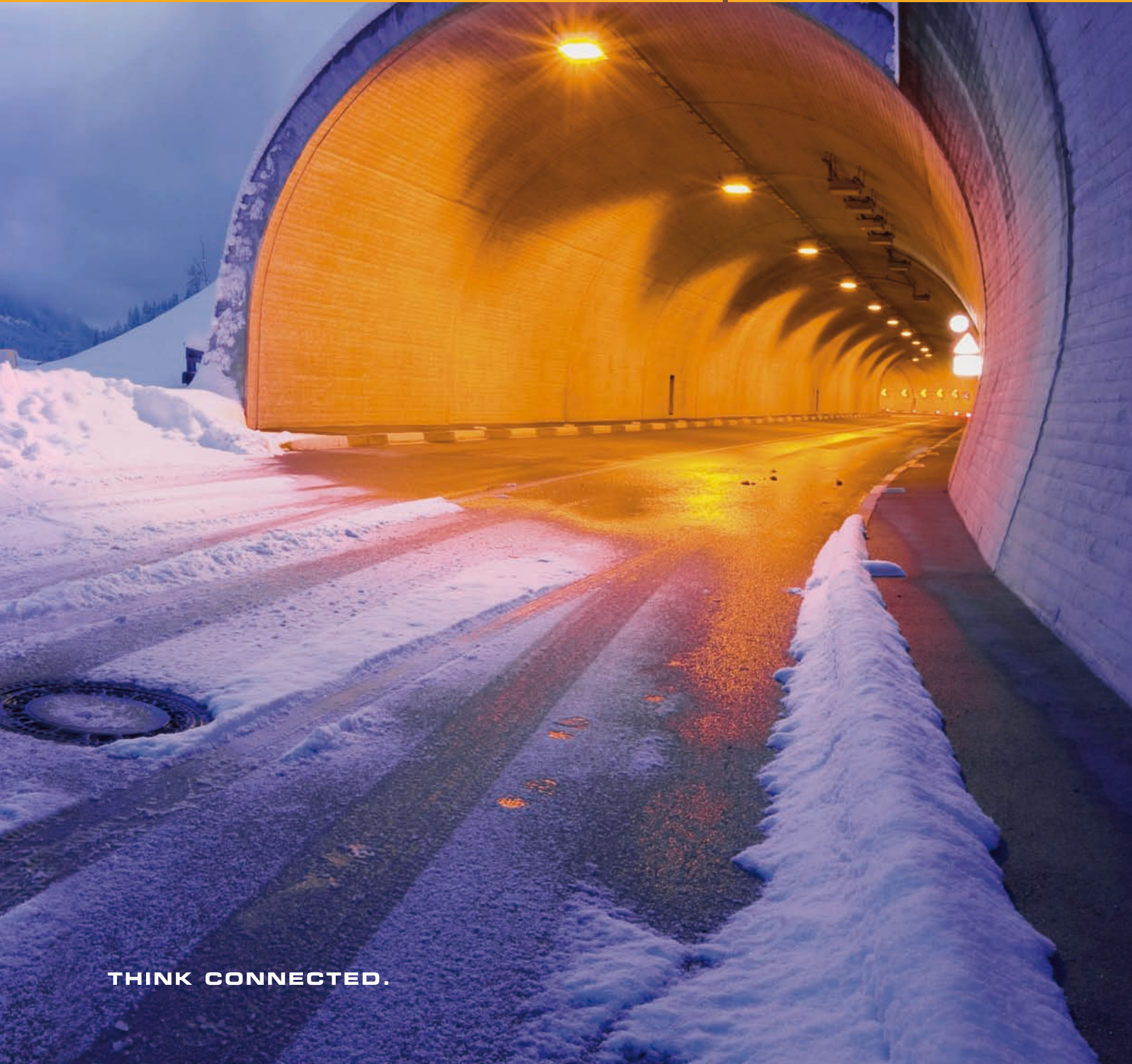


Solutions for tunnels



THINK CONNECTED.

# OBO solutions for fault-free operation and maximum safety in tunnel construction.

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Each year, Europe's tunnels are tested when the holiday season begins. A large number of accidents and fires have led to a rethink and consequent modernisation of most systems. Today, the requirements – even for the electrical infrastructure – are enormously high. OBO makes the passage safer.

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## **Think connected**

OBO stands for networked thinking – all over the world our systems provide a reliable backbone for building and system technology for industry, commerce and infrastructure systems.



# Contents

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## **Comprehensive solutions – from the entrance to the exit**

They are usually invisible, but ensure a good, safe feeling. OBO systems for tunnel construction

- Create passive safety
- Function reliably if there is a fault
- Ensure a reliable power supply and error-free data transmission
- Fulfil all the requirements of modern fire protection

## **Our selection for your project**

This solutions catalogue contains a select of our products for tunnel construction projects. You can find over 30,000 additional products for all areas of electrical installations in our seven main catalogues or on the Internet.

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## **Cable routing**

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## **Distributing and connecting**

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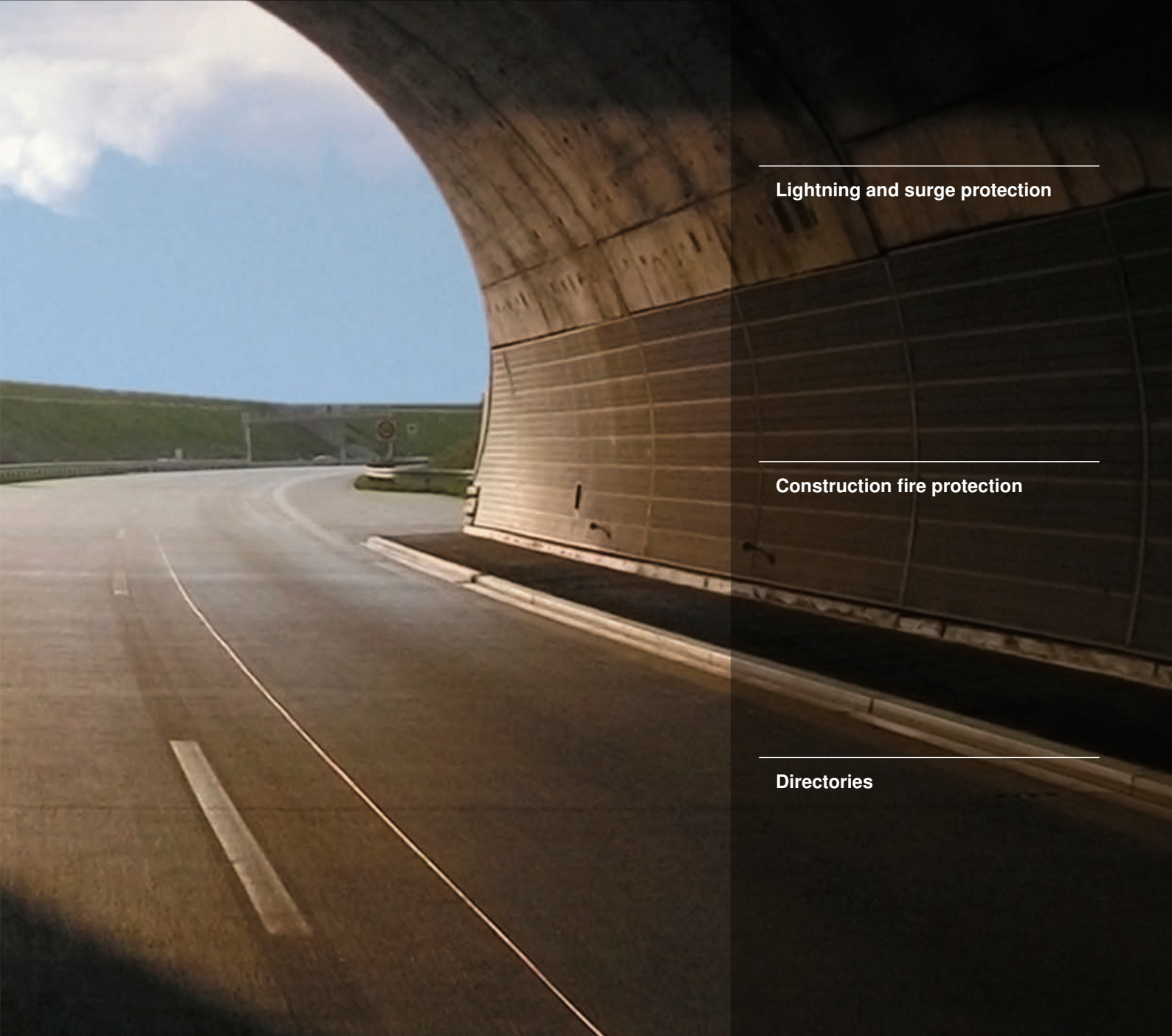
## **Lightning and surge protection**

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## **Construction fire protection**

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## **Directories**



# Overview of OBO systems

## Cable routing

For practical, mounting-friendly cable routing. Whether individual routing or routing of an array of cables running in parallel – you can find the perfect system here.



## Distributing and connecting

For safe connection of the electrical cabling system and the maximum IP protection.





**Lightning and surge protection**

To protect the control and power centre against surges and partial lightning currents.



**Construction fire protection**

Tested fire protection systems, preventing the spread of fire, smoke and heat through wall and masonry penetrations.



## Tunnels are not all the same

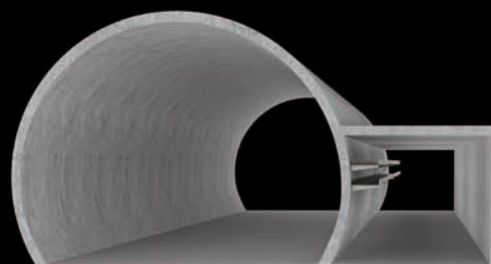
With regard to the accompanying planning for tunnel systems, experience has shown us that each project will have its own conditions and requirements for technical equipment.

The OBO consultants and developers know exactly what is required and include important requirements with regard to the environment, corrosion protection, control technology and safety into the planning and construction processes from the very start.

A perfectly equipped testing centre is ready for this, in which not only our standard products are tested but also project-specific special solutions as well. The highly modern, flexible production facility permits constant availability of OBO products.

### Solutions for all kinds of tunnels

Whether a round or square cross-section, with or without supply shaft, emergency exit route, inflow and exhaust air supply or direct ventilation and de-aeration – whatever the parameters of your tunnel project area: OBO has the right solutions for cable routing.



## Our motto: Always do it better

We like short routes – in any phase of a project. This is why, at OBO, everything comes from one source. This ranges from personal on-site consultancy, through planning and highly modern production, right up to quality assurance and logistics. With comprehensive in-house storage capacities and an extremely high availability in specialist wholesalers, OBO products are always available quickly and anywhere in the world. And the OBO Customer Service is available to offer help and advice for special requirements.

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**We want to be the best. Therefore, we always take a critical look at our services and products – without any compromises.**

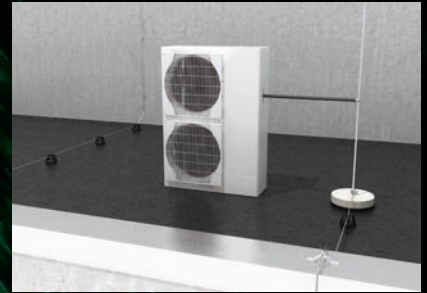


## Functionality and fault-free operation are guaranteed

Trouble-free normal operation is the top priority for the operator of a tunnel system. To ensure that this is possible, all the components used must fulfil high material requirements. OBO tunnel construction products are resistant against high levels of moisture and pressure.

OBO has the right solutions for cable routing in various different qualities of stainless steel. If requested, a high-quality coloured coating can be applied and a wealth of installation material for the toughest jobs is available.

The significance of a functioning tunnel only really becomes clear when there is a problem. There are reliable OBO lightning and surge protection systems available to prevent such failures, along with components for earthing and equipotential bonding.





## Gain speed with the OBO Magic solutions

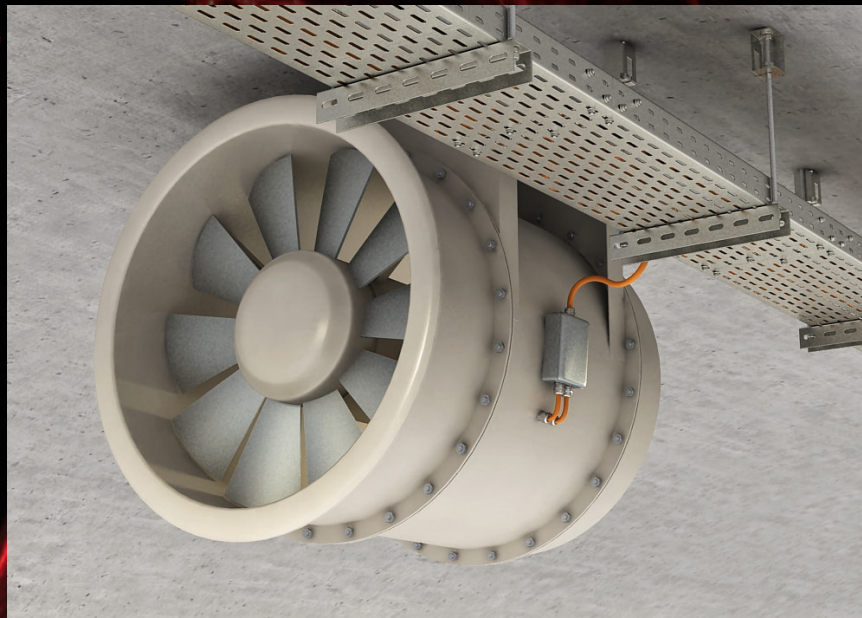
The mounting time is a decisive factor in the choice of products for tunnel construction. OBO has set new standards in this area. The mounting time could be reduced considerably with the quick fastening of (mesh) cable trays.

The OBO GR-Magic® and RKSMagic® quick mounting systems are an ideal solution if the tunnel project has to be completed quickly. They minimise down times and make a considerable contribution to meeting the deadlines of a construction project.



## The emergency: Now every second counts

Wherever a fault in the tunnel occurs: The safety of the people in the tunnel has priority over everything else. For example, if there is a fire, the systems for emergency lighting, emergency contacts, smoke gas removal, monitoring and public address must work perfectly. OBO systems can make a significant contribution to personnel protection and the restriction of the spread of a fire.





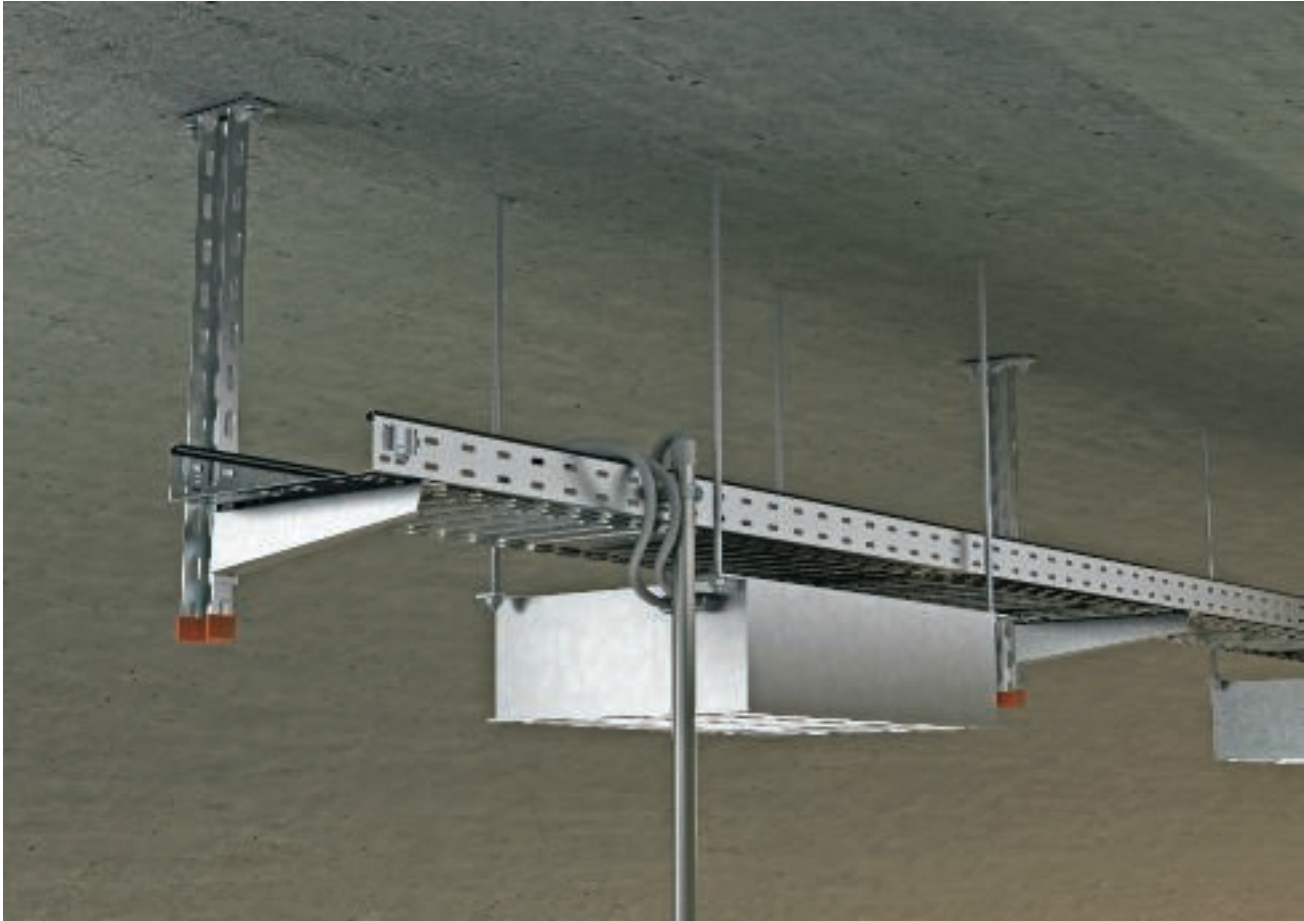
### Function maintenance

OBO function maintenance systems are tested and approved according to DIN 4102-12. The cable support systems were developed especially for function maintenance in the classes E 30 and E 90. Their hallmarks are spans of up to 1.5 m and a load capacity of up to 20 kg/m. Then the cable tray can be routed in one or two layers. Individual holes can be made with single clips or clamp clips.

### Insulation

Tunnel constructions have a dense network of power and data cables, even running through walls and ceilings. These construction limitations for fires must be particularly protected in order to prevent a fire from spreading via these wall penetrations – the OBO insulation systems can guarantee this.





#### **Installation for basic installations**

The following pages contain our range of practical and easy-to-mount cable routing systems. From routing systems for a wide range of cables routed in cable trays up to open or closed routing with pipes and single clips. OBO can offer comprehensive systems with different material qualities.


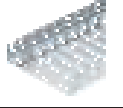






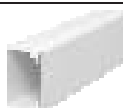
#### **Installation of safety-relevant function maintenance systems**

To aid orientation, at the end of this section, you will find the function maintenance systems and fire protection ducts specially developed and tested for this area. The cable trays tested for function maintenance excel through the choice of different materials and a large proportion of holes. This means that cable trays of type DKS, which is more than 30% holes, can be used under sprinkler systems and can drain any collected liquid with ease.

#### **Quality makes the difference.**

The following pages contain a small overview of our product range for cable routing, specifically for the requirements of tunnel construction. When selecting the articles, we prioritised the quality of articles made of stainless steel. Of course, all the systems listed here as well as others are available in other materials and surfaces. The main catalogues of the different product units contain a detailed overview of our complete product range.

## Cable routing

	Function maintenance systems	Cable tray DKS	14
		Suspension clamp	14
	Cable tray systems	Cable tray	16
		Fittings	17
		Cover	17
	Mesh cable tray systems	Mesh cable tray GR-Magic®	19
		Wall and floor fastener	21
		G mesh cable tray Magic	22
	Cable ladder and ladder systems	Cable ladder LG 60	23
		Clamp clip	24
	Mounting systems	US 3 suspended support	25
		US 5 suspended support	26
		Wall and support bracket	28
	Rail and clamp clips	Profile rails VA	30
		Accessories, profile rails VA	31
		Clamp clips VA	31
	Pipe systems	Metal pipe, with threaded ends	33
	BSK fire protection duct for direct wall and ceiling mounting	BSK fire protection duct I 90/E 30, internal height 50 mm	34
		BSK end piece I 90/E 30 for internal height 105 mm	34
		BSK fire protection duct I 120/E 90, internal height 50 mm	35
		BSK end piece I 120/E 90 for internal height 105 mm	35
		BSK mortar	36
	Wall trunking systems, halogen-free	Duct depth 30 mm, duct height 45 mm	37
		Duct depth 40 mm, duct height 60 mm	38
		Duct depth 60 mm, duct height 90 mm	40
		Duct depth 60 mm, duct height 110 mm	41
		Duct depth 60 mm, duct height 150 mm	42



# Function maintenance systems

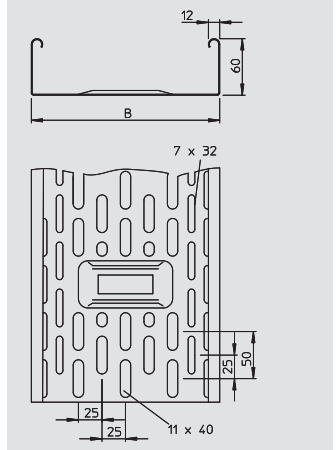


## Cable tray DKS

Type	Width mm	Plate thickness mm	Length mm	Useful cross- section cm <sup>2</sup>	Weight kg/100 m	Item No.
<b>DKS 610 VA4301</b>	100	0.8	3000	58	157.000	<b>6085 60 1</b>
<b>DKS 620 VA4301</b>	200	0.8	3000	118	213.000	<b>6085 62 8</b>
<b>DKS 630 VA4301</b>	300	0.8	3000	178	214.000	<b>6085 63 6</b>
<b>DKS 610 VA4571</b>	100	0.8	3000	58	157.000	<b>6085 66 8</b>
<b>DKS 620 VA4571</b>	200	0.8	3000	118	213.000	<b>6085 67 2</b>
<b>DKS 630 VA4571</b>	300	1	3000	178	264.000	<b>6085 67 3</b>

V2A Stainless steel, 1.4301 V4A Stainless steel, 1.4571 /m

DKS 60 = perforated cable tray system with 60 mm side height.  
Magnetic shield insulation without cover 20 dB, with cover 50 dB.

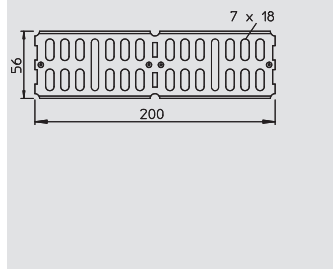


## Straight and angle connector

Type	Side height mm	Pack. pcs	Weight kg/100 pcs.	Item No.
<b>RWVL 60 VA4301</b>	60	10	17.500	<b>6067 66 2</b>
<b>RWVL 60 VA4571</b>	60	10	17.500	<b>6067 66 4</b>

V2A Stainless steel, 1.4301 V4A Stainless steel, 1.4571 /pc.

Straight and angle connector for cable trays, fittings and barrier strips with a side height of 60 mm.

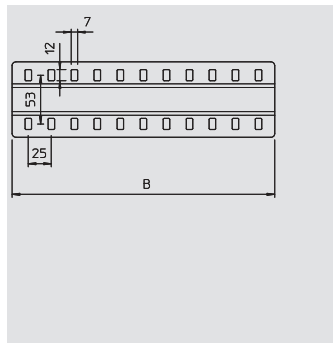


## Joint plate

Type	Width mm	Quantity of bolts pc.	Pack. pcs	Weight kg/100 pcs.	Item No.
<b>SSLB 100 VA4301</b>	85	2	20	7.700	<b>7070 35 3</b>
<b>SSLB 200 VA4301</b>	185	2	20	16.700	<b>7070 36 1</b>
<b>SSLB 300 VA4301</b>	285	3	20	25.700	<b>7070 36 5</b>
<b>SSLB 100 VA4571</b>	85	2	20	7.700	<b>7070 39 0</b>
<b>SSLB 200 VA4571</b>	185	2	20	16.700	<b>7070 39 2</b>
<b>SSLB 300 VA4571</b>	285	3	20	25.700	<b>7070 39 4</b>

V2A Stainless steel, 1.4301 V4A Stainless steel, 1.4571 /pc.

Wide joint plate for use in all cable trays and wide span cable trays.

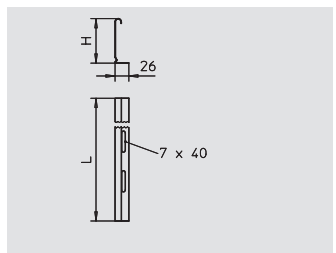


## Separating retainer

Type	Dimen- sion H mm	Dimen- sion L mm	Pack. m	Weight kg/100 m	Item No.
<b>TSG 45 VA4301</b>	45	3000	45	0.000	<b>6062 02 5</b>
<b>TSG 45 VA4571</b>	45	3000	45	0.000	<b>6062 02 8</b>

V2A Stainless steel, 1.4301 V4A Stainless steel, 1.4571 /m

Barrier strip for separation of cables of different voltages or functions.

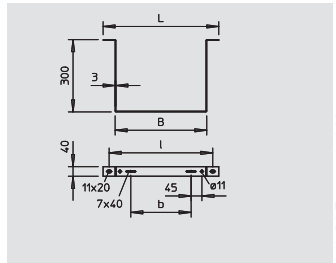


## Suspension clamp

Type	Dimen- sion B mm	Dimen- sion L mm	Dimen- sion b mm	Dimen- sion l mm	Pack. pcs	Weight kg/100 pcs.	Item No.
<b>AHB-T 200</b>	280	380	150	330	1	94.000	<b>6363 88 8</b>
<b>AHB-T 300</b>	380	480	250	430	1	103.000	<b>6363 89 2</b>
<b>AHB-T 400</b>	480	580	350	530	1	113.000	<b>6363 89 6</b>

V5A Stainless steel, 1.4529 /pc.

Special suspension clamp for cable support systems in tunnels.

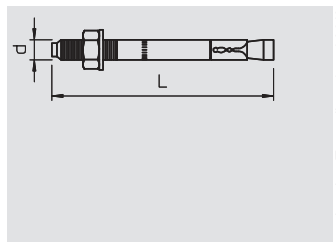


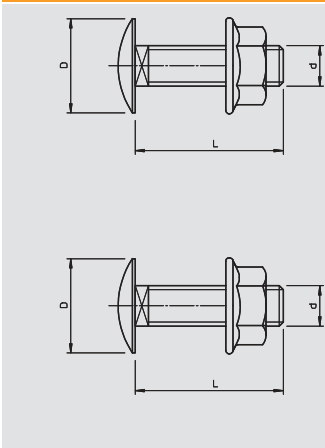
## Bolt tie

Type	Thread	Dimen- sion L mm	Dimen- sion d mm	Clamping range mm	Perm. load range, tension zone kN	Pack. pcs	Weight kg/100 pcs.	Item No.
<b>FAZ II 10/10GS V</b>	M 10	90	10	10	3.57	50	7.680	<b>3498 82 4</b>

V4A Stainless steel, rust-proof 1.4401 price/100 pc.

Anchor bolt for fastening high loads. Matches OBO mounting systems and wall support brackets and supports.





## Truss-head bolt

Type	Grade	Dimension mm	Dimension L mm	Dimension d mm	Dimension D mm	Pack. pcs	Weight kg/100 pcs.	Item No.
<b>FRSB 6X12 VA4301</b>	1.4301	M6 x 12	12	6	16	100	0.830	<b>6406 13 8</b>
<b>FRSB 6X16 VA4301</b>	1.4301	M6 x 16	16	6	16	100	0.800	<b>6406 18 9</b>

V2A Stainless steel, 1.4301

price/100 pc.

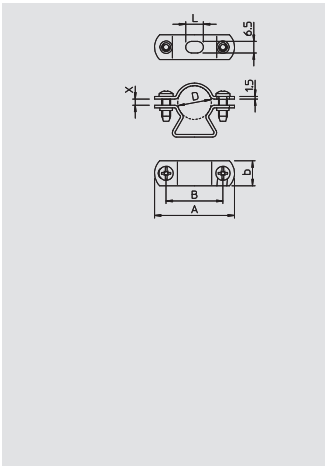
Truss-head bolt with square neck including nut-and-washer assembly.

Type	Dimension mm	Dimension L mm	Dimension d mm	Dimension D mm	Pack. pcs	Weight kg/100 pcs.	Item No.
<b>FRSB 6X12 VA4401</b>	M6 x 12	12	6	16	100	0.796	<b>6406 14 2</b>
<b>FRSB 6X16 VA4401</b>	M6 x 16	16	6	16	100	0.800	<b>6406 19 3</b>

V4A Stainless steel, rust-proof 1.4401

price/100 pc.

Truss-head bolt with square neck including combination nut.



## Cable and pipe spacer clip

Type	Clamping range D mm	Hole size mm	Material thickness mm	Size	Bolt	Box quantity pcs	Pack. pcs	Weight kg/100 pcs.	Item No.
<b>733 16 VA</b>	14-16	6,5 x 10	1.5	M16	M5 x 12	500	50	2.430	<b>1362 01 1</b>
<b>733 19 VA</b>	17-19	6,5 x 10	1.5	Pg11	M5 x 16	500	50	2.800	<b>1362 03 8</b>
<b>733 21 VA</b>	19-21	6,5 x 10	1.5	M20	M5 x 16	500	50	2.740	<b>1362 04 6</b>
<b>733 23 VA</b>	21-23	6,5 x 10	1.5	Pg16	M5 x 16	500	50	2.800	<b>1362 05 4</b>
<b>733 29 VA</b>	24-29	6,5 x 10	1.5	M25	M5 x 16	450	50	3.475	<b>1362 06 2</b>
<b>733 38 VA</b>	30-38	6,5 x 10	1.5	M32	M5 x 18	250	25	4.500	<b>1362 07 0</b>
<b>733 48 VA</b>	39-48	6,5 x 10	1.5	M40	M5 x 18	300	25	5.200	<b>1362 08 9</b>
<b>733 54 VA</b>	48-54	6,5 x 14	1.5	M50	M5 x 18	300	25	5.800	<b>1362 09 7</b>
<b>733 61 VA</b>	53-61	6,5 x 14	1.5	Pg48	M5 x 18	240	20	6.800	<b>1362 10 0</b>
<b>733 63 VA</b>	63	8 x 18	2	M63	M5 x 18	160	20	6.940	<b>1362 12 7</b>

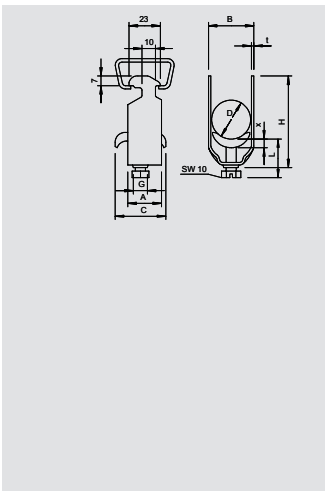
V2A Stainless steel, 1.4301

price/100 pc.

Bolt material: VA

\* Size M16 not suitable for nail device.

\* Sizes M16 to PG16 not suitable for bolt-firing tool.



## Clamp clip, single, metal pressure trough

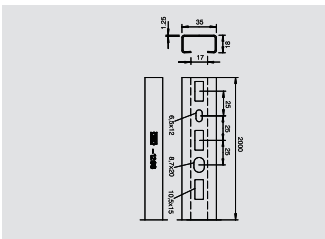
Type	Clamping range D mm	Dimension A mm	Dimension B mm	Dimension C mm	Dimension G mm	Dimension t mm	Dimension H mm	Dimension L mm	Pack. pcs	Weight kg/100 pcs.	Item No.
<b>2056 M 12 VA</b>	8-12	23	16	30	M6	1.5	44	32.5	50	3.200	<b>1159 71 2</b>
<b>2056 M 16 VA</b>	12-16	23	20	30	M6	1.5	44	32.5	50	3.500	<b>1159 71 6</b>
<b>2056 M 22 VA</b>	16-22	23	27	30	M6	1.5	60	32.5	50	4.400	<b>1159 72 2</b>
<b>2056 M 28 VA</b>	22-28	23	33	30	M6	2	58	44	50	6.100	<b>1159 72 8</b>
<b>2056 M 34 VA</b>	28-34	23	39	35	M8	2	66	44	50	7.700	<b>1159 73 4</b>
<b>2056 M 40 VA</b>	34-40	23	45	35	M8	2	72	44	25	8.600	<b>1159 74 0</b>
<b>2056 M 46 VA</b>	40-46	23	51	35	M8	2	79	44	25	9.600	<b>1159 74 6</b>
<b>2056 M 52 VA</b>	46-52	23	57	35	M8	2	86	44	25	10.400	<b>1159 75 2</b>
<b>2056 M 58 VA</b>	52-58	23	64	35	M8	2	93	44	15	13.100	<b>1159 75 8</b>
<b>2056 M 64 VA</b>	58-64	23	70	35	M8	2.5	99	56	15	14.500	<b>1159 76 4</b>
<b>2056 M 70 VA</b>	64-70	25	76	35	M8	2.5	106	56	15	16.100	<b>1159 77 0</b>
<b>2056 M 76 VA</b>	70-76	25	82	40	M8	2.5	114	56	10	18.300	<b>1159 77 6</b>

V2A Stainless steel, 1.4301

price/100 pc.

Suitable for all C profile rails with slot width 16–17 mm.

Clip, bolt and pressure trough all made of rust-proof stainless steel.



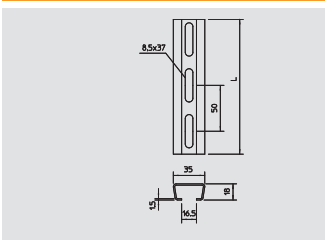
## Profile rail, slot 17 mm

Type	Version	Surface finish	Dimension b x h mm	Material thickness mm	Length mm	Bundle m	Weight kg/100 m	Item No.
<b>1268 L 1M VA</b>	Perforated	Bright	35 x 18	1.25	1000	10	71.000	<b>1104 49 8</b>
<b>1268 L 2M VA</b>	Perforated	Bright	35 x 18	1.25	2000	20	71.000	<b>1104 50 1</b>

V2A Stainless steel, 1.4301

price/100 m

Lightweight profile rail, perforated, slot width 17 mm.



## Profile rail, slot 16.5 mm

Type	Pack. m	Weight kg/100 m	Item No.
<b>2068 L 2M VA</b>	20	80.000	<b>1119 70 2</b>
<b>2068 L 6M VA</b>	6	80.000	<b>1119 72 9</b>

V2A Stainless steel, 1.4301

price/100 m

Profile rail, perforated, slot width 16.5 mm.



# Cable tray systems

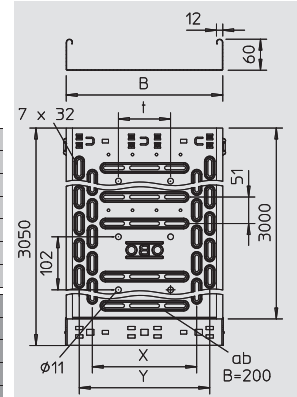


## RKSM cable tray

Type	Width mm	Plate thickness mm	Length mm	Useful cross- section cm <sup>2</sup>	Dimen- sion x mm	Dimen- sion y mm	Dimen- sion t mm	Weight kg/100 m	Item No.
<b>RKSM 610 VA4301</b>	100	0.75	3050	58	—	50	—	134.300	<b>6047 61 3</b>
<b>RKSM 615 VA4301</b>	150	0.75	3050	88	50	100	—	157.700	<b>6047 63 2</b>
<b>RKSM 620 VA4301</b>	200	0.75	3050	118	100	150	—	183.000	<b>6047 64 0</b>
<b>RKSM 630 VA4301</b>	300	0.75	3050	178	200	250	100	239.000	<b>6047 65 6</b>
<b>RKSM 640 VA4301</b>	400	0.9	3050	238	300	350	200	331.300	<b>6047 69 1</b>
<b>RKSM 650 VA4301</b>	500	0.9	3050	298	400	450	300	392.300	<b>6047 72 1</b>
<b>RKSM 660 VA4301</b>	600	0.9	3050	358	450	550	400	453.330	<b>6047 73 7</b>
<b>RKSM 610 VA4571</b>	100	0.75	3050	58	—	50	—	134.300	<b>6047 61 4</b>
<b>RKSM 615 VA4571</b>	150	0.75	3050	88	50	100	—	157.700	<b>6047 63 3</b>
<b>RKSM 620 VA4571</b>	200	0.75	3050	118	100	150	—	183.000	<b>6047 64 1</b>
<b>RKSM 630 VA4571</b>	300	0.75	3050	178	200	250	100	239.000	<b>6047 65 7</b>
<b>RKSM 640 VA4571</b>	400	0.9	3050	238	300	350	200	331.300	<b>6047 69 2</b>
<b>RKSM 650 VA4571</b>	500	0.9	3050	298	400	450	300	392.300	<b>6047 72 2</b>
<b>RKSM 660 VA4571</b>	600	0.9	3050	358	450	550	400	453.330	<b>6047 73 8</b>

V2A Stainless steel, 1.4301 V4A Stainless steel, 1.4571 Stained /m

RKSM 60 = efficient magic cable tray system with 60 mm side height.  
Magnetic shield insulation without cover 20 dB, with cover 50 dB.

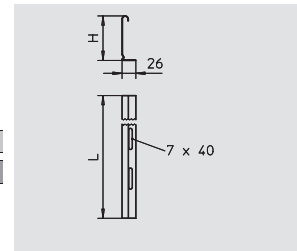


## Separating retainer

Type	Dimen- sion H mm	Dimen- sion L mm	Pack. m	Weight kg/100 m	Item No.
<b>TSG 60 VA4301</b>	60	3000	45	0.000	<b>6062 08 4</b>
<b>TSG 60 VA4571</b>	60	3000	45	0.000	<b>6062 08 6</b>

V2A Stainless steel, 1.4301 V4A Stainless steel, 1.4571 /m

Barrier strip for separation of cables of different voltages or functions.

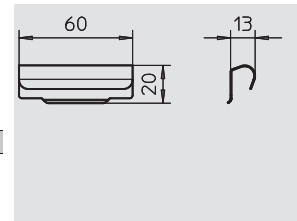


## Separating retainer connector

Type	Pack. pcs	Weight kg/100 pcs.	Item No.
<b>TSGV VA4310</b>	10	1.000	<b>6067 97 0</b>

V2A Stainless steel, rust-proof 1.4310 /pc.

Barrier strip connector for screwless connection of the TSG barrier strip in all side heights.

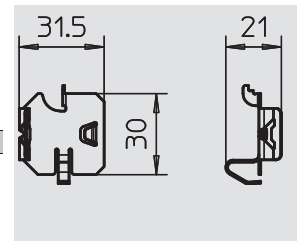


## Clamping piece for separating retainer fastening

Type	Pack. pcs	Weight kg/100 pcs.	Item No.
<b>KS KR VA4310</b>	30	0.580	<b>6062 28 0</b>

V2A Stainless steel, rust-proof 1.4310 price/100 pc.

Clamping piece for screwless fastening of barrier strips in the cable tray types RKSM, MKS and SKS.

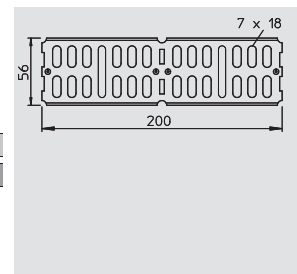


## Straight and angle connector

Type	Side height mm	Pack. pcs	Weight kg/100 pcs.	Item No.
<b>RWVL 60 VA4301</b>	60	10	17.500	<b>6067 66 2</b>
<b>RWVL 60 VA4571</b>	60	10	17.500	<b>6067 66 4</b>

V2A Stainless steel, 1.4301 V4A Stainless steel, 1.4571 /pc.

Straight and angle connector for cable trays, fittings and barrier strips with a side height of 60 mm.

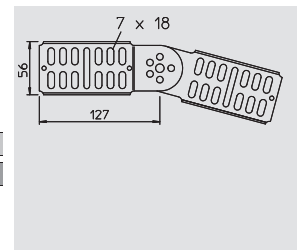


## Articulated connector

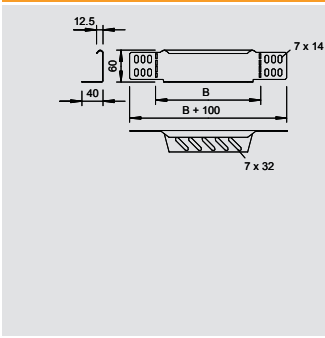
Type	Side height mm	Pack. pcs	Weight kg/100 pcs.	Item No.
<b>RGV 60 VA4301</b>	60	10	24.000	<b>7082 25 8</b>
<b>RGV 60 VA4571</b>	60	10	25.000	<b>7082 26 5</b>

V2A Stainless steel, 1.4301 V4A Stainless steel, 1.4571 /pc.

Adjustable connector for cable trays and barrier strips with a side height of 60 mm.



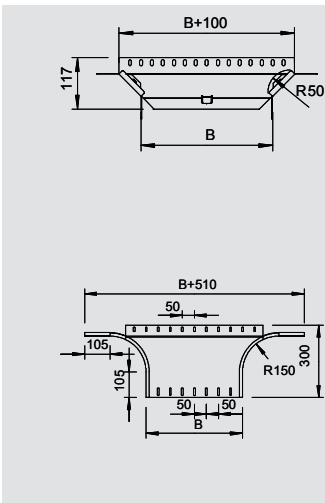




## Reducing bracket and end closure

Type	Width	Pack.	Weight	Item No.
	mm	pcs	kg/100 pcs.	
<b>RWEB 610 VA4301</b>	100	1	9.000	<b>7109 81 4</b>
<b>RWEB 620 VA4301</b>	200	1	18.000	<b>7109 83 0</b>
<b>RWEB 630 VA4301</b>	300	1	26.000	<b>7109 85 7</b>
<b>RWEB 640 VA4301</b>	400	1	34.000	<b>7109 87 3</b>
<b>RWEB 650 VA4301</b>	500	1	42.000	<b>7109 90 3</b>
<b>RWEB 660 VA4301</b>	600	1	49.000	<b>7109 93 8</b>

**V2A** Stainless steel, 1.4301 /pc.  
Reducer / stop-end for cable trays with side height 60 mm.



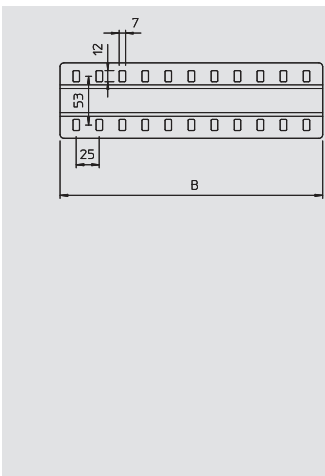
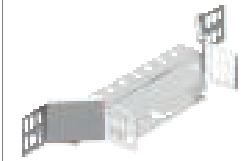
## Mounting/branch piece

Type	Width	Pack.	Weight	Item No.
	mm	pcs	kg/100 pcs.	
<b>RAA 610 VA4301</b>	100	1	43.000	<b>7136 12 0</b>
<b>RAA 620 VA4301</b>	200	1	40.000	<b>7136 13 3</b>
<b>RAA 630 VA4301</b>	300	1	50.000	<b>7136 14 1</b>

**V2A** Stainless steel, 1.4301 /pc.  
Add-on tee for horizontal and vertical use. For all cable tray types of 60 mm side height.

Type	Width	Pack.	Weight	Item No.
	mm	pcs	kg/100 pcs.	
<b>RAAU 640 VA4301</b>	400	1	220.000	<b>7136 24 2</b>
<b>RAAU 650 VA4301</b>	500	1	255.000	<b>7136 25 0</b>
<b>RAAU 660 VA4301</b>	600	1	285.000	<b>7136 26 9</b>

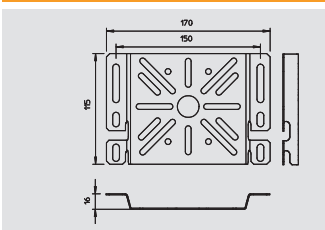
**V2A** Stainless steel, 1.4301 /pc.  
Add-on tee, unperforated, for horizontal and vertical use. For all cable tray types of 60 mm side height.



## Joint plate

Type	Width	Quantity of bolts	Pack.	Weight	Item No.
	mm	pc.	pcs	kg/100 pcs.	
<b>SSLB 100 VA4301</b>	85	2	20	7.700	<b>7070 35 3</b>
<b>SSLB 200 VA4301</b>	185	2	20	16.700	<b>7070 36 1</b>
<b>SSLB 300 VA4301</b>	285	3	20	25.700	<b>7070 36 5</b>
<b>SSLB 400 VA4301</b>	385	4	20	34.700	<b>7070 36 9</b>
<b>SSLB 500 VA4301</b>	485	5	20	43.700	<b>7070 37 3</b>
<b>SSLB 600 VA4301</b>	585	6	20	52.700	<b>7070 38 1</b>
<b>SSLB 100 VA4571</b>	85	2	20	7.700	<b>7070 39 0</b>
<b>SSLB 200 VA4571</b>	185	2	20	16.700	<b>7070 39 2</b>
<b>SSLB 300 VA4571</b>	285	3	20	25.700	<b>7070 39 4</b>
<b>SSLB 400 VA4571</b>	385	4	20	34.700	<b>7070 39 6</b>
<b>SSLB 500 VA4571</b>	485	5	20	43.700	<b>7070 39 8</b>
<b>SSLB 600 VA4571</b>	585	6	20	52.700	<b>7070 40 0</b>

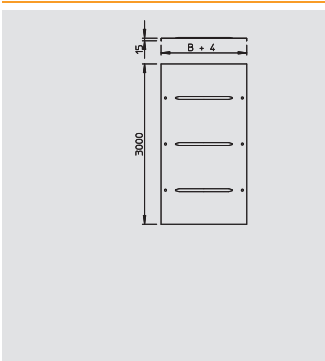
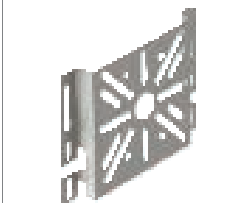
**V2A** Stainless steel, 1.4301 **V4A** Stainless steel, 1.4571 /pc.  
Wide joint plate for use in all cable trays and wide span cable trays.



## Mounting plate

Type	Height	Width	Pack.	Weight	Item No.
	mm	mm	pcs	kg/100 pcs.	
<b>MP UNI VA4301</b>	115	170	40	13.300	<b>7085 13 3</b>

**V2A** Stainless steel, 1.4301 /pc.  
Mounting plate, for fastening on the side rail of cable support systems.



## Cover with sash lock

Type	Width	Plate thickness	Length	Weight	Item No.
	mm	mm	mm	kg/100 m	
<b>DRL 100 VA4301</b>	100	1	3000	105.000	<b>6052 87 8</b>
<b>DRL 200 VA4301</b>	200	1	3000	185.000	<b>6052 89 4</b>
<b>DRL 300 VA4301</b>	300	1	3000	264.000	<b>6052 90 8</b>
<b>DRL 400 VA4301</b>	400	1	3000	340.000	<b>6052 93 2</b>
<b>DRL 500 VA4301</b>	500	1.25	3000	625.000	<b>6052 95 9</b>
<b>DRL 600 VA4301</b>	600	1.25	3000	745.000	<b>6052 97 5</b>

**V2A** Stainless steel, 1.4301 /m  
Cover for cable trays and cable ladders with three pairs of turn-buckles.  
Ensure protective measures for construction if there are high wind speeds.



# Cable tray systems

## Cover for mounting/branch piece

Type	Width mm	Plate thickness mm	Pack. pcs	Weight kg/100 pcs.	Item No.
<b>DFAA 100 VA4301</b>	100	1	1	52.500	<b>7136 90 0</b>
<b>DFAA 200 VA4301</b>	200	1	1	72.000	<b>7136 91 9</b>
<b>DFAA 300 VA4301</b>	300	1	1	92.000	<b>7136 92 7</b>

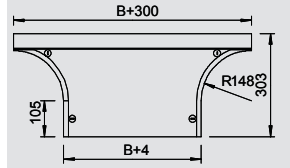
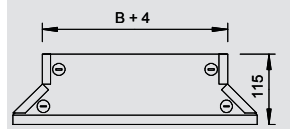
V2A Stainless steel, 1.4301 /pc.

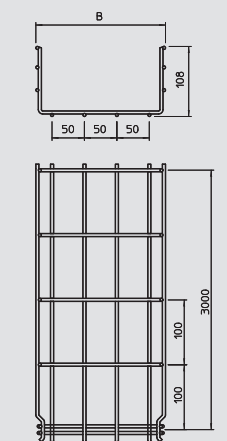
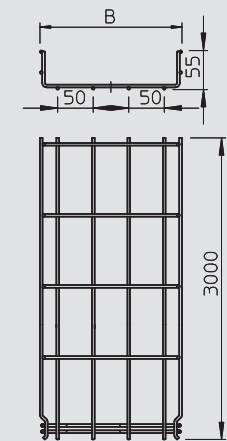
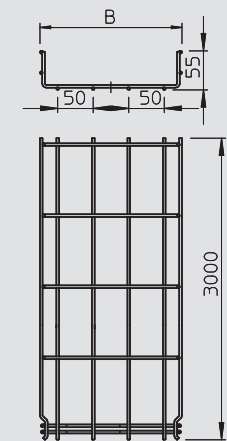
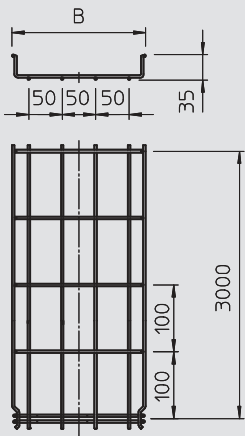
Cover for add-on tee with pre-mounted turn-buckles.

Type	Width mm	Plate thickness mm	Pack. pcs	Weight kg/100 pcs.	Item No.
<b>DFAA 400 VA4301</b>	400	1.25	1	111.500	<b>7136 93 5</b>
<b>DFAA 500 VA4301</b>	500	1.25	1	159.000	<b>7136 94 3</b>
<b>DFAA 600 VA4301</b>	600	1.25	1	183.500	<b>7136 97 8</b>

V2A Stainless steel, 1.4301 /pc.

Cover for add-on tee with pre-mounted turn-buckles.





## Mesh cable tray GR-Magic®

Type	Width mm	Wire Ø mm	Length mm	Useful cross- section cm <sup>2</sup>	Weight kg/100 m	Item No.
GRM 35 50VA4301	50	3.9	3000	17,5	45.000	6000 05 4
GRM 35 100VA4301	100	3.9	3000	35	49.000	6000 05 5
GRM 35 150VA4301	150	3.9	3000	52,5	62.600	6000 05 6
GRM 35 200VA4301	200	3.9	3000	70	76.300	6000 05 7
GRM 35 300VA4301	300	4.8	3000	105	157.900	6000 05 9
GRM 35 100VA4401	100	3.9	3000	35	49.000	6000 08 7
GRM 35 150VA4401	150	3.9	3000	52,5	62.600	6000 08 9
GRM 35 200VA4401	200	3.9	3000	70	76.300	6000 09 0
GRM 35 300VA4401	300	4.8	3000	105	157.900	6000 09 1

V2A Stainless steel, 1.4301 V4A Stainless steel, rust-proof 1.4401 /m

Mesh cable tray with shaped connector of side height 35 mm.

Magnetic shield insulation without cover 15 dB, with cover 25 dB.

Type	Width mm	Wire Ø mm	Length mm	Useful cross- section cm <sup>2</sup>	Weight kg/100 m	Item No.
GRM 55 50VA4301	50	3.9	3000	16	67.000	6001 07 0
GRM 55 100VA4301	100	3.9	3000	40	75.000	6001 07 2
GRM 55 150VA4301	150	3.9	3000	63	88.000	6001 07 4
GRM 55 200VA4301	200	3.9	3000	87	97.000	6001 07 6
GRM 55 300VA4301	300	4.8	3000	129	200.000	6001 07 8
GRM 55 400VA4301	400	4.8	3000	175	243.000	6001 08 0
GRM 55 500VA4301	500	4.8	3000	220	287.000	6001 08 2
GRM 55 600VA4301	600	4.8	3000	265	331.000	6001 08 5

V2A Stainless steel, 1.4301 Stained /m

Mesh cable tray with shaped connector of side height 55 mm.

Magnetic shield insulation without cover 15 dB, with cover 25 dB.

Type	Width mm	Wire Ø mm	Length mm	Useful cross- section cm <sup>2</sup>	Weight kg/100 m	Item No.
GRM 55 50VA4401	50	3.9	3000	16	67.000	6001 08 7
GRM 55 100VA4401	100	3.9	3000	40	75.000	6001 08 8
GRM 55 150VA4401	150	3.9	3000	63	88.000	6001 09 0
GRM 55 200VA4401	200	3.9	3000	87	97.000	6001 09 1
GRM 55 300VA4401	300	4.8	3000	129	200.000	6001 09 3
GRM 55 400VA4401	400	4.8	3000	175	243.000	6001 09 5
GRM 55 500VA4401	500	4.8	3000	220	287.000	6001 09 7
GRM 55 600VA4401	600	4.8	3000	265	331.000	6001 09 9

V4A Stainless steel, rust-proof 1.4401 Stained /m

Mesh cable tray with shaped connector of side height 55 mm.

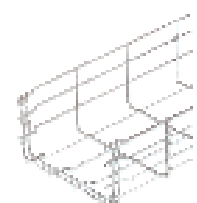
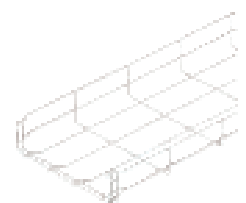
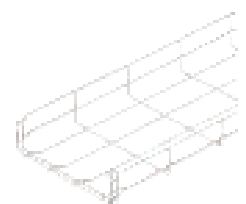
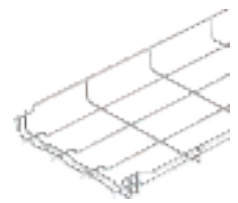
Magnetic shield insulation without cover 15 dB, with cover 25 dB.

Type	Width mm	Wire Ø mm	Length mm	Useful cross- section cm <sup>2</sup>	Weight kg/100 m	Item No.
GRM105 100VA4301	100	3.9	3000	82	99.000	6002 45 1
GRM105 200VA4301	200	4.8	3000	175	193.200	6002 45 7
GRM105 300VA4301	300	4.8	3000	268	235.100	6002 46 0
GRM105 400VA4301	400	4.8	3000	363	277.100	6002 46 3
GRM105 500VA4301	500	4.8	3000	459	319.100	6002 46 6

V2A Stainless steel, 1.4301 Stained /m

Mesh cable tray with shaped connector of side height 105 mm.

Magnetic shield insulation without cover 15 dB, with cover 25 dB.



# Mesh cable tray systems

Cable routing



## Separating retainer

Type	Dimension H mm	Dimension L mm	Pack. m	Weight kg/100 m	Item No.
<b>TSG 30 VA4301</b>	30	3000	45	0.000	<b>6062 05 2</b>
<b>TSG 30 VA4571</b>	30	3000	45	0.000	<b>6062 05 4</b>

V2A Stainless steel, 1.4301 V4A Stainless steel, 1.4571 /m

Barrier strip for separation of cables of different voltages or functions.

Type	Dimension H mm	Dimension L mm	Pack. m	Weight kg/100 m	Item No.
<b>TSG 45 VA4301</b>	45	3000	45	0.000	<b>6062 02 5</b>
<b>TSG 45 VA4571</b>	45	3000	45	0.000	<b>6062 02 8</b>

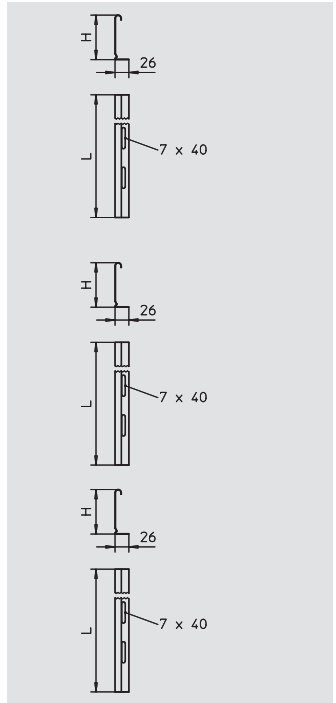
V2A Stainless steel, 1.4301 V4A Stainless steel, 1.4571 /m

Barrier strip for separation of cables of different voltages or functions.

Type	Dimension H mm	Dimension L mm	Pack. m	Weight kg/100 m	Item No.
<b>TSG 85 VA4301</b>	85	3000	45	0.000	<b>6062 17 3</b>

V2A Stainless steel, 1.4301 /m

Barrier strip for separation of cables of different voltages or functions.



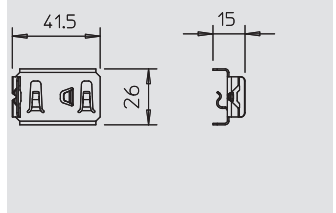
## Clamping piece for separating retainer fastening



Type	Pack. pcs	Weight kg/100 pcs.	Item No.
<b>KS GR VA4310</b>	30	0.830	<b>6062 28 2</b>

V2A Stainless steel, rust-proof 1.4310 price/100 pc.

Clamping piece for fastening barrier strips in mesh cable trays.



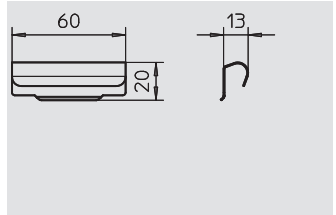
## Separating retainer connector



Type	Pack. pcs	Weight kg/100 pcs.	Item No.
<b>TSGV VA4310</b>	10	1.000	<b>6067 97 0</b>

V2A Stainless steel, rust-proof 1.4310 /pc.

Barrier strip connector for screwless connection of the TSG barrier strip in all side heights.



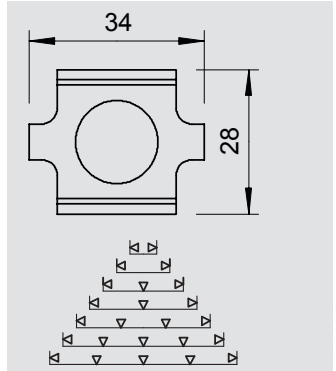
## Joint connector



Type	Pack. pcs	Weight kg/100 pcs.	Item No.
<b>GSV 34 VA4301</b>	25	3.000	<b>6016 64 2</b>
<b>GSV 34 VA4401</b>	10	3.000	<b>6016 64 8</b>

V2A Stainless steel, 1.4301 V4A Stainless steel, rust-proof 1.4401 /pc.

Screwed version of joint connector for mesh cable trays.



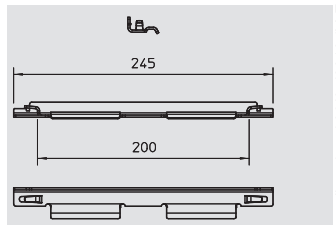
## Quick connector



Type	Width mm	Pack. pcs	Weight kg/100 pcs.	Item No.
<b>GRV 245 VA4404</b>	245	50	13.500	<b>6016 68 8</b>

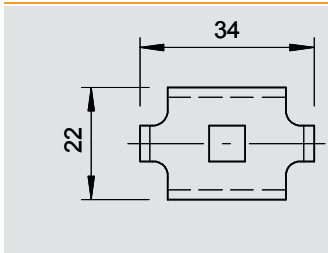
V4A Stainless steel, 1.4404 /pc.

Long mesh cable tray connection for screwless straight connection of mesh cable trays.



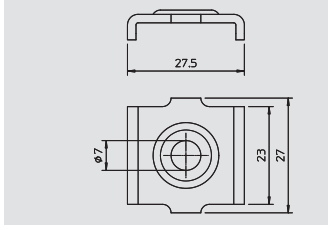
12 LTB Lösungskatalog Tunnelbau / en / 06/04/2010 (LLExpport\_01022)

# Mesh cable tray systems



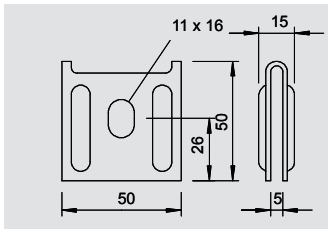
Type	Clamping piece		
	Pack.	Weight	Item No.
	pcs	kg/100 pcs.	
<b>GKS 34 VA4301</b>	100	2.000	<b>6016 83 9</b>
<b>GKS 34 VA4401 SP</b>	10	2.000	<b>6016 85 9</b>
V2A Stainless steel, 1.4301 V4A Stainless steel, rust-proof 1.4401			/pc.

Clamp for fixing mesh cable trays to wall or support brackets.



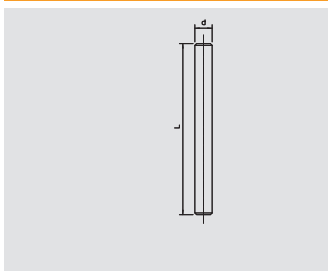
Type	Clamping piece		
	Pack.	Weight	Item No.
	pcs	kg/100 pcs.	
<b>GKB 34 VA</b>	50	1.000	<b>6016 67 6</b>
V2A Stainless steel, 1.4301			/pc.

Clamping piece for fastening mesh cable trays of width 50 mm to the floor.



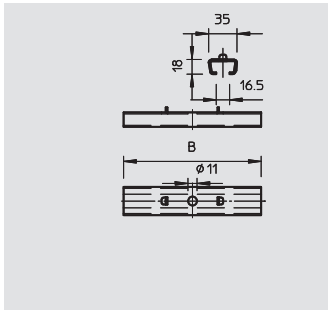
Type	Wall and floor fastener		
	Pack.	Weight	Item No.
	pcs	kg/100 pcs.	
<b>K12 1818 VA4301</b>	25	7.600	<b>6016 42 1</b>
V2A Stainless steel, 1.4301			/pc.

Wall and floor fastener for mesh cable trays.



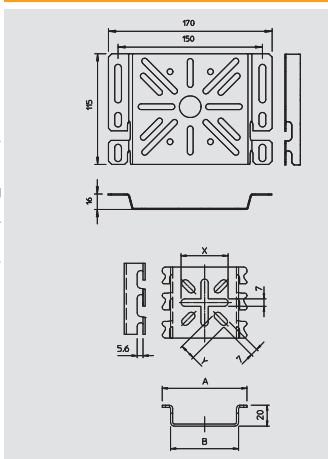
Type	Thread	Dimension d mm	Dimension L mm	Breaking load kN	Threaded rod		
					Pack.	Weight	Item No.
					pcs	kg/100 pcs.	
<b>2078 M8 VA</b>	M8	8	1000	18.3	50	30.000	<b>3141 31 0</b>
<b>2078 M10 VA</b>	M10	10	1000	29	25	49.000	<b>3141 31 2</b>
<b>2078 M12 VA</b>	M12	12	1000	42.2	20	70.000	<b>3141 31 4</b>
V2A Stainless steel, 1.4301					price/100 pc.		

Threaded rod to DIN 976.



Type	Dimension B mm	Central suspension		
		Pack.	Weight	Item No.
		pcs	kg/100 pcs.	
<b>GMS 170 VA4401</b>	170	25	20.000	<b>6015 41 8</b>
<b>GMS 270 VA4401</b>	270	25	32.000	<b>6015 41 9</b>
<b>GMS 370 VA4401</b>	370	25	43.000	<b>6015 42 0</b>
<b>GMS 470 VA4401</b>	470	10	55.000	<b>6015 42 1</b>
<b>GMS 570 VA4401</b>	570	10	67.000	<b>6015 42 2</b>
V4A Stainless steel, rust-proof 1.4401			/pc.	

Central suspension including clamp for mesh cable tray suspensions.

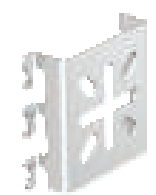
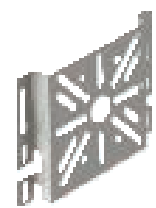


Type	Height mm	Width mm	Mounting plate		
			Pack.	Weight	Item No.
			pcs	kg/100 pcs.	
<b>MP UNI VA4301</b>	115	170	40	13.300	<b>7085 13 3</b>
V2A Stainless steel, 1.4301			/pc.		

Mounting plate, for fastening on the side rail of cable support systems.

Type	Dimension A mm	Dimension B mm	Dimension x mm	Dimension y mm	Mounting plate		
					Pack.	Weight	Item No.
					pcs	kg/100 pcs.	
<b>MPG 65 VA4404</b>	81	65	45	15	30	8.800	<b>6006 48 8</b>
<b>MPG 90 VA4404</b>	111	95	45	38	30	16.100	<b>6006 48 9</b>
V4A Stainless steel, 1.4404					/pc.		

Mounting plate for screwless fastening on mesh cable trays.



# Mesh cable tray systems

Cable routing

## Unperforated cover

Type	Width mm	Plate thickness mm	Length mm	Weight kg/100 m	Item No.
<b>DRLU 050 VA4301</b>	50	1	3000	60.000	<b>6052 82 1</b>
<b>DRLU 100 VA4301</b>	100	1	3000	104.000	<b>6052 82 4</b>
<b>DRLU 150 VA4301</b>	150	1	3000	138.200	<b>6052 82 8</b>
<b>DRLU 200 VA4301</b>	200	1	3000	178.000	<b>6052 83 1</b>
<b>DRLU 300 VA4301</b>	300	1	3000	256.000	<b>6052 83 4</b>
<b>DRLU 400 VA4301</b>	400	1	3000	334.400	<b>6052 83 7</b>
<b>DRLU 500 VA4301</b>	500	1.25	3000	516.100	<b>6052 84 1</b>
<b>DRLU 600 VA4301</b>	600	1.25	3000	614.300	<b>6052 84 4</b>

V2A Stainless steel, 1.4301 /m

Cover for cable trays and mesh cable trays.

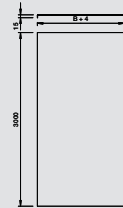
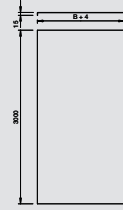
Take appropriate constructive protection measures if there are high wind speeds.

Type	Width mm	Plate thickness mm	Length mm	Weight kg/100 m	Item No.
<b>DRLU 100 VA4571</b>	100	1	3000	99.000	<b>6052 99 1</b>
<b>DRLU 200 VA4571</b>	200	1	3000	178.000	<b>6052 99 3</b>
<b>DRLU 300 VA4571</b>	300	1	3000	256.000	<b>6052 99 4</b>
<b>DRLU 400 VA4571</b>	400	1	3000	334.400	<b>6052 99 5</b>
<b>DRLU 500 VA4571</b>	500	1.25	3000	516.100	<b>6052 99 6</b>
<b>DRLU 600 VA4571</b>	600	1.25	3000	614.300	<b>6052 99 8</b>

V4A Stainless steel, 1.4571 /m

Cover for cable trays and mesh cable trays.

Take appropriate constructive protection measures if there are high wind speeds.

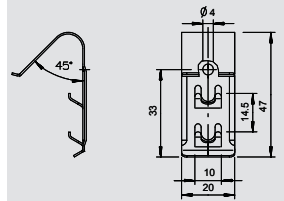


## Cover clamp

Type	Pack. pcs	Weight kg/100 pcs.	Item No.
<b>DKU 60 VA4310</b>	60	0.650	<b>6065 60 0</b>
<b>DKU 120 VA4310</b>	120	0.650	<b>6065 61 0</b>

V2A Stainless steel, rust-proof 1.4310 price/100 pc.

Cover clamp for universal fastening of covers on cable trays, mesh cable trays and AZ small ducts.

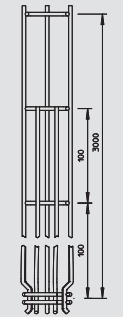
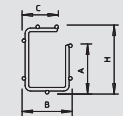


## G mesh cable tray Magic

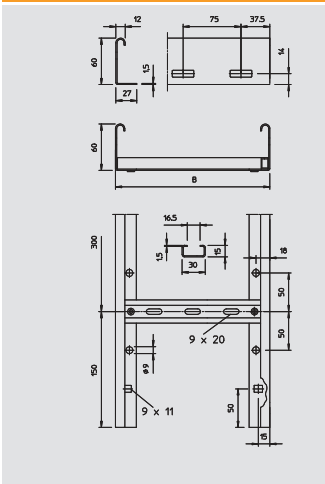
Type	Dimension B mm	Dimension H mm	Dimension C mm	Dimension A mm	Length mm	Weight kg/100 m	Item No.
<b>G-GRM 50 50 VA</b>	55	55	33	40	3000	67.100	<b>6005 55 0</b>
<b>G-GRM 75 50 VA</b>	53	73	40	53	3000	79.900	<b>6005 55 3</b>
<b>G-GRM 125 75 VA</b>	75	125	40	96	3000	109.000	<b>6005 55 6</b>
<b>G-GRM 150 100 VA</b>	100	155	70	120	3000	128.000	<b>6005 55 9</b>

V2A Stainless steel, 1.4301 /m

G-shaped mesh cable tray made of spot-welded steel wire with different side heights and widths.



# Cable ladder and ladder systems



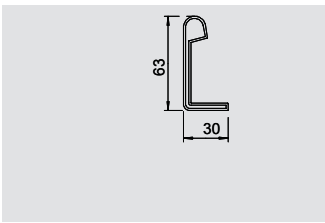
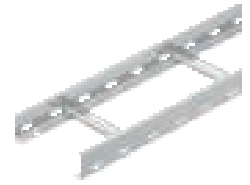
## Cable ladder LG 60

Type	Width mm	Rail thickness mm	Length mm	Weight kg/100 m	Item No.
LG 620 VS VA4301	200	1.5	6000	273.800	6208 70 0
LG 630 VS VA4301	300	1.5	6000	298.000	6208 70 3
LG 640 VS VA4301	400	1.5	6000	322.200	6208 70 6
LG 650 VS VA4301	500	1.5	6000	346.300	6208 70 9
LG 660 VS VA4301	600	1.5	6000	378.300	6208 71 2
LG 620 VS VA4571	200	1.5	6000	273.800	6101 20 0
LG 630 VS VA4571	300	1.5	6000	298.000	6101 20 8
LG 640 VS VA4571	400	1.5	6000	322.200	6101 21 6
LG 650 VS VA4571	500	1.5	6000	346.300	6101 22 3
LG 660 VS VA4571	600	1.5	6000	378.300	6101 23 2

V2A Stainless steel, 1.4301 V4A Stainless steel, 1.4571 /m

Cable ladder with perforated side rail of side height 60 mm with riveted C profile rungs, open in an upwards direction (VS version).

Magnetic shield insulation without cover 10 dB, with cover 15 dB.

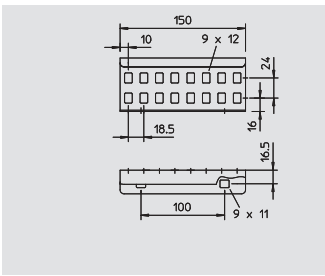


## Protective cap

Type	Colour	Pack. pair	Weight kg/100 pairs	Item No.
SKH 60 OR	Pastel orange	40	1.100	6222 53 7

PE Polyethylene /pair

Protective cap to cover cable ladder ends of side height 60 mm.

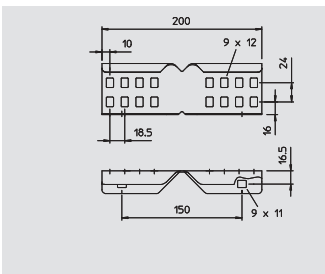
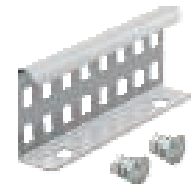


## Straight connector

Type	Side height mm	Pack. pcs	Weight kg/100 pcs.	Item No.
LVG 60 VA4301	60	20	22.000	6208 84 6
LVG 60 VA4571	60	20	22.000	6208 83 5

V2A Stainless steel, 1.4301 V4A Stainless steel, 1.4571 Bright /pc.

Straight connector as external connector to connect cable ladders and fittings with a side height of 60 mm and continuous rail perforation.

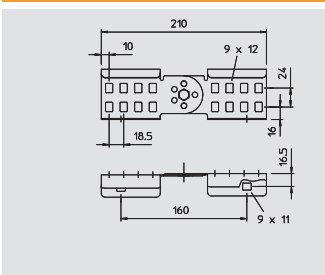
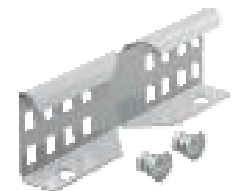


## Angle connector

Type	Side height mm	Pack. pcs	Weight kg/100 pcs.	Item No.
LWVG 60 VA4301	60	20	24.000	6208 89 8
LWVG 60 VA4571	60	20	22.000	6208 89 1

V2A Stainless steel, 1.4301 V4A Stainless steel, 1.4571 Bright /pc.

Angle connector as external connector to join cable ladders and fittings with a side height of 60 mm and continuous rail perforation.

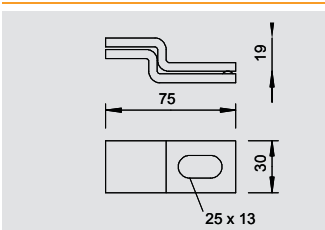


## Articulated connector

Type	Side height mm	Pack. pcs	Weight kg/100 pcs.	Item No.
LGVG 60 VA4301	60	10	29.000	6208 94 7
LGVG 60 VA4571	60	10	29.000	6208 93 2

V2A Stainless steel, 1.4301 V4A Stainless steel, 1.4571 Bright /pc.

Adjustable connector as external connector to join cable ladders and fittings with a side height of 60 mm and continuous rail perforation. Angle can be adjusted vertically.

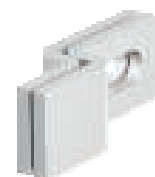


## Wall strap

Type	Pack. pcs	Weight kg/100 pcs.	Item No.
WB 30 75 VA4301	10	20.000	6019 66 8

V2A Stainless steel, 1.4301 /pc.

Wall bracket for fastening vertical ladders, type LG 60, to concrete walls and masonry.



# Cable ladder and ladder systems



## Fastening bracket

Type

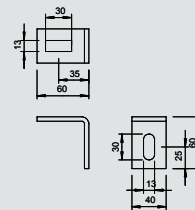
Pack.	Weight	Item No.
pcs	kg/100 pcs.	
10	22.000	<b>6019 58 7</b>

**BW 60 40 VA4301**

V2A Stainless steel, 1.4301

Fastening bracket of limb dimension 60 x 60 mm.

/pc.



## Clamp clip

Type	Clamping range D mm	Dimen- sion A mm	Dimen- sion B mm	Dimen- sion C mm	Dimen- sion G mm	Dimen- sion t mm	Dimen- sion H mm	Dimen- sion L mm	Pack. pcs	Weight kg/100 pcs.	Item No.
<b>2056 12 VA</b>	8-12	23	16	34	M6	1.5	40	34	100	3.300	<b>1159 51 8</b>
<b>2056 16 VA</b>	12-16	23	20	34	M6	1.5	44	34	100	3.600	<b>1159 52 6</b>
<b>2056 22 VA</b>	16-22	23	27	34	M6	1.5	50	34	100	4.200	<b>1159 53 4</b>
<b>2056 28 VA</b>	22-28	23	33	34	M6	2	58	34	100	6.500	<b>1159 54 2</b>
<b>2056 34 VA</b>	28-34	23	39	34	M8	2	66	37.5	100	7.400	<b>1159 55 0</b>
<b>2056 40 VA</b>	34-40	23	45	34	M8	2	72	37.5	100	8.000	<b>1159 56 9</b>
<b>2056 46 VA</b>	40-46	23	51	34	M8	2	79	44.5	100	10.900	<b>1159 57 7</b>
<b>2056 52 VA</b>	46-52	23	57	40	M8	2	86	45.5	100	11.400	<b>1159 58 5</b>
<b>2056 58 VA</b>	52-58	23	64	40	M8	2.5	93	45.5	100	14.500	<b>1159 59 3</b>
<b>2056 64 VA</b>	58-64	23	70	40	M8	2.5	99	45.5	100	15.600	<b>1159 60 7</b>
<b>2056 70 VA</b>	64-70	25	76	40	M8	2.5	106	45.5	50	18.200	<b>1159 61 5</b>
<b>2056 76 VA</b>	70-76	25	82	40	M8	2.5	114	45.5	25	20.800	<b>1159 62 3</b>

V2A Stainless steel, 1.4301

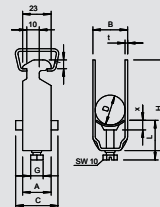
price/100 pc.

Suitable for all C profile rails with slot width 16–17 mm.

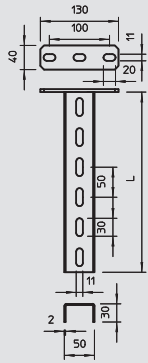
Stainless steel clip and bolt.

Polypropylene pressure sleeve, halogen-free, colour light grey RAL 7035.

(Metal pressure troughs on request).



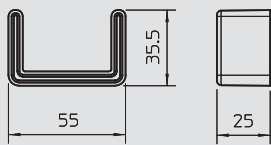




## US 3 suspended support

Type	Length mm	Material thickness mm	Tensile load kN	Pack.	Weight	Item No.
				pcs	kg/100 pcs.	
US 3 K 20VA4301	200	2	5	1	44.000	6342 40 1
US 3 K 30VA4301	300	2	5	1	58.000	6342 40 3
US 3 K 40VA4301	400	2	5	4	71.000	6342 40 5
US 3 K 50VA4301	500	2	5	1	84.000	6342 40 7
US 3 K 60VA4301	600	2	5	1	97.000	6342 40 9
US 3 K 70VA4301	700	2	5	1	110.000	6342 41 1
US 3 K 80VA4301	800	2	5	1	123.000	6342 41 3
US 3 K 90VA4301	900	2	5	1	137.000	6342 41 5
US 3 K 100VA4301	1000	2	5	1	150.000	6342 41 7
US 3 K 20VA4571	200	2	5	1	44.000	6342 37 5
US 3 K 30VA4571	300	2	5	1	58.000	6342 53 0
US 3 K 40VA4571	400	2	5	4	71.000	6342 37 9
US 3 K 50VA4571	500	2	5	1	84.000	6342 38 1
US 3 K 60VA4571	600	2	5	1	97.000	6342 38 9
US 3 K 70VA4571	700	2	5	1	110.000	6342 39 1
US 3 K 80VA4571	800	2	5	1	123.000	6342 39 3
US 3 K 90VA4571	900	2	5	1	137.000	6342 39 5
US 3 K 100VA4571	1000	2	5	1	150.000	6342 39 7

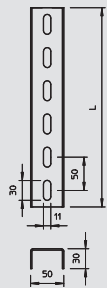
V2A Stainless steel, 1.4301 V4A Stainless steel, 1.4571 Stained /pc.  
Suspended support (U profile) of dimensions 50 x 30 mm with welded head plate.



## Protective cap

Type	Colour	Pack.	Weight	Item No.
		pcs	kg/100 pcs.	
US 3 KS OR	Pastel orange	20	1.070	6338 45 8

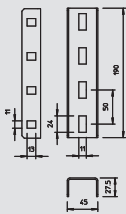
PE Polyethylene /pc.  
Protective cap to cover the ends of US 3 supports.



## US 3 support

Type	Length mm	Material thickness mm	Pack.	Weight	Item No.
			pcs	kg/100 pcs.	
US 3 30 VA4301	300	2	1	39.500	6342 45 5
US 3 50 VA4301	500	2	1	65.800	6342 45 7
US 3 100 VA4301	1000	2	1	131.700	6342 46 0
US 3 150 VA4301	1500	2	1	197.500	6342 46 3
US 3 200 VA4301	2000	2	1	263.300	6342 46 6
US 3 600 VA4301	6000	2	1	789.900	6342 46 8
US 3 30 VA4571	300	2	1	39.500	6342 48 5
US 3 50 VA4571	500	2	1	65.800	6342 48 8
US 3 100 VA4571	1000	2	1	131.700	6342 49 1
US 3 150 VA4571	1500	2	1	197.500	6342 49 4
US 3 200 VA4571	2000	2	1	263.300	6342 49 7
US 3 600 VA4571	6000	2	1	789.900	6342 50 5

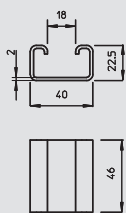
V2A Stainless steel, 1.4301 V4A Stainless steel, 1.4571 Stained /pc.  
U support in fixed lengths. Dimensions 30 x 50 mm.



## U support connector

Type	Pack.	Weight	Item No.
	pcs	kg/100 pcs.	
VUS 3 VA4301	10	25.600	6018 51 7
VUS 3 VA4571	10	48.000	6018 52 0

V2A Stainless steel, 1.4301 V4A Stainless steel, 1.4571 Stained /pc.  
U support connector to connect US 3 supports.



## Spacer

Type	Box quantity pcs	Pack.	Weight	Item No.
		pcs	kg/100 pcs.	
DSK 25 VA4301	25	25	7.500	6416 44 8

V2A Stainless steel, 1.4301 Stained /pc.  
Spacer for use in U 3 supports.



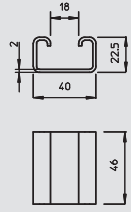
# Mounting systems



## Spacer

Type	Box quantity	Pack.	Weight	Item No.
	pcs	pcs	kg/100 pcs.	
<b>DSK 25 VA4571</b>	25	25	7.500	<b>6416 45 0</b>
<b>V4A</b>	Stainless steel, 1.4571		/pc.	

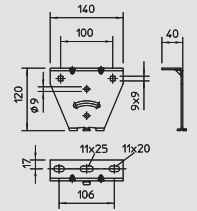
Spacer for use in U supports.



## Head plate, variable

Type	Pack.	Weight	Item No.		
	pcs	kg/100 pcs.			
<b>KU 3 V VA4301</b>	20	26.700	<b>6348 88 4</b>		
<b>KU 3 V VA4571</b>	20	26.700	<b>6348 88 5</b>		
<b>V2A</b>	Stainless steel, 1.4301	<b>V4A</b>	Stainless steel, 1.4571	Stained	/pc.

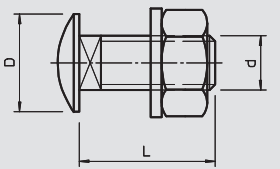
Head plate for installation on US 3 supports and profile rails, type 2068.



## Truss-head bolt

Type	Dimension	Dimension L	Dimension d	Dimension D	Pack.	Weight	Item No.
	mm	mm	mm	mm	pcs	kg/100 pcs.	
<b>FRS 10X25 VA4301</b>	M10 x 25	25	10	24	50	4.500	<b>6406 71 8</b>
<b>V2A</b>	Stainless steel, 1.4301				price/100 pc.		

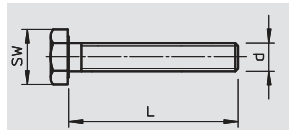
Truss-head bolt with square neck including washer and hexagonal nut.



## Hexagonal bolt

Type	Dimension	Dimension L	Dimension d	SW	Pack.	Weight	Item No.
	mm	mm	mm	mm	pcs	kg/100 pcs.	
<b>SKS 10X80 VA4401</b>	M10 x 80	80	10	17	20	7.800	<b>6418 24 8</b>
<b>V4A</b>	Stainless steel, rust-proof 1.4401				/pc.		

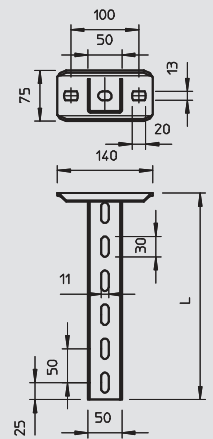
Hexagonal bolt for universal fastening of construction components.



## US 5 suspended support

Type	Length	Material thickness	Pack.	Weight	Item No.
	mm	mm	pcs	kg/100 pcs.	
<b>US 5 K 20 VA4301</b>	200	2.5	1	82.000	<b>6341 35 8</b>
<b>US 5 K 30 VA4301</b>	300	2.5	2	106.000	<b>6341 36 2</b>
<b>US 5 K 40 VA4301</b>	400	2.5	1	131.000	<b>6341 36 6</b>
<b>US 5 K 50 VA4301</b>	500	2.5	1	155.000	<b>6341 37 0</b>
<b>US 5 K 100VA4301</b>	1000	2.5	1	279.000	<b>6341 39 0</b>
<b>US 5 K 120VA4301</b>	1200	2.5	1	328.000	<b>6341 39 8</b>
<b>US 5 K 20 VA4571</b>	200	2.5	1	82.000	<b>6341 20 9</b>
<b>US 5 K 30 VA4571</b>	300	2.5	2	106.000	<b>6341 21 3</b>
<b>US 5 K 40 VA4571</b>	400	2.5	1	131.000	<b>6341 21 7</b>
<b>US 5 K 50 VA4571</b>	500	2.5	1	155.000	<b>6341 22 1</b>
<b>US 5 K 100VA4571</b>	1000	2.5	1	279.000	<b>6341 24 1</b>
<b>US 5 K 120VA4571</b>	1200	2.5	1	328.000	<b>6341 24 9</b>
<b>V2A</b>	Stainless steel, 1.4301	<b>V4A</b>	Stainless steel, 1.4571	Stained	/pc.

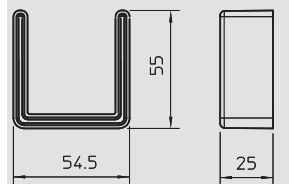
U support with welded head plate.  
For fastening to horizontal concrete ceilings and steel girders.



## Protective cap

Type	Colour	Pack.	Weight	Item No.
		pcs	kg/100 pcs.	
<b>US 5 KS OR</b>	Pastel orange	20	1.300	<b>6338 46 2</b>
<b>PE</b>	Polyethylene		/pc.	

Protective cap for end covering of US 5 supports.

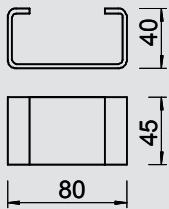




## US 5 support

Type	Length mm	Material thickness mm	Pack. pcs	Weight kg/100 pcs.	Item No.
<b>US 5 30 VA4301</b>	300	2.5	1	72.000	<b>6341 10 5</b>
<b>US 5 40 VA4301</b>	400	2.5	1	97.000	<b>6341 10 9</b>
<b>US 5 50 VA4301</b>	500	2.5	1	121.000	<b>6341 11 3</b>
<b>US 5 70 VA4301</b>	700	2.5	1	169.000	<b>6341 12 1</b>
<b>US 5 80 VA4301</b>	800	2.5	1	193.000	<b>6341 12 5</b>
<b>US 5 90 VA4301</b>	900	2.5	1	217.000	<b>6341 12 9</b>
<b>US 5 100 VA4301</b>	1000	2.5	1	242.000	<b>6341 13 3</b>
<b>US 5 110 VA4301</b>	1100	2.5	1	266.000	<b>6341 13 7</b>
<b>US 5 120 VA4301</b>	1200	2.5	1	290.000	<b>6341 14 1</b>
<b>US 5 300 VA4301</b>	3000	2.5	1	726.000	<b>6341 15 2</b>
<b>US 5 30 VA4571</b>	300	2.5	1	73.000	<b>6341 05 3</b>
<b>US 5 40 VA4571</b>	400	2.5	1	97.000	<b>6341 05 5</b>
<b>US 5 50 VA4571</b>	500	2.5	1	121.000	<b>6341 05 7</b>
<b>US 5 60 VA4571</b>	600	2.5	1	145.000	<b>6341 05 9</b>
<b>US 5 80 VA4571</b>	800	2.5	1	193.000	<b>6341 06 3</b>
<b>US 5 90 VA4571</b>	900	2.5	1	217.000	<b>6341 06 5</b>
<b>US 5 300 VA4571</b>	3000	2.5	1	726.000	<b>6341 07 3</b>

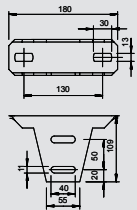
V2A Stainless steel, 1.4301 V4A Stainless steel, 1.4571 /pc.  
U support in fixed lengths. Dimensions 50 x 50 mm.



## Spacer

Type	Box quantity pcs	Pack. pcs	Weight kg/100 pcs.	Item No.
<b>DSK 45 VA4571</b>	25	25	15.000	<b>6416 46 2</b>

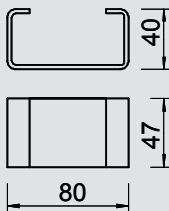
V2A Stainless steel, 1.4301 V4A Stainless steel, 1.4571 /pc.  
Spacer for use in U 5 supports.



## Head plate

Type	Pack. pcs	Weight kg/100 pcs.	Item No.
<b>KU 5 V VA4571</b>	1	81.000	<b>6348 92 7</b>

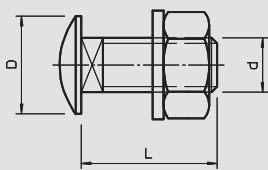
V2A Stainless steel, 1.4301 V4A Stainless steel, 1.4571 Stained /pc.  
Variable head plate for installation on US 5 support.



## Spacer

Type	Box quantity pcs	Pack. pcs	Weight kg/100 pcs.	Item No.
<b>DSK 47 VA4571</b>	25	25	16.000	<b>6416 51 1</b>

V2A Stainless steel, 1.4301 V4A Stainless steel, 1.4571 /pc.  
Spacer for use in head plate, type KU 5 V.



## Truss-head bolt

Type	Dimen- sion mm	Dimen- sion L mm	Dimen- sion d mm	Dimen- sion D mm	Pack. pcs	Weight kg/100 pcs.	Item No.

V2A Stainless steel, 1.4301 price/100 pc.  
Truss-head bolt with square neck including washer and hexagonal nut.



## Hexagonal bolt

Type	Dimen- sion mm	Dimen- sion L mm	Dimen- sion d mm	SW mm	Pack. pcs	Weight kg/100 pcs.	Item No.

V4A Stainless steel, rust-proof 1.4401 /pc.  
Hexagonal bolt for universal fastening of construction components.



# Mounting systems

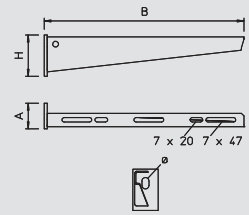
Cable routing



## Wall and support bracket AW 15

Type	Width mm	Dimen- sion H mm	Dimen- sion A mm	Hole Ø mm	F in kN kN	Pack. pcs	Weight kg/100 pcs.	Item No.
<b>AW 15 21 VA4301</b>	210	60	40	11	1.5	30	25.600	<b>6421 02 4</b>
<b>AW 15 31 VA4301</b>	310	65	40	11	1.5	30	32.500	<b>6421 03 2</b>
<b>AW 15 41 VA4301</b>	410	70	40	11	1.5	30	55.000	<b>6421 03 6</b>
<b>AW 15 51 VA4301</b>	510	75	40	11	1.5	20	68.000	<b>6421 04 0</b>
<b>AW 15 61 VA4301</b>	610	80	40	11	1.5	20	85.000	<b>6421 04 4</b>
<b>AW 15 11 VA4571</b>	110	50	40	11	1.5	30	14.100	<b>6392 00 8</b>
<b>AW 15 21 VA4571</b>	210	60	40	11	1.5	30	25.600	<b>6392 01 4</b>
<b>AW 15 31 VA4571</b>	310	65	40	11	1.5	30	35.200	<b>6392 02 4</b>
<b>AW 15 41 VA4571</b>	410	70	40	11	1.5	30	55.000	<b>6392 03 2</b>
<b>AW 15 61 VA4571</b>	610	80	40	11	1.5	20	85.000	<b>6392 05 9</b>

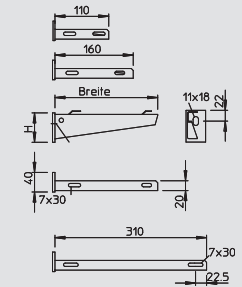
V2A Stainless steel, 1.4301 V4A Stainless steel, 1.4571 Stained /pc.  
Light-duty wall and support bracket with welded head plate.



## Wall and support bracket AWG 15

Type	Width mm	Dimen- sion H mm	Dimen- sion A mm	Hole Ø mm	F in kN kN	Pack. pcs	Weight kg/100 pcs.	Item No.
<b>AWG 15 21VA4301</b>	210	60	40	11	1.5	30	25.000	<b>6420 62 8</b>
<b>AWG 15 31VA4301</b>	310	65	40	11	1.5	30	33.000	<b>6420 63 1</b>
<b>AWG 15 41VA4301</b>	410	70	40	11	1.5	30	53.000	<b>6420 63 4</b>
<b>AWG 15 51VA4301</b>	510	75	40	11	1.5	20	65.000	<b>6420 63 7</b>
<b>AWG 15 61VA4301</b>	610	80	40	11	1.5	20	80.000	<b>6420 64 0</b>
<b>AWG 15 11 VA4571</b>	110	65	40	11	1.5	30	13.000	<b>6420 64 2</b>
<b>AWG 15 21 VA4571</b>	210	65	40	11	1.5	30	25.000	<b>6420 64 4</b>
<b>AWG 15 31VA4571</b>	310	65	40	11	1.5	30	33.000	<b>6420 64 6</b>
<b>AWG 15 41 VA4571</b>	410	65	40	11	1.5	30	53.000	<b>6420 64 8</b>
<b>AWG 15 51 VA4571</b>	510	65	40	11	1.5	20	65.000	<b>6420 65 0</b>
<b>AWG 15 61 VA4571</b>	610	65	40	11	1.5	20	80.000	<b>6420 65 2</b>

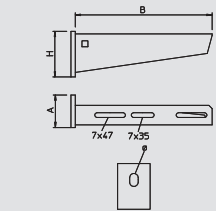
V2A Stainless steel, 1.4301 V4A Stainless steel, 1.4571 Stained /pc.  
Light-duty wall and support bracket with welded head plate for screwless mesh cable tray fastening.



## Wall and support bracket AW 30

Type	Width mm	Dimen- sion H mm	Dimen- sion A mm	Hole Ø mm	F in kN kN	Pack. pcs	Weight kg/100 pcs.	Item No.
<b>AW 30 21 VA4301</b>	210	70	50	13	3.0	25	38.200	<b>6442 83 8</b>
<b>AW 30 31 VA4301</b>	310	80	50	13	3.0	25	61.000	<b>6442 85 4</b>
<b>AW 30 41 VA4301</b>	410	80	50	13	3.0	20	86.200	<b>6442 87 0</b>
<b>AW 30 51 VA4301</b>	510	90	50	13	3.0	10	126.000	<b>6442 89 7</b>
<b>AW 30 61 VA4301</b>	610	100	50	13	3.0	10	154.000	<b>6442 91 9</b>

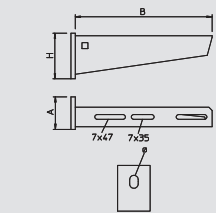
V2A Stainless steel, 1.4301 Stained /pc.  
Medium-duty wall and support bracket with welded head plate.



## Wall and support bracket AW 30

Type	Width mm	Dimen- sion H mm	Dimen- sion A mm	Hole Ø mm	F in kN kN	Pack. pcs	Weight kg/100 pcs.	Item No.
<b>AW 30 21 VA4571</b>	210	70	50	13	3.0	25	38.000	<b>6443 31 1</b>
<b>AW 30 31 VA4571</b>	310	80	50	13	3.0	25	61.000	<b>6443 62 1</b>
<b>AW 30 41 VA4571</b>	410	80	50	13	3.0	20	86.000	<b>6443 34 6</b>
<b>AW 30 51 VA4571</b>	510	90	50	13	3.0	10	126.000	<b>6443 62 5</b>
<b>AW30 56 VA4571</b>	560	100	50	13	3.0	10	142.000	<b>6443 62 6</b>
<b>AW 30 61 VA4571</b>	610	100	50	13	3.0	10	154.000	<b>6443 62 7</b>

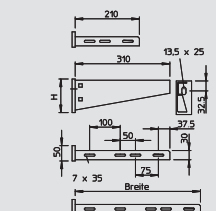
V4A Stainless steel, 1.4571 Stained /pc.  
Medium-duty wall and support bracket with welded head plate.



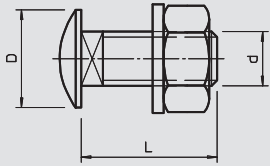
## Wall and support bracket AW 55

Type	Width mm	Dimen- sion H mm	Dimen- sion A mm	Hole Ø mm	F in kN kN	Pack. pcs	Weight kg/100 pcs.	Item No.
<b>AW 55 31 VA4301</b>	310	110	50	13.5	5.5	1	123.000	<b>6443 06 7</b>
<b>AW 55 41 VA4301</b>	410	130	50	13.5	5.5	1	167.000	<b>6443 07 1</b>
<b>AW 55 51 VA4301</b>	510	145	60	13.5	5.5	1	249.000	<b>6443 07 5</b>
<b>AW 55 61 VA4301</b>	610	165	60	13.5	5.5	1	305.000	<b>6443 07 9</b>
<b>AW 55 71 VA4301</b>	710	195	60	13.5	5.5	1	445.000	<b>6443 08 3</b>

V2A Stainless steel, 1.4301 Stained /pc.  
Heavy-duty wall and support bracket with welded head plate.



12 LTB Lösungskatalog Tunnelbau / en / 06/04/2010 (LLExpert\_01022)



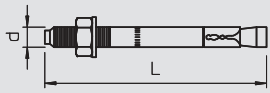
## Truss-head bolt

Type	Dimension mm	Dimension L mm	Dimension d mm	Dimension D mm	Pack. pcs	Weight kg/100 pcs.	Item No.
<b>FRSB 6X12 VA4301</b>	M6 x 12	12	6	13.5	100	0.760	<b>6406 52 1</b>
<b>FRSB 6X16 VA4301</b>	M6 x 16	15	6	13.5	100	0.900	<b>6406 55 6</b>
<b>FRSB 6X20 VA4301</b>	M6 x 20	20	6	13.5	100	1.000	<b>6406 60 2</b>
<b>FRS 8X16 VA4301</b>	M8 x 16	16	8	20	50	2.200	<b>6406 69 6</b>
<b>FRS 8X20 VA4301</b>	M8 x 20	20	8	20	50	2.100	<b>6406 80 7</b>
<b>FRS 8X25 VA4301</b>	M8 x 25	25	8	20	50	2.300	<b>6406 81 5</b>
<b>FRS 8X35 VA4301</b>	M8 x 35	35	8	20	50	2.700	<b>6406 82 3</b>
<b>FRS 10X20 VA4301</b>	M10 x 20	20	10	24	50	3.900	<b>6406 86 6</b>
<b>FRS 10X25 VA4301</b>	M10 x 25	25	10	24	50	4.500	<b>6406 71 8</b>
<b>FRS 10X30 VA4301</b>	M10 x 30	30	10	24	50	4.500	<b>6406 72 6</b>
<b>FRS 12X25 VA4301</b>	M12 x 25	25	12	30	25	6.400	<b>6406 75 0</b>
<b>FRS 12X30 VA4301</b>	M12 x 30	30	12	30	25	6.800	<b>6406 76 9</b>
<b>FRS 6X12 VA4401</b>	M6 x 12	12	6	16	100	0.820	<b>6406 56 4</b>
<b>FRS 6X16 VA4401</b>	M6 x 16	16	6	16	100	0.900	<b>6406 58 0</b>
<b>FRS 6X20 VA4401</b>	M6 x 20	20	6	16	100	1.000	<b>6406 61 0</b>
<b>FRS 10X20 VA4401</b>	M10 x 20	20	10	24	50	4.000	<b>6406 87 0</b>
<b>FRS 10X20SVA4401</b>	M10 x 20	20	10	24	50	4.100	<b>6406 87 2</b>
<b>FRS 12X25 VA4401</b>	M12 x 25	25	12	30	25	6.400	<b>6406 78 5</b>

V2A Stainless steel, 1.4301 V4A Stainless steel, rust-proof 1.4401 price/100 pc.  
 Truss-head bolt with square neck including washer and hexagonal nut.



Cable routing



## Bolt tie

Type	Thread	Dimension L mm	Dimension d mm	Clamping range mm	Perm. load range, tension zone kN	Pack. pcs	Weight kg/100 pcs.	Item No.
<b>FAZ II 10/10GS V</b>	M 10	90	10	10	3.57	50	7.680	<b>3498 82 4</b>
<b>FAZ II 12/10 VA</b>	M12	103	12	10	4.76	20	10.400	<b>3498 85 9</b>

V4A Stainless steel, rust-proof 1.4401 price/100 pc.  
 Anchor bolt for fastening high loads. Matches OBO mounting systems and wall support brackets and supports.



# Rail and clamp clips

Cable routing



## Profile rails VA

Type	Version	Surface finish	Dimension b x h mm	Material thickness mm	Length mm	Bundle m	Weight kg/100 m	Item No.
<b>2060 2M VA</b>	Unperforated	Bright	20 x 8	0.75	2000	20	23.550	<b>1105 12 5</b>

V2A Stainless steel, 1.4301 Bright price/100 m  
Profile rail with 11 mm slot width.

Type	Version	Surface finish	Dimension b x h mm	Material thickness mm	Length mm	Bundle m	Weight kg/100 m	Item No.
<b>2063 L 2M VA</b>	Perforated	Bright	35 x 18	2	2000	20	108.000	<b>1112 70 9</b>

V2A Stainless steel, 1.4301 Bright price/100 m  
Profile rail with 16.5 mm slot width.

Type	Pack. m	Weight kg/100 m	Item No.
<b>2068 L 2M VA</b>	20	80.000	<b>1119 70 2</b>
<b>2068 L 6M VA</b>	6	80.000	<b>1119 72 9</b>

V2A Stainless steel, 1.4301 price/100 m  
Profile rail, perforated, slot width 16.5 mm.

Type	Version	Surface finish	Dimension b x h mm	Material thickness mm	Length mm	Bundle m	Weight kg/100 m	Item No.
<b>1268 L 1M VA</b>	Perforated	Bright	35 x 18	1.25	1000	10	71.000	<b>1104 49 8</b>
<b>1268 L 2M VA</b>	Perforated	Bright	35 x 18	1.25	2000	20	71.000	<b>1104 50 1</b>

V2A Stainless steel, 1.4301 price/100 m  
Lightweight profile rail, perforated, slot width 17 mm.

Type	Version	Surface finish	Dimension b x h mm	Material thickness mm	Length mm	Pack. m	Weight kg/100 m	Item No.
<b>CPS 4L 2M VA</b>	Perforated	Bright	40 x 22,5	2	2000	10	152.500	<b>1121 96 0</b>
<b>CPS 4L 6M VA</b>	Perforated	Bright	40 x 22,5	2	6000	1	152.500	<b>1121 90 1</b>

V2A Stainless steel, 1.4301 price/100 m  
Heavy-duty profile rail, perforated, slot width 18 mm.

Type	Version	Surface finish	Dimension b x h mm	Material thickness mm	Length mm	Pack. m	Weight kg/100 m	Item No.
<b>CPS 5 L 2M VA</b>	Perforated	Bright	50 x 30	3	2000	2	282.500	<b>1121 48 0</b>
<b>CPS 5 L 6M VA</b>	Perforated	Bright	50 x 30	3	6000	6	282.500	<b>1121 49 9</b>

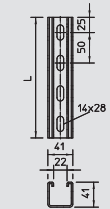
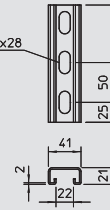
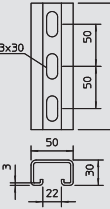
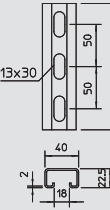
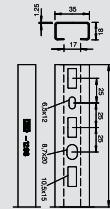
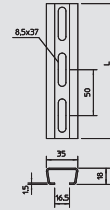
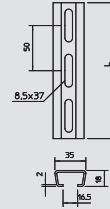
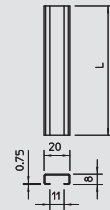
V2A Stainless steel, 1.4301 price/100 m  
Heavy-weight profile rail with continuous perforation, slot width 22 mm.

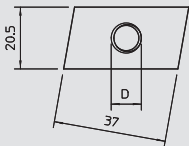
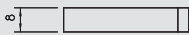
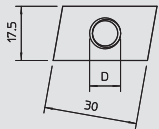
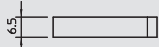
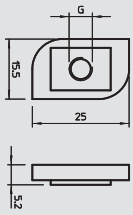
Type	Version	Surface finish	Dimension b x h mm	Material thickness mm	Length mm	Pack. m	Weight kg/100 m	Item No.
<b>MS 21 L 3M V2A</b>	Perforated	Bright	41x21	2	3000	1	201.488	<b>1122 92 8</b>
<b>MS 21 L 6M V2A</b>	Perforated	Bright	41x21	2	6000	1	201.488	<b>1122 92 9</b>

V2A Stainless steel, 1.4301 price/100 m

Type	Version	Surface finish	Dimension b x h mm	Material thickness mm	Length mm	Pack. m	Weight kg/100 m	Item No.
<b>MS 41 LS1M 2 V2A</b>	Perforated	Bright	41x41	2	1000	1	183.888	<b>1123 01 4</b>
<b>MS 41 LS3M 2 V2A</b>	Perforated	Bright	41x41	2	3000	1	183.888	<b>1123 01 6</b>
<b>MS 41 LS6M 2 V2A</b>	Perforated	Bright	41x41	2	6000	1	183.888	<b>1123 01 8</b>

V2A Stainless steel, 1.4301 price/100 m





## Slide nuts

Type	Thread	Version	Box quantity	Pack.	Weight		Item No.
					pcs	kg/100 pcs.	
<b>5017 M6 OS VA</b>	M6	No bolt	1000	100	0.985	<b>1143 12 3</b>	
<b>5017 M8 OS VA</b>	M8	No bolt	600	100	1.432	<b>1143 12 5</b>	
<b>5017 M10 OS VA</b>	M10	No bolt	600	100	1.310	<b>1143 12 7</b>	

**V4A** Stainless steel, 1.4571 price/100 pc.

Slide nut for profile rails with a slot width of 16–17 mm.  
For VS rung, mountable from above.

Type	Thread	Dimension D	Recommended load capacity	Box quantity	Pack.	Weight		Item No.
						mm	kN	
<b>GMH18 M6 VA</b>	M6	6	1.94	500	50	2.400	<b>1146 55 6</b>	
<b>GMH18 M8 VA</b>	M8	8	3.57	500	50	2.300	<b>1146 55 8</b>	
<b>GMH18 M10 VA</b>	M10	10	5.7	500	50	2.300	<b>1146 56 0</b>	
<b>GMH18 M12 VA</b>	M12	12	8.32	500	50	2.000	<b>1146 56 2</b>	

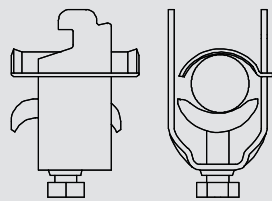
**V4A** Stainless steel, rust-proof 1.4401 price/100 pc.

Slide nut for profile rails with a slot width of 18 mm.

Type	Thread	Dimension D	Recommended load capacity	Box quantity	Pack.	Weight		Item No.
						mm	kN	
<b>GMH22 M6 VA</b>	M6	6	1.94	300	50	4.500	<b>1146 64 6</b>	
<b>GMH22 M8 VA</b>	M8	8	3.57	300	50	4.300	<b>1146 64 8</b>	
<b>GMH22 M10 VA</b>	M10	10	5.7	300	50	4.300	<b>1146 65 0</b>	
<b>GMH22 M12 VA</b>	M12	12	8.32	300	50	4.200	<b>1146 65 2</b>	

**V4A** Stainless steel, rust-proof 1.4401 price/100 pc.

Slide nut for profile rails with a slot width of 22 mm.



## Clamp clips VA

Type	Clamping range D	Dimension A	Dimension B	Dimension C	Dimension G	Dimension t	Dimension H	Dimension L	Pack.	Weight		Item No.
										mm	mm	
<b>2056N SAS 8 VA</b>	4-8	20	12	28	M6	1.5	30	32.5	100	2.900	<b>1167 00 6</b>	
<b>2056N SAS 12 VA</b>	8-12	20	16	34	M6	1.5	34	34	100	3.700	<b>1167 01 4</b>	
<b>2056N SAS 16 VA</b>	12-16	20	20	34	M6	1.5	38	34	100	4.200	<b>1167 02 2</b>	
<b>2056N SAS 22 VA</b>	16-22	20	27	34	M6	1.5	44	34	100	4.850	<b>1167 03 0</b>	
<b>2056N SAS 28 VA</b>	22-28	20	33	34	M6	2	51	34	100	6.600	<b>1167 04 9</b>	

**V2A** Stainless steel, 1.4301 price/100 pc.

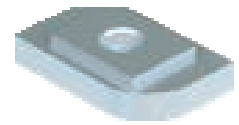
For electrical connection of the braided shield of stripped cables,  
Delivery complete with counter-trough; pressure trough and VA counter-trough.

A cable screen for protection against electromagnetic influences, can also contribute towards  
equipotential bonding as both ends are connected to the reference potential.

Type	Clamping range D	Dimension A	Dimension B	Dimension C	Dimension G	Dimension t	Dimension H	Dimension L	Pack.	Weight		Item No.
										mm	mm	
<b>2056 M 12 VA</b>	8-12	23	16	30	M6	1.5	44	32.5	50	3.200	<b>1159 71 2</b>	
<b>2056 M 16 VA</b>	12-16	23	20	30	M6	1.5	44	32.5	50	3.500	<b>1159 71 6</b>	
<b>2056 M 22 VA</b>	16-22	23	27	30	M6	1.5	60	32.5	50	4.400	<b>1159 72 2</b>	
<b>2056 M 28 VA</b>	22-28	23	33	30	M6	2	58	44	50	6.100	<b>1159 72 8</b>	
<b>2056 M 34 VA</b>	28-34	23	39	35	M8	2	66	44	50	7.700	<b>1159 73 4</b>	
<b>2056 M 40 VA</b>	34-40	23	45	35	M8	2	72	44	25	8.600	<b>1159 74 0</b>	
<b>2056 M 46 VA</b>	40-46	23	51	35	M8	2	79	44	25	9.600	<b>1159 74 6</b>	
<b>2056 M 52 VA</b>	46-52	23	57	35	M8	2	86	44	25	10.400	<b>1159 75 2</b>	
<b>2056 M 58 VA</b>	52-58	23	64	35	M8	2	93	44	15	13.100	<b>1159 75 8</b>	
<b>2056 M 64 VA</b>	58-64	23	70	35	M8	2.5	99	56	15	14.500	<b>1159 76 4</b>	
<b>2056 M 70 VA</b>	64-70	25	76	35	M8	2.5	106	56	15	16.100	<b>1159 77 0</b>	
<b>2056 M 76 VA</b>	70-76	25	82	40	M8	2.5	114	56	10	18.300	<b>1159 77 6</b>	

**V2A** Stainless steel, 1.4301 price/100 pc.

Suitable for all C profile rails with slot width 16–17 mm.  
Clip, bolt and pressure trough all made of rust-proof stainless steel.



# Rail and clamp clips



## Clamp clips VA

Type	Clamping range D mm	Dimension A mm	Dimension B mm	Dimension C mm	Dimension G mm	Dimension t mm	Dimension H mm	Dimension L mm	Pack. pcs	Weight kg/100 pcs.	Item No.
<b>2056U 12 VA</b>	8-12	20	16	34	M6	1.5	42	34	100	3.000	<b>1178 50 4</b>
<b>2056U 16 VA</b>	12-16	20	20	34	M6	1.5	46	34	100	3.200	<b>1178 51 2</b>
<b>2056U 22 VA</b>	16-22	20	27	34	M6	1.5	53	34	100	3.800	<b>1178 52 0</b>
<b>2056U 28 VA</b>	22-28	20	33	34	M6	2	59	34	100	5.350	<b>1178 53 9</b>
<b>2056U 34 VA</b>	28-34	20	39	34	M8	2	67	37.5	100	7.200	<b>1178 54 7</b>
<b>2056U 40 VA</b>	34-40	20	45	34	M8	2	73	37.5	100	8.100	<b>1178 55 5</b>
<b>2056U 46 VA</b>	40-46	20	51	40	M8	2	79	37.5	100	9.900	<b>1178 56 3</b>
<b>2056U 52 VA</b>	46-52	20	57	40	M8	2	85	38.5	100	11.200	<b>1178 57 1</b>
<b>2056U 58 VA</b>	52-58	23	64	40	M8	2.5	91	38.5	100	13.400	<b>1178 59 8</b>
<b>2056U 64 VA</b>	58-64	23	70	40	M8	2.5	97	38.5	100	14.300	<b>1178 60 1</b>
<b>2056U 70 VA</b>	64-70	23	76	40	M8	2.5	103	38.5	50	20.500	<b>1178 62 8</b>
<b>2056U 76 VA</b>	70-76	25	82	40	M8	2.5	110	45.5	25	19.100	<b>1178 63 6</b>

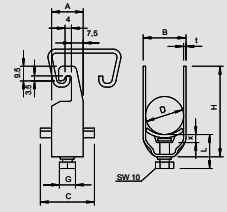
V2A Stainless steel, 1.4301

price/100 pc.

Suitable for all C profile rails with slot width 18 mm. Also suitable for flat, angular and U irons of 4–12 mm material thickness.

Stainless steel clip and bolt.

Polypropylene pressure trough, halogen-free, colour light grey RAL 7035.







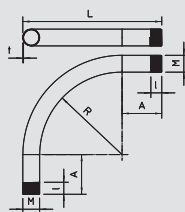
Electrical installation pipe

Type	Dimension M	Dimension L	Dimension I	Dimension t	Pack.	Weight	Item No.
		mm	mm	mm	m	kg/100 m	
<b>SM16 VA</b>	M16x1,5	3000	13	1.5	51	53.600	<b>2047 65 7</b>
<b>SM20 VA</b>	M20x1,5	3000	14	1.5	51	68.400	<b>2047 65 8</b>
<b>SM25 VA</b>	M25x1,5	3000	19	1.5	30	86.900	<b>2047 66 0</b>
<b>SM32 VA</b>	M32x1,5	3000	19	1.5	21	112.800	<b>2047 66 1</b>
<b>SM40 VA</b>	M40x1,5	3000	19	1.5	15	142.400	<b>2047 66 2</b>

V2A Stainless steel, 1.4301 price/100 m

Stainless steel electrical installation pipe with threaded ends to EN 61386 (Code: 5557) for mechanical protection of cables.

One connection sleeve is already screwed onto each pipe.



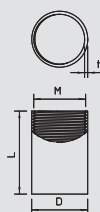
90° bend

Type	Dimension M	Dimension L	Dimension I	Dimension A	Dimension R	Dimension t	Pack.	Weight	Item No.
		mm	mm	mm	mm	mm	pcs	kg/100 pcs.	
<b>SBM16 VA</b>	M16x1,5	178	13	65	97	1.5	10	8.000	<b>2047 69 0</b>
<b>SBM20 VA</b>	M20x1,5	183	14	53	110	1.5	25	10.500	<b>2047 69 2</b>
<b>SBM25 VA</b>	M25x1,5	207	17	59	123	1.5	25	25.000	<b>2047 69 3</b>
<b>SBM32 VA</b>	M40x1,5	245	19	69	144	1.5	25	42.000	<b>2047 69 4</b>
<b>SBM40 VA</b>	M40x1,5	288	19	83	165	1.5	10	65.000	<b>2047 69 5</b>

V2A Stainless steel, 1.4301 price/100 pc.

Accessory part: 90° bend, stainless steel, for electrical installation pipes with threaded ends to EN 61386 (Code: 5557).

One connection sleeve is already screwed onto each pipe bend.

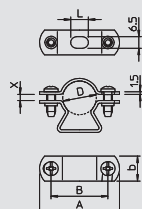


Pipe connection sleeve

Type	Dimension M	Dimension L	Dimension D	Dimension t	Pack.	Weight	Item No.
		mm	mm	mm	pcs	kg/100 pcs.	
<b>SVM16 VA</b>	M16x1,5	32	18.1	1.5	50	2.000	<b>2047 67 3</b>
<b>SVM20 VA</b>	M20x1,5	40	27.1	1.5	50	2.600	<b>2047 67 4</b>
<b>SVM25 VA</b>	M25x1,5	40	27.1	1.5	50	3.800	<b>2047 67 6</b>
<b>SVM32 VA</b>	M32x1,5	44	33.1	1.5	25	5.300	<b>2047 67 7</b>
<b>SVM40 VA</b>	M40x1,5	50	43.3	1.5	25	7.700	<b>2047 67 8</b>

V2A Stainless steel, 1.4301 price/100 pc.

Accessory part: Stainless steel pipe connection sleeve with thread to EN 61386 (Code: 5557) to connect electrical installation pipes and 90° bends.



Cable and pipe spacer clip

Type	Clamping range D	Hole size	Material thickness	Size	Bolt	Box quantity	Pack.	Weight	Item No.
	mm	mm	mm			pcs	pcs	kg/100 pcs.	
<b>733 16 VA</b>	14-16	6,5 x 10	1.5	M16	M5 x 12	500	50	2.430	<b>1362 01 1</b>
<b>733 19 VA</b>	17-19	6,5 x 10	1.5	Pg11	M5 x 16	500	50	2.800	<b>1362 03 8</b>
<b>733 21 VA</b>	19-21	6,5 x 10	1.5	M20	M5 x 16	500	50	2.740	<b>1362 04 6</b>
<b>733 23 VA</b>	21-23	6,5 x 10	1.5	Pg16	M5 x 16	500	50	2.800	<b>1362 05 4</b>
<b>733 29 VA</b>	24-29	6,5 x 10	1.5	M25	M5 x 16	450	50	3.475	<b>1362 06 2</b>
<b>733 38 VA</b>	30-38	6,5 x 10	1.5	M32	M5 x 18	250	25	4.500	<b>1362 07 0</b>
<b>733 48 VA</b>	39-48	6,5 x 10	1.5	M40	M5 x 18	300	25	5.200	<b>1362 08 9</b>
<b>733 54 VA</b>	48-54	6,5 x 14	1.5	M50	M5 x 18	300	25	5.800	<b>1362 09 7</b>
<b>733 61 VA</b>	53-61	6,5 x 14	1.5	Pg48	M5 x 18	240	20	6.800	<b>1362 10 0</b>
<b>733 63 VA</b>	63	8 x 18	2	M63	M5 x 18	160	20	6.940	<b>1362 12 7</b>

V2A Stainless steel, 1.4301 price/100 pc.

Bolt material: VA

\* Size M16 not suitable for nail device.

\* Sizes M16 to PG16 not suitable for bolt-firing tool.



# BSK fire protection duct for direct wall and ceiling mounting

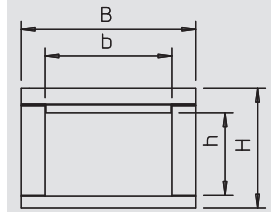


## BSK fire protection duct I 90/E 30, internal height 50 mm

Type	Dimension B mm	Dimension H mm	Dimension h mm	Dimension b mm	Length mm	Weight kg/100 m	Item No.
<b>BSK 090506</b>	120	95	50	60	1000	730.000	<b>7215 15 0</b>
<b>BSK 090511</b>	170	95	50	110	1000	940.000	<b>7215 15 4</b>
<b>BSK 090521</b>	270	95	50	210	1000	1350.000	<b>7215 15 8</b>

/m

Fire protection duct I90/I30, to DIN 4102 Part 11 and Part 12, incl. 12 x countersunk head screws and 3 x 1 m sealing strip.

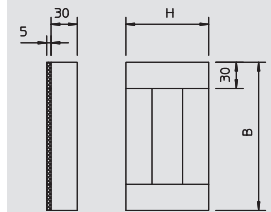


## BSK end piece I 90/E 30 for internal height 50 mm

Type	Dimension B mm	Dimension H mm	Pack. pcs	Weight kg/100 pcs.	Item No.
<b>BSK-E090506</b>	120	95	1	38.000	<b>7215 25 0</b>
<b>BSK-E090511</b>	170	95	1	51.000	<b>7215 25 2</b>
<b>BSK-E090521</b>	270	95	1	78.000	<b>7215 25 4</b>

/pc.

End piece for fire protection duct BSK I90/E30 Including bolts and sealing strip.



## BSK wall connection collar I 90 for internal height 50 mm

Type	Pack. pcs	Weight kg/100 pcs.	Item No.
<b>BSK-K0506</b>	1	40.000	<b>7215 53 3</b>
<b>BSK-K0511</b>	1	45.000	<b>7215 53 7</b>
<b>BSK-K0521</b>	1	55.000	<b>7215 54 1</b>

/pc.

Wall connection collar for BSK, consisting of three single plates, to double the insulation for wall penetrations. Incl. fastening material Only for I90 classification.

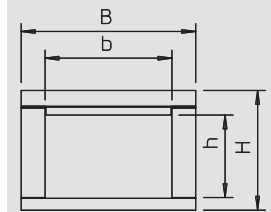


## BSK fire protection duct I 90/E 30, internal height 105 mm

Type	Dimension B mm	Dimension H mm	Dimension h mm	Dimension b mm	Length mm	Weight kg/100 m	Item No.
<b>BSK 091016</b>	220	150	105	220	1000	1430.000	<b>7215 16 2</b>
<b>BSK 091026</b>	320	150	105	260	1000	1830.000	<b>7215 16 6</b>

/m

Fire protection duct I90/I30, to DIN 4102 Part 11 and Part 12, incl. 12 x countersunk head screws and 3 x 1 m sealing strip.

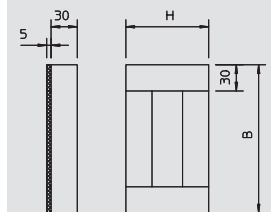


## BSK end piece I 90/E 30 for internal height 105 mm

Type	Dimension B mm	Dimension H mm	Pack. pcs	Weight kg/100 pcs.	Item No.
<b>BSK-E091016</b>	220	150	1	93.000	<b>7215 25 6</b>
<b>BSK-E091026</b>	320	150	1	131.000	<b>7215 25 8</b>

/pc.

End piece for fire protection duct BSK I90/E30 Including bolts and sealing strip.

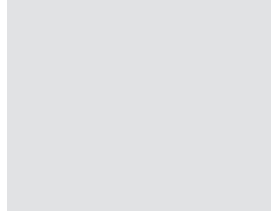


## BSK wall connection collar I 90 for internal height 105 mm

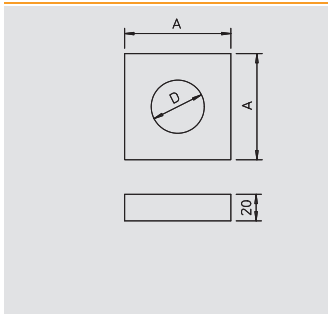
Type	Pack. pcs	Weight kg/100 pcs.	Item No.
<b>BSK-K1016</b>	1	65.000	<b>7215 54 5</b>
<b>BSK-K1026</b>	1	75.000	<b>7215 54 9</b>

/pc.

Wall connection collar for BSK, consisting of three single plates, to double the insulation for wall penetrations. Incl. fastening material Only for I90 classification.



# BSK fire protection duct for direct wall and ceiling mounting

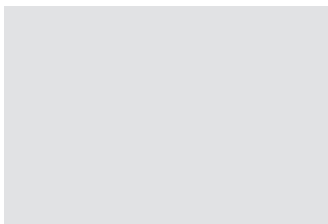


## BSK doubler I 90

Type	Dimen- sion A	Dimen- sion D	Pack. pcs	Weight kg/100 pcs.	Item No.
	mm	mm			
<b>BSK-A0908</b>	80	40	1	10.000	<b>7215 45 2</b>
<b>BSK-A0910</b>	100	60	1	14.000	<b>7215 45 8</b>

/pc.

Doubler for cable routing for BSK I90 and for BSKH I90:  
BSK-A0908 for duct heights to 95 mm,  
BSK-A0910 for duct heights from 110 mm.  
Including fastening screws.

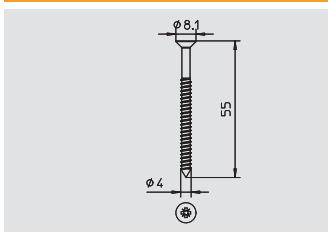


## BSK sealing strip I 90/E 30

Type	Dimen- sion	Length m	Pack. kg/100 pcs.	Item No.
	mm			
<b>BSK-D0930</b>	5 x 30	15	37.500	<b>7215 42 3</b>

/pc.

Self-adhesive sealing strip for BSK I90/E30 and BSKH I90/E30

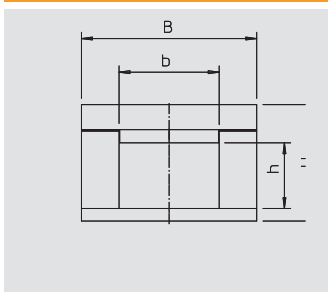


## BSK countersunk head screw I 90/E 30

Type	Dimen- sion mm	Pack. pcs	Weight kg/100 pcs.	Item No.

**ST** Steel **G** Electrogalvanised price/100 pc.

Countersunk head screw for fire protection duct I 90/E 30, for cover and doubler fastening

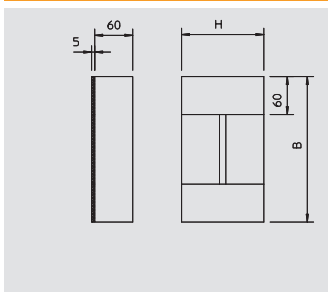


## BSK fire protection duct I 120/E 90, internal height 50 mm

Type	Dimen- sion B	Dimen- sion H	Dimen- sion b	Dimen- sion h	Length mm	Weight kg/100 m	Item No.
	mm	mm	mm	mm			
<b>BSK 120506</b>	180	130	60	50	1000	1490.000	<b>7215 21 0</b>
<b>BSK 120511</b>	230	130	50	110	1000	1800.000	<b>7215 21 6</b>
<b>BSK 120521</b>	330	130	50	210	1000	2420.000	<b>7215 22 2</b>

/m

Fire protection duct I120/E90, to DIN 4102 Part 11 and Part 12, incl. 12 x countersunk head screws and 3 x 1 m sealing strip.

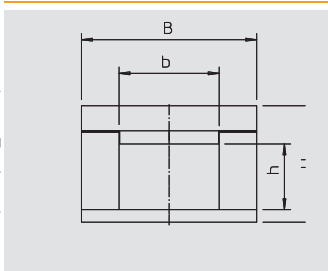


## BSK end piece I 120/E 90 for internal height 50 mm

Type	Dimen- sion B	Dimen- sion H	Pack. pcs	Item No.
	mm	mm		
<b>BSK-E120506</b>	180	130	1	<b>7215 27 0</b>
<b>BSK-E120511</b>	230	130	1	<b>7215 27 2</b>
<b>BSK-E120521</b>	330	130	1	<b>7215 27 4</b>

/pc.

End piece for fire protection duct BSK I120/E90  
Including bolts and sealing strip.

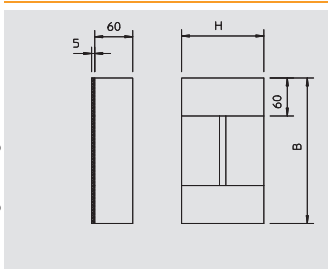


## BSK fire protection duct I 120/E 90, internal height 105 mm

Type	Dimen- sion B	Dimen- sion H	Dimen- sion b	Dimen- sion h	Length mm	Weight kg/100 m	Item No.
	mm	mm	mm	mm			
<b>BSK 121016</b>	280	185	105	160	1000	2570.000	<b>7215 22 8</b>
<b>BSK 121026</b>	380	185	105	260	1000	3190.000	<b>7215 23 4</b>

/m

Fire protection duct I120/E90, to DIN 4102 Part 11 and Part 12, incl. 12 x countersunk head screws and 3 x 1 m sealing strip.



## BSK end piece I 120/E 90 for internal height 105 mm

Type	Dimen- sion B	Dimen- sion H	Pack. pcs	Item No.
	mm	mm		
<b>BSK-E121016</b>	280	185	1	<b>7215 27 6</b>
<b>BSK-E121026</b>	380	185	1	<b>7215 27 8</b>

/pc.

End piece for fire protection duct BSK I120/E90  
Including bolts and sealing strip.



# BSK fire protection duct for direct wall and ceiling mounting

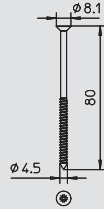


## BSK sealing strip I 120/E 90

Type	Dimension mm	Length m	Weight kg/100 pcs.	Item No.
<b>BSK-D1260</b>	5 x 60	15	74.200	<b>7215 43 2</b>

/pc.

Self-adhesive sealing strip for BSK I120/E90.



## BSK countersunk head screw I 120/E 90

Type	Dimension mm	Pack. pcs	Weight kg/100 pcs.	Item No.
<b>BSK-S1280</b>	4.5 x 80	50	0.500	<b>7215 41 2</b>

**ST** Steel **G** Electrogalvanised price/100 pc.

Countersunk head screw for BSK I120/E90, for cover fastening.

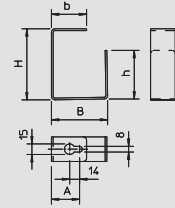


## BSK separating clamp for ceiling mounting

Type	Dimension H mm	Dimension h mm	Dimension B mm	Dimension b mm	Dimension A mm	Pack. pcs	Weight kg/100 pcs.	Item No.
<b>BSK-B0511</b>	46	18	55	37.5	36.5	25	7.500	<b>7215 35 6</b>
<b>BSK-B0521</b>	46	18	105	62.5	52.5	25	14.500	<b>7215 36 2</b>
<b>BSK-B1016</b>	101	69	80	50	40	25	19.000	<b>7215 36 8</b>
<b>BSK-B1026</b>	101	69	130	75	65	25	29.000	<b>7215 37 4</b>

**ST** Steel **FS** Strip-galvanised price/100 pc.

Separating clamp for BSK fire protection duct, as installation aid for ceiling mounting. Fastening by clamping under the fire protection bolt tie.

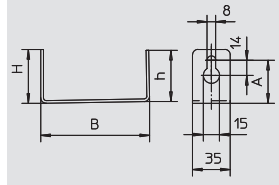


## BSK separating bracket for wall mounting

Type	Dimension B mm	Dimension H mm	Dimension h mm	Dimension A mm	Pack. pcs	Weight kg/100 pcs.	Item No.
<b>BSK-W0511</b>	46	37.5	22.5	37.5	25	5.000	<b>7215 31 2</b>
<b>BSK-W0521</b>	46	62.5	52.5	52.5	25	9.000	<b>7215 31 8</b>
<b>BSK-W1016</b>	101	50	40	40	25	12.500	<b>7215 32 4</b>
<b>BSK-W1026</b>	101	75	97.5	65	25	17.500	<b>7215 33 0</b>

**ST** Steel **FS** Strip-galvanised price/100 pc.

Separating bracket for BSK fire protection duct, as installation aid for wall mounting. Fastening by clamping under the fire protection bolt tie.



## BSK mortar

Type	Pack. pcs	Weight kg/100 pcs.	Item No.
<b>BSK-M</b>	1	350.000	<b>7215 50 0</b>

/pc.

Fire protection duct mortar, dried ready-to-use mortar in a bucket for filling joints and small cracks when mounting the fire protection ducts BSK and BSKH.

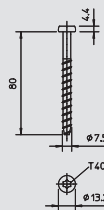


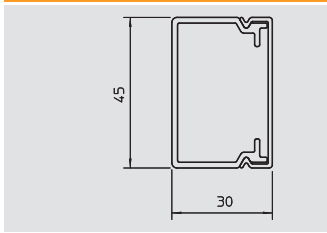
## Fire protection bolt tie

Type	Dimension mm	Pack. pcs	Weight kg/100 pcs.	Item No.
<b>MMS7.5X80</b>	7.5 x 80	50	2.174	<b>3498 27 1</b>

**ST** Steel **G** Electrogalvanised price/100 pc.

Fire protection bolt tie with pan head, drive T40, drill hole 6 mm. Fire protection tested according to DIN 4102. Fire resistance class to F90.

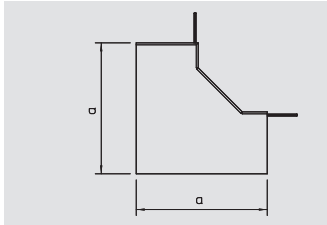




## Duct, type WDK-H 30045

Type	Colour	Length	Pack.	Weight	Item No.
		mm	m	kg/100 m	
<b>WDK-H30045</b>	Pure white	2000	32	28.000	<b>6175 00 8</b>
<b>PC/ABS</b> Polycarbonate/Acrylnitrile-butadiene-styrene					/m

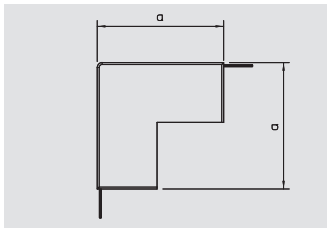
Trunking cover and base With base perforation made of halogen-free plastic.



## Internal corner hood

Type	Colour	Dimension a	Pack.	Weight	Item No.
		mm	pcs	kg/100 pcs.	
<b>WDK-HI30045</b>	Pure white	60	1	2.200	<b>6175 05 1</b>
<b>PC/ABS</b> Polycarbonate/Acrylnitrile-butadiene-styrene					/pc.

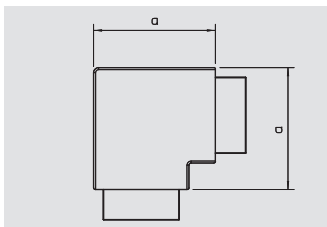
Internal corner cover for changing the direction of the halogen-free WDK-H trunking.



## External corner hood

Type	Colour	Dimension a	Pack.	Weight	Item No.
		mm	pcs	kg/100 pcs.	
<b>WDK-HA30045</b>	Pure white	60	1	2.700	<b>6175 10 3</b>
<b>PC/ABS</b> Polycarbonate/Acrylnitrile-butadiene-styrene					/pc.

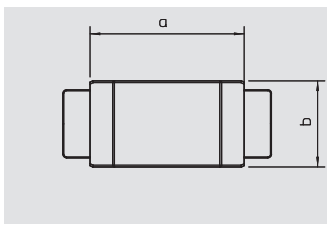
External corner cover for changing the direction of the WDK-H trunking.



## Flat angle hood

Type	Colour	Dimension a	Pack.	Weight	Item No.
		mm	pcs	kg/100 pcs.	
<b>WDK-HF30045</b>	Pure white	60	1	1.900	<b>6175 20 4</b>
<b>PC/ABS</b> Polycarbonate/Acrylnitrile-butadiene-styrene					/pc.

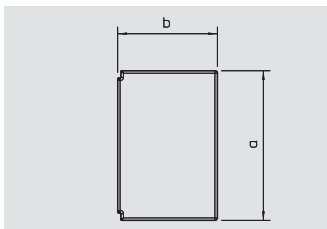
Flat angle cover for changing the direction of the halogen-free WDK-H trunking.



## T and intersection hood

Type	Colour	Dimension a	Pack.	Weight	Item No.
		mm	pcs	kg/100 pcs.	
<b>WDK-HT30045</b>	Pure white	130	1	3.300	<b>6175 25 5</b>
<b>PC/ABS</b> Polycarbonate/Acrylnitrile-butadiene-styrene					/pc.

T and intersection cover for changing the direction of the halogen-free WDK-H trunking.



## End piece

Type	Colour	Dimension a	Dimension b	Pack.	Weight	Item No.
		mm	mm	pcs	kg/100 pcs.	
<b>WDK-HE30045</b>	Pure white	45	30	1	0.800	<b>6175 15 6</b>
<b>PC/ABS</b> Polycarbonate/Acrylnitrile-butadiene-styrene					/pc.	

End piece for closing the WDK-H trunking.



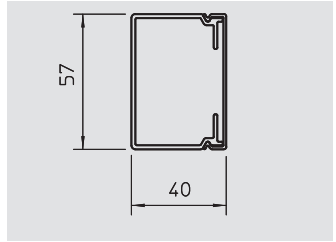
# Wall and ceiling duct



## Duct, type WDK-H 40060

Type	Colour	Length mm	Pack. m	Weight kg/100 m	Item No.
<b>WDK-H40060</b>	Pure white	2000	24	40.600	<b>6175 01 4</b>
<b>PC/ABS</b> Polycarbonate/Acrylnitrile-butadiene-styrene					/m

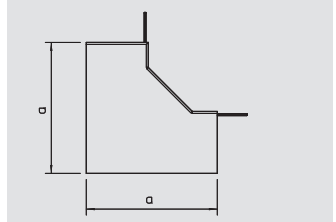
Trunking cover and base With base perforation made of halogen-free plastic including cover fixing devices.



## Internal corner hood

Type	Colour	Dimension a mm	Pack. pcs	Weight kg/100 pcs.	Item No.
<b>WDK-HI40060</b>	Pure white	85	1	4.800	<b>6175 05 7</b>
<b>PC/ABS</b> Polycarbonate/Acrylnitrile-butadiene-styrene					/pc.

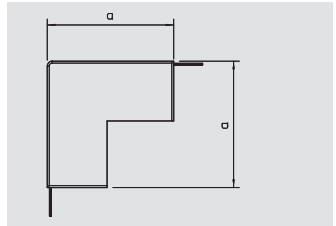
Internal corner cover for changing the direction of the halogen-free WDK-H trunking.



## External corner hood

Type	Colour	Dimension a mm	Pack. pcs	Weight kg/100 pcs.	Item No.
<b>WDK-HA40060</b>	Pure white	85	1	5.600	<b>6175 10 9</b>
<b>PC/ABS</b> Polycarbonate/Acrylnitrile-butadiene-styrene					/pc.

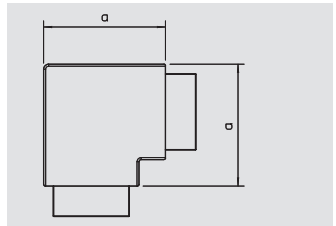
External corner cover for changing the direction of the WDK-H trunking.



## Flat angle hood

Type	Colour	Dimension a mm	Pack. pcs	Weight kg/100 pcs.	Item No.
<b>WDK-HF40060</b>	Pure white	85	1	4.400	<b>6175 21 0</b>
<b>PC/ABS</b> Polycarbonate/Acrylnitrile-butadiene-styrene					/pc.

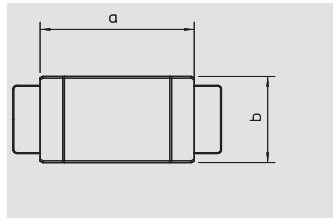
Flat angle cover for changing the direction of the halogen-free WDK-H trunking.



## T and intersection hood

Type	Colour	Dimension a mm	Dimension b mm	Pack. pcs	Weight kg/100 pcs.	Item No.
<b>WDK-HT40060</b>	Pure white	170	—	1	7.200	<b>6175 26 1</b>
<b>PC/ABS</b> Polycarbonate/Acrylnitrile-butadiene-styrene					/pc.	

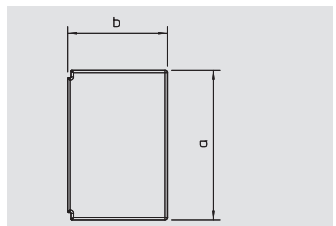
T and intersection cover for changing the direction of the halogen-free WDK-H trunking.

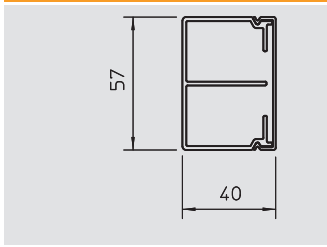


## End piece

Type	Colour	Dimension a mm	Dimension b mm	Pack. pcs	Weight kg/100 pcs.	Item No.
<b>WDK-HE40060</b>	Pure white	60	40	1	1.200	<b>6175 16 2</b>
<b>PC/ABS</b> Polycarbonate/Acrylnitrile-butadiene-styrene					/pc.	

End piece for closing the WDK-H trunking.

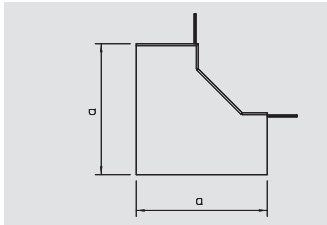




## Duct, type WDK-H 40061

Type	Colour	Length	Pack.	Weight	Item No.
		mm	m	kg/100 m	
<b>WDK-H40061</b>	Pure white	2000	24	46.700	<b>6175 02 0</b>

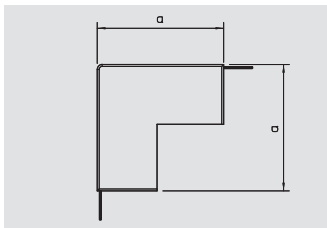
**PC/ABS** Polycarbonate/Acrylnitrile-butadiene-styrene /m  
 Trunking cover and base With base perforation made of halogen-free plastic including cover fixing devices.



## Internal corner hood

Type	Colour	Dimension a	Pack.	Weight	Item No.
		mm	pcs	kg/100 pcs.	
<b>WDK-HI40061</b>	Pure white	85	1	4.800	<b>6175 06 3</b>

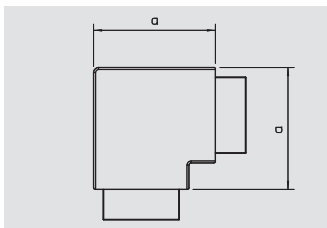
**PC/ABS** Polycarbonate/Acrylnitrile-butadiene-styrene /pc.  
 Internal corner cover for changing the direction of the halogen-free WDK-H trunking.



## External corner hood

Type	Colour	Dimension a	Pack.	Weight	Item No.
		mm	pcs	kg/100 pcs.	
<b>WDK-HA40061</b>	Pure white	85	1	5.600	<b>6175 11 5</b>

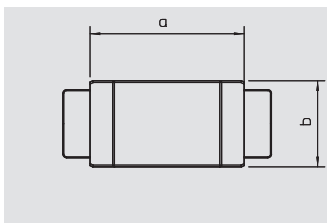
**PC/ABS** Polycarbonate/Acrylnitrile-butadiene-styrene /pc.  
 External corner cover for changing the direction of the WDK-H trunking.



## Flat angle hood

Type	Colour	Dimension a	Pack.	Weight	Item No.
		mm	pcs	kg/100 pcs.	
<b>WDK-HF40061</b>	Pure white	85	1	4.400	<b>6175 21 6</b>

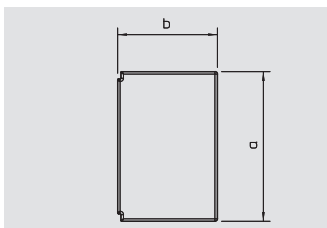
**PC/ABS** Polycarbonate/Acrylnitrile-butadiene-styrene /pc.  
 Flat angle cover for changing the direction of the halogen-free WDK-H trunking.



## T and intersection hood

Type	Colour	Dimension a	Pack.	Weight	Item No.
		mm	pcs	kg/100 pcs.	
<b>WDK-HT40061</b>	Pure white	170	1	7.200	<b>6175 26 7</b>

**PC/ABS** Polycarbonate/Acrylnitrile-butadiene-styrene /pc.  
 T and intersection cover for changing the direction of the halogen-free WDK-H trunking.



## End piece

Type	Colour	Dimension a	Dimension b	Pack.	Weight	Item No.
		mm	mm	pcs	kg/100 pcs.	
<b>WDK-HE40061</b>	Pure white	60	40	1	1.200	<b>6175 16 8</b>

**PC/ABS** Polycarbonate/Acrylnitrile-butadiene-styrene /pc.  
 End piece for closing the WDK-H trunking.



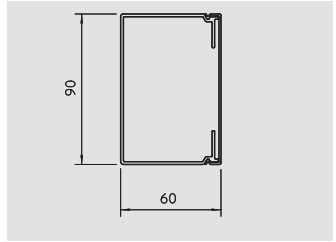
# Wall and ceiling duct



## Duct, type WDK-H 60090

Type	Colour	Length mm	Pack. m	Weight kg/100 m	Item No.
<b>WDK-H60090</b>	Pure white	2000	12	69.300	<b>6175 02 6</b>
<b>PC/ABS</b> Polycarbonate/Acrylnitrile-butadiene-styrene					/m

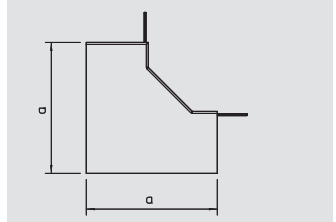
Trunking cover and base With base perforation made of halogen-free plastic including cover fixing devices.



## Internal corner hood

Type	Colour	Dimension a mm	Pack. pcs	Weight kg/100 pcs.	Item No.
<b>WDK-HI60090</b>	Pure white	130	1	9.800	<b>6175 06 9</b>
<b>PC/ABS</b> Polycarbonate/Acrylnitrile-butadiene-styrene					/pc.

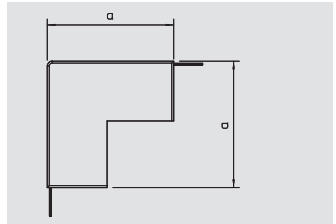
Internal corner cover for changing the direction of the halogen-free WDK-H trunking.



## External corner hood

Type	Colour	Dimension a mm	Pack. pcs	Weight kg/100 pcs.	Item No.
<b>WDK-HA60090</b>	Pure white	130	1	12.300	<b>6175 12 1</b>
<b>PC/ABS</b> Polycarbonate/Acrylnitrile-butadiene-styrene					/pc.

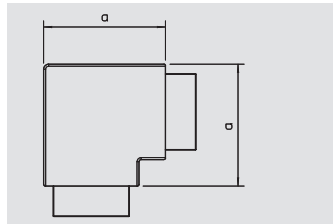
External corner cover for changing the direction of the WDK-H trunking.



## Flat angle hood

Type	Colour	Dimension a mm	Pack. pcs	Weight kg/100 pcs.	Item No.
<b>WDK-HF60090</b>	Pure white	120	1	8.400	<b>6175 22 2</b>
<b>PC/ABS</b> Polycarbonate/Acrylnitrile-butadiene-styrene					/pc.

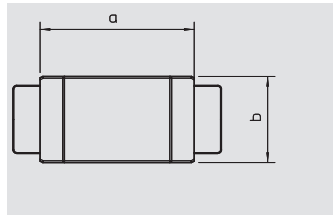
Flat angle cover for changing the direction of the halogen-free WDK-H trunking.



## T and intersection hood

Type	Colour	Dimension a mm	Pack. pcs	Weight kg/100 pcs.	Item No.
<b>WDK-HT60090</b>	Pure white	170	1	10.400	<b>6175 27 3</b>
<b>PC/ABS</b> Polycarbonate/Acrylnitrile-butadiene-styrene					/pc.

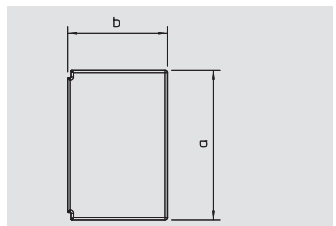
Flat angle cover for changing the direction of the halogen-free WDK-H trunking.



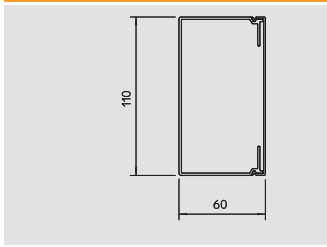
## End piece

Type	Colour	Dimension a mm	Dimension b mm	Pack. pcs	Weight kg/100 pcs.	Item No.
<b>WDK-HE60090</b>	Pure white	90	60	1	2.800	<b>6175 17 4</b>
<b>PC/ABS</b> Polycarbonate/Acrylnitrile-butadiene-styrene					/pc.	

End piece for closing the WDK-H trunking.



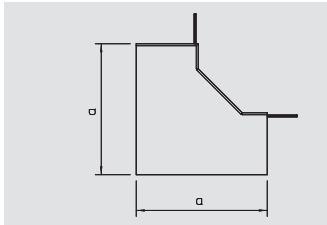




## Duct, type WDK-H 60110

Type	Colour	Length	Pack.	Weight	Item No.
		mm	m	kg/100 m	
<b>WDK-H60110</b>	Pure white	2000	24	89.600	<b>6175 03 2</b>

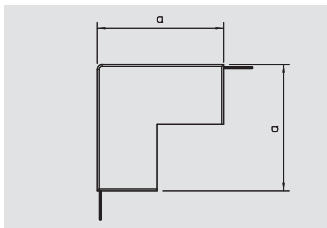
**PC/ABS** Polycarbonate/Acrylnitrile-butadiene-styrene /m  
 Trunking cover and base With base perforation made of halogen-free plastic including cover fixing devices.



## Internal corner hood

Type	Colour	Dimension a	Pack.	Weight	Item No.
		mm	pcs	kg/100 pcs.	
<b>WDK-HI60110</b>	Pure white	130	1	12.500	<b>6175 07 5</b>

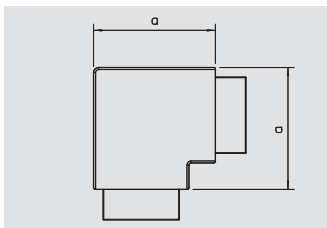
**PC/ABS** Polycarbonate/Acrylnitrile-butadiene-styrene /pc.  
 Internal corner cover for changing the direction of the halogen-free WDK-H trunking.



## External corner hood

Type	Colour	Dimension a	Pack.	Weight	Item No.
		mm	pcs	kg/100 pcs.	
<b>WDK-HA60110</b>	Pure white	130	1	14.000	<b>6175 12 7</b>

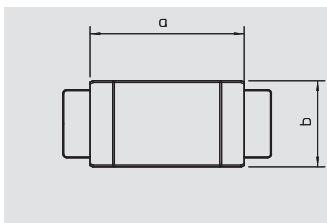
**PC/ABS** Polycarbonate/Acrylnitrile-butadiene-styrene /pc.  
 External corner cover for changing the direction of the WDK-H trunking.



## Flat angle hood

Type	Colour	Dimension a	Pack.	Weight	Item No.
		mm	pcs	kg/100 pcs.	
<b>WDK-HF60110</b>	Pure white	140	1	11.200	<b>6175 22 8</b>

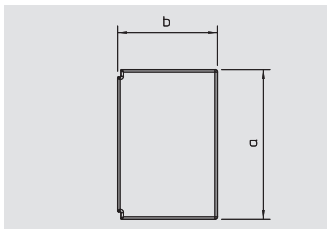
**PC/ABS** Polycarbonate/Acrylnitrile-butadiene-styrene /pc.  
 Flat angle cover for changing the direction of the halogen-free WDK-H trunking.



## T and intersection hood

Type	Colour	Dimension a	Pack.	Weight	Item No.
		mm	pcs	kg/100 pcs.	
<b>WDK-HT60110</b>	Pure white	190	1	13.800	<b>6175 27 9</b>

**PC/ABS** Polycarbonate/Acrylnitrile-butadiene-styrene /pc.  
 T and intersection cover for changing the direction of the halogen-free WDK-H trunking.



## End piece

Type	Colour	Dimension a	Dimension b	Pack.	Weight	Item No.
		mm	mm	pcs	kg/100 pcs.	
<b>WDK-HE60110</b>	Pure white	110	60	1	3.200	<b>6175 18 0</b>

**PC/ABS** Polycarbonate/Acrylnitrile-butadiene-styrene /pc.  
 End piece for closing the WDK-H trunking.

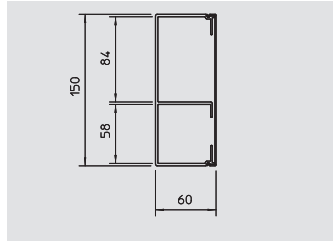


# Wall and ceiling duct



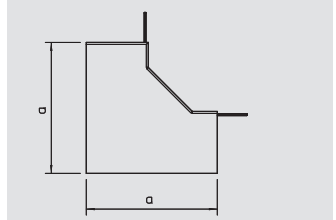
## Duct, type WDK-H 60150

Type	Colour	Length mm	Pack. m	Weight kg/100 m	Item No.
<b>WDK-H60150</b>	Pure white	2000	12	128.600	<b>6175 03 8</b>
<b>PC/ABS</b> Polycarbonate/Acrylnitrile-butadiene-styrene					/m
Trunking cover and base With base perforation made of halogen-free plastic including cover fixing devices.					



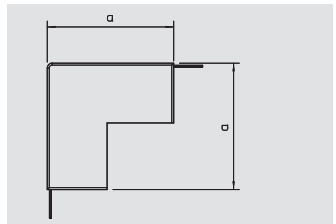
## Internal corner hood

Type	Colour	Dimension a mm	Pack. pcs	Weight kg/100 pcs.	Item No.
<b>WDK-HI60150</b>	Pure white	130	1	15.600	<b>6175 08 1</b>
<b>PC/ABS</b> Polycarbonate/Acrylnitrile-butadiene-styrene					/pc.
Internal corner cover for changing the direction of the halogen-free WDK-H trunking.					



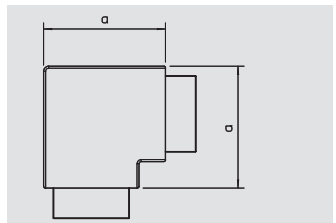
## External corner hood

Type	Colour	Dimension a mm	Pack. pcs	Weight kg/100 pcs.	Item No.
<b>WDK-HA60150</b>	Pure white	130	1	20.200	<b>6175 13 3</b>
<b>PC/ABS</b> Polycarbonate/Acrylnitrile-butadiene-styrene					/pc.
External corner cover for changing the direction of the WDK-H trunking.					



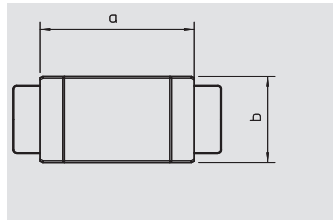
## Flat angle hood

Type	Colour	Dimension a mm	Pack. pcs	Weight kg/100 pcs.	Item No.
<b>WDK-HF60150</b>	Pure white	180	1	16.700	<b>6175 23 4</b>
<b>PC/ABS</b> Polycarbonate/Acrylnitrile-butadiene-styrene					/pc.
Flat angle cover for changing the direction of the halogen-free WDK-H trunking.					



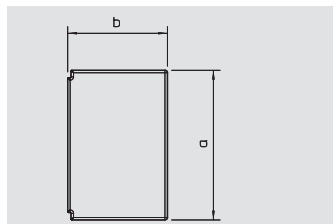
## T and intersection hood

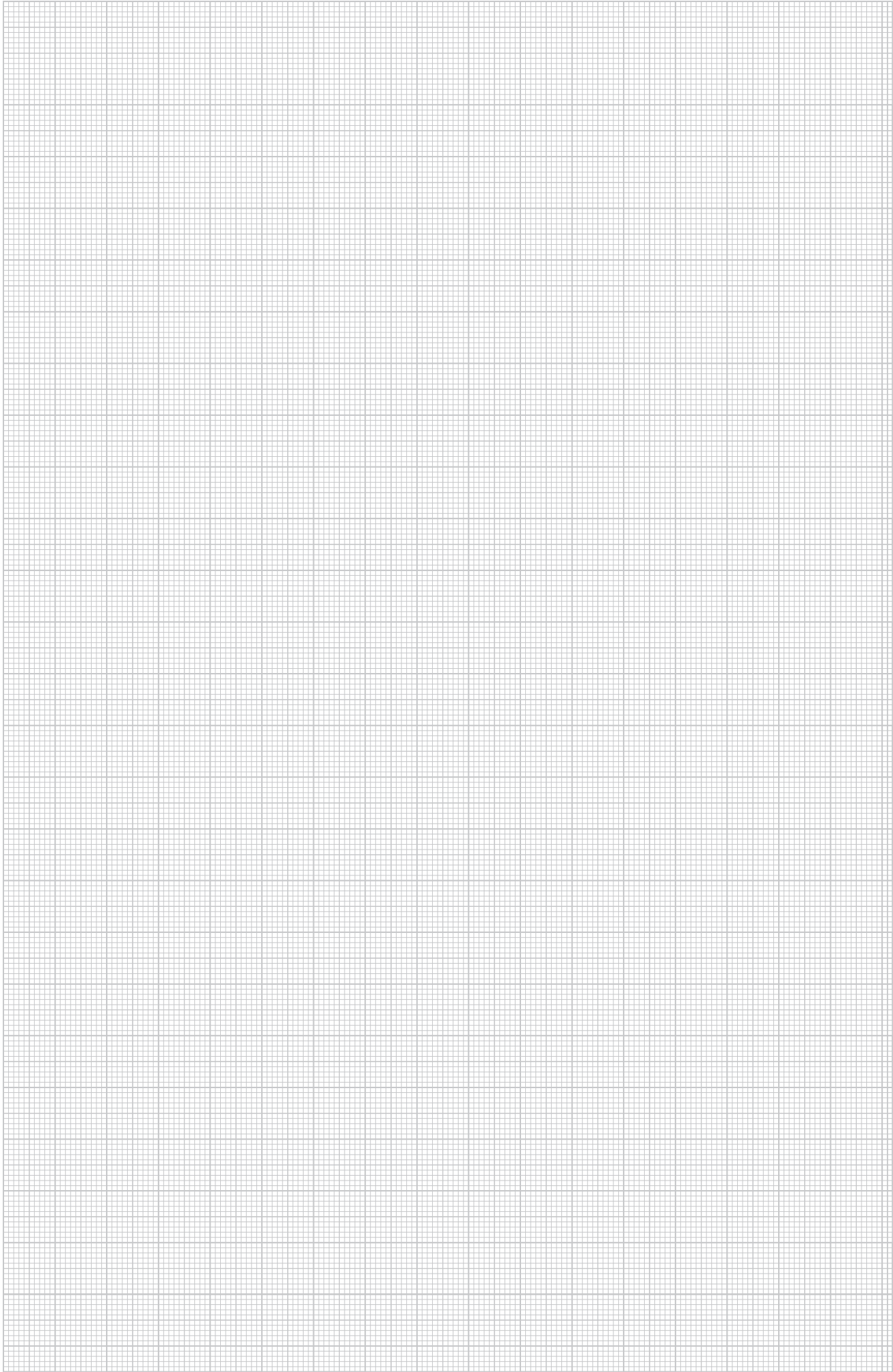
Type	Colour	Dimension a mm	Pack. pcs	Weight kg/100 pcs.	Item No.
<b>WDK-HT60150</b>	Pure white	250	1	21.700	<b>6175 28 5</b>
<b>PC/ABS</b> Polycarbonate/Acrylnitrile-butadiene-styrene					/pc.
T and intersection cover for changing the direction of the halogen-free WDK-H trunking.					

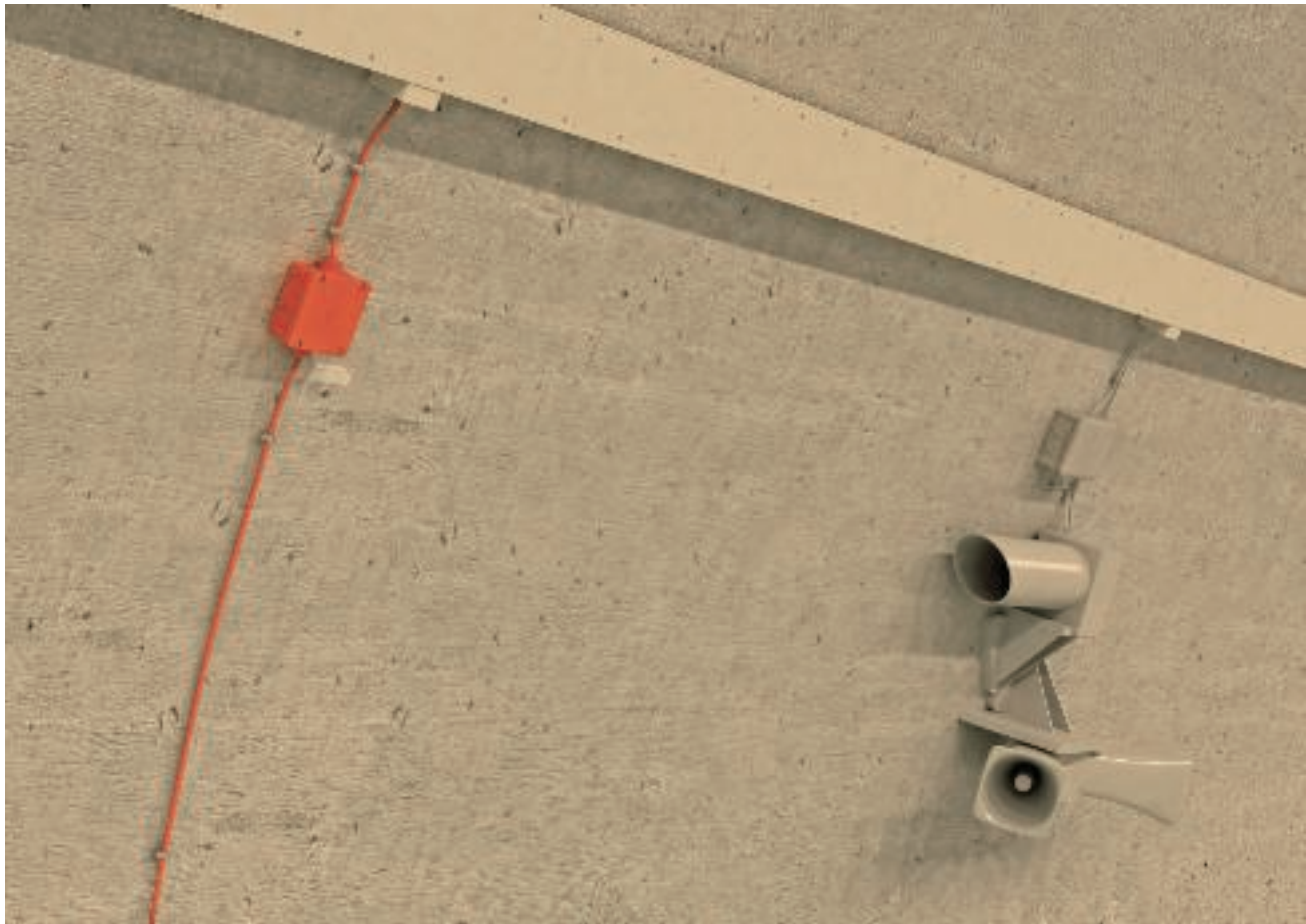


## End piece

Type	Colour	Dimension a mm	Dimension b mm	Pack. pcs	Weight kg/100 pcs.	Item No.
<b>WDK-HE60150</b>	Pure white	150	60	1	4.000	<b>6175 18 6</b>
<b>PC/ABS</b> Polycarbonate/Acrylnitrile-butadiene-styrene					/pc.	
End piece for closing the WDK-H trunking.						










### **It's all about making the right connection**

Junction boxes for classic surface mounting are used to connect cables and to distribute electrical power. The perfectly matched systems, made up of junction box, glands and terminals can offer maximum IP protection against contact and foreign bodies, as well as against the ingress of water.

### **Much more versatile**

The following pages contain a small overview of our product range for distributing and connecting cables, specifically for the requirements of tunnel construction. This selection is simply an extract from our main VBS Connection and fastening systems catalogue. This can provide you with a detailed overview of our complete product range for connection and fastening systems.

## Distributing and connecting

	Junction boxes	T series	46
	-	AQUASIT casting compound	48
	-	FireBox	49



# Junction box, T series

Distributing and connecting



## Junction box, T series

Type	Version	Entries	Colour	Box quantity pcs	Pack. pcs	Weight kg/100 pcs.	Item No.
<b>T 60 F</b>	960 °C flame-resistant	7 x M25	Light grey	60	5	12.300	<b>2007 33 9</b>
<b>T 60 RO-LGR</b>	With red cover	7 x M25	Red grey	60	5	12.300	<b>2007 63 8</b>
<b>T 60 KL</b>	With terminal strip	7 x M25	Light grey	60	5	16.700	<b>2007 43 4</b>

**PP** Polypropylene price/100 pc.

The junction boxes are made of a thermoplastic polypropylene polymer with plug-in seals made of ethylene vinyl acetate (EVA). This allows installation of cables either directly through the 7 x M25 seals, or the seals can be cut with a knife at the pre-marked points, in order to create an insertion opening for cables or pipes. Alternatively, cable glands can be pushed through the openings instead of the seals and locked with a locknut from the inside.

The junction boxes can be mounted on mounting plates in the openings on the floor using steel screws 3.5 x 9.5.

Clear internal dimensions: 100 x 100 x 48 mm

Cover with labelling panel and lead-sealed.

Type	Version	Entries	Colour	Box quantity pcs	Pack. pcs	Weight kg/100 pcs.	Item No.
<b>T 100 F</b>	960 °C flame-resistant	10 x M25	Light grey	40	1	16.270	<b>2007 34 7</b>
<b>T 100 KL</b>	With terminal strip	10 x M25	Light grey	40	1	40.000	<b>2007 43 6</b>
<b>T 100 RO-LGR</b>	With red lid	10 x M25	Red grey	40	1	16.270	<b>2007 64 4</b>

**PP** Polypropylene price/100 pc.

The junction boxes are made of a thermoplastic polypropylene polymer with plug-in seals made of ethylene vinyl acetate (EVA). This allows installation of cables either directly through the 10 x M25 seals, or the seals can be cut with a knife at the pre-marked points, in order to create an insertion opening for cables or pipes. Alternatively, cable glands can be pushed through the openings instead of the seals and locked with a locknut from the inside.

The junction boxes can be mounted on mounting plates in the openings on the floor using steel screws 3.5 x 9.5.

Clear internal dimensions: 136 x 102 x 57 mm

Cover with labelling panel and lead-sealed.

Type	Version	Entries	Colour	Box quantity pcs	Pack. pcs	Weight kg/100 pcs.	Item No.
<b>T 160 F</b>	960 °C flame-resistant	7 x M25 5 x M32	Light grey	20	1	30.000	<b>2007 35 5</b>
<b>T 160 KL</b>	With terminal strip	7 x M25 5 x M32	Light grey	20	1	64.200	<b>2007 44 0</b>
<b>T 160 RO-LGR</b>	With red lid	7 x M25 5 x M32	Red grey	20	1	30.000	<b>2007 64 9</b>

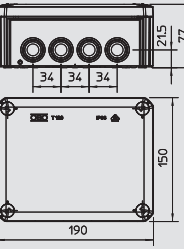
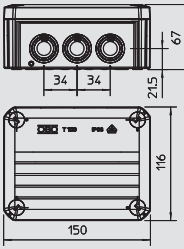
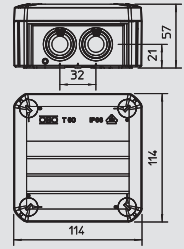
**PP/GF** Polypropylene, Glass-fibre reinforced price/100 pc.

The junction boxes are made of a thermoplastic polypropylene polymer with plug-in seals made of ethylene vinyl acetate (EVA). This allows installation of cables either directly through the 7x M25 + 5x M32 seals, or the seals can be cut with a knife at the pre-marked points, in order to create an insertion opening for cables or pipes. Alternatively, cable glands can be pushed through the openings instead of the seals and locked with a locknut from the inside.

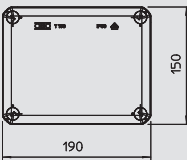
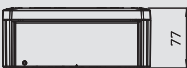
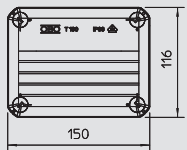
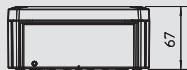
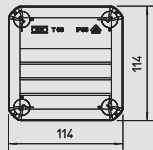
The junction boxes can be mounted on mounting plates in the openings on the floor using steel screws 3.5 x 9.5.

Clear internal dimensions: 176 x 135 x 67 mm

Cover with labelling panel and lead-sealed.



# Junction box, T series, closed



## Junction box, T series, closed

Type	Version	Entries	Colour	Box quantity pcs	Pack. pcs	Weight kg/100 pcs.	Item No.
<b>T 60 OE</b>	Closed	None	Light grey	60	5	12.000	<b>2007 23 9</b>

**PP** Polypropylene price/100 pc.

The junction boxes are made of a thermoplastic polypropylene polymer with closed side walls. This means that the required openings can be made wherever they are required. EDK plug-in seals or cable glands with locknuts can be inserted in these openings, to allow cable insertion. The junction boxes can be mounted on mounting plates in the openings on the floor using steel screws 3.5 x 9.5.

Clear internal dimensions: 100 x 100 x 46 mm

Cover with labelling panel and lead-sealed.

Type	Version	Entries	Colour	Box quantity pcs	Pack. pcs	Weight kg/100 pcs.	Item No.
<b>T 100 OE</b>	Closed	None	Light grey	40	1	16.200	<b>2007 25 5</b>

**PP** Polypropylene price/100 pc.

The junction boxes are made of a thermoplastic polypropylene polymer with closed side walls. This means that the required openings can be made wherever they are required. EDK plug-in seals or cable glands with locknuts can be inserted in these openings, to allow cable insertion. The junction boxes can be mounted on mounting plates in the openings on the floor using steel screws 3.5 x 9.5.

Clear internal dimensions: 136 x 102 x 57 mm

Cover with labelling panel and lead-sealed.

Type	Version	Entries	Colour	Box quantity pcs	Pack. pcs	Weight kg/100 pcs.	Item No.
<b>T 160 OE</b>	Closed	None	Light grey	20	1	30.000	<b>2007 27 1</b>

**PP/GF** Polypropylene, Glass-fibre reinforced price/100 pc.

The junction boxes are made of a thermoplastic polypropylene polymer with closed side walls. This means that the required openings can be made wherever they are required. EDK plug-in seals or cable glands with locknuts can be inserted in these openings, to allow cable insertion. The junction boxes can be mounted on mounting plates in the openings on the floor using steel screws 3.5 x 9.5.

Clear internal dimensions: 176 x 135 x 67 mm

Cover with labelling panel and lead-sealed.



Distributing and connecting



# AQUASIT casting compound



## AQUASIT casting compound

Type	Contents	Pack.	Weight	Item No.
	I	pcs	kg/100 pcs.	
<b>KVM</b>	0.25	1	42.000	<b>2363 01 0</b>

/pc.

Aquasit is a two-component casting compound in a cartridge for applications in areas with extremely high, continuous moisture. It can also be used for mechanical shock and vibrations. The cartridge is suitable for use in standard cartridge pistols. The unopened aluminium packaging can be stored for up to a year at room temperature. After opening the cartridge, the material must be used within 24 hours.

Aquasit properties:

Protection rating: IP68 at 1.8 bar/1,000 h

Rated voltage: 400 V

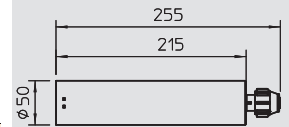
Penetration resistance: >20 kv/mm to VDE 0291 Part 2

Operating temperature: -40 to +90 °C

Processing temperature: 0 to +40 °C

Halogen-free, silicon-free, isocyanite-free

Environmentally friendly and without the need to be labelled



## Mixer tubes

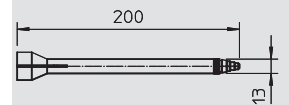


Type	Pack.	Weight	Item No.
	PU	kg/100 PUs	
<b>KVM-M</b>	1	17.000	<b>2363 01 5</b>

/VPE

10 mixer pipes in the set.

Simple, automatic mixing of OBO AQUASIT when pressing out the compound from the cartridge.



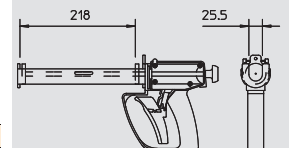
## Cartridge pistol



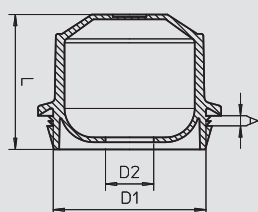
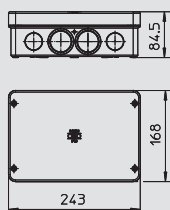
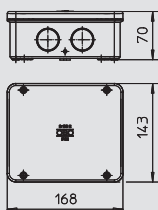
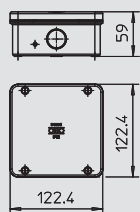
Type	Pack.	Weight	Item No.
	pcs	kg/100 pcs.	
<b>KVM-P</b>	2	100.000	<b>2363 01 9</b>

/pc.

High-quality 1-K cartridge for use with the AQUASIT cold casting compound. The cartridge pistol can also be used with normal 300 mm cartridges.







## FireBox

Type	Colour	Nominal cross section mm <sup>2</sup>	Number of terminals	Box quantity pcs	Pack. pcs	Weight kg/100 pcs.	Item No.
<b>B 100 E 4-5</b>	Pastel orange	4	5	10	1	39.700	<b>2002 57 1</b>

**UF** Duroplast, Aminoplast, type 131.5 price/100 pc.

Approved for electrical function maintenance according to DIN 4102 Part 12, function maintenance classes E 30 to E 90.

Including pre-mounted connection unit made of high temperature-resistant special ceramic with fire protection bolt ties for anchorless fastening and 4 plug-in seals M32 or M40.

Power cable nominal cross-sections: 1.5 to 16 mm<sup>2</sup>, data cable with wire Ø 0.8 mm. High protection rating IP65.

You can find details on cable types and manufacturers in the general construction testing certificate of the MPA NRW materials testing institute, Erwitte.

Number of terminals including protective conductor terminal  
Internal clearance: 108 x 108 x 51 mm

Type	Colour	Nominal cross section mm <sup>2</sup>	Number of terminals	Box quantity pcs	Pack. pcs	Weight kg/100 pcs.	Item No.
<b>B 160 E 4-7</b>	Pastel orange	6	7	10	1	0.000	<b>2002 57 5</b>
<b>B 160 E 10-5</b>	Pastel orange	10	5	10	1	65.800	<b>2002 57 8</b>

**UF** Duroplast, Aminoplast, type 131.5 price/100 pc.

Approved for electrical function maintenance according to DIN 4102 Part 12, function maintenance classes E 30 to E 90.

Including pre mounted connection unit made of high temperature-resistance special ceramic with fire protection bolt ties for anchorless fastening and 4 plug-in seals M32 or M40.

Power cable nominal cross-sections: 1.5 to 16 mm<sup>2</sup>, data cable with wire Ø 0.8 mm. High protection rating IP65.

You can find details on cable types and manufacturers in the general construction testing certificate of the MPA NRW materials testing institute, Erwitte.

Number of terminals including protective conductor terminal  
Internal clearance: 150 x 125 x 61 mm

Type	Colour	Nominal cross section mm <sup>2</sup>	Number of terminals	Box quantity pcs	Pack. pcs	Weight kg/100 pcs.	Item No.
<b>B 250 E 4-8</b>	Pastel orange	6	8	6	1	0.000	<b>2002 58 0</b>
<b>B 250 E 10-6</b>	Pastel orange	10	6	6	1	18.800	<b>2002 58 2</b>
<b>B 250 E 16-5</b>	Pastel orange	16	5	6	1	111.000	<b>2002 58 5</b>

**UF** Duroplast, Aminoplast, type 131.5 price/100 pc.

Approved for electrical function maintenance according to DIN 4102 Part 12, function maintenance classes E 30 to E 90.

Including pre-mounted connection unit made of high temperature-resistance special ceramic with fire protection bolt ties for anchorless fastening and 4 plug-in seals M32 or M40.

Power cable nominal cross-sections: 1.5 to 16 mm<sup>2</sup>, data cable with wire Ø 0.8 mm. High protection rating IP65.

You can find details on cable types and manufacturers in the general construction testing certificate of the MPA NRW materials testing institute, Erwitte.

Number of terminals including protective conductor terminal  
Internal clearance: 224 x 149 x 75 mm

Type	Size	For Ø mm	Colour	Box quantity pcs	Pack. pcs	Weight kg/100 pcs.	Item No.
<b>EDFB M32</b>	M32	8-23	Pastel orange	600	50	0.730	<b>2012 70 9</b>
<b>EDFB M40</b>	M40	11-30	Pastel orange	300	25	0.970	<b>2012 73 3</b>

**TPE** Thermoplastic elastomer price/100 pc.

Plug-in seal for the junction box, type FireBox.









To avoid failures OBO lightning and surge protection systems help to maintain the function of tunnel constructions if there are direct lightning strikes or, which is much more common, surge voltages, and thus are able to guarantee an unimpeded traffic flow and protect the power supply.

And much, much more....  
On the following pages, you will find an extract from our main catalogue, which will inform you about the various different systems for internal and external lightning and surge protection. You can find additional detailed explanations and planning aids in our TBS catalogue (Transient and lightning protection systems).

## External and internal lightning and surge protection

	External and internal surge protection	Round conductor, aluminium	52
		Interception rod, one end rounded	52
		Stand FangFix system 16 kg	52
		Screwless cable brackets	52
	Earthing and equipotential bonding	Stainless steel flat conductor	53
		Equipotential bonding rail	53
		Strip earthing clip	53
	Surge protection in energy technology	Combination arrester	54
		Lightning current and surge arrester	54
		Surge arrester	54
	Surge protection in data and video technology and MCR systems	Surge protection	56
		MCR protection	56
		Combination protection	57



# External lightning protection

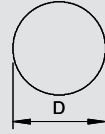


## Round conductor, aluminium

Type	Material symbol	Inter-face	Nominal size Ø	Cross-section	Normal ring	Normal ring	Weight	Item No.
			mm	mm <sup>2</sup>	ca. m	ca. kg	kg/100 m	
<b>RD 8-ALU-T</b>	Al	—	8	50	150	20	13.500	<b>5021 29 4</b>

**Al** Aluminium price/100 m

- According to DIN EN 50164-2 (VDE 0185 Part 202)
- Meets the requirements of VDE 0185-305 (IEC 62305)
- RD 8/ALU: Semi-hard (E-AlMgSi0.5 corresponds to DIN 48801)
- RD 8/ALU-T: Twistable (E-AlMgSi0.5 corresponds to DIN 48801)
- RD 10/ALU: Pure aluminium (E-Al corresponds to DIN 48801)
- AL and ALMgSi may not be routed directly on, in or under the plaster, mortar or concrete nor underground

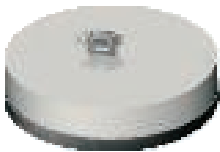


## Interception rod, one end rounded

Type	Material symbol	Length	Nominal size Ø	Pack.	Weight	Item No.
		mm	mm	pcs	kg/100 pcs.	
<b>101 ALU-2000</b>	Al	2000	16	10	109.000	<b>5401 83 6</b>

**Al** Aluminium price/100 pc.

- Ø 16 mm, Al
- For stand system with female thread M16

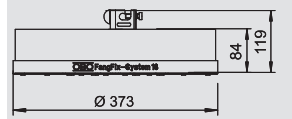


## Stand FangFix system 16 kg

Type	Pack.	Weight	Item No.
	pcs	kg/100 pcs.	
<b>F-FIX-16</b>	1	1732.500	<b>5403 20 0</b>

price/100 pc.

- System consists of FangFix stone with base and clamp
- FangFix clamp made of VA; lightning current tested with 100 kA (10/350)
- 16 kg stone of Ø 365 mm, high level of stability
- Quick and easy mounting of interception rod using anchors
- Concrete, frost-resistant
- The FangFix stone can be stacked

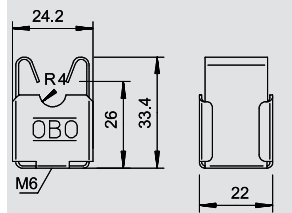


## Screwless cable brackets

Type	Fit	Installation height	Pack.	Weight	Item No.
	mm	mm	pcs	kg/100 pcs.	
<b>177 20 VA M6</b>	Rd 8	20	50	2.500	<b>5207 33 9</b>

**V2A** Stainless steel, 1.4301 price/100 pc.

- With female thread M6 or through hole Ø 5 mm
- From stainless steel (V2A)
- Version -VK: copper-plated

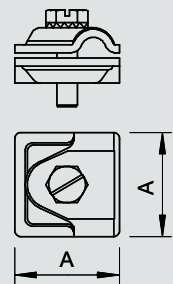


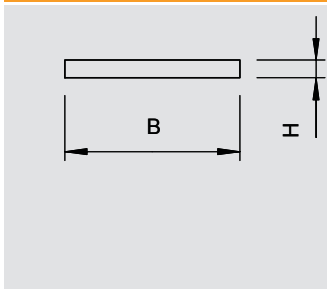
## Variable earthing connector

Type	Fit	Dimension A	Material symbol	Pack.	Weight	Item No.
	mm	mm		pcs	kg/100 pcs.	
<b>249 8-10 ALU</b>	Rd 8-10	44	Al	30	6.600	<b>5311 51 9</b>

**Al** Aluminium price/100 pc.

- For T, cross and parallel connectors
- Quick installation using hex-head screw M10 x 30, high-grade stainless steel
- Conforms to the requirements according to DIN VDE 0185-305 (IEC 62305)



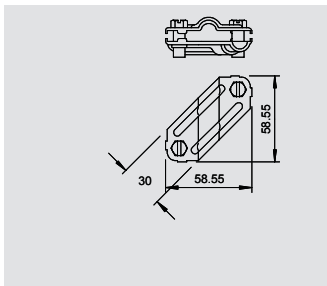


## Stainless steel flat conductor

Type	Material symbol	Inter-face	Dimension b x h mm	Cross-section mm <sup>2</sup>	Normal ring ca. m	Normal ring ca. kg	Weight kg/100 m	Item No.
<b>5052 V4A 30X3.5</b>	V4A	—	30 x 3,5	105	50	42	82.425	<b>5018 70 6</b>

V4A Stainless steel, rust-proof 1.4401 price/100 m

- According to DIN EN 50164-2 (VDE 0185 Part 202)
- Meets the requirements of VDE 0185-305 (IEC 62305)
- For use in areas at risk of corrosion
- For lightning protection, earthing systems and ring equipotential bonding

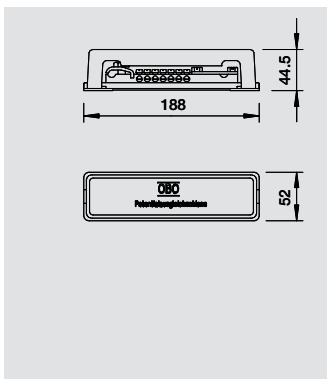


## Cross-connectors

Type	Fit mm	Material symbol	Inter-face	Pack. pcs	Weight kg/100 pcs.	Item No.
<b>250 VA</b>	Rd 8-10/FL30	V2A	—	25	10.260	<b>5312 92 2</b>

V2A Stainless steel, 1.4301 price/100 pc.

- Fit: Rd 8-10 x Rd 8-10
- Fit: Rd 8-10 x FL 30
- Fit: FL 30 x FL 30
- Installed with 2 hex-head screws M8 x 20 (F)

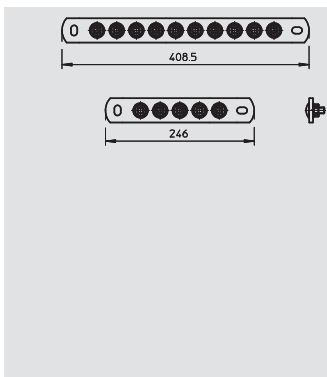


## Equipotential bonding rail for outside installation

Type	Colour	Pack. pcs	Weight kg/100 pcs.	Item No.
<b>1809 A</b>	Black	1	23.000	<b>5015 11 1</b>

V2A Stainless steel, 1.4301 /pc.

- Connection options:
- 7 single or multi-core conductors to 25 mm<sup>2</sup> or fine-core conductors to 16 mm<sup>2</sup>
  - 1 round conductor Rd 8-10
  - 1 flat strip to FL30 or round conductor Rd 8-10
  - Base plate and covering hood from polystyrene
  - Colour: black, UV-resistant
  - Screws and over-piece from VA
  - Capable of carrying lightning current 100 kA (10/350)

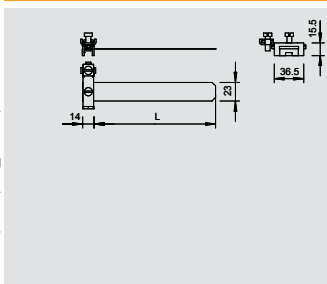


## BigBar equipotential bonding bar

Type	Material symbol	Number of connections	Width mm	Length mm	Height mm	Pack. pcs	Weight kg/100 pcs.	Item No.
<b>1802 10 VA</b>	V2A	10	40	408.5	6	1	190.000	<b>5015 86 6</b>

V2A Stainless steel, 1.4301 /pc.

- Main potential equalisation to VDE 0100 Part 410 and Part 540, and also lightning protection potential equalisation to VDE 0185-305 (IEC 62305)
- Insulation feet
- Quick, simple assembly of connection conductors to the contact rail using lock bolts M10
- The high-grade stainless steel versions (V2A) are suitable for outdoor use
- Complete with anchors and bolts for wall mounting
- With lock washer (DIN 137) for bolt locking against loosening (e.g. required in industry and Ex areas)



## Strip earthing clip

Type	for pipe Ø inch	for pipe Ø mm	Pack. pcs	Weight kg/100 pcs.	Item No.
<b>927 2</b>	3/8-4	17.2-114	10	8.550	<b>5057 52 3</b>

V2A Stainless steel, 1.4301 price/100 pc.

- For pipes of Ø 3/8 - 6"
- Connection options: Max. 2 cables 2.5-25 mm<sup>2</sup>
- Round conductor Rd 8
- Clip element, bolts and tightening strap made of rustproof stainless steel (VA)





## Combination arrester/MCD, 255 V for TN-S and TT networks

Type	Highest continuous voltage V	Version	Pack. pcs	Weight kg/100 pcs.	Item No.
<b>MCD 50-B 3+1</b>	255	3 + NPE	1	168.000	<b>5096 87 9</b>

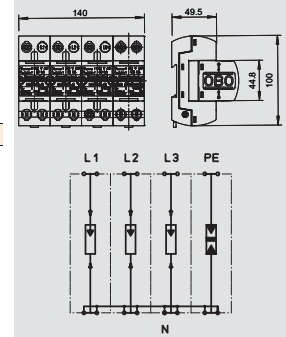
/pc.

Combination arrester, Type 1, according to DIN EN 61643-11(B according to VDE 0675 Part 6).

Completely pre-terminated and ready for connection, consisting of:  
 MCD 50-B: Coordinated lightning current arrester, Type 1 (Class B) to EN 61643-11 and MCD 125-B/NPE: Coordinated N-PE spark gap, Type 1 (Class B) to EN 61643-11 for use in TN-S and TT systems. Interface 0 to 1 according to lightning protection zone concept according to IEC 61312-1 and VDE 0185-305 (IEC62305).

- Arresting capacity 50 kA 10/350 µs per pole (L-N)
- Arresting capacity 125 kA (10/350 µs) per pole (N-PE)
- Suitable for any TN or TT system
- Conforms to VDN Directive 2nd Edition 2004
- Protection level < 1.3 kV
- Line follow current quenching 25 kA Ipeak
- Incl. plug caps for identifying the connections
- Encapsulated, non-extinguishing spark gap

Application: Lightning protection equipotential bonding in buildings with external lightning protection of Class I to IV and in standard distributor housings.



## Lightning current and surge arrester / V50, 280 V

Type	Highest continuous voltage V	Version	Pack. pcs	Weight kg/100 pcs.	Item No.
<b>V50-B+C 3+NPE</b>	280	3+NPE	1	55.000	<b>5093 65 4</b>

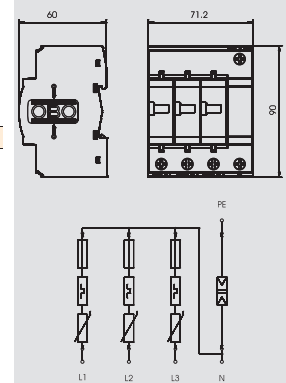
/pc.

Combination arrester set, lightning and surge arrester Type 1+2 to DIN EN 61643-11 (B+C to VDE 0675 part 6).

- For lightning protection equipotential bonding to VDE 0185-305 (IEC 62305)
- Lightning current arresting capacity 12.5 kA (10/350) per pole and 50 kA (10/350) in total
- Universally suitable for TN and TT systems
- With new Multibase base with multi-connection terminals
- Complete unit, consisting of cover and base, pre-mounted and ready for connection
- Arrester, connectable with dynamic cut-off unit
- With visual function display
- Voltage protection level < 1,3 kV
- Encapsulated, non-extinguishing zinc oxide varistor arrester for use in distributor housings
- Labelled connections

Application: Equipotential bonding in buildings, even those with external lightning protection of class III and IV, and in standard distributor housings.

\* Complete = cover and base



## Surge arrester / V20, 280 V

Type	Highest continuous voltage V	Version	Pack. pcs	Weight kg/100 pcs.	Item No.
<b>V20-C 3+NPE-280</b>	280	3 + NPE	1	41.700	<b>5094 65 6</b>

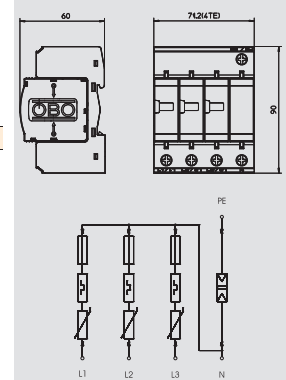
/pc.

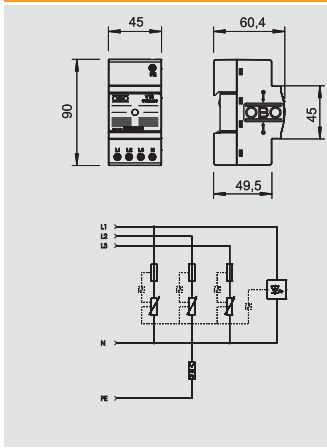
V 20-C/...: Surge protection device Type 2 (Class C) to VDE 0675 part 6-11 (DIN EN 61643-11).

- With new MultiBase base part and Multi-connection clamps
- Complete unit consisting of upper part and base, pre-mounted and ready for connection
- VDE-tested
- Suitable for TN- and TT network systems
- Plug-in upper part; upper part can be separated from base without tools
- Including thermal and dynamic separating device
- With visual display of defects
- High current conductivity and long service life
- Marked connections

Application example: residential buildings, single-family homes without outer lightning protection system.

\* Complete = cover and base





## Surge arrester / V10 Compact, 255 V

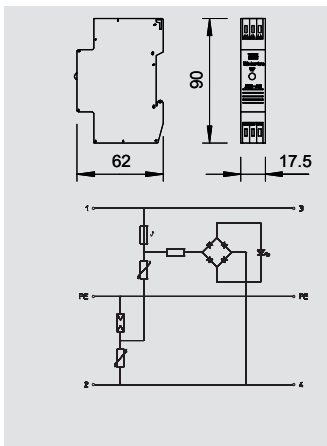
Type	Highest continuous voltage V	Version	Pack. pcs	Weight kg/100 pcs.	Item No.
<b>V10 COMPACT 255</b>	255	3 + NPE	1	15.800	<b>5093 38 0</b>

/pc.

Surge arrester, Type 2+3 to EN 61643-11 (Class C+D to VDE 0675 Parts 6-11)

- Suitable for TN and TT network systems
- Integrated 3+1 solution
- Incl. thermal and dynamic cut-off unit
- With visual function display
- High current conductivity with long lifespan
- Labelled connections
- Separation unit only 45 mm

Application: Industrial, housing and protection of rotary current systems



## Surge arrester / VF, 255 V

Type	U max AC V	U max DC V	Version	Pack. pcs	Weight kg/100 pcs.	Item No.
<b>VF230-AC/DC</b>	255	350	230 V version	1	8.000	<b>5097 64 9</b>

/pc.

Surge protection device, fine protection Type 3 to EN 61643-11 (Class D to VDE 0675, Parts 611)

- Suitable for DC and AC voltage systems
- With visual function display
- With installation-friendly, screwless connection terminals
- In a space-saving 17.5 mm grid
- Y circuit

Application: Universal use on 35 mm hat profile rail in every normal commercially available distributor housings.



# Surge protection in data and video technology and MCR systems



## Surge protection for telecommunication systems

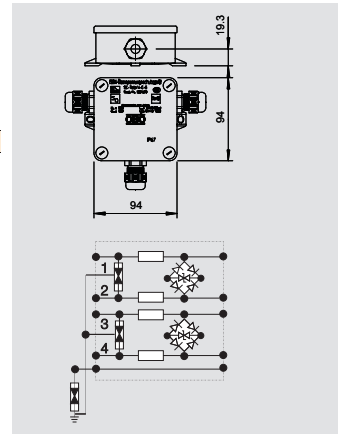
Type	Version	Connection system	Pack. pcs	Weight kg/100 pcs.	Item No.
<b>SC-TELE 4-C-G</b>	Combi protection	Terminal	1	30.000	<b>5081 68 8</b>

/pc.

Data cable protection device for telecommunication systems in insulated housing

- Suitable for any analogue, ISDN or DSL system
- Supports ADSL 2
- With two-level protective circuit
- Insulating housing to IP 54
- With screwless terminals for quick mounting
- For 2 DA systems (4 protected cores)

Application: For use at supply location on line, upstream of NT-SO or splitter interface.



## Surge protection for LSA-Plus systems

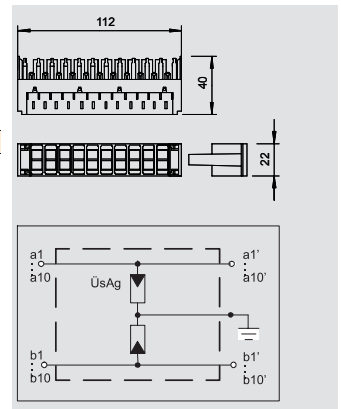
Type	Highest continuous voltage V	Pack. pcs	Weight kg/100 pcs.	Item No.
<b>LSA-B-MAG</b>	180	1	8.600	<b>5084 02 0</b>

/pc.

LSA-B-MAG: LSA basic protection magazine for use in multi-core data cable systems, MCR systems and telephone switchboards.

- Basic protection
- Fitted with 20 gas discharge protectors
- Max. voltage: 180 V

Application: Direct on LSA-Plus separation or connection bars



## MCR protection for two-core systems

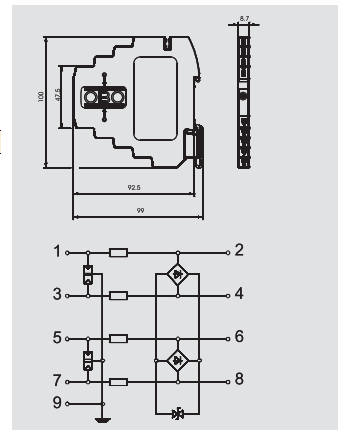
Type	Nominal voltage V	Version	Maximum continuous voltage Vc / AC	Maximum continuous voltage Vc / DC	Pack. pcs	Weight kg/100 pcs.	Item No.
<b>MDP-4 D-24-T</b>	24	4-pole	20	28	1	5.800	<b>5098 43 1</b>

/pc.

MDP.../D...T: Lightning barrier with test function

- Protection device for multi-wire systems
- Direct shield earthing
- With easy-to-mount screwless connection terminals
- Space-saving width of just 8.1 mm
- Protection circuit testable with Life Control
- High bandwidth to 100 MHz

Application: Use on 35 mm hat profile rail in any standard distribution housing.



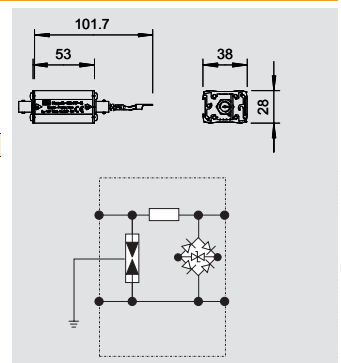
## Surge protection for coaxial systems

Type	Version	Connection system	Pack. pcs	Weight kg/100 pcs.	Item No.
<b>KOAX B-E2 MF-F</b>	Fine protection	Coax connector	1	15.000	<b>5082 42 0</b>

/pc.

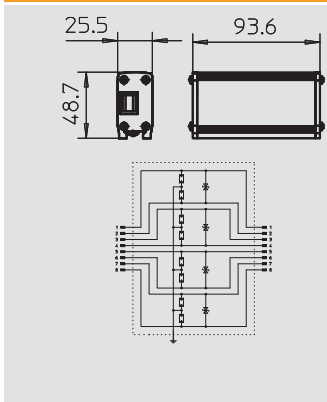
Data line protection device for coaxial Ethernet network systems.

- In aluminium housing
- BNC connector for Cheapernet, 10BASE2
- Simple installation with adapter plug
- Two-stage protection circuit
- Suitable for the protection of video signals; cameras and/or TV systems





# Surge protection in data and video technology and MCR systems



## Surge protection for network technology

Type	Version	Connection system	Pack.	Weight	Item No.
			pcs	kg/100 pcs.	
<b>ND-CAT6A/EA</b>	8-pole	RJ45	1	16.600	<b>5081 80 0</b>

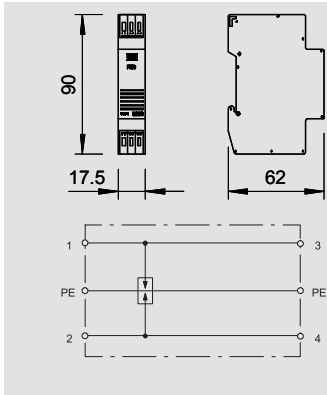


/pc.

Data cable protection devices for high-speed networks

- High-quality RJ-45 sockets
- Low protection level at high current load
- Support for Power over Ethernet + up to 1 A
- Tested transmission quality in networks up to 10 GBit (Class EA) or CAT6A
- Quick installation through connectable version

Application example: 10 GBit Ethernet, 10/100 MBit Ethernet, PoE applications



## Basic protection for dual cores

Type	U max DC V	U max AC V	Pack.	Weight	Item No.
	V	V	pcs	kg/100 pcs.	
<b>TKS-B</b>	170	120	1	7.500	<b>5097 97 5</b>

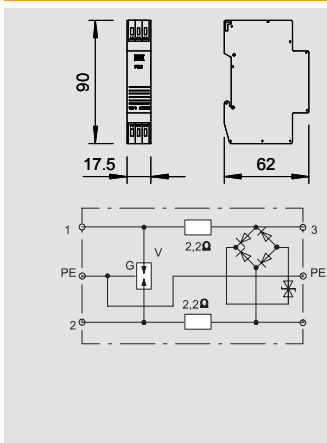


/pc.

Basic protection for use in measuring, control and regulation systems, as well as telecommunication systems

- Basic protection for lightning protection equipotential bonding
- High impulse deflection capacity 6 kA (10/350)
- With installation-friendly, screwless connection terminals
- In space-saving 17.5 mm grid

Application: Universal use on 35 mm hat profile rail in any standard distributor housings.



## Combined protection for HF applications and BUS systems

Type	U max DC V	U max AC V	Pack.	Weight	Item No.
	V	V	pcs	kg/100 pcs.	
<b>FRD 24 HF</b>	28	19.7	1	5.000	<b>5098 57 4</b>



/pc.

Surge protection for use in measuring, control and regulation systems.

- Basic, medium and fine protection
- Two-stage protection circuit with high lightning current carrying capacity
- High transmission frequency of 100 MHz
- Suitable for all bus systems (e.g. Profibus)
- With installation-friendly, screwless connection terminals
- In space-saving 17.5 mm grid

Application: Multi-purpose use on any 35 mm hat profile rail in every commercially available distribution housings.






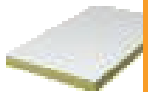
### **Perfect fire protection for any area**

OBO can offer a complete range of professional products for all application areas of fire protection systems in building installation. Tested cable insulation systems have proved the required effect in a fire test. The approvals are based on fire tests, which are carried out by official materials testing offices on the basis of DIN 4102 Part 9. In addition, we can also offer the knowledgeable advice of an experienced, competent system manufacturer.

And much, much more....

On the following pages, you will find an extract from our main catalogue, which will inform you about the various different insulation systems. You can find additional detailed explanations and planning aids in our BSS catalogue (Fire protection systems).

## Construction fire protection

	Insulation systems	HSM hard ballast	60
		FPS-P finished coating plate	61



# Insulation: HSM mortar ballast



## HSM hard ballast in a sack

Type	Contents	Pack.	Weight	Item No.
	kg	pcs	kg/100 pcs.	
<b>HSM-S</b>	20	1	2050.000	<b>7206 10 0</b>

/pc.

Wall ballast, dry mortar in a sack Free of fibres, halogens and phenols, suitable for pumping, pressing and for manual installation. Fire resistance class S120, DIBt approval Z-19.15-262



## HSM hard ballast in a bucket

Type	Contents	Pack.	Weight	Item No.
	kg	pcs	kg/100 pcs.	
<b>HSM-E1</b>	3.5	1	390.000	<b>7206 03 8</b>
<b>HSM-E2</b>	10.5	1	1130.000	<b>7206 05 4</b>

/pc.

Wall ballast, dry mortar in a bucket Free of fibres, halogens and phenols, suitable for pumping, pressing and for manual installation. Fire resistance class S120, DIBt approval Z-19.15-262



## HSM-SP filler in a cartridge

Type	Dimension	Pack.	Weight	Item No.
		pcs	kg/100 pcs.	
<b>HSM-SP</b>	310ml	20	55.000	<b>7205 10 4</b>

/pc.

Fire protection filler in cartridge to form an insulating layer, to fill residual joints for retroinstallations in the HSM hard ballast system. The fire protection must be stored so that it is protected from frost. At storage temperatures between +5 °C and +35 °C, the filler can be stored for at least six months.

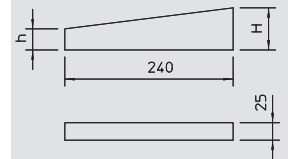


## HSM-NIK retrofit wedge

Type	Dimension	Pack.	Weight	Item No.
	mm	pcs	kg/100 pcs.	
<b>HSM-NIK 1</b>	25 x 30 x 240	1	67.000	<b>7206 20 8</b>

/pc.

Retrofit wedge set for HSM mortar ballast, for installation in the fresh hard ballast. One set consists of four wedges.

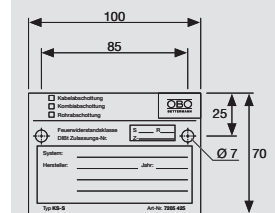


## Identification plate

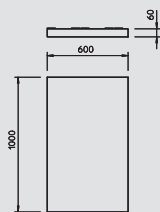
Type	Pack.	Weight	Item No.
	pcs	kg/100 pcs.	
<b>KS-S</b>	1	2.400	<b>7205 42 5</b>

/pc.

Universal identification plate to be written on for all OBO insulation. For approved identification, including two push-fit anchors.

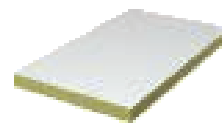


# Insulation: FPS ready-assembled panel insulation



## FPS-P finished coating plate

Type	Dimension mm	Pack. pcs	Weight kg/100 pcs.	Item No.
<b>FPS-P</b>	1,000 x 600 x 60	2	684.000	<b>7202 27 0</b>



/pc.

Mineral fibre plate, ready coated with insulation forming substance, as the basis of the FPS insulation system, fire resistance class S90, DIBt approval Z-19.15.1636.

## FPS-A coating

Type	Dimension	Pack. pcs	Weight kg/100 pcs.	Item No.
<b>FPS-A</b>	2kg	1	220.000	<b>7202 27 4</b>



/pc.

Intumescent coating for FPS ready-assembled panel insulation To coat the cables, cable support systems and the path sealing. In dry, frost-free rooms, the coating can be stored at temperatures from +5 °C to +30 °C for up to 12 months in closed original containers.

## FPS-SP filler in a cartridge

Type	Contents	Pack. pcs	Weight kg/100 pcs.	Item No.
<b>FPS-SP K</b>	0.3l	1	41.000	<b>7202 27 8</b>



/pc.

Fire protection filler in a cartridge, for filling residual joints and for retroinstallations in the FPS assembled panel insulation.  
Also approved as intumescent material for closing drill holes for individual cable penetration. Fire resistance classes F30 to F90, DIBt approval Z-19.11-1594. In dry, frost-free rooms, the filler can be stored at temperatures from +5 °C to +30 °C for up to 12 months in closed original containers.

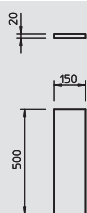
## FPS-SP filler in a bucket

Type	Dimension	Pack. pcs	Weight kg/100 pcs.	Item No.
<b>FPS-SP E</b>	5 kg	1	500.000	<b>7202 28 1</b>



/pc.

Fire protection filler in a bucket, for filling residual joints and for retroinstallations in the FPS assembled panel insulation.  
Also approved as intumescent material for closing drill holes for individual cable penetration. Fire resistance classes F30 to F90, DIBt approval Z-19.11-1594. In dry, frost-free rooms, the filler can be stored at temperatures from +5 °C to +30 °C for up to 12 months in closed original containers.



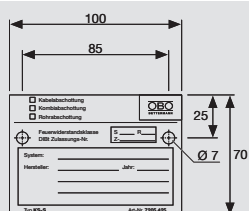
## FPS-K calcium silicate plate

Type	Dimension mm	Pack. pcs	Weight kg/100 pcs.	Item No.
<b>FPS-K</b>	500 x 150 x 20	1	42.000	<b>7202 28 2</b>



/pc.

Calcium silicate plate for FPS assembled plate insulation, for the construction of frames in the penetration or doubling for wall thicknesses of less than 15 cm. Materials class A1 – non-combustible



## Identification plate

Type	Pack. pcs	Weight kg/100 pcs.	Item No.
<b>KS-S</b>	1	2.400	<b>7205 42 5</b>








/pc.

Universal identification plate to be written on for all OBO insulation. For approved identification, including two push-fit anchors.



## Directories

	Alphabetical table of contents	64
	Numeric directory	66
	Type listing	70
	Discount groups	78
	Terms and conditions of sale and delivery	79

# Alphabetical table of contents

## 9

90° bend, 33

## A

Angle connector, 23  
AQUASIT casting compound, 48  
Articulated connector, 16, 23

## B

Basic protection for dual cores, 57  
BigBar equipotential bonding bar, 53  
Bolt tie, 14, 29  
BSK countersunk head screw I 120/E 90, 36  
BSK countersunk head screw I 90/E 30, 35  
BSK doubler I 90, 35  
BSK end piece I 120/E 90 for internal height 105 mm, 35  
BSK end piece I 120/E 90 for internal height 50 mm, 35  
BSK end piece I 90/E 30 for internal height 105 mm, 34  
BSK end piece I 90/E 30 for internal height 50 mm, 34  
BSK fire protection duct I 120/E 90, internal height 105, 35 mm  
BSK fire protection duct I 120/E 90, internal height 50, 35 mm  
BSK fire protection duct I 90/E 30, internal height 105, 34 mm  
BSK fire protection duct I 90/E 30, internal height 50, 34 mm  
BSK mortar, 36  
BSK sealing strip I 120/E 90, 36  
BSK sealing strip I 90/E 30, 35  
BSK separating bracket for wall mounting, 36  
BSK separating clamp for ceiling mounting, 36  
BSK wall connection collar I 90 for internal height 105, 34 mm  
BSK wall connection collar I 90 for internal height 50, 34 mm

## C

Cable and pipe spacer clip, 15, 33  
Cable ladder LG 60, 23  
Cable tray DKS, 14  
Cartridge pistol, 48  
Central suspension, 21  
Clamp clip, 24  
Clamp clip, single, metal pressure trough, 15  
Clamp clips VA, 31-32  
Clamping piece, 21  
Clamping piece for separating retainer fastening, 16, 20  
Combination arrester/MCD, 255 V for TN-S and TT, 54 networks  
Combined protection for HF applications and BUS, 57 systems  
Cover clamp, 22  
Cover for mounting/branch piece, 18  
Cover with sash lock, 17  
Cross-connectors, 53

## D

Duct, type WDK-H 30045, 37  
Duct, type WDK-H 40060, 38  
Duct, type WDK-H 40061, 39  
Duct, type WDK-H 60090, 40  
Duct, type WDK-H 60110, 41  
Duct, type WDK-H 60150, 42

## E

Electrical installation pipe, 33  
End piece, 37-42  
Equipotential bonding rail for outside installation, 53  
External corner hood, 37-42

## F

Fastening bracket, 24  
Fire protection bolt tie, 36  
FireBox, 49  
Flat angle hood, 37-42  
FPS-A coating, 61  
FPS-K calcium silicate plate, 61  
FPS-P finished coating plate, 61  
FPS-SP filler in a bucket, 61  
FPS-SP filler in a cartridge, 61

## G

G mesh cable tray Magic, 22

## H

Head plate, 27  
Head plate, variable, 26  
Hexagonal bolt, 26-27  
HSM hard ballast in a bucket, 60  
HSM hard ballast in a sack, 60  
HSM-NIK retrofit wedge, 60  
HSM-SP filler in a cartridge, 60

## I

Identification plate, 60-61  
Interception rod, one end rounded, 52  
Internal corner hood, 37-42

## J

Joint connector, 20  
Joint plate, 14, 17  
Junction box, T series, 46  
Junction box, T series, closed, 47

## L

Lightning current and surge arrester / V50, 280 V, 54

## M

MCR protection for two-core systems, 56  
Mesh cable tray GR-Magic®, 19  
Mixer tubes, 48  
Mounting plate, 17, 21  
Mounting/branch piece, 17

## P

Pipe connection sleeve, 33  
Profile rail, slot 16.5 mm, 15  
Profile rail, slot 17 mm, 15  
Profile rails VA, 30  
Protective cap, 23, 25-26

## Q

Quick connector, 20

## R

Reducing bracket and end closure, 17  
RKSM cable tray, 16  
Round conductor, aluminium, 52

## S

Screwless cable brackets, 52  
Separating retainer, 14, 16, 20  
Separating retainer connector, 16, 20  
Slide nuts, 31  
Spacer, 25-27  
Stainless steel flat conductor, 53  
Stand FangFix system 16 kg, 52  
Straight and angle connector, 14, 16  
Straight connector, 23  
Strip earthing clip, 53



## S

- Surge arrester / V10 Compact, 255 V, 55
- Surge arrester / V20, 280 V, 54
- Surge arrester / VF, 255 V, 55
- Surge protection for coaxial systems, 56
- Surge protection for LSA-Plus systems, 56
- Surge protection for network technology, 57
- Surge protection for telecommunication systems, 56
- Suspension clamp, 14

## T

- T and intersection hood, 37-42
- Threaded rod, 21
- Truss-head bolt, 15, 26-27, 29

## U

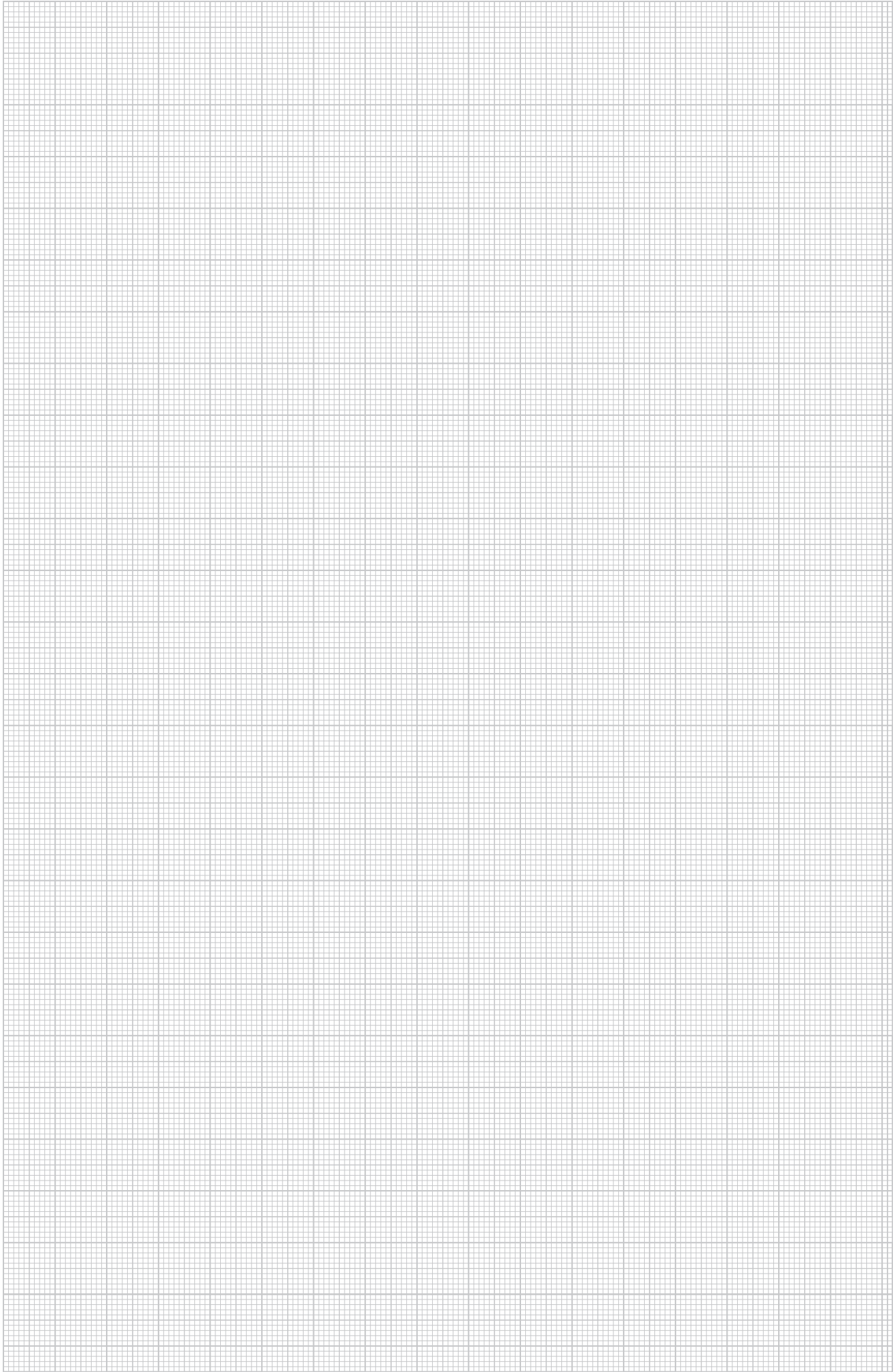
- U support connector, 25
- Unperforated cover, 22
- US 3 support, 25





# Numeric directory

EAN-C.	Art. no.	Price	Page
		/pc.	
6779116	<b>7215 45 8</b>		35
6888214	<b>7215 50 0</b>		36
6025923	<b>7215 53 3</b>		34
6026043	<b>7215 53 7</b>		34
6026166	<b>7215 54 1</b>		34
6026289	<b>7215 54 5</b>		34
6026401	<b>7215 54 9</b>		34



# Type listing

Structure of the EAN number: Country code 40

Manufacturer code 1219 (for articles beginning with 0: 1010)

Individual EAN-C 5647589

Type	Dimensions/Colour/Div.	EAN-C.	Art. no.	Price	Page	Type	Dimensions/Colour/Div.	EAN-C.	Art. no.	Price	Page
101 ALU-2000	2000 / AI	5427872	5401 83 6	price/100 pc.	52	2056 M 16 VA	12-16 23/ V2A	5668206	1159 71 6	price/100 pc.	32
177 20 VA M6	/ V2A	5404774	5207 33 9		52	2056 M 22 VA	16-22 23/ V2A	5668213	1159 72 2		15
249 8-10 ALU	44 / AI	5417736	5311 51 9		52	2056 M 22 VA	16-22 23/ V2A	5668213	1159 72 2		32
250 VA	/ V2A	5418757	5312 92 2		53	2056 M 28 VA	22-28 23/ V2A	5668220	1159 72 8		31
						2056 M 28 VA	22-28 23/ V2A	5668220	1159 72 8		32
						2056 M 34 VA	28-34 23/ V2A	5668268	1159 73 4		15
733 16 VA	14-16 6,5 x 10/ V2A	5116714	1362 01 1		15	2056 M 34 VA	28-34 23/ V2A	5668268	1159 73 4		32
733 16 VA	14-16 6,5 x 10/ V2A	5116714	1362 01 1		33	2056 M 40 VA	34-40 23/ V2A	5668275	1159 74 0		15
733 19 VA	17-19 6,5 x 10/ V2A	5116776	1362 03 8		15	2056 M 40 VA	34-40 23/ V2A	5668275	1159 74 0		32
733 19 VA	17-19 6,5 x 10/ V2A	5116776	1362 03 8		33	2056 M 46 VA	40-46 23/ V2A	5668282	1159 74 6		15
733 21 VA	19-21 6,5 x 10/ V2A	5116837	1362 04 6		15	2056 M 46 VA	40-46 23/ V2A	5668282	1159 74 6		32
733 21 VA	19-21 6,5 x 10/ V2A	5116837	1362 04 6		33	2056 M 52 VA	46-52 23/ V2A	5668299	1159 75 2		15
733 23 VA	21-23 6,5 x 10/ V2A	5116899	1362 05 4		15	2056 M 52 VA	46-52 23/ V2A	5668299	1159 75 2		32
733 23 VA	21-23 6,5 x 10/ V2A	5116899	1362 05 4		33	2056 M 58 VA	52-58 23/ V2A	5668305	1159 75 8		15
733 29 VA	24-29 6,5 x 10/ V2A	5116950	1362 06 2		15	2056 M 58 VA	52-58 23/ V2A	5668305	1159 75 8		32
733 29 VA	24-29 6,5 x 10/ V2A	5116950	1362 06 2		33	2056 M 64 VA	58-64 23/ V2A	5668312	1159 76 4		15
733 38 VA	30-38 6,5 x 10/ V2A	5117018	1362 07 0		15	2056 M 64 VA	58-64 23/ V2A	5668312	1159 76 4		32
733 38 VA	30-38 6,5 x 10/ V2A	5117018	1362 07 0		33	2056 M 70 VA	64-70 25/ V2A	5668329	1159 77 0		15
733 48 VA	39-48 6,5 x 10/ V2A	5117070	1362 08 9		15	2056 M 70 VA	64-70 25/ V2A	5668329	1159 77 0		32
733 48 VA	39-48 6,5 x 10/ V2A	5117070	1362 08 9		33	2056 M 76 VA	70-76 25/ V2A	5668336	1159 77 6		15
733 54 VA	48-54 6,5 x 14/ V2A	5117131	1362 09 7		15	2056 M 76 VA	70-76 25/ V2A	5668336	1159 77 6		32
733 54 VA	48-54 6,5 x 14/ V2A	5117131	1362 09 7		33	2056N SAS 12 VA	8-12 20/ V2A	5432432	1167 01 4		31
733 61 VA	53-61 6,5 x 14/ V2A	5117193	1362 10 0		15	2056N SAS 16 VA	12-16 20/ V2A	5432494	1167 02 2		31
733 61 VA	53-61 6,5 x 14/ V2A	5117193	1362 10 0		33	2056N SAS 22 VA	16-22 20/ V2A	5432555	1167 03 0		31
733 63 VA	63-63 8 x 18/ V2A	5117254	1362 12 7		15	2056N SAS 28 VA	22-28 20/ V2A	5432616	1167 04 9		31
733 63 VA	63-63 8 x 18/ V2A	5117254	1362 12 7		33	2056N SAS 8 VA	4-8 20/ V2A	5432371	1167 00 6		31
927 2	/ V2A	5388630	5057 52 3		53	2056U 12 VA	8-12 20/ V2A	5074595	1178 50 4		32
1268 L 1M VA	/ V2A	5627074	1104 49 8	price/100 m	15	2056U 16 VA	12-16 20/ V2A	5074656	1178 51 2		32
1268 L 1M VA	/ V2A	5627074	1104 49 8		30	2056U 22 VA	16-22 20/ V2A	5074717	1178 52 0		32
1268 L 2M VA	/ V2A	5627081	1104 50 1		15	2056U 28 VA	22-28 20/ V2A	5074779	1178 53 9		32
1268 L 2M VA	/ V2A	5627081	1104 50 1		30	2056U 34 VA	28-34 20/ V2A	5074830	1178 54 7		32
1802 10 VA	/ V2A	5002284	5015 86 6	/pc.	53	2056U 40 VA	34-40 20/ V2A	5074892	1178 55 5		32
1809 A	Black/ V2A	5959427	5015 11 1		53	2056U 46 VA	40-46 20/ V2A	5074953	1178 56 3		32
2056 12 VA	8-12 23/ V2A	5063612	1159 51 8	price/100 pc.	24	2056U 52 VA	46-52 20/ V2A	5075011	1178 57 1		32
2056 16 VA	12-16 23/ V2A	5063674	1159 52 6		24	2056U 58 VA	52-58 23/ V2A	5075073	1178 59 8		32
2056 22 VA	16-22 23/ V2A	5063735	1159 53 4		24	2056U 64 VA	58-64 23/ V2A	5075134	1178 60 1		32
2056 28 VA	22-28 23/ V2A	5063797	1159 54 2		24	2060 2M VA	/ V2A	5627098	1105 12 5	price/100 m	30
2056 34 VA	28-34 23/ V2A	5063858	1159 55 0		24	2063 L 2M VA	/ V2A	5627128	1112 70 9		30
2056 40 VA	34-40 23/ V2A	5063919	1159 56 9		24	2068 L 2M VA	/ V2A	5047650	1119 70 2		15
2056 46 VA	40-46 23/ V2A	5063971	1159 57 7		24	2068 L 2M VA	/ V2A	5047650	1119 70 2		30
2056 52 VA	46-52 23/ V2A	5064039	1159 58 5		24	2068 L 6M VA	/ V2A	5047711	1119 72 9		15
2056 58 VA	52-58 23/ V2A	5064091	1159 59 3		24	2068 L 6M VA	/ V2A	5047711	1119 72 9		30
2056 64 VA	58-64 23/ V2A	5064152	1159 60 7		24	2078 M10 VA	M10 10/ V2A	5023579	3141 31 2	price/100 pc.	21
2056 70 VA	64-70 25/ V2A	5064213	1159 61 5		24	2078 M12 VA	M12 12/ V2A	5594437	3141 31 4		21
2056 76 VA	70-76 25/ V2A	5064275	1159 62 3		24	2078 M8 VA	M8 8/ V2A	5023456	3141 31 0		21
2056 M 12 VA	8-12 23/ V2A	5668190	1159 71 2		15	5017 M10 OS VA	M10/ V4A	5086017	1143 12 7		31
2056 M 12 VA	8-12 23/ V2A	5668190	1159 71 2		32	5017 M6 OS VA	M6/ V4A	5119920	1143 12 3		31
2056 M 16 VA	12-16 23/ V2A	5668206	1159 71 6		15	5017 M8 OS VA	M8/ V4A	5085980	1143 12 5		31

12 L TB Lösungskatalog Tunnelbau / en / 01/04/2010 (LLEExport\_01022)

Type	Dimensions/Colour/Div.	EAN-C.	Art. no.	Price	Page	Type	Dimensions/Colour/Div.	EAN-C.	Art. no.	Price	Page
5052 V4A 30X3.5	/ V4A	5800477	5018 70 6	price/100 m	53	B 160 E 10-5	Pastel orange / UF	5445807	2002 57 8	price/100 pc.	49
						B 160 E 4-7	Pastel orange / UF	5738374	2002 57 5		49
AHB-T 200	280 380 / V5A / V5A	5079729	6363 88 8	/pc.	14	B 250 E 10-6	Pastel orange / UF	5738398	2002 58 2		49
AHB-T 300	380 480 / V5A / V5A	5079736	6363 89 2		14	B 250 E 16-5	Pastel orange / UF	5445845	2002 58 5		49
AHB-T 400	480 580 / V5A / V5A	5079743	6363 89 6		14	B 250 E 4-8	Pastel orange / UF	5738381	2002 58 0		49
AW 15 11 VA4301	110 50 / V2A	6207558	6421 00 8		28	BSK 090506	120 95	6024834	7215 15 0	/m	34
AW 15 11 VA4571	110 50 / V4A	6817634	6392 00 8		28	BSK 090511	170 95	6024957	7215 15 4		34
AW 15 21 VA4301	210 60 / V2A	6207619	6421 02 4		28	BSK 090521	270 95	6025077	7215 15 8		34
AW 15 21 VA4571	210 60 / V4A	6817696	6392 01 6		28	BSK 091016	220 150	6025190	7215 16 2		34
AW 15 31 VA4301	310 65 / V2A	6207671	6421 03 2		28	BSK 091026	320 150	6025312	7215 16 6		34
AW 15 31 VA4571	310 65 / V4A	6817757	6392 02 4		28	BSK 120506	180 130	6645794	7215 21 0		35
AW 15 41 VA4301	410 70 / V2A	5061953	6421 03 6		28	BSK 120511	230 130	6645855	7215 21 6		35
AW 15 41 VA4571	410 70 / V4A	6817818	6392 03 2		28	BSK 120521	330 130	6887477	7215 22 2		35
AW 15 51 VA4301	510 75 / V2A	5061960	6421 04 0		28	BSK 121016	280 185	6887538	7215 22 8		35
AW 15 61 VA4301	610 80 / V2A	5061977	6421 04 4		28	BSK 121026	380 185	6887590	7215 23 4		35
AW 15 61 VA4571	610 80 / V4A	6817931	6392 05 9		28	BSK-A0908	80 40	6779055	7215 45 2	/pc.	35
AW 30 11 VA4301	110 60 / V2A	6208937	6442 80 3		28	BSK-A0910	100 60	6779116	7215 45 8		35
AW 30 11 VA4571	110 60 / V4A	5021049	6443 61 5		28	BSK-B0511	46 18 / St / FS	6896356	7215 35 6	price/100 pc.	36
AW 30 21 VA4301	210 70 / V2A	6209057	6442 83 8		28	BSK-B0521	46 18 / St / FS	6896417	7215 36 2		36
AW 30 21 VA4571	210 70 / V4A	6349753	6443 31 1		28	BSK-B1016	101 69 / St / FS	6896479	7215 36 8		36
AW 30 31 VA4301	310 80 / V2A	6209118	6442 85 4		28	BSK-B1026	101 69 / St / FS	6896530	7215 37 4		36
AW 30 31 VA4571	310 80 / V4A	6955879	6443 62 1		28	BSK-D0930	5 x 30 15	6025558	7215 42 3	/pc.	35
AW 30 41 VA4301	410 80 / V2A	6209170	6442 87 0		28	BSK-D1260	5 x 60 15	6645978	7215 43 2		36
AW 30 41 VA4571	410 80 / V4A	6554478	6443 34 6		28	BSK-E090506	120 95	5430360	7215 25 0		34
AW 30 61 VA4301	610 100 / V2A	6209293	6442 91 9		28	BSK-E090511	170 95	5430384	7215 25 2		34
AW 30 61 VA4571	610 100 / V4A	5021100	6443 62 7		28	BSK-E090521	270 95	5430391	7215 25 4		34
AW 55 21 VA4301	210 90 / V2A	6441433	6443 06 3		28	BSK-E091016	220 150	5430407	7215 25 6		34
AW 55 31 VA4301	310 110 / V2A	6441495	6443 06 7		28	BSK-E091026	320 150	5430414	7215 25 8		34
AW 55 41 VA4301	410 130 / V2A	6617111	6443 07 1		28	BSK-E120506	180 130	5430421	7215 27 0		35
AW 55 51 VA4301	510 145 / V2A	6661091	6443 07 5		28	BSK-E120511	230 130	5430438	7215 27 2		35
AW 55 61 VA4301	610 165 / V2A	6661152	6443 07 9		28	BSK-E120521	330 130	5430445	7215 27 4		35
AW 55 71 VA4301	710 195 / V2A	6661879	6443 08 3		28	BSK-E121016	280 185	5430476	7215 27 6		35
AW30 56 VA4571	560 100 / V4A	5049722	6443 62 6		28	BSK-E121026	380 185	5430483	7215 27 8		35
AWG 15 11 VA4571	110 65 / V4A	5706304	6420 64 2		28	BSK-K0506		6025923	7215 53 3		34
AWG 15 11VA4301	110 50 / V2A	5058373	6420 62 5		28	BSK-K0511		6026043	7215 53 7		34
AWG 15 21 VA4571	210 65 / V4A	5706311	6420 64 4		28	BSK-K0521		6026166	7215 54 1		34
AWG 15 21VA4301	210 60 / V2A	5058380	6420 62 8		28	BSK-K1016		6026289	7215 54 5		34
AWG 15 31VA4301	310 65 / V2A	5058427	6420 63 1		28	BSK-K1026		6026401	7215 54 9		34
AWG 15 31VA4571	310 65 / V4A	5395362	6420 64 6		28	BSK-M		6888214	7215 50 0		36
AWG 15 41 VA4571	410 65 / V4A	5706052	6420 64 8		28	BSK-S0955	4.0 x 55 / St / G	6887651	7215 40 0	price/100 pc.	35
AWG 15 41VA4301	410 70 / V2A	5058434	6420 63 4		28	BSK-S1280	4.5 x 80 / St / G	6887774	7215 41 2		36
AWG 15 51 VA4571	510 65 / V4A	5706328	6420 65 0		28	BSK-W0511	46 37,5 / St / FS	6896110	7215 31 2		36
AWG 15 51VA4301	510 75 / V2A	5058502	6420 63 7		28	BSK-W0521	46 62,5 / St / FS	6896172	7215 31 8		36
AWG 15 61 VA4571	610 65 / V4A	5706359	6420 65 2		28	BSK-W1016	101 50 / St / FS	6896233	7215 32 4		36
AWG 15 61VA4301	610 80 / V2A	5058540	6420 64 0		28	BSK-W1026	101 75 / St / FS	6896295	7215 33 0		36
B 100 E 4-5	Pastel orange / UF	5445791	2002 57 1	price/100 pc.	49						

# Type listing

Structure of the EAN number: Country code 40

Manufacturer code 1219 (for articles beginning with 0: 1010)

Individual EAN-C 5647589

Type	Dimensions/Colour/Div.	EAN-C.	Art. no.	Price	Page	Type	Dimensions/Colour/Div.	EAN-C.	Art. no.	Price	Page
BW 60 40 VA4301	/ V2A	6014651	6019 58 7	/pc.	24	DSK 47 VA4301	25/ V2A / blk	5018346	6416 50 7	/pc.	27
						DSK 47 VA4571	25/ V4A / blk	5018407	6416 51 1		27
CPS 4L 2M VA	/ V2A	5050179	1121 96 0	price/100 m	30	EDFB M32	M32/ TPE	5651727	2012 70 9	price/100 pc.	49
CPS 4L 6M VA	/ V2A	5049999	1121 90 1		30	EDFB M40	M40/ TPE	5651734	2012 73 3		49
CPS 5 L 2M VA	/ V2A	5049272	1121 48 0		30	FAZ II 10/10GS V	M 10 90/ V4A	5692713	3498 82 4		14
CPS 5 L 6M VA	/ V2A	5049333	1121 49 9		30	FAZ II 10/10GS V	M 10 90/ V4A	5692713	3498 82 4		29
						FAZ II 12/10 VA	M12 103/ V4A	5692652	3498 85 9		29
DFAA 100 VA4301	100 1/ V2A	6257058	7136 90 0	/pc.	18	F-FIX-16		5548713	5403 20 0		52
DFAA 200 VA4301	200 1/ V2A	6257119	7136 91 9		18						
DFAA 300 VA4301	300 1/ V2A	6257171	7136 92 7		18	FPS-A		6141616	7202 27 4	/pc.	61
DFAA 400 VA4301	400 1,25/ V2A	6257232	7136 93 5		18	FPS-K	500 x 150 x 20	6141739	7202 28 2		61
DFAA 500 VA4301	500 1,25/ V2A	6257294	7136 94 3		18	FPS-P	1,000 x 600 x 60	6141555	7202 27 0		61
DFAA 600 VA4301	600 1,25/ V2A	6257355	7136 97 8		18	FPS-SP E		5466970	7202 28 1		61
DKS 610 VA4301	100 0,8/ V2A	6070459	6085 60 1	/m	14	FPS-SP K		6141678	7202 27 8		61
DKS 610 VA4571	100 0,8/ V4A	6181933	6085 66 8		14						
DKS 620 VA4301	200 0,8/ V2A	6070510	6085 62 8		14	FRD 24 HF	28 19,7	5814993	5098 57 4		57
DKS 620 VA4571	200 0,8/ V4A	6343218	6085 67 2		14						
DKS 630 VA4301	300 0,8/ V2A	6070572	6085 63 6		14						
DKS 630 VA4571	300 1/ V4A	6955510	6085 67 3		14	FRS 10X20 VA4301	M10 x 20 20/ V2A	6200894	6406 86 6	price/100 pc.	29
						FRS 10X20 VA4401	M10 x 20 20/ V4A	6822072	6406 87 0		29
						FRS 10X20SVA4401	M10 x 20 20/ V4A	6437894	6406 87 2		29
DKU 120 VA4310	/ V2A	6617050	6065 61 0	price/100 pc.	22	FRS 10X25 VA4301	M10 x 25 25/ V2A	6200474	6406 71 8		26
						FRS 10X25 VA4301	M10 x 25 25/ V2A	6200474	6406 71 8		27
DKU 60 VA4310	/ V2A	6441372	6065 60 0		22	FRS 10X25 VA4301	M10 x 25 25/ V2A	6200474	6406 71 8		29
						FRS 10X30 VA4301	M10 x 30 30/ V2A	6200535	6406 72 6		29
DRL 100 VA4301	100 1/ V2A	6058877	6052 87 8	/m	17	FRS 12X25 VA4301	M12 x 25 25/ V2A	6200597	6406 75 0		29
DRL 200 VA4301	200 1/ V2A	6058938	6052 89 4		17	FRS 12X25 VA4401	M12 x 25 25/ V4A	6064328	6406 78 5		29
DRL 300 VA4301	300 1/ V2A	6058990	6052 90 8		17	FRS 12X30 VA4301	M12 x 30 30/ V2A	6200658	6406 76 9		29
DRL 400 VA4301	400 1/ V2A	6059058	6052 93 2		17	FRS 6X12 VA4401	M6 x 12 12/ V4A	6291311	6406 56 4		29
DRL 500 VA4301	500 1,25/ V2A	6059119	6052 95 9		17	FRS 6X16 VA4401	M6 x 16 16/ V4A	6817573	6406 58 0		29
DRL 600 VA4301	600 1,25/ V2A	6059171	6052 97 5		17	FRS 6X20 VA4401	M6 x 20 20/ V4A	6603077	6406 61 0		29
DRLU 050 VA4301	50 1/ V2A	6031818	6052 82 1		22	FRS 8X16 VA4301	M8 x 16 16/ V2A	6200412	6406 69 6		29
DRLU 100 VA4301	100 1/ V2A	6031931	6052 82 4		22	FRS 8X20 VA4301	M8 x 20 20/ V2A	6200719	6406 80 7		29
DRLU 100 VA4571	100 1/ V4A	5021124	6052 99 1		22	FRS 8X25 VA4301	M8 x 25 25/ V2A	6200771	6406 81 5		29
DRLU 150 VA4301	150 1/ V2A	6031993	6052 82 8		22	FRS 8X35 VA4301	M8 x 35 35/ V2A	6200832	6406 82 3		29
DRLU 200 VA4301	200 1/ V2A	6032051	6052 83 1		22	FRSB 6X12 VA4301	M6 x 12/ V2A	6077595	6406 13 8		15
DRLU 200 VA4571	200 1/ V4A	5021155	6052 99 3		22	FRSB 6X12 VA4301	M6 x 12 12/ V2A	6200238	6406 52 1		29
DRLU 300 VA4301	300 1/ V2A	6032174	6052 83 4		22	FRSB 6X12 VA4401	M6 x 12 12/ V4A	6078370	6406 14 2		15
DRLU 300 VA4571	300 1/ V4A	5021162	6052 99 4		22	FRSB 6X16 VA4301	M6 x 16/ V2A	6077717	6406 18 9		15
DRLU 400 VA4301	400 1/ V2A	6032235	6052 83 7		22	FRSB 6X16 VA4301	M6 x 16 15/ V2A	6200290	6406 55 6		29
DRLU 400 VA4571	400 1/ V4A	5021216	6052 99 5		22	FRSB 6X16 VA4401	M6 x 16 16/ V4A	6078431	6406 19 3		15
DRLU 500 VA4301	500 1,25/ V2A	6032297	6052 84 1		22	FRSB 6X20 VA4301	M6 x 20 20/ V2A	6200351	6406 60 2		29
DRLU 500 VA4571	500 1,25/ V4A	5021223	6052 99 6		22					/m	
DRLU 600 VA4301	600 1,25/ V2A	6032358	6052 84 4		22	G-GRM 125 75 VA	75 125/ V2A	5686491	6005 55 6		22
DRLU 600 VA4571	600 1,25/ V4A	5021247	6052 99 8		22	G-GRM 150 100 VA	100 155/ V2A	5686507	6005 55 9		22
DSK 25 VA4301	25/ V2A	5706045	6416 44 8	/pc.	25	G-GRM 50 50 VA	55 55/ V2A	5686477	6005 55 0		22
DSK 25 VA4571	25/ V4A	5618485	6416 45 0		26	G-GRM 75 50 VA	53 73/ V2A	5686484	6005 55 3		22
DSK 45 VA4301	25/ V2A	6202751	6416 48 9		27						
DSK 45 VA4571	25/ V4A	6818235	6416 46 2		27						

12 L TB Lösungskatalog Tunnelbau / en / 01/04/2010 (LLEExport\_01022)



Type	Dimensions/Colour/Div.	EAN-C.	Art. no.	Price	Page	Type	Dimensions/Colour/Div.	EAN-C.	Art. no.	Price	Page
GKB 34 VA	/ V2A	5694069	6016 67 6	/pc.	21	GSV 34 VA4301	/ V2A	6013210	6016 64 2	/pc.	20
GKS 34 VA4301	/ V2A	6013456	6016 83 9		21	GSV 34 VA4401	/ V4A	6120079	6016 64 8		20
GKS 34 VA4401 SP	/ V4A	6120437	6016 85 9		21	HSM-E1		6263899	7206 03 8		60
GMH18 M10 VA	M10 10-10 / V4A	5084907	1146 56 0	price/100 pc.	31	HSM-E2		6263950	7206 05 4		60
GMH18 M12 VA	M12 12-12 / V4A	5084167	1146 56 2		31	HSM-NIK 1	25 x 30 x 240	6264131	7206 20 8		60
GMH18 M6 VA	M6 6-6 / V4A	5084129	1146 55 6		31	HSM-S		6264070	7206 10 0		60
GMH18 M8 VA	M8 8-8 / V4A	5084150	1146 55 8		31	HSM-SP		6263653	7205 10 4		60
GMH22 M10 VA	M10 10-10 / V4A	5084211	1146 65 0		31	K12 1818 VA4301	/ V2A	6013036	6016 42 1		21
GMH22 M12 VA	M12 12-12 / V4A	5084228	1146 65 2		31	KOAX B-E2 MF-F		5684855	5082 42 0		56
GMH22 M6 VA	M6 6-6 / V4A	5084174	1146 64 6		31						
GMH22 M8 VA	M8 8-8 / V4A	5084181	1146 64 8		31						
GMS 170 VA4401	170 / V4A	6952090	6015 41 8	/pc.	21	KS GR VA4310	/ V2A	5694625	6062 28 2	price/100 pc.	20
GMS 270 VA4401	270 / V4A	6952151	6015 41 9		21	KS KR VA4310	/ V2A	5694618	6062 28 0		16
GMS 370 VA4401	370 / V4A	6952212	6015 42 0		21	KS-S		5448259	7205 42 5	/pc.	60
GMS 470 VA4401	470 / V4A	6952274	6015 42 1		21	KS-S		5448259	7205 42 5		61
GMS 570 VA4401	570 / V4A	6952335	6015 42 2		21						
GRM 35 100VA4301	100 3,9 / V2A	5467700	6000 05 5	/m	19	KU 3 V VA4301	/ V2A	5706038	6348 88 4		26
GRM 35 100VA4401	100 3,9 / V4A	5360759	6000 08 7		19	KU 3 V VA4571	/ V4A	5395393	6348 88 5		26
GRM 35 150VA4301	150 3,9 / V2A	5467731	6000 05 6		19	KU 5 V VA4301	/ V2A	5018360	6348 92 5		27
GRM 35 150VA4401	150 3,9 / V4A	5360766	6000 08 9		19	KU 5 V VA4571	/ V4A	5018452	6348 92 7		27
GRM 35 200VA4301	200 3,9 / V2A	5470724	6000 05 7		19	KVM		5577768	2363 01 0		48
GRM 35 200VA4401	200 3,9 / V4A	5360773	6000 09 0		19						
GRM 35 300VA4301	300 4,8 / V2A	5470731	6000 05 9		19	KVM-M		5686354	2363 01 5	/VPE	48
GRM 35 300VA4401	300 4,8 / V4A	5360780	6000 09 1		19						
GRM 35 50VA4301	50 3,9 / V2A	5650591	6000 05 4		19	KVM-P		5687771	2363 01 9	/pc.	48
GRM 55 100VA4301	100 3,9 / V2A	6101290	6001 07 2		19						
GRM 55 100VA4401	100 3,9 / V4A	5166016	6001 08 8		19					/m	
GRM 55 150VA4301	150 3,9 / V2A	6101351	6001 07 4		19	LG 620 VS VA4301	200 1,5 / V2A	5064411	6208 70 0		23
GRM 55 150VA4401	150 3,9 / V4A	5166023	6001 09 0		19	LG 620 VS VA4571	200 1,5 / V4A	6159314	6101 20 0		23
GRM 55 200VA4301	200 3,9 / V2A	6101412	6001 07 6		19	LG 630 VS VA4301	300 1,5 / V2A	5064428	6208 70 3		23
GRM 55 200VA4401	200 3,9 / V4A	5166061	6001 09 1		19	LG 630 VS VA4571	300 1,5 / V4A	6514038	6101 20 8		23
GRM 55 300VA4301	300 4,8 / V2A	6101771	6001 07 8		19	LG 640 VS VA4301	400 1,5 / V2A	5064435	6208 70 6		23
GRM 55 300VA4401	300 4,8 / V4A	5166078	6001 09 3		19	LG 640 VS VA4571	400 1,5 / V4A	5022114	6101 21 6		23
GRM 55 400VA4301	400 4,8 / V2A	6102198	6001 08 0		19	LG 650 VS VA4301	500 1,5 / V2A	5064442	6208 70 9		23
GRM 55 400VA4401	400 4,8 / V4A	5166085	6001 09 5		19	LG 650 VS VA4571	500 1,5 / V4A	5022121	6101 22 3		23
GRM 55 500VA4301	500 4,8 / V2A	6102259	6001 08 2		19	LG 660 VS VA4301	600 1,5 / V2A	5064473	6208 71 2		23
GRM 55 500VA4401	500 4,8 / V4A	5166122	6001 09 7		19	LG 660 VS VA4571	600 1,5 / V4A	6524952	6101 23 2		23
GRM 55 50VA4301	50 3,9 / V2A	5430933	6001 07 0		19						
GRM 55 50VA4401	50 3,9 / V4A	5431046	6001 08 7		19					/pc.	
GRM 55 600VA4301	600 4,8 / V2A	6102310	6001 08 5		19	LGVG 60 VA4301	60 / V2A	5065647	6208 94 7		23
GRM 55 600VA4401	600 4,8 / V4A	5166139	6001 09 9		19	LGVG 60 VA4571	60 / V4A	5046370	6208 93 2		23
GRM105 100VA4301	100 3,9 / V2A	5149620	6002 45 1		19	LSA-B-MAG		5525318	5084 02 0		56
GRM105 200VA4301	200 4,8 / V2A	5149637	6002 45 7		19						
GRM105 300VA4301	300 4,8 / V2A	5149644	6002 46 0		19	LVG 60 VA4301	60 / V2A	5065579	6208 84 6		23
GRM105 400VA4301	400 4,8 / V2A	5149675	6002 46 3		19	LVG 60 VA4571	60 / V4A	6666799	6208 83 5		23
GRM105 500VA4301	500 4,8 / V2A	5149682	6002 46 6		19	LWVG 60 VA4301	60 / V2A	5065616	6208 89 8		23
					19	LWVG 60 VA4571	60-60 / V4A	5022084	6208 89 1		23
GRV 245 VA4404	245 / V4A	6054312	6016 68 8	/pc.	20	MCD 50-B 3+1		5077091	5096 87 9		54

# Type listing

Structure of the EAN number: Country code 40

Manufacturer code 1219 (for articles beginning with 0: 1010)

Individual EAN-C 5647589

Type	Dimensions/Colour/Div.	EAN-C.	Art. no.	Price	Page	Type	Dimensions/Colour/Div.	EAN-C.	Art. no.	Price	Page
MDP-4 D-24-T		5406884	5098 43 1	/pc.	56	RWEB 650 VA4301	500/ V2A	6242290	7109 90 3	/pc.	17
						RWEB 660 VA4301	600/ V2A	6242351	7109 93 8		17
MMS7.5X80	7.5 x 80/ St / G	5519973	3498 27 1	price/100 pc.	36	RWVL 60 VA4301	60/ V2A	6066070	6067 66 2		14
						RWVL 60 VA4301	60/ V2A	6066070	6067 66 2		16
						RWVL 60 VA4571	60/ V4A	6343157	6067 66 4		14
						RWVL 60 VA4571	60/ V4A	6343157	6067 66 4		16
MP UNI VA4301	115 170/ V2A	5166320	7085 13 3	/pc.	17						
MP UNI VA4301	115 170/ V2A	5166320	7085 13 3		21						
MPG 65 VA4404	81 65/ V4A	6933372	6006 48 8		21	SBM16 VA	M16x1,5 178/ V2A	5622611	2047 69 0	price/100 pc.	33
MPG 90 VA4404	111 95/ V4A	6933433	6006 48 9		21	SBM20 VA	M20x1,5 183/ V2A	5622628	2047 69 2		33
						SBM25 VA	M25x1,5 207/ V2A	5622635	2047 69 3		33
MS 21 L 3M V2A	/ V2A	5697558	1122 92 8	price/100 m	30	SBM32 VA	M40x1,5 245/ V2A	5622642	2047 69 4		33
MS 21 L 6M V2A	/ V2A	5697565	1122 92 9		30	SBM40 VA	M40x1,5 288/ V2A	5622659	2047 69 5		33
MS 41 LS1M 2 V2A	/ V2A	5698333	1123 01 4		30						
MS 41 LS3M 2 V2A	/ V2A	5698340	1123 01 6		30						
MS 41 LS6M 2 V2A	/ V2A	5698388	1123 01 8		30						
						SC-TELE 4-C-G		5834793	5081 68 8	/pc.	56
ND-CAT6A/EA		5614364	5081 80 0	/pc.	57						
						SKH 60 OR	Pastel orange/ PE	5668008	6222 53 7	/pair	23
RAA 610 VA4301	100/ V2A	6821235	7136 12 0		17						
RAA 620 VA4301	200/ V2A	6821297	7136 13 3		17	SKS 10X80 VA4401	M10 x 80 80/ V4A	6822133	6418 24 8	/pc.	26
RAA 630 VA4301	300/ V2A	6821358	7136 14 1		17	SKS 10X80 VA4401	M10 x 80 80/ V4A	6822133	6418 24 8		27
RAAU 640 VA4301	400/ V2A	6256877	7136 24 2		17					price/100 m	33
RAAU 650 VA4301	500/ V2A	6256938	7136 25 0		17	SM16 VA	M16x1,5 3000/ V2A	5622338	2047 65 7		33
RAAU 660 VA4301	600/ V2A	6256990	7136 26 9		17	SM20 VA	M20x1,5 3000/ V2A	5622345	2047 65 8		33
						SM25 VA	M25x1,5 3000/ V2A	5622352	2047 66 0		33
						SM32 VA	M32x1,5 3000/ V2A	5622369	2047 66 1		33
RD 8-ALU-T	/ Al	5901273	5021 29 4	price/100 m	52	SM40 VA	M40x1,5 3000/ V2A	5622376	2047 66 2		33
RGV 60 VA4301	60/ V2A	6230839	7082 25 8	/pc.	16	SSLB 100 VA4301	85/ V2A	6095728	7070 35 3	/pc.	14
RGV 60 VA4571	60/ V4A	6080113	7082 26 5		16	SSLB 100 VA4301	85/ V2A	6095728	7070 35 3		17
						SSLB 100 VA4571	85/ V4A	5021520	7070 39 0		14
						SSLB 100 VA4571	85/ V4A	5021520	7070 39 0		17
RKSM 610 VA4301	100 0,75/ V2A	5706083	6047 61 3	/m	16	SSLB 200 VA4301	185/ V2A	6095780	7070 36 1		14
RKSM 610 VA4571	100 0,75/ V4A	5706113	6047 61 4		16	SSLB 200 VA4301	185/ V2A	6095780	7070 36 1		17
RKSM 615 VA4301	150 0,75/ V2A	5706120	6047 63 2		16	SSLB 200 VA4571	185/ V4A	5021582	7070 39 2		14
RKSM 615 VA4571	150 0,75/ V4A	5706137	6047 63 3		16	SSLB 200 VA4571	185/ V4A	5021582	7070 39 2		17
RKSM 620 VA4301	200 0,75/ V2A	5706144	6047 64 0		16	SSLB 300 VA4301	285/ V2A	6095841	7070 36 5		14
RKSM 620 VA4571	200 0,75/ V4A	5706175	6047 64 1		16	SSLB 300 VA4301	285/ V2A	6095841	7070 36 5		17
						SSLB 300 VA4571	285/ V4A	5021605	7070 39 4		14
RKSM 630 VA4301	300 0,75/ V2A	5706182	6047 65 6		16	SSLB 300 VA4571	285/ V4A	5021605	7070 39 4		17
RKSM 630 VA4571	300 0,75/ V4A	5706199	6047 65 7		16						
						SSLB 400 VA4301	385/ V2A	6095902	7070 36 9		17
RKSM 640 VA4301	400 0,9/ V2A	5706205	6047 69 1		16	SSLB 400 VA4571	385/ V4A	5021766	7070 39 6		17
RKSM 640 VA4571	400 0,9/ V4A	5706236	6047 69 2		16						
						SSLB 500 VA4301	485/ V2A	6095964	7070 37 3		17
RKSM 650 VA4301	500 0,9/ V2A	5706243	6047 72 1		16	SSLB 500 VA4571	485/ V4A	5021711	7070 39 8		17
RKSM 650 VA4571	500 0,9/ V4A	5706250	6047 72 2		16						
						SSLB 600 VA4301	585/ V2A	6096022	7070 38 1		17
RKSM 660 VA4301	600 0,9/ V2A	5706267	6047 73 7		16	SSLB 600 VA4571	585/ V4A	5021827	7070 40 0		17
RKSM 660 VA4571	600 0,9/ V4A	5706298	6047 73 8		16						
RWEB 610 VA4301	100/ V2A	6242054	7109 81 4	/pc.	17	SVM16 VA	M16x1,5 32/ V2A	5622475	2047 67 3	price/100 pc.	33
RWEB 620 VA4301	200/ V2A	6242115	7109 83 0		17	SVM20 VA	M20x1,5 40/ V2A	5622482	2047 67 4		33
RWEB 630 VA4301	300/ V2A	6242177	7109 85 7		17	SVM25 VA	M25x1,5 40/ V2A	5622499	2047 67 6		33
RWEB 640 VA4301	400/ V2A	6242238	7109 87 3		17	SVM32 VA	M32x1,5 44/ V2A	5622505	2047 67 7		33

12 L TB Lösungskatalog Tunnelbau / en / 01/04/2010 (LLExpert\_01022)

Type	Dimensions/Colour/Div.	EAN-C.	Art. no.	Price	Page	Type	Dimensions/Colour/Div.	EAN-C.	Art. no.	Price	Page
SVM40 VA	M40x1,5 50/ V2A	5622512	2047 67 8	price/100 pc.	33	US 3 K 60VA4301	600 2/ V2A	5705390	6342 40 9	/pc.	25
							US 3 K 60VA4571	600 2/ V4A	5618461		6342 38 9
T 100 F	/ PP	5286547	2007 34 7		46						
T 100 KL	/ PP	5441212	2007 43 6		46	US 3 K 70VA4301	700 2/ V2A	5705406	6342 41 1		25
						US 3 K 70VA4571	700 2/ V4A	5705666	6342 39 1		25
T 100 OE	/ PP	5246855	2007 25 5		47	US 3 K 80VA4301	800 2/ V2A	5705413	6342 41 3		25
						US 3 K 80VA4571	800 2/ V4A	5705673	6342 39 3		25
T 100 RO-LGR	/ PP	5303282	2007 64 4		46						
T 160 F	/ PP/GF	5286554	2007 35 5		46	US 3 K 90VA4301	900 2/ V2A	5705420	6342 41 5		25
						US 3 K 90VA4571	900 2/ V4A	5705680	6342 39 5		25
T 160 KL	/ PP/GF	5682189	2007 44 0		46						
T 160 OE	/ PP/GF	5246862	2007 27 1		47	US 3 KS OR	Pastel orange/ PE	5668039	6338 45 8		25
T 160 RO-LGR	/ PP/GF	5303299	2007 64 9		46	US 5 100 VA4301	1000 2,5/ V2A	6082094	6341 13 3		27
T 60 F	/ PP	5286509	2007 33 9		46	US 5 110 VA4301	1100 2,5/ V2A	6082155	6341 13 7		27
T 60 KL	/ PP	5441182	2007 43 4		46	US 5 120 VA4301	1200 2,5/ V2A	6082216	6341 14 1		27
T 60 OE	/ PP	5246848	2007 23 9		47	US 5 20 VA4301	200 2,5/ V2A	6081554	6341 10 1		27
T 60 RO-LGR	/ PP	5303275	2007 63 8		46	US 5 30 VA4301	300 2,5/ V2A	6081615	6341 10 5		27
						US 5 30 VA4571	300 2,5/ V4A	5020981	6341 05 3		27
TKS-B	170 120	5336730	5097 97 5	/pc.	57	US 5 300 VA4301	3000 2,5/ V2A	6082278	6341 15 2		27
						US 5 300 VA4571	3000 2,5/ V4A	5022305	6341 07 3		27
				/m		US 5 40 VA4301	400 2,5/ V2A	6081677	6341 10 9		27
						US 5 40 VA4571	400 2,5/ V4A	6181995	6341 05 5		27
TSG 30 VA4301	30 3000/ V2A	5694502	6062 05 2		20	US 5 50 VA4301	500 2,5/ V2A	6081738	6341 11 3		27
TSG 30 VA4571	30 3000/ V4A	5694533	6062 05 4		20	US 5 50 VA4571	500 2,5/ V4A	6182053	6341 05 7		27
TSG 45 VA4301	45 3000/ V2A	5694441	6062 02 5		14	US 5 60 VA4571	600 2,5/ V4A	6183319	6341 05 9		27
TSG 45 VA4301	45 3000/ V2A	5694441	6062 02 5		20	US 5 70 VA4301	700 2,5/ V2A	6081851	6341 12 1		27
TSG 45 VA4571	45 3000/ V4A	5694472	6062 02 8		14						
TSG 45 VA4571	45 3000/ V4A	5694472	6062 02 8		20	US 5 80 VA4301	800 2,5/ V2A	6081912	6341 12 5		27
TSG 60 VA4301	60 3000/ V2A	5694557	6062 08 4		16	US 5 80 VA4571	800 2,5/ V4A	6237135	6341 06 3		27
TSG 60 VA4571	60 3000/ V4A	5694564	6062 08 6		16	US 5 90 VA4301	900 2,5/ V2A	6081974	6341 12 9		27
TSG 85 VA4301	85 3000/ V2A	5694601	6062 17 3		20	US 5 90 VA4571	900 2,5/ V4A	6183371	6341 06 5		27
				/pc.							
TSGV VA4310	/ V2A	5694724	6067 97 0		16	US 5 K 100VA4301	1000 2,5/ V2A	6350711	6341 39 0		26
TSGV VA4310	/ V2A	5694724	6067 97 0		20	US 5 K 100VA4571	1000 2,5/ V4A	6459919	6341 24 1		26
US 3 100 VA4301	1000 2/ V2A	5705727	6342 46 0		25	US 5 K 120VA4301	1200 2,5/ V2A	6350834	6341 39 8		26
US 3 100 VA4571	1000 2/ V4A	5705833	6342 49 1		25	US 5 K 120VA4571	1200 2,5/ V4A	6816613	6341 24 9		26
US 3 150 VA4301	1500 2/ V2A	5705765	6342 46 3		25	US 5 K 20 VA4301	200 2,5/ V2A	6477135	6341 35 8		26
US 3 150 VA4571	1500 2/ V4A	5705840	6342 49 4		25	US 5 K 20 VA4571	200 2,5/ V4A	6815531	6341 20 9		26
US 3 200 VA4301	2000 2/ V2A	5705772	6342 46 6		25	US 5 K 30 VA4301	300 2,5/ V2A	6644230	6341 36 2		26
US 3 200 VA4571	2000 2/ V4A	5705871	6342 49 7		25	US 5 K 30 VA4571	300 2,5/ V4A	6815593	6341 21 3		26
US 3 30 VA4301	300 2/ V2A	5705703	6342 45 5		25	US 5 K 40 VA4301	400 2,5/ V2A	6350292	6341 36 6		26
US 3 30 VA4571	300 2/ V4A	5705789	6342 48 5		25	US 5 K 40 VA4571	400 2,5/ V4A	6815654	6341 21 7		26
US 3 50 VA4301	500 2/ V2A	5705710	6342 45 7		25	US 5 K 50 VA4301	500 2,5/ V2A	6350414	6341 37 0		26
US 3 50 VA4571	500 2/ V4A	5705826	6342 48 8		25	US 5 K 50 VA4571	500 2,5/ V4A	6815715	6341 22 1		26
US 3 600 VA4301	6000 2/ V2A	5706373	6342 46 8		25	US 5 KS OR	Pastel orange/ PE	5668046	6338 46 2		26
US 3 600 VA4571	6000 2/ V4A	5618478	6342 50 5		25						
US 3 K 100VA4301	1000 2/ V2A	5705437	6342 41 7		25	V10 COMPACT 255		5076551	5093 38 0		55
US 3 K 100VA4571	1000 2/ V4A	5705697	6342 39 7		25	V20-C 3+NPE-280		5240099	5094 65 6		54
US 3 K 20VA4301	200 2/ V2A	5705352	6342 40 1		25	V50-B+C 3+NPE		5425120	5093 65 4		54
US 3 K 20VA4571	200 2/ V4A	5705635	6342 37 5		25	VF230-AC/DC	255 350	5447856	5097 64 9		55
US 3 K 30VA4301	300 2/ V2A	5705369	6342 40 3		25	VUS 3 VA4301	/ V2A	5706007	6018 51 7		25
US 3 K 30VA4571	300 2/ V4A	5395355	6342 53 0		25	VUS 3 VA4571	/ V4A	5618454	6018 52 0		25
US 3 K 40VA4301	400 2/ V2A	5705376	6342 40 5		25	WB 30 75 VA4301	/ V2A	6014774	6019 66 8		23
US 3 K 40VA4571	400 2/ V4A	5705642	6342 37 9		25						
US 3 K 50VA4301	500 2/ V2A	5705383	6342 40 7		25						
US 3 K 50VA4571	500 2/ V4A	5705659	6342 38 1		25						

# Type listing

Structure of the EAN number: Country code **40**

Manufacturer code **1219** (for articles beginning with **0: 1010**)

Individual EAN-C **5647589**

Type	Dimensions/Colour/Div.	EAN-C.	Art. no.	Price	Page				
WDK-H30045	Pure white 2000/ PC/ABS	5237402	6175 00 8	/m	37				
WDK-H40060	Pure white 2000/ PC/ABS	5237419	6175 01 4		38				
WDK-H40061	Pure white 2000/ PC/ABS	5237426	6175 02 0		39				
WDK-H60090	Pure white 2000/ PC/ABS	5237457	6175 02 6		40				
WDK-H60110	Pure white 2000/ PC/ABS	5237464	6175 03 2		41				
WDK-H60150	Pure white 2000/ PC/ABS	5237471	6175 03 8		42				
WDK-HA30045	Pure white 60/ PC/ABS	5237549	6175 10 3	/pc.	37				
WDK-HA40060	Pure white 85/ PC/ABS	5237556	6175 10 9		38				
WDK-HA40061	Pure white 85/ PC/ABS	5237563	6175 11 5		39				
WDK-HA60090	Pure white 130/ PC/ABS	5237570	6175 12 1		40				
WDK-HA60110	Pure white 130/ PC/ABS	5237587	6175 12 7		41				
WDK-HA60150	Pure white 130/ PC/ABS	5237594	6175 13 3		42				
WDK-HE30045	Pure white 45/ PC/ABS	5237631	6175 15 6		37				
WDK-HE40060	Pure white 60/ PC/ABS	5237648	6175 16 2		38				
WDK-HE40061	Pure white 60/ PC/ABS	5237655	6175 16 8		39				
WDK-HE60090	Pure white 90/ PC/ABS	5237662	6175 17 4		40				
WDK-HE60110	Pure white 110/ PC/ABS	5237693	6175 18 0		41				
WDK-HE60150	Pure white 150/ PC/ABS	5237709	6175 18 6		42				
WDK-HF30045	Pure white 60/ PC/ABS	5237716	6175 20 4		37				
WDK-HF40060	Pure white 85/ PC/ABS	5237723	6175 21 0		38				
WDK-HF40061	Pure white 85/ PC/ABS	5237730	6175 21 6		39				
WDK-HF60090	Pure white 120/ PC/ABS	5237747	6175 22 2		40				
WDK-HF60110	Pure white 140/ PC/ABS	5237754	6175 22 8		41				
WDK-HF60150	Pure white 180/ PC/ABS	5237778	6175 23 4		42				
WDK-HI30045	Pure white 60/ PC/ABS	5237488	6175 05 1		37				
WDK-HI40060	Pure white 85/ PC/ABS	5237495	6175 05 7		38				
WDK-HI40061	Pure white 85/ PC/ABS	5237501	6175 06 3		39				
WDK-HI60090	Pure white 130/ PC/ABS	5237518	6175 06 9		40				
WDK-HI60110	Pure white 130/ PC/ABS	5237525	6175 07 5		41				
WDK-HI60150	Pure white 130/ PC/ABS	5237532	6175 08 1		42				
WDK-HT30045	Pure white 130/ PC/ABS	5237785	6175 25 5		37				
WDK-HT40060	Pure white 170/ PC/ABS	5237815	6175 26 1		38				

# Terms and conditions of sale and delivery of the companies OBO BETTERMANN GmbH & Co. KG and OBO BETTERMANN Projekt und Systemtechnik GmbH, and OBO Befestigungselemente GmbH, Menden

1. All our supplies and services shall be governed exclusively by the following terms and conditions, including our additional terms and conditions for cable tray business transactions. Any terms and conditions of business and purchasing of the customer shall be valid only if we have acknowledged them in writing. Our quotations are without engagement; they are mere invitations to submit contract offers. Any and all transactions and agreements, including those entered into by our employees and agents shall only be binding upon our written confirmation or invoicing. The foregoing provision shall also apply to any modifications of the agreed formal requirements.

2. The documents and data pertaining to the quotation, such as illustrations, brochures, drawings, dimensions, loading capacity values and weight details are approximate only, unless they are expressly stipulated to be binding.

Samples are non-binding samples for inspection. Any purchase according to sample will be subject to customary deviations and deviations resulting from normal production processes. The properties of the sample shall be no guaranteed quality of the purchase object unless expressly stated otherwise in the confirmation of order. Samples must be returned to us at the latest within four weeks in perfect condition. If they are not returned within this period in proper condition, we shall be entitled to charge the purchase price for the sample in accordance with our current price list. All information on our products, in particular the illustrations, drawings, weight, dimension and performance data included in our quotations and printed matter shall be regarded as approximate average values and shall not represent any quality guarantee.

With regard to products made according to customer drawings, samples and other instructions of the customer, we will not provide any warranty nor assume any liability for the due and proper functioning of the product or for any other defects if and to the extent they are based upon the customer's specifications. The customer shall indemnify us from any third party claims, including claims for product liability as may be asserted against us for damages resulting from the products unless we have caused such damages by intent or gross negligence. The customer shall warrant that the manufacture and supply of products made in accordance with his instructions will not infringe any proprietary rights of third parties. Should any proprietary rights be asserted against us, we shall be entitled, without any legal review of the third party claims, to withdraw from the contract after hearing the customer, unless the third party withdraws the claims asserted against us under its proprietary rights within eight days by written declaration. The customer shall compensate us for any damage sustained as a result of the assertion of proprietary rights. In case of withdrawal, the work we have carried out so far shall be remunerated. Further rights under the statutory provisions shall not be affected thereby.

Any moulds, tools and design data produced by us for the execution of the order shall be our exclusive property. Unless expressly agreed otherwise, the customer shall not have any claims thereto, even if he has contributed to the costs of producing any such moulds, tools and design data.

3. The packing, shipping route and means of transportation shall be left to our discretion in the absence of any other agreements. They shall be charged at their cost price. We will take back undamaged cases, when being returned carriage paid, at 2/3 of the amount invoiced. The one-way or pool pallets used for transport shall be either exchanged upon taking delivery or returned. The smallest packing units stocked and listed may not be broken up for rationalisation reasons. In case of orders for different quantities, the nearest packing unit will be supplied.

We reserve the right to deviate from the agreed delivery quantity, in particular in the case of custom-made products, to a customary extent or in conformity with national or international standards. In case of a demand for adhering to a precise quantity, an express reference is necessary and subject to confirmation.

Master and call orders shall oblige the customer to accept the total quantity on which the master/call order is based. Where no particular call orders are specified in the contract, the total quantity of the master call order must be called within twelve months. If the customer fails to adhere to call deadlines, we shall be entitled to deliver and charge the total quantity in full after four weeks from written notice with reference to the consequences of any failure to call. Our rights arising from any default of the customer shall not be affected thereby.

4. Unless otherwise agreed, our prices are quoted ex works and do not include packing and insurance. The value added tax at the rate applicable on the date of dispatch will be added to our prices. The purchaser shall ensure the correctness of his VAT identification number, which he must notify to us immediately without being asked. He shall undertake to inform both us and the competent domestic tax authority without delay of any change in his name, address and VAT identification number.

Delivery shall be franco domicile within Germany, i.e. carriage and packing prepaid, if the net order value is in excess of € 1,200. For small orders below € 100 (net excluding value added tax), we shall invoice a lower quantity surcharge of € 10 (net) per order. Upon transfer of our supplies and services to a carrier or forwarding agent, at the latest upon their leaving our warehouse or supply plant, the risk shall pass to the recipient, even in case of deliveries free place of destination.

5. Delivery periods and delivery deadlines shall be approximate only unless we have expressly stated in writing that they are binding. Delivery periods shall commence upon receipt of our confirmation of order, but not before clarification of all execution details, ex place of delivery. The customer shall only be entitled to withdraw from the contract after having granted a reasonable extension of time. We reserve the right to make partial deliveries. Claims for damages and reimbursement of expenses - for any reason whatsoever - shall be subject to the provisions set out in article 10.

In the event of any circumstances that are beyond our control within the scope of normal operating risks and obstruct or make impracticable any delivery, we shall be entitled to suspend delivery by the duration of such obstruction plus a reasonable start-up period or to withdraw from the contract for the part not yet fulfilled. The purchaser can demand a statement from us as to whether we wish to deliver within a reasonable period or withdraw. If we fail to make such a statement, the purchaser may withdraw. Our notice to the purchaser shall be deemed to be sufficient evidence that we have been prevented from delivering.

Delivery time is extended in case of such events as labour disputes, strikes and lockouts, orders from the authorities, difficulties with the procurement of materials, spoiled work or post-processing, shutdowns and staff shortage as well as shortage of means of transport, and general occurrence of unforeseen events beyond our scope of influence, by the length of duration of these events.

6. Payments shall be made upon receipt of invoice less a 3% cash discount for payment within 10 days or net after 30 days from date of invoice. Erection work and all paid labour work must be paid within 10 days without deduction of any cash discount. In case of non-cash payments, the date of the credit note will be deemed to be the date of receipt of payment. Payments received shall always be credited first against costs, then against interest and then against the earliest liability. Cheques and bills of exchange shall only be accepted as means of payment. Any payment by bill of exchange shall be subject to a prior separate and written agreement, whereby all bill costs shall be borne by the customer and no discount can be granted. The customer shall have no right to refuse performance and no right of retention - for any legal reason whatsoever - unless we have acknowledged his claim beforehand in writing or his claim has the force of law.

The customer shall only be entitled to set off claims which have the force of law, are undisputed or acknowledged by us in writing.

7. We shall retain title to the goods supplied by us until all our claims arising from our business transactions with the customer have been satisfied - current account clause - and all bills of exchange or cheques submitted for payment by the customer have been honoured.

Any treatment or processing of goods subject to our retention of title (reserved goods) shall be carried out for us as the manufacturer in accordance with § 950 BGB (German Civil Code) without any obligation on our part. If our reserved goods are to be regarded as the main item or the main item is owned by the customer, full title to the new item shall pass to us when it is created. In other cases, we shall acquire a co-ownership interest in the new item in the proportion of the sales value of our reserved goods to the other goods used for the new item at the time of processing, intermingling, joining or mixing. The customer shall take custody of our ownership or co-ownership interest free of charge; it shall be treated as reserved goods.

Before transfer of title, our goods shall be neither pledged nor assigned as collateral without our prior consent. In addition, any third party rights or pledges shall be notified to us immediately and we shall be given all details and provided all documents necessary for intervention; otherwise the customer must bear our loss. In the latter case, our total claims against the customer shall also be immediately payable.

The customer shall be entitled to sell or to use our reserved goods in the ordinary course of business subject to the condition that the relevant claims are transferred in accordance with article 8 below. This right shall lapse upon the customer's failure to promptly meet his payment obligations towards us or in the event of any cheque or bill protests or his suspension of payments. In such cases, we shall be entitled to take back the goods provisionally at the

customer's expense and to sell them at our duly exercised discretion after a corresponding reminder has been sent to the customer. We will then pass the due amount to the customer's credit.

8. If our goods are sold before payment of our claim, the customer shall be obliged to retain our title against his purchaser until the goods have been paid for in full by the purchaser. The claim arising against the purchaser from such resale as well as any other ancillary rights or security interests of the customer resulting from the sale and any claims for compensation in case of damage to or destruction of our reserved property, including the relevant insurance sum shall hereby be assigned to us. We hereby accept this assignment. Where our co-ownership interest is sold, the relevant claims shall be assigned in the amount corresponding to the value of our interest.

The customer shall, at our request, inform us of his purchasers, notify them of the assignment made and provide us with any and all documents required to assert our rights.

As long as the customer meets his contractual obligations without delay, he shall be authorised to collect the claims assigned. He shall keep the amounts collected on our behalf separately and remit them to us immediately as soon and as far as our claims become due. The authorisation shall lapse in case of any cheque or bill protest of the customer or his definite suspension of payments. The customer shall bear the costs incurred for any action taken against third parties and shall advance them upon request.

If the security provided to us by the retention of title and the anticipatory assignment should exceed the claims to be secured by more than 20%, we shall, at the customer's request, release paid supplies of our choice. Upon payment of all our claims by the customer, assigned claims shall pass to the customer.

9. Any complaints for obvious defects regarding the quantity or quality of our supplies and services that are identifiable upon careful inspection shall without delay, but at the latest within the period of limitation of eight days from arrival of the goods at the address of the customer or the person appointed by him, be notified in writing to us, not to our representatives. Slight deviations in dimensions and designs within the scope of defined technical tolerances shall not give rise to any right of complaint. Any rejected goods may only be returned to us with our prior written authorisation.

In case of justified complaints within the prescribed period, we shall, at our option, take remedial action by way of subsequent performance, by rectifying the defect, supplying non-defective goods or providing a credit note for the lower value calculated.

We shall be entitled to refuse subsequent performance in accordance with the statutory provisions. If we refuse subsequent performance, if any subsequent performance remains unsuccessful or if the customer cannot be reasonably expected to accept any subsequent performance, the latter shall be entitled to withdraw from the contract in compliance with the provisions of the following sentences. The customer shall only be entitled to withdraw from the contract - where a withdrawal is not excluded by law - upon the unsuccessful expiry of a reasonable period for subsequent performance set by him, unless this period was not required under the statutory provisions (§§ 281 para. 2, 323 para. 2, 440, 441 para. 1 BGB (German Civil Code)).

In case of his withdrawal, the customer shall be liable for any deterioration, destruction or loss of use resulting from any negligence or intent on his part. Any claims for damages or reimbursement of expenses of the customer shall be subject to the provisions set out in article 10.

In the case of any fraudulent concealment of a defect or in the case of any provision of a quality guarantee for the goods sold at the time of the passing of risk within the meaning of § 444 BGB (German Civil Code) (seller's declaration that the object sold has a specific property at the time of the passing of risk and that the seller, regardless of any fault on his part, intends to be answerable for any and all consequences resulting from its absence), the customer's rights shall be exclusively governed by the statutory provisions.

We shall - in addition to the statutory grounds for refusal - also be entitled to refuse subsequent performance if and as long as the customer fails to send us, at our request, the rejected goods or a sample thereof; the customer shall have no right of withdrawal for any such refusal. We may further refuse any subsequent performance if the goods concerned have been altered or modified without our consent unless the customer can prove that the defect was not caused by such alteration or modification.

The limitation period for any claims arising from defects shall be one year; in the case of goods which have been used in accordance with their intended purpose for a building and have caused its defectiveness, the limitation period shall be two years. The provisions of §§ 478, 479 BGB (German Civil Code) on recourse in the chain of suppliers shall not be affected thereby.

10. In the case of a pre-contractual, contractual or non-contractual breach of duty, including unsatisfactory delivery, tortious conduct and producer's liability, we shall only be liable for compensatory damages and reimbursement of expenses - subject to further contractual or statutory liability requirements - in the case of intent, gross negligence or slightly negligent breach of a material contractual duty (contractual duty the infringement of which jeopardises the fulfilment of the object of the contract). However - except in the case of intent - our liability shall be limited to the typical contractual damage that was foreseeable at the time the contract was entered into. The purchaser shall not be permitted to make a claim for expenses incurred in vain.

Except for any breach of material duties, our liability for slight negligence shall be excluded, but in any case be limited to the amount of the purchase price.

Any claim asserted by the customer or a third party for payment of a contractual penalty shall be excluded.

With regard to damages caused by delay, we shall only be liable for slight negligence up to the amount of 5% of the purchase price agreed with us.

The exclusions and limitations of liability set forth above shall not apply in the event that a guarantee is given with respect to the quality of the object sold within the meaning of § 444 BGB (German Civil Code) if a defect is fraudulently concealed or in the event of injury to life, physical injury or injury to health, or strict liability under the German Product Liability Act.

Any and all claims for damages against us, for any legal reason whatsoever, shall become statute-barred at the latest after one year from delivery of the goods to the customer, in the case of tortious liability from the time of knowledge, or grossly negligent ignorance, of the circumstances giving rise to the claim and the person liable to pay damages. This provision shall not apply in the case of liability for intent and in the event that a guarantee is given for the quality of the object sold, in the case of fraudulent concealment of a defect or in the event of injury to life, physical injury or injury to health, or strict liability under the German Product Liability Act. Any shorter limitation periods shall take precedence.

11. We shall be entitled to process and store any customer data obtained with regard to or in connection with the business relationship in accordance with the German Federal Data Protection Act, irrespective of whether such data is provided by the purchaser himself or by any third parties.

12. Place of performance for delivery and payment is Menden/Sauerland. The court of competent jurisdiction for any and all disputes, including disputes with regard to bills of exchange and cheques, is the Local Court (Amtsgericht) of Menden or, at our option, the District Court (Landgericht) of Arnsberg, irrespective of the value of the object in dispute. We shall, however, also be entitled to take legal proceedings against the customer at the place of his registered office.

German law shall be exclusively applicable. The application of international purchase laws is hereby excluded. Should, for any reason whatsoever, individual provisions of our terms and conditions of sale and delivery be invalid, the validity and binding nature of the other provisions shall not be affected thereby. The customer agrees, that the invalid provision shall be replaced by a valid provision that comes as close as possible to the economic meaning of the invalid provision.

13. The prices of products made of brass and copper are subject to certain fluctuations that are based on the relevant DEL listings. The prices of our brass articles are based on a DEL listing of € 150 for Ms 58, those of our copper products on a DEL value for electrolyte copper of € 200.

In case of any increase or reduction in these prices by more than € 15, a five per cent surcharge or deduction shall be made for each 15 points. The calculation of any such surcharges or deductions shall be based on the DEL listing of the date of our receipt of the order.

Valid from August 2004



#### **QR Code**

With the QR Code you have direct access to our products on the Internet.

You can find further information on the QR Code at [www.obo-bettermann.com](http://www.obo-bettermann.com).

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