

# FLOAT LEVEL SWITCH

The label *Trafag Industrial Components* extends the Trafag brand name to instruments manufactured by qualified partner companies. *Trafag Industrial Components* complement the genuine Trafag product range to offer customers a complete portfolio from one single source.

The principle of operation of these instruments is based on the drive of one or more magnetic reed contacts, placed inside of the measuring rod, by one or more floats. Up to 6 floats with individual switchpoints are available for comprehensive monitoring of the liquid level.



## Applications

- Water treatment
- Machine tools
- Mobile hydraulics
- Food & Beverages
- Chemical & Pharmaceutical

### Features

- Up to 6 switch points
- Minimum degree of protection IP65
- Optional temperature sensor PT1000 or thermostat
- Potted electrical contacts

### Reference

- EN61010-1

09/2024

Data sheet H20041f

Standard parameters			
Type	TFSO	TFSS	TFSP / D / V
Floats	Spansil - Butadiene - Acrylonitrile Copolymer	Stainless steel AISI316	PVDF - PP - PVC
Ambient temperature	-30 ... + 55°C	-30 ... +55°C	-30 ... +55°C
Media temperature	Up to 105°C, optional 120°C	Up to 105°C, optional 150°C or 180°C	Up to 130°C (PVDF) Up to 90°C (PP) Up to 60°C (PVC)
Working pressure <sup>1</sup>	20 bar max	50 bar max	6 bar (PVDF or PVC) max 3 bar (PP) max

<sup>1</sup> Depend of type of float.

## Ordering code

				TFS - X - X - XXX - XX - XXXX - XXX - XX - X - X - X - XX						
<b>1. Float and Stem Material<sup>1</sup></b>	Brass and Spansil	<b>O</b>	PVDF	<b>D</b>						
	AISI316 L	<b>S</b>	PVC	<b>V</b>						
	PP	<b>P</b>								
<b>2. Number of contacts</b>	Nr. contact (special versions)	<b>X</b>	4 contacts	<b>4</b>						
	1 contacts	<b>1</b>	5 contacts	<b>5</b>						
	2 contacts	<b>2</b>	6 contacts	<b>6</b>						
	3 contacts	<b>3</b>								
<b>3. Floats<sup>2-5</sup></b>	<i>Float material</i>	<i>Type</i>	<i>Dimension (are in mm)</i>	<i>Float material</i>	<i>Type</i>	<i>Dimension (are in mm)</i>				
	Spansil	TFSO	Ø 13,5x30	<b>B13</b>	PVDF	TFSP	Ø 20x25	<b>F20</b>		
			Ø 25x15	<b>B15</b>			Ø 25x25	<b>F25</b>		
			Ø 30x20	<b>B20</b>			Ø 49x53	<b>F49</b>		
			Ø 20x28	<b>B28</b>			PP	TFSP	Ø 20x25	<b>P20</b>
			Ø 44x50	<b>B44</b>					Ø 49x53	<b>P49</b>
	AISI316 L	TFSS	Ø 30x32	<b>S29</b>	PVC	TFSP	Ø 49x53	<b>V49</b>		
			Ø 41x35	<b>S41</b>			Special float <sup>8</sup>	<b>Z99</b>		
			Ø 52	<b>S53</b>						
			Ø 100	<b>S10</b>						
	<b>4. Electrical contacts<sup>6</sup></b>	SPST, High voltage type	<b>03</b>	SPDT, High voltage and current	<b>07</b>					
		SPST, High current type	<b>04</b>	SPDT, Low voltage and current	<b>7D</b>					
	<b>5. Stem length<sup>5</sup></b>	"L0" max 2000 mm			<b>XXXX</b>					
<b>6. Process connection<sup>3</sup></b>	Inside, G 1/8" m	<b>G06</b>	G 3/4 m, mounting from outside	<b>G34</b>						
	Inside, 1/8" NPT m	<b>N06</b>	3/4 NPT m, mounting from outside	<b>N34</b>						
	Inside, G 1/4" m	<b>G08</b>	Outside, G 2" m	<b>G50</b>						
	Inside, 1/4" NPT m	<b>N08</b>	Outside, 2" NPT m	<b>N50</b>						
	Inside, G 1/2" m	<b>G15</b>	Flange type DIN (to specify dimension for ex. 2")	<b>DN1</b>						
	Inside, 1/2" NPT m	<b>N15</b>	Flange type ANSI (to specify dimension for ex. DN40 PN16)	<b>DN2</b>						
	Outside, G 1" m	<b>G25</b>	Flange 6 holes on Ø60 mm in brass	<b>FOH</b>						
	Outside, 1" NPT m	<b>N25</b>	Flange 6 holes on Ø60 mm in SS	<b>FSH</b>						
	Outside, G 1 1/2" m	<b>G40</b>	Bilge - Bracket connection	<b>B99</b>						
	Outside, 1 1/2" NPT m	<b>N40</b>	Special process connection <sup>9</sup>	<b>X99</b>						
	<b>7. Electrical connection<sup>4-7</sup></b>	Housing Max 5 terminals	<b>W1</b>	Cable gland brass including 3 m PVC cable	<b>P1</b>	PVC Cable L=3 m	<b>C1</b>			
Housing Max 18 terminals		<b>W2</b>	Cable gland brass including 3 m SILICON cable	<b>P2</b>	SILICON Cable L=3 m	<b>C2</b>				
DIN43650 A (29x29 mm)		<b>S1</b>			Bilge armoured cable 3x0.75 - PVC - 10m	<b>A1</b>				
Special <sup>10</sup>		<b>C9</b>	Bilge armoured cable 3x0.75 - PVC - 5m	<b>A5</b>						
<b>8. Temperature class<sup>2</sup></b>	Standard	<b>L</b>	Medium	<b>M</b>	High <sup>16</sup>	<b>H</b>				
<b>9. Wiring<sup>7</sup></b>	Separately wired contacts	<b>I</b>	Common wired contacts	<b>C</b>						
<b>10. Contact status<sup>12</sup></b>	Normally open (NO)	<b>1</b>	Normally closed (NC)	<b>2</b>	SPDT	<b>3</b>				
<b>11. Options</b>	PT1000 EN60751 IEC751 Class A	<b>PT</b>	Other options <sup>11</sup>	<b>ZZ</b>						
	TRM (thermostat). Range: +40 ... +120°C (10°C step); Precision ±5% FS; Differential 10°C ±4°C	<b>TR</b>	Bilge <sup>15</sup>	<b>BL</b>						
	Flexible version with PA11 hose extension <sup>13</sup>	<b>FL</b>								
	Number of contacts (only with option FL)	<b>YY</b>								
	Shipbuilding version - EUOMR <sup>14</sup>	<b>MR</b>								

<sup>1)</sup> See table Materials

<sup>2)</sup> See table Floats

<sup>3)</sup> See table Process Connections

<sup>4)</sup> See table Electrical Connections

<sup>5)</sup> See table Dimensions

<sup>6)</sup> See table Electrical Contacts

<sup>7)</sup> See table Wiring

<sup>8)</sup> For other floats, please contact factory

<sup>9)</sup> For other process connections, please contact factory

<sup>10)</sup> For other electrical connections, please contact factory

<sup>11)</sup> For other options, please contact factory

<sup>12)</sup> If we have more contacts, in our code is necessary to specify the different contact status for each contact.

<sup>13)</sup> Only for option FL choose

<sup>1)</sup> «X» (section 2),

<sup>2)</sup> Number of contacts «YY» (section 11)

<sup>14)</sup> Not available with PVC/PP/PVDF

<sup>15)</sup> Bilge version requires code TFS-S-1-S41-07-0142-B99-A1/A5-L-I-2-MR-BL. See table BILGE

<sup>16)</sup> In combination with cooling tower

## Material

Tab. 1

Type	Stem	Float	Process connection	Flange
TFSO x B xx	Brass	Spansil	Brass	Brass
TFSS x S xx	AISI316	AISI316	AISI316	AISI316
TFSD x F xx	PVDF	PVDF	PVDF	PVDF
TFSP x P xx	PP	PP	PP	PP
TFSV x V xx	PVC	PVC	PVC	PVC

## Floats TFSSO

Tab. 2

						
Code	B15	B20	B25	B28	B45	B44
Material	Spansil	Spansil	Spansil	Spansil	Spansil	Spansil
Dimension (mm)	Ø25x15	Ø30x20	Ø25x	Ø20x28	Ø30x45	Ø44x50
Specific gravity (kg/dm <sup>3</sup> )	0,45	0,4	0,55	0,4	0,35	0,45
Max. Pressure (bar)	20	20	20	20	20	20
Media temperature standard code "L"	105°C	105°C	105°C	105°C	105°C	105°C
Media temperature medium code "M"	120°C	120°C	120°C	120°C	120°C	120°C







## Floats TFSS

Tab. 2

					
Code	S29	S32	S41	S53	S10
Material	AISI316	AISI316	AISI316	AISI316	AISI316
Dimension (mm)	Ø30x32	Ø30x32	Ø41x35	Ø52	Ø100
Specific gravity (kg/dm <sup>3</sup> )	0,75	0,55	0,65	0,7	0,6
Max. Pressure (bar)	30	10	10	50	15
Media temperature standard code "L"	105°C	105°C	105°C	105°C	105°C
Media temperature medium code "M"	150°C	180°C	150°C	150°C	150°C
Media temperature high code "H"	180°C	-	180°C	180°C	180°C

## Floats TFSP / D / V

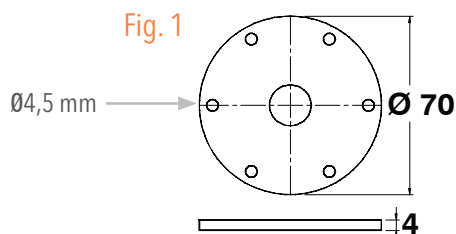
Tab. 2

						
<b>Code</b>	<b>F20</b>	<b>F25</b>	<b>F49</b>	<b>P20</b>	<b>P49</b>	<b>V49</b>
<b>Material</b>	PVDF	PVDF	PVDF	PP	PP	PVC
<b>Dimension (mm)</b>	Ø20x25	Ø25x25	Ø49x53	Ø20x25	Ø49x53	Ø49x53
<b>Specific gravity (kg/dm<sup>3</sup>)</b>	0,7	0,65	0,8	0,5	0,45	0,7
<b>Max. Pressure (bar)</b>	6	6	6	3	3	6
<b>Media temperature standard code "L"</b>	130°C	130°C	130°C	90°C	90°C	60°C

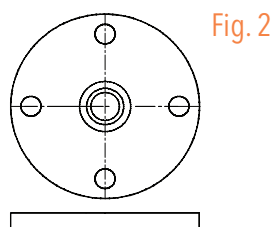
## Process connection

Tab. 3

CODE	PROCESS CONNECTION	TFSO						TFSS				TFSP / D / V					
		B13	B15	B20	B28	B45	B44	S29	S41	S53	S10	F20	F25	F49	P20	P49	V49
G06	G ⅜ m, mounting from inside	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
N06	⅜ NPT m, mounting from inside	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
G08	G ¼ m, mounting from inside	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
N08	¼ NPT m, mounting from inside	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
G15	G ½ m, mounting from inside	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
N15	½ NPT m, mounting from inside	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
G25	G 1" m, mounting from outside		✓	✓				✓				✓	✓		✓		
N25	1" NPT m, mounting from outside		✓									✓	✓		✓		
G40	G 1 ½" m, mounting from outside			✓		✓	✓	✓	✓								
N40	1 ½" NPT m, mounting from outside			✓		✓		✓	✓								
G34	G ¾ m, mounting from outside				✓												
N34	¾ NPT m, mounting from outside				✓												
G50	G 2" m			✓		✓	✓	✓	✓					✓		✓	✓
N50	2" NPT m			✓		✓	✓	✓	✓					✓		✓	✓
DN1	Flange type DIN			✓		✓	✓	✓	✓	✓				✓		✓	✓
DN2	Flage type ANSI			✓		✓	✓	✓	✓	✓				✓		✓	✓
FOH	Flange 6 hole on Ø60mm in brass		✓	✓		✓						✓	✓		✓		
FSH	Flange 6 hole on Ø60mm in SS							✓									



FOH - FSH  
6 holes on Ø60 mm



DN = DIN - ANSI Flanges

### Flanges available

DIN type	ANSI type
DN25 PN6 or PN16 or PN40	1" ANSI 150# RF or 300# RF or 600# RF
DN50 PN6 or PN16 or PN40	2" ANSI 150# RF or 300# RF or 600# RF
DN80 PN6 or PN16 or PN40	3" ANSI 150# RF or 300# RF or 600# RF
DN125 PN6 or PN16 or PN40	4" ANSI 150# RF or 300# RF or 600# RF

## Electrical Connection

**Tab. 4**

Code	W1	W2	S1	C1/C2	P1/P2
Dimension (mm)					
IP Rating	IP65	IP65	IP65	IP65	IP68
Max No of wires	5	18	3	12	12
Material	Die Cast Aluminium	Die Cast Aluminium	Plastic (Polyamide + Fiber glass)	PVC (max105°C) or Silicon (max150°C)	Cable gland brass Cable PVC (max 105°C) or SILICON (max 150°C)
Ambient temperature	-30...+55°C	-30...+55°C	-30...+55°C	-30...+55°C	-30...+55°C

## Dimension (mm)

**Tab. 5**

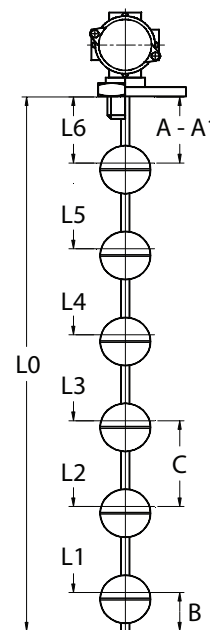
Code	B13	B15	B20	B28	B45 <sup>1</sup>	B45 <sup>2</sup>	B44	S29	S41	S53	S10
A	20	15	15	20	30	35	35	20	30	35	60
A1	35	30	30	35	45	50	55	40	50	55	
B	25	25	20	25	35	40	40	25	35	40	70
C	-	35	40	45	65	75	75	45	65	75	125

Code	F20	F25	F49	P20	P49	V49				
A	20	20	40	20	40	40				
A1	35	35	60	35	60	60				
B	25	25	40	25	40	40				
C	50	50	80	50	80	80				

<sup>1</sup>With contact type 3

<sup>2</sup>With contacts type 4 | 7



A = Flanged connection  
A1 = Threaded connection  
L0 = max length 2000 mm

## Electrical contacts

**Tab. 6**

Type	Power	AC	DC
SPST 03	70 VA / 50 W	300 VAC, 0.5 A	350 VDC, 0.7 A
SPST 04	80 VA / W	250 VAC, 1.3 A	250 VDC, 1.3 A
SPDT 07	60 VA / W	230 VAC, 1 A	230 VDC, 1 A
SPDT 7D	20 VA / W	150 VAC, 0.5 A	150 VDC, 0.5 A

## Max. no. of contacts

**Tab. 6**

Type	TFSO						TFSS				TFSP / D / V					
	B13	B15	B20	B28	B45	B44	S29	S41	S53	S10	F20	F25	F49	P20	P49	V49
SPST 3	1	6	6	4	6		6				6	6		6		
SPST 4					4	6		6	6				6		6	6
SPDT 7					3	6		6	6	6			6		6	6
SPDT 7D			6	3			4				4	6		4		

## Wiring

Tab. 7					
No. of switches	Contacts <sup>1</sup>	Status	No. of wires standard	Electrical connection standard	Electrical connection with option (PT or TR) <sup>2</sup>
1	I	NO	2	All type of electrical connection	W1, W2, C1, C2, P1, P2
		NC	2	All type of electrical connection	W1, W2, C1, C2, P1, P2
		SPDT	3	All type of electrical connection	W1, W2, C1, C2, P1, P2
	C	NO	3	All type of electrical connection	W1, W2, C1, C2, P1, P2
		NC	3	All type of electrical connection	W1, W2, C1, C2, P1, P2
		SPDT	3	All type of electrical connection	W1, W2, C1, C2, P1, P2
2	I	NO	4	W1, W2, C1, C2, P1, P2	W2, C1, C2, P1, P2
		NC	4	W1, W2, C1, C2, P1, P2	W2, C1, C2, P1, P2
		SPDT	6	W2, C1, C2, P1, P2	W2, C1, C2, P1, P2
	C	NO	3	All type of electrical connection	W1, W2, C1, C2, P1, P2
		NC	3	All type of electrical connection	W1, W2, C1, C2, P1, P2
		SPDT	5	W1, W2, C1, C2, P1, P2	W2, C1, C2, P1, P2
3	I	NO	6	W2, C1, C2, P1, P2	W2, C1, C2, P1, P2
		NC	6	W2, C1, C2, P1, P2	W2, C1, C2, P1, P2
		SPDT	9	W2, C1, C2, P1, P2	W2, C1, C2, P1, P2
	C	NO	4	W1, W2, C1, C2, P1, P2	W2, C1, C2, P1, P2
		NC	4	W1, W2, C1, C2, P1, P2	W2, C1, C2, P1, P2
		SPDT	7	W2, C1, C2, P1, P2	W2, C1, C2, P1, P2
4	I	NO	8	W2, C1, C2, P1, P2	W2, C1, C2, P1, P2
		NC	8	W2, C1, C2, P1, P2	W2, C1, C2, P1, P2
		SPDT	12	W2, C1, C2, P1, P2	W2
	C	NO	5	W1, W2, C1, C2, P1, P2	W2, C1, C2, P1, P2
		NC	5	W1, W2, C1, C2, P1, P2	W2, C1, C2, P1, P2
		SPDT	9	W2, C1, C2, P1, P2	W2, C1, C2, P1, P2
5	I	NO	10	W2, C1, C2, P1, P2	W2, C1, C2, P1, P2
		NC	10	W2, C1, C2, P1, P2	W2, C1, C2, P1, P2
		SPDT	15	W2	W2
	C	NO	6	W2, C1, C2, P1, P2	W2, C1, C2, P1, P2
		NC	6	W2, C1, C2, P1, P2	W2, C1, C2, P1, P2
		SPDT	11	W2, C1, C2, P1, P2	W2
6	I	NO	12	W2, C1, C2, P1, P2	W2
		NC	12	W2, C1, C2, P1, P2	W2
		SPDT	18	W2	-
	C	NO	7	W2, C1, C2, P1, P2	W2, C1, C2, P1, P2
		NC	7	W2, C1, C2, P1, P2	W2, C1, C2, P1, P2
		SPDT	13	W2	W2

<sup>1)</sup> I = Independent and C = Common

<sup>2)</sup> 2 wires more than standard

Optional: temperature sensor located at the bottom of the rod inside the instrument.

Temperature sensor		
PT1000	EN 60751 – IEC 751	Class A
TRM (Thermostat)	40°C ... 120°C - 10°C step	Precision ± 5% Differential 10°C ± 4°C

BILGE	
Wiring	
Dimensions (mm)	
Ambient temperature	-30 / + 55 °C - 90% RH
Maximum working temperature	105°C
Weight	1,2 Kg
Minimum degree of protection	IP68



Additional information			
Documents	Data sheet	H20041	<a href="http://www.trafag.com/H20041">www.trafag.com/H20041</a>
	Instructions	H21040	<a href="http://www.trafag.com/H21040">www.trafag.com/H21040</a>

## Modification

a	08/2017	New Datasheet
b	12/2017	Page 4: Table floats Change the title "TFSS" in "TFSP" Added 3 new type of floats (F20, F25, P20) that was in ordering code but not in this table.
c	02/2018	Page 2: Floats Point 3 _ Create new code "Z99" for not standard floats Page 2: Process connection Point 6 _ Create new code "X99" for not standard process connection Page 2: Electrical connection Point 7 _ Create new code "C9" for not standard electrical connection Page 2: Options Point 9 _ Create new code "ZZ" for not standard options Page 2: Contact status Point 10 _ Insert note to defined (for the level TFS) the type switches "If the TFS have more contacts, in our code is necessary to specify the different" contact status for each contact. Page 3: Table floats TFSO Added 2 new type of floats (B13, B15) that was in ordering code but not in this table. Page 4: Table process connection Added 5 new type of floats (B13, B15, F20, F25, P20) that was in ordering code but not in this table. Page 5: Table dimension Added 5 new type of floats (B13, B15, F20, F25, P20) that was in ordering code but not in this table. Page 5: Table Max. no. contacts Added 5 new type of floats (B13, B15, F20, F25, P20) that was in ordering code but not in this table.
d	03/2018	New Version
e	09/2022	Page 2: 2.Number of contacts; 11. options; note Page 3: Float TFSO: B13 -> add B25 and update b15; Floats TFSS: add S32 Page5: Dimensions B15 B quote is 25 not 30
f	11/2022	Page 2: update processing connection: G34, N34 Page 4: update processing connection: G34, N34