

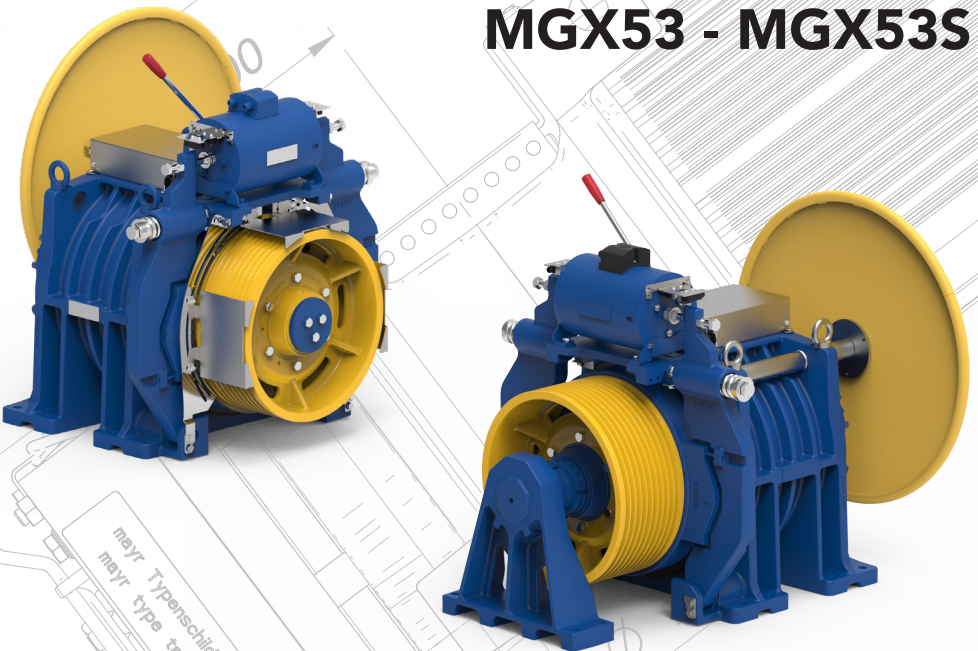


Montanari Group
GEARLESS & GEARBOX
TRACTION MACHINES



INSTALLATION, USE AND MAINTENANCE
GEARLESS

MGX53 - MGX53S



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Since 1970, Montanari Group has been focused on providing its customers with the best traction machines and components for lifts and escalators.

We are proud to have you as a customer and user of the Montanari traction machines, and we are confident that we can work together for a long time.








Thanks again for your choice.

Massimo Montanari
CEO of Montanari Group



REV.	DATE	DESCRIPTION	EDITED BY	VERIFIED BY	APPROVED BY
1	07/05/2020	First Redaction	Marketing Dept	Technical Dept Alberto Mantovani	STEFANO BERTONI (DTE)
2	02/03/2021	Update	Marketing Dept	Technical Dept Alberto Mantovani	STEFANO BERTONI (DTE)

WARNING SYMBOLS USED IN THE MANUAL:

	It indicates that safety measures must be taken to avoid electric shock.
	It indicates that safety measures must be taken to prevent personal injury.
	It indicates that safety measures must be taken to prevent damage to components.
	It indicates that safety measures must be taken to prevent burns due to contact with hot/ overheated surface.
	It indicates useful information before and during the installation step.
	It refers to specific parts of the manual.
	It refers to the proper product disposal.

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1. GENERAL INFORMATION

1.1 Introduction

These operating instructions must always be available for consultation. No liability is accepted for any malfunction due to installation not conforming to specifications, except in cases approved by Montanari Giulio & C.

All persons involved in the installation, operation, maintenance and repair of the unit must have read and understood the instructions.

No liability is accepted for damage, breakage or accident caused by failure to follow the instructions.

To make technical improvements, Montanari reserves the right, if deemed necessary, to modify the units and accessories, preserving their essential characteristics and improving efficiency and safety, without notice.

1.2 Copyright

All rights to these operating instructions belong to Montanari Giulio & C. S.r.l. The information in this manual may not be reproduced or used in an unauthorized manner or made available to third parties without prior approval.

If you have any questions, please contact:

MONTANARI GROUP
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Via Bulgaria 39 - 41122 - Modena - Italia
Tel: +39 059 453611 - Fax: +39 059 315890
www.montanarigiulio.com
info@montanarigiulio.com



2. SAFETY

2.1 Intended use

The MGX53 gearless machine is supplied ready for safe and reliable use. Any modification by the user that may affect safety or reliability is prohibited; it is also prohibited to tamper with devices or functions designed to prevent accidental contact.



The Montanari MGX53 gearless machine must be used and operated in strict compliance with the conditions set out in the supply contract.

Technical specifications considered: speed, cab capacity, cab weight, presence or absence of compensation, roping at the time of order.

No liability is accepted for any malfunction due to installation not conforming to specifications, except in cases approved by Montanari Giulio & C.

2.2 User's obligations

The operator must ensure that all persons involved in installation, operation, maintenance and repair have read and understood the supplied operating instructions and have adapted to them in order to:

- Avoid damage to property or persons.
- Ensure safe and reliable operation of the unit.
- Avoid breakage and environmental damage due to misuse.

In particular:

- Always observe the relevant environmental and safety regulations when transporting, assembling, installing, operating, maintaining and dismantling the unit.
 - The unit must only be used, maintained and repaired by authorized, properly trained and qualified personnel.
 - The gearless must not be cleaned using high-pressure cleaning equipment.
 - All work must be carried out with care and with due attention to safety.
 - Any work on the unit should only be carried out when it is not in operation.
 - A warning must be placed on the main switch to clearly indicate that work is in progress on the unit.
 - No welding must be carried out on the unit.
 - Do not use the unit as a grounding point for welding operations.
 - If any changes are detected (e.g. overheating or unusual noise) during operation, switch off immediately.
 - Rotating components must be equipped with appropriate guards to prevent contact.
 - If the unit is intended for installation in plant or machinery, the manufacturer of such plant or machinery must ensure that the standards, indications and descriptions contained in these operating instructions are incorporated into its own instructions.

- The information on the warning or identification plates must be complied with. These plates must be kept clean and legible at all times. Missing plates must be replaced.
- All spare parts can be obtained from Montanari Group.

2.3 Correct disposal



Respect the environment and dispose of the product according to the regulations in force in the country of installation.

2.4 Specific hazards

Depending on the conditions of use, the surface of the unit can become very hot.



Danger of burning!

2.5 Legal References

Tab. 1

N	Norm	Description
1	UNI 10147	Maintenance: Terminology.
2	EN 81-20	Safety rules for the construction and installation of lifts - Lifts for the transport of persons and goods.
3	EN 81-50	Safety rules for the construction and installation of lifts - Examinations and tests.
4	EN 81-21	Safety rules for the construction and installation of lifts - Lifts for the transport of persons and goods - Part 21: New passenger and goods passenger lifts in existing building.

3. IDENTIFICATION AND DATA

3.1 Identification plate

The data on the plate are:

Fig. 1 - Example of Identification Plate

The identification plate contains the following information:

- Manufacturer:** Montanari Giulio & C.
- Manufacturer's address:** Via Bulgaria, 39, 41122 Modena - ITALY
- Year of production:** 2019
- Model:** MGX80
- Speed:** 96 - 53 RPM
- Rated torque:** 670 Nm
- Rated voltage:** 380 - 208 V_L
- Serial number:** 022611
- Frequency:** 25,6 - 14,1 Hz
- Rated current:** 15 A
- Cycle type:** S5 180S/H 40% ED
- Weight:** 330 Kg
- Power rating:** 6,7 - 3,7 kW
- Motor pole no.:** 32 Poles

Additional features include a QR code to access relevant documentation, a CE mark, and a gearless machine code (MGX800809638E00).

GEARLESS MACHINE TECHNICAL CHARACTERISTICS: MGX53



MGX53

Tab. 2

MGX53	Type	Pn	Speed	Vn	Cn	In	Cmax	Imax	EMF	Poles	F	Rs	Ls	Static Load*	I	Duty Cycle	Weight*
Code machine		kW	[RPM]	[V]	[Nm]	[A]	[Nm]	[A]	[V/s/rad]	[N°]	[Hz]	[Ω]	[mH]	[Kg]	[kg·m ²]		[Kg]
MGX53250563AV00	MGX53	12,3	56	360	2100	27,5	3600	47	43	20	9,3	0,91	25	6200	4,1	180S/H 40%	1300
MGX53250883AV00	MGX53	19,3	88	360	2100	39	3600	66	32	20	14,7	0,46	12	6200	4,1	180S/H 40%	1300
MGX53251203AV00	MGX53	26,4	120	360	2100	54	3600	95	24	20	20	0,26	7	6200	4,1	180S/H 40%	1300
MGX53251523AV00	MGX53	33,4	152	360	2100	64	3600	112	20	20	25,3	0,19	5	6200	4,1	180S/H 40%	1300
MGX53251903AV00	MGX53	42,0	191	360	2100	78	3600	137	17	20	31,7	0,13	3	6200	4,1	180S/H 40%	1300
MGX53252443AV00	MGX53	53,6	244	360	2100	95	3600	165	13	20	40,7	0,076	2	6200	4,1	180S/H 40%	1300
MGX53252943AV00	MGX53	64,6	294	360	2100	113	3600	200	9	20	49	0,056	1	6200	4,1	180S/H 40%	1300

*** MGX53S**

Static Load: 9000 kg

Weight: 1410

Tab. 3

BRAKE CHARACTERISTICS						
Model	Brake model	Power	Voltage	Current	Braking Force	Certificate
		[W]	[V]	[A]	[Nm]	
MGX53 - MGX53S	EMG00	1035W – 518W	207V _{DC-PEAK} - 104V _{DC-HOLD}	5A – 2.5A	2X2100Nm	EDPS 016

3.2 Dimensions

The technical drawing and the overall dimensions follow.

Fig. 2 MGX53

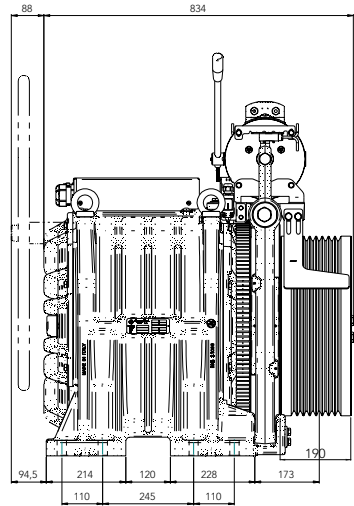
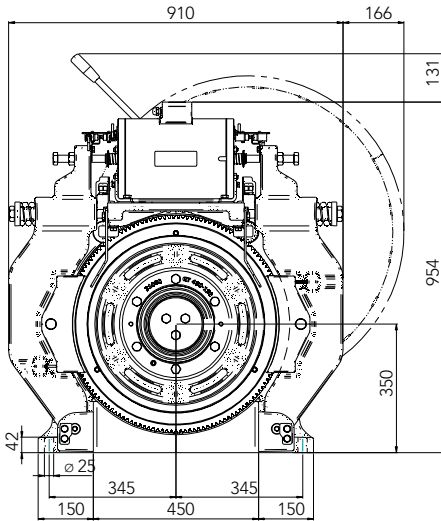
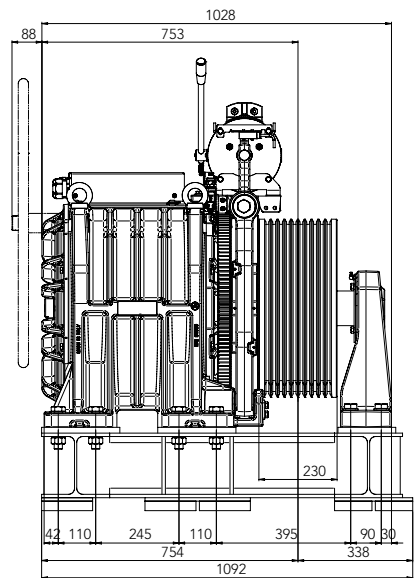
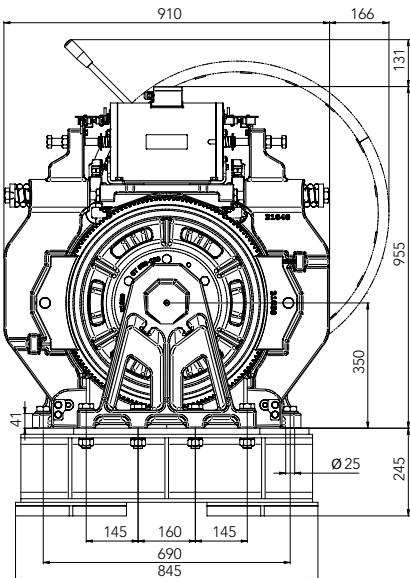


Fig. 3 MGX53S





Only use lifting systems and equipment with adequate lifting capacity for handling. The entire packaging is designed to allow movement with for lift and for lift truck.

4. TRANSPORT AND STORAGE

4.1 Handling

All gearless machines are packed in crates or cages.

Different types of packaging can be used, depending on the size and means of transport. Unless otherwise specified, the packaging complies with the HPE guidelines.

In some cases, the machines are mounted on wooden pallets to enable them to be transported correctly on trucks. The packaging may not be stacked in any way. It is recommended to check the conditions of the material when it is received. In case of damage, do not proceed with the installation unless expressly authorized by Montanari Giulio & C. Observe the symbols on the packaging to prevent damage to property or personal injury. Here are the meanings of the symbols that may appear on the packaging.



Keep dry



Handle with care



Attachment point



Upper side



Do not use hooks



Keep away from heat sources



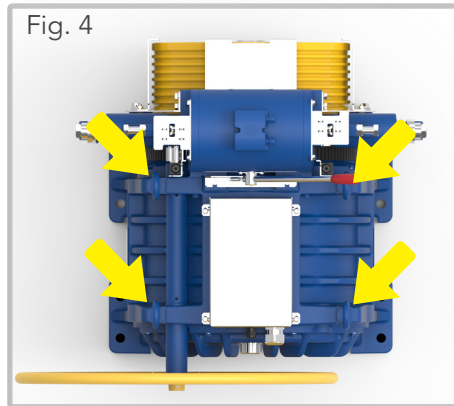
Fragile



Center of gravity



For lifting, anchor points (eyebolts) are provided as shown in Fig. 4. Use only the specified eyebolts to handle the unit.



4.2 Storage

The gearless machine must be stored in the position of use on a wooden base not subject to vibrations, in a covered and sheltered place.



If the unit is stored outdoors, it should be covered, taking care that no moisture and/or other foreign matter can accumulate on it.



Supplies for special environmental conditions during transport (e.g. by ship) and storage (climate, temperature, etc.) must be contractually agreed.



- Check the correct operation of the motor and brake after installation.
- Repairs may only be carried out by the manufacturer or by authorised personnel.
- The machine can be hot.
- These machines must be connected to inverters.
- When the machine is rotating, both manually and mechanically, it can act as a generator and produce high voltage.
- During configuration, the machine is powered by high voltage.




5. DESCRIPTION

5.1 General description

The MGX53 series gearless machines are permanent magnet motors with double brake system.

5.2 Main components

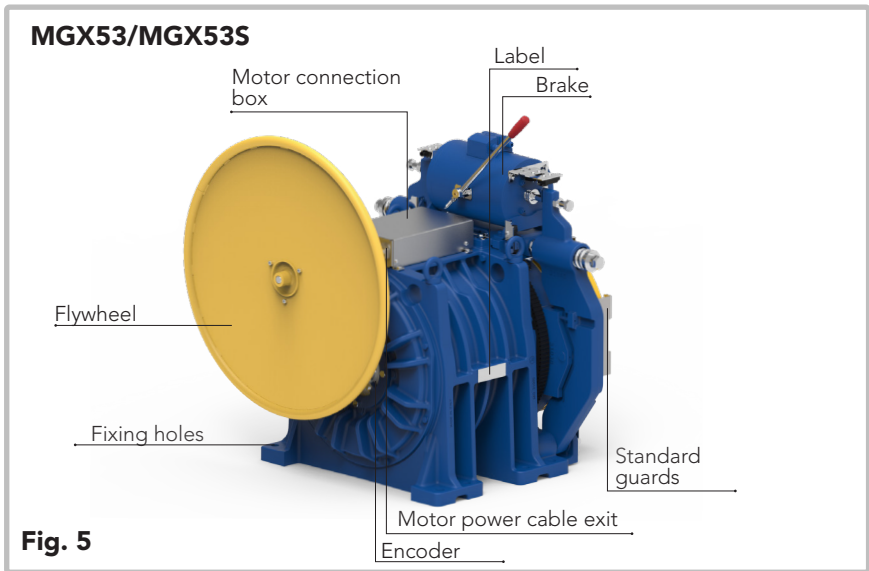
The unit consists of the main groups as shown in Fig. 5 - 6 - 7.

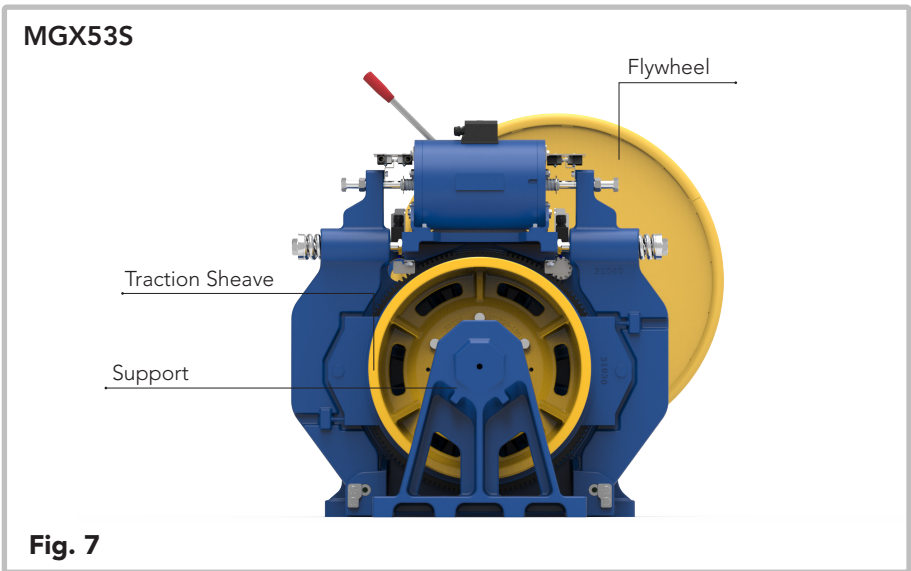
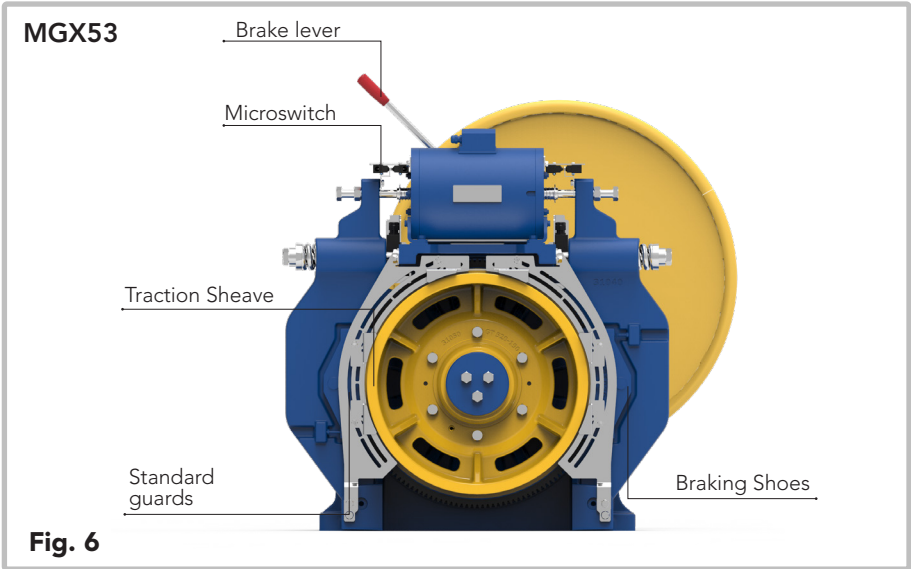
MGX53 is equipped with a PTC thermal probe inside the windings to protect against overheating (winding temperature up to 130°C) and with a thermo-contact for the activation of the fans. Refer to the electrical connections for more details. -  See Par. 6.4.

Lubrication



The gearless machine contains no oil and it is supplied with bearings already lubricated throughout the life of the machine; no further lubrication is required.







5.3 Brake

The gearless machine is supplied with a brake that conforms to the standards indicated in paragraph 2.5.

The brake system is pre-calibrated by the manufacturer and no further adjustment is required.

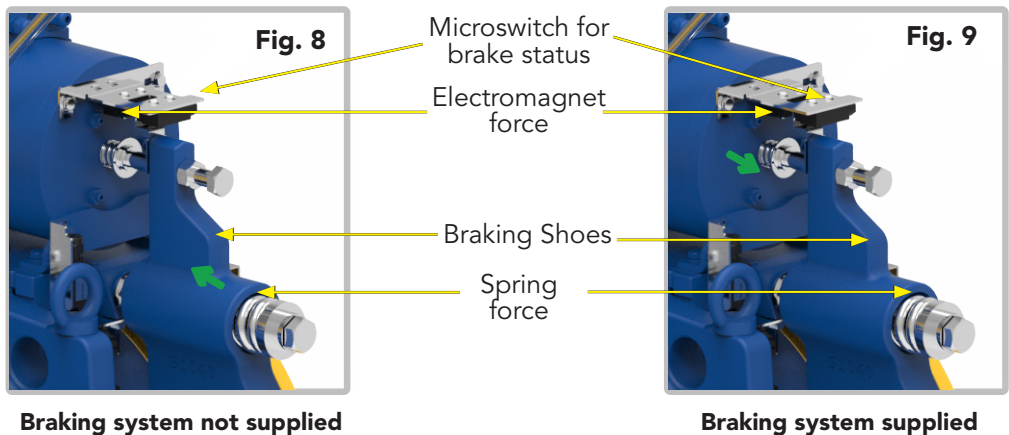


Danger: to assure the correct functioning of the braking system, avoid drop of oil or grease on the brake drum.

The braking system works as follows:

In resting state (electro-magnet not supplied), the braking drum is gripped by the braking shoes and the system doesn't move. The gripping force of the braking shoes is given by the springs (green arrow Fig. 8).

When the brake electromagnet is powered, it releases the braking drum (green arrow in Fig. 9)



6. INSTALLATION

6.1 General installation information



The gearless machine must be installed in a building or in a closed travel compartment.

Do not use the gearless machine in an explosive atmosphere.

The room temperature must be between 0°C and +40°C.

Assembly and installation must be carried out with great care by qualified and trained personnel.

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.

6.2 Installation surface

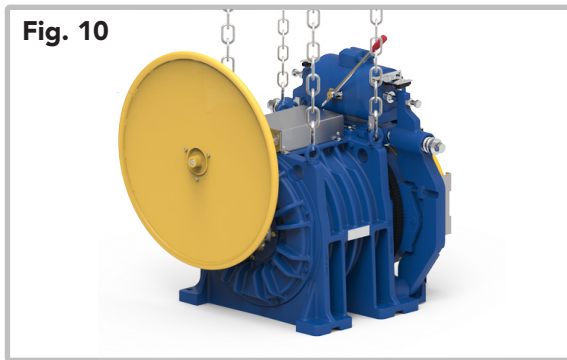
The installation surface must be uniform and level.

The levelling tolerance is 0.2 mm.

The installation surface must be rigid and robust enough to withstand the forces involved.

6.3 Installation procedure

The gearless machine can be lifted using the eyebolts for the insertion of the belts or lifting chains (see also the paragraph on storage and handling). Particular attention is needed to avoid that the gearless machine receives blows in correspondence of the braking shoes. Lifting example Fig. 10.



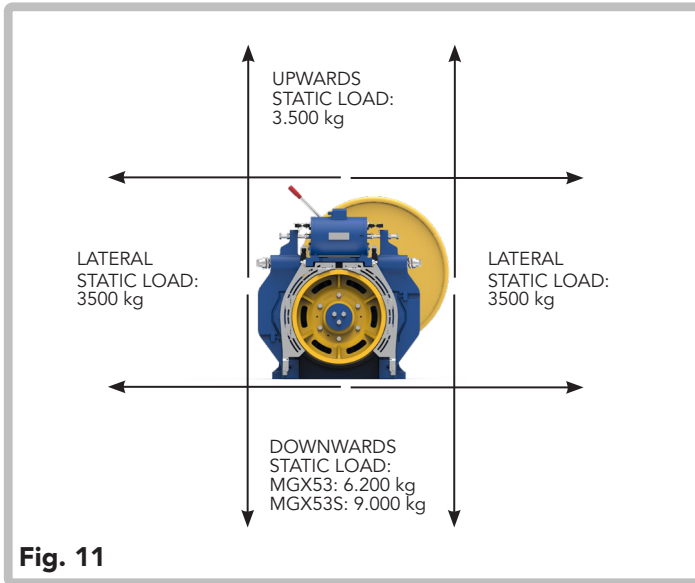
Place the unit on the installation surface and secure it.

- Fixing screws and nuts must be tightened to the prescribed torque.
- Use bolts with a minimum strength class of 8.8.
- Do not force or hit the fixings to position them; this could damage the bearings, rings, etc.
- Mount the safety devices.



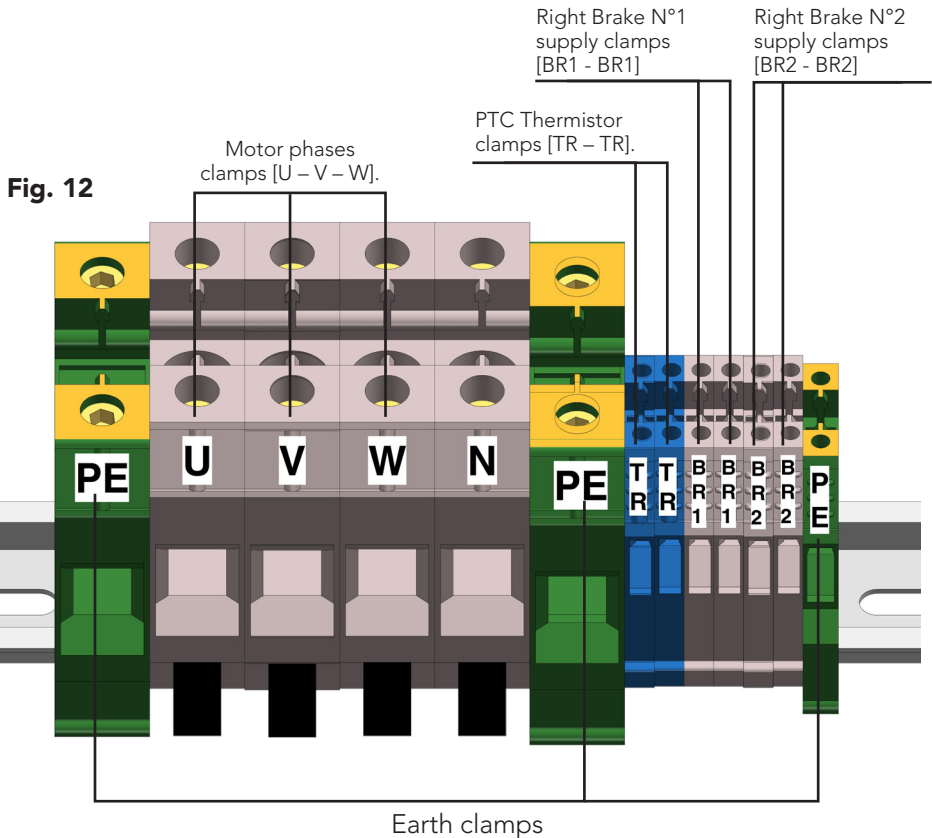
The static load changes depending on the roping direction. (Fig. 11):

Load direction



6.4 Electrical installation - Connections

The Gearless is provided of terminal block:



- The power cable must be routed separately from the other cables.
- The motor power cable is shielded and the shield must be grounded.
- The encoder cable must be routed away from the motor power cable to avoid electrical interference.



The brake system should be connected to two Booster devices.
The booster is an electronic device that provides an overvoltage of 207 Vdc for a few seconds and an hold voltage of 104 Vdc.

Connect one Booster to each coil.

Important: the boosters must be synchronized for the correct functioning of the brake system (each coil drives one braking shoe).

Below an example for setting the parallel connection of the brake coil.

- **Standard mode:**

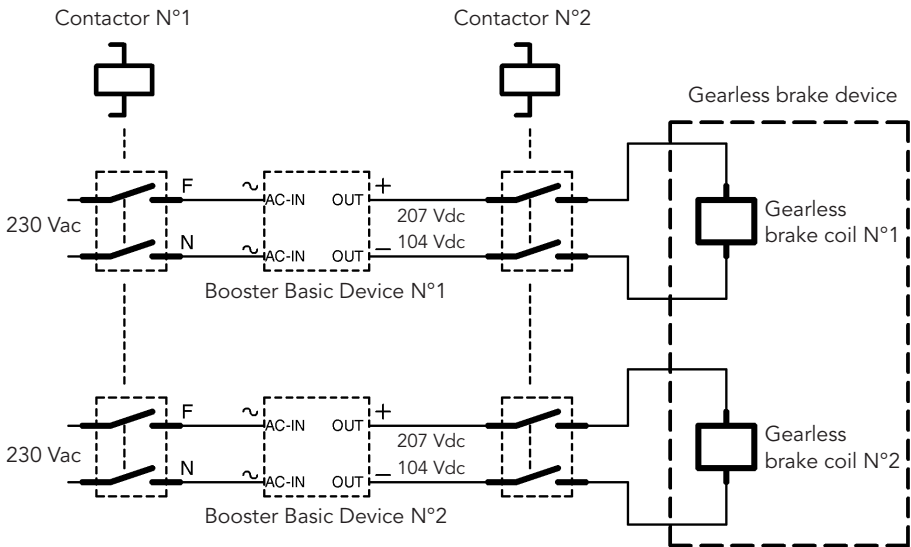
It is possible controlling only contactor 1 and leaving contactors 2 and 3 closed. (Fig. 13). This protects the brake from dangerous overvoltage and noise when closing.

- **Emergency mode and inspection mode:**

The use of all contactors is recommended. Using only contactor no. 1 during opening and/or closing operations may cause an unacceptable delay when closing the brake.

Fig. 13 Typical application with brake coils in parallel configuration.

MGX53

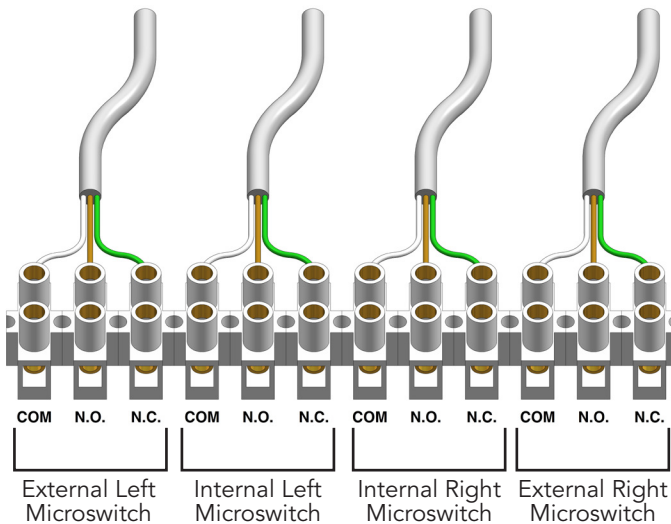


The power supply signals of the braking system are located inside the motor connection box.

Each breaking shoe has two micro switches with N.O. and N.C. contacts (Refer to Fig. 8 and Tab. 4 for detail).

NOTE: to preserve the electromagnet against overvoltage, there are two varistors between "BR1" and "BR1" and two between "BR2" and "BR2" clamps in the terminal block (Example: S20K275 - This component cuts off voltage peaks).

Fig. 14 Mammut clamps



Tab. 4

Brake disc closed	Condition contact	Brake disc free	Condition contact
WHITE COM. ——— / ——— BROWN N.O.	Disconnected	WHITE COM. ——— / ——— BROWN N.O.	Connected
WHITE COM. ——— / ——— GREEN N.C.	Connected	WHITE COM. ——— / ——— GREEN N.C.	Disconnected



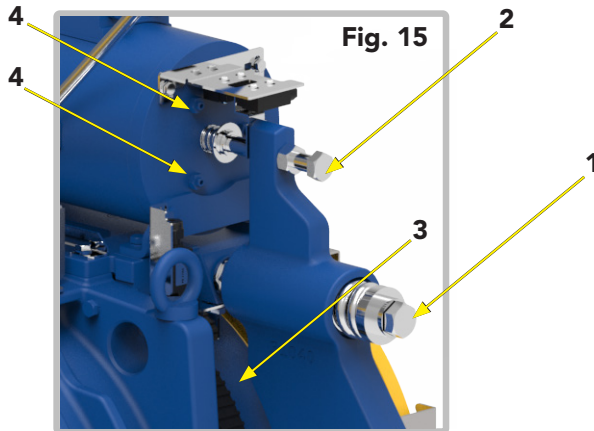
7. BRAKING SYSTEM ADJUSTMENT

The braking shoes are calibrated by Montanari Giulio & C., therefore the nuts (1) and (4) don't required any further adjustment.

The braking shoes should open with the minimum stroke possible to avoid contact between braking pads and brake drum and consequently noise in braking phase. The stroke is calibrated by Montanari Giulio & C. but during the machine life, brake pads can wear.

If the space (3) between brake pad center and brake drum is or becomes more than 0.5 mm when the electromagnet is supplied, tighten or loosen the regulation screws (2) to adjust the stroke.

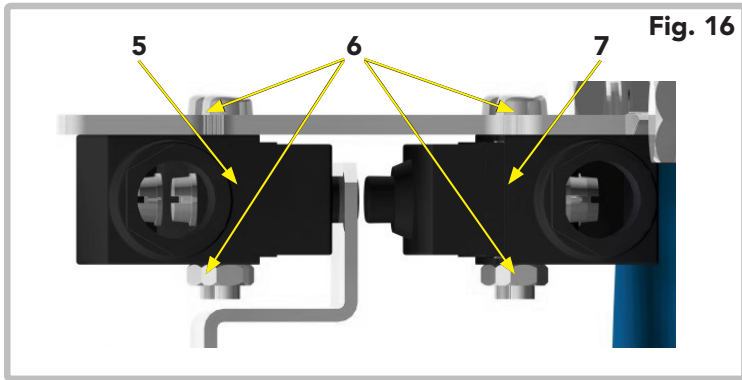
NOTE: the braking shoes must be replaced when the brake pads thickness is $\leq 2\text{mm}$.



Each breaking shoe has two micro switches (Fig. 16) which are already set in fabric. If adjustment is necessary, unscrew the two screws (6) of each microswitch and move to the left or right in order to get the correct contact signal.

The microswitch n°7 on Fig. 16 is used to check braking shoe closing while n°5 on Fig. 16 is to check the opening.

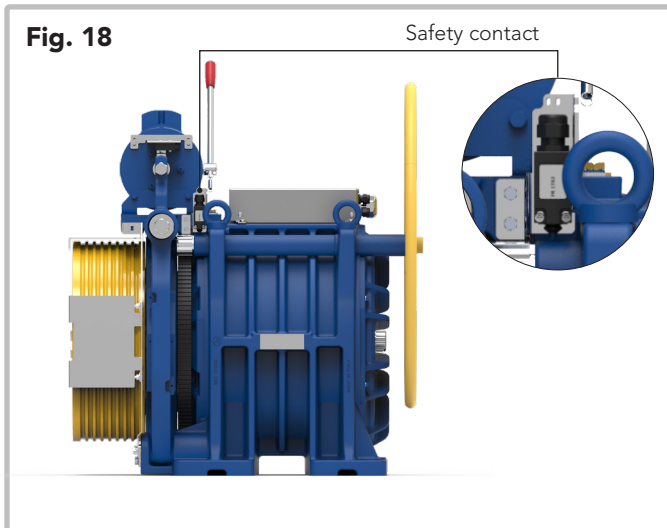
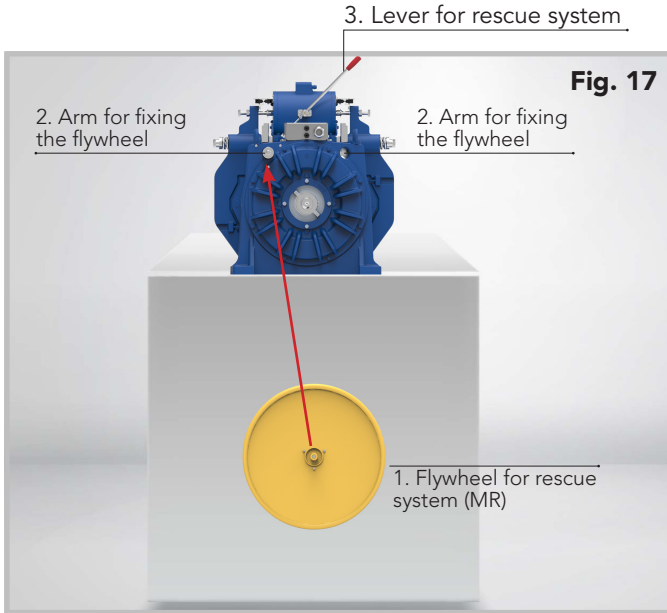
NOTE: The contacts can withstand a maximum load of 250 Vac with 1A, for a mechanical duration of over 2 million operations.





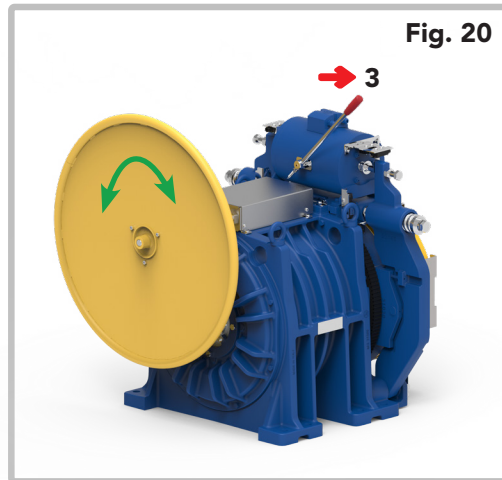
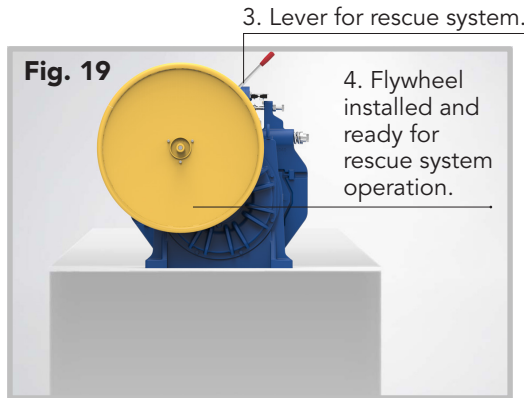
8. RESCUE SYSTEM

IMPORTANT: during normal functioning the flywheel is not installed. Use it only to perform rescue system.



Stop the system and remove electrical supply.

- Calm any people inside the cab.
- Remove the flywheel (1) from the hook and install it in the arm. The flywheel can be installed in one of the two specific arms (2) (Fig. 17). The NC contact (Fig. 18) of the flywheel switch opens the supply circuit and ensures safe manual operation. The machine now looks like in Fig. 19. * (NC = Normally Closed)



Grasp the flywheel firmly (4).

Operate lever (3) for manual brake release. Red arrow direction (Fig. 20). Slowly turn the flywheel in the wanted direction to move the cab until the floor is reached. Close the brake by releasing the lever.

Open the floor door and the cab door to free the people inside.

Note: the company carrying out the maintenance of the lift system is responsible for these operations



9. OPERATION

9.1 Connections

Connect the motor, brake, and monitoring devices.

The connection must be made by qualified personnel in accordance with the applicable safety regulations. Installation and operation requirements and current national and international standards must be met.

9.2 Additional components

If third party additional components or options are installed, please refer to the information in the respective separate documentation provided.

9.3 General operation information

When operating the MGX53 unit, be sure to check that the following situations do not occur:

- Excessive operating temperature.
- Excessive and unusual noise.

If any irregularity occurs during operation, turn off the power immediately. Identify the cause of the malfunction by using the table in Chap. 9, containing a list of possible problems, causes and suggested remedies.



If the cause of the malfunction cannot be identified, or if the unit has been repaired using the means available, you should contact one of our service centres for a specialised service.

10. TROUBLESHOOTING, MAINTENANCE AND REPAIR

10.1 General information



Problems and malfunctions occurring during the warranty period, which are not precisely identified or which require work on the unit, must be referred to the manufacturer's Customer Service department.

Observe all safety rules.

Do not disassemble the motor on site.

The bearings are protected and do not require any additional lubrication under standard conditions of use.

Do not use high-pressure cleaners on the motor.

Montanari cannot guarantee or be held responsible for unauthorized operations on the unit, improper use, modifications made without its consent or the use of non-genuine spare parts.



When repairing problems or malfunctions, the unit must be put out of service in order to prevent unintentional start-up. Place a warning sign on the starting switch.

10.2 Traction/return sheave

Periodically, at least once a year, check the wear of the grooves in the traction sheave.

In case of slipping ropes or excessive wear, contact Montanari Giulio & C. for replacement instructions, always indicating the serial number.

10.3 Replacement of components

Instructions for the replacement of any component must be requested each time from the technical department specifying the serial number.

10.4 Problems, causes and solutions

Tab. 5

Diagnostic Table		
Problems	Causes	Solutions
The motor does not work	Motor phases are connected in the wrong way	Check the connection condition of the motor phases
	Wrong inverter configuration	Check the inverter settings
	Inverter defective	Replace the device
	Brake faulty	See below
	Motor mechanically locked	Contact Montanari Giulio & C.
	Motor connections loosened	Tighten the connections of the machine controller.
	Excessive temperature	See below
Brake system not working	Brake power supply wrong	Check the correct supply voltage of the brake coil.
	Brake system defective	Contact Montanari Giulio & C.
Excessive temperature	Cooling fan not working.	Replace the fan
	Cooling fan not correctly connected.	Check the voltage of the cooling fan. (230 V ac)
	PTC sensor defective	Contact Montanari Giulio & C.
	Wrong inverter settings	Check the inverter settings
Noise while travelling	Alignment of the motor with the deflection sheave incorrect.	Check and correct the alignment.
	Encoder defective	Replace encoder
	Wrong inverter settings	Check the inverter settings
	Bearing defective	Contact Montanari Giulio & C.



10.5 Maintenance and repair

10.5.1 General indications



The unit must only be used, maintained and repaired by authorized, properly trained and qualified personnel.

Compliance with the inspection and maintenance intervals is part of the conditions for the validity of the warranty.

10.5.2 Description of maintenance activities

Stop the unit and put it out of service. Place a warning sign on the start switch to prevent unintentional start.

Cleaning the unit.

Remove dirt on the unit with a hard brush.

Remove corrosion signs.

The unit must not be cleaned with high pressure washing equipment.

11. SPARE PARTS

11.1 General information



By keeping the main spare parts and wear parts in stock, the unit can always be used.

11.2 How to order spare parts

The manufacturer guarantees only genuine spare parts and accessories supplied by him.

Other parts not supplied by the manufacturer have not been tested or approved. The use of these parts can therefore compromise certain characteristics of the gearless machine and expose it to active and passive safety risks.



The manufacturer will not assume any responsibility and will not recognize warranty for damage caused by spare parts and accessories not supplied by the manufacturer himself.

When ordering spare parts, always specify:

- Order no. of the machine to which they must be applied;
- Part code;
- Description;
- Quantity.

To order spare parts, write to **service@montanarigiulio.com**.



12. COMPLIANCE DECLARATION



Montanari Group
GEARLESS&GEARBOX
TRACTION MACHINES

MONTANARI GIULIO & C. S.r.l.

COMPLIANCE DECLARATION
GEARLESS

Manufacturer:

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

Models concerned by the current declaration:

MGX19 – MGVI19 – MSG19M – MGS19L – MGVI20M – MGVI20L – MG200.3 – MGX21 – MGVI25S
– MGVI25M – MGVI25ML – MGVI25L – MGVI34 – MGVI34S – MGVI34M – MGVI34ML – MGVI34L –
MGVI34.4 – MG34S.6 – MGVI34.6 – MGX75 – MGX80 – MDD035 – MDD070 – MGVI30.4 – MGVI30.6
– MGX53 – MGX53S.

It is stated that the gearless 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 1 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 81-20:2014

Note:

As regards, the fulfillment of the paragraph 9.7 of the UNI EN81-1:2010 and 5.5.7 UNI EN81-20:2014, it is recalled that Montanari provides safety device only upon explicit request by the customer.

Drafting:

Stefano Bertoni – Technical Director

Signature:

Massimo Montanari – Legal Representative

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Modena, il 20/03/2020

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Montanari Group
GEARLESS&GEARBOX
TRACTION MACHINES

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