MANUAL
Micro Driver

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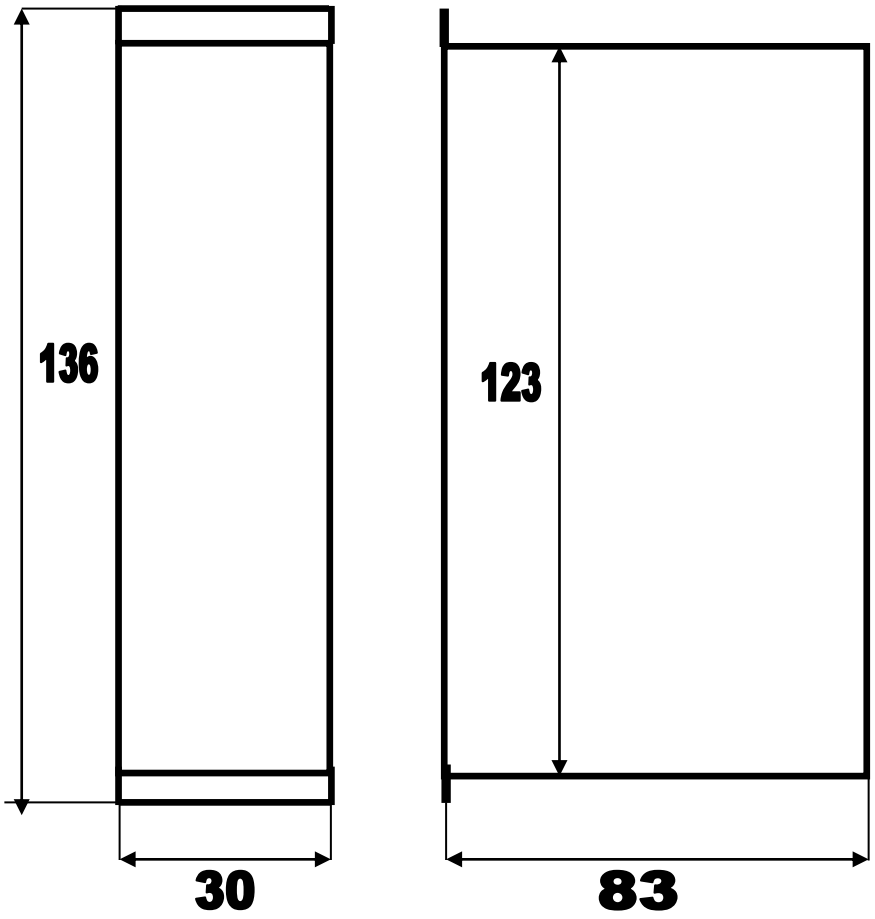
GENERAL FEATURES:

Mechanical features:



Avaiable Size:

VDC	VAC	I nom.	I peak	V motor
60 V	*28÷44V*	*5A*	*10A*	*24÷48V*
60 V	*28÷44V*	*10A*	*20A*	*24÷48V*

Electrical Features

- Switching driver with PWM technology four quadrant with high speed response .
- Single supply in dc .
- Double loop for speed and current control .
- FF next to one, it is not required inductance in series to the motor
- Analogue control signal ±10V from C.N., potentiometer or other source.
- Switching Frequency 16khz (no sound noise)
- Cutting frequency switching >600 Hz (response time<16ms).
- Both single and differential mode speed control input.
- Speed Offset adjustable.
- Input impedence 20Kohm.
- Temperature range from 0°C to 40°C.
- Start current (I peack) double of noninal current for one second.
- Speed feedback from tacho dynamo or from armature with R*I compensation.

Protections:

- MOSFET failure
- Missing of internal supply voltage.
- Short circuit of the motor.
- Overtemperature
- Minimum voltage.
- Overvoltage.

The intervention of protection is signalled by RED LED (fault), and by the opening of the transistor in open collector configuration between terminal 7 and 0V of the driver .

Signalling LED :

- GREEN LED – Driver is supplied and works correctly .
- YELLOW LED – Driver is in limited current condition (the load requires a greater current than nominal current)
- RED LED – Driver is in fault for the intervention of one of the aforementioned protections.

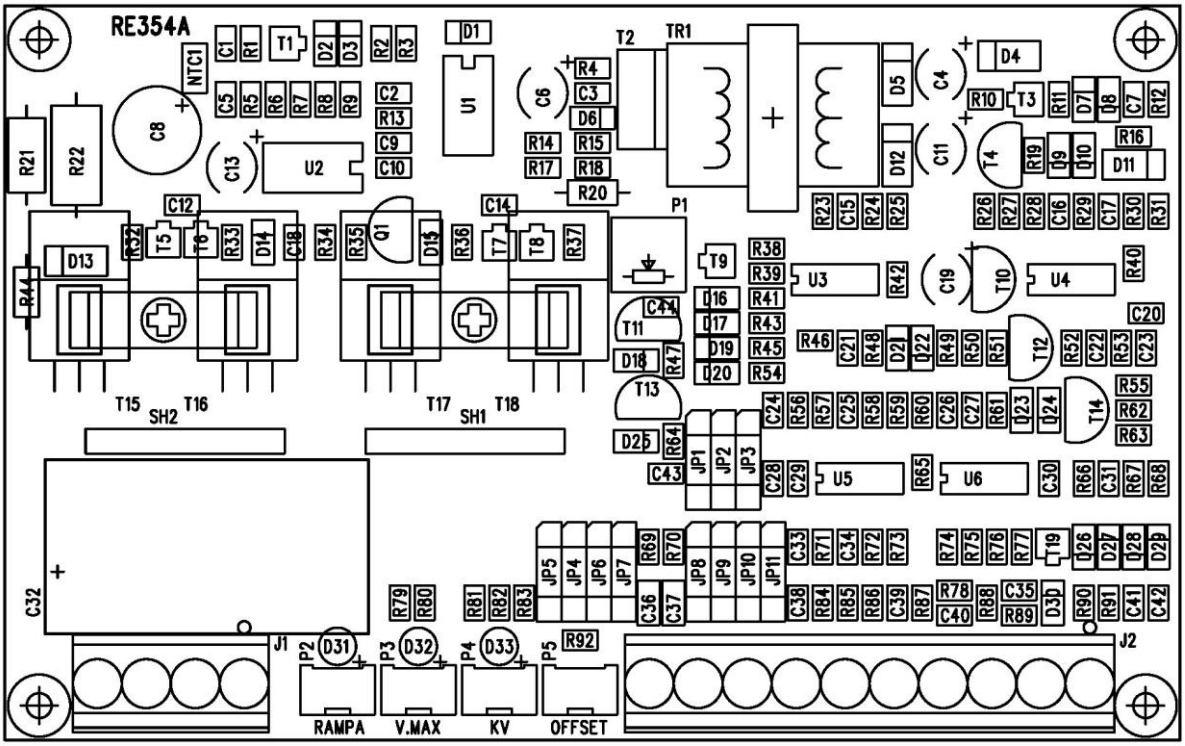
Setting Trimmers:

Ramp.: to adjust the acceleration and deceleration time.
V.max.: to adjust the V max of the motor.
K V: to adjust gain of speed loop (improving the response of the motor to load variations)
Offset: to bring the speed to 0 when indicated by the reference.

Terminal connections:

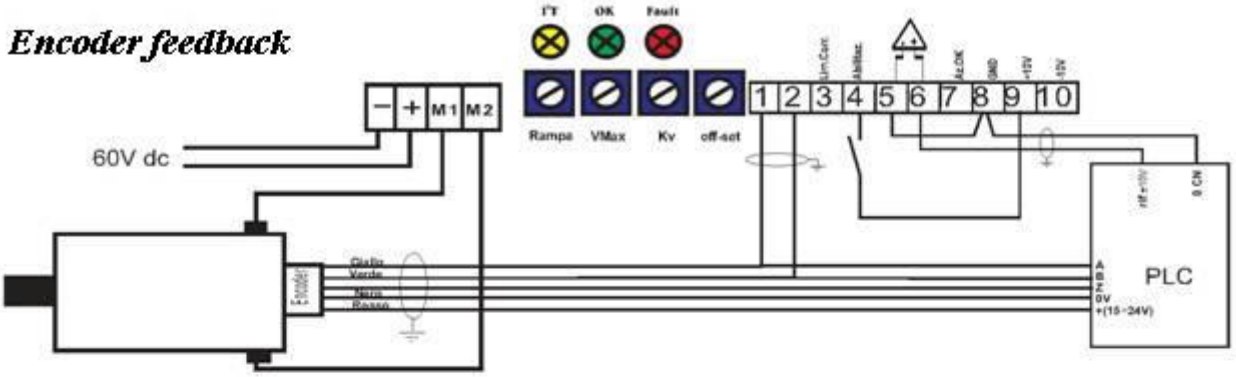
1. - Tacho-dinamo input
2. - Tacho-dinamo input
3. - Input for current limitation
4. - Enabling, the driver is enabled if a voltage between 8 and 24 V is present on terminal 4
5. – Negative differential input for speed reference
6. - Positive differential input for speed reference
7. – Output driver OK (open collector transistor 0,1A, normally 0V)
8. - Common zero V
9. - Positive supply +10V (5mA MAX)
10. - Negative supply –10V (5mA MAX)

Layout components:

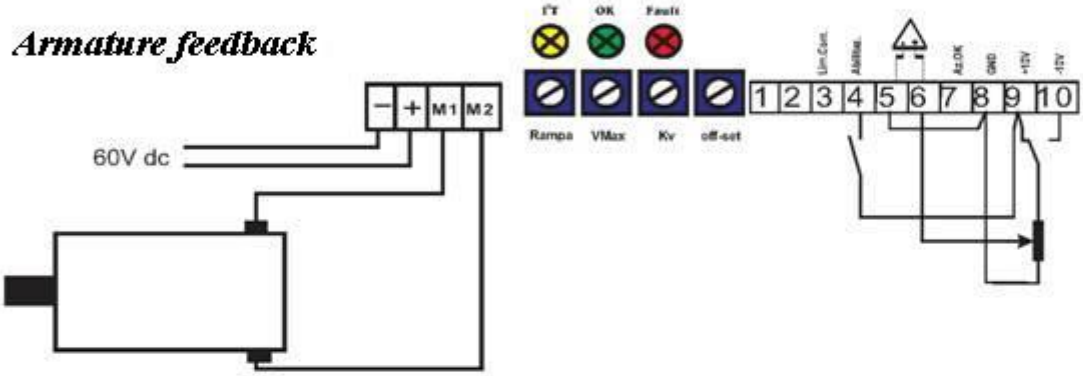


Examples of linking

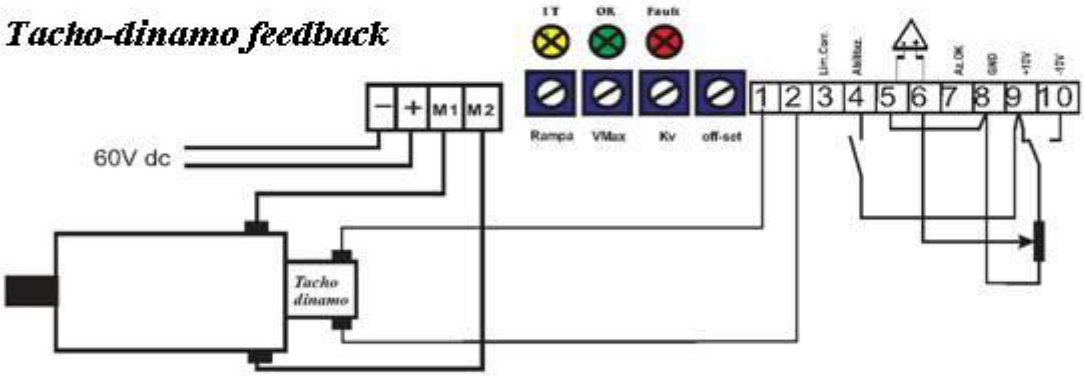
Encoder feedback



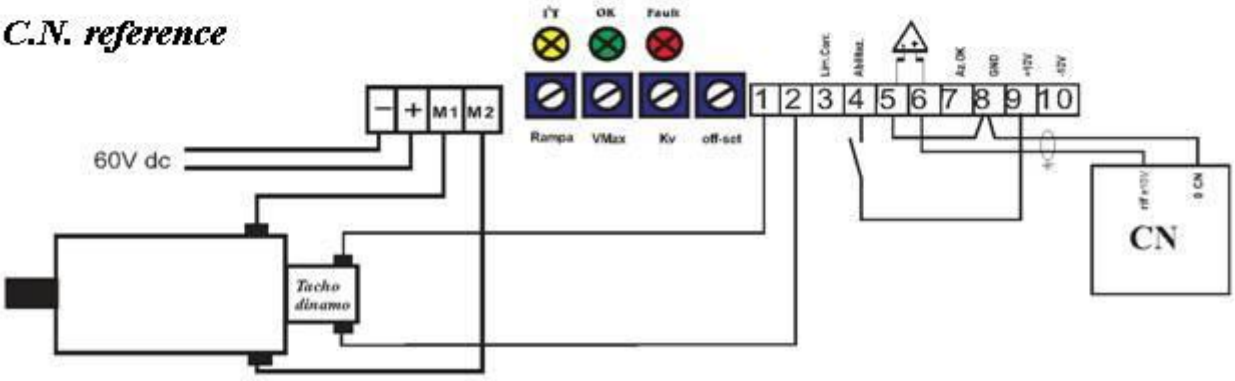
Armature feedback



Tacho-dinamo feedback



C.N. reference



Calibration resistors:

(see page 4 for layout components)

Tacho dynamo feedback:

JP6	JP7	Dynamo Votage
10K	10K	5÷20V
47K	47K	11÷45V
150K	150K	30÷120V

JUMPERS I JP2,JP4 e JP5 MUST BE OPEN .

ARMATURE FEEDBACK :

JP2	JP4	JP5	Motor voltage
See note 1	Jumper	Jumper	12÷35V
See note 1	47K	47K	20÷75V
See note 1	82K	82K	30÷100V

JUMPERS JP6 AND JP7 MUST BE OPEN .

NOTE 1: JP2 sets R*I compensation, it must be chosen in a way that the motor speed remains constant as the load changes.

Example of current setting:

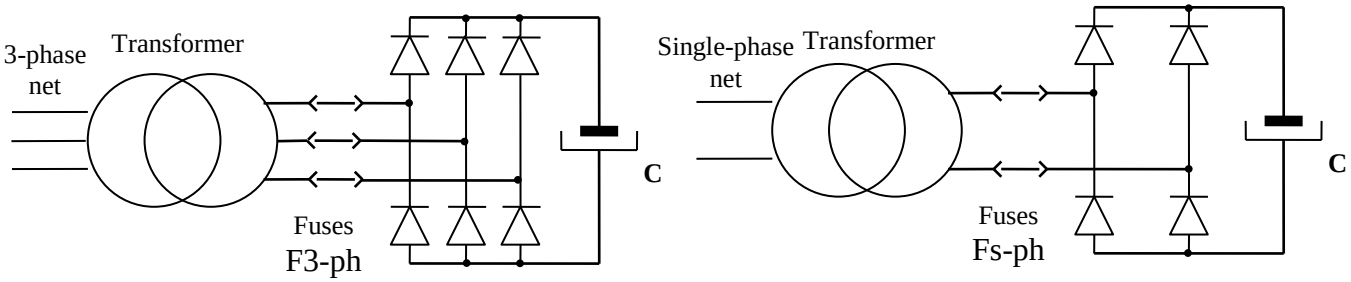
JP1	JP3	Current (In – Ip)
100K	100K	1.25 – 2.5 A
47K	47K	2.5 – 5 A
22K	22K	5 – 10 A
27K	27K	8 – 16 A
22K	22K	10 – 20 A

NOTE 2: pay attention to the output current when adjusting JP1 and JP3, a current too high can damage the driver

Size of external components

Supply:

3-phase supply **Single-phase supply**



The output voltage from the transformer is 0.9*(motor nominal V). In any case between:

- 28 - 44 Vac for MicroDriver60 driver type

Power of the transformer

Pt = 1.5 * (motor nominal V) * (motor nominal I)

Levelling capacitors

100V voltage for MicroDriver60 driver type

Capacity in μF C = (motor power) / Vdc * 1000

If, during braking phase, overvoltage protection turns on, use higher and higher capacity capacitors until the driver works correctly.

Fuses

$$\text{Fs-ph (Ampere)} = \frac{1.7 * Pt}{Vdc}$$ Single-phase supply

$$\text{F3-ph (Ampere)} = \frac{Pt}{Vdc}$$ 3-phase supply

Attention: these sizing indications are for general use, after evaluating specific applications it is possible to reduce the power of the transformer and the capacity of capacitors.

FAILURE SEARCH:

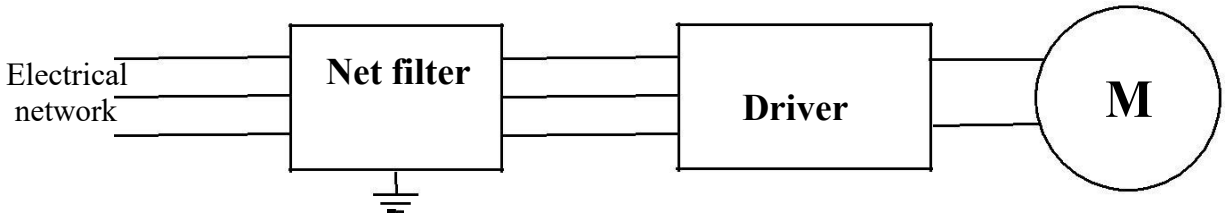
FAILURE	PROBABLY CAUSE	REMEDY
• The motor does not break • RED FAULT ON , LED OK OFF	• The supply capacitor is not enough to absorb the braking energy	• Increase the supply capacitor
• The motor escapes	• Tacho-dynamo connection interrupt or reversed • Failure on the tacho-dynamo.	• Check connection from dynamo to driver • Check the efficiency of the dynamo.
• LED OK OFF • Supply is OK • LED FAULT ON	• External short circuit • Internal short circuit • Supply voltage exceed the nominal voltage • Termal protection for excessive heating of the driver.	• Remove the short circuit • Replace the driver • Reduce the supply voltage • Turn off supply voltage, wait for 15 minutes and eventually install a fan.

General rules to eliminate network disturbs and EMI (CE certification)

All the electrical equipments that switch inductive loads generate disturbs that can spread electromagnetically (EMI) or via conduction (along the electrical network, on inductive couplings of wires). We supply some rules to eliminate these disturbs.
ATTENTION!!! *The driver you bought has been tested for electromagnetical compatibility and CE certification, anyways to guarantee the electromagnetical compatibility of the whole equipment you have to follow these instructions.*

Net filters utilization

To prevent the generated disturbs from propagating on the electrical networks and from disturbing other connected devices is necessary to use net filters.
To choose a net filter you must pay attention to the type of network it will be connected (single phase or three phase), to the power absorbed by the load and to the power of the filter (single cell or double cell).
It is important to connect the filter near to the driver (not beyond 30 cm of wire), and its metallic cover must be grounded.
In this manual there is written next to each driver size the adequate net filter. If needed net filters can be bought from us.



Shielded cables use

Connection cables are antennas that receive and transmit disturbs; you must use shielded cables both for low-power links (control links) and high-power links (links with the motor).
By doing this you will reduce the noise and the emitted electro-magnetic interference.
Attention! The shield must be grounded only on one end of the cable, you can link it to the mass of the motor which will be grounded as well.

Adequate cables layout

The correct wiring of the panel is fundamental for a good functioning of the entire system and to solve problems of electromagnetical compatibility. Here there are the main rules for the array of the cables.

- Use shielded cable both for control and power links.

- If possible keep a distance between control and power cables. Put the cables into wireways or metal pipes.
- Avoid tangles and crossings, where this is not possible make only 90° crossings.

Grounding

Grounding is fundamental to reduce disturbs; follow this general rules:

- Ground the mass of the driver (0V signal) linking it to all the shields of the control cables.
- Ground all the metallic shells of the system (cover and radiator of the driver, motor shell, etc.) trying to use wide surfaces of contact.
- For the groundings use low-impedance cable even for high frequencies.
- Remove layers of paint or oxide from the surfaces of contact.
- Insert in the usual maintenance program the control of the low-impedance of ground links.

Electric panel example