NEW

PiloTREK WT–300

COMPACT 80 GHz (W-BAND) RADAR
FOR SOLIDS



5 YEARS WARRANTY

NIVELCO

LEVEL TRANSMITTERS

The new **PiloTREK WT–300** non-contact radar level transmitters utilize 80 GHz FMCW radar technology—the most advanced in industrial measurement—for bulk solids in food processing, agriculture, construction materials, chemicals, and mining. They deliver millimeter accuracy across light powders to large-particle solids.

Beyond level, volume, and weight measurement, the family includes threshold functions to eliminate false echoes. Compatible with HART®-enabled NIVELCO **EView2**, **MultiCONT** universal process controller, **MonoCONT** smart field display & data logger, and PACTware™ software, or programmable via Bluetooth® with the **MobileEView** app.

FEATURES

- 2-wire 80 GHz (W-band) radar
- 60 m (197 ft) measurement range
- Accuracy of ±2 mm (±0.08")
- Easy installation
- Plug-in graphic display module
- User-friendly threshold management
- Tiltable flanged design
- Compatible with the NIFLANGE tiltable flange
- Prepared for compressed air dust blowing
- Compact design with IP66/IP67 (NEMA 4X/6 eq.) protection
- Configuration via Bluetooth® with MobileEView app
- PACTware™ compatible
- High-temperature version *(under development)*
- 5 years warranty

CERTIFICATES

- ATEX (in prep.)

AREAS OF APPLICATION

- For level measurement of powders and granular materials with a minimum dielectric constant (ε_r) of 1.4
- Agriculture
- Construction Materials
- Chemical Industry
- Food Industry
- Mining
- Energy Production
- Packaging Industry
- Recycling
- Plastics Industry



APPLICATIONS

- For free flowing solids
- Wide range of applications, from light powders to bulk solids with large particle sizes
- Measurement through a plastic tank roof *(only in case of higher dielectric constant liquid)*
- It can also be used in a vacuum



OPERATING PRINCIPLE

The reflection of the millimeter-waves is highly dependent on the dielectric constant of the medium. The actual measurable distance achievable with microwave level measurement is limited when the dielectric constant (ε_r) is low.

Informative ε_r values					
Granulated plastic	1.1…2.8	Corn, cereals, grain, sunflower seed	2.0…5.0	Flour	2.4
Cement	1.5…10			Ground stone, gravel, sand,	2.5…5.0
Powdered lime *(CaO)*	1.6…2.2	Seed-corn, granulated fodder mixture	2.0…3.0	Sodium chloride *(NaCl)*, Table salt, rock salt	3.3
Powdered milk	1.6…2.2	Malt *(dry)*	2.2…3.0	Sodium carbonate, Soda *(Na_2CO_3)*	5.3…8.4
Granule fertilizers *(Nitrates, Phosphates)*	1.6…6.4	Coal, coal powder, metal ore	2.3…15	Sodium bicarbonate, Baking soda *($NaHCO_3$)*	5.7
Powdered sugar	1.8	Coal dust	2.3		

The measurement principle of a level transmitter using a millimeter-wave signal is based on measuring the total time of flight of the measuring microwave signal. The speed of propagation of millimeter-wave signals in the air, gases, and vacuum is almost constant regardless of temperature and medium pressure, so the measured distance does not depend on the physical parameters of the intermediate medium.

The **PiloTREK WT–300** level transmitter operates on a continuous-wave frequency-modulated radar (FMCW) principle, utilizing the 80 GHz (W-band) frequency. A portion of the millimeter-wave continuous wave energy radiated by the level transmitter antenna is reflected from the measured surface, depending on the material to be measured. The distance of the reflecting surface is calculated with high accuracy by the electronics from the frequency shift of the reflected signal and converted into a distance, level, mass, or volume signal by the electronics.

TECHNICAL DATA

		PiloTREK W□□–3□□–□	
Measured values		Distance; calculated values: level, volume, mass, flow	
Signal frequency		77…81 GHz (W-band)	
Measurement range[1]		0…60 m (0…197 ft)	
Lowest ε_r of medium		1.4	
Resolution		0.1 mm (0.004")	
Supply voltage		12…36 V DC	
Output	Analog	4…20 mA (3.9…20.5 mA); $R_{Lmax} = (U_S - 12\ V) / 0.02\ A$	
	Digital	HART® interface, HART® loop resistance ≥250 Ω	
	Display	SAP–300 – graphic display unit	
	Service interface	Compatible with SAT–506–0	
	Relay *(optional)*	SPDT 30 V / 1 A DC; 42 V / 0.5 A AC	
Connectivity		Bluetooth® LE 6.0 (optional)	
Measuring frequency		~1/s	
Antenna material		Aluminum / PTFE	
Process temperature		–40…+80 °C (–40…+176 °F), High-temperature version: –40…+200 °C (–40…+400 °F)[2]	
Ambient temperature		–40…+70 °C (–40…+158 °F), with display –20…+70 °C (–4…+158 °F)	
Seal		FPM (Viton®), Optional: EPDM, FFKM Perfluoroelastomer (Kalrez® 6375)	
Process pressure		–1…3 bar (–14.5…43.5 psi)	
Maximum pressure of the pneumatic system		10 bar (145 psi)	
Process connection		3" BSP/NPT, DIN, ANSI, JIS flanges, prepared for tiltable flange (NIFLANGE)	
Ingress protection		IP66 / IP67 (NEMA 4X/6 eq.)	
Electrical connection		2× M20×1.5 cable glands + 2× internally threaded ½" NPT connection, cable outer diameter: Ø6…12 mm (Ø0.24…0.47") (shielded cable is recommended), wire cross section: 0.5…1.5 mm² (20…16 AWG)	
Electrical protection		Overvoltage Class 1; (Class III [SELV])	
Housing material[1]		Painted aluminum	Stainless steel 1.4571/1.4404
Weight		1.5…2.5 kg (3.3…5.5 lb)	2.5…3.5 kg (5.5…7.7 lb)

[1] *According to order code.*

[2] *High-temperature version only with metal housing and stainless steel flange, under development.*

ANTENNA DATA

	W□□–33□–□	W□□–36□–□
Dead zone[3]	0 m (0 ft)	
Maximum measurement range[4]	30 m (98.5 ft)	60 m (197 ft)
Accuracy[5]	±2 mm (±0.08")	
Beam angle (–3 dB)	3°	
Antenna insertion length[6]	17 mm (0.67")	

[3] *Measured from the tip of the antenna.*

[4] *May be limited in the case of low dielectric constant or non-perpendicular or non-planar media.*

[5] *In the case of an ideal reflecting surface.*

[6] *Measured from the seal plane of the process connection.*

BACKGROUND MAPPING

Thanks to its 80 GHz FMCW technology, it is much less sensitive to the presence of clutter than previous-generation radars. It now has an easy-to-use, flexible threshold management ***(EView2)*** that allows echoes from clutter in the tank to be easily masked if necessary. The threshold curve is designed to mask unwanted echoes from the measurement. Echo peaks below the threshold are not included in the evaluation.



Bluetooth® CONNECTIVITY

The Bluetooth® option on the **PiloTREK W–300** Series allows for convenient device setup and diagnostics via the NIVELCO MobileEView app for Android or iOS or the free **EView2** software download for laptops.



ORDER CODES *(NOT ALL COMBINATIONS AVAILABLE)*

2-wire compact non-contact radar level transmitter with plastic lens antenna and tiltable flange

PiloTREK W ■ ■ – 3 ■ ■ – ■ (1)

Version		Code
Standard Transmitter		T
	+ plug-in display	B
	+ air purge	C
	+ plug-in display + air purge	D
High temperature Transmitter (2)		K
	+ plug-in display	L
	+ air purge	M
	+ plug-in display + air purge	N

Antenna / Housing		Code
PTFE	Fiberglass-reinforced plastic (PBT)	F
	Painted aluminum	T
	Stainless steel	L

Measurement range	Code
30 m (98.5 ft)	3
60 m (197 ft)	6

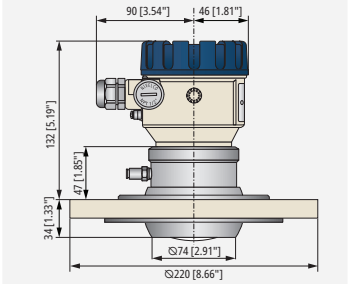
Process connection			Code
3" BSP			M
3" NPT			N
DIN flanges	Stainless steel (1.4571/1.4404 (316Ti eq.))	DN100 PN16	1
		DN125 PN16	2
		DN150 PN16	3
RF ANSI flanges		4" RF 150 psi	4
		5" RF 150 psi	5
		6" RF 150 psi	6
JIS flanges		JIS 10K 100A	7
		JIS 10K 125A	8
		JIS 10K 150A	9
DIN flanges	Polypropylene (PP)	DN100 (as per PN16)	A
		DN125 (as per PN16)	B
		DN150 (as per PN16)	C
RF-ANSI flanges		4" RF (as per 150 psi)	D
		5" RF (as per 150 psi)	E
		6" RF (as per 150 psi)	F
JIS flanges		JIS 100A (as per 10K)	G
		JIS 125A (as per 10K)	H
		JIS 150A (as per 10K)	J
Ø100 mm (Ø3.94") / prepared for tiltable flange (4)			U

Output / Certificates		Code
4...20 mA + HART®		4
	Ex ta D (3)	5
	Ex ia GD (3)	8
	+ Bluetooth®	B
	+ Bluetooth® / Ex ta D (3)	C
	+ Bluetooth® / Ex ia GD (3)	E
	+ Relay	H
	+ Relay / Ex ta D (3)	F
	+ Relay + Bluetooth®	R
	+ Relay + Bluetooth® / Ex ta D (3)	J

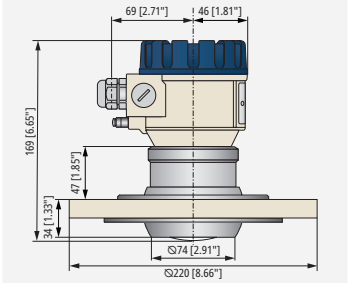
(1) For explosion-proof devices, the article number is followed by "Ex" on the data plate.
(2) High-temperature version (max. +200 °C (+400 °F)) *(only with metal housing and stainless steel flange)* currently under development.
(3) Under development.
(4) Flange type MF□–□□□–W (from size DN100 (NPS 4")) to be ordered separately.

DIMENSIONS

Aluminum housing
W□T–3□□–□



Plastic housing
W□F–3□□–□



ACCESSORIES

Graphic plug-in display module	UNIDISP SAP–300–0
HART®–USB/Bluetooth® modem for remote programming	UNICOMM SAT–504–□
eLink module	UNICOMM SAT–506–□
HART®–USB/RS485 modem for remote programming with PC, DIN rail mountable	UNICOMM SAK–305–□
Multichannel process controller and display unit	MultiCONT PRW–2□□–□
24 V DC power supply, DIN rail mountable	NIPOWER PPK–431–□
Intrinsically safe isolator module, DIN rail mountable	UNICONT PGK–301–□ Ex
EView2 configuration software for remote programming with PC	FREE download
MobileEView – free mobile application communicating with devices via Bluetooth®	Download on the App Store / GET IT ON Google Play
Smart Field Display & Data Logger	MonoCONT P□F–□1□–□
Sun protection shielding caps	UNIMOUNT SAB

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PiloTREK WT–300 – CONFIGURATION & REQUEST FOR QUOTE

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wts30026en02b // Information is accurate to the best of NIVELCO'S knowledge. We reserve the right to change specifications at any time. The general tolerance on the dimensions shown on the outline drawings is ±1 mm. We reserve the right to make changes to the dimensions.
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