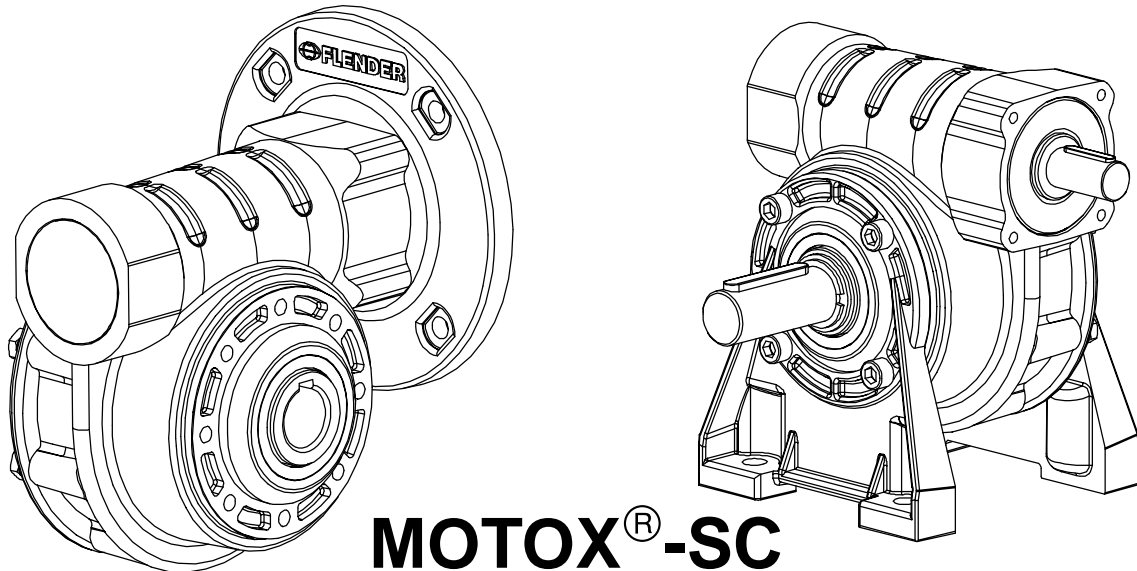


Operating Instructions

BA SC298 EN 08.98

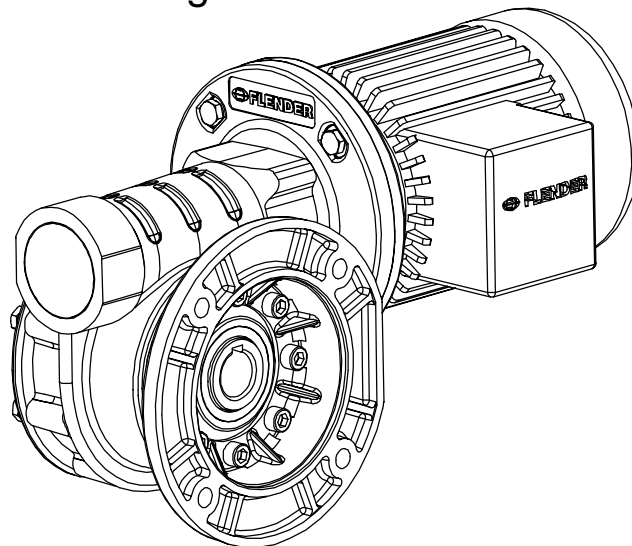


MOTOX[®]-SC

Worm gear units

and

gear motors



FLENDER
TÜBINGEN

FLENDER TÜBINGEN GMBH · Bahnhofstr. 40-44 · D-72072 Tübingen
Tel. +49 (0) 7071/707-0 · Telefax +49 (0) 7071/707-400 · www.flender.com
A company of A. Friedr. Flender GmbH

1. General notes

These Operating Instructions constitute part of the gear unit shipment and should be kept in the immediate vicinity of the gear unit at all times.

Only a precise knowledge of the Operating Instructions will ensure trouble-free operation of the drive by avoiding operating errors and incorrect usage. It is therefore in the interest of the operator that the Operating Instructions are read, understood and observed in all respects by the persons responsible for handling, installation and operation.

Note: We accept no liability for any damage or malfunction resulting from non-observance of the Operating Instructions.

The drives described here are manufactured in accordance with the latest technology at the time of these Operating Instructions going into print.

In the interest of further development, we reserve the right to introduce modifications to the individual subassemblies and accessories which, while retaining the essential features, can be regarded as desirable to increase their efficiency and safety.

The copyright of these Operating Instructions remains the property of **FLENDER TÜBINGEN GMBH**.

These Operating Instructions may not be duplicated in part or whole, utilized for the purpose of publicity or communicated to third parties without our express consent.

Alterations or additions of these Operating Instructions may be done exceptionally by us only; otherwise complete liability will be cancelled.

Note: For couplings, motors, brake motors and additional features of motors (external fan, back stop, encoder system, etc.) please observe further Operating Instructions supplied with shipment (e.g.: BA 3400, B-IND 01, N-R 430, etc.). For special designs of drives and their optional features the particular contractual agreements and technical documentation, e.g. special dimension sheet, etc. are effective in addition to these Operating Instructions.

Please contact our works listed below in respect of all technical queries

FLENDER TÜBINGEN GMBH

Postfach 1709 · D-72007 Tübingen
Bahnhofstr. 40-44 · D-72072 Tübingen
Tel. +49 (0) 7071/707-0
Fax +49 (0) 7071/707-400
Internet: <http://www.flender.com>

or one of our service branches which are listed in 11.2.

The **MOTOX[®]-SC drives** dealt with in these Operating Instructions have been developed for stationary usage in general engineering. If not otherwise agreed the drives are suitable **for use in machines and plants in industrial areas** (proper usage).

2. Safety notes



2.1 Notes and symbols in the Operating Instructions

Instructions in the Operating Instructions which concern operating safety are emphasized as follows:



Attention!

This symbol draws attention to safety measures to prevent **personal injury**.

This symbol draws attention to the safety measures which must be observed to prevent **damage to the gear unit**.

Note: This note draws attention to general **operating notes** which should be especially observed.

2.2 General safety notes



The gear unit is constructed and tested in accordance with the latest technology and is reliable in the condition as shipped. Unauthorized modifications which impair its reliability are not permissible. This also applies to guards which are fitted as protection against accidental contact.



The drive unit may only be used and operated within the scope of the conditions specified in the contract of performance and supply.



The operator should ensure that the persons entrusted with installation, operation, care and maintenance have read and understood the Operating Instructions and observe them in all respects in order to:

- Prevent hazard to the life and limb of the user and third parties
- ensure the reliability of the gear unit
- prevent failure and environmental pollution due to incorrect handling.



The drive unit may only be installed, started up, operated, serviced and repaired if need be, by authorized, trained and properly instructed personnel. Definition for trained personnel see e.g. IEC 364.



All work should be carried out carefully with the safety aspect in mind.



Notes affixed to drive units, such as rating plate, direction of rotation arrows, etc., must be observed. They must be kept free from paint and dirt. Missing plates must be replaced.



All work on the gear unit may only be carried out when it is stationary.

The drive unit must be secured to prevent accidental startup (e.g. by locking the key switch or by removing the fuses in the power supply).



The relevant regulations concerning industrial safety and pollution control should be observed during handling, installation, operation, care and maintenance.



Rotating parts, such as couplings, gear wheels or belt drives must be protected by means of suitable guards to prevent accidental contact.



The drive unit should be shut off at once if changes in the gear unit are detected during operation, such as strongly increased operating temperature or a change in gear unit noises.

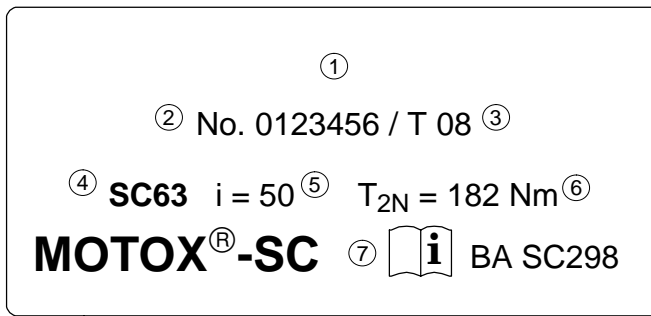


During installation of the gear unit in devices or systems, the manufacturer of the device or system is obliged to incorporate the requirements, notes and descriptions contained in these Operating Instructions in his own Operating Instructions.

3. Technical data

- 3.1 **The rating plate contains the most essential technical data.** This data and the contractual agreements for the drives define the limits of its proper use. In case of gear motors a separate rating plate is to be found on the motor. It contains all data of the motor and any additional features, such as brakes and the like.

Example: Rating plate of gear unit



- ① Company logo
- ② Identification No.
- ③ Date of manufacture (coded)
- ④ Type - Size
- ⑤ Ratio i
- ⑥ Nominal torque T_2 [Nm]
(at ratio i and ambient temperature 20°C)
- ⑦ Name of corresponding Op.Instr.

3.2 The **MOTOX[®]-SC**-gear units may be operated in **all mounting positions**, (e.g. according to IEC 60034-7) or installation positions respectively.

3.3 With the standard design, the gear units may be operated at **ambient temperatures** of -20°C to +40°C.
Use of the gear units at lower or higher temperatures is only possible after contractual agreement.

4. Technical description

4.1 **MOTOX[®]-SC**-gear units are supplied as single-stage worm gear units. The special characteristic by itself is the smooth running and high efficiency.
The gear units usually are not painted at works. If required, the units can be coated with all varnishes customary in the trade.

Attention! Cover shaft seals. Seal lips must not come in contact with varnish.

4.2 **Gear housing and housing parts** (feet, flanges, etc.) from die cast aluminium result in low weights and a good thermal conductivity.

4.3 As **worm gearing set** the reliable and high performance **CAVEX[®]**-gearing sets are used.

4.4 All shafts are mounted in adequately dimensioned **anti-friction bearings**.

4.5 Radial **shaft seal rings** at the shaft outlets prevent lubricant from escaping and dirt from entering.

4.6 The gear units are filled with high quality synthetic oil for **lifetime lubrication**.

4.7 The gear units do not require any additional **cooling**. The generously dimensioned housing surface is sufficient for dissipating the heat loss by means of convection.

Attention! The surface of the gear unit or the gear motor should be kept free of dirt.

4.8 The **rating plates** of the gear units consist of coated aluminium foil.

The adhesives and materials are chosen in a way that guarantees an extremely solid fixation and a durable good readability.

5. Incoming goods, handling and storage

5.1 Incoming goods

Check shipment for completeness and shipping damage immediately on receipt. If necessary, a loss advice note should be written out in the presence of the forwarder, otherwise repairing the damage without costs will not be possible.



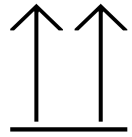
Damaged drives must not be put into operation.

5.2 Handling

The basic drive unit, assembled ready for operation, is shipped packed together with the accessories (push in-shaft, torque arm, assembly parts and the like).

The packing, unless otherwise agreed contractually, complies with **HPE Packing Guidelines**.

Observe symbols:



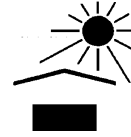
This side up



Fragile Goods



Keep dry



Protect from heat

Attention!

When handling and loading/unloading, exercise special care to avoid damages.

5.3 Storage

Drives should be stored in dry rooms with minimum temperature fluctuations on a horizontal wooden support packed or covered.

Attention!

The storage area must be free of vibrations (shocks) otherwise the anti-friction bearings may be damaged.



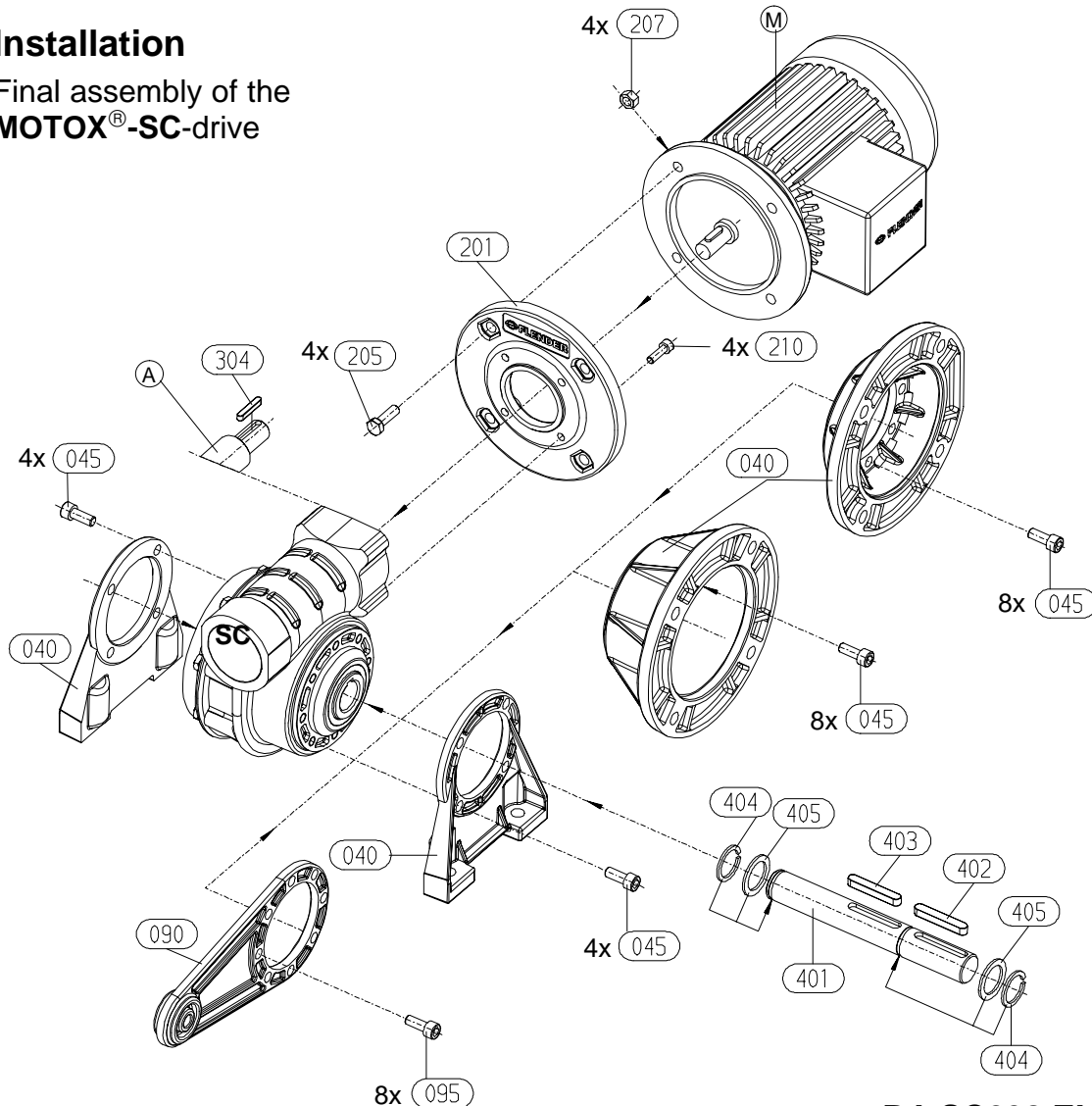
It is not permissible to stack drives on top of one another.

Note: Standard preservation is effective for max. 6 months.

In the case of prolonged interim storage check preservation and renew it.

6. Installation

6.1 Final assembly of the MOTOX[®]-SC-drive



- Attach **feet** 040 on both sides, or **flange** 040, or **torque arm** 090 on desired side and in desired location by means of screws 045 or 095 respectively.
- If present insert **push in-shaft** 401 after fitting key 403, into hollow shaft and fasten axial using washers 405 and circlips 404.
Fit key 402 (2x in case of both side shaft ends).



For design with motor  :

- **SC63 / SC50:** Attach **adapter plate** 201 by means of screws 210;
SC36: Adapter plate is integral part of gear housing.
- Flange **motor** M using screws 205 and nuts 207.
In case of "IM B14"-motors ("C-type" flange) use hexagon socket screws 205, nuts 207 are inapplicable.

Note: In case of installation of the drive for a higher degree of protection (\geq IP 55):
Seal both centerings of adapter plate with sealing compound.

For design with free input shaft  :

- Fit key 304.

Thread size	Property class min.	Tightening torque
M 6	8.8	10 Nm
M 8	8.8	25 Nm
M 10	8.8	50 Nm

Table 6.1: Tightening torques for screws

6.2 Mounting, insertion



Observe safety notes given in Section 2. "Safety notes".

Attention!

All mounting possibilities assigned to the respective mounting position should be used.

Note: Use shoulder studs of property class 8.8 or higher for mounting the drives in all mounting designs (foot, flange, torque arm). Tightening torques (also with 10.9/12.9 properties) see Table 6.1.

Attention!

Gear unit housings must not be distorted when tightening the fastening screws.

For drives with foot mounting foundation has to be

- flat (\leq 0,1 mm)
- uncoupled from neighbouring foundations (danger of resonance)
- torsionally rigid in case of steel structures
- designed corresponding to weight and torque of the drive.

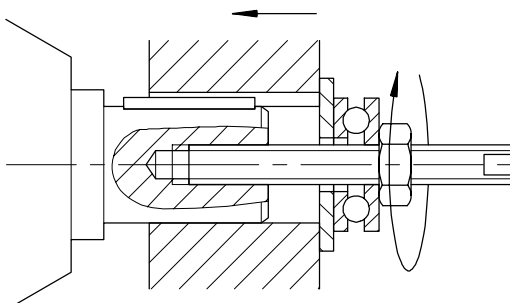
6.2.1 Running wheels, chain sprockets, gearwheels, couplings, belt pulleys, etc. should only be installed on gear unit shafts using a fitting device.

Use herewith the threaded centre bores (DIN 332) in the shaft faces.

Attention!

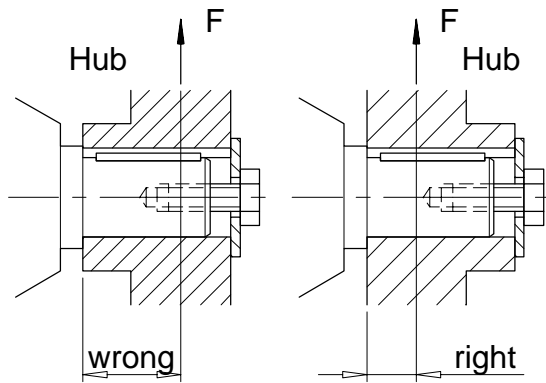
Beim Reinigen: Kontakt von Waschbenzin oder Lösungsmittel mit den Wellendichtringen unbedingt vermeiden.

- Fit input drive and output drive elements on the shaft ends and secure them, if necessary.



Example: Fitting device for couplings or hubs.





Correct assembly arrangement of running or gear wheel, chain sprocket, pulley, or similar, in order to keep the load of the shaft or bearing by shearing forces as low as possible.

6.2.2 Shaft mounting of gear units with hollow shaft

- Apply a suitable lubricant to the contact surfaces to avoid fretting corrosion, e.g. grease H 443 HD88, manufacturer Calypsol.
- Slide drive onto machine shaft ($\varnothing h6$).

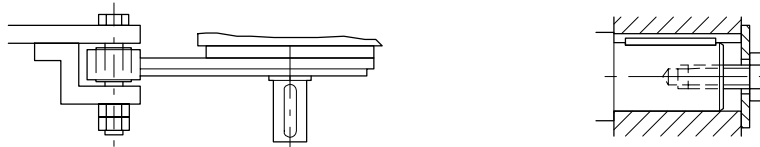


Attention!

Hollow shaft must be in line with machine shaft. Avoid distortion when flanging. Danger of excessive bearing load.

6.3 Mounting of gear unit with torque arm

Example:



Note: Torque arm should be supported on both sides and not be distorted. Fix gear and machine shafts in axial direction.

7. Startup

- After conclusion of installation as per section 6. the drive is ready for operation.
- Operate drive without load for a short time.
- Check for irregularities (heavy vibrations, noises).
- Impose load.

8. Operation

Operation of the drive is only permissible under the settled operation conditions corresponding with its technical data.

9. Disturbances and remedy

Malfunctions occurring with the **MOTOX[®]-SC**-drive during the warranty period, especially

- excessive operating temperature
- any changes in gear unit noises
- oil leakage at housing or shaft seals

may only be repaired by **FLENDER TÜBINGEN GMBH** service personnel.

Even after the warranty period has elapsed, we recommend our customers to consult our Service Division concerning malfunctions.

10. Maintenance and repair

MOTOX[®]-SC-gear units are lifetime lubricated and nearly maintenance free.

Recommended maintenance measures:

- clean drive when soiled.
- check all fixing screws once a year for tightness, retighten if necessary.

11. Accessory parts, service addresses

11.1 Accessory parts

For alterations of the gear unit assembly all accessories such as flanges, push in-shaft, and many others more, are available from stock for short-term supply.

We assume warranty only for original accessory parts supplied by us.

Attention!

We would like to explicitly draw attention to the fact that accessory parts not supplied by us have not been tested and approved by us either. Fitting and/or use of such products can therefore under certain circumstances adversely effect structurally specified properties of the drive and will thus impair active and/or passive safety. No form of reliability or warranty will be assumed by FLENDER TÜBINGEN GMBH for damage caused by the use of non-original accessories.

When ordering accessory parts, the following data should be stated:

- Identification No. (see rating plate ②)
- Type designation (see rating plate ④)
- Designation of parts (see Section 6. "Installation")
- Quantity

11.2 Accessory parts and Customer Service addresses

**FLENDER TÜBINGEN GMBH D-72072 Tübingen,
Tel. +49 (0) 7071/707-123, -386, -326, -435, -469
Fax +49 (0) 7071/707-456, -475, -211, -458
Service-Hotline +49 (0) 172/7322955**

12. Declaration by the manufacturer

as defined by EC Machinery Directive 98/37/EC, Annex II B

We hereby declare that the

Gear Units and Gear Motors of types

SC 36

SC 50

SC 63

described in these Operating Instructions are meant for being installed in a machine and that their putting into operation is prohibited until it has been ascertained that the machine, in which these components will be installed, corresponds to the regulations of the EC Directive 98/37/EC.

All the harmonised standards published by the EC-Commission in the Official Journal of the European Community applicable for our products are either totally or partly observed with this manufacturers declaration.

Insbesondere sind dies:

- EN 292-1
- EN 292-2
- EN 294
- EN 349
- EN 60204-1

Tübingen, the 31.07.1998


(Manager of Standards Department)