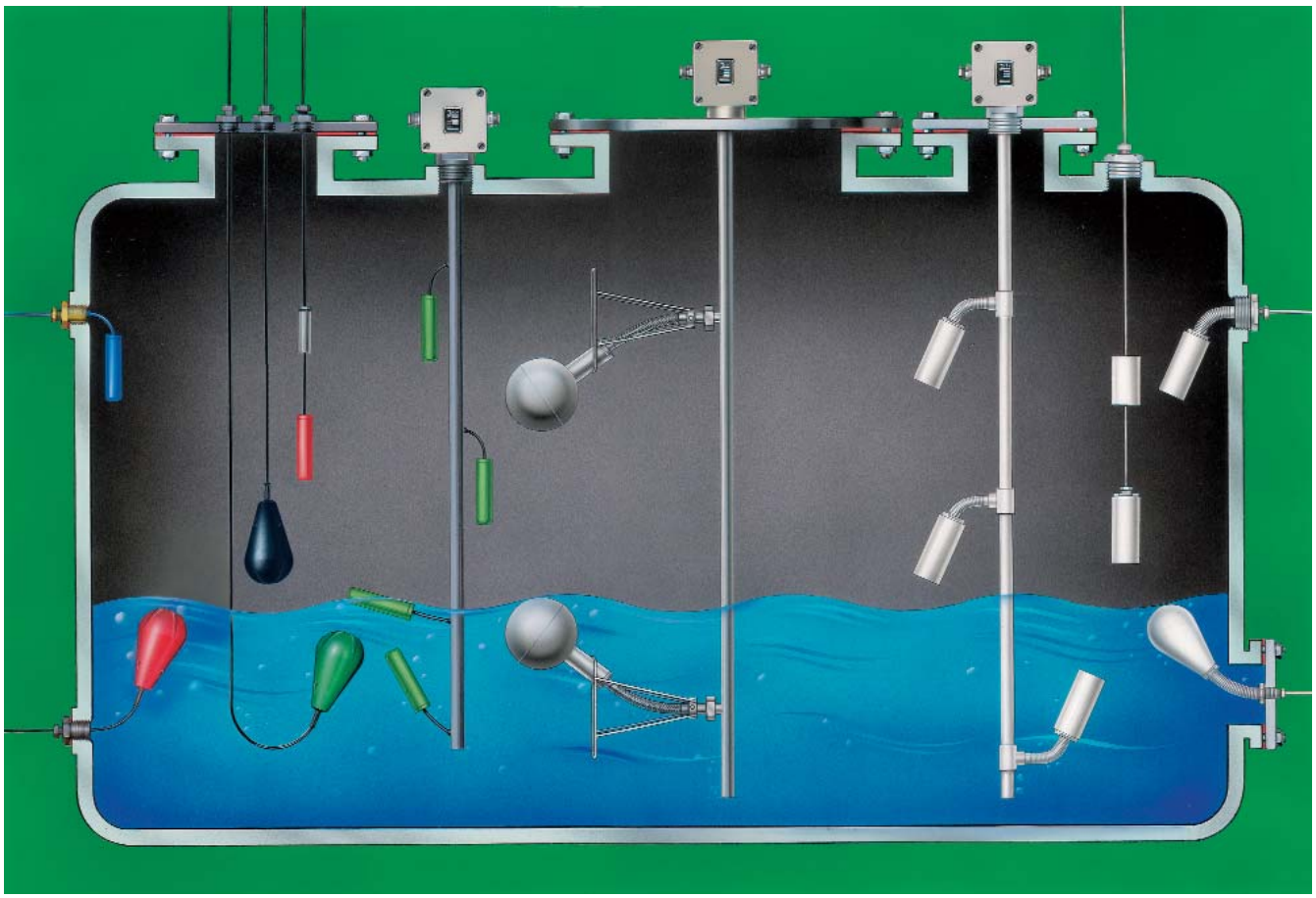
Mercury-free floating switches and immersion probes with potential-free micro-contact

for automatic control, regulation and signalling of liquid levels

Switching element: potential-free microswitch

- **Contact is effected by the rising and falling of the float with the liquid**



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SSP ... and SI/SSP/NL 1/K/... Variant 0 ⟨Ex⟩ I M2 / II 2 GD EEx ia I / IIB T6 floating switches

These floating switches are designed for mounting **from the side or from the top.**

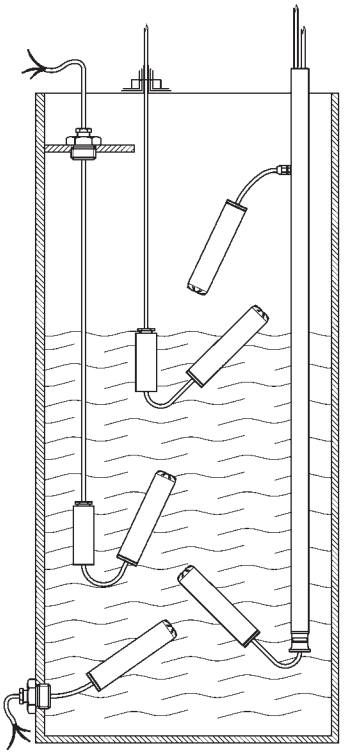
To ensure a correct switching the cable must be fixed at the required height using a stuffing gland, for example, in the case of mounting from the side or using a fixing weight, for example, in case of mounting from the top.

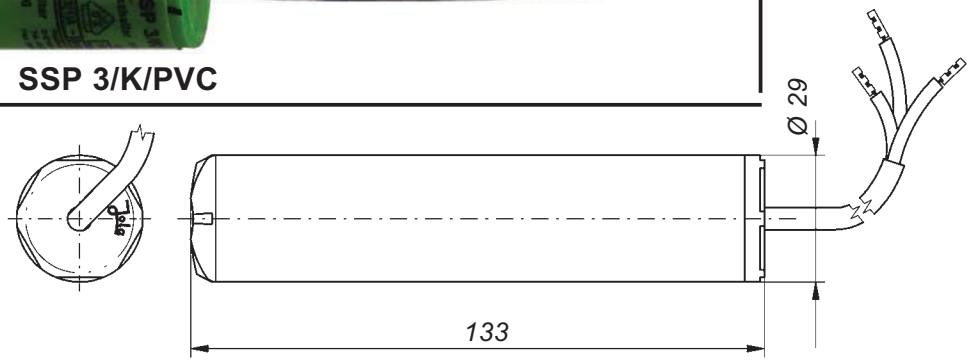
These units are not suitable for use in turbulent liquids (e.g. in stirrer tanks).

Technical data	**SSP 3/K/... SSP/S3/K/...**	**SSP 1/K/... SSP/S1/K/...**	**SI/SSP/NL 1/K/... Variant 0 ⟨Ex⟩ I M2 / II 2 GD EEx ia I / IIB T6**
Application	for standard appl.	for light current appl.	for use in intrinsically safe circuits in mines susceptible to firedamp or in potentially explosive atmospheres in categories zone 1, 21, 2 or 22. EC type examination certificate INERIS 03ATEX0149
Switching voltage	between AC/DC 24 V and AC/DC 250 V	between AC/DC 1 V and AC/DC 42 V	
Switching current	between AC 20 mA and AC 3 (1) A or between DC 20 mA and DC 100 mA	between AC 0.1 mA and AC 100 (50) mA or between DC 0.1 mA and DC 10 mA	
Switching capacity	max. 350 VA	max. 4 VA	
Operating principle	ball-operated microswitch, potential-free changeover contact		
Options for safety appl.	——	diodes (= variant 1) or resistors (= variant 2), see page 1-1-21	
Recommended appl.	——	via Jola protection relay	
		KR ..	KR 5/Ex ⟨Ex⟩ I (M1) / II (1) GD [EEx ia] I / IIC
Float material	PP		
Seal material	FPM; on request: EPDM		
Float protection class	IP 68		IP 68 T80°C
Temperature appl. range	see chart on page 1-1-5		
Max. immersion depth of the float	max. 10 metres head of water at + 20°C		
Connecting cable	see chart on page 1-1-5		
Application range of the connecting cable	**– black or blue PVC cable:** water, used water, slightly aggressive liquids, oils without aromatic additives, fuel oil and diesel fuel with a specific gravity ≥ 0.82 g/cm³ **– grey A05RN-F cable:** water, used water, slightly aggressive liquids with a specific gravity ≥ 0.82 g/cm³ **– red-brown silicone cable:** water and certain other liquids with a specific gravity ≥ 0.82 g/cm³, with low mechanical strength **– black CM cable:** water and certain acids and lyes with a specific gravity ≥ 1 g/cm³		
Connecting cable length	1 metre, other cable lengths on request. **When ordering, please always state the desired cable length and cable type.**		
Optional extras	**stuffing glands and fixing weights made of brass, stainless steel 316 Ti or PP**		**stuffing glands and fixing weights made of brass, stainless steel 316 Ti or conductive PP**

SSP 3/K/PVC

Application examples

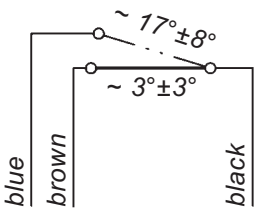


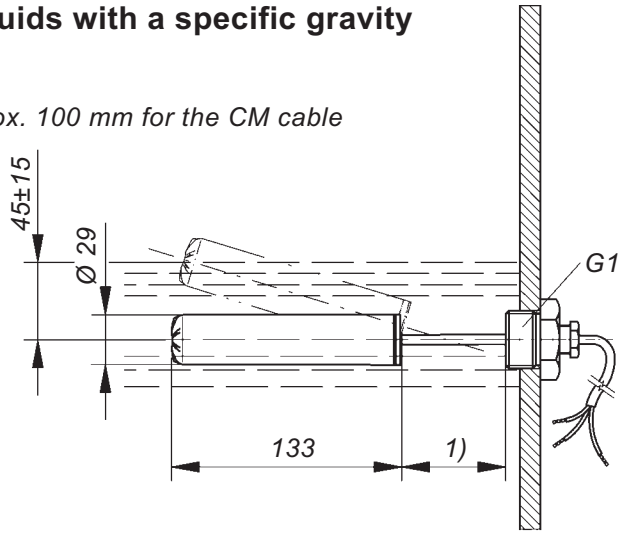


Switching action in liquids with a specific gravity of 1 g/cm³

1) approx. 60 mm, but approx. 100 mm for the CM cable

Contact switches over at





Optional extras:

Floating switch mounting only possible **from the inside**:
- stuffing gland G3/8, brass
- stuffing gland G1/2, brass
- stuffing gland G1/2, stainless steel 316 Ti
- stuffing gland G1/2, PP

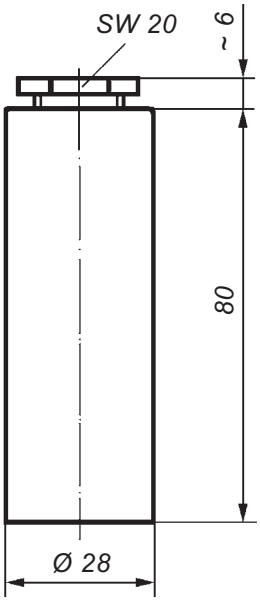
Floating switch mounting possible **from the outside**:
- stuffing gland G1, brass
- stuffing gland G1, stainless steel 316 Ti
- stuffing gland G1, PP

Stuffing gland G1, stainless steel

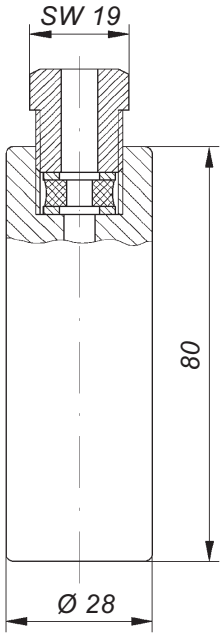
Stuffing gland G1, PP

Optional extras: fixing weight for SSP ... or SI/SSP/NL ...

stainless steel 316 Ti or brass



PP or conductive PP (suitable for Ex)



SSX ... and SI/SSX 1/K/... Variant 0 ⟨Ex⟩ I M2 / II 1 GD EEx ia I / IIC T6 floating switches

These floating switches are designed for mounting **from the side or from the top.**

To ensure a correct switching the cable must be fixed at the required height using a stuffing gland, for example, in the case of mounting from the side or using a fixing weight, for example, in case of mounting from the top.

These units are not suitable for use in turbulent liquids (e.g. in stirrer tanks).

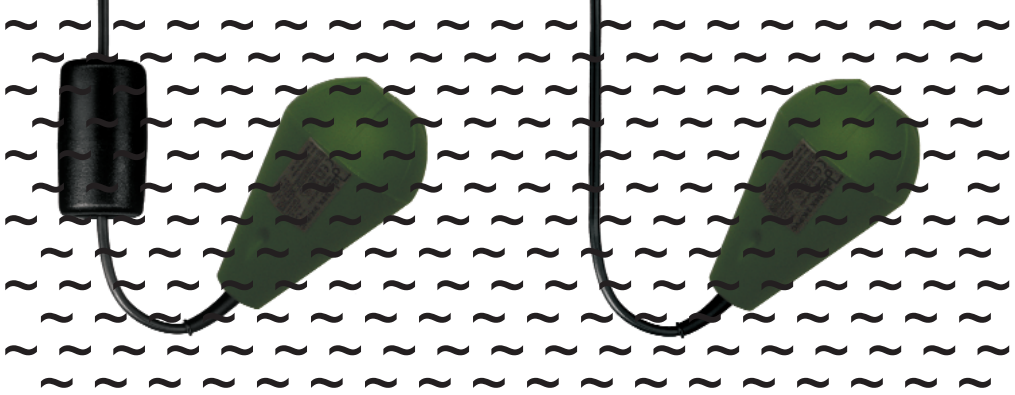
Technical data	**SSX 3/K/... SSX/S3/K/...**	**SSX 1/K/... SSX/S1/K/...**	**SI/SSX 1/K/... Variant 0 ⟨Ex⟩ I M2 / II 1 GD EEx ia I / IIC T6**
Application	for standard appl.	for light current appl.	for use in intrinsically
Switching voltage	between AC/DC 24 V and AC/DC 250 V	between AC/DC 1 V and AC/DC 42 V	safe circuits in mines susceptible to firedamp
Switching current	between AC 20 mA and AC 3 (1) A or between DC 20 mA and DC 100 mA	between AC 0.1 mA and AC 100 (50) mA or between DC 0.1 mA and DC 10 mA	or in potentially explosive atmospheres in categories zone 0, 20, 1, 21, 2 or 22. EC type examination certificate
Switching capacity	max. 350 VA	max. 4 VA	INERIS 03ATEX0149
Operating principle	ball-operated microswitch, potential-free changeover contact		
Options for safety appl.	——	diodes (= variant 1) or resistors (= variant 2), see page 1-1-21	
Recommended appl.	——	via Jola protection relay KR ..	KR 5/Ex ⟨Ex⟩ I (M1) / II (1) GD [EEx ia] I / IIC
Float material	PP		conductive PP
Seal material	FPM; on request: EPDM		
Float protection class	IP 68		IP 68 T80°C
Temperature application range	see chart on page 1-1-6		
Max. immersion depth of the float	max. 10 metres head of water at + 20°C		
Connecting cable	see chart on page 1-1-6		
Application range of the connecting cable	**– black or blue PVC cable:** water, used water, slightly aggressive liquids, oils without aromatic additives, fuel oil and diesel fuel with a specific gravity ≥ 0.8 g/cm³ **– grey A05RN-F cable:** water, used water, slightly aggressive liquids with a specific gravity ≥ 0.8 g/cm³ **– black CM cable:** water and certain acids and lyes with a specific gravity ≥ 0.8 g/cm³ **– white PTFE cable:** suitable for all liquids in which the float material PP and the seal material FPM or EPDM are also resistant with a specific gravity ≥ 0.8 g/cm³		
Connecting cable length	2 metres, other cable lengths on request. **When ordering, please always state the desired cable length and cable type.**		
Optional extras	**– external fixing weight made of** cast steel for liquids with a specific gravity ≥ 0.8 g/cm³ (**not suitable** for the **PTFE cable**)		——
	– external fixing weight made of stainless steel 316 Ti for liquids with a specific gravity ≥ 0.8 g/cm³ (**not suitable** for the **PTFE cable**)		
	– internal fixing weight (integrated in the float) for liquids with a specific gravity between 0.95 and 1.05 g/cm³		

Switching action of the SSX ... or SI/SSX 1/K/... with e x t e r n a l fixing weight (optional)

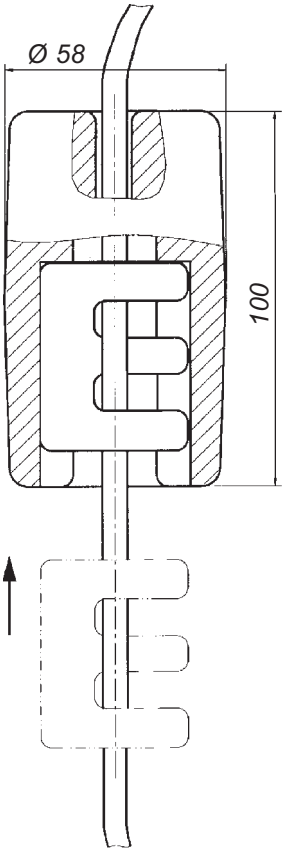
(optimal functioning)

Switching action of the SSX ... or SI/SSX 1/K/... with i n t e r n a l fixing weight (optional)

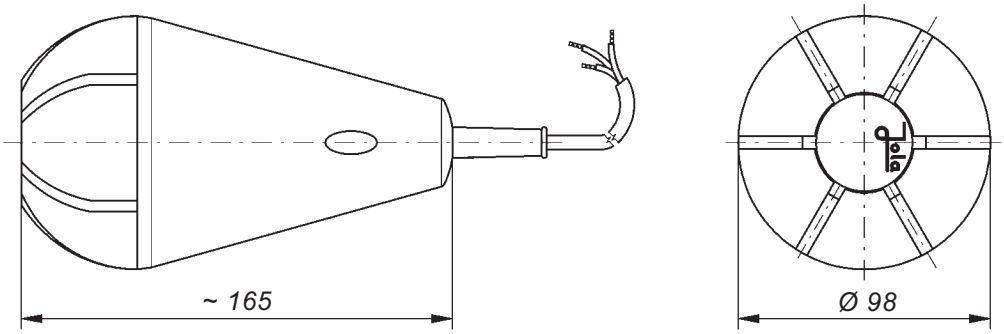
(optimal functioning)



Optional extras:
external fixing weight made of cast steel or stainless steel 316 Ti

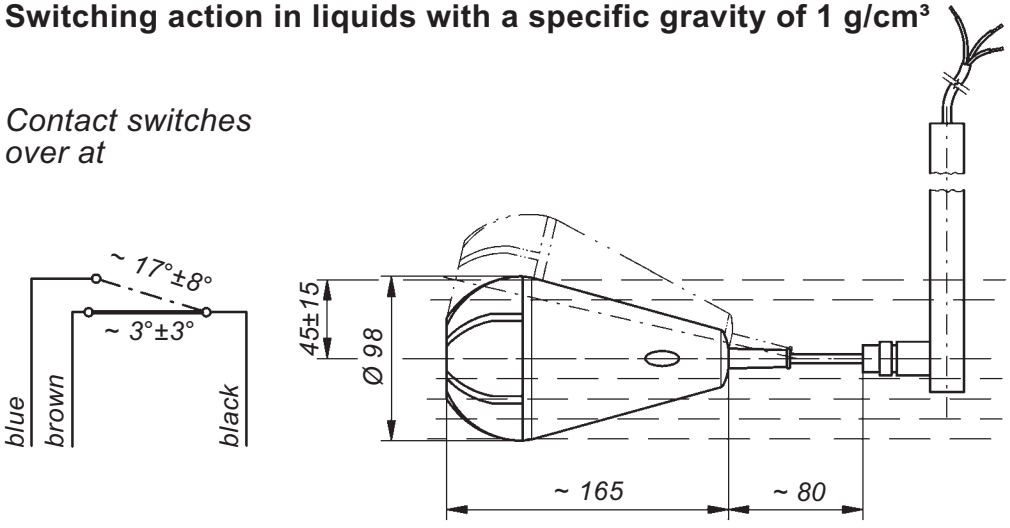


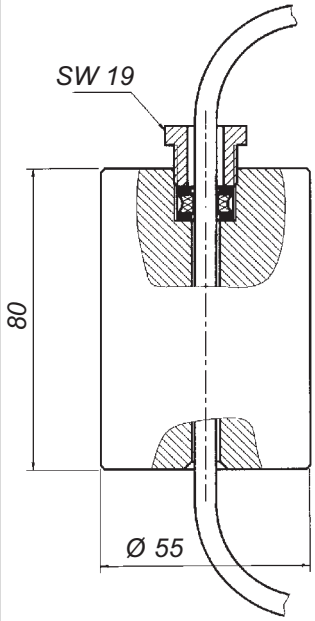
External fixing weight made of cast steel



Switching action in liquids with a specific gravity of 1 g/cm³

Contact switches over at





External fixing weight made of stainless steel 316 Ti

List of the available SSP ... and SI/SSP ... floating switches

Types	Application and cable (1) = 3 x 0.75	Temperature application range	VDE mark	EMC certificate	EEx certificate
SSP **3**/K/PVC	**application up to max. 250 V,** black PVC cable, (1)	min. + 8°C max. + 60°C	yes	yes	no
SSP **1**/K/PVC	**light current application,** black PVC cable, (1)	min. + 8°C max. + 60°C	no	yes	no
SSP **3**/K/RN	**application up to max. 250 V,** grey A05RN-F cable, (1)	min. 0°C max. + 60°C	yes	yes	no
SSP **1**/K/RN	**light current application,** grey A05RN-F cable, (1)	min. 0°C max. + 60°C	no	yes	no
SSP/**S3**/K/SIL	**application up to max. 250 V,** red-brown silicone cable, (1)	min. 0°C max. + 85°C	no	yes	no
SSP/**S1**/K/SIL	**light current application,** red-brown silicone cable, (1)	min. 0°C max. + 85°C	no	yes	no
SSP/**S3**/K/CM	**application up to max. 250 V,** black CM cable, (1)	min. 0°C max. + 85°C	no	yes	no
SSP/**S1**/K/CM	**light current application,** black CM cable, (1)	min. 0°C max. + 85°C	no	yes	no
SI/SSP/NL 1/K/PVC Variant 0 Ⓔx I M2 / II 2 GD EEx ia I / IIB T6	**for use in intrinsically safe circuits *,** blue PVC cable, (1)	min. + 8°C max. + 60°C	no	yes	yes
SI/SSP/NL 1/K/RN Variant 0 Ⓔx I M2 / II 2 GD EEx ia I / IIB T6	**for use in intrinsically safe circuits *,** grey A05RN-F cable, (1)	min. 0°C max. + 60°C	no	yes	yes
SI/SSP/NL 1/K/SIL Variant 0 Ⓔx I M2 / II 2 GD EEx ia I / IIB T6	**for use in intrinsically safe circuits *,** red-brown silicone cable, (1)	min. 0°C max. + 60°C	no	yes	yes
SI/SSP/NL 1/K/CM Variant 0 Ⓔx I M2 / II 2 GD EEx ia I / IIB T6	**for use in intrinsically safe circuits *,** black CM cable, (1)	min. 0°C max. + 60°C	no	yes	yes

*** = in mines susceptible to firedamp or in potentially explosive atmospheres in categories zone 1, 21, 2 and 22**

List of the available SSX ... and SI/SSX ... floating switches

Types	Application and cable (1) = 3 x 0.75	Temperature application range	VDE mark	EMC certificate	EEx certificate
SSX **3**/K/PVC	**application up to max. 250 V,** black PVC cable, (1)	min. + 8°C max. + 60°C	yes	yes	no
SSX **1**/K/PVC	**light current application,** black PVC cable, (1)	min. + 8°C max. + 60°C	no	yes	no
SSX **3**/K/RN	**application up to max. 250 V,** grey A05RN-F cable, (1)	min. 0°C max. + 60°C	yes	yes	no
SSX **1**/K/RN	**light current application,** grey A05RN-F cable, (1)	min. 0°C max. + 60°C	no	yes	no
SSX/**S3**/K/CM	**application up to max. 250 V,** black CM cable, (1)	min. 0°C max. + 85°C	no	yes	no
SSX/**S1**/K/CM	**light current application,** black CM cable, (1)	min. 0°C max. + 85°C	no	yes	no
SSX/**S3**/K/PTFE	**application up to max. 250 V,** white PTFE cable, (1)	min. 0°C max. + 85°C	no	yes	no
SSX/**S1**/K/PTFE	**light current application,** white PTFE cable, (1)	min. 0°C max. + 85°C	no	yes	no
SI/SSX 1/K/PVC Variant 0 Ⓔx I M2 / II 1 GD EEx ia I / IIC T6	**for use in intrinsically safe circuits *,** blue PVC cable, (1)	min. + 8°C max. + 60°C	no	yes	yes
SI/SSX 1/K/RN Variant 0 Ⓔx I M2 / II 1 GD EEx ia I / IIC T6	**for use in intrinsically safe circuits *,** grey A05RN-F cable, (1)	min. 0°C max. + 60°C	no	yes	yes
SI/SSX 1/K/CM Variant 0 Ⓔx I M2 / II 1 GD EEx ia I / IIC T6	**for use in intrinsically safe circuits *,** black CM cable, (1)	min. 0°C max. + 60°C	no	yes	yes
SI/SSX 1/K/ PTFE Variant 0 Ⓔx I M2 / II 1 GD EEx ia I / IIC T6	**for use in intrinsically safe circuits *,** white PTFE cable, (1)	min. 0°C max. + 60°C	no	yes	yes

*** = in mines susceptible to firedamp or**
in potentially explosive atmospheres in categories zone 0, 20, 1, 21, 2 and 22

FS ... and SI/FS 1/K/... Variant 0 ⟨Ex⟩ I M2 / II 2 GD EEx ia I / IIC T6 floating switches

with built-in weight for fixing of switching point

These floating switches are designed for mounting **from the top.**

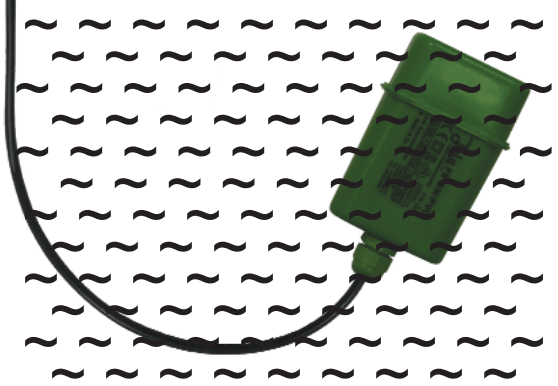
They are fitted with a **built-in weight for fixing the switching point** at the desired height; this renders **additional fastening** of the switch at the height of the switching point **unnecessary**. This weight is dimensioned in such a way that the switch tilts around its own axis when the liquid level rises and then follows the rising liquid level (see function diagram on page 1-1-8). This tilting action of the float activates the switching process.

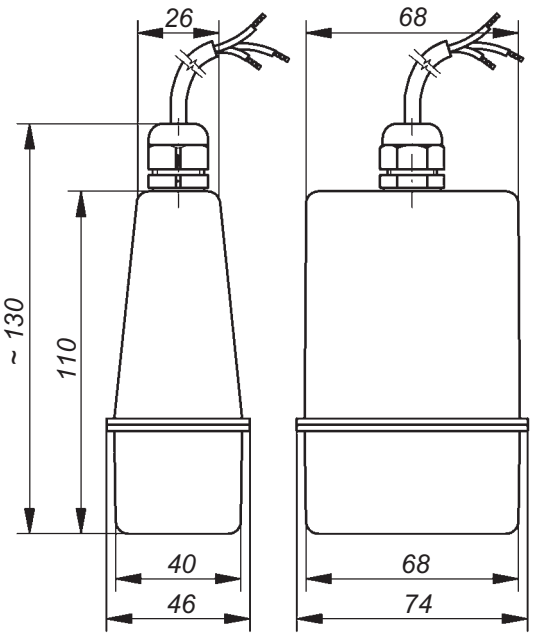
These units are not suitable for use in turbulent liquids (e.g. in stirrer tanks).

Technical data	**FS 3/K/... FS/S3/K/...**	**FS 1/K/... FS/S1/K/...**	**SI/FS 1/K/... Variant 0 ⟨Ex⟩ I M2 / II 2 GD EEx ia I / IIC T6**
Application	for standard appl.	for light current appl.	for use in intrinsically safe circuits in mines susceptible to firedamp or in potentially explosive atmospheres in categories zone 1, 21, 2 or 22. EC type examination certificate INERIS 03ATEX0149
Switching voltage	between AC/DC 24 V and AC/DC 250 V	between AC/DC 1 V and AC/DC 42 V	
Switching current	between AC 20 mA and AC 3 (1) A or between DC 20 mA and DC 100 mA	between AC 0.1 mA and AC 100 (50) mA or between DC 0.1 mA and DC 10 mA	
Switching capacity	max. 350 VA	max. 4 VA	
Operating principle	ball-operated microswitch, potential-free changeover contact		
Options for safety appl.	——	diodes (= variant 1) or resistors (= variant 2), see page 1-1-21	
Recommended appl.	——	via Jola protection relay	
		KR ..	KR 5/Ex ⟨Ex⟩ I (M1) / II (1) GD [EEx ia] I / IIC
Float material	PP		conductive PP
Seal material	FPM; on request: EPDM		
Float protection class	IP 68		IP 68 T80°C
Temperature application range	see chart on page 1-1-11		
Max. immersion depth of the float	max. 10 metres head of water at + 20°C		
Application range	**in liquids with a specific gravity between 0.95 and 1.05 g/cm³**		
Connecting cable	see chart on page 1-1-11		
Application range of the connecting cable	**– black or blue PVC cable:** water, used water and slightly aggressive liquids **– grey A05RN-F cable:** water, used water and slightly aggressive liquids **– red-brown silicone cable:** water and certain other liquids, with low mechanical strength **– black CM cable:** water and certain acids and lyes		
Connecting cable length	1 metre, other cable lengths on request. **When ordering, please always state the desired cable length and cable type.**		

FS 3/K/PVC
floating switch

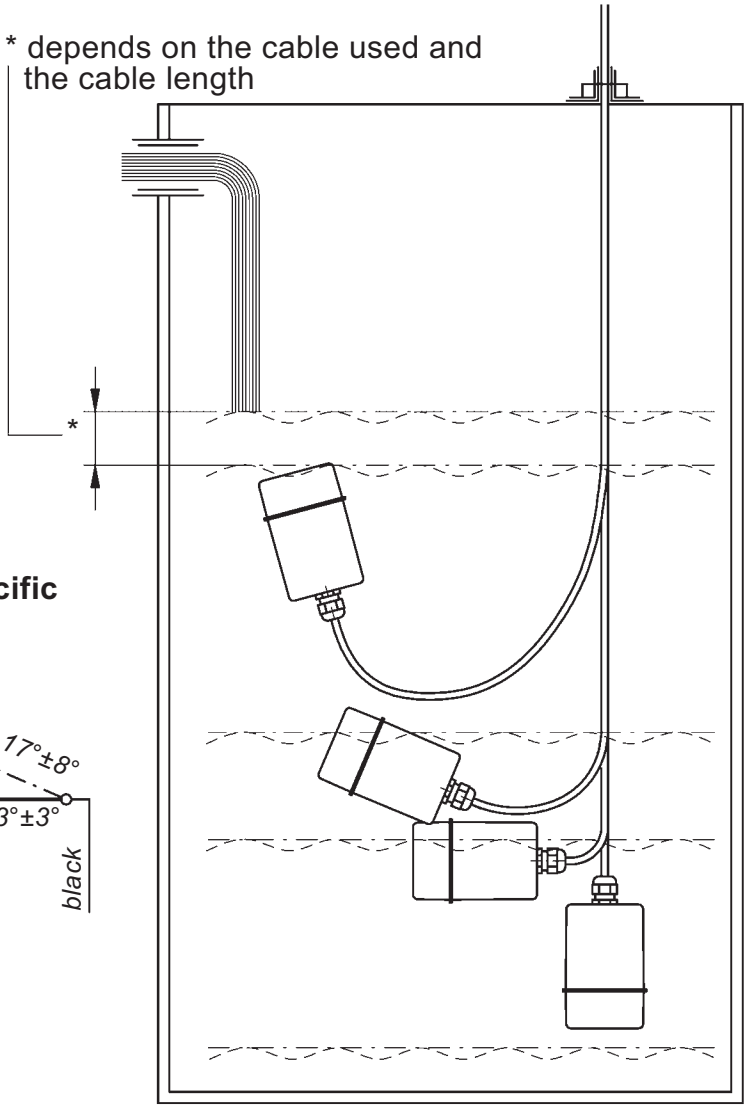
(optimal functioning)





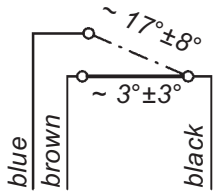
Function diagram of the
FS ... or SI/FS 1/K/... floating switch

(optimal functioning)



Switching action in liquids with a specific gravity of 1 g/cm³

Contact switches over at



SSR ... and SI/SSR 1/K/... Variant 0 ⟨Ex⟩ I M2 / II 1 G EEx ia I / IIC T6 floating switches

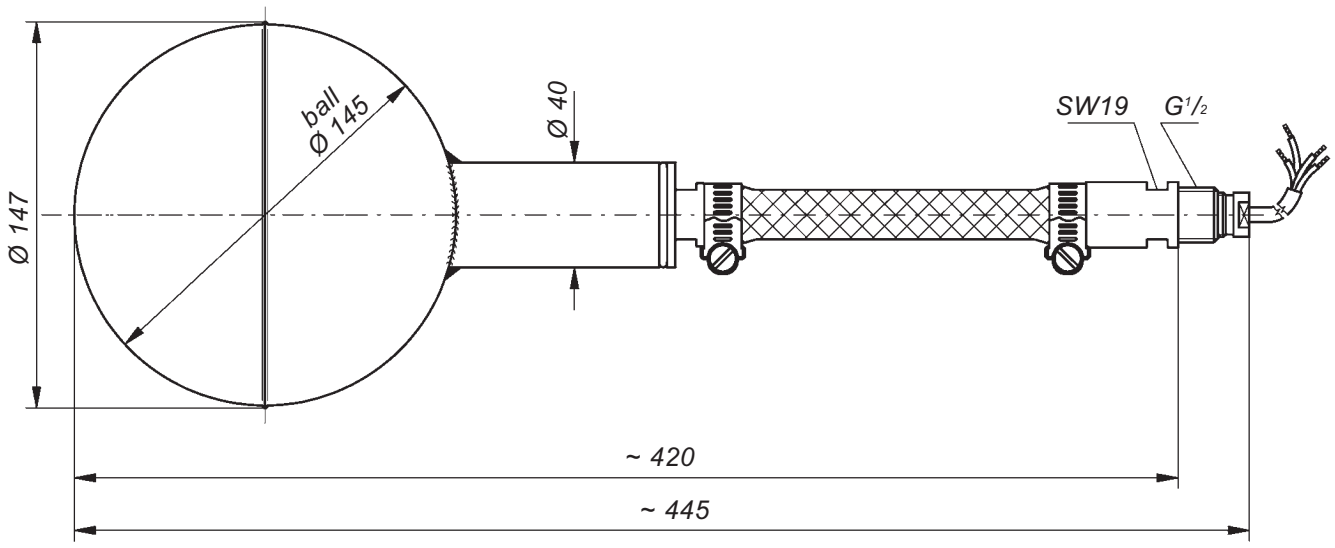
These floating switches are designed for mounting **from the side.**

To ensure a correct switching the G½ screw-in nipple must be screwed in a horizontal G½ sleeve

These units are not suitable for use in turbulent liquids (e.g. in stirrer tanks).

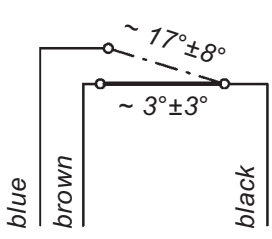
Technical data	**SSR 3/K/... SSR/S3/K/...**	**SSR 1/K/... SSR/S1/K/...**	**SI/SSR 1/K/... Variant 0 ⟨Ex⟩ I M2 / II 1 G EEx ia I / IIC T6**
Application	for standard appl.	for light current appl.	for use in intrinsically safe circuits in mines susceptible to firedamp or in potentially explosive atmospheres in categories zone 0, 1 or 2. EC type examination certificate INERIS 03ATEX0149
Switching voltage	between AC/DC 24 V and AC/DC 250 V	between AC/DC 1 V and AC/DC 42 V	
Switching current	between AC 20 mA and AC 3 (1) A or between DC 20 mA and DC 100 mA	between AC 0.1 mA and AC 100 (50) mA or between DC 0.1 mA and DC 10 mA	
Switching capacity	max. 350 VA	max. 4 VA	
Operating principle	ball-operated microswitch, potential-free changeover contact		
Options for safety appl.	——	diodes (= variant 1) or resistors (= variant 2), see page 1-1-21	
Recommended appl.	——	via Jola protection relay	
		KR ..	KR 5/Ex ⟨Ex⟩ I (M1) / II (1) GD [EEx ia] I / IIC
Float material	stainless steel 316 Ti		
Seal material	PTFE		
Appliance protection class	in installed condition inside the tank: IP 68, on the stuffing gland screw fitting outside the tank: IP 54		
Temperature application range	see chart on page 1-1-12		
Max. immersion depth of the float	max. 30 metres head of water at + 20°C		
Application range	in liquids with a specific gravity ≥ 0.8 g/cm³		
Connecting cable	see chart on page 1-1-12. **The connecting cable is routed through a protective bellows made of stainless steel 316 Ti to which a G$^{1}/_{2}$ screw-in nipple is fastened.**		
Connecting cable length	2 metres from screw-in nipple, other cable lengths on request. **When ordering, please always state the desired cable length and cable type.**		
Optional extra	**stainless steel stirrup to limit the movement of the float**		

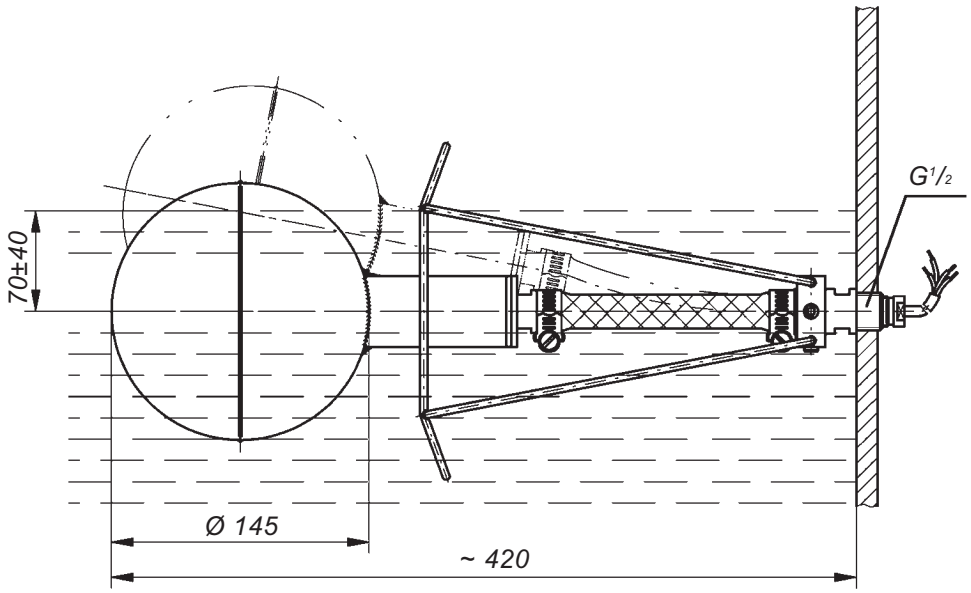
SSR 3/K/RN



**Switching action in liquids with a specific gravity of 1 g/cm³ –
Diagram of SSR ... or SI/SSR 1/K/... with stainless steel stirrup (optional)**

Contact switches over at





List of the available FS ... and SI/FS ... floating switches

Types	Application and cable (1) = 3 x 0.75	Temperature application range	VDE mark	EMC certificate	EEx certificate
FS **3**/K/PVC	**application up to max. 250 V,** black PVC cable, (1)	min. + 8°C max. + 60°C	yes	yes	no
FS **1**/K/PVC	**light current application,** black PVC cable, (1)	min. + 8°C max. + 60°C	no	yes	no
FS **3**/K/RN	**application up to max. 250 V,** grey A05RN-F cable, (1)	min. 0°C max. + 60°C	yes	yes	no
FS **1**/K/RN	**light current application,** grey A05RN-F cable, (1)	min. 0°C max. + 60°C	no	yes	no
FS/**S3**/K/SIL	**application up to max. 250 V,** red-brown silicone cable, (1)	min. 0°C max. + 85°C	no	yes	no
FS/**S1**/K/SIL	**light current application,** red-brown silicone cable, (1)	min. 0°C max. + 85°C	no	yes	no
FS/**S3**/K/CM	**application up to max. 250 V,** black CM cable, (1)	min. 0°C max. + 85°C	no	yes	no
FS/**S1**/K/CM	**light current application,** black CM cable, (1)	min. 0°C max. + 85°C	no	yes	no
SI/FS 1/K/PVC Variant 0 Ⓔx I M2 / II 2 GD EEx ia I / IIC T6	**for use in intrinsically safe circuits *,** blue PVC cable, (1)	min. + 8°C max. + 60°C	no	yes	yes
SI/FS 1/K/RN Variant 0 Ⓔx I M2 / II 2 GD EEx ia I / IIC T6	**for use in intrinsically safe circuits *,** grey A05RN-F cable, (1)	min. 0°C max. + 60°C	no	yes	yes
SI/FS 1/K/SIL Variant 0 Ⓔx I M2 / II 2 GD EEx ia I / IIC T6	**for use in intrinsically safe circuits *,** red-brown silicone cable, (1)	min. 0°C max. + 60°C	no	yes	yes
SI/FS 1/K/CM Variant 0 Ⓔx I M2 / II 2 GD EEx ia I / IIC T6	**for use in intrinsically safe circuits *,** black CM cable, (1)	min. 0°C max. + 60°C	no	yes	yes

*** = in mines susceptible to firedamp or**
in potentially explosive atmospheres in categories zone 1, 21, 2 and 22

List of the available SSR ... and SI/SSR ... floating switches

Types	Application and cable (1) = 4 G 0.75	Temperature application range	VDE mark	EMC certificate	EEx certificate
SSR **3**/K/RN	**application up to max. 250 V,** black H05RN-F cable, (1)	min. 0°C max. + 70°C	yes	yes	no
SSR **1**/K/RN	**light current application,** black H05RN-F cable, (1)	min. 0°C max. + 70°C	no	yes	no
SSR/**S3**/K/SIL	**application up to max. 250 V,** red-brown silicone cable, (1)	min. 0°C max. + 85°C	no	yes	no
SSR/**S1**/K/SIL	**light current application,** red-brown silicone cable, (1)	min. 0°C max. + 85°C	no	yes	no
SI/SSR 1/K/RN Variant 0 Ex I M2 / II 1 G EEx ia I / IIC T6	**for use in intrinsically safe circuits *,** black H05RN-F cable, (1)	min. 0°C max. + 60°C	no	yes	yes
SI/SSR 1/K/SIL Variant 0 Ex I M2 / II 1 G EEx ia I / IIC T6	**for use in intrinsically safe circuits *,** red-brown silicone cable, (1)	min. 0°C max. + 60°C	no	yes	yes

*** = in mines susceptible to firedamp or**
in potentially explosive atmospheres in categories zone 0, 1 and 2

SS/PVDF 63/A ./K floating switches

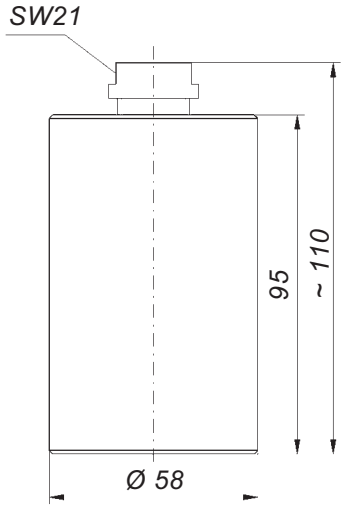
These floating switches are designed for mounting **from the top.**

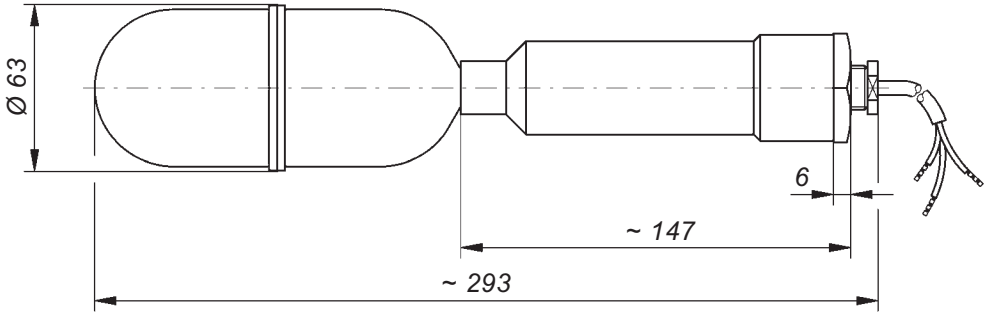
To ensure a correct switching the cable must be fixed at the required height using for example a fixing weight or a mounting pipe.

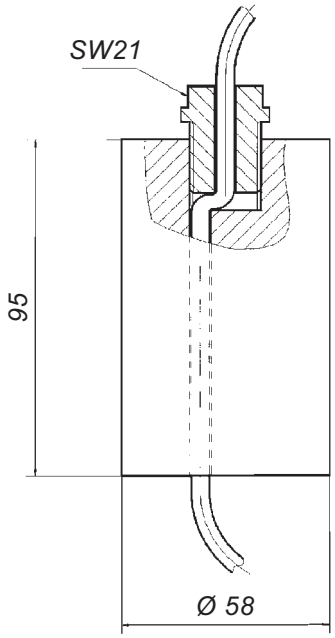
These units are not suitable for use in turbulent liquids (e.g. in stirrer tanks).

Technical data	**SS/PVDF 63/A 3/K**	**SS/PVDF 63/A 1/K**
Application	for standard applications	for light current applications
Switching voltage	between AC/DC 24 V and AC/DC 250 V	between AC/DC 1 V and AC/DC 42 V
Switching current	between AC 20 mA and AC 3 (1) A or between DC 20 mA and DC 100 mA	between AC 0.1 mA and AC 100 (50) mA or between DC 0.1 mA and DC 10 mA
Switching capacity	max. 350 VA	max. 4 VA
Operating principle	ball-operated microswitch, potential-free changeover contact	
Options for safety applications	——	diodes (= variant 1) or resistors (= variant 2), see page 1-1-21
Recommended application	——	via Jola protection relay KR ..
Float material	PVDF	
Seal material	FPM	
Float protection class	IP 68	
Temperature application range	from 0°C to + 85°C	
Max. immersion depth of the float	max. 10 metres head of water at + 20°C	
Application range	in liquids with a specific gravity ≥ 0.8 g/cm³	
Connecting cable	white PTFE cable, 3 x 0.75 mm²	
Connecting cable length	2 metres, other cable lengths on request. **When ordering, please always state the desired cable length.**	
Optional extra	**fixing weight made of PTFE or PVDF**	

SS/PVDF 63/A ./K



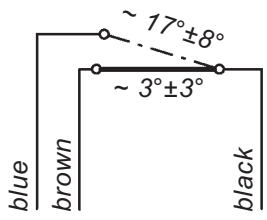


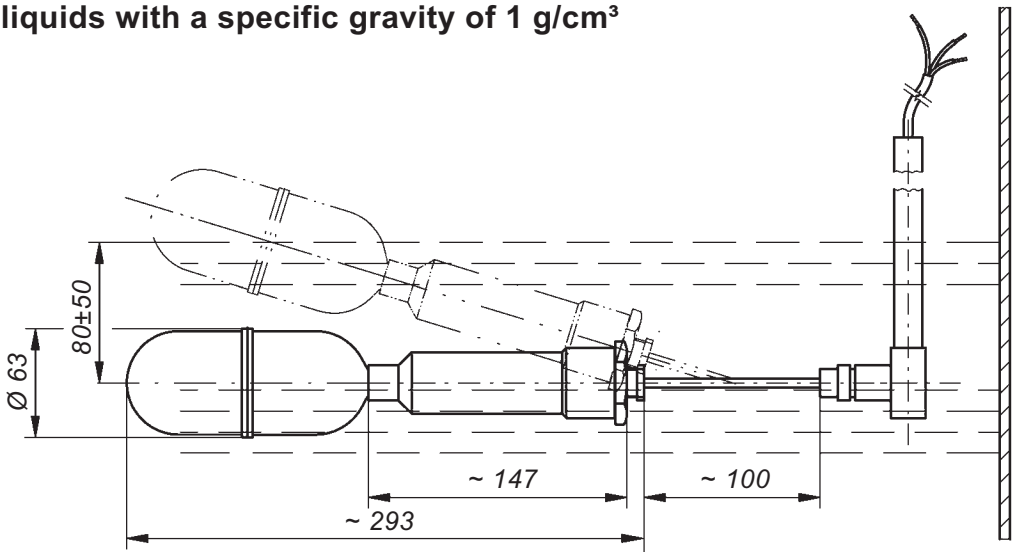


Optional extra: fixing weight made of PTFE or PVDF

Switching action in liquids with a specific gravity of 1 g/cm³

Contact switches over at





SS/PTFE 55/A ./K floating switches

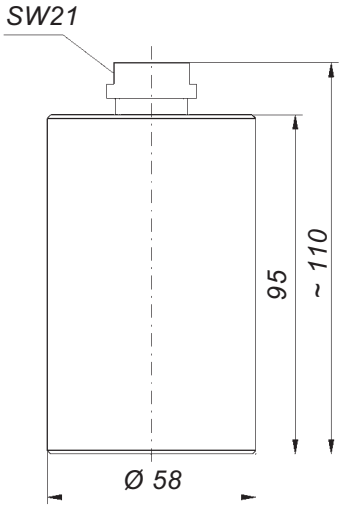
These floating switches are designed for mounting **from the top.**

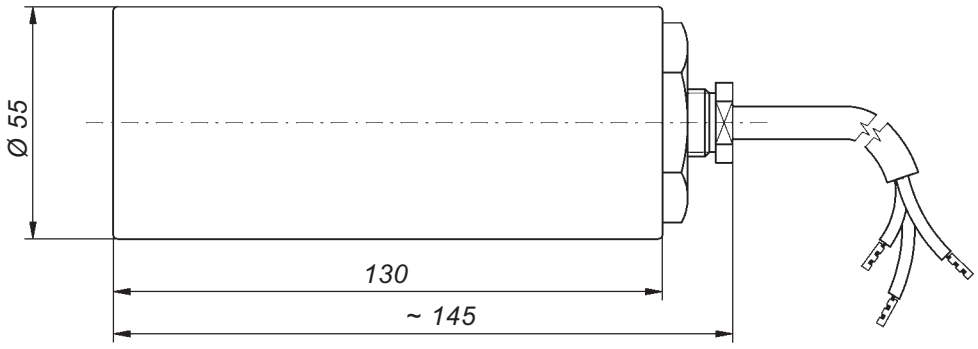
To ensure a correct switching the cable must be fixed at the required height using for example a fixing weight or a mounting pipe.

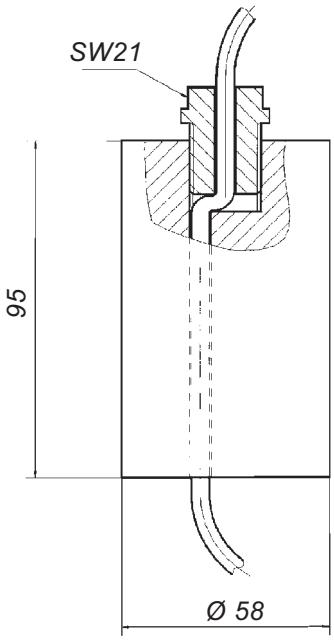
These units are not suitable for use in turbulent liquids (e.g. in stirrer tanks).

Technical data	**SS/PTFE 55/A 3/K**	**SS/PTFE 55/A 1/K**
Application	for standard applications	for light current applications
Switching voltage	between AC/DC 24 V and AC/DC 250 V	between AC/DC 1 V and AC/DC 42 V
Switching current	between AC 20 mA and AC 3 (1) A or between DC 20 mA and DC 100 mA	between AC 0.1 mA and AC 100 (50) mA or between DC 0.1 mA and DC 10 mA
Switching capacity	max. 350 VA	max. 4 VA
Operating principle	ball-operated microswitch, potential-free changeover contact	
Options for safety applications	——	diodes (= variant 1) or resistors (= variant 2), see page 1-1-21
Recommended application	——	via Jola protection relay KR ..
Float material	PTFE	
Seal material	FPM	
Float protection class	IP 68	
Temperature application range	from 0°C to + 85°C	
Max. immersion depth of the float	max. 3 metres head of water at + 20°C	
Application range	in liquids with a specific gravity ≥ 1.0 g/cm³	
Connecting cable	white PTFE cable, 3 x 0.75 mm²	
Connecting cable length	2 metres, other cable lengths on request. **When ordering, please always state the desired cable length.**	
Optional extra	**fixing weight made of PTFE**	

SS/PTFE 55/A ./K



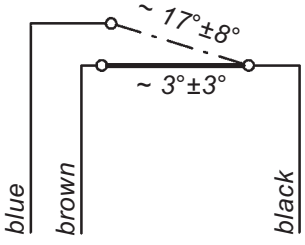


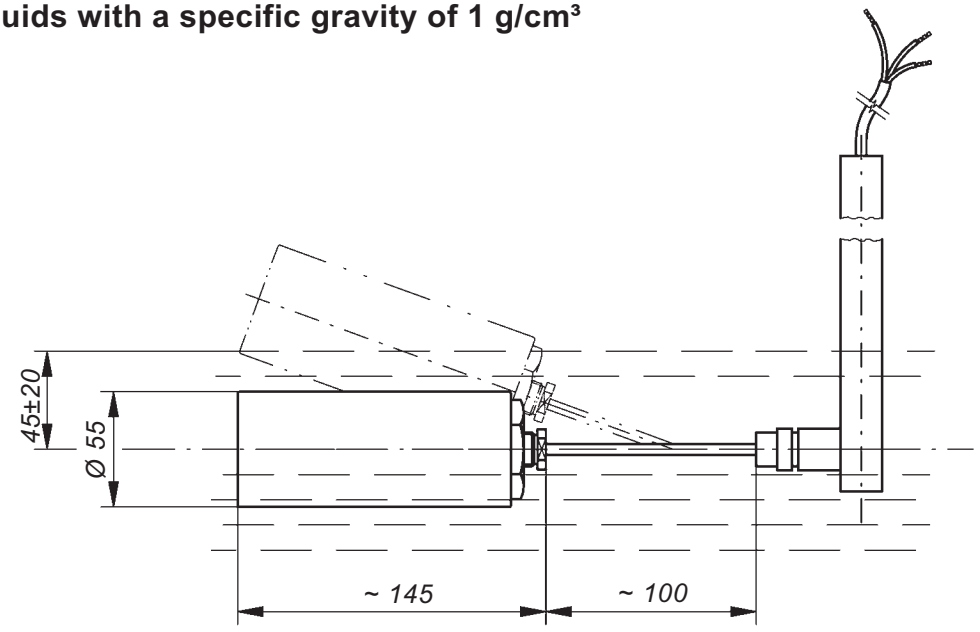


Optional extra: fixing weight made of PTFE

Switching action in liquids with a specific gravity of 1 g/cm³

Contact switches over at





SS/PTFE 55/./K floating switches

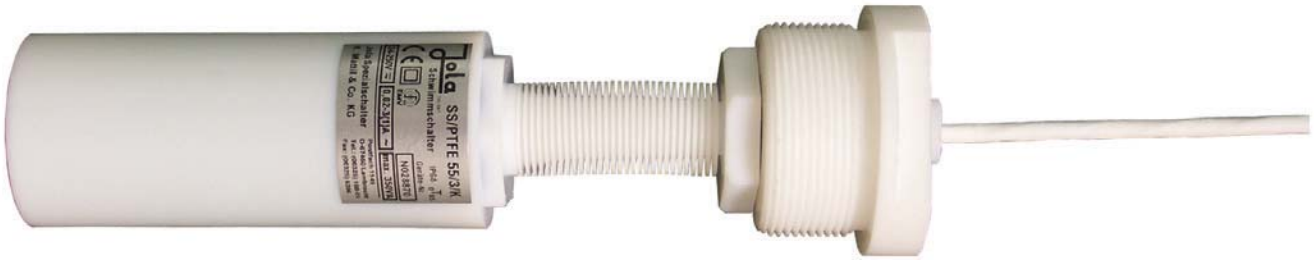
These floating switches are designed for mounting **from the side.**

To ensure a correct switching the G½ (G2) screw-in nipple must be screwed in a horizontal G½ (G2) sleeve.

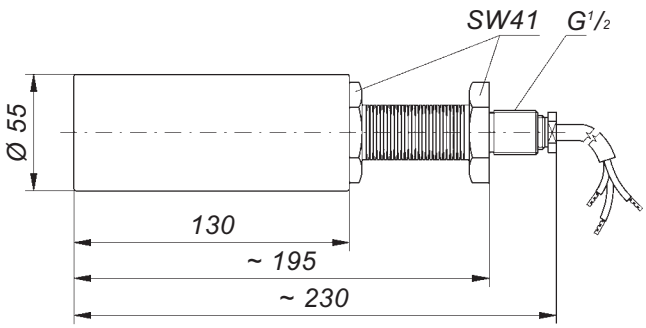
These units are not suitable for use in turbulent liquids (e.g. in stirrer tanks).

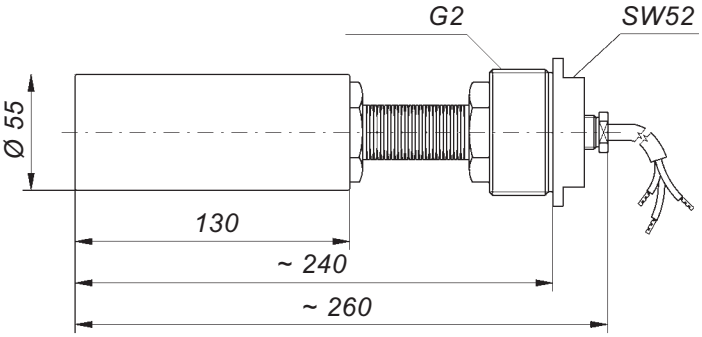
Technical data	**SS/PTFE 55/3/K**	**SS/PTFE 55/1/K**
Application	for standard applications	for light current applications
Switching voltage	between AC/DC 24 V and AC/DC 250 V	between AC/DC 1 V and AC/DC 42 V
Switching current	between AC 20 mA and AC 3 (1) A or between DC 20 mA and DC 100 mA	between AC 0.1 mA and AC 100 (50) mA or between DC 0.1 mA and DC 10 mA
Switching capacity	max. 350 VA	max. 4 VA
Operating principle	ball-operated microswitch, potential-free changeover contact	
Options for safety applications	——	diodes (= variant 1) or resistors (= variant 2), see page 1-1-21
Recommended application	——	via Jola protection relay KR ..
Float material	PTFE	
Seal material	FPM	
Appliance protection class	in installed condition inside the tank: IP 68, on the stuffing gland screw fitting outside the tank: IP 54	
Temperature application range	from 0°C to + 85°C	
Max. immersion depth of the float	max. 1 metre head of water at + 20°C	
Application range	in liquids with a specific gravity ≥ 1.0 g/cm³	
Connecting cable	white PTFE cable, 3 x 0.75 mm². **The connecting cable is routed through a protective bellows made of PTFE to which a G 1/2 screw-in nipple made of PTFE is fastened.**	
Connecting cable length	2 metres from screw-in nipple, other cable lengths on request. **When ordering, please always state the desired cable length.**	
Option	**G2 screw-in nipple in place of G 1/2 nipple for installation from the outside through the tank wall**	

SS/PTFE 55/./K



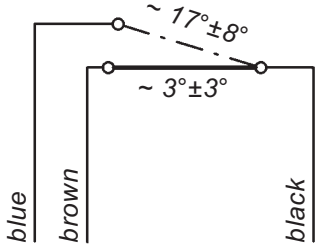
SS/PTFE 55/./K
with screw-in nipple G2 (optional)

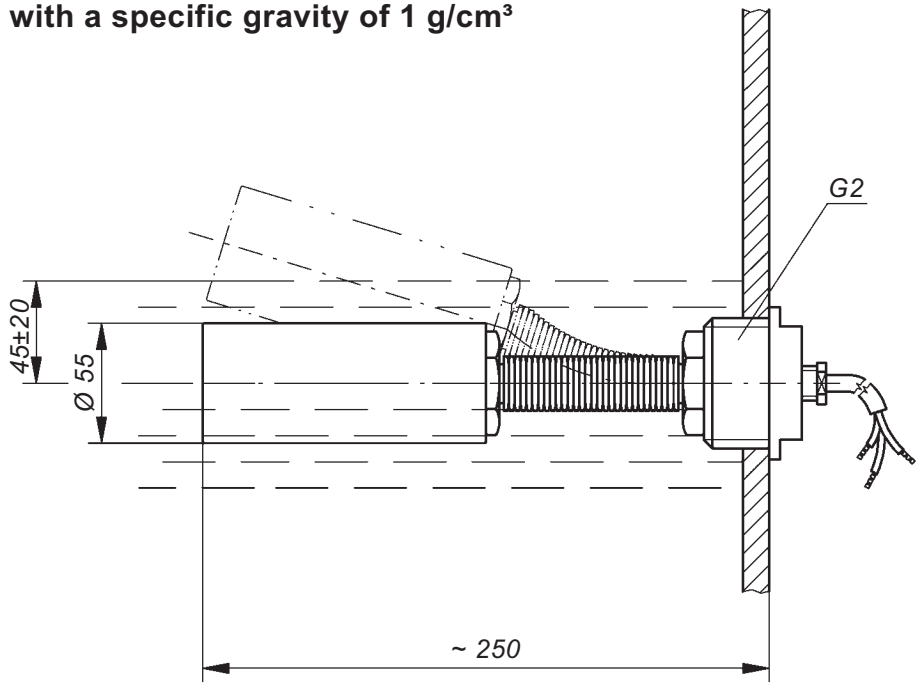




Switching action in liquids with a specific gravity of 1 g/cm³

Contact switches over at





SS/PTFE/B ./K floating switches

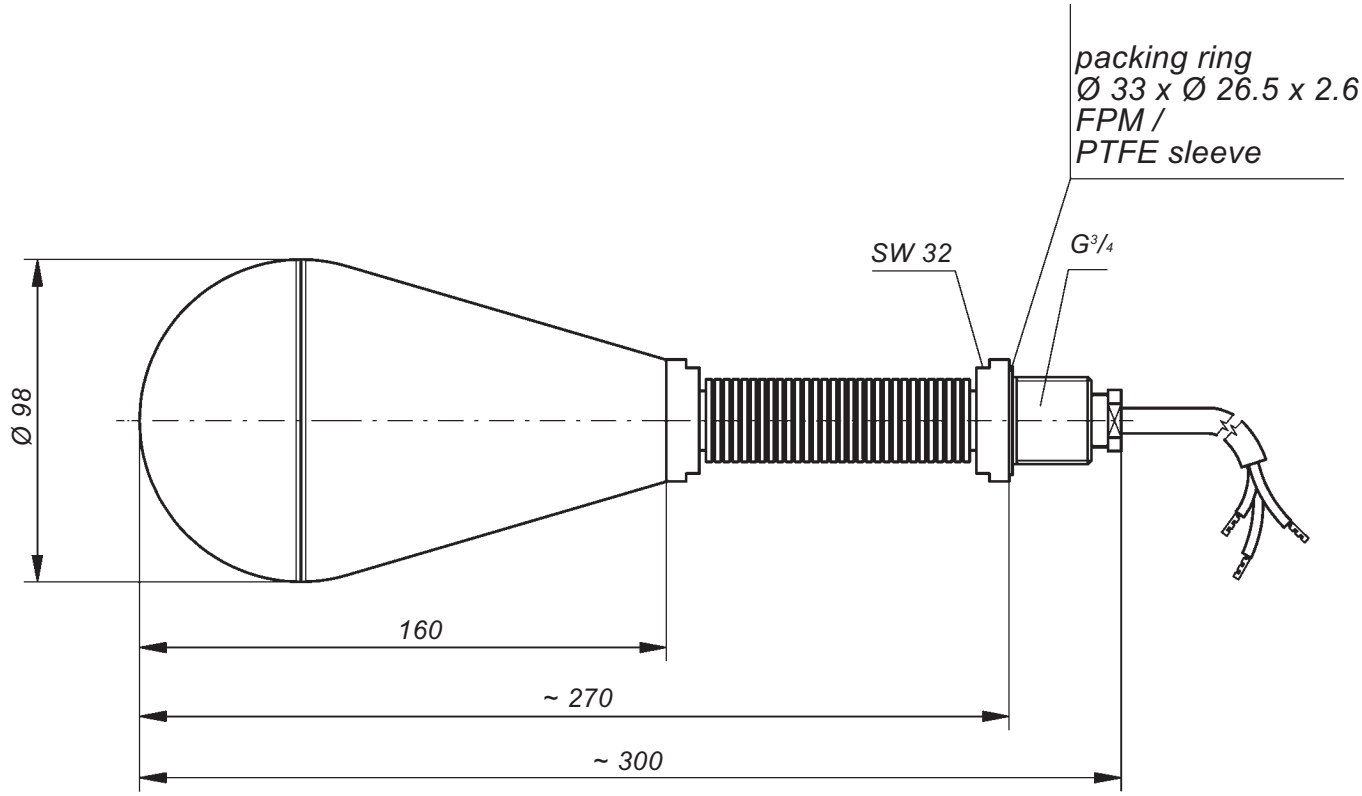
These floating switches are designed for mounting **from the side.**

To ensure a correct switching the G$^{3}/_{4}$ screw-in nipple must be screwed in a horizontal G$^{3}/_{4}$ sleeve.

These units are not suitable for use in turbulent liquids (e.g. in stirrer tanks).

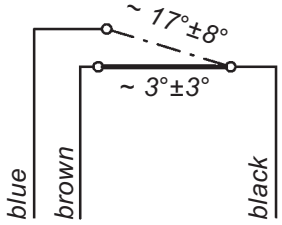
Technical data	SS/PTFE/B 3/K	SS/PTFE/B 1/K
Application	for standard applications	for light current applications
Switching voltage	between AC/DC 24 V and AC/DC 250 V	between AC/DC 1 V and AC/DC 42 V
Switching current	between AC 20 mA and AC 3 (1) A or between DC 20 mA and DC 100 mA	between AC 0.1 mA and AC 100 (50) mA or between DC 0.1 mA and DC 10 mA
Switching capacity	max. 350 VA	max. 4 VA
Operating principle	ball-operated microswitch, potential-free changeover contact	
Options for safety applications	——	diodes (= variant 1) or resistors (= variant 2), see page 1-1-21
Recommended application	——	via Jola protection relay KR ..
Float material	PTFE	
Seal material	FPM	
Appliance protection class	in installed condition inside the tank: IP 68, on the stuffing gland screw fitting outside the tank: IP 54	
Temperature application range	from 0°C and + 85°C	
Max. immersion depth of the float	max. 1.5 metre head of water at + 20°C	
Application range	in liquids with a specific gravity ≥ 0.9 g/cm³	
Connecting cable	white PTFE cable, 3 x 0.75 mm². **The connecting cable is routed through a protective bellows made of PTFE to which a G$^{3}/_{4}$ screw-in nipple made of PTFE is fastened.**	
Connecting cable length	2 metres from screw-in nipple, other cable lengths on request. **When ordering, please always state the desired cable length.**	

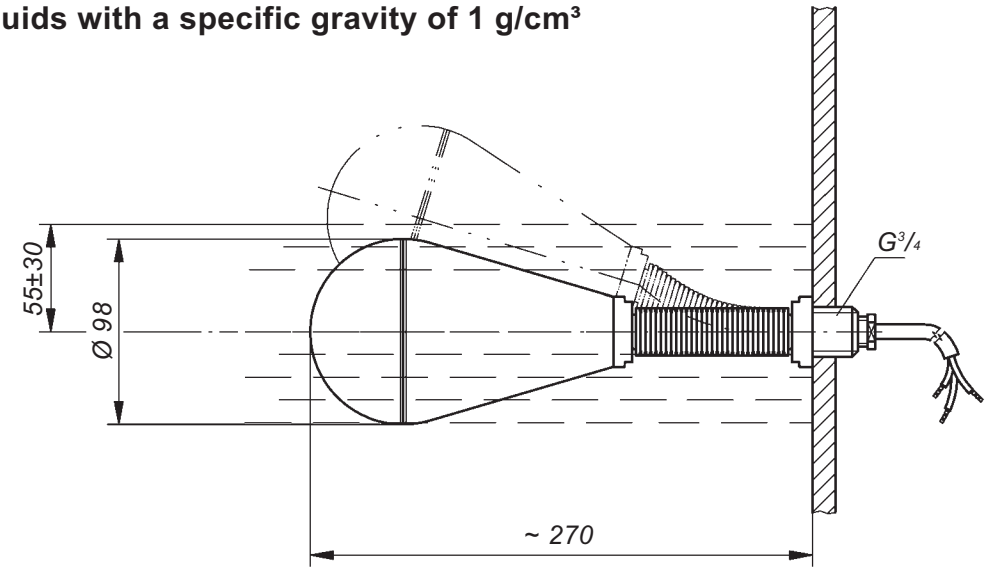
SS/PTFE/B ./K



Switching action in liquids with a specific gravity of 1 g/cm³

Contact switches over at

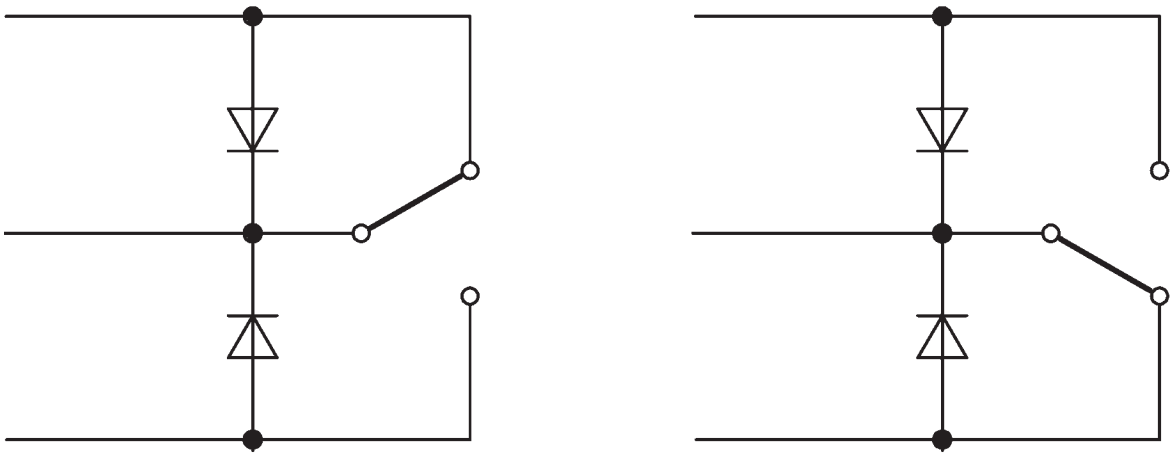




Options for ..... 1/K/... and SI/... 1/K/... floating switches types:

Variant 1:

Two (2) diodes of the type 1N4004 or equivalent

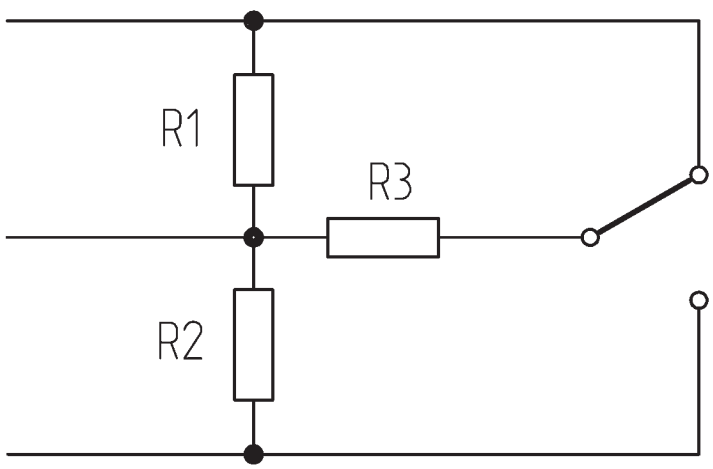


Variant 2:

Two (2) metal film resistors or carbon film resistors R 1, R 2,
each greater than or equal to 2 kohm,
each P greater than or equal to 1/4 W

and

one (1) metal film resistor or carbon film resistor R 3
greater than or equal to 330 ohm,
P greater than or equal to 1 W.



TS/O/... mercury-free immersion probes

for automatic control of liquid levels

Particularly suitable for **fuel oil tanks, diesel-fired emergency power generators and hydraulic oil tanks.**

These units are not suitable for use in turbulent liquids (e.g. in stirrer tanks).

Functional description based on a switching example:

Automatic filling of a tank

The bottom floating switch falls together with the liquid to a minimum level and acts on the contactor coil winding when it falls below the horizontal. Liquid is then pumped into the tank. When the maximum level is reached, the top floating switch rises above the horizontal, the contactor holding circuit is interrupted, and the filling process is stopped.

Technical data	TS/O/...
Probe tube material	PP
Probe tube diameter	depends on the type and number of switches, see chart
Probe tube length	according to customer´s specifications
Screw-in nipple (on request)	PP; flange on request
Terminal box	PP, A 307, 120 x 80 x 55 mm, protection class IP 65, for max. 12 terminals; for more than 12 terminals: polyester, A 113, 160 x 160 x 90 mm, protection class IP 65
Mounting orientation	vertical
Temperature application range	depends on the type of cable used, see page 1-1-5
Pressure resistance	for pressureless applications only
Mounted floating switches	**SSP ••• (please always state when ordering)**
Electrical data	see technical data on pages 1-1-1 and fol.

Type designation	No. of mounted floating switches	Type of mounted floating switches	Probe tube diameter	Screw-in nippel (on request)
TS/O/1 x SSP •••	1	SSP ••• (please always state when ordering)	16 mm	G1 1/2 or G2
TS/O/2 x SSP •••	2		20 mm	G2
TS/O/3 x SSP •••	3		25 mm	G2
TS/O/4 x SSP •••	4		25 mm	G2
TS/O/5 x SSP •••	5		25 mm	G2

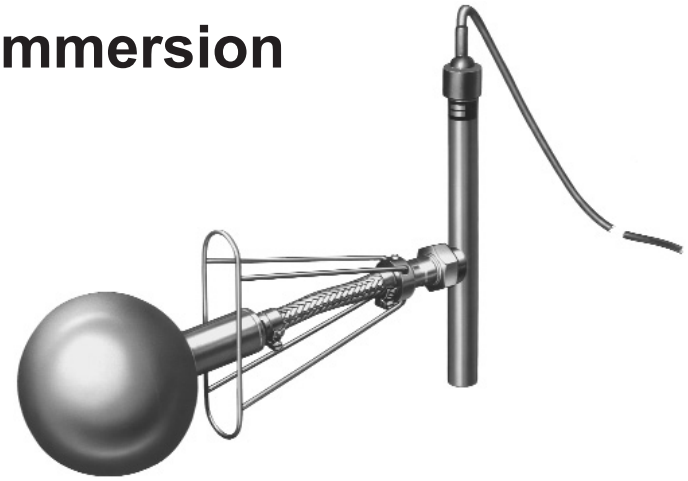
••• = to be specified, see page 1-1-5

On request:
- **with more than 5 mounted floating switches,**
- **with adjustable screw-in nipple.**

The above equipment will be manufactured in accordance with customer´s specifications.

For enquiries or orders, please complete the questionnaire on page 1-1-29 or 1-1-30 (as applicable).

TS/... mercury-free immersion probes



**TS/E/1 x SSR ...
with stainless steel stirrup to limit float movement and with cable in place of terminal box**

For the automatic control of liquids levels **in tanks or shafts.**

These units are not suitable for use in turbulent liquids (e.g. in stirrer tanks).

Mode of operation:
see example on page 1-1-22.

Technical data	**TS/PP/...**	**TS/G/...**	**TS/E/...**	**TS/PTFE/...**
Probe tube material	PP	stainless steel 316 Ti		PTFE
Probe tube diameter	see chart on page 1-1-24			
Probe tube length	according to customer´s specifications			
Option: flange	on request, but making allowance for the installation dimensions of the mounted floating switches			
Terminal box	PP, A 307, 120 x 80 x 55 mm, protection class IP 65, for max. 9 terminals	cast aluminiun, A 119, 125 x 80 x 60 mm, protection class IP 65, for max. 12 terminals		PP, A 307, 120 x 80 x 55 mm, protection class IP 65, for max. 9 terminals
	for more than 9 or 12 terminals: polyester, A 113, or cast aluminiun, A 113b, each 160 x 160 x 90 mm, protection class IP 65; on request: with free connecting cable			
Mounting orientation	vertical			
Temperature application range	depends on the type of cable used, see page 1-1-6	1-1-6	1-1-12	1-1-15
Pressure resistance	for pressureless applications only			
Mounted floating switches	**SSX •••**	**SSX •••**	**SSR •••**	**SS/PTFE 55/•/K**
Electrical data	see technical data on page 1-1-3	1-1-3	1-1-9	1-1-17

Suitable for types on pages 1-1-23 and 1-1-24:
••• = to be specified according to the list of types on page 1-1-6 or 1-1-12
• = to be specified: 3 or 1 (for type ... 3/K or ... 1/K); see page 1-1-17

On request **TS/PTFE/... with screw-in nipple G2 for mounting from inside the container** (the terminal box has to be removed prior to mounting and then fixed back in place).

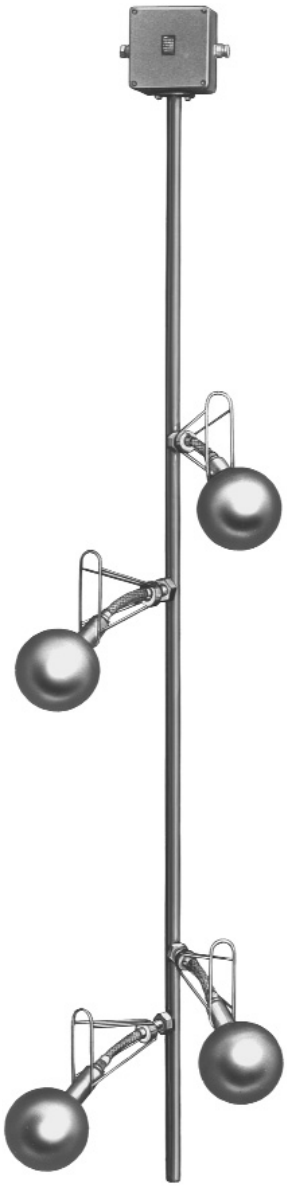
The above equipment will be manufactured in accordance with customer´s specifications.

For enquiries or orders, please complete the questionnaire on page 1-1-29 or 1-1-30 (as applicable).

Model overview

Type designation	No of mounted floating switches	Type of mounted floating switches	Probe tube dia-meter
TS/PP/1 x SSX ●●● TS/PP/2 x SSX ●●● TS/PP/3 x SSX ●●● TS/PP/4 x SSX ●●● TS/PP/5 x SSX ●●●	1 2 3 4 5	SSX ●●● **(please always state when ordering)**	32 mm
TS/G/1 x SSX ●●● TS/G/2 x SSX ●●● TS/G/3 x SSX ●●● TS/G/4 x SSX ●●● TS/G/5 x SSX ●●●	1 2 3 4 5	SSX ●●● **(please always state when ordering)**	28 mm 28 mm 34 mm 34 mm 34 mm
TS/E/1 x SSR ●●● TS/E/2 x SSR ●●● TS/E/3 x SSR ●●● TS/E/4 x SSR ●●● TS/E/5 x SSR ●●●	1 2 3 4 5	SSR ●●● with stirrup **(please always state when ordering)**	28 mm 28 mm 34 mm 34 mm 34 mm
TS/PTFE/1 x SS/PTFE 55/●/K TS/PTFE/2 x SS/PTFE 55/●/K TS/PTFE/3 x SS/PTFE 55/●/K TS/PTFE/4 x SS/PTFE 55/●/K TS/PTFE/5 x SS/PTFE 55/●/K	1 2 3 4 5	SS/PTFE 55/●/K **(please always state when ordering)**	27 mm

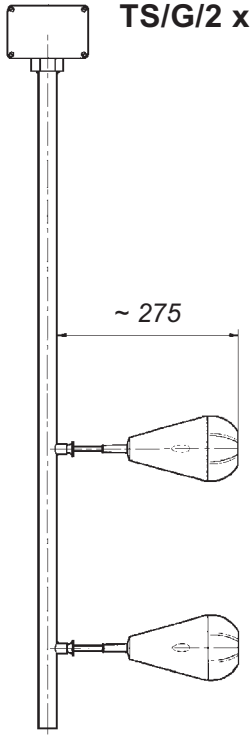
On request also with more than 5 mounted floating switches.



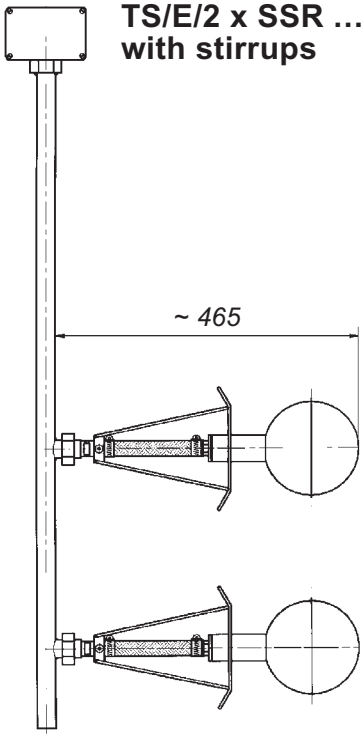
TS/E/4 x SSR …
with stirrups

Design examples:

TS/G/2 x SSX …



TS/E/2 x SSR …
with stirrups



TS/PTFE/2 x SS/PTFE 55/./K
with mounting flange

TSV/... mercury-free level monitors

For maximum or minimum display or alarm signal.

Probe tube in terminal box / screw-in nipple adjustable; hense all desired filling levels can be recorded along the entire length of the probe tube.

These units are not suitable for use in turbulent liquids (e.g. in stirrer tanks).

Technical data	**TSV/PP/SSP ./K/...**	**TSV/E/SSP ./K/...**
Probe tube material	PP	stainless steel 316 Ti
Probe tube diameter	12 mm	12 mm
Probe tube length	approx. 500 mm, longer on request	
Screw-in nipple	PP, G1	stainless steel 316 Ti, G1
Terminal box	PP, A 307, 120 x 80 x 55 mm, protection class IP 54	
Mouting orientation	vertical	
Temperature application range	depends on the type of cable used, see chart on page 1-1-5	
Pressure resistance	for pressureless applications only	
Mounted floating switch	**SSP ••• (see pages 1-1-1, 1-1-2 and 1-1-5)**	
Electrical data	see technical data on pages 1-1-1, 1-1-2 and 1-1-5	

. = to be specified: 3 or 1 (for type SSP 3/K or SSP 1/K); see page 1-1-1

... = to be specified according to the list of types on page 1-1-5

TS/E../. x SI/SSP/NL 1/K/... Variant 0 ⟨Ex⟩ II 2 G EEx ia IIB T6 and TS/E../. x SI/SSX 1/K/... Variant 0 ⟨Ex⟩ II 2 G EEx ia IIC T6 and TS/E..../. x SI/SSR 1/K/... Variant 0 ⟨Ex⟩ II 2 G or II 2/1 G EEx ia IIC T6 mercury-free immersion probes

These units are not suitable for use in turbulent liquids (e.g. in stirrer tanks).

Mode of operation: see example on page 1-1-22.

Technical data	**TS/E../. x SI/SSP/NL 1/K/... Variant 0 ⟨Ex⟩ II 2 G EEx ia IIB T6 and TS/E../. x SI/SSX 1/K/... Variant 0 ⟨Ex⟩ II 2 G EEx ia IIC T6**	**TS/E../. x SI/SSR 1/K/... Variant 0 ⟨Ex⟩ II 2 G EEx ia IIC T6**	**TS/EZT../. x SI/SSR 1/K/... Variant 0 ⟨Ex⟩ II 2/1 G EEx ia IIC T6**
Application	for use in intrinsically safe circuits in potentially explosive atmospheres in categories		
	zone 1 or 2	- probe tube: zone 1 or 2;	- probe tube up to the DN 500 PN 16 flange (to separate zone 0 from zones 1 and 2): zone 0, 1 or 2;
		- terminal box: zone 1 or 2	
	EC type examination certificate: INERIS 03ATEX0149		
Probe tube material	stainless steel 316 Ti		
Probe tube diameter	according to chart on pages 1-1-27 and 1-1-28		
Probe tube length	according to customer´s specifications, **but max. 6,000 mm**		
Screw-in nipple	without		
	for the type TS/E20/. x SI/SSP/NL 1/K/...: G2 on request	—	—
Mounting flange	**flange** made of stainless steel 316 Ti **on request**	**flange** made of stainless steel 316 Ti **on request**	**DN 500 PN 16 flange** or larger made of stainless steel 316 Ti (to separate Zone 0 from zones 1 and 2) **necessary**
Terminal box	acc. to chart on pages 1-1-27 and 1-1-28, material: glas fibre and graphite reinforced polyester, protection class IP 65, dimensions: A 301: 110 x 75 x 55 mm, A 120: 160 x 75 x 55 mm, A 113a: 160 x 160 x 90 mm		
Mounting orientation	vertical		
Temperature appl. range	see technical data of the floating switches used		
Pressure resistance	for pressureless applications only		
Mounted float. switches	**SI/SSP/NL 1/K/••• or SI/SSX 1/K/•••**	**SI/SSR 1/K/•••**	
	(••• = to be specified according to the list of types on page 1-1-5, 1-1-6 or 1-1-12)		
Technical data of the mounted floating switches	s. p. 1-1-1 ... / 1-1-3 ...	see pages 1-1-9 and following	
Options for safety appl.	diodes (= variant 1) or resistors (= variant 2), see page 1-1-21		

For enquiries or orders, please complete the questionnaire on page 1-1-29 or 1-1-30 (as applicable).

Model overview and technical data

Type designation	No of mounted floating switches	Type of mounted floating switches	Probe tube dia-meter	Terminal box used	Design example on page 1-1-28
TS/E20/1 x SI/SSP/NL 1/K/••• Variant 0 ⟨Ex⟩ II 2 G EEx ia IIB T6	1	SI/SSP/NL 1/K/••• Variant 0 ⟨Ex⟩ I M2 / II 2 GD EEx ia I/IIB T6	20 mm	A 301	
TS/E20/2 x SI/SSP/NL 1/K/••• Variant 0 ⟨Ex⟩ II 2 G EEx ia IIB T6	2		20 mm	A 301	(1)
TS/E20/3 x SI/SSP/NL 1/K/••• Variant 0 ⟨Ex⟩ II 2 G EEx ia IIB T6	3		20 mm	A 120	
TS/E28/1 x SI/SSP/NL 1/K/••• Variant 0 ⟨Ex⟩ II 2 G EEx ia IIB T6	1	SI/SSP/NL 1/K/••• Variant 0 ⟨Ex⟩ I M2 / II 2 GD EEx ia I/IIB T6	28 mm	A 301	as (1), but probe tube dia. 28 mm Ø instead of 20 mm Ø
TS/E28/2 x SI/SSP/NL 1/K/••• Variant 0 ⟨Ex⟩ II 2 G EEx ia IIB T6	2		28 mm	A 301	
TS/E28/3 x SI/SSP/NL 1/K/••• Variant 0 ⟨Ex⟩ II 2 G EEx ia IIB T6	3		28 mm	A 120	
TS/E28/4 x SI/SSP/NL 1/K/••• Variant 0 ⟨Ex⟩ II 2 G EEx ia IIB T6	4		28 mm	A 120	
TS/E28/5 x SI/SSP/NL 1/K/••• Variant 0 ⟨Ex⟩ II 2 G EEx ia IIB T6	5		28 mm	A 113a	
TS/E28/6 x SI/SSP/NL 1/K/••• Variant 0 ⟨Ex⟩ II 2 G EEx ia IIB T6	6		28 mm	A 113a	
TS/E28/1 x SI/SSX 1/K/••• Variant 0 ⟨Ex⟩ II 2 G EEx ia IIC T6	1	SI/SSX 1/K/••• Variant 0 ⟨Ex⟩ I M2 / II 1 GD EEx ia I/IIC T6	28 mm	A 301	(2)
TS/E28/2 x SI/SSX 1/K/••• Variant 0 ⟨Ex⟩ II 2 G EEx ia IIC T6	2		28 mm	A 301	
TS/E34/3 x SI/SSX 1/K/••• Variant 0 ⟨Ex⟩ II 2 G EEx ia IIC T6	3		34 mm	A 120	
TS/E34/4 x SI/SSX 1/K/••• Variant 0 ⟨Ex⟩ II 2 G EEx ia IIC T6	4		34 mm	A 120	
TS/E34/5 x SI/SSX 1/K/••• Variant 0 ⟨Ex⟩ II 2 G EEx ia IIC T6	5		34 mm	A 113a	
TS/E34/6 x SI/SSX 1/K/••• Variant 0 ⟨Ex⟩ II 2 G EEx ia IIC T6	6		34 mm	A 113a	
Version <u>without</u> flange (to separate zone 0 from zones 1 a. 2):					
TS/E28/1 x SI/SSR 1/K/••• Variant 0 ⟨Ex⟩ II 2 G EEx ia IIC T6	1	SI/SSR 1/K/••• Variant 0 ⟨Ex⟩ I M2 / II 1 G EEx ia I/IIC T6, all with stirrup	28 mm	A 301	(3)
TS/E28/2 x SI/SSR 1/K/••• Variant 0 ⟨Ex⟩ II 2 G EEx ia IIC T6	2		28 mm	A 301	
TS/E34/3 x SI/SSR 1/K/••• Variant 0 ⟨Ex⟩ II 2 G EEx ia IIC T6	3		34 mm	A 120	
TS/E34/4 x SI/SSR 1/K/••• Variant 0 ⟨Ex⟩ II 2 G EEx ia IIC T6	4		34 mm	A 120	
TS/E34/5 x SI/SSR 1/K/••• Variant 0 ⟨Ex⟩ II 2 G EEx ia IIC T6	5		34 mm	A 113a	
TS/E34/6 x SI/SSR 1/K/••• Variant 0 ⟨Ex⟩ II 2 G EEx ia IIC T6	6		34 mm	A 113a	

••• = to be specified according to the list of types on page 1-1-5 or 1-1-6 or 1-1-12

Version <u>with</u> flange (to separate zone 0 from zones 1 a. 2):					as
TS/EZT28/1 x SI/SSR 1/K/••• Variant 0 ⟨Ex⟩ II 2/1 G EEx ia IIC T6	1	SI/SSR 1/K/••• Variant 0 ⟨Ex⟩ I M2 / II 1 G EEx ia I/IIC T6, all with stirrup	28 mm	A 301	(3), but with DN 500 PN 16 flange (to separate zone 0 from zones 1 and 2
TS/EZT28/2 x SI/SSR 1/K/••• Variant 0 ⟨Ex⟩ II 2/1 G EEx ia IIC T6	2		28 mm	A 301	
TS/EZT34/3 x SI/SSR 1/K/••• Variant 0 ⟨Ex⟩ II 2/1 G EEx ia IIC T6	3		34 mm	A 120	
TS/EZT34/4 x SI/SSR 1/K/••• Variant 0 ⟨Ex⟩ II 2/1 G EEx ia IIC T6	4		34 mm	A 120	
TS/EZT34/5 x SI/SSR 1/K/••• Variant 0 ⟨Ex⟩ II 2/1 G EEx ia IIC T6	5		34 mm	A 113a	
TS/EZT34/6 x SI/SSR 1/K/••• Variant 0 ⟨Ex⟩ II 2/1 G EEx ia IIC T6	6		34 mm	A 113a	

••• = to be specified according to the list of types on page 1-1-12

Design examples:

(1)

TS/E20/3 x SI/SSP/NL 1/K/…
with screw-in nipple G2 (optional) and with terminal box A 120

(2)

TS/E34/4 x SI/SSX 1/K/…
with mounting flange (optional) and with terminal box A 113 a instead of A 120 (optional)

(3)

TS/E28/2 x SI/SSR 1/K/…
with terminal box A 301, without flange that is only for applications in zone 1 and 2

Questionnaire for enquiries and orders
for immersion probes <u>with</u> screw-in nipple or flange

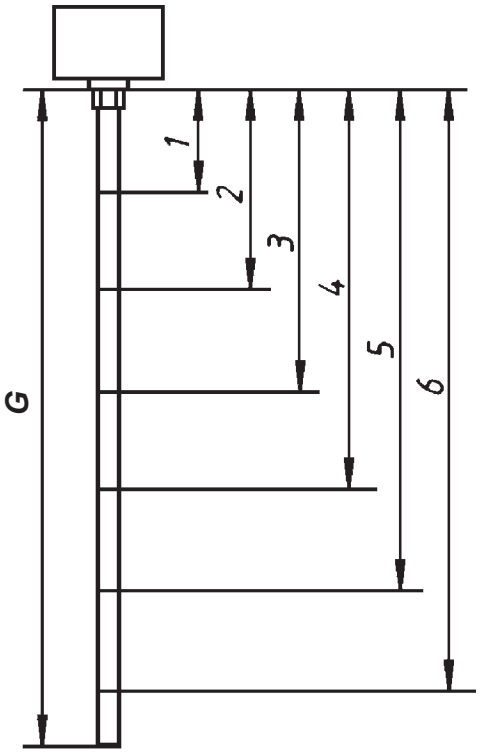
Desired switching functions (indication max., min., pump or valve ON – OFF, filling or emptying, dry-run or overflow protection): _____

Tank dimensions and installation conditions (sketch if applicable): _____

Type of liquid: _____ Specific gravity: _____

Viscosity: _____ Temperature: _____ Operating pressure: _____

Desired immersion probe type: TS/...



When planning the design of the immersion probes, please consider that **when the liquid level rises,** the contact of the floating switches is not activated when the floating switches reach the horizontal position, but is activated as depicted in the diagrams of the various floating switches on pages 1-1-1 and following. **When the liquid level sinks,** the contact of the floating switches is activated **shortly below their horizontal position.**

	Desired floating switch type	*Distance from sealing surface of screw-in nipple or flange in mm*	*Switching function (e.g. high alarm, pump ON, pump OFF etc.)*	*If float has a working direction: rising = ↑ falling = ↓*
1				
2				
3				
4				
5				
6				

Desired options:

Questionnaire for enquiries and orders
for immersion probes <u>without</u> screw-in nipple or flange

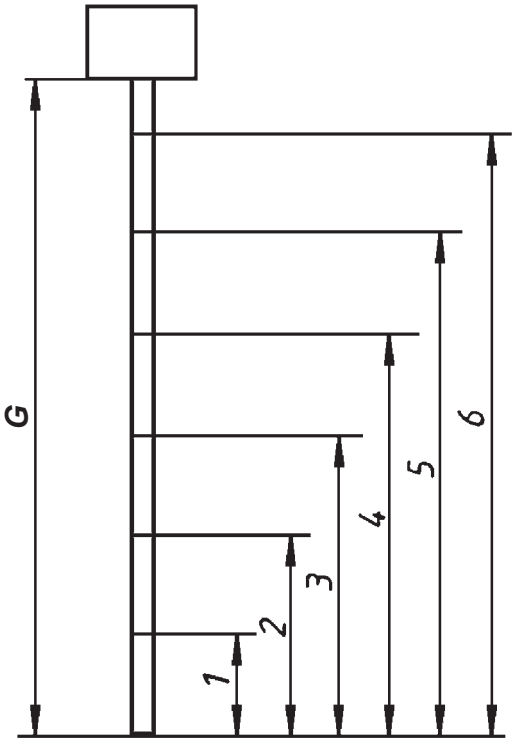
Desired switching functions (indication max., min., pump or valve ON – OFF, filling or emptying, dry-run or overflow protection): _____

Tank dimensions and installation conditions (sketch if applicable): _____

Type of liquid: _____ Specific gravity: _____

Viscosity: _____ Temperature: _____ Operating pressure: _____

Desired immersion probe type: TS/...



When planning the design of the immersion probes, please consider that **when the liquid level rises,** the contact of the floating switches is not activated when the floating switches reach the horizontal position, but is activated as depicted in the diagrams of the various floating switches on pages 1-1-1 and following. **When the liquid level sinks,** the contact of the floating switches is activated **shortly below their horizontal position.**

	Desired floating switch type	*Distance from end of probe tube in mm*	*Switching function (e.g. high alarm, pump ON, pump OFF etc.)*	*If float has a working direction: rising = ↑ falling = ↓*
1				
2				
3				
4				
5				
6				

Desired options:

The units described in this documentation may only be installed, connected and started up by suitably qualified personnel!

Subject to deviations from the diagrams and technical data.

The details in this brochure are product specification descriptions and do not constitute assured properties in the legal sense.