AMETEK®

DREXELBROOK®

DATA SHEET

DR7000 Series

Level Radar for
Distance, Level and Volume of Liquids, Slurries and Solids

The new DR7000, **FMCW** 26 GHz radar offers State-of-the-Art components. The DR7000 is able to operate over a larger bandwidth: This ensures sharper resolution and higher accuracy. The higher signal dynamics of the DR7000 allow the accurate detection of even the smallest level changes.

The DR7000 is a 2-Wire, Loop Powered, device with an easy navigation display and touch screen user interface which allows for easy configuration and setup.

- **Easy Navigation Display**

  Choice of different Touch Screens:
  (tank illustration, bargraph, signal and reflectivity screen)
- **2-Wire**

  Class I Div1, Zone 0 Installation
- **Process Seal Ensures Vessel Integrity**
- **Antenna Types and Materials for all Applications**

Designed to Perform Better than any Other Radar

Vessel Obstructions Ignored
Agitators and other objects such as struts, inlets, ladders, have less effect on signal reduction.

The 26GHz FMCW signal is easier to evaluate and the results are more accurate and repeatable.

Agitated Surface
State-of-the-Art signal processing and a 2GHz bandwidth allow the DR7000 to determine the true level in the tank - even with agitated surfaces.

Makes Level Gauging Easier than Ever

Wizard Works Wonders
Setting up a 2-wire level gauge couldn't be easier: Simply fit the gauge to the tank, wire it up and switch it on:

- Step 1 – The DR7000 tests itself to make sure its electronics are working perfectly.
- Step 2 – The DR7000's Wizard walks you through a simple series of questions to define your tank and the product you want to measure.
- Step 3 – That's all you need. Your DR7000 is already measuring.

Interactive Help
Not certain what to do? You don't need a handbook. Simply wait 10 seconds, the help screen will appear and tell you what to do.

DR7000 Series

Specifications

Input

Function	K-band 26 GHz FMCW radar
Parameter	Level, distance, volume and reflectivity
Min. Tank Height	0.5 m / 1.5 ft
Max. Range	80 m / 262 ft
Dead Zone	Antenna length + 0.1 m antenna length + 4”

Output Signal

Output signal	4 - 20 mA HART® or 3.8 - 20.5 mA acc. to NAMUR NE 43
Accuracy	0.05% (rel. 20 mA; 20°C / 68°F)
Resolution	±2 µA
Temperature Drift	Typically 50 ppm/K
Error Signal	High: 22 mA; Low: 3.6 mA acc. to NAMUR NE 43
Max. Load	350 ohm

Measuring Accuracy - Reference conditions acc. to IEC770

Temperature	+20°C ±5°C / +68°F ±9°F
Pressure	1013 mbar abs. ±20 mbar 14.69 psig ±0.29 psig
Relative Humidity	60% ±15%
Resolution	1 mm / 0.04 “
Accuracy	±3 mm / ±0.12”
Beam Angle:	DN 40 / ANSI 1 1/2” 20° DN 50 / ANSI 2” 15° DN 80 / ANSI 3” 10°

Application Conditions

Ambient Temp.	-40…+80°C / -40…+175°F
Storage Temp.	-40…+85°C / -40…+185°F
Process Connection Temp.	Horn Antenna -40…+200°C / -40…+392°F Drop Antenna (PTFE) -40…+150°C / -40…+300°F Drop Antenna (PP) -40…+104°C / -40…+212°F (Ex: refer to relevant device spec.)
Shock Resistance	<40°C/s / <72°F/s

Process Conditions

Operating Pressure	Drop Antenna (PP) -1…16 bar / -14.5…232 psig; subject to process connection and flange temp. All Other Antennas -1…40 bar / -14.5…580 psig; subject to process connection and flange temp.
Dielectric Constant	≥1.5
Vibration Resistance	IEC 60068-2-6 and EN 50178 (10...57Hz: 0.075 mm / 57...150 Hz: 1 g)
Protection Category	IP 66/67 equiv. to NEMA 6-6X

Mechanical Data

Housing	Aluminium
Wetted Parts	Stainless steel (1.4404 / 316L); Hastelloy C-22 (2.4602)
Process Fitting	Stainless steel (1.4404 / 316L); Hastelloy C-22 (2.4602)
Gaskets	Viton (-40…+150°C / -40…+300°F); Kalrez 6375 (-20…+150°C / -5 …+300°F)

Process Connection

Thread	G 1 1/2; NPT 1 1/2
Flange	DN 40…DN 150 (PN 40 / PN 16); 1 1/2”…8” (150 lb / 300 lb); 10 K (40…100A)

Electrical Connection - 2-Wire Power Supply

Terminals Output 1	Non-Ex/ EEx i 24 V DC (14 … 30 V DC) EEx d 24 V DC (20 … 36 V DC)
Cable Entry Terminals	M20x1.5; 1/2 NPT; G 1/2 0.5…1.5 mm²

Human machine interface

Display	9 lines, 160x160 pixels in 8-step greyscale with 4-button keypad
Operating Languages	English, German, French, Italian, Spanish, Portugese, Japanese, Chinese (Mandarin), Russian

Approvals

CE-Mark		Conforms to applicable EU directives.
ATEX KEMA 04ATEXxxxxX	Ex ia	ATEX II 1 G D or II 1/2 G D or II 2 G D;
	EEx ia	IIC T6…T3 T65°C … T90°C IP 6X
	Exd	ATEX II 1/2 G D or II 2 G D;
	EEx d	[ia] IIC T6...T3 T65°C … T90°C IP 6X
FM CSA	Ex ia	Intrinsically Safe (IS) IS CL I, DIV 1, GR A,B,C,D DIP CL II, III, DIV 1, GR E,F,G NI ANI CL I, DIV 2, GR A,B,C,D (FM Only) DIP CL II, III, DIV 1 GR E,F,G Sensor Probe suitable for use in DIV 1 or ZONE 0 DIV 1 or ZONE 0 CL I, Zone 0, AEx ia IIC CL I, Zone 2, GR IIC T6, Ta = 60° C
	Ex d	Explosion Proof (XP) XP CL I, DIV 1, GR A,B,C,D (FM Only) CL I, DIV 2, GR A,B,C,D DIP CL II, III, DIV 1, GR E,F,G NI ANI CL I, DIV 2, GR A,B,C,D (FM Only) DIP CL II, III, DIV 2 GR F,G Sensor Probe suitable for use in DIV 1 or ZONE 0 CL I, Zone 0, AEx d ia IIC CL I, Zone 2, GR IIC T6, Ta = 60° C

DR7000 Series

Model Numbering

DR7000

Approval

0	Without	**E**	NEPSI Ex ia IIC T3-T6
2	ATEX II G/D 1,1/2, 2 Ex ia IIC T3-T6	**F**	NEPSI Ex d ia IIC T3-T6
3	ATEX II G/D 1/2, 2 Ex d ia IIC T3-T6	**H**	CSA IS Class I, Div1. Div.1 GR A-G Dual Seal
6	FM IS Class I, Div.1 GR. A-G Dual Seal	**K**	CSA XP Class I, Div1. Div.1 GR A-G Dual Seal
7	FM XP Class I, Div.1 GR. A-G Dual Seal	**M**	IECEX Zone 0, Ex ia IIC T3-T6 Ex ia D 20
A	ATEX II 3G EX nA II T3-T6	**N**	IECEX Zone 0, Ex d ia IIC T3-T6 Ex t D iaD A21/20

Material of Process Connection / Antenna Type and Material (Pressure)

0	Horn 316SS(1.4404)/40 bar Drop PTFE 40Bar/Drop PP 16bar	**2**	Horm 316L (1.4404)/ 100 bar
1	Horn Hast C-22 (2.460)/40 bar	**3**	Hast. C-22 (2.4602)/ 100 bar

Antenna Type

3	DN 80 Long OD=75mm (2.95")	**H**	PEEK hygenic antenna FDA co no ext and feed through A,B,C
4	DN 40 Long OD=39mm (1.54")	**P**	Drop PTFE DN 80 Long-OD = 75 mm (2.95") 50C to +1500C
5	DN 50 Long OD=43mm (1.69")	**S**	Drop PP DN 80 Long OD = 75mm (2.95") 40C to +100C 232 psig
6	DN 80 Long OD=75mm (2.95") w/ Purging System	**U**	Sheet Metal Horn DN80 75mm (2.95") long
7	DN 40 Long OD=39mm (1.54") w/Purging System	**V**	Sheet Metal Horn DN100 95mm (3.7") long
8	DN 60 Long OD=43mm (1.69") w/ Purging System	**W**	Sheet Metal Horn DN80 75mm (2.95") long w/Purging System
F	DN 100 Long-OD = 95 mm (3.75")	**X**	Sheet Metal Horn DN100 95mm (3.7") long w/Purging System
G	DN 100 Long-OD = 95 mm (3.75") with Purge System		

Antenna Extension

0	Without (mandatory for HAST C materials)	**8**	840mm (33.07") not Drop Antenna
1	105mm (4.13")	**A**	945mm (37.2") not Drop Antenna
2	210mm (8.26")	**B**	1050mm (41.34") not Drop Antenna
3	315mm (12.4")	**P**	Flange Facing for PP Drop DN80/100 3" , 4" Flanges
4	420mm (16.54")	**R**	Flange Facing for PP Drop DN 150 6" , 8" Flanges
5	525mm (20.67")	**S**	Flange Facing for PTFE Drop DN80/100 3" , 4" Flanges
6	630mm (24.8") not Drop Antenna	**T**	Flange Facing for PTFE Drop DN 150 6" , 8" Flanges
7	735mm (28.94") not Drop Antenna		

Feedthrough / Temperature / Sealing

0	Std/Viton: -40°C to 150°C (-40°F to 302°F)	**B**	Standard / -20°C to +150°C (-4° to 302°F)/EPDM for Bio control
1	Std/Kalrez: -20°C to 150°C (-4°F to 302°F)	**C**	Standard / -20°C to +150°C (-4° to 302°F)/Tri-Clamp, SMS, DIN
2	Metaglas/Viton: -30°C to 150°C (-22°F to 302°F)	**F**	Standard / -40°C to +200°C (-40° to 392°F)/Viton
3	Metaglas/Kalrez: -20°C to 150°C (-4°F to 302°F)	**G**	Standard / -20°C to +200°C (-40° to 392°F)/ Kalrez
4	Standard / EPDM: -50°C to 150°C (-58°F to 302°F)	**H**	Metaglas / -30°C to +200°C (-22° to 392°F)/ Viton
5	Metaglass / -30°C to 150°C (-22°F to 302°F)	**K**	Metaglas / -30°C to +200°C (-4° to 392°F)/ Kalrez 6375
A	Standard / -20°C to +150°C (-4° to 302°F)/Tri-Clamp, SMS, DIN		

Process Connection EN

0	Without	**D**	DN50 PN63 Form B1 EN1092
3	G 1 1/2 A ISO228	**E**	DN80 PN63 Form B1 EN1092
5	DN40 PN40 Form B1 EN1092	**F**	DN100 PN63 Form B1 EN1092
6	DN50 PN40 Form B1 EN1092	**L**	DN40 PN63/PN100 Form B1 EN1092
7	DN80 PN40 Form B1 EN1092	**M**	DN50 PN100 Form B1 EN1092
8	DN100 PN16 Form B1 EN1092	**N**	DN80 PN100 Form B1 EN1092
A	DN100 PN40 Form B1 EN1092	**P**	DN100 PN100 Form B1 EN1092
B	DN150 PN16 Form B1 EN1092	**R**	DN150 PN63 Form B1 EN1092
C	DN100 PN40 Form B1 EN1092	**S**	DN150 PN100 Form B1 EN1092

Process Connection ANSI

0	Without
3	1 1/2" NPT
5	1 1/2" RF 150# ANSI B16.5
6	1 1/2" RF 300# ANSI B16.5
7	2" RF 150# ANSI B16.5
8	2" RF 300# ANSI B16.5
A	3" RF 150# ANSI B16.5
B	3" RF 300# ANSI B16.5
C	4" RF 150# ANSI B16.5
D	4" RF 300# ANSI B16.5
E	6" RF 150# ANSI B16.5
F	8" RF 150# ANSI B16.5
G	6" RF 300# ANSI B16.5
N	1 1/2" RF 600# ANSI B16.5
P	2" RF 600# ANSI B16.5
R	3" RF 600# ANSI B16.5
S	4" RF 600# ANSI B16.5
U	1 1/2" RF 900# ANSI B16.5
V	2" RF 900# ANSI B16.5
W	3" RF 900# ANSI B16.5
X	4" RF 600# ANSI B16.5

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DR7000 Series

Model Numbering (Continued)

Process Connection Other
- **0** Without
- **5** 10k 40A RF JIS B2238 Antenna sizes: DN40,DN40-Long
- **6** 10k 50A RF JIS B2238 Antenna sizes: DN50,DN50-Long
- **7** 10k 80A RF JIS B2238 Antenna sizes: DN80,DN80-Long
- **8** 10k 100A RF JIS B2238 Antenna sizes: DN80,DN80-Long
- **C** Bio Control DN 50
- **F** Tri-Clamp 2”
- **L** DIN 11851 DN 50
- **P** SMS 51

Output
- **0** 1 output 4-20mA (HART)
- **2** 2 Outputs: 4-20mA HART +4-20mA

Housing / Cable Entry / Cable Gland
- **0** Aluminum/ M20x1.5/ Without
- **1** Aluminum/ 1/2” NPT/ Without
- **2** Aluminum/ G 1/2/ Without
- **3** Aluminum/ M20x1.5/Plastic (Non EEx: black, EEx i:blue)
- **4** Aluminum/ M20x1.5/Metal (Only for EEx d Devices)
- **A** SS/ M25x1.5/ Without
- **B** SS 1/2” NPT/ Without
- **D** SS/ M25x1.5/ Plastic M20 Standard Eex i:blue
- **E** SS/ M25x1.5/Metal M20 (Only for EEx d Devices)

Housing option
- **0** Without
- **2** Weather Protection

HMI (Display & Keys)
- **0** Without
- **1** English (Spanish: 2nd Language)
- **2** German
- **3** French
- **4** Italian
- **5** Spanish
- **6** Portuguese
- **7** Japanese
- **8** Chinese (Mandarin)
- **A** Russian

Version
- **1** Drexelbrook

Special Option
- **0** Without
- **1** Metaglas (Dual Process Seal)

Material Certifications
- **0** Without
- **1** 3.1b for Wetted Parts
- **2** 3.1b for Pressurized Parts
- **3** PMI Wetted Parts
- **4** PMI Pressurized Parts
- **5** 2.1 Material Conformity

Hydraulics Certifications
- **0** Without
- **2** 3.1b Hydraulic Test
- **3** 2.2 Hydraulic Test

Calibration Certifications
- **0** Without
- **1** Calibration 2 points
- **2** Calibration 5 points
- **3** Calibration 5 points (Cust)

Miscellaneous Certifications
- **0** Without
- **1** 2.1 Order Conformity
- **2** NACE
- **3** 2.1 Order Conformity & NACE

Drawing/Tag Numbers
- **0** Without
- **1** Drawing (Overall Dimension)
- **2** Tag No. SS
- **3** Drawing + Tag No. SS

D7000												1						

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