



SOBY.COM
TRUSTED SINCE 1961



User manual

HLSG

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.

Contents

General Information.....	2
Safety Instructions	4
Use of the Machine	6
Explanation of the Pictograms.....	7
Centre of gravity here.	7
Residual Risk.....	8
Descriptions of Components.....	9
Technical Data and Specifications	10
Noise Values.....	12
Commissioning.....	13
Changing of the fan wheel.....	15
Dismounting of the motor.....	16
Maintenance.....	18
Troubleshooting.....	19
Declaration of Conformity	21

General Information



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

If the purchaser makes any technical modifications to the machine, then any warranty from SØBY will be cancelled. The declaration will lose its validity. The factory warranty does not include water- or transportation damages or consequences thereof. Therefore, protect the fan from moisture and water. Likewise, the factory warranty will become void if the instructions in this manual are not followed.

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 may require the equipment to be re-certified.
- Assembly, commissioning and operation only by using this User Manual.
- Documentable compliance with maintenance intervals according to the instructions.
- Only use the original spare parts of the manufacturer.
- The assembly around the casing of the fan is sealed so that it is airtight.
- Emergency stop must be installed according to current standard EN 60204-1.
- At normal operation at the machine, see the pictogram devices and read the User/Assembly Instructions.
- Be aware that the fan is set so that there is optimal air supply from the outside.; only in the case of fresh air, optimal drying is achieved.
- Position the fan in a way that the air flow to the main channel is as straight as possible, and that no performance reducing measures are fitted at the blowing out stub.
- When mounting a warm air heater, the temperature of the intake-air must not exceed 55°; this may reduce the germination of the grain.

When working in areas where there might be a risk of explosion, the safety of persons and equipment is subject to compliance with the relevant safety regulations. Performing installation works and maintenance in such areas, involves a special responsibility of the persons performing the work. The work in question requires that the assembly personnel and maintenance personnel have a thorough knowledge of laws, regulations and standards within the area. This construction provides a brief review of the most important safety issues associated with installation, maintenance and use of the equipment. Please pay attention to the fact, that the end user has the final responsibility of identifying any potentially explosion hazardous areas according to current regulations, with the following requirements for zone classification and possible reporting to the local authorities.

Repair, service and maintenance must be performed carefully in strict compliance with the instructions of SØBY and must be carried out by staff who possess the necessary qualifications for the performance of the equipment's explosion safety. Inspection and maintenance for the electrical equipment must be based on the instructions in EN60079-17.

- For the mechanical parts during the lifetime of the fan, and in connection with use, special attention must be paid to:
 - Service lifetimes (see diagram)
 - Damages to parts and screens
 - Corrosion
 - After tensioning of bolts and screws
- Modifications or alterations to the equipment that affect the explosion safety of the equipment, are not allowed. Before using the equipment, please check that the equipment is undamaged, assembled, and installed as directed by SØBY.

Attention is particularly drawn to:

- National safety rules
- National health and safety requirements at work
- National installation rules for the type of installation in question
- Recognized standards
- Safety information in this manual
- Data and information on permissible installation and operating conditions on the equipment's rating plate
- Instructions on any type certificates for equipment mounted on the device

	Particle Size [µm] [Microns]	Ignition Temperature Cloud of Dust [°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	-

The manufacturer reserves the right to make technical changes.

If the air contains stones, metal or other foreign objects, the explosion safety of the equipment cannot be guaranteed.

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

Safety Instructions



The manual, and especially information concerning safety must be read carefully prior to assembly, commissioning, operation and maintenance

All installations and components must be assembled in accordance with the applicable accident prevention regulations.

The machine must be shielded correctly in relation to the current Machine Directive, and as such make 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 fan must be properly ensured appropriate potential equalization.

During any repair or maintenance, disconnect the power source from the drive motor. As the fan wheel has a long stop time, make sure that the fan wheel is completely stopped before repair.

When fan is running, do not put your hand or your fingers into the drive device or elsewhere. Please make sure that no people are near the fan when it is going to be started. Also, it necessary to ensure that the grid and outlet stub are correctly mounted. In addition, the fan should always be mounted with transition stub to silo or to air channel.

Shieldings must be maintained on a regular basis.

The machine must be installed so that there are ergonomic good conditions for servicing the machine.

Prior to starting the fan, please make sure that all screws, bolts and attachments are properly tightened.

The motor must be properly protected via overload protection equipment, as an overloading can produce an overheating. Always use gloves if the fan is stalled, or if it has just run. Likewise, it is recommended, that you let the fan stand for a few minutes prior to starting-up the repair of the machine.

The fan may only be put into operation when it is assured that it is not defective. The user is obliged only to operate the system, when it is in perfect condition.

SØBY is not liable for damages arising from misuse or technical alterations to the system and breach of the instructions given in this manual.

If the fan is placed in areas classified as potentially explosive, specially approved motor 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 in which 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 unit, it is necessary to consider take any possible external heat sources that might affect the ambient temperature in the area where the equipment is installed.

During any kind of work with the fan, there must be adequate work lighting

Safety shoes, earmuffs and other required precautions that might be required by the local workplace assessment, must be used during any kind of work with the machine, where the fan is installed. Furthermore, a 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 might be a risk of sharp edges.

The fan must be in a dry place to avoid oxidation of engine and switch.

The equipment must not be exposed to more dust impact (dust layers) than allowed in EN 60079-14.

Use of the Machine

The fan is designed for drying and airing of grain or of other agricultural crops. The fan is driven by an electric motor, which is placed on the side of the fan. The fan takes in air through the suction and then blows the air out through the blowout. Under normal circumstances, the fan will be mounted with a blowing out stub, and thereafter mounted with a transition stub either to the silo or to the air channel.

The fan can have an output of 3.0 kW and up to 37 kW depending on the model designation.

The fan is not intended for extraction of air, gases, etc.
The intake air must not be heated to temperatures above 55° C. In case of a breach of the above, any warranty obligation lapses.

Explanation of the Pictograms



Prior to repair, maintenance and cleaning, turn off the motor and unplug the power cord. Hearing protection is mandatory.

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

All shielding must be mounted before starting up of the machine.



Lifting point.



Centre of gravity here.

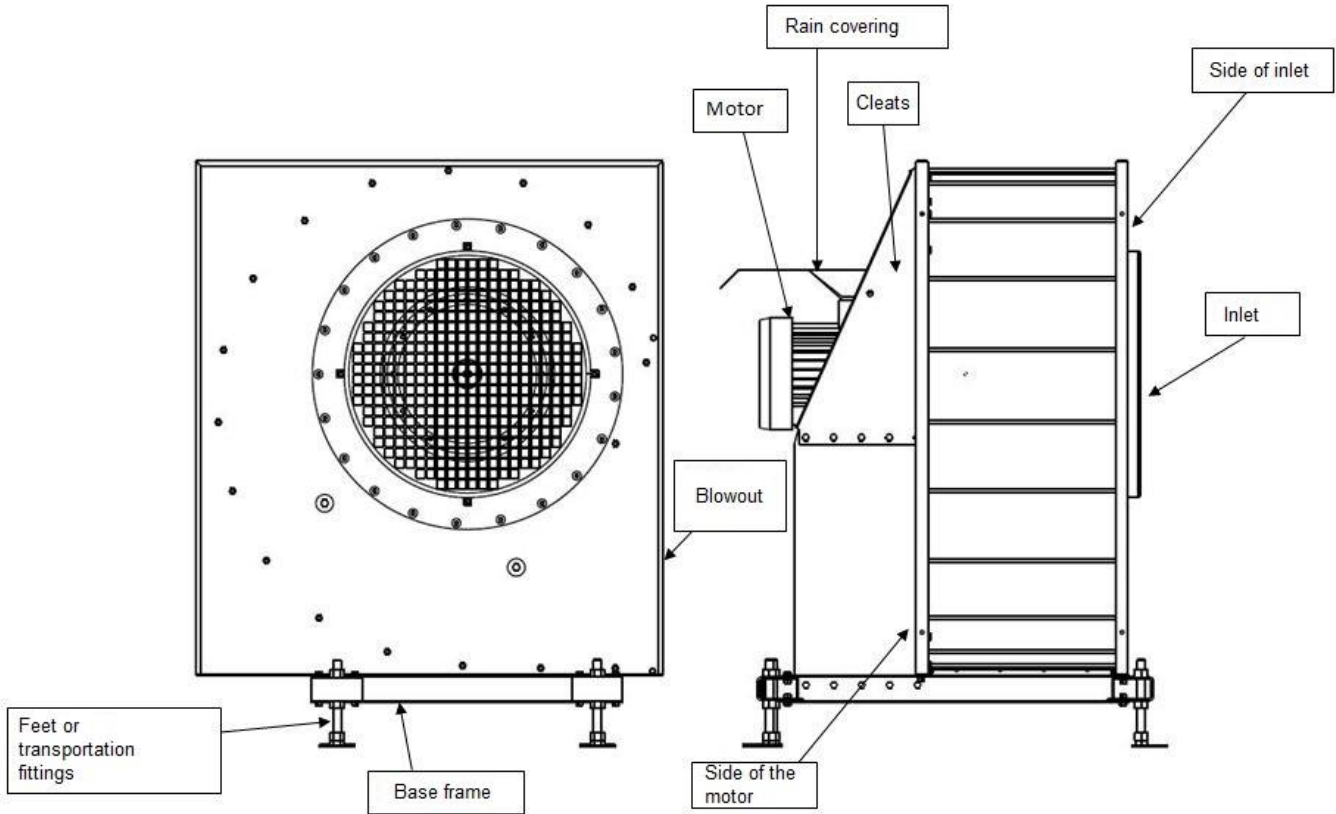


The arrow indicates the direction of the fan wheels for rotating.

Residual Risk

The fan is produced in accordance with the health and safety requirements, which are set out in the ATEX and in the Machinery Directive, and in accordance with the consequently harmonized standards. If these regulations are disregarded, the fan might be a danger to the operator or to the life and limb of a third party. See Declaration of Conformity.

Descriptions of Components



Technical Data and Specifications

Type	Ampere Consumption	RPM	Factor directly	Factor Y/D	Weight kg
HLSG 3,0 kW	6,4	1460	7,8	-	125
HLSG 4,0 kW	8,1	1460	7,1	-	146
HLSG 5,5 kW	10,4	1465	8,5	-	204
HLSG 7,5 kW	14,4	1465	8,8	3,0	217
HLSG 11,0 kW	20,9	1470	7,3	2,5	334
HLSG 15,0 kW	28,3	1475	8,1	2,8	392
HLSG 18,5 kW	33,9	1475	7,9	2,7	437
HLSG 22,0 kW	41,1	1475	8,4	2,9	477
HLSG 30,0 kW	52,0	1477	6,4	2,2	729
HLSG 37,0 kW	65,0	1476	6,2	2,1	730

Equipment selection:

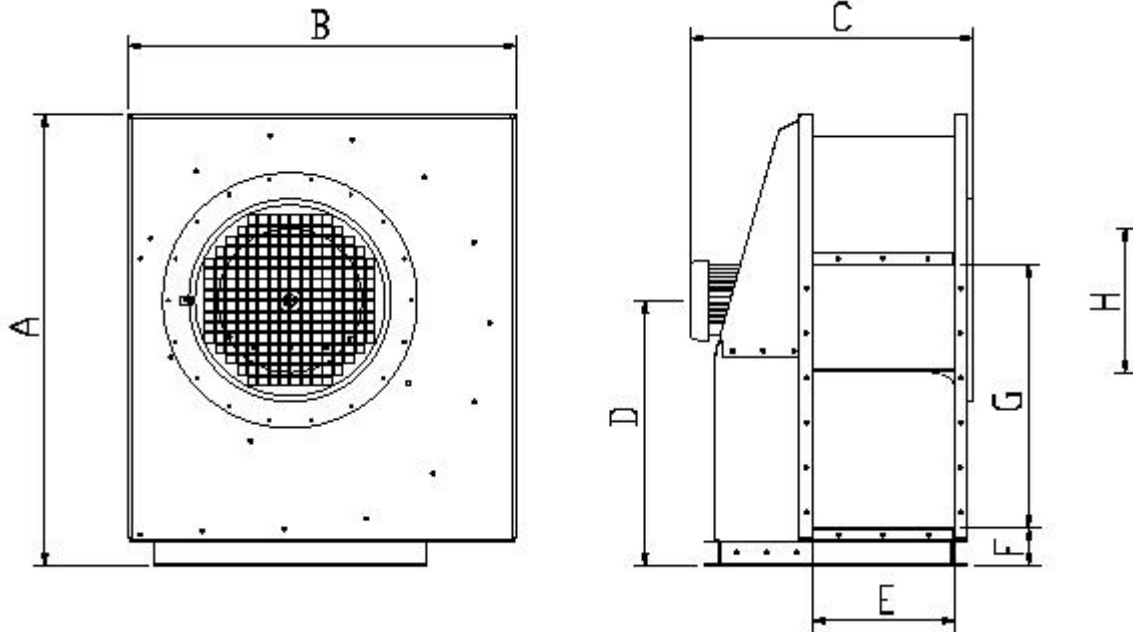
It is recommended that you use class 30 starting equipment.

Flows are indicated at 400 V supply.

Be aware of limited running time in star connection, before delta connection.

The fans are tested in an ambient temperature of 25 ° C

Note, however, that power consumption may be higher at colder temperatures!



TYPE	kW	HK	A	B	C	D	E	F	G	H
HLSG	3,0	4,0	1255	1084	705	735	360	105	735	400
HLSG	4,0	5,5	1155	1084	822	735	400	105	735	400
HLSG	5,5	7,5	1445	1170	866	880	400	115	825	440
HLSG	7,5	10,0	1445	1170	891	880	460	115	825	440
HLSG	11,0	15,0	1550	1340	1011	940	500	115	915	515
HLSG	15,0	20,0	1550	1340	1067	940	540	115	915	515
HLSG	18,5	25,0	1805	1435	1233	1085	540	134	1065	580
HLSG	22,0	30,0	1805	1435	1313	1085	620	134	1065	580
HLSG	30,0	40,0	2000	1626	1379	1209	570	136	1065	654
HLSG	37,0	50,0	2000	1626	1379	1209	640	136	1065	654

Noise Values

The noise values measured in dB(A) at a distance from the fan of 1.5m

Type HLSG

Size	Motor Side / Rear	Suction Side
4,0 kW	89	92
5,5 kW	89	92
7,5 kW	90	95
11,0 kW	89	95
15,0 kW	89	92
18,5 kW	92	95
22,0 kW	92	100
30,0 kW	98	105
37,0 kW	99	107

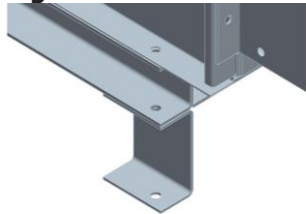
Commissioning

The fan is placed on a solid concrete base in connection with a main channel or silo, and it is screwed into the foundation with anchor bolts or dowels.

When supplying fans from 3kW-7.5kW, 4 pieces of transport brackets are mounted so that the forks from a forklift truck can enter under the fan.

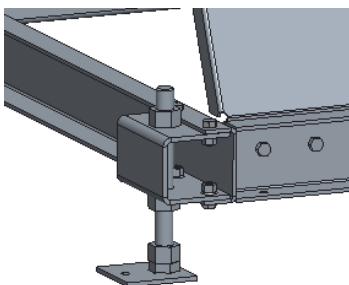
Remember to remove the transport brackets before attaching the fan to the foundation.

Figure 1



When supplying fans from 11kW-37kW, the fans are mounted with feet as shown in figure 2.

Figure 2



If the main channel is a brick wall, you can use a built-in stub, which should be mounted between the fan and the hole in the wall, figure 3.

Figure 3

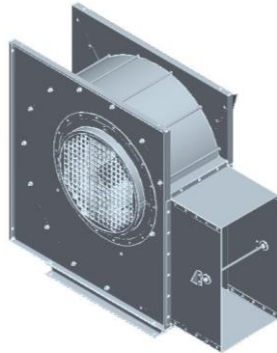
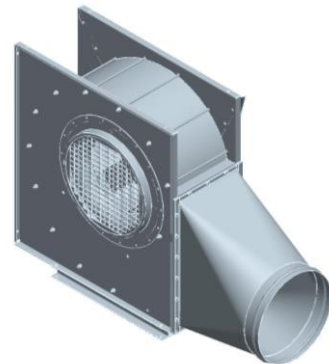


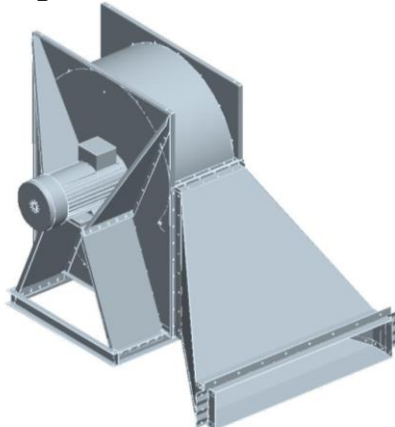
Figure 4



If the fan is going to be mounted into a pipe, you can use a circular blowing out stub from the fan, figure 4.

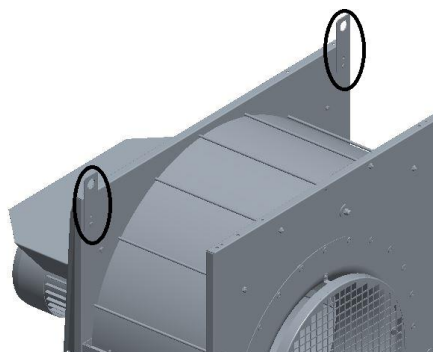
In connection with a circular silo, you should use an adaptor, figure 5.

Figure 5



When lifting the machine, use these lifting hooks marked in the picture of figure 6.

Figure 6



Changing of the fan wheel

before starting to replacement work, make sure that the power is disconnected and that the fan wheel is completely at ease.

Start by dismantling the safety grate as shown in figure 7, and then dismantle the air intake nozzle

Figure 7

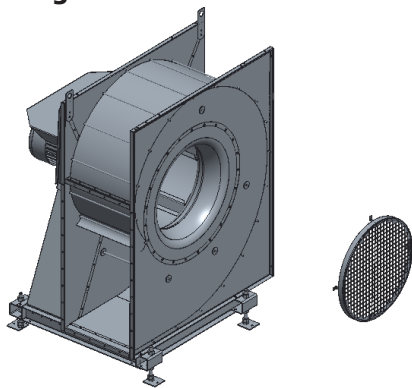
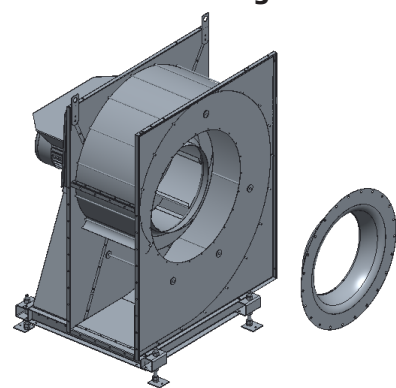


Figure 8



Now detach / unscrew the pointed screw, which sits on the shaft inside the fan as shown in figure 9. Now the bolt and the lock washer are ready to be dismantled, as shown on figure 10, and the wheel can now be pulled off.

Figure 9

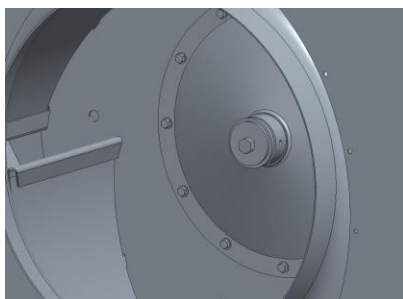
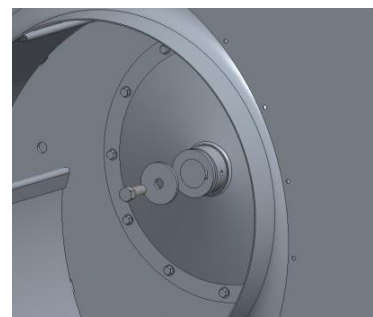


Figure 10



In order for the wheel to be pulled off, use suitable lifting equipment, as the wheel is very heavy.

Dismounting of the motor

In order to be able to dismantle the motor on the fan, it is predicted that fan wheels have been removed.

Start by dismounting of the rain cover as shown in figure 11. Now dismount the electrical connection, thereafter the four bolts, which hold the motor, fixed as shown in figure 12.

Figure 11

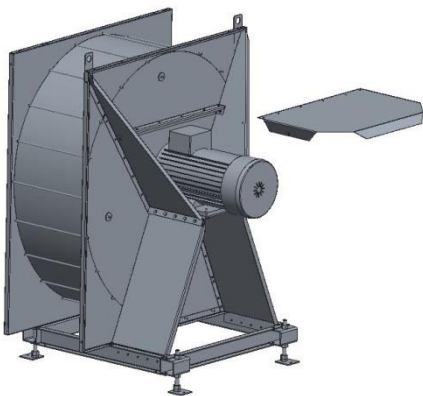
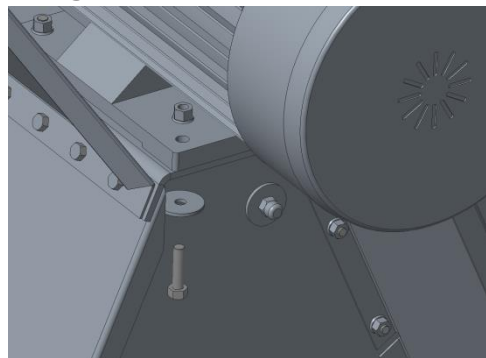
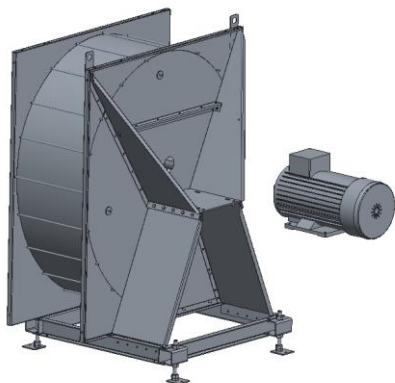


Figure 12



The motor is now ready for dismounting as shown in figure 13.

Figure 13



Electrical connection

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



During installation, be aware of the voltage and data indicated on the motor data plate.

The connection terminals of the motor are connected according to the instructions on the motor. The motor must be secured with a thermal protection and by a lockable circuit breaker, as otherwise the warranty from the motor manufacturer will be cancelled (thermal protection and circuit breaker are not included in the delivery).

Installation and connection of the unit must take place in accordance with national rules of installation, supplemented by the demands, which are stated in EN60204-1 and EN60079-14. Starting up of the electrical parts and subsequent maintenance must be in accordance with the instructions in EN60079-17.

The fan must always be connected to a motor protection device and star / delta switch.

If a frequency converter or a soft starter is installed, it is necessary to observe carefully data from the converter and from the data plate. Pay attention to the labeling of the electrical components in classified areas.

When connecting the fan, make sure that the direction of rotation of the fan wheel is aligned with the direction arrow on the fan.

Potential equalization:

There is an external terminal for connecting the equalization connection to the motor. The connection must be carried out in accordance with the instructions in EN60079-14.

Maintenance

During maintenance work, the safety regulations, which are described in the section Safety Instructions, must be observed.

Please note that the safety of the motor and bearings is subject to compliance with maintenance intervals / replacement.

At each start-up, clean the intake grille.

The following equipment at the unit must be maintained with the following intervals:

Equipment	Manufacturer	Intervals of maintenance:
Motor	Cantoni /techtop	Must be replaced for every 30.000 operating hours
Washers and nuts	Bossard	It must be controlled after 40 operating hours that all washers and nuts are properly tightened.
Fan Wheel	SØBY	Must be controlled every year before season. Check if fan wheel balances/ check if it shakes.
Lubrication of bearings + grease (30-37 kW)	SØBY	Must be re-lubricated after 2.000 operating hours with 20g grease on 30 and 37kW fans.

Troubleshooting

Errors	Possible Cause	Remedy
The fan does not start	The power supply is disconnected	Check power cable and replace if necessary
	The motor fuses are defective	Replace fuses/adjust start procedure
	The motor safety switch is defect	Replace the motor safety switch
	The motor is defect	Replace the motor
	A foreign object blocks the fan	Remove the foreign object by suitable means
The motor stops / is overloaded	A foreign object blocks the fan	Remove the foreign object by suitable means
	The outlet/out blowing is blocked	Clean the outlet
	The power supply is disconnected	Check power cable and replace if necessary
	The motor fuses are defect	Replace fuses
The fan is not efficient/ is irregular	The fan wheel is too worn	Renew/replace
	The fan blades are bent due to foreign object	Remove the foreign object by suitable tools, straighten out the fan blades or replace them if necessary
The fan is shaking	The fan is not adjusted/ straightened up/fitted	Adjust the surface/ fix the fan
	The fan wheel out of balance or damaged during transportation/collision	If possible, straighten up or order spareparts

Potential equalization:

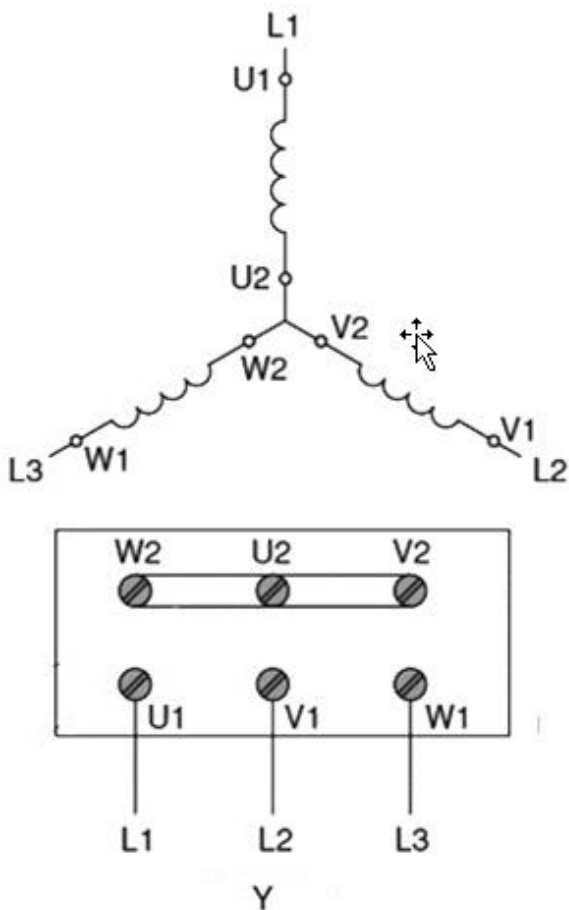
There is a terminal for connecting the equalization connection in the terminal box of the motor. The connection must be carried out in accordance with the instructions in EN60079-14.

Connection diagram for Cantoni motors for either star or triangle connection.

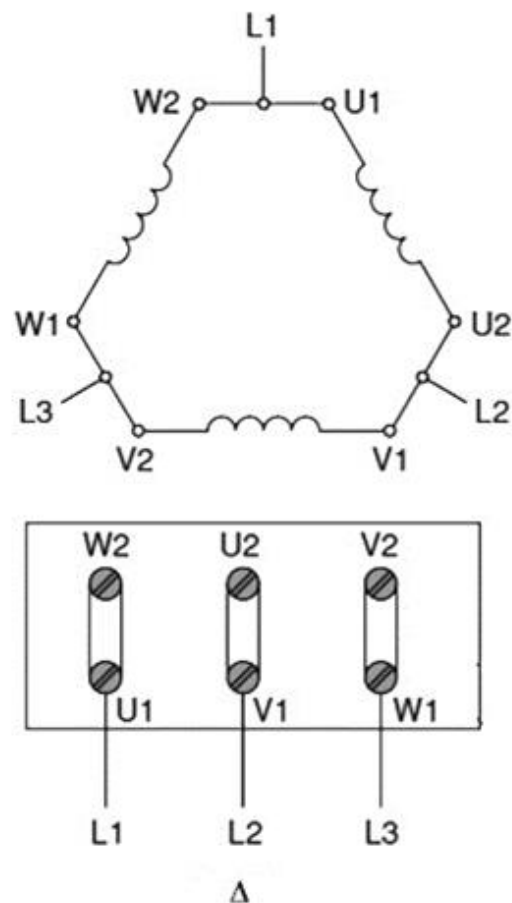
Standard motor terminal connection diagrams

3-phase single-speed motors:

Connection in a Y



Connection in a Δ





Declaration of Conformity

The Company
Søby Maskinaktieselskab
Viborgvej 306
DK-7840 Højslev
Denmark

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

type: HLSG

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/- X

Højslev, Nov-22

Morten Frantsen
Co-Owner



SOBY TRUSTED
SINCE 1961

Viborgvej 306 · DK-7840 Højslev
(+45) 97 53 50 33 · soby@soby.com
www.soby.com