STAGEMAKER®

INSTALLATION
MAINTENANCE
SPARE PARTS

ELECTRIC CHAIN HOIST TYPE SM 5

VERLINDE
LIFTING EQUIPMENT

Table of contents

1 – EC declaration of conformity

VERLINDE
LIFTING EQUIPMENT

VERNOUILLET
France

As defined by the EC directive relating
to machinery 98/37/EEC.
Annex II A
Herewith, we declare that the product:

Wire rope hoist	Belt hoist	**Electric chain hoist** ●	Manual chain hoist	Electric trolley	Manual winch
●	●	●	●	●	●
●	●	●		●	
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Complies with the following provisions applying to it:
- Machinery directive 98/37/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).

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 15400; DIN 15401,

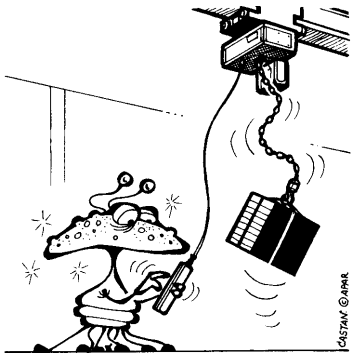
Quality system applied:
- EN29001/ISO9001

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".
- EN 818 "chain quality, choice criteria and technical requirements".
- FEM 9.683 "choice of motors".
- FEM 9.755 "steps to be taken to determine the operating periods for mass-produced motorized lifting mechanisms (S.W.P.)".
- FEM 9.751 "Motorized lifting mechanism: safety"
- FEM 9.901 "bases of design for the mass-produced lifting devices for travelling cranes equipped with mass-produced lifting devices".

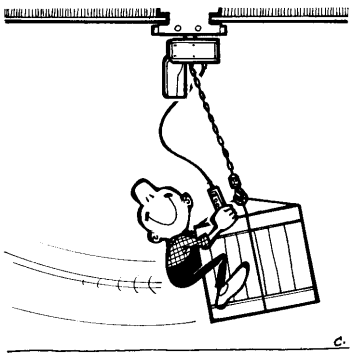
Bernard DELEFOSSE

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

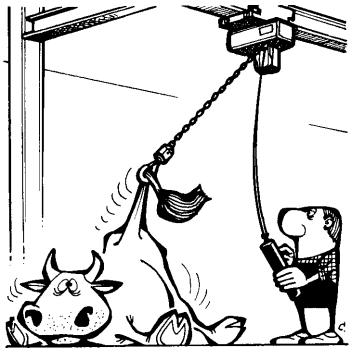


Do not let an unqualified person use the hoist.


Never swing the load intentionally.

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, if it is not necessary.
Never use the hoist as an earth reference for welding.
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...).*
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 transport a load with people nearby. Do not pass the hook, with or without a load, above a person.

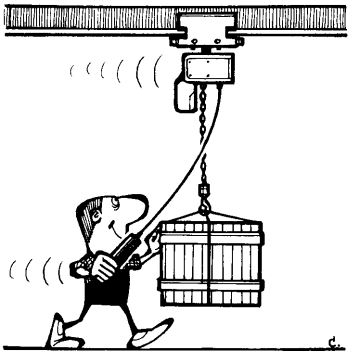

Never pull the load slantwise.

3 - What to do

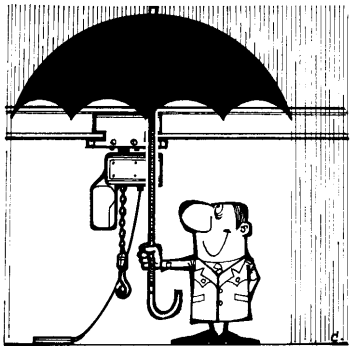
Handle the hoist by its structure, or by the devices provided for this purpose, or in its original packing.
Store the hoist in its normal operating position (without load) away from aggressive atmospheres *(dust, humidity...).*
Make sure that the hoist is always clean and protected from corrosion *(lubrication...).*
The hoist should be installed by a competent.
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.

Make sure that the hoist is always clean.

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 clear surrounding machines and other objects.
Make sure that the hoist is vertical to the load before hoisting.
If manually moving the hoist, push the load.
Use plastic stops, or better still, electric limit switches, to avoid repetitive stops on the stops.



If manually moving the hoist, push the load.



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

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...).*
Material used outdoors should be protected as well as possible against bad weather conditions. Hoist should be covered to avoid water going inside the chain bucket. A hole must be made to the chain bucket's bottom to let water to drain out. Always lift the load from the floor. Never add load to a lifted hook.

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

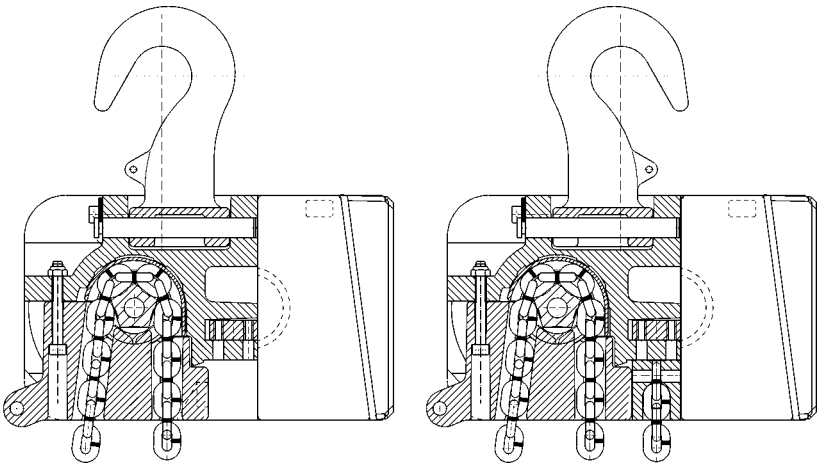
5-1 Acceptance of the material

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.

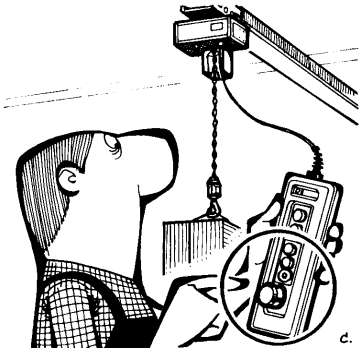
5-2 Installation

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 9-1: Electrical connection).*
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.
Check that the tightening torques of the hook blocks, locking plates and chain guide conform to the torques indicated in this manual *(refer to 10.4: 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 buffers are correctly fitted (steel plate towards the hoist body).
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.

IMPORTANT !
The slack fall stop is a safety component , not a functional one.
A correct lenght of chain is required to avoid using it .

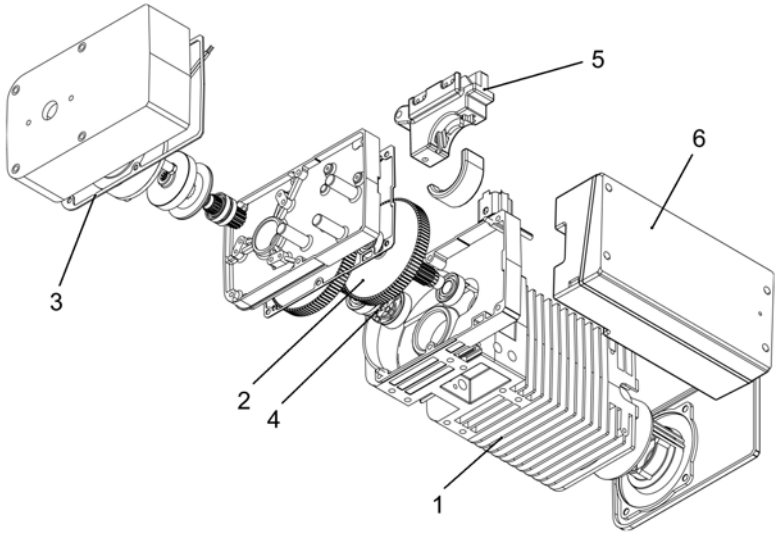
6 - Description – tecnical charactéristics

6-1 Types de palans

Type	Load Kg	Number of falls	Speed m/min (50Hz)	Speed ft/min (60Hz)	Motor power kW	Speed reducing ratio	FEM Group	Chain d / t
SM5 254 m1	250	1	4	16	0.42	43	1Bm	4,8 / 12,5
SM5 258 m1			8	32	0.85			
SM5 504 m1	500		4	16	0.42			
SM5 508 m1			8	32	0.85			
SM5 1004 m1	1000	2	4	16	0.85			
SM5 1002 m1			2	8	0.42			

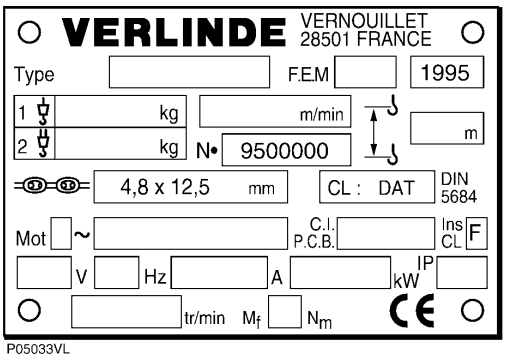
The slipping clutch is factory adjusted at a value of 140% of a nominal load

6-2 Main sub-assemblies



1- Main casing
2- Gears
3- Brake / limiter / housing assembly
4- Chain sprocket with output shaft
5- Chain guide
6- Electrical box

Identification plate

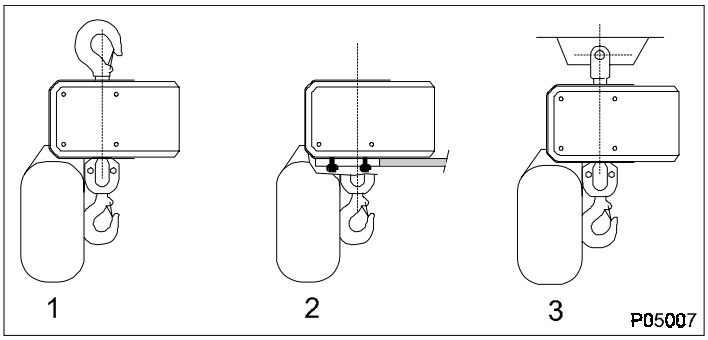


The hoist which you have just purchased should only be used with a maximum load equal to the nominal load (refer to the table above).
The length of its useful service life depends on the demands placed on it, the average operating time, the number of start-ups and its maintenance.

6-3 Hoist dimensions and weight

Refer to dimensional drawings

6-4 Attachment of the hoist



1. Suspension hook
2. Base mounting
3. Suspension L or // attachment using the coupling part

6-5 Environmental data

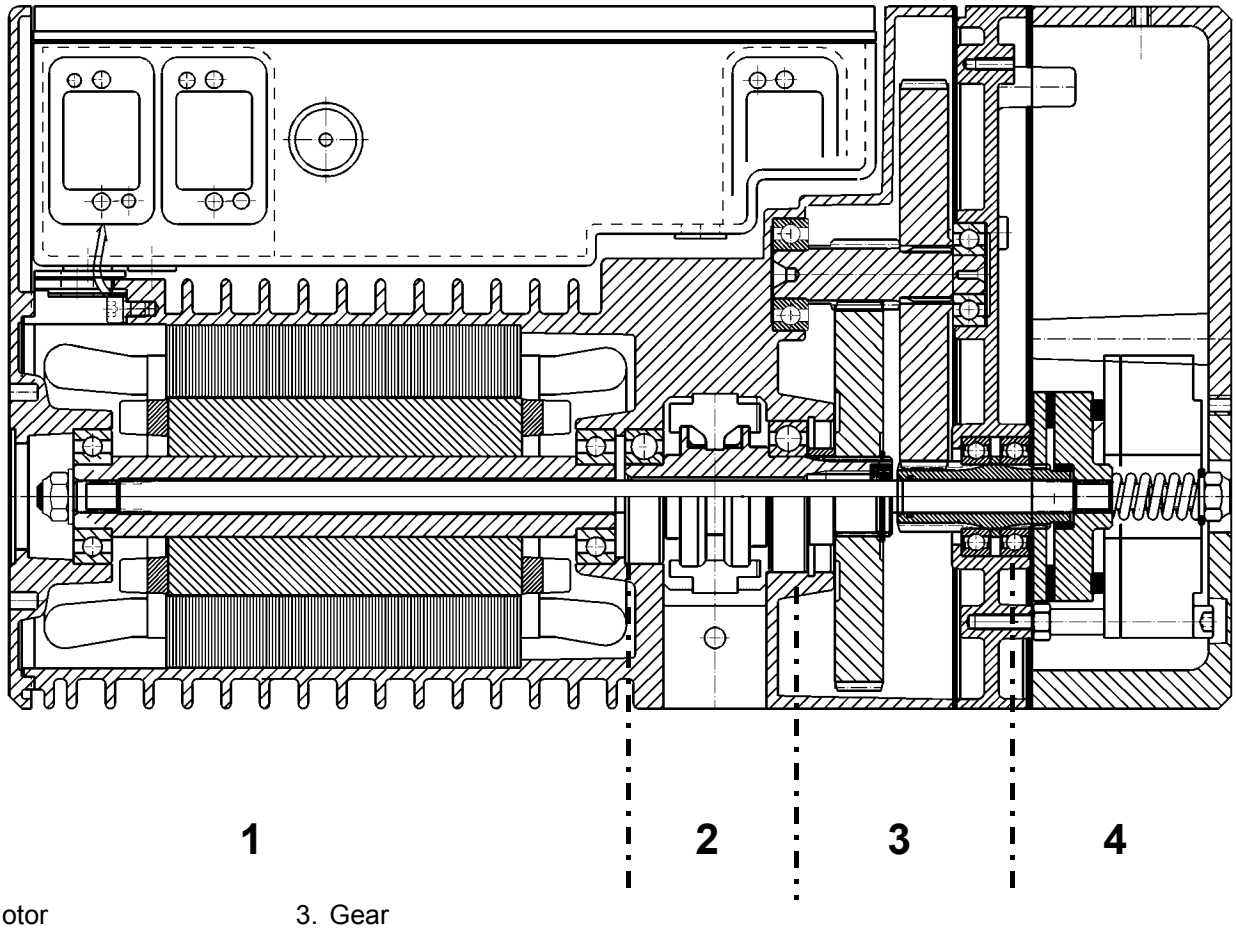
Ambient temperature :	-20°C à +40°C
Protection class :	IP55 as standard
Side pulling angle :	3 degrees maximum

Impact of the environment :

Sound level :	70 decibels

6-6 Operation of the hoist

Kinematic chain



1. Motor
2. Chain sprocket
3. Gear
4. Brake/limiter

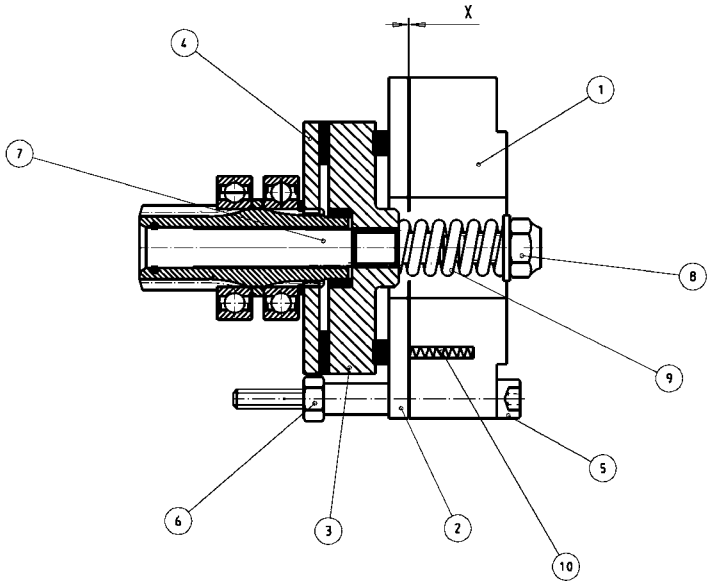
Technical advantage

The position of the limiter allows, should it slip, the load to be held in all cases by releasing the control box button.

7- Brake / limiter assembly

7-1 Operation

The parts of limiter are mounted free on the gear input shaft (1). Other brake parts are mounted on the gear flange.
The spring (9) keeps a pressure between the limiter lining (4) and brake disc (3).
The nut (8) maintains the assembly on the gear input shaft.
When the coil (1) is energized, during lifting or lowering, it pulls the brake disk (7) *(releasing the brake and clutch disc (3) there is a play X for this purpose).*
The disks (3 and 4) turn freely, transmitting the movement to the pinion (7).
Braking occurs when the coil is no longer energized and the spring (10) drives back the brake lining against the disk (3).



7-2 Adjustment of the limiter:

1. Hook a load of 1.25 times the nominal load into the hoist.
2. Remove the brake endcap and the sealing.
3. Raise the load at slow and fast speed.
4. Use a key to turn the adjusting nut (8) in the required direction.
   - Turn the nut clockwise to increase the torque.
   - Turn the nut counterclockwise to decrease the torque.
5. Repeat steps 3 and 4 until the load can barely be lifted at fast speed. The limiter is now adjusted.
6. Fit the sealing and the brake endcap.
7. Check, at fast speed, the lifting of a nominal load.

Note : That when the limiter is adjusted the brake end cap must be removed and the motor must not be running.

Do no touch the moving components. Before pressing the "lift" button on the control box, check that there is nothing in contact with the adjusting nut *(key, for example).*

7-3 Adjustment of the brake:

1. Before starting the adjustment, remove the load and switch off the power supply.
2. Remove the brake endcap and the sealing.
3. Use feeler gauge to measure the air gap (**X**) between the brake disk (2) and the electromagnet at at least three points around the electromagnet.
4. To ajust the brake :
   - Unscrew one of the locking screw (5).
   - Adjust the air gap by turning the adjusting screw (6) counterclockwise to reduce the airgap, clockwise to increase it.
   - Thigten the locking screw (5).
   - Make the same operation with the 2 other adjustment points.
   - Control the air gap adjustment all around the magnet.
5. Check the operation of the brake
6. Fit the sealing and the brake endcap

Brake air gap	**Minimum air gap (mm)**	**Maximum air gap (mm)**
Between brake disk (2) and coil (1)	**X** = 0.2	**X** = 0.5

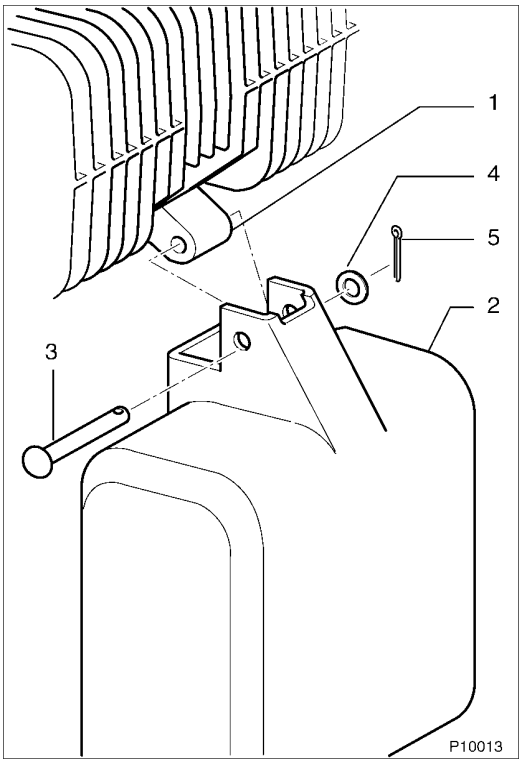
Note : To replace the brake/limiter assembly, the electromagnet supply wires inside the electric box must first of all be disconnected.

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 oiled and check that it is in good condition every day.

8-1 Chain bucket



INSTALLATION:
1. Insert the chain into the bucket (2)
2. Position the bucket on the chain guide (1) and put the suspension pin (3).
3. Lock with the washer (4) and ths split pin (5).

Severals chain buckets are available, a standard one for up to 8 m of chain and special ones other lenghs.

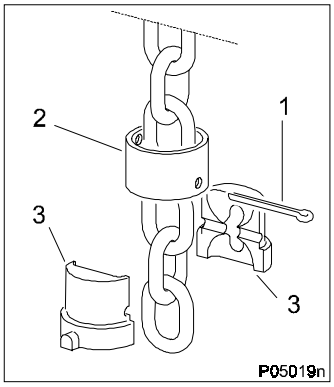
8-2 Slack fall stop (in the chain bucket

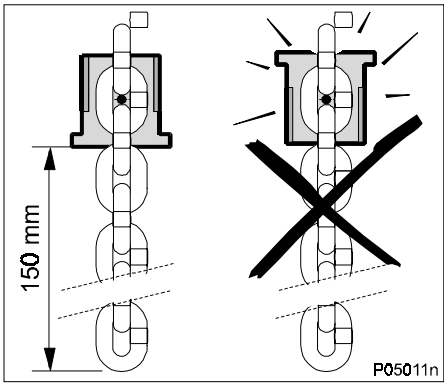
CAUTION !

The slack fall stop is a safety component, not a functional one.
A correct length of chain is required to avoid using it.

REMOVAL:
1. Remove the pin.
2. Remove the tube from the stop.
3. Remove the two halves of the stop.

REPLACEMENT:
1. Check that there is at least 150 mm of chain under the slack fall stop. Position the two halves of the stop around the chain.
2. Insert the tube around the stop.
3. Insert the pin.

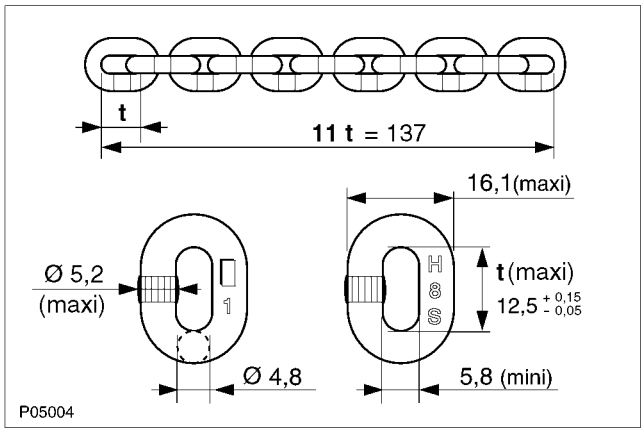




Note : Make sure that the stop is correctly fitted. The locking tube should be turned towards the hoist..

8-3 Chain «Certificat»

Chain type :	standard
Diameter (d) / pitch (t) :	4,8 mm /12,5 mm
Class :	DAT
Grade :	H8S ou HE G80 RAS
Maximum working stress :	135,5 N/mm^2
Hardened surface :	580 ou 700 HV
Thickness :	0,1 à 0,2 mm
Standard :	DIN 5684 – 8
Marking (10 x t) :	❒1 ou ❒16
	H 8 S ou A 8
Maximum working load, 1 fall :	500 kg
Breaking load :	29 kN
Maximum breaking stress :	800 N/mm^2
Total breaking elongation :	>10% mini.
Weight for 100 links :	0,680 kg



Measuring the wear on the chain :
This should be done by measuring the dimensions, at several points of the chain, of one link (d) and (t), and over 11 links (11 t)

Maximum wear allowed :

Minimum link thickness allowed (d):	4.30 mm
Maximum pitch allowed (t):	13.10 mm
Maximum length allowed (11 t):	140.25 mm

WARNING !

A repetitive stop and start at the same point of the chain will create a more important wear on the 2-3 links which are in the chain sprocket

If these limits are exceeded**, the chain must be replaced immediately**. In this case, the wear on the guide chain 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**

8-4 Removal of the chain

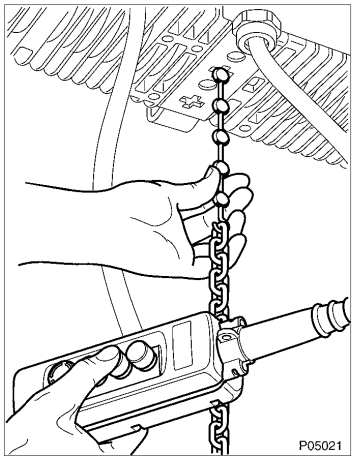
1-fall chain :
1. Remove the load from the hook.
2. Disassemble the hook block.
3. Lower the chain into the chain bucket.
4. Remove the chain bucket and unscrew and remove the lower chain guide.

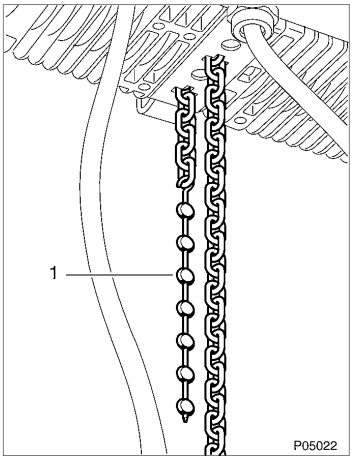
2-fall chain :
1. Raise the hook block to about 30 cm from the hoist body.
2. Remove the chain bucket.
3. Carefully remove the lower chain guide.
4. Disassemble the fixed point of the chain.
5. Remove the 2-fall hook block, without disassembling it, letting the chain run through it.
6. Let the rest of the chain slide through the chain sprocket.

8-5 Replacement of the chain

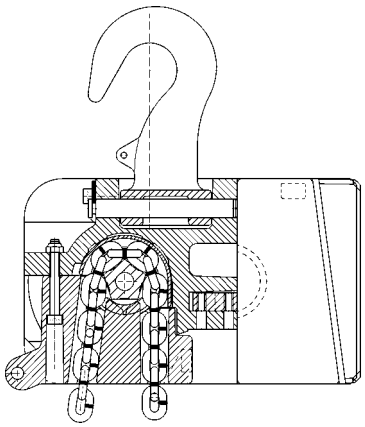
The chain should always be fitted using the flexible plastic insertion tool (1). Use of this tool always ensures that the chain is fitted correctly.

Warning :
Don't forget to put the rubber rings around the chain when changing it. The metallic ring must be oriented towards the hoist body.





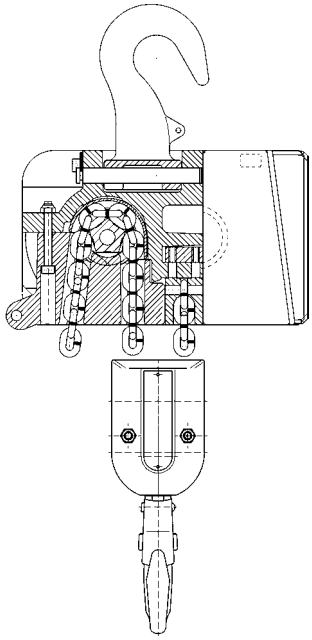
1 fall chain :



1. Insert the last link in the small plastic hook of the insertion tool.
2. Insert the other side of the tool in the sprocket, chain bucket side.
3. Raise the chain at slow speed so that the tool and the chain come out the other side of the sprocket.

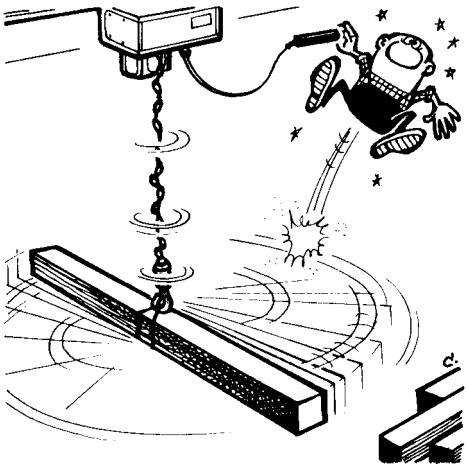
Note : the welds (1) of the vertical chain links should be towards the chain sprocket.

2 falls chain :



1. Insert the last link in the small plastic hook of the insertion tool.
2. Insert the other side of the tool in the sprocket, chain bucket side.
3. Raise the chain at slow speed so that the tool and the chain come out the other side of the sprocket. Continue until about 50 cm of chain are visible.
4. Put the chain through the idler sprocket, **taking care not to twist the chain**
5. Carefully remove the chain anchor (5) removing the 4 screws. Take out the pin (6).
6. Insert the end of the chain into the hole of the chain anchor.
   Insert the pin (6) into the hole of the chain anchor.
   Insert the chain anchor and tighten the 4 screws (torque 20 Nm).

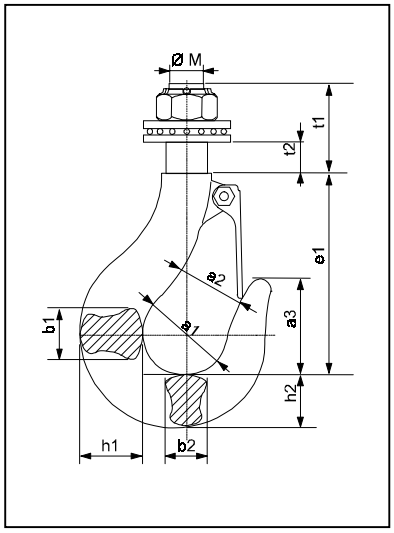
Note : the welds (1) of the vertical chain links should be to the side away from the idler sprocket.



Never twist the lifting chains
(turning around of the hook block)

8-6 Hook "Certificat"

Load capacity	FEM Group	Test load	Number of falls	Minimum ruin load	Marking Class	Dimensions (mm)										
(Kg)		(Kg)		(Kg)		ØM	Øa1	a2	a3	b1	b2	e1	h1	h2	t1	t2
250	1Bm	500	1	1575	012 T	14	30	20	34	19	15	83	22	19	32	10
500		1000	1 - 2	2500	012T / 025T	16	36	26	41	22	19	96	28	24	38	13
1000		2000	2	5000	025 T											



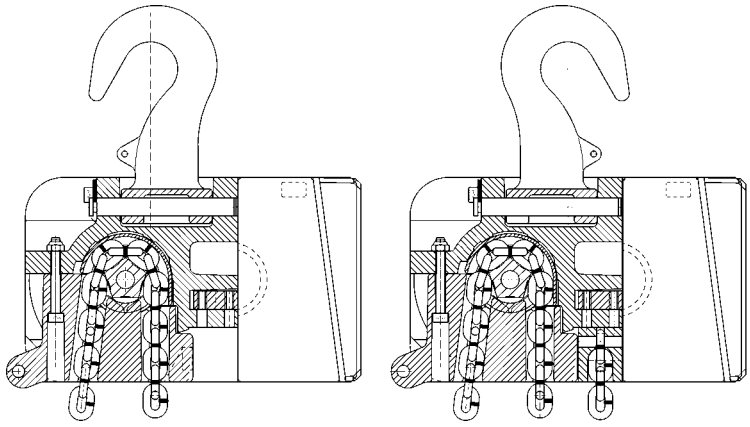
Mark : ISO 2766
DIN 15400 class : T
DIN model number : 15401
DIN 15401 material : 35 CD 4

8-7 Suspension hook

REMOVAL :
1. Remove the screw and the locking plate.
2. Remove the two pins.Take the hook out.

REPLACEMENT :
1. Put the hook into its housing.
2. Place the two pins inside the hook
3. Fit the screw and the locking plate without forgeting the safety washer.

(Refer to paragraph 10-4 for the tightening torque)



Note : The hook should be set depending on 1/1 and 2/1 revings.

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

The wear on the suspension and lifting hooks (dimention **a2 and 32.5**- see drawing at top of page) should be checked regulary.Damage safety catches schould be replaced immediatly.

• Bottom hook :

If the maximum dimention (**a2**) on the lifting hook is greater than the initial dimention by more than 15% , the hook schould be replaced.

Class :	012	025
a2 maxi allowed :	23 mm	30 mm

• Top hook :

maximum allowed for the throat opening (dimension 32.5 mm) : 37mm
Please change your hook if the dimension is upper than 37 mm

9 - Electricity

CAUTION !

Before any operation on the electric box, check that the hoist supply is disconnected.
An isolator switch should be installed at a maximum of 6 meters from the hoist.

9-1 General

- The customer must supply the power supply cable, the fuses and the main isolator switch (refer to the wiring diagram).
- Check that the mains system is correct for the hoist.
- Check that the voltage does not vary by more than ± 5% from the nominal value.
- Neutralize the electric sources.
- Make sure that the main hoist electric power switch is off.
- Do not use binding posts (luster terminals, etc.) to connect the power supply cable to the hoist.
- Do not use rigid cable or cable with a section different to that indicated below to supply the hoist.
- Never shunt the isolators, the power switches or the limitation or prevention equipment.
- Never block, adjust or remove the limit stops or switches to go higher or lower than these allow.

9-2 Low voltage control

9-2.1 Electrical connection

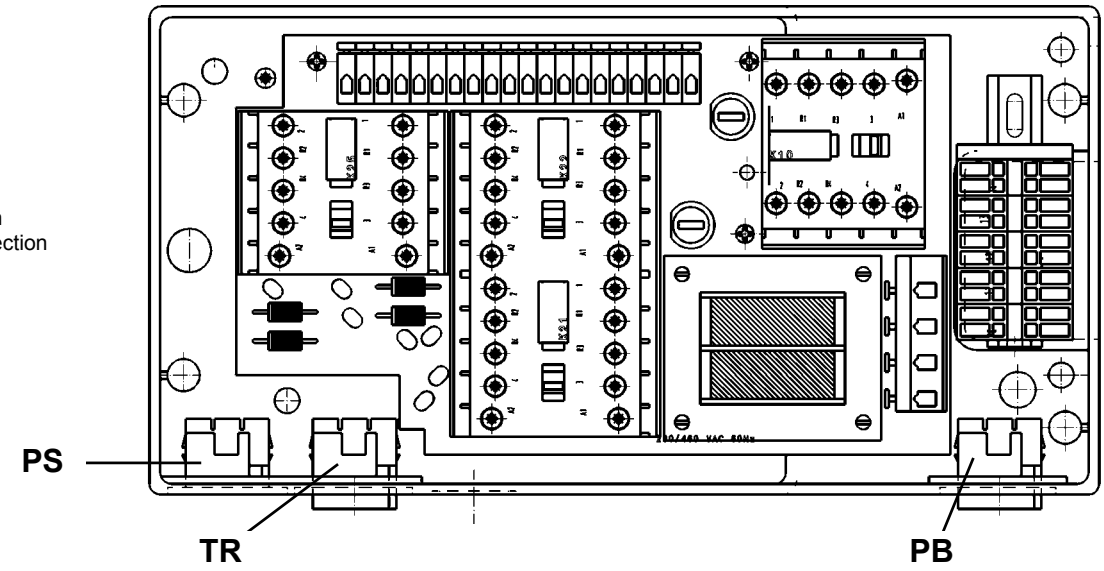
Connection :

1. Remove the control box cover.
2. Insert the cable (PS) into the box through the PG cable gland.
3. Connect phases L01 - L02 - L03 to contactor K10 (1), and the ground wire to the terminal board (2).
4. Check that the terminals are correctly tightened.
5. Close the box.
6. Check the hoist operation

Minimum cable sections :

Power supply :	1,50 mm2
Auxiliary current :	0,75 mm2
Control box/hoist :	1,00 mm2
Fuses (low voltage) :	T 630 mA
power supply (customer supply) :	6 A

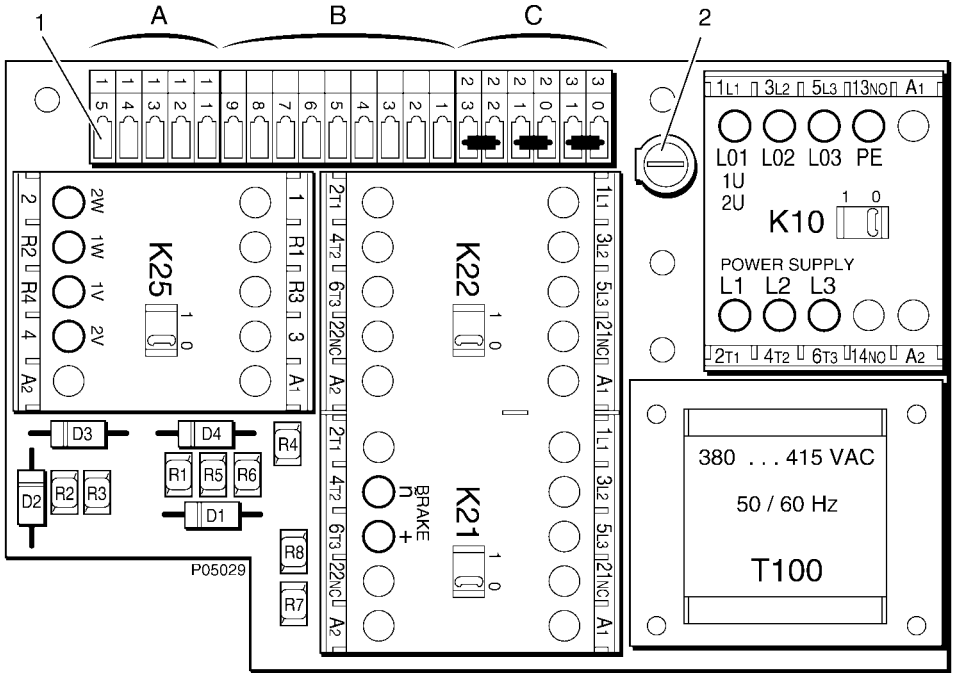
PS : Power supply
TR : Trolley connection
PB : Control box connection



CAUTION !

Do not change the travel direction labels in the control box or in the hoist internal wiring

9-2.2 Printed circuit board (2 lifting speeds with emergency stop)



HOIST SUPLLY

L1		hoist supply
L2		hoist supply
L3		hoist supply
BR1	–	brake
BR2	+	brake
BR3	–	2nd brake (OPTION)
BR4	+	2nd brake (OPTION)
1U		motor supply
2U		motor supply teur
1V		motor supply
2V		motor supply
1W-L01		motor supply
2W-L01		motor supply

GROUND WIRES

ground terminal, 4 connections (see previous page)

- PE motor
- PE p.c. board (K10)
- PE trolley connection (X24)
- PE power supply

TROLLEY CONNECTION (X24)

- L01 electric trolley supply
- L02 electric trolley supply
- L03 electric trolley supply
- 1P1 motor thermal protection
- 1P2 motor thermal protection

PRINTED CIRCUIT BOARD

Terminal (1)

A Trolley

11	48 V	common
12	SD	low speed
13	F	high speed
14	D2	left
15	D1	right

B control box

1	common
2	lifting
3	lowering
4	hoisting speed selector
5	emergency stop
6	right, electric trolley
7	left, electric trolley
8	travelling speed selector
9	-

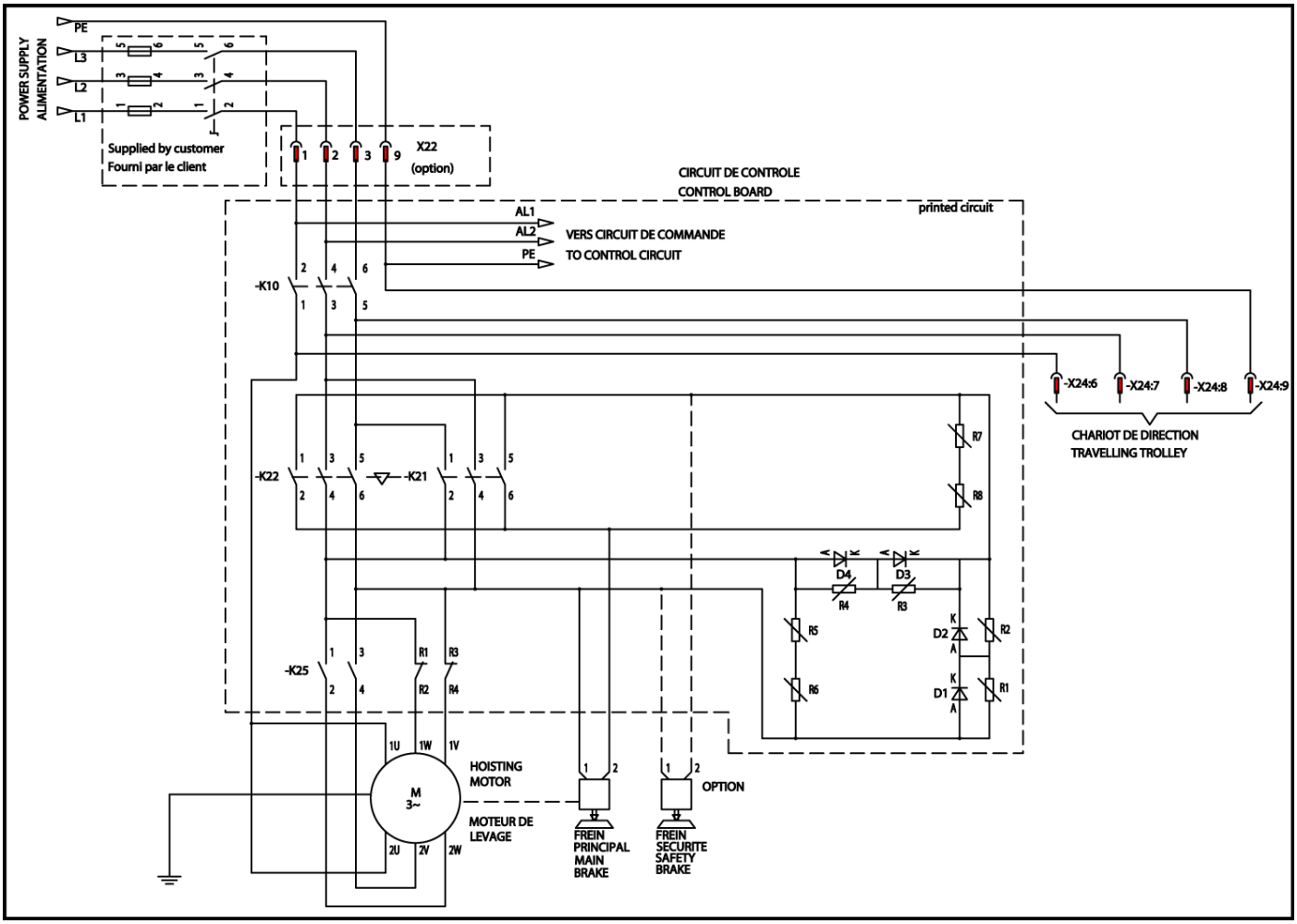
C Options

30-31	thermal protection *(replace the shunt)*
20-21	top limit switch *(replace the shunt)*
22-23	bottom limit switch *(replace the shunt)*

Fuse (2) T 630 mA

- K10 Emergency stop contactor
- K21 Lifting contactor
- K22 Lowering contactor
- K25 Reversal contactor
- T100 Control transformer

9-2.3 Power diagram

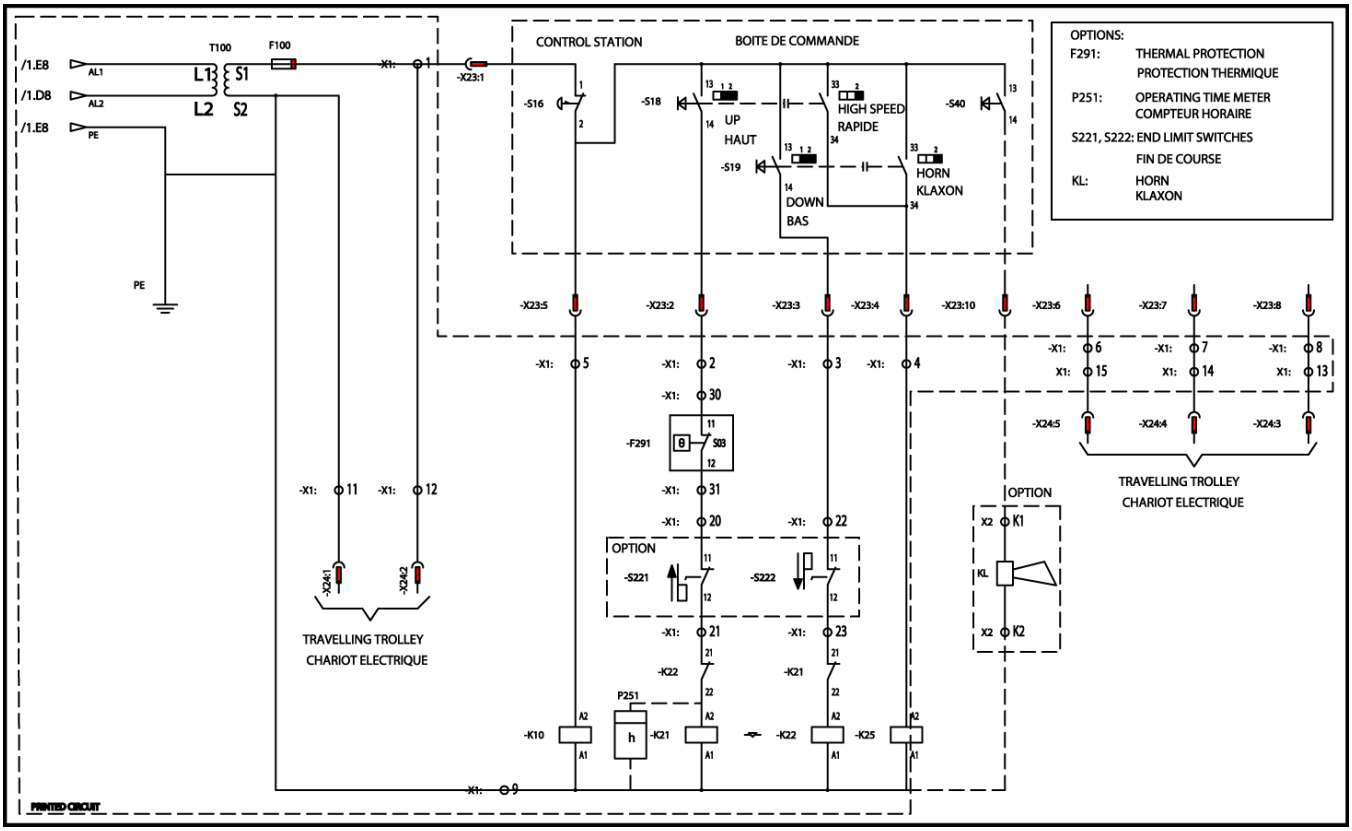


D	Supplied by customer
B	Electric trolley
E	Brake
F1-F2-F3	Fuse
M	Motor
Q1	Power switch
K10	Emergency stop contactor
K21	Lifting contactor
K22	Lowering contactor
K25	Reversal contactor
T100	Control transformer
X0	Supply terminal board
X22	Supply connection plug (OPTION)
X24	Trolley connection plug

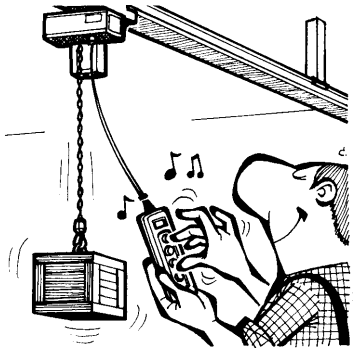
CAUTION !

The supply cable must be equiped with a power switch or an isolator in conformity with the regulation.
The supply cable and the main isolator switch must be supplied by the customer

9-2.4 Control diagram (2 lifting speeds with emergency stop)



A	Control unit	X1	Hoist terminal
B	Electric trolley	X23	Control box plug
AU	Emergency stop	F291	Bimetal thermal cutoff
T100	Control transformer	S221	Top limit switch
F100	T 630 mA fuse	S222	Bottom limit switch
K10	Emergency stop control	P251	Hour counter (OPTION)*
K21	Lifting control		
K22	Lowering control	(*) The counter add only the times during lifting operation.	
K25	Inverter control		

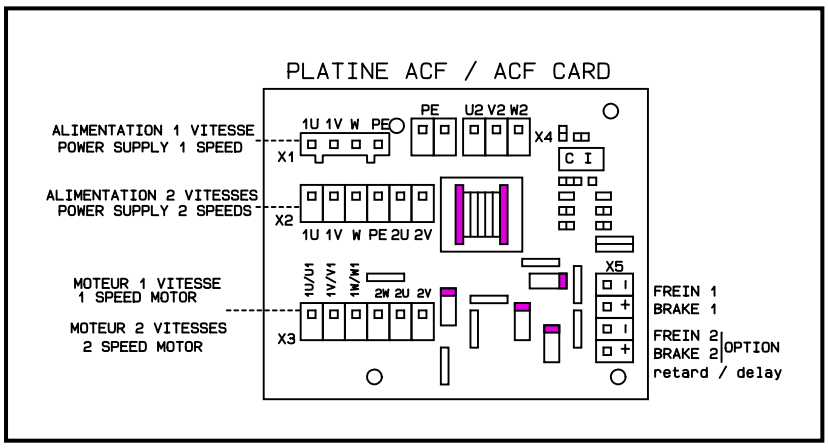


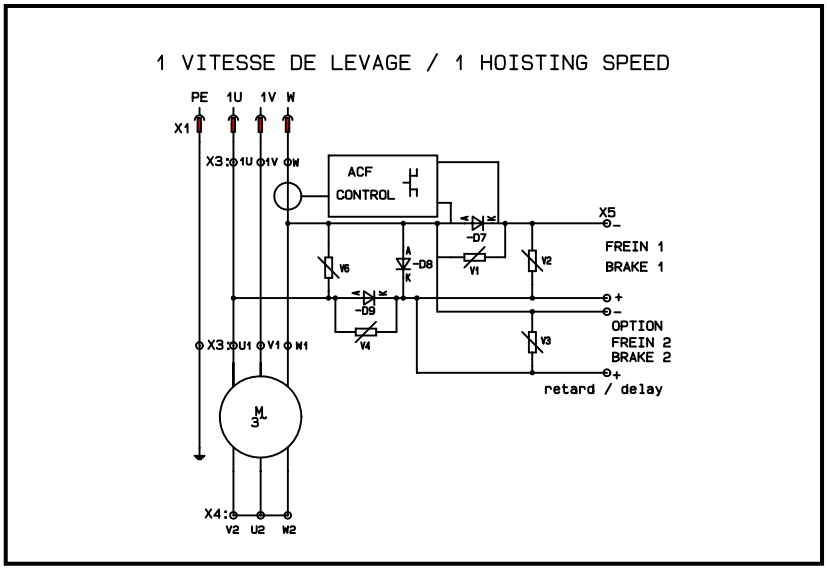
Do not use the controls needlessly (avoid inching - stop-start operation).

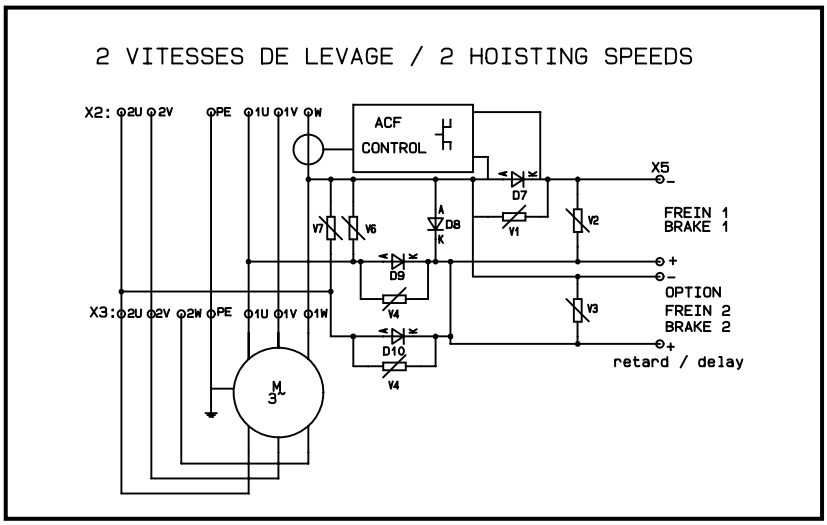
9-3 Direct control

ACF board

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



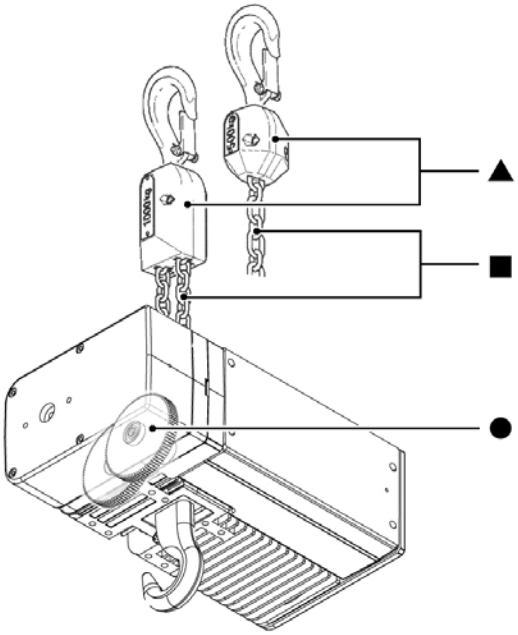




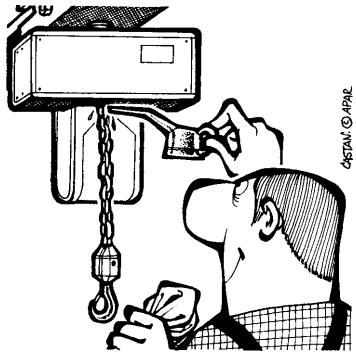
10 - Maintenance - replacement

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	Monthly	Operator
Limiter operation	Monthly	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	Annually	Qualified mechanic
Lubrication of the gears	Lubricated for life	



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.



Oil the chain regularly

10-2 Lubricants

Lubrication point	Specifications	Possible brands	Quantity
Chain ■	Oil or liquid grease	Chain lubricating fluid (Ceplattyn or similar)	As required
Idler sprocket ▲ slide bearing + bearing	Grease (**without MoS2**) KP 2 (DIN 51 502) Soap-based lithium Approx. drip point + 260°C Worked penetration 265 - 295° Operating temperature - 20°C à + 130°C	**Aral :** Aralub FK 2 **BP** : BP Energrease LS - EP 2 **Esso** : Unirex N2 **Mobil :** Mobilgrease HP **Shell :** Shell Alvanio EP Grease 2 **DEA :** Paragon EP 2 **Fuchs :** Renolit Duraplex EP 2	As required
Gears ●	KP 0 K grease (DIN 51502) Soap-based lithium + MoS 2 Approx. drip point + 180°C Worked penetration 355 - 385° Operating temperature - 30°C à + 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 grease EP 2 **Fuchs:** Renolit FLM0	0.05 liter

10-3 Spare parts replacement table

Further to a long storage time or during annual service, check the function and the setting of the safety devices (brake, end limit switch, clutch…).If any component is disformed, or if abnormal wear is noticed, the pieces must be changed.

CAUTION ! Disconnect the power supply before replacing any parts.

Spare part	To be replaced by	Qualification of the personnel
Upper chain guide	Authorized manufacturer personnel	Qualified electrician
Output shaft	Authorized manufacturer personnel	Qualified electrician
PG cable gland	Authorized manufacturer personnel	Qualified electrician
Gear input shaft + adjusting nuts	Authorized manufacturer personnel	Qualified mechanic
Motor endcap	Authorized manufacturer personnel	Qualified mechanic
Gearing (1st/2nd stage)	Authorized manufacturer personnel	Qualified electrician
Brake cap/endcap sealing	Customer	Qualified mechanic
Other sealings and O-rings	Authorized manufacturer personnel	Qualified mechanic
Brake-limiter	Authorized manufacturer personnel	Qualified electrician
Brake endcap	Customer	Qualified mechanic
Lower chain guide	Customer	Qualified mechanic
Rubber buffer	Customer	Qualified mechanic
Electric box	Authorized manufacturer personnel	Qualified electrician
PC-board	Authorized manufacturer personnel	Qualified electrician
Plugs	Customer	Qualified electrician
Chain	Customer	Qualified mechanic
Chain bucket	Customer	Qualified mechanic
Slack fall stop	Customer	Qualified mechanic
Suspension hook	Customer	Qualified mechanic
Hook block (1/1; 2/1)	Customer	Qualified mechanic
Control box	Customer	Qualified electrician

Once a part has been replaced, check the operation of the hoist (*refer to 5.2: Installation).*

10-4 Screw tightening torques (Nm)

	M5	M6	M8	M10	M12
Standard screws	6	10	24	48	83
Self-tapping screws	5	8	20	40	72

10-5 Discording 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.

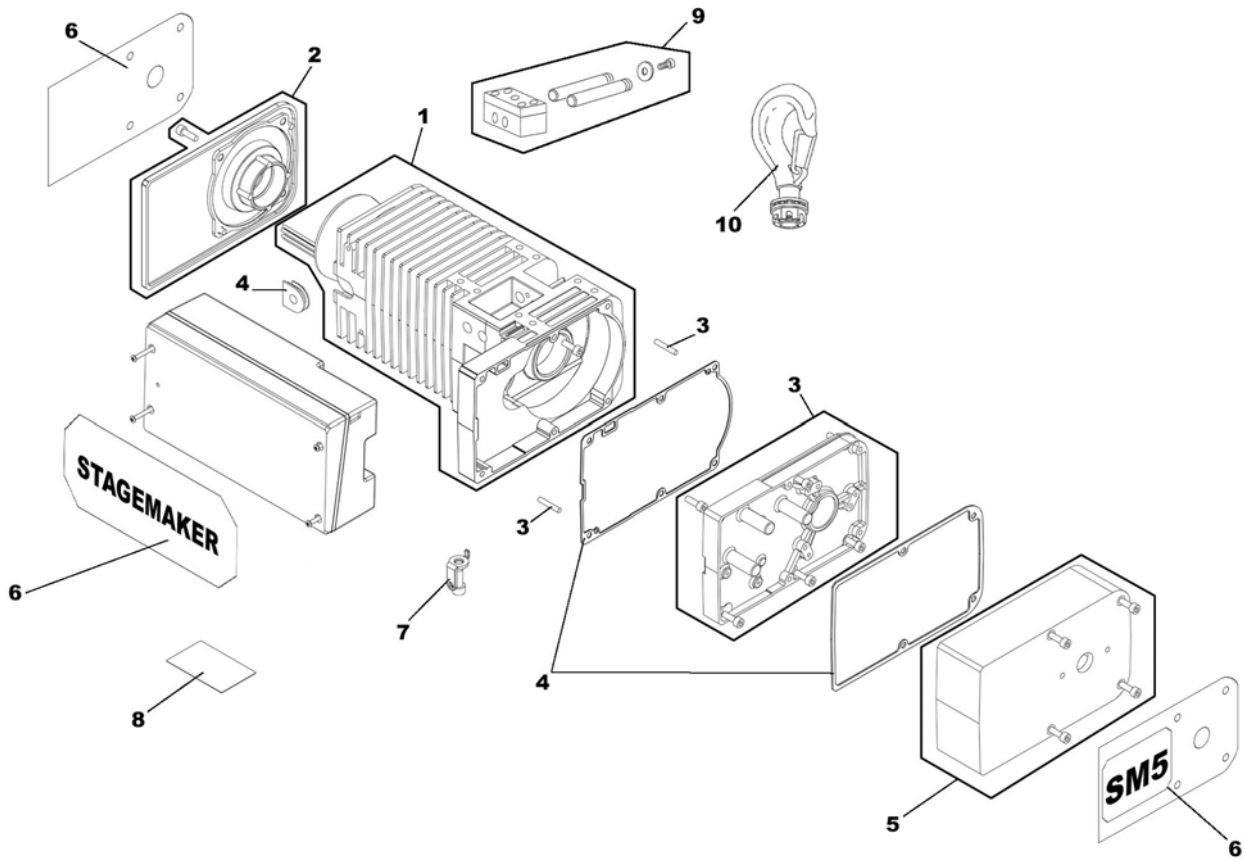
Remove all greases and oils from the hoist before discarding it

11 - Troubleshooting

Problem	Cause	Solution
The chain hoist does not work	• The emergency stop button is activated	• Deactivate it
	• Triggered fuse	• Replace the fuse
	• Temperature control *(optional)* activated	• Allow to cool down
	• Contactor terminal screws loose	• Tighten them
	• Main switch is off	• Turn it on
Impossible to lift the load	• Overload	• Reduce the load
	• Limiter worn or incorrectly adjusted	• 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	• Lubricate the components
	• Chain is worn	• Replace it
	• Sprocket or chain guide is worn	• Replace the sprocket or chain guide
	• Idler sprocket is worn	• Replace it
	• A supply phase is missing	• Check the connection of the 3 phases

12 – Illustrated catalogue

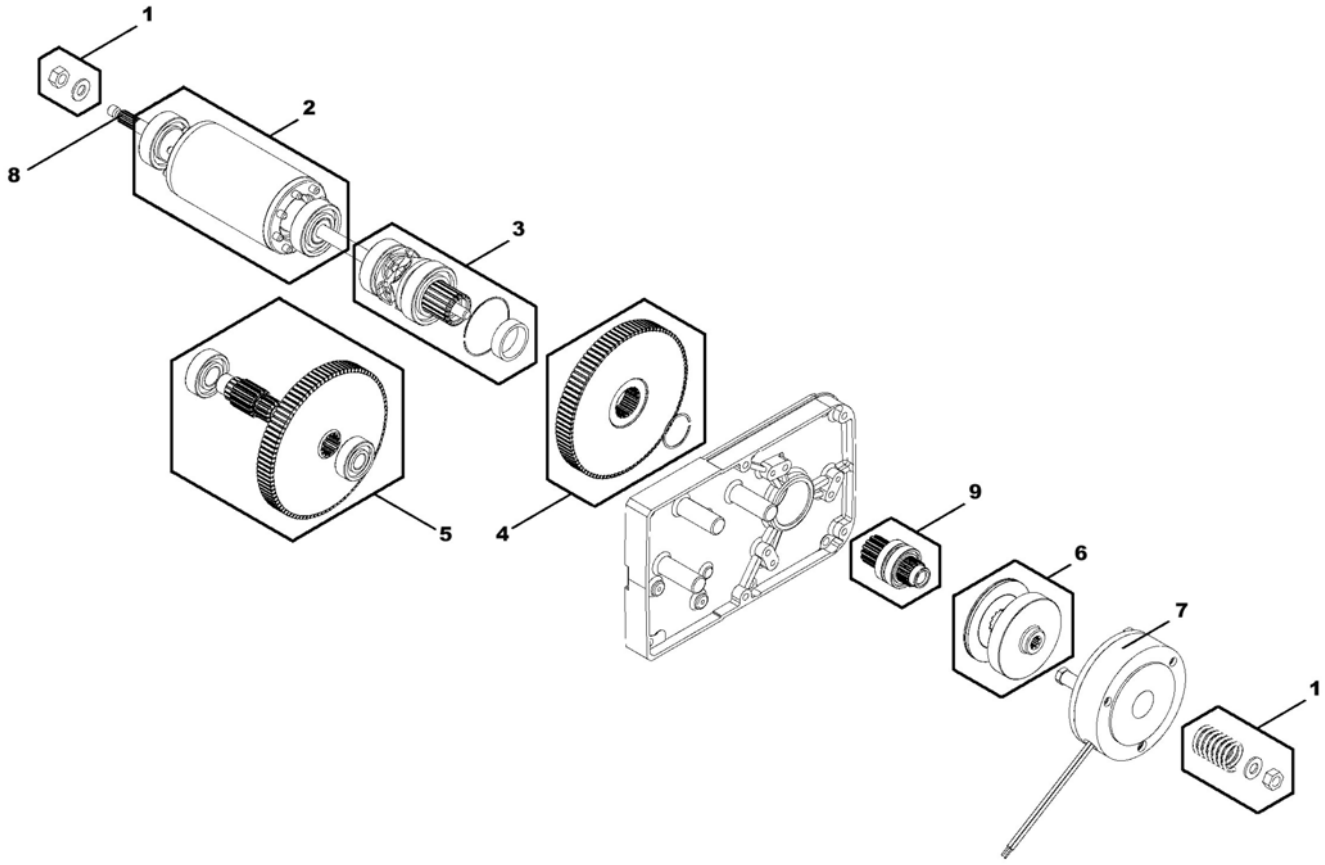
12-1 Casings



Pos	Qty	Code	Description
1	1	52308696	Casing assembled with stator 400V/50Hz3PH.2&8P
1	1	52308697	Casing assembled with stator 230V/50Hz3PH.2&8P
1	1	52308698	Casing assembled with stator 400V/60Hz3PH.2&8P
1	1	52308699	Casing assembled with stator 230V/60Hz3PH.2&8P
1	1	52308700	Casing assembled with stator 500V/50Hz3PH.2&8P
1	1	52308701	Casing assembled with stator 400V/50HzBIM.2&8P
1	1	52308702	Casing assembled with stator 230V/50HzBIM.2&8P
1	1	52308703	Casing assembled with stator 230V/60HzBIM.2&8P
1	1	52308704	Casing assembled with stator 500V/50HzBIM.2&8P
1	1	52308705	Casing assembled with stator 400V/50Hz3PH.4P
1	1	52308706	Casing assembled with stator 230V/50Hz3PH.4P
1	1	52308707	Casing assembled with stator 400V/50HzBIM.4P
1	1	52308708	Casing assembled with stator 500V/50HzBIM.4P
1	1	52308709	Casing assembled with stator 230V/460V60HzBIM.2P
1	1	52308710	Casing assembled with stator 230V/400V60HzBIM.4P
2	1	52308741	Motor flange assy
3	1	52308742	Gear cover set
4	1	52308768	Set of sealings
5	1	52308747	Brake cover set

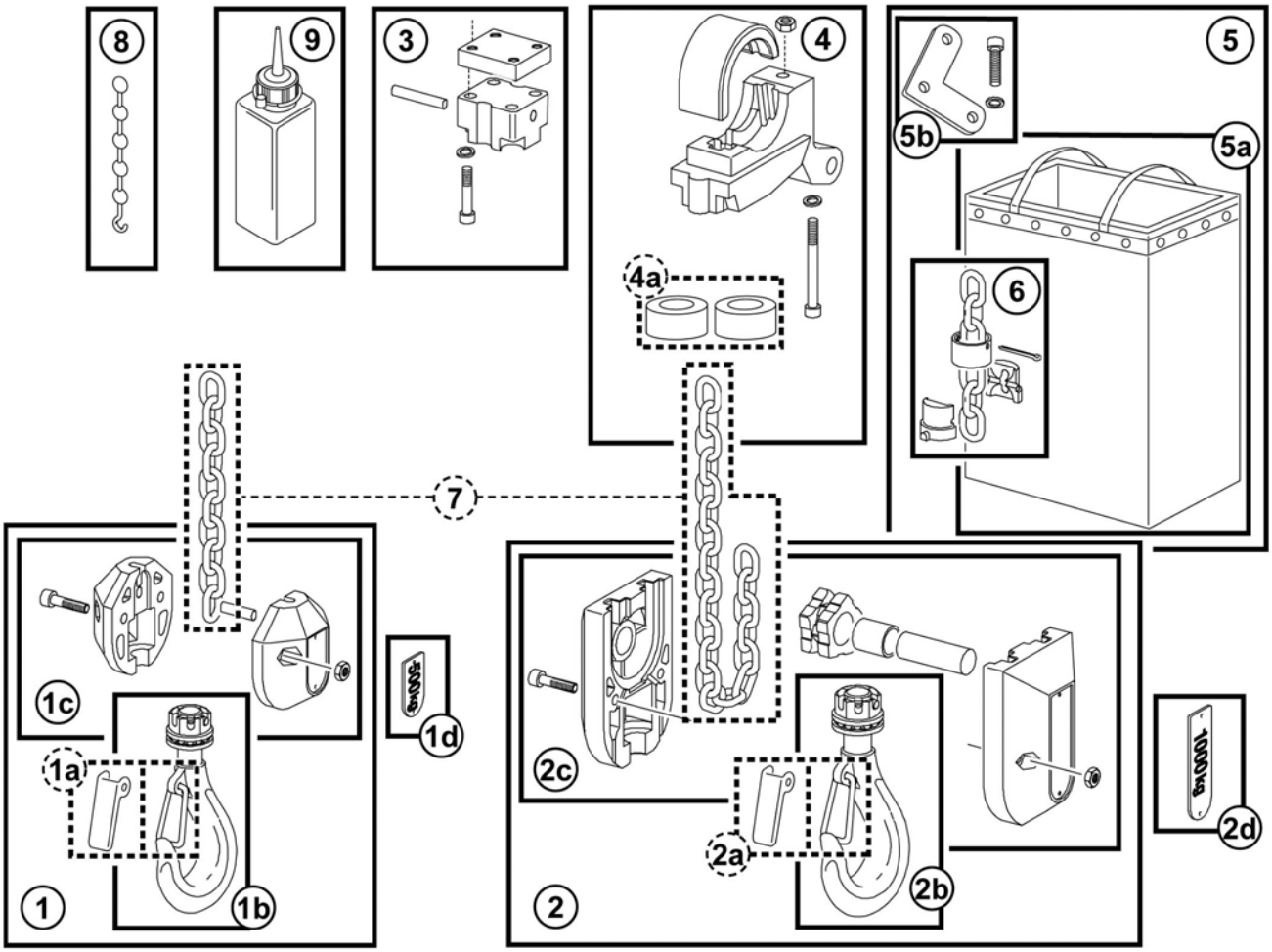
6	1	52311213	Stickers set for SM5
7	1	2218000	Push button station fixing point
8	1	2219918	Set of load plate 250 Kg (set of 10)
8	1	2219920	Set of load plate 500 Kg (set of 10)
8	1	2219922	Set of load plate 1000 Kg (set of 10)
9	1	52311221	Rotating hook base set
10	1	2217004	Rotating hook
-	1	52308744	Caps set
-	1	2212017	Safety catch – steel plate type

12-2 Mechanism / brake



Pos	Qty	Code	Description
1	1	2211016	Clutch spring set
2	1	52305652	Rotor Assembly
3	1	52305659	Chain sprocket assembly
4	1	52305473	Gear wheel set
5	1	52308771	Gear assembly
6	1	52308772	Clutch set
7	1	52305489	Brake 190V/400V
7	1	52305488	Brake 100V/230V
7	1	52305490	Brake 230V/500V-575V
8	1	52305461	Motor shaft
9	1	52305658	Pinion set

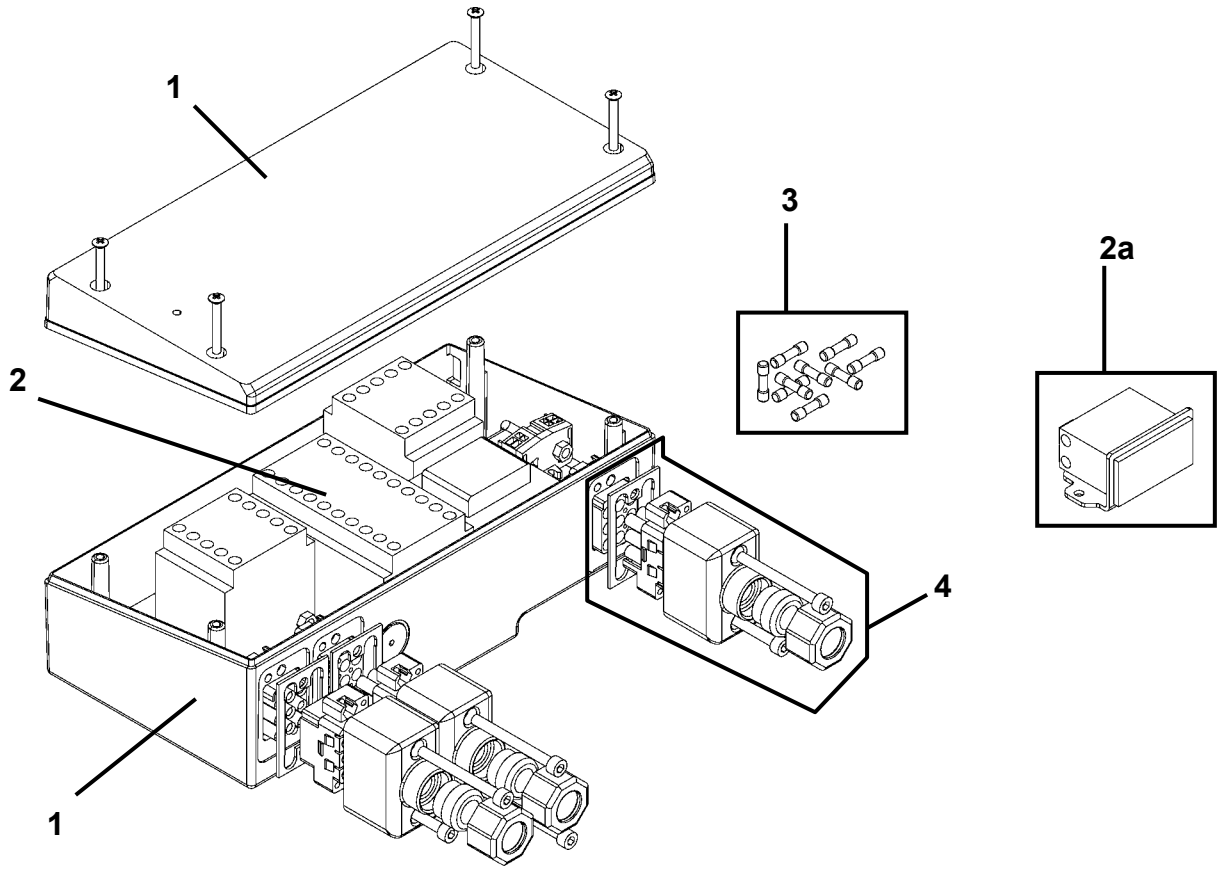
12-3 Lifting assembly



Pos	Qty	Code	Description
1	1	2219902	1-fall lifting hook block - Standard type
1	1	2212018	1 fall lifting hook block - Self-locking type
1a	1	001512	Safety latch - Steel wire type - 1 fall
1a	1	2212016	Safety latch - Steel plate type - 1 fall
1b	1	2212011	1-fall lifting hook - Standard type
1b	1	2217015	1-fall lifting hook - Self-locking type
1c	1	2219985	Set of 2 half-casings with axle and screws
1d	1	2219907	Load plates - 1 fall type - 250Kg (set of 10)
1d	1	2219909	oad plates - 1 fall type - 500Kg (set of 10)
2	1	2212020	2-fall lifting hook - Standard type -
2	1	2212028	2-fall lifting hook - Self-locking type -
2a	1	001515	Safety latch - Steel wire type - 2 falls
2a	1	2212017	Safety latch - Steel plate type - 2 falls
2b	1	2217004	2-fall lifting hook block - Standard type
2b	1	2247015	2-fall lifting hook block - Self-locking type
2c	1	2219987	Set of 2 half-casings, axle, return sprocket, and screws

2d	1	2219911	Load plates - 2 falls type - 500Kg (set of 10)
2d	1	2219913	Load plates - 2 falls type - 1000Kg (set of 10)
3	1	52309350	Chain anchor assembly
4	1	52309351	Upper and lower chain guide assembly with rubber buffer
4a	2/3	52305498	Rubber buffer
5	2	52311223	Chain bag assembly
5a	2	2257500	Chain bag
5b	2	52306044	Fixing plate + screws + washers
6	1	2211050	Slack fall stop assembly
7	-	2213500	Load chain - Galvanized type
7	-	2213501	Load chain - Black type
8	1	2211045	Load chain mounting tool
9	1	9995008	Oil can

12-4 Electrical box



Pos	Qty	Code	Description
1	1	52308791	Electrical box set
1a	1	52305502	Metal electrical box
2	1	2213004	PC board 400V50&60Hz48vac
2	1	2213003	PC board 230V50&60Hz48vac
2	1	2213013	PC board 460V60Hz48vac
2	1	2213011	PC board 500V50&60Hz48vac
2	1	2213012	PC board 575V60Hz48vac
2	1	2213025	PC board 400V50&60Hz115vac
2	1	2213014	PC board 460V60Hz115vac
2	1	2213015	PC board 230V60Hz115vac
2	1	2213017	PC board 230V/460V60Hz115vac standard
2	1	2213018	PC board 230V/460V60Hz115vac reconnectable
2	1	833098	Rectifier 230V/400V direct voltage
2	1	833096	Rectifier 500V direct voltage
2a	1	52305692	Hour counter 48V50Hz
2a	1	52305693	Hour counter 48V60Hz
2a	1	52305694	Hour counter 115vac60Hz
2b	1	834176	ACF card
3	1	2219988	Set of 10 fuses
4	1	2249945	Push button station plug set
4	1	2249946	Trolley plug set
4	1	2249982	Power supply plug set