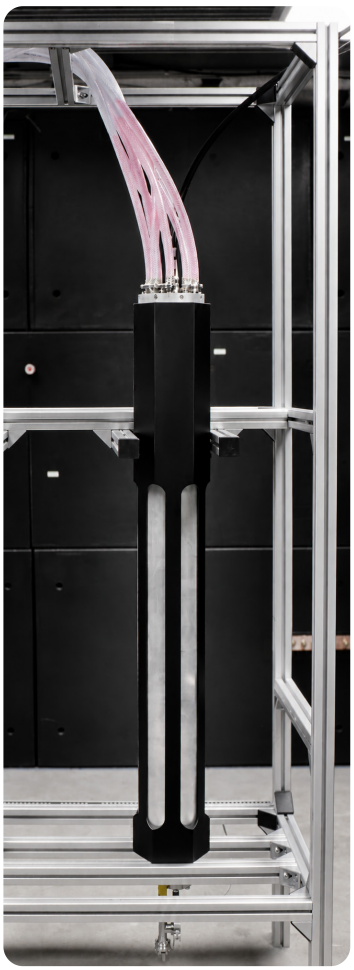
Astral-MSFR-DD/DT-Mk0-18kW

Specification

	DD (2.45 MeV)	DT (14.1 MeV)
Neutron Yield (n/s)	>1 x 10^{8}	> 1 x 10^{10}
Maximum Flux (n/cm²/s)	> 3 x10^{5}	> 3 x 10^{7}
Minimum Flux (n/cm²/s)	1 × 10^{4}	1 × 10^{6}



- Fusion neutron emission zone concentrated along the central 350 mm length of the reactor head (neutron field distribution available on request)
- Maximum voltage 120 kV, maximum current 150 mA
- >25,000-hour lifetime
- Non-pulsed continuous operation
- Stable and repeatable operations over device lifetime
- Tunable neutron production capability from low to maximum output
- Outer casing at ground potential
- Input power 400VAC ± 10% by 3-phase configuration to HV Power Supply Unit (PSU)
- Automated unattended operation for industrial applications
- Submersible option

Operational lifetime

- Operation lifetime >25,000 hours, backed by 1-year warranty
- Recommended fusion fuel refill at 10 years (DD) due to Helium gas build-up
- Recommended fusion fuel refill at 5 years (DT) due to tritium decay
- Frequent on-off deep thermal cycle operation will not reduce operational lifetime
- Reactor heads can be replaced in situ for near continuous operation

Quick start and quick stop

The sealed fuel system begins with a 20-30 minute warm-up period to reach standby mode. The system then remains continuously heated for near-instant operation.

From standby, the reactor reaches maximum neutron output almost immediately, no run-up period required - suitable for scanning or screening applications.

Neutron production shuts down instantaneously via manual control or safety interlock.

Flexible configuration

Multiple systems deploy in a “neutron oven” layout or planar array to increase neutron flux. Shifting the neutron emission zone to the end of the reactor chamber enables end-on pairing with a second system for larger arrays.

Connectivity

Software automation control for remote user interface and data logging, with multi-module array control capability.

Interface for data integration into any industrial or research experiment system.

Form factor

Reactor head is separate from the electronics units, connected via 2 cables and water-cooling tubes.

Item	Dimensions
Reactor head	1500mm length, 140 mm Outer Diameter, 35 kg
Control Unit & HV PSU	600 mm (w) x 1300 mm (d) x 800 mm (h), 255 kg
Chiller	800 mm (w) x 1250 mm (d) x 1450 mm (h), 250kg

Safety

- Intelligent fail-safe automation control
- Remote connection watchdog
- UN2911 Class 7 excepted transport package (applicable to DT only)
- No environmentally harmful SF6-gas
- DD or DT gas is stored and sealed in a solid state form at room temperature (no risk of outward gas leakage)

Available options

- Neutron Energy: DD 2.5 MeV or DT 14 MeV
- Reactor head fully submersible (if specified)
- Neutron counter monitor alarm inputs
- Lead bremsstrahlung shielding sleeves for ~10^{-5} attenuation

Delivery lead time

- Single systems available with 3 month lead time (specification dependant)
- Batch orders 3+ months lead time (specification and quantity dependent)

About Astral Systems

Astral Systems is a developer and manufacturer of the most advanced long-life fusion reactors currently operational. Our patent-protected application of two simultaneous fusion reactions unlocks unparalleled neutron output within an ultra-compact form factor.

This unique combination of form factors and performance capabilities enables unique applications that have not previously been possible with existing industrial neutron source technologies. Such capability is underpinned by an industrially robust and safe-to-operate design that remains cost-effective for a wide range of applications.