

**HYCONTROL**  
LEVEL MEASUREMENT SOLUTIONS



**RB SERIES**  
**RC SERIES**  
**RE SERIES**  
**24 GHz RADAR**  
**LEVEL GAUGES**

# WHY USE 24 GHz RADAR FOR LEVEL MEASUREMENT?

## UNAFFECTED BY CHANGES IN

- ◆ Dielectric
- ◆ Pressure
- ◆ Vacuum
- ◆ Humidity
- ◆ Dust
- ◆ Viscosity
- ◆ Foam
- ◆ Temperature

## 24 GHz RADAR'S KEY FEATURES INCLUDE

- ◆ Measuring range of up to 100 m (328 ft) with accuracy of +/- 2 mm (0.08")
- ◆ Versatile technology for monitoring and control of both solid and liquid products
- ◆ Measures level, distance or volume
- ◆ Wide selection of antenna types shapes including horn and drop
- ◆ Choice of antenna materials including PEEK and PTFE
- ◆ Two-wire loop-powered 24 VDC
- ◆ Compact, durable IP66/68 design suitable for tough industrial environments
- ◆ Profibus outputs pending
- ◆ ATEX Ex ia hazardous area options available
- ◆ Powerful K-band 24 GHz transmitter (LPR and TLPR)
- ◆ Simple to install and retrofit with a wide selection of process connections
- ◆ HART Protocol output for ease of system compatibility
- ◆ Measures fast-moving and changeable processes
- ◆ Empty tank spectrum function eliminates false reflections caused by tank internals

## APPLICATIONS IN MANY INDUSTRIES

- ◆ Wastewater
- ◆ Quarry
- ◆ Chemical
- ◆ Food
- ◆ Plastics
- ◆ Power Generation
- ◆ Oil & Gas
- ◆ Construction
- ◆ Pharmaceutical
- ◆ Pulp & Paper
- ◆ Animal Feed
- ◆ Recycling

## EFFECTIVE REPLACEMENT FOR

- ◆ Capacitance transmitters
- ◆ Yo-Yo/Plumbob
- ◆ Hydrostatic
- ◆ Ultrasonic transmitters

## MANUFACTURED TO ISO9001 Q.M.S.



*The standard of all Hycontrol products is strictly monitored to conform to all ISO quality requirements.*

*This ensures we meet the needs of customers as well as statutory and regulatory requirements.*



Pellets



Liquids



Flakes



Slurry



Granules



Oils

# REFLEX RC SERIES RADAR - SOLIDS

The RC Series is a two-wire 24 GHz FMCW radar level transmitter for basic applications with solid products. It provides continuous, non-contact level measurement of **stones, granules, flakes and other such solid products** for a variety of industries. The level transmitter can be equipped with a **metallic horn antenna** or **PP and PTFE drop antennas**. The drop antenna design minimises product build-up and is **unaffected by the angle of repose**, eliminating the need for antenna aiming kits or purging systems.

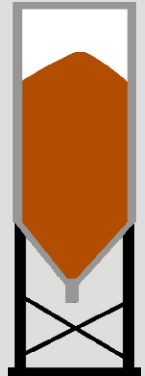
The RC Series provides accurate and reliable readings, even with uneven product surfaces. Due to its small beam angle and high dynamic range, the 24 GHz radar can measure distances **up to 100 m/328 ft**. This makes it a cost-effective, more powerful alternative to pulse radar transmitters. **Hazardous area approvals** are available. The transmitter offers flange or thread connections, with optional antenna extensions to suit any nozzle length. HART®7 comes as standard.

- ◆ Aluminium or stainless steel housing
- ◆ Measuring range up to 100 m (328 ft)
- ◆ Unaffected by angle of repose
- ◆ Horn or drop antenna options
- ◆ Large, backlit LCD display
- ◆ Built-in surface profile configurations
- ◆ 4~20 mA & HART output
- ◆ Max. temperature 130°C (266°F)
- ◆ Purging system for horn antenna
- ◆ Variety of process connections
- ◆ Accuracy of +/- 2 mm (0.08")
- ◆ Two-wire loop powered



## RC SERIES TECHNICAL DATA

TYPE	RC SERIES FMCW RADAR
Frequency range	K-band (24 GHz)
Dielectric constant $\epsilon_r$	>1.4 (TBF 1.1)
Measuring range	0...100 m (0...328 ft)
Accuracy	±2 mm (±0.08")
Repeatability	±1 mm (±0.04")
Housing material	Aluminium, 316L, Deep-drawn 316L
Ingress protection	IP66/68
Process connection	G1", G1½", 1" NPT, 1½" NPT, DN80...200, 3...8", 80...200 A
Gasket	FKM/FPM, EPDM, Kalrez® 6375
Ambient temperature	-40°C - +80°C (-40°F - +176°F)
Process temperature	-50°C - +130°C (-58°F - +266°F)
Process pressure	-1 - 16 bar (-14.5 - 232 psi)
Power supply	12...30 V DC (Ex i), 16...36 V DC (Ex d), 2-wire
Output	2-wire: 4-20 mA (HART®7), PROFIBUS PA (pending)
ATEX	Yes
ANTENNA TYPE	SIZES (BEAM ANGLES)
Metallic Horn (316L)	DN80...200; 3"...8" (9°...5°)
Drop (PP)	DN80; 3" (9°), DN100; 4" (7°), DN150; 6" (5°)
Drop (PTFE)	DN80; 3" (8°), DN100; 4" (7°), DN150; 6" (4°)



Solids, powders,  
granules, flakes

**HART**  
COMMUNICATION PROTOCOL

HART®7  
as standard



# REFLEX RB SERIES RADAR - BASIC LIQUIDS

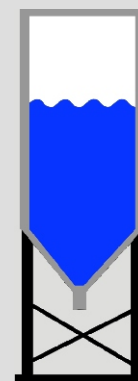
The **RB Series two-wire 24 GHz FMCW radar level transmitter** has been developed by **Hycontrol** for **basic liquid process applications**. It is particularly appropriate for continuous, non-contact level measurement in the **chemical, petrochemical, and oil and gas** industries. Options include **metallic horn antennas or PP drop antennas** for condensing atmospheres and corrosive media. The 24 GHz radar has a high dynamic range and can **measure distances up to 100 m/328 ft**.

The RB Series provides accurate readings even in processes with **fast-changing levels**, in closed tanks or in open air (for example in dams or rivers). This unit is an **effective level measurement upgrade for basic applications** that require higher accuracy. There are flange or thread connections as well as optional antenna extensions to suit any nozzle length. It is approved for **hazardous areas** and comes with extensive device diagnostics (acc. to NE 107) as well as **HART®7 communication as standard**.

- ◆ Aluminium or stainless steel housing
- ◆ Measuring range up to 100 m (328 ft)
- ◆ Monitor fast-changing levels (60 m/min)
- ◆ Flanged or threaded process connection
- ◆ Large, backlit LCD display
- ◆ Empty tank spectrum counters false echoes
- ◆ 4~20 mA & HART output
- ◆ Max. temperature 130°C (266°F)
- ◆ Suitable for small and high tanks
- ◆ Horn or drop antenna options
- ◆ Accuracy of +/- 2 mm (0.08")
- ◆ Two-wire loop powered

## RB SERIES TECHNICAL DATA

TYPE	RB SERIES FMCW RADAR
Frequency range	K-band (24 GHz)
Dielectric constant $\epsilon_r$	>1.4 (TBF 1.1)
Measuring range	0...100 m (0...328 ft)
Accuracy	±2 mm (±0.08")
Repeatability	±1 mm (±0.04")
Housing material	Aluminium, 316L, Deep-drawn 316L
Ingress protection	IP66/68
Process connection	G1", G1½", 1" NPT, 1½" NPT, DN40...200, 1½"...8", 40...200 A
Gasket	FKM/FPM, EPDM, Kalrez® 6375
Ambient temperature	-40°C - +80°C (-40°F - +176°F)
Process temperature	-50°C - +130°C (-58°F - +266°F)
Process pressure	-1 - 16 bar (-14.5 - 232 psi)
Power supply	12...30 V DC (Ex i) 16...36 V DC (Ex d), 2-wire
Output	2-wire: 4-20 mA (HART® 7), PROFIBUS PA (pending)
ATEX	Yes
ANTENNA TYPE	SIZES (BEAM ANGLES)
Metallic Horn (316L)	DN40...200; 1½"...8" (17°...5°)
Drop (PP)	DN80; 3" (9°), DN100; 4" (7°), DN150; 6" (5°)



Basic liquid applications



Fast-changing levels



Corrosive applications

# REFLEX RE SERIES RADAR - CORROSIVE LIQUIDS

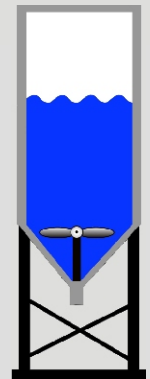
Hycontrol's RE Series two-wire 24 GHz FMCW radar level transmitter is designed for a broad spectrum of **liquid applications**. It measures distance, level and volume of liquids and pastes, and is ideal for measuring the level of **corrosive liquids in agitated tanks** up to a range of **100 m/328 ft**. The unique **drop-shaped antenna** option is perfectly suited for aggressive liquids. For toxic and dangerous products, the RE series can be equipped with a **Metaglas® second sealing barrier**.

The RE Series is ideal for use in **hazardous areas**, and can be used in process conditions of up to +200°C/+392°F and 100 bar/1450 psi. There is also a dedicated version for non-Ex applications with **very high-temperature liquids** of up to +700°C/+1292°F. Additionally, the radar level transmitter comes with a **quick coupling system** that allows the housing to be removed under process conditions. The level transmitter is also compatible with HART®7 communication, as well as having 4-20 milliamp outputs.

- ◆ Aluminium or stainless steel housing
- ◆ Measuring range up to 100 m (328 ft)
- ◆ Antenna extensions to suit any nozzle length
- ◆ Horn or drop antenna options
- ◆ Large, backlit LCD display
- ◆ Empty tank spectrum counters false echoes
- ◆ 4~20 mA & HART output
- ◆ Max. temperature 200°C (392 °F)
- ◆ Metaglas® sealing barrier available
- ◆ High-temperature version available
- ◆ Accuracy of +/- 2 mm (0.08")
- ◆ Two-wire loop powered

## RE SERIES TECHNICAL DATA

TYPE	RE SERIES FMCW RADAR
Frequency range	K-band (24 GHz)
Dielectric constant $\epsilon_r$	>1.4 (TBF 1.1)
Measuring range	0...100 m (0...328 ft)
Accuracy	±2 mm (±0.08")
Repeatability	±1 mm (±0.04")
Housing material	Aluminium, 316L, Deep-drawn 316L
Ingress protection	IP66/68
Process connection	G1½", 1½" NPT, DN40...200, 1½"...8", 40...200 A
Gasket	FKM/FPM, EPDM, Kalrez® 6375
Ambient temperature	-40°C - +80°C (-40°F - +176°F)
Process temperature	-50°C - +200°C (-58°F - +392°F) -50°C - +700°C (-58°F - +1292°F) high temp. option (non-ATEX)
Process pressure	-1 - 100 bar (-14.5 - 1450 psi) Higher pressure capability on request
Power supply	12...30 V DC (Ex i) 16...36 V DC (Ex d), 2-wire
Output	2-wire: 4-20 mA (HART®7), PROFIBUS PA (pending)
ATEX	Yes
ANTENNA TYPE	SIZES (BEAM ANGLES)
Metallic Horn (316L)	DN40...200; 1½"...8" (17°...5°)
Drop (PEEK)	DN80; 3" (9°)
Drop (PTFE)	DN80; 3" (8°), DN100; 4" (7°), DN150; 6" (4°)



Liquids with agitators



Corrosive applications

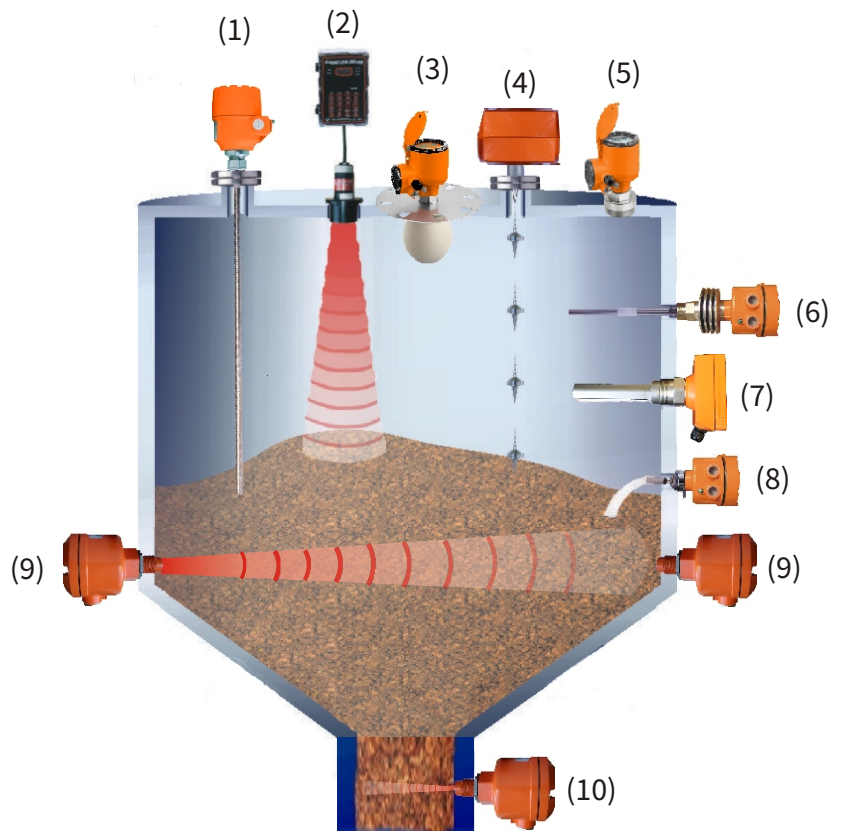


High-temperature applications



## Product Range For Solids:

- (1) TDR Radar for Solids
- (2) 2-Wire Ultrasonic Transmitter
- (3) 24 GHz FMCW 2-Wire Radar
- (4) Continuous Servo Level Indicator
- (5) 80 GHz FMCW 2-Wire Radar
- (6) Capacitance Level Switch
- (7) Vibrating Probe Level Switch
- (8) Rotating Paddle Level switch
- (9) Microwave Level Switch



## Product Range For Liquids:

- (1) Bypass Level Indicator
- (2) TDR Radar for Liquids
- (3) 2-Wire Ultrasonic Transmitter
- (4) 24 GHz FMCW 2-Wire Radar
- (5) Magnetic Float Switches
- (6) 80 GHz FMCW 2-Wire Radar
- (7) Capacitance Level Switch
- (8) RF Admittance Level Switch
- (9) Side Mounting 316 SS Float Switch
- (10) Tuning Fork Level Switch
- (11) Tuning Fork Level Switch
- (12) Ultrasonic Through Wall

