

sitrans

LC 300

SIEMENS

Safety Guidelines

Warning notices must be observed to ensure personal safety as well as that of others, and to protect the product and the connected equipment. These warning notices are accompanied by a clarification of the level of caution to be observed.

Qualified Personnel

This device/system may only be set up and operated in conjunction with this manual. Qualified personnel are only authorized to install and operate this equipment in accordance with established safety practices and standards.

Warning: This product can only function properly and safely if it is correctly transported, stored, installed, set up, operated, and maintained.

Note: Always use product in accordance with specifications.

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Disclaimer of Liability

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While we have verified the contents of this manual for agreement with the instrumentation described, variations remain possible. Thus we cannot guarantee full agreement. The contents of this manual are regularly reviewed and corrections are included in subsequent editions. We welcome all suggestions for improvement.

Technical data subject to change.

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Introduction to the SITRANS LC 300

The SITRANS LC 300 is a cost-effective instrument for level measurement in high accuracy applications such as the processing of food and beverages, pharmaceuticals, detergents and pet food. It performs in liquids, bulk solids and slurries, including viscous (conductive or non-conductive) materials, even in challenging environments involving vapour and dust.

The LC 300 is a 2-wire instrument combining a sophisticated, yet easy-to-adjust, microprocessor transmitter with field-proven Pointek CLS 300 probes.

The electronic component contains the measurement module (driver) and the microprocessor module. This set of parts forms a calibrated pair, so that readout in pico Farads (pF) is achieved. An optional safety barrier can be included in the electronic component.

The probe comprises a measurement section and an active shield section that is a fixed length. The probe is the primary system sensor, and it indicates the electrical capacitance value of the measurement section relative to the environment (tank wall, stilling well, or conductive material). This part of the probe connects to the capacitance detector in the electronic transmitter.

SITRANS LC 300 Applications

- Food, beverages, and water
- Liquids, slurries, powders, granules, and solids
- Power industry (fly-ash)

SITRANS LC 300 Features

- NPT, BSPT, and JIS connections, DIN and ANSI flanges (other connections upon request)
- Corrosion resistant construction, PFA, PEEK^{TM 1}, and 316L stainless steel wetted parts
- 25 m (82 ft) maximum insertion length
- Rugged shear and abrasion resistant probe
- Fully adjustable range: level, damping, diagnostics, etc.
- Field adjustable insertion length for probes without an insulation jacket
- Probe input ESD protection to 55 kV continuous discharge
- Field proven and patented Active-Shield technology and variable frequency oscillator

SITRANS LC 300 Outputs

- 4 – 20 or 20 – 4 mA, 2-wire current loop circuit
- Isolated from the measurement circuit
- Current signalling according to NAMUR NE 43

¹ PEEK is a registered trademark of Victrex plc.

Safety Notes

Special attention must be paid to warnings and notes highlighted from the rest of the text by grey boxes.



WARNING: relates to a caution symbol on the product, and means that failure to observe the necessary precautions can result in death, serious injury, and/or considerable material damage.







WARNING: means that failure to observe the necessary precautions can result in death, serious injury, and/or considerable material damage.

CAUTION: means that failure to observe the necessary precautions can result in considerable material damage.

Note: means important information about the product or that part of the instruction manual.

Safety marking symbols

	Alternating Current
	Direct Current
	Earth (ground) Terminal
	Protective Conductor Terminal

The Manual

Notes:

- Please follow the installation and operating procedures for a quick, trouble-free installation and to ensure the maximum accuracy and reliability of your Siemens Milltronics instrument.
- This manual applies to the SITRANS LC 300 only.

This manual will help you set up your LC 300 for optimum performance. We always welcome suggestions and comments about manual content, design, and accessibility.

Please direct your comments to techpubs@siemens-milltronics.com. For the complete library of Siemens Milltronics manuals, go to www.siemens-milltronics.com.

Abbreviations and Identifications

Short form	Long Form	Description	Units
CE / FM / CSA	Conformité Européene / Factory Mutual / Canadian Standards Association	safety approval	
DCS	Distributed Control System	control room apparatus	
Ex	Explosion Proof		
Exd	Flame Proof		
ESD	Electrostatic Discharge		
LRV	Lower Range Value	value for 0 % (in pF)	4 mA
PED	Pressure Equipment Directive	safety approval	
pF	pico Farads	10^{-12}	Farad
PV	Primary Variable	measured value	
Stilling Well	Grounded metal tube with openings		
URV	Upper Range Value	value for 100% (in pF)	20 mA

Technical Specifications: LC 300

Power

- Supply voltage 9 – 32 Vdc any polarity, 2-wire current loop (9 V @ 22 mA), max. resistance value 550 Ω @ 24 V DC
- Measurement signal 4 – 20 mA or 20 – 4 mA

Environmental

Location	indoor/outdoor
Altitude	2000 m max.
Ambient temperature	– 40 to 85°C (– 40 to 185°F)
Relative humidity	suitable for outdoors (Type 4 / NEMA 4 / IP 65 enclosure)
Installation category	II
Pollution degree	4

Performance

Measurement range	0 to 3300 pF
Minimum span	3.3 pF
Measurement frequency	600 kHz max.
Accuracy	< 0.5% of actual measurement value
Non-linearity and reproducibility	< 0.4% full scale and actual measurement value
Temperature stability	max. temperature drift of 0.25% of actual capacitance value
Safety	<ul style="list-style-type: none">- current signalling according to NAMUR NE 43, signal 3.8 to 20.5, fault ≤ 3.6 or ≥ 21 mA (22 mA)- probe input ESD protected to 55 kV- inputs/outputs fully galvanically isolated- polarity-insensitive current loop- wiring connections max. 2.5 mm², PED / 97 / 23 / EC
Diagnostics ¹	<ul style="list-style-type: none">- primary variable (PV) out of measurement limits- failure in measurement circuit- memory check sum- system watch dog

¹ See Fault Values on page 18 for detailed descriptions of Diagnostic messages.

Outputs

Current loop

- continuous signal 4 to 20 mA / 20 to 4 mA

User Interface

Display

- local LCD 4-digit (each digit can be 0 to 9 or limited alpha characters)

Function rotary switch

- position 0 Actual measurement value (in pF)
- position 1 Zero value (LRV) 0% of scale
- position 2 Span value (URV) 100% of scale
- position 3 Actual mA signal and system fault setting according to NAMUR NE 43
- position 4 Diagnostic information/Software revision
- position 5 Damping

Electrodes

Process connections

- threaded connections AISI 316 L stainless steel, NPT/BSPT/JIS, $\frac{3}{4}$ " 1" $\frac{1}{4}$ " and 1 $\frac{1}{2}$ " rod probe connection, 1 $\frac{1}{4}$ " and 1 $\frac{1}{2}$ " rope probe connection
- flat-faced flanges AISI 316 L stainless steel, ANSI (1" to 4"), DIN (NW25 to NW100)¹

Probe diameter

- rod probes 19 mm/0.75 inch (with or without PFA jacket)
- rope probe version 9 mm/ 0.35 inch, with PFA jacket
6 mm/ 0.24 inch, without PFA jacket

Probe lengths

- rod version: min. 300 mm (12") - max. 5000 mm (197")
- rope/Cable version: min. 500 mm (20") - max. 25000 mm (984")

Active Shield length

- rod version: 100 mm
- rope/cable version: 125 mm

Max. tensile load (rope/cable version)

- 1900kg (4188 lbs)

¹. Other process connections available on request. See Probe: Standard on page 9, or Probe: Cable on page 10.

Max. horizontal tensile load

- 30 Nm (Rod version)

Wetted Parts

AISI 316L/PEEK™/PFA¹

Enclosure (Electronics)

- construction aluminium, epoxy coated
- ingress protection Type 4 / NEMA 4 / IP65
- cable inlet 2 X ½" NPT

Weight

Depends on configuration

Process Conditions

Pressure range ²	-1 to 35 barg (-14.6 to 511 psig)
Temperature range	-40 to 200° C (-40 to 392° F)
Min. dielectric constant (ϵ_r):	1.5

Approvals*

- CE, CENELEC, FM, CSA_{NRTL/C}, ATEX
- Lloyd's Register of Shipping, categories ENV1, ENV2, and ENV5

*Please verify against device nameplate.

1. For a chemical resistance list for PFA/PEEK, contact your local distributor.

2. See the Pressure/Temperature Curve in Appendix I: Application Notes on page 21.

Installation

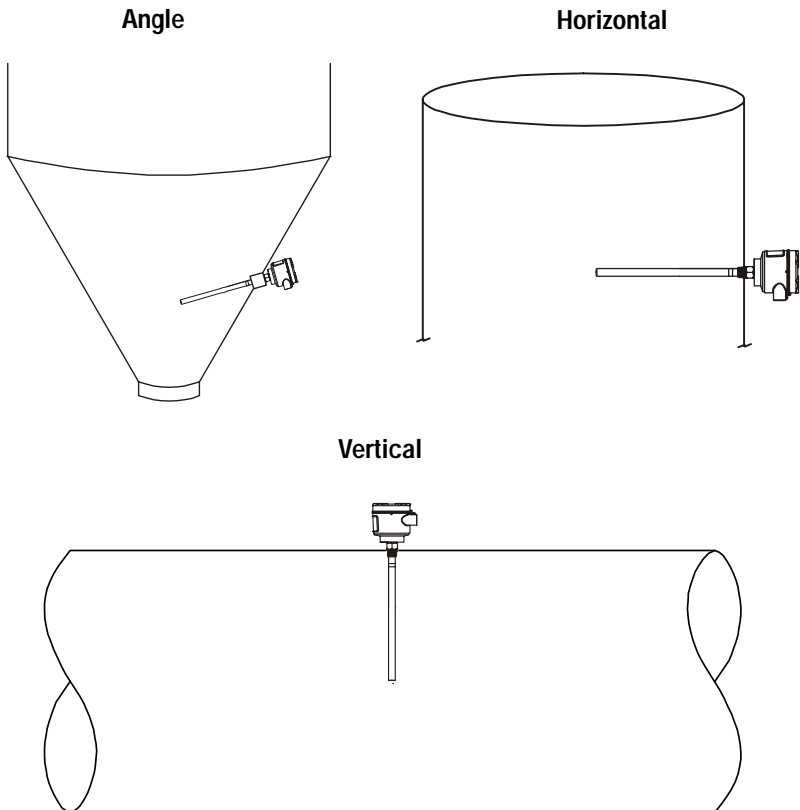
Location

Notes:

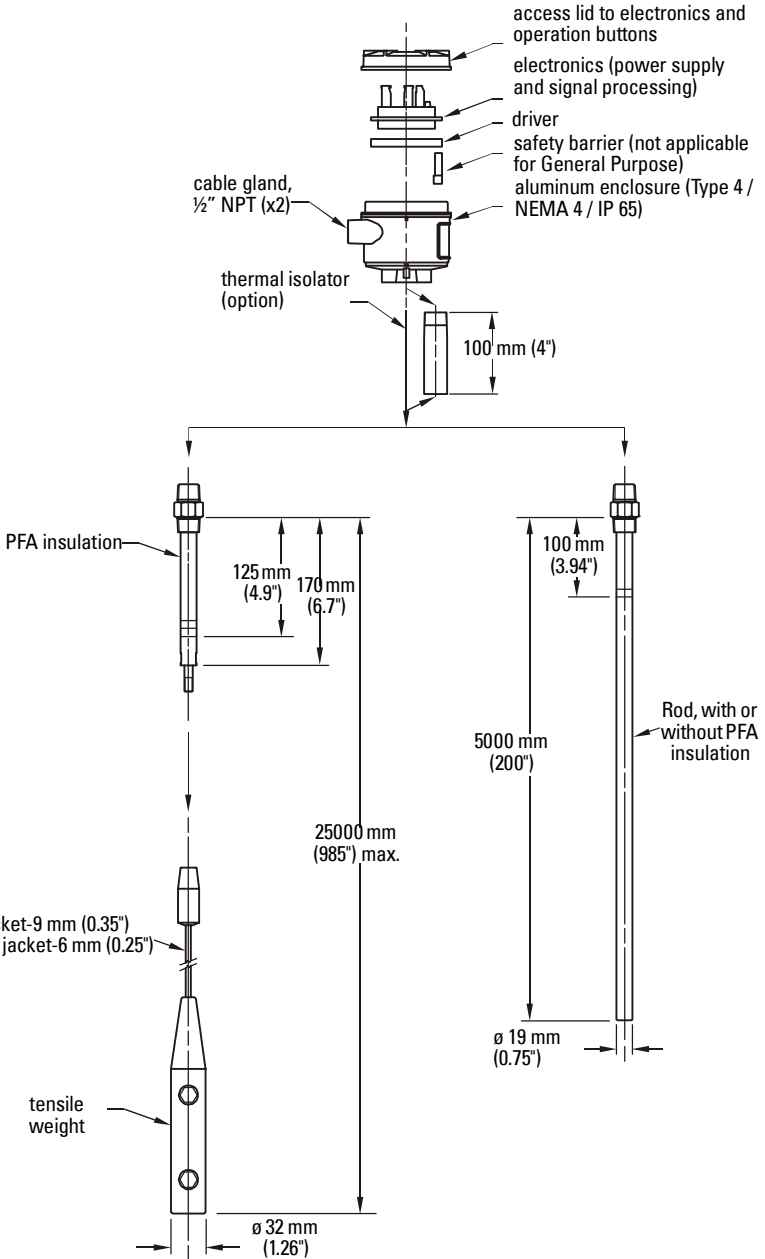
- Installation shall only be performed by qualified personnel and in accordance with local governing regulations.
- This product is susceptible to electrostatic shock. Follow proper grounding procedures.

The SITRANS LC 300 as supplied in the standard probe lengths is normally mounted on the vessel top or through the tank wall at the detection level (if used as Point Level switch).

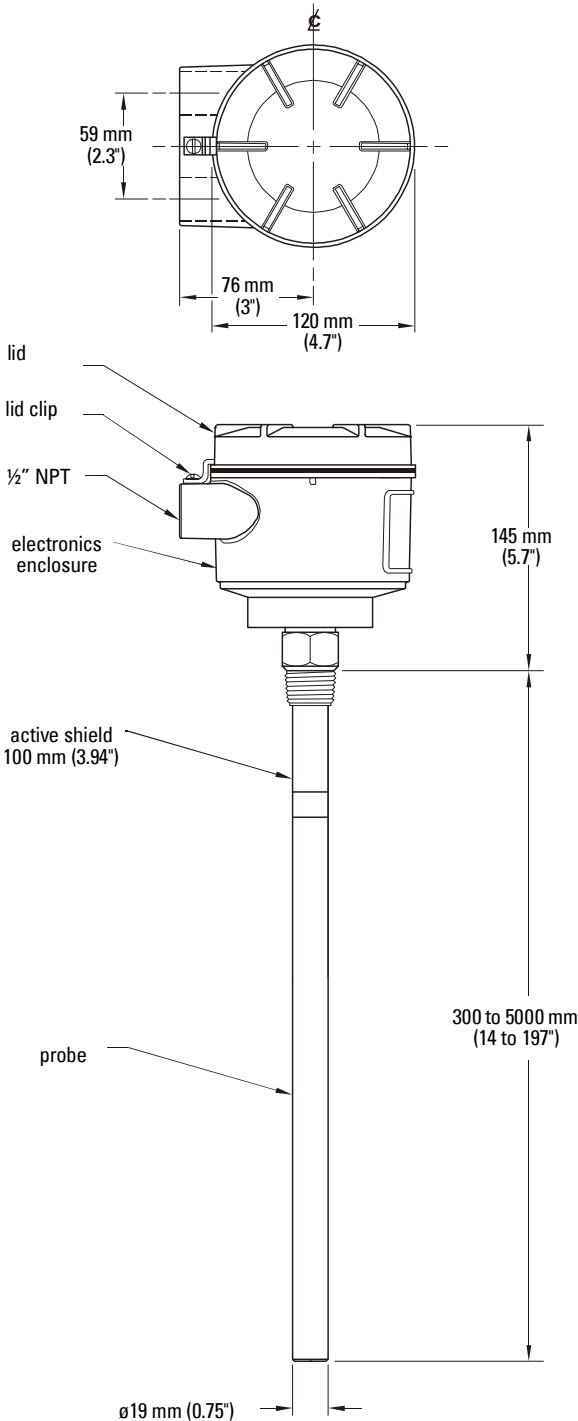
The cable version is designed for top mounting. The cable suspends vertically so that it reaches into the process at the desired detection level (high or low detection alarm).



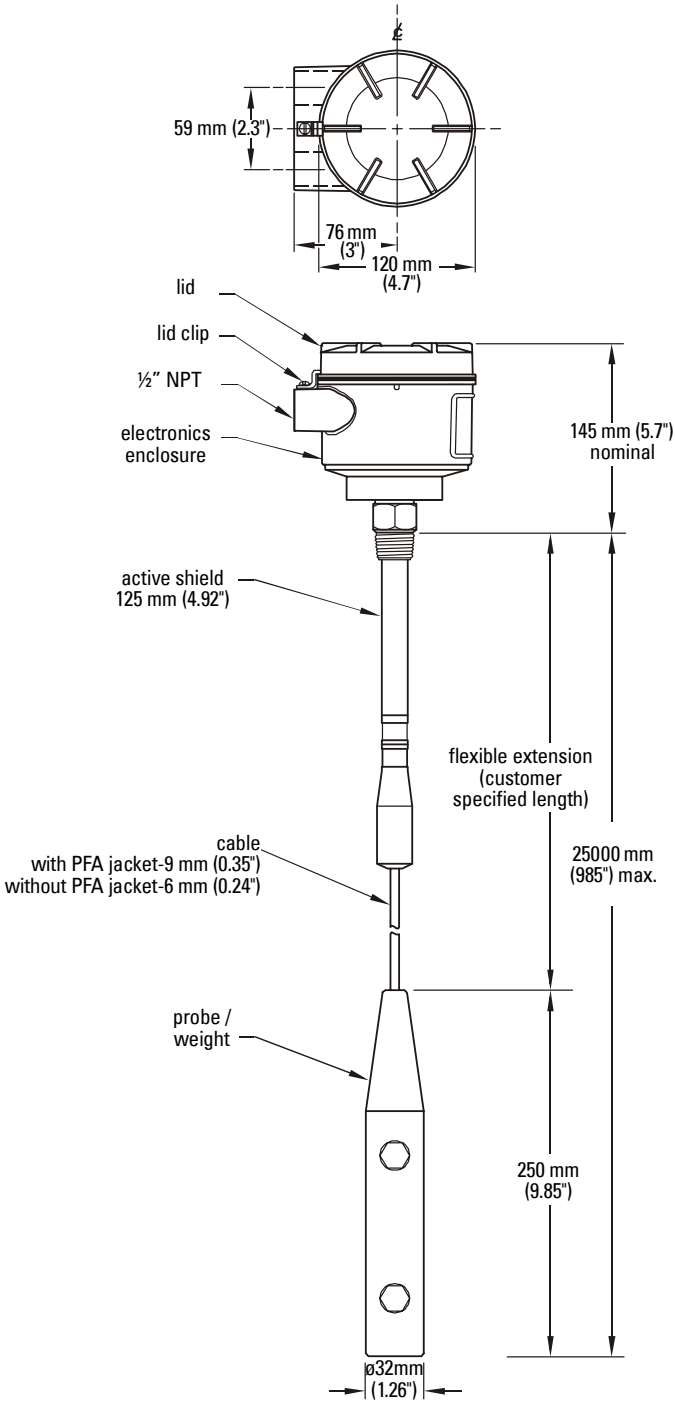
Configuration and Dimensions



Rod Version with PFA jacket



Cable Version



Configuration and Dimensions

Cable Tensile Strength

CAUTION: Do not exceed the tensile strength of the cable at 1900 kg / 4188 lbs.

Always confirm that the load carrying capability of the silo/tank roof is sufficient to withstand the actual force on the cable conditions, especially where the force will be, or could be, as great as 1900 kg / 4188 lbs. A cable (rope) probe with a PFA jacket reduces the amount of possible product build-up on the probe as well as the tensile force on the cable.

Shortening the Cable

Methods

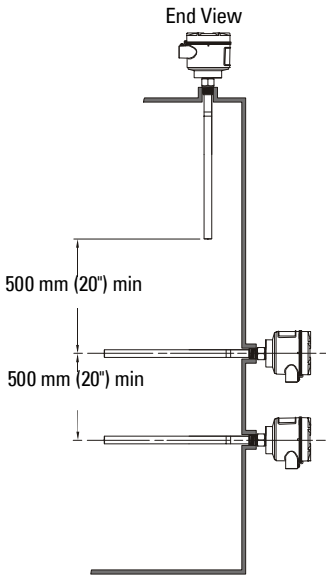
- An angle grinder (preferably with a disc suitable for stainless steel)
or
- Wire cutters (suitable for piano cable $\varnothing 6 - 9\text{mm}$).

Procedure

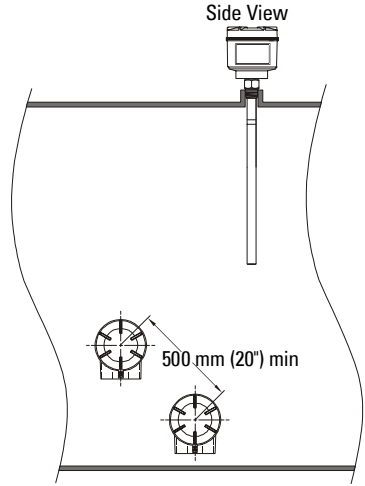
1. Loosen the three set screws and pull weight from the cable.
2. Grind/cut the cable to the required length, and then remove rough edges from the cable.
3. Ensure that cable strands are properly seated in the lay of the cable (i.e. no wire strands sticking outside the normal cable profile). Make sure **ALL** strands are properly seated before continuing the assembly.
4. Push the weight onto the cable while simultaneously **rotating it counter-clockwise** around the cable. Make sure that no cable strands are pushed out of their position in the cable and that the cable is fully inserted.
5. Re-fasten the weight by tightening the three set screws.

Mounting

Multiple units

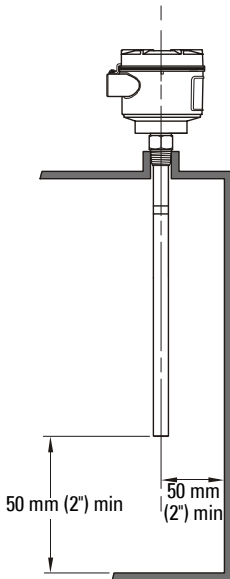


Sensors must be 500 mm (20") apart.



Mount diagonally if vertical space is restricted.

Wall Restriction

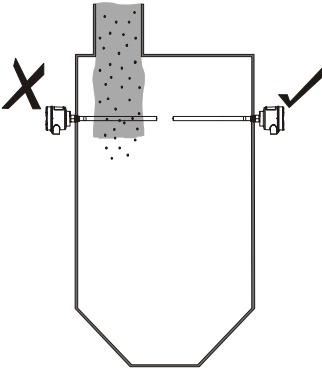


Notes:

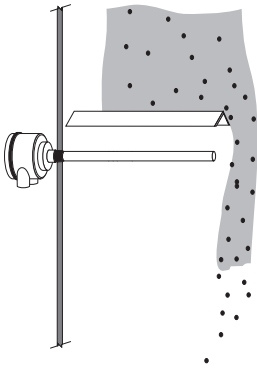
- These drawings are not to scale.
- Distance applies to standard version.

Process Cautions

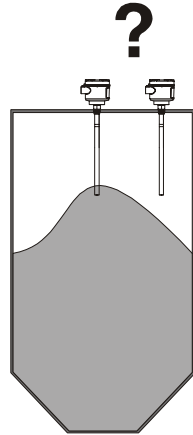
Caution: Keep unit out of path of falling material.



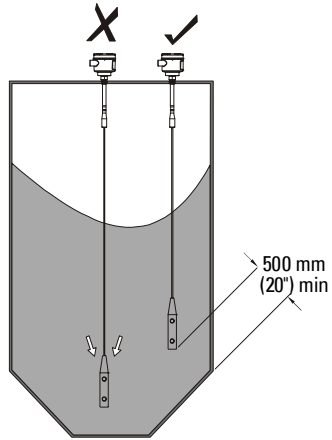
Caution: Protect probe from falling material.



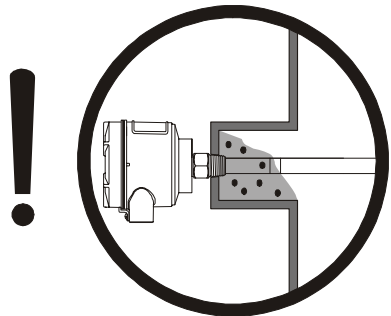
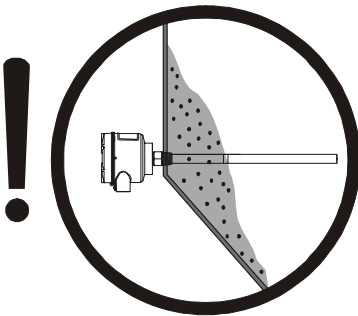
Caution: Consider material surface configuration when installing unit.



Caution: Tensile load must not exceed probe or vessel rating.



Note: Buildup of material in active shield area does not affect the instrument.

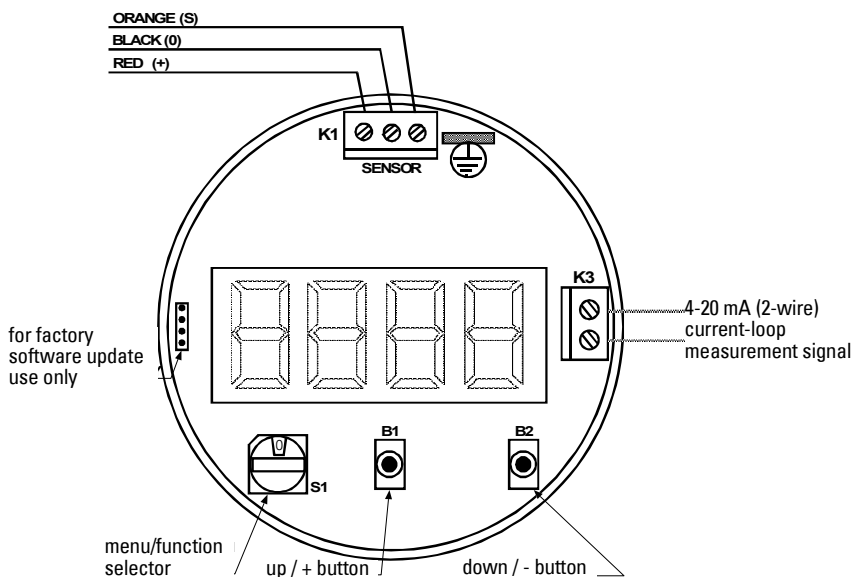


Interconnection

Signal Amplifier/Power Supply

The SITRANS LC 300 uses a switched power supply circuit that makes the most efficient use of the available power present on the terminals. If the signal current is low (4 mA), the terminal voltage will increase due to a voltage drop of other components in the loop, and if the signal current is high (20 mA), the terminal voltage will decrease.

Loosen the lid clip and remove the enclosure cover to access connectors and electronics. The identification label is on the inside of the enclosure.



Connecting the LC 300

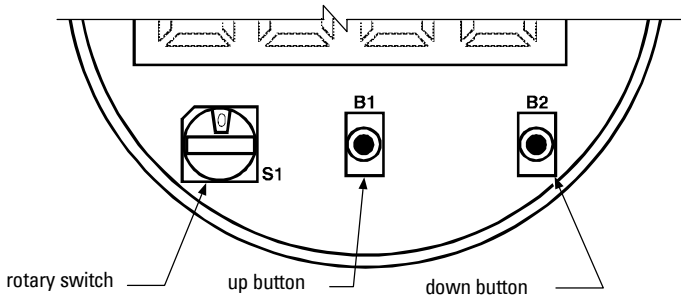
1. Loosen the retaining lid clip and remove the enclosure cover.
2. Loosen the cable gland and thread the cable through it.
3. Connect the power/signal conductor wires to the current-loop terminal blocks (any polarity). The loop voltage must be between 9 and 32 Vdc.
4. Ground the enclosure by connecting the housing and the process connection with either the stilling well and/or the tank wall, using the ground lug near the bottom of the housing.
5. Check that all connections are secure.
6. Replace enclosure cover and tighten retaining lid clip.

! **WARNING:** The sensor terminal block connects the electronics to the measurement module, providing the supply voltage and receiving the frequency signal from the measurement. The user should not alter these connections.

Operation

Start Up

The LC 300 user interface comprises the display (LCD), the 6-position rotary switch, and two push-buttons. Select a menu using the rotary switch; select and/or alter a readout or value using the push-buttons.



The rotary switch can be set from 0 to 5. Each position represents a menu. The position wraps from 5 to 0.

The LCD (Liquid Crystal Display) displays settings altered by the rotary switch and the push-buttons.

Menu Functions

Rotary Switch Position	0	1	2	3	4	5
Display	Read PV (pF)	Read LRV (pF) (0% level)	Read URV (pF) (100% level)	Read mA loop-current	Diagnostics	Damping
Up button		Increase LRV	Increase URV	Set fault protection setting to 22 mA	Product Version	Increase Damping
Down button		Decrease LRV	Decrease URV	Set fault protection setting to 3.6 mA		Decrease Damping
Both buttons		Set LRV from PV	Set URV from PV	Disable fault protection	Reset/Acknowledge Fault	Set Damping to 1.00

When you turn the rotary switch, the LCD shows the new menu selection for about 1 second followed by the data for that selection. When you alter a read-out or value, a colon (:) is displayed when the debounce delay timer has expired and the new value has been accepted.

Positions 0 (Primary Variable in pF) and 3 (corresponding loop-current values in mA) are the recommended positions during normal operation.

Position 0

Display	<ul style="list-style-type: none">• LCD displays the PV (Primary Variable) in pF.• In case of a system fault, the display alternates between PV value and Ft. View the fault details in menu 4.• Pressing either or both push-buttons in menu 0 has no effect.
----------------	--

Position 1

Display	<ul style="list-style-type: none">• LCD displays the LRV (Lower Range Value) in pF, occurring when the range is at 0% and the loop-current is set to 4 mA.
Up Button	<ul style="list-style-type: none">• Pressing Up button for less than 1 second adjusts the LRV in the current step size (initially 0.01 pF).• Holding the Up or Down buttons for more than 1 second increases the step size to 0.1 pF. If you continue to hold the button, the step size increases to 10, 100, and 1000 (displayed as 1E3). When no button is pressed for 4 seconds, the step size decreases to the next smallest value. At each step size, press the buttons for less than 1 second to adjust the value.
Down Button	<ul style="list-style-type: none">• Pressing Down button for less than 1 second decreases the LRV in the current step size (initially 0.01 pF).• When held for more than 1 second, the Down Button will increase the step size by 0.1, 10, 100, and 1000. When no button is pressed for 4 seconds, the step size decreases to the next smallest value.
Both Buttons	<ul style="list-style-type: none">• Pressing both buttons for more than 1 second sets the LRV to the current PV value.

Position 2

Display	<ul style="list-style-type: none">• LCD displays the URV (Upper Range Value) in pF, occurring when the range is at 100% and the loop-current is set to 20 mA.
Up Button	<ul style="list-style-type: none">• Pressing Up button for less than 1 second adjusts the URV in the current step size (initially 0.01 pF).• Holding the Up or Down buttons for more than 1 second increases the step size to 0.1 pF. If you continue to hold the button, the step size increases to 10, 100, and 1000 (displayed as 1E3). When no button is pressed for 4 seconds, the step size decreases to the next smallest value. At each step size, press the buttons for less than 1 second to adjust the value.

Down Button	<ul style="list-style-type: none"> Pressing Down button for less than 1 second decreases the URV in the current step size (initially 0.01 pF). When held for more than 1 second, the Down Button will increase the step size by 0.1, 10, 100, and 1000. When no button is pressed for 4 seconds, the step size decreases to the next smallest value.
Both Buttons	<ul style="list-style-type: none"> Pressing both buttons for more than 1 second sets the URV to the current PV value.

Position 3

Position 3 displays the Analog signal as it is set for the loop current. The Up and Down buttons set the system fault protection settings (according to NAMUR NE 43). System fault protection is used by D.C.S. equipment to determine whether or not the LC 300 is presenting a reliable signal.

When a system fault occurs:

Position 3 Fault Protection Setting	Menu 3 LCD Display	Current Signal to D.C.S	Menu 0 reading
C:Hi	22 mA	22 mA	pF reading
C:Lo	3.6 mA	3.6 mA	alternating with FLT
C:An	mA value at time of fault	none	pF reading

Display	<ul style="list-style-type: none"> LCD shows the Analog Signal as it is set for the loop-current in mA. Normal primary variables would give mA values between 3.8 mA (lower saturation point) and 20.5 mA (upper saturation point). When the reading goes above the URV or below the LRV but still within the measurement range of the unit, it will remain at 20.5 or 3.8 respectively until the level returns between URV and LRV.
Up Button	<ul style="list-style-type: none"> Pressing the Up button for less than 1 second shows the system fault protection setting. Holding the Up button for longer than 1 second will change the fault protection setting to C:Hi.¹
Down Button	<ul style="list-style-type: none"> Pressing the Down button for less than 1 second shows the system fault protection setting. Holding the Down button for longer than 1 second will change the fault protection setting to C:Lo.
Both Buttons	<ul style="list-style-type: none"> Pressing both buttons for more than 1 second disables the system fault protection and the LCD will read C:An.

¹ System errors that would trigger a fault are a checksum error, an absence of measurement signal, or a primary variable beyond 1.66 pF (low) or 3300 pF (high).

Position 4

Display	<ul style="list-style-type: none"> LCD shows diagnostic information. A correctly operating device shows 0.00 on the LCD. See chart below for explanation of system fault values.
Up Button	<ul style="list-style-type: none"> LCD shows revision information. Please note this information when calling Siemens Milltronics representatives for assistance.
Both Buttons	<ul style="list-style-type: none"> Holding both buttons for more than 1 second will try to reset the error status. The LCD reads 0.00 when the status has been successfully reset. Monitor the LC 300 more closely after a diagnostic error has occurred.

Fault values

128	The device is in calibration mode. The measurement values and the loop-current setting may no longer be trusted.
64	A checksum error has occurred in the program and/or data memory. The measurement values and the loop-current setting may no longer be trusted.
32	The LC 300 system watchdog has been activated. This fault can be combined with fault 64, resulting in fault 96. The measurement values and the loop-current setting may no longer be trusted.
8	An arithmetic error has occurred, perhaps caused by an incorrect value setting. This event type error will rarely affect the operation of the LC 300.
4	An error occurred while trying to store settings in the local non-volatile memory. The LC 300 may not operate correctly.
2	The primary variable has exceeded the device limits (1.66 pF and 3300 pF). Check that the probe is correctly connected to the measurement module.
1	The measurement circuit no longer emits signal. Check the wiring to/from the measurement module or barrier circuit.

Note: It is possible for more than one fault to occur at the same time. The display will read the combined result of both fault values.

For example: If fault value 1 and fault value 2 occur together, the display will read **fault value 3**. If the display reads **fault value 10**, it means fault value 8 and fault value 2 have occurred together.

Position 5

Display	<ul style="list-style-type: none"> LCD shows the damping value. The damping value alters the speed at which the primary variable will track the signal from the probe.
Up Button	<ul style="list-style-type: none"> Pressing Up button for less than 1 second increases the damping value in 0.01 steps. Damping can be set to any value from 1.0 to 1000.0 Holding the Up or Down buttons for more than 1 second increases the step size to 0.1. If you continue to hold the button, the step size increases to 10, 100, and 1000 (displayed as 1E3). When no button is pressed for 4 seconds, the step size decreases to the next smallest value. At each step size, press the buttons for less than 1 second to adjust the value.
Down Button	<ul style="list-style-type: none"> Pressing Down button for less than 1 second decreases the damping value in 0.01 steps. Damping can be set to any value from 1.0 to 1000.0 When held for more than 1 second, the Down Button will increase the step size by 0.1, 10, 100, and 1000. When no button is pressed for 4 seconds, the step size decreases to the next smallest value. At each step size, press the buttons for less than 1 second to adjust the value.
Both Buttons	<ul style="list-style-type: none"> Holding both buttons for more than 1 second sets the damping value back to 1.0 (default).

Operation

Recommissioning

The LC 300 should be recommissioned whenever the transmitter or probes are replaced.

The LC 300 LRV will be programmed as factory default. The LRV can be re-adjusted in menu 1 when the probe is at least 20 cm away from material.

Setting URV	
If probe is fully covered in application:	
Set URV by pressing both buttons for more than 1 second in menu 2 when probe is fully covered.	
If probe is rarely or never fully covered, set the LC 300 to your application based on the following example:	
LRV (0%)	Menu 1 reads 12.5 pF
Actual level is at 45% of the measurement length of probe:	
PV (45%)	Menu 0 reads 37 pF
The correct setting for URV:	
URV =	$\frac{[(PV - LRV) * 100 / \text{actual level in \%}] + LRV}{[(37 - 12.5) * 100 / 45] + 12.5}$ $= 66.94 \text{ pF}$
When calculating the URV, best results are achieved when using the highest possible actual level.	

Maintenance

The SITRANS LC 300 requires no regular maintenance or cleaning. Even with significant build-up on the SITRANS LC 300 probe, the level controller will continue to operate.

Note: Build-up of material on the active shield area has little or no effect on the performance of the SITRANS LC 300.

Unit Repair and Excluded Liability

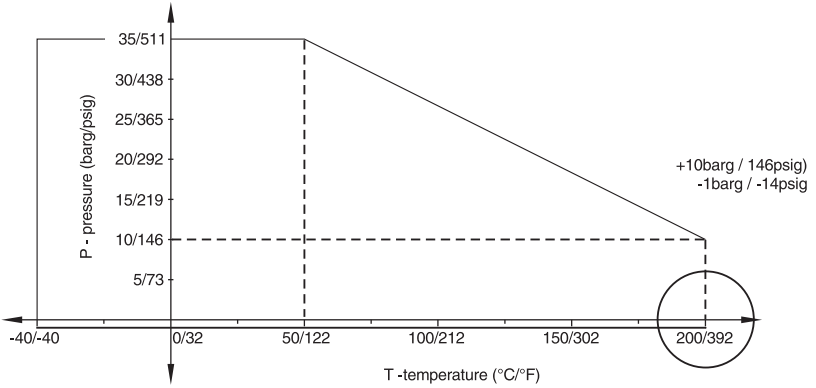
All changes and repairs must be done by qualified personnel, and applicable safety regulations must be followed. Please note the following:

- The user is responsible for all changes and repairs made to the device.
- All new components must be provided by Siemens Milltronics Process Instruments Inc.
- Restrict repair to faulty components only.
- Do not re-use faulty components.

Appendix I: Application Notes

Application Notes

Temperature and Pressure Recommendations for Application



PT - CURVE FOR STANDARD VERSION

Note: 1 bar = 100 Pascals

Appendix II: Approvals



WRITTEN DECLARATION OF CONFORMITY

We, Siemens Milltronics Process Instruments B.V.
Nikkelstraat 10 - 4823 AB BREDA - The Netherlands

Declare, solely under own responsibility, that the product

Capacitance Level Transmitter, SITRANS LC 300

Mentioned in this declaration, complies with the following standards and/or normative documents:

Requirements	Remarks	Certificate No
Environment	Commercial, light Industrial and industrial	2017488-QUA/EMC 02-4158
EN 61326: 1998	Product group standard for "Electrical equipment for measurement, control and laboratory use;" from which:	
EN 55011: 1998	Emission – Class B	
EN 61000-4-2: 1995	Electrostatic Discharge (ESD) Immunity	
EN 61000-4-3: 1996	Radiated Electro-Magnetic Field Immunity	
EN 61000-4-4: 1995	Electrostatic Fast Transient (EFT) Immunity	
EN 61000-4-5: 1995	Surge Transient Immunity	
EN 61000-4-6: 1996	Conducted Radio-Frequency Disturbances Immunity	
ATEX Directive 94/9/EC	Audit Report No 2003068	KEMA 00ATEXQ3047
	 II 1/ 2 GD EEx d [ia] IIC T6...T1	KEMA 00ATEX2040X
	 0344 T 100 °C IP 66	
EN 50014: 1992	General Requirements	
EN 50018: 1994	Flameproof Enclosures "d"	
EN 50020: 1994	Intrinsic Safety "i"	
EN 50284: 1999	Special Requirements for Category 1G Equipment	
EN 50281-1-1: 1998	Dust Ignition Proof	

The notified body: N.V. KEMA – Utrechtseweg 310 – 6812 AR Arnhem – The Netherlands

97/23/EC Pressure Equipment Directive Lloyd's Register, DAD No.: 8033472, 8033473, 8033628

The notified body: Stoomwezen B.V. – Weena Zuid 168 – 3012 NC Rotterdam – The Netherlands

Location: Breda **Named Representative:** C.S. van Gils

Date: June 19th, 2002 **Function:** Managing Director

Note: For specific safety specifications, please consult the instrument label.

SCHRIFTLICHE KONFORMITÄTSERKLÄRUNG

Erklärung der, Siemens Milltronics Process Instruments B.V.
Nikkelstraat 10 - 4823 AB BREDA - Niederlande

Wir erklären hiermit auf eigene Verantwortung, dass das

Kapazitive Füllstand Messgerät, SITRANS LC 300

Das Gegenstand dieser Erklärung ist, mit den folgenden Normen und/oder Regelwerken übereinstimmt:

Anforderungen	Bemerkungen	Zertifizierungs-Nr.
Umwelt EN 61326: 1998	Handel, Leichtindustrie und Industrie Standard Produkt Gruppe für Elektrische Mess- Regel und Laborgeräte bezüglich:	2017488-QUA/EMC 02-4158
EN 55011: 1998	Störaussendung - Klasse B	
EN 61000-4-2: 1995	Überspannungsschutz (ESD)	
EN 61000-4-3: 1996	Elektromagnetische Verträglichkeit	
EN 61000-4-4: 1995	Störfestigkeit gegen schnelle Transienten	
EN 61000-4-5: 1995	Störfestigkeit gegen Stoßspannungen	
EN 61000-4-6: 1996	Störfestigkeit gegen leitungsgeführte Störgrößen	
ATEX Richtlinie 94/9/EC	Prüfungsbericht Nr 2003068  II 1/ 2 GD EEx d [ia] IIC T6...T1  0344 T 100 °C IP 66	KEMA 00ATEXQ3047 KEMA 00ATEX2040X
EN 50014: 1992	Allgemeine Bestimmungen	
EN 50018: 1994	Druckfeste Kapselung "d"	
EN 50020: 1994	Eigensicherheit "I"	
EN 50284: 1999	Besondere Bestimmungen für Betriebsmittel der Kategorie 1G	
EN 50281-1-1: 1998	Staub-Ex-Sicherheit	

Benachrichtigte Stelle: N.V. KEMA – Utrechtseweg 310 – 6812 AR Arnhem – Niederlande

97/23/EC Richtlinie über Druckgeräte Lloyd's Register, DAD No.:
8033472, 8033473, 8033628

**Benachrichtigte Stelle: Stoomwezen B.V. – Weena 168 – 3012 NC
Rotterdam– Niederlande**

Ort, Breda **Name des Vertreters,** C.S. van Gils

Datum, 19 Juni 2002 **Stellung,** Managing Director

Hinweis: Besondere Sicherheitsangaben finden Sie auf den Typenschild

Instrument Label: SITRANS LC 300

SIEMENS

SITRANS LC 300

SERIAL No : **TL 1234** YEAR: 200 00ATEX2040 X **CE 0344**

INPUT : 12-30 Vdc
 AMB. TEMP. : -40 TO +85 °C (-40 TO +185 °F)
 ENCLOSURE : IP65 / TYPE 4 / NEMA 4
 OUTPUTS : 3.6-22.0 mA (NAMUR NE43)
 CABLE ENTRY : 2x 1/2" NPT

FM APPROVED **SF** APPROVED

DI9 CLASS III DIV. 1 GROUPS E,F&G T4

WARNING / REMARKS:
 * M.V. PRESSURE: PLEASE CONSULT INSTRUCTION MANUAL

SIEMENS MILLITRONICS P.L.B.V. - NIKKELSTRAAT 10 - 4823 AB BREDA - THE NETHERLANDS
 MADE IN THE NETHERLANDS #222081(0)

SIEMENS

SITRANS LC 300

SERIAL No : **TK 1234** YEAR: 200

INPUT : 12-30 Vdc
 AMB. TEMP. : -40 TO +85 °C (-40 TO +185 °F)
 ENCLOSURE : IP65 / TYPE 4 / NEMA 4
 OUTPUTS : 3.6-22.0 mA (NAMUR NE43)
 CABLE ENTRY : 2x 1/2" NPT

FM APPROVED **SF** APPROVED

WARNING / REMARKS:
 * M.V. PRESSURE: PLEASE CONSULT INSTRUCTION MANUAL

SIEMENS MILLITRONICS P.L.B.V. - NIKKELSTRAAT 10 - 4823 AB BREDA - THE NETHERLANDS
 MADE IN THE NETHERLANDS #222090(0)

SIEMENS

SITRANS LC 300

SERIAL No : **TM 1234** YEAR: 200 00ATEX2040 X **CE 0344**

INPUT : 12-30 Vdc
 AMB. TEMP. : -40 TO +85 °C (-40 TO +185 °F)
 ENCLOSURE : IP65 / TYPE 4 / NEMA 4
 OUTPUTS : 3.6-22.0 mA (NAMUR NE43)
 CABLE ENTRY : 2x 1/2" NPT

FM APPROVED **SF** APPROVED

II 1/2 GD
 EEx d [ia] IIC T6 .. T1
 T = 100 °C

XP CLASS I, DIV. 1 GROUPS A, B, C & D T4

* SEAL CONDUIT < 18" (FM REQUIREMENT)
 * M.V. PRESSURE: PLEASE CONSULT INSTRUCTION MANUAL
 * USE CABLE IN ACCORDANCE WITH STICKER INSIDE ENCLOSURE
 * DO NOT OPEN WHEN AN EXPLOSIVE GAS ATMOSPHERE IS PRESENT

SIEMENS MILLITRONICS P.L.B.V. - NIKKELSTRAAT 10 - 4823 AB BREDA - THE NETHERLANDS
 MADE IN THE NETHERLANDS #222083(A)



(1) EC-TYPE EXAMINATION CERTIFICATE


- (2) Equipment or protective system intended for use in potentially explosive atmospheres - Directive 94/9/EC
- (3) EC-Type Examination Certificate Number: **KEMA 00ATEX2040 X**
- (4) Equipment or protective system: **Capacitance Level Switch Type Pointek CLS 300**
- (5) Manufacturer: **Miltronics B.V.**
- (6) Address: **Nikkelstraat 10, 4823 AB Breda, The Netherlands.**
- (7) This equipment or protective system and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.
- (8) KEMA, notified body number 0344 in accordance with Article 9 of the Council Directive 94/9/EC of 23 March 1994, certifies that this equipment or protective system has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres given in Annex II to the Directive.


The examination and test results are recorded in confidential report no. 2003077

- (9) Compliance with the Essential Health and Safety Requirements has been assured by compliance with:

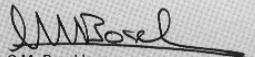
EN 50014 : 1997 + A1, A2 and prA3
EN 50018 : 1994 + prA1 ... prA3
EN 50020 : 1994
EN 50281-1-1 : 1998
EN 50284 : 1999

- (10) If the sign "X" is placed after the certificate number, it indicates that the equipment or protective system is subject to special conditions for safe use specified in the schedule to this certificate.
- (11) This EC-Type Examination Certificate relates only to the design and construction of the specified equipment or protective system. If applicable, further requirements of this Directive apply to the manufacture and supply of this equipment or protective system.
- (12) The marking of the equipment or protective system shall include the following:

 II 1/2 G EEx d[ia] IIC T6...T1 or

 II 1/2 D T 100 °C

Arnhem, 14 August 2000
by order of the Board of Directors of N.V. KEMA


C.M. Boschloo
Certification Manager

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(13)

SCHEDULE

(14)

to EC-Type Examination Certificate KEMA 00ATEX2040 X

(15) **Description**

The Capacitance Level Switch Type Pointek CLS 300 detects the level of a process medium.

For use in potentially explosive atmospheres of flammable gases, fluids or vapours:

Ambient and process temperature range for category II 1 G: -20 ... +60 °C

Ambient and process temperature range for category II 2 G:

The relation between temperature class, ambient temperature range and maximum process medium temperature is shown in the following table:

Temperature class	Ambient temperature range	Max. process medium temperature
T6	-40 ... +70 °C	85 °C
T5	-40 ... +85 °C	100 °C
T4	-40 ... +85 °C	135 °C
T3	-40 ... +85 °C	200 °C
T2	-40 ... +85 °C	300 °C
T1	-40 ... +85 °C	400 °C

For use in the presence of combustible dust:

The maximum surface temperature "T 100 °C" is based on a maximum ambient temperature of 85 °C.

Electrical data

Supply voltage 12 - 250 V, 0 - 400 Hz
 Power dissipation max. 2 VA

Installation instructions

For temperatures above 70 °C, suitable heat resistant cables and cable glands shall be used.

For use in potentially explosive atmospheres of flammable gases, fluids or vapours:
 The cable entry devices and the closing elements of unused apertures shall be of a certified flameproof type, suitable for the conditions of use and correctly installed.

For use in the presence of combustible dust:
 The cable entry devices and the closing elements of unused apertures shall be of a certified flameproof type of E- or ATEX-Generation, suitable for the conditions of use and correctly installed. The minimum ingress protection requirement of IP 6X according to EN 60529 must be satisfied.

SCHEDULE

(13)

(14)

to EC-Type Examination Certificate KEMA 00ATEX2040 X

Routine tests

Each welded glass bushing must be submitted to the routine test according to Clause 16.1 of EN 50018 at a static pressure of 17,3 bar.

(16) **Report**

No. 2003077

(17) **Special conditions for safe use**

The insulated probe shall be installed in such a way, that ignition due to hazardous electrostatic charges cannot occur.

(18) **Essential Health and Safety Requirements**

Essential Health and Safety Requirements not covered by standards listed at (9)	
Clause	Subject
1.0.5	Marking
1.0.6.b and d	Instructions

These Essential Health and Safety Requirements are examined and positively judged. The results are laid down in the report listed at (16).

(19) **Test documentation**

1. Certificate of Conformity KEMA No. Ex-99.E.4410 X

signed

2. Description (4 pages)

03.07.2000/09.06.2000

3. Drawing No. 20001750.revA.wpd
 20001756.rev0.wpd
 A10229R0, rev R
 A10237R0, rev M
 A10233R0, rev B
 A10212R0, rev I
 O.BA.0255, rev B
 O.BA.0241, rev F
 O.BA.0204, rev C
 O.BA0.204_1
 O.BA.0204_2
 O.BA.0204_3
 O.BA.0223, rev C
 O.BA.0199, rev J
 O.BA.0202, rev E
 O.BA.0203, rev G

19.06.2000
 19.06.2000
 28.06.2000
 28.06.2000
 05.06.2000
 06.06.2000
 21.06.2000
 16.06.2000
 06.06.2000
 16.06.2000
 16.06.2000
 16.06.2000
 16.06.2000
 16.06.2000
 28.06.2000
 08.06.2000
 08.06.2000

SCHEDULE

(14) to EC-Type Examination Certificate KEMA 00ATEX2040 X

(18) Test documentation (continued)

	<u>signed</u>
3. Drawing No. O.BA.0207, rev C	16.06.2000
O.BA.0218, rev D	14.06.2000
O.BA.0242, rev D	16.06.2000
O.BA.0222, rev E	08.06.2000
O.BA.0238, rev B	16.06.2000
O.BA.0232, rev B	08.06.2000
O.BA.0235, rev A	16.06.2000
O.BA.0236, rev B	08.06.2000
O.BC.0051, rev K	16.06.2000
O.BC.0058, rev C	16.06.2000
O.BC.0059, rev C	16.06.2000
O.BC.0060, rev C	16.06.2000
O.BC.0061, rev C	16.06.2000
O.BC.0062, rev C	16.06.2000
O.BC.0063, rev C	16.06.2000
O.BC.0064, rev C	16.06.2000
O.BC.0057, rev F	16.06.2000
O.BC.0066, rev A	28.06.2000
O.BC.0067, rev A	28.06.2000
O.BC.0068, rev A	28.06.2000
O.BC.0069	16.06.2000
O.BC.0070	16.06.2000
O.BC.0071	16.06.2000
O.BA.0263	28.06.2000
O.BA.0264	16.06.2000
CLS32DHS.SCH	30.06.2000
CLS32DHS.12	30.06.2000
CLS32DHS.13	30.06.2000
CLS32DHS.10	30.06.2000
CLS32DHS.11	30.06.2000
CLS32DHS.121	30.06.2000
CLS32DHS.131	30.06.2000
CLS32DHS.150	30.06.2000
CLS32DHS.122	30.06.2000
CLS32DHS.123	30.06.2000

4. Samples

AMENDMENT 3

to EC-Type Examination Certificate KEMA 00ATEX2040 X

Manufacturer: **Siemens Milltronics Process Instruments B.V.**Address: **Nikkelstraat 10, 4823 AB Breda, The Netherlands****Description**

In future the Capacitance Level Switch Type Pointek CLS 300 may also be constructed in accordance with the documentation stated below.

The modifications concern the mechanical and electrical assembly

The model code for this version will be SITRANS LC300.

Electrical data

Supply voltage 12 – 30 Vdc
Current output 3,6 – 22 mA

All other data remain unchanged.

Test documentation

	<u>dated</u>
Drawing Index Sheet	04.09.2002

Arnhem, 19 September 2002
KEMA Quality B.V.



T. Pijpker
Certification Manager

[2023370]

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Notes:



www.siemens-milltronics.com

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