

Ultrasonic transducers

ST-H Transducer

Quick Start Manual • 12/2013



EchoMax

SIEMENS

ST-H Quick Start Manual

This manual outlines the essential features and functions of the ST-H Series transducers. The *Transducer Applications Manual* is available for free download on our website: www.siemens.com/processautomation. A printed version can be purchased from your local Siemens Milltronics representative.

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

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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.

MILLTRONICS is a registered trademark of Siemens Milltronics Process Instruments.

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.



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.

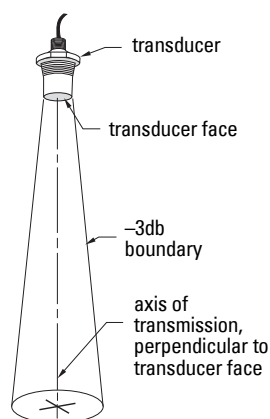
Note: means important information about the product or that part of the operating manual.

Introduction

The ST-H transducer operates with Siemens Milltronics ultrasonic level monitoring products.

The transducer converts the electrical energy of the transmit pulse from the transceiver into acoustical energy. It then converts the acoustical energy of the echo back into electrical energy for the controller.

The transducer face emits acoustical energy that radiates outward, decreasing in amplitude at a rate inversely proportional to the square of the distance. Maximum power radiates perpendicularly from the transducer face on the axis of transmission. Where power is reduced by half (-3 dB), a conical boundary centered around the axis of transmission defines the sound beam, the diameter of which is the beam angle.



The ST-H transducers have an integrated temperature sensor that reports the air temperature at the transducer to the controller.

General Guidelines



WARNING: 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.

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.

Wiring setups for hazardous area installations

Always check the device nameplate and process device tag to verify the approval rating.

1. Intrinsically Safe wiring

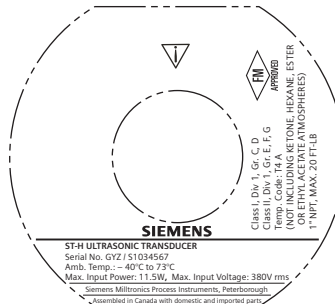
Device nameplate (ATEX/INMETRO/C-TICK/CSA)



The ATEX certificate can be downloaded from the product page of our website at: <https://www.automation.siemens.com/w1/automation-technology-st-h-transducer-18736.htm>. Go to **Support > Approvals / Certificates**.

CSA Intrinsically Safe connection drawing number **1-9470004Z-DX-A** can be downloaded from the product page of our website at: <https://www.automation.siemens.com/w1/automation-technology-st-h-transducer-18736.htm>. Go to **Support > Installation Drawings > Level Measurement > Continuous - Ultrasonic**.

Device nameplate (FM)



- Refer to *Instructions specific to hazardous area installations (Reference European ATEX Directive 94/9/EC, Annex II, 1/0/6)* on page 4.

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 13ATEX5017X.

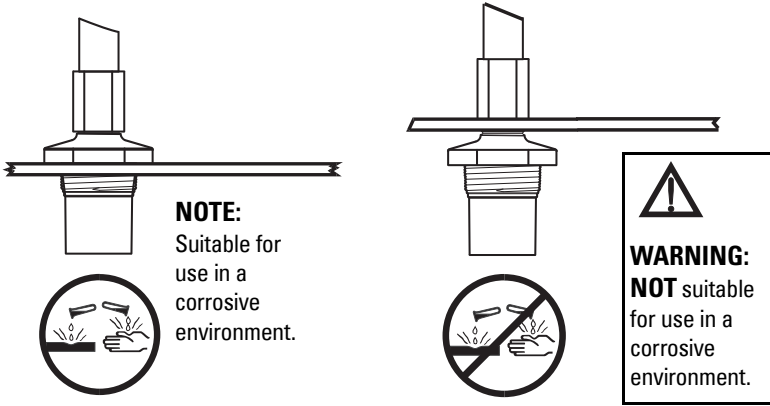
1. The equipment may be used with flammable gases and vapors with the Apparatus Group II and with Temperature class T5.
2. The equipment is certified for use in an ambient temperature range of -20 °C to +60 °C.
3. The equipment has not been assessed as a safety related device as referred to by EC Directive 94/9/EC Annex II, clause 1.5.
4. The certificate has a 'X' suffix, which indicates that special conditions of installation and use apply. Those installing or inspecting this equipment must have access to the contents of the certificate.
5. The apparatus shall only be supplied from a circuit containing a suitably rated fuse having a breaking capacity of at least 1500A.
6. Installation and inspection of this equipment shall be carried out by suitably trained personnel in accordance to the applicable code of practice (EN 60079-14 and EN 60079-17 within Europe).
7. Repair of this equipment shall be carried out by suitably trained personnel in accordance with the applicable code of practice (e.g. EN60079-19 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 certification of this equipment relies upon the following materials used in its construction:
 - Norton Performance Plastics Chemgrip bonding compound
 - ETFE housing material
 - PVDF housing material
 - Dow-Corning 3-4207 encapsulant
 - Royal EPOCAP 42174/52174
 - Cotronics Durapot 864 encapsulant

If the equipment is likely to come into contact with aggressive substances, such as solvents that may affect polymeric materials, it is the responsibility of the user to take suitable precautions to prevent the equipment from being adversely affected. It is important to perform routine inspections and establish from the materials data sheet that the transducer is resistant to chemicals used in the application.

Safety Precautions

The ST-H transducer body is a two part design moulded in PVDF or ETFE with internal parts potted in epoxy. The joint between the upper and lower sections is not a hermetic seal. The structural integrity of the transducer will be compromised if the joint is exposed to an environment that attacks epoxy. As a result, the top section will separate from the main body of the transducer.

For environments that are compatible with PVDF or ETFE but may degrade epoxy, the transducer must be mounted through a flange or stub mount using the 2" thread on the lower section of the transducer. The joint between upper and lower sections of the transducer must be isolated from the corrosive environment.



If the top section separates from the main body of the transducer, live circuitry will be exposed to the hazardous environment, increasing the risk of an explosion if volatile or explosive dusts or gases are in sufficient concentration. A malfunction of the level system may also occur, which may affect the process using the ultrasonic ranging system.

Specifications

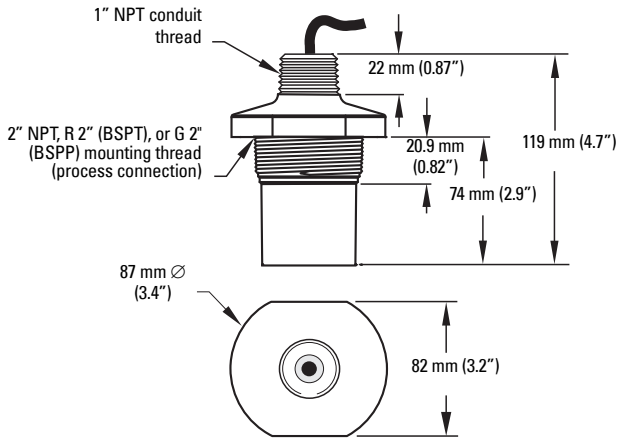
ST-H Transducer	
Measurement Range	0.3 - 10 m (1 - 33 ft)
Pressure	vent to atmosphere
Supply Source	transducer shall only be supplied by a Siemens Milltronics certified controller
Frequency	44 kHz
Beam Angle	12°
Weight*	1.4 kg (3 lbs)
Separation	365 m (1200 ft) from transceiver
Environmental	
Location	indoor/outdoor
Altitude	2000 m (maximum)
Ambient Temperature	-20 to +60 °C (-5 to +140 °F) (ATEX approved model, INMETRO) -40 to +73 °C (-40 to +163 °F) (CSA/FM approved model)
Construction	
Housing	PVDF or ETFE base and lid (epoxy fitted joint)**
Mounting	2" NPT (Taper), R 2" (BSPT), or G 2" (BSPP) process connection
Cable	2-core shielded/twisted, 0.519 mm ² (20 AWG), PVC sheath
Options	<ul style="list-style-type: none"> flange adapter, refer to associated instructions
Approvals	CE***, FM, ATEX, C-TICK, INMETRO, CSA (ETFE only)

* Approximate shipping weight of transducer with standard cable length.

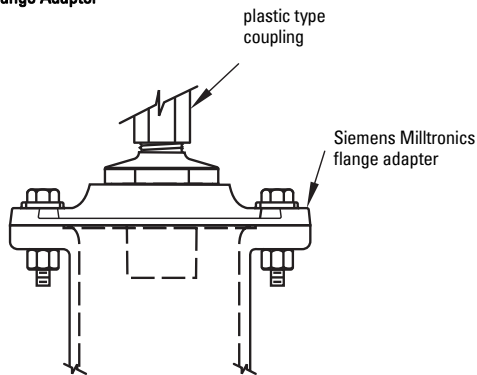
** For chemical application check compatibility of ETFE or PVDF and epoxy, or mount joint external to process.

*** Performance available upon request.

Outline and Dimensions



Flange Adapter

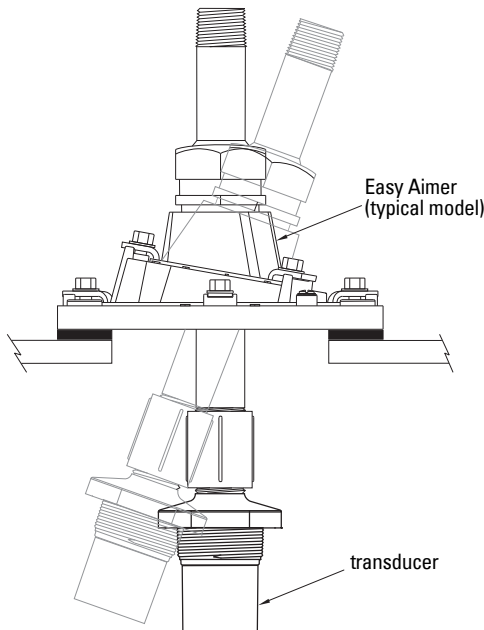


Mounting

- Do not mount the transducer directly to metal. Use a plastic type coupling and nipple for isolation (customer supplied).
- Mount the transducer so that it is **above the maximum material level by at least the blanking value**. Refer to the associated controller manual.
- For liquid applications, the transducer must be mounted so that the axis of transmission is perpendicular to the liquid surface. For tanks with a parabolic top, an Easy Aimer may be used to mount the transducer face perpendicular to the liquid surface.
- For solids applications, use a Siemens Milltronics Easy Aimer to aim the transducer.
- Where the transducer is mounted to a standpipe, the inner standpipe surface and end must be smooth and free of burrs, ridges, and seams.
- Consider the optional temperature sensor when mounting the transducer.
- Do not overtighten mounting. Hand tightening of the mounting hardware is sufficient.

Mounting – Solids Applications

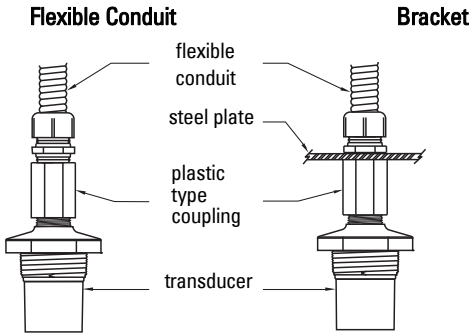
Non-Corrosive Applications



In solids applications, mount the transducer so that it is aimed toward the low level draw point. Use the optional Siemens Milltronics Easy Aimer to facilitate this mounting.

Mounting – Liquids Applications

Non-Corrosive Applications

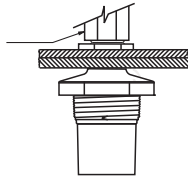


Flexible conduit mounted transducer should not be subjected to wind, vibration, or jarring



WARNING!
NOT suitable
for use in a
corrosive
environment.

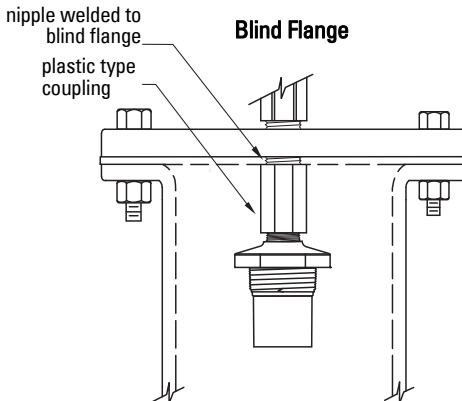
Plywood



Plywood mounting provides excellent isolation, but must be rigid enough to avoid flexing if subjected to loading.



WARNING!
NOT suitable
for use in a
corrosive
environment.



Flange, gasket, and hardware supplied by customer.

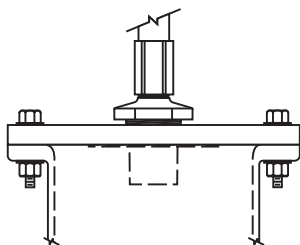


WARNING!
NOT suitable
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corrosive
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Mounting – Liquids Applications

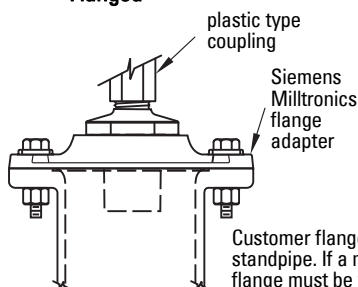
Corrosive Applications

Blind Flange



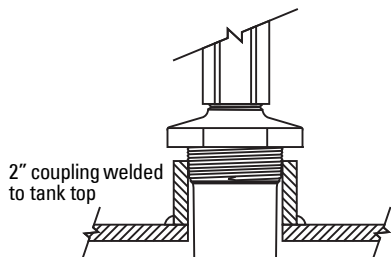
Flange, gasket, and hardware supplied by customer.

Flanged

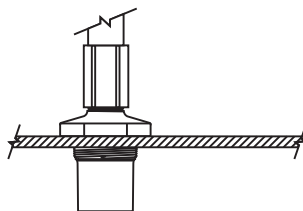


Customer flanged standpipe. If a metal flange must be welded to pipe, refer to the *Transducer Application Manual*, available at www.siemens.com/processautomation

Coupling



Coupling



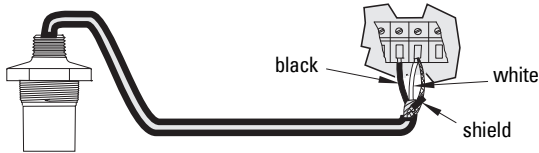
Interconnection

Note: Installation shall only be performed by qualified personnel and in accordance with local governing regulations.

- For optimum isolation against electrical noise, run cable separately in a grounded metal conduit with no other cabling (except temperature sensor). Ground shield only at transceiver. Insulate shield at junctions to prevent inadvertent grounding.
- Seal all thread connections to prevent ingress of moisture.
- Do not route cable openly.
- Do not run cable near high voltage or current runs, contactors, and SCR control drives.

Direct Connection

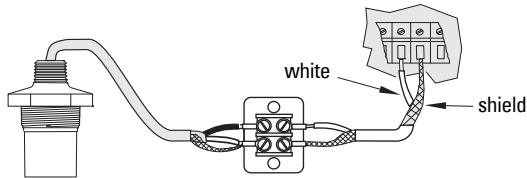
Connect the transducer directly to the Milltronics transceiver using the two conductor shielded cable.



Note: When connecting to a SITRANS LUT400, a MultiRanger 100/200, or a HydroRanger 200, the white, black, and shield wires are all connected separately. DO NOT tie the white and shield wires together.

Coaxial Extension

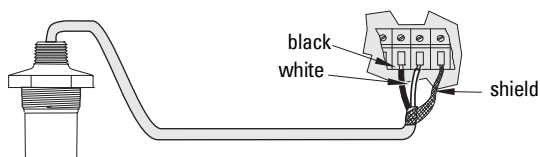
Connect the transducer to the Siemens Milltronics transceiver via a junction box and RG-62 A/U coaxial cable. This setup is effective for combined runs up to 365 m (1200 ft).



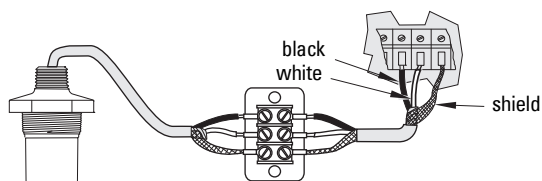
Extend cable using RG-62 A/U coax.

Note: When connecting to a SITRANS LUT400, MultiRanger 100/200, and HydroRanger 200, do NOT use coaxial cable; see diagram below for proper procedure.

3 Terminal Direct*



3 Terminal Extension*



Extend cable using 0.823 mm² (18 AWG) shielded/twisted pair.

* For SITRANS LUT400, MultiRanger 100/200, and HydroRanger 200 only

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.
- È 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:iltä.
- Korjaukset on kohdistettava ainoastaan viallisiin osiin.
- Viallisia osia ei saa käyttää uudelleen.

Reparation och ansvarfrihet:

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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