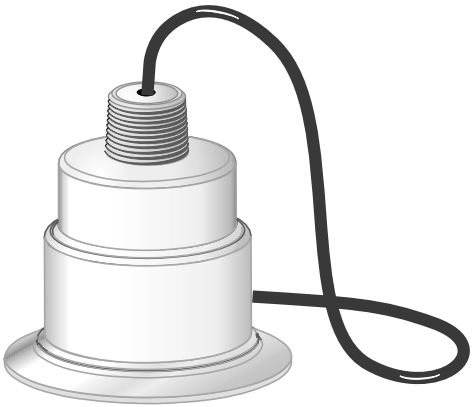
MILLTRONICS

XKS-6 SANITARY TRANSDUCER

Instruction Manual PL-542 January 2001



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Rev. 11

XKS-6 SANITARY TRANSDUCER

Safety Guidelines

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

Qualified Personnel

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

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

Note: Always use product in accordance with specifications.

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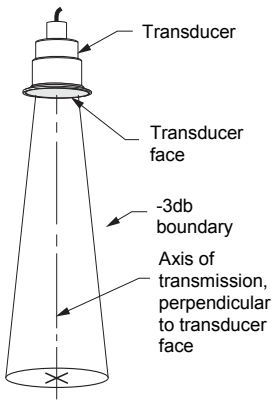
SPECIFICATIONS

Maximum Range	»	0.5m (15”) to 6.0m (20’) typical (may depend on application variables)
Minimum Range	»	0 to 20 °C (32 to 68 °F) ..... 0.3m (12”)
	»	20 to 110 °C (68 to 230 °F) ..... 0.4m (16”)
Beam Angle	»	10°
Frequency	»	46.5 KHz
Environmental		
Location	»	indoor / outdoor
Operating Temperatures	»	0° to 110°C (32° to 230°F)
	»	130°C (266°F) cleaning cycle max. 40 minutes
Altitude	»	2000m maximum
Pollution degree	»	4
Pressure (gauge)	»	200 kPa (29 psi)
Temperature Sensor	»	Internal
Supply Source	»	Transducer shall only be supplied by Milltronics certified controller
Enclosure	»	Kynar* with 316 Stainless Steel transducer face
Mounting	»	Base: 4” 3A compliant Tri-clamp
	»	Conduit: 1” NPT thread
Separation (max. cable run)	»	1, 5, 10m (3, 16, 33’) supplied 3-wire shielded cable
	»	365m (1200’) using coaxial cable
Cable	»	3-wire with braided shield, 0.75 mm^2 (18 AWG) Tefzel** jacket (integral)
	»	RG-62 A/U coaxial cable (extension)
Approvals	»	3A
	»	CE
	»	$CSA_{NRTL/C}$

* Kynar is a registered trademark of Elf Atochem
** Tefzel is a trademark of Dupont

ABOUT THE TRANSDUCER

The Echomax XKS-6 transducer works with Milltronics transceivers and provides the ultrasonic pulse and echo reception that these devices require.



The transducer converts electrical pulses provided by the transceiver to ultrasonic pulses used for measurement and then converts the ultrasonic echos back to an electrical signal. This signal is interpreted by the Milltronics tranceiver using the patented Sonic Intelligence™ algorithms. The ultrasonic pulse reduces in power by –3db in a 10° cone from the transducer face. It is important to keep objects out of this cone to reduce the chance of false echos being recorded.

The XKS-6 transducer incorporates an integral temperature sensor that reports the ambient temperature to the transceiver. The connection is transparent in that both the ultrasonic and temperature components of the transducer use the same leads. This ensures that the Milltronics transceiver can automatically compensate the speed of sound constant for varying temperatures.

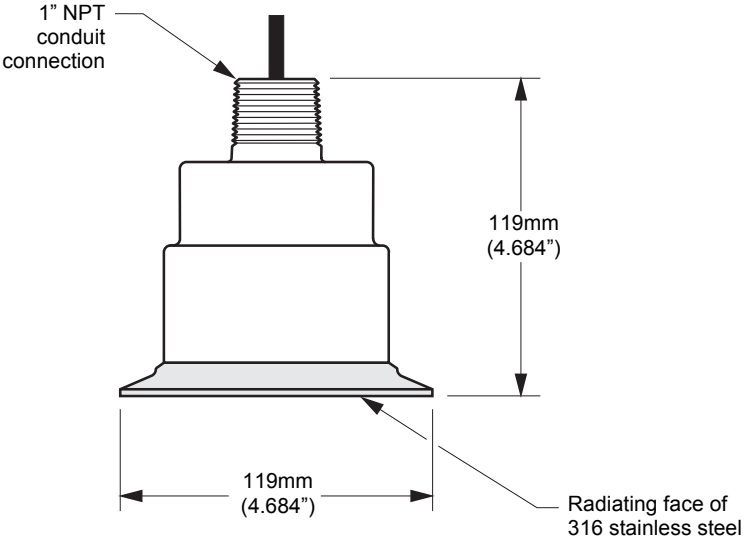
The 316 stainless steel face of the XKS-6 allows it to be used in the food industry in intense “clean in place” applications.

TRANSCEIVERS

Milltronics transceivers that will connect to the XKS-6 are:

- SPL
- DPL Plus
- XPL Plus

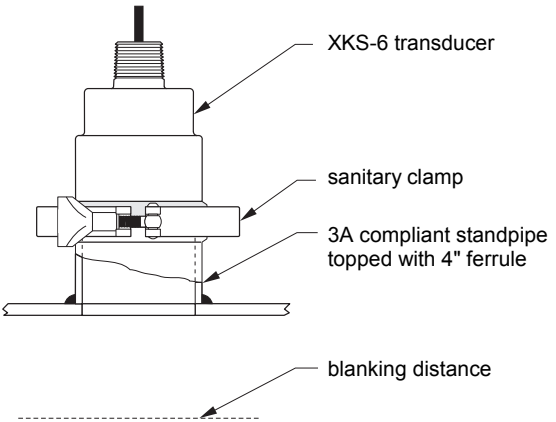
OUTLINE AND DIMENSIONS



FERRULE CONSIDERATIONS

The primary customer requirement is a 4", 3A compliant sanitary ferrule welded to a short standpipe on the top of the tank. The inner standpipe wall and ends must be smooth and free of burrs, ridges, or seams and comply with all applicable 3A regulations.

The standpipe extension between the mating ferrule and the tank top must be no longer than the blanking distance as determined by the Milltronics transceiver. The blanking distance is the minimum possible measurement distance listed in the Specifications on page 4.



Do not over tighten the mounting. Hand tightening of the mounting hardware is sufficient.

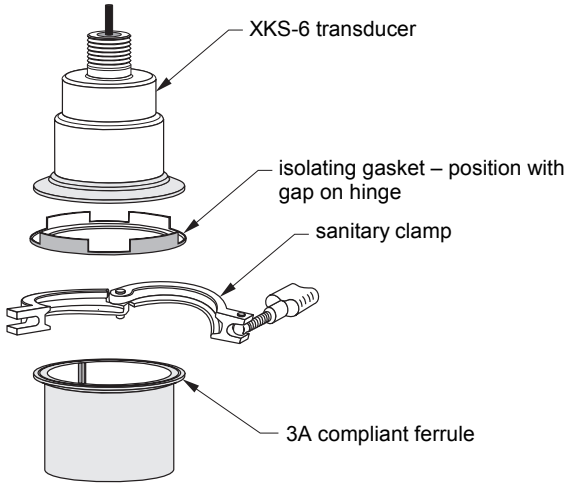
MOUNTING

Mount the transducer so that it is above the maximum material level by more than the blanking value to ensure that accurate results are achieved. Refer to the associated transceiver manual for information on setting the blanking value.

The transducer must be mounted so that the axis of transmission is perpendicular to the measured surface to get the most reliable signal. See Transducer Placement on page 10 for an example.

Ensure that one of the four gaps on the isolating gasket lines up with the hinge pin to ensure drainage of cleaning material.

Always use a Milltronics isolation gasket (P/N 22600515) when mounting the XKS-6. This gasket is specially designed to reduce ultrasonic energy coupling to the mounting hardware and provide you with accurate measurements.



Transducer must be mounted on a 4" ferrule.

Do not mount by conduit threads.

After applying the sanitary clamp, adjust the clamp as required to seal the transducer to the vessel ferrule. **Do not over tighten the mounting.** Hand tightening of the mounting hardware is sufficient.

- **Isolating Gasket** – Milltronics P/N 22600515
  Supplied with transducer, do not substitute parts

- **Sanitary Clamp** – Milltronics P/N 21200167
  May be substituted with a clamp meeting these specifications:
  - 4" single hinge, sanitary clamp
  - 4.820" interior diameter
  - 300 psi rated

- **3A compliant ferrule** – customer supplied to 3A specification

Refer to the associated transceiver manual for details on blanking, standpipe length, and wiring.

INTERCONNECTION

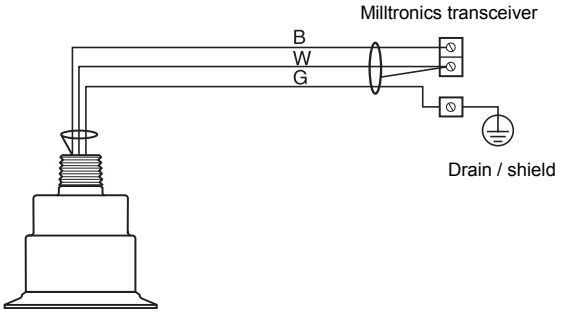
Installation shall only be performed by qualified personnel and in accordance with local governing regulations.

For best results follow these installation rules:

- » Do not route cable openly, instead run cable separately in a grounded metal conduit to protect it from ambient electrical noise.
- » Seal all thread connections to prevent the ingress of moisture.
- » Do not run cable near high voltage or current runs, contactors or SCR control drives.

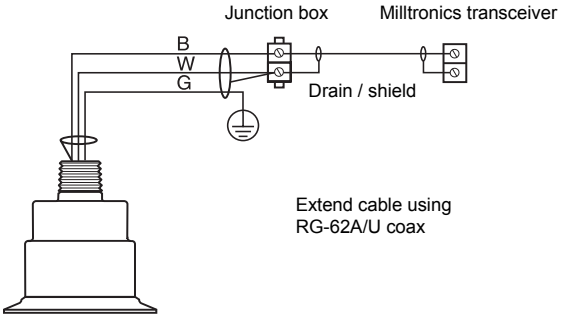
In all of the following examples the terminal blocks on the transceiver are described in the transceiver manual.

DIRECT CONNECTION



Use the supplied shielded, 3-wire cable to connect the transducer to the Milltronics transceiver. Supplied cable lengths are 1m (3'), 5m (16'), and 10m (33').

COAXIAL CONNECTION



Connect the supplied cable to a junction box and use RG–62 A/U coaxial cable from there to the Milltronics transceiver. This setup is effective for combined runs up to 365m (1200').

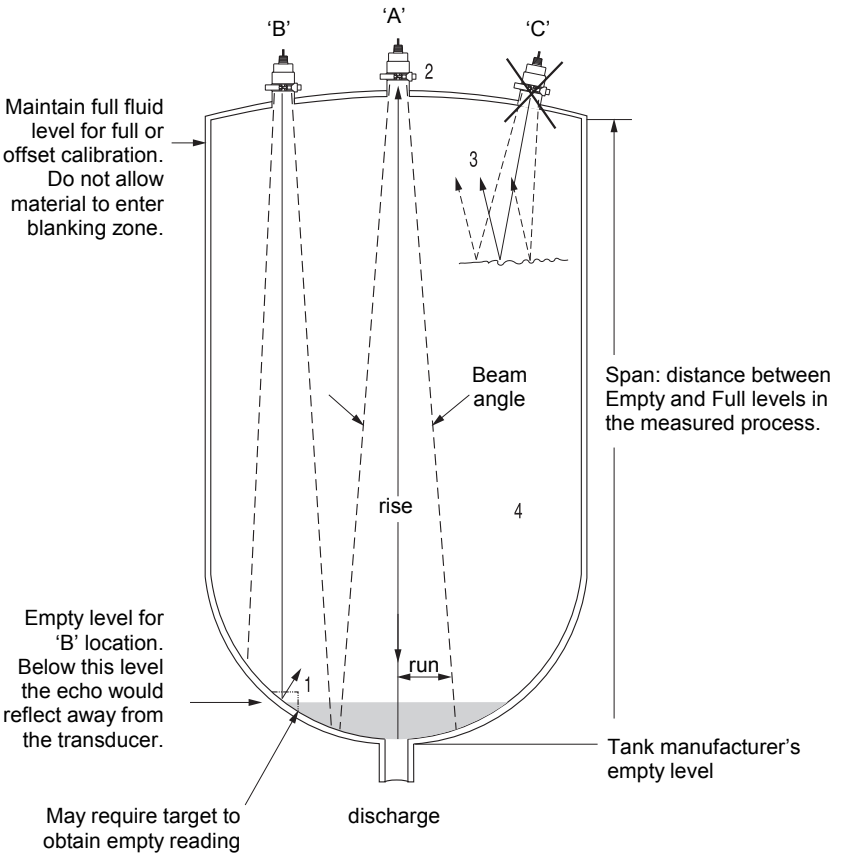
APPLICATION

The transducer is to be used only in the manner outlined in this instruction manual.

This transducer is recommended for use with liquids only.

TRANSDUCER PLACEMENT

The following graphic shows the best placement of the XKS-6 transducer.



LOCATIONS

A **Primary location.** This is the preferred location and should be used whenever possible. The centre of the tank generally gives the most reliable readings because there are fewer obstructions to provide false echos.

B **Alternate location.** This location is used if the centre of the tank is already in use or if the tank roof is too weak to hold the transducer safely.

C **Poor location.** This is a poor installation location. The echos are shown reflecting away from the transducer face.

NOTES

1. **Beam should not detect bin bottom.** If this occurs use range extension parameters (on transceivers where available) to omit false echos. The XKS-6 transducer operates with a beam angle of 10° and has a rise:run ratio of approximately 10:1. This means that for every 1m (3.3') of tank height you must allow for 0.1m (0.3')of material surface to reflect the ultrasonic pulses. In most tanks the transducer should be centred as much as possible (without interference from inlet) for optimum reading range.

2. **Sound beam must be perpendicular to liquid surface.** When mounting the standpipe and ferrule you must ensure that the transducer face will be parallel with the liquid surface.

3. **Echo has missed an improperly leveled transducer.** As 2, ensure that the standpipe and ferrule are mounted to set the transducer face level with the measured liquid.

4. **Calibrate under normal conditions.** When performing an empty or full calibration, the tank must contain its normal vapour and be at its normal temperature.

PROCESS TEMPERATURE VARIATIONS

The 316 stainless steel facing is constructed to allow for intense "clean-in-place" applications. When installing the XKS-6 transducer into a system that uses a high temperature "clean-in-place" process you must account for temperature variations in the transducer.

The temperature sensor's time constant is 45 minutes. This means that it takes 45 minutes to change 63.2% of the temperature difference between the transducer and ambient. Consult your engineering handbook for details on temperature constants.

MAINTENANCE

Normally, the XKS-6 requires no special maintenance or cleaning.

However, if performance changes are observed, shut down the level measurement system and perform a thorough inspection, especially on the transducer.

MILLTRONICS

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