DNV·GL

Certificate No:
TAA00002MY

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Level Switches

with type designation(s)
Liquiphant ES FTL41, FTL51B

Issued to
Endress + Hauser SE + Co. KG
Maulburg, Germany

is found to comply with
DNV GL 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 GL.

Location classes:

Temperature	**B**
Humidity	**B**
Vibration	**A**
EMC	**A**
Enclosure	**B, C***

***Not Alu housing**

Issued at **Hamburg** on **2020-04-24**
This Certificate is valid until **2025-04-23**.
DNV GL local station: **Augsburg**

Approval Engineer: **Dariusz Lesniewski**

for **DNV GL**

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.

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Product description

Level limit switch for liquids

Liquiphant FTL41

Selection code	Description
10 Approval	
xy	Any two letter/number combination
20 Output	
A2	FEL42, 3-wire PNP 10-55VDC
A4	FEL44, relay DPDT 19-253VAC/19-55VDC contact 253V/6A
A8	FEL48, 2-wire NAMUR
30 Display; Operation	
A	W/o; switch
40 Housing	
A	Single compartment; plastic
B	Single compartment; Alu, coated
50 Electrical connection	
A	Gland M20, plastic, IP66/68 NEMA Type 4X/6P
B	Gland M20, brass nickel plated, IP66/68 NEMA Type 4X/6P
F	Thread M20, IP66/68 NEMA Type 4X/6P
G	Thread G1/2, IP66/68 NEMA Type 4X/6P
H	Thread NPT1/2, IP66/68 NEMA Type 4X/6P
I	Thread NPT3/4, IP66/68 NEMA Type 4X/6P
M	Plug M12, IP66/67 NEMA Type 4X
60 Application	
A	Process max 150°C/302°F, max 64bar
80 Surface Refinement	
A	Standard Ra<3,2um/126uin
85 Type of probe	
1	Compact version
2	Tube extension
3	Short tube version
90 Sensor Length: Material	
AJ	Compact version; 316L
BJ	Short tube version; 316L
CJ[1)]	117…6.000 mm L, Ra<3,2um/126uin; 316L
DJ[1)]	4,61…236,22 inch L, Ra<3,2um/126uin; 316L
YY[2)]	Special version, TSP-no. to be spec.
105 Process Connection, Sealing Surface	
AA	Flange ASME B16.5, RF
AB	Thread ASME B1.20.3, NPT
AC	Flange EN1092-1, A
A1	Flange EN1092-1, B1

EA	Thread EN10226, R
EB	Flange HG/T20592, RF
ED	Flange HG/T20615, RF
EE	Thread ISO228, G
EF	Flange JIS B2220, RF
110 Process Connection	
AAJ	NPS 1" Cl.150, 316/316L
ABJ	NPS 1-1/4" Cl.150, 316/316L
ACJ	NPS 1-1/2" Cl.150, 316/316L
ADJ	NPS 2" Cl.150, 316/316L
AFJ	NPS 3" Cl.150, 316/316L
AGJ	NPS 4" Cl.150, 316/316L
ANJ	NPS 1-1/4" Cl.300, 316/316L
AQJ	NPS 2" Cl.300, 316/316L
ASJ	NPS 3" Cl.300, 316/316L
ATJ	NPS 4" Cl.300, 316/316L
EBJ	DN32 PN6, 316L
ECJ	DN40 PN6, 316L
EDJ	DN50 PN6, 316L
ESJ	DN80 PN10/16, 316L
ETJ	DN100 PN10/16, 316L
EZJ	DN25 PN25/40, 316L
E0J	DN32 PN25/40, 316L
E1J	DN40 PN25/40, 316L
E2J	DN50 PN25/40, 316L
E3J	DN65 PN25/40, 316L
E4J	DN80 PN25/40, 316L
E5J	DN100 PN25/40, 316L
PAJ	10K 25A, 316L
PCJ	10K 40A, 316L
PDJ	10K 50A, 316L
VBJ	3/4", 316L
VCJ	1", 316L
WSJ	G1, 316L, install > accessory weld-in adapter
W5J	G3/4, 316L, install > accessory weld-in adapter
7GJ	DN40 PN40, 316L
7HJ	DN50 PN40, 316L
7KJ	DN80 PN40, 316L
7NJ	1-1/2" Cl.150, 316L
7PJ	2" Cl.150, 316L
7RJ	3" Cl.150, 316L
7UJ	1-1/2" Cl.300, 316L

7VJ	2" Cl.300, 316L
7XJ	3" Cl.300, 316L
570 Service	
xy	Any two letter/number combination
580 Test, Certificate, Declaration	
xy	Any two letter/number combination
590 Additional Approval	
LD	WHG overfill prevention, leakage
LJ	DNV GL marine approval
LS	CRN
L9	Special version, TSP-no. to be spec.

[1] Extension pipes max. 1600mm, longer pipes be supported after each 1600mm
[2] Only allowed modification = Any customer-specific extension pipe length shorter 148mm

Liquiphant FTL51B

Options	
Selection code	**Description**
10 Approval	
xy	Any two letter/number combination
20 Output	
A1	FEL61, 2-wire 19-253VAC + test button
A2	FEL62, 3-wire PNP 10-55VDC + test button
A3	FEL64DC, relay DPDT 9-20VDC contact 253V/6A + test button
A4	FEL64, relay DPDT 19-253VAC/19-55VDC contact 253V/6A + test button
A7	FEL67, 2-wire PFM + test button
A8	FEL68, 2-wire NAMUR + test button
30 Display; Operation	
A	W/o; switch
B	LED module outside visible; switch
40 Housing	
A	Single compartment; plastic
B	Single compartment; Alu, coated
C	Single compartment; 316L, cast
M	Dual compartment L-shape; Alu, coated
50 Electrical connection	
A	Gland M20, plastic, IP66/68 NEMA Type 4X/6P
B	Gland M20, brass nickel plated, IP66/68 NEMA Type 4X/6P
C	Gland M20, 316L, IP66/68 NEMA Type 4X/6P
F	Thread M20, IP66/68 NEMA Type 4X/6P
G	Thread G1/2, IP66/68 NEMA Type 4X/6P
H	Thread NPT1/2, IP66/68 NEMA Type 4X/6P
I	Thread NPT3/4, IP66/68 NEMA Type 4X/6P
M	Plug M12, IP66/67 NEMA Type 4X

60 Application	
A	Process max 150°C/302°F, max 64bar
B	Process max 150°C/302°F, max 100bar
C	Process max 80°C/176°F, max 25bar
80 Surface Refinement	
A	Standard Ra<3,2um/126uin
85 Type of probe	
1	Compact version
2	Tube extension
3	Short tube version
90 Sensor Length; Material	
AC	Compact version; AlloyC22
AJ	Compact version; 316L
BC	Short tube version; AlloyC22
BJ	Short tube version; 316L
CC[1)]	148…3.000 mm L, Ra<3,2um/126uin; AlloyC22
CJ[2)]	117…6.000 mm L, Ra<3,2um/126uin; 316L
DC[1)]	5,83…118,11 inch L, Ra<3,2um/126uin; AlloyC22
DJ[2)]	4,61…236,22 inch L, Ra<3,2um/126uin; 316L
105 Process Connection, Sealing Surface	
AA	Flange ASME B16.5, RF
AB	Thread ASME B1.20.3, NPT
AC	Flange EN1092-1, A
A1	Flange EN1092-1, B1
EA	Thread EN10226, R
EB	Flange HG/T20592, RF
ED	Flange HG/T20615, RF
EE	Thread ISO228, G
EF	Flange JIS B2220, RF
E1	Thread EN10226, R
HA	Flange HG/T20592, RF
HB	Flange HG/T20615, RF
HC	Flange HG/T20615, RJ
I1	Thread ISO228, G
JA	Flange JIS B2220, RF
110 Process Connection	
AAJ	NPS 1" Cl.150, 316/316L
ABJ	NPS 1-1/4" Cl.150, 316/316L
ACJ	NPS 1-1/2" Cl.150, 316/316L
ADJ	NPS 2" Cl.150, 316/316L
ADM	NPS 2" Cl.150, AlloyC22>316/316L
AFJ	NPS 3" Cl.150, 316/316L

AGJ	NPS 4" Cl.150, 316/316L
ANJ	NPS 1-1/4" Cl.300, 316/316L
APJ	NPS 1-1/2" Cl.300, 316/316L
AQJ	NPS 2" Cl.300, 316/316L
ASJ	NPS 3" Cl.300, 316/316L
ASM	NPS 3" Cl.300, AlloyC22>316/316L
ATJ	NPS 4" Cl.300, 316/316L
A0J	NPS 2" Cl.600, 316/316L
A1J	NPS 3" Cl.600, 316/316L
EBJ	DN32 PN6, 316L
ECJ	DN40 PN6, 316L
EDJ	DN50 PN6, 316L
EDM	DN50 PN6, AlloyC22>316L
ESJ	DN80 PN10/16, 316L
ETJ	DN100 PN10/16, 316L
ETM	DN100 PN10/16, AlloyC22>316L
EZJ	DN25 PN25/40, 316L
EZM	DN25 PN25/40, AlloyC22>316L
E0J	DN32 PN25/40, 316L
E1J	DN40 PN25/40, 316L
E2J	DN50 PN25/40, 316L
E2M	DN50 PN25/40, AlloyC22>316L
E3J	DN65 PN25/40, 316L
E4J	DN80 PN25/40, 316L
E4M	DN80 PN25/40, AlloyC22>316L
E5J	DN100 PN25/40, 316L
FMJ	DN50 PN100, 316L
PAJ	10K 25A, 316L
PCJ	10K 40A, 316L
PDJ	10K 50A, 316L
PDM	10K 50A, AlloyC22>316L
PFJ	10K 80A, 316L
PGJ	10K 100A, 316L
VBC	3/4", AlloyC22
VBJ	3/4", 316L
VCC	1", AlloyC22
VCJ	1", 316L
WSJ	G1, 316L, install > accessory weld-in adapter
W5J	G3/4, 316L, install > accessory weld-in adapter
7GJ	DN40 PN40, 316L
7HJ	DN50 PN40, 316L
7KJ	DN80 PN40, 316L

7NJ	1-1/2" Cl.150, 316L
7PJ	2" Cl.150, 316L
7RJ	3" Cl.150, 316L
7UJ	1-1/2" Cl.300, 316L
7VJ	2" Cl.300, 316L
7XJ	3" Cl.300, 316L
72J	2" Cl.600, 316L
540 Application Package	
EH	Heartbeat Verification + Monitoring
EL	Prepared for Heartbeat Verification + Monitoring
570 Service	
xy	Any two letter/number combination
580 Test, Certificate, Declaration	
xy	Any two letter/number combination
590 Additional approval	
LD	WHG overfill prevention, leakage
LJ	DNV GL marine approval
LS	CRN
L9	Special version, TSP-no. to be spec.
600 Sensor design	
MR	Temperature separator (Only allowed with single compartment plastic or single compartment alu coated)
MS	Pressure tight feed through (Second line of defence)
610 Accessory Mounted	
NF	Bluetooth
NG	Prepared for Bluetooth
620 Accessory Enclosed	
R6	Test magnet

[1] Extension pipes max. 1600mm, longer pipes be supported after each 1600mm
[2] Only allowed modification = Any customer-specific extension pipe length shorter 148mm

Approval conditions

The Type Approval covers hardware listed under Product description. When the hardware is used in applications to be classed by DNV GL, 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 GL rules for classification of ships Pt.4 Ch.9 Control and monitoring systems.

Application/Limitation

Electronics FEL67 only in connection with FTL325P
Electronics FEL68, FEL48 only in connection with FTL325N

Type Approval documentation

Tests carried out

Applicable tests according to class guideline DNVGL-CG-0339, December 2019.

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