FramoMorat Slip-on geared motor COMPACTA GS, GR

Operating instructions/General description for types GS, GR

1.0 Technical documentation

1.1 The following are included in the description:

- Dimension drawing of gear unit
- Electrical circuit diagram
- Adjustment instructions for switching unit
- Installation plan and cable cross sections

which are attached to the drive in a protective envelope when delivered. The documentation is available in German, English and French.

1.2 Read all documents carefully before commissioning or assembly. An appropriately skilled person must carry out installation and electrical connection! Technical operating data and other important information is attached to the gear unit with adhesive film and must be followed!

2. Delivery conditions and warranty

2.1 All Compacta gear units are subjected to a detailed test run before delivery and are checked in accordance with order data. Only skilled personnel are permitted to open the gear unit in the vicinity of the terminal box for the purpose of electrical connection. The gear units are ready for operation, filled with a synthetic oil, the long service life of which corresponds to that of the gear unit.

2.2 The gear units are only suitable for connection to a 24 V DC mains. The transformer required to convert 1-phase alternating current into 24 V direct current should be designed so that a maximum voltage of 40 V during idling is not exceeded. In normal operation, the current intensity is max. 20 A. Lengths and cross sections of the supply lead from the transformer to the gear unit can be seen in the enclosed installation plan.

2.3 The gear motor emits operating heat via the housing surface. Additional cooling is not provided, which means that only short-time operation is permissible. An uninterrupted running time of 5 minutes should not be exceeded. Appropriate cooling times and rest periods of a few minutes should be observed. If a maximum temperature of 70° is exceeded on the motor, a thermostatic switch switches off the controller if the limit switches are correctly evaluated by the used controller. It is not allowed that motor current flows over the limit switches because they are only suitable for max. 2 A=!

2.4 If repairs are necessary or if the drive is damaged, we recommend that you send the drive to the manufacturer or to the systems supplier or contract dealer. In urgent cases, a service technician can be requested at short notice (subject to a charge).

2.5 The warranty period for a correctly installed and operated gear unit is 1 year following commissioning or a maximum of 18 months following delivery. Incorrect connection or handling of the gear unit releases us from the obligation to provide any warranty service.

3.0 Setting up, attachment and electrical connection

3. 1 The gear unit must not be distorted when assembled and fitted. The hollow gear shaft must be slipped onto and removed from the drive axle without the use of force. Gear unit is supplied with limit switches in central position. We recommend assembling the drive with the cover half unwound.
The drive unit is fitted with four screws. Please ensure the correct screw length. **Excessively long screws break the bores of the threads!**

3.2 With regard to the electrical commissioning, we would refer to the relevant protection directives (VDE 0100, part 702; set-up of power plant in the area of swimming pools), which must be observed by the user! Work on the transformer housing may only be done if there is a guarantee that your place of work is free of voltage and is secured against unintentional switching-on. The transformer may only be connected to a mains with a functioning protective conductor.

3.3 The following always apply for the initial electrical operation: Read the circuit diagrams and ensure that the correct operating voltage (24 V=) is available. Also read the gear unit rating plate. The terminals in the switching unit must be connected as specified. First, check the direction of rotation and, if necessary, correct it by changing the motor connections1+2.
Using a screwdriver, set the limit switches to the individual switching point for both directions of rotation (see separate adjustment instructions). Make sure that there is sufficient safety clearance for the end points, because the stopping behaviour of the gear unit differs slightly depending on its temperature. Different roatational speeds or speeds during operation, which can be up to ± 50 %, are obtained from the characteristic of a direct current motor for different power consumptions.

D6-GS-301e1/05.12

Framo Morat GmbH & Co. KG
Höchst 7 • D-79871 Eisenbach
Tel.: +49 (0) 7657 / 88-0
Fax: +49 (0) 7657 / 88-333
www.framo-morat.com
info@framo-morat.com

3.4 Safety coupling switch spindle in types GS
As a result of errors in commissioning (limit switches not connected or connected wrongly), the limit switching can be moved over the final positions. In order not to destroy the mechanics, a safety coupling (white plastic ring, 12 ø, with cams) has been positioned between the gear and the limit switch and is destroyed in cases of overload.
For the event of damage, a replacement coupling fitted with a cable binder is enclosed in the circuit-breaker. In order to replace the couplings, the entire casing of the circuit-breaker must be lifted off following loosening of the four fitting screws arranged in the base.

3.5 Attention: When operating without control electronics of Framo it is necessary to connect a RC element parallel to the motor in order to correspond to protection directives EMV (Framo order No. 04051204391250)

4.0 Maintaining and protecting the gear unit
Regular maintenance of the gear unit is not necessary. The gear unit, including the motor and switching unit, form a completely closed unit which is protected against the ingress of water and dust. The protection class corresponds to IP 54. However, high humidity or marked temperature differences can cause the formation of codensation. To avoid the damage resulting from this, a condensation water opening (diameter 4 mm) is provided in both the motor casing and in the switching unit. Depending on requirements, this opening can subsequently be sealed with a silicon mass. The gear units are splashproofed. An overfloating can damage the geared motor! Protection class IP 54 is only reached if the condensation water opening is closed.

5.0 Safety instructions
Only skilled personnel may perform electrical connection. The customer must secure rotating parts against unintentional contact (in accordance with the legislation on technical working equipment).

6.0 Condition of use
The application of gear units in equipment which is intended for the transport of passengers is only permissible after prior written consultation and the agreement of the manufacturer MORAT or their representatives.
We would refer users of gear units to safety rules, regulations and laws governing the protection of personnel working in the area of moving equipment and to the need for protective guards or barriers. Similarly protective measures are required where suspended loads are involved.

7.0 Load-carrying capacity of the gear unit hollow shaft

	Radial load	Axial load
Type GS 12	1500 N	750 N
Type GR 30	2000 N	1000 N

8.0 Options/Accessories

- Stub shafts
- Mounting angles
- Control electronics within plastic casing
- Transformer with rectifier and switch On/Off within plastic casing enclosure IP 20
- Same transformer as indicated above with built-in control electronics

Framo Morat GmbH & Co. KG
Höchst 7 • D-79871 Eisenbach
Tel.: +49 (0) 7657 / 88-0
Fax: +49 (0) 7657 / 88-333
www.framo-morat.com
info@framo-morat.com

Installation instructions (Translation)

1.0 Safety information

1.1 Warning notices

Signal words are meant to indicate danger, proscription or important informations.
The following signal words are used:

Danger: DANGER indicates a hazardous situation which, if not avioded, will result in death or serious injury.

Warning: WARNING indicates a hazardous situation which, if not avioded, could result in death or serious injury.

Caution: CAUTION indicates a hazardous situation which, if not avioded, can cause damage or could result in minor or moderate injury.

Notice : NOTICE is used to address practices not related to personal injury.

For furter visualisation we use the following symbols:


General Warning


Hot surfaces


Electrical dangers


Slip danger


Pending loads


Crush hazard


Environmental danger

The symbol indicates the type of danger, the signal word indicates the severity of the danger.

1.2 General safety notes

Before installation of the Framo slip-on geared motor the following predictions have to be fulfilled, so that it can be assembled with other parts to a complete machine, without harming the security or health of persons.

- Every slip-on geared motor is shipped with the installation instruction and the circuit diagram. These are taped to the drive in an envelope. Installation without this documentation is forbidden. Unintended or inappropriate use leads to the loss of any liability claim. This installation instruction and the annexed declaration of incorporation have to be attached to the Framo drive until it is assembled into a complete machine and therefore becomes a part of the technical documentation of the complete machine.

- Before installation and operation read all documents carefully and follow all instructions.

- The abidance of basic safety- and health protection requirements is considered by application of accredited engineer standards during design and is approved by the declaration of incorporation.

- The mechanical and electrical installation as well as the adjustment and setup has to be done by certified electricians, authorized by responsible authority.

- Doublecheck the technical data on the name plate and follow the instructions on the labels of the drive.

Framo Morat GmbH & Co. KG
Höchst 7 • D-79871 Eisenbach
Tel.: +49 (0) 7657 / 88-0
Fax: +49 (0) 7657 / 88-333
www.framo-morat.com
info@framo-morat.com

• Moving parts have to be secured against unintentional contact to avoid injuries. The manufacturer points out that this is the responsibility of the user.

• Don't modify the drive. Modifying the drive is dangerous and voids the warranty.

• Don't block the drive while operating. This may cause hazard to persons and/or property and may damage the drive seriously.

• Don't overload the drive. The values for torque and duty cycle declared on the name plate can't be exceeded. Non-observance may cause danger to persons and property and the drive may be damaged seriously.

• The gear units are only suitable for connection to a 24 V DC mains. The transformer required to convert 1-phase alternating current into 24 V direct current should be designed so that a maximum voltage of 40 V during idling is not exceeded. In normal operation, the current intensity is max. 20 A. Lengths and cross sections of the supply lead from the transformer to the gear unit can be seen in the enclosed installation plan.

• Make sure that power is disconnected before working on the open terminal box or limit switches. Secure the power source against unintentional switch on.

• Pay attention to the appropriate circuit diagram (schematic).

• Don't touch the drive during operation. The housing temperature can rise up to 90°C (close to 200°F).

1.3 Conditions of use

Framo slip-on geared motors are drive systems, solely determined to drive machines, devices and equipment that exclude direct or indirect hazards to persons. If hazards to persons cannot be excluded, it is obligatory to build additional devices (e.g. cover, shut off, cutting unit) to eclude the risk. As long as this additional device is not attached it is forbidden to use our drive.
We refer users of gear motors to safety rules, regulations and laws governing the protection of staff working in the area of moving equipment. Protective guards or barriers shall be used. Similarly-protective measures are required where suspended loads are involved.
Keep in mind the common due diligence in connection with technical products to avoid further hazards.

Attention Danger!
Applications intended for the transport of passengers are not permissible!

Attention Notice!
If our product optionally allows such an application, has to be clarified with the manufacturer in advance.

Attention Caution!
By default our gear motors are intended for environmental temperarture from 0°C up to 60°C, and a duty cycle of up to 60%. The protection class is IP54.

Framo Morat GmbH & Co. KG
Höchst 7 • D-79871 Eisenbach
Tel.: +49 (0) 7657 / 88-0
Fax: +49 (0) 7657 / 88-333
www.framo-morat.com
info@framo-morat.com

2.0 Transport, Setup and Installation

2.1 Transport

Attention Caution!
Wear safety-shoes while carrying and working on/with the drive. A falling drive may cause injuries. Use a solid packaging to tansport the drive to the installation-site.

2.2 Setup and Installation

Mount the drive with four screws, making sure that the case is not distorted. Other parts (e.g. couplings, chain sprockets) must not be mounted by hammering (bearings and retaining rings may be damaged).

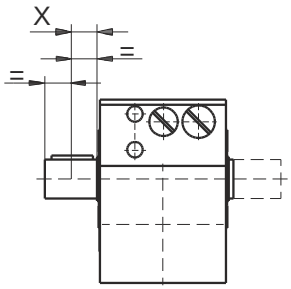
2.3 Fastening torque for mounting screws

Attention Warning
The property class for the mounting screws has to be 8.8 or better. Use the correct screw length to avoid damage of the housing. Use the following table for correct fastening torques and screw-in depth.

Type	Torque	Min. screw-in depth	Max. screw-in depth
GS12	14 Nm	10 mm	12 mm
GR30	25 Nm	12 mm	15 mm

2.4 Capacity of the output shaft

Type	Max. radial load	Min. axial load	X
GS12	1500 N	750 N	20 mm
GR30	2000 N	1000 N	20 mm



3.0 Electrical Installation

Attention Danger!
- Make sure to interrupt the current supply before working on the terminal box or limit switches and secure it against unintentional switch on.
- Read the circuit diagram carefully and pay attention to use the right voltage (see name plate on the drive)
- Connect all external control- and power supplies to the corresponding internal contacts (according to circuit diagram). If limit switches and/or thermal protection are not connected the drive can be destroyed. The thermal sensor (bimetal) is an NC contact (normally closed) and shall interrupt the motor power if activated.

Framo Morat GmbH & Co. KG
Höchst 7 • D-79871 Eisenbach
Tel.: +49 (0) 7657 / 88-0
Fax: +49 (0) 7657 / 88-333
www.framo-morat.com
info@framo-morat.com

• With regard to the electrical commissioning, we would refer to the relevant protection directives (VDE 0100, part 702; set-up of low-voltage supplies in the area of swimming pools), which must be observed by the user!
Work on the transformer housing may only be done if there is a guarantee that your place of work is free of voltage and is secured against unintentional switching-on. The transformer may only be connected to a mains with a functioning protective conductor.

• The following always apply for the initial electrical operation: Read the circuit diagrams and ensure that the correct operating voltage (24 V=) is available. Also read the gear unit rating plate. The terminals in the switching unit must be connected as specified. First, check the direction of rotation and, if necessary, correct it by changing the motor connections1+2.
Using a screwdriver, set the limit switches to the individual switching point for both directions of rotation (see separate adjustment instructions). Make sure that there is sufficient safety clearance for the end points, because the stopping behaviour of the gear unit differs slightly depending on its temperature. Different roatational speeds or speeds during operation, which can be up to ± 50 %, are obtained from the characteristic of a direct current motor for different power consumptions.

Attention Danger!
Protect the motor against unintentional start, because the thermal switch automatically closes the contact after cooling down (bi-metal contact).

• Confirm that the direction of the drive correponds with the dedicated limit switches (see adjustment instructions).

• The standard protection rating is IP54. The IP rating can only be assured if the approriate cable connectors are used.

Attention Notice!
Don't decellerate the motor by reversing the motor power. The life of the gear motor will be dramatically reduced.

4.0 Important informations

4.1 Duty cycle

Compacta gear motors are typically used for intermittent forward / reverse applications (max. duty rating 20 %) using the internal limit switches and a standard non-ventilated motor. The duty cycle reference time is 10 minutes in a max. ambient temperature 40°C at an altitude of 1000 meters.

4.2 Ambient temperature, water condensation

Attention Notice!
Permanently changing temperatures or high humidity can lead to water condensation.

Attention Warning!
The drain holes will effect the standard protection class (IP54).

4.4 Operating temperature

Attention Warning!
If the temperature of the drive, in spite of approved usage, exceeds 90°C, refer to the manufacturer. Perhapst there's a defect.

Framo Morat GmbH & Co. KG
Höchst 7 • D-79871 Eisenbach
Tel.: +49 (0) 7657 / 88-0
Fax: +49 (0) 7657 / 88-333
www.framo-morat.com
info@framo-morat.com

4.5 Safety coupling between limit switches and main gearing GS

Attention Warning!
In-approriate installation (no or false wiring of the switches) can cause the shift nut to overtravel and run against the limit switches. A coupling between the limit switch box and the main gearbox protects the limit switch assembly by breaking in case of overloading (white plastic coupling with 12mm diameter).

Attention Notice!
Compacta MS12 and AG60 gear motors are equipped with a spare coupling. Please contact the manufacturer if you need instructions to replace the coupling.

4.6 Oil leaks:

Use extra caution if the gear motor is leaking oil.
The surface might be slippery.

Under these circumstances environmentally detractions are possible.

4.7 Self-locking

Attention Notice!
Self-locking is affected by lead angle, face surface roughness, running speed, lubricant and temperature rise. A distinction must be made between dynamic (from motion) and static (standstill) self-locking.
Shaking or vibration can annul the self-locking.
Similarly a number of factors associated with lubrication, running speed and load can favour slip characteristics to such an extent that self-locking is counteracted.
This means that gearing which is self-locking in theory is no substitute for a brake or reverse lock.
Therefore it is impossible for us to accept warranty obligations in respect of self-locking.

Attention Danger!
Important: Self-locking can NOT be responsible for safety characteristics!

5.0 Warranty, maintenance, approved usage

The drive is maintenance free due to lifetime-lubrication.
The lifetime of the drive depends on the application (eg. ambient temperature, torque, speed, cycles, environmental influences).

6.0 Warranty and repair

All drives are tested before delivery. During warranty-time the drive shall not be opened except for the cover of the terminal box or the limit switch box. Further dismantling leads to expiration of any warranty by the manufacturer.

If a drive has to be repaired send it back to the manufacturer or a suitable agency. A service technician can be ordered for on-site service on short notice.

7.0 End of product life-time:

7.1 When the indicated lifetime is reached you can send the drive back for an overhaul.

7.2 If you want to dispose the drive please pay attention to ecological and legal regulations.

Framo Morat GmbH & Co. KG
Höchst 7 • D-79871 Eisenbach
Tel.: +49 (0) 7657 / 88-0
Fax: +49 (0) 7657 / 88-333
www.framo-morat.com
info@framo-morat.com

8.0 Service

To offer fast and competent help to our customers - e.g. while installation - we provide a service-number. Under +49 (0)160 / 941 84 444 you can reach the 24 hour hotline. Please note that the usual fee will arise.

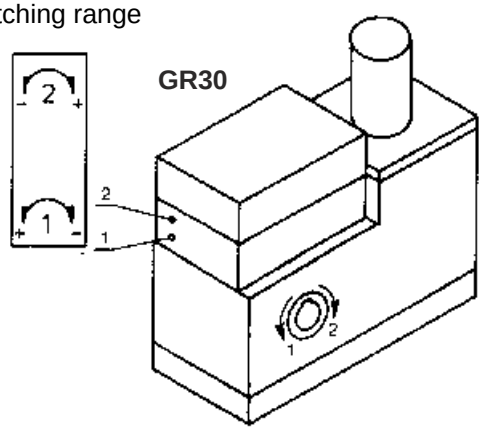
Framo Morat GmbH & Co. KG
Höchst 7 • D-79871 Eisenbach
Tel.: +49 (0) 7657 / 88-0
Fax: +49 (0) 7657 / 88-333
www.framo-morat.com
info@framo-morat.com

Slip-on geared motor COMPACTA GS, GR

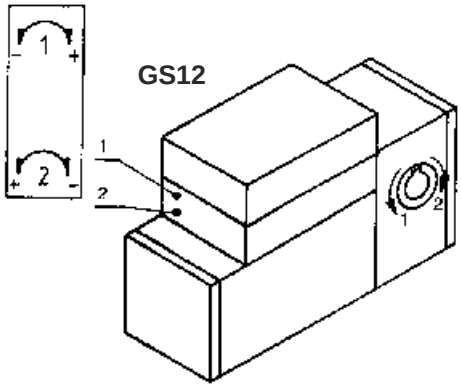
Adjustment instructions for the switching unit

Important: Please follow the adjustment instructions carefully! Connection and adjustment may only be carried out by a specialist!
To simplify adjustment, we have put the appropriate numbers on the front panel of the working and adjustment spindle (see diagram).

Switching range



Switching range



Adjustment spindle 1 is for direction of rotation 1
Adjustment spindle 2 is for direction of rotation 2

1 and 2 = Adjustment spindles for limit switch positioning

1. Connect the gear units as shown in the enclosed circuit diagrams.

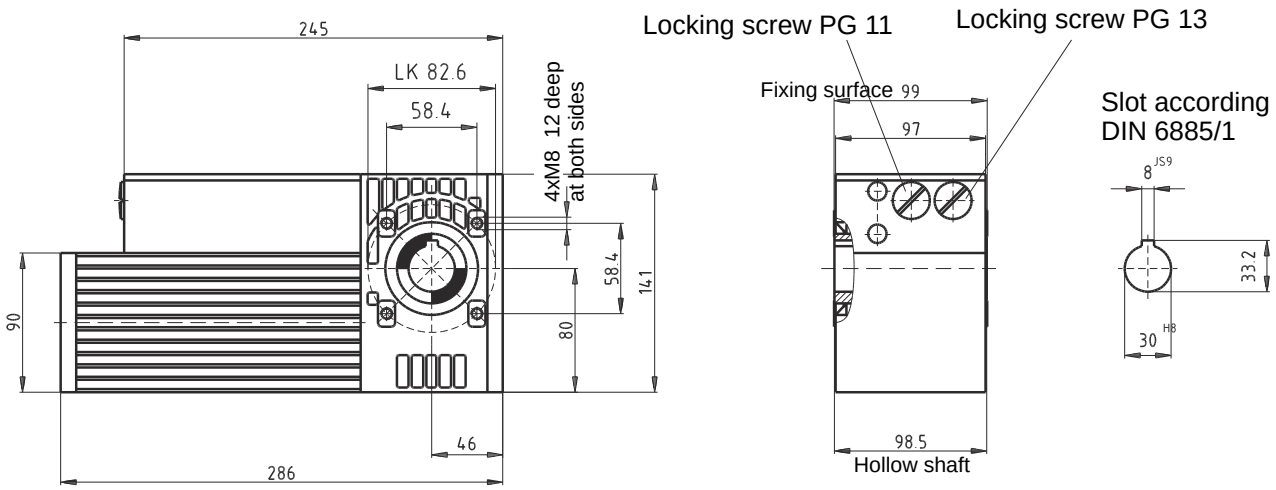
2. Press a Start key. If the gear unit does not start up, press the other Start key.

3. With the help of a screwdriver over the adjustment spindels, set the maximum travel or the two limit points as described above. To do this, you can approach the relevant end points with the Start and Stop key and, with the switch housing opened, turn the limit switch in the direction of the trip cam until the switch switches audibly. If the limit switch-off facility responds before the requested position is reached , the limit switch must first be moved away from the trip cam.

Framo Morat GmbH & Co. KG
Höchst 7 • D-79871 Eisenbach
Tel.: +49 (0) 7657 / 88-0
Fax: +49 (0) 7657 / 88-333
www.framo-morat.com
info@framo-morat.com

FramoMorat Slip-on geared motor COMPACTA GS12

Dimension drawing of drive GS12



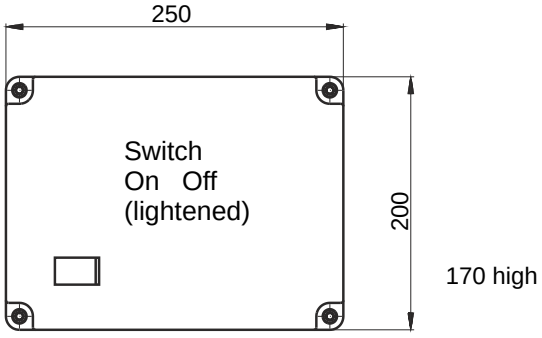
Technical dates:

Output torque:	120 Nm max.
Output speed:	4,5 rpm at 120 Nm
Idling speed:	8,5 rpm
Transmission:	i = 297:1
Motor nominal power:	280 W
Duty cycle at 120 Nm:	20 % S3
Nominal voltage:	24 V DC smoothed
Power input:	appr. 17 A at 120 Nm
Motor tpye:	Permanent magnetic
Protection class:	IP 54
Weight:	8,7 kg
Hollow shaft:	stainless steel

The values indicated are only valid in combination with Framo-transformer!

Limit switch range: 25 rev. of output shaft (Standard)
Increased limit switch range can be supplied as an option.

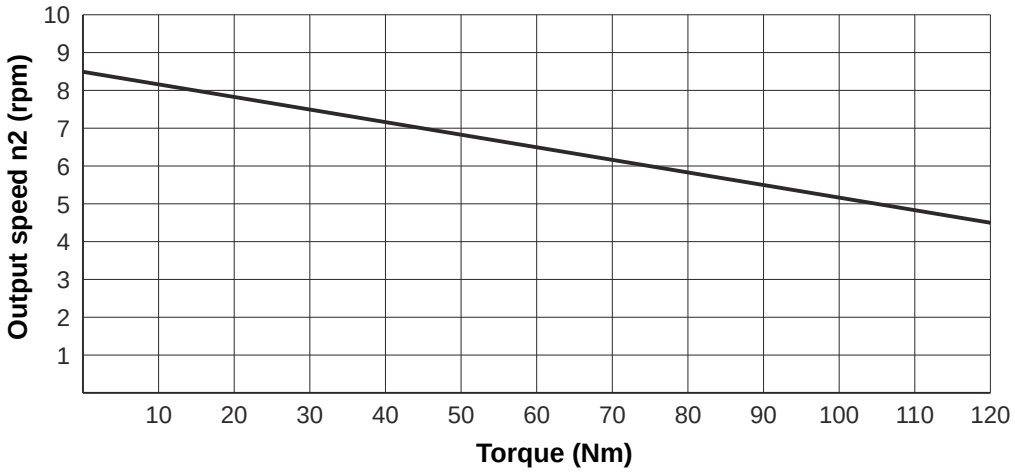
Transformer (power unit)



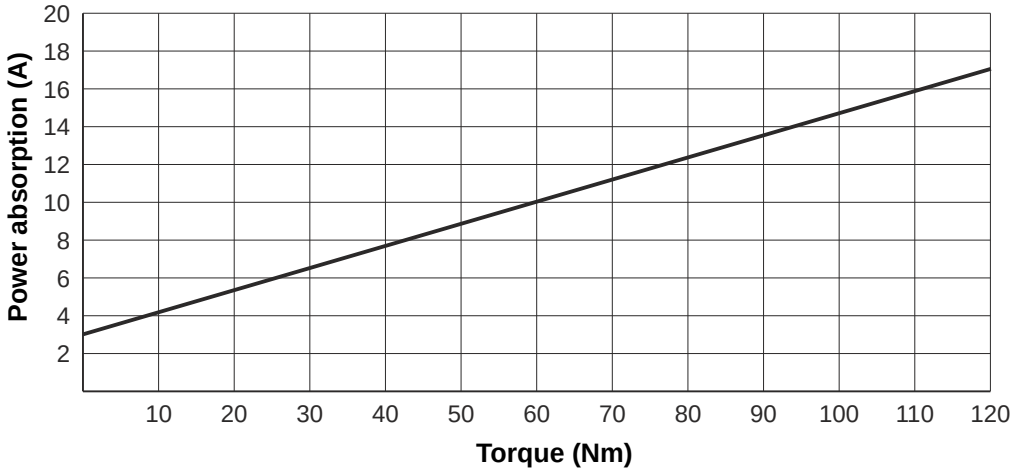
Framo Morat GmbH & Co. KG
Höchst 7 • D-79871 Eisenbach
Tel.: +49 (0) 7657 / 88-0
Fax: +49 (0) 7657 / 88-333
www.framo-morat.com
info@framo-morat.com

Characteristic Type GS 12

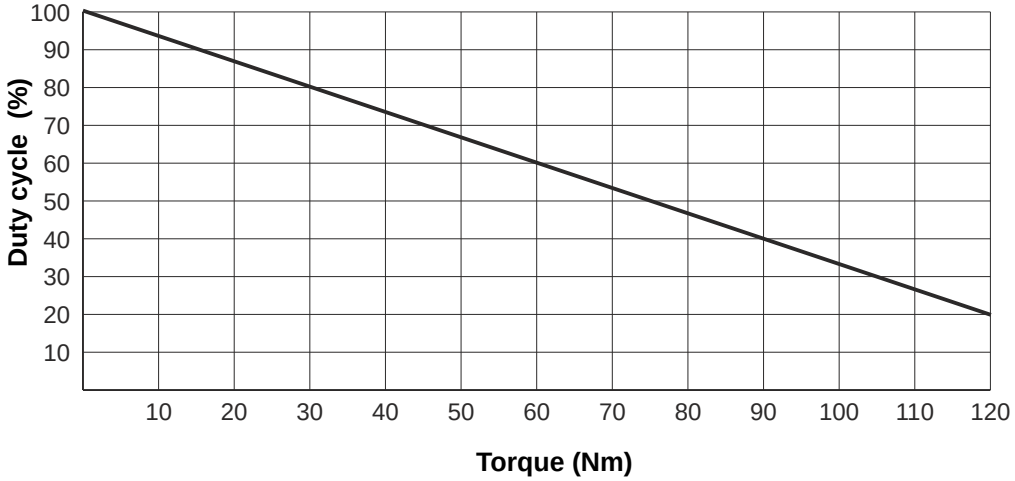
speed-torque-characteristic



power absorption-torque-characteristic



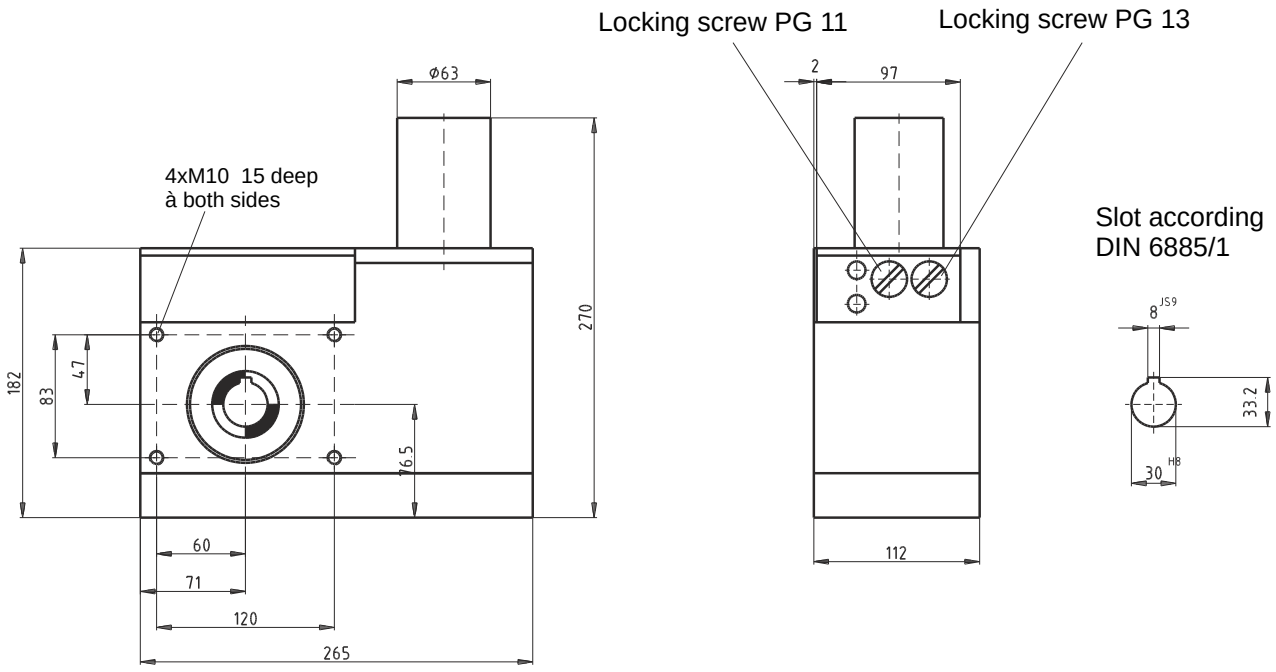
duty cycle-torque-characteristic



Framo Morat GmbH & Co. KG
Höchst 7 • D-79871 Eisenbach
Tel.: +49 (0) 7657 / 88-0
Fax: +49 (0) 7657 / 88-333
www.framo-morat.com
info@framo-morat.com

Framo Morat Slip-on geared motor COMPACTA GR30

Dimension drawing of drive GR30



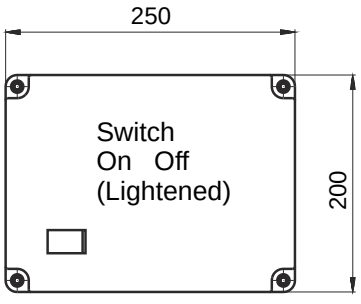
Technical dates:

Output torque:	250 Nm max.
Output speed:	2 rpm at 250 Nm
Idling speed:	6 rpm
Transmission:	i = 887:1
Motor nominal power:	280 W
Duty cycle at 250 Nm:	20 % S3
Nominal voltage:	24 V DC smoothed
Power input:	appr. 18 A at 250 Nm
Motor tpye:	Permanent magnetic
Protection class:	IP 54
Weight:	12,5 kg
Hollow shaft:	stainless steel

The values indicated are only valid in combination with Framo-transformer!

Limit switch range: 35 rev. of output shaft (Standard)
Increased limit switch range can be supplied as an option.

Transformer (power unit)

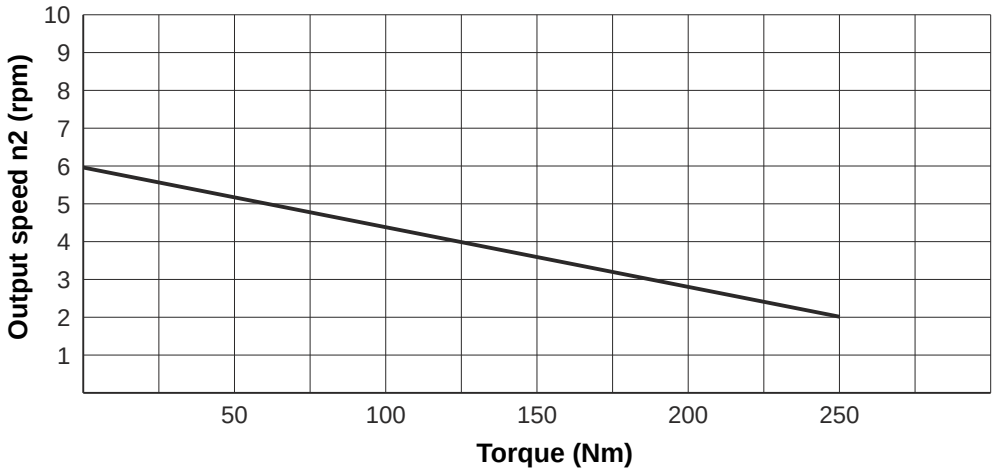


150 high

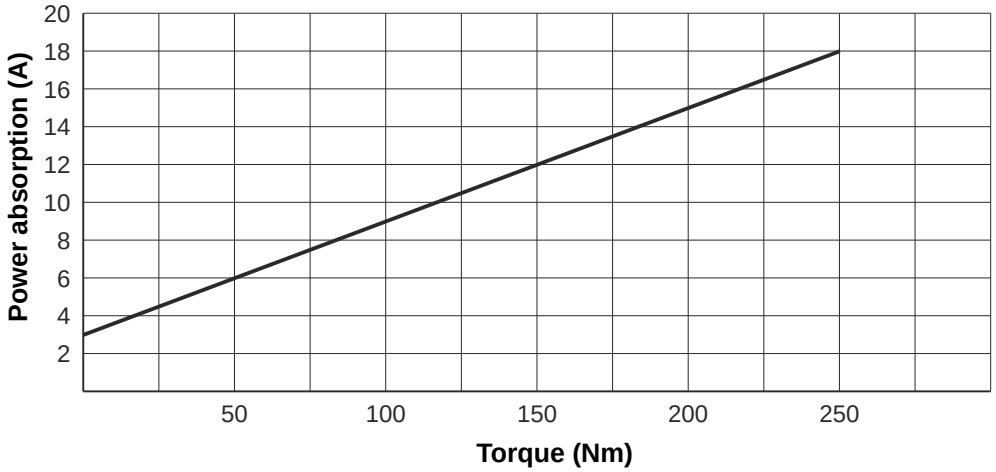
Framo Morat GmbH & Co. KG
Höchst 7 • D-79871 Eisenbach
Tel.: +49 (0) 7657 / 88-0
Fax: +49 (0) 7657 / 88-333
www.framo-morat.com
info@framo-morat.com

Characteristic Type GR 30

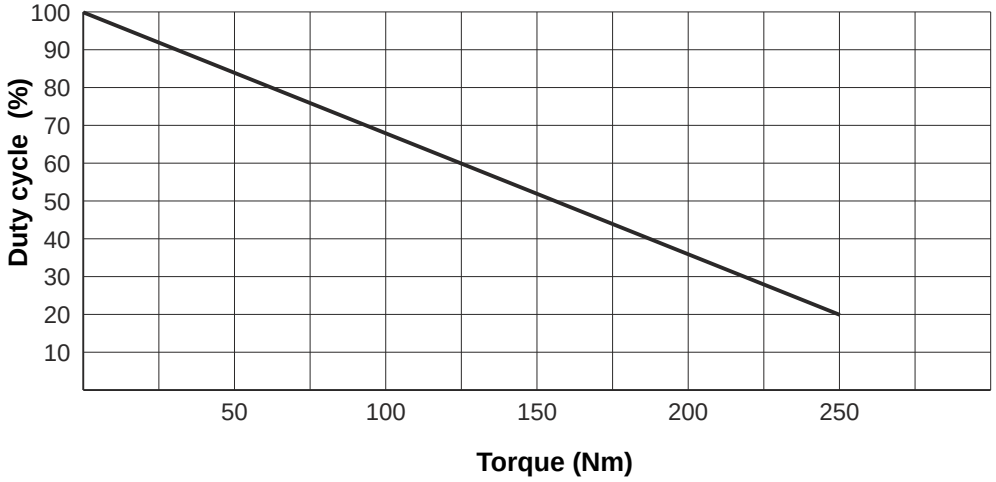
speed-torque-characteristic



power absorption-torque-characteristic

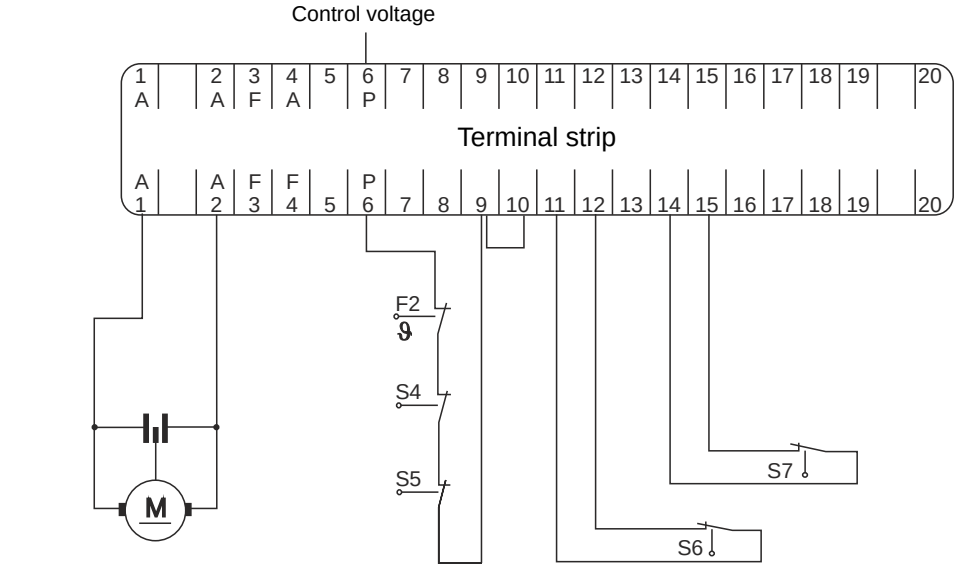


duty cycle-torque-characteristic



Framo Morat GmbH & Co. KG
Höchst 7 • D-79871 Eisenbach
Tel.: +49 (0) 7657 / 88-0
Fax: +49 (0) 7657 / 88-333
www.framo-morat.com
info@framo-morat.com

Electrical circuit diagram Types GS, GR



D.C. permanent magnetic motor

Attention!

Direction of rotation is changed by reversing the polarity of the connections to terminals 1 and 2.

External Emergency-Stop-button is connected between terminal 9 and 10 after having removed the jumper. External change of rotation buttons are connected between terminal 10 and 12 or between terminal 10 and 15.

S4 = Safety limit switch top
S5 = Safety limit switch bottom
S6 = Limit switch top
S7 = Limit switch bottom
F2 = Thermal switch

* When operating without control electronics of Framo it is necessary to connect a RC element parallel to the motor in order to correspond to protection directives EMV (Framo order No. 04051204391250)

Framo Morat GmbH & Co. KG
Höchst 7 • D-79871 Eisenbach
Tel.: +49 (0) 7657 / 88-0
Fax: +49 (0) 7657 / 88-333
www.framo-morat.com
info@framo-morat.com

Technical description for direct current control (within transformer)

General details

1.0 The transformer contains an electronic subassembly which proecesses a direct voltage of 24 V (max. 40 V) for permanently excited direct current motors. The maximum current requirement should not exceed 24 A (GS, GR) and 30 A (GG).

2.0 The printed circuit board has various functions and is subdivided into:

2.1 Two power terminals for 24 V input.

2.2 10-pole terminal strip for auxiliary functions and safety units, including the terminals for collecting 24 V for 0,5 A loads (e.g. remote control).

2.3 Six power terminals for 24 V input connection, motor output and brake or other units whilst operating.

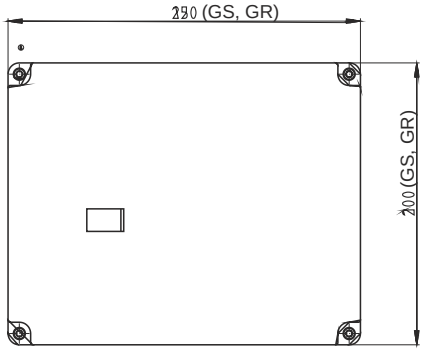
2.4 Potentiometer for adjusting and limiting the desired torque - standard setting = max. current 24 A

3.0 To control the direction of rotation, 2 relaiys which switch in the de-energized state are located on the printed circuit board. When the motor is switched off, a time-delayed linear current reduction occurs. This permits soft braking. This reduces the wear on the switching relays and has a positive influence on the service life. The third relay avoids false polarity.

4.0 Position indication over LED

LED red = overload during 2 seconds and switch off
LED yellow = Safety circuit interrupted e.g. by thermal protection. The LED will also light up after switching on if you have already activated a direction signal.

Dimensions

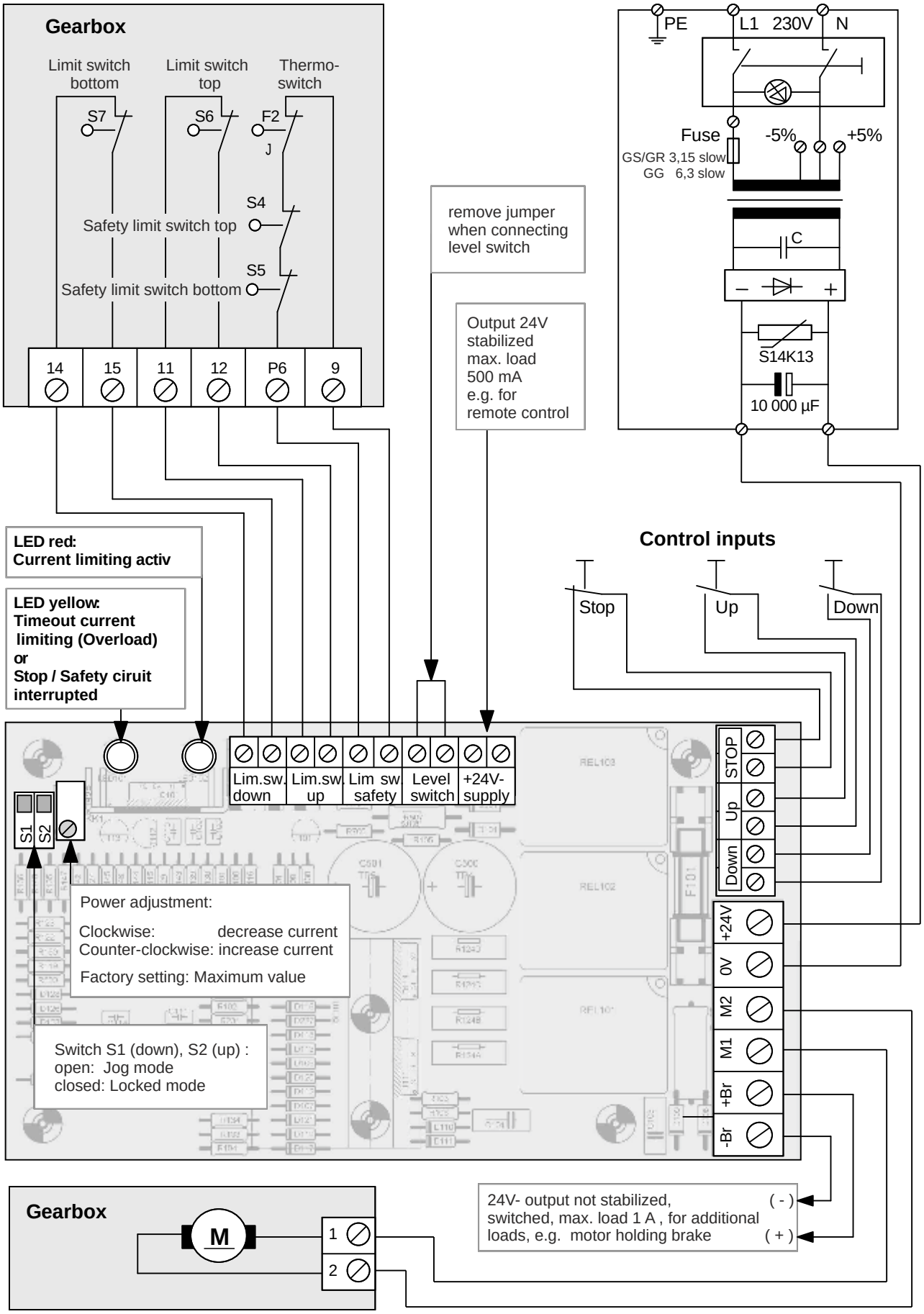


170 high (GS, GR)

Framo Morat GmbH & Co. KG
Höchst 7 • D-79871 Eisenbach
Tel.: +49 (0) 7657 / 88-0
Fax: +49 (0) 7657 / 88-333
www.framo-morat.com
info@framo-morat.com

FramoMorat Slip-on geared motor COMPACTA GS, GR

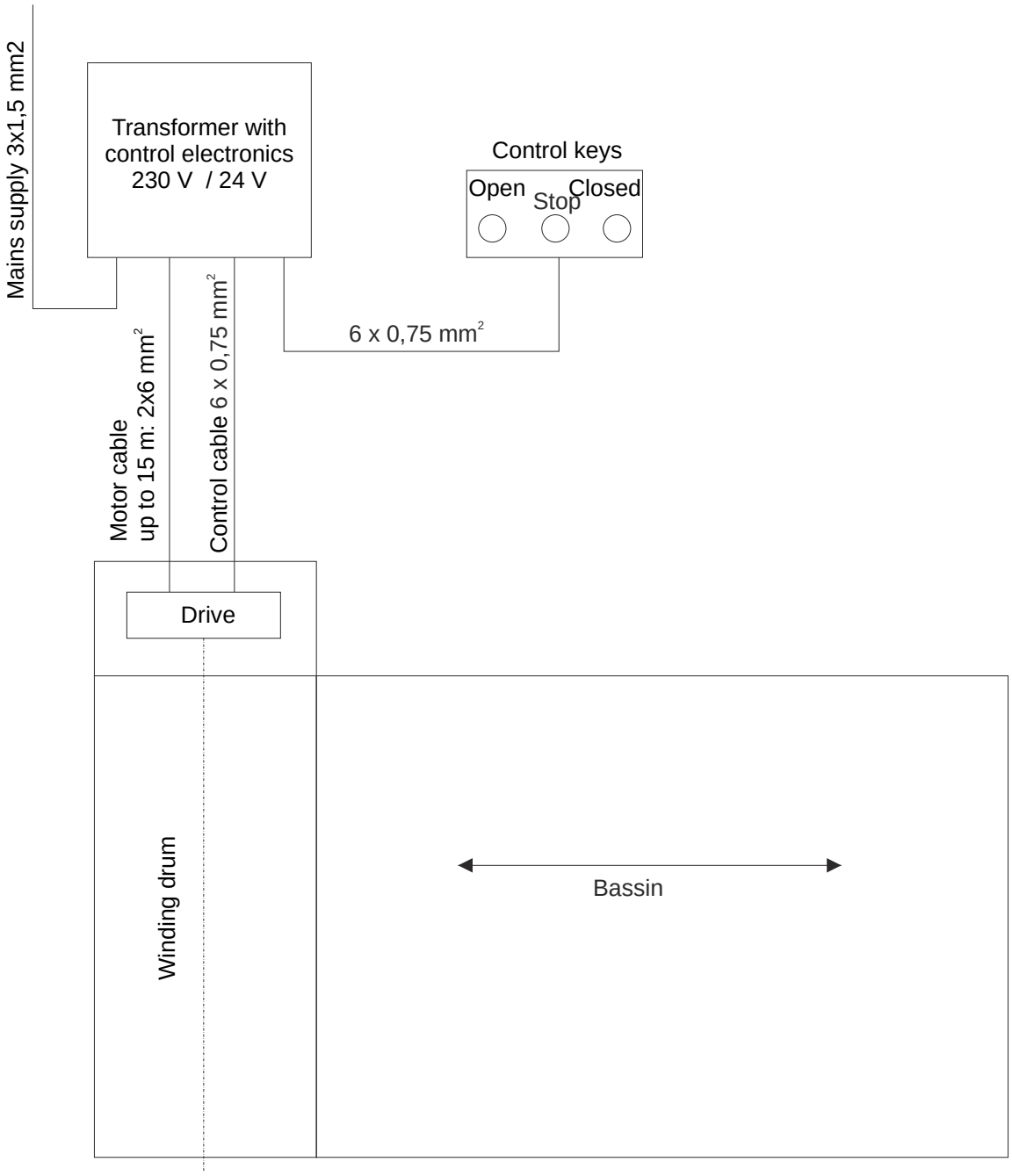
Wiring diagram for Gearbox motor with control circuit integrated in supply cabinet



Subject to technical changes

Framo Morat GmbH & Co. KG
Höchst 7 • D-79871 Eisenbach
Tel.: +49 (0) 7657 / 88-0
Fax: +49 (0) 7657 / 88-333
www.framo-morat.com
info@framo-morat.com

Installation diagram of cable-laying (electronics within transformer)



Attention:
For distances over 30m the control unit has to be seperated from the power suply and located closer to the pool cover drive (see: control unit in seperate enclosure).

0,75 mm²	=>	AWG 20
1,5mm²	=>	AWG 14
6mm²	=>	AWG 8

Framo Morat GmbH & Co. KG
Höchst 7 • D-79871 Eisenbach
Tel.: +49 (0) 7657 / 88-0
Fax: +49 (0) 7657 / 88-333
www.framo-morat.com
info@framo-morat.com

Technical description for direct current control (in separate housing)

General details

1.0 The separate casing contains an electronic subassembly which proecesses a direct voltage of 24 V (max. 40 V) for permanently excited direct current motors. The maximum current requirement should not exceed 24 A (transformer for GS and GR).

2.0 The printed circuit board has various functions and is subdivided into:

2.1 Six power terminals for 24 V input connection, motor output and brake or other units whilst operating.

2.2 10-pole terminal strip for limit switches and safety units, including the terminals for collecting 24 V for 0,5 A loads.

2.2 10-pole terminal strip for auxiliary functions and safety units, including the terminals for collecting 24 V for 0,5 A loads (e.g. remote control).

2.3 Six power terminals for 24 V input connection, motor output and brake or other units whilst operating.

3.0 To control the direction of rotation, 2 relaiys which switch in the de-energized state are located on the printed circuit board. When the motor is switched off, a time-delayed linear current reduction occurs. This permits soft braking. This reduces the wear on the switching relays and has a positive influence on the service life. The third relay avoids false polarity.

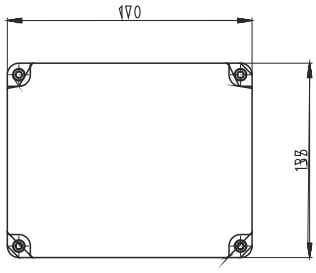
4.0 The transformer used should be fitted with a varistor in order to smooth current peaks of the motor. The transformer must have a smoothing of 10000 mF. Sufficient cable cross sections between transfomer and gear unit must be guaranteed. We recommend the original Framo transformer.

5.0 Position indication over LED

LED red = overload during 2 seconds and switch off
LED yellow = Safety circuit interrupted e.g. by thermal protection. The LED will also light up after switching on if you have already activated a direction signal.

6.0 Incorrect motor pole connection + or - will not damage the unit. If the control doesn't work after first setup, probably plus and minus is interchanged at the input terminal.

Dimension

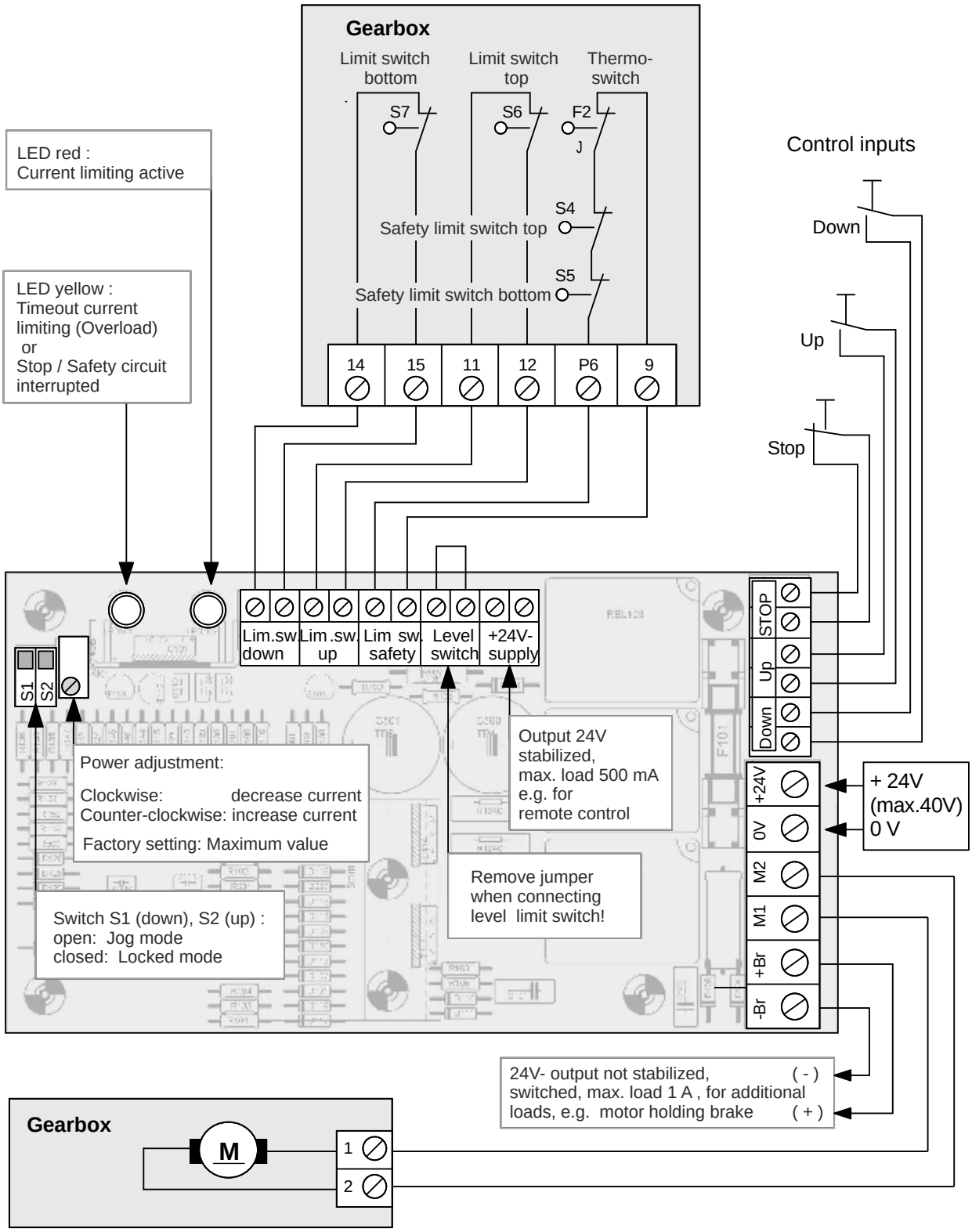


115 hoch

Framo Morat GmbH & Co. KG
Höchst 7 • D-79871 Eisenbach
Tel.: +49 (0) 7657 / 88-0
Fax: +49 (0) 7657 / 88-333
www.framo-morat.com
info@framo-morat.com

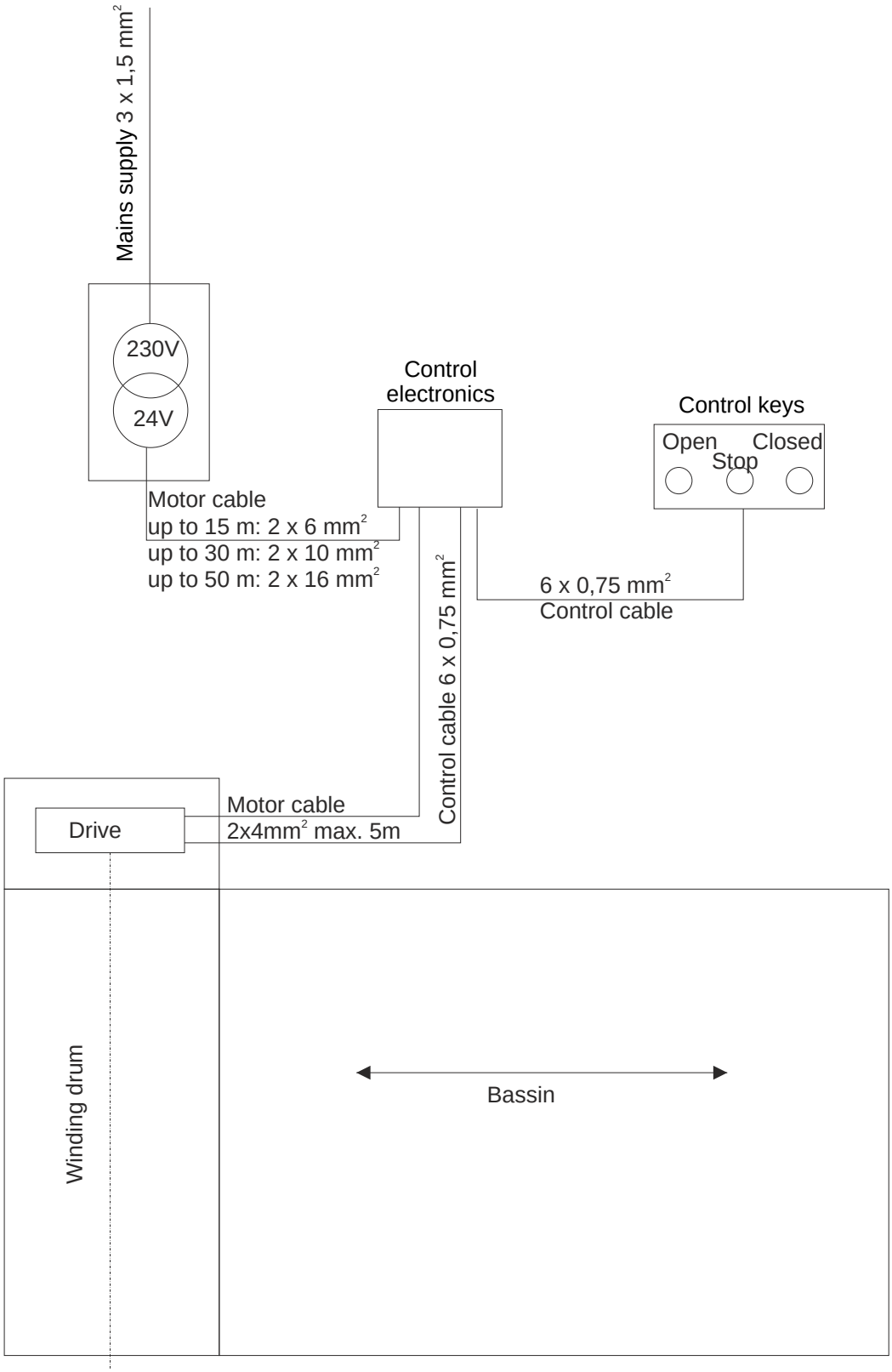
FramoMorat Slip-on geared motor COMPACTA GS, GR

Wiring diagram for Gearbox motor with control circuit in separate housing
(Size 170 x 135 x 115 L x W x H)



Framo Morat GmbH & Co. KG
Höchst 7 • D-79871 Eisenbach
Tel.: +49 (0) 7657 / 88-0
Fax: +49 (0) 7657 / 88-333
www.framo-morat.com
info@framo-morat.com

Installation diagram of cable-laying (electronics in separate housing)



0,75 mm²	=>	AWG 20
1,5mm²	=>	AWG 14
4mm²	=>	AWG 10
6mm²	=>	AWG 8
10mm²	=>	AWG 6
16mm²	=>	AWG 4

Framo Morat GmbH & Co. KG
Höchst 7 • D-79871 Eisenbach
Tel.: +49 (0) 7657 / 88-0
Fax: +49 (0) 7657 / 88-333
www.framo-morat.com
info@framo-morat.com

Slip-on geared motor COMPACTA GP6

General description

1. Construction

The Framo slip-on gearemotor COMPACTA GP6 is an integrated gearmotor having a 24 V DC motor with 2-gear stages to achieve the required output torque and speed. This gear motor has been especially developed for driving the winding drum for the cover of smaller domestic swimming pools (appr. 4.0 x 8.0 metres).
These covers are generally made up of plastic inter-linking slats which float on the pool surface and are pushed forward or backward by the driven drum. Where flexible pool covers are used, it is usual to employ guide ropes to position the material as it is unrolled.
The GP6 is designed for installation well above pool water level for direct connection to the drum and avoids the need for manual turning. Other applications of the 24 V DC COMPACTA GP6 are possible within the limitations of the torque and duty rating.

2. Performance of Gear Motor:

Suppliy voltage:	24 V DC (preferably smoothed)
Current at maximum torque:	4 Amps (max. current 6 Amps)
Maximum torque:	60 Nm (peak momentary torque 80 Nm)
Gear ratio:	i = 600:1
Output speed at foll load:	n2 = approx 4 rpm (refer data sheet)
Limit switch range:	28 revolutions (adjustable)
Hollow drive shaft:	20 mm dia F8 with keyway
CE Marked:	when supplied with MORAT transformer.

3. Available Versions:

Version 1 (IP00 without enclosure): This version is intended for pool cover manufacturers to provide their own design cover (usually stainless steel or plastic) and incorporates otherwise no protection against water spray or physical contact. The standard unit is provided with an 8 pole terminal block. On/off control is by a 2-way key operated switch (not included in supply and usually fitted into cover) with "off" in central position. The GP6 includes a double diode/rectifier which ensures that the correct travel motion switch is actuated, assuming correct connection (positive and negative) of the 24V DC power supply. If connected incorrectly the unit does not operate.

Dimensions: 202 x 154 x 127 (LxWxDepth) refer separate data sheet.

Version 2 (IP 54. Plastic Enclosure): This enclosed version protects the gear motor from water spray and physical contact. This version can be supplied with works fitted 2-way key switch or key switch with ermergency stop (in conjunction with electronic control module).

Dimensions: 220 x 168 x 145 mm (LXWXDepth) refer separate data sheet.

4. Motor

The GP6 uses a permanent magnet DC motor with primary gear. The motor has no integral thermal protection. It is important to ensure that the peak torque of 80 Nm and the running time/duty rating 20 % are not exceeded. Exceeding these values can damage the drive unit.

5. Duty rating:

The GP6 is designed for intermittent short period operation and a duty rating of 20 % (related to 10 minute period). Should it be necessary to start the unit several times, then depending on the torque applied it is recommended to allow a pause of up to 8 minutes before repeating operation.

Framo Morat GmbH & Co. KG
Höchst 7 • D-79871 Eisenbach
Tel.: +49 (0) 7657 / 88-0
Fax: +49 (0) 7657 / 88-333
www.framo-morat.com
info@framo-morat.com

6.Travel switch:

The GP6 standard design of integral (adjustable) limit switch is for a maximum of 28 output shaft revolutions.

7. Safety Regulations / Approverd usage:

It is a condition of sale that Framo components shall not be used for the movement of loads whereby persons can be directly or indirectly endangered. The application of Framo gearmotors in equipment which is intended for the transport of passengers is only permissible after prior written consultation and the agreement of the manufacturer Framo or their representatives. We would refer users of gearmotors to safety rules, regulations and laws governing the protection of personnel working in the area of moving equipment and to the need for protective guards or barriers. Similarly-protective measures are required where suspended loads are involved. In order to rule out unauthorised use (e.g. by children), a key switch or push-button should always be used to actuate the drive.

8. Registered Trade Mark:

The GP6 COMPACTA is a registered product.

9. Accessories/Options:

Transformer (Mains unit): 24 V DC smoothed output CE marked 120 Watt at 50 % Duty rating. Supplied in plastic housing (PVC) IP 20. Dimensions 200 x 150 x 150 (LxWxDepth).

Switch Type 1: 2-pole keyswitch with centre stop position. Supplied loose for Version 1 or fitted to enclosure for Version 2.

Switch Type 2: Key switch with stop-button. Supplied loose for use with control electronic module where it is intended to use radio signal control.

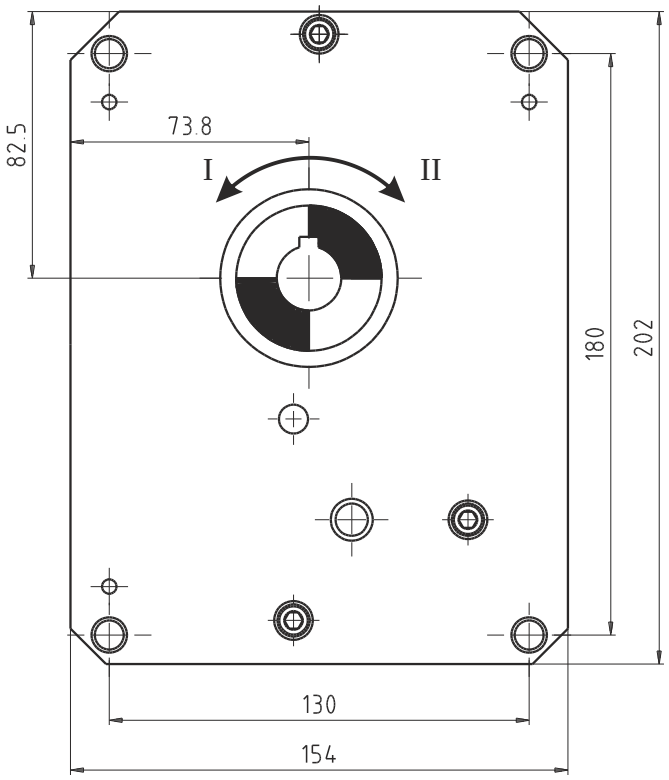
Electronic control module: DC control module with locking relays. The driver board is built into a plastic housing (PVC) IP 54 having compression cable glands. Dimensions 103 x 103 x 65 mm (L x Wx Depth). The circuit board includes a voltage regulator 24V DC suitable for a radio receiver, either one or three channel facility (selectable), as well as electronic and switching relays for limit switch travel control. Note: Where the electronic control mudule is separately ordered the user must remove the double diode/rectifier from, the GP6 gear. Refer wiring diagram attached.

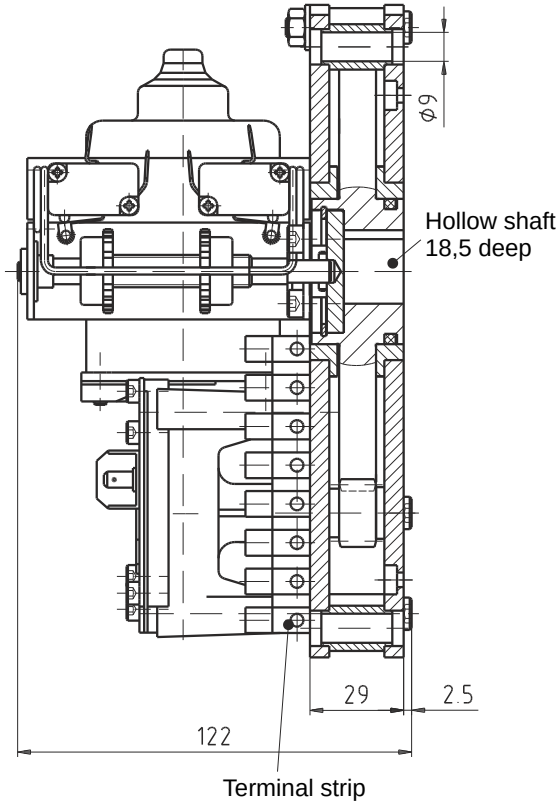
Framo Morat GmbH & Co. KG
Höchst 7 • D-79871 Eisenbach
Tel.: +49 (0) 7657 / 88-0
Fax: +49 (0) 7657 / 88-333
www.framo-morat.com
info@framo-morat.com

Framo Morat Slip-on geared motor COMPACTA GP6

Dimension sheet

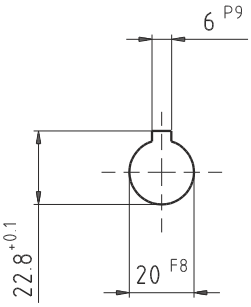
Version 1 (without enclosure IP 00)



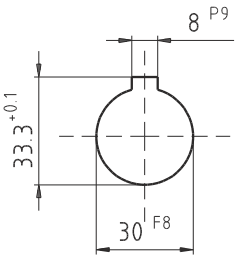


Dimensions of hollow shaft

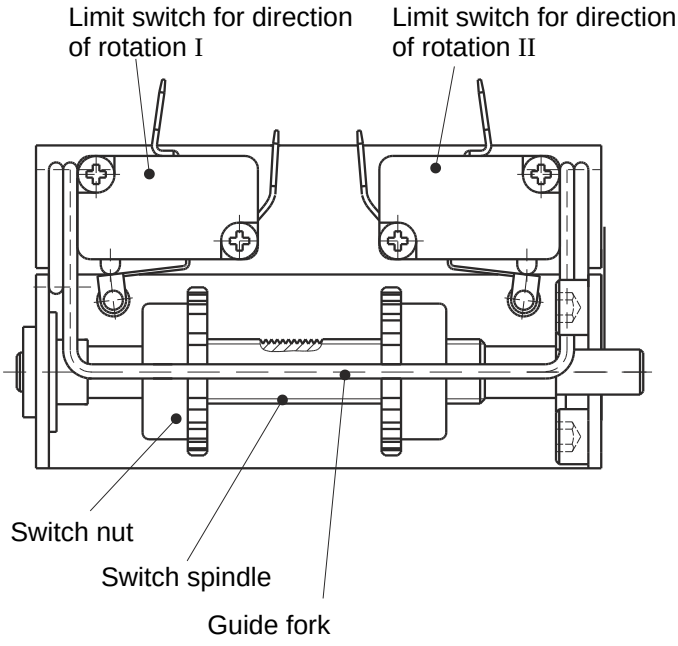
Standard



Option



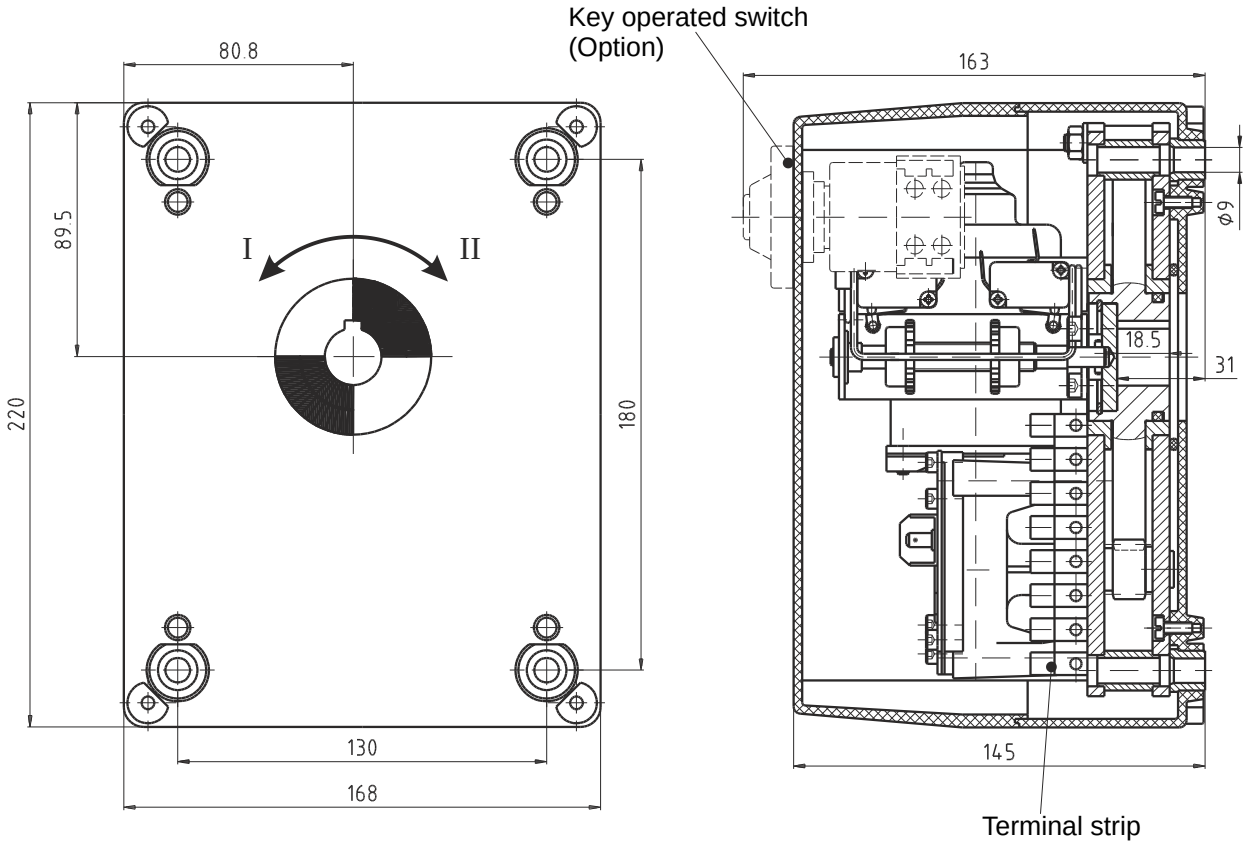
Detail of limit switching



Framo Morat GmbH & Co. KG
Höchst 7 • D-79871 Eisenbach
Tel.: +49 (0) 7657 / 88-0
Fax: +49 (0) 7657 / 88-333
www.framo-morat.com
info@framo-morat.com

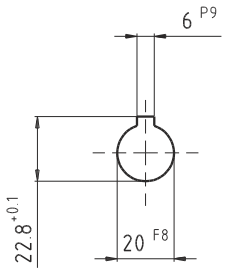
Dimension sheet GP 6

Version 2 (plastic enclosure IP 54)

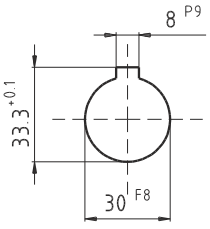


Dimensions of hollow shaft

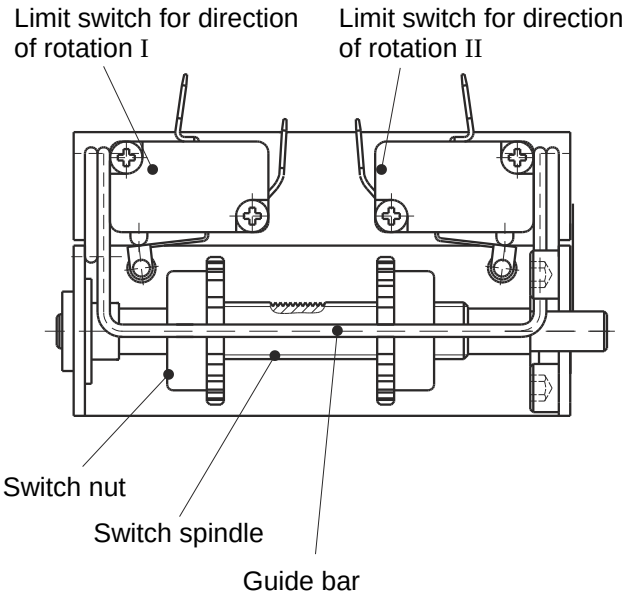
Standard



Option



Detail of limit switching

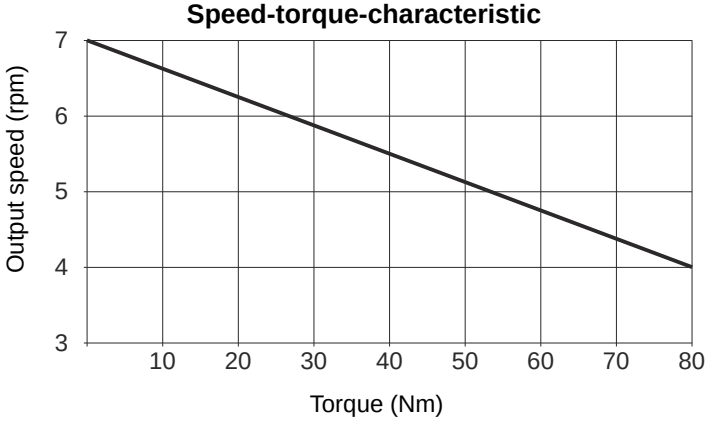


Framo Morat GmbH & Co. KG
Höchst 7 • D-79871 Eisenbach
Tel.: +49 (0) 7657 / 88-0
Fax: +49 (0) 7657 / 88-333
www.framo-morat.com
info@framo-morat.com

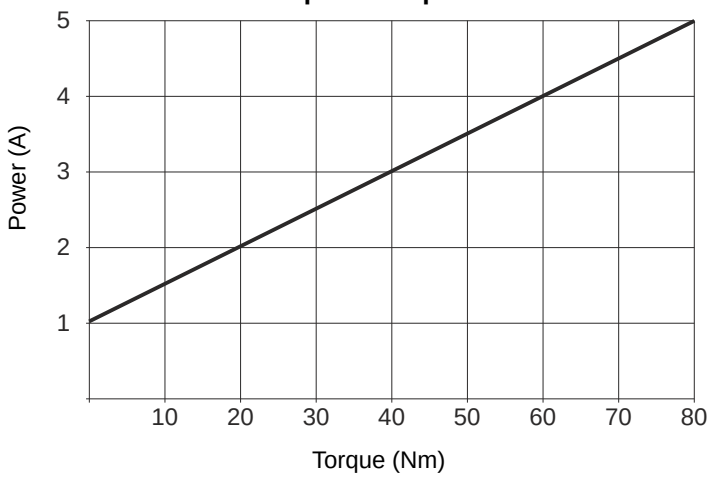
Characteristic

It is important to ensure that the peak torque of 80 Nm and the running time/duty rating 20 % are not exceeded. Exceeding these values can damage the drive unit.
Values calculated with Morat transformer 120 W

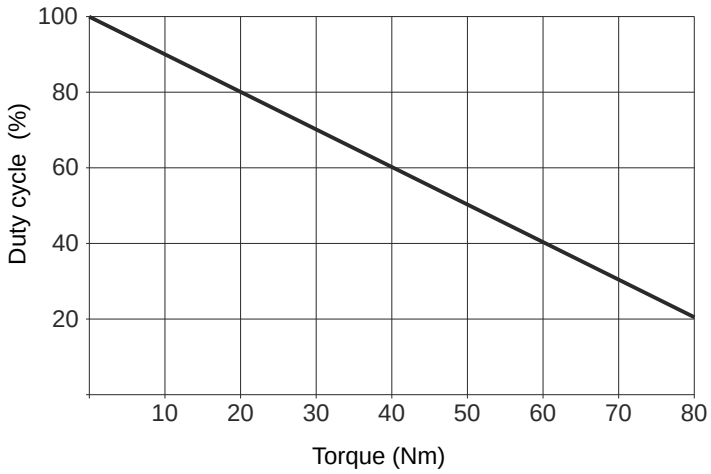
Speed-torque-characteristic



Power absorption-torque-characteristic



Duty cycle-torque-characteristic



Framo Morat GmbH & Co. KG
Höchst 7 • D-79871 Eisenbach
Tel.: +49 (0) 7657 / 88-0
Fax: +49 (0) 7657 / 88-333
www.framo-morat.com
info@framo-morat.com

Installation instructions (Translation)

1.0 Safety information

1.1 Warning notices

Signal words are meant to indicate danger, proscription or important informations.
The following signal words are used:

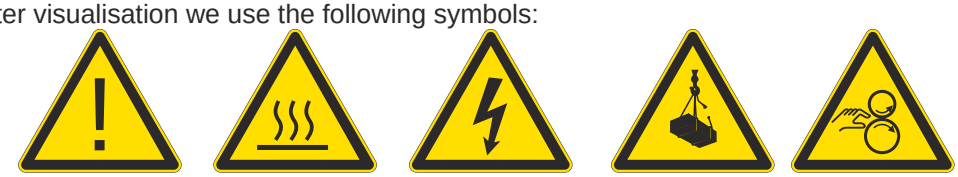
Danger: DANGER indicates a hazardous situation which, if not avioded, will result in death or serious injury.

Warning: WARNING indicates a hazardous situation which, if not avioded, could result in death or serious injury.

Caution: CAUTION indicates a hazardous situation which, if not avioded, can cause damage or could result in minor or moderate injury.

Notice : NOTICE is used to address practices not related to personal injury.

For furter visualisation we use the following symbols:



General Warning | Hot surfaces | Electrical dangers | Pending loads | Crush hazard

The symbol indicates the type of danger, the signal word indicates the severity of the danger.

1.2 General safety notes

Before installation of the Framo slip-on geared motor the following predictions have to be fulfilled, so that it can be assembled with other parts to a complete machine, without harming the security or health of persons.

- Every slip-on geared motor is shipped with the installation instruction and the circuit diagram. These are taped to the drive in an envelope. Installation without this documentation is forbidden. Unintended or inappropriate use leads to the loss of any liability claim. This installation instruction and the annexed declaration of incorporation have to be attached to the Framo drive until it is assembled into a complete machine and therefore becomes a part of the technical documentation of the complete machine.
- Before installation and operation read all documents carefully and follow all instructions.
- The abidance of basic safety- and health protection requirements is considered by application of accredited engineer standards during design and is approved by the declaration of incorporation.
- The mechanical and electrical installation as well as the adjustment and setup has to be done by certified electricians, authorized by responsible authority.
- Doublecheck the technical data on the name plate and follow the instructions on the labels of the drive.
- Moving parts have to be secured against unintentional contact to avoid injuries. The manufacturer points out that this is the responsibility of the user.
- Don't modify the drive. Modifying the drive is dangerous and voids the warranty.

Framo Morat GmbH & Co. KG
Höchst 7 • D-79871 Eisenbach
Tel.: +49 (0) 7657 / 88-0
Fax: +49 (0) 7657 / 88-333
www.framo-morat.com
info@framo-morat.com

- Don't block the drive while operating. This may cause hazard to persons and/or property and may damage the drive seriously.

- Don't overload the drive. The values for torque and duty cycle declared on the name plate can't be exceeded. Non-observance may cause danger to persons and property and the drive may be damaged seriously.

- The gear units are only suitable for connection to a 24 V DC mains. The transformer required to convert 1-phase alternating current into 24 V direct current should be designed so that a maximum voltage of 40 V during idling is not exceeded. In normal operation, the current intensity is max. 20 A with type GS 12 and type GR 30 and 30 A with type GG 60. Lengths and cross sections of the supply lead from the transformer to the gear unit can be seen in the enclosed installation plan.

- Make sure that power is disconnected before working on the open terminal box or limit switches. Secure the power source against unintentional switch on.

- Pay attention to the appropriate circuit diagram (schematic).

- Don't touch the drive during operation. The housing temperature can rise up to 90°C (close to 200°F).

1.3 Conditions of use

Framo slip-on geared motors are drive systems, solely determined to drive machines, devices and equipment that exclude direct or indirect hazards to persons. If hazards to persons cannot be excluded, it is obligatory to build additional devices (e.g. cover, shut off, cutting unit) to eclude the risk. As long as this additional device is not attached it is forbidden to use our drive.
We refer users of gear motors to safety rules, regulations and laws governing the protection of staff working in the area of moving equipment. Protective guards or barriers shall be used. Similarly-protective measures are required where suspended loads are involved.
Keep in mind the common due diligence in connection with technical products to avoid further hazards.

Attention Danger!
Applications intended for the transport of passengers are not permissible!

Attention Notice!
If our product optionally allows such an application, has to be clarified with the manufacturer in advance.

Attention Caution!
By default our gear motors are intended for environmental temperarture from 0°C up to 60°C, and a duty cycle of up to 60%. The protection class is IP54 for the version with housing and IP00 for the version without housing.
The gear motor emits operating heat via the housing surface. Additional cooling is not provided, which means that only short-time operation is permissible. An uninterrupted running time of 5 minutes should not be exceeded. Appropriate cooling times and rest periods of a few minutes should be observed.

Framo Morat GmbH & Co. KG
Höchst 7 • D-79871 Eisenbach
Tel.: +49 (0) 7657 / 88-0
Fax: +49 (0) 7657 / 88-333
www.framo-morat.com
info@framo-morat.com

2.0 Transport, Setup and Installation

2.1 Transport

Attention Caution!
Wear safety-shoes while carrying and working on/with the drive. A falling drive may cause injuries.
Use a solid packaging to tansport the drive to the installation-site.

2.2 Setup and Installation

Mount the drive with four screws, making sure that the case is not distorted. Other parts (e.g. couplings, chain sprockets) must not be mounted by hammering (bearings and retaining rings may be damaged).

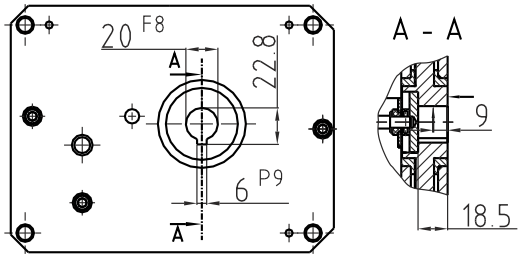
2.3 Fastening torque for mounting screws

Attention Warning
The property class for the mounting screws has to be 8.8 or better. The correct fastening torques is 10Nm.

2.4 Capacity of the output shaft

Radialload = 1500N

Axialload = 100N



3.0 Electrical Installation

Attention Danger!

- Make sure to interrupt the current supply before working on the terminal box or limit switches and secure it against unintentional switch on.
- Read the circuit diagram carefully and pay attention to use the right voltage (see name plate on the drive)
- Connect all external control- and power supplies to the corresponding internal contacts (according to circuit diagram). If limit switches are not connected the drive can be destroyed.
- With regard to the electrical commissioning, we would refer to the relevant protection directives (VDE 0100, part 702; set-up of low-voltage supplies in the area of swimming pools), which must be observed by the user!
  Work on the transformer housing may only be done if there is a guarantee that your place of work is free of voltage and is secured against unintentional switching-on. The transformer may only be connected to a mains with a functioning protective conductor.
- The following always apply for the initial electrical operation: Read the circuit diagrams and ensure that the correct operating voltage (24 V=) is available. Also read the gear unit rating plate. The terminals in the switching unit must be connected as specified.
  Set the limit switches to the individual switching point for both directions of rotation (see separate adjustment instructions). Make sure that there is sufficient safety clearance for the end points, because the stopping behaviour of the gear unit differs slightly depending on its temperature. Different roatational speeds or speeds during operation, which can be up to ± 50 %, are obtained from the characteristic of a direct current motor for different power consumptions.

Framo Morat GmbH & Co. KG
Höchst 7 • D-79871 Eisenbach
Tel.: +49 (0) 7657 / 88-0
Fax: +49 (0) 7657 / 88-333
www.framo-morat.com
info@framo-morat.com

Attention Danger!
Protect the motor against unintentional start, because the thermal switch automatically closes the contact after cooling down (bi-metal contact).

- Confirm that the direction of the drive correponds with the dedicated limit switches (see adjustment instructions).
- The standard protection rating is IP54. The IP rating can only be assured if the approriate cable connectors are used.

Attention Notice!
Don't decellerate the motor by reversing the motor power. The life of the gear motor will be dramatically reduced.

4.0 Important informations

4.1 Duty cycle

Compacta gear motors are typically used for intermittent forward / reverse applications (max. duty rating 20 %). The duty cycle reference time is 10 minutes in a max. ambient temperature 40°C at an altitude of 1000 meters.

4.2 Ambient temperature, water condensation

Attention Notice!
Consult the manufacturer for operation under 0°C (to select a suitable gear oil).
Permanently changing temperatures or high humidity can lead to water condensation. For proof we offer optional versions (condensed water drain holes or moisture protection vanish coat for rotor and stator).

Attention Warning!
The drain holes will effect the standard protection class (IP54).

Attention Notice!
The provision of stand-by heating of the gear unit serves the same purpose. Contact the manufacturer or foreign agent for further details.

4.3 Hand crank

Attention Danger!
In case of operation with hand crank an overtravel of the limit switches must be avoided. It is possible to incorporate a sight glass to the switch box cover as an option.

4.4 Operating temperature

Attention Warning!
If the temperature of the drive, in spite of approved usage, exceeds 90°C, refer to the manufacturer. Perhapst there's a defect.

Framo Morat GmbH & Co. KG
Höchst 7 • D-79871 Eisenbach
Tel.: +49 (0) 7657 / 88-0
Fax: +49 (0) 7657 / 88-333
www.framo-morat.com
info@framo-morat.com

4.5 Safety coupling between limit switches and main gearing (MS and AG)

Attention Warning!
In-approriate installation (no or false wiring of the switches) can cause the shift nut to overtravel and run against the limit switches. A coupling between the limit switch box and the main gearbox protects the limit switch assembly by breaking in case of overloading (white plastic coupling with 12mm diameter).

Attention Notice!
Compacta MS12 and AG60 gear motors are equipped with a spare coupling. Please contact the manufacturer if you need instructions to replace the coupling.

4.6 Oil leaks:

Use extra caution if the gear motor is leaking oil.
The surface might be slippery.

Under these circumstances environmentally detractions are possible.

4.7 Self-locking

Attention Notice!
Self-locking is affected by lead angle, face surface roughness, running speed, lubricant and temperature rise. A distinction must be made between dynamic (from motion) and static (standstill) self-locking.
Shaking or vibration can annul the self-locking.
Similarly a number of factors associated with lubrication, running speed and load can favour slip characteristics to such an extent that self-locking is counteracted.
This means that gearing which is self-locking in theory is no substitute for a brake or reverse lock.
Therefore it is impossible for us to accept warranty obligations in respect of self-locking.

Attention Danger!
Important: Self-locking can NOT be responsible for safety characteristics!

5.0 Warranty, maintenance, approved usage

The drive is maintenance free due to lifetime-lubrication.
The lifetime of the drive depends on the application (eg. ambient temperature, torque, speed, cycles, environmental influences).

6.0 Warranty and repair

All drives are tested before delivery. During warranty-time the drive shall not be opened except for the cover of the terminal box or the limit switch box. Further dismantling leads to expiration of any warranty by the manufacturer.

If a drive has to be repaired send it back to the manufacturer or a suitable agency. A service technician can be ordered for on-site service on short notice.

7.0 End of product life-time:

7.1 When the indicated lifetime is reached you can send the drive back for an overhaul.

7.2 If you want to dispose the drive please pay attention to ecological and legal regulations.

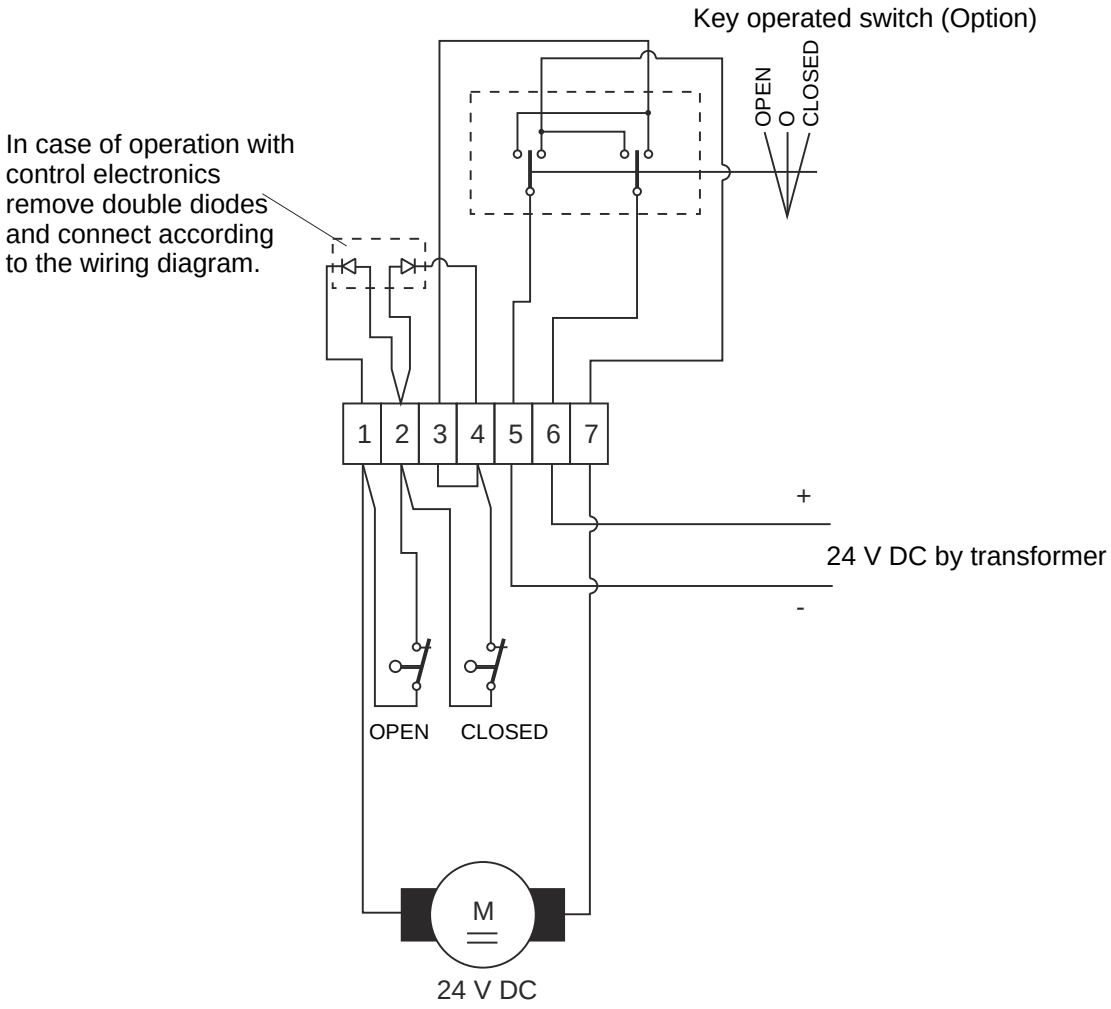
Framo Morat GmbH & Co. KG
Höchst 7 • D-79871 Eisenbach
Tel.: +49 (0) 7657 / 88-0
Fax: +49 (0) 7657 / 88-333
www.framo-morat.com
info@framo-morat.com

8.0 Service

To offer fast and competent help to our customers - e.g. while installation - we provide a service-number.
Under +49 (0)160 / 941 84 444 you can reach the 24 hour hotline. Please note that the usual fee will arise.

Framo Morat GmbH & Co. KG
Höchst 7 • D-79871 Eisenbach
Tel.: +49 (0) 7657 / 88-0
Fax: +49 (0) 7657 / 88-333
www.framo-morat.com
info@framo-morat.com

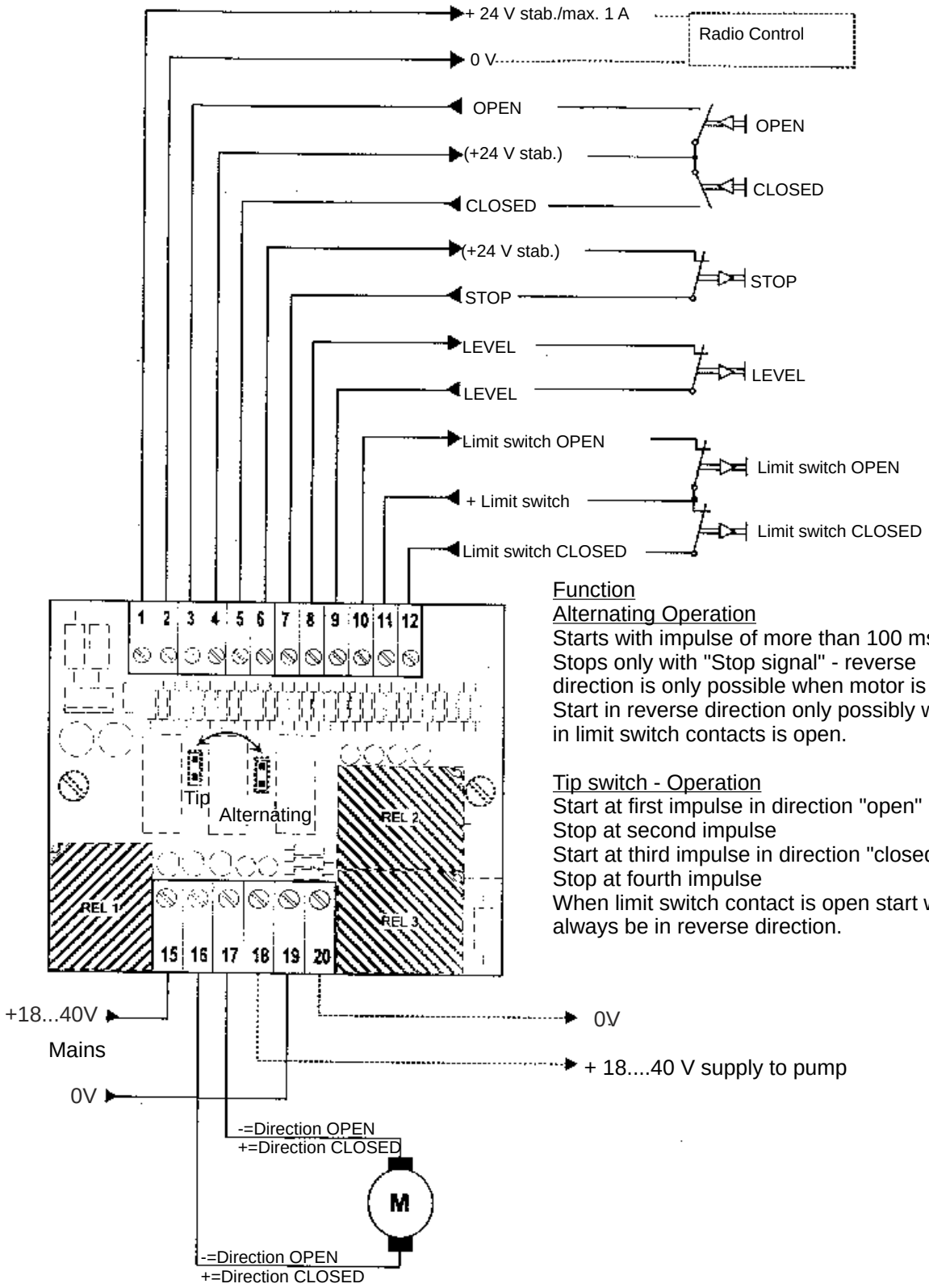
Connection Diagram (standard)



Framo Morat GmbH & Co. KG
Höchst 7 • D-79871 Eisenbach
Tel.: +49 (0) 7657 / 88-0
Fax: +49 (0) 7657 / 88-333
www.framo-morat.com
info@framo-morat.com

Framo Morat Slip-on geared motor COMPACTA GP6

Connection Diagram for electronic control necessary when using a 1- or 3-channel remote control



Function

Alternating Operation

Starts with impulse of more than 100 ms
Stops only with "Stop signal" - reverse direction is only possible when motor is at rest.
Start in reverse direction only possibly when built-in limit switch contacts is open.

Tip switch - Operation

Start at first impulse in direction "open"
Stop at second impulse
Start at third impulse in direction "closed"
Stop at fourth impulse
When limit switch contact is open start will always be in reverse direction.

*On installation , select the appropriate bridge contact for the radio signal (1 or 3 channel)
The "stop" and the "level" input must be closed.
The 1-channel remote control is to be connected to the open (AUF) terminal.

Framo Morat GmbH & Co. KG
Höchst 7 • D-79871 Eisenbach
Tel.: +49 (0) 7657 / 88-0
Fax: +49 (0) 7657 / 88-333
www.framo-morat.com
info@framo-morat.com