

SEACON ADVANCED PRODUCTS, LLC PRODUCT DATASHEET

CM2001 HIGH INTEGRITY, SINGLE PIN, WET-MATE, ELECTRICAL CONNECTOR



CM2001/2mm single pin connector set

DESCRIPTION

The CM2001 is a very small, single pin underwater mateable electrical connector which is a simple yet robust design with very few moving parts. It is designed for high pressure applications and is available in a high temperature version.

KEY FEATURES

- Very small single pin connector
 - Diameter: Less than 1" (25mm)
 - Receptacle length: Less than 3" (75mm)
 - Plug length: Less than 2.7" (69mm)
- CM2000 series of connectors have:
 - A field proven track record of over 20 million accumulated operating hours
 - Mean Time Between Failure (MTBF) of better than 4.4 million hours
- Oil-filled pressure balanced socket contacts
- Extensive qualification testing data available
- Successful completion of long-term testing (3 years) by an independent body
- Voltage rating to 1,000 VAC
- Current rating to 10 amps
- Rated to 23,000 feet (7,000m)
- Simple and robust with few moving parts
- Redundant sealing barriers for contacts
- No single point failures
- Wide operational temperature rating to +65°C (+149°F)
- Elastomers have over 20 years of use underwater
- Alternative range of terminations available

QUALITY

- SEACON Advanced Products, LLC operate a Quality Management System certified to ISO 9001:2008, ISO 14001:2004 and OHSAS 18001:2007.





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CONFIGURATIONS

- Stab configuration as standard
- Diver or ROV configurations available
- Ø2mm electrical contact size
- Oil filled pressure balanced socket contacts
- Redundant sealing barriers for each contact
- Terminations:
 - Oil-filled
 - Molded cable
 - Customer specific
- Easily configured into many different configurations:
 - Flying lead
 - Bulkhead mounted, flange mounted
 - Straight terminations, 90° terminations
 - Omnitec MKII interface
 - Molded terminations
 - Parking places
 - Long-term protective caps
 - Short-term protective caps

DESIGN RATINGS

- Ø2mm contacts: 1,000 VAC, 10 amps
- Depth Rating: Ø2mm contact is an ultra-deepwater configuration, rated to 690 bar (10,000psi), equates to over 7,000m (23,000 feet)
- Socket contacts never see the outside environment, always contained in dual nested oil-filled bladders
- Design life: 25 years
- Minimum Life-Cycle: 100 mate/de-mates
- Maintenance-free over design life (within number of mate/de-mate cycles)
- Operating Temperature: -5°C to +65°C (23°F to +149°F)
- Storage Temperature: -20°C to +65°C (-4°F to +149°F)

OPERATION

- Typical mate force: 3 to 6 lbs (1.36 to 2.72kg)
- De-mate force: 25% of mating force
- Force to maintain: 0 lbs
- Typical mating stroke length: 1.7" (43mm)
- Maximum angular misalignment: 0.5°
- Maximum axial separation: 2.5mm (0.1 inches)

MATERIALS

- Housing of choice: Titanium, 17-4 PH, Nitronic 50, Inconel, Ferralium, 316, Al Ni Bronze, Beryllium copper and PEEK)
- Insulator: PEEK
- Compensation bladders: Natural rubber (Alternative elastomers available for special fluid compatibility requirements)
- O-rings: Nitrile

TRACK RECORD AND RELIABILITY DATA

- Deepest recorded actual operating depth to 15,420 feet (4,700m)
- The CM2000's currently in service have now reached accumulated operating hours in excess of 26 million hours with a Mean Time Between Failure of better than 6.1 million hours

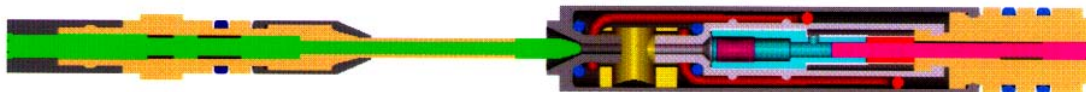


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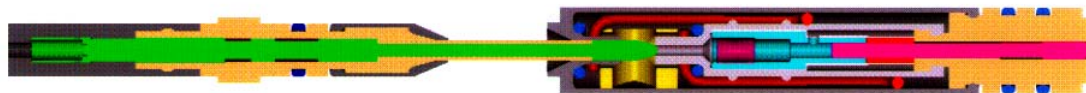
PRINCIPLE OF OPERATION

The critical electrical contact is made without exposure to external contamination in a harsh subsea environment. This is achieved as described by the following mating sequence:

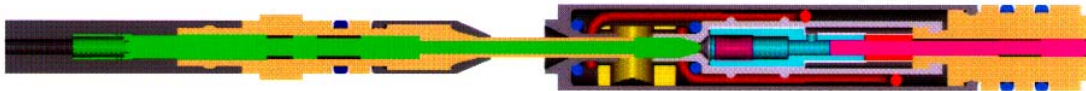
Step 1: The contact pin enters the outer bladder entry of the receptacle contact.



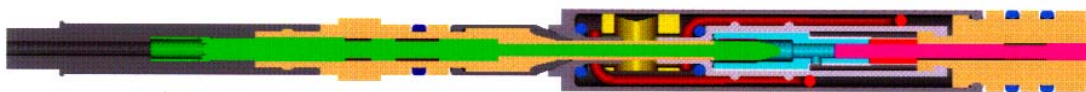
Step 2: The contact pin is wiped and bathed in dielectric fluid as the entry throat maintains a force around the pin ensuring a secure seal.



Step 3: The contact pin continues and enters a second inner bladder entry and is wiped and bathed in dielectric fluid again.



Step 4: The pin engages with the mating socket within the dielectric filled inner bladder enclosure.



Mated Contact: During and after the mating activity, two seals are created and maintained around the pin contact within the oil-filled and pressure-compensated bladders

QUALIFICATION TESTING

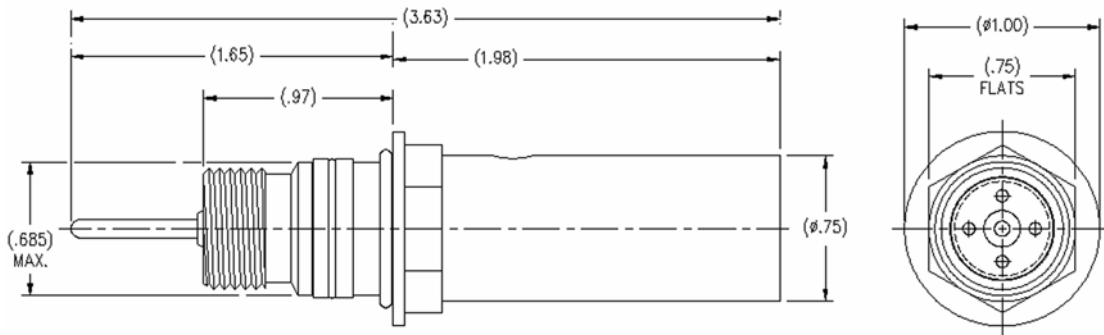
In addition to the full range of testing highlighted in SEACON document SC-ENG-1011. The following was specifically additionally completed for the CM2001 / 2mm connector:

- Deepwater Testing - Performed by SEACON - Mated connector to 10,000 psi (690 bar), open face to 10,000 psi (690 bar)

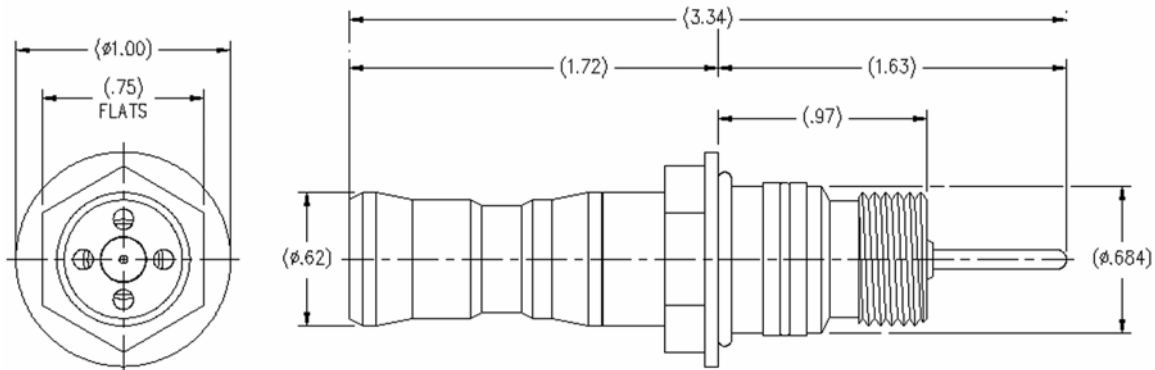
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KEY INTERFACE DIMENSIONS

CM2001 / 2mm Receptacle (with pin)
(Dimensions are in inches)



CM2001 / 2mm Plug (with socket)
(Dimensions are in inches)



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