



LFV

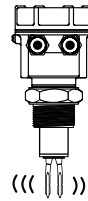
Vibrating Fork Level Switch for Liquids



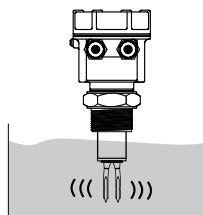
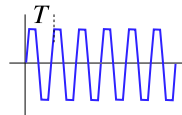
Product Overview

Trumen vibrating fork point level switch model LFV is suitable for free flowing liquids use in all process industries like food and beverages, chemical, pharma, oil & gas, water treatment plant and many more. Trumen vibrating fork gives reliable measurement values and is not affected by flow, vibrations, change in the media properties and material build-up.

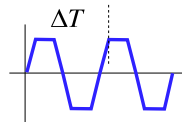
Operating Principle



Electronics of LFV excites the piezo-electric-crystals inside the tuning fork, which makes the fork tines vibrate at their natural resonance frequency in free air.



When fork tines are immersed in liquid, the frequency of fork vibration falls due to the density of liquid.



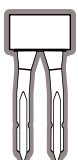
This change in frequency is detected by electronic circuit of LFV.

Presence of liquid is thus detected.

Applications

- Vibrating fork liquid level switch is used in different applications like
 - Water
 - Beverages
 - Milk
 - Hydraulic oil
 - Diesel
 - Liquid LPG
 - Edible Oil
 - Honey
 - Paints
 - Chemical
 - WFI water
- Flow/no-flow detection in pipelines

Acid Safe Coatings



- PTFE
- PFA
- HALAR
- TEFZEL ... etc

Features

- Compact size
- Fast switching response 0.5 to 2 sec
- Low power consumption
- Calibration-less operation
- Durable Construction
- Immune to External Vibrations
- Suitable for side as well as top mounting
- Minimum and maximum failsafe field selectable
- External indication LED available
- NAMUR (L-H / H-L) as per IEC-60947-5-6
- Ingress protection : IP 67/68 (as per IS/IEC 60529:2001)
- Process temperature max 250°C
- Process pressure max.20 bar
- 1/2" threaded mountings available
- Threaded / flanged / customized process connections
- Remote electronics with standard 10 meters cable length

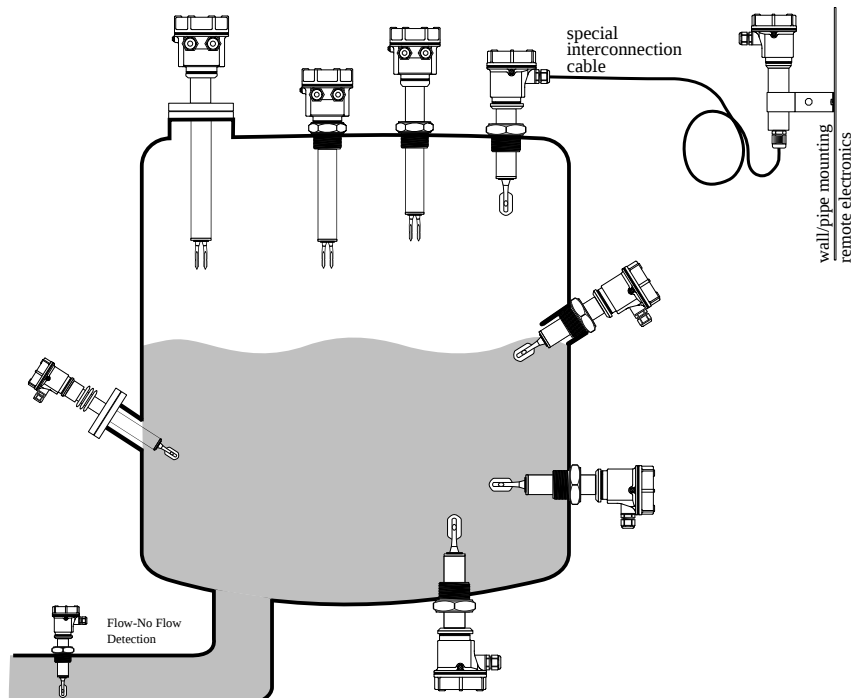
LFV: Vibrating Fork Level Switch for Liquids

Performance Specifications

Parameter	Description
General	
Max. Viscosity	10,000 cStokes (= $cPose/(g/cm^3)$), (Higher viscosity available on request)
Maximum measured error	Max. ± 1 mm (at reference operating conditions)
Switching response	0.5 to 2 sec
Repeatability	0.1 mm
Hysteresis	Approx. 2 mm
Influence of medium temperature	Max +2 to -3 mm (-20 to +150 °C)
Influence of medium density	Max +5 to -4 mm (1.0 to 2.5 g/cm^3)
Influence of medium pressure	Max 0 to -3 mm (-1 to 20 bar)
Sensor Cable	Remote electronics require special cable from fork to controller, 10 meter standard length (Longer length max. upto 15m)
Process	
Ambient Temperature	-20°C ... 70°C (-4°F ... 158 °F)
Process Temperature	-20°C ... 80°C (-4°F ... 176 °F)
Extended Process Temperature	-30°C ... 250°C (-22°F ... 482 °F), (extensions & heat sinks required)
Process Pressure	Absolute / max. 20 bar
Physical Specifications	
Wetted Parts	SS 316 or SS 316L, PTFE, PFA, TEFZEL, HALAR
Process Connections	NPT / BSP / Hygienic 1/2", 3/4", 1", 1-1/4", 1-1/2", 2" & Triclover 1-1/2", 2" and Flanged ANSI / JIS / DIN / ASA / custom
Extensions Tube & Material	SS 304, SS 316, SS 316L
Insertion Length	50mm to 3,000mm
Approvals & Certifications	
ISO Certification	ISO 9001:2015
CE certification	All product comply as per directives 2014/35/EU Low Voltage Directive & 2014/30/EU Electromagnetic Compatibility Directive
RoHS Certification	RoHS Compliance as per RoHS Directive (2011/65/EU); Certificate No. RoHS-TTPL-2021-0305
Ingress Protection	IP67/68 as per IS/IEC 60529:2001
Ex-proof (Ex d T6 IIC)	Flameproof as per IS/IEC 60079-1:2014, Ingress Protection (IP-67) as per IS/IEC 60529:2001 Suitable for Gas Group: IIC, Suitable for Zone 1 & 2 atmospheres and Dust hazardous area Zone 21 & 22
Ex-ia Approval	Intrinsically safe according to the requirement of IS/IEC 60079-0:2011, IS/IEC 60079-11:2006 & IS/IEC 60529: 2001
EMC Certification	EMC Certified as per Standard IEC 61000-4-3, IEC 61000-4-2, IEC 61000-4-6, IEC 61000-4-29, IEC 61000-4-4, IEC 61000-4-5, CISPR 11
Vibration Test Certificate	Vibration complied as per IEC 60068 part 2-6 sinusoidal, 10-55Hz, 0.15mm

Specifications are subject to change without prior notice

Typical Installation



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Performance Specifications

Parameter	Description	Electrical Connection
Electrical		
EIUD / ERUD Supply Output Relay Rating	Integral / Remote Electronics Universal Power Supply 15 to 80 VDC & 15 to 260 VAC 50/60Hz 1 DPDT potential free relay contact output 5 A each @ 24VDC or 220VAC	
EIDP / ERDP Supply Output Output Limit	Integral / Remote Electronics 12 to 60 VDC PNP Output 250mA max. Short Circuit Safe	
EINL/EINH Supply Output	NAMUR (L-H / H-L) as per IEC-60947-5-6 8.2 VDC $\leq 1.2\text{mA}$ & $\geq 2.1\text{mA}$ NAMUR output, 1K Ω series resistance	
EIUSP / ERUSP Supply Output Relay Rating DC Supply PNP Output	Integral / Remote Electronics Universal Power Supply 15 to 80 VDC & 15 to 260 VAC 50/60Hz Potential free SPDT relay contact output 5 A each @ 24VDC or 220VAC 15 to 60 VDC for PNP output 250mA max. Short Circuit Safe	
EIAR Supply Output Output Limit	Integral Electronics 18 to 260 VAC Two Wire AC series relay not less than 4mA to release external relay maximum 150mA to magnetize relay Use relays / contactors will more than 4mA holding current	
EIDL Supply Output Output Limit	Integral Electronics 4-20mA Loop Powered 15 to 60 VDC Two Wire 8 / 16mA & 4 / 20mA output 8mA ($\pm 1\text{mA}$ max) / 16mA ($\pm 1\text{mA}$ max) 4mA ($\pm 1\text{mA}$ max) / 20mA ($\pm 1\text{mA}$ max)	
EIPFM Supply Output Output Limit	Integral Electronics From PFM tester device < 30VDC PFM sourced powered output PFM 50Hz / 150Hz 200 μS , 10mA	
EIFS / ERFS	Integral / Remote Electronics Specially designed with special output	Electrical connection depends on selected model code.

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Ordering Information

LFV **Hxx** - **Tx** - **Sx** - **Gx** - **Px** - **Cx** - **Exxx** - **Dx** - **Lxxxx**

Enclosure

HAN: Aluminum Non-Hazardous IP-67/68
HAX: Aluminum Flameproof IIa, IIb and IIc
HSN: Stainless steel
HPN: Polycarbonate (Plastic)
HES: Specially designed as per customer requirement

Material Temperature

T1: max 80°C
T2: max 200°C
T3: max 250°C
TS: Customer Specified Special designed

Sensing Surface Material

S6: SS 316
SL: SS 316L
ST: PTFE Coated
SF: PFA Coated
SZ: TEFZEL Coated
SH: HALAR Coated
SS: Special Surface

Sensor Extension Material

G4: SS 304
G6: SS 316
GL: SS 316L
GT: PTFE Coated
GF: PFA Coated
GZ: TEFZEL Coated
GH: HALAR Coated
GS: Special Surface

Process Connection Type

PB1: 1" BSP
PB2: 1-1/2" BSP
PB3: 3/4" BSP
PB4: 1-1/4" BSP
PB5: 1/2" BSP
PB6: 2" BSP
PN1: 1" NPT
PN2: 1-1/2" NPT
PN3: 3/4" NPT
PN4: 1-1/4" NPT
PN5: 1/2" NPT
PN6: 2" NPT
PT1: 1", 1-1/2" Triclover/Triclamp
PT2: 2" Triclover/Triclamp
PS1: 1" SMS Union
PS1: 2" SMS Union
PD: Dairy Coupling
PFL: Flanged Type (Fxxx)
F001: 1/2" B16.5 ANSI/ASA 150#RF
F002: 3/4" B16.5 ANSI/ASA 150#RF
F003: 1" B16.5 ANSI/ASA 150#RF
F004: 1-1/4" B16.5 ANSI/ASA 150#RF
F005: 1-1/2" B16.5 ANSI/ASA 150#RF
F006: 2" B16.5 ANSI/ASA 150#RF
F007: 2-1/2" B16.5 ANSI/ASA 150#RF
F008: 3" B16.5 ANSI/ASA 150#RF
F009: 4" B16.5 ANSI/ASA 150#RF
F010: 5" B16.5 ANSI/ASA 150#RF
F011: 6" B16.5 ANSI/ASA 150#RF
PCS: Special Process Connection

Insertion Length
50mm to 3000mm

Fork Length

D1: 100mm (OD-30mm, suitable for 1" and above)
D2: 40mm (OD-22mm, suitable for 3/4" and above)
D3: 40mm (OD-18mm, suitable for 1/2" and above)

Electronics (Refer page 3 for detail description)

EIUD: 1 DPDT relay O/P
EIDP: PNP O/P
EINL: ≤1.2mA NAMUR (L-H) O/P
EINH: ≥2.1mA NAMUR (H-L) O/P
EIUSP: 1 SPDT relay+PNP O/P
EIAR: Two Wire AC series relay O/P
EIDL: 8/16mA & 4-20mA O/P
EIPFM: PFM sourced powered O/P
EIFDS: Special O/P
ERUD: Remote Electronics with 1 DPDT relay O/P
ERDP: Remote Electronics with PNP O/P
ERUSP: Remote Electronics with 1 SPDT relay+PNP O/P
ERFS: Remote Electronics with special O/P

Process Connection Material

C4: SS 304
C6: SS 316
CL: SS 316L
CT: PTFE Coated
CF: PFA Coated
CS: Special Surface