Level limit switch
Series VN 7000
Product configuration - Technical notes

Vibranivo®

УВТ
LEVEL. UP TO THE MAX.

Overview

Applications

The Vibranivo series VN 7000 is a level limit switch for detection of liquids.
It works in all types of vessels, pipes or agitator tanks within a wide range of applications like:
• Food, brewery, dairy, beverage and pharmaceuticals
• Chemical and petrochemical
• Water and waste water
• Machine building industry
It can also be used for leckage detection in double walled vessels, tanks or collecting ponds

Features

Process

• Level limit detection in liquids
• Wide range of applications
• Full-, demand-, empty detector
• Overfill and Leackage detection
• Independent from dielectricity and conductivity
• Insensitive to material buildup, flow, turbulences and air bubbles
• Allows measurement of most applications without sensitivity setting
• CIP and SIP capable
• No maintenance

Approvals

• CE, UKCA, usFMc, WHG, EHEDG

Electronics

• IO-Link, PNP, NPN or Push-Pull output (configurable)
• 3-wire PNP
• 2-wire without contact
• M12 plug, Valve plug
• Bright signal LED, selectable colours
• Sensitivity and signal delay setting by IO-Link

Mechanics

• Compact unit
• Short vibration fork lenght
• Pipe extension
• Optional sliding sleeve allows to change the switch point easily during operation
• Various process connections
• Resistant to temperature, vibration, humidity, condensation
• Corrosion resistant construction (316L stainless steel)
• Hygienic design

Vibranivo®

Level limit switch
Series VN 7000
Product configuration - Technical notes

UWT
LEVEL. UP TO THE MAX.

Overview

Specification

Process

Ambient temperature	-40 .. +75°C (-40 .. +167°F)
Process temperature	-40 .. +100/150°C (-40 .. +185/302°F)
Process pressure	-1 .. +40 bar (-14.5 .. +580 psi)
Sensitivity	Densitiy 0,7 .. 2,5 g/cm³ (44 .. 156 lb/ft³) Optional 0,5 .. 2,5 g/cm³ (31 .. 156 lb/ft³)
Viscosity	Dynamic viscosity, max. 10.000 mPa s (10.000 cP)

Approvals

CE, usFMc, UKCA	General purpose
EHEDG	Type EL class I, Hygiene
WHG	Overfill and leackage protection

Electronics

3/4-wire IO-Link	IO-Link with PNP, NPN, Push Pull signal output 10,8 - 30 V DC (operation with IO-Link min. 18 V) Connection by plug M12 x 1,5
3-wire PNP	10,8 - 30 V DC Connection by plug M12 x 1,5 or Valve plug
2-wire without contact	20 - 253V AC/DC Connection by Valve plug

Mechanics

Enclosure	Ø31mm (1.2") 1.4404 (316L)	
Lid	Plug M12 x 1,5: Valve plug:	PC transparent or 1.4404 (316L) PC transparent
Ingress protection	Type 4X / IP67 Type 6P / IP69k with Lid 1.4404 (316L)	
Length of extension	VN 7120: VN 7130:	64 mm (2.52") 75 mm (2.95"), G1" hygienic 104 mm (4.09"), elongated switchpoint 115 mm (4.53"), elongated switchpoint G1" hygienic 115 (4.53") ... 4.000 mm (157") 115 (4.53") ... 1.500 mm (59"), 1/2" process connection 115 (4.53") ... 1.000 mm (39.4"), hygienic
Process connection	Thread: Thread hygiene adapter: Tri-clamp: Flanges (threaded):	G 1/2", G 3/4", G 1" DIN ISO 228-1 NPT 1/2", NPT 3/4", NPT 1" G 3/4", G 1"; DIN ISO 228-1 M24 x 1,5 DIN 13 DN25 (1"), DN40 (1 1/2"), DN50 (2") DN 25, DN 40, DN 50, ASME 1", 1 1/2". 2"
Wetted sensor material	Metal parts: Flat sealing:	1.4404 (316L) AFM30 (with G-threads, non hygienic)
Wetted sensor surface	Ra < 3.2 µm (126 µin) Ra < 0.76 µm (30 µin), threads for hygiene adapter	

Vibranivo®

Level limit switch
Series VN 7000
Product configuration - Technical notes

UWT
LEVEL. UP TO THE MAX.

Overview

VN7120
100°C version
M12 x 1,5 plug
Lid PC transparent
G 1/2" thread

VN7120
150°C version
M12 x 1,5 plug
Lid PC transparent
G 1/2" thread

VN7120
100°C version
M12 x 1,5 plug
G 1" thread
Elongated
switchpoint

VN7120
100°C version
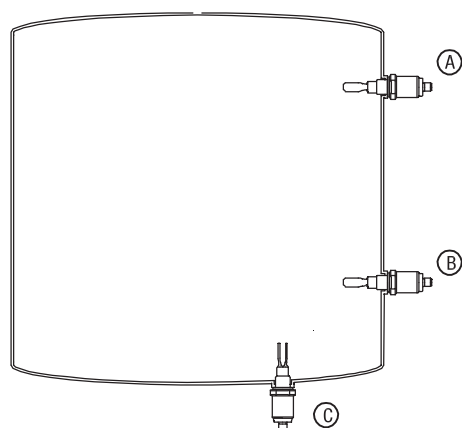Valve plug
G 3/4" thread
Elongated
switchpoint

VN7130
100°C version
M12 x 1,5 plug
Lid 1.4404 (316L)
G 3/4" thread
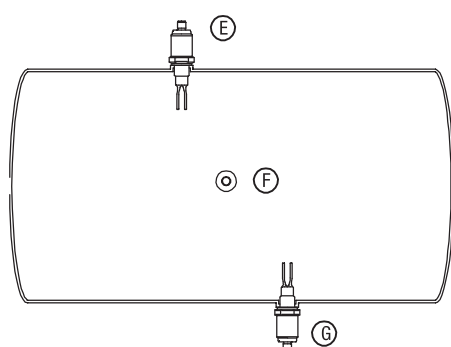
VN7130
150°C version
M12 x 1,5 plug
G 1/2" thread

Level limit switch
Series VN 7000
Product configuration - Technical notes

UWT
LEVEL. UP TO THE MAX.

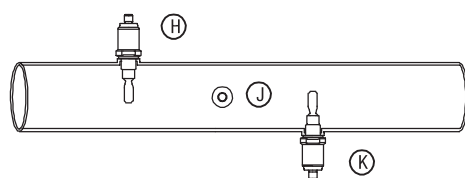# Vibranivo®

Applications

VN 7120

Vertical vessel
A Full detector horizontal
B Demand or empty detector horizontal
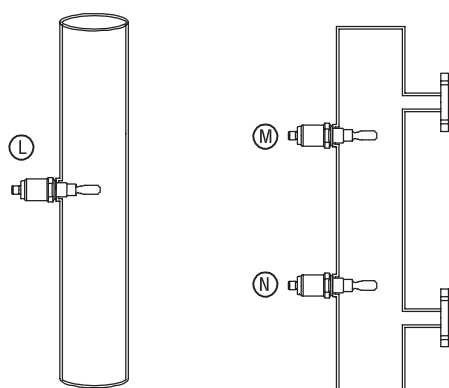**C** Empty detector vertical from the bottom

Horizontal vessel
E Full detector vertical
F Demand or empty detector horizontal
G Empty detector vertical from the bottom

Horizontal pipe
H Full detector vertical
J Demand or empty detector horizontal
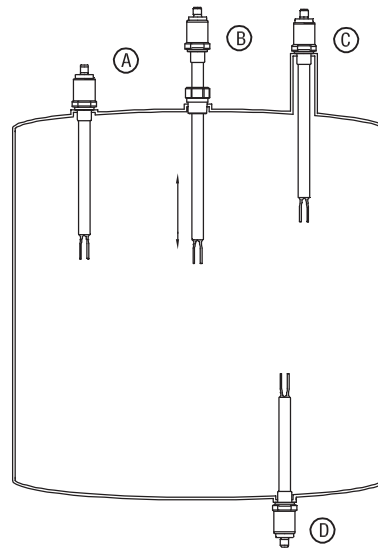**K** Empty detector vertical from the bottom

Vertical pipe
L Full, demand or empty detector horizontal

Bypass
M Full detector horizontal
N Demand or empty detector horizontal

Vibranivo®

Level limit switch
Series VN 7000
Product configuration - Technical notes

UWT
LEVEL. UP TO THE MAX.

Applications

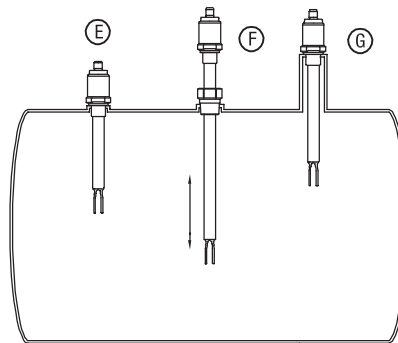VN 7130

Vertical vessel
Full, demand or empty detector:
A   Vertical
B   Vertical with sliding sleeve
C   Vertical with long mounting socket
D   Vertical from bottom

Horizontal vessel
E   Full, demand or empty detector vertical
F   Vertical with sliding sleeve
G   Vertical with long mounting socket
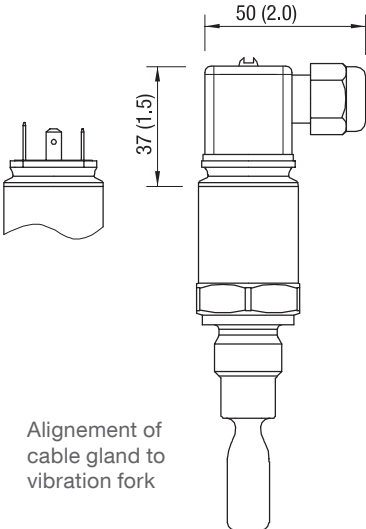
Bypass
H   Full, demand or empty detector vertical

Vibranivo®

Level limit switch
Series VN 7000
Product configuration - Technical notes

UWT
LEVEL. UP TO THE MAX.

Dimensions

All dimensions in mm (inch)

Plugs

Plug	M12 with lid PC (transparent)	M12 with lid 1.4404 (316L)	Valve
Available for electronics	IO-Link 3-wire PNP	IO-Link 3-wire PNP	2-wire without contact 3-wire PNP
	22 (0.9)	22 (0.9)	50 (2.0) 37 (1.5) Alignement of cable gland to vibration fork

Vibranivo®

Level limit switch
Series VN 7000
Product configuration - Technical notes

UWT
LEVEL. UP TO THE MAX.

Dimensions

VN 7120 compact version

Thread

G 1/2"	G 3/4"	G 1"

G 1/2": 43 (1.69), Ø31 (1.2), G 1/2", Ø17 (0.67), L = 64 (2.52), 35 (1.38)

G 3/4": 43 (1.69), Ø31 (1.2), G 3/4", Ø17 (0.67), L = 64 (2.52), 35 (1.38)

G 1": 43 (1.69), Ø31 (1.2), G 1", Ø17 (0.67), L = 64 (2.52), 35 (1.38)

NPT 1/2"	NPT 3/4"	NPT 1"

NPT 1/2": 43 (1.69), Ø31 (1.2), NPT 1/2", Ø17 (0.67), L = 64 (2.52), 35 (1.38)

NPT 3/4": 43 (1.69), Ø31 (1.2), NPT 3/4", Ø17 (0.67), L = 64 (2.52), 35 (1.38)

NPT 1": 43 (1.69), Ø31 (1.2), NPT 1", Ø17 (0.67), L = 64 (2.52), 35 (1.38)
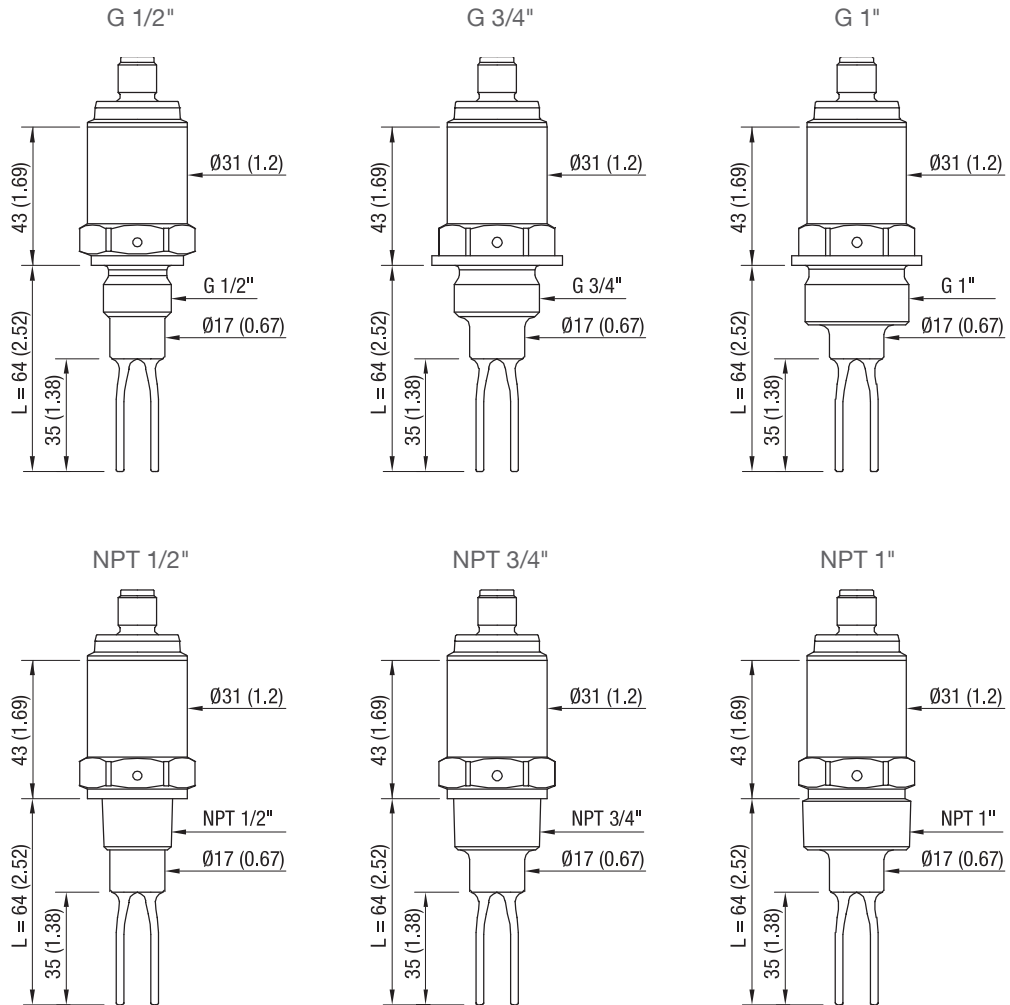
Stated versions 100°C (212°F)

Thread for hygiene adapter

M24 x 1,5	G 3/4"	G 1"

M24 x 1,5: 43 (1.69), 14 (0.55), Ø31 (1.2), M24 x 1,5, Ø17 (0.67), L = 64 (2.52), 35 (1.38)

G 3/4": 43 (1.69), 19 (0.75), Ø31 (1.2), G 3/4", Ø17 (0.67), L = 64 (2.52), 35 (1.38)

G 1": 43 (1.69), Ø31 (1.2), 29.5 (1.16), G 1", Ø17 (0.67), L = 75 (2.96), 35 (1.38)
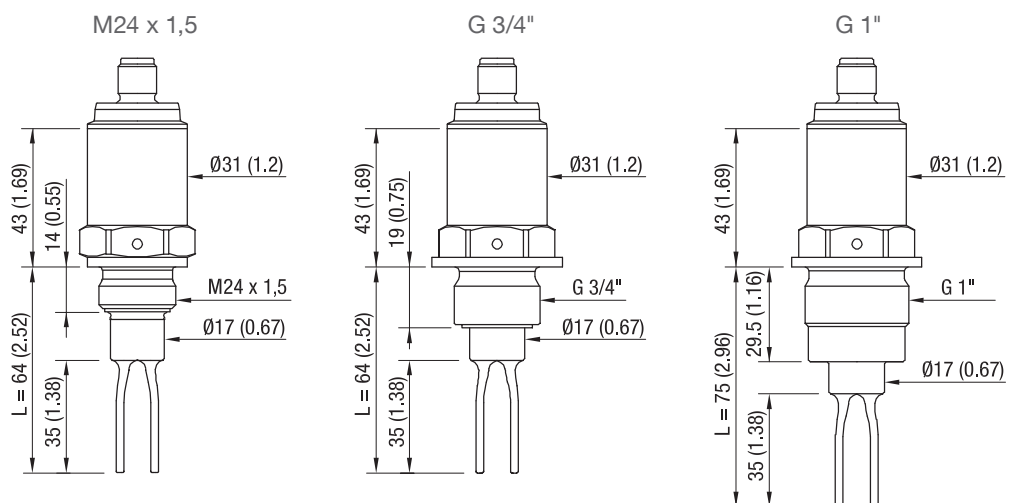
Stated versions 100°C (212°F)
Available with certificate EHEDG EL class I in combination with hygiene adapter

Vibranivo®

Level limit switch
Series VN 7000
Product configuration - Technical notes

UWT
LEVEL. UP TO THE MAX.

Dimensions

VN 7120 with elongated switchpoint

Thread

G 1/2"

Ø31 (1.2)
43 (1.69)
G 1/2"
L = 104 (4.09)
Ø17 (0.67)
35 (1.38)

G 3/4"

Ø31 (1.2)
43 (1.69)
G 3/4"
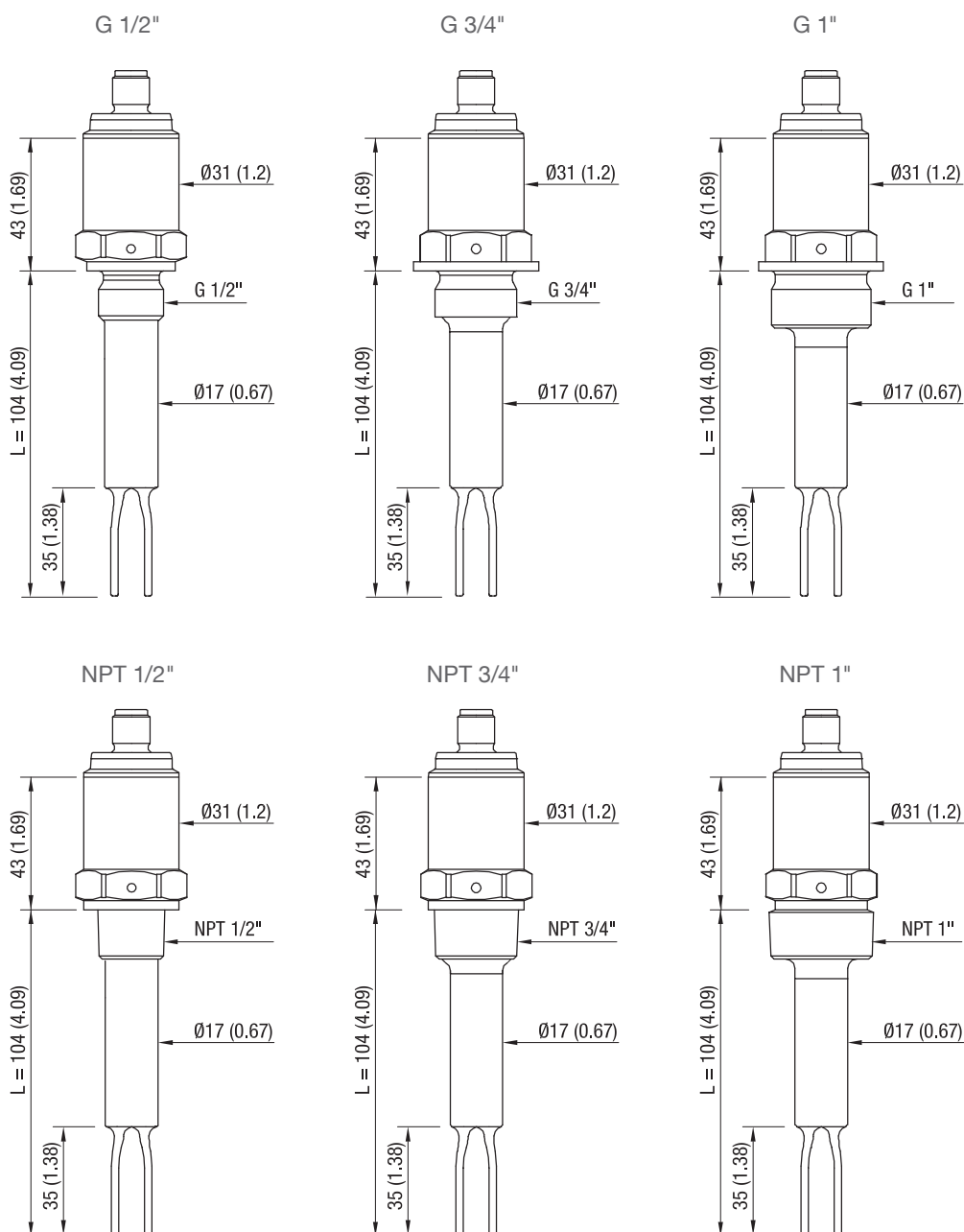L = 104 (4.09)
Ø17 (0.67)
35 (1.38)

G 1"

Ø31 (1.2)
43 (1.69)
G 1"
L = 104 (4.09)
Ø17 (0.67)
35 (1.38)

NPT 1/2"

Ø31 (1.2)
43 (1.69)
NPT 1/2"
L = 104 (4.09)
Ø17 (0.67)
35 (1.38)

NPT 3/4"

Ø31 (1.2)
43 (1.69)
NPT 3/4"
L = 104 (4.09)
Ø17 (0.67)
35 (1.38)

NPT 1"

Ø31 (1.2)
43 (1.69)
NPT 1"
L = 104 (4.09)
Ø17 (0.67)
35 (1.38)

Stated versions 100°C (212°F)

Vibranivo®

Level limit switch
Series VN 7000
Product configuration - Technical notes

UWT
LEVEL. UP TO THE MAX.

Dimensions

VN 7120 with elongated switchpoint

Thread for hygiene adapter

M24 x 1,5

43 (1.69)
14 (0.55)
L = 104 (4.09)
35 (1.38)
Ø31 (1.2)
M24 x 1,5
Ø17 (0.67)

G 3/4"

43 (1.69)
19 (0.75)
L = 104 (4.09)
35 (1.38)
Ø31 (1.2)
G 3/4"
Ø17 (0.67)

G 1"

43 (1.69)
29.5 (1.16)
L = 115 (4.53)
35 (1.38)
Ø31 (1.2)
G 1"
Ø17 (0.67)

Stated versions 100°C (212°F)

Vibranivo®

Level limit switch
Series VN 7000
Product configuration - Technical notes

UWT
LEVEL. UP TO THE MAX.

Dimensions

VN 7130

Thread

G 1/2"	G 3/4"	G 1"

43 (1.69) Ø31 (1.2)
G 1/2"
Ø17 (0.67)
L 115 (4.53) ... 1.500 (59)
35 (1.38)

43 (1.69) Ø31 (1.2)
G 3/4"
Ø21.3 (0.84)
L 115 (4.53) ... 4.000 (157)
Ø17 (0.67)
35 (1.38)

43 (1.69) Ø31 (1.2)
G 1"
Ø21.3 (0.84)
L 115 (4.53) ... 4.000 (157)
Ø17 (0.67)
35 (1.38)

NPT 1/2"	NPT 3/4"	NPT 1"

43 (1.69) Ø31 (1.2)
NPT 1/2"
Ø17 (0.67)
L 115 (4.53) ... 1.500 (59)
35 (1.38)

43 (1.69) Ø31 (1.2)
NPT 3/4"
Ø21.3 (0.84)
L 115 (4.53) ... 4.000 (157)
Ø17 (0.67)
35 (1.38)

43 (1.69) Ø31 (1.2)
NPT 1"
Ø21.3 (0.84)
L 115 (4.53) ... 4.000 (157)
Ø17 (0.67)
35 (1.38)

Stated versions 100°C (212°F)

Vibranivo®

Level limit switch
Series VN 7000
Product configuration - Technical notes

UWT
LEVEL. UP TO THE MAX.

Dimensions

VN 7130

**Thread
for hygiene
adapter**

M24 x 1,5

Ø31 (1.2)
43 (1.69)
14 (0.55)
M24 x 1,5
Ø17 (0.67)
L 115 (4.53) ... 1.000 (39.4)
35 (1.38)

G 3/4"

Ø31 (1.2)
43 (1.69)
19 (0.75)
G 3/4"
Ø17 (0.67)
L 115 (4.53) ... 1.000 (39.4)
35 (1.38)

G 1"

Ø31 (1.2)
43 (1.69)
29.5 (1.16)
G 1"
Ø17 (0.67)
L 115 (4.53) ... 1.000 (39.4)
35 (1.38)
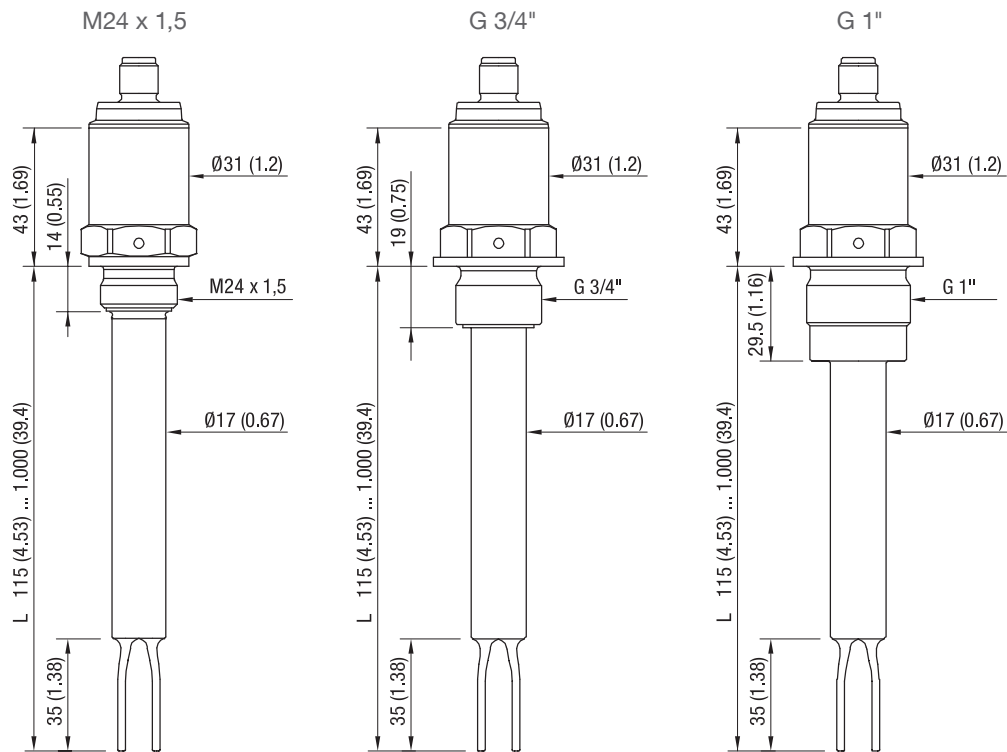
Stated version 100°C (212°F)
Available with certificate EHEDG EL class I in combination with hygiene adapter

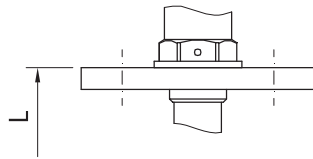### VN 7120 / VN 7130 Version 150°C (302°F)

73 (2.87)
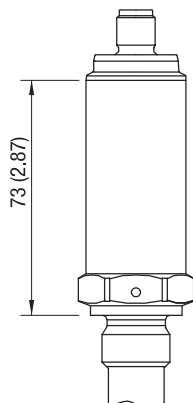
See VN 7120 and VN 7130 for:
• Dimensions not shown
• Various process connections

Vibranivo®

Level limit switch
Series VN 7000
Product configuration - Technical notes

UWT
LEVEL. UP TO THE MAX.

Dimensions

Flange

VN 7120 and VN7130
Flange is screwed to
G 3/4" thread process connection

	Code	Type	Number of holes	d2 mm (Inch)	Lk mm (Inch)	D mm (Inch)	T thickness mm (Inch)
ASME B16.5, raised face	R	1" 150 lbs	4	15,9 (0.63)	79,3 (3.12)	108,0 (4.25)	14,3 (0.56)
	S	1" 300 lbs	4	19,1 (0.75)	88,9 (3.5)	123,8 (4.87)	17,5 (0.69)
	T	1½" 150 lbs	4	15,9 (0.63)	98,6 (3.88)	127,0 (5.0)	17,5 (0.69)
	U	1½" 300 lbs	4	22,2 (0.87)	114,3 (4.5)	155,6 (6.13)	20,6 (0.81)
	V	2" 150 lbs	4	19,1 (0.75)	120,7 (4.75)	152,4 (6.01)	19,1 (0.75)
	W	2" 300 lbs	8	19,1 (0.75)	127,0 (5.0)	165,1 (6.5)	22,2 (0.87)
EN 1092-1 type A, flat faced	N	DN25 PN16/40	4	14,0 (0.55)	85,0 (3.35)	115,0 (4.53)	18,0 (0.71)
	P	DN40 PN16/40	4	18,0 (0.71)	110,0 (4.33)	150,0 (5.91)	18,0 (0.71)
	Q	DN50 PN16/25/40	4	18,0 (0.71)	125,0 (4.92)	165,0 (6.5)	18,0 (0.71)
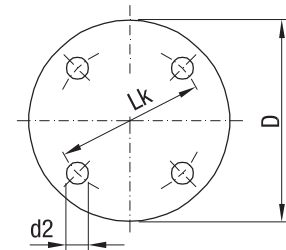
Raised face
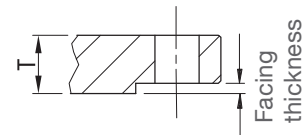
Type	Facing thickness
ASME 150 lbs ASME 300 lbs	2 mm (0.08")

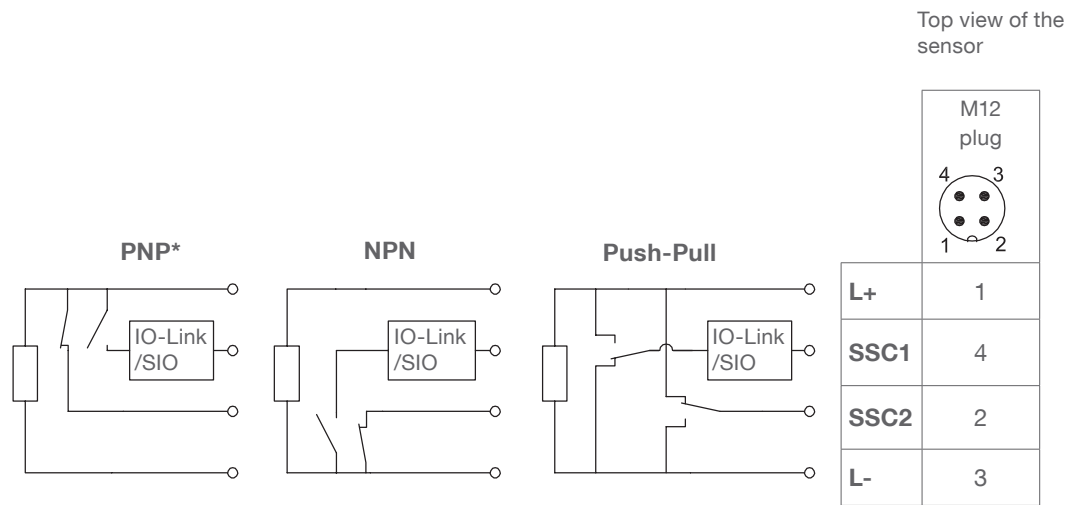**Sliding sleeve**
VN 7130
(option)

G 1 1/4", G 1 1/2"; DIN ISO 228-1
NPT 1 1/4", NPT 1 1/2"; ASME B 1.20.1
Material: 1.4404 (316L)
Sealing material to the extension pipe: FKM
Max. process pressure: –1 to 10 bar (146 psi)

G 1 1/4"   G 1 1/2"   NPT 1 1/4"   NPT 1 1/2"

Vibranivo®

Level limit switch
Series VN 7000
Product configuration - Technical notes

UWT
LEVEL. UP TO THE MAX.
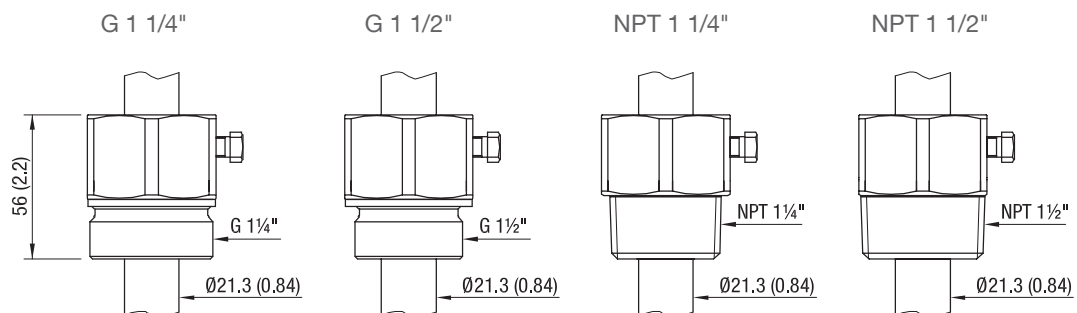
Electrical installation

IO-Link

Wiring diagram

Top view of the sensor

M12 plug

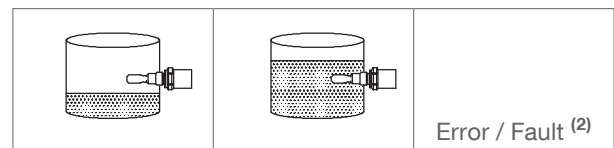|	
L+	1
SSC1	4
SSC2	2
L-	3

PNP* — IO-Link /SIO

NPN — IO-Link /SIO

Push-Pull — IO-Link /SIO

*Factory setting
Change to NPN or Push-Pull can be done in IO-Link registers.
External fuse in L+: max. 0,5A, fast or slow, HBC, 250V

Output logic and LED's

Error / Fault [2]

SSC1 [1]	FSL	PNP/NPN Push-Pull	L+ L-	L+ L-	L+ L-
SSC2 [1]	FSH	PNP/NPN Push-Pull	L+ L-	L+ L-	L+ L-

LED on transparent lid [3]

LED				
	Green	☼	●	●
	Yellow	●	☼	●
	Red	●	●	◑ ☼

LED's on M12 connector [4]

LED's				
	Green (Power)	☼	☼	☼
	Yellow (SSC1)	●	☼	●
	Yellow (SSC2)	☼	●	●
	Red (Failure)	—	—	—

Vibranivo®

Level limit switch
Series VN 7000
Product configuration - Technical notes

UWT
LEVEL. UP TO THE MAX.

Electrical installation

(1) SSC1 and SSC2
    Factory setting:
      SSC1 is set to FSL and PNP.
      SSC2 is set to FSH and PNP.
      Settings can be changed in IO-Link registers.
    FSL = Fail safe low. Contact opens in case of uncovered vibration fork (safe state).
    FSH = Fail safe high. Contact opens in case of covered vibration fork (safe state).

(2) Error / Fault:
    The stated output logic (safe state, open contacts) is present in case of Fault (unit defect).
    In case of Error (remediable), the outputs go to safe state (open contacts) and revover after the
    Error is cleared.

(3) LED on transparent lid:
    The internal LED is visible on the transparent lid.
    Yellow LED is ON in case of covered vibration fork.
      Note: This concept is used for all VN7 devices with M12 plug.
    Red LED Flashing: Error remediable:
      Output current overload, incorrect wiring, to high temperature, testmagnet too long present
    Red LED ON: Fault, unit defect

(4) LED's on M12 connector:
    For devices with 316L lid, internal LED is not present, instead LED's on M12 connector are used.
    The stated colours (green, yellow) are typically used in M12 connectors, check datasheet of
    used connector.
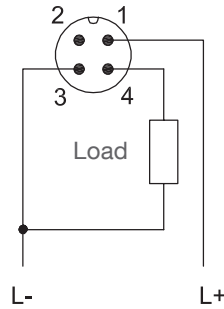   Yellow LEDs are ON in case of closed SSC1 and SSC2 contacts (dependent on FSL/FSH setting).
    Red LED is not present.

Vibranivo®

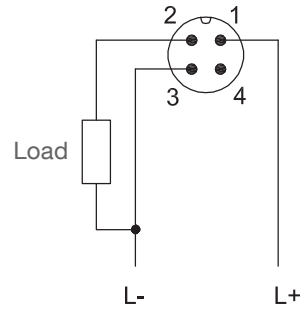**Electrical installation**

Level limit switch
Series VN 7000
Product configuration - Technical notes

UWT
LEVEL. UP TO THE MAX.

3-wire PNP with M12 plug

Wiring diagram

**3-wire PNP
FSL wiring [1]**

**3-wire PNP
FSH wiring [1]**

Top view of the sensor

Load

Load

L-   L+

L-   L+

Connect either as FSL wiring or as FSH wiring, depending on required output logic (see below)
If required, both outputs (pin 2 and pin 4) can be connected (antivalent).
External fuse in L+: max. 0,5A, fast or slow, HBC, 250V

**Output logic
and LED's**

			Error / Fault [2]
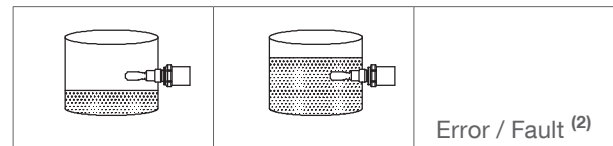
FSL wiring [1]	1 — 4	1 — 4	1 — 4
FSH wiring [1]	1 — 2	1 — 2	1 — 2

LED on transparent lid [3]

LED	Green	☼	●	●
	Yellow	●	☼	●
	Red	●	●	◐ ☼

LED's on M12 connector [4]

LED's	Green (Power)	☼	☼	☼
	Yellow (Pin 4)	●	☼	●
	Yellow (Pin 2)	☼	●	●
	Red	—	—	—

Vibranivo®

Level limit switch
Series VN 7000
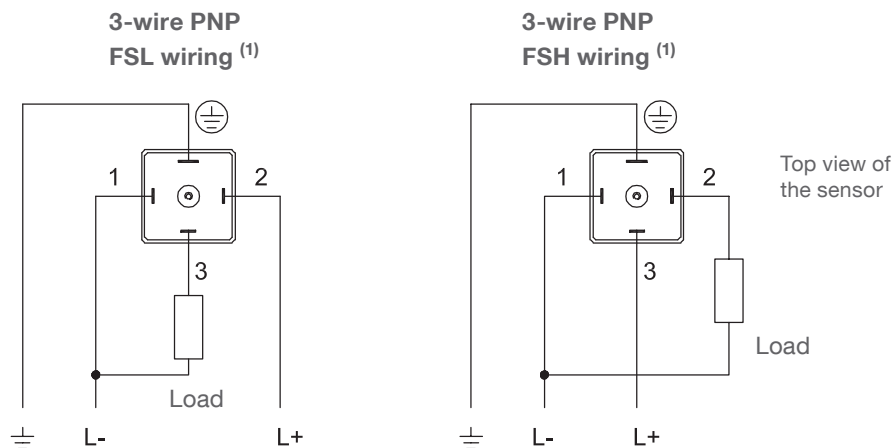Product configuration - Technical notes

UWT
LEVEL. UP TO THE MAX.

Electrical installation

(1) FSL = Fail safe low. Contact opens in case of uncovered vibration fork (safe state).
FSH = Fail safe high. Contact opens in case of covered vibration fork (safe state).

(2) Error / Fault:
The stated output logic (safe state, open contacts) is present in case of Fault (unit defect).
In case of Error (remediable), the outputs go to safe state (open contacts) and revover after the
Error is cleared.

(3) LED on transparent lid:
The internal LED is visible on the transparent lid.
Yellow LED is ON in case of covered vibration fork.
Note: This concept is used for all VN7 devices with M12 plug.
Red LED Flashing: Error remediable:
Output current overload, incorrect wiring, to high temperature, testmagnet too long present
Red LED ON: Fault, unit defect

(4) LED's on M12 connector:
For devices with 316L lid, internal LED is not present, instead LED's on M12 connector are used.
The stated colours (green, yellow) are typically used in M12 connectors, check datasheet of
used connector.
Yellow LED's are ON in case of closed Pin 4 and Pin 2 contacts (dependent on FSL/FSH setting).
Red LED is not present.

Vibranivo®

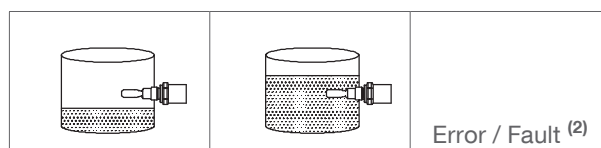Level limit switch
Series VN 7000
Product configuration - Technical notes

UWT
LEVEL. UP TO THE MAX.

Electrical installation

3-wire PNP with Valve plug

Wiring diagram

3-wire PNP
FSL wiring [1]

3-wire PNP
FSH wiring [1]

Top view of
the sensor

Connect either as FSL wiring or as FSH wiring, depending on required output logic (see below)
External fuse in L+: max. 0,5A, fast or slow, HBC, 250V

**Output logic
and LED's**

				Error / Fault [2]

FSL wiring [1]		3 — 2	3 — 2	3 — 2
LED [3]	Green	☼	●	●
	Yellow	●	☼	●
	Red	●	●	◐ ☼

FSH wiring [1]		2 — 3	2 — 3	2 — 3
LED [3]	Green	●	☼	●
	Yellow	☼	●	●
	Red	●	●	◐ ☼

Vibranivo®

Level limit switch
Series VN 7000
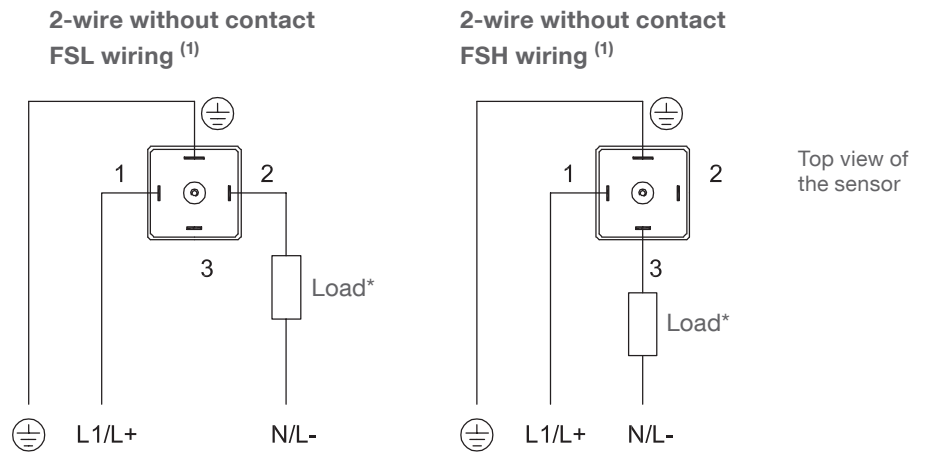Product configuration - Technical notes

UWT

LEVEL. UP TO THE MAX.

Electrical installation

(1) FSL = Fail safe low. Contact opens in case of uncovered vibration fork (safe state).
   FSH = Fail safe high. Contact opens in case of covered vibration fork (safe state).

(2) Error / Fault:
   The stated output logic (safe state, open contacts) is present in case of Fault (unit defect).
   In case of Error (remediable), the outputs go to safe state (open contacts) and revover after the
   Error is cleared.

(3) LED:
   The internal LED is visible on the transparent lid.
   Yellow LED is ON in case of closed contact.
      Note: This concept is used for all VN7 devices with Valve plug.
   Red LED Flashing: Error remediable:
      Output current overload, incorrect wiring, to high temperature, testmagnet too long present
   Red LED ON: Fault, unit defect

Vibranivo®

Level limit switch
Series VN 7000
Product configuration - Technical notes

UWT
LEVEL. UP TO THE MAX.

Electrical installation

2-wire without contact

Wiring diagram

2-wire without contact
FSL wiring [1]

1

2

3

Load*

⏚ L1/L+   N/L-

2-wire without contact
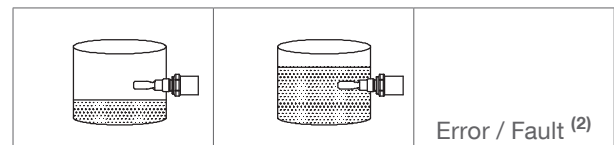**FSH wiring** [1]

1

2

3

Load*

⏚ L1/L+   N/L-

Top view of
the sensor

Connect either as FSL wiring or as FSH wiring, depending on required output logic (see below)
External fuse in L1/L+: max. 0,5A, fast or slow, HBC, 250V

* Provide protection against spikes with inductive loads (e.g. relay)

Output logic
and LED's

		Error / Fault [2]

FSL wiring [1]		1 ⟋ — 2	1 ⟋ — 2	1 ⟋ — 2
LED [3]	Green	☼	●	●
	Yellow	●	☼	●
	Red	●	●	◑ ☼

FSH wiring [1]		1 — 3	1 ⟋ — 3	1 ⟋ — 3
LED [3]	Green	●	☼	●
	Yellow	☼	●	●
	Red	●	●	◑ ☼

Vibranivo®

Level limit switch
Series VN 7000
Product configuration - Technical notes

UWT
LEVEL. UP TO THE MAX.

Electrical installation

(1) FSL = Fail safe low. Contact opens in case of uncovered sensor (safe state).
FSH = Fail safe high. Contact opens in case of covered sensor (safe state).

(2) Error / Fault:
The stated output logic (safe state, open contacts) is present in case of Fault (unit defect).
In case of Error (remediable), the outputs go to safe state (open contacts) and revover after the
Error is cleared.

(3) LED:
The internal LED is visible on the transparent lid.
Yellow LED is ON in case of closed contact.
Note: This concept is used for all VN7 devices with Valve plug.
Red LED Flashing: Error remediable:
Output current overload, short circuit, to high temperature, testmagnet too long present
Red LED ON: Fault, unit defect