

A Higher Level of Performance



Data Sheet

ORCA

Sonar System

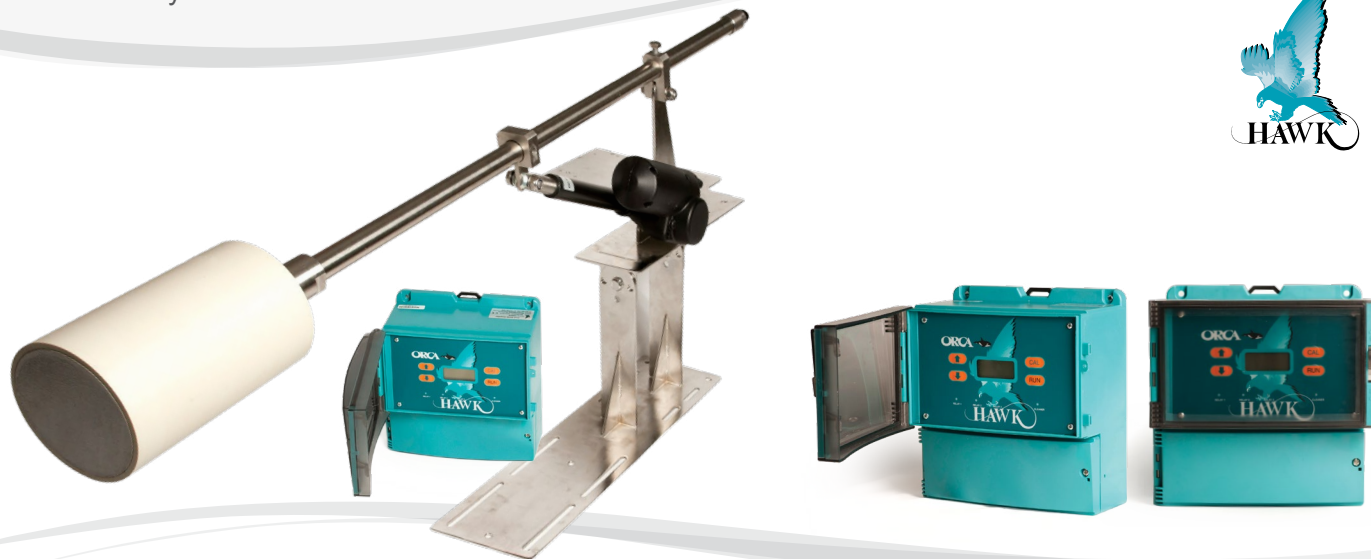
Sludge and Settling Level Interface Monitoring



For more information, please visit >
www.hawkmeasure.com

Overview

ORCA Sonar System



Principle of Operation

The ORCA Sonar Series transducer emits a high powered acoustic pulse, which is reflected from the interface density selected. The reflected signal is processed using specially developed software algorithms, that eliminate lighter floating densities and stratified layers, allowing measurement of Bed or RAS levels. It can be calibrated to measure lighter densities such as the hindered / free settling layer & floc or one of the outputs could be used for a "Clarity" output, similar to a basic turbidity transmitter measuring solids in suspension. The ORCA can be used in full automation of the vessel chemical by measuring the Bed level in conjunction with the lighter settling layer.

By choosing the correct sonar transducer frequency, the ORCA sonar guarantees the optimized performance when measuring both light and heavy density interfaces.

Function

The ORCA Series Sonar, sludge blanket and interface controller, consists of a microprocessor based transmitter, with easy menu driven programming via keypad, PC or 3G modem. The ORCA controller works together with appropriate sonar transducer and transducer cleaning mechanism.

Primary Areas of Application

Mining / Process:

- Concentrate Thickeners
- Tailings Thickeners
- Hi-Rate Thickeners
- Paste Thickeners
- Deep Cone Thickeners
- Thickeners
- CCD's
- Settling Ponds / Lagoons
- Water Treatment
- Carbon Columns.

Sewage & Wastewater:

- Primary Sedimentation – Blanket level
- Secondary and final Clarifiers – RAS Blanket and fluff / pin floc layer
- Thickeners and DAF – Bed level and clarity of water
- Sequential Batch Reactors – Blanket monitoring (floating sonar)
- Lagoons – Bed sludge level
- Lamella Clarifier – Bed level and floc level.

Features

- Dual independent analogue outputs to track two different interfaces, or clarity simultaneously, with the one sonar sensor
- Full range of sonar transducers to optimise detection of heavy and light density interfaces
- Widest range of sonar frequencies to optimise performance
- Easy calibration to track specific density interfaces, eg: RAS blanket - 4g/l, floc / fluff layer - 1g/l, Bed 10g/l+
- Industrial scum cleaning mechanisms, that do not require maintenance
- No wiper blade assemblies
- Control room graphics of tanks and interfaces
- Wide range of communications: Modbus, HART, Foundation Fieldbus, Devicenet, Profibus DP and Profibus PA
- 3G remote support capability for calibration, commissioning or technical back-up
- Relay alarms.



Technological Breakthrough for ORCA Sonar Transducer Range

HAWK has released the “fourth generation” sonar transducers, designed to increase the overall power, penetration and calibration density range of thickeners and CCD’s. HAWK has recognized that when monitoring thickeners and CCD’s, further penetration of the Bed level interface was necessary, to provide a wider density calibration range for the sonar transmitter.

The ORCA sonar transducer will allow the following improved capability in Thickeners and CCD’s when monitoring Bed level.

1. Greater penetration through the clarified level & the free settling zone
3. Penetration into the hindered settling zone dependent on frequency
4. The compacted zone can also be monitored using the second analogue output or one of the communication options: Modbus, Profibus PA, Profibus DP, Foundation Fieldbus, DeviceNet, HART etc.

The ORCA sonar transmitter can monitor two (2) different densities from one sonar transducer simultaneously - typically bed level and the hindered / settling density to be targeted with chemical dosing.

Transducer Selection Guidelines

The standard sensor for mining & heavy industry process is the OSIRT302SHXC6 (150kHz).

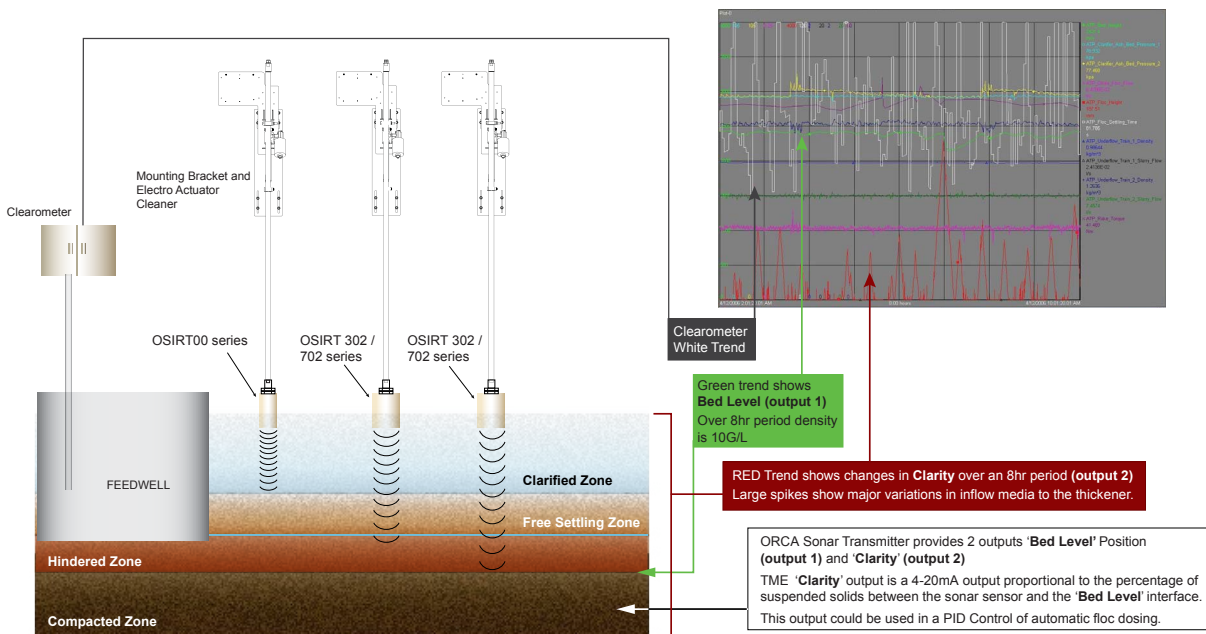
For the water / waste water industry select the OSIRT00x series. Most applications will be the OSIRT002 (150kHz) and the OSIRT003 (300kHz). Higher frequencies are available for finer materials.

General mounting requirements:

1. Identify a position away from direct inflow, where turbulence is minimized
2. An automatic scum cleaner is required - typically mounted on the hand rail
3. The sonar transducer should be at least 1/3 radius from circumference of the tank away from the influence of the feed well
4. Submerge approximately half of the transducer.

Mining Thickeners

Typical Bed Level Control

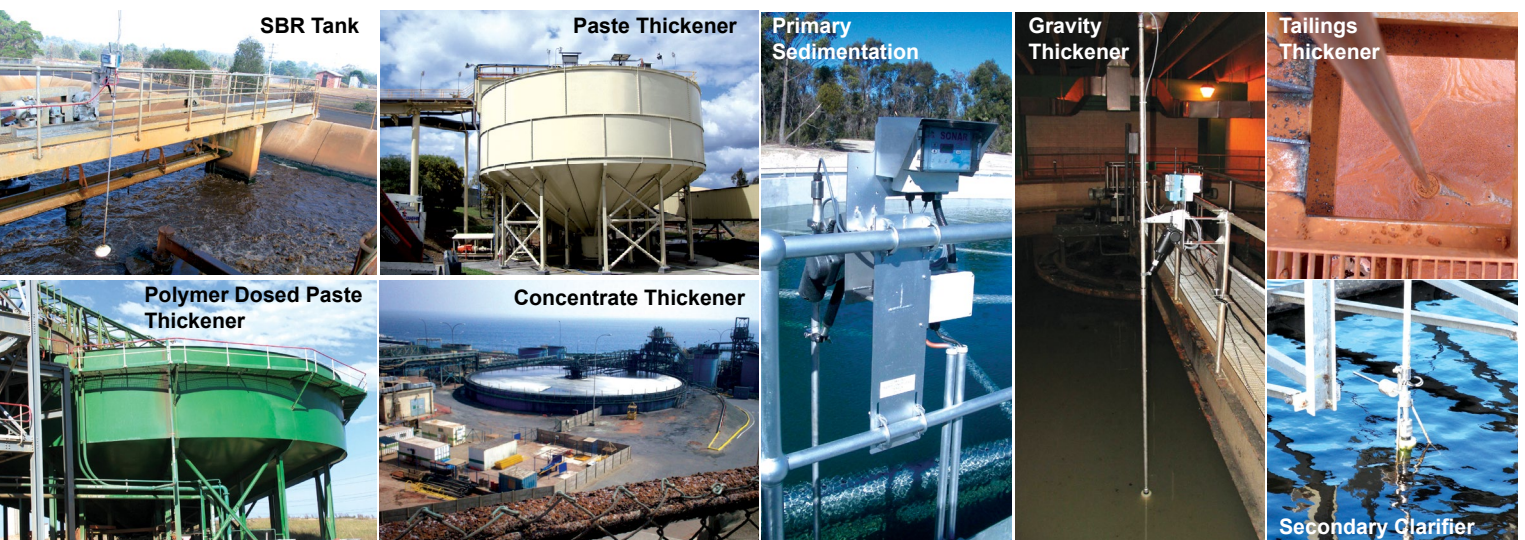


Sonar Transducer Penetration Capability Depending On Power Level.

- OSIRT00: PN Clarifier, Clarifiers, Tailings Dam
- OSIRT302 / 702: Tailings Thickeners, Paste Thickener, Hi-rate Thickener, CCD’s, Concentrate Thickeners.



Area	Functions
Mining / Mineral processing	
Clarifier Tank	Blanket level / clarity suspended solids / stratified floc layers
Thickener Tank	Sludge bed level / clarity suspended solids / stratified floc layers
CCD's Tank	Sludge bed level / clarity suspended solids / stratified floc layers
Settling Ponds	Sludge bed level
Water Treatment Plant	
Primary Sedimentation Tank	Floc level / sludge blanket level
Sludge Thickener Tank	Sludge bed level / clarity suspended solids / floc level
Calcium Hydroxide Reactor	Sand / pellet bed level
Sodium Hydroxide Reactor	Sand / pellet bed level
Sewage Treatment Plant	
Primary Sedimentation Tank	Sludge blanket level
Secondary / Final Clarifier	RAS blanket level / rag/pinfloc layer / clarity suspended solids
Sludge Thickener Tank	Sludge bed level / clarity suspended solids
"DAF" Tank	Sludge bed level / floating sludge level
Sequential Batch Reactor (SBR)	Settling bed level / RAS blanket level
Industrial (food, paper etc.)	
Primary Sedimentation Tank	Sludge blanket level
Secondary Clarifier Tank	RAS blanket level / clarity suspended solids / rag/pinfloc layer
Thickener Tank	Sludge bed level / clarity suspended solids / floc level
"DAF" Tank	Sludge bed level / floating sludge level
Sequential Batch Reactor (SBR)	Settling blanket level / RAS bed level
Carbon Column	Carbon bed level



Dimensions

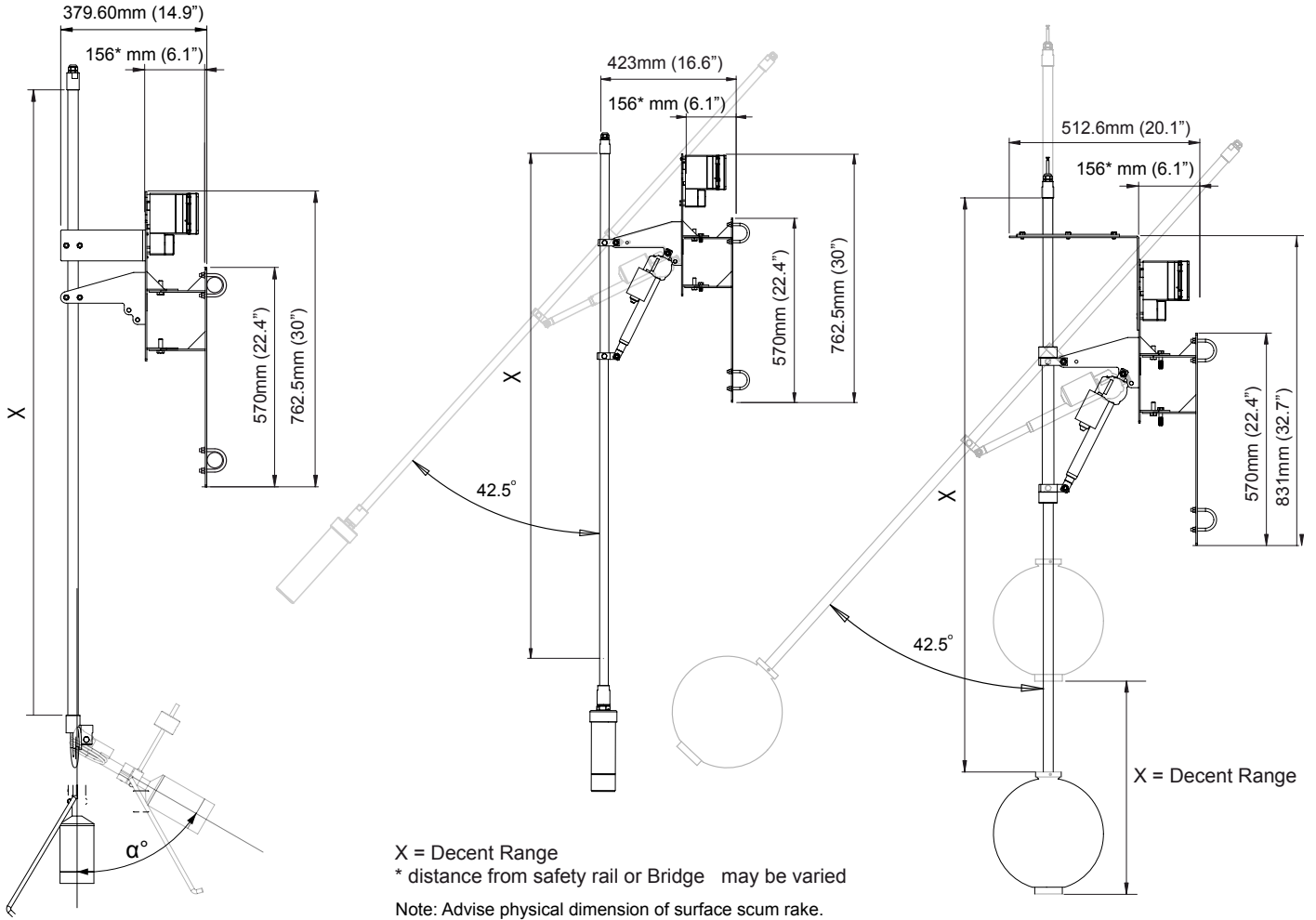
ORCA Sonar System



Sonar Impact Plate

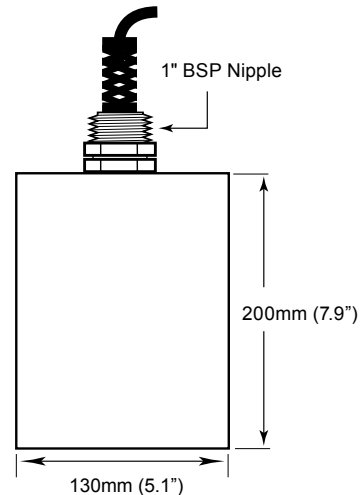
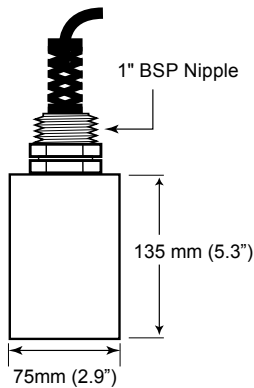
Sonar Actuator Cleaner

Floating Sonar Sensor



OSIRT00 Transducer

OSIRT 302 / 702 Transducer

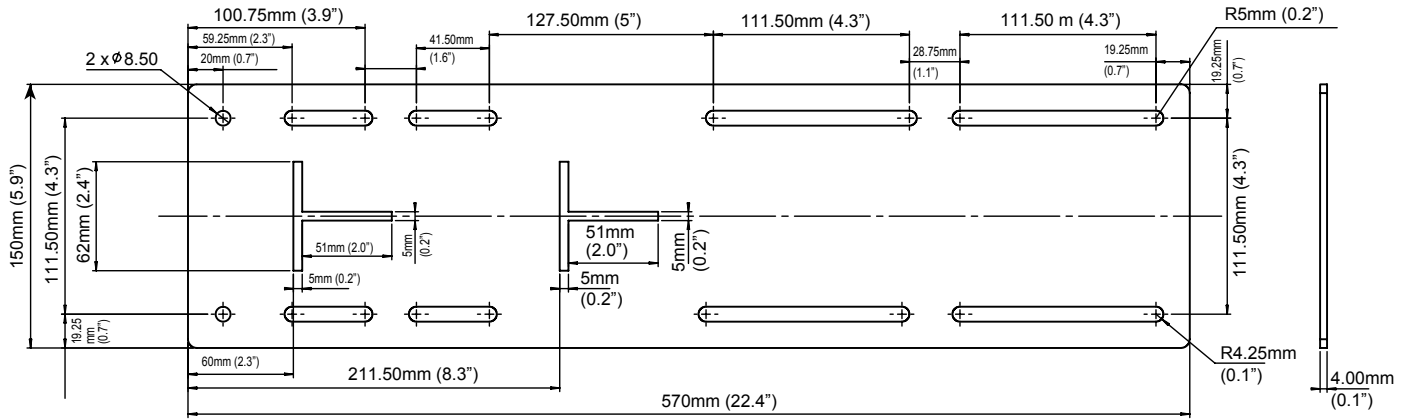


Dimensions

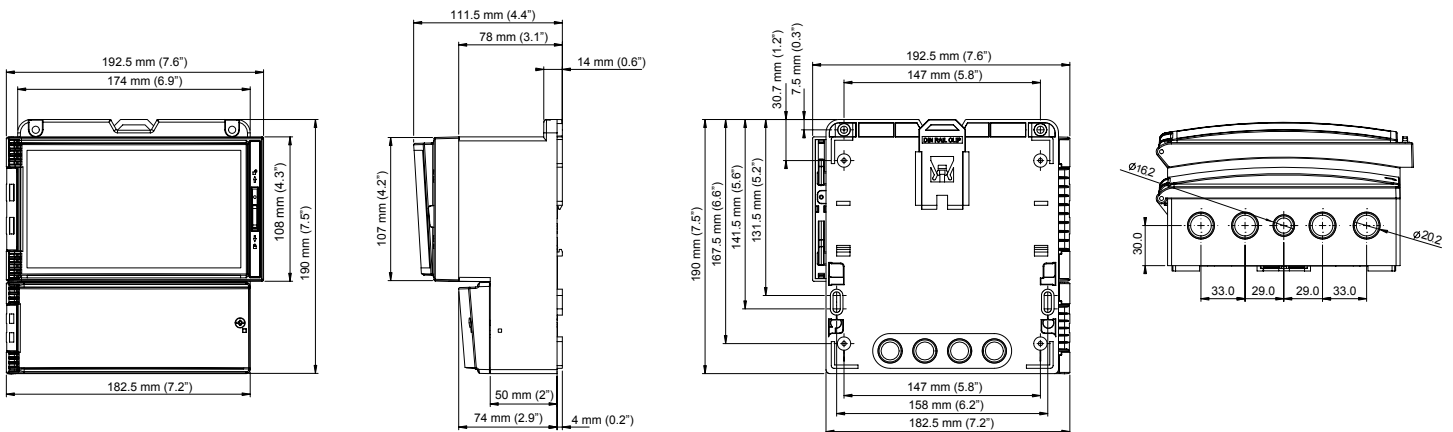
ORCA Sonar System



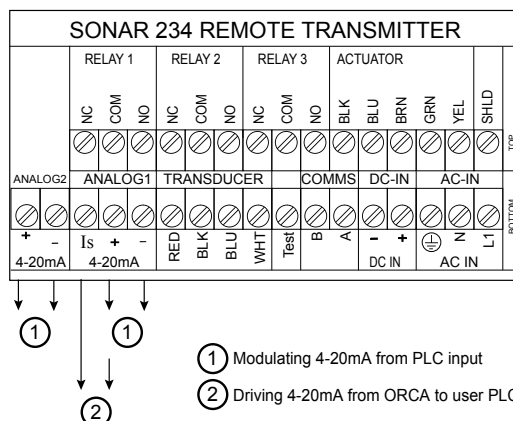
Rail Base Plate



Remote Enclosure



ORCA Remote Wiring





ORCA Remote Electronics

OSIR Sonar Level Transmitter, 3 relay alarms, Modbus

Power Supply

- B 24-30 VDC
- D 90-250VAC and 24-30VDC

Additional Communications

- X 1 x 4-20mA analog output modules with Modbus Comms
- Y 2 x 4-20mA analog output modules with Modbus Comms
- I 1 x 4-20mA analog output modules with Modbus and HART
- J 2 x 4-20mA analog output modules with Modbus and HART
- W Modbus only
- P Profibus DP
- A Profibus PA
- F Foundation Fieldbus
- D DeviceNet
- X

OSIR D Y X

Accessories

Mounting Extension

OSIRMEL Mounting Extension Stainless Steel Pipe

Length

- 2 2 meters
- 3 3 meters
- 4 4 meters
- 5 5 meters

H Full transducer / pole FRP fibreglass encapsulation (consult factory)

OSIRMEL 2

Automatic Scum Cleaner

OSIRSC Automatic Scum Cleaner

Type

- A 24VDC Electric Actuator incl. Mounting Accessories
- B Pneumatic Actuator (please consult the factory)
- D Floating Sonar with 24VDC Electric Actuator incl. Mounting Accessories
- E Impact Plate Dual Direction plus Mounting Bracket with Mounting Accessories

OSIRSC A

Remote Sonar Transducer

OSIRT ORCA Sonar Transducer

Transducer Strength

- 0 Water / Wastewater
- 3 Industrial / Mining (select 150kHz Transducer only)
- 7 Heavy Industrial / Mining (select 150kHz Transducer only)

Transducer

- 02 (150kHz)
- 03 (300kHz)
- 04 (450kHz)
- 05 (700kHz)

Facing & Housing material*

- S4 Fiberglass face with Polypropylene housing (max 50C) neutral pH (~7)
- SH Full fiberglass high temperature version (max 80C 180F) high / low pH

Approval Standard

(consult safety instructions for potential IS barrier req)

- X Not Required
- i0 IECEx Zone 0 (Ex ia IIA T4 IP68 Tamb -20°C to 70°C)
- A0 ATEX Grp II Cat 1 GD EEx ia IIA T4 IP68 (Tamb -20°C to 65°C)
- A1 ATEX Grp II Cat 2 GD EEx m II IP68 T5 (Tamb -20°C to 65°C) T6 (Tamb -20°C to 50°C)
- i1 IECEx Zone 1 (Ex mb II IP68 T5(Tamb -20°C to 65°C) T6(Tamb -20°C to 50°C))

Connection

- C IP68 Sealed with 6 metre cable
 - 6 6m cable
 - 15 15m cable
 - 30 30m cable
 - 50 50m cable

FRP Full transducer / pole FRP fibreglass encapsulation (requires OSIRMELxH) consult factory

OSIRT 3 02 SH X C 6

*Other facing & housing materials including GH and HH are now same specification as SH option.

Specifications

ORCA Sonar System



Sonar Frequency Selection

- 150kHz, 300kHz, 450kHz, 700kHz.

Operating Voltage

- 90 - 260Vac 50 / 60Hz
- 24Vdc (min 5A supply)
- Residual ripple no greater than 100mV.

Power Consumption

- <10VA @ 240Vac
- <10W @ 24Vdc.

Analogue Output

- Either single or dual analogue
- 1 x 4-20mA (isolated) 600 ohms max
- 1 x 4-20mA (non isolated) 600 ohms max.

Communications

- GosHawk, HART, Modbus, Profibus DP, DeviceNet, Foundation Fieldbus, Profibus PA.

Relay Output

- 3 x s.p.d.t. 0.5amp / 240vac
- Form c. type non-inductive load
- Fully programmable.

Maximum Range

- 65 meters.

Blanking Distance

- 450mm: 150kHz, 300kHz, 450kHz
- 600mm: 700kHz.

Resolution

- 1mm.

Accuracy

- +/- 0.25%

Operating Temperature

- Remote Electronics: -40°C to 70°C
- Sonar Transducer Polypropylene: -40°C to 50°C
- Sonar Transducer FRP Fibreglass -40°C to 80°C.

Transducer / Transmitter Separation

- >500m

Note: Must be BELDEN 3084A

IMPORTANT
"USE SPECIFIED CABLE ONLY"

Cable (Sonar Transducer)

- BELDEN 3084A.

Sealing

- Remote Electronics IP67
- Remote Transducer IP68.

Cable Entries

- Remote Electronics: 3 x 20mm 1 x 16mm.

Typical Weight

- Remote Electronics 1kg
- Remote Transducer 1kg
- Cleaning Mechanism 5kg.

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Additional product warranty and application guarantees upon request.

Technical data subject to change without notice.

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