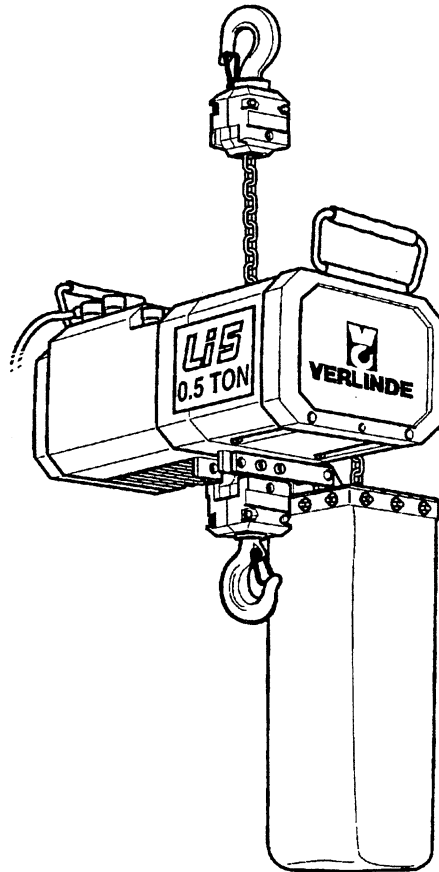


STAGEMAKER



INSTALLATION

MAINTENANCE

SPARE PARTS

ELECTRIC CHAIN HOIST LI 5 & LI 10

 **VERLINDE**
L I F T I N G E Q U I P M E N T

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1 - EC Declaration of conformity



Vernouillet - France

As defined by the EC directive relating to machinery 89/392/EEC.

Annex II A

Herewith, we declare that the product:

[illegible]

Complies with the following provisions applying to it:

- Machinery directive 89/392/EEC (93/68/EEC).
- Machinery directive 91/368/EEC.
- Directive 73/23/CEE.
- "EMC" Directive 89/336/EEC

Applied harmonized standards, in particular:

- EN 60204-1,
- EN 292, parts 1 and 2 (safety of the machines).
- ISO 2141,
- ISO 2766.

National regulations, standards and specifications:

- order of June 9, 1993 / circular of September 22, 1993.
- decree no. 92-765, 92-766, 92-767, of July 29, 1992.
- DIN 5684,
- DIN 15400; DIN 15401,
- NFE 26-010,
- NFE 26-030.

Technical standards and specifications complied with, in particular:

- FEM 9.511 "classification of the mechanisms".
- FEM 9.661 "dimensions and quality of the drive and cable lifting block elements for mass-produced lifting devices".
- FEM 9.671 "chain quality, choice criteria and technical requirements".
- FEM 9.681 "choice of travel motors".
- FEM 9.682 "choice of lifting motors".
- FEM 9.755 "steps to be taken to determine the operating periods for mass-produced motorized lifting mechanisms (S.W.P.)".
- FEM 9.811 "electric hoist specifications sheet".
- FEM 9.901 "bases of design for the mass-produced lifting devices for travelling cranes equipped with mass-produced lifting devices".
- IEC 34-1 "assigned characteristics and operating characteristics".
- IEC 34-5 "classification of the degrees of protection".
- IEC 947-5-1 "low voltage equipment".

According to annex V of the EC machinery directive:

- Application of the EC mark to the machines.
- Supply of the technical, installation and user documentation with the machines.



2 - What not to do

Never move or lift the hoist by the electric cables.

Do not set down the hoist without having an adapted support, to avoid damaging the components on the underside (*electric cable, lifting chain, fixed point, PG cable gland, chain bucket...*).

Never modify the hoist unless the constructor has studied and authorized the modification.

Never modify the values and adjustments of the safety components, outside the limits provided for in the manual, or without the approval of the constructor.

Never try to repair or intervene on the hoist (*welding...*) without the authorization of the constructor or a trained maintenance agent.

Do not let an unqualified person use the hoist.

Never lift more than the maximum working load indicated on the hoist. Shocks or accidental collision of the load with objects can cause excess loads.

Avoid sharp contact between two hoist or between hoist and end stop.

Never remove the hook safety catches.

Never block, adjust or remove the limit switches or stops to go higher or lower than these allow.

Never use the hoist to extract, loosen, or pull sideways.

Never use the hoist to transport people.

Do not touch the moving components.

Do not operate the hoist if your physical condition does not allow it.

Never use the hoist when in bad repair (*wear, deformation...*).

Never use suspect spare parts or parts whose origin is not known.

Never swing the load intentionally.

Do not subject the hoist to brutal shocks.

Do not use the mechanical stops as a repetitive means of stopping.

Never use the lifting chain as a sling.

Never sling onto the hook jaw (as there is a risk of damage to the hook and of the load falling).

Never use a hook other than in the vertical position.

Never twist the load chains (*turning the hook block around...*).

Never distract the operator while the hoist is being operated.

Never leave a suspended load hanging.

Never use the hoist as an earth reference for welding.

Never touch a live welding electrode to the load chain.

Do not use the hoist for a purpose or in an area for which it is not intended.

Do not expose the hoist to an aggressive atmosphere (*temperature, acidity... Refer to 6.7: Environmental data*).

Do not use limit switch(es) for normal operating stop(s). These are safety devices only and should be checked on a regular basis for proper operation.

Do not use the safety components as operation components.

Do not use the controls needlessly (avoid inching - stop-start operation of the buttons). This can cause overheating and even damage to the hoist.

Never pull the load slantwise, maximum angle 3 degrees.

Do not use the hoist with a power supply that is different to the one recommended (*undervoltage or overvoltage, absence of phase...*).

Never operate a hoist which has an inherent or suspected mechanical or electrical.

Never transport a load with people nearby. Do not pass the hook, with or without a load, above a person.

Do not use the hoist to lift people.

Do not divert attention from load while operating hoist.

Do not exceed working load limit.

Do not shock or impact load.

Do not side load - center line of load must coincide with center line of shackle.

Do not replace pin or bolt with other than original equipment parts.

Inspect before use for wear, deformation and pin engagement.

3 - What to do

Handle the hoist by its structure, or by the devices provided for this purpose, or in its original packing.

Store the hoist in its normal operating position (without load) away from aggressive atmospheres (*dust, humidity...*).

Make sure that the hoist is always clean and protected from corrosion (*lubrication...*).

The hoist should be installed by a technician with the necessary competence.

Make sure that the hoist attaching structure is rigid.

Make sure that the safety rules are followed (*harness, clearance of work areas, posting up of instructions to be followed in the area...*).

The hoist should be maintained regularly, following the instructions in this manual.

Keep the moving components clean and oiled as indicated in this manual.

The components should only be replaced by original parts that are compatible with the type of hoist.

Make sure that the limit stops are in place.

Always be ready during operation to press the emergency stop button. This makes all functions inactive.

Before operation, check that the load is correctly fastened and installed on the hook. The hook safety catches should be closed correctly.

Make sure that the load is correctly balanced before moving it. Avoid lifting using only one point of the load. Use adequate accessories (*slings, lifting beam...*). Pay attention to the center of gravity of the load to be moved.

The elements used to hang the load should be free in relation to the load to be moved (*prefer a sling to a rigid beam*).

When moving the load, make sure that it is sufficiently raised and distant from the surrounding machines and other objects so as to avoid all obstacles during operation.

Make sure that the hoist is vertical to the load before moving it.

If manually moving the hoist, push the load.

Use plastic stops, or better still, electric limit switches, to avoid repetitive stops on the stops.

The prevention instructions to be carried out during the different operations should be well known.

Avoid rocking the load or the hook when using the traveling trolley or crane, by limiting the starting and braking jerks.

In the case of several speeds, do the starting and braking operations at low speed.

Use the material under normal working conditions (*ambient temperature, atmosphere...*).

Material used outdoors should be protected as well as possible against bad weather conditions.

The use of several machines to move a single load should be done by an experienced supervisor. All the necessary precautions should be taken to carefully ensure the distribution of the loads and to avoid overloading a single machine. The machines should be carefully checked before such an operation.

Notify the necessary people after a dangerous operation or if the hoist seems problematic (*abnormal noise, abnormal behavior...*).

4 - Guarantee

Our electric chain hoists are guaranteed **for two years** from the date of delivery.

If for a reason outside the control of the vendor, the delivery is delayed, the time lag cannot exceed three months.

If the use (*installation*) of the hoist is delayed, the corresponding extension of the guarantee (a single extension limited to three months) must be requested, and written confirmation obtained.

The vendor undertakes to eliminate all operating errors originating from the concept, the execution, the components or the materials themselves.

The guarantee does not cover normal wear*, nor the failures resulting from lack of regular and periodic maintenance. It does not cover damage due to a lack of supervision, to false operation or to a bad utilization of the hoists, particularly due to overload conditions, slantwise drawing, undervoltage or overvoltage or a connection error.

The guarantee does not apply when there is disassembly, modification or replacement of parts (*mechanical or electrical*) by an unauthorized party or without our prior agreement.

The guarantee only applies for original, factory-installed spare parts, including the chain.

For the duration of the guarantee, the vendor undertakes to replace or repair, free of charge, the parts that are acknowledged to be damaged following examination by a qualified and authorized technical service.

The guarantee excludes any other services or indemnities. The repairs covered by the guarantee are carried out, as a rule, in the workshops of the vendor or authorized agent. When servicing of the equipment is done outside these workshops, the labor costs for disassembly or assembly of these parts are borne by the vendor when these are done exclusively by his staff or by an authorized agent. The replaced parts become the property of the vendor and must be returned to the vendor at his expense.

For components of a relative particular importance that are not manufactured by the vendor and which carry the brand name of specialized manufacturers, the manufacturer's guarantee (which can vary according to the manufacturer) is applicable.

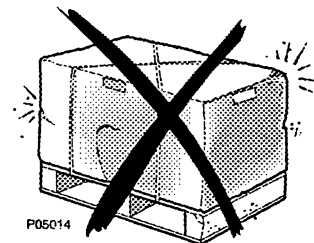
* The guarantee does not apply for expendable parts defined by the manufacturer :

- Lifting chain
- Chain guide
- Rubber buffer
- Sprockets
- Chain bucket
- Hooks
- Friction and brake discs
- Control box cable

5 - General

5-1 Acceptance of the material

Visually inspect the packaging to ensure that it is intact.
If not, notify it as required.
Check that the hoist corresponds to your order.
For transport reasons the chain bucket is delivered disassembled.



5-2 Installation

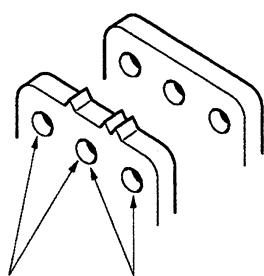
The service life of the hoist depends on the way it is installed.
The instructions in this manual must be followed carefully for the installation, use and maintenance of the hoist.
Any use contrary to our instructions can be dangerous. In this case, the manufacturer will not accept any responsibility.
Do not use the hoist until this manual has been fully read and assimilated.
Always keep this manual near the hoist, available to the operator and the person in charge of maintenance.
Make sure that the safety rules are followed (*harness, clearance of work areas, posting up of instructions to be followed in the area...*).

Carry out:

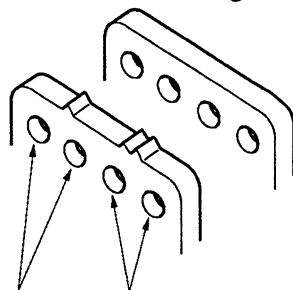
- The electrical connection (refer to 9-7 and 9-8: *Electrical connections*).
- Fitting of the chain bucket (refer to 8.1: *Chain bucket*).
- Check that the suspension hook is correctly positioned, depending on whether for 1 or 2 falls.

0.125 TON ==> 1 TON
125 → 1000kg

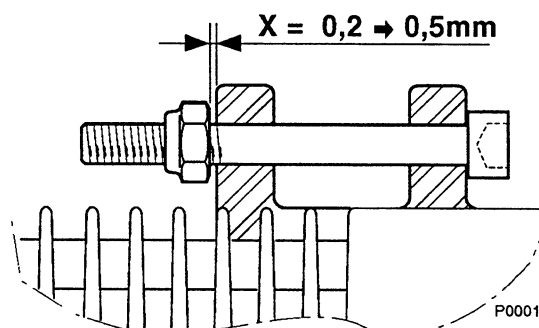
0.5 TON ==> 3 TON
500 → 3000kg



1 fall 2 falls



1 fall 2 falls



X: Required play

- Check that the tightening torques of the hook blocks, locking plates and chain guide conform to the torques indicated in this manual (refer to 10.5: *Screw tightening torques*).
- Check that the chain is not twisted.
- Check that the slack fall stop is correctly attached in the chain bucket and that the fixed point and the 2-fall chain are correctly held.
- Check that the rubber buffer is correctly fitted.
- Measure the dimension of the opening of the suspension hooks and the hook block. Note it for a follow-up.

Once these checks have been completed, proceed as follows (be ready to press the emergency stop button at all times).

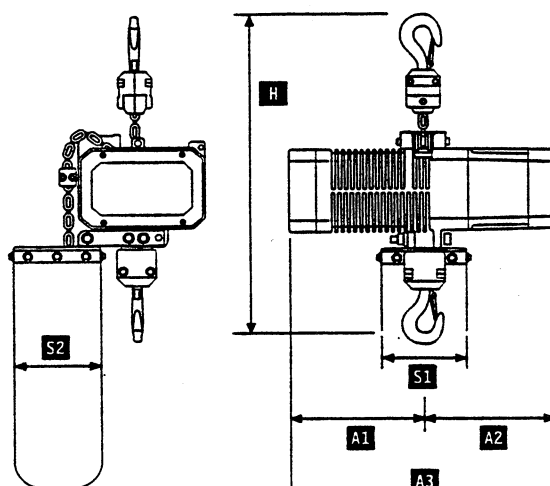
- Oil and start to run in the chain by a few movements without load.
- Check, when not under load, that the movement of the hook corresponds to the direction of the arrows on the control box. If not, invert 2 supply phases.
- Check the operation of the limiter: operate the hoist, without a load, until it reaches the upper and lower hook positions and let the limiter slip for a maximum of 3 seconds. The chain should not move and the motor should continue to run.
- Check the operation of the brake: lift up a nominal load and then lower it.
- Check the operation and the adjustment of the limit switch.
- **Carry out dynamic tests with +10% of the nominal load and static tests with +25% of the nominal load on your installation equipped with our hoist.**

6 -Description - technical characteristics

6-1 Types of hoists / Hoist dimensions

Dim	LI 5		LI 10	
	Metric	US measure	Metric	US measure
A1	220	8 - 2/3	248	9 - 3/4
A2	220	8 - 2/3	267	10 - 1/2
A3	440	17 - 1/3	515	20 - 1/4
S1	140	5 - 1/2	190	7 - 1/2
S2	145	5 - 7/10	177	7
H	440	17 - 1/3	525	20 - 7/10

Model	Falls	Capacity		Lifting speed		Motor	
		kg	Tons	M/min	Ft/min	kW	hp
1 = LI5	1	250	1/4	5	20	0.45	3/4
2 = LI5	1	250	1/4	8	32	0.45	3/4
3 = LI5	1	500	1/2	5	20	0.45	3/4
4 = LI5	1	500	1/2	8	32	0.92	1-1/2
5 = LI10	1	1000	1	4	16	1.8	2-1/2
6 = LI10	1	1000	1	8	32	1.8	2-1/2
7 = LI10	2	2000	2	4	16	1.8	2-1/2

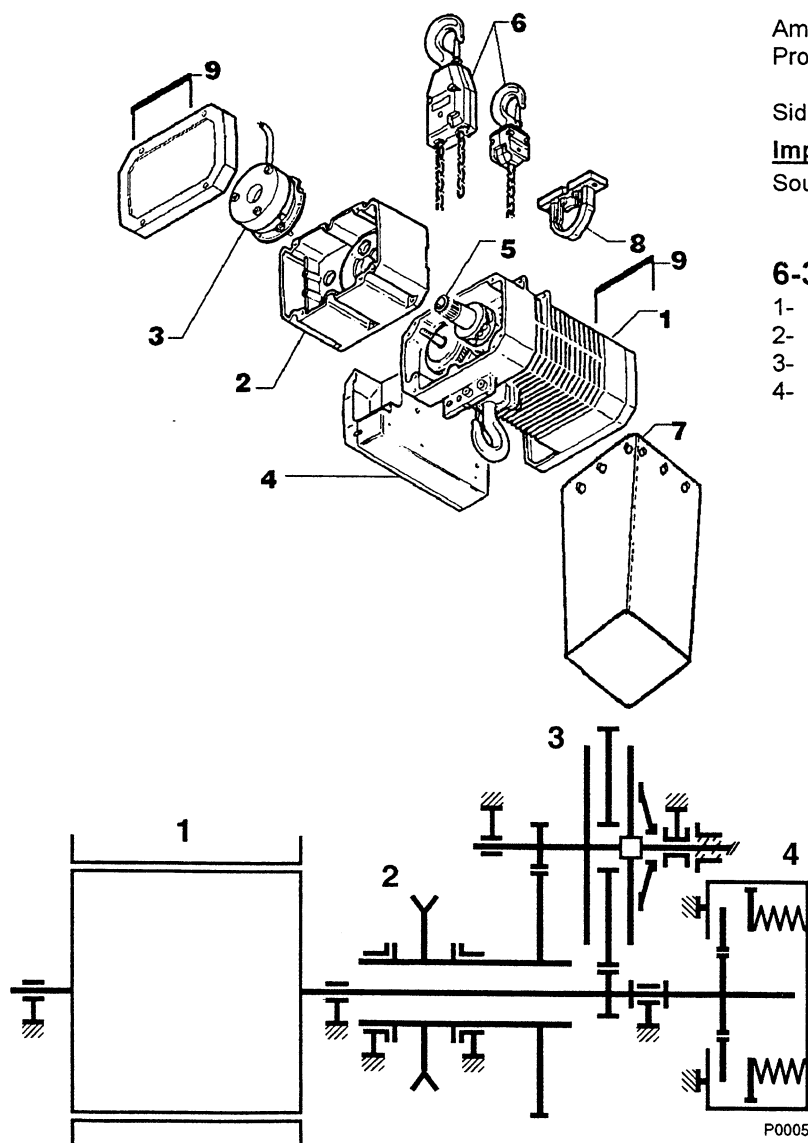


6-2 Environmental data

Ambient temperature: -20°C à +40°C
 Protection class: IP54 as standard, IP55 as an option
 Side pulling angle: 3 degrees maximum
Impact on the environment:
 Sound level: 70 decibels

6-3 Main sub-assemblies

- | | |
|-----------------|----------------------|
| 1- Main casing | 5- Chain sprocket |
| 2- Gears | 6- Hook block / hook |
| 3- Brake | 7- Chain bucket |
| 4- Electric box | 8- Chain guide |
| | 9- Handles |



6-4 Operation of the hoist

- 1- Motor
 2- Chain sprocket
 3- Limiter
 4- Brake

2-step kinematic chain

6-5 Top and bottom limit switches

LOW VOLTAGE, LI 5 AND LI 10

The 2-cam limit switch is housed in the hoist reduction casing and is adjusted in the factory. This device means that the operation of the torque limiter as a top or bottom travel limit can be avoided. Because it is used less, there is less wear on the limiter and adjustments are less frequent.

To modify or reset (after the chain has been replaced) the adjustment of the 2-cam limit switch, proceed as follows:

- Remove the locking plate on the side opposite the motor (counterweight).
- Rear disk: bottom limit switch; front disk: top limit switch.
- Operate the hoist to check the direction of rotation of the disks.
- Each of the programming disks has two sectors which are mobile in relation to each other, one red, the other gray.
- Move each of the two red and gray sectors in the desired direction complying with a difference of 5 mm between the red and gray sectors.
- Check that the limit switch cuts in the correct position. If not start the adjustment again.

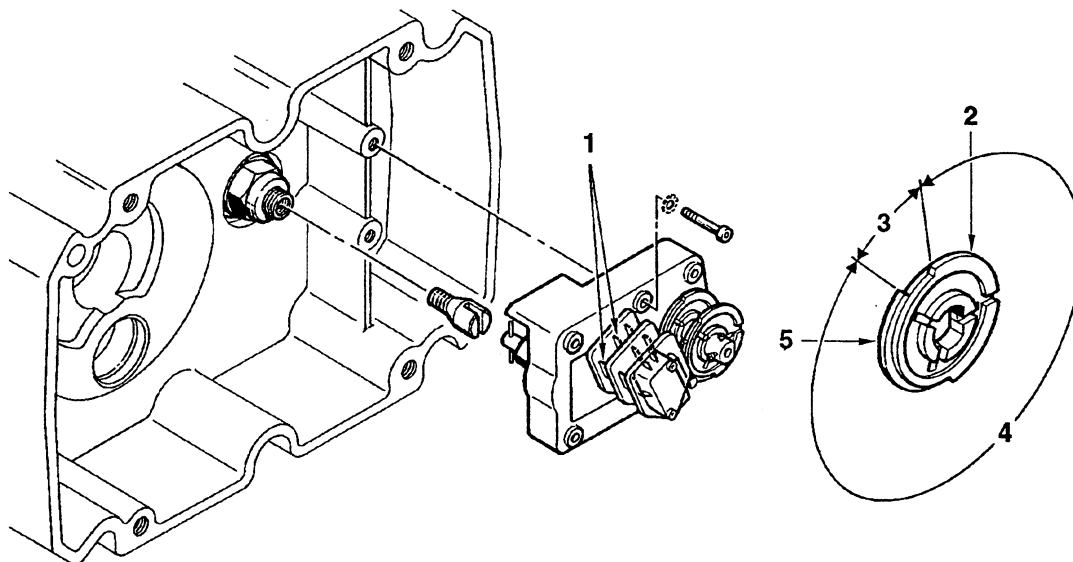
If your machine is equipped with a chain bucket, the top limit switch may be adjusted so that the load can never come into contact with the bucket.

Note: The drive pin on the LI 10 or the drive pinion on the LI 5 are glued on with LOCTITE 638.

On LI 5 instead of standard counterweight, place the cam limit switch (ref: 06 556 410).

MAXIMUM LIFTING HEIGHT (m)

Lifting speed m / min.		No. of falls	REDUCTION VALUE OF THE LIMIT SWITCH					
			Reference					
			100 06 550 312	200 06 550 313	325 07 557 700	650 07 557 701	2385 07 557 702	2600 07 557 703
LI 5 (N°1/2/3/4)	5	1	13	27				
	8	1	21	43				
LI 10 (N°5/6/7)	4	1			7.5	15	34	65
	8	1			11	23	49	
	4	2			5.5	11	24	



1. Connection points
2. RED disk
3. 5 mm MIN

4. Hook travel
5. GRAY disk

Note: For the 4-cam limit switch, the adjustment of the top and bottom points is done as described above, the other cams being used for the intermediate stops are adjusted by the user.

7 - Limiter / Brake

7-1 Limiter

Description

The direct-action lifting power limiting device is a friction torque limiter which is activated at a maximum working load X by the activation coefficient. This coefficient is $1.4 \pm 5\%$.

Example: Working load 1 Ton

Activation of the limiter 1.4 Ton

Min.: 1350

Max.: 1450

The activation coefficient may decrease to $1.2 \pm 5\%$. At this point, the hoist must be calibrated again.

Operation

5 x 15

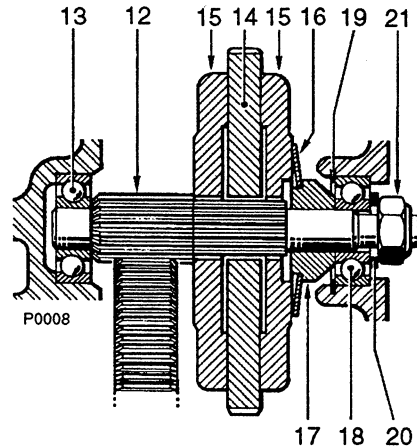
2 spring washers only (16)

for 0.5 Ton (1 fall) and 1 Ton (2 falls).

The limiter gear (14) which slides on the shaft (12) is held between two friction disks (15) which are integral with the shaft (12) through the splines.

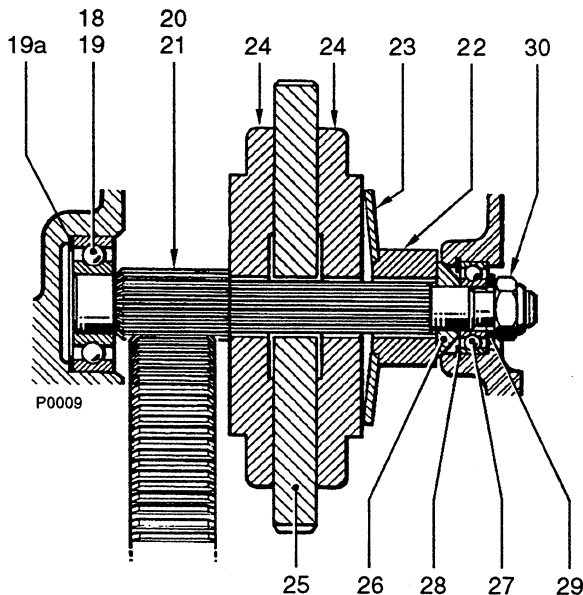
The gear (14) is kept under pressure by means of the spring washer(s) (16).

The pressure exerted by the spring washer(s) is greater or lesser depending on the tightness of the nut (21), which causes the shaft (12) to slide.



6,5 x 19,5 & 8 x 24

2 steps



The limiter gear (25) which slides on the shaft (20) is held between two friction disks (24) which are integral with the shaft (20) through the splines.

The gear (25) is kept under pressure by means of the spring washer(s) (23).

The pressure exerted by the spring washer(s) is greater or lesser depending on the tightness of the nut (30), which causes the shaft (20) to slide.

7-2 Brake

Description

The brake assembly is connected to the hoist by means of 3 socket head screws (6)

- 1 Spring
- 2 Armature
- 3 Friction disk
- 4 Splined hub
- 5 Adjusting rod
- 6 Screw

Operation

When the coil is energized, during lifting or lowering, it creates a magnetic force which acts against the pressure of the springs (1). The armature (2) presses against the inductor and the value of the air gap E is zero.

There is therefore a play between the friction surfaces of the disk (3) and the armatures (2). The hub (4) and the disk (3) therefore rotate freely.

Adjustment

- The brake must be adjusted when the value of the air gap E is 0.4 mm. The air gap should be adjusted to 0.2 mm.
- When the coil is no longer energized, the springs (1) press the armatures (2) against the friction disk (3) preventing the hub (4) from rotating.
- Disconnect the hoist power supply.
- Remove the electric box cover, disconnect the brake cables on the terminals marked "BRAKE".
- Remove the 3 socket head screws (6), remove the inductor assembly and armatures (2) and the friction disk (3).
- Remove the outside retaining ring (25) or (37) for 2 and 3 steps, then the friction disk coupling hub (4).
- Remove the armature (2) rear plate.
 - Slightly screw the rods into the brake inductor.
 - Press all of the parts together and fit a nut on each screw (6).
 - Insert a 0.2 mm shim for air gap E, tighten or loosen the 3 nuts and check the gap at several points.

During this operation, the hexagonal heads of the rods should not rest on the armature rear plate.

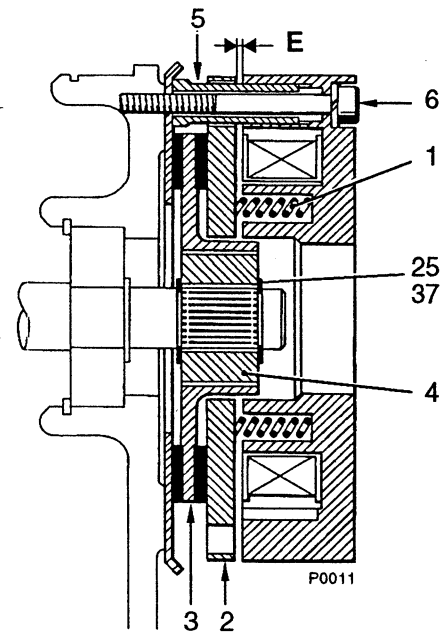
- Once the 0.2 mm air gap E has been adjusted and checked, **bring the hexagonal heads of the rods into contact** with the rear plate of the armature (2) without forcing.
- Remove the 3 nuts.
- Fit the armature (2) rear plate, the hub (4), the retaining ring (25) or (37), the friction disk, the inductor, the armature and the 3 socket head screws.
- Lock.
- Fit the brake cables, connect them to the terminals marked "BRAKE".
- Fit the electric box cover.
- Check that the brake operates correctly. A slight "click" will be heard when it is turned on.

Note: The air gap of the brakes MAYR type RSM can't be adjusted.

The friction disk must be change when the value is:

RMS 08 = 6.55 mm

RMS 16 = 7.6 mm



WARNING! The voltage of the brake's coil must be adapted to the main voltages.

8 - Lifting assembly

CAUTION!

Only a genuine, manufacturer's chain may be used.
Never use the lifting chain as a sling.
Never twist the lifting chain.
Do not bundle the chain into the chain bucket.
Always keep the chain clean and check that it is in good condition daily.

8-1 Chain bucket

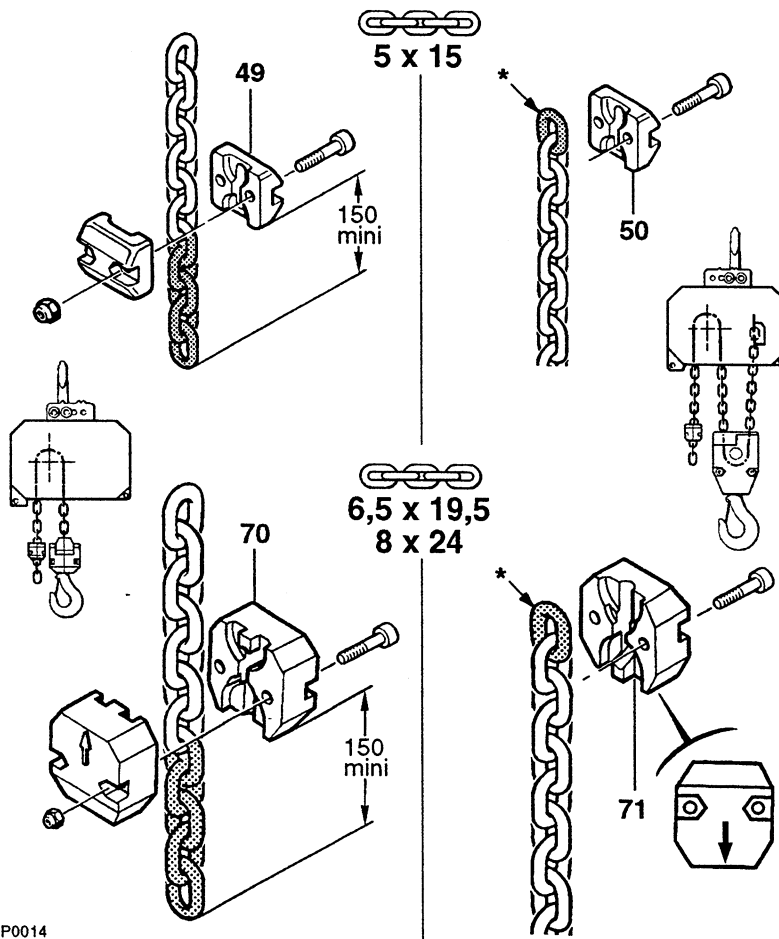
Once the chain bucket has been installed, check that the slack fall stop outlet is correct.

8-2 Slack fall stop (in the chain bucket)

IMPORTANT!

The slack fall stop is a safety component, not a functional one.
A minimum of 150 mm of chain should be left after the stop.

Positioning of the slack fall stop Attachment of the fixed fall stop



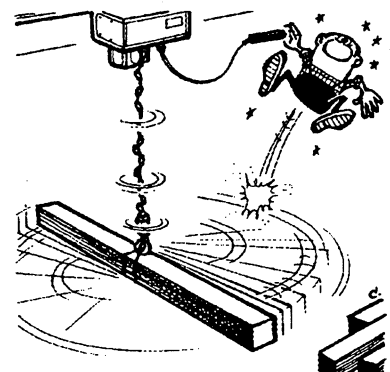
P0014

CAUTION: The slope of the stop should be turned to the limit switch roller side.

To facilitate the attachment of the stop, remove the electric box cover.

The link (*) should be visible above the stop.

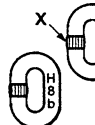
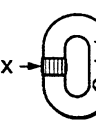
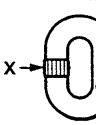
TAKE CARE not to twist the chain.



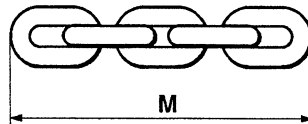
8-3 Chain "certificate"

A : Type of chain chosen
 B : Chain diameter x pitch
 C : Class
 D : Quality
 E : Type
 F : Minimum breaking stress (N/mm²)
 G : Hardened surface
 H : Norms

I : Stamping
 J : Maximum working load on 1 fall
 K : Breaking load (kN)
 L : Minimum total elongation for 7 links
 M : Dimension over 5 links + 2 dia.
 N : Weight per meter (kg)
 O : Illustration

A	STANDARD				SPECIAL		
B	5 x 15	5 x 15	6,5 x 19,5	8 x 24	5 x 15	6,5 x 19,5	8 x 24
C	P	DAT	DAT	DAT	DT	DT	DT
D	5	8SS	8SS	8SS	8S	8S	8S
E	H 50 b	H 80 b	H 80 b	H 80 b	H 80 c	H 80 c	H 80 c
F	500	800	800	800	800	800	800
G	NON	500-600 HV 5	500-650 HV 5	500-650 HV 10	500-650 HV 5	500-650 HV 5	500-650 HV 10
H	DIN 5684-5 NFE 26-010	DIN 5684-8 NFE 26-030	DIN 5684	DIN 5684	DIN 50049-3-1B	DIN 50049-3-1B	DIN 50049-3-1B
I	P ⊗ H5b	TT ⊗ H8b			TT ⊗ H8c		
J	250	500	1000	1500 / 1Bm 1000 / 2 m	400 / 1Bm 315 / 2 m	675 / 1Bm 540 / 2 m	1000 / 1Bm 800 / 2 m
K	19,60	31,36	53	80	31,5	53	80
L	10 %	10 %	10 %	10 %	5 %	5 %	5 %
M	84,5 ^{+0,2} _{-0,1}	84,5 ^{+0,2} _{-0,1}	110 ± 0,2	136 ^{+0,12} _{-0,66}	84,5 ^{+0,2} _{-0,1}	110 ± 0,2	136 ^{+0,12} _{-0,66}
N	0,550	0,550	0,945	1,390	0,550	0,945	1,390
O							

X = Weld



P0016

8-4 Criteria for removing chains

Chain dia. x pitch	Min. dia. of the wire < 0.9d	Max. pitch on 1 link < 1.05P	Inside length over 11 links < 1.02P
5 x 15	4.50	15.75	168.3
6.5 x 19.5	5.85	20.47	218.8
8 x 24	7.20	25.20	269.3

If these limits are exceeded, the chain must be replaced immediately.

In this case, the wear on the chain guide and chain sprocket should also be checked and they should be replaced if necessary. If a single link is defective in any way whatsoever, the chain must be replaced.

8-5 Fitting the chain

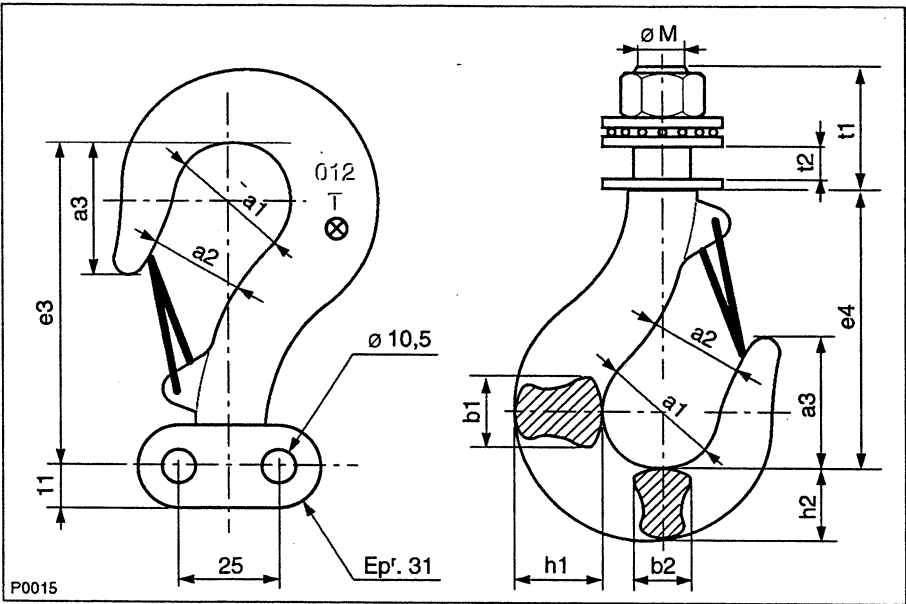
- Take an electric wire of about 50 cm in length or the plastic chain-mouting tool.
- Insert it into the chain guide and push until it comes out the other side of the guide.
- Hook the chain onto the end of the electric wire on the load side.
- Pull on the wire to bring the chain into contact with the sprocket (check its positioning at the same time: the welds of the vertical links should be to the side of the sprocket).
- Press the "lift" control button to run the motor.
- Take care not to twist the chain.
- Put the chain bucket back in place.
- Clean and lubricate the bottom hook stop.

Hook block: Lubricate the self lubrication ring of the sprocket.

8-6 Hook "certificate"

Marking: ISO 2766
DIN model no.: 15401
DIN 15400 class: T
DIN 15401 material: 35 CD 4

A: S.W.L.
B: F.E.M. group
C: Proof load
D: Number of falls
E: Minimum breaking load
F: Marking Class



A (kg)	B	C (kg)	D	E (kg)	F	Ø M	Ø a1	a2	a3	b1	b2	e3	e4	h1	h2	t1	t2
125	1 Bm	250	1	1575	012 T	M 14	30	24	34	19	15	81	72	22	19	33	10,5
250	2 m	500	1														
500	1 Bm	1000	1	2500	025 T	M 16	38	28	41	22	19	95	85	28	24	36	
	2 m	1000	1	3150													
			2														
250	2 m	500	2	1575													
1000		1 Bm	2000	1	5000	05 T	M 20	43	34	49	29	24	111	105	37	31	36
	2 m	2000	1	6300													
	1500	1 Bm	3000	1	7500												
1000	2 m	2000	2	6300	08 T												
2000	1 Bm	4000	2	10000													
	2 m	4000	2	12600													
3000	1 Bm	6000	2	15000													

8-7 Measurement of the wear on the suspension and lifting hooks

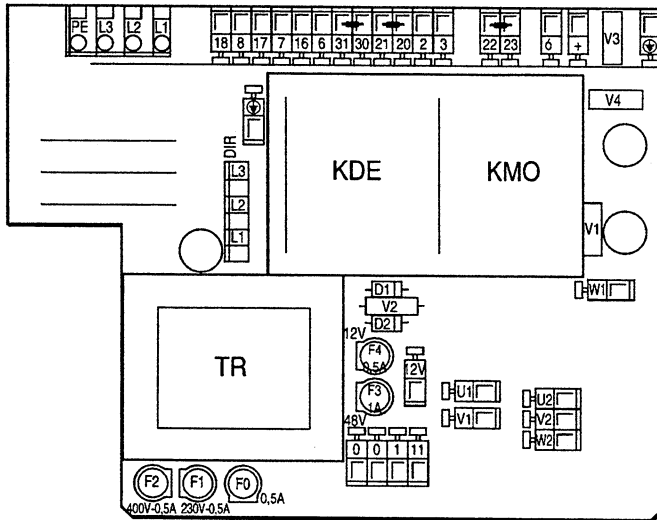
The wear on the suspension and lifting hooks (dimensions (a2), see table above) should be checked regularly. Damaged safety catches should be replaced immediately. If the maximum dimension (a2) is greater than the initial dimension by more than 15%, the hook should be replaced immediately.

Class:	012	025	05	08
a2 max. allowed:	28 mm	32 mm	39 mm	44 mm

9 - Electricity

9-1 K3 DIR M (Very low voltage : 48 Volts)

K3 DIR M, 1 Lifting speed



LIFTING SUPPLY:

L1 L2 L3 PE

TRAVEL SUPPLY:

L1 L2 L3 ground

MOTOR CONNECTION:

230V	U1 W2	400V	U1	U2
	V1 U2		V1	V2
	W1 V2		W1	W2

MOTOR:

U1 U2 ground
V1 V2
W1 W2

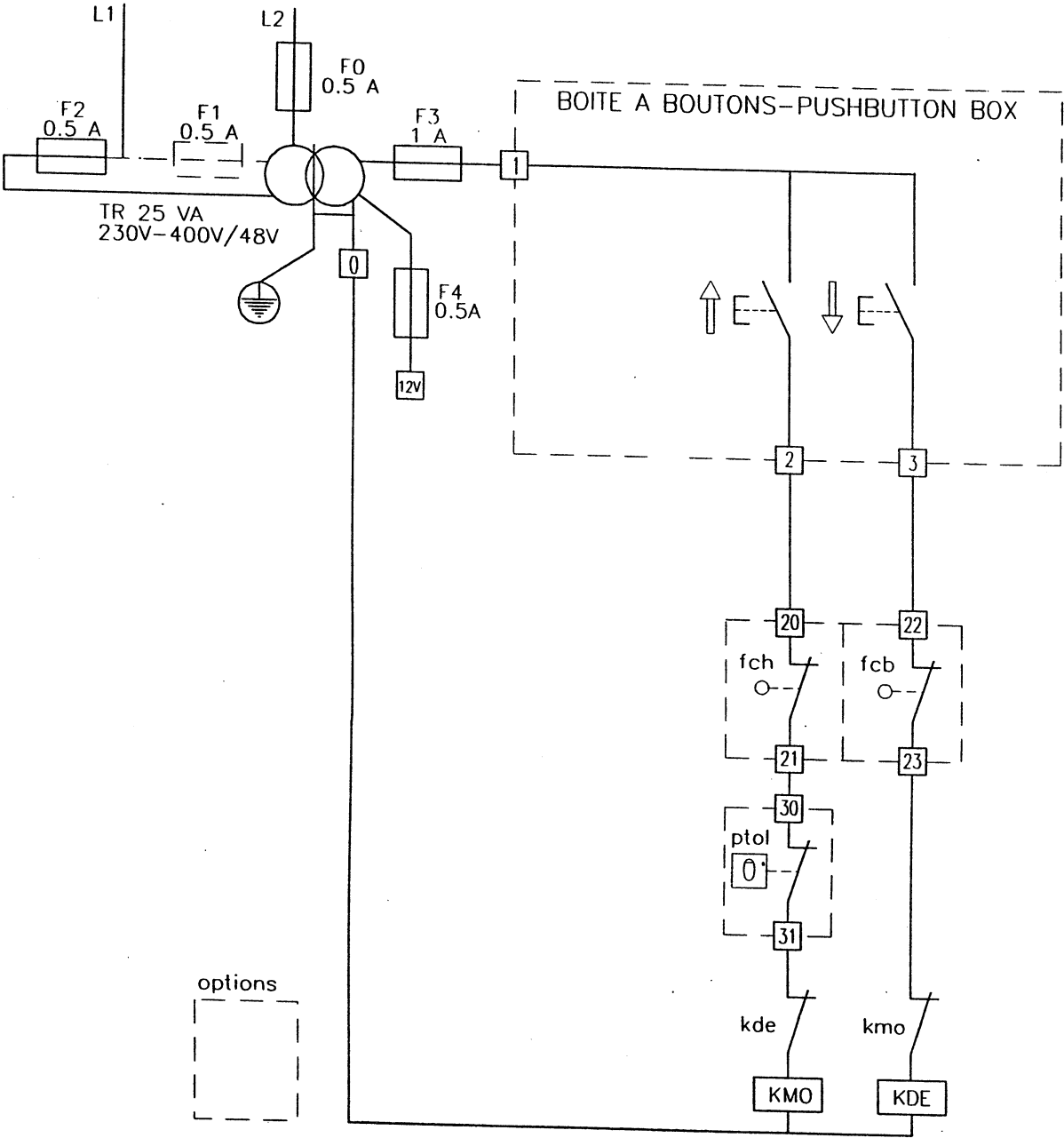
OPTIONS:

20 - 21 top limit switch (blue)
22 - 23 bottom limit switch (red)
30 - 31 lifting protection

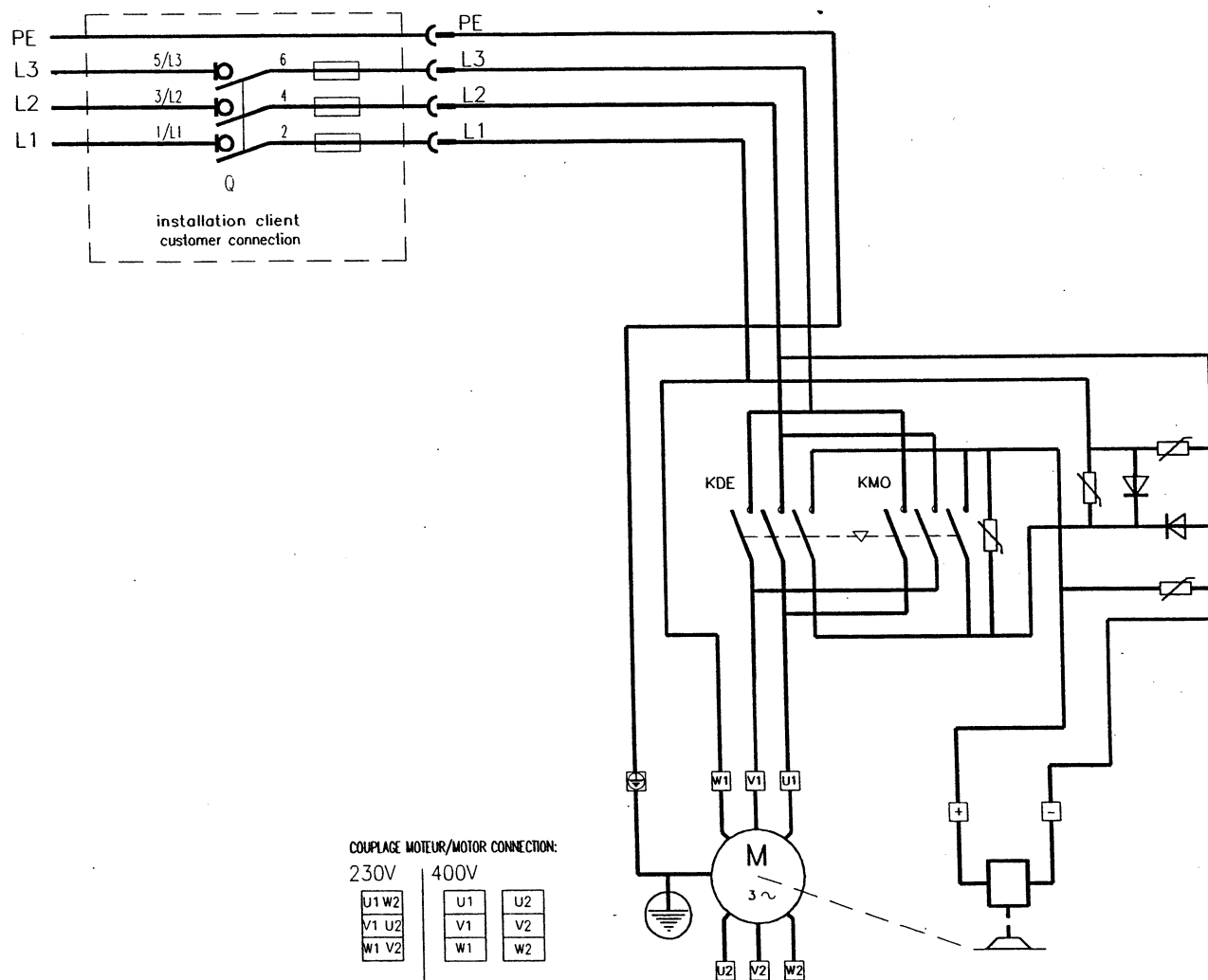
CONTROL BOX:

1 common
2 lifting control
3 lowering control

9-2 Control diagram K3 DIR M



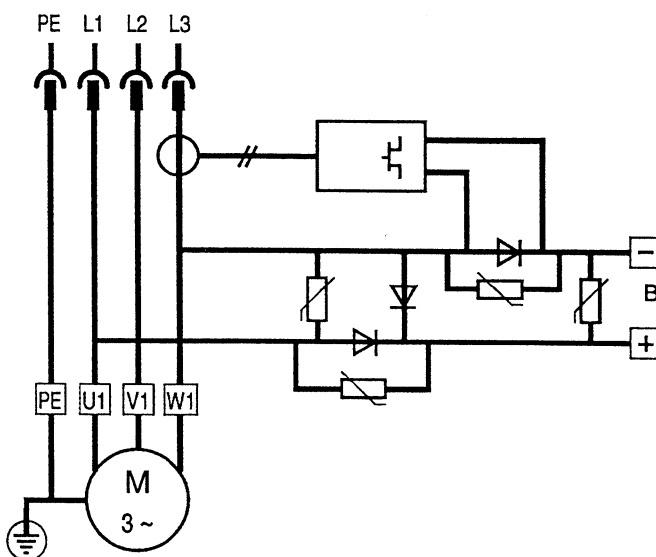
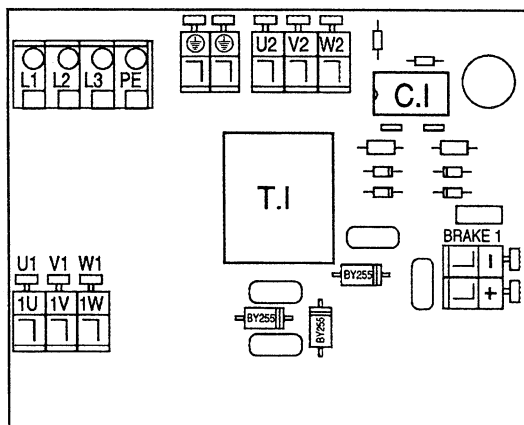
9- 3 Power supply diagram K3 DIR M



9- 4 ACF board (Option)

The ACF board control electronically the brake. It enables a rapid brake acceleration. (As the hoist is not equipped with contactor control electrics).

ACF 1, 1 lifting speed



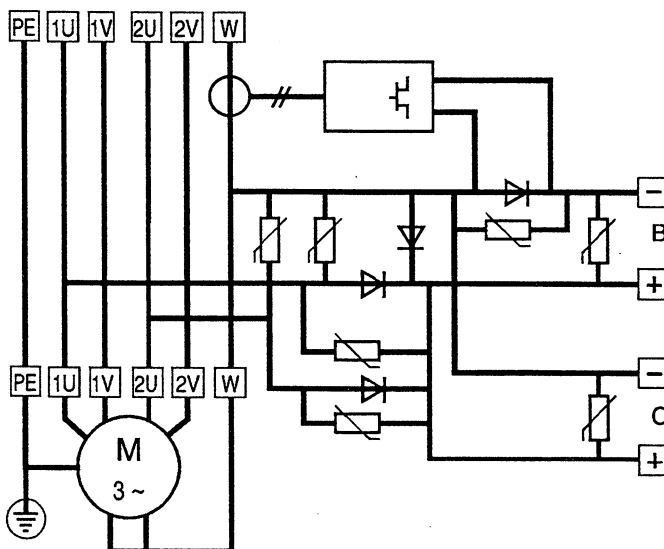
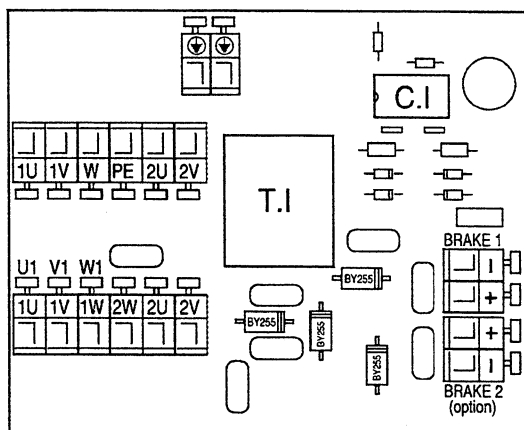
POWER SUPPLY :
L1 L2 L3 PE

MOTOR CONNECTION :

230V	U1 W2	400V	U1	U2
	V1 U2		V1	V2
	W1 V2		W1	W2

B- BRAKE :
+ - brake

ACF 2, 2 lifting speed



POWER SUPPLY :
1U 1V W 2U 2V PE

MOTOR :

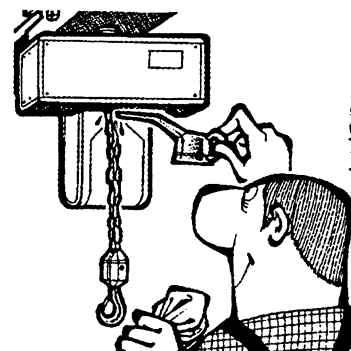
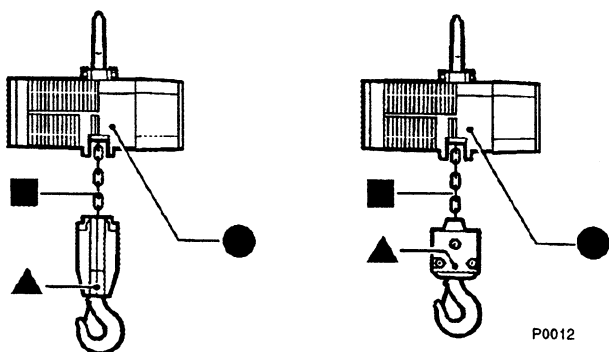
1U 1V low speed
2U 2V high speed
1W 2W common

B- MAIN BRAKE
C- EMERGENCY BRAKE
(OPTION)
+ - brake

10 - Maintenance - replacement

10-1 Maintenance table

Check	Interval	Qualification of the customer's personnel
Brake operation	Daily	Operator
Visual inspection of the chain	Daily	Operator
Suspension of the control box by the steel wire	Daily	Operator
Cleanness and lubrication of the chain	Every month	Operator
Limiter operation	Every month	Operator
Measuring of the wear on the chain	Every 3 months	Operator
Measuring of the wear on the hooks	Every 3 months	Operator
Tightening of the hook block screws	Every 3 months	Operator
Checking of the locking plate screws	Every 3 months	Operator
Lubrication of the idler sprocket	Annually	Operator
Checking of the screw tightening torques and checking for signs of corrosion	Annually	Qualified mechanic
Adjustment of the limiter and brake (see 7.1: Limiter assembly)	Annually	Qualified mechanic
Lubrication of the gears	Lubricated for life	



Oil the chain regularly.

CAUTION! These intervals should be shortened if the hoist is used a lot, if it is used with maximum loads or in difficult ambient conditions.

10-2 Lubricants

Lubrication point	Specifications	Possible brands	Quantity
Chain ■	Oil (SAE 80 or ISO 220) Liquid grease	Chain lubricating fluid (Ceplattyn or similar)	As required
Idler sprocket ▲	Grease without MoS2		As required
Bearings	Lubricated for life		
Gears ●	Mobilux E P1 semi-liquid grease KP 0 K grease (DIN 51 502) Soap-based lithium + MoS 2 Approx. drip point + 180°C Worked penetration 355 - 385°C Operating temperature - 30°C to + 130°C	Tribol: Molub Alloy multi-purpose grease Aral: Aral P 64037 grease Aralub PMD0 BP: Multi-purpose grease L 21 M Esso: Multi-purpose grease M Mobil: Mobilgrease special Shell: Shell Retimax AM Texaco: Molytex EP 2 grease Fuchs: Renolit FLM2	0.5 liter (5 x 15 chain) 1.5 liter (6.5 x 19.5 & 8 x 24 chains)

10-3 Spare parts replacement table

If the hoist has not been used for a long time, or during a routine inspection, check the operation and adjustment of the safety components (brake, limit switch, limiter...). If a suspect element, deformation or abnormal wear is noted, the part must be changed.

CAUTION! Disconnect the power supply before replacing any parts.

Spare part	To be replaced by	Qualification du personnel
Upper chain guide	Authorized manufacturer personnel	Qualified mechanic
Motor shaft	Authorized manufacturer personnel	Qualified mechanic
PG gland cable	Authorized manufacturer personnel	Qualified electrician
Pinion shaft + adjusting nuts	Authorized manufacturer personnel	Qualified mechanic
Motor	Authorized manufacturer personnel	Qualified electrician
Gearing	Authorized manufacturer personnel	Qualified mechanic
Sealing	Customer	Qualified mechanic
Other seals and O-rings	Authorized manufacturer personnel	Qualified mechanic
Limiter	Authorized manufacturer personnel	Qualified mechanic
Brake	Authorized manufacturer personnel	Qualified mechanic
Lower chain guide	Customer	Qualified mechanic
Rubber buffer	Customer	Qualified mechanic
Electric box	Authorized manufacturer personnel	Qualified mechanic
PC-board	Authorized manufacturer personnel	Qualified electrician
Chain	Customer	Qualified electrician
Chain bucket	Customer	Qualified mechanic
Slack fall stop	Customer	Qualified mechanic
Suspension hook	Customer	Qualified mechanic
Hook block (1 or 2 falls)	Customer	Qualified mechanic
Control box	Customer	Qualified mechanic
		Qualified electrician

Once a part has been replaced check the operation of the hoist (*refer to: 5-2 Installation*).

10-4 Tools necessary for removing and replacing operations

<u>Top hook</u>	17 mm ring spanner + 8 mm Allen key	<u>Limiter</u>	19 mm open-end wrench or extension spanner
<u>Electric box</u>	10 mm ring spanner + 5 mm Allen key Pozidriv no. 2 or Torx T 10 screwdriver 2.5 mm blade screwdriver	<u>Mechanic assembly</u>	5 mm Allen key Pliers for ext. retaining rings, dia. 30.50 and 12 or 15 Pliers for ext. retaining rings, dia. 32 et 35
<u>Brake sub-assembly</u>	3 M5 or M6 nuts + 4 or 5 mm Allen key Adjusting rod - 9 or 11 mm open-end wrench Feeler gauge: 0.2 mm min. - 0.6 max.	<u>Limit switch</u>	3 mm Allen key
		<u>Bottom hook</u>	5 and 6 mm Allen keys

10-5 Screw tightening torques (Nm)

	MECHANICAL			ELECTRICAL		LIFTING	
	M4	M5	M6	M4	M6	M6	M8
Normal screws	2,5	4,5	8	1.5	3.5	13	25
Self-tapping screws				1.5			

10-6 Discarding the hoist

Once the hoist has been used for the **FEM class duration** all of the components must be checked by an authorized agent or by the manufacturer. **The hoist should no longer be used, unless agreement is obtained from the authorized agent or the manufacturer.**

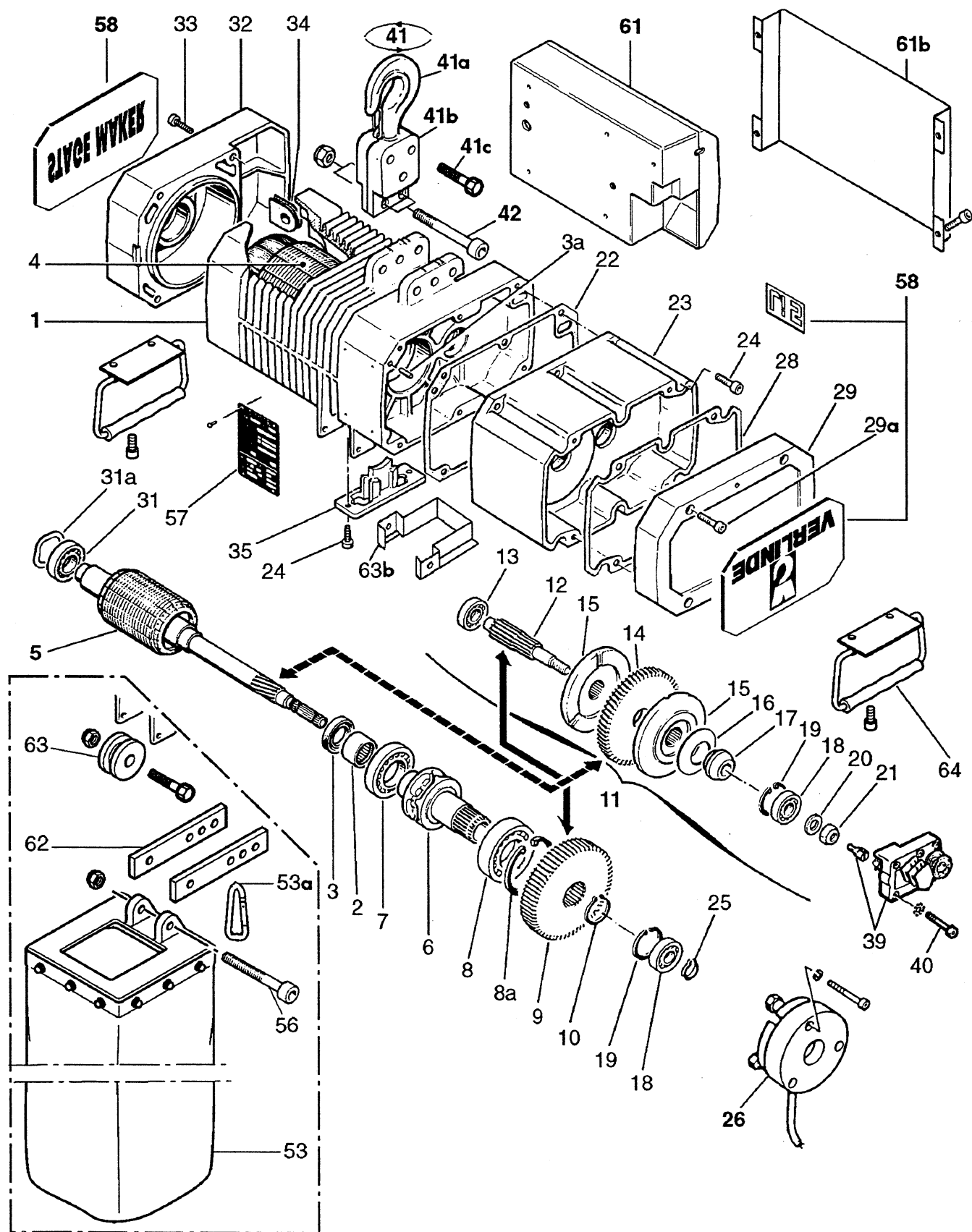
All greases and oils MUST be removed from the hoist before discarding it!

11 - Troubleshooting

Problem	Cause	Solution
The chain hoist does not work	The emergency stop button is activated Triggered fuse Temperature control <i>(optional)</i> activated Contactor terminal screws loose Main switch is off	Deactivate it Replace the fuse Allow to cool down Tighten them Turn it on
Impossible to lift the load	Overload Limiter worn or incorrectly adjusted	Reduce the load Adjust or replace it
Braking path of more than 10 cm	Brake lining worn	Adjust the brake and replace the brake components if necessary
The travel direction does not correspond to that indicated on the control box	The power supply is incorrectly connected	Change two phases of the power supply
Abnormal noises while the load is being moved	The chain components are not lubricated Chain is worn Sprocket or chain guide is worn Idler sprocket is worn A supply phase is missing	Lubricate the components Replace it Replace the sprocket or chain guide Replace it Check the connection of the 3 phases
The hoist equipped with a limit switch lifts but does not lower	The power supply is incorrectly connected	Invert two phases

12 - Illustrated catalogue

12-1 Casings, mechanism - LI 5



12-1 Casings, mechanism - LI 5

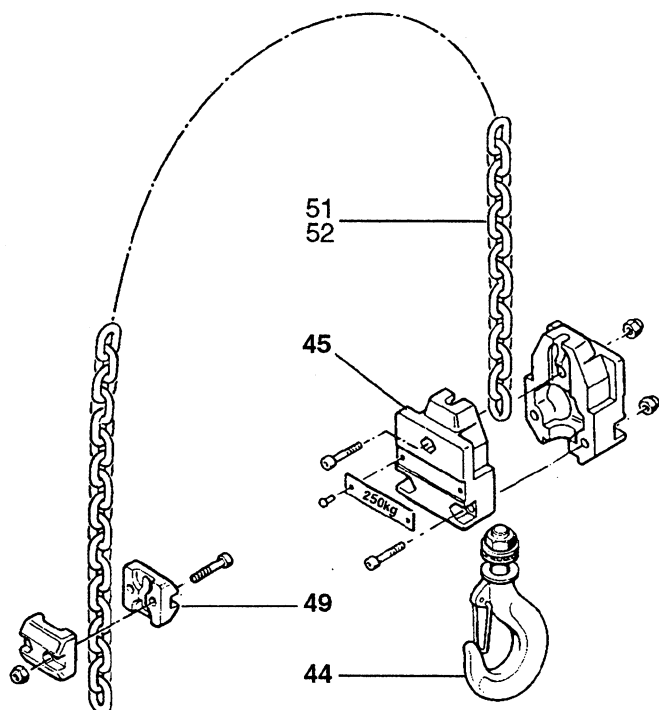
ITEM	CODE	DESCRIPTION	505m1 205m1 (N° 1 & 3)	208m2 (N° 2)	508m2 (N° 4)
1	556 110	Motor casing, unequipped, with 2 + 3 + 3a	1	1	1
2	833 725	Needle bush, INA HK 22 12 (22 x 28 x 12)	1	1	1
3	556 243	Seal, PAULSTRA 22 x 32 x 7	1	1	1
3a	556 209	Cylindrical pin 8 x 20	2	2	2
4	556 189	Stator, length 65, single speed, 400V and 230V	1	1	1
-	556 190	Stator, length 100, single speed 400V and 230V			
5	556 359	Rotor, length 65, single speed, 14-tooth shaft	1	1	1
-	556 331	Rotor, length 100, single speed, 14-tooth shaft			1
6	556 255	Sprocket, 5 x 15 chain	1	1	1
7	550 783	Bearing, 602RS (30 x 55 x 13)	1	1	1
8	833 701	Bearing, 622NS (30 x 62 x 16)	1	1	1
8a	300 079	Retaining ring, 62 I	1	1	1
9	556 251	Sprocket gear, 82 teeth	1	1	1
9a	556 552	Sprocket gear, 62 teeth	1	1	1
10	001 104	Retaining ring, 26 E	1	1	1
11	556 104	Limiter sub-assembly: 125-250 kg - 1 Fall	1	1	1
-	556 105	Limiter sub-assembly: 500 kg - 1 Fall		1	1
12	556 502	Pinion shaft, 13 teeth	1		
12a	556 551	Pinion shaft, 16 teeth		1	1
13	833 730	Bearing, 6201 (12 x 32 x 10)	1	1	1
14	556 550	Limiter gear, 94 teeth	1	1	1
15	556 220	Friction disk	2	2	2
16	832 060	Spring washer 50 x 25.4 x 1.5	1 or 2	1	2
17	556 203	Limiter ring	1	1	1
18	833 719	Bearing 6201 2RS (12 x 32 x 10)	2	2	2
19	830 866	Retaining ring, 32 I	2	2	2
20	100 338	Washer, Z 12 U	1	1	1
21	831 589	Locknut, Thisert M 12 x 125	1	1	1
22	556 242	Gear casing gasket	1	1	1
23	556 510	Gear casing	1	1	1
24	830 909	Socket head screw, M 6 - 20	12	12	12
25	830 862	Retaining ring, 12 E	1	1	1
26		Assembled brake	1	1	1
28	556 241	Gasket casing	1	1	1
29	556 410	Casing	1	1	1
29a	556 513	Socket head screw M6-60	1	1	1
31	833 703	Bearing, 6203 2NS (17 x 40 x 12)	1	1	1
31a	832 040	Washer, Onduflex E Ref. 54 29 01	1	1	1
32	556 512	Rear endcap	1	1	1
33	830 910	Socket head screw, M 6 - 50	4	4	4
34	833 431	Cable guide	1	1	1
35	556 235	Chain guide	1	1	1
39	550 312	Top and bottom limit switch selector (3m) with limit switch drive pin	1 1	1 1	1 1
40	830 925	Socket head screw M 4 - 40 + washer AZ 4	2	2	2
41	556 409	Upp. hook sub-assembly, version 025	1	1	1
41a	557 152	Hook	1	1	1
41b	556 402	1/2 Hook block	1	1	1
41c	550 989	Screw Chc M8-50	2	2	2
42	830 916	Socket head screw, M 10 - 100	2	2	2
	831 593	Nut, Nylstop M 10	2	2	2
53	556 406	Chain bucket with support and external rings	1	1	1
53 a	830 870	Fixing parts	2+1	2+1	2+1
	556 212	Chain bucket, cap. 6 m or			
	556 213	Chain bucket B2, cap. 12 m or			
	556 214	Chain bucket B3, cap. 17 m or			
	556 215	Chain bucket B4, cap. 40 m			
56	830 916	Fixing set	1	1	1
57	557 085	Rating plate and motor with 4 rivets	1	1	1
58	556 531	STAGEMAKER / VERLINDE label	2	2	2
	556 528	LI 5 label	2	2	2
61	556 548	Electric box	1	1	1
61b	556 415	Protection plate	1	1	1
62	556 404	Chain bag support	2	2	2
63	556 401	Diabolo (+fixing parts)	1	1	1
63b	556 400	Diabolo support	1	1	1
64	556 412	Handles (+ screws)	2	2	2



12-2 Casings, mechanism - LI 10

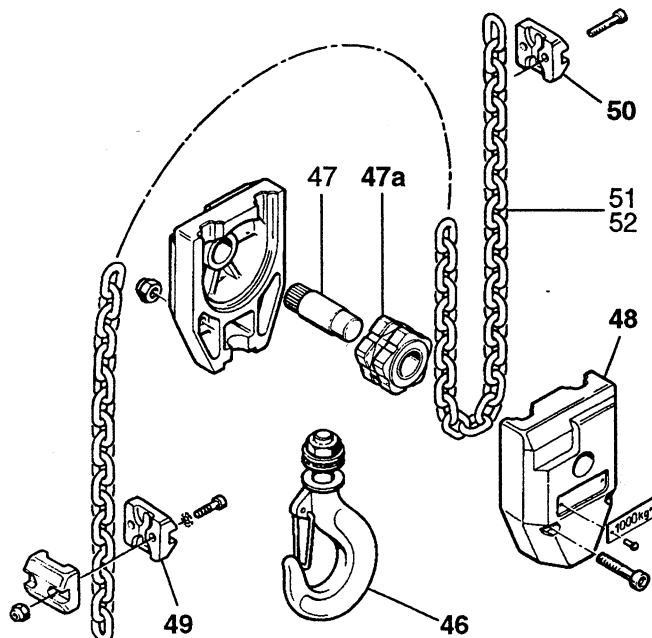
ITEM	CODE	DESCRIPTION	1004m1 (N° 5)	2004m2 1008m2 (N° 6 & 7)
1	557 140	Motor casing, unequipped, with 2 + 3 + 3a.....	1	1
2	833 725	Needle bush, INA HK 22 12 (22 x 28 x 12).....	1	1
3	556 243	Seal, PAULSTRA 22 x 32 x 7.....	1	1
3a	556 509	Cylindrical pin, 8 x 20.....	2	2
4	557 263	Stator, length 80, single speed 400V and 230V.....	1	1
8	557 342	Rotor, length 80, with 16-tooth shaft.....	1	1
10	557 110	Sprocket, 6.5 x 19.5 chain.....	1	
11	557 111	Sprocket, 8 x 24 chain.....	1	
12	557 025	Bearing, 6008 2RS (40 x 68 x 15).....	1	1
13	557 026	Bearing, 6011 2RS (55 x 90 x 18).....	1	1
13a	400 080	Retaining ring, 90 l.....	1	1
14	557 114	Sprocket gear, 102 teeth.....	1	1
14a	557 113	Sprocket gear, 96 teeth.....	1	1
15	400 079	Retaining ring, 50 E.....	1	1
16	557 060	Limiter sub-assembly (14 and 141 teeth) (2 steps).....	1	1
-	557063	Limiter sub-assembly (19 and 141 teeth) (2 steps).....	1	
18	550 787	Bearing, 6204 (20 x 47 x 14).....	1	
19	550 789	Bearing, NJ 204 (20 x 47 x 14).....	1	
19a	832 041	Washer, Onduflex, 54 x 35 x 1.....		1
20	557 120	Pinion shaft, 14 teeth.....	1	
21	557 121	Pinion shaft, 19 teeth.....		1
22	557 043	Support ring, spring washer.....	1	1
23	557 032	Washer, CRIBO 80 x 31 x 3.....	1	1
24	557 101	Friction disk.....	2	2
25	557 115	Limiter gear, 141 teeth.....	1	1
26	557 042	Limiter spacer ring.....	1	1
27	557 028	Bearing, 6002 2NSL (15 x 32 x 9).....	2	2
28	830 866	Retaining ring, 32 l.....	2	2
29	100 338	Washer, Z 12 U.....	1	1
30	831 589	Locknut, TRISTOP M 12 - 125.....	1	1
38	557 038	Gear casing gasket.....	1	1
39	558 428	Gear casing.....	1	1
41	830 909	Socket head screw, M 6 - 20.....	6	6
37	830 865	Retaining ring, 15 E.....	1	1
43		Assembled brake.....	1	1
45	557 036	Gasket casing.....	1	1
46	557 104	Gasket casing.....	1	1
47	830 901	Socket head screw, M 6 - 30.....	8	10
47b	550 979	Socket head screw, M 6 - 25.....	2	
47c	550 979	Socket head screw, M 6 - 50.....	4	4
48	833 431	Cable guide.....	1	1
49	833 703	Bearing 6203 2 RS.....	1	1
49a	832 040	Washer, Onduflex type E REF. 542901.....	1	1
50	557 103	Rear endcap.....	1	1
51	557 105	Upper chain guide, 6.5 x 19.5 chain.....	1	
52	557 106	Lower chain guide, 6.5 x 19.5 chain.....	1	
53	557 107	Upper chain guide, 8 x 24 chain.....		
54	557 108	Lower chain guide, 8 x 24 chain.....		1
55	557 037	Gasket, lower chain guide.....	1	1
56	558 117	Limit switch drive pin with.....	1	1
57	557 700	Top and bottom limit switch selector (3m).....	1	1
58	830 925	Socket head screw, M4 - 40 + Washer AZ 4.....	2	2
59	557 168	Upper hook sub-assembly, 025.....	1	
-	557 160	Upper hook sub-assembly, 05.....	1	1
-	557 163	Upper hook sub-assembly, 08.....		1
61	830 918	Socket head screw, M 10 - 110.....	2	2
	831 593	Nut, Nylstop M 10.....	2	2
62	557 404	Plate for chain bag support.....	2	2
62b	557 403	Chain bag support.....	1	1
62c	557 407	Axle for chain bag support.....	1	1
63	557 401	Diabolo + fixing parts.....	1	1
63b	557 405	Supporting plate for chain bag.....	1	1
74		Chain bucket with Support and Base part and 5 rings.....	1	1
74a	830 870	Fixing part.....	2+1	2+1
-	557 099	BE6, cap. 50 m (6.5 x 19.5) - 30 m (8 x 24).....		
78	557 085	Rating plate and motor with 4 rivets.....	1	1
79	557 092	STAGEMAKER / VERLINDE label.....	2	2
	557 082	LI10 label.....	2	2
82	557 548	Electric box.....	1	1
82 b	557 415	Protection plate.....	1	1
83	556 412	Handles + screws.....	2	2

12-3 Lifting (1-fall hook, 2-fall hook block, 5 x 15 chain)



1 Fall

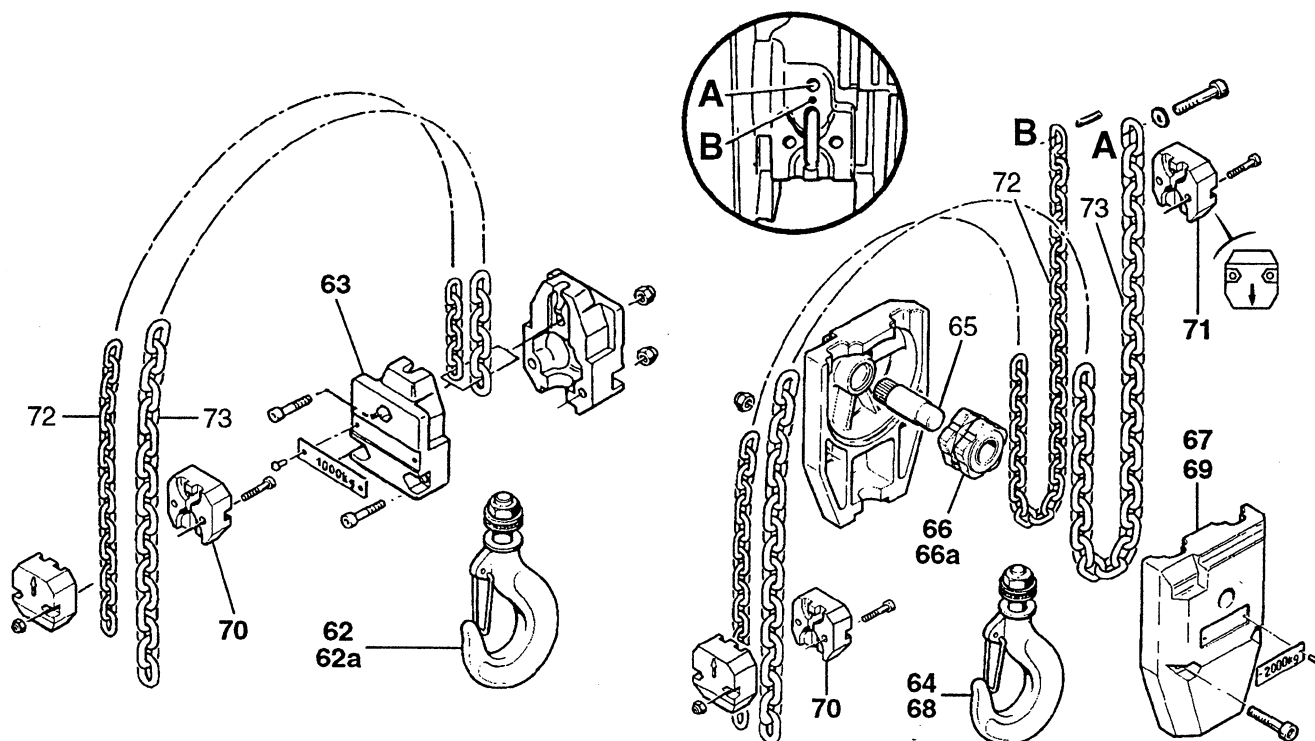
ITEM	QTY	CODE	DESCRIPTION
44	1	556 360	Lower hook sub-assembly . Washer, M 14 U . Needle bearing, AX 4 15 28 . Back plate, CP 2 15 28 . Nut, H M 14 (welded)
45	1	556 228	Complete case . 3 socket head screws, M 6 - 45 . 3 nuts, Nylstop M6
		556 137	. 2 load plates, 250 kg (1/4 Ton) or
		556 138	. 2 load plates, 500 kg (1/2 Ton)
			. 4 rivets, SIM U-type, gauge 4, width 6.4 head R
49	1	556 232	Slack fall stop . 2 socket head screws, M 6 - 25 . 2 nuts, Nylstop M 6
51	1	820 146	5 x 15 chain, 500 N/mm2, corrosion-proof
52	1	820 153	5 x 15 chain, 800 N/mm2 hardened, corrosion-proof



2 Falls

ITEM	QTY	CODE	DESCRIPTION
46	1	557 152	Lower hook sub-assembly . Washer, Z 16 U . Needle bearing, AXK 17-30 . 2 back plates, LS 17-30 . Nut, HM 16 (welded) Sprocket shaft
47	1	556 001	
47a	1	554 330	Idler sprocket . Bearing, Glycodur A SKF GLY PG 18-20-25 A
48	1	556 248	Hook block . 2 socket head screws, M 6 - 40 . 2 nuts, Nylstop M6
		556 272	. 2 load plates, 250 kg or
		556 271	. 2 load plates, 500 kg or
		556 351	. 2 load plates, 1000 kg
			. 4 Rivets SIM U-type gauge no. 4, Width 6.4
49	1	556 232	Slack fall stop . 2 socket head screws, M 6 - 25 . 2 nuts, Nylstop M 6
50	1	556 233	Fixed point . 2 socket head screws, M 6 - 20
51	1	820 146	5 x 15 chain, 500 N/mm2, corrosion-proof
52	1	820 153	5 x 15 chain, 800 N/mm2 hardened, corrosion-proof

12-4 Lifting (1-fall hook, 2-fall hook block, 6.5 x19.5 and 8 x 24 chains)



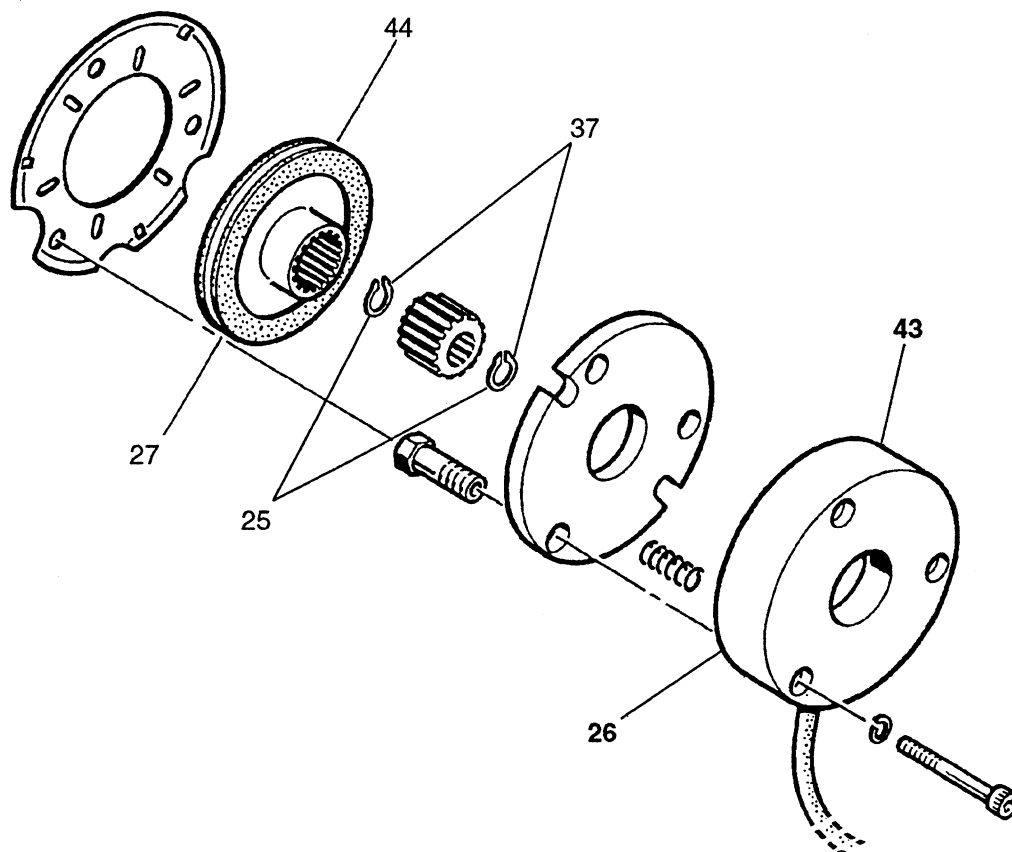
1 Fall

ITEM	QTY	CODE	DESCRIPTION
62	1	557 152	Complete hook body 025
62a	1	557 156	Complete hook body 05
			. Washer, Z 16 U
			. Needle bearing, AXK 17-30
			Back plate, LS 17-30
			. Nut, H M 16 welded
63	1	557 144	Complete case
			. 3 socket head screws, M 8 - 50
			. 3 nuts, Nylstop M 8
		556 139	. 2 load plates, 1000 kg (1 Ton)
			. 4 Rivets SIM U-type, gauge 4 width 6,4 head R
70	1	557 142	Slack fall stop
			. 2 socket head screws, M 8 - 35
			. 2 nuts, Nylstop M 8
72	1	820 148	6.5x19.5 chain, 800N/mm2, hardened, corrosion-proof
73	1	820 147	8x24 chain, 800 N/mm2, hardened, corrosion-proof

2 Falls

ITEM	QTY	CODE	DESCRIPTION
64	1	557 157	Complete hook body 05
			. Washer, Z 20 U
			. Needle bearing, AXK 20-35
			. Back plate, LS 20-35
			. Nut, H M 20 welded
65	1	556 101	Sprocket shaft
66	1	556 124	Idler sprocket, 6.5 x 19.5 chain
			. Bearing, Glycodur F SKF GLY PG 20-23-30 F
66a	1	556 172	Idler sprocket, 8 x 24 chain
			. Bearing, Glycodur A SKF GLY PG 20-23-30 A
67	1	557 145	Hook block for 6.5 x 19.5 chain
			. 2 socket head screws, M 6 - 50
			. 2 nuts, Nylstop M 6
		557 137	. 2 load plates, 2000 kg (2 Ton)
			. 4 Rivets SIM U-type gauge 4 width 6,4 head R
68	1	557 158	Complete hook body 08
			. Needle bearing, AXK 2542
			. Back plate, LS 2542
			. Nut, H M 24 welded
			. Washer, Z 24 U
69	1	557 147	Hook block for 8 x 24 chain
			. 2 socket head screws, M 8 - 50
			. 2 nuts, Nylstop M 8
		557 137	. 2 load plates, 2000 kg (2 Ton)
			. 4 Rivets SIM U-type, gauge 4 width 6,4 head R
70	1	557 142	Slack fall stop
			. 2 socket head screws, M 8 - 35
			. 2 nuts, Nylstop M 8
71	1	557 143	Fixed point
			. 2 socket head screws, M 8 - 30 (6.5 x 19.5 chain)
			. 1. "Mécanindus" pin, dia. 3 x 20 (6.5x19.5 chain)
			. 1 washer, M 8 U (8x24 chain)
			. 1 socket head screw, M 8 - 30 (8x24 chain)
72	1	820 148	6.5x19.5 chain, 800 N/mm2, hardened, corrosion-proof
73	1	820 147	8x24 chain, 5 800 N/mm2, hardened, corrosion-proof

12-6 Brake



5x15



ERD 5: 125-250 kg - 500 (2 falls)
ERD 10: 500 kg (1 fall) et 1000 kg

REP.	QTY	CODE	DESIGNATION
26	1	556 554	complete brake ERD 5, L 6 or RSE 4 - 96 V or 115 V for power supply 230 V
	1	556 555	complete brake ERD 5, L 6 or RSE 4 - 190 V or 207 V for power supply 400 V
	1	556 556	complete brake ERD 10, L 8, RSE 4 or RSM 08 - 96 V or 115 V for power supply 230 V
	1	556 557	complete brake ERD 10, L 8, RSE 4 or RSM 08 - 190 V or 207 V for power supply 400 V
27	1		Supplied with attaching screws and washers
25	2	830 862	Brake lining (indicate brand and type)
			Retaining ring, 12 E

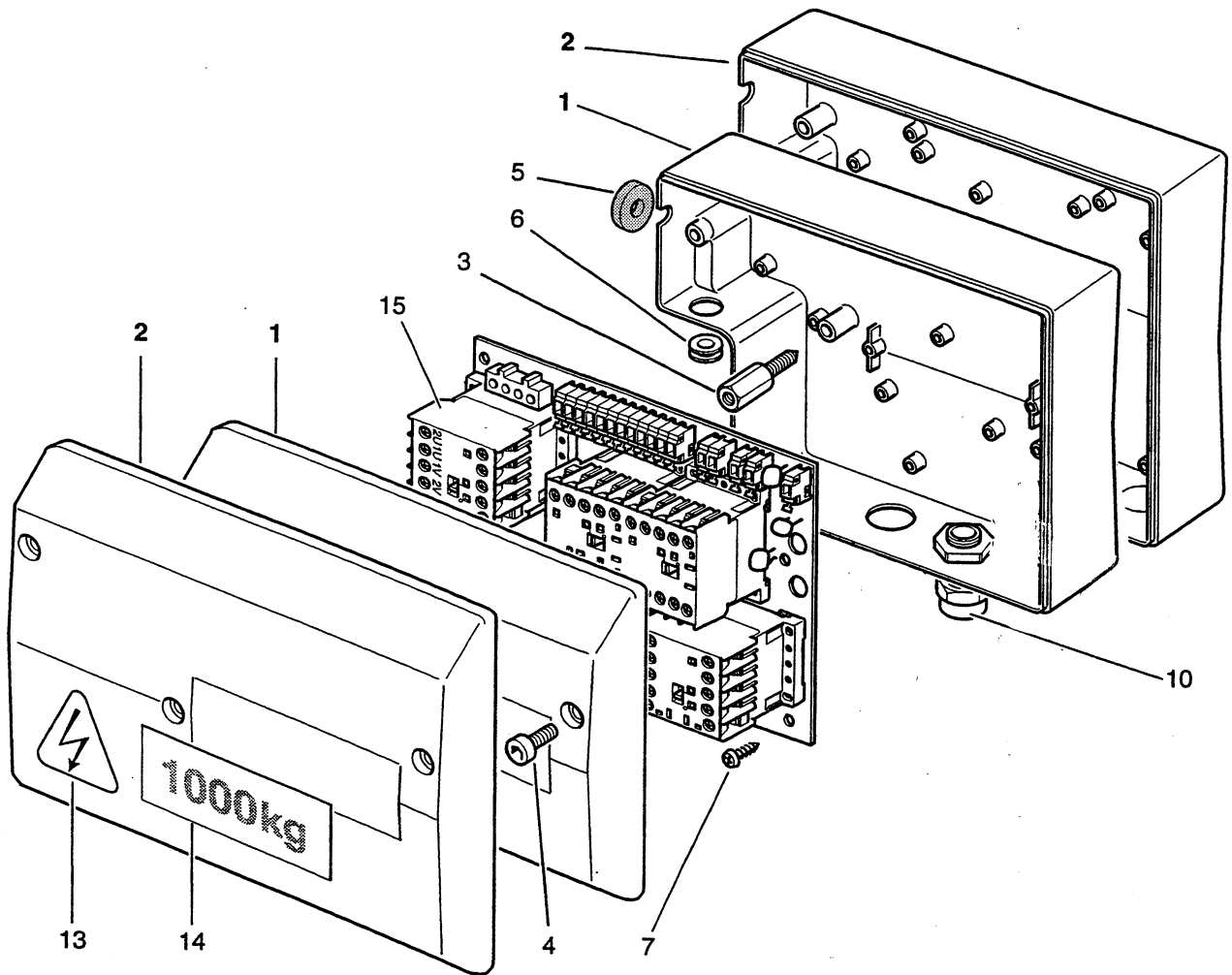
6,5x19,5
8 x 24





ERD 10S: 500 kg
ERD 20: 1000-2000 et 3000 kg

REP.	QTY	CODE	DESIGNATION
43	1	557 056	Frein ERD 10S, L 8S or RSM 08 S - 96 V or 115 V for power supply 230 V
	1	557 057	Frein ERD 10S, L 8S or RSM 08 S - 190 V or 207 V for power supply 400 V
	1	557 051	Frein ERD 20, L 10 or RSM 16 - 96 V or 115 V for power supply 230 V
	1	557 052	Frein ERD 20, L 10 or RSM 16 - 190 V or 207 V for power supply 400 V
			Supplied with attaching screws and washers
44	1		Brake lining (indicate brand and type)
37	2	830 865	Retaining ring, 15 E

12-7 Very low voltage (48 V) electric box (2 lifting speeds)



ITEM	QTY		CODE	DESCRIPTION	
	5x15	6,5x19,5 8 x 24			
					
1	1		556 548	Electric box	
	1		832 044	. O-ring	
2		1	557 548	Electric box	
		1	832 045	. O-ring	
3	3	3	990 754	Adjusting rod	
4	2	3	550 979	Socket head screw, M6-25	
	1		830 924	Socket head screw, M6-12	
	1		831 558	Nut, Nylstop M6	
	3	3	832 043	Fiber washer	
5	1	1	832 042	Sealing washer	
6	1		833 434	Cable guide, diameter 7 mm	Limit switch option
7	6	7	831 423	Attaching screw, printed circuit	
10			833 257	Cable gland, ST 16	
			833 203	Plastic nut, PG 16	
			833 258	Cable gland, ST21	
			833 206	Plastic nut, PG 21	
			833 261	Platic cover PG 16	
13	1	1	833 097	Electrical label	
14	1	1		Load plate	
15	1	1		Printed circuit	Refer to 9-2 - P.C. board table (page 9.2)

[illegible]



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