

# Rectangular, High-Pin-Count Rack/Panel Insulation Displacement Connectors (IDC)

## QR/P18 Series



### Overview

The QR/P18 Series of miniature rack/panel connectors is designed for the complete segmentation of the structure of the external holder/terminal units of the well-received QR/P Series of plug-in rectangular rack/panel connectors; furthermore, the subsequent insertion of the harnessed terminal unit affords a more efficient harness mounting task. These connectors are configured with 12, 18, or 24 pos.(IDC) in the signal line, and 4 pos.(crimp) in the power line.

### Features

#### 1. Completely separated structure of the external holder/terminal unit

In order to improve the harness procedures, the connectors are designed for the complete segmentation of the external holder and the signal/power supply unit, and inserting the harnessed contacts aims to improve the workability of the power supply/signal line harness as well as the mounting to the set.

#### 2. Signal unit

The signal unit uses the highly reliable insulation displacement connection method. (The wire is AWG #26 and the insulation outer diameter is 0.88 mm.) The insulation displacement procedure can now be used by attaching a special applicator to a commercially available automatic insulation displacement machine, or a manual press tool can also be selected.

#### 3. Power supply

The power supply terminals permit the use of a crimp harness using wire of AWG#16 to 18 (and insulation outside diameter of 2.1 to 2.2 mm), and can accommodate a maximum of 12 A.

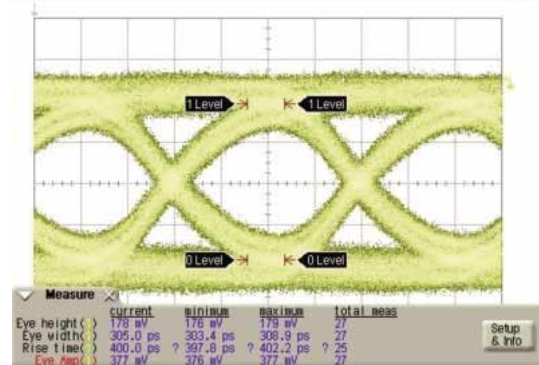
#### 4. Sequential mating structure

Two sequential contacts in the signal male unit and one sequential contact in the power supply female unit are provided for safety operation.

#### 5. Panel installation

Installation to a panel uses a single-action method on the anchored side and a floating screw structure on the floating side which permits smooth insertion and disconnection without forcing.

### 2.5Gbps Eye Diagram



2.5Gbps  
AWG#28 2m  
Scale  
X : 100psec/div  
Y : 100V/div

Fig.1

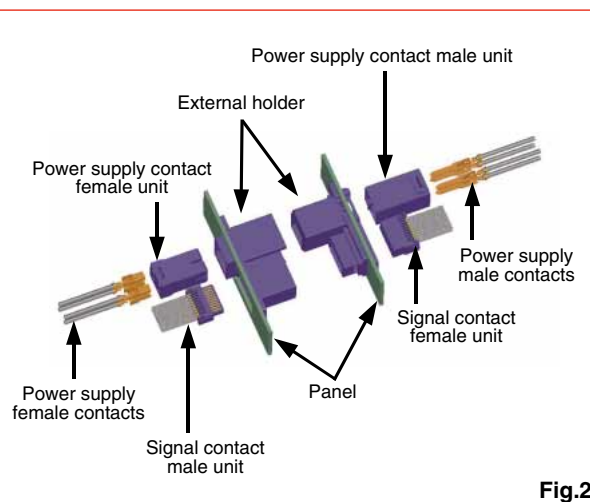


Fig.2

## Product Specifications

Ratings	Voltage rating	125V AC (Signal contacts) 300V AC (Power contacts)	Operating temperature range	-40°C to +105°C (Note 1)
	Current rating	1A (Signal contacts) 12A (Power contacts)		

Item	Specification	Conditions
1. Contact resistance	50mΩ max. (Signal contacts) (Note 2) 10mΩ max. (Power contacts) (Note 2)	100mA MAX (DC or 1000Hz)
2. Insulation resistance	1000MΩ min. (Signal contacts) 5000MΩ min. (Power contacts)	500V DC
3. Withstanding Voltage	No flashover or insulation breakdown.	500V AC / one minute
4. Durability (mating / un-mating)	Contact resistance: 70mΩ max. (Signal contacts) 20mΩ max. (Power contacts)	3000 cycles
5. Vibration	No electrical discontinuity of 10μs or more.	Frequency: 10 to 55 Hz, single amplitude of 0.75 mm, 2 hours in each of the 3 axis.
6. Shock	No damage, cracks or parts dislocation.	Acceleration of 490 m/s <sup>2</sup> , 11 ms duration, sine half-wave waveform, 3 cycles in each of the 3 axis
7. Temperature cycle	Contact resistance: 70mΩ max. (Signal contacts) 20mΩ max. (Power contacts) No damage, cracks or parts dislocation.	Temperature: -55°C → +5 to +35°C → +105°C → +5°C to +35°C Time: 30 → 5 → 30 → 5 (Minutes) 5 cycles
8. Humidity (Steady state)	Insulation resistance: 100MΩ min. (Signal contacts, state) 3000MΩ min. (Power contacts, state) No damage, cracks or parts dislocation.	96 hours at 40°C and RH 90% to 95%
9. Salt mist	No HEAVY corrosions.	5% salt water solution for 48 hours

Note1: Includes temperature rise caused by current flow.

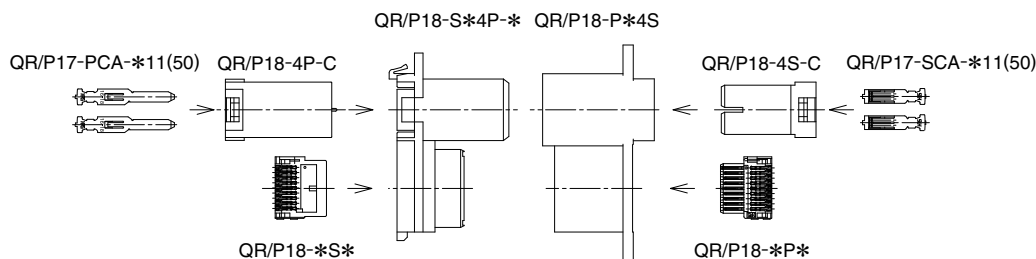
Note2: Excludes wire conductor resistance.

## Materials

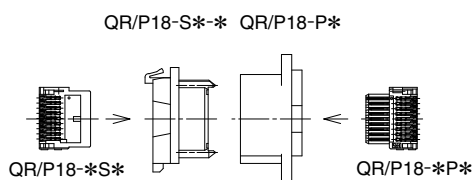
Product	Components	Material	Finish	Remarks
External holder	Insulator	PBT	—	UL94V-0
	Insulator	PA	—	
Signal contact unit	Female contacts	Phosphor bronze	Gold plated	—
	Male contacts			—
Power contact unit	Insulator	PBT	—	UL94V-0
Power supply contacts	Female contacts	Copper alloy	Gold plated + Tin copper plated	—
	Male contacts			—

## Function Diagram

### ● Power supply/signal combination type



### ● Signal type



## ■ Product Number Structure

### ● External holder

QR / P18 - S A 4 P - A  
 ①                      ②    ③    ④    ⑤    ⑥

① Series name	④ Number of power contact
② Signal contact type    S: Female contact P: Male contact	⑤ Power contact type    S: Female contact P: Male contact
③ Number of signal contact of external holder A: 12 pos. (Contact pitch 1.5mm) B: 18 pos. (Contact pitch 1.5mm) C: 24 pos. (Contact pitch 1.5mm)	⑥ Applicable panel thickness A: 2mm B: 1.5mm

### ● Signal Unit

QR / P18 - 12 S A  
 ①                      ②    ③    ④

① Series name	④ Signal unit size A: 12 pos. (Contact pitch 1.5mm) B: 18 pos. (Contact pitch 1.5mm) C: 24 pos. (Contact pitch 1.5mm)
② Number of signal contact	
③ Signal contact type    S: Female contact P: Male contact	

### ● Power Unit

QR / P18 - 4 P - C  
 ①                      ②    ③    ④

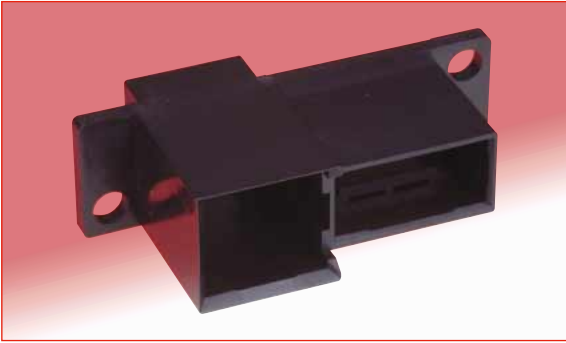
① Series name	④ Connector type    C: Crimp housing
② Number of power contact	
③ Power contact type    S: Female contact P: Male contact	

### ● Power contact

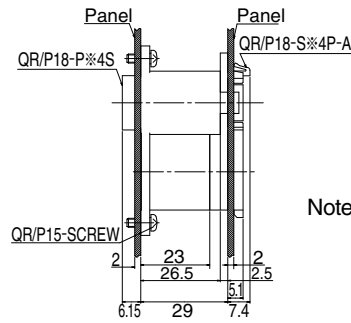
QR / P17 - PC A - 1 1 1  
 ①                      ②    ③    ④    ⑤    ⑥

① Series name	④ Packaging            1: Pack packaging 2: Reel packaging
② Power contact type    PC: Male crimp contact SC: Female crimp contact	
③ Applicable wire style    A: UL1015	⑤ Applicable wire    1: AWG#16 to 18
	⑥ Contact plating        1: Gold plated

■ External holder

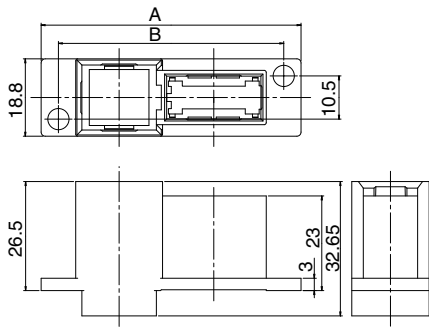


Mated condition (Shown for reference)



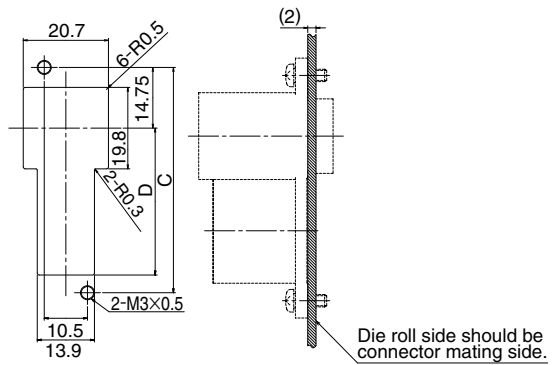
Note: Distance between the power supply side and the signal side when fully mated must be 1.5mm max.

● Female power contact, male signal contact type



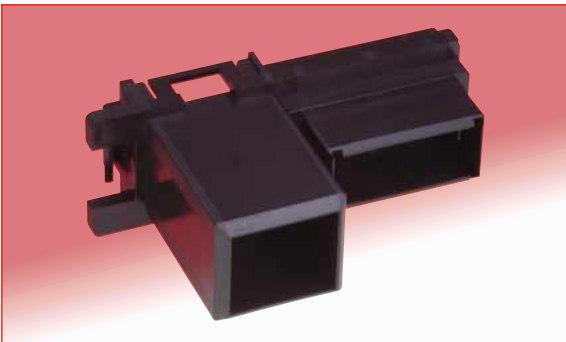
Panel cutout

Applicable panel thickness: 2.0mm



Part No.	HRS No.	No. of contacts		A	B	C	D
		Signal	Power				
QR/P18-PA4S	221-0293-8	12	4	54.65	46.25	27.2	
QR/P18-PB4S	221-0313-3	18		58.65	50.25	31.2	
QR/P18-PC4S	221-0297-9	24		63.15	54.75	35.7	

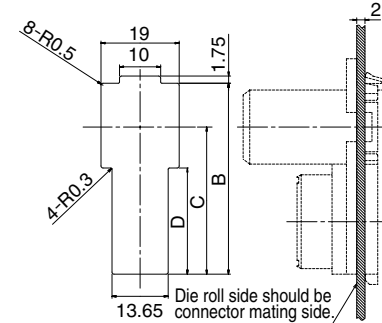
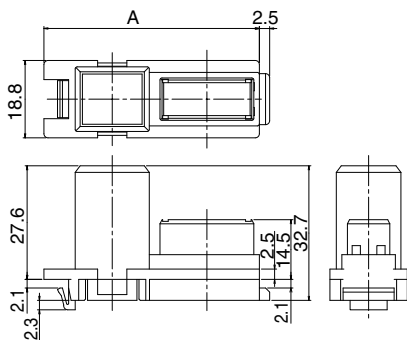
Panel attachment screw (QR/P15-SCREW 221-0251-8) is optional.



● Male power contact, female signal contact type

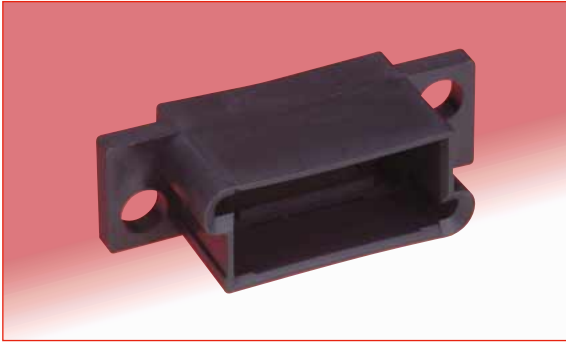
Panel cutout

Applicable panel thickness: 2.0mm

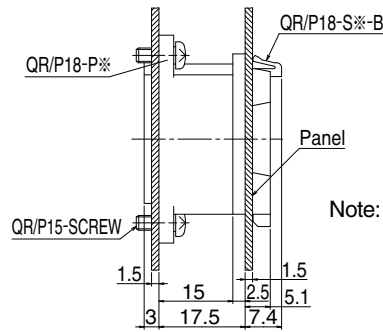


Part No.	HRS No.	No. of contacts		A	B	C	D
		Signal	Power				
QR/P18-SA4P-A	221-0294-0	12	4	43.85	37.9	27.25	17.3
QR/P18-SB4P-A	221-0315-9	18		47.85	41.9	31.25	21.3
QR/P18-SC4P-A	221-0298-1	24		52.35	46.4	35.75	25.8

## External holder (Signal type)

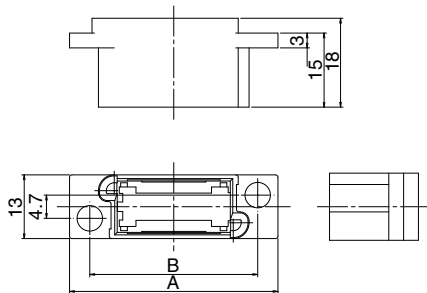


### Mated condition (Shown for reference)



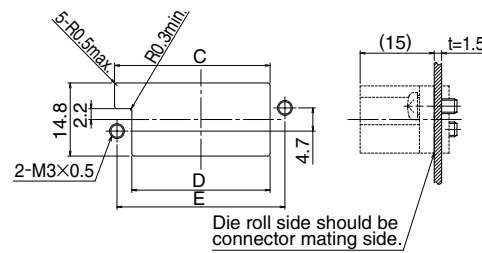
Note: Distance between the power supply side and the signal side when fully mated must be 1.5mm max.

### Male signal contact type



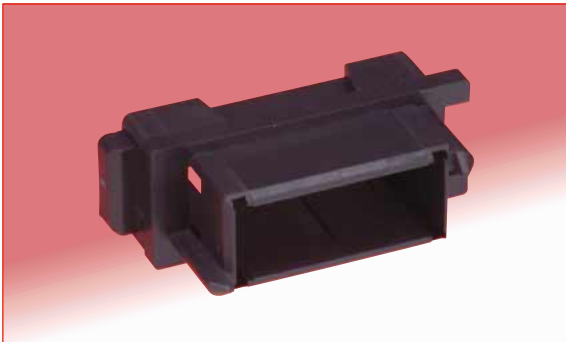
### Panel cutout

Applicable panel thickness: 1.5mm

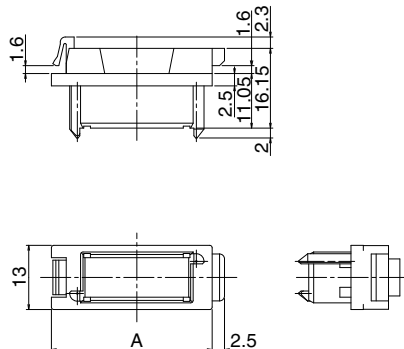


Part No.	HRS No.	No. of contacts	A	B	C	D	E
		Signal					
QR/P18-PB	221-0309-6	18	37.7	29.5	27	23.5	29.5
QR/P18-PC	221-0311-8	24	42.2	34	31.5	28	34

Panel attachment screw (QR/P15-SCREW 221-0251-8) is optional.

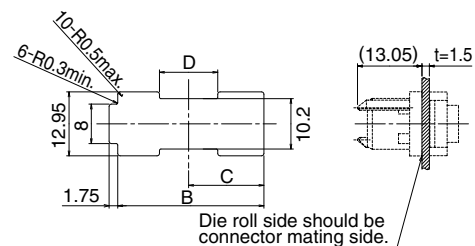


### Female signal contact type



### Panel cutout

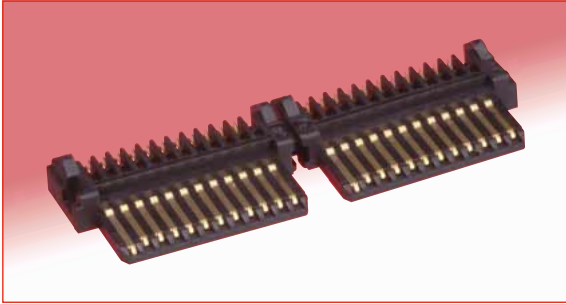
Applicable panel thickness: 1.5mm



Part No.	HRS No.	No. of contacts	A	B	C	D
		Signal				
QR/P18-SB-B	221-0310-5	18	28.05	25.1	13	7.3
QR/P18-SC-B	221-0312-0	24	32.55	29.6	15.25	11.8

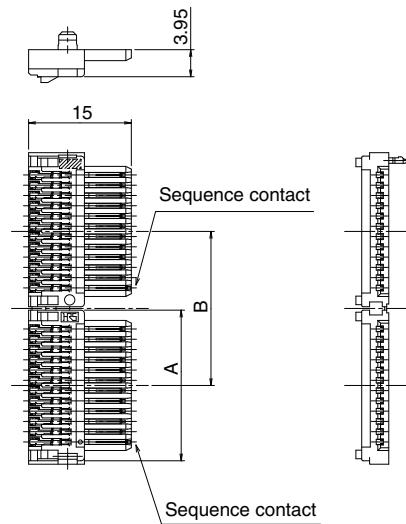
### ■ Signal Unit

#### ● Male, contact pitch 1.5mm

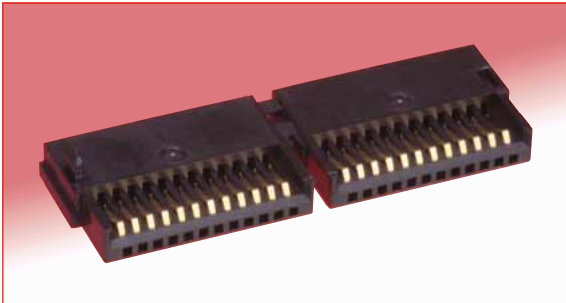


Part No.	HRS No.	No. of contacts	A	B
QR/P18-12PA	221-0291-2	12	13.5	14
QR/P18-18PB	221-0285-0	18	17.5	18
QR/P18-24PC	221-0295-3	24	22	22.5

Adscable cable: AWG#26, insulator diameter 0.88mm

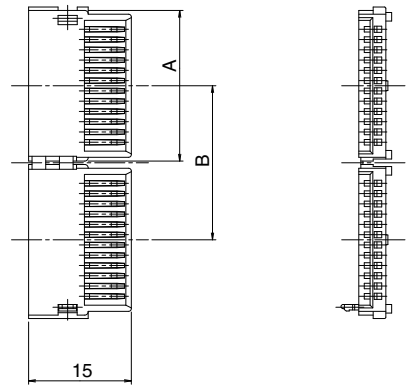


#### ● Female, contact pitch 1.5mm



Part No.	HRS No.	No. of contacts	A	B
QR/P18-12SA	221-0292-5	12	13.5	14
QR/P18-18SB	221-0286-2	18	17.5	18
QR/P18-24SC	221-0296-6	24	22	22.5

Applicable cable: AWG#26, insulator diameter 0.88mm

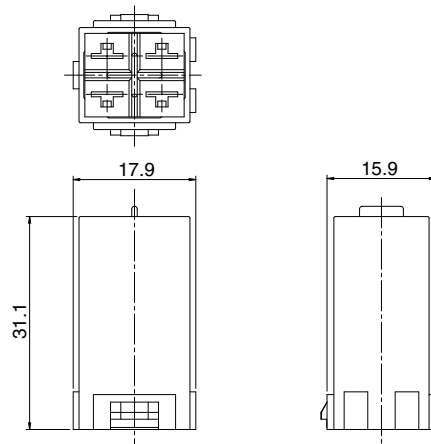


### ■ Power Unit

#### ● Male



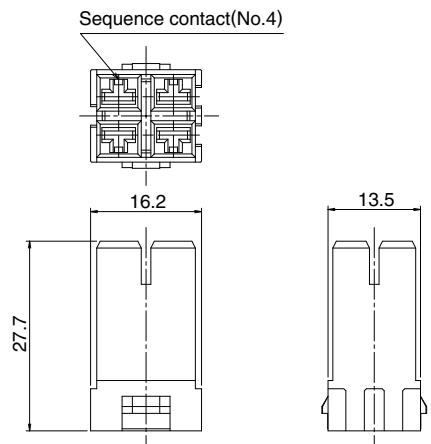
Part No.	HRS No.
QR/P18-4P-C	221-0316-1



#### ● Female

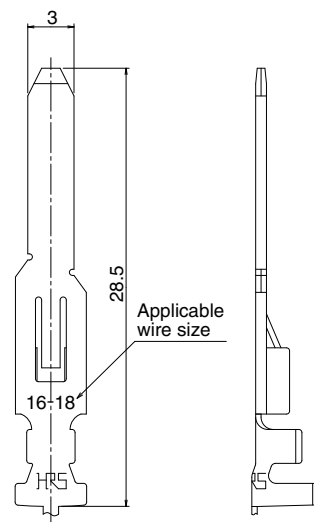
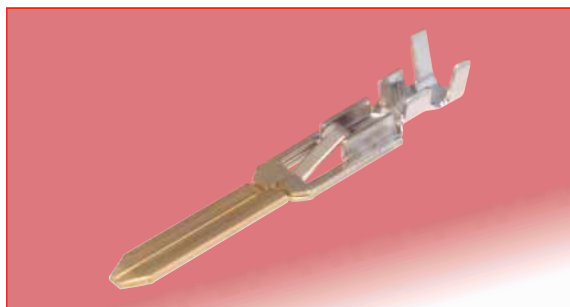


Part No.	HRS No.
QR/P18-4S-C	221-0314-6



◆ Power contact

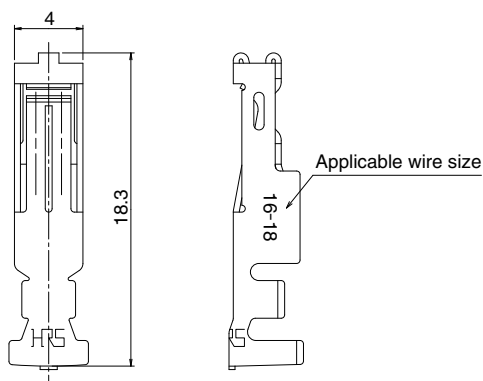
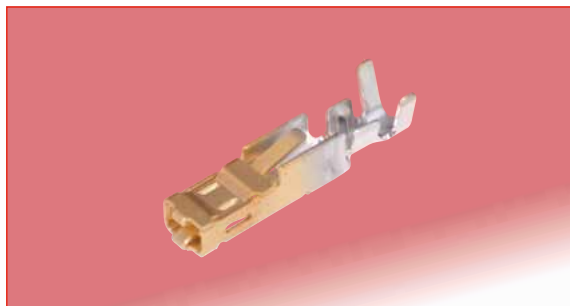
● Male contact



Part No.	HRS No.	Applicable cable	Packaging	Q'ty
QR/P17-PCA-111(50)	221-0265-2 50	AWG#16 to 18 UL1015	Pack	100
QR/P17-PCA-211(50)	221-0263-7 50		Reel	3000

Applicable cable: AWG#16 to 18, insulator diameter 2.1mm to 3.2mm

● Female contact



Part No.	HRS No.	Applicable cable	Packaging	Q'ty
QR/P17-SCA-111(50)	221-0264-0 50	AWG#16 to 18 UL1015	Pack	100
QR/P17-SCA-211(50)	221-0262-4 50		Reel	3000

Applicable cable: AWG#16 to 18, insulator diameter 2.1mm to 3.2mm

◆ Tools

● Signal contact termination block IDC tool

Applicable connector	Insulation displacement connection		
	IDC unit	Press	Tool body
QR/P18-12PA	QR/P18-12UNIT	HOS-7 902-0132-8	QR/P18/IDCR-MP 902-2144-8
QR/P18-12SA	902-2147-6		
QR/P18-18PB	QR/P18-18UNIT		
QR/P18-18SB	902-2145-0		
QR/P18-24PC	QR/P18-24UNIT		
QR/P18-24SC	902-2148-9		

Automatic IDC machine (Murata kogyo co., Ltd., P/N MS-01) is available.

● Power contact crimp tool

Manual

Applicable contact	Manual crimping tool
QR/P17-PCA-111(50)	HT104/QR/P17-1
QR/P17A-SCA-211	250-0238-5

Automatic

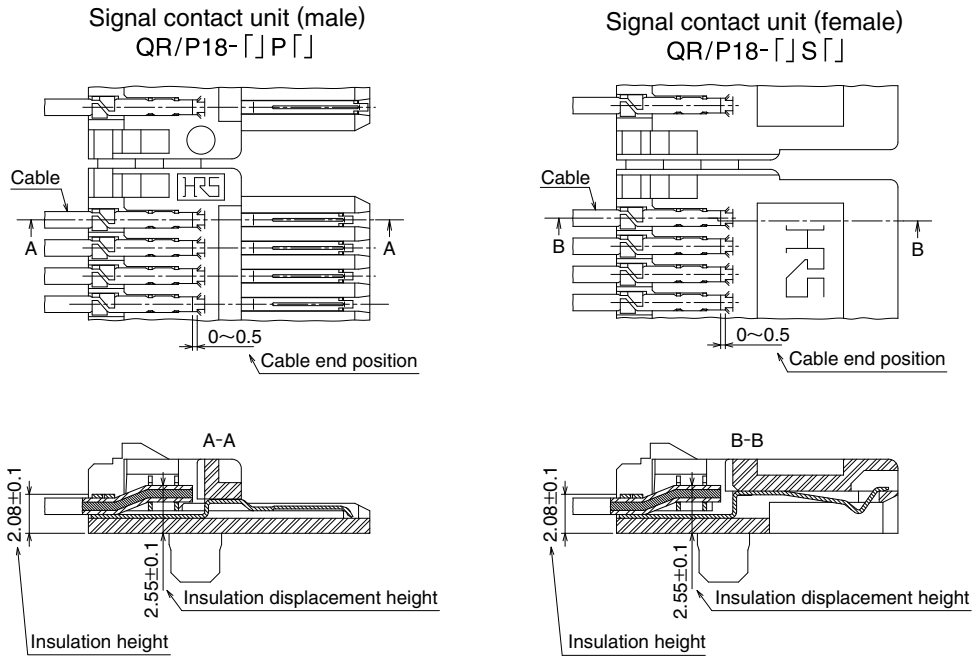
Applicable contact	Automatic crimping machine body	Applicator
QR/P17-PCA-211(50)	CM-105	AP105-QR/P17-1
QR/P17A-SCA-211	901-0005-4	901-2579-4

Extraction tool

Applicable contact	Extraction tool
QR/P17-PCA-111(50)	QR/P17-TC 250-0237-2
QR/P17A-SCA-111	
QR/P17-PCA-211(50)	
QR/P17A-SCA-211	

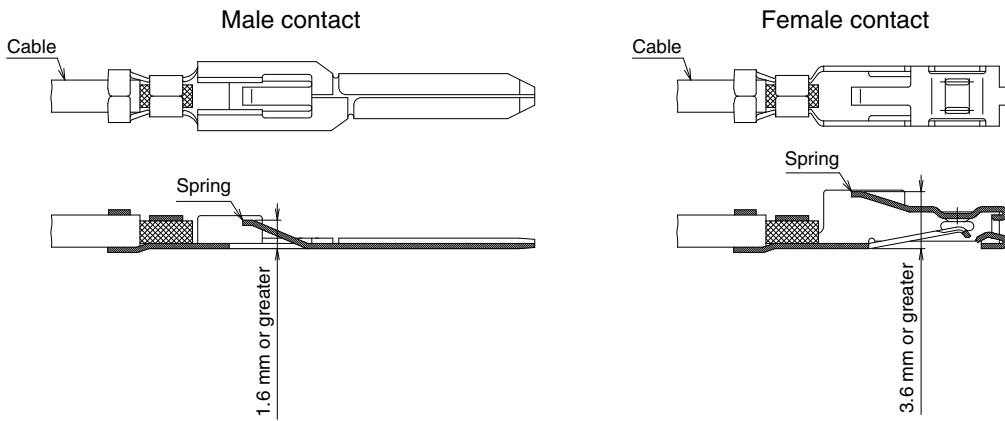
## ◆ Inspection After Cable Wiring

### ● Signal contact unit



- (1) After wiring the cable, examine the cable end position, the insulation displacement height, and the insulation height.
- (2) In examining the insulation displacement height and the insulation height, use a measurement pin having a tip of 0.5 mm diameter.
- (3) For information about the detailed inspection method, please request the "Inspection Standards Manual" from Hirose Electric.
- (4) The inspection method of the diagrams is for cable with AWG#26 wire and an insulation outside diameter of 0.88 mm.

### ● Power supply contacts



**HIROSE ELECTRIC CO.,LTD.**

2-6-3,Nakagawa Chuoh,Tsuzuki-Ku,Yokohama-Shi 224-8540,JAPAN

TEL: +81-45-620-3526 Fax: +81-45-591-3726

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