

Overview



The SITRANS LUT400 series controllers are compact, single point, long-range ultrasonic controllers for continuous level or volume measurement of liquids, slurries, solids, and high accuracy monitoring of open channel flow.

Benefits

- Small 1/2 DIN enclosure [144 h x 144 d x 146 w mm (5.7 x 5.7 x 5.75 inch)] with standard universal mounting bracket for wall, pipe, and DIN rail, plus an optional panel mount
- Easy to use HMI display with local four-button programming, menu-driven parameters, and Wizard support for key applications
- English, German, French, Spanish, Chinese, Italian, Portuguese, and Russian texts on the HMI.
- Level, Volume, OCM Flow monitoring
- Three relays combined with a suite of pump, alarm, and relay control features
- HART Communications
- EDDs for SIMATIC PDM, AMS Device Manager, and Field Communicator 375/475, plus DTM for FDTs (Field Device Tools)
- Web browser for local programming from an intuitive web-based interface
- Two discrete inputs for backup level override and pump interlock functions
- Echo profile and trend views from the local display
- Patented digital receiver for improved performance in electrically noisy applications (close proximity to VSDs)
- Real time clock with daylight savings time, supporting an integrated datalogger and energy saving algorithms for minimizing pump operation during high cost energy periods
- Removable terminal blocks for ease of wiring
- MCERTS Certified for Open Channel Flow

Application

The SITRANS LUT400 comes in three different models, depending on the application, level of performance and functionality required:

- SITRANS LUT420 Level Controller: Level or volume measurement of liquids, slurries, and solids, as well as basic pump control functions, and basic data logging capability
- SITRANS LUT430 Level, Pump and Flow Controller: Includes all features of the LUT420 plus a full suite of advanced pump control and alarm functionality, open channel flow monitoring, and basic flow data logging capability
- SITRANS LUT440 High Accuracy OCM: Our most featured, highest accuracy model. Includes all features of the LUT430, plus the industry's best accuracy (± 1 mm within 3 m), full suite of advanced control functionality, and enhanced flow logging capability
- Key Applications: wet wells, reservoirs, flumes/weirs, chemical storage, liquid storage, hoppers, crusher bins, dry solids storage

Level Measurement

Continuous level measurement - Ultrasonic controllers

SITRANS LUT400 series

Technical specifications

Mode of Operation		Ultrasonic level, volume, pump, and open channel flow	Design	
Measuring range		0.3 ... 60 m (1 ... 196 ft), transducer dependent	Weight	1.3 kg (2.87 lb) 1.2 kg (2.65 lb)
Input			Material (enclosure)	Polycarbonate
Discrete		0 ... 50 V DC switching level Logical 0 ≤ 10 V DC Logical 1 = 10 ... 50 V DC Max. 3 mA	Degree of protection	IP65/Type 4X/NEMA 4X IP20
Output			Remote display lid	IP65/Type 3/NEMA 3
Transducer frequency		10 ... 52 kHz	Cable	
Ultrasonic transducer		Compatible transducers: All Echo-Max and ST-H series transducers	Transducer and mA output signal	<ul style="list-style-type: none"> Transducer, mA output: 2 copper conductors, twisted, with foil shield/drain wire, 300 V 0.5 ... 0.75 mm² (22 ... 18 AWG) Relay/power to be copper conductors per local requirements to meet 250 V 5 A contact rating
Relays		<ul style="list-style-type: none"> 1 SPDT Form C, NO or NC relay, rated 1A at 250 V AC, non-inductive and 3A at 30 V DC 2 SPST Form A, NO relays, rated 5A at 250 V AC, non-inductive and 3 A at 30 V DC 	Max. separation between transducer and transceiver	365 m (1 200 ft)
mA output		4 ... 20 mA, isolated	Displays and controls	
Max. load		600 Ω max. in ACTIVE mode, 750 Ω max. in PASSIVE mode	Programming	60 x 40 mm (2.36 x 1.57 inch) removable LCD, 240 x 160 pixels resolution, operational up to 5 m from enclosure base
Resolution		0.1 % of range	<ul style="list-style-type: none"> Primary Secondary 	<ul style="list-style-type: none"> 4 Local push buttons PC running SIMATIC PDM PC running Emerson AMS Device Manager PC running a web browser PC running a Field Device Tool (FDT) Field Communicator 375/475 (FC375/FC475)
Accuracy			Memory	<ul style="list-style-type: none"> 512 kB flash EPROM 1.5 MB flash for data logging
Error in measurement		<ul style="list-style-type: none"> Standard operation: ± 1 mm (0.04 inch) plus 0.17 % of measured distance High accuracy OCM: ± 1 mm (0.04 inch), within 3 m (9.84 ft) range 	Power supply	
Resolution		<ul style="list-style-type: none"> Standard operation: 0.1 % of range or 2 mm (0.08 inch), whichever is greater High accuracy OCM: 0.6 mm (0.02 inch), within 3 m (9.84 ft) range 	AC version	100 ... 230 V AC ± 15 %, 50/60 Hz, 36 VA Fuse: 5 x 20 mm, Slow Blow, 0.25 A, 250 V
Temperature compensation		<ul style="list-style-type: none"> -40 ... +150 °C (-40 ... +300 °F) Integral temperature sensor in transducer External TS-3 temperature sensor (optional) Programmable fixed temperature values 	DC version	10 ... 32 V DC, 10 W Fuse: 5 x 20 mm, Slow Blow, 1.6 A, 125 V
Rated operating conditions			Certificates and approvals	
Installation conditions			General	CSAusC, CE, FM, UL listed, RCM, EAC, KCC, MCERTS certified for Open Channel Flow
<ul style="list-style-type: none"> Location Installation category Pollution degree 		Indoor/outdoor II 4	Hazardous	CSA Class I, Div. 2, Groups A, B, C, D; Class II, Div. 2, Groups F, G; Class III
Ambient conditions		-20 ... +50 °C (-4 ... +122 °F)	<ul style="list-style-type: none"> Non-incendive (Canada) 	Lloyd's Register, ABS
<ul style="list-style-type: none"> Ambient temperature (enclosure) 			Shipping	
			Communication	HART 7.0, USB

Level Measurement

Continuous level measurement - Ultrasonic controllers

SITRANS LUT400 series

Category	Feature	SITRANS LUT420	SITRANS LUT430	SITRANS LUT440
Operations	Level, space, and distance measurement	✓	✓	✓
	Open channel flow measurement		✓	✓
	Volume conversion	✓	✓	✓
Specifications	Compatible with EchoMax and ST-H transducers	✓	✓	✓
	Standard accuracy: ± 1 mm + 0.17 % of measured distance	✓	✓	✓
	High accuracy: ± 1 mm within 3 meters			✓
	Mounting options: wall or panel, pipe, DIN-rail	✓	✓	✓
Data logging and communications	HART communications	✓	✓	✓
	4 ... 20 mA output (active and passive)	✓	✓	✓
	Integrated datalogger for measurement value and alarms	✓	✓	✓
	Integrated datalogger for fixed rate flow logging		✓	✓
	Integrated datalogger for variable rate flow logging triggered by changes in flow condition			✓
	Daily data logging for maximum, minimum and average flow, daily totalized volume, and minimum and maximum temperature		✓	✓
Flow monitoring	High accuracy open channel flow measurement			✓
	9 digit daily and running flow totalizers		✓	✓
	High and low flowrate alarms		✓	✓
	External totalizer and sampler control		✓	✓
	MCERTS Class 1 Certification			✓
	MCERTS Class 2 Certification		✓	
Pump control	Energy saving algorithms for pump control		✓	✓
	Wall cling reduction	✓	✓	✓
	Pump run-on functionality		✓	✓
	Pump start and power resumption delays		✓	✓
	Alternate duty pump routines	✓	✓	✓
	Fixed duty and service ratio pump routines		✓	✓
	Pumped volume totalizer		✓	✓
	Submergence detection	✓	✓	✓
	Discrete input pump interlocks		✓	✓
	Time to spill calculation		✓	✓

Level Measurement

Continuous level measurement - Ultrasonic controllers

SITRANS LUT400 series

Selection and Ordering data

SITRANS LUT420 and LUT430

Compact ultrasonic level controllers for continuous short to long-range level or volume measurement of liquids, slurries, and solids. Both units include basic relay functions for pumps, alarms, and other controls, plus onboard data logging. LUT430 offers additional advanced pump control and alarm functionality, open channel flow monitoring, and basic flow data logging capability. Functionality varies by model.

↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.

Model

SITRANS LUT420 - Level controller

Article No.

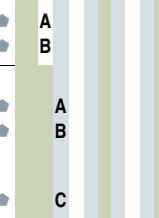
7ML5050-

0 [A] - [B] 0

SITRANS LUT430 - Level, Pump & Flow controller

Enclosure display options

With display



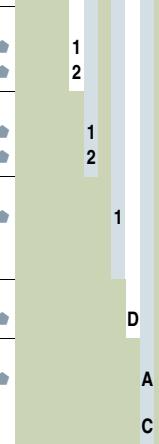
With remote panel mount display
[Includes panel mount cable extension,
2.5 m (8.2 ft)]

No display (blank lid provided)

Note: Enclosure includes back-plate for wall
and pipe mounting, and an integrated clip for
DIN-rail mounting. DIN-rail mounting for standard
TS35 x 7.5 and TS35 x 15 mm DIN-rail to
IEC 60715, EN 60715

Input voltage

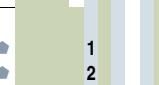
100 ... 230 V AC ± 15 %



10 ... 32 V DC

Cable inlet

3 cable inlets, cable glands not supplied



3 cable inlets, 3 M20 plastic cable glands supplied

Number of measurement points

Single point system (includes one transducer input, one mA output, and one external temperature sensor input)

Communications and I/O

HART, 2 discrete inputs, 3 relays

Approvals

General purpose CE, FM, CSA_{US/C}, UL, RCM, EAC, KCC

Hazardous locations CSA Class I, II, III, Div. 2,
Groups A, B, C, D, F, G

↗ We can offer shorter delivery times for configurations designated with the Quick Ship Symbol ⚡. For details see page 10/11 in the appendix.

Selection and Ordering data

Order code

Further designs

Please add "-Z" to Article No. and specify Order code(s).

Manufacturer's test certificate M to DIN 55350, Part 18 and to ISO 9000



Stainless steel tag [69 x 50 mm (2.71 x 1.97 inch)]: ⚡ Y15
Measuring-point number/identification
(max. 27 characters) specify in plain text

Namur NE43 failsafe setting - device preset to
failsafe < 3.6 mA

Operating Instructions

English

German

Note: The Operating Instructions should be ordered as a separate line item on the order.

All literature is available to download for free, in a range of languages, at <http://www.siemens.com/processinstrumentation/documentation>

Selection and Ordering data

Article No.

Accessories

Tag, stainless steel, 12 x 45 mm (0.47 x 1.77 inch),
one text line, suitable for enclosure

TS-3 Temperature Sensor - see TS-3 on page 4/181

Panel mount cable extension, 2.5 m (8.2 ft)

Qty 3 cable glands and retaining nuts

USB cable, 2 m (6.56 ft) - Standard USB-A to
USB-mini B

Hart modem/USB
(for use with a PC and SIMATIC PDM)

Sunshield, 304 stainless steel

SITRANS RD100, loop powered display -
see Chapter 7

SITRANS RD200, universal input display with
Modbus conversion - see Chapter 7

SITRANS RD300, dual line display with totalizer and
linearization curve and Modbus conversion - see
Chapter 7

SITRANS RD500 web, universal remote monitoring
solution for instrumentation - see Chapter 7

Spare parts

Panel mount retrofit kit (convert standard unit with
display to panel mount version)

Terminal block replacement kit
(5 piece kit with one of each removable terminal)

Wall/Pipe mount plate

Enclosure (include blank label)

SITRANS LUT400 Lid (with Display)

SITRANS LUT400 Lid (blank)

Fuse - AC (0.25 A, 250 V, Slow Blow)

Fuse - DC (1.6 A, 125 V, Slow Blow)

Panel mount gasket and fastener kit

DIN-rail clip

↗ We can offer shorter delivery times for configurations designated with the Quick Ship Symbol ⚡. For details see page 10/11 in the appendix.

Selection and Ordering data
Article No.
SITRANS LUT440

The SITRANS LUT440 is the most accurate and featured model in the LUT400 series. It includes high accuracy open channel monitoring, relay functions for external samplers, totalizers, alarms, and enhanced data logging, as well as all pump and control functions available with other models in the LUT400 series.

↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.

Model

SITRANS LUT440 - High accuracy Open Channel Monitor¹⁾

Enclosure display options

With display

7ML5050-
0
0

With remote panel mount display [includes panel mount cable extension, 2.5 m (8.2 ft)]

C
A
B
C

No display (blank lid provided)

1
2

Note: Enclosure includes back-plate for wall and pipe mounting, and an integrated clip for DIN-rail mounting. DIN-rail mounting for standard TS35 x 7.5 and TS35 x 15 mm DIN-rail to IEC 60715, EN 60715

1
Input voltage

100 ... 230 V AC ± 15 %

1
2

10 ... 32 V DC

1
Cable inlet

3 cable inlets, cable glands not supplied

1
2

3 cable inlets, 3 M20 plastic cable glands supplied

D
Number of measurement points

Single point system (includes one transducer input, one mA output, and one external temperature sensor input)

A
Communications and I/O

HART, 2 discrete inputs, 3 relays

C
Approvals

General purpose CE, FM, CSA_{US/C}, UL, RCM, EAC, KCC

Hazardous locations CSA Class I, II, III, Div. 2, Groups A, B, C, D, F, G

¹⁾ Compatible with all EchoMax Transducers. High accuracy OCM performance with the use of an XRS-5 transducer and TS-3 temperature sensor (each sold separately).

↗ We can offer shorter delivery times for configurations designated with the Quick Ship Symbol . For details see page 10/11 in the appendix.

Selection and Ordering data
Order code
Further designs

Please add "-Z" to Article No. and specify Order code(s).

C11

Manufacturer's test certificate M to DIN 55350, Part 18 and to ISO 9000

Y15

Stainless steel tag [69 x 50 mm (2.71 x 1.97 inch)]: Measuring-point number/identification (max. 27 characters) specify in plain text

N07

Namur NE43 failsafe setting - device preset to failsafe < 3.6 mA

Article No.
A5E33329501
A5E35690863
Operating Instructions

English

German

Note: The Operating Instructions should be ordered as a separate line item on the order.

All literature is available to download for free, in a range of languages, at <http://www.siemens.com/processinstrumentation/documentation>

Selection and Ordering data
Article No.
Accessories

Tag, stainless steel, 12 x 45 mm (0.47 x 1.77 inch), one text line, suitable for enclosure

7ML1930-1AC

TS-3 Temperature Sensor - see TS-3 on page 4/181

7ML1813-...

Panel mount cable extension 2.5 m (8.2 ft)

7ML1930-1GF

Qty 3 cable glands and retaining nuts

7ML1930-1GB

USB cable 2 m (6.56 ft) - Standard USB-A to USB-mini B

7ML1930-1GD

HART modem/USB (for use with PC and SIMATIC PDM)

7MF4997-1DB

Sunshield, 304 stainless steel

7ML1930-1GE

SITRANS RD100, loop powered display - see Chapter 7

7ML5741-...

SITRANS RD200, universal input display with Modbus conversion - see Chapter 7

7ML5740-...

SITRANS RD300, dual line display with totalizer and linearization curve and Modbus conversion - see Chapter 7

7ML5744-...

SITRANS RD500 web, universal remote monitoring solution for instrumentation - see Chapter 7

7ML5750-...
Spare parts

Panel mount retrofit kit (convert standard unit with display to panel mount version)

7ML1830-1PA

Terminal block replacement kit (5 piece kit with one of each removable terminal)

7ML1830-1PB

Wall/Pipe mount plate

7ML1830-1PC

Enclosure (include blank label)

7ML1830-1PD

SITRANS LUT400 Lid (with Display)

7ML1830-1PE

SITRANS LUT400 Lid (blank)

7ML1830-1PF

Fuse - AC (0.25 A, 250 V, Slow Blow)

7ML1830-1PG

Fuse - DC (1.6 A, 125 V, Slow Blow)

7ML1830-1PH

Panel mount gasket and fastener kit

7ML1830-1PK

DIN-rail clip

7ML1830-1PL

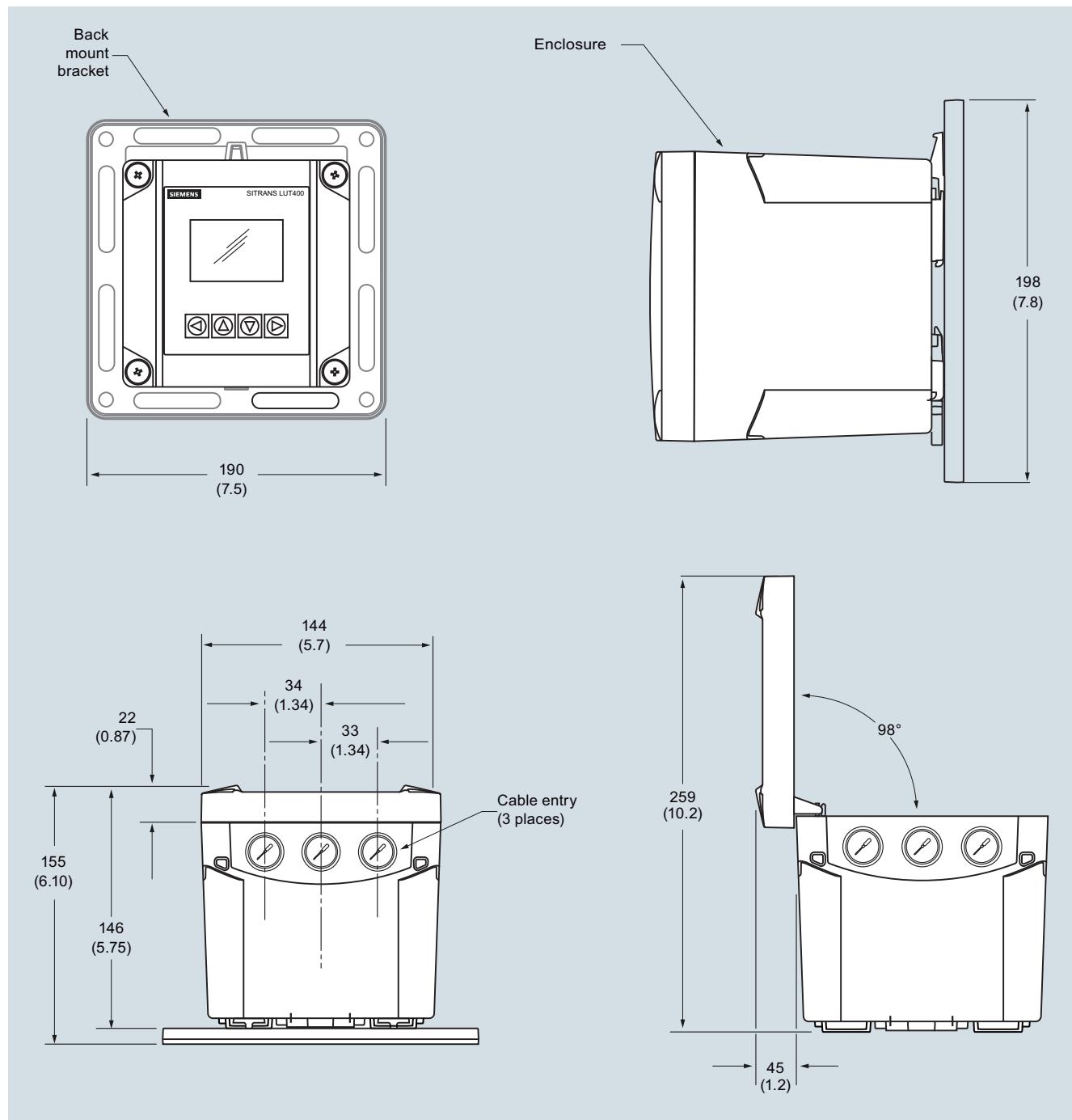
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Level Measurement

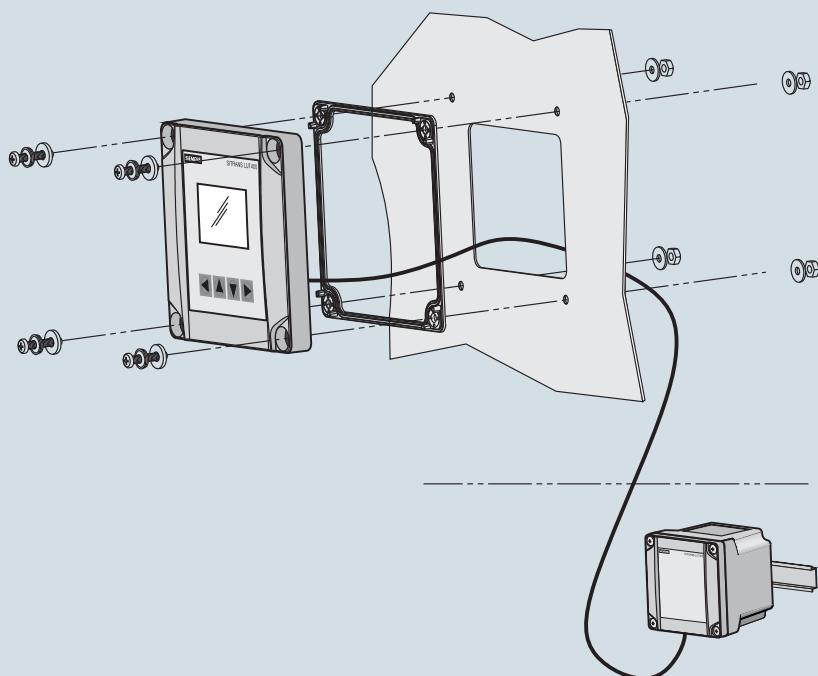
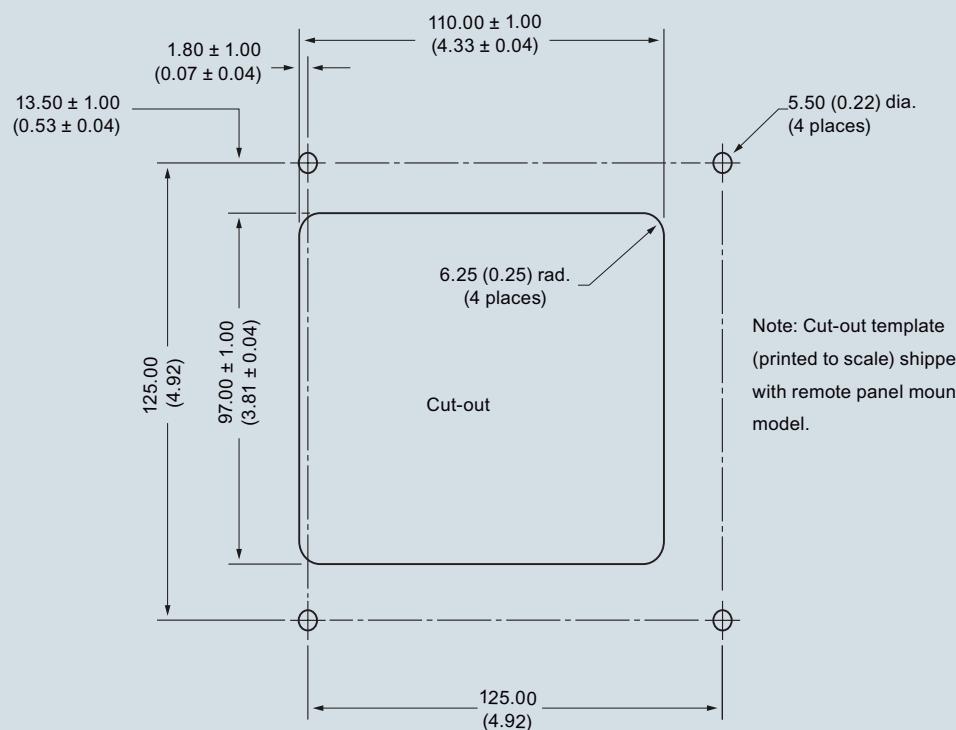
Continuous level measurement - Ultrasonic controllers

SITRANS LUT400 series

Dimensional drawings



SITRANS LUT400, dimensions in mm (inch)



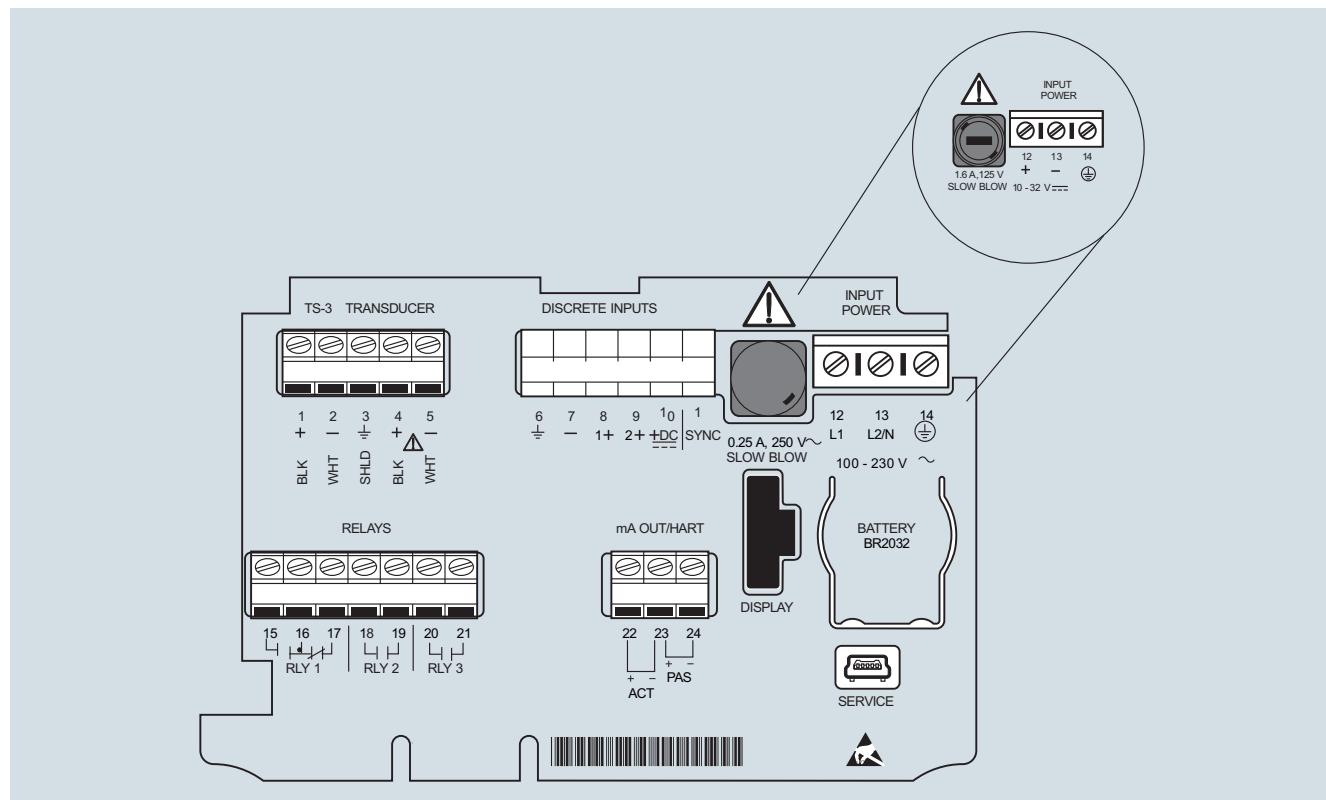
SITRANS LUT400, dimensions in mm (inch)

Level Measurement

Continuous level measurement - Ultrasonic controllers

SITRANS LUT400 series

Schematics



SITRANS LUT400 connections