



Operating Manual

Drive W332B

ThyssenKrupp Aufzugswerke



ThyssenKrupp

Imprint

All rights reserved

© Copyright by: THYSSENKRUPP AUFZUGSWERKE GmbH
Postfach 23 03 70, D-70623 Stuttgart

Printed in Germany

These operating instructions may – even in extract form – only be reprinted or otherwise copied with the express written approval of THYSSENKRUPP AUFZUGSWERKE GmbH. All copying, distribution or saving in any form on data storage media which is not authorised by THYSSENKRUPP AUFZUGSWERKE GmbH constitutes a copyright infringement and will result in prosecution. We expressly reserve the right to carry out technical alterations which lead to an improvement of our products or increase the safety standard – also without special prior notice.

The issuer responsible for the content:
THYSSENKRUPP AUFZUGSWERKE GmbH

Preface

We are delighted that you have decided upon a quality product from the company THYSSENKRUPP AUFZUGSWERKE GmbH.

These operating instructions will help you to get to know our products and to benefit from their intended applications. Important safety and hazard instructions will help you to operate our products safely and properly.

Subject to technical alterations.

Table of contents

W332B machine		PAGE
1.	Safety	7
1.1	Symbols	7
1.2	Safety instructions	8
2.	Product description	11
2.1	Description	11
2.2	Functional description	12
3.	Technology	13
3.1	Technical data	13
3.2	Dimensions of the drive	15
3.3	Machine base frame (optional)	18
3.4	Motor data	22
4.	Transport and storage	23
5.	Mounting the machine	25
5.1	Machine setup	25
5.2	Connecting the motor	26
5.3	Terminal connecting plan	27
5.4	Terminal connecting plan for gear drive motor and magnetic clamps	28
5.4.1	Terminal connecting information for motors complying with BV 6531 – 09	29
5.4.2	Terminal connecting information for motors complying with BV 6531 – 14	30
5.4.3	Bridge connection at motor	31
5.5	Connection data for pulse generator	32
5.5.1	Mounting on motor	32
5.5.2	Tachometer pulse generator on worm shaft	33
5.6	Rope guard for traction sheave	34
6.	Commissioning	35
6.1	Run-in operation of the drive	36
7.	Maintenance / service	37
7.1	Maintenance	37
7.2	Lubrication	38
7.3	Replacing the brake blocks	39
7.4	Setting braking deceleration	39
7.5	Setting brake block stroke and armature base plate	40
7.6	Traction sheave replacement	41
7.7	Motor replacement	42
7.8	Checking the backlash	44
7.9	Bearing replacement at the outside bearing	45
7.10	Checking for escaping grease / oil	51
7.11	Check of the brake linkages	53

8.	Special versions (optional)	54
8.1	Overview of special versions	54
8.2	SA3 brake monitoring circuit	55
8.3	SA3 brake monitoring circuit BRC	56
8.4	SA7 tachometer and pulse generator mounting	58
9.	Appendix	60
9.1	Tightening torques, tightness values	60
9.2	Blocking clamp	62
	Manufacturer specifications for pulse generator	
	Manufacturer specifications for SA7 tacho-generators	
10.	Changes	73

1. Safety

1.1 Explanation of the symbols used

The following pictograms and designations are used in this operating manual:



Danger

This symbol indicates extreme danger to life and the health of persons. Nonobservance can lead to death or severe injury!



Danger

This symbol indicates an immediate danger to the life and health of persons due to electrical current. Hazard warnings must always be observed!



Warning

This symbol warns against imminent danger. Nonobservance can lead to bodily injury or extensive damage to property. Warnings must always be observed!



Note

This symbol indicates important information and operating instructions. Nonobservance can lead to damage, danger or malfunctions.

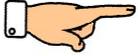


Check

Test steps are specified with this symbol. The test instructions marked in this way must be followed without fail. They contribute to preventing personal injury or damage to property.

1.2 General safety instructions

Notes regarding the operating manual



A requirement for safe handling and non-disruptive operation of this assembly is knowledge of the fundamental safety regulations. This operating manual contains the most important information that is required to operate the assembly safely. The operating manual, in particular the safety instructions, is to be complied with by all persons that work on this assembly. Furthermore, the rules and regulations covering accident prevention that apply to the usage site are to be complied with.

Obligations of the operator and/or of the installation firm

The operator and / or installation firm undertakes only to allow persons to work on the assembly who

- are familiar with the regulations regarding work safety and accident prevention and have been instructed in handling the assembly.
- have read the chapter on safety and the warnings in this operating manual.



Note: Check at regular intervals that the personnel work with a heightened awareness with regard to safety.

Obligations on the part of personnel

Persons assigned to work on subassemblies undertake before starting work to

- observe the regulations regarding work safety and accident prevention.
- read the chapter on safety and the warnings in this operating manual.

Training of the personnel

Only trained and instructed qualified personnel may work on the assembly. The responsibility of the personnel is to be clearly defined for all tasks involving commissioning, operation, maintenance and repair.

Organisational measures

The required personal protective equipment is to be provided by the operator or installation firm, as the case may be. All existing safety devices are to be checked regularly in accordance with the maintenance plan.



Informal notes on the safety measures

- The operating manual is to be kept permanently at the usage site of the installation.
- Complementary to the operating manual, the generally applicable and local regulations for accident prevention and environmental protection are to be provided and complied with.
- Legally prescribed safety instructions are to be provided for the users at clearly visible positions.
- Keep all safety and hazard warnings on the installation in a legible condition.

Use in line with intended purpose



The W332B has been constructed using state-of-the-art technology and in line with the recognised technical safety regulations. The W332B may only be

- deployed in line with the intended purpose and
- used when all the technical safety features are in perfect condition.

The exclusive intended purpose of the W332B is to drive elevators.

Any other or additional form of use shall be regarded as non-compliant with the intended use.

THYSSENKRUPP AUFZUGSWERKE GmbH shall not be liable for any damage arising from such use and any damage arising due to operator errors.

Proper use in line with the intended purpose also includes

- observance of all instructions in the operating manual and
- adherence to commissioning instructions, system description and inspection and maintenance work.

Warranty and liability

As a general principle, the "General Terms of Sale and Delivery" of ThyssenKrupp Aufzugswerke GmbH apply.

Warranty and liability claims in the event of personal injury and damage to property shall be excluded if they arise due to any of the following causes:

- Improper use that is not in line with the intended purpose of the W332B
- Installation, commissioning, operation and maintenance of the W332B that is not in line with accepted technical principles
- Operation of the W332B with defective and/or inoperative safety and protective devices
- Nonobservance of the instructions in the operating manual with regard to Transport, storage, installation, commissioning, operation and maintenance of the W332B
- Constructional changes to the W332B performed by the operator

- Changes to the drive ratios / power output etc. performed by the operator
- deficient monitoring of parts that are subject to wear
- repairs that are carried out improperly
- Cases of catastrophe due to third-party interference and force majeure.

Constructional changes to the W332B performed by the operator



The W332B is set at the plant and delivered ready for operation.

NB: before commissioning, **add the supplied **oil**!**

If changes are made to the machine, the entire warranty of ThyssenKrupp Aufzugswerke GmbH

Dangers in handling the W332B



The traction sheave and handwinding wheel of the W332B are designed without safety covers. This means that the drive may only be operated in a closed machine room.

It must be ensured when persons are in the machine room that there is adequate safety clearance to all revolving (marked in yellow) parts.

In the event of improper use, there is a risk of personal injury or to the life of the user or third parties, or impairment on the assembly or other assets can arise.

Malfunctions that can diminish safety are to be rectified immediately.

2. Product description

2.1 Description

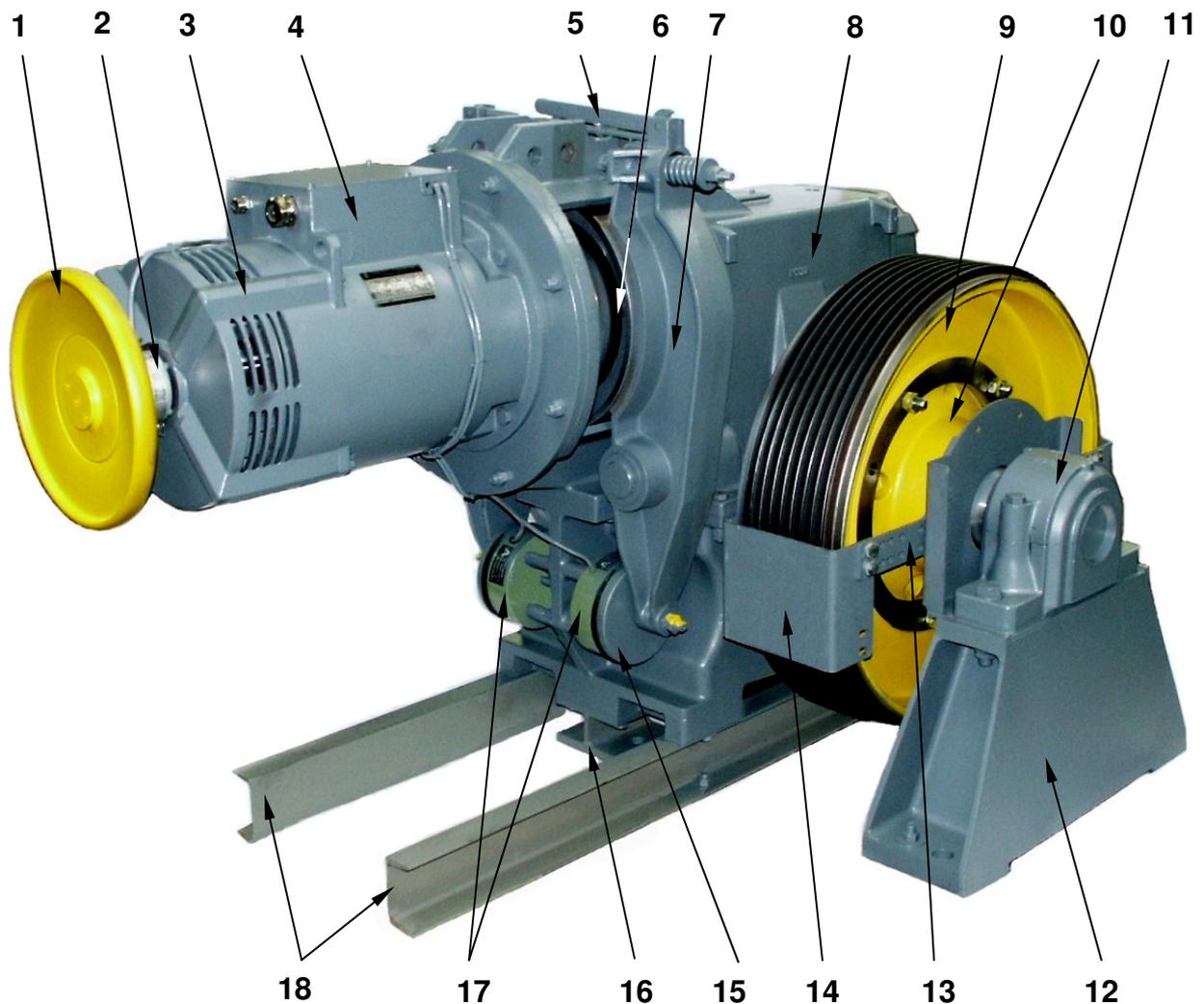


Fig. 2.1

Item	Part designation	Item	Part designation
1	Handwinding wheel	10	Traction sheave hub
2	Drehzahlgeber	11	Outside bearing
3	motor	12	Bracket
4	Motor terminal box	13	Rope guard
5	Brake release lever	14	Rope guard plate
6	Brake disc	15	Armature base plate on brake
7	Brake blocks	16	Pedestal support
8	Gear drive (worm gear)	17	Brake magnet
9	Traction sheave rim	18	Transport rail

Versions:

The following versions of the gear drive can be chosen by the customer: gear reduction, right-hand / left-hand design traction sheave version, motor version (illustration Fig. 2.1 in right-hand design).



Note: for a more detailed description of the special versions, see chapter 8.

2.2 Functional description

The W332B machine consists of a worm gear (gear drive) with flange-connected three-phase motor.

The power transmission of the B5 motor design takes place via a flexible coupling to the worm shaft, via worm wheel, wheel shaft to the traction sheave.

The forces on the installation surface are transferred on the traction sheave side via an outside bearing (self-aligning bearing), on the machine side via two compensating supports fitted at the plant under the gear box casing (Fig. 2.1, Item 16).

Brake:

The dual circuit shoe brake is spring actuated. Two independently acting brake blocks press the brake linings with preset spring force against the brake disc.

The braking force is set in such a way that one of the brake blocks is sufficient to bring an elevator car loaded with rated load from rated speed to a standstill.

The brake is released by electrically operated magnetic clamps.

For manual brake operation, a brake release lever is fitted to the brake blocks.

Traction sheave:

The traction sheave is two-part.

In the standard version, the traction sheave **hub** is firmly pressed onto the wheel shaft and fitted with a feather key.

The traction sheave rim is positive fitted on the traction sheave hub, centered and screw-connected with hexagon screws.

In the event of replacement, it can be pressed off the hub through the thread present in the traction sheave rim.

In the case of the special version "traction sheave in the shaft" (SA9), the traction sheave is arranged at the shaft end of the wheel shaft. The traction sheave is pressed onto the conical shaft end and secured by a disc with 3 microencapsulated screws on the front of the shaft.

The groove flanks of the traction sheave are hardened (min. 50 HRc).

3. Technology

3.1 Technical data

Gear ratios of the W332B:

63:1; 47:1; 59:2; 46:2; 57:3

Backlash:

0.022 ° - 0.04 °

Permitted radial stress of the traction sheave shaft:

for standard version	max. 155 kN
for SA4	max. 124 kN
for SA9	max. 124 kN

Mass moments of inertia J_{rot} : 1.520 kgm²

The value applies to the version of the machine with motor in B5 design. It includes the driving gear with brake disc and coupling as well as a proportion for the traction sheave.

It does not include the mass moments of inertia for the motor with handwinding wheel or flywheel rim hub as well as the flywheel rim for AC2 versions.

Additional flywheel masses:

In the case of machines with pole changing motor versions (AC2), flywheel masses are required on the motor shaft depending on the installation data.

The additional flywheel mass consists of a flywheel rim hub and the flywheel rim screw-connected onto it.

Designation	Unit	Mass moments of inertia J_{rot} [kgm ²]									
		330	360	370	380	400	410	430	455	480	510
Size Ø	mm										
Flywheel rim	kgm ²	0.285	0.458	0.533	0.600	0.758	0.900	1.070	1.435	1.750	2.280
Flywheel rim hub		0.057									
Total		0.342	0.515	0.590	0.657	0.815	0.957	1.127	1.492	1.807	2.337

Weight data:

Gear drive (without motor and traction sheave)	1210 kg
------------------------------------------------	---------

Weight of the machine (**standard version** without traction sheave):

with motor construction size 180	approx. 1435 kg
with motor construction size 225	approx. 1510 kg
with motor construction size 250	approx. 1600 kg
with motor construction size 280	approx. 1790 kg

Weight of the machine (version **SA4** without traction sheave):

with motor construction size 180	approx. 1540 kg
with motor construction size 225	approx. 1660 kg
with motor construction size 250	approx. 1750 kg
with motor construction size 280	approx. 1940 kg

Weight of the machine (version **SA9** without traction sheave):

with motor construction size 180	approx. 1390 kg
with motor construction size 225	approx. 1510 kg
with motor construction size 250	approx. 1600 kg
with motor construction size 280	approx. 1790 kg

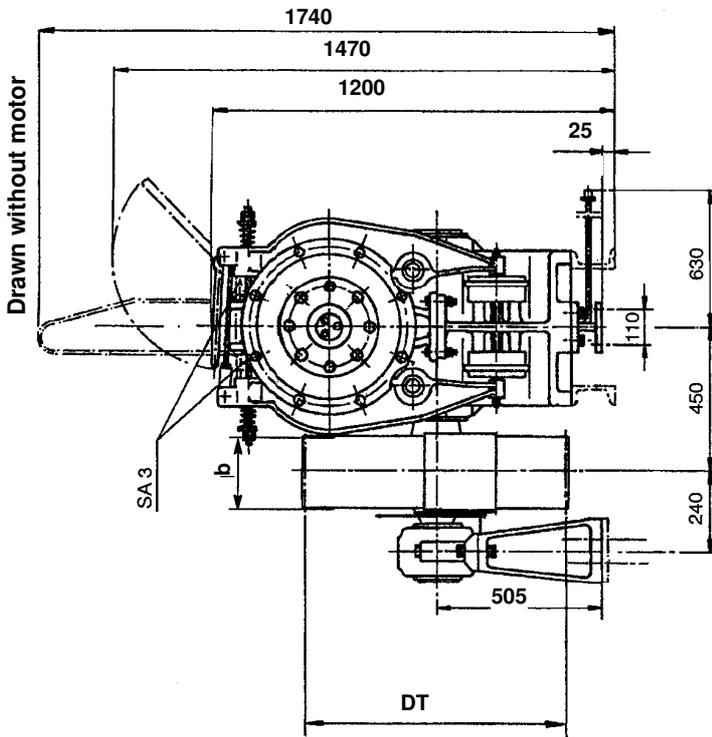
Weight of standardised traction sheaves:

$\varnothing [D_T]$	Grooves x rope \varnothing	Rim width	Weight
640	8x13 / 8x16	180 / 215	approx. 175 / 180 kg
700	8x16	215	approx. 210 kg
740	8x16	215	approx. 230 kg
800	7x13 / 8x16	160 / 215	approx. 245 / 265 kg

On machines in the pole changing version (AC2), the weight data are increased to include the values of the additional flywheel masses.

Flywheel rim size \varnothing	MM	330	360	370	380	400	410	430	455	480	510
Weight	kg	14	20	22	24	28	31	35	42	48	57

3.2 Dimensions of the drive



Left-hand design as drawn, right-hand design mirror-inverted
 Kproj specified dimension for the motor length can be found in
 chapters 3.4.1 – 3.4.3

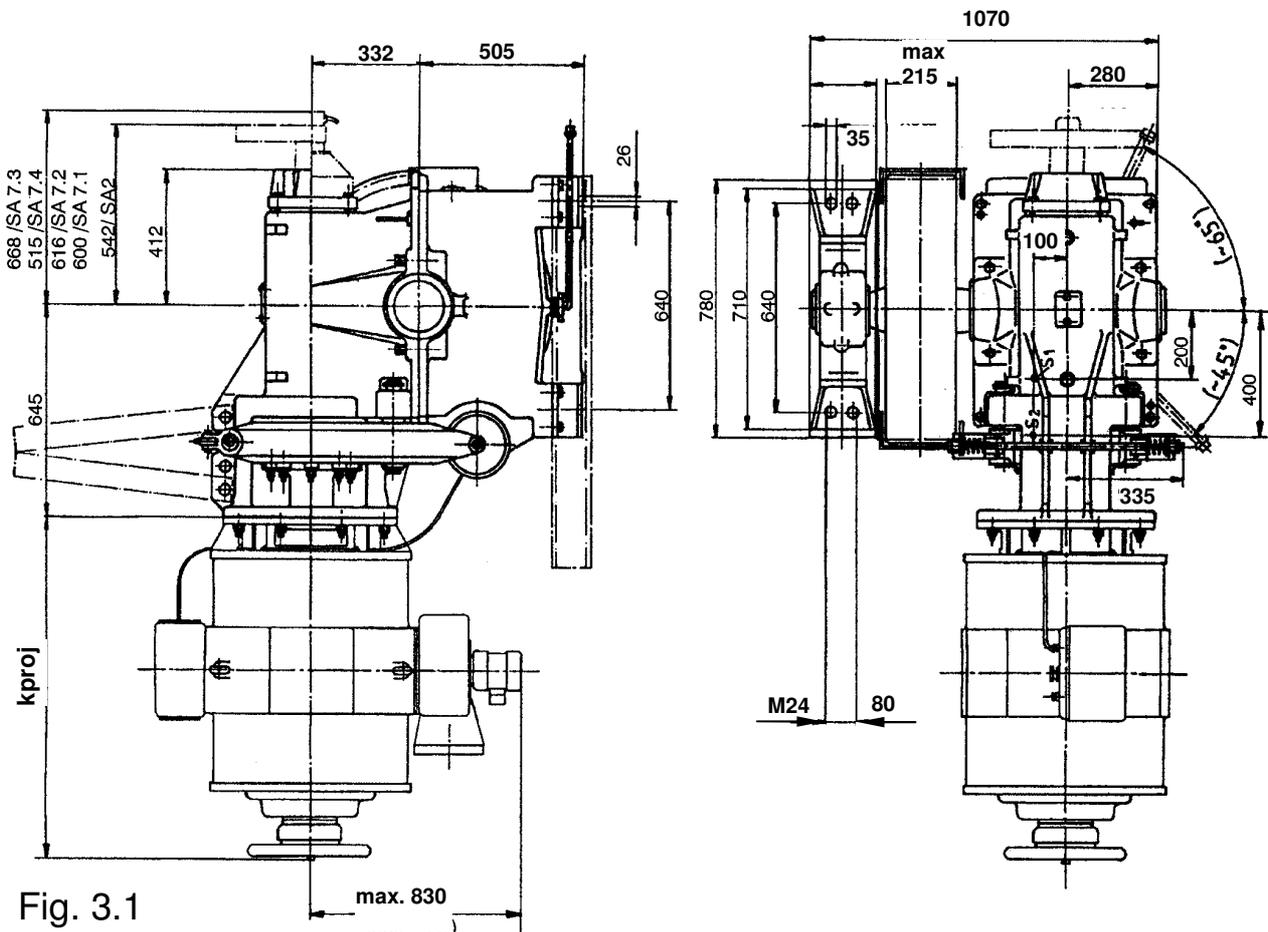


Fig. 3.1

W332B SA 4 (version for vapour-proof partition wall)

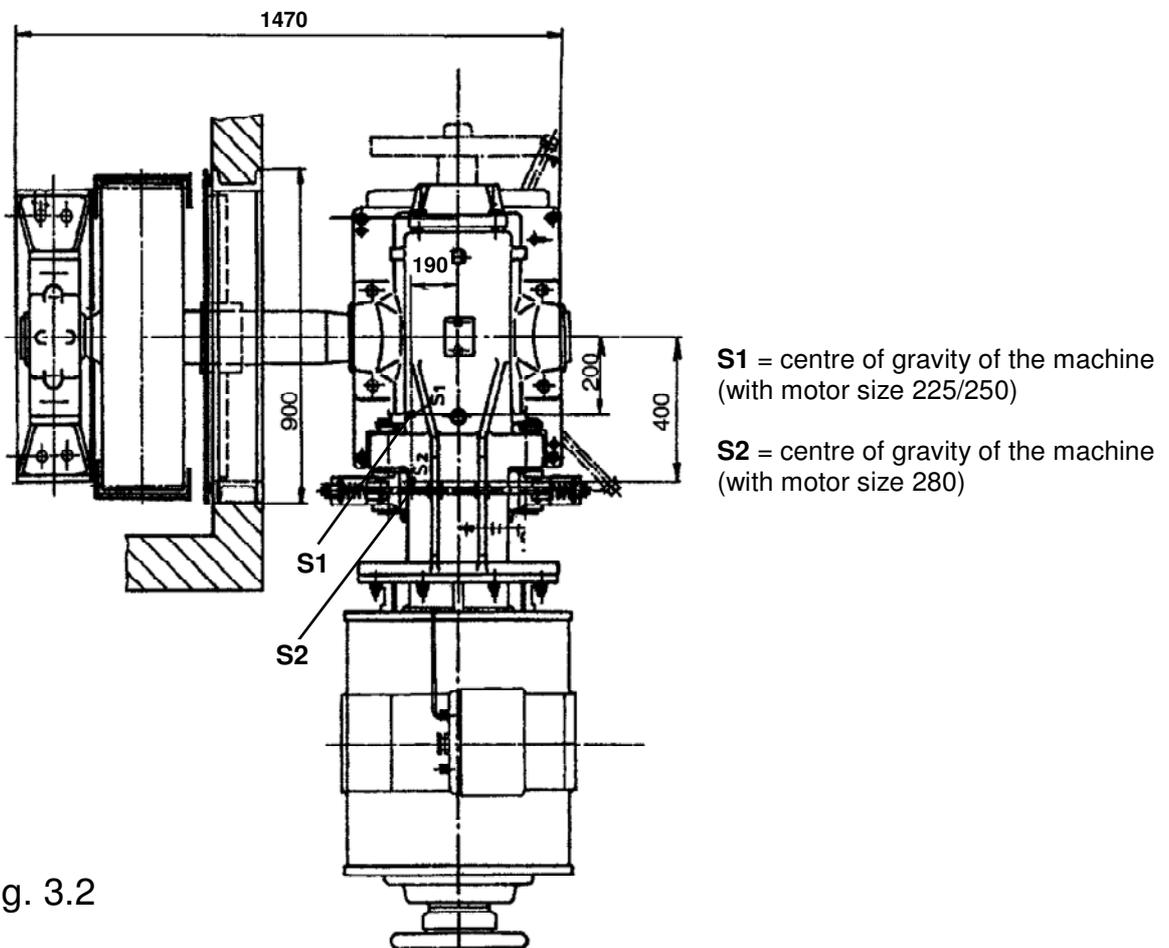
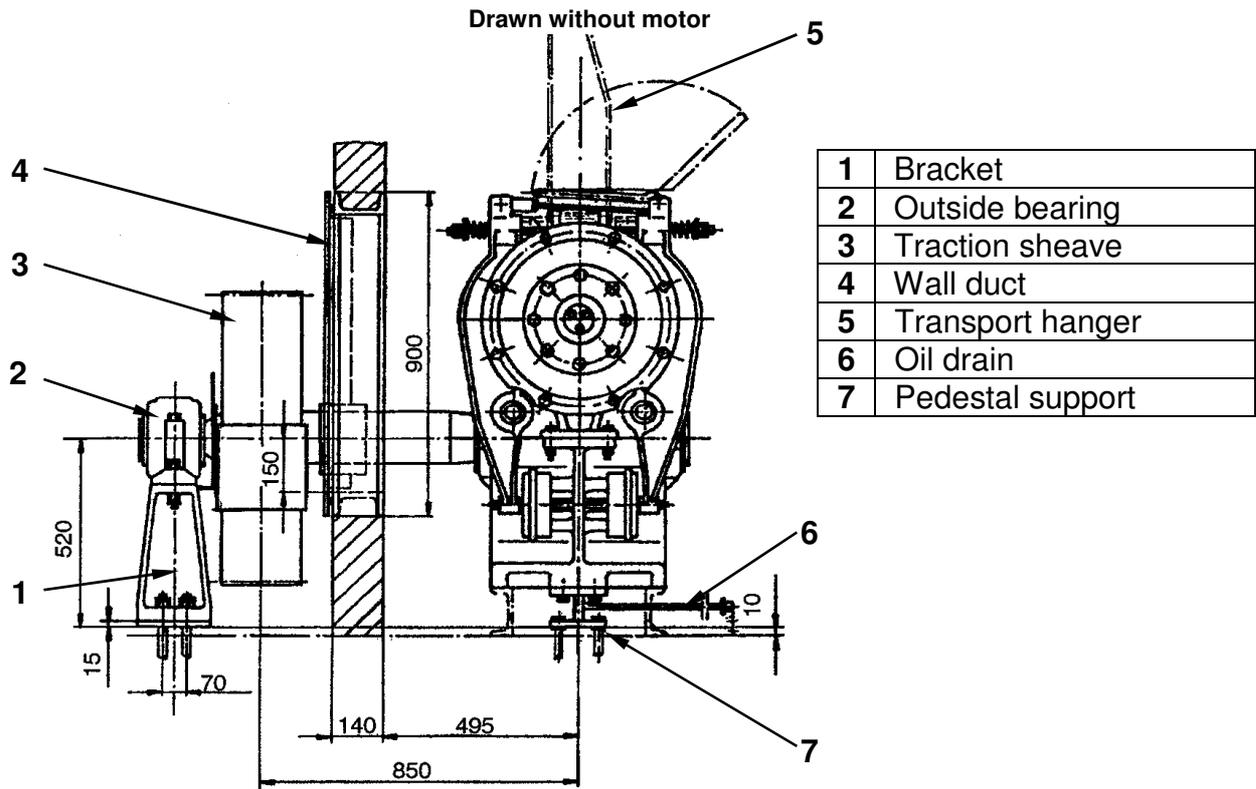
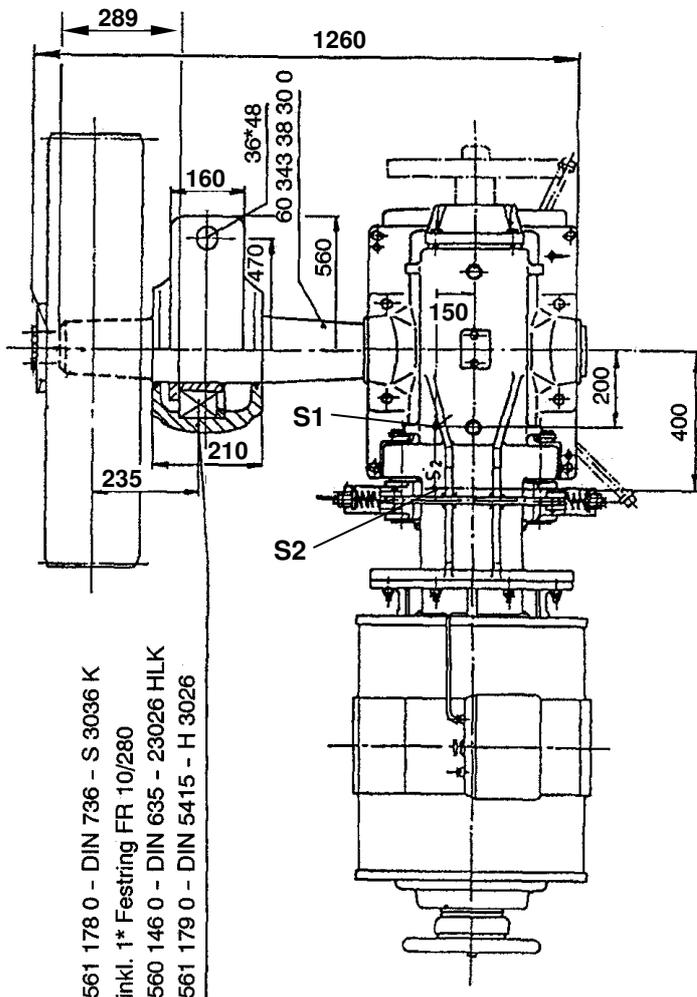
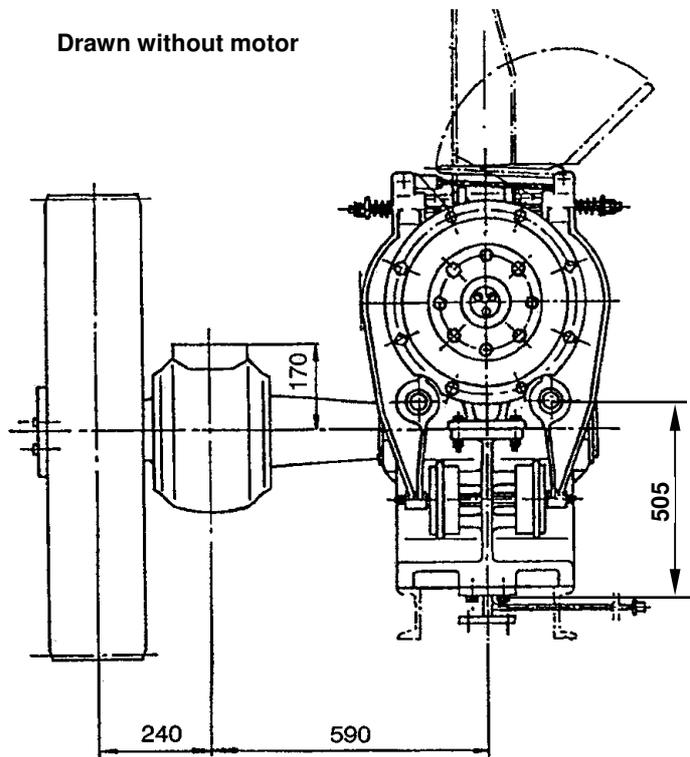


Fig. 3.2

W332B SA 9 (version for traction sheave in the shaft)



S1 = centre of gravity of the machine
 (with motor size 225/250)

S2 = centre of gravity of the machine
 (with motor size 280)

Fig. 3.4

3.3 Machine base frame (optional)

Standardised versions:

1. **Without rope pulley**, for direct rope departure elevator car – counterweight, or 2:1 suspension. Version, see Table 1. Illustration in Fig. 3.5
2. **With rope pulley**, the desired rope departure measurement (ASL dimension) is reached by arranging the rope pulley.
The machine base frame lies on concrete supports (on supports)
Under the machine base frame, a pulley frame to accommodate the rope pulley with $\varnothing 640$ mm is mounted on roller or sleeve bearings.
The base frame length "L" depends on the diameter of traction sheave and the desired gap between the ropes on the rope departure. See formula specified in Fig. 3.6.
Machine base frames can be supplied in left-hand or right-hand design (determined by the location of the rope pulley in relation to the machine, looking at the traction sheave in front of the machine.) Versions, see illustration in Fig. 3.6 and 3.7.

More information and setup instructions can be found in chapter 5.

Explanation of abbreviated designations:

- ASL** = parallel gap between the ropes on the rope departure
 \varnothing DT = diameter of traction sheave
 \varnothing SR = diameter of rope pulley



Note: The specified direction for left-hand or right-hand design of the machine is defined by the arrangement of the traction sheave, viewed from the motor onto the machine.
The guide value for the design of the machine base frame is defined by the location of the rope pulley in relation to the traction sheave looking at the traction sheave in front of the machine.

Machine base frame without rope pulley on concrete foundation

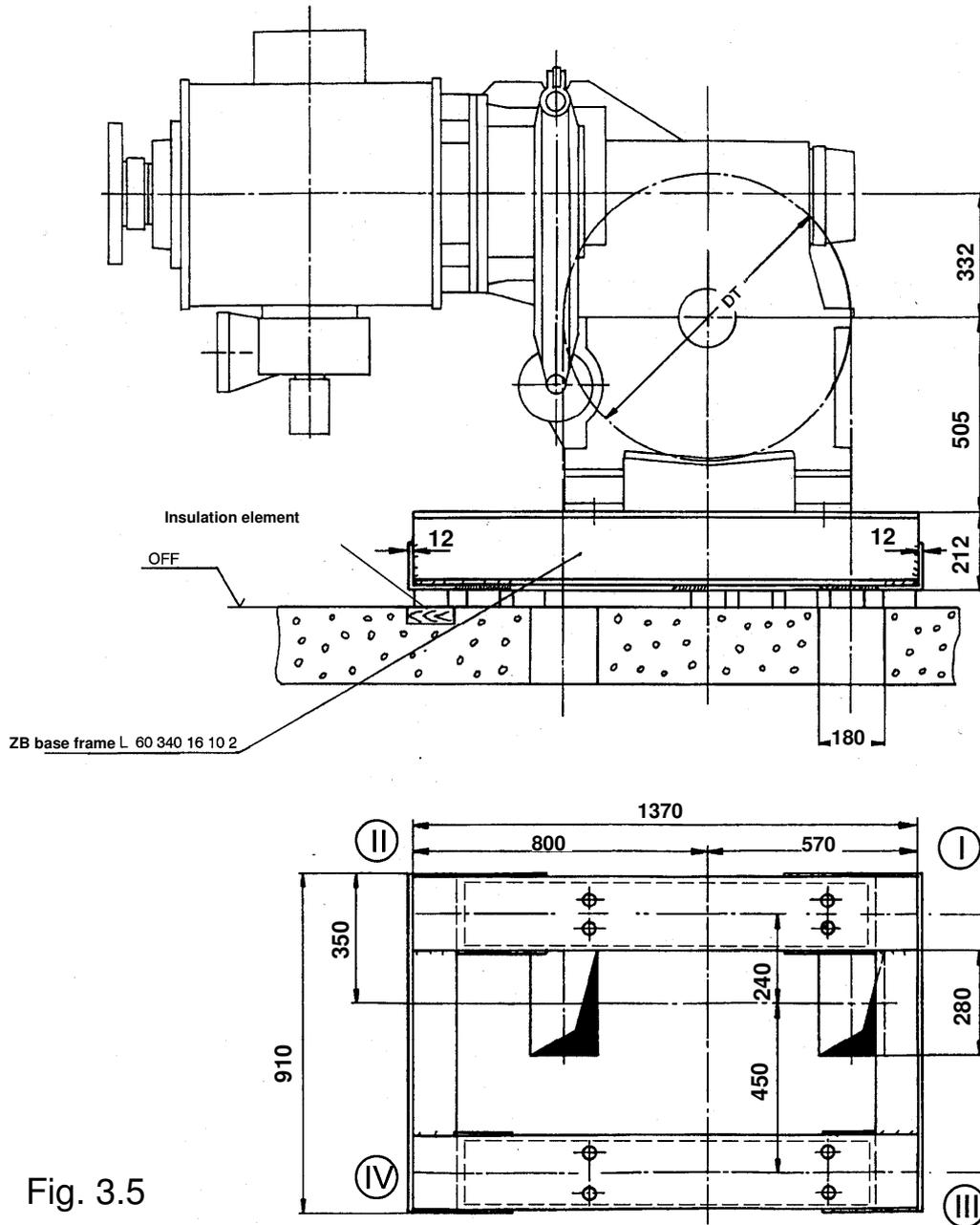


Fig. 3.5

Weight of the machine base frame approx. 240 kg

The location of the insulation elements is to be specified in the plan of installation.

Number and arrangement of insulation elements

Insulation element number		I	II	III	IV
Static shaft load F_t [kN]	150	6	4	4	3
	120	5	3	3	2
	90	4	2	3	2
	60	3	2	2	2

Machine base frame with rope pulley on concrete foundation

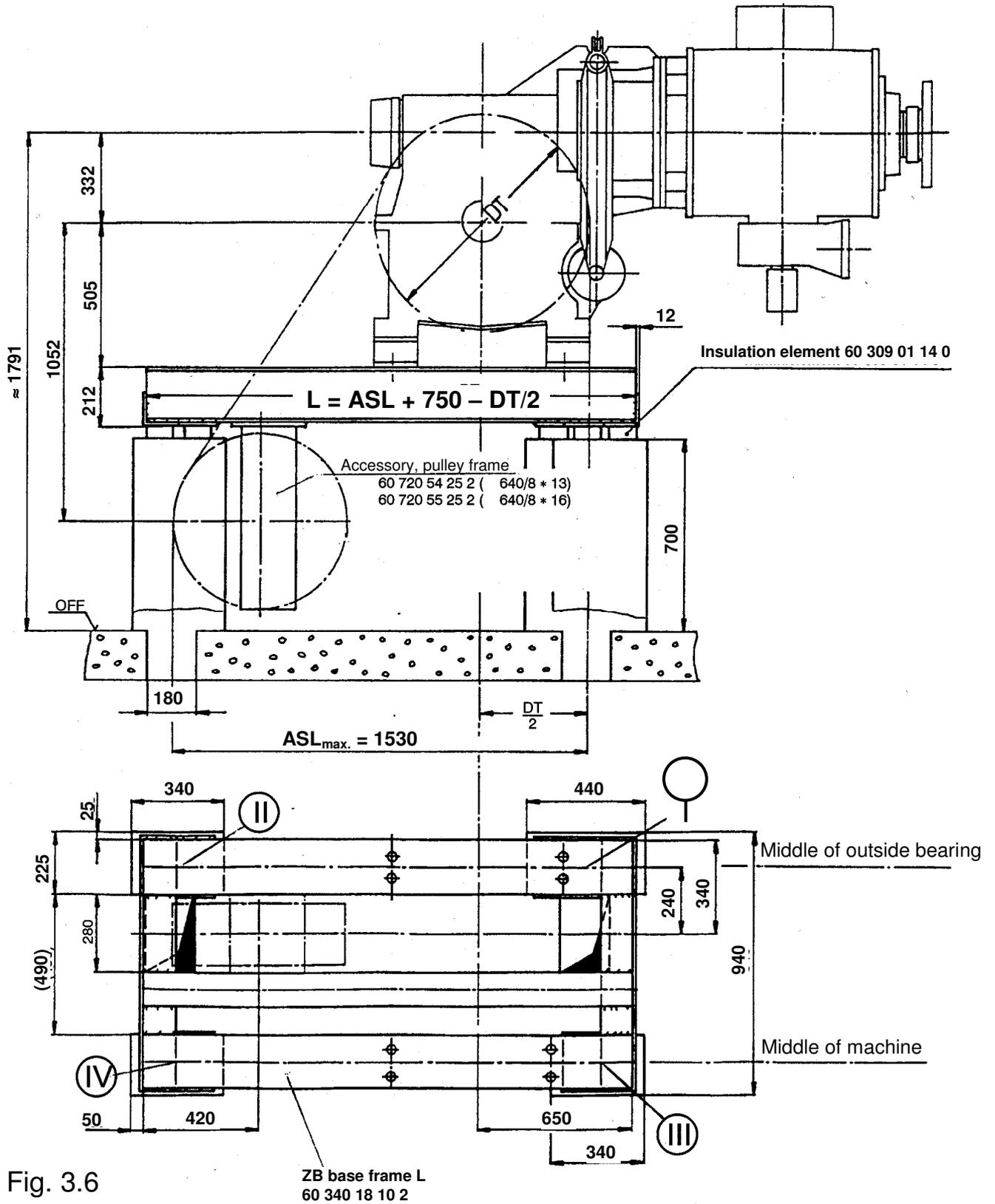


Fig. 3.6

Illustration of machine base frame W332B in right-hand design (looking at traction sheave in front of the machine) Machine in right-hand design (viewed from motor to gear)

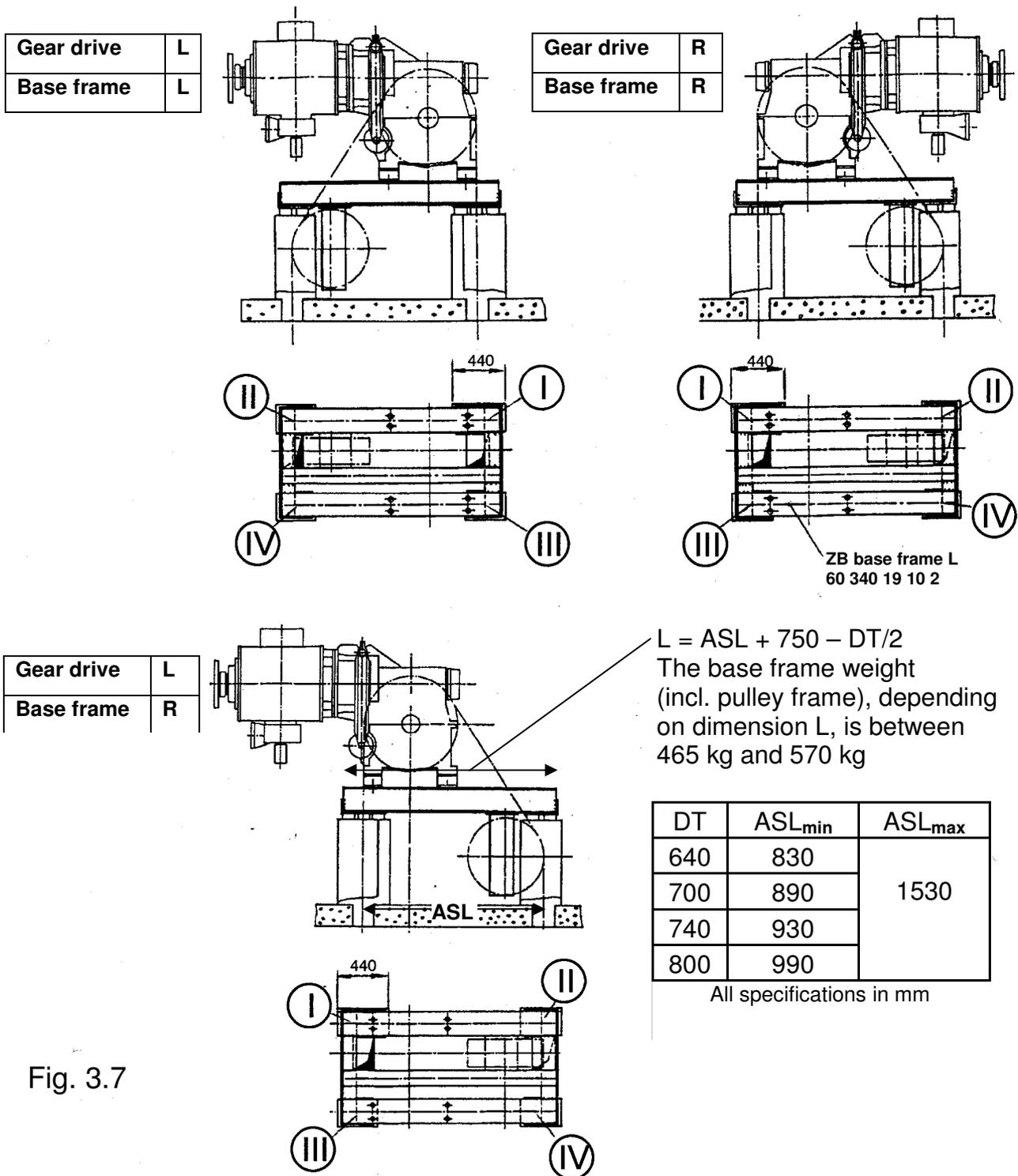


Fig. 3.7

Number and location of the insulation elements for base frame with rope pulley:

Insulation elements Position		ASL											
		ASL _{min}				1200				ASL _{max}			
		Ⓘ	Ⓜ	Ⓝ	Ⓓ	Ⓘ	Ⓜ	Ⓝ	Ⓓ	Ⓘ	Ⓜ	Ⓝ	Ⓓ
Static shaft load F _t [kN]	150	5	5	4	4	6	4	4	3	6	3	5	2
	120	4	4	3	3	5	3	4	3	5	3	4	2
	90	3	3	3	3	4	2	3	2	4	2	3	2
	60	2	2	2	2	3	2	2	2	3	2	3	2

3.4 Motor data

The motor data apply to the following locations:

Maximum altitude 1000 m amsl

Max. temperature + 40 °C at max. 50% air humidity.

Max. relative air humidity 70% at 20 °C

If the stated conditions are undershot, the deratings in line with VDE 0530 apply.

All specified performance data apply to the following application conditions:

- Operating data operating time max. 180 c/h at 40%
- Temperature in the machine room +5 °C to +40 °C

The technical data can be found on the type plate.

4. Transport and storage

Packaging:



Fig. 4.1



Fig. 4.2

U-profiles are placed under the gear housing and the gear housing is bolted onto the special pallet.

The pallet must be widened due to the protruding traction sheave.

Other packaging depends on the order and is effected on a country-specific basis (air / sea / truck or other freight).



Transport:

Transport must be effected in **compliance with the safety regulations** and observing the centre of gravity of the machine or base frame.

Fork-lift truck transport:

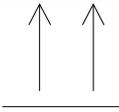
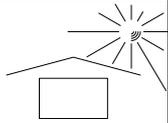
- In the case of transport with a fork lift, the forks used must be long enough to prevent the transported goods from tipping over.
- Always pick up the transport pallet with the forks, not the machine itself.
- Pay attention to protruding parts!
Danger of injury and damage!



Crane transport:

- Do not walk underneath suspended loads!
- Use transport hangers to mount the transportation chains or ropes.
- Do not lift by the housing!
- After transport, remove the transport hangers.

Pay attention to the icons on the packaging or elsewhere.

					
Top	Fragile goods	Protect against water	Protect against heat	Hand hooks prohibited	Attach here

Dimensions and weight

The weight data is specified on the packaging on a label below the transport hangers.

Please refer to the delivery note for the dimensions.

Approximate specifications can be found in chapter 3.

**Check on acceptance by the recipient**

The delivered parts and their packaging are to be checked for completeness, damage or other conspicuous features.

Reporting and documenting damage in transit

On delivery, make sure that no damage in transit has occurred.

Information

- Any damage that is determined is to be documented immediately (sketch, photo, description of the damage).
 - Forward the corresponding documents without delay to THYSSENKRUPP AUFZUGSWERKE GmbH.
-

Unpacking

Information

- Dispose of packaging materials in an environmentally compatible manner or reuse them.
 - Specific transport aids and shipping braces remain with the customer.
-

Intermediate storage

- If the assembly is not installed immediately after delivery, it must be stored carefully in a protected location. On covering, attention is to be paid to ensuring that no condensation can form and that no moisture can penetrate.
- The assembly must not be stored outdoors. Bare parts have no long-term preservation.

Ambient conditions

Information

The environment at the final location (moisture, temperature) must correspond to normal indoor climate conditions for machine rooms in line with regulations.

5. Mounting the machine

5.1 Machine setup

The machine and machine base frame of the W332B are delivered separately. If the gap between the ropes on the rope departure deviates from the diameter of the traction sheave, a deflecting rope pulley is required on the machine base frame.

The base frame is set up by the customer on the floor of the machine room or on a ready-made concrete foundation.

In order to comply with regulations for noise abatement and sound transmission, the delivered insulation elements are to be inserted between the frame support and the ground or concrete pedestal. These differ according to the type of mounting:

a) Insulation element 100 x 100 x 50 high without support

For mounting the machine on the machine room floor without a cement floor or directly surface mounted on the cement floor.

b) Insulation element as described at a), but with additional laminated wood support 140 x 140 x 80 mm high

For mounting on a cement floor, whereby the wooden support is cast in the cement floor (thickness of the cement floor \leq 60 mm)

The location and arrangement of the insulation elements can be found in the plan of installation. (Information can be found in chapter 3.)



Note: for the layout of the insulation, the load per insulation element should be with the range from 7 kN to 12 kN.

On arrangement of the supports, it is to be taken into account that the overall centre of gravity lies within the insulation elements (this also applies to elevator car suspension on the rope pulley side).

When mounting on a cement floor (max. 60 mm thickness), the insulation elements are to cast in the cement floor with the proportion of wood (approx. 80 mm high) downwards.

Mounting with inclined pulling or rope departure upwards (SA1)

For the machine outside bearing and base frame mount, the forces exerted in the pulling direction are also to be taken into account. When required, the base frame is to be additionally supported by insulation elements in the direction of force.

Setting up

Tip: in the case of a base frame with pulley frame, it is advantageous to mount this on the machine base frame first, then to install the rope pulley and align with the axle holder (the correct mounting side is important here).

Place the insulation elements on the support (floor or concrete pedestal) according to the plan of installation.

Balance out differences in the support height by inserting wooden supports or in the case of insulation elements with laminated wood supports by removing part of the wooden supports.

Place the machine base frame on the insulation elements and align it. Place the machine, including outside or pedestal bearing, on the machine base frame and secure loosely.

The rope departure on the traction sheave is to be aligned plumb on the elevator car mounting or elevator car rope pulley. The machine should stand horizontally aligned on the machine base frame. Irregularities are to be balanced out by inserting shims under the mounting surface.

Base frame with rope pulley: align the traction sheave and rope pulley as parallel and the location of the rope groove in relation to one another.

The alignment of the grooves of the traction sheave and rope pulley must correspond exactly.

Check the required **ASL** dimension (parallel gap between the ropes at the rope departure).



NB: when setting up machines with outside bearings or pedestal bearings, it must be ensured that:

- the pedestal supports are mounted and secured according to instructions
- the traction sheave shaft is aligned horizontally in when load is applied
- the sheave shaft bearings of the machine and outside bearings or pedestal bearings must be aligned (max. deviation ± 1 mm)

After alignment, the securing bolts are to be tightened with the prescribed tightening torque, see chapter 9.

Explosion protection:

setting up partial Ex or full Ex machine versions

A description of the additionally required measures can be found in the separate operating manual "Explosion protection for gear drives".

5.2 Connecting the motors



The wiring diagram for connection of the motor is attached to the inside of the lid of the motor terminal box or is loose in the box.

Alongside the terminal connecting information, the corresponding building codes are to be complied with.

In the following chapters, you will find the terminal connection diagrams for the standardised motors and pulse generators as well as terminal connecting information in line with building codes.

Please comply with the special instructions and manufacturer specifications in chapter 9.

The technical data of the motors are listed in chapter 3.



NB: In the case of operating-angle-controlled motors Isostop 12 / 16M (Isostop 25M), comply with the special instructions for the bridge connection of terminals 16 and 9, as the printed circuit board (brake board) will be destroyed if incorrectly connected.



Do not apply a voltage greater than 2.5 V at the terminals of the posistor. Adhere to the internal resistance of the measurement devices!

5.3 Terminal connecting plan

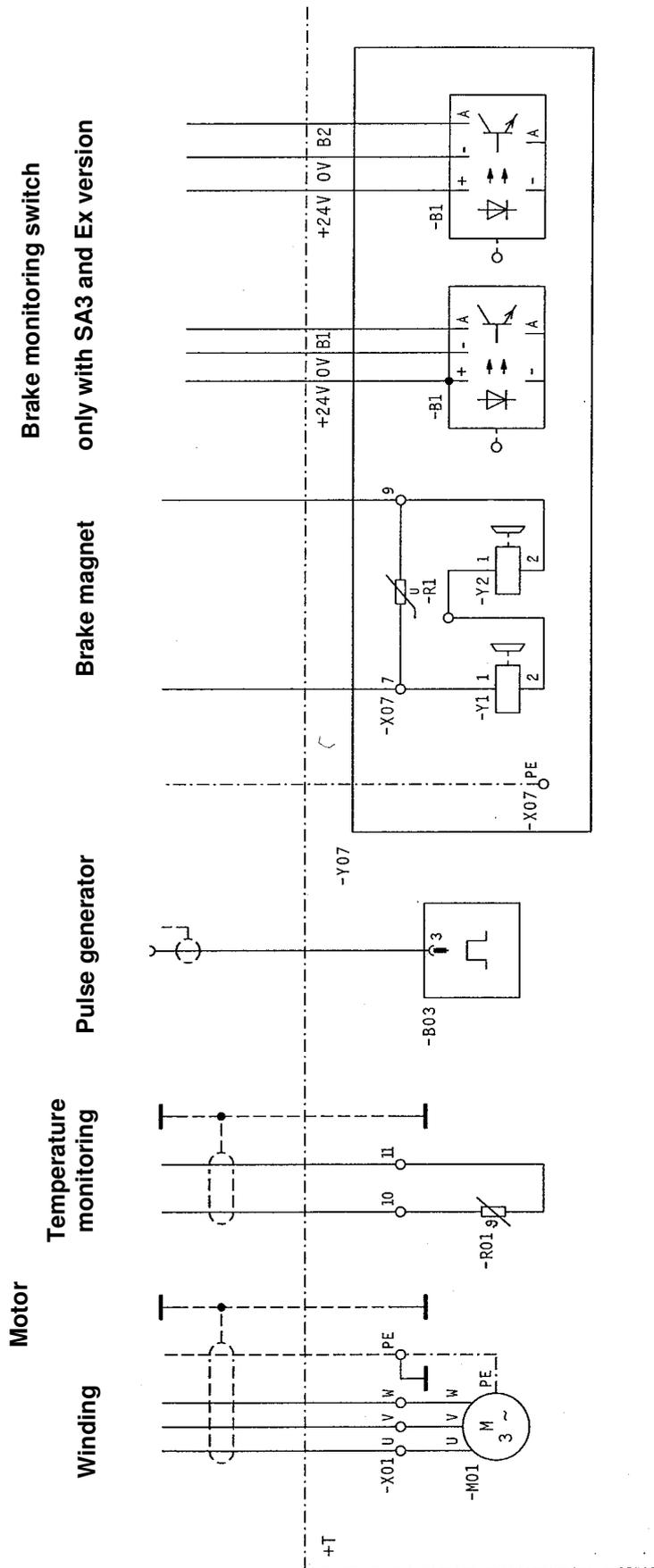
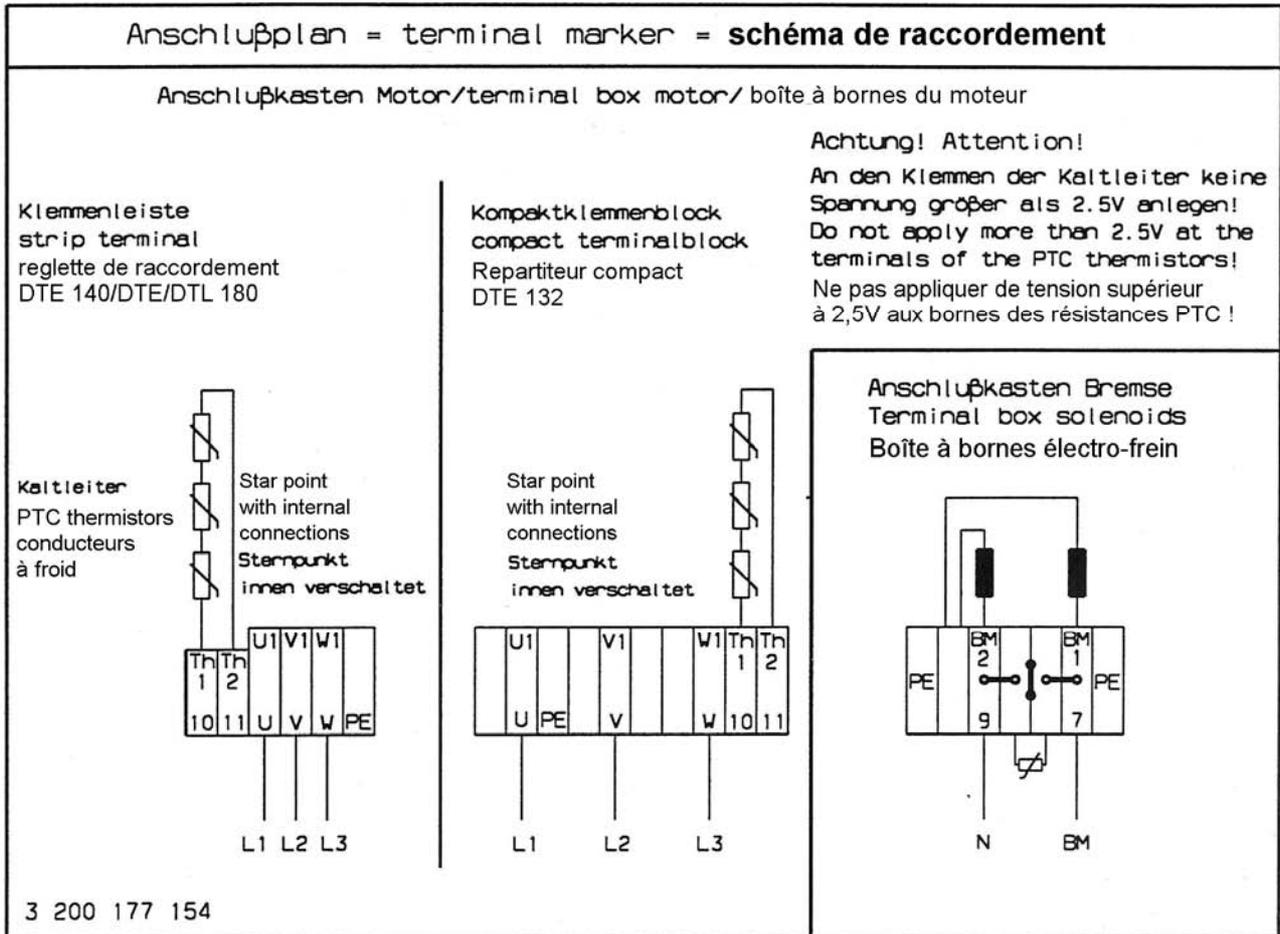


Fig. 5.1

5.4 Terminal connecting plan for gear drive motor and magnetic clamps



Connection terminals
motor

Connection terminals
Magnetic clamps

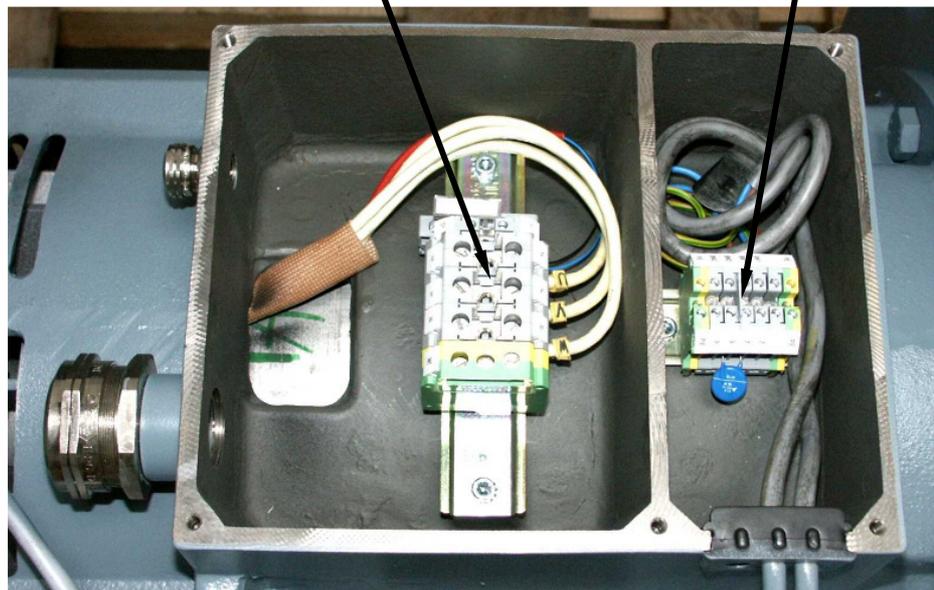


Fig. 5.2

Fig.: motor terminal box with cast-on terminal box for the brake magnet connection.

5.4.1 Terminal connecting information for motors complying with BV 6531 -09

pole changing for three-phase motors

Schaltungsausführung nach Angabe im Leistungsschild.

Connection as stated on the rating plate.

Branchement suivant indications sur la plaque signalétique.

 = Kaltleiter
PTC thermistors
Résistances PTC

ACHTUNG! N.B.! ATTENTION !

An die Klemmen der Kaltleiter keine Spannung größer als 2,5 V anlegen!

Do not apply more than 2.5 V at the terminals of the PTC thermistors!

Ne pas appliquer de tension supérieure à 2,5V aux bornes des résistances PTC !

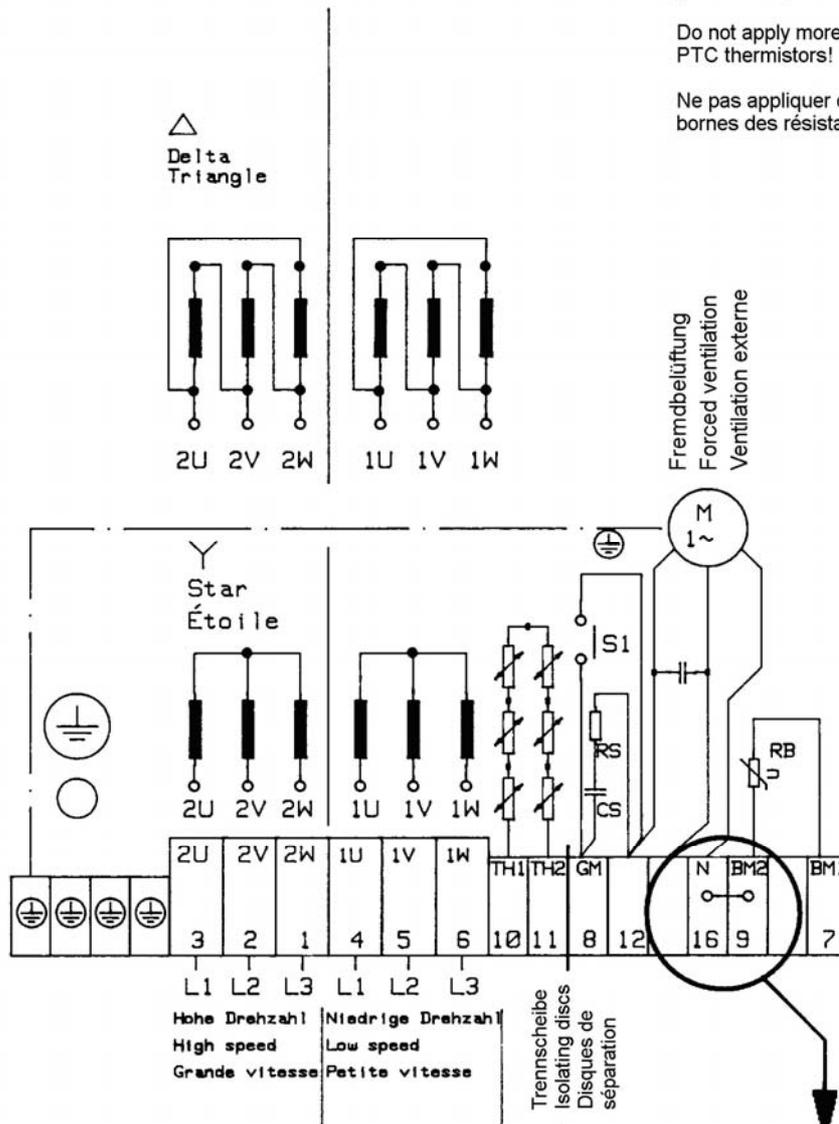


Fig. 5.3

NB: follow the instructions regarding bridge connection!

 <p>Am Wickelkopf verbunden Connected at the winding head Raccordé à la tête du bobinage</p>	 <p>An Klemme geführt Connected to terminal Raccordé à la borne</p>
-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------

5.4.2 Terminal connecting information for motors complying with BV 6531 - 14

for operating-angle-controlled three-phase motors with direct current brake winding

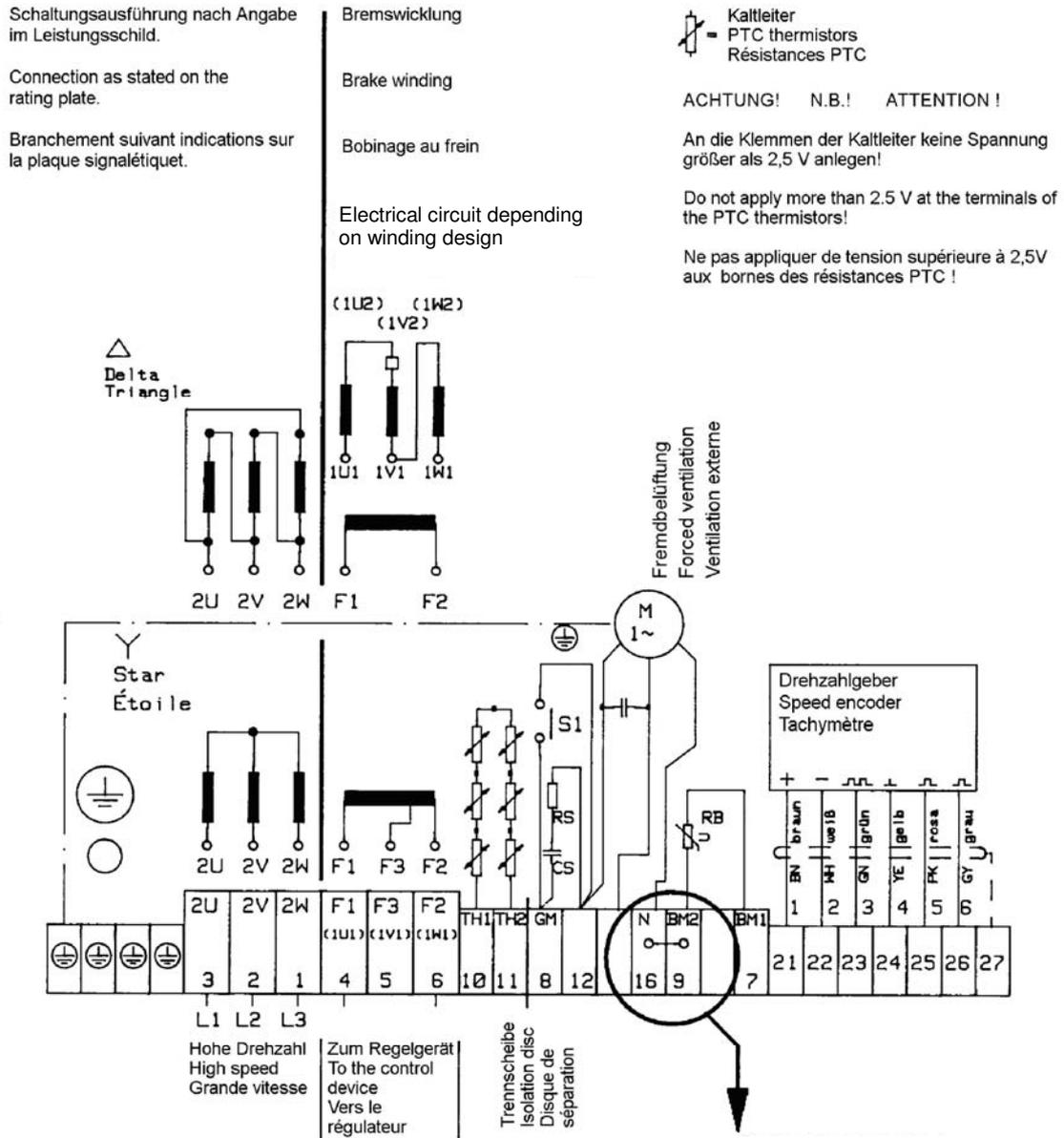


Fig. 5.4

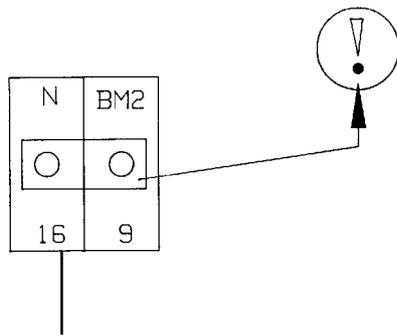
NB: follow the instructions regarding bridge connection!

<p>Am Wickelkopf verbunden Connected at the winding head Raccordé à la tête du bobinage</p>	<p>An Klemme geführt Connected to terminal Raccordé à la borne</p>	<p>Verbindung lose im Anschlußkasten (Lüsterkl.) Connection loose in the terminal box Connexion séparée dans la boîte de bornes</p>
-----------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------

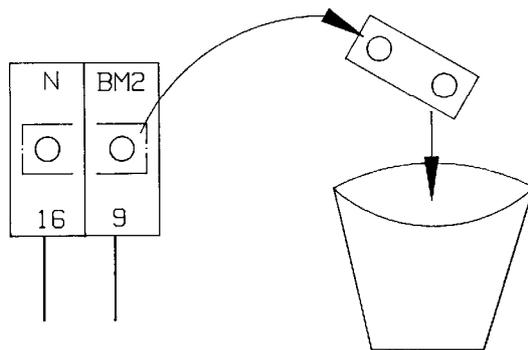
5.4.3 Bridge connection at motor

Concerns operating-angle-controlled motors with the control systems Isostop 12M, 16M and 25M

On shipment of the machine, motor terminals 16 - 9 are bridged.



If there is only one external supply line for terminals 16 - 9, the bridge must remain!



If terminals 16 and 9 are each connected with a separate external supply line, the bridge must be removed!

Fig. 5.5



NB: if this instruction is ignored, the printed circuit board (brake board) will be destroyed!

5.5 Pulse generator

Pulse generator:

As standard, a pulse generator is fitted on the shaft end of the motor (in front of the handwinding wheel), see Fig. 2.1, Item 2.

Depending on the converter and control system, four different digital pulse generators can be selected.

Tacho-generator and/or pulse generator (optional SA7.1 – 7.4):

For control systems with an analogue input, a tacho-generator or pulse generator can be mounted on the shaft end of the worm shaft. You will find a more detailed description and terminal connecting information for the tacho-generator and pulse generator mounting can be found in chapter 8 or at the manufacturer specifications in chapter 9.

5.5.1 Pulse generator for mounting on the motor

The distinction is made by type depending on the control system used

1. TTL for Thyssen control system CPI

for $v < 1.5$ m/s with 2 x **1024** impulses

for $v \geq 1.5$ m/s with 2 x **4096** impulses

The connection is made with a cable SUB-D 9 connector and screw retention

2. HTL for third-party control systems

with 2 x **64** impulses

Connection takes place with a cable and cased wire end sleeves.

3. HTL for third-party control systems

with **1024** impulses

Connection takes place with a cable and cased wire end sleeves.

4. Sine-cosine for third-party control systems

with **1024** impulses

Connection takes place with a cable and cased wire end sleeves.

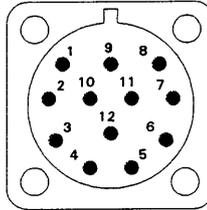
Connector pin assignment as well as electrical data, see chapter 9:

Also comply with the instructions in chapter 9.

5.5.2 Tachometer and pulse generator mounting on the worm shaft (SA7)

(Optional) Drive with tachometer and pulse generator mounting:

Contact assignment of the pulse generator flange tube for 1 024 and 4 096 impulses

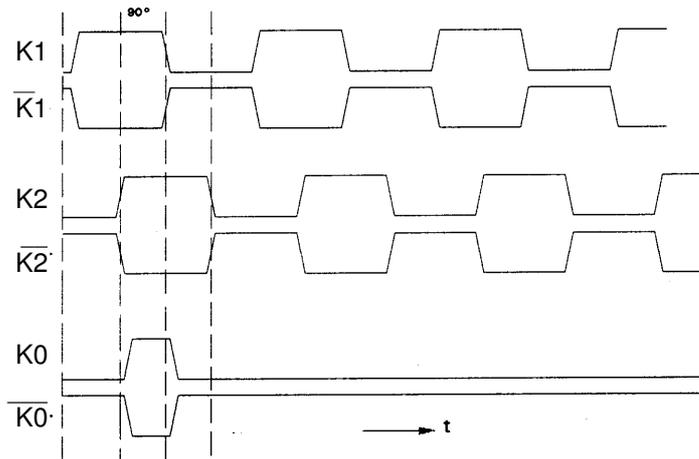


1	2	3	4	5	6	7	8	9	10	11	12
$\overline{K2}$	/	K0	$\overline{K0}$	K1	$\overline{K1}$	/	K2	/	0 V	0 V	+5V

Ausgangssignale

Output signals

Signaux de sortie



Note: more details, data, illustration can be found at the description of special versions in chapter 8.

Brake data:

On the W332B gear drive, the two brake magnets are switched in succession (in series).

Connection value for each magnetic clamp - Total connection value:

Rated voltage:	50 V
Rated current:	2.7 A
Type of protection:	IP65

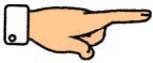
Power supply	
for field forcing device:	200 V
for retentive voltage:	100 V

Magnetic clamp nominal force :	2 x 7500 N
Max. braking torque: approx.	2 x 625 Nm (adjustable)
Brake disc diameter	420 mm
Brake release gap	0.3 mm (adjustable)
Manual release:	with fitted brake release lever

5.6 Rope guard for traction sheave

Use the enclosed screws to bolt the rope guard onto the rope guard carrier. Pivot the rope guard carrier to set the guard in such a way that the gap between the rope and guard on the rope run-in and run-out side of the traction sheave is as small as possible (1 -2 mm). The protective plates must be arranged parallel to the ropes.

With **inclined pulling**, adapt the location of the rope guard carrier by remounting the changed rope pull direction.



Note: Tighten the securing bolts of the rope guard carrier on the gear drive after alignment with the prescribed torque.

Tightening torque, see table in the Appendix of the operating manual.

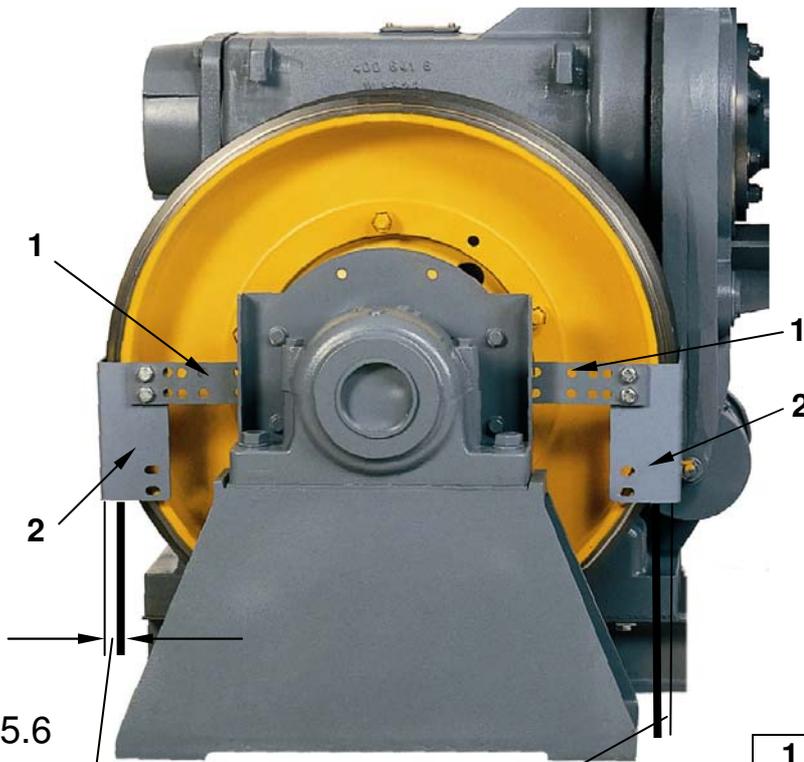


Fig. 5.6

Maximum 1 – 2 mm distance
between hoop guard and rope

1	Rope guard carrier
2	Rope guard



NB:

For machines with rope run-in direction of 0 - 90° above the horizontal (e.g.: machine arrangement up/down beside), an additional rope guard is required to prevent the entry of foreign bodies between the rope and groove. If the rope run-in zone is protected within the machine base frame, the function "protection against injury" is not required.

In the case of machines in special version SA4 or SA9, depending on the danger situation of the installation, provide the corresponding protection. In this context, refer to the supplementary operating manual for ex-protected installations.

6. Commissioning



Before commissioning the machine, the following points should be checked and carried out:

- Safety, auxiliary and installation tools removed from the danger zone
- Setup of the machine, base frame, pedestal and rope departure checked
- Oil drain pipe with dip stick mounted and drainage opening closed with cap
- Gear oil added and oil level checked.
- Before the first run, oil must be added in the upper side pockets at the height of the worm shaft.
(See label on the cover of the upper gear opening)
- Outside bearing filled with grease (first filling at the plant)
- Mounting of the machine and outside bearing checked
- If present, check the mounts of base frame connections: pulley frame with rope pulley; wall duct and wall bearing
- Bolts must be tightened and secured with the prescribed torque, see 'Tightening torques', Table 9.
- Brake block stroke and setting checked
- With SA3, setting and function of the brake test switch checked
- Brake test carried out with one brake block in each case
- Function of manual release of the brake checked
- Distance of rope guard to traction sheave / ropes set
- Power connections and earthing of motor, forced ventilation and brake magnet connected and secured
- Special add-on components (tachometer / pulse generator mounting) mounted and function checked
- Direction arrow (Up / Down) attached above traction sheave and clearly visible on the motor near the handwinding wheel



NB: the W332B machine may only be operated briefly in inspection operation, as the lubrication is configured for the rated speed. Oil is supplied to the sleeve bearing in that it is thrown from the worm shaft.

Ambient conditions:

The environment at the location of the drive (moisture, temperature) must correspond to normal indoor climate conditions for machine rooms (According to EN 81. between +5° and +40° C)
The relative air humidity must not exceed 70%.

Acoustic specifications:

The airborne noise levels in the machine room at a distance of 1 m for the standard version of the machine with operation at normal rating are **≤ 74 dB(A)**

6.1 Run-in operation of the drive



On commissioning W332B drives, these are to be run in with the following loads.

During the run-in operation, no smoke should form due to the oil.

Furthermore, the surface temperature of the gear is to be checked. Here, the thrust bearing cover can heat up to 80 °C (ambient temperature plus 50 °C to 60 °C).

Sequence:

24-hour run-in operation (operating time \leq 40%) with the following load

- a) $q\% / 100 \times 0.5 \times$ rated load
- b) $q\% / 100 \times 1.5 \times$ rated load

With $q\%$ = Factor for offset load (e.g. 45%)

Explanation of abbreviated designations:

ASL = parallel gap between the ropes on the rope departure

\varnothing **DT** = diameter of traction sheave

\varnothing **SR** = diameter of rope pulley



Note: The specified direction for left-hand or right-hand design of the machine defines the arrangement of the traction sheave, viewed from the motor onto the machine.

The **guide value** for the design of the machine base frame is defined by the location of the rope pulley in relation to the traction sheave looking at the traction sheave in front of the machine, see Fig. 3.6.

7. Maintenance / service

7.1 Maintenance

Maintenance period: maintenance of the machine should take place within the framework of central maintenance of the elevator, at least once a year.



Note: commissioning and maintenance work may only be carried out by trained and instructed qualified personnel.

All laws and regulations for elevator systems as well as accident prevention regulations must be known and complied with.

More details on the sequence, settings and data can be found in chapter: ↓

• Check the oil level; top up if necessary.	
• Carry out an oil change (see chapter 7).	7
• Check brake blocks for wear, remaining lining thickness must be at least 3 mm	7
• Check the brake adjustment, block stroke should be within 0.3 mm + 0.1 mm.	7
• Check armature base plate setting (pretension)	7
• Check the braking deceleration	7
• Check worm gear toothing for wear	
• Check the backlash between the worm shaft and worm wheel (max. 2.5 mm)	7
• Check groove profile on the traction sheave for damage and wear	
• Check secure seating of bolts of the traction sheave mount	9
• Check pulley grooves for damage and wear.	
• Check motor bearings for wear (noise, backlash)	
• Check grease filling of outside bearing (type F1*) and seating of the groove nuts on the outside bearing. If required, top up and/or tighten.	7
• Check that electrical connections are in proper and adequate condition and check that they are securely attached	
• Check that protective and safety devices are present and correctly set	

7.2 Lubrication

Lubricant	Replacement interval	Filling amount
Synthetic gear oil SM1/220 ¹⁾	For the first time after 3 years then every 6 years	33 litres

¹⁾ For machines from year mid / late 2010
(see SM1/220 marking on the nameplate of the machine)

Oil change



- Before the oil change, run the gear until it reaches operating temperature (approx. 35 °C)

NB: after longer periods of operation, there is a risk of scalding!

- Discharge the gear oil by removing the cap on the oil drain pipe.
- Collect the old oil in a container specifically designed for the purpose.
- After draining the gear, close the cap on the oil drain pipe with sealing tape and check whether everything is sealed tightly.
- Remove the cover of the upper opening on the gear box casing and fill the machine with the prescribed oil quantity.
- Check the level at the oil dip stick (see illustration below).
- Enter the date for the next oil change on the type plate of the machine and close the fill opening.
- Never mix various types of oil.
- Do not let any oil seep through to the groundwater.
- Dispose of old oil as well as cleaning cloths contaminated with oil and grease according to applicable regulations and ordinances.
- Use only lubricants approved by THYSSENKRUPP AUFZUGSWERKE.



Note: THYSSENKRUPP AUFZUGSWERKE GmbH shall not be liable for losses caused by the use of non-approved lubricants.

Oil level monitoring

Pull out the oil dip stick to check the oil level. The oil on the dip stick should be within the markings.

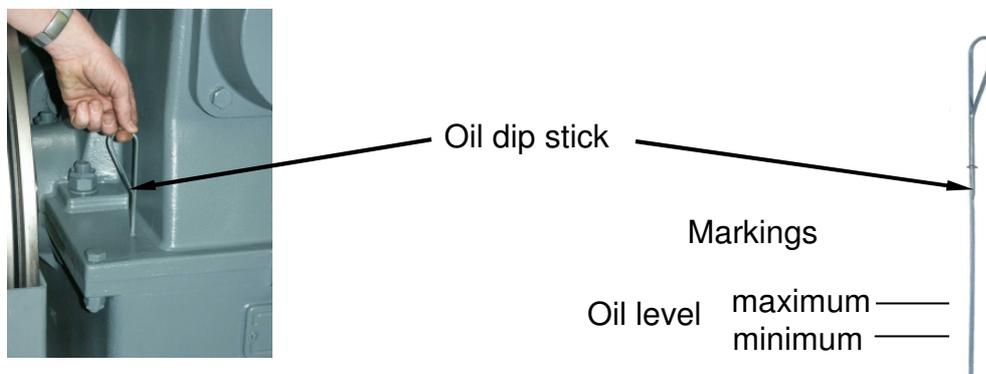


Fig. 7.1

7.3 Replacing brake blocks



Note: With a remaining lining thickness of less than 3 mm, or if the linings are contaminated with oil, the brake linings are to be replaced.



- Before starting work, secure the counterweight and elevator car; switch off the power to the installation.
- Remove one brake block; mount the brake linkage and armature base plates on new brake blocks.
- Fit the pre-assembled brake block and align to the middle of the brake disc. Ensure that the brake linkage is aligned.
- Set the brake block stroke. The brake block stroke should be 0.3 mm, measured to the middle of the brake disc.
- Pretension the springs by approx. 20 mm.
- Modify, replace and set the second brake block in the same manner.
- After replacement, operate with electrical recall and observe whether both brake blocks open evenly.
- Check the stroke paths, adjust if required.

7.4 Setting braking deceleration

The brake adjustment is to be carried out only with one effective brake block with the elevator car loaded with loading capacity on a descending run (full down) or with an empty elevator car on an ascending run (empty up) according to the deceleration values in the table below.

The braking torque must be set on uniformly on both brake blocks by pretensioning the brake spring depending on the installation.

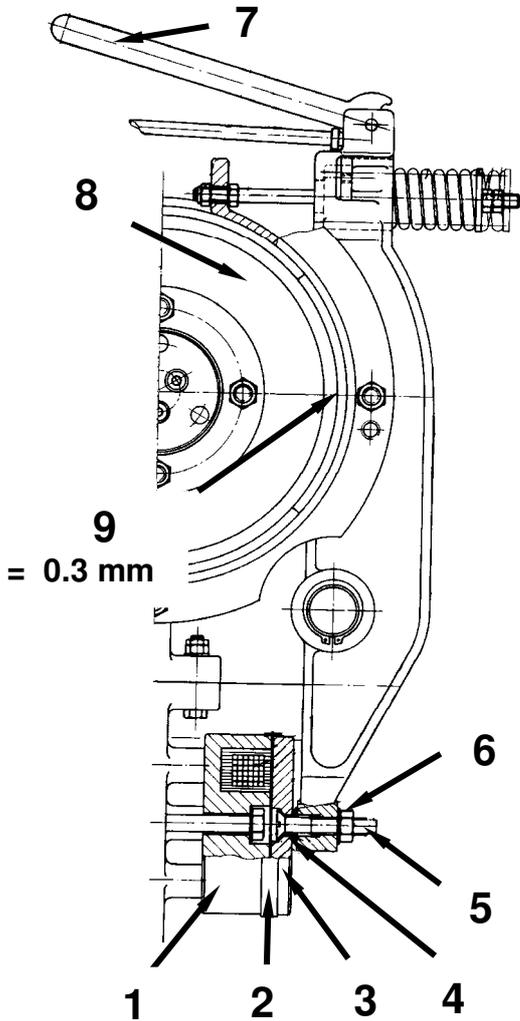
		Machine with flywheel mass		Machine with handwinding wheel		
		≤	≤	≤	≤	>
v	m/s	0.63	1.25	0.63	1.25	1.25
- a (full down)	m/s²	0.2	0.3	0.3	0.4	0.50
- a (empty up)	m/s²	0.4	0.5	0.5	0.6	0.75

Table: brake deceleration values



Note: If brake test switch SA3 is present, this must be checked or adjusted after brake adjusting.
See SA3 Brake test switch mounting.

7.5 Setting and checking the brake block stroke and armature base plate



Before first commissioning and during monitoring, the working stroke of the brake blocks, the pretension and movement of the armature base plates are to be checked. The working stroke of the brake blocks is set at the plant to the height of the centre of the brake disc, measured to 0.3 mm + 0.1 mm by adjusting the armature screw with armature base plate.

On opening the brakes, make sure that both brake blocks work with the same stroke. To set the working stroke, the lock nut of the armature screw must be loosened and the prescribed stroke of the brake block set by turning the screw. After a longer period of use, it can occur that the rubber disc settles between the armature base plate and brake block, and this means that the pretension of the armature base plate is insufficient. To restore the pretension, spacer washers must be placed between the armature base plate and brake blocks. Correct pretension is achieved when the armature base plate can be turned on the armature screw despite light suction.

Fig.: 7.2 Brake adjusting (symbolic diagram)

1	Magnetic clamp
2	Cover ring
3	Armature base plate
4	Rubber disc
5	Armature screw
6	Lock nut
7	Brake release lever
8	Brake disc
9	Working stroke of blocks 0.3 mm



Note: If brake test switch SA3 is present, this must be checked or adjusted after brake adjusting

See SA3 brake monitoring circuit, chapter 8

7.6 Traction sheave replacement

Removal:



- De-energise the system, secure car and counterweight
- Take the load off the traction sheave, take off the ropes, and use a rope to secure the traction sheave rim on the lifting gear.
- Remove the rope guard
- Brace the traction sheave shaft between the machine and traction sheave
- * Open the outside bearing housing, remove the bracket.
Cover the bearing inner ring on the shaft end, sealed against dust.
- Undo the screws on the traction sheave hub and in the same circle of holes screw into the pressure thread of the traction sheave rim.
- By tightening the screws alternately and evenly, push the traction sheave rim off the hub.
- Remove the pressure screws and use lifting gear to remove the traction sheave rim from the assembly area.

* Only in the case of machines where the outside bearing is arranged on the shaft end.



Note: in the case of machines where the space available in front of the traction sheave shaft end is not sufficient to enable removal of the traction sheave, the complete machine must be raised and supported accordingly for assembly.

Mounting:



- Place the new traction sheave rim in position; check the data and dimensions.
- Use lifting gear to transport the traction sheave rim towards the hub
- Clean the hub and new traction sheave rim in the area of the locating connection (do not grease or oil)
- Align the hub seat for hub fitting and screw holes to the hub threads (insert the screws in the drilled holes).
- Use hexagon screws to bolt together the traction sheave rim and hub. Use a torque wrench to screw in the screws. This must be repeated alternately in a circle until no rotational movement can be perceived and the prescribed torque is reached.
- **NB:** if installed incorrectly, the traction sheave can jam and is not flush at the hub.
- Ensure screws are secure and tightening torque is correct!
See chapter 9.
- Mount and align the outside bearing, bracket and rope guard.
- Remove the brace, hang up the ropes, remove the strain relief
- **Before commissioning**, check the installation and machine room.
Anything that might endanger operation must be dealt with.



7.7 Motor replacement

Removal:



Place the new motor in position; check the technical data.



Disconnect the power from the installation and secure the car and counterweight.

Attach and secure the motor to the lifting gear.

Unplug the electrical connections and lines from the motor (motor magnetic clamp and pulse generator connections)

Loosen the nuts on the coupling disc and unscrew until the conical spring washer no longer contacts the dutch rubber (reduce initial tension of the dutch rubber). Remove the nuts of the motor mounting on the motor flange (Fig. 7.3 Item 8).

Screw 2 hexagon screws into the pressure thread on the mounting flange (Fig. 7.3, Item 7) and press the motor (secured on the lifting gear) off the motor flange.

Carefully pull the motor with coupling disc from the coupling on the gear and place on the ground.

Remove the pressure screws on the gear flange.



Note: the coupling half on the motor has been fitted at a heat of 300 °C. It can only be pulled off by means of a hydraulic press. We therefore recommend in the event of motor replacement that you obtain the motor with the coupling half mounted.

Mounting:

Attach and secure the motor to the lifting gear.

Raise the motor using the lifting gear and align the motor coupling and brake disc. The positions of the motor mounting holes in relation to the screws on the gear flange, as well as of the drilled holes on the coupling disc in relation to the dutch rubber, must correspond.

(If there is an offset, hold the motor firmly and align the position of the coupling holes by turning the handwinding wheel of the motor.)

Push the motor with coupling half on screws on the motor flange and with coupling disc over the dutch rubber of the brake disc. Screw the nuts onto the threaded bolts on the gear flange and tighten evenly with the prescribed torque. Tighten the lock nuts on the coupling pins (pretension) until the rubber elements make contact with the hole diameter of the motor coupling half. It must no longer be possible to turn the conical spring washers (Item 4) before the dutch rubbers by hand.

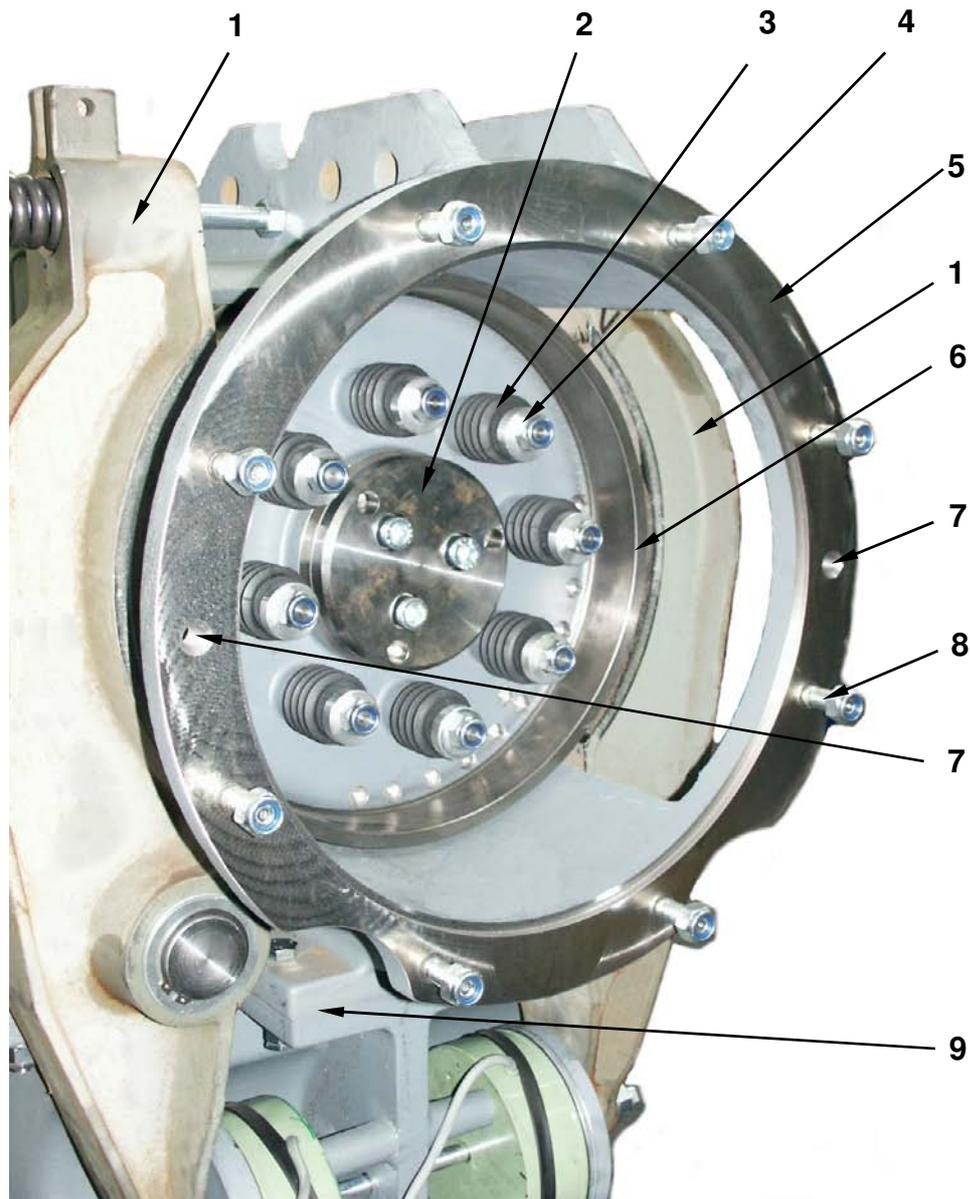


Fig. 7.3

1	Brake blocks
2	Disc on worm shaft
3	Dutch rubber
4	Conical spring washer
5	Motor flange on the gear
6	Brake coupling disc
7	Pressure thread
8	Threaded bolts
9	Gear box casing

7.8 Checking the backlash



Natural wear enlarges the backlash on the worm drive between the worm wheel and worm shaft.

If the **wear limit value** (backlash) of **2.5 mm** is reached, the gear drive can no longer be deployed for safety reasons.

The gear set (worm wheel and worm shaft) is to be replaced or the gear drive is to be replaced.

Measurement possibility:

- Take the load off the gear drive; (remove ropes from the traction sheave)
- Perform the measuring operation with the brake closed; secure the brake disc against axial movement (bearing play)
- Fit a measuring attachment to the traction sheave, e.g. screw clamp
- Specify the measured radius (M) and mark the measuring point
The radius (r) for the W332B = 270 mm
- Attach a dial gauge with magnet stator at the gear drive housing and align to the measuring point (M).
- Turn the traction sheave by hand until the dial gauge pointer moves.
- Move the traction sheave back and forth until resistance is felt in both directions. The tooth flanks of the worm wheel should have a load of approx. 20 - 50 N.
- Read off the dial gauge (ME).
- Use the formula below to calculate the backlash.
- This measurement is to be carried out in at least three different positions on the wheel circumference!

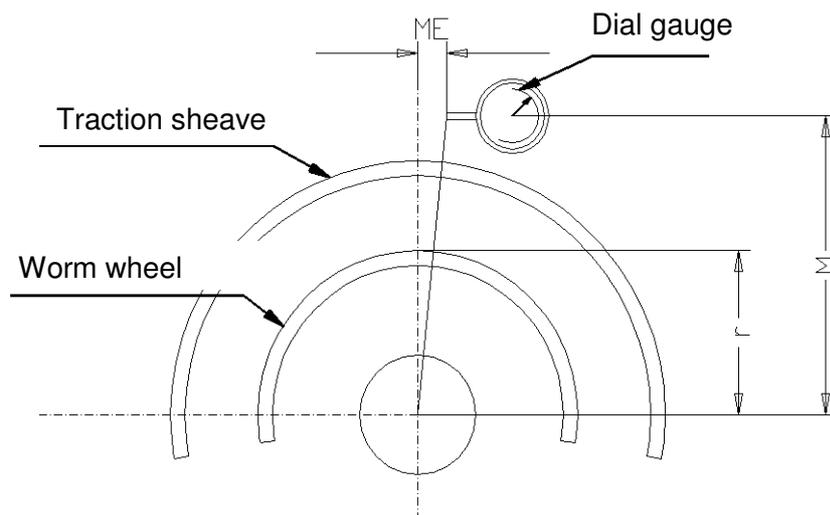


Fig. 7.4

M = radius

ME = measurement result

r = radius of worm wheel

All dimensions in mm

$$\text{Backlash} = \frac{\text{ME} * r}{M}$$

7.9 Bearing replacement at the outside bearing

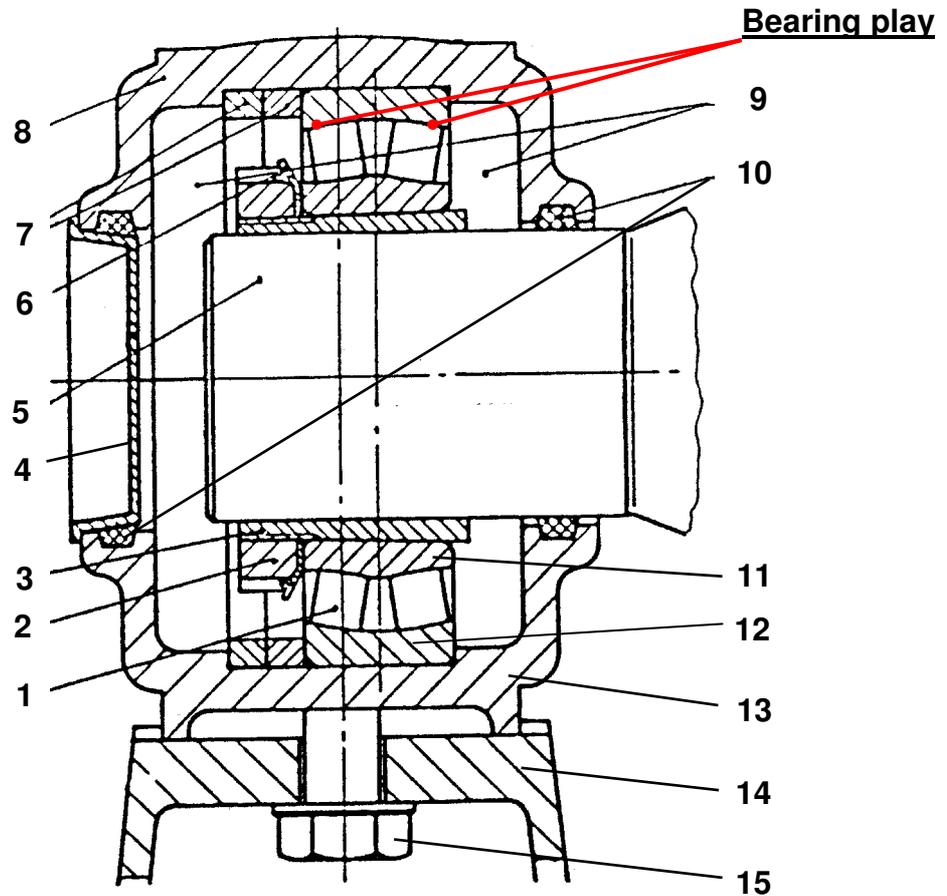


Fig. 7.5

Illustration: outside bearing arranged on the shaft end of the wheel shaft (without rope guard carrier mounting)

1	Self-aligning bearings	9	Grease chamber
2	Groove nut	10	Sealing ring (felt)
3	Adapter sleeve	11	Bearing inner ring
4	Bearing cover	12	Bearing outer ring
5	Traction sheave shaft	13	Lower part of the housing
6	Retaining plate	14	Bracket
7	Integral collars	15	Hexagon screw
8	Upper part of the housing		



Note: due to the different bearing dimensions, different setting and control values apply for the minimum permitted radial play / backlash after installation for the various versions (standard, SA4 / SA9). You will find the relevant values at the end of this chapter.

Removing

- Support the wheel shaft with a supporting structure or with lifting gear (two-point mounting, pedestal supports)
- Remove the traction sheave from the shaft end (only with version in SA9)
- Remove the outside bearing bracket (not with SA9)
- Unscrew the upper part of the bearing housing
- Wipe off the grease and remove the two spacer rings
- Bend open the bent tooth of the toothed lock washer in the groove of the groove nut
- Loosen the groove nut with sickle spanner A135-145; for SA9 with A 205 - 220
- Loosen the adapter sleeve using light knocks (make sure that the seals on the bearing housing are not damaged!)
- Push the housing half and bearing to the shaft end and remove

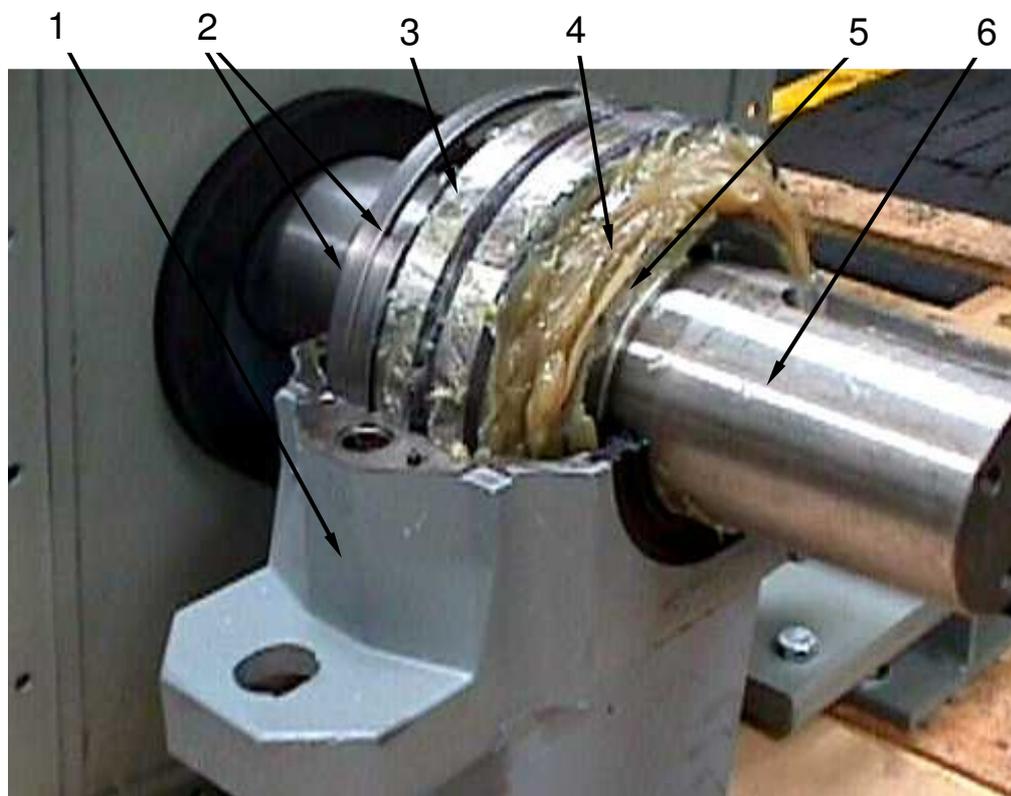


Fig. 7.6

Illustration: outside bearing without upper bearing half and traction sheave

Bearing supporting in shaft centre arranged before the traction sheave (SA9)

1	Lower part of bearing housing
2	Integral collars
3	Self-aligning bearings
4	Toothed lock washer
5	Adapter sleeve
6	Traction sheave shaft

**Mounting:**

Note: the washed mounting borehole as well as the seating of the shaft and adapter sleeve may only be oiled extremely thinly. Otherwise there is a danger that the fixed bearing ring and the adapter sleeve shift during operation.

- Push the rope guard mount onto the shaft. (Comply with the direction of installation!)
- Push the adapter sleeve with the collar side aligned towards the machine onto the shaft end of the wheel shaft
- Push the bearing and groove nut onto the adapter sleeve. Lightly tighten the groove nut with sickle spanner (A 135 - 145 or A 205 – 220 for SA9) to pretension the bearing.
- Check the dimension of the gap of the bearing fit in relation to the traction sheave hub (85 mm), see Fig. 7.7. With SA9, check the seating of the supporting bearing in relation to the shaft end = 293 mm, see Fig. 7.8.
- If required, correct the dimension of the gap. The adapter sleeve can be shifted on the shaft by knocking it lightly.
- Remove the groove nut, insert the safety plate and screw on the groove nut once again.
- Use a sickle spanner to tighten the groove nut until the prescribed radial bearing play is reached on both rows of pulley bodies.
See description "Checking radial play / backlash" in this chapter.
- Secure this setting by bending one of the teeth of the toothed lock washer into the groove of the groove nut.
- Insert felt packing in the outer ring grooves on the lower part of the housing of the pedestal bearing.
- Raise the lower part of the housing and join from below to the bearing.
- Slide the bracket under the lower part of the housing and align to the mounting holes on the lower part of the housing.
- Insert two integral collars in the lower part of the housing before the self-aligning bearing.
- Oil the felt packing and align in the outer ring grooves in the upper part of the housing.
- Grease the bearings with rolling bearing grease type F1
- Position the outside bearing housing upper part and bolt onto the lower part.
- Remove the strut of the traction sheave shaft, check the horizontal position and, if required, correct it by adding shims to the compensating support or outside bearing.
In the case of SA9, mount the traction sheave on the shaft end and secure the conical spring washer with new microencapsulated screws before checking.
- Secure the bracket; tighten the bearing housing screw connection; mount the traction sheave rope guard.



Note: in the case of inclined pulling (SA1), align the bracket in such a way that the bearing housing makes contact at the collar on the pull side.

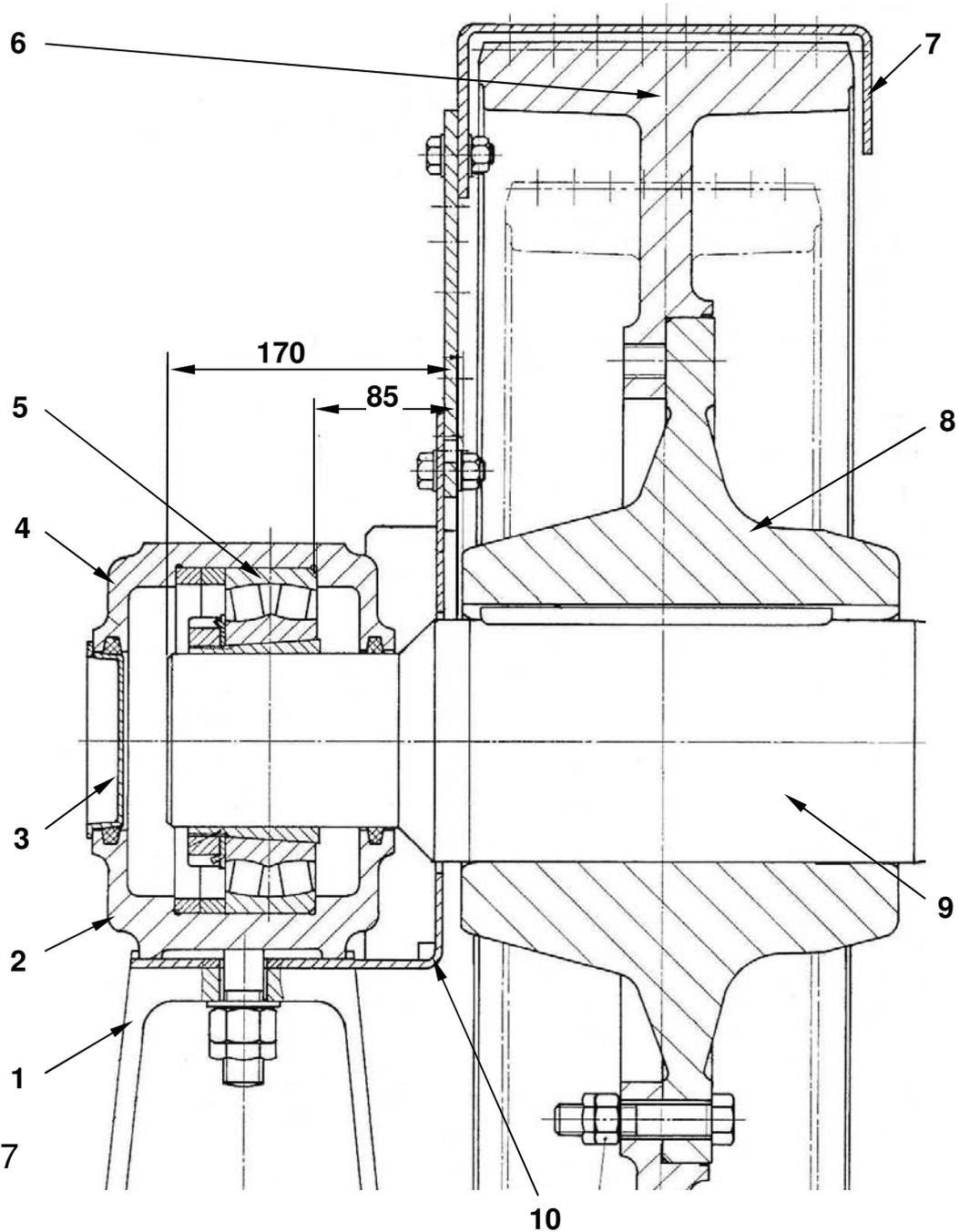


Fig. 7.7

Illustration of outside bearing for W332B

1	Bracket	6	Traction sheave rim
2	Lower part of the housing	7	Rope guard carrier
3	Protective cover	8	Traction sheave hub
4	Upper part of the housing	9	Wheel shaft
5	Upper part of the housing	10	Rope guard carrier

Arrangement of supporting bearing for SA9 version of the W332B

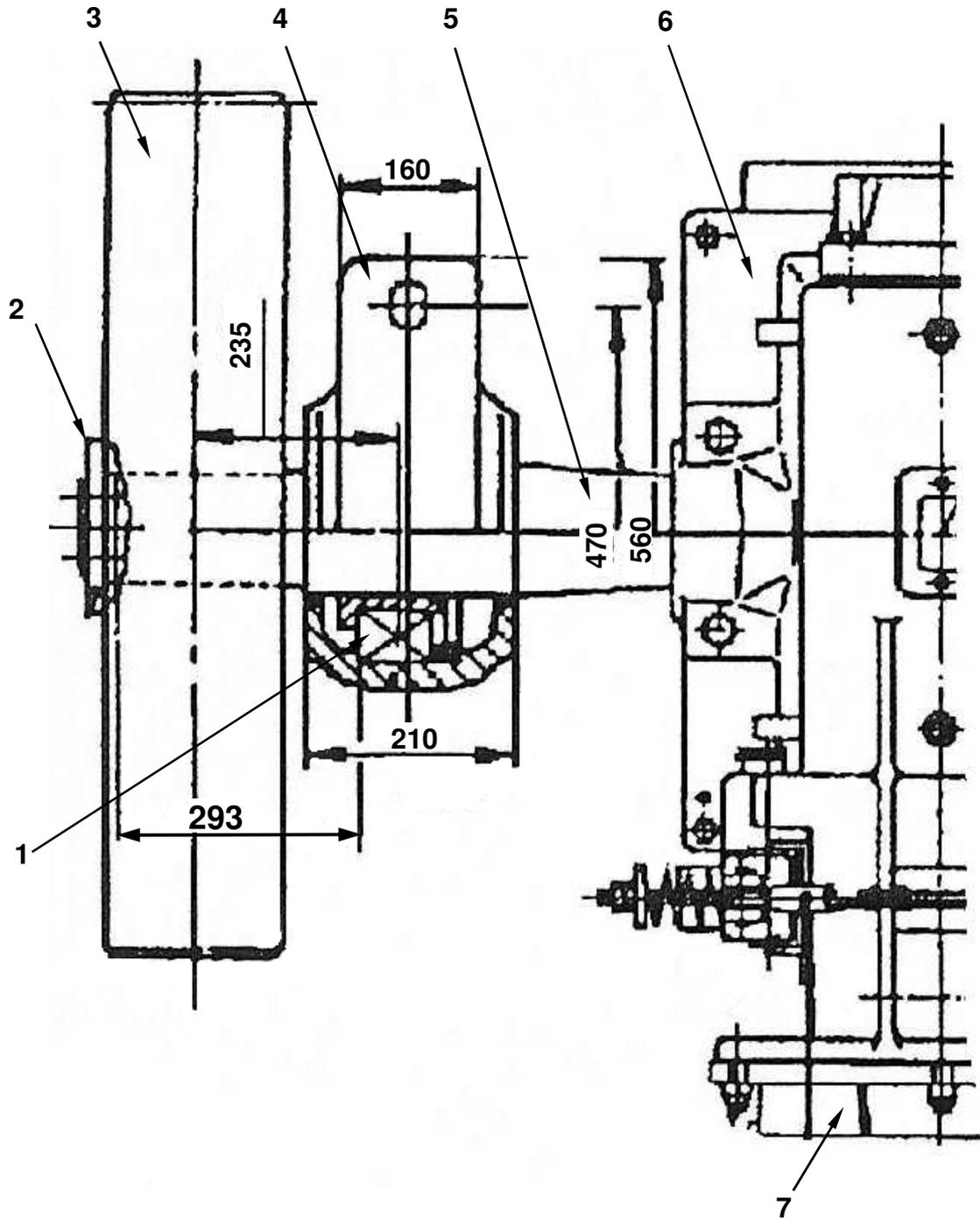


Fig. 7.8

1	Self-aligning bearings	5	Wheel shaft SA9
2	Disc	6	Gear box casing
3	Traction sheave	7	Motor flange
4	Supporting bearing		

Checking the radial play / backlash on the outside bearing / self-aligning bearing

The radial play / backlash on the self-aligning bearing must be checked at both rows of pulley bodies. Use a feeler gauge with different thicknesses of gauge plates for the measurement.

Check the radial play / backlash before, during and after installation of the bearing.

Run the check between the bearing outer ring and pulley without load (Fig. 7.9)

Before each check, turn the bearing a number of times, allowing the pulleys to evenly distribute around the circumference of the bearing.

Only if both rows of pulleys have the same check values is it ensured that the inner ring is not laterally offset in relation to the outer ring.

For installation, determine the permissible bearing play on the basis of the mounting borehole and radial backlash group.

The radial backlash group is based on the operating conditions and is marked on the outer ring of each bearing.

It is divided into the groups C0 (= normal), C3 and C4.

Group **C0** is prescribed for the outside bearing. If another group is used, we shall not assume any service life guarantee!

Check values for bearing play **before** installation:

Radial backlash group	Ø up to 100 mm Normal and SA4		Ø up to 160 mm for SA9	
	min.	max.	min.	max.
C0 [mm]	0.08	0.11	0.13	0.18

Check values for the **smallest permitted** bearing play **after** installation

Radial backlash group	Ø up to 100 mm Normal and SA4	Ø up to 160 mm for SA9
C0 [mm]	0.035	0.055

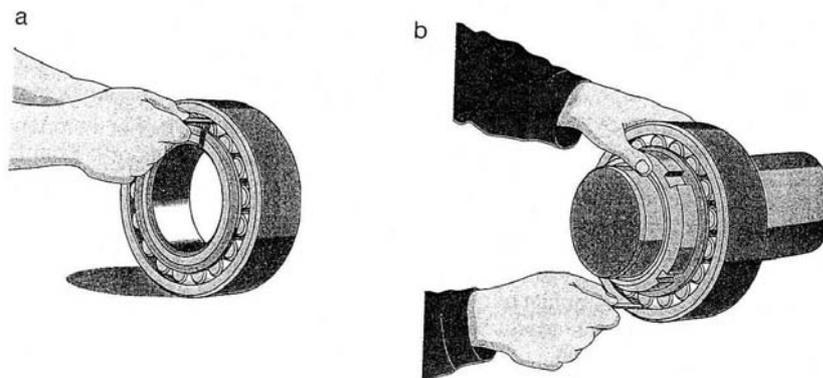


Fig. 7.9

Check the radial play / backlash with a feeler gauge

7.10 Checking for escaping grease / oil

Examine the area around the bearing cover, brake drum and brake linings for traces of oil.

A small amount of escaping oil means individual drops of oil or traces of oil in the area of the bearing seal.

Contamination level	Procedure	
No escaping oil determined	Check regularly within the framework of maintenance	Every 3 months (6 months if elevator used infrequently, < 50 000 runs per year)
If a small amount of escaping oil is determined	Clean and check regularly within the framework of maintenance	Every 3 months (6 months if elevator used infrequently, < 50 000 runs per year)
If a large amount of escaping oil is determined or oil is escaping from the brake disc / brake linings present	Clean the drive and, if necessary, the brake, and carry out short-term repairs Before continuing operation until modification, run a brake test. If the braking effect is inadequate, shut down the installation.	Repair after 4 weeks at the latest

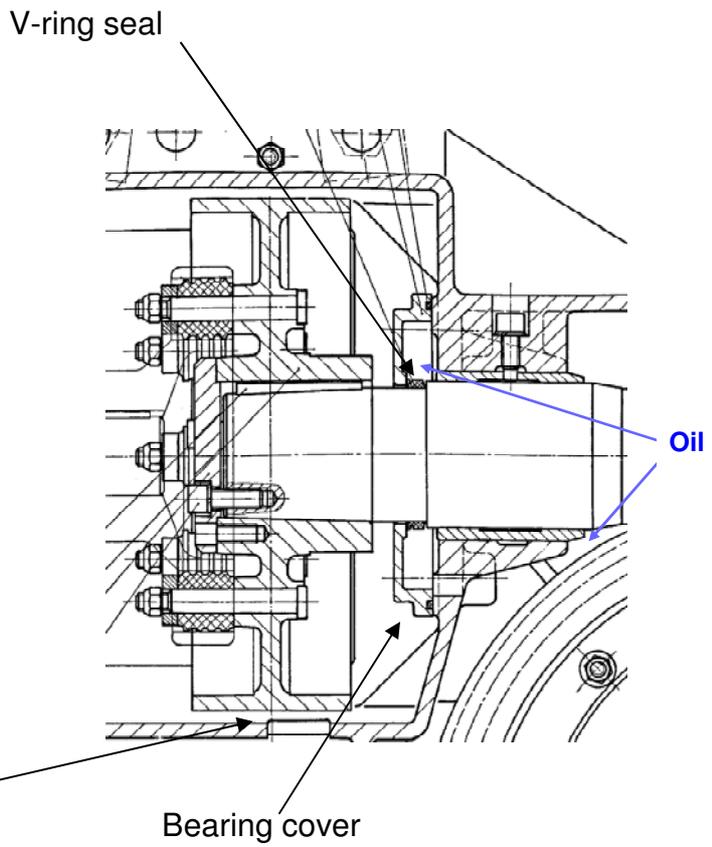


Fig. 7.10

Brake drum

Bearing cover

7.11 Check of the brake linkages

The brake linkages could chafe against the cast edge of the brake block. In the process, material could be removed and the braking effect impaired. Make sure that the brake linkages are "free" and unable to chafe.

Break the cast edge at the brake block (debur or radius)

Examine the brake release rod for traces of chafing; grease if necessary



Fig. 7.11

Remedy:

If necessary, debur the cast edge with a file so that there is no longer a sharp edge at this position and the brake linkages do not get stuck. If necessary, twist, align or grease the brake linkage.

8. Special versions (optional)

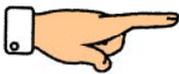
8.1 Overview of special versions (optional)

(extras for certain applications)

- SA 1** With bearing bushes turned by 90° for horizontal rope departure
- SA 2** extended worm shaft for handwinding wheel / flywheel rim on gear drive
- SA 3*** with brake monitoring
- SA 4** with extended traction sheave shaft and vapour-proof wall duct
- SA 7.1*** with tacho-generator (1 collector)
- SA 7.2*** with tacho-generator (2 collector)
- SA 7.3*** with tacho-generator / pulse generator
- SA 7.4*** with pulse generator
- SA 9** with extended traction sheave shaft for traction sheave arrangement in the shaft with pedestal bearing support
- SA 12** With additional terminal box for brake magnets in the case of motors without terminal boxes
- SA 15** With brake magnets in version sG4 (Ex)

The special versions marked with * are delivered separately due to the risk of damage in transit.

- SA3** **Brake monitoring** for checking the brake blocks (opened-closed) and brake lining wear.



Note: After adjusting the brake, the setting of the brake test switch must be checked and readjusted if necessary.

Description of setting, see 8.2 SA3 brake monitoring circuit

- SA4** With **extended worm wheel shaft and vapour-proof partition wall** for separation of drive and shaft. A sealing bearing bracket achieves partial Ex protection. With SA4 equipment, a supplementary operating manual with material number 60 000 20 86 0 for installation and operation of this special version is enclosed.

- SA7.1-SA7.4** **The tacho-generator or pulse generator mounting** is fitted on the end of the worm gear shaft of the gear. The tacho-generator / pulse generator mounting are delivered as loose parts due to the risk of damage in transit.

- SA9** **Traction sheave arrangement in the shaft.** Extended traction sheave shaft for traction sheave arrangement in the shaft. The traction sheave shaft is supported here by a bearing.

- SA12** Additional **connection box** for connection of the brake magnets on motors without connection box.

- SA15** The brake magnets are ex-protected versions (sG4)

8.2 SA3 brake monitoring circuit

a) Version for Thyssen control systems TCI, TCM

The brake monitoring circuit checks the brake blocks. It prevents motor movements when the brake is partially or fully closed. It enables detection of any brake lining wear at an early stage. Switches (sensors) are used to check whether the brake blocks are closed, open, or worn. The travel signal is used for the evaluation. If the monitoring circuit triggers, it switches the drive off once the destination has been reached.

Display is by means of LEDs on the sensors, on the brake monitoring in the control cabinet, and by deactivation of the drive. If a Teleservice device is connected, the fault is shown on the display.

Requirements for retrofitting:

Brake blocks with cast-on surfaces for mounting the setting screws. If these are not present, they must be replaced or a mechanical mounting must be created for mounting the screws.

Installation:

1. If not included in the scope of delivery, make two cables (0.3*0.75 mm² with PVC jacket) for direct connection of the sensors to the control system and connect them.
2. In the case of gear drives of the W row (W191, W263, W332) Secure the sensors with angle brackets on the pressure rod for the brake springs, see Fig. 8.3
3. Screw lock nuts onto the enclosed hexagon screws and screw into the thread on the brake blocks. The switch tappet must be opposite the setting screw, but should not make contact with it.

Setting:

Before starting the sensor setting, the brake block stroke setting must be completed! For description, see chapter 7

4. Switch on the emergency operation switch and elevator control system.
5. Adjust the setting screw for the switch until the LED lights up.
6. Slowly turn the screw back until the LED goes out.
7. Adjust the setting screw by ¼ revolution (corresponds to around 0.3 mm) towards the switch and lock with the nut. The LED lights up constantly.
8. Open and close the brakes by switching the motor on.
In doing so, check that a switch between opened and closed brake takes place at the sensors.

8.3 SA3 brake monitoring circuit BRC

b) Version for third-party products and older control systems (not TCI, not TCM!)

The brake monitoring circuit BRC is a set of retrofit electronics for checking the brake blocks. It evaluates the signals of the sensors and forwards them to the downstream control electronics. When the value set at the sensor is reached, the device switches off the drive.

Indication is in the form of light emitting diodes at the sensors and at the BRC brake monitoring in the control cabinet. If a Teleservice device is connected, the fault is shown on the display.

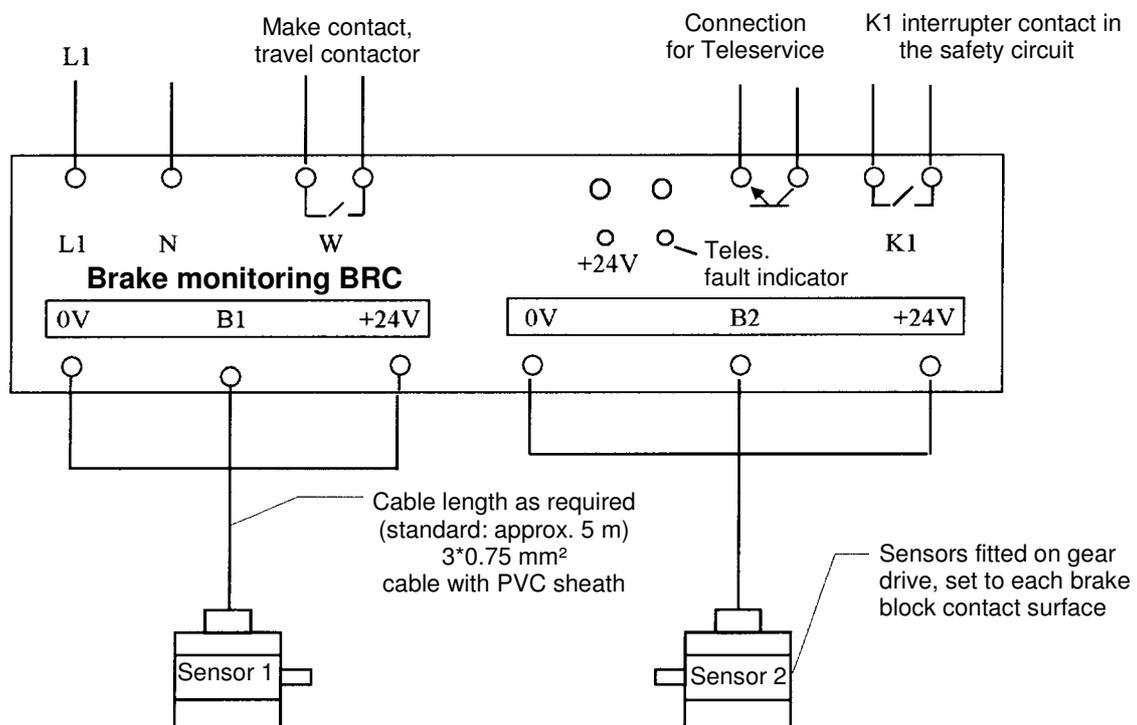


Fig. 8.1 **Connection plan for brake monitoring BRC**
valid for third-party products and older control systems (not TCI, not TCM)

Connections:

L1 and N For mains connection 230 V

W For make contact of the W contactor

B1 Sensor 1 with power supply 24V/0V

B2 Sensor 2 with power supply 24V/0V

K1 Make contact for evaluation (e.g. integration in the safety circuit)

Teles. for connection to a ThyssenKrupp Teleservice device (remote monitoring of the elevator)

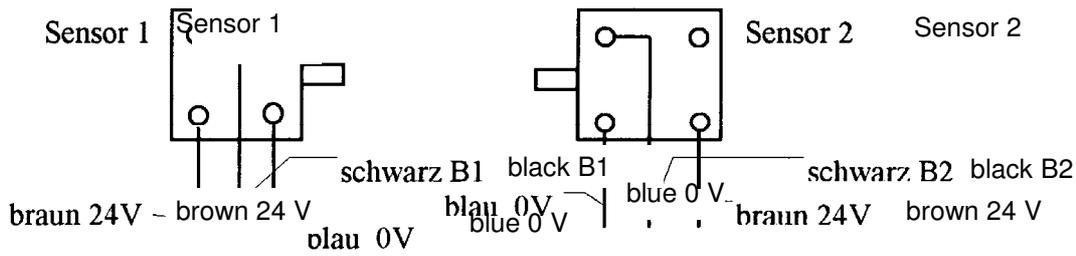


Fig. 8.2 Terminal connecting plan for sensors

Switch mounting SA3 on gear drives of the W series

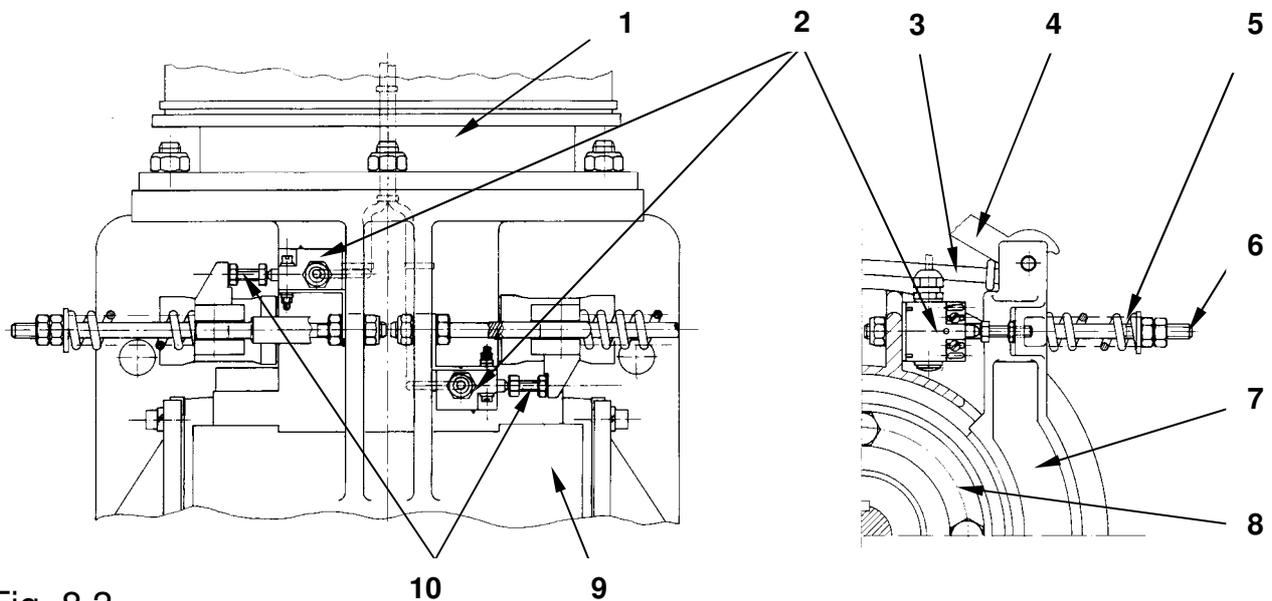


Fig. 8.3

1	motor	6	Spring tension screw
2	Test switch (sensor)	7	Brake blocks
3	Pressure rod	8	Brake disc
4	Brake release lever	9	Gear drive
5	Compression spring	10	Setting screw

8.4 Tachometer and pulse generator mounting SA7

(diagram W263B)

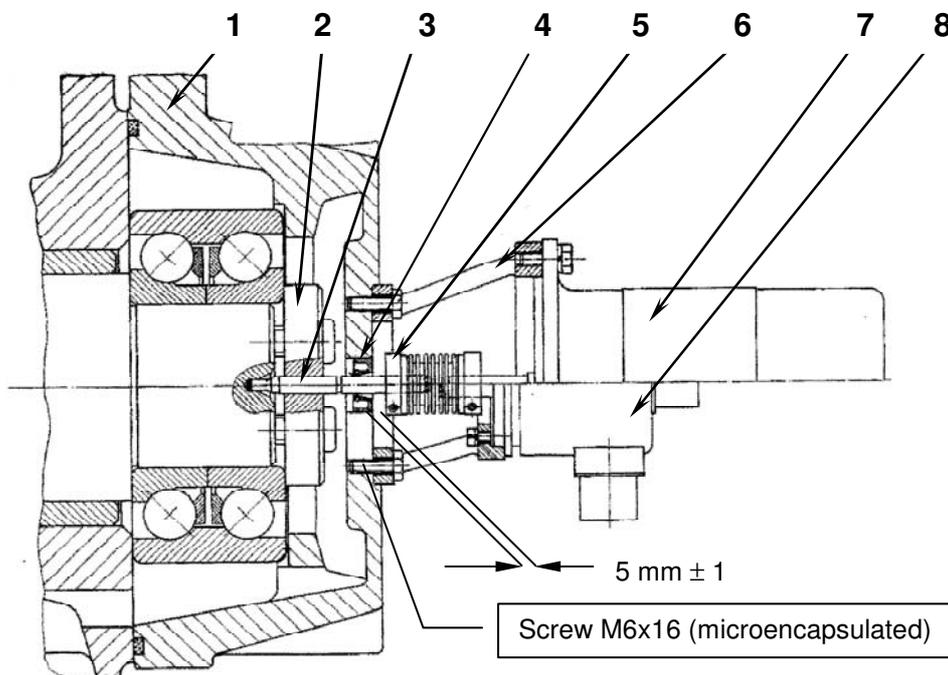


Fig. 8.4

1	Bearing cover	5	Coupling
2	Disc	6	Flange
3	Bolt	7	Actual-value sensor
4	Shaft sealing ring	8	Pulse encoder

Technical data:

SA 7.1 Tacho-generator RE.0444 1 x 60 V / 1000 rpm analogue DC
 I_{max} 0.18 A N_{max} 5000 rpm IP 44

SA 7.2 Tacho-generator RE.0444 2 x 60 V / 1000 rpm
 I_{max} 2 x 0.09 A N_{max} 5000 rpm IP 44

SA 7.3 Tachometer with pulse generator 1 x 60 V / 1000 rpm 2 x 120 imp./rev.
 I_{max} 0.06 A N_{max} 9000 rpm IP 55
 Power supply: 11 – 26 V DC

SA 7.4 Pulse generator 2 x 1000 impulses
 I_{max} 0.15 A N_{max} 9000 rpm IP 65
 Power supply: 10 – 30 V DC



Note: the values stated here can vary depending on the manufacturer; consult the type plate for exact details.

Mounting the SA7 tachometer and pulse generator mounting



Bearing cover replacement (only with **later** modification)
NB: take the load the gear drive before starting work!
 (set down counterweight, secure elevator car)

- Unscrew the rear bearing cover (Fig. 8.3, Item 1) on the gear drive and disc (Item 2) on the end of the worm gear shaft.
- Press in a new disc with pin (Items 3/4) in the centre of the worm shaft, align and screw on. Use a dial gauge to check the concentric running deviation of the pin (max. 0.05 mm).
If the maximum value is exceeded, correct it by aligning the disc.
- Tighten the screws evenly with the prescribed torque.
⇒ See table in chapter 9, 'Tightening torques'.
- Loosely screw the new bearing cover (Item 1) onto the gear drive.
- Use a centring sleeve to align the bearing cover centrally to the pin (Item 3); tighten the screws with the prescribed torque.
- Grease the shaft sealing ring (Item 4) with multipurpose grease F1. Carefully push over the pin and press into the bearing cover. Pay attention to the installation position!
⇒ see illustration in Fig. 8.3

Installing the tachometer / pulse generator

(Due to risk of damage, the mounting parts are supplied separately.)

- Remove the transport guard from the bearing cover (not required in the case of modification).
- Before continuing installation, check the concentric running of the pin (max. 0.05 mm) once again and align if necessary.
- Push the coupling (Item 5) onto the pin; secure with screw.
Comply with dimension 5 mm ± 1.
- Use microencapsulated screws to bolt the flange (Item 6) onto the bearing cover. NB: the screws may only be used once.
- Push the drive shaft of the tachometer / pulse generator into the coupling hole; secure with bolt. Firmly bolt the tachometer / pulse generator onto the flange.
- Connect according to the manufacturer's instructions, see Appendix, Chapter 9.



Note: comply with safety, installation and terminal connecting instructions in the operating manual and terminal connecting plan of the manufacturer,
 ⇒ see Appendix, Chapter 9

Mounting bolts for:	
Bearing cover (Item 1)	Disc (Item 2)
150 Nm	180 Nm

Tightening torques



Note: The centring sleeve required for alignment of the bearing cover is part of the equipment of ThyssenKrupp customer service, but it can be ordered from Lift Equip GmbH if required.

9. Appendix

9.1 Tightening torques



NB: during work on the machine or parts replacement, care must be taken to ensure that the prescribed bolt tightness and tightening torques are complied with.

Bolts / screws are to be secured against unwanted loosening during installation using Loctite 241.

	Tight- ness	DIN / ISO	Tightening torque Nm
Disc to worm shaft (brake disc side)			
Slotted pan head tapping screw M16 * 40	8.8	4762	150
Lock washer A16		128	
Disc to worm shaft (bearing cover)			
Slotted pan head tapping screw M16 * 40	8.8	4762	180
Lock washer A16		128	
Motor to gear drive			
Stud M16FO * 40	5.6	939	80
Hexagon nut M16	8	10511	80
Brake magnet to housing			
Hexagon screw M16 * 260	8.8	4014	150
Hexagon nut M16		10511	150
Front bearing cover to housing			
Hexagon screw M16 * 40	8.8	4017	50
Lock washer A16		128	
Rear bearing cover to housing			
Hexagon screw M16 * 60	8.8	4017	150
Lock washer A16		128	
SA9 disc to front of the traction sheave			
Slotted pan head tapping screw M16 * 60, microencapsulated	10.9	4762	300
Detent edged washer SK M16			
Outside bearing housing to bracket			
Hexagon screw M24 * 120	8.8	4014	200
Disc A25		7089	
Hexagon nut M24	8	24032	
Lock nut M24		7967	

Bracket to machine base frame

Hexagon screw M24 * 100		4017	200
Disc A25		7089	
Hexagon nut M24	8	24032	

Pedestal support to gear drive housing

Hexagon screw M16 * 40	8.8	4017	190
Lock washer A16		128	
Square taper washer for channels 18		434	

Pedestal support on machine base frame

Hexagon screw M24 * 80		4017	200
Disc 25		7089	
Hexagon nut M24	8	24032	

Traction sheave rim to hub

Hexagon screw M20 * 90	8.8	4014	330
Hexagon nut M20	8	24032	
Lock nut M20		7967	

For use cases not listed in the table, the following apply for

Allen screws DIN 912 ISO 4762

Hexagon screws DIN 931 / 933 ISO 4014 / 4017

Dimensions	Tightening torque M_A (Nm)		
	8.8	10.9	12.9
M4	2.6		
M5	5.3		
M6	9.0	12	15
M8	23	30	35
M10	45	60	75
M12	75	110	130
M16	190	270	320
M20	370	520	620
M24	640	900	1100

The screws are to be tightened with a torque wrench!



Note: microencapsulated screws are to be replaced after they have been used **once**.

9.2 Blocking clamp

A blocking clamp that matches the traction sheave (rim width and design) is part of each machine



Deployment of the blocking clamp:

Use the blocking clamp to prevent movements due to **slipping ropes** during installation work on the elevator car or counterweight or during work where the rope traction of the installation is insufficient (e.g. pulling out of the safety gear).



Note: the blocking clamp is to be tensioned by evenly tightening the hook bolts until it is excluded that ropes will slip.

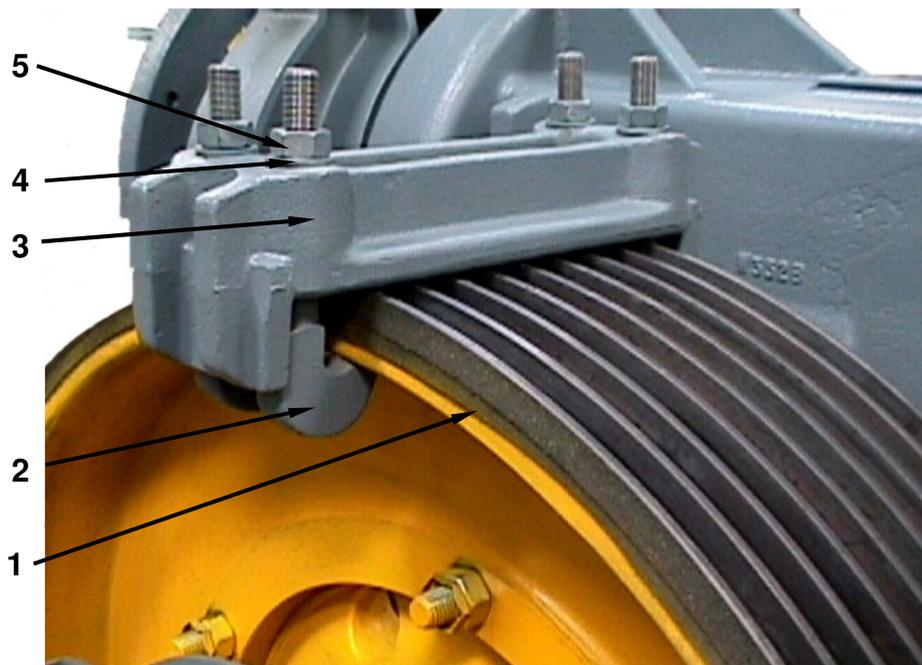


Fig. 9.1

Mounting the blocking clamp on the traction sheave

1	Traction sheave
2	Hook bolt
3	Clamp strap
4	Washer with tap
5	Hexagon nut



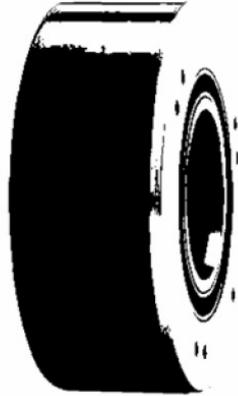
NB: after completion of the installation work, remove the blocking clamp, as otherwise the installation will be damaged.



WACHENDORFF

ELEKTRONIK GMBH & CO KG
 Industriestrasse 7 • D-65366 Geisenheim
 Tel.: 06722/9965-0 • Fax: 06722/9965-43

Hollow shaft Encoder WDG 100H

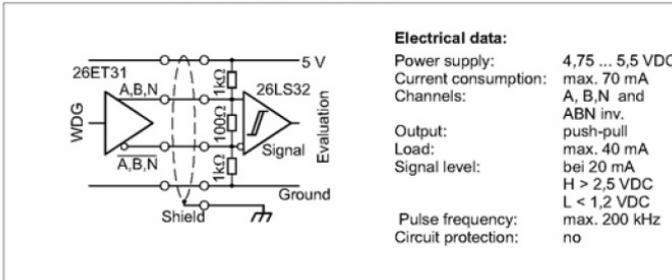


Order-No.: WDG 100H-XX-YYYY-ABN-I05-K3-D56

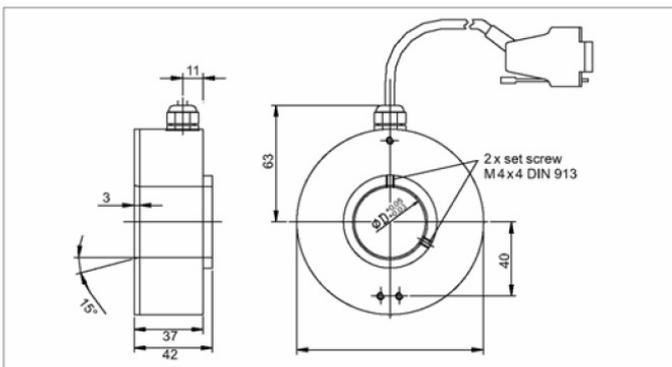
YYYY = No. of lines = 1024, 4096
 XX = Hollowshaft: 30, 38 mm

Suggested shaft adjustment:
 about hollow shaft diameter D (XX) = 38: 38m6 (k6, j6)
 about hollow shaft diameter D (XX) = 30: 30m6 (k6, j6)
 Max. concentricity deviation of motor shaft: 0,05 mm

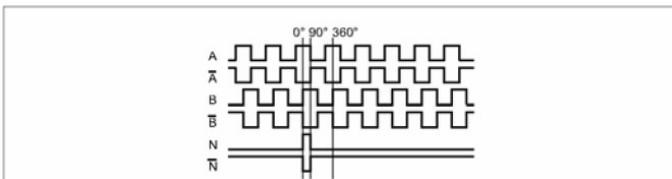
Thyssen-No.: 9950 000 6021 für 1024 lines
 9950 000 6022 für 4096 lines



Output circuit: 5 VDC: I05



Dimensional drawing WDG 100H, Dimensional specifications in mm.



View from shaft end, rotating clockwise.

Specifications

Mechanical Data

Housing	
- Servo flange:	Aluminium
- Housing:	Aluminium,
- Depth:	42 mm
- Attachment:	about Hollow-shaft with 2 set screw M4
Hollow shaft	
- Material:	Stainless steel
- Diameter:	30, 38 mm
- Loading on shaft-end:	max. 200 N radial max. 100 N axial
- Starting torque:	approx. 1.5 Ncm at ambient temperatur
Attachment:	2 x Hub M4, DIN 913
Bearings	
- Type:	2 precision ball bearings
- Service life:	3 x 10 ¹⁰ revs. at 100% of full rated shaft load 10 ¹¹ revs. at 40% 10 ¹² revs. at 20% max. 3.500 r.p.m.
Speed:	ca. 720 g
Weight:	radial with 10 m shielded cable with converted and metallised SUB-D9 connector with knurled screw UNC 4-40
Connection:	

Electrical Data

General Layout:	DIN VDE 0160
Supply / Output:	→ Output circuit
Cable length:	max. 100 m

Optics

Light source:	IR - LED
Service life:	typ. 100.000 hrs. differential
Scanning:	

Accuracy

in % einer Periodendauer des Signals A

Quadratue phasing:	90° ± 7,5%
Pulse on/off ratio:	50% ± 7%

Environmental Data

Measured mounted and housing grounded.

ESD (DIN EN 61000-4-2):	8 kV
Burst (DIN EN 61000-4-4):	2 kV
Protection rating (EN 60529):	IP54
Vibration (DIN EN 60068-2-6):	50m/s ² (10-2000 Hz)
Shock (DIN EN 60068-2-27):	1000m/s ² (6 ms)
Operating temperature:	-10°C to +70°C
Storage temperature:	-30°C to +80°C

Pin arrangement:

Function:	Pin	Colour:	
Negative	7	white	
Positive	9	brown	
A	2	green	
A inv.	1	red	
B	3	yellow	
B inv.	4	black	
N	5	grey	
N inv.	6	violet	
Shield	8	cord	+ Connector housing electrically



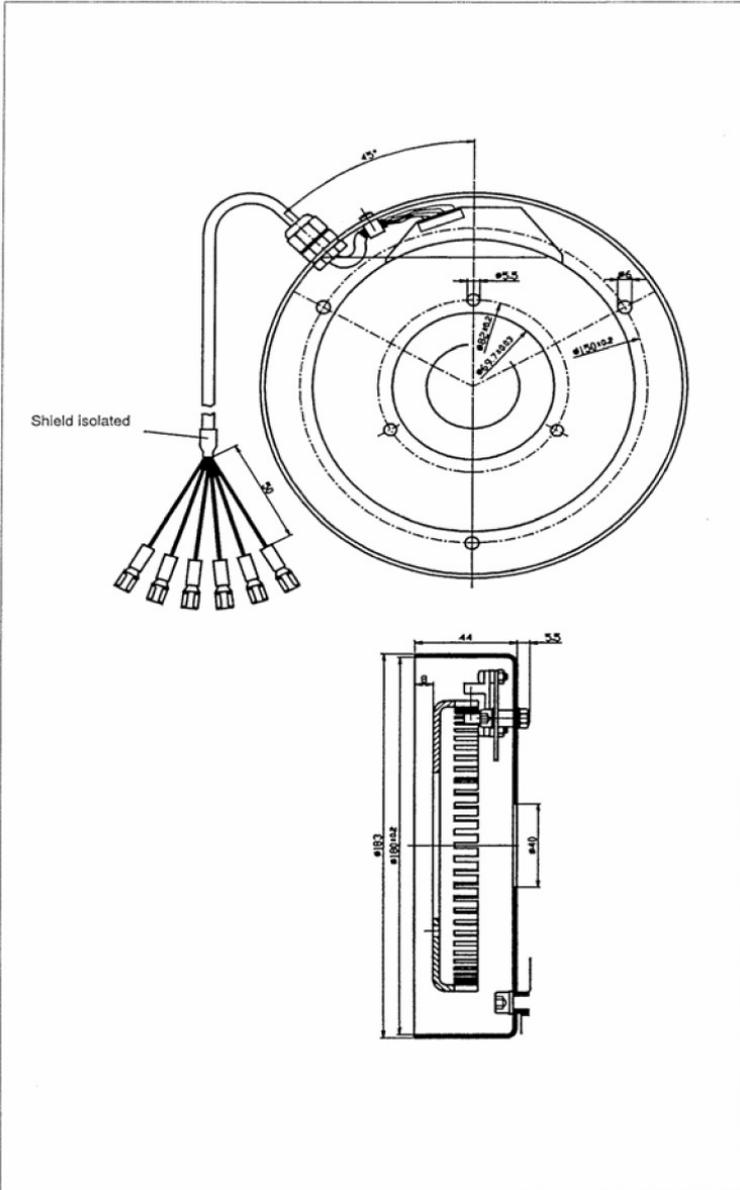
WACHENDORFF

ELEKTRONIK GMBH & CO KG
 Industriestrasse 7 • D-65360 Geisenheim
 Tel.: 06722/9965-0 • Fax: 06722/9965-43

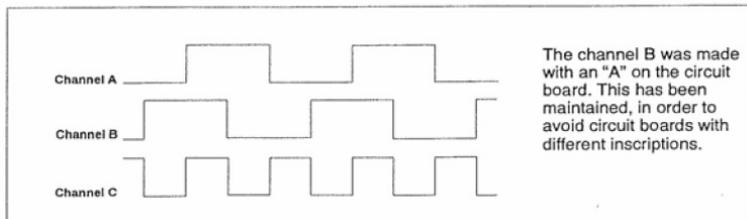
Encoder Kit K3

Ordering Code: K364AB15S-B56

Thyssen Reference No.: 00 990 12 03 0



Dimensional drawing Encoder-Kit with connector cup wheel.



Shaft turning clockwise, when looking at encoder front.

Specifications

max. Permissible line length	30m
max. Speed	1800 r.p.m.
Polarity-reversal protection	no
Short-circuit protection (signals)	yes
Operating temperature	-5° .. +50°C
Storage temperature	-20° .. +70°C
Protection rating	Ip00

Power supply	15V +15V / -15V
Tolerance (power supply)	+/-5%
Power consumption +15V	<=90 mA
Power consumption -15V	<=10 mA
Signal-Outputs A/B	3mA max.
Signal-Outputs C	1mA max.

Output level A / B High at max. Load and min. supply	min. 11,7 V
Output level A / B Low at max. Load and max. supply	max. 2,8 V
Rise time (10% .. 90%)	<= 10us
Fall time (90% .. 10%)	<= 10us
Pulse width (A / B)	50% +/-5%
Phase displacement (A / B)	75° .. 105°
max. difference A / B	7%
Connection:	10 m shielded cable connected with terminal sockets 6.3 - 1. Shield connected with Protective cover

Outputs:	A-Channel 64 r.p.m. at 15V
	B-Channel 64 r.p.m. at 15V
	C-Channel 128 r.p.m. at +/- 15V

In case of 15V supply, -15V can be connected to ground. Channel C is available in case of +/- 15V supply only.

Scope of delivery:

Circuit board
 Pre-assembled under galvanised protective cover
 with 10 m cable (connected) including terminal
 sockets; Connector cup wheel

Packing : Plastic bag

Connector details:

Function	Pin	Colour
A	6	grey
B	5	rose
C	3	green
Ground	4	yellow
+15V	1	brown
-15V	2	white
Shield	open	

Ground (potential) has been isolated from shield and housing.



WACHENDORFF

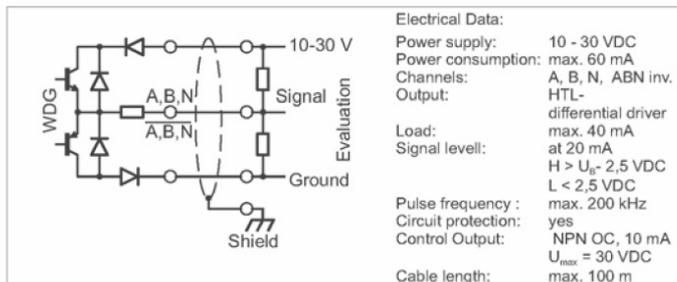
ELEKTRONIK GMBH & CO KG
 Industriestrasse 7 • D-65360 Geisenheim
 Tel.: 06722/9965-0 • Fax: 06722/9965-43

Hollow-Shaft Encoder WDG 100H

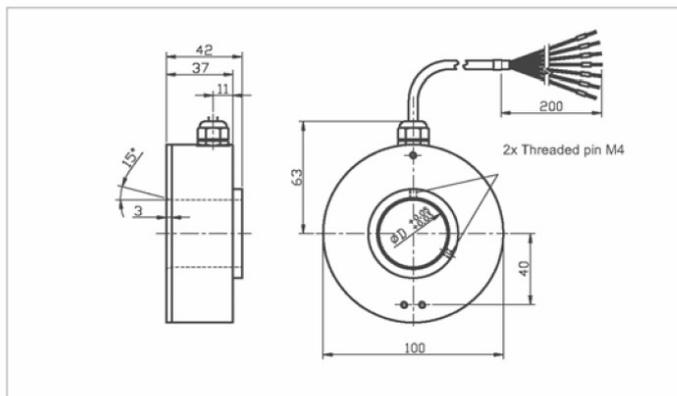


Ordering Code: WDG 100H-38-1024-ABN-I24-K3-C07

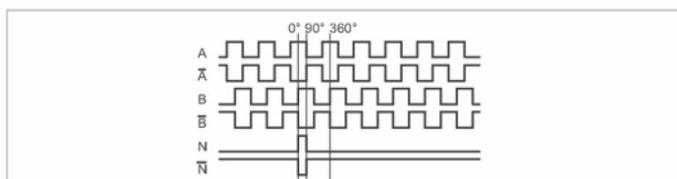
No. of lines: 1024 r.p.m.
 Hollow-Shaft diameter: 38 mm
 Thyssen Reference No.: 0099016030



Output circuit: 10-30 VDC: I24



Dimensional drawing WDG 100 H, Dimensional specifications in mm.



Shaft turning clockwise, when looking at encoder front.

Specifications

Mechanical Data

Housing
 - Flange: Aluminium
 - Housing: Aluminium
 - Diameter: 100 mm
 - Depth: 42 mm
 - Attachment: about Hollow-shaft with 2 set screw M4

Hollow Shaft
 - Material: stainless steel
 - Diameter: 38 mm
 - Load on Shaft end: max. 200 N radial
 max. 100 N axial
 - Torque: 1,5 Ncm
 Fastening: 2 x M4, DIN 913

Bearings
 - Type: 2 precision ball
 - Life: 3 x 10¹⁰ revs. at 100%
 Of full rated shaft load
 4 x 10¹¹ revs. at 40%
 3 x 10¹² revs. at 20%
 max. 3.500 r.p.m.
Speed: approx. 720 g
Weight: radial with 10 m
Connection: shielded cable with end splice

Electrical Data

General Layout: DIN VDE 0160
Supply / Output: Output circuit

Optic

Light source: IR - LED
Life: typ. 100.000 hrs.
Scanning: differential

Accuracy

Phase shift: 90° ± 7,5%
Pulse -on/off- ratio: 50% ± 7%

Environmental - Data

with housing shielded
ESD (DIN EN 61000-4-2): 8 kV
Burst (DIN EN 61000-4-4):
 -Power supply: 2 kV
 -Signals: 1 kV
Protection rating (DIN 60529): IP 54
Vibration (DIN EN 60068-2-6): 50m/s² (10-2000 Hz)
Shock (DIN EN 60068-2-27): 1000m/s² (11 ms)
Operating temperature: -10 - +70°C
Storage temperature: -30 - +80°C

Cable details

Function	Colour
Positive	brown
A	green
B	yellow
N	grey
A inv.	red
B inv.	black
N inv.	violet
Negative	white
Shield	cord



WACHENDORFF

ELEKTRONIK GMBH & CO KG
 Industriestrasse 7 • D-65360 Gelsenheim
 Tel.: 06722/9965-0 • Fax: 06722/9965-43

Hollow-Shaft Encoder WDG 100H

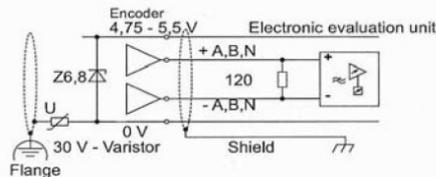


Ordering Code: WDG 100H-38-1024-ABN-SIN-K3-C07

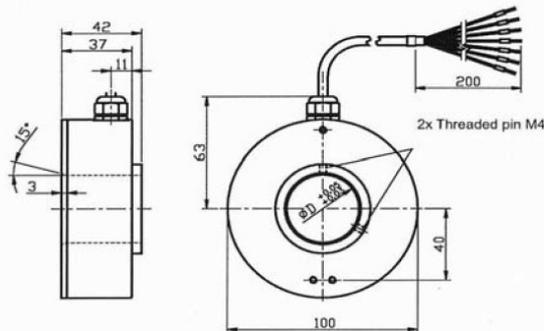
No. of lines: 1024 r.p.m.
 Hollow-Shaft diameter: 38 mm
 Thyssen Reference No.: 0099019030

Electrical Data:

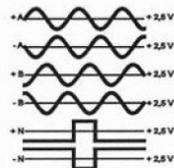
Power supply: 4,75 - 5,5 VDC
 Power consumption: max. 100 mA without load
 Channels: Sinus, Cosinus, N
 Output: push pull
 Load on output: min. 120 Ohm terminating resistor
 between + and - output
 Signal level: 1 V_{SS} +/- 25%
 Pulse frequency (-3dB): 100 kHz
 Circuit protection: no
 Control Output: conducting when defective
 Cable length: max. 150m at <260pF/m
 Design according to: gem. DIN VDE0160



Output circuit Sinus: SIN



Dimensional drawing WDG 100 H, Dimensional specifications in mm



Shaft turning clockwise, when looking at encoder front.

Specifications

Mechanical Data

Housing
 - Flange: Aluminium
 - Housing: Aluminium
 - Diameter: 100 mm
 - Depth: 42 mm
 - Attachment: about Hollow-shaft with 2 set screw M4

Hollow Shaft

- Material: stainless steel
 - Diameter: 38 mm
 - Load on Shaft end: max. 200 N radial, max. 100 N axial
 - Torque: 1,5 Ncm
 Fastening: 2 x M4, DIN 913

Bearings

- Type: 2 precision ball
 - Life: 3 x 10¹⁰ revs. at 100% Of full rated shaft load, 4 x 10¹¹ revs. at 40%, 3 x 10¹² revs. at 20%
 Speed: max. 3.500 r.p.m.
 Weight: approx. 720 g
 Connection: radial with 10 m shielded cable with end splice

Optic

Light source: IR - LED
 Life: typ. 100.000 hrs.
 Scanning: differential

Accuracy

Phase shift: 90° ± 7,5%

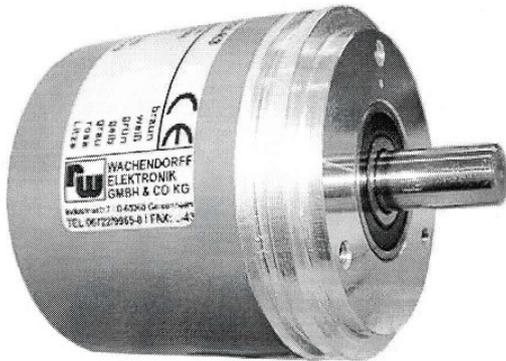
Environmental - Data

with housing earthed
 ESD (DIN EN 61000-4-2): 8 kV
 Burst (DIN EN 61000-4-4): 2 kV
 -Power supply: 1 kV
 -Signals: IP 54
 Protection rating (DIN 60529):
 Vibration (DIN EN 60068-2-6): 50m/s² (10-2000 Hz)
 Shock (DIN EN 60068-2-27): 1000m/s² (11 ms)
 Operating temperature: -10 - +70°C
 Storage temperature: -30 - +80°C

Cable details

Function	Colour
Positive	brown
A	green
A inv.	yellow
B	grey
B inv.	rose
N	black
N inv.	violet
Negative	white
Shield	cord

Encoder WDG 58C

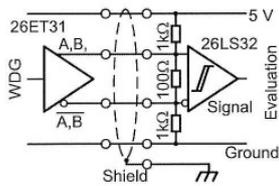


Order-No.: WDG 58C-XXXX-ABN-I05-S5R

No. of lines XXXX: : 250, 500 oder 1000 I/U
 Thyssen-number: 0099010030

Output circuit I05 (RS422 TTL compatible):

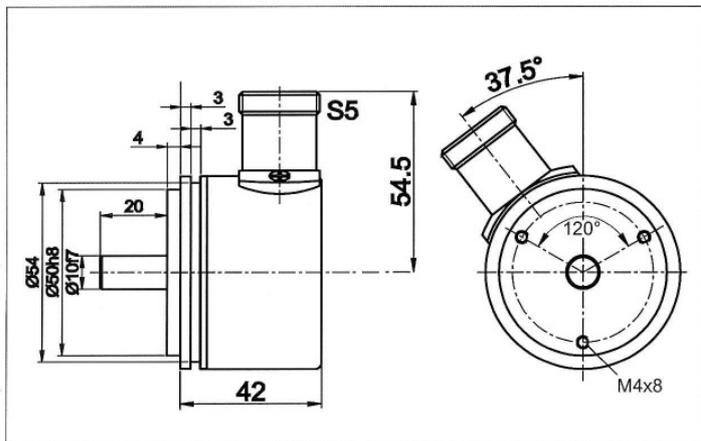
Design according to: DIN VDE 0160



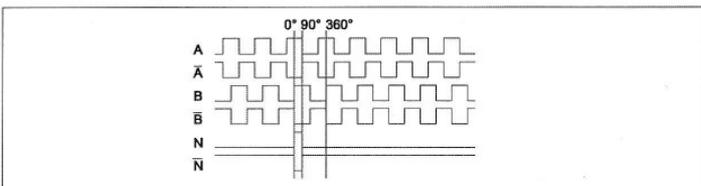
Electrical data:

Power supply: 4,75...5,5 VDC
 Current consumption: max. 70 mA
 Channels: A, B und AB inv. RS 422
 Output: max. 40 mA at 20 mA
 Load: H > 2,5 VDC L < 0,5 VDC
 Signal level: max. 200 kHz
 Pulse frequency: no
 Circuit protection: conducting when defective
 Early-warning output: max. 100m
 Cable length:

Output circuit: I05



Dimensioned drawing WDG 58C with S5, Dimensions in mm



Shaft turning clockwise, as seen from front of encoder..

Specifications

Mechanical Data

- Housing
 - Servoflange: Aluminium
 - Housing: Aluminium, powder coated
- Cam mounting: pcd. 69 mm
- Shaft
 - Material: stainless steel
 - Load on shaft end: max. 150 N radial
 - Torque: max. 80 N axial
 - 1 Ncm
- Bearings
 - Type: 2 precision ball bearings
 - Life: 10⁹ U at 100% of full rated shaft load
 - 10¹⁰ U at 40%
 - 10¹¹ U at 20%
- Speed: max. 8.000 r.p.m.
- Weight: ca. 250 g without plug
- Connection: 12-pin-Connector, radially, turning right

Electrical Data

General layout: acc. DIN VDE 0160
 Supply/output: → Output circuit

Optics

Light source: IR - LED
 Life: typ. 100.000 hrs.
 Scanning: differential

Accuracy

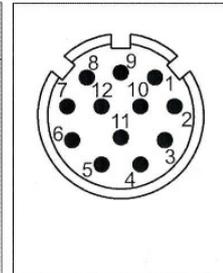
Phase shift: 90° ± 7,5%
 Pulse -on/off-ratio: 50% ± 7%

Environmental Data

With housing earthed
 ESD (DIN EN 61000-4-2): 8 kV
 Burst (DIN EN 61000-4-4): 2 kV
 Protection rating (EN 60529): IP 65
 Vibration (DIN EN 60068-2-6): 50m/s² (10-2000 Hz)
 Shock (DIN EN 60068-2-27): 1000m/s² (11 ms)
 Operating temperature: -10 - +70°C
 Storage temperature: -30 - +80°C

Pin arrangement

Circuit Function	I05, 245 Pin
Negative	10
Positive	12
A	5
B	8
N	3
Output*	11
A inv.	6
B inv.	1
N inv.	4
n.c.	2,7,9



Connector housing electrically connected to encoder housing.

SA 7 Instructions tachogenerators / pulse encoders

Assembly

- Check tachogenerator and motor for alignment.
- Use balanced coupling only.

Service:

- Every 2000 operating hours.

Brushes

- Check the brushes for freely rotating in the housing.
- The brush supports must be free of dust (do not use compressed-air cleaner since the brushes may be oily).
- Replace when the brushes are 5 to 6 mm long.
- The new brushes will be adapted to the collector form.
- The exact surface contact will be reached after 10 operating hours.
- If the brushes must be disassembled, mark position to be able to re-install them accordingly.

Collector

- Do not remove the patina below the brush path.
- Slightly drench rag in alcohol and clean, if required.
- Never use abrasives.

Lubrication

- The dynamo has sealed bearings with life-time lubrication.
Further lubrication not required.



Important information

We urgently advise not to remove the rotor from the stator.
The dynamo must always be re-calibrated after disassembly.

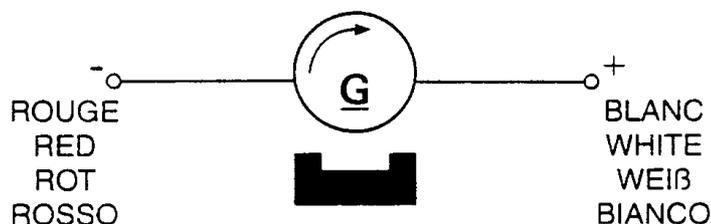
SA 7.1 Tachogenerator RE.0444

Connection

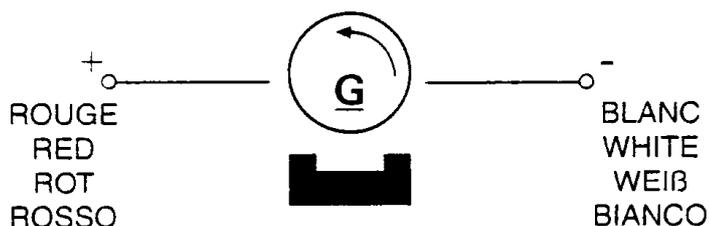
	RADIO-ENERGIE	SCHEMA DE BRANCHEMENT CONNECTING DIAGRAM	43856
-----------------------------------------------------------------------------------	----------------------	-----------------------------------------------------	--------------

Dynamo Tachymétrique à aimants permanents (1 collecteur)
Tacho Generator with permanent magnets (1 commutator)
Gleichstrom-Tachometerdynamo mit Permanentmagnet-Erregung (1 Kollektor)
Dinamo Tachimetrica a magneti permanenti (1 collettore)

Rotation sens horaire face au bout d'arbre
Clockwise direction facing the shaft end
Rechtsdrehung auf A-Seite gesehen
Rotazione in senso orario guardando frontalmente l'albero



Rotation sens anti-horaire face au bout d'arbre
Anti-clockwise direction facing the shaft end
Linksdrehung auf A-Seite gesehen
Rotazione in senso antiorario guardando frontalmente l'albero



Machine à sorties par cables
Unit with cable connections
Tacho mit Kabelanschluß
Versione con connessione tipo a cavo

A	18/07/97	JLM	Première diffusion - First issue
Indice - Index	Date - Date	Auteur - Name	Désignation - Description

ZI Fontaine de Jouvence - 3, rue Joly de Barmeville - 91462 MARCOUSSIS Cedex (France)
 Téléphone : (33) 01 69 80 67 04 - Fax : (33) 01 69 80 67 08 - Télex : RADERGI 604 359 F

SA 7.2 Tachogenerator RE.0444 N2B

2 windings voltage: 60 V / 1000 U/Min

Connection:

Direction of rotation (seen from drive side: clock-wise anti-clockwise

Connection 1 yellow wire	-	+
Green wire	+	-
Connection 2 white wire	-	+
blue wire	+	-

Installation-specific connection see respective connection diagram.

SA 7.3 Tachogenerator with incremental encoder

Type TDP 0,2 LT- 4 + OG 9D 120 constructional shape B10

Electrical data tachogenerator:

Tachogenerator voltage at 1000 U/Min	60 V DC
Max. tachogenerator speed	9000 U/MIN
Max. strength of current	67 mA
Protection class	IP 55

Electrical data double pulse encoder:

Pulses / rotation	2 x 120 electrically offset (delayed) by 90°
Supply voltage	+11 V to +26 V DC
Output load current per system	max. 60 mA

Connect tachogenerator with incremental encoder to rear wall board in control cabinet using cable (part No. 65 000 34 87 0) to rear wall board in control cabinet.

See circuit diagram of installation.



Wachendorff incremental encoders WDG

Product information WDG

This product information serves for the installation and connection of the encoder. You will find further information in our catalogue Wachendorff encoders WDG.

Safety-Related Guidelines

General Notes

The product knowledge is written for technically qualified personnel having special knowledge required in the field of measuring and control technology.

The exact information on all safety instructions and warnings contained in this product information as well as their appropriate technical application are prerequisites for safe installation and setup as well as the safety in operation and maintenance of the Wachendorff encoders. This absolutely requires that all measures be taken by qualified personnel. All persons working on the projection and installation of encoders should be familiar with the safety concepts of automation technology and qualified as defined above.

For the sake of clarity, not all details of the handling of encoders in all conceivable cases of application are described in this product information, nor can it cover all conceivable ways of mounting, operation and maintenance.

Should you require further information or face special problems that have not been dealt with in sufficient detail in this product information, please contact us and ask for this information. The technical data are given in the specification.

If these safety guidelines are not respected, this can result in damage to property, personal injury or death.

The Wachendorff encoders can only be operated in the application cases described in this product information.

We would also point out that all obligations of Wachendorff only result from the respective purchase agreement definitely regulating the warranty.

Purpose of application, improper usage

Wachendorff encoders exclusively serve for producing a number of electrical signals proportional to the mechanical turning of the encoder shaft. These signals can be used for the following purposes: Calculation of a pulse number, e.g. for the determination of a position, a volume or a force.

Calculation of a frequency e.g. for the determination of a speed or speed change.

The evaluation of the signal should be performed using adequate electronic components. Please consider especially that no signals are given when the shaft is turned without power being connected to the unit. Nor can an actual value memory of the evaluating device recognize these turnings.

An encoder should not be used as the only means of averting dangerous conditions of the machines and installations.

The machines and installations must be designed in a way that defective conditions cannot provoke situations dangerous to the operating personnel (e.g. caused by independent limit switches, mechanical locks). Above all make sure that the malfunction or failure cannot result in damage to property or danger to the operating personnel. If this is observed, an encoder can be used to prevent defects in machines or installations.

It is also important to prevent precautions taken for the safety of an installation from being rendered ineffective by the use of encoders. Moreover, an encoder should not be used as a step or tension device for driving elements. Mechanical and electrical limit values should not be exceeded, "emergency off" installations have to remain effective in all operating modes of the machine.

Notes on mounting

When mounting the unit, you should especially make sure not to exceed the admissible bearing loads. If the encoder shaft is mounted fixed, an adequate sprong or shaft, that keeps housing in place should be used so that the admissible loads of the encoder bearings are not exceeded. The encoder shaft, the flange and the bezel should not be worked on subsequently. The encoder may only be mounted with little force. The encoders should not be thrown or dropped. The min. admissible cable bending radii have to be observed. The connection cable must not be routed with mechanical tension. Please consider the fact that, in spite of their protection mode IP65, the encoders must not be exposed to a constant strong influence of water. The encoder does not contain any parts that have to be maintained by the user; it must not be opened. Repairs may only be carried out by the producer.

The non-observation of these guidelines will result in the loss of the producer's warranty and possibly in a malfunction or the failure of the encoder.

Notes on installation

The encoders have to be installed and connected respecting the relevant EN, DIN and VDE standards. During installation, power must not be connected to the encoder. Install the power supply and signal cables in such a manner as to prevent electric noise signals (e.g. inductive or capacitive interference voltages) from affecting the function of the encoder.

Attention: In case of encoders having a 5VDC power supply as well as certain output circuits the wrong polarity of the power supply, a short-circuit of the outputs or the connection of power to the outputs can cause the failure of the encoders.

Suitable hardware and software safety measures will have to be taken in order to prevent an interruption of the power supply or signal lines from causing an undefined or dangerous condition.

Notes on mounting, maintenance and repair work

The malfunction of an encoder can result in the following events:

- Breakdown of a channel: The channel either sends a constant voltage signal or no signals at all. Possible cause: cable break, breakdown of parts, measure to take: repair at the factory.
- Too many pulses: The electronic device counts more pulses than those given by the shaft rotations of the encoder. Possible cause: electric noise on the signal lines, defective parts. Measures to take: effective electric noise protection measures, repair at the factory.
- Not enough pulses: The electronic device counts less pulses than those given by the shaft rotations of the encoder. Possible cause: troubles of the power supply, mechanical slippage, limit frequency of the encoder or of the electronic device exceeded. Measures to take: test power supply, remove mechanical slippage, test limit frequencies.
- Electrical breakdown of the encoder: The encoder gives no signals. Possible causes: power supply defective, defective parts in the encoder. Measures to take: test power supply, repair of the encoder at the factory.
- Defective encoder shaft: The encoder shaft can only be turned with difficulty or not at all. Possible cause: defective bearings. Measures to take: test the mechanical load of the encoder shaft, repair at the factory.
- Bezel damage: The bezel of the encoder is damaged visibly (esp. crushed or burst bezels)

In any case of malfunction and especially of visible defects, the safe-function of the encoder is no longer guaranteed. The encoder may not be operated any more. Measures to take: put out of action, test the whole system and repair at the factory. Please consider the notes on electrical noise protection.

Encoders do not contain any parts that can or have to be maintained by the user. Repairs may only be carried out by Wachendorff.

ThyssenKrupp Aufzugswerke GmbH

Bernhäuser Strasse 45
73765 Neuhausen a. d. F.
Deutschland

Tel.: +49 7158/12-0

Fax: +49 7158/12-2585

E-Mail: info.aufzuege.de@thyssenkrupp.com

www.thyssenkrupp-aufzuege.de

Version 11/2010

Nr. 60 340 02 86 0