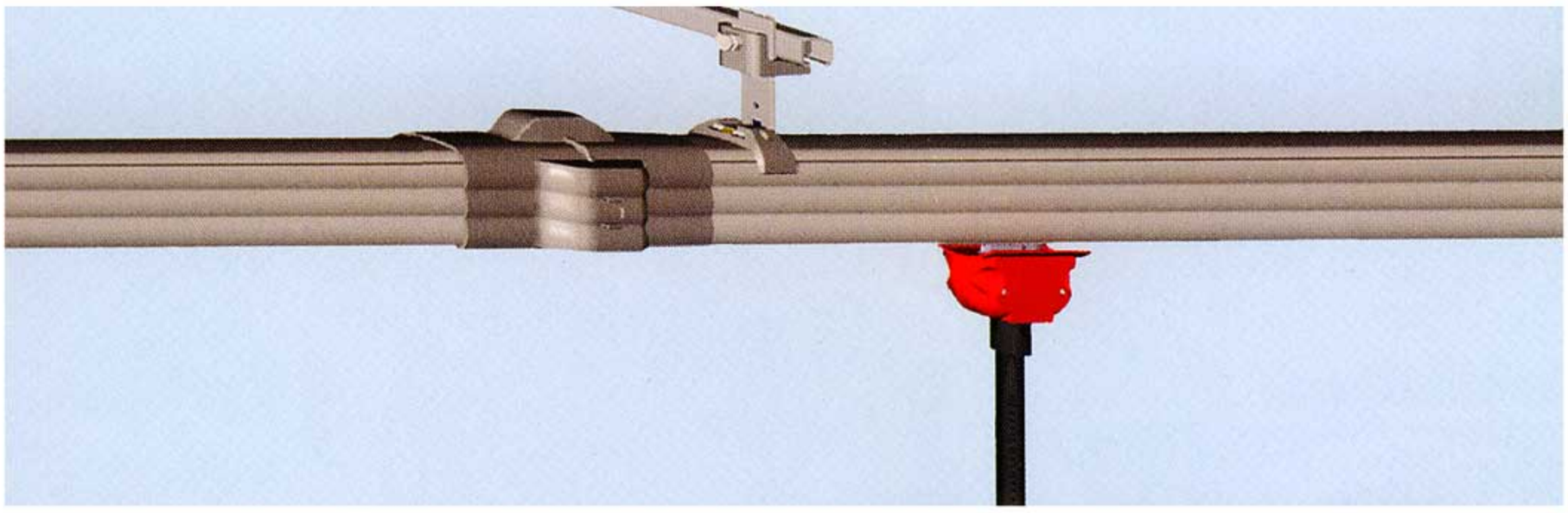
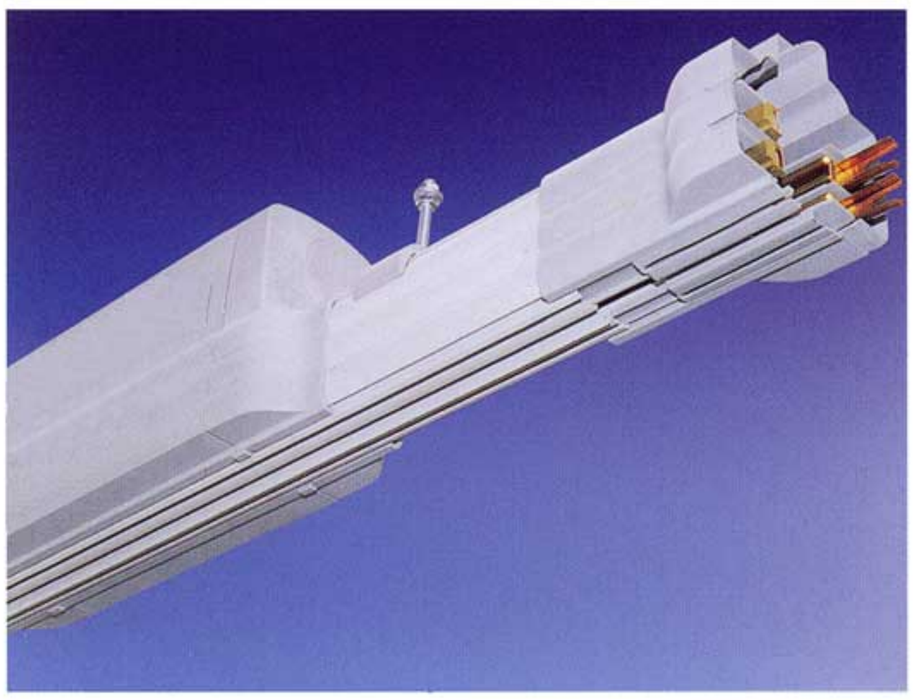
Compact Enclosed Conductor System



Simple to install due to the new connection joints, one screw per conductor to be tightened (max. 7 conductors) then slid and click joint covers together all joints are pre-assembled with each length. Additional sealing lip can be provided to protect against dust and moisture.



Centre Feed Length can be fitted anywhere along the run, end feeds also available.

Collector Trolley single or used in tandem.

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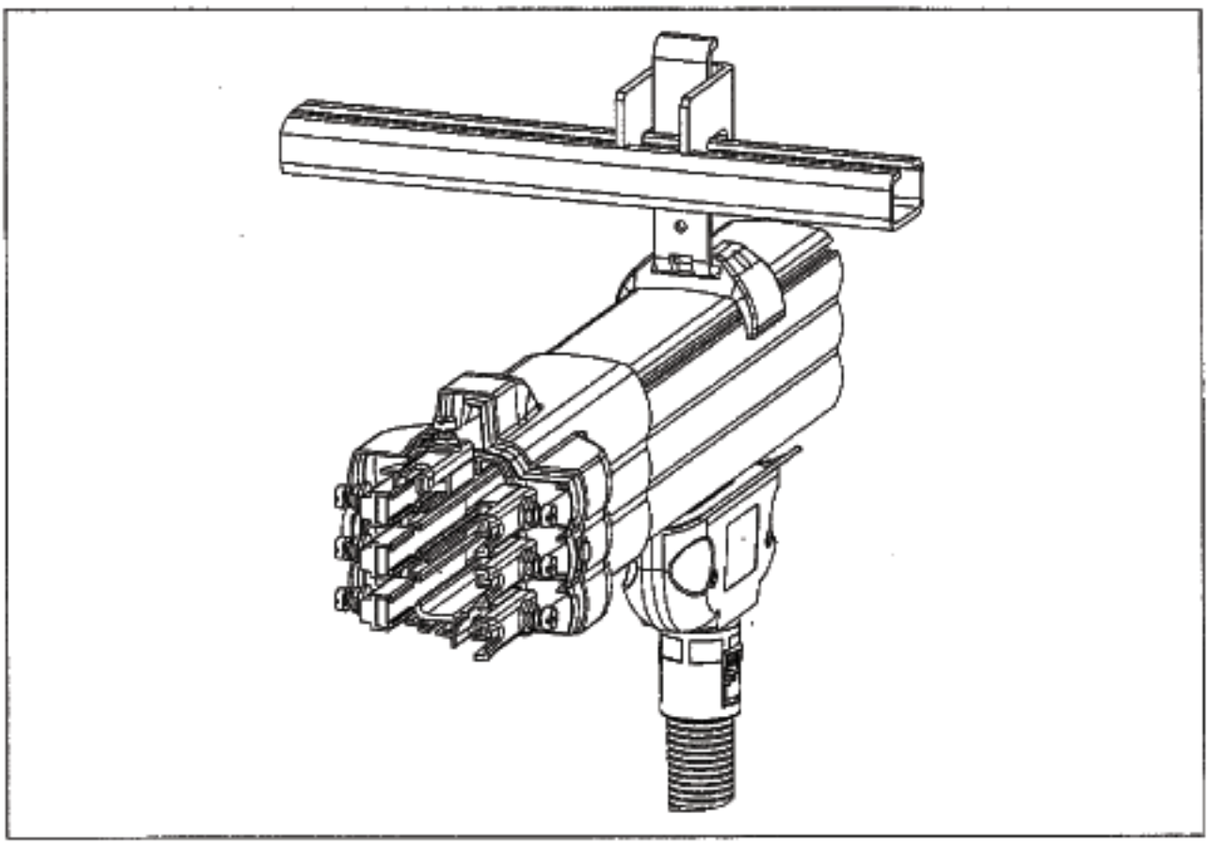
Technical data

Compact Line SCL



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1 General

1.1 Symbol description

The following symbols and recommendations indicate potential safety hazards or causes of damage or provide useful information.

Warning against dangerous electrical voltage

Contact with live parts can result in immediate death. Protective covers (e.g. covers and enclosures) marked with this sign may only be opened by qualified electricians. Before opening, all relevant operating, control, feed or other voltages must be disconnected.

Operating hazard for the installation

This symbol in the operating instructions indicates all warnings which, if not complied with, may result in damage to the product.

1.2 SCL installation

Conductor

Enclosure material		PVC				
Standard length	mm	4000				
Number of conductors		max. 7				
Distance between suspensions max. **2)**	mm	1000 **2)** / 2000				
Voltage U_N	V AC	24 to 690				
Size **1)**		35	60	100	140	200
Permissible current (100% CDF to 35 °C) **1)**	A	68	78	100	140	180
Conductor cross-section	mm²	10	15	25	38	56
Ambient temperature / Enclosure temperature	°C	-30 to +70				
DIN VDE 0470 T.1/EN 60529 enlcosure	IP-Code	IP 23 / IP 24 with sealing lip				
Curve section minimum radius	mm	≥ 800 mm **4)**				
Fire protection		UL94 / V0; not halogen-free				

Current collector trolley

Number of poles		max. 7	
Rated current I_N (80 % CDF)	A	40 bronze	20 graphite
Max. connecting cable cross-section.	mm²	6	4
Max. control cable cross-section	mm²	1,5	
Connecting cable length (standard) **5)**	mm	2000	
Fuse protection max.	A	100	
Travel speed max.	m/min	200	100 **3)**

1) The voltage drop must be checked for installations with large power feed sections and high currents. Refer to calculation from page 6.
2) With single-sided thermal effect.
3) For straight sections with entry/transfer section.
4) Not for 5 and 7-pole type.
5) Other cable lengths possible.

2 Design and installation notes

Please note:

Conductor lines must be operated in accordance with generally accepted engineering principles. Ensure compliance with DIN VDE/EN, SEV, CSA and UL regulations. We make special reference to the DIN VDE regulations, particularly to DIN VDE 0100.

Of the many regulations, we refer to the following definitions:

see DIN VDE 0106, Part 200.

2.1 Definitions

2.1.1 Arm's length

Arm's length is the area which a person's hand may reach in all directions from normal locations without any special equipment. Measured from the position where a person is standing, this area ranges up to at least 2,5 m upwards and at least 1,25 m to the side and downwards (see DIN 31 001 Sheet 1).

Wherever large or long objects which are not insulated for the operating voltage are moved, the minimum arm's length must be correspondingly increased.

2.1.2 Protection against indirect contact

Protection against direct contact constitutes all measures to protect people from hazards resulting from contact with live parts of electrical equipment. This may be partial or full protection.

Partial protection only provides protection against accidental contact. Protection against accidental contact does not mean any protection against deliberate contact.

Enclosure type IP 2X to DIN VDE 0470 Part 1 offers protection against accidental contact. Complete protection starts from IP 5X to DIN VDE 0470 Part 1.

3 Calculating and selecting the conductor cross-section

Voltage drop 1. and permissible current 2. must be considered when calculating power supply cross-sections.

1. - Calculate the cross-section considering the max. permissible voltage drop of 2,5 % for crane runways + 2,5 % for crane bridge.
   - The relevant value is the starting current · $\cos\varphi_A$ of the largest motor + the rated current · $\cos\varphi_N$ of the next smaller motor.
   - The currents must be added for motors connected in parallel.

   The calculated cross-sections must be halved for power supplies to solo hoists.

2. - Calculate the cross-section considering the max. permissible current for cables to DIN VDE 100 Part 430/523.
   - The relevant value is the sum of all rated currents of all drives. The currents indicated in diagram 1, section 3.1.2 must not be exceeded.

Permissible voltage drop

The voltage drop is determined by current I_G.
Current I_G results from adding the starting - ($I_A \cdot \cos\varphi_A$) and rated currents ($I_N \cdot \cos\varphi_N$) (see table 1 below).
The conductor cross-section may be determined according to the calculation method described in section 3.1.1 or diagram 1, section 3.1.2.
Table 1 indicates the number of consumers to be considered for calculating I_G depending on the number of cranes fed by a conductor line.

Table 1

Number of cranes fed by a conductor line	Of all cranes taken together (in order of output)			
	1st motor	2nd motor	3rd motor	4th motor
1	$I_A \cdot \cos\varphi_A$	$I_N \cdot \cos\varphi_N$	-	-
2	$I_A \cdot \cos\varphi_A$	$I_N \cdot \cos\varphi_N$	$I_N \cdot \cos\varphi_N$	-
3	$I_A \cdot \cos\varphi_A$	$I_A \cdot \cos\varphi_A$	-	-
4	$I_A \cdot \cos\varphi_A$	$I_A \cdot \cos\varphi_A$	$I_N \cdot \cos\varphi_N$	-
5	$I_A \cdot \cos\varphi_A$	$I_A \cdot \cos\varphi_A$	$I_N \cdot \cos\varphi_N$	$I_N \cdot \cos\varphi_N$

For double drive arrangements correspondingly: $2 \cdot I_A \cdot \cos\varphi_A$ or $2 \cdot I_N \cdot \cos\varphi_N$.

Exception: For double hoist units with delayed starting
$I_A \cdot \cos\varphi_A + I_N \cdot \cos\varphi_N$.

3.1 Calculating the conductor cross-section

3.1.1 Calculation method

Abbreviations used in the equations:

A	=	Conductor cross-section of the SCL	[mm²]
L	=	cable length	[m]
I	=	starting current ($I_A \cdot \cos\varphi_A$) or rated current ($I_N \cdot \cos\varphi_N$)	[A]
I_G	=	sum of the currents according to table 1	[A]
f	=	frequency in Hertz	[Hz]
χ	=	conductibility (for $\chi_{Cu} = 56$)	[m²/Ωm]
ΔU	=	permissible voltage drop	[V]
U	=	voltage in volts	[V]

1. Conductor cross-section of the SCL

$$A = \frac{1{,}73 \times L \times I_G}{\Delta U \times \chi} \quad [mm^2]$$

2. Required conductor length

$$L_1 = \frac{\Delta U \times \chi \times A}{1{,}73 \times I_G} \times \frac{f_2}{f_1} \quad [m]$$

3. Conversion for starting current $I_A \cdot \cos\varphi_A$ or rated current $I_N \cdot \cos\varphi_N$ fornon-standard voltage U

$$I_2 = \frac{U_1 \times I_1}{U_2} \quad [A]$$

4. Conversion for conductor cross-section A_2 for non-standard conductor length L_2

$$A_2 = \frac{L_2 \times A_1}{L_1} \quad [mm^2]$$

5. Permissible voltage drop

ΔU = 2,5 % = 10 V (for 400 V)

$$\Delta U = \frac{U \times 2{,}5\ \%}{100\ \%} \quad [V]$$

6. Conversion from 400 V, 50 Hz to a new voltage and frequency

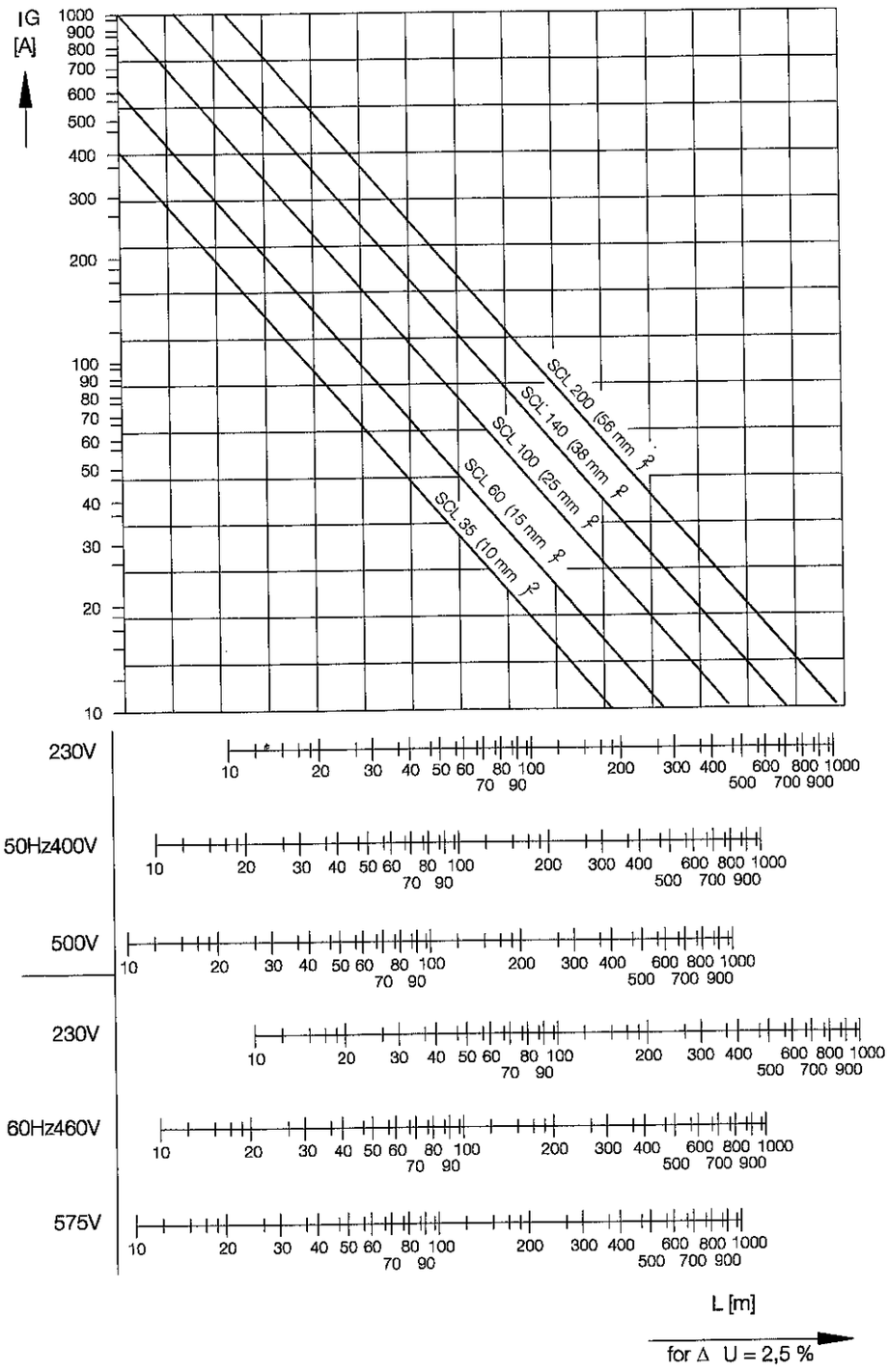
$$I_{new} = I_{old} \times \frac{400\ V}{U_{new}} \times \frac{f_{new}}{50\ Hz} \quad [A]$$

3.1.2 Graphical method

Calculating the conductor cross-section for the permissible voltage drop.

The SCL conductor line cross-section and/or voltage drop may be reduced by the position and quantity of power feeds.

Diagram 1



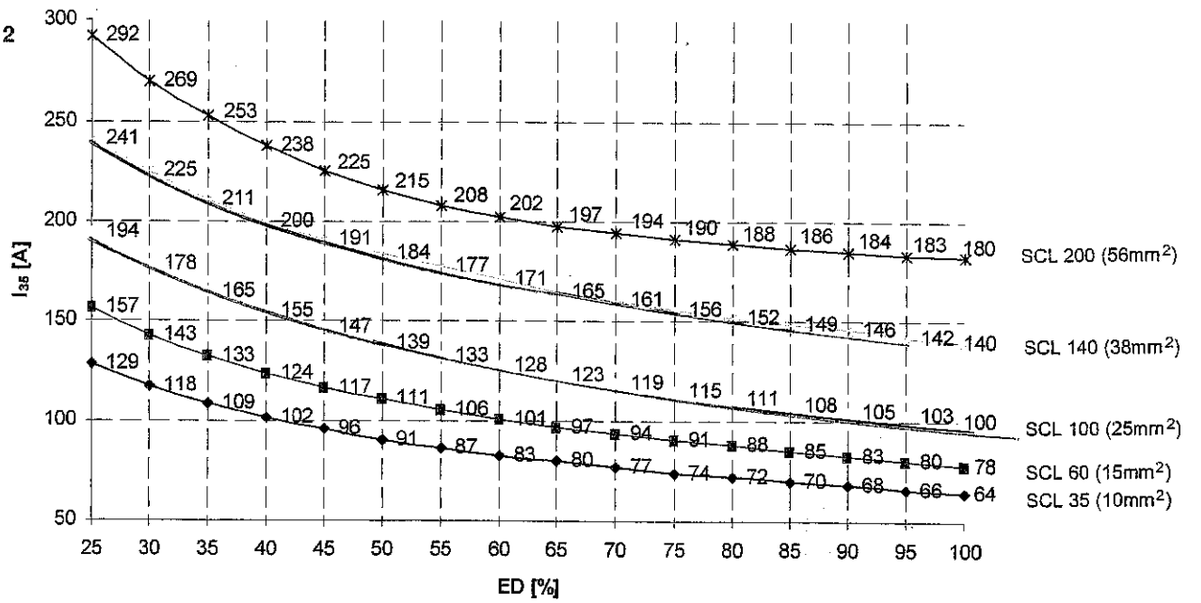
3.1.3 SCL maximum permissible current I_{35} [A] for an ambient temperature of 35°C

Check the maximum permissible current for the conductor cross-section as a function of the cyclic duration factor (CDF) at an ambient temperature of 35 °C.

For other ambient temperatures, the current (I_ϑ) must be calculated with the conversion factor (f_ϑ) according to the table below.

The same or the next largest conductor cross-section must be selected.

Diagram 2

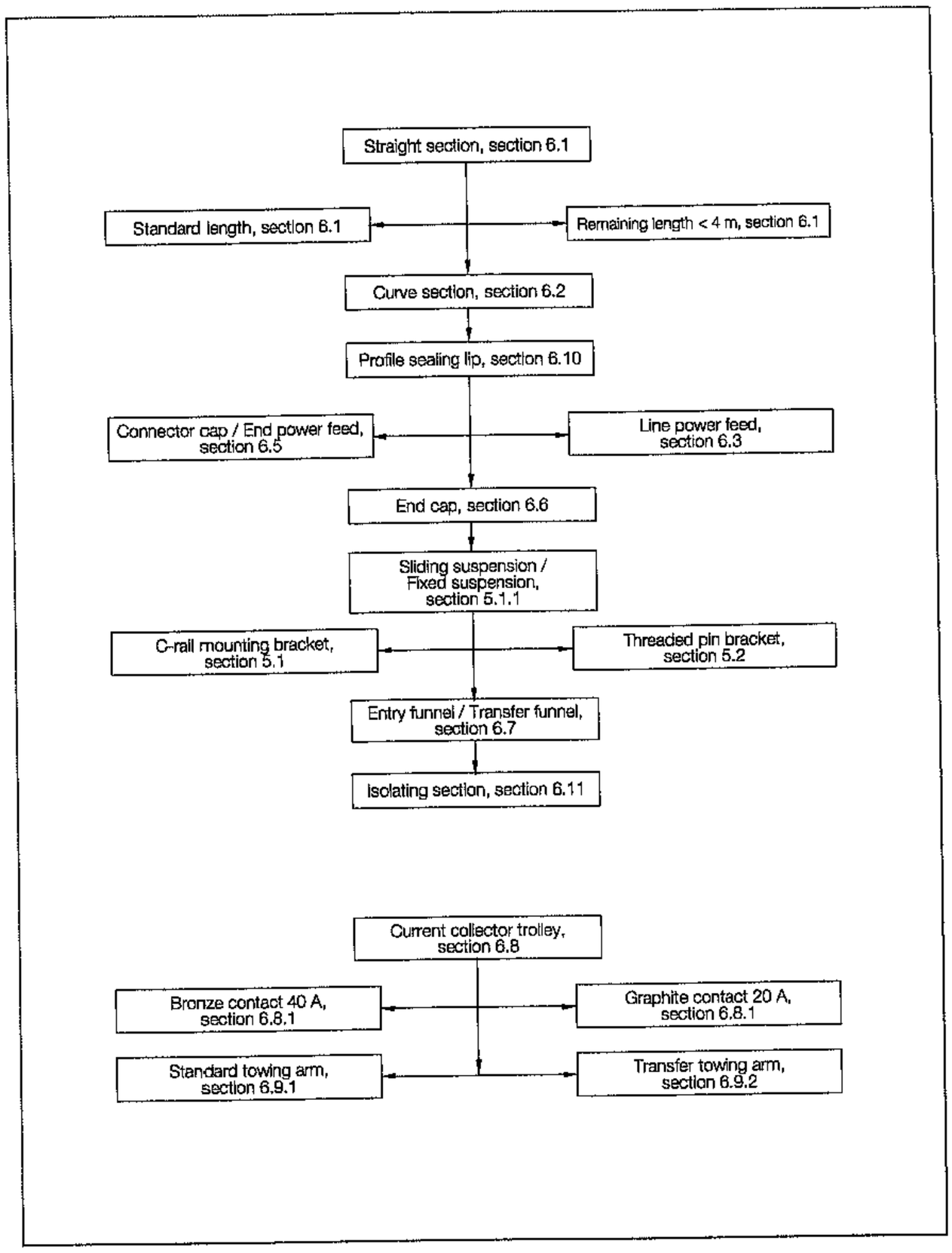


Calculating the maximum permissible current I_ϑ [A] for other ambient temperatures

Ambient temperature	ϑ [°C]	20	25	30	35	40	45	50	55	60	65
Conversion factor	f_ϑ	1,20	1,14	1,07	1,00	0,92	0,84	0,74	0,64	0,51	0,35

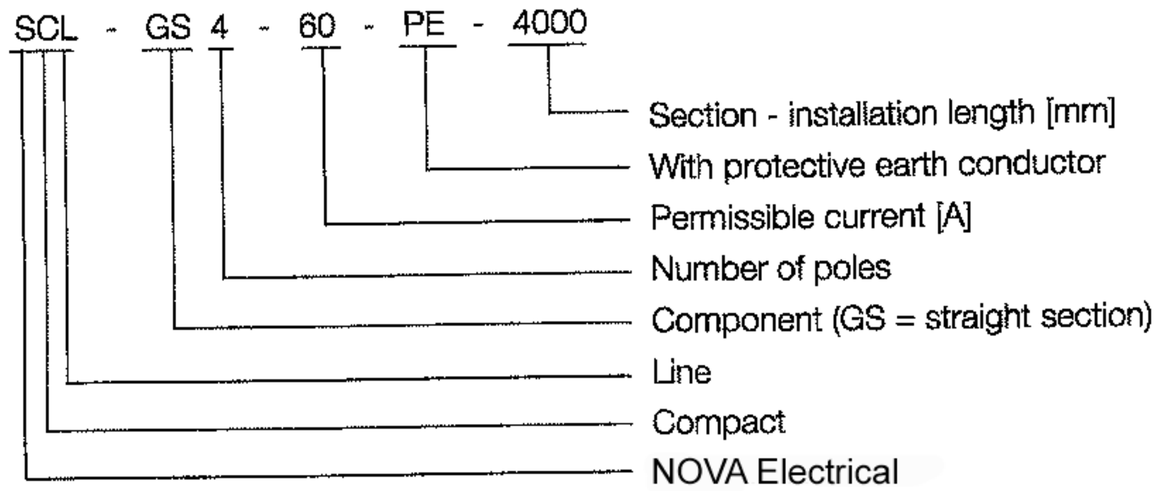
Maximum permissible current $I_\vartheta = I_{35} \cdot f_\vartheta$

3.2 SCL basic structure

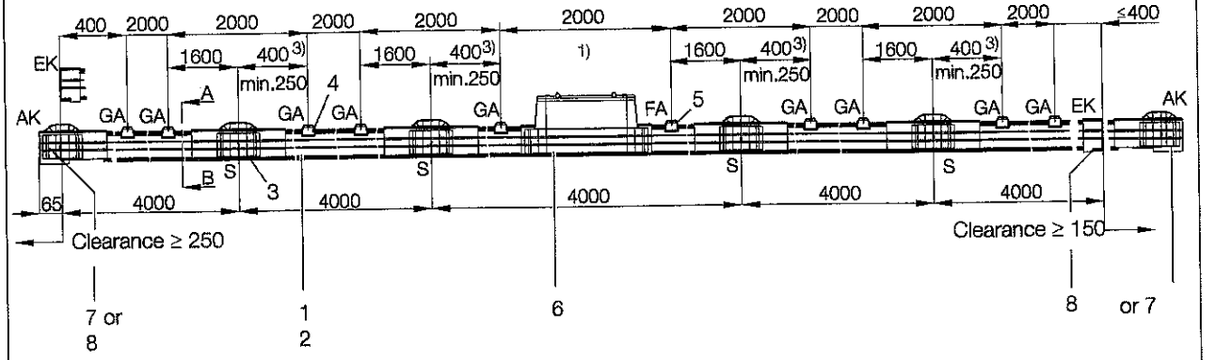


Model code:

(Example for ordering a straight section)

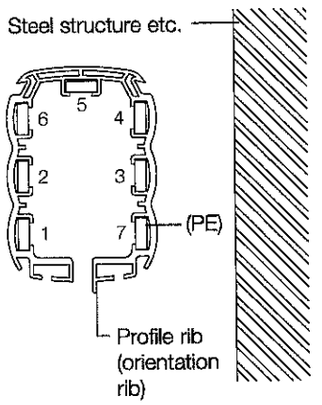


4 General layout



In place of an AK connector end cap an entry/transfer funnel may be fitted.
To do this, an additional suspension must be fitted at 200 mm.

Section A - B



Item	Designation		Dimensions
1	SCL straight sectio	GS	4000 mm
2	SCL curve section	BS	R ≥ 800 mm 4)
3	Joint connector	S	
4	Sliding suspension	GA	
5	Fixed suspension	FA	
6	Line power feed	ES	4000 mm
7	Connector end cap as end power feed	AK	
	Connector end cap as track end cap		
8	End cap	EK	
	Current collector trolley 2)		
	Towing arm 2)		
	Towing arm for transfer sections 2)		
	Entry / transfer funnel 2)		

Please note

In place of an AK connector end cap,
- a track extension,
- an entry section,
- or a transfer section

may be fitted.

SCL installations

- **with a line power feed** are supplied with an end cap item (8) at both ends.

  A track cannot be extended when an end cap is fitted. An installation with an end cap is exactly 74 mm shorter than the rated length.

  On request also available with connector end cap as track end cap so that the track can be extended.
- **with an end power feed** are supplied with a connector end cap (7) at both ends.

  An installation with a connector end cap is exactly 130 mm longer than the rated length. Allow for clearance to connect the end power feed (approx. 250 mm).

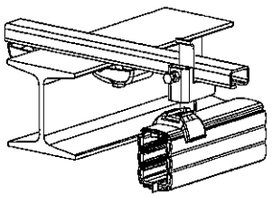
1) When large cable cross-sections (from size PG42) are used with a SCL section with a line power feed, a third additional sliding suspension must be fitted close to the power feed enclosure.
2) Not shown
3) The 400 mm dimension **must not** be exceeded.
4) Not for 5 and 7-pole type.

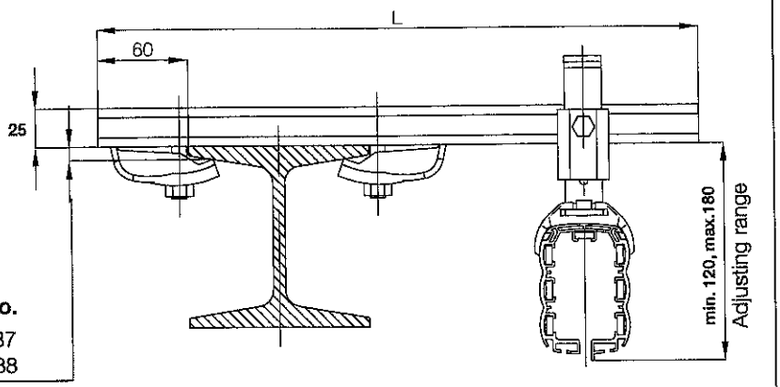
5 Suspension arrangements

5.1 SCL suspension with C-rail bracket

5.1.1 Sliding suspension/fixed suspension

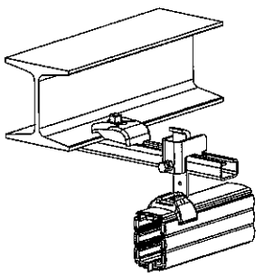
Attachment to upper flange I

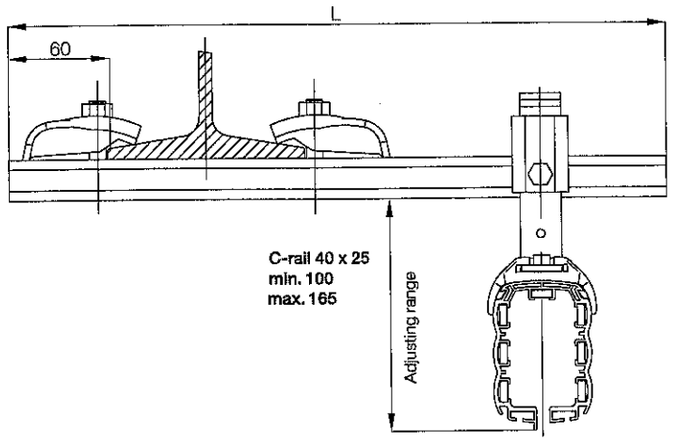


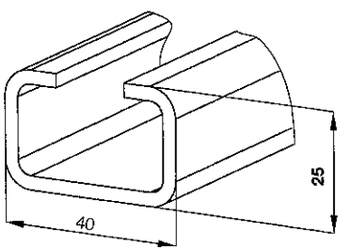


Flange clamp		Part no.
Clamping range	8 to 16 mm	910187
Clamping range	16 to 30 mm	910188

Attachment to lower flange II

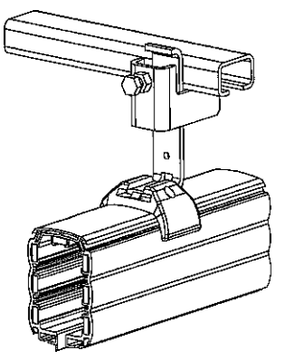


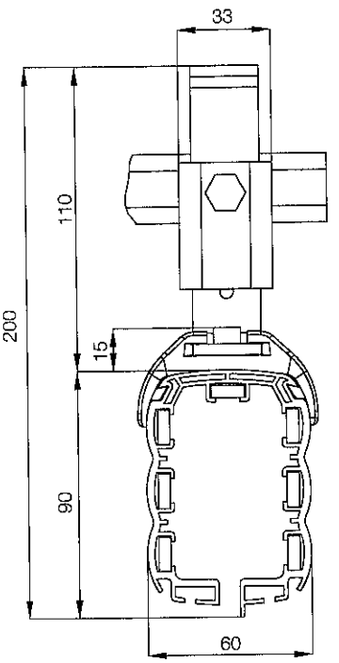


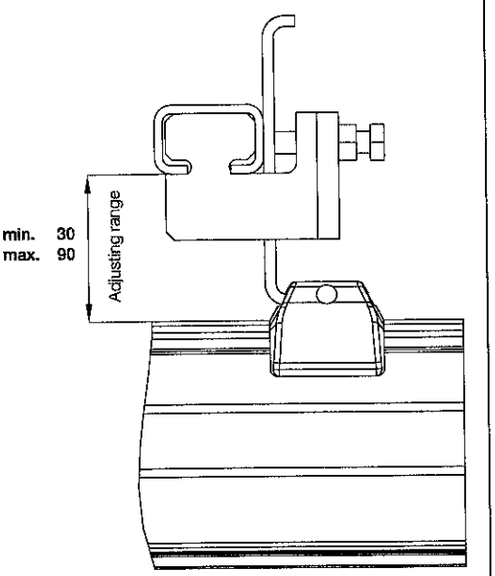


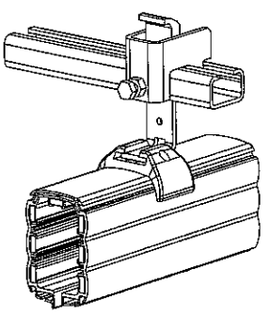
Part no. for C-rail 40 x 25	
L = 300	1910033
L = 400	1910034
L = 500	1910092
L = 600	1910093
L = 800	1910037
L = 1000	1910038

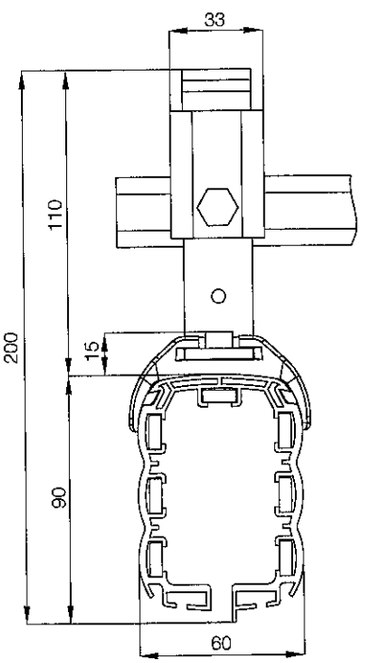
5.1.2 Mounting and operating dimensions

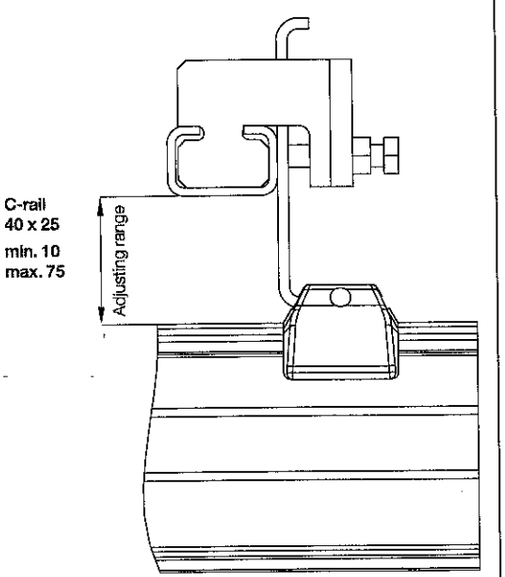


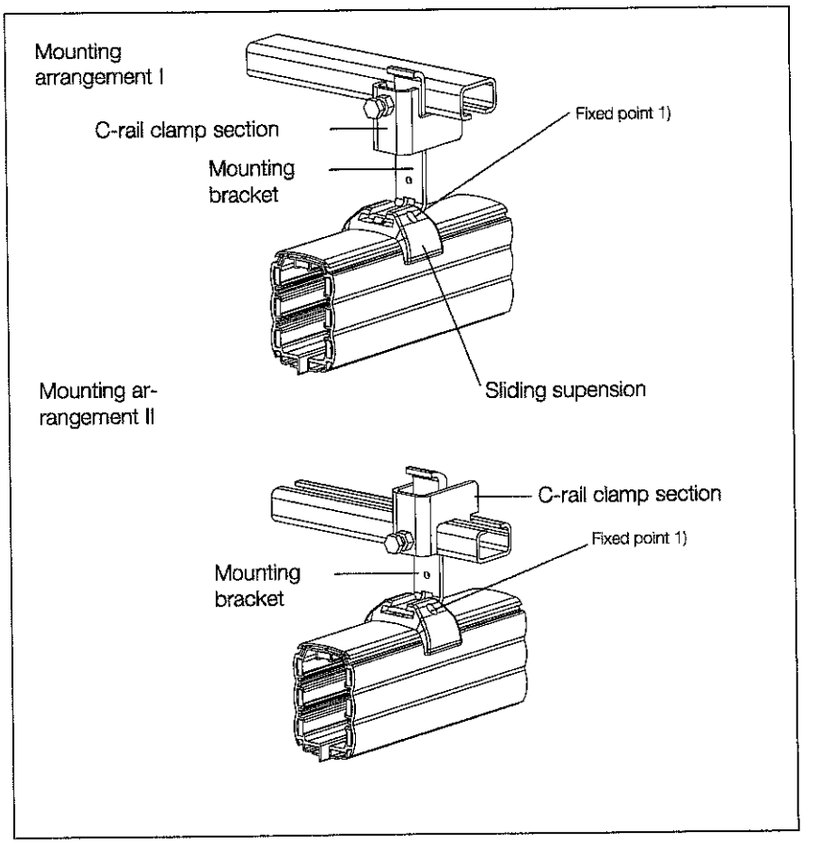












Component set for sliding suspension with C-rail bracket	Bestell-Nr.
1 off C-rail clamp section	7910236
1 off mounting bracket	
1 off sliding suspension	

The following information is required for ordering C-rails and flange clamps to fit SCL to I-beams:

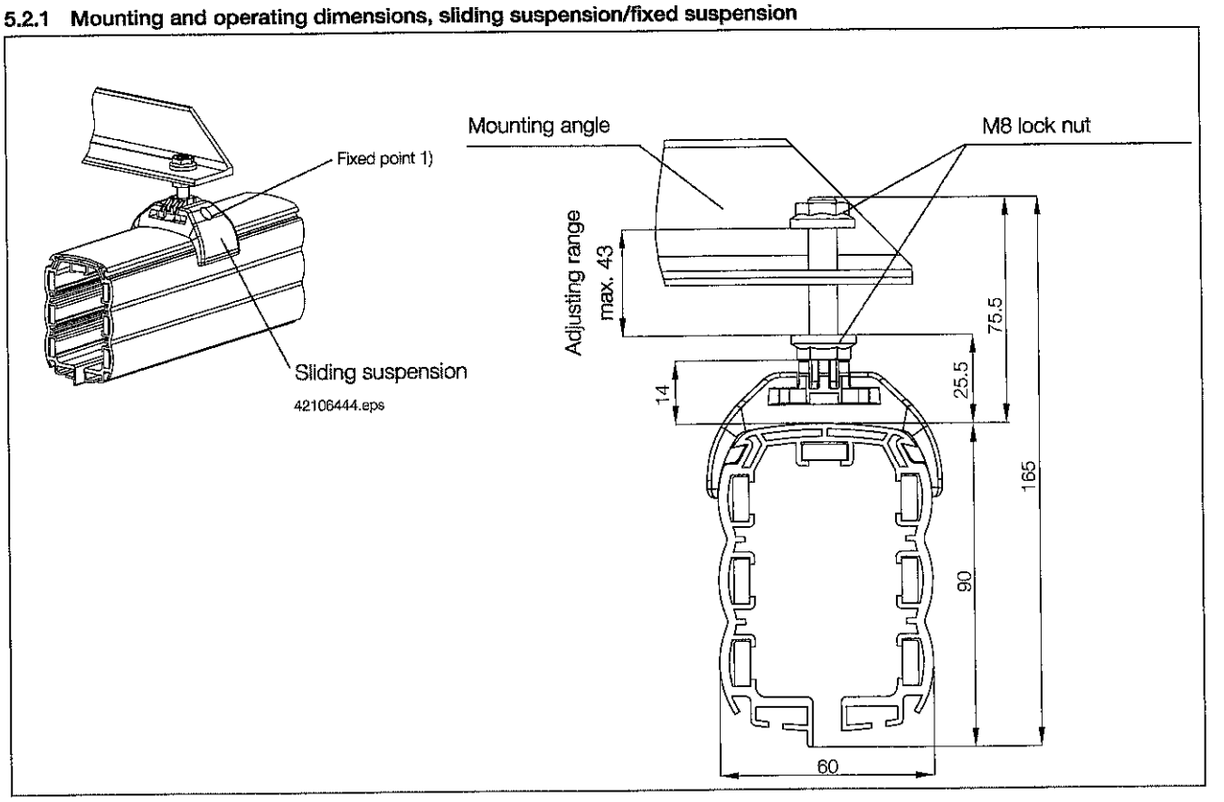
- C-rail type and length (see table on page 12).
- Flange clamps for I-beams (see below).

Girder width	Clamping range	Part no.
I 160 - I 400	8 - 16 mm	910187
I 425 - I 600	16 - 30 mm	910188

1) Only for fixed suspension. The fixed suspension is a sliding suspension which is fixed on the profile section by means of a self-tapping screw. Self-tapping screw 3,5 x 9,5 to DIN 7981.

5.2 SCL suspension with M8 threaded pin

5.2.1 Mounting and operating dimensions, sliding suspension/fixed suspension



Component set for sliding suspension with M8 threaded pin	Part no.
1 off threaded pin fitting	7910237
1 off countersunk screw M8 x 70	
2 off lock nut M8	
1 off sliding suspension	

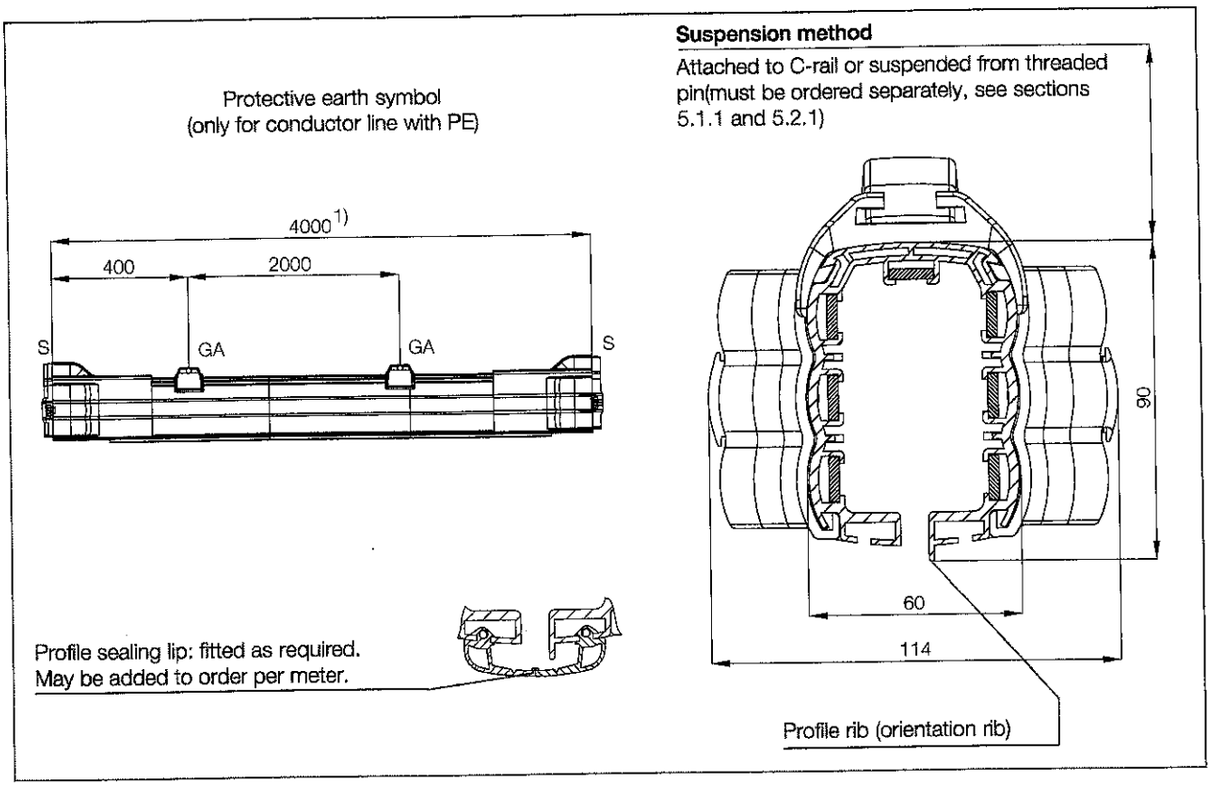
5.3 Further fitting information

- Straight sections feature plastic sliding suspensions for connection to C-rail or threaded pin fittings..
- Line power feeds feature an additional sliding suspension.
- For C-rail fittings:
  - The mounting brackets are clipped into the sliding suspensions.
  - The C-rail clamp section is fitted according to mounting arrangement I or II (see section 5.1.2).
- For threaded pin fittings:
  - The threaded pin fitting with countersunk screw is clipped into the sliding suspensions.
- The max. distance between SCL sliding suspensions is 2000 mm for straight sections (see chapter 4).
- Sliding suspensions must be fitted every 500 mm (along the curve) for curved sections.
- The centre of every SCL installation must be secured by a fixed suspension. To do this, screw the enclosed 3,5 x 9,5 self-tapping screw into the sliding suspension.
  For SCL installations with entry/transfer sections, the funnels must be arrested.

1) Only for fixed suspension. The fixed suspension is a sliding suspension which is fixed on the profile section by means of a self-tapping screw. Self-tapping screw 3,5 x 9,5 to DIN 7981.

6 Technical data

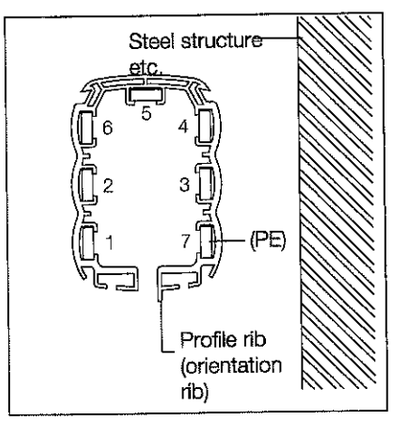
6.1 SCL straight section 4, 5, 6 und 7 poles



S = Joint connectors are pre-assembled on the conductor enclosures.

GA = Sliding suspensions: are fitted to the conductor enclosures and have to be positioned during assembly.

- Additional sliding suspensions may be fitted.
- Specify suspension method and order separately.
- Suspension diagram with dimensions see chapter 4.



Note

Unless the installation is designed otherwise, it must be ensured that all SCL straight and curve sections are fitted in such a way that the protective earth conductor (PE) and the profile rib of the enclosure face towards the steelwork, etc.

When all SCL straight and curve sections have been fitted, one sliding suspension must be fixed with a SCL straight section in the middle of the track (fixed point) to prevent the SCL installation moving to the side.

Fixed point or fixed suspension:

Screw the enclosed 3,5 x 9,5 self-tapping screw through the sliding suspension and into the SCL enclosure.

Use only the enclosed 3,5 x 9,5 self-tapping screws to DIN7981 as there is a risk of accidental contact with live parts if longer screws are used.

1) Standard length 4000 mm. Indicate reduced length in order text for part no. Minimum reduced length 500 mm.
For complete conductor line installations, the entire conductor line length including the power feed(s) must be specified in the order text.

Part number table

Number of poles	Size				
	35	60	100	140	200
	Permissible current (A) at 100 % CDF up to 35 °C 2)				
	64	78	100	140	160
	L1 - L3 conductor cross-section mm²				
	10	15	25	38	56
4	**7910187**	**7910191**	**7910195**	**7910199**	**7910203**
Phase L1 - L3 PE conductor Control cable	3 x 10 mm² 1 x 10 mm² -	3 x 15 mm² 1 x 15 mm² -	3 x 25 mm² 1 x 25 mm² -	3 x 38 mm² 1 x 25 mm² -	3 x 56 mm² 1 x 38 mm² -
5	**7910188**	**7910192**	**7910196**	**7910200**	**7910204**
Phase L1 - L3 PE conductor Control cable	3 x 10 mm² 1 x 10 mm² 1 x 10 mm²	3 x 15 mm² 1 x 15 mm² 1 x 10 mm²	3 x 25 mm² 1 x 25 mm² 1 x 10 mm²	3 x 38 mm² 1 x 25 mm² 1 x 10 mm²	3 x 56 mm² 1 x 38 mm² 1 x 10 mm²
6	**7910189**	**7910193**	**7910197**	**7910201**	**7910205**
Phase L1 - L3 PE conductor Control cable	3 x 10 mm² 1 x 10 mm² 2 x 10 mm²	3 x 15 mm² 1 x 15 mm² 2 x 10 mm²	3 x 25 mm² 1 x 25 mm² 2 x 10 mm²	3 x 38 mm² 1 x 25 mm² 2 x 10 mm²	3 x 56 mm² 1 x 38 mm² 2 x 10 mm²
7	**7910190**	**7910194**	**7910198**	**7910202**	**7910206**
Phase L1 - L3 PE conductor Control cable	3 x 10 mm² 1 x 10 mm² 3 x 10 mm²	3 x 15 mm² 1 x 15 mm² 3 x 10 mm²	3 x 25 mm² 1 x 25 mm² 3 x 10 mm²	3 x 38 mm² 1 x 25 mm² 3 x 10 mm²	3 x 56 mm² 1 x 38 mm² 3 x 10 mm²

For straight sections **not fitted with a protective earth conductor (PE)**, this must be indicated in the order section and specified as a part no. with **"no PE"**.

The following information is required for ordering a straight section (see model code order text):

⇒ Conductor line type, component **SCL-GS**

⇒ Number of poles (4, 5, **6**, or 7 conductors)

⇒ Permissible current (35, 60, **100**, 140, 200 A)

⇒ protective earth conductor **PE** (with or without)

⇒ Section and installation length in mm 1)

1) Standard length 4000 mm. Indicate reduced length in order text for part no. Minimum reduced length 500 mm.
For complete conductor line installations, the entire conductor line length including the power feed(s) must be specified in the order text.

2) The permissible current for the conductors must be checked.
Calculation or tables see chapter 3.

Model code

Order text, e.g.:

SCL-GS-6-100-PE-4000

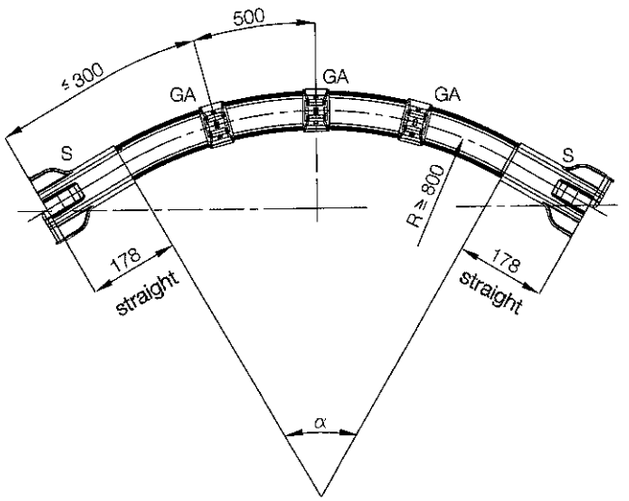
or SCL-GS-7-60-3500 **(no PE, 3500 mm long)**

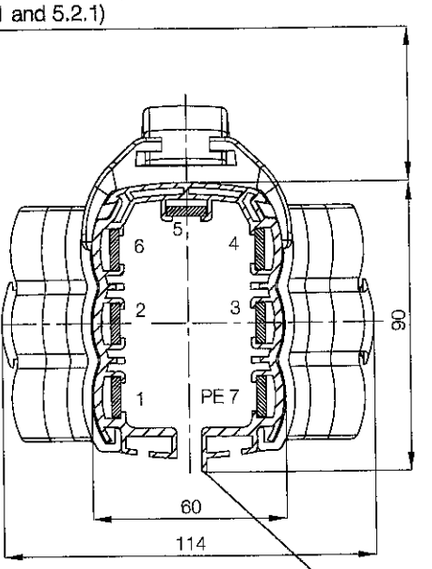
6.2 SCL curved section 4, 5, 6 and 7 poles

Suspension method

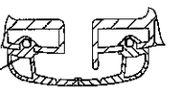
Attached to C-rail or suspended from threaded pin (must be ordered separately, see sections 5.1.1 and 5.2.1)

This diagram shows an inside curve

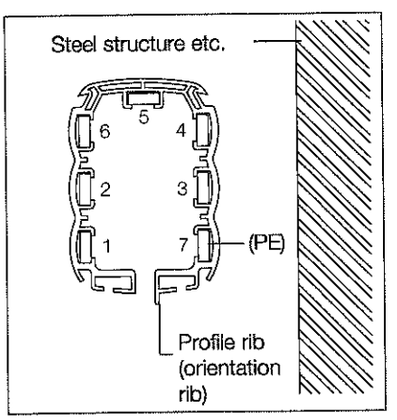




Profile rib (orientation rib)



Profile sealing lip: fitted as required. May be added to order per meter.



S = Joint connectors are pre-assembled on the conductor enclosures.

GA = Sliding suspensions: are fitted to the conductor enclosures and have to be positioned during assembly.

- Suspensions spaced at a distance of 500 mm along the curve.
- Specify suspensions and order separately.
- Suspension diagram with dimensions see chapter 4.

Note

Unless the installation is designed otherwise, it must be ensured that all SCL straight and curve sections are fitted in such a way that the protective earth conductor (PE) and the profile rib of the enclosure face towards the steelwork, etc.

The straight end sections with 178 mm are fixed values.

For curved sections **not fitted with a protective earth conductor (PE)**, this must be indicated in the order section and specified as a part no. with **"no PE"**.

The following information is required for ordering a curved section (see model code order text):

⇒ Conductor line type, component **SCL-BS**
⇒ Number of poles (4, **5**, 6, or 7 conductors)
⇒ Permissible current (35, 60, **100**, 140, 200 A) 1)
⇒ protective earth conductor **PE** (with or without)
⇒ Radius (mm)
⇒ Angle α (degrees)
⇒ Curve I or **curve A** 2)

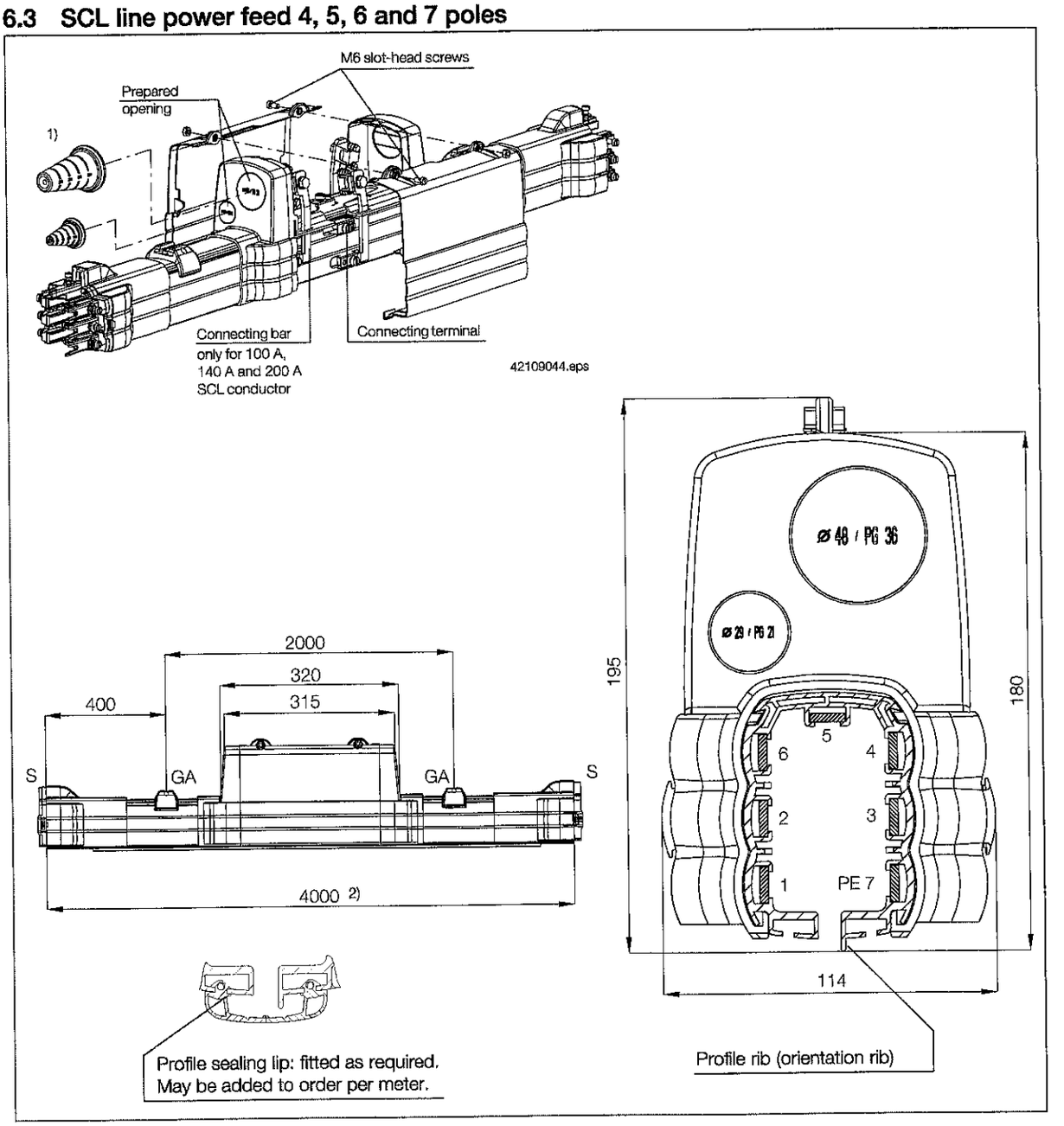
1) The permissible current for the conductors must be checked.
Calculation or tables see chapter 3.

2) **Definition of curve type I and curve type A:**
On curve I the protective earth conductor and the profile rib are on the inside of the curved section.
On curve A the protective earth conductor and the profile rib are on the outside of the curved section.
On curved sections which do not feature a protective earth conductor, the profile rib is only for orientation.
The view refers to the centre of the radius.

Model code	Order text, e.g.:
	SCL-BS 5-100- PE- R = 1500, α = 45, curve A 3)

3) Profile sealing lip may be added to order per meter. Please specify in the order.

6.3 SCL line power feed 4, 5, 6 and 7 poles



S = Joint connectors are pre-assembled on the conductor enclosures.

GA = Sliding suspensions: are fitted to the conductor enclosures and have to be positioned during assembly.
Line power feeds feature an additional sliding suspension.
- Additional sliding suspensions may be fitted.
- Specify suspension method and order separately, see chapter 5.
- Suspension diagram with dimensions see chapter 4.

1) Cut off the rubber sleeves to the required cable diameters.
   - dia. 48 PG 42 only with rubber sleeve max. 43 mm cable diameter, PG 36 for PG screw fitting.
   - dia. 29 PG 21 with rubber sleeve max. 24 mm cable diameter,

   The rubber sleeves are supplied loose inside the line power feed enclosure.
2) Standard length 4000 mm. Indicate reduced length in order text for part no. Minimum reduced length 1000 mm.

Part number table

Number of poles	Size				
	35	60	100	140	200
	Permissble current (A) at 100 % CDF up to 35 °C 1)				
	64	78	100	140	160
	L1 - L3 conductor cross-section mm²				
	10	15	25	38	56
4	**7910207**	**7910211**	**7910215**	**7910219**	**7910223**
L1 - L3 + PE Control cable	4 x 1,5 - 16 mm² -	4 x 1,5 - 16 mm² -	4 x 25 - 70 mm² -	4 x 25 - 70 mm² -	4 x 25 - 70 mm² -
5	**77910208**	**7910212**	**7910216**	**7910220**	**7910224**
L1 - L3 + PE Control cable	4 x 1,5 - 16 mm² 1 x 1,5 - 16 mm²	4 x 1,5 - 16 mm² 1 x 1,5 - 16 mm²	4 x 25 - 70 mm² 1 x 1,5 - 16 mm²	4 x 25 - 70 mm² 1 x 1,5 - 16 mm²	4 x 25 - 70 mm² 1 x 1,5 - 16 mm²
6	**7910209**	**7910213**	**7910217**	**7910221**	**7910225**
L1 - L3 + PE Control cable	4 x 1,5 - 16 mm² 2 x 1,5 - 16 mm²	4 x 1,5 - 16 mm² 2 x 1,5 - 16 mm²	4 x 25 - 70 mm² 2 x 1,5 - 16 mm²	4 x 25 - 70 mm² 2 x 1,5 - 16 mm²	4 x 25 - 70 mm² 2 x 1,5 - 16 mm²
7	**7910210**	**7910214**	**7910218**	**7910222**	**7910226**
L1 - L3 + PE Control cable	7 x 1,5 - 16 mm² 3 x 1,5 - 16 mm²	7 x 1,5 - 16 mm² 3 x 1,5 - 16 mm²	4 x 25 - 70 mm² 3 x 1,5 - 16 mm²	4 x 25 - 70 mm² 3 x 1,5 - 16 mm²	4 x 25 - 70 mm² 3 x 1,5 - 16 mm²

For line power feeds **not fitted with a protective earth conductor (PE)**, this must be indicated in the order section and specified as a part no. with **"no PE"**.

The following information is required for ordering a line power feed (see model code order text):

⇒ Conductor line type, component **SCL-ES**

⇒ Power feed, number of poles (**4**, 5, 6, or 7 conductors)

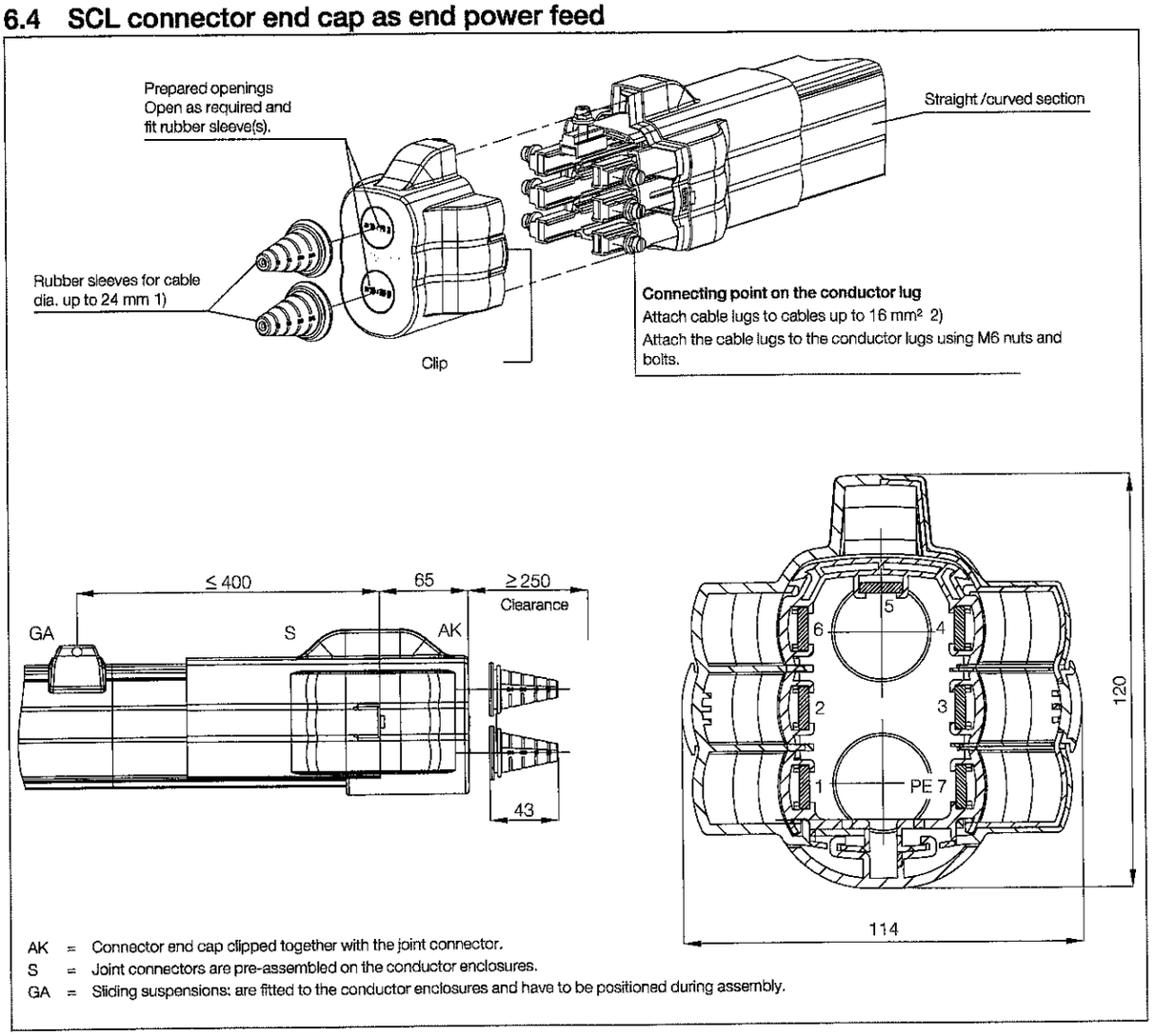
⇒ **Permissible current** (35, 60, 100, **140**, 200 A)

⇒ protective earth conductor **PE** (with or without)

1) The permissible current for the conductors must be checked. Calculation see tables in chapter 3.

Model code	Order text, e.g.:	
	Line power feed	**SCL-ES-4-140-PE**
	or	SCL-ES-7-60 **(no PE)**

6.4 SCL connector end cap as end power feed



AK = Connector end cap clipped together with the joint connector.
S = Joint connectors are pre-assembled on the conductor enclosures.
GA = Sliding suspensions: are fitted to the conductor enclosures and have to be positioned during assembly.

The following information is required for ordering or selecting a connector end cap as a power feed (see model code order text):

⇒ Conductor line type, **SCL**

⇒ AK connector end cap

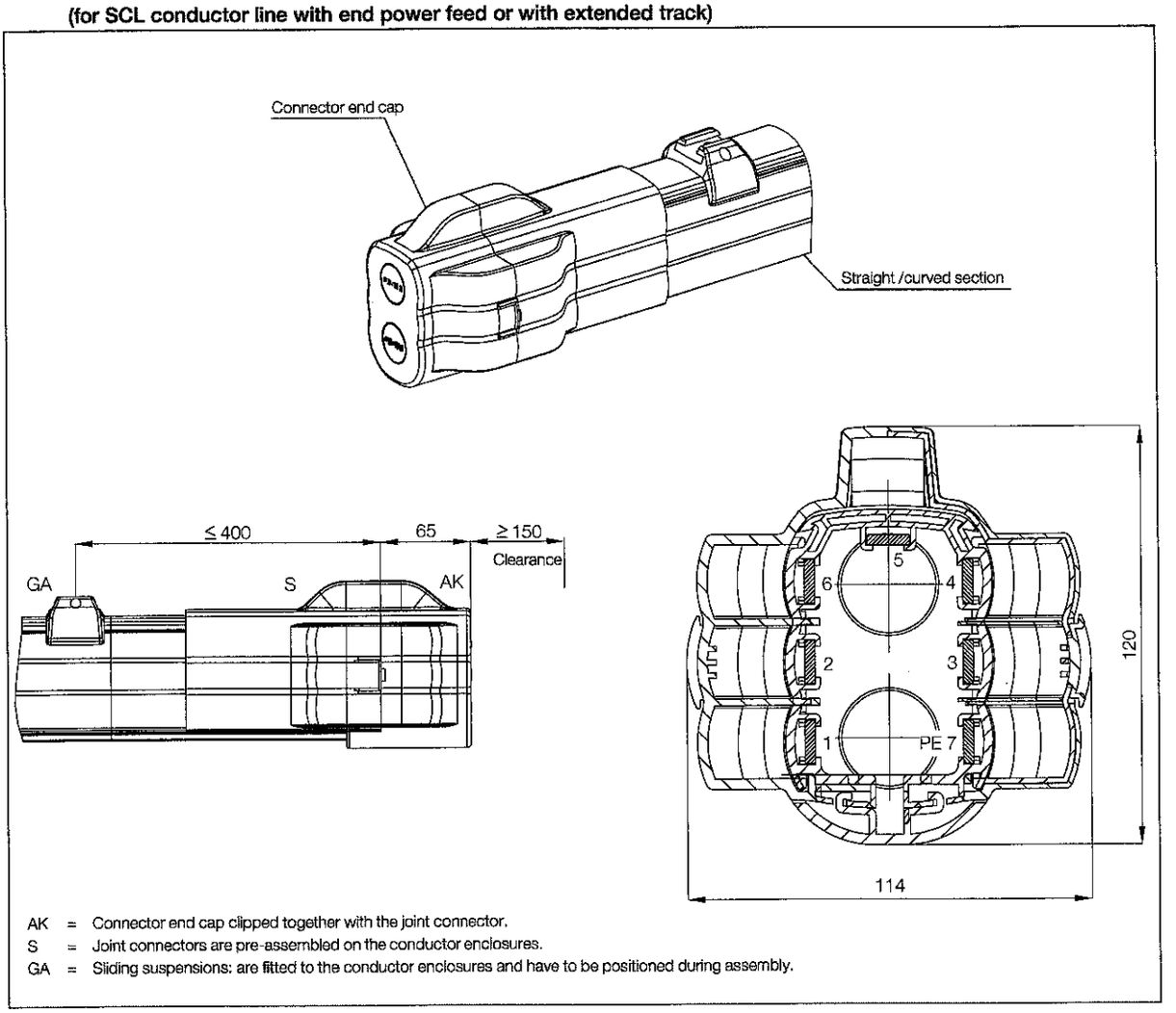
⇒ Connection cross-section ≤ **16 mm²** (I_N ≤ 60 A)

1) Not included in the scope of supply.
Cut off the rubber sleeves to the required cable diameters.
2) Cable lugs are not included in the scope of supply.

Model code	Order text, e.g.:
	SCL connector end cap as end power feed **SCL-AK-16**
	Rubber sleeve **PG 21**

6.5 SCL connector end cap as track end cap

(for SCL conductor line with end power feed or with extended track)



AK = Connector end cap clipped together with the joint connector.
S = Joint connectors are pre-assembled on the conductor enclosures.
GA = Sliding suspensions: are fitted to the conductor enclosures and have to be positioned during assembly.

The following information is required for ordering or selecting a connector end cap as track end cap (see model code order text):

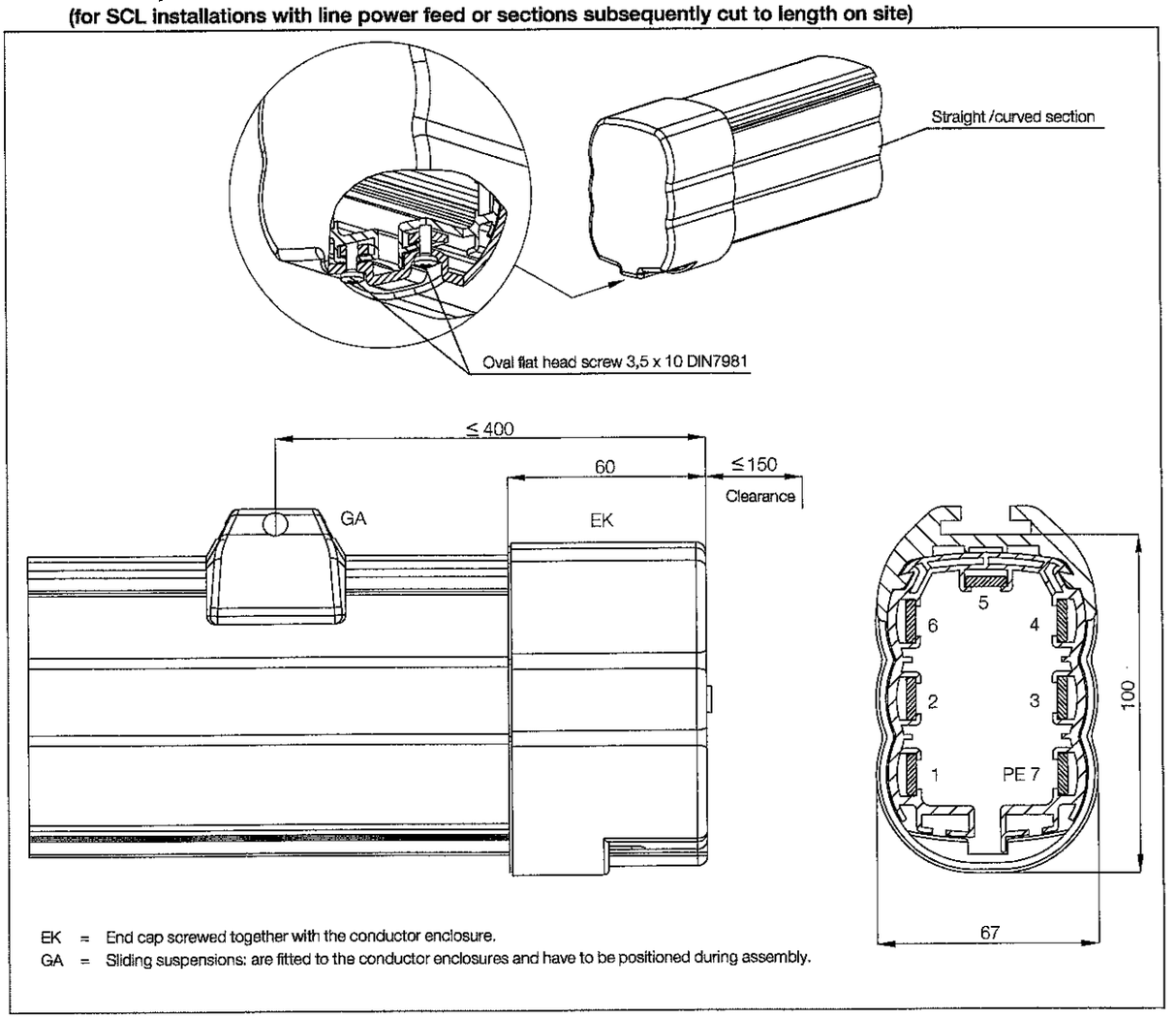
⇒ Conductor line type, **SCL**

⇒ **AK** connector end cap

Model code	Order text, e.g.:	
	SCL connector end cap as track end cap	**SCL-AK**

6.6 End cap

(for SCL installations with line power feed or sections subsequently cut to length on site)



EK = End cap screwed together with the conductor enclosure.
GA = Sliding suspensions: are fitted to the conductor enclosures and have to be positioned during assembly.

Use only the enclosed 3,5 x 10 oval flat head screws to DIN7981 as there is a risk of accidental contact with live parts if longer screws are used.

The following information is required for ordering or selecting an end cap (see model code order text):

⇒ Conductor line type, **SCL**

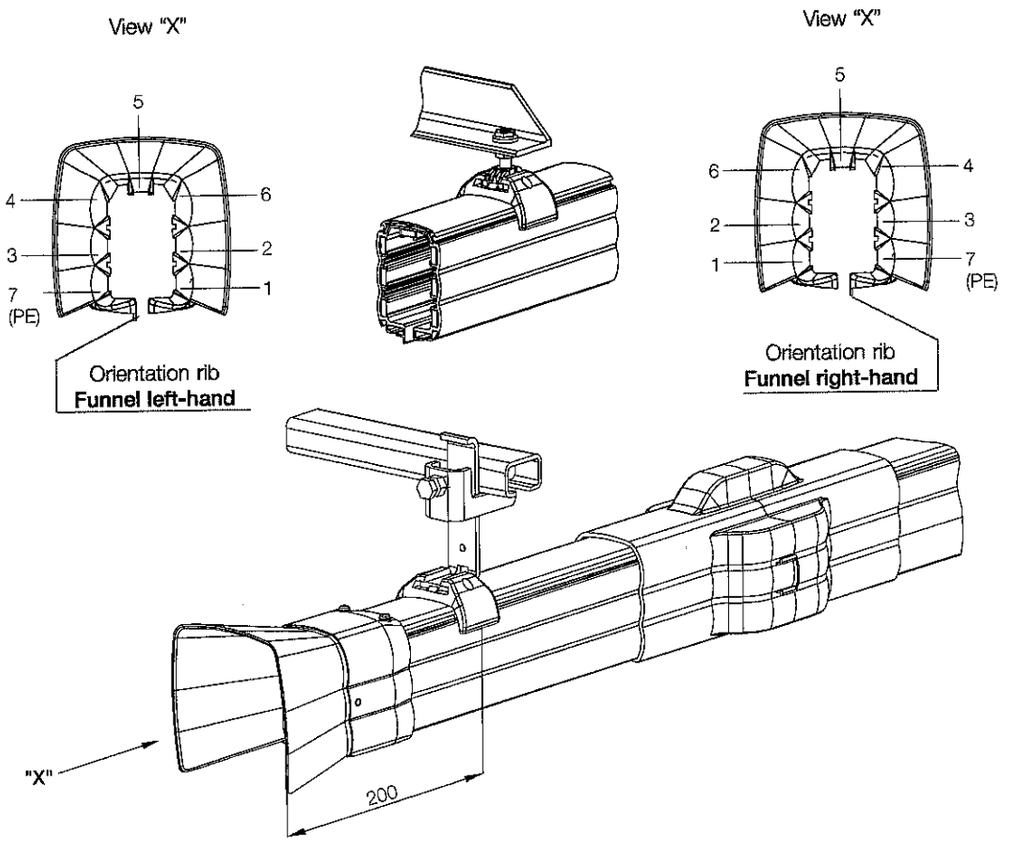
⇒ **EK** end cap

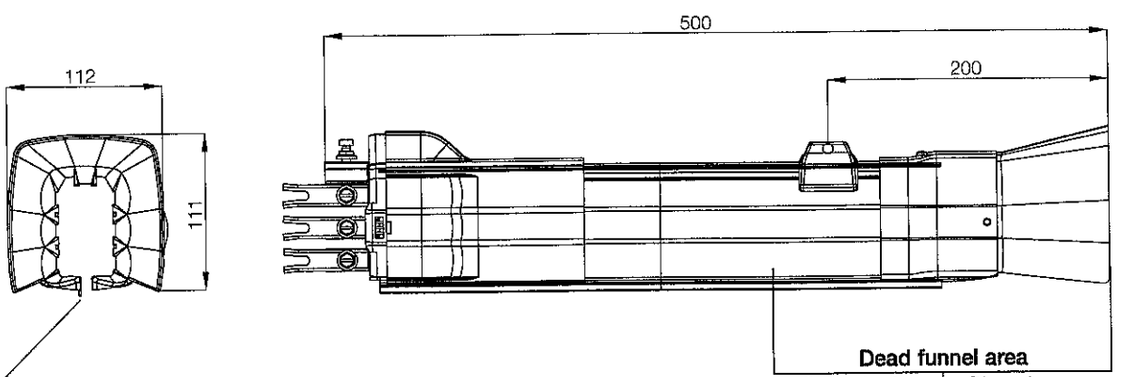
Model code	Order text, e.g.:
	End cap **SCL-EK**

6.7 Entry/transfer section

Suspension method

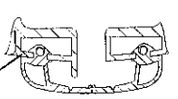
Attached to C-rail or suspended from threaded pin(must be ordered separately, see sections 5.1.1 and 5.2.1)





Conductor line	Dimension mm
1	243
2	
3	
4	
5	352
6	243
7	
PE	134

Profile rib (orientation rib)



Profile sealing lip: fitted as required.
May be added to order per meter.

For transfers left-hand and right-hand funnels are required.

Entry/transfer speed 100 m/min.

Min. distance between transfer funnels 10 mm.

Max. lateral misalignment between the funnels ± 10 mm.

Max. vertical misalignment between the funnels ± 8 mm.

S = Joint connectors are pre-assembled on the conductor enclosures.

F = Fixed suspension slides on funnel enclosure to be positioned and secured with self-tapping screw during assembly.

Use only the enclosed 3,5 x 9,5 self-tapping screws to DIN7981 as there is a risk of accidental contact with live parts if longer screws are used.

Part number table

Number of poles	Type	Conductor line assignment	Part no.
4	right-hand	1-3,7 (PE)	7910227
	left-hand		7910228
5	right-hand	1-3,7 (PE) 5	7910229
	left-hand		7910230
6	right-hand	1-3,7 (PE) 4,6	7910231
	left-hand		7910232
7	right-hand	1-3,7 (PE) 4-6	7910233
	left-hand		7910234

For transfer sections not fitted with a protective earth conductor (PE), this must be indicated in the order section and specified as a part no. with "no PE".

Note

The current collector trolley must be prepared for SCL with entry/transfer setions or profile sealing lip.

Open the terminal box on the current collector trolley and separate the upper terminal box enclosure half on the prepared openings (prepared openings see figure in section 6.8).

The following information is required for ordering or selecting transfer sections (see model code order text):

⇒ Conductor line type, **SCL**

⇒ **ÜTR** Transfer section

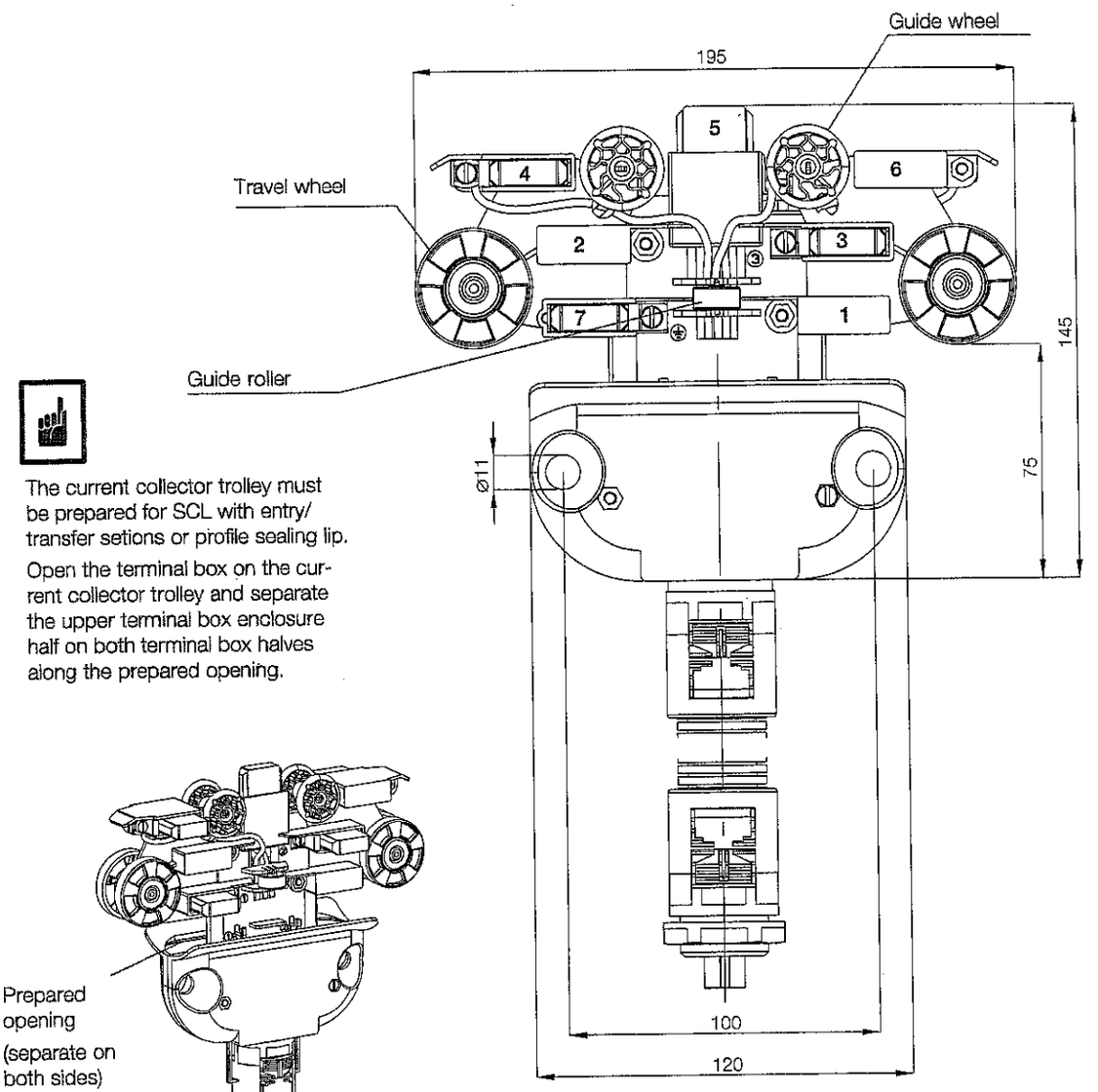
⇒ Type (L = left-hand or **R** = right-hand)

⇒ Number of poles (**4**,5, 6, or 7 conductors)

⇒ protective earth conductor **PE** (with or without)

Model code	Order text, e.g.:	
	Transfer section (funnel right-hand)	**SCL-ÜTR-4-PE**
	or (funnel left-hand)	SCL-ÜTL-7 **(no PE)**

6.8 SCL current collector trolley 4, 5, 6 and 7 poles



The current collector trolley must be prepared for SCL with entry/ transfer setions or profile sealing lip.

Open the terminal box on the current collector trolley and separate the upper terminal box enclosure half on both terminal box halves along the prepared opening.

Prepared opening (separate on both sides)

1) Bronze sliding contact material, connecting conductor cross-sections L1 - L3 + PE max. 6,0 mm². Control conductor connecting cable cross-section 2,5 mm². Other cross-sections on request.

2) Graphite sliding contact material, connecting conductor cross-sections L1 - L3 + PE max. 4,0 mm². Control conductor connecting cable cross-section 2,5 mm². Other cross-sections on request.

Refer to current collector technical data table in section 6.8.1 for operating criteria.

Designation	Poles	Rated current 80 % CDF	Metric cable union/ corrugated tube	Connecting cable conductors
SCL SAW-4-40 1)	4	40 A	M 25 / NW 17	4 x 6 mm²
SCL SAW-4-20 2)	4	20 A		4 x 4 mm²
SCL SAW-5-40 1)	5	40 A		4 x 6 + 1 x 2,5 mm²
SCL SAW-5-20 2)	5	20 A		4 x 4 + 1 x 2,5 mm²
SCL SAW-6-40 1)	6	40 A		4 x 6 + 2 x 2,5 mm²
SCL SAW-6-20 2)	6	20 A		4 x 4 + 2 x 2,5 mm²
SCL-SAW-7-40 1)	7	40 A		4 x 6 + 3 x 2,5 mm²
SCL SAW-7-20 2)	7	20 A		4 x 4 + 3 x 2,5 mm²

6.8.1 Current collector technical data

Sliding contact material		Bronze	Graphite 1)
Permissible voltage		24 to 690 V ≈	
Continuous current 2)	with 80 % CDF	40 A	20 A
	with 60 % CDF	45 A	20 A
	with 40 % CDF	50 A	25 A
Connecting cable 3)	L1 - L3 + PE	6 mm² x 2000 mm	4 mm² x 2000 mm
	Control cable	1,5 mm², max. 8 A, 80 % CDF	
Travel speed	Straight section	max. 200 m/min	
	Curve section	max. 80 m/min. on application	
	Transfers		
Curve-negotiating for R		≥ 800 mm	

If control or low-voltage signals are transferred, it is recommendable to use at least 2 current collector trolleys.

The following information is required for ordering a current collector trolley (see model code order text):

⇒ Conductor line type, **SCL**
⇒ Current collector trolley
⇒ Number of poles (**4**,5, 6, or 7 sliding contacts)
⇒ Permissible current (20 or **40** A)
⇒ Protective earth conductor **PE** (with or without)
⇒ Connecting cable length (mm)

For current collector trolleys not fitted with a protective earth conductor **(PE)**, this must be indicated in the order section and specified as a part no. with **"no PE"**.

The standard connecting cable length is 2000 mm. Other lengths are possible.

1) Current collector trolleys with graphite sliding contacts must be used in SCL installations operated close to the sea, outdoors and in chemical environments. Use a higher number of current collector trolleys to ensure contact reliability.
2) If 2 current collector trolleys are connected in parallel, twice the rated current can be expected to occur. If 3 current collector trolleys are connected in parallel, the rated current will be increased by a factor of 3 - 10%.
3) Single conductors in the corrugated tube. Maximum cable length 2000 mm Other lengths on request. Minimum length: 500 mm / maximum length: 10000 mm.

Model code

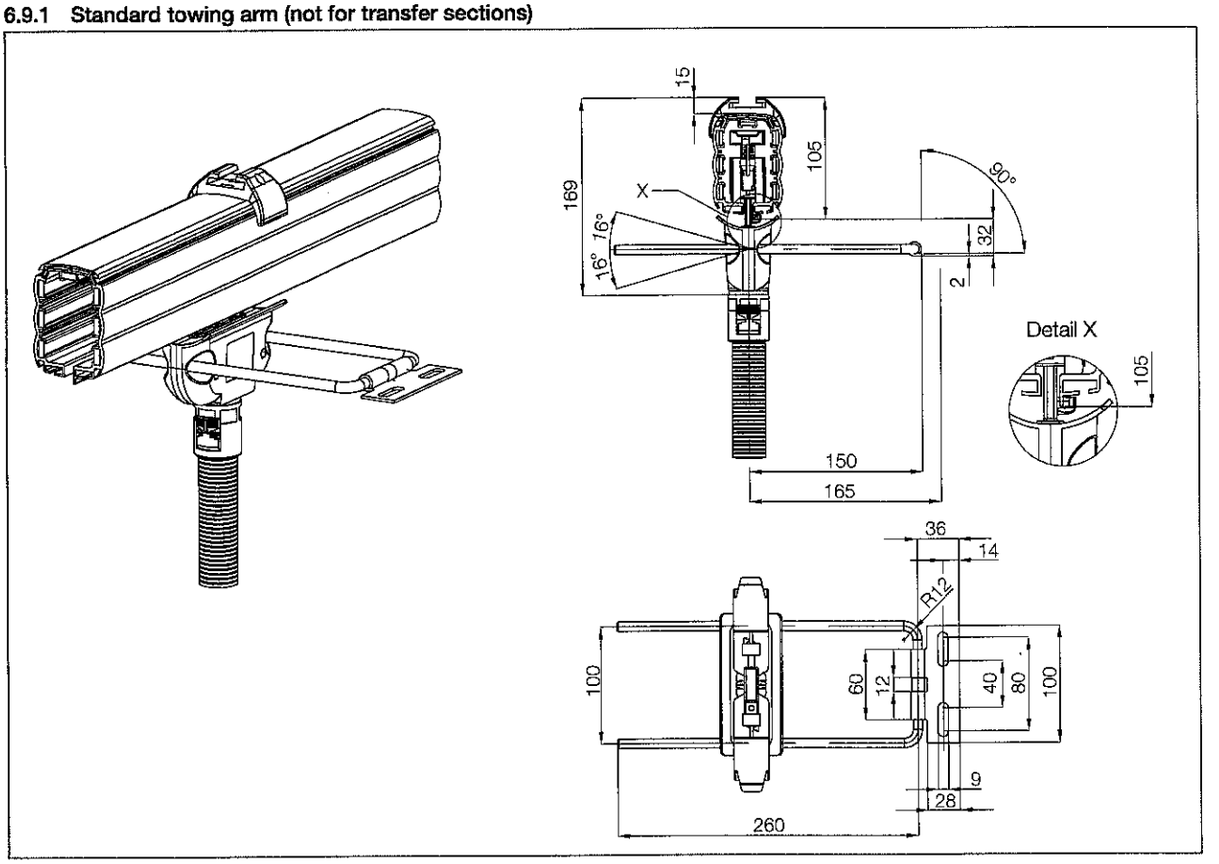
Order text, e.g.:

SCL-SAW-4-40-PE

or SCL-SAW-7-20-3500 **(no PE, 3500 mm connecting cable)**

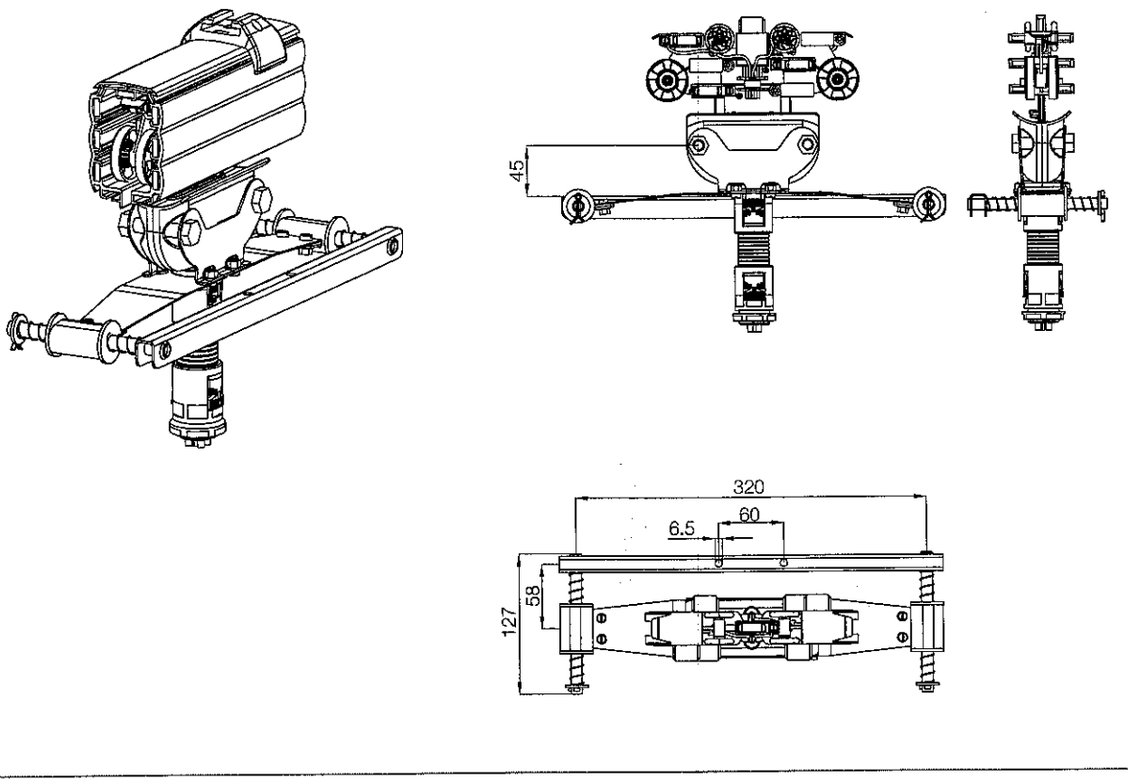
6.9 Towing arm for SCL current collector trolley

6.9.1 Standard towing arm (not for transfer sections)



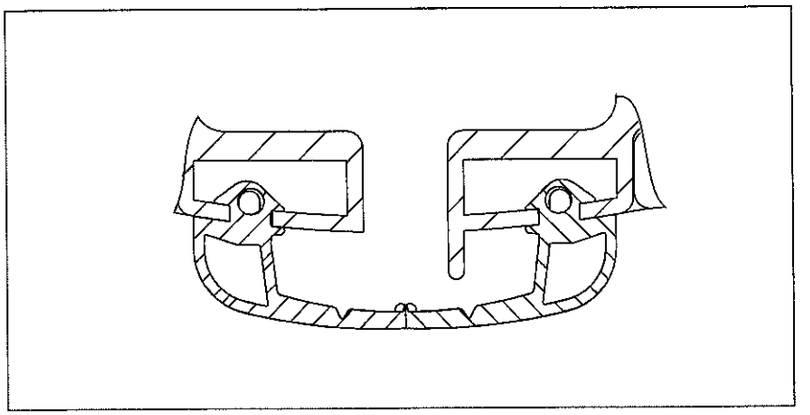
Model code	Order text, e.g.:	
	Towing arm	**SCL-MIT**

6.9.2 Towing arm for free transfer sections



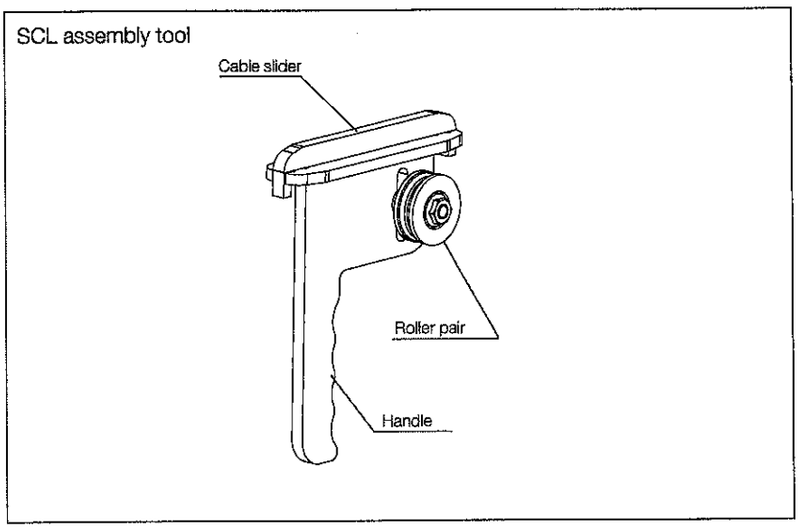
Model code	Order text, e.g.:	
	Towing arm for transfer section	**SCL-MITÜ**

6.10 Profile sealing lip



6.10.1 Assembly tool for fitting the profile sealing lip

Disconnect the SCL installation from the power supply before fitting the profile sealing lip.



The profile sealing lip is supplied on rolls in lengths measuring 40 m.

Profile sealing lip sections have to be bonded together using cyanoacrylate glue (super glue)[2] for longer SCL tracks. Ensure the bonding surfaces are clean and fit together.

Profile sealing lip length = 2 x SCL installation length

The profile sealing lips are individually pushed into both sides of the SCL conductor enclosure (see also assembly instructions 214 399 44, section 3.11.1).

If profile sealing lips are used with the SCL, the teminal box enclosure halves on the current collector trolley must be prepared. (see note in section 6.8).

Model code	Order text, e.g.:	
	SCL – profile sealing lip	**910065 1)**
	SCL assembly tool for profile sealing lip	**7910182**
	Cyacrylat glue (super glue), 20 gr.	**910082 2)**

1) Profile sealing lip may be added to order per meter. Please specify in the order.
2) Order, if required.

6.11 Isolating section

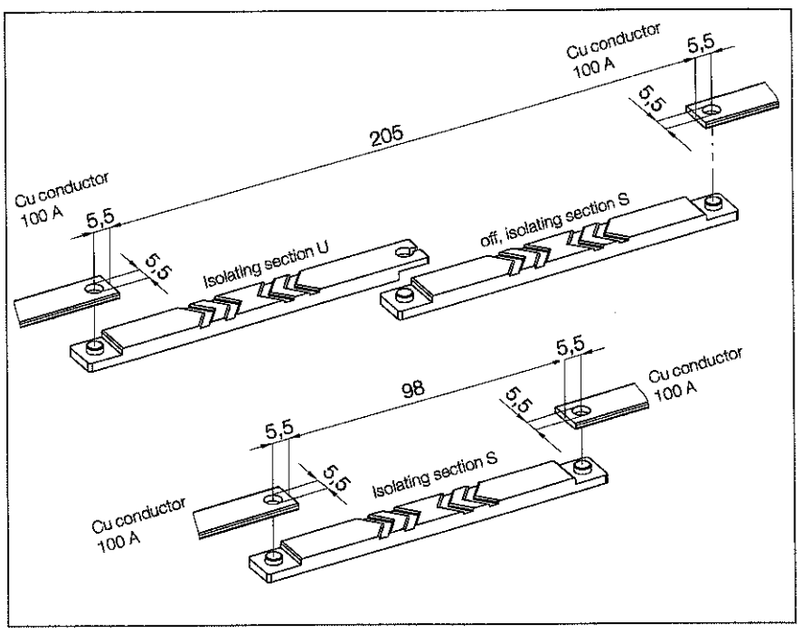
For control purposes, the SCL conductor line can be interrupted by means of isolating sections on straigth sections or line feeds.

The isolating sections can only be combined with 100 A copper conductors.

The isolating section can be fitted in the factory or on site.

If the isolating sections are fitted in the factory, the following detailed information is required:

- postition of the isolating section/sections in the installation
- conductor no.
- length of each isolating section



Model code	Order text, e.g.:	
	Isolating section U	**910059**
	Isolating section S	**910061**

7 Component parts

7.1 Straight sections and accessories

7.1.1 Component set for sliding suspension with C-rail bracket

Designation	Part no.
Sliding suspension	910034
Mounting bracket	
C-rail clamping section	

7.1.2 Component set for sliding suspension with M8 threaded pin

Designation	Part no.
Sliding suspension	7910237
Threaded pin fitting	
Lock nutM8 (2 off)	
Countersunk screw M8 x 70	

7.1.3 Component set for conductor connector

Designation	Quantity	Part no.
Conductor connector U section	1	7910181
Conductor connector lug	2	
Round head screw M6 x 20	2	
Lock nut M6	2	
Clamp section **1)**	2	
Round head screw M6 x 22	2	

7.1.4 Isolating sections

Designation	Part no.
Isolating section U **2)**	910059
Isolating section S **2)**	910091

1) Clamp section not required for 100 A, 140 A and 200 A conductors.
2) off, isolating section S = 97 mm isolating distance
off, isolating section S + off, isolating section U = 205 mm isolating distance
The isolating distance can be extended by adding further isolating sections (isolating section U) (see assembly instructions 214 399 44, section 4.12).

7.2 Current collector and current collector trolley

The parts listed below are subject to a greater or lesser amount of wear while a current collector trolley is in operation.

Wear depends on various factors and is not determined by the current collector trolley operating period alone.

Preventive maintenance is therefore required.

Worn current collector trolleys or other components must be replaced immediately.

7.2.1 Sliding contact set

Sliding contact sets DCL - SAW - 4 + 5 / 6 + 7 - **40 A, bronze**	
Designation	**Part no.**
liding contact set 4-pole 40 A (for 4 + 5-pole)	7910298
Sliding contact set 7-pole 40 A (for 6 + 7-pole)	7910299

Sliding contact sets DCL - SAW - 4 + 5 / 6 + 7 - **20 A, graphite**	
Designation	**Part no.**
Sliding contact set 5-pole 20 A (für 4 + 5-pole)	7910300
Sliding contact set 7-pole 20 A (für 6 + 7-pole)	7910301

8 Resistance to acids, chemicals and fuels

8.1 Acids

Medium			Remark
Acid	Conc.		
Chromic acid	40 %	⊕	Avoid direct contact.
Chromic-sulfuric acid	20 %	⊕	
Nitric acid	10 %	+	Increased wear of sliding contacts
Sulfuric acid	10%	+	
Ethanoic acid	5 %	+	
Carbonic acid	10 %	+	
Oleic acid		+	
D-tartaric acid	10 %	+	
Formic acid	20 %	+	Max. temperature + 30°C from +30°C to +60°C increased wear of current collectors
Arsenic acid	20 %	+	
Boric acid	10 %	+	
Hydrofluoric acid		+	
Lactic acid	10 %	+	
Phosphoric acid	50 %	+	
Oxalic acid	10 %	+	
Hydrochloric acid	20 %	⊕	
Citric acid	10 %	+	

8.2 Fuels, oil, grease etc.

Medium			Remark
Petroleum spirit		⊕	Avoid direct contact
Regular petrol		⊕	
Supergrade petrol		⊕	
Kerosine		⊕	
White petroleum spirit		⊕	
Diesel oil		⊕	
Benzole		-	
Oil, grease (free from aromatics)		+	Avoid direct contact
Drilling oil		⊕	
ATE brake oil		⊕	
Foodstuffs		+	
Seawater	distance < 5km	+	Use double current collectors
	distance > 5km	+	

8.3 Chemicals

Medium			Remark
Alkaline solutions	< 1 %	+	
	> 1 %	⊕ / –	Minimum distance 5 m
Ammonia water		-	
Alcohol		+	
Hydrocarbons	alipphatic	-	
	aromatic	-	
Chloric solvents		-	
Ester		-	
Ketone		-	
Trichlorethylene		-	
Alcaline solvents			Cannot be answered in a general way.
Ethyl acetate		⊕	
Butanol		-	
Butyl acetate		-	
Methanol		-	
Tuluol		-	
Xylene		-	
Carbon tetrachloride		⊕	
Acetone		-	
Bleaching lye		⊕	

Applies to all chemicals:

Conductors (Cu) subject to increased oxidation (corrosion)

Resistance information only valid for room temperature (20 °C).

+ resistant

⊕ resitant to a limited extent

- not resistant

Enquiry

Compact Line

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Project no.

Compact-Line	O	SCL - ____ - ____ PE - PVC		
Selected/dimensioned by	O	Customer	O	
Type	____	Number of poles	____	A (rated current)
Length	____	m		
Rated voltage/frequency	____	V	____	Hz
Control voltage	____	V		
Protective earth conductor PE	O	Yes	O	No
Complete SCL track	O	Yes	____	number of SCL tracks
	O	No	O	Spare parts→ see remark
Track layout	O	straight	O	curved according to enclosed drawing
Electrical power feed point	O	Line power feed	____	number of
	O	End power feed	____	number of
Current collector trolley	____	number of	____	mm cable length
	O	Bronze sliding contacts		
	O	Graphite sliding contacts		
	O	Including standard towing arm (not for transfer sections)		
Suspension method	O	C-rail	O	M 8 threaded pin

Accessories	O	Yes, the following:	O	No

Remarks:

Address and reference of the customer

_____

Order

Compact Line

Project no.

Compact-Line	O	SCL - _____ - _____ PE - PVC		
Selected/dimensioned by	O	Customer	O	
Type	_____	Number of poles	_____	A (rated current)
Length	_____	m		
Rated voltage/frequency	_____	V	_____	Hz
Control voltage	_____	V		
Protective earth conductor PE	O	Yes	O	No
Complete SCL track	O	Yes	_____	number of SCL tracks
	O	No	O	Spare parts→ see remark
Track layout	O	straight	O	curved according to enclosed drawing
Electrical power feed point	O	Centre power feed section	_____	number of
	O	End power feed	_____	number of
Current collector trolley	_____	number of	_____	mm cable length
	O	Bronze sliding contacts		
	O	Graphite sliding contacts		
	O	Including standard towing arm (not for transfer sections)		
Suspension method	O	C-rail	O	M 8 threaded pin

Accessories	O	Yes, the following:	O	No

Remarks:

Address and reference of the customer

_____