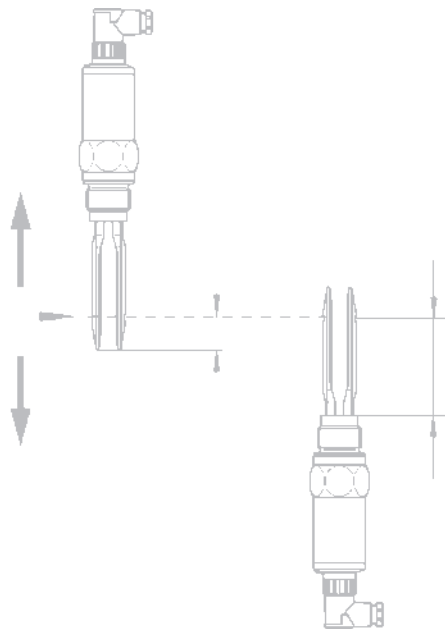


LS 4100/LS 4150 Vibration Level Switch for liquids



- Set-up without adjustment
- Economical and compact
- Unaffected by product variations in density, conductivity, dielectric constant or viscosity
- Insensitive to foam, pressure and temperatures variations
- Insensitive to external vibrations

Variable area flowmeters

Vortex flowmeters

Flow controllers

Electromagnetic flowmeters

Ultrasonic flowmeters

Mass flowmeters

Level measuring instruments

Communications technology

Engineering systems & solutions

Switches, counters, displays and recorders

Heat metering

Pressure and temperature



LS 4100/LS 4150 Vibration Level Switch for liquids

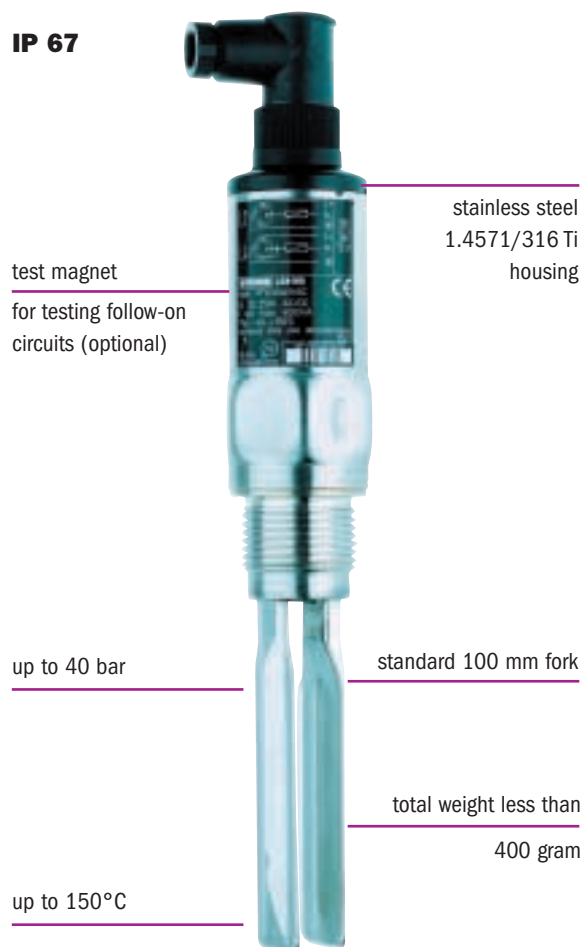
- Overfill or dry-run protection
- Particularly suitable for applications in confined spaces
- Off-the-shelf item
- Proven technology

Operating principle

The tuning fork is piezoelectrically energised and vibrates at its mechanical resonance frequency of approx. 400 Hz. This frequency is transferred to the electronics of LS 4100/LS 4150. When the tuning fork is submerged in the product, the frequency changes. This change is detected by the integrated oscillator and converted into a switching command.

The LS 4150 is mainly suitable for level detection in the food processing and pharmaceutical industry. Due to the polished sensor surface ($Ra \leq 0.5 \mu\text{m}$ or $Ra \leq 1.5 \mu\text{m}$) bacteria have no chance to collect. The LS 4150 is also suitable for CIP and SIP cleaning. Many different hygienic fittings such as cone with compression nut, Tri-Clamp 1" and 2", bolting, Tuchenhagen VARIVENT or special hygienic connections are available.

IP 67



The responsibility as to the suitability, intended use and corrosion-resistance of the materials used in their construction rests solely with the purchaser.

Technical Data

Process conditions	
Pressure	≤ 40 bar (580 psig)
Process temperature	-40...+150°C (-40...+302°F)
Density	≥ 0.6 kg/l
Viscosity	max. 10 000 mPa·s
Materials	
Probe	stainless steel 1.4581
Housing	stainless steel 1.4571/316 Ti
Version	
Probe length	100 mm (3.94")
Process connection	
Screwing	G1A, 1" NPT
Electronic unit	
Standard	solid-state switch 20 - 250 V AC/DC, max. 400 mA
Option	transistor output floating NPN/PNP 10 - 55 V DC, max. 400 mA.

Protection class	
DIN 40 050	IP 66 / IP 67
Approvals	
as overfill protection in conformity with WHG (Germany)	

Accessories

Test magnet
for testing follow-on circuits (such as PLCs and control systems) without dismantling the device and without coming into contact with the product.

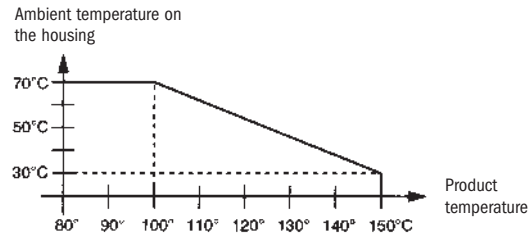
Welding socket
for thread G1A of 1.4571 with O-ring in front, optionally with welding mark for defined fork alignment

Axial plug
with 5 m non-detachable cable for solid-state switch or for transistor output, IP 66/IP 67 type of protection.

Ambient conditions

Operating pressure
Ambient temperature on the housing
Storage and transport temperature
Product temperature

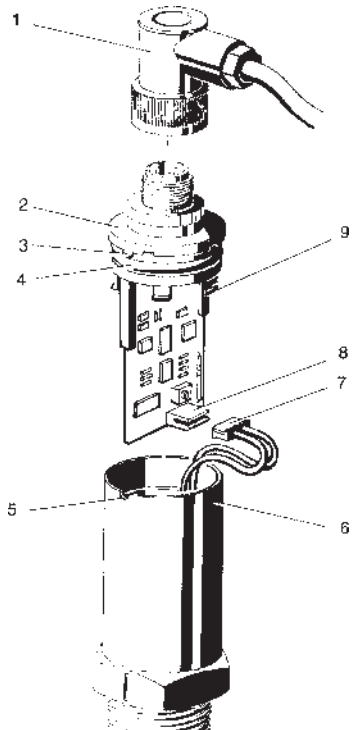
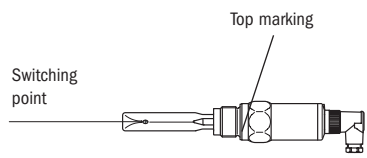
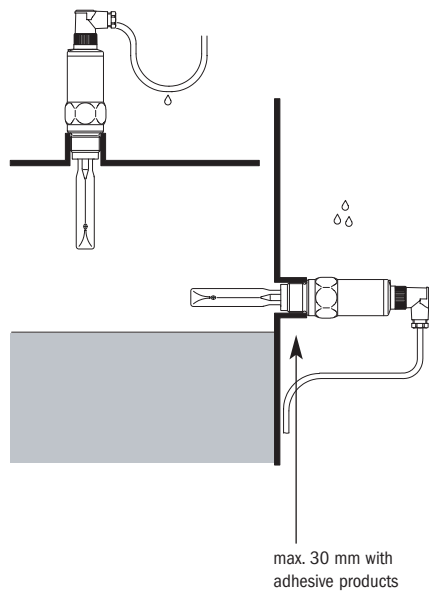
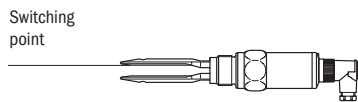
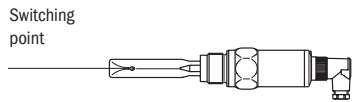
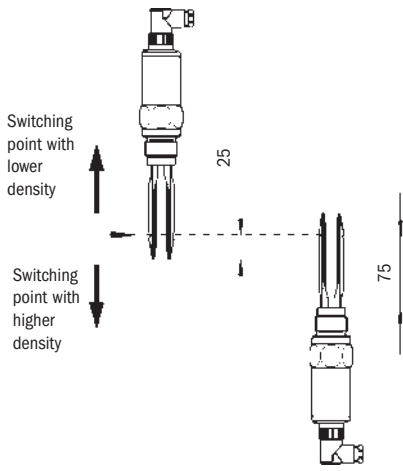
max. 40 bar
-40 ... +70°C
-40 ... +70°C
-40 ... +150°C



Function charts:

	Mode A (overflow protection) max. detection		Mode B (dry-run protection) min. detection		Response of the fault monitoring	Failure of the supply voltage
Level					individual	individual
Transistor (T)	conducts	blocks	conducts	blocks	blocks	blocks
Contactless electrical switch (C)	Switch closed	Switch open	Switch closed	Switch open	Switch open	Switch open
Signal lamp	green	red	green	red	red	

Mounting info:



- | | |
|---------------|--------------------------|
| 1 Plug | 6 Housing |
| 2 Plug insert | 7 Connection plug |
| 3 Locking tab | 8 Socket |
| 4 Seal ring | 9 Snap-on-hooks (4 pcs.) |
| 5 Notch | 10 Slots (4 pcs.) |

Electrical connections

Floating transistor output (SW E72 T)

Power supply: 10 ... 55 V DC (for further information see the following connection examples as well as technical data)

To determine the switching status of the transistor output (mode A/B), the supply cable (terminals 1 and 4) must be polarised respectively.

Mode A

Max. detection or overflow protection:

- terminal 1: +
- terminal 4: -

For mode B you have to switch the polarity of terminals 1 and 4.

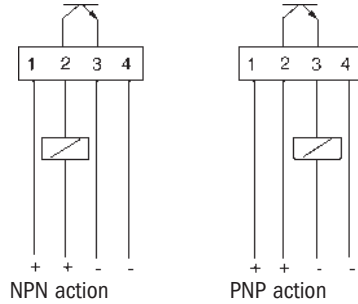
Mode B

Min. detection or dry run protection:

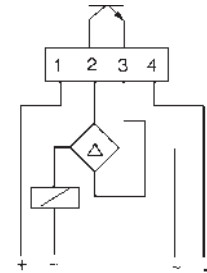
- terminal 1: -
- terminal 4: +

Control of alternating current loads

The transistor switches a galvanically separated alternating voltage 10 ... 42 V AC to a load.

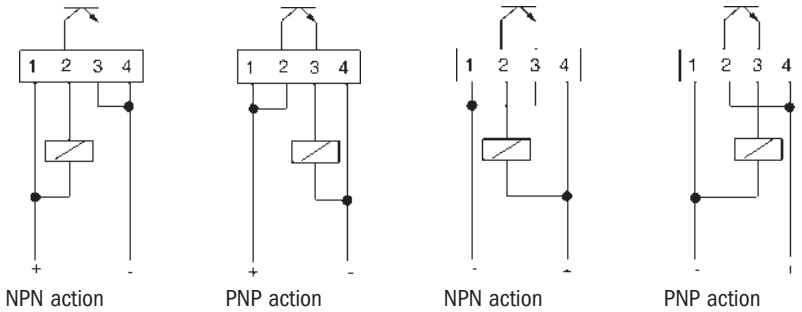


Note: The transistor outputs of several LS 4100/LS 4150 can be switched in series or in parallel to connect their signals logically. The connection must be made in the way that terminal 2 always has a higher voltage potential than terminal 3.

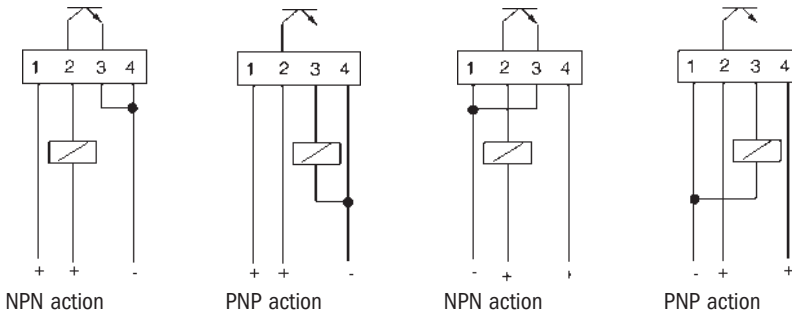


Connection examples

The transistor switches the supply voltage of the oscillator to the binary input of a PLC or to an electrical load.



The transistor switches a second, galvanically isolated voltage source to the binary input of a PLC or to an electrical load.



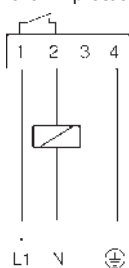
Contactless electrical switch (SW E72 C)

Power supply 20 ... 250 V AC, 50/60 Hz or 20 ... 250 V DC (for further information see the following connection examples as well as the technical data). To determine the switching status of the transistor output (mode A/B), the supply cable (terminals 1 and 4) must be polarised respectively.

Mode A

Max. detection or overflow protection:

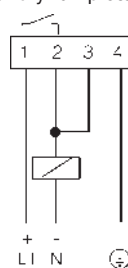
- terminal 1: +
- terminal 4: -



Mode B

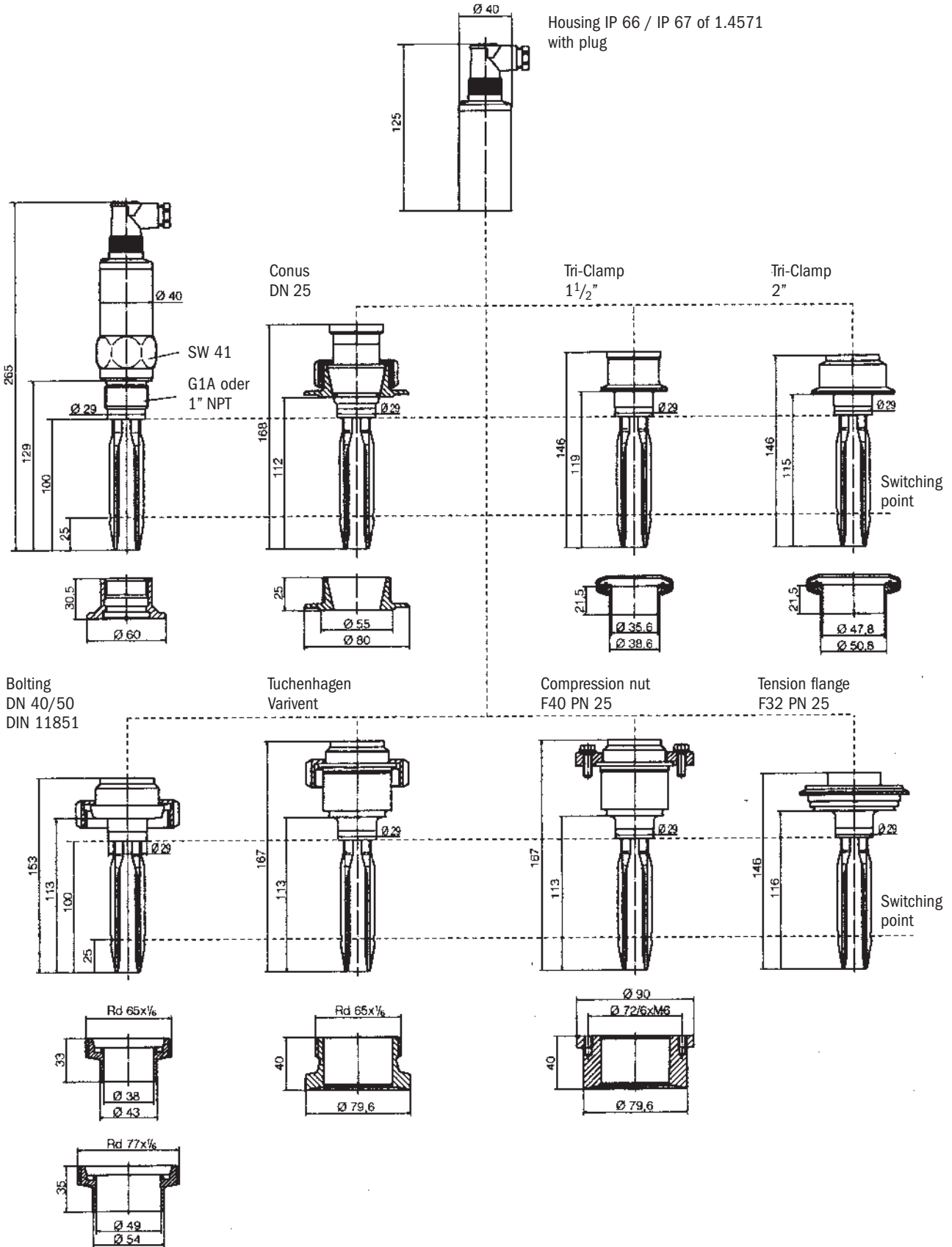
Min. detection or dry run protection:

- terminal 1: -
- terminal 4: +



In mode A, terminal 3 remains free. Therefore do not connect a cable to terminal 3, not even up to the next junction box, since the cable can pick up interfering signals.

Dimensions



Ordering Code

LS 4100 Vibrating Level Switch for liquids for use as overflow or dry run protection system

Code Type	VF12	0								
Approval										
X										
A										
Process connection										
G										
A										
Thread G 1" A 1.4571										
N										
A										
Thread NPT 1" 1.4571										
Probe Material										
V										
1.4571 or 1.4581										
Product Temperature										
X										
-40°C ... +150°C										
Housing Connection										
S										
1.4571 with plug IP67, LED for switching status										
Electronics										
C										
Non-contact switch 20...250 V AC/DC										
T										
Floating transistor (NPN/PNP) 10...55 V DC										
Complete ordering code	VF12	0			A	V	X	S		

Accessories for Level Switch LS 4100

KROHNE Reference	Designation
VF12100001	Test magnet for function test
VF12100002	Axial plug with 5 meters fix connected cable for transistor output, protection IP66/IP67
VF12100003	Axial plug with 5 meters fix connected cable for contactless electronic switch mode (A) overflow protection, protection IP66/IP67
VF12100004	Axial plug with 5 meters fix connected cable for contactless electronic switch mode (B) dry run protection, protection IP66/IP67
VF12100005	Welding socket for thread G 1" A of 1.4571 with EPDM O-ring in front with welding marking for defined fork directing
VF12100006	Welding socket for conus DN25 of 1.4571

LS 4150 Vibrating Level Switch for liquids for use as overflow or dry run protection system - in the food processing and pharmaceutical industry

Code Type	VF14	0								
Approval										
X										
A										
Process connection										
C										
A										
Tri-Clamp 2"										
C										
B										
Tri-Clamp 1 1/2"										
G										
A										
Thread 1" BSP										
K										
A										
Conus DN25										
L										
B										
Hygienic connection with tension flange										
L										
A										
Hygienic connection with compression nut mutter										
N										
A										
Thread 1"NPT										
R										
A										
Bolting DN40 according to DIN 11 851										
R										
B										
Bolting DN50 according to DIN 11 851										
T										
A										
Tuchenhagen Varivent DN50/40 PN10										
Fork material and Surface Quality										
P										
1.4571 or 1.4581 Ra<1.5 µm										
L										
1.4571 or 1.4581 Ra<0.5 µm										
Product Temperature										
X										
-40°C ... +150°C										
Housing Connection										
S										
1.4571 with plug IP67, LED for switching status										
Electronics										
C										
Non-contact switch 20...250 V AC/DC										
T										
Floating transistor (NPN/PNP) 10...55 V DC										
Complete ordering code	VF14	0					X	S		

Accessories for Level Switch LS 4150

KROHNE Reference	Designation
VF14100001	Test magnet for function test
VF14100002	Axial plug with 5 meters fix connected cable for transistor output, protection IP66/IP67
VF14100003	Axial plug with 5 meters fix connected cable for contactless electronic switch, protection IP66/IP67
VF14100005	Welding socket for thread G 1" A of 1.4571 with EPDM O-ring in front with welding marking for defined fork directing
VF14100006	Welding socket for conus DN25 of 1.4571