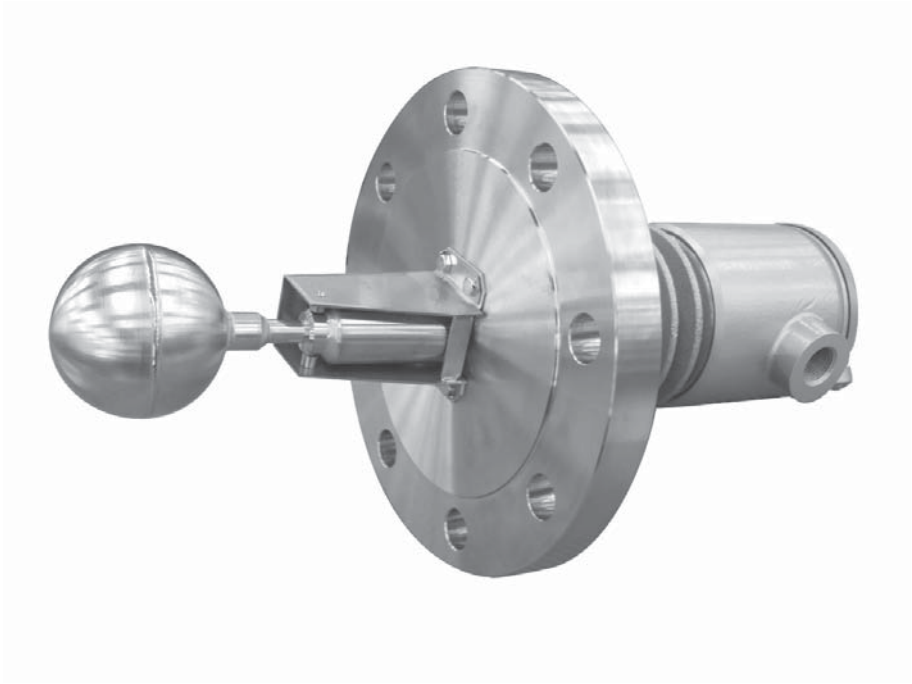
Level | Pressure | Flow | Temperature | Liquid Analysis | Registration | Systems Components | Services | Solutions

Technical Information

Float Level Switch CS5603/CS5613

High Temperature and High Pressure



Application

Float Level Switch CS5603/CS5613 is a float type compact level explosion-proof switch. Being manufactured from steel makes it compatible with most liquids. Float Level Switch CS5603/CS5613 is especially suited for use in high temperature (max. 350°C), high pressure (max. 4.9MPa) applications and simplifies the liquid level control process.

Features and Benefits

- Simple Function
- Safety Operation
- Reliable Mechanical Contact
- Easy Mounting
- High Corrosion Resistance (Stainless Steel)
- Automatic Pump and Valve Control with Nivotester "FTW 325"

TI01006G/08/EN/01.13
71227296

Endress+Hauser

People for Process Automation

Table of Contents

Function and System Design

Operating Principle

Liquid level variations in a tank are detected by the float. Microswitch is activated by repulsive force produced between magnets on the float and magnets arranged inside the housing. Operating signals are emitted as contact ON/OFF signals Wiring is completed as shown in the diagrams below. External output wiring is made so that it forms NO or NC circuit depending on signal utilization.

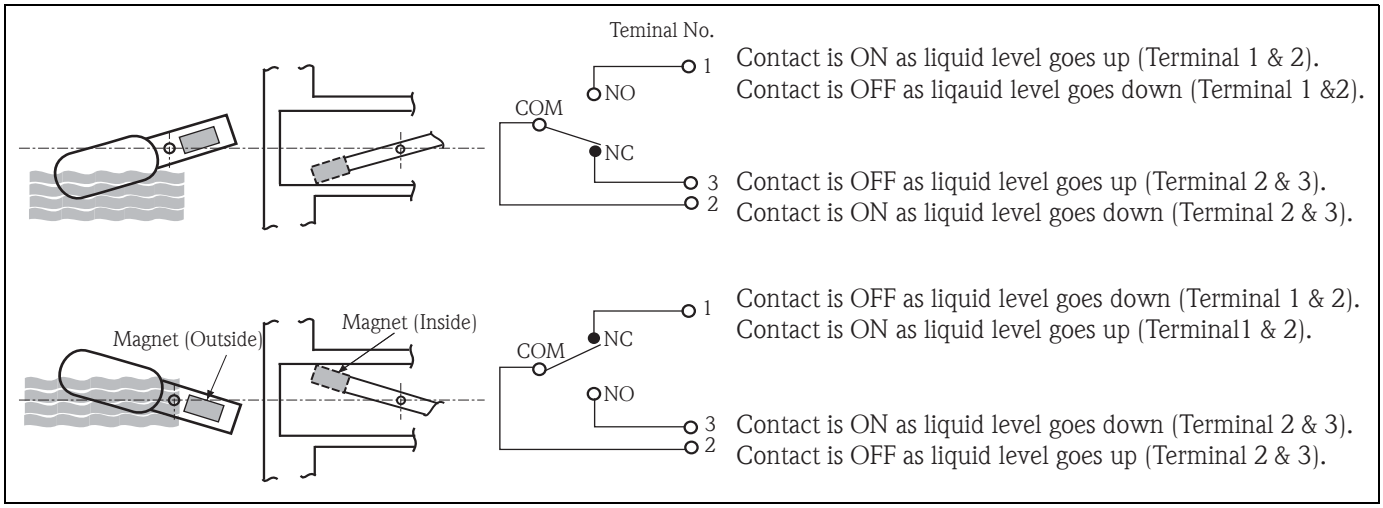


Figure 1: Microswitch Operation

Standard Specification

Ambient Temperature

-10 to +60 °C (14 ° F to 140° F) (operation not possible in freezing temperature)

Measured Liquid Temperature

-20 to +350 °C (-4 ° F to 662° F) (operation not possible in freezing temperature)

Float Shape

The specifications vary depending on the float type.

	Spherical	Cylindrical
Level Accuracy (50 mm displacer)	±5mm (ρ = 1g/cm^3)	±8mm (ρ = 0.8g/cm^3)
Hysteresis	10mm (ρ = 1g/cm^3)	±16mm (ρ = 0.8g/cm^3)
Measured Liquid Specific Density	≥ 0.65g/cm^3	≥ 0.45g/cm^3
Maximum Allowable Working Pressure	4.9MPa (at 200°C max.)	2.35MPa (at 100°C max.)
Containment Temperature	-20 to 350°C (at 4.41MPa max.)	-20 to 350°C (at 1.96MPa max.)

Measured Liquid Specific Density

0.45 to 2.0g/cm^3

Approval

Flame proof, TIIS, d2G4

Protection Class

IP65

Installation

10K 80A RF, flange JIS B2220
20K 80A RF, flange JIS B2220
10K 100A RF, flange JIS B2220
20K 100A RF, flange JIS B2220
3" 150lbs RF, flange ANSI 16.5
3" 300lbs RF, flange ANSI 16.5
4" 150lbs RF, flange ANSI 16.5
4" 300lbs RF, flange ANSI 16.5

Material

Float (Cylindrical, Spherical): SUS316
Flange: SUS304, SUS316
Housing: SCS13, AC4CT6
Cover: AC4A

Contact Capacity

AC250V, 5A (Resistance Load)
DC125V, 0.3A (Resistance Load)

Contact Arrangement

SPDT (Microswitch)

Cable Entry

PF(G)1/2

Weight

Approx. 7.5kg (CS5603: 10K 80A RF, flange JIS B2220)

Paint Color

Silver

Dimensions

CS5603

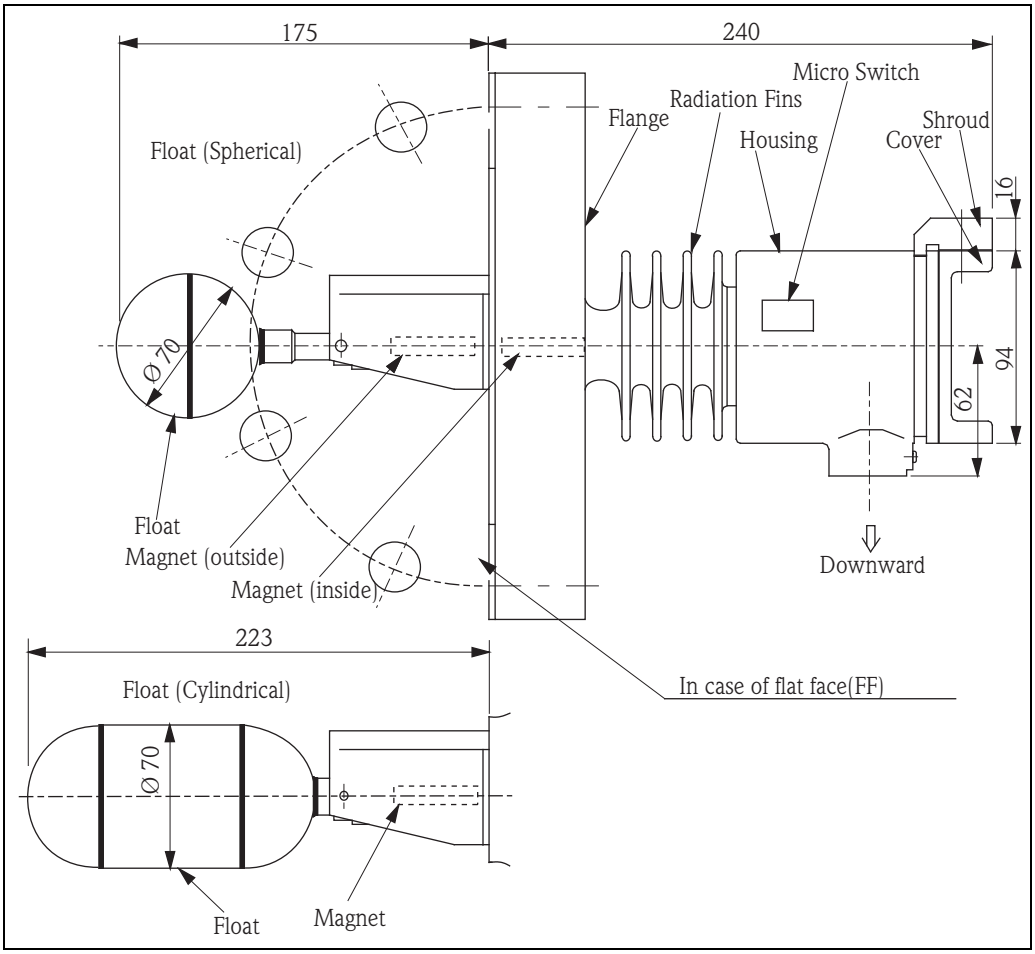


Figure 2: CS5603 Dimensions

Operation Condition: Installation

Flange Type

CS should be mounted horizontally in the tank side wall. Since CS is installed by using 80A or larger flange, use 4B or larger nozzle. For CS with external type chamber, the flange is a 25A connection (refer to Figure 5).

Prepare a size 3B or larger nozzle when using flange type connection.

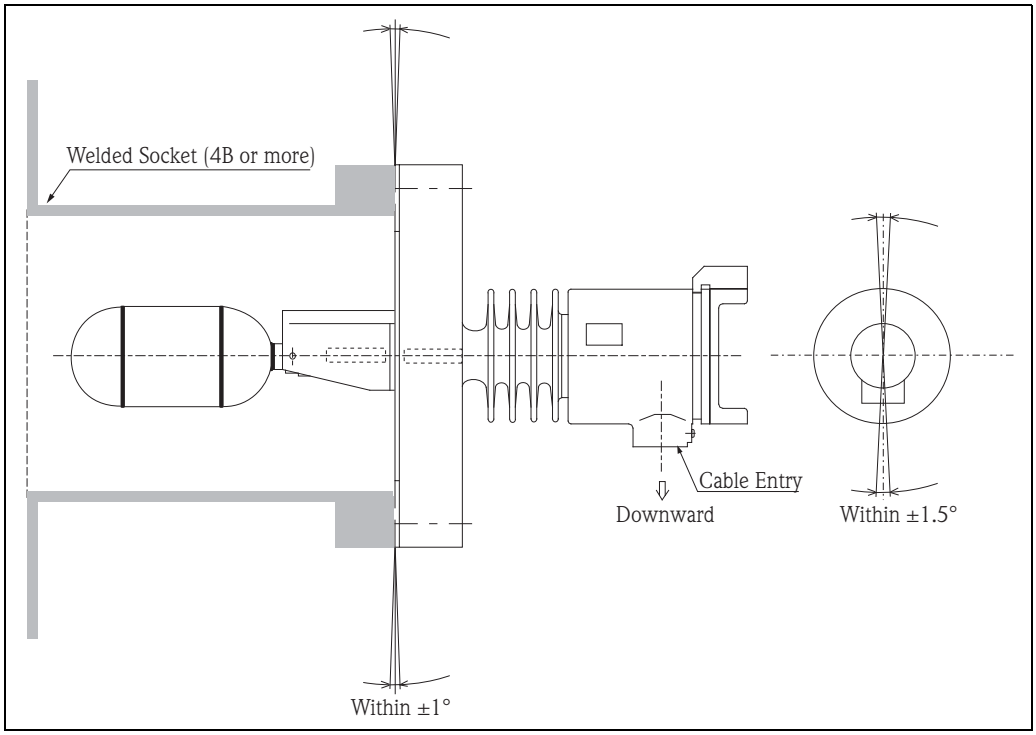


Figure 3: Allowable Angle for Installation

Nozzle Limitation in 80A Flange

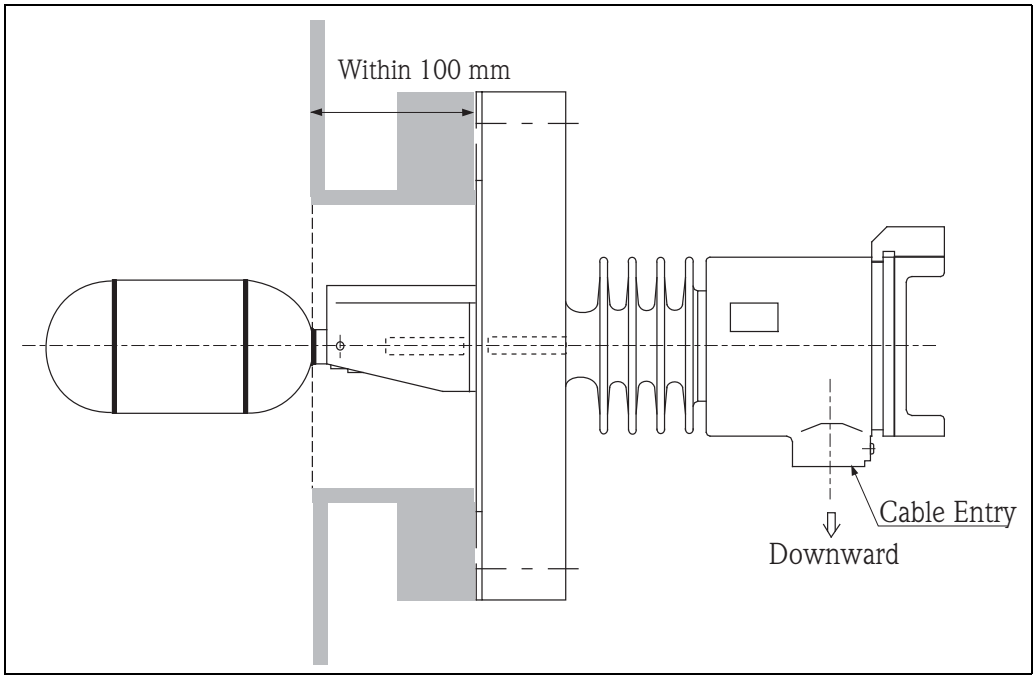


Figure 4: Nozzle Limitation

External Chamber Type

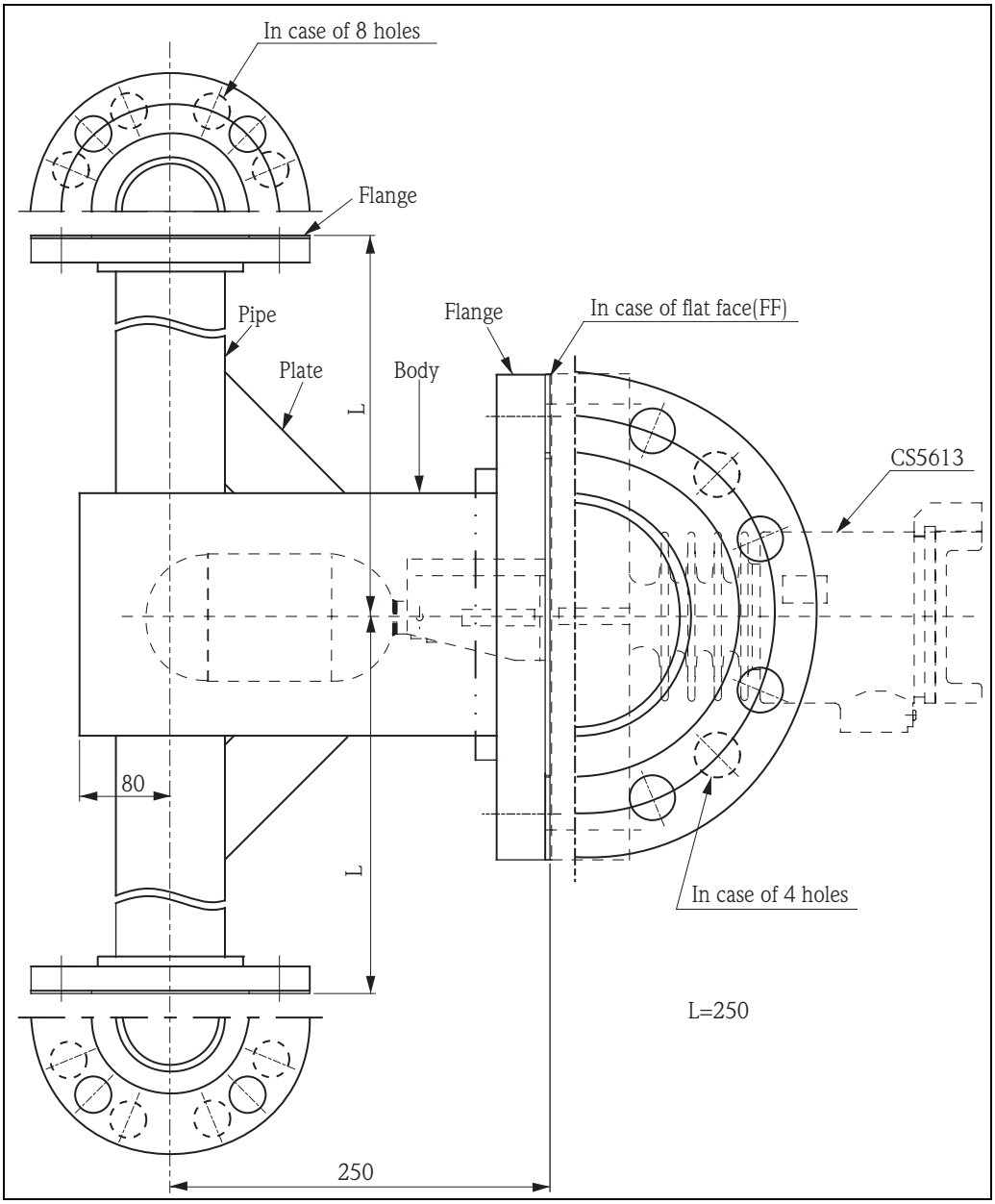


Figure 5: External Chamber Type Installation

Application

- The best suited for high temperature and high pressure tank
- Wetted parts is high corrosion resistance (stainless steel).
- Reliable magnet repulsion performance
- Available for flame proof type

Alarm

When level float switch is combined with an annunciator, it can illuminate an alarm lamp and sound an alarm buzzer.

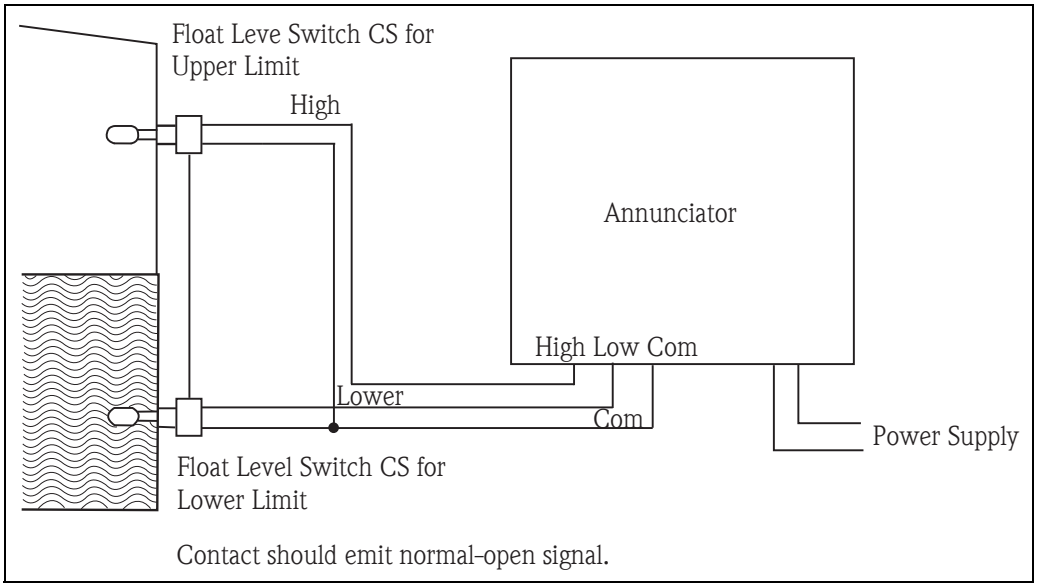


Figure 6: Float Level Switch for Alarm

Control of Pump and Valve

When the level float switch is combined with Nivotester FTW325, no control circuit is required. Valves can be opened or closed by connecting the contact output directly to a pump or valve from Nivotester FTW325.

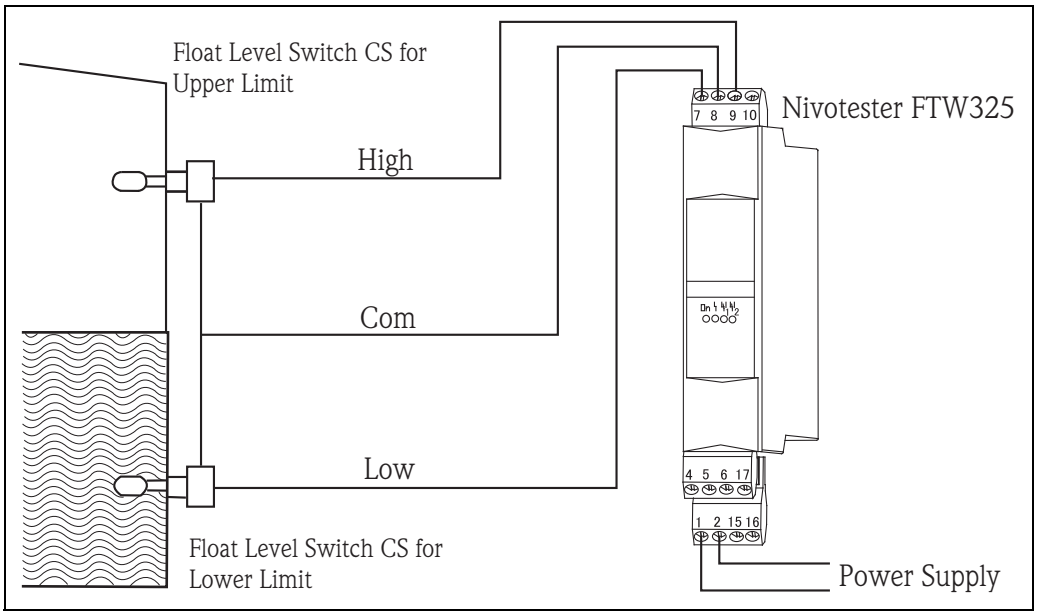


Figure 7: Float Level Switch for Pump and Valve

Certificates and Approvals

Ex Approval	TIIS
	TIIS d2G4
Protection Class	IP65

Order Information

CS5603

010	**Function:**								
	0	Standard function							
	1	Non standard function							
020		**Process Connection:**							
		1	10K 80A RF, flange JIS B2220						
		2	20K 80A RF, flange JIS B2220						
		3	10K 100A RF, flange JIS B2220						
		4	20K 100A RF, flange JIS B2220						
		5	3" 150lbs RF, flange ANSI 16.5						
		6	3" 300lbs RF, flange ANSI 16.5						
		7	4" 150lbs RF, flange ANSI 16.5						
		8	4" 300lbs RF, flange ANSI 16.5						
		9	Special version, TSP-no.to be spec.						
030			**Material Process Connection; Float:**						
			4	SUS304; SUS316, Spherical					
			5	SUS304; SUS316, Cylindrical					
			6	SUS316; SUS316, Spherical					
			7	SUS316; SUS316, Cylindrical					
			9	Special version, TSP-no.to be spec.					
040				**Approval:**					
				2	Flame proof d2G4 E[*1], IP65				
				3	Flame proof d2G4 EB[*2] , IP65				
				9	Special version, TSP-no.to be spec.				
050					**External Chamber:**				
					0	Not used			
					9	Special version, TSP-no.to be spec.			
060						**Cable Entry:**			
						0	PF(G) 1/2		
						1	PF(G) 3/4 cable gland, TF16-11		
						2	PF(G) 3/4 cable gland, TF16-12		
						3	PF(G) 3/4 cable gland, TF16-9		
						9	Special version, TSP-no.to be spec.		
070							**Colour:**		
							0	Sliver	
							9	Special version, TSP-no.to be spec.	
CS5603-									Order code

[*1] TIIS d2G4 (E)
[*2] TIIS d2G4 + cable gland (EB)

Standard

Old	New
PT male thread	R
PT female thread	Rc
PS	Rp
PF	PF(G)

CS5613

10	**Function:**								
	0	Standard function							
	1	Non standard function							
20		**Switch Head Connection:**							
		3	10K 100A RF, flange JIS B2220						
		4	20K 100A RF, flange JIS B2220						
		7	4" 150lbs RF, flange ANSI 16.5						
		8	4" 300lbs RF, flange ANSI 16.5						
		9	Special version, TSP-no.to be spec.						
30			**material Switch Head Connection; Float:**						
			4	SUS304; SUS316, spherical					
			5	SUS304; SUS316,cylindrical					
			6	SUS316; SUS316, spherical					
			7	SUS316; SUS316,cylindrical					
			9	Special version, TSP-no.to be spec.					
40				**Protection class:**					
				2	Flame proof d2G4 E, IP65				
				3	Flame proof d2G4 EB, IP65				
				9	Special version, TSP-no. to be spec.				
50					**External Chamber:**				
					A	STPG370, 10K 25A RF, SS400,flangeJIS B2220			
					B	STPG370, 20K 25A RF, S25C,flangeJIS B2220			
					C	STPG370, 1" 150lbs RF, SS400,flangeANSI B 16.5			
					D	STPG370, 1" 300lbs RF, S25C,flangeANSI B 16.5			
					E	SUS304, 10K 25A RF,SUS304,flange JIS B2220			
					F	SUS304, 20K 25A RF,SUS304,flange JIS B2220			
					G	SUS304, 1" 150lbs RF, SUS304,flangeANSI B 16.5			
					H	SUS304, 1" 300lbs RF, SUS304,flangeANSI B 16.5			
					J	SUS316, 10K 25A RF,SUS316,flangeJIS B2220			
					K	SUS316, 20K 25A RF,SUS316,flangeJIS B2220			
					L	SUS316, 1" 150lbs RF, SUS316,flangeANSI B 16.5			
					M	SUS316, 1" 300lbs RF, SUS316,flangeANSI B 16.5			
					9	Special version, TSP-no. to be spec.			
60						**Cable entry:**			
						0	PF(G) 1/2		
						1	PF(G) 3/4 cable gland, TF16-11		
						2	PF(G) 3/4 cable gland, TF16-12		
						3	PF(G) 3/4 cable gland, TF16-9		
						9	Special version, TSP-no. to be spec.		
70							**Colour:**		
							0	Silver	
							9	Special version, TSP-no. to be spec.	
CS5613-									Order code

*1 TIIS d2G4 (E)
*2 TIIS d2G4 + cable gland (EB)

Standard

Old	New
PT male thread	R
PT female thread	Rc
PS	Rp
PF	PF(G)

Documentation

Technical Information	**TI 373F** Technical Information Nivotester FTW325
Operating Instructions	**BA01010G** Operating Instructions Float Level Switch CS5603/CS5613
	KA199F Compact Instructions Nivotester FTW325

Endress+Hauser Yamanashi Co., Ltd.
862-1 Mitsukunugi Sakaigawa-cho
Fuefuki-shi Yamanashi,
406-0846 Japan

Phone: ++81 55 266 4964
Fax: ++81 55 266 4969
http://www.endress.com

Endress+Hauser

People for Process Automation

TI01006G/08/EN/01.13
71227296
FM/DITA 11.0