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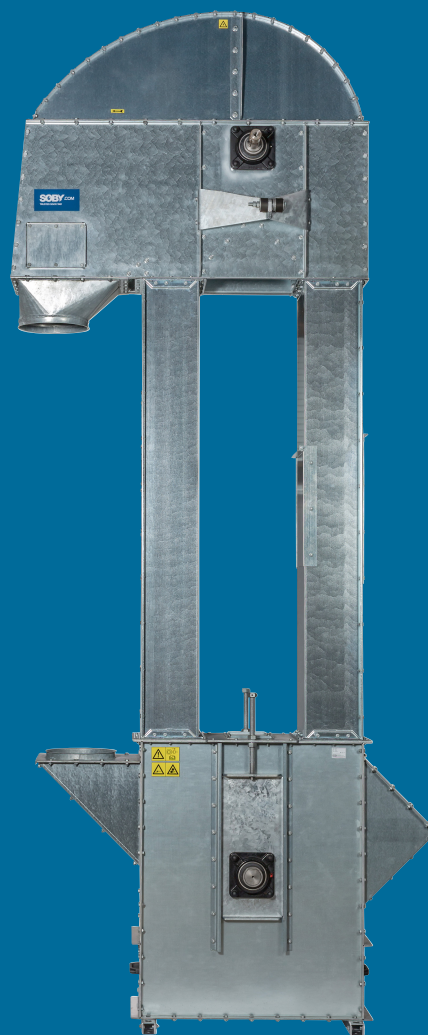


User manual

SK25-175

Thank you for choosing SØBY
In order for the machine to function
optimally, it is important to forllow the
instructions in this manual.

Enjoy.



Introduction

Thank you for choosing SØBY.

It is very important that you read this user manual to obtain the necessary knowledge regarding installation, operation, service, maintenance, and dismantling. It is important to keep the user manual in a safe location for future use.

At SØBY we always work to improve our machines therefore we reserve the right to improve and update our products continually. This mean that some machine parts will be removed from the product selection, but it will always be possible to get a corresponding machine part for our machines. SØBY will always be ready to help and guide regarding our products.

Enjoy.

INDEX

General Information	2
Use of the Machine.....	8
Explanation of the Pictograms.....	9
Residual Risk	10
Specifications.....	11
Descriptions of Components.....	12
Mounting	14
Adjustment of the Elevator Belt.....	20
Electrical Equipment	24
Maintenance	25
Cleaning	27
Technical Data	28
Troubleshooting	29
Declaration of Conformity	2

General Information



Please read the entire User Instructions before assembling and operating the installation.

If the purchaser makes any technical modifications to the machine, any warranty from SØBY will then be cancelled. The declaration will lose its validity.

The guarantee is only granted if the following conditions are met:

- The unit may only be used as described in this manual. Replacement of parts or changing in the construction of the unit might cause the equipment to be re-certified.
- Assembly, putting into operation and operation only by using this User Instructions.
- Documentable compliance with maintenance intervals, cf. instructions.
- Use the original spare parts of the manufacturer only.
- Operation of the bucket elevator only by using motor protection or star-delta connection with motor-protection.
- In order to prevent dust emissions, all joints must be sealed by silicone.
- Emergency stop must be installed in accordance with current standard EN 60204-1.
- By normal operation at the machine, see pictogram devices and read the User/Assembly Instructions.
- When performing operations in areas where there might be a risk of explosion, the safety of personnel and equipment is subject to compliance with relevant safety regulations. Performing installation and maintenance work in such areas, involves a special responsibility for the persons performing the work. This work requires that the assembly and maintenance personnel have a thorough knowledge of laws, regulations and standards within the area. This construction provides a brief overview of the most important safety conditions in connection with installation, maintenance and use of the equipment. Please pay attention to the fact that it is the responsibility of the end user to identify potentially explosion areas according to current regulations, with the following requirements for zone classification and, if applicable, reporting to the local authorities.
- Repair, service and maintenance must be performed carefully in strict compliance with the instructions of SØBY and must be performed by personnel who possess the qualifications required in relation to the explosion safety of the equipment. Inspection and maintenance in respect of the electrical equipment must be based on the instructions in EN60079-17.

- During the life time of the bucket elevator and in connection with use, special attention must be paid to the following:
 - Lifetimes (see diagram page 27)
 - Damages to parts and screens
 - Corrosion
 - Tightening of bolts and screws
 - Data and information about allowable installation- and operating conditions on the data plate of the equipment
 - Instructions in possible types certificates for equipment installed on the unit

- Modifications or alterations of the equipment, which influence the explosion safety of the equipment, are not allowed. Before using the equipment, check that the equipment is undamaged, assembled, and installed as directed by SØBY.

The manufacturer reserves the right to make technical changes.

The machine can be used for transportation of feed, which give reason for an inner Zone 22. In case the machine is placed in an Atex zone, please select suitable gear and motor. The machine can be used for transportation of the following materials, with data as shown below:

- Grain, mixed dust
- Flour
- Minerals
- Soya bean meal
- Rape/beans
- Feed pellets and wooden pellets, up to 8mm in diameter

	Particle-size [µm]	Ignition-temperature Dust clouds [°C]	Ignition temperature 5mm Layer of Dust [°C]	LEL [g/m ³]	MIE [mJ]	Kst [bar m/s]	Reference
Limit values	12	400	280	30	50	131	-

If the media transported, contains stones or metal parts, the explosion safety of the equipment cannot be guaranteed.

Must comply with EN 60079-10-2:2015 concerning explosive atmospheres/atmosphere of dust.

Safety Instructions



The instructions and especially the safety information must be read carefully prior to assembling, operating, servicing and maintaining.

All plants and components must be assembled in accordance with the applicable accident prevention rules.

The machine must be shielded correctly in relation to the current Machinery Directive and as such making it impossible to get in touch with moving parts. The shielding may only be removed by using tools. The shielding must be mounted before the machine is put into operation.

The motor must be properly protected through overload protection equipment, and the bucket elevator must be properly fitted with a suitable potential equalization.

For any repair or maintenance, disconnect the power source from the drive motor.

When the bucket elevator is running, do not put your hand or your fingers into the drive device or elsewhere.

There must always be shielding of inlet and at outlet, and here there is a required mesh size of up to 120mm, with a safety distance of minimum 850mm. This must be observed in relation to DS/EN ISO 13857.

Shielding such as shaft shields and backstop shields for preventing or elimination of risks must be maintained on a regular basis.

The machine must be installed in a way that provides good ergonomic conditions for service of the machine.

The safety equipment, which has been removed during repair, cleaning or maintenance work, must be re-established before the plant is put back into service.

All screws, bolts and attachments must be properly tightened.

If the machine is stuck/clogged, the transmission might be overheated.

The bucket elevator may only be put into operation, when it is assured that it is not defective. The user is obliged to only operating the installation when it is in perfect condition.

SØBY is not liable for damages arising from abuse or technical modifications of the installation and breach of the instructions given in this manual.

The bucket elevator, type SK25-175 is constructed in accordance with the 2014/34/EU Directive (ATEX) and can be used for transportation of the materials listed in this manual. If the bucket elevator is used for transportation of material types, which have characteristics that can cause that the material, when blending into air, immediately can cause an explosion if ignited, it should be noted that such materials **may not contain foreign objects**, such as steel or stone, which during the transportation through the bucket elevator may cause mechanical sparks, with the risk of ignition of the explosive atmosphere inside in the elevator. This could damage the elevator and in worst case harm human beings, animals and property.

If the bucket elevator is used for transportation of the above combination of explosive material and foreign objects, SØBY cannot guarantee for the safety of the bucket elevator in relation to explosion. In such situations it is recommended that the elevator is produced with safety devices in form of explosion relief and/or systems of explosion suppression, whose efficiency must be determined by more detailed calculation, as not all types of dust will explode at the same speed and pressure.

If the bucket elevator is placed in areas classified as potentially explosive, specially approved motor and gearbox must be used for the zone in question. If you have any questions, please contact SØBY for further information. It must be ensured that the ambient temperature in the area, where the equipment is installed, remains within the allowed limit values of the equipment $-20^{\circ}\text{C} \leq \text{TA} \leq 40^{\circ}$. Therefore, when installing the device, it is necessary to consider any external heat sources that might affect the ambient temperature in the area where the equipment is installed.

During any work with the bucket elevator there must be sufficient work lighting.

Respiratory masks, safety shoes, earmuffs and other required safety precautions that might be required by the local workplace assessment, should be used during any work with the machine, where the bucket elevator is installed. Furthermore, helmet must be used during installation, service and assembly/disassembly.

When assembling machines, heavy lifting might occur. Persons setting up the machine must read the assembly/user manual at first. Suitable lifting equipment must be used in connection with installation and assembly.

Gloves must be used while handling the machine as there is a risk of sharp edges.

The equipment must not be exposed to larger dust loads (dust layers) than permitted in EN60079-14.

It should be noted that if the bucket elevator is expected to run empty for more than 5 minutes, it is necessary to install a dry-running sensor to ensure that the machine stops; likewise, it is also ensured that the machine outlet is not clogged.

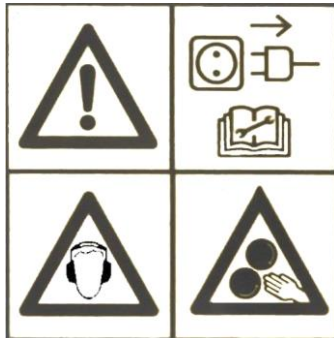
The electrical connection to the supplied machines may only be carried out by specially trained personnel.

Use of the Machine

The bucket elevator is designed for transportation of grain and almost all seeds and flour products within agriculture (see material specifications in general references).

The bucket elevator **may not** be used for tasks beyond these.

Explanation of the Pictograms



Prior to repair, maintenance and cleaning work turn off the motor and unplug power cord.

Moving machine parts can be dangerous. They are only to be touched when they are all at ease.



Direction arrow shows the direction of the rotation. If this is wrong, it might damage the backstop, buckets and belts.

NB! Do not forget removing of fittings before testing.



Lifting point.

Residual Risk

The bucket elevator is produced in accordance with the safety and health requirements set out in the ATEX and Machinery Directive, and consequent harmonization standards. If these regulations are disregarded, the bucket elevator may endanger the life and limb of the user or third party. See Declaration of Conformity.

Specifications

Capacity ranges are from 25-175 t/h.

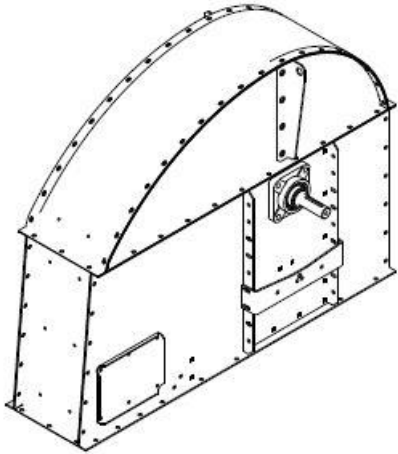
As an option, you can order different inlet funnels, inlet slide, and speed monitors for monitoring of irregular runs, and monitoring of side runs. To facilitate access to the service at the top of the elevator, ladders with fall restraint hoops and service platforms can be supplied.

If the capacity of the elevator for an outgoing transportation conveying is too high, or if the grain can run uncontrolled to the elevator, a slide must be installed between the elevator and the inlet funnel.

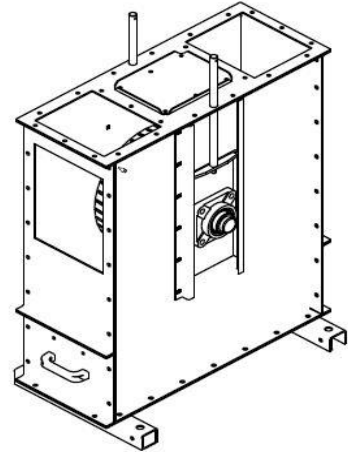
Backstop prevents that the filled up bucket elevators are running back, when the elevator is stopped.

Descriptions of Components

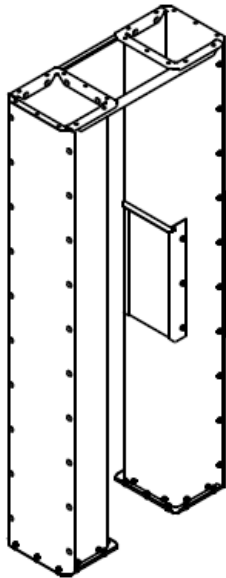
Bucket Elevator Top



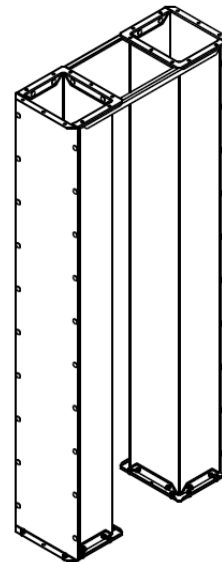
Bucket Elevator Bottom



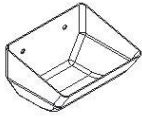
Extension with Inspection



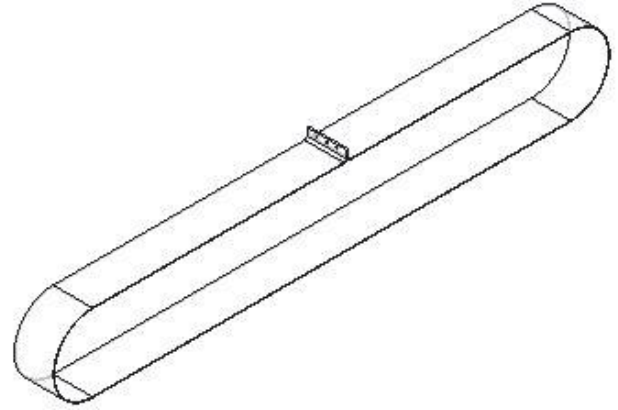
Extension w/out Inspection



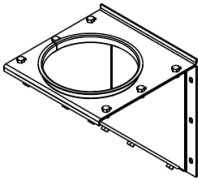
Elevator Bucket



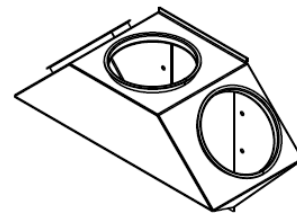
Elevator Belt



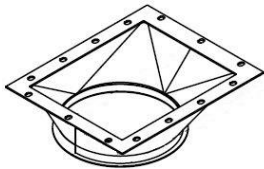
Inlet for Bucket Elevator Foot



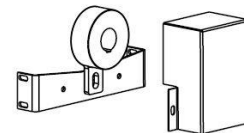
3-way Inlet for Bucket Elevator Foot



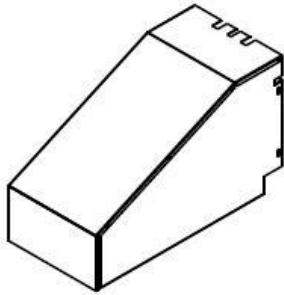
Outlet for Bucket Elevator Head



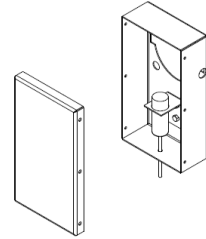
Backstop incl. Cover



Cover of Gear-motor



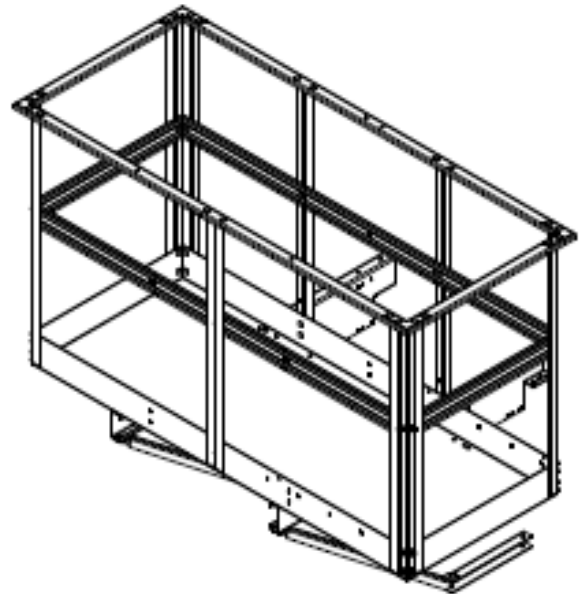
Rotating sensor with cover



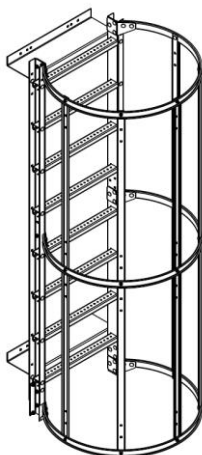
Side Run Indicator



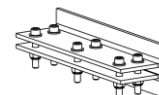
Platform at Elevator Head



Ladder w/
Fail restraint Hoops



Belt Clamp



Mounting

Installation of the Bucket Elevator

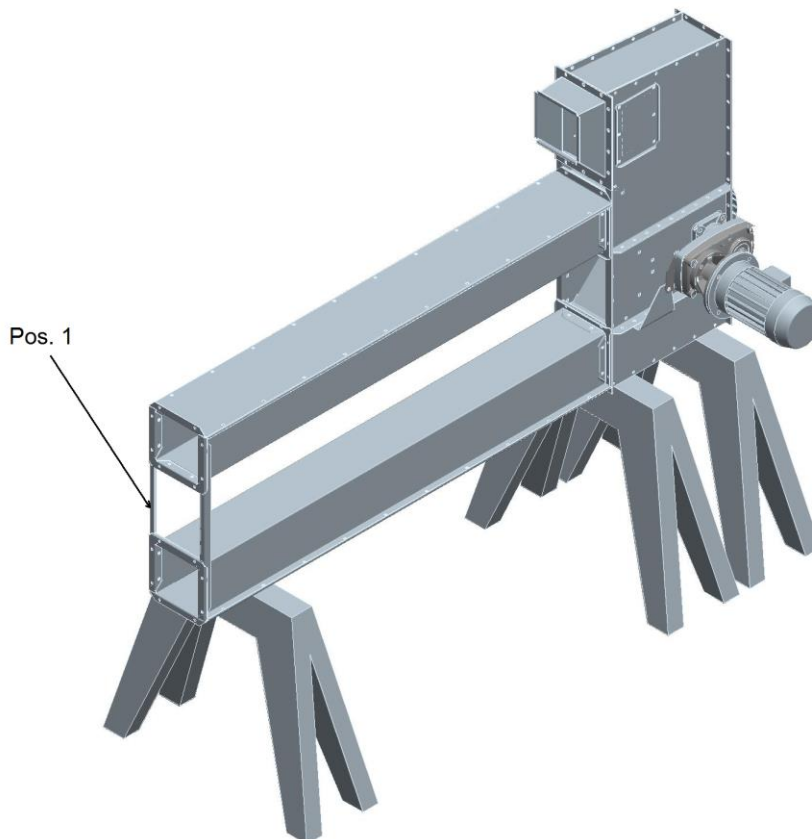
Place the head of the bucket elevator with the backside on trestles (height about 800 mm, if a service platform is going to be installed) with outlets pointing upwards. Adjust the elevator head so that the flange side is plumb. Remove the top of the elevator head so that you can mount elevator belts later on.

Place the elevator tubes as shown in figure 1, with the accompanying spacers as guide. These spacers should be used with all 2m extensions. Adjust the elevator tubes so they are horizontal and tighten them to the elevator head. It may be necessary to loosen the bolts at flanges in order to adjust the elevator tubes.

Pull a rope/a wire through both elevator tubes, so eventually you can pull the elevator belt into position.

Other extensions are installed in the same way. Be sure to check by a spirit level that all extensions are horizontal and that they are in a straight line.

Figure 1

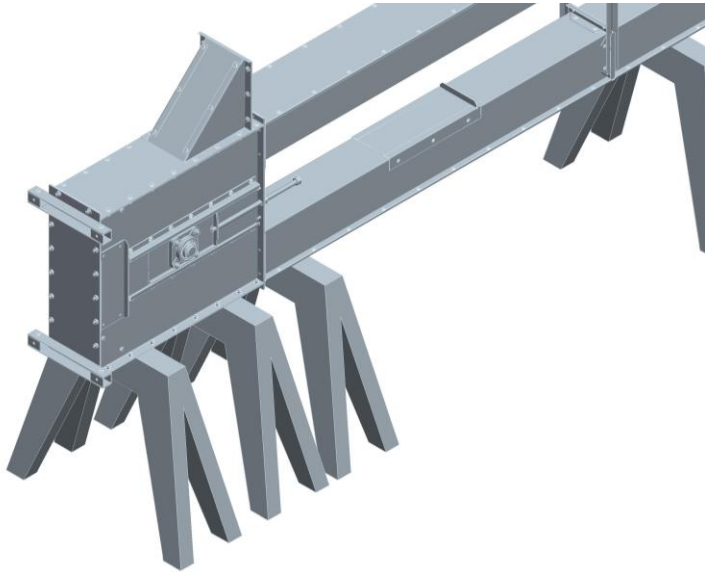


When all extensions (Maximum 12m) are assembled, (the last extension must always be with inspection hatch in the lower elevator tube) the elevator foot is to be placed figure 2.

If the bucket elevator is more than 12m, it is necessary to assemble it in two parts and assemble these two, when the elevator has been raised to vertical position. Belts and buckets can be mounted in the upper part before the two parts are assembled.

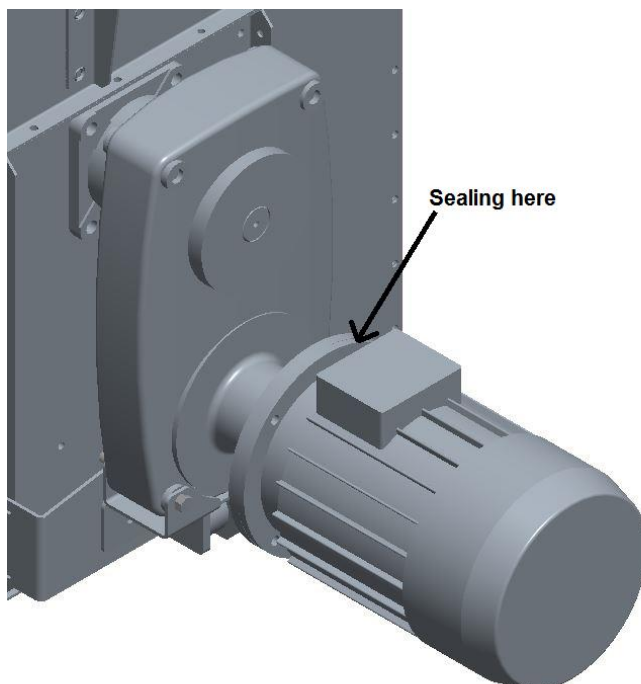
NB! Do not forget the rope/the wire.

Figure 2



Sealing of the Flange between Gear and Motor

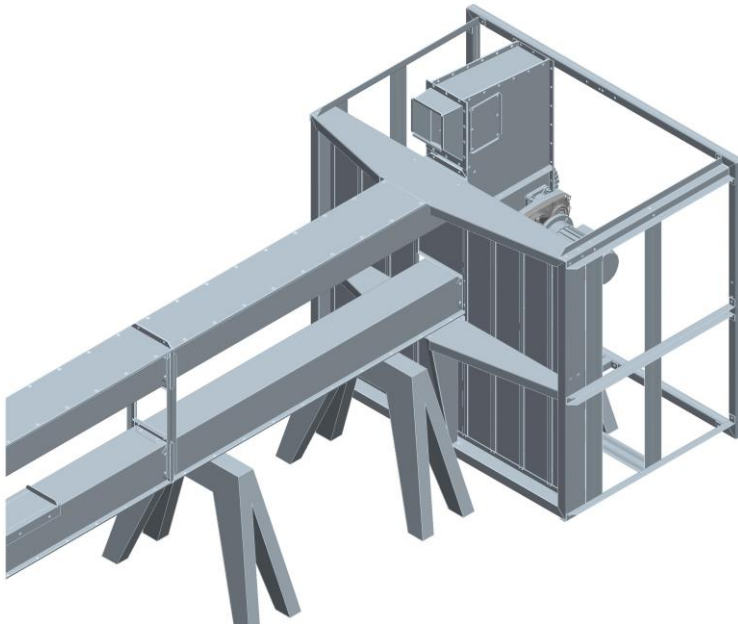
The joint is sealed on the upper side to prevent water ingress.



Mounting of Service Platform

If the bucket elevator is going to be mounted with a service platform, the best thing will be to mount it before it is going to be raised. Mount the two conical profiles on the extensions in the upper bolts just under the elevator head. Bearers and supports are going to be mounted as shown in figure 3.

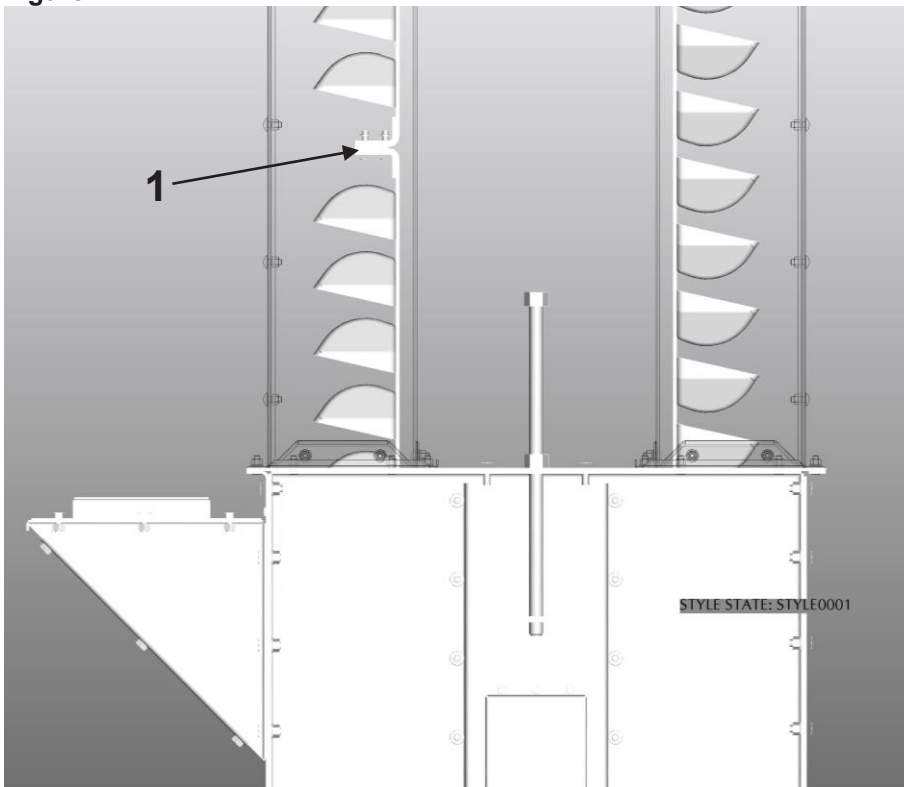
Figure 3



Insertion of the Belt

The belt-tensioning device at the elevator foot is completely loosened. Remove one cover plate on the upper elevator tube at the elevator foot. The belt is passed through both elevator tubes. One end of the belt is lead via the rope/ the wire under the lower belt wheel to the opening. The other end is lead over the belt wheel at the head of the elevator to the opening. The belt is assembled with the provided assembly fittings pos. 1, as seen in figure 4. If needed, the belt is shortened. Attach the elevator buckets with the supplied screws. Before that, check if the belt has not been twisted when it was led into the elevator tubes.

Figure 4

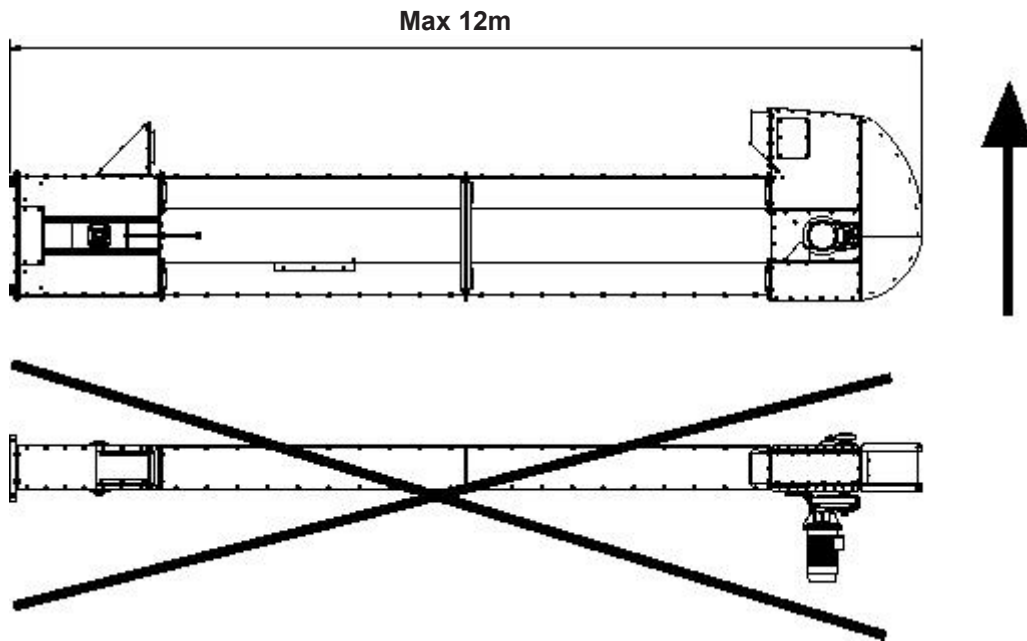




When the elevator is to be raised, it is important that it is raised at the high edge as shown in figure 5, **never at the flat side.**

Place the lifting chain into the lifting eyes of the elevator head. When the bucket elevator has been raised into vertical position, it can be placed on its final foundation.

Figure 5



Adjustment of the Elevator Belt

Tension of the Belt

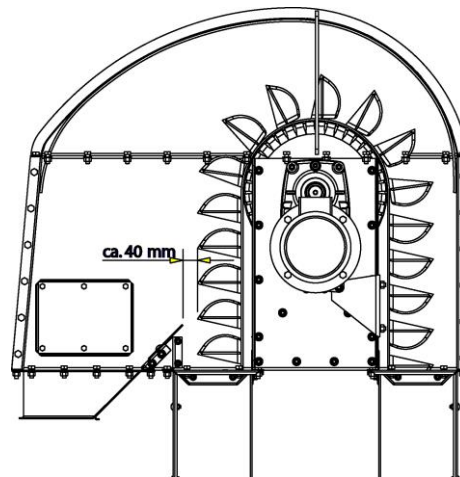
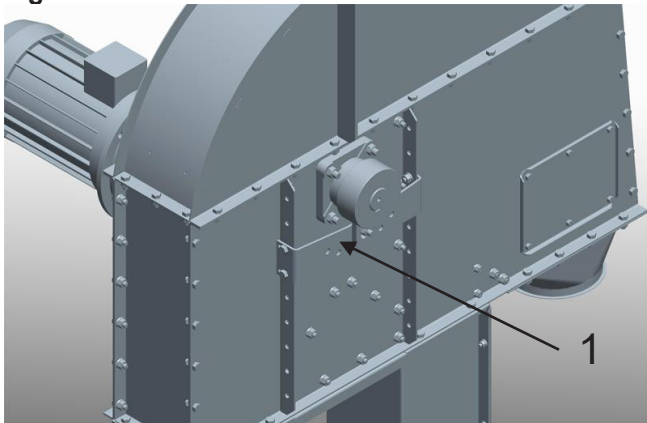
The belt is tightened equally in both sides. Run a test and be aware of the fact that the belt is running in the centre of the elevator drum (elevator drums are convex).

If the belt runs irregularly this can be corrected by adjustment of the foot of the elevator (the belt is always running to the highest point of the elevator drum).

Attention! During test running and control of the rotation direction, the fittings of the backstop figure 6, must be removed, position 1

Adjustment of the scraper ca. 40mm

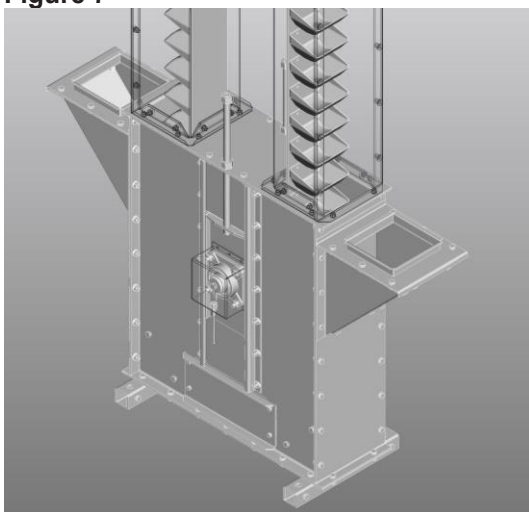
Figure 6



Inlet Hopper (Additional)

An additional inlet hopper can be mounted at the elevator tube side at the elevator foot. There may be a capacity reduction of 20%.

Figure 7

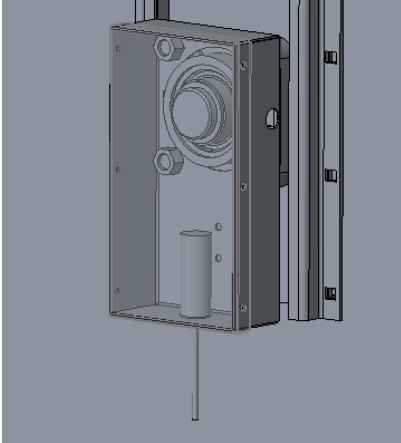


Monitoring of Irregular Drive and Speed

Speed Monitoring (extra accessories)

The rotating sensor is mounted on the tension plate (the foot of the elevator) around the flange bearing. Mount the scanner at the end of the shaft, see figure 8. The sensor is adjusted to a 5mm distance between sensor and scanner. **IMPORTANT!** See datasheet for sensor adjustment.

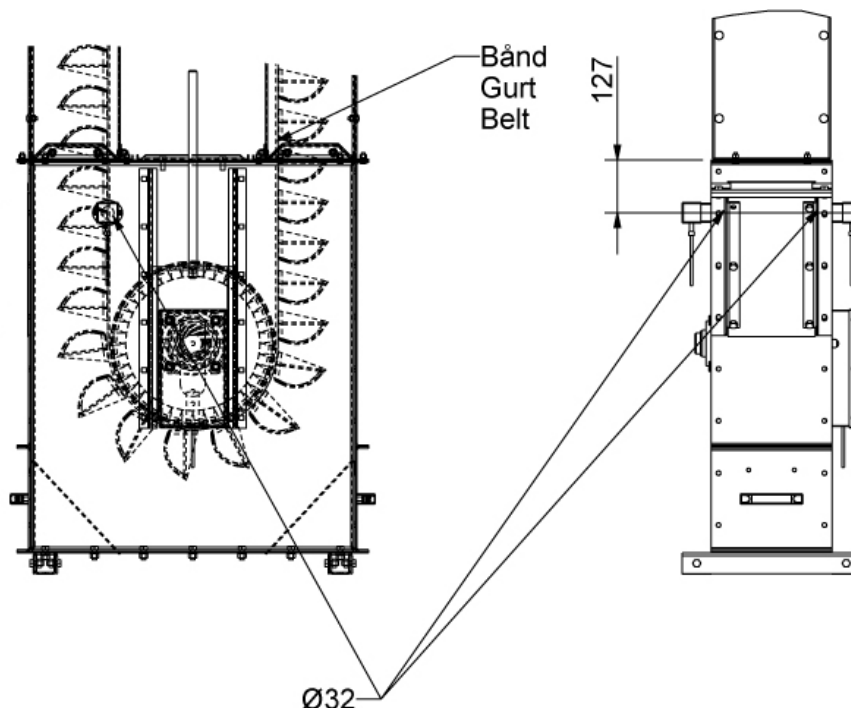
Figure 8



Side Run Indicator (extra accessories)

The side run indicator is placed in the elevator foot at the side of the chute, drill one \varnothing (diameter) 32mm hole in each side of the elevator foot, the hole is drilled abreast of the elevator belt, see figure 9, also find the accompanying supplier guidance inside the packing.

Figure 9

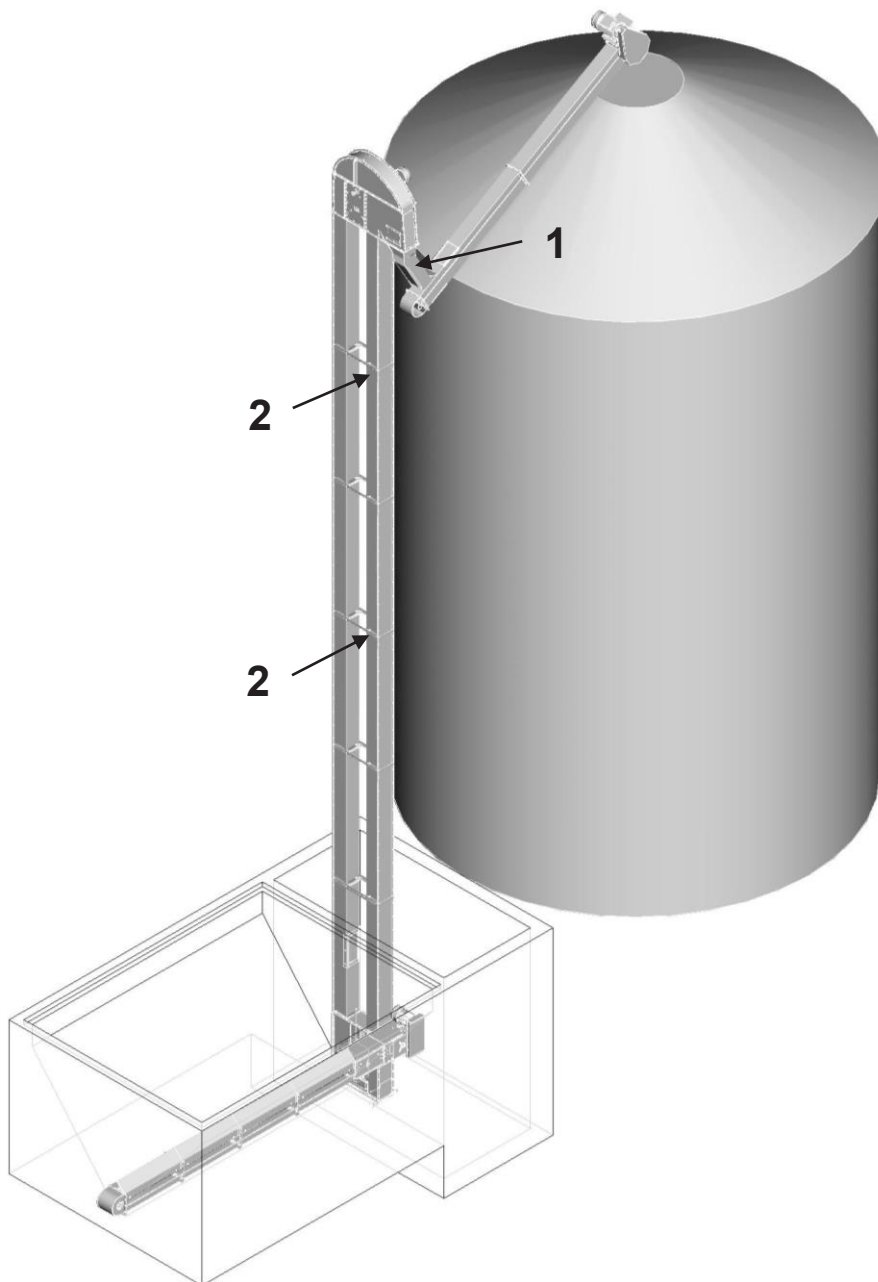


Outlet Tube

The specified tube cross section must not be reduced. The outlet tubes, position 1, with grain must be fitted with a minimum 45° downgrade slope, whilst flour-like materials require 60°.

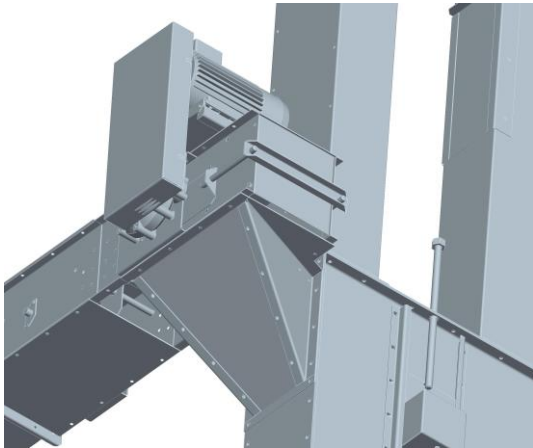
Reinforcement from the bucket elevator to the silo should be done with fittings for every 4 m. These are to be placed as close to extension joints as possible, position 2. The head of the elevator should be anchored to the silo or other by mounting angle iron or by bracing.

Figure 10

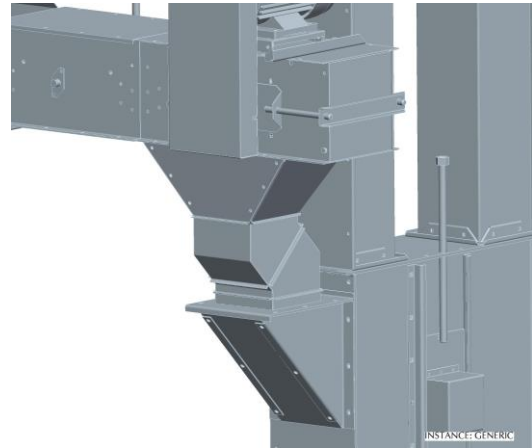


Examples of Joinings

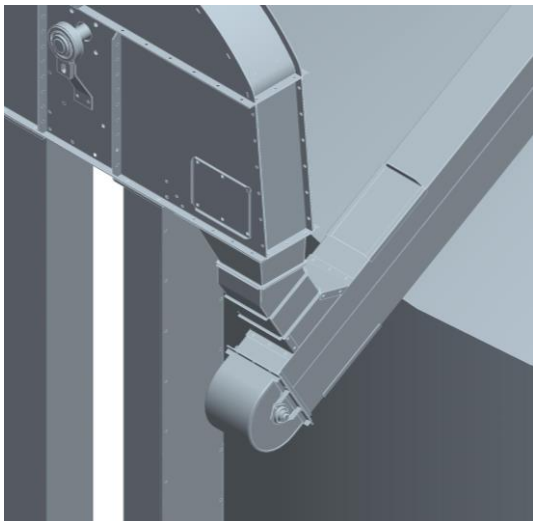
90° Inlet directly from a pit chain conveyor



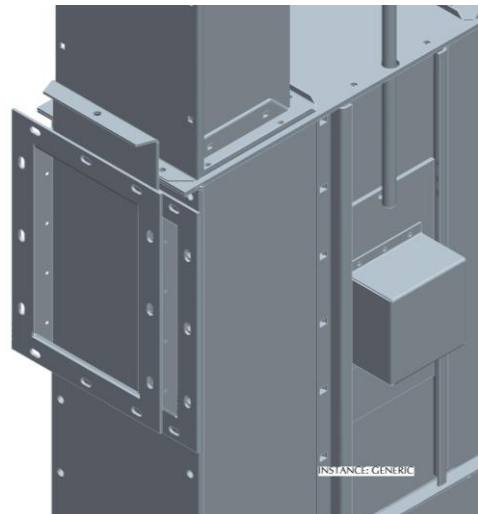
Standard inlet w/ 45° Q bends



Standard outlet for chain elevator w/ 30° Q bends and Q tubes



Flow regulator for limiting access to the bucket elevator



Electrical Equipment

Specially trained staff only may perform the electrical connection to machinery supplied by SØBY.



During installation, pay attention to the voltages and data listed on the motor rating plate.

The connection terminals of the motor are connected according to the instructions on the motor. The motor must be protected with thermal protection and by a lockable main circuit breaker.

Installation of connection of the unit must take place in accordance with national installation regulations, supplemented by the requirements, which are stated in EN60204-1 and EN60079-14. Commissioning of the electrical parts and subsequent maintenance must comply with the instructions in EN60079-17.

The bucket elevator must always be connected to motor protection or motor protection with star/delta switch.

If a frequency converter or a soft starter is inserted, carefully check the data from the converter and from the rating plate. Pay attention to the labeling of the electrical components in classified areas.

When connecting the bucket elevator, make sure that the direction of rotation of the bucket elevator matches the directional arrow.

Equipotential bonding:

There is an external terminal for connection of the interconnector on the motor. The connection must be carried out in accordance with the instructions in EN60079-14.

PLEASE NOTE!

At test running and control of the direction of the rotation, the fitting on the backstop must be removed.

Maintenance



During maintenance works, the precautions described in Safety Instructions, must be observed.

The bucket elevator is worn out more or less, depending on amount of dirt in the transport material and must be inspected once a year for abrasion or damages. Foreign objects, such as pieces of wood, stone or iron, may cause damages.

If foreign objects are stuck inside the bucket elevator, these can be removed by using appropriate tools, but under no circumstances with your own hands. In such case, please dismantle the bucket elevator. Parts that might be worn out should be replaced during the same round. However, foreign objects should always be avoided and must not get into the machine.

Please be aware of that the safety of motors, gears and bearings is subject to compliance with intervals of maintenances/replacements.

The electrical motors are dimensioned so that they cannot be overloaded during normal operations, if they have been properly mounted and installed. The motor safety switch will disconnect the power supply if the motor is overloaded or if there is a power failure. Fuses and the safety of the motor switch must be checked and, if necessary, replaced by specially trained staff.

The bucket elevator belt is checked for the first time after 50 operating hours, for proper tension and tilted running. This is performed by turning off the main switch, and then removing the inspection plate at the extension, or in the bottom of the elevator. This enables you to test the belt and check the tension and the tightening of the belt (please see previous section under mounting).

The following equipment at the unit is maintained with the below intervals:

Equipment	Manufacturer	Maintenance Interval
Buckets	SØBY	Every 1000 hours, however, at least once a year the tightening of the elevator belt must be checked as well as abrasion of the buckets.
Bearing at the drive-tension section	PTI	Must be replaced for every 10.000 operating hours
Bearing at turnover	PTI	Must be replaced for every 10.000 operating hours
Motor	Cantoni /techtop	Bearings must be replaced for every 25.000 operation hours
Motor	Nordgear	Bearings must be replaced for every 30.000 operation hours
Gearbox	Nordgear	It is important to emphasize that explosion safety is contingent on the maintenance required below.: Dust layer of more than 5 mm must be removed by a vacuum cleaner. Every 6 months, visual inspection of oil seals is done, and replacement is done in case of signs of abrasion. Oil level is checked once a year. For every 10.000 operating hours the oil should be replaced. Also, regular checks on noises are performed.

Cleaning

The bucket elevator should be cleaned regularly to avoid product mixtures, bacterial formation and damages to the product.



In order to avoid overheating, dust deposits at motor and gear must be removed regularly.

At least once a year the entire bucket elevator must be cleaned and inspected for defects and abrasion.

Cleaning is necessary when changing crops in order not to mix these together.

During transportation of highly adhesive products like rape, corn, soya bean and the like, all inlets and all outlets must be checked for free passage.

Make sure that the buckets are in good condition and that the belt is not defective, otherwise they should be replaced.

When cleaning, all prescribed safety precautions must be observed.

Technical Data

Type	Efficiency Tons/Hour	Bucket	Speed of Belt m/min	Number Buckets/m	Type of Tube
SK25	26	SPS130	182	5,15	Q16/Ø150
SK50	51	SPS130	182	10,3	Q20/Ø200
SK60	63	SPS180	173	6,3	Q24/Ø250
SK80	85	SPS180	173	8,5	Q24/Ø250
SK100	102	SPS230	168	6	Q30/Ø300
SK120	119	SPS230	168	7	Q30/Ø300
SK150-175	162	SPS280	165	7,4	Q30

Noise level: Operation with grain: 76 dB(A)
 without grain: 63 dB(A)

Troubleshooting

Errors	Possible Cause	Remedy
The bucket elevator does not start	Power supply disconnected	Check power cable and replace if necessary
	The motor fuses are defective	Replace fuses
	The motor safety switch is defective	Replace the switch
	The motor is defective	Replace the motor
	Voltage is too low, below 400 V	Inform possibly electricity supplier
	Foreign objects block the bucket elevator	Remove the foreign object with appropriate tools
The bucket elevator does not transport/ does not transport properly	The outlet is blocked/ not opened	Clean outlet / open
	The inlet quantity is too low	Increase the inlet quantity
	The belt of transportation is too loose	Retighten transportation belt/set up
	Outflow tube is too small dimensioned	Change outflow tube, larger diameter
	Outflow tube has too small fall	Modify to at least 45° of fall
	Wrong transportation material	Transportation material according to intended purpose
	Insufficient transportation material	Add transportation material
	Foreign object blocks outflow tube	Remove foreign object with appropriate tools
Bucket elevator emits loud sounds	Defective bearing	Renew bearing
	Buckets strike against	Setup/retighten the belt again and bring into position
	Loose bearing	Fix the bearing
	The belt drags	Retighten the belt evenly



Declaration of Conformity

The Company
Søby Maskinaktieselskab
Viborgvej 306
DK-7840 Højslev
Denmark

Hereby declares that this machine type supplied by **Søby Maskinaktieselskab**

type: SK25-SK175

Complies with the following normative documents:

DIRECTIVE 2006/42/EC	OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 17 May 2006 on machinery, and amending Directive 95/16/EC
DIRECTIVE 2014/34/EU	OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 26 February 2014 on the harmonisation of the laws of the Member States relating to equipment and protective systems intended for use in potentially explosive atmospheres
DS/EN ISO 12100:2011	Safety of machinery – General principles for design – Risk assessment and risk reduction
DS/EN ISO 13857:2019	Safety of machinery – Safety distances to prevent hazard zones being reached by upper and lower limbs
DS/EN IEC 60079-0:2018	Explosive atmospheres – Part 0: Equipment – General requirements
DS/EN ISO 80079-36:2016	Non-electrical equipment for use in potentially explosive atmospheres Part 1: Basic method and requirements
DS/EN ISO 80079-37:2016	Non-electrical equipment for use in potentially explosive atmospheres Part 5: Protection by constructional safety 'c'
DS/EN ISO 1127-1:2011	Explosive atmospheres - Explosion prevention and protection - Part 1: Basic concepts and methodology

The electrical components mounted on this machine type complies with the following normative documents:

DIRECTIVE 2014/30/EU	OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 26 February 2014 on the harmonisation of the laws of the Member States relating to electromagnetic compatibility
DIRECTIVE 2014/35/EU	OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 26 February 2014 on the harmonisation of the laws of the Member States relating to the making available on the market of electrical equipment designed for use within certain voltage limits
DIRECTIVE 2011/65/EU	OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment

This machine is designed for equipment group II category 3/- D and have the following marking.

   II 3D/- Ex IIIC 135C° Dc/-

Højslev, Nov-22

Morten Frantsen
Co-Owner

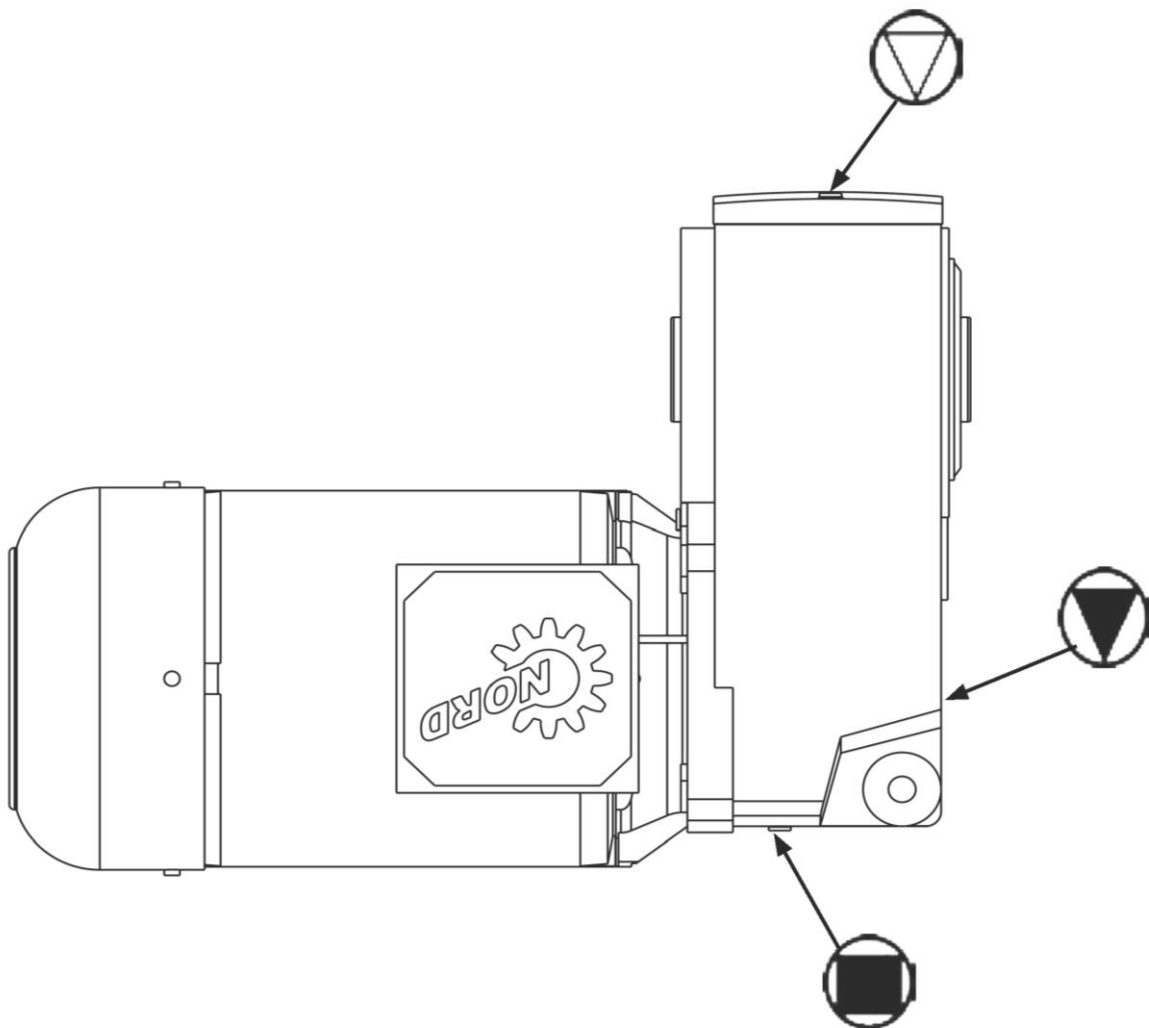
Vedligeholdelse og vedligeholdelsesintervaller for gear



1. When filling or refilling oil, please do it as follows:




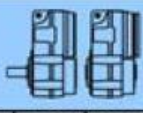
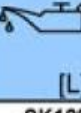





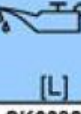

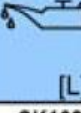



1. Unscrew the ventilation and oil level plug
2. Using a funnel, the oil is poured into the ventilation hole
3. The correct amount of oil is measured by the oil just reaching the top of the thread at the oil level hole.

ATTENTION: Both plugs must be unscrewed to prevent air bubbles from forming in the gear!



3. In the picture below you can read how much oil to use for which flat gear according to the type of construction.

Fladgear

 [L]							 [L]						
⇒ [L] 6.1	M1	M2	M3	M4	M5	M6	⇒ [L] 6.1	M1	M2	M3	M4	M5	M6
SK0182NB A	0,40	0,55	0,55	0,40	0,40	0,40							
SK0282NB A	0,70	1,10	0,80	1,10	0,90	0,90							
							SK1382NB A	1,40	2,30	2,20	2,20	2,00	2,00
 [L]							 [L]						
SK1282 A	0,95	1,30	0,90	1,30	1,00	1,00	SK2382 A	2,30	2,70	2,10	3,20	2,00	2,00
SK2282 A	1,70	2,30	1,70	2,20	1,90	1,90	SK3382 A	3,80	4,30	3,00	5,50	3,00	3,00
SK3282 A	2,80	4,00	3,30	3,80	3,00	3,00	SK4382 A	6,10	6,90	4,90	8,40	5,00	5,00
SK4282 A	4,20	5,40	4,40	5,00	4,20	4,20	SK5382 A	12,50	12,00	6,70	14,00	8,30	8,30
SK5282 A	7,50	8,80	7,50	8,80	7,20	7,20	SK1382 A	1,45	1,60	1,15	1,70	1,10	1,10
 [L]							 [L]						
SK6282 A	17,00	15,50	12,50	17,50	11,00	14,00	SK6382 A	16,00	13,00	10,00	18,00	14,00	12,50
SK7282 A	25,50	21,00	20,50	27,00	16,00	21,00	SK7382 A	22,00	21,00	16,00	25,00	23,00	22,00
SK8282 A	37,50	33,00	30,50	44,00	31,00	31,00	SK8382 A	34,50	32,50	25,00	38,00	35,00	30,00
SK9282 A	74,50	70,00	56,00	80,00	65,00	59,00	SK9382 A	73,50	70,00	43,00	74,50	65,00	60,00
 [L]							 [L]						
SK10282 A	90	90	40	90	60	82	SK10382 A	85	90	73	100	80	80
SK11282 A	165	160	145	195	100	140	SK11382 A	160	155	140	210	155	135
							SK12382 A	160	155	140	210	155	135
							SK10382.1 A	76,0	80,0	71,0	92,5	71,5	66,5
							SK11382.1 A	127	133	118	194	124	112



Betriebsanleitung Operating instructions

BOCKWOLDT GETRIEBEMOTORENWERK

Schmierstoffe

Lubricants

9.1 Schmierstofftabelle

Getriebe und Getriebemotoren (außer F-Getriebe) sind bei der Auslieferung betriebsfertig mit Mineralöl entsprechend des standard Umgebungstemperaturbereiches der nachfolgenden Schmierstofftabelle befüllt. Maßgebend hierfür ist die Angabe der Bauformen bzw. Einbaulage bei der Bestellung des Antriebes. Bei späterer Einbaulagenänderung muß die Schmierstoff-Füllung der geänderten Bauform angepasst werden.

Umgebungstemperaturbereich temperature range (° C)	Schmierstoffart	(ISO) DIN	Viskositätsklasse	Schmierstoffhersteller											
				ARAL	bp	Castrol	Falcon	Esso	Mobil	Shell	elf	TOTAL			
-10 -Standard- +50	Mineralöl	CLP	VG 320	Degol BG 320	Energol GR-XP 320	Alpha SP 320	Falcon CLP 320	Spartan EP 320	Mobilgear 632	Shell Omala 320	Carter EP 320				
-30 +80	Synthetisches Öl	CLP PG	VG 220	Degol GS 220	Energol SG-XP 220	Alphasyn PG 220	Polydea PG LP 220	Glycollube 220	Glygoyle 30	Shell Tivela Oil WB	Carter SY 220				
-40 +80	Synthetisches Öl	CLP HC	VG 220	Degol PAS 220					Mobil SHC 630	Shell Omala 220 HD					
-30 +80	Synthetisches Öl	CLP PG	VG 460	Degol GS 460	Energol SG-XP 460	Alpha PG 460	Polydea PG LP 460		Glygoyle HE 460	Tivela Oil SD					
-20 +40	biologisch abbaubares Öl	E	VG 460	Degol BAB 460											
-30 +40	Lebensmittelverträgliches Öl	HCE	VG 460	Eural Gear 460						Cassida Fluid GL 460					
-30 +60	Fett (mineralölbasis)			Aralub HL 3	Energrease LS 3	Spheerol AP 3	Glissando 30	Beacon 3	Mobilux 3	Alvania Fett R 3					

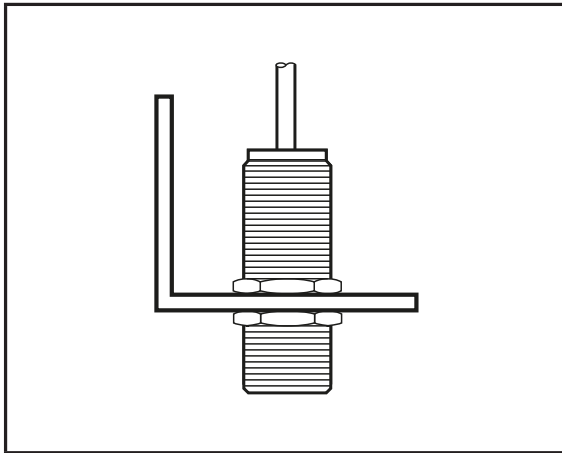
E = Esteröl (Wassergleichgewichtsklasse 1)
HCE = synth. Kohlenwasserstoffe + Esteröl

Legende : CLP = Mineralöl
CLP PG = Polyglykol
CLP HC = synthetische Kohlenwasserstoffe

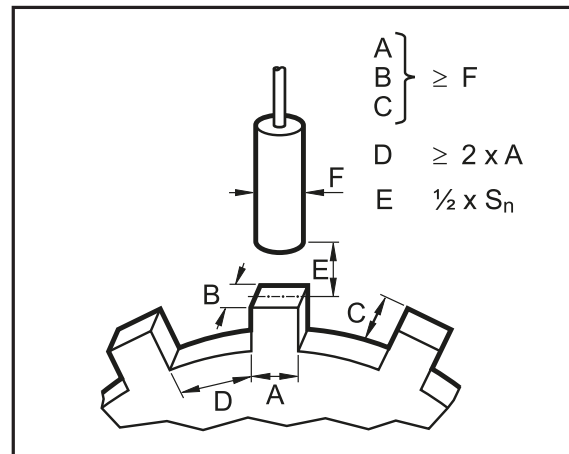
Betriebsanleitung

Achtung ! Das Mischen von mineralischen und synthetischen Schmiermitteln ist nicht zulässig !

4 Installation



Mounting principle

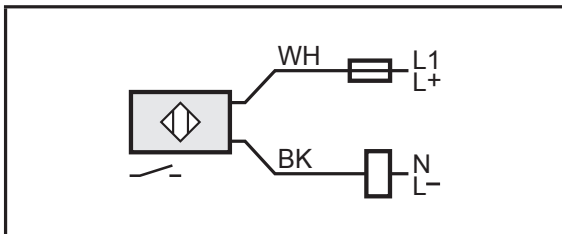


Mounting specifications

UK

- ▶ Fix the unit by means of a mounting device and secure it by means of the nuts provided so that it cannot work loose.
Flush installation.
- ▶ Adhere to the above mounting specifications to ensure a correct function.
Nominal sensing range S_n (→ 8 Technical data)

5 Electrical connection

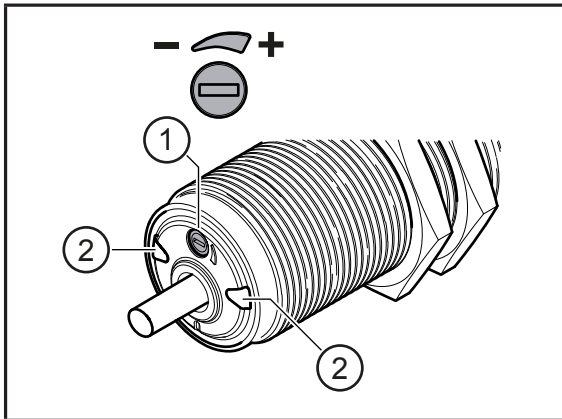


BK = black
WH = white

Wiring

- ▶ Disconnect power.
 - ▶ Connect the device according to the wiring arrangement.
- !** Miniature fuse to IEC60127-2 sheet 1, ≤ 2 A (fast acting)
ATEX units (DI1xxA):
Place the fuse outside the hazardous area.

6 Setting



- 1: Multi-turn potentiometer for switch point setting (without end stop)
- 2: LEDs for switching status indication (→ 3.1 Switching function)

Operating and display elements

- ▶ Keep the minimum speed to be monitored in the plant on a constant level.
- ▶ Switch on the device.
- ▶ Wait until the start-up delay is over (→ 8 Technical data).
- ▶ Set the switch point depending on the status of the LEDs.

If the LEDs are not lit:

- Turn the pot slowly anticlockwise (-) until the LEDs are lit.
Setting is finished.

If the LEDs are lit:

- Turn the pot clockwise (+) until the LEDs go off.
- Turn the pot slowly anticlockwise (-) until the LEDs are lit.
Setting is finished.

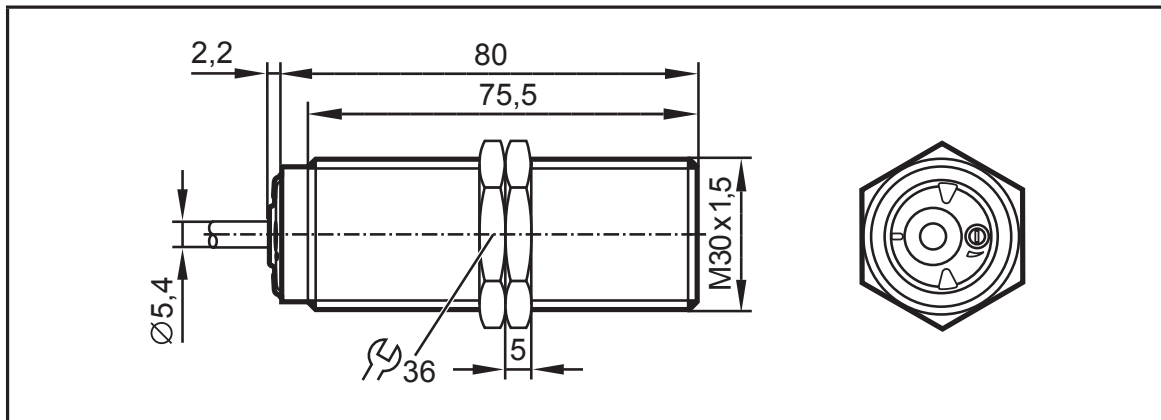
7 Operation

The operation is maintenance-free.

Ensure the following for a correct function:

- ▶ Keep the sensing face and the open space free of metal deposits and foreign bodies.
- ▶ Do not operate units with high field intensity (e.g. mobile phones) at close range to the speed monitor.

8 Technical data



UK

Dimensions [mm]

		DI0101	DI0104	DI103A
Nominal voltage	[V]	20...250 AC/DC (45...65 Hz, AC)		
Current rating (continuous)	[mA]	350 AC, 50 °C 250 AC, 80 °C 100 DC, 80 °C		200 AC, 60 °C 100 DC, 60 °C
Current rating (peak)	[mA]	2200 (20 ms / 0.5 Hz)		
Minimum load current	[mA]	> 6		
Leakage current	[mA]	< 1.5		
Voltage drop	[V]	< 7.5		
Reverse polarity protection		yes		
Short circuit / overload protection		no / no		
Nominal sensing range (Sn)	[mm]	10		
Operating distance (Sa)	[mm]	0...8.1		
Setting range	[pulses/min]	5...3600		
Hysteresis	[% of SP]	10		
Start-up delay	[s]	12	< 0.5	12
Damping frequency	[pulses/min]	≤ 4800 (for Sn/2)		
Ambient temperature	[°C]	-25...80		-20...60
Protection		IP 65 / IP 67 / II		
ATEX equipment category		-		3D
Connection		PUR cable / 2 m; 2 x 0.5 mm ²		

Data sheets and EC declarations of conformity can be found at:
www.ifm.com → Data sheet search → Article number



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