Mobile communications product selection

Lightning and surge protection, earthing and equipotential bonding

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Why lightning and surge protection?

Cell sites should operate reliably. That much is clear. Yet one direct lightning strike can cripple the entire system, while damage from surges often arises merely from lightning strikes nearby.

Nobody either wants or can afford outages or restricted service.

In other words: safeguards are required.
A comprehensive lightning and surge protection concept ensures high system reliability and optimum network availability.

This overview is intended to help installers and specialist lightning protection companies with their product selection. It shows you all the relevant components for lightning protection, surge protection, earthing and equipotential bonding. Very practical: now with an additional column for entering quantities.

An important criterion for the permanent functionality of all the components used are the tightening torques of screws as per manufacturer specifications. The table below provides a quick overview.

Recommended values

Screw	Tightening torque
M5 / M6	≥ 4 Nm
M8	≥ 10 Nm
M10	≥ 20 Nm
M12	≥ 25 Nm
M16	≥ 25 Nm

Product selection – how it's done

Now even easier: Enter the quantities that you need directly into the order code/quantity column during an on-site inspection.

Now even more convenient: Scan the QR code with your smartphone. This gathers the products directly onto your digital notepad and simplifies the order. Here you can also download installation instructions, certificates and other documents.

Red/Line surge protection:

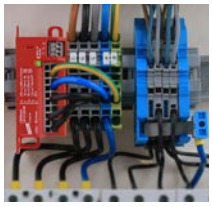
Product image	Description	Mounting	System configuration
	**DEHNvap** Prewired combined arrester, energy-coordinated, for protecting the 230/400-V power supply of cell sites (**NG**: **N**ext **G**eneration = **5G-ready**). Maximum system availability due to follow-current-limiting RAC (Rapid Arc Control) technology. Simple replacement of protection modules without tools with module release button. Space-saving design with 4 modules. Low protection level: ≤ 1.5 kV	DIN rail	TT system (3+1) TN-S system (3+1)
	**DEHNvap** Prewired combined arrester, energy-coordinated, for protecting the 230-V power supply of cell sites (**NG**: **N**ext **G**eneration = **5G-ready**). Maximum system availability due to follow-current-limiting RAC (Rapid Arc Control) technology. Simple replacement of protection modules without tools with module release button. Space-saving design with 2 modules. Low protection level: ≤ 1.5 kV	DIN rail	TT system (1+1) TN-S system (1+1)
	**DEHNvap** Prewired combined arrester, energy-coordinated, for protecting the 230/400-V power supply of cell sites. Maximum system availability due to follow-current-limiting RADAX Flow spark gap technology. Simple replacement of protection modules without tools with module release button. Low protection level: ≤ 1.5 kV	DIN rail	TT system (3+1) TN-S system (3+1)
	**DEHNvap** Prewired combined arrester, energy-coordinated, for protecting the 230-V power supply of cell sites. Maximum system availability due to follow-current-limiting RADAX Flow spark gap technology. Simple replacement of protection modules without tools with module release button. Low protection level: ≤ 1.5 kV	DIN rail	TT system (1+1) TN-S system (1+1)
	**DEHNvap** Prewired combined arrester, energy-coordinated, for protecting the 230/400-V power supply of cell sites. Maximum system availability due to follow-current-limiting spark gap technology. Compact, space-saving design with 4 modules. Low protection level: ≤ 1.5 kV	DIN rail	TT system (3+1) TN-S system (3+1)
	**DEHNvap** Prewired combined arrester, energy-coordinated, for protecting the 230-V power supply of cell sites. Maximum system availability due to follow-current-limiting spark gap technology. Compact, space-saving design with 2 modules. Low protection level: ≤ 1.5 kV	DIN rail	TT system (1+1) TN system (1+1)
	**DEHNsecure** Prewired lightning current arrester, energy-coordinated, for protecting DC power supplies in cell sites, specially for remote radio units (RRUs) and active antenna systems (AASs). Maximum system availability due to follow-current-limiting spark gap technology based on graphite stacks. Low protection level: ≤ 1.5 kV Residual voltage at 5 kA (10/350 µs): ≤ 0.4 kV	DIN rail	DC systems (48 V), single-pole
	**DEHNsecure** Prewired lightning current arrester, energy-coordinated, for protecting DC power supplies in cell sites, specially for remote radio units (RRUs) and active antenna systems (AASs). Maximum system availability due to follow-current-limiting spark gap technology based on graphite stacks. Low protection level: ≤ 1.5 kV Residual voltage at 5 kA (10/350 µs): ≤ 0.4 kV	DIN rail	DC systems (48 V), two-pole (1+1)
	**Pin-shaped Terminal** For series connection of surge protective devices up to 25 mm²	to surge protective device, screwed on	—

Connection	Order code / quantity	Type	Part no.	Application
L1, L2, L3, N, PE, ⏚ 10 mm² solid (min.) 10 mm² flexible (min.) L1, L2, L3, N, PE, ⏚ 35 mm² stranded (max.) 25 mm² flexible (max.)	Your quantity	**DVA M NG 3P 100 FM** 5G READY	**900 352**	
L, N, PE, ⏚ 10 mm² solid (min.) 10 mm² flexible (min.) L, N, PE, ⏚ 35 mm² stranded (max.) 25 mm² flexible (max.)	Your quantity	**DVA M NG 1P 50 FM** 5G READY	**900 351**	
10 mm² solid (min) 10 mm² flexible (min.) L1, L2, L3, N, PE 50 mm² stranded (max.) 35 mm² flexible (max.) L1', L2', L3', N', ⏚ 35 mm² stranded (max.) 25 mm² flexible (max.)	Your quantity	**DVA CSP 3P 100 FM**	**900 360**	
10 mm² solid (min.) 10 mm² flexible (min.) L, N, PE 50 mm² stranded (max.) 35 mm² flexible (max.) L', N', ⏚ 35 mm² stranded (max.) 25 mm² flexible (max.)	Your quantity	**DVA CSP 1P 50 FM**	**900 361**	
L1, L2, L3, N, PE 35 mm² stranded (max.) 25 mm² flexible (max.)	Your quantity	**DVA CSP 3P 100 S FM**	**900 367**	
L, N, PE 35 mm² stranded (max.) 25 mm² flexible (max.)	Your quantity	**DVA CSP 1P 50 S FM**	**900 366**	
DC+/DC-, DC+'/DC-', ⏚/DC- 10 mm² solid (min.) 10 mm² flexible (min.) DC+/DC-, ⏚/DC- 50 mm² stranded (max.) 35 mm² flexible (max.) DC+'/DC-' 35 mm² stranded (max.) 25 mm² flexible (max.)	Your quantity	**DSE M 1 60 FM**	**971 126**	
10 mm² solid (min.) 10 mm² flexible (min.) DC+/DC-, DC-/DC+, ⏚ 50 mm² stranded (max.) 35 mm² flexible (max.) DC+'/DC-', DC-'/DC+' 35 mm² stranded (max.) 25 mm² flexible (max.)	Your quantity	**DSE M 2P 60 FM**	**971 226**	
Front 1.5 mm² solid (min.) 1.5 mm² flexible (min.) 25 mm² stranded (max.) 16 mm² flexible (max.)	Your quantity	**STAK 25**	**952 589**	

Product image	Description	Mounting	System configuration
	**DEHNcord** Multipole surge arrester type 2 + type 3, energy-coordinated, for protecting mobile communication systems, specially for small-cell applications. For universal use with AC and/or DC power supply. Multipole (1pole/3pole) Maximum continuous operating voltage: 275 V AC Maximum continuous operating voltage: 350 V AC Low protection level: ≤ 1.5 kV	DIN rail, wall or enclosure installation	AC and/or DC systems
	**DEHNsite** Combined arrester based on a varistor (zinc oxide varistor) with a high discharge capacity and low protection level, with/without remote signalling contact. Approvals: UL Protection level: ≤ 0.4 kV Discharge capacity (10/350 µs): 12.5 kA I_{imp} Nominal discharge capacity (8/20 µs): 40 kA I_{max}	DIN rail	AC and/or DC systems

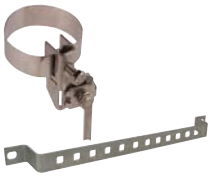
Yellow/Line surge protection:

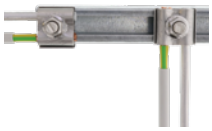
Product image	Description	Mounting	System configuration
	**DEHNpatch outdoor** Class E surge arrester. Outdoor arrester for Gbit Ethernet applications, Power over Ethernet (up to PoE++ / 4PPoE) and similar applications, in a fully shielded IP66 enclosure. SPD class type 2 / P1, for all data services up to 60 V DC (PoE++/4PPoE), for protecting 4 pairs of data network interfaces through RJ45 sockets, for use in indoor and outdoor areas. D1 total lightning impulse current (10/350 µs): 4 kA C2 Total nominal impulse discharge current (8/20 µs): 10 kA	Wall-mounted, wall, mast	—
	**DEHNpatch Class E** Class E surge arrester, SPD class type 2 / P1, shielded. Can be used for all data services up to 57 V DC, for protecting 4 pairs of data network interfaces through RJ45 sockets, for distributor or single-location use, space-saving, width 19 mm. Max. continuous operating voltage (DC): 48 V C2 Total nominal impulse discharge current (8/20 µs): 10 kA	DIN rail	—
	**DEHNgate AG** Lightning current arrester type 1, for coaxial 50 Ohm antenna systems, tested to EN 61643-21. Suitable for remote supply, earthing via bushing, guide cage for interchangeable gas discharge tubes. Max. continuous operating voltage (DC): 180 V D1 lightning impulse current (10/350 µs): 5 kA C2 nominal impulse discharge current (8/20 µs) 20 kA Frequency range: 0–1 GHz	Mounting plate, equipotential bonding bar, earthing busbar	—
	**DEHNgate AG** Lightning current arrester type 1, for coaxial 50 Ohm antenna systems, tested to EN 61643-21. Suitable for remote supply, earthing via bushing or earthing screw, guide cage for interchangeable gas discharge tubes. Max. continuous operating voltage (DC): 180 V D1 lightning impulse current (10/350 µs): 5 kA C2 nominal impulse discharge current (8/20 µs) 20 kA Frequency range: 0–2.5 GHz	Mounting plate, equipotential bonding bar, earthing busbar	—
	**DEHNgate LG / L4** Combined arrester type 1 / P1, with maintenance-free quarter-wave technology, with very low intermodulation damping for multi-frequency applications. No remote supply as the arrester represents an electrical short circuit for low-frequency signals. Broadband device for all 3+4G services and BOS applications. Max. continuous operating voltage (DC): 0 V D1 lightning impulse current (10/350 µs): 25 kA C2 nominal impulse discharge current (8/20 µs) 50 kA Frequency range: 380–512 MHz	Mounting plate, equipotential bonding bar, earthing busbar	—
	**DEHNgate LG / L4** Combined arrester type 1 /P1, for coaxial 50 Ohm antenna systems, tested to EN 61643-21. Designed with maintenance-free quarter-wave technology specially for multi-carrier applications, with minimal passive intermodulation. Broadband device for all 3+4G services. Max. continuous operating voltage (DC): 0 V D1 lightning impulse current (10/350 µs): 40 kA C2 nominal impulse discharge current (8/20 µs) 80 kA Frequency range: 690 MHz–2.7 GHz	Mounting plate, equipotential bonding bar, earthing busbar	—

Connection	Order code / quantity	Type	Part no.	Application
0.2 to 6 mm² solid 0.2 to 6 mm² flexible	Your quantity	**DCOR 3P TT 275 FM**	**900 439**	
1.5 mm² solid (min.) 1.5 mm² flexible (min.) 35 mm² stranded (max.) 25 mm² flexible (max.)	on request on request	**DSIT S CSP DC 48** **DSIT S CSP DC 48 FM**	**921 078** **921 098**	

Connection	Order code / quantity	Type	Part no.	Application
RJ45 socket / RJ45 socket	Your quantity	**DPA CLE IP66**	**929 221**	
RJ45 socket / RJ45 socket	Your quantity	**DPA M CLE RJ45B 48**	**929 121**	
BNC bushing / BNC connector	Your quantity	**DGA AG BNC**	**929 043**	
N bushing / N connector	Your quantity	**DGA AG N**	**929 045**	
7/16 bushing / 7/16 connector	Your quantity	**DGA L4 7 16 S**	**929 047**	
7/16 bushing / 7/16 connector	Your quantity	**DGA L4 7 16 MFA**	**929 148**	

Earthing/equipotential bonding:

Product image	Description	Mounting	Clamping range
	**Equipotential bonding bar for industrial use** For the main equipotential bonding as per IEC 60364-4-41/60364-5-54 and the lightning equipotential bonding as per EN 62305. Type: UV-stabilised Material: StSt Material no. 1.4301 / 1.4303 Short circuit current (AC 50 Hz / DC): 8.9 kA	Wall-mounted	—
	**Equipotential bonding bar K12** With snap-on terminals for the main equipotential bonding as per IEC 60364-4-41/ 60364-5-54 and the lightning equipotential bonding as per EN 62305. Contact bar material: Cu/gal Sn Cross-section: 30 mm² Fixing: [2x] 6 x 8 mm	Wall-mounted	—
	**UNI seam clamp** For integrating mounting systems or parapets into the functional or lightning equipotential bonding, with an M8 screw and nut.	U-shaped profiles, parapet	Seam: 0.7–8 mm
	**UNI earthing clamp** For integrating parts of an installation into the functional equipotential bonding / functional earthing and lightning equipotential bonding, StSt, with an M10 (38/17) hammerhead bolt and self-locking nut with serrated bearing.	C-rail	—
	**UNI earthing clamp** For integrating parts of an installation into the functional equipotential bonding / functional earthing and lightning equipotential bonding. Contact plate and double clamp, StSt, with an M10 screw and self-locking nut with serrated bearing.	U-shaped profile, cable tray, equi-potential bonding bar	—
	**KS connector** Universal clamping screw connector, for connecting round conductors and solid/stranded conductors to flat profiles, and equipotential bonding bars. Be careful not to twist the StSt head with the "round" connection, as well as "solid/stranded"!	U-shaped profile, cable tray, equipotential bonding bar, connection bracket, cable lug	—
	**KS connector** With spring washer for connecting round conductors to flat profiles, and equipotential bonding bars.	U-shaped profile, cable tray, equi-potential bonding bar, connection bracket, cable lug	—
	**Mounting set** With direct clamping of round material and solid/stranded. Consisting of: 2x BRS 16.168 AK1X10 2X6.8 V2A (part no. 540 100) 1x ES 12AP 11X11 V2A (part no. 472 349) Can be combined with: UNI earth clamp (part no. 540 263) and/or universal clamping screw connector (part no. 540 122)	Pipe / mast	—
	**Pipe clamp for antennas** For integrating pipes and masts into the functional equipotential bonding / functional earthing; possible to connect 2 flexible earthing conductors to an earth connection point (1). Strap dimensions: 570 x 25 x 0.3 mm	Pipe / mast	—
	**Separate grip head** For combination with endless tensioning strap (part no. 540 901) or pipe clamp for antennas (part no. 540 100).	Pipe / mast	—
	**Tensioning strap** For combining with various fasteners, connection components or pipe clamps for antennas.	Pipe / mast	—

Connection	Order code / quantity	Type	Part no.	Application
Screw: M10 x 25 mm Number of terminals: 6 Number of terminals: 10	1) 2)	**PAS I 6AP M10 V2A** [1] **PAS I 10AP M10 V2A** [2]	**472 209** **472 219**	
10 conductors 2.5-95 mm² (solid/stranded) **or** 10x Rd 10 mm 1x Fl 30x4 mm	Your quantity	**PAS 11AK UV**	**563 201**	
1x Rd 8-10 mm 4-50 mm² (solid/stranded)	Your quantity	**UNI FK 8.10 KBF0.7 8 AL V2A**	**365 250**	
1x Rd 8-10 mm 4-50 mm² (solid/stranded)	Your quantity	**UEK 8.10 AQ4 50 HKSBM 10 V2A**	**540 262**	
1x Rd 8-10 mm 4-50 mm² (solid/stranded)	Your quantity	**KP AQ4 50 DUL 8.10 VKL11 FRSM10 V2A**	**540 263**	
1x Rd 6-10 mm 16-50 mm² (solid/stranded) Max. two cable lugs (2) under one screw (1)	Your quantity	**UKSV 6.10 AQ16 50 V4A**	**540 122**	
1x Rd 7-10 mm Max. two cable lugs (2) under one screw (1)	Your quantity	**KSV 7.10 FER STTZN**	**301 010**	
12x Rd 8-10 mm 12x solid/stranded Max. two cable lugs (2) under one screw (1)	Your quantity	**BRS 16.168 ES 12AP V2A SET**	**540 111**	
2x Rd 6-8 mm 1x Rd 10 mm 4-50 mm² (solid/stranded) Max. two cable lugs (2) under one screw (1)	Your quantity	**BRS 16.168 AK1X10 2X6.8 V2A**	**540 100**	
2x Rd 6-8 mm 1x Rd 10 mm 4-50 mm² (solid/stranded)	Your quantity	**SPK 25 BRS AK1X10 2X6.8 V2A**	**540 110**	
—	Your quantity	**SPB 25X0.3 L100M V2A**	**540 901**	

Product image	Description	Mounting	Clamping range
	**Connection bracket** For connecting metal cladding using blind rivets or screws (bore hole: 11 x 11 mm), can be combined with universal clamping screw connector (part no. 540 122) or KS connector (part no. 301 010).	Metal cladding / mast	—
	**Earthing pipe clamp** For integrating pipes into the lightning equipotential bonding, can be combined with KS connector (part no. 301 010).	Pipe / mast	Pipe: d = 48 mm (1 ½") d = 60 mm (2")
 	**Terminal for steel girder** Vertical, with KS connector (part no. 540 122) or clamping piece.	Steel girder / load-bearing parts	3-18 mm 18-35 mm
	**Terminal** Longitudinal or transversal, for connection to steel structures and sheet metal.	Steel girder / load-bearing parts / strips	0.4-12 mm
	**Constant force spring** For the earthing of cable shields, for installation without tools and without interruptions in the shield.	Shield connection on the cable	Rd 4-10 mm Rd 14-v22 mm solid/stranded, flexible
	**Self-bonding rubber tape** For wrapping around constant force springs for permanent corrosion protection.	Shield connection on the cable	—

External lightning protection system:

Product image	Description	Mounting	Installation
	**Insulated lightning protection** High voltage-resistant, insulated down conductors, for maintaining the separation distance to electrically conductive parts, etc. HVI light, DEHNcon-H HVI Conductor / HVI long Conductor HVI power, HVI power long Conductor Each HVI model has different thicknesses and characteristics (separation distances) and thus different installation requirements. A distinction is also drawn between black and grey wires in the HVI conductor product series.	Wall-mounted, roof, mast, tower	See installation instructions
	**Overvoltage protection box (OVP box)** Pre-assembled OVP box for protecting DC power supplies for cell sites, such as remote radio units (RRUs) in a weather-resistant outdoor enclosure. Integrated shield terminals for incorporating the cable shield within the equipotential bonding.	Wall-mounted, wall, mast, indoor, outdoor	Space-saving terminals with spring clamp technology for all incoming and outgoing cables.

Connection	Order code / quantity	Type	Part no.	Application
1x Rd 6-10 mm 16-50 mm² (solid/stranded)	Your quantity	**AL ZF B11.11 B5.2 6.5 L81 V2A**	**377 009**	
1x Rd 7-10 mm	1) 2)	**ERS 48 AB11 V2A** 1) **ERS 60 AB11 V2A** 2)	**410 359** **410 379**	
1x Rd 6-10 mm	1) 2) 3) 4)	**AK 6.10 KSV S KBF3 18 V2A** 1) **AK 6.10 KB S KBF3 18 STTZN** 2) **AK 6.10 KSV S KBF18 35 V2A** 3) **AK 6.10 KB S KBF18 35 STTZN** 4)	**372 129** **372 110** **372 159** **372 140**	
1x Rd 7-10 mm	Your quantity	**AK 7.10 FRM10X45 KBF0.4 12 TGTZN**	**371 009**	
—	1) 2)	**SA KRF 10 V2A** 1) **SA KRF 22 V2A** 2)	**919 031** **919 033**	
—	Your quantity	**SKB 19 9M SW**	**919 030**	

Order code / quantity	Type	Part no.	Application
Your quantity	**You can find more information, applications and accessories on the Internet.** More information at: **de.hn/8rauw**		
Your quantity	**The OVP box is configured to your specific application. You can find information about the OVP box on the Internet.** More information at: **de.hn/6Y3S1**		

Surge Protection
Lightning Protection / Earthing
Safety Equipment
DEHN protects.

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