

INSTRUCTION MANUAL

CODE 119/92

FOR ASYNCHRONOUS ROWAN SINGLE-PHASE MOTORS with
TACHOMETER



CONFORMITY



Rowan Elettronica

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UNI EN ISO 9001:2000



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Warning !

- ROWAN ELETTRONICA s.r.l. declines any responsibility for any inaccuracies contained in this manual, due to printing and/or transcription errors. ROWAN ELETTRONICA s.r.l. reserves the right to make any variations that it considers necessary for better functioning of the product, without prior notification.
- Regarding the data and characteristics mentioned in the manual, a maximum tolerance of 10% has been allowed, if not otherwise indicated.
- The product guaranty is considered ex-works and is valid 6 months from the date of leaving ROWAN ELETTRONICA s.r.l.
- The electrical equipment could create dangerous situations for the safety of both personnel and objects; the user is responsible for the installation of the equipment and for the conformity of the installation with the regulations in force.
- The diagrams contained in this manual are mere examples and should be perfected by the customer according to their specific needs.
- **The equipment must be installed only by qualified personnel**, after having read and understood this manual. In case of doubt, the supplier should be contacted.

CODE 119/92

DRIVE FOR ASYNCHRONOUS ROWAN SINGLE-PHASE MOTORS

with TACHOMETER

POWER RANGES

This drive is produced in two sizes on the same base:

- **C119/92** for commanding of Rowan single phase motors up to 1HP provided with 10A protection fuse.
- **C119/92/2** for commanding of Rowan single-phase motors up to 2HP provided with 20A protection fuse.

TECHNICAL CHARACTERISTICS

- **CE** product
- Standard supply voltage: 230Vac $\pm 10\%$ 50/60Hz.
- Environmental temperature limit: -5°C +40°C.
- Storing temperature from -25°C to +70°C.
- Working humidity limit from 5 to 95% (without condensation).
- Preset for ROWAN single-phase motors 2 - 4 - 6 pole, with 10Vdc at 1400rpm (20Vdc at 2800rpm) tachometer.
- Input/output signals galvanically insulated from high voltage and connectable to PLC, programmable logics, interface drives, etc.
- Input for tachometer with precision rectifier for functioning in both rotational sense.
- Motor revolution control adjustable through potentiometer (connected at 2 or 3 wires) or 0/+10Vdc signal.
- Motor torque limitation internally adjustable through trimmer, or externally through potentiometer or 0 / +10Vdc signal.
- Input for pure contact (or NPN open collector transistor) for static run/stop command(12Vdc 2mA).
- Internal regulations through trimmer for:
 - > acceleration/deceleration ramp
 - > max speed
 - > minimum speed
 - > max torque
 - > minimum torque
 - > stability (anti-oscillation trimmer)
- Signalling by led illumination of the following functions:
 - > power on
 - > tachometer generator presence
 - > motor run
- Driving circuit protection with 0.5 A fuse (power protection to be performed externally).
- Cage-clamp terminal strip (on type 119/92 2 Hp power terminal strips are screw-clamp type).
- Standard open version with metal support and poly-carbonate cover, protection level IP 20

STANDARD CONFORMITY

Drive Code 119/92 is in conformity with the general IEC EN 60204-1 standard corresponding to the essential safety requirement of the "Machinery Directive 89/392/EU", modified by the EU Directive 91/368 - 93/44 - 93/68. In particular, regarding the Electro-magnetic Compatibility (EMC) in industrial environment, drive Code 119/92 is in conformity to the product CEI EN 61800-3 standard, for "VARIABLE SPEED ELECTRICAL DRIVES" if connected to the network through a filtering device as indicated by diagrams on page 9 and installed as written on page 8.

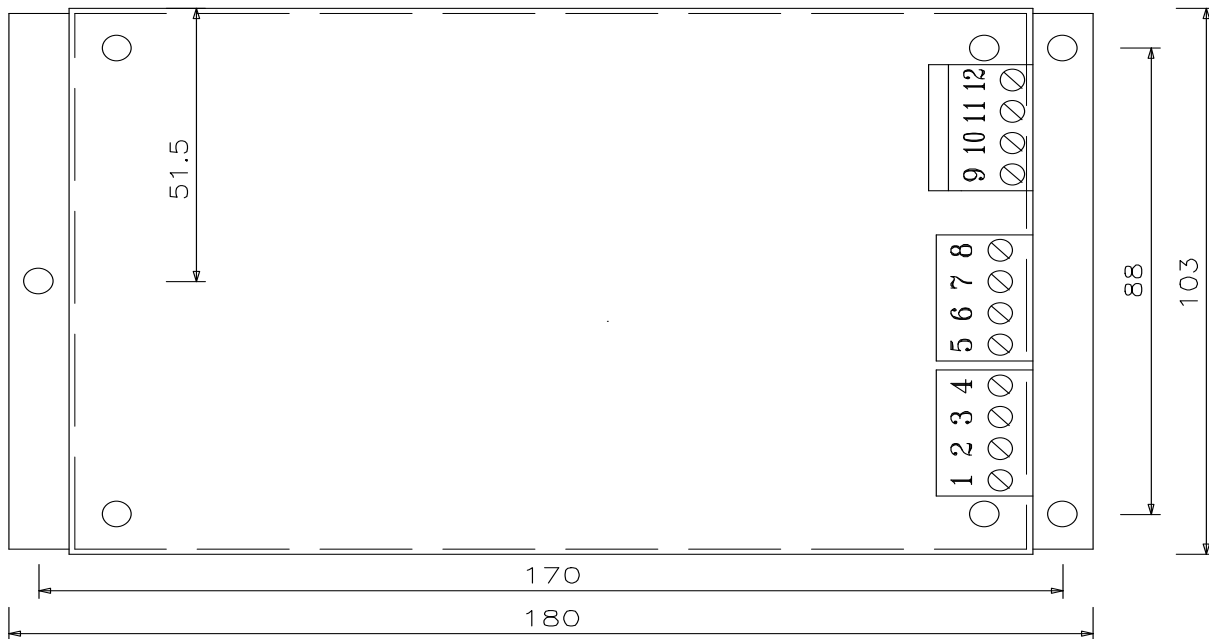
Ask Rowan El. for choosing the correct anti E.M.I. Filter (ELECTROMAGNETIC INTERFERENCE).

OVERALL DIMENSIONS in mm

Height:

Code 119/92 = 65 mm

Code 119/92 - 2HP = 95 mm

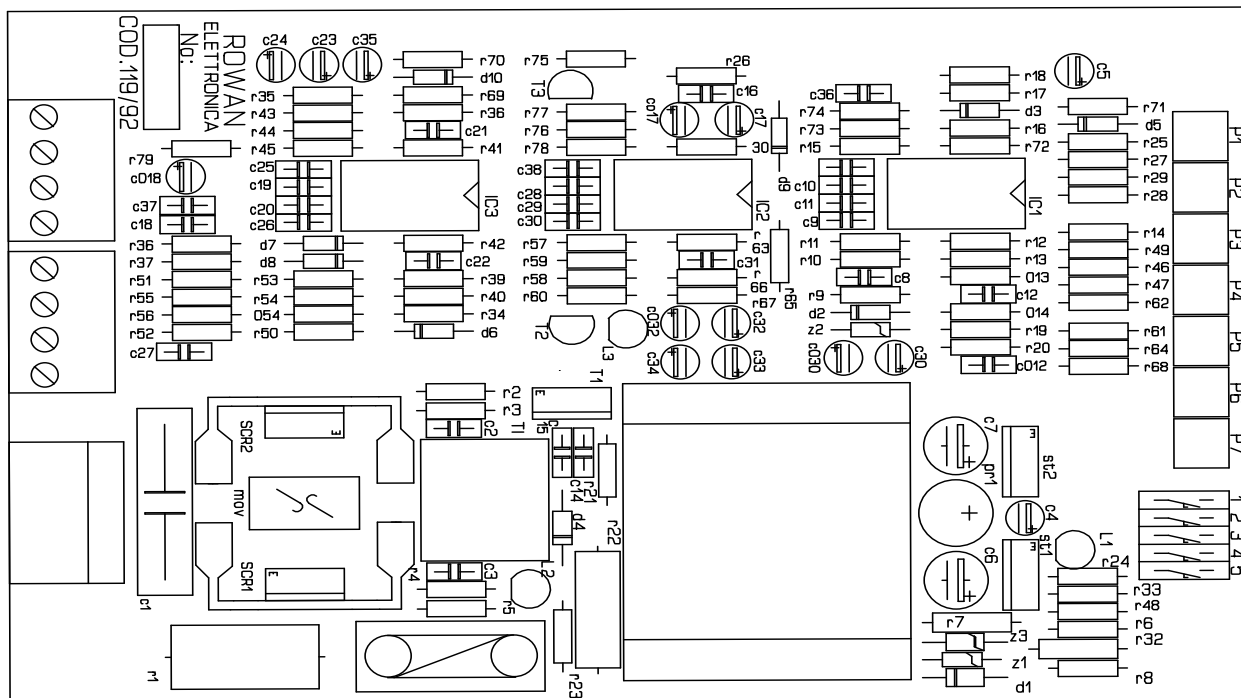


WORKING PRINCIPLES

Drive code 119/92 is a single-phase voltage regulator with tachometer feedback using controlled diodes (SCR) driven by a system at phase partialization.

The voltage supplying the motor results from an analog process maintaining constant rotations by means of the differential control between the real speed reference taken from the tachymeter generator and the one set by the potentiometer or external analog voltage. The coupling with the asynchronous single-phase high slip Rowan motor gives a variable speed system extremely silent (Absence of typical PWM whistle) and uniform, from zero to the maximum motor rounds. The application of controlled diodes on the power part gives reliability against extravoltages or over-currents. In addition, it is possible to adjust the acceleration/deceleration ramp upon the application needs; the controlled acceleration ramp works for moving braking loads or irreversible systems only.

Drive code 119/92 gives the possibility to control the speed/torque of the Rowan single-phase motor; the torque regulation can be done by limiting the maximum voltage on the motor through internal trimmer P1 or, externally, through potentiometer or 0/+10Vdc signal; for a more precise control of the motor torque, it is necessary to let the code 119/92 communicate with other devices working at current closed loop (ex. code 199/92 or code 268).



DESCRIPTION OF CONNECTION TERMINAL BOARD

1 - 6 - 7 ZERO VOLT for input/output signals.

1 - 2 A.R. contact connection (static run consent) or NPN open collector transistor; when open, assents acceleration ramp motor rotation up to maximum set speed and causes RUN led illumination. Closed, it removes voltage from the motor and set acc./dec. ramp to zero.

1 - 3 torque limitation 0 / +10VDC signal input:
0VDC = minimum torque / +10VDC maximum torque

1 - 4 +10VDC 3mA reference voltage output for speed and torque (max. 3kohm load) regulation external potentiometers.

1 - 5 speed regulation 0 / +10VDC signal input:
0VDC = zero turns / +10VDC = max speed

1 = extreme
3 = cursor
4 = extreme

} torque limitation external potentiometer connection
(active with S1 open) R = 10kohm

4 = extreme
5 = cursor
6 = extreme

} speed regulation external potentiometer connection
(active with S3 open) R = 10kohm

For connection of the 2 wire potentiometer (R = 10kohm) close microswitch S3 and use terminals 5 - 6 only .

7 - 8 tachogenerator type 20VDC / 2800 rpm input

9 - 10 regulated output for powering starting and power windings of single phase Rowan motor (max 230VAC 8A for code 119/92 up to 1HP and max 230VAC 15A for code 119/92/2 - 2HP).

11 - 12 power supply 230 VAC $\pm 10\%$ 50/60 Hz. - PE $\oplus$ GROUND CONNECTION.

DESCRIPTION OF TRIMMERS

- P1 max torque limitation** if adjusted counter-clockwise, it limits max voltage to motor windings (active with microswitch S2 closed).
- P2 minimum torque** if adjusted clockwise, it increases min voltage to motor windings (active with microswitch S2 closed).
- P3 acceleration/deceleration ramp** min 20 mSec, max 8 Sec.
- P4 max speed** regulates motor max speed with speed regulation potentiometer at maximum and in any case with input on terminal 5 = +10VDC. Turned clockwise, it increases speed.
- P5 min speed** regulates motor min speed with speed regulation potentiometer at minimum and in any case with input on terminal 5 = 0VDC. Turned clockwise, it increases speed.
- P6 stability:** to be regulated clockwise to stabilise any oscillations in the control of speed if regulation of trimmer P7 was not sufficient (proportional / integral action).
- P7 stability:** to be regulated in a counter-clockwise direction to stabilise any oscillations in the control of speed (integral action).

DESCRIPTION OF MICROSWITCHES

- S1** open: activates external torque limitation from potentiometer or from 0+10VDC signal connected to terminal 3
closed: activates board internal torque limitation from trimmer P1
- S2** open: cuts out torque limitation
closed: activates torque limitation
- S3** open: in case of 3 wire speed regulation potentiometer connection
closed: in case of 2 wire speed regulation potentiometer connection
- S4** open: in case of connection to 2 pole motor
closed: in case of connection to 4 pole (or 6 pole) motor. In case of 6 pole motor recalibrate maximum speed with P4 until the tachogenerator generates a maximum voltage of 6 VDC.
- S5** open: in case of maximum precision in controlling speed (minimum shift from loadless to loaded)
closed: enhances prompter response in speed change transients to the detriment of precision (greater shift from loadless to loaded)

DESCRIPTION OF DISPLAYS

- L1 POWER ON:** indicates power supply flowing through the board and driving circuit.
- L2 RUN:** when on indicates that motor rotation has been enabled with the opening of run consent contact (AR) at terminals 1 - 2. It illuminates in proportion to the voltage to motor windings.
- L3 TACHOMETER GENERATOR PRESENCE:** when on indicates that motor is rotating and that tachometer generator voltage is available at terminals 7 -8. Tachometer generator voltage is directly proportional to motor speed and assumes a value of approximately 20VDC at 2800 tpm.

STANDARD SET-UP

119/92 drives come out of Rowan labs ready tested and set-up for:

- 4-pole motors with speed regulation by 3-wire potentiometer (min. 0 rpm - max. 1300 rpm);
- torque limitation not active;
- acc/dec ramp: 2 Sec.;
- S4 microswitch closed (all other microswitches open).

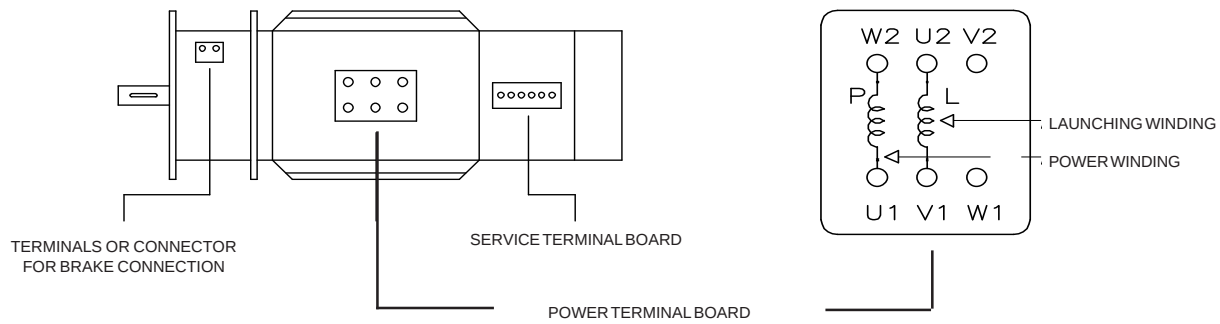
SINGLE-PHASE MOTORS CHARACTERISTICS AND POWER ABSORBED BY BRAKE AND COOLING FAN

The capacitor within parentheses increases starting torque by approx. 20% but cannot be used for continual service; its use is recommended only for intermittent movements.

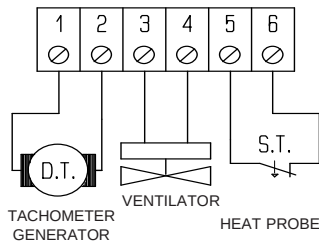
The maximum current of Rowan single-phase motors is to be calculated to an approximate value by multiplying the rated value by 1.5. The same current can be used during the starting phase or in cycles that require the use for a period equivalent to a maximum of 20% of the entire work cycle.

MOTOR MEC	HP	KW	I Nom A	LAUNCH COND. uF (increased torque needed at start)	FAN POWER W	BRAKE POWER W
63	0.15	0.11	1.2	12 (16)	16	20
71	0.25	0.18	1.6	20 (25)	16	20
80	0.5	0.37	3.7	25 (31)	16	25
90	1	0.75	6	40 (50)	19	30
100	2	1.5	9.5	50 (60)	40	30

INSTRUCTIONS FOR THE CONNECTION OF SINGLE PHASE ROWAN MOTORS



MOTOR SERVICE BOARD CONNECTION



1-2 TACHOMETER GENERATOR: from these terminals it is possible to have the voltage of the tachometer generator that is spliced to the motor shaft. It supplies a direct voltage of 20VDC at 2800RPM that is directly proportional to motor speed; for this reason, besides being connected to the drive for speed control, it can be used for analog revolution counters, display counters or other servomechanisms, provided the overall loading being not lower than 5Kohm (max tachometer current 5mA). **It is always necessary, to avoid interferences, to connect the tachometer with screened cable.**

3-4 VENTILATOR: it is necessary to supply these terminals with 230VAC for the separated ventilation of motor; make sure that this voltage is present also when the motor is not running, in order to guarantee the max cooling efficiency. As for the power absorbed by cooling fans, see table on the previous page.

5-6 HEAT PROBE: it is a N.C. contact which opens when the temperature of motor windings exceeds 150°C, safety limit corresponding to H class (180°C). It is used as emergency for the switching off of RUN remote control switch. The max capacity of this contact is 1A - 230VAC. (Rowan motor MEC 63 0,15 HP is not equipped with Heat Probe; for this reason terminals 5-6 are not present in its service terminal board).

BRAKE CONNECTION

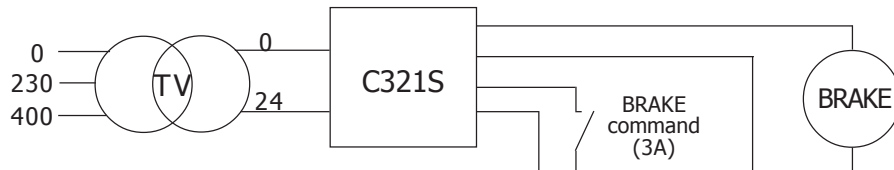
On request, ROWAN motors can be provided with electromagnetic brake. In this case the motor must be constructed expressly with lengthened motor shaft and the brake is mounted on the front part, supported by a bell which reproduces the normal flanging conditions.

There are 2 different types of brakes:

- **DIRECT BRAKE:** in this case it is necessary to supply the brake to block the motor shaft. This kind of brake is suitable for precision stops.
- **SAFETY SPRING BRAKE:** in this case it is necessary to remove supply from the brake to block the motor shaft. It is used as safety brake in case of lack of main power supply, with suspended loads as overhead travelling cranes, cranes etc.

Both brakes operate with direct voltage 24VDC, for an operating cycle S6 with max 5 'of excitation and 5' of de-excitation and are supplied through the single terminal or connector placed on the front brake bearing-bell.

For an optimized management of the brake, ROWAN suggests the card code 321S, to be connected as shown below:



The C321S provides a peak of max 34VDC and a subsequent holding voltage of 24VDC. This speeds up the release of the BRAKE and prevents overheating during continuous service for prolonged periods. For repeated excitations, wait at least 1 second between de-excitation and re-excitation of the brake.

INSTRUCTIONS FOR CONNECTION and START-UP

Before powering, connect **PE** to the ground and set up the microswitches on the board to suit the desired type of operation:

- 2 or 3 wire speed regulation potentiometer
 - inclusion of internal/external torque limitation
 - 2, 4 or 6-pole motor
- (see microswitch description)

In case of a 6-pole single-phase motor recalibrate the maximum speed with trimmer P4 until the tachometer dynamo generates approx. 5.7 VDC with the speed regulation potentiometer or DC signal at maximum value.

- Before powering, adjust the potentiometer or DC signal for zero speed; at power up the motor must be stationary. Illumination of led L1 (power on) indicates that power supply is flowing through the driving circuits. Turn potentiometer or increase DC signal: motor speed should increase or decrease according to the set acceleration/deceleration ramp, while leds L2 (run) and L3 (tachometer gen. presence) must light up accordingly; progressive illumination of led L2 indicates the presence of voltage in the motor windings, whereas light-up of L3 indicates that the motor is rotating.

- If the motor suddenly races to maximum speed without following potentiometer regulation, and pilot lamp L3 does not illuminate, it means that tachometer dynamo voltage is not reaching terminals 7 and 8; when this happens, check the connections again.

- Check attainment of maximum speed and, if necessary, fine adjust the maximum value with trimmer P4; be sure not to exceed the maximum speed as this would cause the motor to overheat even when loadless; when this happens regulate P4 until motor consumption equals the value measured at an intermediate speed. In any case check that motor consumption (measured at power supply line) conforms with the rated value. If during motor operation oscillations take place due to a particular type of load or due to mechanical transmission, these may be suppressed by regulating trimmer P7 clockwise; if regulation of P7 were not enough, also regulate trimmer P6 counter-clockwise. To prompt and smoothen motor response you may close microswitch S5.

Drive 119/92 is provided with a 0,5A protection fuse only for driving circuit; provide external power protection through a 10A fuse for drive 119/92 and 20A fuse for drive 119/92-2HP. Use a shielded cable for control connections (potentiometer, tachometer generator) especially if they are long stretches or run close to power cables; connect cable braiding to ground and not to the circuit negative, and only at one cable terminal; the board negative must also not be connected to ground; at any rate, do your best to avoid routing near power cables or large transformers.

Use relays with contacts for low current for the switching of DC signals on the control terminal panel, and avoid the use of electromagnetic switch auxiliary contacts for these types of operations.

Drives 119/92 operate efficiently with panel temperatures ranging from -5°C to +40°C; temperatures outside this range may give rise to faulty operation, speed control drifts and, if temperatures are particularly high, breakdown. Thus place the boards far from heat sources and provide adequate ventilation to the panel if the environment is subject to high temperatures.

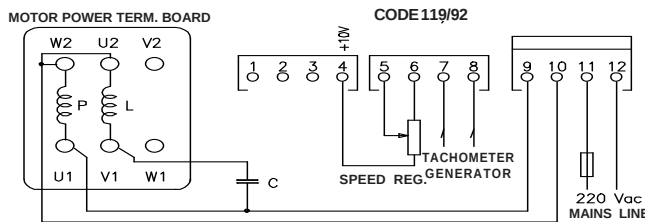
ISTRUCTIONS FOR THE CORRECT INSTALLATIONS AS PER THE ELECTRO-MAGNETIC COMPATIBILITY STANDARDS (E.M.C.)

Drive Code 119/92 must be powered on through anti E.M.I. filter as indicated in the connection diagrams on page 11; if more C119/92 drives are installed into the same cabinet we can use a unique filter dimensioned for the total supply currents. In addition, it is necessary to use a shielded cable to connect the commands (potentiometer, tachometer) especially when distances are long and we are near to power cables; the cable sleeve must be connected to ground (not to the negative of the circuit) to one end only; do not connect the negative of the drive to ground; avoid, in any case, the proximity to power cables or big transformers. Avoid, finally, to create ground loops.

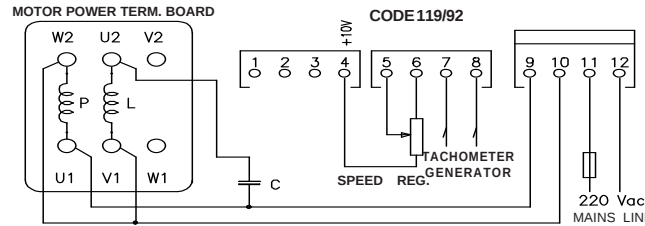
CONNECTION DIAGRAMS

Application Diagram No. 1

RIGHT
ROTATION
SENSE

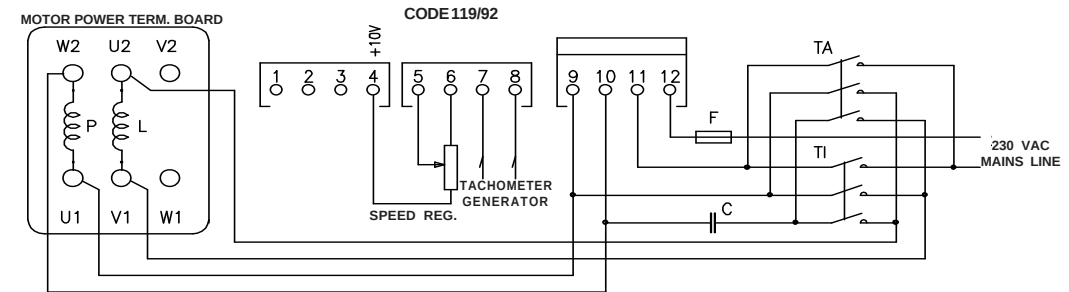


LEFT ROTATION
SENSE



This is the basic schematic diagram for drive 119/92 connection; the two individual diagrams show how to manually invert the rotation sense of the motor by operating on power connections (tachometer dynamo polarity does not need to be inverted); speed regulation is by potentiometer connected with 3 wires which ensures linear regulation of speed with respect to potentiometer rotation, whereas torque adjustment is excluded. In this case (if the motor is a 4-pole one) only microswitch S4 is to be closed.

Application Diagram No.2



In this case 119/92 drives the single-phase motor in both rotation senses; rotation sense is changed by inverting the starting winding with respect to power winding.
Set up board 119/92 as shown in schematic diagram No. 1.

EXAMPLES OF HOW TO CONNECT THE CONTROL TERMINAL BOARD

Connection of 2-wire speed regulating potentiometer:

Should you need to use the 2-wire speed regulating potentiometer (as for instance when replacing Rowan drives of previous manufacture such as old C119) close microswitch S1 and connect a 10 KOhm potentiometer; speed regulation with 2-wire potentiometer is not very linear with respect to its rotation.

Selection of different speeds with more potentiometers in parallel:

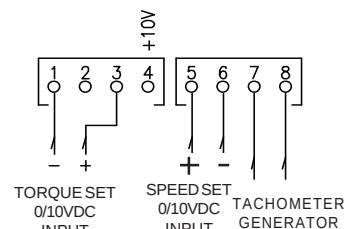
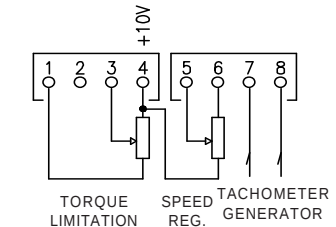
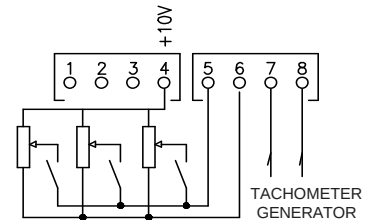
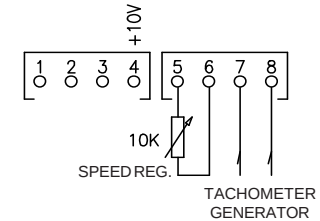
Two or more potentiometers can be connected in parallel making sure that the overall resistance between terminals 4 and 6 is not lower than 3 KOhm.

Motor torque limitation through external potentiometer:

The potentiometer value has not to load the voltage reference of +10Vdc on terminal 4 ($R = 3\text{Kohm}$ including the value of the potentiometer); in this case close microswitch S2 and it is possible to limit the regulation range of the potentiometer by using trimmer P1 (max.) and P2 (min.). If maximum torque internal limitation were enough, the external potentiometer can be omitted: in this case close microswitch S1 and limit torque by regulating trimmer P1.

Speed/torque control from analog signal 0/+10VDC:

In code 119/92 speed and torque regulations, in addition to the conventional manual potentiometer, can be performed by applying a 0/+10 VDC signal; depending on requirements, this signal can be picked up by Rowan interface boards or by other commercial equipment as PLCs, LOGIC BOARDS, COMPUTERS, etc.; the connection can be carried out directly because the board inputs are galvanically insulated from high voltage. Input impedance is 100 KOhm. Close microswitch S2.



Static run:

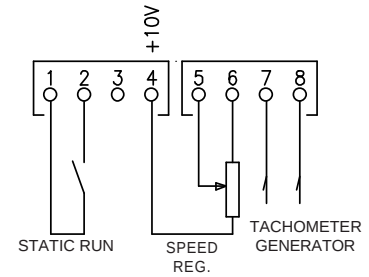
When the single-phase motor is used in only one direction, and frequent run and stop operations have to be performed, it is convenient to keep the power supply electromagnet switch excited and to enable static motor rotation by opening contact AR connectable to terminals 1-2.

- By opening contact AR, the motor follows the acceleration ramp up to the maximum speed set and with a ramp time that is adjustable by trimmer P3.
- Closure of contact AR immediately removes voltage, zero-sets the ramp and switches off RUN led L2.

If motor run/stop were necessary with acceleration and deceleration ramps without immediately removing voltage from the motor in its stopping phase, perform the following operations:

- disconnect terminal clamp 5 from the voltage reference to cause the motor to decelerate to zero revs (or at a minimum speed calibrated with P5);
- connect terminal clamp 5 to the voltage reference to cause the motor to accelerate to the maximum speed set.

Speed variations are conditioned by the acceleration/deceleration ramp set with trimmer P3; the controlled deceleration ramp operates with motors applied to braking loads or irreversible systems, but it is inefficient with inertial type loads.



MAINTENANCE INSTRUCTIONS FOR HIGH SLIP ROWAN MOTORS

“HIGH SLIP ROWAN” type motors are specifically designed to be controlled by tachometrically controlled electronic circuits and their intrinsic characteristics are especially suited to support repeated start-up surges and dynamic braking.

Since they are brushless their maintenance is reduced to a bare minimum and normally merely concerns the bearings and changing the tachometric dynamo, which nevertheless may be necessary after a minimum of 5000 work hours.

Changing bearings or tachometric dynamo

If the motor has to be dismantled to change the bearings, proceed as follows:

- 1- remove the screws on the rear fan housing or scroll fan and slide it out, disconnecting the wires on the service terminal block
- 2- take out the tachometric dynamo
- 3- slide the stays out and remove the rear housing
- 4- remove the front housing that comes out followed by the rotor attached to it
- 5- if necessary remove the front bearing, the dust guard screws and remove the snap ring (if mounted) on the shaft
- 6- slide the shaft out of the bearing
- 7- remove the snap ring (if mounted) that holds the bearing on the housing
- 8- slide off the bearing and replace it with an equivalent type - Z C3 version lubricated with high temperature stringy grease
- 9- the rear bearing must be type 2RS C3.

If necessary, replace the tachometric dynamo while assembling the motor.

Calibration of the air gap on the spring or direct brake

If a **spring brake** is mounted and the air gap requires calibration, proceed as follows:

- 1- remove the bolts coupling the motor to the brake hub
- 2- slide off the hub and brake off the shaft
- 3- remove the screws attaching the brake to the hub,
- 4- disconnect the brake cable from the terminal block
- 5- slide the brake off the hub.

At this stage the calibration can be made by adjusting the 3 bolts until an air gap between 0.2 and 0.3mm is obtained. If the brake mounts a dustproof filter, remove it to access the calibration bolts.

The spring brake is supplied with the maximum braking torque, which can be reduced by unscrewing the specific crown to a maximum of 40%, always making sure not to unscrew it right out.

If the **direct brake** has been mounted, there is no need to disassemble it, just control the air gap (maximum 0.3 mm) with a calliper through the side vents and if necessary correct it by slackening the grub screw on the brake hub.

Rowan motors require continuous ventilation and therefore it is essential that all the internal and external air passages in the motor are not blocked by foreign bodies and moreover an adequate air change must be provided. In particularly aggressive environments Rowan motors, which are normally **IP 23**, can mount a dustproof filter up to reach an **IP 43** protection rating, and especially in this case frequent controls have to be made to ensure the filter is clean and the fan is in perfect working order.

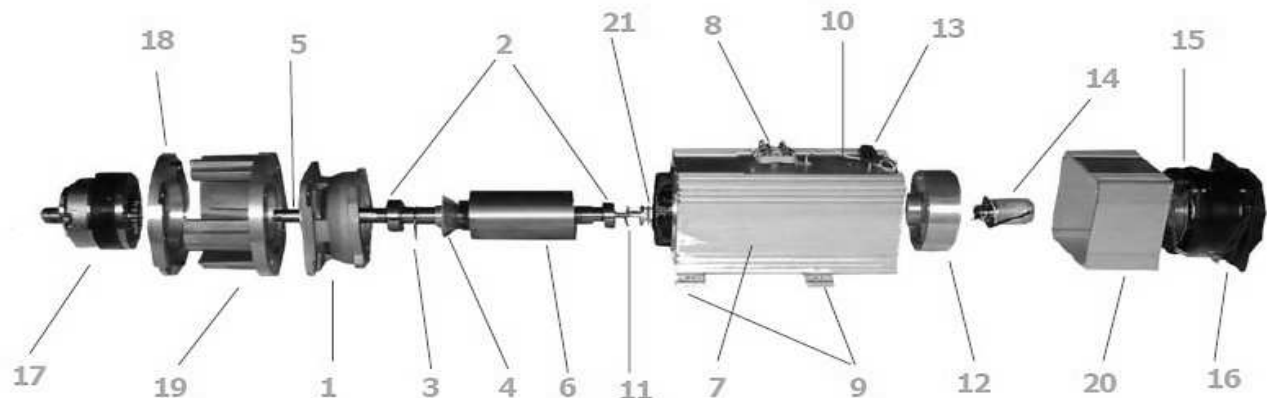
Greater protection ratings can be obtained, up to **IP 54**, providing a completely closed motor down-rated by 50%. The motor has a **heat sensor** in the windings that is calibrated to trip at 150°C (Rowan motor windings are class H with a working temperature limit of 180°C).

The sensor gives a normally closed contact that opens at 150°C and has to be used to cut off the motor power by a suitable relay switch in the event of an overload. The sensor will take a maximum load of 1A at 230VAC.

If the overload probe trips, check:

- the fan operation
- a free air flow
- the motor absorption, if over the ID plate data, may be caused by excessive load or worn bearings.

The stator winding is for a three or single phase asynchronous motor, particularly well built in class H insulation. If necessary it can be carried out by any coil winder so long as the winding data is respected, which is available from our technical dept.



- 1 > **FRONT SHIELD** (aluminium), which can be supplied in the following versions
 - *FLANGED* for B5, B3/B5 motors or with auxiliary electromagnetic brake motors;
 - *FOOTED* for B3 and B3/B5 motors.
- 2 > **FRONT AND REAR BEARING** in C3 2RS.
- 3 > **SEEGER RING** (63, 71 and 80 motors have this part only if equipped with brake).
- 4 > **CONIC DEFLECTER** (aluminium).
- 5 > **MOTOR SHAFT** (C40 Steel) normally supplied in the following versions:
 - **STANDARD SHAFT** for B3 or B5 motors without brake; **LONG SHAFT** for motors equipped with brake; **REDUCED SHAFT** (hardened steel) with reduced output dimensions.
- 6 > **MASSIVE ROTOR** (iron) with cavities for air cooling passage.
- 7 > **STATOR FRAME** composed by: **EXTERNAL RIBBED FRAME** with the housing for power terminal board (Aluminium F91); **STATOR CORE** (iron); **STATORIC WINDING** (copper).
- 8 > **POWER TERMINAL BOARD** for the connection of motor windings, with relative terminal board covering.
- 9 > **FEET** for B3 or B3/B5 versions
- 10 > **THERMIC SENSOR INSIDE WINDINGS**
- 11 > **COMPENSATOR RING**
- 12 > **REAR RING** for rear bearing housing.
- 13 > **SERVICE TERMINAL BOARD** for tachometer generator, ventilator and thermic sensor connection.
- 14 > **TACHOMETER GENERATOR TYPE 24VDC/2800 rpm, IP54, with relative joints; it can be supplied in 2 versions:**
 - DIN55: for motors MEC 63, 71, 80, 90, 100
 - DIN70: for motors from MEC 112 to MEC 200L
- 15 > **INDEPENDENT VENTILATOR**, for motor cooling, of 2 possible types: Axial and Scroll.
- 16 > **VENTILATOR COVERING** for axial fan; not present on motors with scroll fan where there is the fan support only.
- 17 > **ELECTROMAGNETIC BRAKE** which can be supplied in the following 2 types: spring/safety brake (normally closed) and direct brake (normally open); the spring/safety brake can be equipped on request with a lever for manual opening.
- 18 > **FLANGED DISC OF BRAKE BEARING BELL** (separated from the brake bearing bell only on motors Mec 90, 100, 112 and 112L).
- 19 > **BRAKE BEARING BELL** (aluminium).
- 20 > **REAR SPACER**.
- 21 > **TACHOMETER JOINT**.

ROWAN MOTORS OPERATE CORRECTLY AT AMBIENT TEMPERATURES BETWEEN -15°C AND +40°C; HIGHER TEMPERATURES CAN CAUSE OPERATING FAULTS AND, IF VERY HIGH, BREAKDOWNS. THEREFORE, IT IS RECOMMENDED TO KEEP THEM AWAY FROM HEAT SOURCES AND GUARANTEE A MINIMUM AIR CHANGE.

INSTRUCTIONS FOR THE REPLACEMENT OF PREVIOUS DRIVES WITH ACTUAL TYPE CODE 119/92

Drive code 119/92 replaces previous drives for the Rowan single phase motors type code 119 and code 120/121. Remember that in any case code 119/92-2HP board is necessary for the single phase motor 2HP Mec 100.

Replacing drive 119 with drive 119/92:

With regard to power connections:

the wires previously connected to terminals 7 and 8 are to be shifted to terminals 11 and 12 of the code 119/92, whereas the wires connected to terminals 5 and 6 are to be shifted to terminals 9 and 10.

With regard to control connections:

the tachometer wires that were previously connected to terminals 3 and 4 are to be connected to terminals 7 and 8 of the code 119/92, whereas potentiometer wires as follows: P- (OV) connected to terminal 2 is to be shifted to terminal 6, and P+ connected to terminal 1 is to be shifted to terminal 5 of the code 119/92. For functioning as old card cod. 119, microswitch S3 must be closed.

With new drive C119/92, speed regulation with 2 wire potentiometer is not linear but according to an exponential curve which presents strong variations at slow speed and small variations at high speed. If one wishes to avoid this behaviour and obtain a variation directly proportional to potentiometer variation, it is necessary to connect speed potentiometer with 3 wires as indicated in connection diagram of code 119/92 and open microswitch S3.

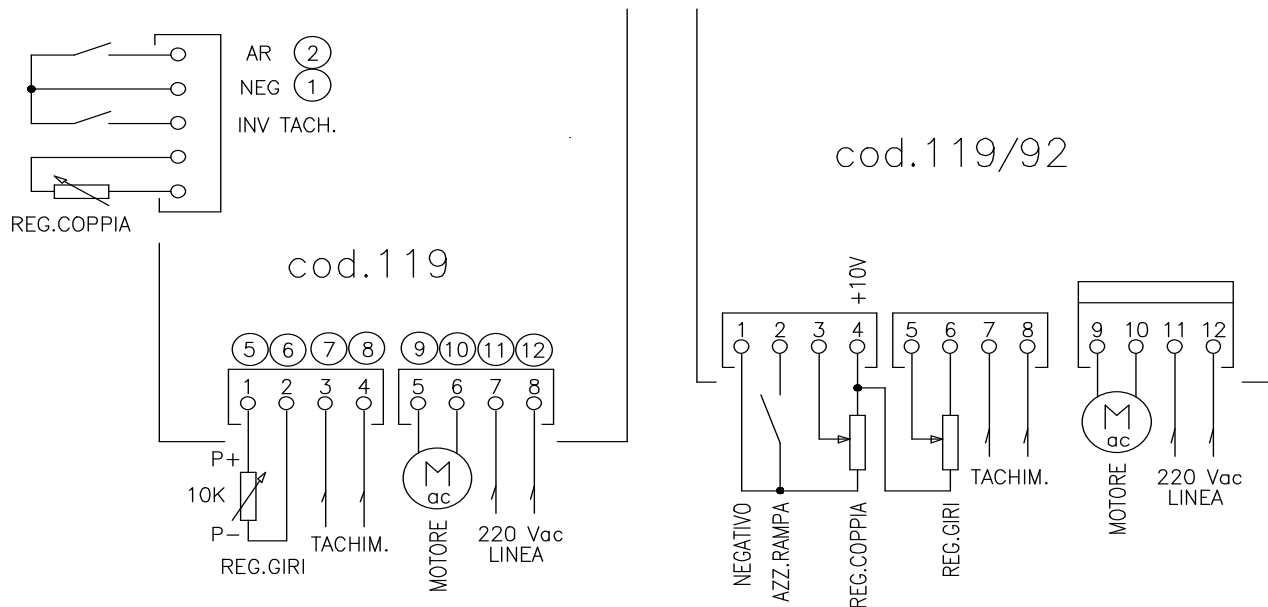
With regard to control wires connected to the lateral terminal strip of code 119:

- the wire connected to terminal **NEG** is to be shifted to terminal 1 of the code 119/92
- the wire connected to terminal **AR** is to be shifted to terminal 2 of the code 119/92
- the wire connected to terminal **INV.TACH.** is to be omitted (not necessary for the C119/92)
- the resistor connected to terminal **REG. COPPIA** must be eliminated.

Close microswitch S1 (for the other microswitches refer to the section containing the description of the microswitches).

If a potentiometer is connected to torque regulation terminals, reconnect it to code C119/92 with 3 wires to terminals **1 3 4** as from electrical drawing; in this case microswitch **S2** must be closed.

The circled numbers in the electrical drawing designate the terminals in the code C119/92.



Reg. Coppia = Torque Regulation
 Reg. Giri = Speed Regulation
 Tachim. = Tachometer Generator
 Linea = Mains Line
 Negativo = Negative
 Azz. Rampa = Ramp to zero setting
 Inv. Tach. = Tachometer Inversion

Replacing drive C120/121 with drive C119/92

For the power connections proceed as follows:

the wires that were connected to the terminals 1 and 2 are to be shifted to terminals 11 and 12 of C119/92, whereas the wires connected to terminals 3 4 5 6 7 8 related to the capacitor and power and launching windings are to be reconnected together as shown in the schematic.

For the control connections proceed as follows:

the tachometer wires that were connected to terminals 9 and 10 are to be connected to terminals 7 and 8 of C119/92, whereas the potentiometer wires as follows: P-(OV), connected to terminal 11, must be shifted to terminal 6, whereas P+, connected to terminal 12, must be shifted to terminal 5 of C119/92.

For control wires connected to lateral terminal strip M2 of board C120/121 proceed as follows:

shift the wire connected to terminal NEG to terminal 1 of C119/92;

shift the wire connected to terminal AR to terminal 2 of C119/92;

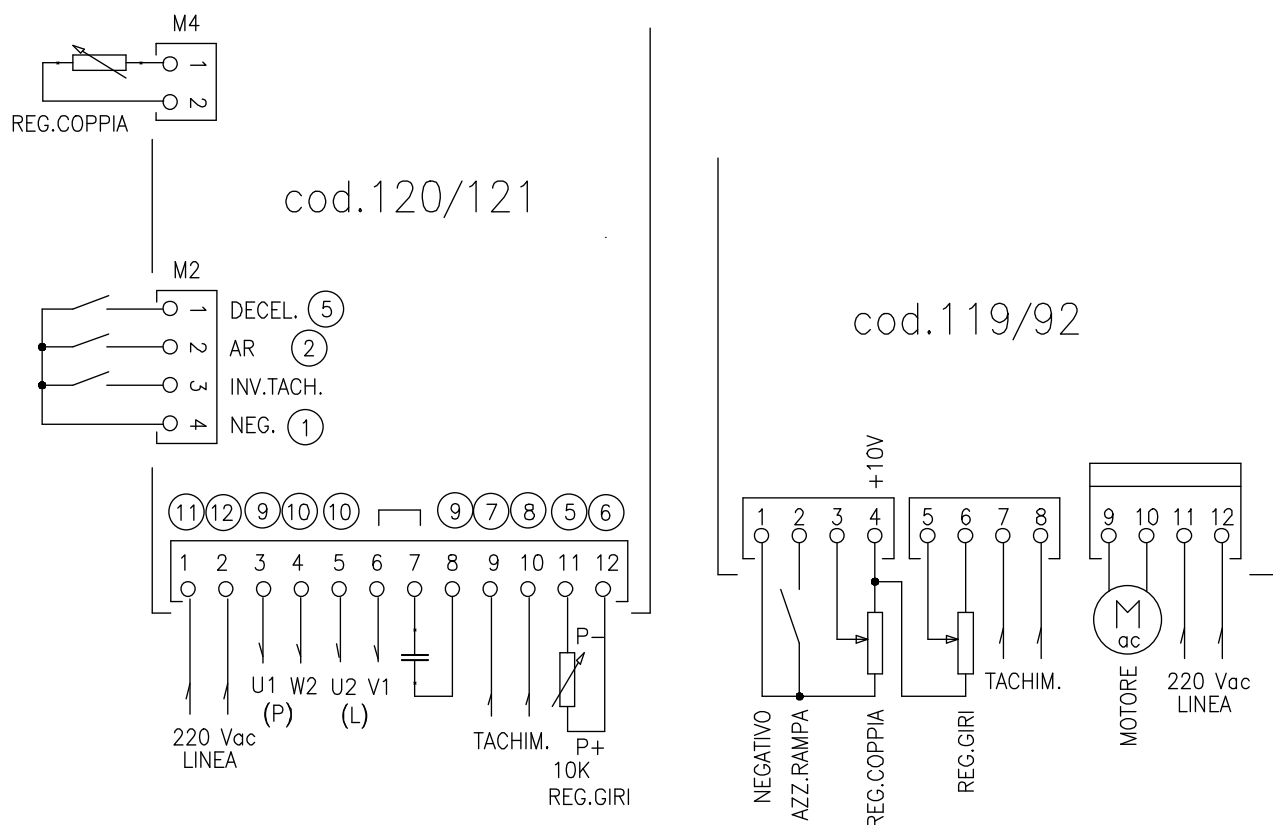
exclude the wire connected to terminal INV. TACH. since it is unnecessary for C119/92;

connect wire connected to terminal DECEL to terminal 5 of C119/92.

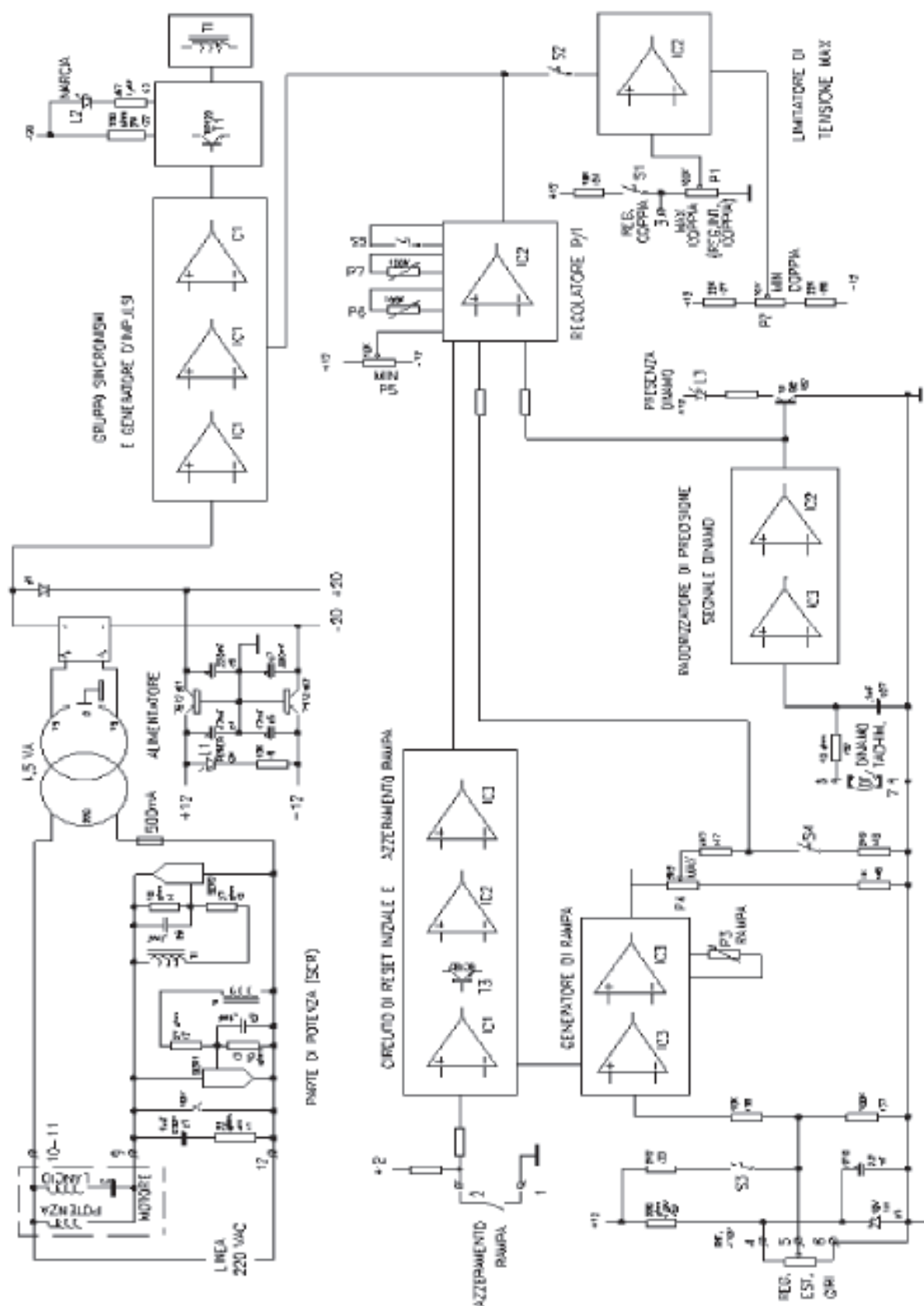
Close microswitch S1 (for other microswitches refer to the paragraph describing the microswitches).

If a potentiometer is connected to terminal board M4 for torque limitation, you should reconnect it to terminals 1 3 4 of code 119/92 with 3 wires as illustrated in the schematic diagram; in this case close microswitch S2.

The circled numbers in the schematic refer to the terminals on C119/92.



BLOCK DIAGRAM



CONFORMITY



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