Preface

We are delighted that you have decided upon a quality product from the company THYSSENKRUPP AUFZUGWERKE 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

Compact gearless® DAF380

1. Safety
   1.1 Explanation of the symbols used 6
   1.2 Safety instructions 7
   1.3 Emergency measure "Releasing the car from the engaged position (safety gear) 10

2. Product description
   2.1 Description 12
   2.2 Functional description 14

3. Technology
   3.1 Technical data 15
   3.2 Dimensions of machine 16
   3.3 Dimensions of machine base frame 17
   3.4 Motor data 20
   3.5 Type plate 21
   3.6 Pulse generator 22

4. Transport and storage 24

5. Mounting the machine
   5.1 Machine setup 26
   5.2 Aligning the machine and machine base frame 26
   5.3 Connecting the machine 28

6. Commissioning 30

7. Maintenance / service
   7.1 Maintenance 31
   7.2 Lubrication 32
   7.3.1 Testing the brakes 34
   7.3.2 Setting braking deceleration 35
   7.4.1 Setting brake test switch (not CSA) 36
   7.4.2 Setting brake test switch (CSA version) 37
   7.5 Replacing brake blocks 38
   7.6 Replacing the traction sheave 39
   7.7 Replacing the pulse generator 41
   7.8 Checking for escaping grease / oil 43

8. Special versions / accessories (optional) 45

9. Appendix
   9.1 Tightening torques – tightness values 46
   9.2 Accessory parts 47
      Type test certificate of the braking device 50
      Declaration of conformity for the braking device 53
      CSA- Certificate of Compliance 54
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 are to 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 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.

For countries in which the CSA regulations must be complied with, the applicable regulations of the latest version of the National Electrical Code, Article 620, the latest version of the ASME A17.1, Safety Code for Elevators and the applicable regional regulations must be observed and/or complied with when carrying out the measures and following the instructions described in this manual.

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.

Obligation of the personnel

Persons assigned to work on the assembly 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 involved in 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 device 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 DAF380 has been constructed using state-of-the-art technology and in line with the recognised technical safety regulations. The DAF380 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 DAF380 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 the commissioning instructions, the installation description as well as the 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 DAF380
- Installation, commissioning, operation and maintenance of the DAF380 that is not in line with accepted technical principles
- Operation of the DAF380 with defective and/or malfunctioning safety and protective devices
1. SAFETY

- Nonobservance of the instructions in the operating manual with regard to transport, storage, assembly, commissioning, operation and maintenance of the DAF380
- Constructional changes to the DAF380 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
- Case of catastrophe due to third-party interference and force majeure.

Constructional changes to the DAF380 performed by the operator

The DAF380 is set at the plant and delivered ready for operation. If changes are made to the machine, the entire warranty of THYSSENKRUPP AUFZUGSWERKE GmbH shall become null and void.

Dangers in handling the DAF380

The DAF380 may only be operated in an enclosed machine room and only with the rope guard fitted on the traction sheave and deflecting rope pulley. Before mounting the handwinding wheel, the power to the drive must be disconnected and the installation secured against inadvertent activation. Remove the handwinding wheel **before** reconnection.

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.
1.3 Emergency measure "Releasing the car from the engaged position (safety gear)"

If the safety gear on the elevator car or counterweight has triggered, it can occur that the driving force of the traction sheave is insufficient to move the elevator; the ropes slip through.

Perform the following measures in this case:

- Switch off the drive and control system.
- Remove the traction sheave cover above the traction sheave.
- Release the hydraulic cylinder on the pull side of the traction sheave and place it in the mounting borehole in the machine base frame.
- Screw the pressure arm with centring pin facing downwards onto the front of the traction sheave. Here, use the thread near the cylinder (see Fig. 2).
- Engage the blocking clamp with lug in the ring groove under the brake disc and bolt in the next thread above the pressure arm on the traction sheave (see Fig. 1).
- Tighten the 3 pressure screws to clamp the ropes with the pressure piece.
- Operate the release lever on the brake magnet and pump the cylinder to move the traction sheave in the desired direction until the safety gear lock is released. (The drain valve must be closed; the centring pin of the pressure arm must be located in the groove of the cylinder)
- After the pulling operation has been completed, remove the blocking clamp and mount the rope fixing beam as well as the traction sheave cover according to instructions.

Note: if the path of the hydraulic cylinder or the traction sheave movement is not enough to free the elevator car, secure it by applying the rope clamp. Here, the rope clamp must be on the recess on the machine base frame. The other side of the rope clamp must be on the welded flat steel on the inside of the frame.
Lower the hydraulic cylinder, reset the pressure arm to the next securing thread on the traction sheave above the hydraulic cylinder. If there is not an adequate path for the blocking clamp, reset this too. Then repeat the procedure described until the elevator car is free. During the pulling operation, the rope clamp should not be attached to the ropes, as otherwise there is a danger that it gets between the ropes and traction sheave.

**NB:** before reconnection of the installation, ensure that the cause of the malfunction has been remedied and that the installation is in proper working order.

**Fitting the cylinder on the traction sheave**

![Diagram of cylinder fitting](image)

Note: you will find more illustrations of the additional tools required for the process in chapter 8 'Accessory parts'
2.1 **Description**

The machine consists of:

<table>
<thead>
<tr>
<th>Item</th>
<th>Part designation</th>
<th>Item</th>
<th>Part designation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Brake disc</td>
<td>8</td>
<td>Pressure piece</td>
</tr>
<tr>
<td>2</td>
<td>Disc on motor shaft</td>
<td>9</td>
<td>Brake test switch</td>
</tr>
<tr>
<td>3</td>
<td>Traction sheave</td>
<td>10</td>
<td>Terminal box</td>
</tr>
<tr>
<td>4</td>
<td>Pressure springs</td>
<td>11</td>
<td>Tightening screw</td>
</tr>
<tr>
<td>5</td>
<td>Brake magnet</td>
<td>12</td>
<td>Housing</td>
</tr>
<tr>
<td>6</td>
<td>Brake release lever</td>
<td>13</td>
<td>Brake block</td>
</tr>
<tr>
<td>7</td>
<td>Forced ventilation</td>
<td>14</td>
<td>Grease overflow pipe</td>
</tr>
</tbody>
</table>

![Illustration without rope guard](image)
Versions

The following versions can be supplied:

1. Elevator speed: 1.6 – 4 m/s
2. Electrical design for sinusoidal current regeneration, or braking to resistors
3. Groove profile of the traction sheave
4. Machine base frame versions
5. Safety-relevant accessory parts

Special versions, see description in 8
2.2 Functional description

**Machine**: the DAF380 consists of a frequency-controlled motor in design B3 (DIN IEC 34).

**Note**: it is intended for operation with 1:1-, 2:1- suspension with single or double rope wrap.

Depending on the motor type and control, the generated braking energy can be

a) routed to resistors
b) returned sinusoidally to the mains system (see chapter 5)

The motor shaft and rope pulley are mounted on rolling bearings. The traction sheave with integrated brake disc is pressed onto the conical end of the motor shaft and additionally secured with a disc screwed onto the front. The screws are microencapsulated to prevent inadvertent loosening and are seated on detent edged washers.

**The gearless machine has no automatic interlock.**

**Brake**: An electromagnetically actuated dual-circuit outer shoe brake in installed at the motor casing. Two independently acting brake blocks press the brake lining with preset spring force onto the brake disc cast on the traction sheave.

The braking force is configured in such a way that one of the brake blocks is sufficient to bring an elevator car loaded with full weight to a standstill.

The position of the brake blocks and wear on the brake linings is monitored by the test switch. In the event of a malfunction or if the set wear limit is reached, a signal is issued.

An electrically actuated double-vane magnet releases the brake. (each brake block has its own solenoid.)

For manual operation, a brake release lever is fitted to the double-vane magnet. This releases both brake blocks simultaneously when operated.

**Machine base frame**: a machine base frame that is required for setting up the machine (with double wrap including built-in rope pulley mounted on roller bearings) is delivered if so ordered with the drive, fully mounted as a unit.

(More details on the machine base frame and its dimensions, see chapter 3)

**Accessories**: The accessories necessary for the operation, maintenance work and removal of malfunctions such as the blocking clamp for the traction sheave and rope pulley, rope clamp, handwinding wheel and hydraulic cylinder is delivered as options.

**Note**: A description of specified use is provided in chapter 9.
3.1 Technical data

**Permitted axle load of the motor shaft:** max. 190 kN

Braking torque : max. 2 x 2400 Nm

**Moment of inertia (mot.+ traction sheave) / (+ counterroller)**
24 kgm² / 30 kgm²

**Traction sheave** with integrated brake disc
560 mm rim diameter / 660 mm brake disc diameter

Number of grooves with version and rope diameter

**a) double wrap = number of semicircular groove unhardened * diameter**
- 14 * 10 mm
- 14 * 12 mm
- 12 * 13 mm

**b) single wrap = number of seat or vee grooves for the stated rope Ø with hardened groove flanks**
- 4 – 11 * 10 mm
- 3 – 10 * 11 mm
- 3 – 10 * 12 mm
- 2 – 9 * 13 mm

The groove shape (wedge angle for vee grooves, or re-entrant angle for seat grooves) must be selected in accordance with the required moving force.

**Weight:**
- Machine weight: 1500 kg
- Traction sheave weight: 250 kg
- Machine weight, including frame and counterroller: 2230 kg

**Technical data of double-vane magnet:**

<table>
<thead>
<tr>
<th>Power supply</th>
<th>Normal version</th>
<th>CSA version</th>
</tr>
</thead>
<tbody>
<tr>
<td>Holding current: (at U₄ = 50V)</td>
<td>2.3 A</td>
<td></td>
</tr>
<tr>
<td>Pick-up current (at UA = 95 V)</td>
<td>4.5 A</td>
<td></td>
</tr>
<tr>
<td>Rated retentive voltage:</td>
<td>100 V</td>
<td></td>
</tr>
<tr>
<td>for field forcing device:</td>
<td>180 V</td>
<td></td>
</tr>
<tr>
<td>Type of protection:</td>
<td>IP65</td>
<td></td>
</tr>
</tbody>
</table>

On the DAF380, the two magnet coils are connected in series.

**Technical data, forced ventilation:**

<table>
<thead>
<tr>
<th></th>
<th>Normal version</th>
<th>CSA version</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating voltage:</td>
<td>380 – 400 V</td>
<td>230 V AC</td>
</tr>
<tr>
<td>Mains frequency:</td>
<td>50 / 60 Hz</td>
<td>50 / 60 Hz</td>
</tr>
<tr>
<td>Rated power:</td>
<td>0.08 kW</td>
<td>0.10 kW</td>
</tr>
<tr>
<td>Current:</td>
<td>0.12 / 0.13 A</td>
<td>0.44 / 0.51 A</td>
</tr>
<tr>
<td>Air volume:</td>
<td>550 m³/h</td>
<td>550 m³/h</td>
</tr>
<tr>
<td>Noise level max.:</td>
<td>65 dB(A)</td>
<td>65 dB(A)</td>
</tr>
<tr>
<td>RC3 element</td>
<td>2µF / 450 V DB</td>
<td></td>
</tr>
</tbody>
</table>
3.2 Dimensions of machine

Fig. 4
3.3 Dimensions of machine base frame (optional)

Diagram of frame in left-hand design

**ASL** = parallel gap between the ropes on the rope departure
Fig. 19

M = middle offset of the rope groove position; traction sheave / deflecting pulley
Location and arrangement of isolation elements

Fig. 20

Machine base frame DAF380M with number and location of the isolation elements

<table>
<thead>
<tr>
<th>Static total load on all isolation elements</th>
<th>Number and location of isolation elements</th>
</tr>
</thead>
<tbody>
<tr>
<td>kN</td>
<td>G1</td>
</tr>
<tr>
<td>to 95</td>
<td>2</td>
</tr>
<tr>
<td>to 80</td>
<td>1</td>
</tr>
<tr>
<td>to 65</td>
<td>1</td>
</tr>
<tr>
<td>to 50</td>
<td>1</td>
</tr>
</tbody>
</table>
3.4 Motor data

In the case of synchronous machines, the max. current must not exceed the value on the type plate.

The technical data can be found on the type plate.
3.5 **Name plate**

**Version:**

1. **THYSSENKRUPP AUFZUGSWERKE**

<table>
<thead>
<tr>
<th>ASM 3-phase gearless</th>
<th>Type</th>
<th>No.</th>
<th>Year</th>
<th>Bj.</th>
</tr>
</thead>
<tbody>
<tr>
<td>IM Bau</td>
<td>IP</td>
<td>IP</td>
<td>Ins.-cl. F</td>
<td>Max. sheave load (SW)</td>
</tr>
<tr>
<td>S 5</td>
<td>Fahrt</td>
<td>ED</td>
<td>duty cycle</td>
<td>Weight</td>
</tr>
<tr>
<td>$P_n$ [kW]</td>
<td>$n_n$ [r/min]</td>
<td>$U_n$ [V]</td>
<td>$I_n$ [A]</td>
<td>$\cos f$</td>
</tr>
<tr>
<td>$P_n$ n Y U l-</td>
<td>$\cos f$ M</td>
<td>$M$</td>
<td>l-</td>
<td></td>
</tr>
<tr>
<td>Braking torque 2 f Nm [Nm]</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Traction sheave $\phi$ Treib. [mm]</td>
<td>Max. no. of ropes $\phi$</td>
<td>$\phi$</td>
<td>$\phi$</td>
<td></td>
</tr>
</tbody>
</table>

Made in Germany 9000 000 9184

2. **Lift Equip**

<table>
<thead>
<tr>
<th>ASM 3-phase gearless</th>
<th>Type</th>
<th>No.</th>
<th>Year</th>
<th>Bj.</th>
</tr>
</thead>
<tbody>
<tr>
<td>IM Bau</td>
<td>IP</td>
<td>IP</td>
<td>Ins.-cl. F</td>
<td>Max. sheave load (SW)</td>
</tr>
<tr>
<td>S 5</td>
<td>Fahrt</td>
<td>ED</td>
<td>duty cycle</td>
<td>Weight</td>
</tr>
<tr>
<td>$P_n$ [kW]</td>
<td>$n_n$ [r/min]</td>
<td>$U_n$ [V]</td>
<td>$I_n$ [A]</td>
<td>$\cos f$</td>
</tr>
<tr>
<td>$P_n$ n Y U l-</td>
<td>$\cos f$ M</td>
<td>$M$</td>
<td>l-</td>
<td></td>
</tr>
<tr>
<td>Braking torque 2 f Nm [Nm]</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Traction sheave $\phi$ Treib. [mm]</td>
<td>Max. no. of ropes $\phi$</td>
<td>$\phi$</td>
<td>$\phi$</td>
<td></td>
</tr>
</tbody>
</table>

Made in Germany 9900 000 6184

3. **ThyssenKrupp Aufzugswerke (CSA version)**

<table>
<thead>
<tr>
<th>ASM 3-phase gearless</th>
<th>Type</th>
<th>No.</th>
<th>Year</th>
<th>Bj.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inverter - duty motor / VPWM</td>
<td>IP</td>
<td>IP</td>
<td>Max. sheave load (SW)</td>
<td>Last</td>
</tr>
<tr>
<td>S 5</td>
<td>Fahrt</td>
<td>ED</td>
<td>duty cycle</td>
<td>Ins.-cl.: B</td>
</tr>
<tr>
<td>Power [HP]</td>
<td>Speed [rpm]</td>
<td>$U_-$ [V]</td>
<td>$I_-$ [A]</td>
<td>$\cos f$</td>
</tr>
<tr>
<td>$P_n$ n Y U l-</td>
<td>$\cos f$ M</td>
<td>$M$</td>
<td>l-</td>
<td></td>
</tr>
<tr>
<td>Rating 2 h Braking torque</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$P_n$</td>
<td>n Y U l-</td>
<td>$\cos f$ l-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 f Nm [Nm]</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Traction sheave $\phi$ $\phi$ [mm]</td>
<td>Max. no. of ropes $\phi$</td>
<td>$\phi$</td>
<td>$\phi$</td>
<td></td>
</tr>
</tbody>
</table>

Made in Germany 0000 000 6182

The current type and the technical data are specified on the type plate of product.
3.6 Pulse generator:

A sealed incremental hollow shaft pulse generator is fitted to the end of the rotor shaft to regulate and control the DAF380. The connection to the control system is via a 10-m long shielded connection cable with 9-pin Sub-D (RS 422) connector with UNC screwed connection that is firmly connected to the pulse generator. The line shield is placed on the connector and pulse generator housing.

Connection, assembly instructions and drawing, see chapter 7

Technical data for pulse generator type TTL:
sealed hollow shaft anchoring pulse generator with 2 signals offset by 90° and reference mark .

Number of marks (Z): 16384 impulses/revolution
Supply voltage: 4...6 V
Output driver: RS 422 / sine
Max. output frequency RS 422: 300 kHz
Push-pull output: 200 kHz
Permitted shaft movement of the drive element:
radial movement, static: ± 0.5 mm
Radial movement, dynamic: ± 0.1 mm
Axial movement, static: ± 0.5 mm
Axial movement, dynamic: ± 0.5 mm

Angle movement vertical to the axle:
Static 34 x 10^{-3} mm/mm
Dynamic 17 x 10^{-3} mm/mm

Operating temperature range: -20...+70 °C
Storage temperature range: -20...+85 °C
Permitted relative air humidity: 90 %
Operating current without load at 5 V 120 mA
Protection type: IP 65
Connection assignment of the pulse generator at the cable connector

(Make: Stegmann)

<table>
<thead>
<tr>
<th>PIN</th>
<th>TTL Signal</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>#UA1</td>
<td>signal line</td>
</tr>
<tr>
<td>2</td>
<td>UA1</td>
<td>signal line</td>
</tr>
<tr>
<td>3</td>
<td>UA2</td>
<td>signal line</td>
</tr>
<tr>
<td>4</td>
<td>#UA2</td>
<td>signal line</td>
</tr>
<tr>
<td>5</td>
<td>UAØ</td>
<td>signal line</td>
</tr>
<tr>
<td>6</td>
<td>#UAØ</td>
<td>signal line</td>
</tr>
<tr>
<td>7</td>
<td>GND</td>
<td>earth connection</td>
</tr>
<tr>
<td>8</td>
<td>Shield</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>+5VENC</td>
<td>supply voltage</td>
</tr>
</tbody>
</table>

View of insertion side

Fig. 6

Fig. 7
4. Transport and storage

Packaging:
The DAF380 is shipped as follows:

a) Ready-mounted on machine base frame, whereby the base frame and machine are in seal-wrapped in foil.
To provide protection during transport, wooden wedges are screwed underneath the machine base frame. These are to be removed before setup at the place of destination.

b) Only machine, bolted onto wooden pallet, seal-wrapped in foil.

Transport:
Transport must be effected in compliance with the safety regulations and observing the centre of gravity of the machine and 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 base frame and/or transport pallet, not the machine itself, with the forks.
• Pay attention to protruding parts! Danger of injury and damage!

Crane transport:
• Do not walk underneath suspended loads!
• Transportation chains or ropes are to be secured in the 4 corner drilled holes of the machine base frame. Pay attention to the centre of gravity!
• In the case of delivery without a base frame, secure to the transport base or eye bolts beside the forced ventilation and secure against falling over. Do not lift by the motor casing!
• After transport, remove the wooden transport protection slats.

Pay attention to the icons on the packaging or elsewhere.
Dimensions and weight
The weight data are specified on the packaging on a label on the machine. Please refer to the delivery note for the dimensions. Approximate details, see 3 Technical data, Fig. 4, or Fig. 18/19 (version mounted on base frame).

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. (According to EN 81, between +5° and +40° C)
The relative air humidity must not exceed 70%.
5.1. Mounting the machine

Setting up
The DAF380 machine is delivered fully mounted and aligned with an optional machine base frame (with double wrap, including rope pulley). The base frame is set up depending on the customer on the machine room floor or directly in a cement floor.

In order to comply with regulations for noise abatement and sound transmission, isolation elements are to be inserted between the frame supports and the ground. These differ according to the type of mounting:

a) Rubber block 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) Rubber block same as a) however with an additional base
   140 x 140 x 80 mm high, for mounting on a cement floor, support cast in cement floor (coating thickness \(\leq\) 60 mm). The support is also to be cemented in place.

The number of rubber elements is based on the total load.
The required individual load on the supports should be between 7000 and 12 000 N / support.
On arrangement of the supports, it is to be taken into account that the overall centre of gravity lies within the rubber elements. See Fig. 20.
You will find the versions and dimensions of the machine base frames in chapter 5

5.2 Aligning the machine and machine base frame

The machine is to be set up according to the plan of installation. The rope departure from the traction sheave and deflecting pulley is to be aligned plumb according to the drawing on the elevator car rope pulley or the counterweight pulley. With load applied to the ropes, the machine should be aligned horizontally on its installation surface. Irregularities are to be balanced out by inserting shims under the support.

Rope arrangement: the outermost rope coming from the elevator car rope pulley must be arranged on the 1st groove of the traction sheave on the brake disc side if all the grooves of the traction sheave are used.

Alignment of the machine on the frame:
The machine is aligned at the plant prior to delivery. After changing the machine location or after replacing the traction sheave or rope pulley, check the alignment and, if required, correct it.
The machine must be aligned on the base frame in such a way that the axle alignment of the traction sheave and rope pulley are exactly parallel. The lateral location of the rope grooves must be offset by half of the groove gap dimension (M). The parallel dimension of the gap (ASL) of the outgoing ropes is to be complied with.
(see illustration in Fig. 19).
Setting: the location of the axles and/or the dimension of the gap can be changed by loosening the securing bolts of the machine on the base frame and adjusting the lateral stop screws on the machine foot.

Take the direction of travel sign "Up - Down" out of the plastic bag connected to the drive and attach its according to the directions of travel where it is clearly visible above the traction sheave on the brake magnet housing.

Note: After completion of the setting up procedures, the securing bolts are to be tightened with the prescribed torque.

See chapter 9.
5.3 Terminal connection diagrams

Motor connection terminal plan:

- 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!

- The ventilation must be connected in such a way that the air flow is taken in and blown through the motor. See arrow direction on the air entry side at the ventilation.

**Note:** Observe direction of rotation.
Motor terminal box, CSA version

Connection
Brake test switch

Connection
Double-vane magnet

Blower motor connection

Fig. 15

Fig. 16

Fig. 17
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 and alignment of machine, frame and rope departure checked
- Mounting of the machine and base frame checked
- Bolts tightened and secured with the prescribed torque (see table 'Tightening torques', 9)
- Brake block stroke and setting checked (chapter 7)
- Setting and function of the brake test switch checked (chapter 7)
- Brake test run, each with one jaw (chapter 7)
- Function of handbrake release checked
- Rope protection cover fitted, function of safety shutdown device on removing the traction sheave hood checked
- Power connections, earthing of motor, forced ventilation and brake magnet connected and checked
- Special add-on components (optional) mounted and function checked
- Direction arrow (Up / Down) attached according to the direction of travel in a clearly visible position above the traction sheave on the brake vane magnet
  (the label is enclosed with a brief description in the brochure sleeve tied to the drive)

**NB:** if the drive is to be operated with a brake control circuit as a substitute for an emergency braking device (safety gear) in the upward direction in line with ABV 502/1 (see Appendix 9), we would like to expressly point out that the elevator system may only be put into operation with a functioning brake monitoring system!

Under no circumstances may the feedback cable or brake test switch be disconnected to put the installation into operation without a brake test switch by resetting the non-volatile memory (EPROM). Ignoring this instruction can endanger persons.
## 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 chapters:

<table>
<thead>
<tr>
<th>Item</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Check the brake blocks for wear; the remaining lining thickness must be at least 3 mm</td>
<td>7</td>
</tr>
<tr>
<td>Check the brake setting; the block stroke should be 0.3 mm</td>
<td>7</td>
</tr>
<tr>
<td>Check the braking deceleration</td>
<td>7</td>
</tr>
<tr>
<td>Check the function of the brake test switches</td>
<td>7</td>
</tr>
<tr>
<td>The grease filling of the front motor shaft bearing is to be topped up with the prescribed amount of grease every two years *)</td>
<td>7</td>
</tr>
<tr>
<td>Check groove profile on the traction sheave for damage and wear</td>
<td></td>
</tr>
<tr>
<td>Check that the screws securing the traction sheave and drive are securely seated; tighten if required</td>
<td>9</td>
</tr>
<tr>
<td>On the rope pulley (if present), check the grooves for damage and wear</td>
<td></td>
</tr>
<tr>
<td>Check motor bearings for wear (noise, play)</td>
<td></td>
</tr>
<tr>
<td>Check that electrical connections are in proper and adequate condition, i.e. undamaged; check that they are securely attached</td>
<td></td>
</tr>
<tr>
<td>Check that protective and safety devices are present, functioning and correctly set</td>
<td></td>
</tr>
</tbody>
</table>

*) Comply with the specified amount and procedure in chapter 7
7.2 Lubrication

**Lubrication quantity** on the **front** bearing (AS) of the motor shaft

<table>
<thead>
<tr>
<th>Yearly lubrication quantity</th>
<th>200 gr</th>
<th>See Fig. 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>e.g. multipurpose grease F1 cartridge 400 gr</td>
<td>Code no. 60 300 27 90 0</td>
<td></td>
</tr>
</tbody>
</table>

The lubricator is positioned on the drive side on the traction sheave (see Fig. 5).

The DAF380 requires otherwise no further relubrication.

- The second motor shaft rolling bearing has lifetime lubrication.
- The rolling bearings for the machine base frame rope pulley also have lifetime lubrication

e.g. multipurpose grease F1, can be obtained through THYSSENKRUPP AUFZUGSWERKE GmbH
Relubrication

When relubricating:
To distribute the grease filling uniformly in the bearing, observe the following:

a) Grease filling: Add in several partial quantities during operation (min. 3 or several parts).
b) Operate the drive for at least 3 minutes between the individual filling operations.

Note:
Lubricant must be refilled when the machine is running in order to ensure that distribution in the bearing is uniform!
Filling of uncontrolled lubricant quantities without redistribution through bearing rotary movements may cause damage to the bearing and sealing systems!
Use the specified lubricating grease only.
If other greases are used the:
  - Lubricating ability may degrade.
  - Grease ducts may harden.
  - Bearings may become damaged.

THYSSENKRUPP AUFZUGSWERKE GmbH will not be held liable for damage resulting from the use of non-approved lubricants.
7.3.1 Testing the brakes

Prior to initial operation and with the monitoring system running, the work stroke of the brake blocks must be checked. When opening the brakes, ensure that both brake blocks are operating with the same stroke.

**Setting the brake block stroke:**
With the solenoid actuated, the air gap between brake disc and brake lining should be **0.3 mm** (see the cast-in value at the brake blocks)

- Actuate brake magnet, check air gap with feeler gauge.
- Correct the setting by twisting the nuts on the setting screw at the brake block until the feeler gauge set at 0.3 mm can be pushed through the air gap at the same height of the arrow cast in the brake block without resistance.
- Secure this setting by tightening the counter nut and repeat this procedure at the second brake block.

---

**Fig. 21 Adjusting the brake**

This diagram is an example

---

**Important:** After adjusting the brake, the deceleration must be checked and the test switch inspected or readjusted.
7.3.2 Setting braking deceleration

The braking torque must be set on uniformly on both brake blocks by pretensioning the brake spring depending on the installation. The brake adjustment for the DAF380 is to be carried out only with one effective brake block with the elevator car loaded with the rated load on a descending run (full down) according to the value specified in the table below.

In a brake test, the braking distance \( s_a \) with one braking block should be below the specified value.

<table>
<thead>
<tr>
<th>Speed</th>
<th>( V ) m/s</th>
<th>1.6 – 1.75</th>
<th>2.0 – 2.5</th>
<th>3.0 – 3.5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Braking distance ( s_a ) M</td>
<td>( \leq 5 )</td>
<td>( \leq 10 )</td>
<td>( \leq 15 )</td>
<td></td>
</tr>
</tbody>
</table>

Important: In the case of repeated braking, the brake disc heats up, which causes braking behaviour and setting values to change. It is recommended, therefore, to have a sufficiently long cooling down phase between tests.

**Setting the braking force** (contact pressure of the brake block)

The braking force setting is made by changing the pressure spring pretension.

The system-specific deceleration is set by turning the pressure spring tightening screw at the brake block. Secure this setting with the counter nuts on the brake block. Repeat the setting procedure on the second brake block.

Important: **The maximum initial tension distance** for one block is **32 mm** (corresponds to approx. 13 screw revolutions).

The brake is set to this value when it leaves the factory. It must not be exceeded.

If the maximum value is exceeded, this can impair the brake function.

Caution: When setting, the test switch setting screw must not touch the switch contact, or only very lightly, because otherwise the switch will be damaged.

Note: Brake test switches must be checked or readjusted after adjusting the brake.

See 'Setting the brake test switch', chapter 7
7.4.1 Setting brake test switch (not for CSA)

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

**Setting:**

1. Switch on the emergency operation switch and elevator control system.
2. Adjust the setting screw (Fig. 14, item 6) towards the switch until the LED lights up.
3. Slowly turn the screw back until the LED goes out.
4. Adjust the setting screw by 1/4 revolution (corresponds to around 0.3 mm) towards the switch and lock. LED lights up continuously.
5. **Checking the setting:**
   Open and close the brakes by switching the motor. Check whether the sensors display the switch between open and closed brake.

**NB:** if brake monitoring is used as a substitute for an emergency braking device upwards, consult the instructions in chapter 6.
7.4.2 Setting brake test switch (CSA version)

Function:
There are two sets of identical brake test switches with the same function to monitor each brake circuit separately. The switches each contain a break contact and a make contact.

The break contact with contacts 11 and 12 is used to monitor the position of the brake block. With the brake open, the switch is closed.

The make contact closes the contacts 23 / 24 only when the wear limit of the brake linings has been reached and the brake is closed. The contacts must be switched in such a way that when one contact of both switches closes the drive is prevented from starting up.

With a correctly set brake test switch, all switch contacts must be interrupted with a closed brake.

Setting:

Note: Before starting to set the test switch, the brake block stroke setting must have been carried out! For description, see chapter 7 During the setting up procedures, the drive should be switched off for safety reasons.

- Connect the continuity test device to contacts 11 and 12 of the break contact. The adjusting screw must not touch the control tappet.
- In the home position of the drive (brake magnet without current), unscrew the setting screw for brake monitoring from the brake block towards the switch tappet until the signal interruption at the continuity checker indicates opening of the contact.
- Continue unscrewing the adjusting screw a further approx. 1/4 revolution.
- Secure this setting by tightening the lock nut.
- Repeat the setting procedure at the second brake test switch.

Checking setting:
Open and close the brakes by switching the motor. Observe whether the switch at the contacts corresponds to the above described procedure. Slide a feeler gauge between the setting screw and switch tappet. Select the thickness so that contact 23/24 is closed. When one of the contacts is closed, it must no longer be possible to start up the drive.
7.5 Replacing brake blocks

**Note:** With a remaining lining thickness less or equal to 3 mm, or if the brake linings have become unusable and the required deceleration is not achieved, the brake linings have to be replaced.

**Caution:** Before starting work, the counterweight and elevator car must be secured against uncontrolled movement. The plant must be de-energised. Torque must not act on the traction sheave.

1.) Disassembling brake blocks:
- Remove the tightening screw and pressure spring on the brake block; remove the securing element on the brake block pin.
- Remove brake block and refit the adjusting screw for brake magnet and test switch actuation at approx. the same distances on the new brake block.
- Install new brake block on machine.
- Reseat or bed in the lining to 75% contact area of the lining surface.
- Check the lateral alignment of the brake lining in relation to the brake disc support. In the case of misalignment, disassemble brake block and align to the brake disc centre by rearranging the spacer washers at the block bearing. (Washer thickness = 1 mm.)
- Fit the pressure spring with screw on the brake block until the brake lining makes contact with the brake disc.

**Caution:** the test switch screw must not touch the switch contact, or only very lightly, because otherwise the switch will be damaged.

2.) Setting brake block stroke
- With the solenoid actuated, the air gap between brake disc and brake lining should be 0.3 mm
- Set stroke as described in chapter 7
- Change and set the second brake block in the same manner.
- Secure setting by tightening the counter nuts.

3.) Setting braking deceleration
- Set the deceleration as described in chapter 7.

4.) Setting brake test switch
- Make the setting of the brake test switch at the brake blocks as described in chapter 7.

5.) Checking the settings at the replaced blocks
- After replacement, run the elevator with return and observe whether the both brake blocks open uniformly.

**Important:** After every brake block change, the block stroke, braking deceleration, setting and operation of the test switches must be checked and corrected if necessary.
7.6 Replacing the traction sheave

Disassembly:

- Disconnect the power from the installation and secure it against inadvertent activation
- Secure the car and counterweight
- Remove the traction sheave cover
- Ease load on traction sheave; lay down cables
- Secure traction sheave with lifting gear
- Measure the dimension of the pretensioned pressure springs on the brake and note down the value
- Relieve pressure on the tension springs by unscrewing the tightening screws until the traction sheave is free
- Unscrew the disc (Fig. 3, item 2) on the motor shaft
- Lightly screw in the disc with screws in the outer circle of holes of the disc at the traction sheave hub
- Place a spacer of approx. 5 to 10 mm thickness between the shaft end and the traction sheave. The dimension of the spacer must be such that it does not protrude beyond the front shaft face.
- By tightening the screws diagonally and evenly, remove the traction sheave from the shaft.
- Place down the traction sheave with lifting gear

Installation:

- Clean shaft end and traction sheave bore; do not under any circumstances alter dimensions of feather key, groove, shaft or bore.
- Do not apply grease or oil to the shaft and bore.
- Carefully mount new traction sheave with lifting gear on tapered shaft end of the motor shaft.
- Align the locations of the feather key and groove in relation to one another.
- Fit traction sheave on motor shaft, taking care with the brake blocks! (If necessary, operate the brake release lever)
- Screw disc at inner hole circle on the motor shaft.
  Use new microencapsulated screws with strength 8.8. Place detent edged washers under the screws to secure them against inadvertent release.
- Use a torque wrench to tighten the screws evenly (alternately, clockwise) in several turns to the prescribed tightening torque. See table 9
- Check the lateral alignment of the brake linings in relation to the brake disc support. In the case of middle offset, remove the brake blocks. Align the linings to the middle of the brake surface by rearranging the spacer washers. (Washer thickness = 0.5 mm.)
- Set the press-on force of the springs, brake block stroke 0.3 mm and brake test switches. See 7
• In the case of drives with counterrollers or deflecting pulleys, the middle offset "M" (see Fig. 19) and/or the alignment of the rope groove of the traction sheave and rope pulley are to be checked. If necessary, align them by moving the drive on the base frame.
• Fit the traction sheave cover.

**Important:** If installed incorrectly, the traction sheave can be released. Ensure screws are secure and tightening torque is correct! See table 9 in the Appendix.
7.7 Replacing the pulse generator

Disassembly:
- Pull off the plug connector for the pulse generator connection at the control system.
- Unscrew the pulse generator cover on the rear bearing bracket of the machine and pull off in an axial direction.
- Use an M2.5 Allen key to undo the locking screw at the locking ring.
- Grip the pulse generator by the housing and carefully pull it off the shaft end.

Technical data, see chapter 3
Installation:

- Before mounting the pulse generator, clean the shaft end; do not apply grease. The shaft end must be free of dirt and grease.
- Carefully push the pulse generator with mounting sleeve in the arrow direction (Fig. 23) on the shaft until it touches the next shaft collar. The locking ring should be located at the rear accessible end and make contact with the pulse generator housing.
- Carefully tighten the screw on the locking ring; the pulse generator must not be tensioned. It must be easy to move the pulse generator housing on the shaft.
- Push the cover over the pulse generator, whereby the fixing pin in the cover is to be aligned to the mounting point on the pulse generator.
- Push the pulse generator further using small rotational movements until it makes contact with the motor and the fixing pin secures the pulse generator housing.
- Tighten the screws for the cover on the motor casing (bearing cover).
- Secure the fixing pin with a lock nut.
- Plug in the connector for the pulse generator connection in the socket on the control system.

**NB:** do not connect the pulse generator when it is under voltage, as otherwise electronic components in the pulse generator are destroyed. When the pulse generator is not connected, the drive may only be switched on for testing with the rope slack.

![Diagram of pulse generator components](image)

**Fig. 24**

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Cover plate</td>
</tr>
<tr>
<td>2</td>
<td>Fixing pin</td>
</tr>
<tr>
<td>3</td>
<td>Encoder</td>
</tr>
<tr>
<td>4</td>
<td>Motor shaft</td>
</tr>
<tr>
<td>5</td>
<td>Pulse generator connection</td>
</tr>
<tr>
<td>6</td>
<td>Rear bearing cover</td>
</tr>
<tr>
<td>7</td>
<td>Ventilation grille</td>
</tr>
</tbody>
</table>
### 7.8 Checking for escaping grease / oil

Check the area around the bearing cover, brake drum, brake linings as well as the lower and/or inner area of the traction sheave for traces of oil. For the check, remove the cover plate above the traction sheave!

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

<table>
<thead>
<tr>
<th>Contamination level</th>
<th>Procedure</th>
<th>Procedure</th>
</tr>
</thead>
<tbody>
<tr>
<td>No escaping oil determined</td>
<td>Check regularly within the framework of maintenance</td>
<td>Every 3 months (6 months if elevator used infrequently, &lt; 50 000 runs per year)</td>
</tr>
<tr>
<td>If a small amount of escaping oil is determined</td>
<td>Clean and check regularly within the framework of maintenance</td>
<td>Every 3 months (6 months if elevator used infrequently, &lt; 50 000 runs per year)</td>
</tr>
<tr>
<td>If a large amount of escaping oil is determined or oil is escaping from the brake disc / brake linings</td>
<td>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.</td>
<td>Repair after 4 weeks at the latest</td>
</tr>
</tbody>
</table>
Traction sheave / brake drum

Fig. 7.8.1
8.0 Special versions

SA2 With motor snubber (version not for CSA)
The motor snubber limits switching surges on the motor winding. Not required in the case of THYSSEN frequency converters with integrated energy recovery, as standard precautions have been taken in the converter to limit the switching surges at the motor.
9.1 Tightening torques – tightness values

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.
Microencapsulated screws may only be screwed once. After unscrewing, they are to be replaced with new screws of the same type.

The following values apply for:
Allen screws DIN 912  ISO 4762
Hexagon screws DIN 931 / 933  ISO 4014 / 4017

The screws are to be tightened with a torque wrench!

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>Tightening torque M</th>
<th>M&lt;sub&gt;A&lt;/sub&gt; (Nm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tightness</td>
<td>8.8</td>
<td>10.9</td>
</tr>
<tr>
<td>M4</td>
<td>2.6</td>
<td></td>
</tr>
<tr>
<td>M5</td>
<td>5.3</td>
<td></td>
</tr>
<tr>
<td>M6</td>
<td>9.0</td>
<td>12</td>
</tr>
<tr>
<td>M8</td>
<td>23</td>
<td>30</td>
</tr>
<tr>
<td>M10</td>
<td>45</td>
<td>60</td>
</tr>
<tr>
<td>M12</td>
<td>75</td>
<td>110</td>
</tr>
<tr>
<td>M16</td>
<td>190</td>
<td>270</td>
</tr>
<tr>
<td>M20</td>
<td>370</td>
<td>520</td>
</tr>
<tr>
<td>M24</td>
<td>640</td>
<td>900</td>
</tr>
</tbody>
</table>
9.2 Accessory parts

For operation of the DAF380, the following optional accessory parts can be supplied:
1. Handwinding wheel
2. Rope clamp
3. Blocking clamp
4. Pressure arm
5. Hydraulic cylinder

Note: the listed parts are necessary for deployment in emergencies or in the case of maintenance or repair work and at least one of each should be present in every machine room.

1. Handwinding wheel

The handwinding wheel is bolted onto the front of the traction sheave. It is used to move the elevator when the weight of the car and counterweight are balanced. The brake is to be vented by hand.

Fig. 25

NB: the handwinding wheel **must** be removed **before switching on the motor**! No motor operation with the handwinding wheel fitted.

2. Rope clamp

- Undo the screws on the rope clamp.
- Insert the halves of the clamp in the drilled hole on the front of the machine base frame (on rope departure side of the traction sheave), one half on the left and one on the right of the ropes.
- Align the groove of the halves of the clamp on the ropes.
- Place the rope clamp on the frame profile at the bottom.
- Clamp the ropes into place by screwing together the halves. Tighten the screws firmly.
Deployment:
a) Rope locking; it prevents rope movements in the direction of the support.
b) To hold the elevator car in position
c) For readjustment on releasing the car from the engaged position (safety gear)

3. Blocking clamp  (for traction sheave)

Engage the blocking clamp with lug (item 1) in the ring groove under the brake disc. Screw in the securing bolt on the front of the traction sheave. Tighten the pressure screws to clamp the ropes.

Deployment: in the event of slipping ropes.
Example: on releasing the car from the engaged position (safety gear).
4. Pressure arm
(for hydraulic cylinder)

**Mounting:** screw on the pressure arm as closely as possible, with the pin facing downwards, above the cylinder on the traction sheave.

**Deployment:**
The pressure arm is for power transmission from the hydraulic cylinder to the traction sheave.

5. Hydraulic cylinder

**Mounting:** place the cylinder with support in the drilled hole on the base frame on the pull side under the traction sheave. Close the drain plug at the cylinder. Pump the lever with pressure cylinder to move the pressure arm and traction sheave. Make sure that the pin of the pressure arm is lying on the cylinder groove to prevent slipping.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Admission</td>
</tr>
<tr>
<td>2</td>
<td>Drain valve</td>
</tr>
<tr>
<td>3</td>
<td>Lever</td>
</tr>
<tr>
<td>4</td>
<td>Pressure cylinder with groove</td>
</tr>
</tbody>
</table>

**Deployment:**
The hydraulic cylinder serves to lift the car out of the engaged safety gear. Application description, see 1.3 "Releasing the car from the engaged position (safety gear)"

Fitted pressure arm with cylinder. Movement in the direction of the arrow.
EC type-examination certificate

Certificate no.: ABV 502/1
Notified body: TÜV Süddeutschland Bau und Betrieb GmbH
Zertifizierungsstelle
für Aufzüge und Sicherheitsbauteile
Westendstraße 199, D-80686 München

Applicant/Certificate holder: Thyssen Aufzugswerke GmbH
Bernhäuser Straße 45
D-73765 Neuhausen a. d. F.

Date of submission: 2001-11-23
Manufacturer: Thyssen Aufzugswerke GmbH
Bernhäuser Straße 45
D-73765 Neuhausen a. d. F.

Product, type: Braking device acting on the traction sheave, as part of
the protection device against overspeed for the car
moving in upwards direction, type DAF (290/330/380)

Test Laboratory: TÜV Süddeutschland Bau und Betrieb GmbH
Abteilung Aufzüge und Sicherheitsbauteile
Westendstraße 199, D-80686 München

Date and Number of test report: 2002-01-10 502/1

EC-directive: 95 / 16 / EC

Statement: The safety component conforms to the directive's
essential safety requirements for the respective scope of
application stated on page 1 of the annex to this EC type-
examination certificate.

Certificate date: 2002-01-10

Zertifizierungsstelle für Aufzüge und Sicherheitsbauteile
Identification number: 0036

[Signature]
Peter Tkalec
Annex to the EC type-examination certificate No. ABV 502/1
dated 2001-01-10

1. Scope of Application

1.1 Permissible brake moment when the brake device acts on the traction sheave while the car is moving upward

<table>
<thead>
<tr>
<th>Type designation</th>
<th>Diameter of the brake disk (mm)</th>
<th>Diameter of the traction sheave (mm)</th>
<th>Permissible brake moment (Nm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>DAF 290</td>
<td>480</td>
<td>360</td>
<td>540 - 1800</td>
</tr>
<tr>
<td>DAF 330</td>
<td>540</td>
<td>440</td>
<td>900 - 3000</td>
</tr>
<tr>
<td>DAF 380</td>
<td>660</td>
<td>520 - 560</td>
<td>1350 - 4800</td>
</tr>
</tbody>
</table>

Brake disk diameters and traction sheave diameters have fixed values in relation to one another and for each type designation.

1.2 Maximum tripping speed of the overspeed governor and maximum rated speed for the traction sheave diameters listed under point 1.1 (in relation to the rope’s center) and car suspension of 1:1

1.2.1 Maximum tripping speed

DAF 290 = 7,54 m/s / DAF 330 = 8,75 m/s / DAF 380 = 10,00 m/s

1.2.2 Maximum rated speed

DAF 290 = 6,00 m/s / DAF 330 = 7,00 m/s / DAF 380 = 8,00 m/s

1.3 The rotary speeds of the traction sheave which correspond to the speeds for maximum traction sheave diameters and a 1:1 car suspension

<table>
<thead>
<tr>
<th>Type designation</th>
<th>Max. tripping speed (m/s)</th>
<th>Max. rated speed (m/s)</th>
<th>Max. tripping rotary speed (min⁻¹)</th>
<th>Max. rated rotary speed (min⁻¹)</th>
</tr>
</thead>
<tbody>
<tr>
<td>DAF 290</td>
<td>7,54</td>
<td>6,00</td>
<td>402</td>
<td>320</td>
</tr>
<tr>
<td>DAF 330</td>
<td>8,75</td>
<td>7,00</td>
<td>380</td>
<td>304</td>
</tr>
<tr>
<td>DAF 380</td>
<td>10,00</td>
<td>8,00</td>
<td>294</td>
<td>273</td>
</tr>
</tbody>
</table>

If deviating traction sheave diameters, car speeds or car suspension are used, care must be taken that these rotary speeds are not exceeded during operation and tripping of the overspeed governor.

2. Conditions

2.1 Since the brake device represents only a part of the protection device against overspeed for the car moving in upwards direction an overspeed governor as per EN 81-1, paragraph 9.9 must be used to monitor the upward speed and the brake device must be triggered (engaged) via the overspeed governor’s electric safety device. Alternatively, the speed may also be monitored and the brake device engaged by a device other than an overspeed governor as per paragraph 9.9 if the device shows the same safety characteristics and has been type tested.

2.2 The movement of each brake circuit (each brake lever) is to be monitored separately and directly (e.g. by micro switches). If a brake circuit fails to engage (close) while the lift machine is at standstill, next movement of the lift must be prevented.

2.3 In cases where the lift machine moves despite the brake being engaged (closed), the lift machine must be stopped at the next operating sequence at the latest and the next movement of the lift must be prevented. (The car may, for example, be prevented from traveling or, if already moving, halted either immediately or at the next floor, by querying the position of the micro switch which is used to monitor the mechanical movement of the brake circuits, should both brake circuits fail to open).

3. Remarks

3.1 The permissible braking moments must be applied to the lift system in such a manner that they do not decelerate more than 1 m/s², if the empty car is moving upwards.

3.2 The brake device as part of the protection device against overspeed for the car moving in upwards direction, also functions as a brake for normal operation. The type examination only refers to the requirements pertaining to brake devices as per EN 81-1, paragraph 9.10, which stipulates that the component decelerate and stop the car in normal operation and that it be designed as a redundant system.

Checking whether the requirements as per paragraph 12.4 have been complied with is not part of this type examination.

3.3 In order to provide identification and information about the basic design and its functioning and to show the environmental conditions and connection requirements pertaining to the tested and approved type, and to define which parts have been tested, drawing „Gearless Bremsen/brake frein, DAF 290/330/380” dated 30 April 1998 is to be enclosed with the EC type-examination certificate and the Annex thereto.

3.4 The EC type-examination certificate may only be used in connection with the pertinent annex.
EG - Konformitätserklärung
nach Richtlinie 95/16/EG, Anhang II, A
EC - Declaration of Conformity
acc. to directive 95/16/EC, annex II, A
Déclaration de Conformité CE
selon directive 95/16/EN, annexe II, A

Hiermit erklären wir, dass das Sicherheitsbauteil
This is to confirm that the safety device
Par la présente nous confirmons que le composant de sécurité

Art / Product / Produit : Bremseinrichtung auf die Treibscheibe wirkend, als Teil der Schutzeinrichtung für den aufwärtsfahrenden Fahrschacht gegen Überschwindigkeit : Braking device acting on the traction sheave, as part of the protection device against overspeed for the car moving in upwards direction : Dispositif de freinage agissant sur la poulie de traction et faisant partie du dispositif protégeant la cabine qui monte contre une vitesse excessive

Typ / Type / Type : DAF (290/330/380)

Baujahr : siehe Typenschild am Bauteil
Year of manufacture : see name plate of component
Année de fabrication : voir plaque d'identité du composant

Hergestellt von : Thyssen Aufzugswerke GmbH
Manufactured by : Bernhäuser Str. 45
Fabriqué par : D-73765 Neuhausen a.d.F.

in der gelieferten Ausführung dem geprüften Sicherheitsbauteil und der Richtlinie 95/16/EG - Aufzugsrichtlinie - entspricht.
is designed in accordance with the safety device tested and complies with the directive 95/16/EC – lift directive.
est conforme au composant de sécurité testé et respecte la directive 95/16/CE – directive ascenseurs.

Angewendete harmonisierte Norm : EN 81- 1/2
Harmonised standard applied : Norme harmonisée appliquée

Bescheinigungs-Nr. : ABV 502/1
Certificate No. : No. d’attestation

Benannte Stelle : TÜV Süddeutschland Bau und Betrieb GmbH
Notified body : Zertifizierungsstelle für Aufzüge und Sicherheitsbauteile
Organisme agréé : Westendstraße 199
Thyssen Aufzugswerke GmbH
Bernhäuser Str. 45
D-73765 Neuhausen a.d.F.

Gerhard Thumm
(Geschäftsführer Technik)
(Member of the board – R&D and Engineering)
(Membre du directoire – Bureaux d’Etudes et Projets)
Certificate of Compliance

Certificate: 1221768  Master Contract: 211764
Project: 1221768  Date Issued: December 5, 2001

Issued to: Thyssen Aufzugswerke GmbH
Bernhauser Strasse 45
D-72765 Neuhausen a.d.F.
GERMANY

The products listed below are eligible to bear the CSA Mark shown with adjacent indicators 'C' and 'US'

Issued by: G. Foulem, E.I.T.

PRODUCTS

CLASS 2411 01 - ELEVATOR EQUIPMENT
CLASS 2411 81 - ELEVATOR EQUIPMENT - CERTIFIED TO U.S. STANDARDS

Three-phase asynchronous drive motors, for elevators use, are either enclosed ventilated type or outer rotor ventilated type; 500V ac, 30Hz (max.), insulation class B, provided with a brake unit, 90V – 180V dc, insulation class B.

Notes:

1. The drive motors are Certified as component parts of other installation where the acceptability of the final installation has to be determined by Canadian Standards Association.
2. The control unit for the elevator and thus for the drive motor units are not included in this examination.
3. The Drive motor is for short-duty operation.

The 'C' and 'US' indicators adjacent to the CSA Mark signify that the product has been evaluated to the applicable CSA and ANSI/UL Standards, for use in Canada and the U.S., respectively. This 'US' indicator includes products eligible to bear the 'NRTL' indicator. NRTL, i.e. National Recognized Testing Laboratory, is a designation granted by the U.S. Occupational Safety and Health Administration (OSHA) to laboratories which have been recognized to perform certification to U.S. Standards.
### DAF380-Series

<table>
<thead>
<tr>
<th></th>
<th>$P_n$ [kW]</th>
<th>$P_s$ [hp]</th>
<th>$n_n$ [rpm]</th>
<th>$U_{nom}$ [V]</th>
<th>$I_s$ [A]</th>
<th>$I_A$ [A]</th>
<th>$f_{motor}$ [Hz]</th>
</tr>
</thead>
<tbody>
<tr>
<td>DAF280M003/101</td>
<td>33.5</td>
<td>45</td>
<td>171</td>
<td>440</td>
<td>61</td>
<td>115</td>
<td>19.5</td>
</tr>
<tr>
<td>DAF380M003/103</td>
<td>37</td>
<td>50</td>
<td>205</td>
<td>239</td>
<td>67</td>
<td>125</td>
<td>21.5</td>
</tr>
</tbody>
</table>

### DAB450-Series

<table>
<thead>
<tr>
<th></th>
<th>$P_n$ [kW]</th>
<th>$P_s$ [hp]</th>
<th>$n_n$ [rpm]</th>
<th>$U_{nom}$ [V]</th>
<th>$I_s$ [A]</th>
<th>$I_A$ [A]</th>
<th>$f_{motor}$ [Hz]</th>
</tr>
</thead>
<tbody>
<tr>
<td>DAB450S008</td>
<td>42</td>
<td>56</td>
<td>159</td>
<td>174</td>
<td>78</td>
<td>140</td>
<td>22</td>
</tr>
<tr>
<td>DAB450S009</td>
<td>40</td>
<td>54</td>
<td>127</td>
<td>112</td>
<td>66</td>
<td>140</td>
<td>18</td>
</tr>
<tr>
<td>DAB450L002</td>
<td>45</td>
<td>60</td>
<td>127</td>
<td>112</td>
<td>86</td>
<td>150</td>
<td>17.8</td>
</tr>
<tr>
<td>DAB450L003</td>
<td>55</td>
<td>74</td>
<td>159</td>
<td>191</td>
<td>99</td>
<td>165</td>
<td>21.95</td>
</tr>
<tr>
<td>DAB450L004</td>
<td>58</td>
<td>78</td>
<td>174</td>
<td>174</td>
<td>103</td>
<td>165</td>
<td>24.05</td>
</tr>
<tr>
<td>DAB450L005</td>
<td>58</td>
<td>78</td>
<td>174</td>
<td>174</td>
<td>103</td>
<td>165</td>
<td>24.05</td>
</tr>
<tr>
<td>DAB450L007</td>
<td>35</td>
<td>25</td>
<td>96</td>
<td>101</td>
<td>67</td>
<td>113</td>
<td>13.5</td>
</tr>
</tbody>
</table>

### DAB530-Series

<table>
<thead>
<tr>
<th></th>
<th>$P_n$ [kW]</th>
<th>$P_s$ [hp]</th>
<th>$n_n$ [rpm]</th>
<th>$U_{nom}$ [V]</th>
<th>$I_s$ [A]</th>
<th>$I_A$ [A]</th>
<th>$f_{motor}$ [Hz]</th>
</tr>
</thead>
<tbody>
<tr>
<td>DAB530L002</td>
<td>92</td>
<td>125</td>
<td>155</td>
<td>450</td>
<td>163</td>
<td>276</td>
<td>21.4</td>
</tr>
<tr>
<td>DAB530L003</td>
<td>92</td>
<td>125</td>
<td>155</td>
<td>450</td>
<td>163</td>
<td>276</td>
<td>21.4</td>
</tr>
<tr>
<td>DAB530L004</td>
<td>76</td>
<td>103</td>
<td>129</td>
<td>450</td>
<td>135</td>
<td>205</td>
<td>18.1</td>
</tr>
<tr>
<td>DAB530L005</td>
<td>68</td>
<td>93</td>
<td>109</td>
<td>430</td>
<td>124</td>
<td>215</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Certificate:</td>
<td>1221768</td>
<td>Master Contract:</td>
<td>211764</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-------------</td>
<td>---------</td>
<td>------------------</td>
<td>--------</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Project:</td>
<td>1221768</td>
<td>Date:</td>
<td>December 5, 2001</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**APPLICABLE REQUIREMENTS**

<table>
<thead>
<tr>
<th>CAN/CSA-C22.2 No.</th>
<th>100-95</th>
<th>-</th>
<th>Motors and Generators</th>
</tr>
</thead>
<tbody>
<tr>
<td>UL Std No.</td>
<td>1004</td>
<td>-</td>
<td>Electric Motors</td>
</tr>
</tbody>
</table>