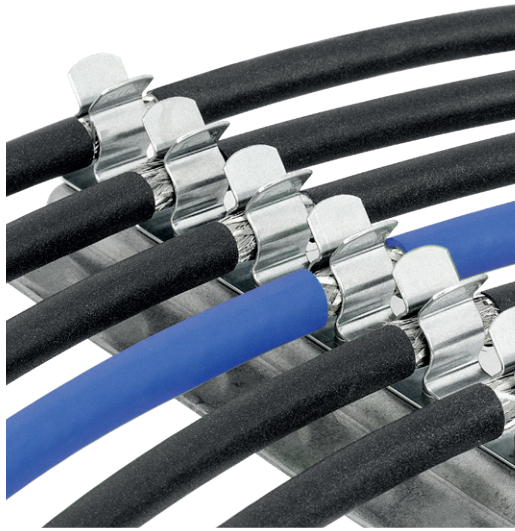


English

icotek[®]
smart cable management.



Product catalogue 33

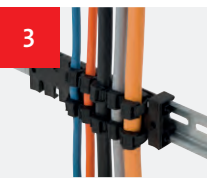
Cable management systems

A company of the icotek group

smart cable management.

Ideas move the world – this has been our motto under which we have been developing innovative cable management systems since 1995. From our headquarters in Eschach, Germany, we produce our smart cable management solutions and distribute them in more than 60 countries. We are a strong and reliable partner for the industry together with our subsidiaries in Europe, China and North America as well as our global representatives. Globally leading companies from various sectors rely on our know-how and our innovative strength. Numerous patents and certifications are both an incentive and aspiration for us.

Product groups

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1 Cable entry systems for cables with connectors



1

Product group 1 includes all split cable entry systems in round and rectangular versions. Cables with and without preassembled connectors with a maximum diameter of 75 mm can thus be inserted. The split frame and split grommets alleviate the need to cut and re-wire pre-terminated cables. Therefore, cable warranties are unaffected.

By closing the upper and lower part of the frame a high contact pressure on the cable grommets and lines is achieved. In most cases, the lines are strain

relieved according to EN 62444 and immediately sealed with IP54 to IP66/ IP68/UL type 4X (depending on type).

icotek also offers split and non-split brush plates for cable pass-through, based on rectangular and round standard cut-outs – a very cost-effective solution if sealing with IP54 ist not required.

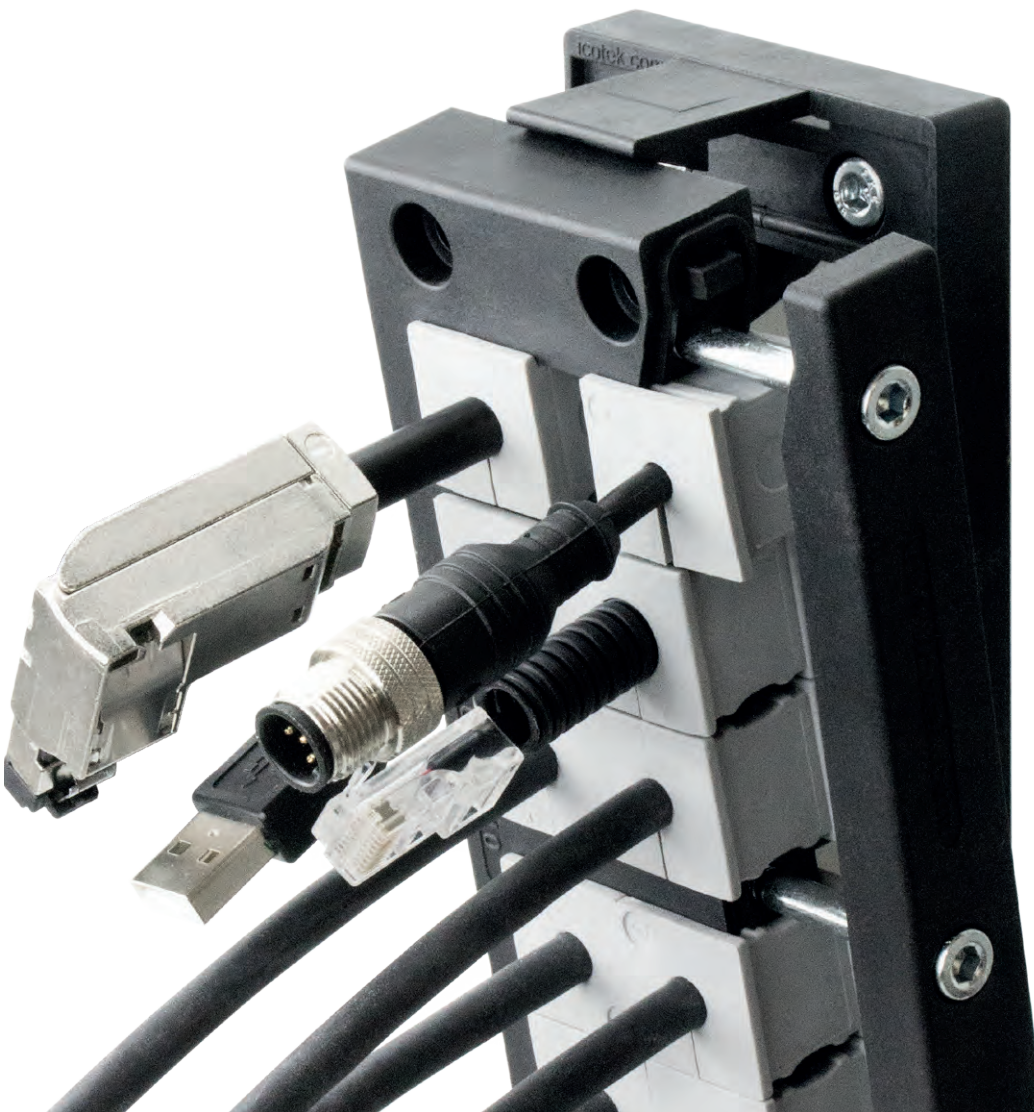


All icotek products with a type rating have been tested and certified by UL according to UL 50E!

More information about UL Type Rating vs. NEMA Rating:
www.icotek.com/en/service/ul-nema-type-rating/



Configure your custom frames and grommets conveniently online with our Module Configurator on www.icotek.com



ProductFinder

Product	IP54	IP66	IP68	UL TYPE 12	UL TYPE 4X	Strain relief	IMAS-CONNECT compatible	Cable Ø mm min max	Max. no. of cables	Page
KEL-ER	■	■		■	■	■	■	1 – 35	10	8–10
KEL-ER-E	■	■		■		■	■	1 – 16	5	11
KEL-U	■			■		■	■	1 – 35	40	12–14
KEL-E	■			■		■	■	1 – 16	20	15
KEL	■			■		■	■	1 – 35	40	16–19
KEL 16/24 Extensions	■					■	■	1 – 35	120	20–25
KEL-FG-A/B	■			■		■	■	1 – 35	40	30–32
KEL-FG-E	■			■		■	■	1 – 16	20	33
KEL-FL	■					■	■	1 – 16 + flat cables	13	28
KEL 183	■			■		■	■	1 – 75	16	26
KEL-JUMBO	■			■		■	■	1 – 65	2	36
KVT-ER	■	■	■	■	■	■	■	1 – 35	4	40–41
KVT	■			■		■	■	1 – 35	16	42–44
KVT-SNAP	■					■	■	1 – 35	16	45
KVT-W90	■					■	■	1 – 35	16	46
KVT 80	■			■		■	■	1 – 35	24	44
KEL-QUICK	■			■			■	1 – 29	40	60–63
QVT	■						■	1 – 15	16	64–66
QVT-CLICK	■						■	1 – 15	8	65/67
KEL-QTA	■							1 – 15	26	68–70
KEL-QTE	■							1 – 15	2	69/71
KEL-BES / KEL-BES-S								max. 33		82–83

Further details on certifications and technical specifications can be found on the product pages.

1.11 Split cable entry frames for the KT grommet system



1.11

The patented cable entry system enables the user to enter, seal and provide strain relief according to EN 62444 for pre-terminated cables (up to 65 mm in diameter) and cables without connectors (up to 75 mm in diameter).

Electrical, pneumatic or hydraulic lines as well as corrugated conduits and hoses can be easily routed, sealed and strain relieved using split cable entry systems.

The key feature of icotek's patented system is the split frame and split grommets which provide quick, convenient and cost effective routing of pre-terminated and multi-conductor cables, hoses and conduits. The split frame and split grommets alleviate the need to cut and re-wire pre-terminated cables. Therefore, cable warranties are unaffected.

Cables, pipes and conduits with various diameters can be routed due to a large variety of split grommets. When assembled correctly, the split grommets are held tightly within the frame. Correctly sizing the grommet to the cable diameter ensures a high degree of protection (up to IP66/UL type 4X) and provides strain relief.

Split system

Secure and tight connection

Maintain warranty on pre-terminated cables

Fast and easy assembly

Most sizes are industrial standard cut-outs. No need for additional tooling.

Integrated strain relief according to EN 62444

High cable density, wide variety in cable grommets and adapter grommets

**KEL-U/KEL: IP54 rated protection
KEL-ER: IP66 due to a high clamping pressure on the cover lid and injected sealing**

Can be combined with IMAS-CONNECT grommets

Chapter content 1.11

1.11



Split cable entry frames
for cable diameters up to 35 mm

KEL-ER 24 / KEL-ER 16 / KEL-ER 10 / KEL-ER-B
KEL-ER-E5 / KEL-ER-E4 / KEL-ER-E3 / KEL-ER-E2

8 – 11



Split cable entry frames
for cable diameters up to 35 mm

KEL-U 24 / KEL-U 16 / KEL-U 10 / KEL-U-B
KEL-E5 / KEL-E4 / KEL-E3 / KEL-E2

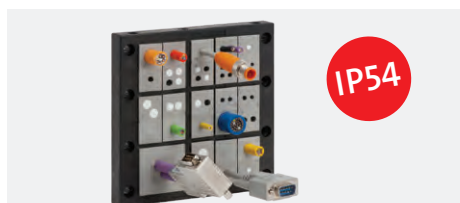
12 – 15



Centrally split cable entry frames
for cable diameters up to 35 mm

KEL 24 / KEL 16 / KEL 10 / KEL-B

16 – 19



Extended split cable entry frames
for cable diameters up to 35 mm

KEL 24-E / KEL 24-MT / KEL 24-2MT
KEL 16-E / KEL 16-MT / KEL 16-2MT

20 – 25



Split cable entry frames
for cable diameters up to 75 mm

KEL 183 / KEL 183-E / KTMB 183

26 – 27



Split cable entry frames for flat cables
& round cables up to 16 mm in diameter

KEL-FL / FT

28 – 29



Split flange enclosure
for cable diameters up to 35 mm

KEL-FG-A / KEL-FG-B /
KEL-FG-E5 / KEL-FG-E3 / KEL-FG-E2

30 – 33



Snap mounting frames
for installation of KEL-U / KEL frames

KEL-SNAP 24 / KEL-SNAP 16 / KEL-SNAP 10 /
KEL-SNAP-B / KEL-SNAP 24-E / KEL-SNAP 24-MT

34 – 35



Split cable entry frames
for cable diameters up to 65 mm

KEL-JUMBO / KTF

36 – 37



Grommets and plugs
for cables with/without connectors,
cable diameter range 1 – 35 mm

KT small / KT large / KT-DPF / KTMB / KT-SC /
KT-DT / ST / KT Service Box

48 – 53



IMAS-CONNECT™
Modular adapter system
for the KT system

AT-PP / AT-KS / AT-K-M / AT-M / AT-B

54 – 59

Cable entry frames with IP66 rating KEL-ER series

1.11

Product description

Split cable entry system for routing and sealing cables with connectors, providing an IP66/UL Type 12/4X rating and strain relief for cable diameters from 1 to 16 mm (single-hole grommets KT 1 to 15) and 16 to 35 mm (single-hole grommets KT 16 to 34).

The cable entry system is easy to install. Cable grommets are placed into compartments and are securely fixed to the frame during assembly.

The KEL-ER frames match exactly the cut-out dimensions for 10-, 16- and 24-pin standard industrial connectors. Either a cut-out of 36 mm or 46 mm in height can be chosen depending on the cables being routed. The KEL-ER-B frame matches the cut-out dimensions of 46 × 46 mm measuring instruments.

The single-row versions KEL-ER-E are particularly suited for flat connectors. The small frames are ideal for applications with limited space. A flat rubber gasket is included in the shipment.

The version with threaded bushings enables the cable entry frame to be screwed onto the housing from the inside out. This protects against vandalism and tampering with the housing from the outside.

Advantages & benefits

- Maintain manufacturer's warranty on pre-terminated cables
- Retrofits, repairs and maintenance can be done much more easily and quickly
- High cable density, wide variety of grommets
- Strain relief according to EN 62444
- High stability, vibration resistant
- Can be combined with IMAS-CONNECT adapter grommets

Specifications

Material	Polyamide (PA)
Flame class	UL94-Vo, self-extinguishing
IP rating	IP66, with gasket and correct selection of single grommets (certified acc. to EN 60529)
UL type rating	UL type 4X (acc. to UL 50E)
Temperature	- 40°C to + 140°C (static)
Properties	Halogen-free, silicone-free
Frame depth	17 mm

Accessories

KT Cable grommets	48 – 52
AT Adapter grommets	54 – 59
KEL-EMC Cable collectors	158 – 160
ST Plugs	53



Also available with stainless steel screws (V2A).



Also available with threaded bushings.



The cable entry frames enable the integration of the IMAS-Connect™ adapter grommets.



Split KT grommets



KEL-ER

Cable entry frames
KEL-ER 24, KEL-ER 16

IP66

Description	Cut-out Drilling template	Type	Cut-out mm	Grommets small large	Order No.	PU
		KEL-ER 24 10	36/46 × 112	10 –	48241	10
		KEL-ER 24 10 with V2A screws	36/46 × 112	10 –	48241.200	10
		KEL-ER 24 10 with threaded bushings M4	36/46 × 112	10 –	48241.400	10
		KEL-ER 24 7	36/46 × 112	6 1	48247	10
		KEL-ER 24 7 with V2A screws	36/46 × 112	6 1	48247.200	10
		KEL-ER 24 7 with threaded bushings M4	36/46 × 112	6 1	48247.400	10
		KEL-ER 24 4	36/46 × 112	2 2	48244	10
		KEL-ER 24 4 with V2A screws	36/46 × 112	2 2	48244.200	10
		KEL-ER 24 4 with threaded bushings M4	36/46 × 112	2 2	48244.400	10
		KEL-ER 16 8	36/46 × 86	8 –	48168	10
		KEL-ER 16 8 with V2A screws	36/46 × 86	8 –	48168.200	10
		KEL-ER 16 8 with threaded bushings M4	36/46 × 86	8 –	48168.400	10
		KEL-ER 16 5	36/46 × 86	4 1	48165	10
		KEL-ER 16 5 with V2A screws	36/46 × 86	4 1	48165.200	10
		KEL-ER 16 5 with threaded bushings M4	36/46 × 86	4 1	48165.400	10
		KEL-ER 16 2	36/46 × 86	– 2	48162	10
		KEL-ER 16 2 with V2A screws	36/46 × 86	– 2	48162.200	10
		KEL-ER 16 2 with threaded bushings M4	36/46 × 86	– 2	48162.400	10

KEL-ER

Cable entry frames

KEL-ER 10, KEL-ER B

IP66



1.11

Description	Cut-out Drilling template	Type	Cut-out mm	Grommets small large	Order No.	PU
		KEL-ER 10 6	36/46 × 65	6 –	48216	10
		KEL-ER 10 6 with V2A screws	36/46 × 65	6 –	48216.200	10
		KEL-ER 10 6 with threaded bushings M4	36/46 × 65	6 –	48216.400	10
		KEL-ER 10 3	36/46 × 65	2 1	48212	10
		KEL-ER 10 3 with V2A screws	36/46 × 65	2 1	48212.200	10
		KEL-ER 10 3 with threaded bushings M4	36/46 × 65	2 1	48212.400	10
		KEL-ER-B4	46 × 46	4 –	48204	10
		KEL-ER-B4 with V2A screws	46 × 46	4 –	48204.200	10
		KEL-ER-B4 with threaded bushings M4	46 × 46	4 –	48204.400	10
		KEL-ER-B1	46 × 46	– 1	48206	10
		KEL-ER-B1 with V2A screws	46 × 46	– 1	48206.200	10
		KEL-ER-B1 with threaded bushings M4	46 × 46	– 1	48206.400	10

Cable entry frames with IP54 rating KEL-U series

1.11

Product description

Split cable entry system for routing cables with connectors providing an IP54/UL Type 12 rating. Routing, sealing and providing strain relief for cable diameters from 1 to 35 mm.

The cable entry system is easy to install. Cable grommets are placed into compartments and are securely fixed to the frame during assembly.

The KEL-U frames match exactly the cut-out dimensions for 10-, 16- and 24-pin standard industrial connectors. Either a cut-out of 36 mm or 46 mm in height can be chosen depending on the cables being routed. The KEL-U-B frame matches the cut-out dimensions of 46 × 46 mm measuring instruments. For tool-free assembly/disassembly of the cable entry frames the snap mounting frame KEL-SNAP can be used.

The single-row versions KEL-E are particularly suited for flat connectors. The small frames are ideal for applications with limited space. A flat rubber gasket is included in the shipment.

The version with threaded bushings enables the cable entry frame to be screwed onto the housing from the inside out. This protects against vandalism and tampering with the housing from the outside.

Advantages & benefits

- Fast and easy assembly
- Maintain manufacturer's warranty on pre-terminated cables
- Retrofits, repairs and maintenance can be done much more easily and quickly
- High cable density, wide variety of grommets
- Strain relief according to EN 62444
- High stability, vibration resistant
- Can be combined with IMAS-CONNECT adapter grommets

Specifications

Material	Polyamide (PA)
Flame class	UL94-Vo, self-extinguishing
IP rating	IP54, with gasket and correct selection of cable grommets (certified acc. to EN 60529)
UL type rating	UL type 12 (acc. to UL 50E)
Temperature	- 40°C to + 140°C (static)
Properties	Halogen-free, silicone-free
Frame depth	17 mm

Accessories

KT Cable grommets	48 - 52
AT Adapter grommets	54 - 59
KEL-SNAP Mounting frames	34 - 35
KEL-EMC Cable collectors	158 - 160
KDR Base plates	190 - 197
FP Flange plates	210 - 219
ST Plugs	53



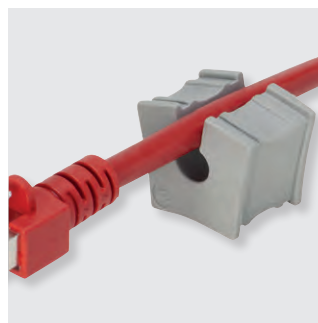
Also available with stainless steel screws (V2A).



Also available with threaded bushings.



The cable entry frames enable the integration of the IMAS-CONNECT™ adapter grommets.



Split KT grommets

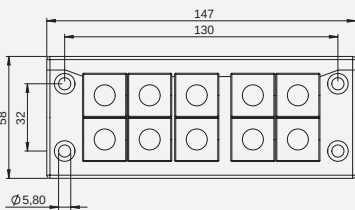
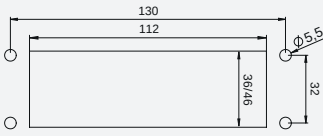
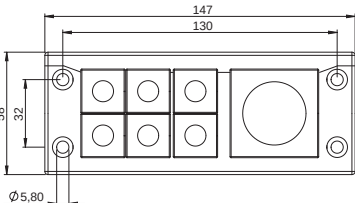
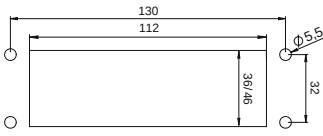
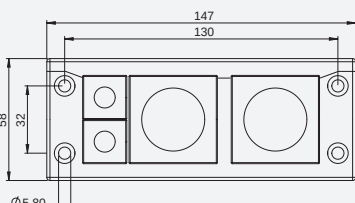
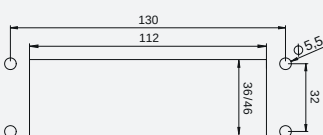
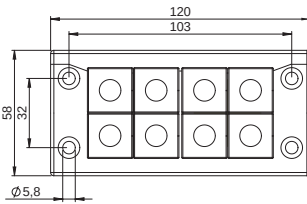
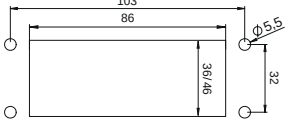
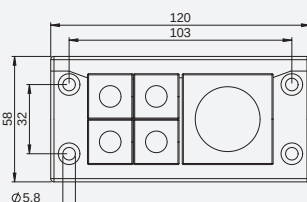
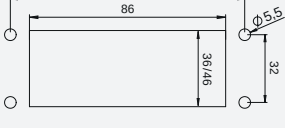
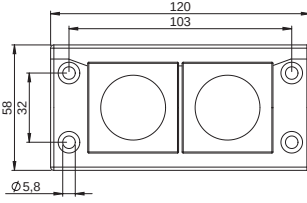
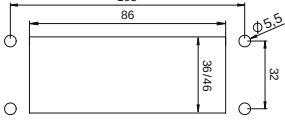
KEL-U

Cable entry frames

KEL-U 24, KEL-U 16



IP54

Description	Cut-out Drilling template	Type	Cut-out dimensions mm	Grommets small large	Order No.	PU
		KEL-U 24 10	36/46 × 112	10 –	54241	10
		KEL-U 24 10 with V2A screws	36/46 × 112	10 –	54241.200	10
		KEL-U 24 10 with threaded bushings M4	36/46 × 112	10 –	54241.400	10
		KEL-U 24 7	36/46 × 112	6 1	54247	10
		KEL-U 24 7 with V2A screws	36/46 × 112	6 1	54247.200	10
		KEL-U 24 7 with threaded bushings M4	36/46 × 112	6 1	54247.400	10
		KEL-U 24 4	36/46 × 112	2 2	54244	10
		KEL-U 24 4 with V2A screws	36/46 × 112	2 2	54244.200	10
		KEL-U 24 4 with threaded bushings M4	36/46 × 112	2 2	54244.400	10
		KEL-U 16 8	36/46 × 86	8 –	54168	10
		KEL-U 16 8 with V2A screws	36/46 × 86	8 –	54168.200	10
		KEL-U 16 8 with threaded bushings M4	36/46 × 86	8 –	54168.400	10
		KEL-U 16 5	36/46 × 86	4 1	54165	10
		KEL-U 16 5 with V2A screws	36/46 × 86	4 1	54165.200	10
		KEL-U 16 5 with threaded bushings M4	36/46 × 86	4 1	54165.400	10
		KEL-U 16 2	36/46 × 86	– 2	54162	10
		KEL-U 16 2 with V2A screws	36/46 × 86	– 2	54162.200	10
		KEL-U 16 2 with threaded bushings M4	36/46 × 86	– 2	54162.400	10

KEL-U

Cable entry frames

KEL-U 10, KEL-U-B

IP54



1.11

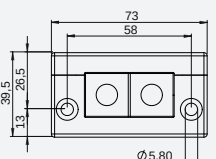
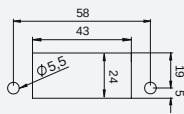
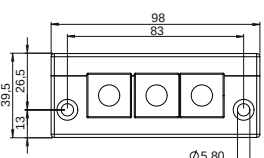
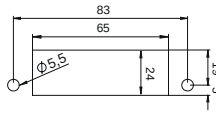
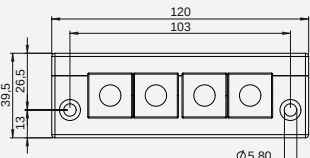
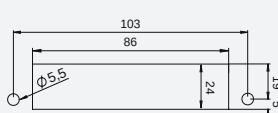
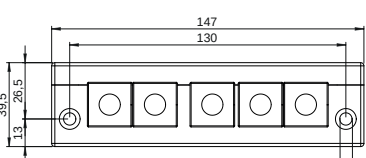
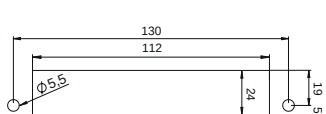
Description	Cut-out Drilling template	Type	Cut-out dimensions mm	Grommets small large	Order No.	PU
		KEL-U 10 6	36/46 × 65	6 –	54216	10
		KEL-U 10 6 with V2A screws	36/46 × 65	6 –	54216.200	10
		KEL-U 10 6 with threaded bushings M4	36/46 × 65	6 –	54216.400	10
		KEL-U 10 3	36/46 × 65	2 1	54212	10
		KEL-U 10 3 with V2A screws	36/46 × 65	2 1	54212.200	10
		KEL-U 10 3 with threaded bushings M4	36/46 × 65	2 1	54212.400	10
		KEL-U-B4	46 × 46	4 –	54204	10
		KEL-U-B4 with V2A screws	46 × 46	4 –	54204.200	10
		KEL-U-B4 with threaded bushings M4	46 × 46	4 –	54204.400	10
		KEL-U-B1	46 × 46	– 1	54206	10
		KEL-U-B1 with V2A screws	46 × 46	– 1	54206.200	10
		KEL-U-B1 with threaded bushings M4	46 × 46	– 1	54206.400	10

KEL-E

Cable entry frames



IP54

Description	Cut-out Drilling template	Type	Cut-out dimensions mm	Grommets small large	Order No.	PU
		KEL-E2	43 × 24	2 –	42249	10
		KEL-E2 with V2A screws	43 × 24	2 –	42249.200	10
		KEL-E2 with threaded bushings M4	43 × 24	2 –	42249.400	10
		KEL-E3	65 × 24	3 –	42258	10
		KEL-E3 with V2A screws	65 × 24	3 –	42258.200	10
		KEL-E3 with threaded bushings M4	65 × 24	3 –	42258.400	10
		KEL-E4	86 × 24	4 –	42259	10
		KEL-E4 with V2A screws	86 × 24	4 –	42259.200	10
		KEL-E4 with threaded bushings M4	86 × 24	4 –	42259.400	10
		KEL-E5	112 × 24	5 –	42250	10
		KEL-E5 with V2A screws	112 × 24	5 –	42250.200	10
		KEL-E5 with threaded bushings M4	112 × 24	5 –	42250.400	10

Cable entry frames with IP54 rating KEL series

1.11

Product description

The classic KEL is a centrally split cable entry system for routing cables with connectors, providing an IP54/up to UL Type 12 rating.

The split KT grommet matching the cable diameter is placed around the cable and inserted into the cable entry frame. The split cable entry frames KEL match exactly the cut-out dimensions of 10-, 16- and 24-pin standard industrial connectors. Either a cut-out of 36 mm or 46 mm in height can be chosen depending on the cables being routed. The size KEL-B matches the cut-out dimensions of 46 × 46 mm measuring instruments.

Based on the frame sizes KEL 16 and KEL 24, there are also extended versions with additional middle frames available. Thus allowing a quick, easy and cost effective routing solution for up to 120 cables or hoses.

For tool-free assembly / disassembly of the cable entry frames the snap mounting frame KEL-SNAP can be used. All frame systems come with a rubber gasket.

The version with threaded bushings enables the cable entry frame to be screwed onto the housing from the inside out. This protects against vandalism and tampering with the housing from the outside.

Advantages & benefits

- Maintain manufacturer's warranty on pre-terminated cables
- Retrofits, repairs and maintenance can be done more easily and quickly
- High cable density, wide variety of grommets
- Strain relief according to EN 62444
- High stability, vibration resistant
- Can be combined with IMAS-CONNECT adapter grommets

Specifications

Material	Polyamide (PA)
Flame class	UL94-Vo, self-extinguishing
IP rating	IP54, with gasket and correct selection of cable grommets (certified acc. to EN 60529)
UL type rating	UL type 12 (acc. to UL 50E)
Temperature	- 40°C to + 140°C (static)
Properties	Halogen-free, silicone-free
Frame depth	17 mm

Accessories

KT Cable grommets	48 - 52
AT Adapter grommets	54 - 59
KEL-SNAP Mounting frames	34 - 35
KEL-EMC Cable collectors	158 - 160
KDR Base plates	190 - 197
FP Flange plates	210 - 219
MP Module plates	204 - 205
ST Plugs	53



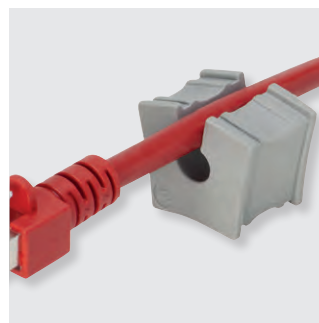
Also available with stainless steel screws (V2A).



Also available with threaded bushings.



The cable entry frames enable the integration of the IMAS-CONNECT™ adapter grommets.



Split KT grommets



Can be combined with IMAS-CONNECT adapter grommets

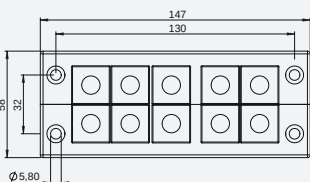
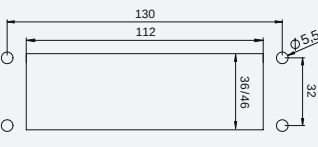
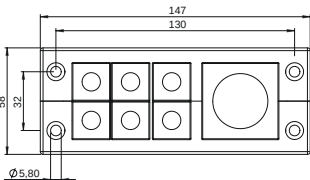
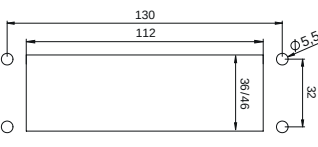
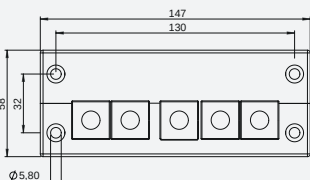
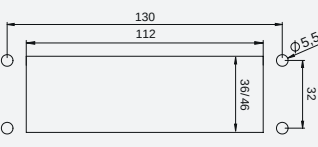
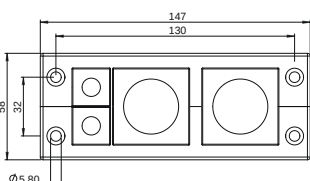
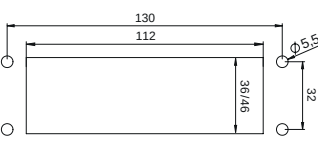
KEL

Cable entry frames

KEL 24



IP54

Description	Cut-out Drilling template	Type	Cut-out dimensions mm	Grommets small large	Order No.	PU
		KEL 24 10	36/46 × 112	10 –	42241	10
		KEL 24 10 with V2A screws	36/46 × 112	10 –	42241.200	10
		KEL 24 10 with threaded bushings M4	36/46 × 112	10 –	42241.400	10
		KEL 24 7	36/46 × 112	6 1	42247	10
		KEL 24 7 with V2A screws	36/46 × 112	6 1	42247.200	10
		KEL 24 7 with threaded bushings M4	36/46 × 112	6 1	42247.400	10
		KEL 24 5	36/46 × 112	5 –	42248	10
		KEL 24 5 with V2A screws	36/46 × 112	5 –	42248.200	10
		KEL 24 5 with threaded bushings M4	36/46 × 112	5 –	42248.400	10
		KEL 24 4	36/46 × 86	2 2	42244	10
		KEL 24 4 with V2A screws	36/46 × 86	2 2	42244.200	10
		KEL 24 4 with threaded bushings M4	36/46 × 86	2 2	42244.400	10

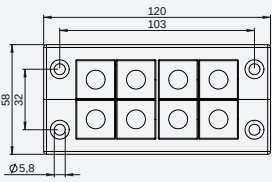
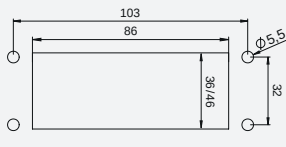
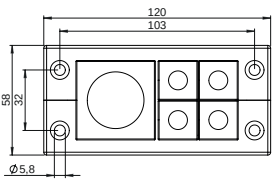
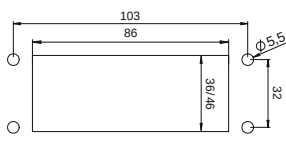
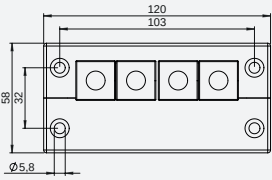
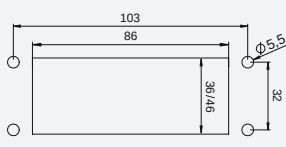
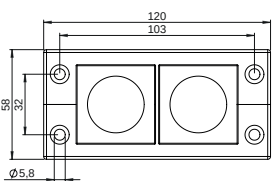
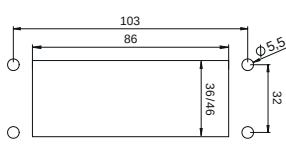
KEL

Cable entry frames

KEL 16



1.1

Description	Cut-out Drilling template	Type	Cut-out dimensions mm	Grommets small large	Order No.	PU
		KEL 16 8	36/46 × 86	8 –	42168	10
		KEL 16 8 with V2A screws	36/46 × 86	8 –	42168.200	10
		KEL 16 8 with threaded bushings M4	36/46 × 86	8 –	42168.400	10
		KEL 16 5	36/46 × 86	4 1	42165	10
		KEL 16 5 with V2A screws	36/46 × 86	4 1	42165.200	10
		KEL 16 5 with threaded bushings M4	36/46 × 86	4 1	42165.400	10
		KEL 16 4	36/46 × 86	4 –	42164	10
		KEL 16 4 with V2A screws	36/46 × 86	4 –	42164.200	10
		KEL 16 4 with threaded bushings M4	36/46 × 86	4 –	42164.400	10
		KEL 16 2	36/46 × 86	– 2	42162	10
		KEL 16 2 with V2A screws	36/46 × 86	– 2	42162.200	10
		KEL 16 2 with threaded bushings M4	36/46 × 86	– 2	42162.400	10

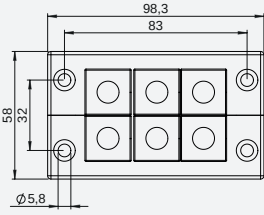
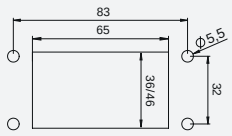
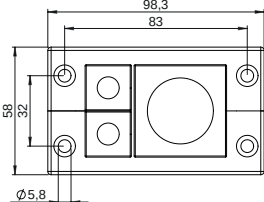
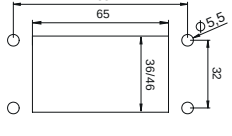
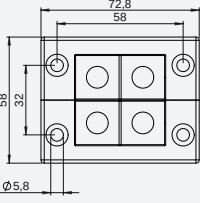
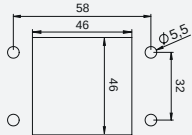
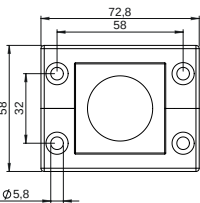
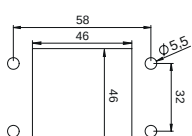
KEL

Cable entry frames

KEL 10, KEL-B



IP54

Description	Cut-out Drilling template	Type	Cut-out dimensions mm	Grommets small large	Order No.	PU
		KEL 10 6	36/46 × 65	6 –	42216	10
		KEL 10 6 with V2A screws	36/46 × 65	6 –	42216.200	10
		KEL 10 6 with threaded bushings M4	36/46 × 65	6 –	42216.400	10
		KEL 10 3	36/46 × 65	2 1	42212	10
		KEL 10 3 with V2A screws	36/46 × 65	2 1	42212.200	10
		KEL 10 3 with threaded bushings M4	36/46 × 65	2 1	42212.400	10
		KEL-B4	46 × 46	4 –	42204	10
		KEL-B4 with V2A screws	46 × 46	4 –	42204.200	10
		KEL-B4 with threaded bushings M4	46 × 46	4 –	42204.400	10
		KEL-B1	46 × 46	– 1	42206	10
		KEL-B1 with V2A screws	46 × 46	– 1	42206.200	10
		KEL-B1 with threaded bushings M4	46 × 46	– 1	42206.400	10

Cable entry frames, extended with IP54 rating KEL series

1.11

Product description

Based on the frame sizes KEL 16 and KEL 24, there are also extended versions with additional middle frames available. Thus allowing a quick, easy and cost effective routing solution for up to 120 cables or hoses.

A flat rubber gasket is included in the shipment.

The version with threaded bushings enables the cable entry frame to be screwed onto the housing from the inside out. This protects against vandalism and tampering with the housing from the outside.

Advantages & benefits

- Maintain manufacturer's warranty on pre-terminated cables
- Retrofits, repairs and maintenance can be done much more easily and quickly
- High cable density
- Strain relief according to EN 62444
- High stability, vibration resistant
- Can be combined with IMAS-CONNECT adapter grommets
- Great variability in the cable grommets

Specifications

Material	Polyamide (PA)
Flame class	UL94-Vo, self-extinguishing
IP rating	IP54, with gasket and correct selection of cable grommets (certified acc. to EN 60529)
UL type rating	UL type 12 (acc. to UL 50E)
Temperature	- 40°C to + 140°C (static)
Properties	Halogen-free, silicone-free
Frame depth	17 mm

Accessories

KT Cable grommets	48 - 52
AT Adapter grommets	54 - 59
KEL-SNAP Mounting frames	34 - 35
KEL-EMC Cable collectors	158 - 160
ST Plugs	53



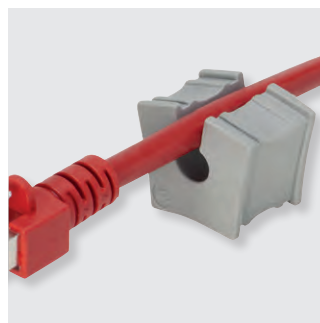
Also available with stainless steel screws (V2A).



Also available with threaded bushings.



The cable entry frames enable the integration of the IMAS-CONNECT™ adapter grommets.



Split KT grommets

KEL
Cable entry frames
KEL-24-E



IP54

Description	Cut-out Drilling template	Type	Cut-out dimensions mm	Grommets small large	Order No.	PU
		KEL 24 15-E	66 x 112	15 –	42209	1
		KEL 24 15-E with V2A screws	66 x 112	15 –	42209.200	1
		KEL 24 15-E with threaded bushings M4	66 x 112	15 –	42209.400	1
		KEL 24 12-E	66 x 112	11 1	42208	1
		KEL 24 12-E with V2A screws	66 x 112	11 1	42208.200	1
		KEL 24 12-E with threaded bushings M4	66 x 112	11 1	42208.400	1
		KEL 24 9-E	66 x 112	7 2	42207	1
		KEL 24 9-E with V2A screws	66 x 112	7 2	42207.200	1
		KEL 24 9-E with threaded bushings M4	66 x 112	7 2	42207.400	1
		KEL 24 10-E	66 x 112	10 –	49056	1
		KEL 24 10-E with V2A screws	66 x 112	10 –	49056.200	1
		KEL 24 10-E with threaded bushings M4	66 x 112	10 –	49056.400	1

KEL

Cable entry frames

KEL-24-MT



Description

Cut-out | Drilling template

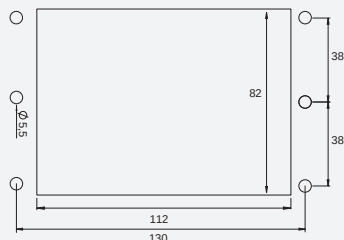
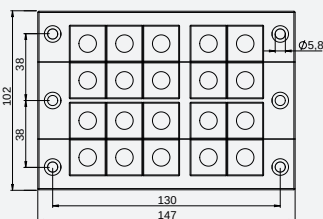
Type

Cut-out dimensions mm

Grommets small | large

Order No.

PU



KEL 24|20-MT

82 x 112

20 | -

42232

1

KEL 24|20-MT
with V2A screws

82 x 112

20 | -

42232.200

1

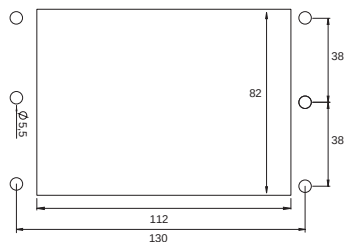
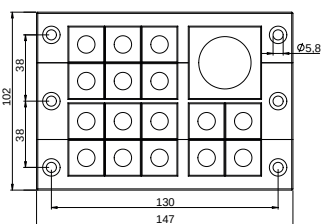
KEL 24|20-MT
with threaded bushings M4

82 x 112

20 | -

42232.400

1



KEL 24|17-MT

82 x 112

16 | 1

42224

1

KEL 24|17-MT
with V2A screws

82 x 112

16 | 1

42224.200

1

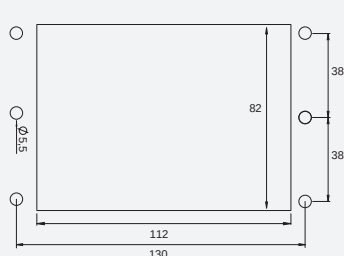
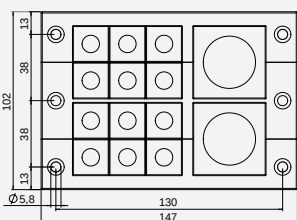
KEL 24|17-MT
with threaded bushings M4

82 x 112

16 | 1

42224.400

1



KEL 24|14-MT

82 x 112

12 | 2

42225

1

KEL 24|14-MT
with V2A screws

82 x 112

12 | 2

42225.200

1

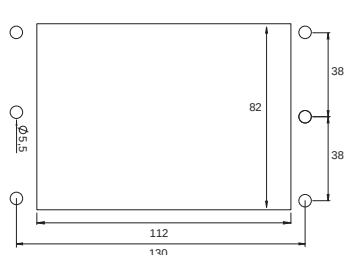
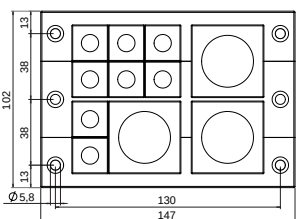
KEL 24|14-MT
with threaded bushings M4

82 x 112

12 | 2

42225.400

1



KEL 24|11-MT

82 x 112

8 | 3

42222

1

KEL 24|11-MT
with V2A screws

82 x 112

8 | 3

42222.200

1

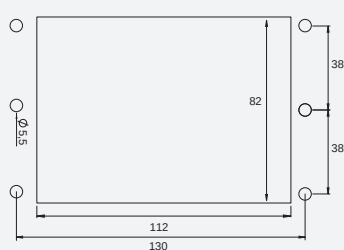
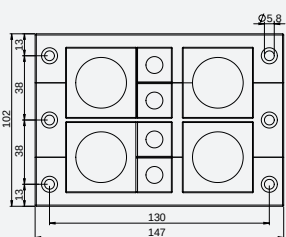
KEL 24|11-MT
with threaded bushings M4

82 x 112

8 | 3

42222.400

1



KEL 24|8-MT

82 x 112

4 | 4

42221

1

KEL 24|8-MT
with V2A screws

82 x 112

4 | 4

42221.200

1

KEL 24|8-MT
with threaded bushings M4

82 x 112

4 | 4

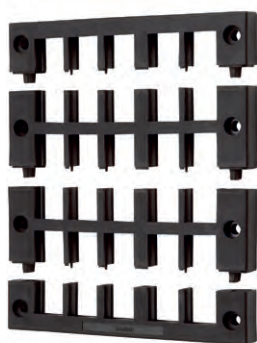
42221.400

1

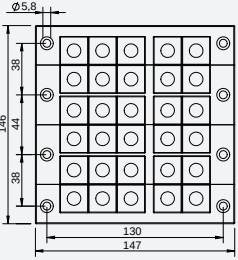
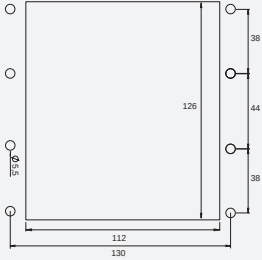
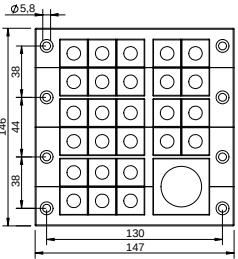
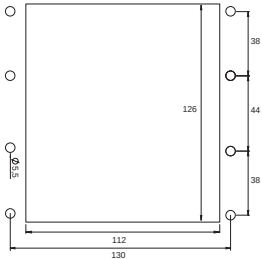
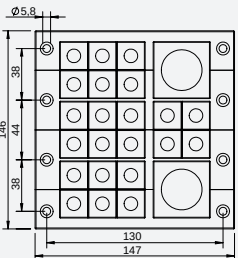
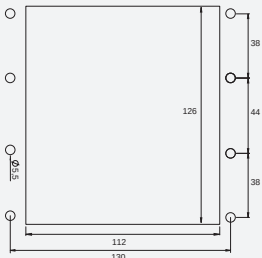
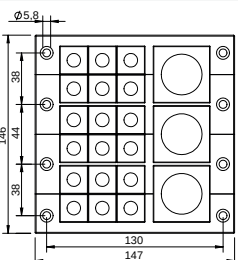
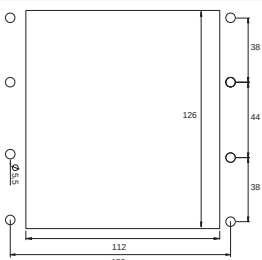
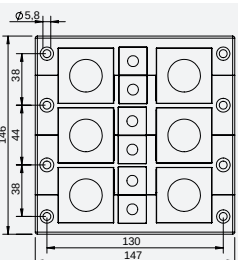
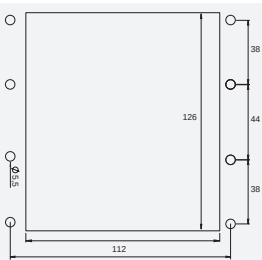
KEL

Cable entry frames

KEL-24-2MT



IP54

Description	Cut-out Drilling template	Type	Cut-out dimensions mm	Grommets small large	Order No.	PU
		KEL 24 30-2MT	126 x 112	30 –	42234	1
		KEL 24 30-2MT with V2A screws	126 x 112	30 –	42234.200	1
		KEL 24 30-2MT with threaded bushings M4	126 x 112	30 –	42234.400	1
		KEL 24 27-2MT	126 x 112	26 1	42233	1
		KEL 24 27-2MT with V2A screws	126 x 112	26 1	42233.200	1
		KEL 24 27-2MT with threaded bushings M4	126 x 112	26 1	42233.400	1
		KEL 24 24-2MT	126 x 112	22 2	42227	1
		KEL 24 24-2MT with V2A screws	126 x 112	22 2	42227.200	1
		KEL 24 24-2MT with threaded bushings M4	126 x 112	22 2	42227.400	1
		KEL 24 21-2MT	126 x 112	18 3	42226	1
		KEL 24 21-2MT with V2A screws	126 x 112	18 3	42226.200	1
		KEL 24 21-2MT with threaded bushings M4	126 x 112	18 3	42226.400	1
		KEL 24 12-2MT	126 x 112	6 6	42223	1
		KEL 24 12-2MT with V2A screws	126 x 112	6 6	42223.200	1
		KEL 24 12-2MT with threaded bushings M4	126 x 112	6 6	42223.400	1

KEL

Cable entry frames

KEL 16-E, KEL 16-MT

IP54



Description	Cut-out Drilling template	Type	Cut-out dimensions mm	Grommets small large	Order No.	PU
		KEL 16 12-E	66 x 86	12 –	42141	1
		KEL 16 12-E with V2A screws	66 x 86	12 –	42141.200	1
		KEL 16 12-E with threaded bushings M4	66 x 86	12 –	42141.400	1
		KEL 16 6-E	66 x 86	4 2	42140	1
		KEL 16 6-E with V2A screws	66 x 86	4 2	42140.200	1
		KEL 16 6-E with threaded bushings M4	66 x 86	4 2	42140.400	1
		KEL 16 16-MT	82 x 86	16 –	42145	1
		KEL 16 16-MT with V2A screws	82 x 86	16 –	42145.200	1
		KEL 16 16-MT with threaded bushings M4	82 x 86	16 –	42145.400	1
		KEL 16 10-MT	82 x 86	8 2	42144	1
		KEL 16 10-MT with V2A screws	82 x 86	8 2	42144.200	1
		KEL 16 10-MT with threaded bushings M4	82 x 86	8 2	42144.400	1
		KEL 16 4-MT	82 x 86	– 4	42143	1
		KEL 16 4-MT with V2A screws	82 x 86	– 4	42143.200	1
		KEL 16 4-MT with threaded bushings M4	82 x 86	– 4	42143.400	1

KEL

Cable entry frames

KEL 16-2MT



IP54

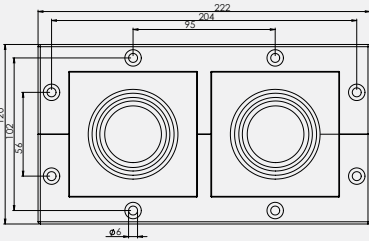
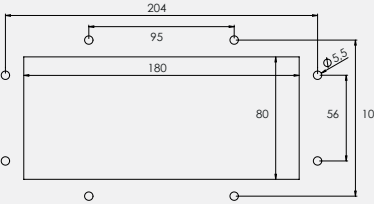
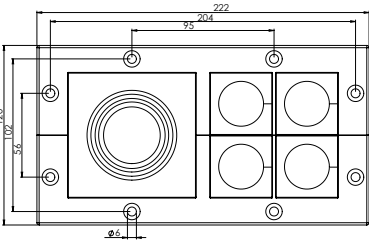
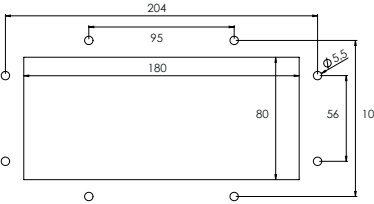
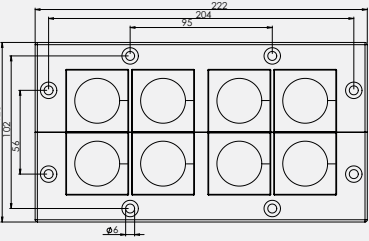
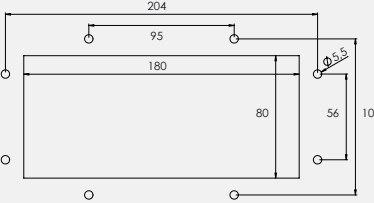
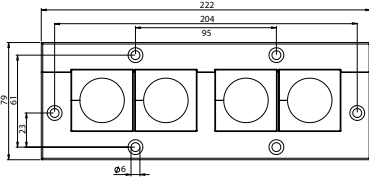
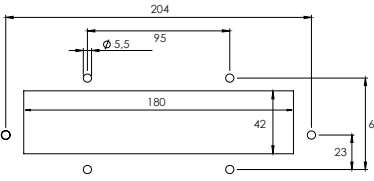
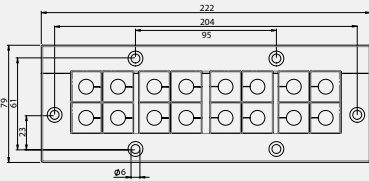
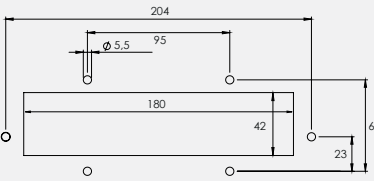
Description	Cut-out Drilling template	Type	Cut-out dimensions mm	Grommets small large	Order No.	PU
		KEL 16 24-2MT	126 x 86	24 –	42149	1
		KEL 16 24-2MT with V2A screws	126 x 86	24 –	42149.200	1
		KEL 16 24-2MT with threaded bushings M4	126 x 86	24 –	42149.400	1
		KEL 16 12-2MT	126 x 86	8 4	42148	1
		KEL 16 12-2MT with V2A screws	126 x 86	8 4	42148.200	1
		KEL 16 12-2MT with threaded bushings M4	126 x 86	8 4	42148.400	1
		KEL 16 6-2MT	126 x 86	– 6	42147	1
		KEL 16 6-2MT with V2A screws	126 x 86	– 6	42147.200	1
		KEL 16 6-2MT with threaded bushings M4	126 x 86	– 6	42147.400	1

KEL 183

Cable entry frames
for supply cables

KEL 183, KEL 183-E

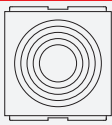
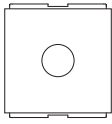
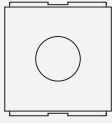
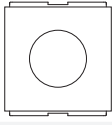
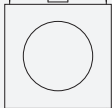


Description	Cut-out Drilling template	Type	Cut-out mm	Grommets KT KT 183 KT large	Order No.	PU
		KEL 183 2	180 x 80 mm	2 –	47200	1
		KEL 183 2 with V2A screws	180 x 80 mm	2 –	47200.200	1
		KEL 183 5	180 x 80 mm	1 4	47220	1
		KEL 183 5 with V2A screws	180 x 80 mm	1 4	47220.200	1
		KEL 183 8	180 x 80 mm	– 8	47240	1
		KEL 183 8 with V2A screws	180 x 80 mm	– 8	47240.200	1
		KEL 183-E4	180 x 42 mm	– 4	47250	1
		KEL 183-E4 with V2A screws	180 x 42 mm	– 4	47250.200	1
		KEL 183-E16	180 x 42 mm	16 KT small	47255	1
		KEL 183-E16 with V2A screws	180 x 42 mm	16 KT small	47255.200	1

KTMB 183

Grommets for KEL 183



	Type	Order No.	Clamping range	PU
	KTMB-O	41410	Blank grommet	1
	KTMB-P	41415	34 - 44 mm	1
	KTMB-Q	41420	44 - 54 mm	1
	KTMB-R	41425	54 - 64 mm	1
	KTMB-S	41430	64 - 75 mm	1



Product description

The split cable entry frame KEL 183 enables the user to route cables and tubes with a diameter of up to 75 mm (depending on the frame type) and to seal them in accordance with IP54/up to UL type 12. For cables up to 35 mm the cable grommets KT can be used. With these split cable grommets, pre-terminated cables can be routed.

For cables up to 75 mm we have created the grommets KTMB for KEL 183. Those are not split and have a defined area for pushing the cable through.

The blank grommet KTMB-O can accept cable sizes within a specified range. The membrane of the KTMB-O can be pierced or cut (cable diameter minus 10 mm) for cables up to 55 mm in diameter.

All frame systems come with a rubber gasket.

Advantages & benefits

- Installation of cables up to 75 mm
- Grommets allow rigid cables to be properly positioned and oriented during the installation process
- Retrofits, repairs and maintenance can be done much more easily and quickly
- Can be combined with IMAS-CONNECT adapter grommets
- Great variability in the cable grommets

Specifications

Material	KEL 183: Polyamide (PA) KTMB: Elastomere
Flame class	UL94-Vo, self-extinguishing
IP rating	IP54 with gasket and correct selection of the cables (certified acc. to EN 60529)
UL type rating	UL type 12 (acc. to UL 50E)
Temperature	KEL 183: - 40°C to + 140°C (static) KTMB: - 40°C to + 100°C (static)
Properties	Halogen-free, silicone-free
Frame depth	17 mm

Accessories

KT Cable grommets	48 - 52
AT Adapter grommets	54 - 59
KEL-EMC Cable collectors	158 - 160
ST Plugs	53

KEL-FL

Cable entry frames
for flat cables



1.11

Description	Cut-out Drilling template	Type	Order No.	Cut-out [mm]	Grommets KT FT	PU
		KEL-FL A	46100	43 × 24	0× KT 1× FT-1	10
		KEL-FL B	46105	65 × 24	0× KT 1× FT-2	10
		KEL-FL C	46110	65 × 24	1× KT 1× FT-1	10
		KEL-FL D	46115	86 × 24	0× KT 1× FT-3	10
		KEL-FL E	46120	86 × 24	1× KT 1× FT-2	10
		KEL-FL F	46125	86 × 24	0× KT 2× FT-1	10
		KEL-FL G	46130	86 × 24	2× KT 1× FT-1	10
		KEL-FL H	46135	112 × 24	2× KT 1× FT-2	10
		KEL-FL I	46140	112 × 24	1× KT 2× FT-1	10
		KEL-FL J	46145	112 × 24	3× KT 1× FT-1	10
		KEL-FL K	46150	112 × 24	1× FT-1 1× FT-2	10
		KEL-FL L	46155	112 × 24	1× FT-4	10



IP54

Product description

The KEL-FL range enables simple, fast and flexible cable routing and sealing of flat wires, e.g. in lift construction.

Innovative construction of the grommets compensates for manufacturing inconsistencies in flat cables. Split KT grommets can be utilised to additionally route round cables with connectors. All frame systems come with a rubber gasket.

FT grommets are used to route flat cables, e.g. in lift construction. Suitable for cable entry frames KEL-FL. Innovative construction of the grommets compensates for manufacturing inconsistencies in flat cables.

Advantages & benefits

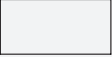
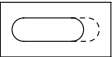
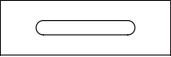
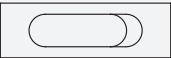
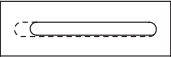
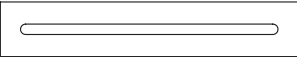
- Routing of flat cables in combination with pre-terminated round cables by using a single KEL-FL cable entry frame
- Routing of flat cables with various dimensions
- Space saving shape

Specifications

Material	KEL-FL: Polyamide (PA)
Flame class	FT: Elastomer
IP rating	UL94-Vo, self-extinguishing IP54, with gasket and correct selection of the cable grommets
Temperature	KEL-FL: - 40°C to + 140°C (static) FT: - 40°C to + 100°C (static)
Properties	Halogen-free, silicone-free
Frame depth	17 mm

Accessories

KT Cable grommets, small	48 - 52
KTMB/KT-DPF Cable grommets, small	51
KEL-EMC Cable collectors	158 - 160
ST Plugs	53

Description	Type	Order No.	Clamping range	PU
	FT-1 0	46201	Blank grommet	5
	FT-1 A	46210	Width: 19 - 23 mm Thickness: 5.5 - 6 mm	5
	FT-1 B	46211	Width: 28 - 33 mm Thickness: 5.5 - 6 mm	5
	FT-1 C	46212	Width: 24 - 30 mm Thickness: 8.5 - 9 mm	5
	FT-1 E	46214	Width: 19 - 24 mm Thickness: 6.5 - 7 mm	5
	FT-1 F	46215	Width: 28 - 33 mm Thickness: 9 - 9.5 mm	5
	FT-2 0	46202	Blank grommet	5
	FT-2 A	46250	Width: 32.5 - 38 mm Thickness: 5 - 5.5 mm	5
	FT-2 B	46251	Width: 45 - 50.5 mm Thickness: 6 - 6.5 mm	5
	FT-2 C	46252	Width: 47 - 52 mm Thickness: 9.5 - 10 mm	5
	FT-2 F	46255	Width: 38 - 43 mm Thickness: 12.5 - 13 mm	5
	FT-2 G	46256	Width: 49 - 54 mm Thickness: 5 - 6 mm	5
	FT-3 0	46203	Blank grommet	5
	FT-3 A	46300	Width: 72 - 77 mm Thickness: 5 - 5.5 mm	5
	FT-4 0	46204	Blank grommet	5
	FT-4 A	46330	Width: 85 - 99 mm Thickness: 4.2 - 5.2 mm	5

Flange enclosures for cable entry with IP54 rating KEL-FG series

1.11

Product description

The cable entry frames KEL-FG are suited for installation, sealing and strain relief of cables with connectors and conduits at an angle of 90° to the cabinet, enclosure or machine wall.

The KEL-FG-A frame matches exactly the cut-out dimensions for 24-pin standard industrial connectors. For tool-free assembly/disassembly of the KEL-FG-A the snap mounting frame KEL-SNAP 24 can be used. The KEL-FG-B is suited for cut-outs 36 × 46 mm.

The single-row versions KEL-FG-E are particularly suited for flat connectors. The small frames are ideal for applications with limited space.

The version with threaded bushings enables the cable entry frame to be screwed onto the housing from the inside out. This protects against vandalism and tampering with the housing from the outside.

A flat rubber gasket is included in the shipment.

Advantages & benefits

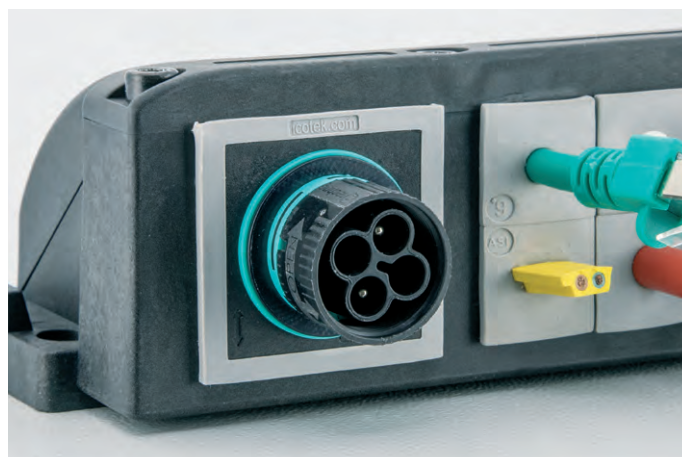
- Installation at an angle of 90° to the wall
- Mechanical protection of cable directly at the place of entry
- Protection against water spray and drips
- Maintain manufacturer's warranty on pre-terminated cables
- Strain relief according to EN 62444
- High stability, vibration resistant
- Can be combined with IMAS-CONNECT adapter grommets.

Specifications

Material	Polyamide (PA)
Flame class	UL94-V0, self-extinguishing
IP rating	IP54, with gasket and correct selection of the cable grommets
Temperature	- 40°C to + 140°C (static)
Properties	Halogen-free, silicone-free

Accessories

KT Cable grommets	48 - 52
AT Adapter grommets	54 - 59
KEL-SNAP Mounting frames	34 - 35
KEL-EMC Cable collectors	158 - 160
ST Plugs	53



The cable entry frames enable the integration of the new IMAS-CONNECT™ adapter grommets.



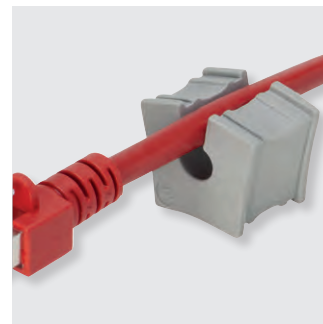
Also available with stainless steel screws (V2A).



Also available with threaded bushings.



KEL-FG-A

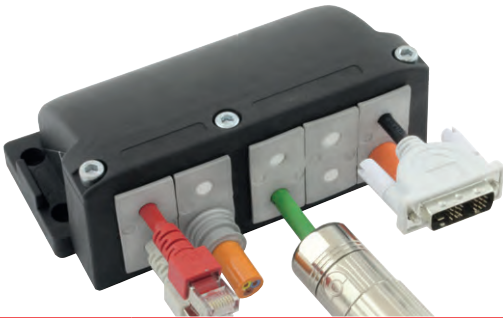


Split KT grommets

KEL-FG

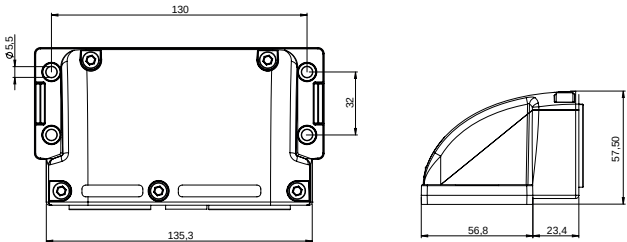
Flange enclosures
for cable entry

KEL-FG-A



IP54

Description	Cut-out Drilling template	Type	Cut-out mm	Grommets small large	Order No.	PU
		KEL-FG-A10	36 x 112	10 –	42320	1
		KEL-FG-A10 with V2A screws	36 x 112	10 –	42320.200	1
		KEL-FG-A10 with threaded bushings M4	36 x 112	10 –	42320.400	1
		KEL-FG-A7	36 x 112	6 1	42322	1
		KEL-FG-A7 with V2A screws	36 x 112	6 1	42322.200	1
		KEL-FG-A7 with threaded bushings M4	36 x 112	6 1	42322.400	1
		KEL-FG-A4	36 x 112	2 2	42324	1
		KEL-FG-A4 with V2A screws	36 x 112	2 2	42324.200	1
		KEL-FG-A4 with threaded bushings M4	36 x 112	2 2	42324.400	1



KEL-FG-A

Flange enclosures

for cable entry

KEL-FG-B



Description	Cut-out Drilling template	Type	Cut-out mm	Grommets small large	Order No.	PU
		KEL-FG-B4	46 x 36	4 –	42330	1
		KEL-FG-B4 with V2A screws	46 x 36	4 –	42330.200	1
		KEL-FG-B4 with threaded bushings M4	46 x 36	4 –	42330.400	1
		KEL-FG-B1	46 x 36	– 1	42332	1
		KEL-FG-B1 with V2A screws	46 x 36	– 1	42332.200	1
		KEL-FG-B1 with threaded bushings M4	46 x 36	– 1	42332.400	1

KEL-FG-A

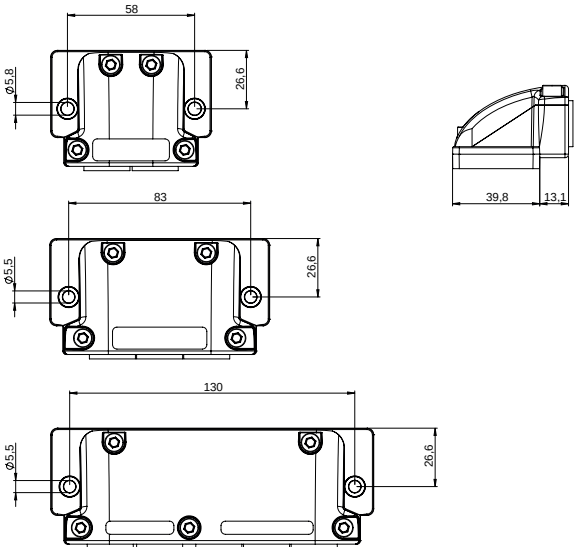
Flange enclosures
for cable entry

KEL-FG-E



IP54

Description	Cut-out Drilling template	Type	Cut-out mm	Grommets small large	Order No.	PU
		KEL-FG-E2	43 x 24	2 –	42333	5
		KEL-FG-E2 with V2A screws	43 x 24	2 –	42333.200	5
		KEL-FG-E2 with threaded bushings M4	43 x 24	2 –	42333.400	5
		KEL-FG-E3	65 x 24	3 –	42334	5
		KEL-FG-E3 with V2A screws	65 x 24	3 –	42334.200	5
		KEL-FG-E3 with threaded bushings M4	65 x 24	3 –	42334.400	5
		KEL-FG-E5	112 x 24	5 –	42336	5
		KEL-FG-E5 with V2A screws	112 x 24	5 –	42336.200	5
		KEL-FG-E5 with threaded bushings M4	112 x 24	5 –	42336.400	5



Snap mounting frames with IP54 rating KEL-SNAP

1.11

Product description

The patented KEL-SNAP frame provides a quick snap-in assembly of the KEL/KEL-U/KEL-QUICK/KEL-FG-A cable entry systems. Control panels, cabinets or machines can be equipped with the KEL-SNAP frame at delivery, allowing a simple push in of the KEL frame when routing cables and conduit. Perfect for enclosures that are maintenance intensive or for an install at a later date.

A cut-out of 46 mm can also be chosen instead of 36 mm. Thus prefabricated multi-pin connectors can be used.

Advantages & benefits

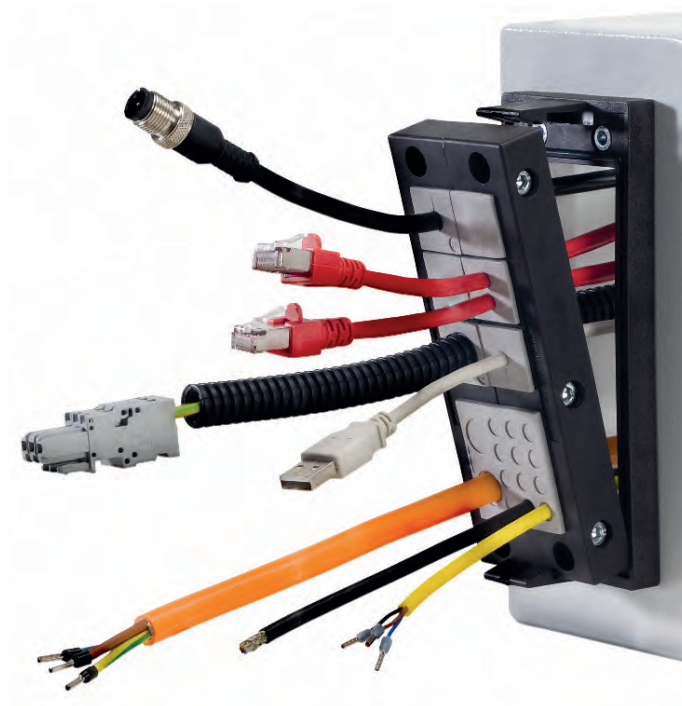
- Upon disassembly (e.g. maintenance) screwing and unscrewing of KEL frame is not necessary
- Previously assembled KEL frames are quickly and easily attached
- Integrated gasket
- Drilling template identical to KEL frame (except KEL-SNAP-B)

Specifications

Material	Polyamide (PA)
Flame class	UL94-Vo, self-extinguishing
IP rating	IP54 (certified acc. to EN 60529)
UL type rating	UL type 12 (acc. to UL 50E)
Temperature	- 40°C to + 140°C (static)
Properties	Halogen-free, silicone-free

Accessories

KEL Cable entry frames	16 - 19
KEL-U Cable entry frames	12 - 15
KEL-FG Flange enclosure	30 - 33
KEL-QUICK Cable entry frames	60 - 63
MP Module plates	204 - 205
BPK-SNAP Blank plates	222
ST Plugs	53



Integrated circular sealing (IP54)



Blank plate BPK-SNAP,
see page 222



KEL-SNAP

Snap mounting frames



IP54

Description	Cut-out Drilling template	Type	Cut-out [mm]	Fits for	Order No.	PU
		KEL-SNAP-B	46 × 38	KEL-B KEL-U-B KEL-QUICK-B	42038	10
		KEL-SNAP 10	46 × 65	KEL 10 KEL-U 10 KEL-QUICK 10	42039	10
		KEL-SNAP 16	46 × 85	KEL 16 KEL-U 16 KEL-QUICK 16	42040	10
		KEL-SNAP 24	46 × 112	KEL 24 KEL-U 24 KEL-FG-A KEL-QUICK 24	42042	10
		KEL-SNAP 24-E	71 × 112	KEL 24-E	42044	1
		KEL-SNAP 24-MT	89 × 112	KEL 24-MT	42046	1

KEL-JUMBO

Cable entry frames
for supply cables



Description	Cut-out Drilling template	Type	Order No.	Dimensions length width height	PU
		KEL-JUMBO 1	42360	110 × 116 × 35 mm	1
		KEL-JUMBO 1 with V2A screws	42360.200	110 × 116 × 35 mm	1
		KEL-JUMBO 2	42350	200 × 116 × 35 mm	1
		KEL-JUMBO 2 with V2A screws	42350.200	200 × 116 × 35 mm	1



Also available with stainless steel
screws (V2A).



KTF

Grommets for KEL-JUMBO



IP54

Product description

The KEL-JUMBO cable entry system for installation of cables and conduits with a diameter of up to 65 mm, especially suited for supply cables.

The innovative grommet design with the flex-membrane provides flexing and adjustment of the position for larger and more rigid cables.

We recommend round cut-outs, which can be made using standard punching tools. Suggested cut-out: cable diameter +15–20%. All frame systems come with a rubber gasket.

The grommets KTF are suitable for cable diameters up to 65 mm.

Cables with a comparatively smaller diameter can be utilised with KEL-JUMBO frames by using an adapter grommet.

Advantages & benefits

- Installation of cables up to 65 mm
- KTF grommets allow flexing and adjustment of the cable position
- Retrofitting and maintenance can be carried out easily and quickly

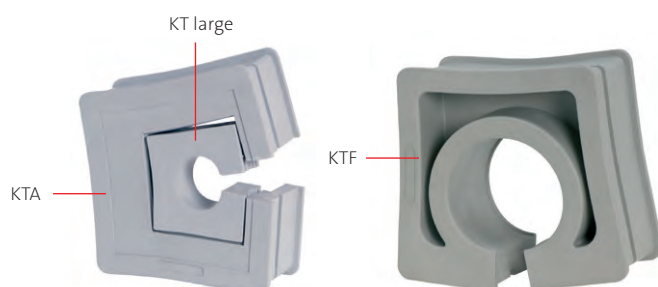
Specifications

Material	KEL-JUMBO: Polyamide (PA) KTF: Elastomer
Flame class	UL94-Vo, self-extinguishing
IP rating	IP54
UL type rating	UL type 12 (acc. to UL 50E)
Temperature	KEL-JUMBO: - 40°C to + 140°C (static)
Properties	KTF:- 40°C to + 100°C (static)
Cut-out dimensions	Halogen-free, silicone-free
Frame depth	Round, cable diameter +15% 35 mm

Accessories

KDR-ESR Base plates	190 - 197
KDR2 Split base plates	198 - 199
MP Module plates	204 - 205

Type	Order No.	Clamping range	PU
KTF 00	42371	Blank grommet	1
KTA	42370	Adapter grommet for KT large	1
KTF 34	42376	33 - 36 mm	1
KTF 38	42379	37 - 40 mm	1
KTF 42	42382	41 - 44 mm	1
KTF 46	42385	45 - 48 mm	1
KTF 50	42388	48 - 52 mm	1
KTF 54	42391	53 - 56 mm	1
KTF 58	42394	56 - 60 mm	1
KTF 62	42397	61 - 65 mm	1



1.12 Split cable glands for the KT grommet system

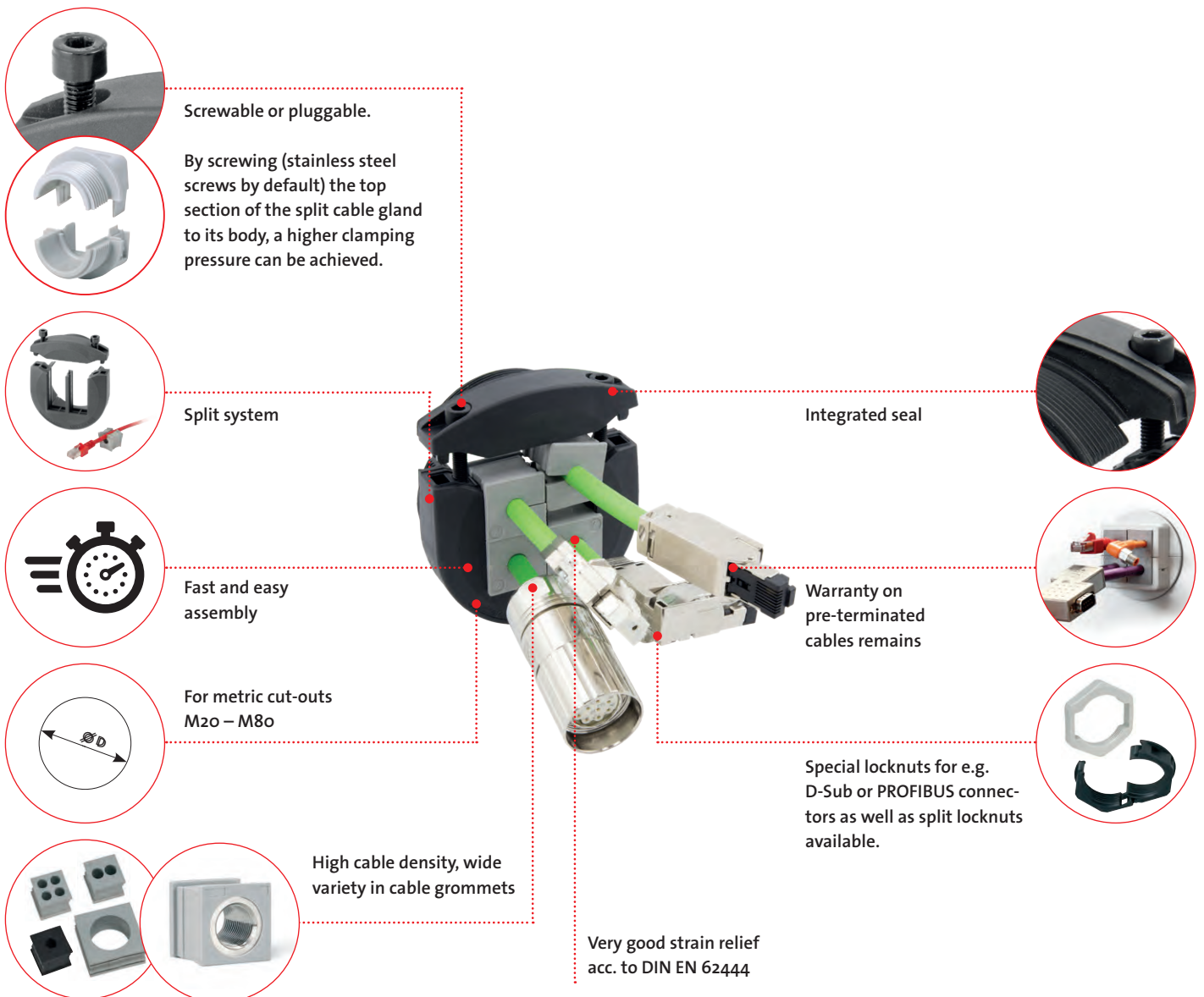


By using icotek's split cord grips, cables with or without connectors or complete cable harnesses with diameters from 1 to 35 mm can be quickly routed into enclosures, cabinets or machines and achieve protection levels up to IP66/IP68/UL type 4X rated.

The split system of the KVT cable glands enables quick and easy assembly which is great for retrofitting and maintenance. The cable is placed into the split grommet which is set into one of the gland halves.

Depending on the size of the cable gland one, two, four or six separate grommets can be installed. The two gland halves can be easily snapped together without the need of tools. The routed lines are securely sealed and held inside the grommets.

To mount the cable glands either snap it into the round metric standard cut-out (sizes available from M20 to M80) or screw it with a hexagonal locknut. The mounting method is dependent on which model is being used.



Chapter content 1.12



Split cable glands
M25 – M63, for cable diameters up to 35 mm

KVT-ER

40 – 41



Split cable glands
M20 – M80, for cable diameters up to 35 mm

KVT / KVT 80 / KVT-SNAP / KVT-W90

42 – 46



Grommets and plugs
for cables with/without connectors,
cable diameter range 1 – 35 mm

KT small / KT large / KT-DPF / KTMB / KT-SC /
KT-DT / ST / KT ServiceBox

47 – 53



IMAS-CONNECT™
Modular adapter system

AT-PP / AT-KS / AT-K-M / AT-M / AT-B

54 – 59

1.12

Split cable glands with IP66/IP68 rating KVT-ER



Product description

KVT-ER are split cable glands for routing and sealing cables with and without connectors, conduits or pneumatic hoses with diameters from 1 to 16 mm (KT 1 - 15) and 16 to 35 mm (KT 16 - 34).

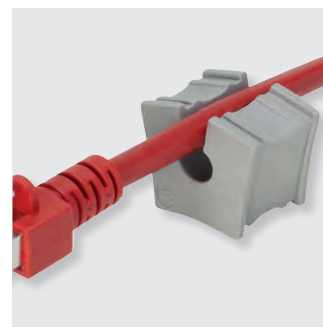
Because of an integrated gasket, the KVT-ER provides certified protection ratings IP65/IP66/IP67/IP68 when using single position cable grommets.

The KVT-ER sizes are based on metric standard cut-outs M25, M32, M50 and M63. Hexagonal locknuts are included in the shipment.

For assembly, we recommend to tighten the cover lid screws with max. 2 Nm.



Certified protection class
IP65/IP66/IP67/IP68



Slit KT grommets

Advantages & benefits

- Certified protection class IP65/IP66/IP67/IP68 according to EN 60529 and UL Type 12 & 4X (certified according to UL 50E)
- Very high strain relief according to EN 62444
- Maintain manufacturer's warranty on pre-terminated cables
- Retrofits, repairs and maintenance can be done easily and quickly
- High cable density
- Suitable for metric cut-outs
- Hexagonal nut included in the delivery
- V2A stainless steel screws
- Very robust housing, vibration resistant
- Modern design



With stainless steel screws (V2A).



Injected elastomer gasket

Specifications

Material	Frame: Polypropylene (PP) Injected gasket: Elastomer
Flame class	UL94-Vo, self-extinguishing
IP rating	IP65/IP66/IP67/IP68, if correctly assembled with single grommets (certified acc. to EN 60529)
Temperature	- 40°C to + 110°C (static)
Properties	Halogen-free, silicone-free
Cut-out dimension	Metric sizes

Accessories

KT Cable grommets	48 - 52
AT Adapter grommets	54 - 59
KVT-EMC Brackets	161
Locknuts	224 - 225
ST Plugs	53

Locknuts

Locknuts with special cut-outs are available separately.



KGM-SUB-D9
fits D-Sub 9 connectors
(Required wall cut-out: Ø 36 mm,
PU: 10)

■ Order No. 45106

KGM-SUB-D25
fits SUB-D25 connectors
(Required wall cut-out: Ø 50 - 54
mm, PU: 10)

■ Order No. 45110



Type GMT: Split locknut, p. 225

KVT-ER

Split cable glands



IP66 IP68

Description	Type	Order No.	Grommets KT small large	Thread Thread length	PU
	KVT-ER 25*	45450	1 –	M25 × 1.5 Length: 18 mm	10
	KVT-ER 32	45452	1 –	M32 × 1.5 Length: 18 mm	10
	KVT-ER 50 2	45454	2 –	M50 × 1.5 Length: 20.5 mm	5
	KVT-ER 63 1	45455	– 1	M63 × 1.5 Length: 20.5 mm	5
	KVT-ER 63 4	45456	4 –	M63 × 1.5 Length: 20.5 mm	5

* Max. cable diameter of 15 mm

Split cable glands with IP54 rating KVT



Product description

KVT is a circular split frame for quick and easy installation and sealing of cables with connectors or complete cable harnesses.

Polyamide locknuts as well as a sealing ring are included in the shipment.

For routing D-Sub, DVI or PROFIBUS connectors in combination with the split cable glands KVT, special locknuts with cut-outs are required.

Advantages & benefits

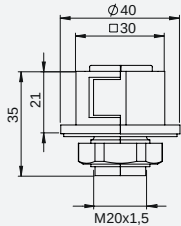
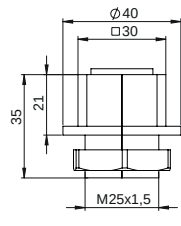
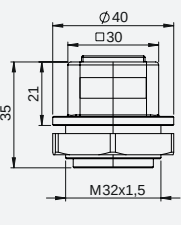
- Insertion of pre-terminated cables
- Maintain manufacturer's warranty on pre-terminated cables
- Retrofits, repairs and maintenance can be done much more easily and quickly
- High cable density, wide variety of grommets
- Suitable for metric cut-outs
- Locknut is included

Specifications

Material	Polycarbonate (PC)
Colour	■ grey (similar RAL 7035) ■ black
Flame class	UL94-Vo, self-extinguishing
IP rating	IP54, with gasket and correct selection of the cable grommets (certified acc. to EN 60529)
UL type rating	UL type 12 (acc. to UL 50E)
Temperature	- 30°C to + 100°C (static)
Properties	Halogen-free, silicone-free
Cut-out dimension	Metric sizes

Accessories

KT Cable grommets	48 - 52
AT Adapter grommets	54 - 59
KVT-EMC Brackets	161
Locknuts	224 - 225
ST Plugs	53

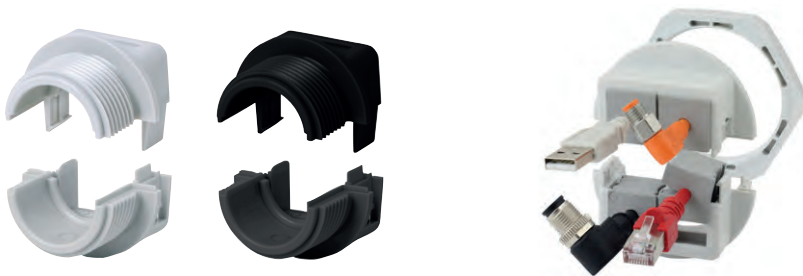
Description	Type	Order No.	Grommets small large	Thread Thread length	PU
	KVT 20**	■ 45034 ■ 45024	1 -	M20 × 1.5 Length: 14 mm	10
	KVT 25***	■ 45035 ■ 45025	1 -	M25 × 1.5 Length: 14 mm	10
	KVT 32	■ 45036 ■ 45026	1 -	M32 × 1.5 Length: 14 mm	10
	KVT 32 + KGM-SUB-D9	■ 45037 ■ 45027	1 -	M32 × 1.5 Length: 14 mm	10

* Only valid for grey product types ** Max. cable diameter of 11 mm | *** Max. cable diameter of 15 mm



KVT

Split cable glands



IP54

Locknuts

Locknuts with special cut-outs are available separately. The cut-out dimensions are listed on page 225.



KGM-SUB-D9 fits D-Sub 9 connectors
(Required wall cut-out: Ø 36 mm, PU: 10)

Order No. 45105 Order No. 45106

KGM-PB fits DVI and PROFIBUS connectors
(Required wall cut-out: Ø 42 mm, PU: 10)

Order No. 45107 Order No. 45109

KGM-SUB-D25 fits SUB-D25 connectors
(Required wall cut-out: Ø 50 - 54 mm, PU: 10)

Order No. 45108 Order No. 45110



Type GMT: Split locknut, p. 225

Description	Type	Order No.	Grommets small large	Thread Thread length	PU
	KVT 40	45203 45028	1 -	M40 x 1.5 Length: 14 mm	10
	KVT 40 + KGM-PB	45205 45029	1 -	M40 x 1.5 Length: 14 mm	10
	KVT 50 2	45204 45030	2 -	M50 x 1.5 Length: 14 mm	5
	KVT 50 2 + KGM-SUB-D25	45206 45031	2 -	M50 x 1.5 Length: 14 mm	5
	KVT 63 1	45212 45112	- 1	M63 x 1.5 Length: 14 mm	5
	KVT 63 4	45215 45115	4 -	M63 x 1.5 Length: 14 mm	5

* Only valid for grey product types

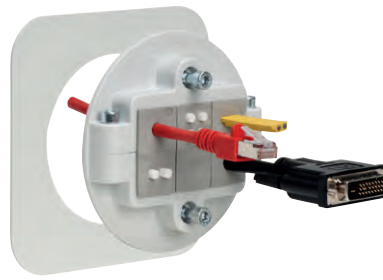


The cable glands enable the integration of the new IMAS-CONNECT™ adapter grommets.

KVT 80

Split cable glands for front mounting

IP54



Product description

The KVT 80 split cable glands are designed for routing and sealing cables with connectors. By assembling the two frame halves with the screws provided, the grommets provide sufficient pressure on the routed cables to obtain a high degree of strain relief. The KVT 80 can be fitted to a wall thickness from 1.5 mm to 10 mm. A flat rubber gasket is included in the shipment.

Advantages & benefits

- Insertion of pre-terminated cables
- Maintain manufacturer's warranty on pre-terminated cables
- Retrofits, repairs and maintenance can be done much more easily and quickly
- High cable density, wide variety of grommets
- Fast and easy mounting from the front side
- Strain relief according to EN 62444

Note

When mounting the KVT 80 on sheet metal, we recommend the following torque values:
1.5 mm sheet = 1 Nm | 2 - 10 mm sheet = 1.5 Nm

Specifications

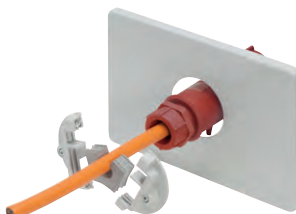
Material	Polycarbonate (PC)
Colour	grey (similar RAL 7035) black
Flame class	UL94-Vo, self-extinguishing
IP rating	IP54, with gasket and correct selection of the cable grommets (certified acc. to EN 60529)
UL type rating	UL type 12 (acc. to UL 50E)
Temperature	- 30°C to + 100°C (static)
Properties	Halogen-free, silicone-free
Cut-out dimension	80 mm in diameter

Accessories

Cable grommets	48 - 52
ST Plugs	53

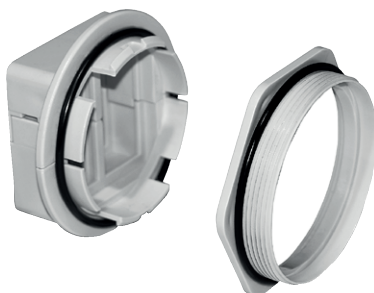
Description	Type	Order No.	Grommets KT small large	PU
	KVT 80 3	45236 45239	2 1	1
	KVT 80 6	45237 45238	6 -	1

*Only valid for grey product types



KVT-SNAP

Split pluggable cable glands



IP54

Product description

KVT is a circular split frame for quick and easy installation of cables with connectors or complete cable harnesses.

By using the model KVT-SNAP, cables can be routed through thick walls (> 5 mm) e.g. into cast terminal boxes without the use of tools. A sealing ring is included in the shipment.

Assembly

- The snap ring is screwed into metric thread or tapped into the cut-out (it can also be fastened with a locknut, which is included in the shipment of KVT-SNAP 63)
- Once the snap ring is affixed to the housing the equipped KVT is simply pushed into it. Fast and easy installation!

Specifications

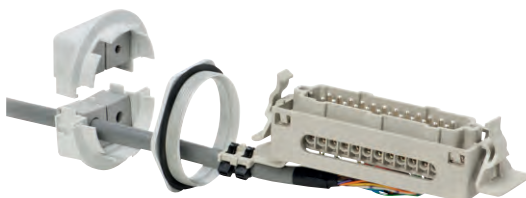
Material	Polycarbonate (PC)
Colour	■ grey (similar RAL 7035)
Flame class	UL94-Vo, self-extinguishing
IP rating	IP54, with gasket and correct selection of the cable grommets (certified acc. to EN 60529)
Temperature	- 30°C to + 100°C (static)
Properties	Halogen-free, silicone-free
Cut-out dimension	Metric cut-outs

Accessories

Cable grommets	48 - 52
KVT-EMC Brackets	161
KGM Locknuts	224 - 225
ST Plugs	53

Description	Type	Order No.	Grommets small large	Thread Thread length	PU
	KVT-SNAP 32	45130	1 -	M32 × 1.5 Length: 11 mm	10
	KVT-SNAP 40	45134	1 -	M40 × 1.5 Length: 11 mm	10
	KVT-SNAP 63 4 + KGM 63	45152	4 -	M63 × 1.5 Length: 11 mm	5
	KVT-SNAP 63 1 + KGM 63	45154	- 1	M63 × 1.5 Length: 11 mm	5
	KGM 32	■ 52275 ■ 52285	PA	M32 × 1.5	10
	KGM 40	■ 52276 ■ 52286	PA	M40 × 1.5	10
	KGM 63	■ 52278 ■ 52288	PA	M63 × 1.5	5

* Only valid for grey product types



KVT-W90

Split cable glands

IP54



Product description

The split KVT-W90 cable glands are used to insert and seal pre-terminated cables and conduits at a 90° angle.

In particular, the KVT 50-W90 is perfectly suited to hold corrugated or smooth hoses. A large number of cable entry grommets is available to the user.

Polyamide standard locknuts as well as a sealing ring are included in the shipment. Split locknuts can be ordered separately.

Advantages & benefits

- Installation at an angle of 90° to the cabinet
- Insertion of pre-terminated cables and conduits
- Maintain manufacturer's warranty on pre-terminated cables
- Suitable for metric cut-outs

Specifications

Material	Polycarbonate (PC)
Colour	grey (similar RAL 7035) black
Flame class	UL94-Vo, self-extinguishing
IP rating	IP54, with gasket and correct selection of the cable grommets (certified acc. to EN 60529)
Temperature	- 30°C to + 100°C (static)
Properties	Halogen-free, silicone-free
Cut-out dimension	Metric cut-outs

Accessories

Cable grommets	48 - 52
KVT-EMC Brackets	161
KGM Locknuts	224 - 225
ST Plugs	53

Description	Type	Order No. with locknut	Grommets small large	Thread Thread length	PU
	KVT 32-W90	45404 45406	1 -	M32 x 1.5 Length: 115 mm	10
	KVT 50 4-W90	45424 45426	4 -	M50 x 1.5 Length: 115 mm	5
	KVT 50 1-W90	45414 45416	- 1	M50 x 1.5 Length: 115 mm	5

*Only valid for grey product types



KT ServiceBox

Service box
for cable grommets



Product description

Convenient - everything available right away!

The KT ServiceBox is perfect for installations and service calls. It ensures your KT grommets are readily available.

Order No. 88001

Content*

Cable grommets, small:

- 110 KT for cables 1 - 17 mm
- 10 BTK blank grommets
- 10 KTMB multi-range grommets
- 2 KT-DPF multi-range grommets
- 8 KT-ASI for ASI-Bus cables
- 1 AT-K-M 12x1.5

Cable grommets, large:

- 25 KT for cables 16 - 35 mm
- 4 BTG blank grommets / ATG adapter grommets
- 3 KTMB multi-range grommets
- 2 KT-DT multi-membrane grommets
- 2 KT-DPF multi-range grommets
- 2 KT-SC
- 2 AT-M 12x1.0

Accessories:

- 1 Cable entry frame KEL-U 10|3
- 1 Cable entry frame KEL-E3
- 1 KVT split cable gland
- 1 KZL strain relief plate
- 1 Cable template

* Subject to alterations



KMS Cable template

The correct size of the KT grommets can easily be determined by using the cable template (material: stainless steel V2A).

- Determining the diameter of the cable using the cable template
- Selecting the KT grommets according to the data on the cable template

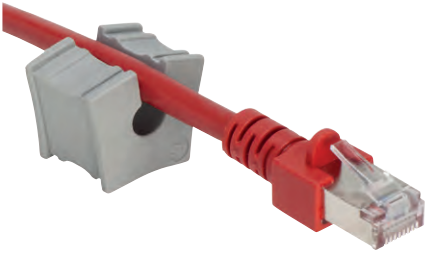
Cable templates can also be ordered separately. **Order-No. 39800**



KT

Grommets, small, single

IP54 IP66 IP68



1.1

Product description

Cable grommets KT small are used with the cable entry frames & cable glands of product groups 1.11, 1.12 and 4.2.

The model range KT small is designed for cable diameters from 1 to 17 mm.

Assembly note

When installing the grommets, the flat side should be facing the middle of the frame. This allows the flat sides of adjacent grommets to match up and provide a secure seal.

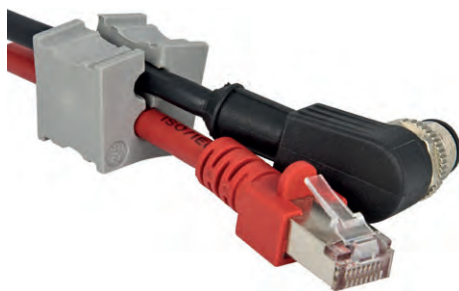
Description	Type	Order No grey	Order No black	Clamping range	PU
	BTK	41251	41351	Blank grommet	10
	KT round				
	KT 1	39941	39943	1 - 2 mm	10
	KT 2	39934	41302	2 - 3 mm	10
	KT 3	41203	41303	3 - 4 mm	10
	KT 4	41204	41304	4 - 5 mm	10
	KT 5	41205	41305	5 - 6 mm	10
	KT 6	41206	41306	6 - 7 mm	10
	KT 7	41207	41307	7 - 8 mm	10
	KT 8	41208	41308	8 - 9 mm	10
	KT 9	41209	41309	9 - 10 mm	10
	KT 10	41210	41310	10 - 11 mm	10
	KT 11	41211	41311	11 - 12 mm	10
	KT 12	41212	41312	12 - 13 mm	10
	KT 13	41213	41313	13 - 14 mm	10
	KT 14	41214	41314	14 - 15 mm	10
	KT 15	41215	41315	15 - 16 mm	10
	KTs 16	39901	39912	16 mm	10
	KTs 17	39900	39913	17 mm	10

*Only valid for grey product types



KT

Grommets, small, multi
& special grommets



Specifications KT grey

Material	Elastomer
Flame class	UL94-Vo, self-extinguishing
IP rating	KT round, single: up to IP66/IP68 KT round, multi: IP54 KT special, multi: IP54
UL type rating	up to UL type 4X (acc. to UL 50E)
Temperature	- 40°C to + 100°C (static)
Properties	Halogen-free, silicone-free

Specifications KT black

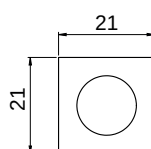
Material	Elastomer
Flame class	UL94-HB
IP rating	KT round, single: up to IP66/IP68 KT round, multi: IP54 KT special, multi: IP54
Temperature	- 30°C to + 90°C (static)
Properties	Higher chemical resistance e.g. with aggressive oils, coolants

Accessories

ST Plugs 53

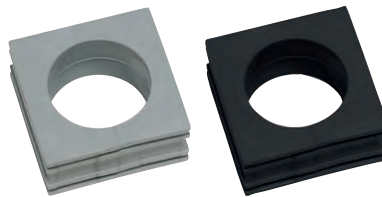
Description	Type	Order No grey	Order No black	Clamping range	PU	
	KT 2 x	KT 2 1	 39942	 39944	2× ø 1 mm	10
		KT 2 2	 39935	 39936	2× ø 2 mm	10
		KT 2 3	 39939	 39940	2× ø 3 mm	10
		KT 2 4	 39906	 39907	2× ø 4 mm	10
		KT 2 5	 41200	 39904	2× ø 5 mm	10
		KT 2 6	 41201	 39905	2× ø 6 mm	10
		KT 2 7	 41202	 39916	2× ø 7 mm	10
		KT 2 8	 39917	 39918	2× ø 8 mm	10
	KT 4 x	KT 4 2	 39937	 39938	4× ø 2 mm	10
		KT 4 3	 39914	 39915	4× ø 3 mm	10
		KT 4 4	 39909	 39911	4× ø 4 mm	10
		KT 4 5	 39908	 39910	4× ø 5 mm	10
		KT 4 6	 39932	 39933	4× ø 6 mm	10
	KT ASI	KT-ASI	 39902	 39903	1 ASI-cable	10
		KT-ASI2 rl	 39922	 39924	2 ASI-cables	10
		KT-ASI2 lll	 39921	 39923	2 ASI-cables	10
	KT oval	KT oval	 39930	—	approx. 8 × 4 mm	10
	KT S1	KT S1	 39931	—		10
	KT tele	KT tele	 39929	—	Telephone cable	10
		KT tele1	 41257	—	Data cable RJ12	10
		KT tele2	 41258	—	Data cable RJ10 / RJ45	10

*Only valid for grey product types



KT

Grommets, large



1.1

Product description

Cable grommets KT large accept a wide range of cable diameters from 16 to 35 mm. They are used with the cable entry frames & cable glands of product groups 1.11, 1.12 and 4.2.

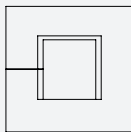
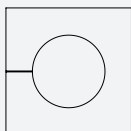
ATG adapter grommets provide the possibility to hold a small KT grommet to reduce the clamping range down to 1 mm.

Specifications KT grey

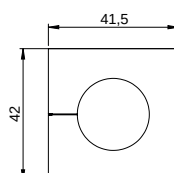
Material	Elastomer
Flame class	UL94-Vo, self-extinguishing
IP rating	KT round, single: up to IP66/IP68 ATG/BTG: IP54
UL type rating	up to UL type 4X (acc. to UL 50E)
Temperature	- 40°C to + 100°C (static)
Properties	Halogen-free, silicone-free

Specifications KT black

Material	Elastomer
Flame class	UL94-HB
IP rating	KT round, single: up to IP66/IP68 ATG/BTG: IP54
Temperature	- 30°C to + 90°C (static)
Properties	Higher chemical resistance e.g. with aggressive oils, coolants

Description	Type	Order No. grey	Order No. black	Clamping range	PU
	ATG				
	ATG	41253	41353	Adapter grommet	10
	BTG				
	BTG	41252	41352	Blank grommet	10
	KT 16	41216	41316	16 - 17 mm	10
	KT 17	41217	41317	17 - 18 mm	10
	KT 18	41218	41318	18 - 19 mm	10
	KT 19	41219	41319	19 - 20 mm	10
	KT 20	41220	41320	20 - 21 mm	10
	KT 21	41221	41321	21 - 22 mm	10
	KT 22	41222	41322	22 - 23 mm	10
	KT 23	41223	41323	23 - 24 mm	10
	KT 24	41224	41324	24 - 25 mm	10
	KT 25	41225	41325	25 - 26 mm	10
	KT 26	41226	41326	26 - 27 mm	10
	KT 27	41227	41327	27 - 28 mm	10
	KT 28	41228	41328	28 - 29 mm	10
	KT 29	41229	41329	29 - 30 mm	10
	KT 30	41230	41330	30 - 31 mm	10
	KT 31	41231	41331	31 - 32 mm	10
	KT 32	41232	41332	32 - 33 mm	10
	KT 33	41233	41333	33 - 34 mm	10
	KT 34	41234	41334	34 - 35 mm	10

*Only valid for grey product types



KT / KT-DPF large



KT-DPF | KT-SC | KTMB

Grommets, multi-range



Product description

The KT-DPF /KTMB grommets accept a wide range of cable diameters. This is a great benefit when the exact cable diameter is not known in advance. The KT-DPF /KTMB grommets are not split and therefore only usable for cables without connectors. Cutting of KT-DPF grommets: Cable diameter less 20%.

The KT-SC grommet is based on the large KT grommet and enables flexible routing and sealing of electrical cables and pneumatic hoses with diameters from 5 – 28 mm.

Specifications grey

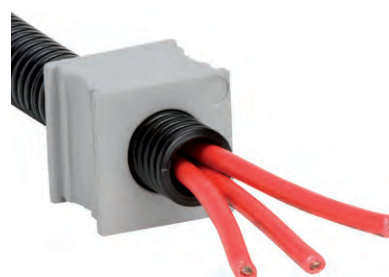
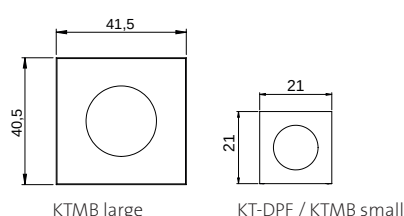
Material	Elastomer
Flame class	UL94-Vo, self-extinguishing
IP rating	IP54
UL type rating	UL type 12 (acc. to UL 50E)
Temperature	- 40°C to + 100°C (static)
Properties	Halogen-free, silicone-free

Specifications black

Material	Elastomer
Flame class	UL94-HB
IP rating	IP54
Temperature	- 30°C to + 90°C (static)
Properties	Higher chemical resistance e.g. with aggressive oils, coolants

Description	Type	Order No.	Size KT	Clamping range	PU
 KT-DPF-A	KT-DPF-A	41260 41360	KT small	3 - 12 mm	10
 KT-DPF-B	KT-DPF-B	41261 41361	KT large	4 - 18 mm	10
 KT-DPF-C	KT-DPF-C	41262 41362	KT large	14 - 26 mm	10
 KT-SC	KT-SC	41485	KT large	5 - 28 mm	10
 KTMB-A	KTMB-A	41432	KT small	2.5 - 6.5 mm	10
 KTMB-B	KTMB-B	41434	KT small	4 - 7.5 mm	10
 KTMB-C	KTMB-C	41436	KT small	6.5 - 10 mm	10
 KTMB-D	KTMB-D	41438	KT small	9.5 - 13 mm	10
 KTMB-E	KTMB-E	41440	KT small	13 - 16 mm	10
 Cross section KTMB					
 KTMB-G	KTMB-G	41460	KT large	13 - 18 mm	10
 KTMB-H	KTMB-H	41465	KT large	18 - 23 mm	10
 KTMB-I	KTMB-I	41470	KT large	23 - 28 mm	10
 KTMB-J	KTMB-J	41475	KT large	28 - 33 mm	10
 KTMB-K	KTMB-K	41480	KT large	2x 13 - 18 mm	10

*Only valid for grey product types



KMS Cable template

Page 47
Order No. 39800



KT-DT

Membrane cable grommets



1.1

Product description

The KT-DT cable grommets are designed for cables without preassembled connectors. A large number of cables can be routed utilising minimal space.

KT-DT 1 – KT-DT 5 grommets are designed to fit in KT large grommet spaces. KT-DT7 & KT-DT 8 grommets are designed to fit in KT small grommet spaces.

The KT-DT grommets are also perfectly suitable for the assembly of subsequently terminated cable harnesses.

Advantages & benefits

- Combination of routing pre-terminated cables and cables without connectors with one cable entry frame
- Enables sub-assembly of cable harnesses
- High cable density

Specifications

Material	Elastomer
Flame class	UL94-Vo, self-extinguishing
IP rating	IP54
UL type rating	UL type 12 (acc. to UL 50E)
Temperature	- 40°C to + 100°C (static)
Properties	Halogen-free, silicone-free

Accessories

ST-B Plugs 107

Description	Type	Order No.	Number of cables	PU
	KT-DT 1	41500	12× max. 6.5 mm 2× max. 12.2 mm	10
	KT-DT 2	41510	16× max. 7.1 mm	10
	KT-DT 3	41520	4× max. 6.5 mm 3× max. 9.5 mm 3× max. 11.3 mm	10
	KT-DT 4	41530	9× max. 9.5 mm	10
	KT-DT 5	41540	4× max. 14.5 mm 1× max. 9.5 mm	10
	KT-DT 7	41550	4× max. 6 mm	10
	KT-DT 8	41552	2× max. 7 mm 2× max. 4 mm	10



ST

Plugs for cable grommets



Description	Type	Order No.	Diameter D	Length L	PU
	ST 1	42900	1 mm	25 mm	25
	ST 2	42909	2 mm	25 mm	25
	ST 3	42901	3 mm	25 mm	25
	ST 4	42908	4 mm	25 mm	25
	ST 5	42906	5 mm	25 mm	25
	ST 6	42903	6 mm	25 mm	25
	ST 7	42905	7 mm	25 mm	25
	ST 8	42899	8 mm	20 mm	25
	ST 9	42897	9 mm	20 mm	25
	ST 10	42895	10 mm	20 mm	25
	ST 11	42893	11 mm	20 mm	25
	ST 12	42891	12 mm	20 mm	25
	ST 13	42889	13 mm	20 mm	25
	ST 14	42887	14 mm	20 mm	25
	ST 15	42885	15 mm	20 mm	25
	ST 16	42883	16 mm	20 mm	25
	ST 17	42881	17 mm	20 mm	25
	ST ASI	42877	-	25 mm	25

Product description

Plugs are used to close either KT or QT grommets which are not equipped with cables. IP ratings of the grommets remain.

Perfect for applications where cables have been removed or might be routed at a later stage.

Advantages & benefits

- Sealing unused cable grommets

Specifications

Material	Polyamide (PA), white
Flame class	UL94-Vo, self-extinguishing
IP rating	IP rating of grommets remains
UL type rating	UL type 12 (acc. to UL 50E)
Temperature	- 40°C to + 120°C
Properties	Halogen-free, silicone-free

Compatible with

KT Cable grommets	48 - 52
QT Cable grommets	72



1.13 Modular adapter system IMAS-CONNECT™ for the KT system

icotek
exclusive
LINE

IP54

IP66

HL3
EN 45545-2

EN ISO 14644

PNEUMATICS

UV
ISO 4892-2A

ECOLAB
certified

RoHS
compliant

Made in
Germany

The new IMAS-CONNECT™ modular adapter system by icotek is a modular designed grommet system for mounting metric connectors, PushPull modules, Keystone couplers, hose fittings, pressure compensation elements and much more.

By utilising the modular adapter system, the cable entry frame becomes a hybrid system. Pre-terminated and standard cables or hoses can be routed and at the same time the system serves as an interface for connectors.

The grommets, made of elastomer with a polyamide body, fit perfectly into the icotek cable entry frames, like e.g. KEL-U, KEL-ER, KEL-FG and meet the protection classes IP54 to IP66.

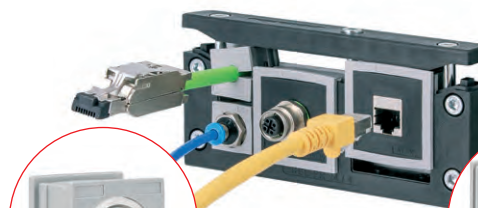


NEW

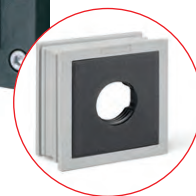
Available with pre-terminated cut-out for PushPull systems (AT-PP)



High protection class:
up to IP66



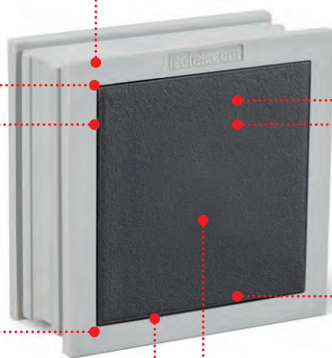
Available with threaded insert (AT-K-M/AT-K-Z), based on the KT cable grommet.



Perfect integration into the split icotek cable entry frames.



At a high cable density only one cut-out is necessary.



Available with metric inner threads of M12 x 1.0, M16 x 1.5, M20 x 1.5, M25 x 1.5 (AT-M).

Usable area for special cut-outs and drill-holes: 24 x 24 mm; Wall thickness: 6 mm (AT-B)

Elastomer grommet with polyamide body based on the grommet KT large.

Available with pre-terminated cut-out for Keystone couplers (AT-KS).

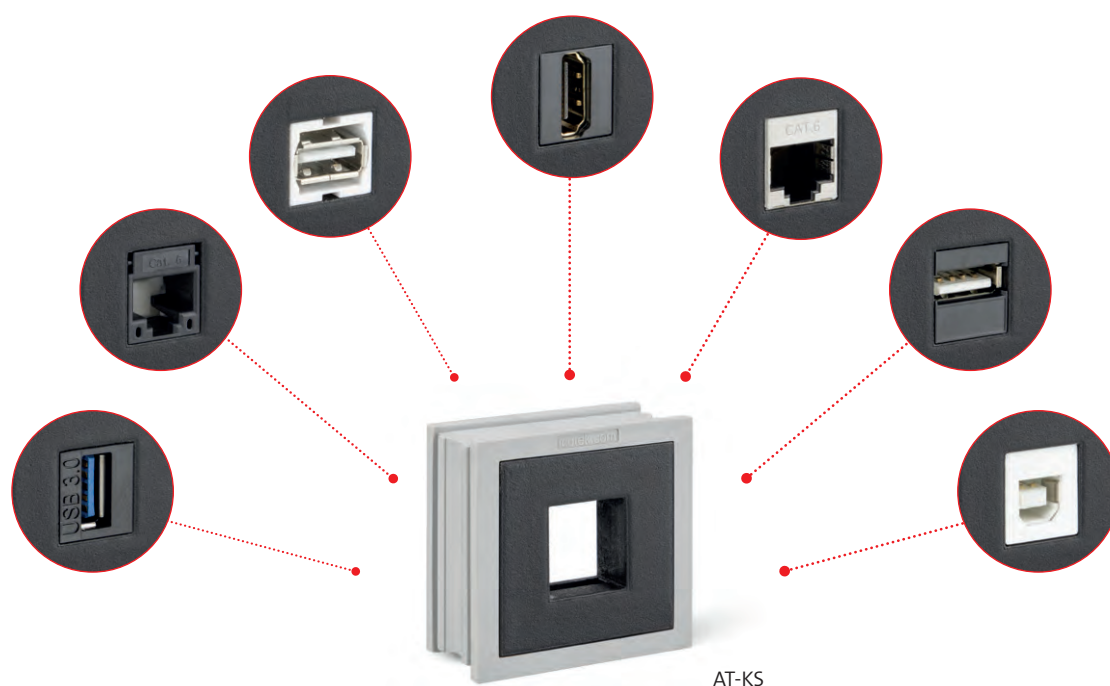


Chapter content 1.13

 IP65 Adapter grommet for PushPull connector systems AT-PP 56	 IP54 Adapter grommet for Keystone couplers AT-KS 57	 IP66 Adapter grommet, small with threaded insert AT-K-M AT-K-Z 58
 IP68 Pressure compensation element with metric thread PCE 58	 IP65 Adapter grommet with metric inner thread AT-M 59	 IP65 Adapter grommet, blank AT-B 59

Various application examples

USB, RJ45, HDMI and approx. 70 other Keystone couplers.



AT-PP

Adapter grommet for PushPull connector systems

IP65



Product description

The grommet AT-PP is constructed on the basis of a large KT cable grommet. In this elastomer grommet, a polyamide body is integrated. All modules based on the PushPull system can be inserted into the grommet.

By using the grommet AT-PP, the split cable entry frame can be used to route pre-terminated cables and at the same time it can also be used as an interface for connectors. This can save additional cut-outs and reduce labour costs.

PushPull modules and add-on housings are not included in the scope of delivery.

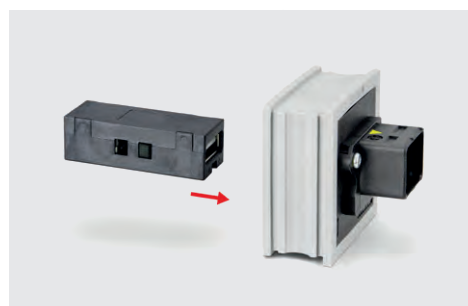
Advantages & benefits

- By using AT-PP grommets, panel connectors and sockets can be integrated directly into the cable entry system
- Separate cut-outs for connectors are no longer necessary
- Time saving solution
- Space-saving solution
- Assembly costs are reduced

Specifications

Material	Grommet: Elastomer Body with thread: Polyamide
Flame class	UL 94-Vo, self-extinguishing
Protection class	IP65 when using correct components
Temperature	-40°C to +100°C (static)
Properties	Halogen free, silicone free

Type	Order No.	Height x width x length [mm]	Material	PU
AT-PP	39961 NEW	42 x 41.5 x 19	PA / Elastomer	5



The module (left) snaps into the rear of the add-on housing mounted on the AT-PP.

AT-KS

Adapter grommet
for Keystone couplers

IP54

Product description

The grommet AT-KS is constructed on the basis of a KT cable grommet. In this elastomer grommet, a polyamide body is integrated. All couplers based on the Keystone system can be simply snapped in.

By using the grommet AT-KS, the split cable entry frame can be used to route pre-terminated cables and at the same time it can also be used as an interface for connectors. This can save additional cut-outs and reduce labour costs.

Advantages & benefits

- By utilising the AT-KS grommet, connectors can be integrated directly into the cable entry frame
- Separate cut-outs for connectors are no longer necessary
- Space-saving solution
- Grommet is suitable for all Keystone couplers
- Snap-in assembly

Specifications

Material	Grommet: Elastomer Body: Polyamide
Flame class	UL 94-Vo, self-extinguishing
Protection class	IP54 depending on Keystone module and manufacturer
Temperature	-40°C to +100°C (static)
Properties	Halogen free, silicone free

Type	Order No.	Height x Width x Length [mm]	Material	PU
AT-KS	39952	42 x 41.5 x 19	PA / Elastomer	10



KEL-U 24|7 assembled with 1x AT-KS, equipped with a Keystone coupler.



USB-, RJ45 or e.g. HDMI connectors can be plugged in from the front and from the back.



KEL-U 24|4 assembled with 1x AT-K-M, 1x AT-M and 1x AT-KS

AT-K-M | AT-K-Z

Adapter grommet, small with threaded insert

IP66



Product description

The AT-K-M grommet is constructed on the basis of a KT cable grommet. The grommets are made of elastomer with a nickel-plated brass body. The AT-K-M grommets are available with inner threads in sizes M5 x 0.5, M8 x 1.0, M12 x 1.0, M12 x 1.5, M14 x 1.0 and M16 x 1.5 and the AT-K-Z grommets with inner threads in sizes 1/8" and 1/4".

By using the AT-K-M adapter grommet, several connectors can be inserted directly into the cable entry frame, e.g. pneumatic bulkhead connectors M12 x 1.0 and M14 x 1.0, metric connectors and pressure compensation elements.

They are compatible with all split icotek cable entry systems that are suitable for KT cable grommets.

Advantages & benefits

- By using AT-K-M grommets, panel connectors and sockets can be integrated directly into the cable entry system
- Separate cut-outs for connectors are no longer necessary
- Space-saving solution
- Thread sizes M5 to M16 and 1/8" to 1/4" available

Specifications

Material	Grommet: Elastomer Body: nickel-plated brass
Flame class	UL 94 V-0, self-extinguishing
Protection class	IP66 when using correct components
Temperature	-40°C bis +100°C (static)
Properties	Halogen free, silicone free

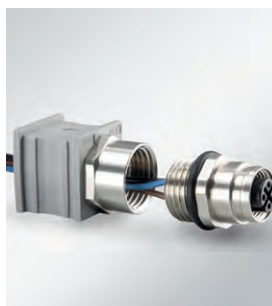
PCE M12 x 1.5

The new pressure compensation element PCE with M12 x 1.5 thread is used to avoid variations in pressure caused by differences in temperature and thus to prevent damage caused by condensation. It provides protection class IP68. The pressure compensation element is easy to install by screwing it directly into the enclosure wall or via icotek adapter grommets AT-K-M 12x1.5.

Order No. 99190
PU 10



Type	Order No.	Height x Width x Length [mm]	Thread	Material	PU
AT-K-M 5x0.5	39953 NEW	21 x 21 x 19	M5 x 0.5	Brass / Elastomer	5
AT-K-M 8x1.0	39954 NEW	21 x 21 x 19	M8 x 1.0	Brass / Elastomer	5
AT-K-M 12x1.0	39955 NEW	21 x 21 x 19	M12 x 1.0	Brass / Elastomer	5
AT-K-M 12x1.5	39956 NEW	21 x 21 x 19	M12 x 1.5	Brass / Elastomer	5
AT-K-M 14x1.0	39962 NEW	21 x 21 x 19	M14 x 1.0	Brass / Elastomer	5
AT-K-M 16x1.5	39957 NEW	21 x 21 x 19	M16 x 1.5	Brass / Elastomer	5
AT-K-Z 1/8"	39963 NEW	21 x 21 x 19	1/8"	Brass / Elastomer	5
AT-K-Z 1/4"	39964 NEW	21 x 21 x 19	1/4"	Brass / Elastomer	5



AT-K-M with extension M16x1.5 for M12 built-in connectors



KEL-U 183-E16 mounted with 16x AT-K-M 12x1.5, equipped with 16x pneumatic Schott plug-in connector

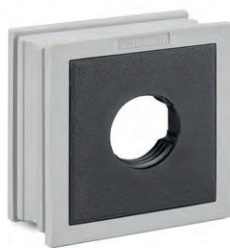


KVT-ER 63|4 equipped with 1x pressure compensation element



KEL-ER 24|7 mounted with 1x AT-K-M, equipped with 1x hybrid connector

AT-M | AT-B

Adapter grommet
with metric inner thread

IP65

Product description

AT-M is a grommet (based on large KT grommets) with integrated metric threads, suitable for split icotek cable entry systems. The AT-M grommets are made of elastomer with a polyamide body. AT-M grommets are available with inner threads in sizes M12x1.0, M16x1.5, M20x1.5 and M25x1.5.

The AT-M is ideal for creating an interface for signal, data, power and hybrid connectors by simply screwing them into the AT-M thread. Pressure compensation elements or conduit connectors up to M25x1.5 can also be screwed into the AT-M.

icotek also offers screw plugs for sizes M16, M20 and M25 to close the new adapter grommet with the metric internal thread AT-M.

There is also a blank AT-B grommet available. The integrated polyamide body is completely closed on one side. The effective area is 24 x 24 mm, the wall thickness is 6 mm. Custom drill-holes and cut-outs can be made here for e.g. installation of screw mounted hybrid connectors.

Advantages & benefits

- By using AT-M grommets, panel connectors and sockets can be integrated directly into the cable entry system
- Separate cut-outs for connectors are no longer necessary
- Space-saving solution
- Thread sizes M12 to M25 available
- Blank grommet for flexible use

Specifications

Material	Grommet: Elastomer Body with thread: Polyamide
Flame class	UL94-Vo, self-extinguishing
Protection class	IP65 when using correct components
Temperature	-40°C to +100°C (static)
Properties	Halogen free, silicone free

Type	Order No.	Height x width x length [mm]	Thread	Material	PU
AT-M 12x1.0	39946	42 x 41.5 x 19	M12 x 1.0	PA / Elastomer	10
AT-M 16x1.5	39947	42 x 41.5 x 19	M16 x 1.5	PA / Elastomer	10
AT-M 20x1.5	39948	42 x 41.5 x 19	M20 x 1.5	PA / Elastomer	10
AT-M 25x1.5	39949	42 x 41.5 x 19	M25 x 1.5	PA / Elastomer	10
AT-B blank	39950	42 x 41.5 x 19	—	PA / Elastomer	10



KEL-U 24|7 mounted with 1x AT-M, equipped with 1 connector M12x1.0, for the connection of sensors.



KEL 24|21-2 MT mounted with 3x AT-M, equipped with M16 circular connector, M12 pressure compensation element and a hybrid connector.

Screw plugs for AT-M

Type	Order No.	Thread	Material	PU
Screw plug M16 x 1.5	99195	M16	Polyamide	10
Screw plug M20 x 1.5	99196	M20	Polyamide	10
Screw plug M25 x 1.5	99197	M25	Polyamide	10



1.21 Split cable entry frames for the QT grommet system

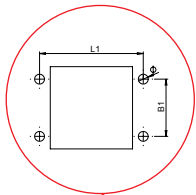


With the new version of the compact, split cable entry system KEL-QUICK icotek released a highly efficient and cost-effective possibility for pass-through and IP54 sealing of cables with or without connectors, conduits and pneumatic hoses.

Slit cable grommets of the QT series are used for routing lines with diameters of 1 – 29 mm within the KEL-QUICK. In addition, there are multi-hole grommets for up to 4 lines per slot and special grommets e.g. for ASI cables.

The cable entry system KEL-QUICK is an outstanding alternative to cable glands. Especially for applications that do not necessarily require standard-compliant strain relief acc. to EN 62444, the KEL-QUICK is the perfect solution.

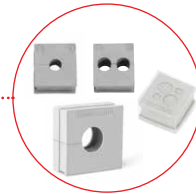
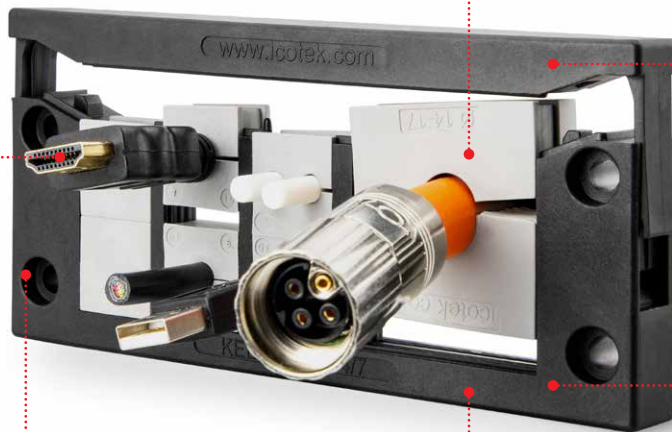
After equipping the frame with the cables or hoses, the cover lid of the KEL-QUICK is simply snapped onto the frame. A fast and easy assembly is the biggest benefit when using the QUICK series – when used with the KEL-SNAP frame a complete tool-free installation is possible.



Cut-outs according to industrial standard dimensions



Warranty on pre-terminated cables remains



High cable density, wide variety

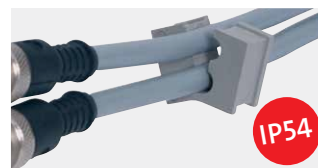


Can be combined with IMAS-CONNECT grommets



Fast and easy assembly

Split system



Grommets QUICK for cables with/without connectors, cable diameter range 1 – 15 mm
QT / QTMB / QT-DT / QT Servicebox

72 – 75



IMAS-CONNECT™ Modular adapter system for the QT system

76 – 81

Cable entry frames for quick assembly with IP rating IP54 KEL-QUICK

Product description

The KEL-QUICK range is a compact system to route and seal pre-terminated cables as well as conduits or pneumatic hoses utilising split QT and QTMB grommets. After populating the entry frame with QT / QTMB grommets and cables, the cover lid is snapped onto the frame without using assembly hardware.

The KEL-QUICK frames match exactly the cut-out dimensions for 10-, 16- and 24-pin standard industrial connectors. The KEL-QUICK-B frames match the cut-out dimensions 46 × 36 mm. These KEL-QUICK frames can either be screw mounted or simply snapped into the KEL-SNAP frame.

The single-row KEL-QUICK-E versions are particularly suited for flat connectors. The small frames are ideal for applications with limited space.

A flat rubber gasket is included in the shipment.

Advantages & benefits

- Fast and easy assembly and when used with the KEL-SNAP frame, mounting without tools possible
- Maintain warranty on pre-terminated cables
- Retrofits, repairs and maintenance can be done much more easily and quickly
- High cable density, wide variety of grommets
- Can be combined with IMAS-CONNECT grommets

Specifications

Material	Polyamide (PA)
Flame class	UL94-Vo, self-extinguishing
IP rating	IP54, with gasket and correct selection of the cable grommets
Temperature	- 40°C to + 140°C (static)
Properties	Halogen-free, silicone-free
Frame depth	17 mm

Accessories

QT Cable grommets	72
KEL-SNAP Mounting frames	34 - 35
KEL-EMC Cable collectors	158 - 160
KDR Base plates	190 - 197
FP Flange plates	210 - 219
MP Module plates	204 - 205
ST Plugs	53



Cover lid is simply snapped onto the frame.



Tool-free mounting with KEL-SNAP frame.



KEL-QUICK-E



Split grommets



KEL-QUICK

Cable entry frames

for quick assembly

KEL-QUICK 24, KEL-QUICK 16,

KEL-QUICK 10, KEL-QUICK-B



IP54

Description	Cut-out Drilling template	Type	Order No.	Cut-out [mm]	Grommets	PU
		KEL-QUICK 24 10	42410	112 × 36	10 –	10
		KEL-QUICK 24 7	42412	112 × 36	6 1	10
		KEL-QUICK 24 4	42413	112 × 36	2 2	10
		KEL-QUICK 16 8	42418	86 × 36	8 –	10
		KEL-QUICK 16 5	42425	86 × 36	4 1	10
		KEL-QUICK 16 2	42426	86 × 36	0 2	10
		KEL-QUICK 10 6	42420	65 × 36	6 –	10
		KEL-QUICK 10 3	42427	65 × 36	2 1	10
		KEL-QUICK-B4	42434	46 × 46	4 –	10

KEL-QUICK

Cable entry frames
for quick assembly
KEL-QUICK-E



IP54

Description	Cut-out Drilling template	Type	Order No.	Cut-out [mm]	Grommets	PU
		KEL-QUICK-E5	42424	24 x 112	5 QT	10
		KEL-QUICK-E4	42423	24 x 86	4 QT	10
		KEL-QUICK-E3	42422	24 x 65	3 QT	10
		KEL-QUICK-E2	42421	24 x 43	2 QT	10

1.22 Split cable glands for the QT grommet system



By using split QVT cable glands by icotek cables with or without connectors or complete cable harnesses with diameters from 1 to 15 mm can be quickly routed into enclosures, cabinets or machines and be sealed with IP54 rated ingress protection.

installed. The two gland halves can be easily snapped together without the need of tools. The routed lines are securely sealed and held inside the grommets. To mount the cable glands either snap it into the round metric standard cut-out (sizes available from M16 to M50) or screw it with a hexagonal locknut. The mounting method is dependent on the model type.

1.22

The split system of the QVT cable glands enables quick and easy assembly which is great for retrofitting and maintenance. The cable is placed into the slit grommet which is set into one of the gland halves. Depending on the size of the cable gland one, two or four separate grommets can be

For metric cut-outs
M16 - M50

Warranty on pre-terminated
cables remains

Split system

Special locknuts for e.g. D-Sub or
PROFIBUS connectors as well as
split locknuts available.

High cable density,
wide variety in cable
grommets

Fast and easy assembly

QVT-CRICK

IP54

Grommets QUICK
for cables with/without
connectors,
cable diameter range 1 – 15 mm
QT / QTMB / QT-DT /
QT Servicebox **72 – 75**

IP54

IMAS-CONNECT™
Modular adapter system
for the QT system **76 – 81**

Split cable glands with IP54 rating QVT and QVT-CLICK

Product description

QVT and QVT-CLICK are circular split frames for quick and easy installation of pre-terminated cables or complete cable harnesses. But also electric, pneumatic or hydraulic lines without terminals or connectors as well as corrugated conduits can be easily routed and sealed with IP54. Because of its extremely compact design, the QVT/QVT-CLICK range is especially suitable for small machines, devices and instruments.

The cable glands are easy to install. The prefabricated cable is placed into the slit grommet which is set into one of the gland halves. Depending on the size of the cable gland, one, two or four separate grommets can be installed. By using multi-hole grommets up to 16 lines can be routed with one cable gland.

The QVT-CLICK can be assembled without tools from the front side of the enclosure wall. Sizes QVT-CLICK 16 & QVT-CLICK 20 can be also screwed with a locknut.

QVT: Polyamide locknuts as well as a sealing ring are included in the shipment.

QVT-CLICK: A sealing ring is included in the shipment.

Advantages & benefits

- Compact design
- Routing of pre-terminated cables
- Maintain warranty on pre-terminated cables
- Retrofits, repairs and maintenance can be done much more easily and quickly
- Suitable for metric hole sizes
- Locknut is included
- QVT-CLICK: Fast and easy mounting from the front side
- QVT-CLICK: For wall thickness 1 - 2.5 mm, QVT-CLICK 16/ QVT-CLICK 20 for wall thickness 1.5 – 2.5 mm
- QVT-CLICK: Sizes 16 and 20 pluggable and screwable
- Can be combined with IMAS-CONNECT system

Specifications

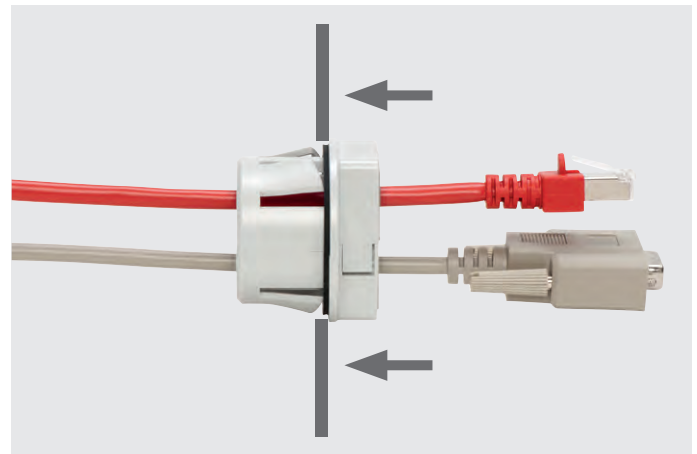
Material	Polycarbonate (PC)
Colour	grey (similar RAL 7035)
Flame class	UL94-Vo, self-extinguishing
IP rating	IP54, with gasket and correct selection of the cable grommets
Temperature	- 30°C to + 100°C (static)
Properties	Halogen-free, silicone-free
Cut-out dimension	Metric sizes



QVT



QVT-CLICK



QVT-CLICK: Fast and easy mounting from the front side



QVT – back view

QVT

Split cable glands

IP54



Description	Type	Order No.	Cable Grommets	Thread Thread length	PU
	QVT 16*	45692	1 × QT	M16 × 1.5 Length: 13 mm	10
	QVT 20**	45695	1 × QT	M20 × 1.5 Length: 13 mm	10
	QVT 25	45702	1 × QT	M25 × 1.5 Length: 13 mm	10
	QVT 32	45711	1 × QT	M32 × 1.5 Length: 13 mm	10
	QVT 40 2	45715	2 × QT	M40 × 1.5 Length: 13 mm	10
	QVT 50 4	45722	4 × QT	M50 × 1.5 Length: 13 mm	10

* Max. cable diameter of 10 mm | ** Max. cable diameter of 11 mm

Accessories

QT Cable grommets	72
KVT-EMC Brackets	161
KGM Locknuts	224 – 225
ST Plugs	53



Type GMT: Split locknut, p. 225

QVT-CLICK

Split pluggable cable glands



IP54

Description	Type	Order No.	Cable Grommets	Cut-out* diameter	Thread Thread length	PU
	QVT Click 16**	45726	1 × QT	16.2 mm	M16 × 1.5 (13 mm)	10
	QVT Click 20**	45728	1 × QT	20.4 mm	M20 × 1.5 (13 mm)	10
	QVT-CLICK 25	45730	1 × QT	25.5 mm	—	10
	QVT-CLICK 32	45732	1 × QT	32.5 mm	—	10
	QVT-CLICK 40 2	45734	2 × QT	40.5 mm	—	10
	QVT-CLICK Tool	61435	Mounting tool	—	—	1

* Please consider any paint layers or powder coatings!

** pluggable and screwable; locknut is not included in the shipment

Accessories

The QVT-CLICK Tool for quick and easy mounting.
Order No. 61435 (PU: 1)

QT Cable grommets
QVT-CLICK Tool
ST Plugs

72
Order No. 61435
53



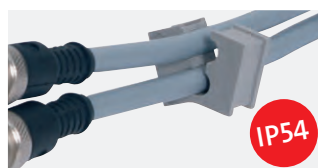
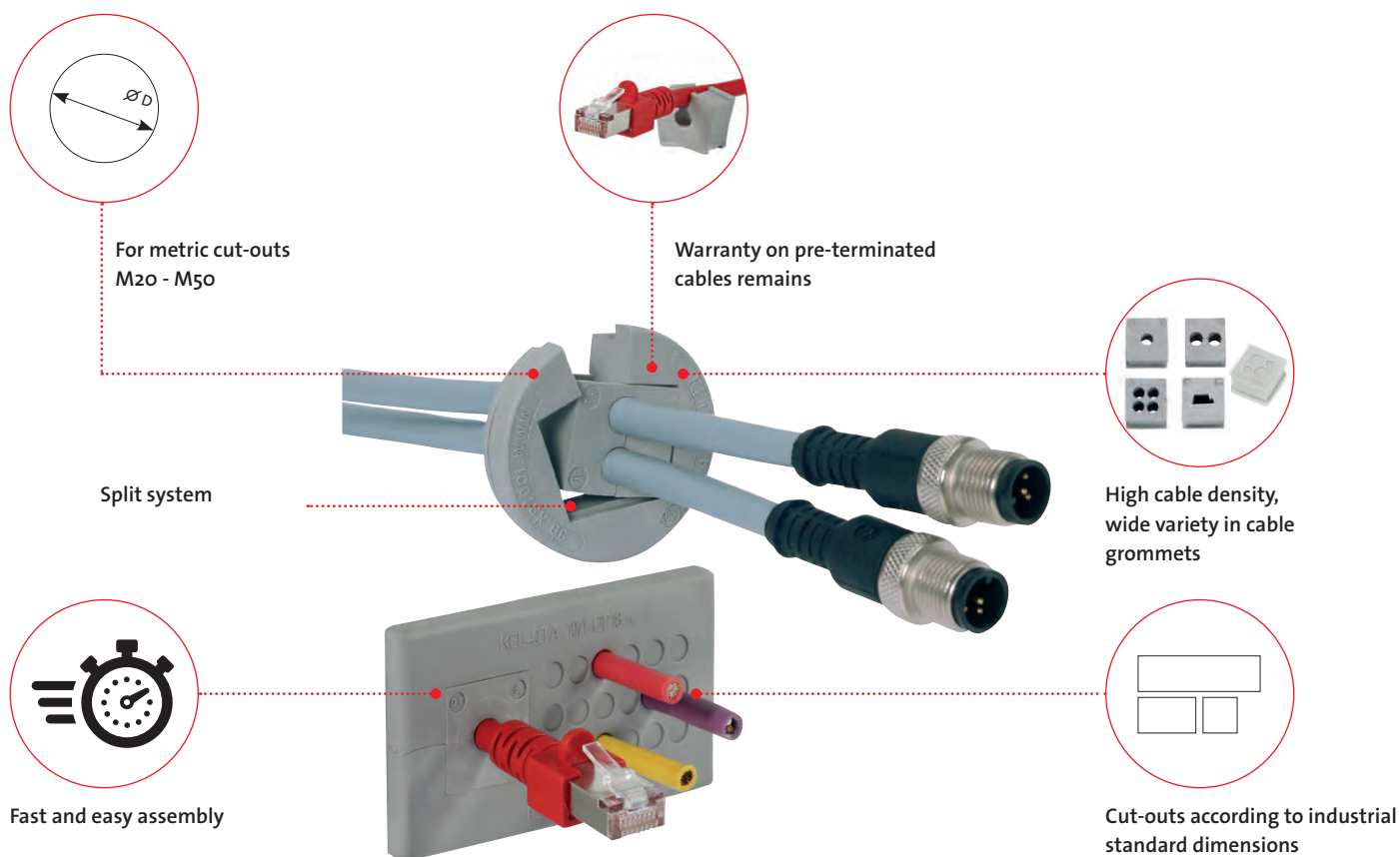
1.23 Split cable entry plates for the QT grommet system



KEL-QTA are push-in, split IP54 cable entry plates for wall thicknesses from 1.5 to 4 mm. icotek offers several versions for rectangular standard cut-outs as well as for round metric cut-outs. The QTA system offers a large size variety.

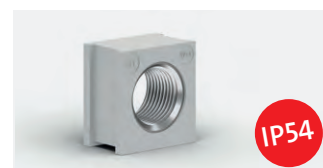
Split cable grommets of the QT series are used for the routing of pre-terminated lines with diameters of 1–15 mm within the KEL-QTA. In addition, there are multi-hole grommets for up to 4 lines per slot and special grommets e.g. for ASI cables.

KEL-QTA enable cable routing with or without preassembled connectors. Some types offer a combination of membranes for cable pass-through and the QT grommet system.



Grommets QUICK
for cables with/without connectors,
cable diameter range 1–15 mm
QT / QTMB / QT-DT /
QT Servicebox

72 – 75



IMAS-CONNECT™
Modular adapter system
for the QT system

76 – 81

Push-in, split cable entry plates with IP54 rating KEL-QTA | KEL-QTE

Product description

Push-in, split cable entry plates (IP54) for routing pre-terminated and standard cables utilising split QT grommets or membranes. Suitable for cut-outs for 10- and 24-pin industrial connectors. The compact size KEL-QTA-B is suitable for cut-outs 45.5 x 45.5 mm. The round versions of the KEL-QTA are suitable for cut-outs 32 / 50 mm in diameter.

The KEL-QTA/KEL-QTE easily routes pre-terminated cables, multi-conductors, hoses or conduits without using any tools for assembly.

The KEL-QTE fits on cut-outs of 20 mm in diameter.

Advantages & benefits

- Fast and easy assembly without tools
- High cable density by using multi-position grommets
- Simple assembly and disassembly in case of change or service
- Routing of cables with and without connectors in a high density
- Suitable for standard industrial connector cut-outs

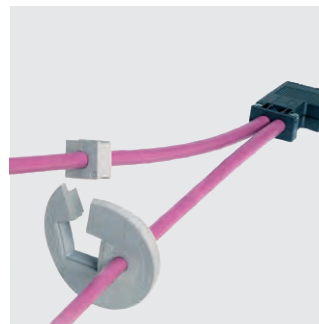
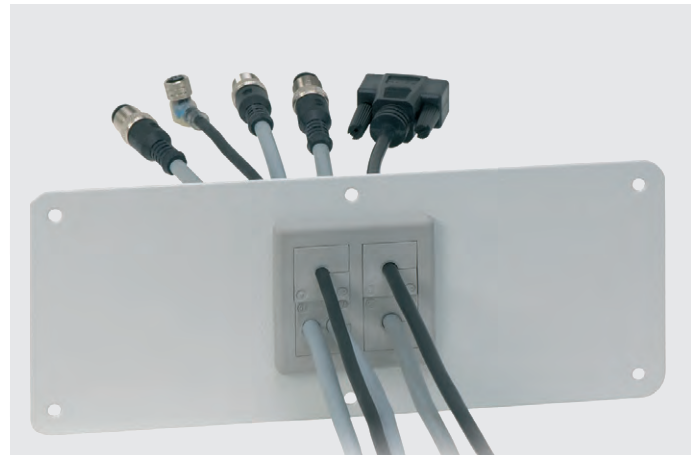
Specifications

Material	Elastomer
Flame class	UL94-V0, self-extinguishing
IP rating	IP54, with correct selection of the cable grommets (QT single)
Temperature	- 40°C to + 100°C (static)
Properties	Halogen-free, silicone-free
Cut-out dimension	Metric sizes (QTE)
Frame depth	5 mm (QTA)

Type A:	For wall thickness 1.5 - 2.5 mm
Type B:	For wall thickness 2.8 - 4 mm

Accessories

QT Cable grommets	72
ST-B Plugs	107
FP Flange plates	210 - 219

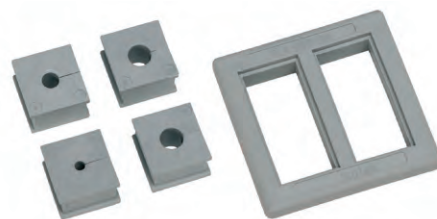


KEL-QTE (Patent)

KEL-QTA

Split cable entry plates

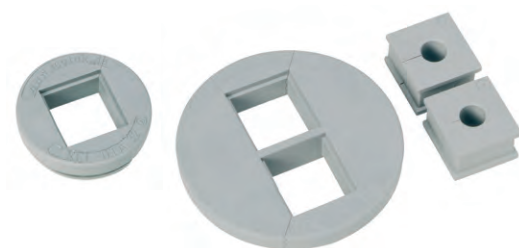
IP54



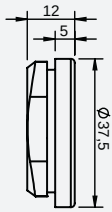
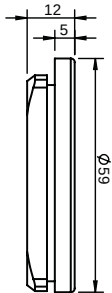
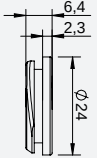
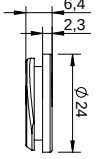
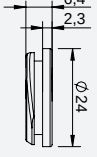
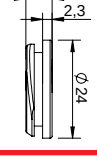
Description	Cut-out Drilling template	Type	Order No. Type A	Order No. Type B	Cut-out [mm]	Cables	PU
		KEL-QTA 24 2-DP 18	43642	43643	112 × 36	pre-terminated 2 × 1 - 15 mm without connector 16 × max. 7 mm 1 × max. 12 mm 1 × max. 16 mm	10
		KEL-QTA 24 4	43644	43645	112 × 36	pre-terminated 4 × 1 - 15 mm	10
		KEL-QTA 10 1-DP 18	43655	43658	65 × 36	pre-terminated 1 × 1 - 15 mm without connector 18 × max. 5 mm	10
		KEL-QTA 10 2-DP 6	43656	43659	65 × 36	pre-terminated 2 × 1 - 15 mm without connector 6 × max. 5 mm	10
		KEL-QTA-B4	43660	-	46 × 46	pre-terminated 4 × 1 - 15 mm	10

KEL-QTA | KEL-QTE

Split cable entry plates



IP54

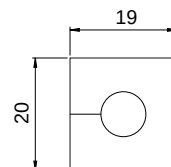
Description	Type	Order No. Type A	Order No. Type B	Cut-out [mm]	Cables		PU
					pre-terminated	non-pre-term.	
	KEL-QTA 32	43632	43636	ø 32	1× 1 - 15 mm	-	10
	KEL-QTA 50	43622	43626	ø 50	2× 1 - 15 mm	-	10
	KEL-QTE 20 2.5	43412	-	ø 20	1× 2.6 - 3.2 mm	1× max. 5.2 mm	10
	KEL-QTE 20 3	43413	-	ø 20	1× 3.1 - 3.8 mm	1× max. 5.2 mm	10
	KEL-QTE 20 4	43414	-	ø 20	1× 3.8 - 4.8 mm	1× max. 5.2 mm	10
	KEL-QTE 20 5	43415	-	ø 20	1× 4.7 - 5.6 mm	1× max. 5.2 mm	10

1.23

QT

Cable grommets

IP54



Product description

The QT range supports cable diameters from 1 to 15 mm. They are used with cable entry frames and cable glands of product groups 1.21, 1.22 & 1.23.

Assembly note

When installing multiple grommets make sure the flat side of the grommet faces the other grommet. This ensures a secure seal.

Specifications

Material	Elastomer
Flame class	UL94-Vo, self-extinguishing
IP rating	IP54
Temperature	- 40°C to + 100°C (static)
Properties	Halogen-free, silicone-free

Accessories

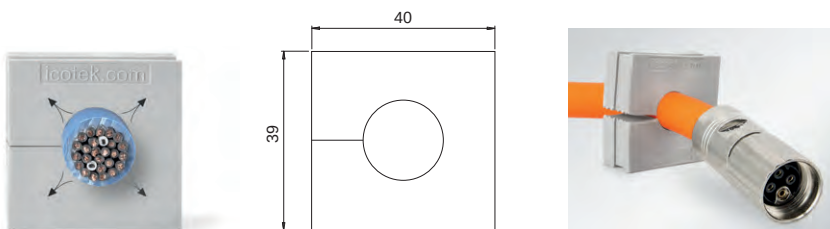
ST Plugs 53



QT grommet in combination with QVT-CLICK

Description		Type	Order No.	Clamping range	PU
QT small					
	QTB	QTB	42540	Blank grommet	10
	QT	QT 1	42501	1 - 2 mm	10
		QT 2	42502	2 - 3 mm	10
		QT 3	42503	3 - 4 mm	10
		QT 4	42504	4 - 5 mm	10
		QT 5	42505	5 - 6 mm	10
		QT 6	42506	6 - 7 mm	10
		QT 7	42507	7 - 8 mm	10
		QT 8	42508	8 - 9 mm	10
		QT 9	42509	9 - 10 mm	10
		QT 10	42510	10 - 11 mm	10
		QT 11	42511	11 - 12 mm	10
		QT 12	42512	12 - 13 mm	10
		QT 13	42513	13 - 14 mm	10
		QT 14	42514	14 - 15 mm	10
	QT-ASI	QT-ASI 1	42573	1× ASI-cable	10
		QT-ASI 2	42574	2× ASI-cable	10
	QT tele	QT tele	42575	Telephone cable	10
	QT 2 x	QT 2 3	42566	2× ø 3 mm	10
		QT 2 4	42568	2× ø 4 mm	10
		QT 2 5	42570	2× ø 5 mm	10
		QT 2 5.5	42571	2× ø 5.5 mm	10
		QT 2 6	42572	2× ø 6 mm	10
		QT 2 6.5	42576	2× ø 6.5 mm	10
		QT 2 7	42578	2× ø 7 mm	10
	QT 4 x	QT 4 3	42580	4× ø 3 mm	10
		QT 4 4	42582	4× ø 4 mm	10
		QT 4 4.5	42583	4× ø 4.5 mm	10
		QT 4 5	42584	4× ø 5 mm	10
		QT 4 5.5	42585	4× ø 5.5 mm	10
		QT 4 6	42586	4× ø 6 mm	10

QTMB

Multi-range cable grommets
for QUICK systems

IP54

Product description

The new QTMB is used to route pre-terminated cables into the KEL-QUICK system.

The innovative membrane enables the routing of cables with diameters that can vary up to 3 mm.

For the first time, utilising the QTMB, even large cables with cable diameters from 14 to 29 mm can be routed.

Advantages & benefits

- High flexibility: Due to the innovative membrane, one grommet can be used for various cable diameters (can vary up to 3 mm)
- For the first time, it is also suitable for large cables with clamping ranges up to 29 mm
- Innovative wave cut for more tightness

Specifications

Material	Elastomer
Flame class	UL94-Vo, self-extinguishing
IP rating	IP54
Temperature	- 40°C to + 100°C (static)
Properties	Halogen-free, silicone-free

Description	Type	Order No.	Clamping range	PU
QT large				
	QTMB 14–17	42515	14–17 mm	10
	QTMB 16–19	42516	16–19 mm	10
	QTMB 18–21	42517	18–21 mm	10
	QTMB 20–23	42518	20–23 mm	10
	QTMB 22–25	42519	22–25 mm	10
	QTMB 24–27	42520	24–27 mm	10
	QTMB 26–29	42521	26–29 mm	10
	QTMB-BTG	42545	Blank grommet	10



Ø 14 – 17 mm



Ø 16 – 19 mm



Ø 18 – 21 mm



Ø 20 – 23 mm



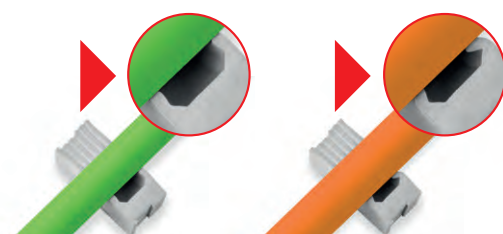
Ø 22 – 25 mm



Ø 24 – 27 mm

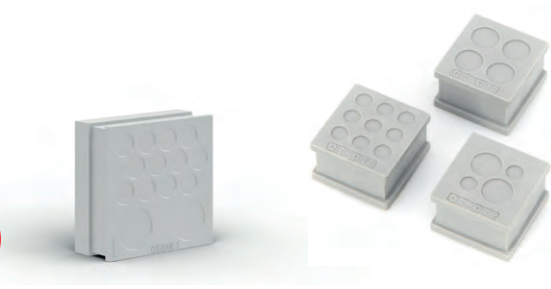


Ø 26 – 29 mm



QT-DT

QT-DT grommets
for QUICK system



Product description

The new QT-DT membrane cable grommet enables the routing of cables without connectors. Using the QT-DT grommet considerably increases the cable packing density and decreases the space needed. This new grommet can be used in the KEL-QUICK cable entry frames as well as in the KEL-QTA cable entry plates. Therefore, it is possible to insert cables with and without connectors into one cable entry system.

Advantages

- Combination of pre-assembled and non-assembled cables in one cable entry product
- Very high packing density
- Considerable space and cost savings
- Pre-assembly of individual assemblies possible

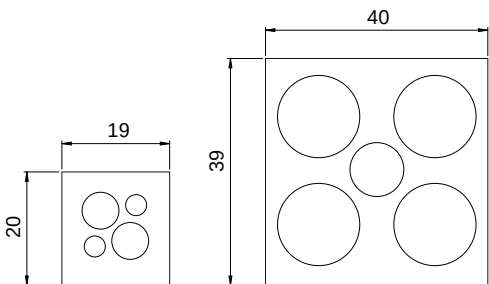
Specifications

Material	Elastomer
Flame class	UL94-Vo, self-extinguishing
IP rating	IP54
Temperature	- 40°C to + 100°C (static)
Properties	Halogen-free, silicone-free

Accessories

ST Plugs 53

Description	Type	Order No. grey	Clamping range	PU
QT-DT small				
	QT-DT 1	42550	4x max. 6.5 mm	10
	QT-DT 2	42551	2x max. 3.5 mm 2x max. 6.5 mm	10
	QT-DT 3	42552	9x max. 3.5 mm	10
QT-DT large				
	QT-DT 8	42556	12x max. 6.5 mm 2x max. 12.2 mm	10
	QT-DT 9	42557	15x max. 7.1 mm	10
	QT-DT 10	42558	4x max. 6.5 mm 3x max. 9.5 mm 3x max. 11.3 mm	10
	QT-DT 11	42559	9x max. 9.5 mm	10
	QT-DT 12	42560	4x max. 14.5 mm 1x max. 9.5 mm	10



QT ServiceBox

Service box
for cable grommets



Product description

Convenient – everything available right away!

The QT ServiceBox is perfect for installations and service calls. It ensures your QT grommets are readily available.

Order No. 88005

Content*

Cable grommets:

- 210 QT for cables 1 - 15 mm
- 10 QTB blank grommets
- 1 QT-DT 1
- 1 QT-DT 2
- 1 QT-DT 3

5 Cable entry components:

- 1 KEL-QTA 50 A cable entry plates
- 1 KEL-QTA 32 A cable entry plate
- 1 KEL-QTA 24|2-DP 18 A cable entry plate
- 1 KEL-QTA 10|1-DP 18 A cable entry plate
- 1 KEL-QUICK 24|10 cable entry frame
- 1 QVT 25 split cable gland
- QVT-CLICK 32 split cable gland

1 Accessories:

Cable template

* Subject to alterations



KMS Cable template

The correct size of the QT grommets can easily be determined by using the cable template

- Determining the diameter of the cable using the cable template
- Selecting the QT grommets according to the data on the cable template

Cable templates can also be ordered separately. **Order-No. 39800**

1.2

1.24 Modular adapter system IMAS-CONNECT™ for the QT system

icotek
exclusive
LINE

IP54

HL3
EN 45545-2



ECOLAB
certified

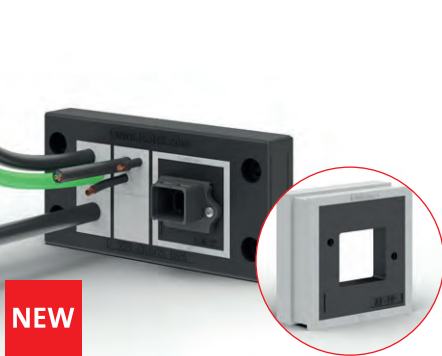
RoHS
compliant

Made in
Germany

The new IMAS-CONNECT™ modular adapter system by icotek is a modular designed grommet system for mounting metric connectors, PushPull modules, Keystone couplers, hose fittings, pressure compensation elements and much more.

The grommets, made of elastomer with a polyamide body, fit perfectly into the icotek cable entry frames like e.g. KEL-QUICK and meet the protection class IP54.

By utilising the modular adapter system, the cable entry frame becomes a hybrid system. Pre-terminated and standard cables or hoses can be routed and at the same time the system serves as an interface for connectors.



NEW

Available with pre-terminated cut-out for PushPull systems (QT-AT-PP)

Perfect integration into the split icotek cable entry frames.

Protection class IP54



Available with threaded insert (QT-AT-K-M), based on the QT cable grommet.

Available with metric inner threads of M12 x 1.0, M16 x 1.5, M20 x 1.5 and M25 x 1.5 (QT-AT-M).

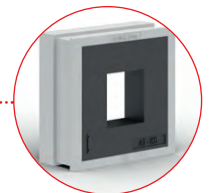
Usable area for special cut-outs and drill-holes: 24 x 24 mm; Wall thickness: 6 mm



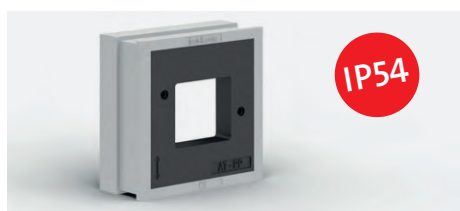
At a high cable density only one cut-out is necessary.

Elastomer grommet with polyamide body based on the grommet QT large.

Available with pre-terminated cut-out for Keystone couplers (QT-AT-KS).



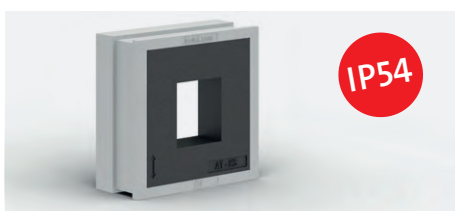
Chapter content 1.24



Adapter grommet
for PushPull connector systems

QT-AT-PP

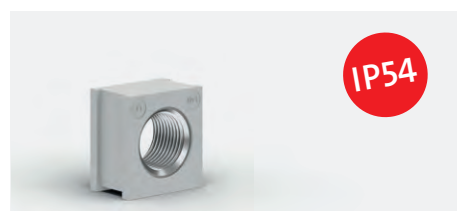
78



Adapter grommet
for Keystone couplers

QT-AT-KS

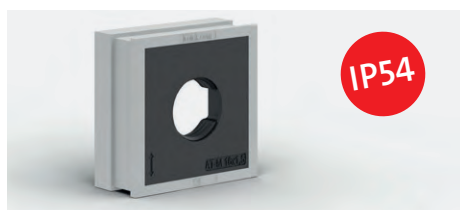
79



Adapter grommet, small
with threaded insert

QT-AT-K-M

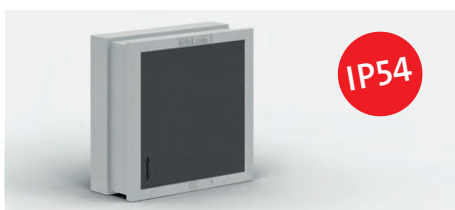
80



Adapter grommet
with metric inner thread

QT-AT-M

81



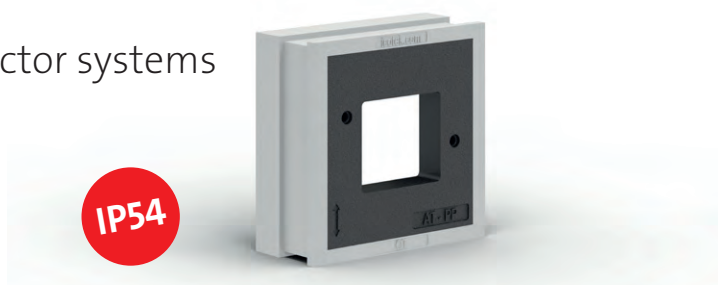
Adapter grommet, blank

QT-AT-B

81

QT-AT-PP

Adapter grommet for PushPull connector systems



Product description

The grommet QT-AT-PP is constructed on the basis of a large QT cable grommet. In this elastomer grommet, a polyamide body is integrated. All modules based on the PushPull system can be inserted into the grommet.

By using the grommet QT-AT-PP, the split cable entry frame can be used to route pre-terminated cables and at the same time it can also be used as an interface for connectors. This can save additional cut-outs and reduce labour costs.

PushPull modules and add-on housings are not included in the scope of delivery.

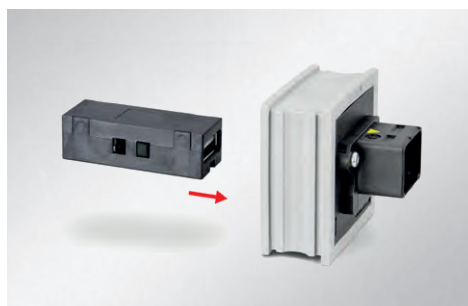
Advantages & benefits

- By using QT-AT-PP grommets, panel connectors and sockets can be integrated directly into the cable entry system
- Separate cut-outs for connectors are no longer necessary
- Time saving solution
- Space-saving solution
- Assembly costs are reduced

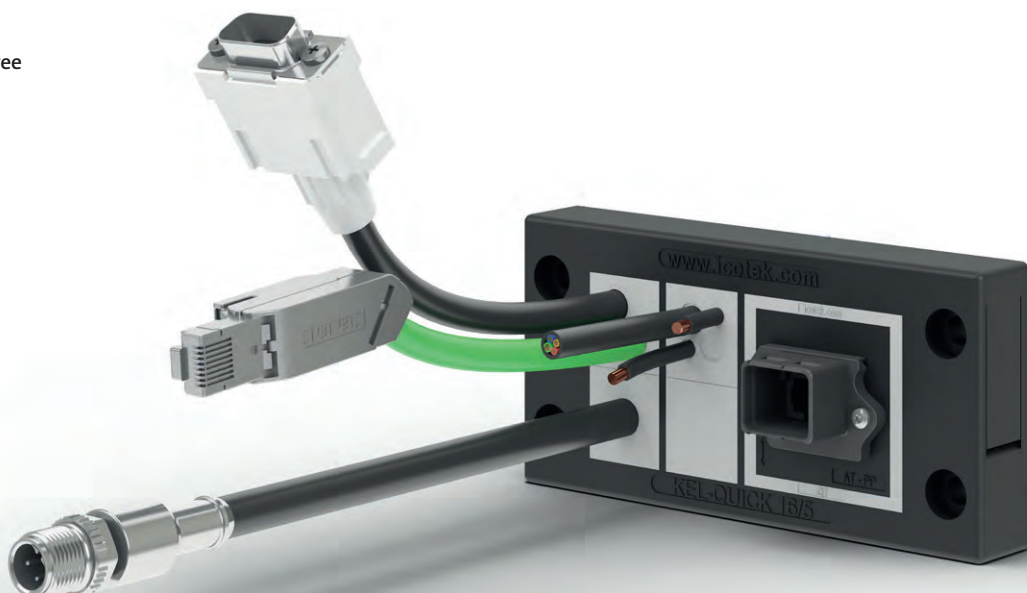
Specifications

Material	Grommet: Elastomer Body with thread: Polyamide
Flame class	UL94-Vo, self-extinguishing
Protection class	IP54 when using correct components
Temperature	-40°C to +100°C (static)
Properties	Halogen free, silicone free

Type	Order No.	Height x width x length [mm]	Material	PU
QT-AT-PP	42602	39 x 40 x 17	PA / Elastomer	10

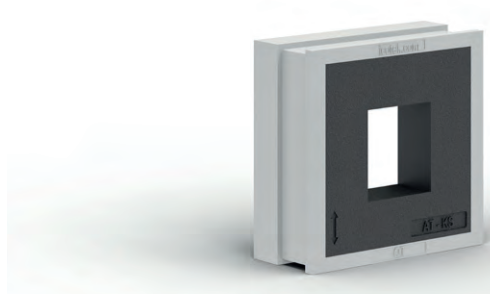


The module (left) snaps into the rear of the add-on housing mounted on the AT-PP.



QT-AT-KS

Adapter grommet
for Keystone couplers



IP54

Type	Order No.	Height × width × length [mm]	Material	PU
QT-AT-KS	42601	39 × 40 × 17	PA/Elastomer	10

Product description

The grommet QT-AT-KS is constructed on the basis of a QT cable grommet. In this elastomer grommet, a polyamide body is integrated. All couplers based on the Keystone system can be simply snapped in.

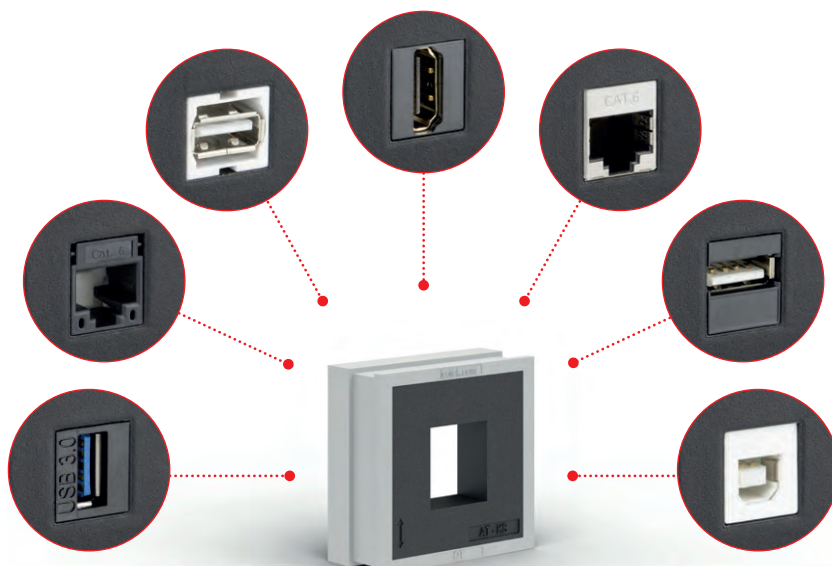
By using the grommet QT-AT-KS, the split cable entry frame can be used to route pre-terminated cables and at the same time it can also be used as an interface for connectors. This can save additional cut-outs and reduce labour costs.

Advantages & benefits

- By utilising the QT-AT-KS grommet, connectors can be integrated directly into the cable entry frame
- Separate cut-outs for connectors are no longer necessary
- Space-saving solution
- Grommet is suitable for all Keystone couplers
- Snap-in assembly

Specifications

Material	Grommet: Elastomer Body: Polyamide
Flame class	UL94-Vo, self-extinguishing
Protection class	IP54 depending on Keystone module and manufacturer
Temperature	-40°C to +100°C (static)
Properties	Halogen free, silicone free



QT-AT-K-M

Adapter grommet with threaded insert



Product description

The QT-AT-K-M grommet is constructed on the basis of a QT cable grommet. The grommets are made of elastomer with a nickel-plated brass body. The QT-AT-K-M grommets are available with inner threads in sizes M5 x 0.5, M8 x 1.0, M12 x 1.0, M12 x 1.5.

By using the QT-AT-K-M adapter grommet, several connectors can be inserted directly into the cable entry frame, e.g. pneumatic bulkhead connectors M12 x 1.0 and M14 x 1.0, metric connectors and pressure compensation elements.

They are compatible with all split icotek cable entry systems that are suitable for QT cable grommets.

Advantages & benefits

- By using QT-AT-K-M grommets, panel connectors and sockets can be integrated directly into the cable entry system
- Separate cut-outs for connectors are no longer necessary
- Space-saving solution
- Thread sizes M5 to M12 available

Specifications

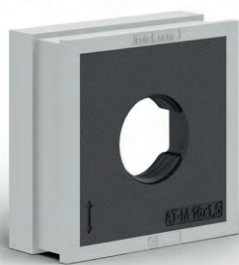
Material	Grommet: Elastomer Body: nickel-plated brass
Flame class	UL 94 V-o, self-extinguishing
Protection class	IP65 when using correct components
Temperature	-40°C bis +100°C (static)
Properties	Halogen free, silicone free

Type	Order No.	Height x Width x Length [mm]	Thread	Material	PU
QT-AT-K-M 5x0.5	42604	20 x 19 x 17	M5 x 0.5	Brass / Elastomer	5
QT-AT-K-M 8x1.0	42605	20 x 19 x 17	M8 x 1.0	Brass / Elastomer	5
QT-AT-K-M 12x1.0	42606	20 x 19 x 17	M12 x 1.0	Brass / Elastomer	5
QT-AT-K-M 12x1.5	42607	20 x 19 x 17	M12 x 1.5	Brass / Elastomer	5



QT-AT-M

Adapter grommet
with metric inner thread



IP54

Product description

QT-AT-M is a grommet (based on large QT grommets) with integrated metric threads, suitable for split icotek cable entry systems. The QT-AT-M grommets are made of elastomer with a polyamide body. QT-AT-M grommets are available with inner threads in sizes M12x1.0, M16x1.5, M20x1.5 and M25x1.5.

The QT-AT-M is ideal for creating an interface for signal, data, power and hybrid connectors by simply screwing them into the QT-AT-M thread. Pressure compensation elements or conduit connectors up to M25x1.5 can also be screwed into the QT-AT-M.

There is also a blank QT-AT-B grommet available. The integrated polyamide body is completely closed on one side. The effective area is 24 x 24 mm, the wall thickness is 6 mm. Custom drill-holes and cut-outs can be made here for e.g. installation of screw mounted hybrid connectors.

icotek also offers screw plugs for sizes M16, M20 and M25 to close the new adapter grommet with the metric internal thread QT-AT-M.

Advantages & benefits

- By using QT-AT-M grommets, panel connectors and sockets can be integrated directly into the cable entry system
- Separate cut-outs for connectors are no longer necessary
- Space-saving solution
- Thread sizes M12 to M25 available

Specifications

Material	Grommet: Elastomer Body with thread: Polyamide
Flame class	UL94-Vo, self-extinguishing
Protection class	IP54 when using correct components
Temperature	-40°C to +100°C (static)
Properties	Halogen free, silicone free

Type	Order No.	Height x Width x Length [mm]	Thread	Material	PU
QT-AT-M 12x1,0	42596	39 x 40 x 17	M12 x 1.0	PA/Elastomer	10
QT-AT-M 16x1,5	42597	39 x 40 x 17	M16 x 1.5	PA/Elastomer	10
QT-AT-M 20x1,5	42598	39 x 40 x 17	M20 x 1.5	PA/Elastomer	10
QT-AT-M 25x1,5	42599	39 x 40 x 17	M25 x 1.5	PA/Elastomer	10
QT-AT-B blank	42600	39 x 40 x 17	—	PA/Elastomer	10

Screw plugs for QT-AT-M

Type	Order No.	Thread	Material	PU
Screw plug M16 x 1.5	99195	M16	Polyamide	10
Screw plug M20 x 1.5	99196	M20	Polyamide	10
Screw plug M25 x 1.5	99197	M25	Polyamide	10



1.24

KEL-BES

Brush plate

for cable pass-through



Product description

Brush plates KEL-BES for routing cables into server racks, control panels and electrical enclosures.

KEL-BES is also an ideal solution for entry and exit of cables that are routed inside raised floors, e.g. in datacentres or IT closets. The brush plates can either be mounted via screws or via expanding rivets.

The KEL-BES plates match exactly the cut-out dimensions for 10-, 16- or 24-pin standard industrial connectors.

Advantages & benefits

- Fast and easy assembly (optional: snap in assembly)
- Versatile utilisation
- Allows reduced airflow while filtering out dust, hair and larger particulate matter
- Visual screening
- Protects cables against wear due to sharp edges of the cut-out

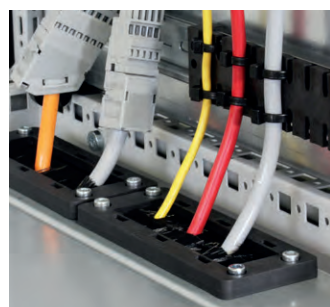
Specifications

Material	Frame, rectangular: Polyamide (PA) (Flame class UL94-Vo) Brushes: Polyamide (PA) Brush profile: sheet steel, zinc plated
Temperature	- 20°C to + 90°C
Properties	Halogen-free, silicone-free
Frame depth	10 mm

Accessories

KEL-EMC-PF Cable collectors 159

Description	Type	Order No.	Cut-out	PU
	KEL-BES 24	51515	36 x 112 mm	10
	KEL-BES 16	51510	36 x 86 mm	10
	KEL-BES 10	51505	36 x 65 mm	10
	Expanding rivets	99153	For wall thickness 1-4 mm	100



Suitable for control panel construction



... as well as for energy and building technology.

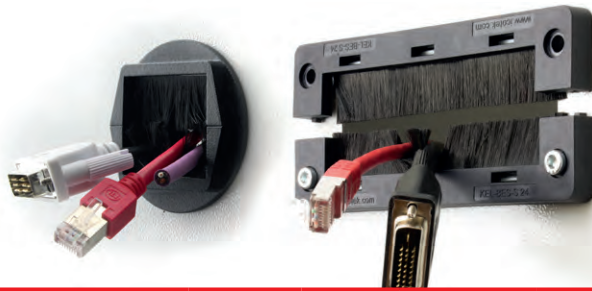


Screw mounting or mounting via expanding rivets possible.



Round version with M50 thread for locknut or snap-in mounting.

KEL-BES-S

Split brush plate
for cable pass-through

Product description

Split brush plates KEL-BES-S for routing cables into server racks, control panels and electrical enclosures. The brush plates can either be mounted via screws or via expanding rivets. Due to the split frame the KEL-BES-S can also be subsequently installed around the routed cables. The KEL-BES-S frames match exactly the cut-out dimensions for 10-, 16- or 24-pin standard industrial connectors.

For round metric cut-outs M32/M50 icotek offers the split KEL-BES-S 32/50. It can be either directly snapped into the cut-out or screwed with a locknut.

Advantages & benefits

- Fast and easy assembly (optional: snap in assembly)
- Subsequent assembly possible
- Versatile utilisation
- Allows reduced airflow while filtering out dust, hair and larger particulate matter
- Visual screening
- Protects cables against wear due to sharp edges of the cut-out

Specifications

Material	Frame, rectangular: Polyamide (PA)
	Frame, round: Polycarbonate (PC)
Temperature Properties	(Flame class UL94-Vo)
	Brushes: Polyamide (PA)
	Brush profile: sheet steel, zinc plated
	- 20°C to + 90°C
Frame depth	Halogen-free, silicone-free
	10 mm

Accessories

KEL-EMC-PF Cable collectors 159

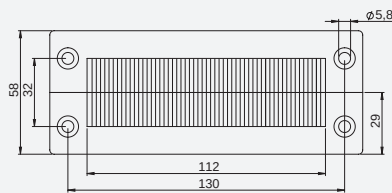
Description

Type

Order No.

Cut-out

PU



KEL-BES-S 24

51522

36 x 112 mm

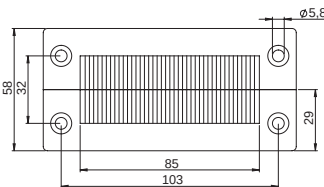
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KEL-BES-S 24
with expanding
rivets

51522.002

36 x 112 mm

10



KEL-BES-S 16

51521

36 x 86 mm

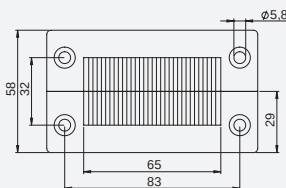
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KEL-BES-S 16
with expanding
rivets

51521.002

36 x 86 mm

10



KEL-BES-S 10

51520

36 x 65 mm

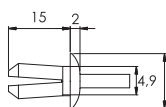
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KEL-BES-S 10
with expanding
rivets

51520.002

36 x 65 mm

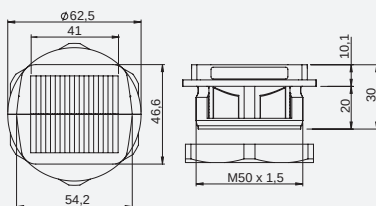
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Expanding
rivets

99153

For wall thick-
ness 1-4 mm

100

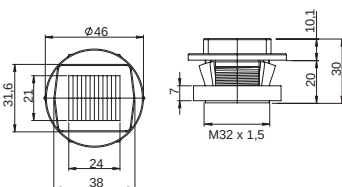


KEL-BES-S 50

51540

M50 x 1.5
Snap-in function
for wall thick-
ness 1 - 2.5 mm

10



KEL-BES-S 32

51538

M32 x 1.5
Snap-in function
for wall thick-
ness 1 - 2.5 mm

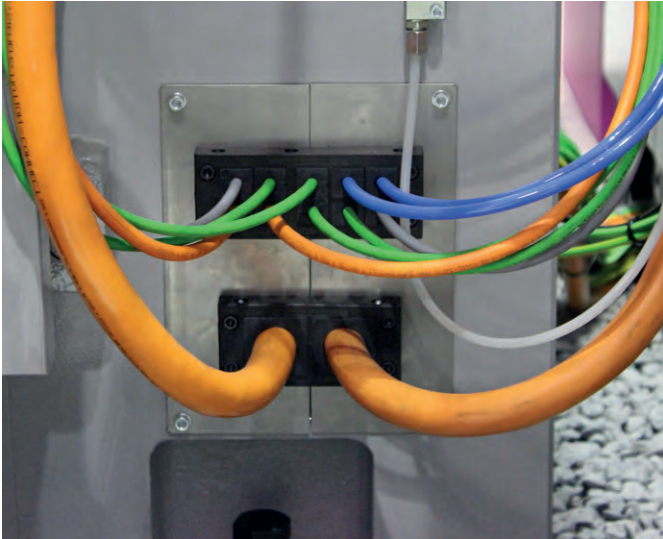
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Typical applications

Cable entry systems for pre-terminated cables

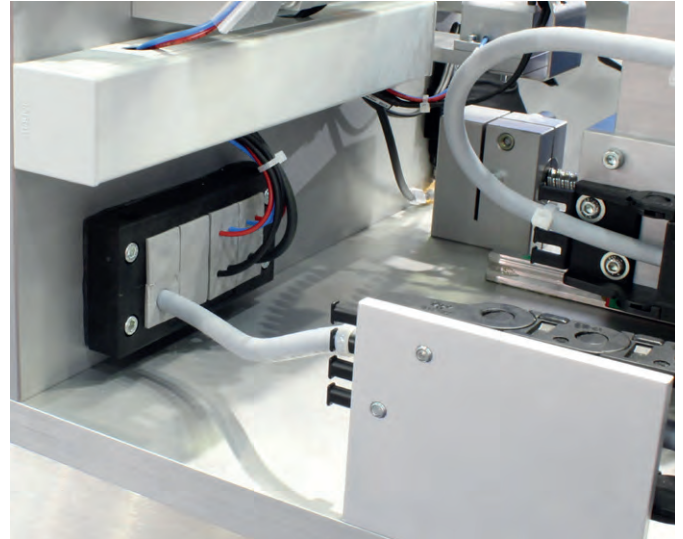
1.1

1.2



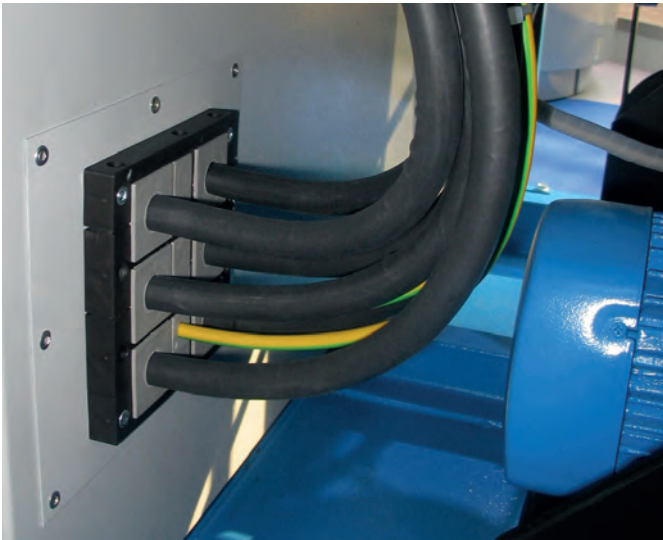
KEL-U 24|10 / KEL-U 16|2

Routing of 12 cables with various diameters (some of them assembled with connectors) into the body of a grinding machine.



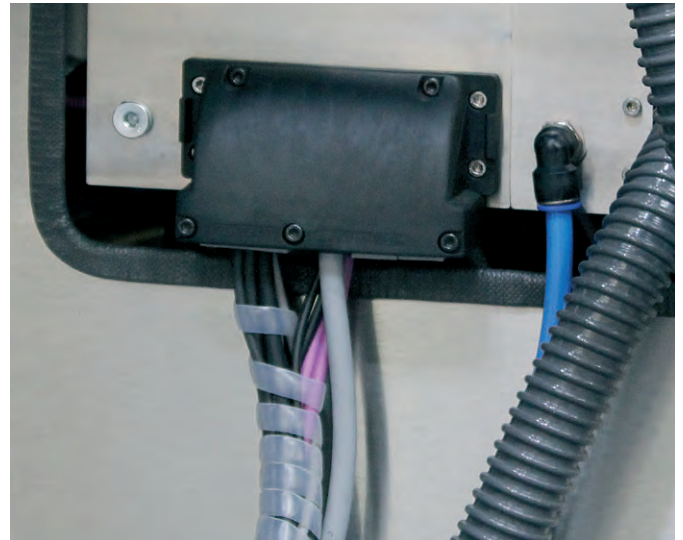
KEL 16|8

Routing of several pre-terminated lines into the electrical enclosure of a tension measuring machine.



KEL 24|12-2MT

Routing of 6 large cables up to 35 mm with one cable entry frame.



KEL-FG A10

Used in combination with drag chains to provide strain relief and compact, high density cable entry into an integrated switch cabinet.



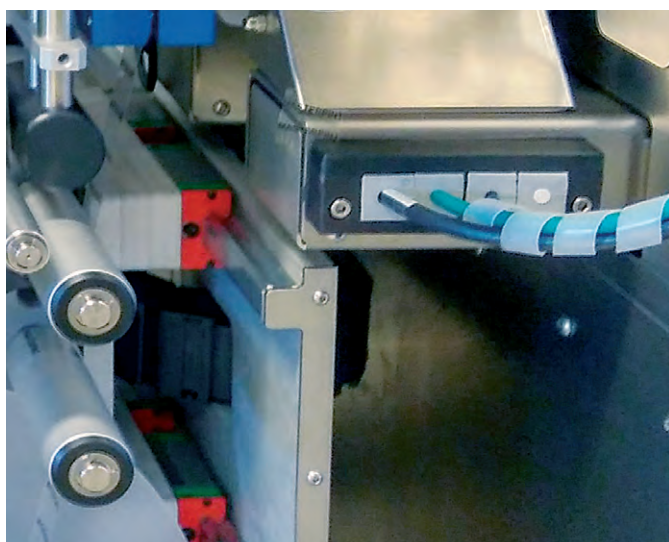
KEL-JUMBO 2 / KEL 24|x

Routing of conduits and large cables between vehicle body and chassis



KVT 50-W90

Low profile 90 degree routing of a terminated cable from a control panel into the machine



KEL-QUICK-E4

Routing of cables with connectors into a control panel / IPC



KEL-QUICK 24|10 / KEL-SNAP 24

Routing of corrugated conduits into an external enclosure of a construction machine. Tool-free mounting/unmounting with snap frame

1.1

1.2

2 Cable entry systems for cables without connectors



For routing cables without connectors icotek offers a wide range of products with a lot of advantages and benefits in comparison to conventional cable glands.

The compact, slim and innovative design of the membrane-based cable entry plates offer a professional appearance and high ingress protection ratings up to IP68 / UL type 4X.

Due to high cable densities, especially suitable for applications where a lot of cables have to be entered through a small space.

For routing rigid large diameter cables icotek offers highly flexible conical cable entry grommets with high protection ratings.



ProductFinder

Product	IP54	IP64	IP65	IP66	IP68	UL TYPE 12	UL TYPE 4X	Strain relief	Cable Ø mm min max	Max. no. of cables	Page
KEL-DPU 24	■	■	■	■	■	■	■	■	3.2 – 20.5	32	90 – 91
KEL-DPZ 24	■	■	■	■		■		■	2.5 – 22	119	92 – 94
KEL-DPZ 16	■	■	■	■				■	3.2 – 16.2	34	95
KEL-DPZ 6	■	■	■	■				■	2.5 – 8	27	96
KEL-DPZ-B	■	■	■	■		■		■	3.2 – 22	25	97
KEL-DPZ-E	■	■	■	■		■		■	3.2 – 12	21	97
KEL-DPZ-KL	■	■	■			■		■	3.2 – 22	72	97
KEL-DPZ round	■	■	■	■	■	■	■	■	1.5 – 22.2	78	98 – 99
KEL-DP 24	■	■				■			max. 16.1	48	100 – 101
KEL-DP 16	■	■				■			max. 12.6	26	102
KEL-DP 6	■	■				■			max. 16.1	25	103
KEL-DP-E	■	■				■			max. 12.1	21	103
KEL-DP round	■	■	■			■			max. 22.5	35	104 – 106
KEL-SCDP	■	■	■						5 – 36	1	110 – 111
KEL-DPF	■	■	■	■	■	■	■	■	3 – 70	1	112 – 113
KEL-JUMBO flex	■					■		■	27 – 68	1	115
KEL-ULTRA flex	■	■	■	■		■		■	25 – 115	1	114

2.1 Cable entry plates for cables without connectors



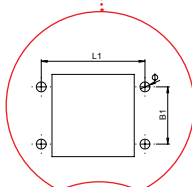
High cable density



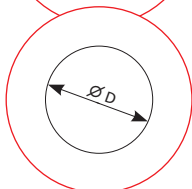
Fast and easy, partially tool-free assembly



Compact, space-saving design

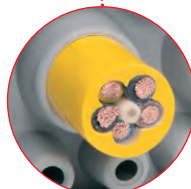


Many cut-outs according to industrial standard dimensions



For metric cut-outs M25 – M63 (KEL-DPZ/KEL-DP round)

IP64 to IP68 rated protection, double cable sealing on front and back side (KEL-DPU/KEL-DPZ)



Flexible clamping range

Chapter content 2.1



Cable entry plates
screw/snap-in mounting, high strain relief

KEL-DPU 24

90 – 91



Cable entry plates
screw mounting, strain relief

KEL-DPZ 24 / KEL-DPZ 16 / KEL-DPZ 6

92 – 97



Cable entry plates
screw mounting, strain relief

KEL-DPZ-KL

97



Cable entry plates, round
with thread and locknut M25 – M63,
strain relief

KEL-DPZ round

98 – 99



Cable entry plates
plug-in mounting

KEL-DP 24 / KEL-DP 16 / KEL-DP 6

100 – 103



Cable entry plates, round
plug-in mounting, M25 – M50

KEL-DP round

104 – 106



Plugs for membranes

ST-B

107



Cable entry plates, round
Hygienic Design Line

KEL-DPZ-HD

232 – 236

2.1

Heavy-duty cable entry plates with high strain relief with IP66/IP68 rating KEL-DPU

Product description

KEL-DPU entry plates are designed to route and seal cables without connectors (from 3.2 mm to 20.5 mm in diameter) in limited space with IP66/IP68**/up to UL type 4X ratings. The KEL-DPU is particularly characterised by its solid robust frame and the increased strain relief of the routed cables.

The KEL-DPU 24 matches exactly the cut-out dimensions of 24-pin standard industrial connectors. For optional screw assembly just pierce the membranes on the integrated screw holes with the screw itself.

The assembly of the KEL-DPU with cables or pneumatic hoses can be done quick and easy. Simply make a small hole in the thin membrane and push the cables through. ST-B Plugs can be used for sealing pierced membranes if cables have been removed.

The version with threaded bushings enables the cable entry plate to be screwed onto the housing from the inside out. This protects against vandalism and tampering with the housing from the outside.

Advantages & benefits

- Dual cable sealing with IP66/IP68**/up to UL type 4X
- Snap or screw mounting possible
- High strength and stability
- High strain relief
- Fast and easy assembly
- Very high cable density
- Hygienic design – free of dirt-collecting recesses

Specifications

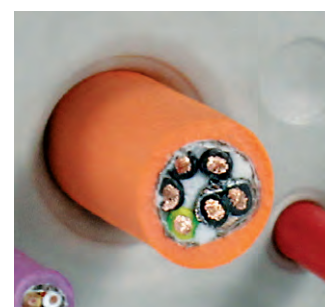
Material	Frame: Polypropylene (PP)
	Sealing plate: Elastomer
Colour	☐ grey (similar RAL 7035) ☒ black
Flame class	UL94-Vo, self-extinguishing
IP rating	IP66/IP67/IP68 (certified acc. to EN 60529)
UL type rating	UL type 12 (acc. to UL 50E) UL type 4X (acc. to UL 50E)
Temperature	- 40°C to + 100°C (static)
Properties	Halogen-free, silicone-free
Plate depth	14 mm
For wall thickness	1.5 - 2 mm (snap-in mounting)

Accessories

ST-B Plugs	107
KEL-EMC-PF Cable collectors	159
FP Flanged plates	210 - 219



Tool-free assembly possible due to snap-in function



Membrane on front



Conical shape on back provides additional sealing and strain relief



Resistant against industrial detergents (ECOLAB certified)



Also available in black.



Also available with threaded bushings.

** IP68 only when screw mounted

KEL-DPU

Heavy-duty cable entry plates
with high strain relief

KEL-DPU 24



IP66

IP68

Description	Cut-out Drilling template	Type	Cut-out mm	Number of cables	Order No.	PU
		KEL-DPU 24 13	36 x 112 mm	10× 3.2 - 6.3 mm 3× 16 - 20.5 mm	43940 50940	10
		KEL-DPU 24 13 with threaded bushings M4	36 x 112 mm		43940.400 50940.400	10
		KEL-DPU 24 14	36 x 112 mm	5× 3.2 - 6.3 mm 2× 4 - 7.5 mm 3× 5.5 - 10.5 mm 1× 8 - 12.5 mm	43944 50944	10
		KEL-DPU 24 14 with threaded bushings M4	36 x 112 mm	3× 12 - 16.2 mm	43944.400 50944.400	10
		KEL-DPU 24 16	36 x 112 mm	8× 3.2 - 5.5 mm 6× 5 - 8.5 mm 2× 9.5 - 14.5 mm	43936 50936	10
		KEL-DPU 24 16 with threaded bushings M4	36 x 112 mm		43936.400 50936.400	10
		KEL-DPU 24 16-1	36 x 112 mm	2× 3.2 - 6.3 mm 9× 4 - 7.5 mm 1× 5.5 - 10.5 mm 1× 8 - 12.5 mm	43932 50932	10
		KEL-DPU 24 16-1 with threaded bushings M4	36 x 112 mm	3× 12 - 16.2 mm	43932.400 50932.400	10
		KEL-DPU 24 17	36 x 112 mm	4× 3.2 - 6.3 mm 2× 4 - 7.5 mm 1× 5.5 - 10.5 mm 10× 8 - 12.5 mm	43934 50934	10
		KEL-DPU 24 17 with threaded bushings M4	36 x 112 mm		43934.400 50934.400	10
		KEL-DPU 24 20	36 x 112 mm	12× 3.2 - 5.5 mm 8× 5 - 10.5 mm	43938 50938	10
		KEL-DPU 24 20 with threaded bushings M4	36 x 112 mm		43938.400 50938.400	10
		KEL-DPU 24 21	36 x 112 mm	1× 3.2 - 6.3 mm 14× 4 - 7.5 mm 4× 5.5 - 10.5 mm 2× 8 - 12.5 mm	43930 50930	10
		KEL-DPU 24 21 with threaded bushings M4	36 x 112 mm		43930.400 50930.400	10
		KEL-DPU 24 32	36 x 112 mm	32× 3.2 - 6.3 mm	43942 50942	10
		KEL-DPU 24 32 with threaded bushings M4	36 x 112 mm		43942.400 50942.400	10

* Only valid for grey product types | ** IP68 only when screw mounted

Cable entry plates with IP66 rating KEL-DPZ series

Product description

KEL-DPZ cable entry plates are designed to route and seal a large number of cables without connectors, hoses or fibre optics (from 2.5 mm to 22 mm in diameter) in limited space. The KEL-DPZ products are a cost and time saving alternative to traditional cable glands.

The assembly of the KEL-DPZ with cables or pneumatic hoses can be done quick and easy. Simply make a small hole in the thin membrane, push the cables through. The KEL-DPZ provides strain relief and protection up to IP66/UL type 12.

2.1

The KEL-DPZ matches exactly the cut-out dimensions of 6-, 16- and 24-pin standard industrial connectors. The size KEL-DPZ-B fits on cut-outs 46 × 46 mm. The very compact size KEL-DPZ-E is designed for routing cables in very small space. Through a cut-out of only 18 × 112 mm, up to 21 cables can be easily routed and sealed.

Especially for Rittal KL/KX terminal boxes the size KEL-DPZ-KL was created. It was designed for routing up to 72 cables through the pre-cut standard cut-out. The self-tapping screws (M4) required for assembly are included in the scope of delivery. ST-B Plugs can be used for sealing pierced membranes if cables have been removed.

The version with threaded bushings enables the cable entry plate to be screwed onto the housing from the inside out. This protects against vandalism and tampering with the housing from the outside.



Also available in black.



Also available with threaded bushings.

Advantages & benefits

- Dual sealing acc. to IP65/IP66/UL type 12
- Fast and easy assembly
- High cable density
- High strain relief
- Hygienic design

Specifications

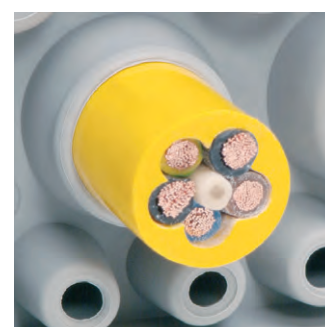
Material	Frame: Polyamide (PA) Stainless steel V2A: KEL-DPZ 6 + KEL-DPZ-KX/KL
Colour	Sealing plate: Elastomer ■ grey (similar RAL 7035) ■ black
Flame class	UL94-Vo, self-extinguishing
IP rating	IP65/IP66 (certified acc. to EN 60529)
UL type rating	UL type 12 (acc. to UL 50E)
Temperature	- 40°C to + 100°C (static)
Properties	Halogen-free, silicone-free
Plate depth	14 mm

Accessories

ST-B Plugs	107
KEL-EMC-PF Cable collectors	159
FP Flanged plates	210 - 219



Membrane on front



Conical shape on back provides additional sealing and strain relief

KEL-DPZ

Cable entry plates

KEL-DPZ 24



Description	Cut-out Drilling template	Type	Cut-out mm	Number of cables	Order No.	PU
		KEL-DPZ 24 14	36 x 112 mm	10x 3.2 - 6.5 mm 4x 16 - 22 mm	43700 50700	10
		KEL-DPZ 24 14 with threaded bushings M4	36 x 112 mm	10x 3.2 - 6.5 mm 4x 16 - 22 mm	43700.400 50700.400	10
		KEL-DPZ 24 15	36 x 112 mm	15x 7.2 - 12 mm	43720 50720	10
		KEL-DPZ 24 15 with threaded bushings M4	36 x 112 mm	15x 7.2 - 12 mm	43720.400 50720.400	10
		KEL-DPZ 24 16	36 x 112 mm	8x 3.2 - 6.5 mm 4x 5 - 9.7 mm 2x 9 - 16.2 mm 2x 16 - 22 mm	43725 50725	10
		KEL-DPZ 24 16 with threaded bushings M4	36 x 112 mm	8x 3.2 - 6.5 mm 4x 5 - 9.7 mm 2x 9 - 16.2 mm 2x 16 - 22 mm	43725.400 50725.400	10
		KEL-DPZ 24 17	36 x 112 mm	6x 3.2 - 6.5 mm 6x 5 - 10.2 mm 5x 9 - 16.2 mm	43705 50705	10
		KEL-DPZ 24 17 with threaded bushings M4	36 x 112 mm	6x 3.2 - 6.5 mm 6x 5 - 10.2 mm 5x 9 - 16.2 mm	43705.400 50705.400	10
		KEL-DPZ 24 25	36 x 112 mm	12x 3.2 - 6.5 mm 7x 4.8 - 9.7 mm 6x 7.5 - 12 mm	43710 50710	10
		KEL-DPZ 24 25 with threaded bushings M4	36 x 112 mm	12x 3.2 - 6.5 mm 7x 4.8 - 9.7 mm 6x 7.5 - 12 mm	43710.400 50710.400	10
		KEL-DPZ 24 26	36 x 112 mm	26x 5.0 - 10.2 mm	43711 50711	10
		KEL-DPZ 24 26 with threaded bushings M4	36 x 112 mm	26x 5.0 - 10.2 mm	43711.400 50711.400	10

* Only valid for grey product types

KEL-DPZ

Cable entry plates

KEL-DPZ 24

IP66



Type	Cut-out Drilling template	Type	Cut-out mm	Number of cables	Order No.	PU
		KEL-DPZ 24 32	36 x 112 mm	21x 3.2 - 6.5 mm 8x 5 - 10.2 mm 3x 7.5 - 12 mm	■ 43730 ■ 50730	10
		KEL-DPZ 24 32 with threaded bushings M4	36 x 112 mm	21x 3.2 - 6.5 mm 8x 5 - 10.2 mm 3x 7.5 - 12 mm	■ 43730.400 ■ 50730.400	10
		KEL-DPZ 24 42	36 x 112 mm	42x 3.2 - 6.5 mm	■ 43715 ■ 50715	10
		KEL-DPZ 24 42 with threaded bushings M4	36 x 112 mm	42x 3.2 - 6.5 mm	■ 43715.400 ■ 50715.400	10
		KEL-DPZ 24 121	36 x 112 mm	119x 1.5 - 2.6 mm 2x 2.5 - 5 mm	■ 43735 ■ 50735	10
		KEL-DPZ 24 121 with threaded bushings M4	36 x 112 mm	119x 1.5 - 2.6 mm 2x 2.5 - 5 mm	■ 43735.400 ■ 50735.400	10

* Only valid for grey product types



High cable density

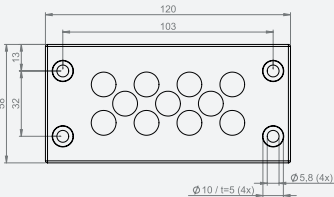
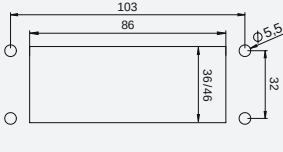
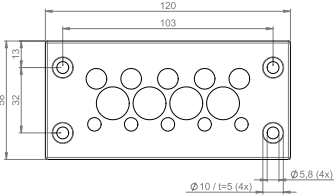
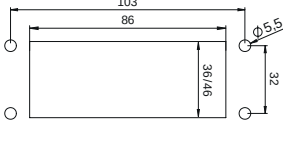
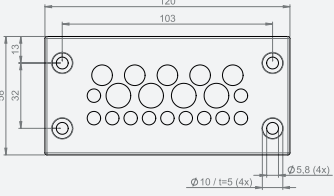
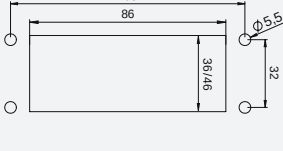
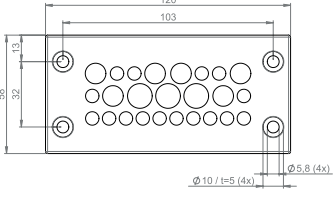
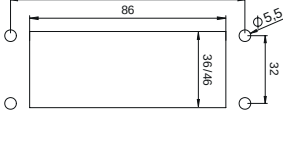
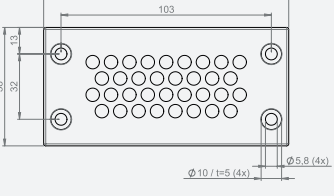
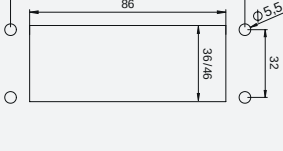


KEL-DPZ 16

KEL-DPZ

Cable entry plates
KEL-DPZ 16

IP66

Type	Cut-out Drilling template	Type	Cut-out mm	Number of cables	Order No.	PU
		KEL-DPZ 16 11	36 x 86 mm	11 x 7.5 - 12 mm	43815	10
		KEL-DPZ 16 11 with threaded bushings M4	36 x 86 mm	11 x 7.5 - 12 mm	43815.400	10
		KEL-DPZ 16 14	36 x 86 mm	5 x 3.2 - 6.5 mm 5 x 5 - 10.2 mm 4 x 9 - 16.2 mm	43816	10
		KEL-DPZ 16 14 with threaded bushings M4	36 x 86 mm	5 x 3.2 - 6.5 mm 5 x 5 - 10.2 mm 4 x 9 - 16.2 mm	43816.400	10
		KEL-DPZ 16 20	36 x 86 mm	11 x 3.2 - 6.5 mm 5 x 5 - 10.2 mm 4 x 7.5 - 12 mm	43817	10
		KEL-DPZ 16 20 with threaded bushings M4	36 x 86 mm	11 x 3.2 - 6.5 mm 5 x 5 - 10.2 mm 4 x 7.5 - 12 mm	43817.400	10
		KEL-DPZ 16 25	36 x 86 mm	16 x 3.2 - 6.5 mm 6 x 5 - 10.2 mm 3 x 7.5 - 12 mm	43818	10
		KEL-DPZ 16 25 with threaded bushings M4	36 x 86 mm	16 x 3.2 - 6.5 mm 6 x 5 - 10.2 mm 3 x 7.5 - 12 mm	43818.400	10
		KEL-DPZ 16 34	36 x 86 mm	34 x 3.2 - 6.5 mm	43819	10
		KEL-DPZ 16 34 with threaded bushings M4	36 x 86 mm	34 x 3.2 - 6.5 mm	43819.400	10

KEL-DPZ

Cable entry plates

KEL-DPZ 6

IP66



Type

Cut-out | Drilling template

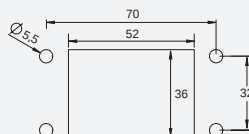
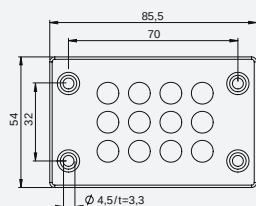
Type

Cut-out
mm

Number of
cables

Order No.

PU



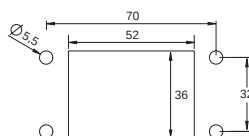
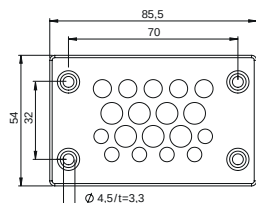
KEL-DPZ 6|12

52 x 36 mm

12 x 4.5 - 8.0 mm

43809

10



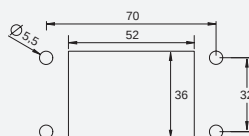
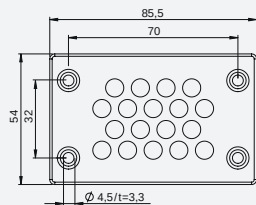
KEL-DPZ 6|18-1

52 x 36 mm

7 x 4.5 - 8.0 mm
5 x 3.2 - 6.5 mm
6 x 2.5 - 5.0 mm

43811

10



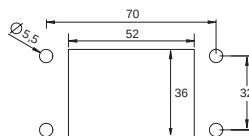
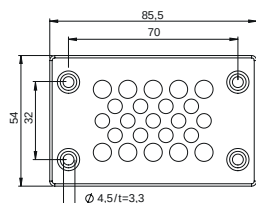
KEL-DPZ 6|18

52 x 36 mm

18 x 3.2 - 6.5 mm

43812

10



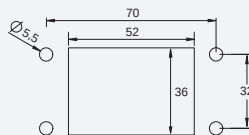
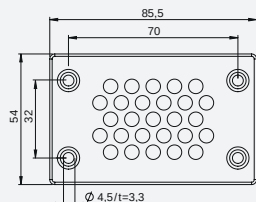
KEL-DPZ 6|23

52 x 36 mm

10 x 3.2 - 6.5 mm
13 x 2.5 - 5.0 mm

43813

10



KEL-DPZ 6|27

52 x 36 mm

27 x 2.5 - 5.0 mm

43814

10



KEL-DPZ

Cable entry plates
KEL-DPZ-B, KEL-DPZ-E,
KEL-DPZ-KX/KL



Type	Cut-out Drilling template	Type	Cut-out mm	Number of cables	Order No.	PU
		KEL-DPZ-B 13	46 x 46 mm	8× 3.2 - 6.5 mm 4× 5 - 10.2 mm 1× 16 - 22 mm	■ 43794 ■ 50794	10
		KEL-DPZ-B 13 with threaded bushings M4	46 x 46 mm	8× 3.2 - 6.5 mm 4× 5 - 10.2 mm 1× 16 - 22 mm	■ 43794.400 ■ 50794.400	10
		KEL-DPZ-B 17	46 x 46 mm	10× 3.2 - 6.5 mm 4× 5 - 10.2 mm 2× 7.5 - 12 mm 1× 9 - 16.2 mm	■ 43796 ■ 50796	10
		KEL-DPZ-B 17 with threaded bushings M4	46 x 46 mm	10× 3.2 - 6.5 mm 4× 5 - 10.2 mm 2× 7.5 - 12 mm 1× 9 - 16.2 mm	■ 43796.400 ■ 50796.400	10
		KEL-DPZ-B 25	46 x 46 mm	25× 3.2 - 6.5 mm	■ 43798 ■ 50798	10
		KEL-DPZ-B 25 with threaded bushings M4	46 x 46 mm	25× 3.2 - 6.5 mm	■ 43798.400 ■ 50798.400	10
		KEL-DPZ-E 112 7	18 x 112 mm	7× 7.5 - 12 mm	■ 43780 ■ 50780	10
		KEL-DPZ-E 112 7 with threaded bushings M4	18 x 112 mm	7× 7.5 - 12 mm	■ 43780.400 ■ 50780.400	10
		KEL-DPZ-E 112 21	18 x 112 mm	21× 3.2 - 6.5 mm	■ 43790 ■ 50790	10
		KEL-DPZ-E 112 21 with threaded bushings M4	18 x 112 mm	21× 3.2 - 6.5 mm	■ 43790.400 ■ 50790.400	10
		KEL-DPZ-KX/KL 72	62 x 192 mm	42× 3.2 - 6.5 mm 21× 5 - 10.2 mm 6× 9 - 16.2 mm 3× 16 - 22 mm	■ 43675.001 ■ 43675.101	1

Cable entry plates with IP66/IP68 rating KEL-DPZ round series

Product description

KEL-DPZ round cable entry plates are designed to route and seal cables without connectors or fibre optics (from 1.5 mm to 22 mm in diameter) in limited space.

The assembly of the KEL-DPZ round with cables or pneumatic hoses can be done quick and easy. Simply make a small hole in the thin membrane, push the cables through. The KEL-DPZ round provides strain relief and protection IP66/IP68/UL Type 4X.

The round versions of the KEL-DPZ series have a thread to fit in metric cut-outs from M25 to M63. Thus cut-outs for metric cable glands can be used. ST-B Plugs can be used for sealing pierced membranes if cables have been removed.



Advantages & benefits

- Dual sealing of cables acc. to IP66/IP68/up to UL type 4X
- Quick and easy tool-free assembly
- High cable density
- High strain relief
- Suitable for metric cut-outs
- Polyamide locknuts are included in the shipment
- Hygienic design – free of dirt-collecting recesses
- Available as an FDA compliant version

Specifications

Material	Thread frame: Polyamide (PA) Sealing plate: Elastomer
Colour	■ grey (similar RAL 7035) ■ black
Flame class	UL94-Vo, self-extinguishing
IP rating	IP65/IP66/IP67/IP68 (certified acc. to EN 60529)
UL type rating	UL type 12 (acc. to UL 50E) UL type 4X (acc. to UL 50E)
Temperature	- 40°C to + 100°C (static)
Properties	Halogen-free, silicone-free
Cut-out dim.	Metric sizes
Thread length	14 mm
Plate depth	8 mm

Accessories

ST-B Plugs	107
FP Flanged plates	210 - 219
MP Module plates	201 - 205



Membrane on front



Conical shape on back provides additional sealing and strain relief



Also available in black.



KEL-DPZ 25



This product range is also available as a KEL-DPZ-HD version for the food sector, see pages 232 – 236.

KEL-DPZ round

Cable entry plates



IP66

IP68

Type	Order No.	Number of cables	Thread metric	Thread length	External diameter	Mounting height	PU
KEL-DPZ 25 3	■ 43736	2× 3.2 - 5.2 mm	M25 × 1.5	14 mm	39 mm	8 mm	10
	■ 50736	1× 3.2 - 6.5 mm					
KEL-DPZ 25 4	■ 43737	4× 3.2 - 5.2 mm	M25 × 1.5	14 mm	39 mm	8 mm	10
	■ 50737						
KEL-DPZ 32 4	■ 43732	3× 3.2 - 6.5 mm	M32 × 1.5	14 mm	44 mm	8 mm	10
	■ 50732	1× 7.2 - 12.5 mm					
KEL-DPZ 32 4-2	■ 43733	4× 5 - 9.5 mm	M32 × 1.5	14 mm	44 mm	8 mm	10
	■ 50733						
KEL-DPZ 32 7	■ 43734	7× 3.2 - 6.5 mm	M32 × 1.5	14 mm	44 mm	8 mm	10
	■ 50734						
KEL-DPZ 40 8	■ 43741	4× 3.2 - 6.5 mm	M40 × 1.5	14 mm	52 mm	8 mm	10
	■ 50741	4× 5 - 10.2 mm					
KEL-DPZ 50 8	■ 43750	5× 5 - 10.2 mm	M50 × 1.5	14 mm	62 mm	8 mm	10
	■ 50750	3× 7.2 - 12.5 mm					
KEL-DPZ 50 10	■ 43751	7× 3.2 - 6.5 mm	M50 × 1.5	14 mm	62 mm	8 mm	10
	■ 50751	2× 5 - 10.2 mm 1× 16 - 22.2 mm					
KEL-DPZ 50 12	■ 43752	4× 3.2 - 6.5 mm	M50 × 1.5	14 mm	62 mm	8 mm	10
	■ 50752	8× 5 - 10.2 mm					
KEL-DPZ 50 19	■ 43758	19× 3.2 - 6.5 mm	M50 × 1.5	14 mm	62 mm	8 mm	10
	■ 50758						
KEL-DPZ 50 78	■ 43756	76× 1.5 - 2.6 mm	M50 × 1.5	14 mm	62 mm	8 mm	10
	■ 50756	2× 2.5 - 5 mm					
KEL-DPZ 63 9	■ 43760	1× 3.2 - 6.5 mm	M63 × 1.5	14 mm	75 mm	8 mm	10
	■ 50760	3× 5 - 10.2 mm 4× 9 - 16.2 mm 1× 16 - 22.2 mm					
KEL-DPZ 63 13	■ 43761	4× 3.2 - 6.5 mm	M63 × 1.5	14 mm	75 mm	8 mm	10
	■ 50761	4× 5 - 10.2 mm 5× 9 - 16.2 mm					
KEL-DPZ 63 14	■ 43762	14× 5 - 10.2 mm	M63 × 1.5	14 mm	75 mm	8 mm	10
	■ 50762						
KEL-DPZ 63 35	■ 43763	35× 3.2 - 6.5 mm	M63 × 1.5	14 mm	75 mm	8 mm	10
	■ 50763						

* Only valid for grey product types

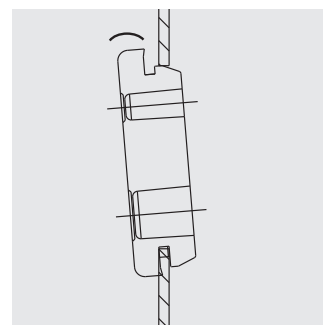
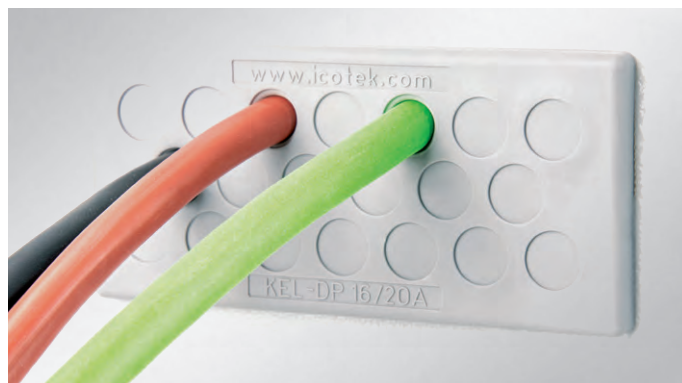
Cable entry plates with IP64 rating KEL-DP series

Product description

KEL-DP entry plates are designed for routing cables without connectors, hoses or fibre optics in limited space.

The KEL-DP products are an easy to assemble and cost saving alternative to traditional cable glands. Simply make a small hole in the thin membrane and push the cables through. The KEL-DP provides protection IP64/UL type 12.

The KEL-DP matches exactly the cut-out dimensions of 6-, 16- and 24-pin standard industrial connectors. The very compact size KEL-DP-E is designed for routing cables in very small space. Through a cut-out of only 18 x 112 mm, up to 21 cables can be easily routed and sealed. A special rib ensures a centred fit in the cut-outs. ST-B Plugs can be used for sealing pierced membranes if cables have been removed.



Fastening

Advantages & benefits

- Fast and easy assembly, no tools required
- Very good strain relief on the cable bundle
- Very high cable density
- Cost-effective
- Hygienic design – free of dirt-collecting recesses
- For wall thickness 1.5 - 4 mm

Specifications

Material	Elastomer
Colour	☐ grey (similar RAL 7035) ☒ black
Flame class	UL94-Vo, self-extinguishing
IP rating	IP64 (certified acc. to EN 60529)
UL type rating	UL type 12 (acc. to UL 50E)
Temperature	- 40°C to + 100°C (static)
Properties	Halogen-free, silicone-free
Plate depth	5 mm
Type A:	For wall thickness 1.5 - 2.5 mm
Type B:	For wall thickness 2.8 - 4 mm



Also available in black.

Accessories

ST-B Plugs	107
FP Flanged plates	210 - 219

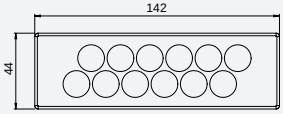
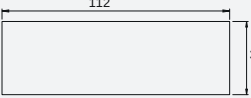
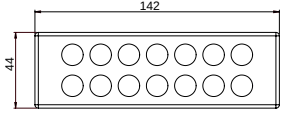
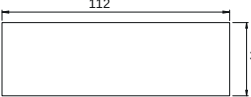
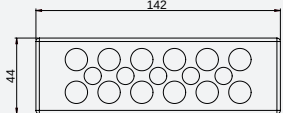
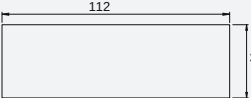
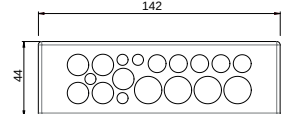
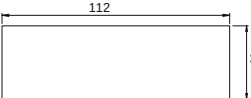
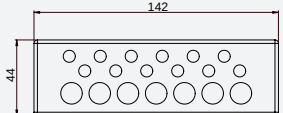
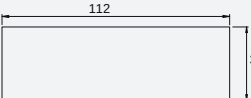
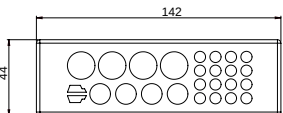
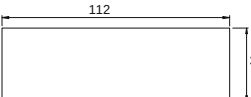
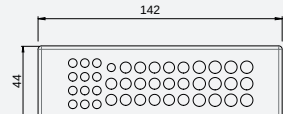
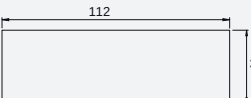
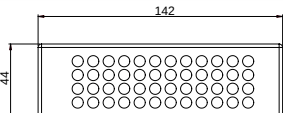
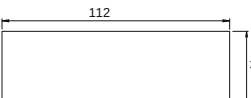
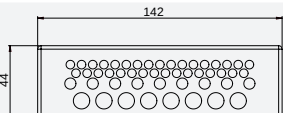
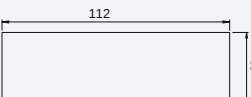
KEL-DP

Cable entry plates

KEL-DP 24



IP64

Description	Cut-out	Type	Cut-out mm	Number of cables	Order No. Type A	Order No. Type B	PJ
		KEL-DP 24 12	112 x 36 mm	12× max. 15 mm	43508 50508	—	10
		KEL-DP 24 14	112 x 36 mm	14× max. 12.1 mm	43512 50512	43522 50522	10
		KEL-DP 24 17	112 x 36 mm	5× max. 10.5 mm 12× max. 12.6 mm	43514 50514	43523 50523	10
		KEL-DP 24 18	112 x 36 mm	4× max. 6.5 mm 5× max. 10.5 mm 5× max. 12.6 mm 4× max. 16.1 mm	43515 50515	43528 50528	10
		KEL-DP 24 19	112 x 36 mm	12× max. 6.5 mm 7× max. 12.1 mm	43516 50516	43524 50524	10
		KEL-DP 24 26	112 x 36 mm	16× max. 6.5 mm 4× max. 12.1 mm 4× max. 16.1 mm 2× ASI cables	43518 50518	43525 50525	10
		KEL-DP 24 42	112 x 36 mm	12× max. 7.2 mm 17× max. 6.4 mm 12× max. 5 mm 1× max. 4.7 mm	43511 50511	43521 50521	10
		KEL-DP 24 48	112 x 36 mm	48× max. 6.5 mm	43519 50519	43526 50526	10
		KEL-DP 24 50	112 x 36 mm	33× max. 5.3 mm 9× max. 6.4 mm 8× max. 8.3 mm	43520 50520	43527 50527	10

* Only valid for grey product types

2.1

KEL-DP

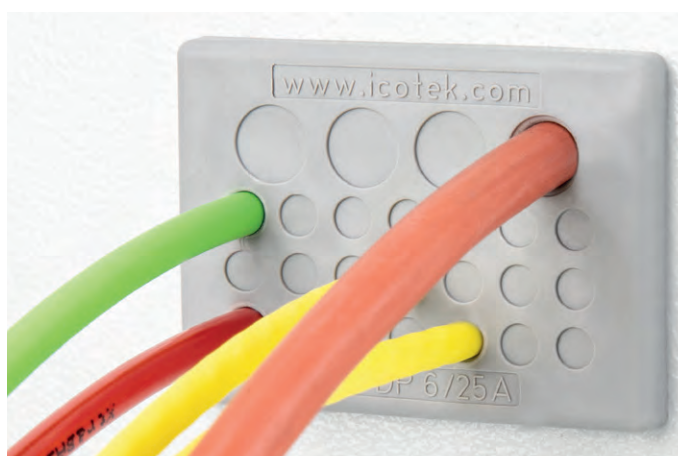
Cable entry plates

KEL-DP 16

IP64



Description	Cut-out	Type	Cut-out mm	Number of cables	Art.-Nr.	PU
		KEL-DP 16 10	86 x 36 mm	10 x max. 12.1mm	43460	10
		KEL-DP 16 11	86 x 36 mm	3 x max. 10.5 mm 8 x max. 12.6 mm	43461	10
		KEL-DP 16 20	86 x 36 mm	20 x max. 8.3 mm	43462	10
		KEL-DP 16 22	86 x 36 mm	5 x max. 12.1 mm 4 x max. 8.3 mm 13 x max. 6.5 mm	43463	10
		KEL-DP 16 23	86 x 36 mm	18 x max. 6.5 mm 5 x max. 12.1 mm	43464	10
		KEL-DP 16 26	86 x 36 mm	19 x max. 6.5 mm 7 x max. 8.3 mm	43465	10

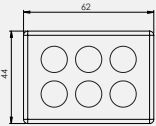
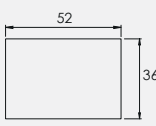
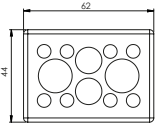
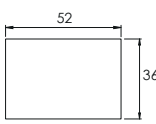
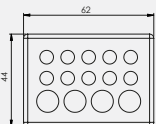
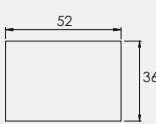
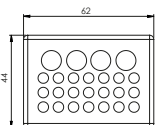
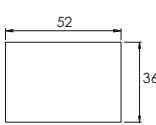
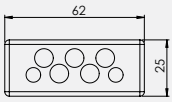
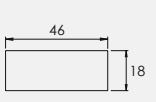
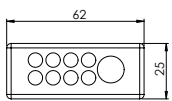
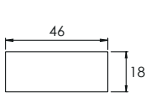
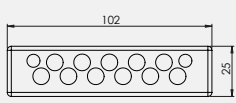
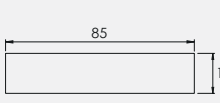
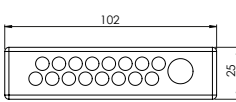
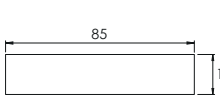
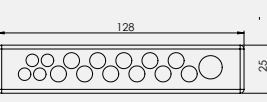
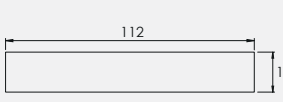
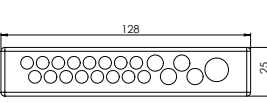
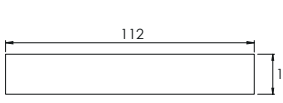
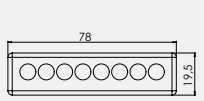
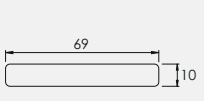


KEL-DP 6

KEL-DP

Cable entry plates KEL-DP 6, KEL-DP-E



Description	Cut-out	Type	Cut-out mm	Number of cables	Art.-Nr.	PU
		KEL-DP 6 6	52 x 36 mm	6 x max. 12.1 mm	43450	10
		KEL-DP 6 12	52 x 36 mm	8 x max. 6.5 mm 2 x max. 12.6 mm 2 x max. 16.1 mm	43451	10
		KEL-DP 6 14	52 x 36 mm	10 x max. 6.5 mm 4 x max. 10.5 mm	43452	10
		KEL-DP 6 25	52 x 36 mm	21 x max. 5.0 mm 4 x max. 8.3 mm	43453	10
		KEL-DP-E 46 7	46 x 18 mm	5 x max. 8.3 mm 2 x max. 6.5 mm	43585 50585	10
		KEL-DP-E 46 9	46 x 18 mm	8 x max. 6.5 mm 1 x max. 12.1 mm	43587 50587	10
		KEL-DP-E 86 13	85 x 18 mm	11 x max. 8.3 mm 2 x max. 6.5 mm	43581 50581	10
		KEL-DP-E 86 17	85 x 18 mm	16 x max. 6.5 mm 1 x max. 12.1 mm	43583 50583	10
		KEL-DP-E 112 16	112 x 18 mm	4 x max. 6.5 mm 11 x max. 8.3 mm 1 x max. 12.1 mm	43576 50576	10
		KEL-DP-E 112 21	112 x 18 mm	16 x max. 6.5 mm 4 x max. 8.3 mm 1 x max. 12.1 mm	43578 50578	10
		KEL-DP-S 69 8	69 x 10 mm Edge radii R2	8 x max. 7.5 mm	43591 50591	10

Cable entry plates with IP65 rating KEL-DP round

Product description

KEL-DP entry plates are designed for routing cables without connectors, hoses or fibre optics in limited space.

The KEL-DP products are an easy to assemble and cost saving alternative to traditional cable glands. Simply make a small hole in the thin membrane and push the cables through. The KEL-DP round provides protection IP65 / UL type 12.

The round version of the KEL-DP fits perfectly into metric cut-outs M20 | M25 | M32 | M40 | M50. A special rib ensures a centred fit in the cut-outs.

ST-B Plugs can be used for sealing pierced membranes if cables have been removed.

Advantages & benefits

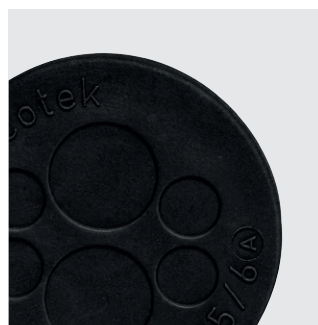
- Fast and easy assembly, no tools required
- High cable density
- Very good strain relief on the cable bundle
- Cost-effective
- For wall thickness 1.5 - 4 mm
- Hygienic design – free of dirt-collecting recesses

Specifications

Material	Elastomer
Colour	☐ grey (similar RAL 7035) ☒ black
Flame class	UL94-V0, self-extinguishing
IP rating	IP65 (certified acc. to EN 60529)
UL type rating	UL type 12 (acc. to UL 50E)
Temperature	- 40°C to + 100°C (static)
Properties	Halogen-free, silicone-free
Cut-out dimensions	Metric sizes
Plate depth	5 mm
Type A:	For wall thickness 1.5 - 2.5 mm
Type B:	For wall thickness 2.8 - 4 mm

Accessories

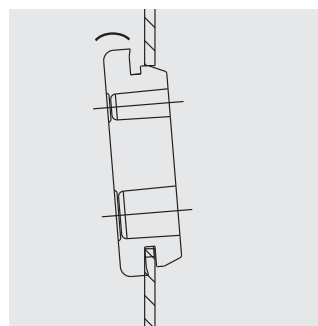
ST-B Plugs	107
FP Flange plates	210 - 219



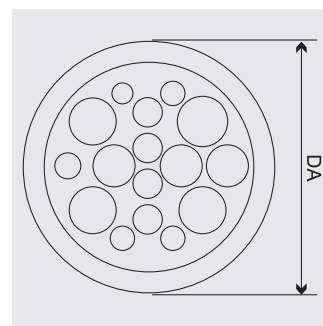
Also available in black.



Membrane on front



Fastening



Special fixing ribs ensure a centred fit.

KEL-DP round

Cable entry plates



IP65

Type	Order No. Typ A	Order No. Typ B	Number of cables	Cut-out	External diameter DA	PU
KEL-DP 20 4	■ 43572	—	4× max. 5.2 mm	Ø 20 mm	27 mm	10
KEL-DP 20 5	■ 43573	—	1× max. 10.6 mm 2× max. 4.6 mm 2× max. 3.6 mm	Ø 20 mm	27 mm	10
KEL-DP 20 9	■ 43574	—	5× max. 4.6 mm 4× max. 3.6 mm	Ø 20 mm	27 mm	10
KEL-DP 25 4	■ 43533 ■ 50533	—	4× max. 8 mm	Ø 25 mm	32 mm	10
KEL-DP 25 6	■ 43531 ■ 50531	—	4× max. 5.2 mm 2× max. 9.4 mm	Ø 25 mm	32 mm	10
KEL-DP 25 7	NEW ■ 43534	—	7x 5.2 mm	Ø 25 mm	32 mm	10
KEL-DP 32 7	NEW ■ 43592	■ 43596	7x 8.0 mm	Ø 32 mm	38 mm	10
KEL-DP 32 10	■ 43532 ■ 50532	■ 43560 ■ 50560	6× max. 5.2 mm 2× max. 6.4 mm 2× max. 9.4 mm	Ø 32 mm	38 mm	10
KEL-DP 32 10-2	NEW ■ 43593	■ 43597	10x 6.4 mm	Ø 32 mm	38 mm	10
KEL-DP 32 11	NEW ■ 43594	■ 43598	2x 8.0 mm 9x 5.2 mm	Ø 32 mm	38 mm	10
KEL-DP 32 13	NEW ■ 43595	■ 43599	13x 5.2 mm	Ø 32 mm	38 mm	10
KEL-DP 40 9	■ 43536	■ 43561	8× max. 9.5 mm 1× max. 11.3 mm	Ø 40 mm	50 mm	10
KEL-DP 40 16	■ 43537	■ 43563	2× max. 5.3 mm 10× max. 6.3 mm 2× max. 9.5 mm 2× max. 11.3 mm	Ø 40 mm	50 mm	10
KEL-DP 40 17	■ 43538	■ 43565	1× max. 4 mm 16× max. 7.2 mm	Ø 40 mm	50 mm	10

* Only valid for grey product types

2.1

KEL-DP round

Cable entry plates

IP65



Type	Order No. Type A	Order No. Type B	Number of cables	Cut-out	External diameter DA	PU
KEL-DP 50 9	43554 50554	43568 50568	5× max. 7 mm 4× max. 18 mm	Ø 50 mm	60 mm	10
KEL-DP 50 11	43555 50555	43569 50569	7× max. 7.2 mm 3× max. 11.2 mm 1× max. 22.5 mm	Ø 50 mm	60 mm	10
KEL-DP 50 12	43551 50551	43562 50562	10× max. 9.2 mm 2× max. 11.2 mm	Ø 50 mm	60 mm	10
KEL-DP 50 16	43550 50550	43564 50564	4× max. 5.3 mm 5× max. 6.3 mm 3× max. 9.5 mm 4× max. 11.3 mm	Ø 50 mm	60 mm	10
KEL-DP 50 18	43553 50553	43567 50567	2× max. 4 mm 2× max. 6 mm 4× max. 7.2 mm 5× max. 9.4 mm 5× max. 12 mm	Ø 50 mm	60 mm	10
KEL-DP 50 20	43552 50552	43566 50566	16× max. 6.3 mm 4× max. 9.3 mm	Ø 50 mm	60 mm	10
KEL-DP 50 35	43556 50556	43570 50570	35× max. 5.2 mm	Ø 50 mm	60 mm	10

* Only valid for grey product types

ST-B

Plugs for membranes



Type	Order No.	Diameter D1	Diameter D2	Length L	PU
ST-B 6	42806	8 mm	6 mm	16 mm	25
ST-B 10	42810	12 mm	10 mm	16 mm	25
ST-B 12	42812	15 mm	12 mm	16 mm	25
ST-B 16	42816	19 mm	16 mm	16 mm	25
ST-B 22	42822	25 mm	22 mm	21 mm	25
Assortment ST-B Plugs	42801	5× ST-B 6 5× ST-B 10 2× ST-B 12 1× ST-B 16 1× ST-B 22			

Product description

Plugs ST-B are used to seal already pierced membranes in various cable entry plates (KEL-DPU / KEL-DPZ / KEL-DP / KEL-QTA-DP) and DT grommets.

Perfect for applications where cables have been removed.

The IP rating of the cable entry plate remains.

Advantages & benefits

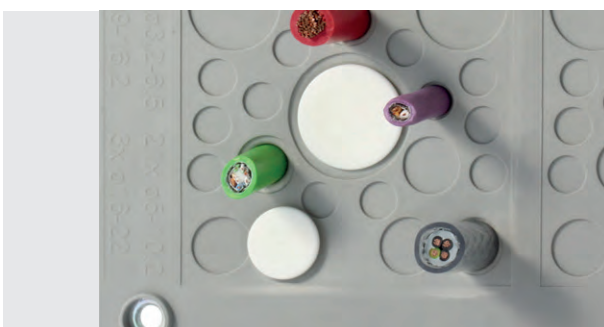
- Sealing of pierced cable entry membranes which are no longer in use

Specifications

Material	Polyamide (PA), white
Flame class	UL94-Vo, self-extinguishing
Temperature	- 40°C to + 120°C
Properties	Halogen-free, silicone-free

Compatible with

KEL-DPU Cable entry plates	90 - 91
KEL-DPZ Cable entry plates	92 - 99
KEL-DP Cable entry plates	100 - 106
KT-DT Cable entry grommets	52
KEL-QTA-DP Cable entry plates	68 - 71



2.2 Flexible cable entry grommets for cables without connectors



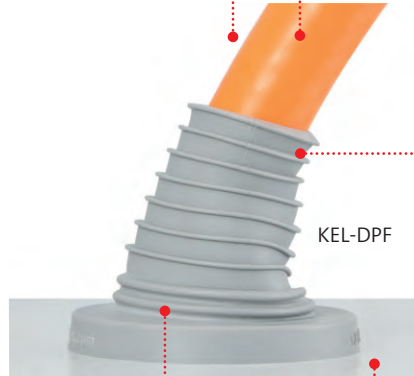
Fast and easy, partially tool-free assembly



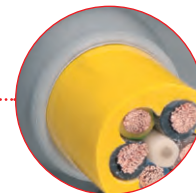
High flexibility when routing rigid cables



KEL-SCDP



KEL-DPF



Up to IP66/IP68 rated protection

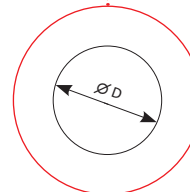


Easy peeling of the membrane rings. The peeled-off area is always round and thus seals the cable very well.



Due to high elasticity also suitable for routing preassembled cable lugs/terminals.

Compact, space-saving design



For metric cut-outs M25 - M85 (KEL-DPF)

Chapter content 2.2



Cable entry plates
pluggable, for cable diameters up to 36 mm

KEL-SCDP / KEL-SCDP-RW

110 – 111



Cable entry grommets
M25 – M85, for cable diameters
up to 70 mm

KEL-DPF

112 – 113



Cable entry grommets
screw mounting, for cable diameters
up to 115 mm

KEL-ULTRA flex

114



Cable entry grommets
screw mounting, for cable diameters
up to 68 mm

KEL-JUMBO flex

115

KEL-SCDP | KEL-SCDP-RW

Cable entry plate

Product description

With the KEL-SCDP cable entry grommet, single cables, hoses, and conduits can be routed and sealed at a rating of IP65. Its unique advantage is the large sealing range.

The single circular membrane can be peeled away to accommodate the specific diameter of the cable or hose. No tooling is required to peel off the membrane. The peeled-off area is always round, ensuring a secure seal around cable/hose.

Another advantage is the high mounting flexibility. The KEL-SCDP can simply be plugged into cut-outs with wall thicknesses from 1.5 to 4.0 mm.

The version KEL-SCDP-RW is approved for the use in the railway technology in accordance with EN45545-2 HL3.



Due to high elasticity also suitable for routing preassembled cable lugs/terminals.

Advantages & benefits

- Approved for the use in the railway technology (EN 45545-2, EN 45545-3 and EN 1363-1)
- Perfect edge protection and sealing
- Circular membranes can be peeled off easily
- Easy, tool-free assembly
- Protection class up to IP65

Specifications

Material	Elastomer
Flame class	UL 94 V-o, self-extinguishing
IP rating	IP65
Temperature	KEL-SCDP: - 40°C to + 80°C (static) KEL-SCDP-RW: - 40°C to + 90°C (static)
Properties	Halogen-free, silicone-free



KEL-SCDP | KEL-SCDP-RW

Cable entry plate



	Type	Order No.	Number of cables	Clamping range mm	PU
	KEL-SCDP 25	43480	1 max.	5 – 16 mm	10
	KEL-SCDP 32	43481	1 max.	5 – 22 mm	10
	KEL-SCDP 40	43482	1 max.	8 – 28 mm	10
	KEL-SCDP 50	43483	1 max.	8 – 36 mm	10
KEL-SCDP-RW for the use in the railway technology					
	KEL-SCDP-RW 25	43490	1 max.	5 – 16 mm	10
	KEL-SCDP-RW 32	43491	1 max.	5 – 22 mm	10
	KEL-SCDP-RW 40	43492	1 max.	8 – 28 mm	10
	KEL-SCDP-RW 50	43493	1 max.	8 – 36 mm	10

* Only valid for KEL-SCDP-RW



The single membrane rings are peeled off according to the diameter of the routed cable/hose. For this purpose, only a small hole between the rings needs to be pierced. Then the corresponding ring can be removed.

KEL-DPF

Cable entry grommets

Product description

The KEL-DPF was developed particularly for routing large or unknown sizes of cables into a switch cabinet or machine (max. cable diameter 70 mm). Due to the flexibility and unique pyramid shape, cable entry and flexible positioning is much easier compared to using conventional cable glands. Also perfect for bundling or restraining large cables.

Cutting of DPF grommets: Cable diameter less 20%. The corresponding diameters are marked on the grommet.

It is recommended that additional strain relief be provided for cables using cable ties.

For mounting the KEL-DPF sizes 75 and 85 we offer suitable wrenches with widths for M75 and M85 plastic locknuts.

Advantages & benefits

- Quick and tool-free assembly
- It is possible to install rigid cables at angles
- Suitable for metric cut-outs
- Polyamide locknuts are included in the shipment

Specifications

Material	Thread frame: Polyamide (PA) Pyramid: Elastomer
Colour	■ grey (similar RAL 7035) ■ black
Flame class	UL94-Vo, self-extinguishing
IP rating	IP66/ IP68 (certified acc. to EN 60529)
UL type rating	UL type 12 (acc. to UL 50E) UL type 4X (acc. to UL 50E)
Temperature	- 40°C to + 100°C (static)
Properties	Halogen-free, silicone-free
Thread length	11 mm; KEL-DPF 85 48-70: 14 mm
Cut-out dimensions	Metric sizes

Accessories

FP Flanged plates	210 - 219
MP Module plates	204 - 205



Due to high elasticity also suitable for routing preassembled cable lugs/terminals.



Wrenches

for M75/M85 plastic locknuts

Material: Aluminium

M75: Order No.61436 | M85: Order No. 61437 | PU: 1

KEL-DPF

Cable entry grommets


IP66
IP68

	Type	Order No.	Thread metric	External diameter	Clamping range	PU
	KEL-DPF 25 3-12	■ 42652 ■ 50652	M25 × 1.5	39 mm	3 - 12 mm	5
	KEL-DPF 32 6-18	■ 42653 ■ 50653	M32 × 1.5	46 mm	6 - 18 mm	5
	KEL-DPF 40 12-27	■ 42654 ■ 50654	M40 × 1.5	54 mm	12 - 27 mm	5
	KEL-DPF 50 22-36	■ 42655 ■ 50655	M50 × 1.5	64 mm	22 - 36 mm	5
	KEL-DPF 63 27-50	■ 42656 ■ 50656	M63 × 1.5	77 mm	27 - 50 mm	5
	KEL-DPF 75 39-60	■ 42657 ■ 50657	M75 × 1.5	89 mm	39 - 60 mm	1
	KEL-DPF 85 48-70	■ 42658 ■ 50658	M85 × 2	99 mm	48 - 70 mm	1

* Only valid for grey product types

KEL-ULTRA flex

Cable entry grommets

IP66



Product description

The KEL-ULTRA flex is designed as a cable entry grommet for any large cable or conduit that is difficult to manage. The KEL-ULTRA flex comes in two sizes and is ideal for routing and sealing cables and conduits with a diameter from 25 to 115 mm. Due to the high flexibility of the elastomer pyramid, inserting large, thick cables with KEL-ULTRA flex is easier than using standard cable glands.

After inserting the cable or conduit, the KEL-ULTRA flex is quickly and easily mounted with the metal ring and screws. This ring enables a circular fixing and sealing of the grommet at the enclosure wall. The ring is supplied with each KEL-ULTRA flex. Cutting of grommets: Cable diameter less 25%. It is recommended that additional strain relief be provided for cables as part of the installation.

Advantages & benefits

- Quick assembly
- Grommets allow easy orientation and seal of rigid cables
- IP66 / up to UL type 12 rating

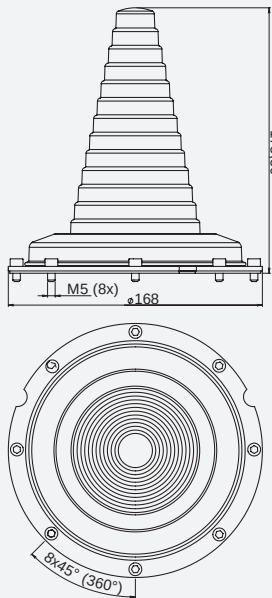
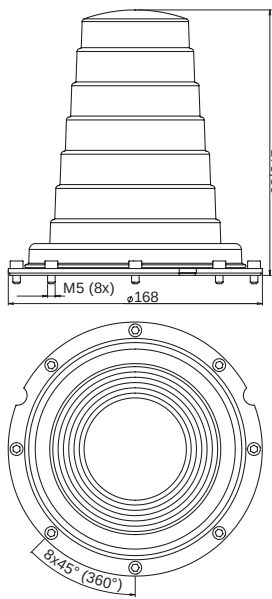
Specifications

Material	Pyramid: Elastomer Fixing metal ring: Steel, zinc-plated Blind plate: Steel, zinc-plated
Flame class	UL94-Vo, self-extinguishing
IP rating	IP66, when fastened with 8 screws (certified acc. to EN 60529)
UL type rating	UL type 12 (acc. to UL 50E)
Temperature	- 40°C to + 100°C (static)
Properties	Halogen-free, silicone-free
Cut-out dimension	Round, Ø-cable +30%, max. Ø 140 mm

Accessories

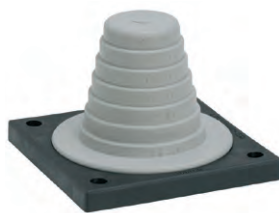
MP Module plates	204 - 205
BPM Blank plates	221



Description	Type	Order No.	Sealing range	PU
	KEL-ULTRA flex 1 incl. fixing screws	42630	25 - max. 90 mm cable diameter	1
	KEL-ULTRA flex 2 incl. fixing screws	42631	75 - max. 115 mm cable diameter	1

KEL-JUMBO flex

Cable entry grommets



IP54

Product description

The KEL-JUMBO flex is a flexible cable entry grommet for cables without connectors with a diameter range from 27 - 68 mm.

They are ideal for the routing supply cables into the switch cabinets.

Cutting of KEL-JUMBO flex grommets:
Cable diameter less 25%. The corresponding diameters are marked on the grommet.

It is recommended that additional strain relief be provided for cables as part of the installation.

Advantages & benefits

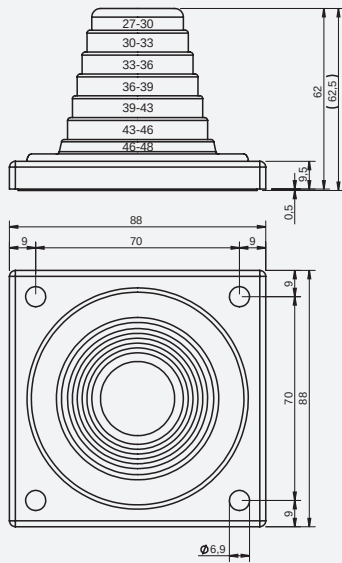
- Quick assembly
- Grommets allow dynamic and flexible movement of rigid cables
- Compact installation area (88 × 88 mm)

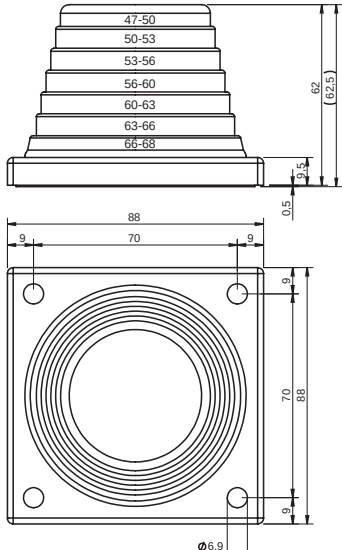
Specifications

Material	Frame: Polyamide (PA)
	Pyramid: Elastomer
Flame class	UL94-Vo, self-extinguishing
IP rating	IP54
UL type rating	UL type 12 (acc. to UL 50E)
Temperature	- 40°C to + 100°C (static)
Properties	Halogen-free, silicone-free
Cut-out dimensions	Round, Ø-cable +20%

Accessories

MP Module plates	204 - 205
BP Blank plates	220 - 221

Description	Type	Order No.	Clamping range	PU
	KEL-JUMBO flex 27-48	42614	27 - 48 mm	1

	KEL-JUMBO flex 47-68	42616	47 - 68 mm	1
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3 Strain relief & cable management



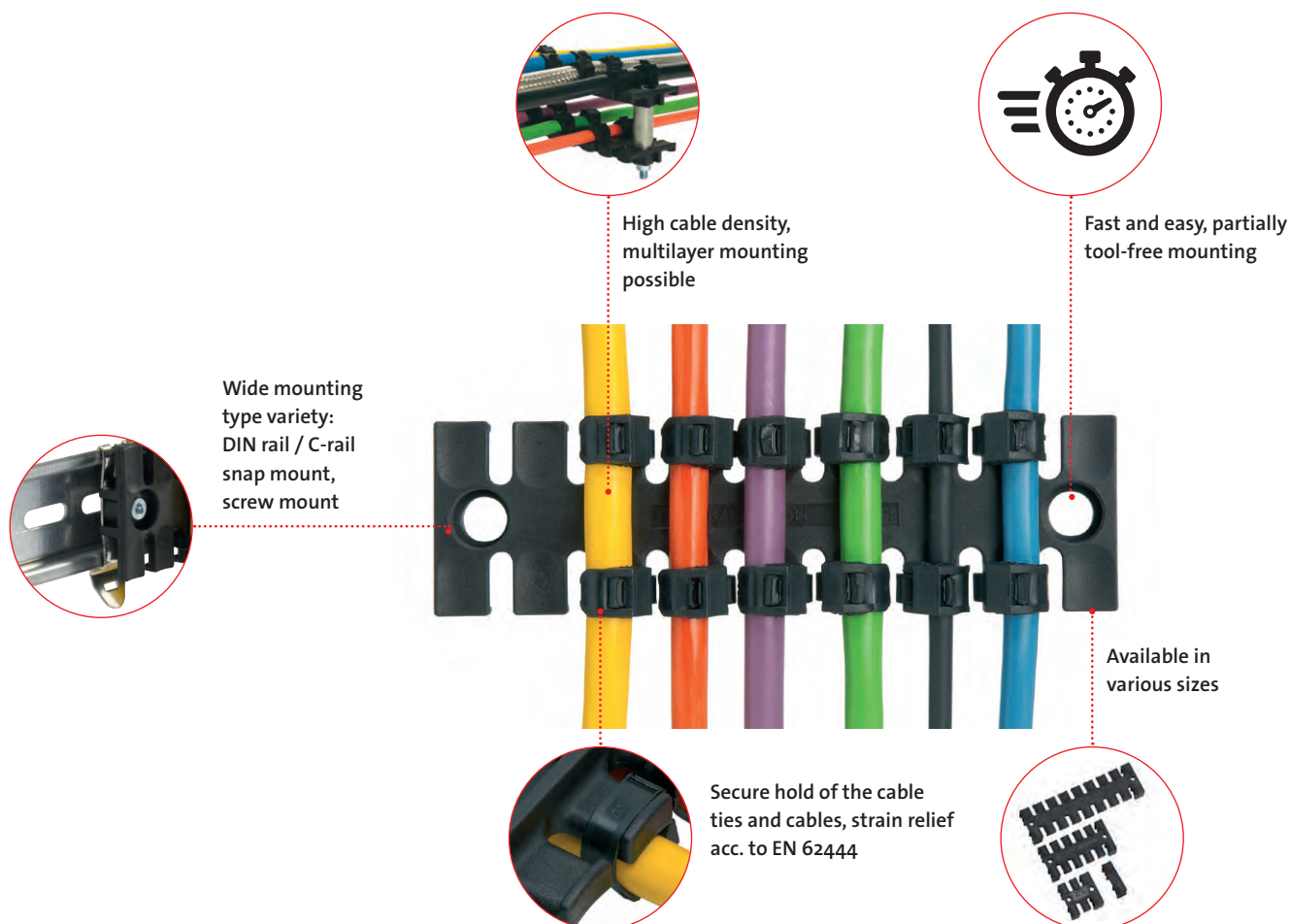
By using icotek strain relief systems the user can quickly assemble, organise and provide strain relief for cables according to EN 62444.

The systems can be used for organising and securing cables in machines, switch cabinets, enclosures and dynamic drag chains. Due to the wide variety of mounting requirements, options range from DIN rail snap-mount, C-rail to screw mount.

The strain relief plates are available in several sizes. The cable density can be greatly increased by using spacers for multilayer mounting.

Securing the cables is done quickly and inexpensively with standard cable ties. The shape of the strain relief securely holds cable tie and cable.

3



Chapter content 3



Cable clamp
for C-rail mount

CCL

118



Strain relief plates
for screw mount

ZL

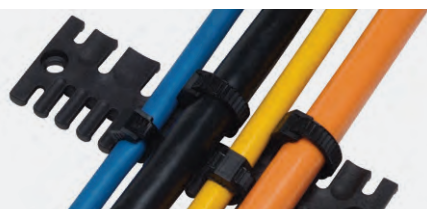
119



Strain relief plates
for screw mount, with bushings

ZL-AB / ZL-MS

120



Strain relief plates
for screw mount, for various cable diameters

ZL 03 | 04 | 05

121



Strain relief plates
for 35 mm DIN rail / C-rail snap mount

KZL

122



Strain relief plates
for 35 mm DIN rail snap mount

SF|ZL

123



Spacers
for multilayer mounting of strain relief plates

DH

121



EMC Strain relief plates

KAFM-EMC

162



Shield plate for ZL strain relief plates

ZL|SB-EMC

163



Hook-and-loop cable ties
re-usable

KLKB / KLB

124



Holder for hook-and-loop cable ties
various mounting types

KBH

125

CCL

Cable clamp
for C-rails

Product description

The cable clamps are characterized by a high clamping range and great flexibility. Ideally suited for strain relief on the C-rail for opening dimensions 16 – 17 mm. It offers flexible clamping ranges from 6 mm to 64 mm. Individual cables or entire cable bundles can be relieved of strain. This results in a very high packing density.

Advantages & benefits

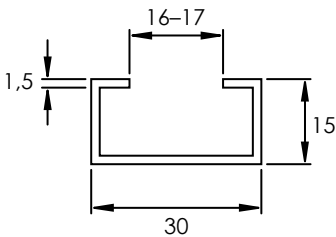
- Quick and easy assembly
- Tool-free and space-saving assembly
- For mounting on all common C-rails with 16 – 17 mm opening dimensions

Specifications

Material Galvanized steel



Type	Clamping range	Order No.	PU
CCL 6-13	6 – 13 mm	32000	25
CCL 12-19	12 – 19 mm	32001	25
CCL 18-23	18 – 23 mm	32002	25
CCL 22-32	22 – 32 mm	32003	25
CCL 30-38	30 – 38 mm	32004	25
CCL 38-42	38 – 42 mm	32005	25
CCL 42-50	42 – 50 mm	32006	25
CCL 50-64	50 – 64 mm	32007	25



C-rail dimensions (mm)



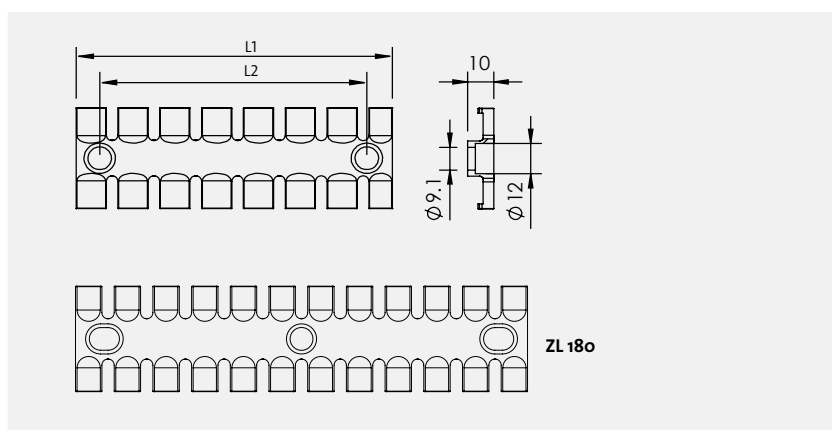
Applications on the C-Rail with cable clamp CCL

ZL

Strain relief plates for screw assembly



Type	Order No.	Length L1	Length L2	No. of teeth	PU
ZL 39	32222	38.5 mm	19.5 mm	3	10
ZL 60	32224	59.5 mm	43.5 mm	4	10
ZL 70	32226	69.1 mm	43.5 mm	5	10
ZL 87	32228	86.5 mm	68 mm	6	10
ZL 103	32230	102.5 mm	84 mm	7	10
ZL 121	32232	121 mm	102.5 mm	8	10
ZL 140	32234	139.5 mm	121 mm	9	10
ZL 180	32236	180 mm	157 mm	12	10



Product description

The strain relief plate ZL is used for static or dynamic applications for organising and securing cables on machines, control panels or drag chains.

The design of the strain relief unit provides secure strain relief according to EN 62444. Mount of the cables or pneumatic tubing is easily done using cable ties.

For multilayer installation please use DH spacers.

Advantages & benefits

- Strain relief according to EN 62444
- Easy assembly
- Cost-effective
- High cable density
- Wide variety of mounting options
- Vibration proof

Specifications

Material	Polyamide (PA)
Flame class	UL94-Vo, self-extinguishing
Temperature	- 40°C to + 140°C (static)
Properties	Halogen-free, silicone-free

Accessories

DH Spacers	121
ZL SB-EMC Shield plates	163



ZL-AB | ZL-MS

Strain relief plates for screw assembly

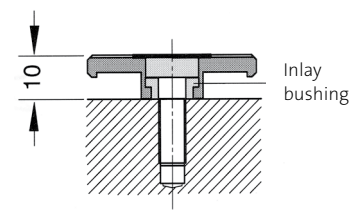
Product description

The strain relief plate ZL-AB / ZL-MS is used for static or dynamic applications for organising and securing cables on machines, control panels or drag chains.

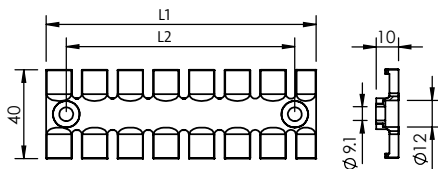
By using aluminium / brass nuts for the screw holes, a better fit of the strain relief plate is achieved, even in high vibration environments.

Advantages & benefits

- Strain relief according to EN 62444
- Easy assembly
- Cost-effective
- High cable density
- Wide variety of mounting options
- Vibration proof



Type	Order No. for M4 screws	Order No. for M5 screws	Order No. for M6 screws	Length L1	Length L2	No. of teeth	PU
ZL 39 AB ZL 39 MS	32270	32280 32360	32290	38.5 mm	19.5 mm	3	10
ZL 60 AB ZL 60 MS	32271	32281 32361	32291	59.5 mm	43.5 mm	4	10
ZL 70 AB ZL 70 MS	32272	32282 32362	32292	69.1 mm	43.5 mm	5	10
ZL 87 AB ZL 87 MS	32273	32283 32363	32293	86.5 mm	68 mm	6	10
ZL 103 AB ZL 103 MS	32275	32284 32364	32294	102.5 mm	84 mm	7	10
ZL 121 AB ZL 121 MS	32277	32285 32365	32295	121 mm	102.5 mm	8	10
ZL 140 AB ZL 140 MS	32274	32286 32366	32296	139.5 mm	121 mm	9	10
ZL 180 AB ZL 180 MS	32276	32287 32367	32297	180 mm	157 mm	12	10



Specifications

Material	ZL: Polyamide (PA)
Bushing:	■ Aluminium (ZL-AB) ■ Brass (ZL-MS)
Flame class	UL94-Vo, self-extinguishing
Temperature	- 40°C to + 140°C (static)
Properties	Halogen-free, silicone-free

Accessories

ZL|SB-EMC Shield plates 163



Inlay bushings also available
in brass.



ZL 03 | 04 | 05

Strain relief plates for screw assembly for various cable diameters

Product description

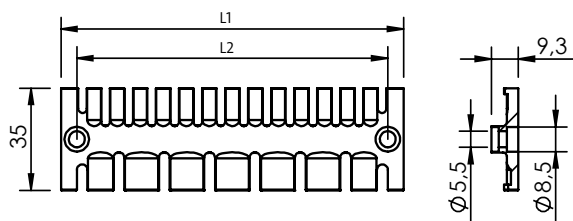
Strain relief plates ZL feature different comb widths. Thus providing a multi-purpose product for various cable sizes. The design of the strain relief unit provides secure strain relief according to EN 62444. Mount of the cables or pneumatic tubing is easily done using cable ties.

Advantages & benefits

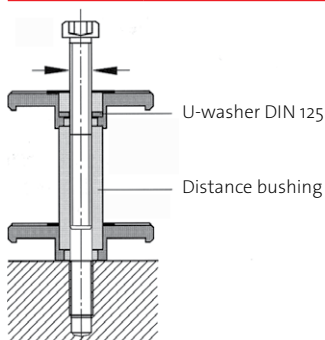
- Strain relief according to EN 62444
- Easy assembly
- Cost-effective
- High cable density
- Wide variety of mounting options
- Vibration proof

Specifications

Material	Polyamide (PA)
Flame class	UL94-Vo, self-extinguishing
Temperature	- 40°C to + 140°C (static)
Properties	Halogen-free, silicone-free



Type	Order No.	Fits with	Length	Diameter		PU
				inner	outer	
DH 30	32251	ZL 03 04 05	30 mm	5.2 mm	8.5 mm	10
DH 32	32252	ZL	32 mm	6.2 mm	12 mm	10



DH Spacers

Due to DH spacers strain relief plates can be mounted in multi-layers to achieve an increase of the cable density.

Advantages & benefits

- Increase of cable density

Specifications

Material	Aluminium
----------	-----------

Compatible with

ZL Strain relief plates	119
ZL 03 04 05 Strain relief plates	121

KZL

Strain relief plates for mounting rails



Product description

The strain relief plate KZL is used for static or dynamic applications for organising and securing cables on machines, control panels or drag chains.

The design of the strain relief unit provides secure strain relief according to EN 62444. Mount of the cables or pneumatic tubing is easily done using cable ties.

KZL Strain relief plates can be mounted on 30 mm DIN rails (C-rails) and 35 mm DIN rails.

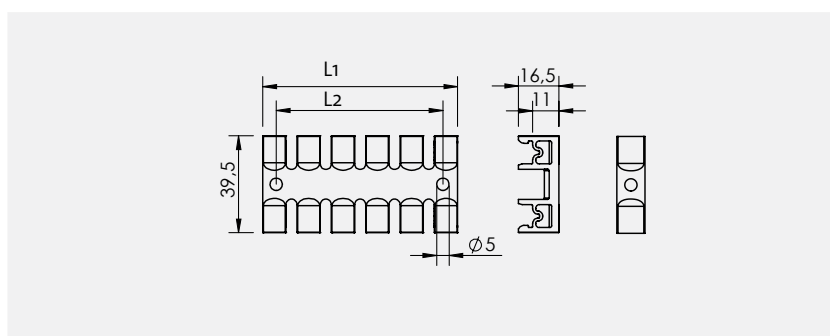
Advantages & benefits

- Strain relief according to EN 62444
- Easy assembly
- Cost-effective
- High cable density
- Wide variety of mounting options
- Vibration proof

Type	Best.Nr.	Length L1	Length L2	No. of teeth	VE
KZL 11	32250	11.5 mm	—	1	10
KZL 39	32260	38.5 mm	28.3 mm	3	10
KZL 80	32262	79.5 mm	68 mm	6	10
KZL 140	32264	139.5 mm	128.1 mm	9	10

Specifications

Material	Polyamide (PA)
Flame class	UL94-Vo, self-extinguishing
Temperature	- 40°C to + 140°C (static)
Properties	Halogen-free, silicone-free

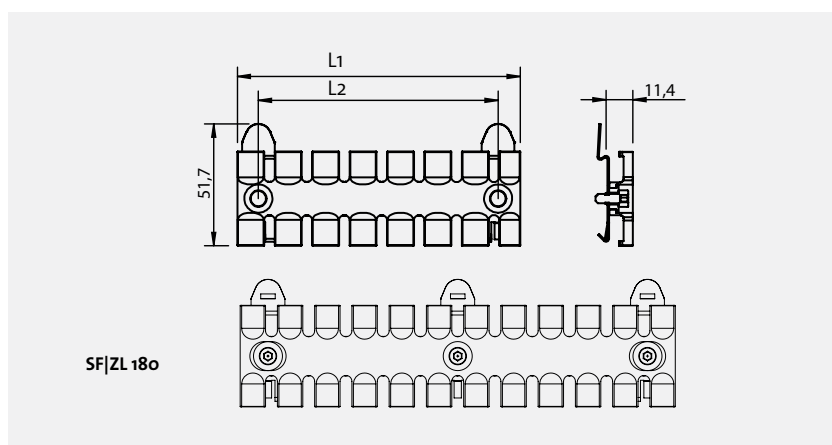


SF|ZL

Strain relief plates
for 35 mm DIN rail



Type	Order No.	Length L1	Length L2	No. of teeth	PU
SF ZL 39	32351	38.5 mm	19.5 mm	3	10
SF ZL 60	32352	59.5 mm	43.5 mm	4	10
SF ZL 70	32353	69.1 mm	43.5 mm	5	10
SF ZL 87	32354	86.5 mm	68 mm	6	10
SF ZL 103	32355	102.5 mm	84 mm	7	10
SF ZL 121	32356	121 mm	102.5 mm	8	10
SF ZL 140	32357	139.5 mm	121 mm	9	10
SF ZL 180	32358	180 mm	157 mm	12	10



Product description

The strain relief plate SF|ZL is used for assembly on 35 mm DIN rails. It can be used for strain relief of cables and conduits.

The SF|ZL range is based upon the strain relief plate ZL, which is mounted on snap feet for 35 mm DIN rails.

Advantages & benefits

- Strain relief according to EN 62444
- Easy assembly
- Cost-effective
- High cable density
- Wide variety of mounting options

Specifications

Material	ZL: Polyamide (PA) SF-foot: Spring steel
Flame class	UL94-Vo, self-extinguishing
Temperature	- 40°C to + 140°C (static)
Properties	Halogen-free, silicone-free

Accessories

ZL|SB-EMC Shield plates 163



KLKB | KLB

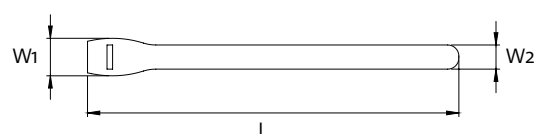
Hook-and-loop cable ties



Product description

Cable ties with hook-and-loop fasteners are a more and more common fixing mode for cables. They are used instead of standard cable ties, because they can be easily closed and opened several times. The soft material is gentle on cables, especially where vibrations are present.

Hook-and-loop cable ties are available individually (KLKB) in four different sizes or as a continuous roll (KLB) in four different sizes.



3

Advantages

- Reusable
- Adaptable
- The cable tie material is gentle on cables, especially if there are vibrations

Specifications

Material	Polypropylene + Velours PA
Colour	black
Flame class	UL 94 V-2
Temperature	-30°C to +80°C

Accessories

KBH Holder for hook-and-loop fastener 125

Type	Size [mm]			Order No.	PU
	L	W1	W2		
KLKB 200 × 7 bk (PU 100 = 1 reel)	200	13	7	61021	100
KLKB 200 × 7 bk on reel (750 pcs.)	200	13	7	61025	1
KLKB 200 × 13 bk (PU 100 = 1 reel)	200	20	13	61022	100
KLKB 200 × 13 bk on reel (750 pcs.)	200	20	13	61026	1
KLKB 230 × 13 bk (PU 100 = 1 reel)	230	20	13	61023	100
KLKB 230 × 13 bk on reel (650 pcs.)	230	20	13	61027	1
KLKB 300 × 17 bk (PU 100 = 1 reel)	300	25	17	61024	100
KLKB 300 × 17 bk on reel (500 pcs.)	300	25	17	61028	1
KLB 10 bk			10	61011	25 m
KLB 15 bk			15	61012	25 m
KLB 20 bk			20	61013	25 m
KLB 25 bk			25	61014	25 m



KBH

Holder for
hook-and-loop fastener

Description

Type

Order No.

fits KLKB | KLB

Compatible with

PU

Holder for hook-and-loop fastener, screwable



KBH-S

■ 61019

KLKB 200 × 7
KLKB 200 × 13
KLB 1023 × 23 mm
mounting rail

100



KBH-SB

■ 61002

KLKB 200 × 7

universal

100

Holder for hook-and-loop fastener, pluggable



KBH-R

■ 61018

KLKB 200 × 7
KLKB 200 × 13
KLB 1023 × 23 mm
mounting rail
systems for
Rittal VX25

100

KBH-RBA
nc

□ 61003

KLKB 200 × 7

drill-hole Ø 6 mm

100



KBH-RBB

■ 61004

KLKB 200 × 7

drill-hole Ø 6.5 mm

100

* Only KBH-S / KBH-R

Product description

These holders can be used in combination with cable ties with hook-and-loop fastener KLKB and hook-and-loop tape KLB.

Large variety of holders provides unique and numerous mounting possibilities.

Advantages

- Assembly within seconds
- Secure hold
- Flexible usage

Specifications KBH-S / KBH-R

Material	Polyamide (PA)
Colour	■ black
Flame class	UL94-Vo, self-extinguishing
Temperature	- 40°C to + 110°C
Properties	Halogen-free, silicone-free

Specifications KBH-SB / KBH-RBA

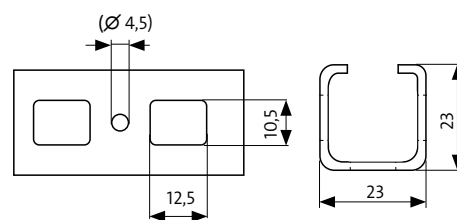
Material	Polyamide (PA)
Colour	■ black (KBH-SB) □ nc (KBH-RBA)
Flame class	UL94-V2
Temperature	- 40°C to + 85°C (short-term to 110°C)

Specifications KBH-RBB

Material	Polyamide (PA)
Colour	■ black
Temperature	- 40°C to + 120°C

Compatible with

KLKB / KLB Cable ties with
hook-and-loop fastener 124



23 × 23 mm mounting rail

4.1 EMC cable shield earthing

Shield clamps & earthing components



For process measurement and control equipment, an increasingly higher level of protection against failure is required. Earthing of the cable shields is very important. The area where the cable shield is connected to the enclosure earth is a critical point. It is very important that the connection has a low resistance.

icetek EMC products therefore provide a good solution. The SKL shield clamps offer a large contact area to the cable shield (see figure A). In comparison to conventional shield brackets (see figure B) an up to 50% higher

contact area can be achieved when using the SKL line. The specified clamping range can be exceeded up to 10%.

In high frequency fields, the SKL shield clamps provide a low resistance. The effective range is up to 1,000 MHz below 120 Ohms and 10 kHz to 100 MHz significant below 20 Ohms.

Assembly possibilities



Assembly with rivets



Assembly with screws



Assembly on 35 mm DIN rails



Assembly on 10 x 3 mm bus bars



Assembly on 30 mm C-rails



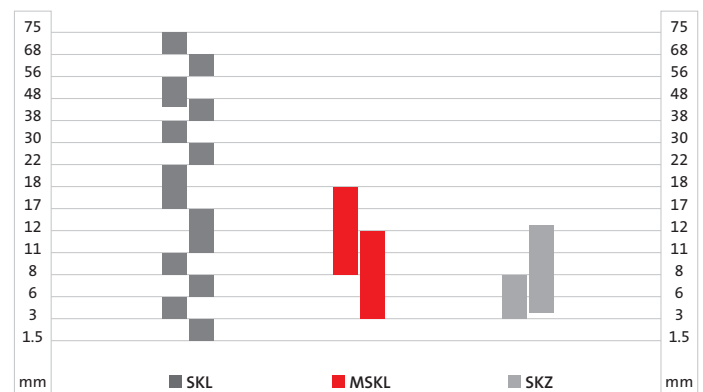
Assembly by clamping onto sheet edges

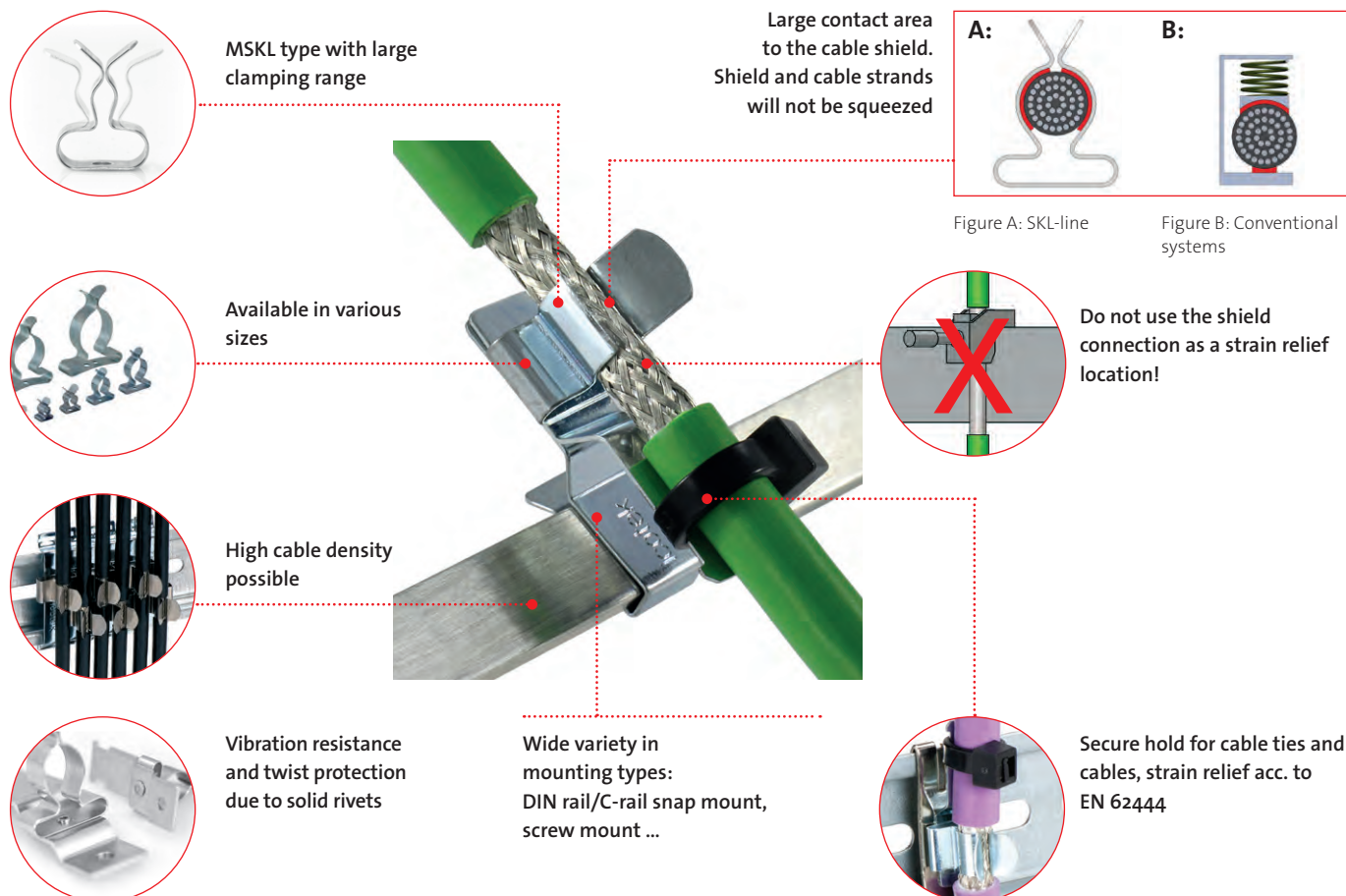
Advantages of solid rivets



- Vibration resistance according to EN 61373
- Twist protection due to solid rivets
- Stronger contact pressure of the riveted parts

Difference between SKL | MSKL | SKZ clamping ranges





4.1



EMC shield clamps MSKL

Due to its special design, the clamping ranges of the MSKL are very large while the dimensions are comparatively small. (Example: MSKL 3-12, assembled with a 12 mm cable shield: width 26.25 mm).

Advantages & benefits

- Large clamping areas, therefore less product sizes needed to cover a large cable diameter range
- Space-saving design, even when fully assembled
- Partially with integrated strain relief
- Large cable shield contact area
- Easy assembly
- The spring design requires no adjustments and will permanently maintain contact to the cable shield
- Shock and vibration resistant, maintenance free



More information about the connection between the cable shield and the equipotential bonding bar in PROFINET applications:
www.icotek.com/en/profinet

EMC

Test results



Leakage and Impedance

All icotek shield clamps have been tested utilising various frequency ranges and in all tests there was minimal leakage resistance.

icotek EMC shield clamps are proven to absorb electromagnetic interferences.

Electrical impedance values:

- from 10 kHz to 100 MHz under 20 Ohm
- up to 1.000 MHz under 120 Ohm

The unique design of icotek shield clamps effectively reduce high frequency interferences.

4.1

Contact area

The SKL shield clamps offer a large contact area to the cable shield (see figure A).

In comparison to conventional shield clamps, an up to 50% higher contact area is achieved when using the SKL product line.



Figure A: SKL-line

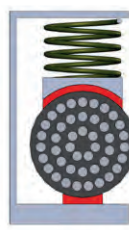
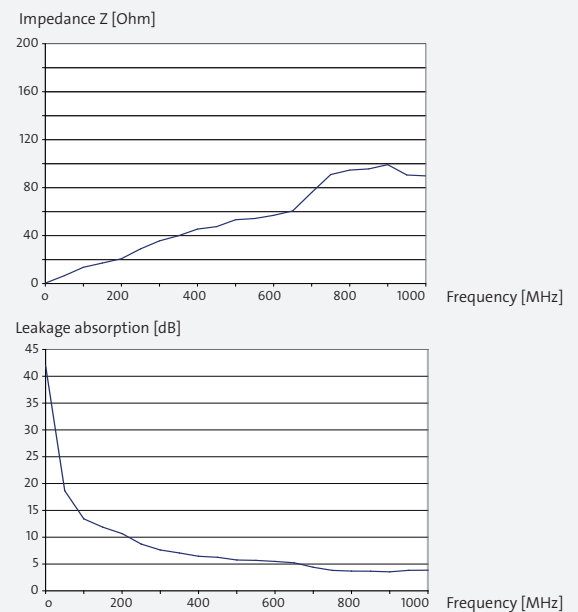
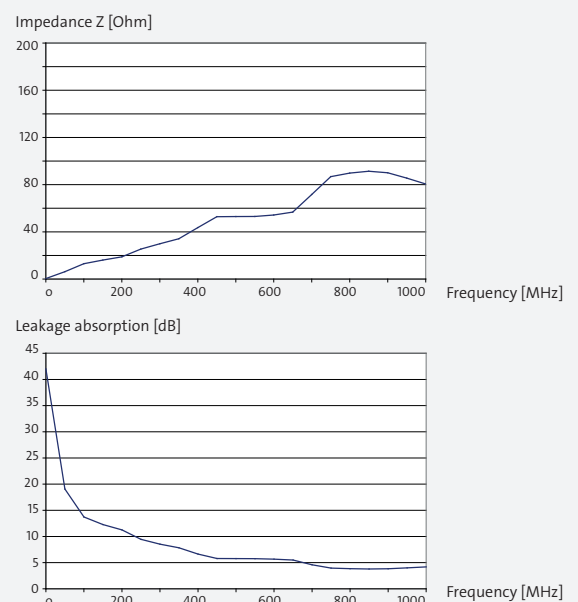


Figure B: Conventional systems

LF|SKL 8-11



SF|SKL 6-8



Chapter content 4.1



EMC shield clamps
for assembly with rivets

MSKL, SKL, RCL|MSKL, RCL|SKL, RCLZ|MSKL

130 – 131



EMC shield clamps
for assembly with screws
with/without strain relief function

LFZ-M|MSKL, LFZ|SKL, LFZ-U|SKL, LFZ-U-AB,
LFZ-M(45°)|MSKL, LFZ-M(90°)|MSKL, LF2Z-M|SKL,
SKZ, LF|MSKL, LF|SKL, SK

132 – 133



EMC shield clamps
for 35 mm DIN rails
with/without strain relief function

SFZ-M|MSKL, SFZ|SKL, SF2Z-M|MSKL,
SF2Z|SKL, SF|SKZ, SF-M|MSKL, SF|SKL,
SFS|SKL, SF|SK

134 – 135



EMC shield clamps
for 10 x 3 mm bus bars
with/without strain relief function

PFSZ-M|MSKL, PFSZ|SKL, PFS2Z-M|MSKL,
PFS2Z|SKL, SS|SKZ, PFS|SKL, PFS|SCL, SS|SK,
SKS, PFS2Z|SKL, PFS2|SKL

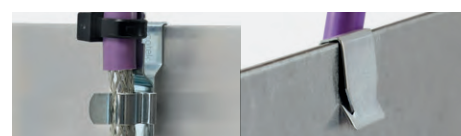
136 – 139



EMC shield clamps
for 30 mm C-rails
with/without strain relief function

SC|LFZ-M|MSKL, SC|LFZ|SKL, SC|LF2Z-M|M-
SKL, SC|SKZ, SC|LF|MSKL, SC|LF|SKL, SC|SK,
LFC, CC-LFC

140 – 143



EMC shield clamps
for assembly on sheet edges
with/without strain relief function

PFKZ-M|MSKL, PFKZ|SKL, PFK|SKL,
PFK2Z|SKL, PFK2|SKL

144 – 147



Shield clamps
for printed circuit boards

PCB|SKL

148



Shield clamps
for decentralised bus modules

STFZ|SKL / STFZ2|SKL / STFZ-U|SKL /
STFZ-SP|SKL / STFZ2-SP|SKL

149 – 151



Assortment of SKL shield clamps

EMC ServiceBox multi
EMC ServiceBox

152 – 153



EMC Shield clamp assemblies

RLFZ(-M) - clamp assembly for screw mount
SC|RLFZ(-M) - clamp assembly for C-rails
SF|RLFZ - clamp assembly for DIN-rails
RLF - clamp assembly without strain relief

154 – 157



EMC cable assemblies
as accessories for cable entry components

KEL-EMC-Z / KEL-EMC-PF / KEL-EMC / KVT-
EMC

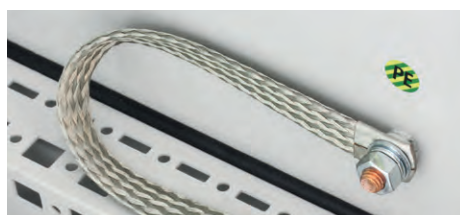
158 – 161



EMC strain relief plates
various mounting types

KAFM

162 – 163



Earthing tapes

MB

164 – 165



EMC Cable entry frames

EMC-KEL-DS

170 – 171



EMC Split cable gland

EMC-KVT-DS

172 – 173

EMC shield clamps for assembly with rivets



MSKL

Product description

Whenever a cable shielding is required with the possibility of grounding, EMC shield clamps can be used. Shield clamps are easy to use and effective in dissipating conducted disturbances.

Due to its special design, the clamping ranges of the MSKL are very large while the dimensions are comparatively small. (Example: MSKL 3-12, assembled with a 12 mm cable shield: width 26.25 mm).

Assembly

The shield clamps can be mounted using rivets.

Advantages & benefits

- Large clamping areas, therefore less product sizes needed to cover a large cable diameter range
- Space-saving design, even when fully assembled
- Partially with integrated strain relief
- Large cable shield contact area
- Easy assembly
- The spring design requires no adjustments and will permanently maintain contact to the cable shield
- Shock and vibration resistant, maintenance free

Specifications

Material

MSKL clamp, SK clamp Spring steel, zinc plated

** SKL 30–38 mm,

SKL 38–48 mm Stainless steel



SF single



SFS single

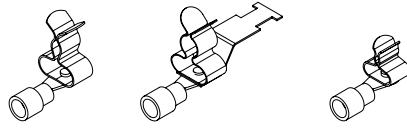


		MSKL single	SKL single
	Clamping range	Order No.	Order No.
MSKL	3 – 12 mm	37600	–
	8 – 18 mm	37602	–
SKL	1.5 – 3 mm	–	36200
	3 – 6 mm	–	36202
	6 – 8 mm	–	36204
	8 – 11 mm	–	36205
	11 – 17 mm	–	36206
	17 – 22 mm	–	36207
	22 – 30 mm	–	36208
	30 – 38 mm **	–	36209 *
	38 – 48 mm **	–	36213 *
	44 – 56 mm	–	NEW 36216 *
	56 – 68 mm	–	NEW 36217 *
	68 – 75 mm	–	NEW 36218 *
PU		50	50 * 5

SF single | SFS single | SC single

Type	Order No.		PU
SF single M4	36230	Mounting foot, single with screw thread M4	10
SF single M5	36221	Mounting foot, single with screw thread M5	10
SFS single	36229	Mounting foot, single	10
SC single	36231	Screw-foot loose, for 30 mm DIN-rail shape C (width of mouth: 16 mm) with twist protection notch	10

EMC shield clamps on cable lugs for assembly with rivets



			RCL MSKL	RCLZ MSKL with strain relief	RCL SKL
	Clamping range	RCL	Order No.	Order No.	Order No.
MSKL	3 – 12 mm	0.5 – 1.5 mm	36296.2	NEW 36301.2	–
	3 – 12 mm	1.0 – 2.5 mm	36297.2	NEW 36302.2	–
	3 – 12 mm	4 – 6 mm	36298.2	NEW 36303.2	–
SKL	1.5 – 3 mm	0.5 – 1.5 mm	–	–	36296.1
	1.5 – 3 mm	1.0 – 2.5 mm	–	–	36297.1
	1.5 – 3 mm	4 – 6 mm	–	–	36298.1
PU			25	25	25

Product description

Whenever a cable shielding is required with the possibility of grounding, EMC shield clamps can be used. Shield clamps are easy to use and effective in dissipating conducted disturbances.

Assembly

The shield clamps can be mounted using rivets.

Advantages & benefits

- Large contact area
- Simple and tool-free mounting, easy assembly
- The spring design requires no adjustments and will permanently maintain contact to the cable shield
- Shock and vibration resistant, maintenance free
- Designed for high density applications

4.1

Specifications

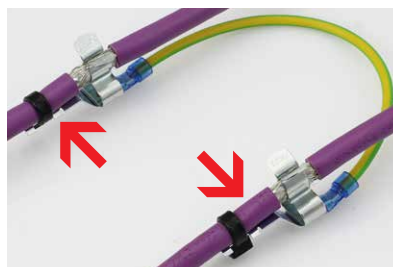
Material

MSKL clamp, SK clamp Spring steel, zinc plated
Cable lug UL listed

Applications in which both cable shields must be brought to the same potential.



Example for an application with
RCL|MSKL 3-12.



Example for an application with
RCLZ|MSKL 3-12. The contacted electrical
cables are also fixed.



EMC shield clamps for assembly with screws with strain relief function



Product description

Whenever a cable shielding is required with the possibility of grounding, EMC shield clamps can be used. Shield clamps are easy to use and effective in dissipating conducted disturbances.

Optional strain relief function: the cable is fixed via the cable jacket using cable ties.

Shield clamps are easily attached to mounting plates via screw. The shield clamp LFZ-U|SKL is available for M4 or M5 screws. During assembly it is sufficient to loosen the existing screw slightly to be able to slide the clamp underneath before re-tightening the screw.

Assembly

The shield clamps can be mounted using screws, e.g. on a mounting plate.

Advantages & benefits

- Integrated strain relief function
- Large cable shield contact area
- Easy, tool-free assembly
- The spring design requires no adjustments and will permanently maintain contact to the cable shield
- Designed for high density applications
- Shock and vibration resistant, maintenance free
- Double strain relief: acc. to PROFINET installation guidelines

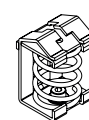
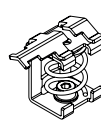
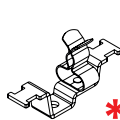
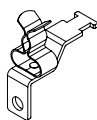
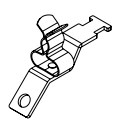
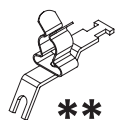
Specifications

Material

MSKL clamp, SKL clamp	Spring steel, zinc plated
LF/LFZ foot	Steel, galvanically zinc plated
	fixing hole 4.2 mm/5.2 mm
SK bracket	Steel, galvanically zinc plated

		LFZ-M MSKL Fixing hole M4	LFZ SKL Fixing hole M4	LFZ-U SKL Fixing hole M4	LFZ-U SKL Fixing hole M5
	Clamping range	Order No.	Order No.	Order No.	Order No.
MSKL	3 – 12 mm	37612	–	–	–
	8 – 18 mm	37614	–	–	–
SKL	1.5 – 3 mm	–	36910	36886.1	36887.1
	3 – 6 mm	–	36915	36886.2	36887.2
	6 – 8 mm	–	36920	36886.3	36887.3
	8 – 11 mm	–	36925	36886.4	36887.4
	11 – 17 mm	–	36930	NEW 36886.5	NEW 36887.5
	17 – 22 mm	–	36935	–	–
	22 – 30 mm	–	36940	–	–
	30 – 38 mm	–	36941	–	–
	PU	10	10	10	10

EMC shield clamps for assembly with screws with/without strain relief function



	LFZ-U-AB Fixing hole M4	LFZ-M(45°) MSKL Fixing hole M5	LFZ-M(90°) MSKL Fixing hole M5	LF2Z-M MSKL* Fixing hole M4	SKZ Fixing hole M4	LF MSKL Fixing hole M4	LF SKL Fixing hole M4	SK Fixing hole M4
	Clamping range	Order No.	Order No.	Order No.	Order No.	Order No.	Order No.	Order No.
MSKL	3 – 12 mm	–	37660.1	37661.1	37665.150	–	37608	–
	8 – 18 mm	–	37660.2	37661.2	37666.150	–	37610	–
SKL	1.5 – 3 mm	–	–	–	–	–	36251	–
	3 – 6 mm	–	–	–	–	–	36253	–
	6 – 8 mm	NEW 36948.3	–	–	–	–	36255	–
	8 – 11 mm	NEW 36948.4	–	–	–	–	36256	–
	11 – 17 mm	–	–	–	–	–	36257	–
	17 – 22 mm	–	–	–	–	–	36258	–
	22 – 30 mm	–	–	–	–	–	36259	–
SK/SKZ	3 – 8 mm	–	–	–	36222	–	–	36222.002
	4 – 13.5 mm	–	–	–	36224	–	–	36224.002
	10 – 20 mm	–	–	–	–	–	–	36226
	15 – 32 mm	–	–	–	–	–	–	36228
PU		10	10	10	10	10	10	10

* with double strain relief function

** LFZ-U-AB are especially suitable for mounting on Allen Bradley Powerflex 525/527 frequency inverters. Direct contacting on the converter saves space and interference signals are picked up directly at the interference source.



EMC shield clamps for 35 mm DIN rails with strain relief function



SFZ-M|MSKL

Product description

Whenever a cable shielding is required with the possibility of grounding, EMC shield clamps can be used. Shield clamps are easy to use and effective in dissipating conducted disturbances.

Optional strain relief function: the cable is fixed via the cable jacket using cable ties.

Assembly

The shield clamps can be mounted on 35 mm DIN rails.

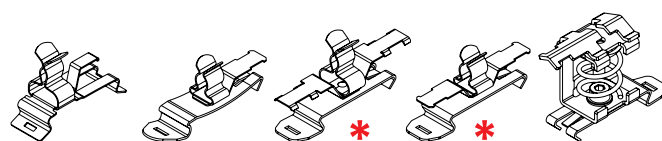
Advantages & benefits

- Integrated strain relief function
- Large cable shield contact area
- Easy, tool-free assembly
- The spring design requires no adjustments and will permanently maintain contact to the cable shield
- Designed for high density applications
- Shock and vibration resistant, maintenance free
- Double strain relief: acc. to PROFINET installation guidelines

Specifications

Material

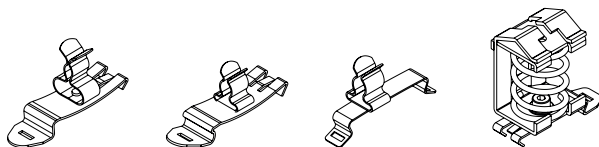
MSKL clamp, SKL clamp **Spring steel, zinc plated**
SF/SFZ foot **Spring steel**
SK bracket **Steel, galvanically zinc plated**



		SFZ-M MSKL	SFZ SKL	SF2Z-M MSKL	SF2Z SKL	SF SKZ
	Clamping range	Order No.	Order No.	Order No.	Order No.	Order No.
MSKL	3 – 12 mm	37620	–	37620.150	–	–
	8 – 18 mm	37622	–	37622.150	–	–
SKL	1.5 – 3 mm	–	36850	–	36850.150	–
	3 – 6 mm	–	36855	–	36855.150	–
	6 – 8 mm	–	36860	–	36860.150	–
	8 – 11 mm	–	36865	–	36865.150	–
	11 – 17 mm	–	36870	–	36870.150	–
	17 – 22 mm	–	36875	–	36875.150	–
	22 – 30 mm	–	36880	–	36880.150	–
	30 – 38 mm	–	36885	–	–	–
SKZ	3 – 8 mm	–	–	–	–	36500
	4 – 13.5 mm	–	–	–	–	36502
	PU	10	10	10	10	10

* with double strain relief function

EMC shield clamps for 35 mm DIN rails without strain relief



		SF-M MSKL	SF SKL	SFS SKL	SF SK
	Clamping range	Order No.	Order No.	Order No.	Order No.
MSKL	3 – 12 mm	37616	–	–	–
	8 – 18 mm	37618	–	–	–
SKL	1.5 – 3 mm	–	36243	36810	–
	3 – 6 mm	–	36244	36815	–
	6 – 8 mm	–	36245	36820	–
	8 – 11 mm	–	36246	–	–
	11 – 17 mm	–	36247	–	–
	17 – 22 mm	–	36248	–	–
	22 – 30 mm	–	36249	–	–
	30 – 38 mm	–	36250	–	–
	38 – 48 mm	–	36252	–	–
	3 – 8 mm	–	–	–	36500.002
SK	4 – 13.5 mm	–	–	–	36502.002
	10 – 20 mm	–	–	–	36504
	15 – 32 mm	–	–	–	36506
	PU	10	10	10	10



SFS|SKL

Product description

Whenever a cable shielding is required with the possibility of grounding, EMC shield clamps can be used. Shield clamps are easy to use and effective in dissipating conducted disturbances.

Assembly

The shield clamps can be mounted on 35 mm DIN rails.

Advantages & benefits

- Large cable shield contact area
- Easy, tool-free assembly
- The spring design requires no adjustments and will permanently maintain contact to the cable shield
- Designed for high density applications
- Shock and vibration resistant, maintenance free

Specifications

Material

MSKL clamp, SKL clamp	Spring steel, zinc plated
SF/SFZ foot	Spring steel
SK bracket	Steel, galvanically zinc plated

EMC shield clamps for 10 × 3 mm bus bars with strain relief function



PFSZ-M|MSKL

Product description

Whenever a cable shielding is required with the possibility of grounding, EMC shield clamps can be used. Shield clamps are easy to use and effective in dissipating conducted disturbances.

Optional strain relief function: the cable is fixed via the cable jacket using cable ties.

Assembly

The shield clamps can be mounted on 10 × 3 mm bus bars.

Advantages & benefits

- Integrated strain relief function
- Large cable shield contact area
- Easy, tool-free assembly
- The spring design requires no adjustments and will permanently maintain contact to the cable shield
- Designed for high density applications
- Shock and vibration resistant, maintenance free
- Double strain relief: acc. to PROFINET installation guidelines

Specifications

Material

MSKL-clamp,

SKL-clamp

PFS-foot

SK-bracket

Bus bar

Spring steel, zinc plated

Spring steel

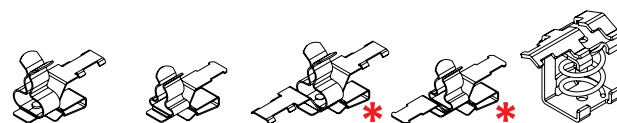
Sheet steel, galvanically zinc plated

Cu, tin plated, current load 140 A

Accessories

KEL-EMV-PF cable assembly bracket 159

MF Supports for bus bars 223



		PFSZ-M MSKL	PFSZ SKL	PFS2Z-M MSKL	PFS2Z SKL	SS SKZ
	Clamping range	Order No.	Order No.	Order No.	Order No.	Order No.
MSKL	3 – 12 mm	37630	–	37630.150	–	–
	8 – 18 mm	37632	–	37632.150	–	–
SKL	1.5 – 3 mm	–	36787.1	–	36787.151	–
	3 – 6 mm	–	36787.2	–	36787.152	–
	6 – 8 mm	–	36787.3	–	36787.153	–
	8 – 11 mm	–	36787.4	–	36787.154	–
	11 – 17 mm	–	36787.5	–	36787.155	–
	17 – 22 mm	–	36787.6	–	36787.156	–
SKZ	3 – 8 mm	–	–	–	–	36235
	4 – 13.5 mm	–	–	–	–	36236
	PU	10	10	10	10	10

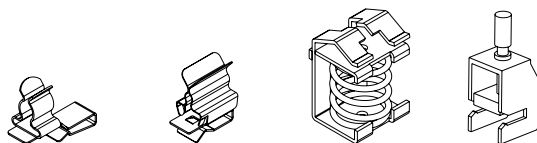
* with double strain relief function

Bus bar 10 × 3 mm

Type	Order No.	PU
Bus bar 10 × 3 mm	10 × 3 × 1000 mm*	36100
		1

* Other lengths available on request

EMC shield clamps for 10 × 3 mm bus bars without strain relief function



	PFS SKL	PFS SCL	SS SK	SKS
Clamping range	Order No.	Order No.	Order No.	Order No.
SKL	1.5 – 3 mm	36786.1	36611	–
	3 – 6 mm	36786.2	36612	–
	6 – 8 mm	36786.3	–	–
	8 – 11 mm	36786.4	–	–
	11 – 17 mm	36786.5	–	–
	17 – 22 mm	36786.6	–	–
SK	3 – 8 mm	–	–	36235.002
	4 – 13.5 mm	–	–	36236.002
	10 – 20 mm	–	–	36237
	15 – 32 mm	–	–	36238
SKS	2 – 5 mm	–	–	36282
	3 – 8 mm	–	–	36283
	3 – 14 mm	–	–	36284
	3 – 20 mm	–	–	36285
	5 – 28 mm	–	–	36286
	20 – 35 mm	–	–	36287
PU	10	10	10	10



PFS|SKL

Product description

Whenever a cable shielding is required with the possibility of grounding, EMC shield clamps can be used. Shield clamps are easy to use and effective in dissipating conducted disturbances.

Assembly

The shield clamps can be mounted on 10 × 3 mm bus bars.

Advantages & benefits

- Large cable shield contact area
- Easy, tool-free assembly
- The spring design requires no adjustments and will permanently maintain contact to the cable shield
- Designed for high density applications
- Shock and vibration resistant, maintenance free

Specifications

Material

MSKL-clamp,	Spring steel, zinc plated
SKL-clamp	Spring steel
PFS-foot	Spring steel
SK-bracket	Sheet steel, galvanically zinc plated
Bus bar	Cu, tin plated, current load 140 A

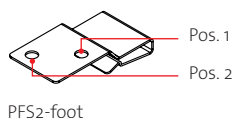
Accessories

KEL-EMV-PF cable assembly bracket	159
MF Supports for bus bars	223

EMC double shield clamps for 10 × 3 mm bus bars with strain relief function



PFSZ2|SKL



PFS2-foot



Product description

Whenever a cable shielding is required with the possibility of grounding, EMC shield clamps can be used. Shield clamps are easy to use and effective in dissipating conducted disturbances.

Optional strain relief function: the cable is fixed via the cable jacket using cable ties.

Assembly

The shield clamps can be mounted on 10 × 3 mm bus bars.

Advantages & benefits

- Integrated strain relief function
- Large cable shield contact area
- Easy, tool-free assembly
- The spring design requires no adjustments and will permanently maintain contact to the cable shield
- Designed for high density applications
- Shock and vibration resistant, maintenance free

Specifications

Material

MSKL-clamp,

SKL-clamp

PFS-foot

Bus bar

Spring steel, zinc plated

Spring steel

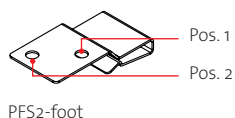
Cu, tin plated, current load 140 A

Accessories

Bus bar 136

MF Supports for bus bars 223

PFSZ2 SKL		
Clamping range Pos. 1	Clamping range Pos. 2	Order No.
blank	1.5 – 3 mm	36789.01
blank	3 – 6 mm	36789.02
blank	6 – 8 mm	36789.03
blank	8 – 11 mm	36789.04
1.5 – 3 mm	blank	36789.10
1.5 – 3 mm	1.5 – 3 mm	36789.11
1.5 – 3 mm	3 – 6 mm	36789.12
1.5 – 3 mm	6 – 8 mm	36789.13
1.5 – 3 mm	8 – 11 mm	36789.14
3 – 6 mm	blank	36789.20
3 – 6 mm	1.5 – 3 mm	36789.21
3 – 6 mm	3 – 6 mm	36789.22
3 – 6 mm	6 – 8 mm	36789.23
3 – 6 mm	8 – 11 mm	36789.24
6 – 8 mm	blank	36789.30
6 – 8 mm	1.5 – 3 mm	36789.31
6 – 8 mm	3 – 6 mm	36789.32
6 – 8 mm	6 – 8 mm	36789.33
6 – 8 mm	8 – 11 mm	36789.34
8 – 11 mm	blank	36789.40
8 – 11 mm	1.5 – 3 mm	36789.41
8 – 11 mm	3 – 6 mm	36789.42
8 – 11 mm	6 – 8 mm	36789.43
PU		10



PFS2|SKL

	Clamping range Pos. 1	Clamping range Pos. 2	Order No.
SKL	blank	1.5 – 3 mm	36788.01
	blank	3 – 6 mm	36788.02
	blank	6 – 8 mm	36788.03
	blank	8 – 11 mm	36788.04
	1.5 – 3 mm	blank	36788.10
	1.5 – 3 mm	1.5 – 3 mm	36788.11
	1.5 – 3 mm	3 – 6 mm	36788.12
	1.5 – 3 mm	6 – 8 mm	36788.13
	1.5 – 3 mm	8 – 11 mm	36788.14
	3 – 6 mm	blank	36788.20
	3 – 6 mm	1.5 – 3 mm	36788.21
	3 – 6 mm	3 – 6 mm	36788.22
	3 – 6 mm	6 – 8 mm	36788.23
	3 – 6 mm	8 – 11 mm	36788.24
	6 – 8 mm	blank	36788.30
	6 – 8 mm	1.5 – 3 mm	36788.31
	6 – 8 mm	3 – 6 mm	36788.32
	6 – 8 mm	6 – 8 mm	36788.33
	6 – 8 mm	8 – 11 mm	36788.34
	8 – 11 mm	blank	36788.40
	8 – 11 mm	1.5 – 3 mm	36788.41
	8 – 11 mm	3 – 6 mm	36788.42
	8 – 11 mm	6 – 8 mm	36788.43
	PU		10

EMC double shield clamps for 10 × 3 mm bus bars without strain relief function



PFS2|SKL

Product description

Whenever a cable shielding is required with the possibility of grounding, EMC shield clamps can be used. Shield clamps are easy to use and effective in dissipating conducted disturbances.

Assembly

The shield clamps can be mounted on 10 × 3 mm bus bars.

Advantages & benefits

- Large cable shield contact area
- Easy, tool-free assembly
- The spring design requires no adjustments and will permanently maintain contact to the cable shield
- Designed for high density applications
- Shock and vibration resistant, maintenance free

Specifications

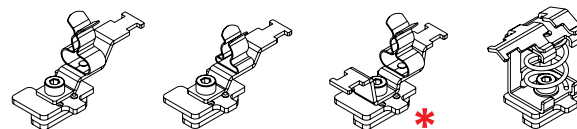
Material

MSKL-clamp,	Spring steel, zinc plated
SKL-clamp	Spring steel
PFS-foot	Spring steel
Bus bar	Cu, tin plated, current load 140 A

Accessories

Bus bar	136
MF Supports for bus bars	223

EMC shield clamps for 30 mm C-rails with strain relief function



Product description

Whenever a cable shielding is required with the possibility of grounding, EMC shield clamps can be used. Shield clamps are easy to use and effective in dissipating conducted disturbances.

Optional strain relief function: the cable is fixed via the cable jacket using cable ties.

Assembly

The shield clamps can be mounted on 30 mm C-rails using the SC mounting foot (included in the shipment).

Advantages & benefits

- Integrated strain relief function
- Large cable shield contact area
- Easy, tool-free assembly
- The spring design requires no adjustments and will permanently maintain contact to the cable shield
- Designed for high density applications
- Shock and vibration resistant, maintenance free
- Double strain relief: acc. to PROFINET installation guidelines
- For mounting on all common C-rails with an opening dimension of 16–17 mm

Specifications

Material

MSKL-clamp,

SKL-clamp

LFZ foot

Spring steel, zinc plated

Sheet steel, galvanically zinc plated
Fixing hole M4

SC foot

SK-bracket

Sheet steel, galvanically zinc plated
Sheet steel, galvanically zinc plated

		SC LFZ-M MSKL Fixing hole M4	SC LFZ SKL Fixing hole M4	SC LF2Z-M MSKL Fixing hole M4	SC SKZ
	Clamping range	Order No.	Order No.	Order No.	Order No.
MSKL	3 – 12 mm	37612.100	–	37612.150	–
	8 – 18 mm	37614.100	–	37614.150	–
SKL	1.5 – 3 mm	–	36910.100	–	–
	3 – 6 mm	–	36915.100	–	–
	6 – 8 mm	–	36920.100	–	–
	8 – 11 mm	–	36925.100	–	–
	11 – 17 mm	–	36930.100	–	–
	17 – 22 mm	–	36935.100	–	–
	22 – 30 mm	–	36940.100	–	–
SKZ	30 – 38 mm	–	36941.100	–	–
	3 – 8 mm	–	–	–	36696
	4 – 13.5 mm	–	–	–	36700
	PU	10	10	10	10

* with double strain relief function



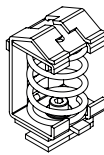
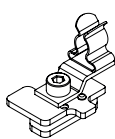
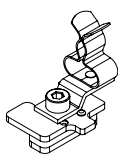
SC foot single for C-rail
PU: 10, Order No. 36220



Screw-foot loose, for 30 mm DIN-rail
shape C (width of mouth: 16 – 17 mm)
with twist protection notch
PU: 10, Order No. 36231

SC-foot: space-saving design enables
high cable density. Mounting foot
adjusts itself when tightening the
screw.

EMC shield clamps for 30 mm C-rails without strain relief function

SC|LF|MSKL
Fixing hole M4SC|LF|SKL
Fixing hole M4

SC|SK

	Clamping range	Order No.	Order No.	Order No.
MSKL	3 – 12 mm	37608.100	–	–
	8 – 18 mm	37610.100	–	–
SKL	1.5 – 3 mm	–	36251.100	–
	3 – 6 mm	–	36253.100	–
	6 – 8 mm	–	36255.100	–
	8 – 11 mm	–	36256.100	–
	11 – 17 mm	–	36257.100	–
	17 – 22 mm	–	36258.100	–
	22 – 30 mm	–	36259.100	–
SK	3 – 8 mm	–	–	36696.002
	4 – 13.5 mm	–	–	36700.002
	10 – 20 mm	–	–	36704
	15 – 32 mm	–	–	36708
	PU	10	10	10



Product description

Whenever a cable shielding is required with the possibility of grounding, EMC shield clamps can be used. Shield clamps are easy to use and effective in dissipating conducted disturbances.

Assembly

The shield clamps can be mounted on 30 mm C-rails using the SC mounting foot (included in the shipment).

Advantages & benefits

- Large cable shield contact area
- Easy, tool-free assembly
- The spring design requires no adjustments and will permanently maintain contact to the cable shield
- Designed for high density applications
- Shock and vibration resistant, maintenance free

Specifications

Material

MSKL-clamp,

SKL-clamp

LF foot

SC foot

SK-bracket

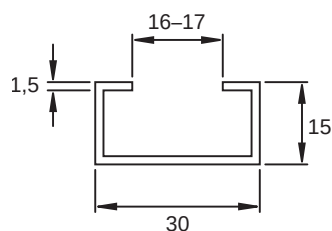
Spring steel, zinc plated

Sheet steel, galvanically zinc plated

Fixing hole M4

Sheet steel, galvanically zinc plated

Sheet steel, galvanically zinc plated



C-rail dimensions (mm)

EMC shield clamps
for cable clamps
for 30 mm C-rails



LFC|MSKL

Product description

The LFC shield clamp offers a space-saving solution for mounting on the C-rail.

The shield clamp LFC contacts the cable shield directly on the C-rail while the use of the existing cable clamp provides the strain relief.

Whenever a cable shielding is required with the possibility of grounding, EMC shield clamps can be used. Shield clamps are easy to use and effective in dissipating conducted disturbances.

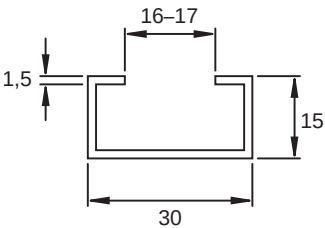
4.1

Advantages & benefits

- Suitable for clamps that are mounted on C-rails
- Easy, tool-free assembly
- Space-saving assembly
- Large clamping range 3 – 30 mm
- Large cable shield contact area
- Shield contacting and strain relief are separated from each other
- For mounting on all common C-rails with an opening dimension of 16–17 mm

Specifications

Material Spring steel, zinc plated



C-rail dimensions (mm)



LFC MSKL		LFC SKL
Clamping range	Order No.	Order No.
MSKL	3 – 12 mm	–
	8 – 18 mm	–
SKL	17 – 22 mm	37672.100
	22 – 30 mm	37673.100
PU	10	10



Set of EMC shield clamps and cable clamps for 30 mm C-rails



		CC-LFC MSKL	CC-LFC SKL
Clamping range		Order No.	Order No.
MSKL	3 – 12 mm	37680	–
	8 – 18 mm	37681	–
SKL	17 – 22 mm	–	37682
	22 – 30 mm	–	37683
PU		10	10



CC-LFC|MSKL

Product description

Set consisting of EMC shield clamp LFC and matching cable clamp.

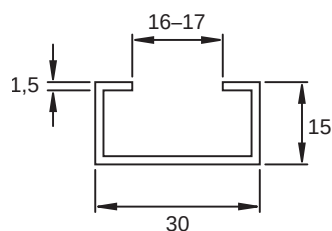
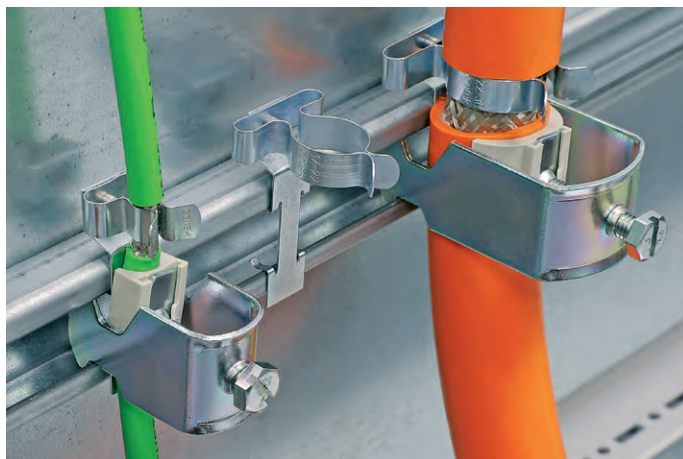
The shield clamp LFC contacts the cable shield directly on the C-rail while the cable clamp provides the strain relief. The combination of two products helps to save space in the enclosure.

Advantages & benefits

- Space-saving due to the combination of the LFC shield clamp with a cable clamp
- Practical set consisting of shield clamp and matching cable clamp
- Quick and easy assembly
- Large clamping range 3 – 30 mm
- Large cable shield contact area
- Shield contacting and strain relief are separated from each other
- For mounting on all common C-rails with an opening dimension of 16–17 mm

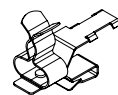
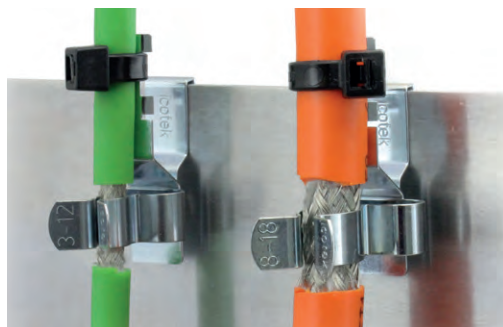
Specifications

Material LFC: Spring steel, zinc plated
Cable clamp: Steel, zinc plated



C-rail dimensions (mm)

EMC shield clamps for assembly on sheet edges with strain relief function



PFKZ-A-M/MSKL
for sheet thickness
1.5 – 2 mm

PFKZ-B-M/MSKL
for sheet thickness
2 – 3 mm

PFKZ-A/SKL
for sheet thickness
1.5 – 2 mm

PFKZ-B/SKL
for sheet thickness
2 – 3 mm

	Clamping range	Order No.	Order No.	Order No.	Order No.
MSKL	3 – 12 mm	37640	37650	–	–
	8 – 18 mm	37642	37652	–	–
SKL	1.5 – 3 mm	–	–	36779.1	36783.1
	3 – 6 mm	–	–	36779.2	36783.2
	6 – 8 mm	–	–	36779.3	36783.3
	8 – 11 mm	–	–	36779.4	36783.4
PU		10	10	10	10

Product description

Whenever a cable shielding is required with the possibility of grounding, EMC shield clamps can be used. Shield clamps are easy to use and effective in dissipating conducted disturbances.

Optional strain relief function: the cable is fixed via the cable jacket using cable ties.

Assembly

The shield clamps are used where a screw connection is either not possible or wanted. It is simply clamped onto the sheet edge. The claws provide a secure grip, even in case of vibrations.

Advantages & benefits

- Integrated strain relief function
- Large cable shield contact area
- Easy, tool-free assembly
- The spring design requires no adjustments and will permanently maintain contact to the cable shield
- Designed for high density applications
- Maintenance free

Specifications

Material

SKL-clamp Spring steel, zinc plated
PFKZ foot Spring steel

Type A: For wall/sheet thickness 1.5 – 2 mm
Type B: For wall/sheet thickness 2 – 3 mm

EMC shield clamps for assembly on sheet edges without strain relief function



PFK-A|SKL
for sheet thickness 1.5 – 2
mm

PFKZ-B|SKL
for sheet thickness 2 – 3 mm

	Clamping range	Order No.	Order No.
SKL	1.5 – 3 mm	36778.1	36782.1
	3 – 6 mm	36778.2	36782.2
	6 – 8 mm	36778.3	36782.3
	8 – 11 mm	36778.4	36782.4
	PU	10	10



Product description

Whenever a cable shielding is required with the possibility of grounding, EMC shield clamps can be used. Shield clamps are easy to use and effective in dissipating conducted disturbances.

Assembly

The shield clamps are used where a screw connection is either not possible or wanted. It is simply clamped onto the sheet edge. The claws provide a secure grip, even in case of vibrations.

Advantages & benefits

- Large cable shield contact area
- Easy, tool-free assembly
- The spring design requires no adjustments and will permanently maintain contact to the cable shield
- Designed for high density applications
- Maintenance free

Specifications

Material

SKL-clamp

Spring steel, zinc plated

PFKZ foot

Spring steel

Type A:

For wall/sheet thickness 1.5 – 2 mm

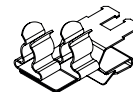
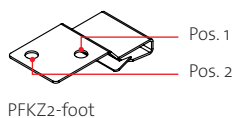
Type B:

For wall/sheet thickness 2 – 3 mm



Secure grip on metal sheets due to mounting claws

EMC double shield clamps for assembly on sheet edges with strain relief function



PFKZ2-A/SKL
for sheet thickness
1.5 – 2 mm

PFKZ2-B/SKL
for sheet thickness
2 – 3 mm

Product description

Whenever a cable shielding is required with the possibility of grounding, EMC shield clamps can be used. Shield clamps are easy to use and effective in dissipating conducted disturbances.

Optional strain relief function: the cable is fixed via the cable jacket using cable ties.

Assembly

The shield clamps are used where a screw connection is either not possible or wanted. It is simply clamped onto the sheet edge. The claws provide a secure grip, even in case of vibrations.

Advantages & benefits

- Integrated strain relief function
- Large cable shield contact area
- Easy, tool-free assembly
- The spring design requires no adjustments and will permanently maintain contact to the cable shield
- Designed for high density applications
- Maintenance free

Specifications

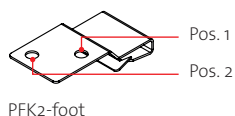
Material

SKL-clamp Spring steel, zinc plated
PFKZ2 foot Spring steel

Type A: For wall/sheet thickness 1.5 – 2 mm
Type B: For wall/sheet thickness 2 – 3 mm

	Clamping range Pos. 1	Clamping range Pos. 2	Order No.	Order No.
SKL	blank	1.5 – 3 mm	36781.01	36785.01
	blank	3 – 6 mm	36781.02	36785.02
	blank	6 – 8 mm	36781.03	36785.03
	blank	8 – 11 mm	36781.04	36785.04
	1.5 – 3 mm	blank	36781.10	36785.10
	1.5 – 3 mm	1.5 – 3 mm	36781.11	36785.11
	1.5 – 3 mm	3 – 6 mm	36781.12	36785.12
	1.5 – 3 mm	6 – 8 mm	36781.13	36785.13
	1.5 – 3 mm	8 – 11 mm	36781.14	36785.14
	3 – 6 mm	blank	36781.20	36785.20
	3 – 6 mm	1.5 – 3 mm	36781.21	36785.21
	3 – 6 mm	3 – 6 mm	36781.22	36785.22
	3 – 6 mm	6 – 8 mm	36781.23	36785.23
	3 – 6 mm	8 – 11 mm	36781.24	36785.24
	6 – 8 mm	blank	36781.30	36785.30
	6 – 8 mm	1.5 – 3 mm	36781.31	36785.31
	6 – 8 mm	3 – 6 mm	36781.32	36785.32
	6 – 8 mm	6 – 8 mm	36781.33	36785.33
	6 – 8 mm	8 – 11 mm	36781.34	36785.34
	8 – 11 mm	blank	36781.40	36785.40
	8 – 11 mm	1.5 – 3 mm	36781.41	36785.41
	8 – 11 mm	3 – 6 mm	36781.42	36785.42
	8 – 11 mm	6 – 8 mm	36781.43	36785.43
PU			10	10

EMC double shield clamps for assembly on sheet edges without strain relief function



PFK2-A|SKL
for sheet thickness
1.5 – 2 mm

PFK2-B|SKL
for sheet thickness
2 – 3 mm



	Clamping range Pos. 1	Clamping range Pos. 2	Order No.	Order No.
SKL	blank	1.5 – 3 mm	36780.01	36784.01
	blank	3 – 6 mm	36780.02	36784.02
	blank	6 – 8 mm	36780.03	36784.03
	blank	8 – 11 mm	36780.04	36784.04
	1.5 – 3 mm	blank	36780.10	36784.10
	1.5 – 3 mm	1.5 – 3 mm	36780.11	36784.11
	1.5 – 3 mm	3 – 6 mm	36780.12	36784.12
	1.5 – 3 mm	6 – 8 mm	36780.13	36784.13
	1.5 – 3 mm	8 – 11 mm	36780.14	36784.14
	3 – 6 mm	blank	36780.20	36784.20
	3 – 6 mm	1.5 – 3 mm	36780.21	36784.21
	3 – 6 mm	3 – 6 mm	36780.22	36784.22
	3 – 6 mm	6 – 8 mm	36780.23	36784.23
	3 – 6 mm	8 – 11 mm	36780.24	36784.24
	6 – 8 mm	blank	36780.30	36784.30
	6 – 8 mm	1.5 – 3 mm	36780.31	36784.31
	6 – 8 mm	3 – 6 mm	36780.32	36784.32
	6 – 8 mm	6 – 8 mm	36780.33	36784.33
	6 – 8 mm	8 – 11 mm	36780.34	36784.34
	8 – 11 mm	blank	36780.40	36784.40
	8 – 11 mm	1.5 – 3 mm	36780.41	36784.41
	8 – 11 mm	3 – 6 mm	36780.42	36784.42
	8 – 11 mm	6 – 8 mm	36780.43	36784.43
PU			10	10

Product description

Whenever a cable shielding is required with the possibility of grounding, EMC shield clamps can be used. Shield clamps are easy to use and effective in dissipating conducted disturbances.

Assembly

The shield clamps are used where a screw connection is either not possible or wanted. It is simply clamped onto the sheet edge. The claws provide a secure grip, even in case of vibrations.

Advantages & benefits

- Large cable shield contact area
- Easy, tool-free assembly
- The spring design requires no adjustments and will permanently maintain contact to the cable shield
- Designed for high density applications
- Maintenance free

Specifications

Material

SKL-clamp
PFK2 foot

Spring steel, zinc plated
Spring steel

Type A:

For wall/sheet thickness 1.5 – 2 mm

Type B:

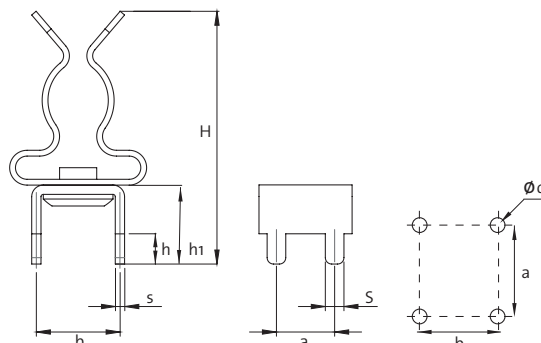
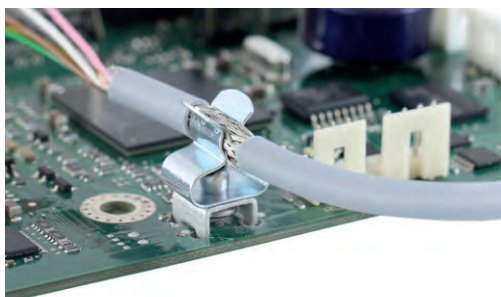
For wall/sheet thickness 2 – 3 mm



Secure grip on metal sheets due to mounting claws

PCB|SKL

EMC Shield clamps for printed circuit boards



Product description

PCB|SKL shield clamps are easy to use and effective in earthing single cable shields.

PCB|SKL consist of SKL clamps, fixed on a soldering foot that enables assembly on printed circuit boards. There are various designs to choose from.

Advantages & benefits

- The spring design requires no adjustments and will permanently maintain contact to the cable shield
- Large contact area

Specifications

Material

SKL-clamp **Spring steel, zinc plated**
PCB-foot **Brass, tin plated**

SKL-clamp
PCB-ET-4-V-4,1|SKL 3-6 **Spring steel, tin plated**

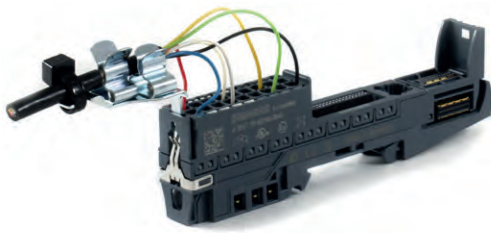
Type	Order No.	Height H [mm]	Height h1 [mm]	Width s [mm]	Pin h [mm]	Pin S [mm]	Grid a x b [mm]	Drill-hole d [mm]	PJ
PCB-4-V-6,8 SKL 1.5-3 Clamping range 1.5 - 3 mm	36650.1	20	6.8	0.8	2.6	1.6	7.2 x 5	Ø 1.8	10
PCB-4-V-6,8 SKL 3-6 Clamping range 3 - 6 mm	36650.2	20	6.8	0.8	2.6	1.6	7.2 x 5	Ø 1.8	10
PCB-4-V-6,8 SKL 6-8 Clamping range 6 - 8 mm	36650.3	22	6.8	0.8	2.6	1.6	7.2 x 5	Ø 1.8	10
PCB-4-V-12,5 SKL 1.5-3 Clamping range 1.5 - 3 mm	36656.1	25	12.5	1	4	1.6	10.1 x 5	Ø 1.8	10
PCB-4-V-12,5 SKL 3-6 Clamping range 3 - 6 mm	36656.2	26	12.5	1	4	1.6	10.1 x 5	Ø 1.8	10
PCB-4-V-12,5 SKL 6-8 Clamping range 6 - 8 mm	36656.3	27	12.5	1	4	1.6	10.1 x 5	Ø 1.8	10
PCB-ET-4-V-4,1 SKL 3-6 (one-piece) Clamping range 3 - 6 mm	36653.1	17.5	4.4	0.3	2.6	1.6	5 x 7.2	Ø 1.8	25



PCB-ET-4-V-4,1|SKL 3-6

STFZ|SKL

EMC Terminal clamp
for peripheral modules



STFZ-SP|SKL



STFZ-U|SKL



STFZ|SKL

Application terminal clamp

STFZ|SKL

- Bosch Rexroth
IP2o Inline Module
 - PHOENIX CONTACT
All terminals of the INLINE range.
The terminals 1.4 and 2.4 must not be used for signal I/O.
 - Pilz
All PSSu-Modules with shield terminals 13 and 23
 - Siemens
All terminals of the ET200s range.
Terminals 4 and 8 must not be used for signal I/O.
 - TURCK
For terminals of the BL2o I/O system.
 - VIPA SLIO
All terminals of the SLIO range. Terminals 4+8 must not be used for signal I/O.
 - WAGO
All terminals of the WAGO I/O Systems 750.
Terminals 4 and 8 must not be used for signal I/O.
 - Rockwell Automation / Allen-Bradley
Series 1734
- Further manufacturers upon request.

STFZ-U|SKL

- BECKHOFF
EL 3122, ES 3122, ES 9100, ES 9410, KL 114, KS 2134

STFZ-SP|SKL

- Siemens
SIMATIC ET 200SP

Product description

The EMC terminal clamps STFZ|SKL combine the functions strain relief, cable guidance and earthing of signal cables. Available in two versions for 1 or 2 lines.

The STFZ2|SKL is used for analogue I/O modules using two actuators / sensors.

The STFZ EMC terminal clamp is compatible to bus modules listed on the left side.

For the SIMATIC ET 200SP module by Siemens icotek has developed a special terminal clamp STFZ-SP for 1 or 2 lines.



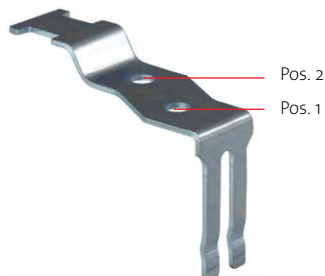
STFZ I/O Insert Tool

STFZ I/O Insert Tool for quick and easy mounting of STFZ terminal clamps.

Order No. 61430

STFZ | STFZ2

EMC Terminal clamp, single and double
for various brands



Product description

The STFZ|SKL EMC terminal clamp provides strain relief, cable guidance and earthing for decentralised bus modules (see compatibility table page 149).

The STFZ2|SKL is used for analogue I/O modules using two actuators / sensors.

The EMC shield clamps as listed below are available to mount:

SKL 1.5-3 | SKL 3-6 | SKL 6-8

Advantages & benefits

- Earthing of signal cables close to the terminal
- Strain relief and cable management directly on the bus module

Specifications

Material

SKL-clamp Spring steel, zinc plated
STFZ-foot Spring steel

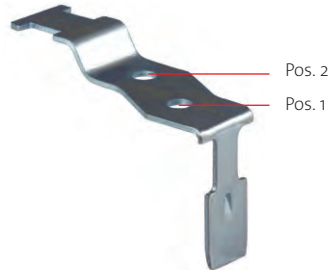
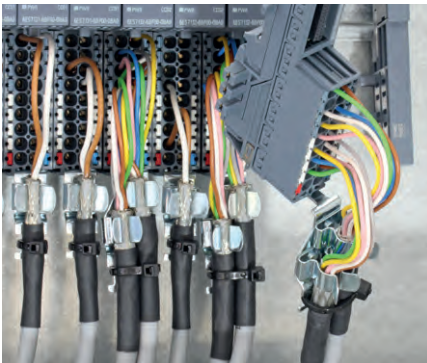
Accessories

STFZ I/O Insert Tool 149

Type	Shield diameter Pos. 1	Shield diameter Pos. 2	Order No.	PU
STFZ SKL with one shield clamp:				
STFZ SKL 1.5-3	1.5 - 3 mm	-	37510.1	10
STFZ SKL 3-6	3 - 6 mm	-	37510.2	10
STFZ SKL 6-8	6 - 8 mm	-	37510.3	10
STFZ2 SKL with two shield clamps:				
STFZ2 01	blank	1.5 - 3 mm	37505.01	10
STFZ2 02	blank	3 - 6 mm	37505.02	10
STFZ2 03	blank	6 - 8 mm	37505.03	10
STFZ2 10	1.5 - 3 mm	blank	37505.10	10
STFZ2 11	1.5 - 3 mm	1.5 - 3 mm	37505.11	10
STFZ2 12	1.5 - 3 mm	3 - 6 mm	37505.12	10
STFZ2 13	1.5 - 3 mm	6 - 8 mm	37505.13	10
STFZ2 20	3 - 6 mm	blank	37505.20	10
STFZ2 21	3 - 6 mm	1.5 - 3 mm	37505.21	10
STFZ2 22	3 - 6 mm	3 - 6 mm	37505.22	10
STFZ2 23	3 - 6 mm	6 - 8 mm	37505.23	10
STFZ2 30	6 - 8 mm	blank	37505.30	10
STFZ2 31	6 - 8 mm	1.5 - 3 mm	37505.31	10
STFZ2 32	6 - 8 mm	3 - 6 mm	37505.32	10
STFZ2 33	6 - 8 mm	6 - 8 mm	37505.33	10

STFZ-U | STFZ-SP | STFZ2-SP

EMC Terminal clamp, single and double for Siemens & Beckhoff modules



Type	Shield diameter Pos. 1	Shield diameter Pos. 2	Order No.	PU
STFZ-SP SKL / STFZ-U SKL with one shield clamp:				
STFZ-SP SKL 1.5-3	1.5 - 3 mm	-	37512.1	10
STFZ-U SKL 1.5-3	1.5 - 3 mm	-	37514.1	10
STFZ-SP SKL 3-6	3 - 6 mm	-	37512.2	10
STFZ-U SKL 3-6	3 - 6 mm	-	37514.2	10
STFZ-SP SKL 6-8	6 - 8 mm	-	37512.3	10
STFZ-U SKL 6-8	6 - 8 mm	-	37514.3	10
STFZ2-SP with two shield clamps:				
STFZ2-SP 01	blank	1.5 - 3 mm	37507.01	10
STFZ2-SP 02	blank	3 - 6 mm	37507.02	10
STFZ2-SP 03	blank	6 - 8 mm	37507.03	10
STFZ2-SP 10	1.5 - 3 mm	blank	37507.10	10
STFZ2-SP 11	1.5 - 3 mm	1.5 - 3 mm	37507.11	10
STFZ2-SP 12	1.5 - 3 mm	3 - 6 mm	37507.12	10
STFZ2-SP 13	1.5 - 3 mm	6 - 8 mm	37507.13	10
STFZ2-SP 20	3 - 6 mm	blank	37507.20	10
STFZ2-SP 21	3 - 6 mm	1.5 - 3 mm	37507.21	10
STFZ2-SP 22	3 - 6 mm	3 - 6 mm	37507.22	10
STFZ2-SP 23	3 - 6 mm	6 - 8 mm	37507.23	10
STFZ2-SP 30	6 - 8 mm	blank	37507.30	10
STFZ2-SP 31	6 - 8 mm	1.5 - 3 mm	37507.31	10
STFZ2-SP 32	6 - 8 mm	3 - 6 mm	37507.32	10
STFZ2-SP 33	6 - 8 mm	6 - 8 mm	37507.33	10

Product description

The STFZ-SP|SKL EMC terminal clamp provides strain relief, cable guidance and earthing for decentralised bus modules SIMATIC ET 200SP by Siemens. STFZ2-SP|SKL is a version for analogue I/O modules using two actuators / sensors. STFZ-U terminal clamps for various Beckhoff modules (see page 129).

The EMC shield clamps as listed below are available to mount:

SKL 1.5-3 | SKL 3-6 | SKL 6-8

Advantages & benefits

- Earthing of signal cables close to the terminal
- Strain relief and cable management directly on the bus module

Specifications

Material

SKL-clamp Spring steel, zinc plated
STFZ-SP-foot Spring steel

Accessories

STFZ I/O Insert Tool 149



STFZ-U|SKL

EMC ServiceBox *multi*

Service box with assorted MSKL shield clamp



Product description

The suitable EMC clamp is always readily available!

The EMC ServiceBox multi is very universal, especially when the cable diameter is unknown in advance. With the new ServiceBox multi you always have the right size on hand.

The EMC ServiceBox multi is perfect for installations and service calls. Retrofitting and maintenance can be carried out easily and quickly.

Order No. 88006

Content*

MSKL / SKL for TS35 DIN rails:

Type SFZ-M MSKL - sizes: 8 - 18 mm	10 × MSKL
Type SFZ-M MSKL - sizes: 3 - 12 mm	20 × MSKL
Type SFZ SKL - sizes: 1.5 - 3 mm	10 × SKL

MSKL / SKL for assembly via screws:

Type LFZ-M MSKL - sizes: 8 - 18 mm	10 × MSKL
Type LFZ-M MSKL - sizes: 3 - 12 mm	20 × MSKL
Type LFZ SKL - sizes: 1.5 - 3 mm	10 × SKL

MSKL for 10 × 3 mm bus bar:

Type PFSZ-M MSKL - sizes: 3 - 12 mm	10 × MSKL
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MSKL / SKL for clipping on metal sheets:

Type PFKZ-B-M MSKL - sizes: 1.5 - 8 mm	10 × MSKL
Type PFKZ-B SKL 22	2 × SKL

SKL for decentralised bus modules:

Type STFZ SKL - sizes: 3 - 6 mm	6 × SKL
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SKL for clipping on metal sheets

Typ PFKZ-B SKL 1.5-3 mm	3 × SKL
Typ PFKZ-B SKL 3-6 mm	3 × SKL
Typ PFKZ-B SKL 6-8 mm	3 × SKL

EMC - Accessories:

RLFZ - Clamp assembly 5 × SKL	1 piece
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* Subject to alterations

90% of all cable shields are contacted



EMC ServiceBox

Service box with assorted SKL shield clamps



Exact gradations of the shield clamps



Product description

The suitable EMC clamp is always readily available!

The EMC ServiceBox is perfect for installations and service calls. Retrofitting and maintenance can be carried out easily and quickly

Order No. 88002

Content*

SKL for TS35 DIN rails:

Type SFZ SKL - sizes: 1.5 - 17 mm	15 × SKL
Type SFS SKL - sizes: 1.5 - 8 mm	6 × SKL
SFZ-M MSKL - sizes: 3-18 mm	4 × SKL

SKL for assembly via screws:

Type LFZ SKL - sizes: 1.5 - 17 mm	21 × SKL
Type LFZ-U4 SKL - sizes: 1.5-11 mm	8 × SKL
Type LFZ-M MSKL - sizes: 3-18 mm	4 × SKL

SKL for 10 × 3 bus bar:

Type PFSZ2 SKL 11	1 × SKL
Type PFSZ2 SKL 22	1 × SKL
Type PFSZ2 SKL 33	1 × SKL

SKL for clipping on metal sheets:

Type PFSZ SKL - sizes: 1.5 - 11 mm	15 × SKL
Type PFSZ-M MSKL - sizes: 3-18 mm	4 × SKL

SKL for decentralised bus modules:

STFZ SKL - sizes: 3 - 6 mm	1 × SKL
STFZ2 SKL 23	1 × SKL

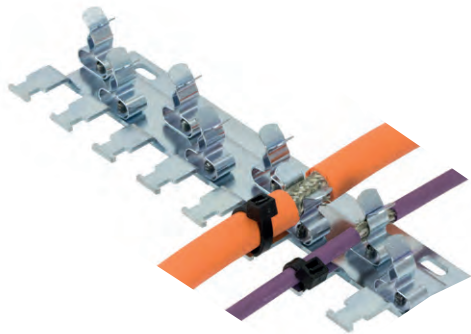
SKL for Siemens module ET 200 SP:

STFZ-SP SKL - sizes: 3-6 mm	1 × SKL
STFZ2-SP SKL 23	1 × SKL

* Subject to alterations

RLFZ-M | SC|RLFZ-M

EMC Clamp assembly with strain relief and a large clamping range



for screw mounting



Type SC: Mounted on screw-foot for DIN-rail shape C

Configure
online
now

Product description

The RLFZ-M range is a further development of the EMC clamp assembly which enables earthing and strain relief of up to 12 cable shields from 3-12 mm using only one shield clamp size.

There are 10 different carriers available which can be easily user configured with up to 12 MSKL 3-12 shield clamps.

Advantages & benefits

- Easy storage due to large clamping range 3-12 mm
- Designed for high density applications
- Possibility to configure custom specific EMC clamp assemblies
- Separate strain relief and EMC shield earthing
- Online design tool for EMC Clamp assembly on www.icotek.com

Specifications

Material

MSKL-clamp

Spring steel, zinc plated

RLFZ-M-foot

Sheet steel, galvanically zinc plated

SC-foot

Sheet steel, galvanically zinc plated

Type	Order No. for direct mounting	Order No. for C-rails*	Number of shield clamps	Length	Width	PU
NEW RLFZ-M (x2)	38069.002	—	2× MSKL 3-12	36 mm	54.1 mm	1
RLFZ-M (x3)	38070.002	38070.100	3× MSKL 3-12	52 mm	54.1 mm	1
RLFZ-M (x4)	38071.002	38071.100	4× MSKL 3-12	73 mm	54.1 mm	1
RLFZ-M (x5)	38072.002	38072.100	5× MSKL 3-12	94 mm	54.1 mm	1
RLFZ-M (x6)	38073.002	38073.100	6× MSKL 3-12	115 mm	54.1 mm	1
RLFZ-M (x7)	38074.002	38074.100	7× MSKL 3-12	136 mm	54.1 mm	1
RLFZ-M (x8)	38075.002	38075.100	8× MSKL 3-12	157 mm	54.1 mm	1
RLFZ-M (x9)	38076.002	38076.100	9× MSKL 3-12	178 mm	54.1 mm	1
RLFZ-M (x10)	38077.002	38077.100	10× MSKL 3-12	199 mm	54.1 mm	1
RLFZ-M (x11)	38078.002	38078.100	11× MSKL 3-12	220 mm	54.1 mm	1
RLFZ-M (x12)	38079.002	38079.100	12× MSKL 3-12	241 mm	54.1 mm	1



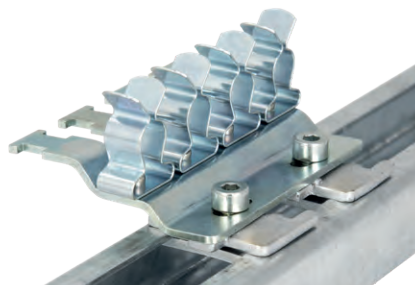
SC foot single for C-rail
PU: 10, Order No. 36220



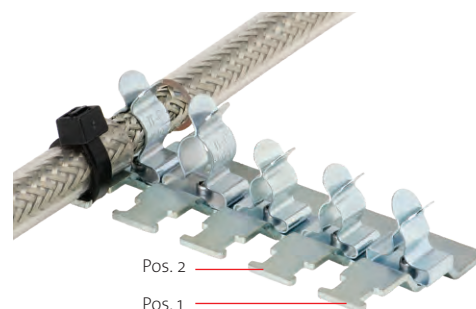
Try our EMC configurator: EMC cable shield clamps as single, double or multi solution – individually configurable for your applications on www.icotek.com

RLFZ | SC|RLFZ

EMC Clamp assembly with strain relief



Type SC: Mounted on screw-foot for DIN-rail shape C*



for screw mounting

Type	Order No. for direct mounting	Order No. for C-rails*	Number of shield clamps	Length	Width	PU
RLFZ (x3)	38005	38005.100	3× SKL	41.2 mm	44.4 mm	1
RLFZ (x4)	38010	38010.100	4× SKL	56.8 mm	44.4 mm	1
RLFZ (x5)	38015	38015.100	5× SKL	72.4 mm	44.4 mm	1
RLFZ (x6)	38020	38020.100	6× SKL	88 mm	44.4 mm	1
RLFZ (x7)	38025	38025.100	7× SKL	103.6 mm	44.4 mm	1
RLFZ (x8)	38030	38030.100	8× SKL	119.2 mm	44.4 mm	1
RLFZ (x9)	38035	38035.100	9× SKL	134.8 mm	44.4 mm	1
RLFZ (x10)	38040	38040.100	10× SKL	150.4 mm	44.4 mm	1
RLFZ (x11)	38045	38045.100	11× SKL	166 mm	44.4 mm	1
RLFZ (x12)	38050	38050.100	12× SKL	181.6 mm	44.4 mm	1

Product description

The RLFZ range enables earthing and strain relief of up to 12 cables in a small space.

The combination of EMC shield earthing and strain relief is the key feature of this system.

There are 10 different carriers available which can be user configured with up to 12 SKL shield clamps.

The EMC shield clamps as listed below are available to mount:

SKL 1.5-3 | SKL 3-6 | SKL 6-8 | SKL 8-11

Advantages & benefits

- Designed for high density applications
- Possibility to configure custom specific EMC clamp assemblies
- Separate strain relief and EMC shield earthing
- Online design tool for EMC Clamp assembly

Specifications

Material

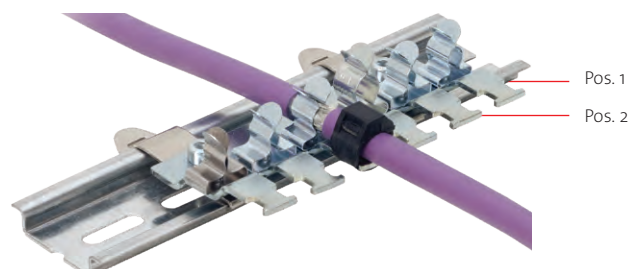
SKL-clamp	Spring steel, zinc plated
RLFZ-foot	Carbon steel, galvanically zinc plated
SC-foot	Carbon steel, galvanically zinc plated



Try our EMC configurator: EMC cable shield clamps as single, double or multi solution – individually configurable for your applications on www.icotek.com

SF|RLFZ

EMC Clamp assembly for 35 mm DIN rail



Product description

The SF|RLFZ range is based upon the RLFZ clamp assembly, which is mounted on snap feet for 35 mm DIN rails shape H.

There are 10 different carriers available, which can be user configured with up to 12 SKL shield clamps.

The EMC shield clamps as listed below are available to mount:

SKL 1.5-3 | SKL 3-6 | SKL 6-8 | SKL 8-11

Advantages & benefits

- Designed for high density applications
- Possibility to configure custom specific EMC clamp assemblies
- Separate strain relief and EMC shield earthing
- Simple and tool-free mounting, easy assembly
- configure online on www.icotek.com

Specifications

Material

SKL-clamp	Spring steel, zinc plated
RLFZ-foot	Sheet steel, galvanically zinc plated

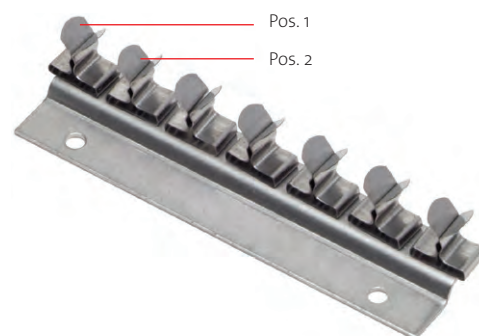
Type	Order No. (unfitted)	Number of shield clamps	Length	Width	PU
SF RLFZ (x3)	38105	3× SKL	41.2 mm	70.7 mm	1
SF RLFZ (x4)	38110	4× SKL	56.8 mm	70.7 mm	1
SF RLFZ (x5)	38115	5× SKL	72.4 mm	70.7 mm	1
SF RLFZ (x6)	38120	6× SKL	88 mm	70.7 mm	1
SF RLFZ (x7)	38125	7× SKL	103.6 mm	70.7 mm	1
SF RLFZ (x8)	38130	8× SKL	119.2 mm	70.7 mm	1
SF RLFZ (x9)	38135	9× SKL	134.8 mm	70.7 mm	1
SF RLFZ (x10)	38140	10× SKL	150.4 mm	70.7 mm	1
SF RLFZ (x11)	38145	11× SKL	166 mm	70.7 mm	1
SF RLFZ (x12)	38150	12× SKL	181.6 mm	70.7 mm	1



Try our EMC configurator: EMC cable shield clamps as single, double or multi solution – individually configurable for your applications on www.icotek.com

RLF

EMC Clamp assembly



Type	Order No. (unfitted)	Number of shield clamps	Length	Width	PU
RLF (x3)	36965	3× SKL	46.2 mm	24 mm	1
RLF (x4)	36984	4× SKL	60.8 mm	24 mm	1
RLF (x5)	36958	5× SKL	72.4 mm	24 mm	1
RLF (x6)	36952	6× SKL	88 mm	24 mm	1
RLF (x7)	36963	7× SKL	103.6 mm	24 mm	1
RLF (x8)	36953	8× SKL	119.2 mm	24 mm	1
RLF (x9)	36985	9× SKL	140.8 mm	24 mm	1
RLF (x10)	36954	10× SKL	150.4 mm	24 mm	1
RLF (x11)	36955	11× SKL	166 mm	24 mm	1
RLF (x12)	36962	12× SKL	181.6 mm	24 mm	1

Product description

Comparable with the RLFZ clamp assembly, just without strain relief.

There are 10 different carriers available which can be user configured with up to 12 SKL shield clamps.

The EMC shield clamps as listed below are available to mount:

SKL 1.5-3 | SKL 3-6 | SKL 6-8 | SKL 8-11

Advantages & benefits

- Designed for high density applications
- Possibility to configure custom specific EMC clamp assemblies
- Online design tool for EMC Clamp assembly

Specifications

Material

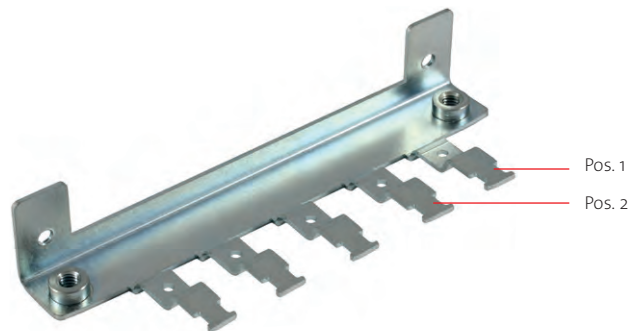
SKL-clamp	Spring steel, zinc plated
RLF-foot	Stainless steel



Try our EMC configurator: EMC cable shield clamps as single, double or multi solution – individually configurable for your applications on www.icotek.com

KEL-EMC-Z

Cable assembly with strain relief



Product description

Cable entry, EMC shield earthing and strain relief – all in one location!

Cables pass through the KEL cable entry frame and lead directly to the EMC clamps and strain relief.

Simply insert the cable shield into the shield clamp and secure the cable jacket to the strain relief. Two separate functions (according to regulations) carried out quickly and easily!

Custom configurations are available for shield clamps up to 16 mm in diameter with minimal order quantities and lead time.

Type	Order No.	No. of teeth	Fastening	Fits with	PU
KEL-EMC-Z 16 4	36525	4	long side	KEL-(ER-)E4 KEL 16 x KEL-U 16 x KEL-ER 16 x KEL-QUICK 16	1
KEL-EMC-Z 24 5	36527	5	long side	KEL-(ER-)E5 KEL 24 x KEL-U 24 x KEL-ER 24 x KEL-QUICK 24	1

4.1

Advantages & benefits

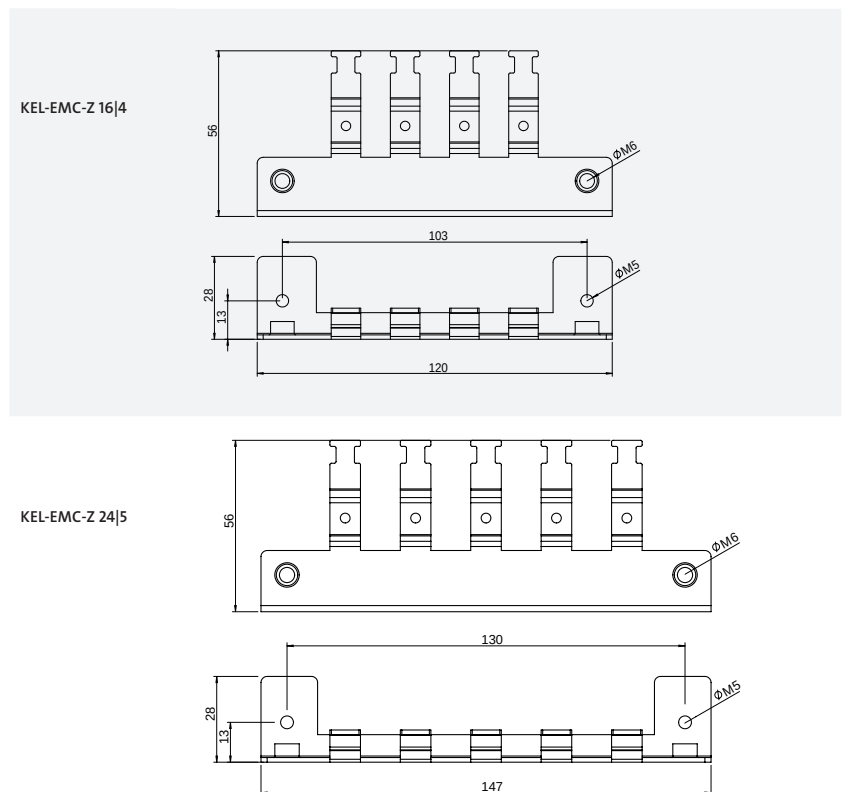
- Large surface contact between cable shield and housing, especially on conductive coated surfaces
- Sealing by outer cable jacket – EMC earthing by cable shield (in acc. with regulations)
- Easily combines cable routing, EMC and strain relief due to the use of the same mounting holes
- Available without SKL shield clamps if only additional strain relief is required
- Mounting hole for earthing tape or PE connection

Specifications

Material **Sheet steel, zinc plated**

Compatible with

KEL-U Cable entry frames	12 - 15
KEL-ER Cable entry frames	8 - 11
KEL Cable entry frames	16 - 19
KEL-QUICK Cable entry frames	60 - 63



KEL-EMC-PF

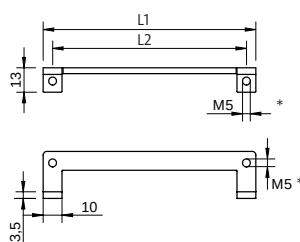
Cable assembly, bracket version



KEL-EMC-PF



KEL-EMC-PFM



Type	Fits with	Order No.	Length L1	Length L2	PU
KEL-EMC-PFM 10	KEL(-U) 10 x KEL-QUICK 10 x KEL-ER 10 x	39184	93 mm	83 mm	1
KEL-EMC-PFM 16	KEL(-U) 16 x KEL-QUICK 16 x KEL-ER 16 x KEL-DPZ 16 x	39183	113 mm	103 mm	1
KEL-EMC-PFM 24	KEL(-U) 24 x KEL-QUICK 24 x KEL-ER 24 x KEL-DPZ 24 x KEL-DPU 24 x	39181	140 mm	130 mm	1
KEL-EMC-PF B4	KEL(-ER)-E2 KEL-QUICK-E2 KEL(-U)-B KEL-QUICK-B KEL-ER-B	39150	68 mm	58 mm	1
KEL-EMC-PF 10	KEL(-ER)-E3 KEL-QUICK-E3 KEL(-U) 10 x KEL-QUICK 10 x KEL-ER 10 x	39160	93 mm	83 mm	1
KEL-EMC-PF 16	KEL(-ER)-E4 KEL-QUICK-E4 KEL(-U) 16 x KEL-QUICK 16 x KEL-ER 16 x KEL-DPZ 16 x	39170	113 mm	103 mm	1
KEL-EMC-PF 24	KEL(-ER)-E5 KEL-QUICK-E5 KEL(-U) 24 x KEL-QUICK 24 x KEL-ER 24 x KEL-DPZ 24 x KEL-DPU 24 x	39180	140 mm	130 mm	1
KEL-EMC-PF 183	KEL 183 KEL 183-E	39190	200 mm	95 / 190 mm	1

Product description

The EMC bracket combined with the matching PFS|SKL EMC shield clamp is perfect in conjunction with the KEL cable entry frame for alleviating interferences due to shields.

The EMC clamp is assembled inside the control panel. For this process the fixing screws for the assembly of the KEL frame on the panel are used. A female screw thread M5 is already integrated in the KEL-EMC-PF bracket.

Depending on the cable diameter, the corresponding PFS|SKL EMC shield clamp can be snapped onto the EMC bracket.

Advantages & benefits

- Supports a wide range of cable and wire sizes
- Large surface contact of the cable shield
- Permanent spring pressure on the cable shield
- Fast and easy assembly

Specifications

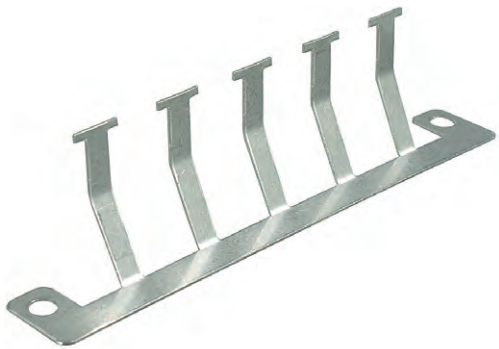
Material Sheet steel, galvanically zinc plated

Compatible with

KEL-U Cable entry frames	12 - 15
KEL-ER Cable entry frames	8 - 11
KEL Cable entry frames	16 - 19
KEL 183 Cable entry frames	26
KEL-QUICK Cable entry frames	60 - 63
KEL-BES Brush frames	82
KEL-DPU Cable entry plates	90 - 91
KEL-DPZ Cable entry plates	92 - 97
PFSZ SKL / PFSZ-M MSKL Shield clamps	136
PFS SKL Shield clamps	137

KEL-EMC

Cable assembly



Product description

Installation of pre-terminated cables without shield interruption.

Advantages & benefits

- Direct, easy and quick contact to the enclosure
- Space saving, usable for up to 10 cables with the two row model
- Alternative to EMC cable glands, even for pre-terminated cables
- Low resistance shield contact

Specifications

Material **Stainless steel**

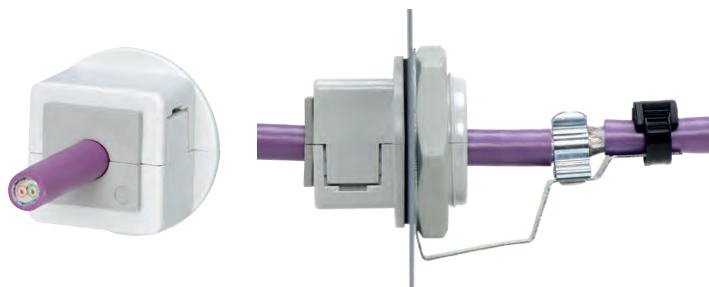
Compatible with

KEL-U Cable entry frames	12 - 15
KEL-ER Cable entry frames	8 - 11
KEL Cable entry frames	16 - 19
KEL-QUICK Cable entry frames	60 - 63
KEL-BES Brush frames	82

Type	Order No.	No. of teeth	Fastening	Fits with	PU
KEL-EMC-B	36520	2	long side	KEL-E2 KEL(-U)-B x KEL-ER-B x KEL-QUICK-B2 B4	5
KEL-EMC 10	36522	3	long side	KEL-E3 KEL(-U) 10 x KEL-ER 10 x	5
KEL-EMC 16 4	36524	4	long side	KEL-E4 KEL(-U) 16 x KEL-ER 16 x KEL-QUICK 16	5
KEL-EMC 24 5	36526	5	long side	KEL-E5 KEL(-U) 24 x KEL-ER 24 x KEL-QUICK 24	5
KEL-EMC F	39110	3	long side	KEL(-U)-B x KEL-ER-B x KEL(-U) 10 x KEL-ER 10 x KEL(-U) 16 x KEL-ER 16 x KEL(-U) 24 x KEL-ER 24 x	5

KVT-EMC

EMC bracket for cable glands



Type	Order No.	Shield diameter	PU
KVT-EMC-25 SKL 1.5-3	37180.1	1.5 - 3 mm	5
KVT-EMC-25 SKL 3-6	37180.2	3 - 6 mm	5
KVT-EMC-25 SKL 6-8	37180.3	6 - 8 mm	5
KVT-EMC-25 SKL 8-11	37180.4	8 - 11 mm	5
KVT-EMC-32 SKL 1.5-3	37181.1	1.5 - 3 mm	5
KVT-EMC-32 SKL 3-6	37181.2	3 - 6 mm	5
KVT-EMC-32 SKL 6-8	37181.3	6 - 8 mm	5
KVT-EMC-32 SKL 8-11	37181.4	8 - 11 mm	5

Product description

The KVT-EMC brackets in combination with the split cable glands KVT and QVT combine routing, EMC shield earthing and strain relief. The connection to the earth potential is possible via the enclosure wall or an earthing tape.

Cables pass through the split cable glands and lead directly into the EMC clamps.

Separate functions (according to regulations) carried out quickly and easily!

Advantages & benefits

- Simple and tool free assembly
- Large contact area
- Subsequent assembly possible
- Additional M5 hole for earthing tape

Specifications

Material Sheet steel, zinc plated

Compatible with

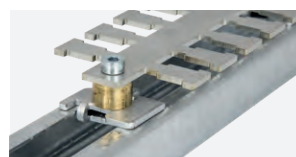
KVT Split cable glands 38 - 46
QVT Split cable glands 64 - 66

KAFM-EMC

EMC Strain relief plates



Type SF: Mounted on snap foot for DIN-rail shape H



Type SC: Mounted on screw-foot for DIN-rail shape C



Type SK: Mounted on screw-foot for DIN-rail shape H

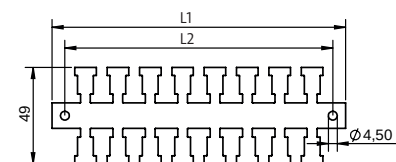


Type DH: Mounted on bushing for flexible fixation on bottom sheet

Product description

The EMC strain relief plate KAFM is practical for earth-interferences on the cable shield.

The cable assembly can be assembled on a mounting plate with screws, with SC foot on DIN-rails shape C or with SF or SK mounting foot on 35 mm DIN-rails shape H.



Specifications

Material **Stainless steel**



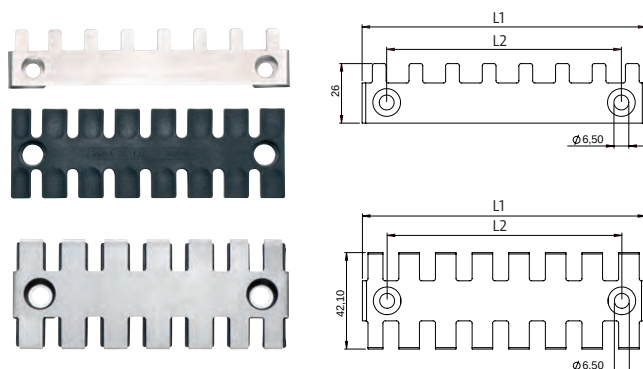
SC-foot with twist protection notch: space-saving design enables high cable density.

Mounting foot adjusts itself when tightening the screw.

Type	Order No. Type SF	Order No. Type SK	Order No. Type SC	Order No. Type DH	Order No. loose rail	Length L1	Length L2	No. of teeth	PU
KAFM 2	36442	36432	36412	36482	36422	50.5	37.5	2	1
KAFM 4	36444	36434	36414	36484	36424	83.5	70.5	4	1
KAFM 6	36446	36436	36416	36486	36426	116.5	103.5	6	1
KAFM 8	36448	36438	36418	36488	36428	149.5	136.5	8	1
KAFM 10	36450	36440	36400	36490	36430	182.5	169.5	10	1
KAFM 16	36452	36470	36465	36460	36530	281.5	268.5	16	1
KAFM 29	36454	36471	36466	36462	36540	494.5	481.5	29	1
KAFM 59	36458	36472	36467	36464	36550	990	978	59	1
KAFM 59 zinc plated	36459	-	-	-	36562	990	978	59	1
SF	36230	Mounting foot loose, for 35 mm DIN-rail shape H							10
SK	36232	Screw-foot loose, for 35 mm DIN-rail shape H							10
SC	36231	Screw-foot loose, for 30 mm DIN-rail shape C (width of mouth: 16–17 mm) with twist protection notch							10
Bushing DH	36234	Distance bushing 8 mm high							10

ZL|SB-EMC

Shield plate for ZL strain relief plates



Type	Model	Order No.	Fits with	Length L1	Length L2	PU
ZL 39 SB-EMC-1	single-row	36322	ZL 39	42 mm	19.5 mm	10
ZL 39 SB-EMC-2	double-row	37150	ZL 39	42 mm	19.5 mm	10
ZL 60 SB-EMC-1	single-row	36328	ZL 60	64 mm	43.5 mm	10
ZL 60 SB-EMC-2	double-row	37152	ZL 60	64 mm	43.5 mm	10
ZL 87 SB-EMC-1	single-row	36324	ZL 87	90 mm	68 mm	10
ZL 87 SB-EMC-2	double-row	37154	ZL 87	90 mm	68 mm	10
ZL 103 SB-EMC-1	single-row	36332	ZL 103	106 mm	84 mm	10
ZL 103 SB-EMC-2	double-row	37156	ZL 103	106 mm	84 mm	10
ZL 121 SB-EMC-1	single-row	36330	ZL 121	124 mm	102.5 mm	10
ZL 121 SB-EMC-2	double-row	37158	ZL 121	124 mm	102.5 mm	10
ZL 140 SB-EMC-1	single-row	36326	ZL 140	142 mm	121 mm	10
ZL 140 SB-EMC-2	double-row	37159	ZL 140	142 mm	121 mm	10

Product description

The shield plates ZL|SB-EMC provide shield earthing in addition to strain relief.

Affix the corresponding shield plates to ZL strain relief plates. The shield plate contacts the cable shield with the earth potential.

The result is a secure low resistance connection between cable shield and earth.

ZL strain relief plates offered separately.

Specifications

Material

Shield plate **Stainless steel**

Compatible with

SF ZL Strain relief plates	123
ZL Strain relief plates	119
ZL-AB Strain relief plates	120

MB

Earthing tapes



Product description

Manufactured with highly flexible E-Cu stranded wires with connecting end pads made of tinned copper strips.

The minimum transition and connecting resistance makes them perfectly suitable for use as earthing tapes.

Earthing Tapes are available with M4, M5, M6, M8 or M10 connections and in some sizes with both connection sizes combined.

Type	Order No.	Length L [mm]	Cross-section mm²	Hole size	PU
MB 100 6 M6	32700	100	6	M6	1
MB 150 6 M6	32701	150	6	M6	1
MB 200 6 M4	32707	200	6	M4	1
MB 200 6 M6	32702	200	6	M6	1
MB 250 6 M6	32706	250	6	M6	1
MB 300 6 M6	32703	300	6	M6	1
MB 400 6 M6	32704	400	6	M6	1
MB 500 6 M6	32705	500	6	M6	1
MB 100 10 M6	32730	100	10	M6	1
MB 100 10 M8	32731	100	10	M8	1
MB 150 10 M5	32709	150	10	M5	1
MB 150 10 M5 + M6	32746	150	10	M5 + M6	1
MB 150 10 M8	32732	150	10	M8	1
MB 200 10 M5	32744	200	10	M5	1
MB 200 10 M6	32733	200	10	M6	1
MB 200 10 M6 + M8	32741	200	10	M6 + M8	1
MB 200 10 M8	32734	200	10	M8	1
MB 250 10 M6 + M8	32742	250	10	M6 + M8	1
MB 300 10 M6	32735	300	10	M6	1
MB 300 10 M6 + M8	32743	300	10	M6 + M8	1
MB 300 10 M8	32736	300	10	M8	1
MB 400 10 M6	32737	400	10	M6	1
MB 400 10 M8	32738	400	10	M8	1
MB 500 10 M6	32739	500	10	M6	1
MB 100 16 M6	32760	100	16	M6	1
MB 100 16 M6 + M8	32758	100	16	M6 + M8	1
MB 100 16 M8	32761	100	16	M8	1
MB 100 16 M10	32759	100	16	M10	1
MB 150 16 M6	32762	150	16	M6	1
MB 150 16 M8	32763	150	16	M8	1
MB 200 16 M6	32764	200	16	M6	1
MB 200 16 M5 + M6	32776	200	16	M5 + M6	1
MB 200 16 M6 + M8	32773	200	16	M6 + M8	1
MB 200 16 M8	32765	200	16	M8	1
MB 250 16 M8	32766	250	16	M8	1
MB 250 16 M6 + M8	32774	250	16	M6 + M8	1

MB

Earthing tapes

Type	Order No.	Length L [mm]	Cross-section mm ²	Hole size	PU
MB 300 16 M6	32767	300	16	M6	1
MB 300 16 M6 + M8	32775	300	16	M6 + M8	1
MB 300 16 M8	32768	300	16	M8	1
MB 350 16 M8	32769	350	16	M8	1
MB 350 16 M5 + M6	32777	350	16	M5 + M6	1
MB 400 16 M6	32873	400	16	M6	1
MB 400 16 M8	32770	400	16	M8	1
MB 500 16 M8	32771	500	16	M8	1
MB 600 16 M8	32772	600	16	M8	1
MB 1000 16 M8	32778	1000	16	M8	1
MB 100 25 M10	32800	100	25	M10	1
MB 150 25 M10	32801	150	25	M10	1
MB 200 25 M8	32802	200	25	M8	1
MB 200 25 M10	32803	200	25	M10	1
MB 250 25 M8	32804	250	25	M8	1
MB 250 25 M10	32805	250	25	M10	1
MB 300 25 M8	32806	300	25	M8	1
MB 300 25 M10	32807	300	25	M10	1
MB 350 25 M10	32808	350	25	M10	1
MB 400 25 M8	32809	400	25	M8	1
MB 500 25 M8	32810	500	25	M8	1
MB 500 25 M10	32812	500	25	M10	1
MB 600 25 M8	32811	600	25	M8	1
MB 800 25 M8	32815	800	25	M8	1
MB 200 35 M10	32823	200	35	M10	1
MB 250 35 M10	32824	250	35	M10	1
MB 300 35 M10	32825	300	35	M10	1
MB 150 50 M10	32847	150	50	M10	1
MB 200 50 M10	32848	200	50	M10	1
MB 250 50 M10	32849	250	50	M10	1
MB 300 50 M10	32850	300	50	M10	1
MB 200 70 M10*	32868	200	70	M10	1
MB 300 70 M10*	32870	300	70	M10	1
MB 500 70 M10*	32872	500	70	M10	1



Connecting end pads (copper)



Advantages & benefits

- Available in a variety of lengths and cross-sections
- Low impedances
- UL 467 listed

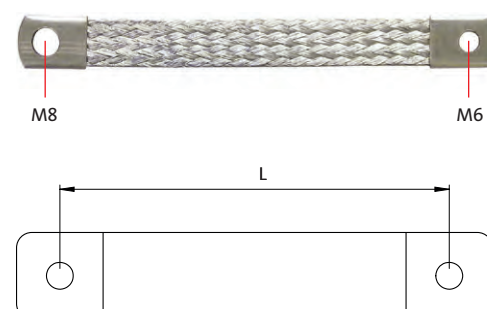
Specifications

Material Cu-ETP with connecting end pads
Pads made of tinned copper strips

Current Load

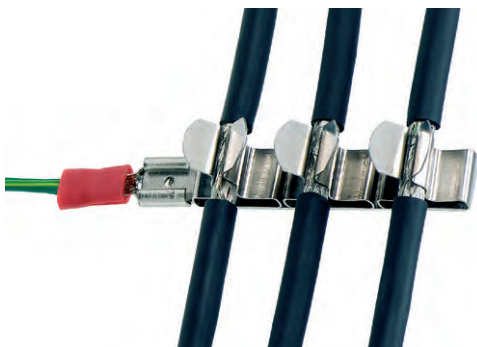
Cross-section:	Current load:
6 mm ²	67 – 80 A
10 mm ²	89 – 106 A
16 mm ²	132 – 157 A
25 mm ²	177 – 210 A
35 mm ²	230 – 275 A
50 mm ²	280 – 350 A
70 mm ²	338 – 403 A

4.1



EMC

Customised solutions



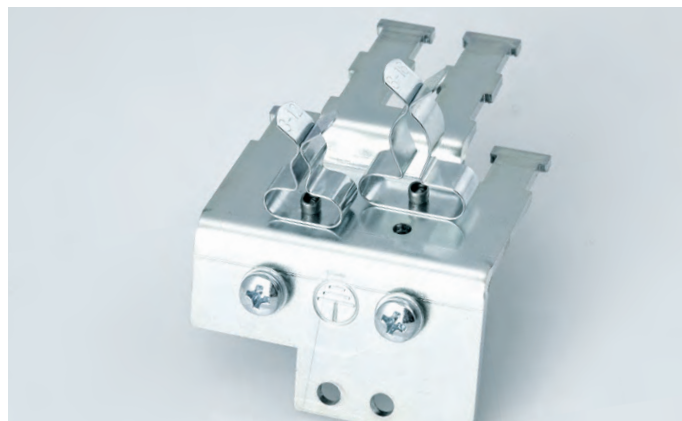
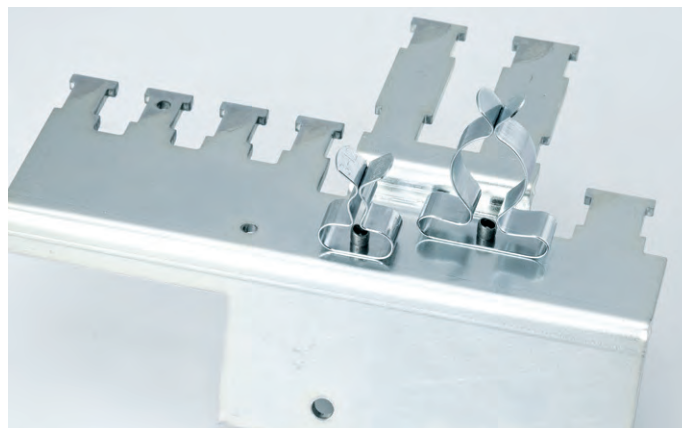
Product description

In addition to our standard product offering we offer customised solutions for your application – even for small quantities!

A wide range of standard clamp assemblies are already available (see pages 156 - 159).

If a standard EMC clamp assembly is not practicable in your case, a custom designed carrier for shield clamps can be supplied.

We look forward to sharing our ideas and custom EMC solutions with you.

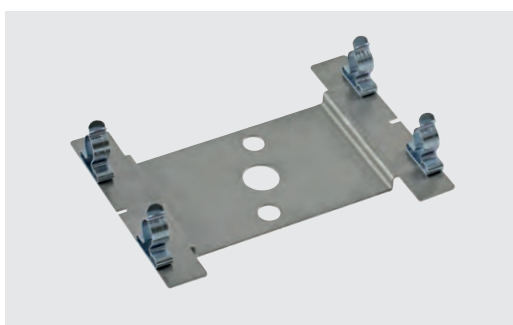
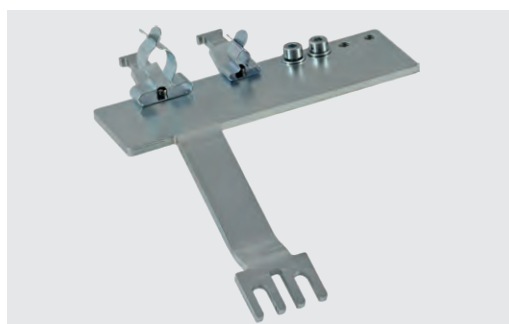
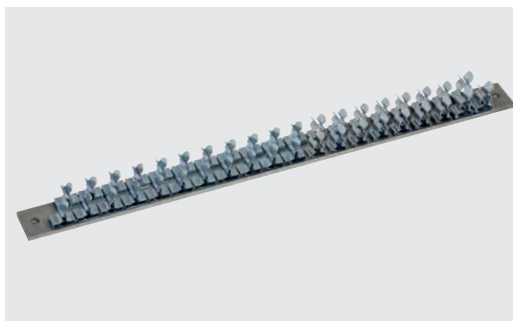
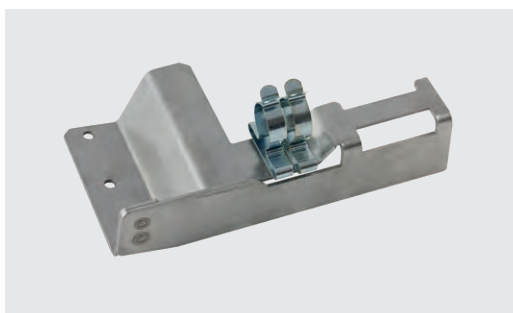


Advantages & benefits

- Supply of custom designed carriers for SKL shield clamps
- Cost-effective even for small quantities
- Available for a wide range of cable diameters

EMC

Customised solutions



4.2 EMC cable entry systems

Solutions for conducted and field-bound disturbances



The industrial process technology demands increasing security against disturbances for electrical MCR facilities (measure, control, regulate). Special emphasis is being placed on the derivation of electromagnetic interference. A distinction is made between screening-related and field-related disturbances.

Screening-related interference is being transmitted directly from the source of interference to the cable shield of the supply or signal leads and then to the susceptible device. All capacitive and inductive influences of electrical or magnetic fields are called **field bound disturbances**. The field bound disturbances are being transferred, for example as a cable's electromagnetic field, from the source of interference to the susceptible device and received there, for instance, by a head acting as an antenna.

A large contact area of the cable shield for the derivation of the interference to a conductive housing wall combined with the shielding of the housing interior generally offers a good solution for both types of interference.

In case of conducted as well as field bound EMC disturbances, our cable entry system offers an effective way to divert and block those disturbances.

The key feature of icotek's system is the split frame and split grommets which provide quick, convenient and cost effective routing of pre-terminated and multi-conductor cables, hoses and conduits. The split frame and split grommets alleviate the need to cut and re-wire pre-terminated cables. Therefore, cable warranties are unaffected.



▲ Space saving icotek solution:
EMC cable entry frame
EMC-KEL-U 24|10

◀ normal EMC cable glands

Chapter content 4.2



EMC Cable entry frames

EMC-KEL-DS

170 – 171



EMC Split cable gland

EMC-KVT-DS

172 – 173



EMC Cable entry frames

EMC-KEL

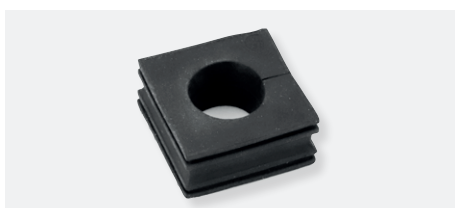
174 – 175



EMC grommets, small

EMC-KT

176



EMC grommets, large

EMC-KT

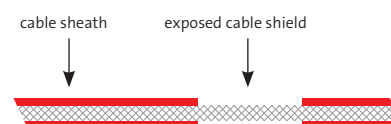
177

Test results

Conducted and field-bound disturbances

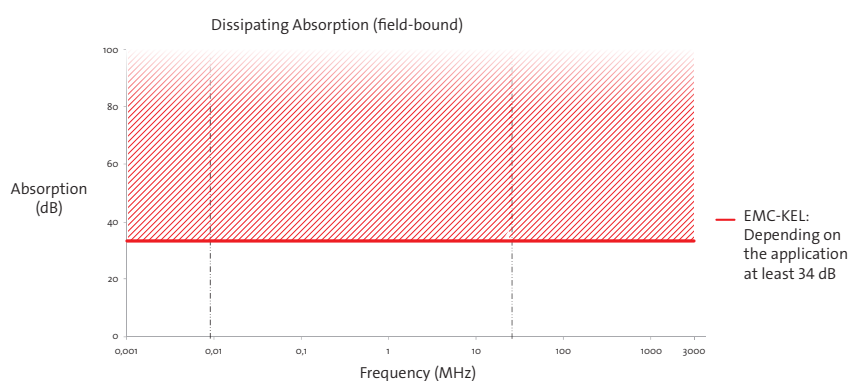
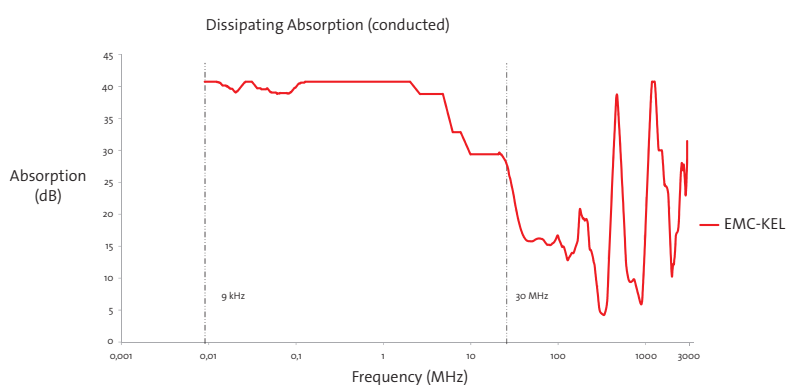
Conducted disturbances

The EMC-KEL shows during cable-bound disruptions stable attenuation values up to 40 dB in the frequency ranges from 9 kHz to 30 MHz.



Field-bound disturbances

Regarding the field-bound disturbances and depending on the application, in the relevant frequency ranges up to 3 GHz constant measurements of at least 34 dB have been achieved. Below the attenuation range, the curve falls only at extreme high frequencies above 3 GHz.



EMC-KEL-DS

EMC Cable entry frames

Product description

The EMC cable entry frame EMC-KEL-DS has been metallised (galvanise coated) to create a conductive surface.

The front cable grommet (A) is used for strain relief and cable sealing on the cable jacket. The cable shield is contacted over 360° via the rear conductive grommet (B).

The contact between the EMC-KEL-DS and the conductive housing wall is realized via the included conductive flat gasket.

Advantages & benefits

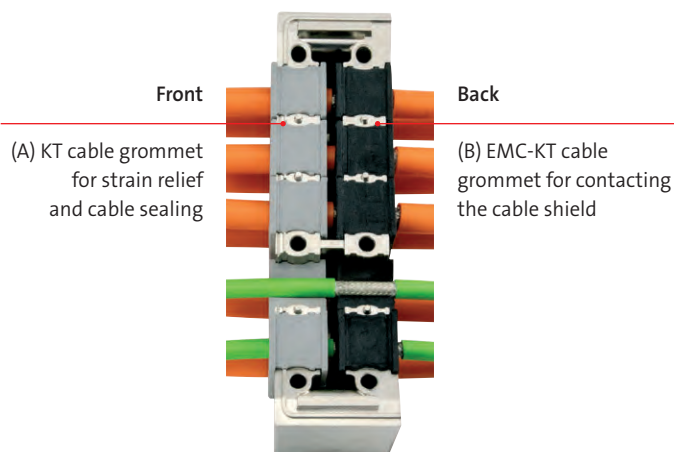
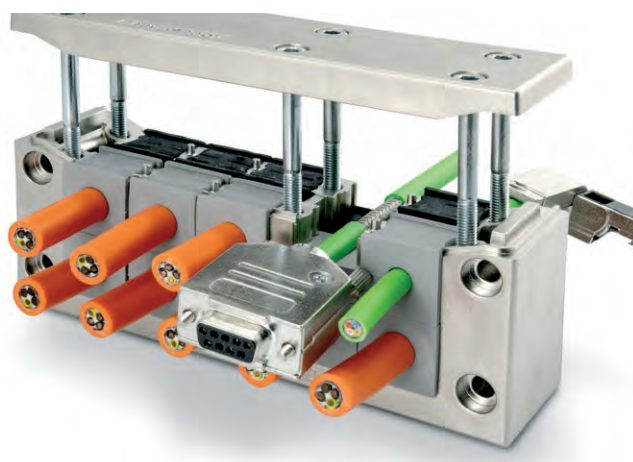
- Perfect for already pre-terminated cables. The connector does not have to be removed for wiring
- Strain relief and sealing are separated from the EMC contact
- Both conducted and field-bound disturbances are reliably diverted
- Very attractive and scratch-resistant surface
- Contacting the cable shield over 360°
- EMC grommets made entirely from conductive elastomer
- Very good dissipation values
- Very good shielding effect with regard to EMC tightness
- Integrated strain relief
- Protection class IP55

Specifications

Material	Polyamide, highly conductive coating
Flame class	acc. to UL 94 HB
Temperature	-40°C to + 140°C
Properties	Halogen free, silicone free
Frame depth	40 mm
IP rating	IP55

Accessories

EMC-KT grommets	176 - 177
KT grommets	48 - 52



EMC-KEL-DS

EMC Cable entry frames



IP55

Description

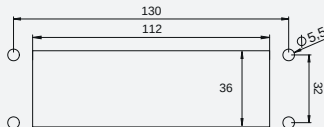
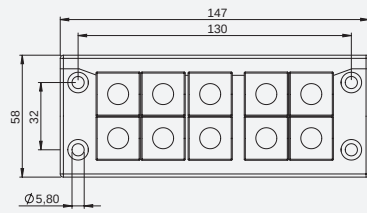
Cut-out | Drilling template

Type

Order No.

Cut-out
mmKT Grommets
small | largeEMC
grommets
small | large

PU



EMC-KEL-DS 24|10

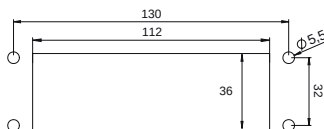
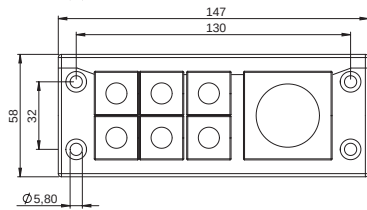
99410

112 × 36 mm

10 | –

10 | –

1



EMC-KEL-DS 24|7

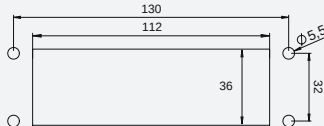
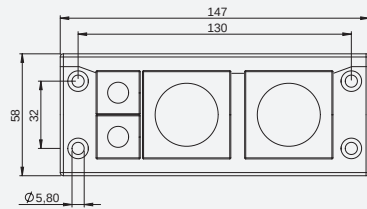
99411

112 × 36 mm

6 | 1

6 | 1

1



EMC-KEL-DS 24|4

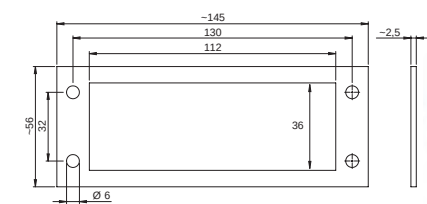
99412

112 × 36 mm

2 | 2

2 | 2

1



EMC gasket
size 24
conductive gasket
for EMC-KEL-DS

98047

112 × 36 mm

–

–

1



EMC-KVT-DS

EMC Split cable gland

Product description

The split cable gland EMC-KVT-DS is based on the standard icotek KVT product. However, the EMC-KVT-DS has been metallised (galvanise coated) to create a conductive surface.

The first cable grommet (KT small) is used for strain relief and cable sealing on the cable jacket. The second grommet (EMC-KT small) contacts the cable shield at a full 360 degrees.

The conductive flat gasket included in the scope of delivery makes contact between the cable gland and the conductive housing wall. The EMC-KVT-DS can thus be fixed using a plastic lock nut. Alternatively, an additional contact to the metal wall can be made using a special EMC lock nut.

Advantages & Benefits

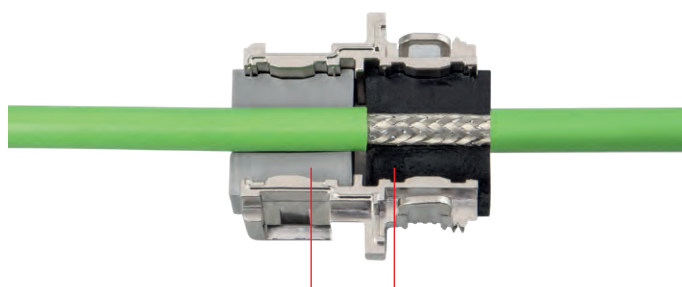
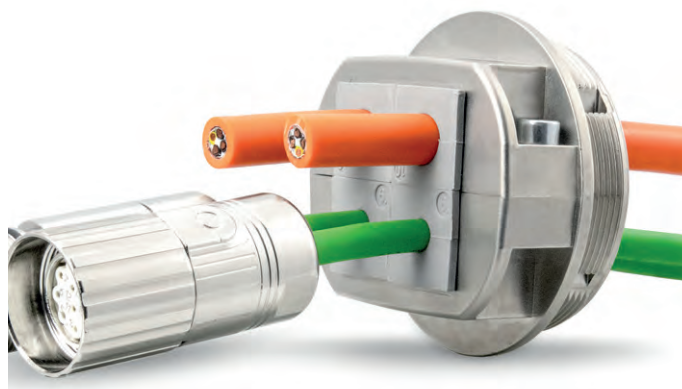
- Perfect for already pre-terminated cables. The connector does not have to be removed for wiring
- Strain relief and sealing are separated from the EMC contact
- Both conducted and field-bound disturbances are reliably diverted
- Very attractive and scratch-resistant surface
- Contacting the cable shield over 360°
- EMC grommets made entirely from conductive elastomer
- Very good dissipation values
- Very good shielding effect with regard to EMC tightness
- Integrated strain relief
- Protection class IP55

Specifications

Material	Plastic, highly conductive coating
EMC locknut	Nickel-plated brass
Flame class	acc. to UL 94 HB
Temperature	-40°C to +90°C
Properties	Halogen free, silicone free
IP rating	IP55

Accessories

KT grommets	48 - 52
EMC-KT grommets	176 - 177
KGM	224 - 225



Front Back
(A) KT cable grommet for strain relief and cable sealing
(B) EMC-KT cable grommet for contacting the cable shield



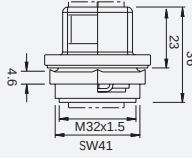
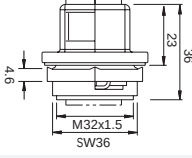
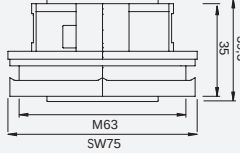
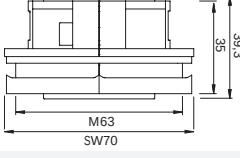
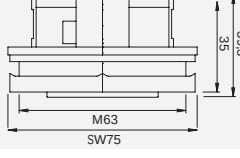
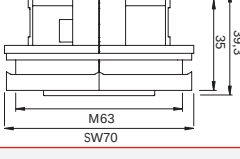
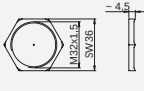
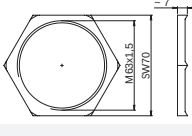
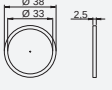
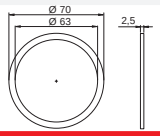
EMC locknut

EMC-KVT-DS

EMC Split cable gland



IP55

Description	Type	Order No.	KT Grommets small large	EMC grommets small large	Thread Thread length	PU
	EMC-KVT-DS 32 with plastic lock nut KGM 32	99431	1 –	1 –	M32 x 1.5 Length 14 mm	5
	EMC-KVT-DS 32 with EMC lock nut EMC-GM 32 Nickel-plated brass	99432	1 –	1 –	M32 x 1.5 Length 14 mm	5
	NEW EMC-KVT-DS 63 1 with plastic lock nut KGM 63	99434	– 1	– 1	M63 x 1.5 Length 14 mm	1
	NEW EMC-KVT-DS 63 1 with EMC lock nut EMC-GM 63 Nickel-plated brass	99435	– 1	– 1	M63 x 1.5 Length 14 mm	1
	NEW EMC-KVT-DS 63 4 with plastic lock nut KGM 63	99436	4 –	4 –	M63 x 1.5 Length 14 mm	1
	NEW EMC-KVT-DS 63 4 with EMC lock nut EMC-GM 63 Nickel-plated brass	99437	4 –	4 –	M63 x 1.5 Length 14 mm	1
	EMC-GM 32 EMC lock nut M32 for EMC-KVT-DS 32 Nickel-plated brass	99557	–	–	–	5
	NEW EMC-GM 63 EMC lock nut M63 for EMC-KVT-DS 63 Nickel-plated brass	99558	–	–	–	1
	NEW EMC gasket 32 conductive gasket for EMC-KVT-DS 32	99555	–	–	–	1
	NEW EMC gasket 63 conductive gasket for EMC-KVT-DS 63	99556	–	–	–	1

4.2

EMC-KEL

EMC Cable entry frames

Product description

The EMC cable entry frames EMC-KEL are based on the KEL-U and KEL-E. Due to a conductive surface, disturbances in the cable shields on the control cabinet can be easily dissipated. Field bound disturbances are derived by the metallisation.

The cable entry system is easy to install. Cable grommets are placed into compartments and are securely fixed to the frame during assembly.

The EMC-KEL-U frames match exactly the cut-out dimensions for 16- and 24-pin standard industrial connectors. Either a cut-out of 36 mm or 46 mm in height can be chosen depending on the cables being routed.

The single-row versions EMC-KEL-E are particularly suited for flat connectors. The small frames are ideal for applications with limited space.

Between the EMC-KEL and the metal wall a conductive flat gasket (included) is mounted. The flange surface on the metal wall must be free of paint.



Advantages & Benefits

- Both conducted and field-bound disturbances can be reliably diverted
- Very attractive and scratch-resistant surface
- Contacting the cable shield over 360°
- Grommets made entirely from conductive elastomer
- High cable density
- Very good dissipation values
- Very good shielding effect with regard to EMC tightness



Specifications

Material	Polyamide, highly conductive coating
Flame class	UL 94 HB
Temperature	-40°C to +140°C
Properties	Halogen free, silicone free
Frame depth	17 mm

Accessories

EMC-KT grommets	176 - 177
-----------------	-----------



EMC-KEL

EMC Cable entry frames



Description	Cut-out	Type	Order No.	Cut-out	Grommets EMC-KT small large	PU
		EMC-KEL-U 24 10	99400	36 × 112 mm	10 –	1
		EMC-KEL-U 24 4	99401	36 × 112 mm	2 2	1
		EMC-KEL-U 16 8	99402	36 × 86 mm	8 –	1
		EMC-KEL-E3	99420	24 × 65 mm	3 –	1
		EMC-KEL-E5	99422	24 × 112 mm	5 –	1
		EMC gasket size 24, conductive gasket for EMC-KEL-U 24 10, EMC-KEL-U 24 4	99550	36 × 112 mm	–	1

EMC-KT

EMC grommets



Product description

The cable grommets type EMC-KT are made of a very conductive elastomer. Thus, faults are dissipated from the cable shield directly via the grommet, a frame and the flat gasket. This ensures full-area protection against field-bound interference!

Assembly

When installing the grommets, the flat side should be facing the middle of the frame. This allows the flat sides of adjacent grommets to match up and provide a secure seal.

Specifications

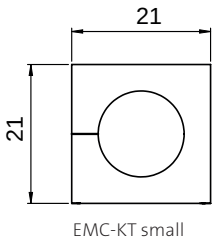
Material	Elastomer, conductive
Flame class	in accordance with UL94-HB
Colour	black
Temperature	-30°C to +80°C
Properties	Halogen free, silicone free

Accessories

ST Plugs 53

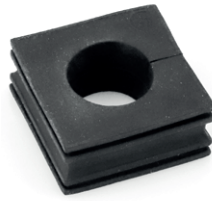
KT grommets can be found on pages 48 – 52.

Description	Type	Ordner No.	Clamping range	PU
  	EMC-BTK	99473	blank grommet	5
	EMC-KT 3	99460	3 - 4 mm	5
	EMC-KT 4	99461	4 - 5 mm	5
	EMC-KT 5	99462	5 - 6 mm	5
	EMC-KT 6	99463	6 - 7 mm	5
	EMC-KT 7	99464	7 - 8 mm	5
	EMC-KT 8	99465	8 - 9 mm	5
	EMC-KT 9	99466	9 - 10 mm	5
	EMC-KT 10	99467	10 - 11 mm	5
	EMC-KT 11	99468	11 - 12 mm	5
	EMC-KT 12	99469	12 - 13 mm	5
	EMC-KT 13	99470	13 - 14mm	5
	EMC-KT 14	99471	14 - 15 mm	5
	EMC-KT 15	99472	15 - 16 mm	5



EMC-KT

EMC grommets



IP54

Product description

The cable grommets type EMC-KT are made of a very conductive elastomer. Thus, faults are dissipated from the cable shield directly via the grommet, the frame and the flat gasket. This ensures full-area protection against field-bound interference!

Assembly

When installing the grommets, the flat side should be facing the middle of the frame. This allows the flat sides of adjacent grommets to match up and provide a secure seal.

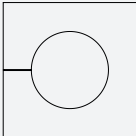
Specifications

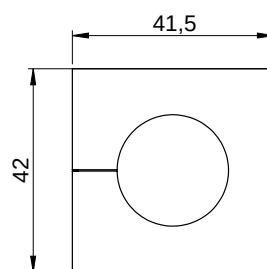
Material	Elastomer, conductive
Flame class	in accordance with UL94-HB
Colour	black
Temperature	-30°C to +80°C
Properties	Halogen free, silicone free

Accessories

ST Plugs 53

KT grommets can be found on pages 48 – 52.

Description	Type	Ordner No.	Clamping range	PU
	EMC-BTG	99495	blank grommet	5
	EMC-KT 16	99475	16 - 17 mm	5
	EMC-KT 17	99476	17 - 18 mm	5
	EMC-KT 18	99477	18 - 19 mm	5
	EMC-KT 19	99478	19 - 20 mm	5
	EMC-KT 20	99479	20 - 21 mm	5
	EMC-KT 21	99480	21 - 22 mm	5
	EMC-KT 22	99481	22 - 23 mm	5
	EMC-KT 23	99482	23 - 24 mm	5
	EMC-KT 24	99483	24 - 25 mm	5
	EMC-KT 25	99484	25 - 26 mm	5
	EMC-KT 26	99485	26 - 27 mm	5
	EMC-KT 27	99486	27 - 28 mm	5
	EMC-KT 28	99487	28 - 29 mm	5
	EMC-KT 29	99488	29 - 30 mm	5
	EMC-KT 30	99489	30 - 31 mm	5
	EMC-KT 31	99490	31 - 32 mm	5
	EMC-KT 32	99491	32 - 33 mm	5



EMC-KT large

Assembly possibilities

	Var. 1	Var. 2	Var. 3	Var. 4	Var. 5
Outside	EMC-KEL	EMC-KEL	EMC-KEL	KEL-ER (U)	EMC-KEL
Inside	–	–	KEL-EMC-PFM	EMC-KEL	–
EMC: conducted	–	✓	✓	✓	**
EMC: field-bound	✓	✓	✓	✓	–
IP rating	IP54	not defined	IP54	IP66 (IP54)	not defined
Strain relief	✓	–	✓	✓	*

* Standard KT grommets only

** EMC-KT grommets only

Field-bound disturbances with strain relief

The EMC cable entry frame (EMC-KEL) is screwed to the outside of the housing.
The cable shield is not exposed.



Conducted and field-bound disturbances

The EMC cable entry frame (EMC-KEL) is screwed to the outside of the housing. The cable shield is exposed in the area of the cable grommets.

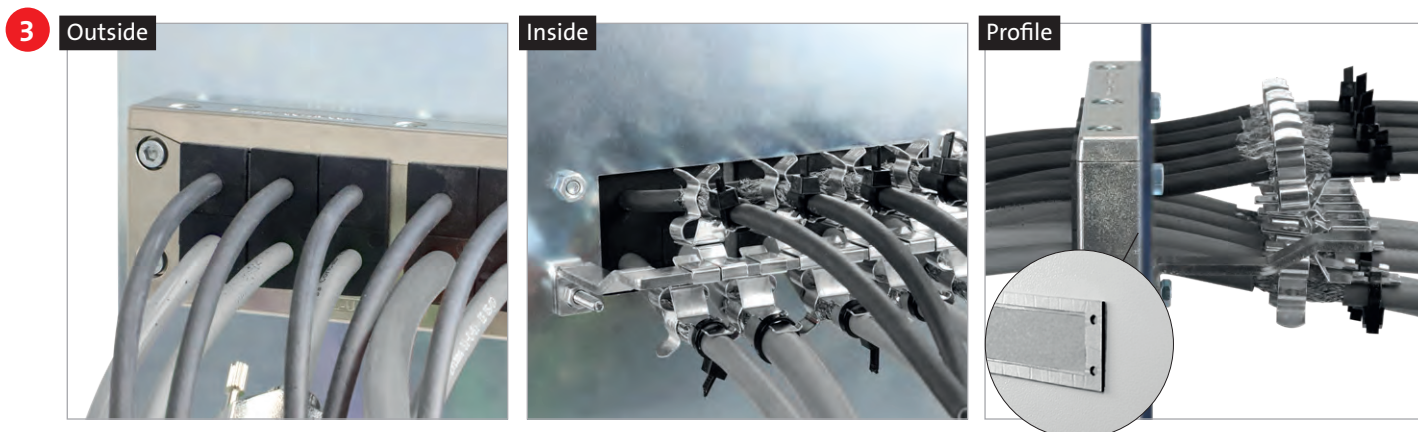


Assembly possibilities

Conducted and field-bound disturbances with strain relief

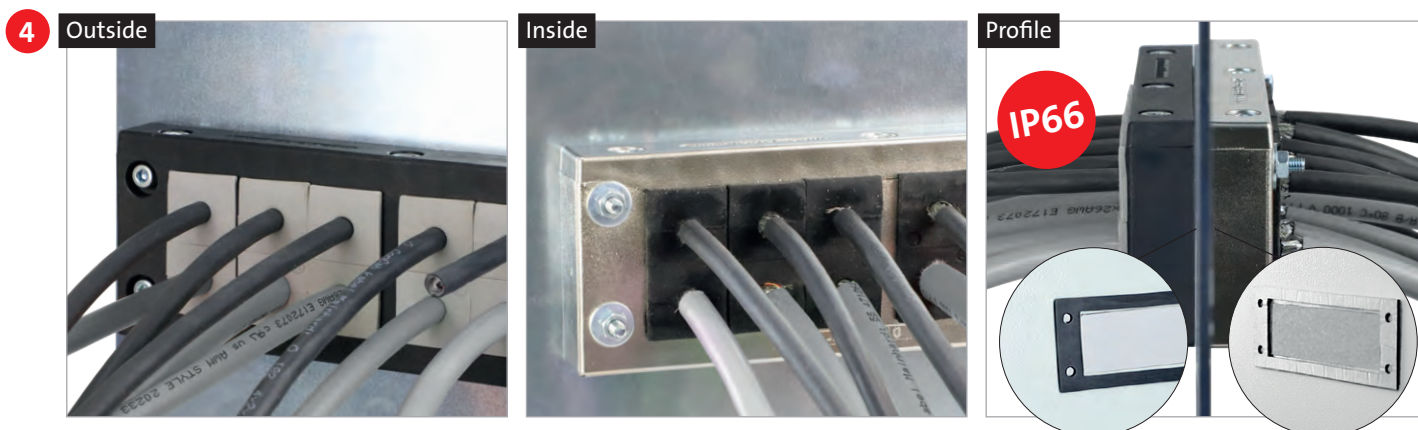
The EMC cable entry frame (EMC-KEL) is screwed to the outside of the housing.

Inside the housing, the EMC bracket KEL-EMC-PFM is mounted and the exposed cable shield is placed.



Conducted and field-bound disturbances with strain relief and IP66

A cable entry frame (e.g., KEL-ER or KEL-U) is bolted to the outside of the housing. Inside the housing, the EMC cable entry frame (EMC-KEL) is mounted and the cable shield is exposed in the area of the cable grommets.



Conducted disturbances with single strain relief

The EMC cable entry frame (EMC-KEL) is screwed to the outside of the housing.

The cable shield is exposed in the area of the cable grommets. It's possible to use different grommets (KT & EMC-KT).



5 CONFiX™ Cable conduit system



The 90° angled conduit fitting CONFiX FWS is perfect for installation of parallel corrugated cable protection conduits, e.g. in machines, control panels or control cabinets. The liftable cover is tightly fixed by a hinge to the mounting box. Therefore, the system is very easy to handle.

Corrugated conduits CONFiX WS for cable routing are used where cables have to be protected from mechanical damage or certain weather conditions.

In addition, icotek offers split corrugated conduits CONFiX WST for routing pre-terminated cables and corresponding conduit clips CONFiX SH.

Advantages & benefits

1. Fast and easy assembly

The liftable cover of the bulkhead fitting CONFiX FWS is tightly fixed by a hinge to the mounting box. The system is therefore very easy to mount.

2. Easy to maintain

The split version of the corrugated conduits CONFiX WST offers the possibility of routing standard or pre-terminated cables in harsh environments.

3. Flexible

The corrugated conduits CONFiX WS can be used for various applications, depending on the material. UV resistant polyamide conduits for high mechanical requirements (indoor and outdoor use), polypropylene conduits with high resistance against acids / alkalis.

5

CONFiX™ FWS Assembly

Installation of CONFiX FWS is quick and easy:

1. Use top screw(s) to mount the FWS
2. Insert conduit
3. Secure and complete installation with two side screws

1



Fix

2



Insert

3



Lock

Chapter content 5



Bulkhead fittings, split | IP54
for conduit screw connections /
direct conduit pickup

CONFiX FWS

182 – 183



Corrugated conduits
NW 7.5 - NW 50

CONFiX WS

184 – 185



Corrugated conduits, split
for cables with connectors
NW 10 - NW 70

CONFiX WST

186



Conduit clips
for split corrugated conduits CONFiX WST

CONFiX SH

187

CONFIX™ FWS-A

Bulkhead fittings
for conduit screw connections



Metric internal thread for
conduit screw connections

Product description

The 90° angled conduit fitting CONFIX FWS is for installation of parallel corrugated cable protection conduits, e.g. in machines, control panels or control cabinets.

The liftable cover is tightly fixed by a hinge. Therefore, the system is fast and easy to install.

CONFIX FWS is offered in the following versions:

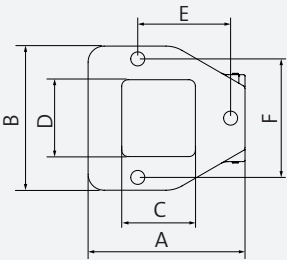
- CONFIX FWS-A with metric internal thread M16 to M50
- CONFIX FWS-B with a grooved conduit clip for types with sizes NW 13, 17, 23, 29, 37 and 50.

The available colours are grey (RAL 7011) and black (RAL 9005).

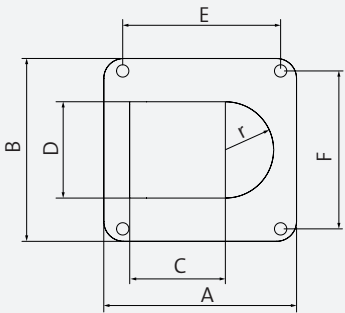
Accessories

CONFIX WS conduits 184 – 185

Type	Internal Thread	Hole Ø [mm]	Size (A × B) [mm]	Cut-out (C × D) [mm]	Drill. Templ. (E × F) [mm]	Order No.	PU
CONFIX FWS-A 16	M16 × 1.5	3 × 4.3	49 × 45	22 × 22.6	29 × 37	■ 31381	10
						■ 31380	
CONFIX FWS-A 20	M20 × 1.5	3 × 4.3	49 × 45	22 × 22.6	29 × 37	■ 31384	10
						■ 31383	
CONFIX FWS-A 25	M25 × 1.5	3 × 6.6	67 × 63	37 × 28	41.5 × 51.5	■ 31387	10
						■ 31386	
CONFIX FWS-A 32	M32 × 1.5	4 × 6.6	85.5 × 76	41.9 × 40 r = 20	64.5 × 64.5	■ 31390	10
						■ 31389	
CONFIX FWS-A 40	M40 × 1.5	4 × 6.6	97 × 92	48.3 × 48.4 r = 24.2	79.5 × 79.5	■ 31393	5
						■ 31392	
CONFIX FWS-A 50	M50 × 1.5	4 × 6.6	111.5 × 100.5	53 × 60.5 r = 30.25	87.5 × 87.5	■ 31396	5
						■ 31395	



Size / Drilling template
FWS-A 16 to 25



Size / Drilling template
FWS-A 32 to 50

CONFIX™ FWS-BBulkhead fittings
for direct conduit pickup

Grooved conduit clip



Fixed cover due to hinges

IP54



Advantages & benefits

- Hinged cover
- Fast and easy installation
- Functional design
- Protection class IP54

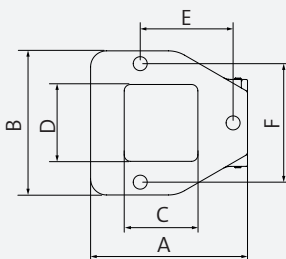
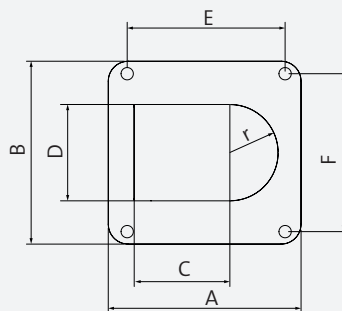
Specifications

Material	Polycarbonate (PC)
Colour	■ grey (RAL 7011) ■ black (RAL 9005)
IP rating	IP54
Flame class	UL94-Vo, self-extinguishing
Temperature	-30°C to +100°C (static)
Properties	Halogen free, silicone free

Accessories

CONFIX WS conduits 184 – 185

Type	Dimension*	Hole Ø [mm]	Size (A × B) [mm]	Cut-out (C × D) [mm]	Drill. Templ. (E × F) [mm]	Order No.	PU
CONFIX FWS-B 11	NW 13	3 × 4.3	49 × 45	22 × 22.6	29 × 37	■ 31411 ■ 31410	10
CONFIX FWS-B 16	NW 17	3 × 4.3	49 × 45	22 × 22.6	29 × 37	■ 31414 ■ 31413	10
CONFIX FWS-B 21	NW 23	3 × 6.6	67 × 63	37 × 28	41.5 × 51.5	■ 31417 ■ 31416	10
CONFIX FWS-B 29	NW 29	4 × 6.6	85.5 × 76	41.9 × 40 r = 20	64.5 × 64.5	■ 31420 ■ 31419	10
CONFIX FWS-B 36	NW 37	4 × 6.6	97 × 92	48.3 × 48.4 r = 24.2	79.5 × 79.5	■ 31423 ■ 31422	5
CONFIX FWS-B 48	NW 50	4 × 6.6	111.5 × 100.5	53 × 60.5 r = 30.25	87.5 × 87.5	■ 31426 ■ 31425	5

Size / Drilling template
FWS-B 11 to 21Size / Drilling template
FWS-B 29 to 48

* For parallel corrugated cable protection conduit with dimension (NW)

CONFIX™ WS

Corrugated conduits



Compatible with CONFiX FWS-B

Product description

Parallel corrugated conduits for cable routing are used where cables have to be protected from mechanical damage or certain weather conditions.

icotek provides conduits in sizes NW 7.5, 8.5, 10, 13, 17, 23, 29, 37, and 50. Conduits from size NW 13 can be mounted with CONFiX FWS bulkhead fittings.

Parallel corrugated conduits are available in 3 different versions:

- **CONFIX WS-PA:** Polyamide conduit for high mechanical requirements (e.g. engine compartments, car bodies, construction machines, ship building, rail transportation technology, switch cabinets).
→ Suitable for ground installation
- **CONFIX WS-PAL (light):** Polyamide conduit for high mechanical requirements
→ Suitable for suspended installation
- **CONFIX WS-PP:** Polypropylene conduit for use in engine compartments, car bodies and for static installation at machinery and plant engineering.
→ Advantages: Cost-effective, flame class UL94-V2, temperature resistant, resistant to chemicals

Type	External Ø	Internal Ø	Compatible with:	Order No.	PU (Length)
CONFIX WS-G-PA-NW 7.5	Ø 10 mm	Ø 6.7 mm	-	■ 31550	50 m
CONFIX WS-B-PA-NW 7.5	Ø 10 mm	Ø 6.7 mm	-	■ 31570	50 m
CONFIX WS-G-PA-NW 8.5	Ø 11.7 mm	Ø 8.4 mm	-	■ 31552	50 m
CONFIX WS-B-PA-NW 8.5	Ø 11.7 mm	Ø 8.4 mm	-	■ 31572	50 m
CONFIX WS-G-PA-NW 10	Ø 13 mm	Ø 9.9 mm	-	■ 31554	50 m
CONFIX WS-B-PA-NW 10	Ø 13 mm	Ø 9.9 mm	-	■ 31574	50 m
CONFIX WS-G-PA-NW 13	Ø 15.8 mm	Ø 12.7 mm	CONFIX FWS-B 11	■ 31556	50 m
CONFIX WS-B-PA-NW 13	Ø 15.8 mm	Ø 12.7 mm	CONFIX FWS-B 11	■ 31576	50 m
CONFIX WS-G-PA-NW 17	Ø 21.2 mm	Ø 16.6 mm	CONFIX FWS-B 16	■ 31558	50 m
CONFIX WS-B-PA-NW 17	Ø 21.2 mm	Ø 16.6 mm	CONFIX FWS-B 16	■ 31578	50 m
CONFIX WS-G-PA-NW 23	Ø 28.3 mm	Ø 23.2 mm	CONFIX FWS-B 21	■ 31560	50 m
CONFIX WS-B-PA-NW 23	Ø 28.3 mm	Ø 23.2 mm	CONFIX FWS-B 21	■ 31580	50 m
CONFIX WS-G-PA-NW 29	Ø 34.5 mm	Ø 29 mm	CONFIX FWS-B 29	■ 31562	25 m
CONFIX WS-B-PA-NW 29	Ø 34.5 mm	Ø 29 mm	CONFIX FWS-B 29	■ 31582	25 m
CONFIX WS-G-PA-NW 37	Ø 42.4 mm	Ø 36 mm	CONFIX FWS-B 36	■ 31564	25 m
CONFIX WS-B-PA-NW 37	Ø 42.4 mm	Ø 36 mm	CONFIX FWS-B 36	■ 31584	25 m
CONFIX WS-G-PA-NW 50	Ø 54 mm	Ø 47.7 mm	CONFIX FWS-B 48	■ 31566	25 m
CONFIX WS-B-PA-NW 50	Ø 54 mm	Ø 47.7 mm	CONFIX FWS-B 48	■ 31586	25 m

CONFIX™ WS

Corrugated conduits



Type	External Ø	Internal Ø	Compatible with:	Order No.	PU (Length)
CONFIX WS-B-PAL-NW 7.5	Ø 10 mm	Ø 6.7 mm	-	■ 31590	50 m
CONFIX WS-B-PAL-NW 8.5	Ø 11.5 mm	Ø 8.5 mm	-	■ 31592	50 m
CONFIX WS-B-PAL-NW 10	Ø 13.2 mm	Ø 10.1 mm	-	■ 31594	50 m
CONFIX WS-B-PAL-NW 13	Ø 16 mm	Ø 13 mm	CONFIX FWS-B 11	■ 31596	50 m
CONFIX WS-B-PAL-NW 17	Ø 21.2 mm	Ø 17.1 mm	CONFIX FWS-B 16	■ 31598	50 m
CONFIX WS-B-PAL-NW 23	Ø 28.4 mm	Ø 23.5 mm	CONFIX FWS-B 21	■ 31600	50 m
CONFIX WS-B-PAL-NW 29	Ø 34.5 mm	Ø 29.4 mm	CONFIX FWS-B 29	■ 31602	25 m
CONFIX WS-B-PAL-NW 37	Ø 42.2 mm	Ø 36.7 mm	CONFIX FWS-B 36	■ 31604	25 m
CONFIX WS-B-PAL-NW 50	Ø 54 mm	Ø 48.1 mm	CONFIX FWS-B 48	■ 31606	25 m

CONFIX WS-B-PP-NW 7.5	Ø 9.9 mm	Ø 6.9 mm	-	■ 31610	50 m
CONFIX WS-B-PP-NW 8.5	Ø 11.6 mm	Ø 8.5 mm	-	■ 31612	50 m
CONFIX WS-B-PP-NW 10	Ø 12.7 mm	Ø 10.1 mm	-	■ 31614	50 m
CONFIX WS-B-PP-NW 13	Ø 15.8 mm	Ø 12.9 mm	CONFIX FWS-B 11	■ 31616	50 m
CONFIX WS-B-PP-NW 17	Ø 21 mm	Ø 16.8 mm	CONFIX FWS-B 16	■ 31618	50 m
CONFIX WS-B-PP-NW 23	Ø 28 mm	Ø 23.7 mm	CONFIX FWS-B 21	■ 31620	50 m
CONFIX WS-B-PP-NW 29	Ø 33.9 mm	Ø 29.3 mm	CONFIX FWS-B 29	■ 31622	25 m
CONFIX WS-B-PP-NW 37	Ø 42 mm	Ø 36.7 mm	CONFIX FWS-B 36	■ 31624	25 m
CONFIX WS-B-PP-NW 50	Ø 53.6 mm	Ø 47.8 mm	CONFIX FWS-B 48	■ 31626	25 m

* For parallel corrugated cable protection conduit with dimension (NW)

Specifications WS-PA

Material	Polyamide (PA)
Colour	■ black ■ grey
Flame class	UL94-HB
Temperature	-40°C to +120°C
Properties	Halogen free, UV resistant, according to EN ISO 8580

Specifications WS-PAL

Material	Polyamide (PA)
Colour	■ black
Flame class	UL94-HB
Temperature	-40°C to +120°C
Properties	Halogen free, UV resistant according to EN ISO 8580

Specifications WS-PP

Material	Polypropylene (PP)
Colour	■ black
Flame class	UL94-V2, self-extinguishing
Temperature	-40°C to +135°C
Properties	Halogen free, high resistance against acids / alkalis

Compatible with

CONFIX FWS Bulkhead fitting 182 – 183

CONFiX™ WST

Split corrugated conduits



Individual lengths are possible!

Product description

The CONFiX WST is a two piece corrugated conduit. Perfect for routing cables with or without connectors in rough environments.

In conjunction with e.g. KVT-W90, a high degree of flexibility is achieved. Numerous conduit sizes can be used thanks to the wide variety of split grommets offered (see KT grommets on pages 44 - 46).

The length of the CONFiX WST split corrugated conduit can be customized to your application. All conduits are available by the meter (0.5 m steps).

Advantages & benefits

- Containing pre-terminated cables, warranty of cable remains
- Retrofitting and maintenance carried out easily and quickly

Type	Order No.	Internal diameter	External diameter	Compatible grommets	Compatible with CONFiX FWS-B	Dimensions	Ring length*	Bending radius (static)
CONFiX WST NW 10	31200	8.4 mm	13.4 mm	KT 13	—	NW 10	50 m*	25 mm
CONFiX WST NW 14	31210	12.5 mm	18.5 mm	KT 18	31411 31410	NW 14	50 m*	35 mm
CONFiX WST NW 16	31215	16 mm	21.5 mm	KT 22	31414 31413	NW 16	50 m*	40 mm
CONFiX WST NW 20	31220	19.2 mm	25.30 mm	KT 25	—	NW 20	50 m*	45 mm
CONFiX WST NW 23	31230	23.4 mm	30.8 mm	KT 30	31417 31416	NW 23	50 m*	50 mm
CONFiX WST NW 29	31235	27.3 mm	35.5 mm	KTMB-P	31420 31419	NW 29	25 m*	90 mm
CONFiX WST NW 37	31240	31 mm	41.4 mm	KTMB-P	31423 31422	NW 37	25 m*	110 mm
CONFiX WST NW 45	31250	42.7 mm	54 mm	KTMB-Q	31426 31425	NW 45	25 m*	130 mm
CONFiX WST NW 70	31260	67 mm	79.8 mm	KEL-ULTRA flex	—	NW 70	10 m*	190 mm

*All conduits are also available by the metre (0.5 m steps).

Specifications

Material	Polypropylene, black
Flame class	UL 94-V2
Temperature	- 30°C to + 105°C
Properties	UV resistant

Compatible with

CONFiX SH Conduit clip	187
Cable entry systems for pre-terminated cables	8 – 83
Cable entry systems for standard cables	86 – 115

CONFIX™ SH

Conduit clips for WST



Type	Order No.	Suitable conduit	Fixing hole	Width [mm]	Height [mm]	PU
CONFIX SH 10	31300	WST NW 10	M5	18.5	21	10
CONFIX SH 14	31310	WST NW 14	M5	24	25.5	10
CONFIX SH 16	31315	WST NW 16	M6	30	35	10
CONFIX SH 20	31320	WST NW 20	M6	35	36	10
CONFIX SH 23	31330	WST NW 23	M6	42	43.5	10
CONFIX SH 29	31335	WST NW 29	M6	48	48.5	10
CONFIX SH 37	31340	WST NW 37	M6	55	56.5	10
CONFIX SH 45	31350	WST NW 45	M6	67	68	10
CONFIX SH 70	31360	WST NW 70	M6	100	101	10

Product description

CONFIX SH Conduit clips are a one-piece clamping system to provide secure mounting points for corrugated conduit systems.

The clips are secured to their mounting position through a central mounting point with a hexagonal counter-bore.

Specifications

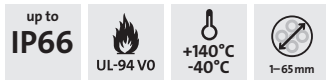
Material	Polyamide (PA), black
Flame class	UL94-V2, self-extinguishing
Temperature	- 40°C to + 120°C
Properties	Halogen free, silicone free

Compatible with

CONFIX WST
Split corrugated conduit 186

6 Enclosure accessories

Gland plates, flange plates & accessories



Enclosure gland plates

Electronic enclosures which are used in industrial manufacturing processes have to be reliably protected against dirt and dust ingress. The accumulation of dust and dirt can lead to short circuits and overheating of internal components. This can easily lead to machine downtime, premature maintenance requirements and at worst fire or electric shock incidents.

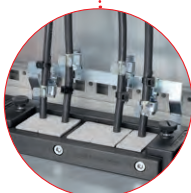
When running cables through the base of an enclosure you are susceptible to dust and debris entering through the cable ingress point. Components with internal fans and air-conditioning can create a suction through any opening, pulling dust and debris into the cabinet. The icotek gland plates KDR-ESR and KDRS-ESR provide the perfect solution to prevent dust build up and keep your cabinet running efficiently.

KDR-ESR-VX25

KDRS-ESR-VX25



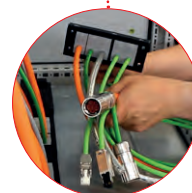
Routing of pre-terminated cables of up to 35 mm in diameter (KEL 24)



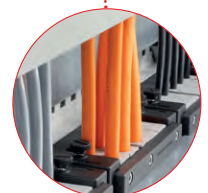
Optional with EMC cable assembly KDR-EMC-PFM



Fast and tool-free mounting of KEL-U cable entry frames



Routing of pre-terminated cables of up to 35 mm in diameter (KEL-U 24)



Straight cable routing into the cable duct

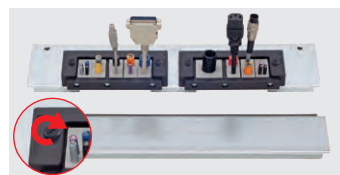
6

KDR-ESR/KDRS-ESR Assembly



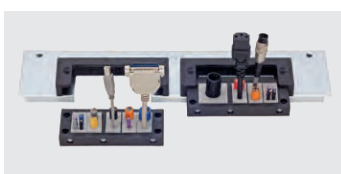
1

The gland plate is fixed in the enclosure floor. The KEL cable entry frames are fitted.



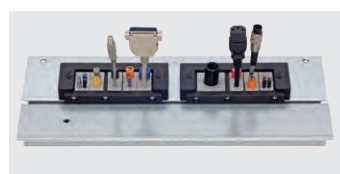
3

Afterwards the KEL frames are pushed into the slide frames and fixed with the knurled screws.



2

The KEL cable entry frames are screwed together after fitting.



4

Finally, the middle gland plate which is part of the standard enclosure, moves together with the KDR-ESR plates.

Chapter content 6



Rittal / Hoffman
Enclosure gland plates
with slide frames for cable entry frames

KDR-ESR-VX25 / KDRS-ESR-VX25 /
KDR-ESR-TS8 / KDR-ESR-HG2

190 – 197



Rittal
Enclosure gland plates
split, for cable entry frames

KDR 2-VX25 / KDR 2-TS8

198 – 199



Rittal / Hoffman / Others
Universal brush strip
for enclosures

KDR-BES-U / KDR-BES-U-VX25 /
KDR-BES-U-TS8 / KDR-BES-U-HG2

200 – 201



Rittal
Enclosure gland plates
with brush grommets

KDR-BES-TS8

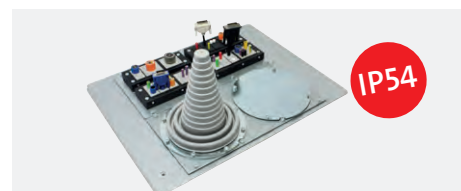
202 – 203



Rittal / Lohmeier
Module plates
for cable entry components

MP

204 – 205



Rittal
Enclosure gland plates
for MP module plates

KDR-BMP-VX25 / KDR-BMP-TS8

206 – 209



Rittal / Fibox
Flange plates for enclosures
for cable entry components

FP-AX / FP-AE / FP-KX / FP-KL / FP-BG /
FP-FL21

210 – 219



Blank plates

BPK / BPK-RF / BPM / BPK-SNAP

220 – 222



Supports
for DIN rails and bus bars

MF

223



Hexagonal Locknuts
M16 -M85

KGM / GM / GMT

224 – 225



Cable clamp
for C-rail mount

CCL

118

KDR-ESR-VX25

Rittal enclosure gland plate
with slide frames

IP54

Product description

The KDR-ESR is a one-piece plate to be assembled on enclosure bases. Slide frames for the KEL cable entry frames are already pre-assembled.

After installing all cables into the KEL frames, they are easily and quickly inserted into the slide frames and fixed. During maintenance, the KEL frames are removed without tools from the slide frames. Due to the combination KDR-ESR and KEL cable entry frames, a rating of IP54 is achieved (with correct selection of cable grommets). Slide frames which are no longer required, are closed with BPK-SNAP blank plates.

Advantages & benefits

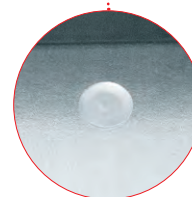
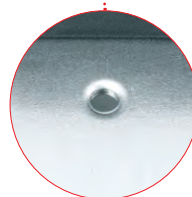
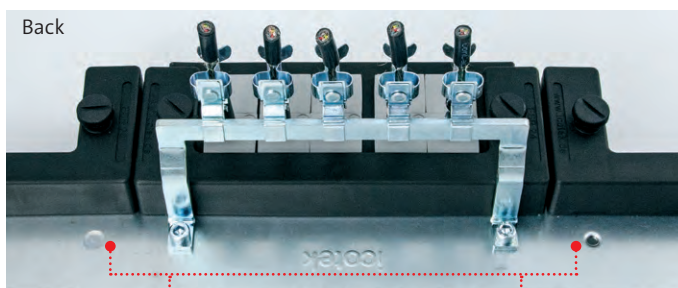
- Easy assembly and removal
- Prepared for the assembly of KDR-EMV-PFM
- Ideal for maintenance and retrofitting
- Reserve can be scheduled
- Space-saving solution
- No additional sheet metal work required

Specifications

Material	Gland plate: Sheet steel, zinc-plated KDR-ESR Frame: Polyamide (PA)
Flame class	UL94-Vo, self-extinguishing
IP rating	IP54, with gasket and correct selection of cable entry devices
Temperature	- 40°C to + 90°C (static)
Properties	Halogen free, silicone free

Compatible with

KEL-ER 16/24 Cable entry frames	8 - 9
KEL(-U) 16 / 24 Cable entry frames	12 - 18
KEL-QUICK 16 / 24 Cable entry frames	60 - 62
KEL-JUMBO Cable entry frames	36
BPK-SNAP 16 / 24 Blank plates	222



Prepared for the assembly of KDR-EMV-PFM. The plates are fitted with threaded screw holes (M5), blocked with plugs. These can be easily removed if necessary. By using the KDR-EMV-PFM, there is no need to additionally install a DIN rail/bus bar above the cable entry, which would otherwise have to be attached in order to implement the EMC connection.

KDRS-ESR-VX25

Rittal enclosure gland plate,
narrow, with slide frames



Advantage KDRS: Straight cable routing into the cable duct due to the extremely narrow gland plate

IP54

Product description

The KDRS-ESR is a one-piece plate to be assembled on enclosure bases. Slide frames for the KEL cable entry frames are already pre-assembled.

After installing all cables into the KEL frames, they are easily and quickly inserted into the slide frames and fixed. During maintenance, the KEL frames are removed without tools from the slide frames. Due to the combination KDRS-ESR and KEL cable entry frames, a rating of IP54 is achieved (with correct selection of cable grommets). Slide frames which are no longer required, are closed with BPK-SNAP blank plates.

Advantages & benefits

- Easy assembly and removal
- The KDRS-ESR floor plate is very narrow. As a result, the inserted cables are inserted straight into the cable duct.
- Ideal for maintenance and retrofitting
- Reserve can be scheduled
- Space-saving solution
- No additional sheet metal work required

Specifications

Material	Gland plate: Sheet steel, zinc-plated KDR-ESR Frame: Polyamide (PA)
Flame class	UL94-Vo, self-extinguishing
IP rating	IP54, with gasket and correct selection of cable entry devices
Temperature	- 40°C to + 90°C (static)
Properties	Halogen free, silicone free

Compatible with

KEL-ER 16/24 Cable entry frames	8 - 9
KEL(-U) 16 / 24 Cable entry frames	12 - 18
KEL-QUICK 16 / 24 Cable entry frames	60 - 62
BPK-SNAP 16 / 24 Blank plates	222



icotek can also produce enclosure gland plates for numerous other enclosure brands and in other sizes according to your wishes. Ask us at pm@icotek.com!



Sealing tape
Order No. 42999 (L: 1 m)
Order No. 42999.10000 (L: 10 m)

KDR-ESR-VX25

Rittal enclosure gland plate
with slide frames

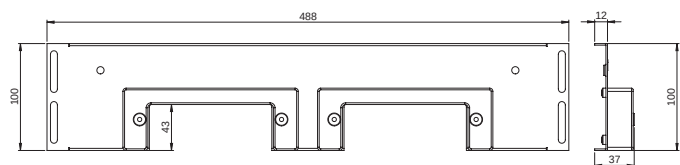
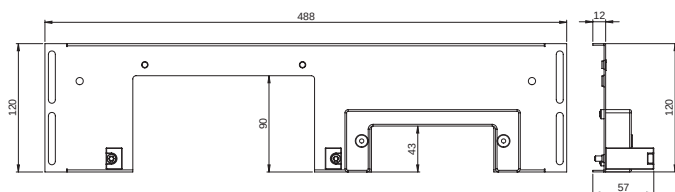
IP54



Type	Enclosure width	Total length gland plate	Sight size of base plate opening	No. of possible cable entries				Order No.
				JUMBO 1	JUMBO 2	KEL(-U) 16 ...	KEL(-U) 24 ...	
KDR-ESR-VX25-600	600 mm	488 mm	452 mm	-	-	-	2	44500
KDR-ESR-VX25-600	600 mm	488 mm	452 mm	-	1	-	1	44501
KDR-ESR-VX25-600	600 mm	488 mm	452 mm	1	-	2	-	44502
KDR-ESR-VX25-800	800 mm	688 mm	652 mm	-	-	1	3	44503
KDR-ESR-VX25-800	800 mm	688 mm	652 mm	1	-	1	2	44504
KDR-ESR-VX25-800	800 mm	688 mm	652 mm	-	1	-	2	44505
KDR-ESR-VX25-1000	1000 mm* with division bar	438 mm	402 mm	-	-	-	2	44506
KDR-ESR-VX25-1000	1000 mm* with division bar	438 mm	402 mm	1	-	-	1	44507
KDR-ESR-VX25-1000	1000 mm* with division bar	438 mm	402 mm	-	1	1	-	44508
KDR-ESR-VX25-1200	1200 mm*	538 mm	502 mm	-	-	-	3	44509
KDR-ESR-VX25-1200	1200 mm*	538 mm	502 mm	1	-	1	1	44510
KDR-ESR-VX25-1200	1200 mm*	538 mm	502 mm	-	1	-	1	44511

6

* if both fields of the enclosure are fitted, two complete gland plates are required.



EMC cable assembly for KDR-ESR-VX25

Type	Order No.	Material	PU
KDR-EMC-PFM 16	39192	Steel, zinc plated	1
KDR-EMC-PFM 24	39191	Steel, zinc plated	1



Suitable EMC shield clamps can be found on pages 136, 137 (PFSZ, SKS, SS|SK, SS|SKZ).

KDRS-ESR-VX25

Rittal enclosure gland plate,
narrow, with slide frames



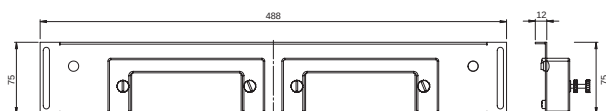
IP54

Type	Enclosure width	Total length gland plate	Sight size of base plate opening	No. of possible cable entries				Order No.
				JUMBO 1	JUMBO 2	KEL(-U) 16 ...	KEL(-U) 24 ...	
KDRS-ESR-VX25-600 (narrow) 75 mm	600 mm	488 mm	452 mm	-	-	-	2	44512
KDRS-ESR-VX25-800 (narrow) 75 mm	800 mm	688 mm	652 mm	-	-	-	3	44513
KDRS-ESR-VX25-1000 (narrow) 75 mm	1000 mm*	438 mm	402 mm	-	-	-	2	44514
KDRS-ESR-VX25-1200 (narrow) 75 mm	1200 mm*	538 mm	502 mm	-	-	-	3	44515

* if both fields of the enclosure are fitted, two complete gland plates are required.



Advantage KDRS: Straight cable routing into the cable duct due to the extremely narrow gland plate



icotek can also produce enclosure gland plates for numerous other enclosure brands and in other sizes according to your wishes. Ask us at pm@icotek.com!

KDR-ESR-TS8

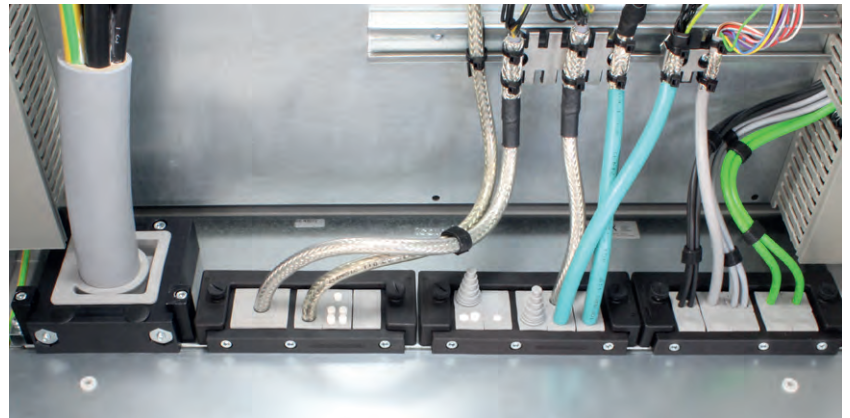
Rittal TS8 enclosure gland plate with slide frames



Product description

The KDR-ESR is a one-piece plate to be assembled on enclosure bases. Slide frames for the KEL cable entry frames are already pre-assembled.

After installing all cables into the KEL frames, they are easily and quickly inserted into the slide frames and fixed. During maintenance, the KEL frames are removed without tools from the slide frames. Due to the combination KDR-ESR and KEL cable entry frames, a rating of IP54 is achieved (with correct selection of cable grommets). Slide frames which are no longer required, are closed with BPK-SNAP blank plates.



Advantages & benefits

- Easy assembly and removal
- During assembly, almost the complete base of the enclosure can be used for installation of cables
- Even large connectors can be installed easily
- The gland plate KDR-ESR is designed for Rittal enclosures VX25 & TS 8. Other sizes can be supplied on request
- No additional sheet metal work required
- Retrofitting possible without disconnecting cables. Everything can be built around the cables

Specifications

Material	Gland plate: Sheet steel, zinc-plated KDR-ESR Frame: Polyamide (PA)
Flame class	UL94-Vo, self-extinguishing
IP rating	IP54, with gasket and correct selection of cable entry devices
Temperature	- 40°C to + 90°C (static)
Properties	Halogen free, silicone free

Compatible with

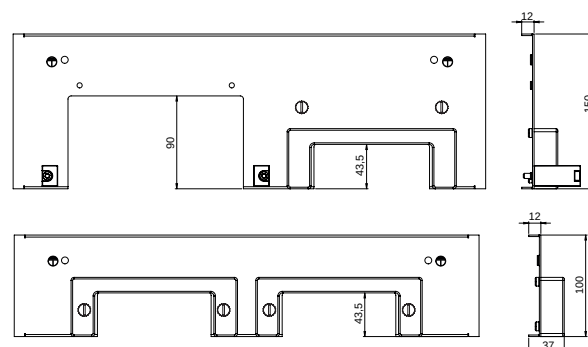
KEL(-U) 16 / 24 Cable entry frames	12 - 18
KEL-QUICK 16 / 24 Cable entry frames	60 - 62
KEL-JUMBO Cable entry frames	36
BPK-SNAP 16 / 24 Blank plates	222



Sealing tape
Order No. 42999 (L: 1 m)
Order No. 42999.10000 (L: 10 m)

KDR-ESR-TS8

Rittal TS8 enclosure gland plate
with slide frames



KDR-ESR-TS8 for Rittal TS 8

Type	Enclosure width	Total length gland plate	Sight size of base plate opening	No. of possible cable entries				Order No.
				JUMBO 1	JUMBO 2	KEL(-U) 16 ...	KEL(-U) 24 ...	
KDR-ESR for Rittal TS8								
KDR-ESR-TS8-600	600 mm	458 mm	435 mm	-	-	-	2	43079
KDR-ESR-TS8-600	600 mm	458 mm	435 mm	-	1	-	1	43070
KDR-ESR-TS8-600	600 mm	458 mm	435 mm	1	-	2	-	43071
KDR-ESR-TS8-800	800 mm	658 mm	635 mm	-	-	1	3	43080
KDR-ESR-TS8-800	800 mm	658 mm	635 mm	1	-	-	3	43072
KDR-ESR-TS8-800	800 mm	658 mm	635 mm	-	1	-	2	43073
KDR-ESR-TS8-1000	1000 mm without division bar	858 mm	835 mm	-	-	-	5	43081
KDR-ESR-TS8-1000	1000 mm without division bar	858 mm	835 mm	1	-	-	4	43074
KDR-ESR-TS8-1000	1000 mm without division bar	858 mm	835 mm	-	1	-	3	43075
KDR-ESR-TS8-1000	1000 mm* with division bar	420 mm	398 mm	-	-	-	2	43082
KDR-ESR-TS8-1000	1000 mm* with division bar	420 mm	398 mm	1	-	-	1	43076
KDR-ESR-TS8-1000	1000 mm* with division bar	420 mm	398 mm	-	1	-	1	43077
KDR-ESR-TS8-1200	1200 mm*	518 mm	495 mm	-	-	-	3	43083
KDR-ESR-TS8-1200	1200 mm*	518 mm	495 mm	1	-	-	2	43078
KDR-ESR-TS8-1200	1200 mm*	518 mm	495 mm	-	1	-	1	43084

* in case both fields of the enclosure are equipped, 2 complete gland plates are necessary.

KDR-ESR-HG2

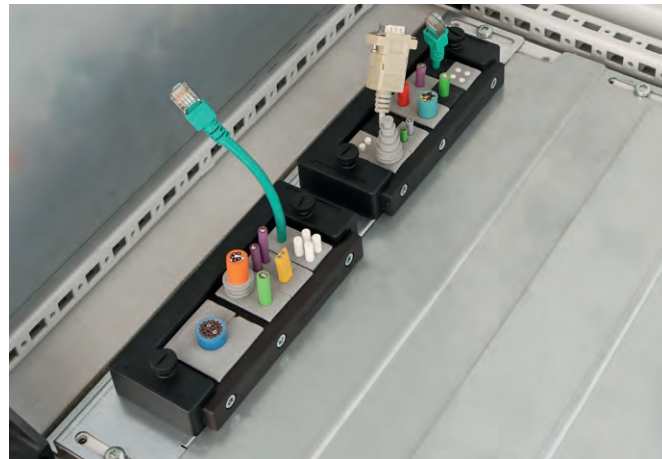
Enclosure gland plate with slide frames
for Hoffman PROLINE G2



Product description

The KDR-ESR-HG2 is a one-piece plate to be assembled on enclosure bases. Slide frames for the KEL cable entry frames are already pre-assembled.

After installing all cables into the KEL frames, they are easily and quickly inserted into the slide frames and fixed. During maintenance, the KEL frames are removed without tools from the slide frames. Due to the combination KDR-ESR-HG2 and KEL cable entry frames, a rating of IP54 is achieved (with correct selection of cable grommets). Slide frames which are no longer required, are closed with BPK-SNAP blank plates.



Advantages & benefits

- Easy assembly and removal
- During assembly, almost the complete base of the enclosure can be used for installation of cables
- Even large connectors can be installed easily
- The gland plate KDR-ESR-HG2 is designed for Hoffman enclosures PROLINE G2. Other sizes can be supplied on request
- No additional sheet metal work required
- Retrofitting possible without disconnecting cables. Everything can be built around the cables



Specifications

Material	Gland plate: Sheet steel, zinc-plated KDR-ESR Frame: Polyamide (PA)
Flame class	UL94-Vo, self-extinguishing
IP rating	IP54, with gasket and correct selection of cable entry devices
Temperature	- 40°C to + 90°C (static)
Properties	Halogen free, silicone free

Compatible with

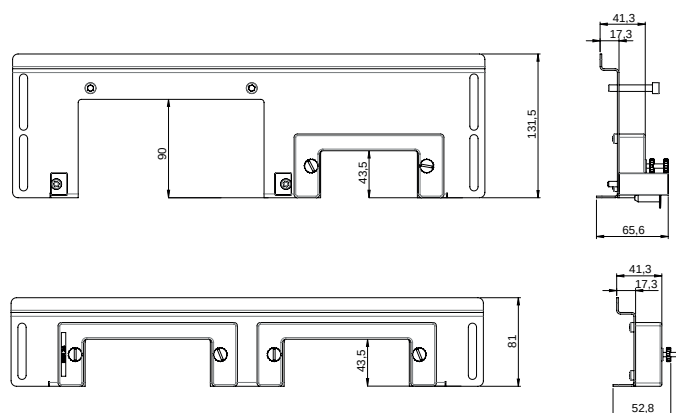
KEL(-U) 16 / 24 Cable entry frames	12 - 18
KEL-QUICK 16 / 24 Cable entry frames	60 - 62
KEL-JUMBO Cable entry frames	36
BPK-SNAP 16 / 24 Blank plates	222



Sealing tape
Order No. 42999 (L: 1 m)
Order No. 42999.10000 (L: 10 m)

KDR-ESR-HG2

Enclosure gland plate with slide frames
for Hoffman PROLINE G2

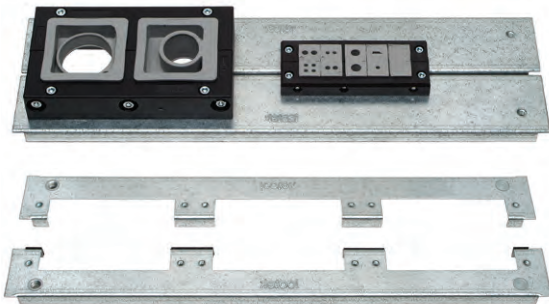


Type	Enclosure width	Total length gland plate	Sight size of base plate opening	No. of possible cable entries			Order No.
				JUMBO 2	KEL(-U) 16 ...	KEL(-U) 24 ...	
KDR-ESR-HG2-600	600 mm / 1200 mm*	432 mm	368 mm	1	1	-	43250
KDR-ESR-HG2-600	600 mm / 1200 mm*	432 mm	368 mm	-	-	2	43251
KDR-ESR-HG2-800	800 mm	632 mm	568 mm	1	-	2	43252
KDR-ESR-HG2-800	800 mm	632 mm	568 mm	-	-	3	43253
KDR-ESR-HG2-1000	1000 mm	832 mm	768 mm	1	-	3	43254
KDR-ESR-HG2-1000	1000 mm	832 mm	768 mm	-	-	4	43255

* in case both fields of the enclosure are equipped, 2 complete gland plates are necessary.

KDR 2-VX25 | KDR 2-TS8

Split Rittal enclosure gland plates



Product description

Split, 2-part gland plates KDR 2 with pre-cut holes for KEL and KEL-JUMBO cable entry systems.

Integrated screw holes provide quick and easy installation of KEL frames.

Advantages & benefits

- During assembly, almost the complete base of the enclosure can be used for installation of cables
- Even large connectors can be installed easily
- The gland plate KDR 2 is designed for Rittal enclosures TS 8 & VX25. Other sizes can be supplied on request
- Retrofitting is possible without disconnecting of cables. All can be installed around the cables.
- No additional sheet metal work required
- Cut-outs, which are no longer required, are covered with metal blank plates Type BPM

Specifications

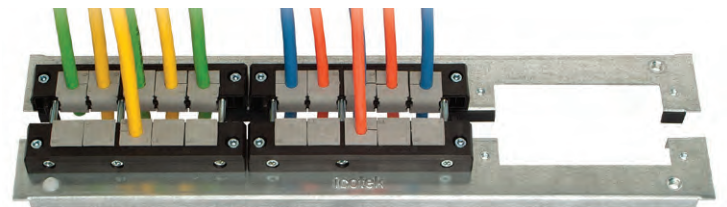
6

Material Sheet steel, zinc-plated

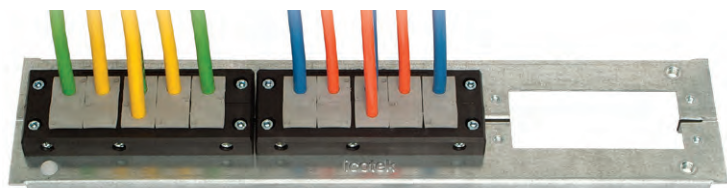
Compatible with

KEL 24 Cable entry frames	17
KEL-JUMBO Cable entry frames	36
BPM Blank plates metal	221

KDR 2 Assembly



When the cable entry frames are assembled, the KDR gland plates move together for a tight, secure hold of the cable entry systems.



The frame parts with grommets have to be built up before final assembly, i.e. before screwing the system together.

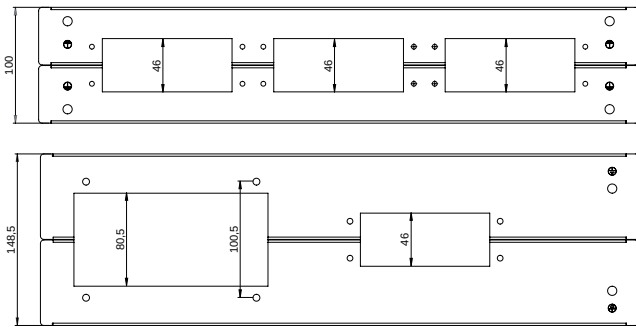
Screwing of the cable entry frames tightens both parts of the split gland plate.



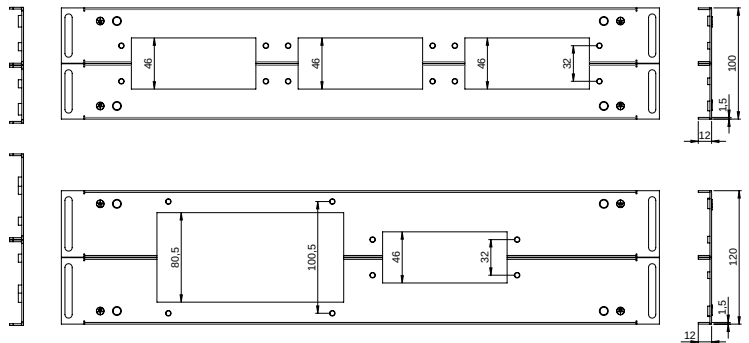
Sealing tape
Order No. 42999 (L: 1 m)
Order No. 42999.10000 (L: 10 m)

KDR 2-VX25 | KDR 2-TS8

Split Rittal enclosure gland plates



KDR 2-TS8 for Rittal TS 8



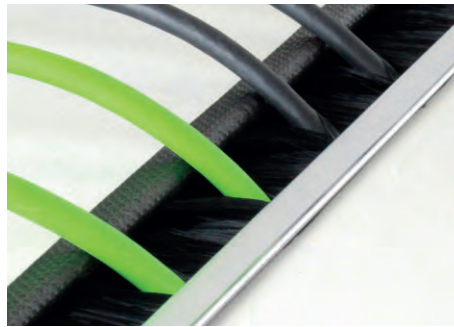
KDR 2-VX25 for Rittal VX25

Type	Enclosure width	Total length gland plate	Sight size of base plate opening	No. of possible cable entries			Order No.
				JUMBO 1	JUMBO 2	KEL 24 ...	
KDR 2 for Rittal VX25:							
KDR 2-VX25-600	600 mm	488 mm	452 mm	-	-	3	44400
KDR 2-VX25-600	600 mm	488 mm	452 mm	1	-	2	44401
KDR 2-VX25-600	600 mm	488 mm	452 mm	-	1	1	44402
KDR 2-VX25-800	800 mm	688 mm	652 mm	-	-	4	44403
KDR 2-VX25-800	800 mm	688 mm	652 mm	1	-	3	44404
KDR 2-VX25-800	800 mm	688 mm	652 mm	-	1	2	44405
KDR 2-VX25-1000	1000 mm* with division bar	438 mm	402 mm	-	-	2	44406
KDR 2-VX25-1000	1000 mm* with division bar	438 mm	402 mm	1	-	1	44407
KDR 2-VX25-1000	1000 mm* with division bar	438 mm	402 mm	-	1	1	44408
KDR 2-VX25-1200	1200 mm*	538 mm	502 mm	-	-	3	44409
KDR 2-VX25-1200	1200 mm*	538 mm	502 mm	1	-	2	44410
KDR 2-VX25-1200	1200 mm*	538 mm	502 mm	-	1	1	44411
KDR 2 for Rittal TS 8:							
KDR 2-TS8-600	600 mm	458 mm	435 mm	-	-	3	42924
KDR 2-TS8-600	600 mm	458 mm	435 mm	1	-	2	42953
KDR 2-TS8-600	600 mm	458 mm	435 mm	-	1	1	42941
KDR 2-TS8-800	800 mm	658 mm	635 mm	-	-	4	42922
KDR 2-TS8-800	800 mm	658 mm	635 mm	1	-	3	42954
KDR 2-TS8-800	800 mm	658 mm	635 mm	-	1	2	42945
KDR 2-TS8-1000	1000 mm without division bar	858 mm	835 mm	-	-	5	42923
KDR 2-TS8-1000	1000 mm without division bar	858 mm	835 mm	1	-	4	42955
KDR 2-TS8-1000	1000 mm without division bar	858 mm	835 mm	-	1	3	42952
KDR 2-TS8-1000	1000 mm* with division bar	420 mm	398 mm	-	-	2	42958
KDR 2-TS8-1000	1000 mm* with division bar	420 mm	398 mm	1	-	1	42957
KDR 2-TS8-1000	1000 mm* with division bar	420 mm	398 mm	-	1	1	42959
KDR 2-TS8-1200	1200 mm*	518 mm	495 mm	-	-	3	42920
KDR 2-TS8-1200	1200 mm*	518 mm	495 mm	1	-	2	42956
KDR 2-TS8-1200	1200 mm*	518 mm	495 mm	-	1	1	42943

* in case both fields of the enclosure are equipped, 2 complete split gland plates are necessary.

KDR-BES-U

Universal brush strip for enclosures



Edge protection trim (100m)
Order No. 99152

Product description

Cable pass-through brush strip for enclosure bases or individual cut-outs on cabinets, enclosures, panels, server racks or machine walls.

Due to the innovative and universal clamp strip the brush can also be assembled in a 90° angle, e.g. on bent sheet metal. Suitable for wall thickness 1.5 - 2 mm or 2.5 - 3 mm. Brush may be removed from the profile at any time and remounted using other mounting options.

The KDR-BES-U brush strip is adaptable to almost any enclosure or cabinet type on the market. The standard gland plates included in the enclosure delivery can be used for assembly. They do not have to be changed!

Advantages & benefits

- Fast, simple and tool-free mounting
- Original enclosure gland plates can be used
- Three mounting types possible
- Brush may be remounted at any time using other mounting options
- Available in any custom length up to 1.500 mm

Specifications

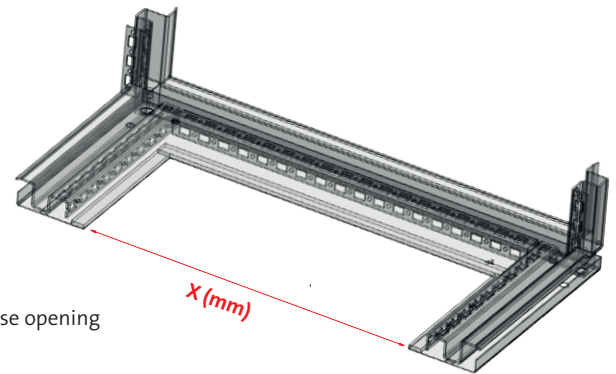
Material clamp strip	Aluminium
Material backing strips	Metal, galvanised
Material bristles	Polyamide (PA)
For sheet thickness	1.5 - 2 mm / 2.5 - 3 mm
Temperature	-20°C to +90°C
Properties	Halogen free, silicone free

Accessories

ZL Strain relief plates

119 - 121

Brush strips in your required length (up to 1.500 mm)



X (mm) = sight size of base opening
X max. = 1500 mm

Order numbers examples:

For sheet thickness 1.5 - 2 mm, trim height 35 mm:

X = 999 mm → Order No. 58210.0999

For sheet thickness 2.5 - 3 mm, trim height 35 mm:

X = 999 mm → Order No. 58225.0999

For sheet thickness 1.5 - 2 mm, trim height 50 mm:

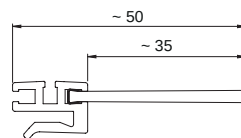
X = 999 mm → Order No. 58215.0999

For sheet thickness 2.5 - 3 mm, trim height 50 mm:

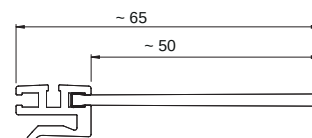
X = 999 mm → Order No. 58230.0999

Scope of delivery:

1× KDR-BES-U (clamp strip + brush)



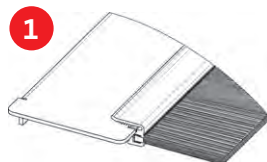
pure brush length: 35 mm



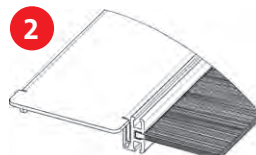
50 mm

KDR-BES-U mounting options

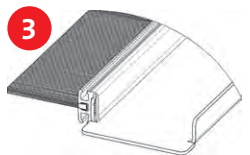
1



2



3



KDR-BES-U

Brush strip for gland plates
Rittal VX25/TS 8 & Hoffman PROLINE G2



Type	Enclosure type	Enclosure width	Brush strip length	Trim height	Order no.	PU
KDR-BES-U for Rittal VX25 enclosures						
KDR-BES-U-VX25-600	Rittal VX25	600 mm	452 mm	35 mm	58225.0452	1
KDR-BES-U-VX25-800	Rittal VX25	800 mm	652 mm	35 mm	58225.0652	1
KDR-BES-U-VX25-1000	Rittal VX25	1000 mm* with division bar	402 mm	35 mm	58225.0402	1
KDR-BES-U-VX25-1200	Rittal VX25	1200 mm* with division bar	502 mm	35 mm	58225.0502	1
KDR-BES-U-VX25-600	Rittal VX25	600 mm	452 mm	50 mm	58230.0452	1
KDR-BES-U-VX25-800	Rittal VX25	800 mm	652 mm	50 mm	58230.0652	1
KDR-BES-U-VX25-1000	Rittal VX25	1000 mm* with division bar	402 mm	50 mm	58230.0402	1
KDR-BES-U-VX25-1200	Rittal VX25	1200 mm* with division bar	502 mm	50 mm	58230.0502	1
KDR-BES-U for Rittal TS8 enclosures						
KDR-BES-U-TS8-600	Rittal TS8	600 mm	435 mm	35 mm	58210.0435	1
KDR-BES-U-TS8-800	Rittal TS8	800 mm	635 mm	35 mm	58210.0635	1
KDR-BES-U-TS8-1000	Rittal TS8	1000 mm* with division bar	397 mm	35 mm	58210.0397	1
KDR-BES-U-TS8-1000	Rittal TS8	1000 mm without division bar	835 mm	35 mm	58210.0835	1
KDR-BES-U-TS8-1200	Rittal TS8	1200 mm* with division bar	495 mm	35 mm	58210.0495	1
KDR-BES-U for Hoffman PROLINE G2 enclosures						
KDR-BES-U-HG2-600	Hoffman PROLINE G2	600 mm / 1200 mm*	362 mm	35 mm	58210.0362	1
KDR-BES-U-HG2-800	Hoffman PROLINE G2	800 mm	562 mm	35 mm	58210.0562	1
KDR-BES-U-HG2-1000	Hoffman PROLINE G2	1000 mm	762 mm	35 mm	58210.0762	1
Edge protection trim	universal	Clamping range 1-2 mm			99152	100 m

* in case both fields of the enclosure are equipped, 2 complete gland plates are necessary.

KDR-BES

Enclosure gland plate
with brush grommets



For standard cut-outs:
KEL-BES – see page 82

Product description

The new 2-piece enclosure gland plates KDR-BES are supplied with preassembled brush grommets.

The gland plates are installed with standard Rittal clips.

Depending on the maximum cable diameter to be routed, the 2 halves of the brush gland plate are aligned further or closer to each other.

The gland plates KDR-BES are perfect for protection of the enclosure interiors against dirt.

Advantages & benefits

- During assembly, almost the complete base of the enclosure can be used for installation of cables.
- Retrofitting is possible without disconnecting of cables. All can be installed around the cables.
- The gland plates KDR-BES are designed for Rittal enclosures TS 8. Other sizes can be supplied on request.

KDR-BES Assembly



6

Specifications

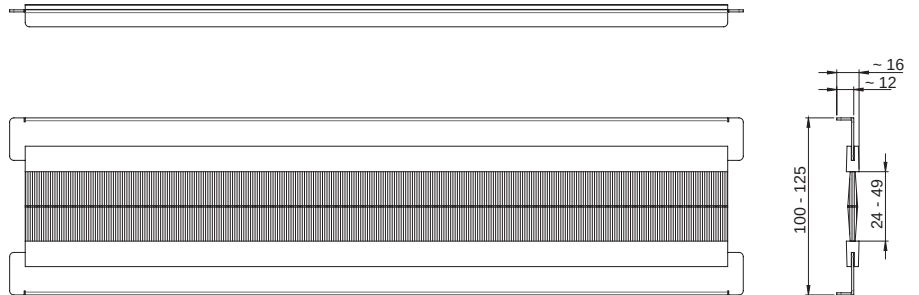
Material	Gland plate: Sheet steel, zinc-plated Brush grommets: Polyamide (PA)
Temperature	- 20°C to + 90°C (static)
Properties	Halogen free, silicone free

Accessories

ZL Strain relief plates 119 - 121

KDR-BES

Enclosure gland plate
with brush grommets



Type	Enclosure type	Enclosure width	Total length gland plate	Sight size of base plate opening	Order No.
KDR-BES-TS 8-600	Rittal TS 8	600 mm	458 mm	435 mm	58000
KDR-BES-TS 8-800	Rittal TS 8	800 mm	658 mm	635 mm	58006
KDR-BES-TS 8-1000	Rittal TS 8	1000 mm without division bar	858 mm	835 mm	58012
KDR-BES-TS 8-1200	Rittal TS 8	1200 mm*	518 mm	495 mm	58018

* in case both fields of the enclosure are equipped, 2 complete gland plates are necessary.

MP

Module plates



Product description

The module plates have cut-outs for fixing the KEL range cable entry systems KEL 24, KEL-U 24, KEL-QUICK 24, KEL-JUMBO, KEL-DPF, KEL-JUMBO flex and KEL-ULTRA flex.

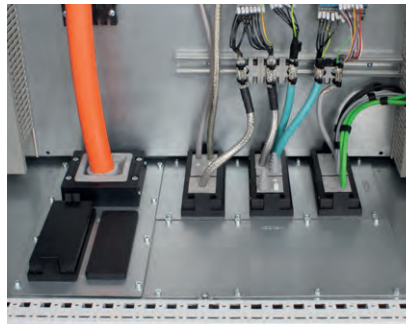
The module plates can be installed on:

- Separation walls by Rittal
- closed enclosure bases and roofs (various manufacturers)
- Bases of Lohmeier enclosures
- Bases of Rittal enclosures via KDR-BMP gland plates

The module blank plate without cut-outs (Order No. 43882) is designed for closing unused cut-outs. This module plate can even be used for self-made cut-outs.

Module plates are supplied with a gasket.

MP Applications



Cable routing via module plates in the base of a Rittal TS 8 enclosure. Mounting with icotek gland plate KDR BMP.



Cable routing through the divider panel of a Rittal TS 8 baying enclosure system via module plates.



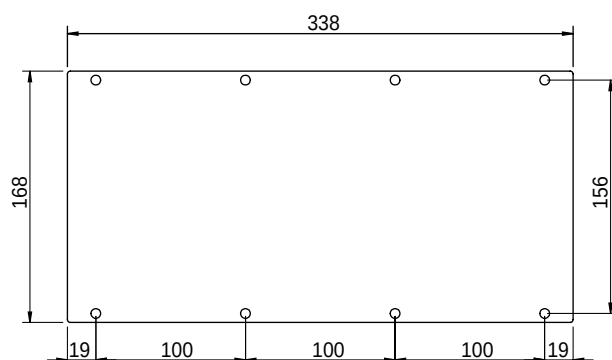
Routing of several cables with and without connectors through a closed enclosure roof via module plates. Cut-out size 314 x 144 mm.



Routing of a rigid supply line through a closed enclosure roof via module plates. Cut-out size 314 x 144 mm.

MP

Module plates



IP54

Specifications

Material	Sheet steel, zinc-plated Aluminium (Order No. 43883, 43899)
Dimension	338 × 168 × 2 mm

Compatible with

KEL 24 Cable entry frames	17
KEL-U 24 Cable entry frames	13
KEL-QUICK 24 Cable entry frames	60 - 62
KEL-SNAP snap frames	34 - 35
KEL-JUMBO Cable entry frames	36
KEL-DPF Cable entry grommets	112 - 113
KEL-JUMBO flex Cable entry ins.	115
KEL-ULTRA flex Cable entry ins.	114
Blank plates	220 - 222

Description	Type	Order No.	Compatible with
	MP 0	43882	Module plate, blank
	MP 1	43891	3× KEL(-U/-QUICK) 24 x
	MP 2	43890	4× KEL(-U/-QUICK) 24 x
	MP 3	43886	1× KEL-JUMBO 1 1× KEL-JUMBO 2
	MP 4	43888	2× KEL-JUMBO 1
	MP 5	43887	2× KEL(-U/-QUICK) 24 x 1× KEL-JUMBO 1
	MP 6	43883	5× cut-out M50 for KEL-DPF or KEL-DPZ
	MP 7	43889	Cut-out 3× KEL-JUMBO flex
	MP 8	43894	Cut-out 2× KEL-ULTRA flex
	MP 10	43896	2× KEL(-U/-QUICK) 24 x 1× cut-out M63 for KEL-DPF or KEL-DPZ
	MP 11	43899	5× cut-out M63 for KEL-DPF or KEL-DPZ

KDR-BMP for VX25

Enclosure gland plates
for module plates



IP54

Product description

The KDR-BMP gland plates are ideally suited for Rittal VX25 enclosures and can be used instead of the 3 piece standard gland plates. The KDR-BMP gland plates are fixed by screwing.

On KDR-BMP gland plates, our MP Module Plates MPO-MP11 can be easily mounted and used for installation of cable entry components.

Note: The division bar can be removed in Rittal enclosures.

Advantages & benefits

- Very simple mounting
- No sheet metal work required

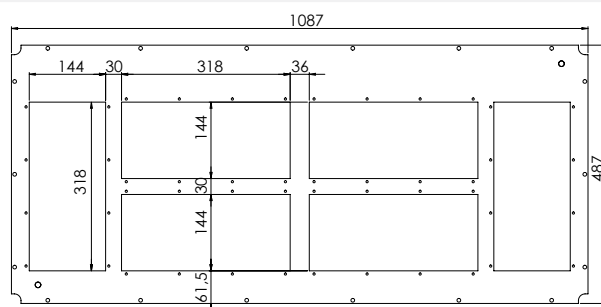
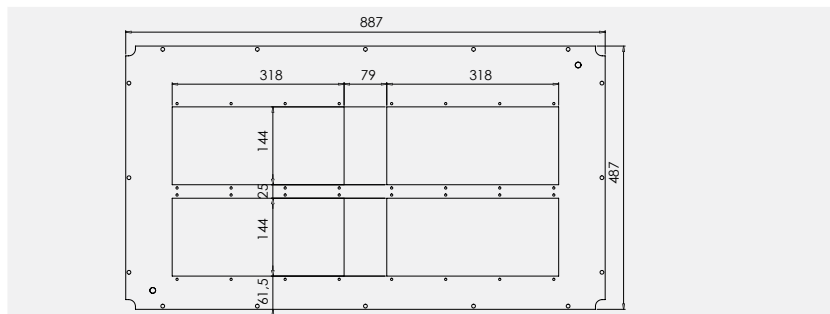
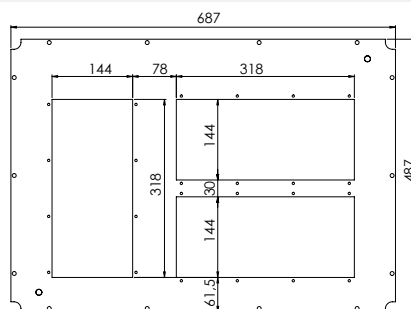
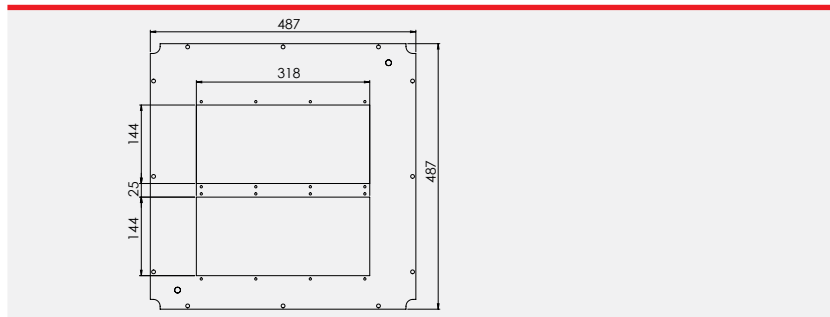
Specifications

Material	Sheet steel, zinc-plated
IP rating	IP54, with gasket and correct selection of cable entry devices

6

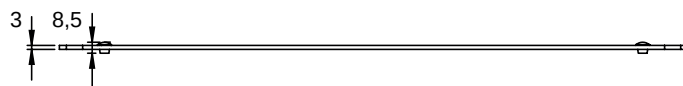
Compatible with

MP Module plates 204 - 205



KDR-BMP for VX25

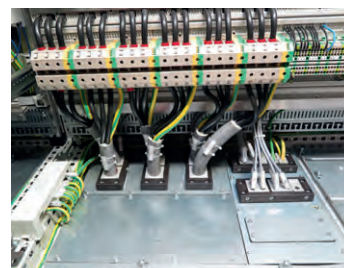
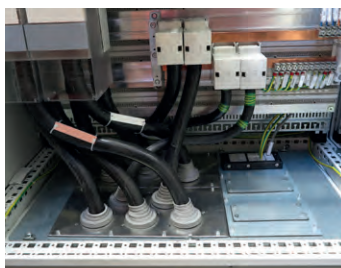
Enclosure gland plates
for module plates



Type	Enclosure type	Enclosure width	Enclosure depth	No. of cut-outs for module plates	Order No.
KDR-BMP 600/600	VX25	600 mm	600 mm	2	43334
KDR-BMP 800/600	VX25	800 mm	600 mm	3	43340
KDR-BMP 1000/600	VX25	1000 mm without division bar	600 mm	4	43346
KDR-BMP 1200/600	VX25	1200 mm without division bar	600 mm	6	43352

KDR-BMP for TS8

Enclosure gland plates
for module plates



IP54

Product description

The KDR-BMP gland plates are ideally suited for Rittal TS enclosures and can be used instead of the 3 piece standard gland plates. Rittal standard mounting clips are used for fixing the plate.

On KDR-BMP gland plates, our MP Module Plates MPO-MP8 can be easily mounted and used for installation of cable entry components.

Advantages & benefits

- Very simple mounting
- No sheet metal work required

Specifications

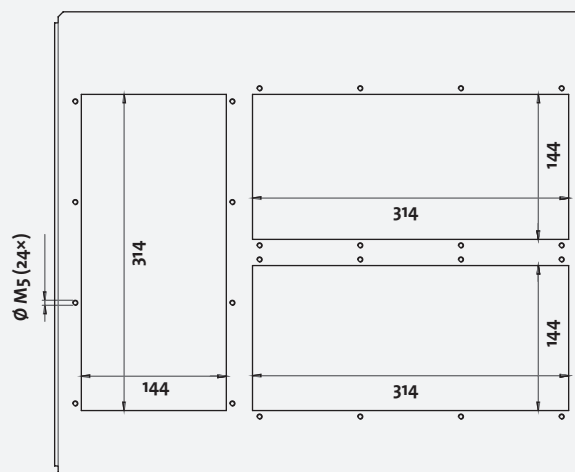
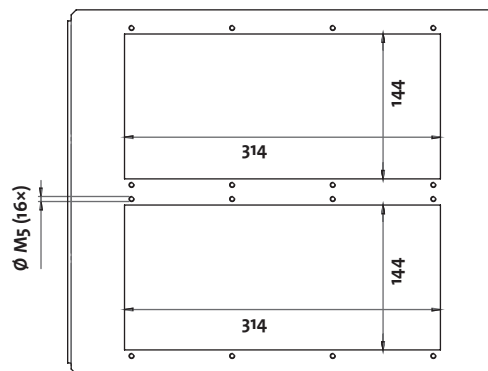
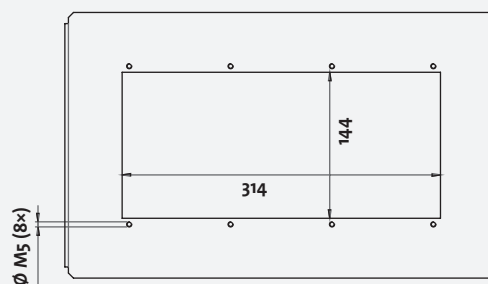
Material Sheet steel, zinc-plated
IP rating IP54, with gasket and correct selection of cable entry devices

6

Compatible with

MP Module plates 204 - 205

Description



KDR-BMP for TS8

Enclosure gland plates for module plates

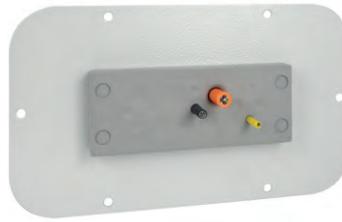


Type	Enclosure type	Enclosure width	Enclosure depth	No. of cut-outs for module plates	Order No.
KDR-BMP 600/400	TS 8	600 mm	400 mm	1	43300
KDR-BMP 600/500	TS 8	600 mm	500 mm	2	43302
KDR-BMP 600/600	TS 8	600 mm	600 mm	2	43304
KDR-BMP 800/400	TS 8	800 mm	400 mm	1	43306
KDR-BMP 800/500	TS 8	800 mm	500 mm	3	43308
KDR-BMP 800/600	TS 8	800 mm	600 mm	3	43310
KDR-BMP 1000/400	TS 8	1000 mm with division bar	400 mm	1	43312
KDR-BMP 1000/500	TS 8	1000 mm with division bar	500 mm	2	43314
KDR-BMP 1000/600	TS 8	1000 mm with division bar	600 mm	2	43316
KDR-BMP 1200/400	TS 8	1200 mm with division bar	400 mm	1	43318
KDR-BMP 1200/500	TS 8	1200 mm with division bar	500 mm	2 × 3	43320
KDR-BMP 1200/600 for left section	TS 8	1200 mm with division bar	600 mm	3	43322
KDR-BMP 1200/600 for right section	TS 8	1200 mm with division bar	600 mm	3	43324

FP-AX

Flange plates for compact enclosures

IP66



Product description

We supply complete flange plates FP with 112 × 36 mm cut-outs for compact enclosures of the AX series. The cut-outs, as well as the drilling template, conform to the standard cut-outs for 24-pole industrial connectors.

All flange plates are RAL 7035 powder-coated. Please use the gaskets of the standard plates. Enclosures are supplied with gaskets and screws.

We recommend fastening the cable entry systems with a torque of 1.5 - 2.0 Nm.

Advantages & benefits

- No expensive extra sheet metal work is required
- High cable density is achieved by using KEL, KEL-U, KEL-QUICK, KEL-DPU, KEL-DPZ or KEL-DP
- Reduce labour costs by using cable entry systems compared to the assembly of conventional cable glands

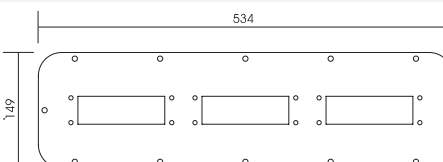
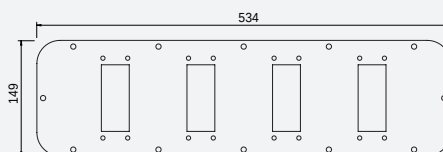
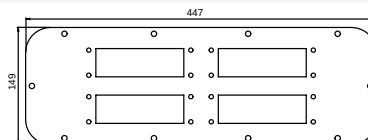
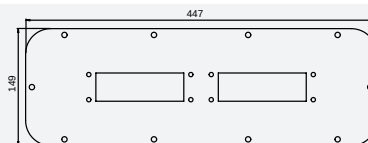
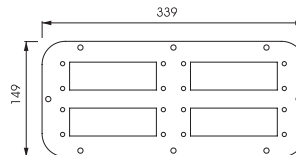
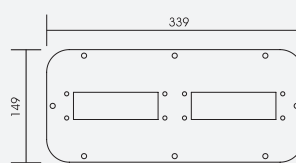
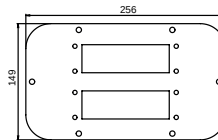
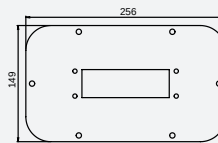
Specifications

Material Sheet steel, powder coated

Compatible with

KEL Cable entry frames	16 - 19
KEL-U Cable entry frames	12 - 15
KEL-QUICK Cable entry frames	60 - 62
KEL-SNAP Mounting frames	34 - 35
KEL-QTA 24 Cable entry frames	70 - 71
KEL-DPU 24 Cable entry plates	90 - 91
KEL-DPZ 24 Cable entry plates	92 - 94
KEL-DP 24 Cable entry plates	100 - 101
KEL-BES	82
KEL-BES-S	83
Blank plates	220 - 222

Description



FP-AX

Flange plates for compact enclosures



IP66

Type	Order No. RAL 7035	Compatible with: (Product Group 1)	Compatible with: (Product Group 2)	Size FP	Compatible with
FP-AX 256 149 with 1 cut-out 36 x 112 mm horizontal	43901	KEL 24 KEL-U 24 KEL-QUICK 24 KEL-QTA 24 KEL-BES 24 KEL-BES-S 24	KEL-DPZ 24 KEL-DPU 24 KEL-DP 24	1	AX 1033.000 AX 1034.000
FP-AX 256 149 with 2 cut-outs 36 x 112 mm horizontal	43902	KEL 24 KEL-U 24 KEL-QUICK 24 KEL-QTA 24 KEL-BES 24 KEL-BES-S 24	KEL-DPZ 24 KEL-DPU 24 KEL-DP 24	1	AX 1033.000 AX 1034.000
FP-AX AE 339 149 with 2 cut-outs 36 x 112 mm	43840	KEL 24 KEL-U 24 KEL-QUICK 24 KEL-SNAP 24 KEL-QTA 24 KEL-BES 24 KEL-BES-S 24	KEL-DPZ 24 KEL-DPU 24 KEL-DP 24	2	AX 1031.000 AX 1380.000 AX 1038.000 AX 1077.000 AX 1100.000 AX 1045.000
FP-AX AE 339 149 with 4 cut-outs 36 x 112 mm	43846	KEL 24 KEL-U 24 KEL-QUICK 24 KEL-QTA 24 KEL-BES 24 KEL-BES-S 24	KEL-DPZ 24 KEL-DPU 24 KEL-DP 24	2	AX 1031.000 AX 1380.000 AX 1038.000 AX 1077.000 AX 1100.000 AX 1045.000
FP-AX 447 149 with 2 cut-outs 36 x 112 mm horizontal	43903	KEL 24 KEL-U 24 KEL-QUICK 24 KEL-QTA 24 KEL-BES 24 KEL-BES-S 24	KEL-DPZ 24 KEL-DPU 24 KEL-DP 24	3	AX 1050.000 AX 1057.000
FP-AX 447 149 with 4 cut-outs 36 x 112 mm horizontal	43904	KEL 24 KEL-U 24 KEL-QUICK 24 KEL-QTA 24 KEL-BES 24 KEL-BES-S 24	KEL-DPZ 24 KEL-DPU 24 KEL-DP 24	3	AX 1050.000 AX 1057.000
FP-AX AE 534 149 with 4 cut-outs 36 x 86 mm	43871	KEL 16 KEL-U 16 KEL-QUICK 16 KEL-SNAP 16 KEL-BES 16 KEL-BES-S 16	KEL-DPZ 16 KEL-DPU 16 KEL-DP 16	4	AX 1039.000 AX 1060.000 AX 1054.000 AX 1076.000 AX 1058.000 AX 1090.000
FP-AX AE 534 149 with 3 cut-outs 36 x 112 mm	43842	KEL 24 KEL-U 24 KEL-QUICK 24 KEL-SNAP 24 KEL-QTA 24 KEL-BES 24 KEL-BES-S 24	KEL-DPZ 24 KEL-DPU 24 KEL-DP 24	4	AX 1039.000 AX 1060.000 AX 1054.000 AX 1076.000 AX 1058.000 AX 1090.000

FP-AX

Flange plates
for compact enclosures

IP66



Product description

We supply complete flange plates FP with 112 × 36 mm cut-outs for compact enclosures of the AX series. The cut-outs, as well as the drilling template, conform to the standard cut-outs for 24-pole industrial connectors.

All flange plates are RAL 7035 powder-coated. Please use the gaskets of the standard plates. Enclosures are supplied with gaskets and screws.

We recommend fastening the cable entry systems with a torque of 1.5 - 2.0 Nm.

Advantages & benefits

- No expensive extra sheet metal work is required
- High cable density is achieved by using KEL, KEL-U, KEL-QUICK, KEL-DPU, KEL-DPZ or KEL-DP
- Reduce labour costs by using cable entry systems compared to the assembly of conventional cable glands

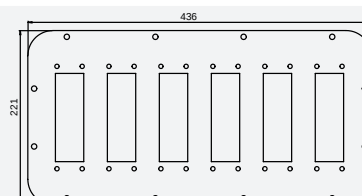
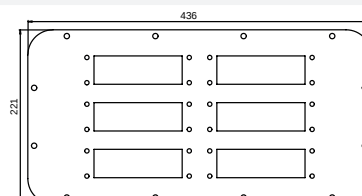
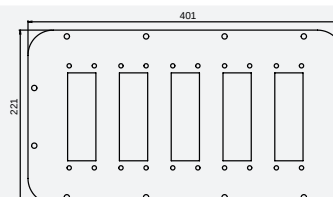
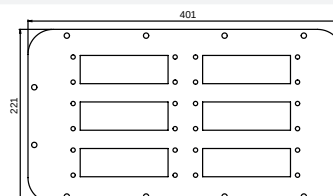
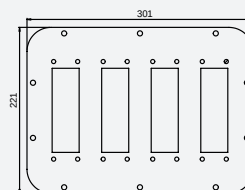
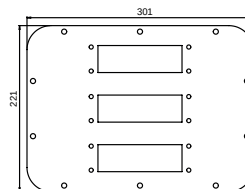
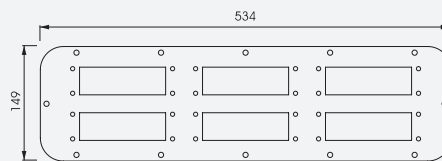
Specifications

Material **Sheet steel, powder coated**

Compatible with

KEL Cable entry frames	16 - 19
KEL-U Cable entry frames	12 - 15
KEL-QUICK Cable entry frames	60 - 62
KEL-SNAP Mounting frames	34 - 35
KEL-QTA 24 Cable entry frames	70 - 71
KEL-DPU 24 Cable entry plates	90 - 91
KEL-DPZ 24 Cable entry plates	92 - 94
KEL-DP 24 Cable entry plates	100 - 101
KEL-BES	82
KEL-BES-S	83
Blank plates	220 - 222

Description



FP-AX

Flange plates
for compact enclosures



IP66

Type	Order No. RAL 7035	Compatible with: (Product Group 1)	Compatible with: (Product Group 2)	Size FP	Compatible with
FP-AX AE 534 149 with 6 cut-outs 36 x 112 mm	43848	KEL 24 KEL-U 24 KEL-QUICK 24 KEL-QTA 24 KEL-BES 24 KEL-BES-S 24	KEL-DPZ 24 KEL-DPU 24 KEL-DP 24	4	AX 1039.000 AX 1060.000 AX 1054.000 AX 1076.000 AX 1058.000 AX 1090.000
FP-AX 301 221 with 3 cut-outs 36 x 112 mm horizontal, 3 rows	43905	KEL 24 KEL-U 24 KEL-QUICK 24 KEL-SNAP 24 KEL-QTA 24 KEL-BES 24 KEL-BES-S 24	KEL-DPZ 24 KEL-DPU 24 KEL-DP 24	5	AX 1338.000 AX 1037.000 AX 1073.000 AX 1055.000 AX 1180.000 AX 1280.000 AX 1181.000 AX 1281.000
FP-AX 301 221 with 4 cut-outs 36 x 112 mm vertical, 1 row	43906	KEL 24 KEL-U 24 KEL-QUICK 24 KEL-SNAP 24 KEL-QTA 24 KEL-BES 24 KEL-BES-S 24	KEL-DPZ 24 KEL-DPU 24 KEL-DP 24	5	AX 1338.000 AX 1037.000 AX 1073.000 AX 1055.000 AX 1180.000 AX 1280.000 AX 1181.000 AX 1281.000
FP-AX 401 221 with 6 cut-outs 36 x 112 mm horizontal, 3 rows	43907	KEL 24 KEL-U 24 KEL-QUICK 24 KEL-SNAP 24 KEL-QTA 24 KEL-BES 24 KEL-BES-S 24	KEL-DPZ 24 KEL-DPU 24 KEL-DP 24	6	AX 1350.000 AX 1130.000 AX 1110.000 AX 1213.000 AX 1114.000 AX 1214.000 AX 1115.000
FP-AX 401 221 with 5 cut-outs 36 x 112 mm vertical, 1 row	43908	KEL 24 KEL-U 24 KEL-QUICK 24 KEL-SNAP 24 KEL-QTA 24 KEL-BES 24 KEL-BES-S 24	KEL-DPZ 24 KEL-DPU 24 KEL-DP 24	6	AX 1350.000 AX 1130.000 AX 1110.000 AX 1213.000 AX 1114.000 AX 1214.000 AX 1115.000
FP-AX 436 221 with 6 cut-outs 36 x 112 mm horizontal, 3 rows	43909	KEL 24 KEL-U 24 KEL-QUICK 24 KEL-SNAP 24 KEL-QTA 24 KEL-BES 24 KEL-BES-S 24	KEL-DPZ 24 KEL-DPU 24 KEL-DP 24	7	AX 1339.000 AX 1360.000 AX 1376.000 AX 1260.000 AX 1116.000 AX 1059.000 AX 1091.000 AX 1261.000
FP-AX 436 221 with 6 cut-outs 36 x 112 mm vertical, 1 row	43910	KEL 24 KEL-U 24 KEL-QUICK 24 KEL-SNAP 24 KEL-QTA 24 KEL-BES 24 KEL-BES-S 24	KEL-DPZ 24 KEL-DPU 24 KEL-DP 24	7	AX 1339.000 AX 1360.000 AX 1376.000 AX 1260.000 AX 1116.000 AX 1059.000 AX 1091.000 AX 1261.000

FP-KX/KL

Flange plates for terminal boxes

IP55



Product description

The FP flange plates type KX/KL, designed to fit the Rittal KX/KL series terminal boxes, are installed in combination with a cable entry system for either pre-terminated or standard cables. FP flange plates are pre-cut, pre-drilled and painted for easy and quick installation of icotek cable routing products.

We recommend fastening the cable entry systems with a torque of 1.5 - 2.0 Nm.

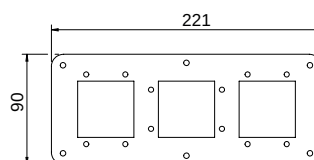
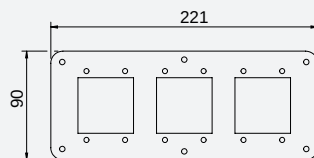
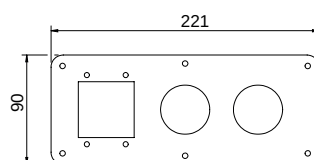
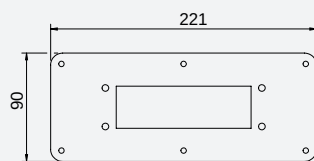
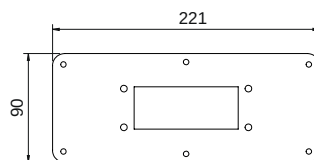
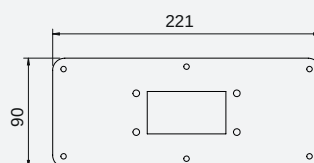
Specifications

Material **Sheet steel, powder coated**

Compatible with

KEL Cable entry frames	16 - 19
KEL-U Cable entry frames	12 - 15
KEL-QUICK Cable entry frames	60 - 62
KEL-SNAP Mounting frames	34 - 35
KEL-QTA 24 Cable entry frames	70 - 71
KEL-DPU Cable entry plates	90 - 91
KEL-DPZ Cable entry plates	92 - 94
KEL-DP 24 Cable entry plates	100 - 101
KEL-DPF Cable entry grommets	112 - 113
KEL-BES	82
KEL-BES-S	83
Blank plates	220 - 222

Description



IP65 cable entry plate for Rittal KL:
KEL-DPZ-KL - see page 92

FP-KX/KL

Flange plates for terminal boxes



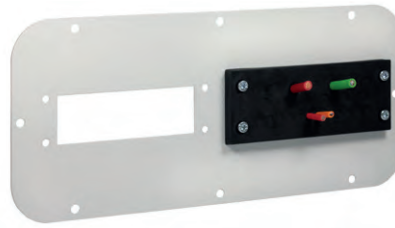
IP55

Type	Order No. RAL 7035	Flange plates compatible with	Size FP	Compatible with	
FP-KX/KL 221x90 10 with 1 cut-out 36 x 65 mm	43853	KEL 10 KEL-U 10 KEL-QUICK 10 KEL-SNAP 10 KEL-BES 10 KEL-BES-S 10	2	Terminal boxes Type KL KX 1530.000 KX 1531.000 KX 1532.000 KX 1533.000 KX 1535.000	KX 1536.000 KX 1537.000 KX 1538.000 KX 1539.000 KX 1540.000 KX 1541.000
FP-KX/KL 221x90 16 with 1 cut-out 36 x 86 mm	43855	KEL 16 KEL-U 16 KEL-QUICK 16 KEL-SNAP 16 KEL-BES 16 KEL-BES-S 16	2	Terminal boxes Type KL KX 1530.000 KX 1531.000 KX 1532.000 KX 1533.000 KX 1535.000	KX 1536.000 KX 1537.000 KX 1538.000 KX 1539.000 KX 1540.000 KX 1541.000
FP-KX/KL 221x90 24 with 1 cut-out 36 x 112 mm	43834	KEL 24 KEL-U 24 KEL-QUICK 24 KEL-SNAP 24 KEL-QTA 24 KEL-DPZ 24 KEL-DPU 24 KEL-DP 24 KEL-BES 24 KEL-BES-S 24	2	Terminal boxes Type KL KX 1530.000 KX 1531.000 KX 1532.000 KX 1533.000 KX 1535.000	KX 1536.000 KX 1537.000 KX 1538.000 KX 1539.000 KX 1540.000 KX 1541.000
FP-KX/KL 221x90 A with 3 cut-outs	43852	KEL-B KEL-U-B KEL-QUICK-B KEL-SNAP-B KEL-DPZ-B KEL-DPZ 40 KEL-DPF 40	2	Terminal boxes Type KL KX 1530.000 KX 1531.000 KX 1532.000 KX 1533.000 KX 1535.000	KX 1536.000 KX 1537.000 KX 1538.000 KX 1539.000 KX 1540.000 KX 1541.000
FP-KX/KL 221x90 B with 3 cut-outs 46 x 46 mm	43854	Use with: 2× KEL-SNAP-B and 1× KEL-DPZ-B	2	Terminal boxes Type KL KX 1530.000 KX 1531.000 KX 1532.000 KX 1533.000 KX 1535.000	KX 1536.000 KX 1537.000 KX 1538.000 KX 1539.000 KX 1540.000 KX 1541.000
FP-KX/KL 221x90 C with 3 cut-outs 46 x 46 mm	43856	KEL-B KEL-U-B KEL-QUICK-B KEL-DPZ-B	2	Terminal boxes Type KL KX 1530.000 KX 1531.000 KX 1532.000 KX 1533.000 KX 1535.000	KX 1536.000 KX 1537.000 KX 1538.000 KX 1539.000 KX 1540.000 KX 1541.000

FP-AE

Flange plates
for compact enclosures

IP66



Product description

We supply complete flange plates FP with 112 × 36 mm cut-outs for compact enclosures of the AE series. The cut-outs, as well as the drilling template, conform to the standard cut-outs for 24-pole industrial connectors.

All flange plates are RAL 7035 powder-coated. Please use the gaskets of the standard plates. Enclosures are supplied with gaskets and screws.

We recommend fastening the cable entry systems with a torque of 1.5 - 2.0 Nm.

Advantages & benefits

- No expensive extra sheet metal work is required
- High cable density is achieved by using KEL, KEL-U, KEL-QUICK, KEL-DPU, KEL-DPZ or KEL-DP
- Reduce labour costs by using cable entry systems compared to the assembly of conventional cable glands

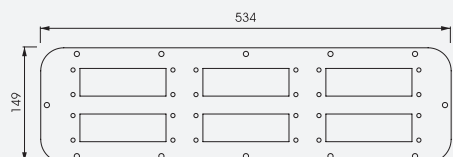
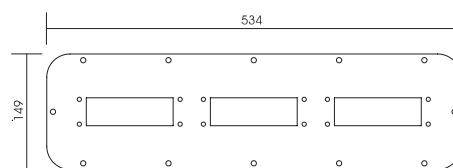
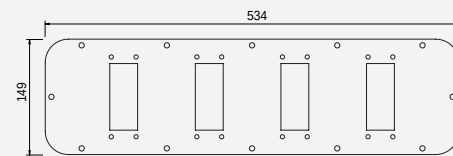
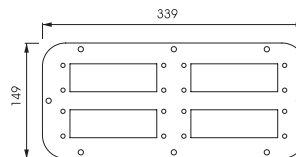
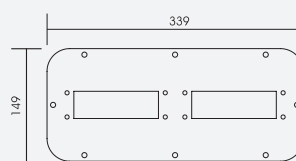
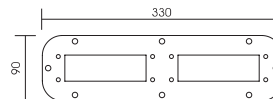
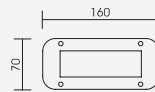
Specifications

Material **Sheet steel, powder coated**

Compatible with

KEL Cable entry frames	16 - 19
KEL-U Cable entry frames	12 - 15
KEL-QUICK Cable entry frames	60 - 62
KEL-SNAP Mounting frames	34 - 35
KEL-QTA 24 Cable entry frames	70 - 71
KEL-DPU 24 Cable entry plates	90 - 91
KEL-DPZ 24 Cable entry plates	92 - 94
KEL-DP 24 Cable entry plates	100 - 101
KEL-BES	82
KEL-BES-S	83
Blank plates	220 - 222

Description



FP-AE

Flange plates
for compact enclosures

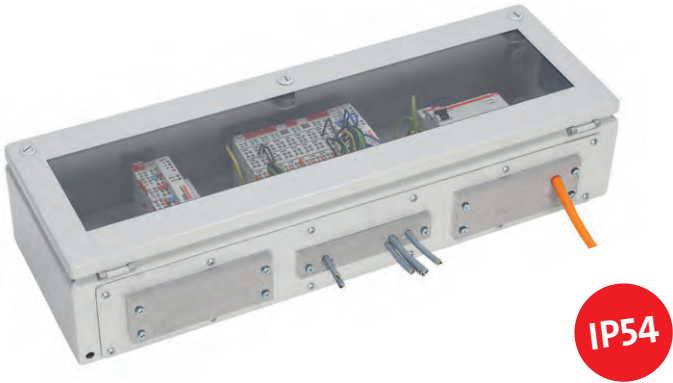


IP66

Type	Order No. RAL 7035	Compatible with: (Product Group 1)	Compatible with: (Product Group 2)	Size FP	Compatible with
FP-AE 160 70 with 1 cut-out 36 x 112 mm	43836	KEL-QTA 24	KEL-DP 24	1	AE 1032 AE 1035
FP-AE-24 330 90 with 2 cut-outs 36 x 112 mm	43838	KEL 24 KEL-U 24 KEL-QUICK 24 KEL-QTA 24 KEL-BES 24 KEL-BES-S 24	KEL-DPZ 24 KEL-DPU 24 KEL-DP 24	3	AE 1030 AE 1031 AE 1038 AE 1380
FP-AE-16 330 90 with 2 cut-outs 36 x 86 mm	43861	KEL 16 KEL-U 16 KEL-QUICK 16 KEL-BES 16 KEL-BES-S 16	KEL-DPZ 16 KEL-DP 16	3	
FP-AX AE 339 149 with 2 cut-outs 36 x 112 mm	43840	KEL 24 KEL-U 24 KEL-QUICK 24 KEL-SNAP 24 KEL-QTA 24 KEL-BES 24 KEL-BES-S 24	KEL-DPZ 24 KEL-DPU 24 KEL-DP 24	4	AE 1037 AE 1045 AE 1050 AE 1057 AE 1100 AE 1110 AE 1114 AE 1130 AE 1213 AE 1338 AE 1350
FP-AX AE 339 149 with 4 cut-outs 36 x 112 mm	43846	KEL 24 KEL-U 24 KEL-QUICK 24 KEL-QTA 24 KEL-BES 24 KEL-BES-S 24	KEL-DPZ 24 KEL-DPU 24 KEL-DP 24	4	CS 9751.125 CS 9751.145 CS 9751.165 CS 9752.125 TP 6710 TP 6712 TP 6714 TP 6716
FP-AX AE 534 149 with 4 cut-outs 36 x 86 mm	43871	KEL 16 KEL-U 16 KEL-QUICK 16 KEL-SNAP 16 KEL-BES 16 KEL-BES-S 16	KEL-DPZ 16 KEL-DP 16	5	AE 1039 AE 1054 AE 1055 AE 1058 AE 1060 AE 1073 AE 1076 AE 1077 AE 1090 AE 1180 AE 1260 AE 1280 AE 1339 AE 1360 AE 1376 AE 1958 EL 1919 EL 1926
FP-AX AE 534 149 with 3 cut-outs 36 x 112 mm	43842	KEL 24 KEL-U 24 KEL-QUICK 24 KEL-SNAP 24 KEL-QTA 24 KEL-BES 24 KEL-BES-S 24	KEL-DPZ 24 KEL-DPU 24 KEL-DP 24	5	IN 1076.290
FP-AX AE 534 149 with 6 cut-outs 36 x 112 mm	43848	KEL 24 KEL-U 24 KEL-QUICK 24 KEL-QTA 24 KEL-BES 24 KEL-BES-S 24	KEL-DPZ 24 KEL-DPU 24 KEL-DP 24	5	TP 6711 TP 67113 TP 6715 TP 6717

FP-BG | FP-FL21

Flange plates for bus enclosures



Product description

The FP flange plates type BG, designed to fit the Rittal BG series enclosures, have up to 3 cut-outs that match the dimensions of the standard cut-outs for the 24-pole industrial connectors. These flange plates are installed in combination with a cable entry system for either pre-terminated cables (KEL 24, KEL-U 24 or KEL-QUICK 24) or standard cables (KEL-DPZ 24, KEL-DPU 24 or KEL-DP 24).

We recommend fastening the cable entry systems with a torque of 1.5 - 2.0 Nm.

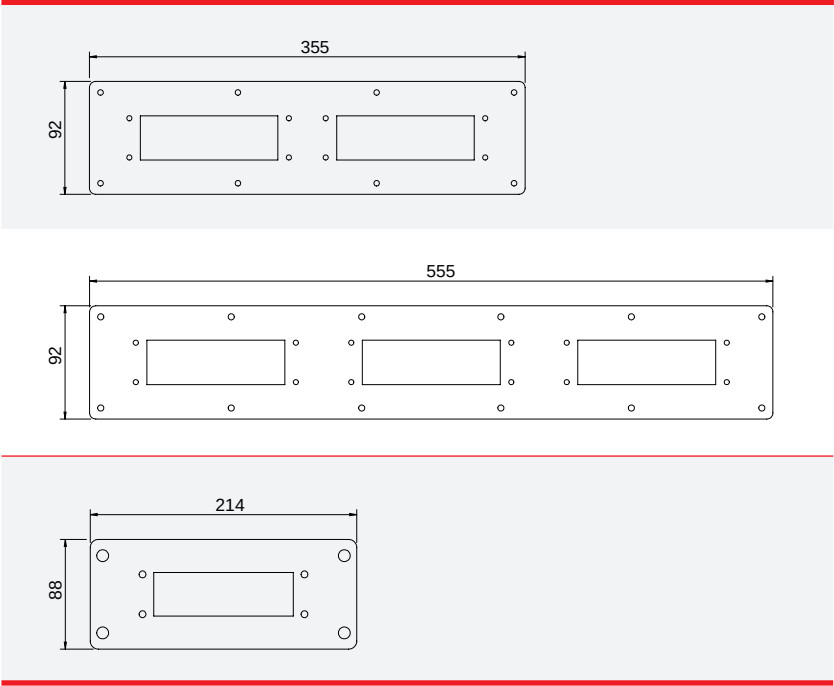
Specifications

Material Sheet steel, powder coated

Compatible with

KEL 24 Cable entry frames	17
KEL-U 24 Cable entry frames	13
KEL-QUICK 24 Cable entry frames	62
KEL-SNAP Mounting frames	34 - 35
KEL-QTA 24 Cable entry frames	70
KEL-DPU 24 Cable entry plates	90 - 91
KEL-DPZ 24 Cable entry plates	92 - 94
KEL-DP 24 Cable entry plates	100 - 101
Blank plates	220 - 222

Description



FP-BG | FP-FL21

Flange plates for bus enclosures



IP54

Type	Order No. RAL 7035	Flange plates compatible with	Size FP.	Compatible with
FP-BG 355x92 with 2 cut-outs 36 x 112 mm	43866	KEL 24 KEL-U 24 KEL-QUICK 24 KEL-SNAP 24 KEL-QTA 24 KEL-DPZ 24 KEL-DPU 24 KEL-DP 24 KEL-BES 24 KEL-BES-S 24	-	BG 1558.510
FP-BG 555x92 with 3 cut-outs 36 x 112 mm	43865	KEL 24 KEL-U 24 KEL-QUICK 24 KEL-SNAP 24 KEL-QTA 24 KEL-DPZ 24 KEL-DPU 24 KEL-DP 24 KEL-BES 24 KEL-BES-S 24	6	BG 1050.900 BG 1559.510 IN 1510.280
FP-FL 21 with 1 cut-out 36 x 112 mm	43832	KEL 24 KEL-U 24 KEL-QUICK 24 KEL-SNAP 24 KEL-QTA 24 KEL-DPZ 24 KEL-DPU 24 KEL-DP 24 KEL-BES 24 KEL-BES-S 24	-	Fibox plates

BPK

Blank plates, plastic



BPK-RF: Snap function, tool-free assembly



BPK: screwable

Product description

BPK Blank plates seal cut-outs for standard 10-pole / 16-pole / 24-pole industrial connectors with IP rating up to IP66.

Plastic blank plates are available in two different versions:

- Type BPK: Blank plates for screw connection
- Type BPK-RF A: Blank plates for snapping into metal sheet plates up to a thickness from 1.5 to 3 mm

Advantages & benefits

- Fast mounting of the blank plates BPK-RF range by snapping into the cut-out
- Integrated circular sealing (up to IP66)

Specifications

Material	Polypropylene (PP)
Flame class	UL94-V0
IP rating	BPK: IP66 BPK-RF A: IP54
Temperature Properties	- 30°C to + 140°C (static) Halogen free, silicone free

Compatible with

FP Flange plates 210 - 219

Type	Order No.	Blank plate for KEL cut-out	Dimensions	PU
BPK Blank plates for screw connection:				
BPK-B	42010	KEL-B KEL-U-B KEL-ER-B KEL-QUICK-B	76 × 53 mm	10
BPK 10	42015	KEL 10 KEL-U 10 KEL-ER 10 KEL-QUICK 10	101 × 53 mm	10
BPK 16	42016	KEL 16 KEL-U 16 KEL-ER 16 KEL-QUICK 16	121 × 53 mm	10
BPK 24	42024	KEL 24 KEL-U 24 KEL-ER 24 KEL-QUICK 24 KEL-FG-A	148 × 53 mm	10
BPK Blank plates for snapping into cut-outs:				
BPK-B-RF A	42010.002	KEL-B KEL-U-B KEL-QUICK-B	76 × 53 mm	10
BPK 10-RF A	42015.002	KEL 10 KEL-U 10 KEL-QUICK 10	101 × 53 mm	10
BPK 16-RF A	42016.002	KEL 16 KEL-U 16 KEL-QUICK 16	121 × 53 mm	10
BPK 24-RF A	42024.002	KEL 24 KEL-U 24 KEL-QUICK 24 KEL-FG-A	148 × 53 mm	10
BPK-JFX	42620	KEL-JUMBO flex	88 × 88 mm	5

BPM

Blank plates, metal

IP66



Product description

Blank plates to close cut-outs for standard 6-pole / 10-pole / 16-pole / 24-pole industrial connectors.

Blank plates are supplied with a gasket.

Specifications

Material	Steel, zinc-plated
	Width 2 mm
IP rating	IP66

Compatible with

KDR 2 Split gland plates	198 - 199
FP Flange plates	210 - 219
MP Module plates	204 - 205

Type	Order No.	Blank plate for KEL cut-out	Dimensions	PU
BPM-E2	42048	KEL-E2 KEL-ER-E2 KEL-FG-E2 KEL-QUICK-E2	73 × 39.5 mm	10
BPM-E3	42049	KEL-E3 KEL-ER-E3 KEL-FG-E3 KEL-QUICK-E3	98 × 39.5 mm	10
BPM-E4	42050	KEL-E4 KEL-ER-E4 KEL-QUICK-E4	120 × 39.5 mm	10
BPM-E5	42051	KEL-E5 KEL-ER-E5 KEL-FG-E5 KEL-QUICK-E5	147 × 39.5 mm	10
BPM-B	42013	KEL-B KEL-U-B KEL-ER-B KEL-QUICK-B	75 × 58 mm	10
BPM 6 BPM 6 V2A	42011 41991	Standard 6-pin industrial connectors	90 × 52 mm	10
BPM 10 BPM 10 V2A	42014 41992	KEL 10 KEL-U 10 KEL-ER 10 KEL-QUICK 10	99 × 58 mm	10
BPM-FG-B	42012	KEL-FG-B	80 × 58 mm	10
BPM 16 BPM 16 V2A	42025 41994	KEL 16 KEL-U 16 KEL-ER 16 KEL-QUICK 16	118 × 56 mm	10
BPM 16-E	42023	KEL 16-E	120 × 87 mm	1
BPM 16-MT	42026	KEL 16-MT	120 × 102 mm	1
BPM 16-2MT	42031	KEL 16-2MT	120 × 146 mm	1
BPM 24 BPM 24 V2A	42027 41995	KEL 24 KEL-U 24 KEL-ER 24 KEL-QUICK 24	145 × 56 mm	10
BPM 24-E	42029	KEL 24-E	143 × 83 mm	1
BPM 24-MT	42028	KEL 24-MT	147 × 102 mm	1
BPM-JUMBO flex	42033	KEL-JUMBO flex	88 × 88 mm	1
BPM-JUMBO 1	42030	KEL-JUMBO 1	116 × 110 mm	1
BPM-JUMBO 2	42032	KEL-JUMBO 2	200 × 116 mm	1
BPM-ULTRA	42633	KEL-ULTRA flex	Ø 168 mm Width: 1.5 mm	1

BPK-SNAP

Blank plates for KEL-SNAP frames



Product description

Blank plate BPK-SNAP to close cut-outs of pre-assembled KEL-SNAP frames.

A snap frame can be closed, i.e. during transport to avoid entry of dust, as long as a KEL frame is not mounted.

The BPK-SNAP blank plate is simply snapped on the KEL frame. There is no tool needed to remove it.

BPK-SNAP 16 and BPK-SNAP 24 for closing cut-outs of the KEL-SNAP mounting frames and unused Slide frames of the KDR-ESR gland plates.

Type	Order No.	Blank plate compatible with	Dimensions l × b × h	PU
BPK-SNAP-B	42003	KEL-SNAP-B4	58 × 72.8 × 17 mm	10
BPK-SNAP 10	42004	KEL-SNAP 10	58 × 98.3 × 17 mm	10
BPK-SNAP 16	42007	KEL-SNAP 16	58 × 120 × 17 mm	10
BPK-SNAP 24	42017	KEL-SNAP 24	58 × 147 × 17 mm	10
BPK-SNAP 24-E	42008	KEL-SNAP 24-E	83 × 147 × 17 mm	10

Specifications

Material	Polyethylene (PE)
Flame class	UL94-HB
IP rating	IP54
Temperature	- 40°C to + 80°C (static)
Properties	Silicone free

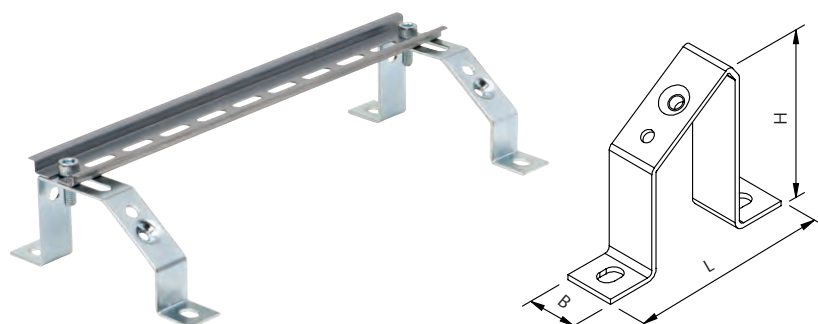
6

Compatible with

KEL-SNAP Mounting frames	34-35
KDR-ESR Gland plate with Slide frames	190 - 197

MF

Supports for DIN rails and bus bars



Product description

There are 4 models of supports for mounting bus bars 10 × 3 mm or 35 mm DIN rails. Various supports are available to provide solutions for different conditions.

A mounting clip is used for fastening the bus bar to the supports. The support has M6 female screw threads to affix the mounting clip of the DIN rail with a M6 screw.

Mounting clip
Order No. 36150

Advantages & benefits

- Wide variety of supports with different sizes and designs
- Simple assembly of TS35 DIN rails and 10 × 3 mm bus bars
- Support type D provides possibility to affix 2 TS335 DIN rails

Specifications

Material Sheet steel, galvanically zinc-plated

Accessories

Bus bar Order No. 36100
Mounting clip Order No. 36150

Description	Type	Version	Order No. without Clip	Order No. with Clip	Dimension [L × B × H]	PU	
	Type A	MF-A49	Type A	36056	36058	80 × 20 × 49 mm	10
		MF-A68	Type A	36064	36066	80 × 20 × 68 mm	10
		MF-A88	Type A	36072	36074	80 × 20 × 88 mm	10
	Type B	MF-B20	Type B	36000	36002	80 × 20 × 20 mm	10
		MF-B30	Type B	36008	36010	80 × 20 × 30 mm	10
		MF-B50	Type B	36016	36018	80 × 20 × 50 mm	10
	Type C	MF-B90	Type B	36024	36026	80 × 20 × 90 mm	10
		MF-C40	Type C	36032	36034	40 × 18 × 40 mm	10
	Type D	MF-C53	Type C	36040	36042	40 × 18 × 53 mm	10
		MF-D49	Type D	36048	36050	120 × 20 × 49 mm	10
	Bus bar 10 × 3 mm	-	36100	-	10 × 3 × 1000 mm*	1	

* Other lengths available on request

KGM | GMT

Locknuts



Type KGM: Standard nut, plastic

Product description

Hexagonal locknut with metric threads for attaching components together.

For routing SUB-D, DVI or PROFIBUS connectors in combination with the split cable glands KVT / QVT, special locknuts with suitable cut-outs are required:

KGM-SUB-D9 fits D-Sub 9 connectors
(Required wall cut-out: Ø 36 mm)

KGM-PB fits DVI and PROFIBUS connectors
(Required wall cut-out: Ø 42 mm)

KGM-SUB-D25 fits SUB-D25 connectors
(Required wall cut-out: Ø 50 - 54 mm)

Split hexagonal locknuts GMT for use in combination with split cable glands KVT/QVT whenever pre-terminated cables are routed inside cable protection conduits through a machine or cabinet wall. Suitable for split corrugated conduits CONFiX WST.

Thread	Type	Order No.	Material	Height [mm]	Wrench size	Diagonal [mm]	Cut-out a x b [mm]	PU
Type KGM: Standard nut, plastic								
M16 x 1.5	KGM 16	52272	PA	4.3	SW 22.8	28.2	-	10
M20 x 1.5	KGM 20	52273	PA	7	SW 26	28.2	-	10
		52283						
M25 x 1.5	KGM 25	52274	PA	7	SW 32	36	-	10
		52284						
M32 x 1.5	KGM 32	52275	PA	7	SW 41	46	-	10
		52285						
M40 x 1.5	KGM 40	52276	PA	7	SW 50	56	-	10
		52286						
M50 x 1.5	KGM 50	52277	PA	8.5	SW 60	66	-	10
		52287						
M63 x 1.5	KGM 63	52278	PA	8.5	SW 75	83	-	5
		52288						
M75 x 1.5	KGM 75	52289	PA	8.5	SW 85	93.1	-	5
M85 x 2	KGM 85	52290	PA	10	SW 100	109.5	-	5

6



Wrenches

for M75/M85 plastic locknuts

For mounting the new KEL-DPF sizes we offer suitable wrenches with widths for M75 and M85 plastic locknuts. Material: aluminium

M75: Order No.61436 | M85: Order No. 61437 | PU: 1

KGM | GMT Locknuts



Type KGM: SUB-D9, PB, SUB-D25



Type GMT: Split locknut



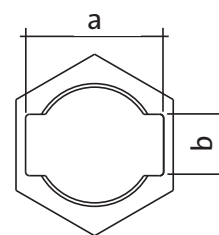
Thread	Type	Order No.	Material	Height [mm]	Wrench size	Diagonal [mm]	Cut-out a × b [mm]	PU
Type KGM: PB, SUB-D9, SUB-D25								
M32 × 1.5	KGM-SUB-D9	 45105  45106	PC	7	SW 41	46	35 × 16	10
M40 × 1.5	KGM-PB	 45107  45109	PC	8	SW 50	55	43 × 17	10
M50 × 1.5	KGM-SUB-D25	 45108  45110	PC	8	SW 60	66	55 × 16	10
Type GMT: Split locknut								
M16 × 1.5	GMT 16	 31105	PA	8	SW 19	21	-	10
M20 × 1.5	GMT 20	 31110	PA	9	SW 27	29	-	10
M25 × 1.5	GMT 25	 31100	PA	9	SW 32	35	-	10
M32 × 1.5	GMT 32	 31120	PA	12	SW 40	44	-	10
M40 × 1.5	GMT 40	 31130	PA	15	SW 48	53	-	10
M50 × 1.5	GMT 50	 31140	PA	15	SW 63	69	-	10

Specifications

Material	Polyamide (PA) / Polycarbonate (PC)
Colour	grey (similar RAL 7035) black
Flame class	UL94-Vo, self-extinguishing
Temperature	- 30°C to + 120°C
Properties	Halogen free, silicone free

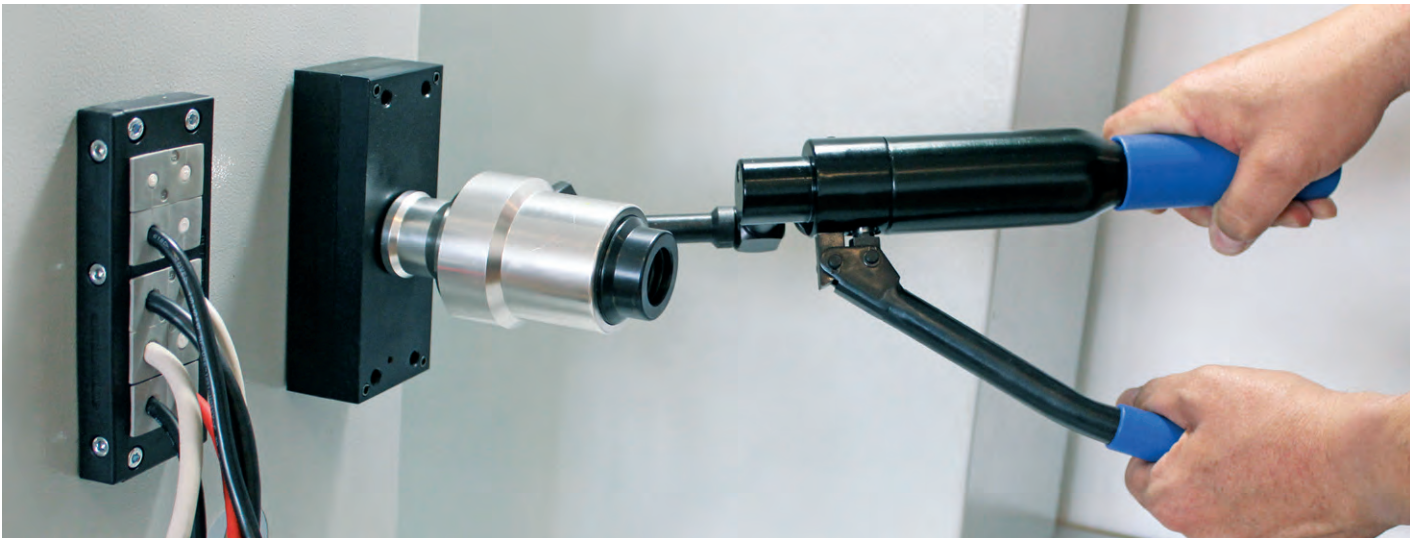
Compatible with

KVT, KVT-SNAP, KVT-W90	
Split cable glands	42 - 46
QVT Split cable glands	66
KEL-DPZ Cable entry plates	92 - 97
KEL-DPF Cable entry grommets	112 - 113



7 icotek TOOLS

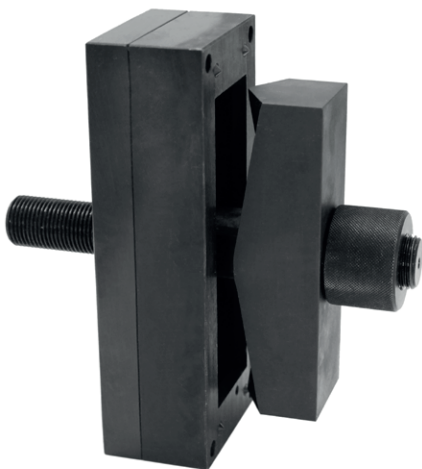
Punch drivers, knockout punches & useful tools



icotek now offers a small-sized hand hydraulic punch driver without a hose which allows quick and easy punching of rectangular, square or round holes. When you have to punch several holes, this hand hydraulic punch driver is much faster than manual wrench-style punches.

icotek offers round knockout punches for cut-outs in metric and PG sizes. This self-centering knockout punches split slugs into 2 or 3 pieces for easy slug removal. For installation of pushbuttons and round switches icotek offers a 22.5 mm punch with integrated twist protection notch.

icotek also offers rectangular and square punches and dies, for cut-out sizes of 10-, 16-, and 24- multi-pin industrial connectors as well as for most icotek cable entry systems.



Advantages & benefits ...

1. Maximum flexibility

Due to its high hydraulic force the compact, lightweight hand hydraulic punch driver makes it easy to punch holes into stainless V2A steel, mild steel, aluminium or plastics. The cylinder of the punch driver rotates 360° on 3 axes. Therefore, maximum flexibility even in hard-to-reach places is provided.

2. Multi-fold slug splitting

The special cutting geometry of the round punches reduces the cutting pressure and therefore the required effort. The punch splits slugs into several pieces for easy slug removal (type related).

3. Perfect for icotek cable entry components

The metric round, rectangular & square knockout punches can be used for industrial standard cut-outs of heavy multi-pin connectors and many icotek cable entry components.

Chapter content 7



Punch driver sets
Hand hydraulic punch driver
& round knockout die set, metric,
Hydraulic Foot Pump

228



Rectangular & square punches
for cut-outs of heavy multi-pin industrial
connectors and many icotek cable entry
components

229



Round punches
for cut-outs in PG and metric sizes

230 – 231

KMS

Cable template

The correct size of the KT grommets can easily be determined
by using the cable template

- Determining the diameter of the cable using the cable template
- Selecting the KT grommets according to the data on the cable template

Order No. 39800 | PU: 1



QVT-CLICK Tool

Mounting tool

The QVT-CLICK Tool for a quick and easy mounting of the split
cable glands QVT-CLICK (see page 65)

Order No. 61435 | PU: 1



Wrenches

for plastic locknuts M75/M85

For mounting the new KEL-DPF sizes we offer suitable wrenches
with widths for M75 and M85 plastic locknuts.

Material: aluminium

M75: Order No. 61436 | M85: Order No. 61437 | PU: 1



STFZ I/O Insert Tool

Mounting tool for I/O modules

STFZ I/O Insert Tool for a quick and easy mounting of STFZ
terminal clamps (EMC shield clamps for peripheral modules,
see page 149).

Order No. 61430 | PU: 1



Punch driver sets

Hand hydraulic punch driver
and metric punches,
Hydraulic foot pump



Product description

The compact, lightweight hand hydraulic punch driver makes it easy to punch holes into stainless V2A steel, mild steel, aluminium or plastics with a max. sheet thickness of 3 mm (V2A: 2 mm), due to its high hydraulic force. The cylinder of the punch driver rotates 360° on 3 axles, so maximum flexibility even in hard-to-reach places is provided.

The punch driver can be used with all icotek punches and also with punches of other manufacturers.

Advantages & benefits

- Maximum flexibility due to 360° head rotation
- High hydraulic force (60 kN, 600 bar) for easy punching
- Compact, lightweight aluminium design (2 kg)
- Fast and easy operation
- Punch driver also suitable for punches by other manufacturers

Specifications

Material	Aluminium
Punching force	60 kN
Operating pressure	600 bar

Accessories

Round punches	230 – 231
Rectangular & square punches	229

Type	Scope of delivery	Order No.	PU
Punch driver set BASIC	1 hand hydraulic punch driver (weight: 2 kg) 1 draw stud for punches (steel) ø 9.5 mm (3/8" UNF) to ø 19 mm (3/4" UNF), L: 105 mm 1 draw stud ø 19 mm (3/4" UNF), L: 125 mm 1 spacer 1 tube lubricant 1 HSS co pilot drill (multi step drill) 1 robust plastic storage case	80000	1

Punch driver set PRO 16-32	1 hand hydraulic punch driver (weight: 2 kg) 1 draw stud for punches (steel) ø 9.5 mm (3/8" UNF) to ø 19 mm (3/4" UNF), L: 105 mm 1 draw stud ø 19 mm (3/4" UNF), L: 125 mm 1 spacer 1 tube lubricant 1 HSS co pilot drill (multi step drill) 1 each knockout punch for steel M16 M20 M25 M32 1 robust plastic storage case	80005	1
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Punch driver set PRO 16-63	1 hand hydraulic punch driver (weight: 2 kg) 1 draw stud for punches (steel) ø 9.5 mm (3/8" UNF) to ø 19 mm (3/4" UNF), L: 105 mm 1 draw stud ø 19 mm (3/4" UNF), L: 125 mm 1 spacer 1 tube lubricant 1 HSS co pilot drill (multi step drill) 1 each knockout punch for steel M16 M20 M25 M32 M40 M50 M63 1 robust plastic storage case	80006	1
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Hydraulic foot pump

with hydraulic cylinder and accessories

Universally applicable single-stage foot pump with a fixed operating pressure of 450 bar and built-in pressure relief valve. Suitable for all icotek round punches, rectangular and square punches. Keeps your hands free to position the sheet metal punch precisely, especially when using larger sheet metal punches.

Type	Scope of delivery	Order No.	PU
Hydraulic foot pump	1 foot pump 2,5 m high pressure hose including quick coupling 1 hydraulic cylinder for holding round and rectangular punch 1 draw stud for rectangular punch, Order No. 80209 1 draw stud for round punch (steel) M16 – M25, Order No. 80200 1 multi-step drill, Order No. 80204 1 spacer, Order No. 80202 1 tube lubricant, Order No. 80203 Note: storage case not included in delivery	80002	1

Rectangular & square punches sized for heavy multi-pin industrial connectors & icotek cable entry systems



Type	Cut-out size	Max. sheet thickness	For cut-out of connector	Order No.	PU
Punches for steel and aluminium					
Punch 22x45	22 x 45 mm	2 mm	–	80059	1
Punch 68x68	68 x 68 mm	2 mm	–	80064	1
Punch 92x92	92 x 92 mm	2 mm	–	80060	1
Punch 125x125 * **	125 x 125 mm	2 mm	–	80063	1
Punch 66x112 *	66 x 112 mm	2 mm	–	80061	1
Punch E2	24 x 43 mm	2 mm	–	80055	1
Punch E3	24 x 65mm	2 mm	–	80056	1
Punch E4	24 x 86mm	2 mm	–	80057	1
Punch E5	24 x 112mm	2 mm	–	80058	1
Punch 6	36 x 52 mm	2 mm	6-pin	80062	1
Punch B	46 x 46 mm	2 mm	–	80050	1
Punch 10	36 x 65 mm	2 mm	10-pin	80051	1
Punch 16	36 x 86 mm	2 mm	16-pin	80052	1
Punch 24	36 x 112 mm	2 mm	24-pin	80053	1
Punch 24-XL	46 x 112 mm	2 mm	24-pin	80054	1
Punches for stainless steel V2A					
Punch 6 for stainless steel V2A	36 x 52 mm	2 mm	6-pin	80149	1
Punch B for stainless steel V2A	46 x 46 mm	2 mm	–	80150	1
Punch 10 for stainless steel V2A	36 x 65 mm	2 mm	10-pin	80151	1
Punch 16 for stainless steel V2A	36 x 86 mm	2 mm	16-pin	80152	1
Punch 24 for stainless steel V2A	36 x 112 mm	2 mm	24-pin	80153	1
Punch 24-XL for stainless steel V2A	46 x 112 mm	2 mm	24-pin	80154	1
Centre punch for rectangular and square punches	–	–	–	80065	1

* storage case not included in delivery

** only to be used with hydraulic foot pump (order no. 80002). Please order draw stud (order no. 802139) and special nut (order no. 80214) as well.

Product description

Rectangular and square punches and dies make it easy to punch holes into stainless steel (V2A versions), mild steel, aluminium or plastics with a max. sheet thickness of 2 mm. Available for cut-outs sizes of 10-, 16-, and 24- multi-pin heavy industrial connectors and also for numerous special cut-outs. Therefore, the punches are suitable for most icotek cable entry systems. Centre punches are integrated in the die for exact drilling of mounting holes.

The punches are for hydraulic operation only.

Advantages & benefits

- Centre punches for exact drilling of mounting holes
- Robust plastic storage case
- Suitable for hand hydraulic punch driver by icotek and other manufacturers

Specifications

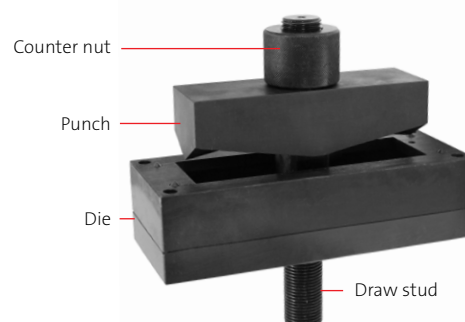
Material Steel, hardened and burnished

Scope of delivery

Punch, die and draw stud, robust plastic storage case

Compatible with

Hydraulic punch driver 228



Round punches

for steel and aluminium,
for cut-outs PG & M16 – M85



3-fold slug splitting



Punch set M16 - M63
Order No. 80007

Product description

Self-centering knockout punches for mild steel, aluminium and plastic walls. Punches available for cut-outs PG 16, M16, M20, M25, M32, M40, M50, M63, M75 and M85. Cut-outs for icotek split cable glands and round cable entry plates can be punched.

The special cutting geometry of the punch reduces the cutting pressure and therefore the required effort. The punch splits slugs into several pieces (type related)* for easy slug removal. For installation of round switches icotek offers a PG 16 punch with an integrated 3 mm twist protection notch.

The punches are designed for manual and hydraulic operation.

Advantages & benefits

- Multiple splitting punches for easier slug removal/ for easy punching
- Suitable with hand hydraulic punch driver by icotek or other manufacturers

Specifications

Material **Steel, hardened and burnished**

Scope of delivery

Punch and die (without draw stud)

Compatible with

Hydraulic punch driver 228

Type	Cut-out diameter	Max. sheet thickness	Thread Ø	Order No.	PU
Punches for steel and aluminium					
Punch set M16 – M63	16.2 – 63.5 mm	M16 – M25: 2.0 mm M32 – M63: 3.0 mm	9.5 mm/19 mm	80007	1
Punch M16	16.2 mm	2 mm	9.5 mm	80020	1
Punch M20	20.4 mm	2 mm	9.5 mm	80021	1
Punch M25	25.4 mm	2 mm	9.5 mm	80022	1
Punch M32	32.5 mm	3 mm	19 mm	80023	1
Punch M40	40.5 mm	3 mm	19 mm	80024	1
Punch M50	50.5 mm	3 mm	19 mm	80025	1
Punch M63	63.5 mm	3 mm	19 mm	80026	1
Punch M75	75.5 mm	2 mm	19 mm	80029	1
Punch M85	86 mm	2 mm	19 mm	80030	1
Punch PG 16	22.5 mm	3 mm	9.5 mm	80027	1
Punch PG 16 with twist protection notch	22.5 mm + 3 mm notch	3 mm	9.5 mm	80028	1
Draw stud	for punches M16 – M25, Ø 9.5 mm to Ø 19 mm, L: 105 mm			80200	1
Draw stud	for punches M32 – M85, Ø 19 mm, L: 125 mm			80201	1

Note: More PG sizes are available on request.

*Except punches M75/M85

Round punches for stainless steel, for cut-outs PG & M16 – M85



2-fold slug splitting

Type	Cut-out diameter	Max. sheet thickness	Thread Ø	Order No.	PU
Punches for V2A stainless steel					
Punch M16** for stainless steel V2A	16.2 mm	2 mm	11.1 mm	80120	1
Punch M20** for stainless steel V2A	20.4 mm	2 mm	11.1 mm	80121	1
Punch M25** for stainless steel V2A	25.4 mm	2 mm	11.1 mm	80122	1
Punch M32 for stainless steel V2A	32.5 mm	2 mm	19 mm	80123	1
Punch M40 for stainless steel V2A	40.5 mm	2 mm	19 mm	80124	1
Punch M50 for stainless steel V2A	50.5 mm	2 mm	19 mm	80125	1
Punch M63 for stainless steel V2A	63.5 mm	2 mm	19 mm	80126	1
Punch PG 16 with twist protection notch, for stainless steel V2A	22.5 mm + 3 mm notch	2 mm	9.5 mm	80128	1
Draw stud	with adapter 11.1 x 19.0 mm for V2A punches M16 - M25			80210	1

**Draw stud (Order No. 80210) is required.

Note: More PG sizes are available on request.

Product description

Self-centering knockout punches for stainless steel (V2A versions). Punches available for cut-outs PG 16, M16, M20, M25, M32, M40, M50, M63, M75 and M85. Cut-outs for icotek split cable glands and round cable entry plates can be punched.

The special cutting geometry of the punch reduces the cutting pressure and therefore the required effort. The punch splits slugs into two pieces for easy slug removal. For installation of round switches icotek offers a PG 16 punch with an integrated 3 mm twist protection notch.

The punches are designed for manual and hydraulic operation.

Advantages & benefits

- Multiple splitting punches for easier slug removal/for easy punching
- Suitable with hand hydraulic punch driver by icotek or other manufacturers

Specifications

Material Steel, hardened and burnished

Scope of delivery

Punch and die (without draw stud)

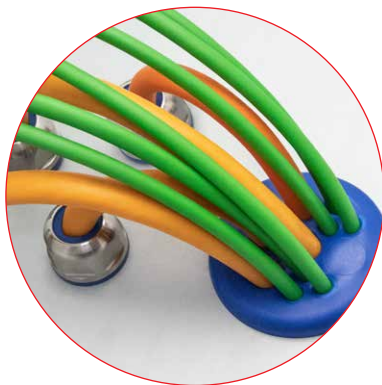
Compatible with

Hydraulic punch driver 228



8 Cable entry plates

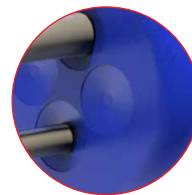
for the food industry – Hygienic Design Line



High cable density

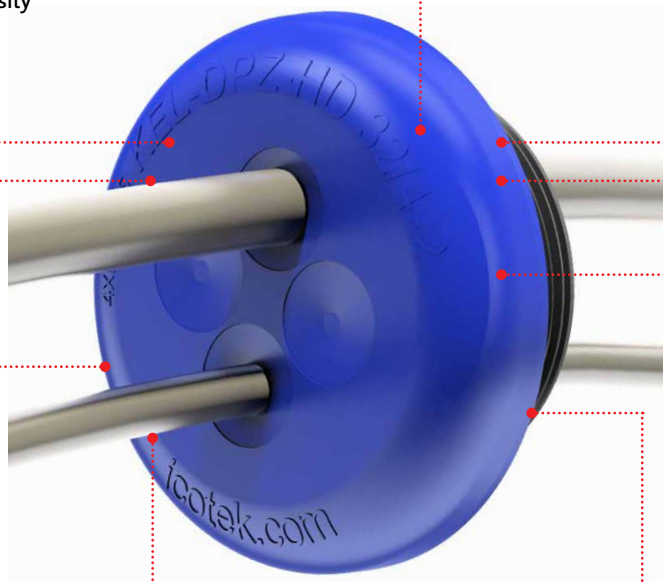


Fast and easy assembly



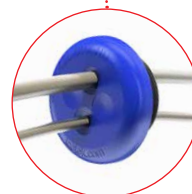
FDA compliant, food approval acc. to 1935/2004/EG and (EU) 10/2011, Ecolab certified

Signal blue colour (similar to Signal Blue RAL 5005)



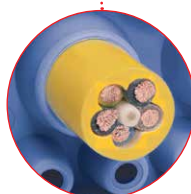
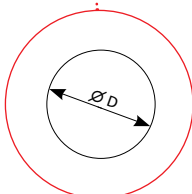
Very smooth surface

Compact, space-saving design

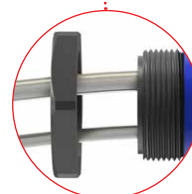


For metric cut-outs

IP65 to IP68 rated protection, double cable sealing on front and back



Flexible clamping range, up to 7 mm



The fixation is very simple with the lock nut.

Cable entry plates KEL-DPZ-HD Hygienic Design Line

Product description

The new cable entry plates KEL-DPZ-HD with metric thread from M32 to M63 have been developed for installation in food processing and packaging machines.

During the development according to the Hygienic Design guidelines, care was taken to ensure that the visible side of the cable entry plate are free of dirt-collecting recesses. The surface was kept very smooth. The outer contour has a radius of 6 mm instead of the required 3 mm. In addition, the KEL-DPZ-HD uses an FDA-compliant elastomer in accordance with food approval 1935/2004/EG and (EU) 10/2011. The signal colour blue ensures a clear visual colour recognition.

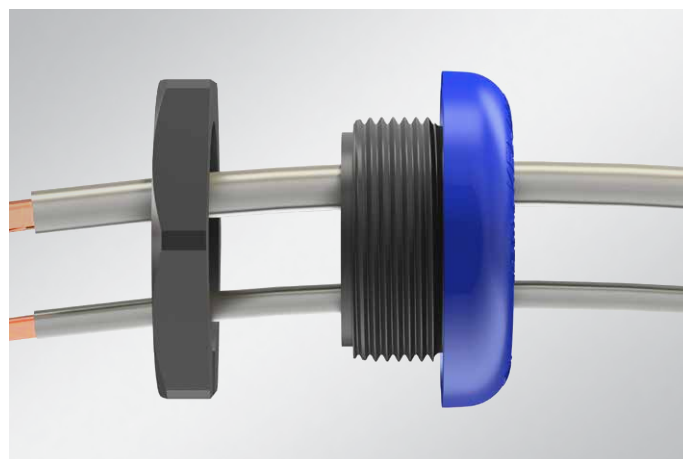
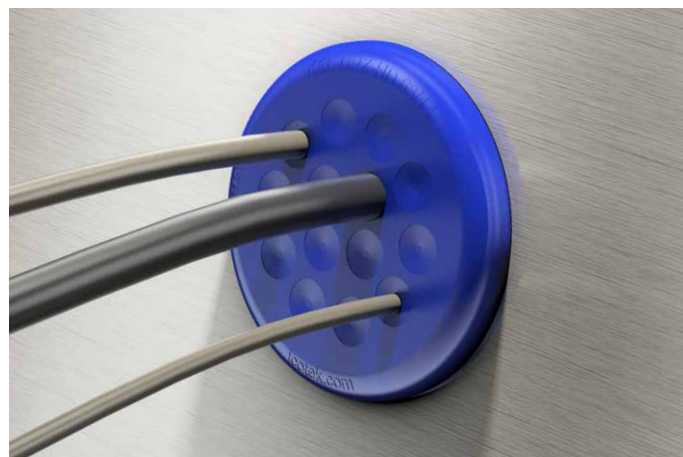
The cable entry plates are designed to route several cables and hoses with a diameter range of 3.2 mm to 22.2 mm and seal them acc. to IP65/66/67/68. A significant advantage over cable glands is the significantly higher cable density and the flexibility of the cable diameter range. The fixation is very simple with the locknut.

Advantages

- Elastomer of the cable entry plate made of material according to 1935/2004/EG, (EU) 10/2011
- FDA compliant
- Developed according to hygienic design guidelines
- Hygienic design – free of dirt-collecting recesses
- Ecolab certified
- Very flat design
- Very smooth surface
- Very fast assembly
- Cable diameter 3,2 – 22,2 mm
- Very large sealing areas and clamping areas
- High cable density
- High strain relief
- Dual sealing of cables (IP66/IP68)
- Suitable for metric cut-outs
- Reproducible cleaning process
- Very low moisture absorption
- High resistance to aromatic solvents, oils, greases, mineral products
- No corrosion possible because plastics have been processed
- Maintenance free

Specifications

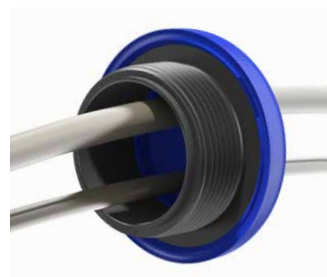
Material	Polyamide and elastomer FDA compliant material Food approval acc. to 1935/2004/EG Food approval acc. to (EU) 10/2011
IP protection	IP65/66/67/68
Colour	Blue (similar to Signal blue RAL 5005)
Temperature	-40°C to +80°C
Properties	Halogen-free, silicone-free



KEL-DPZ-HD

Cable entry plates

Hygienic Design Line



Type	Order No.	Number of cables	Thread metric	Thread length	External diameter	Mounting height	PU
KEL-DPZ-HD 32 4	70351	3× 3.2 - 6.5 mm 1× 7.2 - 12.5 mm	M32 × 1.5	14 mm	44 mm	8 mm	5
KEL-DPZ-HD 32 4-2	70352	4× 5 - 9.5 mm	M32 × 1.5	14 mm	44 mm	8 mm	5
KEL-DPZ-HD 32 7	70353	7× 3.2 - 6.5 mm	M32 × 1.5	14 mm	44 mm	8 mm	5
KEL-DPZ-HD 40 8	70354	4× 3.2 - 6.5 mm 4× 5 - 10.2 mm	M40 × 1.5	14 mm	52 mm	8 mm	5
KEL-DPZ-HD 50 8	70355	5× 5 - 10.2 mm 3× 7.2 - 12.5 mm	M50 × 1.5	14 mm	62 mm	8 mm	5
KEL-DPZ-HD 50 10	70356	7× 3.2 - 6.5 mm 2× 5 - 10.2 mm 1× 16 - 22.2 mm	M50 × 1.5	14 mm	62 mm	8 mm	5
KEL-DPZ-HD 50 12	70357	4× 3.2 - 6.5 mm 8× 5 - 10.2 mm	M50 × 1.5	14 mm	62 mm	8 mm	5
KEL-DPZ-HD 50 19	70358	19× 3.2 - 6.5 mm	M50 × 1.5	14 mm	62 mm	8 mm	5
KEL-DPZ-HD 63 9	70359	1× 3.2 - 6.5 mm 3× 5 - 10.2 mm 4× 9 - 16.2 mm 1× 16 - 22.2 mm	M63 × 1.5	14 mm	75 mm	8 mm	5
KEL-DPZ-HD 63 13	70360	4× 3.2 - 6.5 mm 4× 5 - 10.2 mm 5× 9 - 16.2 mm	M63 × 1.5	14 mm	75 mm	8 mm	5
KEL-DPZ-HD 63 14	70361	14× 5 - 10.2 mm	M63 × 1.5	14 mm	75 mm	8 mm	5
KEL-DPZ-HD 63 35	70362	35× 3.2 - 6.5 mm	M63 × 1.5	14 mm	75 mm	8 mm	5

ST-B-HD | ST-B-HDD

Plugs for cable entry plates
Hygienic Design Line



Type	Order No.	Diameter D1	Diameter D2	Length L	PU
ST-B-HD 6	70500	8 mm	6 mm	16 mm	10
ST-B-HD 10	70501	12 mm	10 mm	16 mm	10
ST-B-HD 12	70502	15 mm	12 mm	16 mm	10
ST-B-HD 16	70503	19 mm	16 mm	16 mm	10
ST-B-HD 22	70504	25 mm	22 mm	21 mm	10
ST-B-HDD 6 detectable	70620	8 mm	6 mm	16 mm	10
ST-B-HDD 10 detectable	70621	12 mm	10 mm	16 mm	10
ST-B-HDD 12 detectable	70622	15 mm	12 mm	16 mm	10
ST-B-HDD 16 detectable	70623	19 mm	16 mm	16 mm	10
ST-B-HDD 22 detectable	70624	25 mm	22 mm	21 mm	10

Product description

icotek offers plugs of the type ST-B-HD in the signal colour blue and in a detectable version of the type ST-B-HDD. The signal colour blue ensures a clear visual color recognition.

The ST-B-HDD plugs consist of a combination of polymer compound and metal particles. These can be sorted out using metal detectors, X-ray devices and visual detection systems.

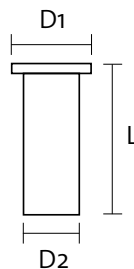
The ST-B-HD and ST-B-HDD plugs are particularly suitable for pharmaceutical applications and for the food industry.

Advantages

- Sealing of pierced cable entry membranes which are no longer in use
- Blue colour for clear visual recognition
- ST-B-HDD: Detectable using metal detectors X-ray devices
- High resistance to aromatic solvents, oils, greases, mineral products

Specifications

Material	Polypropylene
Colour	Blue (similar to Signal blue RAL 5005)
Temperature	-40°C to +120°C
Properties	Food approval acc. to 1935/2004/EG and (EU) 10/2011 ST-B-HDD: Detectable by V2A particles



KB-HDD | KBH-HDD

Detectable cable ties
and holders for cable ties
Hygienic Design Line

Product description

The detectable cables ties and holders for cable ties are particularly suitable for pharmaceutical applications and for the food industry. The cable ties can be used to close packagings and transport containers.

The detectable cable ties and holders are used to install cables in the production systems. Cable ties are proven aids for the economical bundling and fastening of cables, cable harnesses, pipes and hoses. At the same time, the cable ties achieve a very high strain relief.

The holder is mounted using a screw assembly or an adhesive surface.

Advantages

- Cable ties: High resistance to aromatic solvents, oils, greases, mineral products
- Blue colour for clear visual recognition
- Detectable using metal detectors X-ray devices
- Support in quality assurance within food production, for example within the framework of HACCP

Specifications KB-HDD

Material	Polyamide
Colour	Blue (similar to Signal blue RAL 5005)
Temperature	-40°C to +85°C

Specifications KBH-HDD

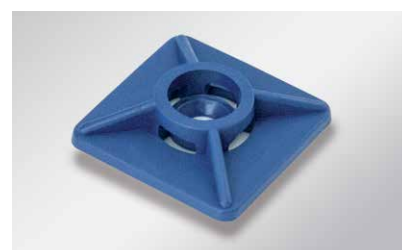
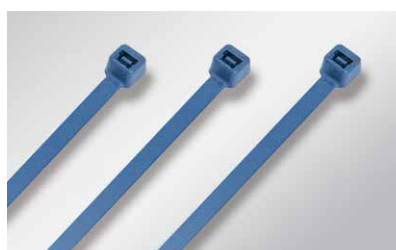
Material	Polyamide
Dimensions	27 x 27 mm
Colour	Blue (similar to Signal blue RAL 5005)
Temperature	-40°C to +60°C; recommended application temperature +15°C to +40°C
Properties	For cable ties up to 4.8 mm wide

Detectable cable ties KB-HDD

Type	Length	Width	Order No.	PU
Cable ties KB 2.5 x 100 HDD	100 mm	2.5 mm	70680	100
Cable ties KB 3.6 x 150 HDD	150 mm	3.6 mm	70681	100
Cable ties KB 4.8 x 200 HDD	200 mm	4.8 mm	70682	100
Cable ties KB 4.8 x 300 HDD	300 mm	4.8 mm	70683	100

Detectable holders for cable ties KBH-HDD

Type	Length	Width	Order No.	PU
Holder for cable ties KBH 27 x 27 HDD	27 mm	27 mm	70710	100



9 Cable entry systems

with IFPS fire penetration seals acc. to EN 45545-3



E45
EI30



Based on the standards EN 45545-3 and EN 1363-1 icotek cable entry systems have been tested on "E" and "EI" in vertical alignment using mounted IFPS fire penetration seals. All tested products have been successfully certified using only one layer of fire penetration seals.

icotek cable entry systems meet the classifications E45 and EI30!

Fire resistance of fire barriers

The European railway standard for fire safety EN 45545-3 regulates the fire resistance of fire barriers. The requirements and measures defined in this part of the standard aim to protect passengers and staff in railway vehicles against onboard fire incidents.

Fire barriers can have different standards:

The lowest standard „E“

Barrier against flames, preventing fissure formation. "E45", for example, means that the specimen can withstand the test for 45 minutes.

The highest standard „EI“

Barrier against flames, preventing fissure formation and thermal insulation, which means that the temperature on the side facing away from the fire must not exceed 200° C (180° K above room temperature). "EI30", for example, means that the specimen can withstand the test for 30 minutes.

Fire penetration seals facing the fire side:



Cable entry systems

with IFPS fire penetration seals

according to EN 45545-3

E45
EI30



Product description

icotek cable entry frames and plates with fire penetration seals, approved for use in railway technology (meeting the standards EN 45545-2, EN 45545-3 and EN 1363-1).

The intumescent (foaming) IFPS fire penetration seals which are mounted at the backside of the cable entry components consist of expandable graphite and increase their volume by a multiple in case of a fire.

This creates a barrier which prevents a penetration of flames and high heat from one room into another for the longest possible period.

Advantages & benefits

- Approved for use in railway technology (EN 45545-2, EN 45545-3 and EN 1363-1)
- Easy assembly
- High cable density
- Only one fire penetration seal per cable entry component required
- Large product variety
- Ingress protection up to IP66 / UL Type 4X
- High classifications E45 / EI30

Specifications

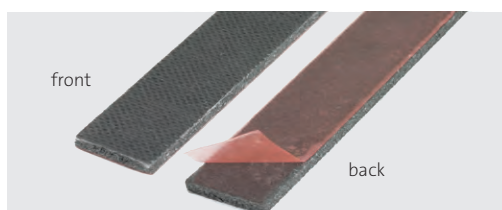
Cable entry comp. See standard products (p. 8 – 77)
Fire penetration seal Intumescent (foaming)
Material Graphite (C)

Scope of delivery

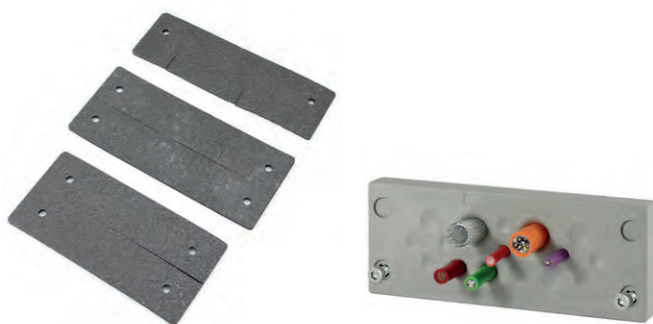
Each 1 cable entry frame / plate
+ suitable fire penetration seal.

Suitable grommets are not included in the shipment and have to be ordered separately.

Type	Order No.	Order No. with V2A screws	Cut-out	Grommets KT small large	IP Ingress protection	PU
KEL-U 24 4-BS	99300.001	99300.201	36 × 112 mm	2 2	IP54	5
KEL-U 24 7-BS	99300.002	99300.202	36 × 112 mm	6 1	IP54	5
KEL-U 24 10-BS	99300.003	99300.203	36 × 112 mm	10 -	IP54	5
KEL-U 16 2-BS	99301.001	99301.201	36 × 86 mm	- 2	IP54	5
KEL-U 16 5-BS	99301.002	99301.202	36 × 86 mm	4 1	IP54	5
KEL-U 16 8-BS	99301.003	99301.203	36 × 86 mm	8 -	IP54	5
KEL-U 10 6-BS	99306.001	99306.201	36 × 65 mm	6 -	IP54	5
KEL-U 10 3-BS	99306.002	99306.202	36 × 65 mm	2 1	IP54	5
KEL-U-B1-BS	99305.001	99305.201	46 × 46 mm	- 1	IP54	5
KEL-U-B4-BS	99305.002	99305.202	46 × 46 mm	4 -	IP54	5
KEL-ER 24 4-BS	99300.004	99300.204	36 × 112 mm	2 2	IP65 / IP66	5
KEL-ER 24 7-BS	99300.005	99300.205	36 × 112 mm	6 1	IP65 / IP66	5
KEL-ER 24 10-BS	99300.006	99300.206	36 × 112 mm	10 -	IP65 / IP66	5
KEL-ER 16 2-BS	99301.004	99301.204	36 × 86 mm	- 2	IP65 / IP66	5
KEL-ER 16 5-BS	99301.005	99301.205	36 × 86 mm	4 1	IP65 / IP66	5
KEL-ER 16 8-BS	99301.006	99301.206	36 × 86 mm	8 -	IP65 / IP66	5
KEL-ER 10 6-BS	99306.003	99306.203	36 × 65 mm	6 -	IP65 / IP66	5
KEL-ER 10 3-BS	99306.004	99306.204	36 × 65 mm	2 1	IP65 / IP66	5
KEL-ER B1-BS	99305.003	99305.203	46 × 46 mm	- 1	IP65 / IP66	5
KEL-ER B4-BS	99305.004	99305.204	46 × 46 mm	4 -	IP65 / IP66	5
KEL-E5-BS	99302.001	99302.201	24 × 112 mm	5 -	IP54	5
KEL-E4-BS	99309.001	99309.201	24 × 86 mm	4 -	IP54	5
KEL-E3-BS	99308.001	99308.201	24 × 65 mm	3 -	IP54	5
KEL-E2-BS	99307.001	99307.201	24 × 43 mm	2 -	IP54	5
KEL-ER-E5-BS	99302.002	99302.202	24 × 112 mm	5 -	IP65 / IP66	5
KEL-ER-E4-BS	99309.002	99309.202	24 × 86 mm	4 -	IP65 / IP66	5
KEL-ER-E3-BS	99308.002	99308.202	24 × 65 mm	3 -	IP65 / IP66	5
KEL-ER-E2-BS	99307.002	99307.202	24 × 43 mm	2 -	IP65 / IP66	5



Also available: IFPS fire penetration seal stripe,
900 × 17 × 2.7 mm, self-adhesive
Order No. 99303



Cable entry systems with IFPS fire penetration seals according to EN 45545-3

E45
EI30

Product description

icotek cable entry frames and plates with fire penetration seals, approved for use in railway technology (meeting the standards EN 45545-2, EN 45545-3 and EN 1363-1).

The intumescent (foaming) IFPS fire penetration seals which are mounted at the backside of the cable entry components consist of expandable graphite and increase their volume by a multiple in case of a fire.

This creates a barrier which prevents a penetration of flames and high heat from one room into another for the longest possible period.

Advantages & benefits

- Approved for use in railway technology (EN 45545-2, EN 45545-3 and EN 1363-1)
- Easy assembly
- High cable density
- Only one fire penetration seal per cable entry component required
- Large product variety
- Ingress protection up to IP66 / UL Type 4X
- High classifications E45 / EI30

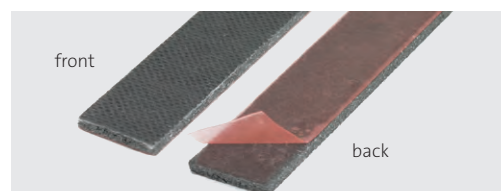
Specifications

Cable entry comp. See standard products (p. 8 – 107)
Fire penetration seal Intumescent (foaming)
Material Graphite (C)

Scope of delivery

Each 1 cable entry frame / plate
+ suitable fire penetration seal.

Suitable grommets are not included in the shipment and have to be ordered separately.



Also available: IFPS fire penetration seal stripe,
900 x 17 x 2.7 mm, self-adhesive
Order No. 99303

Type	Order No.	Cut-out	IP Ingress protection	PU
KEL-DPU 24 13-BS gy	99300.010	36 × 112 mm	IP66 / IP68	5
KEL-DPU 24 14-BS gy	99300.011	36 × 112 mm	IP66 / IP68	5
KEL-DPU 24 16-BS gy	99300.012	36 × 112 mm	IP66 / IP68	5
KEL-DPU 24 16-1-BS gy	99300.013	36 × 112 mm	IP66 / IP68	5
KEL-DPU 24 17-BS gy	99300.014	36 × 112 mm	IP66 / IP68	5
KEL-DPU 24 20-BS gy	99300.015	36 × 112 mm	IP66 / IP68	5
KEL-DPU 24 21-BS gy	99300.016	36 × 112 mm	IP66 / IP68	5
KEL-DPU 24 32-BS gy	99300.017	36 × 112 mm	IP66 / IP68	5
KEL-DPZ 16 11-BS gy	99301.007	36 × 86 mm	IP65 / IP66	5
KEL-DPZ 16 14-BS gy	99301.008	36 × 86 mm	IP65 / IP66	5
KEL-DPZ 16 20-BS gy	99301.009	36 × 86 mm	IP65 / IP66	5
KEL-DPZ 16 25-BS gy	99301.010	36 × 86 mm	IP65 / IP66	5
KEL-DPZ 16 34-BS gy	99301.011	36 × 86 mm	IP65 / IP66	5
KEL-DPZ 24 14-BS gy	99300.018	36 × 112 mm	IP65 / IP66	5
KEL-DPZ 24 15-BS gy	99300.019	36 × 112 mm	IP65 / IP66	5
KEL-DPZ 24 16-BS gy	99300.020	36 × 112 mm	IP65 / IP66	5
KEL-DPZ 24 17-BS gy	99300.021	36 × 112 mm	IP65 / IP66	5
KEL-DPZ 24 25-BS gy	99300.022	36 × 112 mm	IP65 / IP66	5
KEL-DPZ 24 32-BS gy	99300.023	36 × 112 mm	IP65 / IP66	5
KEL-DPZ 24 42-BS gy	99300.024	36 × 112 mm	IP65 / IP66	5

Fire penetration seal

Type	Order No.	Cut-out	PU
Fire penetration seal size 24	99300	36 × 112 mm	1
Fire penetration seal size 16	99301	36 × 86 mm	1
Fire penetration seal size 10	99306	36 × 65 mm	1
Fire penetration seal size B	99305	46 × 46 mm	1
Fire penetration seal size E5	99302	24 × 112 mm	1
Fire penetration seal size E4	99309	24 × 86 mm	1
Fire penetration seal size E3	99308	24 × 65 mm	1
Fire penetration seal size E2	99307	24 × 43 mm	1
Fire penetration seal size 24-MT	99312	82 × 112 mm	1

NEW

10 Cable entry systems for the use in cleanrooms

icotek offers products especially for the use in cleanrooms. The cleanroom suitability describes the emission behaviour of particles. The airborne particle concentration must be kept as low as possible in cleanrooms. The particles in ambient air can otherwise damage, destroy or contaminate products from industries such as the semiconductor and chip industries, the pharmaceutical and food industries. The use of special and suitable materials in the manufacture of our cable entry systems ensures very low outgassing behavior. Thus our cable entry systems can be used in cleanrooms.

In cleanrooms, very often many cables have to be routed through the smallest of spaces. Both pre-terminated cables and cables without connectors can be routed. Thus icotek offers a wide range of products that can be used specifically in this industry.



icotek product ranges for the cleanroom

For pre-terminated cables, icotek offers a variety of different standard sizes that can be integrated easily, quickly and efficiently. The matching grommets complete the range. Pre-terminated cables from 1 – 65 mm can be inserted.

Advantages

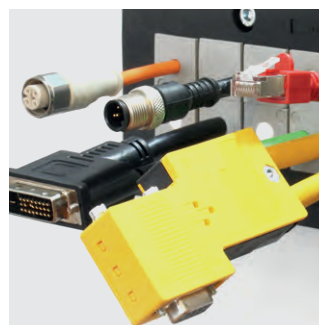
- Low outgassing behaviour
- Maintain manufacturer's warranty on pre-terminated cables
- Retrofits, repairs and maintenance can be done much more easily and quickly
- High cable density
- Wide variety of grommets
- Strain relief according to EN 62444
- High stability, vibration resistant
- Very easy assembly



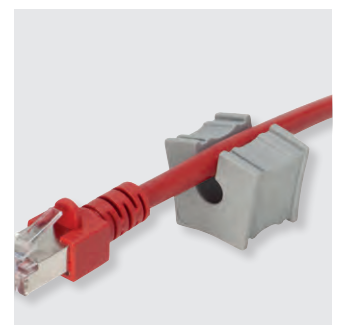
KEL-ER series



KEL-U series



Maintain manufacturer's warranty
on pre-terminated cables



Split KT grommets



icotek product ranges for the cleanroom

icotek also offers a variety of different solutions for cables without connectors for cleanroom technology. Since there is often not much space available and many cables are routed into the cleanroom, icotek's cable entry plates are ideally suited for this. The flexible product portfolio around the KEL-DPU and KEL-DPZ offers a large number of different products.

Advantages

- Low outgassing behaviour
- Snap or screw mounting possible (KEL-DPU)
- High strength and stability
- High strain relief
- Fast and easy assembly
- High cable density
- Dual cable sealing with IP65/IP66/IP68
- Automatic sealing and strain relief

Suitable for these industries

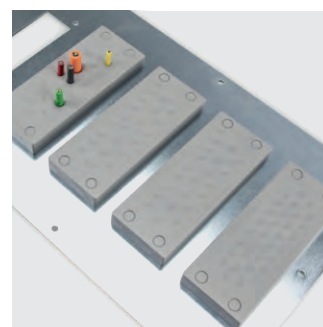
- Semiconductor industry
- Electronics
- Battery technology
- Microsystem technology
- Optics
- Photovoltaics
- Aerospace engineering
- Pharmaceutical industry
- Biotechnology
- Medical technology
- Hospitals



KEL-DPU and KEL-DPZ series



KEL-DPZ round



KEL-DPU



Membrane on front



Conical shape on back provides additional sealing and strain relief



For more information about products for the cleanroom, please contact us directly: pm@icotek.com



KEL-DPZ

GRAB YOUR PHONE

AND FOLLOW US ON:



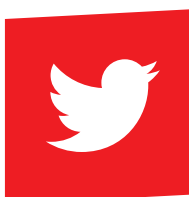
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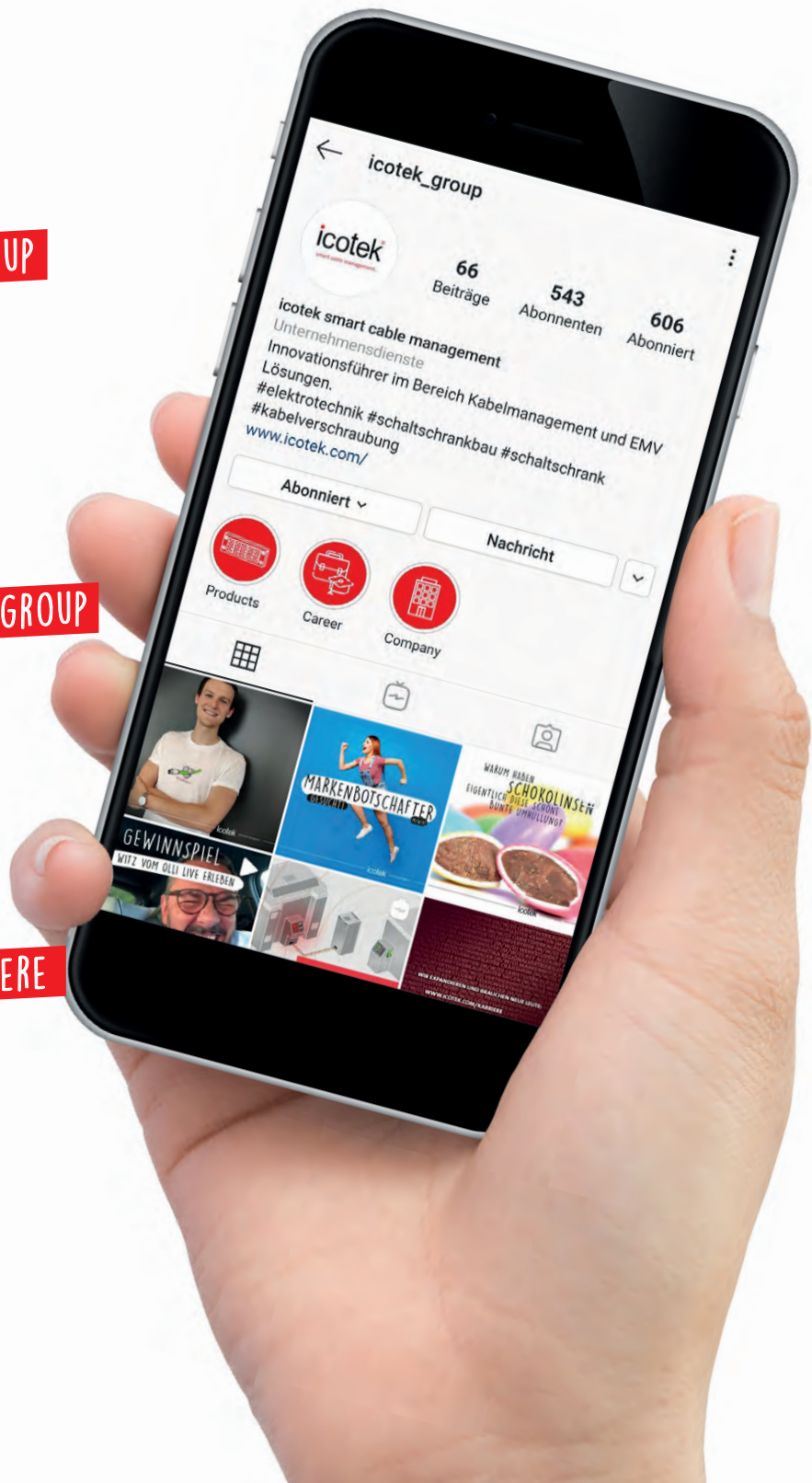
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31110	225	31598	185	32354	123	32809	165	36243	135	36458	162	36780.22	147	36785.01	146
31120	225	31600	185	32355	123	32810	165	36244	135	36459	162	36780.23	147	36785.02	146
31130	225	31602	185	32356	123	32811	165	36245	135	36460	162	36780.24	147	36785.03	146
31140	225	31604	185	32357	123	32815	165	36246	135	36462	162	36780.30	147	36785.04	146
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31413	183	32251	121	32743	164	36074	223	36298.2	131	36650.1	148	36781.43	146	36787.155	136
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31416	183	32260	122	32746	164	36200	130	36102.2	131	36650.3	148	36782.2	145	36787.2	136
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31556	184	32280	120	32769	165	36218	130	36416	162	36778.1	145	36784.10	147	36788.12	139
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31586	184	32296	120	32804	165	36235.002	137	36446	162	36780.12	147	36784.34	147	36788.41	139
31590	185	32297	120	32805	165	36236	136	36448	162	36780.13	147	36784.40	147	36788.42	139
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36789.03	138	36948.4	13	37608	133	38073.100	154	39938	49	41303	48	42004	222	42165	18
36789.04	138	36952	157	37608.100	141	38074	154	39939	49	41304	48	42007	222	42165.200	18
36789.10	138	36953	157	37610	133	38074.100	154	39940	49	41305	48	42008	222	42165.400	18
36789.11	138	36954	157	37610.100	141	38075	154	39941	48	41306	84	42010	220	42168	18
36789.12	138	36955	157	37612	132	38075.100	154	39942	49	41307	48	42010.002	220	42168.200	18
36789.13	138	36958	157	37612.100	140	38076	154	39943	48	41308	48	42011	221	42168.400	18
36789.14	138	36962	157	37612.150	140	38076.100	154	39944	49	41309	48	42012	221	42204	19
36789.20	138	36963	157	37614	132	38077	154	39946	59	41310	48	42013	221	42204.200	19
36789.21	138	36965	157	37614.100	132/140	38077.100	154	39947	59	41311	48	42014	221	42204.400	19
36789.22	138	36984	157	37614.150	140	38078	154	39948	59	41312	48	42015	220	42206	19
36789.23	138	36985	157	37616	135	38078.100	154	39949	59	41313	48	42015.002	220	42206.200	19
36789.24	138	37150	163	37618	135	38079	154	39950	59	41314	48	42016	220	42206.400	19
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36789.42	138	37180.3	161	37632.150	136	38135	156	39962	58	41322	50	42027	221	42209.200	21
36789.43	138	37180.4	161	37640	144	38140	156	39963	58	41323	50	42028	221	42209.400	21
36810	135	37181.1	161	37642	144	38145	156	39964	58	41324	50	42029	221	42212	19
36815	135	37181.2	161	37650	144	38150	156	41200	49	41325	50	42030	221	42212.200	19
36820	135	37181.3	161	37652	144	39110	160	41201	49	41326	50	42031	221	42212.400	19
36850	134	37181.4	161	37660.1	133	39150	159	41202	49	41327	50	42032	221	42216	19
36850.150	134	37505.01	150	37660.2	133	39160	159	41203	48	41328	50	42033	221	42216.200	19
36855	134	37505.02	150	37661.1	133	39170	159	41204	48	41329	50	42038	35	42216.400	19
36855.150	134	37505.03	150	37661.2	133	39180	159	41205	48	41330	50	42039	35	42221	22
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36860.150	134	37505.11	150	37666.150	133	39183	159	41207	48	41332	50	42042	35	42221.400	22
36865	134	37505.12	150	37670.100	142	39184	159	41208	48	41333	50	42044	35	42222	22
36865.150	134	37505.13	150	37671.100	142	39190	159	41209	48	41334	50	42046	35	42222.200	22
36870	134	37505.20	150	37672.100	142	39191	192	41210	48	41351	48	42048	221	42222.400	22
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36875	134	37505.22	150	37680	143	39900	48	41212	48	41353	50	42050	221	42223.200	23
36875.150	134	37505.23	150	37681	143	39901	48	41213	48	41360	51	42051	221	42223.400	23
36880	134	37505.30	150	37682	143	39902	49	41214	48	41361	51	42140	24	42224	22
36880.150	134	37505.31	150	37683	143	39903	49	41215	48	41362	51	42140.200	24	42224.200	22
36885	134	37505.32	150	38005	155	39904	49	41216	50	41410	27	42140.400	24	42224.400	22
36886.1	132	37505.33	150	38005.100	155	39905	49	41217	50	41415	27	42141	24	42225	22
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36886.3	132	37507.02	151	38010.100	155	39907	49	41219	50	41425	27	42141.400	24	42225.400	22
36886.4	132	37507.03	151	38015	155	39908	49	41220	50	41430	27	42143	24	42226	23
36886.5	132	37507.10	151	38015.100	155	39909	49	41221	50	41432	51	42143.200	24	42226.200	23
36887.1	132	37507.11	151	38020	155	39910	49	41222	50	41434	51	42143.400	24	42226.400	23
36887.2	132	37507.12	151	38020.100	155	39911	49	41223	50	41436	51	42144	24	42227	23
36887.3	132	37507.13	151	38025	155	39912	48	41224	50	41438	51	42144.200	24	42227.200	23
36887.4	132	37507.20	151	38025.100	155	39913	48	41225	50	41440	51	42144.400	24	42227.400	23
36887.5	132	37507.21	151	38030	155	39914	49	41226	50	41460	51	42145	24	42232	22
36910	132	37507.22	151	38030.100	155	39915	49	41227	50	41465	51	42145.200	24	42232.200	22
36910.100	140	37507.23	151	38035	155	39916	49	41228	50	41470	51	42145.400	24	42232.400	22
36915	132	37507.30	151	38035.100	155	39917	49	41229	50	41475	51	42147	25	42233	23
36915.100	140	37507.31	151	38040	155	39918	49	41230	50	41480	51	42147.200	25	42233.200	23
36920	132	37507.32	151	38040.100	155	39921	49	41231	50	41485	51	42147.400	25	42233.400	23
36920.100	140	37507.33	151	38045	155	39922	49	41232	50	41500	52	42148	25	42234	23
36925	132	37510.1	150	38045.100	155	39923	49	41233	50	41510	52	42148.200	25	42234.200	23
36925.100	140	37510.2	150	38050	155	39924	49	41234	50	41520	52	42148.400	25	42234.400	23
36930	132	37510.3	150	38050.100	155	39929	49	41251	48	41530	52	42149	25	42241	17
36930.100	140	37512.1	151	38069.002	154	39930	49	41252	50	41540	52	42149.200	25	42241.200	17
36935	132	37512.2	151	38070	154	39931	49	41253	50	41550	52	42149.400	25	42241.400	17
36935.100	140	37512.3	151	38070.100	154	39932	49	41257	49	41552	52	42162	18	42244	17
36940	132	37514.1	151	38071	154	39933	49	41258	49	41991	221	42162.200	18	42244.200	17
36940.100	140	37514.2	151	38071.100	154	39934	48	41260	51	41992	221	42162.400	18	42244.400	17
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42249	15	42505	72	42658	113	43308	209	43560	105	43736	99	43902	211	45106	225
42249.200	15	42506	72	42801	107	43310	209	43561	105	43737	99	43903	211	45107	225
42249.400	15	42507	72	42806	107	43312	209	43562	106	43741	99	43904	211	45108	225
42250	15	42508	72	42810	107	43314	209	43563	105	43750	99	43905	211	45109	225
0042250.2	15	42509	72	42812	107	43316	209	43564	106	43751	99	43906	211	45110	225
42250.400	15	42510	72	42816	107	43318	209	43565	105	43752	99	43907	211	45112	43
42258	15	42511	72	42822	107	43320	209	43566	106	43756	99	43908	211	45115	43
42258.200	15	42512	72	42877	53	43322	209	43567	106	43758	99	43909	211	45130	45
42258.400	15	42513	72	42881	53	43324	209	43568	106	43760	99	43910	211	45134	45
42259	15	42514	72	42883	53	43334	207	43569	106	43761	99	43930	91	45152	45
42259.200	15	42515	73	42885	53	43340	207	43570	106	43762	99	43930.400	91	45154	45
42259.400	15	42516	73	42887	53	43346	207	43572	105	43763	99	43932	91	45203	43
42320	31	42517	73	42889	53	43352	207	43573	105	43780	97	43932.400	91	45204	43
42320.200	31	42518	73	42891	53	43412	71	43574	105	43780.400	97	43934	91	45205	43
42320.400	31	42519	73	42893	53	43413	71	43576	103	43790	97	43934.400	91	45206	43
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42322.200	31	42521	73	42897	53	43415	71	43581	103	43794	97	43936.400	91	45215	43
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42324	31	42545	73	42900	53	43451	103	43585	103	43796	97	43938.400	91	45237	44
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42332.200	32	42558	74	42909	53	43463	102	43595	105	43812	96	43944.400	91	45416	46
42332.400	32	42559	74	42920	199	43464	102	43596	105	43812	96	44400	199	45424	46
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42333.200	33	42566	72	42923	199	43480	111	43598	105	43815	95	44402	199	45450	41
42333.400	33	42568	72	42924	199	43481	111	43599	105	43815.400	95	44403	199	45452	41
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42336.400	33	42575	72	42954	199	43493	111	43642	70	43818.400	95	44409	199	45702	66
42350	36	42576	72	42955	199	43508	101	43643	70	43819	95	44410	199	45711	66
42350.200	36	42578	72	42956	199	43511	101	43644	70	43819.400	95	44411	199	45715	66
42360	36	42580	72	42957	199	43512	101	43645	70	43832	218	44500	192	45722	66
42360.200	36	42582	72	42958	199	43514	101	43655	70	43834	215	44501	192	45726	67
42370	37	42583	72	42959	199	43515	101	43656	70	43836	217	44502	192	45728	67
42371	37	42584	72	42999	194	43516	101	43658	70	43838	217	44503	192	45730	67
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42379	37	42586	72	43071	195	43519	101	43660	70	43842	211/217	44505	192	45734	67
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42385	37	42597	81	43073	195	43521	101	43675.101	97	43848	211/217	44507	192	46105	28
42388	37	42598	81	43074	195	43522	101	43700	93	43852	215	44508	192	46110	28
42391	37	42599	81	43075	195	43523	101	43700.400	93	43853	215	44509	192	46115	28
42394	37	42600	81	43076	195	43524	101	43705	93	43854	215	44510	192	46120	28
42397	37	42601	79	43077	195	43525	101	43705.400	93	43855	215	44511	192	46125	28
42410	62	42602	78	43078	195	43526	101	43710	93	43856	215	44512	193	46130	28
42412	62	42604	80	43079	195	43527	101	43710.400	93	43861	217	44513	193	46135	28
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47255	26	50533	105	50796	97	54241.200	13	70504	235	99153	82	99307	239		
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48212.400	10	50583	103	51510	82	58210.0762	201	80023	230	99300.018	239	99434	173		
48216	10	50585	103	51515	82	58210.0835	201	80024	230	99300.019	239	99435	173		
48216.200	10	50587	103	51520	83	58225.0402	201	80025	230	99300.020	239	99436	173		
48216.400	10	50591	103	51520.002	83	58225.0452	201	80026	230	99300.021	239	99437	173		
48241	9	50652	113	51521	83	58225.0502	201	80027	230	99300.022	239	99460	176		
48241.200	9	50653	113	51521.002	83	58225.0652	201	80028	230	99300.023	239	99461	176		
48241.400	9	50654	113	51522	83	58230.0402	201	80029	230	99300.024	239	99462	176		
48244	9	50655	113	51522.002	83	582300452	201	80030	230	99300.201	238	99463	176		
48244.200	9	50656	113	51538	83	58230.0502	201	80050	229	99300.202	238	99464	176		
48244.400	9	50657	113	51540	83	58230.0652	201	80051	229	99300.203	238	99465	176		
48247	9	50658	113	52272	224	61002	125	80052	229	99300.204	238	99466	176		
48247.200	9	50700	93	52273	224	61003	125	80053	229	99300.205	238	99467	176		
48247.400	9	50700.400	93	52274	224	61004	125	80054	229	99300.206	238	99468	176		
48249	11	50705	93	52275	45/224	61011	124	80055	229	99301	239	99469	176		
48249.200	11	50705.400	93	52276	45/224	61012	124	80056	229	99301.001	238	99470	176		
48249.400	11	50710	93	52277	224	61013	124	80057	229	99301.002	238	99471	176		
48250	11	50710.400	93	52278	45/224	61014	124	80058	229	99301.003	238	99472	176		
48250.200	11	50711	93	52283	224	61018	125	80059	229	99301.004	238	99473	176		
48250.400	11	50711.400	93	52284	224	61019	125	80060	229	99301.005	238	99475	177		
48258	11	50715	94	52285	45/224	61021	124	80061	229	99301.006	238	99476	177		
48258.200	11	50715.400	94	52286	45/224	61022	124	80062	229	99301.007	239	99477	177		
48258.400	11	50720	93	52287	224	61023	124	80063	229	99301.008	239	99478	177		
48259	11	50720.400	93	52288	45/224	61024	124	80064	229	99301.009	239	99479	177		
48259.200	11	50725	93	52289	224	61025	124	80065	229	99301.010	239	99480	177		
48259.400	11	50725.400	93	52290	224	61026	124	80120	231	99301.011	239	99481	177		

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