



# INSTRUCTION MANUAL codes 273S.C/1 - /2

## BIDIRECTIONAL DRIVES FOR 24V DC PERMANENT MAGNET MOTORS

REV.2  
10/10/16

These drives are mosfet switching regulators, AC/DC input, DC output and can be used for:

- Bi-directional torque/speed regulation for DC permanent magnet motors, with option feedback from armature or from tacho-generator;
- DC voltage regulation for proportional Electro valves with or without feedback;
- DC voltage regulation for brakes or frictions.

### Technical Characteristics

#### ● Supply voltage - absolute limits:

AC: Min. 19VAC at 50-60Hz - Max. 44VAC AT 50-60Hz

DC: Min. 22VD - Max. 62VDC

Supply limits to guarantee rated outputs 24V / 48V are indicated on the table below.

**Warning:** When controlling 48Vdc motors in alternating supply, use transformers with max 40Vdc secondary (**don't use 48Vac, or else the drive will break**).

CODE	*Min. Supply VAC		*Min. Supply VDC		In OUT (A)	Imax DRIVE JAMMING (A)	gLRAPID SUPPLY FUSE (A)	TRASFORMER				BRAKING			MAX POWER DISSIPATED from the CASE (W)	WEIGHT (Kg)
	rated output 24VDC	rated output 48VDC	rated output- 24VDC	rated output- 48VDC				rated output 24Vdc		rated output 48Vdc		MINIMUM RESISTANCE (Ohm)	Pn (W)	gLRAPID FUSE (A)		
								Pn (VA)	VAC sec. (V)	Pn (VA)	VAC sec. (V)					
273S.C/1	19	36	26	50	6	45	16	200	24	400	40	20	195	6	15	1
273S.C/2	19	36	26	50	9	90	16	300	24	600	40	20	195	6	25	1,1

#### ● Output Characteristics:

- Regulation range: from 0 to ± 50Vdc suitable for motors 12Vdc, 24Vdc, 48Vdc
- Switching frequency: 15KHz
- Built in braking module for the dissipation of the regenerated current on external resistance, operating at 65Vdc.

#### ● Regulations:

- Speed reg. from analogue signal ± 10VDC with differential input or from potentiometer.
- Torque (current) reg. from analogue signal +10VDC or from potentiometer.
- Feedback type selection by means of armature or by tachometer max 24Vdc.
- Speed feedback by max 24Vdc tachodynamo.
- Slipping compensation in armature feedback.

#### ● Protections:

- Against short-circuit in power output and on +15Vdc reference.
- Against BUSDC overvoltage from the motor re-generation at 75V.

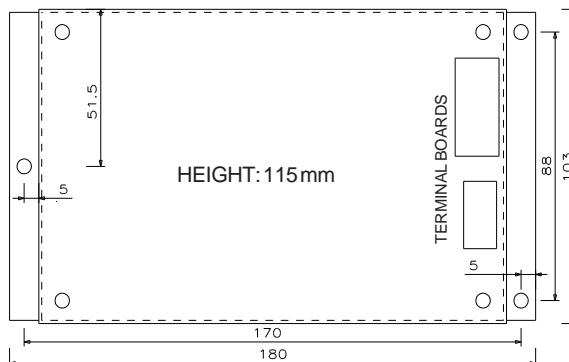
#### ● Environment conditions:

- Operating temperature -5°C/ + 40°C.
- Stocking temperature -25°C/ +70°C
- Non condensated relative humidity from 5% till 95%

### Conformity to Standards

- General standard applied: **CEI EN 60204-1**
- General standard applied **EMC 89/336/CEE** with reference to Norm **CEI EN 61800-3**, if the following rules are respected:
  - use of the net filter (contact Rowan Technical dept.)
  - use of shielded cables for connecting motor, tacho generator and potentiometer, with shielding connected to the

Overall dimensions (mm)



## CONNECTION DESCRIPTION

**1 - 4** =  $\pm 10\text{Vdc}$  differential input for speed regulation

**2** =  $+10\text{Vdc}$  voltage reference output for external regulation potentiometers; max load 10mA.

**3** =  $-10\text{Vdc}$  voltage reference output for external regulation potentiometers; max load 10mA.

**5 - 6** = Speed feedback input by max  $\pm 24\text{Vdc}$  tachometer.

**6** = Common negative

**7 - 8** = DC motor, EV, BRAKES, FRICTIONS command output. **Warning!** switching output at 15Khz, use shielded cable.

**Warning! this output is protected against short-circuit but not against long overload of the drive.**

If you adjust P3 to take advantage of the maximum starting current when driving a DC motor, it is necessary to install a thermic protection set on the drive nominal current (see technical characteristics on page 1).

**9 - 10** = drive supply. See table on page 1 and diagram on page 3.

**NOTE: with speed regulation by external potentiometer, make a BRIDGE between terminals 1-6 as shown in the picture of page 3.**

**A** =  $+15\text{Vdc}/0.2\text{A}$  regulated supply for external devices. Protected against short-circuit.

**B** =  $0/+10\text{Vdc}$  analogue input for torque regulation.

**C** = digit input for run command of the drive; to activate the run, give min 10Vdc, max 35Vdc.

**D (No) E (Nc) F (Com)** = drive relay contact in run: excited when running, de-energized when off-running or locked-out.

**G (+Vbusdc) H (out braking)** = connection of braking resistance 20ohm or bigger.

Resistances available: 20ohm/600W ( ROWAN code: RES.20R.600 ) for maximum braking.

68ohm/50W ( ROWAN code: RES68R50 ) for average braking.

Max braking continuative current in continuous service: 3A.

**0** =  $-V_{\text{busdc}}$

**Warning! The drive has no protections on the braking resistance command.**

Insert a rapid GL 6A protection fuse for the short-circuit.

## TRIMMERS DESCRIPTION

**P0** = Offset zero rounds regulation

**P1** = Acceleration/deceleration ramp regulation on speed: Min. 0.1sec, max 10sec.

Clockwise it raises the ramp duration.

**P2** = Maximum speed regulation. Clockwise it raises the maximum speed.

**P3** = Maximum current regulation. It is set by Rowan for the nominal current of the drive in continuous service.

Clockwise it raises the maximum current.

**P4** = Speed control stability regulation. Anti-clockwise it stabilizes oscillations.

**P5** = Motor slipping compensation. Set clockwise to limit the reducing of speed from empty DC motor to loaded, paying attention not to oscillate the speed control.

**ATTENTION! when there is feedback from tacho-generator, adjust P5 completely anti-clockwise.**

**P6** = Braking intervention. Fabric setting, for authorized personnel only.

**P7** = Switching frequency regulation. Fabric setting, for authorized personnel only.

## MICROSWITCHES DESCRIPTION

**S1** = Feedback type selection

S1 closed = internal feedback by armature.

S1 open = feedback by max 24Vdc external tachodynamo.

**S2** = Selection of the maximum current internal/external regulation

S2 closed = internal regulation

S2 open = external regulation.

## LED DESCRIPTION

**L1** = Power on (ON when it is supplied)

**L2** = Locked-out by short-circuit (ON when the jamming max current has been passed - see table). In this case, leave out the supply and check to find the possible external causes - cables or motor.

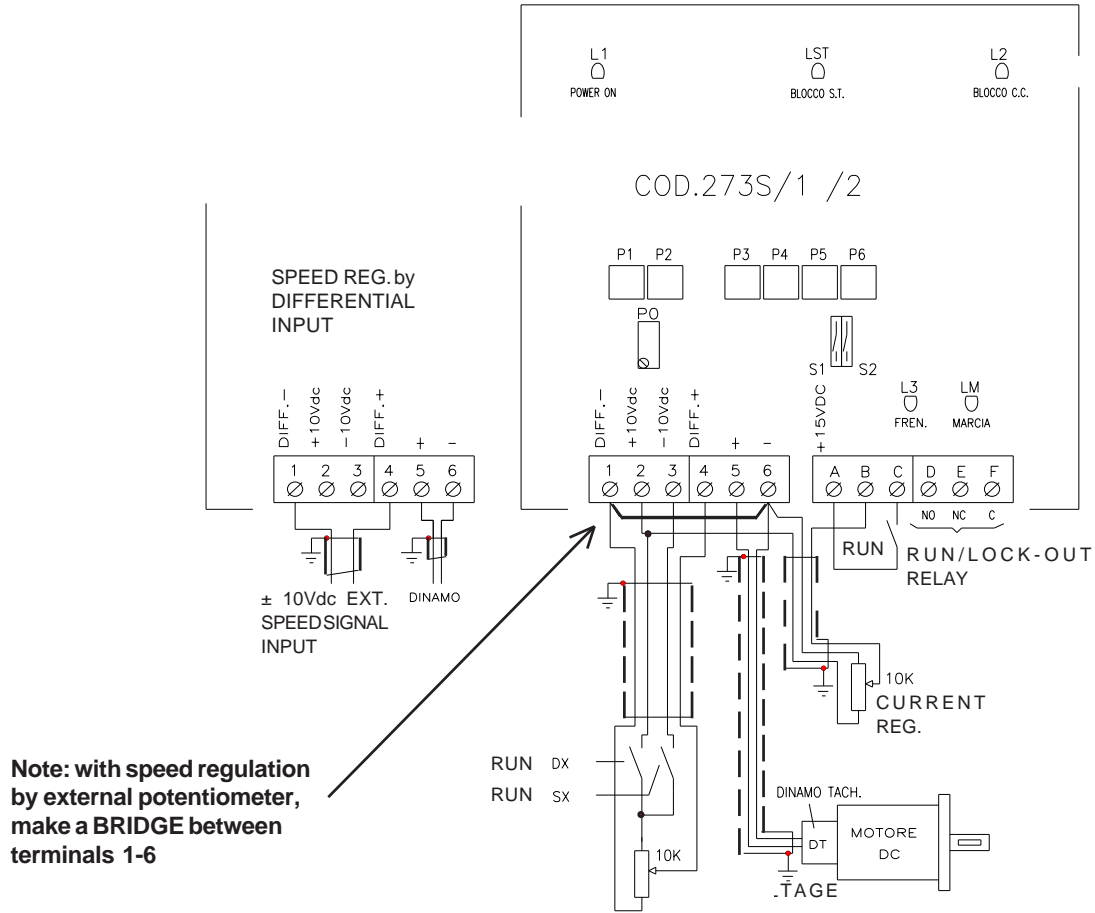
**L3** = Braking on external resistance (ON when the voltage on Bus DC gets over 65Vdc)

**LM** = Run (ON when the contact between A and C is closed)

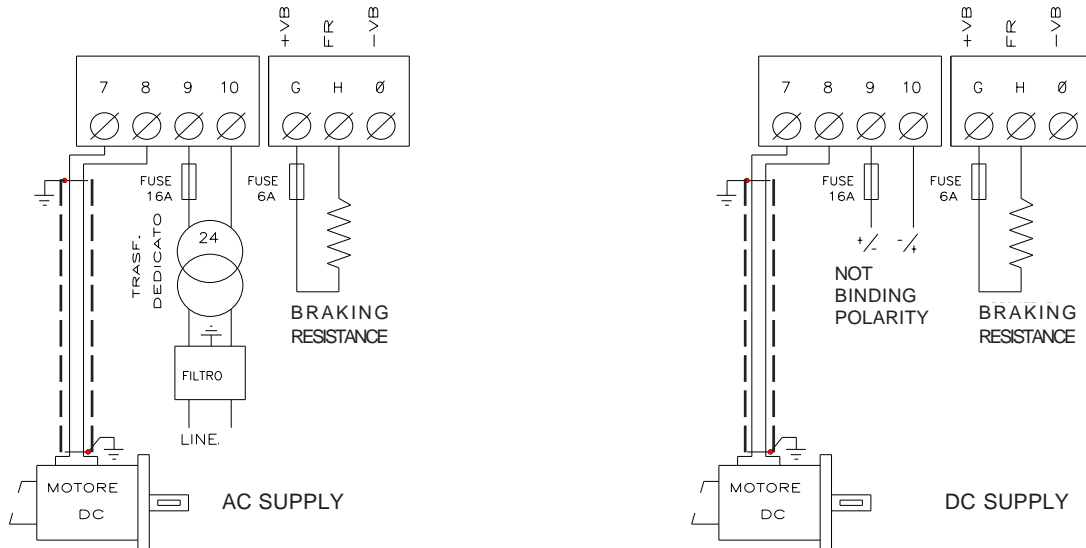
**LST** = Locked-out by BusDC overvoltage (ON when the voltage on Bus DC gets over 75Vdc)

# TRIMMERS, MICROSWITCHES and LED CONNECTION DIAGRAMS and LAYOUT

## COMMANDS TERMINAL BOARD CONNECTION (upper drive)



## POWER TERMINAL BOARD CONNECTION (lower drive)



### CAUTION!

- The NEGATIVE of the board (TERMINAL 6 and -VB) is not decoupled from the supply so you need to pay attention to the following instructions:

- 1) Don't connect together the supply 24VAC and the NEGATIVE of the board to the ground.
- 2) Don't connect all the NEGATIVE of the boards together if you have several C273S supplied from the same trasformer.
- 3) If the boards are supplied from the same trasformer (as same as point 2) it is possible to connect input DIFF- (1) and DIFF+ (4) together in parallel: for example, if the speed range will be regulated from a unique supply  $\pm 10Vdc$  (Ex. PLC); in this case the generator of the signal must be insulated from AC/DC supply of the C273S drives.

CONFORMITY



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