MANUALI - GUIDES - MANUELS
HANDBUCH - MANUAL

Montanari Group
GEARLESS&GEARBOX
TRACTION MACHINES

INSTALLATION, USE AND MAINTENANCE
GEARED TRACTION MACHINES

REV: 10_02/21

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SCOPE
The scope of this lift gears manual is to supply instructions for:
- Installation.
- Use.
- Maintenance.

IMPORTANT - WARNING:
This manual does not cover the procedure for disenabling the entire plant: it contains only the instructions relative to the lift gear. Consequently, before beginning installation operations for the lift gear you must obey the instructions given in the use and maintenance manual for the plant and adopt all precautions laid down by current safety legislation.

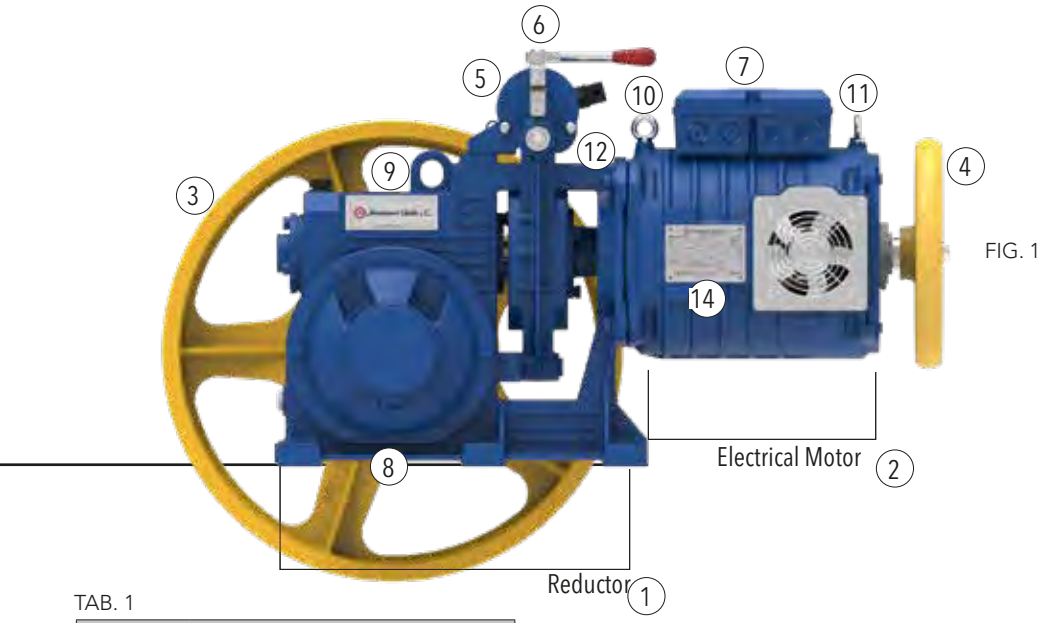


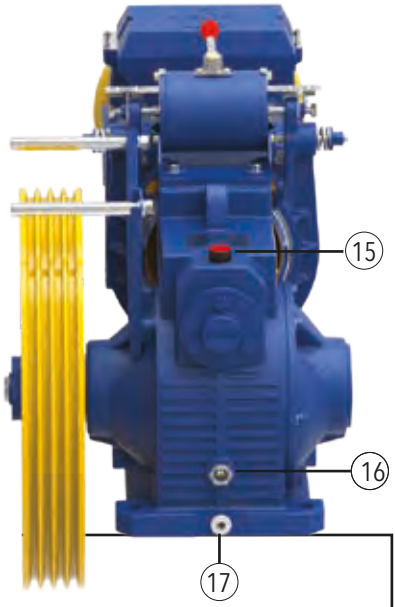
FIG. 1

TAB. 1

GEARBOX	
Rif. Number	Description
1	Reductor
2	Electrical Motor
3	Traction Pulley
4	Flywheel
5	Electromagnet
6	Braking device (see detail next page)
7	Terminal box
8	Gear base
9	Hooking points/eyebolts for hoisting
10	
11	
12	Punched Serial Number
13	Sticker label
13a	QR code for app
14	Motor Label

FIG. 2

FIG.4



TAB. 2

Oil	
Ref. No	Description
15	Filling plug
16	Transparent level indicator
17	Emptying plug

TAB.3

Brake Detail	
Ref. No	Description
18	Brake lever
19	Electromagnet
20	Brake adjustment screw
21	Brake adjustment springs
22	Brake shoes
23	Brake pulley

FIG. 3

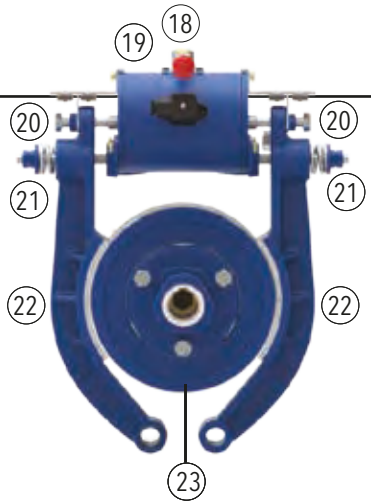


FIG. 5

PENTA - PENTA 830

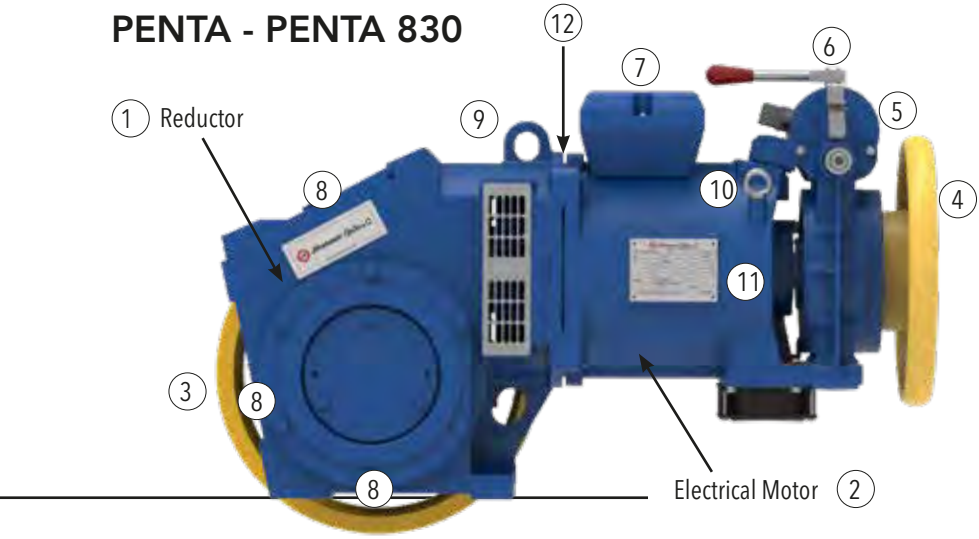


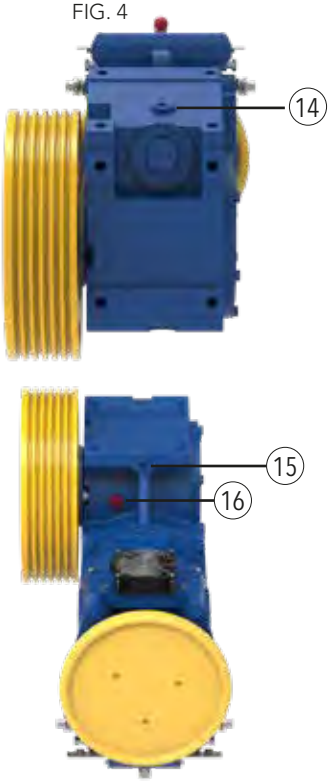
FIG. 1

TAB. 1

GEARBOX	
Rif. Num	Description
1	Reductor
2	Electrical Motor
3	Traction Pulley
4	Flywheel
5	Electromagnet
6	Braking device (TAB.3 - FIG.5)
7	Terminal box
8	Gear base
9	Hooking points/eyebolts for hoisting
10	
11	Motor Label
12	Punched Serial Number
13	Sticker Label
13a	QR code for app

FIG. 2

FIG. 4



TAB. 2

Oil	
Ref. No	Description
14	Oil Filling / Emptying plug
15	Oil Filling / Emptying plug
16	Red breather plug

TAB. 3

Detail: Braking device	
Ref. No	Description
17	Brake lever
18	Electromagnet
19	Brake adjustment screw
20	Brake adjustment springs
21	Brake shoes
22	Brake pulley

FIG. 3

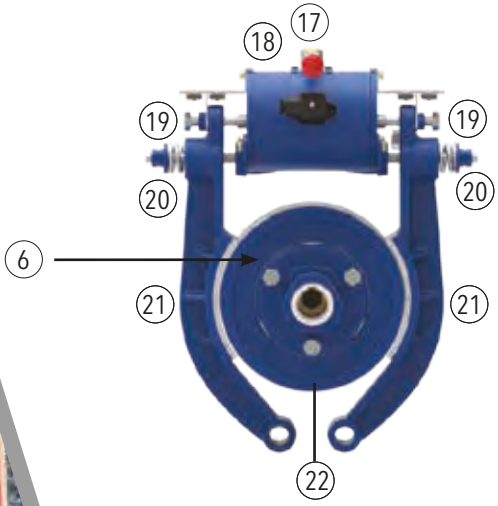


FIG. 5

TAB. 4

REV.	DATE	DESCRIPTION	EDITED BY	VERIFIED BY	APPROVED BY
1	06/11/2001	FIRST EDITION	STEFANO BERTONI (DTE)	STEFANO BERTONI (DTE)	STEFANO BERTONI (DTE)
2	14/06/2010	UPDATE	STEFANO BERTONI (DTE)	STEFANO BERTONI (DTE)	STEFANO BERTONI (DTE)
3	30/05/2014	UPDATE	STEFANO BERTONI (DTE)	STEFANO BERTONI (DTE)	STEFANO BERTONI (DTE)
4	06/04/2018	UPDATE	STEFANO BERTONI (DTE)	STEFANO BERTONI (DTE)	STEFANO BERTONI (DTE)
5	01/06/2018	UPDATE	STEFANO BERTONI (DTE)	STEFANO BERTONI (DTE)	STEFANO BERTONI (DTE)
6	22/01/2019	UPDATE	STEFANO BERTONI (DTE)	STEFANO BERTONI (DTE)	STEFANO BERTONI (DTE)
7	02/12/2019	UPDATE	MARKETING DEPT.	STEFANO BERTONI (DTE)	STEFANO BERTONI (DTE)
8	16/03/2020	UPDATE	MARKETING DEPT.	STEFANO BERTONI (DTE)	STEFANO BERTONI (DTE)
9	26/03/2020	UPDATE	MARKETING DEPT.	STEFANO BERTONI (DTE)	STEFANO BERTONI (DTE)
10	02/02/2021	UPDATE	MARKETING DEPT.	STEFANO BERTONI (DTE)	STEFANO BERTONI (DTE)

Compliance with the following instructions is mandatory to ensure the functionality and safety of the product. If the following instructions given especially but not limited for general safety, transport, storage, mounting, operating conditions, start-up, maintenance, repair, cleaning and disposal / recycling are not observed, the product may not operate safely and may cause a hazard to the life and limb of users and third parties.
Deviations from the following requirements may therefore lead both to the loss of the statutory material defect liability rights and to the liability of the buyer for the product that has become unsafe due to the deviation from the specifications.

1. STANDARD REFERENCE

TAB. 5

N	Reference	REG. TYPE	Description
1	UNI 10147	E	Maintenance: terminology.
2	UNI EN81/1	E	Safety regulations for Construction and Installation of Passenger and Freight Lifts.
	UNI EN81-20		

The regulations are to be taken as a reference and are not necessarily fully applicable to these technical instructions.

2. GENERAL NOTES

The operations described in this manual must be carried out by qualified personnel equipped with standard shop floor tools. The entire plant must be disenabled before any maintenance operations are attempted. Lift gears are normally designed to function at 50% ciclic duration factor at maximum load, but for travels not in excess of 45 sec.
For installations that require higher performance, contact our engineering office.
When ordering any spare parts the lift gear serial number must always be specified.
This number is printed on the sticker (FIG. 3) or punched onto the shaft near the motor flange (FIG. 1 - 2 + TAB. 1).

3. TRANSPORT

All machines are packed in cases or cages (FIG. 7). In some cases they are assembled on wooden pallets for proper transportation by truck.
IMPORTANT: cases and cages are not load-bearing and so they must not be placed on top of one another.

TAB. 6

GEARBOX MODEL	MAX WEIGHT kg
M50P	55
M61	180
M65	90
M73 - M73S - M75S M75S - M73H - M76 M76S - M76H - M68	200
M73B - M73BS - M75B M75BS - M73HB M76B - M76HB - M68B	250
M73AL - M75AL	310
M73BAL - M75BAL	360
PENTA	250
M83 - M85	250
M83B	255
M83AL	310
M83BAL	360
PENTA 830	400
M93	360
M93B	630
M93AL	600
M93BAL	680
M95	550
M98 - M98H	700
M98B - M98HB	800
M98AL	800
M104 - M104B9 - M105	1350
M104B - M104B9B - M105B	1450
M109	1600
M109B3	1650
Notes: The weights shown are to be considered as maximum, but not inclusive of any bedframe or casings related to the lift gear.	

3.1 UNLOAD

The product must be unloaded from the carrier's vehicle using equipment that is suited to the weight and size of the lift gear. See TAB. 6.
All packaging is suitable for handling with forklifts or lift trucks (FIG. 6).

IMPORTANT: please check the status of the goods when delivered. If damaged, you must not install the equipment.

FIG. 6

4. WAREHOUSE STORAGE

Even if the lift gears are still packaged, they should be stored in dry places protected from bad weather conditions.
After disposing of packaging ensure that dust does not settle on the equipment
In case of long term storage please contact Montanari Giulio & C. at the contact information available at the end of this user's manual.

FIG. 7

5.INSTALLATION
5.1 HANDLING

The lift gear may be handled using belts or chains (not included) but ensure that you do not load weight on critical areas:

- shafts that jut from electric motors, with or without flywheels;
- all braking organs: brake pulley, shoes, electromagnets, pins with springs;
- lift gear/motor couplings;
- flanges for tachometric dynamo or encoders.

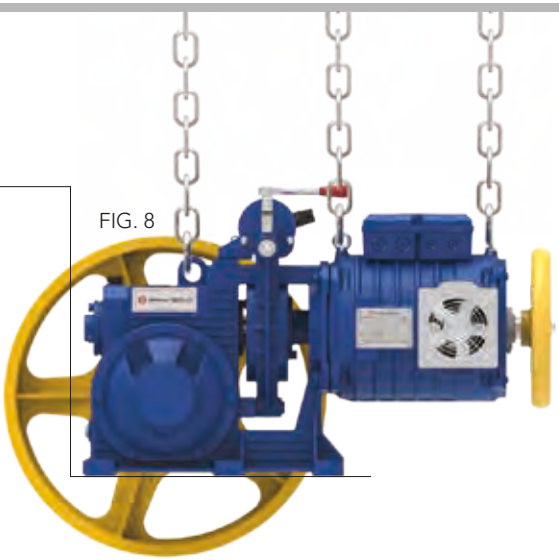


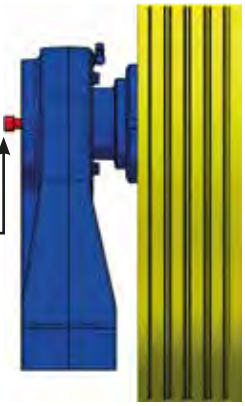
FIG. 8

IMPORTANT: hooking points or eyebolts present on the electric motor are not suitable alone to hoist the lift gear + motor group.
Failure to observe these indications may create dangerous situations and moreover damage the lift gear irreparably.

Disassembling any part of the lift gear, including the motor, without authorisation, for whatever reason, will invalidate any form of guarantee.

Take special care not to subject the lift gear to collision.
The flywheels and encoders or any tachometric dynamos applied are especially sensitive to collision.

IMPORTANT: GEARBOXES WITH SUPPORT

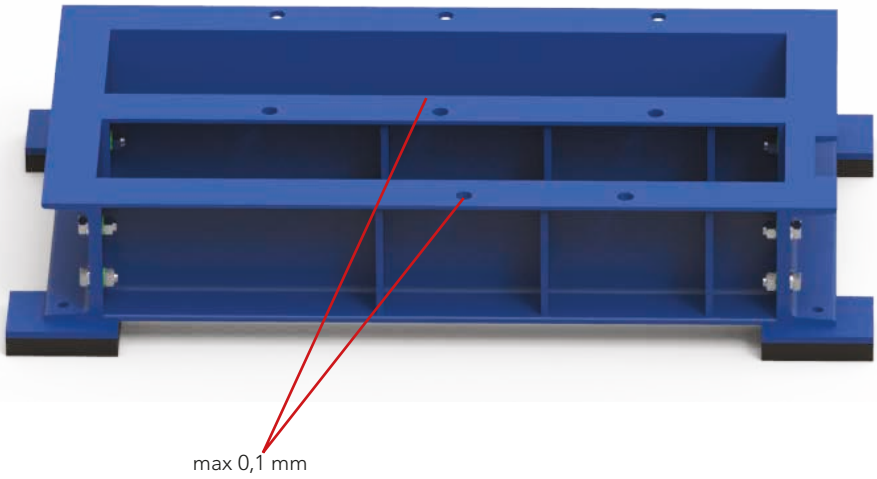


THE RED SCREW PREVENTS THE SUPPORT FROM SLIPPING OUT DURING TRANSPORT, STORAGE AND INSTALLATION.
REMOVE IT BEFORE PUTTING THE GEARBOX INTO OPERATION

5.2 ASSEMBLY ON THE BASE

Use a level to ensure that the base is perfectly horizontal, both in a cross and lengthwise direction. Ensure that the support surface is flat, with maximum tolerance of 0,1 mm. (FIG. 9). If not, shim adequately.

FIG. 9



Planarity Check:

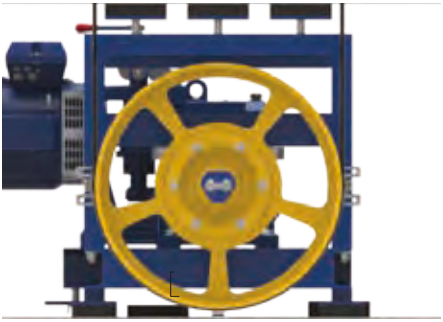
- Rest the lift gear base on the bedframe.
- Verify that the area near mounting holes closely fits and is coincident.
- Proceed to fix the lift gear by tightening bolts cross-wise.

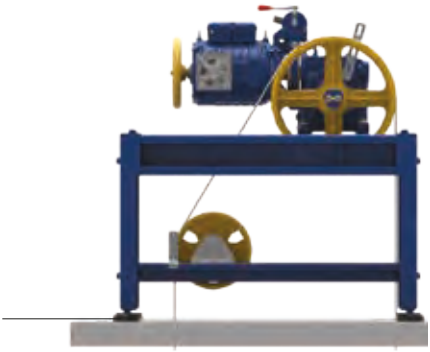
Gears with external bearing:

- First tighten the base bolts.
- Verify that bearing is not blocked and that the clearance between the bearing and the bedframe does not exceed 0,1 mm.

In the the following page (FIG. 10) the correct lift gear assembly is shown in all variations.

FIG. 10 **VARIATIONS**

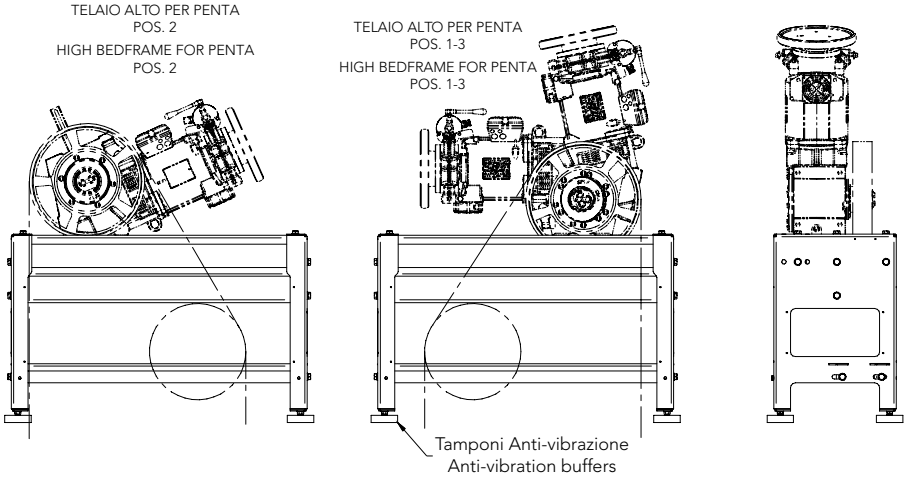


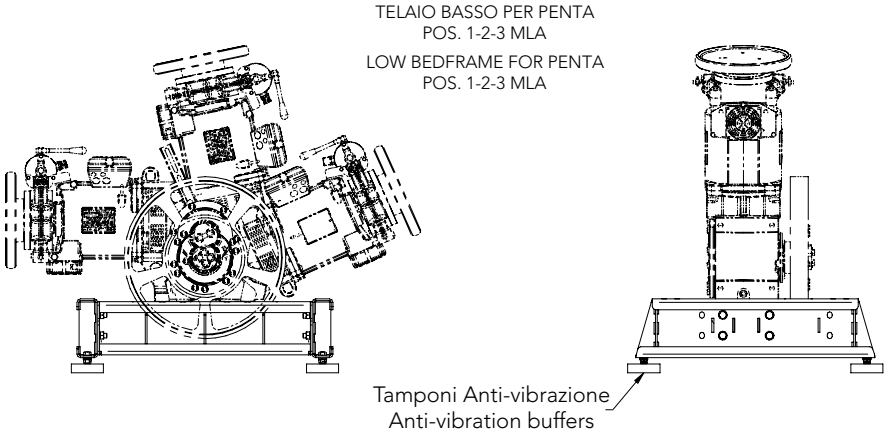


For all executions,
rubber insulation sub-frame.
Tolerance of difference in level between
gear and steel bedframe: 0,1 mm.

VARIATIONS PENTA - PENTA 830

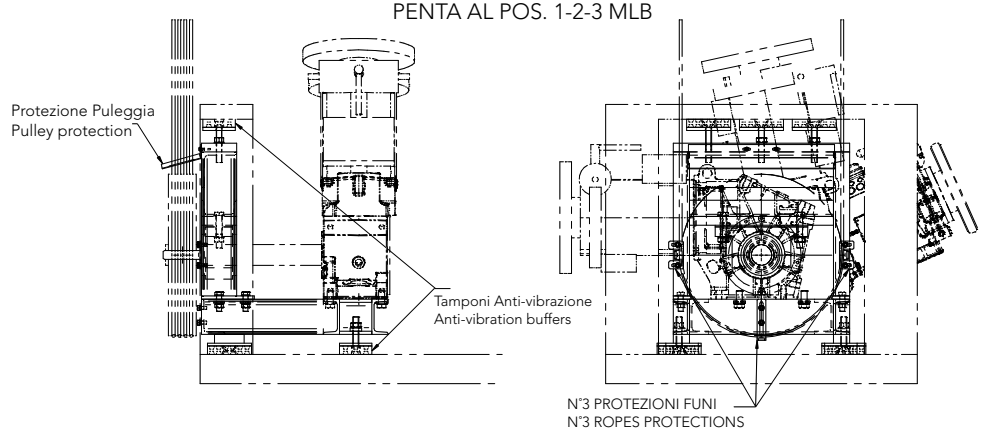
FIG. 10





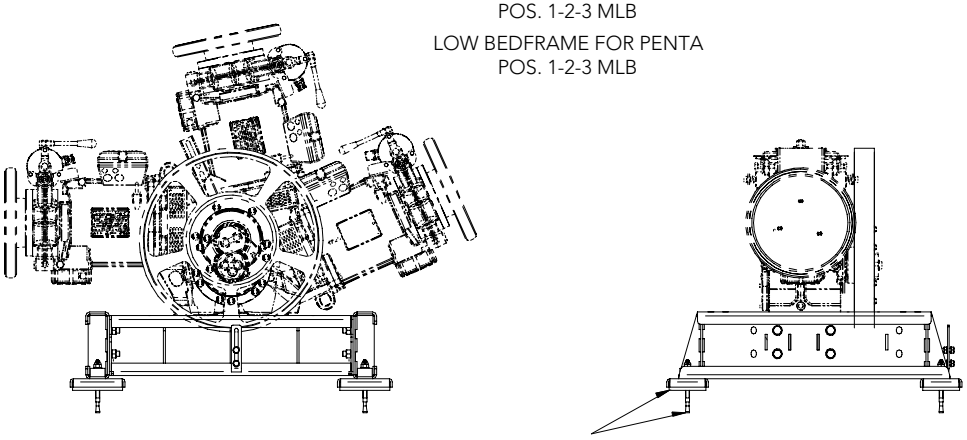
VARIATIONS PENTA - PENTA 830

PENTA AL POS. 1-2-3 MLB



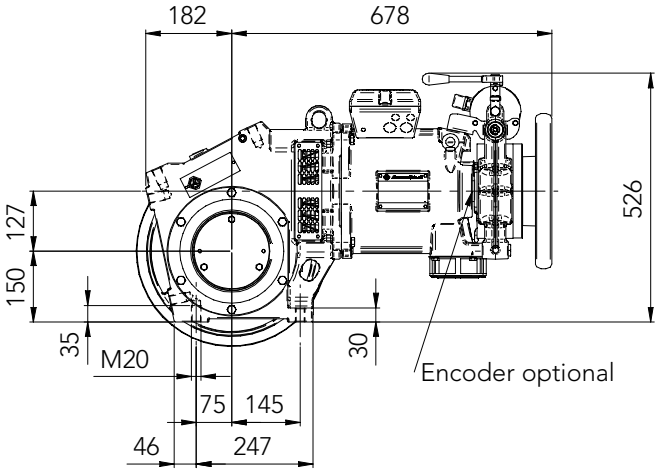
TELAIO BASSO PER PENTA
POS. 1-2-3 MLB

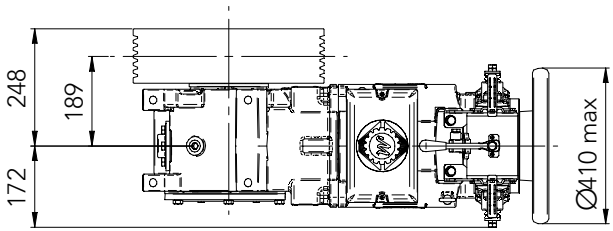
LOW BEDFRAME FOR PENTA
POS. 1-2-3 MLB

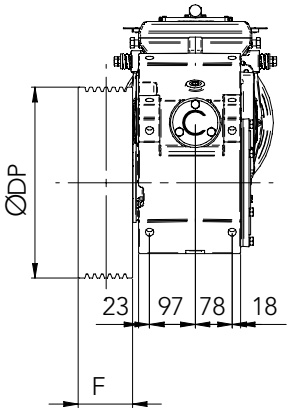


Tamponi Anti-vibrazione e fissaggi telaio
Anti-vibration buffers and bedframe fixing

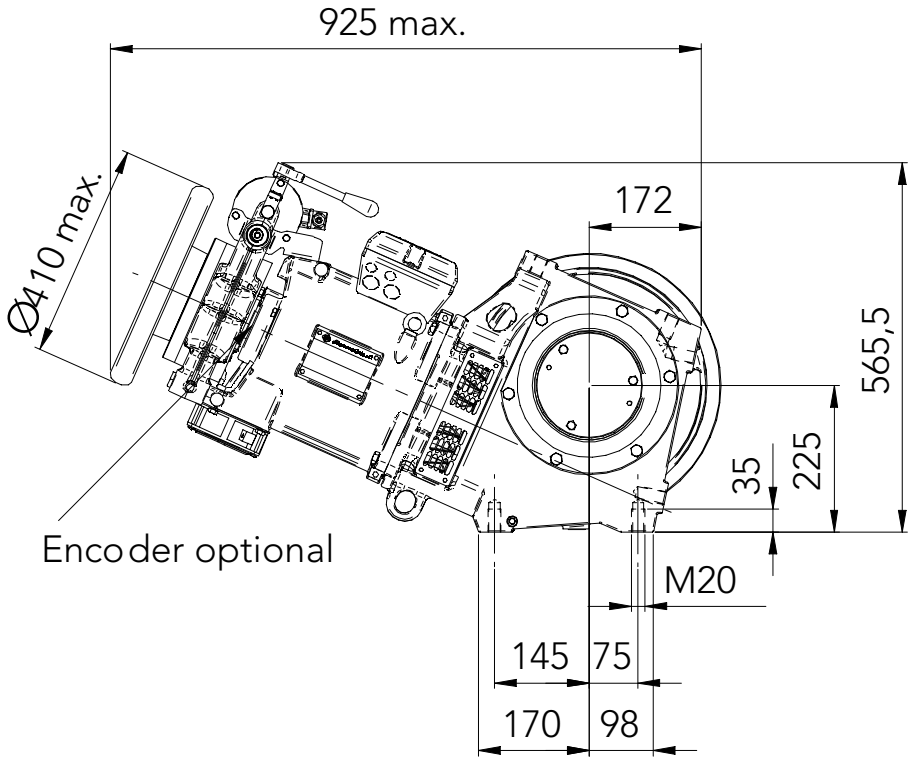
PENTA POS. 1

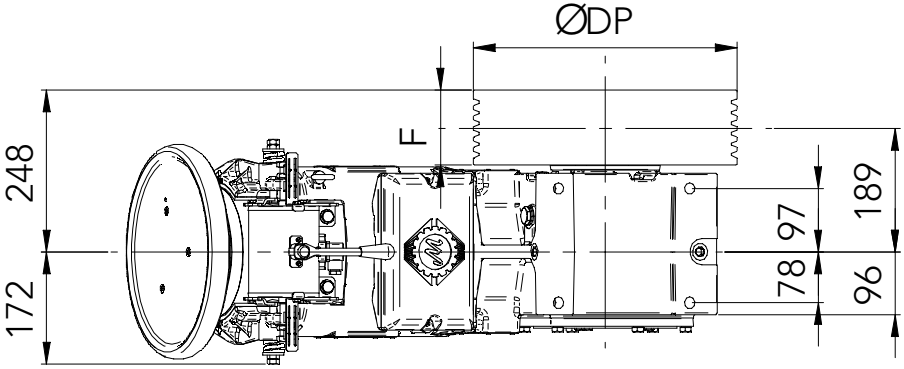

182
678
526
127
150
35
M20
30
Encoder optional
75
145
46
247


248
189
172
Ø410 max

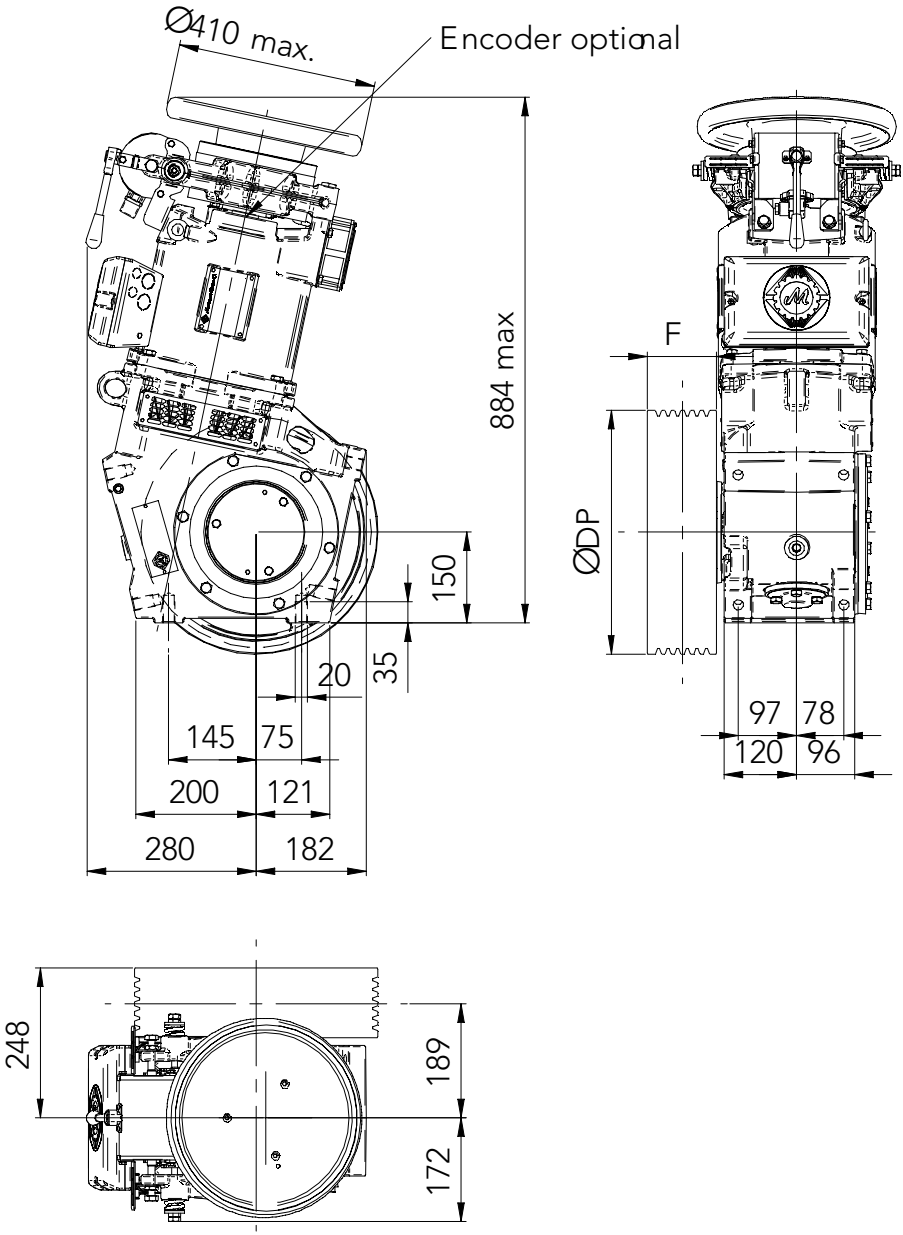

ØDP
23
97
78
18
F

PENTA POS. 2

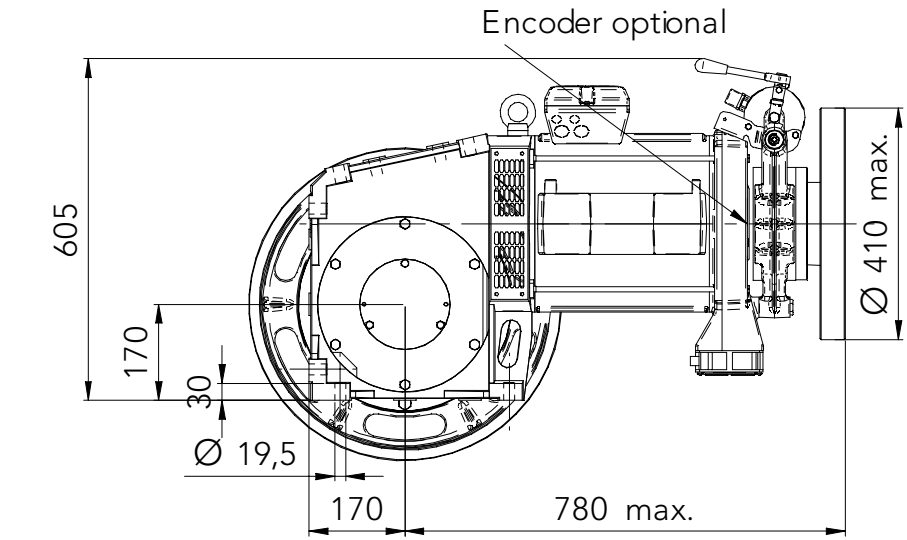

925 max.
Ø410 max.
172
565,5
35
225
Encoder optional
M20
145
75
170
98

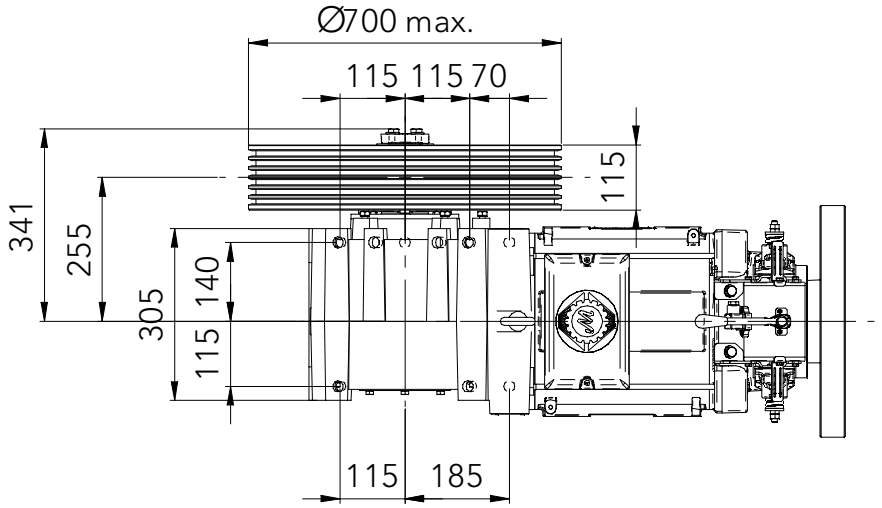

ØDP
F
248
172
97
189
78
96

PENTA POS. 3

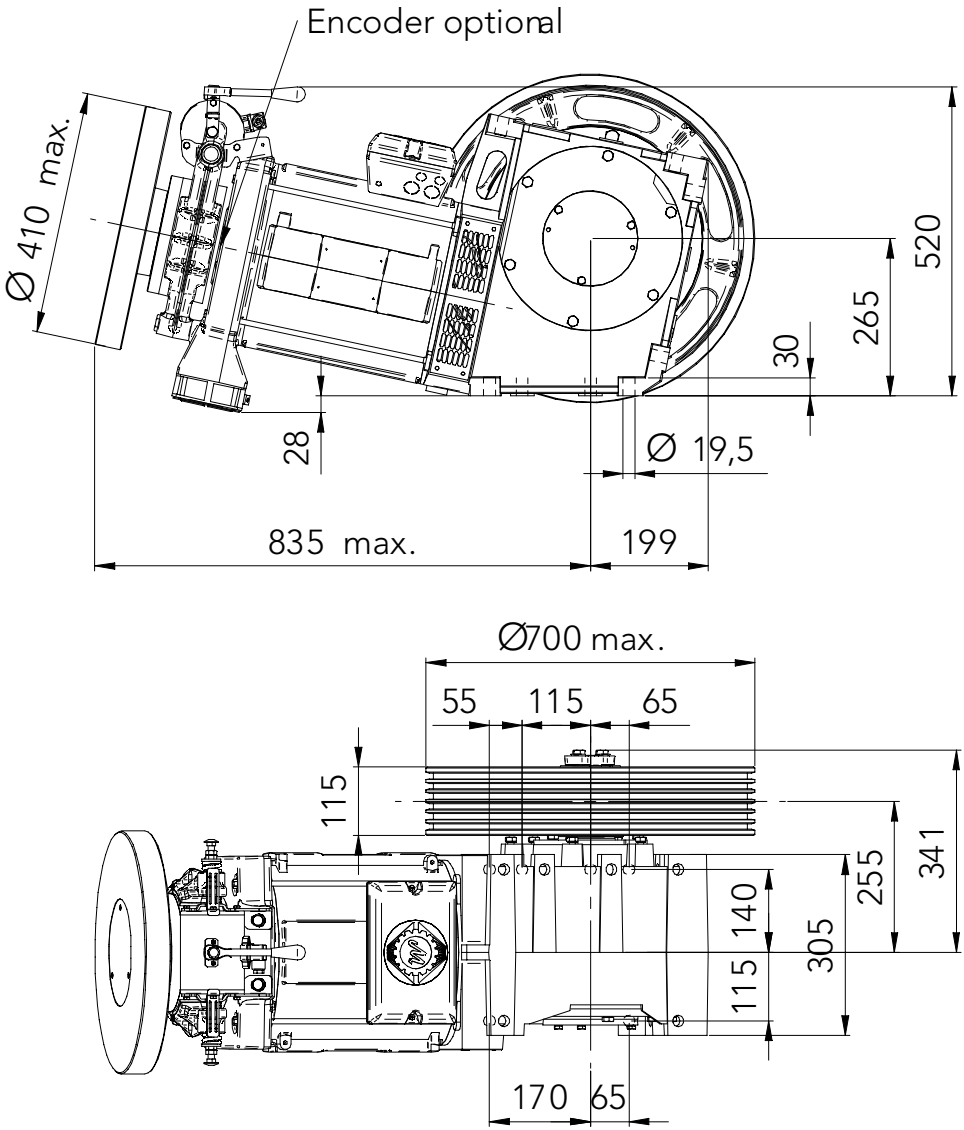

Ø410 max.
Encoder optional
884 max
150
35
20
145
75
200
121
280
182
F
ØDP
97
78
120
96
248
189
172

PENTA 830 POS. 1

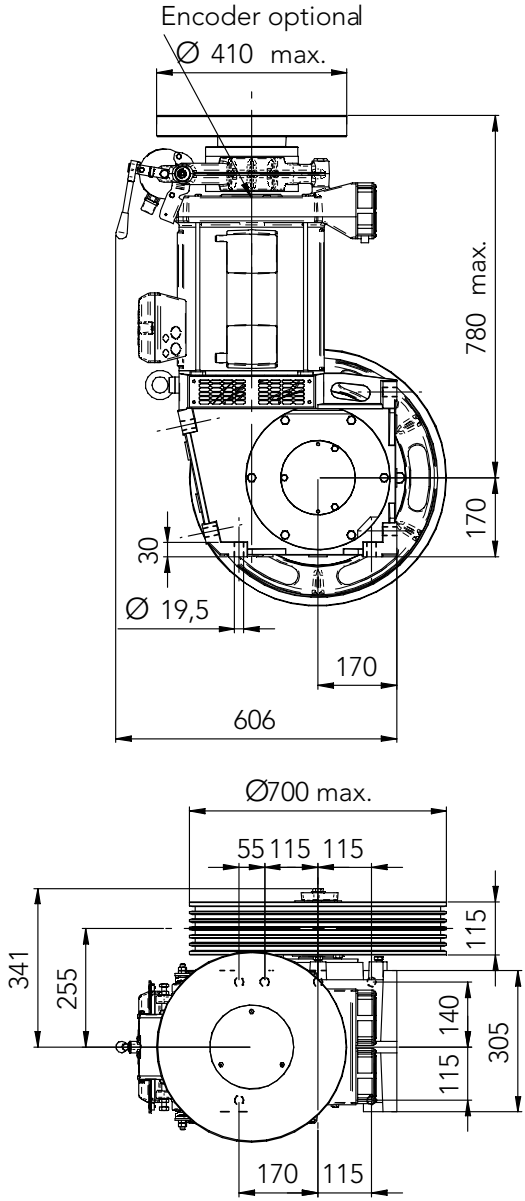




PENTA 830 POS. 2



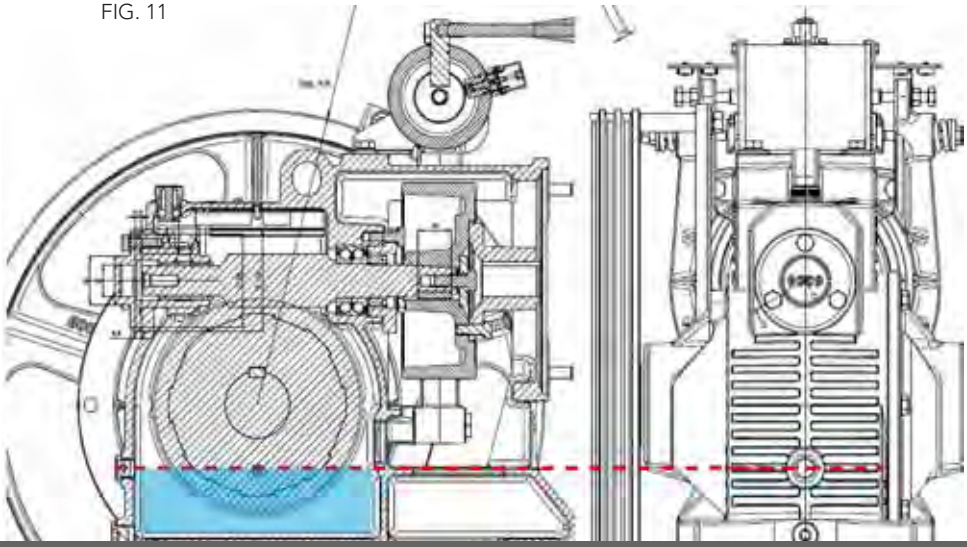
PENTA 830 POS. 3



5.3 LUBRICATION

First Start: oil filling and level check. (FIG. 4 page 39 and FIG. 11 below).
Pour lubricant into the lift gear using the special filling hole as far as the sightline on the transparent level indicator.

FIG. 11



Check lubricant level periodically.
Ensure there are no traces of oil on the brake pulley, brake shoes and traction pulley.

Oil check and replacement (see Maintenance par. 7.4)

TAB. 7

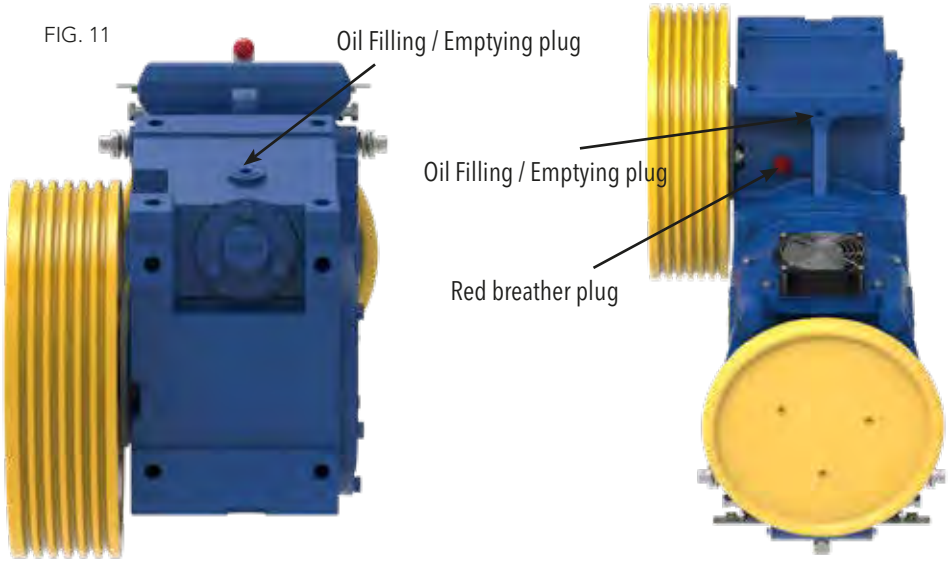
Recommened lubricants	
MINERAL	Synthetic
MOBILGEAR630	MOBIL SHC 630
ESSO SPARTAN 220	
AGIP BLASIA 220	
SHELL OMALA OEL 220	
OR Oils with equivalent characteristics to the following:	
Viscosity ISO VG 220 Viscosity Index 95 Additive EP	Viscosity ISO VG 220 Viscosity Index 151 Ascertained compatibility with traces of mineral oil.

5.3.1 LUBRICATION PENTA - PENTA 830

Because of its particular shape, the PENTA and PENTA 830 gears has no oil level (Image 4 - pag 41 and images below) therefore the following instructions for filling or topping up correctly must be followed.
Pour 3 litres of oil into the gear using the appropriate aperture:

- 3 Litres for PENTA gear.
- 6 Litres for PENTA 830 gear.

FIG. 11



For each position of PENTA therefore, both horizontal and vertical, there is always a filler plug and a drainage plug.

ATTENTION: use only the filler plug, do not unscrew the breather plug.

Check lubricant level periodically.
Ensure there are no traces of oil on the brake pulley, brake shoes and traction pulley.

Oil check and replacement (see Maintenance par. 7.4)

TAB. 7

Recommended Lubricants
Synthetic
SHELL OMALA S4 WE 220 - 320 MOBIL SHC 630
OR Oils with equivalent characteristics to the following:
Viscosity ISO VG 220 Viscosity Index 151 Ascertained compatibility with traces of mineral oil.

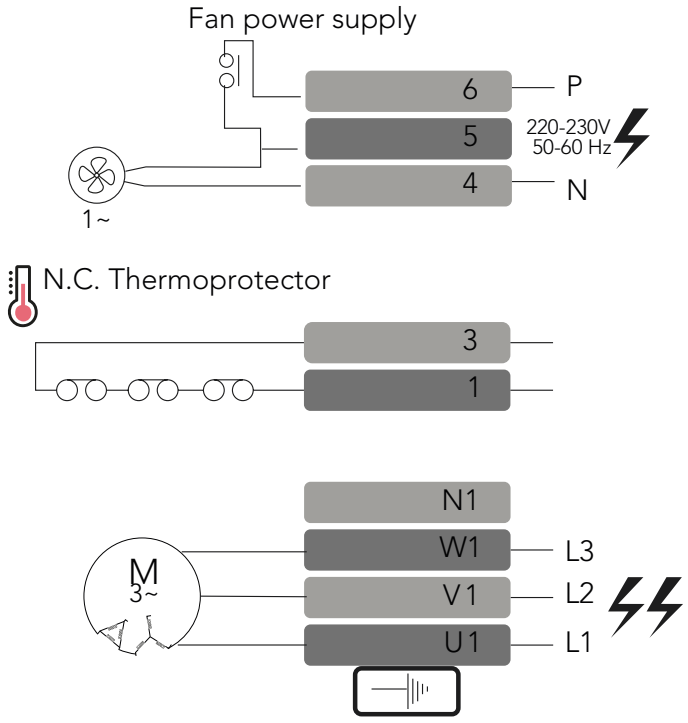
5.4 ELECTRICAL WIRINGS

Wire up the electrical motor following the indications on the wiring diagram in the terminal box. (FIG. 1)
The wiring schemes are included here.

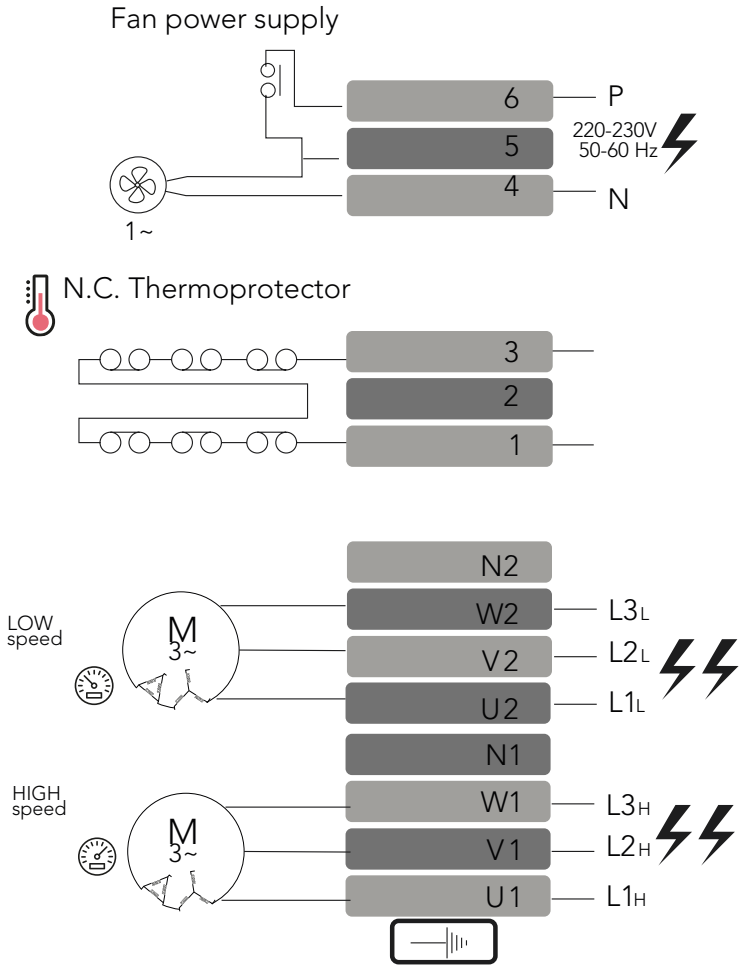
- Scheme Motor A: 1 - 2 Speed and NC Thermoprotector (AC1 - AC2 - VTF).
- Scheme Motor A: 1 - 2 Speed and NC Thermoprotector (AC1 - AC2 - VTF) for Penta.
- Scheme Motor B: 1 - 2 Speed and PTC Thermistors MPV.
- Scheme Motor C: CTF.

WARNING: refer always to the wiring diagram inside the terminal box.

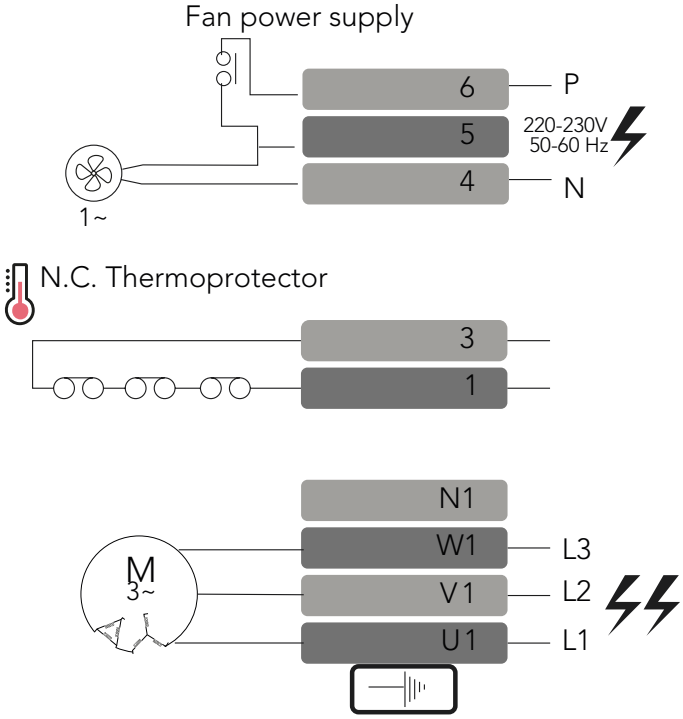
Motor Scheme A
1 Speed: AC1 - VTF with thermpoprotector NC



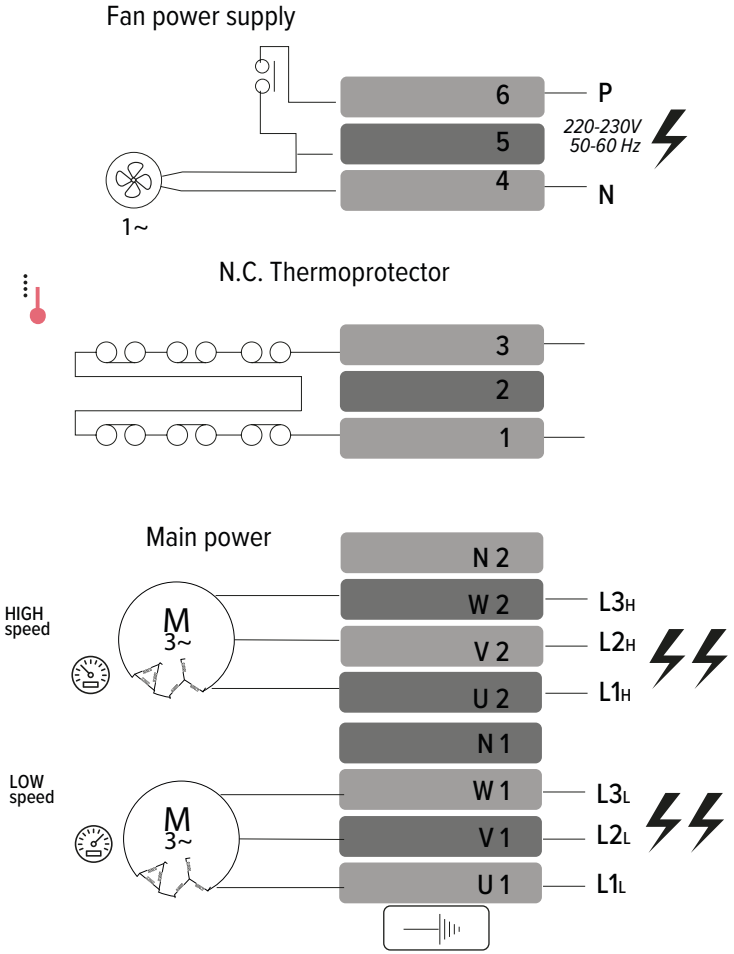
Motor Scheme A
2 Speed: AC2 with NC Thermprotector



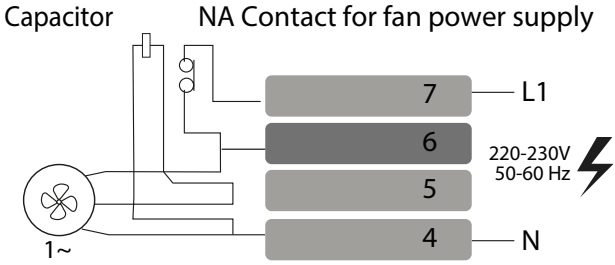
Motor Scheme A - FOR PENTA
1 Speed: AC1 - VTF with thermpoprotector NC



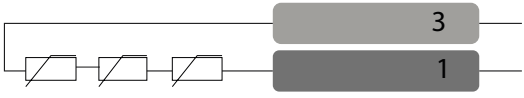
Motor Scheme A - FOR PENTA
2 Speed: AC2 with NC Thermprotector

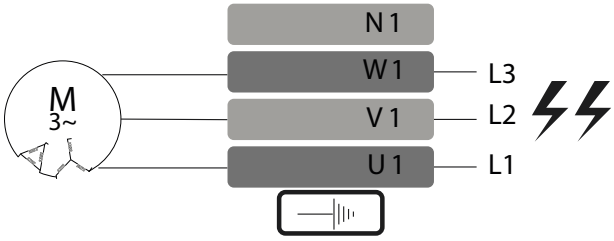


Motor Scheme B
1 Speed: MPV with Thermistors

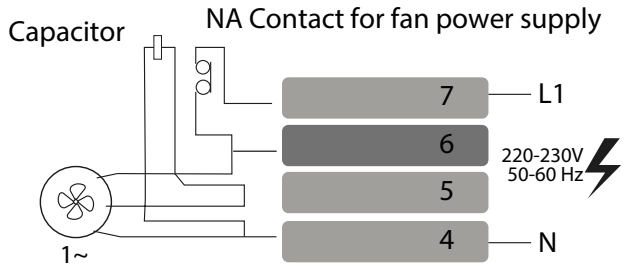


PTC* Thermistors- don't apply > 2,5V tension

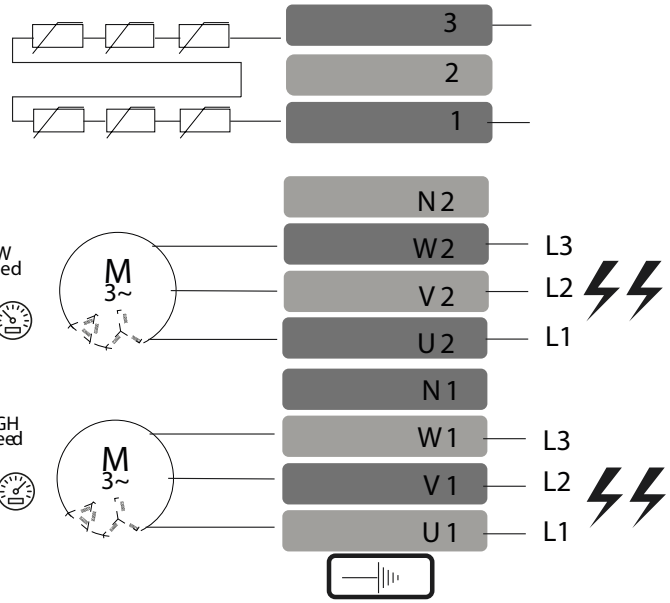




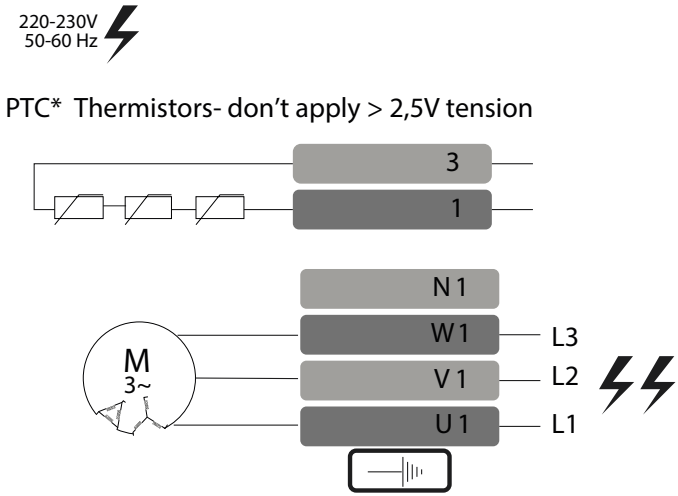
Motor Scheme B
2 Speed: MPV - with Thermistors PTC



PTC* Thermistors- don't apply > 2,5V tension



Motor Scheme C: CTF



Connect the brake electromagnet using the relevant terminal board. (FIG. 12).

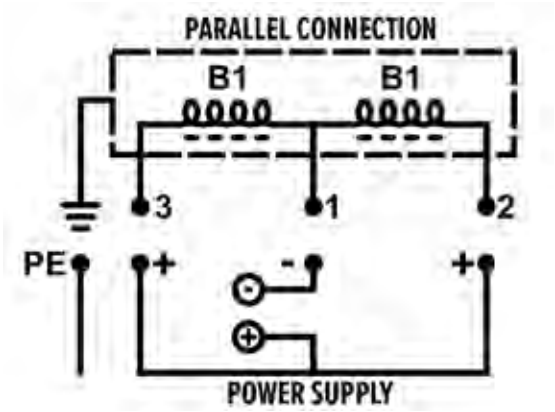
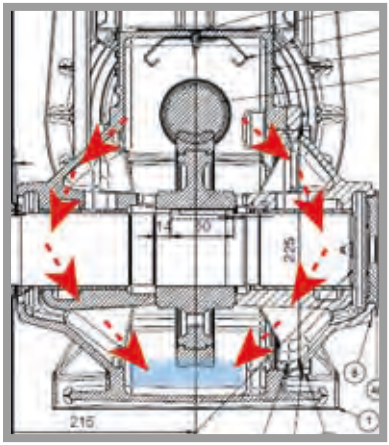


FIG. 12

5.5 COMMISSIONING

Use the handwheel to effect a 360° manual movement of the drive pulley, so that the oil can distribute itself uniformly.

FIG. 13



Ensure the lift gear is working correctly by starting it up before applying ropes and hence load. Only after completing these operations should the ropes be applied.

IMPORTANT: the first complete travels, with ropes applied, should be carried out according to following schedule.

TAB. 8

n Travels	Description
4-5	load about 1/2 of the operating capacity to avoid lift overload
4-5	load that is about 1/4 of the operating capacity
4-5	empty car
4-5	load that is about 3/4 of the operating capacity
4-5	full load

IMPORTANT: the above instructions do not apply to lift gears with drums and without counterweight (FIG. 14).
For these types of plant you should carry out at least 10 travels with an empty cabin.

ATTENTION: with empty cabin or full load cabin it is necessary to respect a 50% inermittence; therefore for a given working time the same pause time is required.

FIG. 14

5.6 BRAKE SHOE ADJUSTMENT

Lift gears are normally supplied with brake shoe openings already adjusted.
If further fine-tuning is required, proceed as follows (FIG. 5).
The brake shoes should open with the least possible run.

- Use the brake lever to open the brake shoes.
- Tighten or loosen the special adjusting screws to ensure that between the brake shoes and the brake pulley is at a min.
- Make different test in order to verify there is no friction between the brake shoes and brake pulley.
- In case of friction, tighten the regulation screw of a quarter turn each time until friction disappears.

The stopping distance will depend on how springs are tuned and they require adjustment from time to time according to load and in compliance with regulation EN81-20 par. 5.9.2.2.2.1 and 6.3 .1.
Ensure that during normal functioning the brake shoes open at the same time.

Check brake shoe
(see maintenance par. 7.3)

6. USE

Lift gears are designed and built to serve as hoisting apparatus for Passenger Lifts and Freight Lifts in compliance with the relative standards (EN81/1 - EN81-20) and therefore any other use is to be considered improper.
The lift gears may not be used in plants with features that differ from those specified at the time of ordering the lift gear (e.g. capacity, speed, etc.).

- **The lift gears must not be used for manually hoisting the cab after engagement of the safety gears in order to disengage them.**
- The gearbox machine must be installed in a building or in a closed travel compartment.
- Do not use the gearbox machine in an explosive atmosphere.
- The room temperature must be between 0°C and +40°C.
- Assembly, installation, trial, inspection or manoeuvre must be carried out with great care by qualified and trained personnel to comply with the EN81/1 - EN81-20 standards.
- The manufacturer cannot be held responsible for damage caused by incorrect assembly or incorrect installation.
- Before starting work, make sure that adequate lifting and handling equipment is available.
- No welding work must be carried out on the unit.
- The unit must not be used as a grounding point for welding operations. The bearings can be irreparably damaged.
- All fixing points specified by the manufacturer must be used. The air supply for cooling must not be
- prevented.
- For installation above 1000 m above sea level contact the technical office for the correct sizing of the electric motor.
- Maximum permitted humidity 95%, not humid environment.

7. MAINTENANCE

7.1 Axial Clearance Check On Thrust Bearing

- Normally all lift gears do not require any adjustment and indeed cannot be adjusted.

Checking procedure:

- Bearing clearance can be seen with the naked eye during reverse movement by watching the axial movement of the brake pulley compared to the brake blocks.
- Inform Montanari Giulio &C. Srl engineering office when this clearance appears on lift gears for which there is no adjustment possibility, to decide whether the bearing should be replaced.
- Even in case of excessive noise it may be necessary to adjust or replace the bearing itself.

7.2 Crown and Worm Clearance Check

After every 3000 hours of use or at least once a year.
Checking Procedure:

- Stop the system with the empty car.
- Place the counterweight in a position so that the traction sheave cannot rotate.
- Open the brake by hand.
- Turn the flywheel manually in clockwise direction until the worm gear tooth pressure can be felt on the crown teeth. Mark the starting point on the brake pulley circumference.
- Turn the flywheel manually in counter clockwise direction until the worm gear tooth pressure can be felt on the crown teeth. Mark the point reached by shifting on the brake pulley circumference.
- Measure the circumference arc between the two marks.
- Compare the values obtained with those supplied by the table of admissible values. (TAB. 9).
- The values given by the table are such that they would guarantee a situation of safety and have no correspondence with running comfort.
- When maximum clearance is exceeded, contact Montanari and **indicate the lift gear serial number.**

TAB. 9

TABLE OF ADMISSIBLE CROWN AND WORM CLEARANCE VALUES		
Model	Ratios	Distance between two markers - mm
M50P	all	from 1,3 to 19
M61	all	from 2,0 to 30
M73 - M75 - M76 - M68 - M65 all versions	all	from 2,0 to 40
PENTA	all	from 2,5 to 40
M83 - M85 all versions	1/69 - 1/60	from 3,5 to 40
	all the others	from 2,5 to 40
PENTA 830	1/50 - 1/43 - 1/37 - 2/50 2/41 - 3/43 - 4/37	from 2,5 to 40
	1/60	from 3,5 to 40
M93 - M95 all versions	all	from 4 to 44
M98 all versions	all	from 5 to 44
M104 - M105 all versions	all	from 5 to 54
M109	all	from 8 to 60

7.3 BRAKE: brake Shoe Wear

Check brake shoe wear regularly.
If they are worn down they should be tuned once again.
Replace the brake shoes when the thickness of the material is equal to or less than 2 mm.

7.4 OIL: replacement and level check

First change:
- mineral oil - after 350 hours.
- synthetic oil - after about 700 hours.

Subsequent mineral oil changes:
- mineral oil every 12 - 18 months.
- synthetic oil every 24 - 36 months.

Oil Top-up Instructions:
Stop the lift gear and pour in the lubricant using the special filling hole, ensuring it reaches the sightline on the transparent level indicator.
Discharging lift gear oil:
Stop the lift gear and unscrew the discharge cap located on the base of the lift gear and then wait for all the lubricant to drain out.

7.5 OIL: Seals Check

All types of lift gears have gaskets (frictionless) and dynamic seals (with friction).
Check regularly to ensure that there are no oil leaks on the lift gear: if there are such leaks, call our engineering office to have the worn gasket replaced as necessary.

7.6 TRACTION PULLEY: Groove Wear check

If groove wear is noted on the drive pulley, it will have to be replaced.
Request relevant instructions from our engineering office, specifying the type of lift gear and year of manufacture or indicating the serial number. **Do not re-machine the grooves unless specifically authorised to do so.**

7.7 REPLACEMENT OF COMPONENTS

The instructions for replacement of any components should be requested each time from our Engineering Office, specifying the lift gear serial number.

7.8 TIGHTENING MOMENT

TAB. 10

Screws with large pitch threading ISO class 8.8	
DIAM mm	Moment Nm
M8	25
M10	50
M12	86
M14	135
M16	215
M18	290
M20	410
M22	560
M24	710

Montanari Group
GEARLESS&GEARBOX
TRACTION MACHINES

MONTANARI GIULIO & C. S.r.l

COMPLIANCE DECLARATION
GEARBOX

Manufacturer:
Montanari Giulio & C. S.r.l.
Via Bulgaria n.39, 41122 Modena

Models concerned by the current declaration

M50P – M61 – M65 – M65B - M68 – M68B - M73 – M73B – M73H – M73HB - M73S – M73AL – M75 – M75B – M75H – M75HB – M75S – M75AL – M75T – M76 – M76B – M76S – M76H – M76HB – M83 – M83B – M83AL – M83T – M85 – M93 – M93B – M93AL – M93T - M98 – M98AL – M98H – M98HB – M104 – M104AL – M104H – M105 – M105B – M105B3 – M109 – PENTA – PENTA B – PENTA T – PENTA 830 – PENTA 830 B – PENTA 830 T.

It is stated that the gearboxes in question comply with the Machines Directive 2006/42/CE as regards its relevant aspects and meets the following essential safety requirements as set out in Annex I of the directive:
- 1.3.2 risk of damage during the functioning;
- 1.5.1 electricity;
- 1.5.4 assembly errors;
- 1.5.8 noise;
- 1.5.9 vibration;
- 1.6 maintenance;
- 1.7.4 instructions.

The related technical documentation has been drafted in compliance with the Annex VII B.

Therefore, it complies with the following directives:
- 2014/33/UE, 2014/30/UE, 2014/35/UE
In addition, with the following regulations:
- UNI 10411-1; UNI 10411-3; UNI 10411-5; UNI EN 81-1:2010; UNI EN 81-20:2020

Note:
As regards, the fulfillment of the paragraph 9.7 of the UNI EN81-1:2010 and 5.5.7 UNI EN81-20:2020, it is recalled that Montanari provides safety device only upon explicit request by the customer.

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MODENA 02/02/2021

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