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SIEMENS

SITRANS L

Ultrasonic non-contacting switch
Pointek ULS200

Operating Instructions

Legal information

Warning notice system

This manual contains notices you have to observe in order to ensure your personal safety, as well as to prevent damage to property. The notices referring to your personal safety are highlighted in the manual by a safety alert symbol, notices referring only to property damage have no safety alert symbol. These notices shown below are graded according to the degree of danger.

> ⚠ **DANGER**
>
> indicates that death or severe personal injury **will** result if proper precautions are not taken.

> ⚠ **WARNING**
>
> indicates that death or severe personal injury **may** result if proper precautions are not taken.

> ⚠ **CAUTION**
>
> indicates that minor personal injury can result if proper precautions are not taken.

> **NOTICE**
>
> indicates that property damage can result if proper precautions are not taken.

If more than one degree of danger is present, the warning notice representing the highest degree of danger will be used. A notice warning of injury to persons with a safety alert symbol may also include a warning relating to property damage.

Qualified Personnel

The product/system described in this documentation may be operated only by **personnel qualified** for the specific task in accordance with the relevant documentation, in particular its warning notices and safety instructions. Qualified personnel are those who, based on their training and experience, are capable of identifying risks and avoiding potential hazards when working with these products/systems.

Proper use of Siemens products

Note the following:

> ⚠ **WARNING**
>
> Siemens products may only be used for the applications described in the catalog and in the relevant technical documentation. If products and components from other manufacturers are used, these must be recommended or approved by Siemens. Proper transport, storage, installation, assembly, commissioning, operation and maintenance are required to ensure that the products operate safely and without any problems. The permissible ambient conditions must be complied with. The information in the relevant documentation must be observed.

Trademarks

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Disclaimer of Liability

We have reviewed the contents of this publication to ensure consistency with the hardware and software described. Since variance cannot be precluded entirely, we cannot guarantee full consistency. However, the information in this publication is reviewed regularly and any necessary corrections are included in subsequent editions.

Table of contents

Introduction

<div style="text-align: right; font-size: 2em;">1</div>

1.1 Operating instructions scope

This manual outlines the essential features and functions of the device.

1.2 Industrial usage

Note

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.

Safety notes

<div style="text-align: right; font-size: 3em;">2</div>

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.

Description

3

Note

The device is to be used only in the manner outlined in this manual, otherwise protection provided by the equipment may be impaired.

3.1 Device overview

The device is an ultrasonic based process level switch providing high or low switch action on liquids or solids. The sensor is ETFE or PVDF, allowing it to be used in a wide variety of industries. The device is used to measure liquids, slurries, and fluid materials, as well as chemicals and plugged chute detection.

The device contains an ultrasonic transducer and temperature sensing element. The transducer emits a series of ultrasonic pulses. Each pulse is reflected as an echo from the material and sensed by the transducer. The device processes the echo using Siemens′ proven Sonic Intelligence techniques. Filtering is applied to help discriminate between the true echo from the material and the false echoes from acoustical and electrical noises and agitator blades in motion. The time for the pulse to travel to the material and back is temperature compensated and then converted into distance for display and relay actuation.

The device is an excellent primary detection device, but should not be used as a backup device. For backup devices use a contacting technology such as the Pointek CLS200.

Installing/mounting

<div style="text-align: right; font-size: 3em;">4</div>

> ⚠️ **WARNING**
>
> **Materials of construction compatibility**
>
> Materials of construction are chosen based on their chemical compatibility (or inertness) for general purposes. For exposure to specific environments, check with chemical compatibility charts before installing.

> ⚠️ **WARNING**
>
> **Explosion hazard**
>
> Substitution of components may impair suitability for Class I, Division 2 applications.

> ⚠️ **WARNING**
>
> **Device functionality**
>
> This product can only function properly and safely if it is correctly transported, stored, installed, set up, operated, and maintained.

> ⚠️ **WARNING**
>
> **Selecting bolting and gasket material**
>
> The user is responsible for the selection of bolting and gasket materials which will fall within the limits of the flange and its intended use, and which are suitable for the service conditions.

4.1   Mounting location

Recommendations:

- Ambient temperature within -40 to +60 °C (-40 to +140 °F), -20 °C (-4 °F) if metal mounting.

- Easy access for viewing the display and programming via two push buttons.

- An environment suitable to the housing rating and materials of construction.

- Keep the sound path perpendicular to the material surface.

Precautions:

- Avoid proximity to high voltage or current wiring, high voltage or current contacts, and to variable frequency motor speed controllers.
- Avoid interference to the sound path from obstructions or from the fill path.

The sound path should be:

- Perpendicular to the monitored surface
- Clear of rough walls, seams, rungs, or other obstructions
- Clear of the fill path

①   Seams
②   Rungs
③   Pipe
④   Fill
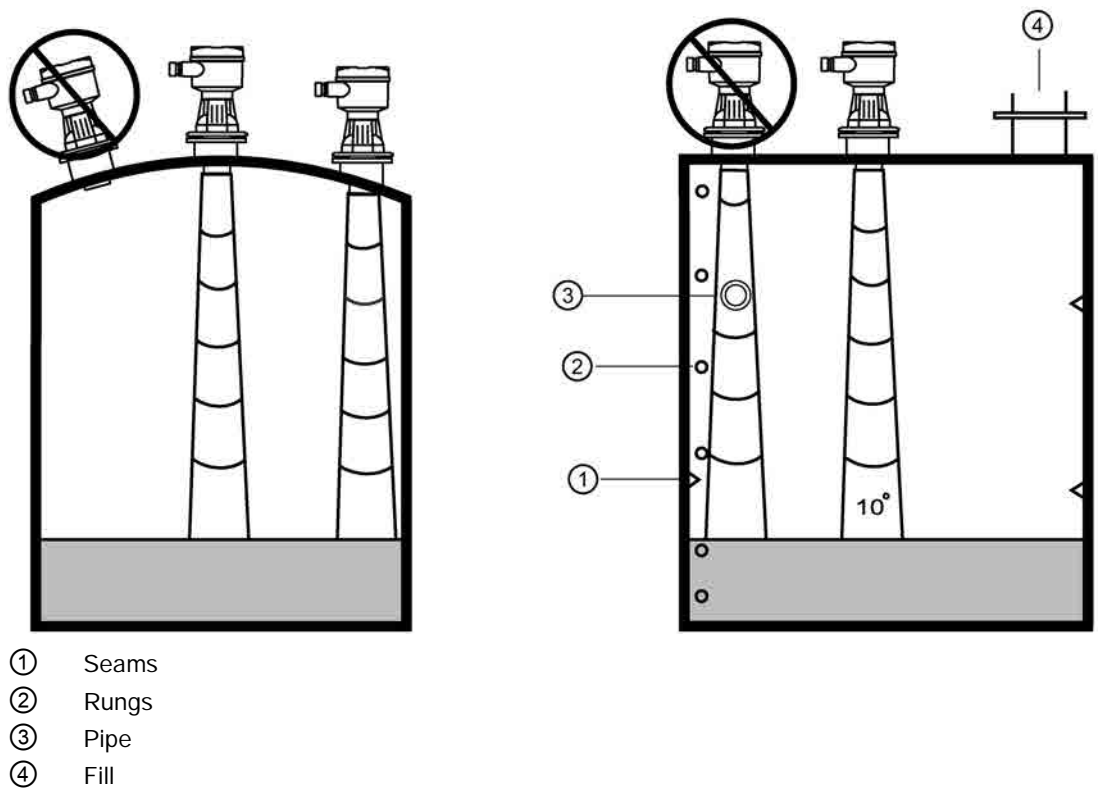
4.2 Mounting instructions

Note

Ideally, mount the device so that the face of the transducer is at least 250 mm (9.84 inch) above the highest anticipated level.

The device is available in three thread types: 2" NPT, 2" BSPT, or 2" G.

Before inserting the device into its mounting connection, ensure that the threads are of the same type to avoid damaging them. Simply screw the device into the process connection, and hand tighten.

Installing/mounting

4.3 Instructions specific to hazardous area installations (Reference European ATEX Directive 94/9/EC, Annex II, 1/0/6)

4.3 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 SIRA 00ATEX1205:

1. The equipment may be used with flammable gases and vapours with apparatus group IIC and temperature class T5.

2. The equipment is certified for use in an ambient temperature range of -20 to +60 °C (-4 to +140 °F).

3. The equipment has not been assessed as a safety related device (as referred to by Directive 94/9/EC Annex II, clause 1.5).

4. 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).

5. 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).

6. 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.

7. The certification of this equipment relies upon the following materials used in its construction:

   Aluminum alloy T356 T6 (main enclosure) and A356 T6 (lid)
   GE Lexan 943A polycarbonate
   Two-part epoxy encapsulant
   Silicon based coating
   Santoprene 111-55 gasket
   Master Bond Polysulphide EP21LPT or Dow Corning 3-4207 encapsulant (transducer)
   ETFE (transducer)

   Epoxy syntactic foam (transducer)

   If the equipment is likely to come in 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. regular checks as part of routine inspections or establishing from the material's data sheet that it is resistant to specific chemicals.

8. Equipment Marking:

   The equipment marking contains at least the information on the product nameplate, shown on the inside front cover of this manual.

9. Special Condition for Safe Use: The apparatus must only be supplied from a circuit containing a suitable rate fuse having a breaking capacity of at least 4 000 A.
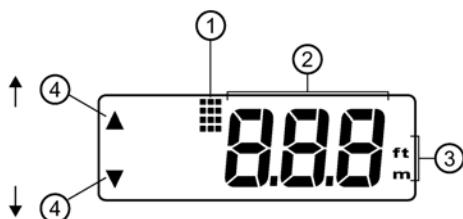
Operating 5

5.1 Startup

With the device correctly installed (or aimed at a wall 0.25 to 5 m away), apply power and view the startup sequence. It will light all possible LED values, show product revision number, product model number, and will enter run mode. Then, the display shows the measurement of the distance from the transducer face to the material level in the units indicated.

5.2 Display/operation status
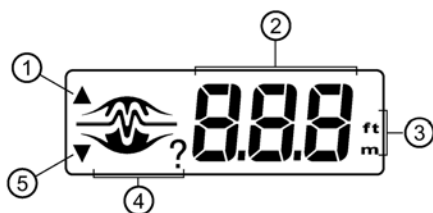
①   Output 1
②   Reading
③   Units
④   Operation status
⑤   Output 2

①   Program mode
②   Adjustment value
③   Units
④   Key

Operation status - run mode

|	
	Echoes are valid and within range.
	Echoes are lost due to poor conditions or out of range. This may be typical in applications where there are deep vessels and the material level is normally out of range. Refer to Troubleshooting (Page 38).
	Extended loss of echo period. Operation has gone into fail-safe. Refer to Troubleshooting (Page 38).

5.3 Quick start

To set a basic high/low application where you can easily adjust the measured distance, use the method below. The device relays are preset as: relay 1 = alarm 1, high alarm at 0.25 m; relay 2 = alarm 2, low alarm at 5.00 m.

To change the setpoints by reference method, set the material or target to the distance as displayed. Press the 1/↑ or 2/↓ key. The display shows the current setpoint function and value. Press the alarm key a second time so the device changes the setpoint to the value currently being measured. After viewing or changing the setpoint, the device reverts to the run mode.

Relay 1

1. Position the unit so that it reads 0.75 m.

2. Press 1/↑

		Function display: high alarm		Current setpoint, 0.5 m
	⇒		⇒	
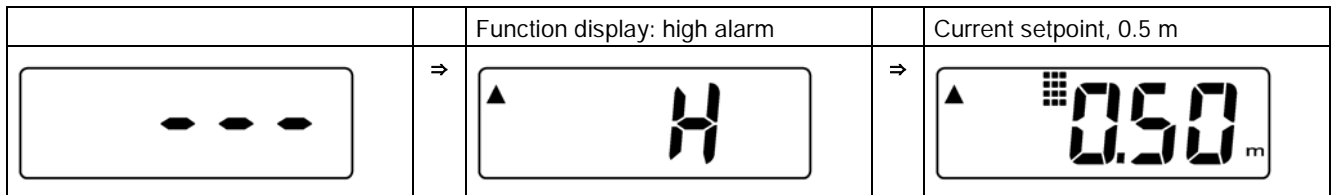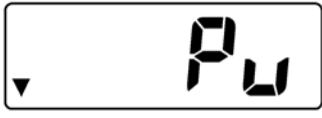
3. Press 1/↑

	⇒		⇒	

4. Once installed, the unit will register a high alarm at 0.75 m from the sensor face. If Loss of Echo `LOE` appears, complete steps 1 to 3 again.

Relay 2

1. Position the unit do that it reads 3.50 m.

2. Press 2/↓.

		Function display: pump up control		
- - -	⇒	**Pu** ▼	⇒	**4.50** m ▼

3. Press 2/↓.

tP2 ▼	⇒	**3.50** m ▼	⇒	**3.50** m

4. Once installed, the unit will register a low alarm at 3.50 m from the sensor face. If Loss of Echo LOE appears, complete steps 1 to 3 again.

5.4 Operating adjustments
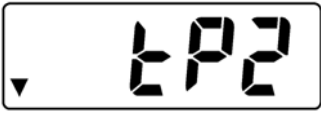
5.4.1 Operating adjustments

To access the operating adjustments, simultaneously press both keys repeatedly until the desired adjustment is obtained. A viewing period of the adjustment value is initiated. During this time the value can be changed by pressing either the 'up' or 'down' key. After viewing or changing, operation automatically reverts to the run mode.
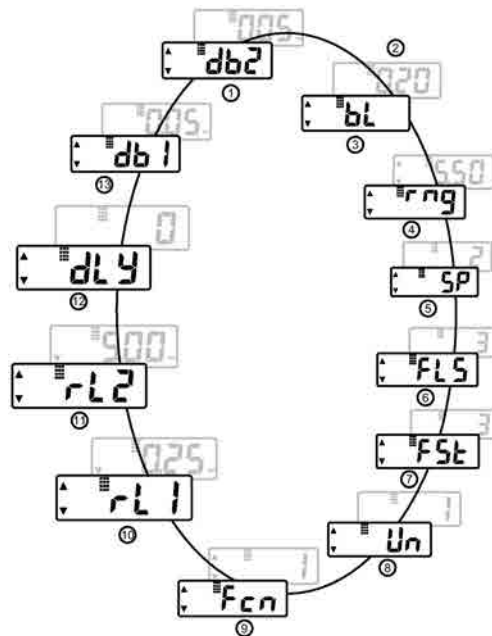
①	Deadband 2
②	On setpoint
③	Blanking
④	Range limit
⑤	Speed of Response
⑥	Fail-safe
⑦	Fail-safe timer
⑧	Units
⑨	Relay function
⑩	Relay 1
⑪	Relay 2
⑫	Delay
⑬	Deadband 1

To adjust a value:

1. Press both operating buttons.

Select adjustment (e.g. relay 1)		Current value (e.g. 0.5 m)
▲ ▼ **rL 1**	⇒	**0.50** m

2. Press 1/↑.

Change value (e.g. increase to 0.75 m)		New value (e.g. new setpoint 0.75 m)		After 6 sec. delay, return to run mode
▲ **0.50** m ▲ **0.75** m	⇒	**0.75** m	⇒	▲ ▼ **1.23** m
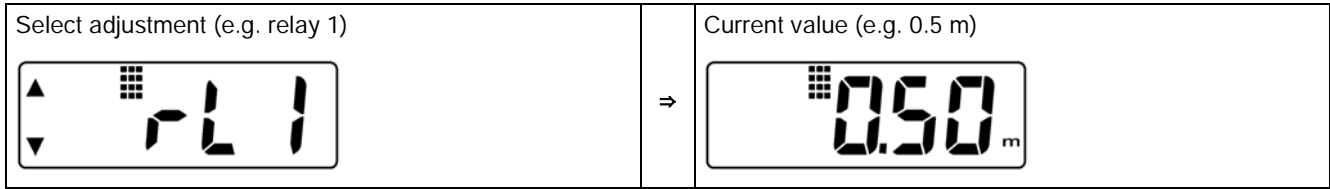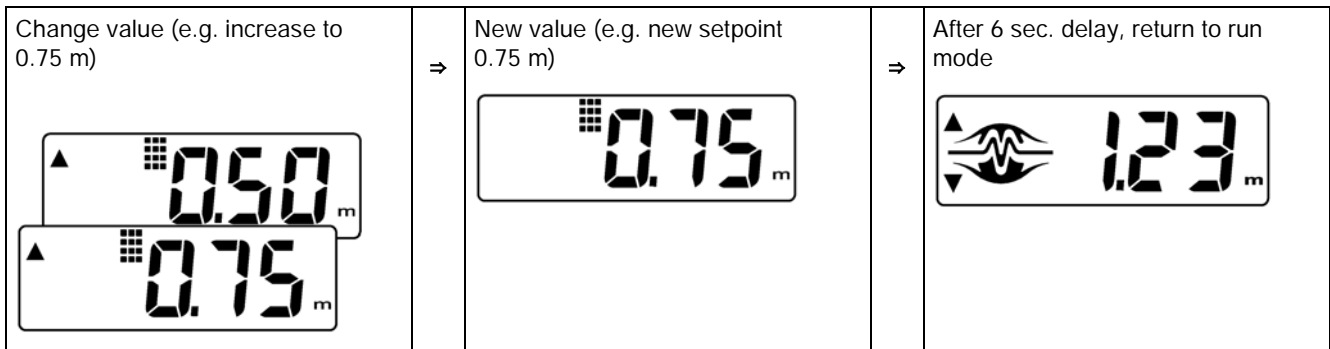
5.4.2 Output function

The alarms can be set to function in the desired mode.

Function	Relay 1	Relay 2
1*	High alarm	Low alarm
2	High alarm	High alarm
3	Low alarm	Low alarm
4	High alarm	LOE alarm
5	Low alarm	LOE alarm
6	Pump down	Low alarm
7	Pump down	High alarm
8	Pump up	Low alarm
9	Pump up	High alarm
10	Pump down	LOE alarm
11	Pump up	LOE alarm
12	Pump down	Pump up
13	Pump down	Pump down
14	Pump up	Pump up

*Factory setting

Function display

High alarm	H
High-high alarm	HH
Low alarm	L
Low-low alarm	LL
Loss of echo alarm	LOE
Pump up control	PU
Pump down control	PD

① High-high

② High

③ Low

④ Low-low
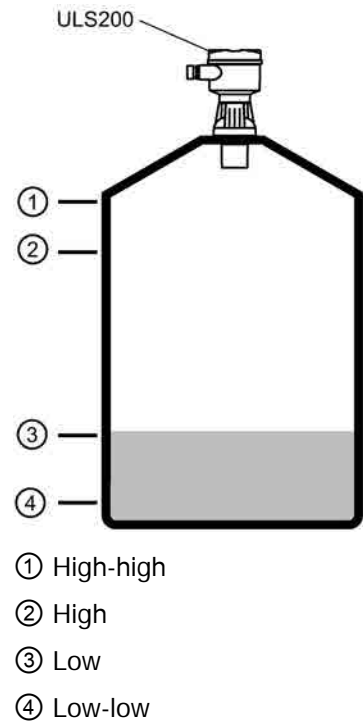
5.4.3 Setpoints

The setpoints can be set where reference levels, either from the material in the vessel or from a target, cannot be provided. This method can also be used to trim the output levels obta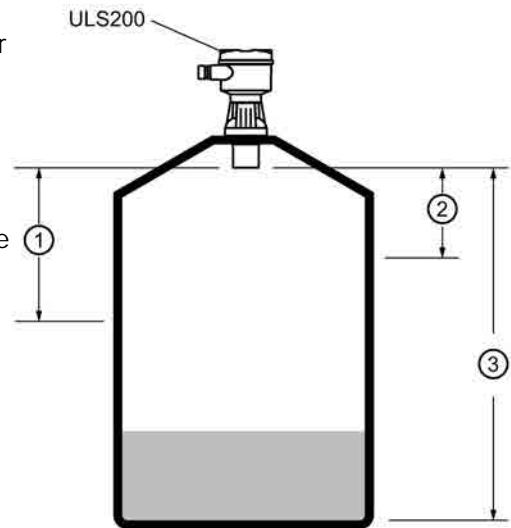ined by the Reference Method (Quick Start). The setpoints are referenced from the face of the sensor. They should not be set at or above the blanking value, or at or below the range limit.

Factory Setting:
Relay 1 = 0.5 m (1.64 ft)
Relay 2 = 4.50 m (14.76 ft)

① Setpoint
② Blanking
③ Range limit

5.4.4 Relay delay

Adjust the time delay, in seconds, from when the material reaches the relay level and the relay is actuated. If the material level withdraws from the setpoint level, the delay is reset to 0. The set time delay applies to both relays and all functions except 'Loss OF Echo'.

Factory setting: 0 seconds.

5.4.5   Relay deadband (reset)

Deadband (hysteresis) prevents relay chatter due to material level fluctuations at the set point. These fluctuations are often waves or turbulence on a fluid's surface caused by agitators in the tank. Once a relay is tripped, the detection level must move beyond the deadband value before it is reset. The direction in which the deadband is measured depends on the application of the relay. If the relay is for a high state then the deadband is measured below the set point. If the relay is for a low state then the deadband is measured above the set point. Refer to the diagram below. Deadband 1 is used for Relay 1 and Deadband 2 is used for Relay 2. The deadband value is entered in the units selected, and applies to both relays and all alarm or control functions except 'Loss Of Echo'.

Factory setting: 0.05 m (0.16 ft)
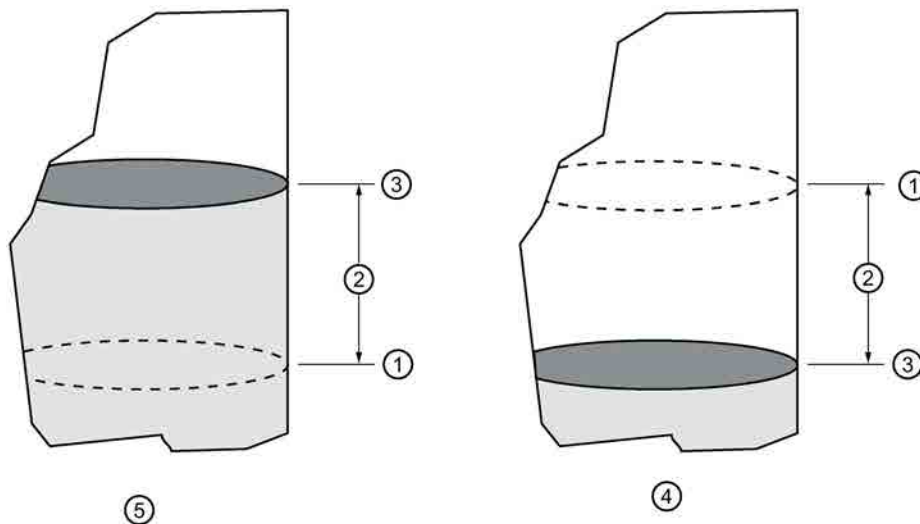
①   Off
②   Deadband
③   On setpoint
④   Low/low-low alarm
⑤   High/high-high alarm

5.4.6   Blanking

Blanking is used to ignore the zone in front of the transducer where false echoes are at a level that interfere with the processing of the true echo. It is measured outward from the sensor face. The minimum recommended blanking value is 0.25 m (0.82 ft) but can be increased in order to extend the blanking.

Factory setting: 0.20 m (0.66 ft)
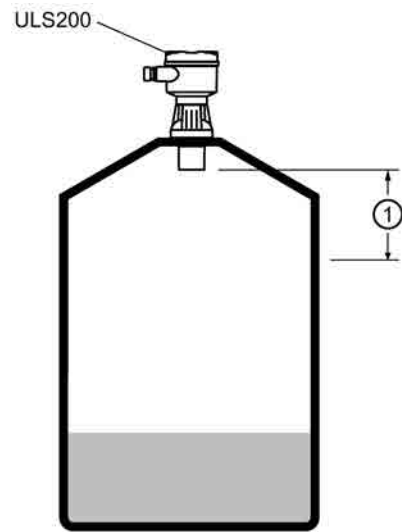
① Blanking

5.4.7　Range limit

The range limit is the distance at which measurements are ignored. Generally, this refers to the bottom of the container being measured. If a measurement is detected beyond the range limit it results in a Loss Of Echo (LOE) reading. The result of this reading is determined by the Fail-safe mode, see Fail-safe mode (Page 24) for more information.

Factory setting: 5.50 m (18.0 ft)
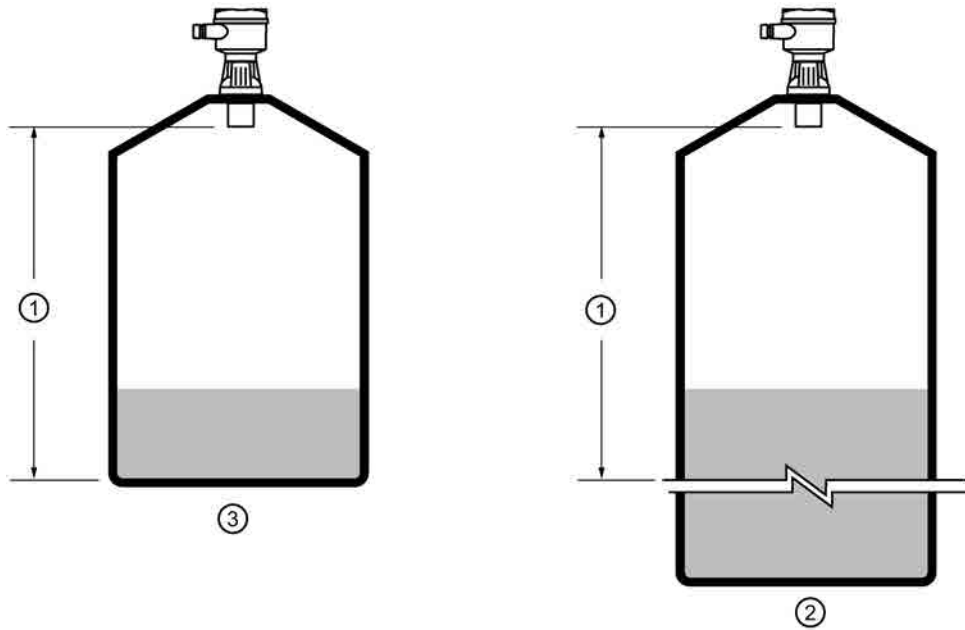
①   Range limit
②   Greater than 3 m vessels (solids)
      Greater than 5 m (liquids)
③   0 to 3 m vessels (solids)
      0 to 5 (liquids)

5.4.8 Speed of response

The speed of response adjustment allows the user to collectively set a number of operating parameters.

Measurement response	Is the limit to which the device is able to keep up with rates of change.
	If the device measurement cannot keep up with the rate of level change, set the adjustment from **1** to **2**. If the device still cannot keep up with the rate of level change, set the adjustment option to **3**. Avoid choosing an option that is too fast for your application.
Agitator discrimination	Discriminates between agitator blades in motion and the material (target) surface.
Filter	Discriminates between false echoes from acoustical and electrical noise and the material (target) surface.
Fail-safe timer	Establishes the `Waiting' period from the time a loss of echo or operating fault condition starts until the fail-safe default is effected.

SP	Measurement response	Agitator discrimination	Filter	FLS timer
1	0.3 m/min. (0.1 ft/min.)	On	On	10 min.
2*	1 m/min. (3.3 ft/min.)	On	On	10 min.
3	5 m/min. (16.4 ft/min.)	On	On	3 min.
4	Immediate	Off	Off	3 min.

*Factory setting

5.4.9 Fail-safe mode

In the event that a loss of echo condition exceeds the fail-safe timer (speed of response variable), **?** appears in the display; and if a relay is assigned to LOE (alarm function option), it is engaged. This function must be used with the Output function (Page 17).

| Fail-safe | Mode | Function | | Reading |
		High and high-high	Low and low-low	
1	High	On	Off	Hold
2	Low	Off	On	Hold
3*	Hold	Hold	Hold	Hold

*Factory setting

5.4.10 Fail-safe timer

The fail-safe timer allows the user to vary the waiting period from the time of a loss of echo or operating fault condition begins, until the fail-safe default is effected. The waiting period is adjustable from 1 to 15 minutes, in 1 minute increments.

5.4.11 Units

The units of the measurement reading can be selected as follows:

- 1 = meters, m (Factory setting)
- 2 = feet, ft

The selected units are also applicable to the **Blanking** and **Relay** adjustments.

Application examples 6

6.1 Applications

The device is designed for use as a process level switch. The local display is used only as an aid during start up. The instrumentation interface is comprised solely of the two relay outputs. Switching applications are based on the relay functions adjustment.

Note

- All level setpoints must be within the device's range (3 m for solids, 5 m for liquids).
- Range applies to the device's switching capability, not to the process range of the material.

The outputs can be set to function in the desired mode.

Application	Function	Relay 1	Relay 2
High/Low level switch	1	High alarm	Low alarm
High level switch with two height alarms	2	High alarm	High alarm
Low level switch with two height alarms	3	Low alarm	Low alarm
High level switch with loss of echo alarm	4	High alarm	LOE alarm
Low level switch with loss of echo alarm	5	Low alarm	LOE alarm
Pump down control with low level alarm	6	Pump down	Low alarm
Pump down control with high level alarm	7	Pump down	High alarm
Pump up control with low level alarm	8	Pump up	Low alarm
Pump up control with high level alarm	9	Pump up	High alarm
Pump down control with loss of echo alarm	10	Pump down	LOE alarm
Pump up control with loss of echo alarm	11	Pump up	LOE alarm
Pump up control and Pump down control	12	Pump down	Pump up
Dual pump down control	13	Pump down	Pump down
Dual pump up control	14	Pump up	Pump up

*Factory setting

Alarm: the relay de-energizes to set the alarm 'ON'.

Control or pump: the relay energizes to set the device 'ON'.

6.2 High level alarm switch

Application: an alarm output, high and/or high-high alarm, when the process material rises to a high level.

Application Notes: It is common to apply the switch on vessels where the material is normally below the unit's range. Under such a condition the device loses echo, and if prolonged, defaults to fail-safe operation. As this would be a normal occurrence, it is not advisable to select the fail-safe high option. If the high level switch is being applied to a vessel within the 3 or 5 m range, a loss of echo and ensuing fail-safe condition would not be a common occurrence and the fail-safe default could be used if required.
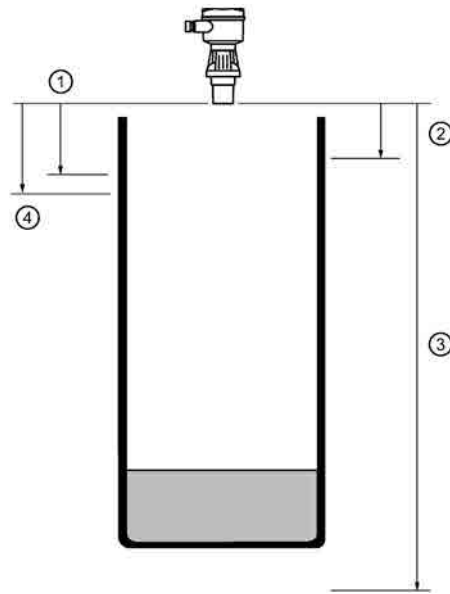
Fail-safe = 1, 2, or 3   **Fail-safe = 2 or 3**

① High-high (e.g. 0.75 m)
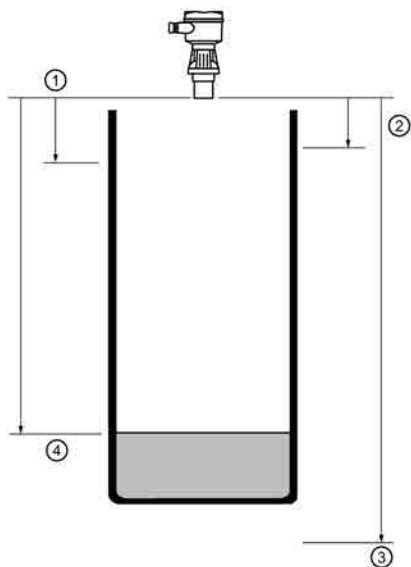
② Blanking (e.g. 0.5 m)

③ Range limit (e.g. 5.5 m)
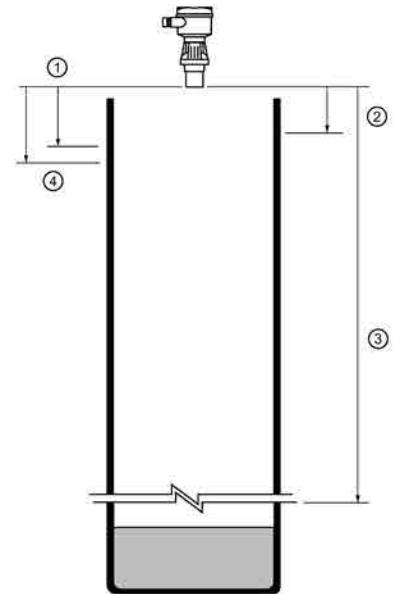
④ High (e.g. 1 m)

① High-high (e.g. 0.75 m)

② Blanking (e.g. 0.5 m)

③ Range limit (e.g. 5.5 m)

④ High (e.g. 1 m)

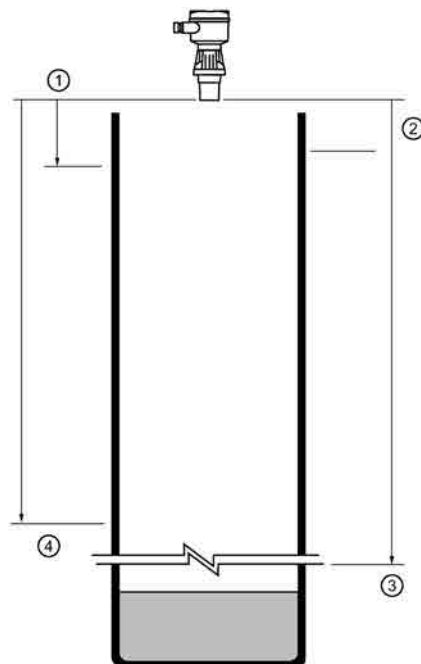| Application Adjustment	
Alarm function	• 2 - high/high-high alarm • 4 - high/Loss of Echo (LOE)
Alarm setpoint	Set the high and/or high-high alarms to the desired values.
Fail-safe mode	• 1 - high, except if the process range is beyond the device operating range (3/5 m) • 2 - low • 3 - hold

6.3　High/low level alarm switch

Application: high and low level alarms.

Application Notes: If the material can fall below the unit's range, the device loses the echo, and if prolonged, defaults to fail-safe operation. The fail-safe default should be set to suit the application.

① High (e.g. 1 m)

② Blanking (e.g. 0.5 m)

③ Range limit (e.g. 5.5 m)

④ Low (e.g. 4.5 m)

① High (e.g. 1 m)

② Blanking (e.g. 0.5 m)
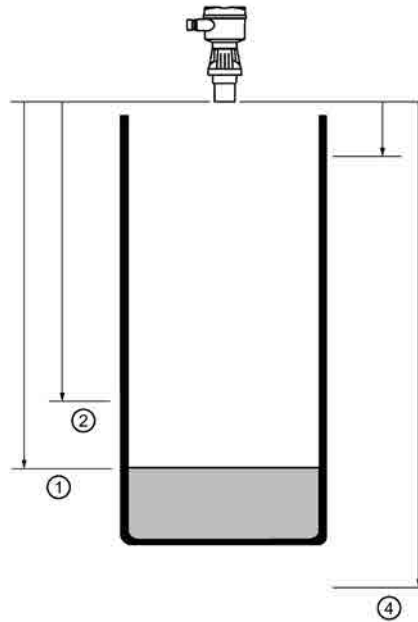
③ Range limit (e.g. 5.5 m)

④ Low (e.g. 4.5 m)

Application adjustments	
Alarm function	• 1 - high/low alarm
Alarm setpoint	Set the high and/or low alarms to the desired values.
Fail-safe mode	• 1 - high • 2 - low • 3 - hold

6.4 Low level alarm switch

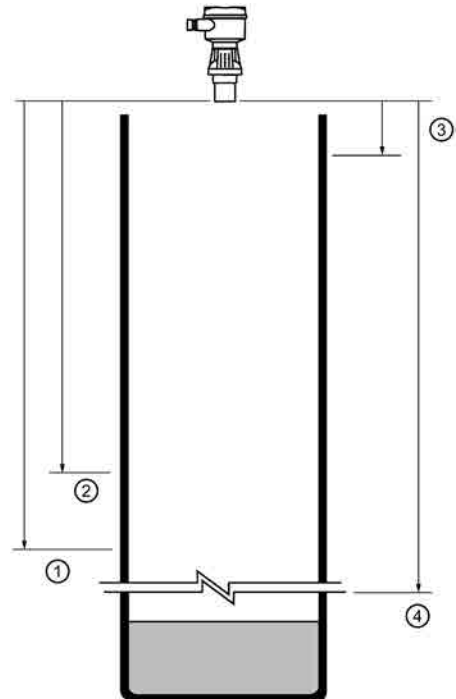This application uses the device to provide one or two low level alarms.

If the material can fall below the unit's range, the device loses the echo, and if prolonged, defaults to fail-safe operation. The fail-safe default should be set to suit the application.

Fail-safe = 1, 2, or 3   **Fail-safe = 2 or 3**

① Low-low (e.g. 4.5 m)

② Low (e.g. 3.5 m)

③ Blanking (e.g. 0.5 m)

④ Range limit (e.g. 5.5 m)

① Low-low (e.g. 4.5 m)

② Low (e.g. 3.5 m)
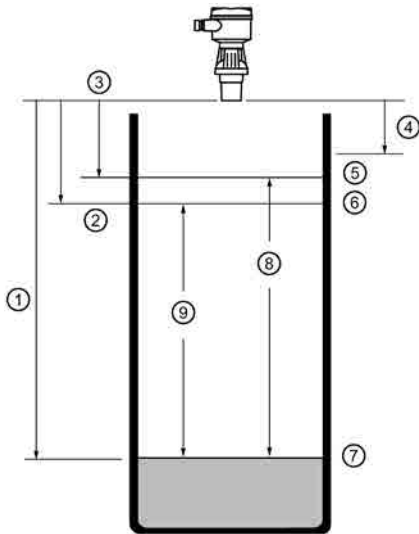
③ Blanking (e.g. 0.5 m)

④ Range limit (e.g. 5.5 m)

Application adjustments	
Alarm function	• 3 - low/low-low alarm • 5 - low/LOE alarm
Alarm setpoint	Set the low and/or low-low alarms to the desired values.
Fail-safe alarm	• 1 - high • 2 - low • 3 - hold

6.5 Dual pump control

This application uses the device to provide a control output when the process material rises to a high level.

Typically, wet wells are used to temporarily hold storm and/or waste water. When the water surface reaches a high level setpoint, the wet well is pumped down. The process material will be pumped down by the deadband value to another setpoint where the control will turn off.

Relay function 13: dual pump down

①   4 m
②   Relay 1 (e.g. 1 m)
③   Relay 2 (e.g. 0.75 m)
④   Blanking (e.g. 0.5 m)
⑤   Pump 2 start
⑥   Pump 1 start
⑦   Both pumps stop
⑧   Deadband 2 (e.g. 3.25 m)
⑨   Deadband 1 (e.g. 3 m)
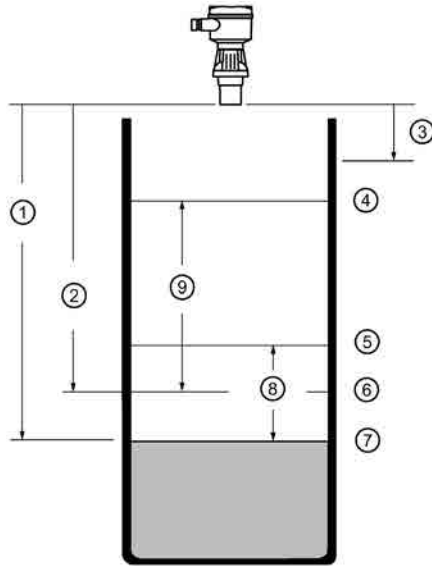
Application adjustments	
Relay function	• 6 - high control/low alarm • 7 - high control/high alarm • 10 - high control/LOE alarm • 13 - high control/high control
Relay setpoints	Set to desired values.
Deadband values	Referenced from relay setpoints (distance from Pump Start setpoint to Pump Stop setpoint).

6.6   Pump control with level alarm

This application uses the device to provide pump control and one level alarm.

If the material reaches a control setpoint, the well is pumped down or up respectively. If the material reaches an alarm setpoint, the alarm will sound until the material moves beyond the deadband value.

Relay Function 8: Pump Up Control with Low Alarm

①   Relay 1 (pump up) (e.g. 3 m)
②   Relay 2 (low alarm) (e.g. 3.5 m)
③   Blanking (e.g. 0.5 m)
④   Pump off
⑤   Alarm off
⑥   Pump on
⑦   Alarm on
⑧   Deadband 2 (e.g. 1 m)
⑨   Deadband 1 (e.g. 2 m)

Application adjustments	
Relay function	• 6 - High control/low alarm
	• 7 - High control/high alarm
	• 8 - Low control/low alarm
	• 9 - Low control/high alarm
	• 10 - High control/LOE alarm
	• 11 - Low control/LOE alarm
Alarm setpoint	Set the low alarm to the desired values.

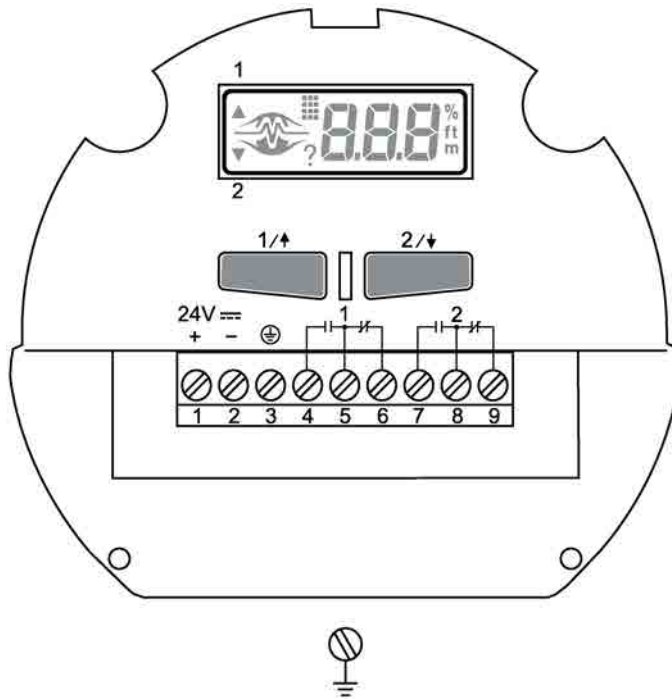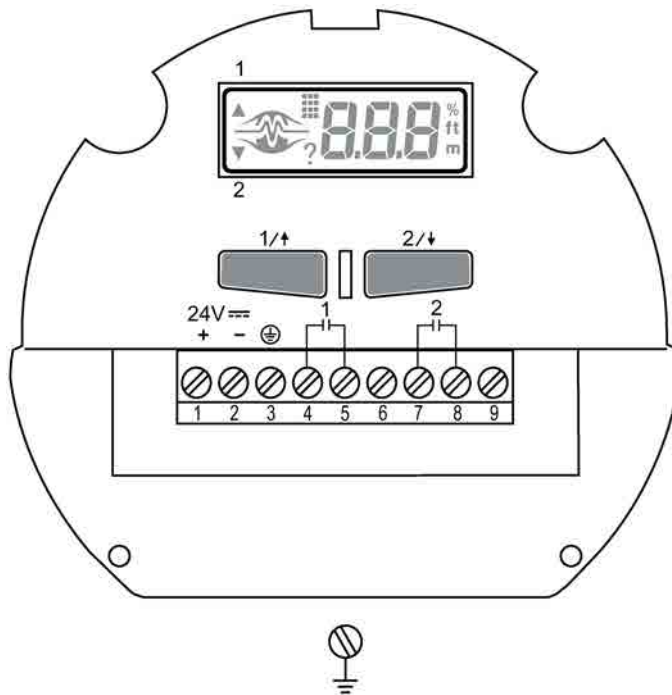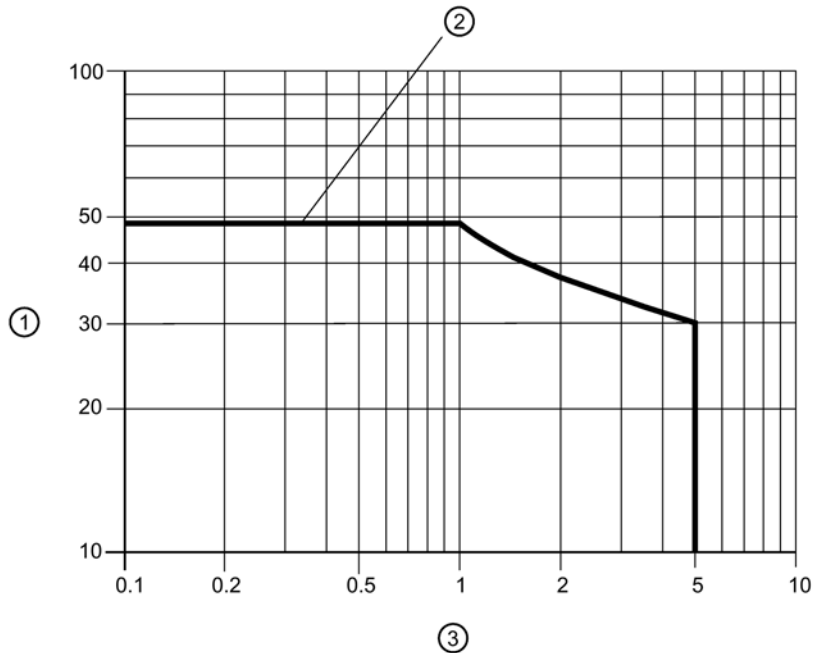# Connection

7

7.1   Interface

AC
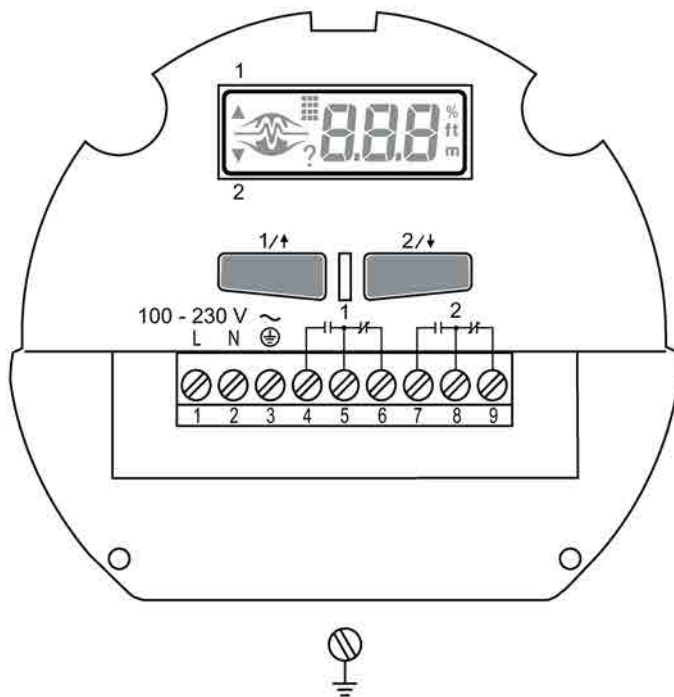
DC - relay output

DC - transistor output

7.1.1 Relay output - DC contact voltage and current limits

①	Switched contact voltage (V DC)
②	48 V DC max.
③	Relay contact current (A) (resistive load only)

| ⚠ WARNING |
| --- |
| **Electrical isolation** |
| The DC input terminals shall be supplied from a source providing electrical isolation between the input and output, in order to meet the applicable safety requirements of IEC 61010-1 |

⚠ WARNING
Suitable insulation
All field wiring must have insulation suitable for rated voltages.

Note
- A circuit breaker or switch in the building installation, marked as the disconnect switch, shall be in close proximity to the equipment and within easy reach of the operator.
- Relay contact terminals are for use with equipment having no accessible live parts and wiring having insulation suitable for at least 250 V.
- This product is susceptible to electrostatic shock. Follow proper grounding procedures.
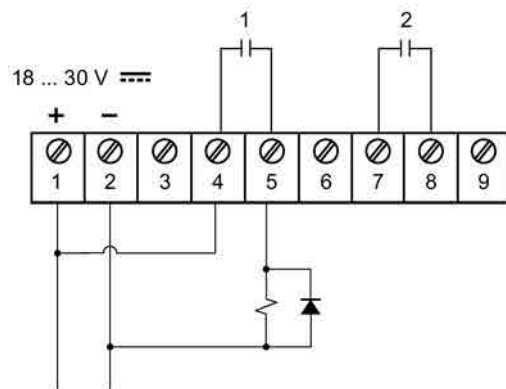
7.2   Wiring

Relay output
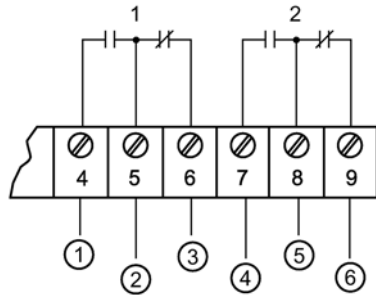
All relays shown are in their de-energized (unpowered state).

①   n/o
②   com
③   n/c
④   n/o
⑤   com
⑥   n/c

Optional transistor output - DC version only
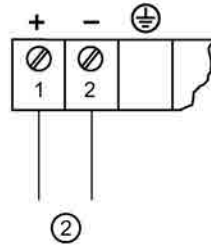
7.2.1 Power
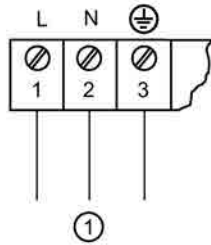
AC version   **DC version**

①   100 ... 230 V AC supply
②   18 ... 30 V DC supply

7.2.2 Minimum supply voltage - DC relay version
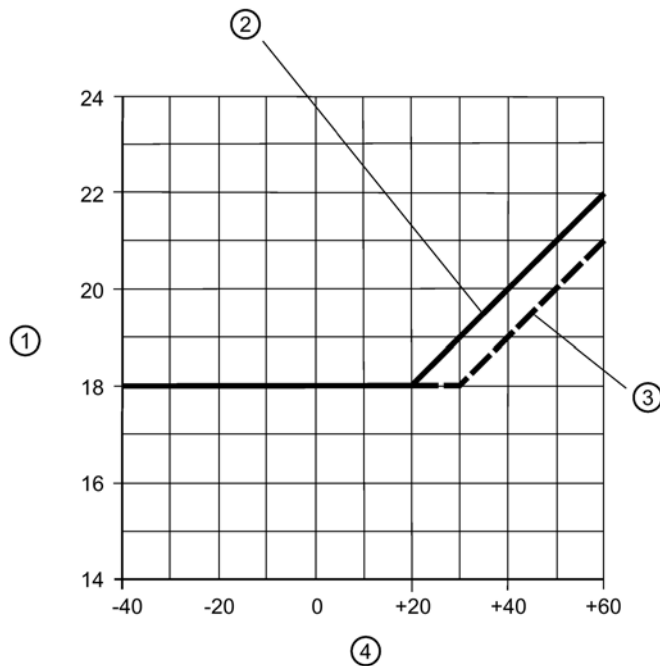
①   Minimum supply voltage (V DC)
②   Relay contact current = 5 A
③   Relay contact current < 1 A
④   Ambient temperature (°C)

Service and maintenance 8

8.1 Maintenance

The device requires no maintenance or cleaning.

8.2 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

Troubleshooting

<div style="text-align: right; font-size: 2em;">9</div>

The echo is not reliable and the device is waiting for a valid echo before updating the measurement.

Probable causes are:	Remedy
Material or object in contact with sensor face.	Lower material level or raise the device.
The device is not perpendicular to the material surface.	Check the device mounting. If angle of repose is too steep, angle the device mounting.
Change in level too fast.	Adjust speed of response.
Material out of range.	Acceptable on some high level switch applications.
Foam on liquid surface.	Mount the device via stilling well or pipe.
Too much dust or interference from material filling.	Relocate the device.
High level of vibration in the mounting structure.	Relocate the device or limit vibration.
Material inside blanking zone or below range limit.	Adjust blanking or range limit
?	Fail-safe default after prolonged Loss Of Echo. Investigate the probable causes listed above.

Technical data 10

10.1 AC version

10.1.1 Power

	100 ... 230 V AC, +15 %, 50/60 Hz, 12 VA (5W) max.

10.1.2 Fuse

	Slow-Blow, 0.25 A, 250 V AC

10.1.3 Output

Repeatability	0.25 % of full range
Resolution	3 mm (0.1 inch)
Relay[1]	2 Form C (SPDT) contacts, rated max. 5A @ 250 V AC/30 V DC non-inductive; min. 10 mA @ 5 V DC

[1] See Interface (Page 32), for operation up to 48 V DC.

10.2 DC version

10.2.1 Power

	18 ... 30 V DC, 3 W[1]

10.2.2 Output

Repeatability	0.25 % of full range
Resolution	3 mm (0.1 inch)
Relay[2]	2 Form C (SPDT) contacts, rated max. 5 A @ 30 V DC non-inductive; min. 10 mA @ 5 V DC
OR	
Transistor	2 transistor switches, rated 100 mA maximum at 48 V DC

[1] See Power (Page 36), for minimum supply voltage required with DC version.

[2] See Interface (Page 32), for operation up to 48 V DC.

10.3 Operating conditions

Location	Indoor/outdoor
Altitude	2 000 m max
Ambient temperature	-40 ... 60 °C (-40 ... 140 °F) *-20 °C (-5 °F) if metal mounting
Relative humidity	Suitable for outdoor (Type 6/NEMA 6/IP67 enclosure)
Installation category	II
Pollution degree	4

10.4 Process pressure

	0.5 bar (7.25 psi) max.

10.5 Switching range

Liquids	0.25 ... 5 m (0.8 ... 16.4 ft)
Solids	0.25 ... 3 m (0.8 ... 9.8 ft)

10.6 Memory

	Non-volatile EEPROM

10.7 Programming

	2 keys

10.8 Temperature compensation

	Built-in to compensate over the operating range

10.9 Display

	• LCD
	• Three 9 mm (0.35 inch) digits for reading of distance between sensor face and material, multi-segment graphic for operation status.

10.10   Construction

Enclosure/electronics	
• Termination	Terminal block, 2.5 mm^2 (14 AWG) solid 1.5 mm^2 (16 AWG) stranded, maximum
• Material	Plastic OR epoxy coated aluminum with gasket
• Ingress protection	Type 6/NEMA 6/IP67[1]
• Cable inlet	2 x ½" NPT or 2 x PG 13.5
Transducers	
• Material	ETFE or PVDF copolymer
• Mounting	Threaded: 2" NPT, 2" BSPT, or 2" G optional flange adapter, to 3" ASME, DIN 65PN10, and JIS 10K3B

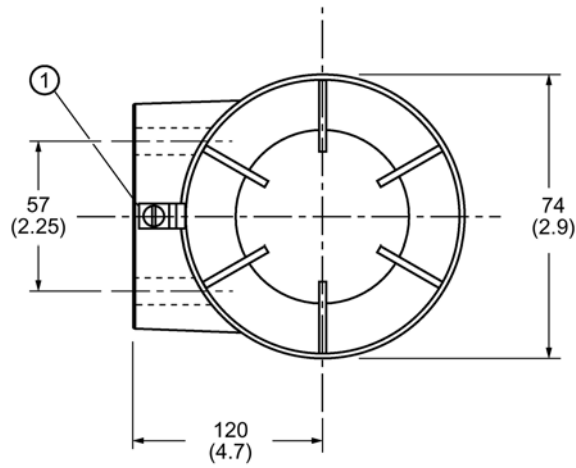[1] Use only approved, suitable size hubs for watertight applications.

10.11   Approvals

See product nameplate	
• General	CSA$_{US/C}$, FM, CE[1], RCM
• Hazardous	
- Non-incendive (Canada)	CSA Class I, II, Div. 2, Groups A, B, C, D, F, G Class III

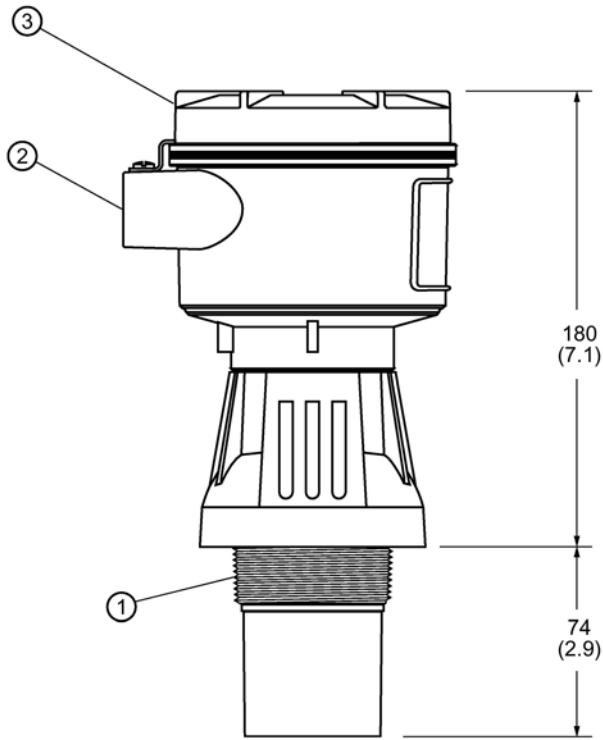[1] EMC performance available upon request.

Dimension drawings

<div style="text-align: right">
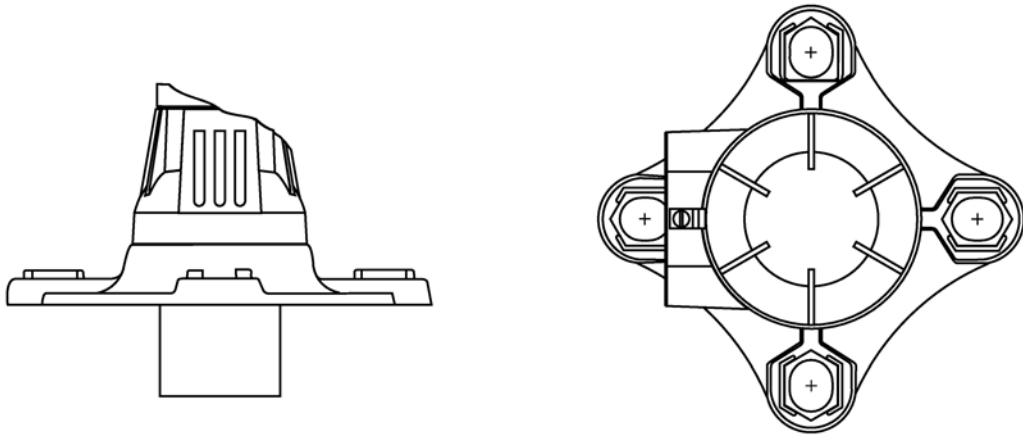
11

</div>

11.1 Standard

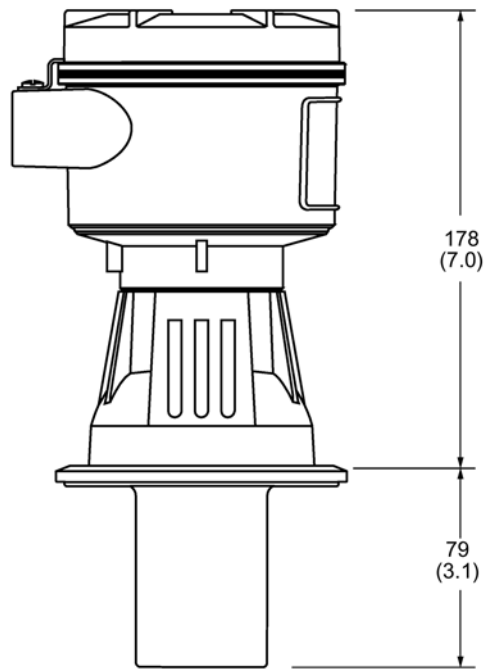①   Lid clip c/w #8 - 32 x 3.8 inch machine screw

①   2" NPT, 2" BSP, or PF2
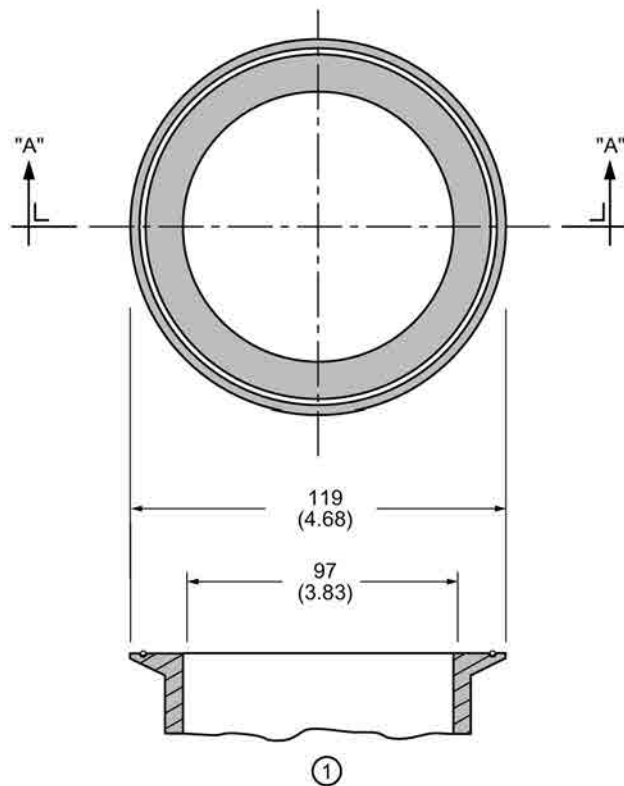②   Conduit connection ½ NPT or PG 13.5
③   Lid

The device can be fitted with the optional 75 mm (3 inch) flange adapter for mating to 3" ANSI, DIN 65 PN10, and JIS 10K 3B flanges.
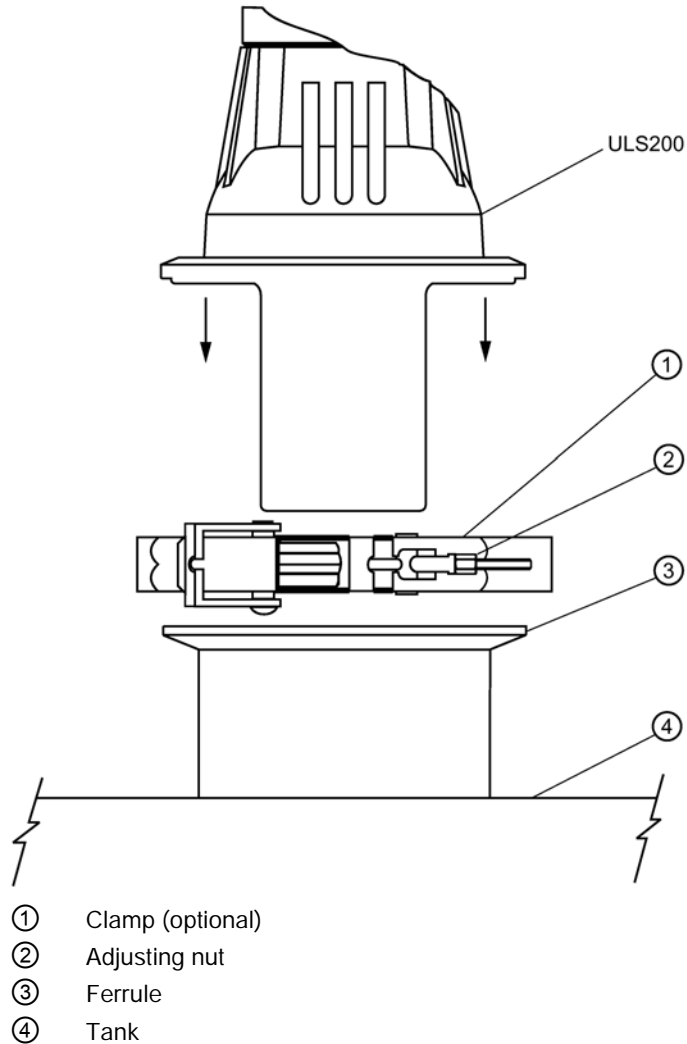
11.2 Sanitary

4" sanitary ferrule

Mount the device onto the top of the tank's sanitary ferrule. Secure mating by surrounding the joint with the optional clamp. Hand tighten the adjusting nut. Do not use a wrench.

① Clamp (optional)
② Adjusting nut
③ Ferrule
④ Tank

11.3 Dimension notes

Note
- Dimensions are nominal and may vary with material types.
- Non-metallic enclosure does not provide grounding between connections.
- Use grounding type bushings and jumpers.
- For CSA/FM approved Hazardous Location Models, see Siemens drawing 0-9440026Z-DI-A.

Certificates and support

<div style="text-align: right; font-size: xx-large;">A</div>

A.1 Certificates

You can find certificates on the Internet at Siemens Industry Online Support or on an included DVD.

See also

Siemens Industry Online Support (https://support.industry.siemens.com/cs/?lc=en-WW)

A.2 Technical support

Technical Support

If this documentation does not provide complete answers to any technical questions you may have, contact Technical Support at:

- More information about our Technical Support is available at
  Support request (http://www.siemens.com/automation/support-request)

- More information about our Technical Support is available at
  Technical support (http://www.siemens.com/automation/csi/service)

Internet Service & Support

In addition to our documentation, Siemens provides a comprehensive support solution at:

- Service & support (http://www.siemens.com/automation/service&support)

Personal contact

If you have additional questions about the device, please contact your Siemens personal contact at:

- Partner (http://www.automation.siemens.com/partner)

To find the personal contact for your product, go to "All Products and Branches" and select "Products & Services > Industrial Automation > Process Instrumentation".

Documentation

You can find documentation on various products and systems at:

Instructions and manuals (http://www.siemens.com/processinstrumentation/documentation)