to +180°C
		Ø 50-60-70	-25 to +350°C
	Plastic	PVC	-20 to +70°C
		PP	-20 to +105°C
		PVDF	-20 to +130°C
PMA - Maximum allowable pressure	Steel	120 bar g	350°C
	Plastic	140 bar g	150°C
Specific gravity of fluid	Steel and plastic	> 0.8 kg/l	
	Titanium	> 0.5 kg/l	
Two-colour line marker material and rollers	Polycarbonate	T < 230°C	
	Aluminium	T < 350°C	
Protection degree graduated scale	Viscorol	IP67	
	Visco	IP40	

**Dimensions / weights (approximate) in mm and Kg**

<b>A</b>	Minimum length	200
	Maximum length For greater lengths, please contact our technical offices	5700
<b>B</b>	Minimum	100
<b>C</b>	Depending on fluid specific gravity and pressure	Starting from 250
<b>D</b>	Depending on fluid specific gravity and pressure	Starting from 80
<b>E</b>	Depending on fluid specific gravity and pressure	Starting from 85
<b>Weights</b>	Dipende dalla dimensione A	



**Accessories**

**Contacts**

Bistable **SPDT** or **DPDT** contacts, can be fixed on a guide system fitted outside of the level indicator body.

The level indicators for ATEX areas are equipped with explosionproof house, or with intrinsic safety contacts (Ex ia), ATEX certified II 2GD Ex db IIC T6 Gb Ex tb IIIC T85°C Db, or intrinsic safety ATEX 2014/34/UE Ex-ia certified.

Enclosure degree IP67.

Thresholds position is always adjustable on field.

SPDT type

DPDT type (two simultaneous SPDT contacts, ATEX version not available)

<b>Contact data</b>	Reed switch contact
	Ermetically sealed in inert gas
	Tungsten, Rhodium coated
	60 W/VA 1A 250 V ≅
	Shock and vibration resistance: 30 days 11 months
	Allowable temperature range -20°C to +200°C

**Transmitter**

The potentiometer transmitter can be 5 mm, or 10 mm, or 20 mm resolution for the continuous reading of the vessel liquid's level.

\* For applications requiring 0.1 mm or 1 mm resolution, magnetostrictive transmitters can be provided on request.

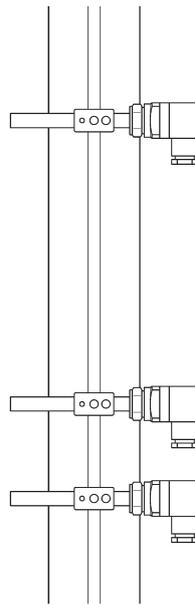
**Valves**

Each standard level indicator is equipped with a screwed on 1/2" NPT drain valve; a 1/2" NPT drain plug only can be provided as alternative. An additional vent valve can be also supplied, on request.

Isolating shutoff valves fitted between the process connections of level indicator and the vessel are recommended to allow the periodic maintenance interventions.

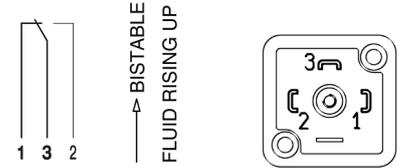
**Note:** Those electrical components are subject to shock, it is therefore recommended to handle them with care during installation and handling.

**Contacts electrical wiring**

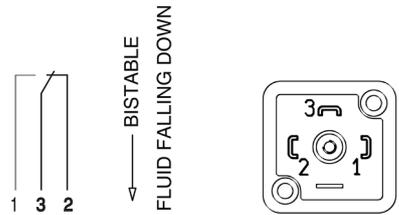


**To Colima VISCO**

In order to control the rising up fluid, electrical contacts wiring shall be as follows:

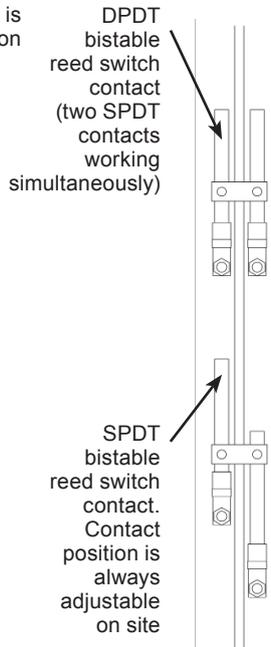


In order to control the falling down fluid, electrical contacts wiring shall be as follows:



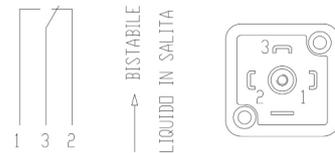
**Contact position:**

90° respect to the visual indicating scale.

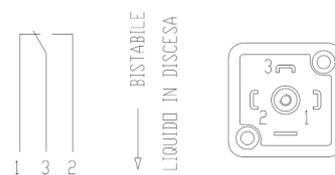


**To Colima VISCOROL**

In order to control the rising up fluid, electrical contacts wiring shall be as follows:



In order to control the falling down fluid, electrical wiring contacts wiring shall be as follows:



**Contact position:**

180° respect to the visual indicating scale.

## Potentiometer transmitter

The potentiometer transmitter allows the continuous remote reading of the liquid's level.

A potentiometer, that is a device consisting of a printed circuit with a welded on reed/resistor chain, is placed into a seal tight vertical tube, fitted outside the level indicator's body.

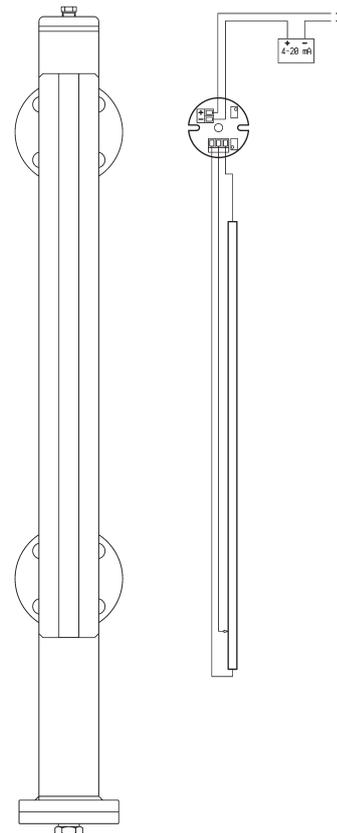
The total resistance of a known value is measured at the ends of this potentiometer.

The float moving up and down according to the liquid' level increase or decrease activates with its own magnetic field the chain of potentiometer's contacts reed by closing the signal locally.

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

The potentiometer's end poles are connected to a converter, capable of transforming the input value into Ohm and the output value into mA.

<b>Available reading resolution</b>	5 mm
	10 mm
	20 mm
<b>Resistance input</b>	1 k ÷ 100 k Ohm
<b>Allowable temperature range</b>	-20°C to +100°C



## Converter's housings

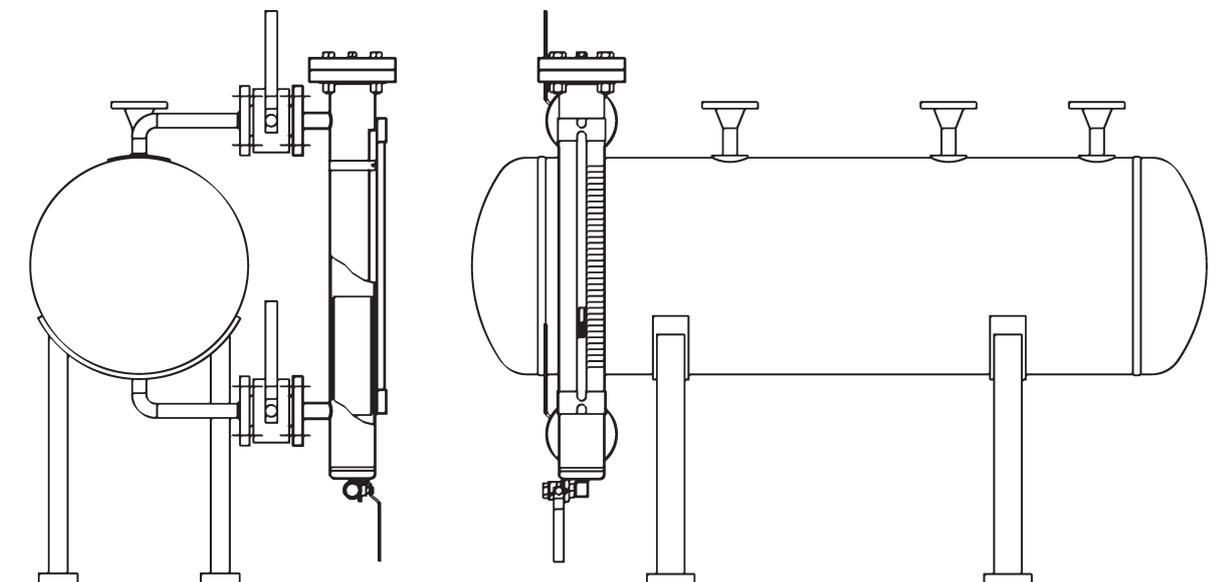
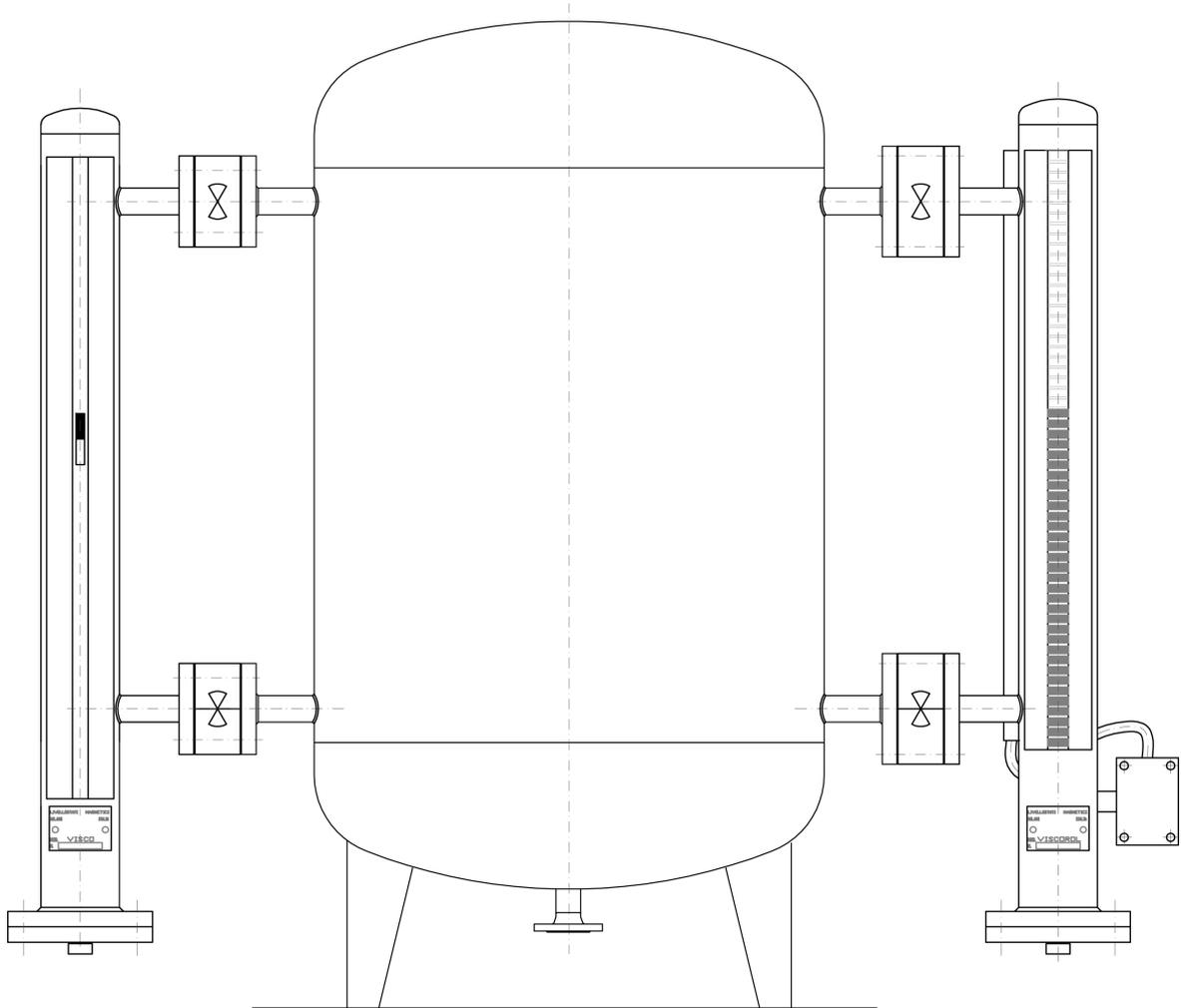
Three types of converter's housings are currently available:

<p><b>Housing for safe area</b></p> <p>Plastic material, enclosure IP65. Process temperature max 180°C min -20°C</p>
<p><b>Housing for safe area, suitable for high temperature</b></p> <p>Special type suitable for low and high temperatures or installation in high concentration saline environments and for use in the food industry. Fully Stainless Steel material. Enclosure IP67. On request IP68. Up to two cable entries. Operating temperature &gt;180°C.</p>
<p><b>Housing for hazardous area</b></p> <p>Explosionproof version, ATEX certified (Ex) II 2GD Ex db IIC T6 Gb Ex tb IIIC T85°C Db, Die-cast Aluminium material with Polyamide painting. Enclosure IP67. Up to two cable entries.</p>
<p><b>Ambient temperature range</b> -20 ÷ 40°C</p>
<p><b>Marking</b> (Ex) II 2GD Ex db IIC T6 Gb Ex tb IIIC T85°C Db</p>
<p><b>Temperature class</b> T6</p>
<p><b>Allowed temperature range</b> -20 ÷ 40°C</p>
<p><b>Suitable for areas class 0, 1, 2, GAS Group II (Directive 99/92/CE)</b></p>

## Converter types

<p><b>Converter for safe area</b></p> <p>Field-adjustable converter by software.</p>
<p><b>Converter for intrinsically safe area, ATEX certified</b></p> <p>II 1 G Ex ia IIC T6, T5 or T4 II 1 D iaD A20 IP6X T80°C, T95°C, T130°C</p> <p>Field-adjustable converter with two 10-turns trimmers for the calibration of Z (Zero) and G (Gain), without any interconnection system.</p>
<p><b>Converter Hart® protocol version 5.3 for intrinsically safe area, ATEX certified</b></p> <p>Adjustable converter with interconnection cable.</p>
<p><b>Resistance input</b> 1 k ÷ 100 k Ohm</p>
<p><b>Current output</b> 4÷20 mA</p>

Typical vessel installations



**Product selection and order placement**

Each magnetic level indicator is defined by one only alphanumeric code describing the manufacturing characteristics suitable for the involved application. The following information shall be confirmed when ordering, in order to define the product correctly:

Operating pressure = \_\_\_\_\_ Fluid's specific gravity = \_\_\_\_\_ Operating temperature = \_\_\_\_\_  
 Design pressure = \_\_\_\_\_ Fluid's viscosity = \_\_\_\_\_ Design temperature = \_\_\_\_\_  
 Fluid type = \_\_\_\_\_ Installation area (Safe area or ATEX) = \_\_\_\_\_  
 If ATEX Ex-d  or Ex-ia

Series	Colima	Colima
<b>Model</b>	V Visco R Viscorol	
<b>Process connections type</b>	LL Side / side mounting LF Side / bottom mounting LT Top / side mounting TF Axial mounting R Top mounting with immersed float GV Colima Visco type only GDV Colima Visco type only	
<b>Body diameter</b>	Ø 25 (R type top mounting only) Ø 40 6 bar max } Viscorol only Ø 50 12 bar max } Ø 60 Ø 70	
<b>Body material</b>	<b>Stainless Steel material</b> 1 304L 2 316L 3 316Ti (R and Ø 40 models excluded) <b>Plastic material</b> 4 PVC } for Viscorol model 70 only 5 PP } 6 PVDF }	
<b>Center to center distance</b>	<b>Insert required distance</b>	
<b>Indicating scale</b>	N <b>Neutral</b> (without any indication) G <b>Graduated</b> (indication each 10 mm; not applicable to R25 or Ø 40 models) V <b>Volumetric</b> (customer to specify)	
<b>Horizontal process connections types LL, LF, LT, GV, GDV (TF excluded)</b>	FL Flanged TH Threaded SW Socket Weld BW Butt Weld	
<b>Process connections size and rating - see page 3</b>	UA	
<b>Vertical process connections types LF, LT, TF (LL excluded)</b>	FL Flanged TH Threaded SW Socket Weld BW Butt Weld	
<b>Process connections size and rating - see page 4</b>	UA	
<b>Float material</b>	A 316L Stainless Steel B 316Ti Stainless Steel C Titanium (for specific gravity <0.8 Kg/l) D Hastelloy E PVC } Viscorol model 70 only F PP } G PVDF }	
<b>Drain connection - see page 5 (LF and TF types excluded)</b>	B Plug 1/2" C Ball valve (T < 180°C) D Needle valve (T ≥ 180°C)	
<b>Vent connection - see page 5 (LT and TF type excluded)</b>	A None B Plug 1/2" C Ball valve (T < 180°C) D Needle valve (T ≥ 180°C)	
<b>Electrical equipment contacts *</b>	1 SPDT 2 DPDT	
<b>SPDT contact's quantity *</b>	from 1 up to 8	
<b>DPDT contact's quantity * (ATEX execution not available)</b>	from 1 up to 4	
	T5 5 mm T10 10 mm T20 20 mm	
<b>Electrical equipment transmitter *</b>	A Housing for safe area C Housing for safe area, high temperature B Housing for hazardous area (ATEX II 2GD Ex db IIC T6 Gb Ex tb IIIC T85A°C Db) C3 Converter for safe area C4 Converter for intrinsic safe area C5 Converter HART® protocol 5.3	
<b>Isolating valve * suitable for temperature 180°C max</b>	F Flanged T Threaded C Carbon Steel body, Stainless Steel balance wetted parts S Fully Stainless Steel	
<b>Isolation valve quantity *</b>	Q Quantity	

\* Optional

**How to order**

1 off Spirax Sarco Colima Visco R-LT-60-2-700-N-FL-UA-FL-UA-A-A-C-2-T10-A-C3-F-S-Q2.