JOHANNES HÜBNER GIESSEN

ideas and solutions

OPERATING INSTRUCTIONS

AC-Synchronous Generators with permanent excitation
DSG P...

Betriebsanleitung-DSGP_en_R0(2016-10-31)ID72065.doc

Read these Operating Instructions before beginning with mounting/installation or other work!

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Table of contents

1 General Information

1.1 Information about these Operating Instructions

These Operating Instructions contain important information regarding working with the machine. Read these Operating Instructions carefully before commencing any work; observe at all times.

Please note you must adhere to local accident prevention regulations applicable to the field of application of the machine as well as all general safety rules and regulations.

1.2 Range of supply

The range of supply includes:

Synchronous generator with permanent magnet excitation from the DSG-P…. range incl. agreed accessories.

1.3 What the symbols mean

Warnings and cautions

Warnings and cautions are indicated in these Operating Instructions by symbols. The warnings and cautions are introduced by signal words that express the level of danger.
To prevent accidents, personal injuries and material damage you must observe the information provided and proceed with due care and attention at all times.

WARNING!

... draws attention to a potentially dangerous situation that can lead to death or serious injury if not avoided.

CAUTION!

... draws attention to a potentially dangerous situation that can lead to minor or light injuries if not avoided.

CAUTION!

... draws attention to a possibly dangerous situation that can lead to material damage if not avoided.

Tips and recommendations

INFORMATION!

... emphasizes useful tips and recommendations and offers information to promote efficient and smooth operations.

Important safety information

DANGER!
Danger of death from electricity!
... indicates dangerous situations that can lead to electrical shock. Failure to observe the safety instructions can lead to serious injury or death. The work must be carried out by a qualified electrician only.

1.4 Limitation of liability

All of the information, warnings and cautions contained in these Operating Instructions were drawn up based on applicable standards and regulations as well as our many years of experience and specialist knowledge.

The manufacturer does not accept any liability for damages arising from:

- Failure to adhere to the Operating Instructions
- Improper use
- Work carried out by unqualified personnel
- Opening the machine or conversions of the device

In all other respects the obligations agreed in the Contract of Sale as well as the manufacturer's Terms and Conditions of Sale apply.

1.5 Copyright

INFORMATION!
The contents, texts, drawings, images and all other representations contained in these Operating Instructions are protected by copyright law and are subject to industrial property rights.

Without the prior written agreement of the manufacturer no copies may be made of any kind or by any means for any purpose other than in conjunction with operating the machine. Offenders will be prosecuted.

1.6 Conditions of warranty

The conditions of warranty are set out in the manufacturer's terms and conditions.

1.7 Customer service

Contact partners are available to answer technical enquiries by phone, fax, e-mail or via the internet. Please refer to the manufacturer's address on page 2.

2 Safety

This section offers an overview of all the important safety aspects to protect personnel and for the safe, trouble-free operation of the machine.

Failure to observe this information can lead to considerable danger.

2.1 Responsibility of the owner

The machine is designed for industrial applications. Therefore, the owner of the machine is subject to statutory obligations with respect to occupational safety as well specific safety, accident prevention and environmental regulations applicable to the field of application in which the machine is deployed.

2.2 Proper use

The machine must be used exclusively for the intended purpose for which is was designed and built as described here.

> Synchronous generators with permanent magnet excitation from the DSG-P range are designed to convert mechanical energy into electrical energy, for example, for feeding into the grid, charging batteries and applying electrical power to resistors (for example for heating purposes).

We do not accept liability of any kind for damages arising from improper use of the machine. The owner bears sole responsibility for any improper use.

2.3 Non intended use

This generator is designed and approved only for the purpose stated by the manufacturer and described in the associated technical documentation. Any other use or use exceeding stated specifications is considered improper use. That includes observing all associated written product specifications. It is not permitted to carry out any modifications to or convert the generator. Consult the manufacturer if any third-party products or components are to be used together with the generator.

You are obliged to pass on these Operating and Assembly Instructions to any new owner/user together with the generator.

2.4 Personal protective equipment

Wear personal protective equipment such as safety shoes and safety clothing to minimise risks to health and safety when carrying out work such as mounting, disassembly or commissioning. Adhere to all applicable statutory regulations as well as the rules and standards determined by the owner.

2.5 Special dangers

The following section describes the residual risks as determined by a hazard analyse.

Electric current

DANGER!
Danger of death from electricity!

There is an immediate danger of death from contact with live components. Damage to the insulation or individual components can be lethal.

Therefore:

– If the insulation is damaged turn off and isolate the power supply immediately; ensure the insulation is repaired.
– Before commencing any work, turn off the electrical installation and isolate the power supply to the installation.
– Ensure live components do not come into contact with moisture. Otherwise, this can lead to a short-circuit.

Rotating shafts and hot surfaces

Warning!
Risk of injury from rotating shafts!

Touching rotating shafts can result in serious injuries.

Therefore:

– Do not tinker with moving parts or work on moving parts or rotating shafts.
– Do not open covers when the machine is operating. Ensure no parts are moving before opening any covers.

Risk of injury from hot surfaces!

– Do not touch the surface of the machine during operations. Do not touch the machine immediately after turning it off; first measure the temperature of the surface and ensure it is < 50°C before touching.

Ensure the power supply cannot be reconnected

DANGER!
Danger of death from unauthorized reconnection of the power supply!

There is risk that the power supply will be reconnected without authorization when carrying out fault rectification work. This represents a serious risk to the life of those in the danger zone.

Therefore:

– Turn off and isolate all power supplies to the machine and equipment concerned before commencing work. Ensure no power supply can be reconnected. You must also ensure that the power supply to any additional circuits or auxiliary circuits is turned off and isolated!

– Do not disable or remove any safety devices when making trial runs!

3 Technical data

3.1 Nameplate

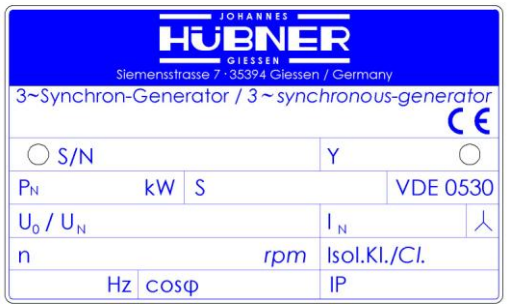


Fig. 1: Nameplate

The nameplate is located on the side of the housing; it contains the following details.

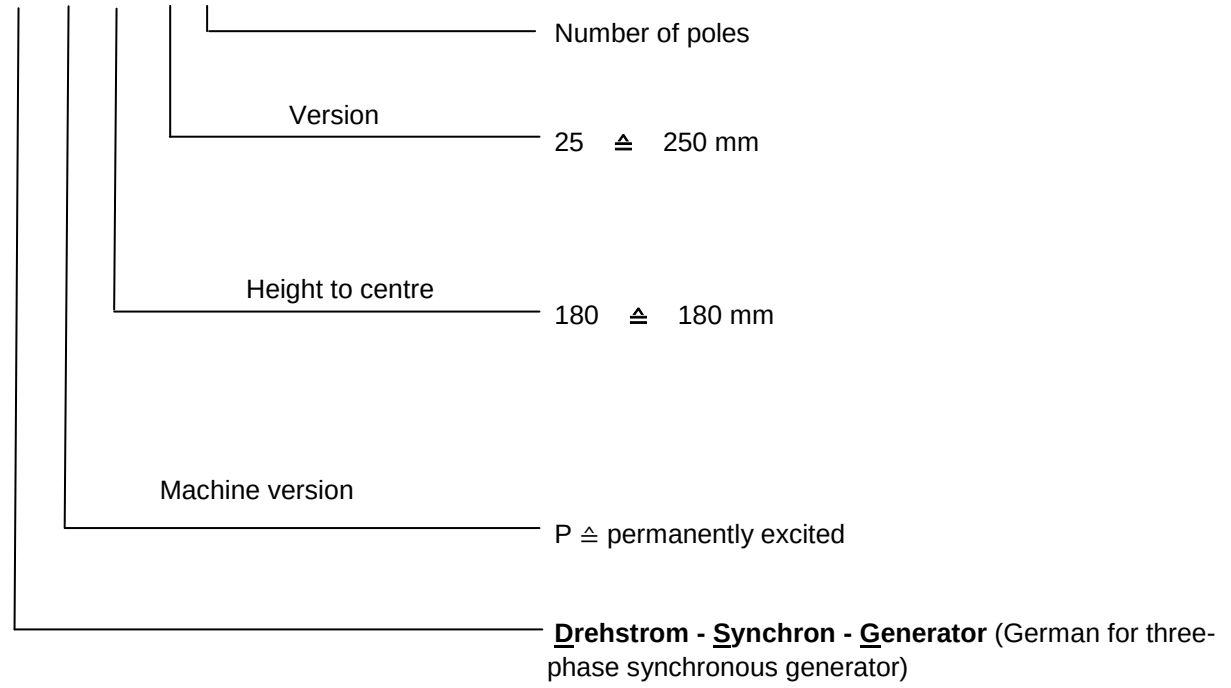
- Manufacturer
- Type / CE mark
- S/N = serial number
- Y = year of manufacture
- P_N = rated power output (effective power)
- S = operating mode
- VDE 0530 = standard
- U_0 / U_N = no-load voltage (interlinked) / rated voltage (interlinked).
- I_N = rated current
- ⅄ = star-connected winding
- n = rated speed
- Isol.Kl. / Cl. = insulation class
- frequency [Hz]
- cosφ = power factor
- IP = degree of protection

Electrical design to VDE 0530

Caution: The details on the nameplate apply exclusively to a purely resistive load. The details differ for inductive or capacitive loads (please consult the manufacturer).

3.2 Type key

DSG-P 180.25-4 (example)



3.3 Connected loads and values

3.3.1 Dimensions, connected loads, environment

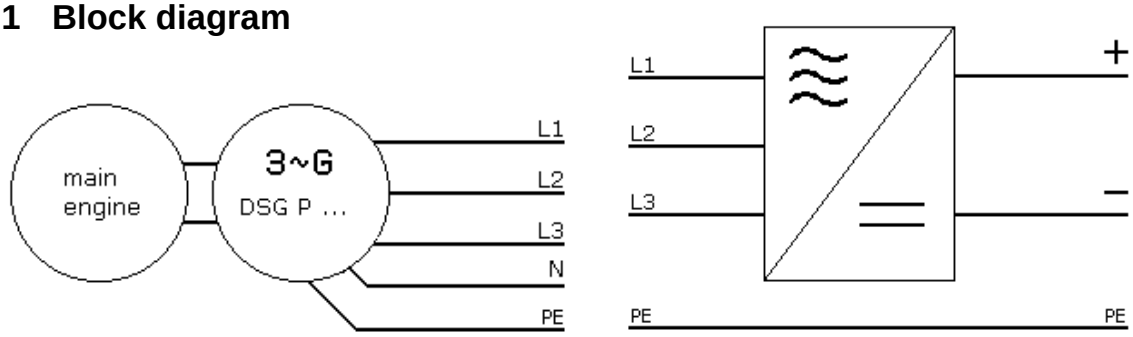
Specification	Value	Unit
Weight	Please see Chapter 11.2 Dimensional drawings/mechanical details	kg
Dimensions	Please see Chapter 11.2 Dimensional drawings/mechanical details	mm
No-load voltage (interlinked)	Please see nameplate	V AC
Rated voltage under load (interlinked)	Please see nameplate	V AC
Rated current	Please see nameplate	A AC
Machine temperature range	- 20 to + 40	°C
Max. shaft load, shaft	Please see Chapter 11.2 Dimensional drawings/mechanical details	kN

3.3.2 Speed

Please see nameplate.

4 Construction and Function

4.1 Block diagram



b. 2: Block diagram *Optional rectifier for DC voltage output*

4.2 Short description

The permanently excited synchronous generator GSG-P consists of a stator and a rotor fitted with permanent magnets. By rotating in the stator the rotor generates a voltage proportional to the speed and a frequency proportional to the speed.

The max. speed-specific voltage is achieved when the generator is being driven at a constant speed in a load-free operation; the voltage decreases with increasing load, whereas the frequency remains constant.

4.3 Connections

The terminal box is fitted with cable glands. The proper cables are an important factor in maintaining the degree of protection.

Please observe the wiring diagrams (⇨Chapter 11 *Appendix 11.1*)

5 Transport, packaging and storage

5.1 Safety information concerning transport

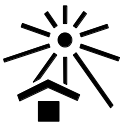
Improper transport

CAUTION!
Material damage caused by improper transport!
– Observe the symbols and information on the packaging.

5.2 Symbols on packaging

Keep dry

Keep packages dry, protect from moisture.



Protect against heat

Protect packages from heat above 40 °C, keep out of direct sunlight.

5.3 Inspection of transported goods

Check the delivery immediately upon receipt for transit damage or short delivery. Make a written record of any damage to the goods in transit and notify the carrier immediately.

5.4 Packaging

Handling packaging materials

The packaging is not taken back; dispose of according to the respectively valid statutory provisions and local regulations.

Storing packages

- Store in a dry and dust-free environment.
- Store free from vibration
- If storing for longer periods of time (> 6 months) we recommend sealing the machine in plastic wrapping, possibly with desiccant.
- Prevent exposure to aggressive media.
- Storage temperature: -15 °C ... +40 °C
- If storing for more than six months: contact the manufacturer.

5.5 Transport

Do not transport or store the generators on their cooling fan cowls. When transporting, use the eye bolts on the generators and suitable lifting tackle

Caution! The eye bolts are not designed to lift the generators with additional attachments such as base plates, drives and so forth still attached!

Use suitably dimensioned transport and lifting equipment to lift a generator together with a fully mounted drive unit.

If the eye bolts are removed following installation, the threaded bores must be sealed off in a manner that maintains the degree of protection.

Secure the generator in such a manner that it is protected against mechanical damage.

Ensure when transporting that no foreign objects can enter into the cooling-fan cowl.

6 Safety information and commissioning

6.1 Uses

Synchronous generators with permanent magnet excitation from the DSG-P range are designed to convert mechanical energy into electrical energy, for example, for feeding into the grid, charging batteries and applying electrical power to resistors (for example for heating purposes).

6.2 Safety information

Personnel

Installation and initial commissioning procedures must be carried out by skilled technical staff only.

Electric current

DANGER!
Danger of death from electricity!

- If the insulation is damaged turn off the generator and isolate the power supply immediately; ensure the insulation is repaired.
- Before commencing any work, turn off the electrical installation and isolate the power supply to the installation.
- Ensure live components do not come into contact with moisture. Otherwise, this can lead to a short-circuit.

Rotating shafts

WARNUNG!
Risk of injury from rotating shafts!

- Do not tinker with moving parts or work on moving parts or rotating shafts.
- Do not open covers when in operation. Ensure no parts are moving before opening any covers.
- Ensure that there are no foreign objects in the fan impeller (in particular before initial commissioning). There is a risk of injury if foreign objects are propelled out by the rotating fan impeller.

Surface temperature

WARNUNG!
Risk of injury from hot surfaces!

- When the generator is operated in line with design specifications the surface can reach temperatures above 100 °C. If the generators are installed in openly accessible areas, you must prevent humans and animals from coming into contact with the surfaces.

6.3 Place of installation

- Installation height ≤ 1000 m above sea level. Consult the manufacturer if the installation height is > 1000 m (possible derating)
- Permissible ambient temperature - 20 °C to + 40 °C
- Generators must only be operated in accordance with the details on the nameplate (ratings, protection class and so forth).
- Adhere to the minimum clearances detailed in the dimensioned drawings. Cooling air must be allowed to circulate without hindrance. Ensure that exhaust air from the machine and neighbouring units cannot be drawn back into the machine.
- Do not attach or lean temperature sensitive components onto or against the machine; do not position such components in the immediate vicinity of the machine.
- Ensure sufficient space is available for maintenance work (please refer to 8.2 Inspection and maintenance schedule)
- We recommend installing a canopy for model designs and shaft ends facing downwards; if the shaft end faces upwards place a cover over the machine that prevents foreign objects from falling into the cooling fan.
- The owner must ensure that no system resonance or vibration arise from interaction between the machine and plant that could result in damage to the machine or the entire plant or accelerate the aging process (for example of the bearings).

  The mass moment of inertia of the rotating parts of the machine are detailed in Appendix 11.2 (dimensional drawings/mechanical details).
- It is the owner's responsibility to undertake suitable measures at the place of installation that ensure that the devices and plant in their totality fulfil the relevant standards applicable to electromagnetic compatibility.

6.4 Installation work

6.4.1 Machine version for flange mount type (B5) or foot mount type (B3) or combination (B35)

1. Use zero-play coupling.
2. Ensure precisely centred mounting, in particular for foot mount type B3.
3. Secure machine via flange or foot.

   Ensure the machine is mounted securely without distortion and not subject to vibration. Securely fasten the feet or flange using standard screws and washers in all of the through holes. It is important to ensure the correct property class, size and length of engagement on the fastening side so that the entire system remains securely and reliably mounted under all operating statuses. The details given in Appendix 11.3 apply (screw tightening torque, material characteristics) when mounting the machine horizontally (foot at bottom, mounting types B3 and B35) without additional attachments.

   The thread engagement, its stability and strength on the fastening side must be guaranteed at all times.

The details given in the Appendix 11.3 apply only to the calculated steady-state and dynamic forces and moments produced by the machine; these do not take into consideration any additional external forces and moments that may act on the machine or the fastenings. Consult the manufacturer in all cases where installation situations deviate.

The screws must be tightened to the torque appropriate for the property class and thread; they must not become loose when the machine is in operation or at a standstill. Use a torque wrench. Regularly check that the fastening screws are seated correctly in accordance with the inspection and maintenance schedule (Chap. 8.2). Use only flexible couplings; align and adjust the generator carefully.

Exercise due care and attention when mounting coupling components, the belt pulley and gear wheels. Support the opposite end of the shaft (blows can damage the bearings).

Observe specifications and the manufacturer's calculation programmes when sizing the drive belt. When mounting, observe the belt manufacturer's specifications exactly when pre-tensioning the belt. Caution: Ensure the belt tension or belt pretension does not exceed the permissible radial force acting on the shaft end of the generator as detailed in our specifications. If a second shaft end is not in use you must secure the key on a permanent basis to ensure it cannot be flung out of the keyway.

4. Making connections in the terminal box
(⇨ *Appendix* 11.1, *Wiring diagrams*).

The generator terminal voltage given on the nameplate must be coordinated with the load. **Caution:** Take account of surge protectors for downstream devices, if these are connected to the output voltage of the generator. The output voltage of the generator increases linearly in line with the speed. The upper speed of the generator during no-load operations must be restricted to ensure that the maximum permissible input voltage of the connected devices is not exceeded. The connected devices will be destroyed if the input voltage is too high.

- Connect according to circuit diagram (please refer to the wiring diagram, Appendix 11.1). The machine winding must be and is connected in a star configuration by the manufacturer.
- The machine must not be operated in a delta connection (results in short-circuit currents of the third harmonic oscillation).
- The machine must not be operated as a motor; that means no separate external voltage must be applied to the electrical connections in the terminal box.
- To guarantee a safe electrical connection the cross-section of the conductors must be sized in accordance with the rated current as detailed on the nameplate.
- Ensure any unused cable glands and the terminal box are sealed dust and water-tight.
- Create a safe earth connection!

Before closing the terminal box you must ensure that

- The connections have been terminated according to the wiring diagram.
- All connections in the terminal box have been securely tightened.
- All minimum clearance values have been maintained (> 8 mm up to 500 V, > 10 mm up to 750 V, > 14 mm up to 1000 V).
- The inside of the terminal box is clean.
- Unused cable glands are sealed and that the screw plugs including the seals are securely screwed tight.
- The seal in the lid of the terminal box is clean and properly glued and that all surfaces of the seals are in a proper condition to guarantee the degree of protection is maintained.
- The rating data match the data given on the nameplate. Voltage deviation tolerances of +/- 5% are permissible (to EN 60034).

5. Check and ensure the flow of cooling air (room temperature max. 40 °C).

Do not allow ventilation openings to be blocked; maintain the minimum clearances behind the cooling fan cowl (size 63-80 = min. 20 mm and size112-200 = min. 40 mm) to ensure the flow of cooling air is not hindered.
Ensure the exhaust air of generator or from neighbouring units is not drawn (back) into the generator.

6. Remove transport locks before beginning commissioning procedures.

7. Check fan impeller for foreign objects; remove foreign objects before beginning commissioning procedures.

Caution:

It is the owner's responsibility to ensure that all moving parts are safeguarded to protect personnel and ensure that the machine is safe to operate!

6.5 Disassembly:

Observe and adhere to safety information (6.2)!

- Shut down and ensure the machine cannot be restarted.
- Turn off and isolate the power supply; turn off and isolate the power supply to any additional or auxiliary circuits.
- Ensure adjacent live components are insulated and safeguarded.
- Examine components for damage and broken edges (for example risk of cuts from broken off foot).
- Exercise due care and attention when removing coupling parts and gear wheels support the opposite end of the shaft (damage to bearings from blows). Coat the shaft with a thin layer of oil and seal with screw cap. Ensure the terminal box and cable glands are sealed dust and water-tight; ensure the degree of protection (see nameplate) is achieved and guaranteed for transport.
- Observe and adhere to transport information (5)!
- Ensure that the packaging (carton + palette) used to transport the machine is correctly sized and that the machine is secured by the packaging in such a manner that forces resulting from the weight of the machine during transport cannot cause any damage to the machine, to neighbouring parts or injure personnel! Use transport locks to reduce the load acting on the bearings.

7 Faults

Please contact the manufacturer if faults occur that cannot be rectified using the following information; please refer to the service address on page 2.

7.1 Safety

The work required to rectify any faults must be carried out by skilled technical staff only.

Fundamental information

WARNUNG!
There is a risk of injury and material damage if faults are rectified improperly!

– Ensure that any components that have been removed are refitted correctly; refit all mounting elements and adhere to the correct screw tightening torques

Rotating shafts

WARNUNG!
Risk of injury from rotating shafts!

– Do not tinker with moving parts or work on moving parts or rotating shafts.
– Do not open covers when the machine is operating. Ensure no parts are moving before opening any covers.

Ensure the power supply cannot be reconnected

DANGER!
Danger of death from unauthorized reconnection of the power supply!

– Turn off and isolate all power supplies to the machine and equipment concerned before commencing work. Ensure no power supply can be reconnected.

Electric current

DANGER!
Danger of death from electricity!

– If the insulation is damaged turn off and isolate the power supply immediately; ensure the insulation is repaired.
– Before commencing any work, turn off the electrical installation and isolate the power supply to the installation.
– Ensure no moisture or moving parts made of conductive material can come into contact with live parts. Otherwise, this can lead to a short-circuit.

7.2 Faults diagnosis table

Faults	Possible cause	Remedial action
Voltage too low	Insufficient input speed	Measure speed, adjust if necessary
	Overload	Reduce drive-end load.
	Overtemperature	Check flow of cooling air, improve if necessary. Clean the machine if dirty (as described in 8.2 Inspection and maintenance schedule)
Insufficient power.	Phase missing	Test voltage (L1, L2, L3-N). Check if cable connections are interrupted. Check winding
Rotor turns with difficulty	Magnets defective	Decouple the machine, re-check; Please contact the manufacturer if mechanical stiffness remains.
Grinding noises	Rotating parts rubbing	Determine cause of rubbing. If possible! remove foreign objects - otherwise please contact the manufacturer.
Machine has difficulty starting up without output load.	Interturn fault	Check voltages (L1, L2, L3).
Humming noise when starting up and during operations	Interturn fault	Check winding and insulation resistance; in the event of an error, please contact the manufacturer.
Bearing noise or bearings freeze up. **Caution:** Bearings must be replaced by the manufacturer only.	Mounting errors/ coupling problems	Check mounting accuracy.
	Bearings corroded	Bearings must be replaced by a certified workshop only.
	Insufficient lubrication	Contact the manufacturer
	Too little/much bearing play	Replace bearings Contact the manufacturer
	Grind marks in the bearing track, scoring	Replace bearings; contact the manufacturer
	Bearing tilted or distorted	Check bearing bore Contact the manufacturer

Faults	Possible cause	Remedial action
Bearings becoming too hot	Rotating parts rubbing; changes to foundations/plant	Determine cause, remove foreign objects, re-align machine.
	Too much grease in the bearing; coolant temperature above 40 °C.	Excessive grease? Please contact the manufacturer.
Bearing becoming too hot	V-seal or gamma ring rubbing	Replace V-seal or gamma ring. Please contact the manufacturer
	Insufficient lubrication	Please contact the manufacturer
	Bearing corroded	Please contact the manufacturer.
	Too little bearing play	Please contact the manufacturer
	Coupling pushes or pulls	Re-align machine
	Belt tensioned too tightly	Adjust belt pulley in line with specifications.
	Bearing tilted or distorted	Contact the manufacturer
	Bearing corroded	Please contact the manufacturer.
Heavy vibration	Rotor imbalance, rotor not round, shaft distorted	Please contact the manufacturer
	Incorrect alignment	Align set of machines; check coupling.
	Imbalance with the coupled prime mover	Rebalance the coupled prime mover
	Shocks from coupled prime mover	Check prime mover
	Resonance in the foundations	Strengthen foundations following consultation with the manufacturer
	Changes in the foundation	Following consultation with the manufacturer determine the cause, eliminate error and realign the machine.

Faults	Possible cause	Remedial action
Surface temperature too high (>100 °C)	Insufficient flow of cooling air due to unsuitable machine installation location or insufficient ventilation	Check installation location and change if necessary
	Cooling air flow reduced due to soiling	Blow-clean the machine with water and oil-free compressed air (focus on: spaces between ribs and ventilation openings.
	Rotating parts rubbing	Determine the cause, remove foreign objects if possible; otherwise please contact the manufacturer.
Other faults		Please contact the manufacturer.

8 Recommended inspections

The machine described in these Operating Instructions is maintenance-free. However, to guarantee optimum fault-free operations we recommend that you carry out the following inspections.

8.1 Safety

The inspection work described in this section must be carried out by skilled technical staff only.

Fundamental information

WARNUNG!
There is a risk of injury and material damage if inspection work is carried out improperly!

– Ensure that any components that have been removed are refitted correctly; refit all mounting elements and adhere to the correct screw tightening torques.

Ensure the power supply cannot be reconnected

DANGER!
Danger of death from unauthorized reconnection of the power supply!

– Turn off and isolate all power supplies to the machine and equipment concerned before commencing work. Ensure no power supply can be reconnected.

Electric current

DANGER!
Danger of death from electricity!

– If the insulation is damaged turn off and isolate the power supply immediately; ensure the insulation is repaired.

– Before commencing any work, turn off the electrical installation and isolate the power supply to the installation.

– Ensure that live components do not come into contact with moisture or conductive objects. Otherwise, this can lead to a short-circuit.

Please note that you must observe and adhere to all operating and owner-relevant accident prevention regulations, laws regarding the safeguarding of machinery and plant as well as application and country-specific regulations, laws and standards.

8.2 Inspection and maintenance schedule

INFORMATION!

No further actions are required on the machine in addition to the following cyclical inspections described in this inspection schedule. Any attempt to tamper with the machine will result in the warranty being declared null and void!

Interval	Inspections	To be carried out by
Regularly	Check the fastening screws are seated correctly	Skilled personnel
After approx. 20 000 operating hours	Check ball bearings for noise, running smoothly.	Bearings must be replaced by a certified workshop only.
Every 48 months	Check ball bearings for noise, running smoothly.	Bearings must be replaced by a certified workshop only.
Regularly (depending on degree of soiling)	Cleaning: Blow-clean the machine with water and oil-free compressed air (focus on: spaces between ribs and ventilation openings. Pay attention to damaged coating and do not use flammable cleaning agents.	Skilled personnel
Regularly	Condensate drain: At installation locations at which it can be assumed that dew will result in condensate forming. Drain at the lowest point of the end shield; ensure you reclose the drainage opening point.	Skilled personnel
Regularly	Check coating. If there is sufficient damage to the protective coating repaint to prevent risk of corrosion (recommended).	Skilled personnel
If the machine has not been in use for a long time (more than 6 months).	Check the insulation resistance of the windings (greater approx. 1-5 mega-ohm). To measure the insulation resistance disconnect all outgoing lines from the generator. Contact the manufacturer if the resistance reading is less than 1 mega-ohm.	Skilled personnel

9 Disposal

The manufacturer is not obliged to take back electrical machines once they have reached the end of their service life. Parts of the machine are defined under current country-specific legislation as special waste (electrical waste); therefore, you must dispose of the machine in accordance with the laws applicable in your country.

10 Spare parts

The spare parts contained in the following list can be obtained as required from the service address given on page 2.

Spare part	Remark
Cooling fan cowl	Cover for shaft end and fan impeller
Fan impeller	Machine self-ventilation
Terminal board	For terminating conductors and winding
End shield	Housing, bearings
Terminal box components	Housing, terminal board
Key	Indicate shaft or key dimensions
Other parts	Available from the manufacturer on request

INFORMATION!

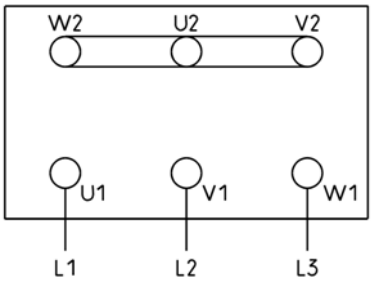
Always indicate the serial number of the device when ordering spare parts!

11 Appendix

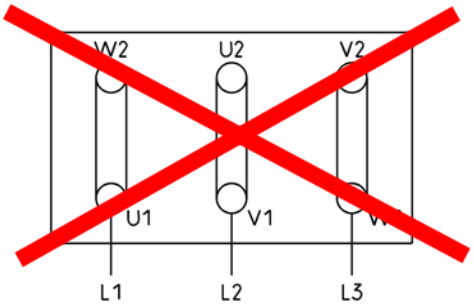
11.1 Wiring diagrams

Wiring diagram

DSG P …
Terminal board (terminal box):



Allowed



Forbidden!

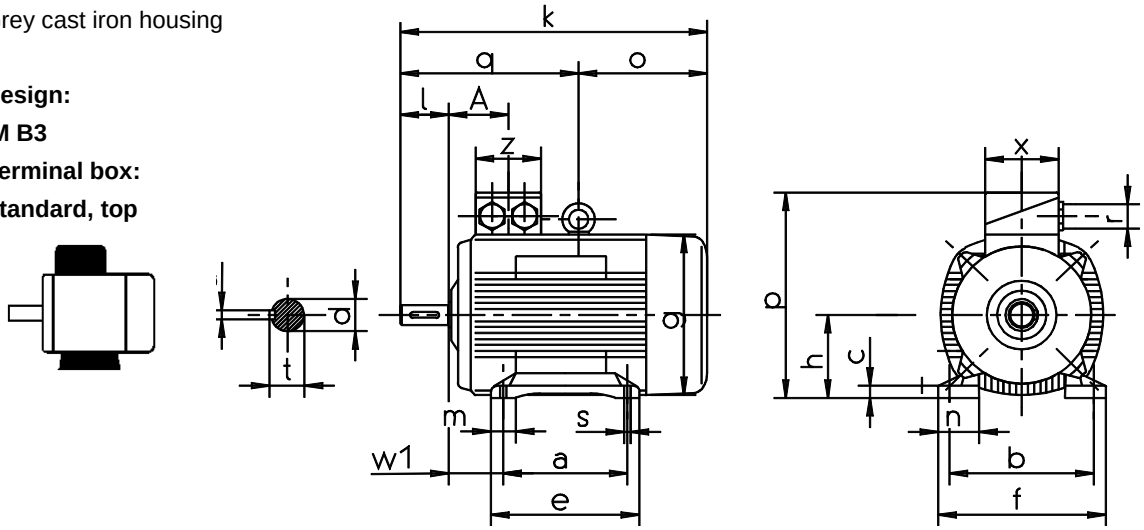
Connection type and terminal assignment: Please refer to Special Appendix 1

11.2 Dimensional drawings/mechanical details

Dimensioned drawing B3

Three-phase synchronous generator with permanent excitation
Grey cast iron housing

Design:
IM B3
Terminal box:
Standard, top



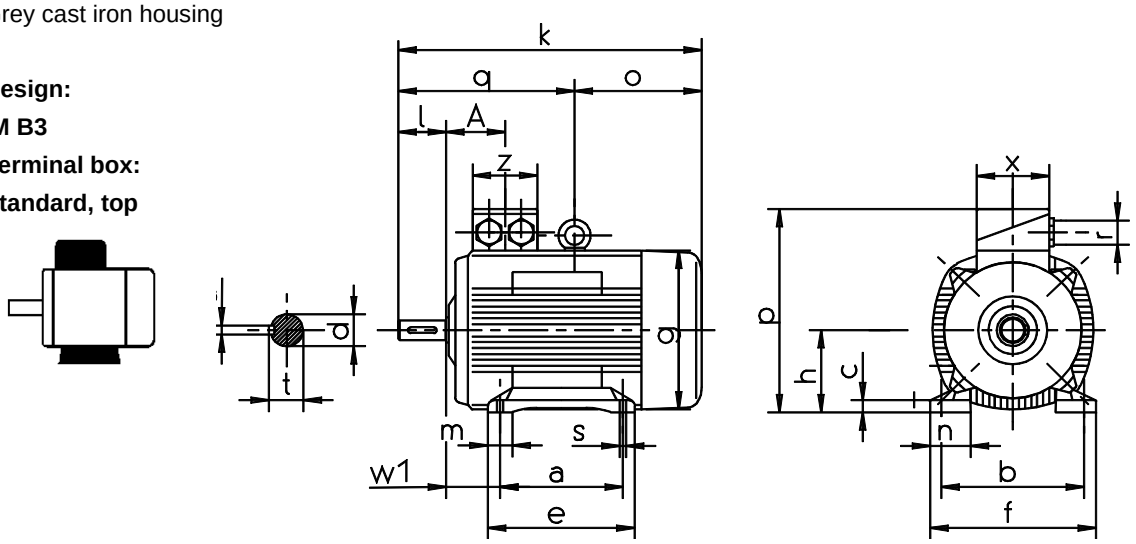
DSG P - Series

Machine type	Dimension	71.07-0.8	71.07-8	80.10-8	112.14-10	112.17-10
Total length	**k**	242	242	297	357	391
Total height with terminal box	**p**	140	140	200	249	249
Shaft length	**l**	30	30	50	60	60
Shaft diameter	**d**	14	14	22	28	28
Max. shaft width with key	**t**	16.1	16.1	24.5	31	31
Width of key	**u**	5	5	6	8	8
Length of foot	**e**	108	108	147	180	180
Distance between foot bores	**a**	90	90	100	140	140
Diameter of foot bores	**s**	7	7	10	12	12
Distance foot bore - shaft collar	**w1**	45	45	50	70	70
Width of foot	**f**	140	140	152	224	224
Distance between foot bores	**b**	112	112	125	190	190
Fan cowl diameter	**g**	138	138	157	196	196
Height to centre	**h**	71	71	80	112	112
Max. axial force	**F_a**	0.145 kN	0.145 kN	0.44 kN	0.52 kN	0.52 kN
Max. radial force (½ shaft length)	**F_r**	0.29 kN	0.29 kN	0.77 kN	0.98 kN	0.98 kN
Mass moment of inertia [kgm²]	**J**	0.00073	0.00073	0.00375	0.01225	0.0139
Mass	**m**	6.5 kg	6.5 kg	18 kg	37 kg	39 kg

Dimensioned drawing B3

Three-phase synchronous generator with permanent excitation
Grey cast iron housing

Design:
IM B3
Terminal box:
Standard, top



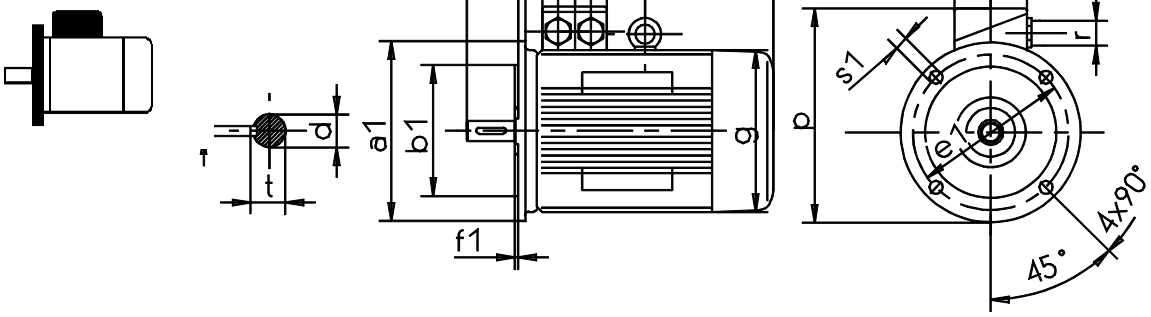
DSG P - Series

Machine type	Dimension	112.16-10	132.15-10	132.20-10	160.20-10	200.25-10
Total length	**k**	479	481	529	609	757
Total height with terminal box	**p**	290	331	331	402	500
Shaft length	**l**	80	80	80	110	140
Shaft diameter	**d**	32	38	38	48	60
Max. shaft width with key	**t**	35	41	41	51.5	64
Width of key	**u**	10	10	10	14	18
Length of foot	**e**	172	180	218	257	322
Distance between foot bores	**a**	140	140	178	210	267
Diameter of foot bores	**s**	12	12	12	15	19
Distance foot bore - shaft collar	**w1**	70	89	89	108	133
Width of foot	**f**	226	256	256	296	372
Distance between foot bores	**b**	190	216	216	254	318
Fan cowl diameter	**g**	217	258	258	313	390
Height to centre	**h**	112	132	132	160	200
Max. axial force	**F_a**	1.4 kN	1.1 kN	1.1 kN	2.5 kN	4.3 kN
Max. radial force (½ shaft length)	**F_r**	1.7 kN	2.6 kN	2.6 kN	3.8 kN	5.6 kN
Mass moment of inertia [kgm²]	**J**	0.023	0.043	0.053	0.145	0.440
Mass	**m**	53 kg	70 kg	86 kg	136 kg	265 kg

Dimensioned drawing B5

Three-phase synchronous generator with permanent excitation
Grey cast iron housing

Design:
IM B5
Terminal box:
Standard, top



DSG P - Series

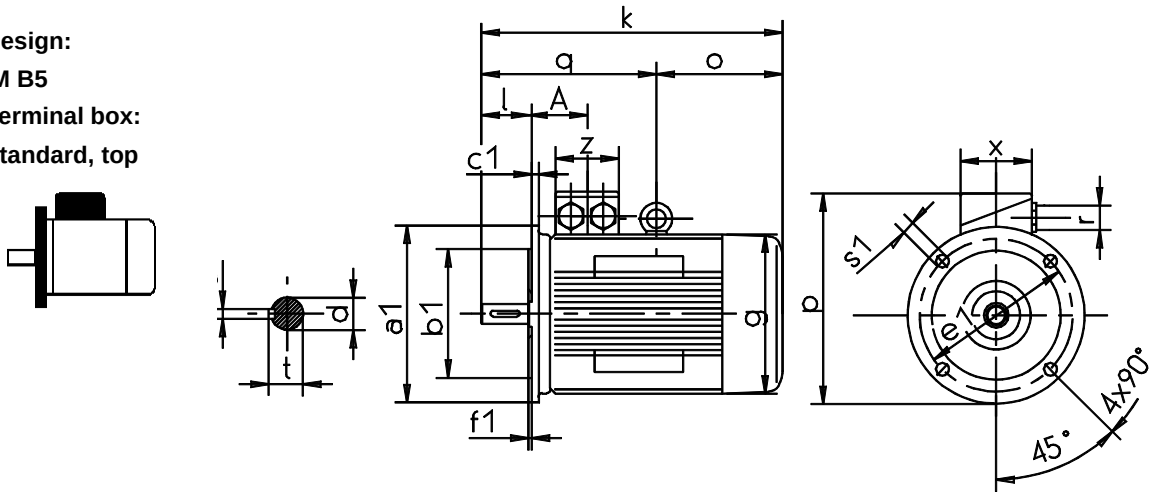
Machine type	Dimension	71.07-0.8	71.07-8	80.10-8	112.14-10	112.17-10
Total length	**k**	242	242	297	357	391
Total height with terminal box	**p**	201.5	201.5	220	262	262
Shaft length	**l**	30	30	50	60	60
Shaft diameter	**d**	14	14	22	28	28
Max. shaft width with key	**t**	16.1	16.1	24.5	31	31
Width of key	**u**	5	5	6	8	8
Fan cowl diameter	**g**	138	138	157	196	196
Flange diameter	**a1**	160	160	200	250	250
Diameter of through-hole circle	**e1**	130	130	165	215	215
Centering seat diameter	**b1**	110	110	130	180	180
Distance centering seat - end shield	**f1**	3.5	3.5	3.5	4	4
Width of end shield	**c1**	10.3	10.3	10	11	11
Flange bore diameter	**s1**	9	9	11	14	14
Max. axial force	**F_a**	0.145 kN	0.145 kN	0.44 kN	0.52 kN	0.52 kN
Max. radial force (½ shaft length)	**F_r**	0.29 kN	0.29 kN	0.77 kN	0.98 kN	0.98 kN

Mass moment of inertia [kgm²]	**J**	0.00073	0.00073	0.00375	0.01225	0.0139
Mass	**m**	6.5 kg	6.5 kg	18 kg	37 kg	39 kg

Dimensioned drawing B5

Three-phase synchronous generator with permanent excitation
Grey cast iron housing

Design:
IM B5
Terminal box:
Standard, top

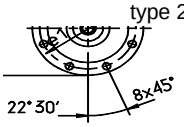


DSG P - Series

Machine type	Dimension	112.16-10	132.15-10	132.20-10	160.20-10	200.25-10
Total length	**k**	479	481	529	609	757
Total height with terminal box	**p**	328	374	374	417	525
Shaft length	**l**	80	80	80	110	140
Shaft diameter	**d**	32	38	38	48	60
Max. shaft width with key	**t**	35	41	41	51.5	64
Width of key	**u**	10	10	10	14	18
Fan cowl diameter	**g**	217	258	258	313	390
Flange diameter	**a1**	300	350	350	350	450
Diameter of through-hole circle	**e1**	265	300	300	300	400
Centering seat diameter	**b1**	230	250	250	250	350
Distance centering seat - end shield	**f1**	4	5	5	5	5
Width of end shield	**c1**	12	13	13	13	16
Flange bore diameter	**s1**	14	18	18	18	18

Max. axial force	F_a	1.4 kN	1.1 kN	1.1 kN	2.5 kN	4.3 kN
Max. radial force (½ shaft length)	F_r	1.7 kN	2.6 kN	2.6 kN	3.8 kN	5.6 kN
Mass moment of inertia [kgm²]	**J**	0.023	0.043	0.053	0.145	0.440
Mass	**m**	53 kg	70 kg	86 kg	136 kg	265 kg

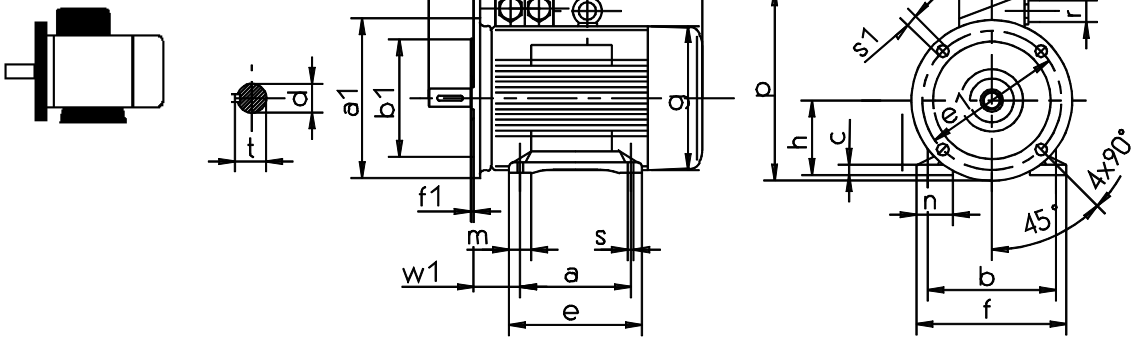
8 flange bores
type 200.25-10



Dimensioned drawing B35

Three-phase synchronous generator with permanent excitation
Grey cast iron housing

Design:
IM B35
Terminal box:
Standard, top



DSG P - Series

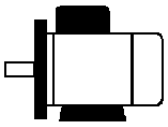
Machine type	Dimension	71.07-0.8	71.07-8	80.10-8	112.14-10	112.17-10
Total length	**k**	242	242	297	357	391
Total height with terminal box	**p**	140	140	200	249	249
Shaft length	**l**	30	30	50	60	60
Shaft diameter	**d**	14	14	22	28	28
Max. shaft width with key	**t**	16.1	16.1	24.5	31	31
Width of key	**u**	5	5	6	8	8
Length of foot	**e**	108	108	147	180	180
Distance between foot bores	**a**	90	90	100	140	140
Diameter of foot bores	**s**	7	7	10	12	12
Distance foot bore - shaft collar	**w1**	45	45	50	70	70
Width of foot	**f**	140	140	152	224	224
Distance between foot bores	**b**	112	112	125	190	190
Fan cowl diameter	**g**	138	138	157	196	196

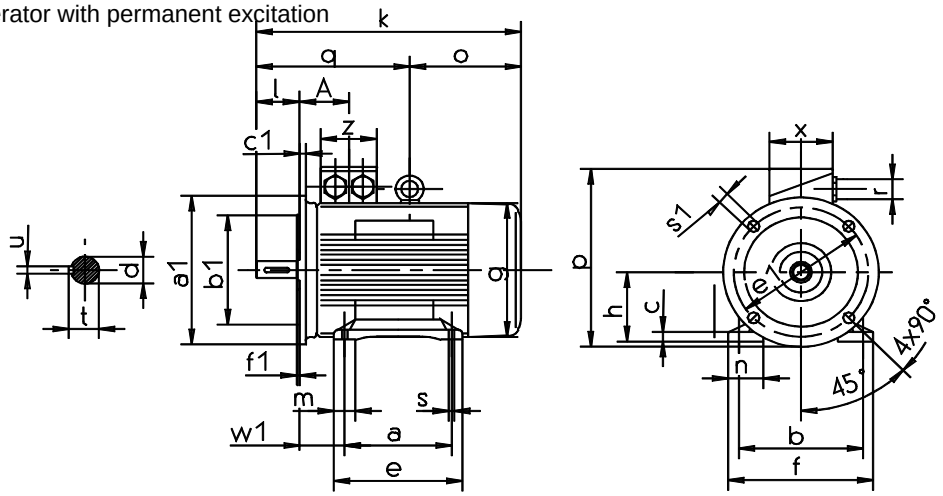
Height to centre	**h**	71	71	80	112	112
Flange diameter	**a1**	160	160	200	250	250
Diameter of through-hole circle	**e1**	130	130	165	215	215
Centering seat diameter	**b1**	110	110	130	180	180
Distance centering seat - end shield	**f1**	3.5	3.5	3.5	4	4
Width of end shield	**c1**	10.3	10.3	10	11	11
Flange bore diameter	**s1**	9	9	11	14	14
Max. axial force	**F_a**	0.145 kN	0.145 kN	0.44 kN	0.52 kN	0.52 kN
Max. radial force (½ shaft length)	**F_r**	0.29 kN	0.29 kN	0.77 kN	0.98 kN	0.98 kN
Mass moment of inertia [kgm²]	**J**	0.00073	0.00073	0.00375	0.01225	0.0139
Mass	**m**	6.5 kg	6.5 kg	18 kg	37 kg	39 kg

Dimensioned drawing B35

Three-phase synchronous generator with permanent excitation
Grey cast iron housing

Design:
IM B35
Terminal box:
Standard, top





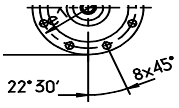
DSG P - Series

Machine type	Dimension	112.16-10	132.15-10	132.20-10	160.20-10	200.25-10
Total length	**k**	479	481	529	609	757
Total height with terminal box	**p**	290	331	331	402	500
Shaft length	**l**	80	80	80	110	140
Shaft diameter	**d**	32	38	38	48	60
Max. shaft width with key	**t**	35	41	41	51.5	64
Width of key	**u**	10	10	10	14	18
Length of foot	**e**	172	180	218	257	322
Distance between foot bores	**a**	140	140	178	210	267
Diameter of foot bores	**s**	12	12	12	15	19
Distance foot bore - shaft collar	**w1**	70	89	89	108	133
Width of foot	**f**	226	256	256	296	372
Distance between foot bores	**b**	190	216	216	254	318
Fan cowl diameter	**g**	217	258	258	313	390
Height to centre	**h**	112	132	132	160	200
Flange diameter	**a1**	300	350	350	350	450

Diameter of through-hole circle	**e1**	265	300	300	300	400
Centering seat diameter	**b1**	230	250	250	250	350
Distance centering seat - end shield	**f1**	4	5	5	5	5
Width of end shield	**c1**	12	13	13	13	16
Flange bore diameter	**s1**	14	18	18	18	18
Max. axial force	**F_a**	1.4 kN	1.1 kN	1.1 kN	2.5 kN	4.3 kN
Max. radial force (½ shaft length)	**F_r**	1.7 kN	2.6 kN	2.6 kN	3.8 kN	5.6 kN
Mass moment of inertia [kgm²]	**J**	0.023	0.043	0.053	0.145	0.440
Mass	**m**	53 kg	70 kg	86 kg	136 kg	265 kg
						8 flange bores
						type 200.25-10

Should there be any variation please refer to Special Appendix 2 Dimensioned drawing.

11.3 Screw tightening torques / material characteristics



Screws utilized to mount the machine (screw material, the material pairings to be fastened and the length of thread engagement) are to be calculated to VDI 2230 (Page 1). The materials used and the construction to which the generator is to be fastened must guarantee a permanently secure and reliable joint. The owner is obliged to inspect and ensure that all specifications are met.

The details given in the table below apply only to horizontal mounting without additional attachments (foot at bottom, mounting types B3 and B35).

Screw tightening torques / material characteristics

for generator series DSG P …

DSG P …		63	71	80	112	132	160	180	200	225	250
Housing	Housing material (stator / stator)	GG 15	AL	GG 15	GG 15	GG 20	GG 20	GG 20	GG 20	GG 20	GG 20
	Material: foot / flange	GG 20	AL	GG 20	GG 20	GG 20	GG 20	GG 20	GG 20	GG 20	GG 20
	Material (screw)	10.9	10.9	10.9	10.9	10.9	10.9	10.9	10.9	10.9	10.9
Fastening, external	Screw: foot mounting	M6	M6	M8	M10	M10	M12	M16	M16	M16	M20
(to existing plant):	Thread engagement [mm]	12	12	16	20	20	32	32	32	32	40
Foot +	Dimensions of washer	12.5 x 6.4 x 1.6	12.5 x 6.4 x 1.6	17 x 8.4 x 1.6	21 x 10.5 x 2	21 x 10.5 x 2	24 x 13 x 2.5	30 x 17 x 3	30 x 17 x 3	30 x 17 x 3	37 x 21 x 3
Flange-type end shield	TM [Nm]	15	15	36	71	71	123	302	302	302	592
	Screw flange mounting	M8	M8	M10	M12	M16	M16	M16	M16	M16	M16
	Thread engagement [mm]	16	16	20	24	32	32	32	32	32	32
	Dimensions of washer [mm]	17 x 8.4 x 1.6	17 x 8.4 x 1.6	21 x 10.5 x 2	24 x 13 x 2.5	30 x 17 x 3	30 x 17 x 3	30 x 17 x 3	30 x 17 x 3	30 x 17 x 3	30 x 17 x 3
	TM [Nm]	36	36	71	123	302	302	302	302	302	302
Fastening (machine, internal):	Flange material	GG 20	AL	GG 20	GG 20	GG 20	GG 20	GG 20	GG 20	GG 20	GG 20
Flange-type end shield + Standard end shield	Screw size [mm]	M4	M4	M5	M8	M8	M10	M12	M12	M16	M16
adjacent cams	Material	8.8	8.8	8.8	8.8	10.9	10.9	10.9	10.9	10.9	10.9
3) non-adjacent cams: half MA value	TM [Nm] **3)**	2	2	4	15	25	45	75	75	170	170
Fastening, internal:	Foot material	GG 20	AL	GG 20	GG 20	GG 20	GG 20	GG 20	GG 20	GG 20	GG 20
Foot	Screw size	M5	M6	M6	M8	M10	M12	M12	M16	M16	M20
	Material	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.8
	TM [Nm]	4	8	8	15	45	75	75	170	170	320
Fan	Screw size	-	-	-	-	M6	M8	M8	M10	M10	M12
	Material	-	-	-	-	8.8	8.8	8.8	8.8	8.8	8.8
	TM [Nm]	-	-	-	-	10	18	25	30	35	40
Cooling fan cowl	Screw size	M4	M4	M4	M5	M6	M6	M6	M6	M8	M8
	Material	4.8	4.8	4.8	4.8	8.8	8.8	8.8	8.8	8.8	8.8
	TM [Nm]	2	2	2	2	8	8	8	8	15	15
Eye bolt	Screw size	-	-	-	M8	M10	M12	M16	M16	M20	M24
	Material	-	-	-	C15E	C15	C15	C15	C15	C15	C15
	TM [Nm]	-	-	-	10	20	40	80	80	160	280
1) D-end **2)** ND end	Screw size	- -	- -	- -	- -	1) M6	2) M6	1) M6	2) M6	1) M8	2) M6	1) M10	2) M8	1) M10	2) M10	1) M10	2) M10
	Material	- -	- -	- -	- -	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.8
bearing cap	TM [Nm]	- -	- -	- -	- -	8	8	8	8	15	8	20	15	20	20	20	20
Terminal box	Screw size	M4	M4	M4	M4	M6	M6	M6	M8	M8	M10
	Material	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.8
	TM [Nm]	2.5	2.5	2.5	2.5	4	4	4	7.5	7.5	12.5
Terminal box lid	Screw size	M5	M5	M5	M5	M6	M6	M6	M8	M8	M10
	Material	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8
	TM [Nm]	1	1	1	1	4	4	4	7.5	7.5	12.5
Terminal mounting	Screw size	M4	M4	M4	M4	M6	M6	M6	M8	M8	M10
	Material	4.8	4.8	4.8	4.8	8.8	8.8	8.8	8.8	8.8	8.8
	TM [Nm]	1.5	1.5	1.5	1.5	4	4	4	7.5	7.5	12.5
Terminal mounting nuts	Screw size	M4	M4	M4	M4	M5	M6	M6	M8	M8	M10
	Material	St	St	St	St	Sm, St	Sm, St	Sm, St	Sm, St	Sm, St	Sm, St
	TM [Nm]	1.8	1.8	1.8	1.8	2.5	4	4	7.5	7.5	12.5

Tolerance for all screw tightening torques: + 10 %.

11.4 EC-Declaration of Incorporation

EG-Einbauerklärung

für unvollständige Maschinen
(EG-Richtlinie 2006/42/EG + 2011/65/EU)

EC-Declaration of Incorporation

for partly completed machinery
(EC-Directive 2006/42/EC + 2011/65/EU)

Hersteller / Manufacturer: Johannes Hübner Fabrik elektrischer Maschinen GmbH

Anschrift / Address: 35394 Giessen, Siemensstrasse 7

Produktbezeichnung / Product designation:

Drehstromsynchrongeneratoren (permanent erregt)
Three-Phase Synchronous Generators (permanently excited)
DSG-P … (< 50 V AC Bemessungsspannung / Rated voltage)

Drehstromasynchrongenerator (Kurzschlussläufer)
Three-Phase Asynchronous Generators (squirrel-cage rotors)
DAG … (< 50 V AC Bemessungsspannung / Rated voltage)

Drehstromsynchronmotoren (permanent erregt)
Three-Phase Synchronous Motors (permanently excited)
DSM-P… / HAC … (< 50 V AC Bemessungsspannung / Rated voltage)

Drehstromasynchronmotoren (Kurzschlussläufer)
Three-Phase Asynchronous Motors (squirrel-cage rotors)
DAM … (< 50 V AC Bemessungsspannung / Rated voltage)

Die bezeichneten Produkte stimmen in der von uns in Verkehr gebrachten Ausführung mit den Vorschriften folgender Europäischer Richtlinien überein:
The products described above in the form as placed on the market are in conformity with the provisions of the following European Directive:

2006/42/EG (Ausgabe / Version 2006-06-09)
Richtlinie des Europäischen Parlaments und des Rates vom 17. Mai 2006 über Maschinen und zur Änderung der Richtlinie 95/16/EG (Neufassung)
Directive of the European Parliament and of the Council of 17 May 2006 on machinery, and amending Directive 95/16/EC (recast)

2011/65/EU (Ausgabe / Version 2011-06-08)
Richtlinie des Europäischen Parlaments und des Rates vom 8. Juni 2011 zur Beschränkung der Verwendung bestimmter gefährlicher Stoffe in Elektro- und Elektronikgeräten
Directive 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

2006/42/EG: Folgende harmonisierte Normen wurden angewandt:

2006/42/EC: Following harmonised standards have been applied:

DIN EN ISO 12100 (Ausgabe / Version 2013-08)
Sicherheit von Maschinen - Allgemeine Gestaltungsleitsätze - Risikobeurteilung und Risikominderung (ISO 12100:2010); Deutsche Fassung EN ISO 12100:2010, Berichtigung zu DIN EN ISO 12100:2011-03

Safety of machinery - General principles for design - Risk assessment and risk reduction (ISO 12100:2010); German version EN ISO 12100:2010, Corrigendum to DIN EN ISO 12100:2011-03

DIN EN 60204-1 (Ausgabe / Version 2010-05)
Sicherheit von Maschinen - Elektrische Ausrüstung von Maschinen - Teil 1: Allgemeine Anforderungen (IEC 60204-1:2005, modifiziert); Deutsche Fassung EN 60204-1:2006, Berichtigung zu DIN EN 60204-1 (VDE 0113-1):2007-06; Deutsche Fassung CENELEC-Cor. :2010 zu EN 60204-1:2006

Safety of machinery - Electrical equipment of machines - Part 1: General requirements (IEC 60204-1:2005, modified); German version EN 60204-1:2006, Corrigendum to DIN EN 60204-1 (VDE 0113-1):2007-06; German version CENELEC-Cor. :2010 to EN 60204-1:2006

Die oben genannten Produkte entsprechen folgenden grundlegenden Anforderungen der Richtlinie 2006/42/EG:
1.1.2 Grundsätze für die Integration der Sicherheit
1.1.3 Materialien und Produkte
1.1.5 Konstruktion der Maschine im Hinblick auf Handhabung
1.3.2 Bruchrisiko bei Betrieb
1.3.3 Risiken durch herabfallende oder herausgeschleuderte Gegenstände
1.3.4 Risiken durch Oberflächen, Kanten und Ecken
1.5.1 Elektrische Energieversorgung
1.5.8 Lärm
1.5.9 Vibrationen
1.6.1 Wartung der Maschine
1.7.1 Informationen und Warnhinweise an der Maschine
1.7.2 Warnung vor Restrisiken
1.7.3 Kennzeichnung der Maschinen

The above mentioned products meets the following essential requirements from directive 2006/42/EC:
1.1.2 Principles of safety integration
1.1.3 Materials and products
1.1.5 Design of machinery to facilitate its handling
1.3.2 Risk of break-up during operation
1.3.3 Risks due to falling or ejected objects
1.3.4 Risks due to surfaces, edges or angles
1.5.1 Electricity supply
1,5.8 Noise
1.5.9 Vibrations
1.6.1 Machinery maintenance
1.7.1 Information and warnings on the machinery
1.7.2 Warning of residual risks
1.7.3 Marking of machinery

Die Inbetriebnahme ist so lange untersagt, bis festgestellt wurde, dass - soweit zutreffend – die Maschine, in die o.a. unvollständige Maschine eingebaut werden soll, den Bestimmungen der Maschinenrichtlinie 2006/42/EG entspricht.

Startup is not permitted until it has been determined, that – as applicable - the machine into which the uncompleted machine has to be incorporated, does comply with the requirement of the machine directive (2006/42/EC).

Die Erstellung der speziellen technischen Unterlagen nach Anhang VII Teil B wird erklärt. Die Unterlagen werden vom Hersteller auf Verlangen der einzelstaatlichen Stellen zur Verfügung gestellt.

The preparation for relevant technical documents to appendix VII part B is delared. The documents will be made available from manufacturer to request by the competent national authorities.

2011/65/EU: Folgende harmonisierte Normen wurden angewandt:

2011/65/EU: Following harmonized standards have been applied:

DIN EN 50581 (Ausgabe / Version 2013-02)
Technische Dokumentation zur Beurteilung von Elektro- und Elektronikgeräten hinsichtlich der Beschränkung gefährlicher Stoffe

Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances

Unterschrift:	Frank Tscherney (Geschäftsführer / General manager)	Gießen, 22.02.2017

EG-Einbauerklärung

für unvollständige Maschinen
(EG-Richtlinie 2006/42/EG + 2014/35/EU + 2011/65/EU)

EC-Declaration of Incorporation

for partly completed machinery
(EC-Directive 2006/42/EC + 2014/35/EU + 2011/65/EU)

Hersteller / Manufacturer: Johannes Hübner Fabrik elektrischer Maschinen GmbH

Anschrift / Address: 35394 Giessen, Siemensstrasse 7

Produktbezeichnung / Product designation:

Drehstromsynchrongeneratoren (permanent erregt)
Three-Phase Synchronous Generators (permanently excited)
DSG-P … (50-1000 V AC Bemessungsspannung / Rated voltage)

Drehstromasynchrongenerator (Kurzschlussläufer)
Three-Phase Asynchronous Generators (squirrel-cage rotors)
DAG … (50-1000 V AC Bemessungsspannung / Rated voltage)

Die bezeichneten Produkte stimmen in der von uns in Verkehr gebrachten Ausführung mit den Vorschriften folgender Europäischer Richtlinien überein:
The products described above in the form as placed on the market are in conformity with the provisions of the following European Directive:

2006/42/EG (Ausgabe / Version 2006-06-09)
Richtlinie des Europäischen Parlaments und des Rates vom 17. Mai 2006 über Maschinen und zur Änderung der Richtlinie 95/16/EG (Neufassung)
Directive of the European Parliament and of the Council of 17 May 2006 on machinery, and amending Directive 95/16/EC (recast)

2014/35/EU (Ausgabe / Version 2014-02-26)
Richtlinie des Europäischen Parlaments und des Rates vom 26. Februar 2014 zur Harmonisierung der Rechtsvorschriften der Mitgliedstaaten über die Bereitstellung elektrischer Betriebsmittel zur Verwendung innerhalb bestimmter Spannungsgrenzen auf dem Markt
Directive 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

2011/65/EU (Ausgabe / Version 2011-06-08)
Richtlinie des Europäischen Parlaments und des Rates vom 8. Juni 2011 zur Beschränkung der Verwendung bestimmter gefährlicher Stoffe in Elektro- und Elektronikgeräten
Directive 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

2006/42/EG: Folgende harmonisierte Normen wurden angewandt:

2006/42/EC: Following harmonised standards have been applied:

DIN EN ISO 12100 (Ausgabe / Version 2013-08)
Sicherheit von Maschinen - Allgemeine Gestaltungsleitsätze - Risikobeurteilung und Risikominderung (ISO 12100:2010); Deutsche Fassung EN ISO 12100:2010, Berichtigung zu DIN EN ISO 12100:2011-03

Safety of machinery - General principles for design - Risk assessment and risk reduction (ISO 12100:2010); German version EN ISO 12100:2010, Corrigendum to DIN EN ISO 12100:2011-03

DIN EN 60204-1 (Ausgabe / Version 2010-05)
Sicherheit von Maschinen - Elektrische Ausrüstung von Maschinen - Teil 1: Allgemeine Anforderungen (IEC 60204-1:2005, modifiziert); Deutsche Fassung EN 60204-1:2006, Berichtigung zu DIN EN 60204-1 (VDE 0113-1):2007-06; Deutsche Fassung CENELEC-Cor. :2010 zu EN 60204-1:2006

Safety of machinery - Electrical equipment of machines - Part 1: General requirements (IEC 60204-1:2005, modified); German version EN 60204-1:2006, Corrigendum to DIN EN 60204-1 (VDE 0113-1):2007-06; German version CENELEC-Cor. :2010 to EN 60204-1:2006

Die oben genannten Produkte entsprechen folgenden grundlegenden Anforderungen der Richtlinie 2006/42/EG:
1.1.2 Grundsätze für die Integration der Sicherheit
1.1.3 Materialien und Produkte
1.1.5 Konstruktion der Maschine im Hinblick auf Handhabung
1.3.2 Bruchrisiko bei Betrieb
1.3.3 Risiken durch herabfallende oder herausgeschleuderte Gegenstände
1.3.4 Risiken durch Oberflächen, Kanten und Ecken
1.5.1 Elektrische Energieversorgung
1.5.8 Lärm
1.5.9 Vibrationen
1.6.1 Wartung der Maschine
1.7.1 Informationen und Warnhinweise an der Maschine
1.7.2 Warnung vor Restrisiken
1.7.3 Kennzeichnung der Maschinen

The above mentioned products meets the following essential requirements from directive 2006/42/EC:
1.1.2 Principles of safety integration
1.1.3 Materials and products
1.1.5 Design of machinery to facilitate its handling
1.3.2 Risk of break-up during operation
1.3.3 Risks due to falling or ejected objects
1.3.4 Risks due to surfaces, edges or angles
1.5.1 Electricity supply
1,5.8 Noise
1.5.9 Vibrations
1.6.1 Machinery maintenance
1.7.1 Information and warnings on the machinery
1.7.2 Warning of residual risks
1.7.3 Marking of machinery

Die Inbetriebnahme ist so lange untersagt, bis festgestellt wurde, dass - soweit zutreffend – die Maschine, in die o.a. unvollständige Maschine eingebaut werden soll, den Bestimmungen der Maschinenrichtlinie 2006/42/EG entspricht.

Startup is not permitted until it has been determined, that – as applicable - the machine into which the uncompleted machine has to be incorporated, does comply with the requirement of the machine directive (2006/42/EC).

Die Erstellung der speziellen technischen Unterlagen nach Anhang VII Teil B wird erklärt. Die Unterlagen werden vom Hersteller auf Verlangen der einzelstaatlichen Stellen zur Verfügung gestellt.

The preparation for relevant technical documents to appendix VII part B is delared. The documents will be made available from manufacturer to request by the competent national authorities.

2014/35/EU: Folgende harmonisierte Normen wurden angewandt:

2014/35/EU: Following harmonised standards have been applied:

DIN EN 60034-1 (Ausgabe / Version 2011-02)
Drehende elektrische Maschinen - Teil 1: Bemessung und Betriebsverhalten (IEC 60034-1:2010, modifiziert); Deutsche Fassung EN 60034-1:2010 + Cor.:2010

Rotating electrical machines - Part 1: Rating and performance (IEC 60034-1:2010, modified); German version EN 60034-1:2010 + Cor.:2010

DIN EN 60034-5 (Ausgabe / Version 2007-09)
Drehende elektrische Maschinen - Teil 5: Schutzarten aufgrund der Gesamtkonstruktion von drehenden elektrischen Maschinen (IP-Code) - Einteilung (IEC 60034-5:2000 + Corrigendum 2001 + A1:2006); Deutsche Fassung EN 60034-5:2001 + A1:2007

Rotating electrical machines - Part 5: Degrees of protection provided by integral design of rotating electrical machines (IP code) - Classification (IEC 60034-5:2000 + Corrigendum 2001 + A1:2006); German version EN 60034-5:2001 + A1:2007

DIN EN 60034-6 (Ausgabe / Version 1996-08)
Drehende elektrische Maschinen - Teil 6: Einteilung der Kühlverfahren (IC-Code) (IEC 60034-6:1991); Deutsche Fassung EN 60034-6:1993

Rotating electrical machines - Part 6: Methods of cooling (IC-Code) (IEC 60034-6:1991); German version EN 60034-6:1993

DIN EN 60034-8 (Ausgabe / Version 2014-10)
Drehende elektrische Maschinen - Teil 8: Anschlussbezeichnungen und Drehsinn (IEC 60034-8:2007 + A1:2014); Deutsche Fassung EN 60034-8:2007 + A1:2014

Rotating electrical machines - Part 8: Terminal markings and direction of rotation (IEC 60034-8:2007 + A1:2014); German version EN 60034-8:2007 + A1:2014

DIN EN 60034-9 (Ausgabe / Version 2008-01)
Drehende elektrische Maschinen - Teil 9: Geräuschgrenzwerte (IEC 60034-9:2003, modifiziert + A1:2007); Deutsche Fassung EN 60034-9:2005 + A1:2007, Berichtigungen zu DIN EN 60034-9 (VDE 0530-9):2008-01

Rotating electrical machines - Part 9: Noise limits (IEC 60034-9:2003, modified + A1:2007); German version EN 60034-9:2005 + A1:2007, Corrigenda to DIN EN 60034-9 (VDE 0530-9):2008-01

DIN EN 60034-11 (Ausgabe / Version 2005-04)
Drehende elektrische Maschinen - Teil 11: Thermischer Schutz (IEC 60034-11:2004); Deutsche Fassung EN 60034-11:2004

Rotating electrical machines - Part 11: Thermal protection (IEC 60034-11:2004); German version EN 60034-11:2004

DIN EN 60034-14 (Ausgabe / Version 2008-03)
Drehende elektrische Maschinen - Teil 14: Mechanische Schwingungen von bestimmten Maschinen mit einer Achshöhe von 56 mm und höher - Messung, Bewertung und Grenzwerte der Schwingstärke (IEC 60034-14:2003 + A1:2007); Deutsche Fassung EN 60034-14:2004 + A1:2007

Rotating electrical machines - Part 14: Mechanical vibration of certain machines with shaft heights 56 mm and higher - Measurement, evaluation and limits of vibration severity (IEC 60034-14:2003 + A1:2007); German version EN 60034-14:2004 + A1:2007

DIN EN 60204-1 (Ausgabe / Version 2010-05)
Sicherheit von Maschinen - Elektrische Ausrüstung von Maschinen - Teil 1: Allgemeine Anforderungen (IEC 60204-1:2005, modifiziert); Deutsche Fassung EN 60204-1:2006, Berichtigung zu DIN EN 60204-1 (VDE 0113-1):2007-06; Deutsche Fassung CENELEC-Cor. :2010 zu EN 60204-1:2006

Safety of machinery - Electrical equipment of machines - Part 1: General requirements (IEC 60204-1:2005, modified); German version EN 60204-1:2006, Corrigendum to DIN EN 60204-1 (VDE 0113-1):2007-06; German version CENELEC-Cor. :2010 to EN 60204-1:2006

2011/65/EU: Folgende harmonisierte Normen wurden angewandt:
2011/65/EU: Following harmonized standards have been applied:

DIN EN 50581 (Ausgabe / Version 2013-02)
Technische Dokumentation zur Beurteilung von Elektro- und Elektronikgeräten hinsichtlich der Beschränkung gefährlicher Stoffe

Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances

Unterschrift:	Frank Tscherney (Geschäftsführer / General manager)	Gießen, 22.02.2017

Notices

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