Escalator Machine

oms Hypodrive EC 2 - 15

Installation instructions

according to Annex VI of the EC Directive 2006/42/EC Mechanical Equipment and further product details

Translation from german original

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1 Foreword

The OMS escalator machine EC 2 – 15 is used as the drive for escalator and passenger conveyors (moving pavement, travolators) and is designed for use inside a confined space (e.g. in a state authority building). Its use in any other way requires release by OMS.

The OMS escalator machine is a high-performance drive unit, consisting of several modules with different tasks. The design of the motor is suitable for operation with frequency converters.

Please read this installation instructions thoroughly. It will help you to avoid possible malfunctions and discrepancies during the commissioning and operation of the machine.

The safety measures and regulations for the commissioning and operation of escalator machines comply with DIN EN 115 and DIN EN 292 Part 1 and 2, each in their respective latest version.

The OMS escalator machine may only be used in a technically perfect condition and the working capacity confirmed by OMS.

Should the machine have been damaged during transport or if a defect is identified during the commissioning of the machine, please inform OMS immediately giving details of the defect or damage.

If water damage exists, please contact OMS.

The decision, whether to repairs can be carried out on site and the machine still be used should only be made after consultation with and release from OMS. If necessary the machine must be returned to OMS in its original packaging.
Therefore, please keep the packaging material until after commissioning.

If changes, become recognisable during the machine's service life, e.g. due to wear, aging, etc., they should be immediately corrected according to this mounting- and maintenance manual.

The gears may only be opened in the factory by OMS, otherwise all warranty and guarantee claims expire.

Should the machine not be used until a later date, measures must be taken to conserve the machine (see Chapter 6, page 21).

2 General

The machine requires low maintenance.

The very high, 95%, efficiency of the gears ensures that the power losses are reduced so far that built on parts and surrounding mechanical and electronic elements are only subjected to low heat loads. This has a favourable influence on wear and temperature-induced aging of the components.

Therefore topping up the gears with oil is called **long-term lubrication**.
For average ambient temperatures of approx. 30°C and under continuous operating methods the oil can be used for up to 30,000 operating hours. Apart from the usual checks, the lubricating properties of the oil should be examined every 2 – 3 years (see Chapter 5).

The OMS escalator machine consists of few modules and built-on parts, which if necessary can be completely replaced.

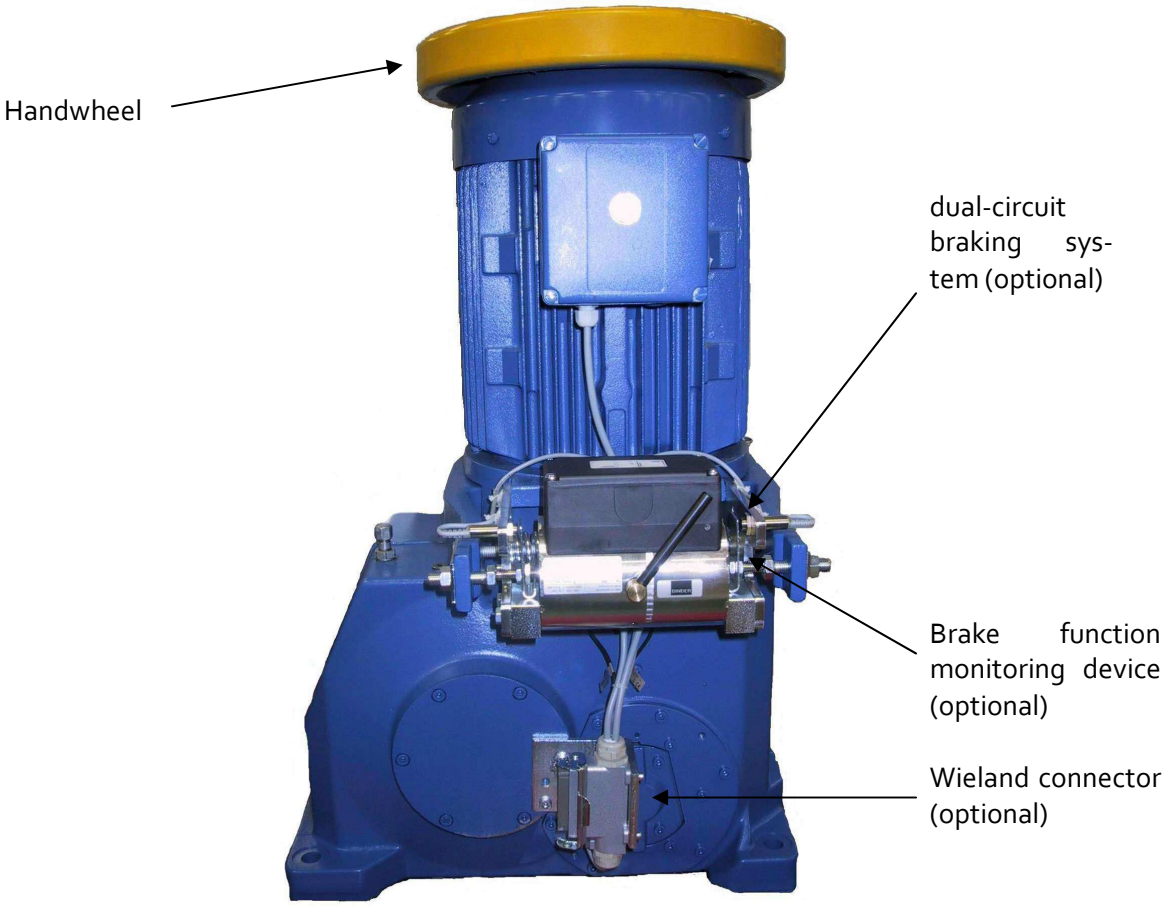


Fig. 1: Design of the OMS escalator machine EC 2 – 15

3 Installation

3.1 Assembly

Prior to installation, the intended frame or foundation upon which the escalator machines are to be installed must always have been calculated and proved adequate.
The frame must be rigid enough to withstand all and any bending and torsional forces that may occur during operation.

Fix the machine in the position as in the order using the four mounting holes in the gear unit base. Using the through-holes in the support frame and bolts and nuts to ensure secure attachment is recommended.

Bolts: *M 20 quality 12.9*
Torque: *350 Nm*
Max. allowed uneveness of the surface : 0,05mm
If necessary, use shimps to achieve the requires eveness.

3.1.1 Assembly and installation of complete traction machine

Before commissioning

Replace the labelled transport screw plug on the gear housing with the dipstick supplied. Please keep the screw plug in a safe place, easy to find for possible subsequent transport of the machine.

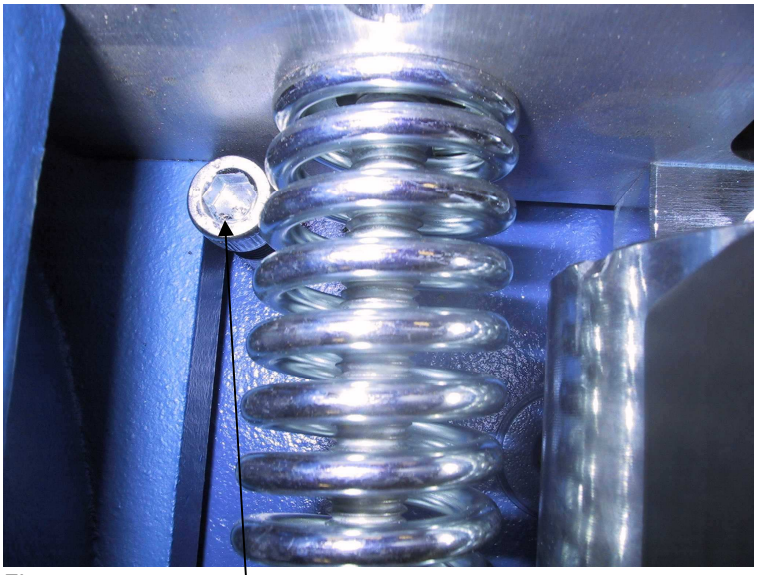


Fig. 2

Transport screw plug

Note:
The gears are sealed oil-tight for transport. With the screw plug and sealing cap the gears do not have any ventilation. If it is started up while being sealed in this way, an overpressure can be created in the housing, with the possible consequence of leaks and oil leaks at the shaft-sealing ring.
The dipstick does not represent a seal for the gears.

Electrical connection

<u>Only</u> trained and qualified personnel may open the terminal box on the motor and the supply voltage connection or carry out maintenance or repairs to electrical parts of the machine.
Switch off the mains switch beforehand and secure it against being accidentally switched back on!

Note:
The machine's electrical equipment has been designed in compliance with the general technical specifications of EN 60 204 – 1.

Procedure:

1. Motor :

The connection to the power supply is carried out according to the circuit diagram in the motor's terminal box (for details see the terminal diagram for the motor in the Appendix).
If another cable output is required as the specified direction, the terminal box can be rotated by undoing the internal screws. Carefully undo and fasten the thin temperature monitoring cable

2. Brake solenoid :

The brake solenoid (dual circuit double lift split magnet) must be connected according to the various requirements (see connection of the brake solenoid to the power supply in the Appendix). Supply voltage generally 230V AC (± 10% max).

a) For a single circuit braking system, both circuits of the solenoid (O-20) are connected via a control module.
b) For a dual-circuit braking system both circuits are connected via a control module with over excitation (O-21) or each connected via separate control modules (o-22, O-23).

4 Basic Machine

4.1 Technical data

Please refer to the Appendix for details of the OMS escalator machine's working capacity, sheet:
„Technical data for escalator machine EC 2 - 15".

All dimensions and connecting dimensions for the OMS escalator machine are given in the Appendix:
„Dimensioned drawing of the escalator machine EC 2 - 15".

4.2 Modules and built on parts

The OMS escalator machine EC 2 - 15 consists of:

- Gears, complete
- Motor, complete (with hand wheel and motor cover)
- Brake system, complete (including brake drum and coupling)
- Sprocket wheel
- Function monitoring devices
  - Brake function monitoring (optional)
  - Brake lining wear monitoring (optional)
  - Brake lining temperature monitoring (optional)
- Safety devices
  - Speed sensors (NRD monitoring) (optional)
  - Over/underspeed monitoring (optional)
  - Stopping distance monitoring (optional)
  - Fan cover switch (safety circuit) (optional)
  - Frequency scaler (5:1) with NAMUR interface (optional)

4.3 Alternative equipment

The escalator machines can also be fitted with the following alternative components:

Motor selection

Standard-features:

- Terminal box (140x140) with metric thread for BG 160
- 3 Winding earthing contact (bimetal opener)
- Colour: gentian blue RAL 5010,
- Fixing facility for hand wheel safety switch,
- Motor shaft and BS end shield provided for magnetic encoders (9 tapped holes M4)
- 50 Hz-Motors 4-pole (=1500 min^{-1}) and 6-pole (=1000 min^{-1}),
- 60 Hz-Motors 6-pole (=1200 min^{-1})

- Duty type S6-60% ED or a motor output stage smaller then S1 certified (E.g. 11kW S6-60% / 9.5kW S1)

Variants

For the following variants of the motor conduit box position as well as the exit for the cable conduit are available:

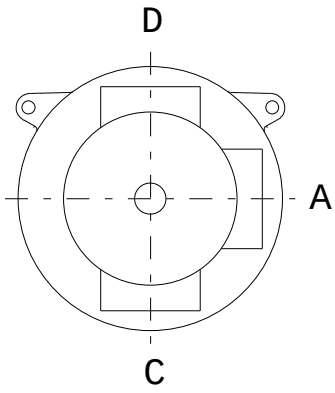


Fig. 3 conduit box position

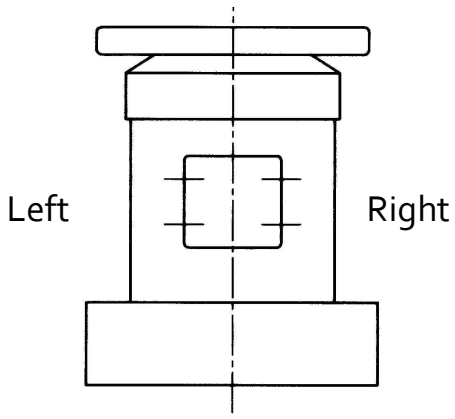


Fig. 4 output cable conduit

4.4 Spare parts

The following components can be exchanged:

- *Gear housing*
  Coupling
  Sprocket wheel
- Motor, complete (incl. motor coupling claw, elast. coupling ring)
  Hand wheel
- Brake
  Brake releasing solenoid, individual in the sizes O 20, O 21(single circuit) – O 22, O 23 dual circuit)
  Brake lever – pair with brake lining
  Spring single circuit/ springs - dual circuit
  Brake lever bolts
- Sensor technology
  Over and underspeed controls
  Brake lining wear control
  Braking function controls
  Hood-type switch

4.5 Gear versions and fitting locations

The type of construction used for the OMS escalator machine EC 2 - 15 enables the braking installations to be positioned in two different fitting locations:

Position A – Brakes opposite the sprocket wheel

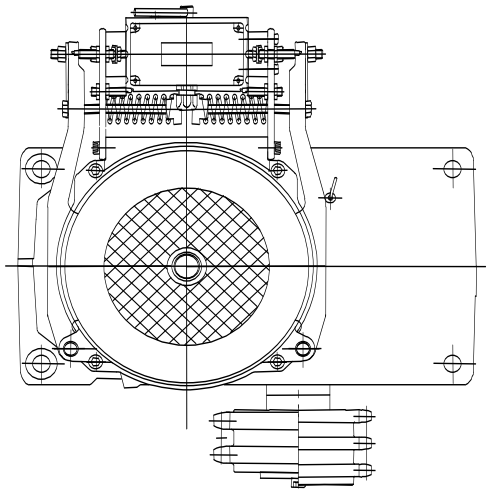


Fig. 5

Position B – Brakes to the right next to the sprocket wheel (view onto the sprocket wheel)

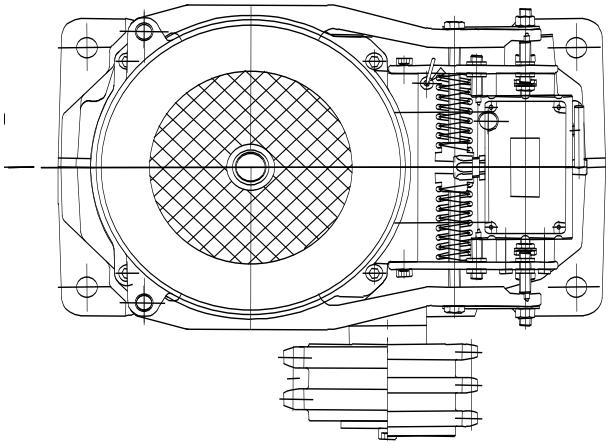


Fig. 6

5 Service and Maintenance

Before starting the maintenance work the main power switch must be switched off and secured against being accidentally switched back on!

5.1 Gear oil

5.1.1 Check the oil level

During each service.

- At the dipstick: Oil level between the marks

5.1.2 Check the condition of the oil

Always check the condition of the oil at regular intervals.

Interval:

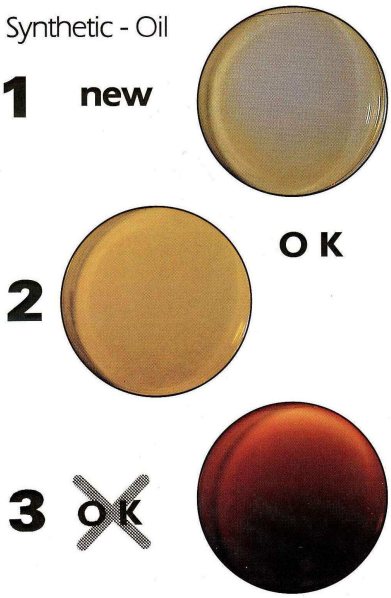
1. after approx. 10.000 h.
2. after approx. 20.000 h.
3. ; 3..... + 5000h Intervals

Check:

- Check the oil for discoloration, pull out the dipstick and allow a drop of oil to fall on the oil test card.

- Oil colour light yellow to mid-brown: Condition of the oil is good to still usable;

- **Oil colour mid-brown to dark-brown: Change oil immediately;**
- **Oil colour dark-brown to black: Oil cannot be used**



Oil check card

5.1.3 Oil change

Please proceed as follows if an oil change is necessary:

1. Place a suitable container beneath the oil drain plug on the bottom of the gears. The volume of oil is approx. 7 l.
2. Carefully open the oil drain plug.
3. Clean the oil drain plug thoroughly.
4. After all the oil has drained, refasten the oil drain hole.
5. Fill the oil by pouring it into the dipstick opening.
6. Please note the filled level (see 5.1.1).
7. Only use the specified oil grade:

   Klübersynth GH 6-220 Quantity: 7 l (never mix with other grades of oil!)
   (Only use other oil grades after consulting OMS)

8. Close the filling opening with the dipstick.

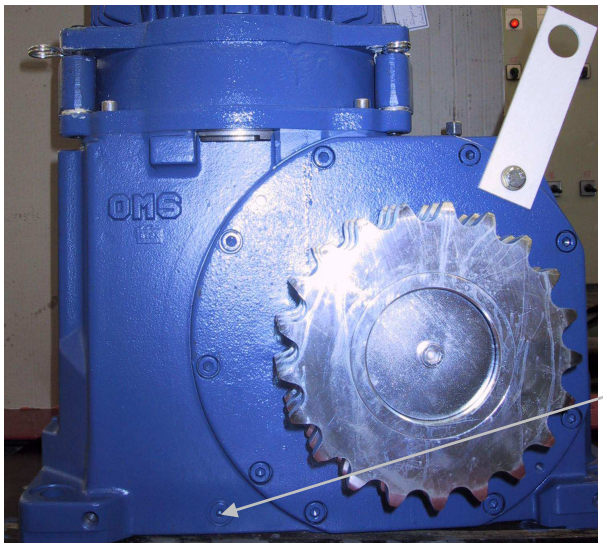


Fig. 7

5.1.4 General comments:

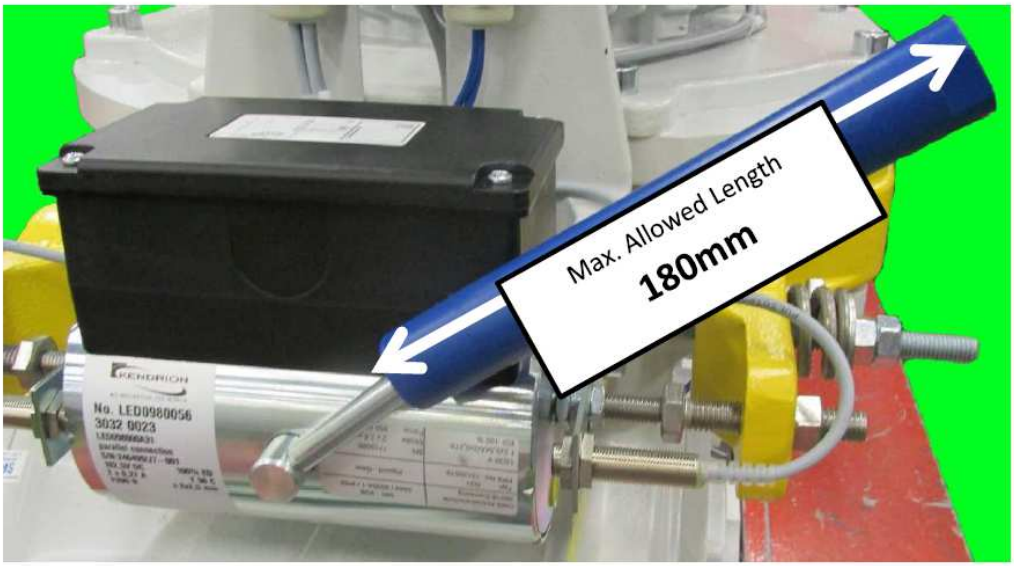
The loss of lubricating properties and the dark brown to black discoloration of the oil result after long maintenance intervals, due to particles or dirt collecting in the oil bath, due to moisture in the gear housing, high ambient temperature and the resulting temperature in the machine room. Please note: These conditions accelerate the end of the oil lubricating properties. Therefore: In case of doubt change the oil.

Any oil that escapes during an oil change or as the result of a leak must be removed immediately.

Used synthetic oil that has been replaced is special waste!

5.2 Servicing the brakes

5.2.1 Manual release lever



To open the brake it´s allowed to put an extension tube onto the manual release lever.
The maximum allowed length of the extension tube is **180mm**.
The manual release lever is allowed to be actuated in **vertical direction**. **ONLY!**
The maximum allowed force for actuating the manual release lever with extension tube is **300N**.

5.2.2 Check: The brake lever for easy movement

During the usual maintenance intervals the brake levers of the escalator equipment must be checked for easy movement. To do this, each individual brake lever must be opened as described under 5.3.4 (check the two brake circuits). The brake lever must close again with easy movement. If necessary the brake lever joint pin must be tightened (see 5.3.3) and regreased before being refitted..

5.2.3 Check: Air clearance and brake lining wear

a) Air clearance:

The air clearance must not be less than 1.0 mm.
As soon as the air clearance reaches 1 mm it must be adjusted back to maximum 1.5 mm
(See Section 5.3.2 and Fig.9).

Procedure:

1. Press back the magnetic tappet and measure the clearance between the tappet and pressure screw (Fig. 9).
2. To adjust, undo the lock nut, turn the pressure screw and retighten the lock nut. Set value S=1.5 mm.
3. After adjusting the clearance open the brake mechanically using the air lever on the magnet and check electrically via the plant controls.

If the air clearance can no longer be adjusted because the screw head is in contact with the brake lever, both brake levers must be replaced with new linings!

b) Brake lining wear:

The amount of brake lining wear determines the position of the brake lever. With increasing brake lining wear the brake lever approaches the inside of the magnet.
The brake lining area in the engagement should be ≥ 70% of the total area.

Check for brake lining wear:

If the minimum spacing at a brake lever has been reached, both brake levers must be replaced with relined levers.

5.2.4 Replace the brake lever

- **You must always replace both brake levers!**
- The brake levers on each side are always replaced one after the other.
- To replace the brake lever, the compression spring must be removed along with the locked pressure washer and the clamping bolt.
- Pull out the splint.
- Push up the joint pin (with flat screwdriver under the bolt head) and pull out.
- Lift out the lever to the side, at the same time removing the intermediate washers.
- A lever with new brake linings is fitted in the reverse order.
- Do not forget the intermediate washers!
- Adjust the brakes, and check braking capacity, as under 5.3.2

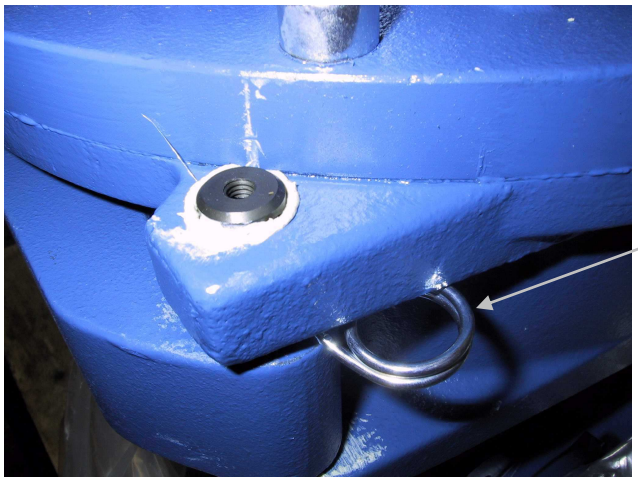


Fig. 8

When new brake linings are fitted the required braking moment is not reached until the brakes have been briefly pressed with the selected spring bias!

5.3 Brakes

5.3.1 Adjusting the brakes

Depending on the nominal moment required for the motor, magnets with the appropriate lifting force and compression springs with the relevant stiffness are specified in the factory. In the dual circuit brakes the magnet is controlled on opening with brief excitation, i.e. with increased lifting force.

To compensate for possible brake lining wear and reliable check of the wear, an air clearance of 1.5 mm is preset between the magnetic tappets and the respective pressure screws. To check and adjust the air clearance see Section 5.3.2.

Please check the function of the brakes before commissioning the escalator. If the preset braking moment does not match the operating conditions you can adjust it.

5.3.2 Adjusting the brake moment of the dual circuit braking system:

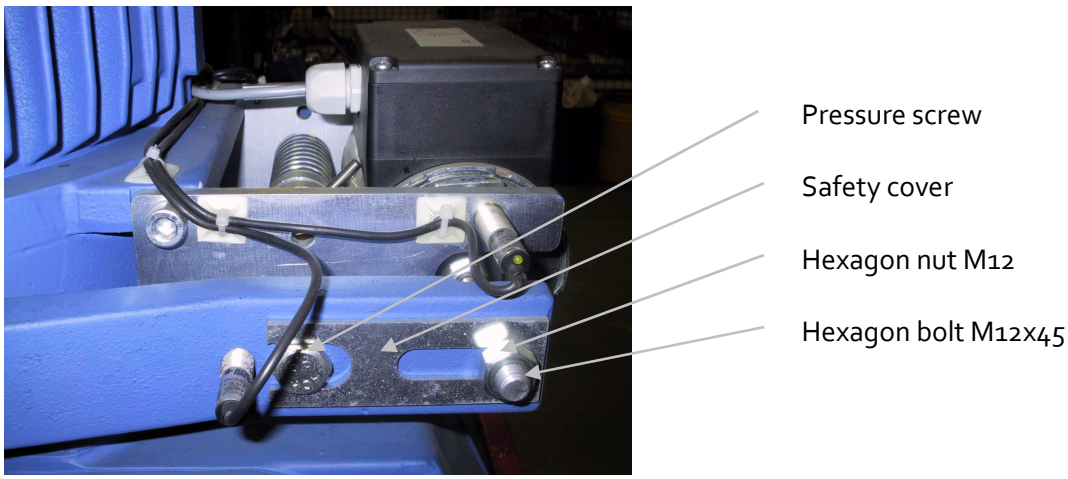


Fig. 9

1. With the brake disengaged, loosen the frontal nut M12 on the hexagon bolt M12x45
2. Pull the safety cover back. The pre set brake spring pressure can be adjusted by turning the brake spring pressure screw (Turning clockwise increases the pre set pressure).
3. Spring pressure preset of spring length **L** between the two surfaces on 88mm, is adjusted during the TÜV field inspection (see Fig. 10).

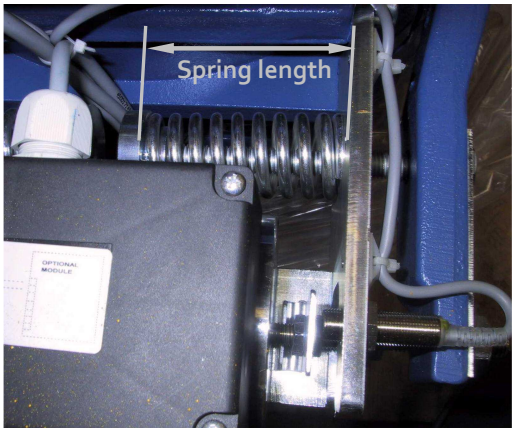


Fig. 10

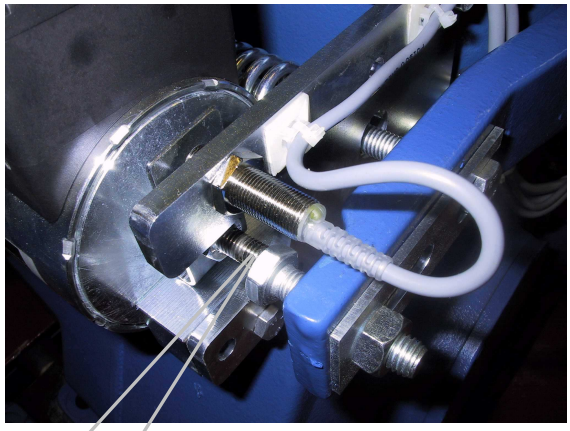


Fig. 11

1...1,5

4. Once the required value has been achieved, move the safety cover forward into position over the head of the screw. If required carefully tighten the screw further.

5. Tighten the hexagon nut M12 with **T= 80Nm** and use the air lever of the magnet to check whether the required air clearance (return stroke) is still available. If necessary reset to the required air clearance of 1.5 mm by adjusting the pressure screw in the brake lever.

6. Check whether the brake magnet completely opens, mechanically with the central air lever and electrically via the plant controls.

5.3.3 Checking the two brake circuits:

Note: The procedure for the brake acceptance inspection within the scope of the escalator acceptance inspection is not described here in detail. Please note the required safety regulations.

a) If the machine is accessible
If the machine is accessible in an operations room, you can individually open each brake lever to the side with the aid of a tyre lever (heavy screwdriver) and check the simple holding torque of the respective other brake lever.

b) Separate electrical remote control: To check the simple holding torque of each braking circuit, the brake levers can be individually controlled separately by the two existing magnetic coils. This requires a Type O 23 solenoid.

5.4 Replacing the motor

If it is necessary to replace the motor after a long service life or if the motor is defective, an elastic coupling ring is supplied for the replacement

- Stop the escalator and secure it against accidentally starting up again.
- Release the brakes by pressing the manual lever on the brake magnet and fix the lever with a wooden wedge to prevent it from moving
- Remove the switch (hood-type switch, controller for overspeed and temperature monitoring) from the motor.
- The motor connection cable on the motor must not be removed. It must only be disconnected at the contactor.
- Dismount the 4 screws from the motor flange above the brake levers..
- Raise the motor using a rope and the eye bolts to be fixed to the side of the motor.
- Replace the elastic coupling ring; at the same time clean the claw coupling e.g. by blowing the dirt out.
- To replace the motor mark a coupling claw on the motor with a gap in the gear coupling and in this way carefully guide the coupling claws into each other while putting down the motor.
- Tighten the fixing screws several times by tightening the diagonally opposite screws one after the other. (Torque approx. **50 Nm**)
- Fit the components in the reverse order.
- Connect all the electric switches and systems.
- Check the electric connections and the correct rotational direction of the motor.

5.5 Replacing the elastic coupling ring

A claw coupling with an elastic coupling ring is located between the motor and the gears. The coupling ring is made of polyurethane material, essentially moisture and heat resistant. The abrasion of the elastic coupling ring depends on climate and usage.
We recommend an inspection of the elastic coupling ring after 2 years and the replacement after 4 years of usage.

Adjusting the braking function sensor

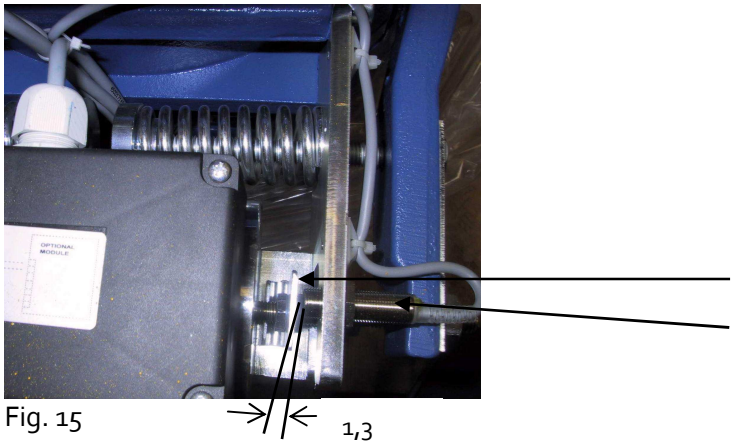


Fig. 15

- The switching lug must be fitted onto the thread of the brake magnet tappet.
- The sensor must be installed in the front drill hole with an air clearance of 1.3mm between the sensor and brake magnet housing. The sensors must be adjusted while the brakes are closed.

Information about the inductive brake function sensor:

Design sensing distance: 2,0mm
Initial function – electric circuit by opened brake closed

5.6 Adjusting the break lining wear control

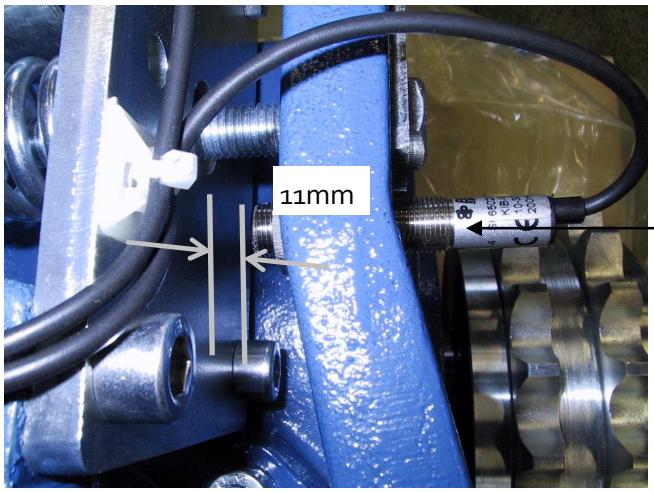


Fig. 16

- The sensor for the brake lining wear is fitted in the external drill hole of the brake lever.
- A spacing of 11mm is set for new machines in the factory, and should not be adjusted. The sensor respond, if the brake lining at the front edge of the brake lever has reached a thickness of 1mm. The machine can still be used. The ever must be replaced.
- If it is necessary to replace the two brake linings a distance of 11mm must be set for the new linings.

Information about the inductive brake lining wear sensor:

Design sensing distance: 2.0mm
Initial function – electric circuit by worn brake lining closed

5.7 Adjusting the hood-type switch

Fig. 17

The safety switch on the machine is used to ensure that when the fan hood is raised the machine drive is switched off via the safety chain.
The safety hood-type switch is fitted by OMS in the factory as an option (at request of the customer).

6 MISCELLANEOUS

6.1 Storage

The machine must not be stored outdoors or be exposed to the effects of weather.

A) Storage up to 3 months:

No special storage measures required.

Before installing the machine, please note:

- Check all brake components (remove any slight rust film on the brake drum by braking).
- Rotate the machine by hand (to evenly distribute the grease in the motor bearings).

B) For storage up to 18 months:

If lengthy storage is planned from the outset, this is specified in the order and the machine is conserved by OMS in the factory and is ordered packaged in a moisture repellent (yellow) foil. If this is not the case then:

- The gears must be filled up to the upper locking screw with oil after 6 months storage time at the latest.
- **Attention: oil grade: see yellow adhesive label; only use the same grade oil.**
- After filling with oil the machine must be packaged in a moisture repellent (yellow) foil. (This foil can be ordered from OMS)
- Otherwise: Store in a dry place

Before installing the machine, please note:

- **Reduce the oil level!** Drain the oil to the specified level (see Section 5.1.1)
- .Check all the brake components (remove any slight rust film on the brake drum by braking).
- Rotate the machine by hand (to evenly distribute the grease in the motor bearings).
- Install the machine (see Section 4. Commissioning)

C) Storage period longer than 18 months:

As an option, have the machine conserved in the factory or carry out the measures described under: **B) up to 18 months storage time**
Otherwise: store in a dry place

Important, please note before installing the machine:

- Completely replace the gear oil! Check the oil grade and filled level (see Section 5.1.1 and 5.1.3)
- Check all the brake components (remove any slight rust film on the brake drum by braking).
- Rotate the machine by hand (to evenly distribute the grease in the motor bearings).
- If the machine moves stiffly when rotated, the motor bearings might have to be replaced.
- Install the machine (see Section 4. Commissioning)

If the machine is stored for a long time, the manufacturer's guarantee may well expire
If a further guarantee is required, the machine can be returned to the manufacturer for an overhaul, which will be charged for (possible replacement of the bearings, etc.) and for the above measures to be carried out.

6.2 Transport

The machine must be sealed oil tight!

The machine is sealed oil tight in the factory for transport, or must be resealed, i.e. the dip-stick must be removed and replaced by the originally enclosed sealing cap.

7 Appendix

Technical data for the OMS-escalator machine EC 2 - 15

Dimensioned drawing of the OMS-escalator machine EC 2 - 15

Electrical connections
(Sheet C)

Please contact us if you have any questions::

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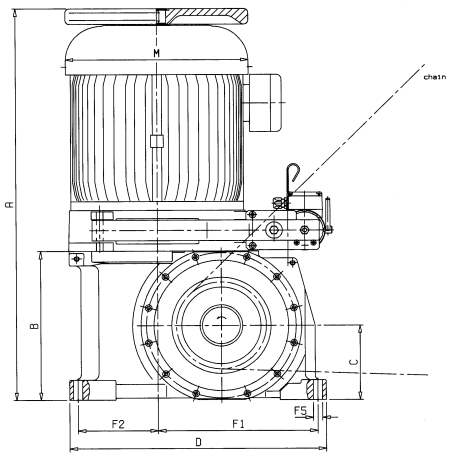
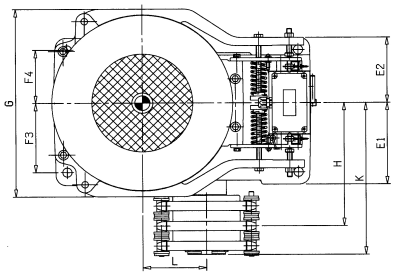
Gear :	
input-torque, max. :	T max. = 150 Nm
input revolution :	n = 1000, 1200 rpm
efficiency :	η,n = ≥ 96 %
starting efficiency :	η,s = ≥ 90 %
average oil temperature :	T = 30 - 35 K above ambient temperature
oil operating time up to :	t = 40.000 hrs
oil quantity :	7 l
toothing :	life time durability
bearing life time:	70.000 hrs
with equivalent loading:	p.equiv. = 0,5 up to 0,62 of nominal motor power
noise pressure level	(1000 rpm) : L,p ≤ 60 dB(A) (25% load at P_{max} 15kW) / motor mains-operated dependet on performance and application
gear ratio :	i = 24,62
for escalator speed :	v = 0,5 up to 0,75 m/s
version :	single- and Tandem-Units for chain-driving suitable for driving escalators and travelators option: for flanging-on to a transmission gear
position at machine room :	left side or right side (look from escalator to landing conditions)
Motors :	three phase induction motor, 6-poles, IP 55, integrated fan, suitable for frequency converter
motor protection :	PTC or bimetal-switch
frequency:	50 Hz or 60 Hz
type :	type 160 vertical
motor-nominal torque :	T,n to 150 Nm
Brake:	double action safety shoe brake
braking torque :	free adjustable up to ≤ 2,4* T,n
Chain wheel:	
version :	duplex or triplex,
size :	(16A-24A or16B-24B) (1", 1 ¼", 1 ½", 1 ¾")
number of teeth :	z = 17 up to 30 @ pitch 1 ¼" z = 17 up to 26 @ pitch 1 ½" z = 17 up to 21 @ pitch 1 ¾"
standard :	DIN 8187 / 8188 (ANSI)
Dimension:	see overleaf, total height A according to motor type
Machine Monitoring:	
optionally for:	brake function monitor brake lining wear monitor vibration measuring sensors
oil bath:	temperature, level
Safety-Sensors :	

optionally for: overspeed / machine reversing (NDR)

oms Hypodrive		
Version :		**EC 2-15**
version left		X
version tandem		-
gear ratio		24,62
input - torque, max.	Nm	150
dimension:	mm	
A,max. ***)		954
B		359
C		177
D		565
E1		161
E2		161
F1		336
F2		169
F3		130
F4		130
F5		22
G		352
H , K		dependent on chain size
L		141
***) M , A		dependent on motor size and power



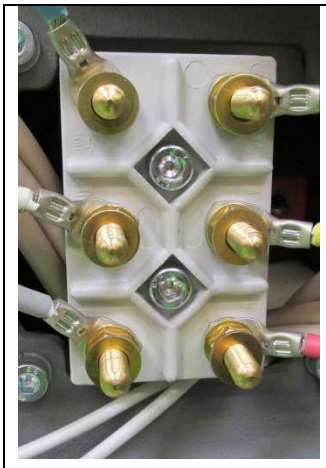


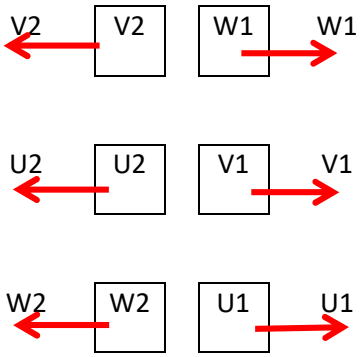
1. Terminal diagram for E - motor
Terminal box:

The machine's motor must be wired for star/delta operation with a 7 way cable (3 + 3 +PE).

Motor connecting of escalator traction machines

Connecting to mains voltage





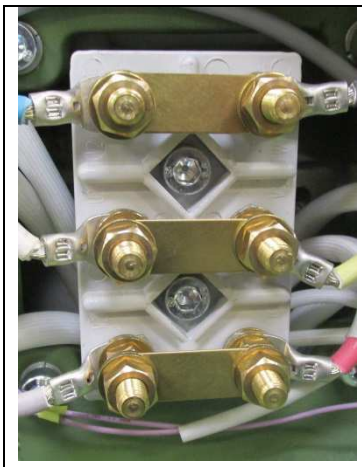
Star_Delta-Connecting

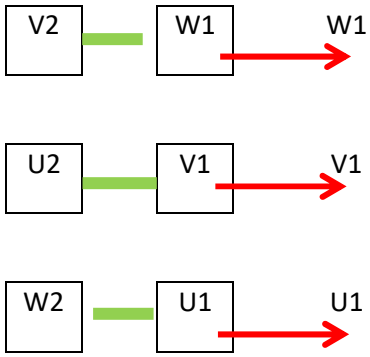
No jumper!

Motor cable (consisting of U1 ; V1 ; W1 ; U2 ; V2 ; W2 and PE) connecting as follows :

U1 to U1 ; V1 to V1 ; W1 to W1 ; U2 to U2 ; V2 to V2 ; W2 to W2 - PE(green-yellow) always first

Connecting to Frequency inverter





Delta-Connecting

Jumper between U1-U2 and – V1-V2 and W1-W2!

Motor cable (consisting of U1 ; V1 ; LW1 and PE) connecting as follows :

U1 to U1 ; V1 to V1 ; W1 to W1 - PE(green-yellow) always first

Attention :

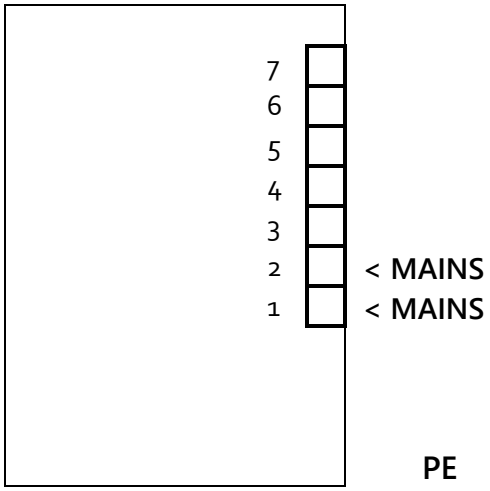
For Fi-operation the following must be observed:

You have to use a filter between the Fi and the motor, which is limiting the increase speed of the voltage from the Fi to the motor connecting points to a limit of $\delta U/\delta t \leq 500V/\mu s$.

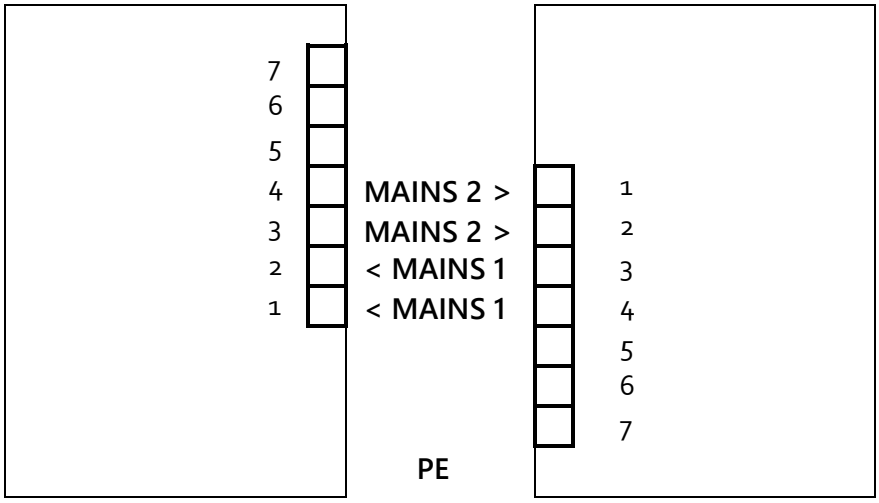
Higher increasing speed of the voltage can damage the motor windings (short circuit is possible).

2. Mains supply connection for OMS brake magnet

Connection with one control switch;
Both magnetic circuits are controlled together.



Connection with two control switches;
Each magnetic circuit is controlled independently.



The pin assignment is agreed with the respective customer and is available to the customer accordingly.

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*
1 Identification of the substance/preparation and of the company/undertaking

· **Product details**

· **Trade name: Klübersynth GH 6- 220**

· **Article number:** 012161
· **Application of the substance / the preparation** Lubricating oil

· **Manufacturer/Supplier:**
KLÜBER LUBRICATION MÜNCHEN KG
Geisenhausenerstrasse 7
D-81379 München
Tel.: 0049 (0) 897876-0
Fax: 0049 (0) 897876-333

· **Further information obtainable from:**
Material Compliance Management
E-Mail: mcm@klueber.com

· **Information in case of emergency:** 0049 (0) 89 7876 700 (24 hrs)

2 Hazards identification

· **Hazard description:** Not applicable.
· **Information concerning particular hazards for human and environment:**
The product has to be labelled due to the calculation procedure of the "General Classification guideline for preparations of the EU" in the latest valid version.
R 52/53 Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
· **Classification system:**
The classification is according to the latest editions of the EU-lists, and extended by company and literature data.

*
3 Composition/information on ingredients

· **Chemical characterization**
· **Description:** polyalkylene glycol oil

· **Dangerous components:**		
CAS: 68411-46-1 EINECS: 270-128-1	Dioctyldiphenylamine R 52/53	≤ 2.5%
CAS: 26444-49-5	Cresyl diphenyl phosphate N; R 51/53	0.25-1%
CAS: 115-86-6 EINECS: 204-112-2	triphenyl phosphate N; R 50/53	0.25-1%
	Amine-neutralized phosphoric acid ester C, Xn, N; R 22-34-51/53	0.25-1%
	phosphate of a derivative of phenol Xn, N; R 21/22-51/53	≤ 0.25%

· **Additional information:** For the wording of the listed risk phrases refer to section 16.

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4 First-aid measures

· **After inhalation:** Supply fresh air; consult doctor in case of complaints.
· **After skin contact:** Wash off with soap and plenty of water.
· **After eye contact:**
Rinse opened eye for several minutes under running water. If symptoms persist, consult a doctor.
· **After swallowing:** If symptoms persist consult doctor.

5 Fire-fighting measures

· **Suitable extinguishing agents:**
Water haze
Foam
Fire-extinguishing powder
Carbon dioxide
· **For safety reasons unsuitable extinguishing agents:** Water with full jet
· **Protective equipment:** Wear fully protective suit.
· **Additional information** Cool endangered receptacles with water spray.

6 Accidental release measures

· **Person-related safety precautions:** Particular danger of slipping on leaked/spilled product.
· **Measures for environmental protection:** Do not allow to enter sewers/ surface or ground water.
· **Measures for cleaning/collecting:**
Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).
Dispose of the material collected according to regulations.

7 Handling and storage

· **Handling:**
· **Information for safe handling:** Prevent formation of aerosols.
· **Information about fire - and explosion protection:** No special measures required.

· **Storage:**
· **Requirements to be met by storerooms and receptacles:**
Store in cool, dry conditions in well sealed receptacles.
· **Information about storage in one common storage facility:**
Store away from oxidizing agents.
Store away from foodstuffs.
· **Further information about storage conditions:** None.

8 Exposure controls/personal protection

· **Additional information about design of technical facilities:** No further data; see item 7.

· **Ingredients with limit values that require monitoring at the workplace:**
The product does not contain any relevant quantities of materials with critical values that have to be monitored at the workplace.
· **Additional information:** The lists valid during the making were used as basis.

· **Personal protective equipment:**
· **General protective and hygienic measures:**
Immediately remove all soiled and contaminated clothing
Avoid close or long term contact with the skin.
Be sure to clean skin thoroughly after work and before breaks.
· **Respiratory protection:** Not required.

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Trade name: Klübersynth GH 6- 220

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· **Protection of hands:** Preventive skin protection by use of skin-protecting agents is recommended.
· **Eye protection:** Goggles recommended during refilling
· **Body protection:** Protective work clothing

9 Physical and chemical properties

· **General Information**

Form:	Fluid
Colour:	Light yellow
Odour:	Product specific

· **Change in condition**

Pour point	< -35°C (DIN ISO 3016)

· **Flash point:** > 250°C (DIN ISO 2592)
· **Danger of explosion:** Product does not present an explosion hazard.
· **Density at 20°C:** ~ 1.05 g/cm³ (DIN 51757)
· **Solubility in / Miscibility with water:** Partly miscible.
· **Viscosity:**

Kinematic at 40°C:	~ 220 mm²/s (DIN 51562)

10 Stability and reactivity

· **Thermal decomposition / conditions to be avoided:**
No decomposition if used and stored according to specifications.
· **Materials to be avoided:** oxidizing agents
· **Dangerous reactions** No dangerous reactions known.
· **Dangerous decomposition products:** none under normal use

11 Toxicological information

· **Acute toxicity:**
· **Primary irritant effect:**
· **on the skin:** > 2000 mg/kg
· **Additional toxicological information:**
Prolonged skin contact may cause skin irritation and/or dermatitis.

12 Ecological information

· **General notes:** Do not allow product to reach ground water, water course or sewage system.

13 Disposal considerations

· **Product:**
· **Recommendation** Can be incinerated in accordance with local and national regulations.
· **Waste disposal key:**
For this product no waste disposal key according the European Waste Catalogue (EWC) can be determined, as only the purpose of application defined by the user enables an allocation. The waste code number has to be determined in accordance with the local waste disposer.

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· **Uncleaned packaging:**
· **Recommendation:**
Empty contaminated packagings thoroughly. They may be recycled after thorough and proper cleaning.

14 Transport information

· **Land transport ADR/RID (cross-border)**
· **ADR/RID class:** -

· **Maritime transport IMDG:**

· **IMDG Class:** 9
· **UN Number:** 3082
· **Label** 9
· **Packing group:** III
· **EMS Number:** F-A,S-F
· **Marine pollutant:** Yes (PP)
· **Proper shipping name:** ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (Cresyl diphenyl phosphate)

· **Air transport ICAO-TI and IATA-DGR:**

· **ICAO/IATA Class:** 9
· **UN/ID Number:** 3082
· **Label** 9
· **Packing group:** III
· **Proper shipping name:** ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (Cresyl diphenyl phosphate)

15 Regulatory information

· **Labelling according to EU guidelines:**
The product has been classified and marked in accordance with EU Directives / Ordinance on Hazardous Materials.

· **Risk phrases:**
52/53 Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

· **Safety phrases:**
61 Avoid release to the environment. Refer to special instructions/safety data sheets.

16 Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

· **Relevant R-phrases**
21/22 Harmful in contact with skin and if swallowed.

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Trade name: Klübersynth GH 6- 220

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22 Harmful if swallowed.
34 Causes burns.
50/53 Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
51/53 Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
52/53 Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

· **Department issuing MSDS:** Material Compliance Management
· **Contact:** +49(0)897876-1564
· * **Data compared to the previous version altered.**

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