



Transducer/Triducer Specifications

Light Marine

Performance Data

A table of performance data is provided for each model.




The following notes are keyed to this data and are important for its proper interpretation.

- The frequency listed is the nominal series resonant frequency (i.e., the best transmit frequency), fr.
- For detailed performance data on a specific piezoceramic designator, refer to the "Piezoceramic Designation Chart" and the *Airmar Technical Data Catalog*.
- B = Barium Titanate
PZT = Lead Zirconate Titanate
L = Langevin or Tonpilz type (laminated assembly)
- Measured for transmitting response.
 $Q = fr/\Delta f$, where fr is the resonance frequency and Δf is the bandwidth at the -3 dB point.
- Peak Transmitting Voltage Response: dB re 1 μ Pa per V at 1 meter.
Peak Receiving Voltage Response: dB re 1V per μ Pa.
- The sum of Transmitting Voltage Response and Receiving Voltage Response, also referred to as Insertion Loss.
- Measured in a balanced transmission line. Rp is the minimum parallel resistance in the frequency response near resonance.
- The series impedance is measured at the resonance frequency, fr.
- Ground discrimination.
- Bar shaped piezoceramic element.
- HPU= Hybrid Plastic Urethane
- Incorporates a transformer. Other impedances can be obtained by changing the transformer turns ratio.

Note: Impedance can be tailored to the customer's specification by changing the turns ratio of the transformer or by adding a transformer if none exists.

Note: This is measured for an untuned condition. Longer cable and high capacity cables will, therefore, adversely affect the measured receive response. However, in actual use, the capacity is usually tuned out.

PERFORMANCE DATA

Frequency ¹ – Airmar Piezoceramic Designator ²	50 kHz – I ⁹	200 kHz – X	50 / 200 kHz – A	
Frequency Tolerance (kHz)	± 1.5	± 4	± 1	± 4
Element Material ³ /Quantity x Diameter (mm)	PZT / L / 4 x 44	PZT/6.6 x 35 ¹⁰	PZT/44	
Element Configuration (not to scale)				
Beam Width at:				
-3 dB	12°	14° x 37°	47°	12°
-6 dB	17°	18° x 51°	67°	17°
-10 dB	22°	22° x 62°	90°	21°
Q (fr/Δ f @ -3 dB) ⁴	6	9	23	27
Rated RMS Power (W)	1,200	125	600	600
Voltage Responses: Transmit/Receive ⁵ (dB)	165 / -179	153 / -191	154 / -175	164 / -184
Figure of Merit (Insertion Loss) ⁶ (dB)	-14	-38	-31	-21
Parallel Impedance ⁷ : Resistance, Rp (ohm)	250	1,000	220	325
Capacitance, Cp (pF)	16,000	250	1,250	700
Series Impedance [R - jX] ⁸ (ohm)	100 - j125	930 - j300	215 - j18	300 - j85
Acoustic Window Material	Epoxy	Plastic	HPU ¹¹	



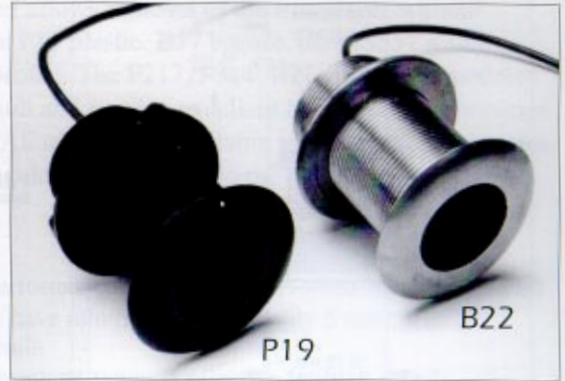
Transducer/Triducer Specifications

P19 Low Profile

B22 Low Profile

50 kHz, 120 kHz, 200 kHz

The model P19 and B22 low profile, thru-hull transducers offer little drag and easy installation. Larger than the P5, the P19 and B22 transducers accommodate larger piezoceramics providing higher sensitivity for better bottom and fish detection. These models are available in depth or depth / temperature configurations. Product update - These models now have new quick wetting acoustic window.



Features

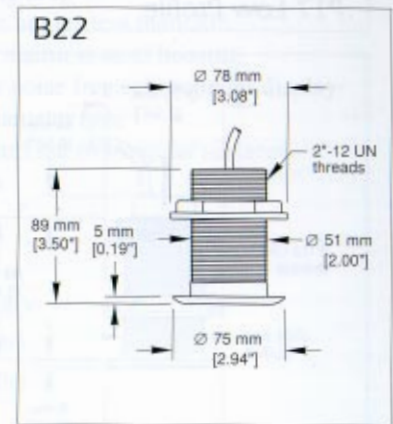
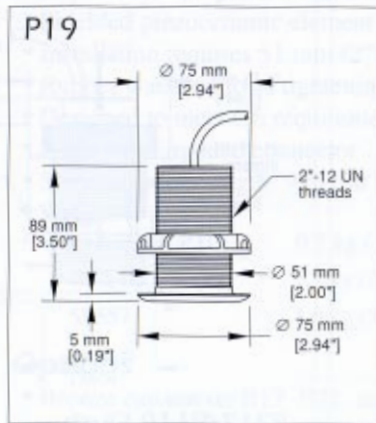
- Good high speed performance on planing hulls when mounted well aft
- Low profile creates minimal drag with only 5 mm (3/16") extending outside hull
- Designed for mounting on deadrise angles less than 20°
- Shielded piezoceramic element for noise free echosounder display
- Rubber washer allows tightening hull nut to irregular surfaces.
- Designed to meet CE requirements
- Installation requires 51 mm (2") diameter hole
- Waterproof molded connector
- Standard cable length: 9 m (30')
- P19 Weight: 0.6 kg (1.3 lb.)
- B22 Weight: 0.9 kg (2 lb.)

Options

- Temperature sensor
- Custom frequencies and cable lengths

Applications

- Planing hull powerboats and sailboats
- P19 not for use in wood hull
- B22 for fiberglass or wood hulls



Notes

- Use with matching ST650 for echosounders requiring depth, speed, and temperature inputs
- P19 Accommodates hull thickness:
 - Min. 6 mm (1/4")
 - Max. 70 mm (2 3/4")
- B22 Accommodates hull thickness:
 - Min. 6 mm (1/4")
 - Max. 70 mm (2 3/4")
- To install, refer to "Installation Guidelines"

PERFORMANCE DATA

Frequency ¹ – Airmar Piezoceramic Designator ²	50 kHz – W	120 kHz – B	200 kHz – B	200 kHz – U
Frequency Tolerance (kHz)	± 1.5	± 2.4	± 4	± 2.4
Element Material ³ /Diameter (mm)	PZT/L/35	PZT/37	BT/28	BT/38
Beam Width at:				
-3 dB	69°	18°	16°	12°
-6 dB	91°	24°	21°	17°
-10 dB	113°	30°	26°	21°
Q (fr/Δ f @ -3 dB) ⁴	5	23	28	28
Rated RMS Power (W)	150	500	300	500
Voltage Responses: Transmit/Receive ⁵ (dB)	150/-179	159/-185	160/-187	163/-185
Figure of Merit (Insertion Loss) ⁶ (dB)	-31	-25	-28	-22
Parallel Impedance ⁷ : Resistance, Rp (ohm)	650	370	470	500
Capacitance, Cp (pF)	1,800	1,000	420	700
Series Impedance [R - jX] ⁸ (ohm)	590 - j220	340 - j100	435 - j115	400 - j200
Acoustic Window Material	Urethane	Urethane	Urethane	Urethane

Note: See page one for footnotes.



Transducer/Triducer Specifications

P32

150 kHz, 200 kHz

U.S. Patent No.
4,644,787
U.S. Patent No.
5,606,253

This model features a non-projecting paddlewheel which affords the speed sensor nearly total protection. A channel is shaped to bend the water flow upwards onto the paddlewheel. We call this working principle "guided flow". Should the paddlewheel become fouled with aquatic growth or sand, it can be removed easily. The P32 incorporates a release bracket to protect against impact damage. The polished plastic window provides excellent high speed operation. Available with a conical or elliptical beam pattern.



Features

- Non-projecting paddlewheel protects from impact and wear
- Paddlewheel assembly easily removed for inspection, cleaning, or replacement
- Unitary bearings inside paddlewheel hub assure exact alignment and minimal rotational friction
- Compact wedge shape provides vertical sound beam orientation on hull deadrise angles up to 30°
- Reversible wedge allows mounting to transom angles from 3° – 20°
- Good high speed operation to 55 knots (63 MPH)
- Designed to meet CE requirements
- Shielded piezoceramic element for noise free echosounder display
- Waterproof molded connector
- Cable retainer prevents chafing
- Standard cable length: 7.6 m (25')
- Weight: 0.5 kg (1.1 lb.)

Speed Sensor Specifications

- Linearity: $\pm 3\%$ from 3 knots (except in transition range between displacement and planing speeds).
- Standard pulse rate:
19,000 pulses/NM (5.3 Hz/kn)

Options

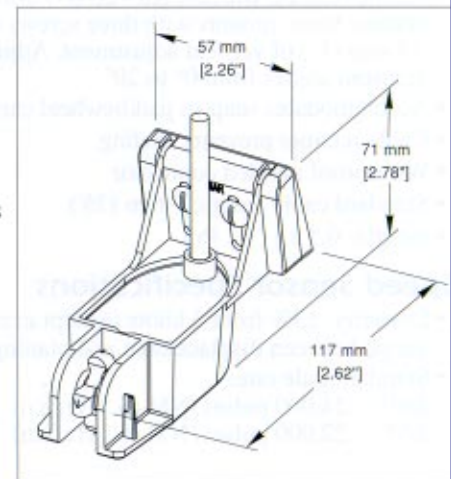
- Portable Bracket Kit #33-173
- Custom frequencies and cable lengths

Applications

- Small general-purpose echosounders
- Outboard, inboard/outboard, or jet boats
- Fiberglass, aluminum, wood, or inflatable hulls

Notes

- To install, refer to "Installation Guidelines"



PERFORMANCE DATA

Frequency ¹ – Airmar Piezoceramic Designator ²	150 kHz – A	200 kHz – A	200 kHz – X
Frequency Tolerance (kHz)	± 3	± 4	± 4
Element Material ³ /Diameter (mm)	PZT/27	PZT/27	PZT/6.6 x 35
Beam Width at:			
–3 dB	18°	14°	14° x 37°
–6 dB	25°	19°	18° x 51°
–10 dB	32°	25°	22° x 62°
Q (fr/ Δf @ –3 dB) ⁴	13	23	9
Rated RMS Power (W)	300	300	125
Voltage Responses: Transmit/Receive ⁵ (dB)	157/–185	158/–187	153/–191
Figure of Merit (Insertion Loss) ⁶ (dB)	–28	–29	–38
Parallel Impedance ⁷ :			
Resistance, Rp (ohm)	980	950	1,000
Capacitance, Cp (pF)	450	420	250
Series Impedance [R – jX] ⁸ (ohm)	825 – j350	785 – j360	930 – j300
Acoustic Window Material	Plastic	Plastic	Plastic

Note: See page one for footnotes.



Transducer/Triducer Specifications

TRANSOM MOUNT ■ Depth ■ Speed ■ Temperature

P37

120 kHz, 150 kHz, 200 kHz

U.S. Patent No. 4,644,788
 U.S. Patent No. 4,850,559
 U.S. Patent No. 4,644,787
 U.S. Patent No. 4,555,938
 Canadian Patent No. 1,233,341

Model P37 is our mid-sized, transom mount transducer. Designed with a polished acoustic window for superior high-speed operation, this unit is available in depth, depth/temperature, and integrated depth/speed/temperature TRIDUCER® multisensor configurations.



Features

- Good high-speed operation to 52 knots (60 MPH)
- Housing allows vertical sound beam orientation on hulls with deadrise angles up to 30°
- Shielded piezoceramic element for noise free echosounder display
- Designed to meet CE requirements
- Plastic Release Bracket Kit #20-039 with selectable release force, mounts with three screws and provides 25 mm (1") of vertical adjustment. Adjusts to transom angles from 0° to 20°
- Accommodates snap-in paddlewheel carrier
- Cable retainer prevents chafing
- Waterproof molded connector
- Standard cable length: 7.6 m (25')
- Weight: 0.5 kg (1.1 lb.)

Options

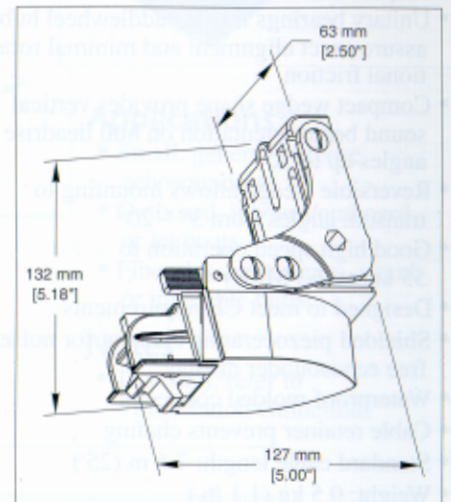
- Speed and/or temperature sensor
- Portable Transom Mount Bracket Kit #20-073
- Protective tape over acoustic window prevents abrasion during shipping and installation
- Custom frequencies and cable lengths
- Stainless steel Kick-Up, Release Bracket Kit #20-035-X
- Stainless steel Fixed Bracket Kit #20-031

Applications

- Outboard, inboard/outboard, or jet boats
- Fiberglass, aluminum, wood, or inflatable hull

Notes

- To install, refer to "Installation Guidelines"



Speed Sensor Specifications

- Linearity: ±3% from 3 knots (except in transition range between displacement and planing speeds).
- Standard pulse rate:
 S61: 24,000 pulses/NM (6.7 Hz/Kn)
 S63: 22,000 pulses/NM (6.1 Hz/Kn)

PERFORMANCE DATA

Frequency ¹ – Airmar Piezoceramic Designator ²	120 kHz – A	120 kHz – B	150 kHz – A	200 kHz – A
Frequency Tolerance (kHz)	± 2.4	± 2.4	± 3	± 4
Element Material ³ /Diameter (mm)	PZT/L/19	PZT/37	PZT/27	PZT/27
Beam Width at:				
-3 dB	34°	17°	18°	14°
-6 dB	53°	24°	25°	19°
-10 dB	70°	29°	32°	25°
Q (fr/Δ f @ -3 dB) ⁴	15	7	13	23
Rated RMS Power (W)	1,500	500	300	300
Voltage Responses: Transmit/Receive ⁵ (dB)	155/-185	157/-182	157/-185	158/-187
Figure of Merit (Insertion Loss) ⁶ (dB)	-32	-27	-28	-29
Parallel Impedance ⁷ :				
Resistance, Rp (ohm)	550	740	980	950
Capacitance, Cp (pF)	920	500	450	420
Series Impedance [R - jX] ⁸ (ohm)	480 - j180	685 - j195	825 - j350	785 - j360
Acoustic Window Material	Plastic	Plastic	Plastic	Plastic



Transducer/Triducer Specifications

TRANSOM MOUNT ■ Speed ■ Temperature

S69, ST69

U.S. Patent No. 4,555,938
 U.S. Patent No. 4,644,787
 U.S. Patent No. 5,606,253
 Canadian Patent No. 1,233,341

The new S69 speed sensor mounts on the transom and features a paddlewheel and housing that do not project below the hull resulting in minimal drag and spray. Unlike pitot tubes, this sensor will not be damaged by beaching, impacts with trailer bunks, or flotsam. There are no sharp edges for swimmers to hit, and it is not susceptible to fouling by weeds. The S69 offers a continually adjustable bracket for transom angles from 3° to 16°, so it will accommodate jet boats, PWCs, stepped transoms, and conventional outboard and I/O powered hulls.

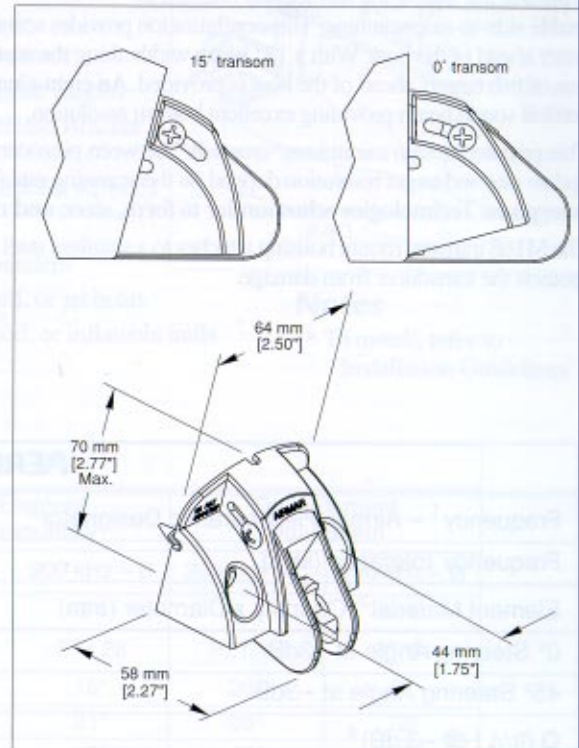


Features

- Sensor does not project below the hull
- Low drag at high boat speeds
- Continually adjustable bracket fitting transom angles from 3° – 16°
- Choice of left, right or top cable exit
- Paddlewheel easily removed for inspection, cleaning, or replacement
- Hall-effect magnetic sensor provides high level pulse output
- Unitary bearing inside paddlewheel hub assures minimal rotational friction
- Polished paddlewheel shaft for quick start-up
- Corrosion proof paddlewheel shaft for long life in saltwater
- Reverse polarity protection
- Shielded cable to minimize noise pick-up and emission
- Designed to meet CE requirements
- Standard cable length: 7.6 m (25')
- Weight: 0.3 kg (0.6 lb.)

Options

- Temperature sensor
- Pulse division circuitry for other pulse rates
- Solder or crimp style connector



Specifications ⁽¹⁾	
Speed range ⁽²⁾	1–50 knots (1–58 MPH)
Pulse rate	21,500 pulses per nautical mile (6 Hz per knot)
Supply voltage	5–25 VDC
Supply current: "OFF"	2.3 mA
"ON"	8 mA at 5 VDC
Circuitry: standard	3 wire format
optional	2 wire format

1. Refer to "Application Notes" for more detailed information.

2. Requires correction for non-linearity below 3 knots (3 MPH) and above 44 knots (50 MPH).

Applications

- Outboard, inboard/outboard, or jet boats
- Fiberglass, aluminum, or wood hulls

Notes

- To install, refer to "Installation Guidelines"