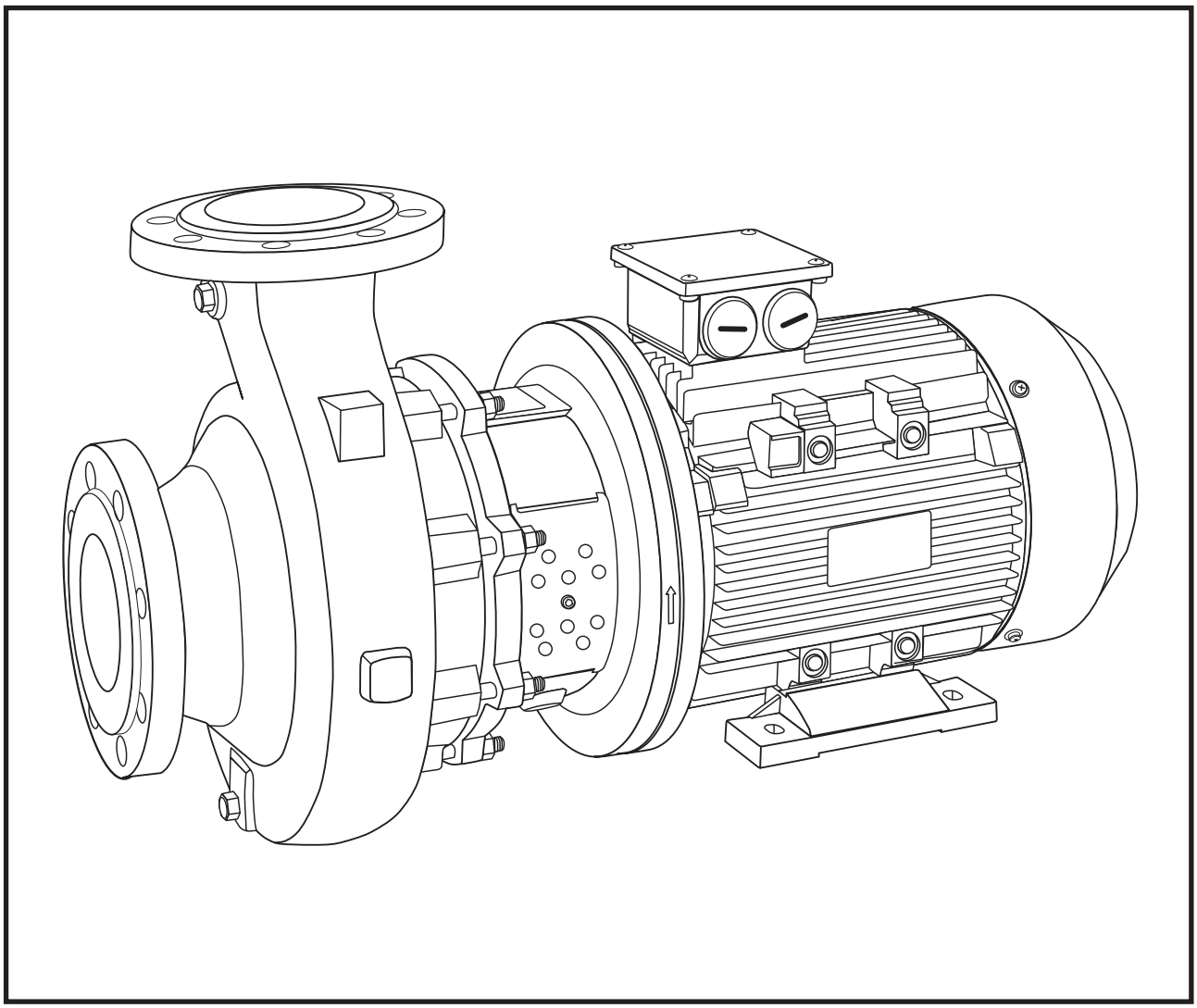
Installation and operation manual

Norm Block Pump



speck pumps

08/09
VG 766.1320.050 2' 08/09

1. General information

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CAUTION

Speck Pumpen Verkaufsgesellschaft GmbH,
Neunkirchen am Sand
Series norm block pumps
Country of origin: Federal Republic of Germany

This Speck pump has been developed and constructed with greatest care corresponding to state-of-the-art technology and is subject to permanent quality checks.

This operation manual introduces the user to the pump and its intended uses.

Please pay attention to the instructions for operating the pump safely, appropriately and efficiently in order to ensure its reliability and longevity, as well as to avoid danger.

The operation manual makes no mention of local regulations! The user alone is responsible for making sure these are adhered to – also by assembly personnel.

⚠ When operating this unit, do not exceed the values – as put down in the technical documentation – with regard to the pumped fluid, flow rate, motor speed, density, pressure and temperature as well as motor performance or other specifications in the operation manual or the contractual documentation. When in doubt, please contact manufacturer.

The nameplate identifies the series / size, the most important operating data and the identification number. Please always quote this number on any inquiries, reorders and especially spare part orders.

Should you require any additional information or advice, or should any damage occur, please contact the closest Speck customer care service.

1.1 Certificates of conformity, test symbols and related matters

The CE-symbol is attached to the pump. The certificate of conformity is part of the appendix of this operation manual.

1.2 Noise level

The noise level mostly depends on the lines connected to the pump.

The noise level stated is only valid for the pump on its own.

The noise level data are included in the Technical Data Sheet in the appendix. If the noise level is not specified, it is lower than 75 dBA.

2. Safety

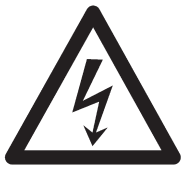
This operation manual contains fundamental instructions concerning installation, operation and servicing. Therefore, the mechanic, the staff in charge of the machine as well as the user must study this operation manual before installation and start-up. Keep the operation manual permanently available at the installation site.

Not only all general safety instructions in this chapter must be observed, but also the special safety instructions in the other chapters.

2.1 Symbols for safety instructions used in the operation manual

Safety instructions for the prevention of danger to persons are indicated by the safety symbol denoting a general hazard area according to ISO 7000 – 04324:

To caution against electrical hazards, the safety symbol according to IC 417 – 5036 is used:



Safety instructions for the prevention of danger to the machine and its functions are emphasized by the word

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Symbols which are affixed directly to the machine, as e.g.

- an arrow denoting the direction of rotation
- sign for fluid connections

must by all means be paid attention to and kept fully legible.

2.2 Qualification and training of staff

Staff responsible for operating, service, inspection and installation must be fully qualified for these tasks.

The details of staff responsibility, competence and surveillance are to be regulated by the user. If the staff lacks the required skills, they must be trained and instructed. The user may charge the manufacturer with doing so. Furthermore the manufacturer must make sure that the staff fully understands the contents of the operation manual.

2.3 Dangers of ignoring safety instructions

Ignoring safety instructions can be dangerous as well to persons as to the environment and the machine. Ignoring the safety instructions will void any warranties.

In detail, ignoring the safety instructions may cause:

- failure of important functions of the machine / unit
- failure of prescribed methods of servicing and maintenance
- danger to persons caused by electrical, mechanical and chemical impact
- danger to the environment caused by leakage of hazardous substances
- damage to institutions and buildings

2.4 **Safety-conscious operating**

The safety-instructions specified in the operation manual, national directions for accident prevention as well as the user's internal directives for operational safety must be observed.

2.5 **Safety instructions for the user / operator**

- Dangerously hot or cold machine parts must be protected from accidental contact by the user.
- Do not remove equipment which protects the machine against accidental contact from moving parts (e.g. a clutch), when the machine is in operation.
- Leakages (e.g. at the shaft seal) of dangerous pumping materials (e.g. explosive, toxic, hot) must be discharged without causing danger to persons or the environment. Observe legal requirements!
- Eliminate any possibility of danger caused by electrical power! For details see e.g. regulations of VDE and the local utilities.

2.6 **Safety instructions for maintenance, inspection and installation**

The user must make sure that authorized and qualified expert staff only is put in charge of maintenance, inspection and installation. These experts must have thoroughly studied the operation manual before beginning their work.

The pump must be at ambient temperature, depressurized and empty.

On principle, the pump must stand still to be worked on. By all means follow the shutting down process as described in the operation manual.

Pumps or pump units conveying materials which are dangerous to health must necessarily be decontaminated.

Immediately after work on the machine is finished, all safety and protection equipment must be reinstalled on the machine and reactivated.

Before restarting the machine, observe all instructions in chapter "Initial start-up" in the operation manual.

2.7 **Unauthorized modification or production of spare parts**

Changing or modifying the machine is only permitted after consulting the manufacturer. The safety of the machine can only be guaranteed if original spare parts and accessories which are authorized by the manufacturer are used. The manufacturer does not assume responsibility for the consequences which result from the use of components from other suppliers.

2.8 **Unauthorized operation**

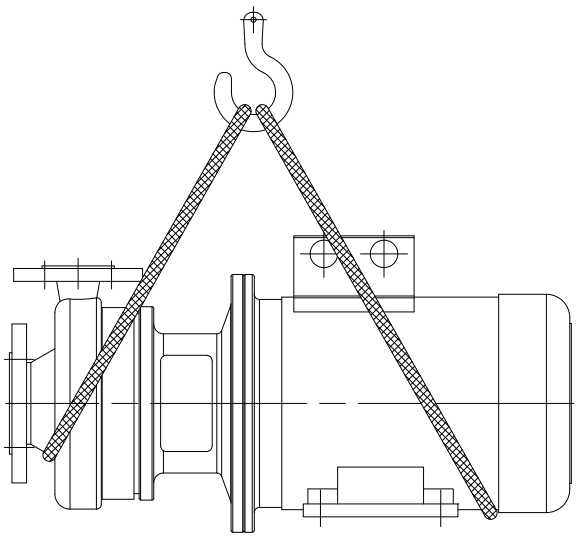
The operational safety of the delivered pump can only be guaranteed, if the pump is appropriately used according to the specifications in the subsequent chapters of the operation manual. The limits stated in the data sheet must not be exceeded under any circumstances.

3. Transport, temporary storage

3.1 **Transportation**

The unit must be transported appropriately. During transportation, the pump must be firmly fixed in a horizontal position to keep it from slipping through the transport straps. Do not hang the pump by its free shaft extension or the ring terminal of the motor! The ring bolts on the motor are only to be used for transporting the motor, not the whole pump!

⚠ A pump slipping through a transport strap can injure persons and damage objects!



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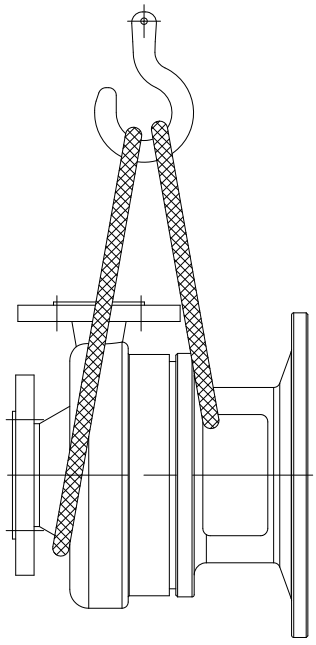
If the pump is transported without the motor, shaft 210 must be fastened:

1. Press the cover panels 68-3 lightly together and remove them through the windows of the lantern bracket 341.
2. Pull the lock washer 931 into the well nut and secure it by means of hexagon head screws 901.3.



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3.2 Temporary storage (Internal storage) rust-proofing

In case of temporary storage only the low-alloyed components in contact with liquids (e.g. cast iron JL 1040) need to be rust-proofed. Commercially available preserving substances can be used for this. For application / removal follow the specific instructions of the manufacturer.

The procedure is described in Section 6.3.

The unit / pump ought to be stored in a dry room, preferable with constant humidity.

For outside storage it is necessary for unit and packing case to be protected by a watertight cover in order to avoid contact with moisture.

CAUTION

Protect stored goods against moisture, dirt, vermin and unauthorized access! All openings of the assembled components of the unit are closed and must only be opened if required during assembly.

For rust-proofing all blank parts and surfaces are oiled, respectively greased (silicon-free oil and grease).

4. Description of product and accessories

4.1 General description

Norm block centrifugal pumps are non self-priming, mono-stage, spiral casing pumps in horizontal block design.

They achieve a high circulation, while taking little space because of their compact design.

The back-pullout design allows the drive unit to be replaced without disconnecting the pipe-work for ease of assembly or disassembly.

4.2 Constructional design

Construction:
Spiral pumps, mono-stage with power rating according to EN 733. Shaft equipped with a replaceable shaft sleeve in the area of the shaft seal. Spiral casing and impeller equipped with replaceable split rings.

Flanged pump and motor are close-coupled to form a block unit with norm motor.

The pump shaft is rigidly connected with the motor shaft.

Shaft seal:
Mechanical seal according to EN 12 756.

Drive:
Electrical motor.

Protection against accidental contact:
Cover plates on the lantern brackets in accordance with EN 294.

4.3 Table of materials:

Version	05	11	12
Casing parts	Tin bronze CC480K-GS	Cast iron EN-JL 1040	Cast iron EN-JL 1040
Impeller	Tin bronze CC480K-GS	Cast iron EN-JL 1040	Tin bronze CC-480K-GS
Mechanical seal	Carbon/SiC/EPDM On request SiC/SiC/HNBR	Carbon/SiC/EPDM On request SiC/SiC/HNBR	Carbon/SiC/EPDM On request SiC/SiC/HNBR
Split rings	CC495-GS	CC495-GS	CC495-GS
Pump shaft	1.4571 X6 Cr Ni Mo Ti 17-12-2	1.4571 X6 Cr Ni Mo Ti 17-12-2	1.4571 X6 Cr Ni Mo Ti 17-12-2
Shaft protection sleeve	1.4571 X6 Cr Ni Mo Ti 17-12-2	1.4571 X6 Cr Ni Mo Ti 17-12-2	1.4571 X6 Cr Ni Mo Ti 17-12-2
Drive lantern	Cast iron EN-JL 1040	Cast iron EN-JL 1040	Cast iron EN-JL 1040

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5. Installation

5.1 Checks before installation

The structural layout must be prepared in accordance with the dimension and assembly drawings.

The concrete foundations should be of sufficient strength (min. class X0) according to DIN 1045.

The concrete foundation must have set before the unit is set up on it. The surface of the foundation must be horizontal and even.

5.1.1 Ground, foundations, wall

It must be possible to set up the pump, respectively the unit safely and stress-free on the foundations.

Distortions can cause an untimely wearing of the pump.

Make sure that no vibrations are passed on through the foundations.

5.1.2 Space requirements for operation and maintenance

When installing the unit, make sure that it is possible to exchange parts of or the complete unit. Heavy units must be equipped with appropriate facilities for fastening and supporting lifting tools and other devices. Access routes for delivery and removal must be provided.

5.2 Installation of the unit

During installation the unit must be leveled with the help of the water level on the pressure connection.

⚠ Spiral casing and pressure cover will approximately assume the temperature of the pumped liquid. Pressure cover and lantern bracket must not be insulated.

Appropriate measures have to be taken to avoid burns.

5.3 Connecting the pipes

CAUTION

The pump must not be used as an anchor point for pipes under any circumstances.

The pipe system must not exert any forces and momentums on the pump (e.g. by distortion or heat expansion).

When laying the suction line, make sure it ascends towards the pump. The supply line must descend towards the pump. The pipes must be supported directly in front of the pump and have stress-free connections.

The nominal diameter of short pipes must at least equal the diameter of the pump connections. The most economical diameter of long pipes must be determined individually.

Adaptor pieces for larger nominal diameters should be designed with an enlargement angle of approx. 8° in order to avoid increased pressure loss.

The advisability of non-return valves and shut-off valves depends on the type of unit and of the pump.

Suitable measures must be taken to compensate for the thermal expansion of the pipes in order not to strain the pump beyond the pipe forces and momentums permitted.

⚠ Exceeding the pipe forces may cause the appearance of leaky spots where the pumping material oozes out.

Hot pumping materials may cause danger of life!

The flange covers on the suction and pressure connection must be removed before installing the piping.

Before starting the unit, the tanks, pipes and connections must be thoroughly cleaned, rinsed and air purged. Weld beads, scaling and other impurities often only dissolve after a long time.

5.3.1 Supplementary connections

See installation drawing or pipe layout diagram for dimensions and position of the supplementary connection for the pump.

5.3.2 Dimensioning of the pipes

In order to avoid friction loss, the flow rate must be max. 1.5m/s in suction or supply lines, max. 2.5 m/s in pressure lines.

The rules of piping construction must be observed concerning the piping layouts and the liquid quantities in order to prevent the pump from sucking air. Dry running of the pump can cause considerable damage to pump and seals.

5.3.3 Measuring point diagram

The pressure of centrifugal pumps is measured following ISO 2548 “standardized experimental arrangements” (sketch 1, page 48).

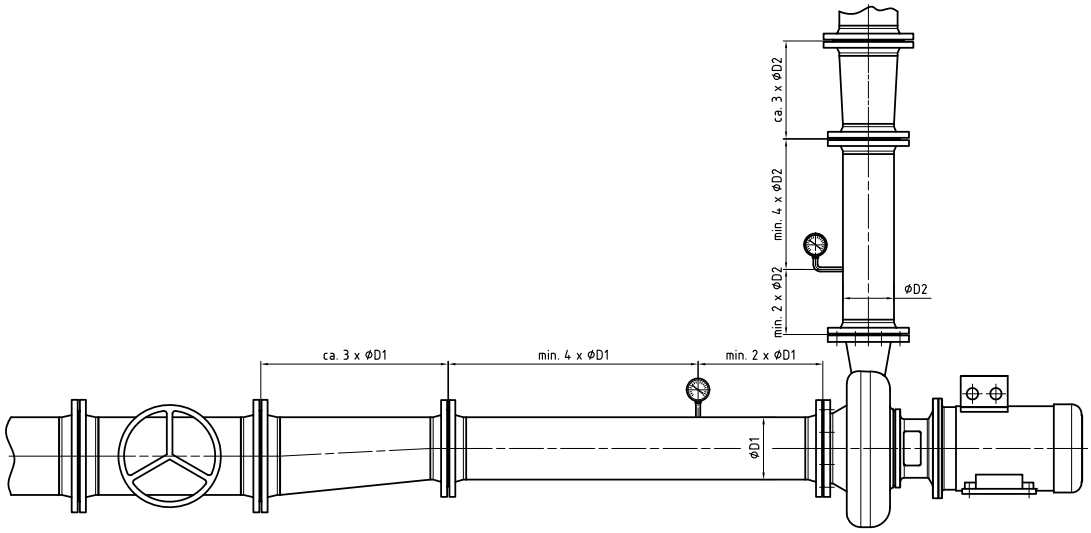
Make sure, however, that the flow rate in the measuring pipe does not considerably exceed the values stated in 5.3.2. If the flow rate exceeds those values, the pressure / suction flanges must be equipped with adaptor pieces. (sketch 2, page 48)

To ensure a reliable measurement, follow the instructions in chapter 5.3.2 and the corresponding sketch with regard to the flow rate values when measuring pressure.

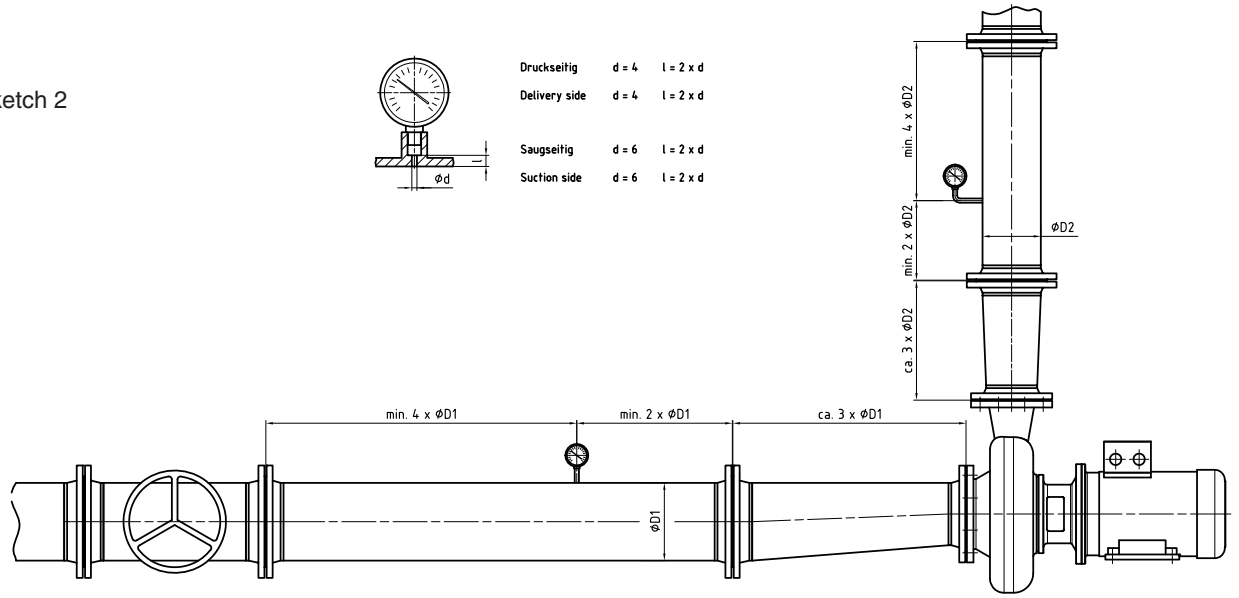
Pipe elbows, valves, adaptor pieces etc. can falsify the measuring results and must therefore be at an adequate distance from the drill holes for the measurement.

The set-up for the flow rate measurement must follow the regulations of the manufacturer of the measuring instrument.

Sketch 1



Sketch 2



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5.4 Electrical connection

The electrical connection may only be carried out by a qualified electrician.

Observe DIN VDE regulations 0100 and explosive atmosphere regulations 0165.

Compare the voltage at hand with the data on the motor rating plate and select the appropriate connection.

Observe the technical connection provisions of the local utility when connecting the unit.

The use of a motor protection device is strongly recommended.

5.4.1 Motor connection

The direction of rotation of the three-phase AC motor is strictly clockwise in accordance with DIN VDE 0530 part 8 (looking on the motor stub shaft).

The direction of rotation of the pump is anti-clockwise (looking on the suction flange).

To convert the motor to the direction of rotation of the pump, it should be connected following fig. 5.4-1 or fig. 5.4-2.

connection Δ (low voltage)

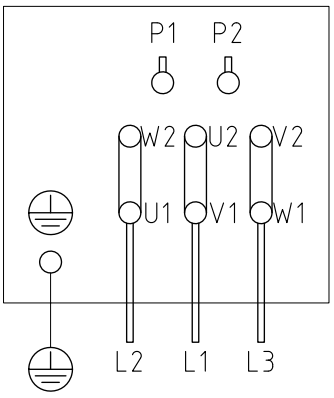

Fig. 5.4-1 Connection diagram for three-phase AC motors, connection Δ

Connection Y (high voltage)

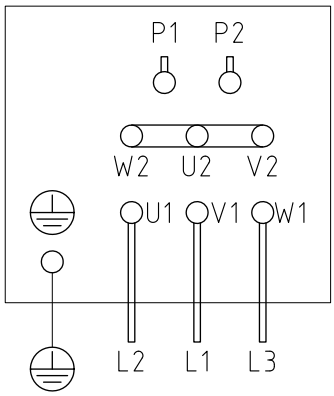

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Fig. 5.4-2 Connection diagram for three-phase AC motors, connection Y

If required, connect PTC thermistor according to DIN 44081 / 44082 to downstream triggering unit following fig. 5.4-3.

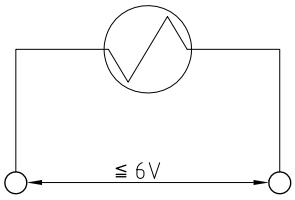


Fig. 5.4-3 Connection diagram for PTC thermistor

5.4.2 **Timer relay setting**

Make sure for three-phase AC motors with star-delta circuit that there is a speedy switchover between star and delta. Long intervals will cause damage to the pump.

For star-delta circuits set the timer relay to <3 s.

5.4.3 **Checking the direction of rotation**

The motor's direction of rotation must correspond to the direction of the arrow on the spiral casing (as viewed from the motor side in clockwise direction). Check by switching the motor on and then immediately off again.

The direction of rotation must only be checked with the pump and the pipes primed, as important components can be destroyed if the pump runs dry.

In case of wrong direction of rotation, reverse any two phases L1, L2 or L3 of the supply line in the terminal box of the motor.

6. Start-up / switching off

6.1 Initial start-up

CAUTION

Before starting the pump ensure that:

- the unit is electrically connected and all prescribed protective measures are taken.
- the pump is filled with pumping material
- the direction of rotation has been checked
- all supplementary connections have been made.

6.1.1 **Shaft seal**

Shaft seal (see 7.4.4 and 7.5.2)

6.1.2 **Filling and checking the pump**

The pump and its supply line must be vented and filled with pumping fluid before start-up.

The shutoff valve in the suction line must be completely open.

CAUTION

Running he pump dry will cause increased wear and must be avoided!

6.1.3 **Final check**

It must be possible to turn the shaft by hand with ease. Check if the connections are working properly.

6.1.4 **Protection against accidental contact**

⚠ According to **accident prevention regulations** the pump may only be operated if it is protected against accidental contact.

6.1.5 **Switching on**

Only switch the unit on with the shutoff valve on the pressure side switched on! When full speed is reached, open it slowly and adjust it to the operating point.

CAUTION

After reaching operating temperature and / or in case of leakages, tighten the hexagonal nut 920.2 or .3 or .4 after switching the unit off.

6.1.6 **Switching off**

Close the shutoff valve in the pressure line.

If a non-return valve is installed in the pressure line, the shut-off valve can remain open as long as there is back pressure.

⚠ When switching the pump off, the shutoff valve in the supply line must not be closed.

Switch off the motor. Make sure that it coasts quietly to a halt.

Depending on the unit the pump - after the heating source has been switched off – should coast for long enough to reduce the temperature of the pumped fluid enough to prevent the heat from accumulating inside the pump.

For a long standstill close the shutoff valve in the supply line. Close the supplementary connections.

In order to protect the pump against frost and in case of a long standstill, the pump should be emptied.

6.2 Operating range limits

6.2.1 **Temperature of the pumped fluid**

CAUTION

Do not operate the pump at temperatures higher than those specified on the data sheet or on the rating plate.

6.2.2 **Switching frequency**

In order to avoid a notable increase of the temperature inside the motor and an excessive strain on the pump, motor, seals and bearings, the following num-

ber of switching cycles per hour (h) must not be exceeded.

Norm block pumps 15 switching cycles per hour

6.2.3 **Minimum volume**

If the type of unit includes the possibility of operating against a closed shutoff valve on the discharge side, provide a minimum pumping volume at

t –30 bis + 70 °C ≈ 15 % von $Q_{opt.}$
t >30 bis + 140 °C ≈ 25 % von $Q_{opt.}$

6.2.4 **Density of the pumped fluid**

The power consumption of the pump changes in proportion to the density of the pumped fluid. In order to avoid overloading of motor and pump, the density must be consistent with the order data.

6.3 **Switching off / storage / rust-proofing**

Every pump is carefully assembled before it leaves the factory. If start-up is to be delayed for any length of time after delivery, we recommend to store the pump as described below.

6.3.1 **Storing new pumps**

- New pumps are packed ready for storing in the factory.

  Protection lasts for approx. 12 months, when appropriately stored inside.
- Store the pump in a dry place.

6.3.2 **Procedures for an extended non-operational period**

1. **The pump remains installed and has its functions checked periodically**

   In order to ensure a constant operational readiness and to prevent deposits on the inside of the pump, a test run of the pump must be carried out (for approx. 5 min.) every 1 -3 months during a long standstill. Only run the pump, if it is filled with an adequate amount of water.

2. **Pump is dismantled and stored**

   Before storing the pump it must be checked according to chapters 7.1 and 7.4. Then proceed with rust-proofing:

   - Spray the inside of the pump with preservative agent, especially the area around the impeller gap. Spray the preservative agent through the pressure and suction connection. It is advisable to close the connections (e.g. by means of plastic caps or similar).

6.4 **Restart after storage**

Before restarting the pump, the checks and maintenance works must be carried out according to 7.1 and 7.2.

For restarting the pump, also observe the instructions in chapter “Initial start-up” (6.1) and “Operational range limits” (6.2).

Immediately after finishing these activities, all safety and protection equipment must be reinstalled and reactivated.

7. Maintenance / Inspection

7.1 **General instructions**

The user has to make sure that maintenance, inspection and installation is carried out by authorized and qualified expert staff after thoroughly studying the operation manual.

Drawing up a maintenance schedule will help avoid expensive repairs at minimal maintenance costs and ensure failure-free and reliable operation of the pump.

Principally the machine must only be worked on when disconnected from electricity. The pump unit must be protected against accidental switch-on in order to avoid danger of life.

Pumps which convey fluids which are dangerous to health must be decontaminated. When draining the fluid make sure to avoid any danger for persons and the environment. Observe legal requirements to avoid danger of life!

7.2 **Maintenance / Inspection**

7.2.1 **Monitoring**

CAUTION

The pump ought to run smoothly and vibration-free at all times.

The pump must not run dry!

Do not run the pump against a closed shut-off valve in order to avoid heating up of the pumped fluid.

Max. permissible ambient temperature 40°C.

Storage temperature may exceed room temperature by 50°C, but by no means rise beyond 90°C (measured on the outside of the motor casing).

For the required minimum volume see 6.2.3.

Make sure the shut-off valve in the supply line is not closed when the pump is in operation.

A properly working mechanical seal must have no, or only a small amount of visible leakage losses (vaporous). It is maintenance-free.

Installed reserve pumps must be operated at least once a week by fast on and off-switching to ensure constant operational readiness.

Watch the functioning of the supplementary connections.

7.2.2 **Lubrication and lubricants**

7.2.2.1 **Lubrication**

The roller bearings in the IEC motor are lubricated with grease. Intervals, quality and amount are specified subsequently.

7.2.2.2 **Quality of grease / grease change**

The bearings are filled with high-quality, lithium-soap grease. Under normal operating conditions the filling will last for 15,000 operating hours or for 2 years. Under bad operating conditions, e.g. high ambient temperature, high humidity, dusty air, aggressive industrial atmosphere etc., the bearings should be checked earlier and, if necessary, be cleaned.

For this purpose use grease containing lithium soap. It should be free of resin and acid, must not become brittle and should provide rust protection. The grease should have a penetration value between 2 and 3, corresponding to a walk penetration of 220 to 295 mm/10. The drop point ought not to be below 175°C. The cavities in the bearings may only be approx. half filled with grease.

If necessary, the bearings can be filled with greases containing other soap bases. As greases containing different soap bases may not be mixed, the cavities must first be cleaned. The lubrication intervals may have to be adjusted to the requirements of these greases.

CAUTION

General legal requirements regarding disposal have to be observed.

Sealed bearings with permanent lubrication (2 RS-bearing or 2 Z bearing) cannot be washed out and refilled with grease. Therefore the bearings must be exchanged.

Motors from manufactured size 180 are equipped with re-lubrication devices and flange lubrication nipples in accordance with DIN 3404.

7.3 **Emptying / disposal**

⚠ If the pump was used for conveying fluids dangerous to health, make sure not to endanger persons or the environment when emptying the pump. Observe legal requirements! If necessary, wear protective clothing and a protective mask!

7.4 **Demontage**

⚠ Before starting the disassembly, make sure that the pump cannot accidentally be switched on. The shut-off valves in the pressure / suction line must be closed.

The pump must be at ambient temperature, depressurized and empty.

Disassembly and assembly may only be carried out as described on the exploded drawing.

7.4.1 **Basic instructions**

Repairs and maintenance of the pump must only be put to the charge of specially trained staff using **original spare parts** (see 2.7).

Observe safety precautions according to instructions in chapter 7.1. When working on the motor, observe the instructions and regulations of the manufacturer. Disassembly and assembly must be carried out following the sequence on the explosion drawings on pages 56 to 63.

In case of damage, please contact the customer service facility closest to you.

See the attached list of addresses for our customer service locations.

7.4.2 **Preparations for disassembly**

1 Cut off electricity.

2 **Disassembly of the complete unit**

2.1 Disconnect the motor leads

2.2 Disconnect the pressure / suction connections from the pipes

2.3 Depending on the manufactured size of the pump / motor, unfasten the mounting bolts of the motor base from the foundation.

2.4 Pull the complete unit out of the piping.

3 **During disassembly the pump casing remains in the piping.**

3.1 Disconnect motor.

3.2 Unscrew hexagonal nut 920.2 / .3 / .4.

3.3 Depending on the manufactured size of the pump / motor, unfasten the mounting bolts of the motor base from the foundation.

3.4 Pull the complete installation set and the motor out of the pump casing.

4. **Pump remains in the piping; disassembly of the motor:**

4.1 Disconnect the motor.

4.2 Press the cover panels 68-3 slightly together and remove them through the windows of the lantern bracket 341.

4.3 Unscrew the hexagonal nut 920.5..

4.4 Unscrew the hexagonal nut 901.3.

4.5 Place both locking plates 931 on the shaft key seat 210.

4.6 Tighten hexagonal bolts 901.3.

4.7 Detach the motor.

After a long period of operation individual parts may possibly be hard to detach from the shaft. In this case use one of the well-known rust solvents or, if possible, a suitable extractor tool.

Do not use force under any circumstances!

7.4.3 **Pump**

Disassembly of the pump must be carried out as described on the explosion drawing on pages 56 to 63.

7.4.4 **Mechanical seal**

In order to exchange the mechanical seal, it is necessary to disassemble the pump.

After removing the impeller 230 pull the mechanical seal 433 from the shaft by hand.

Before assembly clean the shaft sleeve and remove any scores and scratches with emery cloth, if necessary. If scoring or pitting is still visible, replace the shaft sleeve, clean the counter-ring seat.

7.5 **Reassembly**

7.5.1 **Pump**

When assembling the pump, observe the machine-building regulations in force.

Before assembly brush the mating areas of the individual parts with graphite or a similar substance. This applies equally to bolt connections.

Check O-rings for damage and replace where necessary.

As a general rule, gaskets must be replaced. Always replace them with seals of the same thickness.

Gaskets made from asbestos-free materials or graphite must be assembled without the use of lubricants on principle.

Assembly aids should be avoided if at all possible. However, if necessary, use a commercially available contact adhesive (e.g. Pattex) or HY-LOMAR or Epple 33 sealant. Apply a thin film of the sealant at selected points. **Cyanoacrylate adhesive (instant glue) must not be used.**

If the sealing area between the impeller neck and the split ring is worn, the split ring 502.1 and, if existing, 502.2 must be renewed.

Play in the gap:
new 0.3 mm in Ø
max. permissible extension to 0.9 mm in Ø

The assembly is carried out following the sequence of disassembly in reversed order. The correct sequence of the individual parts must be maintained.

7.5.2 Mechanical seal

Installation is carried out following the sequence of removal in reversed order. The basic rules for assembling a mechanical seal are as follows:

Maximum care, extreme cleanliness.

Only remove the contact protection from the slide faces immediately before starting the assembly.

Avoid damaging the sealing surfaces and the O-rings.

Clean the shaft and the counter-ring seat in the pressure cover and carefully remove deposits.

During installation of the seal, the friction forces of the shaft sleeve 523 can be reduced by wetting its surface with water.

CAUTION

Elastomers made of EP-rubber must never come into contact with oil or grease.

Use water as fit-up aid.

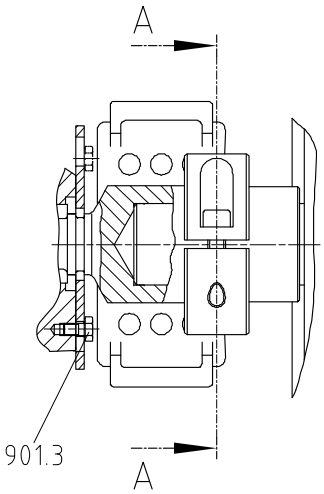
Always press in the counter-ring into the pressure-cover 163 by hand or finger. Apply pressure evenly.

7.5.3 Assembly of the motor

When mounting the motor, follow the reversed sequence of dismantling it. During installation and before start-up, make sure to pull the locking plates 931 out of the shaft keyseat and secure them with the hexagonal bolts 901.3.

CAUTION

When mounting the shaft 210 onto the motor stub shaft, ensure that the keyseat on the motor shaft end and the slot of shaft 210 are congruent and positioned opposite to the slot of clamping ring 515.



Schnitt A-A

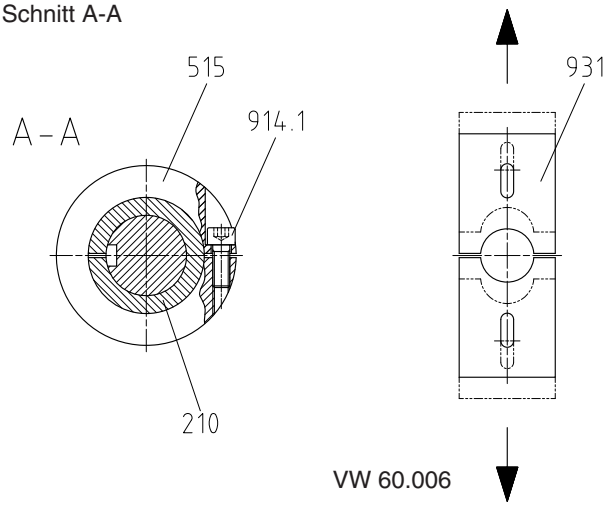


Fig. 7.5-1 Shaft assembly

Part No.	Part name
210	Shaft
515	Clamping ring
901.3	Hexgonal bolt
914.1	Allen screw
931	Locking plate

7.5.4 **Screw tightening torques**

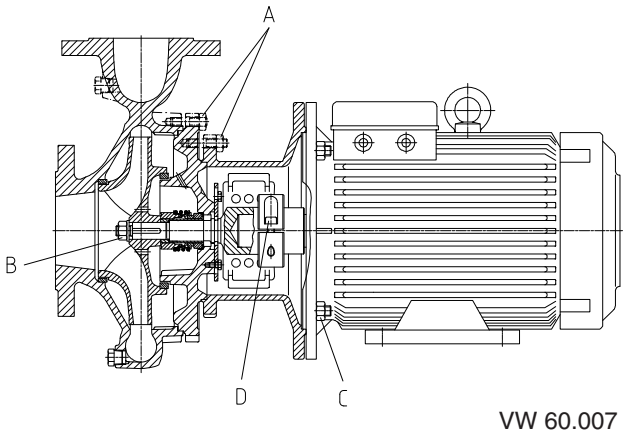


Fig. 7.5-2 Bolt tightening points for pump unit

Item	Thread size [mm]	Tightening torque [1] M_A [Nm]
A	M 10	40
	M 12	55
B	M 12 x 1,5	25
	M 20 x 1,5	85
	M 30 x 1,5	140
C	M 8	15
	M 10	30
	M 12	45
	M 16	80
D	M 6	10
	M 8	25

[1] Refers to non-lubricated threads

A= Bolt connections on the casing parts
B= Impeller nut
C= Bolt connections lantern bracket / motor
D= Bolt clamp ring / stub shaft

7.6 Ordering spare parts

Any order of spare parts must include the following information as specified on the rating plate, e.g.:

Type norm block pumps 50/160
Serial number:
Model:
Year of manufacture: 2002

or the spiral house casing, e.g.: 50/160

7.6.1 Recommended stockkeeping of spare parts for two years of continuous operation according to DIN 24 296

Part No.	Part name	Quantity of pumps (including reserve pumps)						
		2	3	4	5	6 and 7	8 and 9	10 and more
		Quantity of spare parts						
210	Shaft	1	1	1	2	2	2	20 %
230	Impeller (including split ring 502.2)	1	1	1	2	2	2	20 %
230.1/.2	Impeller (set)	1	1	1	2	2	2	20 %
400.1/.2	Gaskets (set)	4	6	8	8	9	12	150 %
412.3	O-ring	2	3	4	4	4	5	100 %
433	Mechanical seal	1	1	2	2	2	3	25 %
502.1	Split ring	2	2	2	3	3	4	50 %
523	Shaft sleeve	2	2	2	3	3	4	50 %

8. Faults / causes and remedies

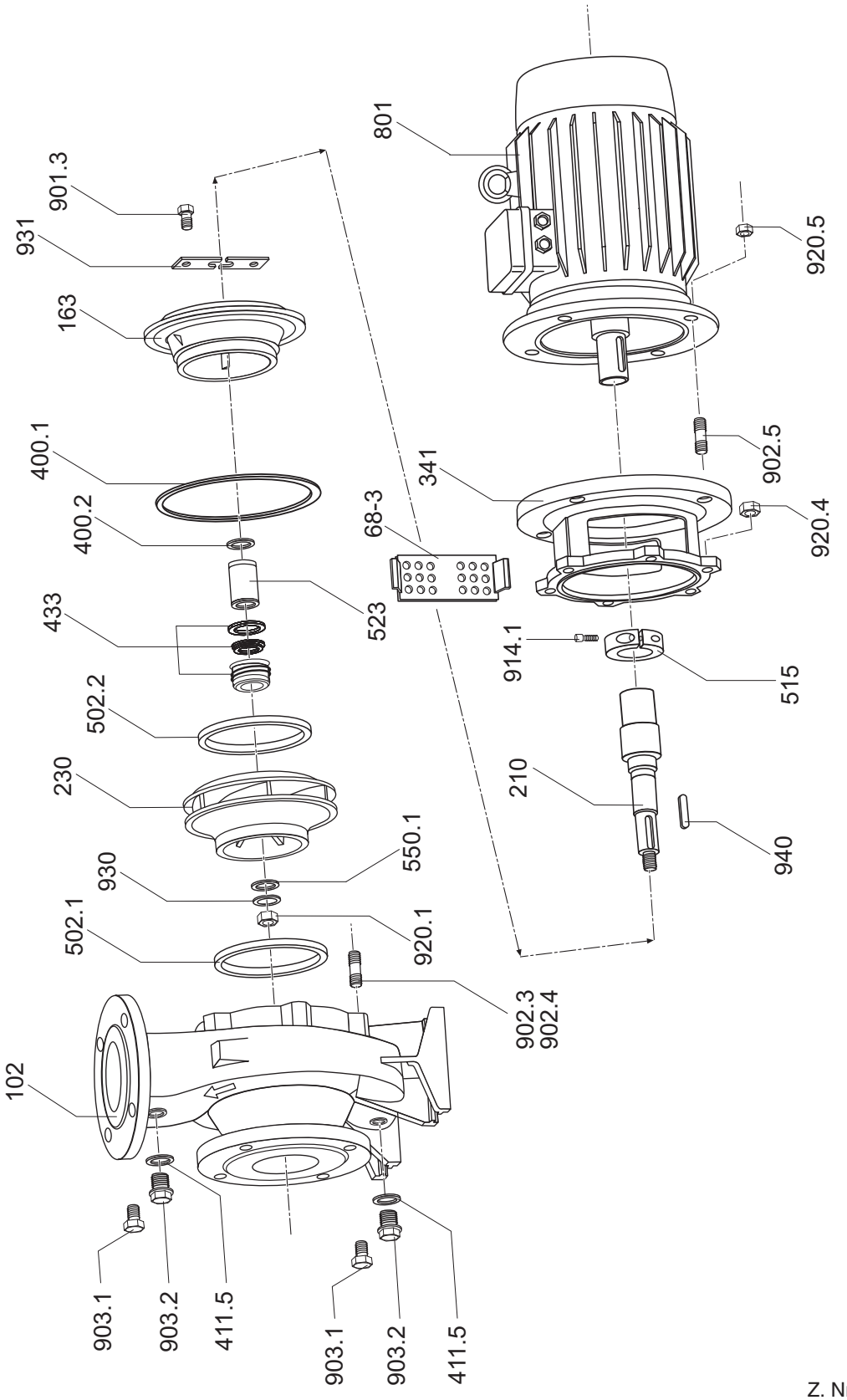
Flow rate of the pump too low	Driving engine overloaded	Protective motor switch de-energized	Increased storing temperature	Pump is leaking	Shaft seal is leaking excessively	Pump is running erratically	Unacceptable temperature increase in the pump	**Cause**	**Remedy** [1]
●								Pump operates against too much pressure	Set new operating point
●								Back pressure too high	Check the unit for impurities
						●	●	Pump or piping not completely deaerated or not completely filled	Deaerate or top up
●								Supply line or impeller blocked	Remove deposits in the pump or the piping
●								Formation of air pocket in piping	Change piping Insert an air-bleed valve
●						●	●	Suction height too large/$NPSH_{unit}$ (supply too low)	Correct liquid level Open shut-off valve in the supply line If the resistance in the supply line is too heavy, change supply line. Check the installed filters/suction openings
●								Wrong direction of rotation	Reverse two phases of the power supply
●						●		Wear on internal parts	Exchange worn parts
	●	●				●		Pump's back pressure is lower than stated in the purchase order	Adjust operating point
	●							Higher density or higher viscosity of the pumped fluid than stated in the purchase order	[2]
				●				Defective seal	Exchange the seal between the spiral casing and pressure cover
					●			Shaft seal worn	Renew shaft seal
●					●			Scores or roughness on the shaft sleeve	Renew the shaft sleeve Renew the shaft seal
					●			Pump runs erratically	Correct suctions conditions Increase the pressure on the suction connection
			●		●	●		Pump is twisted	Check pipe connections and pump fixings; if necessary reduce space between pipe clips; piping on vibration-isolating material
			●					Increased axial stroke [2]	Clean the impeller relief bores Replace the split ring
			●					Too little, too much or unsuitable lubricant	Increase, reduce or replace lubricant
●	●							Running on 2 phases	Replace blown fuse Check the electrical connections
						●		Rotor out of balance	Clean impeller Re-balance impeller
						●		Bearing damaged	Exchange
						●	●	Flow rate too low	Increase minimum flow rate
	●							Protective motor switch incorrectly adjusted	Check adjustment Excange protective motor switch
								Transport safety devices have not been removed from the keyseat	Remove

[1] The pump must be depressurized before correcting faults on parts which are under pressure

[2] Enquiry required

9. Related documents

Spare parts drawing
Norm block pumps
Model with clamped pressure cover



Z. Nr. VW60.003

Spare parts list
Norm block pumps
Model with clamped pressure cover

valid for:
Norm Block Pumps
32/125, 32/160, 40/125, 40/160, 50/125, 50/160, 65/125, 65/160, 80/160, 80/200, 100/160, 100/200, 125/200, 150/200

VDMA-No.	Description
102 [3]	Spiral casing
163 Pressure	cover
183 [2]	Motor base
210	Shaft
230	Impeller
341	Lantern bracket
400.1	Gasket
400.2	Gasket
411.5 [1]	Sealing ring
433	Mechanical seal
502.1	Split ring
502.2	Split ring
515	Clamping ring
523	Shaft sleeve
550.1	Disc
68-3	Cover plate
801	Flanged motor
901.3	Hexagonal bolt
902.3	Stud bolt
902.4 [2]	Stud bolt
902.5	Stud bolt
903.1	Locking screw
903.2 [1]	Locking screw
914.1	Allen bolt
920.1	Hexagonal nut
920.4	Hexagonal nut
920.5	Hexagonal nut
930	Spring washer
931	Locking plate
940	Shaft key

[1] Only for norm block pumps
material combination 07

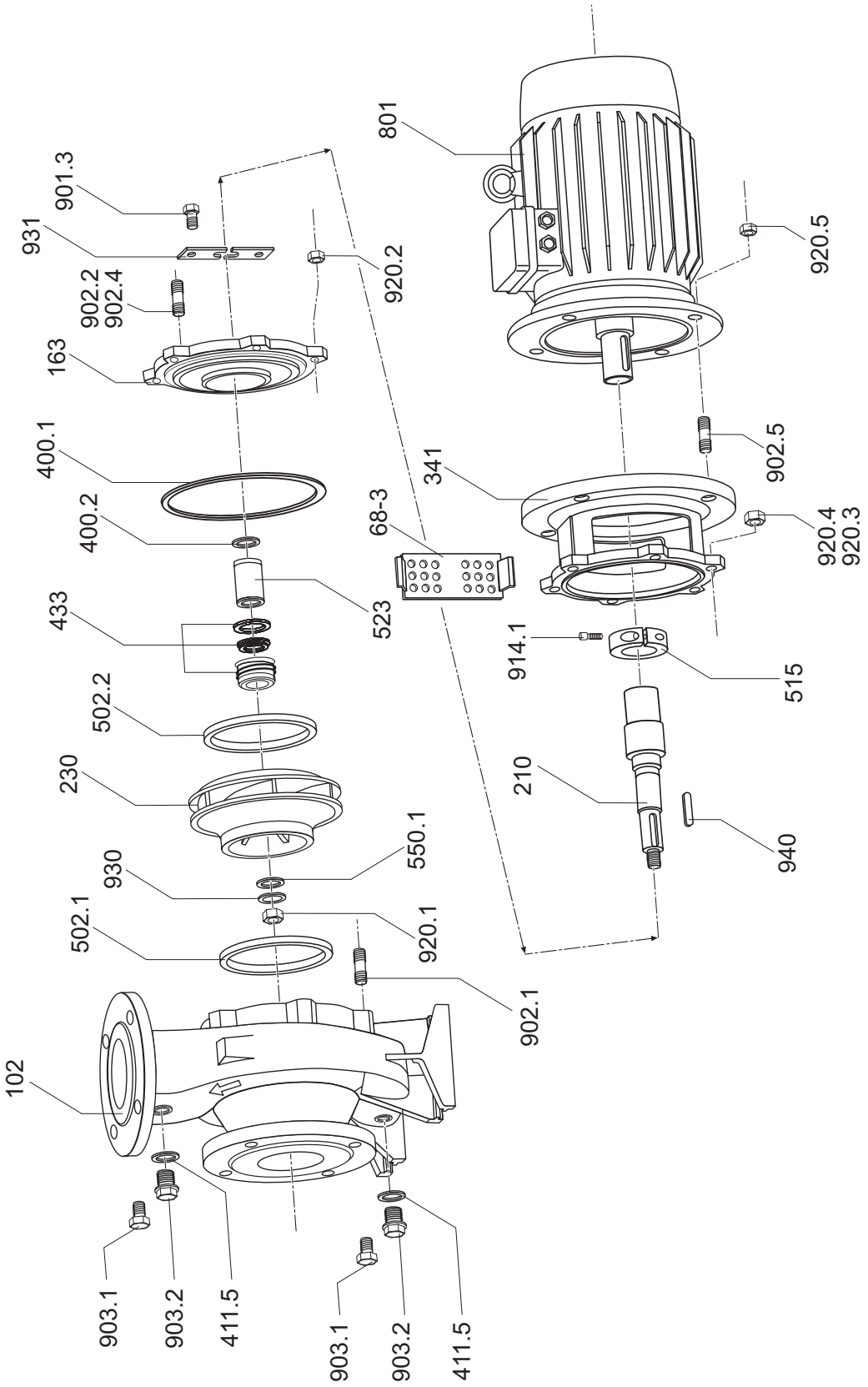
[2] Only for norm block pumps
material combinations 11, 12
up to motor manufactured size 112 = 4 kW
from motor manufactured size 132 = 5.5 kW
with motor base (not contained in explosion drawing)

[3] Spiral casing with base only for material combinations 05, 07

When ordering spare parts, please include type of pump, serial number, and article number of the parts!

VW60.003-01

Spare parts drawing
Norm block pumps
Model with screwed on pressure cover



Z. Nr. VW60.002

Spare parts list
Norm block pumps
Model with screwed on pressure cover

valid for:
Norm block pumps
32/200, 32/250, 40/200, 40/250, 40/315, 50/200, 50/250, 50/315, 65/200, 65/250, 65/315, 80/250, 80/315, 100/250, 100/315, 125/250, 150/250

VDMA-No.	Description
102 [3]	Spiral casing
163 Pressure	cover
183 [2]	Motor base
210	Shaft
230	Impeller
341	Lantern bracket
400.1	Gasket
400.2	Gasket
411.5 [1]	Sealing ring
433	Mechanical seal
502.1	Split ring
502.2	Split ring
515	Clamping ring
523	Shaft sleeve
550.1	Disc
68-3	Cover plate
801	Flanged motor
901.3	Hexagonal bolt
902.1	Stud bolt
902.2	Stud bolt
902.4 [2]	Stud bolte
902.5	Stud bolt
903.1	Locking screw
903.2 [1]	Locking screw
914.1	Allan screw
920.1	Hexagonal nut
920.2	Hexagonal nut
920.3	Hexagonal nut
920.4	Hexagonal nut
920.5	Hexagonal nut
930	Spring washer
931	Locking plate
940	Shaft key

[1] Only for norm block pumps
Material combination 07

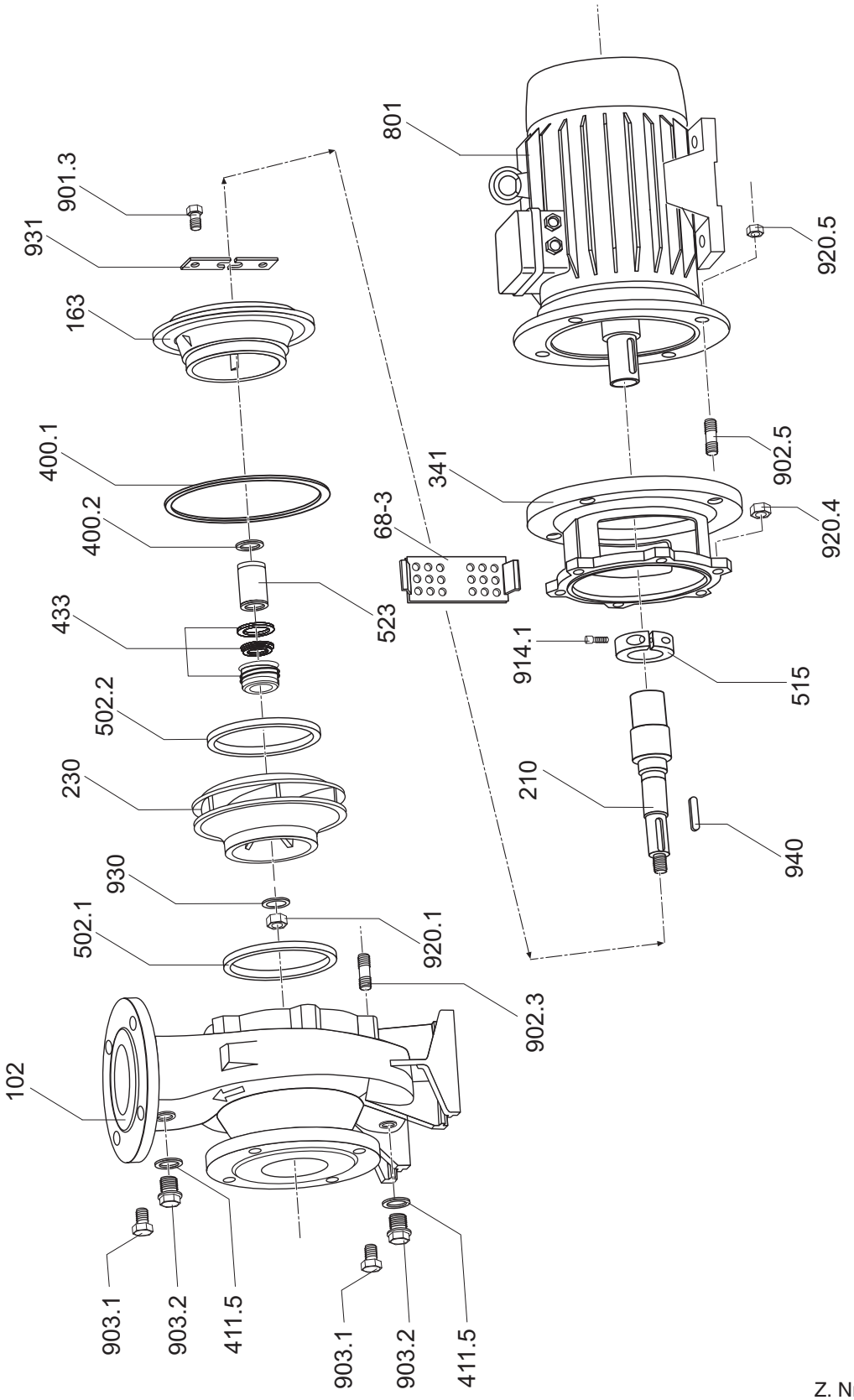
[2] Only for norm block pumps
Material combinations 11, 12
up to motor manufactured size 112 = 4 kW
from Motor manufactured size 132 = 5.5 kW
with motor base
(not contained in explosion drawing)

[3] Spiral casing with base only for norm block pumps material combinations 05, 07

VW60.002-01

When ordering spare parts, please include type of pump, serial number and article number of the parts!

Spare parts drawing
Norm block pumps
Model with clamped pressure cover
(motor manufactured size 200 = 30 kW to 225 = 45 kW)



Z. Nr. VW60.005

Spare parts list

Norm block pumps
Model with clamped pressure cover
(motor manufactured size 200 = 30 kW to 225 = 45 kW)

valid for:
Norm block pumps
80/160, 80/200, 100/160, 100/200, 125/315, 150/315

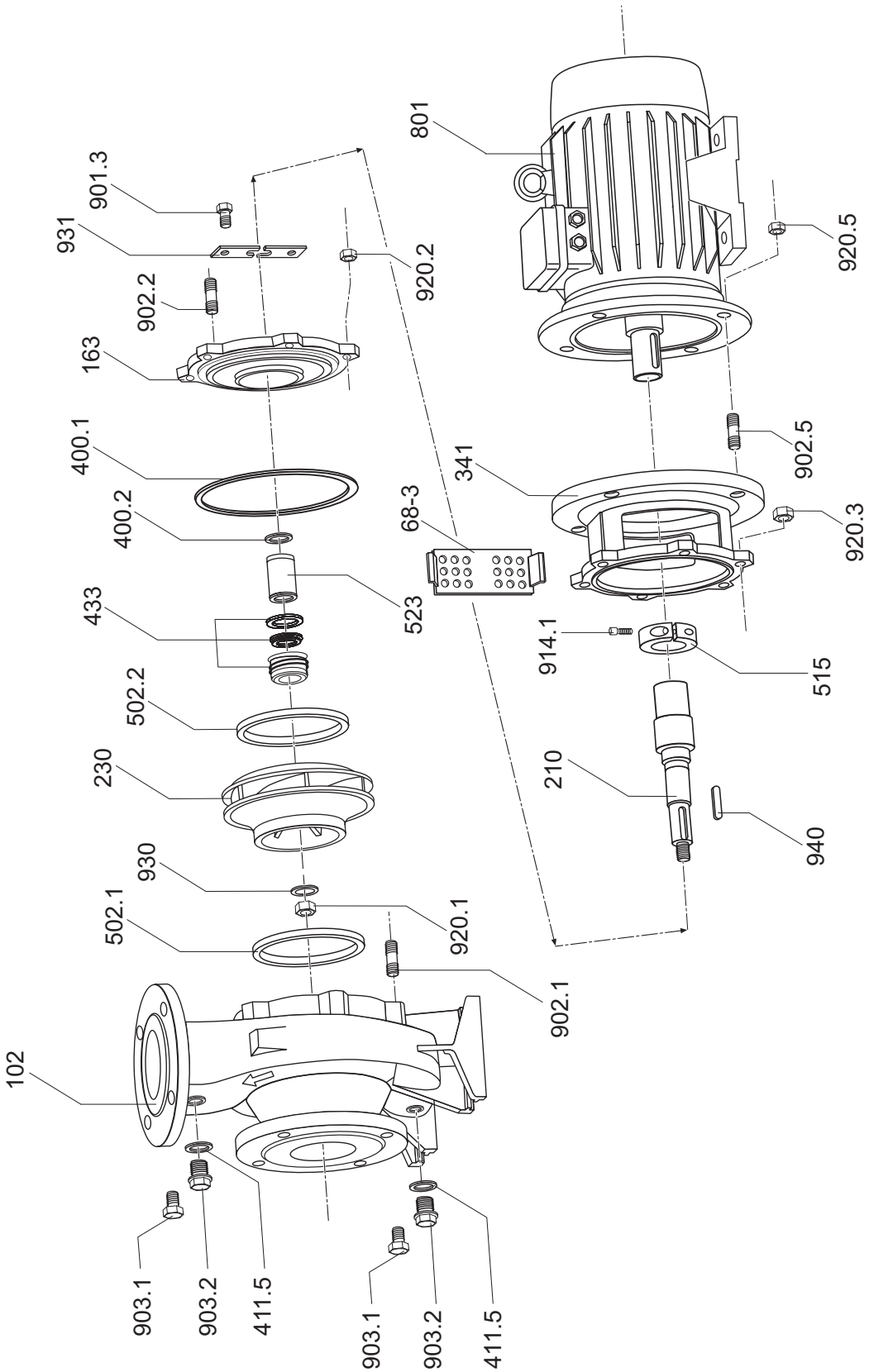
VDMA-No.	Description
102	Spiral casing
163 Pressure	cover
210	Shaft
230	Impeller
341	Lantern bracket
400.1	Gasket
400.2	Gasket
411.5 [1)]	Sealing ring
433	Mechanical seal
502.1	Split ring
502.2	Split ring
515	Clamping ring
523	Shaft sleeve
68-3	Cover plate
801	Flanged motor
901.3	Hexagonal bolt
902.3	Stud bolt
902.5	Stud bolt
903.1	Locking screw
903.2 [1)]	Locking screw
914.1	Allan screw
920.1	Hexagonal nut
920.4	Hexagonal nut
920.5	Hexagonal nut
930	Spring washer
931	Locking plate
940	Shaft key

[1)] Only for norm block pumps material combination 07

When ordering spare parts, please include type of pump, serial number und the article number of the parts!

VW60.005-01

Spare parts drawing
Norm block pumps
Model with screwed-on pressure cover
(motor manufactured size 200 = 30 kW to 225 = 45 kW)



Z. Nr. VW60.004

Spare parts list

Norm block pumps
Model with screwed-on pressure cover
(motor manufactured size 200 = 30 kW to 225 = 45 kW)

valid for:
Norm block pumps
50/200, 50/250, 65/200, 65/250, 80/250, 80/315, 80/400, 100/315, 100/400, 125/250, 125/400, 150/250

VDMA-No.	Description
102[1)]	Spiral casing
163 Pressure	cover
210	Shaft
230	Impeller
341	Lantern bracket
400.1	Gasket
400.2	Gasket
411.5 [1)]	Sealing ring
433	Mechanical seal
502.1	Split ring
502.2	Split ring
515	Clamping ring
523	Shaft sleeve
68-3	Cover plate
801	Flanged motor
901.3	Hexagonal bolt
902.1	Stud bolt
902.2	Stud bolt
902.5	Stud bolt
903.1	Locking screw
903.2 [1)]	Locking screw
914.1	Allan screw
920.1	Hexagonal nut
920.2	Hexagonal nut
920.3	Hexagonal nut
920.5	Hexagonal nut
930	Spring washer
931	Locking plate
940	Shaft key

[1)] Only for norm block pumps material combination 07

When ordering spare parts, please include type of pump, serial number and article number of the part!

VW60.004-01

speck pumpen SPECK

VERKAUFSGESELLSCHAFT GmbH

EG-Konformitätserklärung

Déclaration CE de conformité / EC declaration of conformity / Dichiarazione CE di conformità / EG-verklaring van overeenstemming / EU-yhtäpitävyysilmoitus / Declaracion de conformidad

im Sinne der EG-Maschinenrichtlinie 89/392/EWG, Anhang II A

conformément à la directive CE relative aux machines 89/392/CEE , Annex II A / as defined by machinery directive 89/392/EEC Annexe II A / ai sensi della direttiva CE 89/392 relativa a macchinari, Appendice II A / inzake richtlijn van de raad betreffende machines 89/392/EEG, bijlage II A / määriteltynä konedirektiivin 89/392/EEC liite II mukaan / segun se define en la directriz para maquinas de la CE 89/392/CEE, Anexo II A

Hiermit erklären wir, dass das Pumpenaggregat
Par la présente, nous déclarons que le groupe moteur-pompe / Herewith we declare that the pump unit / Si dichiara, che la pompa / hiermede verklaren wij, dat het pompaggregaat / Täten ilmoitamme, että pumppulaite / Por la presente declaramos que la unidad de bomba:

Type: _____

Type: / Type: / Tipo: / Type: / Malli: / Tipo:

Auftrags- Nr: _____

N° d´ ordre: / Order no.: / Numero d´ordine: / Opdracht-Nr.: / Tilausnumero: / N° pedido:

Baureihe

Série: / Series: / Serie: / Serie: / Mallisarja:/ Serie:

☐ **Normblock Pumpen**

folgenden einschlägigen Bestimmungen entspricht:
correspond aux dispositions pertinentes suivantes: / complies with the following provisions applying to it: / è conforme alle s equenti disposizioni pertinenti: / in de door ons geleverde uitvoering voldoet aan de eisen van de in het vervolg genoemde bepalingen: / cumple las siguientes disposiciones pertinentes: / vastaa seuraavia asiaan kuuluvia määräyksiä:

EG-Maschinenrichtlinie 98/37/EG
CE-Directives européennes 98/37/CE: / EC-machinery directive 98/37/EC: / CE-Direttiva Macchine 98/37/CE: / EG-Machinerichtlijn 98/37/EG: / EU-konedirektiivi 98/37/EU: / directiva europea de maquinaria 98/37 CE:

EMV-Richtlinie 2004/108 EC
Directives CE sur la compatibilité électromagnétique 89/336/CEE modifiées par 93/68/CEE: / EMC-Machinery directive 89/336/EEC, in succession 93/68/EEC / Direttiva di compatibilità elettromagnetica 89/336/CEE mod.93/68/CEE: / Richtlijn 89/336/EEG, gewijzigd door 93/68/ EEG: / Sähkömagneettinen yhteensopivuus (EMC) konedirektiivi 89/336/EEC, jota on muutettu direktiivillä 93/68/EEC: / directiva 89/336/CEE: /

EG-Niederspannungsrichtlinie 2006/95/EG
CE-Directives basse tension 2006/95/CE / EC-Low voltage directive 2006/95/EC / CEE-Direttiva di bassa tensione 2006/95/CE / EG- laagspannings-richtlijn 2006/95/EG / EU-pienjännitedirektiivi 2006/95/EU / directiva de baja tension 2006/95/CE

EG-Richtlinie 2002/96/EG (WEEE)
Directive 2002/96/CE (DEEE) / Directive 2002/96/EC (WEEE) / Direttiva UE 2002/96/EG (WEEE) / EG-Richtlijn 2002/96/EG (WEEE) / E U-direktiivi 2002/96/EC (WEEE) / CE-Directiva 2002/96/EG (tratamiento de residuos de componentes de aparatos eléctricos y electrónicos en desuso)

EG-Richtlinie 2002/95/EG (RoHS)
Directive 2002/95/CE (RoHS) / Directive 2002/95/EC (RoHS) / Direttiva UE 2002/95/EG (RoHS) / EG-Richtlijn 2002/95/EG (RoHS) / E U-direktiivi 2002/95/EC (RoHS) / CE-Directiva 2002/95/EG (limitación de utilización de determinados productos peligrosos en aparatos eléctricos y electrónicos)

Angewendete harmonisierte Normen, insbesondere
Normes harmonisées utilisées, notamment: / Applied harmonized standard in particular / Norme armonizzate applicate in particola re / Gebruikte geharmoniseerde normen, in het bijzondere / Käytettyjä harmonisoituja normeja, erityisesti / Normas armonizadas aplicadas, especialmente

EN 60335-1
EN 60335-2 – Teil 41

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Place	date	(Technical director)	(Product manager)
Localita	data	(Direttore tecnico)	(Responsabile prodotti)
Plaats	Datum	(Technisch directeur)	(Productmanager)
Paikka	Päiväys	(Teknillinen johtaja)	(Tuotepäällikkö)
Lugar	Fecha	(Director tecnico)	(Jefe de producción)

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