

HYCONTROL
LEVEL MEASUREMENT SOLUTIONS



RA SERIES 80 GHz
RB SERIES 24 GHz
RE SERIES 24 GHz
RF SERIES 80 GHz
RADAR LEVEL GAUGES
FOR LIQUIDS

WHY USE RADAR FOR LIQUID LEVEL MEASUREMENT?

UNAFFECTED BY CHANGES IN

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

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 liquid; measured by level, distance or volume
- ◆ Short 'dead zone' allows for full tank measurement
- ◆ 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
- ◆ ATEX Ex ia hazardous area options available
- ◆ Powerful K-band 24 GHz (LPR and TLPR) or W-band 80 GHz transmitters
- ◆ 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
- ◆ Laser Transmitters
- ◆ 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.

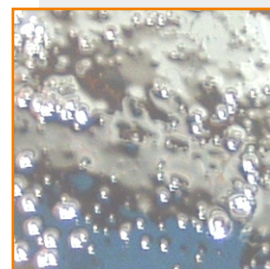
This ensures we meet the needs of customers as well as statutory and regulatory requirements.



Water



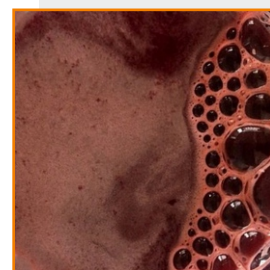
Waste



Acids



Slurry



Juice



Oils

REFLEX RA SERIES RADAR - HYGIENIC LIQUIDS

Hycontrol's Reflex RA Series two-wire 80 GHz FMCW radar level transmitter is designed for **hygienic liquids applications**, where high precision is essential. It provides continuous, non-contact level measurement. A **flush-mounted PEEK lens antenna** with a small beam angle and short dead zone allows for precise level measurement even in small and narrow tanks with agitators. It is also well suited for use on larger tanks, with **measuring distances up to 50 m/164 ft**.

The RA series is ideally suited for the **pharmaceutical** and **food and beverage** industries in applications with any finished or raw product, such as **raw milk, wine or juice**. As the radar withstands process temperatures up to +150°C/+302°F and pressures up to 25 bar/362 psi, it **can be used in CIP/SIP cleaning procedures**. The RA Series offers a large choice of hygienic process connections and comes with extensive device diagnostics as well as HART®7 communication.

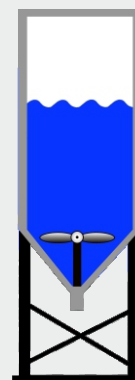
- ◆ Aluminium or stainless steel housing
- ◆ Measuring range up to 50 m (164 ft)
- ◆ Unaffected by vapour and humidity
- ◆ PEEK antenna for zero intrusion
- ◆ Large, backlit LCD display
- ◆ Empty tank spectrum counters false echoes
- ◆ 4~20 mA & HART output
- ◆ Max. temperature 150°C (302°F)
- ◆ Designed for hygienic applications
- ◆ Variety of process connections
- ◆ Accuracy of +/- 2 mm (0.08")
- ◆ Two-wire loop powered

RA SERIES TECHNICAL DATA

TYPE	RA SERIES FMCW RADAR
Frequency range	W-band 80 GHz
Dielectric constant ϵ_r	>1.4 (TBF 1.1)
Measuring range	0 ... 50 m (0 ... 164 ft)
Accuracy	±2 mm (±0.08")
Repeatability	±1 mm (±0.04")
Housing material	Aluminium, 316L, Deep drawn 316L
Ingress protection	IP66/68
Process connection	Tri-Clamp® ISO 2852: 1½", 2"; DIN 11851 or DIN 11864-1 Form A: DN40, DN50; VARIVENT® or NEUMO BioControl®: DN50; SMS 1145: DN51
Gasket	PEEK
Ambient temperature	-40°C - +80°C (-40°F - +176°F)
Process temperature	-40°C - +150°C (-40°F - +302°F)
Process pressure	-1 - 25 bar (-14.5 - 362.6 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

RA SERIES ANTENNA OPTIONS

TYPE	SIZE	BEAM ANGLE
Lens (PEEK)	DN25 (1")	10°
Lens (PEEK)	DN40 (1.5")	8°



Liquids with agitators



Small/narrow tanks & CIP/SIP



Hygienic applications

REFLEX RB SERIES RADAR - BASIC LIQUIDS

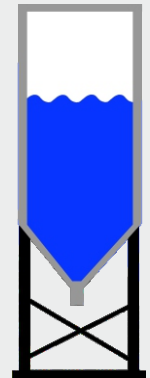
The **RB Series two-wire 24 GHz FMCW radar level transmitter** has been developed by **Hycontrol** for **basic liquid process applications**. It is particularly appropriate for continuous, non-contact level measurement in the **chemical, petrochemical, and oil and gas** industries. Options include **metallic 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 ϵ_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

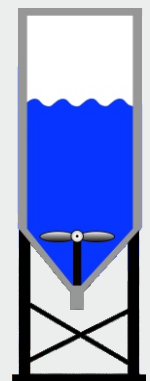
Hycontrol's RE Series two-wire 24 GHz FMCW radar level transmitter is designed for a broad spectrum of **liquid applications**. It measures distance, level and volume of liquids and pastes, and is ideal for measuring the level of **corrosive liquids in agitated tanks** up to a range of **100 m/328 ft**. 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. 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
- ◆ Two-wire loop powered
- ◆ Accuracy of +/- 2 mm (0.08")

RE SERIES TECHNICAL DATA

TYPE	RE SERIES FMCW RADAR
Frequency range	K-band (24 GHz)
Dielectric constant ϵ_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)
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

REFLEX RF SERIES RADAR - NARROW LIQUID TANKS

The **RF Series** is a **two-wire 80 GHz FMCW radar level transmitter** for **challenging liquid applications involving narrow tanks** with long nozzles and internal obstructions like agitators or heating coils. The minimal beam angle and dead zone make this an optimal choice for continuous, non-contact level measurement in both **very small and very high tanks** (up to 100 m/328 ft). The level transmitter can also **measure through tank roofs** made of non-conductive materials.

The RF Series provides accurate readings even in processes with **fast-changing levels**. The PEEK lens antenna is resistant to build-up and well-suited to **corrosive** environments. As the antenna is flush-mounted, there is no intrusion into the tank. Operating temperatures are up to +150°C/+302°F, with pressures up to 40 bar/580 psi. The RF Series offers a range of flange and thread connections, starting from ¾". It comes with approvals for use in hazardous areas as well as extensive device diagnostics (acc. to NE 107) and HART®7 communication.

- ◆ Aluminium or stainless steel housing
- ◆ Measuring range up to 100 m (328 ft)
- ◆ Monitor fast-changing levels (60 m/min)
- ◆ PEEK flange protection against corrosion
- ◆ Large, backlit LCD display
- ◆ Empty tank spectrum counters false echoes
- ◆ 4~20 mA & HART output
- ◆ Max. temperature 150°C (302°F)
- ◆ Suitable for small and high tanks
- ◆ Variety of process connections
- ◆ Accuracy of +/- 2 mm (0.08")
- ◆ Two-wire loop powered

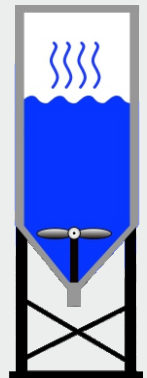


RF SERIES TECHNICAL DATA

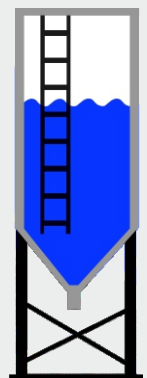
TYPE	RF SERIES FMCW RADAR
Frequency range	W-band 80 GHz
Dielectric constant ϵ_r	>1.4 (TBF 1.1)
Measuring range	0 ... 100 m (0 ... 328 ft)
Accuracy	±2 mm (±0.08")
Repeatability	±1 mm (±0.04")
Housing material	Aluminium, 316L, Deep drawn 316L
Ingress protection	IP66/68
Process connection	G¾", G1", G1½", G3", ¾" NPT, 1" NPT, 1½" NPT, 3" NPT, DN50...200, 2...8", 50...200 A
Gasket	FKM/FPM, EPDM, Kalrez® 6375
Ambient temperature	-40°C - +80°C (-40°F - +176°F)
Process temperature	-50°C - +150°C (-58°F - +302°F) -50°C - +200°C (-58°F - +392°F)
Process pressure	-1 - 40 bar (-14.5 - 580 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

RF SERIES ANTENNA OPTIONS

TYPE	SIZE	BEAM ANGLE
Lens (PEEK)	DN20 (¾")	15°
Lens (PEEK)	DN25 (1")	10°
Lens (PEEK)	DN40 (1.5")	8°
Lens (PEEK)	DN70 (2.75")	4°



Liquids with agitators/coils



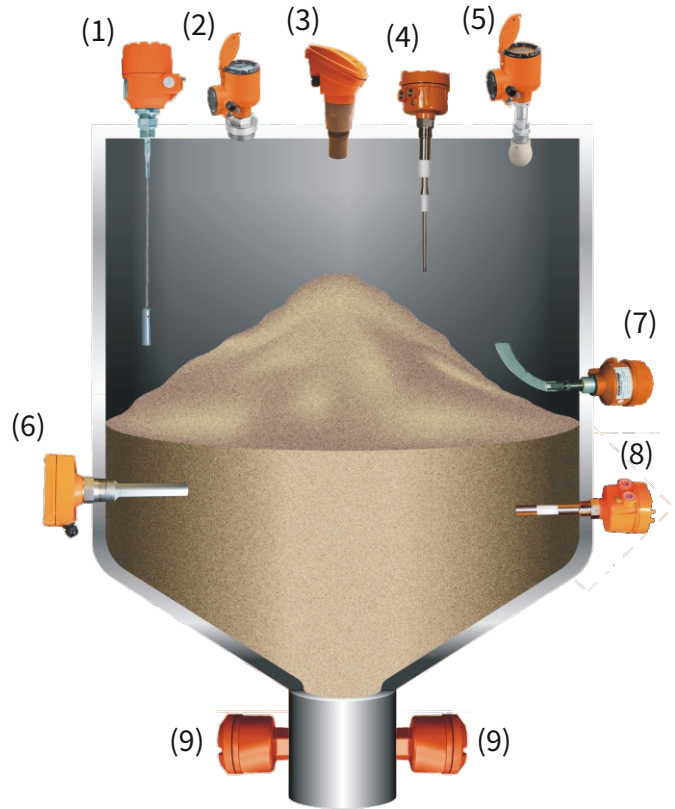
High/narrow/obstructed tanks



Corrosive applications

Product Range for Solids:

- (1) TDR radar for solids
- (2) 80 GHz FMCW radar
- (3) 2-wire ultrasonic transmitter
- (4) RF admittance level switch
- (5) 24 GHz FMCW radar
- (6) Vibrating level probe
- (7) Rotary paddle switch
- (8) Capacitance level switch
- (9) Microwave flow & blockage switch



Product Range for Liquids:

- (1) Bypass level indicator
- (2) 80 GHz FMCW radar
- (3) Foam control system
- (4) 24 GHz FMCW radar
- (5) 2-wire ultrasonic transmitter
- (6) TDR radar for liquids
- (7) Capacitance level switch
- (8) RF admittance level switch
- (9) Tuning fork vibrating level switch

