Датчики уровня Liquiphant FTL360, Liquiphant FTL361

Технические характеристики

По вопросам продаж и поддержки обращайтесь:

Алматы (7273)495-231
Ангарск (3955)60-70-56
Архангельск (8182)63-90-72
Астрахань (8512)99-46-04
Барнаул (3852)73-04-60
Белгород (4722)40-23-64
Благовещенск (4162)22-76-07
Брянск (4832)59-03-52
Владивосток (423)249-28-31
Владикавказ (8672)28-90-48
Владимир (4922)49-43-18
Волгоград (844)278-03-48
Вологда (8172)26-41-59
Воронеж (473)204-51-73
Екатеринбург (343)384-55-89
Иваново (4932)77-34-06
Ижевск (3412)26-03-58
Иркутск (395)279-98-46
Казань (843)206-01-48
Калининград (4012)72-03-81
Калуга (4842)92-23-67
Кемерово (3842)65-04-62
Киров (8332)68-02-04
Коломна (4966)23-41-49
Кострома (4942)77-07-48
Краснодар (861)203-40-90
Красноярск (391)204-63-61
Курск (4712)77-13-04
Курган (3522)50-90-47
Липецк (4742)52-20-81
Магнитогорск (3519)55-03-13
Москва (495)268-04-70
Мурманск (8152)59-64-93
Набережные Челны (8552)20-53-41
Нижний Новгород (831)429-08-12
Новокузнецк (3843)20-46-81
Ноябрьск (3496)41-32-12
Новосибирск (383)227-86-73
Омск (3812)21-46-40
Орел (4862)44-53-42
Оренбург (3532)37-68-04
Пенза (8412)22-31-16
Петрозаводск (8142)55-98-37
Псков (8112)59-10-37
Пермь (342)205-81-47
Ростов-на-Дону (863)308-18-15
Рязань (4912)46-61-64
Самара (846)206-03-16
Санкт-Петербург (812)309-46-40
Саратов (845)249-38-78
Севастополь (8692)22-31-93
Саранск (8342)22-96-24
Симферополь (3652)67-13-56
Смоленск (4812)29-41-54
Сочи (862)225-72-31
Ставрополь (8652)20-65-13
Сургут (3462)77-98-35
Сыктывкар (8212)25-95-17
Тамбов (4752)50-40-97
Тверь (4822)63-31-35
Тольятти (8482)63-91-07
Томск (3822)98-41-53
Тула (4872)33-79-87
Тюмень (3452)66-21-18
Ульяновск (8422)24-23-59
Улан-Удэ (3012)59-97-51
Уфа (347)229-48-12
Хабаровск (4212)92-98-04
Чебоксары (8352)28-53-07
Челябинск (351)202-03-61
Череповец (8202)49-02-64
Чита (3022)38-34-83
Якутск (4112)23-90-97
Ярославль (4852)69-52-93

Россия +7(495)268-04-70 Казахстан +7(7172)727-132 Киргизия +996(312)96-26-47

эл.почта: ehr@nt-rt.ru || сайт: https://endcounters.nt-rt.ru/

Level Limit Switch
liquiphant FTL 360 / FTL 361

Level limit switch Liquiphant II with vibrating probe. For all types of liquid.

Liquiphant level limit switch:
- FTL 360, compact version
- FTL 361, with extension tube
- with various process connections
- with aluminium, plastic or stainless steel housing

Application

The Liquiphant is a level limit switch for all liquids.
It can monitor the upper and lower level limits in tanks and vessels and is suitable for all liquids
- with temperatures lying between –40 °C and +150 °C (–40 °F and +300 °F)
- with a viscosity up to 10.000 mm^2/s (cSt)
- with a density greater than 0.5 g/cm^3

For particularly corrosive liquids the plastic-coated versions or the Hastelloy–version are suitable.
The Liquiphant is used wherever float switches were previously installed.
It is also used in those applications where float switches are not suitable. (due to build-up, turbulence, flow, air bubbles).

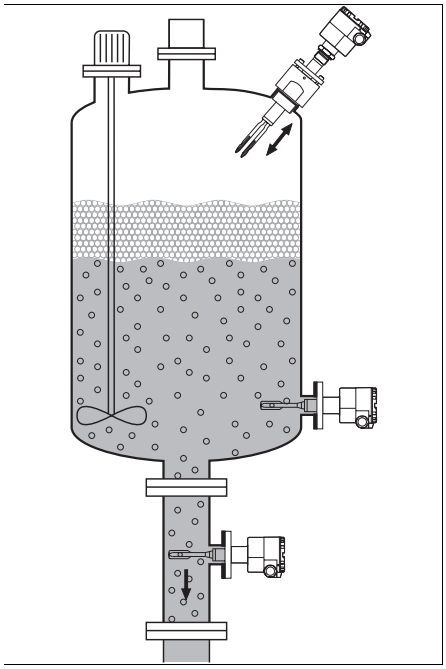
Features at a glance
- Maintenance free: Operates completely reliably even with heavy build-up.
- Cost-effective: An economical standard Liquiphant can be used in all applications. It operates safely in all types of liquids and under all process conditions, independent of turbulence, electrical properties, solids or gas content, foam, or tank vibrations.
- Accurate switching: A constant switchpoint with millimetre accuracy without need for calibration.
- Operational safety: Thanks to its improved and patented system with intelligent drive electronics, the Liquiphant is unequalled in its tolerance to external vibrations The tines are monitored electronically for corrosion.
- Proven in practice: The reliability you need is the experience we offer with 1 000 000 measuring points already installed.

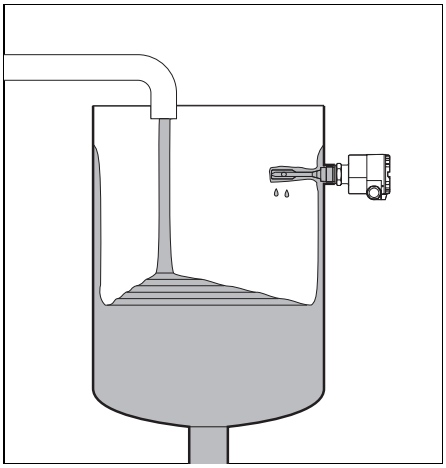
Measurement Principle

Operating principle of the Liquiphant
The sensor in the form of tuning fork is made to vibrate at its resonant frequency. When the sensor is immersed in the liquid, the resonant frequency changes. The frequency change is detected and then converted into a switching signal. The built-in switch for minimum or maximum detection enables the Liquiphant to be used for each application in the required fail-safe mode.

Installation possibilities
A wide range of application-specific designs, process connections and high corrosion-resistant materials allows limit detection of all kinds of liquids in tanks and pipes.
A few examples:

- ☐ Top mounting to monitor the maximum level. Optionally with a sliding sleeve to vary the switchpoint.
- ☐ Side mounting to monitor the minimum level.
- ☐ Mounted in a pipe as dry-run protection for the pump.



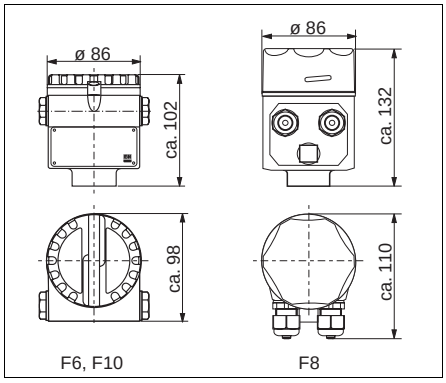


The limit switch with greater operational safety, even for liquids which are adhesive, causing build-up, corrosive, agitated, sparkling or foaming.

Measuring System

Housing F8

- Liquiphant as compact version or with extension tube
- Process connection: Threaded boss, flange or hygienic coupling
- Electronic insert for alternating or direct current, with electronic switching or a relay contact
- Housing
  F6 Aluminium housing
  F8 Stainless steel housing
  F10 Polyester housing (PTB)



Housing versions

Process connections

Application-specific process connections and designs ensure an ideal adaptability to the mounting requirements.

- ☐ Threaded boss G 1 A or 1" NPT
- ☐ Flanges according to various standards: DIN, ANSI, JIS

For particularly hygienic requirements, e.g. food processing:

- ☐ Milk pipe coupling
- ☐ Triclamp® coupling
- ☐ Weld-in socket for flush mounting

Fork and extension tube are polished.

Process connection materials:

- Stainless steel 316 Ti (1.4571) or Hastelloy C (2.4610),
- flange version additionally available with ECTFE (Halar®) or PFA coating.

Threaded boss
G 1A or
1-11 1/2 NPT

Pipe coupling
DIN 11851, DN 50

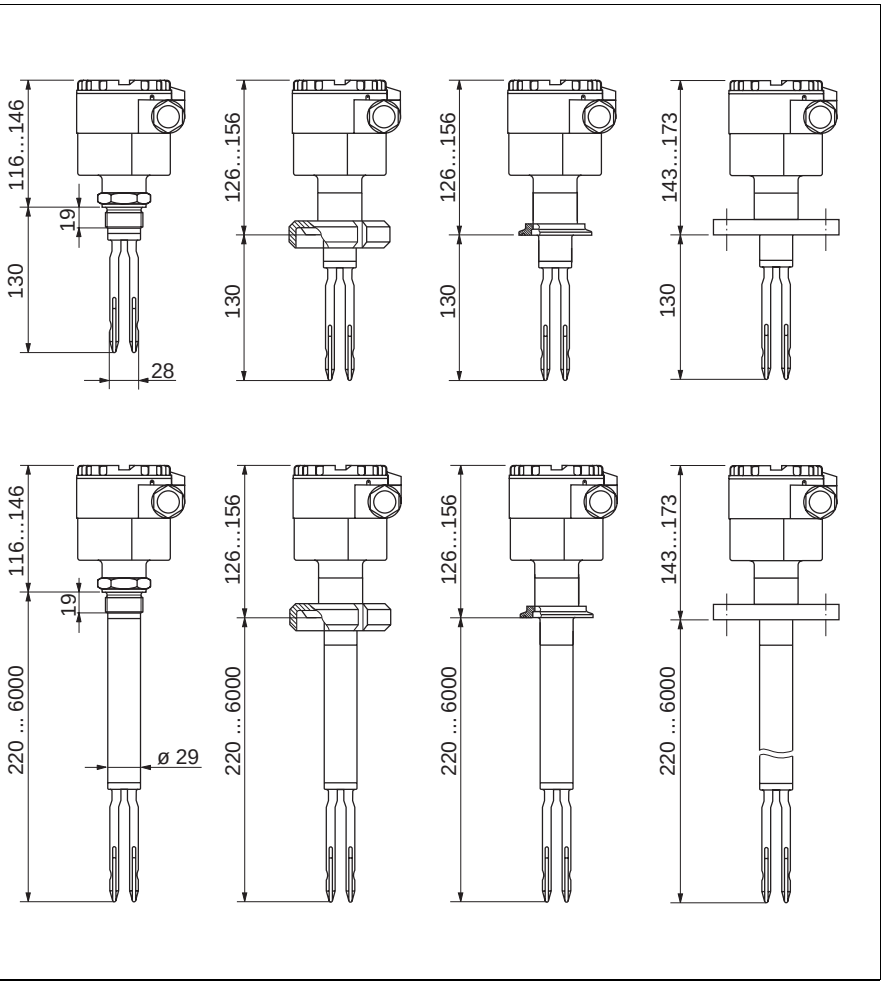
Triclamp coupling
ISO 2852, 2"

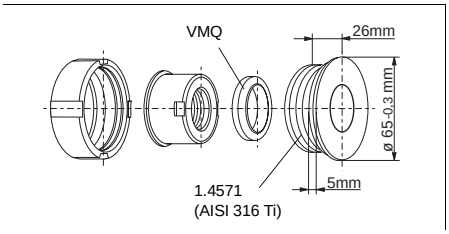
Flange version
DIN, ANSI, JIS

FTL 360
Compact version

FTL 361
Extension tube version

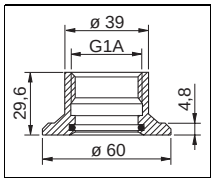
Dimensions in mm
100 mm = 3.94 in
1 in = 25.4 mm



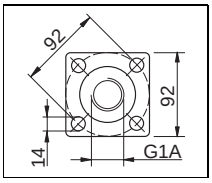


Above:
Weld-in socket
with fork orientation
for FTL 360 with G1A thread for flush mounting (moulded seal)
Order No. 215 159-0000

Below:
Weld-in socket
without fork orientation
for FTL 360 with G1A thread for flush mounting; material: AISI 304 (1.4301) with FPM O-Ring seal.
Order No. 917 969-1000

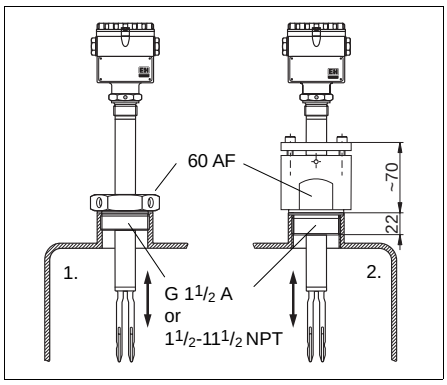


Separate flange
for FTL 360 / 361 with G1A threaded boss



Sliding sleeve
for FTL 361 for variable switchpoint setting

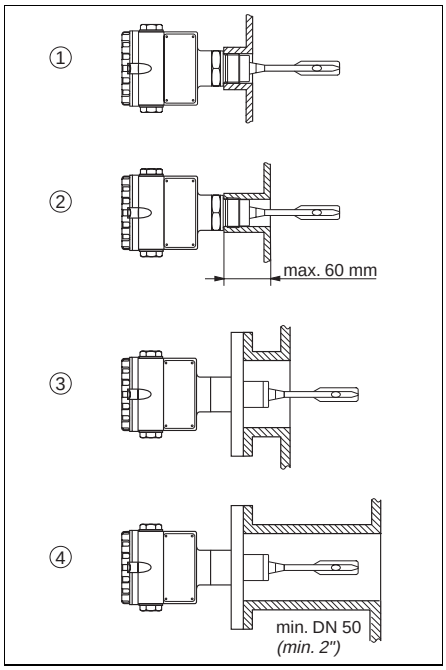
1. Atmospheric pressure sliding sleeve
2. High pressure sliding sleeve for pressure up to 40 bar (600 psi)



Installation

Please note when mounting the Liquiphant:

- The vibration of the tines must not be blocked, e.g. due to adhering material.
- If build-up occurs then sufficient distance to the tank or pipe wall must be maintained.



Nozzle mounting

When mounting the sensor in a nozzle, the viscosity of the liquid should be taken into account:

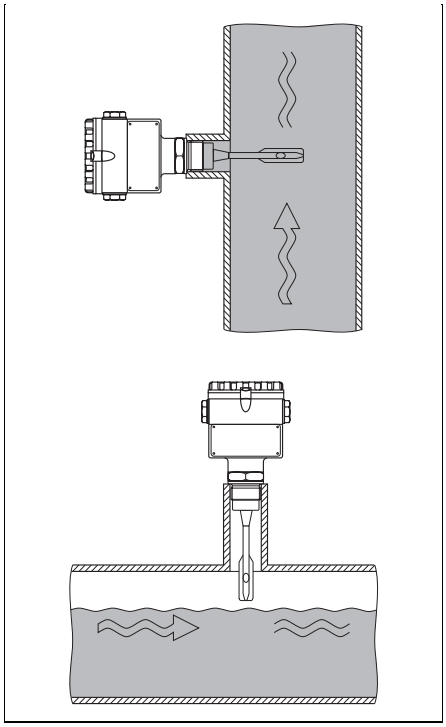
1. Generally:
   The process connection preferably flush with the tank wall
2. With low viscosity liquids
   mount the sensor so that the liquid can flow out of the nozzle and uncover the tines.
3. With high viscosity liquids nozzle max. 60 mm (with a 1"-nozzle).
   Better: Use a nozzle with a larger diameter.
4. Tuning fork in pipe:
   min. DN 50 with low viscosity liquids

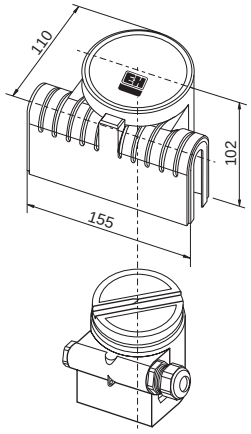
Pipe mounting

- For use as dry-run protection for pumps preferably mount the Liquiphant in a vertical pipe.
- When determining the length of the nozzle take the pipe diameter into account
- If mounted in a horizontal pipe, partial pipe filling can be detected if the correct nozzle length is chosen.

Liquiphant with plastic coating

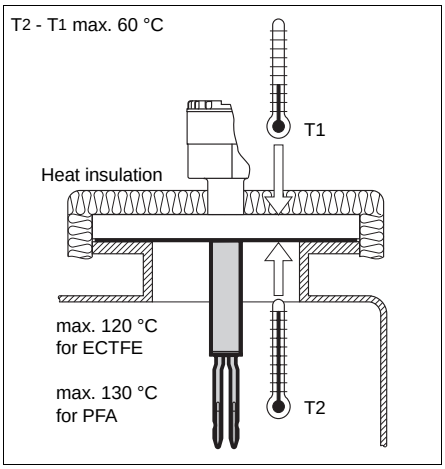
- Maximum operating temperature for ECTFE: 120 °C (250 °F), for PFA: 130 °C (270 °F)
- The temperature difference T2 - T1 between the inner and outer surfaces of the flange must not exceed 60 °C (140 °F). If necessary, insulate the outer surface of the flange.





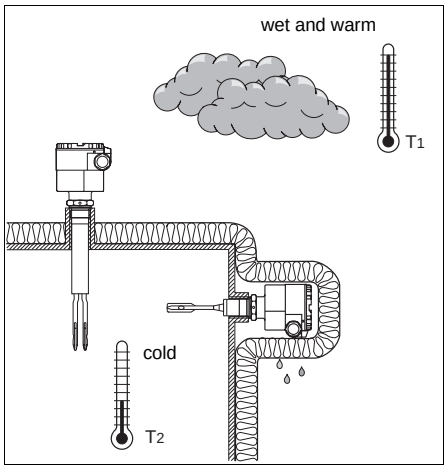
All-Weather Hood for housing F6, F10;
Made of polyamide. The all-weather hood protects the sensor from excessive temperature and from condensation forming in the housing which can occur with wide temperature variations.

Liquiphant with plastic coating (ECTFE or PFA)

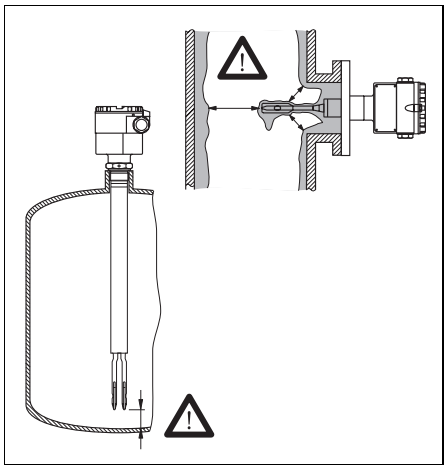


For humid environments or cold media, to avoid condensate forming within the housing:

install a FTL 361, min. length 220 mm, or insulate the housing.



The fork tines may not touch the tank or pipe wall or any build-up



Electrical Connection

CE MARK

The device fulfils the legal requirements of the following EC Guidelines:
- Guideline 89/336/EC (Electromagnetic compatibility)
- Guidelines 73/23/EC and 93/68/EC (Low Voltage Appliances)

Electromagnetic compatibility (EMC):
Immunity to EN 50082-2
and industrial standard NAMUR,
at a field strength of 10 V/m.
Emmission to EN 50081-1.

For general information
on electromagnetic compatibility
(test methods, installation hints)
see TI 241F/00/en.

Electronic inserts
Electronic switch with:
- ☐ Two-wire AC connection
- ☐ Three-wire DC connection PNP
- ☐ Three-wire DC connection NPN
- ☐ Universal connection with potential free relay contact

The electronic inserts are exchangeable without requiring a recalibration!

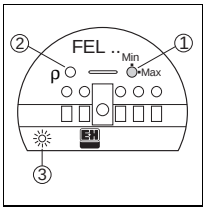
FEL 31
Two-wire AC connection
21 V ... 253 V, 50 / 60 Hz
- Load for short periods
  max. 1.5 A / 40 ms
  max. 375 VA / 250 V
  max. 36 VA / 24 V
  Continuous load max, 350 mA
  max. 87 VA / 250 V
  max. 8.4 VA / 24 V
- Minimum load
  min. 2.5 VA / 250 V (10 mA)
  min 0.5 BA / 24 V (20 mA)
- Residual current when open 4 mA
- Voltage drop across the electronic switch when colsed, 10 V
- Do not use the FEL 31 without an external load!

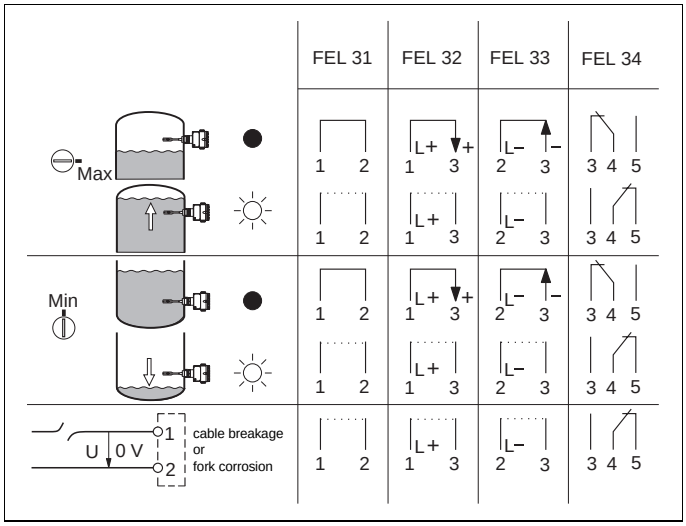
FEL 32
Three-wire DC connection PNP
- Continuous load max. 350 mA for short periods 1 A, max. 1 s
- Operating voltage 10 V ... 55 V
- Overload and reverse polarity protected
- Residual current when open <100 µA
- Current consumption max. 15 mA

FEL 33
Three-wire DC connection NPN
- Continuous load max. 350 mA for short periods 1 A, max. 1 s
- Operating voltage 10 V ... 55 V
- Overload and reverse polarity protected
- Residual current when open <100 µA
- Current consumption max. 15 mA

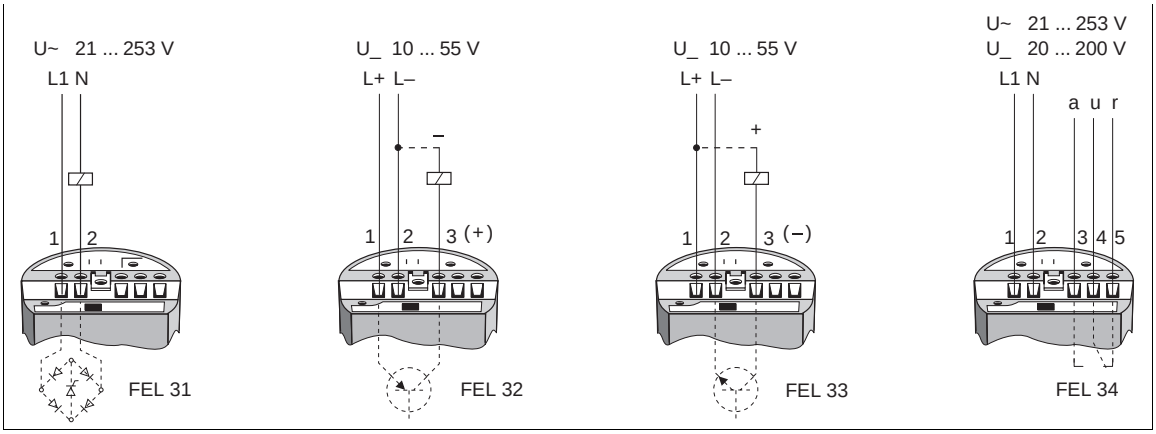
FEL 34
Universal connection for
AC 21 V ... 253 V, 50 / 60 Hz
or DC 20 V ... 200 V.
Current consumptiom max. 7 mA.
Potential free relay contact.
Load capacity:
- With AC max. 250 V, max. 6 A
  P ~ max. 1500 VA, cos φ = 1
  P ~ max. 750 VA, cos φ > 0,7
- With DC 20 V to 200 V,
  P = max. 200 W

1. Maximum-/Minimum fail-safe can be switched on the electronic insert
2. Switch for liquid density:
   ρ > 0.5
   e.g. for liquefied gas;
   ρ > 0.7
   standard setting
3. The LED indicates the switching status





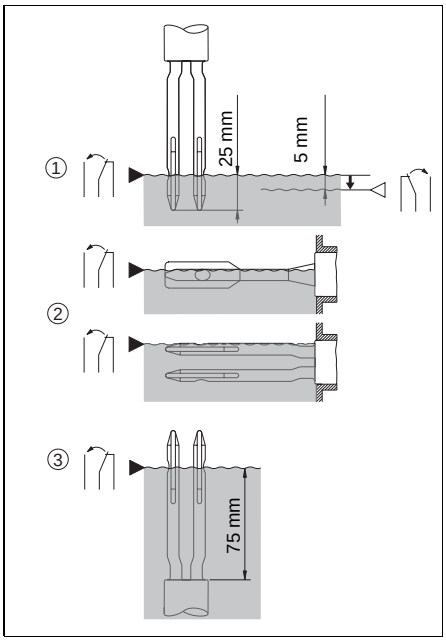
Function and switching of the electronic inserts



Setting the switchpoint
If a switchpoint with millimetre accuracy is required please note the diagram opposite.

1. lop mounting
2. Side mounting with the tines next to each other or above one another
3. Bottom mounting

Switchpoint data are related to water (Density 1 g/cm^3). For use in extremely light liquids (liquified gas - LPG) the switch on the Liquiphant should be set to "Density 0.5".

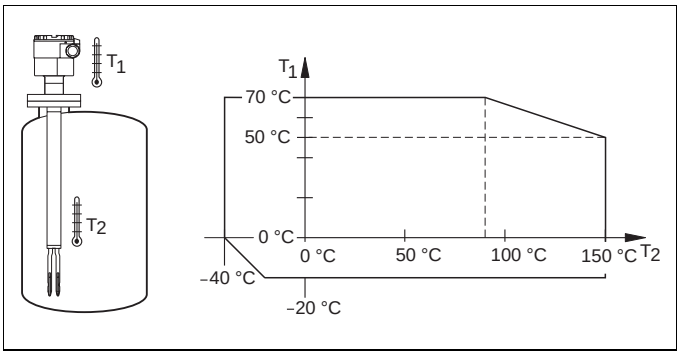


Technical Data

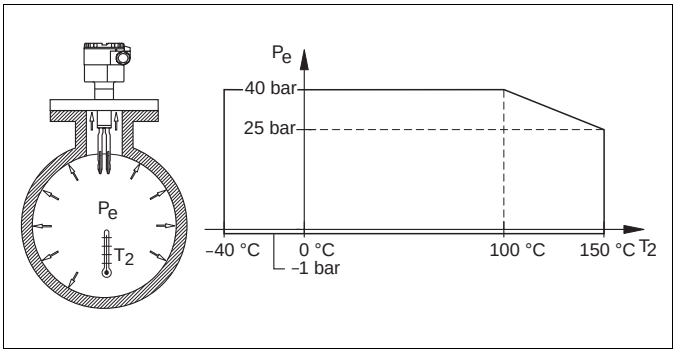
Operating data
Operating pressure in tank
max. 40 bar (600 psi), see the illustration below for permissible temperature
Test pressure: max. 60 bar (900 psi)
Operating temperature in tank:
–40 °C…+150 °C (–40 °F...+300 °F)
Ambient housing temperature:
–20 °C…+70 °C (0 °F...+160 °F)
Liquid viscosity: max. 10000 mm^2/s (cSt)
Minimum density of the liquid: 0.5 g/cm^3
Switching hysteresis: approx. 5 mm
Switching delay:
when covered approx. 0.4 s,
when exposed approx. 1 s
Fail-safe mode: Min./Max. selectable
Switching display:
LED on the electronic insert

Sensor materials
- Stainless steel 1.4581 (~AISI 316 Ti) optionally polished
- Stainless steel 1.4581 (~AISI 316 Ti) with ECTFE or PFA coating, together with coated flanges
- Hastelloy C 2.4610

Accessories
- ☐ Sliding sleeve for variable switchpoint setting (when commisioning)
  - Atmospheric pressure sliding sleeve
  - High pressure sliding sleeve
- ☐ Separate flanges
- ☐ Transparent housing cover: allows the LED status to be seen



The maximum permissible temperature T_1 at the housing depends on the operating temperature T_2 in the tank
x°C = (1.8x + 32) °F



The maximum permissible pressure p_e in the vessel depends on the temperature T_2 in the vessel.
1 bar = 14.5 psi

Product structure

Other
process connections,
materials,
electronic inserts,
housings
on request

FTL 360

Certificate
- R Standard, no particular approval
- U CSA, General Purpose

Process connection / Material
- GR2 Threaded boss G1 A, AISI 316 Ti
- GN2 Threaded boss 1" NPT, AISI 316 Ti
- ME2 Pipe coupling DIN 11851 DN 50, AISI 316 Ti
- TE2 Triclamp (ISO 2852) 2", AISI 316 Ti

} fork surface finish B = polished

- …… For flanges see separate table
- YY9 Special process connection

Fork surface finish
- A Standard fork (Material same as process connection)
- B Polished fork, only with process connection GR2, GN2, ME2, TE2
- Y Special fork finish

Electronic
- 1 FEL 31, AC-2-wire, 21…253 V
- 2 FEL 32, DC-PNP, 10…55 V
- 4 FEL 34, AC/DC with relay contact
  21 V…253 V AC, 20 V…200 V DC
- 9 Special electronic

Housing, cable entry
- K Polyester housing F10, IP 66, Pg 16 (IP 66)
- O Polyester housing F10, IP 66, M 20x1.5
- R Aluminium housing F6, IP 66, Pg 16 (IP 66)
- T Aluminium housing F6, IP 66, 1/2 NPT
- U Aluminium housing F6, IP 66, G 1/2
- V Aluminium housing F6, IP 66, M 20x1.5
- 1 Stainless steel housing F8, IP 66, Pg 13,5
- 2 Stainless steel housing F8, IP 66, G 1/2
- 3 Stainless steel housing F8, IP 66, M 20x1,5
- 4 Stainless steel housing F8, IP 66, 1/2 NPT
- Y Special housing

FTL 360 – [ ][ ][ ][ ][ ] Product designation

Liquiphant FTL 360
compact version

FTL 361

Certificate
- R Standard, no particular approval
- U CSA, General Purpose

Process connection / Material
- GR2 Threaded boss G1A, AISI 316 Ti
- GN2 Threaded boss 1" NPT, AISI 316 Ti
- ME2 Pipe coupling DIN 11851 DN 50, AISI 316 Ti
- TE2 Triclamp (ISO 2852) 2", AISI 316 Ti

} fork surface finish B = polished

- …… For flanges see separate table
- YY9 Special process connection

Fork surface finish
- A Standard fork, material same as process connection,
  not available for process connections ME2, TE2
- B Polished fork
  only with process connection ME2, TE2, GR2, GN2
  and with extension tube »G« or »4«

Sensor length, extension tube material
Plastic coating with flanges only
Min. length 220 mm, max. length 6000 mm
mm/ in
- A / 1 AISI 316 Ti (1.4571)
- B / 2 AISI 316 Ti / ECTFE coated (up to 6 m / 236 in)
- C / 3 Hastelloy C
- G / 4 AISI 316 Ti, polished
- Y Special length, special material (e.g. PFA coated up to 1 m / 40 in)

Electronic
- 1 FEL 31, AC-2-Wire, 21…253 V
- 2 FEL 32, DC-PNP, 10…55 V
- 4 FEL 34, AC/DC with relay contact
  21 V…253 V AC, 20 V…200 V DC
- 9 Special electronic

Housing, cable entry
as FTL 360 - see above

FTL 361 – [ ][ ][ ][ ][ ][ ] Product designation

State length in mm or inch

Liquiphant FTL 361
with extension tube

По вопросам продаж и поддержки обращайтесь:

Алматы (7273)495-231
Ангарск (3955)60-70-56
Архангельск (8182)63-90-72
Астрахань (8512)99-46-04
Барнаул (3852)73-04-60
Белгород (4722)40-23-64
Благовещенск (4162)22-76-07
Брянск (4832)59-03-52
Владивосток (423)249-28-31
Владикавказ (8672)28-90-48
Владимир (4922)49-43-18
Волгоград (844)278-03-48
Вологда (8172)26-41-59
Воронеж (473)204-51-73
Екатеринбург (343)384-55-89
Иваново (4932)77-34-06
Ижевск (3412)26-03-58
Иркутск (395)279-98-46
Казань (843)206-01-48
Калининград (4012)72-03-81
Калуга (4842)92-23-67
Кемерово (3842)65-04-62
Киров (8332)68-02-04
Коломна (4966)23-41-49
Кострома (4942)77-07-48
Краснодар (861)203-40-90
Красноярск (391)204-63-61
Курск (4712)77-13-04
Курган (3522)50-90-47
Липецк (4742)52-20-81
Магнитогорск (3519)55-03-13
Москва (495)268-04-70
Мурманск (8152)59-64-93
Набережные Челны (8552)20-53-41
Нижний Новгород (831)429-08-12
Новокузнецк (3843)20-46-81
Ноябрьск (3496)41-32-12
Новосибирск (383)227-86-73
Омск (3812)21-46-40
Орел (4862)44-53-42
Оренбург (3532)37-68-04
Пенза (8412)22-31-16
Петрозаводск (8142)55-98-37
Псков (8112)59-10-37
Пермь (342)205-81-47
Ростов-на-Дону (863)308-18-15
Рязань (4912)46-61-64
Самара (846)206-03-16
Санкт-Петербург (812)309-46-40
Саратов (845)249-38-78
Севастополь (8692)22-31-93
Саранск (8342)22-96-24
Симферополь (3652)67-13-56
Смоленск (4812)29-41-54
Сочи (862)225-72-31
Ставрополь (8652)20-65-13
Сургут (3462)77-98-35
Сыктывкар (8212)25-95-17
Тамбов (4752)50-40-97
Тверь (4822)63-31-35
Тольятти (8482)63-91-07
Томск (3822)98-41-53
Тула (4872)33-79-87
Тюмень (3452)66-21-18
Ульяновск (8422)24-23-59
Улан-Удэ (3012)59-97-51
Уфа (347)229-48-12
Хабаровск (4212)92-98-04
Чебоксары (8352)28-53-07
Челябинск (351)202-03-61
Череповец (8202)49-02-64
Чита (3022)38-34-83
Якутск (4112)23-90-97
Ярославль (4852)69-52-93

Россия +7(495)268-04-70 Казахстан +7(7172)727-132 Киргизия +996(312)96-26-47

эл.почта: ehr@nt-rt.ru || сайт: https://endcounters.nt-rt.ru/