



TYPE APPROVAL CERTIFICATE

Certificate No:
TAA00002ET
Revision No:
1

This is to certify:

That the Level Transmitter

with type designation(s)
Micropilot FMR60, FMR62, FMR67

Issued to

Endress+Hauser SE+Co. KG
Maulburg, Germany

is found to comply with

DNV rules for classification – Ships, offshore units, and high speed and light craft

Application :

Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV.

Location classes:

Temperature	D
Humidity	B
Vibration	A
EMC	B
Enclosure	B

Issued at **Hamburg** on **2021-12-20**

for **DNV**

This Certificate is valid until **2024-08-04**.

DNV local station: **Augsburg**

Approval Engineer: **Dariusz Lesniewski**

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Joannis Papanuskas
Head of Section

This Certificate is subject to terms and conditions overleaf. Any significant change in design or construction may render this Certificate invalid.
The validity date relates to the Type Approval Certificate and not to the approval of equipment/systems installed.

LEGAL DISCLAIMER: Unless otherwise stated in the applicable contract with the holder of this document, or following from mandatory law, the liability of DNV AS, its parent companies and their subsidiaries as well as their officers, directors and employees ("DNV") arising from or in connection with the services rendered for the purpose of the issuance of this document or reliance thereon, whether in contract or in tort (including negligence), shall be limited to direct losses and under any circumstance be limited to 300,000 USD.



Form code: TA 251

Revision: 2021-03

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Product description

Micropilot FMR6x series is a free space radar device for level measurement in liquids (FMR60/62) and in solids (FMR67)

Main features:

- FMCW modulation with operating frequency 80 GHz
- measuring range up to 50m (FMR60), up to 80m (FMR62), up to 125m (FMR67)
- output signal 4-20mA HART, 4-20mA or open collector switch output
- power supply 24VDC, 2-wire, loop-powered
(to be supplied only via type approved power supply, e. g. RN221N of E+H)
- local display
- Accuracy FMR60/62: $\pm 4\text{mm}$ for measuring distance $\leq 0.8\text{m}$
 $\pm 1\text{mm}$ for measuring distance $> 0.8\text{m}$
- Accuracy (FMR67): $\pm 20\text{mm}$ for measuring distance $\leq 1.5\text{m}$
 $\pm 3\text{mm}$ for measuring distance $> 1.5\text{m}$
- FW: 01.00.xx
- Degree of protection: IP 66/68 (24h at 1.83m)

Product variants: **FMR6x** – 10 20 30 40 50 70 90 100 + (110, 540, 550, 580, 590, 610)

Options		Basic Model		
Selection code	Description	FMR60	FMR62	FMR67
10 Approval				
XX	Any double letter and/or number combination	x	x	x
20 Power supply / Output				
A	2 wire, 4-20mA HART	x	x	x
B	2 wire, 4-20mA HART, switch output	x	x	x
C	2 wire, 4-20mA HART + 4-20mA analog	x	x	x
30 Display				
A	Without, via communication	x	x	x
C	SD02 4 digits display, push buttons + data storage function	x	x	x
E	SD03 4 digits display, touch control + data storage function	x	x	x
L	Prepared for display FHX50 + M12 plug	x	x	x
M	Prepared for display FHX50 + customer connection	x	x	x
40 Housing				
A	GT19 plastic housing PBT	x	x	x
C	GT20 housing Aluminium	x	x	x
50 Electrical connection				
A	Gland M20, IP66/68 NEMA 4X/6P	x	x	x
B	Thread M20, IP66/68 NEMA 4X/6P	x	x	x
C	Thread G1/2, IP66/68 NEMA 4X/6P	x	x	x
D	Thread NPT1/2, IP66/68 NEMA 4X/6P	x	x	x
I	Plug M12, IP 66/68 NEMA4X/6P	x	x	x
M	Plug 7/8", IP 66/68 NEMA4X/6P	x	x	x
70 Antenna				
GA	Drip-off PTFE 50mm/2"	x	-	x
GE	Integrated, PEEK, 20mm/3/4"	-	x	-
GF	Integrated, PEEK, 40mm/1 1/2"	-	x	-
GM	PTFE-plated 50mm / 2"	-	x	-
GN	PTFE-plated 80mm / 3"	-	x	-
GP	PTFE-plated 80mm / 3"	-	x	x
90 Sealing				

A3	FKM Viton GLT-40°C...80°C	x	-	x
A4	FKM Viton GLT-40°C...130°C	x	-	-
A5	FKM Viton GLT-40°C...150°C		x	x
C1	FFKM Kalrez -20°C ...150°C	-	x	-
F5	PTFE-plated, -40°C ... 150°C	-	x	-
100 Process connection				
AFK	NPS 2" CL150, PTFE 316/316L flange ASME B16.5	-	x	-
AGJ	NPS 3" CL150, RF 316/316L flange ASME B16.5	-	-	x
AGK	NPS 3" CL150, PTFE 316/316L flange ASME B16.5	-	x	-
AHJ	NPS 4" CL150, RF 316/316L flange ASME B16.5	-	-	x
AHK	NPS 4" CL150, PTFE 316/316L flange ASME B16.5	-	x	-
AJK	NPS 6" CL150, PTFE 316/316L flange ASME B16.5	-	x	-
ATK	NPS 4" CL300, PTFE 316/316L flange ASME B16.5	-	x	-
CFK	DN50 PN10/16, PTFE 316L flange EN1092-1	-	x	-
CGJ	DN80 PN10/16, B1 316L flange EN1092-1	-	-	x
CGK	DN80 PN10/16, PTFE 316L flange EN1092-1	-	x	-
CHJ	DN100 PN10/16, B1 316L flange EN1092-1	-	-	x
CHK	DN100 PN10/16, PTFE 316L flange EN1092-1	-	x	-
CJK	DN150 PN10/16, PTFE 316L flange EN1092-1	-	x	-
GDJ	Thread ISO228 G3/4", 316L	-	x	-
GGJ	Thread ISO228 G 1 1/2", 316L	x	x	x
KFK	10K 50A, PTFE 316L flange JIS B2220	-	x	-
KGJ	10K 80A RF, 316L flange JIS B2220	-	-	x
KGK	10K 80A, PTFE 316L flange JIS B2220	-	x	-
KHJ	10K 100A RF, 316L flange JIS B2220	-	-	x
KHK	10K 100A, PTFE 316L flange JIS B2220	-	x	-
KJK	10K 150A, PTFE 316L flange JIS B2220	-	x	-
RDJ	Thread ANSI MNPT 3/4", 316L	-	x	-
RGJ	Thread ANSI MNPT 1 1/2", 316L	x	x	x
XJG	UNI Flange 3"/DN80, PP max. 4bar/58psi, fitted to NPS 3" CL150/DN80 PN16 / 10K 80	x	-	x
XJJ	UNI Flange 3"/DN80, 316L max. 4bar/58psi, fitted to NPS 3" CL150/DN80 PN16 / 10K 80	x	-	x
XKG	UNI Flange 4"/DN100, PP max. 4bar/58psi, fitted to NPS 4" CL150/DN100 PN16 / 10K 100	x	-	x
XKJ	UNI Flange 4"/DN100, 316L max. 4bar/58psi, fitted to NPS 4" CL150/DN100 PN16 / 10K 100	x	-	x
XLG	UNI Flange 6"/DN150, PP max. 4bar/58psi, fitted to NPS 6" CL150/DN150 PN16 / 10K 150	x	-	x
XLJ	UNI Flange 6"/DN150, 316L max. 4bar/58psi, fitted to NPS 6" CL150/DN150 PN16 / 10K 150	x	-	x
X3J	Uni flange 8"/DN200, 316L max PN1/14,5lbs /1K fitted NPS8" Cl. 150/DN200 PN10 PN16 /10K 200	-	-	x
X5J	Uni flange 10"/DN250, 316L max PN1/14,5lbs /1K fitted NPS8" Cl. 150/DN250 PN10 PN16 /10K 250	-	-	x
110 Flushing air connection				
A	Without	-	-	x
1	G 1/4"	-	-	x
2	NPT 1/4"	-	-	x
3	Adapter G 1/4"	-	-	x
4	Adapter NPT 1/4"	-	-	x
540 Application package				

EH	Heartbeat Verification + Monitoring	x	x	x
EJ	Heartbeat Verification	x	x	x
E9	Special product	x	x	x
550 Calibration				
XX	Any double letter and/or number combination	x	x	x
580 Test, certificate				
XX	Any double letter and/or number combination	x	x	x
590 Further certificate				
LA	SIL	x	x	x
LD	CRN	x	x	x
LJ	DNVGL marine approval	x	x	x
LW	CoC ASME BPE	-	x	-
L1	EHEDG	-	x	-
610 Accessories mounted				
NA	Surge protection	x	x	x
NC	Gas tight	x	x	-
NF	Bluetooth	-	x	x

Approval conditions

The Type Approval covers hardware listed under Product description. When the hardware is used in applications to be classed by DNV, documentation for the actual application is to be submitted for approval by the manufacturer of the application system in each case. Reference is made to DNV rules for classification of ships Pt.4 Ch.9 Control and monitoring systems.

Ex-certification is not covered by this certificate. Application in hazardous area to be approved in each case according to DNV Rules and Ex-Certification/ Special Condition for Safe Use listed in valid Ex-certificate issued by a notified/recognized Certification Body.

Application/Limitation

Type approved power supply required, e. g. RN221N of E+H.

Type Approval documentation

Test report: MTN No.- 072225.038.19 V2.0, dated 2019-05-09
 E+H Statement EMC test report 072225.038.19 Issue 2, dated 2019-05-20
 Test report: paconsult no. 18-10721, dated 2018-12-03
 Test reports: E+H no. 9700005920 and no. 9700005921, dated 2016-08-25
 Test reports: E+H no. 9700006013 and no. 9700006014, dated 2016-08-24
 Test reports: E+H no. 9700006015 and no. 9700006016, dated 2016-08-30
 Test reports: E+H no. 970006581(-3)(-4), dated 2018-04-13
 Test report: E+H no. 970006582, dated 2018-04-16
 Test report: E+H no. 970008316_AK, dated 2021-09-13
 Ex-Certificates: IECEx IBE 16.0035X issue 1, IBEExU16ATEX1194X issue 2
 Ex-Certificates: FM17US0187X, FM17CA0099X, CSA 70137829
 Order code lists: FMR60 Rev. 3, FMR62 Rev. 3, FMR67 Rev. 3
 Technical Information: TI01302FEN_0418, TI01303FEN_0418, TI01304FEN_0418
 Operating Instructions: BA01618F/00/EN/02.18, BA01619F/00/EN/02.18, BA01620F/00/EN/02.18
 Drawings: 960018584, 960018593, 960018607, 960018608, 960018611, 960018612
 Type approval assessment report issued at Augsburg on 2018-09-25

Tests carried out

Applicable tests according to class guideline DNV-CG-0339, August 2021.

Marking of product

The products to be marked with:

- manufacturer name
- model name
- serial number
- power supply ratings

Periodical assessment

The scope of the periodical assessment is to verify that the conditions stipulated for the type are complied with, and that no alterations are made to the product design or choice of systems, software versions, components and/or materials.

The main elements of the assessment are:

- Ensure that type approved documentation is available
- Inspection of factory samples, selected at random from the production line (where practicable)
- Review of production and inspection routines, including test records from product sample tests and control routines
- Ensuring that systems, software versions, components and/or materials used comply with type approved documents and/or referenced system, software, component and material specifications
- Review of possible changes in design of systems, software versions, components, materials and/or performance, and make sure that such changes do not affect the type approval given
- Ensuring traceability between manufacturer's product type marking and the type approval certificate

Periodical assessment is to be performed after 2 years and after 3.5 years. A renewal assessment will be performed at renewal of the certificate.

END OF CERTIFICATE