

INSTRUCTION MANUAL

COD. 107S



TECHNICAL CHARACTERISTICS

	C107S/1	C107S/2	C107S/3
- Maximum power	1HP-0.75kW	2,5HP- 2kW	4HP-3kW
- Maximum armature current at start-up	10A	30A	55A
- Nominal armature current in continuous service	6A	12A	18A
- Maximum excitation current	1,2A	1,2A	3A
- Supply voltage	230VAC +10% -20%		50/60Hz
- Maximum armature voltage	170VDC		
- Excitation voltage	190VDC		
- Surrounding air temperature limits	-5°C ÷ +40°C		
- Stacking Temperature	-25°C ÷ +70°C		
- Non condensated relative umidity	5% ÷ 95%		
- Maximum power absorbed by the card	3VA		
- Regulation precision as a percentage of the maximum speed with micro S3 open:			
with armature reaction: 10% with a 1/10 regulation field			
with tachometric reaction: 0.2% with a 1/100 regulation field			
- Maximum tachometric generator input 24VDC.			
- Speed regulation input:			
from 10 Kohm potentiometer or 0/+10VDC analogue voltage (2mA)			
- Static stop input from relay contact for low currents			

REGULATIONS CONFORMITY:

- To 2006/95/CE Low Voltage regulation, with reference to EN 60439-1 and CEI EN 60204 standards.
- To CEI EN 61800-3 Cat. C3 product standard without Emi filter.
- To EMC 2004/108/CE regulation with reference to CEI EN 61800-3 Cat. C1 standard, only by respecting the connections described in the present manual and combined with the pertinent Emi filter.
- Emi filters on request:
 FM.ROW.6A.400 for C107S/1
 FM.ROW.14A.400 for C107S/2
 FM.ROW.30A.400 for C107S/3

Internal regulations:

- MIN and MAX trimmer for the speed adjustment field of the external potentiometer or D.C. signal.
 Acceleration RAMP trimmer: regulates the speed rise time from minimum 0.4 sec to maximum 8 sec from zero to maximum revs.
- Connections with snap-on terminals for /1 e /2 models.
 - Connections with screw terminals for /3 model.
 - Printed circuit, "Europa" format.
 - Standard version on sheet base and polycarbonate cover (IP20).

CONFORMITY  	Rowan Elettronica <i>Motori, azionamenti, accessori e servizi per l'automazione</i> Via Ugo Foscolo, 20 - CALDOGNO - VICENZA - ITALIA Tel.: 0444 - 905566 (4 linee r.a.) Fax: 0444 - 905593 E-mail: info@rowan.it Internet Address: www.rowan.it Capitale Sociale Euro 78.000,00 i.v. iscritta al R.E.A di Vicenza al n. 146091 C.F./P.IVA e Reg. Imprese IT 00673770244	 UNI EN ISO 9001	
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REV. 6 - Date 04/03/13

OPERATING PRINCIPLE

The code 107S card is a monodirectional drive that controls the speed of direct current motors with permanent magnets or separate excitation.

Speed regulation is handled by the differential control between the values set using a potentiometer and the feedback voltage extracted from the brushes (armature reaction) or else by extracting the feedback signal from a tachometric generator that is keyed to the motor shaft (tachometric feedback). The differential circuit commands a controlled diode voltage regulator (SCR) which, by way of a rectifier bridge, supplies the motor armature with regulated continuous voltage.

CONNECTING TERMINAL BOARD DESCRIPTION - MICROSWITCHES - TRIMMERS - PILOT LIGHTS

Terminal board:

- 1 (P+) - 2 (P-) = 10 Kohm potentiometer input or DC signal for speed regulation.
- 3 - 4 = Armature winding output.
- 5 - 6 = Excitation winding output.
- 7 - 8 = 230 VAC supply.
- 9 (A.R.) - 10 (NEG.) = Static stop contact output.
- 11 (G+) - 12 (G-) = Maximum tachometric generator input 24VDC.

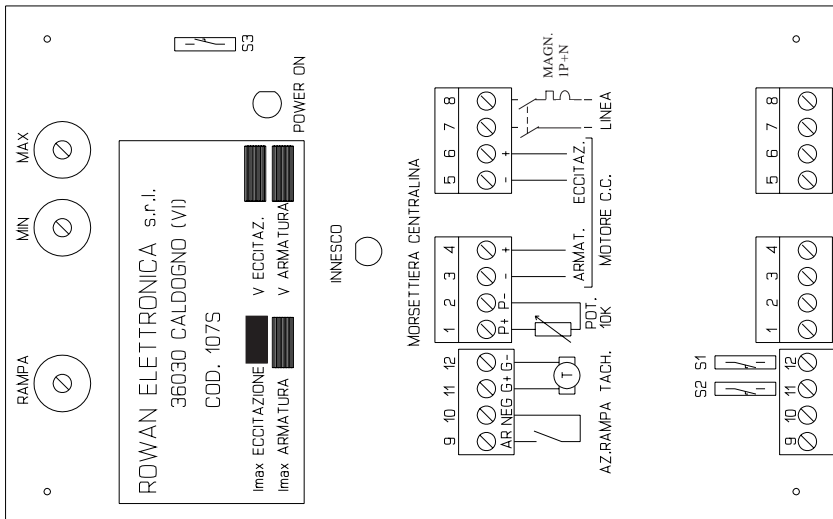
Microswitches

- S1 - S2 open = Tachometric generator reaction.
- S1 - S2 closed = Armature reaction.
- S3 open = Maximum speed control precision.
- S3 closed = Antiswing (less precision).

Trimmers

- MIN = Minimum speed regulation.
- MAX = Maximum speed regulation.
- RAMP = Rise time regulation from 0 revs. to set speed.

UNSEALED VERSION OF THE SCREENED COVER



STARTING INSTRUCTIONS

First of all establish the way of operating:

armature reaction: micro S1 - S2 closed.

tachometric reaction: micro S1 - S2 open.

Connect the tachometric generator to terminals 11 (G+) 12 (G-).

Connect the 230VAC supply to terminals 7 - 8.

Connect the excitation winding to terminals 5 (-) 6 (+).

Connect the 10 Kohm potentiometer to terminals 1 (P+) 2 (P-) and position at 0 revs., which corresponds to a resistance of 0 ohms.

Supply with power.

The stabilised card feeder is working when the POWER ON (L1) led lights up. If the potentiometer resistance is increased, the motor begins to turn until maximum speed is reached, corresponding to a resistance of 10 Kohm.

If it is necessary to recalibrate the maximum revs., this can be done by regulating the MAX trimmer. In the same way the minimum revs. can be calibrated using the MIN trimmer.

While the motor is turning, the trigger pilot led (L2) should light up in a way that is directly proportional to the motor absorption.

Operating with tachometric reaction:

First of all it is necessary to open S1 - S2. After this, when supplied, the motor may escape dangerously out of revs. at the start of regulation without following potentiometer regulation. If this happens, the generator polarity should be inverted and if the defect continues make sure that the generator voltage (maximum 24VDC) reaches the connection terminals.

The code 107S card is not equipped with a maximum current protection because of its constructive simplicity. It is therefore necessary to use fuses or circuit breakers externally.

As regards connection with teleswitches, power should also be disconnected from the card each time the motor is to be stopped in order to obtain correct starting. Remember that with the tachometric version, the polarity of the tachometric generator should also be inverted (**using relays for low currents**) each time the rotational direction is inverted. We recommend following the diagrams given on page 7 that shows correct card connection.

If the motor carries out frequent starts in a single rotational direction, it is possible to avoid using the running teleswitch command by using the static stop or ramp zeroing command. Closing terminals 9 (AR) 10 (NEG) with a relay contact for low voltages stops the motor, while if the contact is opened again the motor rises with the ramp set at the speed established by the external potentiometer.

The acceleration ramp from zero to maximum speed can be regulated from a minimum of 0.4sec to a maximum of 8 sec using the ramp trimmer.

The ramp begins each time the board is powered or when the ramp zeroing contact opens. After this, the set time runs out and the potentiometer can instantly regulate the speed. If the mechanical combination of the motor causes speed control oscillations, the effect can be dampened by closing micro S3.

Speed regulation has been planned for a 10 Kohm potentiometer or for an analogue voltage of 0 \ +10VDC that can be supplied externally from a device (e.g. LM 358 amplifier) that is able to zero the voltage present at terminals P+ P- which is 10VDC with a maximum current of 2mA.

It is worthwhile evidencing that in the armature reaction version the potentiometric input is not insulated against high voltage. The input of the tachometric reaction version is totally insulated and does not need to be insulated if combined with programmable logics.

Pay attention to the potentiometer and tachometric generator (if present) connections. If the connecting sections are long, avoid passing them together with the power cables if possible and use screened cable with the screening connected to earth (**absolutely not** to the circuit negative).

The card works correctly if the internal temperature of the housing panel is between +5°C and +40°C. Lower and higher temperatures can cause operation irregularities, and, if very high, breakages.

It is therefore necessary to keep the card away from heat sources and ventilate the panels if the environment is very hot.

PROTECTIONS

The code 107S card is widely over-dimensioned but, there are no internal protections against overloading and/or short-circuit. For this reason it is essential to use, at the line input, a MAGNETO-THERMIC switch 1P+N type (DOMA45 Schneider or equivalent), as shown in the **connection examples** on page 7, suitable to the motor size.

We suggest:

C107S/1 -> **DOMA45C6** Magneto-thermic switch.

C107S/2 -> **DOMA45C10** Magneto-thermic switch.

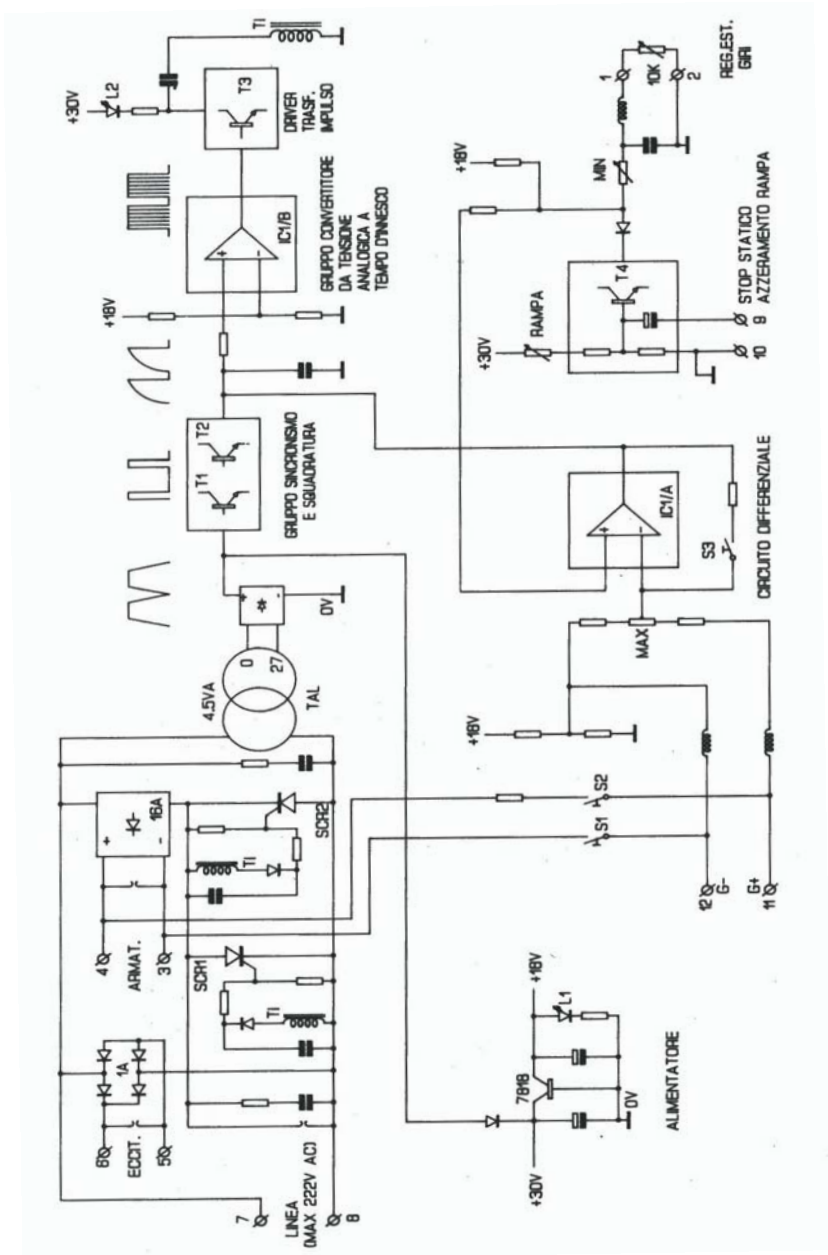
C107S/3 -> **DOMA45C16** Magneto-thermic switch.

STANDARD PRE-SETTING AND CALIBRATIONS

The code 107S card exits from the Rowan test laboratory prepared and calibrated in the following manner:

- minimum speed zero.
- maximum speed corresponds to 170VDC of the armature.
- armature reaction S1 - S2 closed, S3 open.
- acceleration ramp at maximum (8 sec).

BLOCK DIAGRAM



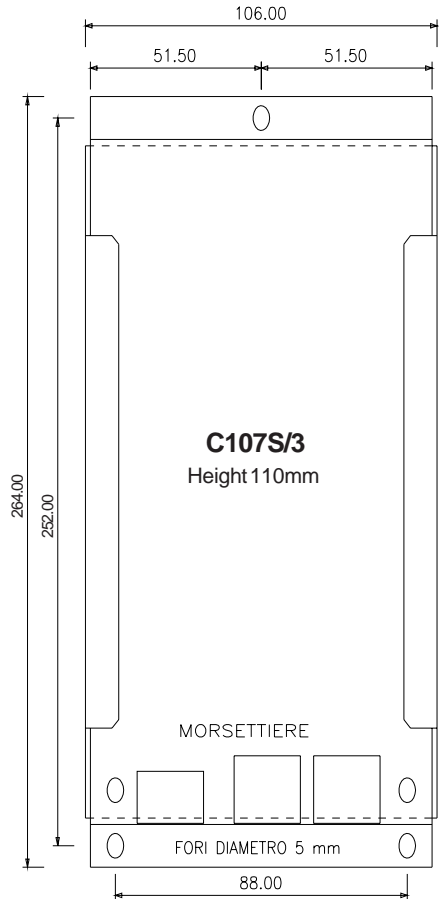
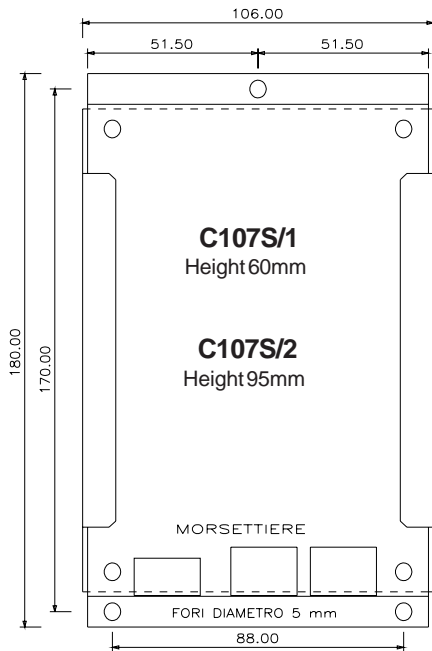
OVERALL DIMENSIONS

VERSION on SHEET METAL BASE

C107S/1 Height: 60mm

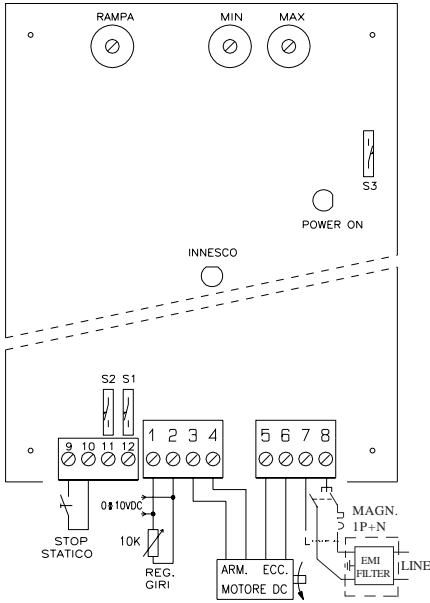
C107S/2 Height: 95mm

C107S/3 Height: 110mm

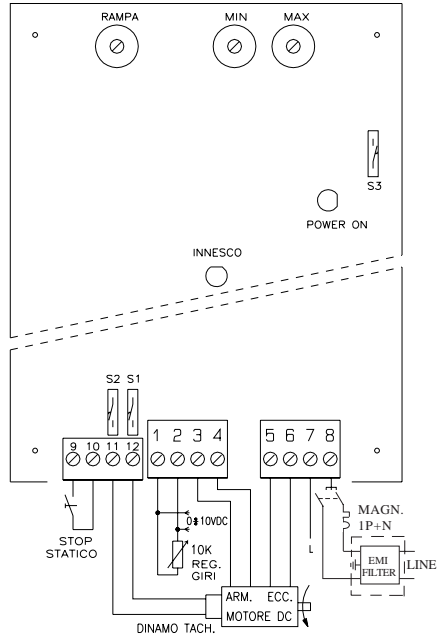


CONNECTION EXAMPLES

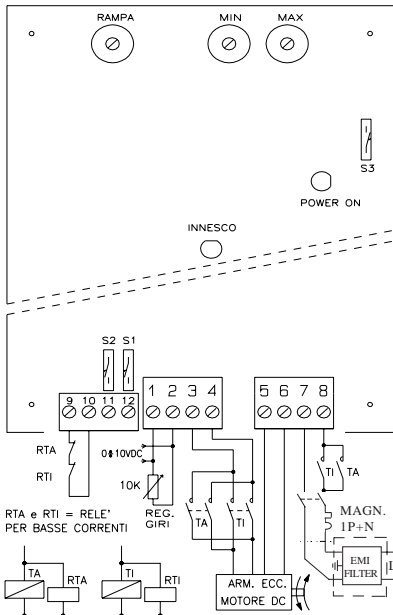
107S STANDARD ARMATURE REACTION



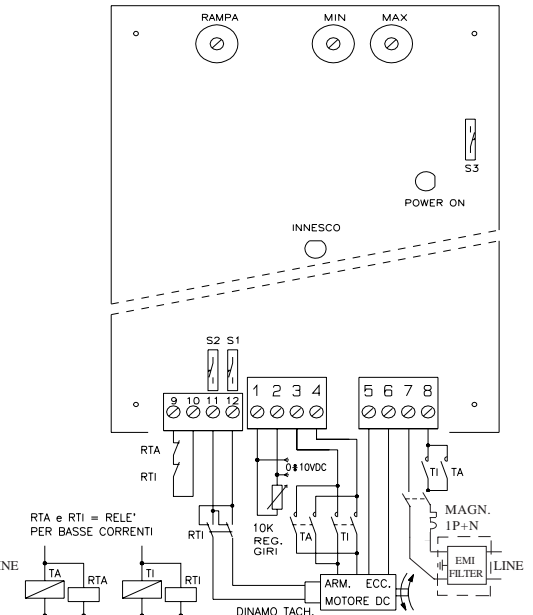
107S STANDARD TACHOMETRIC REACTION



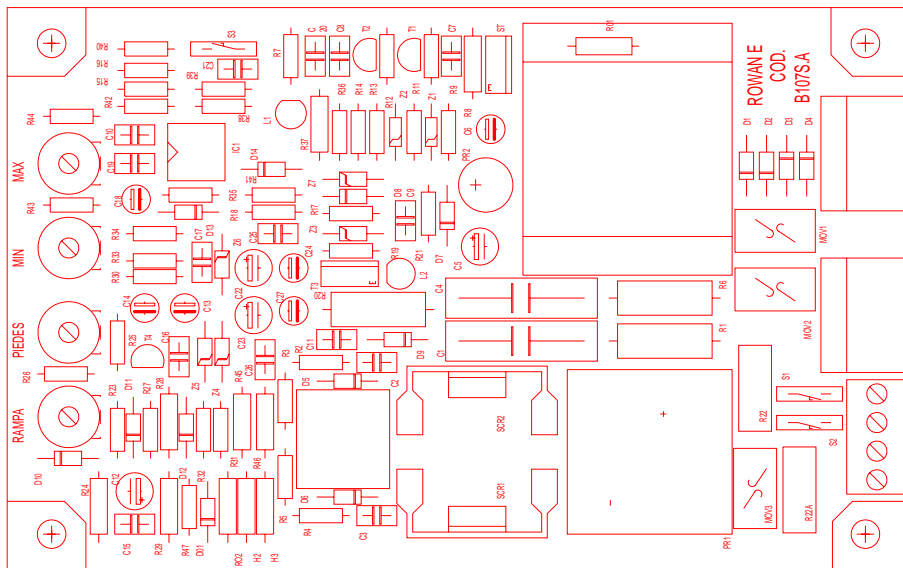
107S ARMATURE REACTION with MOTION INVERSION



107S TACHOMETRIC REACTION with MOTION INVERSION



CIRCUIT SERIGRAPHY



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Warning !

- ROWAN ELETTRONICA s.r.l. cannot be held responsible for any inaccuracies contained in this manual caused by printing and/or transcription errors. The company also reserves the right to carry out any variations that it feels are necessary for improving product operation without forewarning.
- A maximum tolerance of 10% is given for the data and characteristics given in this manual.
- The electric apparatus can create dangerous situations for the safety of people and things. The user is therefore responsible for apparatus installation and installation conformity with current laws.
- This apparatus should only be installed by a specialised technician who has read and understood this manual. For any doubt, please contact the supplier.