

Announcement regarding Development of IP67-compliant 2.0 mm pitch, small-size waterproof connector 'FWS Series'

We have developed the 2.0 mm pitch, small-size, waterproof connector 'FWS Series (relay type).'



The 'FWS Series' is our 2nd waterproof connector following the 'FW Series.' While being compact its protection rating against the ingress of foreign matter into the electrical enclosure satisfies IP67, which is dust tight and has excellent waterproof performance.

The most distinctive feature of the series is its compact and low height design, which is the smallest class in the industry for a 2.0 mm pitch waterproof connector. The mating height of 8.2 mm and the length of 28.45 mm (single-row type) facilitate connection/wiring in a small space.

The crimp terminal shapes are the same on the receptacle and the plug sides, a design uniquely developed by KEL. A highly reliable connection is achieved by the four-point contact using highly reliable springs. The locking structure allows a secure fitting with a firm click feeling, which adopts a mechanism that prevents half engagement.

This series, just like our 5.0 mm pitch waterproof connector 'FW Series' already available in the market, was developed with the concept of reducing the man-hours of users. The same shape male and female crimp terminals enable shared use of crimp applicators. The products are delivered with cable seal/seal ring fitted to the housing so that users can assemble a harness simply by inserting the cable to which the terminal is crimped.

The number of contacts are 2, 3, or 4 for the single-row type and 6 or 8 for the double-row type. The housing color is white, but we will develop and offer more color variations as necessary with a view to improving visibility during operation.



The start of production is scheduled for February 2021. We have already started shipping some samples and are preparing ourselves to meet your requests. We are also exploring the possibility of developing dummy pins and branch relay type products to further expand our lineup.

We believe that the development of this small-size waterproof connector will allow us to contribute to its application to small-size devices, enabling effective use of space, reducing weight, and cutting the overall cost of devices.

<Main Features>

- 2.0 mm pitch waterproof connector that achieves a compact and low height design, which is the smallest class in the industry
- Compact and with a low height, it secures excellent protection against water and dust that conforms to IP67 standard
- Secure contacts achieved by the four-point contact using highly reliable springs
- Terminals are the same shape on the receptacle and the plug sides, enabling use of a common crimping tool (applicator, hand tool)
- Highly reliable design with an effective mating length of 1.0 mm
- Built in cable seal and seal ring
- Removal tool easily repaired using a commercially available precision screwdriver
- Utilizes half-engagement (unlocked state) prevention structure
- Wide variation of contact numbers (2, 3, 4, 6, or 8 contacts)
- Operating temperature range of -55 to +105°C enables application in various devices

<Main Specifications>

- Insulator material: PBT (containing glass fiber) UL94V-0, color: white
- Crimp terminal material: Copper alloy
- Crimp terminal finish: Nickel undercoat plating, (contact, crimp part) finished with reflow Sn plating
- Cable seal/seal ring material: Silicone rubber, color: yellow
- Rated current: 3 A per terminal
- Protection rating: IP67
- Contact resistance: 10 mΩ or less
- Withstand voltage: 1,000 VAC, 1 minute
- Insulation resistance: 1,000 MΩ or more at 500 VDC
- Repeated insertion/extraction: 50 times
- Operating temperature range: -55°C~+105°C
- Applicable cable: AWG#22/24/26/28(0.08~0.3sq) - (Outer diameter of cable covering φ1.3-1.7 mm)

<Target market>

- Sensor · Medical equipment · Retail equipment (e.g. vending machine, show case)
- Drone · Lighting equipment (e.g. LED) · Agriculture-related equipment (e.g. plant factory)
- Electric appliances (e.g. washing machine, refrigerator)
- Security devices (e.g. lighting for outdoor use, security camera)
- Vehicle-mounted devices (e.g. car, motorcycle, electric bike)
- Housing equipment (e.g. water heaters, plumbing products)
- Other equipment

*Note that specifications are subject to change.

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