

LIFT

# CONTROL CABLES

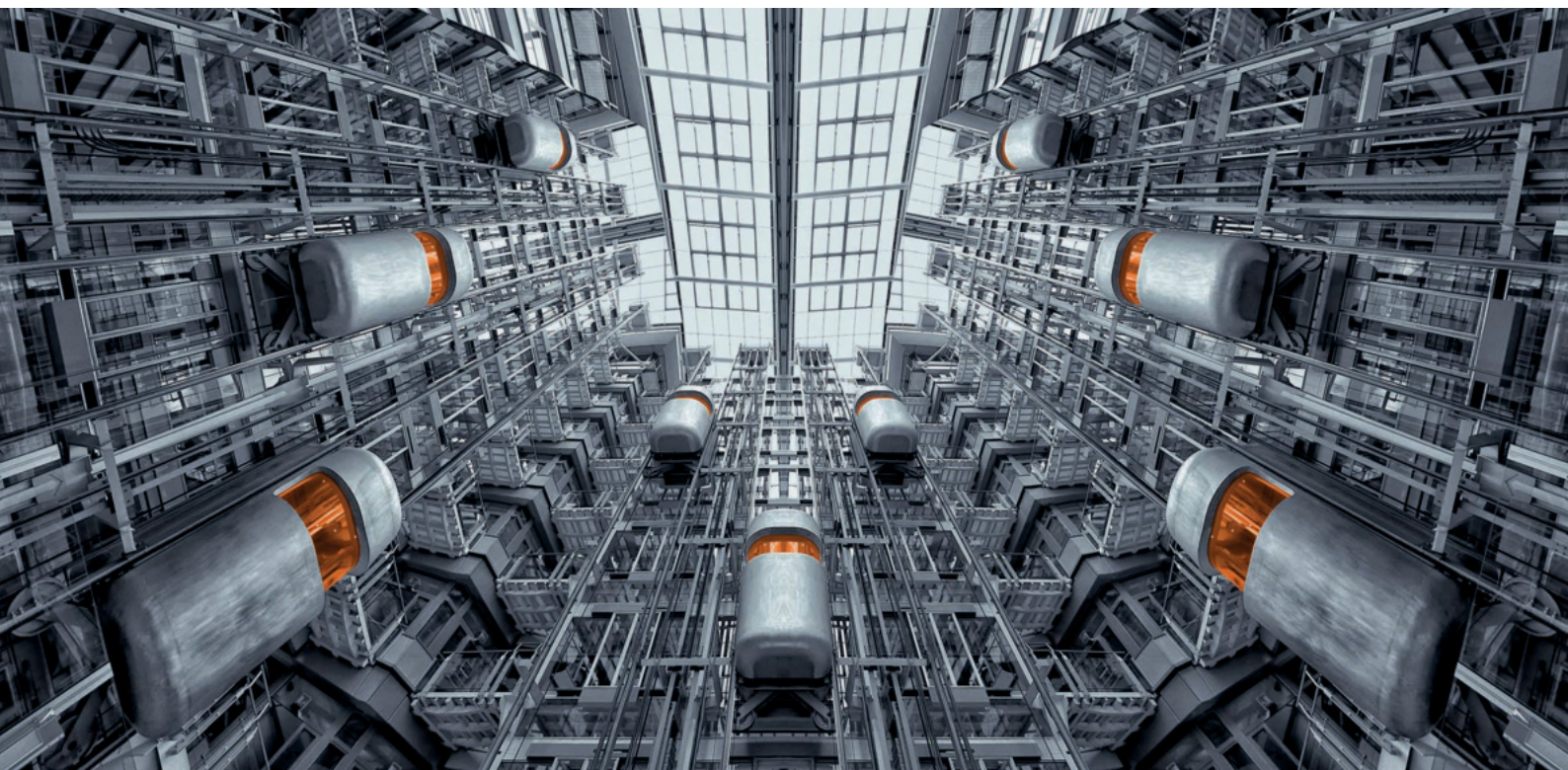


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## Family business in the third generation

**75** years of experience in cable and wire manufacturing as well as in temperature measurement technology turned a one-man business into a company with more than 550 employees. We prove our strength every year with more than 1500 special products according to customers' requirements. Each product is a new challenge for our creative technical team. We at **SAB** see ourselves as a manufacturer and a service provider – in the sense of true partnership and the greatest possible customer orientation.

Today, the quality of our products is known and appreciated in more than 100 countries around the world. In all product ranges, we are certified according to DIN EN ISO 9001. Furthermore, we have implemented an environmental management system for our company according to DIN EN ISO 14001, an occupational health and safety management system according to NLF/ILO-OSH and DIN ISO 45001, and an energy management system according to DIN EN ISO 50001.

And also for the future, our slogan is: **"WE GO FORWARD!"**

FOUNDED:	1947 by Peter Bröckskes sen. an independent, medium-sized company.
CEO:	Peter Bröckskes and Sabine Bröckskes-Wetten
PLANT/LOCATION:	In Viersen (Lower Rhine) 110.000 m <sup>2</sup> company site.  Own manufacturing from copper conductor to outer sheath.  VDE proved burnchamber and laboratory within the company.
EMPLOYEES/WORKERS:	approx. 430 at the plant in Viersen, 550 worldwide
YEARLY SALES:	over 134 Mio. € worldwide
PRODUCTS:	Special Cables  Measurement Technology  Cable Harnessing
CERTIFICATES AND APPROVALS:	Quality management system acc. to DIN EN ISO 9001 for every manufacturing field  Environmental management system acc. to DIN EN ISO 14001  Occupational health and safety management acc. to NLF/ILO-OSH and DIN ISO 45001  Energy management system acc. to DIN EN ISO 50001



# Lift cables

## SAB Lift

Lift control cable with sisal cord as suspension unit

elevated economic efficiency



Marking for SAB Lift 37902410:  
SAB BRÜCKSKES · D-VIERSEN · SAB Lift 24 x 1,0 mm² CE

### Construction:

<b>Conductor:</b>	bare copper strands acc. to IEC 60228, VDE 0295, class 6
<b>Insulation:</b>	special PVC
<b>Colour code:</b>	black cores with consecutive numbers acc. to EN 50334 + VDE 0293-334, green-yellow earth wire from 3 cores
<b>Strain relief:</b>	sisal cord
<b>Stranding:</b>	sisal cord as core, optimized twisting of the conductors in layers
<b>Wrapping:</b>	non-woven tape on each layer with overlap wrapping
<b>Torsion protecting:</b>	special braid
<b>Sheath material:</b>	special PVC
<b>Sheath colour:</b>	black (RAL 9005)

### Technical data:

<b>Nominal voltage:</b>	U <sub>0</sub> /U 300/500 V
<b>Testing voltage:</b>	core/core 2000 V
<b>Min. bending radius:</b>	15 x d
<b>Temperature range</b>	
<i>fixed laying:</i>	-30/+70 °C
<i>flexible application:</i>	-15/+70 °C
<b>Fire performance:</b>	flame retardant and self-extinguishing acc. to IEC 60332-1-2 + VDE 0482-332-1-2
<b>Suspended height:</b>	up to 60 m
<b>Absence of harmful substances:</b>	acc. to RoHS directive of the European Union

### Outstanding features:



- long service life
- elevated economic efficiency
- flame retardant and self-extinguishing

item no.	no. of cores x cross section	medium outer-ø	copper figure	cable weight	ohmic resistance at 20 °C max. Ω/km
	n x mm <sup>2</sup>	ø mm	kg/km	≈ kg/km	
37900510	5 x 1,00	11,1	48,0	150	19,5
37900710	7 x 1,00	11,6	67,2	179	19,5
37900910	9 x 1,00	13,0	86,4	226	19,5
37901210	12 x 1,00	15,4	115,2	308	19,5
37901810	18 x 1,00	20,7	172,8	480	19,5
37902410	24 x 1,00	20,7	230,4	549	19,5
37903010	30 x 1,00	21,9	288,0	653	19,5
37901215	12 x 1,50	18,2	172,8	419	19,5
37905215	52 x 1,50	34,3	748,8	1712	19,5
37901225	12 x 2,50	23,4	288,0	688	19,5

Other dimensions and colours are possible on request.



### Possible on request:

- with total copper braiding
- with different conductor and sheath colours

# Lift cables

## SAB Lift ST

Lift control cable with steel center as suspension unit

highest hanging lengths



Marking for SAB Lift ST 37912410:

SAB BRÜCKSKES · D-VIERSEN · SAB Lift ST 24 x 1,0 mm² CE

### Construction:

<b>Conductor:</b>	bare copper strands acc. to IEC 60228, VDE 0295, class 6
<b>Insulation:</b>	special PVC
<b>Colour code:</b>	black cores with consecutive numbers acc. to EN 50334 + VDE 0293-334, green-yellow earth wire from 3 cores
<b>Strain relief:</b>	steel rope in the center
<b>Stranding:</b>	steel rope as core, optimized twisting of conductors in layers
<b>Wrapping:</b>	non-woven tape on each layer with overlap wrapping
<b>Torsion protecting:</b>	special braid
<b>Sheath material:</b>	special PVC
<b>Sheath colour:</b>	black (RAL 9005)

### Technical data:

<b>Nominal voltage:</b>	U <sub>0</sub> /U 300/500 V
<b>Testing voltage:</b>	core/core 2000 V
<b>Min. bending radius:</b>	15 x d
<b>Temperature range</b>	
<i>fixed laying:</i>	-30/+70 °C
<i>flexible application:</i>	-15/+70 °C
<b>Fire performance:</b>	flame retardant and self-extinguishing acc. to IEC 60332-1-2 + VDE 0482-332-1-2
<b>Suspended height:</b>	up to 200 m
<b>Absence of harmful substances:</b>	acc. to RoHS directive of the European Union

### Outstanding features:



- highest hanging lengths
- long service life
- flame retardant and self-extinguishing

item no.	no. of cores x cross section	medium outer-ø	copper figure	cable weight	ohmic resistance at 20 °C max. Ω/km
	n x mm <sup>2</sup>	ø mm	kg/km	≈ kg/km	
37912407	24 x 0,75	17,1	172,8	417	19,5
37910510	5 x 1,00	9,3	48,0	133	19,5
37910710	7 x 1,00	10,4	67,2	174	19,5
37910910	9 x 1,00	11,9	86,4	266	19,5
37911210	12 x 1,00	14,8	115,2	375	19,5
37911810	18 x 1,00	17,4	172,8	460	19,5
37912410	24 x 1,00	17,6	230,4	536	19,5
37913010	30 x 1,00	20,6	288,0	721	19,5

Other dimensions and colours are possible on request.



### Possible on request:

- with total copper braiding
- with different conductor and sheath colours

# Lift cables

## SABIX® Lift

Lift control cable with sisal cord as suspension unit



Marking for SABIX® Lift 53902410:

SAB BRÜCKSKES · D-VIERSEN · SABIX® Lift 24 x 1,0 mm² CE

**Application:** Our halogen-free lift cables are used whenever there are highest safety requirements, especially in public buildings and institutions as for example department stores, hospitals, railway and airport institutions, etc.

### Construction:

<b>Conductor:</b>	bare copper strands acc. to IEC 60228, VDE 0295, class 6
<b>Insulation:</b>	special SABIX®
<b>Colour code:</b>	black cores with consecutive numbers acc. to EN 50334 + VDE 0293-334 and a green-yellow earth wire
<b>Strain relief:</b>	sisal cord
<b>Stranding:</b>	sisal cord as core, optimized twisting of the conductors in layers
<b>Wrapping:</b>	non-woven tape on each layer with overlap wrapping
<b>Torsion protecting:</b>	special braid
<b>Sheath material:</b>	thermoplastic special elastomer
<b>Sheath colour:</b>	black (RAL 9005)

### Technical data:

<b>Nominal voltage:</b>	U <sub>0</sub> /U 300/500 V
<b>Testing voltage:</b>	core/core 2000 V
<b>Min. bending radius:</b>	15 x d
<b>Temperature range</b>	
<i>fixed laying:</i>	-40/+90 °C
<i>flexible application:</i>	-30/+90 °C
<b>Halogen-free:</b>	acc. to IEC 60754-1 + VDE 0482-754-1
<b>Fire performance:</b>	no flame propagation acc. to IEC 60332-3-24 + VDE 0482-332-3-24 resp. IEC 60332-3-25 + VDE 0482-332-3-25 cat. C resp. D
<b>Suspended height:</b>	up to 60 m
<b>Absence of harmful substances:</b>	acc. to RoHS directive of the European Union

### Outstanding features:



- halogen-free
- long service life
- elevated economic efficiency
- flame retardant and self-extinguishing

item no.	no. of cores x cross section n x mm <sup>2</sup>	medium outer-ø ø mm	copper figure kg/km	cable weight ≈ kg/km	ohmic resistance at 20 °C max. Ω/km
53900710	5 x 1,00	10,7	48,0	132	19,5
53900710	7 x 1,00	11,2	67,2	160	19,5
53900910	9 x 1,00	12,4	86,4	199	19,5
53901210	12 x 1,00	14,4	115,2	261	19,5
53901810	18 x 1,00	19,9	172,8	421	19,5
53902410	24 x 1,00	19,9	230,4	491	19,5
53903010	30 x 1,00	20,9	288,0	581	19,5

Other dimensions and colours are possible on request.



### Possible on request:

- with total copper braiding
- with different conductor and sheath colours

# Lift cables

## SABIX® Lift ST

Lift control cable with steel center as suspension unit

highest hanging lengths

halogen-free



SABIX® Lift ST 24 x 1,0 mm<sup>2</sup> CE



Marking for SABIX® Lift ST 53912410:

SAB BRÜCKSKES · D-VIERSEN · SABIX® Lift ST 24 x 1,0 mm<sup>2</sup> CE

**Application:** Our halogen-free lift cables are used whenever there are highest safety requirements, especially in public buildings and institutions as for example department stores, hospitals, railway and airport institutions, etc.

### Construction:

<b>Conductor:</b>	bare copper strands acc. to IEC 60228, VDE 0295, class 6
<b>Insulation:</b>	special SABIX®
<b>Colour code:</b>	black cores with consecutive numbers acc. to EN 50334 + VDE 0293-334 and a green-yellow earth wire
<b>Strain relief:</b>	steel rope in the center
<b>Stranding:</b>	steel rope as core, optimized twisting of conductors in layers
<b>Wrapping:</b>	non-woven tape on each layer with overlap wrapping
<b>Torsion protecting:</b>	special braid
<b>Sheath material:</b>	thermoplastic special elastomer
<b>Sheath colour:</b>	black (RAL 9005)

### Technical data:

<b>Nominal voltage:</b>	U <sub>0</sub> /U 300/500 V
<b>Testing voltage:</b>	core/core 2000 V
<b>Min. bending radius:</b>	15 x d
<b>Temperature range</b>	
<i>fixed laying:</i>	-40/+90 °C
<i>flexible application:</i>	-30/+90 °C
<b>Halogen-free:</b>	acc. to IEC 60754-1 + VDE 0482-754-1
<b>Fire performance:</b>	no flame propagation acc. to IEC 60332-3-24 + VDE 0482-332-3-24 resp. IEC 60332-3-25 + VDE 0482-332-3-25 cat. C resp. D
<b>Suspended height:</b>	up to 200 m
<b>Absence of harmful substances:</b>	acc. to RoHS directive of the European Union

### Outstanding features:



- halogen-free
- highest hanging lengths
- long service life
- elevated economic efficiency
- flame retardant and self-extinguishing

item no.	no. of cores x cross section n x mm <sup>2</sup>	medium outer-ø ø mm	copper figure kg/km	cable weight ≈ kg/km	ohmic resistance at 20 °C max. Ω/km
53912410	5 x 1,00	8,7	48,0	115	19,5
53910710	7 x 1,00	9,8	67,2	153	19,5
53910910	9 x 1,00	11,5	86,4	246	19,5
53911210	12 x 1,00	14,0	115,2	338	19,5
53911810	18 x 1,00	16,6	172,8	415	19,5
53912410	24 x 1,00	16,8	230,4	494	19,5
53913010	30 x 1,00	19,8	288,0	673	19,5

Other dimensions and colours are possible on request.



### Possible on request:

- with total copper braiding
- with different conductor and sheath colours

# PVC Flat cables

## H05VVH6-F



<VDE> <HAR> H05VVH6-F 24G0,75 mm<sup>2</sup> CE



Marking for PVC Flat cable 02142407:

SAB BRÖCKSKES · D-VIERSEN · <VDE> <HAR> H05VVH6-F 24G0,75 mm<sup>2</sup> CE

**Application:** for example in elevators up to 35 m freely suspended or in fitted vehicles for cranes and hoisting systems with one level bending.

### Construction:

<b>Conductor:</b>	bare copper strands acc. to IEC 60228, VDE 0295, class 5
<b>Insulation:</b>	PVC
<b>Colour code:</b>	black with white numbers and green-yellow earth wire
<b>Stranding:</b>	cores parallel side by side in groups
<b>Sheath material:</b>	PVC
<b>Sheath colour:</b>	black (RAL 9005)

### Technical data:

<b>Nominal voltage:</b>	U <sub>0</sub> /U 300/500 V
<b>Min. bending radius:</b>	10 x high
<b>Temperature range</b>	
<i>fixed laying:</i>	-40/+70 °C
<i>flexible application:</i>	0/+70 °C
<b>Fire performance:</b>	flame retardant and self-extinguishing acc. to IEC 60332-1-2 + VDE 0482-332-1-2
<b>Oil resistance:</b>	acc. to our internal standard
<b>Absence of harmful substances:</b>	acc. to RoHS directive of the European Union

### Outstanding features:



- smaller bending radius  
in contrast to round cables

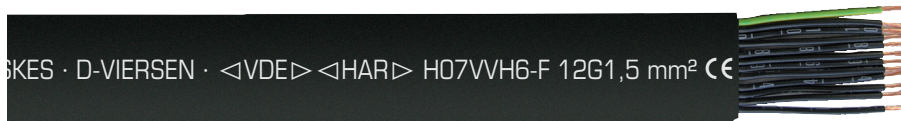
item no.	no. of cores x cross section n x mm <sup>2</sup>	largest single wire ø mm	dimension width x height approx. mm	copper figure kg/km	cable weight ≈ kg/km
02140607	6 x 0,75	0,21	17,8 x 4,2	43,2	137
02140907	9 x 0,75	0,21	25,8 x 4,2	64,8	200
02141207	12 x 0,75	0,21	39,1 x 4,2	86,4	260
02141607	16 x 0,75	0,21	43,5 x 4,2	115,2	342
02141807	18 x 0,75	0,21	48,4 x 4,2	129,6	382
02142007	20 x 0,75	0,21	53,9 x 4,2	144,0	425
02142407	24 x 0,75	0,21	64,3 x 4,2	172,8	509
02140410	4 x 1,00	0,21	12,7 x 4,3	38,4	105
02140510	5 x 1,00	0,21	15,3 x 4,3	48,0	129
02140610	6 x 1,00	0,21	18,4 x 4,3	57,6	154
02140910	9 x 1,00	0,21	26,7 x 4,3	86,4	225
02141210	12 x 1,00	0,21	34,3 x 4,3	115,2	292
02141610	16 x 1,00	0,21	45,1 x 4,3	153,6	386
02141810	18 x 1,00	0,21	50,2 x 4,3	172,8	430
02142010	20 x 1,00	0,21	55,9 x 4,3	192,0	479
02142410	24 x 1,00	0,21	66,7 x 4,3	230,4	572

Other dimensions and colours are possible on request.



# PVC Flat cables

## H07VVH6-F



Marking for PVC Flat cable 02491215:

SAB BRÖCKSKES · D-VIERSEN · <VDE> <HAR> H07VVH6-F 12G1,5 mm² CE

**Application:** for example in elevators up to 35 m freely suspended or in fitted vehicles for cranes and hoisting systems with one level bending.

### Construction:

<b>Conductor:</b>	bare copper strands acc. to IEC 60228, VDE 0295, class 5
<b>Insulation:</b>	PVC
<b>Colour code:</b>	coloured acc. to HD 308 (VDE 0293-308), from 6 cores black cores with consecutive numbers acc. to EN 50334 + VDE 0293-334, from 3 cores a green-yellow earth wire
<b>Stranding:</b>	cores parallel side by side in groups
<b>Sheath material:</b>	PVC
<b>Sheath colour:</b>	black (RAL 9005)

### Technical data:

<b>Nominal voltage:</b>	Uo/U 450/750 V
<b>Min. bending radius:</b>	10 x high
<b>Temperature range</b>	
<i>fixed laying:</i>	-40/+70 °C
<i>flexible application:</i>	0/+70 °C
<b>Fire performance:</b>	flame retardant and self-extinguishing acc. to IEC 60332-1-2 + VDE 0482-332-1-2
<b>Oil resistance:</b>	acc. to our internal standard
<b>Absence of harmful substances:</b>	acc. to RoHS directive of the European Union

### Outstanding features:



- smaller bending radius  
in contrast to round cables

item no.	no. of cores x cross section n x mm <sup>2</sup>	largest single wire ø mm	dimension width x height approx. mm	copper figure kg/km	cable weight ≈ kg/km
02490415	4 x 1,50	0,26	15,3 x 5,2	57,6	145
02490715	7 x 1,50	0,26	25,6 x 5,2	100,8	250
02490815	8 x 1,50	0,26	28,6 x 5,2	115,2	283
02491215	12 x 1,50	0,26	41,9 x 5,2	172,8	421
02490425	4 x 2,50	0,26	18,3 x 5,8	96,0	206
02491225	12 x 2,50	0,26	50,7 x 5,8	288,0	604
02491240	12 x 4,00	0,31	57,4 x 6,8	460,8	858
02490460	4 x 6,00	0,31	22,7 x 7,3	230,4	377
02490560	5 x 6,00	0,31	27,5 x 7,3	288,0	439
02490570	5 x 10,0	0,41	35,7 x 9,3	480,0	807
02490490	4 x 25,0	0,41	42,5 x 12,9	960,0	1407

Other dimensions and colours are possible on request.

## Installation instructions of lift control cables

### ■ Installation instructions of lift control cables **SAB Lift, SAB Lift ST, SABIX® Lift and SABIX® Lift ST**

#### ■ Application and use in buildings

1. In case that the cables are placed in shafts, two different methods are recommended:
  - Placement of cables from machine room  
The placement of the cables from the machine room has to be executed in a way that the cable is led into the shaft in winding direction. In order to avoid upsetting deformation, it is advisable that a second person is in the pit and enables a perfect installation with the help of a cord.
  - Placement of the cables from the shank pit or the first stop  
Herewith, the winding direction for unwinding has to be observed.  
Note: With both methods the pulling-in of the cables has to be done with a minimum of bend. In order to avoid torsion or buckling, the placement of the cable has to be done carefully.
2. In order to guarantee a torsion-free installation, the cable has to be suspended freely for 12 h in the shaft before being finally fixed. The lower cable end is not allowed to lie on or to be in contact with the pit sole. If the cable is longer, the lower cable end (min. 0.3 m above the sole) must be looped or put up with a weight. Any material can be used as weight but it should not come to more than 15% of the cable weight. After having been suspended the cables shall be marked parallel towards the shaft wall and on the same side. Thus a twist-free fixing of the cable is afterwards possible.

#### ■ Hanging up of the cable

1. If the cables are pulled into the shaft, they have to be unwound tangentially from the drum. An axial unwinding from the drum causes torsions of the cable and finally can lead to operational disturbances.
2. The free space between lift cabin and shaft bottom shall be big enough and has to be fully used for the loop height of the cable. The cables have to be suspended at the lift cabin in the course of the natural bow.
3. A natural hanging diameter of the loop has to be guaranteed.

#### ■ Fixing of the cables

1. At any rate large-surface clamps have to be used for the fixing of the cable. The sheath shall not be squeezed, the clamp must be seated firmly on a large surface. There should be at least one suspension at the shaft head and at the lift cabin. Additionally the carrying element has to be supported separately (at both cable ends). In case that the suspended cable length is more than 40 m, an additional suspension should be in the middle of the shaft.
2. The fixing point at the shaft wall has to be at least 2 m above the middle of the travel. At the same time the fixing points of the cables at the lift or at the shaft wall have to be arranged rectangular towards the runoff plane of the cable and with the same distance parallel to the rail axis.
3. With unsteady running behaviour that means the cable moves out of the fall line during operation, the control cable has to be slightly twisted at one of the fixing points until a perfect run of the cable is given.  
Note: Additionally the run of the cable has to be controlled again after the initial operation of the lift.
4. If the lift installation requires the installation of several control cables, it is recommended due to operational reasons that the individual cables have to be hanged up in a way that the different loops have a level difference of approx. 15 cm (hang up step-by-step).
5. The cables are not allowed to be tied up over their suspended length, as otherwise their free run is impeded.

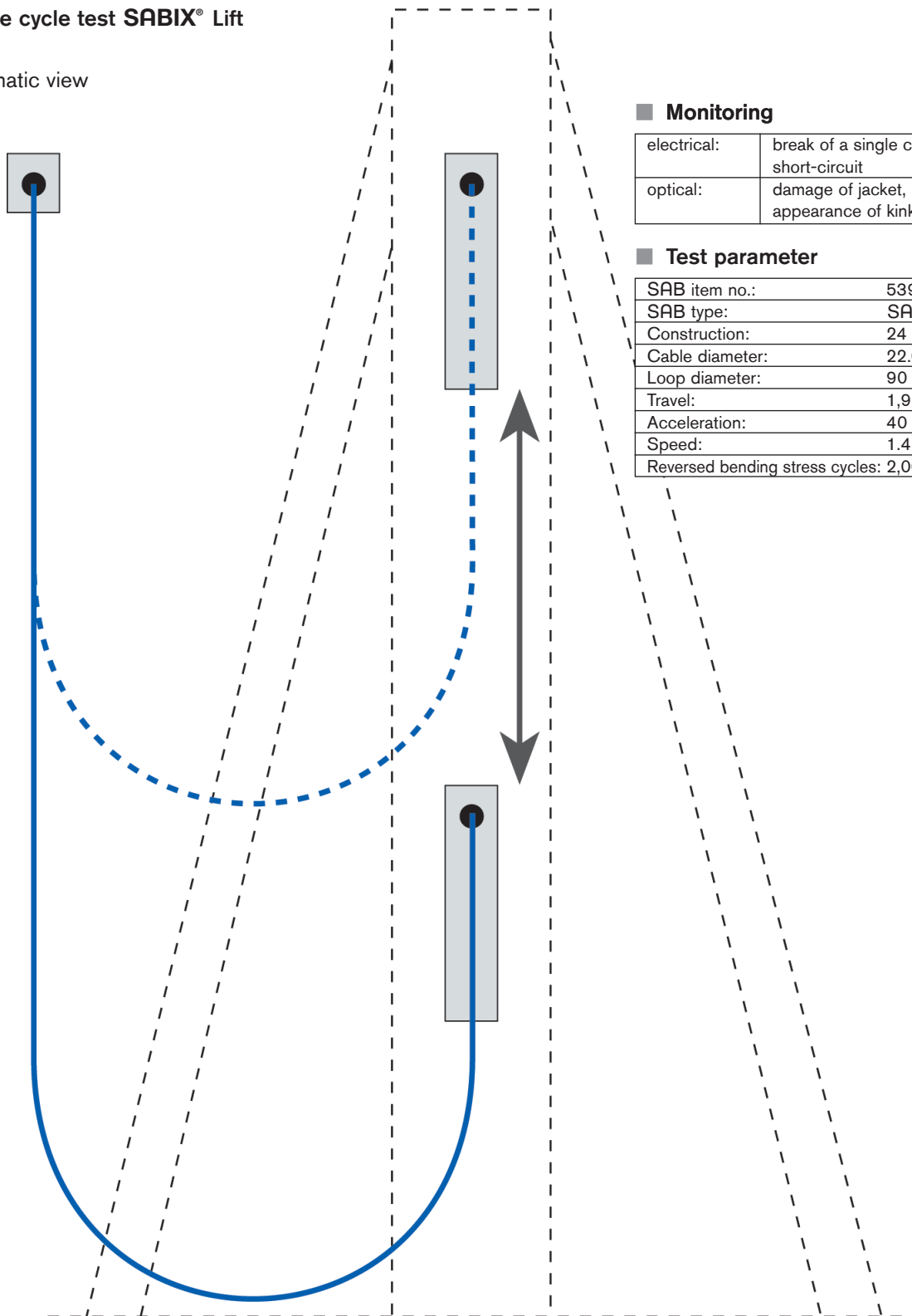
#### ■ General notes

1. The cables are only allowed to be applied with temperature ranges mentioned in their specifications.
2. The inner bending radius is not allowed to be lower than the cable diameter mentioned in the specification. Furthermore, the given bending radius of the cable (equally mentioned in the cable specification) has to be kept.
3. The max. hang up length is dependant on the corresponding carrying element in the cable (mentioned in the cable specification) and is not allowed to be exceeded.
4. In order to reach a perfect and long service life of the lift control cables, they have to be treated and installed with the utmost care.

## Life cycle test for lift control cables

### ■ Life cycle test SABIX® Lift

schematic view

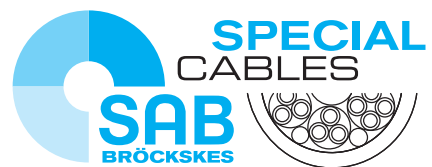


### ■ Monitoring

electrical:	break of a single conductor short-circuit
optical:	damage of jacket, appearance of kinks

### ■ Test parameter

SAB item no.:	5390-2410
SAB type:	SABIX® Lift
Construction:	24 x 1.0 mm <sup>2</sup>
Cable diameter:	22.0 mm
Loop diameter:	90 cm
Travel:	1,9 m
Acceleration:	40 m/s <sup>2</sup>
Speed:	1.4 m/s
Reversed bending stress cycles:	2,000,000



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