

# Float switch

## For the process industry, horizontal installation

### Models HLS-S, HLS-P

KSR data sheet LM 30.02



for further approvals  
see page 2

### Applications

- Level detection for almost all liquid media
- Pump and level control
- Chemical, petrochemical industry, natural gas, offshore, shipbuilding, machine building, power generating equipment, power plants
- Process water and drinking water treatment

### Special features

- Large range of application due to the simple, proven functional principle
- For harsh operating conditions, long service life
- Operating limits:
  - Operating temperature:  $T = -120 \dots +350 \text{ }^\circ\text{C}$
  - Operating pressure:  $P = \text{Vacuum to } 232 \text{ bar}$
  - Limit density:  $\rho \geq 500 \text{ kg/m}^3$
- Stainless steel and plastic versions
- Explosion-protected versions

### Description

In addition to the various applications for float switches for vertical installation (model FLS), the model HLS horizontal float switches likewise offer innumerable possibilities to monitor and/or switch levels in order to indicate minimum/maximum levels.

The float is attached to a supported, swivelling lever and moves with the level of the medium being measured. By means of a permanent magnet, fixed to the end of the lever, when a preset switch point is reached, a reed contact (inert gas contact) within the contact tube is actuated.

**Fig. top: Stainless steel version, model HLS-S**  
**Fig. bottom: Plastic version, model HLS-P**



By using a permanent magnet and a reed contact the switching operation is non-contact, free from wear and needs no power supply. The functioning of the float switch is independent of foaming, conductivity, vapours, bubble formation and vibrations.

The signal processing is universal. Direct connection to PLCs, NAMUR connections, signal amplifiers or contact protection relays is possible.

The float switch is simple to mount and maintenance-free, so the costs of mounting, commissioning and operation are low.

## Model overview

Model	Description	Materials	
		Stainless steel 1.4571 (316Ti)	Polypropylene (PP)
HLS-SA HLS-SB	Standard version	x	-
HLS-P	Plastic version	-	x
HLS-SBI (HAG)	Intrinsically safe, Ex i	x	-

### Temperature range (process)






- Model HLS-SA, HLS-SB -120 ... +350 °C
- Model HLS-P -10 ... +80 °C
- Model HLS-SBI -50 ... +180 °C

### Operating pressure

- Model HLS-SA, HLS-SB 232 bar
- Model HLS-P 6 bar
- Model HLS-SBI 180 bar

## Approvals

### ■ Model HLS-S

Logo	Description	Country
 	<b>EU declaration of conformity</b> <ul style="list-style-type: none"> <li>■ Low voltage directive</li> <li>■ RoHS directive</li> <li>■ ATEX directive (option)</li> </ul> Hazardous areas - Ex i Zone 1 mounting to zone 0 gas II 1/2G Ex ia IIC T6-T2 Ga/Gb Zone 21 dust II 2D Ex ia IIIC T80 °C Db	European Union
	<b>EAC</b> <ul style="list-style-type: none"> <li>■ EMC directive</li> <li>■ Low voltage directive</li> <li>■ Hazardous areas</li> </ul>	Eurasian Economic Community
	<b>DNV GL</b> <ul style="list-style-type: none"> <li>■ Ships, shipbuilding (e.g. offshore)</li> <li>■ Hazardous areas</li> </ul>	International
	<b>ABS</b> Ships, shipbuilding (e.g. offshore)	International

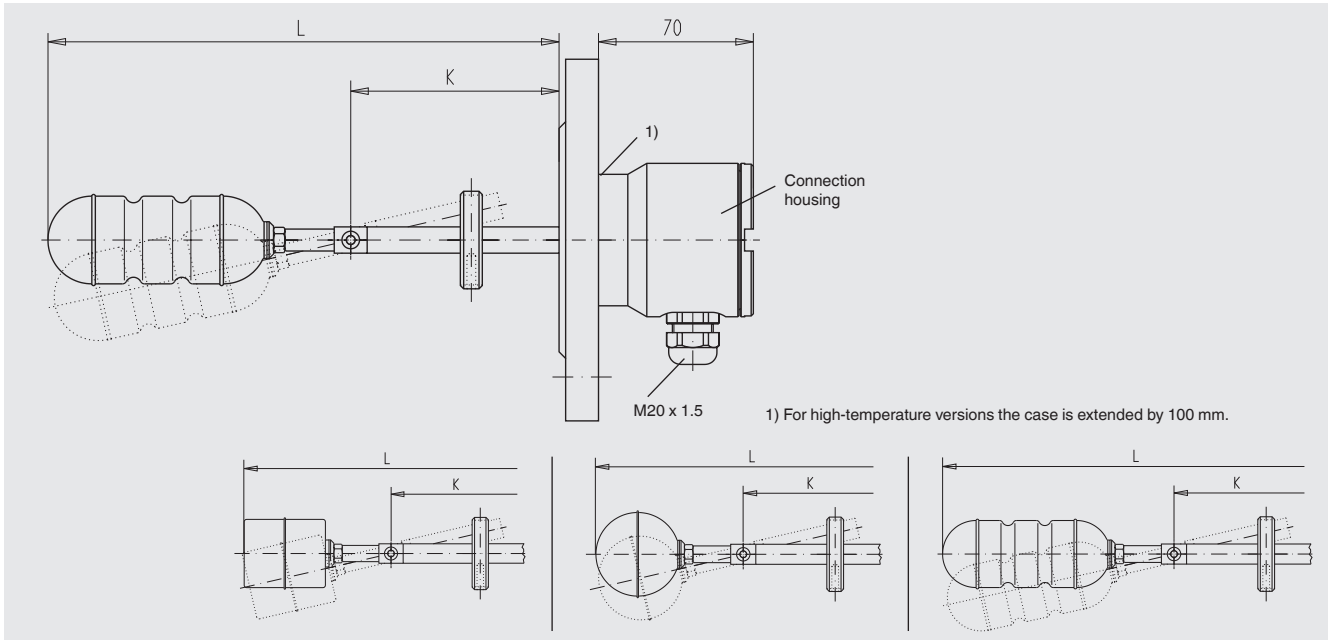
### ■ Model HLS-P

Logo	Description	Country
	<b>EU declaration of conformity</b> <ul style="list-style-type: none"> <li>■ Low voltage directive</li> <li>■ RoHS directive</li> </ul>	European Union
	<b>EAC</b> <ul style="list-style-type: none"> <li>■ EMC directive</li> <li>■ Low voltage directive</li> </ul>	Eurasian Economic Community

Approvals and certificates, see website

## Standard version with connection housing, models HLS-SA, HLS-SB

Process connection, contact tube and float from stainless steel 1.4571

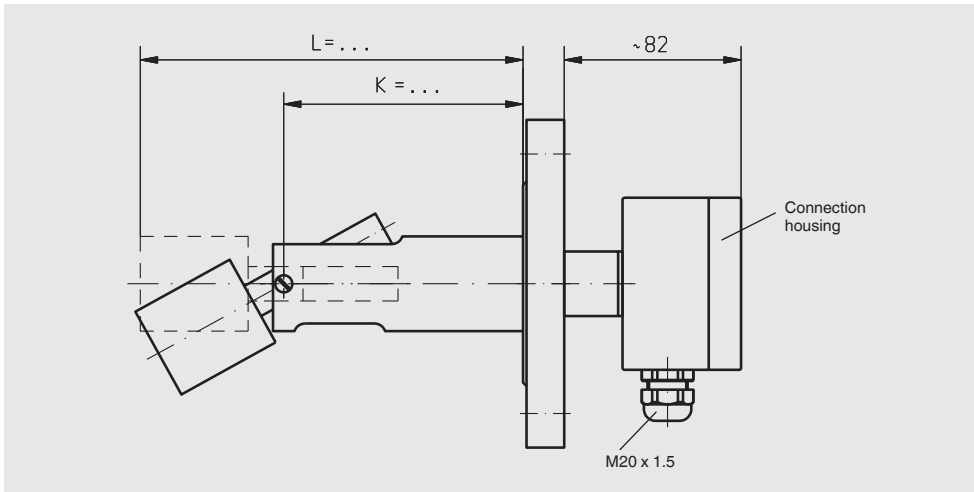


	Model V44HI	Models T52HI, T52HI/Gr. 5	Model ZVSS43/100HI
<b>Electrical connection</b>	Connection housing, stainless steel 1.4571		
<b>Process connection</b>	Mounting flange - DIN DN 50 ... DN 100, PN 6 ... PN 400 - DIN EN 1092-1 DN 50 ... DN 100, PN 6 ... PN 400 - ANSI 2" ... 4", class 150 ... 600 - Square flange DN 80 and DN 92 Others on request		
<b>Insertion length L</b>	190 ... 990 mm	190 ... 990 mm	240 ... 990 mm
<b>Contact tube length K</b>	100 ... 900 mm	100 ... 900 mm	100 ... 850 mm
<b>Float</b>			
Material	Stainless steel 1.4571	Model T52HI: Titanium 3.7035, grade 2 Model T52HI/Gr. 5: Titanium 3.7165, grade 5	Stainless steel 1.4571
Diameter	44 mm	52 mm	43 mm
Length	52 mm	52 mm	100 mm
<b>Max. operating pressure</b>	6 bar	Model T52HI: 100 bar Model T52HI/Gr. 5: 232 bar	20 bar
<b>Min. density</b>	600 kg/m <sup>3</sup>		500 kg/m <sup>3</sup>
<b>Temperature range</b>			
Standard version	-50 ... +180 °C		
High-temperature version HT	-50 ... +250 °C		
High-temperature version HHT	-50 ... +350 °C		
Low-temperature version	-120 ... +250 °C		
<b>Switching function</b>	Alternatively normally open (NO), normally closed (NC) or change-over (SPDT) - on rising or falling level		
<b>Switching power</b>	AC ≤ 230 V; 40 VA; 1 A DC ≤ 230 V; 20 W; 0.5 A Please observe contact protection measures! Attention: versions without protective conductor connection: Operation only at safety extra-low voltage, e.g. contact protection relay or external grounding		
<b>Mounting position</b>	Horizontal		
<b>Ingress protection</b>	IP66/IP68 per IEC/EN 60529		

Versions in titanium, Hastelloy or other materials on request

## Plastic version, model HLS-P

Process connection, contact tube and float from polypropylene (PP)

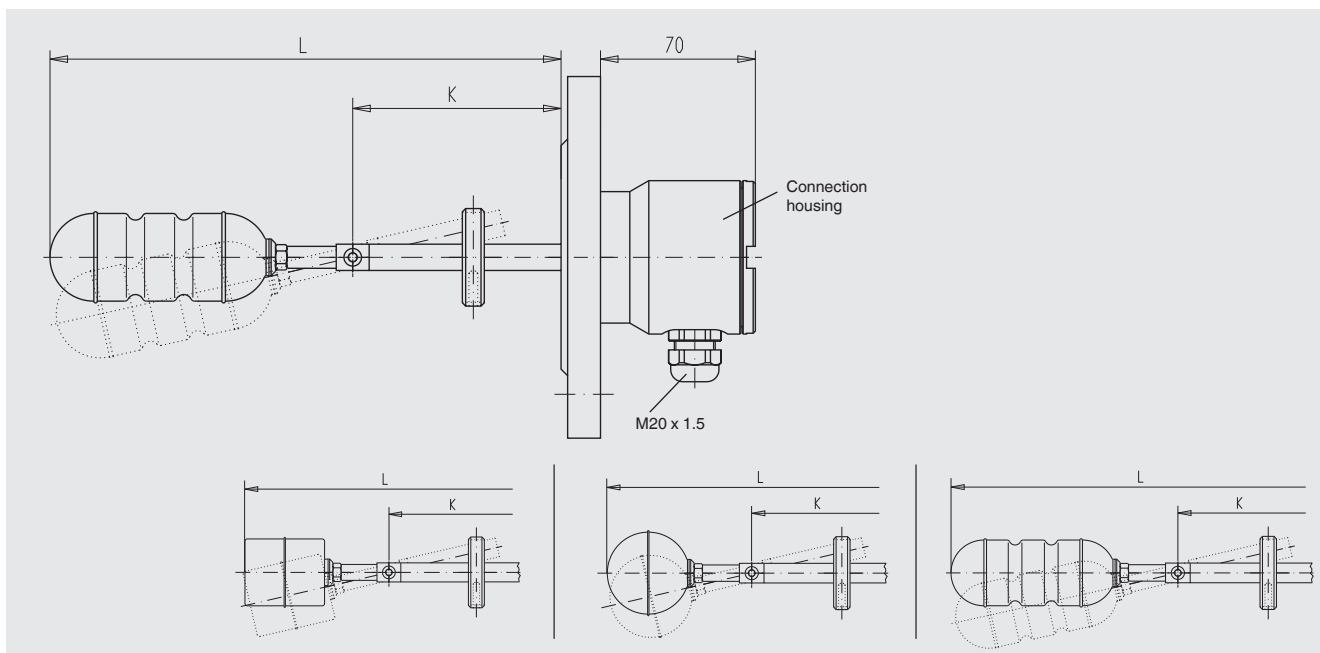


	Model PP44HI
<b>Electrical connection</b>	Connection housing, polyester
<b>Process connection</b>	Mounting flange - DIN DN 50 ... DN 100, PN 16, form A - ANSI 2" ... 4", class 150 FF
<b>Insertion length L</b>	176 mm
<b>Contact tube length K</b>	111 mm
<b>Float</b>	
Material	Polypropylene
Diameter	44 mm
Length	52 mm
<b>Max. operating pressure</b>	4 bar
<b>Min. density</b>	750 kg/m <sup>3</sup>
<b>Temperature range</b>	-10 ... +80 °C
<b>Switching function</b>	Alternatively normally open (NO), normally closed (NC) or change-over (SPDT) - on rising level
<b>Switching power</b>	AC ≤ 230 V; 40 VA; 1 A DC ≤ 230 V; 20 W; 0.5 A Please observe contact protection measures!
<b>Switching power</b>	Attention: versions without protective conductor connection: Operation only at safety extra-low voltage, e.g. contact protection relay or external grounding
<b>Mounting position</b>	Horizontal
<b>Ingress protection</b>	IP65 per IEC/EN 60529

# Intrinsically safe (Ex i), model HLS-SBI (HAG)

II 1/2G Ex ia IIC T6-T2 Ga/Gb or II 2D Ex ia IIIC T80 °C Db

Process connection, contact tube and float from stainless steel 1.4571

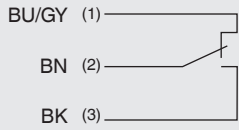


	Model V44HI	Models T52HI, T52HI/Gr. 5	Model ZVSS43/100HI		
<b>Electrical connection</b>	Connection housing, stainless steel 1.4571				
<b>Process connection</b>	Mounting flange - DIN DN 50 ... DN 100, PN 6 ... PN 160 - DIN EN 1092-1 DN 50 ... DN 100, PN 6 ... PN 160 - ANSI 2" ... 4", class 150 ... 900 - Square flange DN 80 and DN 92 Others on request				
<b>Insertion length L</b>	190 ... 990 mm	190 ... 990 mm	240 ... 990 mm		
<b>Contact tube length K</b>	100 ... 900 mm	100 ... 900 mm	100 ... 850 mm		
<b>Float</b>					
Material	Stainless steel 1.4571	Model T52HI: Titanium 3.7035, grade 2 Model T52HI/Gr. 5: Titanium 3.7165, grade 5	Stainless steel 1.4571		
Diameter	44 mm	52 mm	43 mm		
Length	52 mm	52 mm	100 mm		
<b>Max. operating pressure</b>	6 bar	Model T52HI: 100 bar Model T52HI/Gr. 5: 180 bar	20 bar		
<b>Min. density</b>	600 kg/m <sup>3</sup>		500 kg/m <sup>3</sup>		
<b>Temperature range</b>	-50 ... +180 °C depending on the temperature class				
<b>Temperature class</b>	T2	T3	T4	T5	T6
Process temperature	≤ 180 °C	≤ 160 °C	≤ 108 °C	≤ 80 °C	≤ 65 °C
Ambient temperature	≤ 80 °C	≤ 80 °C	≤ 80 °C	≤ 80 °C	≤ 60 °C
<b>Switching function</b>	1 x change-over (SPDT)				
<b>Switching power</b>	Only for connection to a certified intrinsically safe circuit with U <sub>max</sub> = 36 V, I <sub>max</sub> = 100 mA				
<b>Mounting position</b>	Horizontal				
<b>Ingress protection</b>	IP66/IP68 per IEC/EN 60529				

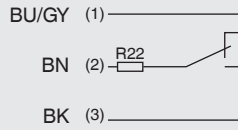
# Electrical connections

## Reed contact

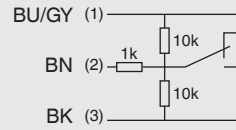
1 switch point



1 switch point  
Wiring for operation with a PLC



1 switch point  
NAMUR circuit per DIN EN 60947-5-6



## Contact protection measures

The reed contacts should be protected against any voltage or current spikes that might occur.

Depending on the different load types different protective circuits are used.



Model KFD2-ER-1.6



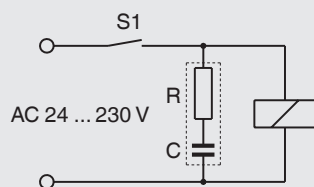
RC element

Contact protection relay	Contacts	Input	Power supply	Approval number	Order no.
<b>KFD2-ER-1.6</b>	1 x change-over AC 250 V, 2 A	2 x contacts	DC 20 ... 30 V	-	123806
<b>KFD2-SR2-Ex2.W</b>	2 x change-over AC 253 V, 2 A	2 x contacts	DC 20 ... 30 V	II 1GD Ex ia IIC PTB 02 ATEX 2073	124344
<b>KFA6-ER-1.6</b>	1 x change-over AC 250 V, 2 A	2 x contacts	AC 230 V	-	124341
<b>KFA6-SR2-Ex2.W</b>	2 x change-over AC 253 V, 2 A	2 x contacts	AC 230 V	II 1GD Ex ia IIC PTB 02 ATEX 2073	123794

RC element	Capacitance	Resistance	Voltage	Order no.
<b>B3/110</b>	0.33 $\mu$ F	470 $\Omega$	AC 110 V	126529
<b>B3/230</b>	0.33 $\mu$ F	820 $\Omega$	AC 230 V	126530

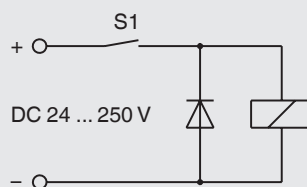
### Inductive load

AC voltage

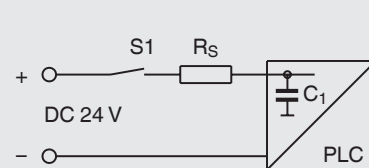


### Inductive load

DC voltage



### Capacitive load



### Ordering information

To order the described product the order number (if available) is sufficient.

Alternatively:

Model / Version / Electrical connection / Process connection / Contact tube (insertion length L, contact tube length K) / Options

© 01/2010 KSR KUEBLER Niveau-Messtechnik GmbH, all rights reserved.  
The specifications given in this document represent the state of engineering at the time of publishing.  
We reserve the right to make modifications to the specifications and materials.



**D-Ex Instruments, s.r.o.**  
Optátova 708/37  
637 00 Brno/Czech Republic  
Mob. +420 775 757 225  
Tel. +420 541 423 225  
ksr@dex.cz  
www.dex.cz/ksr



**D-Ex Instruments, s.r.o.**  
Pražská 3222/1  
811 04 Bratislava/Slovakia  
Mob. +420 775 757 225  
Tel. +421 2 5729 7421  
info@dex.sk  
www.dex.sk/ksr



**KSR KUEBLER Niveau-Messtechnik GmbH**  
Heinrich-Kuebler-Platz 1  
69439 Zwingenberg/Germany  
Tel. +49 6263 87-0  
Fax +49 6263 8799  
info@ksr-kuebler.com  
www.ksr-kuebler.com