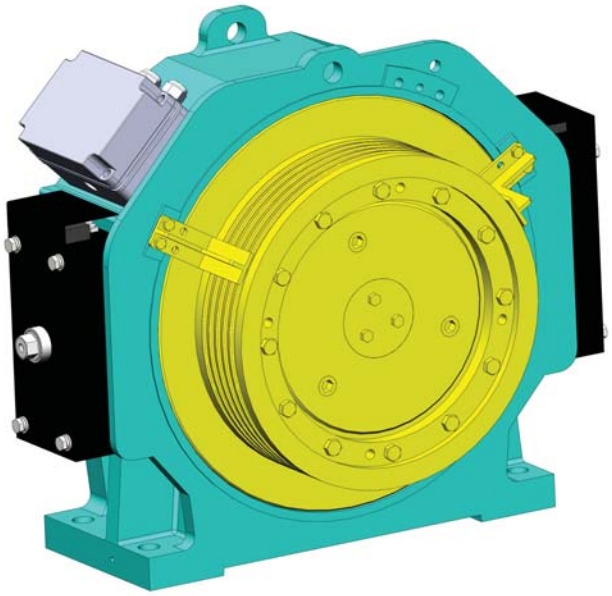
Gearless Synchronous Lift Machines

WSG09.X



English

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These operating instructions are applicable to lift machines:

WSG09.X

with block brake

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EC Declaration of Conformity
EC type-examination certificate WB4600
EC type-examination certificate WB3600

1. General safety instructions

Explanation of symbols used in these instructions


Danger

means that death or serious injury to persons or serious damage to property will occur unless the appropriate precautions are taken.


Warning

means that death or serious injury to persons or serious damage to property may occur unless the appropriate precautions are taken.


Caution

means that injuries to persons or damage to property may occur unless the appropriate precautions are taken.


Note

points out important information and operating instructions. If these are not observed, damage, hazards or faults may result.

Intended use

The WSG09.X lift machines have been manufactured in compliance with the latest state of the art and recognised safety regulations. They may only be used for the purpose for which they are intended, and with all safety devices in proper working order.

The WSG09.X may only be used for driving lifts. "Intended use" also requires that the instructions contained in the documentation supplied with the machine and the commissioning instructions be observed, and that the specified inspection and maintenance work be carried out.

Warranty and liability

Our "Conditions of Sale and Delivery" shall apply for all our supplies and services. The warranty is 18 month.

We do not accept any warranty or liability claims for personal injury or property damage resulting from one or more of the following causes:

- Improper use of the WSG09.X lift machine
- Improper installation, commissioning, operation or maintenance
- Operation of the WSG09.X with defective and/or inoperative safety or protective devices
- Non-compliance with the instructions contained in the operating instructions or other documentation supplied
- Unauthorised construction modifications to the WSG09.X
- Insufficient monitoring of parts subject to wear
- Repairs carried out improperly
- Emergencies caused by external forces or force majeure

Safety precautions

Only qualified personnel are authorized to perform any planning, installation or maintenance work, and this must be done in accordance with the relevant instructions.

The personnel must be trained for the job and must be familiar with the installation, assembly, commissioning and operation of the product.

The WSG09.X lift machines are intended for use in an enclosed, lockable machine room or shaft to which only qualified personnel and personnel authorised by the customer have access.


Danger

- The instructions given in this manual or any other instructions supplied must always be observed to avoid danger or damage.
- WSG09.X lift machines are not ready-to-use products; they may only be operated after they have been installed in lift systems and their safe operation has been ensured by taking the appropriate measures.
- Check the proper functioning of the motor and the brake after installing the machine.
- Repairs may only be carried out by the manufacturer or an authorised repair agency. Unauthorised opening and tempering may result in injuries to persons and property.
- The machines are not designed for direct connection to the three-phase system but are to be operated via an electronic frequency converter. Direct connection to the mains may destroy the motor.
- The machines can only installed by vertical direction.



Warning

- High surface temperatures may occur on the external parts of the machine. Therefore, no temperature-sensitive parts may be in contact with these parts or attached to them. Protection against accidental contact should be provided, if required.

- High voltages are applied at the terminal connections during the operation of synchronous motors.

2. Product description

The gearless WSG09.X lift machines are designed by outer rotor for gearless traction lifts with or without a machine room. They are intended for operation with a 2:1 suspension and are distinguished by their high efficiency, extremely low noise and excellent operating characteristics.

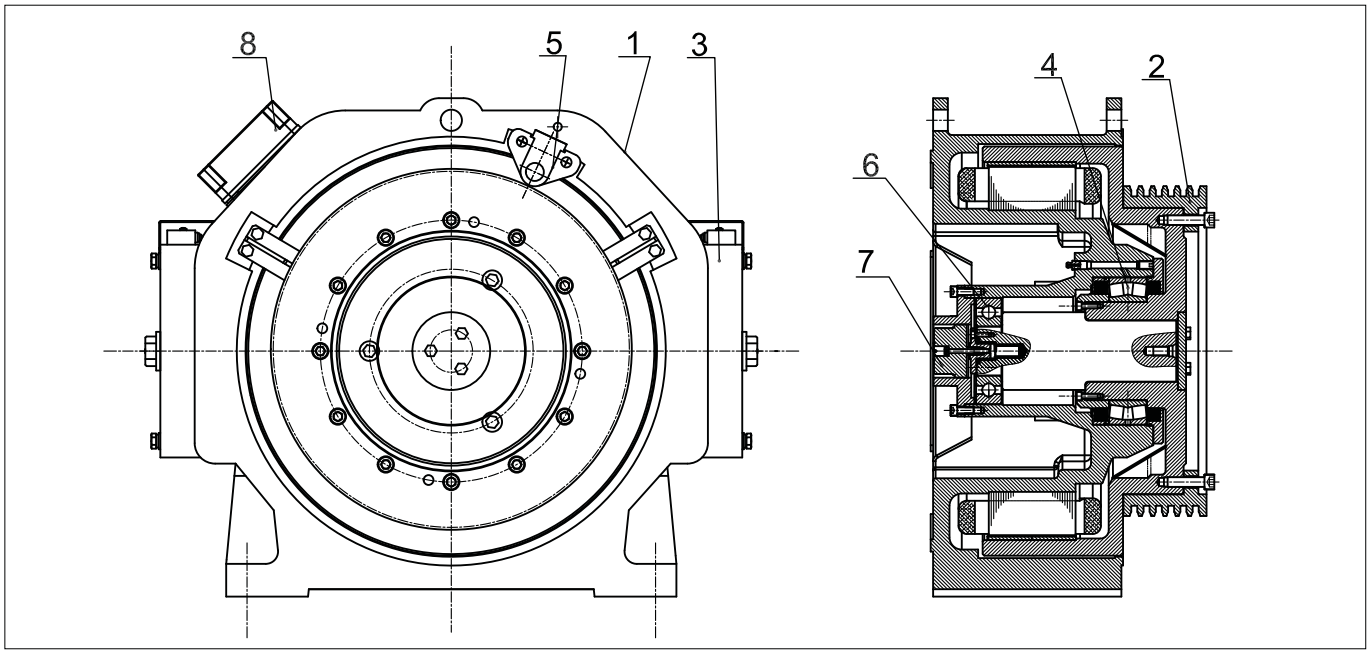
The WSG09.X gearless synchronous lift machines are designed solely for use with electronic frequency inverters. The synchronous motor has been designed for various rated torques. It can also be supplied for several rated speeds, which can then be further adapted to meet individual customer requirements.

It is composed by housing (1), motor, traction sheave (2) and block brake(3). The rope slip off guard is designed to avoid the rope jumping out of the traction sheave.

The rotor shaft is inserted into the stator frame and supported in a self-aligning roller bearing (4) at the traction sheave side. Above it, there is a connection seats (5) which designed for mechanical evacuation. The wheels is intent to adapt to the system for the evacuation in emergency situation as option. At the other side, the rotor shaft is fixed by a supporting ball bearing (6) to the housing. the both bearings were adapted by a heating way during the assembly. The self-aligning roller bearing is sealed and has a provision for re-lubrication.

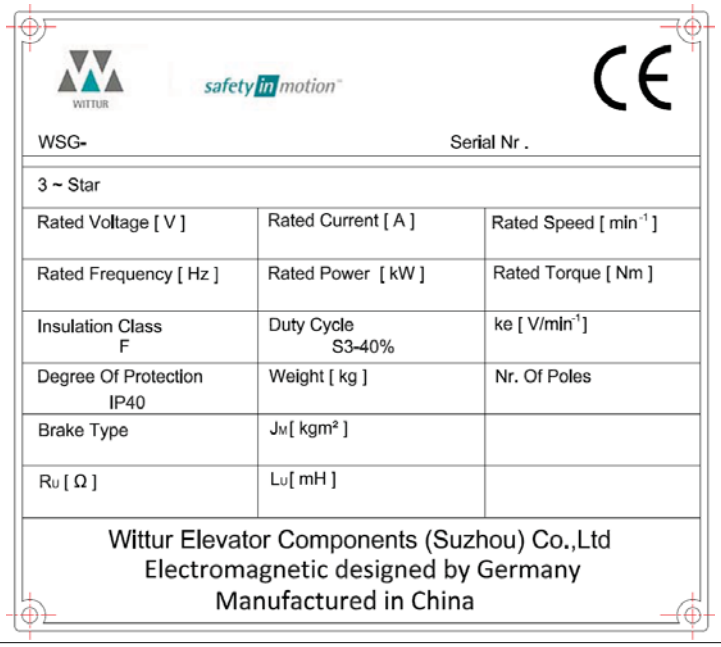
The encoder system (7) is located within the centre of the machine behind the ball bearing. The brakes are powered on by110V DC . The electrical connection of the motor is made in the terminal box (8) where the temperature monitoring device and brake contactor is also connected. The brakes are designed such that in the case of failure of one brake the remaining brakes are able to decelerate a car carrying a full payload. They are also able to be released manually.

We would like to refer to the relevant patents held by KONE Corporation for lifts without machine room.



3. Nameplate

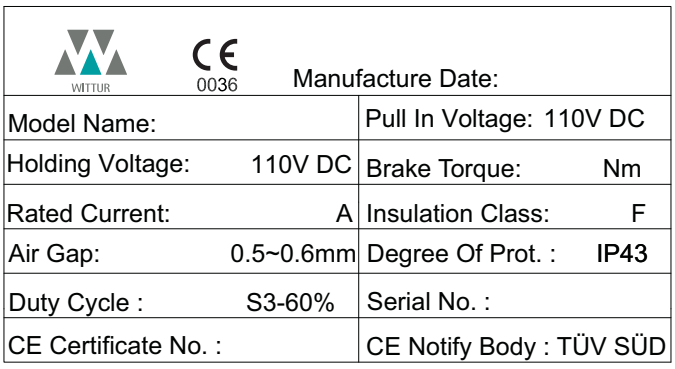
The nameplate of the lift machine is on the motor.



WSG-		Serial Nr .
3 ~ Star		
Rated Voltage [V]	Rated Current [A]	Rated Speed [min^{-1}]
Rated Frequency [Hz]	Rated Power [kW]	Rated Torque [Nm]
Insulation Class F	Duty Cycle S3-40%	ke [V/min^{-1}]
Degree Of Protection IP40	Weight [kg]	Nr. Of Poles
Brake Type	J_M [kgm^2]	
R_U [Ω]	L_U [mH]	

Wittur Elevator Components (Suzhou) Co.,Ltd
Electromagnetic designed by Germany
Manufactured in China

The nameplate of the brake is on the brake.



WITTUR	CE 0036	Manufacture Date:	
Model Name:		Pull In Voltage:	110V DC
Holding Voltage:	110V DC	Brake Torque:	Nm
Rated Current:	A	Insulation Class:	F
Air Gap:	0.5~0.6mm	Degree Of Prot. :	IP43
Duty Cycle :	S3-60%	Serial No. :	
CE Certificate No. :		CE Notify Body :	TÜV SÜD

4. Type code

Example	W	S	G-	09	.	2	-	0	0	09	/	40A	-	01
	W	S	G-	09	.	X	-	X1	X2	X3X4	/	X5X6X7	-	X8X9

Synchronous motor

Frame type

Overall length
Identifyed by: 2, 3, 4

Customer specific identifer

Motor voltage
0: Suitable for converter supply using a link voltage of 500 ... 620V DC

Example.
09: 95r/min(with Dt=400mm v=1.0m/s, suspension 2:1)

X5X6X7 / Traction sheave design:
(Traction sheave diameter; width, groove design, groove geometry)

X8X9 Variant code(measuring system, brake manual release,mechanism evacuation device, remote brake release)
e.g. 01:1313 encoder, with brake manual release, with mechanism evacuation device,w/o remote brake release

Subject to changes without notice!

5. Technical data

Duty type	S3 - 40%
Sheave	Ø400mm / Ø450mm
Traction sheave hardness	Min. 220 HB 30
DE Bearing	self-aligning roller bearing
NDE Bearing	ball bearing
Permissible shaft load	Max. 35,000N
Drive motor	synchronous motor
Number of pole pairs	11
Thermal class	155°(F)
Degree of protection	IP40
Overload capability	2.0fold (Imax/IN)
Winding protection:	triple PTC 150°C

Site conditions

Max. Attitude	Up to 1,000 m (At high altitude decrease this value)
Ambient temperature	+5°C... +40°C
Max. rel. humidity	85%, 20°C (non-condensing)

Block brake

Type	WSG09.2	WSG09.3	WSG09.4
	WB3600	WB3600	WB4600
Max. braking torque	2x700Nm	2x850Nm	2x950Nm
Default setting		$2 \times 1.25\ M_N$	
air gap		0.5mm ~ 0.6 mm	
Nominal current	1.34A	1.34A	1.53A
Pull in voltage/ Holding voltage		110V DC	

* Remark:75-80V DC for holding voltage is preferred for best performances in temperature rise

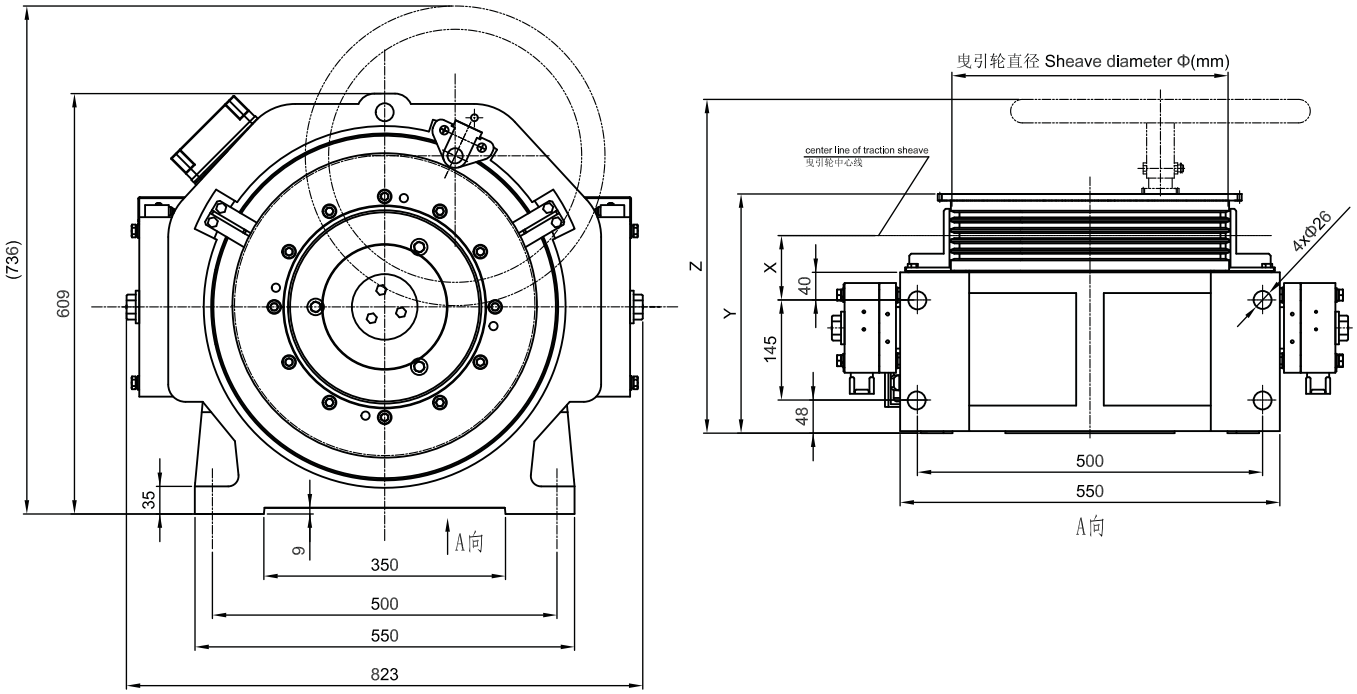
Motor Type		Synchronous 22-pole WSG09.2									
Suspension		2:1									Groove profile
Rated Torque S3-40%, 240s/h	M_N [Nm]	540									
Sheave	ΦDt[mm]	400					450				
loads	Q[kg]	up to 800					up to 630				
Motor current applicable to 500-620Vd.c.link voltage DC 500-620V	v[m/s]	n_N[rpm]	P_N [kW]	I_N[A]	U_N[V]	F_N [Hz]	n_N [rpm]	P_N[kW]	I_N[A]	U_N [V]	F_N [Hz]
	0.5	48	3.7	10.2	281	8.8	42	2.4	10.2	214	7.7
	0.63	60	3.4	11	262	11	54	3.1	11	244	9.9
	1	95	5.4	13	323	17.4	85	4.8	13	293	15.6
	1.5	143	8.1	17.7	332	26.2	127	7.2	17.7	297	23.3
	1.6	153	8.7	19.9	310	28.1	136	7.7	17.7	302	24.9
	1.75	167	9.4	19.9	337	30.6	149	8.4	17.7	342	27.3
	2	191	10.8	22.7	331	35	170	9.6	22.7	297	31.2
	2.5	240	13.6	28.7	331	44	212	12	28.7	295	38.9
Suspension		1:1									5xΦ10/15 γ=30° β=95°
Rated Torque S3-40%, 240s/h	M_N [Nm]	540									
Sheave	ΦDt[mm]	400					450				
loads	Q [kg]	up to 400					up to 320				
Motor current applicable to 500-620Vd.c.link voltage DC 500-620V	v[m/s]	n_N[rpm]	P_N [kW]	I_N[A]	U_N [V]	F_N [Hz]	n_N[rpm]	P_N[kW]	I_N [A]	U_N [V]	F_N[Hz]
	0.63	29	1.6	10.2	169	5.3	25	1.4	10.2	155	4.6
	1	48	2.7	10.2	234	8.8	42	2.4	10.2	214	7.7
	1.6	76	4.3	11	314	13.9	68	3.9	11	288	12.5

Motor Type		Synchronous 22-pole									
		WSG09.3									
Suspension		2:1									Groove profile
Rated Torque S3-40%, 240s/h	MN [Nm]	670									
Sheave	ΦDt [mm]	400					450				
loads	Q [kg]	up to 1000					up to 800				
Motor current applicable to 500-620Vd.c.link voltage DC 500-620V	v[m/s]	nN [rpm]	PN [kW]	IN [A]	UN [V]	FN [Hz]	Nn [rpm]	PN [kW]	IN [A]	UN [V]	FN [Hz]
	0.5	48	3.4	11.1	270	8.8	42	2.9	11.1	244	7.7
	0.63	60	4.2	13.4	265	11	54	3.8	13.4	245	9.9
	1	95	6.7	16.5	303	17.4	85	6.0	16.5	274	15.6
	1.5	143	10	22.6	316	26.2	127	8.9	22.6	283	23.3
	1.6	153	10.7	25.2	300	28.1	136	9.5	22.5	298	24.9
	1.75	167	11.7	25.2	323	30.6	149	10.5	22.5	326	27.3
	2	191	13.4	28.6	322	35	170	11.9	28.6	327	31.2
	2.5	240	16.8	34	325	44	212	14.9	34	288	38.9
Suspension		1:1									6xΦ10/15 or 5xΦ10/15 γ=30° β=95°
Rated Torque S3-40%, 240s/h	MN [Nm]	670									
Sheave	ΦDt [mm]	400					450				
loads	Q [kg]	up to 500					up to 400				
Motor current applicable to 500-620Vd.c.link voltage DC 500-620V	v[m/s]	nN [rpm]	PN [kW]	IN [A]	UN [V]	FN [Hz]	nN [rpm]	PN [kW]	IN [A]	UN [V]	FN [Hz]
	0.63	29	2	11.1	194	5.3	25	1.8	11.1	178	4.6
	1	48	3.4	11.1	270	8.8	42	2.9	11.1	247	7.7
	1.6	76	5.3	13.4	319	13.9	68	4.8	13.4	292	12.5

Motor Type		Synchronous 22-pole									
		WSG09.4									
Suspension		2:1									Groove profile
Rated Torque S3-40%, 240s/h	MN [Nm]	740									
Sheave	ΦDt [mm]	400					450				
loads	Q [kg]	up to 1150					up to 1000				
Motor current applicable to 500-620Vd.c.link voltage DC 500-620V	v[m/s]	nN [rpm]	PN [kW]	IN [A]	UN [V]	FN [Hz]	nN [rpm]	PN [kW]	IN [A]	UN [V]	FN [Hz]
	0.5	48	3.7	12.3	281	8.8	42	3.3	12.5	261	7.7
	0.63	60	4.6	15.7	257	11	54	4.2	15.7	234	9.9
	1	95	7.4	18.5	311	17.4	85	6.6	18.5	288	15.6
	1.5	143	11.1	25	323	26.2	127	9.8	25	250	23.3
	1.6	153	11.9	30	285	28.1	136	10.5	25	265	24.9
	1.75	167	12.9	30	302	30.6	149	11.5	25	277	27.3
	2	191	14.8	33	311	35	170	13.2	33	312	31.2
	2.5	240	18.6	40.5	310	44	212	16.4	40.5	281	38.9
Suspension		1:1									7xΦ10/15 or 6xΦ10/15 γ=30° β=95°
Rated Torque S3-40%, 240s/h	MN [Nm]	740									
Sheave	ΦDt [mm]	400					450				
loads	Q [kg]	up to 575					up to 500				
Motor current applicable to 500-620Vd.c.link voltage DC 500-620V	v[m/s]	nN [rpm]	PN [kW]	IN [A]	UN [V]	FN [Hz]	nN [rpm]	PN [kW]	IN [A]	UN [V]	FN [Hz]
	0.63	29	2.2	12.3	204	5.3	25	1.9	12.3	187	4.6
	1	48	3.7	12.3	281	8.8	42	3.3	12.3	257	7.7
	1.6	76	5.9	15.7	307	13.9	68	5.3	15.7	281	12.5

6. Dimension drawing

Dimensions (mm)



Position	WSG09.2		WSG09.3			WSG09.4		
	Grooves							
	5		5		6	6		7
Traction sheave Φ (mm)	400	450	400	450	400	400	450	400
X	93.25							100.75
Y	346.5							361.5
Z	483.5							498.5

7. Scope of supply

- Lift machine WSG09.X according to order specification
- Operating instructions
- Delivery note
- Qualification certificate
- Manual release lever (for machine room solution)

Options:

- Mechanical evacuation
- Brake remote release system (for MRL solution)
- Encoder cables

8. Transport and storage

The WSG09.X lift machines leave the factory in perfect condition after being tested.

Make a visual check for any external damage immediately upon their arrival on site. If any damage incurred in transit is found, make a notice of claim in the presenceof the carrier. If necessary, do not put these machines into operation.

Transport



Warning

Observe the relevant safety regulations and take the centre of gravity into account when handling the lift machines.

The two eyebolts are designed for the specified machine weight. it is not permitted to suspend additional loads.

Storage

Store the motors only in closed, dry, dust-free, well-ventilated and vibration-free rooms (storage temperature: -20°C to 60°C). Do not store lift machines in the open air.Parts are not sufficiently preserved to withstand extended periods of exposure.

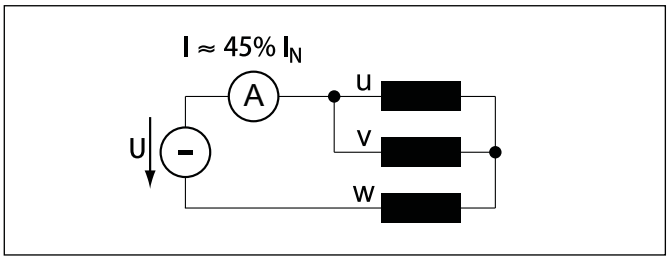
Avoid excessive storage periods (recommendation: max. one year).

After prolonged storage (>3 months), rotate the motor in both directions at a low speed (< 20 min^{-1}) to allow the grease to distribute evenly in the bearings.

Measure the insulation resistance before initial operation of the machine. If the value has dropped below < 1 kΩ per volt of rated voltage, the winding needs to be dried (insulation meter voltage: 1,000 V DC).

This can be done, for instance, with heated air, in a drying oven, or by applying a d.c. voltage to the motor connections.

Make sure that the voltage selected does not exceed the values shown in the figure "Drying the winding". Let the temperature rise to about 70 – 80°C and maintain it for several hours.



Drying the winding

Unpacking

Dispose of the packaging material in an environmentally friendly manner or reuse it.

Any special transport aids or shipping braces are left with the customer.

9. Installation


Danger

Be sure to check the base frame or foundation loads by calculation before installing the lift machine.

The lift machine may only be installed if the relevant safety precautions have been met. The machines can be used in lift systems with or without a machine room but only installed in vertical load case.

The machines may only be installed, electrically connected and put into operation by trained specialist personnel. The system-specific conditions and the requirements of the system manufacturer or plant constructor must be met.


Warning

Cover the machine and especially the brakes when doing any machining or dust- producing work in the shaft or machine room.


Note

The measuring system is only accessible from the rear side. Therefore, leave enough space (min.800mm) between the wall and the rear side of the machine or ensure that the machine can be moved away from the wall.

Degree of protection

WSG09.X Lift machines are designed with degree of protection IP 40. Make sure that the cable entries to the terminal boxes are sealed properly when making the electrical installation.

Ambient conditions

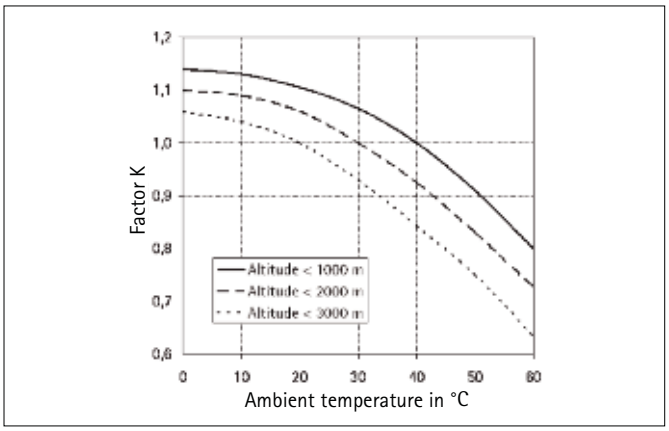
The following ambient conditions must be ensured on site:

Altitude:	max. 1,000 m a.s.l.
Ambient temperature:	+ 5 ... 40°C
Max. rel. humidity:	85 % at 20°C (no moisture condensation)

Install the machine so that ventilation is not obstructed, i.e. sufficient heat dissipation by convection and radia- tion must be ensured.

The torque and power values indicated in the Technical. Data apply to the above ambient temperatures and altitudes. In case of a deviating altitude and/or ambient temperature, the reduction factors k shown in the diagram below must be us -ed.

$$M_{permiss.} = k * M_N$$
$$P_{permiss.} = k * P_N$$



Fastening the machine


Note

The machine or base frame should be mounted on rubber pads for vibration damping.

The machine is fastened using 4x M24 bolts (strength class8.8;).

The permissible unevenness of the mounting surface is 0.1 mm. The mounting surface must be sufficiently distortion-resistant and stable to accommodate the forces occurring in the system.


Danger

After completing the adjusting work, tighten the 4 fastening bolts of the machine, using the specified torque.


Warning

No welding work may be performed on the lift machine, This could destroy the bearings and the magnets.

Lift machines are generally equipped with rope slip-off guards. After putting the ropes in place, adjust them so that the distance between the rope and the rope slip-off guard does not exceed 1 mm.

10. Electrical connection

10.1. General

Danger

The electrical connection may only be made by a qualified electrician.

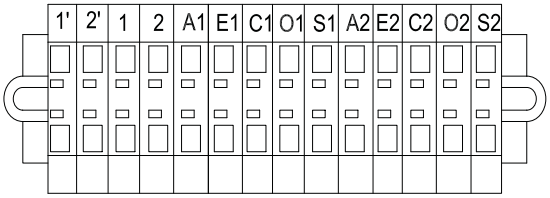
Before starting any work on the machines, ensure that the lift machine or system is properly isolated.

Before making any connections check that

- the connecting cables are suitable for their specific application and for the relevant voltages and currents.
- the sufficiently dimensioned connecting cables and torsion, strain and shear relief as well as anti-kink protection are provided.
- Proper earthing
- there are no foreign bodies, dirt or moisture in the terminal boxes
- cable entries not in use and the terminal box itself are tightly sealed to prevent the ingress of dust or water.

Note

The insulation system of the motors is designed such that they can be connected to a converter with a maximum d.c. link

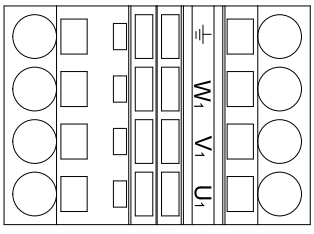


1'/2'- Thermoswitch
1/2- switch for turning machine
A1/E1- left brake power line
C1- left brake micro switch line (yellow-com)
O1- left brake micro switch line (blue-normal close)
S1- left brake micro switch line (red-normal open)
A2/E2- right brake power line
C2- right brake micro switch line (yellow-com)
O2- right brake micro switch line (blue-normal close)
S2- right brake micro switch line (red-normal open)

10.2. Motor connection / Winding protection

The electrical connection of the motor and the winding monitoring devices is made in the terminal box on top of the machine.

There's connection advice stick inside the box as following.



⏚ - Grounding line
W1- Power line (brown)
V1- Power line (blue)
U1- Power line (black)

Caution

Terminal box for motor connection

The motor cable must be shielded.

The motor phases U1, V1 and W1 must be connected correctly to the corresponding voltage Ulink max up to max. 620 Volt.

Note: Ulink max is the maximum value of the d.c. link voltage which is only transient and approximately equivalent to the inception voltage of the braking chopper or of the energy recovery unit.

The WAGO terminal strips are suitable for the following types of copper conductors:


single-core conductor


stranded conductor


fine-stranded conductor


fine-stranded compacted conductor


fine-stranded with ferrule conductor [1)]


fine-stranded with terminal pin conductor

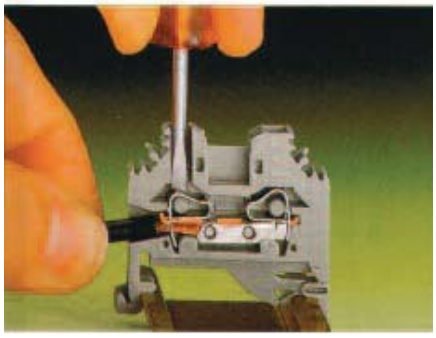
[1)] When using the nominal cross-sections with ferrules, the usable cable cross-section is reduced!

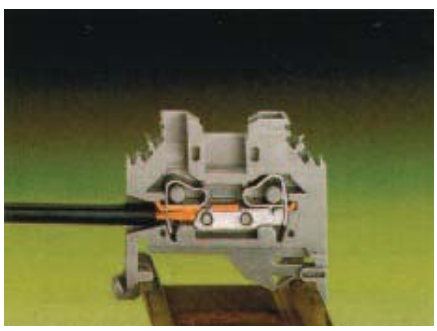
Technical data:

WSG09.2/09.3 1.0m/s: 2.5mm^2
WSG09.2/09.3 1.5m/s: 4mm^2
WSG09.2/09.3 1.75m/s: 4mm^2
WSG09.2/09.3 2m/s: 4mm^2
WSG09.2/09.3 2.5m/s: 6mm^2
WSG09.4 1.0m/s: 2.5mm^2
WSG09.4 1.5m/s: 4mm^2
WSG09.4 1.75m/s:6mm^2
WSG09.4 2.0m/s: 6mm^2
WSG09.4 2.5m/s: 6mm^2
Stripping length required: 9...10 mm

Handling


1. Hold the bared conductor against the terminal.


2. Force down the spring and push the conductor into the terminal.


3. Relieve the spring - the conductor is securely clamped

Cable cross-section required

Note

The currents specified under the machine data for the series WSG09.X refer to duty type S3-40%. This must be taken into account when selecting the cable cross section required. The continuous Ir.m.s. value required for the selected cable is approxi- mated from:

$$I_{r.m.s.\,(cable)} = I_{N\,(motor,\,S3\text{-}40\%)} / 1.58$$

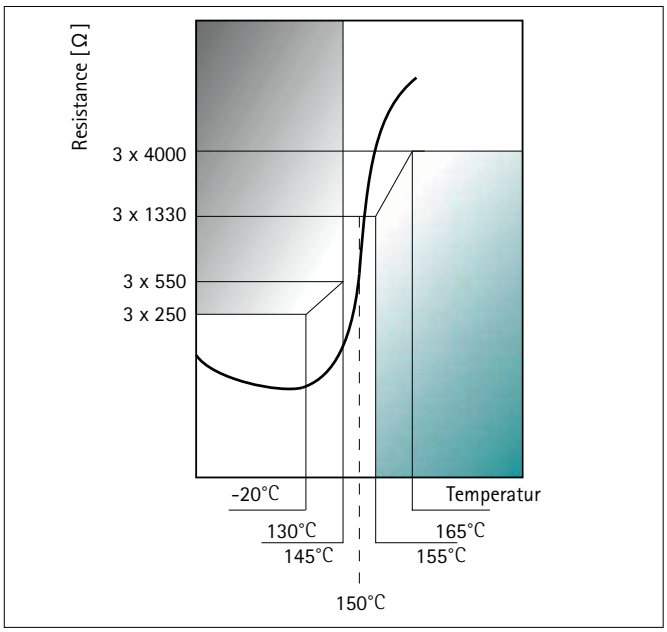
The following table gives the recommended values for the current carrying capacity of PVC cables at a maxi- mum ambient temperature of 40 °C:

Cable cross-section	Permissible max. current (r.m.s. value)	Permissible max. motor current I_N (S3 - 40%)
1.0 mm^2	13.1A	20.7 A
1.5 mm^2	15.7 A	24.8 A
2.5 mm^2	22.6 A	35.7 A
4.0 mm^2	29.6 A	46.7 A
6.0 mm^2	38.3 A	60.5 A

PTC-thermistor

Caution

The operating voltage of the PTC thermistors is not allowed to exceed 25 V DC.



Earthing

For safety reasons, it is very important that the motor be properly and carefully earthed.

Warning

It is essential to use the earthing terminal in the terminal box. In addition, an earthing screw is provided on the motor frame for the connection of a protective or earthing conductor as specified in VDE 0100 and VDE 0141 respectively.

Short-circuiting

Note

The motor terminals of the synchronous lift machines, type WSG09.X, can be short circuited, if required, to brake the lift machine faster. This is, however, only permissible at speeds less than the rated speed of the respective motor.

10.3. Speed/Position measuring system

Lift machine of WSG09.X are equipped with ECN1313 EnDat or ERN1387 encoder from Heidenhain GmbH. or encoder of TS5213N2503 from TAMAGAWA
ECN1313 EnDat is connected via a 12-pole signal coupling fitted to the motor.
ERN1387 is connected via a 14-pole signal coupling fitted to the motor.
TS5213N2503 is connected via a 12-pole signal from the end of the motor.

We can also provide other measuring systems on request.

Note

We recommend the use of an appropriate cable set to connect the measuring system to the converter system. Cable sets can be supplied as accessories.

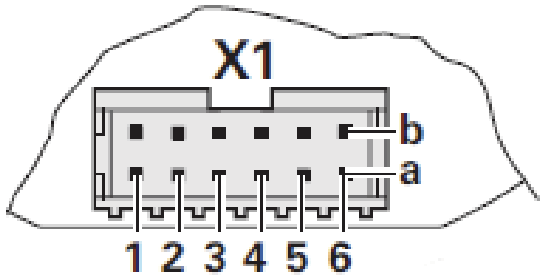
Warning

The measuring system of the WSG09.X lift machines is matched to the associated converter. Do not change the adjustment as this may make it impossible to use the motor.



10.3.1 Measuring system ECN 1313 EnDat

Resolution :	2048
Operating voltage:	5V
Data interface :	EnDat



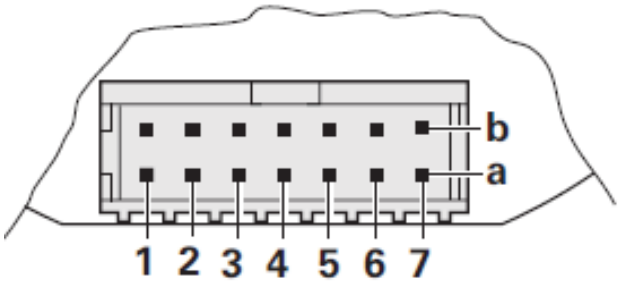
X1

1b	6a	4b	3a	2a	5b
Up	Sensor Up	0V	Sensor 0V	A+	A-

4a	3b	6b	1a	2b	5a
B+	B-	DATA	DATA	CLOCK	CLOCK

10.3.2 Measuring system ERN 1387

Resolution : 2048
Operating voltage: 5V
Commutation signals: sine and cosine



1b	7a	5b	3a	6b	2a	3b
Up	Sensor Up	0V	Sensor 0V	A+	A-	B+

5a	4b	4a	7b	1a	2b	6a
B-	R+	R-	C+	C-	D+	D-

10.3.3 Measuring system TS5213N2503 (TAMAGAWA)

Resolution: 2048
Operating voltage: 5V
Commutation signals: sine and cosine



1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
B-		R+	R-	A+	A-	0V	B+	5V	C-	C+	D+	D-		

10.4. Brake

The brakes are supplied and held with 110V DC . 75-80V DC for holding voltage is preferred for best performances in tem -perature rise.The connecting contacts for the micro-switches which monitor the brakes are also accommodated in this term -inal box.

Note

The rectifier has to be prepared by customer.

Following is two recommend solution for the brake switching which must be realized by the control circuit from customer controller.

Note on the use of d.c./a.c. side switching:

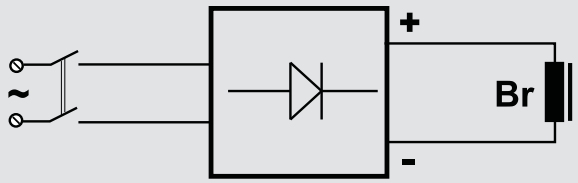
Note

A.c. side switching is recommended for normal operation, since the lift machine is then decelerated in a controlled manner to zero speed and the switching noise of the brake is negligible.

(emergency stop) or during an inspection from the d.c. side, since this ensures a faster braking effect with the car being stopped earlier.

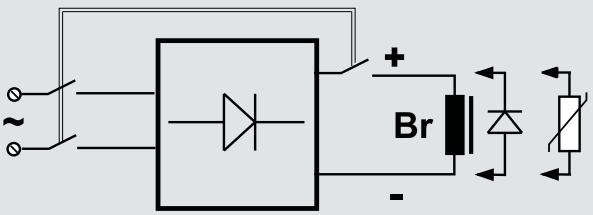
It is therefore recommended to use 2 separate contactors for the brake control circuitry , one of which switching at the d.c. side, the other one at the a.c. side.

A.c. side switching
- Low-noise switching of the brake.
- No protective measures required for switching contact.
- Slow application of the brake.



Attention: schematic diagram!

D.c. side switching
- Noisy switching.
- Burn-up protection for switching contact required. (e.g. varistor, free-wheeling diode)
- Fast application of the brake.



Attention: schematic diagram!

Monitoring the brakes

Danger

The switching state of the brakes is monitored using dust-proof micro switches with gold contacts. Both NC and NO contact is prepared in terminal box. Please refer the connection advice in the box for connecting according to request of the control system as following,

Connect	Power on the brake	Power off the brake
C1-O1 C2-O2	open	close
C1-S1 C2-S2	close	open

11. Commissioning

The following points should be checked or completed:

- Remove all securing, auxiliary and installation tools from the danger area.
- Check that the lift machine is used for its intended purpose and that the permissible ambient conditions are met.
- Check that the lift machine is properly fastened.
- Are all bolts tightened with the specified torque and secured?
- Check the motor connection, especially the earthing.
- Check that the temperature monitoring devices are properly connected and functioning.
- Check that the brakes are properly connected and that the brake monitoring switches are functioning properly.
- Is the measuring system properly connected?
- Check that the offset value indicated on the measuring system agrees with the value set on the converter.
- Check the proper functioning of the brake; perform a braking test using one partial brake
- Is the rope slip-off guard properly tightened and adjusted?
- Check the remote control of the brake using the Bow- den cable, if provided.


Note

An initial functions test of the motor and the brake, together with the converter, should be performed before the ropes are put in place.

12. Operation and maintenance

12.1. General

The regulations concerning operation, maintenance and inspection in accordance with the applicable safety regulations in lift construction such as EN 81 "Safety rules for the construction and installation of lifts", Part 1:

"Electric lifts" and other relevant regulations are to be strictly observed.

The operator is responsible for the proper installation of the motor with regard to safety requirements as well as for its inspection and maintenance as specified in the applicable regulations.


Danger

he proper maintenance of gearless lift machines requires adequately trained specialist personnel and specialised devices and tools.

Bolt/screw tightening torques


Warning

When doing any work on the machine or replacing parts, make sure that the specified bolt/screw strength class and the tightening torques are observed (see table). Secure the bolts/screws with "omnifit 100" or a similar product against accidental loosening.

dimension	tightening torque [Nm]		
strength class	8.8	10.9	12.9
M 4	2.8	4.1	4.8
M 5	5.5	8.1	9.5
M 6	9.6	14	16
M 8	23	34	40
M 10	46	67	79
M 12	79	115	135
M 16	195	290	340
M 20	395	560	660
M 24	680	970	1150

12.2. Maintenance intervals

Relubricate the bearings		see section 12.3.
Check the bearing noise	every six months	
Check the brake air gap	every six months	see section 12.7
Check the proper functioning of the brakes and the brake monitoring switches	every six months	see section 12.7
Check the traction sheave for wear	every six months	
Check the traction sheave for tight seating	every six months	see section 12.5
Check the electrical cables		see section 10.
Check the rope slip-off guard	every six months	
Check the guards and safety devices for their condition and safe functioning	every six months	
Check the tightening torques of the frame, brake and traction sheave fastening bolts/ screws	every six months	see section 12.1.
Clean the external machine surfaces	as required	

12.3. Lubricating instructions

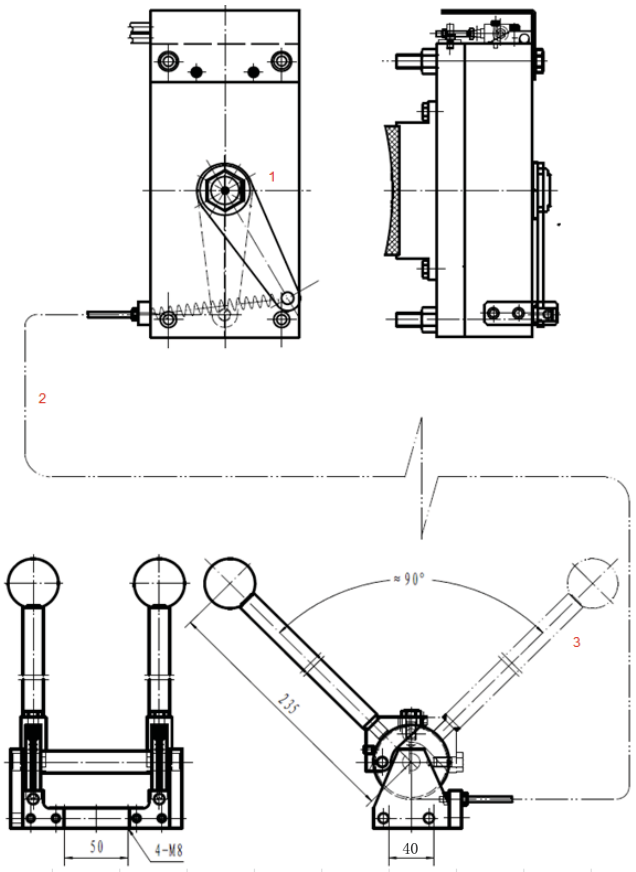
The main bearing (self-aligning roller bearing) has been filled at the factory with a quantity of grease sufficient for the nominal service life of the machine.

Note

In order to use grease BME L-XDEBB2 to lubricate the bearing according to GB/T 7940 M10x1. Rotate the traction sheave when insert the grease to the machine Lubricating position is indicated in red cycle



The (NDE) secondary ball bearing is life-lubricated and not provided with a re-greasing device.



12.4. Brake remote release for MRL solution

A brake remote release system would be required when it is a MRL solution. Besides the standard brake, the system additionally consists of cam mechanism, dragline subgroup and operation mechanism.

Caution

1 As less bending as possible for dragline to reduce the friction between dragline and spool.

2 Radius of curvature ≥ 200mm at the area of bending.

3 Place the system in an area where is easy for operation. Either horizontal or vertical installation is acceptable.

12.5. Mechanical evacuation device

When the mechanical evacuation device ordered, a fixed gear is mounted on the traction sheave. In urgent case, insert the Hand wheel into the supporting shaft then turn the traction sheave by engagement to move the car

12.6. Replacing the traction sheave


Danger

The traction sheave has to be replaced when a limited situation.

Disassembly

- Power off the system and safeguard against un-intentional reclosing.
- Secure the car and the counter-weight.
- Remove the rope slip-off guards and the rope guards, if provided.
- Relieve the load on the traction sheave; remove the ropes.
- Support the traction sheave by means of a hoisting gear.
- Remove the 12xM12 fastening bolts.(red cycle)
- Insert the M12x80-8.8 (or above) bolts into the two threaded forcing holes and force off the traction sheave. (red square)

Assembly

- Clean the traction sheave and the rotor flange.
- For better assembly heat up traction sheave.
- Slide the traction onto the rotor flange as far as possible.
- Insert the fastening bolts and tighten diagonally oppo- site bolts. Use "omnifit 100" or a similar adhesive to secure the bolts. Tighten them along the bolt hole circle (MA = 79 Nm) with a torque spanner.
- Replace the ropes and reinstall the rope slip-off guard.

12.7. Brake


Note

Electromagnetic brakes is a kind of special product for lift using. It is always pre-adjusted before delivery. It can only be assembled , adjusted and maintained by the manufacture of traction machine with qualified skills for certain purpose on the field. The responsibility will not be taken if the above instruction is not complied.

Type selection

In order to find a proper type and torque for the brake, the safety factor is always considered. In common case, M_{brake} = (1.1~1.25) M_N (M_N is the nominal torque of the machine)

Operation condition

Ambient temperature:	+5 ... 40°C
Max. rel. humidity:	85 % at 20°C (no moisture condensation)
IP:	IP43

Replacement of the brake


Note

In case the thickness of brake lining is less than 3mm or the noise of the brake higher than 75dbA, it must be readjusted or replaced.


Danger

Power off the system and safeguard against un- intentional reclosing.

Secure the car and the counter-weight and make sure there's no loading on the traction sheave

Procedure of disassembly

- Disconnect the wiring regarding to the brake power and brake monitoring from the terminal box.
- Relieve the 4xM10 bolts as it is showed in red cycle as following,



Procedure of assembling and adjustment

1. Screw the adjustment sets into the bottom place of the brake.(shortest length outside)



2. Hold the switch cover, move the brake close to the traction machine.

3. Hang up the brake on the traction machine with four M10-12.9 screws. (When tightening the installation screws, the gap between static plate and moving plate turns smaller from originally 1.2 ~ 1.4mm) as red square below

4. Relieve the cross screws to take out switch cover as red cycle below



5. When the gap is about 0.55mm, use a feeler gauge measuring the gap (operation gap) between the static plate and moving plate. To confirm the four corners of the brake have the same gap. Moreover, to confirm the four installation screws have the same force.



6. Screw out the adjustment sets to touch the surface of the housing. Use torque spanner to tight the M12 screws with reserved force to make sure these screws and the adjustment sets could lock each other closely. Locking torque should be no less than 70Nm to avoid loosen.



7. After setting, power on the brake. The moving plate would be pulled in. Use the feeler gauge again to measure the gap between the brake lining and the brake wheels to check whether the gap is 0.10mm ~ 0.20mm. If not, continue to sharp tuning the installation screws and adjustment sets. At the same time, confirm that during interruption of power supply, the air gap between static plate and moving plate should be 0.5 ~ 0.6mm.

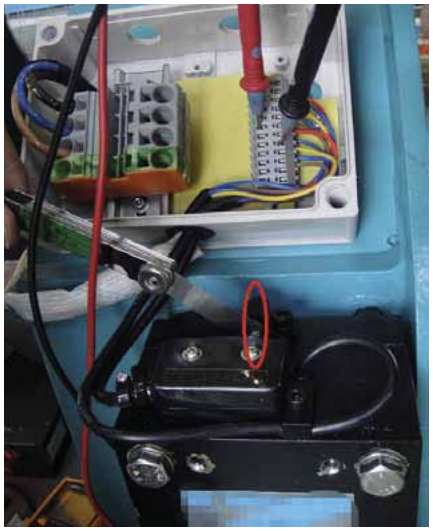
Adjustment of brake monitoring



Note

Basic requirements: No matter hot situation or cold situation, the micro switch must active correctly when brake works

- After the installation of brake, in cold situation with power off, use 0.2mm feeler gauge to put it in between switch trigger and top rod(as picture showed below). In parallel connect a multi-meter to the terminal of brake monitoring (for example C1-S1 and C2-S2 is connected) to make sure a close circuit.
- Take out the 0.2mm feeler but insert a 0.15mm feeler, make sure, this time is an open circuit. (If C1-O1 and C2-O2 is connected, then it should be the opposite result)



Operation and safety instruction

- Ensure working situation of brake is inside the min. Ambient condition
- Ensure the brake works under the designed duty (S3-40%)
- Prevent brakes from dropping or colliding during transportation. Avoid damaging the mechanical parts or electrical components.
- When use the hand release to manually open the brake, make sure the torque is lower than 68Nm/ 82Nm.
- After a long term period operation of the traction machine, the braking lining may be abraded. The brake gap would be increased to cause a loudly noise. In case the thickness of brake lining is less than 3mm or the noise of the brake higher than 75dbA, the brake must be re-adjusted or replaced

Maintenance

- The WB brake requires a high quality of installation because of the special construction characters It is common that in the beginning after the machine and brake handover to customer, the gap may increase a little bit because the brake lining cannot match to brake wheel in 100%. It requires attention frequently. When the air gap turns larger (noise level would increase at the same time), the adjustment is require immediately.
- The work condition of WB brakes is S3-60%, the brakes could not work in normal in certain special condition which gives a high temperature such as: long working period with high electricity more than 60%, or environmental temperature goes up to more than 40 degrees. These will all lead to failure alarm of traction machine. In such cases, the frequence of elevator operation to be reduced or an air condition maybe is needed in the machine room.
- The operation voltage to be checked reguarly otherwise it may cause brake damage by high voltage or operation failure by low voltage.
- After a long time working, the gap may become big by the consumption of the brake lining. In this case, the noise of the braking will be louder and the responding of the braking will be longer with a safety risk. Therefore, a report to the maintainer for maintenance is constraint.

12.8. Replacing the measuring system

Note

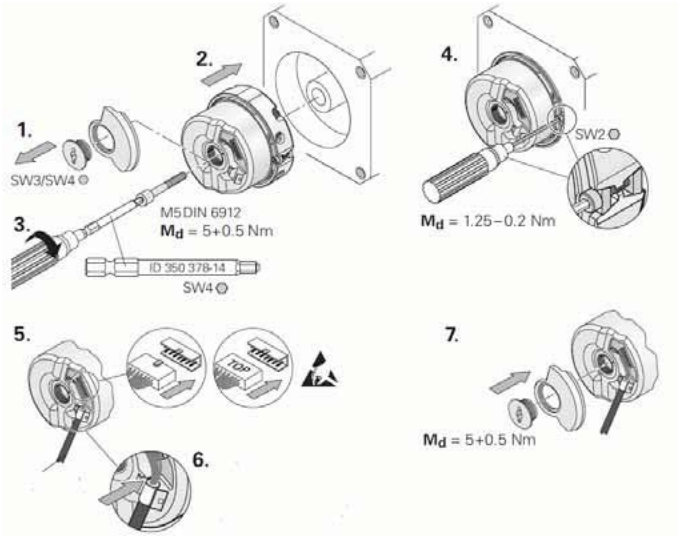
The measuring system is only accessible from the rear side of the motor.

Warning

Disassemble the measuring system only if this is necessary because of a defect. Remember to readjust the offset value after reassembly (see the converter operating instructions).

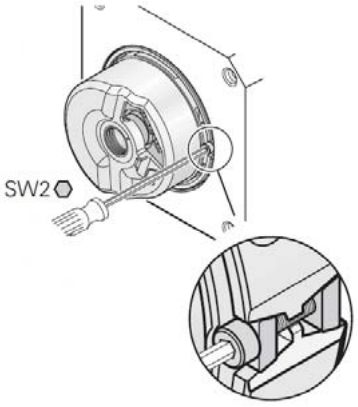
Assembly ECN 1313 EnDat and ERN1387

- Remove the cable cover from the measuring system.
- Plug in the measuring system
- insert the M5x50 fastening screw in the hollow shaft and tighten the screw
- Tighten the clamping ring on the measuring system
- Insert the cable p.c.b. connector (observing the designation"TOP" or the guiding nose).
- Fasten the coupling using the clamp
- Reinstall the cable cover

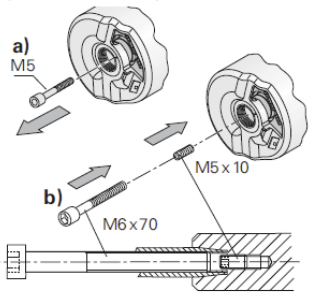


Disassembly

- Remove the cable cover from the measuring system; pull out the cable p.c.b. connector.
- Loosen the clamping ring on the measuring system (2mm Allen screw).



- Remove the M5 fastening screw
- Insert the M5x10 setscrew to protect the thread (see figure) and remove the measuring system by means of the M6x70 forcing screw.



Note

Please take attention thatECN 1313 EnDat andERN1387 requires different encoder cable.

12.8. Replacing the measuring system

Note

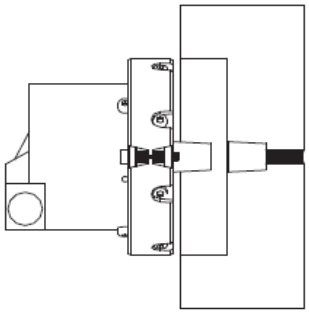
The measuring system is only accessible from the rear side of the motor.

Warning

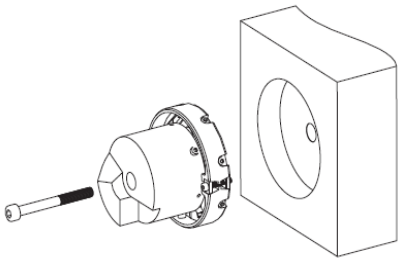
Disassemble the measuring system only if this is necessary because of a defect. Remember to readjust the offset value after reassembly (see the converter operating instructions).

Assembly TS5213N2503

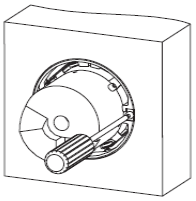
- Plug in the measuring system



- insert the M5x45 fastening screw in the hollow shaft and tighten the screw

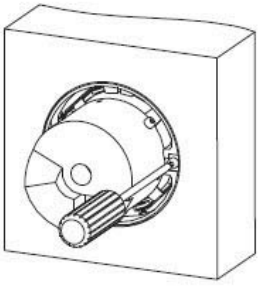


- Tighten the clamping ring on the measuring system



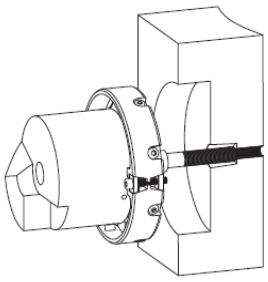
Disassembly

- Loosen the clamping ring on the measuring system (2mm Allen screw).



- Remove the M5x45 fastening screw

- Insert the M5x10 setscrew to protect the thread (see figure) and remove the measuring system by means of the M6x60 forcing screw.



Note

Please take attention TS5213N2503 requires different encoder cable.

12.9. Trouble shooting

Fault	Possible cause	Remedy
Motor does not start, operates out of control or develops no torque	• Motor not connected in proper phase sequence	• Connect motor correctly
	• Measuring system not properly connected	• Connect measuring system correctly
	• Converter parametrisation incorrect	• Check converter parametrisation
	• EMC disturbance	• Carry out shielding and earthing measures as described by the converter manufacturer
	• Measuring system offset angle incorrectly set	• Check measuring system offset angle
	• Measuring system defective	• Replace measuring system
Motor noise	• Bearing defective	• Notify customer service
	• Converter parametrisation incorrect	• Check converter parametrisation
Braking system does not release	• Braking system is not supplied with voltage	• Check electrical connection
	• Brake magnet voltage too low	• Check braking voltage supply voltage
	• Brake mechanically blocked	• Remove mechanical blocking
	• Overexcitation rectifier defective	• Replace overexcitation rectifier
Delay in braking system release	• Overexcitation rectifier defective	• Replace overexcitation rectifier
Braking system does not engage	• Brake shoe mechanically blocked	• Remove mechanical blocking
Delay in engaging of braking system	• Brake defective	• Notify customer service
Brake makes loud switching noise	• Brake air gap too large	• Adjust brake air gap
Braking torque too low	• Brake friction surface or brake lin- ings dirty.	• Clean friction surface / brake linings
	• Foreign bodies between friction surface and brake lining	• Remove foreign bodies
	• Brake friction surface or brake lin- ing have come into contact with oily or greasy materials	• Replace brake lining, clean brake drum thoroughly
	• Load torque too high	• Reduce load torque

13. Accessories

13.1. Connecting cable for measuring systems

Converter	Connection	Encoder	Order number
Emerson Unidrive Yaskawa-L1000		ECN1313 EnDat	Z320WSGS30010V0X
Schneider Altivar		ERN1387	Z320WSGS30006V0X
Monarch Meiden VT Xizitrust Micovert			Z320WSGS30008V0X
G11UD4C4、Lift		ECN1313 EnDat	Z320WSGS30009V0X
iAstar			Z320WSGS30030V0X
iAstar		ERN1387	Z320WSGS30032V0X
SIEI			Z320WSGS30026V0X
KEB F5 Emerson CN7 Soder S9			Z320WSGS30007V0X
Monarch			Z320WSGS30031V0X

Others: V01=7m V02=10m

13.2. Connectin cable for measuring systems

Converter	Connection	Encoder	Order number
Schneider Altivar		TS5213N2503	Z320WSGS30073V0X
Monarch Meiden VT Xizitrust Micovert			Z320WSGS30074V0X
iAstar			Z320WSGS30079V0X
SIEI			Z320WSGS30078V0X
KEB F5 Emerson CN7 Soder S9			Z320WSGS30075V0X
Monarch			Z320WSGS30076V0X

Others: V02=7m V03=10m

13. Accessories

13.2. Mechanical evacuation

In urgent situation, like power off or emergency rescure, in case the system weight at car side equals to cwt side, the car can not move natually, then the qualified people is allowed insert to the hand wheel to mechanical Evacuation device to move the car by turning.



13.3. Brake remote release

In order to open the brake in the shaft, a remote brake release system has to be ordered.



13.4. Brake manual release

In order to open the brake in the shaft, a manual brake release is needed. (in content of delivery if brake remote release is not ordered)



13.5 Mechanical evacuation device

The mechanical evacuation device is fixed on the traction sheave in case MR solution or ordered. In urgent case, the hand wheel can be adapted to this device for moving the car



14. Spare parts

Spare parts	picture	Ban code
Brake (WSG09.2)	 X2	Z320WSGS10072 (for remote) Z320WSGS10069 (for manual)
Brake (WSG09.3)	 X2	Z320WSGS10073 (for remote) Z320WSGS10070 (for manual)
Brake (WSG09.4)	 X2	Z320WSGS10074 (for remote) Z320WSGS10071 (for manual)
Brake (WSG09.2) with remote release (with 5m bowden cable)	 X2+ 	Z320WSGS10039 (5m) Z320WSGS10167 (7m)
Brake (WSG09.3) with remote release (with 5m bowden cable)	 X2+ 	Z320WSGS10037 (5m) Z320WSGS10037V01 (7m)
Brake (WSG09.4) with remote release	 X2+ 	Z320WSGS10035 (5m) Z320WSGS10492 (7m)
Remote release		Z320WSGS10275V01(5m) Z320WSGS10275V02(7m)
Manual release wrench		Z320WSGS10067
Traction sheave (5 grooves)		Z320WSGS10030V03(Ø400mm) Z320WSGS10240V01(Ø450mm)
Traction sheave (6 grooves)		Z320WSGS10030V02(Ø400mm) Z320WSGS10240V02(Ø450mm)
Traction sheave (7 grooves)		Z320WSGS10030V01(Ø400mm)
Shaft with pinion		Z320WSGS10052
Evacuation hand wheel		Z320WSGS10055
Micro-switch		Z320WSGS30011
Rope slip-off (WSG09.2and WSG09.3)		Z320WSGS10047V02
Rope slip-off (WSG09.4)		Z320WSGS10047V01
Terminal box (Chinese label)		Z320WSGS10043V01
Terminal box (English label)		Z320WSGS10043V02
Encoder cables		See accessories

THE LMC
LIFTCOMPONENTS
MANUFACTURING
AND COMMERCE
COMPANY

WITTUR CHINA

WITTUR

EC DECLARATION OF CONFORMITY

THE MANUFACTURER

WITTUR ELEVATOR COMPONENTS (SUZHOU) CO., LTD

Hereby declares that the following drive components
Description: Gearless Synchronous Lift Machine
Type: WSG09.X
Serial Number and Manufacturing Year: See the product identification label
The design and construction of WSG09.X is in compliance with the requirements of the following applicable Directive and European Standard:

Directive:

EC Low Voltage Directive (2006/95/EC)
EMC Directive (2004/108/EC): When connected to a sinus-shaped a.c. voltage system

Standard:

EN / IEC 60 204-1: Safety of machinery – Electrical equipment of machines. Part 1: General requirements
EN / IEC 60 034: Rotating electrical machines
EN ISO 12 100: 2010: Safety of machinery – General principles for design, risk assessment and risk reduction.

The product has already been carried out the Conformity Certification by Notified body TÜV SÜD Industrie Service GmbH / Westendstraße 199, 80686 München – Germany.
The manufacture quality of the product is under the control of Wittur Elevator Components (Suzhou) Co.,Ltd.

Wujiang, 2015 Apr 03
Place and date

Signature and Stamp
(R&D Director. WCN)

Signature and Stamp
(QM Director. WCN)

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(苏州)有限公司
中国江苏吴江北厍
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电话：+86 512 3220888
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ZERTIFIKAT ◆ CERTIFICATE ◆ 認証証書 ◆ СЕРТИФИКАТ ◆ CERTIFICADO ◆ CERTIFICAT

Industrie Service

Certificate

Concerning the examination of conformity

Certificate No.:	KP 308/1
Certification Body:	TÜV SÜD Industrie Service GmbH Zertifizierungsstelle für Produkte der Fördertechnik Westendstraße 199, 80686 München – Germany
Applicant/ Certificate Holder:	Wittur Elevator Components (Suzhou) Co., Ltd. 18 Shexing Road, FOHO Economic Development Zone, Wujiang City, Jiangsu Province, P. R. China, 215214
Date of application:	2014-04-16
Manufacturer	Wittur Elevator Components (Suzhou) Co., Ltd. 18 Shexing Road, FOHO Economic Development Zone, Wujiang City, Jiangsu Province, P. R. China, 215214
Product:	Gearless synchronous lift machines
Type	WSG09.X
Test Laboratory:	TÜV SÜD Industrie Service GmbH Zertifizierungsstelle für Produkte der Fördertechnik Westendstraße 199, 80686 München – Germany
Date and number of test report:	2014-05-06 KP 308/1
Basis of examinations:	- Directive 95/16/EC – Annex I - Standard EN 81-1:1998+A3:2009
Statement:	The lift machine fulfils the safety requirements of the basis of examination and the scope of application stated in the test report. This statement is valid as long as all the lift machines are in full compliance with the sample of this examination of conformity and there is no change of the requirements in the basis of examination referring to lift machines.
Validity:	This certificate is valid until 2019-05-15
Date of issue:	2014-05-16

Certification body for lifts and cranes

Chadi Noureddine

TÜV SÜD Industrie Service GmbH

TÜV®

ZERTIFIKAT ◆ CERTIFICATE ◆ 認証証書 ◆ СЕРТИФИКАТ ◆ CERTIFICADO ◆ CERTIFICAT

Industrie Service

EC Type-examination certificate

Certificate no.:	ABV 941
Notified Body:	TÜV SÜD Industrie Service GmbH Westendstr. 199 80686 München - Germany
Applicant/ Certificate holder:	Wittur Elevator Components (Suzhou) Co., Ltd. 18 Shexing Road, FOHO Economic Development Zone, Wujiang City, Jiangsu Province, P. R. China, 215214
Date of application:	2013-05-31
Manufacturer of the test sample:	Wittur Elevator Components (Suzhou) Co., Ltd. 18 Shexing Road, FOHO Economic Development Zone, Wujiang City, Jiangsu Province, P. R. China, 215214
Product:	Braking device, acting on the brake drum, as part of the protection device against overspeed car movement in upwards direction
Type:	WB4600
Test laboratory:	TÜV SÜD Industrie Service GmbH Prüflaboratorium für Produkte der Fördertechnik Prüfbereich Aufzüge und Sicherheitsbauteile Westendstraße 199 80686 München - Germany
Date and number of the test report:	2013-09-10 ABV 941
EC-Directive:	95 / 16 / EC
Result:	The safety component conforms to the essential safety requirements of the Directive for the respective scope of application stated on page 1-2 of the annex to this EC type-examination certificate.
Date of issue:	2013-10-11

Certification body for lifts and safety components
Identification number: 0036

Christian Rührmeyer

TÜV SÜD Industrie Service GmbH 00 36 Benannte Stelle

TÜV®

Industrie Service

Annex to the EC type-examination certificate No. ABV 941 dated 2013-10-11

1 Scope of Application

1.1 Permissible brake moment when the braking device acts on the brake drum while the car is moving upward. 1900 Nm

The brake moment refers to two single brake and acts on the circumference of the brake drum.

Unless the brake drum is an integral element of the traction sheave (e. g. cast on), it must be connected directly (e. g. as a fix screwed unit) or indirectly with the latter via the common shaft. In cases where brake drum and traction sheave are connected indirectly via the shaft, the brake drum must be positioned in the immediate vicinity of the traction sheave.

1.2 Maximum tripping speed of the overspeed governor and maximum rated speed

The maximum tripping speed and the maximum rated speed must be calculated on the basis of the traction sheaves maximum tripping rotary speed and maximum rated rotary speed as outlined in sections 1.2.1 and 1.2.2 taking into account traction-sheave diameter and car suspension.

$$v = \frac{D \times \pi \times n}{60 \times i}$$

v = Speed (m/s)
D = Diameter of the traction sheave from rope's centre to rope's centre (m)
π = 3.14
n = Rotary speed (rpm)
i = Ratio of the car suspension

1.2.1 Maximum tripping speed (gliding speed) on the brake drum 300 rpm

1.2.2 Maximum rated speed (gliding speed) on the brake drum 261 rpm

2 Conditions

2.1 In order to comply with the redundancy required in Section 9.10.2 of EN 81-1, at least two braking devices (single brakes) must be used.

2.2 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 81-1:1998+A3:2009, 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.

2.3 In order to recognise the loss of redundancy the movement of each brake circuit 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.

2.4 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 travelling 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).

2.5 According to EN 81-1:1998+A3:2009, paragraph 9.10.4 d) a braking device must act directly on the traction sheave or on the same shaft on which the traction sheave is situated in the immediate vicinity thereof.

If the braking device does not act in the immediate vicinity of the traction sheave on the same shaft on which the traction sheave is situated, the standard is not complied with. In cases involving shaft failure in the extended area between the traction sheave and the braking device, safety would no longer be ensured by the latter if the lift car made an uncontrolled upward movement.

Shaft failure in the extended area must therefore be ruled out by appropriate and sufficient dimensioning. In order to eliminate or reduce influencing factors which may lead to failure wherever possible, the following requirements must be satisfied:

- Minimization of bending length between traction sheave and braking device or traction sheave and the next bearing (the next bearing must form part of the drive unit)
- Static defined bearing (e.g. 2-fold borne shaft) otherwise measures are required to obtain a defined loading.
- As far as possible, prevention of a reduction in load-bearing capacity in the area of reversed bending stress (reduction in load-bearing capacity caused, for example, by stress concentration and cross-sectional reductions).
- Between traction sheave and braking device the shaft must be continuous (made from one piece).
- Cross-sectional influences on the shaft are only permitted if they act on the following connections: traction sheave-shaft, braking device-shaft, torque of the transmitting components-shaft (situated between traction sheave and braking device).

The manufacturer of the drive unit must provide calculation evidence that the connection traction sheave-shaft and the shaft itself is sufficiency safe. If necessary, evidence must be provided for the intended measures too (see static undefined bearing).

The calculation evidence must be enclosed with the technical documentation of the lift.

3 Remarks

3.1 The permissible brake force or brake moment must be applied to the lift system in such a manner that the empty car moving in upwards direction is not decelerated by more than $1g_n$.

3.2 Within the scope of this type-examination it was ascertained, that the brake device also functions as a brake for normal operation.

This type examination only refers to the requirements pertaining to the brake devices as per EN 81-1:1998+A3:2009 paragraph 9.10.

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

3.3 In order to provide identification and information about the design and its functioning, drawings no. A10134 with certification stamp dated 2013-10-11 is to be enclosed with the EC type-examination certificate and the Annex thereto. The installation conditions and connection requirements are presented or described in separate documents (e.g. operating instructions).

3.4 The EC type-examination certificate may only be used in connection with the pertinent annex and the list of the authorized manufacturers (according to enclosure). This enclosure shall be updated and re-edited following information of the certificate holder.

Industrie Service

Enclosure of EC type-examination certificate
No. ABV 941 dated 2013-10-11

Authorized manufacturers – production sites (stated: 2013-10-11):

Shenyang Youli Machinery & Electrical Equipment Co., Ltd.
25 Daoyi4 Street, Shenbei New zone, Shenyang,110135, P.R.China,

- END OF DOCUMENT -

Base: Application form of Co. Wittur Elevator Components (Suzhou) Co., Ltd. dated 2013-05-31

ZERTIFIKAT ◆ CERTIFICATE ◆ 認証書 ◆ СЕРТИФИКАТ ◆ CERTIFICADO ◆ CERTIFICAT

Industrie Service

Type-examination certificate

Certificate no.:	ESV 941
Certification office:	TÜV SÜD Industrie Service GmbH Westendstr. 199 80686 München - Germany
Applicant/ Certificate holder:	Wittur Elevator Components (Suzhou) Co., Ltd. 18 Shexing Road, FOHO Economic Development Zone, Wujiang City, Jiangsu Province, P. R. China, 215214
Date of application:	2013-05-31
Manufacturer of the test sample:	Wittur Elevator Components (Suzhou) Co., Ltd. 18 Shexing Road, FOHO Economic Development Zone, Wujiang City, Jiangsu Province, P. R. China, 215214
Product:	Braking element, acting on the brake drum, as part of the protection device against unintended car movement
Type:	WB4600
Test laboratory:	TÜV SÜD Industrie Service GmbH Prüflaboratorium für Produkte der Fördertechnik Prüfbereich Aufzüge und Sicherheitsbauteile Westendstraße 199 80686 München - Germany
Date and number of the test report:	2013-09-10 ESV 941
Examination basis:	EN 81-1:1998+A3:2009 issued December 2009
Result:	The safety component conforms to the requirements of examination basis for the respective scope of application stated on page 1-2 of the annex to this type-examination certificate.
Date of issue:	2013-10-11

Certification office for products of conveyor systems
Lifts and safety components

Christian Rührmeyer

TÜV SÜD Industrie Service GmbH

TÜV®

Industrie Service

Annex to the type-examination certificate No. ESV 941 dated 2013-10-11

1 Scope of Application

1.1 Nominal brake torque and response time with relation to a brand-new brake element

Nominal Brake torque * [Nm]	Maximum tripping rotary speed [rpm]	Maximum response time ** [ms]		
		t_{10}	t_{50}	t_{90}
2 x 950 = 1900	300	80	125	170

Explanation

***Nominal brake torque:** Brake torque assured for installation operation by the safety component manufacturer

****Response time:** t_x time difference between the drop of the braking power until establishing of X% of the nominal braking moment, t_{50} optionally calculated $t_{50}= (t_{10} + t_{90})/2$ or value from the examination record

1.2 Assigned execution features

Type of powering / deactivation	Continuous current / continuous current end
Brake control	Parallel
Maximum air gap	0.5 – 0.6 mm
Damping elements	Yes
Over-excitation	No

2 Conditions

2.1 The above mentioned safety component represents only part of a protection equipment against unintended movement of the elevator car. Only in combination with a detecting and triggering component (two separate components possible) which must be subjected to an own type examination, can the system created fulfil the requirements for a safety component in accordance with Annex F.8, EN 81-1:1998 + A3:2009.

2.2 The safety component is used in combination with the brake device as a part of the ascending car overspeed protection means and as a drive brake.

2.3 The installer of a lift must create an examination instruction in accordance with D.2 p) of EN 81-1:1998+A3:2009 for lift(s) to fulfil the overall concept, add it to lift documentation and provide any necessary tools or measuring devices, which allow a safe examination (e.g. with closed shaft doors).

2.4 The dimension configuration of lift system must be designed as regards the brake torques in such a way that the permissible value of deceleration does not exceed 1 g_n in either direction. Excluded are decelerations, which are caused by an instantaneous safety gear up to a rated speed of lift system of 0.63 m/s for instance.

2.5 The traction and its variance must be taken into account as regards its braking distance (transferable power / torque) and included in the calculation.

2.6 For installer of a lift, the compliance of the component with the type examined component and the assured nominal brake torques and response time must be confirmed in writing (e. g., type plate and/or supplement in the declaration of conformity).

2.7 The information evaluation for self-monitoring must prevent an operational starting of the lift in the event of a fault.

2.8 According to the norm requirements, the brake element of the protective device must impact directly on the traction sheave or on the same shaft in the immediate vicinity of the traction sheave.

If the brake element does not impact in the immediate vicinity of the traction sheave on the same shaft, on which the traction sheave is also arranged, a deviation from the norm exists. A failure of the shaft in the area between the traction sheave and the brake element must be ruled out using corresponding construction designs and sufficient measurements. The manufacturer of the entire drive must prove the sufficient safety of the connection brake element – shaft and traction sheave - shaft as well as the shaft itself in calculations. The proof must be added to the technical documentation of the lift.

3 Remarks

3.1 As part of the type-examination, it was detected that the brake element has a redundant design and that the correct functions is monitored by sensors.

The examination of compliance with all requirements under EN 81-1:1998+A3:2009 Section 12.4, deterioration of the brake torques / braking forces due to wear and tear and the operation related change of the drive capability are not part of this type-examination.

This type-examination refers to the partial requirements for the protection device against unintended car movement only according to EN 81-1:1998+A3:2009, Section 9.11.

3.2 In order to provide identification, information about the basic design and functioning and to show the environmental conditions and connection requirements, drawing with the relevant latest identification from the associated EC type-examination certification ABV 941/X is to be enclosed with the type-examination certificate and the annex thereto.

3.3 The Type-examination certificate may only be used in connection with the pertinent annex and the list of the authorized manufacturers (according to enclosure of the corresponding EC type-examination certification ABV 941/X).

ZERTIFIKAT ◆ CERTIFICATE ◆ 認証書 ◆ СЕРТИФИКАТ ◆ CERTIFICADO ◆ CERTIFICAT

Industrie Service

EC Type-examination certificate

Certificate no.:	ABV 942
Notified Body:	TÜV SÜD Industrie Service GmbH Westendstr. 199 80686 München - Germany
Applicant/ Certificate holder:	Wittur Elevator Components (Suzhou) Co., Ltd. 18 Shexing Road, FOHO Economic Development Zone, Wujiang City, Jiangsu Province, P. R. China, 215214
Date of application:	2013-05-31
Manufacturer of the test sample:	Wittur Elevator Components (Suzhou) Co., Ltd. 18 Shexing Road, FOHO Economic Development Zone, Wujiang City, Jiangsu Province, P. R. China, 215214
Product:	Braking device, acting on the brake drum, as part of the protection device against overspeed car movement in upwards direction
Type:	WB3600
Test laboratory:	TÜV SÜD Industrie Service GmbH Prüflaboratorium für Produkte der Fördertechnik Prüfbereich Aufzüge und Sicherheitsbauteile Westendstraße 199 80686 München - Germany
Date and number of the test report:	2013-09-10 ABV 942
EC-Directive:	95 / 16 / EC
Result:	The safety component conforms to the essential safety requirements of the Directive for the respective scope of application stated on page 1-2 of the annex to this EC type-examination certificate.
Date of issue:	2013-10-11

Certification body for lifts and safety components
Identification number: 0036

TÜV SÜD Industrie Service GmbH 00 36 Benannte Stelle

Christian Rührmeyer

TÜV®

Industrie Service

Annex to the EC type-examination certificate No. ABV 942 dated 2013-10-11

1 Scope of Application

1.1 Permissible brake moment when the braking device acts on the brake drum while the car is moving upward. 1400 or 1700 Nm

The brake moment refers to two single brake and acts on the circumference of the brake drum.

Unless the brake drum is an integral element of the traction sheave (e. g. cast on), it must be connected directly (e. g. as a fix screwed unit) or indirectly with the latter via the common shaft. In cases where brake drum and traction sheave are connected indirectly via the shaft, the brake drum must be positioned in the immediate vicinity of the traction sheave.

1.2 Maximum tripping speed of the overspeed governor and maximum rated speed

The maximum tripping speed and the maximum rated speed must be calculated on the basis of the traction sheaves maximum tripping rotary speed and maximum rated rotary speed as outlined in sections 1.2.1 and 1.2.2 taking into account traction-sheave diameter and car suspension.

$$v = \frac{D \times \pi \times n}{60 \times i}$$

v = Speed (m/s)
D = Diameter of the traction sheave from rope's centre to rope's centre (m)
π = 3.14
n = Rotary speed (rpm)
i = Ratio of the car suspension

1.2.1 Maximum tripping speed (gliding speed) on the brake drum 300 rpm

1.2.2 Maximum rated speed (gliding speed) on the brake drum 261 rpm

2 Conditions

2.1 In order to comply with the redundancy required in Section 9.10.2 of EN 81-1, at least two braking devices (single brakes) must be used.

2.2 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 81-1:1998+A3:2009, 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.

2.3 In order to recognise the loss of redundancy the movement of each brake circuit 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.

2.4 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 travelling 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).

2.5 According to EN 81-1:1998+A3:2009, paragraph 9.10.4 d) a braking device must act directly on the traction sheave or on the same shaft on which the traction sheave is situated in the immediate vicinity thereof.

If the braking device does not act in the immediate vicinity of the traction sheave on the same shaft on which the traction sheave is situated, the standard is not complied with. In cases involving shaft failure in the extended area between the traction sheave and the braking device, safety would no longer be ensured by the latter if the lift car made an uncontrolled upward movement.

Shaft failure in the extended area must therefore be ruled out by appropriate and sufficient dimensioning. In order to eliminate or reduce influencing factors which may lead to failure wherever possible, the following requirements must be satisfied:

- Minimization of bending length between traction sheave and braking device or traction sheave and the next bearing (the next bearing must form part of the drive unit)
- Static defined bearing (e.g. 2-fold borne shaft) otherwise measures are required to obtain a defined loading.
- As far as possible, prevention of a reduction in load-bearing capacity in the area of reversed bending stress (reduction in load-bearing capacity caused, for example, by stress concentration and cross-sectional reductions).
- Between traction sheave and braking device the shaft must be continuous (made from one piece).
- Cross-sectional influences on the shaft are only permitted if they act on the following connections: traction sheave-shaft, braking device-shaft, torque of the transmitting components-shaft (situated between traction sheave and braking device).

The manufacturer of the drive unit must provide calculation evidence that the connection traction sheave-shaft and the shaft itself is sufficiency safe. If necessary, evidence must be provided for the intended measures too (see static undefined bearing).

The calculation evidence must be enclosed with the technical documentation of the lift.

3 Remarks

3.1 The permissible brake force or brake moment must be applied to the lift system in such a manner that the empty car moving in upwards direction is not decelerated by more than $1g_n$.

3.2 Within the scope of this type-examination it was ascertained, that the brake device also functions as a brake for normal operation.

This type examination only refers to the requirements pertaining to the brake devices as per EN 81-1:1998+A3:2009 paragraph 9.10.

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

3.3 In order to provide identification and information about the design and its functioning, drawing no. A10135 with certification stamp dated 2013-10-11 is to be enclosed with the EC type-examination certificate and the Annex thereto. The installation conditions and connection requirements are presented or described in separate documents (e.g. operating instructions).

3.4 The EC type-examination certificate may only be used in connection with the pertinent annex and the list of the authorized manufacturers (according to enclosure). This enclosure shall be updated and re-edited following information of the certificate holder.

Industrie Service

Enclosure of EC type-examination certificate
No. ABV 942 dated 2013-10-11

Authorized manufacturers – production sites (stated: 2013-10-11):

Shenyang Youli Machinery & Electrical Equipment Co., Ltd.
25 Daoyi4 Street, Shenbei New zone, Shenyang,110135, P.R.China,

- END OF DOCUMENT -

Base: Application form of Co. Wittur Elevator Components (Suzhou) Co., Ltd. dated 2013-05-31

ZERTIFIKAT ◆ CERTIFICATE ◆ 認証証書 ◆ СЕРТИФИКАТ ◆ CERTIFICADO ◆ CERTIFICAT

Industrie Service

Type-examination certificate

Certificate no.:	ESV 942
Certification office:	TÜV SÜD Industrie Service GmbH Westendstr. 199 80686 München - Germany
Applicant/ Certificate holder:	Wittur Elevator Components (Suzhou) Co., Ltd. 18 Shexing Road, FOHO Economic Development Zone, Wujiang City, Jiangsu Province, P. R. China, 215214
Date of application:	2013-05-31
Manufacturer of the test sample:	Wittur Elevator Components (Suzhou) Co., Ltd. 18 Shexing Road, FOHO Economic Development Zone, Wujiang City, Jiangsu Province, P. R. China, 215214
Product:	Braking element, acting on the brake drum, as part of the protection device against unintended car movement
Type:	WB3600
Test laboratory:	TÜV SÜD Industrie Service GmbH Prüflaboratorium für Produkte der Fördertechnik Prüfbereich Aufzüge und Sicherheitsbauteile Westendstraße 199 80686 München - Germany
Date and number of the test report:	2013-09-10 ESV 942
Examination basis:	EN 81-1:1998+A3:2009 issued December 2009
Result:	The safety component conforms to the requirements of examination basis for the respective scope of application stated on page 1-2 of the annex to this type-examination certificate.
Date of issue:	2013-10-11

Certification office for products of conveyor systems
Lifts and safety components

Christian Rührmeyer

TÜV SÜD Industrie Service GmbH

TÜV®

Industrie Service

Annex to the type-examination certificate No. ESV 942 dated 2013-10-11

1 Scope of Application

1.1 Nominal brake torque and response time with relation to a brand-new brake element

Nominal Brake torque * [Nm]	Maximum tripping rotary speed [rpm]	Maximum response time ** [ms]		
		t_{10}	t_{50}	t_{90}
2 x 700 = 1400	300	90	125	190
2 x 850 = 1700	300	80	125	170

Explanation

***Nominal brake torque:** Brake torque assured for installation operation by the safety component manufacturer

****Response time:** t_x time difference between the drop of the braking power until establishing of X% of the nominal braking moment, t_{50} optionally calculated $t_{50}= (t_{10} + t_{90})/2$ or value from the examination record

1.2 Assigned execution features

Type of powering / deactivation	Continuous current / continuous current end
Brake control	Parallel
Maximum air gap	0.5 – 0.6 mm
Damping elements	Yes
Over-excitation	No

2 Conditions

2.1 The above mentioned safety component represents only part of a protection equipment against unintended movement of the elevator car. Only in combination with a detecting and triggering component (two separate components possible) which must be subjected to an own type examination, can the system created fulfil the requirements for a safety component in accordance with Annex F.8, EN 81-1:1998 + A3:2009.

2.2 The safety component is used in combination with the brake device as a part of the ascending car overspeed protection means and as a drive brake.

2.3 The installer of a lift must create an examination instruction in accordance with D.2 p) of EN 81-1:1998+A3:2009 for lift(s) to fulfil the overall concept, add it to lift documentation and provide any necessary tools or measuring devices, which allow a safe examination (e.g. with closed shaft doors).

2.4 The dimension configuration of lift system must be designed as regards the brake torques in such a way that the permissible value of deceleration does not exceed 1 g_n in either direction. Excluded are decelerations, which are caused by an instantaneous safety gear up to a rated speed of lift system of 0.63 m/s for instance.

2.5 The traction and its variance must be taken into account as regards its braking distance (transferable power / torque) and included in the calculation.

2.6 For installer of a lift, the compliance of the component with the type examined component and the assured nominal brake torques and response time must be confirmed in writing (e. g., type plate and/or supplement in the declaration of conformity).

2.7 The information evaluation for self-monitoring must prevent an operational starting of the lift in the event of a fault.

2.8 According to the norm requirements, the brake element of the protective device must impact directly on the traction sheave or on the same shaft in the immediate vicinity of the traction sheave.

If the brake element does not impact in the immediate vicinity of the traction sheave on the same shaft, on which the traction sheave is also arranged, a deviation from the norm exists. A failure of the shaft in the area between the traction sheave and the brake element must be ruled out using corresponding construction designs and sufficient measurements. The manufacturer of the entire drive must prove the sufficient safety of the connection brake element – shaft and traction sheave - shaft as well as the shaft itself in calculations. The proof must be added to the technical documentation of the lift.

3 Remarks

3.1 As part of the type-examination, it was detected that the brake element has a redundant design and that the correct functions is monitored by sensors.

The examination of compliance with all requirements under EN 81-1:1998+A3:2009 Section 12.4, deterioration of the brake torques / braking forces due to wear and tear and the operation related change of the drive capability are not part of this type-examination.

This type-examination refers to the partial requirements for the protection device against unintended car movement only according to EN 81-1:1998+A3:2009, Section 9.11.

3.2 In order to provide identification, information about the basic design and functioning and to show the environmental conditions and connection requirements, drawing with the relevant latest identification from the associated EC type-examination certification ABV 942/X is to be enclosed with the type-examination certificate and the annex thereto.

3.3 The Type-examination certificate may only be used in connection with the pertinent annex and the list of the authorized manufacturers (according to enclosure of the corresponding EC type-examination certification ABV 942/X).