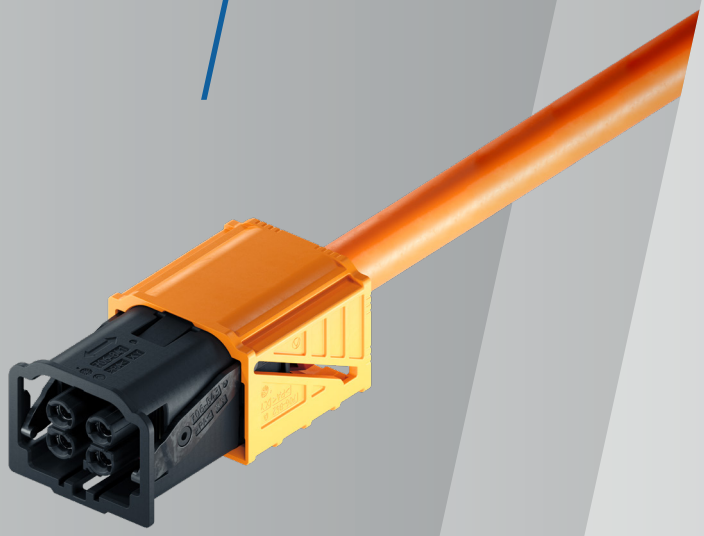


PRODUCT SPECIFICATION

HPS40 4+2
Female Connector MCC

EPS-100108

HIRSCHMANN
AUTOMOTIVE

Table of Contents

1 General

1.1 Introduction

This product specification is valid for the HPS40 4+2 FEMALE CONNECTOR MCC, assembled according to the process specification listed below, and contains the product design and the condition upon delivery, the technical characteristics as well as the qualification inspections performed. In the case of improper application or deviation from specification that results in quality issues, the right of complaint is void.

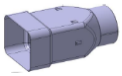
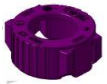
1.2 Other valid documents

A	Hirschmann product drawing	809-981--…00
B	Interface drawing	808-264-…00
C	Process specification	EVS-100108-00
D	Operating guideline	HPS40 4+2 female connector MCC
E	Working committee directive LV214 (cf. TLF 0214)	Working committee test specification for motor vehicle plug-in connector – version March 2010
F	Working committee directive LV215 (cf. TLF 0214)	Electrics/ electronic requirements of HV-plug-in connectors – version March 2017
G	German norm DIN EN 60352-2	Solderless electric connections Part 2: crimp connections
H	DIN EN 60664-1	Insulation coordination for electronic equipment in low voltage systems. Part 1: principles, requirement, and tests
I	2000/53/EG	Directive of the European Parliament and of the council on end-of life vehicles incl. attachments; European Union
J	ISO 6469-3	Electric road vehicles – safety specifications Part 3: protection of persons against electric hazards
K	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 HPS40 4+2 female connector MCC consist of following parts. (see BOM)

HPS40 4+2 Female MCC 4x 6.0 mm²		809-981-…00	Weight without wire:		92,50 g
Article picture	Article description	Article number	Needed parts per system	Packaging unit / MOQ	Weight per pcs.
	HPS40 4+2 locking sleeve	810-044-504	1	128 pcs.	43,60 g
	HPS40 4+2 female contact carrier	810-045-511 (A) 810-045-512 (B) 810-045-515 (Z)	1	1000 pcs.	10,40 g
	HPS40 4+2 shielding sleeve	710-237-511	1	1000 pcs.	7,80 g
	HPS40 4+2 ferrule crimp 4x 6.0 mm² MCC	710-387-511	1	2000 pcs.	2,30 g
	HPS40 4+2 wire seal 4x 6.0 mm² MCC	710-245-501	1	8000 pcs.	0,95 g
	HPS40 4+2 cover cap 4x 6.0 mm² MCC	706-847-501	1	3500 pcs.	2,52 g
	HCT4 terminal 6.0 mm²	709-427-505	4	470 pcs.	1,13 g

This document is not subject to change service!

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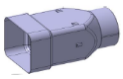
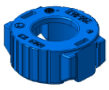
Editor: Jussel E-M.
change date: 10/ 2023

HPS40 4+2 Female MCC 4x 4.0 mm²		809-981-…00	Weight without wire:		92,43 g
	HPS40 4+2 locking sleeve	810-044-504	1	128 pcs.	43,60 g
	HPS40 4+2 female contact carrier	810-045-511 (A) 810-045-512 (B) 810-045-515 (Z)	1	1000 pcs.	10,40 g
	HPS40 4+2 shielding sleeve MCC	710-237-511	1	1000 pcs.	7,80 g
	HPS40 4+2 ferrule crimp 4x 4.0 mm² MCC	710-387-502	1	2000 pcs.	2,30 g
	HPS40 4+2 wire seal 4x 4.0. mm² MCC	710-245-502	1	6000 pcs.	0,95 g
	HPS40 4+2 cover cap 4x 4.0 mm² MCC	706-847-502	1	3500 pcs.	2,52 g
	HCT4 terminal 4.0 mm²	709-427-504	4	0 pcs.	1,13 g

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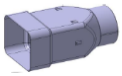
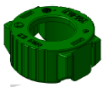
HPS40 4+2 Female MCC 3x 6.0 mm²		809-981-…00	Weight without wire:		84,52 g
	HPS40 4+2 locking sleeve	810-044-504	1	128 pcs.	43,60 g
	HPS40 4+2 female contact carrier	810-045-511 (A) 810-045-512 (B) 810-045-515 (Z)	1	1000 pcs.	10,40 g
	HPS40 4+2 shielding sleeve MCC	710-237-511	1	1000 pcs.	7,80 g
	HPS40 4+2 ferrule crimp 3x 6.0 mm² MCC	710-387-501	1	2000 pcs.	2,30 g
	HPS40 4+2 wire seal 3x 6.0 mm² MCC	710-245-503	1	6500 pcs.	0,95 g
	HPS40 4+2 cover cap 3x 6.0 mm² MCC	706-847-503	1	3500 pcs.	2,52 g
	HCT4 terminal 6.0 mm²	709-427-505	3	470 pcs.	1,13 g

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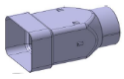
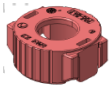
HPS40 4+2 Female MCC 3x 4.0 mm²		809-981-…00	Weight without wire:		86,62 g
	HPS40 4+2 locking sleeve	810-044-504	1	128 pcs.	43,60 g
	HPS40 4+2 female contact carrier	810-045-511 (A) 810-045-512 (B) 810-045-515 (Z)	1	1000 pcs.	10,40 g
	HPS40 4+2 shielding sleeve MCC	710-237-511	1	1000 pcs.	7,80 g
	HPS40 4+2 ferrule crimp 3x 4.0 mm² MCC	710-455-501	1	1000 pcs.	4,40 g
	HPS40 4+2 wire seal 3x 4.0 mm² MCC	710-245-504	1	1000 pcs.	0,95 g
	HPS40 4+2 cover cap 3x 4.0 mm² MCC	706-847-504	1	5000 pcs.	2,52 g
	HCT4 terminal 4.0 mm²	709-427-504	3	0 pcs.	1,13 g

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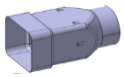
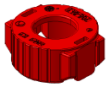
HPS40 4+2 Female MCC 2x 6.0 mm²		809-981-…00	Weight without wire:		78,71 g
	HPS40 4+2 locking sleeve	810-044-504	1	128 pcs.	43,60 g
	HPS40 4+2 female contact carrier	810-045-511 (A) 810-045-512 (B) 810-045-515 (Z)	1	1000 pcs.	10,40 g
	HPS40 4+2 shielding sleeve MCC	710-237-511	1	1000 pcs.	7,80 g
	HPS40 4+2 ferrule crimp 2x 6.0 mm² MCC	710-455-502	1	1000 pcs.	4,40 g
	HPS40 4+2 wire seal 2x 6.0 mm² MCC	710-245-505	1	5500 pcs.	0,95 g
	HPS40 4+2 cover cap 2x 6.0 mm² MCC	706-847-505	1	3500 pcs.	2,52 g
	HCT4 terminal 6.0 mm²	709-427-505	2	470 pcs.	1,13 g

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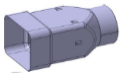
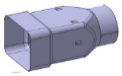
HPS40 4+2 Female MCC 2x 4.0 mm²		809-981-…00	Weight without wire:		84,79 g
	HPS40 4+2 locking sleeve	810-044-504	1	128 pcs.	43,60 g
	HPS40 4+2 female contact carrier	810-045-511 (A) 810-045-512 (B) 810-045-515 (Z)	1	1000 pcs.	10,40 g
	HPS40 4+2 shielding sleeve MCC	710-237-511	1	1000 pcs.	7,80 g
	HPS40 4+2 ferrule crimp 2x 4.0 mm² MCC	710-455-503	1	1000 pcs.	4,40 g
	HPS40 4+2 wire seal 2x 4.0 mm² MCC	710-245-506	1	4500 pcs.	0,95 g
	HPS40 4+2 cover cap 2x 4.0 mm² MCC	706-847-506	1	3500 pcs.	2,52 g
	HCT4 terminal 4.0 mm²	709-427-504	2	0 pcs.	1,13 g

This document is not subject to change service!

HPS40 4+2 Female MCC 2x 6.0 mm²		809-981-…00	Weight without wire:		78,71 g
	HPS40 4+2 locking sleeve	810-044-504	1	128 pcs.	43,60 g
	HPS40 4+2 female contact carrier	810-045-511 (A) 810-045-512 (B) 810-045-515 (Z)	1	1000 pcs.	10,40 g
	HPS40 4+2 shielding sleeve MCC	710-237-511	1	1000 pcs.	7,80 g
	HPS40 4+2 ferrule crimp 2x 6.0 mm² ø11,1-11,7 MCC	710-455-512	1	1000 pcs.	4,40 g
	HPS40 4+2 wire seal 2x 6.0 mm² ø11,1-11,7 MCC	710-245-515	1	2000 pcs.	0,95 g
	HPS40 4+2 cover cap 2x 6.0 mm² ø11,1-11,7 MCC	706-847-515	1	3500 pcs.	2,52 g
	HCT4 terminal 6.0 mm²	709-427-505	2	2600 pcs.	1,13 g
HPS40 4+2 Female MCC Optional Parts					
	HPS40 4+2 90° angle cap	706-990-501	1	350 pcs.	10,28 g
	HPS40 4+2 protection cap	706-991-501	1	500 pcs.	7,26 g

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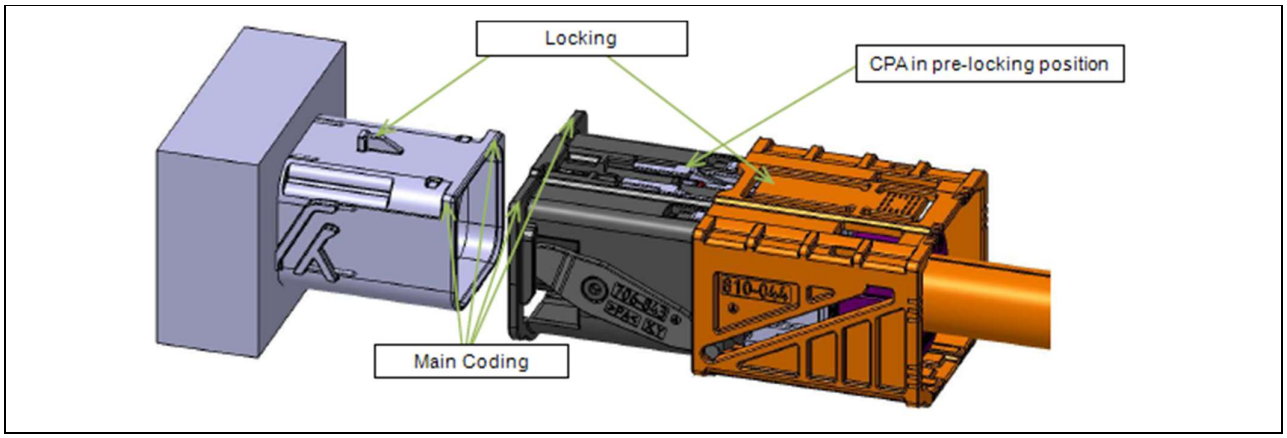
1.3.2 Product features



- Main coding/ polarisation
- HPS40 4+2 locking sleeve is always with CPA
- HPS40 4+2 female contact carrier has always integrated an HVIL bridge
- HPS40 4+2 female contact carrier has 3 coding options (A, B, Z)
- DMC on part
- If plug is locked, but the CPA is not locked yet. The identifying feature is “open lock”.
- If plug and CPA are locked in the end position. The identifying feature is “closed lock”.

2 Technical product information

The connector 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		acc. to OEM specification or the device manufacturer	
Insulating material group:		1 (CTI >=600) – for components with direct contact to HV	
Degree of contamination:		acc. to OEM specification or the device manufacturer	
Overvoltage category:		1	
Rated impulse voltage:		acc. to OEM specification or the device manufacturer	
Test voltage for electric strength:		acc. to OEM specification or the device manufacturer	
Real min. distance in mated condition:		The clearance and creepage distances at the transition of the connector to the unit interface is not considered and must be considered additional – e.g. when using bade versions.	
	Min. clearance distance:	HV-HV:	3.9 mm
		HV-HVIL:	13.5 mm
		HV-Shield:	6.0 mm
	Min. creepage distance:	HV-HV:	5.0 mm
		HV-HVIL:	> 13.5 mm
		HV-Shield:	6.5 mm

2.2.1 Calculation Example

Clearance and creepage distance based on the exemplary following requirements according to DIN EN 60664-1.

Max. operating voltage:	1,000 VDC
Insulating material group:	1
Degree contamination:	2
Altitude:	5,600 m
Rated impulse voltage:	2,500 VDC
Test voltage for electric strength:	2,150 VDC/ 1,500 VAC (basic insulation)
	4,300 VDC/ 3,000 VAC (reinforced-, double insulation)

2.3 Voltage class

Class B according to ISO 6469-3
60 VDC < U ≤ 1,000 VDC
25 VAC < Ueff ≤ 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 connector system.

4.0 mm² /	**6.0 mm²**
Until 2 MHz: < 2. 5 mΩ/m Until 30 MHz: < 5 mΩ/m	Until 2 MHz: < 2.5 mΩ/m Until 30 MHz: < 5 mΩ/m
Shielding attenuation:	
4.0 mm²	**6.0 mm²**
> 65 dB (30 MHz to 300 MHz)	> 65 dB (30 MHz to 300 MHz)

2.6 Shield area

Shield transfer: 360° circumferential
Shield contact resistance R < 2 mΩ (Total from sheathed cable until the device.)

2.7 IP-Degree of protection

IPxxD (plugged female connector)
IPxxB (unplugged female connector)
min. air distance HV contacts to shock-proof protection finger female connector interface at IPxxB: 1.3 mm
min. air distance HV contacts to shock-proof protection finger male connector interface at IPxxB: 1.7 mm

2.8 HVIL system

Min. 1 mm leading HV Interlock contacts to HV load contact at unmating (nominal 2 mm)

2.9 Technical cleanliness

Inside the connector and on the connector, there are no metallic particles *> 1,000 µm allowed*
For metallic particles at each connector: CCC = *N (J4/ K0) acc. to VDA Band 19*
For all other particles at each connector: CCC = *N (J10/ K0) acc. to VDA Band 19*

2.10 Ampacity (derating)

The derating in the housing shows exemplary values. Requirement related to the current capability of the connector has also to be considered with the derating.

2.10.1 Calculation

Calculation for t- / I-curve determination

$$I(t,T_u)_{x\,mm^2\ Material} = \sqrt{\frac{(T_{grenz}-T_u)}{k_1 * \left(1-e^{\frac{-t}{\tau}}\right)}} + \sqrt{\frac{(T_{grenz}-T_u) * \left(1-e^{\frac{-t}{\tau}}\right)}{k_2}}$$

T= time [s]
Tu = ambient temperature [° C]
T_{grenz} = limit temperature connector system [° C]
k1 = constant heat capacity (dynamic time domain) [K/A²]
k2 = constant heat conduction (quasi-statical time domain) [K/A²]
t = time constant [s]
x mm² $_{Material}$ = used cross section incl. Material (for example: 35 mm² Cu)

Leitung Cu wire Cu	2x2,5mm²		2x4mm²		2x6mm²		2x6mm²	
Kontaktsystem contact system	HCT4		HCT4		HCT4		Drehkontakt turned contact	
T_{grenz}	200	°C	200	°C	200	°C	200	°C
K_1	0,189036	K/A²	0,13265	K/A²	0,10099	K/A²	0,07106	K/A²
K_2	0,563691	K/A²	0,4042	K/A²	0,23968	K/A²	0,2169	K/A²
t	290,5736	s	193,285	s	185,582	s	432,516	s
log10 Abweichung log10 deviation	+3 / -2	%	+1 / +3	%	+1 / -3	%	+1 / -2	%

For details see the derating in housing

4x 6.0 mm² SIR-WIRE (T180) incl. HCT4 female contact and HCT4short male contact (Automotive)

Time for calculation (s)	60° calculated	65° calculated	70° calculated	75° calculated	80° calculated	85° calculated	90° calculated	95° calculated	100° calculated	105° calculated	110° calculated	115° calculated	120° calculated
100000	57,07	56,04	55	53,93	52,84	51,73	50,59	49,43	48,24	47,01	45,76	44,47	43,14
3600	57,07	56,04	55	53,93	52,84	51,73	50,59	49,43	48,24	47,01	45,76	44,47	43,14
98	75,29	73,93	72,55	71,14	69,7	68,24	66,74	65,2	63,63	62,02	60,37	58,66	56,91
28	117,64	115,52	113,36	111,16	108,91	106,62	104,28	101,88	99,43	96,91	94,32	91,67	88,9
16	150,09	147,39	144,63	141,83	138,96	136,03	133,04	129,99	126,85	123,64	120,34	116,95	113,46
10	186,32	182,96	179,54	176,05	172,5	168,86	165,15	161,36	157,47	153,48	149,39	145,18	140,84
0,1	1804,2	1771,69	1738,57	1704,81	1670,37	1635,2	1599,26	1562,49	1524,83	1486,22	1446,58	1405,82	1363,85

3x 6.0 mm² SIR-WIRE (T180) incl. HCT4 female contact and HCT4short male contact (Automotive)

Time for calculation (s)	60° calculated	65° calculated	70° calculated	75° calculated	80° calculated	85° calculated	90° calculated	95° calculated	100° calculated	105° calculated	110° calculated	115° calculated	120° calculated
100000	62,78	61,55	60,49	59,32	58,12	56,9	55,65	54,37	53,06	51,71	50,33	48,92	47,46
3600	62,78	61,55	60,49	59,32	58,12	56,9	55,65	54,37	53,06	51,71	50,33	48,92	47,46
66	81,26	79,79	78,3	76,78	75,23	73,65	72,03	70,37	68,67	66,94	65,15	63,32	61,42
18	128,21	125,9	123,55	121,15	118,7	116,2	113,65	111,06	108,36	105,61	102,8	99,9	96,92
10	165,56	162,57	159,53	156,44	153,28	150,05	146,75	143,38	139,92	136,38	132,74	129	125,15
6	209,52	205,74	201,89	197,97	193,97	189,89	185,72	181,45	17707	172,59	167,99	163,25	158,38
0,1	1574,25	1545,89	1516,99	1487,53	1457,48	1426,79	1395,43	1363,34	1330,49	1296,8	1262,21	1226,65	1190,02

2x 4.0 mm² SIR-WIRE (T180) incl. HCT4 female contact and HCT4short male contact (Automotive)

Time for calculation (s)	60° calculated	65° calculated	70° calculated	75° calculated	80° calculated	85° calculated	90° calculated	95° calculated	100° calculated	105° calculated	110° calculated	115° calculated	120° calculated
100000	56,32	55,3	54,27	53,21	52,14	51,04	49,92	48,77	47,6	46,39	45,15	43,88	42,57
3600	56,32	55,3	54,27	53,21	52,14	51,04	49,92	48,77	47,6	46,39	45,15	43,88	42,57
526	57,16	56,13	55,08	54,01	52,92	51,81	50,67	49,5	48,31	47,09	45,83	44,54	43,21
178	63,59	62,45	61,28	60,09	58,88	57,64	56,37	55,07	53,75	52,38	50,99	49,55	48,07
38	98,92	97,14	95,32	93,47	91,58	89,65	87,68	85,67	83,6	81,48	79,31	77,08	74,77
16	142,04	139,48	136,87	134,22	131,5	128,74	125,91	123,01	120,05	117,01	113,89	110,68	107,37
9,4	181,16	177,9	174,57	171,18	167,72	1674,19	160,58	156,89	153,11	149,23	145,25	141,16	136,95
0,1	1699,05	1668,43	1637,25	1605,45	1573,01	1539,89	1506,05	1471,42	1435,96	1399,6	1362,27	1323,89	1284,36

3x 4.0 mm² SIR-WIRE (T180) incl. HCT4 female contact and HCT4short male contact (Automotive)

Time for calculation (s)	60° calculated	65° calculated	70° calculated	75° calculated	80° calculated	85° calculated	90° calculated	95° calculated	100° calculated	105° calculated	110° calculated	115° calculated	120° calculated
100000	47,94	47,07	46,19	45,29	44,38	43,45	42,49	41,51	40,51	39,49	38,43	37,35	36,24
3600	47,94	47,07	46,19	45,29	44,38	43,45	42,49	41,51	40,51	39,49	38,43	37,35	36,24
1709	47,99	47,,12	46,24	45,34	44,43	43,49	45,54	41,56	40,56	39,53	38,48	37,39	36,27
537	48,59	47,71	46,82	45,91	44,98	44,04	43,07	42,08	41,06	40,02	38,96	37,86	36,73
332	49,94	49,04	48,13	47,19	46,24	45,27	44,27	43,25	42,21	41,14	40,04	38,92	37,75
58,5	71,49	70,2	68,89	67,55	66,18	64,79	63,37	61,91	60,42	58,89	57,32	55,7	54,04
15,4	121,72	119,53	117,29	115,02	112,69	110,32	107,89	105,41	102,87	100,27	97,59	94,84	92,01
10,6	144,27	141,67	139,02	136,32	133,27	130,76	127,88	124,94	121,93	118,84	115,67	112,42	109,06
0,1	1429,71	1403,95	1377,71	1350,95	1323,66	1295,79	1267,31	1238,17	1208,33	1177,73	1146,32	1114,02	1080,76

4x 4.0 mm² SIR-WIRE (T180) incl. HCT4 female contact and HCT4short male contact (Automotive)

Time for calculation (s)	60° calculated	65° calculated	70° calculated	75° calculated	80° calculated	85° calculated	90° calculated	95° calculated	100° calculated	105° calculated	110° calculated	115° calculated	120° calculated
100000	44,87	44,06	43,23	42,39	41,54	40,66	39,77	38,86	37,92	36,96	35,97	34,96	33,92
3600	44,87	44,06	43,23	42,39	41,54	40,66	39,77	38,86	37,92	36,96	35,97	34,96	33,92
237	48,7	47,82	46,93	46,02	45,09	44,14	43,17	42,18	41,16	40,12	39,05	37,95	36,82
121	55,12	54,13	53,12	52,09	51,03	49,96	48,86	47,74	46,59	45,41	44,2	42,95	41,67
33	84,18	82,67	81,12	79,55	77,94	76,3	74,62	72,91	71,15	69,35	67,5	65,6	63,64
15	117,92	115,79	113,63	111,42	109,17	106,87	104,52	102,12	99,66	97,13	94,54	91,88	89,14
9	149,19	146,5	143,76	140,97	138,12	135,22	132,24	129,2	126,09	122,9	119,62	116,25	112,78
0,1	1372,13	1347,4	1322,21	1296,54	1270,34	1243,6	1216,26	1188,3	1159,66	1130,3	1100,15	1069,15	1037,23

3 Performed tests

Tests acc. to LV214 / LV215 (cf. TLF 0214)
Details see DVP-Plan HPS40 4+2 female connector MCC

1.1	PG 0 – Receiving inspection and testing (contacts + shield)	E0.2: Resistance measurement with 1A test current E0.4: Test voltage withstand voltage 4,000 VDC, 60 s, leakage current < 10 mA Wire cross section: only 4x 6.0 mm² Coroplast Reduced no. of specimen for EWZ
1.2	PG 4 – Contact overlap	Only tolerance calculation, no proof on the real part for EWZ.
1.3	PG 7 – Handling and functional reliability of the housing	E7.1: Coding not tested (only coding A for EWZ) Reduced no. of specimen for EWZ.
1.4	PG 8 – Insertion and retention forces of the contact parts in the housing	only test group a) tested
1.5	PG 13 – Housing influence on the derating	Wire cross section: only 4x 6.0 mm² Coroplast
1.6	PG 14 – Thermal time constant	Test in housing, E14.2: not tested, Focus on shielding
1.7	PG 17 – Dynamic stress	Wire cross section: only 4x 6.0 mm² Coroplast, First fixation point at 200 mm, Additional test group 2 acc. to requirements spec., E0.2/ E14.0: Resistance measurement with 1A test current
1.8	PG 20 – Climate load of the housing	B20.1: Temperature 140° C, B6.1: drop test from 1 m height
1.9	PG 21 – Long-term temperature	Only test group 2 tested, E0.2: resistance measurement with 1A test current, B21.1: temperature 140° C
1.10	PG 23 – Water leak tightness	Only test group 2+3 tested, Wire cross section: only 4x 6.0 mm² Coroplast, B19.1, B19.3, B23.3: temperature 140° C E1.1: not tested
1.11	PG 51 – Contact protection	
1.12	K-15B – Climatic test	Continuous monitoring of the insulation resistance between shielding and HV

4 Result of performed tests

4.1 Ampacity (I/t) measurement results

4x 6.0 mm² SIR-wire (T180) incl. HCT4 female contact and HCT4short male contact (Automotive)

Ambient temperature	55	65		140	170
Current (A)	59	48		32	16

3x.6.0 mm² SIR -wire (T180) incl. HCT4 female contact and HCT4short male contact (Automotive)

Ambient temperature	55	64	114	149	172
Current (A)	66	64	48	32	16

2x 6.0 mm² SIR-wire (T180) incl. HCT4 female contact and HCT4short male contact (Automotive)

Ambient temperature	53	70	116		150	172
Current (A)	69	64	48		32	16

2x 6.0 mm² PUR-wire (T125) incl. HCT4 female contact and HCT4short male contact (Automotive)

Ambient temperature	31,5	59,9	-	94,8	117,1
Current (A)	57,6	48	-	32	16

4x 4.0 mm² SIR-wire (T180) incl. HCT4 female contact and HCT4short male contact (Automotive)

Ambient temperature	29	58	-	122	164
Current (A)	52	47	-	32	16

3x 4.0 mm² SIR-wire (T180) incl. HCT4 female contact and HCT4short male contact (Automotive)

Ambient temperature	47	64	-	125	165
Current (A)	52	48	-	32	16

2x 4.0 mm² SIR-wire (T180) incl. HCT4 female contact and HCT4short male contact (Automotive)

Ambient temperature	44	91	-	138	170
Current (A)	60	48	-	32	16

4.2 Insulation resistance

Over complete lifetime: >150 MΩ
Lowering during humidity load: >75 MΩ
In plugged condition between HV contacts, HV contacts and shield.

4.3 Contact resistance HV and HVIL

Acc. to LV215-1: 2017-03 (cf. TLF 0214)

wire cross section mm²	contact resistance (total resistance incl. Crimp)	
	new condition mΩ	after aging mΩ
4	0,72	1,44
6	0,68	1,36
acc. to LV215		

wire cross section mm²/ contact sice mm	0,35	0,5
	contact resistance (total reistance incl. Cimp)	
1,2	15 mΩ	15 mΩ

4.4 Watertightness

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

4.5 Vibration load

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

Vibration class severity level 2 fixing point 1: 200 mm/ fixing point 2: 250 mm, Shield contact, HV and IL contact

4.6 Amount of mating cycles

Max. 50 cycles (Ag)

4.7 Polarization/ Koshiri-safety

Failed insertion force min. 225 N (3 times assembly force)
Koshiri-safety is given

4.8 Retention force of the contact in the housing

HV contacts: Primary locking / secondary locking min. 120 N
IL Bridge (stamped part): F > 50 N

4.9 Secondary locking

Activation force < 40 N
No unintentional opening possible.

4.10 Mating/ Unmating force

Assembly force of the female plug into the plug / plug socket:	< 75 N
Disassembly force from the female plug out of the plug / plug socket:	< 75 N
Retention force of the female plug in the plug / plug socket:	> 350 N
Retention force of the female plug in the plug / plug socket incl. CPA:	> 350 N
Operating force of the CPA:	< 30 N

5 Table of change

Change description	Change date	Editor
First version	26.11.2019	Grobnicu V.
Added derating diagrams, pictures updated	05.03.2021	Kleiner T.
I/T curves added, big series DVP added	10.12.2021	Grobnicu V.
Update of design from specification	15.06.2023	Jussel E-M.
Adjusting data of the bottom line	08/ 2023	Jussel E-M.
Adjusting data “Ambient Condition”	10/ 2023	Jussel E-M.