



ARRIVAL
ENERGY SOLUTIONS

TSUNAMI

Tsunami Gen 2.0 On Demand Tandem – Independent Dual-Control Tool

Two tools. Two thresholds. Full independent control — without darts or trips.

The Tsunami Gen. 2.0 On Demand Tandem is engineered for multi-tool BHA deployments. Two tools are run in the string simultaneously, each configured to index at a different flow rate threshold — allowing operators to activate each tool independently from surface. No darts. No trips. Precise, selective control. Arrival's patented real-time hydraulic control system is also used in the Avalanche and the Hurricane.

HOW IT WORKS

Each tool is pre-configured with a unique flow rate indexing threshold. Tool #1 activates at 170 GPM. Tool #2 activates at 210 GPM. Cycling to 250 GPM turns both tools off at once. Normal drilling flow holds each tool in its current state.

COST SAVING BENEFITS

- Independent control of each tool while drilling
- Selective activation — index one tool without disturbing the other
- No darts required for either tool
- No tripping pipe to switch modes
- Reduce drilling dysfunction across the entire string
- Improve weight transfer and sliding ROP
- Optimise agitation output for each zone independently

FEATURES

- Dual configurable flow rate indexing thresholds
- Surface: Chemically Hardened Materials
- Power section positioned below the pulse generator
- Consistent RPM output regardless of nozzle setting
- All fluid flows through the rotor and stator — no through bore
- Low Friction Bearings: Lower operating pressures
- Output controlled via poppet and orifice diameters
- Shock Tool: Configurable amplifiers
- Safety Joint: Arrival manufactured and designed

PATENT

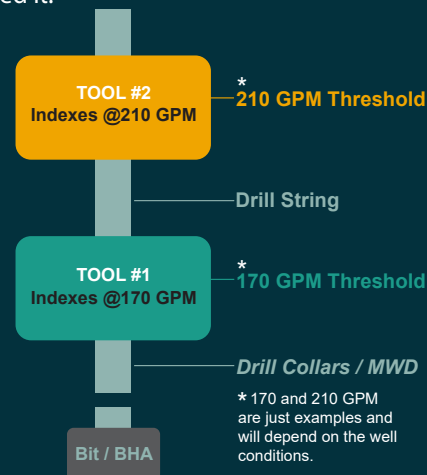
US 10,989,004 B2

US 11,480,020 B1

Additional patents pending

DUAL TOOL DEPLOYMENT

Tools are positioned in the BHA to target specific sections of the wellbore. Each tool operates independently — select the tool you need, at the time you need it.



ON DEMAND ACTIVATION

Both tools are hydraulically activated from surface. Cycling pumps down to 170 GPM activates Tool #1; cycling to 210 GPM activates Tool #2. Cycling to 250 GPM turns both tools off at once. Normal drilling flow holds each tool in its current state.

- No darts required for either tool
- No tripping out of the hole
- Immediate response to flow changes
- Each tool remembers its state until re-indexed

Patents US 10,989,004 B2 | US 12,331,604 | Additional Patents Pending

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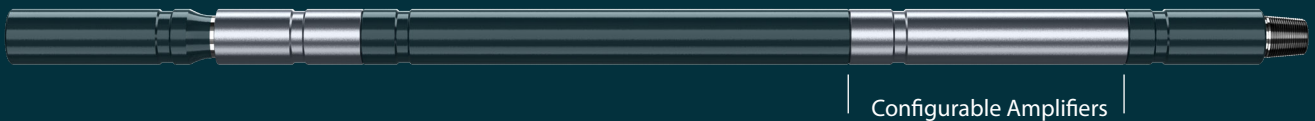
Rev. A
9/16/26

TSUNAMI Technical Specifications: Tsunami Gen. 2.0 On-Demand Tandem

Hole Size	6.00 to 6.75 inch (152 to 172 mm)
Standard Connection	DS-40 †Can accommodate most drill pipe connections.
Make-up Torque	21,000 ft/lbs (28,472 Nm)
Tool Length	TBD †Tool ships in two pieces
Connection OD (Pin)	5.25 inch (133.35 mm)
Connection OD (Box)	5.25 inch (133.35 mm)
Flow Range	200 - 350 GPM (757 - 1325 LPM)
Temperature	320°F (160°C)
Frequency	8 to 14 Hz
Tool #1 Index Threshold	170 GPM
Tool #2 Index Threshold	210 GPM
Activation Method	Dual-dart (primary + secondary; in-hole activate / deactivate / reactivate)
Operating Positions	Off / On — pressure set by dart sizing

SHOCK TOOL DESIGN

Dual action design is optimized to allow for maximum force transfer.



INDEPENDENT ACTIVATION

Each tool is configured with a unique flow rate indexing threshold, enabling selective activation of one tool without affecting the other. This allows precise, zone-specific agitation control across the entire string.

- Tool #1 toggles at 170 GPM
- Tool #2 toggles at 210 GPM
- Normal drilling flow activates neither tool
- Output controlled via poppet and orifice diameters
- Dual-action shock tool design retained on both tools

ON / OFF CONTROL

Each tool operates in two states: Off or Active. Both tools can be in different states simultaneously — one off while the other runs at full output. Each tool can be toggled Off and Active at any time without trips or dart drops.

- Decide when and how to activate each tool
- Control pressure and force output per tool
- Toggle each tool independently between Off and Active
- Match each tool's state to its downhole zone
- Configurable for all applications

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Tsunami Gen. 2.0 On-Demand Tandem – Dual Tool Operation Sequence

Two tools run simultaneously in the BHA, each with two operating states: Off and Active. Cycling pumps down to 170 GPM activates Tool #1; cycling to 210 GPM activates Tool #2. Cycling to 250 GPM turns both tools off at once. Normal drilling flow holds each tool in its current state.

* Flow rates shown are for example purposes only.

