

Overview



Pointek CLS300 (standard version) is an inverse frequency shift capacitance level and material detection switch with optional rod/cable choices and configurable output. CLS300 is ideal for detecting liquids, solids, slurries, foam, and interfaces in demanding conditions where high pressure and temperatures are present and has the ability to tune out buildup on the probe.

Benefits

- Active-Shield technology so measurement is unaffected by material buildup or nozzle interference in active shield section
- Performs in extremely abrasive conditions because of solid rod construction
- Three LED indicators for adjustment control, output status, and power
- High-temperature version up to 400 °C (752 °F)

Application

Pointek CLS300 standard version has three LED indicators with basic relay and solid-state switch alarms.

The robust design of CLS300 makes it specifically applicable for heavy solids applications where abrasive materials occur as in the mining industry. The fully potted electronics are unaffected by condensation, dust or vibration.

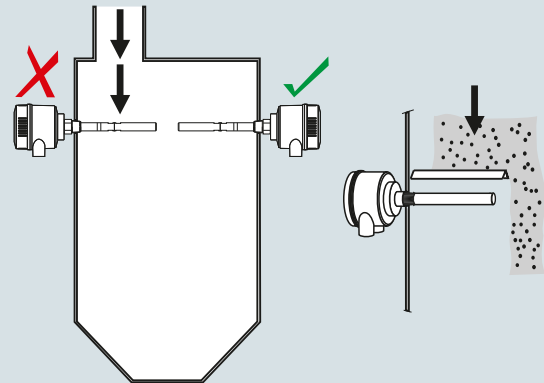
Wetted parts are made of stainless steel with a PFA shield for high chemical resistance, and of ceramic and stainless steel for high temperature version. Materials with low or high dielectric constants can be accurately detected. The unique Active Shield suppresses interference from material buildup or long installation nozzles.

The unique modular design of the Pointek CLS300 provides a wide range of configurations, process connections, extensions and approvals to meet the temperature and pressure requirements of specific applications. The modular design makes ordering easier and reduces stocking requirements. A wide range of probe configurations are available, including rod and cable versions.

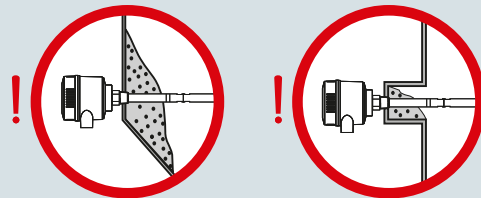
- Key Applications: liquids, slurries, bulk solids, relatively high pressure and temperature, hazardous areas, milling and mining applications

Configuration

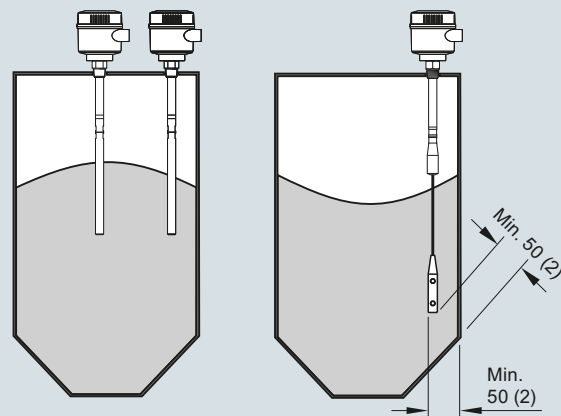
Installation



Keep unit out of path of falling material, or protect probe from falling material.



Build up of material in active shield area does not affect switch operation.



Install probe at least 50 (2) from tank wall.
Note angle of repose and adjust accordingly.

Pointek CLS300 installation, dimensions in mm (inch)

Level Measurement

Point level measurement
RF Capacitance switches

Pointek CLS300 - Standard

Technical specifications

Mode of operation		Design	
Measuring principle	Inverse frequency shift capacitive level detection	Material (enclosure)	Powder-coated aluminum with gasket
Input		Degree of Protection	Standard: Type 4/NEMA 4/IP65 Optional: Type 4/NEMA 4/IP68
Measured variable	Change in picoFarad (pF)	Cable inlet	2 x M20 x 1.5 thread (option: 2 x 1/2" NPT conduit entry including 1 plugged entry)
Output		Controls and displays	
Output signal		Displays	3 LEDs, for probe status, output status and power supply
• Relay output	1 SPDT Form C relay	Potentiometers	2 potentiometers for time delay and sensitivity
- Max. contact voltage	• 30 V DC • 250 V AC	Switches	5 DIP switches for delay on/off, fail-safe high/low, time delay test/adjust, high/low sensitivity, test delay settings
- Max. contact current	• 5 A (DC) • 8 A (AC)	Power supply	
- Max. switching capacity	• 150 W (DC) • 2 000 VA (AC)	Supply	12 ... 250 V AC/DC, 0 ... 60 Hz, galvanically isolated, 2 W
- Time delay (ON and/or OFF)	1 ... 60 s	Certificates and approvals	
• Solid-state output		General Purpose	CSA, FM, CE, RCM
- Output	Galvanically isolated	Flameproof Enclosure with IS Probe	ATEX II 1/2 G EEx d[ia] IIC T6 ... T1 ATEX II 1/2 D T100 °C
- Protection	Against reversed polarity (bipolar)	Dust Ignition Proof with IS Probe	ATEX II 1/2 D T100 °C CSA/FM Class II, Div. 1, Groups E, F, G CSA/FM Class III T4
- Max. switching voltage	• 30 V (DC) • 30 V peak (AC)	Explosion Proof Enclosure with IS Probe	CSA/FM Class I, Div. 1, Groups A, B, C, D CSA/FM Class II, Div. 1, Groups E, F, G CSA/FM Class III T4
- Max. load current	82 mA	Marine	Lloyds Register of Shipping, Categories ENV1, ENV2, and ENV5
- Voltage drop	< 1 V, typical at 50 mA	Overfill Protection	WHG (Germany) VLAREM II (Belgium)
- Time delay (pre or post switching)	1 ... 60 s	Others	Pattern Approval (China)
Accuracy		¹⁾ When operation is in areas classified as hazardous, observe restrictions according to relevant certificate. See also Pressure/Temperature curves starting on page 4/55. ²⁾ Thermal isolator is used if process connection temperature exceeds 85 °C (185 °F). ³⁾ Pressure rating of process seal is temperature dependent. See Pressure/Temperature curves starting on page 4/55.	
Resolution			
• Min. sensitivity (pF)	1 % change in actual capacitance		
• Max. temperature error	0.2 % of actual capacitance value		
Rated operating conditions¹⁾			
Installation conditions			
• Location	Indoor/outdoor		
Ambient conditions			
• Ambient temperature	-40 ... +85 °C (-40 ... +185 °F) ²⁾		
Medium conditions			
	Liquids, bulk solids, slurries and interfaces, and applications with viscous materials		
• Relative dielectric constant ϵ_r	Min. 1.5		
• Process temperature			
- Rod/Cable version	-40 ... +200 °C (-40 ... +392 °F) ²⁾		
- High-temperature version	-40 ... +400 °C (-40 ... +752 °F)		
• Process pressure ³⁾	-1 ... +35 bar g (-14.6 ... +511 psi g)		

Design: Probe

	Rod version	High Temperature version	Cable version
Length	Min. 250 mm (9.8 inch), max. 1 000 mm (40 inch)	Min. 250 mm (9.8 inch), max. 1 000 mm (40 inch)	Min. 1 000 mm (40 inch), max. 25 000 mm (984 inch)
Sensor wetted parts	PFA (no insulation on active probe), 316L stainless steel, PEEK isolators	Ceramic (ZrO ₂ ¹⁾) isolators (no insulation on active probe), 316L stainless steel	316 stainless steel, optional PFA, PEEK isolators
O-ring seal material	FKM (optional FFKM) ²⁾	Graphite ²⁾	FKM (optional FFKM) ²⁾
Thermal isolator	Optional	Standard	Optional
Extension	User selectable length	User selectable length	User selectable cable length

¹⁾ Zirconium Oxide

²⁾ For caustic materials, consult a local sales person for alternative O-rings.
For more information, please visit http://www.automation.siemens.com/aspa_app.

Level Measurement
Point level measurement
RF Capacitance switches

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Selection and Ordering data	Article No.	Selection and Ordering data	Article No.
<p>Pointek CLS300 - Standard - Rod Version with Threaded or Flanged process connection</p> <p>Inverse frequency shift capacitance level and material detection switch with optional rod/cable choices and configurable output. CLS300 is ideal for detecting liquids, solids, slurries, foam, and interfaces in demanding conditions where high pressure and temperatures are present, and has the ability to tune out buildup on the probe.</p> <p>Click on the Article No. for the online configuration in the PIA Life Cycle Portal.</p> <p>Process connection Threaded, 316L stainless steel</p> <p>¾" NPT [(Taper), ANSI/ASME B1.20.1] 1" NPT [(Taper), ANSI/ASME B1.20.1] 1¼" NPT [(Taper), ANSI/ASME B1.20.1] 1½" NPT [(Taper), ANSI/ASME B1.20.1] R ¾" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203] R 1" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203] R 1½" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203] G ¾" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202] G 1" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202] G 1½" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202]</p> <p>Welded flange, 316L stainless steel, raised face</p> <p>1" ASME, 150 lb 1" ASME, 300 lb 1" ASME, 600 lb 1½" ASME, 150 lb 1½" ASME, 300 lb 1½" ASME, 600 lb 2" ASME, 150 lb 2" ASME, 300 lb 2" ASME, 600 lb 3" ASME, 150 lb 3" ASME, 300 lb 3" ASME, 600 lb 4" ASME, 150 lb 4" ASME, 300 lb 4" ASME, 600 lb</p> <p>Welded flange, 316L stainless steel, Type A flat faced</p> <p>DN 25, PN 16 DN 25, PN 40 DN 40, PN 16 DN 40, PN 40 DN 50, PN 16 DN 50, PN 40 DN 80, PN 16 DN 80, PN 40 DN 100, PN 16 DN 100, PN 40 (Note: flange bolting patterns and facings dimensionally correspond to the applicable ASME B16.5 or EN 1092-1 standard.)</p> <p>Probe length (length from flange face) (threaded lengths include process thread) Note: No Y01 needed in Order code for standard lengths</p> <p>Standard version, rod 350 mm (13.78 inch) Extended rod, length 500 mm (19.69 inch) Extended rod, length 750 mm (29.53 inch) Extended rod, length 1 000 mm (39.37 inch)</p>	<p>7ML5650-</p> <p>0 A 0 B 0 C 0 D 1 A 1 B 1 D 3 A 3 B 3 D 5 A 5 B 5 C 5 D 5 E 5 F 5 G 5 H 5 J 5 K 5 L 5 M 5 N 5 P 5 Q 6 A 6 B 6 C 6 D 6 E 6 F 6 G 6 H 6 J 6 K A B C D</p>	<p>Pointek CLS300 - Standard - Rod Version with Threaded or Flanged process connection</p> <p>Inverse frequency shift capacitance level and material detection switch with optional rod/cable choices and configurable output. CLS300 is ideal for detecting liquids, solids, slurries, foam, and interfaces in demanding conditions where high pressure and temperatures are present, and has the ability to tune out buildup on the probe.</p> <p>Add Order code Y01 and plain text: "Insertion length ... mm"</p> <p>Extended rod, factory adjusted length 250 ... 499 mm (9.8 ... 19.65 inch) Extended rod, factory adjusted length 500 ... 749 mm (19.69 ... 29.49 inch) Extended rod, factory adjusted length 750 ... 999 mm (29.53 ... 39.3 inch)</p> <p>Thermal isolator Without thermal isolator With thermal isolator [for process connection temperatures over 85 °C (185 °F)]</p> <p>Wetted seals FKM FFKM [for process temperatures above -20 °C (-4 °F)]</p> <p>Probe material 316L stainless steel with PFA lining and PEEK isolators</p> <p>Approvals Dust Ignition Proof with IS Probe: CE, RCM, ATEX II 1/2 D T100 °C Flameproof Enclosure with IS Probe: CE, RCM, ATEX II 1/2 G EEx d[ia] IIC T6 ... T1, ATEX II 1/2 D T100 °C Flameproof Enclosure with IS Probe, with WHG approval: CE, RCM, ATEX II 1/2 G EEx d[ia] IIC T6 ... T1, ATEX II 1/2 D T100 °C Dust Ignition Proof with IS Probe: CSA/FM Class II, Div. 1, Groups E, F, G CSA/FM Class III T4 Explosion Proof Enclosure with IS Probe: CSA/FM Class I, Div. 1, Groups A, B, C, D CSA/FM Class II, Div. 1, Groups E, F, G CSA/FM Class III T4 General Purpose (CSA, FM) General Purpose (CE, RCM) General Purpose with WHG approval (CSA, FM, CE, RCM)</p> <p>Enclosure and lid Aluminum epoxy coated 2 x ½" NPT via adapter - cable inlet, IP65 2 x M20 x 1.5 cable inlet, IP65 2 x ½" NPT via adapter - cable inlet, IP68 2 x M20 x 1.5 cable inlet, IP68</p> <p>Active shield length Standard length - (125 mm threaded, 105 mm flanged) Extended shield - (250 mm threaded, 230 mm flanged)¹⁾ Extended shield - (400 mm threaded, 380 mm flanged)²⁾</p> <p>¹⁾ Available with Probe version options B ... D, F, G only [≥ 500 mm (19.69 inch)] ²⁾ Available with Probe version options C, D, and G only [≥ 750 mm (29.53 inch)]</p>	<p>7ML5650-</p> <p>E F G 0 1 0 1 0 C D E F G H J K A B C D 0 1 2</p>

Level Measurement

Point level measurement
RF Capacitance switches

Pointek CLS300 - Standard

Selection and Ordering data	Order code	Selection and Ordering data	Article No.
Further designs		Pointek CLS300 - Standard - Cable Version with Threaded or Flanged process connection ↗	7ML5651-
Please add "-Z" to Article No. and specify Order code(s).		Inverse frequency shift capacitance level and material detection switch with optional rod/cable choices and configurable output. CLS300 is ideal for detecting liquids, solids, slurries, foam, and interfaces in demanding conditions where high pressure and temperatures are present, and has the ability to tune out buildup on the probe.	
Total insertion length: enter the total insertion length in plain text description	Y01	↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	
Stainless steel tag [70 x 13 mm (2.75 x 0.5 inch)]: Measuring-point number/identification (max. 27 characters) specify in plain text	Y15	Process connection	
Manufacturer's test certificate: M to DIN 55350, Part 18 and to ISO 9000	C11	Threaded, 316L stainless steel	
Material Inspection Certificate Type 3.1 per EN 10204	C12	1/4" NPT [(Taper), ANSI/ASME B1.20.1]	0 C
Operating Instructions		1 1/2" NPT [(Taper), ANSI/ASME B1.20.1]	0 D
All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation		R 1 1/2" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203]	1 D
Accessories	See page 4/54	G 1 1/2" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202]	3 D
		<u>Welded flange, 316L stainless steel, raised face</u>	
		1 1/2" ASME, 150 lb	5 D
		1 1/2" ASME, 300 lb	5 E
		1 1/2" ASME, 600 lb	5 F
		2" ASME, 150 lb	5 G
		2" ASME, 300 lb	5 H
		2" ASME, 600 lb	5 J
		3" ASME, 150 lb	5 K
		3" ASME, 300 lb	5 L
		3" ASME, 600 lb	5 M
		4" ASME, 150 lb	5 N
		4" ASME, 300 lb	5 P
		4" ASME, 600 lb	5 Q
		<u>Welded flange, 316L stainless steel, Type A flat faced</u>	
		DN 40, PN 16	6 C
		DN 40, PN 40	6 D
		DN 50, PN 16	6 E
		DN 50, PN 40	6 F
		DN 80, PN 16	6 G
		DN 80, PN 40	6 H
		DN 100, PN 16	6 J
		DN 100, PN 40	6 K
		(Note: Flange bolting patterns and facings dimensionally correspond to the applicable ASME B16.5 or EN 1092-1 standard.)	
		Probe length	
		(length from flange face)	
		(threaded lengths include process thread)	
		<u>Note: No Y01 needed in Order code for standard lengths</u>	
		Extended cable, 3 000 mm (118.11 inch), length can be shortened by customer	A
		Extended cable, 6 000 mm (236.22 inch), length can be shortened by customer	B
		<u>Add Order code Y01 and plain text: "Insertion length ... mm"</u>	
		Extended cable, 500 ... 1 000 mm (19.69 ... 39.37 inch)	E
		Extended cable, 1 001 ... 5 000 mm (39.41 ... 196.85 inch)	F
		Extended cable, 5 001 ... 10 000 mm (196.89 ... 393.70 inch)	G
		Extended cable, 10 001 ... 15 000 mm (393.74 ... 590.55 inch)	H
		Extended cable, 15 001 ... 20 000 mm (590.59 ... 787.40 inch)	J
		Extended cable, 20 001 ... 25 000 mm (787.44 ... 984.25 inch)	K

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<p>Pointek CLS300 - Standard - Cable Version with Threaded or Flanged process connection</p> <p>Inverse frequency shift capacitance level and material detection switch with optional rod/cable choices and configurable output. CLS300 is ideal for detecting liquids, solids, slurries, foam, and interfaces in demanding conditions where high pressure and temperatures are present, and has the ability to tune out buildup on the probe.</p>	<p>7ML5651-</p>	<p>Further designs</p> <p>Please add "-Z" to Article No. and specify Order code(s).</p>	
<p>Thermal isolator</p> <p>Without thermal isolator</p> <p>With thermal isolator [for process connection temperatures over 85 °C (185 °F)]</p>	<p>0</p> <p>1</p>	<p>Total insertion length: enter the total insertion length in plain text description</p> <p>Stainless steel tag [70 x 13 mm (2.75 x 0.5 inch)]: Measuring-point number/identification (max. 27 characters) specify in plain text</p> <p>Manufacturer's test certificate: M to DIN 55350, Part 18 and to ISO 9000</p> <p>Material Inspection Certificate Type 3.1 per EN 10204</p>	<p>Y01</p> <p>Y15</p> <p>C11</p> <p>C12</p>
<p>Wetted seals</p> <p>FKM</p> <p>FFKM [for process temperatures above -20 °C (-4 °F)]</p>	<p>0</p> <p>1</p>	<p>Operating Instructions</p> <p>All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation</p>	
<p>Probe material</p> <p>Bare 316L stainless steel cable, PEEK isolators and 316L stainless steel cable weight</p> <p>PFA coated cable, PEEK isolators and 316L stainless steel cable weight</p>	<p>0</p> <p>1</p>	<p>Accessories</p>	<p>See page 4/54</p>
<p>Approvals</p> <p>Dust Ignition Proof with IS Probe: CE, RCM, ATEX II 1/2 D T100 °C</p> <p>Flameproof Enclosure with IS Probe: CE, RCM, ATEX II 1/2 G EEx d[ia] IIC T6 ... T1, ATEX II 1/2 D T100 °C</p> <p>Flameproof Enclosure with IS Probe, with WHG approval: CE, RCM, ATEX II 1/2 G EEx d[ia] IIC T6 ... T1, ATEX II 1/2 D T100 °C</p> <p>Dust Ignition Proof with IS Probe: CSA/FM Class II, Div. 1, Groups E, F, G CSA/FM Class III T4</p> <p>Explosion Proof Enclosure with IS Probe: CSA/FM Class I, Div. 1, Groups A, B, C, D CSA/FM Class II, Div. 1, Groups E, F, G CSA/FM Class III T4</p> <p>General Purpose (CSA, FM)</p> <p>General Purpose (CE, RCM)</p> <p>General Purpose with WHG approval (CSA, FM, CE, RCM)</p>	<p>C</p> <p>D</p> <p>E</p> <p>F</p> <p>G</p> <p>H</p> <p>J</p> <p>K</p>		
<p>Enclosure and lid</p> <p><u>Aluminum epoxy coated</u></p> <p>2 x 1/2" NPT via adapter - cable inlet, IP65</p> <p>2 x M20 x 1.5 cable inlet, IP65</p> <p>2 x 1/2" NPT via adapter - cable inlet, IP68</p> <p>2 x M20 x 1.5 cable inlet, IP68</p>	<p>A</p> <p>B</p> <p>C</p> <p>D</p>		
<p>Active shield length</p> <p>Standard length - (125 mm threaded, 105 mm flanged)</p> <p>Extended shield - (250 mm threaded, 230 mm flanged)</p> <p>Extended shield - (400 mm threaded, 380 mm flanged)¹⁾</p>	<p>0</p> <p>1</p> <p>2</p>		

¹⁾ Available with Probe version options A, B, F ... K, only [≥ 1 000 mm (39.7 inch)].

Level Measurement

Point level measurement
RF Capacitance switches

Pointek CLS300 - Standard

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Selection and Ordering data	Article No.	Selection and Ordering data	Article No.
Pointek CLS300 - Standard - High Temperature Rod Version with Threaded or Flanged process connection Inverse frequency shift capacitance level and material detection switch with optional rod/cable choices and configurable output. CLS300 is ideal for detecting liquids, solids, slurries, foam, and interfaces in demanding conditions where high pressure and temperatures are present, and has the ability to tune out buildup on the probe. ↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	7ML5652- 0 -	Pointek CLS300 - Standard - High Temperature Rod Version with Threaded or Flanged process connection Inverse frequency shift capacitance level and material detection switch with optional rod/cable choices and configurable output. CLS300 is ideal for detecting liquids, solids, slurries, foam, and interfaces in demanding conditions where high pressure and temperatures are present, and has the ability to tune out buildup on the probe. Add Order code Y01 and plain text: "Insertion length ... mm" Extended rod, factory adjusted length 250 ... 499 mm (9.8 ... 19.65 inch) Extended rod, factory adjusted length 500 ... 749 mm (19.69 ... 29.49 inch) Extended rod, factory adjusted length 750 ... 999 mm (29.53 ... 39.3 inch)	7ML5652- 0 -
Process connection Threaded, 316L stainless steel ¾" NPT [(Taper), ANSI/ASME B1.20.1] 1" NPT [(Taper), ANSI/ASME B1.20.1] 1¼" NPT [(Taper), ANSI/ASME B1.20.1] 1½" NPT [(Taper), ANSI/ASME B1.20.1] R ¾" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203] R 1" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203] R 1½" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203] G ¾" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202] G 1" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202] G 1½" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202]	0 A 0 B 0 C 0 D 1 A 1 B 1 D 3 A 3 B 3 D	E F G 0 0 C D E F G H J K	0 0 C D E F G H J K
Welded flange, 316L stainless steel, raised face 1" ASME, 150 lb 1" ASME, 300 lb 1" ASME, 600 lb 1½" ASME, 150 lb 1½" ASME, 300 lb 1½" ASME, 600 lb 2" ASME, 150 lb 2" ASME, 300 lb 2" ASME, 600 lb 3" ASME, 150 lb 3" ASME, 300 lb 3" ASME, 600 lb 4" ASME, 150 lb 4" ASME, 300 lb 4" ASME, 600 lb	5 A 5 B 5 C 5 D 5 E 5 F 5 G 5 H 5 J 5 K 5 L 5 M 5 N 5 P 5 Q	0 C D E F G H J K	0 C D E F G H J K
Welded flange, 316L stainless steel, Type A flat faced DN 25, PN 16 DN 25, PN 40 DN 40, PN 16 DN 40, PN 40 DN 50, PN 16 DN 50, PN 40 DN 80, PN 16 DN 80, PN 40 DN 100, PN 16 DN 100, PN 40 (Note: Flange bolting patterns and facings dimensionally correspond to the applicable ASME B16.5 or EN 1092-1 standard.)	6 A 6 B 6 C 6 D 6 E 6 F 6 G 6 H 6 J 6 K	A B C D	A B C D
Probe length (length from flange face) (threaded lengths include process thread) Note: No Y01 needed in Order code for standard lengths Standard version rod, 350 mm (13.78 inch) Extended rod, length 500 mm (19.69 inch) Extended rod, length 750 mm (29.53 inch) Extended rod, length 1 000 mm (39.37 inch)	A B C D	0 1 2	0 1 2
		1) Available with Probe version options B ... D, F, G only [≥ 500 mm (19.69 inch)] 2) Available with Probe version options C, D, and G only [≥ 750 mm (29.53 inch)]	

Selection and Ordering data	Order code
Further designs	
Please add "-Z" to Article No. and specify Order code(s).	
Total insertion length: enter the total insertion length in plain text description ¹⁾	Y01
Stainless steel tag [70 x 13 mm (2.75 x 0.5 inch)]: Measuring-point number/identification (max. 27 characters) specify in plain text	Y15
Manufacturer's test certificate: M to DIN 55350, Part 18 and to ISO 9000	C11
Material Inspection Certificate Type 3.1 per EN 10204	C12
Operating Instructions	
All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation	
Accessories	See page 4/54

¹⁾ Not available with Probe length option B.