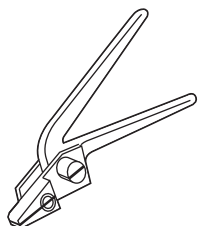


Mounting Instruction for GK MC FC cable and Busbar penetration

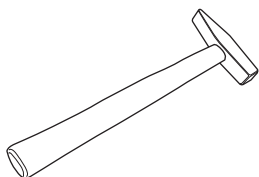
Validity

Only use the GK Multi-cable FC transit in dry steel constructions where there are no requirements relating to pressurized water or gas tightness. Use in bulkhead and deck in fire classes A[0-15-30-60] in accordance with **Regulation**. Applies to all GK Multi-cable FC transits for sealing approved ship cables and busbars type Schneider Canalis KNA & KSA. Configuring a transit simultaneously with cables and bus bars has not been certified. Current certificates (approval & fire protection insulation structure), and welding and installation instructions are to be taken into account. In cases of uncertainty, the regulations of the flag state administrations must be observed. Installation should only be carried out by trained personnel. The installer must comply with the applicable regulations and state of the technological art. For technical assistance, please don't hesitate to contact us: Tel. +49 40 65 73 98 0 or info@de.roxtec.com.

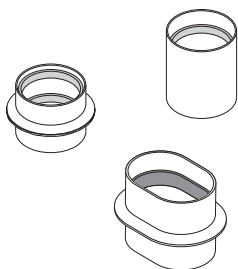
Tools and parts



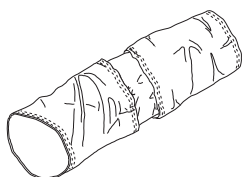
Tightening tool



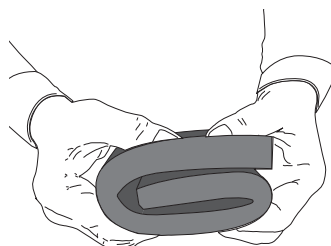
Hammer*)



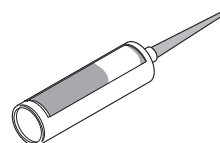
1. GK Multi-cable FC sleeve



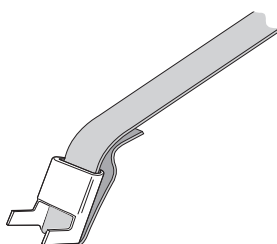
2. GK Multi-cable FC glass hose



3. sealing strip



4. Cold smoke sealant:
"GK MC FC sealant"; "Roxtec Fire
Sealant" or "Sika Firesil® Marine N" *)



5. plastic-coated metal straps

*) Not included in the scope of supply

Aperture sizes for the GK Multi-cable FC transit

The aperture sizes are to be produced as set out in Tables 1 or 2.
The maximum aperture size is required if a complete GK Multi-cable FC weld set is fitted with a flange and a preconfigured glass hose connecting piece on both sides to ensure there is sufficient space for the glass hose, including the metal tension band and lock to penetrate.

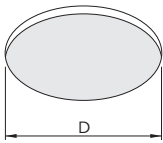


Table 1

Type/size	Aperture diameter D ± 1 mm	
	With flange	Without flange
GK MC FC ROUND 89	92–119	92
GK MC FC ROUND 127	130–147	130
GK MC FC ROUND 140	143–160	143
GK MC FC ROUND 168	172–189	172
GK MC FC ROUND 219	222–229	222
GK MC FC ROUND 244	247–264	247

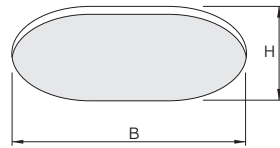
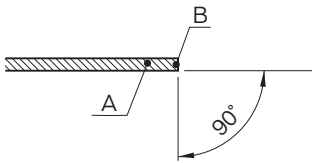


Table 2

Type/size	Aperture WxH ± 1 mm			
	With flange		Without flange	
	Width B	Height H	Width B	Height H
GK MC FC OVAL 200x150	203-220	153-170	203	153
GK MC FC OVAL 350x168	353-370	172-189	-	-
GK MC FC OVAL 450x170	453-470	173-190	-	-
GK MC FC OVAL 350x168	553-570	173-190	-	-

Aperture cutting edge

Create a sufficiently large aperture in the sheet (A) for the GK Multi-cable FC transit.
Position the cut edge (B) vertical (90°) to the surface of the sheet.



Welding instruction

All details and descriptions are recommendations. It is the responsibility of the person performing the operation to carry out the work in accordance with the applicable rules and best practice.

Welding process

Use a suitable welding method to weld the GK Multi-cable FC transit to the structure.

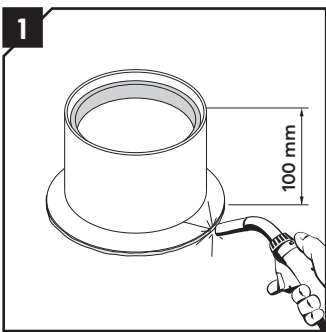
Weld material

A suitable form and material must be selected for the metal filler. The GK Multi-cable FC transits are manufactured from general building material 1.0330/AISI A366(C) or comparable material. You can obtain more detailed information on request.

Weld current

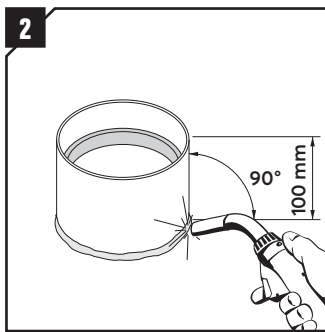
Select the current so that adequate fusing of the base material is achieved.
In addition, select the current so that the heat input is kept as low as possible to avoid any unnecessary thermal stress.

Presentation/work steps



Transit with flange

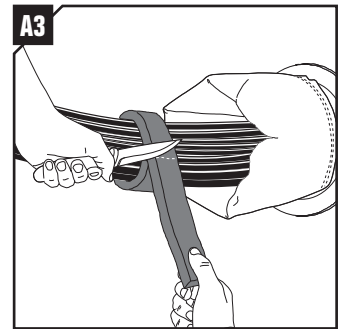
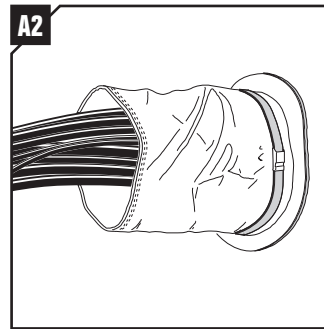
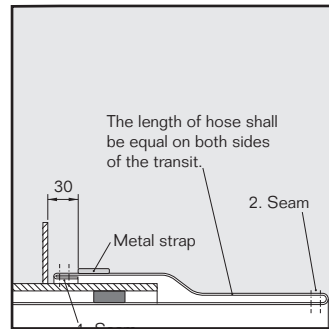
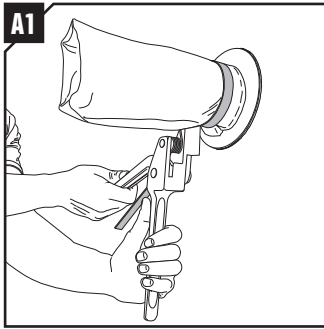
- The aperture is to be produced in accordance with Tables 1 or 2.
- The cut edge and the contact surfaces have to be free from dirt.
- The transit can be fitted from either side of the separation area.
- The flange should be flat and lie without any gap on the structure; no struts or other fixtures may prevent the flange from lying flat. This must therefore be protected from damage in the case of a preconfigured glass hose connecting piece.
- Weld all the way around (360°) in accordance with **DIN EN 5817**.
Note: The intumescent material can react at temperatures in excess of 160°C in the connecting piece.
- Preserve the weld seam, if necessary, in accordance with local requirements.



Transit without a flange

- The aperture is to be produced in accordance with Tables 1 or 2.
- The aperture and the contact area should be free from dirt.
- Position the transit in the interface generally central to the longitudinal axis of the transit (see insulation drawing).
- Attach the transit perpendicular to the interface. Protect this from any damage, if necessary, in the case of a preconfigured glass hose connecting piece.
- Weld (360°) all the way around in accordance with **DIN EN 5817**, at intervals, if necessary.
Note: The intumescent material can react at temperatures in excess of 160°C in the connecting piece.
- Preserve the weld seam, if necessary, in accordance with local requirements.

Installation guide for GK Multi-cable FC system



All GK Multi-cable FC transits consist of two parts plus consumables:

- Welding sleeve with flange, including fireproof elements (intumescent material)
- GK Multi-cable FC glass hose, sealing strips and plastic-coated metal straps
- Consumable cold smoke sealant cartridges

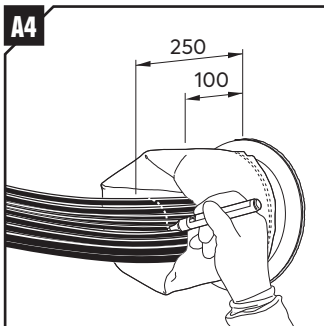
The transit is inserted into the aperture and then welded.

After it has cooled, pull the GK Multi-cable FC glass hose through the transit to the other side, and wrap the end up around the steel housing. Secure the end with a metal tension band (see assembly guide for metal tension band, available on request) on the first seam. The second seam is on the entrance/exit to the transit. After the cloth has been placed on both sides, the GK Multi-cable FC connecting piece is now ready for the cables and busbar to be fed through.

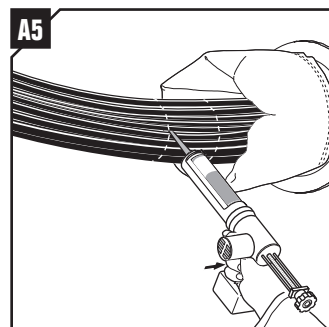
Once the GK Multi-cable FC is fitted in the structure, insert the cable or each busbar. Leave sufficient space on both sides for the installation (see insulation drawing). When tightening the cables, feed individual cables or cable bundles through the transit until all cables are inserted or until the maximum wiring has been reached. Allocation factor or busbar type based on certificate and insulation drawing.
Note: Do not damage the GK Multi-cable FC glass hose connecting piece when tensioning the cables or fitting the busbars.

All the following work steps relate to **both sides of the transit**.

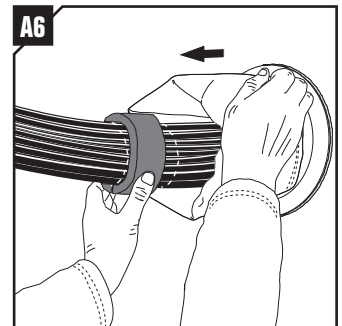
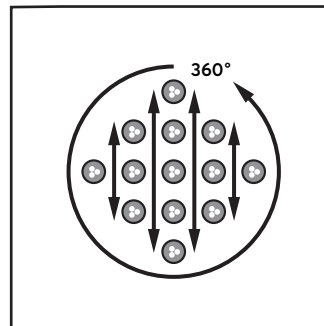
Once the cable has been completely routed, group the cables together individually or in several bundles. Prepare the external seal of the cable bundles before the next step. Depending on the size of the cable bundles, trim the GK Multi-cable FC sealant supplied so that each cable bundles is encircled once. These strips are now laid ready for the transit to be sealed.
To close the GK Multi-cable FC glass hose connecting piece, feed the metal tension band through the lock and lay it loosely around the connecting piece so that it can be pushed up as far as the second joint.



Ensure that the installation is smoke-proof by applying the cold smoke sealant in the cable bundles. Two marks are made at a distance of approximately 60 mm in an area approximately 100-250 mm from the structure, in which the cold smoke sealant is applied.

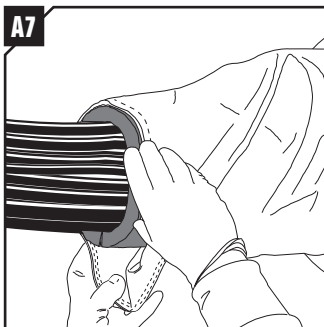


Take care with this step so that all cable sheathing and gaps within and outside the cable bundle have a thin coat of the cold smoke sealant along a length of around 60 mm.

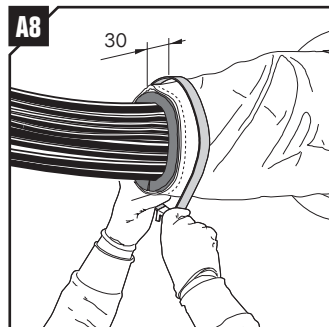


After the cold smoke sealant has been applied, feed the GK Multi-cable FC sealing strips that have been laid out ready around the corresponding cable bundles so that each bundle has been encircled once. Secure the GK Multi-cable FC sealing strip with one hand and feed the GK Multi-cable FC glass hose simply around the sealant strip with the other hand.

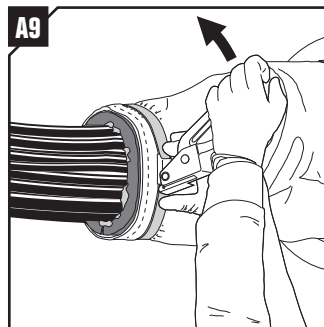
Note: The GK Multi-cable FC sealing strips must not have any gaps.



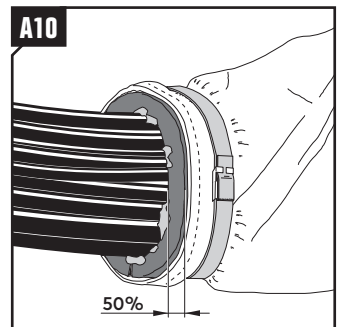
Feed the GK Multi-cable FC glass hose flush over the GK Multi-cable FC sealing strip flush with the outer edge. Then minimize the excess material of the GK Multi-cable FC glass hose by folding over and folding the material.



Lay the metal tension band around the end of the GK Multi-cable FC glass hose that has been laid out and tighten the GK Multi-cable FC sealant strip and the GK Multi-cable FC glass hose to pretension them.
Note: Position the metal tension band in the middle over the GK Multi-cable FC sealant strip (approximately 30 mm from the end of the GK Multi-cable FC glass hose).

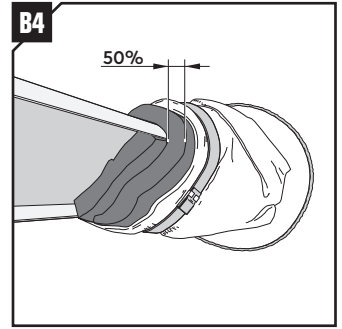
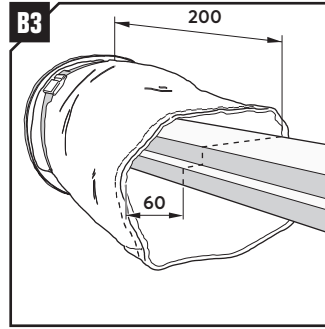
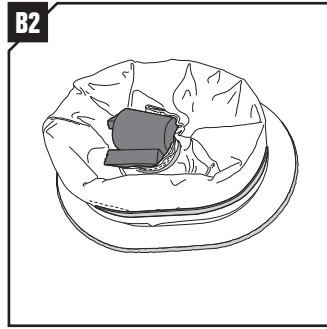
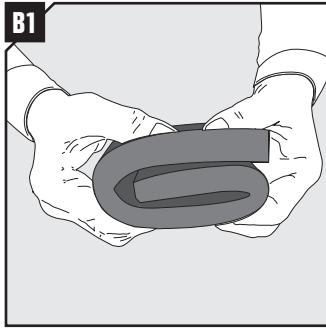


Tighten the metal tension band with a tightening tool (see assembly guide for metal tension band, available on request) until the GK Multi-cable FC sealant strip has been reduced to around half of its original thickness. Ensure that no gaps remain in this process. Firmly pull together the cable bundles and ensure there are no visible gaps with the GK Multi-cable FC transit.



The tightening operation is complete if the GK Multi-cable FC sealant strip is reduced to around 50%, and the cold smoke sealant extends under the GK Multi-cable FC sealant strips, and no visible gaps can be identified. Then tilt the tightening tool forwards, operate the cutting function and then close the tension band. **Note:** Excessive tensioning is to be avoided.

Busbar and empty transit seal



Seal empty transit

If no cables or busbar are fed through, it is possible (certified) to seal the GK Multi-cable FC transit as a spare transit.

After completing the work steps from A1:

To see the GK Multi-cable FC glass hose connecting piece, feed the metal tension band through the lock and lay it loosely around the connecting piece, so that it can be pushed up as far as the second joint.

The GK Multi-cable FC transit is sealed without a configuration by laying an around 20-30 cm long GK Multi-cable FC sealant strip that has been folded three times. Minimize the excess material of the GK Multi-cable FC glass hose by folding over and tensioning the material. Lay the metal tension band around the end of the GK Multi-cable FC glass hose that has been laid out and tighten the GK Multi-cable FC sealant strip and the GK Multi-cable FC glass hose to pretension them.

The tightening operation is complete if the GK Multi-cable FC sealant strip is reduced to around 50% of the original height and there are no visible gaps. Then tilt the tightening tool forwards, operate the cutting function and close the tension band.

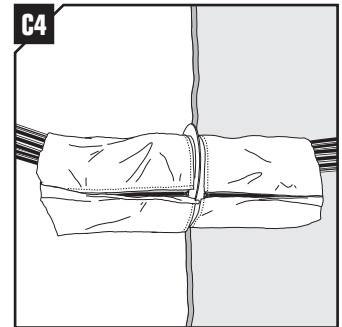
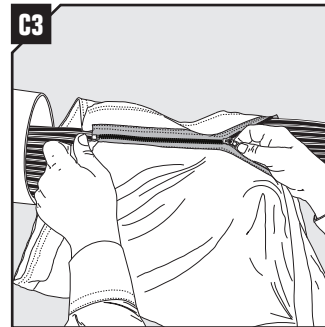
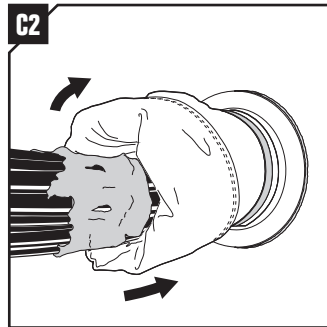
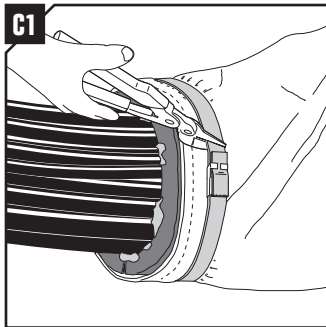
Note: Avoid excessive tensioning!

In contrast to cable assembly, no cold smoke sealant is used for busbar or empty transits.

Busbar seal

The busbar is sealed on both sides with the GK Multi-cable FC sealant strip and the metal tension band. The GK Multi-cable FC sealant strip is laid around the busbar at a distance of approximately 200 mm. Cavities must be topped up, so that a uniform, oval area is formed around the busbar. Excess lengths are shortened. In contrast to cable assembly, no cold smoke sealant is used for busbar. To seal the GK Multi-cable FC glass hose connecting piece, feed the metal tension band through the lock and lay it loosely around the connecting piece, so that it can be pushed up as far as the second joint. Tighten the metal tension band with a tightening tool (see assembly guide for metal tension band, available on request) until the GK Multi-cable FC sealant strip has been reduced to around half of its original thickness. Ensure that no gaps remain in this process. Then tilt the tightening tool forwards, operate the cutting function and close the plastic-coated metal strap.

Disassembly – Cable retrofitting



It is possible to change the configuration of GK Multi-cable FC transits at any time. Cutting through the tension strip around the sealing strip and completely opening up the sealant system allow access to the transit. Remove the GK Multi-cable FC sealant strip if necessary.

Individual cables or cable bundles may be tensioned until the maximum configuration is reached (see certificate).

The work steps based on section A must be followed when closing and sealing the system again.

Any necessary materials are to be added or replaced; the metal tension band is to be replaced.

The openable GK Multi-cable FC glass hose with zipper (Spare Part) can be added at any time to the transit. Open the zipper and wrap the glass hose around the cables or busbar (White side of textile at the surface). Close zipper and push hose through the opening until the zipper is completely closed.

Pull GK Multi-cable FC glass hose through the transit so that on both sides the same lengths of the GK Multi-cable FC glass hose can be wrapped back around the steel housing. Secure both ends with a metal tension band on the first seam. Finish installation according to A1/ B1.

DISCLAIMER

"The Roxtec cable entry sealing system ("the Roxtec system") is a modular-based system of sealing products consisting of different components. Each and every one of the components is necessary for the best performance of the Roxtec system. The Roxtec system has been certified to resist a number of different hazards. Any such certification, and the ability of the Roxtec system to resist such hazards, is dependent on all components that are installed as a part of the Roxtec system. Thus, the certification is not valid and does not apply unless all components installed as part of the Roxtec system are manufactured by or under license from Roxtec ("authorized manufacturer"). Roxtec gives no performance guarantee with respect to the Roxtec system, unless (I) all components installed as part of the Roxtec system are manufactured by an authorized manufacturer and (II) the purchaser is in compliance with (a), and (b), below.

(a) During storage, the Roxtec system or part thereof, shall be kept indoors in its original packaging at room temperature.

(b) Installation shall be carried out in accordance with Roxtec installation instructions in effect from time to time.

The product information provided by Roxtec does not release the purchaser of the

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