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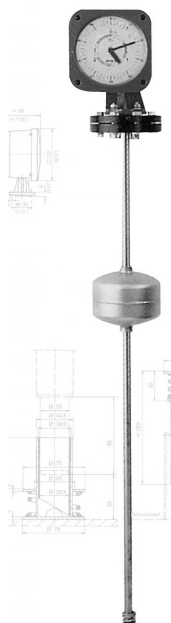
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СИГНАЛИЗАТОРЫ

LS4100/4150





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

magnet
test magnet
for testing follow-on circuits
(optional)

up to 40
bar

up to 150°
C



stainless
steel
Ti housing

standard 100 mm
fork

total weight less
than 400 gram

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

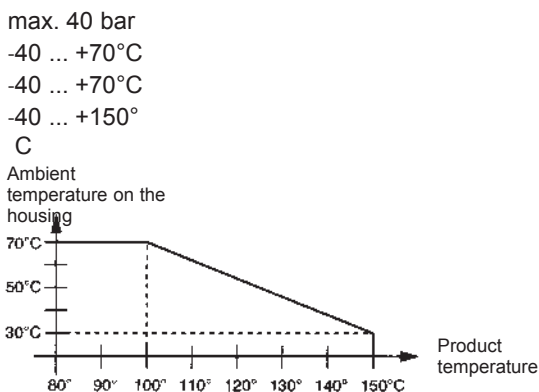
Technical Data

Process conditions	≤ 40 bar (580 psi)
Pressure	-40...+150°C (-40...+302°F)
Process temperature	≥ 0.6 kg/l
Density	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	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) with-out 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



Function charts:

	Mode A (overfill protection)		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	

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

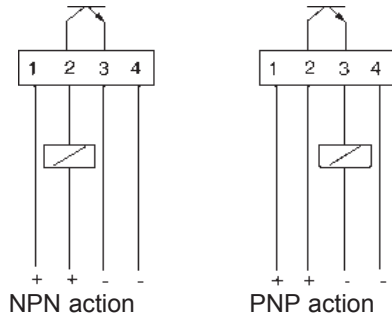
Max. detection or overflow protection:

- terminal 1: +
- terminal 4: -

For mode B you have to switch the polarity of terminals

Control of alternating current loads

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



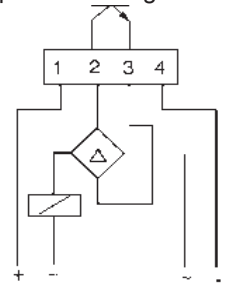
Mode B

Min. detection or dry run protection:

- terminal 1: -
- terminal 4: +

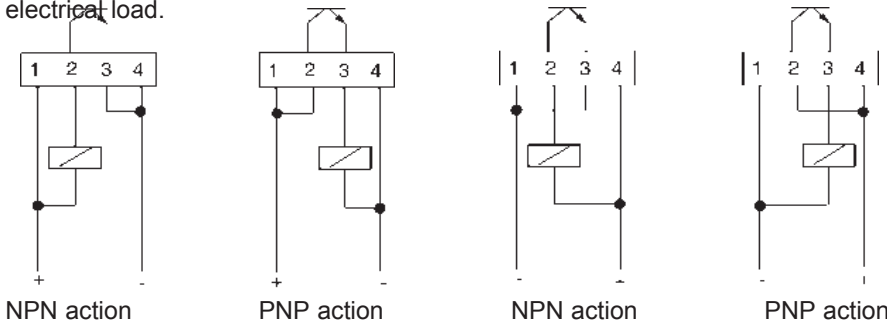
Through different connections of the consumer (load), NPN or PNP action can be preset. Take care that during connection, terminal 2 has always a more positive voltage potential than terminal 3.

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 compared to terminal 3.

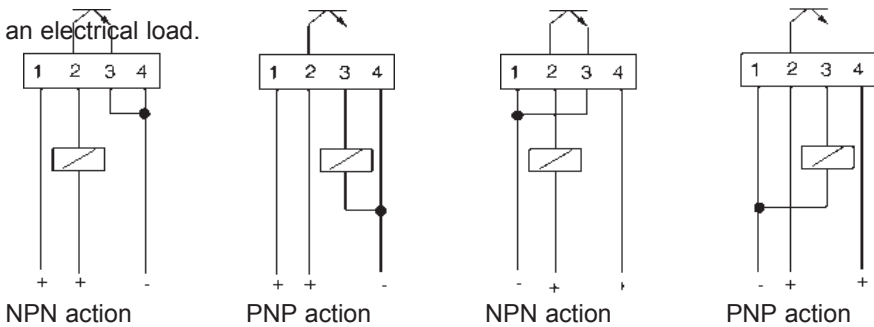


Connection examples

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.



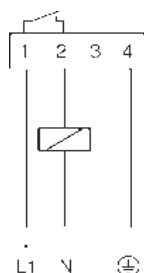
Contactless electrical switch (SW E72 C)

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:

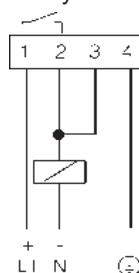
- terminal 1: +
- terminal 4: -



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.

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