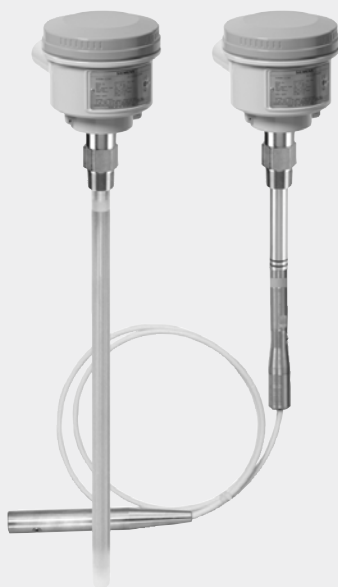


Capacitance Transmitters

SITRANS LC300

Quick Start Manual • 03/2013



SITRANS

SIEMENS

SITRANS LC300 Quick Start Manual

This manual outlines the essential features and functions of the SITRANS LC300. We strongly advise you to acquire the detailed version of the manual so you can use your instrument to its fullest potential. The complete manual is available at: www.siemens.com/level. The printed manual is available from your Siemens Milltronics representative.

Questions about the contents of this manual can be directed to:

Siemens Milltronics Process Instruments
1954 Technology Drive, P.O. Box 4225
Peterborough, Ontario, Canada, K9J 7B1
Email: techpubs.smpi@siemens.com

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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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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:



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.



WARNING¹: 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 operating manual.

¹ This symbol is used when there is no corresponding caution symbol on the product.

Definitions

Short form	Long Form	Description	Units
LRV	Lower Range Value	value for 0 % (in pF)	4 mA
pF	pico Farads	10^{-12}	Farad
PV	Primary Variable	measured value	
URV	Upper Range Value	value for 100% (in pF)	20 mA

SITRANS LC300

Note: SITRANS LC300 is to be used only in the manner outlined in this manual, otherwise protection provided by the equipment may be impaired.

This product is intended for use in industrial areas. Operation of this equipment in a residential area may cause interference to several frequency based communications.

SITRANS LC300 is a cost-effective instrument for level measurement in 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.

LC300 is a 2-wire instrument combining a sophisticated, yet easy-to-adjust, microprocessor transmitter with field-proven probes.

SITRANS LC300 Outputs

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

Specifications

For a complete listing, see the SITRANS LC300 Instruction Manual.

Ambient/Operating Temperature

Process Conditions

Ambient temperature	– 40 to +85 °C (– 40 to +185 °F)
Pressure range	-1 to 35 bar g (-14.6 to 511 psi g)
Process temperature range	-40 to +200 °C (-40 to +392 °F)
Min. relative dielectric constant (ϵ_r):1.5	

Power

- Supply voltage: 12-30 V DC any polarity, 2-wire current loop circuit, max. resistance value 550 Ω @ 24 V DC

Approvals

- General CSAus/c, FM, CE, C-TICK
- Hazardous
 - Dust Ignition Proof With Intrinsically Safe Probe:
 - (Europe) ATEX 1/2 D T100 °C
 - (US/Canada) FM/CSA:
 - Class II, Div. 1, Groups E,FG
 - Class III T4
 - Flameproof With Intrinsically Safe Probe:
 - (Europe) ATEX II 1/2 G EEx d [ia] IIC T6...T1
 - ATEX II 1/2 D T100°C
 - (Brazil) INMETRO DNV 12.0073 X
 - Ex d [ia Ga] IIC T6 ... T4 Gb
 - Ex tb IIIC T85 °C ... T100 °C Db
 - IP65/IP68
 - DNV #OCP 0017
 - ABNT NBR IEC 60079-0:2008,
 - ABNT NBR IEC 60079-1:2009,
 - ABNT NBR IEC 60079-11:2009 e
 - ABNT NBR IEC 60079-31:2011
 - Explosion Proof With Intrinsically Safe Probe:
 - (US/Canada) Class I, Div. 1, Groups A,B,C,D
 - Class II, Div. 1, Groups E,FG
 - Class III T4
- Marine Bureau Veritas Type Approval
ABS Type Approval
- Overfill Protection AIB-Vincotte
- Other Pattern Approval (China)

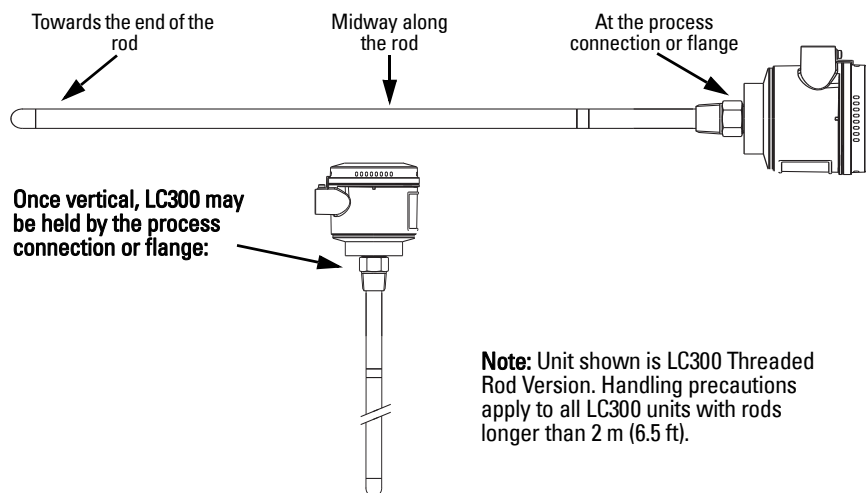
Installation

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

Handling Precautions

! WARNING: To prevent damage, all LC300 units with a rod longer than 2 m (6.5 ft) must be handled as described below.

When lifting LC300 from a horizontal position, support it at these three points:



Mounting Location

Recommendations

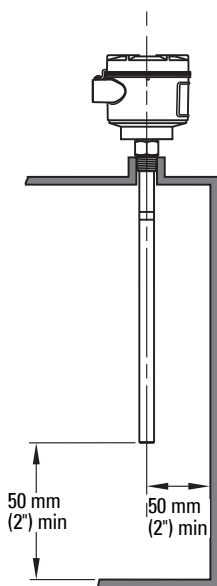
- Easy access for programming the unit using the rotary switch and buttons.
- An environment suitable to the housing rating and materials of construction.

Precautions

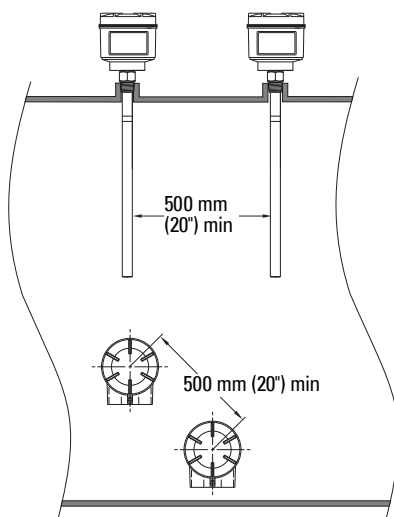
- Keep unit out of path of falling material. Protect probe from falling material by installing a shield.
- Consider material surface configuration when installing unit.
- Tensile load must not exceed probe or vessel rating. On cable units, do not exceed the tensile strength of the cable at 1900 kg / 4188 lbs.

Note: Buildup of material or condensation in the active shield area does not affect operation.

Wall Restriction



Multiple Units



Sensors must be at least 50 mm (2") from the wall or tank bottom and must be 500 mm (20") apart.

Wiring

Signal Amplifier/Power Supply

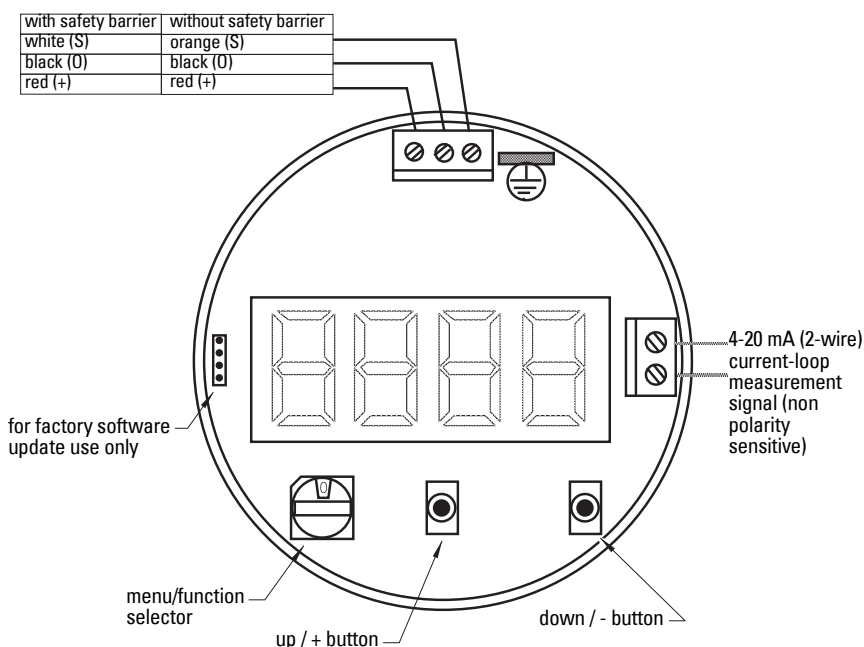


WARNINGS:

- Check the device nameplate and process device tag to verify the approval rating.
- Use appropriate conduit seals to maintain IP or NEMA rating.

SITRANS LC300 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..



Connecting the LC300

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 12 and 30 V DC.
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.

Product nameplates

Note: Information in boxes 1 through 6 based on customer order.

SIEMENS	
SITRANS LC300	
7MLxxxx-xxxx-xxxx [BOX 6]	
Serial No.: GYZ / S1034567	
Input: 12 – 30 V —	
Amb. Temp.: – 40 °C to 85 °C	
Encl.: [BOX 1]	
Cable Entry: [BOX 2]	
Output: 3.6 – 22.0 mA	
 II 1/2 D T 100°C KEMA 00ATEX2040 X  [BOX 5]  N117	
Use Suitably Rated Cable If Ambient Temp. > 70 °C Do Not Open When An Explosive Dust Atmosphere Is Present Siemens Milltronics Process Instruments Inc.	

SIEMENS	
SITRANS LC300	
7MLxxxx-xxxx-xxxx [BOX 6]	
Serial No.: GYZ / S1034567	
Input: 12 – 30 V —	
Encl.: [BOX 1]	
Cable Entry: [BOX 2]	
Output: 3.6 – 22.0 mA	
 II 1/2 G EEx d [ia] IIC T6...T1 1/2 D T100°C KEMA 00ATEX2040 X  [BOX 5]  N117	
Use Suitably Rated Cable If Ambient Temp. > 70 °C Refer To Applicable Certificate For Temp. Rating Do Not Open When An Explosive Atmosphere Is Present Siemens Milltronics Process Instruments Inc.	

SIEMENS	
SITRANS LC300	
7MLxxxx-xxxx-xxxx [BOX 6]	
Serial No.: GYZ / S1034567	
Input: 12 – 30 V —	
Amb. Temp.: – 40 °C to 85 °C	
Encl.: [BOX 1]	
Cable Entry: [BOX 2]	
Output: 3.6 – 22.0 mA	
  APPROVED Class II, Div 1, Gr. E, F, G Class III T4	
Do Not Open When An Explosive Dust Atmosphere Is Present Siemens Milltronics Process Instruments Inc.	

SIEMENS	
SITRANS LC300	
7MLxxxx-xxxx-xxxx [BOX 6]	
Serial No.: GYZ / S1034567	
Input: 12 – 30 V —	
Amb. Temp.: – 40 °C to 85 °C	
Encl.: [BOX 1]	
Cable Entry: [BOX 2]	
Output: 3.6 – 22.0 mA	
  APPROVED Class I, Div 1, Gr. A, B, C, D Class II, Div 1, Gr. E, F, G Class III T4 Seal Conduit < 18 inches	
Use Suitably Rated Cable If Ambient Temp. > 70 °C Do Not Open When An Explosive Atmosphere Is Present Siemens Milltronics Process Instruments Inc.	

SIEMENS	
SITRANS LC300	
7MLxxxx-xxxx-xxxx [BOX 6]	
Serial No.: GYZ / S1034567	
Input: 12 – 30 V —	
Encl.: [BOX 1]	
Cable Entry: [BOX 2]	
Output: 3.6 – 22.0 mA	
Segurança  INMETRO OCP 0017 Ex d [ia Ga] IIC T6...T4 Gb Ex tb IIC T85 °C...T100 °C Db DNV 12.0073 X	
ATENÇÃO - NÃO ABRA ONDE UMA ATMOSFERA EXPLOSIVA POSSA ESTAR PRESENTE ATENÇÃO - UTILIZAR CABOS ADEQUADOS PARA TEMPERATURA AMBIENTE > 70° C Siemens Milltronics Process Instruments, Peterborough	

Wiring setups for hazardous area installations



WARNINGS:

- Turn off power before servicing any device.
- Please check the ambient and operating temperatures under "Ambient/ Operating Temperature" on page 2 for the specific configuration you are about to use or install.
- In potentially explosive atmospheres:
 - open the enclosure only when SITRANS LC300 is not energized.

Note: The transmitter is in operation when the power supply is switched on.

Flameproof / explosion proof configuration in hazardous areas

ATEX/INMETRO

Maximum permissible ambient temperature range in potentially explosive atmospheres:

For category II 1 G:

–20 °C to maximum +60 °C (–4 °F to maximum +140 °F)

For category II 2 G:

–40 °C to maximum +85 °C (–40 °F to maximum +185 °F): T1

–40 °C to maximum +85 °C (–40 °F to maximum +185 °F): T2

–40 °C to maximum +85 °C (–40 °F to maximum +185 °F): T3

–40 °C to maximum +85 °C (–40 °F to maximum +185 °F): T4

–40 °C to maximum +85 °C (–40 °F to maximum +185 °F): T5

–40 °C to maximum +70 °C (–40 °F to maximum +158 °F): T6

- Maximum permissible process temperature range in potentially explosive atmospheres:

For category II 1 G:

–20 °C to maximum +60 °C (–4 °F to maximum +140 °F)

For category II 2 G:

–40 °C to maximum +400 °C (–40 °F to maximum +752 °F): T1

–40 °C to maximum +300 °C (–40 °F to maximum +572 °F): T2

–40 °C to maximum +200 °C (–40 °F to maximum +392 °F): T3

–40 °C to maximum +135 °C (–40 °F to maximum +275 °F): T4

–40 °C to maximum +100 °C (–40 °F to maximum +212 °F): T5

–40 °C to maximum +80 °C (–40 °F to maximum +176 °F): T6

CSA/FM

- Maximum permissible ambient temperature range in potentially explosive atmospheres:
 - 40 °C to maximum +85 °C (–40 °F to maximum +185 °F): T4
- Maximum permissible process temperature range in potentially explosive atmospheres:
 - 40 °C to maximum +200 °C (–40 °F to maximum + 392 °F)
 - 40 °C to maximum +400 °C (–40 °F to maximum +752 °F):
high temperature version

Instructions specific to hazardous area installations

(Reference European ATEX Directive 94/9/EC, Annex II, 1/0/6)

The following instructions apply to equipment covered by certificate number KEMA 00ATEX2040X:

1. For use and assembly, refer to the main instructions.
2. The equipment is certified for use as Category 1/2G, 1/2D. Refer to appropriate certificate.
3. Refer to appropriate certificate for application in specific hazardous environment.
4. Refer to appropriate certificate for ambient temperature range.
5. The equipment has not been assessed as a safety related device (as referred to by Directive 94/9/EC Annex II, clause 1.5).
6. Installation and inspection of this equipment shall be carried out by suitably trained personnel in accordance with the applicable code of practice (EN 60079-14 and EN 60079-17 in Europe).
7. Repair of this equipment shall be carried out by suitably trained personnel in accordance with the applicable code of practice (e.g. EN 60079-19 within Europe).
8. Components to be incorporated into or used as replacements in the equipment shall be fitted by suitably trained personnel in accordance with the manufacturer's documentation.
9. The certificate numbers have an 'X' suffix, which indicates that special conditions for safe use apply. Those installing or inspecting this equipment must have access to the certificates.
10. If the equipment is likely to come into contact with aggressive substances, then it is the responsibility of the user to take suitable precautions that prevent it from being adversely affected, thus ensuring that the type of protection is not compromised.

Aggressive substances: e.g. acidic liquids or gases that may attack metals, or solvents that may affect polymeric materials.

Suitable precautions: e.g. establishing from the material's data sheet that it is resistant to specific chemicals.

Note: Please see www.siemens.com/level for the latest approval certificates.

LC300 Menu Functions

Use the rotary switch and the push-buttons to set the display and programming values for your application.

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

Maintenance

SITRANS LC300 requires no maintenance or cleaning under normal operating conditions. Even with significant build-up on the SITRANS LC300 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 LC300.

Unit Repair and Excluded Liability

For detailed information, please see the inside back cover.

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.
- Restrict repair to faulty components only.
- Do not re-use faulty components

Reparation af enheden og ansvarsbegrænsning:

Alle ændringer og reparationer skal udføres af kvalificeret personale, og de gældende sikkerhedsbestemmelser skal overholdes. Bemærk venligst følgende:

- Brugeren er ansvarlig for alle de på apparatet udførte ændringer og reparationer.
- Alle nye komponenter skal være leveret af Siemens.
- Reparer kun defekte komponenter.
- Defekte komponenter må ikke genbruges

Geräte Reparatur und Haftungsausschluss:

Alle Änderungen und Reparaturen müssen von qualifiziertem Personal unter Beachtung der jeweiligen Sicherheitsbestimmungen vorgenommen werden. Bitte beachten Sie:

- Der Benutzer ist für alle Änderungen und Reparaturen am Gerät verantwortlich.
- Alle neuen Bestandteile sind von Siemens bereit zu stellen.
- Reparieren Sie lediglich defekte Bestandteile.
- Defekte Bestandteile dürfen nicht wiederverwendet werden.

Επισκευή μονάδας και αποκλειόμενη ευθύνη:

Όλες οι αλλαγές και οι επισκευές πρέπει να πραγματοποιούνται από εξειδικευμένο προσωπικό, και πρέπει να τηρούνται όλοι οι σχετικοί κανόνες ασφαλείας. Σημειώστε τα παρακάτω:

- Ο χρήστης είναι υπεύθυνος για όλες τις αλλαγές και επισκευές που γίνονται στη συσκευή.
- Όλα τα καινούργια εξαρτήματα πρέπει να παρέχονται από τη Siemens.
- Περιορίστε τις επισκευές μόνο στα ελαττωματικά εξαρτήματα.
- Μην επαναχρησιμοποιείτε ελαττωματικά εξαρτήματα.

Reparación del dispositivo y límite de responsabilidad:

Las modificaciones y reparaciones deberán ser efectuadas por personal calificado de acuerdo con las normas de seguridad aplicables. Notas importantes:

- El usuario es el único responsable de las modificaciones y reparaciones del dispositivo.
- Recomendamos utilizar sólo recambios originales Siemens.
- Reparar sólo los componentes defectuosos.
- Los componentes defectuosos no se deben reutilizar.

Réparation de l'unité et limite de responsabilité :

Les modifications et réparations doivent être effectuées par un personnel qualifié en accord avec les consignes de sécurité applicables. Remarques importantes :

- L'utilisateur est seul responsable des modifications et réparations effectuées sur l'unité.
- Utiliser seulement des composants fournis par Siemens.
- Réparer uniquement les composants défectueux.
- Les composants défectueux ne doivent pas être réutilisés.

Riparazioni dell'apparecchiatura e limiti di responsabilità:

Le modifiche e le riparazioni devono essere effettuate solo da personale qualificato, rispettando le normative sulla sicurezza. Note importanti:

- L'utente è responsabile delle eventuali modifiche e riparazioni effettuate sull'apparecchiatura.
- Utilizzare solo pezzi di ricambio originali forniti da Siemens.
- Riparare solo i componenti difettosi.
- E' importante non riutilizzare i componenti difettosi.

Reparatie van apparatuur en uitsluiting van aansprakelijkheid:

Alle modificaties en reparaties moeten worden uitgevoerd door gekwalificeerd personeel en de geldende veiligheidsvoorschriften moeten worden aangehouden. Let op:

- De gebruiker is verantwoordelijk voor alle modificaties en reparaties die worden uitgevoerd aan het apparaat.
- Alle nieuwe onderdelen moeten zijn geleverd door Siemens.
- Beperk de reparatie uitsluitend tot de defecte componenten.
- Defecte componenten niet opnieuw gebruiken.

Reparação da Unidade e Responsabilidade Excluída

Todas as alterações e reparações devem ser realizadas por pessoal qualificado e devem ser seguidas as regras de segurança aplicáveis. Por favor, note o seguinte:

- O usuário é responsável por todas as alterações e reparos efetuados no dispositivo.
- Todos os novos componentes devem ser fornecidos pela Siemens.
- Reparo restrito a apenas a componentes danificados.
- Não reutilize componentes danificados.

Yksikön korjaaminen ja vastuuvapaus:

Muutos- ja korjaustyöt saa suorittaa ainoastaan pätevä henkilökunta, ja voimassa olevia turvallisuusmääräyksiä on noudatettava. Pyydämme ottamaan huomioon seuraavat seikat:

- Käyttäjän on vastuussa kaikista laitteeseen tehdyistä muutoksista ja korjauksista.
- Kaikki uudet osat on hankittava Siemens:ltä.
- Korjaukset on kohdistettava ainoastaan viallisiin osiin.
- Viallisia osia ei saa käyttää uudelleen.

Reparation och ansvarsfrihet:

Alla ändringar och reparationer måste utföras av kompetent personal och under iakttagande av gällande säkerhetsbestämmelser. Observera att:

- Användaren ansvarar för alla ändringar och reparationer som görs på enheten.
- Alla nya delar måste komma från Siemens.
- Reparera endast med fel behäftade delar.
- Delar behäftade med fel får ej återanvändas.

For more information

www.siemens.com/level

www.siemens.com/weighing

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