

## Wiring Harness

Wiring harness customization



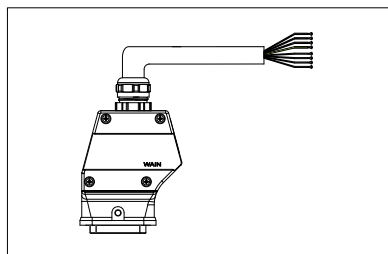
## Overview of wiring harness

Wiring harness which is composed of insulating sheath, terminal blocks, wires and insulating banding materials is a connecting part linking all electrical appliances within the same circuit.

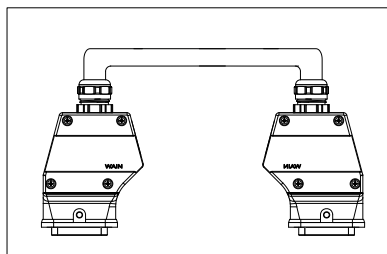
WAIN customized wiring harness: Process and assemble the shells, cores, pins, cable glands, wire rods and other related parts of our company to manufacture customized wiring harness meeting the clients' requirements.

### I、Classification of wiring harness

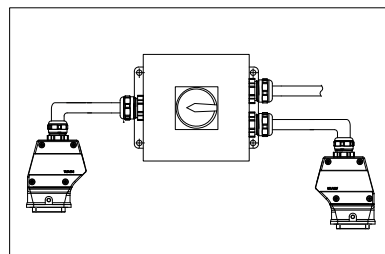
According to the quantity of connectors linking with the wiring harness, customized wiring harness can be classified into three categories, namely, single-ended wiring harness, double-ended wiring harness and multi-ended wiring harness.



【drawing-1】



【drawing-2】



【drawing-3】

Single-ended wiring harness: One end of the wiring harness is equipped with connector of our Company, while the tail end can be crimped with terminals, equipped with cable marker or handled by the clients on their own.

【drawing-1】

Double-ended wiring harness: Both ends of the wiring harness are equipped with connectors of our Company.

【drawing-2】

Multi-ended wiring harness: Divide the wiring harness into multiple ends via junction box or add wire outlets at the shell, and equip the wiring harness with more than two connectors. 【drawing-3】

### II. Wire rods of wiring harness

According to the different operating environment, wire rods of wiring harness can be divided into the following types in accordance with the requirements of clients.:

1、Standard electric wire: Applicable to clients who have no special requirements on the wire rods of wiring harness;

2、Electric installation cable: Applicable to dry or humid indoor environment, especially for various kinds of electrical installation in industrial environment. Such cable with a cross section of 0.5mm<sup>2</sup> or above can be used as control and connecting flexible wire, which is especially applicable to machine tool manufacturing, complete equipment installation, power station, heating installation and air conditioner installation. (It can be equipped with signal shielding functions according to clients' requirements.)

3、Fixed installation cable for lift shaft: Applicable to the installation and fixed laying in lift shaft; however, it can not be used as traveling cable of lift.

4、Control cable: Applicable to control, signal, protection and measuring circuits with DC or AC 50-60 Hz and with rated voltage of 600/1000V and below. It is usually used in electrical control system and power distribution unit. (It can be equipped with signal shielding functions according to clients' requirements.)

5、Oil-resistant cable: With oil-resistant feature, it is applicable to dry or humid indoor environment, installation with occasional moving but without slow release of strong stress or forced guiding. It also can be used in industrial environment with occasional bending and moving, such as machine tool, wood-working machine and grinding machine. (It can be equipped with signal shielding functions according to clients' requirements.)

6、Standard power wire: inapplicable to power supply and illuminating system. In general, it can be categorized into rubber power wire and PVC power wire. According to the different using conditions, the power wire must conform to relevant national certification standards. (The power wire shall conform to China Compulsory Certification in China, VDE certification and CE certification in Europe and UL certification in USA, etc.)

7、Towline cable: With the features of high flexibility and anti-bending ability, the cable is applicable to the installation with frequent bending but without slow release of strong stress or free continuous reciprocating movement which is forcedly guided.

In particular, it can be used in industrial environment with frequent bending, such as wood-working machine, machine tool, logistics transport system, crane, etc. (It can be equipped with signal shielding functions according to clients' requirements.)

Traveling control cable of lift: Applicable to traveling control of lift and long-distance hanging.

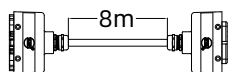
## Ordering process for wiring harness products

|                                     |                                                                         |   |                        |   |                 |   |          |
|-------------------------------------|-------------------------------------------------------------------------|---|------------------------|---|-----------------|---|----------|
| Design personnel<br>Working process | Selection of parts                                                      | > | Design & sample making | > | Enquiry & Order | > | Delivery |
| Purchasing process                  | Electrical design drawing<br>Selection of parts<br>Complete the drawing | > | Order                  | > | Delivery        |   |          |

### Free selection of wiring harness length

The situation of using products of other suppliers:

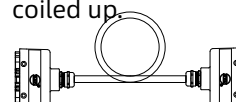
1.The wiring length is 8 meters



2.Only length of 12-meter is available

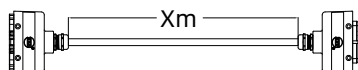


3.The other 4 meters need to be coiled up.



The situation of using WIAN products:

As WAIN products are manufactured according to the clients' requirements, the length can be designated with the unit as 0.1m.



## Guide on model selection of wiring harness

### Five simple steps for model selection

1. Select insert

2. Select number of contacts

3. Select specification of insert

4. Appearance of wiring harness

5. Select length

|                                                                                                                                              | Type of inserts                                                                                                                                                            | Number of contacts                                                              | Type                  | Diagrammatic drawing              | Type of cable                                 | Designated unit                 |
|----------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------|-----------------------|-----------------------------------|-----------------------------------------------|---------------------------------|
| 1. Select insert<br>2. Select number of contacts<br>3. Select specification of insert<br>4. Appearance of wiring harness<br>5. Select length | GCHA(HE, HVE, HEE, HD, HK, HM, HQ, HC)<br>Crimp terminal<br>HA, HE...<br>...Series                                                                                         | 2<br>3<br>46<br>...<br>Select the number of contacts as required.<br>See P00-03 | M<br>(male)           | CN1 Designated length CN2 cut off | CCC                                           | 0.2-50m<br>Designated unit 0.1m |
|                                                                                                                                              |                                                                                                                                                                            |                                                                                 | F<br>(female)         | CN1 Designated length CN2 cut off | CE                                            |                                 |
|                                                                                                                                              |                                                                                                                                                                            |                                                                                 | MM<br>(male-male)     | CN1 Designated length CN2         | UL                                            |                                 |
|                                                                                                                                              |                                                                                                                                                                            |                                                                                 | FF<br>(female-female) | CN1 Designated length CN2         | VD                                            |                                 |
|                                                                                                                                              |                                                                                                                                                                            |                                                                                 | MF<br>(male-female)   | CN1 Designated length CN2         | According to the cable designated by clients! |                                 |
|                                                                                                                                              | YCHR23<br>Crimp terminal<br>HR23 Series<br><br>YLHR23(M8, M12)<br>Screw terminal<br>HR23, M8, M12 Series<br><br>YHHR23(M8, M12)<br>Spring terminal<br>HR23, M8, M12 Series | 2<br>3<br>46<br>...<br>Select the number of contacts as required.<br>See P00-03 | M<br>(male)           | CN1 Designated length CN2 cut off | CCC                                           | 0.2-50m<br>Designated unit 0.1m |
|                                                                                                                                              |                                                                                                                                                                            |                                                                                 | F<br>(female)         | CN1 Designated length CN2 cut off | CE                                            |                                 |
|                                                                                                                                              |                                                                                                                                                                            |                                                                                 | MM<br>(male-male)     | CN1 Designated length CN2         | UL                                            |                                 |
|                                                                                                                                              |                                                                                                                                                                            |                                                                                 | FF<br>(female-female) | CN1 Designated length CN2         | VD                                            |                                 |
|                                                                                                                                              |                                                                                                                                                                            |                                                                                 | MF<br>(male-female)   | CN1 Designated length CN2         | According to the cable designated by clients! |                                 |

## Quality assurance

### Control on welding process

#### 1, Temperature management

The welding temperature shall be maintained at 350°C and records shall be kept.



#### 2, The welding operation shall be conducted by professional staff.

People conducting welding operation must pass examination before engaging in such work, and onsite examination shall be carried out.

#### 3, Judgment criterion for welding process.

Key points of inspection for welding process & examples of bad processing.

Key points of inspection:

- ① .The pin position shall be welded correctly.
- ② .The welding spot shall be smooth, glossy and without such defects as cold joint, icicle, short circuit and tin peeling.
- ③ .The wire core shall be intact without bare wire or wound caused by burning or pinching.
- ④ .The connector shall not be scalded.
- ⑤ .The butt contact of connector shall not have any displacement.

### Control on welding process

#### 1. Crimping tools



#### 2. Judgment criterion

Crimping requirements:

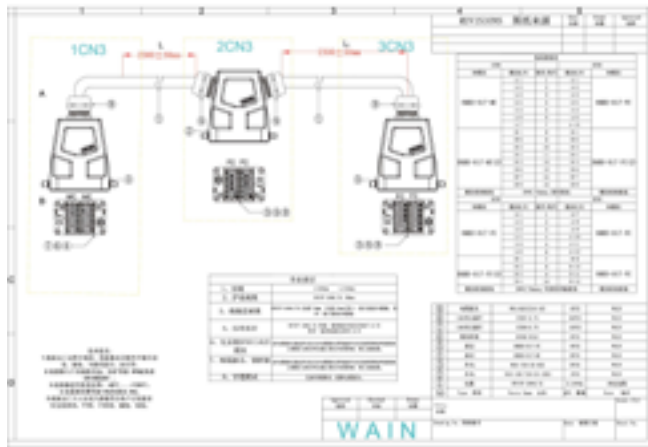
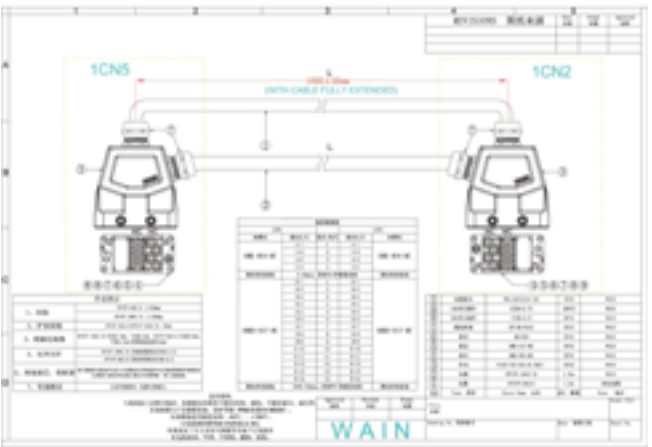
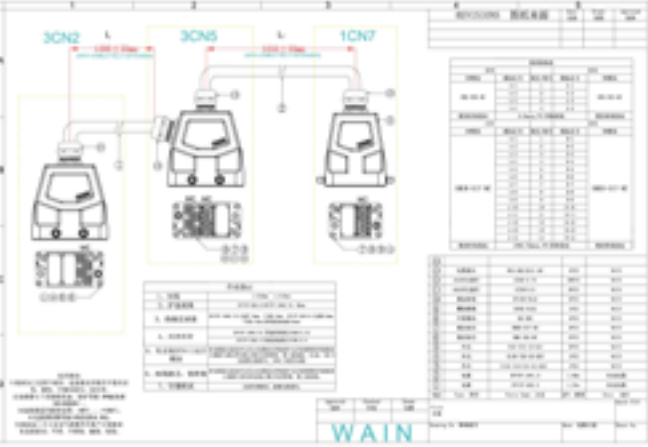
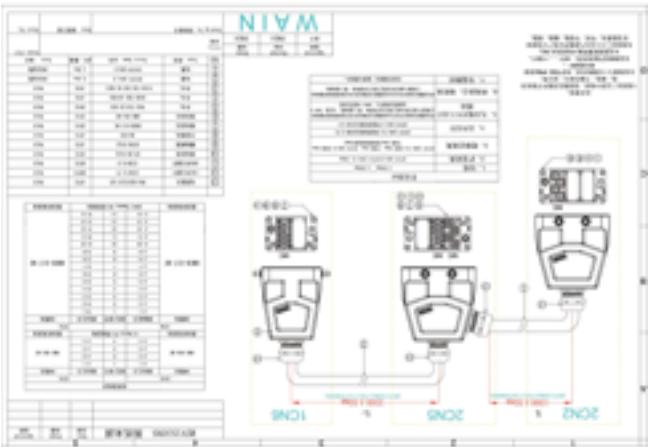
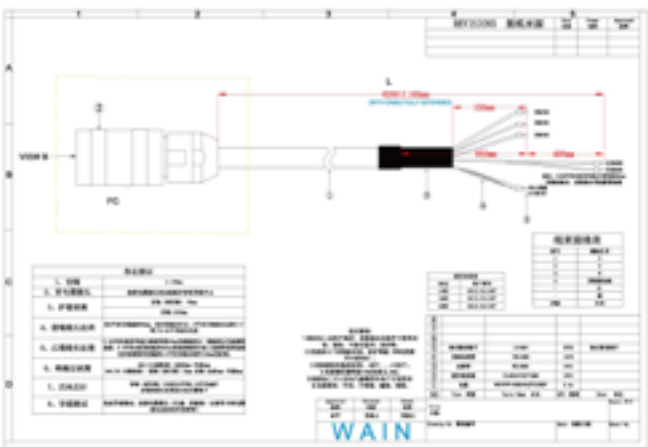
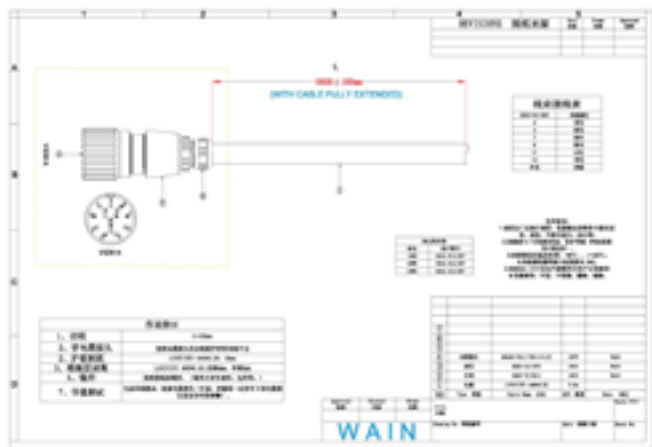
- ① . Before assembling the shell, check the intermediate crimping between the inspection hole and the terminal through which the wire enters into.
- ② .The indentation after crimping shall surround the pin with enough depth.

#### Inspection stations

- ① Inspection before assembling the shell
- ② . Inspection after assembling the shell
- ③ . Inspection before delivery

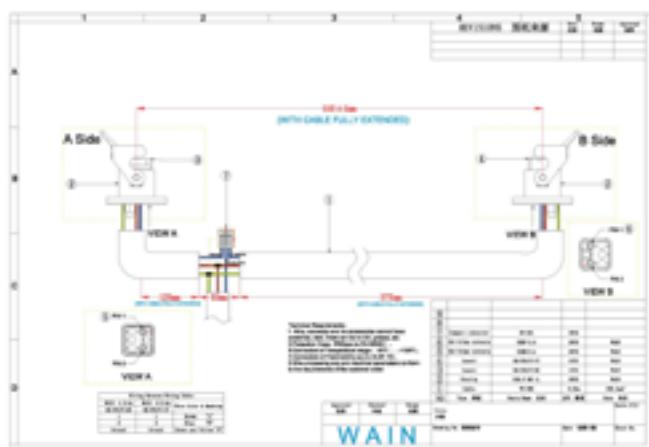
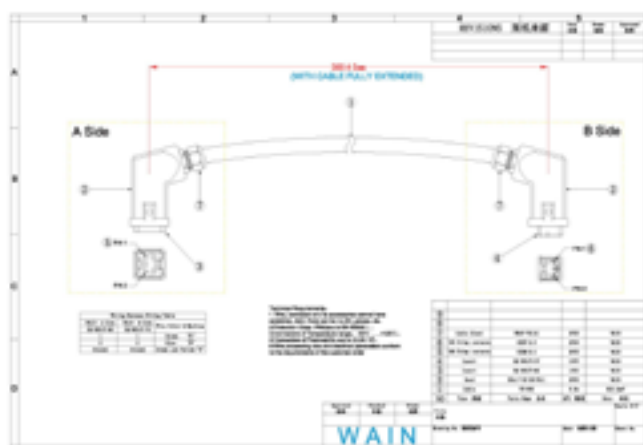
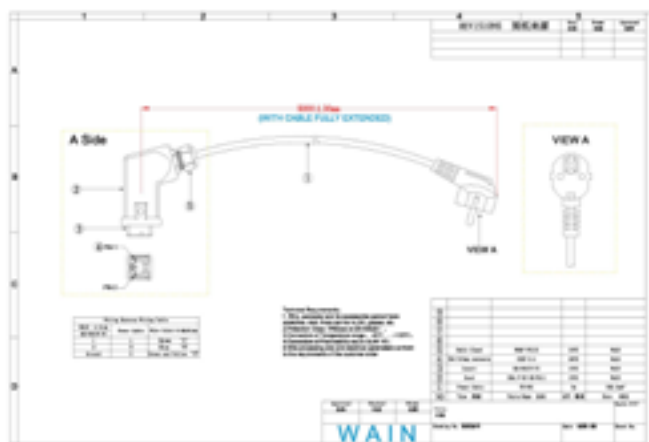
Project Cases

Wind power project



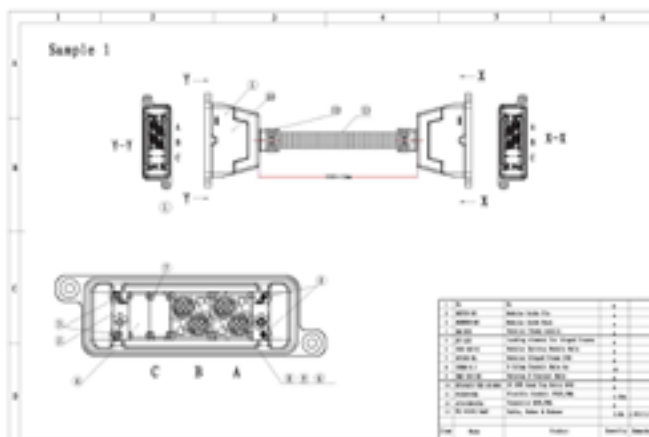
## Project Cases

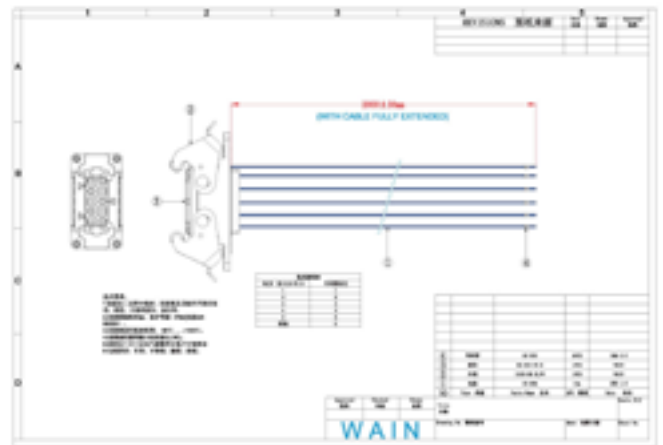
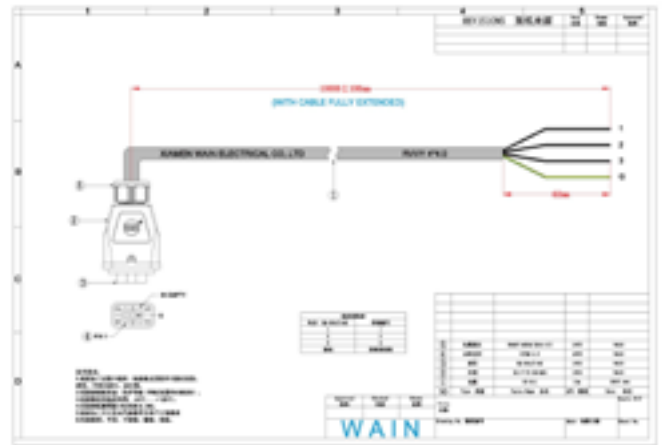
## Electrical appliance connecting wire project



## Project Cases

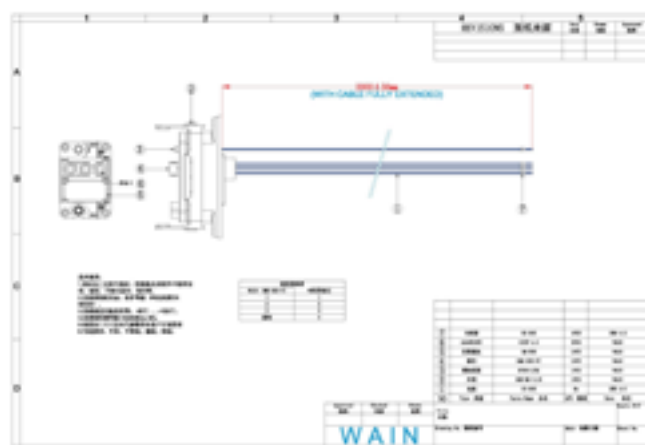
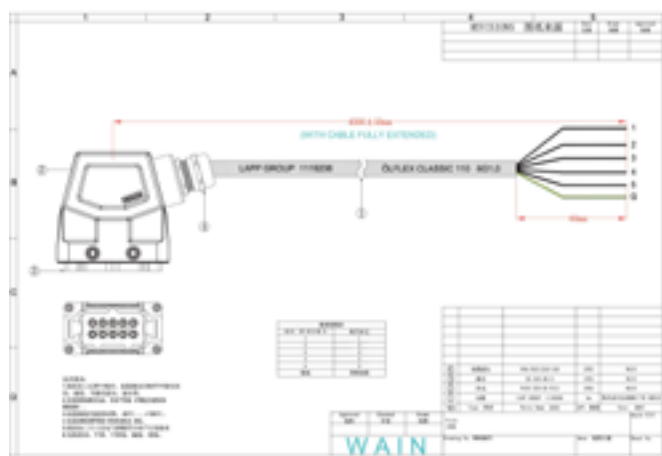
## Railway jumper wire project





## Project Cases

### Automobile production line





## Rectangular crimping type

Customized service Crimping Inter-cabinet wire

## Free length

Selection of connector: Firstly, select the insert; secondly, select the suitable hood; lastly, select the cable gland.

## Identification



| Type of inserts                                                                                                                                                                                                                                                                                                                                                                                                                                         | Number of contacts                                                                    | Diagrammatic drawing | Hoods&Housings <sup>1)</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Type of cable                                                                                 | Designated unit                 |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|---------------------------------|
| GCHA<br>Rectangular-crimping<br>HA Series<br><br>GCHE<br>Rectangular-crimping HE<br>Series<br><br>GCHVE<br>Rectangular-crimping HVE<br>Series<br><br>GCHEE<br>Rectangular-crimping<br>HEE Series<br><br>GCHD<br>Rectangular-crimping<br>HD&HDD Series<br><br>GCHK<br>Rectangular-crimping HK<br>Series<br><br>GCHM<br>Rectangular-crimpingHM<br>Series<br><br>GCHQ<br>Rectangular-crimping HQ<br>Series<br><br>GCHC<br>Rectangular-crimpingHC<br>Series | 3<br>4<br>46<br>...<br>Select the number<br>of contacts as<br>required.<br>See P00-01 |                      | MC1D<br>male·1 lever top-entry<br>MC2D<br>male·2 lever top-entry<br>FC1D<br>female·1 lever top-<br>entry<br>FC2D<br>female·2 lever top-entry<br>MCHD<br>male·tight top-entry<br><br>MT1D<br>male·1 lever top-entry<br>MT2D<br>male·2 lever top-entry<br>FT1D<br>female·1 lever top-entry<br>FT2D<br>female·2 lever top-entry<br>MTHD<br>male·tight top-entry<br><br>MC1C<br>male·1 lever side-entry<br>MC2C<br>male·2 lever side-entry<br>FC1C<br>female·1 lever side-<br>entry<br>FC2C<br>female·2 leverside-entry<br>MCHC<br>female·tight side-entry<br><br>MT1C<br>male·1 lever side-entry<br>MT2C<br>male·2 lever side-entry<br>FT1C<br>female·1 lever side-<br>entry<br>FT2C<br>female·2 lever side-<br>entry<br>MTHC<br>female·tight side-entry<br><br>Select right shell size and<br>cable gland according to<br>the core! | CCC<br><br>CE<br><br>UL<br><br>VDE<br><br>According to the<br>cable designated<br>by clients! | 0.2-50m<br>Designated unit 0.1m |

1)Double-ended wiring harness: MC1D: male 1 lever top-entry, MMC1D: male • male 1 lever top-entry, MFC1D: male • female 1 lever top-entry; for multi-ended wiring harness or special products, please directly contact the wiring harness department of our company.

Rectangular screwing type

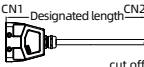
Customized service   Crimping   Inter-cabinet wire

## Free length

Selection of connector: Firstly, select the insert; secondly, select the suitable hood; lastly, select the cable gland.

## Identification



| Type of inserts                               | Number of contacts                                                                    | Diagrammatic drawing                                                              | Hoods&Housings <sup>1)</sup>                                                                                                                                             | Type of cable                                                                                 | Designated unit                 |
|-----------------------------------------------|---------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|---------------------------------|
| GLHA<br>Rectangular·screwing<br>HA Series     | 3<br>6<br>46<br>...<br>Select the number<br>of contacts as<br>required.<br>See P00-01 |  | MC1D<br>male·1 lever top-entry<br>MC2D<br>male·2 lever top-entry<br>FC1D<br>female·1 lever top-entry<br>FC2D<br>female·2 lever top-entry<br>MCHD<br>male·tight top-entry | CCC<br><br>CE<br><br>UL<br><br>VDE<br><br>According to the<br>cable designated<br>by clients! | 0.2-50m<br>Designated unit 0.1m |
| GLHE<br>Rectangular·screwing<br>HE Series     |                                                                                       |                                                                                   | MT1D<br>male·1 lever top-entry<br>MT2D<br>male·2 lever top-entry<br>FT1D<br>female·1 lever top-entry<br>FT2D<br>female·2 lever top-entry<br>MTHD<br>male·tight top-entry |                                                                                               |                                 |
| GLHVE<br>Rectangular·screwing<br>HVE Series   |                                                                                       |                                                                                   |                                                                                                                                                                          |                                                                                               |                                 |
| GLHSB<br>Rectangular·screwing<br>HSB Series   |                                                                                       |                                                                                   |                                                                                                                                                                          |                                                                                               |                                 |
| GLHK<br>Rectangular·screwing<br>HK Series     |                                                                                       |                                                                                   |                                                                                                                                                                          |                                                                                               |                                 |
| GLHEAV<br>Rectangular·screwing<br>HEAV Series |                                                                                       |                                                                                   |                                                                                                                                                                          |                                                                                               |                                 |
| GLHM<br>Rectangular·screwing<br>HM Series     |                                                                                       |                                                                                   |                                                                                                                                                                          |                                                                                               |                                 |
| GLHQ<br>Rectangular·screwing<br>HQ Series     |                                                                                       |                                                                                   |                                                                                                                                                                          |                                                                                               |                                 |
| GLHC<br>Rectangular·screwing<br>HC Series     |                                                                                       |                                                                                   |                                                                                                                                                                          |                                                                                               |                                 |
|                                               |                                                                                       |                                                                                   |                                                                                                                                                                          |                                                                                               |                                 |

1) Double-ended wiring harness: MC1D: male 1 lever top-entry, MM1D: male • male 1 lever top-entry, MF1D: male • female 1 lever top-entry; for multi-ended wiring harness or special products, please directly contact the wiring harness department of our company.

## Rectangular spring type

Customized service spring Inter-cabinet wire

## Free length

Selection of connector: Firstly, select the insert; secondly, select the suitable hood; lastly, select the cable gland.

## Identification



| Type of inserts                             | Number of contacts                                                                    | Diagrammatic drawing | Hoods&Housings <sup>1)</sup>                                                                                                                                                    | Type of cable                                                                     | Designated unit                 |
|---------------------------------------------|---------------------------------------------------------------------------------------|----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|---------------------------------|
| GTHA<br>Rectangular-spring<br>HA Series     | 3<br>4<br>46<br>...<br>Select the number<br>of contacts as<br>required.<br>See P00-01 |                      | MC1D<br>male·1 lever top-entry<br>MC2D<br>male·2 lever top-entry<br>FC1D<br>female·1 lever top-entry<br>FC2D<br>female·2 lever top-entry<br>MCHD<br>male·tight top-entry        | CCC<br>CE<br>UL<br>VDE<br><br>According to the<br>cable designated<br>by clients! | 0.2-50m<br>Designated unit 0.1m |
| GTHE<br>Rectangular-spring<br>HE Series     |                                                                                       |                      | MT1D<br>male·1 lever top-entry<br>MT2D<br>male·2 lever top-entry<br>FT1D<br>female·1 lever top-entry<br>FT2D<br>female·2 lever top-entry<br>MTHD<br>male·tight top-entry        |                                                                                   |                                 |
| GTHVE<br>Rectangular-spring<br>HVE Series   |                                                                                       |                      | MC1C<br>male·1 lever side-entry<br>MC2C<br>male·2 lever side-entry<br>FC1C<br>female·1 lever side-entry<br>FC2C<br>female·2 lever side-entry<br>MCHC<br>female·tight side-entry |                                                                                   |                                 |
| GTHVES<br>Rectangular-spring<br>HVES Series |                                                                                       |                      | MT1C<br>male·1 lever side-entry<br>MT2C<br>male·2 lever side-entry<br>FT1C<br>female·1 lever side-entry<br>FT2C<br>female·2 lever side-entry<br>MTHC<br>female·tight side-entry |                                                                                   |                                 |
| GTHM<br>Rectangular-spring<br>HM Series     |                                                                                       |                      | Select right shell size and<br>cable gland according to<br>the core!                                                                                                            |                                                                                   |                                 |

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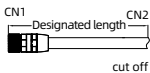
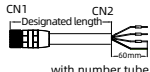
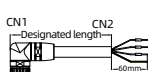
## Circular crimping type

Customized service Crimping Inter-cabinet wire

## Free length

Selection of connector: Firstly, select the insert; secondly, select the suitable hood; lastly, select the cable gland.

## Identification

| Type of inserts                                                                                                                 |  | Number of contacts | Diagrammatic drawing                                                                | Hoods&Housings <sup>1)</sup>                                                                                                 | Type of cable                                                                     | Designated unit                 |
|---------------------------------------------------------------------------------------------------------------------------------|--|--------------------|-------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|---------------------------------|
| <br>YCHR23<br>circular·crimping<br>HR23 Series |  | 12<br>17           |    | MCD<br>male·top-entry<br>FCD<br>female·top-entry                                                                             | CCC<br>CE<br>UL<br>VDE<br><br>According to the<br>cable designated<br>by clients! | 0.2-50m<br>Designated unit 0.1m |
|                                                                                                                                 |  |                    |    | MTD<br>male·top-entry<br>FTD<br>female·top-entry                                                                             |                                                                                   |                                 |
|                                                                                                                                 |  |                    |   | MCS<br>male90°C entry<br>FCS<br>female90°C entry                                                                             |                                                                                   |                                 |
|                                                                                                                                 |  |                    |  | MTS<br>male90°C entry<br>FTS<br>female90°C entry<br><br>Select right shell size and<br>cable gland according to<br>the core! |                                                                                   |                                 |

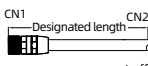
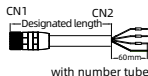
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Circular spring type

Customized service   screwing   Inter-cabinet wire

Free length

Selection of connector: Firstly, select the insert; secondly, select the suitable hood; lastly, select the cable gland.

| Identification                                                                    |                                            | Type of inserts                                                | Number of contacts | Diagrammatic drawing                                                              | Hoods&Housings <sup>1)</sup>                                         | Type of cable                                                                                 | Designated unit                 |  |
|-----------------------------------------------------------------------------------|--------------------------------------------|----------------------------------------------------------------|--------------------|-----------------------------------------------------------------------------------|----------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|---------------------------------|--|
|  | YLHR23<br>Circular-screwing<br>HR23 Series | Select the number<br>of contacts as<br>required.<br>See P00-02 | 3                  |  | MCD<br>male·top-entry<br>FCD<br>female·top-entry                     | CCC<br><br>CE<br><br>UL<br><br>VDE<br><br>According to the<br>cable designated<br>by clients! | 0.2-50m<br>Designated unit 0.1m |  |
|                                                                                   | YLM8<br>Circular-screwing<br>M8 Series     |                                                                | 4                  |                                                                                   | MTD<br>male·top-entry<br>FTD<br>female·top-entry                     |                                                                                               |                                 |  |
|                                                                                   | YLM12<br>Circular-screwing<br>M12 Series   |                                                                | 12                 |  |                                                                      |                                                                                               |                                 |  |
|                                                                                   |                                            |                                                                |                    |                                                                                   | MCS<br>male90°C entry<br>FCS<br>female90°C entry                     |                                                                                               |                                 |  |
|                                                                                   |                                            |                                                                |                    |                                                                                   | MTS<br>male90°C entry<br>FTS<br>female90°C entry                     |                                                                                               |                                 |  |
|                                                                                   |                                            |                                                                |                    |                                                                                   | Select right shell size and<br>cable gland according to<br>the core! |                                                                                               |                                 |  |

1)Double-ended wiring harness: MC1D:male 1 lever top-entry, MMC1D: male • male 1 lever top-entry, MFC1D: male • female 1 lever top-entry; for multi-ended wiring harness or special products, please directly contact the wiring harness department of our company.

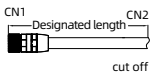
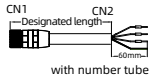
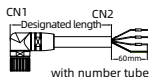
## Circular welding type

Customized service welding Inter-cabinet wire

## Free length

Selection of connector: Firstly, select the insert; secondly, select the suitable hood; lastly, select the cable gland.

## Identification

| Identification                                                                    | Type of inserts                           | Number of contacts                                             | Diagrammatic drawing                                                                | Hoods&Housings <sup>1)</sup>                                         | Type of cable                                                                     | Designated unit                 |
|-----------------------------------------------------------------------------------|-------------------------------------------|----------------------------------------------------------------|-------------------------------------------------------------------------------------|----------------------------------------------------------------------|-----------------------------------------------------------------------------------|---------------------------------|
|  | YTHR23<br>Circular-welding HR23<br>Series | 3                                                              |    | MCD<br>male·top-entry<br>FCD<br>female·top-entry                     | CCC<br>CE<br>UL<br>VDE<br><br>According to the<br>cable designated<br>by clients! | 0.2-50m<br>Designated unit 0.1m |
|                                                                                   | YTM8<br>Circular-welding M8<br>Series     | 6<br>12<br>...                                                 |                                                                                     | MTD<br>male·top-entry<br>FTD<br>female·top-entry                     |                                                                                   |                                 |
|                                                                                   | YTM12<br>Circular-welding M12<br>Series   | Select the number<br>of contacts as<br>required.<br>See P00-02 |    | MCS<br>male90°C entry<br>FCS<br>female90°C entry                     |                                                                                   |                                 |
|                                                                                   |                                           |                                                                |  | MTS<br>male90°C entry<br>FTS<br>female90°C entry                     |                                                                                   |                                 |
|                                                                                   |                                           |                                                                |                                                                                     | Select right shell size and<br>cable gland according to<br>the core! |                                                                                   |                                 |

1)Double-ended wiring harness: MC1D:male 1 lever top-entry, MMC1D: male • male 1 lever top-entry, MFC1D: male • female 1 lever top-entry; for multi-ended wiring harness or special products, please directly contact the wiring harness department of our company.