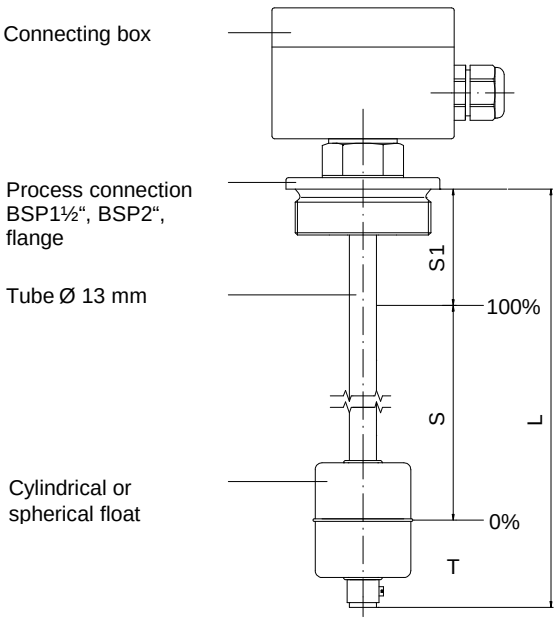
KOMBI - Level / Temperature combined design output analogue
Level and Temperature 4-20mA in stainless steel 316Ti

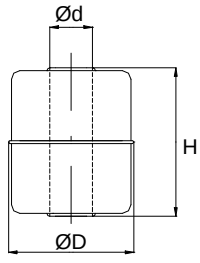
TN 200

Technical Data	
Supply voltage	12 – 32 V DC
Output for level measuring	4 – 20mA (2-wire)
Output for temperature measuring	4 – 20mA (2-wire)
Max. pressure	4,0 MPa
Medium temperature	-30°C up to +100°C, > +100°C on request
Medium density	≥ 750 kg/m³
Accuracy for level measuring	12 mm
Accuracy for temperature measuring	0,5% of the measurement range
Measuring element for temperature	PT100 Class B,
	DIN IEC 751
Connecting box	Aluminium 75 x 80 x 57 mm
	Polycarbonate 80 x 82 x 55 mm
Process connection	Standard: BSP 1½“, BSP 2“,
	Flange DN50 PN16, other types on request
Tube length L	Standard: up to 6000 mm
	> 6000 mm on request

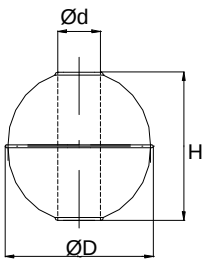
Dimensions



T = dead zone (ca. 40 mm)



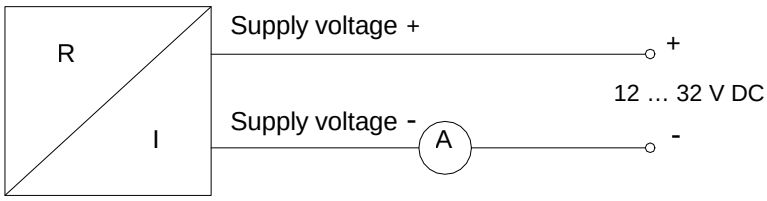
SE1



SE2

Float type	Dimensions			Max. operating pressure (Mpa)	Max. operating temperature (°C)	Medium density kg/m³	Material
	Ø D (mm)	Ø d (mm)	H (mm)				
SE1 Cylindrical float	44	15	52	1,6	100	≥ 750	316Ti
SE2 Spherical float	52	15	52	4,0	100	≥ 750	316Ti

Electrical connection



Product overview / Order table

TN 200

Connecting box
A Aluminium case 75 x 80 x 57 mm, IP66
B Polycarbonate case 80 x 82 x 55 mm, IP66

Process connections (installation: vertical, ± 30°)
A Fixing screw thread BSP $1^1/_2$", 316Ti
B Fixing screw thread BSP 2", 316Ti
C Flange DIN 2527, form B, DN 50 PN 16, 316Ti
X Other types on request

Tube length L (see dimensioned diagram)
Tube in 316Ti
Tube length from sealing face of process connection
Tube length L ≤ 6000 mm; L > 6000 mm on request
Dimensions in mm

Float types
Z SE1 (cylindrical float ∅44 in 316Ti)
K SE2 (spherical float ∅52 in 316Ti)
X Other types on request

Temperature range
C -30°C up to +100°C
D 0°C up to +100°C
X Other types on request

TN 200						

S1=		100% marker for level S1 = distance from sealing face to centre of float

Order instruction: 100% marker S1 in mm, (min. 40 mm)

BESTA

Level / Temperature combined design

Level measurement instrument in stainless steel 1.4571 with integrated temperature sensor

TN 210

Characteristics

- ► Analog level signal 4-20 mA, two-wire transmitter
- ► Max. 4 level switches (bistable) pnp-output. Control elements:
  - reed contacts or
  - magnet sensors
- ► Analog temperature signal 4-20 mA, two-wire transmitter
- ► Temperature switches:
  - pnp-output or
  - thermostat for switch action

Advantages

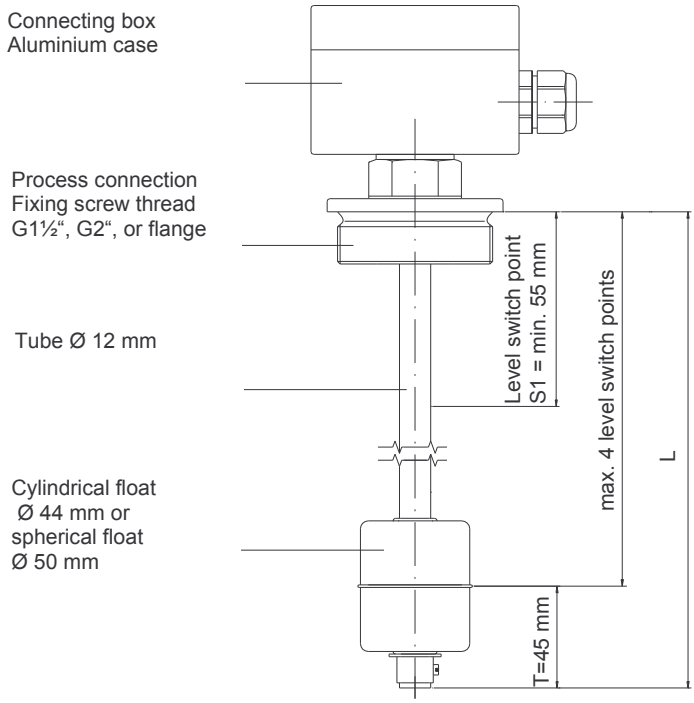
- ► Reductions of costs: max. 4 different measurements in one measuring instrument
- ► Economy of time, of storage costs, of assembly costs etc.

Areas of application

► Combined measuring instruments are suitable even for rough environments and are applicable in the following industries:

- plant engineering
- machine construction
- chemical industrie
- biochemical industrie
- petrochemical industrie
- off-shore
- power plants
- ship-building
- food industrie
- pharmaceutics etc.

Dimensions



S1: Switch point 1
—
S4: Switch point 4

Min. distance between
S1 and process connection
seal face= 55 mm

L: Tube length

T: Dead centre

Technical Data

Analog Level Signal

Analog output	4-20 mA
Supply voltage	12 VDC…32 VDC
Accuracy	12 mm
Faults detection	Short-circuit < 4 mA, wire break > 22 mA
Temperature range	-30°C…+120°C, >120°C on request

Level Switch Points

Switch elements	Reed contacts
Switch function	opener / closer or change-over switch
Max. power	
• Opener / Closer	230 VAC; 100 VA; 1A AC 230 VDC; 50 W; 0,5A DC
• Change-over switch	230 VAC; 40 VA; 1A AC 230 VDC; 20 W; 0,5A DC
Temperature range	-30°C…+180°C, >180°C on request

Level Switch Points

Switch element	Magnet sensor
Switching behavior	bistable, pnp-output (open collector)
Supply voltage Uv	16 VDC…32 VDC
Switch function	pnp-output (open collector)
• Closer	jump from 0 V to Uv
• Opener	jump from Uv to 0 V
Short-circuit resistance, max. current load	< 100 mA
Hysteresis	2 mm
Temperature range	-30°C … +130°C

Analog Temperature Signal

Temperature sensor	PT100
Analog output	4 – 20mA
Supply voltage	12 VDC…32 VDC
Accuracy	≤ 0,5°C
Linearity error	< 0,1%
Faults detection	Short-circuit < 4 mA, wire break > 22 mA
Temperature range	-50°C…+250°C, >250°C on request

Temperature Switch Points with pnp-output

Temperature sensor	PT100
Supply voltage Uv	12 VDC…32 VDC
Output	max. 2 switch points, pnp-output (open collector)
• Closer	jump from 0 V to Uv
• Opener	jump from Uv to 0 V
Accuracy	≤ 0,5°C
Hysteresis	1,5°C
Temperature range	-50°C…+250°C, >250°C on request

Temperature Switch Points , Thermostat for Switch Action

Nominal voltage (50-60 Hz)	250 V
Nominal current	max. 2,5 A ; min. 50 mA
Switch function	opener or closer
Accuracy	± 0,5°C
Temperature range	+50°C…+180°C, stepwise in 5°C-steps

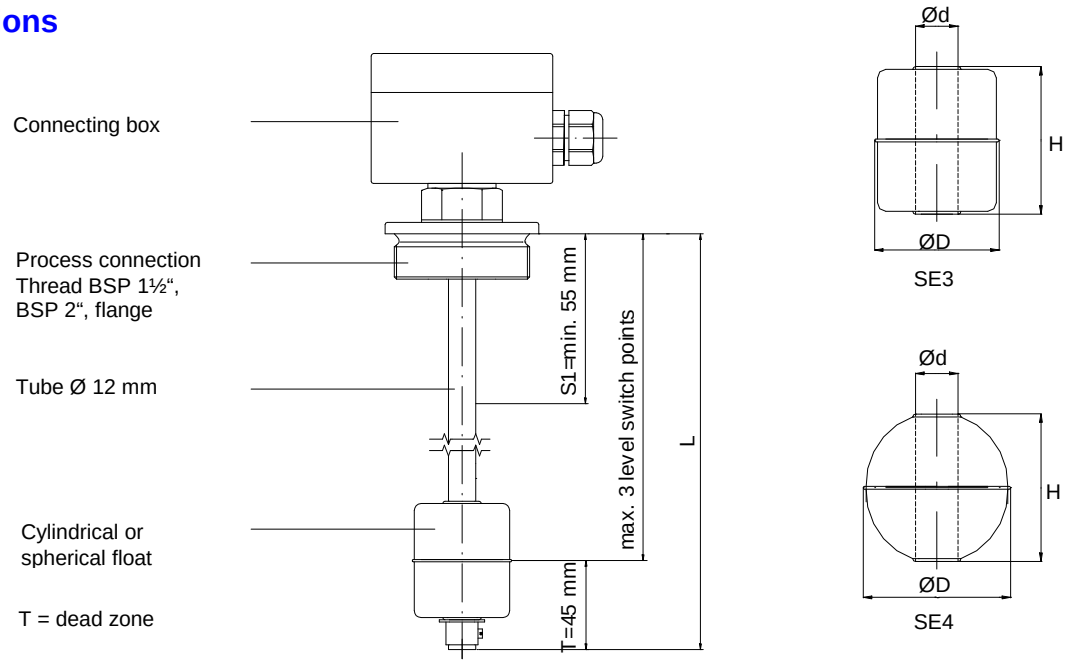
KOMBI - Float Switch with integrated PT100

TN 230

in stainless steel 316Ti

Level Switch Points (max. 3 switch points)		
Max. power	**Opener / Closer:**	230 V AC; 100 VA; 1 A AC
		230 V DC; 50 W; 0,5 A DC
	Change-over switch:	230 V AC; 40 VA; 1 A AC
		230 V DC; 20 W; 0,5 A DC
Switch function	opener / closer / change-over switch with a rising liquid level	
Temperature: PT100, Output: PT100		
Temperature sensor	PT100 Class B	
	DIN IEC 751	
Technical Data		
Installation position	vertical, ± 30°	
Medium density	≥ 750 kg/m³	
Medium temperature	-30°C up to +150°C	
Connecting box	Aluminium 75 x 80 x 57 mm	
	Aluminium 58 x 64 x 36 mm	
	Polycarbonate 80 x 82 x 55 mm	
Protection	IP 66	
Max. pressure	4,0 MPa	
Tube length L	Standard: up to 6000 mm, > 6000 mm on request	
Process connection	Thread BSP 1½“, BSP 2“, Flange DN50 PN16, other types on request	

Dimensions



Float type	Dimensions			Max. operating pressure (MPa)	Max. operating temperature (°C)	Medium density kg/m³	Material
	Ø D (mm)	Ø d (mm)	H (mm)				
SE3 Cylindrical float	44	15	52	1,6	150	≥ 750	316Ti
SE4 Spherical float	52	15	52	4,0	150	≥ 750	316Ti

Product overview / Order table

TN 230

Connecting box
A Aluminium case 75 x 80 x 57 mm, IP66
B Aluminium case 58 x 64 x 36 mm, IP66
C Polycarbonate case 80 x 82 x 55 mm, IP66

Process connections (installation: vertical, ± 30°)
A Fixing screw thread BSP 1½", 316Ti
B Fixing screw thread BSP 2", 316Ti
C Flange DIN 2527, Form B, DN50 PN16, 316Ti
X Other types on request

Tube length L (see dimensioned diagram), Tube in 316Ti
Tube length from sealing face of process connection
Tube length L ≤ 6000 mm; L > 6000 mm on request
Dimensions in mm

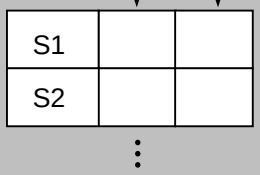
Float types
Z SE3 (cylindrical float ∅44 in 316Ti)
K SE4 (spherical float ∅52 in 316Ti)
X Other types on request

Temperature range
N -30°C up to +80°C
H -30°C up to +150°C

Switch point number for level limit (max. 3 switch points)
(see dimensioned diagram)

Switch function for level (with a rising liquid level)
O Opener
S Closer
U Change-over switch

Switch position
Switch position from sealing face of process connection in mm



Note! **If you have more than 2 switch points, the min. distance between switch point 2 and switch point 3 is: 80 mm, because for designs with more than two switch points a second float is necessary.**

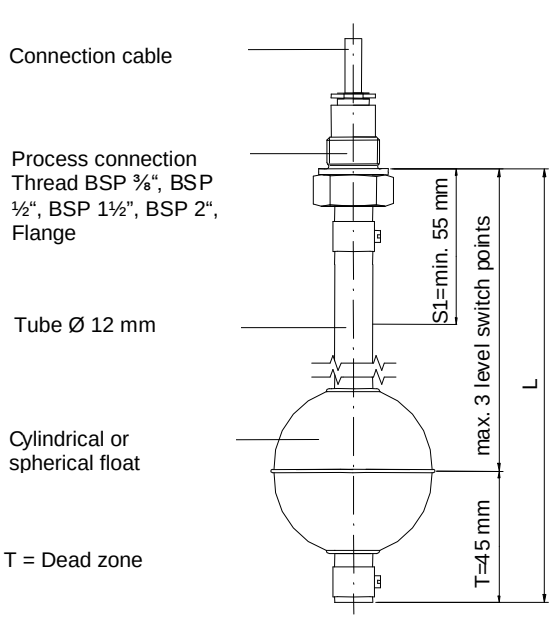
KOMBI - Float Switch with integrated PT100

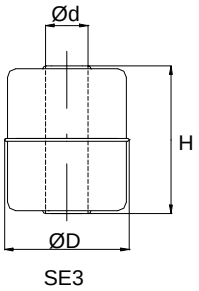
TN 231

in stainless steel 316Ti

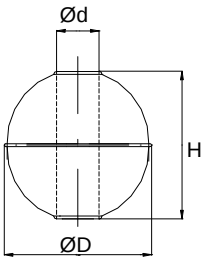
Level Switch Points (max. 3 switch points)		
Max. Power	**Opener / Closer:**	230 V AC; 100 VA; 1 A AC
		230 V DC; 50 W; 0,5 A DC
	Change-over switch:	230 V AC; 40 VA; 1 A AC
		230 V DC; 20 W; 0,5 A DC
Switch function	opener / closer / change-over switch with a rising liquid level	
Temperature: PT100, Output: PT100		
Temperature sensor	PT100 Class B	
	DIN IEC 751	
Technical Data		
Tube length L	Standard: up to 6000 mm, > 6000 mm on request	
Process connection	Thread BSP 3/8“, BSP ½“, BSP 1½“, BSP 2“,	
	flange DN50 PN16, other types on request	
Installation position	vertical, ± 30°	
Medium density	≥ 750 kg/m³	
Temperature	-30°C up to +150°C	
of medium		
Protection	IP 54	
Max. pressure	4,0 MPa	
Switch points	max. 3 level switch points	

Dimensions





SE3



SE4

Float type	Dimensions			Max. operating pressure (MPa)	Max. operating temperature (°C)	Medium density kg/m³	Material
	Ø D (mm)	Ø d (mm)	H (mm)				
SE3 Cylindrical float	44	15	52	1,6	150	≥ 750	316Ti
SE4 Spherical float	52	15	52	4,0	150	≥ 750	316Ti

Product overview / Order table

TN 231

Process connections (installation: vertical, ± 30°)
A Fixing screw thread BSP ⅜“, 316Ti
B Fixing screw thread BSP ½", 316Ti
C Fixing screw thread BSP 1½“, 316Ti
D Fixing screw thread BSP 2", 316Ti
E Flange DIN 2527, Form B, DN50 PN16, 316Ti
X Other types on request

Tube length L (see dimensioned diagram), Tube in 316Ti
Tube length from sealing face of process connection
Tube length L ≤ 6000 mm; L > 6000 mm on request
Dimensions in mm

Float types
Z SE3 (cylindrical float ∅44 in 316Ti)
K SE4 (spherical float ∅52 in 316Ti)
X Other types on request

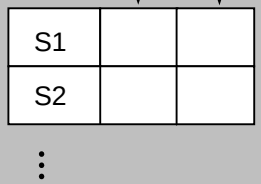
Temperature range
N -30°C up to +80°C
H -30°C up to +150°C

Switch point number (max. 3 switch points)
(see dimensioned diagram)

Cable length
Dimensions in m

Switch function for level (with a rising liquid level)
O Opener
S Closer
U Change-over switch

Switch position
Switch position from sealing face of process connection in mm



Note! **If you have more than 2 switch points, the min. distance between switch point 2 and switch point 3 is: 80 mm, because for designs with more than two switch points a second float is necessary.**
Designs without earthing connection – use low voltage only or external protective earth.

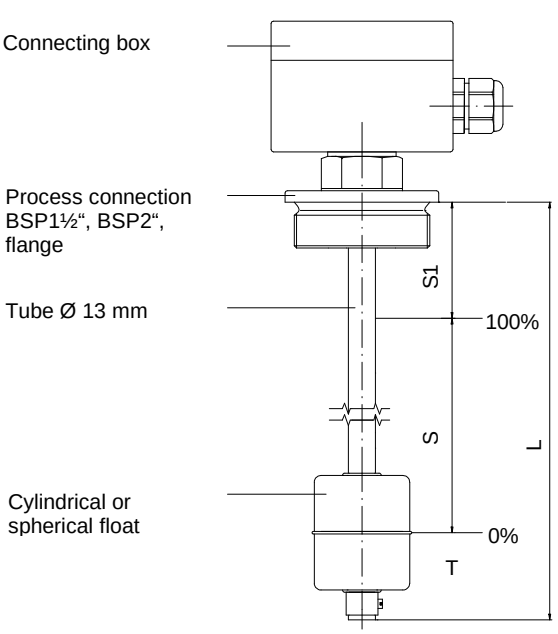
KOMBI – Level sensor 4-20mA with integrated PT100

TN 240

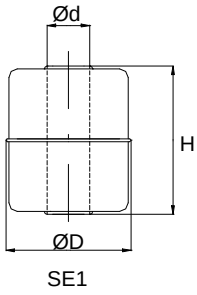
in stainless steel 316Ti

Level output analogue 4-20mA	
Supply voltage	12 – 32 V DC
Output	4 – 20mA (2-wire)
Accuracy	12 mm
Temperature: PT100, Output: PT100	
Temperature sensor	PT100 Class B
	DIN IEC 751
Technical Data	
Tube length L	Standard: up to 6000 mm, > 6000 mm on request
Process connection	Standard: BSP 1½“, BSP 2“, flange DN50 PN16,
	other types on request
Installation position	vertical, ± 30°
Medium density	≥ 750 kg/m³
Temperature of medium	-30°C up to +100°C
Connecting box	Aluminium 75 x 80 x 57 mm
	Polycarbonate 80 x 82 x 55 mm
Protection	IP 66
Max. pressure	4,0 MPa

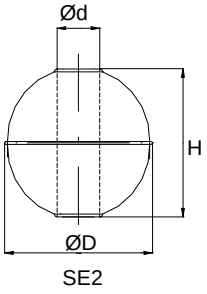
Dimensions



T = dead zone (ca. 40 mm)



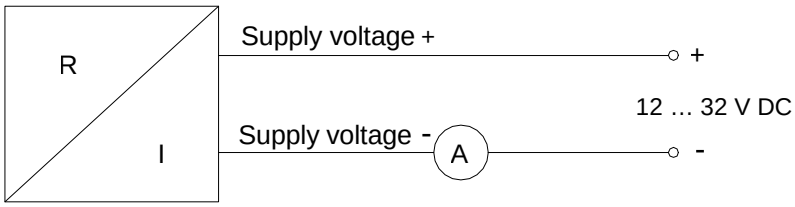
SE1



SE2

Float type	Dimensions			Max. operating pressure (Mpa)	Max. operating temperature (°C)	Medium density kg/m³	Material
	Ø D (mm)	Ø d (mm)	H (mm)				
SE1 Cylindrical float	44	15	52	1,6	100	≥ 750	316Ti
SE2 Spherical float	52	15	52	4,0	100	≥ 750	316Ti

Electrical connection



Product overview / Order table

TN 240

Connecting box
A Aluminium case 75 x 80 x 57 mm, IP66
B Polycarbonate case 80 x 82 x 55 mm, IP66

Process connections (installation: vertical, ± 30°)
A Fixing screw thread BSP $1^1/_2$", 316Ti
B Fixing screw thread BSP 2", 316Ti
C Flange DIN 2527, form B, DN 50 PN 16, 316Ti
X Other types on request

Tube length L (see dimensioned diagram)
Tube in 316Ti
Tube length from sealing face of process connection
Tube length L ≤ 6000 mm; L > 6000 mm on request
Dimensions in mm

Float types
Z SE1 (cylindrical float ∅44 in 316Ti)
K SE2 (spherical float ∅52 in 316Ti)
X Other types on request

TN 240				

S1=	

100% marker for level S1 = distance from sealing face to centre of float

Order instruction: 100% marker S1 in mm, (min. 40 mm)