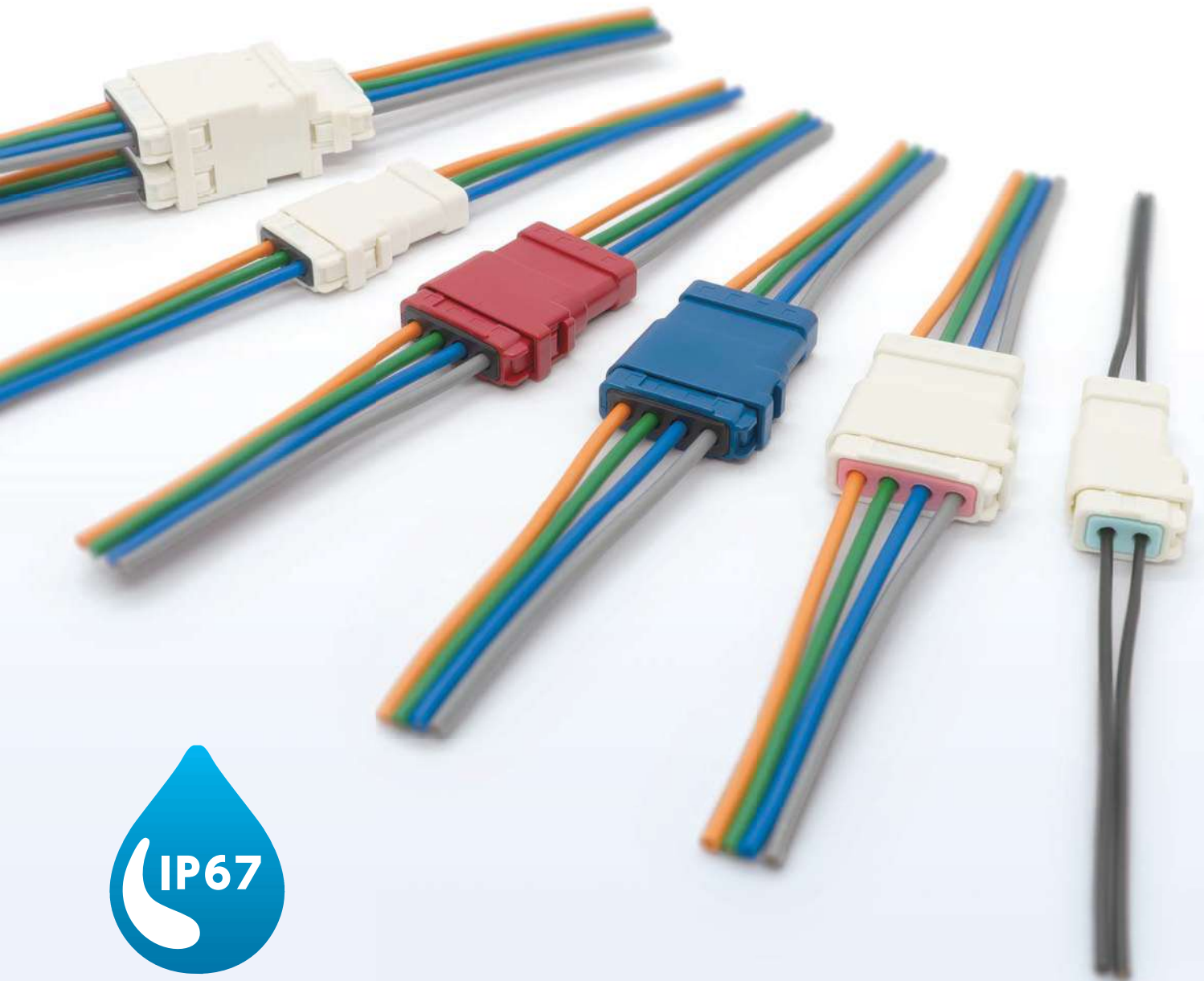


KEL



**5.0 mm pitch
waterproof connector**

FW SERIES



FW SERIES

P TYPE/B TYPE



**5.0 mm pitch
waterproof connector**

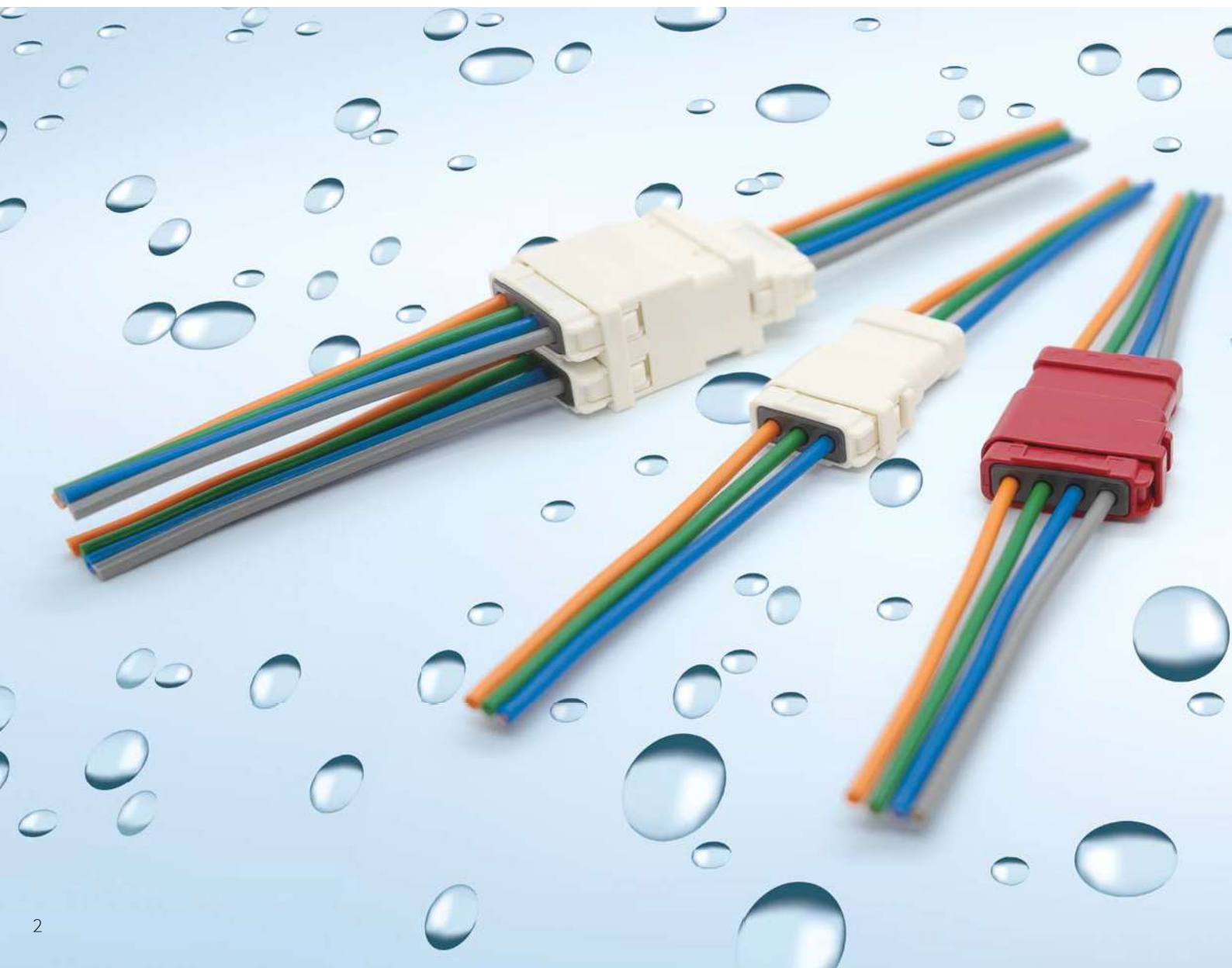


KEL has developed a waterproof connector "FW series" based on know-how of crimp connectors that have been commercialized. For examples, KEL drawer connectors FA & FAS series and KEL two cable crimp connectors FTC series are the result of meeting the needs of customers by adding unprecedented functions. KEL further evolved the know-how and ideas cultivated in the development of crimp connectors and realized the commercialization of "waterproof connector" as our new field.

KEL waterproof connector FW series conformed IP67 standard by the industry's smallest class height and size and commercialized 3 point contact stable connection with the same shape contacts on the plug side and the receptacle side.

KEL waterproof connector FW series will support customers' future new design with innovative specifications.

The next generation small waterproof



Product features

- 1 Industry's smallest class dimensions with 5.0 mm pitch waterproof connector.
- 2 High reliability design with 3 point contact structure. KEL's original contacts on the plug side and the receptacle side have the same shape.
- 3 Connector structure realizing improvement in assembly workability.
- 4 Robust lock mechanism with reliable click feel.
- 5 FW SERIES B TYPE branch relay type that enables reducing the number of cables is being development.

Main Applications



Plant Factory



Vending Machine



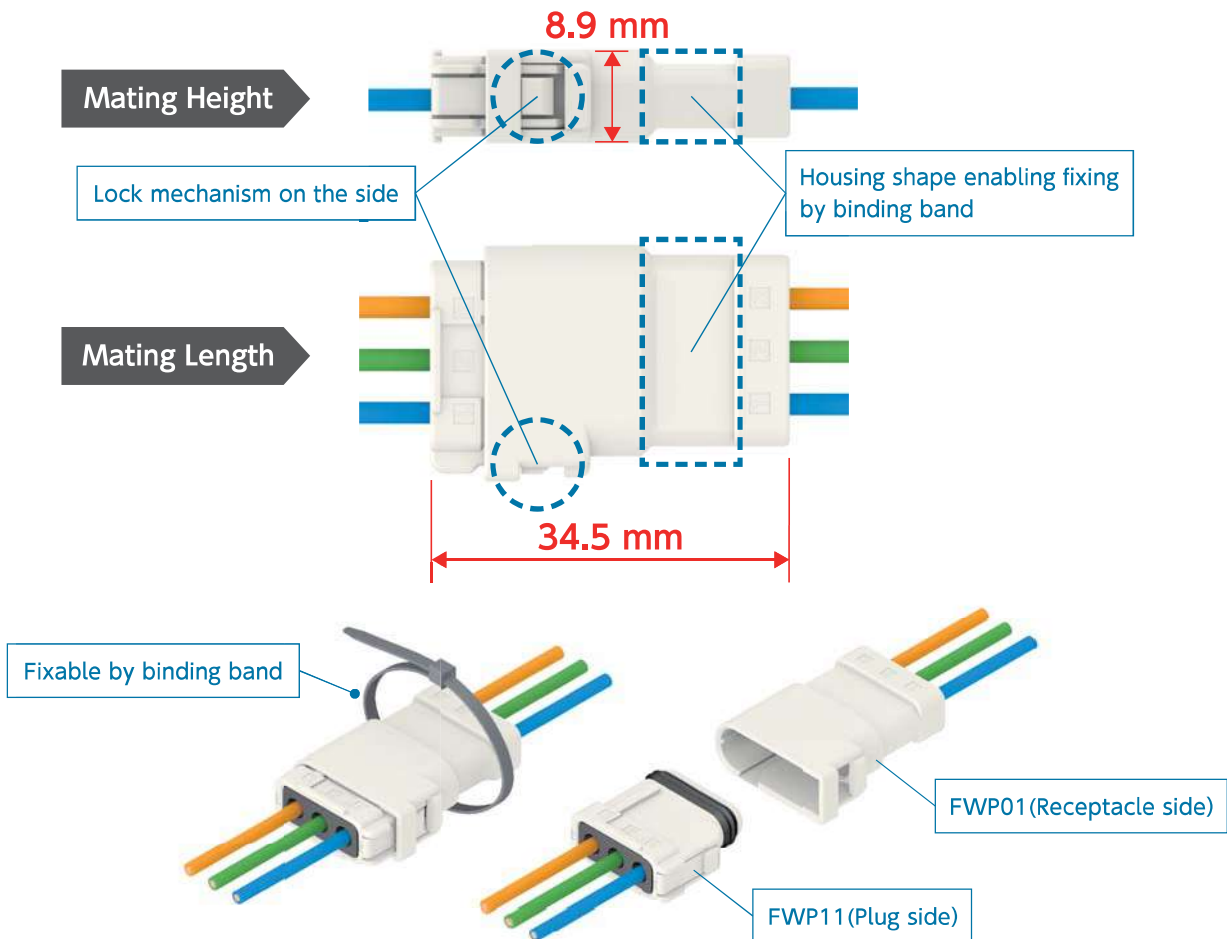
Refrigerated Showcase

connector.



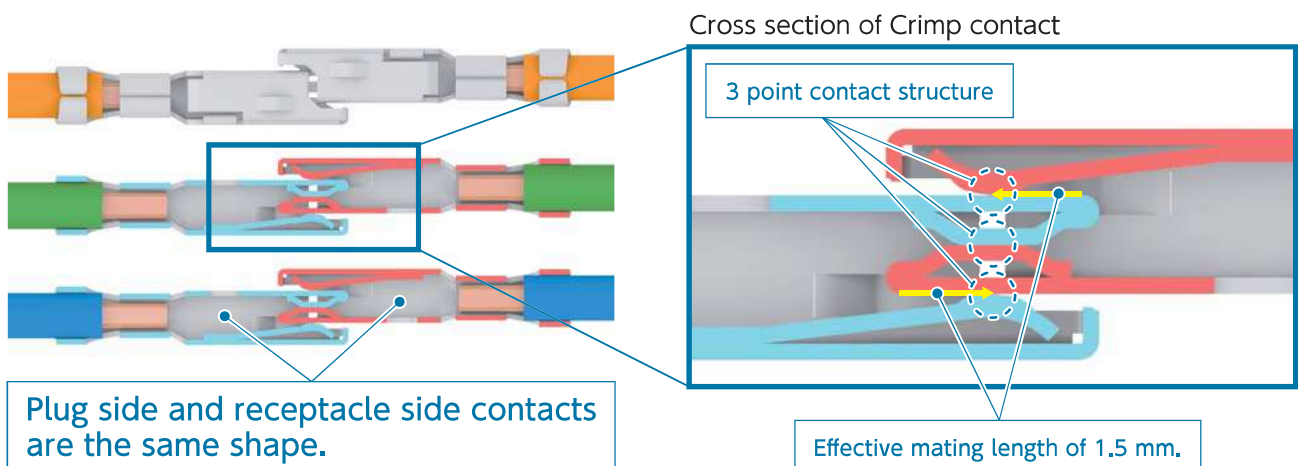
1 Industry's smallest class dimensions with 5.0 mm pitch waterproof connector.

- 5.0 mm pitch waterproof connector achieves the industry's smallest class height (8.9 mm) and length (34.5 mm).
- Lock mechanism on the side for the low profile design.
- Housing shape enabling fixing of binding band.



2 High reliability design with 3 point contact structure. KEL's original contacts on the plug side and the receptacle side have the same shape. (Patent pending)

- Crimp contact adopts the same shape on the plug side and the receptacle side and ensures stable contact by 3 point contact with independent spring.
- Highly reliable design with an effective mating length of 1.5 mm.



3 Connector structure considering assembly workability.

- The crimp contacts on the plug side and the receptacle side have the same shape, so the crimp applicator can be used in common.
- The cable seal and the seal ring are pre-installed in the housing.
- By using dummy pins, it is possible to configure different contact numbers with the same connector.



4 Robust lock mechanism with click feel.

- Robust locking mechanism has tactile click feeling.

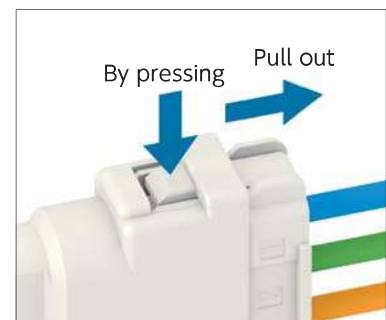
Lock/Insert



Push the plug until it clicks



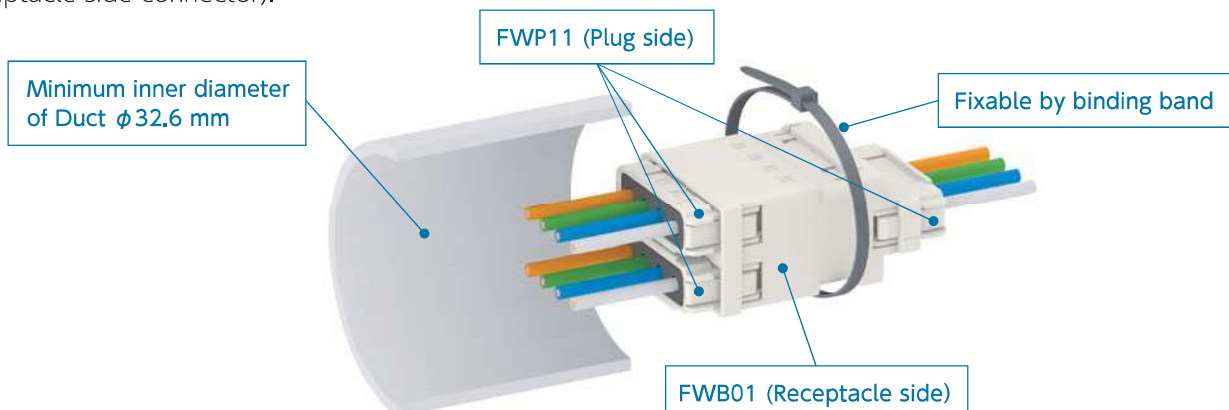
Lock release/Unlock



Pull out the plug while pressing the side lock

5 FW SERIES B TYPE branch relay type enables reducing the number of cables. (Under development)

- FWP11 (Plug side connector) branch relay type can reduce the number of cables by mating with FWB01 (Receptacle side connector).



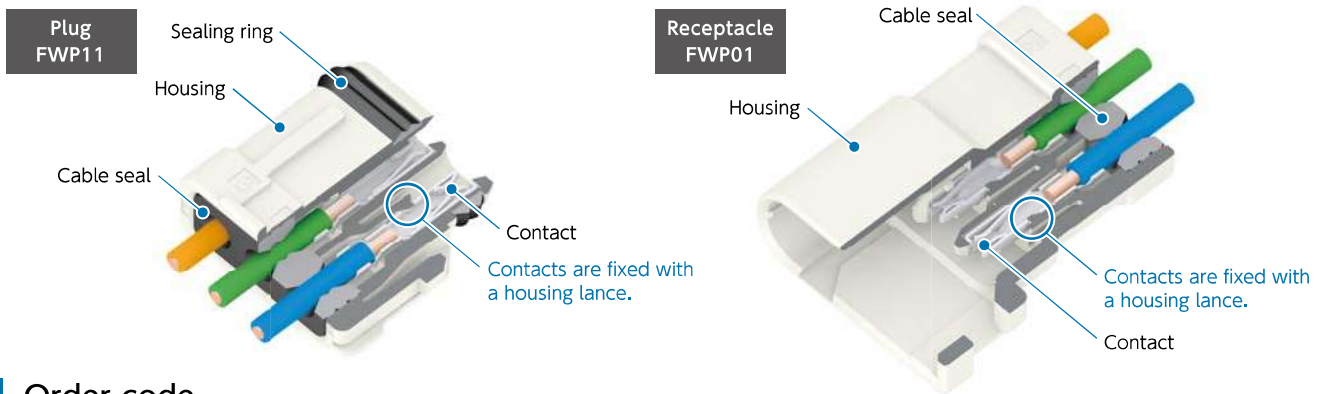
Features

- Industry's smallest-class waterproof connector with 5.0 mm pitch.
- The size is small and thin, but it has excellent waterproof and dustproof conforming to IP67 class.
- 3 point contact structure with independent springs always ensures stable contact.
- Crimp connectors have the same shape, the crimp applicator can be shared.
- Highly reliable design with the effective mating length 1.5 mm.
- Built-in cable seal and seal ring.
- Robust lock mechanism with a tactile click feel.
- The housing color can be selected from 3 colors, white, red, and blue.
- The cable seal color is 3 colors of black, light blue, pink, according to the cable covering diameter.
- Dummy pins for plugging cable insertion holes are available. 2 colors of white and black are set according to the cable covering.
- Can be combined with branch relay type being developed.



Compliance with Electrical Appliance and Material Safety Law
(Clearance distance and creepage distance of insulator)

Sectinal view



Order code

FWP01 - □ □ - □ □

① ② ③ ④

① Type	FWP01 : Receptacle (Cable-Relay Connector)
② Number of contacts	02 : 2 pin 03 : 3 pin 04 : 4 pin
③ Housing color	1 : White 2 : Red 3 : Blue
④ Cable seal color	1 : Black (Cable covering diameter: ϕ 1,9 to 2,7 mm) 2 : Light blue (Cable covering diameter: ϕ 1,5 to 1,9 mm) 3 : Pink (Cable covering diameter: ϕ 2,7 to 3,1 mm)

FWP11 - □ □ - □ □

① ② ③ ④

① Type	FWP11 : Plug (Cable-Relay Connector)
② Number of contacts	02 : 2 pin 03 : 3 pin 04 : 4 pin
③ Housing color	1 : White 2 : Red 3 : Blue
④ Cable seal color	1 : Black (Cable covering diameter: ϕ 1,9 to 2,7 mm) 2 : Light blue (Cable covering diameter: ϕ 1,5 to 1,9 mm) 3 : Pink (Cable covering diameter: ϕ 2,7 to 3,1 mm)

* FWP01/11-□□-□□ is sold only for housing, crimp terminal is sold separately. Please check page 8 for order code of crimp contact.

* Depending on cable covering diameter, the combination of terminal and cable seal may change. For details please contact your local KEL sales office.

Specifications

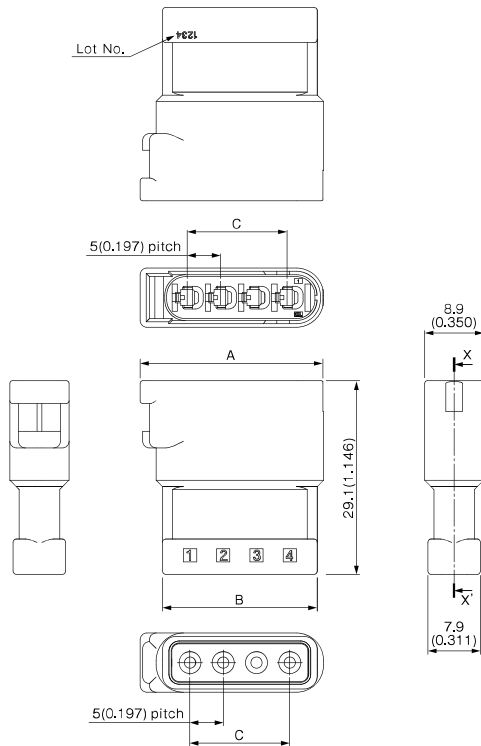
Material and plating	
Housing material	Glass-filled PBT (UL94V-0) Color: White, Red, Blue
Cable seal material	Silicone rubber (Secondary vulcanized) Color: Black, Light blue, Pink
Sealing ring material	Silicone rubber (Secondary vulcanized)
Crimp contact material	Copper alloy
Crimp contact plating	(Contact area / Crimping area) Tin over Nickel

Electrical Characteristics	
Current rating	(AWG#16) 10A MAX per contact (AWG#18/20) 7A MAX per contact
Protection grade	IP67
Contact resistance	10 m Ω max.
Dielectric withstanding voltage	1,700V AC for 1 minute
Insulation resistance	1,000M Ω min. at 500V DC
Operating temperature	-55°C to +105°C
Durability of insertion and withdrawal	50 times
Recommended cable	#16/18/20/22 AWG (0.3 to 1.25 sq) (Cable covering diameter: ϕ 1.5 to 3.1 mm)

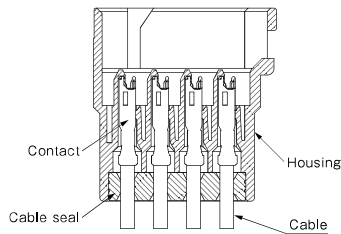
Product outline drawing

Unit: mm(inch)

FWP01-□□-□□ (Receptacle, Cable-Relay Connector)

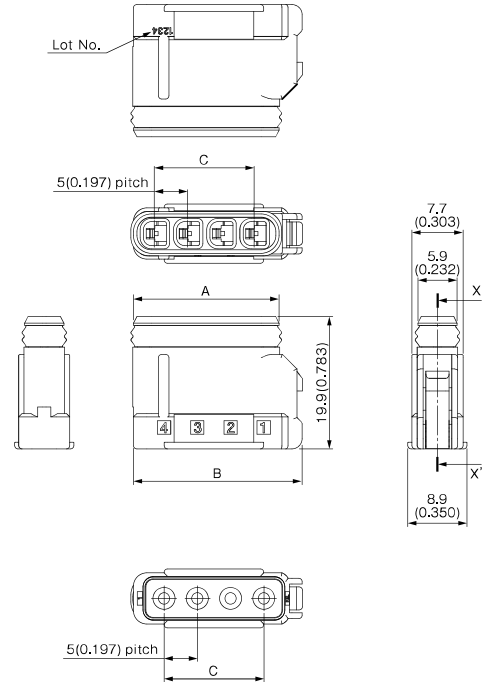


X-X' Cross Section (Contact Inserted)

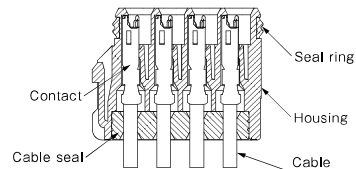


Part Number	Number of contacts	A	B	C	Number of packaging	Packaging style
FWP01-02-□□	2	17.5(0.689)	13.3(0.524)	5.0(0.197)	112	Tray
FWP01-03-□□	3	22.5(0.886)	18.3(0.720)	10.0(0.394)	88	
FWP01-04-□□	4	27.5(1.083)	23.3(0.917)	15.0(0.591)	72	

FWP11-□□-□□ (Plug, Cable-Relay Connector)



X-X' Cross Section (Contact Inserted)



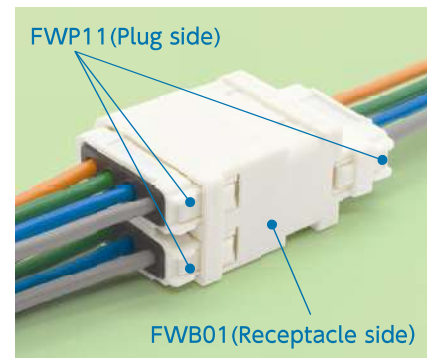
Part Number	Number of contacts	A	B	C	Number of packaging	Packaging style
FWP11-02-□□	2	11.9(0.469)	15.45(0.608)	5.0(0.197)	112	Tray
FWP11-03-□□	3	16.9(0.665)	20.45(0.805)	10.0(0.394)	88	
FWP11-04-□□	4	21.9(0.862)	25.45(1.002)	15.0(0.591)	72	

FW SERIES B TYPE

Wiring saving by branch relay type! (under development)

Features

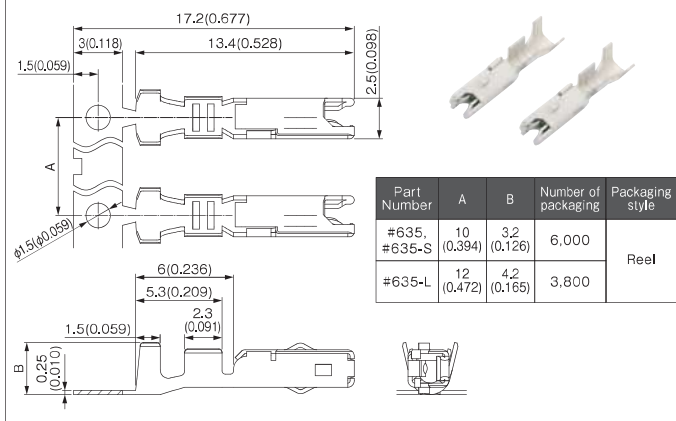
- Branch relay type realizes the industry's smallest class size. (Minimum inner diameter of Duct ϕ 32.6 mm)
- FWP11 (plug side connector) branch relay type can reduce the number of cables by mating with FWB01 (receptacle side connector).
- 3 point contact structure with independent always ensures stable contact.
- Robust lock mechanism with a tactile click feeling.



Crimp contact / Dummy pin

Crimp contact

Crimp contact for FWP01/11-□□-□□



Order code

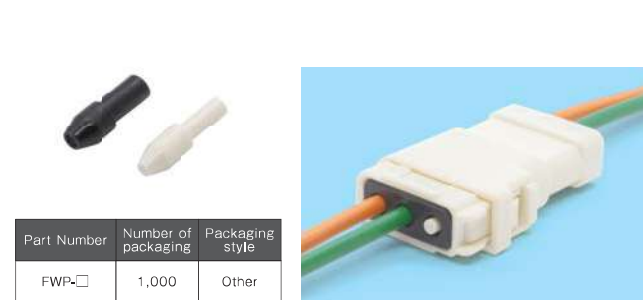
#635-□

① Contact name **#635:** Crimp contact for FWP01/11

② Recommended cable size **Omit:** #18/20 AWG (0.5 to 0.75 sq) (Cable covering diameter: ϕ 1.9 to 2.7 mm)
S: #22 AWG (0.3 sq) (Cable covering diameter: ϕ 1.5 to 1.9 mm)
L: #16 AWG (1.25 sq) (Cable covering diameter: ϕ 2.7 to 3.1 mm)

Dummy pin

Dummy pin for FW Series



Order code

FWP-□

① Type **FWP:** Dummy pin for FW Series

② Dummy pin color **1:** White
 * Applicable cable seal: Black, Light blue
2: Black
 * Applicable cable seal: Pink

Assembly Tool

Hand Tool



Part Number	CH-12	CH-15
Mating cable	#18/20/22 AWG	#16/18 AWG
Mating contact	#635, #635-S	#635-L

Crimping Machine

Mating contact	#635, #635-S	#635-L
Manufacturer	JAPAN AUTOMATIC MACHINE CO., LTD	
Crimping Machine	LOC220S	
Applicator	CFX030500K-UP	CFX046400K-UP

KEL Company Profile

Trade Name: KEL CORPORATION
 Established: July 23, 1962
 Total Capital: 1,617 Million Yen
 President: Etsuro Doi
 Head Office: 6-17-7 Nagayama, Tama,
 Address: Tokyo 206-0025, Japan
 URL: www.kel.jp

Sales Offices

- Head Office (Tama, Tokyo)
- Utsunomiya Sales Office (Utsunomiya, Tochigi)
- Mito Sales Office (Hitachinaka, Ibaraki)
- Nagoya Sales Office (Nagoya, Aichi)
- Osaka Sales Office (Osaka, Osaka)

Factories

- Yamanashi Factory (Nishi-Yatsushiro, Yamanashi)
- Nagano Factory (Kita-azumi, Nagano)
- Minami-Alps Factory (Minami-Alps, Yamanashi)

www.kel.jp/en/

KEL serves systems from connectors to racks.

KEL CORPORATION

Global Network



More Information
https://www.kel.jp/en/fw_lp

