

Heavy-duty connectors

The HEAVYCON HPR and ADVANCE housings are especially suitable for outdoor application. Featuring a robust design with IP68/IP69K degree of protection, they protect the built-in fixed-position or modular contact inserts. They satisfy the stringent requirements of the railway industry. At the same time, they provide a permanent and interference-free connection for electrical cables and data transmission, both inside and at the gangway connections.



Conformity with typical railway requirements

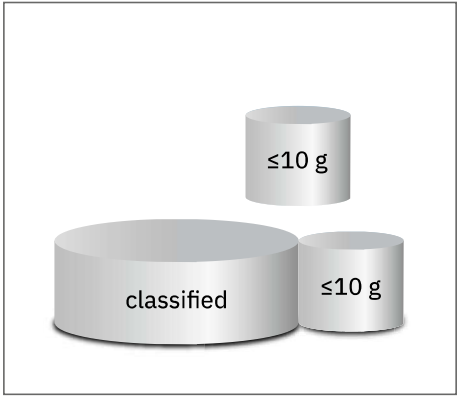
All products in this chapter meet the requirements of EN 61373 for shock and vibration in accordance with Category 1 Class B.

For fire protection in rail vehicles in accordance with EN 45545-2, the classification of the products or the combustible mass of non-classified components is relevant. Contact inserts are typically classified in accordance with EN 45545-2 for R22, R23, and R24: HL1-HL2-HL3. In the following product tables, the fire protection relevant mass of seals

of the metallic housings and cable glands is highlighted in color. The graphics below explain how to use these components in rail vehicles in compliance with the standards.

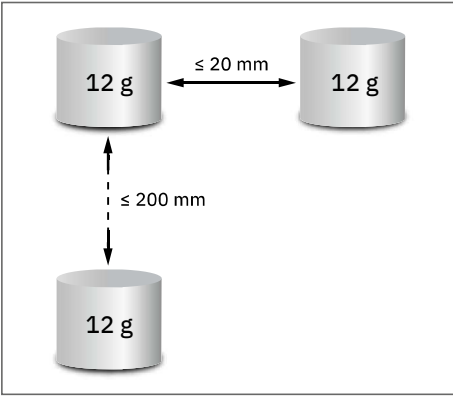
The Railway Guide also provides detailed information on EN 45545-2.

➤ Go directly to the downloadable guide here:
phoenixcontact.com/railway_guide



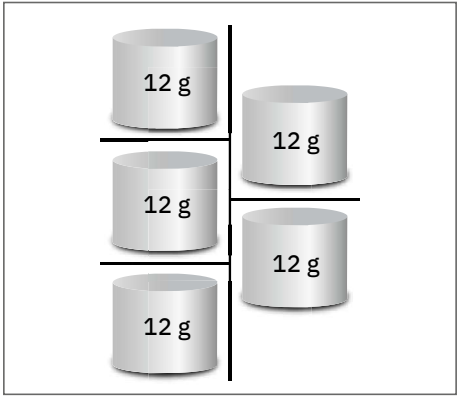
10-gram rule

Housing seals with a flammable mass of up to 10 g are not included in the fire protection technology assessment if they only touch classified components.



Distance rule

Housing seals (<12 g) are to be grouped if the minimum distances are not met. Until the 100 g limit is reached, eight connectors can be installed directly next to each other.



Fire protection separation

Metallic cable glands are effective separation in terms of fire protection. Therefore, they can be installed without compliance with the distance rule.

Product list to download

We offer information on fire protection classification as an Excel list for downloading:
phoenixcontact.com/railway_article_list



	A	B	C	D	E	F
1				EN 45545-2		EN 50155
2	Item number	Type description	R22	R23	R24	EN 61373 broadband noise
3	1648160	HC-B 6-I-CT-F	HL 1 - HL 3	HL 1 - HL 3	HL 1 - HL 3	Category 1, Class B
4	1648157	HC-B 6-I-CT-M	HL 1 - HL 3	HL 1 - HL 3	HL 1 - HL 3	Category 1, Class B
5	1648128	HC-B 6-I-UT-F	HL 1 - HL 3	HL 1 - HL 3	HL 1 - HL 3	Category 1, Class B
6	1648115	HC-B 6-I-UT-M	HL 1 - HL 3	HL 1 - HL 3	HL 1 - HL 3	Category 1, Class B
7	1648225	HC-B 10-I-CT-F	HL 1 - HL 3	HL 1 - HL 3	HL 1 - HL 3	Category 1, Class B
8	1648212	HC-B 10-I-CT-M	HL 1 - HL 3	HL 1 - HL 3	HL 1 - HL 3	Category 1, Class B
9	1648186	HC-B 10-I-UT-F	HL 1 - HL 3	HL 1 - HL 3	HL 1 - HL 3	Category 1, Class B
10	1648173	HC-B 10-I-UT-M	HL 1 - HL 3	HL 1 - HL 3	HL 1 - HL 3	Category 1, Class B
11	1648283	HC-B 16-I-CT-F	HL 1 - HL 3	HL 1 - HL 3	HL 1 - HL 3	Category 1, Class B
12	1648270	HC-B 16-I-CT-M	HL 1 - HL 3	HL 1 - HL 3	HL 1 - HL 3	Category 1, Class B
13	1648241	HC-B 16-I-UT-F	HL 1 - HL 3	HL 1 - HL 3	HL 1 - HL 3	Category 1, Class B
14	1648238	HC-B 16-I-UT-M	HL 1 - HL 3	HL 1 - HL 3	HL 1 - HL 3	Category 1, Class B
15	1407731	HC-B16-I-PT-F	HL 1 - HL 3	HL 1 - HL 3	HL 1 - HL 3	Category 1, Class B
16	1407732	HC-B16-I-PT-M	HL 1 - HL 3	HL 1 - HL 3	HL 1 - HL 3	Category 1, Class B
17	1423020	HC-B16-I-TPT-F	HL 1 - HL 3	HL 1 - HL 3	HL 1 - HL 3	Category 1, Class B
18	1423019	HC-B16-I-TPT-M	HL 1 - HL 3	HL 1 - HL 3	HL 1 - HL 3	Category 1, Class B
19	1648348	HC-B 24-I-CT-F	HL 1 - HL 3	HL 1 - HL 3	HL 1 - HL 3	Category 1, Class B
20	1648375	HC-B 24-I-CT-M	HL 1 - HL 3	HL 1 - HL 3	HL 1 - HL 3	Category 1, Class B

Product lists – heavy-duty connectors

ADVANCE B housings

Unclassified mass in accordance with EN 45545-2:

☐ 0 g

☐ <10 g

☐ 10 - 12 g

	Installed height	Thread	Metric			
			B06	B10	B16	B24
Sleeve housings with screw locking mechanism						
	Straight Short	M20	1420904	1420912		
		M25	1420905	1420913	1420921	1420929
	Straight Tall	M25	1420900	1420908	1420917	1420925
		M32	1420901	1420909	1420918	1420926
		M40			1420919	1420927
	Lateral Short	M20	1420902	1420910		
		M25	1420903	1420911	1420920	1420928
	Lateral Tall	M25	1420898	1420906	1420914	1420922
		M32	1420899	1420907	1420915	1420923
		M40			1420916	1420924
Panel mounting flanges						
	Individual		1686533	1686533	1686533	1686533
	Set of 2		1604638	1604638	1604638	1604638

HPR B housings

Unclassified mass in accordance with EN 45545-2:

☐ 0 g

☐ <10 g

	Installed height	Thread	Metric			
			B06	B10	B16	B24
Sleeve housings with screw locking mechanism						
	Straight Tall	M20	1411879			
		M25	1411106	1411882		
		M32		1411067	1411059	1411888
		M40			1411885	1411062
	Lateral Tall	M20	1411878			
		M25	1411119	1411881		
		M32		1411070	1411058	1411887
		M40			1411884	1411061
Panel-mount bases for screw locking mechanism						
	Without cover		1411122	1411083	1411060	1411055
Surface-mount housings for screw locking mechanism						
	Without cover	M20	1411880			
		M25	1411135	1411883		
		M32		1411096	1411054	1411889
		M40			1411886	1411063
Covers with screw locking mechanism						
	For panel-mount side		1418441	1418444	1418445	1418446

Fixed-position contact inserts for B housings

EN 45545-2 for R22, R23, and R24: HL1-HL2-HL3

	Connection	Version	Housing size								
			B06		B10		B16		B24		
B series				Number of positions							
				6		10		16		24	
	Push-in	Female	Male	1407727	1407728	1407729	1407730	1407731	1407732	1407735	1407736
	TWIN push-in	Female	Male	1423016	1423015	1423018	1423017	1423020	1423019	1423022	1423021
	Screw	Female	Male	1648128	1648115	1648186	1648173	1648241	1648238	1648306	1648296
	Crimp CK 2,5	Female	Male	1648160	1648157	1648225	1648212	1648283	1648270	1648348	1648335
BB series				Number of positions							
				10		18		32		46	
	Push-in	Female	Male	1014417	1014418	1014419	1014420	1014421	1014422	1014423	1014424
	Crimp CK 2,5	Female	Male	1584703	1584774	1584729	1584716	1584745	1584732	1584758	1584761
Series BBB ¹⁾				Number of positions							
								40		64	
	Crimp CK 2,5	Female	Male					1409930	1409921	1409914	1409901
DD series				Number of positions							
				24		42		72		108	
	Crimp CK 2,5	Female	Male	1584046	1584033	1584062	1584059	1584091	1584075	1584130	1584114
HS series				Number of positions							
								6			
	Push-in	Female	Male					1031080	1031082		
	Screw	Female	Male					1406530	1406531		
HV series				Number of positions							
						3		6		10	
	Push-in	Female	Male			1407743	1407739	1407744	1407740	1407745	1407741
	Screw	Female	Male			1405261	1405260	1405263	1405262	1405265	1405264

¹⁾ R22 HL1-HL2

Cable glands

Unclassified mass in accordance with EN 45545-2: <10 g 10 - 12 g

M12-M40 cable glands								
	Thread	M20	M25	M25	M32	M32	M40	M40
	Cable diameter (mm) min./max.	6/12	10/14	11/17	13/18	15/21	18/25	19/28
	Item no.	1411163	1424527	1411165	1424528	1411166	1424529	1411167

Product lists – heavy-duty connectors

Snap-in frames for B housings for modular contact inserts

Metal, 0 g unclassified mass

	Description	Housing size			
		B06	B10	B16	B24
Module carrier frames with side latch springs		Module slots			
		2	3	4	6
	For sleeve housings (A, B, C, etc.)	1182087	1182089	1182093	1182095
	For panel mounting bases, surface mounting housings, and coupling housings (a, b, c, etc.)	1182085	1182088	1182090	1182094

Modular contact inserts for snap-in frames

EN 45545-2 for R22, R23, and R24: HL1-HL2-HL3

POWER		Number of positions									
		1		1		2		2		2	
Connection		Axial screw		Axial screw		Axial screw		Axial screw		Axial screw	
IEC rated data		200 A, 1,000 V, 70 mm²		PE, 70 mm²		100 A, 1,000 V, 35 mm²		70 A, 1,000 V, 25 mm²		40 A, 1,000 V, 10 mm²	
Module slots		2		2		2		1		1	
Female	Male	1417379	1417381	1417380	1417382	1417390	1417392	1417296	1417297	1417387	1417389
		2		2		3		3		3/4	
Connection		Push-in		Crimp CK 4,0		Push-in		Crimp CK 4,0		Crimp CK 4,0	
IEC rated data		40 A, 830 V, 6 mm²		40 A, 1,000 V, 10 mm²		40 A, 500 V, 6 mm²		40 A, 500 V, 10 mm²		40/10 A, 830 V, 6/2.5 mm²	
Module slots		1		1		1		1		1	
Female	Male	1424222	1424223	1414361	1414360	1424218	1424219	1414359	1414358	1414365	1414364
		4		4		5		5x2		6	
Connection		Push-in		Crimp CK 4,0		Push-in		TWIN push-in		Push-in	
IEC rated data		35 A, 690 V, 6 mm²		40 A, 690 V, 6 mm²		16 A, 400 V, 2.5 mm²		16 A, 400 V, 1.5 mm²		16 A, 500 V, 2.5 mm²	
Module slots		1		1		1		1		1	
Female	Male	1424220	1424221	1414362	1414363	1417373	1417372	1423962	1423961	1424224	1424225
		6		6		8		8		20	
Connection		Crimp CK 2,5		Crimp CK 2,5		Push-in		Crimp CK 2,5		Crimp CK 2,5	
IEC rated data		16 A, 830 V, 4 mm²		16 A, 500 V, 4 mm²		16 A, 400 V, 2.5 mm²		16 A, 500 V, 4 mm²		16 A, 500 V, 4 mm²	
Module slots		1		1		1		1		2	
Female	Male	1414369	1414368	1414367	1414366	1424226	1424227	1414371	1414370	1414373	1414372

Modular contact inserts for snap-in frames

EN 45545-2 for R22, R23, and R24: HL1-HL2-HL3

SIGNAL		Number of positions							
		12		12		17		25	
Connection		Push-in		Crimp CK 1,6		Crimp CK 1,6		D-SUB crimp	
IEC rated data		10 A, 250 V, 1.5 mm²		10 A, 250 V, 2.5 mm²		10 A, 160 V, 2.5 mm²		4 A, 50 V, 0.5 mm²	
Module slots		1		1		1		1	
Female	Male	1424228	1424246	1414355	1414354	1414357	1414356	1414375	1414374

DATA		Number of positions					
		8		4		4	
Connection		D-SUB crimp		Coaxial crimp		Coaxial crimp contacts	
Data transmission rate		Cat. 6 _A , 10 Gbps				≤2 GHz	
IEC rated data		5 A, 50 V, 0.5 mm²				75 Ω	50 Ω
Module slots		1		1		1686245	1676815
Female	Male	1417303	1417302	1417370	1417371	1686258	1676802
Connection		RJ45 gender changer		RJ45, crimp		RJ45 patch cables	
Data transmission rate		10 Gbps, 500 MHz		10 Gbps, 500 MHz			
Description		Cat. 6 _A		Cat. 6 _A		For RJ45 patch cable	
Module slots		1		1		1	
Female		1419886		1419887		1419885/1435214	

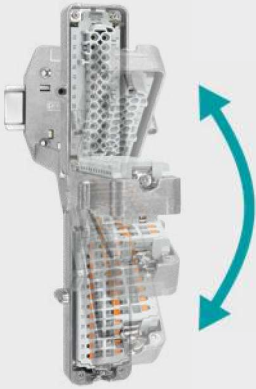
Pneumatics	Number of positions	
	2	3
Hose inner Ø	6 mm	1.6 mm
Module slots	1	1
Female	1417434	1417433



DIN rail mounting frames

The mounting frame for contact inserts enables heavy-duty connectors to be mounted directly on a DIN rail:

- ✓ Can be swiveled 180° for convenient conductor connection
- ✓ Easy subsequent mounting
- ✓ One flexible base frame (item no.: 1424338) for all four sizes of the B series



Web code: #1581

Product lists – heavy-duty connectors

HPR D7 housing

Unclassified mass in accordance with EN 45545-2:

 0 g

 <10 g

	Version	HPR (IP68/IP69K)	
		M20	M25
	Sleeve housings		
	Straight	1424638	1424639
	Panel-mount bases, straight		
	Without cover	1424637	
	Panel-mount bases, angled		
		1424635	
	Surface-mount housing		
	With closed bottom	1424641	
	Cover		
	For pin inserts	1424636	
	For socket inserts	1424636	

Contact inserts for D7 housings

EN 45545-2 for R22, R23, and R24: HL1-HL2-HL3

	Connection	Version					
A series				Number of positions			
				3		4	
	Push-in	Female	Male	1585265	1585252	1585281	1585278
	Screw	Female	Male	1585223	1585210	1585249	1585236
D series				Number of positions			
				7		8	
	Crimp CK 1,6	Female	Male			1584363	1584350
Q series				Number of positions			
				2		3	
	Crimp CK 4	Female	Male	1419895	1419893	1419897	1419896
				5			
	Crimp CK 2,5	Female	Male	1406537	1406538		
				7		12	
	Crimp CK 1,6	Female	Male	1418623	1418624	1418625	1418626
				RJ45			
	RJ45 gender changer Cat. 6A			Female	1422590		
	RJ45 pin insert Cat. 6A			Male	1077117		
	RJ45 adapter for patch cables			Male	1077120		
	RJ45 adapter for RJ industrial inserts			Male	1077119		

Crimp contacts, turned

Metal, 0 g unclassified mass

	For cross-section (mm²)	AWG	Silver		Male, lagging	Gold	
			Female	Male		Female	Male
CK1,6-ED, turned							
	0.14 ... 0.37	26 ... 22	1663394	1663336		1674969	1674901
	0.50	20	1663404	1663349		1674480	1672453
	0.75	18	1663417	1663352		1672440	1674914
	1.00	18	1663420	1663365		1674943	1674888
	1.50	16	1663433	1663378		1674930	1674875
	2.50	14	1663446	1663381		1674985	1674927
CK2,5-ED, turned							
	0.14 ... 0.37	22 ... 26				1585647	1585663
	0.50	20	1663640	1663572		1674859	1674804
	0.75	18	1663653	1663585			
	0.75 ... 1.0	18	1663666	1663598	1663857	1674833	1674781
	1.50	16	1663679	1663608	1663860	1674820	1674778
	2.50	14	1663682	1663611	1663873	1674862	1674817
	3.00	12	1663695	1663624			
	4.00	12	1663705	1663637		1674846	1674794
CK4,0-ED, turned							
	1.50	16	1663271	1663239			
	2.50	14	1663284	1663242			
	4.00	12	1663297	1663255			
	6.00	10	1663307	1663268			
	10.00	8	1586183	1586198			
D-SUB							
	0.08 ... 0.2	28 ... 24				1418787	1418784
	0.2 ... 0.5	24 ... 20				1418788	1418786

Crimp contacts, punched

Metal, 0 g unclassified mass

	For cross-section (mm²)	AWG	Silver	
			Female	Male
CK1,6-ER, punched, single				
	0.34 ... 1.0	22 ... 18	1004362	1004360
	1.5 ... 2.5	16 ... 14	1004366	1004365
CK1,6-BR, punched, taped product				
	0.34 ... 1.0	22 ... 18	1004381	1004380
	1.5 ... 2.5	16 ... 14	1004383	1004382