



# har-bus® HM female connector



## General information

|                                |                                                                                     |                        |
|--------------------------------|-------------------------------------------------------------------------------------|------------------------|
| Design                         | IEC 61076-4-101                                                                     | type: monoblock 47     |
| No. of contacts                | max. 220 or 200 with upper shield                                                   |                        |
| Contact spacing                | 2,0mm                                                                               |                        |
| Test voltage                   | 750V AC                                                                             |                        |
| Contact resistance             | max. 20mOhm                                                                         |                        |
| Insulation resistance          | min. 10 <sup>10</sup> Ohm                                                           |                        |
| Working current                | 1A at 70°C                                                                          | (see derating diagram) |
| Temperature range              | -55°C ... +125°C                                                                    |                        |
| Termination technology         | press-in                                                                            |                        |
| Clearance & creepage distance  | 0,6 mm each for free connector                                                      |                        |
| Insertion and withdrawal force | insertion force per contact: 0,75N max.<br>withdrawal force per contact: 0,15N min. |                        |
| Mating cycles                  | acc. to performance level, see table below                                          |                        |
| UL file                        | E102079                                                                             |                        |
| RoHS - compliant               | Yes                                                                                 |                        |
| Leadfree                       | Yes                                                                                 |                        |

## Insulator material

|                                    |                                                                 |
|------------------------------------|-----------------------------------------------------------------|
| Material                           | LCP (liquid crystalline polymer, glass fiber reinforcement 30%) |
| Colour                             | nature                                                          |
| UL classification                  | UL 94-V0                                                        |
| Material group acc. to IEC 60664-1 | IIIa (175 ≤ CTI < 400)                                          |

## Contact material

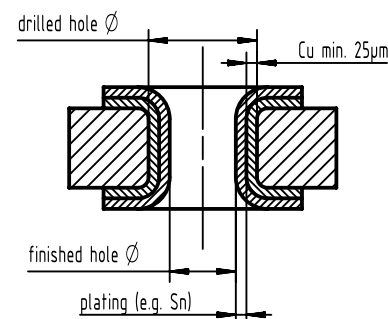
|                        |                                            |
|------------------------|--------------------------------------------|
| Contact material       | Copper alloy                               |
| Treatment contact zone | Bellcore recommended lubricant (PPE)       |
| Plating press-in zone  | Ni                                         |
| Plating contact zone   | acc. to performance level, see table below |
| Shielding contact zone | acc. to performance level, see table below |

| performance level | mating cycles           |                                       | plating contact zone                              | shielding contact zone     |
|-------------------|-------------------------|---------------------------------------|---------------------------------------------------|----------------------------|
|                   | acc. to IEC 61076-4-101 | complementary acc. to IEC 61076-4-101 |                                                   |                            |
| 1                 | 500                     |                                       | <i>Au over Ni</i>                                 | <i>noble metal over Ni</i> |
| 2                 | 250                     |                                       | <i>Au over Ni</i>                                 | <i>noble metal over Ni</i> |
| NM30 (S4)         |                         | 500                                   | min. 0,76µm (30pinch) noble metal (alloy) over Ni |                            |
| Au30              |                         | 500                                   | min. 0,76µm (30pinch) Au over Ni                  | not available              |
| Au50              |                         | 500                                   | min. 1,27µm (50pinch) Au over Ni                  |                            |

Standard plating options highlighted in *italic*, other plating options are available on request.

## Recommended configuration of plated through holes for press-in termination

In addition to the hot-air-level (HAL), other PCB surfaces are getting more important. Due to their different properties - such as mechanical strength and coefficient of friction - we recommend the following configuration of PCB through holes.



|                                         |                |               |
|-----------------------------------------|----------------|---------------|
| Tin plated PCB (HAL) acc. to EN 60352-5 | Drilled hole Ø | 0,7±0,02mm    |
|                                         | Sn             | max. 15µm     |
|                                         | plated hole Ø  | 0,60 - 0,65mm |
| Chemical tin plated PCB                 | Drilled hole Ø | 0,7±0,02mm    |
|                                         | Sn             | min. 0,8µm    |
|                                         | plated hole Ø  | 0,60 - 0,65mm |
| Gold /Nickel plated PCB                 | Drilled hole Ø | 0,7±0,02mm    |
|                                         | Ni             | 3 - 7µm       |
|                                         | Au             | 0,05 - 0,12µm |
|                                         | plated hole Ø  | 0,60 - 0,65mm |
| Silver plated PCB                       | Drilled hole Ø | 0,7±0,02mm    |
|                                         | Ag             | 0,1 - 0,3µm   |
|                                         | plated hole Ø  | 0,60 - 0,65mm |
| Copper plated PCB (OSP)                 | Drilled hole Ø | 0,7±0,02mm    |
|                                         | plated hole Ø  | 0,60 - 0,65mm |

## Assembly instructions

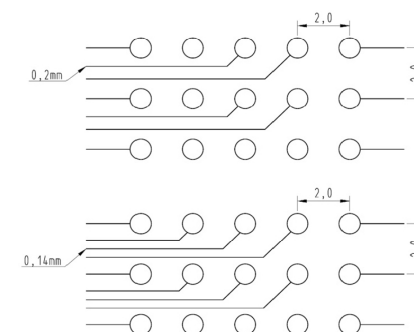
It is highly recommended to use HARTING press-in tools to ensure a reliable press-in process. Please refer to the catalogue for tools, machines and further information about the press-in process.

## Circuit density

When using the specified diameter of the finished through hole according to IEC 61 076-4-101 (0.6 ± 0.05mm) with an appropriate annular ring, the remaining distance between the rings is about 1mm.

Under the condition that the width of the track and the space between should be equal, two tracks of 0.2mm width or three tracks of 0.14mm width can be placed between two rings.

Typical designs are shown in the drawing on the right side.

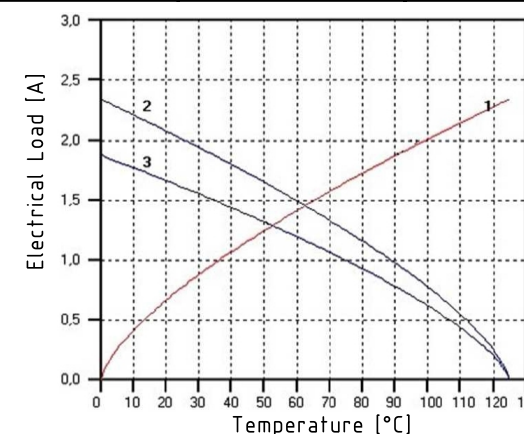


## Derating diagram acc. to IEC 60512-5 (Current carrying capacity)

The current carrying capacity is limited by maximum temperature of materials for inserts and contacts including terminals.  
The current capacity curve is valid for continuous, non interrupted current loaded contacts of connectors when simultaneous power on all contacts is given, without exceeding the maximum temperature.

Control and test procedures according to DIN IEC 60512-5

Curve 1 shows raise in temperature  
Curve 2 shows nominal derating Date Name  
Curve 3 shows reduced values as per IEC512



|  |                                              |                                       |                         |                 |                                                          |                        |
|--|----------------------------------------------|---------------------------------------|-------------------------|-----------------|----------------------------------------------------------|------------------------|
|  | All Dimensions in mm<br>Original Size DIN A3 | Scale<br>1:1                          | Free size tol.          |                 | Ref.                                                     |                        |
|  |                                              |                                       |                         |                 | Sub.                                                     |                        |
|  | All rights reserved<br>Department EL PD      | Created by<br>STORCK                  | Inspected by<br>LEHNERT | Standardisation | Date<br>2021-12-13                                       | State<br>Final Release |
|  | HARTING<br>D-32339 Espelkamp                 | Title<br>har-bus® HM female connector |                         |                 | Doc-Key / ECM-Nr.<br>100580926/UGD/000/C<br>500000207997 |                        |
|  |                                              | Type<br>DS                            | Number<br>17002200102   |                 | Rev.<br>C                                                | Page<br>1/1            |

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