STAGEMAKER

TECHNICAL DATA

CHAIN HOIST STAGEMAKER

DOC567661A / en-US / A / 16 Nov 2020

VERLINDE™
LIFTING EQUIPMENT

Original Instructions

TABLE OF CONTENTS

1 UPDATE HISTORY

Section	Changes	Date	Handled by
All	New Technidal data document for Stagemaker SL05-SL10 created	10/2020	ISOTAPA

2 INTRODUCTION

2.1 About these instructions

2.1.1 How to use these instructions

This manual presents the product range, features, and functional description of an electrical chain hoist, the Stagemaker version.

This manual provides the following information about the product:

- Range of use of the different product types, loads, and lifting speeds
- Standards considered in the design of the product
- List of available product features (standard and optional)
- Technical details.

2.2 About this product

The Stagemaker show business chain hoists are electrical chain hoists that are designed to handle especially stage and theatrical equipment.

The available features and options and the compact design of the product make the Stagemaker chain hoists well-adapted to the use in different stage productions. The product enables the safe and accurate positioning of different stage equipment, such as speakers, lighting systems, stage sets, and sceneries.

The Stagemaker chain hoists meet the requirements of the Machinery Directive EC and CSA (where applicable) standards. The product is designed for lifting and transporting of materials only.

Mounting positions of the Stagemaker chain hoist

The Stagemaker chain hoists can be mounted in two different positions according to the configuration of the chain hoist - in the so called 'normal position' (body of the chain hoist up) or 'inverted position' (body of the chain hoist down).

In the normal position, the chain hoist is mounted with the load chain down and the body of the chain hoist up. The load block attaches to the load and moves up and down. The body of the chain hoist remains stationary.

In the inverted position, the chain hoist is mounted with the load chain up and the body of the chain hoist down. The body of the chain hoist attaches to the load and moves up and down with the load. When the chain hoist is used in the inverted position, it is easier to install and set up because all the cabling is at the same level, and the chain hoist is at truss level.

2.2.1 Design principles

Certifications, standards, and other technical documents

The product fulfills the requirements of the following standards: Machine directive EC, ASME HST-1, ASME B30.16, and EN14492/2.

This product

- is in conformity with the relevant provisions of the Machinery Directive 2006/42/EC and EMC Directive 2004/108/EC
- is applicable with the requirements of the
  - UL 508 – Industrial Control Equipment
  - UL1004-1 – Rotating Electrical Machines – General Requirements
- has ASME duty rating up to H4 (ISO up to M5), depending on chain hoist type and lifting speed [1), 2)]
  For more information about ASME Hoist Duty Service Classification, see ASME publication catalog ASME HST-1M and ASME B30.16 (latest edition) for electric chain hoists.
- is external sound level tested
- is RoHS compliant
- is built with mechanics that are compatible with D8, D8+ requirements
- has EAC approval.

1) For the 60 Hz motors.

2) Not for SR25.

2.2.2 Sound pressure level

The maximum noise level of the chain hoist does not exceed 65 dB(A) for SR01 and SL05-SL10, and 70 dB(A) for SR25.

3 PRODUCT DESCRIPTION

3.1 Product code example for chain hoist

SL	05	A	08	01	050	M5	U	(empty)	405	E	A	080
	(GE09)		(SPD03)	(DES27)	(LOA01)	(DIM01)	(HS31)		(ELE01)	(EL04)	(ELE02)	(DIM02)
1, 2	3, 4	5	6, 7	8, 9	10...12	13, 14	15	16, 17	18...20	21	22	23...25

Pos.	Code	Feature code	Feature	Available properties			
1, 2	**SL**		Short product name	Stagemaker			
3, 4	**05**	(GE09)	Frame size			GE09 value	
				01 SR01		01	
				05 SL05		05	
				10 SL10		10	
				25 SR25		25	
5	**A**		Configuration type	A Configuration A			
				B Configuration B			
				C Configuration C			
				S Configuration S			
6, 7	**08**	(SPD03)	Lifting speed (high)	Speed 50Hz	SPD03 value	Speed 60 Hz	SPD03 value
				04 4 m/min	4	04 16 ft/min	4
				08 8 m/min	8	08 32 ft/min	8
				16 16 m/min	16	16 64 ft/min	16
8, 9	**01**	(DES27)	Reeving system			DES27 value	
				01 1 x 1 falls, normal reeving		01	
				02 1 x 2 falls, normal reeving		02	
10...12	**050**	(LOA01)	Load		LOA01 value		LOA01 value
				025 250 kg	250	025 0.25 ston	250
				050 500 kg	500	050 0.5 ston	500
				100 1000 kg	1000	100 1 ston	1
				150 1500 kg	1500	150 1.5 ston	1.5
				200 2000 kg	2000	200 2 ston	2.0
				250 2500 kg	2500	250 2.5 ston	2.5
13, 14	**M5**	(DIM01)	Hoist duty group			DIM01 value	
				M3 ISO M3		M3	
				M4 ISO M4		M4	
				M5 ISO M5		M5	
				M6 ISO M6		M6	
15	**U**	(HS31)	Hoist position			HS31 value	
				U Body up		INVERTED	
				D Body down		NORMAL	
16, 17				Empty space			
18...20	**405**	(ELE01)	Main voltage (voltage 1)	Main voltage 50 Hz	ELE01 value	Main voltage 60 Hz	ELE01 value
				235 230 V	230	116 115 V	115
				405 400 V	400	206 208 V	208
						236 230 V	230
						466 460 V	460
21	**E**	(EL04)	Electric norm			EL04 value	
				E IEC		IEC	
				C CSA		CSA	
22	**A**	(ELE02)	Control voltage (voltage 2) (ELE02)			ELE02 value	
				A 48 V AC		48	
				B 115 V AC		115	
				C 230 V AC		230	
				D ACF			
23...25	**080**	(DIM02)	Height of lift		DIM02 value		DIM02 value
				060 6 m	6	030 30 m	30
				080 8 m	8	035 35 m	35
				016 16 m	16	050 50 m	50
				020 20 m	20		

3.2 Functional description of the chain hoist

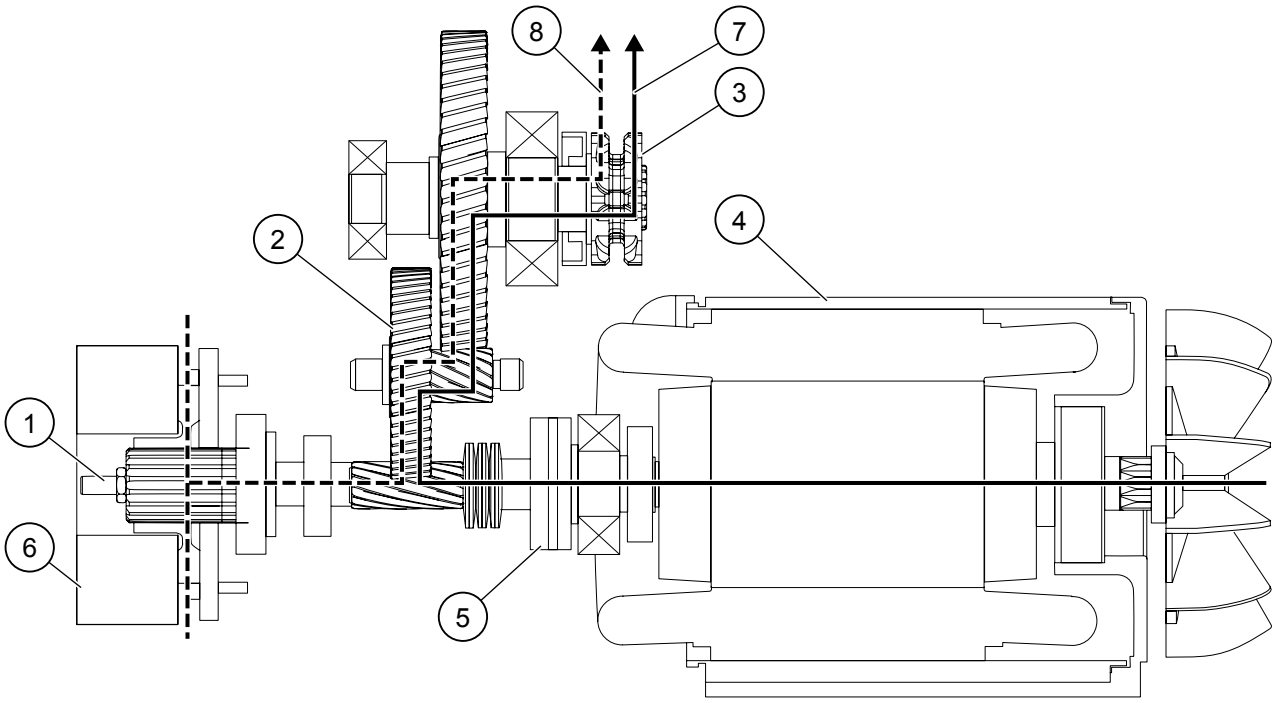


Figure 1. Kinematic chain of the electrical chain hoist

1. Adjustment screw
2. Hoisting gear
3. Chain sprocket
4. Hoisting motor
5. Slipping clutch
6. Hoisting brake
7. Motor torque
8. Brake torque

3.3 Main parts of the electrical chain hoist

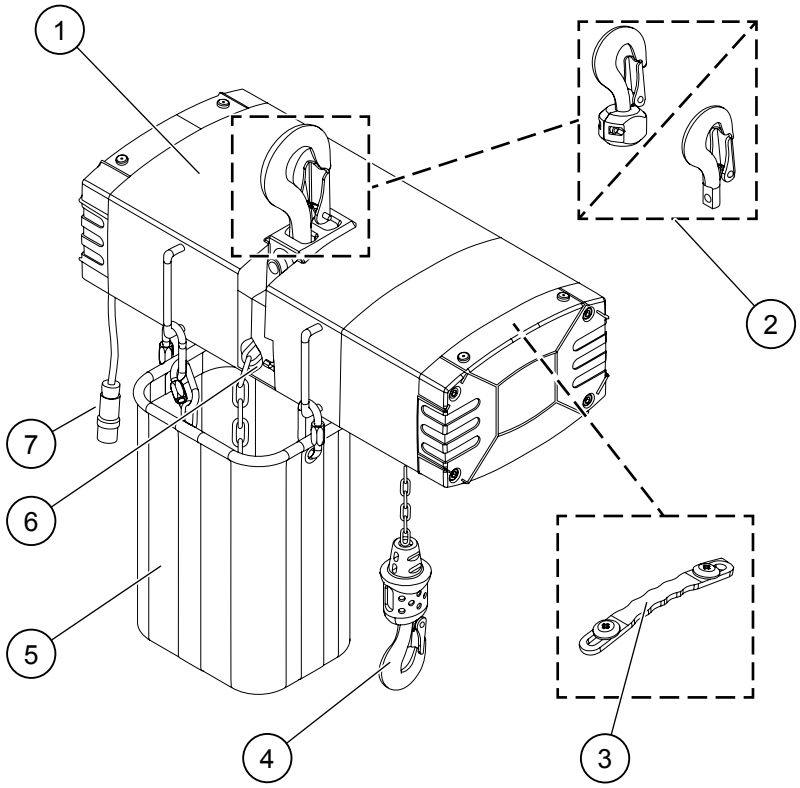


Figure 2. Main components of an SR01 chain hoist

1. Hoisting machinery
2. Suspension hook (rotating or fixed suspension hook)
3. Handles (optional)
4. Hook
5. Chain bag
6. Chain guide
7. Control cable and plug

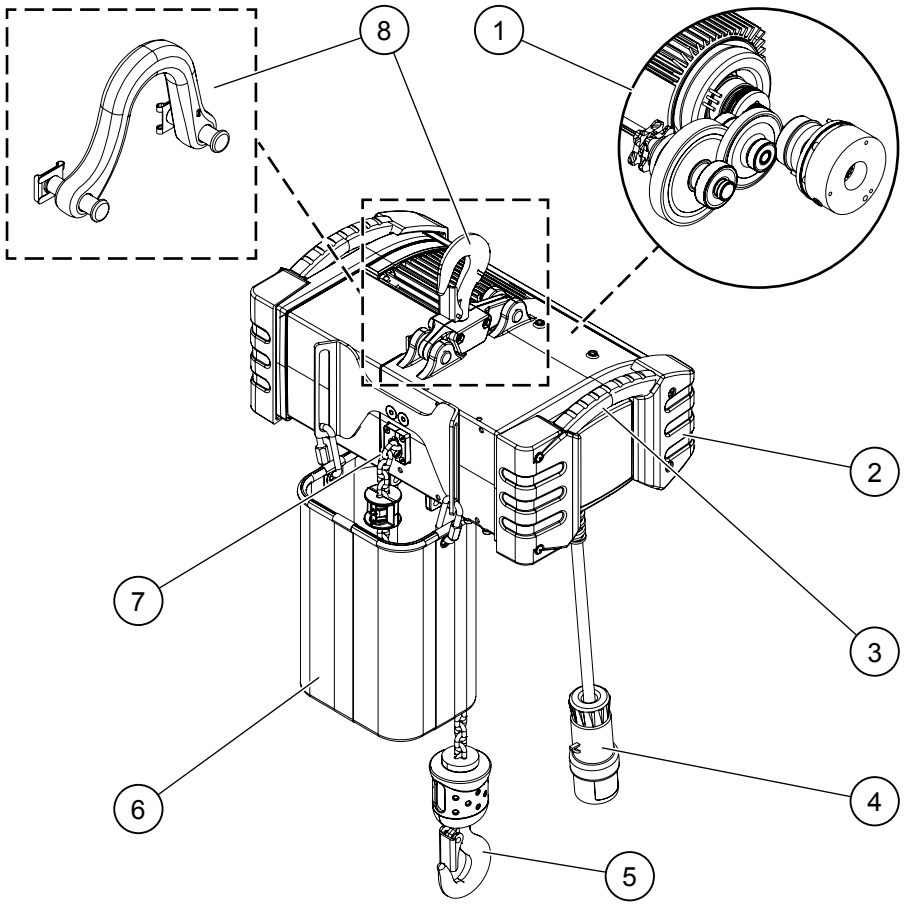


Figure 3. Main components of an SL05-SL10 chain hoist

1. Hoisting machinery
2. Buffer
3. Handle
4. Control cable and plug
5. Hook
6. Chain bag
7. Chain guide
8. Suspension (rotating suspension hook or bracket suspension)

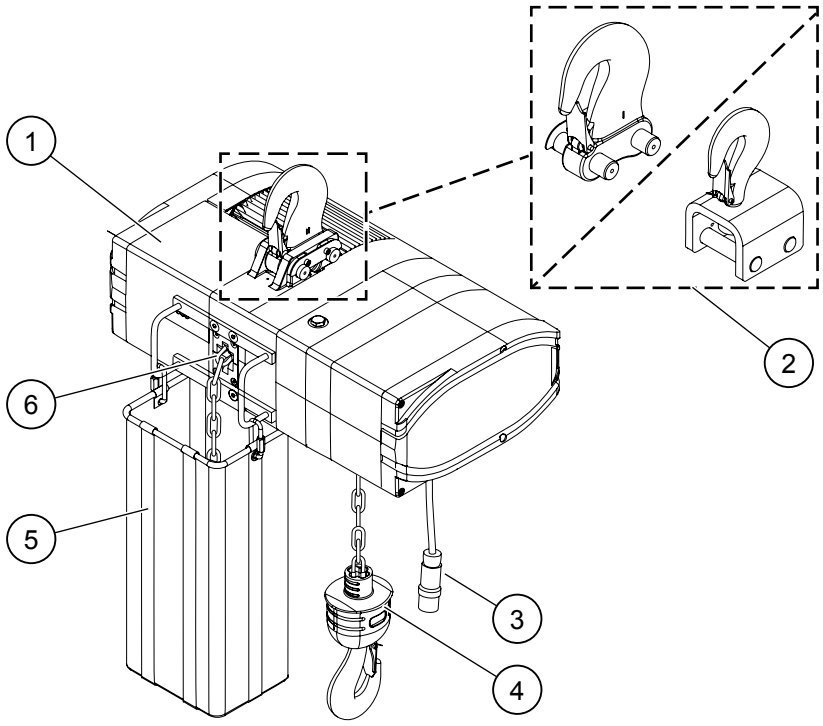


Figure 4. Main components of an SR25 chain hoist

1. Hoisting machinery
2. Suspension hook (rotating or fixed suspension hook)
3. Control cable and plug
4. Hook
5. Chain bag
6. Chain guide

3.4 Load range and duty classes

Hoist classifications

The mechanism group – M4, M5, M6 or M7 – of an electric chain hoist depends on the operating time per working day and on the class of load spectrum.

The hoist operating time (Ot) can be calculated by using the following formula:

$$O_t = \frac{2 \times HOL(m) \times \text{No. of cycles} \left(\frac{1}{h}\right) \times \text{working time} \left(\frac{h}{day}\right)}{60 \left(\frac{min}{h}\right) \times \text{lifting speed} \left(\frac{m}{min}\right) 60}$$

Figure 5. Hoist operating time (Ot) calculation

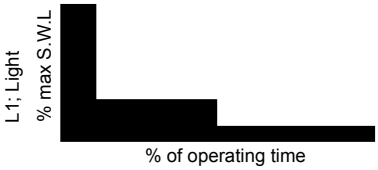
The actual load spectrum factor can be calculated using the following schema:

Load %	Lifting time %		Factor k^3		Load spectrum factor
100%		*	1	=	
	+				
80%		*	0.51	=	

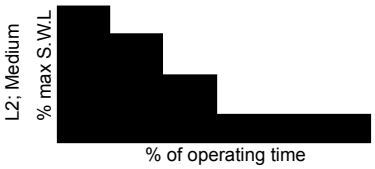
	+				
60%		*	0.22	=	
	+				
40%		*	0.06	=	
	+				
20%		*	0.01	=	
	+				
0 %		*	0	=	
	=				
Sum:	100%			Sum :	
				Divide by 100:	/100 =
				Load spectrum factor, k_m:	

Class of load spectrum	Load spectrum k_m
L1	$k_m \leq 0.125$
L2	$0.125 < k_m \leq 0.250$
L3	$0.250 < k_m \leq 0.500$
L4	$0.500 < k_m \leq 1$

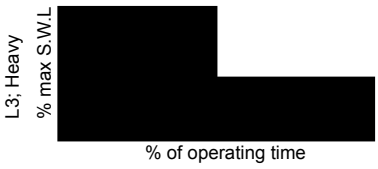
Load spectrum classes



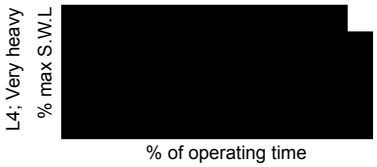
L1 Light
Mainly operated at very low loads and in exceptional cases at maximum loads.



L2 Medium
Operated continually at low loads and frequently at maximum loads.



L3 Heavy
Operated continually at medium loads and frequently at maximum loads.



L4 Very heavy
Operated regularly at maximum and at almost maximum loads.

Load spectrum		Average operating time (Ot) per working day [hrs]			
L1	Light	$1 < O_t \leq 2$	$2 < O_t \leq 4$	$4 < O_t \leq 8$	$8 < O_t \leq 16$
L2	Medium	$0.5 < O_t \leq 1$	$1 < O_t \leq 2$	$2 < O_t \leq 4$	$4 < O_t \leq 8$
L3	Heavy	$0.25 < O_t \leq 0.5$	$0.5 < O_t \leq 1$	$1 < O_t \leq 2$	$2 < O_t \leq 4$
L4	Very heavy	$0.12 < O_t \leq 0.25$	$0.25 < O_t \leq 0.5$	$0.5 < O_t \leq 1$	$1 < O_t \leq 2$
FEM/ISO rating		**1Bm / M3**	**1Am / M4**	**2m / M5**	**3m / M6**

The following table shows the theoretical service lifetime for ISO ratings M3, M4, M5, and M6.

Load spectrum		Theoretical service life [hrs]			
L1	Light	3150	6300	12500	25000
L2	Medium	1600	3200	6300	12500
L3	Heavy	800	1600	3200	6300
L4	Very heavy	400	800	1600	3200
FEM/ISO rating		**1Bm / M3**	**1Am / M4**	**2m / M5**	**3m / M6**

3.5 Product range

Load [kg]	Frame size	Falls	ISO group	Class		BGV	Chain size	Gear life [h]	Motor type	Power [kW]	Speed [m/ min.]	Max. temp [°C] 1)	ED%	Start s/h
				A	Dh									
250	**SR01**	1	M3	A3	Dh2	D8/D8+	4.0 x 11.0	400	MT06CA200	0.2	4	+40	25	150
	SL05	1	M4	A4	Dh3	D8	5.1 x 15.1	800	MT08NB100	0.73	16	+40	30	180
320	**SR01**	1	M3	A3	Dh2	D8	4.0 x 11.0	400	MT06CA200	0.2	4	+40	25	150
500	**SR01**	2	M3	A3	Dh2	D8	4.0 x 11.0	400	MT06CA200	0.2	2	+40	25	150
	SL05	1	M5	A5	Dh2	D8/D8+	5.1 x 15.1	1600	MT08NB200	0.4	4	+40	40	240
	SL05	1	M4	A4	Dh2	D8	5.1 x 15.1	800	MT08NB100	0.73	8	+40	30	180
	SL10	1	M4	A4	Dh3	D8	7.2 x 21.2	800	MT10NB100	1.8	16	+40	30	180
800	**SL10**	1	M4	A4	Dh2	D8	7.2 x 21.2	800	MT10NB100	1.8	8	+40	30	180
1000	**SL10**	1	M5	A5	Dh2	D8/D8+	7.2 x 21.2	800	MT10NB200	1.6	4	+40	30	180
	SL10	1	M4	A4	Dh2	D8	7.2 x 21.2	800	MT10NB100	1.8	8	+40	30	180
1600	**SL10**	2	M4	A4	Dh2	D8	7.2 x 21.2	800	MT10NB100	1.8	4	+40	30	180
2000	**SL10**	2	M4	A4	Dh2	D8	7.2 x 21.2	800	MT10NB100	1.8	4	+40	30	180
2500	**SR25**	1	M5	A5	Dh2	D8	11.3 x 31	1600	MT10CC200	1.8	4	+40	40	240
2500	**SR25**	1	M4	A4	Dh2	D8	11.3 x 31	800	MT10CC106	3.6	8	+40	25	150
5000	**SR25**	2	M3	A3	Dh2	D8	11.3 x 31	400	MT10CC106	3.6	4	+40	25	150

1) Maximum ambient temperature.

3.6 Product features

3.6.1 Standard features

Mechanics	
No	**Feature**
1	1-fall up to 2500 kg, 2-fall up to 5000 kg
2	Mechanical overload device (slipping clutch)
3	Disc brake that is on a separate load path after the motor and the slipping clutch. The brake is linked directly to the load, and holds the load even if the motor or the slipping clutch fails.
4	2-step or 3-step helical gear
5	Sprocket on output shaft in off-center position (SL05-SL10, SR25) or center position (SR01)
6	Operating temperature -20°C…+40°C with rated capacity and speed
7	Chain hoist body with epoxy powder paint of 70-µm thickness, C2 according to EN12944-2 and EN12944-5
8	Upper and lower hook according to DIN classification
9	Chain with G80 black finishing (SR01, SL05–SL10) or electro-galvanization (SR25)
10	Rubber buffers on the chain hoist body (SL05-SL10)
11	Integrated handles (SL05–SL10: standard; SR01: optional)
12	Maximum relative humidity 90%
13	Maximum altitude 1000 m
14	Chain bag
15	Chain guide with a drain hole to avoid water collection in the load wheel compartment
16	Inverted position (body of the chain hoist down)

Electrics	
No	**Feature**
1	3-phase single-speed motors
2	Motor thermal protection (configuration B), protection class IP55, tropical impregnation
3	Motors with TENV classification and insulation class F
4	All components connected by plugs (configuration B: SR01, SL05-SL10)
5	Low voltage control 48 or 115 V AC (configuration B)
6	Electrics on one main printed circuit board (PCB) (configuration A and B)
7	Separate brake rectifier that is connected to the contactor (configuration B: SL05–SL10, SR25)
8	IP55 / NEMA 3R protection
9	Upper and lower limit switches (configuration B): • Magnetic limit switch (MLS) (SL05–SL10) • Rotating geared limit switch (GLS), 2-step version (SR25)

3.6.2 Optional features

Mechanics	
No	**Feature**
1	BGV-D8+ classification according to IGVW SPQ2, including: • Secondary brake • Static safety factor 8 for chain, hook, suspension part, and body parts of the chain hoist • Static safety factor that is twice the D8 classification for gearings
2	Secondary brake (if not a standard feature in the chain hoist)
3	Manual brake release
4	Additional chain stop
5	Upper suspension fixed eye
6	Self-locking hook block with safety hook (SR01, SL05-SL10)
7	Lockable (in 60-degree increments) rotation of the hook forging
8	Soft rain cover; the chain hoist can be operated with the rain cover fitted
9	Industrial position (body of the chain hoist up)

Electrics	
No	**Feature**
1	Upper and lower limit switches • Rotating geared limit switch (GLS), 2- or 4-step [1] version (SL05–SL10) • Rotating geared limit switch (GLS), 4-step version (SR25) [1] The 4-step geared limit switch version increases the length of the chain hoist in frame sizes SL05-SL10.

3.6.3 Compatibility matrix for options

Feature	Value	Option	Configuration A				Configuration B			
			SR01	SL05	SL10	SR25	SR01	SL05	SL10	SR25
BRA01	YES	Secondary brake	x	x	x	x	x	x	x	x
HS21	G2	Geared limit switch, 2-step						x	x	x
HS21	G4	Geared limit switch, 4-step						x	x	x
HOK13	S	Self-locking hook	x	x	x		x	x	x	
-	-	Fixed body hook	x	x	x	x	x	x	x	x
OTH92	YES	Chain stop	x	x	x	x	x	x	x	x
-	-	Rubber handles	x				x			
BRA07	YES	Manual brake release		x	x	x		x	x	x
-	-	LimitFlux		std	std	std		std	std	std
-	-	2-fall hook (spare)	x		x	x	x		x	x
-	-	Power plug, no plug	x	x	x	x	x	x	x	x
PS59	L16-20P	Power plug, L16-20P	x	x	x	x	x	x	x	x
PS59	CEB	Power plug, CE-plug	x	x	x	x				
-	-	Control, no plug					x	x	x	x
PS60	L14-20R	Control, L14-20R					x	x	x	x
-	-	Power/Control, no plug					x	x	x	x

Feature	Value	Option	Configuration A				Configuration B			
			SR01	SL05	SL10	SR25	SR01	SL05	SL10	SR25
PS59	SX07	Power/Control, 7-pin					x	x	x	x
PS59	SCPB	Power/Control, P-14					x	x	x	x
PS60	XLR	Flush mount control					x	x	x	x
EL55	YES	Kellum grips	x	x	x	x	x	x	x	x
-	-	Entry set SR type B, 6 poles					x	x	x	x
-	-	Entry set SR type B, P17					x	x	x	x

3.7 Weights of the chain hoist

Frame size	Chain hoist weight [kg] 1)				Chain [kg/m]
	Without chain		With 20 m of chain		
	Single brake	Double brake	Single brake	Double brake	
SR01	11	13.2	18	20.6	0.37
SL05	29.8	30.8	41.2	42.2	0.62
SL10	45.6	47.6	69.6	71.6	1.2
SR25	107.7	114.3	163.7	170.3	2.8

1) The weights of the chain hoist that are given in this table are valid for the chain hoist configuration A only. The control cable plug is included in the weight of the chain hoist.

3.8 Materials and coatings

Materials			
Part	**Fabrication**	**Material type**	**Norm**
Frame	Pressure die-cast aluminum alloy	GD-AlSi9CU3	EN AC – AlSi9Cu3
Covers	Pressure die-cast aluminum alloy	GD-AlSi9CU3	EN AC – AlSi9Cu3
Profiles	Extruded aluminum alloy	AlMg0.7Si	EN AW - 6063
Gear wheels	Alloy steel	20NiCrMo2-2/16MNCr5	EN 10060
Suspension hook	Forged steel	34CrNiMo6	EN10250-3
Chain bags	TER 630		
Hooks	Forged steel	34CrMo4	EN 10083
Hook blocks	Pressure die-cast aluminum	GD-AlSi9CU3	EN AC – AlSi9Cu3
Chains	Black finish 1), 2)		
	Bent and welded alloy steel	Special steel 3)	EN 818-7
Rubber parts	Molded neoprene	Santoprene	8221.65
1) SL05, SL10.			
2) SR01.			
3) SR25.			

Coatings	
Component	**Coating**
Aluminum alloy components	Epoxy polyester powder painting (70 µm) (C2-M painting)
Steel components	C2-M painting
Chain	Black finish [1), 2)] or Zinc plating [3)]
[1)] SL05, SL10.	
[2)] SR01.	
[3)] SR25.	

Color codes		
Component	**Color code**	**Color**
Body	RAL 7021	Dark gray
End caps	RAL 7021 [1)]	Dark gray
	RAL 9005 [2), 3)]	Black
Hook	RAL 7021	Dark gray
Chain		Black finish [1), 2)] or Electro-galvanized [3)]
[1)] SL05, SL10.		
[2)] SR01.		
[3)] SR25.		

3.9 Lubrication

3.9.1 Lubrication points of the chain hoist

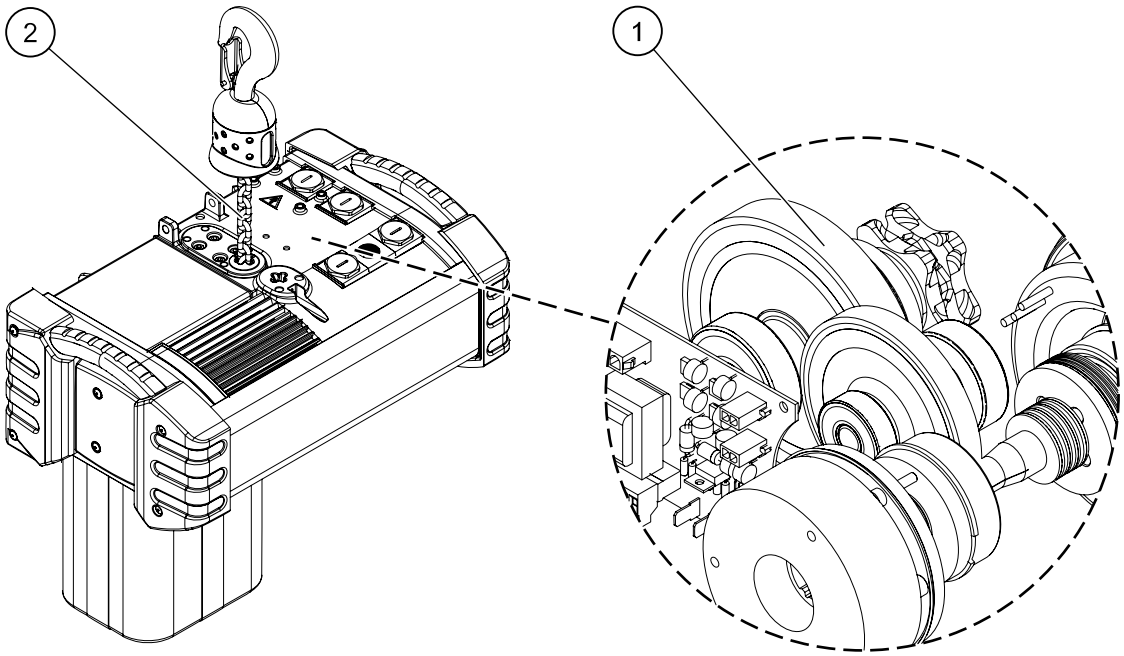


Figure 6. Lubrication points of the chain hoist

Pos.	Component	Intervals
1	Gear	Lubricated for the design working period of the product
2	Chain	From 1 week up to a year (depending on the usage)

NOTE ***Only lubricate the instructed components. Other components are lubricated for the design working period of the product.***

3.9.2 Lubricants for the chain hoist

1 Gear

The gear is lubricated with oil. The lubrication of the gear lasts for the design working period of the product.

Installation	Trade name and number	Quantity
Factory installed	Dexron III	Lubricated for the design working period of the product

Frame size	Quantity [l]
SR01	0.25
SL05	0.23
SL10	0.6
SR25	2.5

2 Chain

The chain is lubricated with oil.

The chain must be lubricated carefully before the first run of the product. To extend the lifetime of the chain, continue to lubricate the chain within regular intervals.

The lubrication interval of the chain varies from a minimum of one week to one year, depending on the usage.

Installation	Trade name and number	Quantity
Factory installed	Mobil Gear 632 MOBILGEAR 600 XP 220 [1)]	As required
[1)] For SL05-SL10.		

4 MAIN COMPONENTS OF THE ELECTRICAL CHAIN HOIST

4.1 Motor of the chain hoist

The motor of the chain hoist is an efficient motor that is specially designed for lifting purposes. The motor is classified as a 'TENV motor', and it has the insulation class F.

Voltage	Frame size	Motor type	P_N [kW]	CDF [%]	c/h	n_N [r/min]	M_N [Nm]	I_N [A]	Cos φ_N	I_{start}/I_N	$I_{no\ load}$	Cos φ_{start}	M_{start}/M_N	J_{mot} [kgm^2X10^{-3}] 1)
Lifting motor 380–415 V / 50 Hz	SR01	MT06CA200	0.2	25	150	1370	1.4	1.0	0.6	2.8	0.9	0.89	2.6	0.3
	SL05	MT08NB200	0.40	40	240	1400	2.7	1.1	0.76	4.55	0.72	0.67	2.1	1.48
	SL05	MT08NB100	0.73	40	240	2760	2.5	1.9	0.81	4.8	1.1	0.76	2.2	1.48
	SL10	MT10NB200	1.60	40	240	1440	10.6	3.1	0.59	4.47 1)	2.65	0.82 1)	3.23 1)	2.65 1)
	SL10	MT10NB100 1)	1.80	40	240	2690	6.4	4.2	0.88	4.1	1.34	0.76	2.7	2.65
	SR25	MT10CC200	1.80	25	150	1370	12.5	3.8	0.86	5	1.9	0.71	2.4	3.90
	SR25	MT10CC106	0.60	25	150	400	12.3	4.3	0.63	1.56	4.3	0.78	1.8	4.90
			3.60			2800		8.2	0.87	4.76	4.5	0.83	2.0	
Lifting motor 460–480 V/60 Hz	SL05	MT08NB200	0.48	40	240	1700	2.7	1.1	0.75	4.55	0.72	0.67	2.1	1.48
	SL05	MT08NB100	0.88	40	240	3360	2.5	1.9	0.8	4.8	1.1	0.76	2.2	1.48
	SL10	MT10NB200	1.90	40	240	1740	10.6	3.1	0.58	4.47 1)	2.65	0.81 1)	3.23 1)	2.65 1)
	SL10	MT10NB100 1)	2.20	40	240	3290	6.4	4.2	0.87	4.1	1.34	0.76	2.7	2.65

1) Calculated values, to be replaced with measured data when available.

Abbreviations	
$I_{no\ load}$	Current without load
I_N	Nominal current
I_{start}	Starting current

4.1.1 Supply voltage and main fuse for the power supply

The size of the main fuse for the power supply of the chain hoist in the different supply voltages is indicated in the following table. The values are valid for chain hoists with a 3-phase motor.

Frame size	Fuse size - Power supply		
	Supply voltage range		
	208–240 V [50/60 Hz]	380–415 V [50 Hz]	440–480V [60 Hz]
SR01	6A gG / 4A Am	6A gG / 4A Am	6A gG / 4A Am
SL05	12A gG / 8A Am	10A gG / 6A Am	6A gG / 4A Am
SL10	16A gG / 10A Am	12A gG / 8A Am	10A gG / 6A Am
SR25	25A gG / 20A Am	20A gG / 16A Am	16A gG / 10A Am

4.2 Gear of the chain hoist

The gear of the chain hoist is specially developed for use in lifting appliances. The gear has two or three helical steps. The gear of the chain hoist is lubricated with oil, and the lubrication lasts for the design working period of the chain hoist.

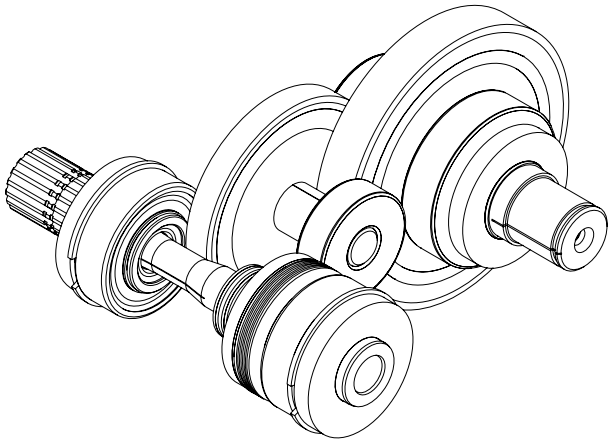


Figure 7. 2-step gear

Frame size	Main lifting speed, 1-fall [m/min.]	Gear type	Gear ratio
SR01	4	2-step	41.6
SL05	4	2-step	54.6
	8	2-step	54.6
	16	2-step	28.2

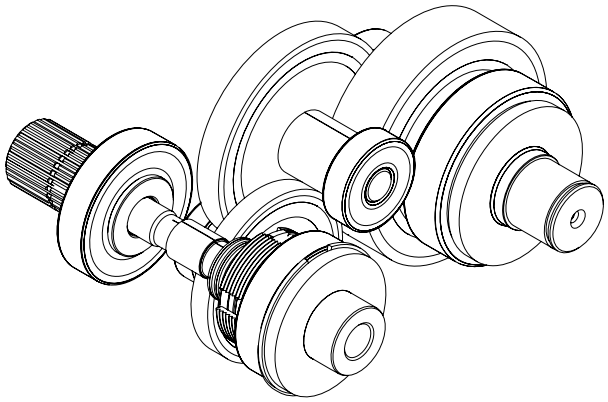


Figure 8. 3-step gear

Frame size	Main lifting speed, 1-fall [m/min.]	Gear type	Gear ratio
SL10	4	3-step	75.7
	8	3-step	75.7
	16	3-step	34.6
S25	4	3-step	110.8
	8	3-step	110.8

4.3 Brakes of the chain hoist

4.3.1 Single brake

The chain hoist is equipped with a disc brake which includes a rotating disc with two friction linings. The brake coil is energized by a DC voltage coming from the brake rectifier. The brake rectifier converts the AC voltage into a DC voltage. To ensure the self-cleaning function, the rotating parts of the brake are not enclosed.

The brake is designed so that it lasts for the design working period of the chain hoist. The brake wear can be checked at the brake coil, through an inspection hole. The brake lining wear criteria is indicated on a sticker that can be found on the brake, next to the brake wear measurement hole. If the brake wear exceeds the allowed measurement criteria, the brake must be replaced.

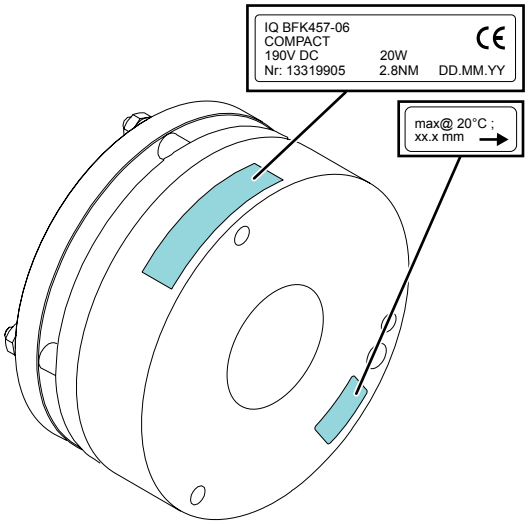


Figure 9. Single brake - INTORQ

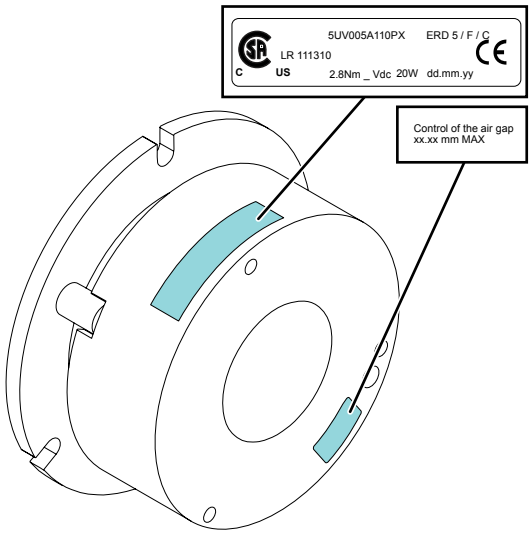


Figure 10. Single brake - Warner

Brake characteristics

Frame size	Brake torque		Brake measurement [20°C] [mm] [1]	
			Brake type	
	[Nm]	[lbf.ft]	INTORQ	Warner
SR01	2.8	2.1	-	20.7
SL05	6.8	5.0	25.3	-
SL10	14	10.3	30.0	-
SR25	21	15.48	33.5	-

[1] The brake measurement value that is given in the table is only a theoretical value. The value varies according to manufacturer and brake series. For each case, the maximum value that must not be exceeded is indicated on the sticker that can be found on the brake.

4.3.2 Double brake

The double brake assembly consists of the main brake (single brake) and the secondary brake (double brake) that are assembled on the same brake hub. During the hoisting motion, the brake board energizes both brakes simultaneously. When the hoisting motion stops, the main brake switches off immediately. The motor inductive effect keeps the secondary brake energized still for a few milliseconds.

The main brake holds the first position (located ‘on the top’) in the double brake assembly, which makes checking of the brake wear easier.

The secondary brake is a holding brake that works as a back-up for the main brake. The secondary brake is the functional brake only if the main brake is damaged and cannot hold the load. If the main brake operates normally, you do not need to check the wear on the secondary brake.

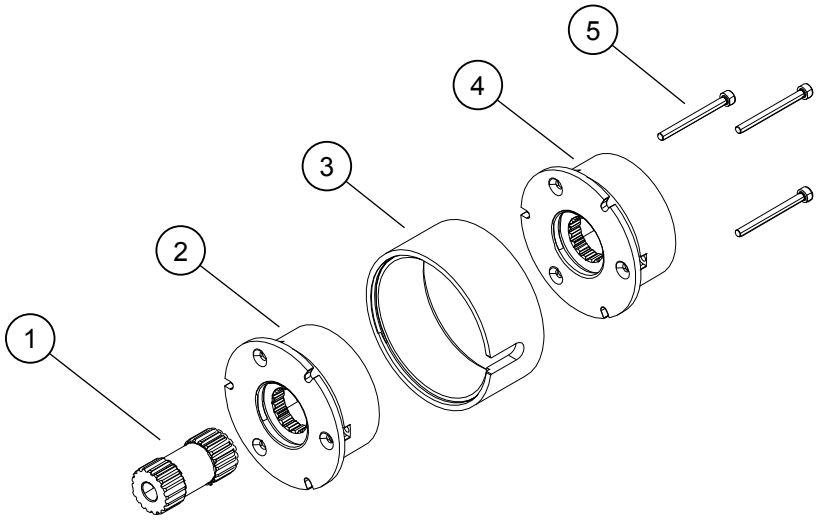


Figure 11. Double brake - Warner (SR01)

1. Brake hub
2. Secondary brake
3. Spacer
4. Main brake
5. Screws

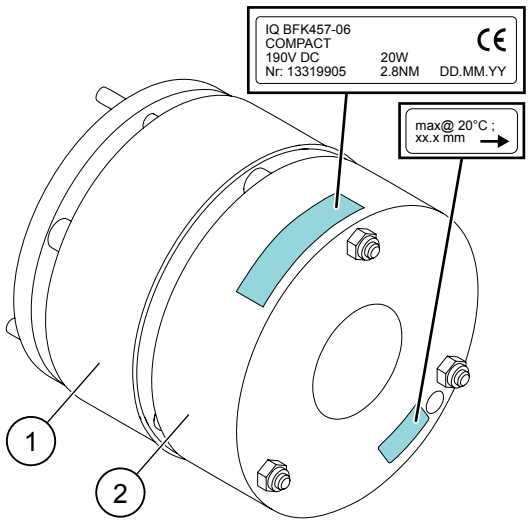


Figure 12. Double brake - INTORQ (SL05-SL10, SR25)

1. Main brake
2. Secondary brake

Brake characteristics

Frame size	Brake (pcs)		Brake torque				Brake measurement [20°C] [mm] 3)	
	Single brake	Double brake1)	Main brake		Secondary brake 1), 2)		Brake type	
			[Nm]	[lbf.ft]	[Nm]	[lbf.ft]	INTORQ	Warner
SR01	1	2	2.8	2.1	2.8	2.1	-	20.7
SL05	1	2	6.8	5.0	6.8	5.0	25.3	-
SL10	1	2	14.0	10.3	14.0	10.3	30.0	-
SR25	1	2	21.0	15.48	21.0	15.48	33.5	-

1) Not possible with the 1-phase chain hoists (configuration S).

2) The secondary brake is only a back-up brake for the main brake. If the main brake operates normally, you do not need to check the wear on the back-up brake.

3) The brake measurement value that is given in the table is only a theoretical value. The value varies according to manufacturer and brake series. For each case, the maximum value that is not to be exceeded is indicated on the sticker that can be found on the brake.

4.3.3 Brake coil voltages and resistance

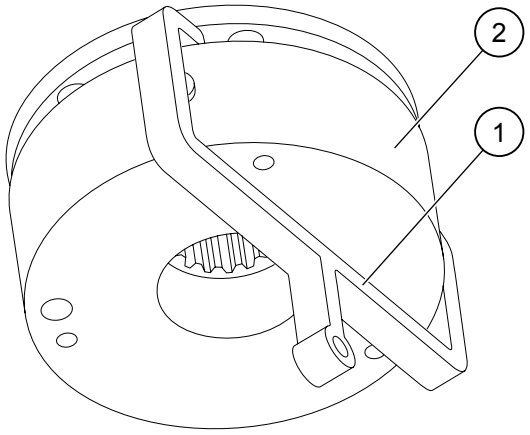
Brake coil voltage

Motor voltage [V AC]		Frequency [Hz]	Brake voltage [V DC]
115 V	1-phase	60	103
208−240 V	3-phase	50/60	103
380−415 V	3-phase	50	190
440−480 V	3-phase	60	190

Brake coil resistance

Frame size	Brake type [single brake]		Brake torque		Rated voltage [V]	Coil resistance [20°C]	
	INTORQ	Warner	[Nm]	[lbf.ft]		Min. [Ω]	Max. [Ω]
SR01	-	5UV005A110P2	2.8	2.1	103	400	550
SR01	-	5UV005A110P1	2.8	2.1	190	1500	2030
SL05	BFK457-06	-	6.8	5.012	103	496.6	564.9
SL05	BFK457-06	-	6.8	5.012	190	1661	1949
SL10	BFK457-08	-	14.0	10.318	103	398.9	449.8
SL10	BFK457-08	-	14.0	10.318	190	1366	1552
SR25	BFK457-10	-	21.0	15.48	103	313	350
SR25	BFK457-10	-	21.0	15.48	190	1125	1282
SR25	BFK457-10	-	21.0	15.48	255	2060	2285
SR25	BFK457-10	-	21.0	15.48	320	3227	3614

4.3.4 Manual brake release (option)



1. Manual brake release lever
2. Hoisting brake

The manual brake release feature is available as an option for the single brake assembly. This feature allows you to release the brake by hand in situations where you must lower the load manually.

The manual brake release should only be used in emergency situations where the brake cannot be released normally. Extensive use of the manual brake release and high lowering speed can result in immediate wear-out of the brake lining.

4.4 Slipping clutch

The overload protection of the lifting function is ensured through a direct acting limiting device, the slipping clutch. The slipping clutch meets the requirements of the EN14492-2 standard that are set for this type of lifting units.

The setting of the slipping clutch allows the chain hoist to lift a load that corresponds to the dynamic test load of 110% (EUR) and 125% (US) of the safe working load (SWL). The slipping clutch function prevents the chain hoist from lifting a load of 160% of the SWL. The slipping clutch enables the brake to hold the load without any interaction with the slipping clutch.

The construction of the slipping clutch assembly and the adjustment of the slipping clutch vary according to the frame size of the chain hoist.

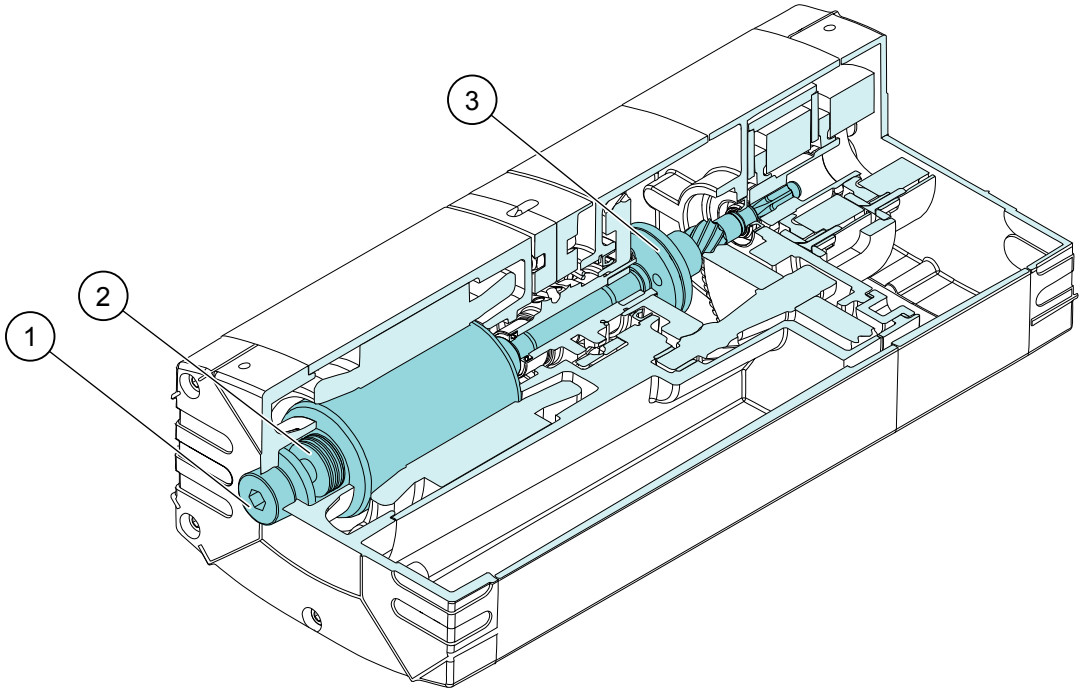


Figure 13. Slipping clutch construction of an SR01 chain hoist

1. Setting screw
2. Belleville washers
3. Torque limiter discs with lining

In the SR01 chain hoists, the slipping clutch adjustment is done from the motor side. The setting screw for the clutch adjustment is on the motor side of the chain hoist.

In the SL05–SL10 and SR25 chain hoists, the slipping clutch adjustment is done from the brake side. The setting screw for the clutch adjustment is on the brake side of the chain hoist.

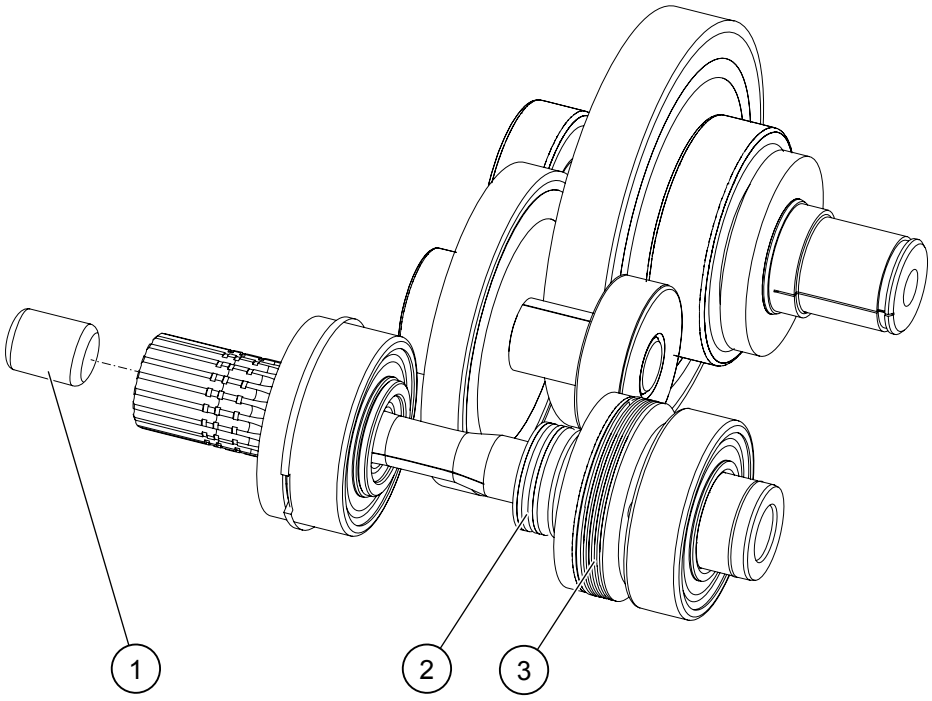


Figure 14. Slipping clutch construction with one torque limiter disc, SL05

1. Setting screw
2. Belleville washers
3. Torque limiter

The SL05 chain hoists use a slipping clutch construction that has just one torque limiter disc, whereas the bigger chain hoist models, the SL10 and SR25, are built with a slipping clutch construction that has two torque limiter discs.

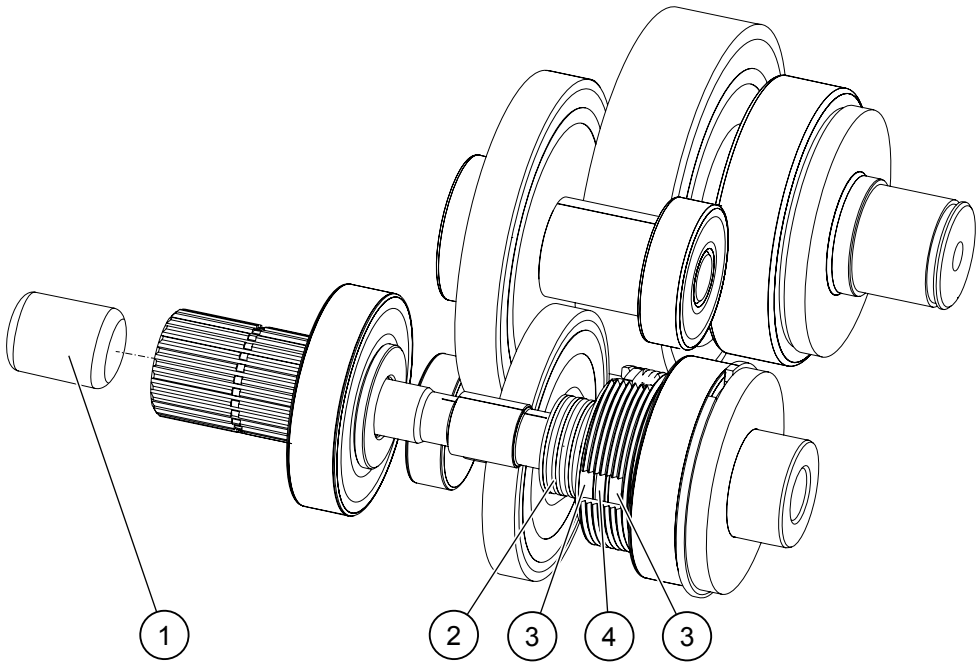


Figure 15. Slipping clutch construction with two torque limiter discs and an intermediate disc, SL10 and SR25

1. Setting screw
2. Belleville washers
3. Torque limiter discs with lining
4. Intermediate torque limiter disc

The slipping clutch construction of the SL10 and SR25 chain hoists consists of two torque limiter discs and an intermediate disc between them. The construction with an intermediate torque limiter disc allows to engage altogether three friction surfaces, which results in an increased torque.

4.5 Suspension types of the chain hoist

4.5.1 Fixed suspension hook

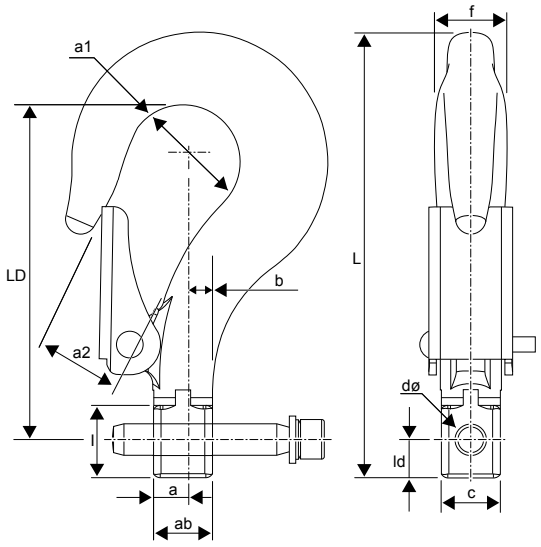


Figure 16. Fixed suspension hook, SR01

Frame size	Hook size [RSN]	Dimensions [mm]														
		a	ab	a_1	a_2[1)]	b	c	d [ø]	d_1	e	f	l	ld	L	LD	w
SR01	012T	5	10	30	22	5	16	8.3	-	-	19	26	10	115	86	-
[1)] The dimension a_2 is given with the hook latch opened.																

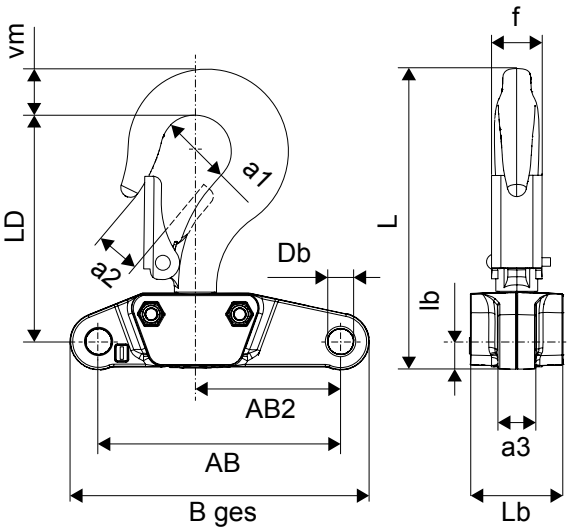


Figure 17. Fixed suspension hook, SL05

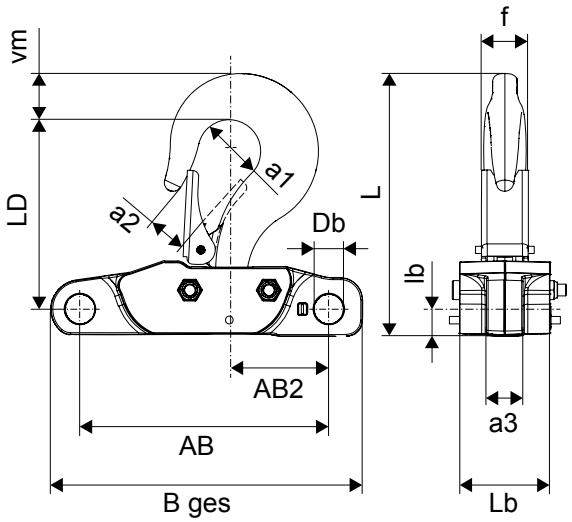


Figure 18. Fixed suspension hook, SL10

Frame size	Hook size [RSN]	Dimensions [mm]												
		vm	L	Lb	AB	AB_2	a_1	a_2[1)]	a_3	B ges	f	LD	Db	ld
SL05	020	22	142	52	115	69	34	21	18	142	21	107.5	12	12.5
SL10	05	31	178.5	76	170	102	43	27	25	210	29	130	20	17.5
[1)] The dimension a_2 is given with the hook latch opened.														
[2)] The fixed suspension hook and rotating suspension hook are the same hook for SL05 and SL10. The hook is fixed with a fixing sheet.														

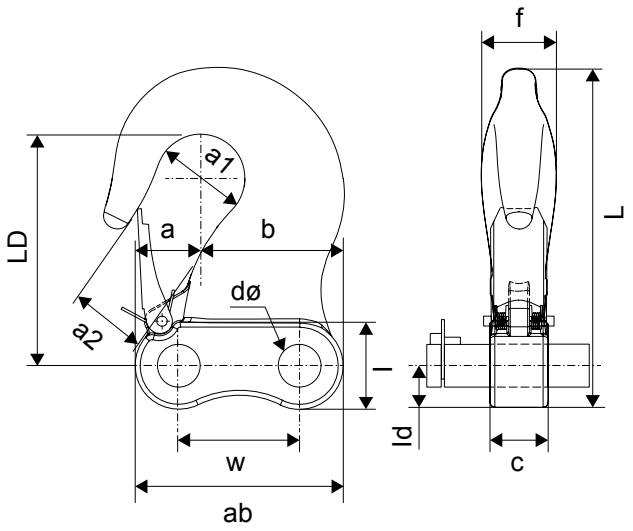


Figure 19. Fixed suspension hook, SR25

Frame size	Forging	Dimensions [mm]												
		a	ab	a_1	a_2 [1)]	b	c	d [ø]	f	l	ld	L	LD	w
SR25		39	124	53	41	85	35	25.1	45	51	26	204	138	72
[1)] The dimension a_2 is given with the hook latch opened.														

4.5.2 Rotating suspension hook

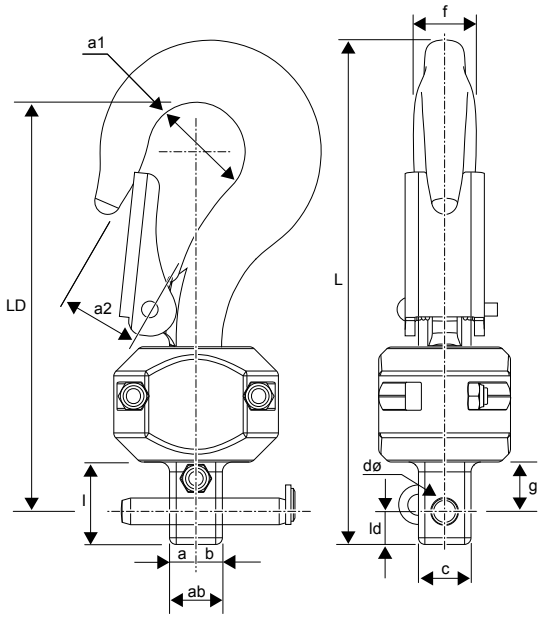


Figure 20. Rotating suspension hook, SR01

Frame size	Hook size [RSN]	Dimensions [mm]													
		a	ab	a_1	a_2 [1)]	b	c	d [ø]	f	g	l	ld	L	LD	w
SR01	012T	9	50	34	25	41	32	8.2	21	30	38	8	168	145	16
[1)] The dimension a_2 is given with the hook latch opened.															

NOTE ***The fixed suspension hook and rotating suspension hook are the same hook for SL05 and SL10. The hook is fixed with a fixing sheet.***

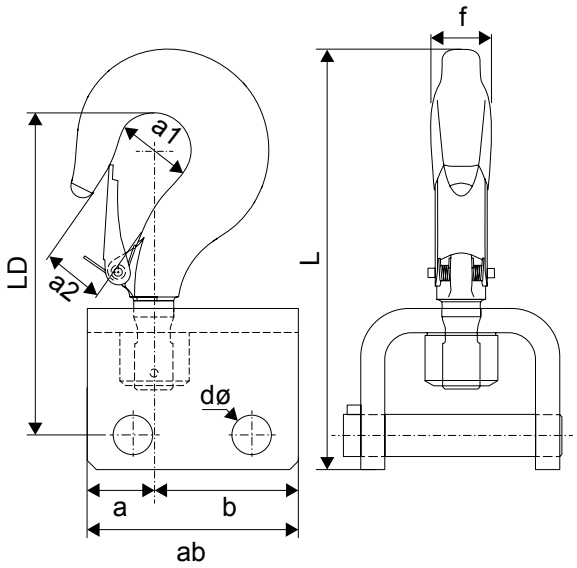


Figure 21. Rotating suspension hook, SR25

Frame size	Hook size [RSN]	Dimensions [mm]													
		a	ab	a_1	a_2 [1)]	b	c	d [ø] [2)]	f	g	l	ld	L	LD	w
SR25	1.6V	40.5	127	56	41	86.5	120	25.5	45	84	104	20	299.5	231.5	72
[1)] The dimension a_2 is given with the hook latch opened.															
[2)] The dimension d [ø] is needed for both (x 2) pins.															

4.5.3 Suspension bracket (option)

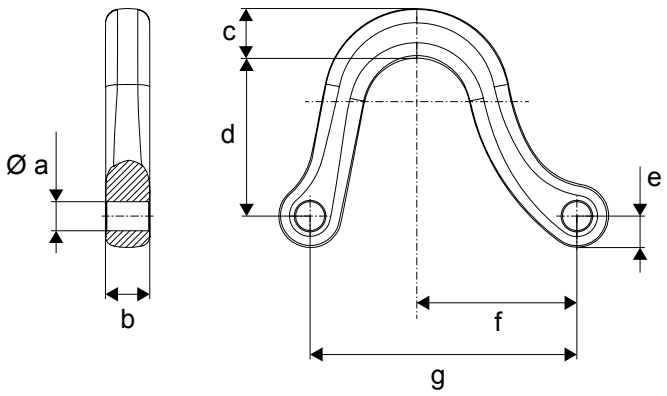


Figure 22. Dimensions of the suspension bracket

Dimensions [mm]								
Frame size	Ø a	b	c	Bracket long	Bracket short	e	f	g
				d				
SL05	12.5	19	21.5	68	30	13.5	69	115
SL10	20	26	26	81	-	18	102	170

NOTE ***The bracket has markings "I" and "II" according to the reeving (1-fall or 2-fall). The markings must match with the markings on the chain hoist body.***

4.6 Chain drive

The chain drive of the electrical chain hoist includes the following components:

- Chain guide
- Chain sprocket
- Return sprocket (in 2-fall chain hoist configurations)
- Chain.

4.6.1 Chain sprocket

The chain sprocket of the SR01 chain hoist has five pockets and five intermediate teeth on the sprocket. The chain sprocket of the SL05-SL10 chain hoist has five pockets and no intermediate teeth.

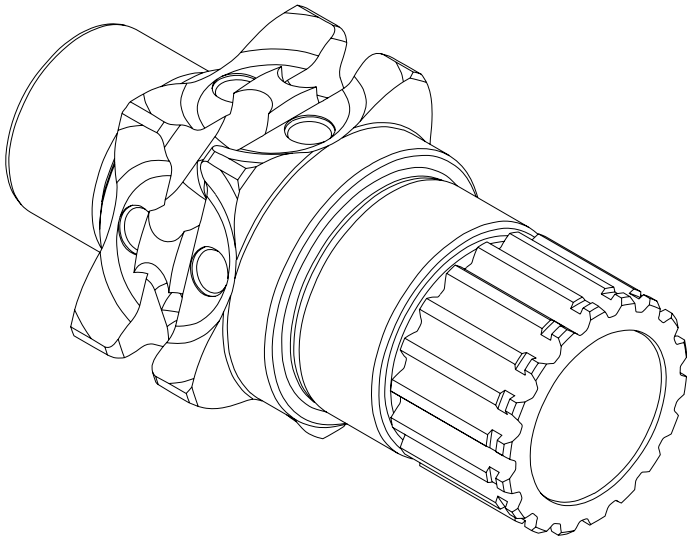


Figure 23. Chain sprocket of an SR01 chain hoist

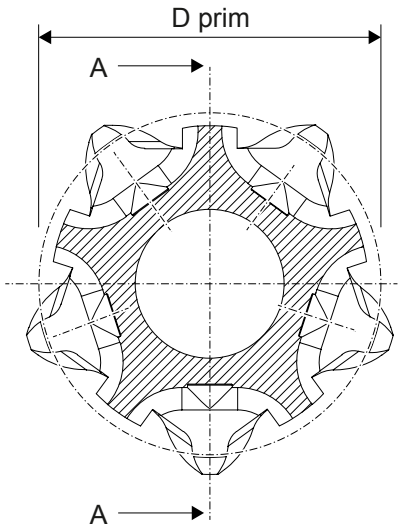


Figure 24. Dimensions of the chain sprocket, SR01

Dimensions [mm]				
Frame size	**Chain sprocket**	**Chain**	**Nbr of pockets**	**D prim [mm]**
SR01	SINGLE	4.0 x 11.0	5	35.01

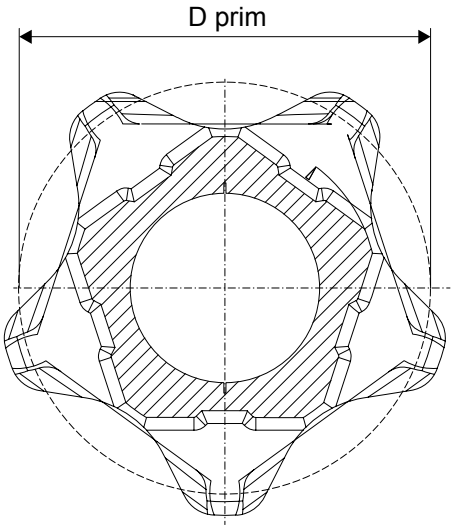


Figure 25. Dimensions of the chain sprocket; SL05-SL10, SR25

Dimensions [mm]				
Frame size	**Chain sprocket**	**Chain**	**Nbr of pockets**	**D prim [mm]**
SL05	SINGLE	5.1 x 15.1	5	48.88
SL10	SINGLE	7.2 x 21.1	5	68.71
SR25	SINGLE	11.3 x 31.0	5	98.69

4.6.2 Return sprocket

The return sprocket is included only in the 2-fall chain hoist configurations.

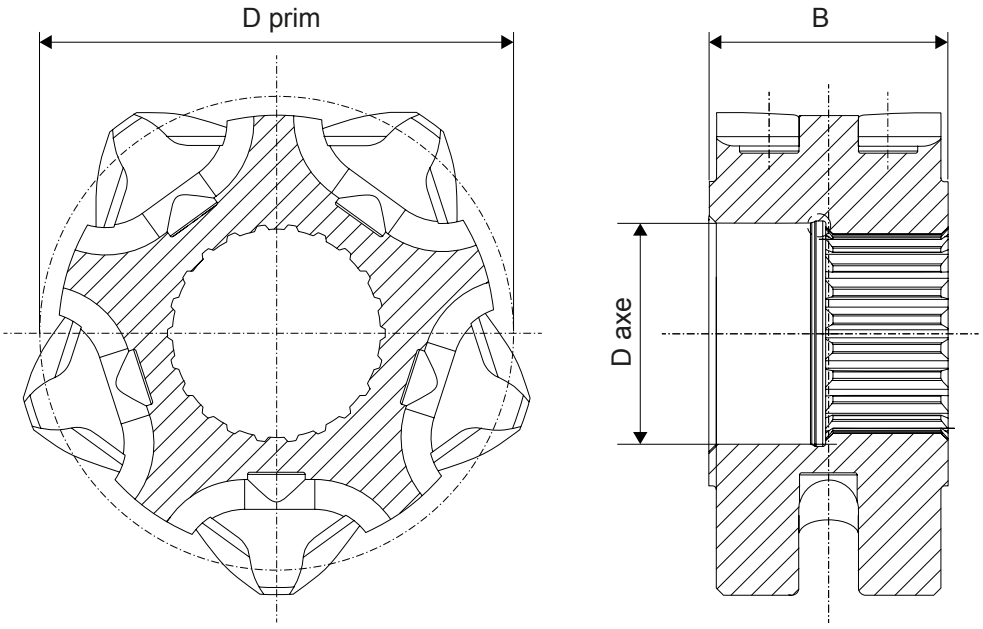


Figure 26. Dimensions of the return sprocket; SR01, SR25

Dimensions [mm]							
Frame size	**Chain sprocket**	**Chain**	**Pockets**	**D prim**	**D shaft [Ø]**	**B**	
SR01	SINGLE	4.0 x 11.0	5	35.01	14h8	20	-0.1
SR25	SINGLE	11.3 x 31.0	5	100.98	44F6	40	-0.1

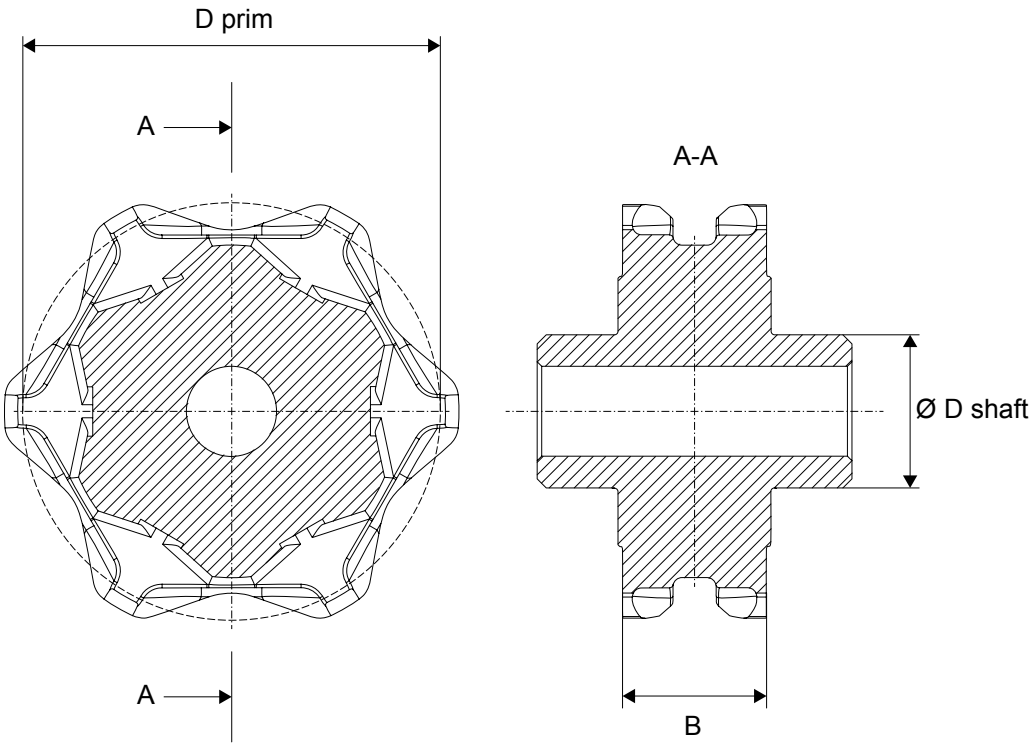


Figure 27. Dimensions of the SL10 return sprocket

Dimensions [mm]							
Frame size	**Chain sprocket**	**Chain**	**Pockets**	**D prim**	**D shaft [Ø]**	**B**	
SL10	SINGLE	7.2 x 21.1	5	68.71	32h7	27	0/-0.2

4.6.3 Chain

Safety factors of the chain

Frame size	**Rated capacity [kg][1)]**	**Static safety factor**	
		G80 chain	**G100 chain**
SR01	250	6.40	8.1
SL05	500	5.00	8.1
SL10	1000	6.27	8.1
SR25	2500	6.52	-

[1)] D8 chain hoists

Technical data of the chain

The load chain is marked with a label that contains information about the chain manufacturer and manufacturing date as well as the chain size and grade.

The weld in the chain can either go towards the chain sprocket or away from it. The weld direction does not affect the chain behavior.

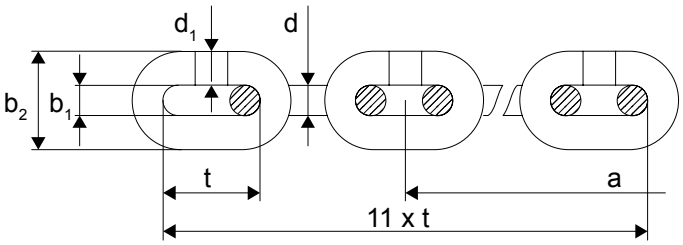


Figure 28. Chain dimensions

Dimensions and weight									
Feature	**Unit**	**Frame size**							
		SR01		**SL05**		**SL10**		**SR25**	
Chain size	t x d	4 x 11		5.1 x 15.1		7.2 x 21.1		11.3 x 31	
Diameter	d [mm]	4	+0.2 -0.2	5.1	+0.2 -0.2	7.2	+0.03 -0.03	11.3	+0.1 -0.4
Pitch	t [mm]	11	+0.15 -0.05	15.1	+0.2 -0.1	21.1	+0.25 -0.15	31	+0.4 -0.2
Control length	11 × t [mm]	121	+0.4 -0.2	167.2	+0.5 -0.255	233.2	+1.7 -1.0	341	+1.1 -0.5
Weld seam	d1 [mm], max.	4.3		5.6		7.8		12	
Internal width	b1 [mm], min.	4.8		5.8		8.2		12.6	
External width	b2 [mm], max.	13.6		16.9		23.7		36.6	
Label spacing	A [m], min.	0.22		0.15		0.22		1	
Label mark height	[mm]	1.5		1.8		2		3	
Chain weight	G [kg/m]	0.37		0.62		1.12		2.81	

Technical characteristics								
	Unit	**Frame size**						
		SR01		**SL05**		**SL10**		**SR25**
Chain size	**t x d**	**4 x 11**		**5.1 x 15.1**		**7.2 x 21.1**		**11.3 x 31**
Chain type		**G80**	**G100**	**G80**	**G100**	**G80**	**G100**	**G80**
Cross section	A [mm2]	25.12		40.9		81.4		200.52
Max. working load	mSWP [kg]	320		500		1250		2500
Stress at max. working load	σ [MPa]	125		120		150		125
Test force	Fm [kN]	12.6	15.8	22	28	43	54.5	100
Min. breaking force	FB [kN]	20.10	25.1	35	44	70	86	160
Min. breaking elongation	A [%]	10	15	10	15	10	15	10
Min. surface hardness	[HV]	400	420	380HV1	420HV15	380HV10	420HV10	380HV1
Corrosion protection		Black finish		Black finish		Black finish		Zinc
Grade		80	100	80	100	80	100	80
Class		T	T	T	T	T	T	T

4.6.4 Chain bag

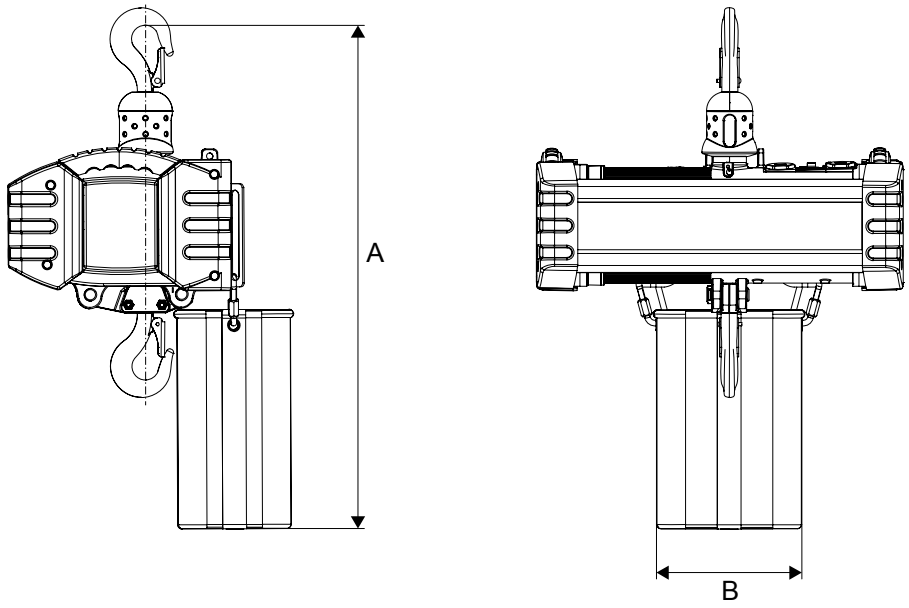


Figure 29. Chain bag dimensions

Frame size	Falls	Chain bag capacity [m]	HOL [m]	Dimensions [mm] 1)	
				A	B
SR01	1/1	16	16	603	143
SR01	1/1	20	20	652	143
SR01	1/1	30	30	792	143
SR01	2/1	16	8	534	143
SR01	2/1	20	10	556	143
SR01	2/1	30	15	688	143
SR25	1/1	20	20	1100	232
SR25	1/1	50	50	1400	410
SR25	2/1	20	10	1250	232
SR25	2/1	50	25	1550	410

1) The values are valid for chain hoist configurations with normal hook block and with the chain hoist in inverted position. With the (1-/2-fall) safety hook (optional), the chain bag values increase around 15 to 35 mm.

Frame size	Falls	HOL [m]	Dimensions [mm]	
			A	B
SL05	1/1	15	634	182
SL05	1/1	40 1)	763	212
SL10	1/1	15	837	212
SL10	1/1	50 1)	1037	212
SL10	2/1	7.5	837	212
SL10	2/1	25	1037	212

1) The values are subject to change, to be confirmed later.

Technical characteristics	
Textile material	Polyester 1100 denier
Fabric	TER 630
Weight	630 g/m^2

Technical characteristics	
Breaking	230/210 daN / 5 cm
Tear	22/17 daN
Standard	DIN 53363
Color	Black

4.7 Hooks and hook blocks of the chain hoist

4.7.1 Standard hook

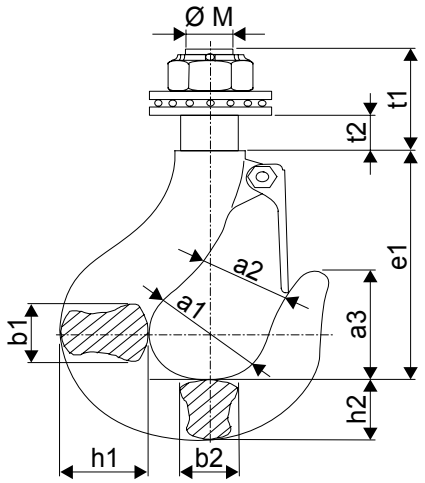


Figure 30. Dimensions of the standard hook; SR01, SL05-SL10

The standard hook of the chain hoist is designed according to the requirements of DIN15401. The material of the hook is 34 CrMo 4.

Frame size	Falls	Hook size [RSN]	Dimensions [mm]										
			M [Ø]	a_1	a_2 [1)]	a_3	b_1	b_2	e_1	h_1	h_2	t_1	t_2
SR01	**1/1**	012T	12	30	22	34	19	15	73	22	19	28.5	10.5
	2/1	012T	12	30	22	34	19	15	73	22	19	28.5	10.5
SL05	**1/1**	020T	16	34	25	39	21	18	84	26	22	36	13.5
SL10	**1/1**	05V	20	43	32	49	29	24	105	37	31	39	14.5
	2/1	08V	20	48	36	54	35	29	116	44	37	43	14.5

1) The dimension a_2 is given with the hook latch opened.

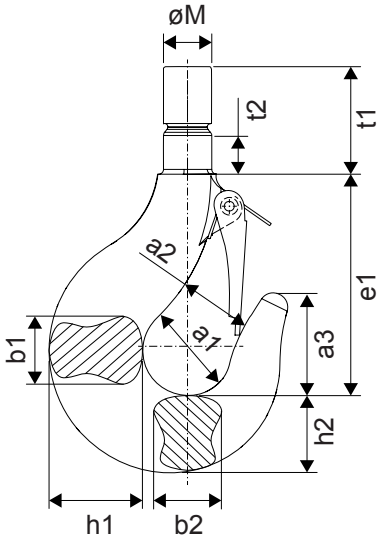


Figure 31. Dimensions of the standard hook, SR25

Frame size	Falls	Hook size [RSN]	Dimensions [mm]										
			M [Ø]	a_1	a_2 [1)]	a_3	b_1	b_2	e_1	h_1	h_2	t_1	t_2
SR25	1/1	08V	24	48	35	54	35	29	116	44	37	55	20.5
	2/1	1.6V	30	56	43	64	45	38	138	56	48	67	24.5

[1)] The dimension a_2 is given with the hook latch opened.

4.7.2 Safety hook (option)

The safety hook is a self-locking version of the hook. It is available as an option.

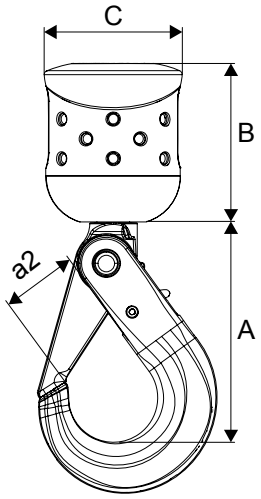


Figure 32. Dimensions of the 1-fall safety hook and hook block

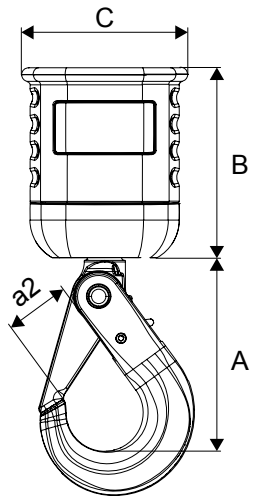


Figure 33. Dimensions of the 2-fall safety hook and hook block

Frame size	Falls	Hook type	Dimensions [mm]				Influence to C-dimension [+mm]
			L	B	G	H	
SL05	**1/1**	BKT 7/8-10	112	36	80	70	27
SL10	**1/1**	BKT 7/8-10	112	36	97	82	7
	2/1	BKT 13-10	172	44	160	126	56

4.7.3 Single fall hook blocks

The material of the hook block rubber part is Santoprene-8221.65.

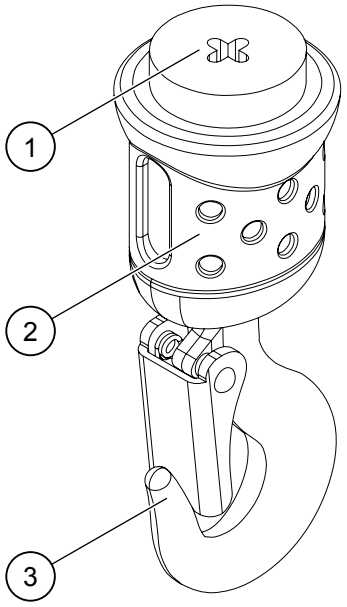


Figure 34. Single fall hook block, SR01

1. Limit switch activator
2. Grip area
3. Turnable hook with safety latch, axial needle bearings

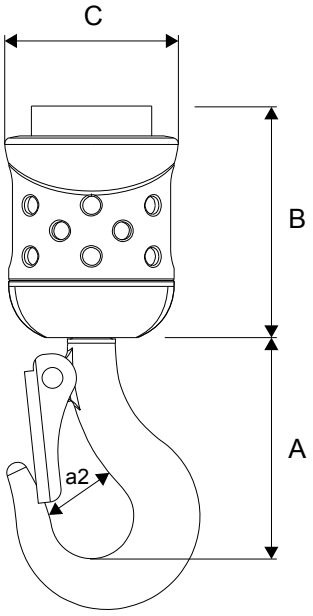


Figure 35. Dimensions of the single fall hook block, SR01

Frame size	Reeving	Dimensions [mm]			
		A	B	C	a_2 [1)]
SR01	1/1	73	77.5	55	22
[1)] The dimension a_2 is given with the hook latch opened.					

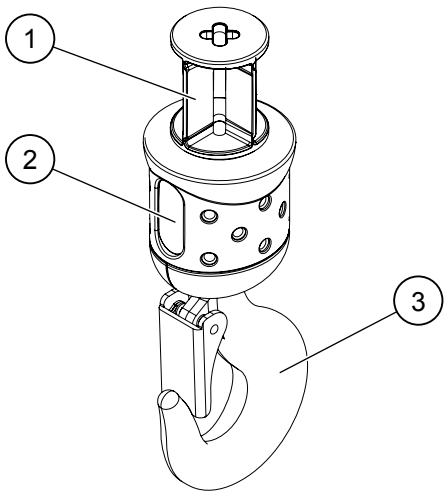


Figure 36. Single fall hook block, SL05-SL10

1. Limit switch activator
2. Grip area
3. Turnable hook with safety latch, axial needle bearings

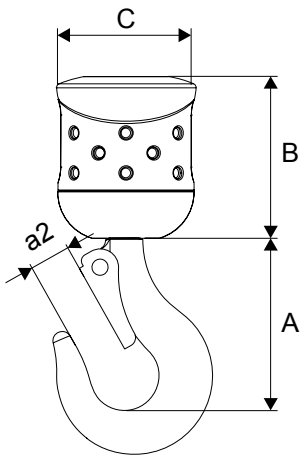


Figure 37. Dimensions of the single fall hook block, SL05-SL10

Frame size	Reeving	Dimensions [mm]			
		A	B	C	a_2 [1)]
SL05	1/1	84	116.5	72	17
SL10	1/1	105.5	115	92	20
[1)] The dimension a_2 is given with the hook latch opened.					

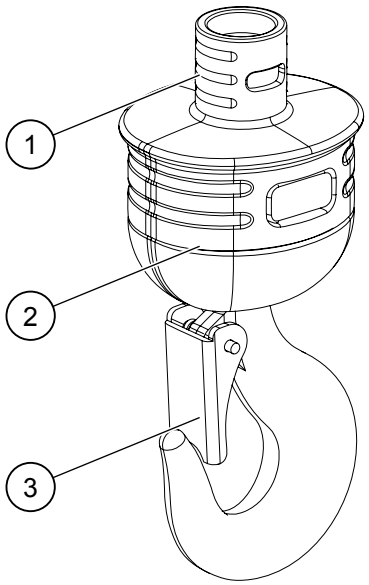


Figure 38. Single fall hook block, SR25

1. Limit switch activator
2. Grip area
3. Turnable hook with safety latch, axial needle bearings

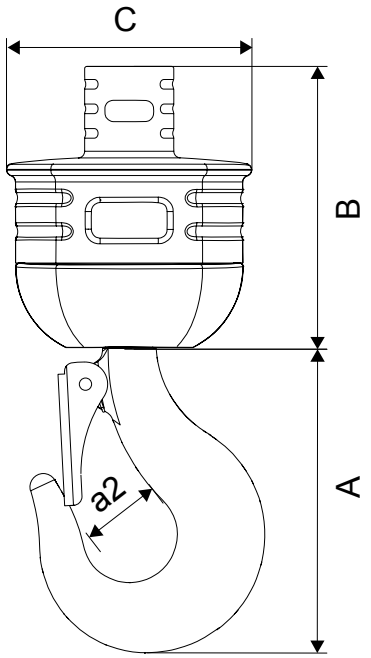


Figure 39. Dimensions of the single fall hook block, SR25

Frame size	Reeving	Dimensions [mm]			
		A	B	C	a_2 [1)]
SR25	1/1	155.5	140	120	48
[1)] The dimension a_2 is given with the hook latch opened.					

4.7.4 Two-fall hook blocks

The material of the rubber part of the hook block is Santoprene-8221.65.

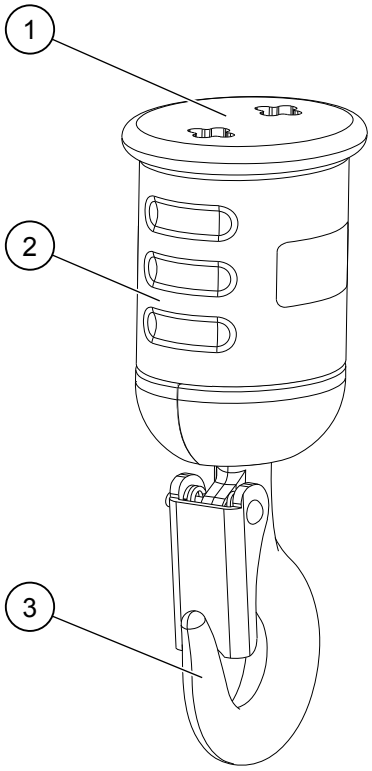


Figure 40. Two-fall hook block, SR01

1. Switch off spring
2. Grip area
3. Turnable hook with safety latch, axial needle bearings

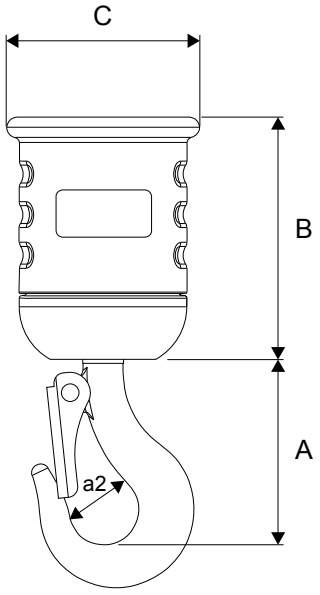


Figure 41. Dimensions of the two-fall hook block, SR01

Frame size	Reeving	Dimensions [mm]			
		A	B	C	a_2 [1)]
SR01	2/1	73	96	76	22

[1)] The dimension a_2 is given with the hook latch opened.

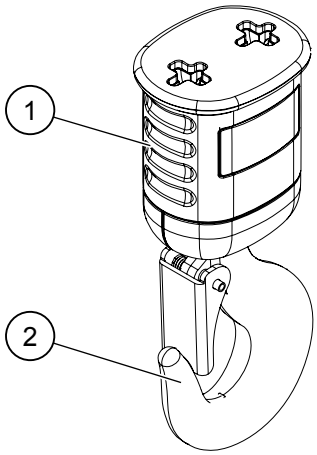


Figure 42. Two-fall hook block, SL10

1. Grip area
2. Turnable hook with safety latch, axial needle bearings

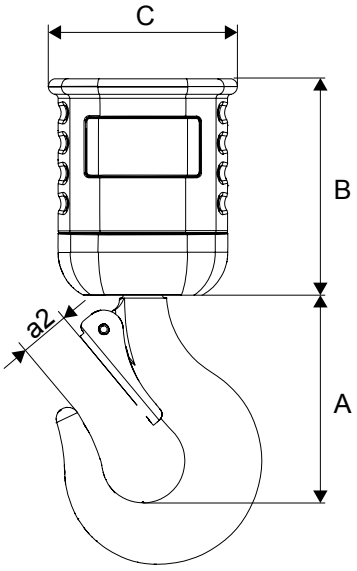


Figure 43. Dimensions of the two-fall hook block, SL10

Frame size	Reeving	Dimensions [mm]			
		A	B	C	a_2 [1)]
SL10	2/1	117	160	126	25
[1)] The dimension a_2 is given with the hook latch opened.					

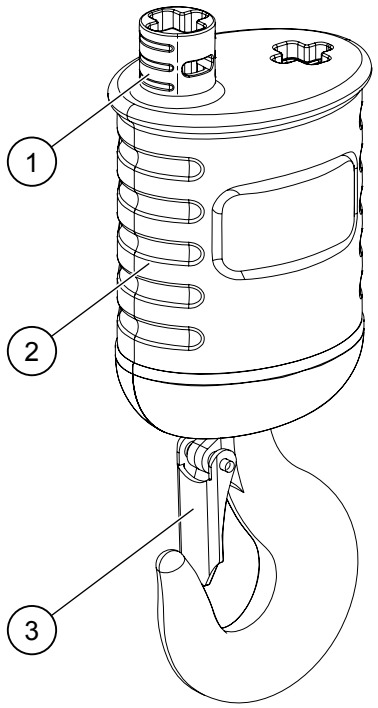


Figure 44. Two-fall hook block, SR25

1. Limit switch activator
2. Grip area
3. Turnable hook with safety latch, axial needle bearings

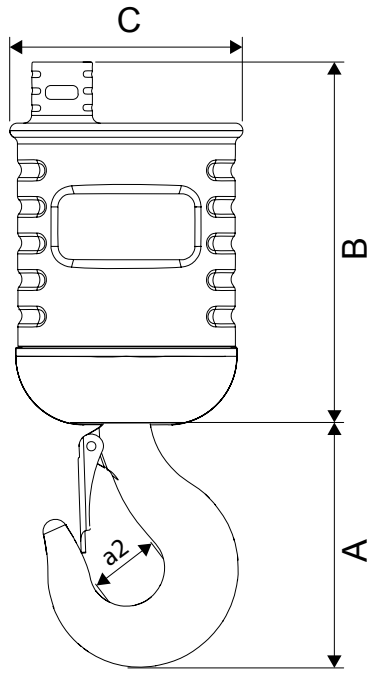


Figure 45. Dimensions of the two-fall hook block, SR25

Frame size	Reeving	Dimensions [mm]			
		A	B	C	a_2 1)
SR25	2/1	186.5	270	176	55.6
1) The dimension a_2 is given with the hook latch opened.					

4.8 Limit switch

4.8.1 Rotating geared limit switch (GLS)

The rotating geared limit switch is available as a 2- or 4-step version in the chain hoist configuration B.

The rotating geared limit switch is either an optional feature (SL05-SL10, SR25) or a standard feature (SR25) in the Stagemaker chain hoists. For the SL05-SL10, the GLS is available as an optional feature (2- or 4-step version). For the SR25, the GLS is available as a standard feature (2-step version) or as an optional feature (4-step version).

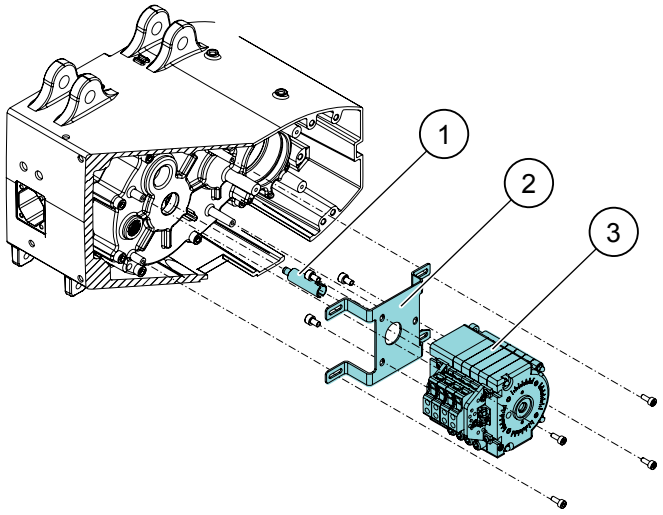


Figure 46. 4-step rotating geared limit switch, SL05-SL10

1. Coupling
2. Fixing plate
3. Rotating geared limit switch

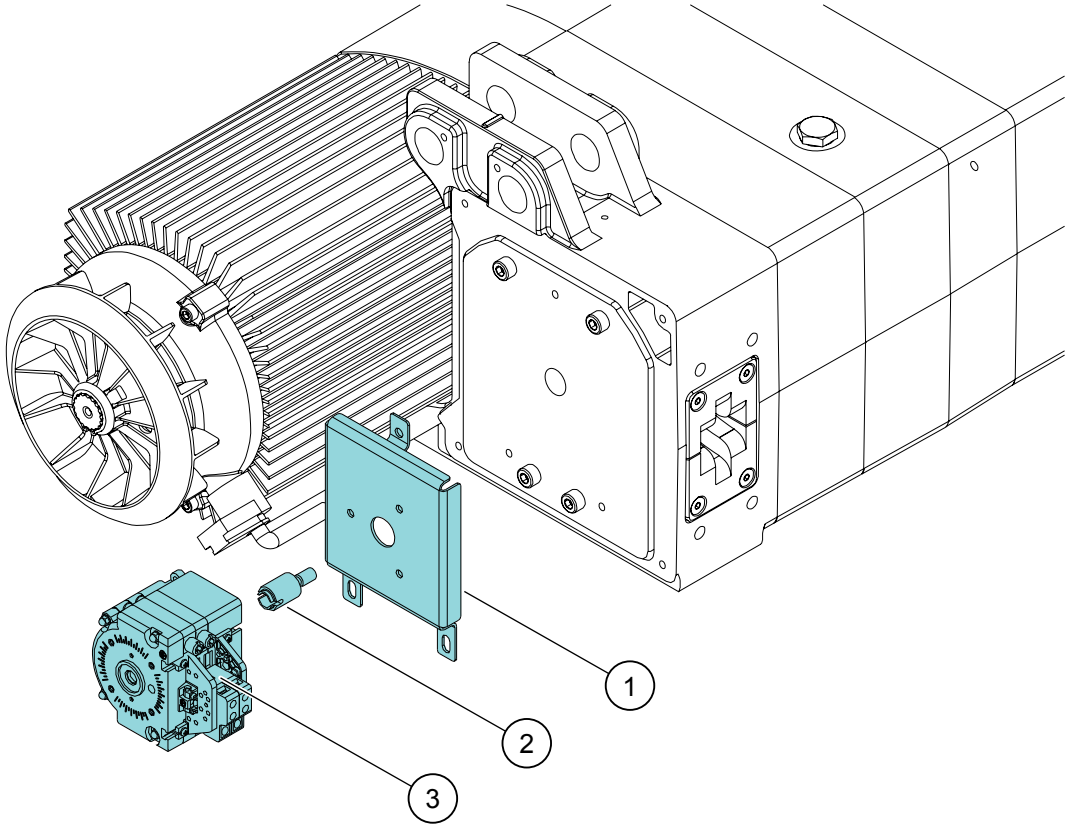


Figure 47. 2-step rotating geared limit switch, SR25

1. Fixing plate
2. Coupling
3. Rotating geared limit switch

4.8.1.1 Rotating geared limit switch types

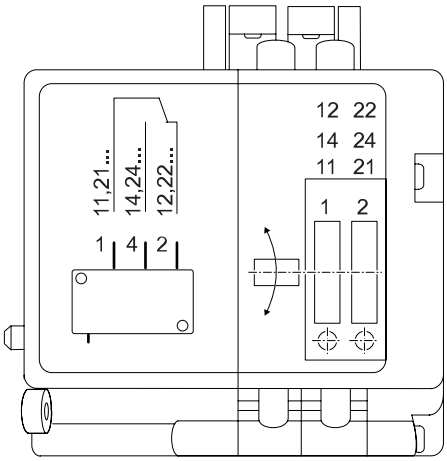


Figure 48. 2-step rotating geared limit switch

The 2-step rotating geared limit switch works together with the internal controls as an adjustable upper and lower stop limit. It is mechanically connected to the hoisting gear and counts the revolutions of the chain sprocket. The internal gear ratio of the geared limit switch must be designed according to the total stroke of the chain hoist.

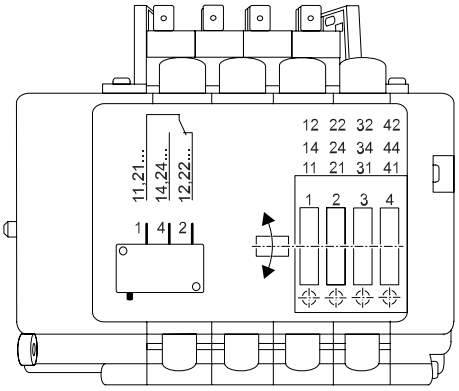


Figure 49. 4-step rotating geared limit switch

The 4-step rotating geared limit switch has a similar operating function as the 2-step geared limit switch, but provides four separately adjustable switching units. There are several configuration possibilities for this feature, but the configuration 1 (see table 4-step geared limit switch) is the standard configuration.

4.8.1.2 Rotating geared limit switch configurations

2-step geared limit switch

Config.	GLS type	Description	Switch unit
1	**2-step GLS + microswitch 1), 2)**	Limit switch safety UP stop	Switch X3A 3)
		Limit switch safety DOWN stop	Switch X4A 3)
		Limit switch working UP stop	GLS UP 1
		Limit switch working DOWN stop	GLS DOWN 1
2	**2-step GLS + microswitch**	Limit switch UP stop	Switch X3A 3)
		Limit switch DOWN stop	Switch X4A 3)
		Slow speed UP	GLS UP 1
		Slow speed DOWN	GLS DOWN 1
1) Standard configuration.			
2) Only for chain hoist frame sizes SL05-SL10.			
3) The switches X3A and X4A are electro-mechanical limit switches that are installed on the chain guide. They are activated mechanically when touched by the buffer of the hook.			

4-step geared limit switch

Config.	GLS type	Description	Switch unit
1	4-step GLS + microswitch 1), 2)	Limit switch safety UP stop	Switch X3A 3)
		Limit switch safety DOWN stop	Switch X4A 3)
		Limit switch working UP stop	GLS UP 1
		Limit switch working DOWN stop	GLS DOWN 1
		Slow speed UP	GLS UP 2
		Slow speed DOWN	GLS DOWN 2
2	4-step GLS + microswitch	Limit switch safety UP stop	Switch X3A 3)
		Limit switch safety DOWN stop	Switch X4A 3)
		Limit switch working UP stop	GLS UP 1
		Limit switch working DOWN stop	GLS DOWN 1
		Free for customer use	GLS UP 2
		Free for customer use	GLS DOWN 2
3	4-step GLS + microswitch	Limit switch UP stop	Switch X3A 3)
		Limit switch DOWN stop	Switch X4A 3)
		Slow speed UP	GLS UP 1
		Slow speed DOWN	GLS DOWN 1
		Free for customer use	GLS UP 2
		Free for customer use	GLS DOWN 2
1) Standard configuration.			
2) Only for chain hoist frame sizes SL05-SL10.			
3) The switches X3A and X4A are electro-mechanical limit switches that are installed on the chain guide. They are activated mechanically when touched by the buffer of the hook.			

4.8.1.3 Functional description of the rotating geared limit switch

If the hoist is equipped with a rotating geared limit switch, adjust the cutting points (upper and lower limits) of the geared limit switch before starting to operate the hoist. Instructions on how to set the limits in the different geared limit switch configurations can be found on a sticker. The sticker is placed on the hoist profile, next to the geared limit switch adjustment holes.

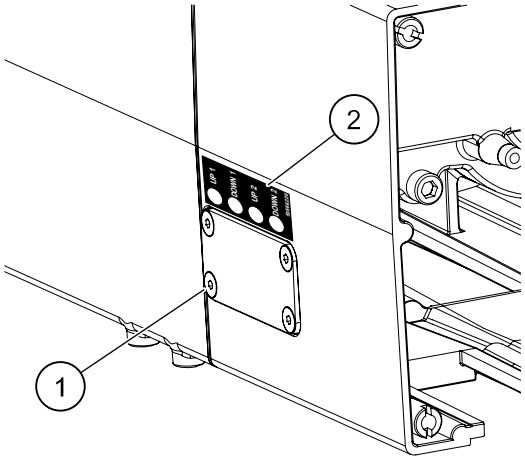


Figure 50. Location of the cover plate and adjustment sticker of the GLS on the hoist profile

1. Cover plate
2. Sticker for GLS adjustment instructions

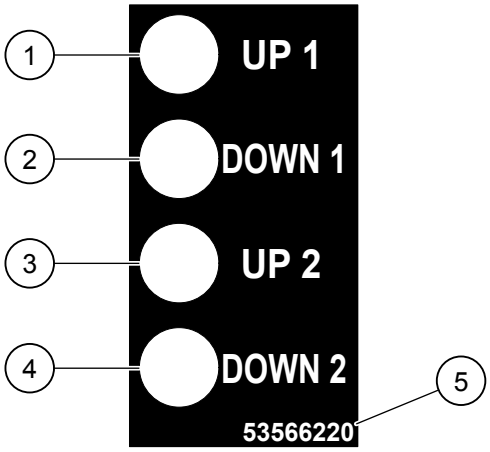


Figure 51. Sticker for GLS adjustment (example of a 4-step GLS)

1. Upper (UP) limit 1
2. Lower (DOWN) limit 1
3. Upper (UP) limit 2
4. Lower (DOWN) limit 2
5. Identification number

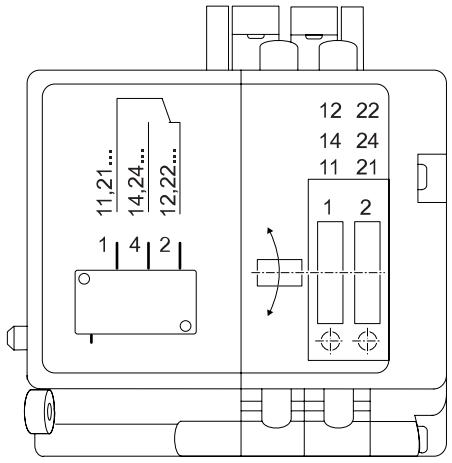


Figure 52. 2-step rotating geared limit switch

The set screw 1 is the upper limit and the set screw 2 is the lower limit.

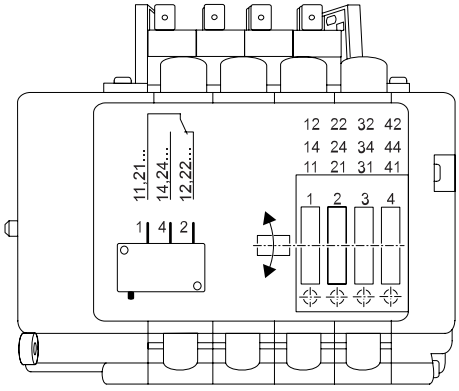


Figure 53. 4-step rotating geared limit switch

The set screw 1 is the upper limit 1 and the set screw 2 is the lower limit 1.

The set screw 3 is the upper limit 2 and the set screw 4 is the lower limit 2.

4.8.1.4 Rotating geared limit switch operational limits

The operational limits for a standard rotating limit switch are shown in the following table.

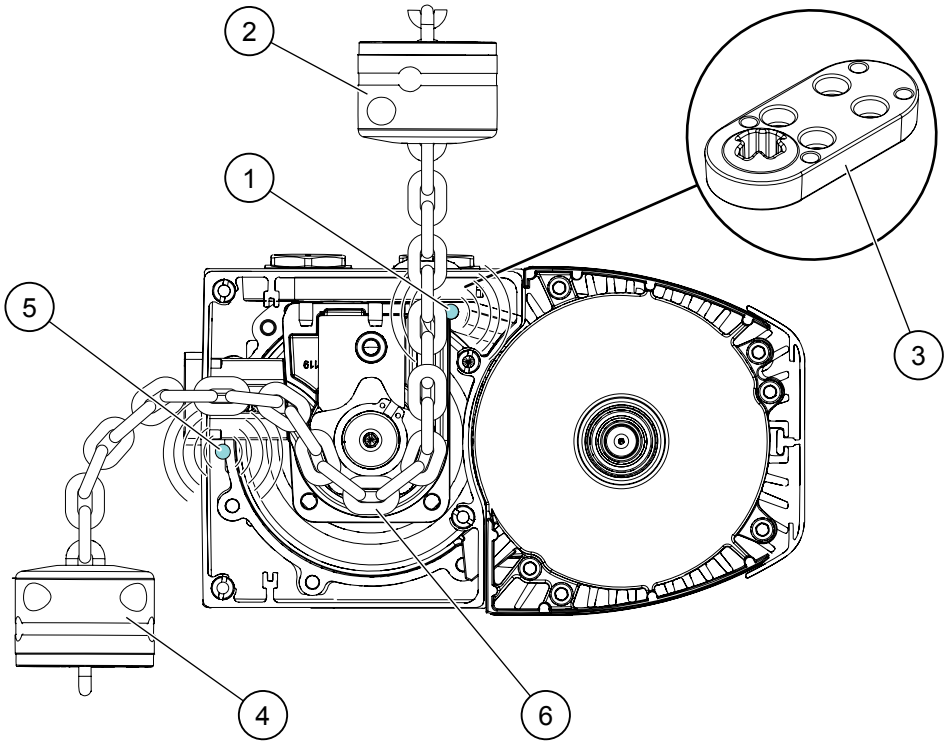
Frame size	Chain	Max. HOL [m]			
		Ratio 180		Ratio 280	
		1-fall	2-fall	1-fall	2-fall
SL05	5.1 x 15.1	25	NA	40	NA
SL10	7.2 x 21.1	36	18	56	28
SR25	11.3 x 31	55	22.5	86	43

Higher lifting heights are available on request. A higher lifting height can increase the length of the chain hoist. Also the standard chain bag size is limited to the standard lifting height.

For the frame sizes SL05–SL10, the length of the chain hoist increases in chain hoist configurations that have a 4-step geared limit switch and a bigger gear ratio.

4.8.2 Magnetic limit switch (MLS)

The magnetic limit switch is available as a standard feature for the frame sizes SL05-SL10, configuration B. The magnetic limit switch feature is only possible for 1-fall chain hoists with a lifting speed of maximum 8 m/min.



1. Magnetic sensor for upper limit switch
2. Upper setting ring
3. Input chain guide
4. Lower setting ring
5. Magnetic sensor for lower limit switch
6. Chain flux MKII

4.8.2.1 Functional description of the magnetic limit switch

The operation of the magnetic limit switch is based on an adjustable upper and lower stop limit that are activated by a magnet. The limit positions (upper and lower hook positions) are set by using setting rings which contain a magnet. The setting rings are placed along the chain. To adjust the limits, the rings can be slid along the chain manually.

The magnetic limit switch feature consists of:

- an upper and lower limit switch (magnetic sensors)
- upper and lower setting rings (containing chain lockers)
- an additional input chain guide (chain entry).

The chain entry prevents the chain from twisting at the entrance of the chain guide. It also protects the upper limit switch from external damage.

The magnetic limit switch feature is only available for lifting speeds of up to maximum 8 m/min. Chain hoist configurations with a faster lifting speed are delivered with a geared limit switch. The magnetic limit switch feature is not available for the 2-fall chain hoists. The magnetic limit switch can be used in both positions of the chain hoist, in the ‘body up’ (industrial) or ‘body down’ (inverted) position. The magnetic limit switch is available also for chain hoist configurations with low control voltage.

4.9 Extension profile

The following optional features extend the hoist length through an extension profile part on the hoist frame:

- Double brake
- Geared limit switch (+ double brake).

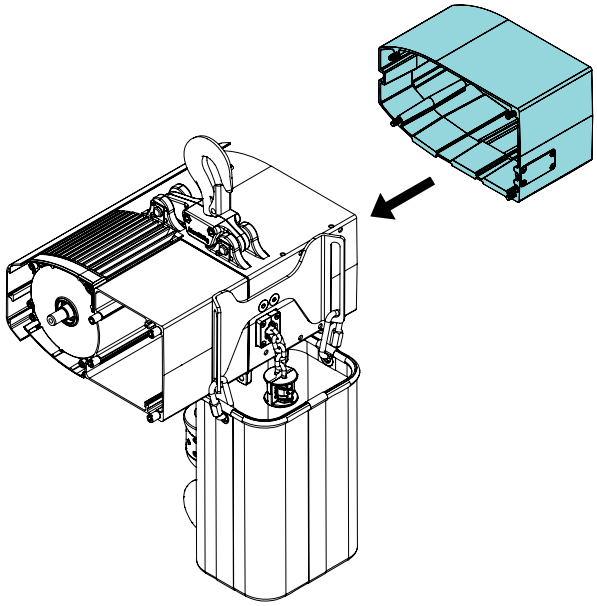


Figure 54. SL chain hoist with extension profile

Frame size	Extension profile [mm]
SR01	37
SL05	30
SL10	52
SR25	112

5 ELECTRICS OF THE CHAIN HOIST

5.1 Cable gland positions on the chain hoist

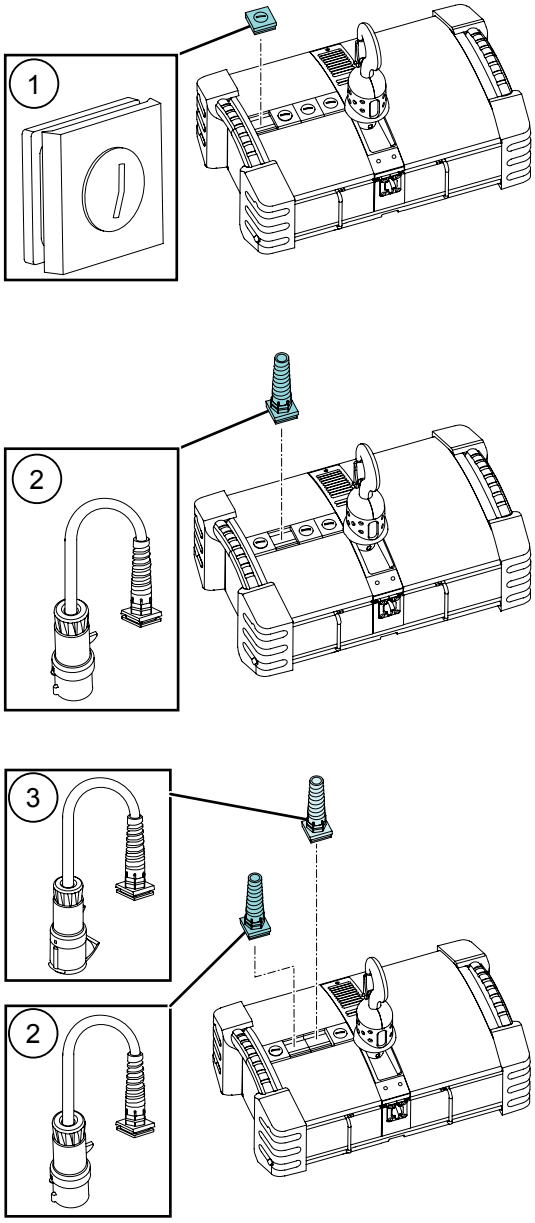


Figure 55. Cable gland positions of the chain hoist configurations A and B; SR01, SR25

1. Free cable gland
2. Power supply cable
3. Pendant / control cable

The size (class) of the cable gland is M25.

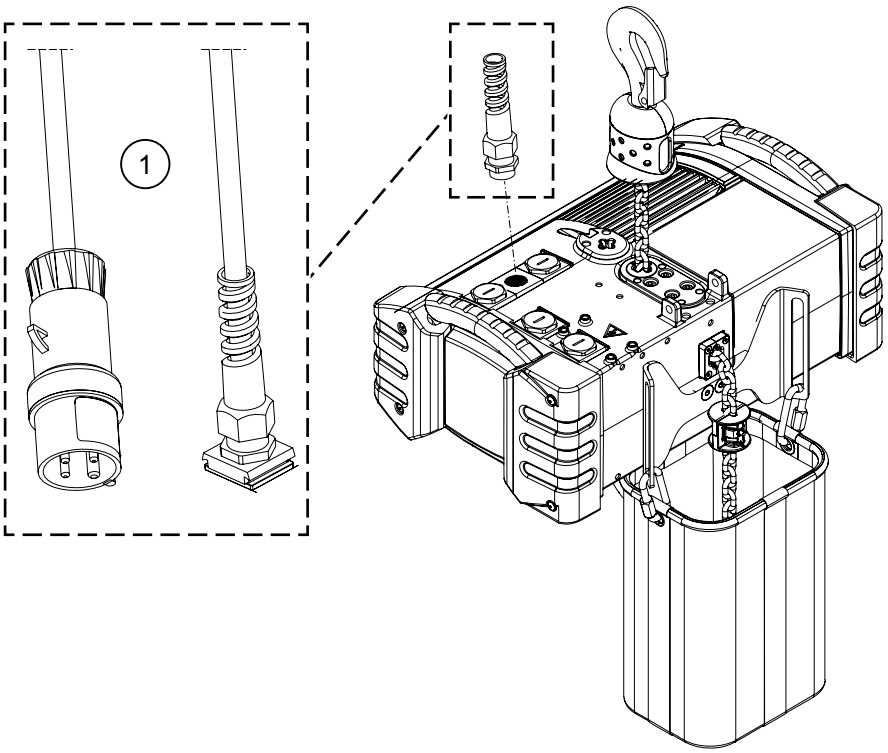


Figure 56. Cable gland positions of the chain hoist configuration A, SL05-SL10

1. Power supply

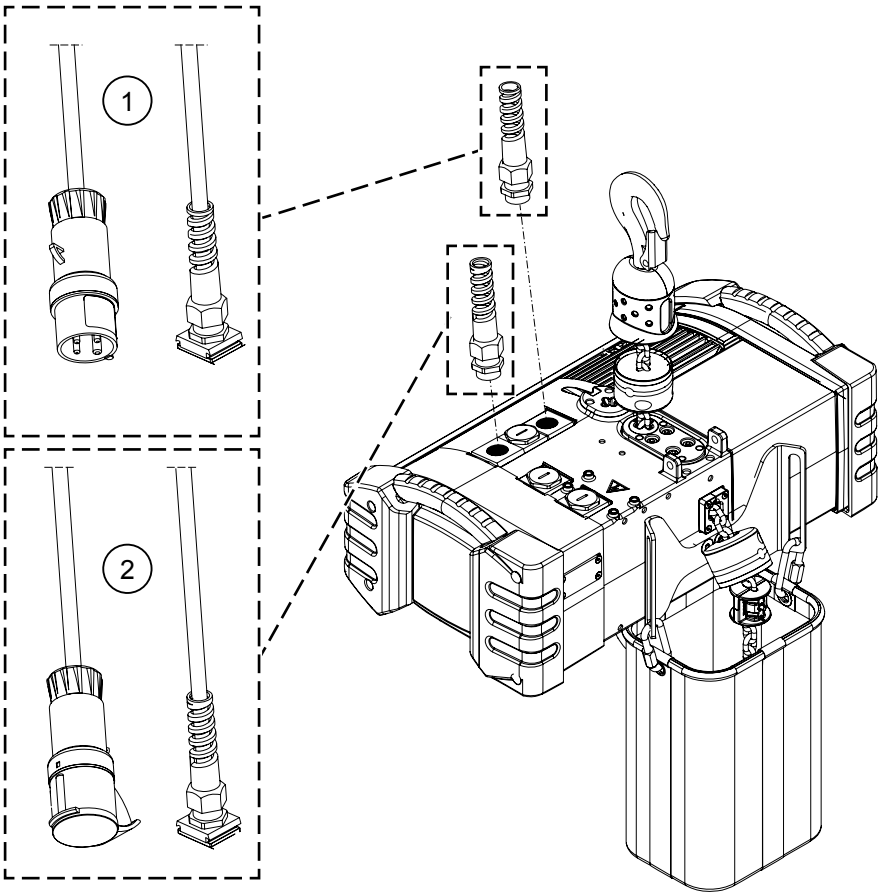


Figure 57. Cable gland positions of the chain hoist configuration B, SL05-SL10

1. Power supply
2. Control cable

5.2 Wiring principle - Configuration A

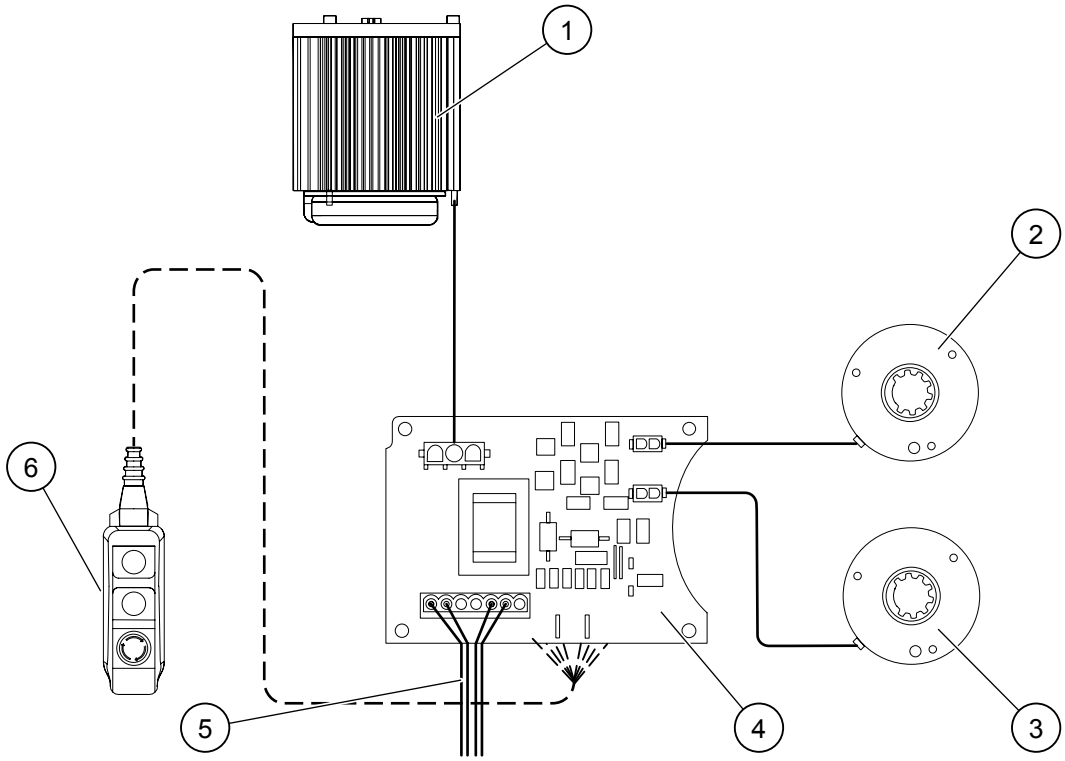


Figure 58. Wiring principle for electrical configuration A; SR01, SR25, SL05-SL10

1. Motor
2. Secondary brake
3. Main brake
4. Direct control voltage board
5. Power supply
6. Pendant (optional) [1)]

[1)] Not available in North America for the direct control chain hoist.

5.3 Wiring principle - Configuration B

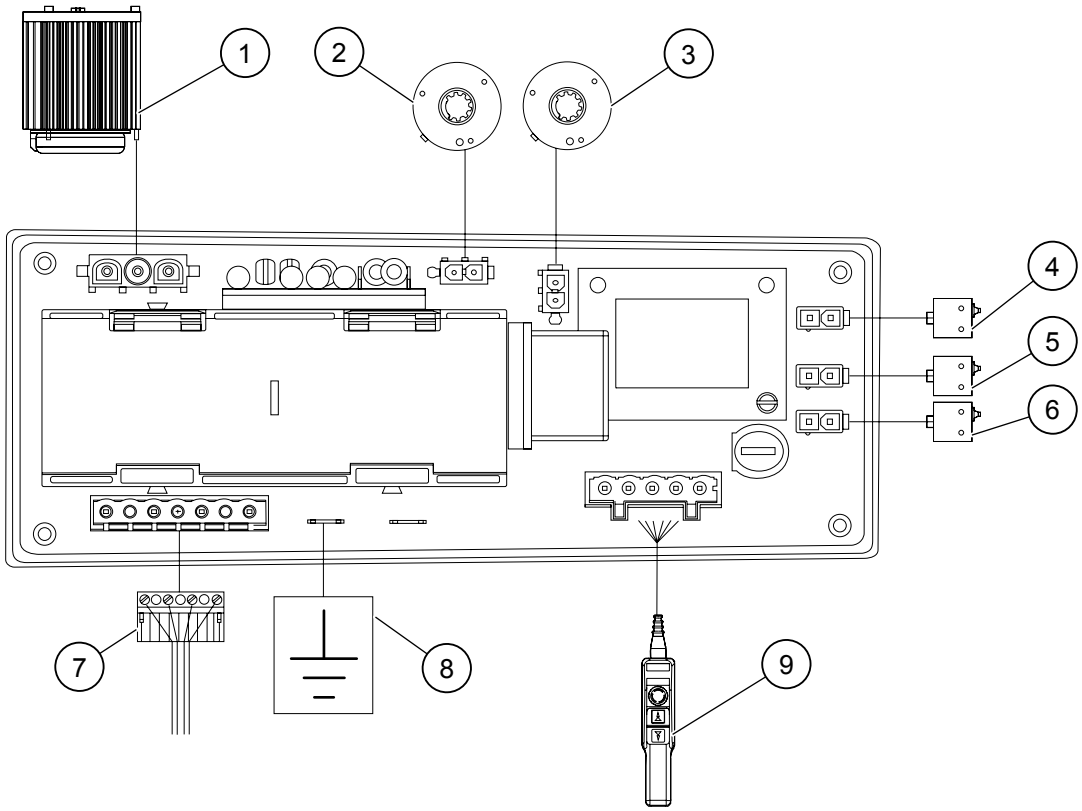


Figure 59. Wiring principle for electrical configuration B, SR01

1. Motor
2. Secondary brake
3. Main brake
4. Limit switch down
5. Thermal sensor
6. Limit switch up
7. Power supply
8. Grounding
9. Pendant / control plug

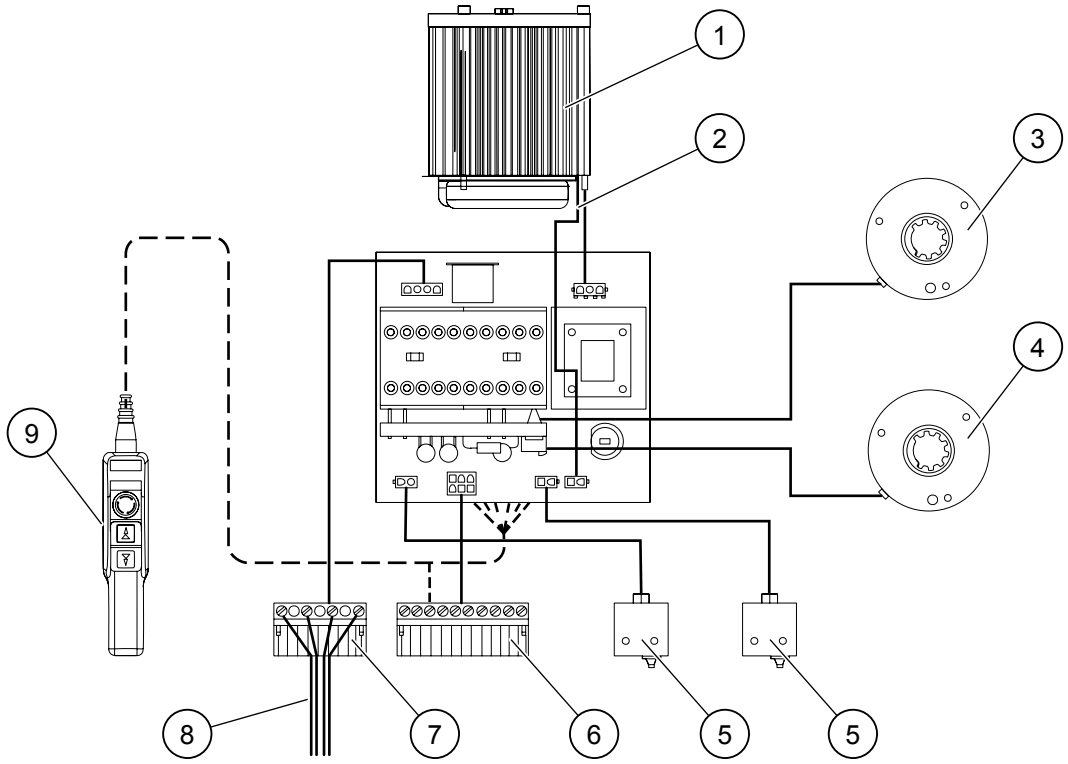


Figure 60. Wiring principle for electrical configuration B, SL05-SL10

1. Motor
2. Thermal sensor
3. Main brake
4. Secondary brake
5. Limit switches
6. Control plug
7. Power plug
8. Power supply
9. Pendant

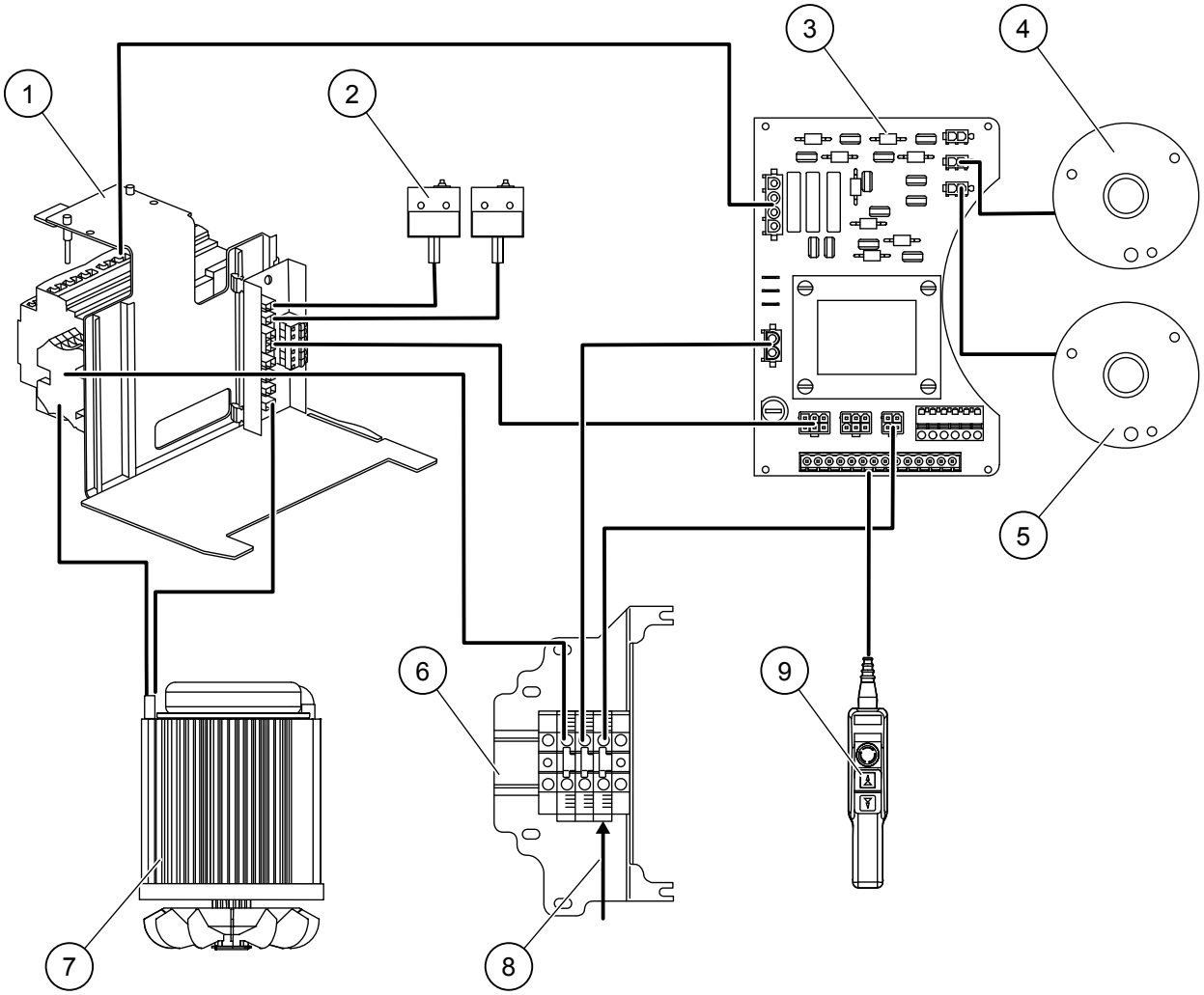


Figure 61. Wiring principle for electrical configuration B, SR25

1. Motor board
2. Limit switches
3. Power board
4. Main brake
5. Secondary brake
6. Pendant
7. Main power supply
8. Terminals
9. Motor