Code 415S

REGULATOR for SEMI-CONTROLLED BRIDGED SCR

cod. 415S

L1

L2

L3

-   **+**

Rowan Elettronica

Motori, azionamenti, accessori e servizi per l'automazione

CSQ
UNI EN ISO 9001

IQNet
CERTIFIED MANAGEMENT SYSTEM

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DRIVE FUNCTIONS

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HOW IT WORKS

The code 415S has been created to regulate the continuos voltage of a semi-controlled diodes bridge by controlling the 3 SCR with the phase partialization system.

The drive can regulate the continuos voltage through a 0/+10Vdc analog signal (or potentiometer), at open or closed loop through a +/- 10Vdc feedback input.

Through a second feedback input, connectable to a current transformer, you can limit the max loading current.

Examples of application:
- Regulation of the continuous voltage for DC suppliers;
- Regolation of DC motors speed by controlling the armature voltage with feedback by tacho-generator;
- Regulation of the BUSDC voltage, on frequency converters with an inside input circuit for the charging of the condensers.

GENERAL CONNECTION DIAGRAM
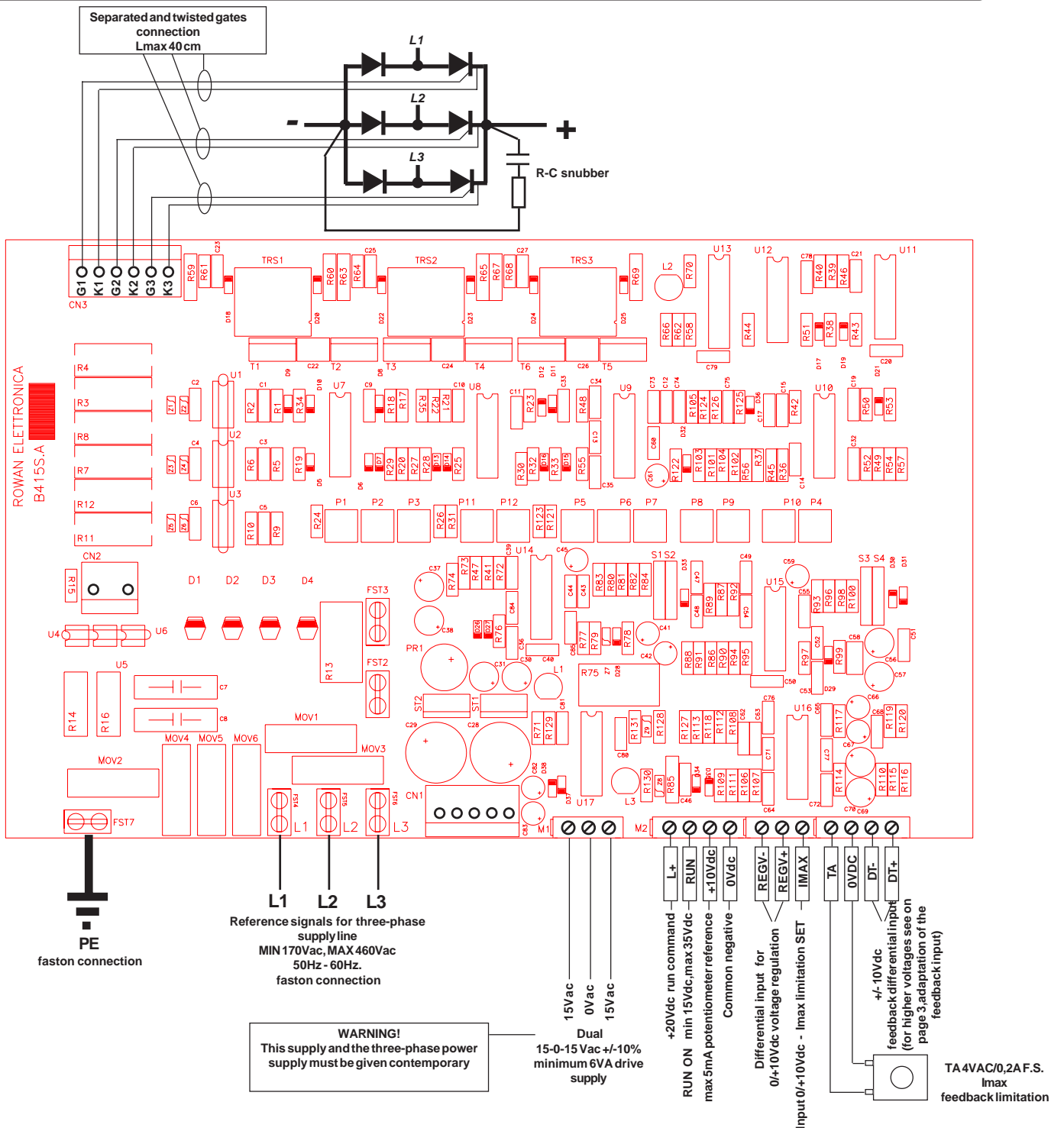
LED VISUALIZATIONS DESCRIPTION

L1 = TURNED ON - the drive is powered
L2 = TURNED ON - SCR are triggered.
L3 = TURNED ON - the drive is running allowing the SCR command.
　　　 TURNED OFF - it locks the SCR command and it zeroes all regulation functions.

MICRO-SWITCHES DESCRIPTION

S1 = OFF, enables the maximum current external limitation on the load by a 0/+10Vdc signal connected between 0V and IMAX terminals.
　　　 ON, enables the maximum current internal limitation on the load.

S2 = OFF, enables the voltage regulation by a +10Vdc signal connected to REGV- and REGV+ terminals.
　　　 ON, enables the voltage regulation by a +3Vdc signal connected to REGV- and REGV+ terminals.

S3 = OFF, ramps regulation field on the voltage regulation from 0,02s to 0,2s.
　　　 ON, ramps regulation field on the voltage regulation from 0,2s to 18s.

S4 = OFF, closed loop voltage regulation with feedback from max +/-10Vdc signal connected to terminals DT- and DT+.
　　　 ON, open loop voltage regulation.

TRIMMERS DESCRIPTION

P1
P2　 = fabric regulation of the phases balancing.
P3

P4 = fabric regulation of the maximum life for the SCR pack.
P5 = P/I reg. of the current limiter; clockwise it reduces the oscillations and delays the response time.
P6 = MAXIMUM limitation of the current regulation field; clockwise it increases the MAX current limit.
P7 = MINIMUM limitation of the current regulation field; clockwise it increases the MIN current limit.
P8 = DECELERATION ramp time on the voltage regulation; clockwise it increases the time.
P9 = ACCELERATION ramp time on the voltage regulation; clockwise it increases the time.
P10 = P/I reg. of the voltage regulation at closed loop; clockwise it reduces the oscillations and delays the response time.
P11 = MINIMUM limitation of the voltage regulation field; clockwise it increases the MIN voltage limit.
P12 = MAXIMUM limitation of the voltage regulation field; clockwise it increases the MAX voltage limit.

ADAPTATION of DT+ DT- FEEDBACK INPUT

The feedback input to DT+ and DT- terminals is created for a +/-10Vdc maximum voltage; for higher voltages it is necessary to connect 2 resistors (1 per each input) of the same value calculated in the following way:

$$\text{ohm RESISTANCE} = \frac{\text{FEEDBACK VOLTAGE}}{10} \times 82000 + 94000$$

When the feedback voltage gets over 300V, it is necessary to use several 1/2W resistors in series. EXAMPLE:
With a 560Vdc voltage, the reduction resistance will be 4686000 ohm; the reduction circuit with commercial resistances could be:

FEEDBACK VOLTAGE ── 2M7 ── 2M7 ── DT+
　　　　　　　　　　 ── 2M7 ── 2M7 ── DT-

WARNING!
Even if, with this type of reduction, the currents to terminals DT+ and DT- are not dangerous to the user, there is no galvanic insulation; if requested, the feedback voltage must be reduced by appropriate insulated adapters.
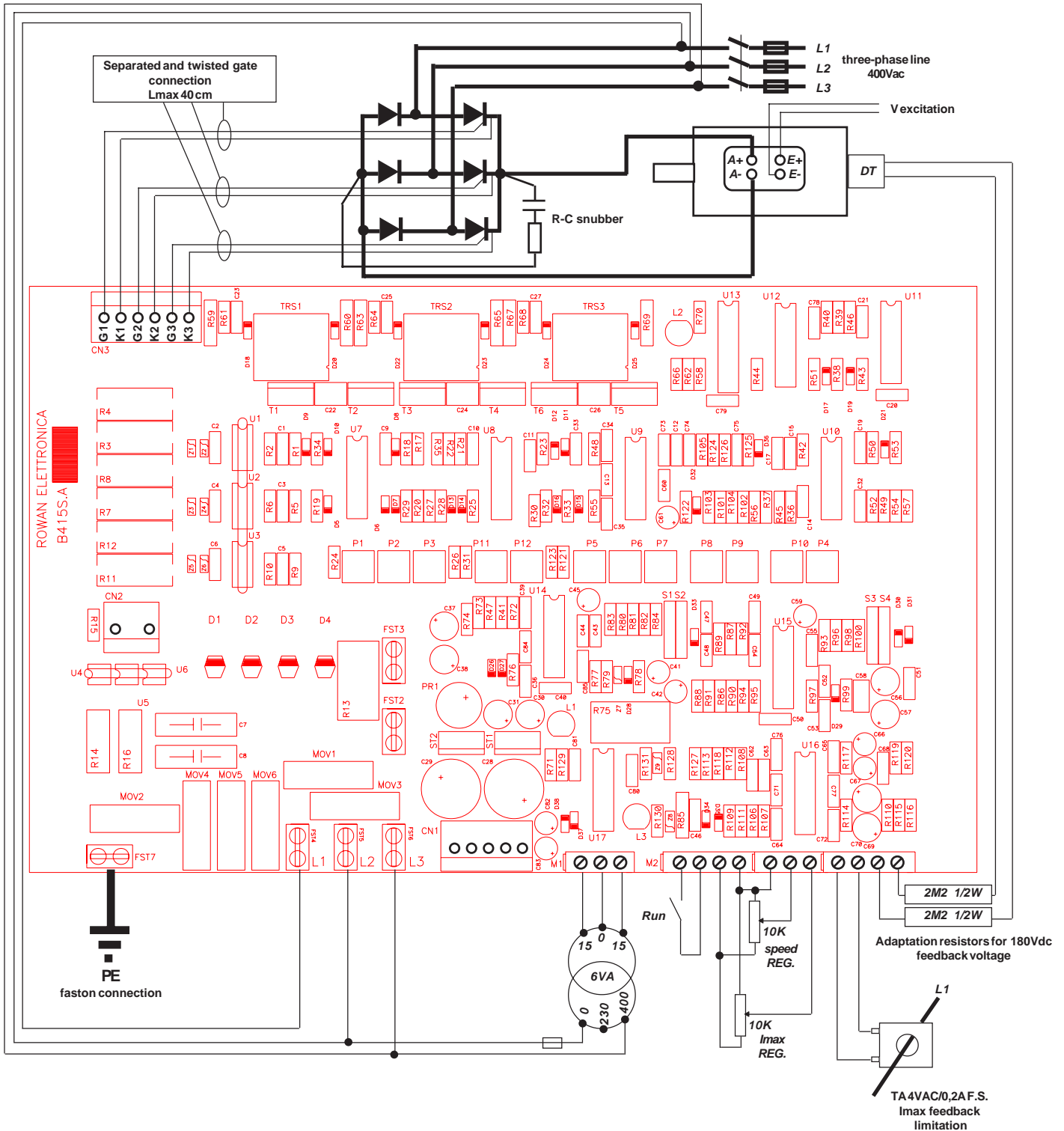
Three-phase supply = 400Vac, Vout = 10Vdc.
DC voltage regulation and maximum current limitation through potentiometer.
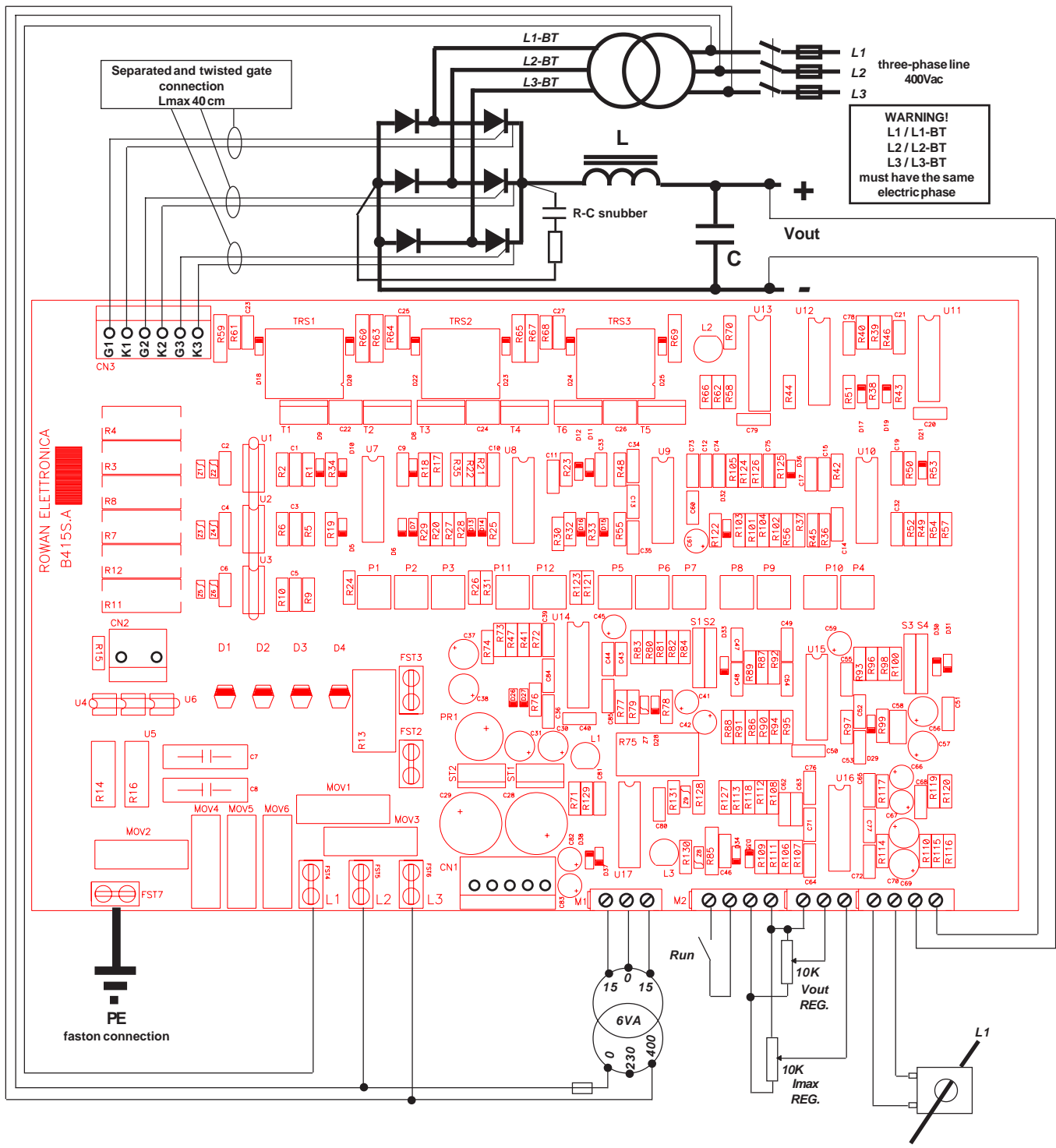
- Micro-switches pre-setting for this application: S3 ON, S1-S2-S4 OFF
- The L inductance and the C capacity have to be accorded to the output current and to the ripple requested on the voltage; if the load can bear the DC partialized voltage, you can leave out L and C.
- To cancel the current limitation, leave out the TA and the REG.Imax potent. connections DC and adjust P6 all clockwise.
- Warning! The DT- and DT feedback voltage input is created for +/-10Vdc maximum; if the voltage is higher, it is necessary to limit it by external resistors.
- If the stabilization is not necessary, cancel the feedback connection to DT- and DT terminals and close the micro S4. (P11 minimum and P12 maximum must be set again).

Three-phase supply = 400Vac, V armature = 440Vdc, Maximum speed= 3000rpm.
Speed regulation and limitation of the maximum current through potentiometer.
Feedback by 60V/1000 rpm tachogenerator.

- Micro-switches pre-setting for this application: S3 ON, S1-S2-S4 OFF
- Warning! The DT- and DT feedback voltage input is created for +/-10Vdc maximum; in this case, the signal generated by the tachogenerator is 180Vdc and it has to be limited by two external 2M2 ohm resistors.

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CONNECTION DIAGRAM for THE SPEED REGULATION of a DC MOTOR, SINGLE-PHASE LINE

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Single-phase supply = 230Vac, V armature = 170Vdc, Maximum speed= 3000rpm.
Speed regulation and limitation of the maximum current through potentiometer.
Feedback by 60V/1000 rpm tachogenerator.
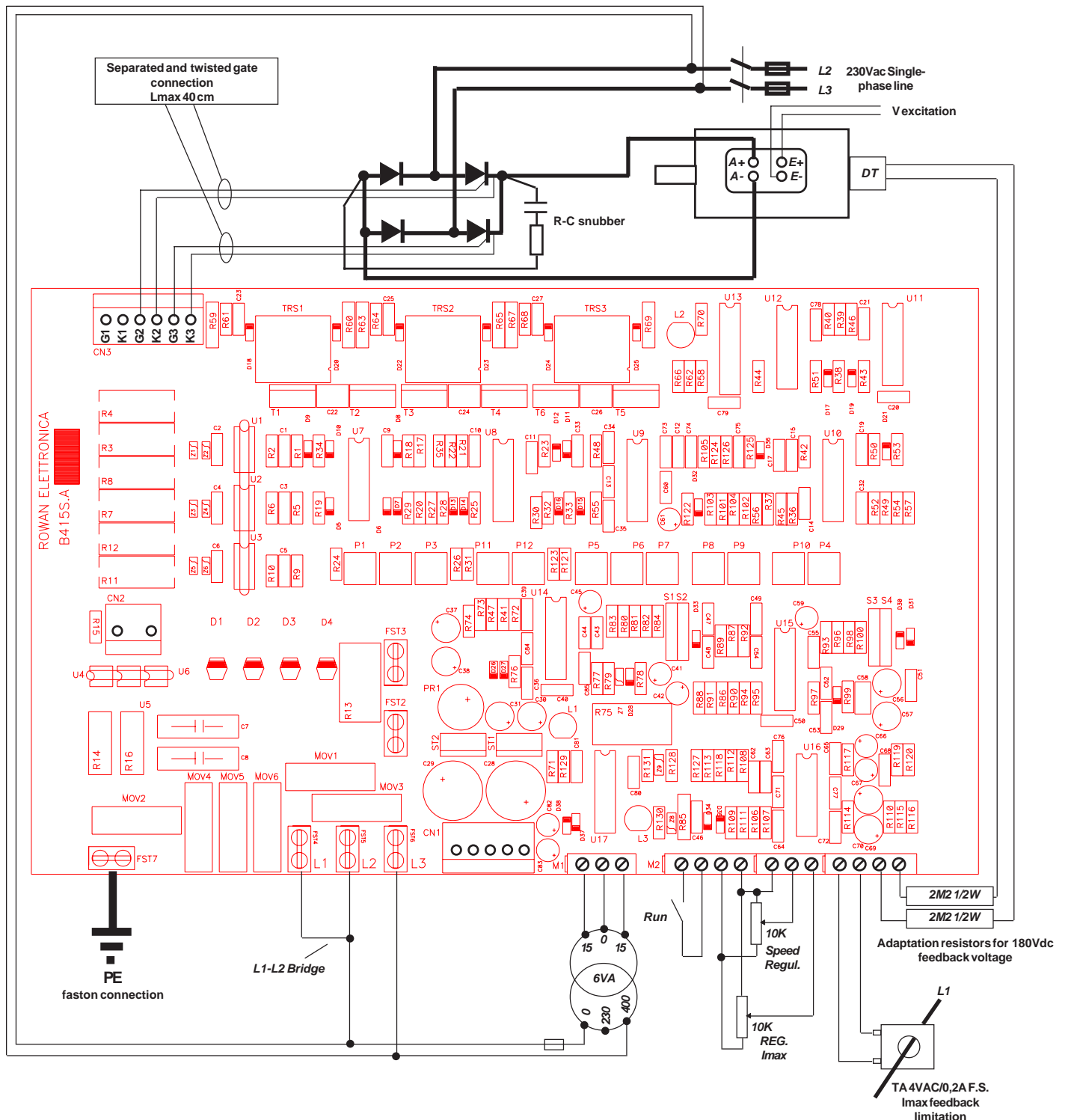
- Micro-switches pre-setting for this application: S3 ON, S1-S2-S4 OFF
- Warning! The DT- and DT feedback voltage input is created for +/-10Vdc maximum; in this case, the signal generated by the tachogenerator is 180Vdc and it has to be limited by two external 2M2 ohm resistors.

INFORMATION on SINGLE-PHASE LINE OPERATION MODE
- It is necessary making a bridge between L1-L2 to avoid unbalancing on DC output voltage.
- The regulation is allowed with pure resistive load and pure capacitive load only (ex. BusDC feeder device); in this last said case, it is suggested to put one impedance on the supply line or between bridge and capacitors, for limiting load current peaks.

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