

SELL

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10991439 EN



ORIGINAL INSTRUCTIONS

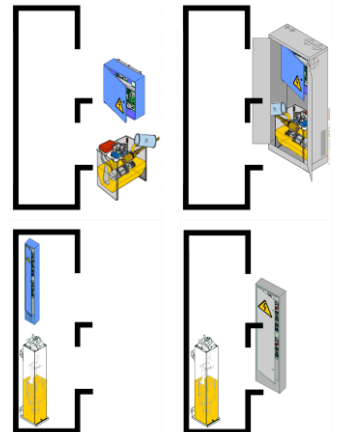
INSTALLATION, USE AND MAINTENANCE MANUAL

TANKS-POWER UNITS

FOR POWER UNITS:

- HL, GL, F1, T2, T3, T4
- 2T2, 2T3, 2T4

- HL-COMPACT, HLV, HLV40
MRLT, MRLH



SYSTEM N°

INSTALLER








GMV SPA
FLUID DYNAMIC EQUIPMENT AND
LIFT COMPONENTS

csq UNI EN ISO 9001
Certified Company

0.01
ENG

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POWER UNIT MAIN DATA

P K

GMV PK N°

SYSTEM REF.

S/N TANK

S/N VALVE

TANK TYPE

EXTERNAL SHAFT HL GL F1 T2 T3 T4


DOUBLE 2T2 2T3 2T4

INTERNALSHAFT HLV HLV40 HL-COMPACT MRLT MRLH

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For all the data not included in this manual refer to the documents of any single part.

 To guarantee the products security, do not use spare parts not genuine or not approved by GMV Spa. GMV Spa will not assume any responsibility if the instructions included in this manual are not observed.

Support and Informations:



FLUID DYNAMICS EQUIPMENTS AND
COMPONENTS FOR LIFTS

CERTIFIED COMPANY
UNI EN ISO 9001



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0 INTRODUCTION

0.1 DEFINITIONS

The definitions are used in this manual as indicated in the following standards and regulations

EN81-20 e EN81-50	Safety regulations for the construction and installation of lifts
UNI EN ISO 14798	Lifts (elevators), escalators and mobile walkways - Risks assessment and reduction methodology
UNI EN ISO 7010	Graphic symbols: Safety signs and colours
EN12016 e EN12015	Electromagnetic compatibility
CEI EN 61439-1	Low voltage switchgear and control gear assemblies (LV control panels)

0.2 MAIN STANDARDS OF REFERENCE

For anything that is not expressly given in this manual, reference should be made to the local standards and regulations in force, observing in particular:

Direttiva 2006/42/CE	Machine Directive – in relation to machines, and amending Directive 95/16/CE (recast)
Direttiva 2014/33/UE	Lifts Directive - on the harmonization of the laws of the Member States relating to lifts and safety components for lifts
Direttiva 2006/95/CE	Low Voltage Directive – approximation of laws in member States regarding electrical materials used within certain voltage limits
Direttiva 2004/108/CE	Electromagnetic Compatibility Directive (EMC) – approximation of laws in member States regarding electromagnetic compatibility, and repealing Directive 89/336/CEE
EN-81 complete series	Safety regulations for the construction and installation of lifts Refer to the complete series and, in particular to:
EN 81-20	Safety rules for the construction and installation of lifts – Lift for the transport of persons and goods - Part 20: Passengers and goods passenger lifts
EN 81-50	Safety rules for the construction and installation of lifts – Examinations and tests - Part 50: Design rules, calculations, examinations and tests of lift components
EN 81-41	Safety regulations for the construction and installation of lifts – Special lifts for the transport of persons and goods – Part 41: Vertical lifting platforms for use by persons with impaired mobility
EN 81-58	Safety regulations for the construction and installation of lifts – Examinations and tests – Part 58: Landing door fire resistance test
EN 81-70	Safety regulations for the construction and installation of lifts – Particular applications for lifts for the transport of persons and goods - Part 70: Accessibility to lifts for persons, including persons with disabilities
CEI EN 60439-1	Low voltage switchgear and control gear assemblies (LV control panels) Part 1: Type tested assemblies (AS) and partially type tested assemblies (ANS)
EN 12015	Electromagnetic compatibility – Product family standard for lifts, escalators and moving walkways – Emission
EN 12016	Electromagnetic compatibility – Product family standard for lifts, escalators and moving walkways – Immunity
UNI EN 13015	Lifts, escalators Maintenance - Maintenance instruction Rules.
UNI EN ISO 7010	Graphic symbols – Safety signs and colours – Registered safety signs
UNI EN ISO 13857	Machine safety – Safety distance to avoid access to dangerous areas with arms or legs
UNI EN ISO 14121-1	Machine safety – Risks assessment – Part 1: Principles
UNI EN ISO 12100	Safety of machinery - General principles for design - Risk assessment and risk reduction
UNI EN ISO 14798	Lifts (elevators), escalators and mobile walkways – Risks assessment and reduction methodology

0.3 TERMS AND SYMBOLS USED

SYMBOLS



NOTE

Indicates information which contents must be seriously taken in consideration.



ATTENTION

Indicates that the described operation is likely to cause, damages to the system or physical damages if performed without complying with the safety standards.



Installation and/or maintenance can be carried out



The system works or can work correctly



Installation and/or maintenance can not be carried out



The system has stopped or does not work correctly

0.4 INSTALLATION DOCUMENTS

The documents to use for installation are the following:

TANK MANUAL	10991439
DISTRIBUTOR VALVE MANUAL	SEE PAR. 0.8

To ensure the correct and safe system maintenance according to the current applying rules, all the documentation must be carefully conserved by the installation manager.

Remember that this documentation is an integral part of the system and must be complete without any missing page to preserve the readability when it needs consulting.

0.5 MATERIALS STORAGE AND DISCHARGE

- Take care when perform discharge and loading materials operations.
- Verify, in the law terms and deadline, that the dispatched materials are complete and matches to those related to the orders.
- Check the state of the parts when received in the work site to detect damages during the shipping: in case of missing parts or damages, please inform GMV SpA.
- Store the electrical and electronic parts in a cool and dry place in their original packages at a temperature from 3°C to 40°C.
- If the system could not be installed for any reason, check periodically all the stored parts to prevent any damage due to an extended storage in unsuitable conditions.
- Check the entirety of the system documentation.
- Take care when placing the material provided, using adequate lifting means

0.6 MAIN COMPONENTS IN THE PACKAGING

- Power unit (tank-valve-cabinet).
- Accessories box.
 - Silencer/Shut-off valve, Rubber pads, Hand-pump lever (PAM).
- Other equipment required by customers (see order form).
- Auxiliary levelling device, if required – (see data sheet or separated manual).

0.7 POWER UNITS DESCRIPTION

GMV power unit is designed and built to drive hydraulic jacks intended to move different type of hydraulic lifts from the small residential lift to the great complex systems (the type of power unit depends on the use). It is composed as follows:

- | | | |
|--|---|--|
| <input type="checkbox"/> Fluid tank. | <input type="checkbox"/> Motor: 1,5 ÷ 58,8 kW | <input type="checkbox"/> Electric plant |
| <input type="checkbox"/> Distributor valve (NGV, NGV A3, 3010) | <input type="checkbox"/> Pump: 12 ÷ 600 l/min | <input type="checkbox"/> Silencer/Shut-off valve |
| | <input type="checkbox"/> Hand Pump | <input type="checkbox"/> Other accessories |



0.8 TECHNICAL CARATHERISTICS

0.8.1 SUBMERGED MOTORS

0.8.1.1 EXTERNAL SHAFT

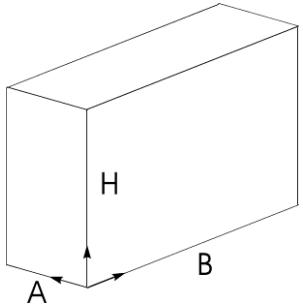
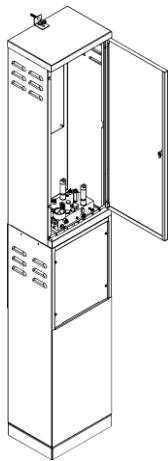
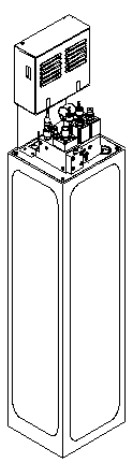
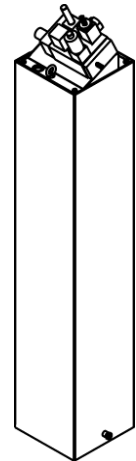
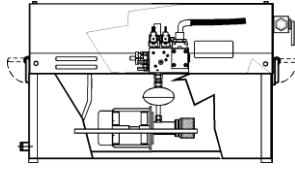
DISTRIBUTOR	MANUAL	U.M.	HL	GL	F1	T2	T3	T4
3010	10990801	-	x	x	x	x	x	x
NGV	10991446	-	x	-	-	-	-	-
NGV A3	10991483	-	-	x	x	x	x	x
Min Fluid Volume.		l	25	45	40	70	100	250
Working Fluid Volume		l	40	75	90	150	300	400
Max Fluid Volume		l	65	120	130	220	400	650
A depth		mm	290	335	470	560	685	750
B width		mm	560	750	830	910	1060	1310
H Height		mm	965	1120	1050	1230	1380	1580
Dry weight		Kg	50	90	100	180	270	360

0.8.1.2 TWIN POWER UNITS

DISTRIBUTOR	MANUAL	U.M.	2T2	2T3	2T4			
3010	10990801	-	x	x	x			
NGV A3	10991483	-	x	x	x			
Min Fluid Volume.		l	140	200	500			
Working Fluid Volume		l	300	600	800			
Max Fluid Volume		l	440	800	1300			
A depth		mm	735	860	925			
B width		mm	1760	2060	2560			
H Height		mm	1230	1380	1520			
Dry weight		Kg	360	540	720			

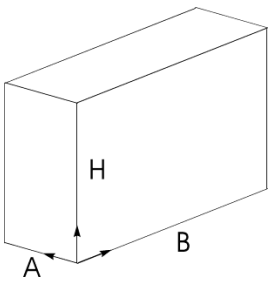
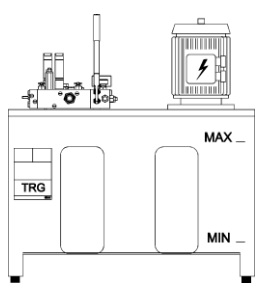
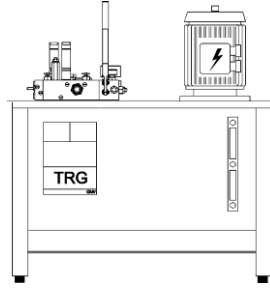
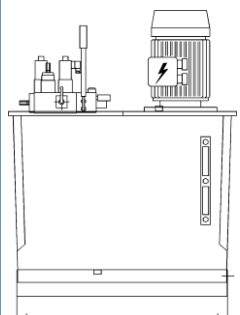
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0.8.1.3 INTERNAL SHAFT POWER UNITS

										
DISTRIBUTOR	MANUAL	U.M.	HL COMPACT	HLV	HLV40	MRLT	MRLH			
3010	10990801	-	X	X	X	X	X			
NGV	10991446	-	-	X	X	-	-			
NGV A3	10991483	-	-	-	-	X	X			
Min Fluid Volume.		l	8	20	25	50	65			
Working Fluid Volume		l	35	20	40	75	80			
Max Fluid Volume		l	43	40	65	125	145			
A depth		mm	260	232	232	300	755			
B width		mm	350	262	262	300	1200			
H Height		mm	2000	1310	1490	1850÷1950	350			
Dry weight		Kg	70	55	55	100	110			

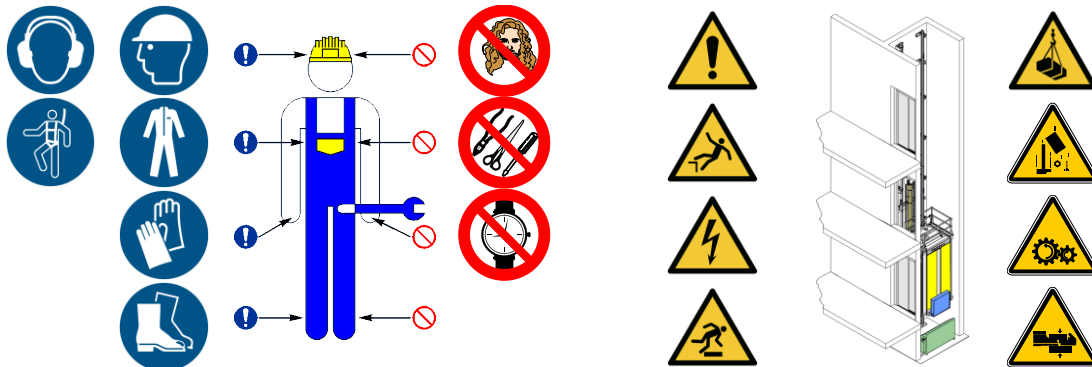
0.8.2 DRY MOTORS

0.8.2.1 EXTERNAL SHAFT POWER UNITS

								
DISTRIBUTOR	MANUAL	U.M.	HL DRY	HL50 DRY	GL DRY	NRGS	F1 DRY	
3010	10990801	-	X	X	X	X	X	
NGV	10991446	-	X	X	-	-	-	
NGV A3	10991483	-	-	-	X	-	X	
Min Fluid Volume.		l	15	15		25	25	
Working Fluid Volume		l	33	50		95	105	
Max Fluid Volume		l	48	65		120	130	
A depth		mm	325	290		440	600	
B width		mm	565	560		750	830	
H Height		mm	790	960		1260	1270	
Dry weight		Kg	45	55	90	90	100	

0.9 INSTALLATION OR MAINTENANCE SAFETY

During installation and maintenance, it should be observed the applicable national safety standards for the workplaces



ATTENTION

Before beginning any of the installation operations, ALWAYS check that all the mechanical and electrical safety devices are turned on and in perfect working order.

0.9.1 TOOLING

No special tools are required unless expressly provided by component manufacturers supplied by third parties. In this case, the related features and operating instructions are indicated in the manuals supplied with them.

1 INSTALLATION

1.1 START UP RECOMMENDATIONS

- Be sure anybody unauthorized enter the machine room and remember that the room must always be locked.
- Observe the other safety recommendations about the machine room of the country where the power unit is installed.
- The customer has to check if the electrical installation is regularly certified for the specific installation country, otherwise the customer should adequate and provide a regular certificate.
- The power unit, once operating, should have all the safety protections mounted on (electric connections cover, tank cover). Remember that, once connected the power unit, be sure to get connected all the safety devices (thermistors, fluid thermostat, etc.) according to the electrical connection scheme.
- Remember that the ideal room temperature should be between 5°C e 40°C (EN 81-20 par. 0.4.16)
- Remember that the power unit should be installed in a room complying the current rules.
- To move the power unit, use tanks handles and lifting means provided (see par.1.2).Ropes or chain to lift, must comply with the current safety regulation.
- Do not place any container of liquids on the power units or on the terminal box.
- Before powering-on the power unit, check all the fittings, especially the silencer/shut-off valve and the inlet pipe fitting.
- The working power unit noise is normally up to 70 dB, even if it may be more in particular working conditions. (personal protective means and clothing should be used for safety.

1.2 HANDLING AND START UP

WARNING

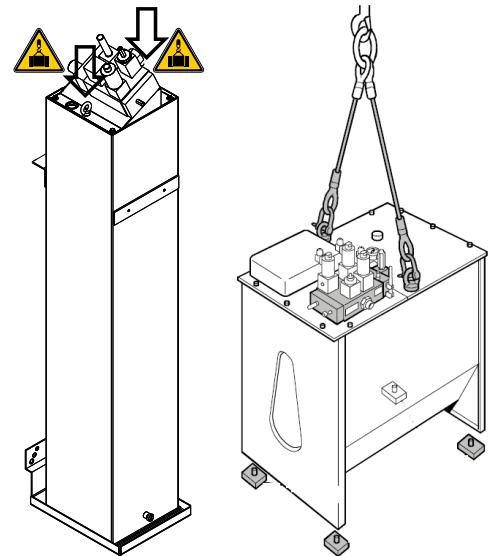


The placing of the power unit in the pit/machine room, is performed empty, without the working fluid. Take care to use personal protective means, clothing and safety belts. Do not hook the power unit at any pipe, valve, wires. Danger of damage.

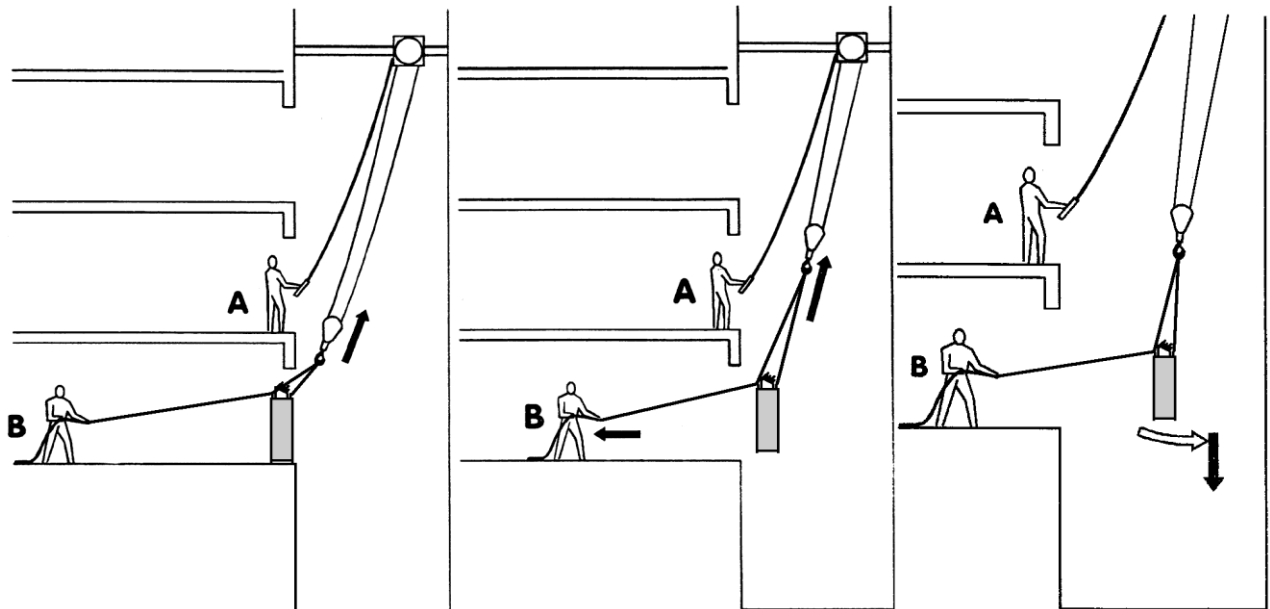


Place the lifting means in the position allowed by the room designer and be sure the ropes and the belts are suitable to support the power unit weight.

- A) Prepare two ropes or belts with an adequate capacity and length
- B) Open the packaging and check the integrity of the parts (damages).
- C) Sling the power unit hooking the two ropes at the side rings.
- D) Hook the end of the ropes to the lifting hanger.
- E) Ensure the control ropes to a power unit hanger
- F) The operators in charge of the following actions, must be at least two: an engineer (A) that manages the operations and is responsible for the activities performed and one or more assistants (B) (see the image below).
- G) The technician (A) activates the tackle until the lifting ropes are almost tensed, to avoid the power unit fall into the shaft.
- H) The operator (B) gathers one end of the rope without binding it or winding it around any part his body, so that he could let it go in case of danger.



- I) Slowly lift the power unit until the bottom rises from its support.
- J) The technician (A) gradually lifts the power unit from the shaft while the operator (B), at an adequate distance from the shaft, tenses the bottom of the power unit, and let it slide on the protection, so that it doesn't damage neither the power unit nor the floor, until reaching the sill of the shaft.
- K) Stop the technician (A) to avoid any power unit fall inside the shaft.
- L) Insert the power unit in the shaft avoiding swaying
- M) Make the power unit slowly lower to stop near the pit floor to assemble the four rubber pads (if provided).
- N) Drive the power unit in the correct side, taking the ropes a little tensioned.
- O) Finally place the power unit complying the building design.
- P) Remove the lifting ropes and move the lifting hanger far from the working zone.



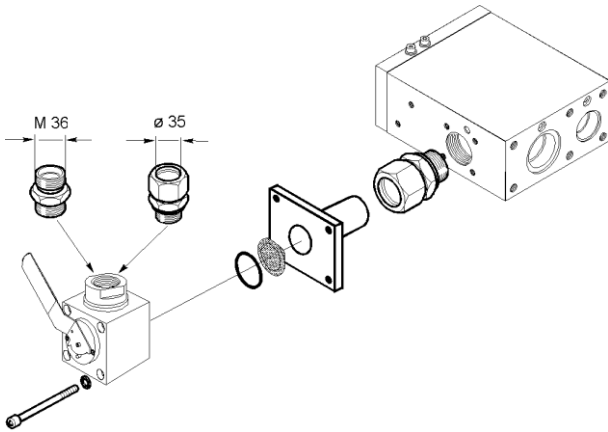
1.3 SHUT OFF VALVE AND SILENCER FITTING

WARNING
Danger of flying solid objects.

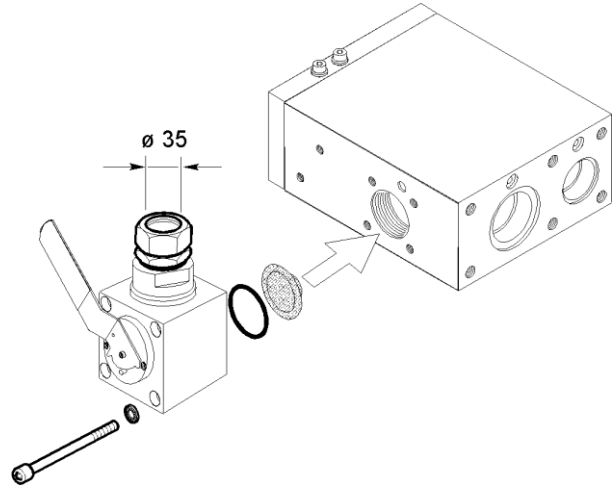
1.3.1 SHUT OFF VALVE INSTALLATION

The assembling must be carefully performed to avoid the dangerous self-detachment in case of bad fitting.

STANDARD INSTALLATION



CABINET INSTALLATION

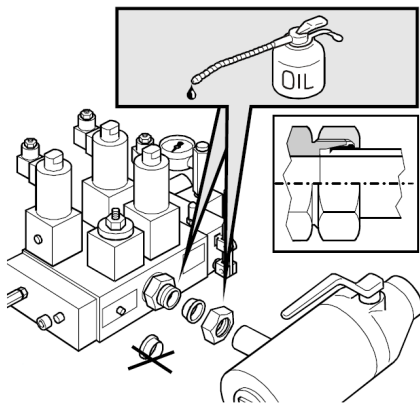


1.3.2 SILENCER INSTALLATION

For all the power unit with distributor, make as follows:

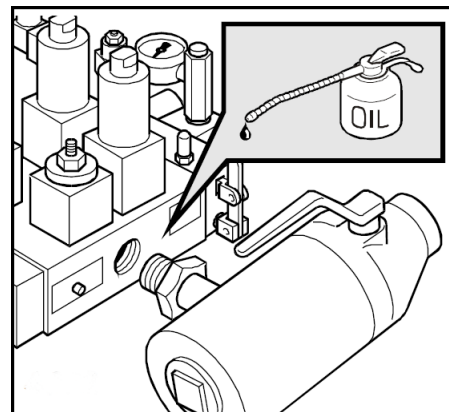
1"1/4 AND 1"1/2 FITTING SILENCER

Clean the joints and lubricate with a thin layer of fluid.
Check the compression ring has a good grip all around the pipe.
Mount the silencer on its own side and fit it as follows:
Turn the nut first. Once arrived to the end limit, just tighten another 1/4 of full turn.



2" FITTING SILENCER

Remove the protection cups.
Tighten the nut on the silencer to the end limit, checking if the seal is valve-side.
Clean the joints and lubricate with a thin layer of fluid.
Tighten the silencer on the valve.
Tighten the nut.



1.4 PIPES FITTING

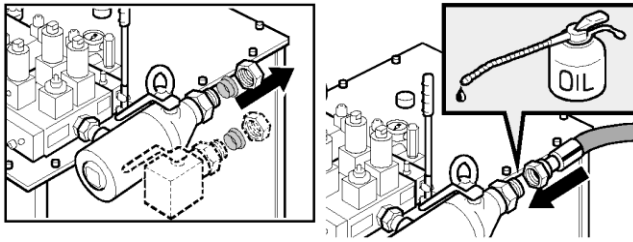
1.4.1 FLEXIBLE HOSE FITTING

- Remove the gear and the cutting ring from the terminal connection of the silencer.
- Ensure that the terminal connection is well fixed on the silencer
- Clean and fluid the threading and their seats
- Fix the flexible hose verifying it is thoroughly tightened.

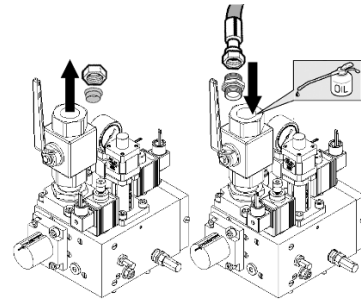
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1.4.1.1 EXTERNAL SHAFT FITTING

3010

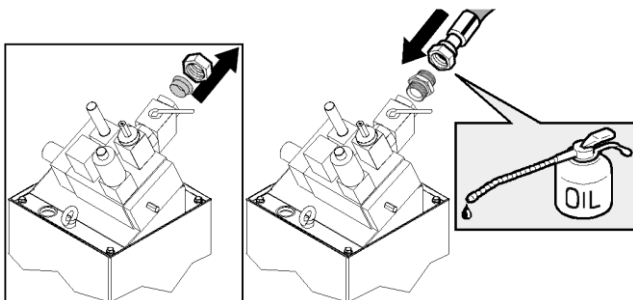


NGV

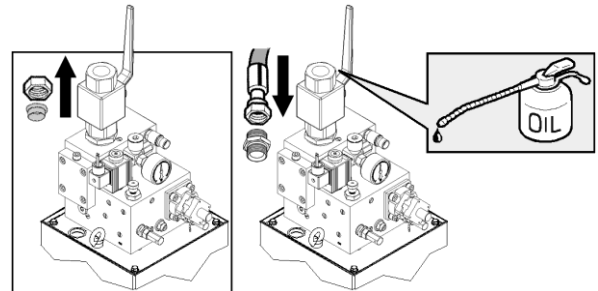


1.4.1.2 INTERNAL SHAFT FITTING

3010



NGV



WARNING

Ensure that there is no dirt inside the tube. These impurities could damage the sealing of the piston and of the valve block and inhibit the correct operation of the system.

1.4.2 RIGID PIPE FITTING

Cut at 90° the head of the tube with a saw (do not use a tube-cutter) paying attention to prevent any metal residuals from falling into the tube and smooth out the burrs internally and externally.

Remove the gear and the cutting ring of the terminal connection and insert it on the pipe.

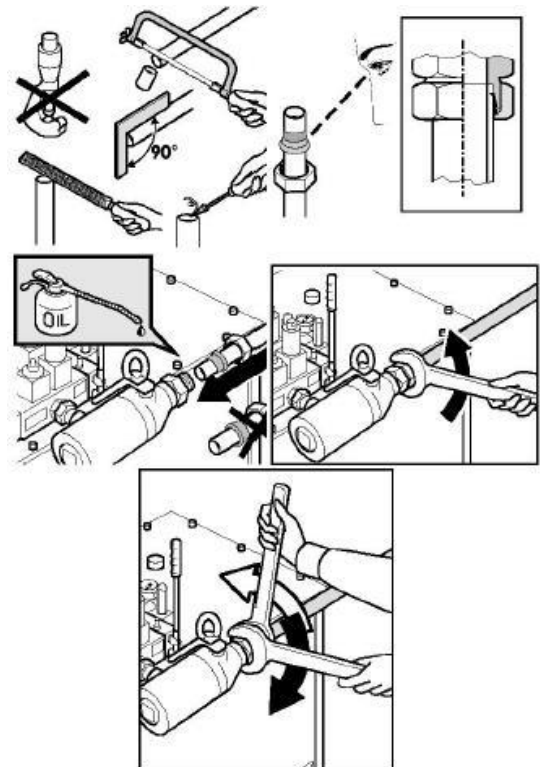
Ensure that the terminal connection is well fixed on the silencer. Clean and lubricate the threading and the connection seat with a slight fluid veil. Insert the pipe into the cone at 24° up to lay it on the stop limit of the cone itself. Screw thoroughly the gear by hand until it is felt that the cutting gear lays perfectly to the nut.

Then screw the nut using a wrench until the cutting edge of the ring is in contact with the tube and prevents it from rotating.

Keep the tube against its stop to avoid it rotates, screw the fixing nut by 3/4 rev. In doing so the ring engraves with the necessary depth the external part of the tube and rises a border in front of its cutting edge.

Loose the nut and check that the tube has all around a well risen border. The border must cover 70% of the front part of the cutting ring.

Fix the tube, close the nut with a wrench until a certain resistance is felt; from this moment on screw for a further 1/4 turn, contrasting wrench against wrench.



1.5 FIRST POWER UNIT FILLING

To correctly carry out the filling of the power unit, we suggest to use a fluid with the following features (in each case, write down the features of your fluid in the “**Used Fluid**”) fields:

PHISICAL FEATURES		U.M.	SUGGESTED FLUID		USED FLUID
Trade name		-	-	-	
Fluid Type		-	Ecological Synthetic base	Mineral	
Density 15°C	(ASTM D 4052)	Kg/dm ³	0,921	0,85 ÷ 0,925	
Viscosity at 40°C	(ASTM D 445)	cSt (mm ² /s)	9,5	41,4 ÷ 50,6	
Viscosity Index	(ASTM D 2270)	-	186	> 130	
Flash point V.A.	(ASTM D 92)	°C	305	> 190	
Pour point	(ASTM D 97)	°C	-36	-35	
Acidity	(ASTM D 664)	mgKOH/g	2,2	-	
FZG Test	(ISO 14635-1)	-	> 12	-	
Biodegradability	(OECD 301 B)	%	> 70	-	
Air release	(D3427-15)	min	< 1	< 6	

NOTA

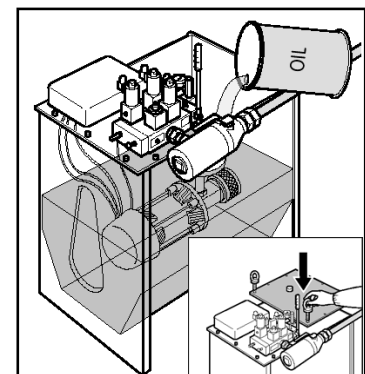
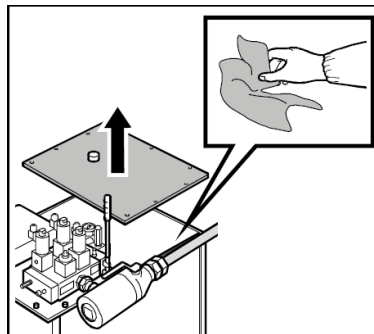


The useful circulating fluid is on the technical data of the system.
(see the project or the drawing, looking for the type of fluid to use).

To fullfilling the tank, just use new and clean fluid without any trace of water. Otherwise, the fluid should be turbid and matt.

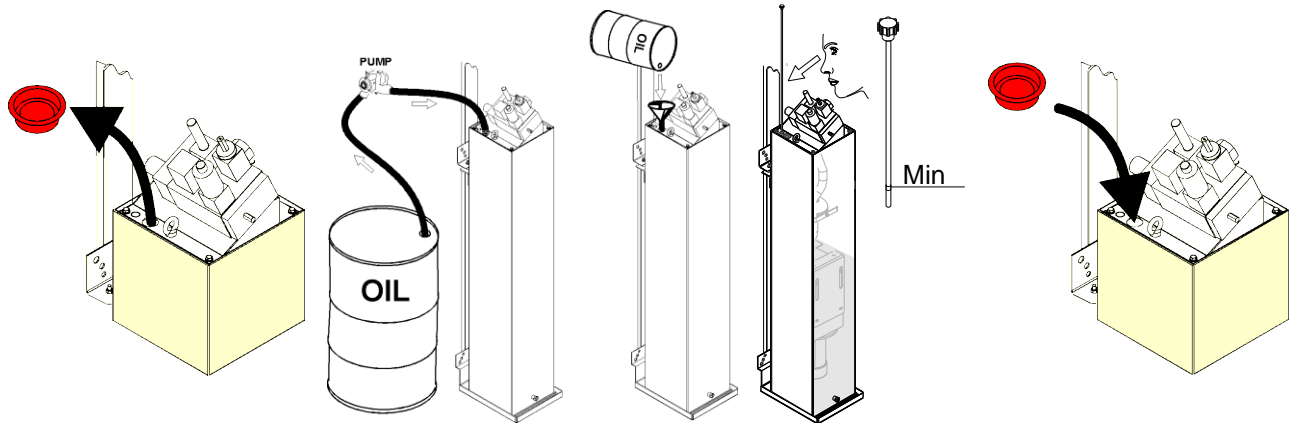
1.5.1 FILLING EXTERNAL SHAFT POWER UNIT

- Remove the cover or the load-hole cup.
- Carefully clean the tank especially from residual particulate or condensation without solvent or alcohol but only dry and clean tatters.
- Fill to cover the motor-pump or in case of dry motor, to completely cover the filter pump.
- Place and stop the tank cover to prevent any dirty from falling inside.



1.5.2 FILLING INTERNAL SHAFT POWER UNIT

Fill to get the **minimum level**: in case of submerged motors cover the motor-pump or in case of dry motor, completely cover the filter pump.
The first filling is done.



Before completing the filling, the power unit must be electrically connected

1.6 POWER UNIT LAST FILLING

Once electrically connected, continue to fill up the power unit..

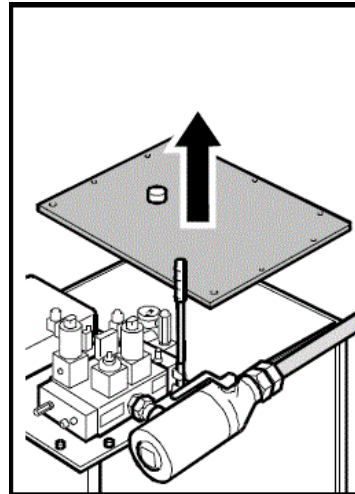
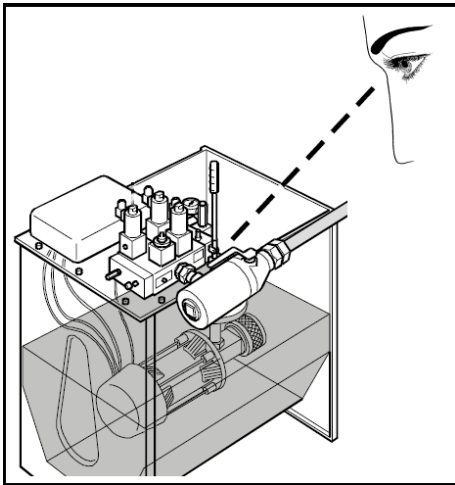


WARNING

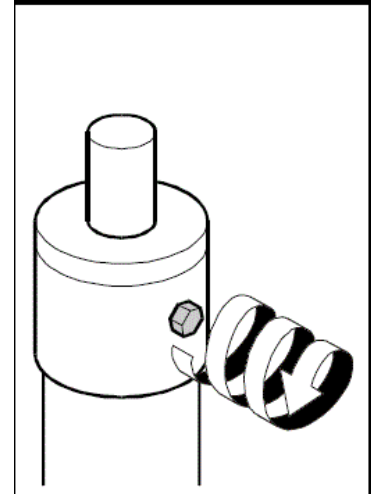
In the filling procedure make sure that the fluid will be **never below the minimum level**. Otherwise, power off the motor and add other fluid to completely cover the motor in order to avoid damage.

- A) Remove the power unit cover and unscrew (2÷3 turns) the air bleed screw on the head of the cylinder **without removing** it.
- B) Open the ball valve B.
- C) Continue to fill the tank up to a maximum of 5 cm below the edge.
- D) Run a travel in slow speed to be able to slowly fill up the cylinder and make sure that the fluid will be never below the minimum level.
- E) Run an up travel adding fluid if necessary.
- F) Tighten the air bleed screw when the fluid spills out.
- G) Repeat the procedure from C) to F) until the upper extra-travel.
- H) Run a down travel to complete close the piston: make sure the fluid doesn't exceed its maximum level of 5 cm below the edge.

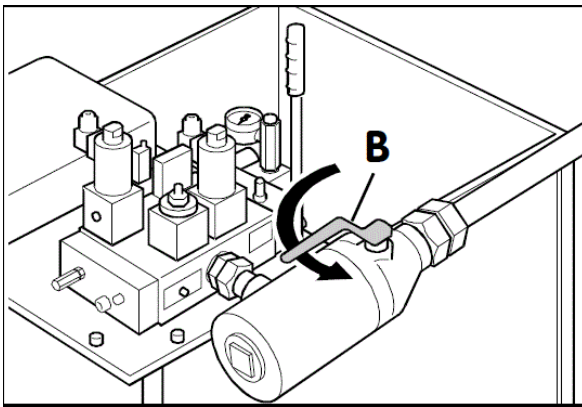
Minimum level



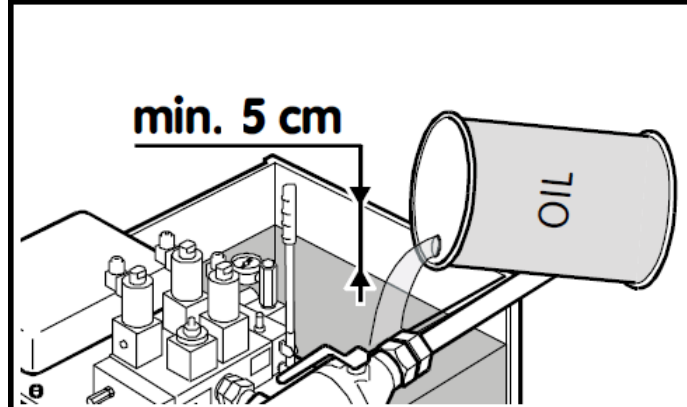
A)



B)



C)-D)



2 ELECTRICAL WIRING



WARNING

For a safe and correct installation, follow the instructions of this manual.

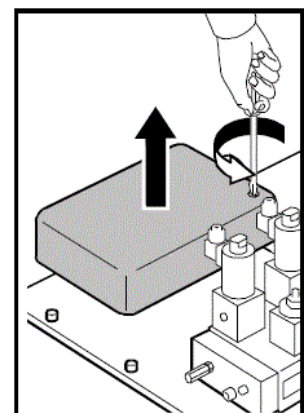
Wiring operations are very simplified: the cabling of the devices is made by the manufacturer and the output are connected to jacks. The electrical wiring should be performed by qualified technicians according to the wiring diagram.

Make sure the main switch is in 0-OFF mode and a lock out tag is placed on.

Open the connection box.

Make the wires pass through the grommets and carry out the electrical connections between the control panel and the terminal board according to its wiring internal scheme.

To start running the system as shown in the control panel manual, first connect the tower unit to the control panel and then the electrical power.



2.1 THREE PHASE MOTOR CONNECTION

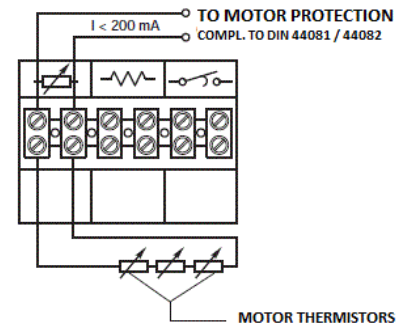
Motor thermistors connection to motor protection circuit.



WARNING !

Before to power-on the motor, pay attention that:

- The motors thermistors are correctly connected to the motor protection device.
- The motor ground wire is connected to the ground clamp
- The ground electrical wiring is regularly certified.

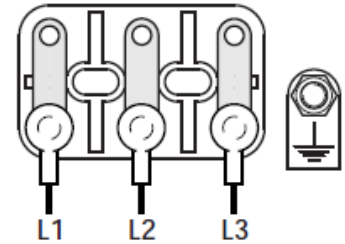


Direct start, delta connection

(line voltage 230-240-400-415 V~)

DELTA CONNECTED MOTORS:

- 230/400 (LINE 230 V)
- 240/415 (LINE 240 V)
- 400/415 (LINE 400 V)
- 415/720 (LINE 415 V)

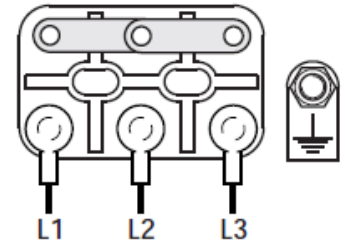


Direct start, star connection

(line voltage 400-415V~)

STAR CONNECTED MOTORS:

- 230/400 (LINE 400 V)
- 240/415 (LINE 415 V)



Star/Delta start

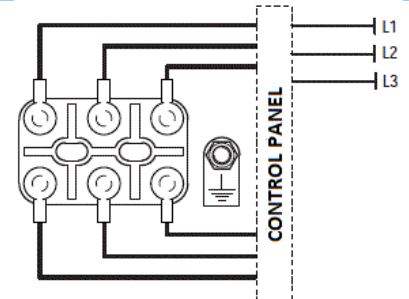
(line voltage 230-240-400-415 V~)



WARNING!

Star/Delta start available just for winding motors suitable with the following twin voltages:

- Line 230 V -> motor 230/400 V
- Line 240 V -> motor 240/415 V
- Line 230 V -> motor 400/690 V
- Line 230 V -> motor 415/720 V



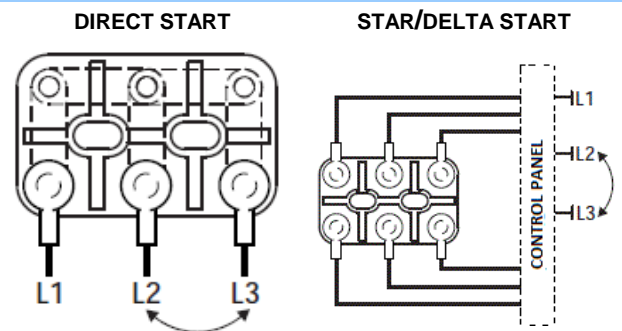
Phases exchange in case of reverse spin



Important:

the power units designed for the Star/Delta start are provided without the bridges. In case the power units are set-up for direct start, the bridges should be removed from the terminal board.

In case of reverse spin, (high noise coming from the pump), suddenly power-off and invert two phases of the motor as shown in the image.



The electrical connection is ended

2.2 SINGLE PHASE MOTOR CONNECTION

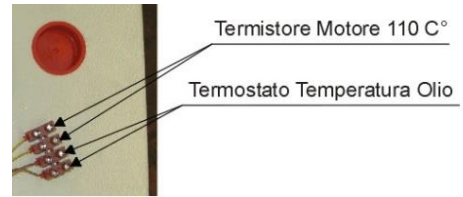
To connect the thermistors and the fluid thermostat, just follow what shown in the image below:

WARNING !

Before powering-on the motor, take care:



- The motor thermistors are correctly connected to the motor protection device and this last device works correctly.
- The ground wire is connected to the ground clamp.
- The ground electrical wiring is regularly certified.



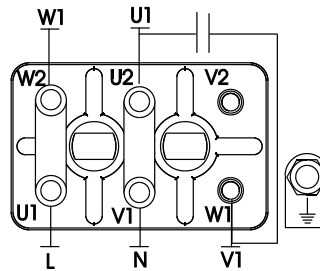
Phases exchange in case of reverse spin

Check if the wiring connections are correct:

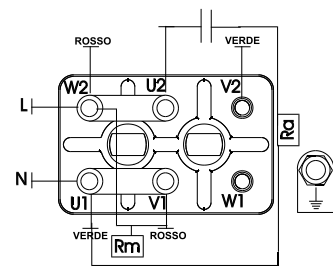


- Check the resistance between the two clamps of the motor thermistors
The value must be included between 180 and 850 Ohm (at the room temperature).
- Check the resistance between the two clamps of the fluid thermostat
The value must be "zero".

SUBMERGED MOTORS



DRY MOTOR EMG TYPO



The electrical connection is ended

3 MAINTENANCE

3.1 GENERAL INFORMATIONS

3.1.1 INFORMATIONS TO THE OWNER

It's necessary for the owner

- to keep the installation in a safe operating condition.
 - To obtain this the owner shall use a maintenance organization complying with the requirements of the Standard and with adequate and proper insurance cover.
- to take care of any regulations and other requirements, where relevant, and their implications on maintenance.
- for planned maintenance to carry out by a maintenance organization, when the installation is put into service for the first time or put back into service after a long wait.
- Put out of service
 - In case of danger.
- to inform the maintenance organization:
 - immediately about any abnormal operation of the installation
 - about any abnormal change in its direct environment
 - immediately after putting the installation out of service in the case of a dangerous situation
 - after any rescue
 - before any modification related to the installation and/or its environment or use
 - before any third party inspection or works other than maintenance works are carried out on the installation
 - before taking the installation out of service for a prolonged period of time
 - before putting the installation back into service after a prolonged period of non operating state



NOTE

The owner of the installation should obtain from the company carrying out the relevant modification the maintenance instructions for the maintenance organization.

- to ensure that the name and the telephone number of the maintenance organisation are always available to the user of the installation, permanently affixed and clearly visible.
- to ensure that the keys of machine and pulley room doors (trap doors) and of inspection and emergency doors (trap doors) are permanently available in the building and are used only by persons authorized to gain access

3.1.1.1 INFORMATIONS TO THE OWNER FOR RESCUE OPERATIONS

It is necessary for the owner that the persons authorized to rescue persons trapped:

- A) Are instructed by the maintenance organization or by a competent third party in accordance with the instructions provided.
- B) Receive an appropriate instruction for the specific system and updated with the instructions provided
- C) Know that they can evacuate passengers only through the landing doors
- D) Call the maintenance organization when they are unable to move the cabin with the emergency device
- E) Know the conditions for which only the maintenance organization has to perform rescue operations

3.1.2 INFORMATION FOR THE MAINTENANCE ORGANIZATION

It's necessary for the maintenance organization:

- A) to carry out the work of maintenance in conformity with the maintenance instructions and based on systematic maintenance checks
 - After these checks, the maintenance organization shall decide in conformity with the maintenance instructions what is required to be done
 - A list of typical examples of maintenance checks to maintain the installation is shown in annex A.
- B) to update the original maintenance instructions if the installation changes its intended use and/or the environmental conditions existing on the completion of the installation.



NOTE

The maintenance organization should be provided by the owner of the installation with the relevant maintenance instructions where modifications are carried out on the installation.

- C) to ensure that a risk assessment for any working area and for any maintenance operation has been carried out taking into account the installer's maintenance instructions and all information supplied by the owner of the installation.
- D) to inform the owner of the installation about any work to be carried out as a consequence of a risk assessment especially for the access and/or the environment related to the building/installation.
- E) to carry out a maintenance plan so that preventive maintenance is suitable for the installation and maintenance time is as short as reasonably practicable, without reducing the safety of persons, in order to minimize the non-operational time of the installation.
- F) to adapt the plan for maintenance so as to take account of any predictable failures, e.g. those due to misuse, mishandling, deterioration, etc..
- G) to carry out maintenance operations by competent maintenance persons and provided with the necessary tools and equipment.
- H) to maintain the competency of maintenance persons
- I) to carry out the maintenance periodically.
- J) To keep records of the result of each intervention due to a failure of the installation.
 - These records shall include the type of failures in order to detect any repetition. They shall be available to the owner of the installation on request.
- K) to put out of service the installation if the maintenance organization is aware of a dangerous situation, detected during the maintenance, which cannot be eliminated immediately, and to inform the owner of the installation of the need to keep it out of service until repaired.
- L) to be organized to provide the necessary spare parts for any repair.
- M) to ensure the attendance of a competent maintenance person, given reasonable notice, for any inspection carried out by an authorized third party or for building maintenance works to be carried out in the areas reserved for the maintenance organization.
- N) to inform in due time the owner of the installation about necessary progressive upgrading of the installation.
- O) to organize rescue operations, even with subcontractor, and to make provision for circumstances such as fire, panic, etc..



3.2 PROGRAMMED MAINTENANCE

For a correct and safe lift use, it is necessary to make a preventive programmed maintenance, following a fixed plan (EN 81-20 appendix C lett. C.1).

To define the periodical maintenance frequency, you should consider more events, particularly:


- Number of travel per year
- Travelling and stopping periods
- Age and condition of the lift
- Site and type of the building in which the lift travel
- Passengers and goods demand
- Inside and outside working condition (climate, vandalism, etc.).

















In the next table, parts are shared in groups and for each group is shown the type of check and its longest frequency recommended. Checks operative instructions are detailed in the maintenance schedules on chapter. Please, note that all checks are applicable only if the part is really installed.

3.3 PERIODICAL MAINTENANCE AND CHECKS TABLE

Legend:

 Visually check that the component features match the requested requirements

 Verify by testing / checking that the component performs the required function

OPERATION CHECKS		CONTROL TYPE	RECOMMENDED MAXIMAL FREQUENCY	
			MONTHS	YEARS
I. GENERAL	I.a All components: cleaning, deterioration and wear		6	
	I.b Signs, labels, signals and diagrams		12	
II. HYDRAULIC MACHINES	II.a Hydraulic fluid		12	
	II.b Tank unit		6	
	II.c Shut-off valve		6	
	II.d Pressure gauge shut-off		6	
	II.e Working pressures		12	
	II.f Valves on power unit		6	
	II.g Over pressure valve		6	
	II.h Manual lowering valve		3	
	II.i Filter			5
	II.j Hand pump		6	
	II.k Fitting and pipe		12	5
	II.l Rupture valve		12	5
	II.m Motor protection		6	5
	II.n Hydraulic system: total revision			5



3.4 MAINTENANCE SCHEDULES



WARNING

Change or restore all components damaged, wear or that don't work properly..
Tighten all the hardware observing all the torque values using a torque wrench.

I. GENERAL



I.a All components: cleaning, deterioration and wear

- Verify, for their correct working, that any component is sufficiently clean, free from corrosion and in good conditions. In case of dirty, clean with a duster, water and neutral soap
See the instructions for each part how to use cleaning products.



I.b Labels signs and diagrams

- Check, visually, that all labels, signs, diagrams, and documents are in the correct position, clearly visible and intact.
If necessary clean using a rag, water and neutral soap.

II. HYDRAULIC MACHINES

II.a Hydraulic fluid



- Check, visually, that no change are occurred in the fluid conditions.
Once a year, after leaving the system stopped for a few hours, it may be appropriate to drain a little fluid from the drain plug (J), placed on the bottom of the tank, checking that the fluid is clean or continuing until you see flowing clean fluid.
- Check with the rod (F) or indicator (L) that the fluid level with the car at the higher floor, is above the minimum:
 - For dry motors: the pump filter must always be covered by the fluid).
 - For submerged motors: the motor must always be covered by the fluid



II.b Tank

- Check, visually, that you have no fluid leakage from the tank.

II.c Shut-off valve



- Check the seal of the shut-off valve as follows:
 - Bring the lift at a floor
 - Close the shut-off valve (B) and open the pressure gauge shut-off (6)
 - Fully discharge the pressure to zero by pressing the push-button on the valve (VMD)
 - Check that the pressure level on the manometer (MAN) does not change
 - Close the pressure gauge shut-off (6) and open the shut-off valve (B)

II.d Pressure gauge shut off



- Check the seal of the EN81 pressure gauge shut-off as follows:
 - Bring the lift at a floor
 - Close the shut-off valve (B) and open the pressure gauge shut-off (6)
 - Fully discharge the pressure to zero by pressing the push-button on the valve (VMD)
 - Close the pressure gauge shut-off (6) and open the shut-off valve (B)
 - Check that the pressure level on the manometer (MAN) remains to zero.

II.e Working pressures



- Check that static and dynamic pressure values correspond to those declared in the test report placed in the side pocket:
 - Bring the lift at the last floor with the car at the nominal load
 - Open the pressure gauge shut-off (6)
 - Check the maximum static pressure value with the lift in stand-by
 - Bring the lift at the lowest floor
 - Run an upward travel with the car at the nominal load
 - Check the dynamic pressure value while running.
 - After the measurements close the shut-off valve (B)
 - Fully discharge the pressure to zero by pressing the push-button on the valve (VMD)
 - Close the pressure gauge shut-off (6) and open the shut-off valve (B)

II.f Valves on power unit

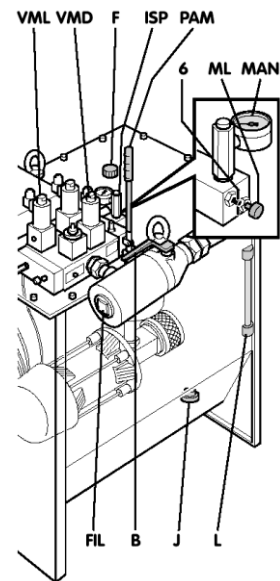


- Check the seal of the valve seals as follows:
 - Bring the lift at a floor
 - With the fluid at room temperature, close the shut-off valve (B)
 - Open the pressure gauge shut-off (6)
 - Check that the pressure on the pressure gauge (MAN) does not drop more than 4 bar in 5 minutes
 - Fully discharge the pressure to zero by pressing the push-button on the valve (VMD)
 - Close the pressure gauge shut-off (6) and open the shut-off valve (B)



This optional test assures you about the integrity of parts under pressure, including those which cannot be visually checked.

- Check the integrity of the components of the valves of the power unit
 - Close the shut-off valve (B).
 - Open the pressure gauge shut-off (6)
 - Operate the hand pump until the required pressure is reached, checking it on the pressure gauge.
 - At the end of the test, discharge the pressure to zero by pressing the push-button on VMD
 - Close the pressure gauge shut-off (6)



II.g Over Pressure valve



- Check, using the pressure gauge of the power unit, the correct overpressure valve calibration:
 - Open the pressure gauge shut-off (6) and run an upward travel
 - During the upward slowly close the shut-off valve (B)
 - Check that the valve limits the pressure to the value complying to the current rules(140% of static pressure)
 - If the operating pressure is incorrect, adjust the over pressure valve according to the instructions of the manual of the installed valve.



II.h Manual lowering valve

- Check that by pressing or by electrically activating the Manual lowering valve(s) the car moves downwards from an up floor



II.i Filters (Valve starting from 250 l/min)

- Verify, if mounted inside the silencer, the status of main filter (FIL) and if is necessary clean it.



II.j Hand pump

- Check that with the shut-off valve (B) closed, by using the hand pump, the overpressure valve (VS) can be activated



II.k Fittings and hose/pipe

- Verify that there is no fluid leakage from the pipe/hose fittings.
- Verify that the hose is not damaged or worn.



II.l Motor protections

- Check the efficiency of the motor protections:
 - Disconnect one of the terminals in the thermistor series and check that the motor protection device intervenes by stopping the motor.

II.m Total Revision

- ❑ Perform, every 5 years, a complete revision of the hydraulic equipment installed in order to restore and make efficient all the factors that over time may have altered.
The review should include the following:
 - Disassembling of the valves
 - Fluid filtration and tank cleaning (filtration degree > 40 microns)
 - Check and replace all the valves seals
 - Check, clean and replace the filters on the system
 - Assembling and at the end of the revision, perform a complete review of components and their start-up controls.

3.5 CLEANING, REFILLING AND REPLACING

3.5.1 MAINTENANCE RECOMMENDATIONS

- Before any maintenance and cleaning operations, bring the system to the “**zero energy state**” (see the image at side)
- If any of the electrical parts should be serviced, the electrical power must be unpowered bringing the main switch to 0-OFF.
- Before performing any fluid re-filling or replacement, wait the system temperature drops to that of the room. Never sit down or lean on the tank.
- Once performed a fluid full-filling or in case of a re-fill, be sure no fluid loss occurs on the floor. In case, clean carefully the dirty.



Do not tamper with, deteriorate or cover the warning signs. In case of damage or unreadability, ask for replacement immediately.



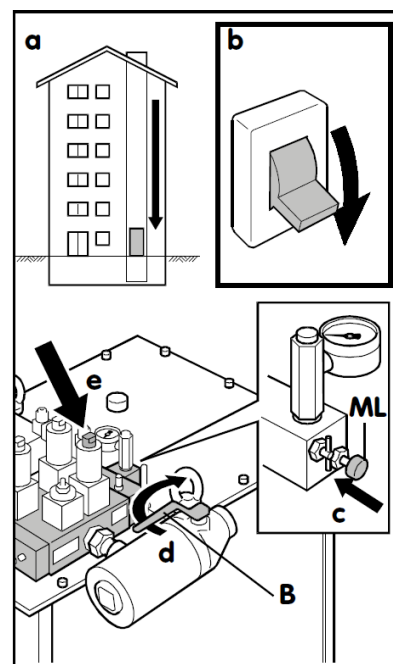
Do not put your hand on the silencer, on the distributor and the tank. Danger of burning. These parts could heat up to 70°C.



- In case of replacing, ask for original spare parts.



Danger of flying solid object



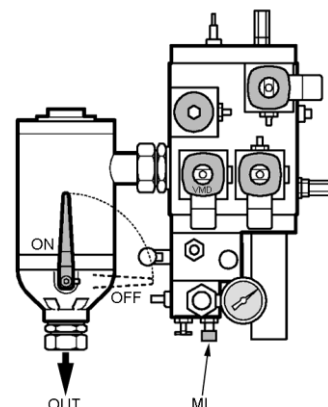
3.5.2 ZERO ENERGY STATE



NOTE

Before any maintenance and cleaning operations, bring the system to the “**zero energy state**”:

- Bring the car down to the last floor
- Remove electric power bringing the main switch to 0-OFF.
- Press the red button “**LOWERING HAND PUSH BUTTON**” (ML) to bring the car at the lower extra travel level (full compressed car suspensions).
- Close (to off) the shut-off valve (B) and remove its lever for safety.
- Completely discharge the residual pressure, operating by VMD solenoid valve.(see also “e” in the above image)
- Observe the other safety recommendations about the machine room of the country where the power unit is installed.



3.5.3 CLEANING OPERATIONS

To clean steel or plate surfaces:

- Do not use carbon steel abrasive and chlorinated components. If needs to abrade, just use properly certified liquid cleaners.
- Plastic laminates surfaces or plastic treated laminate sheet:
Do not use abrasive cleaners for regular clean (abrasive compound, wool).
Do not use cleaners based on acid or acid salt :softeners based on formic acid, exhaust cleaners, hydrochloric acid, silver cleaner, oven cleaners.

3.5.4 RE-FILLING

**WARNING**

The fluid refilling must be performed only by experts technicians.

A re-filling must be done regularly

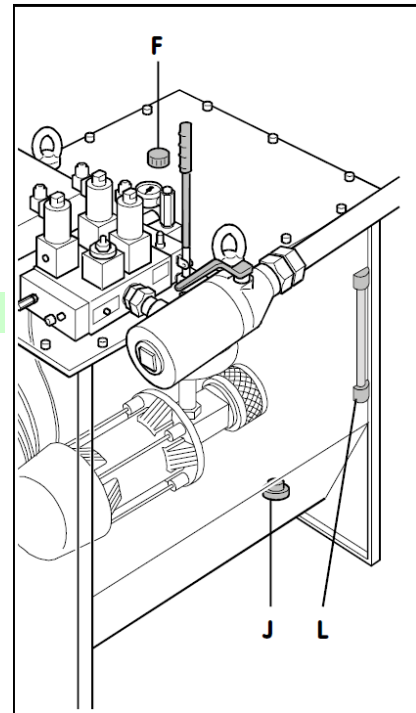
(see par.1.6)

- Bring the system to “zero energy state” (see 2.3.1)
- Provide the same fluid as the one of the fluid label (in the machine room).
- Observe, via the external fluid indicator L or by the dipstick F, the missing fluid.
- Throw the dipstick hole, perform the re-filling as you need.
- Close the dipstick hole with its cup.

3.5.5 FLUID REPLACING

In case of total fluid replacing remember that the exhaust cup (J) is under the bottom of the tank and refer to chap.1.6 and followings.

- Bring the system to “zero energy state” (see 2.3.1)
- Provide the same fluid as the one of the fluid label (in the machine room).
- Observe, via the external fluid indicator L or by the dipstick F, the missing fluid.
- Throw the dipstick hole, perform the re-filling as you need.
- Close the dipstick hole with its cup.



4 FINAL OPERATIONS



4.1 RECOMMENDATIONS

- Check anybody unauthorized enter the machine room and remember that the room must always be locked.
- The power unit, once operating, should have all the safety protections mounted on (electric connections cover, tank cover). Remember that, once connected the power unit, be sure to get connected all the safety devices (thermistors, fluid thermostat, etc..) according to the electrical connection scheme.
- Once performed the fluid full-filling or in case of refill, be sure no fluid loss occurs on the floor. In case, clean carefully the dirty.

**WARNING**

Never touch the silencer, the distributor and the tank with your hands. These parts could heat up to 70°C. Danger of burn.



Do not sit on the power unit.

Do not place liquid any containers on the power unit or on the electrical box (danger of short circuit).

Report your own arrival to the responsible. Before to put out of service the system, place the “out of service tags” one per floor.

Do not forget any part, wrench, grease, spill of fluid on the floor.

Pay attention to any contact when operating on rotating machines or on electrical powered devices

**WARNING**

Never exclude any safety circuits

Before to move the car check the correct intervention of the emergency button on the top of the car.

During the travel, stand firmly to the strut or to other parts of the car. Never touch the ropes.

THE IMAGES IN THIS MANUAL ARE PURELY INDICATIVE AND NOT EXHAUSTIVE.

Pay attention during the up travel. At the end, be sure that all the protections are correctly assembled and lock the machine room.

4.2 TEST

At the end of the installation you need to take a test complying the current regulations.

This test is performed by the same installer (if qualified according to the UNI EN ISO 9000 rules) or by a notified organization complying the Lifts Directive

Once the result of the qualification test is ok, it needs to be notified the installation to the competent authorities, communicating what listed below:

- The building address.
- The speed, the flow, the travel the number of stops and the kind of actuation.
- Name or installer company.
- Copy of the declaration of conformity.
- Name of the maintenance company.
- Name of the entity in charge of periodically verifying the installation.

4.3 MATERIAL DISPOSAL



The system contains recyclable materials do not disperse in the environment but contribute in recycling (Directive 2006/66/CE).



In addition, the following materials, when replaced, must not be dispersed in the environment but must be delivered to authorized collection centers, manufacturers or specialized and preferably certified companies



The fluid



The power unit the piston, the pipes.

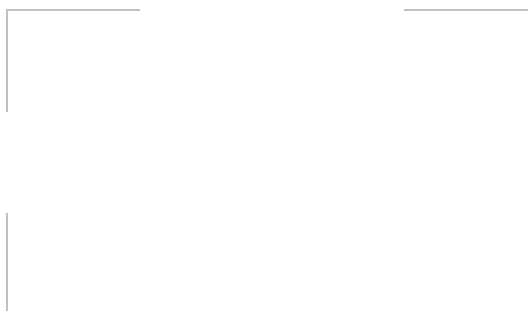


Pb

Electrical and electronic equipment, batteries and / or accumulators, lamps. (RAEE)



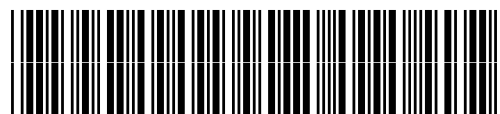
FLUID DYNAMIC EQUIPMENTS
AND LIFT COMPONENTS



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