DNV·GL

Certificate No:
TAA00001N3

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Level Switches

with type designation(s)
Liquiphant M FTL50, Liquiphant M FTL51, Liquiphant M FTL50 H, Liquiphant M FTL51 H, Liquiphant M FTL51C

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	**D**
Humidity	**B**
Vibration	**A**
EMC	**B/A***
Enclosure	**C**

***A: for electronics FEL 51, FEL 54 and FEL 55**

Issued at **Hamburg** on **2018-02-12**
This Certificate is valid until **2023-02-11**.
DNV GL local station: **Augsburg**

for **DNV GL**

Approval Engineer: **Dariusz Lesniewski**

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 M**
Construction: compact or compact housing model
FTL50, FTL50 H
FTL51, FTL51 H with extension pipe (max.1600 mm); longer pipes to be supported after each 1600 mm
FTL51 C corrosion-resisting coating
Electronics with * also available for compact housing models
FEL 51*: level switch, 2-wire AC, 19 ... 253V AC
FEL 52*: level switch, 3-wire DC, PNP 10 ... 55V DC
FEL 54: level switch, 2x c/o-contacts potential-free, 19 ... 253V AC, 19 ... 55V DC
FEL 55: level sensor, 16/8 mA 2-wire, 11 ... 36V DC
FEL 56: level sensor, NAMUR (DIN19234)
FEL 58*: level sensor, NAMUR (EN50227)
FEL 57: level sensor, PFM signal transmission (150/50Hz)
FEL 50 A: level sensor, PROFIBUS-PA
Ex-proof-protection: on request (Ex-proof certificates to be observed)
Software version: V01.xx , V1.x (FEL50A)

Liquiphant M FTL50 (product structure)
FTL50-10 20 30 40 50 60 (based on / related to approval drawing 960015486)
10 = Approval: Any single letter and/or number
20 = Process connection: Any triple letter and/or number combination, except for thread < ½";
except for synthetic material
30 = Probe length; Type: AA, IA, QA
40 = Electronics; output: A, 1, 2, 4, 5, 6, 7, 8, Y* (*Only allow modifications=Different switching delays;
Faom detection)
50 = Housing; cable entry: D3, E1, E3, E5, E6, E7, F1, F5, F6, F7, G1, G5, G6, G7, N3, N5, N6, Y9*
(Only allowed modification=standardized cable entries)
60 = Additional option: A, B, C, D, K, L, N, S, Y (Multiple combination allow)

Liquiphant M FTL51 (product structure)
FTL51-10 20 30 40 50 60 (based on / related to approval drawing 960015487)
10 = Approval: Any single letter and/or number
20 = Process connection: Any triple letter and/or number combination, except for thread < ½";
except for synthetic material
30 = Probe length; Type: Any double letter and/or number combination and YY*;
(*Only allowed modification = Any customer-specific extension pipe length shorter 148mm);
With extension pipes max. 1600mm, longer pipes be supported after each 1600mm
40 = Electronics; output: A, 1, 2, 4, 5, 6, 7, 8, Y* (*Only allow modifications=Different switching delays;
Foam detection)
50 = Housing; cable entry: D3, E1, E3, E5, E6, E7, F1, F5, F6, F7, G1, G5, G6,G7, N3, N5, N6, Y9*
(*Only allowed modification = standardized cable entries)
60 = Additional option: A, B, C, D, K, L, N, P, R, S, Y (Multiple combination allow)

Liquiphant M FTL50 H (product structure)
FTL50 H-10 20 30 40 50 60 (based on / related to approval drawing 960015489)
10 = Approval: Any single letter and/or number
20 = Process connection: Any triple letter and/or number combination, except for thread < ½";
except for synthetic material
30 = Probe length; Type: Any double letter and/or number combination and YY*;
(*Only allowed modification = Any customer-specific surface finish)
40 = Electronics; output: A, 1, 2, 4, 5, 6, 7, 8, Y* (*Only allow modifications=Different switching delays;
Foam detection)
50 = Housing; cable entry: D3, E1, E3, E5, E6, E7, F5, F6, F7, G1, G5, G6, G7, N3, N5, N6, Y9*
(*Only allowed modification = standardized cable entries)
60 = Additional option: A, B, C, D, K, L, S, Y (Multiple combination allow)

Liquiphant M FTL51 H (product structure)
FTL51 H- 10 20 30 40 50 60 (based on / related to approval drawing 960015488)
10 = Approval: Any single letter and/or number
20 = Process connection: Any triple letter and/or number combination; except for thread < ½";
except for synthetic material
30 = Probe length; Type: Any double letter and/or number combination and YY*;
(*Only allowed modification = customer-specific probe length up to 148mm);
With extension pipes max. 1600mm, longer pipes be supported after each 1600mm
40 = Electronics; output: A, 1, 2, 4, 5, 6, 7, 8, Y* (*Only allow modifications=Different switching delays;
Foam detection)
50 = Housing; cable entry: D3, E3, E5, E6, E7, F5, F6, F7, G1, G5, G6, G7, N3, N5, N6, Y9*
(*Only allowed modification = standardized cable entries)
60 = Additional option: A, B, C, D, K, L, S, Y (Multiple combination allow)

Liquiphant M FTL51 C (product structure)
FTL51 C-10 20 30 40 50 60 70 (based on / related to approval drawing 960015490)
10 = Approval: Any single letter and/or number
20 = Process connection: Any triple letter and/or number combination, except for thread < ½";
except for synthetic material
30 = Probe length; Type: Any double letter and/or number combination and YY*,
(*Only allowed modification = customer-specific probe length up to 148mm);
With extension pipes max. 1600mm, longer pipes be supported after each 1600mm
40 = Electronics; output: A, 1, 2, 4, 5, 6, 7, 8, Y* (*Only allow modifications=Different switching delays;
Foam detection)
50 = Housing; cable entry: E1, E5, E6, E7, F1, F5, F6, F7, G1, G5, G6, G7, N3, N5, N6, Y9*
(*Only allowed modifications= standardized cable entries;
316L compact housing (FTL50 product structure 50 = D3, E3, N3))
60 = Addional option 1: A, C, K, S, Y (Multiple combination allow)
70 = Additional option 2: A, B, C, Y (Multiple combination allow)

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

Type Approval documentation

Tests carried out
Applicable tests according to class guideline DNVGL-CG-0339, November 2016.

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 at least every second year and at renewal of this certificate.

END OF CERTIFICATE