SB-120-9 Split beam Transducer

Features
- Centre Frequency of 120 kHz
- Wide bandwidth of 50 kHz
- Beamwidth: 9°
- TVR: 169 dB
- Sidelobes: <-20 dB
- Usable in split beam as well as single beam mode
- Customisation possible

Applications
- Split beam sonar
- Single beam sonar

Description
The SB120 is an electroacoustic ultrasonic transducer for underwater applications containing ceramic elements arranged in quadrants hermetically sealed with water resistant polyurethane rubber in a cylindrical stainless-steel case.

In the projector mode, transmission of four beam configurations is realised through different connections of the transducer quadrants to the driver. A narrow beam with circular cross-section is radiated if all quadrants are connected in parallel. Using two of the quadrants in parallel will generate elliptical cross-section beams in one plane and narrow in the perpendicular plane. A single quadrant will generate a wide beam of approximately circular cross-section.

In the hydrophone mode, the beams formed using the connections described above for the projector mode are identical to the corresponding projector beams.

The transducer also allows passive and active split-beam modes for target detection and localisation. The active split-beam mode normally requires system calibration for target strength measurement.

Customisation
The SB-120-9 design can be adjusted to meet custom specifications. Please contact Callaghan Innovation. This includes centre frequency, beamwidth, mounting, cable, etc.

Technical specifications
Specifications are for 20 °C transducer and ambient water temperature. Values are with 1 metre cable attached.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Min</th>
<th>Typ</th>
<th>Max</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Centre frequency</td>
<td>120</td>
<td>kHz</td>
<td></td>
<td></td>
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<tr>
<td>Bandwidth (-3 dB)</td>
<td>96</td>
<td>146</td>
<td>kHz</td>
<td></td>
</tr>
<tr>
<td>Impedance magnitude*</td>
<td>150</td>
<td>200</td>
<td>250</td>
<td>Ohm</td>
</tr>
<tr>
<td>Impedance phase*</td>
<td>-55</td>
<td>-70</td>
<td>-80</td>
<td>deg</td>
</tr>
<tr>
<td>Transmit response (TVR@120 kHz)**</td>
<td>169</td>
<td>dB</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Beamwidth (circular, all quadrants in parallel)</td>
<td>8</td>
<td>9</td>
<td>10</td>
<td>deg</td>
</tr>
<tr>
<td>Side lobes</td>
<td>-20</td>
<td>dB</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximum peak power input</td>
<td>500</td>
<td>W</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximum continuous power input</td>
<td>10</td>
<td>W</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximum transducer depth</td>
<td>10</td>
<td>m</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cable diameter</td>
<td>7.4</td>
<td>mm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight without cable (in air)</td>
<td>1.2</td>
<td>kg</td>
<td></td>
<td></td>
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<tr>
<td>Storage temperature</td>
<td>-10</td>
<td>50</td>
<td>°C</td>
<td></td>
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<tr>
<td>Dimensions</td>
<td>Diameter 110mm, height 35 mm (excludes cable gland)</td>
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</tbody>
</table>

* All quadrants in parallel, ** re 1 μPa per 1 V, *** Open circuit voltage response re 1 V per 1 μPa
Frequency response
TVR on axis at 20° C. Cable length 25 m.

Directivity pattern
TVR at 120 kHz. All quadrants in parallel.

Single quadrant directivity pattern
TVR on axis at 20° C. Cable length 25 m.

Revision history
<table>
<thead>
<tr>
<th>Date</th>
<th>Version</th>
<th>Notes</th>
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<tbody>
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<td>16 May 2018</td>
<td>1.0</td>
<td>First release</td>
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