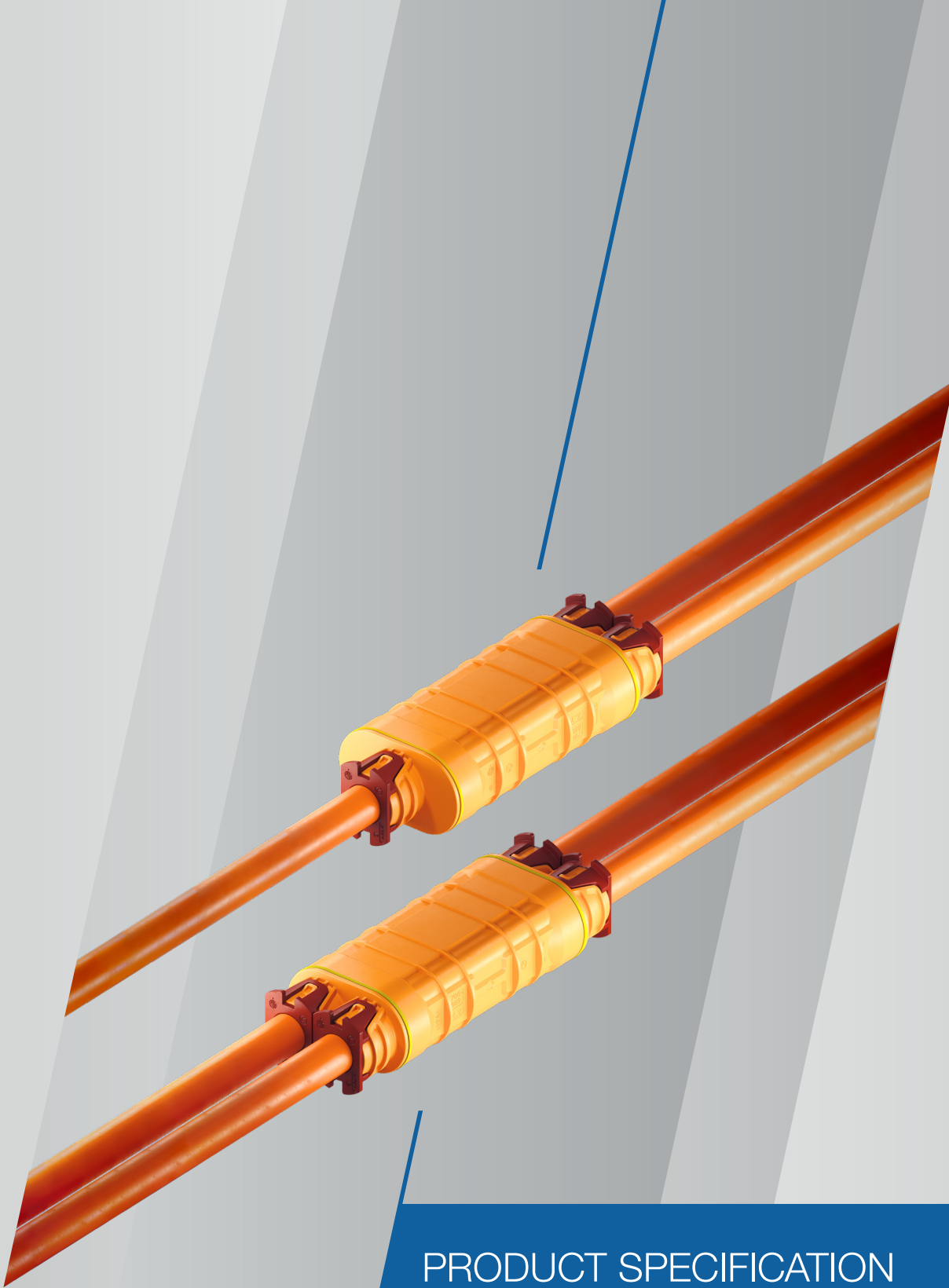




## PRODUCT SPECIFICATION

# **HPS Y/H Distributor MCC**

EPS-100130



**HIRSCHMANN**  
AUTOMOTIVE

# TABLE

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# 1 General

## 1.1 Introduction

This product specification is valid for the HPS DISTRIBUTOR MCC and is assembled according to the below listed process specification where you will find the product structure and the delivery condition as well as the performed qualification tests. In the case of improper application or deviation from specification that results in quality issues, the right of complaint is void.

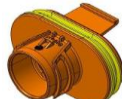
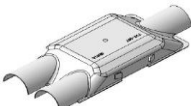
## 1.2 Other valid documents

|   |                                                  |                                                                                                                              |
|---|--------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|
| A | Hirschmann product drawing                       | 809-852-...00                                                                                                                |
| B | Process specification                            | EVS-100130                                                                                                                   |
| C | Working committee directive LV214 (cf. TLF 0214) | Working committee test specification for motor vehicle plug-in connector – version March 2010                                |
| D | Working committee directive LV215 (cf. TLF 0214) | Electrics/ electronic requirements of HV-plug-in connectors – version May 2013                                               |
| E | DIN EN 60664-1                                   | Insulation coordination for electronic equipment in low voltage systems.<br>Part 1: principles, requirement, and tests       |
| F | 2000/53/EG                                       | Directive of the European Parliament and of the council on end-of life vehicles incl. attachments; European Union            |
| G | ISO 6469-3                                       | Electric road vehicles – safety specifications<br>Part 3: protection of persons against electric hazards                     |
| H | ISO 26053                                        | Road vehicles; degrees of protection (IP-Code); protection against foreign objects, water, and access; electrical equipment; |

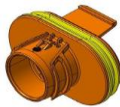
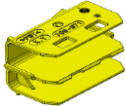
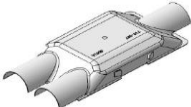
## 1.3 Product Design

### 1.3.1 BOM, PN, description, weight, MOQ

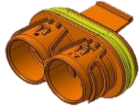
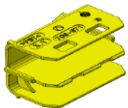
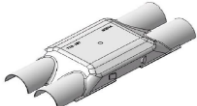
The HPS DISTRIBUTOR MCC consists of following parts. (see BOM)

| HPS Y-Distributor 4.0 mm <sup>2</sup> MCC                                           |                                               | 809-852-...00  | Weight without wire:    |                      | 98,72 g         |
|-------------------------------------------------------------------------------------|-----------------------------------------------|----------------|-------------------------|----------------------|-----------------|
| Article picture                                                                     | Article description                           | Article number | Needed parts per system | Packaging unit / MOQ | Weight per pcs. |
|    | HPS Distributor shieldhousing                 | 706-669-501    | 1                       | 340 pcs.             | 24,74 g         |
|    | HPS Distributor cablehousing one              | 809-853-501    | 1                       | 800 pcs.             | 9,10 g          |
|    | HPS Distributor cablehousing two              | 809-853-502    | 1                       | 600 pcs.             | 10,50 g         |
|   | HPS Distributor insulator yellow              | 706-671-501    | 1                       | 3000 pcs.            | 4,14 g          |
|  | HPS Distributor insulator green               | 706-671-502    | 1                       | 3000 pcs.            | 4,13 g          |
|  | HPS Distributor shield Y MCC                  | 710-097-501    | 2                       | 250 pcs.             | 10,74 g         |
|  | HPS Distributor shieldsleeve MCC              | 710-099-501    | 3                       | 5000 pcs.            | 2,80 g          |
|  | HPS40-2 stress relief 4.0 mm <sup>2</sup> MCC | 709-841-502    | 3                       | 1000 pcs.            | 2,70 g          |
|  | HPS40-2 cable seal 4.0 mm <sup>2</sup> MCC    | 709-113-505    | 3                       | 5000 pcs.            | 1,4 pcs.        |
|  | HPS Distributor cap 4.0 mm <sup>2</sup> MCC   | 706-668-502    | 3                       | 5000 pcs.            | 1,31 g          |

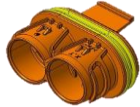
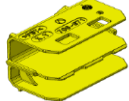
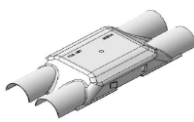
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| HPS Y-Distributor 6.0 mm <sup>2</sup> MCC                                           |                                               | 809-852-...00 | Weight without wire: |           | 78,69 g |
|-------------------------------------------------------------------------------------|-----------------------------------------------|---------------|----------------------|-----------|---------|
|    | HPS Distributor shieldhousing                 | 706-669-501   | 1                    | 340 pcs.  | 24,74 g |
|    | HPS Distributor cablehousing one              | 809-853-501   | 1                    | 800 pcs.  | 9,10 g  |
|    | HPS Distributor cablehousing two              | 809-853-502   | 1                    | 600 pcs.  | 10,50 g |
|    | HPS Distributor insulator yellow              | 706-671-501   | 1                    | 3000 pcs. | 4,14 g  |
|   | HPS Distributor insulator green               | 706-671-502   | 1                    | 3000 pcs. | 4,14 g  |
|  | HPS Distributor shield Y MCC                  | 710-097-501   | 2                    | 250 pcs.  | 10,74 g |
|  | HPS Distributor shieldsleeve MCC              | 710-099-501   | 3                    | 5000 pcs. | 2,80 g  |
|  | HPS40-2 stress relief 6.0 mm <sup>2</sup> MCC | 709-841-503   | 3                    | 1000 pcs. | 1,30 g  |
|  | HPS40-2 cable seal 6.0 mm <sup>2</sup> MCC    | 709-113-506   | 3                    | 5000 pcs. | 1 pcs.  |
|  | HPS Distributor cap 6.0mm <sup>2</sup> MCC    | 706-668-503   | 3                    | 5000 pcs. | 1,31 g  |

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| HPS H-Distributor 4.0 mm <sup>2</sup> MCC                                           |                                               | 809-852-...00 | Weight without wire: |           | 74,75 g |
|-------------------------------------------------------------------------------------|-----------------------------------------------|---------------|----------------------|-----------|---------|
|    | HPS Distributor shieldhousing                 | 706-669-501   | 1                    | 340 pcs.  | 24,74 g |
|    | HPS Distributor cablehousing two              | 809-853-502   | 2                    | 600 pcs.  | 10,50 g |
|    | HPS Distributor insulator yellow              | 706-671-501   | 1                    | 3000 pcs. | 4,14 g  |
|    | HPS Distributor insulator green               | 706-671-502   | 1                    | 3000 pcs. | 4,13 g  |
|   | HPS Distributor shield H MCC                  | 710-197-501   | 2                    | 250 pcs.  | 10,74 g |
|  | HPS Distributor shieldsleeve MCC              | 710-099-501   | 4                    | 5000 pcs. | 2,80 g  |
|  | HPS40-2 stress relief 4.0 mm <sup>2</sup> MCC | 709-841-502   | 4                    | 1000 pcs. | 2,70 g  |
|  | HPS40-2 cable seal 4.0 mm <sup>2</sup> MCC    | 709-113-505   | 4                    | 5000 pcs. | 1,40 g  |
|  | HPS Distributor cap 4.0 mm <sup>2</sup> MCC   | 706-668-502   | 4                    | 5000 pcs. | 1,31 g  |

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| HPS H-Distributor 4.0 mm <sup>2</sup> MCC                                           |                                               | 809-852-...00 | Weight without wire: |           | 96,99 g |
|-------------------------------------------------------------------------------------|-----------------------------------------------|---------------|----------------------|-----------|---------|
|    | HPS Distributor shieldhousing                 | 706-669-501   | 1                    | 340 pcs.  | 24,74 g |
|    | HPS Distributor cablehousing two              | 809-853-502   | 2                    | 600 pcs.  | 10,50 g |
|    | HPS Distributor insulator yellow              | 706-671-501   | 1                    | 3000 pcs. | 4,14 g  |
|    | HPS Distributor insulator green               | 706-671-502   | 1                    | 3000 pcs. | 4,13 g  |
|   | HPS Distributor shield H MCC                  | 710-197-501   | 2                    | 250 pcs.  | 10,74 g |
|  | HPS Distributor shieldsleeve MCC              | 710-099-501   | 4                    | 5000 pcs. | 2,80 g  |
|  | HPS40-2 stress relief 4.0 mm <sup>2</sup> MCC | 709-841-503   | 4                    | 1000 pcs. | 1,30 g  |
|  | HPS40-2 cable seal 4.0 mm <sup>2</sup> MCC    | 709-113-506   | 4                    | 5000 pcs. | 1,00 g  |
|  | HPS Distributor cap 4.0 mm <sup>2</sup> MCC   | 706-668-503   | 4                    | 5000 pcs. | 1,31 g  |

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## 2 Technical product information

The Distributor can be placed in the entire vehicle if the specified characteristics will not be exceeded. The characteristics are determined by tests (see verification plan) and material datasheets.

### 2.1 Current class

The connector system fulfills the class 1 and 2.

### 2.2 Operating condition

|                                     |                       |
|-------------------------------------|-----------------------|
| Nominal voltage                     | 1,000 VDC             |
| Maximum altitude                    | 4,000 m               |
| Insulating material group:          | 1                     |
| Degree of contamination:            | 2                     |
| Overvoltage category:               | 2                     |
| Rated impulse voltage:              | 4,000 VDC             |
| Test voltage for electric strength: | 4,242 VDC (3,000 VAC) |

### 2.3 Voltage class

Class B according to ISO 6469-3

60 VDC < U ≤ 1,000 VDC

25 VAC < U<sub>eff</sub> ≤ 707 VAC (15-150 Hz)

### 2.4 Ambient condition

Permissible temperature range for the plastic used:

-40° C to +140° C according to "temperature collective 4" for 8,000 h

The details of the changes in the properties of the plastics can be found in the plastics data sheets.

**"Temperature collective 4" of MBN 10306, 2020-06 or GS 95024-3-1, 2013-07)**

| Temperature in ° C | Distribution in % |
|--------------------|-------------------|
| -40                | 6                 |
| 23                 | 20                |
| 85                 | 65                |
| 135                | 8                 |
| 140                | 1                 |

## 2.5 EMC performance

Delta transfer impedance of the HV Distributor system.

| 4.0 mm <sup>2</sup>                                           | 6.0 mm <sup>2</sup>                                           |
|---------------------------------------------------------------|---------------------------------------------------------------|
| Until 30 MHz: < 1 mΩ/ m                                       | Until 30 MHz: < 1 mΩ/ m                                       |
| Shielding attenuation:                                        |                                                               |
| 4.0 mm <sup>2</sup>                                           | 6.0 mm <sup>2</sup>                                           |
| > 70 dB (10 kHz to 100 MHz)<br>> 65 dB (100 MHz to 1,000 MHz) | > 75 dB (10 kHz to 500 MHz)<br>> 65 dB (500 MHz to 1,000 MHz) |

## 2.6 Shield area

Shield transfer: 360° circumferential

Shield contact resistance  $R < 2 \text{ m}\Omega$  (total from shielded cable until shielded housing)

## 2.7 IP-Degree of protection

IPxxD (assembled)

## 2.8 Technical cleanliness

Inside the distributor and on the distributor, there are no metallic particles  $> 1,000 \mu\text{m}$  permitted

For metallic particle at each Distributor: CCC =  $N (J4/ K0)$  acc. to VDA Band 19

For all other particle at each Distributor: CCC =  $N (J10/ K0)$  acc. to VDA Band 19

## 2.9 Ampacity MCC (derating)

The distributor does not impact the ampacity of the harness; the derating of the used wires is divisive.

## 2.10 Ampacity MCC (I/t)

The ampacity shall be taken from the respective wire datasheet.

## 3 Performed tests MCC

Tests acc. to LV214 / LV215 (cf. TLF 0214)

Details see DVP-Plan\_ HPS40 H-Distributor

|      |                                                                                                    |                                                                                                                                                                                                                                |
|------|----------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1.1  | PG 0 – Receiving inspection and testing (contacts + shield)                                        | Shield contact resistance: < 2 mΩ<br>Insulation resistance: R > 200 mΩ at 1,000 VDC;<br>Withstand voltage 3,000 VAC for 1 min.<br>(acc. to DIN EN 1987-3 and LV215)<br>min. air distance 3.9 mm +min. creepage distance 5.0 mm |
| 1.2  | PG 1 - Dimension                                                                                   |                                                                                                                                                                                                                                |
| 1.3  | PG 2 – Material and surface test (contacts)                                                        | All metal parts                                                                                                                                                                                                                |
| 1.4  | PG 3 – Material and surface test (housing)<br>PG 10 – Conductor retention (welding + shield)       | All plastic parts and seals<br><br>See EVS-100130-00/ EVS-100131-00                                                                                                                                                            |
| 1.12 | PG 13 – Housing influence on the derating                                                          | No influence, the used wire is decisive.                                                                                                                                                                                       |
| 1.14 | PG 15 – Electrical stress test                                                                     |                                                                                                                                                                                                                                |
| 1.16 | PG 17 – Dynamic stress                                                                             | Shield contact > 2 mΩ<br>- Vibration SG2 Temp. SG4 (HV contact + shield)<br>- Vibration SG3 Temp. SG4 (HV contact + shield)<br>- Vibration SG4 Temp. SG4 (HV contact + shield)                                                 |
| 1.18 | PG 19 – Environmental simulation                                                                   | Max. test temperature: 140° C                                                                                                                                                                                                  |
| 1.19 | PG 20 – Climatic load of the housing                                                               | Max. test temperature: 140° C                                                                                                                                                                                                  |
| 1.20 | PG 21 – Long-term temperature                                                                      | 1,000 h at 140° C                                                                                                                                                                                                              |
| 1.21 | PG 22B – Chemical durability                                                                       | Without battery acid                                                                                                                                                                                                           |
| 1.22 | PG 23 – Water leak tightness<br>PG 49A – Resistance to dust<br>PG 49B – Water tightness after dust | All wire cross section and wire type<br>(4.0 mm <sup>2</sup> / 6.0 mm <sup>2</sup> Coroplast, Kroschu, Leoni)                                                                                                                  |
| 1.24 | PG 50 – EMC test                                                                                   | Acc. to IEC 62153-4-3<br>At frequency area of 10 kHz to 1,000 MHz                                                                                                                                                              |
| 1.25 | PG 51 – Contact protection                                                                         | IPXXD                                                                                                                                                                                                                          |
| 1.26 | K12 –Thermal shock with water surge                                                                | Acc. to LV124:2013                                                                                                                                                                                                             |
| 1.27 | K15b – Climatic test                                                                               | Acc. to LV124:2013                                                                                                                                                                                                             |

## 4 Result of performed tests

### 4.1 Insulation resistance

Over complete lifetime: >200 MΩ  
Lowering during humidity load: >25 MΩ  
In plugged condition between HV conductors and shield.

### 4.2 Watertightness

IP6K9K and IPx8  
PG23 acc. to working group inspection guideline LV214 and LV215 (cf. TLF 0214)

### 4.3 Vibration load

Vibration stability: PG17 acc. to working group inspection guideline LV214 and LV215 (cf. TLF 0214)  
Fixing length: free cable length between distributor and first cable fixing point where the cable is fixed with the same oscillation as the distributor. The cable fixing must be designed for every operation mode.

|                                         |                                               |
|-----------------------------------------|-----------------------------------------------|
| <b>Vibration class severity level 2</b> | no limit of fixing length, Shield contact, HV |
| <b>Vibration class severity level 3</b> | fixing length max. 200 mm, Shield contact, HV |
| <b>Vibration class severity level 4</b> | fixing length max. 50 mm, Shield contact, HV  |

### 4.4 Specific customer approval

BMW = MCC 5A3FD14

## 5 Table of change

| Version | Change description                 | Change date | Editor      |
|---------|------------------------------------|-------------|-------------|
| 1       | First version                      | 18.05.2020  | Hoor R.     |
| 2       | Added test results & SCC-version   | 30.11.2020  | Hoor R.     |
| 3       | Update design specification        | 14.06.2023  | Jussel E-M. |
| 4       | Adjusting data of the bottom line  | 08/ 2023    | Jussel E-M. |
| 5       | Adjusting data "Ambient Condition" | 10/ 2023    | Jussel E-M. |
| 6       | Topic 2.8 – update wording         | 04/ 2024    | Jussel E-M. |