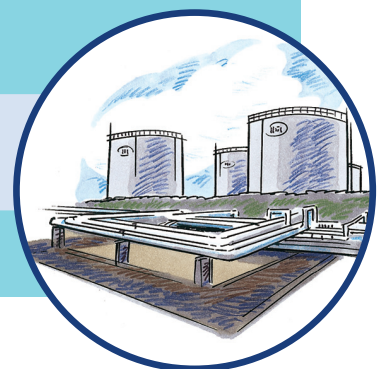


Overfill Prevention System

LS 300 / LS 500

1.2



The Overfill Prevention System for Zone 0 Type LS 300 with LS 500, also with AK5 The Complete Solution

The overfill prevention is a safety device to prevent the overflowing of tanks and process containers. When working with water polluting liquids, the overfill prevention is an essential element for the environmental protection. The level sensor consists of a level detector inside the tank and a transducer with alarm and output terminal.

Overfill protection system
for zone 0
Type LS 300 (up) with
LS 500 (down)



Application

FAFNIR's level sensor is used in all storage tanks filled with liquids that are subject of the WHG. Storage tanks with a volume of more than 1,000 litres must by law be equipped with a level sensor.

Tanks with a smaller volume are not subject to this law. However, operators who already experienced an overflowing will appreciate FAFNIR's level sensors, because they relieve them from the task of permanently checking the filling levels of tanks.

Advantages of FAFNIR's Technology

- Tested and tried under the most difficult conditions
- More than 30 years of FAFNIR-experience in using this technology
- Space-saving, robust and corrosion-resistant design
- Easy adjustability for different tank sizes
- Alignment on site not necessary
- Two-wire connection to the transducer, independent of polarity
- Sensor without moving parts
- Totally maintenance-free
- Continuous self-monitoring of the sensor
- In accordance with the German design and test regulations for overfill prevention systems (registered according to the WHG)
- ATEX-certified for zone 0
- Continuous self-monitoring of the system according to AK 5 (fail safe)
- Proper physical check during running process possible

Our Terminology

Water law: WHG (German Water Law)

Sealed sensor: indicator

Indicator with sheath and

tank connection: level sensor

Required protection class: AK

Fail safe design: AK5

Explosion zone: Zone 0 / Zone 1

Self-monitoring sensor:

Scanner function

Function

The electrical connection between the level sensor, series LS 300, inside the tank, and the transducer, series LS 500, is made by a two-wire cable.

The indicator on the threshold point of the level detector is a sealed PTC-resistor. The PTC-resistor is a variable resistance whose value increases in relation to the rising temperature. As liquids are better thermal conductors than air or gas, the PTC-resistor heats up better in air or gas. When dipped into liquid, the PTC-resistor is cooled down, and the changing resistance-value is interpreted by the transducer.

The correct function of the PTC-resistor is continuously monitored by a scanner function. The transducer controls floating relay contacts for connection to optical and acoustic alarms to controls or power actuators.

If the threshold point of a level detector is immersed into liquid or if the overflow prevention fails, the termination of the filling process is required by an alarm, and/or an actuator is closed or a pump is switched off. By this filling process is stopped automatically.

The periodical check of the level sensor as required by the WHG is performed by triggering or by dismantling the level detector and dipping it into the stored liquid. A pneumatic testing device (optional) facilitates the entire test during the running process without dismantling the level sensor.

Due to the fail-safe operation proven by AK5, the periodical check of the overflow prevention system is not necessary. The required test of the peripheral components can be initiated via push-button.

Installation Advice

The threshold length that must be maintained for each tank can be easily adjusted by shifting the probe tube inside the screw-in unit. The threshold length for flanged probe tubes can be customised.

The transducer is designed for mounting on the wall or in a control unit as well as for integration in 19" systems.

Design

The level sensor consists of:

- Indicator
- Probe tube
- Process connection, optional
 - Screw-in unit
 - Flange
- Connection housing with overvoltage protection
- Optional with plug connection
- Test connection (P-version only)

The transducer consists of:

- Analysing processor for PTC-resistor with scanner function
- Relay contacts (floating)
- Indicator lamps (operation, malfunction S-version only, scanner, indicator)
- Housing with terminals (not for LS 500 19")

Process Connection

The level detector LS 300 is supplied with screw-in unit or flange. The screw-in unit is available with the dimensions G3/8 and a probe tube of 10 mm, and G1 and a probe tube of 24 mm.

The test connection can be supplied with a plug for a portable pneumatic testing device, or with a fixed connection for a pressure cable.

Installation Advice

When installing the level sensor it must be assured that the indicator is not in the area of a gas flow. If this cannot be avoided, the indicator must be equipped with a protective sleeve against increased gas flow.

The transducer may not be operated in an explosive atmosphere. It must be installed in closed rooms or in a housing, protection class IP 54.

Technical Data Level Sensor LS 300:

Operating data:

- Temperature range of products:
-25 °C to +80 °C; -40 °C to +50 °C
- Ambient temperature:
-25 °C to +80 °C or -40°C to + 50 °C
- Pressure: 0 – 25 bar
- Immersion switching delay:
< 2 seconds
- Connection housing LS 300:
Brass chromium-plated,
LS 300 ES / FS stainless steel
- Intergrated overvoltage
protection LS 300...U
- Protection type of housing: IP 67
- Plug-in connection: DD28

Materials of parts in contact with product:

- Stainless steel 316 Ti
- Special materials for parts in
contact with product:
Flange (plated on stainless
steel 316 Ti), screwin unit,
probe tube, test nozzle:
Hastelloy C4 (2.4610), C22 (2.4602);
B2 (2.4617), B3 (2.4600);
Coating on stainless steel 316 Ti:
E-CTFE (Halar)
Indicator: Tantalum; Hastelloy
C4 (2.4610), C22 (2.4602);
B2 (2.4617), B3 (2.4600)

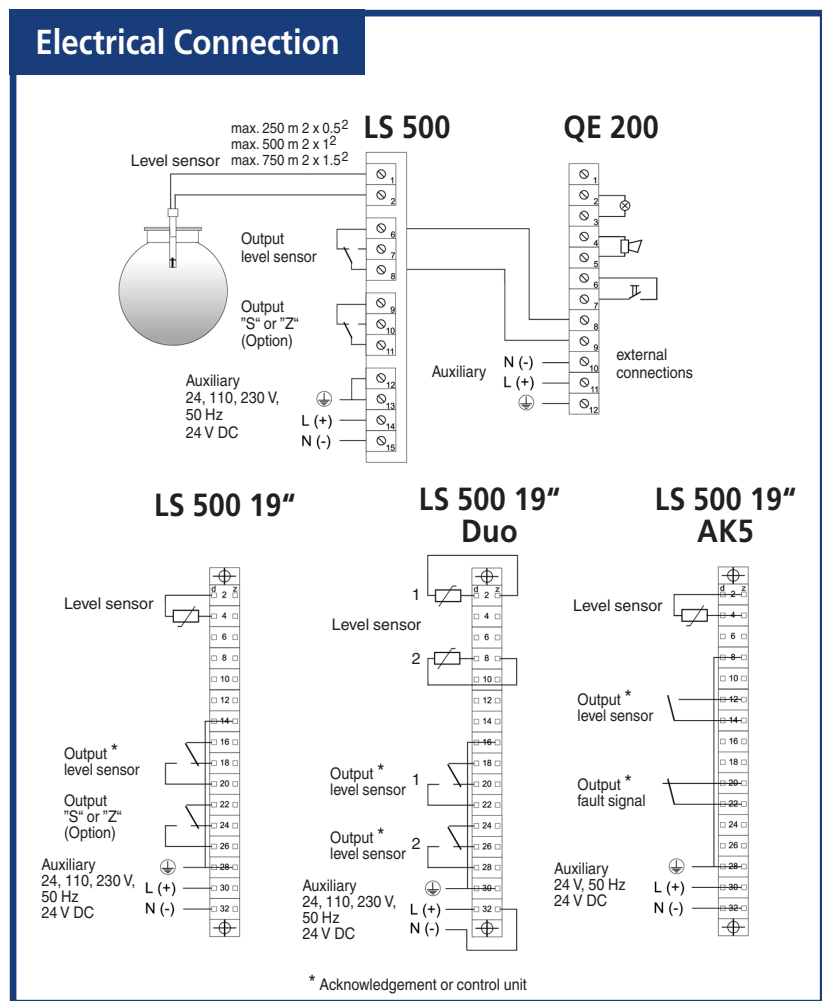
Dimensions:

- Pipe diameter: 10 x 1.5; 24 x 2
- Probe lengths: 100 mm to
3,000 mm, observe the standards
- For more data refer to the illustration

Transducer LS 500:

Operating data:

- Auxiliary power: 24 V, 110 V, 230 V;
50 Hz or 24 V DC
- Power consumption: 4 VA; 5 W
- Auxiliary power LS 500 19" AK5:
24 V, 50 Hz or 24 V DC
- Power consumption: 6 VA; 7 W
- Ambient temperature:
-25 °C to +50 °C
- Protection type of housing: IP 40,
rack IP 20



Outputs, LS 500:

- Change-over contacts (floating)
- Load AC: ≤ 250 V; ≤ 4 A;
cosφ ≥ 0.7; max. 500 VA
- Load DC: ≤ 250 V; ≤ 0.25 A;
max. 50 W

Outputs, LS 500 19" AK5:

- Normally open contacts (floating)
- Load AC: ≤ 60 V; ≤ 4 A;
cosφ ≥ 0.7; max. 500 VA
- Load DC: ≤ 60 V; ≤ 0.25A;
max. 50 W

Inputs:

- Level detector input: twin-wire,
independent of polarity
- max. cable length:
750 m bei 1.5 mm²

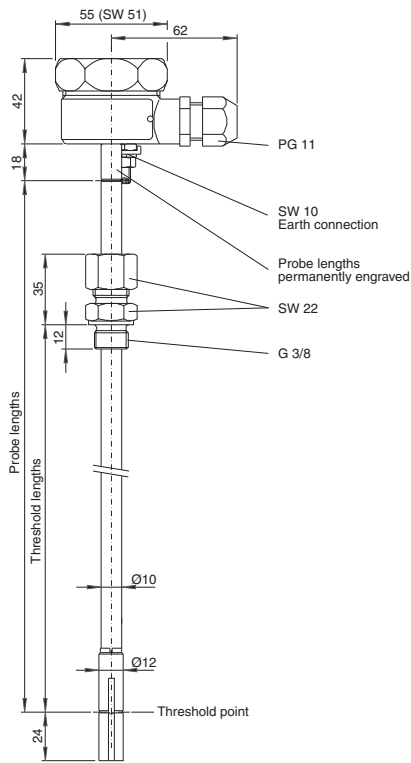
Dimensions:

- LS 500: H 150 x W 75 x D 110
- LS 500 19":
European board 160 x 100; 7TE

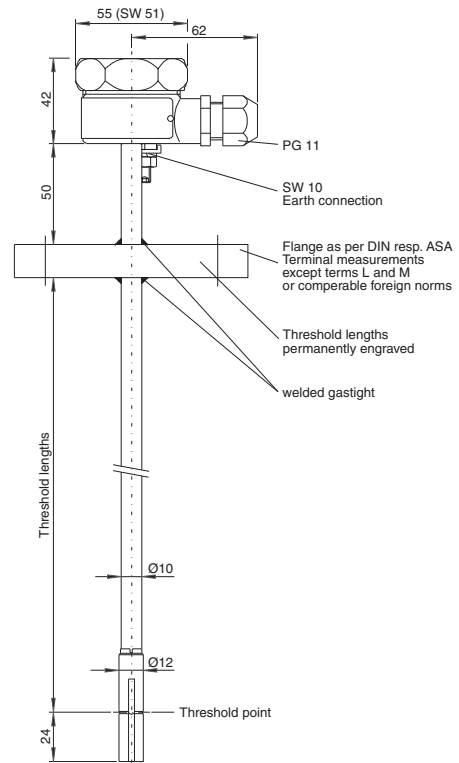
Accessories

- Portable testing device type FS 82 T /
type FS 92 T
- Acknowledge unit, type QE 200
- Collective acknowledge unit, type
SAM 8 for max. 8 fault indicators
- acoustic signal, type HPW 110
- Acoustic signal with integrated
alarm lamp type HR
- Alarm lamp type W
- Alarm lamp type R4
- Counter-plug type S28 for LS 300
with plug-in connection
- Rack 19"
- Plastic housing 19"
- Female connector according
to DIN 41612 model F
- Control unit for
overflow prevention systems

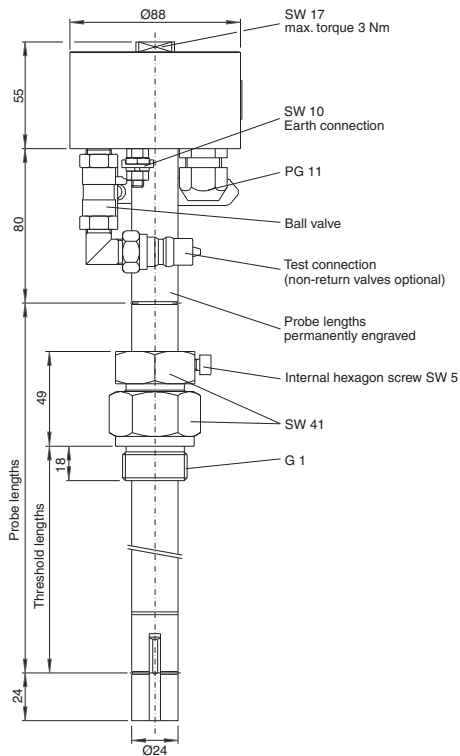
LS 300 EU



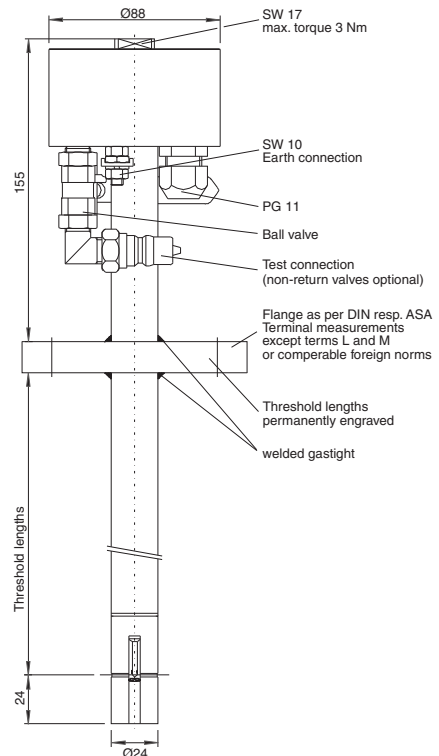
LS 300 FU



LS 300 ESPU



LS 300 FSPU



Dimensions in mm

Purchase Order Codes

Please state the following order number in your purchase order.

Level Detector Type LS 300

Material indicator		Stainless steel 316 Ti	0
		Hastelloy C4 (2.4610), C22 (2.4602)	2
		Hastelloy B2 (2.4617), B3 (2.4600)	3
		ES / FS only Tantalum	4
		other materials	9
Materials for parts in contact with product (without indicator)		Stainless steel 316 Ti	0
		Hastelloy C4 (2.4610), C22 (2.4602)	2
		Hastelloy B2 (2.4617), B3 (2.4600)	3
		with flange F only, FS coating on stainless steel 316 Ti: E-CTFE (Halar)	4
		other materials	9
Probe lengths		for flanged version state the threshold length	0 0
		For screw-in units code two digits: Length in mm / 100 (e. g. 1,500 mm = 15)	
Protection sleeve for strong gas flow		excl.	0
		incl.	1
Pressure range (overpressure)		0 - 3 bar	0
		0 - 6 bar	1
		0 - 10 bar	2
		0 - 16 bar	3
		0 - 25 bar	4
Temperature range		-25 ∞C to +50 ∞C	0
		H: -25 ∞C to +80 ∞C	1
		K: depressurised -40 ∞C to +50 ∞C	2
Electrical plug connection DD 28		excl.	0
		C: incl.	1
Pneumatic test connection (for probe tube 24 x 2 only)		excl.	0
		P: incl.	1
		PR: for fixed connection with non-return valve	2
Process connection / Probe tube		EU: Screw-in unit G3/8 / 10 x 1.5	5
		ESU: Screw-in unit G1 / 24 x 2	6
		FU: Flange / 10 x 1.5	8
		FSU: Flange / 24 x 2	9

Order number	3321																		
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For flanged versions (Type LS 300 F) the following written data are required:

Threshold length	e. g. 151 mm	
Nominal width DN	e. g. DN 40	
Pressure level PN	e. g. PN 16	
Standard DIN/ANSI	e. g. DIN 2527	
Shape	e. g. B	

Purchase Order Codes

Please state the following order number in your purchase order.

Transducer Type LS 500

Auxiliary power		(not for 19" AK5) 230 V AC	1				
		(not for 19" AK5) 110 V AC	2				
		24 V AC	3				
		24 V DC	4				
Housing	Output: 1 x change-over contact (alarm signal)	1	1	0	0		
	S: Outputs: 2 x change-over contacts (1 x alarm signal, 1 x fault signal)	2	1	0	0		
on 19" board	Z: Outputs: 2 x change-over contacts (alarm signal)	3	1	0	0		
	19": Output: 1 x change-over contact (alarm signal)	1	2	0	0		
	19"S: Outputs: 2 x change-over contacts (1 x alarm signal, 1 x fault signal)	2	2	0	0		
	19"Z: Outputs: 2 x change-over contacts (alarm signal)	3	2	0	0		
	19"Duo: 2 x LS 500 on one 19" board, output: 2 x [1 change-over contact (alarm signal)]	1	2	1	0		
	19"AK5 (fail safe): Outputs: 2 x normally open contacts (1 x alarm signal, 1 x fault signal)	4	2	0	2		
Order number		3322					

For further information contact us on telephone +49/40/39 82 07-0

Current information under: www.fafnir.com

Please note:

We also deliver level sensors with several threshold points in different heights, which enable you to realise overflow protection and tank control with only one process connection.