STAGEMAKER SR TECHNICAL GUIDE

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60 Hz Imperial Units

50 Hz Metric Units

Issue Date: 04/2016

R&M MATERIALS HANDLING INC.

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GENERAL

1.1 General description

STAGEMAKER® hoists for show business are electric chain hoists that are designed to handle stage and theatrical equipment and enable the safe and accurate positioning of speakers, lighting systems, stage sets, sceneries, etc.

STAGEMAKER® hoist's features and options, compact design and on-going adaptability (R&D, close corporation with the entertainment industry), make this system the best choice for your stage productions.

STAGEMAKER® hoists are designed for lifting and transporting of materials only. Under no conditions or cirmcumstances, either during initial installation or in regular use, are hoists to be used for lifting or transporting of personnel. For additional safety, precautions such as redundant systems, safety lines from load to structure or enhanced safety features such as the BGV-C1 hoist can be used.

STAGEMAKER® hoists are offered in many configurations, each with its own control type and hoist features.

- **Configuration A:** Utilizes three-phase direct motor control for easier setup and cabling. The hoist is equipped for mobile installations so it can be mounted in the normal or inverted position. A direct motor control hoist in the inverted position is best suited for temporary or short-term setups. Full line voltage controller furnished separately.

- **Configuration B**: Utilizes three-phase power and low voltage control. The hoist (SR01, SR02, SR05, SR10) is equipped for mobile installations so it can be mounted in the inverted or normal position, but the hoist (SR01, SR02, SR05, SR10) can also be used in the normal position of fixed applications. Controller furnished separately. A pendant (pickle), which is used during stage setup, can be connected directly to the low voltage hoist control.

1.2 Mounting positions

1.2.1 Normal position

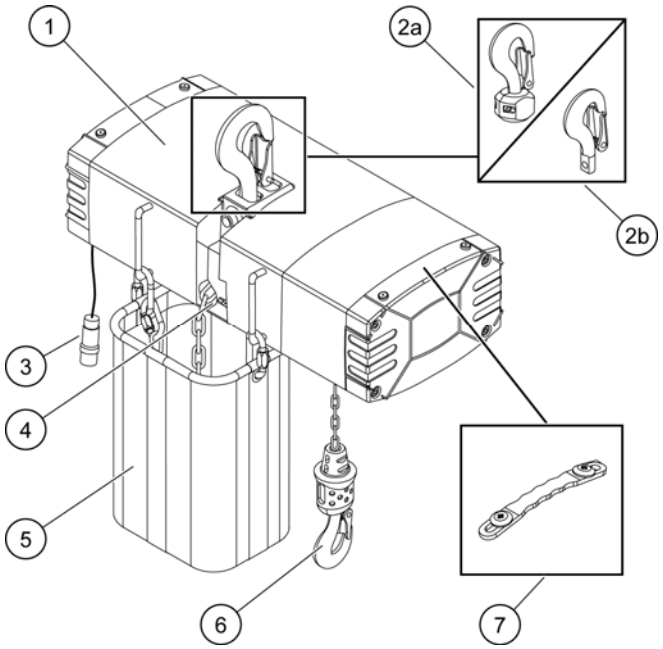
Normal position is where the hoist is mounted with load chain down and hoist body up. The load block attaches to the load and moves up and down. The hoist body is stationary.

1.2.2 Inverted position

Inverted position is where the hoist is mounted with load chain up and hoist body down. The hoist body attaches to the load and moves up and down with the load. The hoist body moves.

1.3 Identifying the key parts of the hoist

SR01



Pos.	Part	Description
1	Hoisting machinery	Equipment composed of hoist frame, hoisting motor, gear, clutch, and brake
2a	Upper hook (rotating)	Rotating upper hook, normally used when hoist is operated in inverted position
2b	Upper hook (fixed)	Fixed suspension, normally used when hoist is operated in normal position
3	Control cable + plug	Plug for connecting power or controls to the hoist
4	Chain guide	Chainflux type chain guide for precise chain alignment
5	Chain bag	A bag made of textile material where the lifting chain is gathered and stored
6	Hook block	Hook Includes hook housing, hook forging, and a rubber grip
7	Handles (optional)	Removable handles for easy carrying of the hoist

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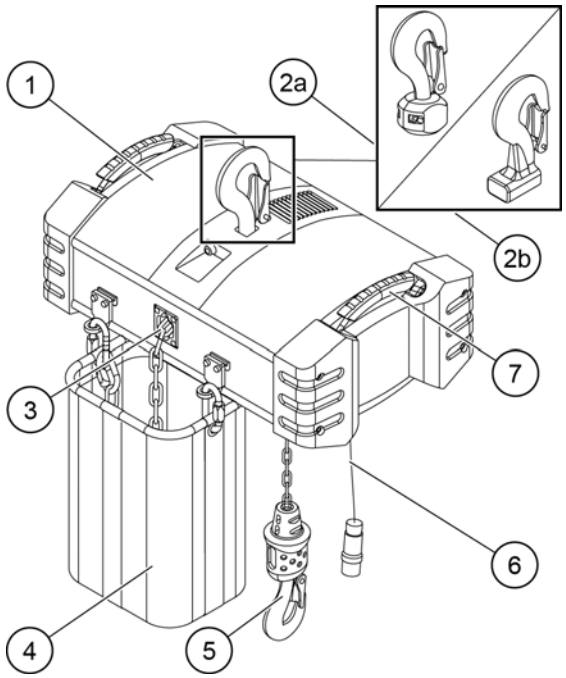
SR02–SR10



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4	Chain bag	A bag made of textile material where the lifting chain is gathered and stored
5	Hook block	Hook Includes hook housing, hook forging, and a rubber grip
6	Control cable + plug	Plug for connecting power or controls to the hoist
7	Handles	Integrated handles for easy carrying of the hoist

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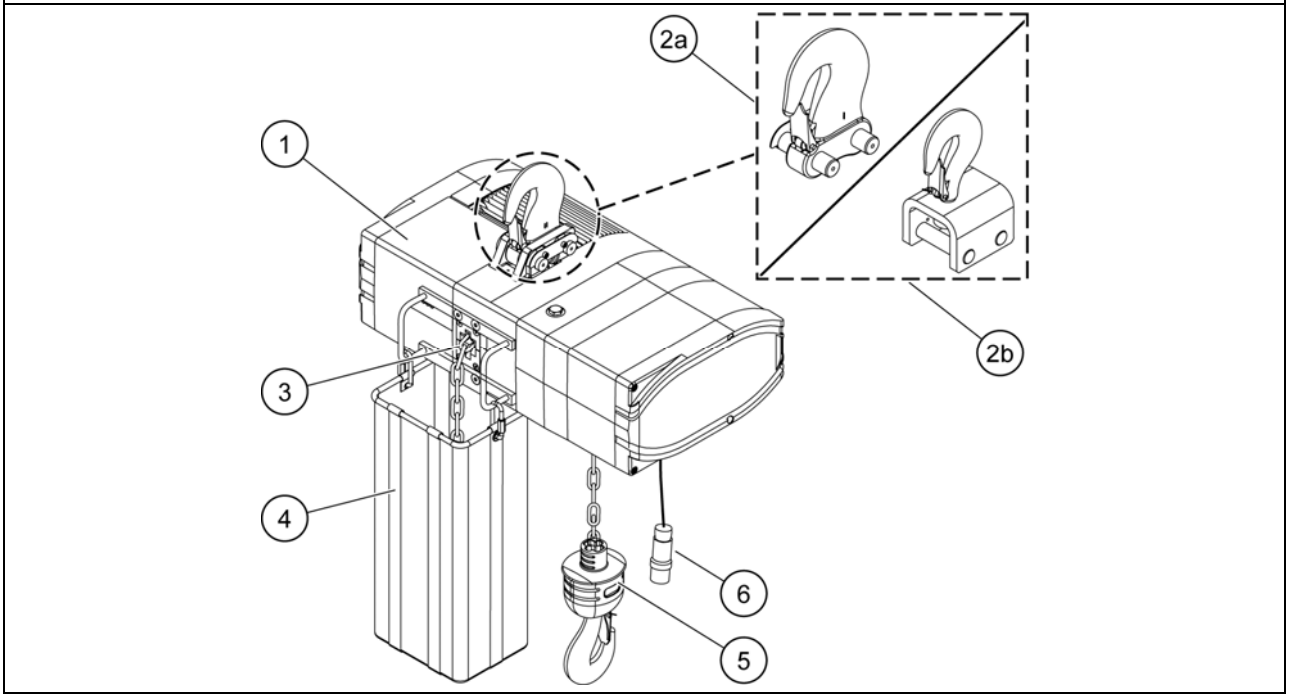
SR25



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5	Hook block	Hook Includes hook housing, hook forging, and a rubber grip
6	Control cable + plug	Plug for connecting power or controls to the hoist

1.4 Standard features

Common Mechanics

- Single fall up to 5000 lbs (2500 kg)
- Two fall at 10000 lbs (5000 kg)
- Mechanical overload device (slipping clutch)
- Single disc brake is located after the motor and the clutch, on a separate load path. It's directly linked to the load and will hold the load even in case of motor or clutch failure.
- Two or three step helical gear
- Operation temperature -4°F to 104°F (-20°C to +40°C) with rated load and speed
- Hoist body has epoxy powder 70µm thickness paint (dark grey), C2 according to EN12944-2 and EN12944-5
- DIN type rotating upper and lower hook
- Maximum relative humidity 90%
- Maximum altitude 3280 ft. (1000m)
- Chain bag
- Chainflux chain guide
    - contains drain hole, the purpose of which is to avoid water collection in load wheel compartment
- Inverted position – hoist body down

SR01

- Grade 80 blued black load chain

SR02-SR10

- Sprocket on output shaft in cantilever position
- Grade 80 blued black load chain
- Rubber buffer on the hoist body
- Integrated handles

SR25

- Sprocket on output shaft in cantilever position
- Grade 80 electro-galvanized load chain

Common Electrics

- 208/230V – 3 Ph (60 Hz) or 380V – 3 Ph (50 Hz)
- Single speed motors
- Motor protection class IP55, tropical impregnation
- Motors are TENV type with insulation class F
- IP55 / NEMA 3R protection
- NO pigtail or plugs for power and/or control

Configuration A Electrics

- Electrics on direct control printed circuit board (PCB)
- One round cable gland

Configuration B Electrics

- Low voltage control 48 VAC (50 Hz) or 115 VAC (60 Hz)
- Motor thermal protection
- Electrics on one main printed circuit board (PCB)
- Upper and lower electrical limit switches
- Two round cable glands

1.5 Optional features

Mechanics

- Second brake
- BGV-D8+ (second brake + static safety factor 10)
- Manual brake release
- Additional chain stop
- Hook block with safety load hook, self locking (not available for SR25)
- Lockable rotation of load hook (lockable in 60° increments)
- Soft rain cover. Hoist can be operated with rain cover fitted.
- Normal position – hoist body up

Electrics

- Alternate voltages/power supplies
- See section 3.6 for limit switch options.

1.6 Sound level

The sound intensity level was tested with a 1500 rpm motor, 16 ft/min (4 m/min) according to ISO11210 and the EN14492-2.

SR01-SR10

- Noise level of the hoist: the sound intensity level measured 56 dB

SR25

- Noise level of the hoist: the sound intensity level measured 70 dB

1.7 Certifications, standards and other technical documents

- The product fulfills the requirements of the following standards: Machine directive EC; CSA (60Hz 115VAC models only); ASME HST-1 (where applicable); and ASME B30.16 (where applicabale), 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 external sound level tested.
- is RoHS compliant.
- has GOST approval.**
- is built with mechanics that are compatible with D8, D8+ requirements.
- (60 Hz 115 VAC) is applicable with the requirements of the

  CSA Standard C22.2 No. 33 – Construction and Test of Electric Cranes and Hoists**

  UL 508 – Industrial Control Equipment

  UL1004-1 – Rotating Electrical Machines – General Requirements

**NOTE: Not valid for the SR25.

1.8 Product range

60 Hz Information

Load [ton]	Frame size	Falls	Duty group ASME	Chain size	Gear life [h]*	Motor type	Motor power [Hp]	Hoisting speed [ft/min.]	Max. amb. temp [°F]	ED%**	Starts/ hour**
¼	01	1	H3	4 x 11	400	MT06CA200	0.3	16	104	25	150
	02	1	H4	4 x 11	1600	MT07CA200	0.4	16	104	50	300
	02	1	H3	4 x 11	800	MT07CA104	0.7	32	104	25	150
	05	1	H4	5 x 14	800	MT08CA106	1.5	64	104	50	300
½	01	2	H3	4 x 11	400	MT06CA200	0.3	8	104	25	150
	05	1	H4	5 x 14	1600	MT08CA200	0.7	16	104	50	300
	05	1	H3	5 x 14	800	MT08CA106	1.5	32	104	25	150
	10	1	H4	7 x 20	800	MT10CA106	3	64	104	50	300
1	10	1	H4	7 x 20	800	MT10CA200	1.5	16	104	50	300
	10	1	H4	7 x 20	800	MT10CA106	3	32	104	50	300
1 ½	10	2	H4	7 x 20	800	MT10CA106	3	16	104	50	300
2	10	2	H4	7 x 20	800	MT10CA106	3	16	104	50	300
2 ½	25	1	H3	11.3 x 31	1600	MT10CC200	3	16	104	25	150
	25	1	H3	11.3 x 31	800	MT10CC106	5.8	32	104	25	150
5	25	2	H3	11.3 x 31	400	MT10CC106	5.8	16	104	25	150

*NOTE: Calculation based on ISO classification.

**NOTE: Calculation based on ISO classification with full load.

50 Hz Information

Load [kg]	Frame size	Falls	Duty group ISO	Chain size	Gear life [h]	Motor type	Motor power [kW]	Hoisting speed [m/min.]	Max. amb. temp [°C]	ED%	Starts/hour
250	01	1	M3	4 x 11	400	MT06CA200	0.2	4	+40	25	150
	02	1	M5	4 x 11	1600	MT07CA200	0.23	4	+40	40	240
	02	1	M4	4 x 11	800	MT07CA104	0.45	8	+40	30	180
	05	1	M4	5 x 14	800	MT08CA106	0.9	16	+40	30	180
500	01	2	M3	4 x 11	400	MT06CA200	0.2	2	+40	25	150
	05	1	M5	5 x 14	1600	MT08CA200	0.45	4	+40	40	240
	05	1	M4	5 x 14	800	MT08CA106	0.9	8	+40	30	180
	10	1	M4	7 x 20	800	MT10CA106	1.8	16	+40	30	180
1000	10	1	M5	7 x 20	800	MT10CA200	0.9	4	+40	30	180
	10	1	M4	7 x 20	800	MT10CA106	1.8	8	+40	30	180
1600	10	2	M4	7 x 20	800	MT10CA106	1.8	4	+40	30	180
2000	10	2	M4	7 x 20	800	MT10CA106	1.8	4	+40	30	180
2500	25	1	M5	11.3 x 31	1600	MT10CC200	1.8	4	+40	40	240
	25	1	M3	11.3 x 31	800	MT10CC106	3.6	8	+40	25	150
5000	25	2	M3	11.3 x 31	400	MT10CC106	3.6	4	+40	25	150

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1.9 Hoist weight

Values given are for single fall units.

Frame size	Hoist weight [lbs]				Chain [lbs/ft]
	Without chain		With 65 ft of chain		
	Single brake	Double brake	Single brake	Double brake	
01	24	26	40	42	0.25
02	44	49	62	64	0.25
05	66	68	90	93	0.38
10	99	104	148	152	0.74
25	238	251	362	375	1.88

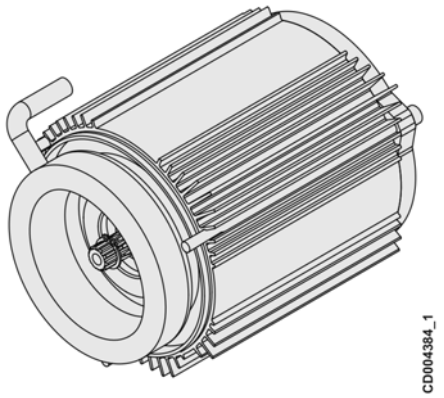
Frame size	Hoist weight [kg]				Chain [kg]
	Without chain		With 20 m of chain		
	Single brake	Double brake	Single brake	Double brake	
01	11	12	18	19	0.37
02	20	22	28	29	0.37
05	30	31	41	42	0.57
10	45	47	67	69	1.1
25	107.7	114.3	163.7	170.3	2.8

2 MAIN COMPONENTS

2.1 Motor

2.1.1 Hoisting motors

The hoisting motor is specially designed for hoisting purposes with good efficiency. The motor is classified as a 'TENV' motor – totally enclosed non-ventilated motor. This includes an aluminum frame with cooling ribs for efficient cooling. Low control voltage hoists have motor thermal protection. This thermal protection is a normally closed; automatic reset thermal protector embedded in the stator windings. It is wired into the hoist control circuit to prevent hoisting in case of over heating.



Motor type	Speed ratio	Power [Hp]	Speed n/rpm	Cos φ	Nbr of pole pairs	Nominal voltage 208 V – Amps (60 Hz)			Nominal voltage 460 V – Amps (60 Hz)		
						Voltage range 208–230 V			Voltage range 440–480 V		
						Io	In	Ist	Io	In	Ist
MT06CA200	**2**	0.3	1640	0.48	2	1.9	2.1	5.9	0.9	1.0	2.8
MT07CA200	**2**	0.4	1740	0.71	2	1.2	1.6	5.1	0.7	0.9	2.9
MT07CA104	**1/4**	0.7	3190	0.73	1	2.6	4.2	11.2	1.4	1.8	6.6
MT08CA200	**2**	0.7	1680	0.82	2	2.0	3.0	10.5	1.2	1.4	6.2
MT08CA106	**1/6**	1.5	3460	0.61	1	3.6	4.6	18.3	2.0	2.5	10.6
MT10CA200	**2**	1.5	1640	0.56	2	4.2	5.1	21	1.9	2.3	9.8
MT10CA106	**1/6**	3	3410	0.59	1	7.9	9.8	37	3.9	4.9	22
MT10CC200	**2**	3	1630	0.87	2	3.8	8.9	40	1.8	4.2	19
MT10CC106	**1/6**	5.8	3400	0.89	1	9.5	18	83	4.5	8.3	39

Motor type	Speed ratio	Power [kW]	Speed n/rpm	Cos φ	Nbr. of pole pairs	Nominal voltage 230 V – Amps (50 Hz)			Nominal voltage 400 V – Amps (50 Hz)		
						Voltage range 220–240 V			Voltage range 380–415 V		
						Io	In	Ist	Io	In	Ist
MT06CA200	**2**	0.2	1370	0.60	2	1.6	1.7	4.9	0.9	1.0	2.8
MT07CA200	**2**	0.23	1410	0.71	2	1.2	1.4	5.1	0.7	0.8	2.9
MT07CA104	**1/4**	0.45	2630	0.73	1	2.6	3.2	11.2	1.5	1.8	6.6
MT08CA200	**2**	0.45	1390	0.82	2	2	2.4	10.5	1.1	1.4	6.2
MT08CA106	**1/6**	0.9	2850	0.77	1	3.6	4.4	18.3	2	2.5	10.5
MT10CA200	**2**	0.9	1350	0.70	2	3.3	4	16.8	1.9	2.3	9.8
MT10CA106	**1/6**	1.8	2780	0.68	1	7.9	9.8	33.5	3.8	4.9	20.9
MT10CC200	**2**	1.8	1370	0.86	2	3.3	6.6	33	1.9	3.8	19
MT10CC106	**1/6**	3.6	2800	0.87	1	7.8	14	68	4.5	8.2	39

The size of the main fuse for the hoist power supply is the following:

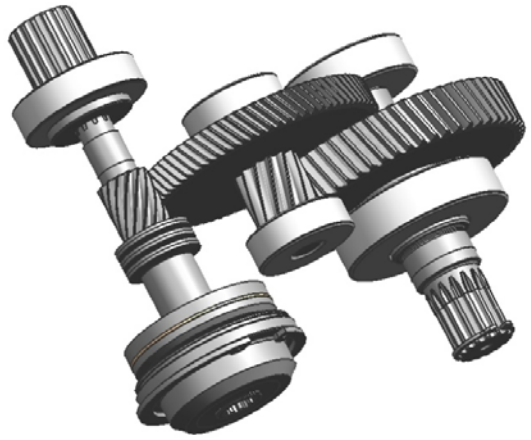
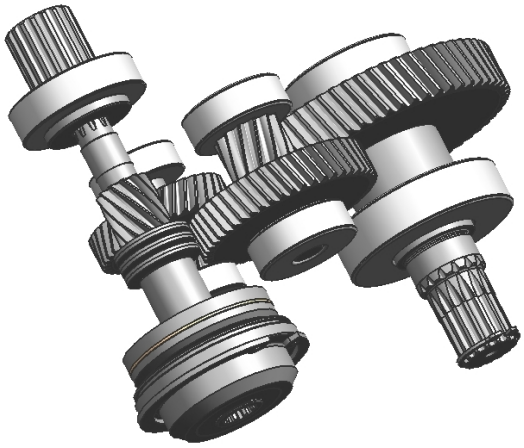
Motor voltages – Power supply main fuse			
Frame size	**Voltage range**		
	208–240 V [50/60Hz]	**380–415 V [50 Hz]**	**440–480V [60 Hz]**
01	6A gG / 4A Am	6A gG / 4A Am	6A gG / 4A Am
02	10A gG / 6A Am	6A gG / 4A Am	6A gG / 4A Am
05	12A gG / 8A Am	10A gG / 6A Am	6A gG / 4A Am
10	16A gG / 10A Am	12A gG / 8A Am	10A gG / 6A Am
25	25A gG / 20A Am	20A gG / 16A Am	16A gG / 10A Am

Abbreviations	
Io	Current without load
In	Nominal current
Ist	Starting current

2.2 Gear

2.2.1 Hoisting gear

The hoisting gear of the chain hoist has two or three helical steps. It is specially developed for hoisting applications. It is lubricated with oil in a way that will last for the designed working period of the hoist.

2-step gears	3-step gears
	

60 Hz Information

Frame size	Main hoisting speed [1 fall (ft/min.)]	Gear type	Gear ratio
01	16	2-step	41.599
02	16	2-step	39.382
02	32	2-step	39.382
05	16	3-step	49.894
05	32	3-step	49.894
05	64	3-step	25.286
10	16	3-step	71.777
10	32	3-step	71.777
10	64	3-step	35.832
25	16	3-step	110.783
25	32	3-step	110.783

50 Hz Information

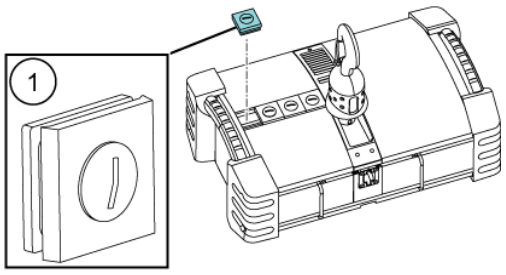
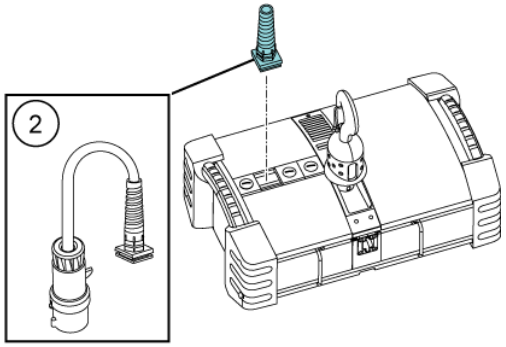
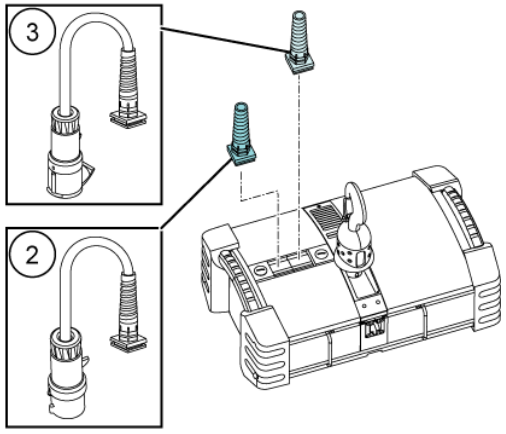
Frame size	Main hoisting speed [1 fall (m/min.)]	Gear type	Gear ratio
01	4	2-step	41.599
02	4	2-step	39.382
02	8	2-step	39.382
05	4	3-step	49.894
05	8	3-step	49.894
05	16	3-step	25.286
10	4	3-step	71.777
10	8	3-step	71.777
10	16	3-step	35.832
25	4	3-step	110.783
25	8	3-step	110.783

2.2.2 AGMA rating

The hoisting gears for SR01-SR25 are AGMA class 10 (AGMA 390.03 and AGMA 2000-A88).

2.3 Electrics

2.3.1 Cable inputs

SR01–SR25	
1	
2	
3	

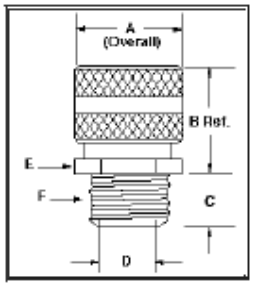
Pos.	Part	Size (class)
1	Free cable gland (inside)	M25
2	Power supply (middle)	M25
3	Control cable (outside)	M25

* NOTE: Accepted outside diameters (O.D.) of the cable is: 0.626 in – 0.748 in (15.9 mm – 19.0 mm).

* NOTE: 4th gland empty for optional hoist additions.

2.3.2 Cable inputs (option ELE55 / ELE56)

Delux cord grip with nylon fitting and non-metallic mesh to provide liquidtight seal for insulated cabels. Prevent cord pull-out and tension on terminals. Straight male thread style. UL94-HB (Mesh) and UL94-V2 (Fitting) Flammability. UL Listed and CSA Certified.

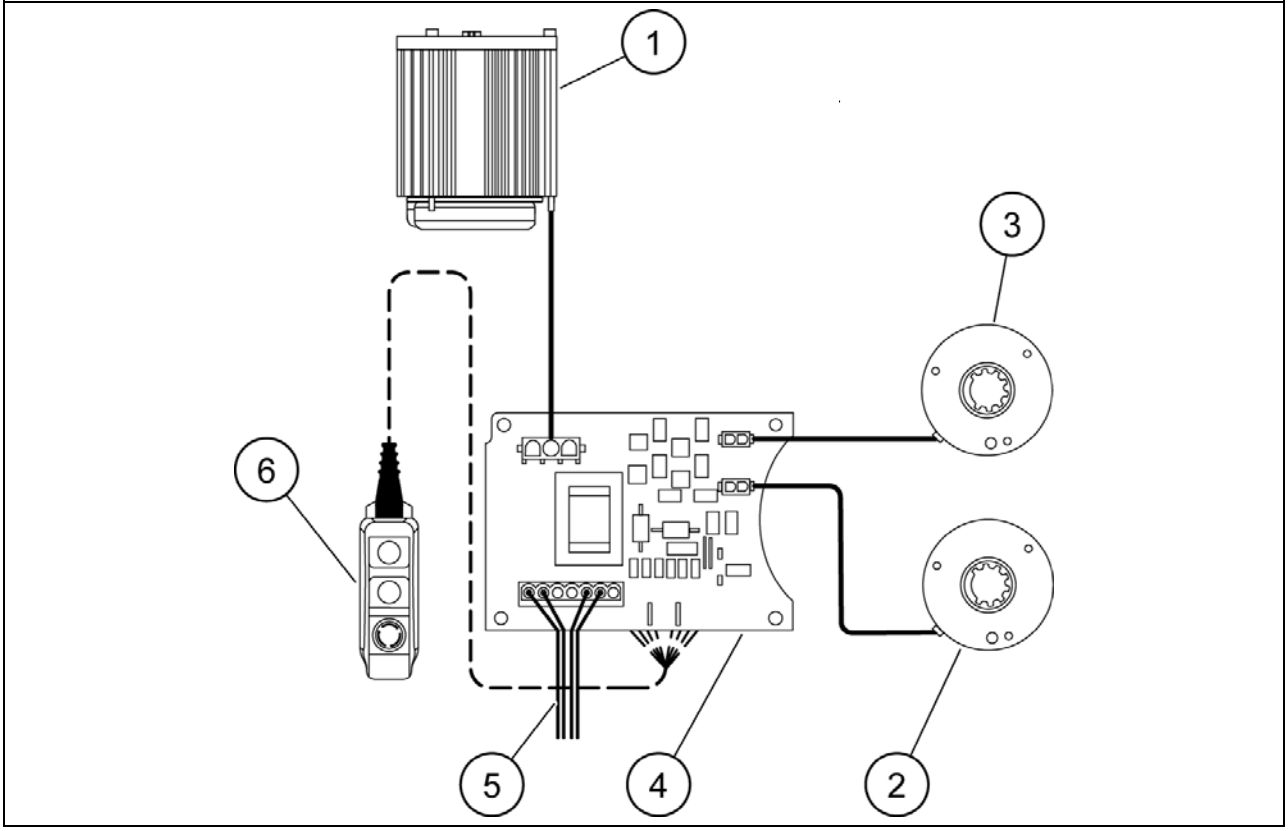


Catalog number	Thread type	Grip thread size	Color	Product type	Dimensions [in]				
					A	B	C	D	F
CG612NM	N.P.T.	0.75 in	Black	Deluxe cord grip	1.56	1.60	.55	.77	0.75 - 14

* NOTE: Accepted outside diameters (O.D.) of the cable is: 0.626 in – 0.748 in (15.9 mm – 19.0 mm).

2.3.3 Wiring principle – Configuration A

SR01–SR25

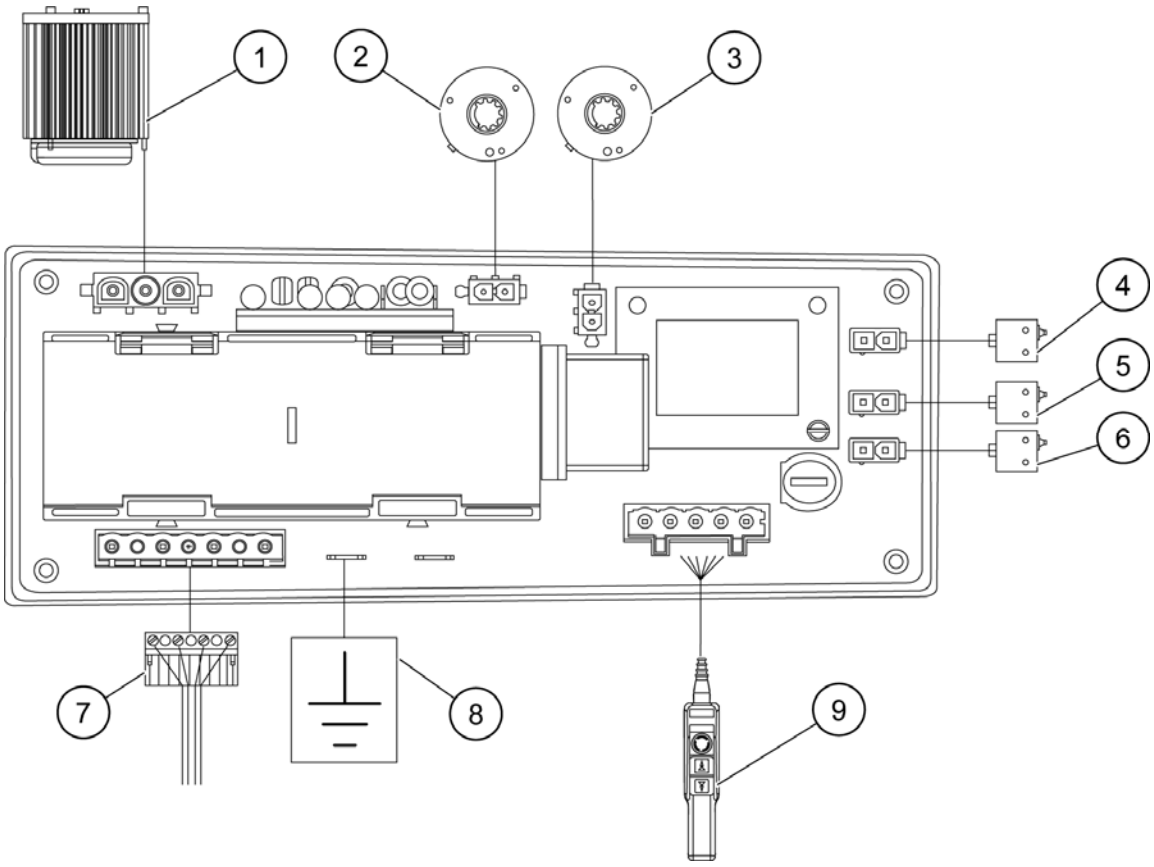


Pos.	Part
1	Hoisting motor
2	Main brake
3	Secondary brake
4	Direct control voltage board
5	Power supply
6	Pendant* (pickle)

*Not available in North America for Configuration A hoist.

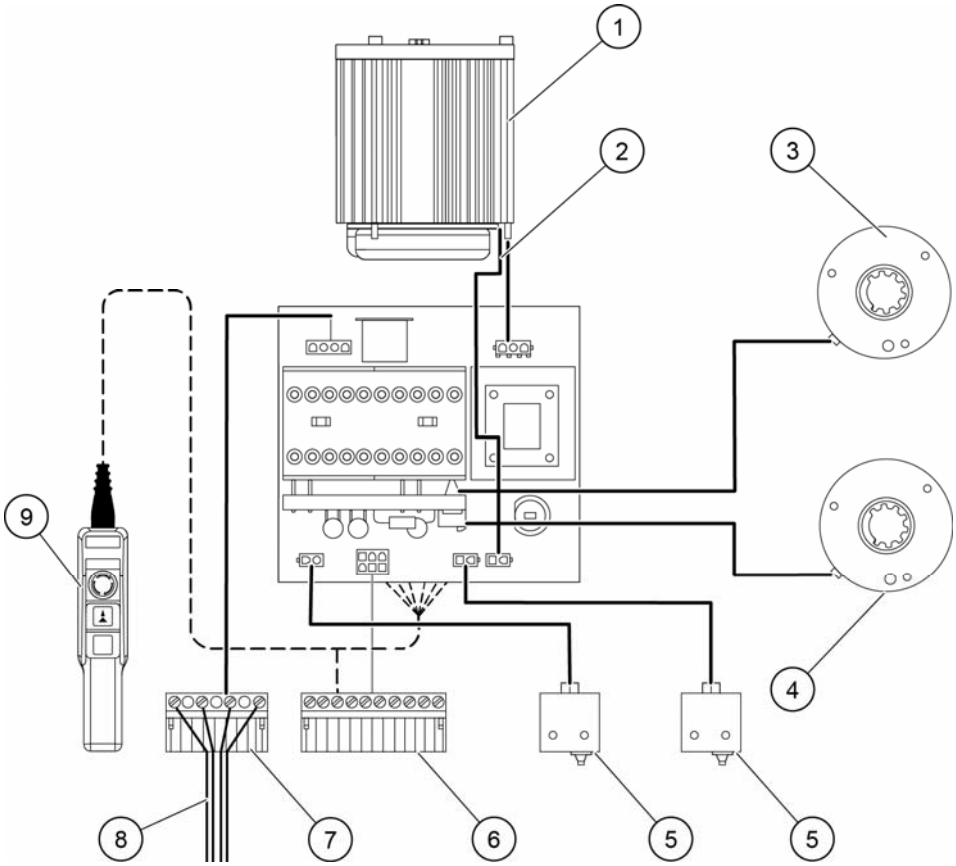
2.3.4 Wiring principle – Configuration B

SR01



Pos.	Part
1	Hoisting 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 (pickle) / control plug

SR02–SR10



Pos.	Part
1	Hoisting motor
2	Thermal sensor
3	Main brake
4	Secondary brake
5	Limit switches
6	Control plug
7	Power plug
8	Power supply
9	Pendant (pickle)

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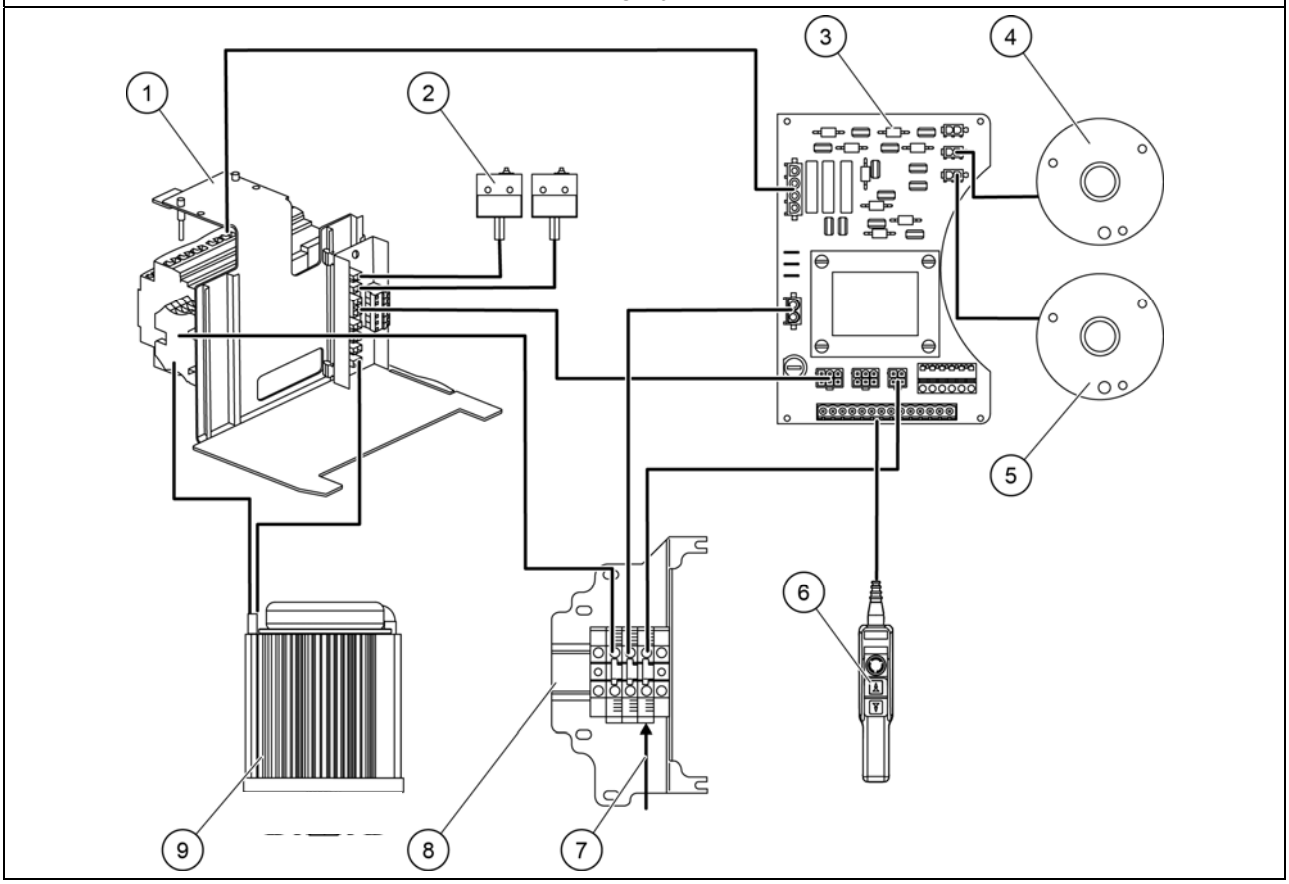
SR25



Pos.	Part
1	Motor board
2	Hoisting limit switches
3	Power board
4	Main brake
5	Secondary brake
6	Pendant (pickle)
7	Main power supply
8	Terminals
9	Hoisting motor

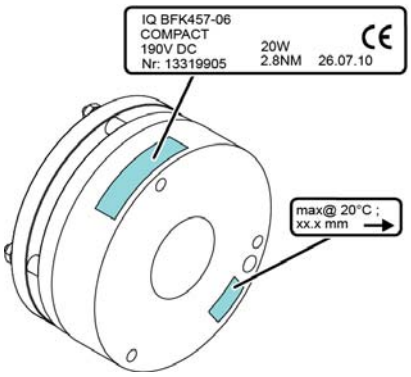
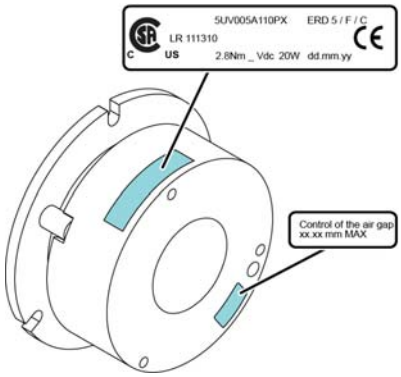
2.4 Hoisting brakes

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. The rotating parts of the brake are not enclosed to ensure the self-cleaning function.

The brake will last for the designed working period of the hoist. The break wear can easily be checked at the brake coil, through an inspection hole. The maximum allowed air gap is indicated on a sticker attached to the brake and is to be checked from there.

The brake lining wear criteria is indicated on the sticker placed next to the measurement hole. If the brake wear has exceeded the allowed measurement criteria, contact authorized service personnel for a brake change.

Brake type	
INTORQ	**Warner**
	

BRAKE CHARACTERISTICS

Frame size	Brake torque [Nm/lbf]		Max. brake measurement [68°F] [inch]*	
	[Nm]	[lbf]	Brake type	
			INTORQ	Warner
01	2.8	2.1	-	0.81
02	2.8	2.1	1	0.81
05	6.8	5.0	1	-
10	14	10.3	1.18	-
25	21	15.48	1.32	-

Frame size	Brake torque [Nm/lbf]		Brake measurement [20 °C] [mm]*	
	[Nm]	[lbf]	Brake type	
			INTORQ	Warner
01	2.8	2.1	-	20.7
02	2.8	2.1	25.3	20.7
05	6.8	5.0	25.3	-
10	14	10.3	30	-
25	21	15.48	33.5	-

*NOTE: 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 you are not allowed to exceed is indicated on the brake sticker that is located on the brake.

*NOTE: Warner brake used with SR02 380/460V hoist models; INTORQ brake used with SR02 208/230V hoist models.

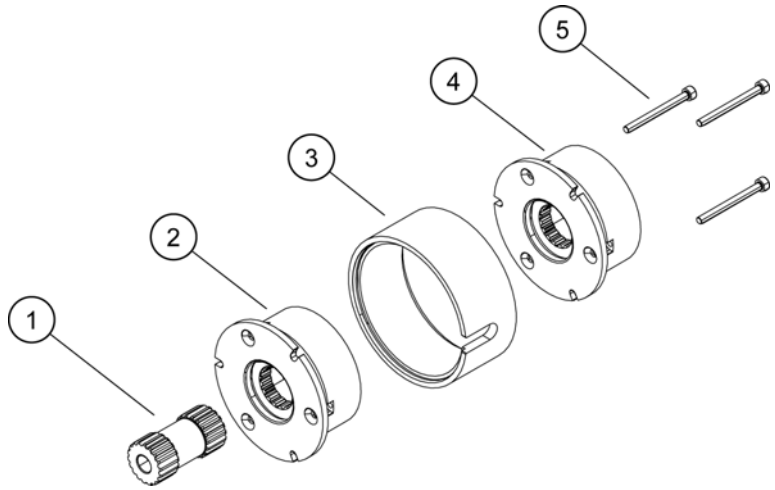
2.4.1 Double brake (option)

The double brake option consist of a main brake and a secondary brake that are assembled on the same hub. During the hoisting motion, the main brake and the secondary brake are energized simultaneously from the brake board. When the hoisting motion stops, the main brake is switched off immediately, whereas the secondary brake is still energized for a few milliseconds by the motor inductive effect.

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

The secondary brake works only as a back-up brake for the main brake. It will be the functional brake only in case the main brake is damaged in such a way that it cannot hold the load. If the main brake operates normally, there is no need to check the wear on the secondary brake.

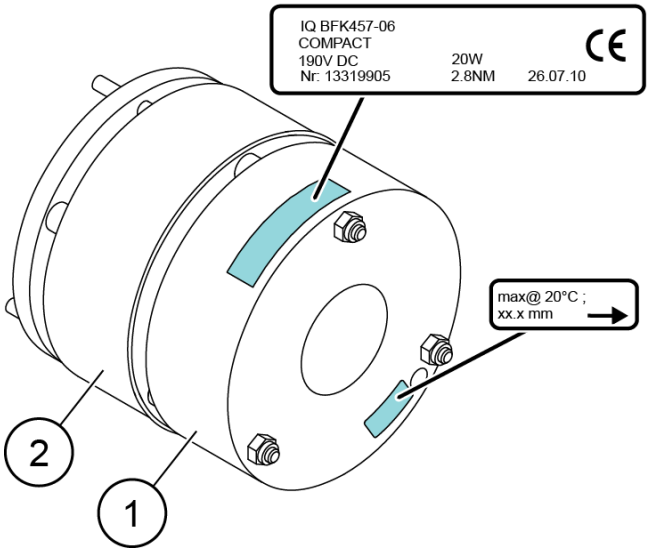
SR01



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

Double brake assembly – Warner brake

SR02–SR25



1. *Main brake*
2. *Secondary brake*

The double brake extends hoist length as follows:

Frame size	Length extension [inch]
01	1.46
02	2.05
05	1.18
10	2.05
25	4.41

Frame size	Length extension [mm]
01	37
02	52
05	30
10	52
25	112

2.4.2 Manual brake release (option)

The manual brake release feature is available as an option. With the help of this feature, the brake can be released by hand in situations where there is a need to be able to lower the load manually.

The manual brake release should only be used in emergency situations where the brake cannot be released normally, since extensive use of it as well as high lowering speed can result in immediate wear-out of the brake lining. Note the warnings related to the use of the manual brake release stated below.

Important notice before starting to use the manual brake release:

WARNING	**Note that extensive use and high lowering-speed can make the brake lining wear out immediately.**

WARNING	**Make sure that the hoist is not connected to any source of electricity, and that the electricity cannot be activated accidentally.** 

WARNING	**No-one must stand within the danger area of the moving load. Clear and secure the danger area.** 

WARNING	**Before using the hoist again, make sure that the manual brake release is stored safely.**

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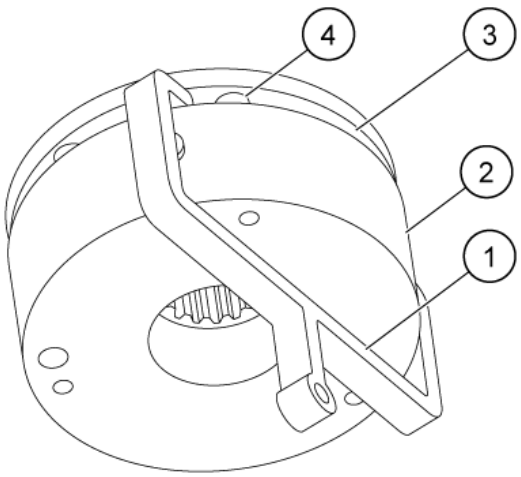
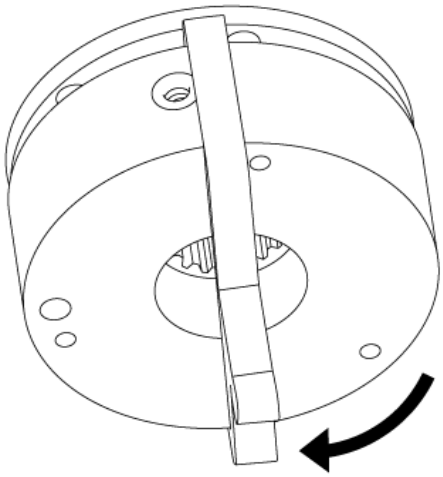
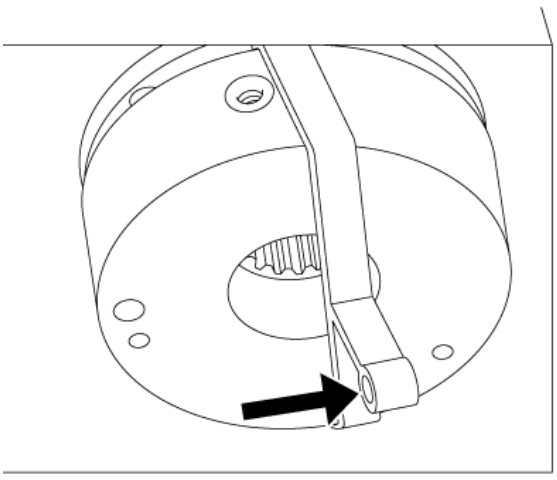
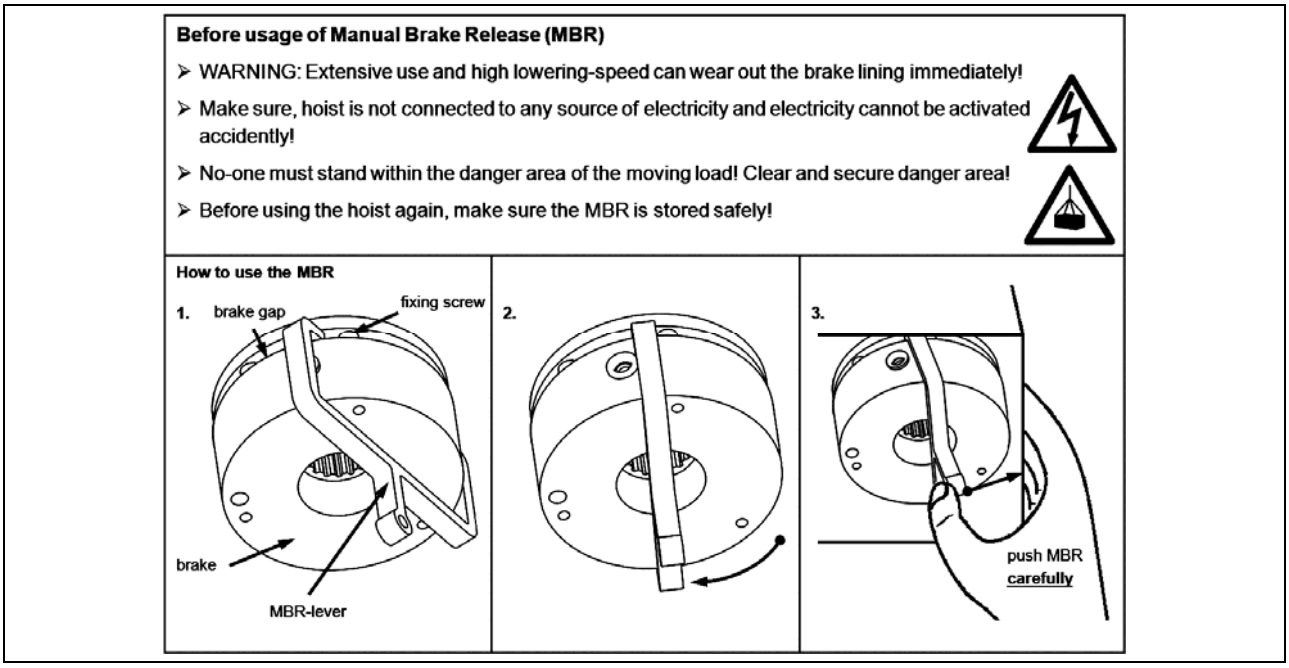
How to use the manual brake release:

1	Take the manual brake release lever and place it on the brake. Insert one arm of the lever into the brake gap on the left side of the upper fixing screw.	 1. *MBR-lever* 2. *Brake* 3. *Brake gap* 4. *Fixing screw*
2	Turn the manual brake release lever in a way that its second arm fits into the brake gap on the opposite side of the brake.	
3	Tilt the manual brake release lever in the brake gap and push it **carefully** to open the brake. **Do not open the brake for more than one (1) second before stopping again.** Repeat the procedures for pushing the lever and lowering the load within short intervals.	

The instructions concerning the use of the manual brake release function as well as the relevant warnings are stated in a sticker attached to the housing of the hoist, see the following example illustration.



2.4.3 Brake coil voltages and resistance

Brake coil voltage

Motor voltage [Vac]		Frequency [Hz]	Brake voltage [Vd]
208–240 V	**3 phases**	50/60	103
380–415 V	**3 phases**	50	190
440–480 V	**3 phases**	60	190

All values are also considered as +/-10% of nominal voltage.

Brake coil resistance

Frame size	Brake type [single brake]		Brake torque		Rated voltage [V]	Coil resistance [68°F]	
	INTORQ	Warner	[Nm]	[lbf]		min. [Ohm]	max. [Ohm]
01	**-**	**5UV005A110P2**	2.8	2.1	103	400	550
01	**-**	**5UV005A110P1**	2.8	2.1	190	1500	2030
02	**-**	**5UV005A110P2**	2.8	2.1	103	400	550
02	**-**	**5UV005A110P1**	2.8	2.1	190	1500	2030
02	**BFK457-06**	-	2.8	2.063	103	496.6	564.9
02	**BFK457-06**	-	2.8	2.063	190	1661	1949
05	**BFK457-06**	-	6.8	5.012	103	496.6	564.9
05	**BFK457-06**	-	6.8	5.012	190	1661	1949
10	**BFK457-08**	-	14	10.318	103	398.9	449.8
10	**BFK457-08**	-	14	10.318	190	1366	1552
25	**BFK457-10**	**-**	21	15.48	103	313	350
25	**BFK457-10**	**-**	21	15.48	190	1125	1282
25	**BFK457-10**	**-**	21	15.48	255	2060	2285
25	**BFK457-10**	**-**	21	15.48	320	3227	3614

Frame size	Brake type [single brake]		Brake torque		Rated voltage [V]	Coil resistance [20°C]	
	INTORQ	Warner	[Nm]	[lbf]		min. [Ohm]	max. [Ohm]
01	**-**	**5UV005A110P2**	2.8	2.1	103	400	550
01	**-**	**5UV005A110P1**	2.8	2.1	190	1500	2030
02	**-**	**5UV005A110P2**	2.8	2.1	103	400	550
02	**-**	**5UV005A110P1**	2.8	2.1	190	1500	2030
02	**BFK457-06**	-	2.8	2.063	103	496.6	564.9
02	**BFK457-06**	-	2.8	2.063	190	1661	1949
05	**BFK457-06**	-	6.8	5.012	103	496.6	564.9
05	**BFK457-06**	-	6.8	5.012	190	1661	1949
10	**BFK457-08**	-	14	10.318	103	398.9	449.8
10	**BFK457-08**	-	14	10.318	190	1366	1552
25	**BFK457-10**	**-**	21	15.48	103	313	350
25	**BFK457-10**	**-**	21	15.48	190	1125	1282
25	**BFK457-10**	**-**	21	15.48	255	2060	2285
25	**BFK457-10**	**-**	21	15.48	320	3227	3614

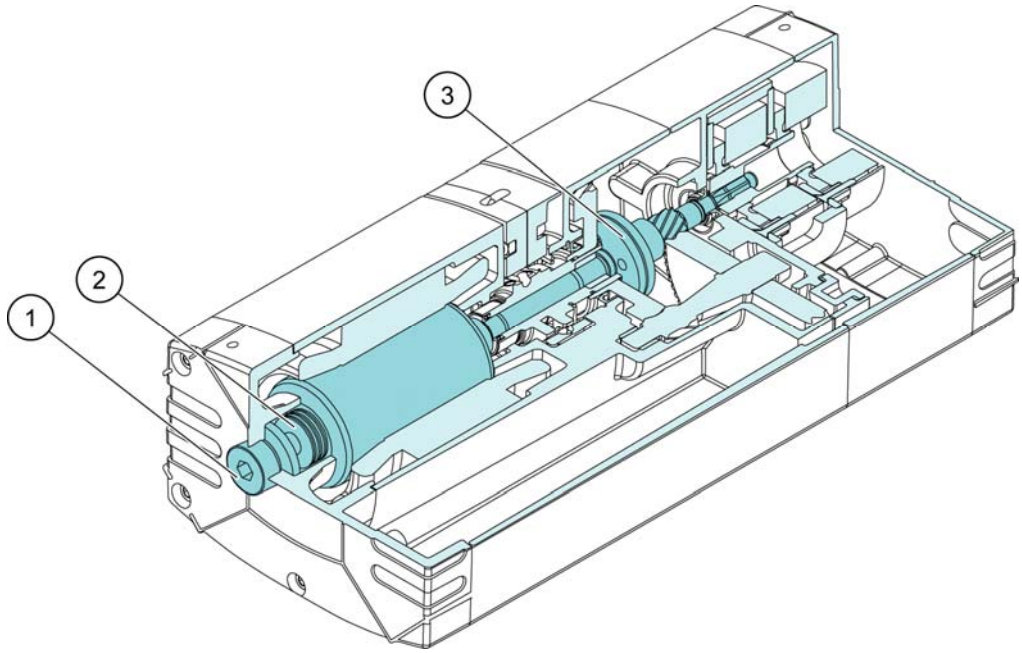
*NOTE: Warner brake used with SR02 380/460V hoist models; INTORQ brake used with SR02 208/230V hoist models.

2.5 Overload device: Slipping clutch

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

The slipping clutch mechanism is built in a way that allows the hoisting unit to lift a load corresponding to the dynamic test load – 110% to 125% of the SWL (safe working load). It prevents the unit from lifting a load of 160% of the SWL. The slipping clutch construction enables the brake to hold the load without any interaction with the clutch when the brake is not energized. The slipping clutch is situated inside the gear case.

SR01

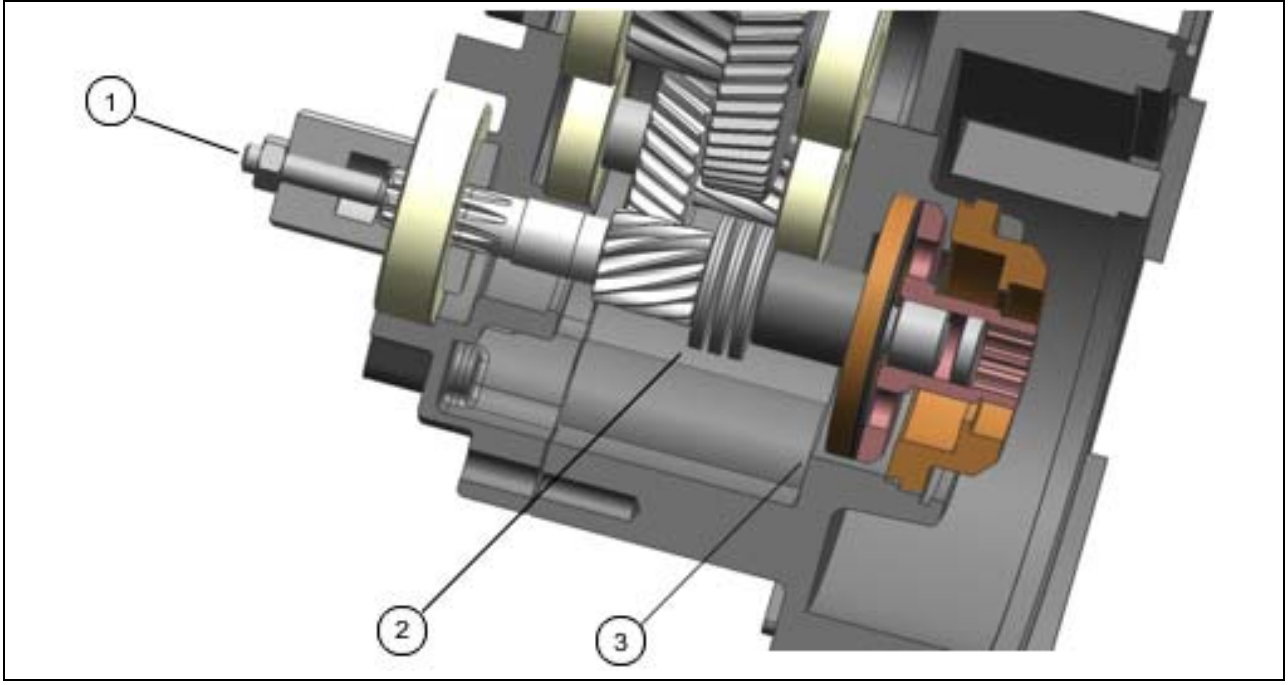


The slipping clutch adjustment is done from the motor side.

Pos.	Part
1	Setting screw
2	Belleville washers
3	Clutch discs with lining

In the SR02–SR25 hoists, the slipping clutch adjustment is done from the brake side (setting screw on the brake side). The slipping clutch construction varies according to the hoist frame size: The SR02 and SR05 hoists use a similar slipping clutch with just one clutch disc, whereas the bigger models SR10 and SR25 are built with a slipping clutch with two clutch discs. An intermediate disc is placed between the two clutch discs providing three friction surfaces to increase the torque.

SR02–SR05



The following illustration presents the slipping clutch used in the SR02 and SR05 hoists. It has only one clutch disc.

Pos.	Part
1	Setting screw
2	Belleville washers
3	Clutch disc with lining

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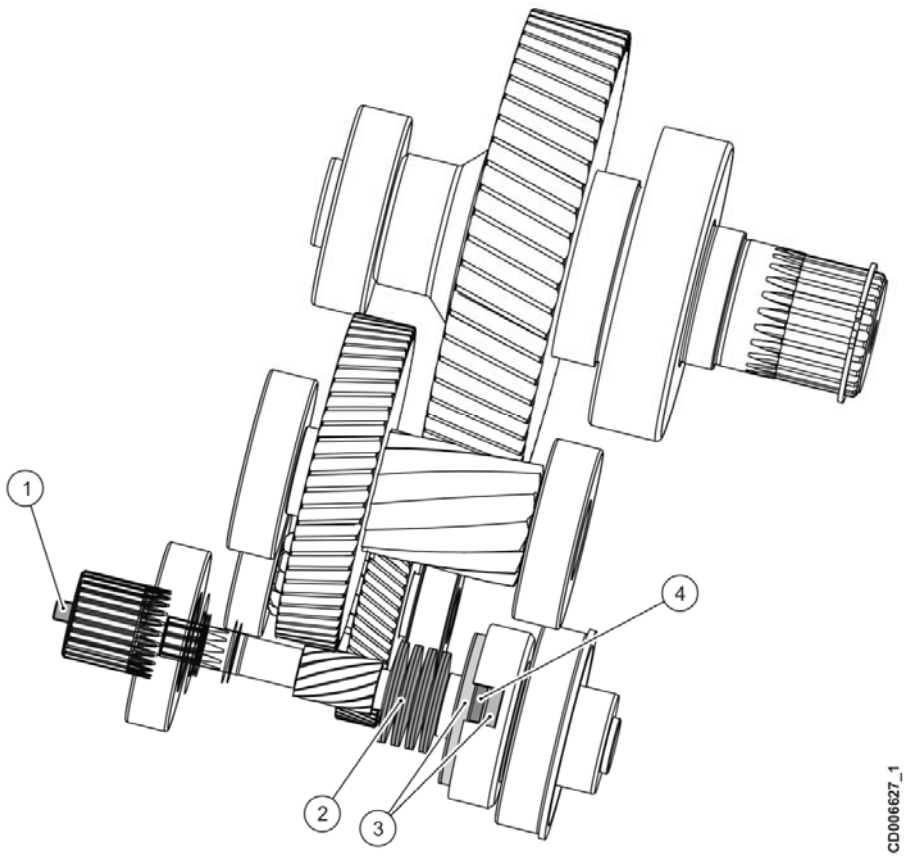
SR10–SR25

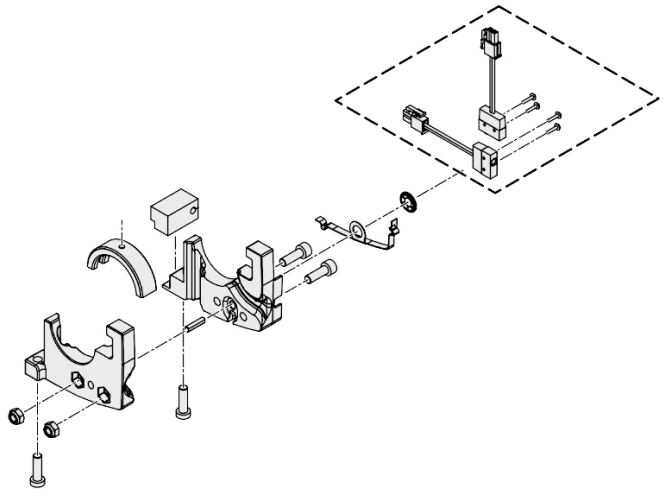


The slipping clutch that is used for the SR10–SR25 is built with two clutch discs and an intermediate disc between them to engage altogether three friction surfaces – resulting in an increased torque.

Pos.	Part
1	Setting screw
2	Belleville washers
3	Clutch discs with lining
4	Intermediate clutch disc

2.6 Limit switch

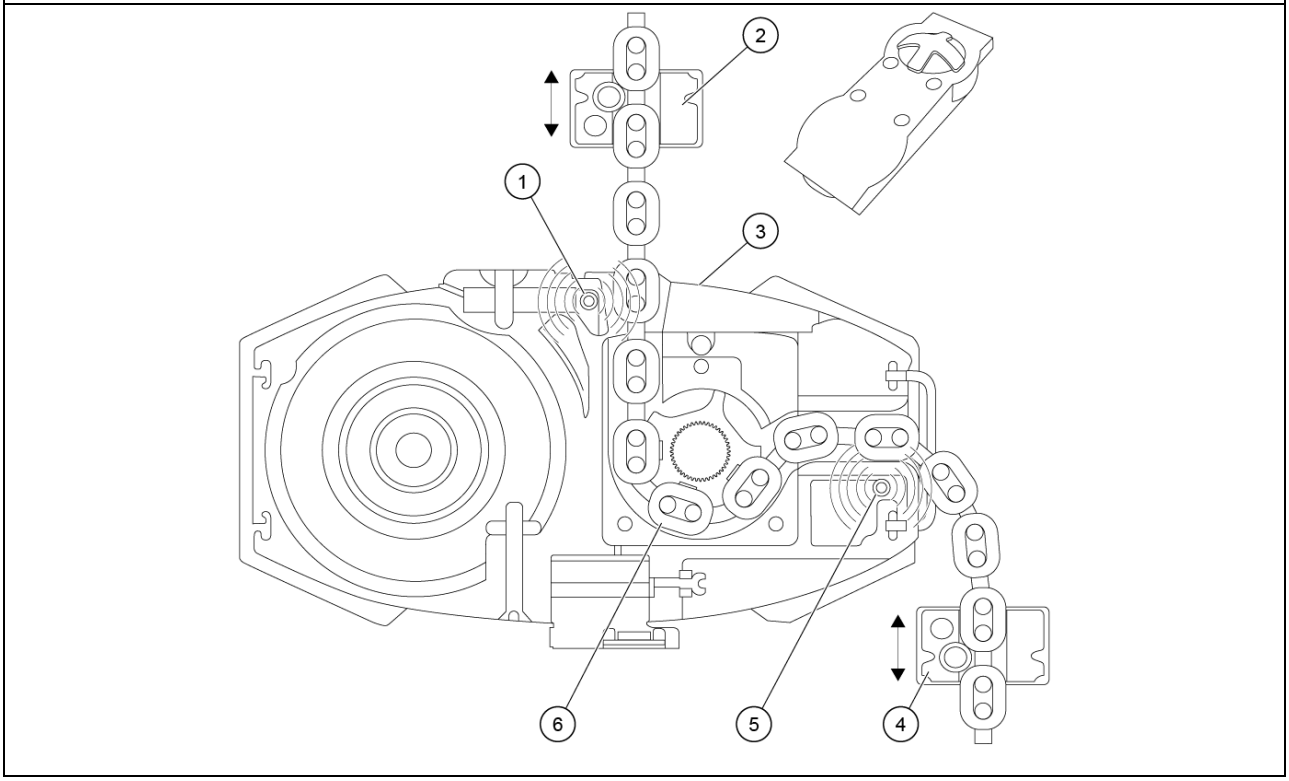
2.6.1 Micro-switch limit switch (SR01 standard)

SR01


*NOTE: Available as follows: Standard feature SR01 hoist configurations that are equipped with a low control voltage; not available on the SR02-SR25.

2.6.2 Magnetic limit switch (SR02 – SR10 standard)

SR02–SR10



Pos.	Part
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	Chainflux MKII

*NOTE: Available as follows: Standard feature SR02–SR10 hoists configurations that are equipped with a low control voltage; not available on the SR01 and SR25.

2.6.3 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 damages.

The magnetic limit switch is only available for a hoisting speed of up to max. 32 ft/min (8m/min). Configurations with a faster speed are delivered with a geared limit switch. The magnetic limit switch feature is not available for the 2-fall hoist versions. It can be used in both hoist positions, ‘normal’ or ‘inverted’, and it is available for the hoist configurations that are equipped with a low control voltage.

2.6.4 Adjusting the magnetic limit switch

To adjust the magnetic limit switch:

- Slide the setting rings up or down on the chain to reach the desired position. When sliding the rings, hold the chain with one hand and slide the ring along the chain with the other.
- Adjust each setting ring separately. The setting ring is properly in place when it cannot be moved easily (the chain lockers inside the setting rings are located between two chain links).

- Because the chain lockers must be placed between two links, the chain pitch defines the minimum setting distance: For example, for an SR10 hoist with a 7 x 20 chain, the minimum setting is 0.8 inches (20mm). For and SR05 hoist with 5x14 chain, the minimum setting is 0.55 inches (14mm).

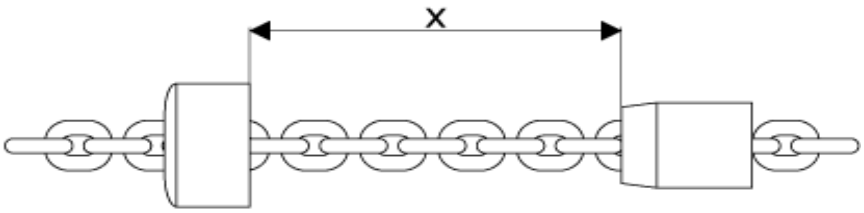
Setting the upper and lower stop limit

To set the upper stop limit (upper position of the hook):

- Slide the upper setting ring along the chain. Place the ring between the hook and the input chain guide.

To set the lower stop limit (lower position of the hook):

- Slide the lower setting ring on the chain. Place the ring between the chain side output and the slack fall stop.



X = min. 20 inches (50 cm)

Note: Keep a minimum of 20 inches (50 cm) between the ring and the slack fall stop to allow a smooth flow of the chain out of the chain bag.

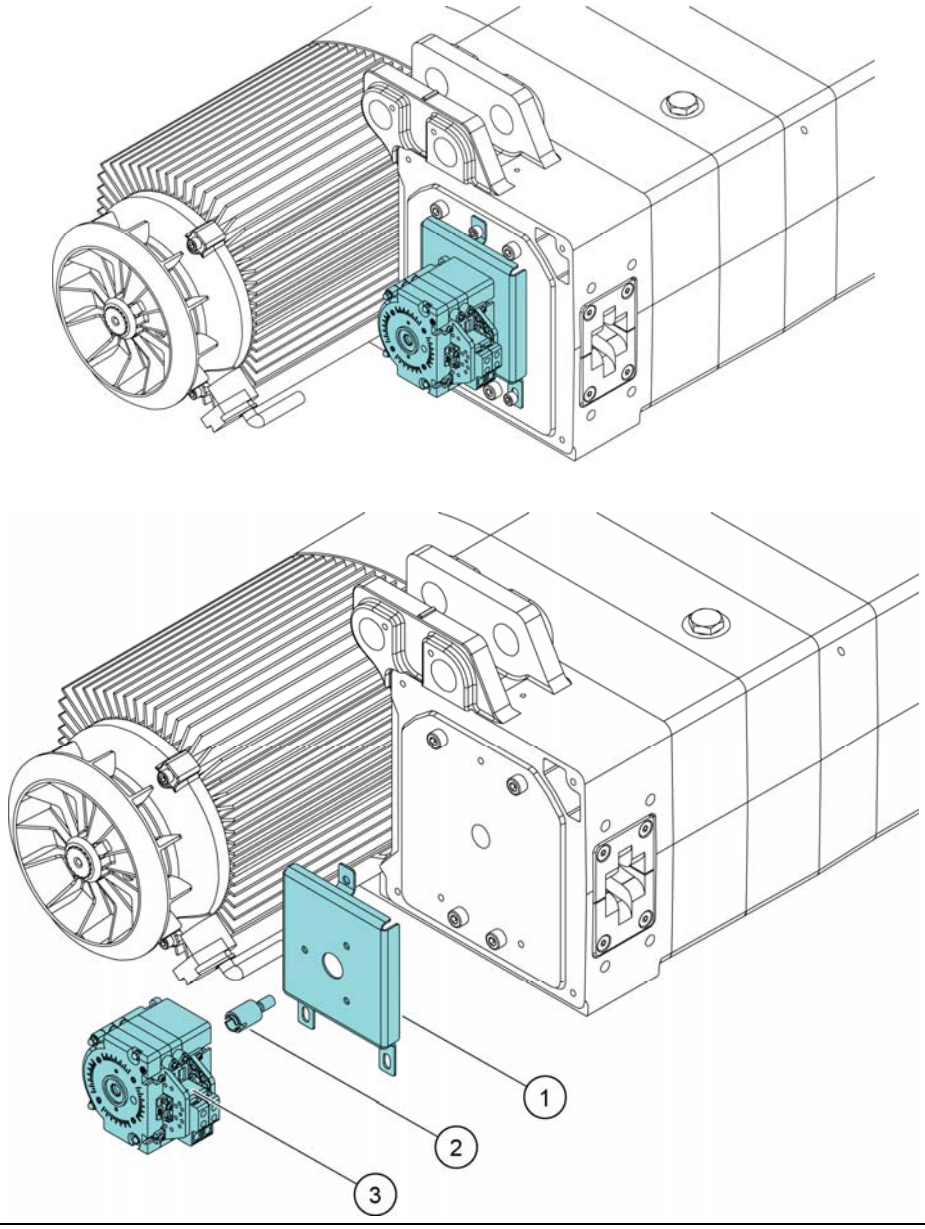
The ring size is the same for all hoists, regardless of the frame size. The difference is only in the chain path.

Setting ring dimensions [inch]	
Diameter	2.52
Height	1.5

Setting ring dimensions [mm]	
Diameter	64
Height	38

2.6.5 Rotating limit switch (SR25 standard)

SR25



Pos.	Part
1	Fixing plate
2	Coupling
3	Rotating geared limit switch**

*NOTE: Available as follows: Standard feature SR25 hoists configurations that are equipped with a low control voltage; not available on the SR01. For SR02-SR10 options, see below.

** NOTE: Able to accept mounting of certain 3rd party equipment.

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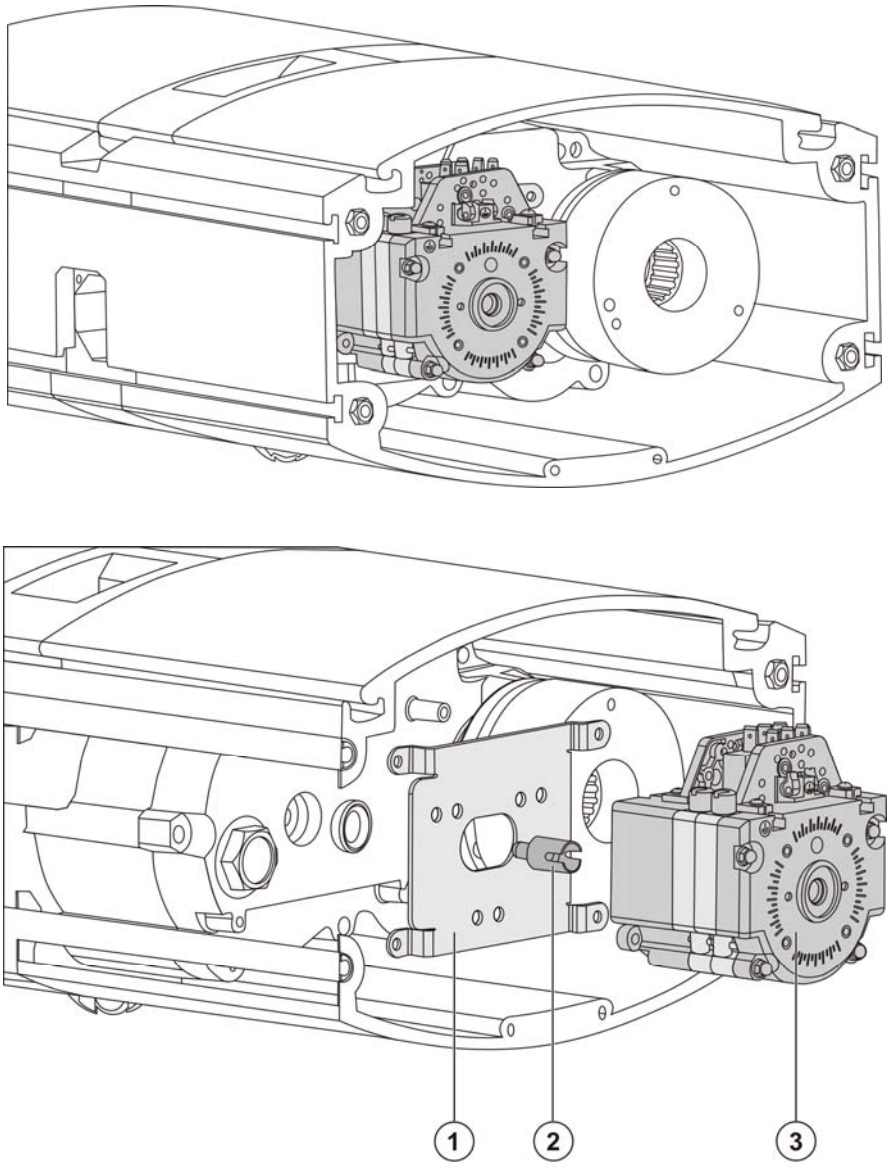
SR02–SR10



Pos.	Part
1	Fixing plate
2	Coupling
3	Rotating limit switch**, 2-step

*NOTE: Available as follows: Optional feature SR02-SR10 hoists configurations that are equipped with a low control voltage; not available on the SR01. For SR25, see above.

** NOTE: Able to accept mounting of certain 3rd party equipment.

2.6.6 Functional description of the rotating limit switch

2-step geared limit switch

The 2-step geared limit switch works as an adjustable upper and lower stop limit together with the controls.

4-step geared limit switch

The 4-step geared limit switch provides an adjustable upper and lower stop limit connected to the internal controls. Two (2) cams are not connected to the controls, and can thus be freely used for end user requirements.

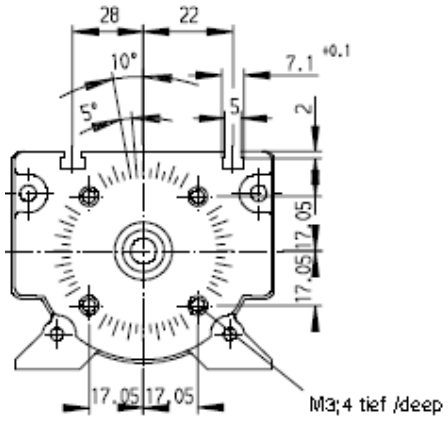
The operation limits for standard rotating limit switches are as follows:

Frame size	Chain	Max. HOL [ft]		
		Ratio 180	Ratio 280	Ratio 470
02	4 x 11	65.6	98.4	173.9
05	5 x 14	82	128	219.8
10 1/1	7 x 20	118.1	183.7	308.4
10 2/1	7 x 20	60.7	93.5	157.5
25 1/1	11.3 x 31	180.4	282.2	475.7
25 2/1	11.3 x 31	73.8	141.1	237.9

Frame size	Chain	Max. HOL [m]		
		Ratio 180	Ratio 280	Ratio 470
02	4 x 11	20	30	53
05	5 x 14	25	39	67
10 1/1	7 x 20	36	56	94
10 2/1	7 x 20	18.5	28.5	48
25 1/1	11.3 x 31	55	86	145
25 2/1	11.3 x 31	22.5	43	72.5

*NOTE: Higher heights of lift are available on request. Hoist length can increase. For the frame sizes SR02–SR10, the hoist length increases in configurations with a 4-step limit switch and a bigger gear ratio. Also note that the standard chain bag size is limited to the standard lifting height.

Dimensions of the rotating limit switch face for mounting of 3rd party equipment**.** The center location threads are M4x7 deep.



2.6.7 Adjusting the rotating limit switch

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

To set the limits, access the geared limit switch by opening the small black rubber plugs on top of the hoist profile. Remove the plugs and follow the instructions given on the sticker next to the adjustment holes to set the upper (UP) and lower (DOWN) limits:

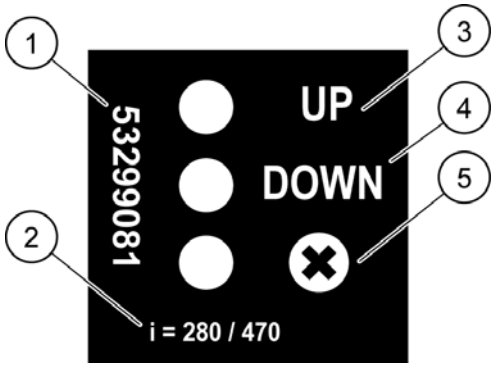


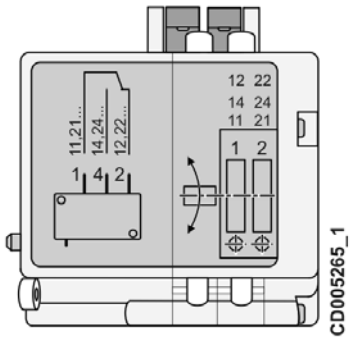
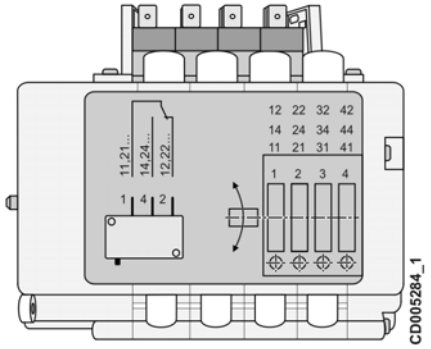
Figure 1. Information sticker for the limit switch adjustment (example of a 2-step geared limit switch).

ID number
Limit switch ratio (e.g. 280/470)
Upper (UP) limit
Lower (DOWN) limit
'X' = Adjustment hole not in use

Set the limits by turning the setscrews (1) ... (4) (depending on the number of the switching elements):

Turn to the left: switching point is moved "downwards".

Turn to the right: switching point is moved "upwards".

2-step geared limit switch	4-step geared limit switch
	

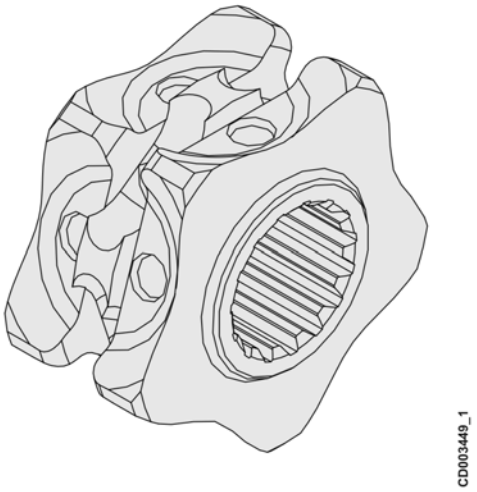
2-step geared limit switch	4-step geared limit switch
Setscrew 1 is the down limit and setscrew 2 the upper limit.	Setscrews 1 and 2 are the down limit and setscrews 3 and 4 the upper limit.

2.7 Chain reeving components

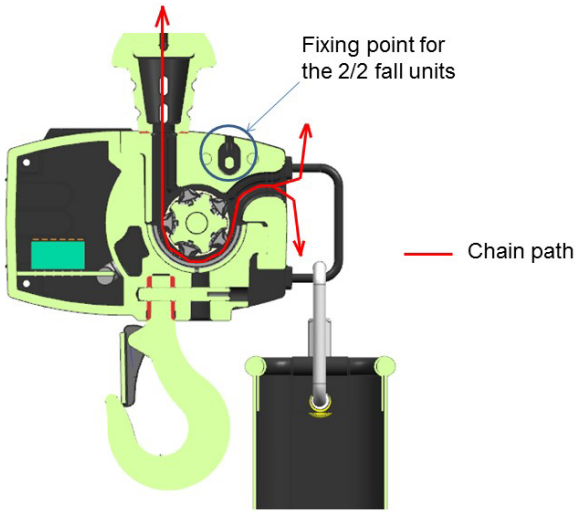
2.7.1 Chain drive

The chain hoist units are fitted with a special patented chain drive. The solution includes additional supporting (intermediate) teeth on the chain sprocket which improve the support for the chain and reduce stress on the chain.

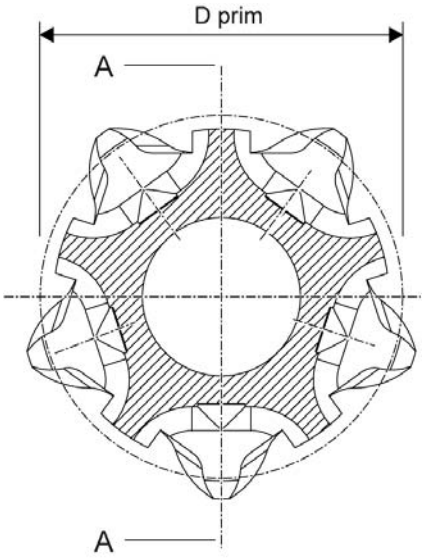
The chain sprocket has five pockets and five intermediate teeth on the sprocket. The intermediate teeth enable an accurate positioning of the chain, resulting in less chain wear and thus a longer lifetime of the chain.



The chain hoist units are fitted with a high strength aluminum constructed Chainflux MKII chain guide designed to provide horizontal flow of the chain as it comes off the chain sprocket. This allows for a more fluid flow of the chain into the chain bag and helps reduce the risk of chain jamming. There is also a drain in the housing to avoid water colletion in the load wheel compartment.



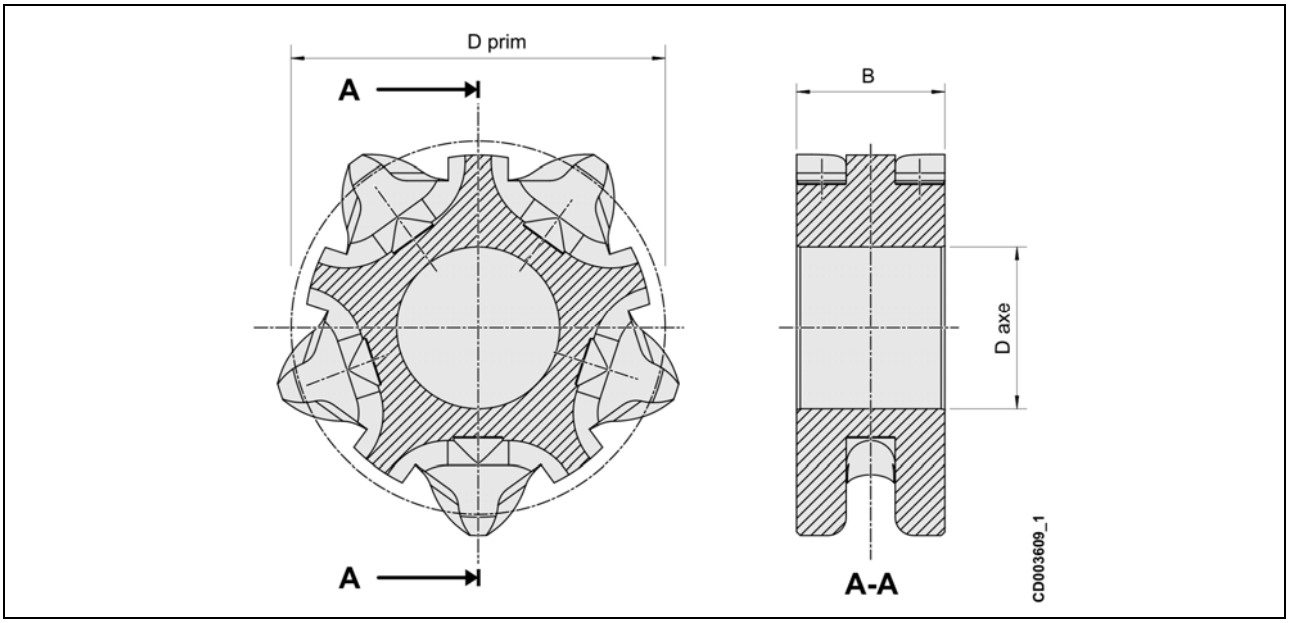
2.7.2 Chain sprocket



Frame size	Chain sprocket	Chain	Nbr. of pockets	D prim [inch]
01	SINGLE	4 x 11	5	1.38
02	SINGLE	4 x 11	5	1.38
05	SINGLE	5 x 14	5	1.8
10	SINGLE	7 x 20	5	2.58
25	SINGLE	11.3 x 31	5	3.89

Frame size	Chain sprocket	Chain	Nbr. of pockets	D prim [mm]
02	SINGLE	4 x 11	5	35.01
05	SINGLE	5 x 14	5	45.61
10	SINGLE	7 x 20	5	65.45
25	SINGLE	11.3 x 31	5	98.69

2.7.3 Bottom Block Sprocket



Frame size	Chain sprocket	Chain	Nbr. of pockets	D prim [inch]	D axe [inch] [Ø]	B [inch]	
01	SINGLE	4 x 11	5	1.38	0.55h0.31	0.79	0.004
10	SINGLE	7 x 20	5	2.57	1.26h0.28	1.3	0.004
25	SINGLE	11.3 x 31	5	3.98	1.73F0.24	1.57	0.004

Frame size	Chain sprocket	Chain	Nbr. of pockets	D prim [mm]	D axe [mm] [Ø]	B [mm]	
01	SINGLE	4 x 11	5	35.01	14h8	20	-0.1
10	SINGLE	7 x 20	5	65.35	32h7	33	-0.1
25	SINGLE	11.3 x 31	5	100.98	44F6	40	-0.1

*NOTE: The return sprocket is only for the 2-fall hoists.

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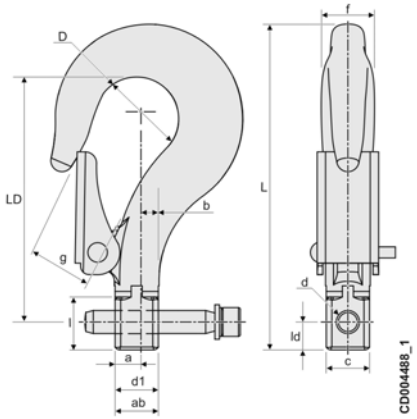
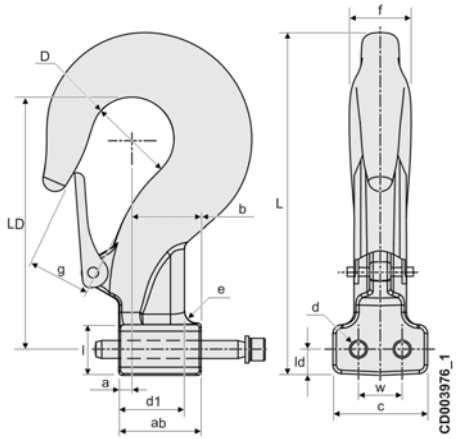
2.8 Upper hook

2.8.1 Fixed upper hook

SR01/SR02	SR05/SR10
	

Frame size	Hook size [RSN]	Dimensions [inch]														
		a	ab	a1	a2*	b	c	dø**	d1	e	f	l	ld	L	LD	W
01	012T	0.2	0.39	1.18	0.87	0.2	0.63	0.33	-	-	0.75	1.02	0.39	4.53	3.39	-
02	012T	0.31	0.61	1.18	0.87	0.31	0.61	0.33	-	-	0.75	0.75	0.39	4.61	3.86	-
05	020T	0.35	1.97	1.34	0.98	1.61	1.3	0.32	1.14	0.31	0.83	0.87	0.39	5.47	3.54	0.63
10	08V	0.3	1.85	1.89	1.42	1.56	2.13	0.47	1.48	0.28	1.38	1.18	0.55	7.72	5.28	1.02

Frame size	Hook size [RSN]	Dimensions [mm]														
		a	ab	a1	a2*	b	c	dø	d1	e	f	l	ld	L	LD	w
01	012T	5	10	30	22	5	16	8.3	-	-	19	26	10	115	86	-
02	012T	7.75	15.5	30	22	7.75	15.5	8.3	-	-	19	19	10	117	98	-
05	020T	9	50	34	25	41	33	8.2	29	8	21	22	10	139	90	16
10	08V	7.5	47	48	36	39.5	54	12	37.5	7	35	30	14	196	134	26

*NOTE: The a2 dimension is the free space with the hook latch.

**NOTE: For the SR05 and the SR10, the dimension ‘dø’ is needed for both (x 2) pins.

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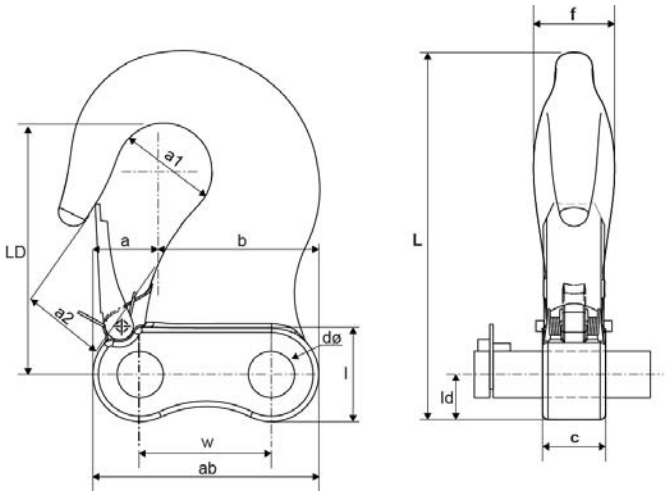
SR25



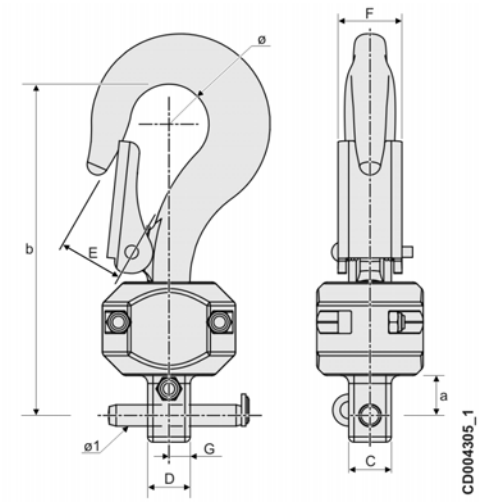
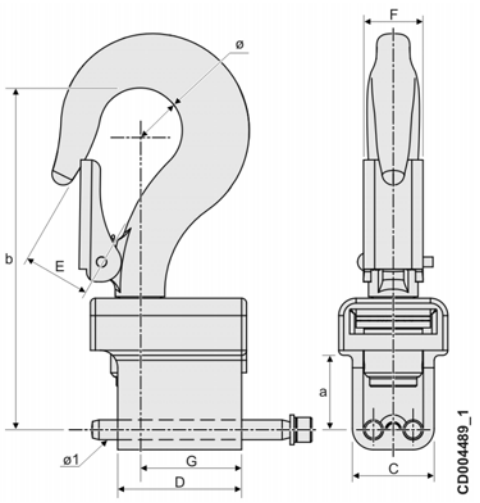
Frame size	Forging	Dimensions [inch]												
		a	ab	a1	a2*	b	c	dø**	F	l	ld	L	LD	W
25		1.54	4.88	2.09	1.61	3.35	1.38	0.99	1.77	2.01	1.02	8.03	5.43	2.83

Frame size	Forging	Dimensions [mm]												
		a	ab	a1	a2*	b	c	dø	f	l	ld	L	LD	w
25		39	124	53	41	85	35	25.1	45	51	26	204	138	72

*NOTE: The a2 dimension is the free space with the hook latch.

**NOTE: For the SR25, the dimension ‘dø’ is needed for both (x 2) pins.

2.8.2 Rotating upper hook

SR01/SR02	SR05/SR10
	

Frame size	Hook size [RSN]	Dimensions [inch]													
		a	ab	a1	a2*	b	c	dø**	f	g	l	ld	L	LD	w
01	012T	0.31	0.63	1.18	0.87	0.31	0.39	0.33	0.75	0.59	0.98	0.39	5.91	4.84	-
02	012T	0.31	0.63	1.18	0.87	0.31	0.63	0.33	0.75	0.59	0.98	0.39	6.02	5.28	-
05	020T	0.35	1.97	1.34	0.98	1.61	1.26	0.32	0.83	1.18	1.5	0.31	6.61	5.71	0.63
10	05V	0.28	1.83	1.57	1.26	1.56	1.97	0.47	1.14	0.85	1.32	0.47	8.35	7.13	1.02

Frame size	Hook size [RSN]	Dimensions [mm]													
		a	ab	a1	a2*	b	c	dø**	f	g	l	ld	L	LD	w
01	012T	8	16	30	22	8	10	8.3	19	15	25	10	150	123	-
02	012T	8	16	30	22	8	16	8.3	19	15	25	10	153	134	-
05	020T	9	50	34	25	41	32	8.2	21	30	38	8	168	145	16
10	05V	7	46.5	40	32	39.5	50	12	29	21.5	33.5	12	212	181	26

*NOTE: The a2 dimension is the free space with the hook latch.

**NOTE: For the SR05 and the SR10, the dimension ‘dø’ is needed for both (x 2) pins.

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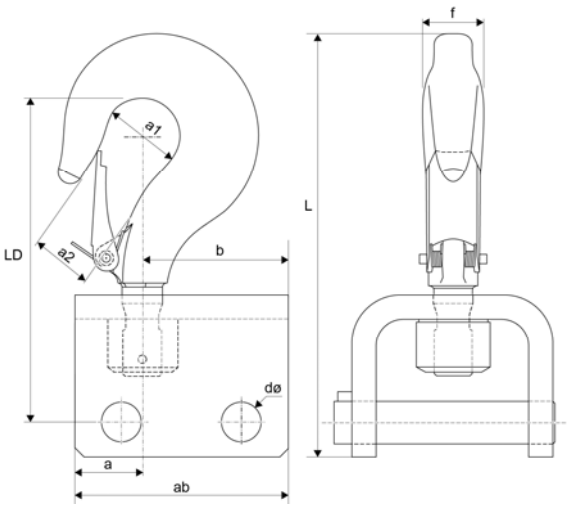
SR25



Frame size	Hook size [RSN]	Dimensions [inch]													
		a	Ab	a1	a2*	B	c	dø**	f	g	l	ld	L	LD	w
25	1.6V	1.59	5.00	2.20	1.61	3.41	14.72	1.00	1.77	3.31	4.09	0.79	11.79	9.11	2.83

Frame size	Hook size [RSN]	Dimensions [mm]													
		a	ab	a1	a2*	B	c	dø**	f	g	l	ld	L	LD	w
25	1.6V	40.5	127	56	41	86.5	120	25.5	45	84	104	20	299.5	231.5	72

*NOTE: The a2 dimension is the free space with the hook latch.

**NOTE: For the SR25, the dimension ‘dø’ is needed for both (x 2) pins.

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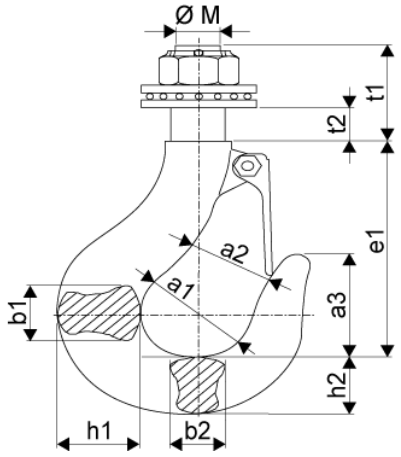
2.9 Hooks

SR01–SR10



The hooks are designed according to the requirements of the DIN15401. The hook material is 34 CrMo 4 (standard hook) or AISI 316L (stainless steel hook).

Frame size	Reeving	Hook size [RSN]	Dimensions [inch]										
			øM	a1	a2*	a3	b1	b2	e1	h1	h2	t1	t2
01	**1/1**	012T	0.47	1.18	0.87	1.34	0.75	0.59	2.87	0.87	0.75	1.12	0.41
	2/1	012T	0.47	1.18	0.87	1.34	0.75	0.59	2.87	0.87	0.75	1.12	0.41
02	**1/1**	012T	0.47	1.18	0.87	1.34	0.75	0.59	2.87	0.87	0.75	1.26	0.41
05	**1/1**	020T	0.63	1.34	0.98	1.54	0.83	0.71	3.31	1.02	0.87	1.42	0.53
10	**1/1**	05V	0.79	1.69	1.26	1.93	1.14	0.94	4.13	1.46	1.22	1.54	0.57
	2/1	08V	0.79	1.89	1.42	2.13	1.38	1.14	4.57	1.73	1.46	1.69	0.57

Frame size	Reeving	Hook size [RSN]	Dimensions [mm]										
			øM	a1	a2*	a3	b1	b2	e1	h1	h2	t1	t2
01	**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
02	**1/1**	012T	12	30	22	34	19	15	73	22	19	32	10.5
05	**1/1**	020T	16	34	25	39	21	18	84	26	22	36	13.5
10	**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

*NOTE: The a2 dimension is the free space with the hook latch.

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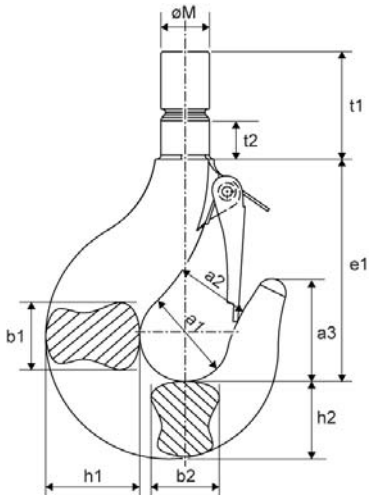
SR25

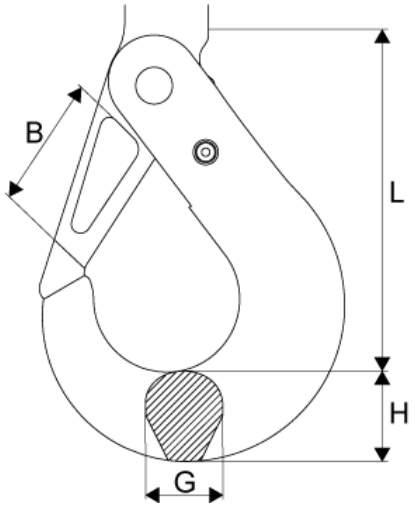


Frame size	Reeving	Hook size [RSN]	Dimensions [inch]										
			øM	a1	a2*	a3	b1	b2	e1	h1	h2	t1	t2
25	1/1	08V	0.94	1.89	1.38	2.13	1.38	1.14	4.57	1.73	1.46	2.17	0.81
	2/1	1.6V	1.18	2.2	1.69	2.52	1.77	1.5	5.43	2.2	1.89	2.64	0.96

Frame size	Reeving	Hook size [RSN] (std.)	Dimensions [mm]										
			øM	a1	a2*	a3	b1	b2	e1	h1	h2	t1	t2
25	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

*NOTE: The a2 dimension is the free space with the hook latch.

2.9.1 Safety hook / self locking hook (option)



Hook type	Dimensions [inch]			
	L	B	G	H
BKT 6-10	3.54	1.14	0.59	0.83
BKT 7/8-10	4.37	1.46	0.67	1.02
BKT 10-10	5.24	1.77	0.83	1.18

Hook type	Dimensions [mm]			
	L	B	G	H
BKT 6-10	90	29	15	21
BKT 7/8-10	111	37	17	26
BKT 10-10	133	45	21	30

Frame size	Falls	Hook type [BKT]	Influence to C-dimension [+inch]
01	1/1	6-10	0.59
	2/1	6-10	0.59
02	1/1	6-10	0.63
05	1/1	6-10	0.12
10	1/1	7/8-10	0.2
	2/1	10-10	0.51
25	-		

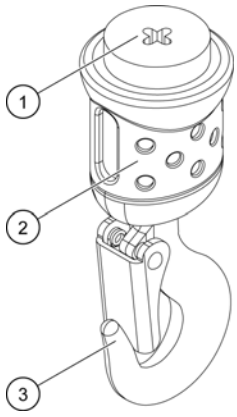
Frame size	Falls	Hook type [BKT]	Influence to C-dimension [+mm]
01	1/1	6-10	15
	2/1	6-10	15
02	1/1	6-10	16
05	1/1	6-10	3
10	1/1	7/8-10	5
	2/1	10-10	13
25	-		

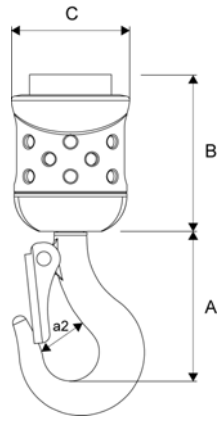
*NOTE: Currently not available for the SR25.

2.9.2 Hook blocks

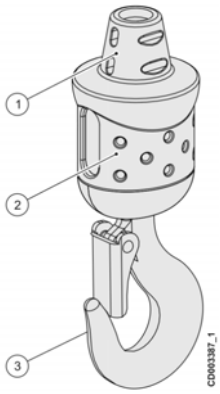
The dimensions for the stainless steel hook blocks are the same as given in the following for the standard hook blocks. The material of the hook block rubber part is Santoprene-8221.65*.

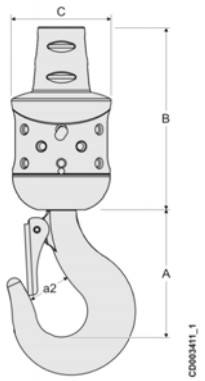
SR01 1-fall (1/1)





SR02–SR10 1-fall (1/1)





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

Frame size	Reeving	Dimensions [inch]			
		A	B	C	a2
01	1/1	2.87	3.05	2.17	0.87
02	1/1	2.87	4.06	2.17	0.59
05	1/1	3.31	4.59	2.83	0.67
10	1/1	4.15	4.53	3.62	0.79

Frame size	Reeving	Dimensions [mm]			
		A	B	C	a2
01	1/1	73	77.5	55	22
02	1/1	73	103	55	15
05	1/1	84	116.5	72	17
10	1/1	105.5	115	92	20

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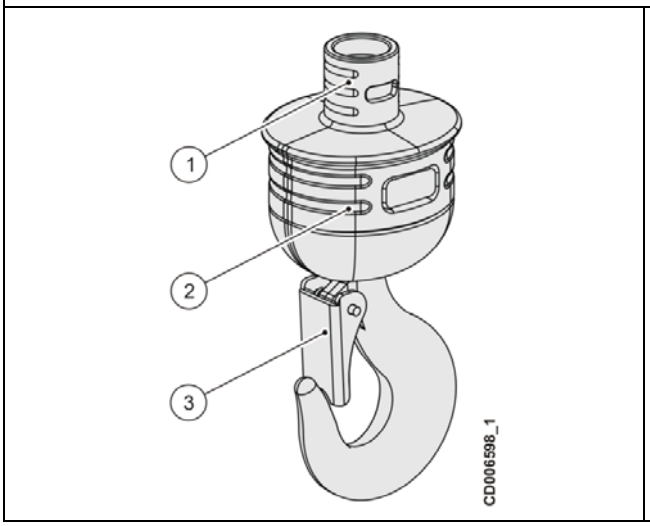
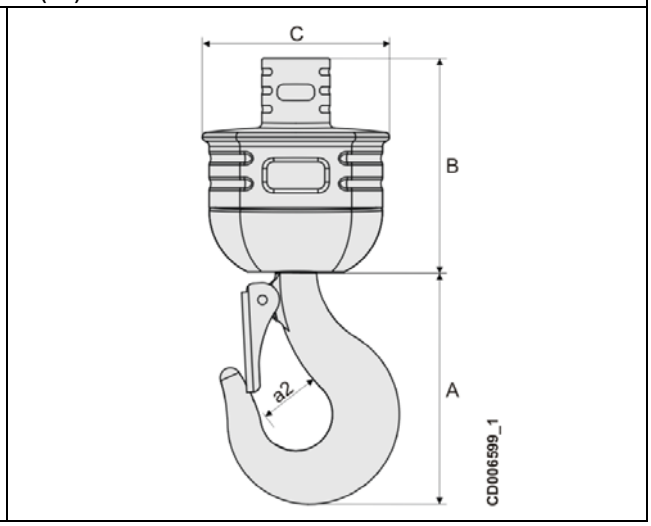
SR25 1-fall (1/1)





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

Frame size	Reeving	Dimensions [inch]			
		A	B	C	a2
25	1/1	6.12	5.51	4.72	1.89

Frame size	Reeving	Dimensions [mm]			
		A	B	C	a2
25	1/1	155.5	140	120	48

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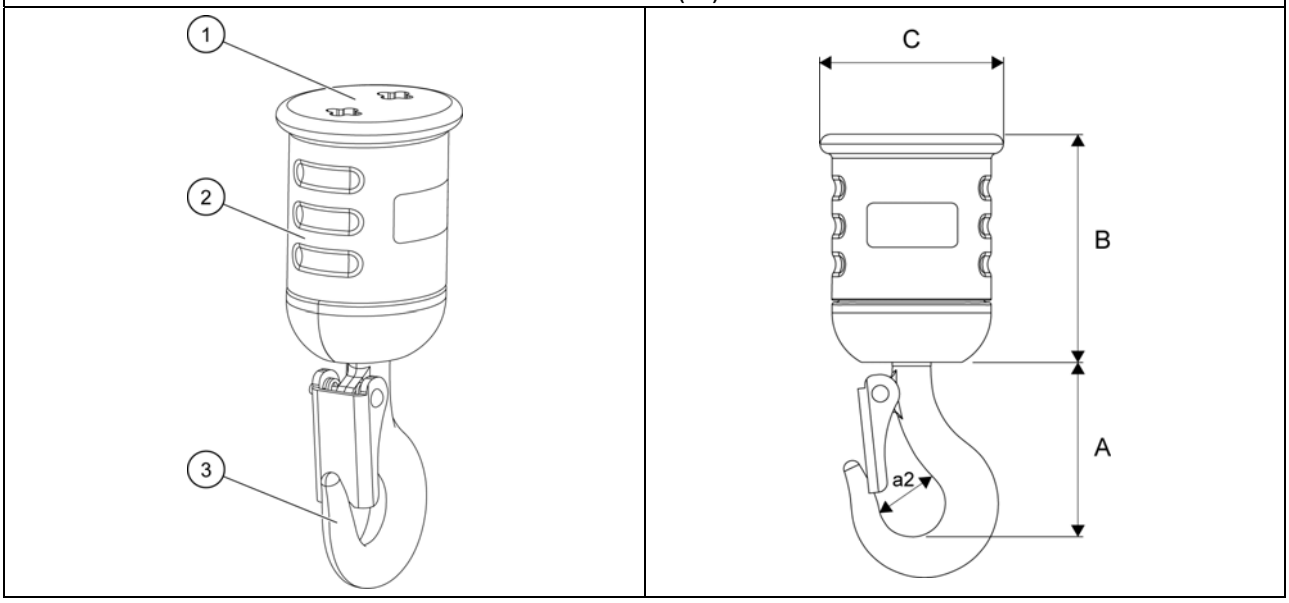
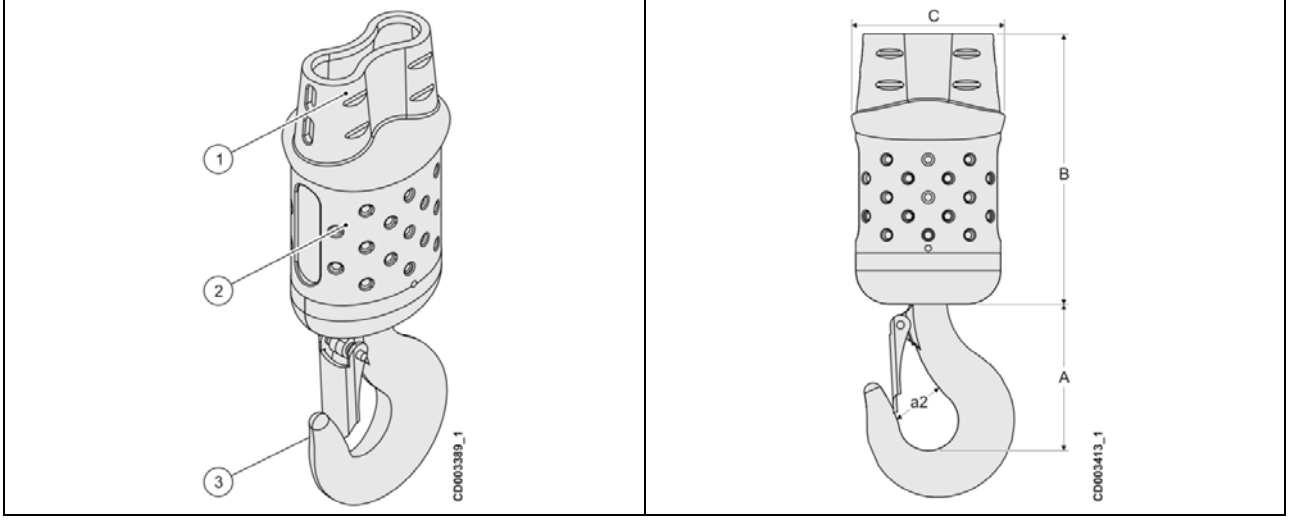
SR01 2-fall (2/1)



SR10 2-fall (2/1)



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

Frame size	Reeving	Dimensions [inch]			
		A	B	C	a2
01	2/1	2.87	3.78	2.99	0.87
10	2/1	4.57	8.46	4.88	0.94

Frame size	Reeving	Dimensions [mm]			
		A	B	C	a2
01	2/1	73	96	76	22
10	2/1	116	215	124	24

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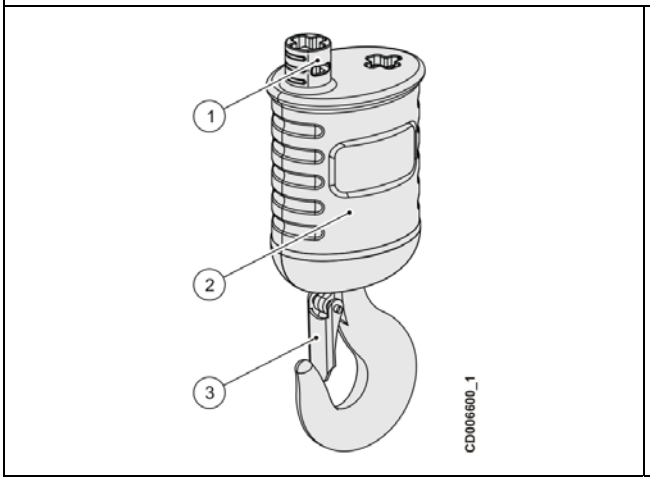
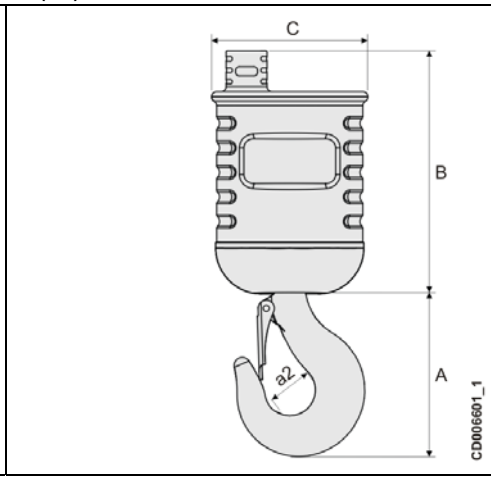
SR25 2-fall (2/1)





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

Frame size	Reeving	Dimensions [inch]			
		A	B	C	a2
25	2/1	7.34	10.63	6.93	2.19

Frame size	Reeving	Dimensions [mm]			
		A	B	C	a2
25	2/1	186.5	270	176	55.6

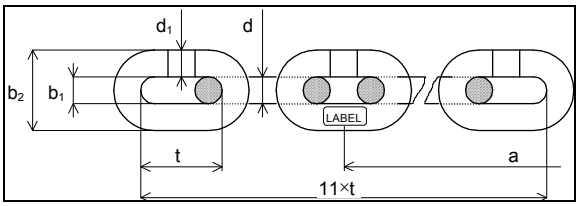
2.10 Hoisting chains

2.10.1 Safety factors according to standards

Frame size	Nominal load [ston] (D8 hoists)	Static safety factor (G80 chain)	Static safety factor (G100 chain)
01	¼	6.4	8.1
02	¼	6.4	8.1
05	½	5	8.1
10	1	6.27	8.1
25	2.5	6.52	-

Frame size	Nominal load [kg] (D8 hoists)	Static safety factor (G80 chain)	Static safety factor (G100 chain)
01	250	6.4	8.1
02	250	6.4	8.1
05	500	5	8.1
10	1000	6.27	8.1
25	2500	6.52	-

2.10.2 Chain data



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.

Dimensions

Chain size	Unit	01/02		05		10		25	
		4 x 11		5 x 14		7 x 20		11.3 x 31	
Diameter	d [mm]	4	+0.2 -0.2	5	+0.2 -0.2	7	+0.03 -0.03	11.3	+0.1 -0.4
Pitch	t [mm]	11	+0.15 -0.05	14	+0.2 -0.1	20	+0.25 -0.15	31	+0.4 -0.2
Control length	11 × t [mm]	121	+0.4 -0.2	154	+0.5 -0.25	220	+0.7 -0.35	341	+1.1 -0.5
Weld seam	d1 [mm], max.	4.3		5.4		7.5		12	
Internal width	b1 [mm], min.	4.8		6		8.4		12.6	
External width	b2 [mm], max.	13.6		16.8		23.6		36.6	
Label spacing	a [m], min.	0.22		0.3		0.4		1	
Label mark height	[mm]	1.5		1.8		2		3	
Weight	G [lb/ft]	0.249		0.383		0.739		1.888	
Weight	G [kg/m]	0.37		0.57		1.1		2.81	

Technical characteristics

Chain size	Unit	01/02		05		10		25
		4 x 11		5 x 14		7 x 20		11.3 x 31
		G80	G100	G80	G100	G80	G100	G80
Cross section	A [mm2]	25.12		39.25		76.93		200.52
Max. working load	mSWP [kg]	320		630		1250		2500
Stress at max. working load	σ [MPa]	125		157.5		159.4		125
Test force	Fm [kN]	12.6	15.8	20	100	40	48.5	100
Min. breaking force	FB [kN]	20.10	25.1	32	160	61.9	98.1	160
Min. breaking elongation	[%]	10	15	10	10	10	10	10
Min. surface hardness	[HV]	400	420	400	380HV10	400	420	380HV10
Corrosion protection		Black finish		Black finish		Black finish		Zinc plated
Grade		80	100	80	100	80	100	80
Class		T	T	T	T	T	T	T

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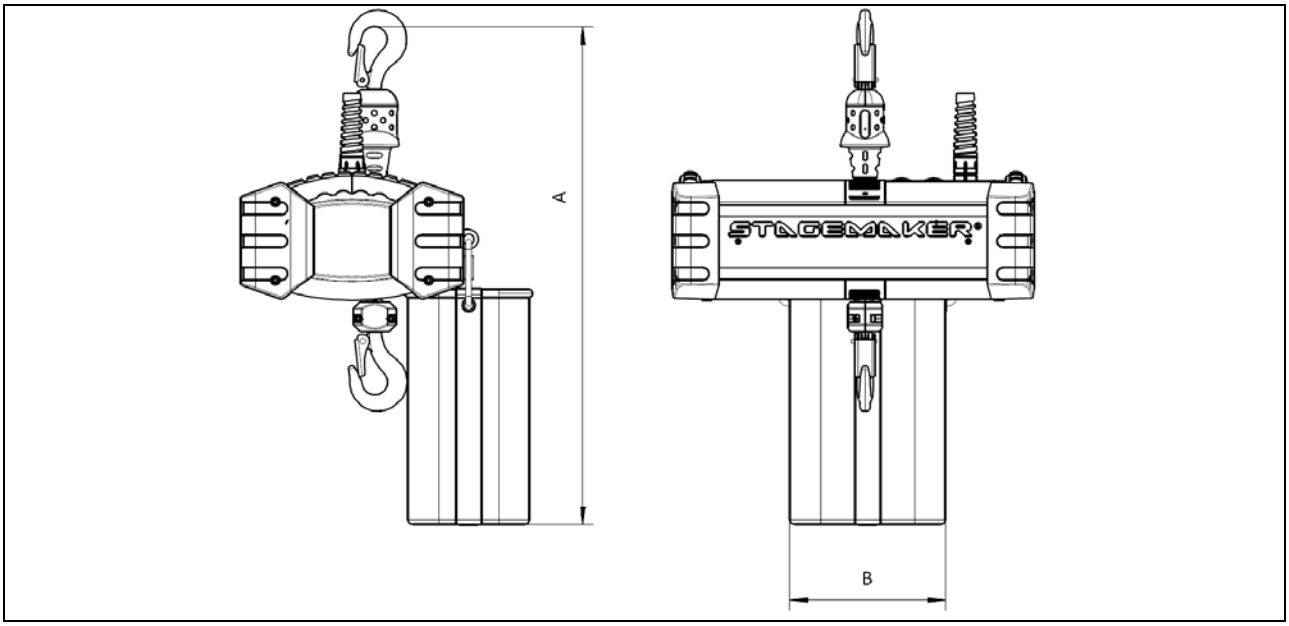
2.10.3 Chain bags



Frame size	Falls	Bag capacity [ft]	HOL [ft]	Dimension [inch]*	
				A	B
01	**1/1**	52.5	52.5	23.74	5.63
01	**1/1**	65.6	65.6	25.67	5.63
01	**1/1**	98.4	98.4	31.18	5.63
01	**2/1**	52.5	26.2	21.02	5.63
01	**2/1**	65.6	32.8	21.89	5.63
01	**2/1**	98.4	49.2	27.09	5.63
02	**1/1**	131.2	131.2	23.15	7.28
05	**1/1**	65.6	65.6	24.33	7.2
05	**1/1**	131.2	131.2	29.25	8.39
10	**1/1**	65.6	65.6	27.6	8.39
10	**1/1**	164	164	35.47	8.39
10	**2/1**	65.6	32.8	27.6	8.39
10	**2/1**	164	82	35.47	8.39
25	**1/1**	65.6	65.6	43.31	9.13
25	**1/1**	164	164	55.12	16.14
25	**2/1**	65.6	32.8	49.21	9.13
25	**2/1**	164	82	61.02	16.14

*NOTE: The values are given with a normal hook block and with the hoist in inverted position. With the (1-/2-fall) safety hook (optional), the chain bag values increase around 0.6 to 1.4 in.

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Frame size	Falls	Bag capacity [m]	HOL [m]	Dimension [mm]*	
				A	B
01	**1/1**	16	16	603	143
01	**1/1**	20	20	652	143
01	**1/1**	30	30	792	143
01	**2/1**	16	8	534	143
01	**2/1**	20	10	556	143
01	**2/1**	30	15	688	143
02	**1/1**	40	40	588	185
05	**1/1**	20	20	618	183
05	**1/1**	40	40	743	213
10	**1/1**	20	20	701	213
10	**1/1**	50	50	901	213
10	**2/1**	20	10	701	213
10	**2/1**	50	25	901	213
25	**1/1**	20	20	1100	232
25	**1/1**	50	50	1400	410
25	**2/1**	20	10	1250	232
25	**2/1**	50	25	1550	410

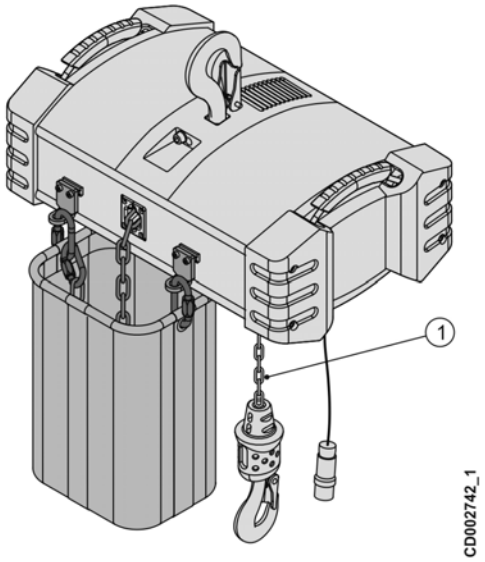
*NOTE: The values are given with a normal hook block and with the hoist in inverted position. With the (1-/2-fall) safety hook (optional), the chain bag values increase around 15 to 35 mm.

CHAIN BAG CHARACTERISTICS:

Item	Material
Textil material	Polyester 1100 denier
Fabric	TER 630
Weight	630 g/m2
Breaking	230/210 daN/5 cm
Tear	22/17 daN
Standard	DIN 53363
Color	Black

3 LUBRICATION

3.1 Lubrication charts



Pos.	Component	Intervals
1	Chain	From min.1 week up to a year (depending on the usage)
2	Hoisting transmission (gear)	Lubricated for the designed working period of the product

Note: Only lubricate the instructed components. Other parts are lubricated for the designed working period of the product.

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1

Chain

- Lubricate the chain carefully before the first run (commissioning). Grease the chain with a substantial amount of lubricant and make sure that the chain is lubricated all over its surface and links, especially on all contact areas between the chain links.
- To extend chain lifetime, continue to lubricate the chain within regular intervals.
- The lubrication interval varies from a minimum of one week to one year, depending on the usage.
- Perform the lubrication before any signs of corrosion or dryness. Using the chain without proper and sufficient lubrication will result in a strong increase of the chain wear.
- Lubricate the chain with a suitable lubricant. The lubricant for chain shall be water resistant, non-adhesive oil or grease which is able to penetrate.
- Excessive lubrication may cause dribbling.

Installation	Trade name and number	Quantity
Factory installed	Mobil Gear 632	As required

2

Hoisting transmission (gear)

- Lubricated with oil. Lubrication will last for the designed working period of the hoist.

Installation	Trade name and number	Quantity
Factory installed	Dexron III	Lubricated for the designed working period of the hoist (for information, see following table)

Frame size	Quantity of oil needed [pt] (l)
01	0.53 (0.25)
02	0.53 (0.25)
05	0.49 (0.23)
10	1.27 (0.6)
25	5.28 (2.5)

4 LIST OF MATERIALS AND COATINGS

MATERIALS:

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

LUBRICANTS:

Component	Lubricant
Hoisting transmission (gear)	Dexron III
Chain	Mobil Gear 632

COATINGS:

Component	Coating
Aluminum alloy components	Epoxy polyester powder painting (70 µm) (C2-M painting)
Steel components	C2-M painting
Chain	Black finish*, ** / Zinc plating***

COLOR CODES:

Component	Color code	Color
Body	RAL 7021	Dark grey
End caps	RAL 7021*	Dark grey
	RAL 9005**, ***	Black
Hook	RAL 7021	Dark grey
Chain	-	Black finish*, ** / Electro-galvanized***

*NOTE: For SR02-SR10.

**NOTE: For SR01.

***NOTE: For SR25.

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5 STAGEMAKER PRODUCT CODE EXAMPLE

SR	05 (GE09)	A	08 (SPD03)	1	050	5	U	(empty space)	405	E	A	080
1,2	3,4	5	6…8 (1-2 numbers)	9	10...12	13	14	15...17	18...20	21	22	23...25

Pos.	Code	Feature code	Feature	Available properties
1,2	**SR**		Hoist type	Hoist type: Stagemaker = SR
3,4	**05**	(GE09)	Frame size	Frame size: 01 = 01; 02 = 02; 05 = 05; 10 = 10; 25 = 25
5	**A**		Configuration	Configuration: A = A; B = B; C = C
6…8 (1-2 numbers)	**08**	(SPD03)	Hoisting speed (high)	50 Hz [m/min] / 60 Hz [ft/min] / Value: 4 / 16 / 04; 8 / 32 / 08; 16 / 64 / 16
9	**1**		Chain falls	Chain falls: One fall = 1; Two fall = 2
10…12 (2-3 numbers)	**050**	(LOA01)	Load [kg] (ton)	Load: 125 (⅛) = 012; 250 (¼) = 025; 500 (½) = 050; 1000 (1) = 100; 2000 (2) = 200; 2500 (2½) = 250; 5000 (5) = 500
13	**5**		ISO duty cycle	ISO Duty Cycle: M3 = 3; M4 = 4; M5 = 5
14	**U**		Position	Position: Normal - Body up = U; Inverted – Body down = D
15...17	**(empty space)**			Empty space
18...20	**405**		Power supply	50 Hz: 230V = 235, 400V = 405; 60 Hz: 208V = 206, 230V = 236, 460V = 466
21	**E**		Electrics code	Electrics Code: CSA = C; IEC = E
22	**A**		Control voltage	Control Voltage: 48VAC = A; 115VAC = B; 230VAC = C; ACF = D
23...25	**080**		Height of lift [m]	Height of lift: 80 = 080

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6 LOAD RANGE AND DUTY CLASSES

6.1 Hoist classifications

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

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

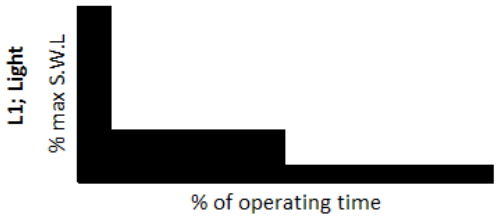
$$O_t = \frac{2 \times HOL(m) \times No.of\ cycles\ \left(\frac{1}{h}\right) \times working\ time\ \left(\frac{h}{day}\right)}{60\ \left(\frac{min}{h}\right) \times lifting\ speed\ \left(\frac{m}{min}\right)}$$

Actual load spectrum factor can be calculated using following table:

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, Km:		

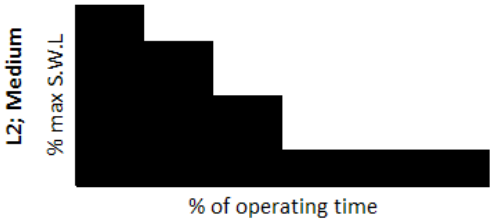
Class of load spectrum	Load spectrum K_m
L1	$K_m \leq 0{,}125$
L2	$0{,}125 < K_m \leq 0{,}250$
L3	$0{,}250 < K_m \leq 0{,}500$
L4	$0{,}500 < K_m \leq 1$

Class of load spectrums:



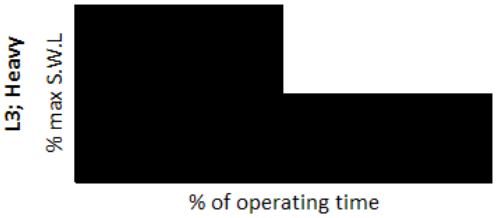
L1 Light

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



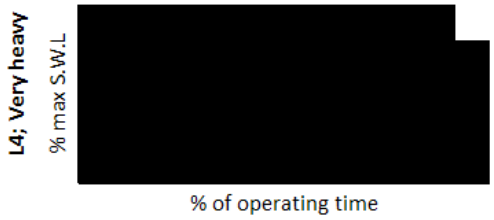
L2 Medium

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 per working day [hrs]			
L1	Light	≤ 2	≤ 4	4 - 8	8 - 16
L2	Medium	≤ 1	≤ 2	2 - 4	4 - 8
L3	Heavy	≤ 0,5	≤ 1	1 - 2	2 - 4
L4	Very heavy	≤ 0,25	≤ 0,5	0,5 - 1	1 - 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

7 CONTROLLERS

7.1 Group Controllers for Configuration A Hoists

These group controllers are for controlling multiple hoists individually or together. The SC type controls are built in to a durable ABS plastic hand case. The control functions are inside the hand case. A remote with the GO button (run command) and E-stop is available as an option.

Model	Number of Channels	Description	Enclosure	Connection
SC4P-UL	4	Direct control without remote	ABS Briefcase	CE - 4p plug
SC8P-UL	8	Direct control without remote	ABS Briefcase	CE - 4p plug

Specifications:

- Direct control, configuration A hoists
- Single hoist up to 1.44HP [1.1kW] per channel at 230V-3Ph-60Hz
- Two hoists with intermediary CE splitter (up to 1.44 HP per channel at 230V-3Ph-60Hz)
- Individual hook level correction
- 3 position selector switch (UP-OFF-DOWN) per channel (group control)
- One GO (Run command) button (effective only on channels selected via selector switch)
- Emergency stop is a push-to-maintain, turn-to-release, red mushroom head push button
- Master-slave function up to two controllers
- Connected motor power: 4 or 8 x 1.44HP [1.1kW] at 230V-3Ph-60Hz
- Short circuit proofing: once at 10kA maximum

7.2 Group Controllers for Configuration B Hoists

- Third-party controller

7.3 Pistol-Grip Pendant Controller (Pickle) for Configuration B

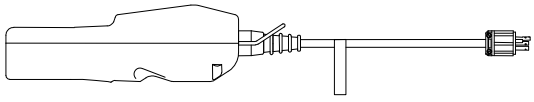
The pistol-grip pushbutton controller or “pickle” is available for the low control voltage hoists. The pickle cannot be used as a suspended pendant station because it does not include any type of strain relief.

Features:

- Pigtail without plug (standard pigtail length is 18” (0.5 m), longer lengths available)
- Contacts for motion buttons are mechanically interlocked and momentary type
- Pendant station enclosure has ratings of NEMA 4, 4X, 5 or IP65.
- Pendant station is suitable for indoor or outdoor use.
- Emergency Stop is a push-to-maintain, turn-to-release, red mushroom head button.
- Two push buttons for each motion, one for each direction of travel.

Optional Features:

- Longer pigtail cable lengths (in 1 ft (1 m) increments up to 50 ft (15 m))
- Twist-Lock male plug

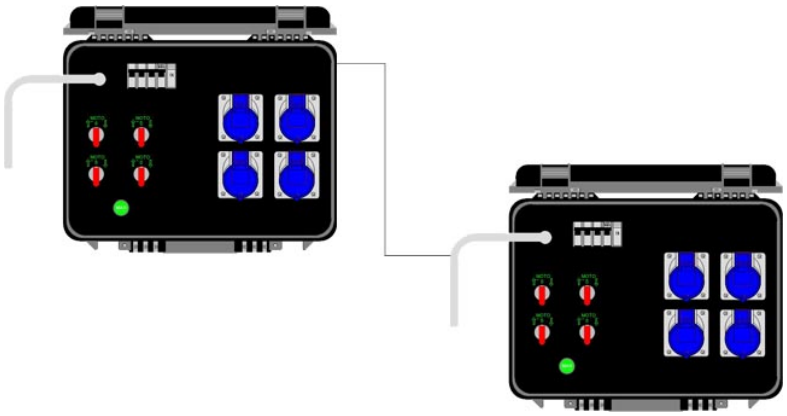


Pistol grip Pushbutton Controller - shown with optional Twist-lock plug

8 CONTROLLERS – EXAMPLES OF USE

8.1 Configuration A – 8 or 12 Channel Controller

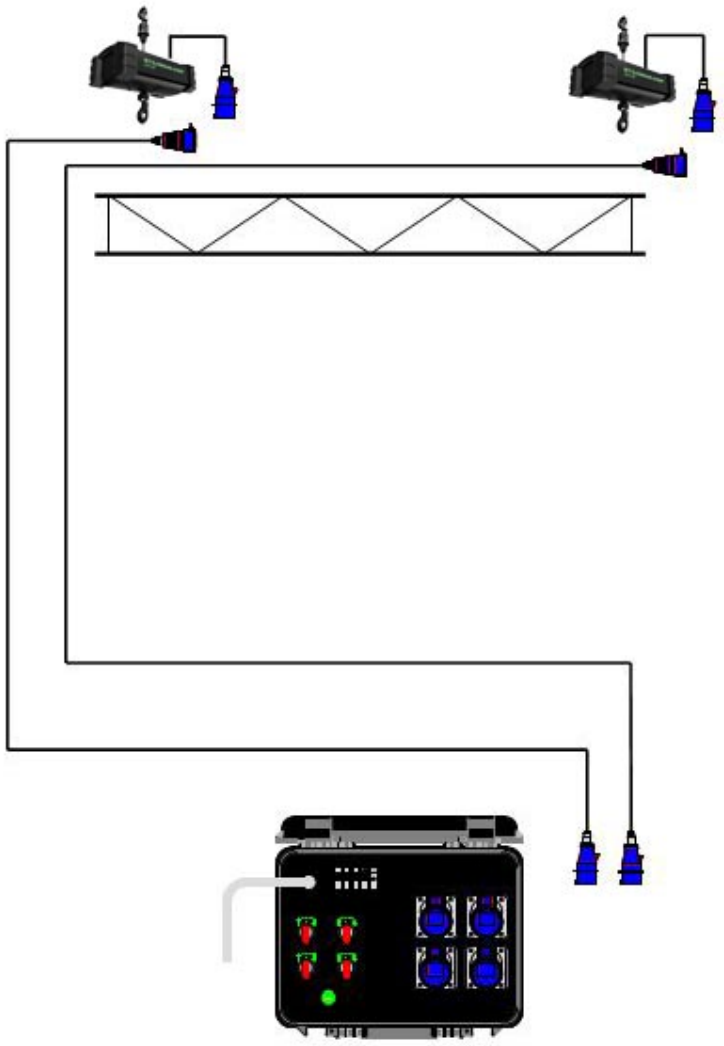
Two SC4P-UL 4-channel controllers can be linked in a master-slave connection to create an eight-channel controller. SC8P-UL 8-channel controller is also available and can be linked in a master-slave connection to create a twelve-channel controller.



Warning: Controllers with remote cannot be linked to controllers without remote. When linking two SC controllers together, the optional “go” button with E-stop remote cannot be used.

8.2 Configuration A – SC Controller, Hoist & Cable

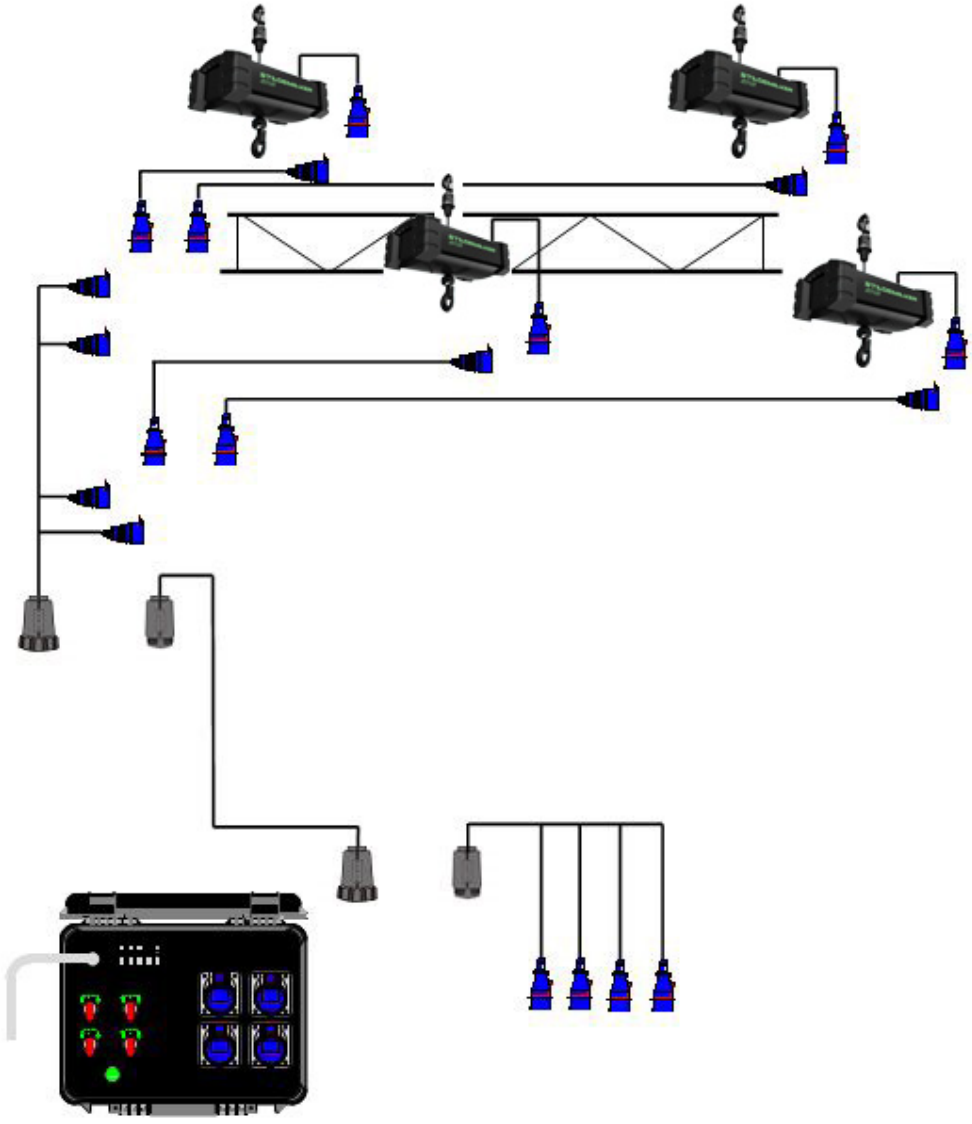
Shown here in a two-hoist, two-cable arrangement, power is supplied to the hoist with a cable equipped with CE connectors.



SC4P Controller

8.3 Configuration A – SC Controller, Hoist & Cable + Splitters

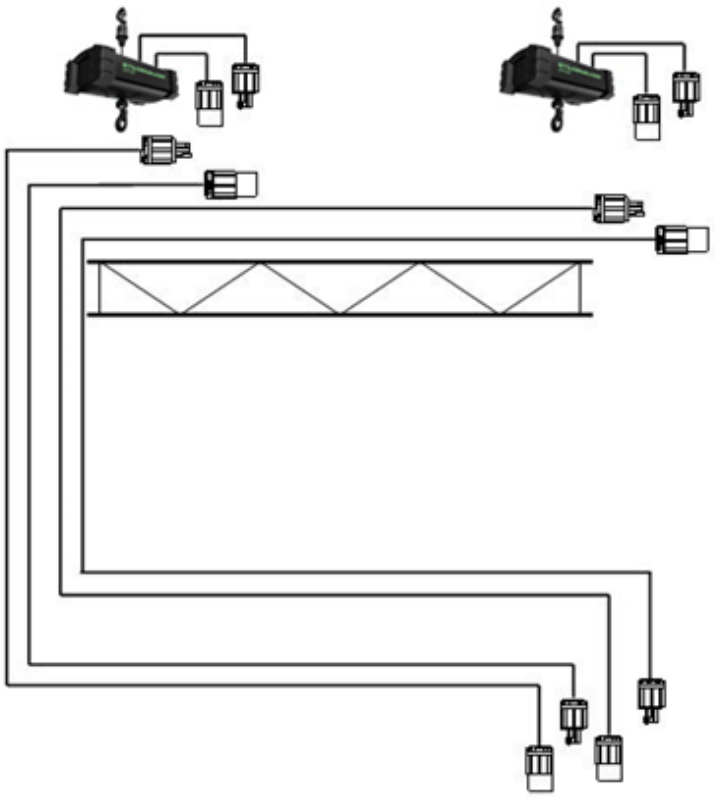
Shown here in a four-hoist, one main cable with splitters arrangement where main cable from controller is equipped with Socapex connectors and uses fan-out and fan-in cables. The fan cables are equipped with multiple CE connectors and one Socapex connector. Hoist cables are outfitted with CE connectors.



SC4P Controller

8.4 Configuration B – Hoist & Cables (separate power & control), 3rd-party Controller

Shown here in a two-hoist, four-cable arrangement where power and control are supplied to each hoist through a separate power cable and a separate control cable. Cables are outfitted with Twist-lock connectors.



3rd-party controller (8-channel shown)

8.5 Configuration B – Hoist & Cable (combined power & control), 3rd-party Controller

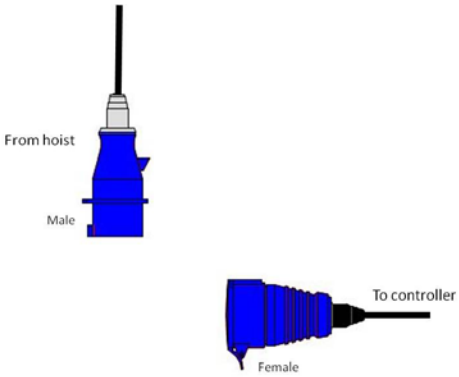
Shown here in a two-hoist, one cable arrangement where power and control is supplied to the hoist with a combined power and control cable. Cable is outfitted with 7 pin Socapex connectors.

3rd-party controller (8-channel shown)

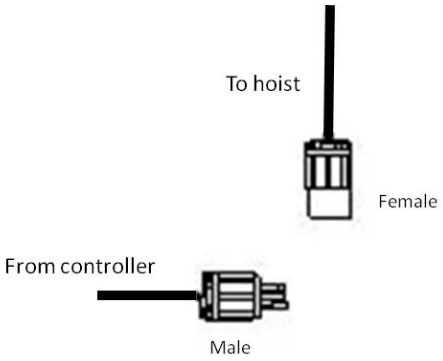
9 PIGTAILS/CABLES/CONNECTORS

9.1 Connector Rules

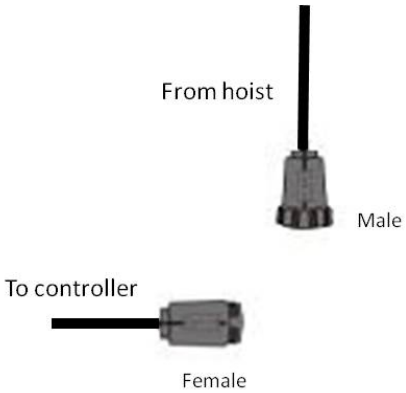
Power Cable



Control Cable



Combined Power/Control Cable



9.2 Pigtail Options

Configuration A – power pigtail

Configuration B– combined power/control pigtail

Configuration B – separate power and control pigtails

Configuration B – combined power/control pigtail
with separate control pigtail

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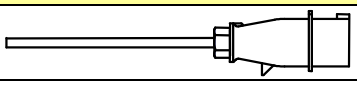
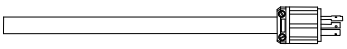
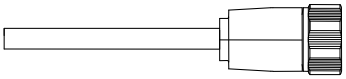
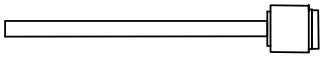
9.3 Pigtails with Plug (options)

Longer pigtail cable lengths are available (in 1 ft (0.5 m) increments from 2 ft (1 m) up to 50 ft (15 m)).

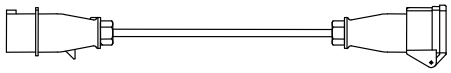
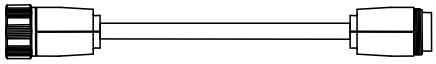
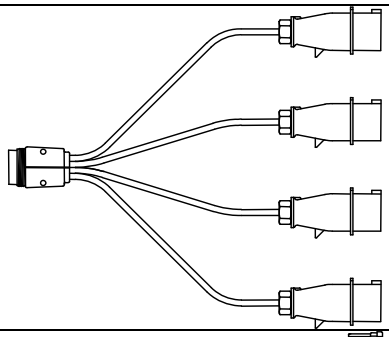
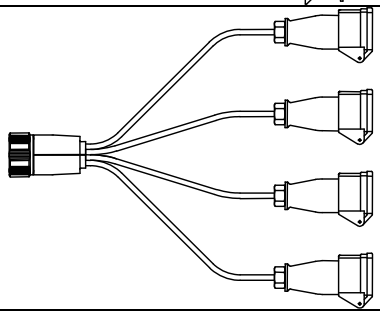
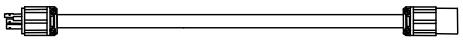
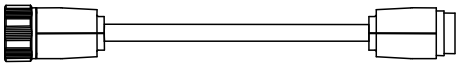
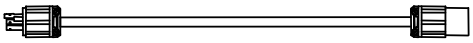
Configuration	Description / Technical Statement	Cable	Standard Length*	Example
A	Power pigtail with Blue CE male plug (420 P9) **PS59 = CEB**	SJO Cable 12 AWG / 4 C	1.5 ft (0.5 m)	
A & B	Power pigtail with (3 prong + Gnd) twist-lock male plug (L16 – 20P) **PS59 = L16-20P**	SJO Cable 12 AWG / 4 C	1.5 ft (0.5 m)	
B	Power/control pigtail with 7-Pin Socapex male plug (SX07LM) **PS59 = SX07 / PS69 = S**	STO Cable 16 AWG / 7 C	1.5 ft (0.5 m)	
B	Control pigtail with twist-lock female receptacle (L14 – 20R) **PS60 = L14-20R / PS70 = S**	STO Cable 16 AWG / 7 C	1.5 ft (0.5 m)	
B	Power/control pigtails with P14 male plug (SCPB06SLX20-27PX) **PS59 = SCPB**	STO Cable 16 AWG / 7 C	1.5 ft (0.5 m)	

* NOTE: This is the length from the hoist body to the end of pigtail.

9.4 Cables with Connectors

Cable lengths are available in 25 ft (7.5 m), 50 ft (15 m) or 75 ft (23 m) lengths for Configuration A hoists only. The maximum cable length for the application must be selected in accordance to the amperage and maximum voltage drop.

The length of the Fan-in and Fan-out cable is 1.5 ft (0.5 m) and is not available in longer lengths.

Configuration	Description	Cable	Cable Length	Example
A	Power cable with Blue CE connectors	SJO Cable 12 AWG / 4 C	25 ft (7.5 m) 50 ft (15 m) 75 ft (23 m)	
A	Extension multi cable with 19 pin connectors	SJO Cable 14 AWG / 16 C	25 ft (7.5 m) 50 ft (15 m) 75 ft (23 m)	
A	Fan-in cable 19 pin female receptacle with 4 CE Blue male plugs	SJO Cable 14 AWG / 4 C	1.5 ft (0.5 m)	
A	Fan-out cable 19 pin male plug with 4 CE Blue female receptacles	SJO Cable 14 AWG / 4 C	1.5 ft (0.5 m)	
A & B	Power cable with twist-lock connectors	SJO Cable 12 AWG / 4 C	25 ft (7.5 m) 50 ft (15 m) 75 ft (23 m)	
B	Power/control cable with 7 pin Socapex connectors	STO Cable 16 AWG / 7 C	25 ft (7.5 m) 50 ft (15 m) 75 ft (23 m)	
B	Control cable with twist-lock connectors	STO Cable 16 AWG / 7 C	25 ft (7.5 m) 50 ft (15 m) 75 ft (23 m)	

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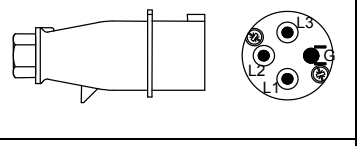
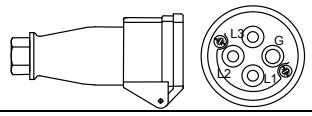
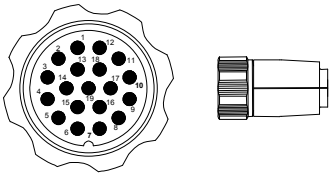
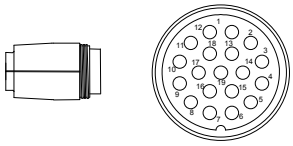
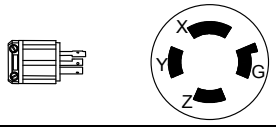
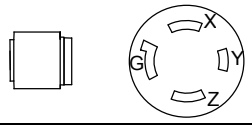
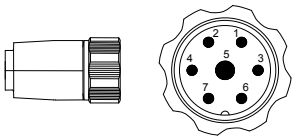
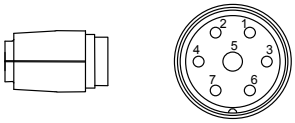
9.5 Connector Types and Plug Wiring Identification

<table>
<tr><th>Configuration</th><th>Description</th><th>Use</th><th colspan="3">Standard Plug Wiring</th><th>Illustration</th></tr>
<tr><td rowspan="2">A</td><td>Blue CE male plug
(420 P9)
PS59 = CEB</td><td rowspan="2">Power</td><td>Pin</td><td>Color</td><td>Function</td><td rowspan="2">  </td></tr>
<tr><td>L1
L2
L3
G</td><td>Black
White
Red
Green</td><td>L1
L2
L3
GND</td></tr>
<tr><td>Blue CE female receptacle
(420 C9)</td><td colspan="3">See male plug wiring</td><td>  </td></tr>
<tr><td rowspan="2">A</td><td rowspan="2">19-pin Socapex male plug (SX19LMB)</td><td rowspan="4">Power</td><td>Pin</td><td colspan="2">Color</td><td rowspan="2">  </td></tr>
<tr><td>1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19</td><td colspan="2">Black 1
White 1
Red 1
Green 1
Black 2
White 2
Red 2
Green 2
Black 3
White 3
Red 3
Green 3
Black 4
White 4
Red 4
Green 4
N/A
N/A
N/A</td></tr>
<tr><td>19-pin Socapex female receptacle
(SX19LFB)</td><td colspan="3">See male plug wiring</td><td>  </td></tr>
<tr><td rowspan="2">A & B</td><td>Twist-lock (3 prong + gnd) male plug
(L16 – 20P)
PS59 = L16-20P</td><td rowspan="2">Power</td><td>Pin</td><td>Color</td><td>Function</td><td rowspan="2">  </td></tr>
<tr><td>X
Y
Z
G</td><td>Black
White
Red
Green</td><td>L1
L2
L3
GND</td></tr>
<tr><td>Twist-lock female receptacle
(L16 – 20R)</td><td colspan="3">See male plug wiring</td><td>  </td></tr>
<tr><td rowspan="2">B</td><td rowspan="2">7-pin Socapex male plug (SX07LM)
PS59 = SX07
PS69 = S</td><td rowspan="2">Combined power and control</td><td>Pin</td><td>Color</td><td>Function</td><td rowspan="2">  </td></tr>
<tr><td>1
2
3
4
5
6
7</td><td>Black
White
Red
Orange
Green
Blue
Blk / wht</td><td>L1
L2
L3 *
UP
GND
COMMON
DOWN</td></tr>
<tr><td>7-pin Socapex female receptacle (SX07LF)</td><td colspan="3">See male plug wiring</td><td>  </td></tr>
</table>

* NOTE: Not used for single-phase (Configuration S)

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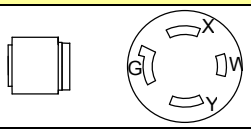
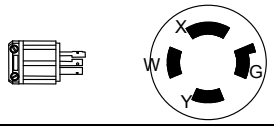
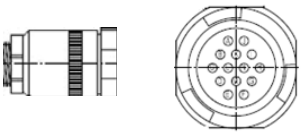
<table>
<tr><th>Configuration</th><th>Description</th><th>Use</th><th colspan="3">Standard Plug Wiring</th><th>Illustration</th></tr>
<tr><td rowspan="6">B</td><td rowspan="5">Twist-lock female receptacle
(L14 – 20R)
PS60 = L14-20R
PS70 = S</td><td rowspan="5">Control</td><td>Pin</td><td>Color</td><td>Function</td><td rowspan="5">  </td></tr>
<tr><td>W</td><td>Orange</td><td>UP</td></tr>
<tr><td>X</td><td>Blue</td><td>COMMON</td></tr>
<tr><td>Y</td><td>Blk / wht</td><td>DOWN</td></tr>
<tr><td>G</td><td>Green</td><td>GND</td></tr>
<tr><td>Twist-lock (3 prong + gnd) male plug
(L14 – 20P)</td><td colspan="3">See female plug wiring</td><td>  </td></tr>
<tr><td rowspan="10">B</td><td rowspan="9">P14 male plug
(SCPB06SLX20-27PX)
PS59 = SCPB</td><td rowspan="9">Combined power and control</td><td>Pin</td><td>Color</td><td>Function</td><td rowspan="9">  </td></tr>
<tr><td>A</td><td>Black</td><td>L1</td></tr>
<tr><td>B</td><td>White</td><td>L2</td></tr>
<tr><td>C</td><td>Red</td><td>L3*</td></tr>
<tr><td>D</td><td>Orange</td><td>UP</td></tr>
<tr><td>E</td><td>Blk / Wht</td><td>COMMON</td></tr>
<tr><td>F</td><td>Blue</td><td>DOWN</td></tr>
<tr><td>G-M</td><td>N/A</td><td>N/A</td></tr>
<tr><td>N</td><td>Green</td><td>GND</td></tr>
<tr><td>P14 female receptacle
(SCPB06SLX20-27SX)</td><td colspan="3">See male plug wiring</td><td></td></tr>
</table>

* NOTE: Not used for single-phase (Configuration S)

9.5.1 Plug Wiring Identification (option)

7 PIN SOCAPEX (SX07LM) PIN-OUT VARIATIONS					
PS59 = SX07 / PS69 = A1 2309789001		**PS59 = SX07 / PS69 = A2 2309789001**		**PS59 = SX07 / PS69 = A3 2309828001**	
ALTERNATE		ALTERNATE		ALTERNATE	
1	L1	1	L1	1	L1
2	L2	2	L2	2	L2
3	L3 *	3	L3 *	3	L3 *
4	GROUND	4	DOWN	4	UP
5	UP	5	GROUND	5	GROUND
6	COMMON	6	UP	6	DOWN
7	DOWN	7	COMMON	7	COMMON
PS59 = SX07 / PS69 = A4 2309830001		**PS59 = SX07 / PS69 = A5 2309832001**		**PS59 = SX07 / PS69 = A6 2309834001**	
ALTERNATE		ALTERNATE		ALTERNATE	
1	L1	1	L1	1	L1
2	L2	2	L2	2	L2
3	L3 *	3	L3 *	3	L3 *
4	DOWN	4	COMMON	4	COMMON
5	GROUND	5	GROUND	5	GROUND
6	COMMON	6	UP	6	DOWN
7	UP	7	DOWN	7	UP

* NOTE: Not used for single-phase (Configuration S)

TWIST-LOCK (L14-20) PIN-OUT VARIATIONS					
PS60 = L14-20R / PS70 = A1 2309836001		**PS60 = L14-20R / PS70 = A2 2309838001**		**PS60 = L14-20R / PS70 = A3 2309840001**	
ALTERNATE		ALTERNATE		ALTERNATE	
W	UP	W	COMMON	W	COMMON
X	DOWN	X	UP	X	DOWN
Y	COMMON	Y	DOWN	Y	UP
G	GROUND	G	GROUND	G	GROUND
PS60 = L14-20R / PS70 = A4 2309842001		**PS60 = L14-20R / PS70 = A5 2309844001**			
ALTERNATE		ALTERNATE			
W	DOWN	W	DOWN		
X	COMMON	X	UP		
Y	UP	Y	COMMON		
G	GROUND	G	GROUND		

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10 CABLE LENGTH SELECTION CHART

Proper wire size is an important aspect in hoist performance. Recommended wire size for power/control cables is listed in the tables below.

S.W.L. [ton]	Frame size	Falls	Hoisting Speed [ft./min]	50 ft.	75 ft.	100 ft.	150 ft.	175 ft.	225 ft.	250 ft.	300 ft.
¼	01	1	16	16 AWG	16 AWG	16 AWG	16 AWG	16 AWG	16 AWG	14 AWG	14 AWG
	02	1	16	16 AWG	16 AWG	16 AWG	16 AWG	16 AWG	16 AWG	14 AWG	14 AWG
	02	1	32	16 AWG	16 AWG	16 AWG	14 AWG	14 AWG	12 AWG	12 AWG	10 AWG
	05	1	64	16 AWG	16 AWG	16 AWG	14 AWG	14 AWG	12 AWG	12 AWG	10 AWG
½	01	2	8	16 AWG	16 AWG	16 AWG	16 AWG	16 AWG	16 AWG	14 AWG	14 AWG
	05	1	16	16 AWG	16 AWG	16 AWG	16 AWG	16 AWG	16 AWG	14 AWG	14 AWG
	05	1	32	16 AWG	16 AWG	16 AWG	14 AWG	14 AWG	12 AWG	12 AWG	10 AWG
	10	1	64	16 AWG	14 AWG	12 AWG	12 AWG	10 AWG	10 AWG	N/A	N/A
1	10	1	16	16 AWG	16 AWG	16 AWG	14 AWG	12 AWG	12 AWG	12 AWG	10 AWG
	10	1	32	16 AWG	14 AWG	12 AWG	12 AWG	10 AWG	10 AWG	N/A	N/A
2	10	2	8	16 AWG	16 AWG	16 AWG	14 AWG	12 AWG	12 AWG	12 AWG	10 AWG
	10	2	16	16 AWG	14 AWG	12 AWG	12 AWG	10 AWG	10 AWG	N/A	N/A
2 ½	25	1	16	16 AWG	14 AWG	12 AWG	12 AWG	10 AWG	10 AWG	N/A	N/A
	25	1	32	12 AWG	12 AWG	10 AWG	10 AWG	10 AWG	N/A	N/A	N/A
5	25	2	16	12 AWG	12 AWG	10 AWG	10 AWG	10 AWG	N/A	N/A	N/A

S.W.L. [kg]	Frame size	Falls	Hoisting Speed [m/min]	15 m	22 m	30 m	45 m	53 m	68 m	76 m	91 m
250	01	1	4	16 AWG	16 AWG	16 AWG	16 AWG	16 AWG	16 AWG	14 AWG	14 AWG
	02	1	4	16 AWG	16 AWG	16 AWG	16 AWG	16 AWG	16 AWG	14 AWG	14 AWG
	02	1	8	16 AWG	16 AWG	16 AWG	14 AWG	14 AWG	12 AWG	12 AWG	10 AWG
	05	1	16	16 AWG	16 AWG	16 AWG	14 AWG	14 AWG	12 AWG	12 AWG	10 AWG
500	01	2	2	16 AWG	16 AWG	16 AWG	16 AWG	16 AWG	16 AWG	14 AWG	14 AWG
	05	1	4	16 AWG	16 AWG	16 AWG	16 AWG	16 AWG	16 AWG	14 AWG	14 AWG
	05	1	8	16 AWG	16 AWG	16 AWG	14 AWG	14 AWG	12 AWG	12 AWG	10 AWG
	10	1	16	16 AWG	14 AWG	12 AWG	12 AWG	10 AWG	10 AWG	N/A	N/A
1000	10	1	4	16 AWG	16 AWG	16 AWG	14 AWG	12 AWG	12 AWG	12 AWG	10 AWG
	10	1	8	16 AWG	14 AWG	12 AWG	12 AWG	10 AWG	10 AWG	N/A	N/A
2000	10	2	2	16 AWG	16 AWG	16 AWG	14 AWG	12 AWG	12 AWG	12 AWG	10 AWG
	10	2	4	16 AWG	14 AWG	12 AWG	12 AWG	10 AWG	10 AWG	N/A	N/A
2500	25	1	4	16 AWG	14 AWG	12 AWG	12 AWG	10 AWG	10 AWG	N/A	N/A
	25	1	8	12 AWG	12 AWG	10 AWG	10 AWG	10 AWG	N/A	N/A	N/A
5000	25	2	4	12 AWG	12 AWG	10 AWG	10 AWG	10 AWG	N/A	N/A	N/A