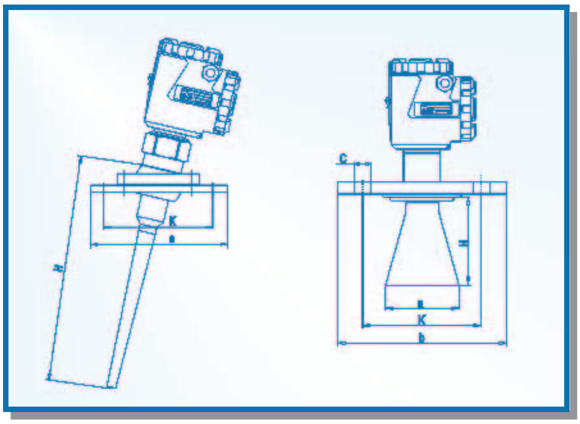
RPL

Radar level transmitters

865B050A

Features

- Continuous, non-contact level measurement for solids, liquids, pulps and slurries
- Measurement not affected by product physical variation, temperature changes, powders or vapours.
- Two measure ranges: up to 40m and to 70m
- Process temperature up to 180°C
- Process pressure up to 40bar
- Easy on-site configuration via menu-driven matrix display (plug-in)
- Easy on-site calibration without product handling. Empty and full distance setting via matrix display
- 2-wire technology
- Analogue output 4÷20mA
- HART protocol (optional)
- Level measurement and echo signal curve visualisation on matrix display
- Storage and recognition system for false echo signals



- ***Continuous, non-contact Radar level transmitters***
- ***Measurement range up to 70m***
- ***Measurement accuracy: ±10mm***
- ***Electrical supply 24Vdc or 230Vac***
- **HART**® FIELD COMMUNICATION PROTOCOL ***(optional)***

General

RPL transmitters are used for continuous, non-contact level measurement. The radar pulses emittend by the antenna are reflected by the product surface and received back by the antenna. The time gap between the emission and the return of the pulse is named " flight time".

The flight time is proportional to the product surface distance and the processing by the electronical components inside the **RPL** allows the level measurement. Through the matrix display it is possible to input all necessary data for the level measurement and to show and recognize false echo signals.

The **SGMware** software is suitable to configure and gauge the **HART** protocol, by means of PC and **COMWAY** converter.

1. MEASUREMENT PRINCIPLE

1.1 Operation Principle

The microwave pulse, emittend by **RPL** radar antenna, travels to the product surface and a part of its energy is reflected and returned back to the antenna. The time gap from the emission and the retun is named “flight time” and is proportional to the distance between the product surface and the “zero point” normally located under the process conection (flanged or threaded).
RPL transmitters are equipped with a radar pulse signal detection technology, suitable to measure correctly the flightime and to obtain the level measurement.

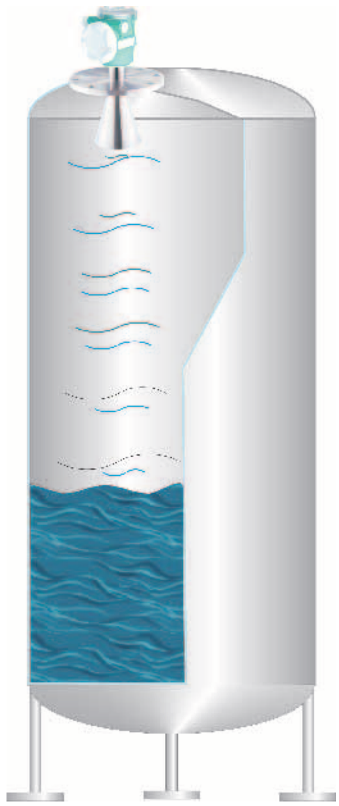


Fig.1

1.2 Characteristics

RPL transmitters are suitable for heavy process conditions because they are equipped with a modern processor and with the **EchoDiscovery** management software.

EchoDiscovery software permits the recognition and the filtering of false echo signals in order to obtain a correct level measurement.

RPL versatility allows the utilisation in heavy process conditions as high temperature, high pressure or low dielectric constant.

The low energy of the radar pulse avoids problems to process connection, to the environment and to operators.

1.3 Level measurement

The level measurement 0÷100% is calculated in relation to the distance between the “**Zero**” point (fig.2) and the product surface, which reflects the radar pulse transmitted by **RPL**.

1.4 Output data processing

Through the matrix display it is possible to input all the operating data, as distance 0÷100%, product type, measurement conditions (vapours, powders), in order to optimize the level measurement.
The percentage calculated level can be converted into a physical value, as volume or mass, by the input of the initial and final values of the measured unit. Through the communication software it is also possible to show the tank shape (cylindric, spheric..), to insert a linearisation measure table, to configure a flow.

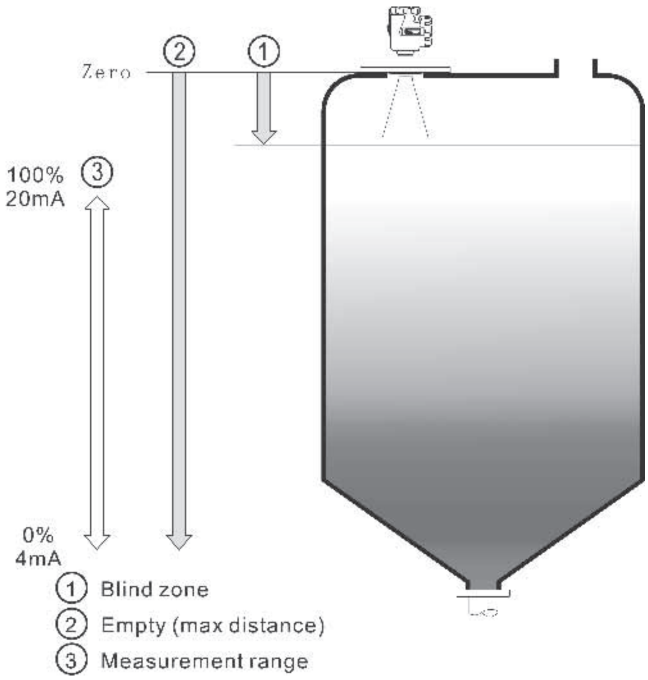


Fig.2

2. LIQUID MEASUREMENT

2.1 Measure range

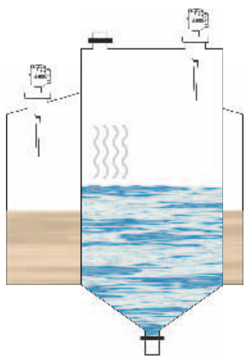
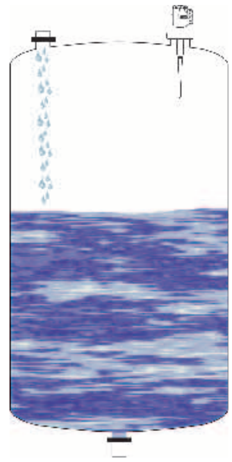
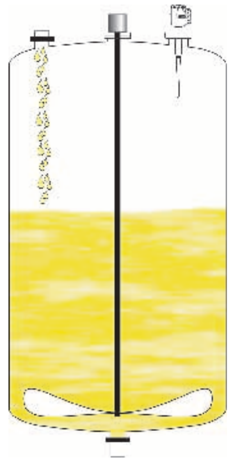
The measure range depends on many factors as product surface characteristics, false echo signals, antenna type. Also the dielectric constant is an important factor in order to determine the maximum measurement range.
See the different type of constant range in table 1.

Group	ε_r	Product type
I	1,4 ÷ 1,9	Non conductive liquids , i.e. liquid gas
II	1,9 ÷ 4	Non conductive liquids, i.e. oil, hydrocarbon
III	4 ÷ 10	Organic solvents, alcohol, concentrated acids
IV	>10	Conductive liquids, i.e. Water solutions (salt, acid)

Tab.1

N.B. - All products with undefined dielectric constant ε_r; must be associated to group **II**
Ammonia NH_3 must be associated to group **I** and requires the installation with calm-pipe

Table 2 and 3 show examples of the interconnection between product type and instrument installation in determining the maximum measurement range:

Transmitter		**Stocking** (periodical handling)		**Intermediate** (uninterrupted handling)		**Stirrer installation**		**Stilling pipe**	**Bypass pipe**
									
		Measure range		Measure range		Measure range		Measure range	Measure range
RPL53		DN80	DN150	DN80	DN150	DN80	DN150	DN50÷150	DN50÷150
RPL51 / 52		-	Rod type	-	Rod type	-	Rod type	-	-
I	ε_r = 1,4 ÷ 1,9	to install in stilling-pipe (30m)						30m	*
II	ε_r = 1,9 ÷ 4	7,5m	15m	3,5m	7,5m	1,5m	6m	30m	*
III	ε_r = 4 ÷ 10	15m	22m	7,5m	11m	3m	9m	30m	30m
IV	ε_r > 10	22,5m	30m	11m	15m	4,5m	12m	30m	30m

*) with stilling pipe into bypass pipe

Tab.2

2.2 Operating conditions

For the installation of **RPL** radar level transmitter and for its operating parameter configuration we must take into consideration several conditions:

- tank diameter **Ø** (fig.3) not less-than the value shown in tab.3
- tank high **H** (fig.3) not less-than the value shown in tab.3
- the maximum distance measurement arrives where the emission lobe meets the bottom of the tank. In case of tanks with conic or convex bottom it is impossible to measure a lower level.
- if the product can form deposits, the measurement could be affected by the contact between the antenna and the deposit itself. In this case it is necessary to mantain a gap not less-than 50 mm from the antenna and the 100% setpoint (fig.3)
- foam on product surface can cause an unreliable measurement.
- in case of products with a low dielectric constant (group **I** and **II** tab.1)it is necessary to fix the 0% point at a certain distance **(A)** from the bottom of thank, as indicated in tab. 3
- the antenna type fixes the minumum possible measurement range.

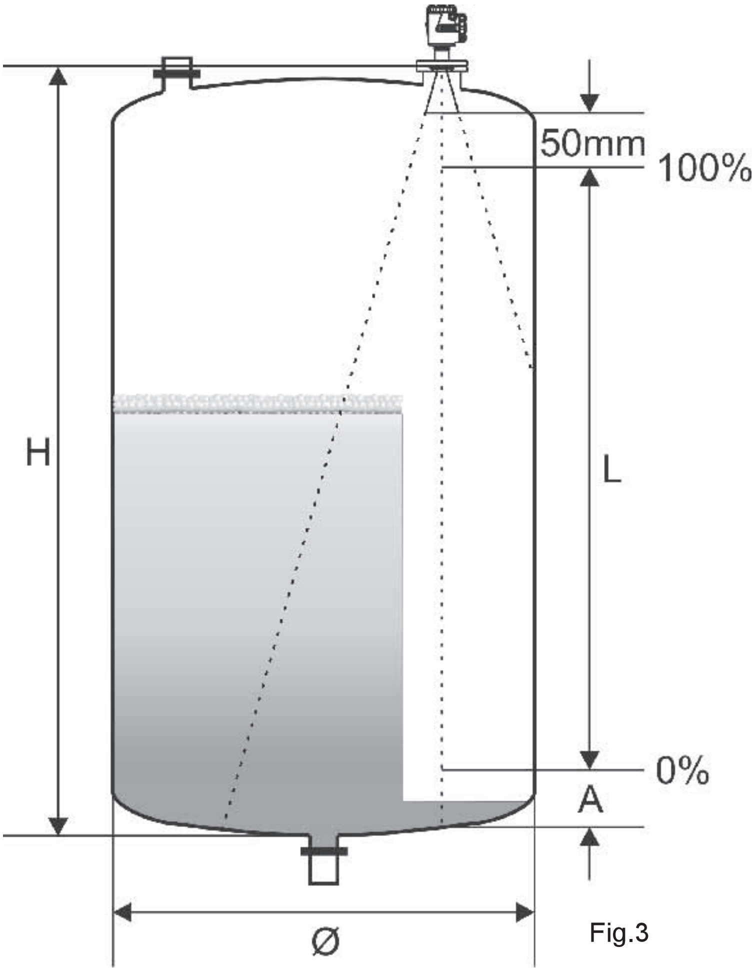


Fig.3

Model	Ø	L	H	A
RPL51 / 52	> 1m	> 0,5m	> 1m	150÷300mm
RPL53	> 1m	> 0,5m	> 1m	150÷300mm
RPL54	> 2m	> 1m	> 3m	300÷600mm

Tab.3

3. SOLIDS MEASUREMENT

3.1 Measure range

The measure range depends on antenna dimensions, installation position, product reflection and possible interferences.The following factors can reduce the maximum measurement range: product deposits (wet products), product static angle, surface reflection of light products loaded by pneumatic system, products having low dielectric constant εr. Table 4 shows the various ranges of dielectric constant

Group	εr	Product types
1°	1,6 ÷ 1,9	Sugar, plastic chips, special concretes, lime
2°	1,9 ÷ 2,5	Calcium sulphate, Concrete
3°	2,5 ÷ 4	Sand, cereals, seeds, gravels
4°	4 ÷ 7	Salt, wet gravel, minerals
5°	>7	Coal, metallic powders, lampblack

Tab.4

3.2 Antenna

Always install the antenna with the maximun possible diameter, in order to obtain an optimum signal intensity.

3.3 Operating conditions

For the installation of **RPL** radar level transmitter and for its operating parameter configuration we must take into consideration several conditions:

- the maximum distance measurement arrives where the emission lobe meets the bottom of the tank. For tanks with conic or convex bottom it is impossible to measure a lower level.
  In this case it is recommended to orient the transmitter up to reach the best measurement range.
- if the product can form deposits, the measurement could be affected by the contact between the antenna and the deposit itself. In this case it is necessary to mantain a gap not less-than 50 mm from the antenna and the 100% setpoint (fig.4)
- in case of products with a low dielectric constant (group **I** and **II** tab.4) it is necessary to fix the 0% point at a certain distance **(A)** from the bottom of the thank (fig.4) non less than 50÷150mm for the **RPL53** transmitter, and not less than 100÷300mm for the **RPL54** transmitter.

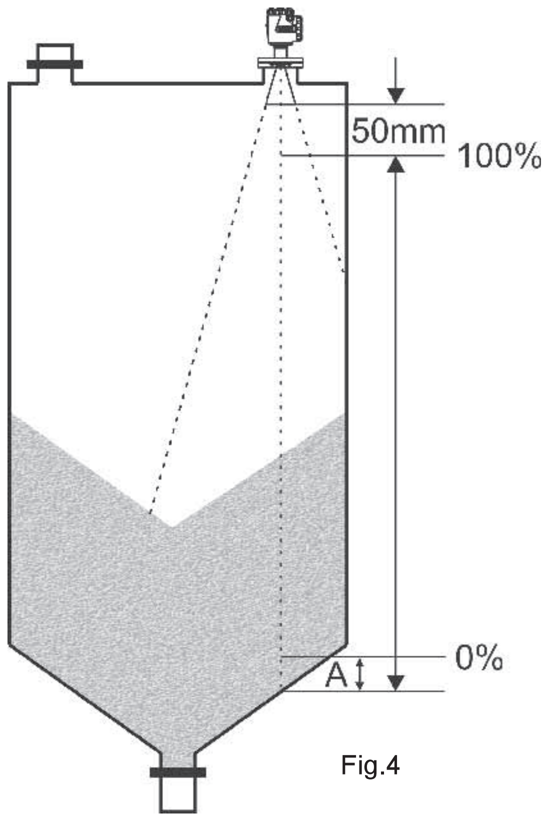


Fig.4

4. MECHANICAL INSTALLATION

4.1 Liquid measurement

The level transmitter must be installed in a suitable position for easy operation during connection, start-up and maintenance. In order to make every operation easier it is possible to rotate the housing at 360°.

4.1.1 Installation position

- Use a protection cover in order to protect the transmitter from direct sun or rain (fig.5/c).
- Do not install the transmitter above the fill stream (fig.5/a)
- In tanks with convex roof, in order to avoid possible interferences, do not install the transmitter in the centre (fig.5/b).
- The transmitter must be installed perpendicularly to the the product surface (fig.5)
- The minimum distance "**d**" between the installation point and the tank side must be not less than 300mm for the **RPL51/52/53** transmitters and not less than 600mm for the **RPL54** ones.

4.1.2 Tank internal device

- Internal devices having symmetrical structures such as heating coils (fig.6/A) and vacuum rings (fig.6/B), can generate false echo signals.
- Avoid any installations, as limit switches or temperature sensors, inside the signal beam.(fig. 6/C).

4.1.3 Optimization

- The transmitter can be installed into a stilling pipe in order to avoid interferences.
- Use a big antenna size: the bigger the antenna, the smaller the beam angle, the less interferences echoes (tab.5),
- With the mapping system is possible to cancel the interferences of the falso echo signals.

Model	RPL51/52	RPL53				RPL54		
Antenna	Rod	Ø50mm	Ø80mm	Ø100mm	Ø150mm	Ø150mm	Ø200mm	Ø250mm
Beam angle α	24°	29°	26°	24°	20°	20°	16°	14°

Tab.5

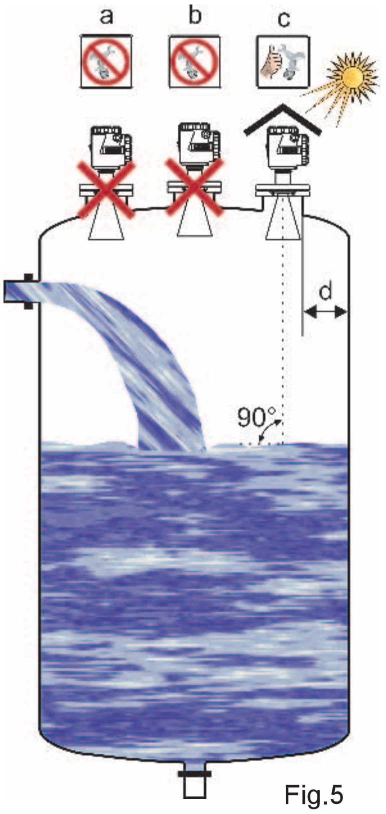


Fig.5

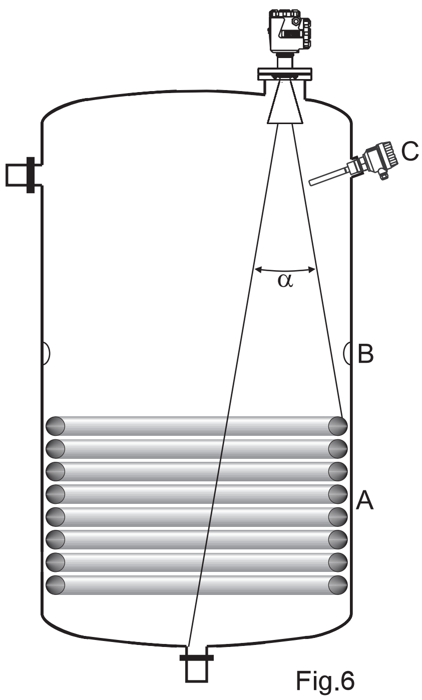


Fig.6

4.2 Solid Measurement

The level transmitter must be installed in a suitable position for easy operation during connection, start-up and maintenance. In order to make every operation easier it is possible to rotate the housing at 360°.

4.2.1 Installation position

- Use a protection cover in order to protect the transmitter from direct sun or rain (fig.5/c).
- Do not install the transmitter above the fill stream (fig.5/a)
- In tanks with convex roof, in order to avoid possible interferences, do not install the transmitter in the centre (fig.5/b).
- In order to avoid the contamination of an excessive powder deposit on the antenna, we suggest to arrange for a periodical cleaning system.
- The minimum distance "**d**" between the installation point and the tank side must be 1/6 of the tank Ø , anyway not less than 300mm for the **RPL53** transmitters and not less than 600mm for the **RPL54**.
  If the tank wall is not smooth (corrugated metal,welding seam, irregularities) we suggest the transmitter is installed at the maximum possible distance. If necessary, arrange for a transmitter bearing system.

4.2.2 Internal tank devices

- Internal devices having symmetrical structure such as reinforcing rings (fig.8/A) can interfere with the measurement.
- Avoid any installations, as limit switches or temperature sensors, inside the signal beam.(fig. 8/C).

4.2.3 Optimization

- In order to reduce falso echoes we suggest mounting metallic screens (fig.8/D).
- Use a big antenna size: the bigger the antenna, the smaller the beam angle, the less interferences echoes (tab.5).
- With the mapping system is possible to cancel the interferences of the falso echo signals.
- The level measurement can be optimized by the antenna bearing. In this way it is possible to increase the measure range and to avoid the interference echoes.

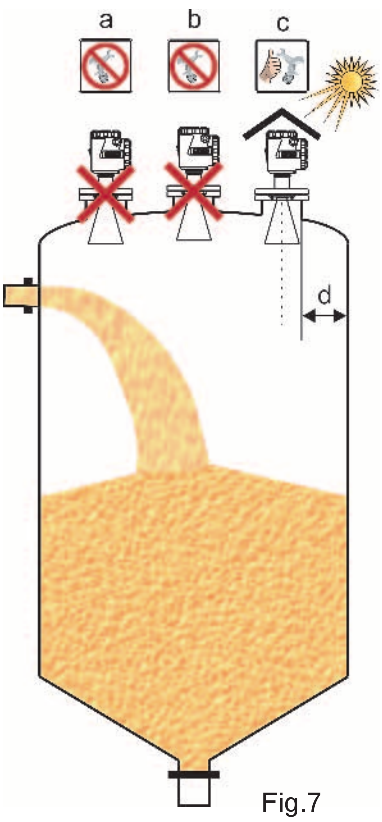


Fig.7

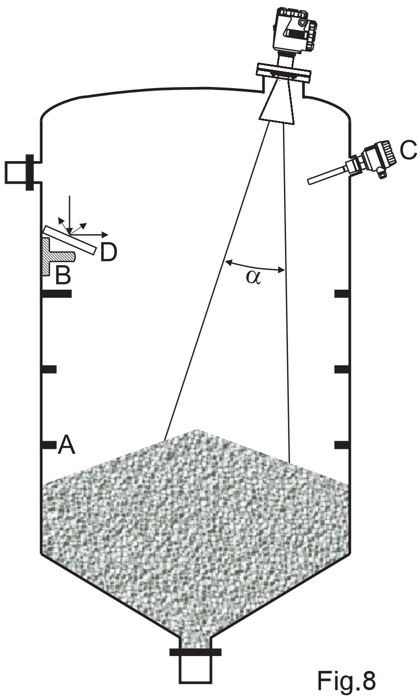


Fig.8

4.3 Plastic tanks and silos

If the outer wall of the tank is made of non-conductive material, i.e. plastic or resins, do not install metallic structure outside the tank (metallic pipes, ladders). The emission beam could reach these metallic parts through the plastic side and recieve a wrong signal. (fig.9 and 10).

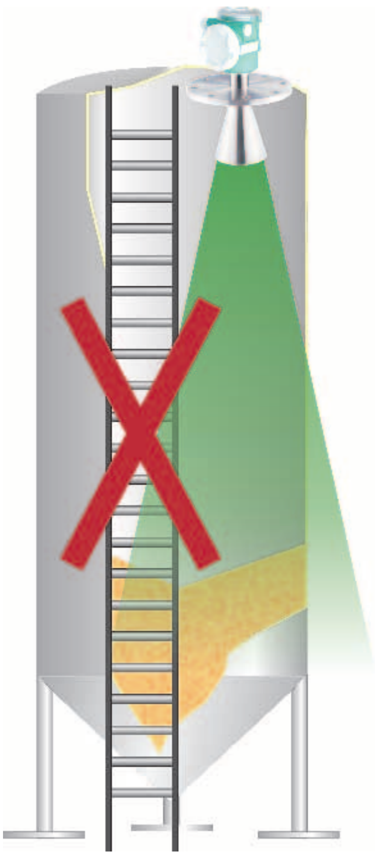


Fig.9

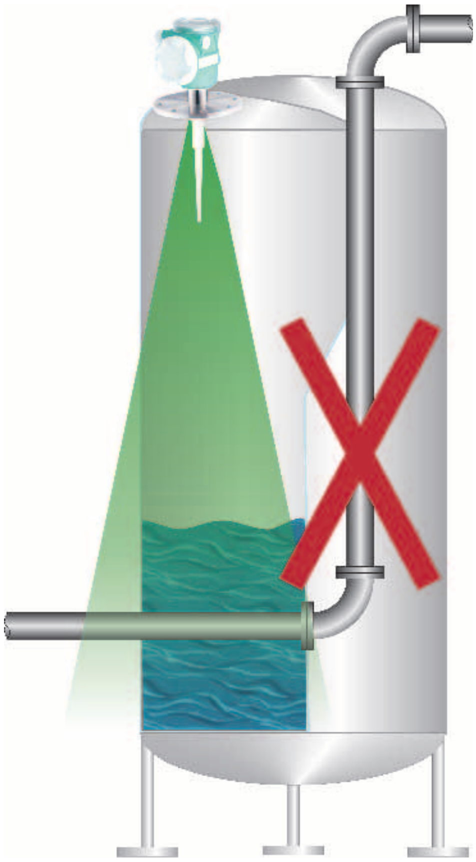


Fig.10

To avoid the problem it's useful to know the beam angle "**α**" (tab.5 and fig.11) in order to calculate the emission beam diameter "**b**" (fig.11) as a function of the distance "**L**" (fig.11) through the following formula: $b = 2 * L * \tan\frac{\alpha}{2}$
In this way it is possible to know in advance if the emission beam would intercept interfering installations.

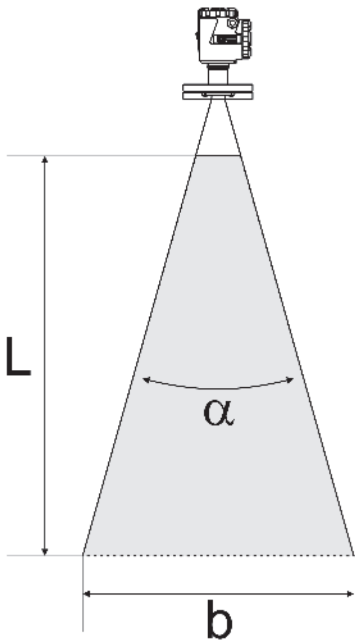


Fig.11

4.4 General installation criteria

4.4.1 Standard installation

- Observe the installation instructions shown in the previous pages.
- After the mounting, the housing can be turned 360° in order to simplify the access to the display and the terminal compartment.
- The horn antenna must extend below the fixing nozzle (fig.12). If necessary, it's possible to use the antenna extension(fig..13)
- The inactive part of the antenna must extend below the nozzle (fig.14). If necessary, it's possible to install an extension (fig.15)
- In order to avoid wet and/or water infiltrations into the housing, curve the cable sheat as shown in fig.16.

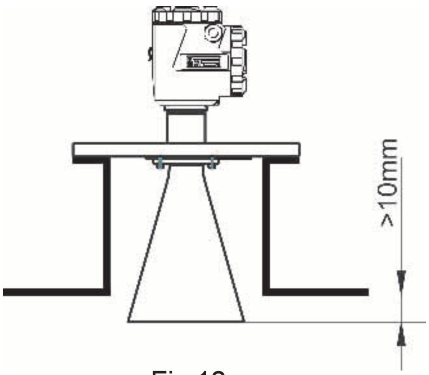


Fig.12

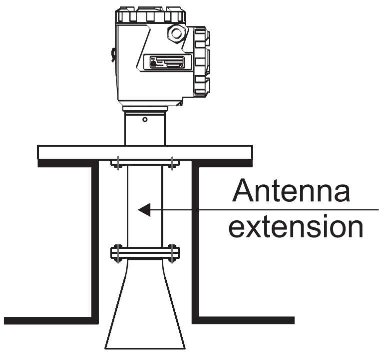


Fig.13

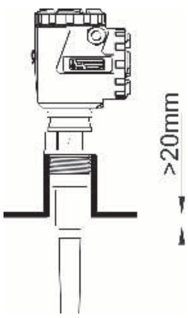


Fig.14

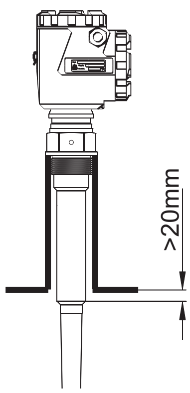


Fig.15

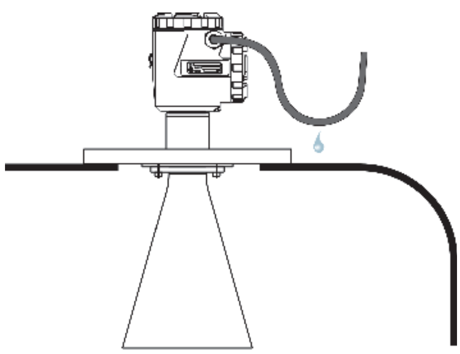


Fig.16

4.4.2 Tanks and silos with conic bottom

- In case of tanks and silos with conic bottom the suggested position for **RPL** transmitter is in the middle of the roof (fig.16), in order to extend the maximum possible measurement range.
  Avoid this solution in case of convex roof (fig.5 and 7)

4.4.3 Tanks with agitators

- In case of tanks equipped with agitators (fig.17), it is necessary to map and memorize the false echo signals created by agitator blades. This procedure allows **RPL** transmitter to recognize a false echo and to trasmitt the correct signal.

4.4.4 Foams

- Sometimes, during the filling procedure, it’s possible to observe a layer of foam on the product surface, which can reduce the reflection. In these cases it’s necessary to use big antenna or install the **RPL** transmitter in a still or bypass pipe.

4.4.5 Stilling and bypass pipe

We suggest the use of stilling ot by-pass pipe in presence of foam or obstacles between the transmitter and the level. For a correct installation it is necessary that:

a) the stilling or by-pass pipe must reach the minumum level (fig.18)
b) the hole for air output on the pipe summit must have a 5÷10mm diameter (fig.18.1)
c) in case of plastic pipe install the sensor in the centre of the tank, in order to avoid false echoes(fig.19)

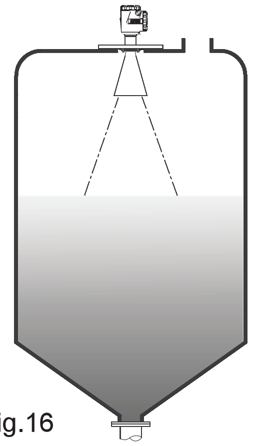


Fig.16

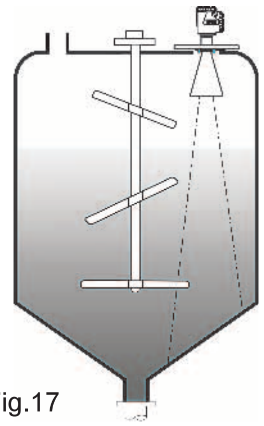


Fig.17

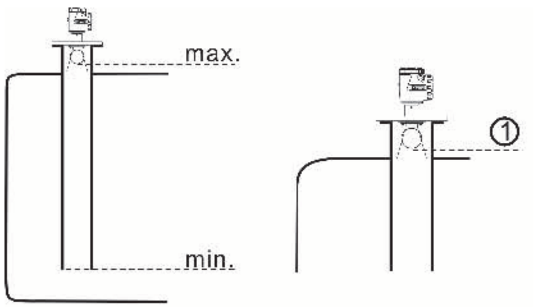


Fig.18

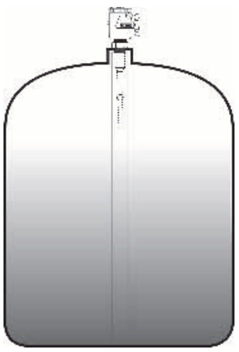


Fig.19

4.4.6 Tanks with plastic cover

In case of tanks with a plastic cover, it's possible to take the level measurement by the external installation of the **RPL54** transmitter (fig.20).

The conditions for a correct measurement are:

a) The plastic cover must have a low dielectric constant and a thickness in accordance with the data shown in tab.6. This solution is not suitable if the tank cover is made of conductive material

b) The product dielectric constant εr must be >10

c) The beam angle α must be 15°÷20° (fig.20)

d) The distance between the maximum product level and the roof of the tank must be equal or more than 150mm (fig.20)

e) The distance between the antenna and the tank cover must be more than 100mm. The correct measurement depends on the tank physical characteristics (fig.20)

f) Absence of condensate or deposits under the cover (fig.20)

g) The spacers must be adjustable in order to reach the correct opeartation conditions.(fig.20)

h) The transmitter must be an **RPL54** with a **DN250** antenna.

i) Absence of metallic structures into the signal beam.

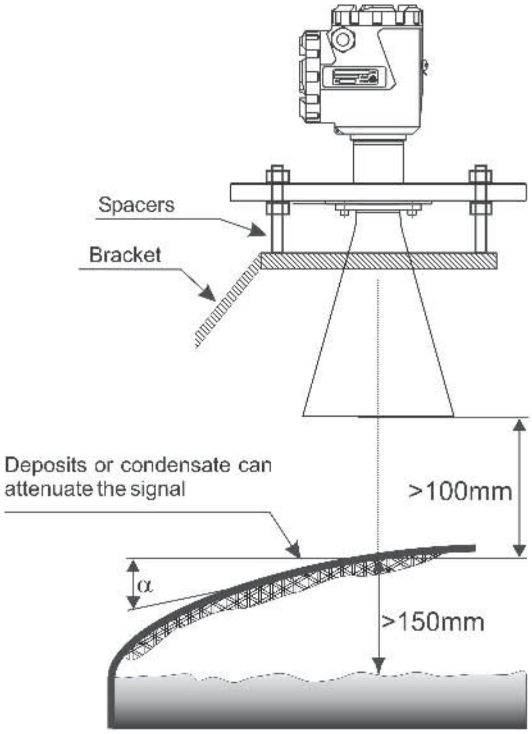


Fig.20

Materiale	PP	PE	PTFE	Perspex
εr	2.3	2.3	2.1	3.1
Tickness	17mm	18mm	17mm	14,4mm

Tab.6

5. ELECTRICAL CONNECTIONS

5.1 Standard conditions

The electric supply voltage can be different according to the transmitter model. Always check the correct value indicated on transmitters label.
It's necessary to observe installation codes and safety operations for the site and the plant conditions..

5.2 Electric supply

5.2.1 4÷20mA / HART, 2-wire model

The same cable is used for both electrical supply and for 4÷20mA signal. The correct values of the electrical supply are indicated on the product technical data sheet.

5.2.2 4÷20mA / HART, 4-wire model

2 different cables are used for electrical supply and for 4÷20mA signal.

5.3 Connecting cables

Use a 6÷11mm diameter cable to ensure a tightness on cable gland. Use shielded cables in order to avoid electromagnetic interferences.

5.3.1 4÷20mA / HART

For 2-wire model use a single cable. For 4-wire model use two cables.

5.4 Earthing of cable shield

The cable shield must be earthed at both ends. Insert a ceramic capacitor, 1nF 1500V type, in order to avoid transient currents on the shield.

5.5 Wiring diagram

See in fig.21 the 2-wire HART connection (point 1 shows the common supply and the 4÷20mA signal)

See in fig.22 the 4-wire HART connection (point 1 shows the common supply and point 2 the 4÷20mA signal).

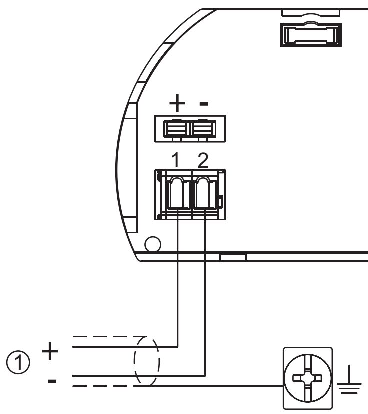


Fig.21

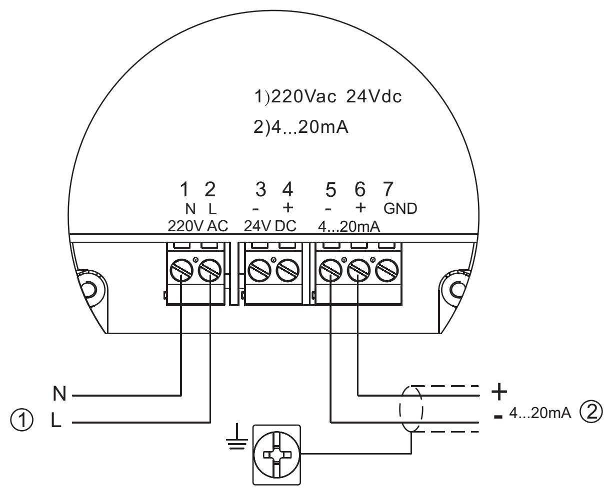


Fig.22

5.6 Intrinsically safety versions

For the intrinsically safety versions, all the connections must be done with shielded cable with a maximum lengh of 500m.

The cable must gave a capacitance <0.1microF/Km and an inductance <1mH/Km.

The **RPL5X** level transmitter must be earthed and cannot be connected to non certified equipments.

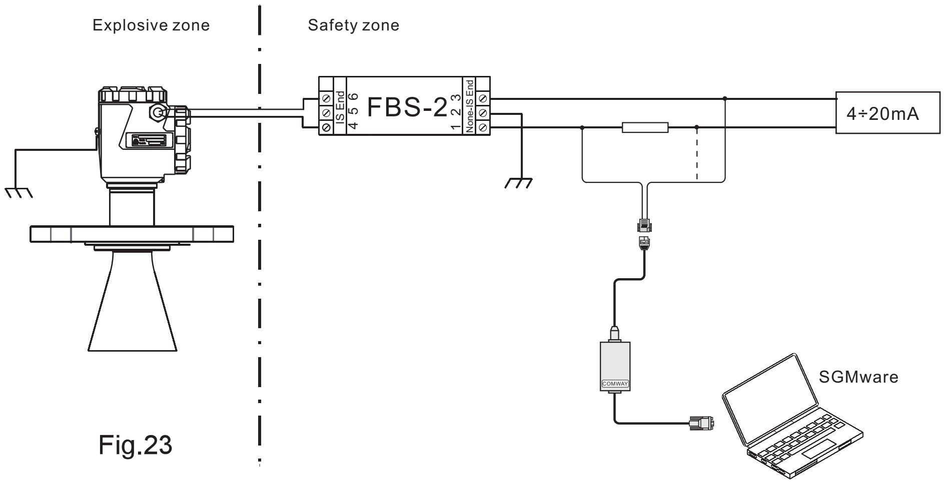


Fig.23

Connection by SGMware

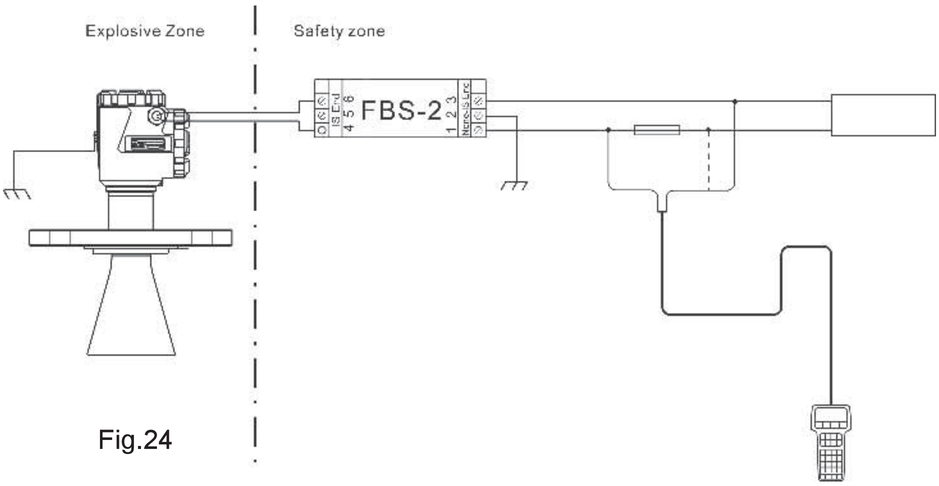


Fig.24

Connection by HART programmer

6. CONFIGURATION

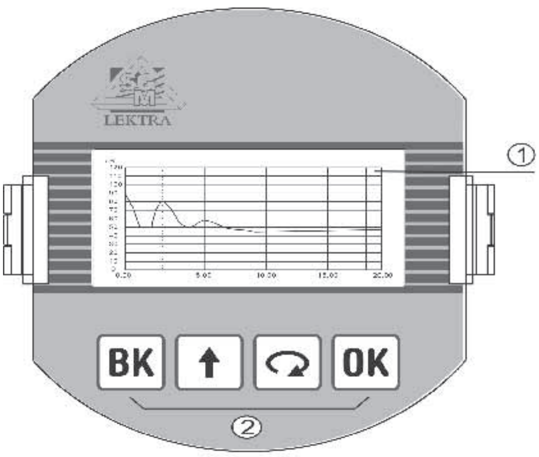
6.1 Setting modalities

The **RPL** radar level transmitters have 3 configuration and setting modalities:

- by programming display
- by **SGMware** communication software
- by portable HART programmer

6.2 Programming display

The programming display (fig.25) has a large matrix LCD. (fig.25, 1).
The multitongue programming guide allows and easy and fast start up through the keyboard. (fig.25, 2). The display also shows the distance and the momentary level during the operating conditions, through the transparent cover.



1) LCD Display
2) Keyboard

Fig.25

OK
- Programmation access
- Options confirmation
- Parameters values confirmation


- Parameter selection
- Programming value selection
- Parameters display


- Parameters value modification

BK
- Exit program
- Back to previous menu
- "**RUN**" and "**ECHO WAVE**" access

6.3 SGMware

6.3.1 Connection by HART line (fig.26)

1) Connector RS232
2) RPL5X with HART communication protocol
3) HART adapter to connect to COMWAY converter
4) Resistance 250ohm
5) COMWAY converter

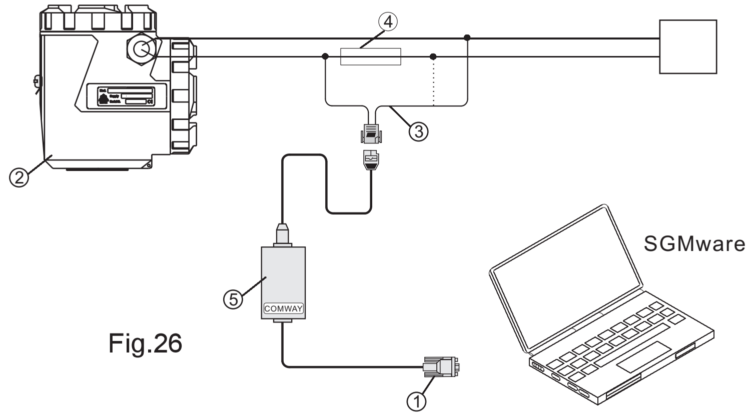


Fig.26

6.3.2 Connection by I²C (fig.27)

1) Connector RS232
2) RPL5X
3) I²C adapter to connect to COMWAY converter
4) COMWAY converter

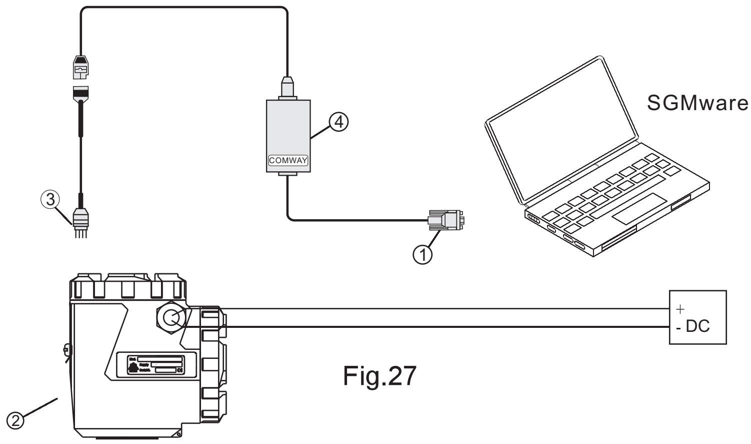


Fig.27

6.3.3 Connection by HART programmer (fig.28)

1) HART programmer
2) RPL5X with HART communication programmer
3) Resistence 250ohm

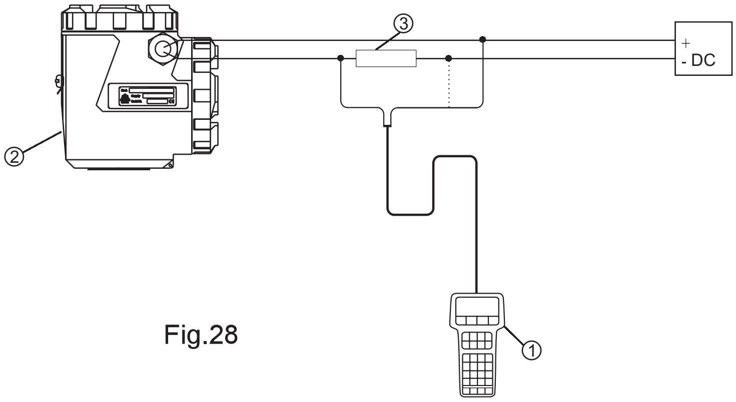
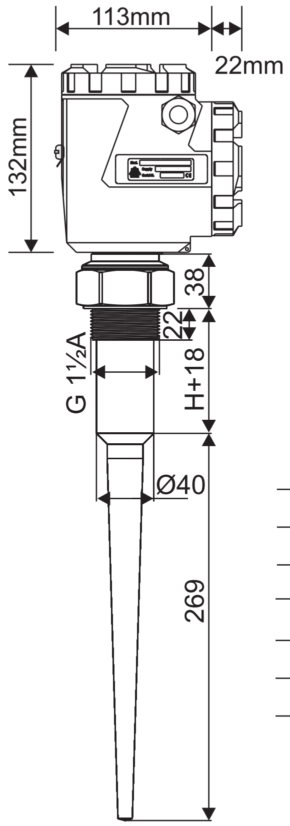


Fig.28

7. DIMENSIONS

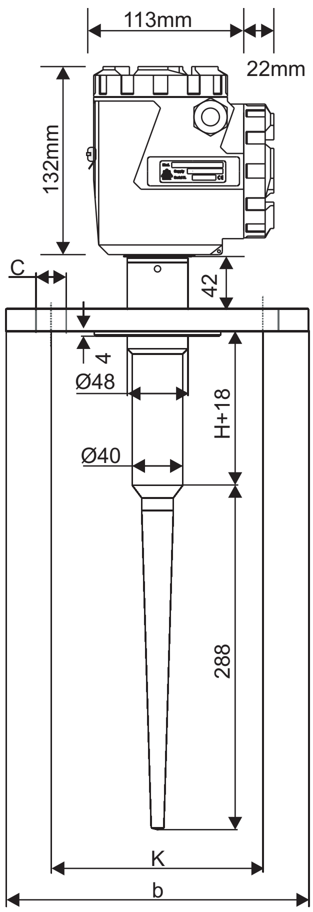
7.1 RPL51 (fig.29)



H
50
100
150
200
250
300

Fig.29

7.2 RPL52 (fig.30)



	K	b	C
DN50	Ø125	Ø165	Ø16x4
DN80	Ø160	Ø200	Ø16x8
DN100	Ø180	Ø220	Ø16x8
DN150	Ø240	Ø285	Ø20x8

H
50
100
150
200
250
300

Fig.30

7.3 RPL53 (fig.31)

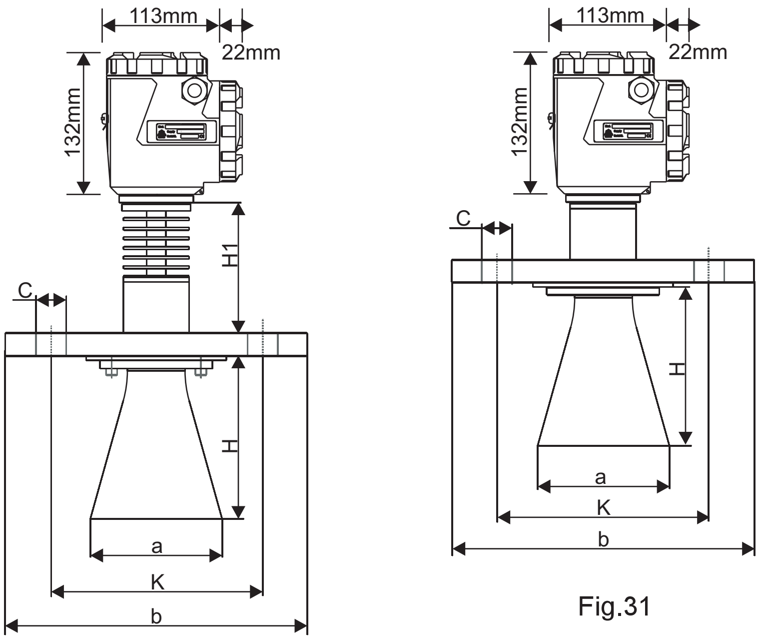


Fig.31

	a	K	b	C	H	H1
DN50		Ø125	Ø165	Ø16x4		123
DN80	Ø75	Ø160	Ø200	Ø16x8	60	123
DN100	Ø96	Ø180	Ø220	Ø16x8	120	123
DN150	Ø146	Ø240	Ø285	Ø20x8	205	123
DN200	Ø197	Ø295	Ø340	Ø20x12	296	123
DN250	Ø244	Ø355	Ø405	Ø24x12	380	123

7.4 RPL54 (fig.32)

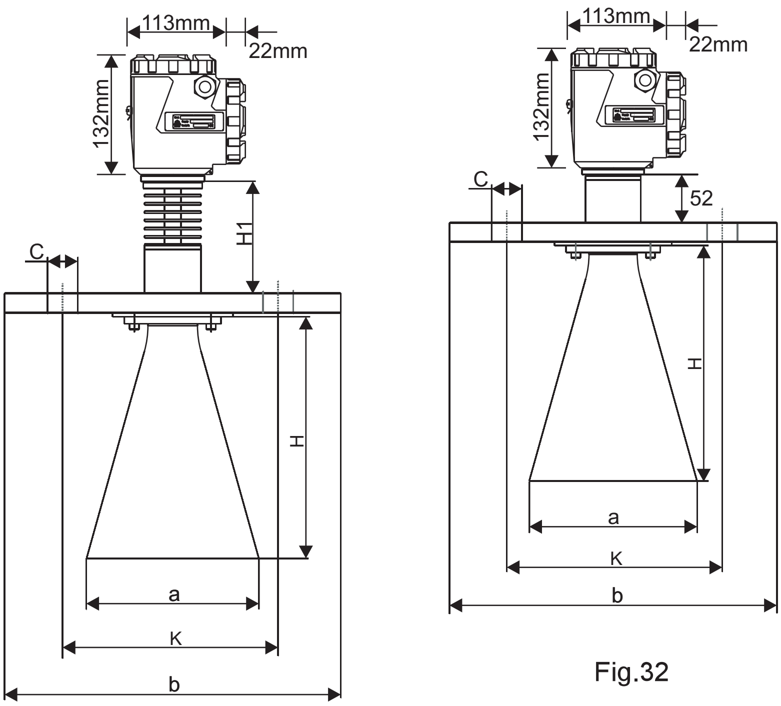


Fig.32

	a	K	b	C	H	H1
DN150	Ø146	Ø240	Ø285	Ø20x8	205	123
DN200	Ø197	Ø295	Ø340	Ø20x12	296	123
DN250	Ø244	Ø355	Ø405	Ø24x12	380	123

8. TECHNICAL SPECIFICATIONS

8.1 Standard features

Process connections:	threaded G 1½ or flanged
Materials:	
- Antenna:	PTFE o PP
- Flanges:	AISI316L
- Housing and blind cover:	PBT
- Transparent cover	polycarbonate
- Gaskets:	NBR
Weight:	
- RPL51:	2Kg (according to mechanical specifications)
- RPL52:	5Kg (according to mechanical specifications)
- RPL53:	6Kg (according to mechanical specifications)
- RPL54:	10Kg (according to mechanical specifications)

8.2 Power supply

2-wire version:	
- input voltage:	15÷36Vdc
- intrinsically safe input voltage:	15÷30Vdc
- consumption:	max. 22.5mA
- max ripple:	<100Hz, Uss>1V; 100Hz÷100KHz, Uss<10mV
4-wire version:	
- input voltage:	24Vdc ±10%; 230Vac ±10%
- intrinsically safe input voltage:	24Vdc ±10%; 230Vac ±10%
- consumption:	max. 4VA, 2W

8.3 Output

output signal:	4÷20mA / HART
resolution:	1,6microA
fault fixed signal :	20.5mA; 22mA; 3.8mA
load:	
- 2-wire version:	see fig.33
- 4-wire version:	max. 500ohm
integration time:	0÷99s, programmable

2 Wires load resistance diagram

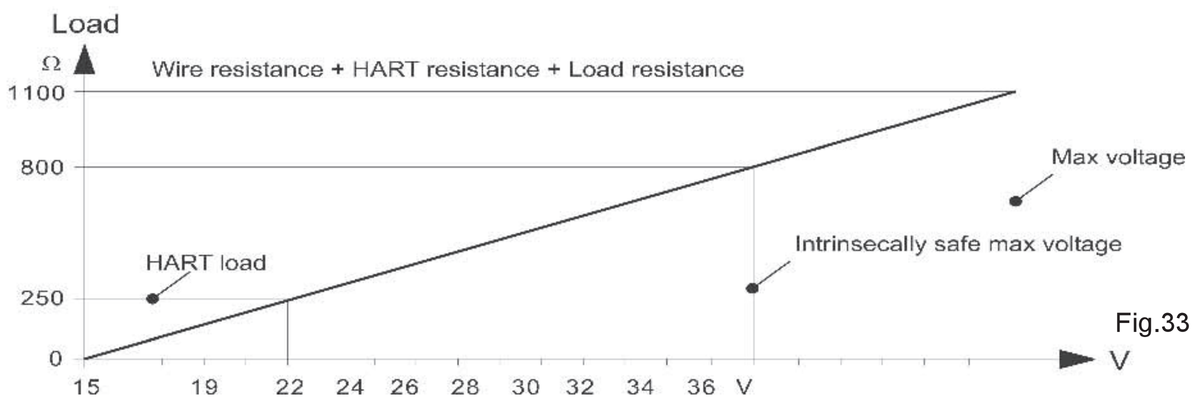


Fig.33

8.4 Technical features

Maximum measurable distance:
- RPL51: 30m (liquids)
- RPL52: 30m (liquids)
- RPL53: 30m
- RPL54: 70m

radar pulse frequency: 6.3GHz

measure span: 1s approx. (according to programm parameters)

refreshing span: 1s approx. (according to programm parameters)

beam angle: see tab.7

Model	RPL51/52	RPL53				RPL54		
Antenna	Rod	Ø50mm	Ø80mm	Ø100mm	Ø150mm	Ø150mm	Ø200mm	Ø250mm
beam angle α	24°	29°	26°	24°	20°	20°	16°	14°

Tab.7

display resolution: 1mm

accuracy:
- RPL51/52 see fig.34
- RPL53 see fig.35
- RPL54 see fig.36

stocking temperature : -40 ÷ +80°C

Operating temperature:
- RPL51: -40 ÷ +120°C
- RPL52: -40 ÷ +150°C
- RPL53: -40 ÷ +180°C
- RPL54: -40 ÷ +180°C

relative humidity: <95%

pressure: max. 40bar

vibration resistance : mechanical vibrations 10m/s^2, 10÷150Hz

8.5 Cables connections

cable input: 1 x PG13,5 or 2 x PG13,5

connecting terminals : max. wires section 2.5mm^2

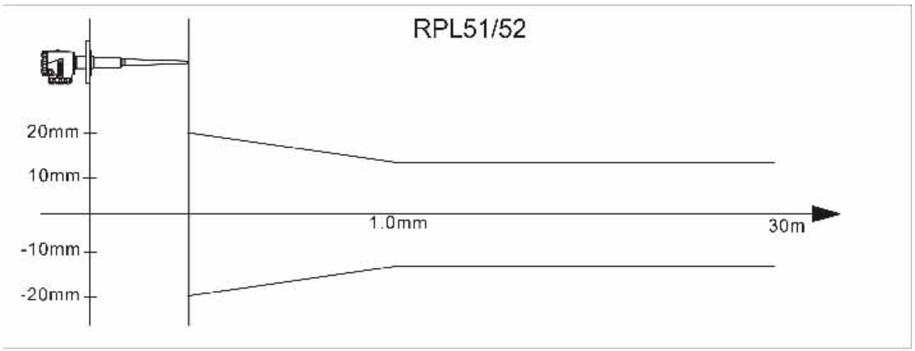


Fig.34

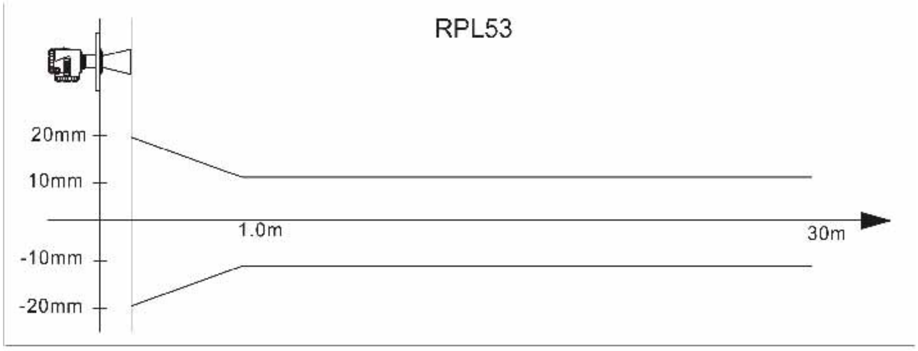


Fig.35

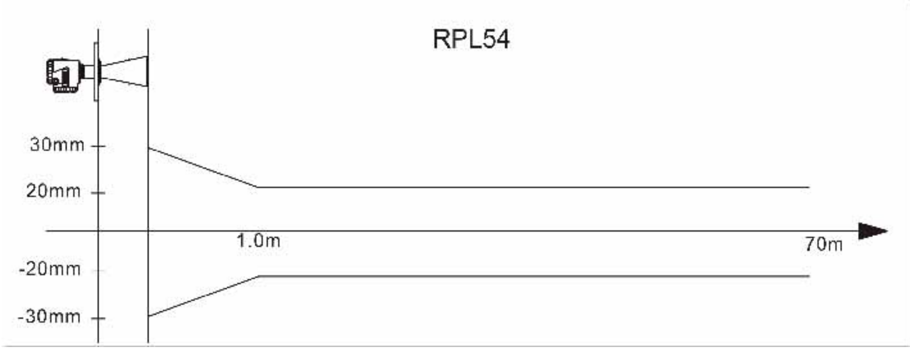


Fig.36

9. MODELS

RPL51 **RPL52**

Fig.37

Fig.38

Applications	Level transmitter for liquids and aggressive media	Level transmitter for liquids and aggressive media with limited pressure and temperature conditions
Max. measure range	30m	30m
Accuracy	±10mm	±10mm
Process connections	G1 ½ PVDF, 1 ½ NPT PVDF	Flanges DN50/80/100/150 PN16 in AISI316L
Antenna material	PP o PTFE	PTFE
Temperature range	-40° ÷ 120°C o -40° ÷ 150°C	-40° ÷ 150°C
Pressure range	-1,0 ÷ 3bar	-1,0 ÷ 16bar
Frequency range	6GHz	6GHz
Output signal	2/4-wire, 4÷20mA, HART	2/4-wire, 4÷20mA, HART

RPL53

Fig.39

RPL54

Fig.40

Applications	Level transmitter for storage and process application	Level transmitter for storage and process application
Max. measure range	30m	70m
Accuracy	±10mm	±20mm
Process connection	AISI316L Flanges DN50/80/100/150/200/250 PN16	AISI316L Flanges DN150/200/250 PN16
Antenna material	PTFE and AISI316L	PTFE and AISI316L
Temperature range	-40° ÷ 200°C	-40° ÷ 200°C
Pressure range	-1,0 ÷ 40bar	-1,0 ÷ 40bar
Frequency range	6GHz	6GHz
Output signal	2/4-wire, 4÷20mA, HART	2/4-wire, 4÷20mA, HART

10. ORDER CODIFICATION

In order to help the customer in making the correct choice, we have created a numeric code

9.1 RPL51 (fig.37)

For liquids measurement also with aggressive medium
Max. distance: 30m
Accuracy: ±10mm
Process pressure: -1,0÷3bar

RPL51	Code	Version
	I	Intrinsically Safe (PENDING)
	P	Standard

Code	Antenna shape / Material/ Process temperature
A	Rod / PP / -40÷120°C
B	Rod / PTFE / -40÷150°C

Code	Antenna extension
A	50mm
B	100mm
C	150mm
D	200mm
E	250mm
F	300mm

Code	Process connection/Material
GP	Thread G1 ½ A PN3/PVDF
NP	Thread G1 ½ NPT PN3/PVDF

Code	Electronic preamplifier
A	4÷20mA 2-wire 24 Vdc
B	4÷20mA HART (2-wire) 24Vdc
C	4÷20mA 20÷72Vdc / 20÷250Vac 4-wire
D	4÷20mA 20÷72Vdc / 20÷250Vac HART (4-wire)

Code	Housing / Protection /Antenna Protection
S	PBT / IP65 / IP67

Code	Cable entry
M	PG13,5

Code	programming display
A	Yes
X	No

RPL51	P	B	A	GP	B	S	M	A

Order codification example

9.2 RPL52 (fig.38)

For liquids measurement also with aggressive medium
Max. distance: 30m
Accuracy: ±10mm
Process pressure: -1,0÷16bar

RPL52	Code	Version
	I	Intrinsically safe (PENDING)
	P	Standard

Code	Antenna shape/ Material/ Process temperature
B	Rod / PTFE / -40÷150°C

Code	Antenna extension
A	50mm
B	100mm
C	150mm
D	200mm
E	250mm
F	300mm

Code	Process connection / Material
FC	DN50 PN16 AISI316L flange
FD	DN80 PN16 AISI316L flange
FE	DN100 PN16 AISI316L flange
FK	DN150 PN16 AISI316L flange

Code	Electronic preamplifier
A	4÷20mA 2-wire; 24Vdc
B	4÷20mA HART (2-wire); 24Vdc
C	4÷20mA 20÷72Vdc / 20÷250Vac 4-wire
D	4÷20mA 20÷72Vdc / 20÷250Vac HART (4-wire)

Code	Housing / Protection /Antenna protection
S	PBT / IP65 / IP67

Code	Cable entry
M	PG13,5

Code	Programming display
A	Yes
X	No

RPL52	P	B	A	FC	B	S	M	A

Order codification example

9.3 RPL53 (fig.39)

For storage or process applications
Max. distance: 30m
Accuracy: ±10mm
Process pressure: -1,0÷40bar

RPL53	Code	Version
	I	Intrinsically safe (PENDING)
	P	Standard

Code	Antenna shape / Material/ Process temperature
C	Horn Ø50mm / AISI316L (only applicable for installation with standpipe)
D	Horn Ø80mm / AISI316L (only applicable for installation with standpipe)
E	Horn Ø100mm / AISI316L
F	Horn Ø150mm / AISI316L

Code	Antenna extension
A	None
B	200mm
C	500mm

Code	Process conection / Material
FA	DN50 PN16 AISI316L flange
FB	DN80 PN16 AISI316L flange
FC	DN100 PN16 AISI316L flange
FD	DN150 PN16 AISI316L flange
FE	Flangia DN200 PN16 AISI316L
FH	Flangia DN250 PN16 AISI316L

Code	Seal / Process temperature
2	Viton / -40÷130°C
3	Kalrez / -20÷130°C
4	Viton / -40÷200°C with radiator fins
5	Kalrez / -20÷200°C with radiator fins

Code	Electronic preamplifier
A	4÷20mA 2-wire; 24Vdc
B	4÷20mA HART (2-wire); 24Vdc
C	4÷20mA 20÷72Vdc / 20÷250Vac 4-wire
D	4÷20mA 20÷72Vdc / 20÷250Vac HART (4-wire)

Code	Housing / Protection /Antenna protection
S	PBT / IP65 / IP67

Code	Cable entry
M	PG13,5

Code	Programming display
A	Yes
X	No

RPL53	P	E	A	FC	2	B	S	M	A

Order codification example

9.4 RPL54 (fig.40)

For storage or process applications
Max. distance: 70m
Accuracy: ±20mm
Process pressure: -1,0÷40bar

RPL53	*Code*	Version
	I	Intrinsically safe (PENDING)
	P	Standard

Code	Antenna shape / Material/ Process temperature
F	Horn Ø150mm / AISI316L
G	Horn Ø200mm / AISI316L
H	Horn Ø120mm / AISI316L

Code	Antenna extension
A	None
B	200mm
C	500mm

Code	Process connection / Material
FB	DN150 PN16 AISI316L flange
FC	DN200 PN16 AISI316L flange
FD	DN250 PN16 AISI316L flange

Code	Seal /Process temperature
2	Viton / -40÷130°C
3	Kalrez / -20÷130°C
4	Viton / -40÷200°C with radiator fins
5	Kalrez / -20÷200°C with radiator fins

Code	Electronic preamplifier
A	4÷20mA 2-wire; 24Vdc
B	4÷20mA HART (2-wire); 24Vdc
C	4÷20mA 20÷72Vdc / 20÷250Vac 4-wire
D	4÷20mA 20÷72Vdc / 20÷250Vac HART (4-wire)

Code	Housing / Protection/ Antenna protection
S	PBT / IP65 / IP67

Code	Cable entry
M	PG13,5

Code	Programming display
A	Yes
X	No

RPL54	P	H	A	FD	2	B	S	M	A

Order codification example

SGM LEKTRA s.r.l.
Via Papa Giovanni XXIII, 49
20090 Rodano (Milano)
tel. ++39 0295328257 r.a.
fax ++39 0295328321
e-mail: info@sgm-lektra.com
web: www.sgm-lektra.com