



**INNERSPACE CORPORATION**  
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## **STATE-OF-THE-ART AMBIENT PRESSURE MOTOR CONTROLLER FROM 50 – 780 VDC**

The 1002 Series Electric Thrusters are offered with a matching SMC (Stand-alone Motor Controller) housed in a separate one atmosphere bottle. Specially designed to match the 1002 Series Electric Thruster range from Innerspace, the SMC controller operates in torque or velocity mode. Torque mode is particularly useful when integration to a vehicle stability control system is anticipated, allowing percentage torque thrust forward and reverse to the RPM limit of the motor. Feedback from the motor to the system controller receipt of the digital commands sent and provides real time RPM and motor Current, along with system health and performance monitoring data. Motor acceleration rates and other parameters can be set to suit the motor and application.

Recording of lifetime performance data including total shaft revolutions, hours since overhaul and power cycles provide data points for operation and maintenance purposes are standard.



Stand-alone Motor Controller (SMC)  
Sizes will vary depending on depth.



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## SPECIFICATIONS

### SMC (Stand-alone Motor Controller):

**Type:** Atmospheric Pressure Housed Three Phase BLDC motor controller.

### Available Configurations:

**Stand Alone (SMC):** Independent control unit with cable connections to motor - phase (power) and sensing (resolver) Communication (Network).

**Motor Power Rating:** 1hp (750W) to 25hp (18kW) with options to 55hp (41kW)

### General Characteristics:

**Voltage:** DC, 50VDC to 780VDC, Positive, Negative, Isolated from Frame Ground.

**Current:** Maximum Continuous 50A (in water)

**Motor Type:** Suitable for Three Phase water cooled BLDC Permanent Magnet motors

**Operating Parameters:** Stand Alone Controller: Sine/CoSine resolver and direct commutation  
Controller parameter matched to associated motor.

### Connections

**Power:** Subconn HPBH4M - Positive, Negative and Frame Safety Ground

**Data:** SubConn DBH13M – 1. 24V+, 2. SHD, 3. 0V-, 4-7 RESERVED, 8. ECAT TX+, 9. ECAT TX-, 10. ECAT RX+, 11. ECAT RX-, 12 & 13 RESERVED

**Motor Phase:** Subconn HPBH4F - Phase A, B, C, Frame Ground/Shield

**Motor Sensor:** Subconn DBH8F Sensor SIN+/-, COS+/-, EXC+/- Frame Ground/Shield

### Control

**Electrical:** Ethercat point to point connection.

A separate 24VDC LV supply used with the Ethercat connection. This enables the condition of the controller to be known without the HV being present. Communication of all the motor parameters is possible.

**Command:** Over 300 commands available please contact for requirements

Ethercat SDO and PDO:

**Action Commands:** RPM setting (velocity mode) - Forward and Reverse, to rated motor RPM

Power setting (torque mode)- Forward and Reverse, 0% to 100% of maximum rated/programmed torque

Safety Lockout (Manual)

Status query

**Status Messages:**

Shaft RPM

Motor Current

Throttle/Thrust setting

Temperature

**Safety State Action:** Condition warnings (Temperature, Voltage, Current)

Control System Connectivity Failure - Automatic shutdown

### Notes:

- Optional External Control Interfaces: Test interface and development code
- DC supply cables must meet minimum length/inductance requirements to eliminate requirement for an external HVDC soft start switch.
- Adequate DC bus capacitance and reverse EMF/Overvoltage protection must be used.
- All Data cable must be shielded for noise prevention
- Data cable should not exceed 6 meters between SMC and electric motors.