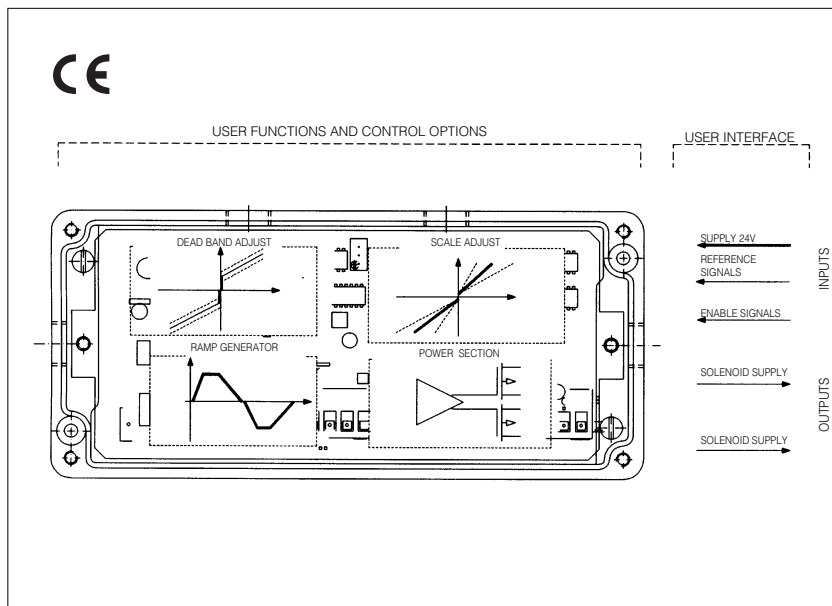


# Electronic drivers type E-RP-AC

sealed box, for single and double solenoid proportional valves without transducer



E-RP-AC electronic drivers supply single or double solenoid proportional valves ZO(R)-A with the correct current signal to align valve regulation to the reference signal.

They are designed to work in open or closed-loop systems according to the block diagram 2.

In closed loop systems, E-RP-AC driver can be coupled to commercial axes card according to the block diagram 2.

The driver operates the valve's regulation proportionally to the input reference signal (voltage or current) by supplying a switching current to the solenoid. Scale and Bias adjustments, for accurate valve regulations are set available.

The driver is normally used with a reference signal supplied by an external set-point potentiometer or by PLC control unit and a symmetrical rising and falling ramp generator.

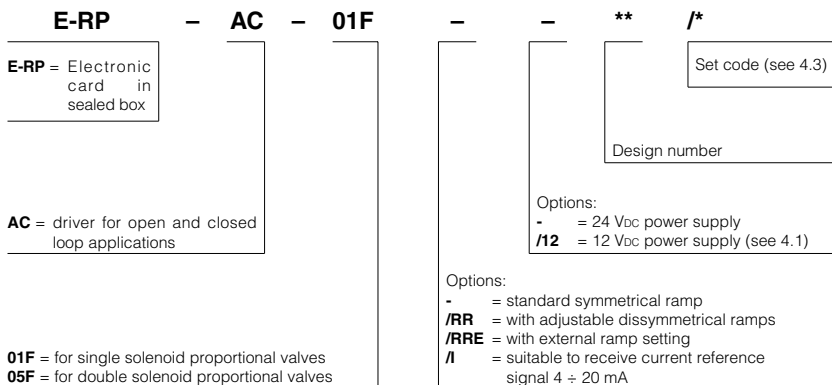
This driver is supplied already set, coupled with the suitable proportional valve, optimising its regulation.

The electronic card is in sealed and rugged box suitable for outdoor use. Electronics are housed and resin encapsulated in an aluminium box to IP65, ensuring antivibration, antishock and weather-proof features.

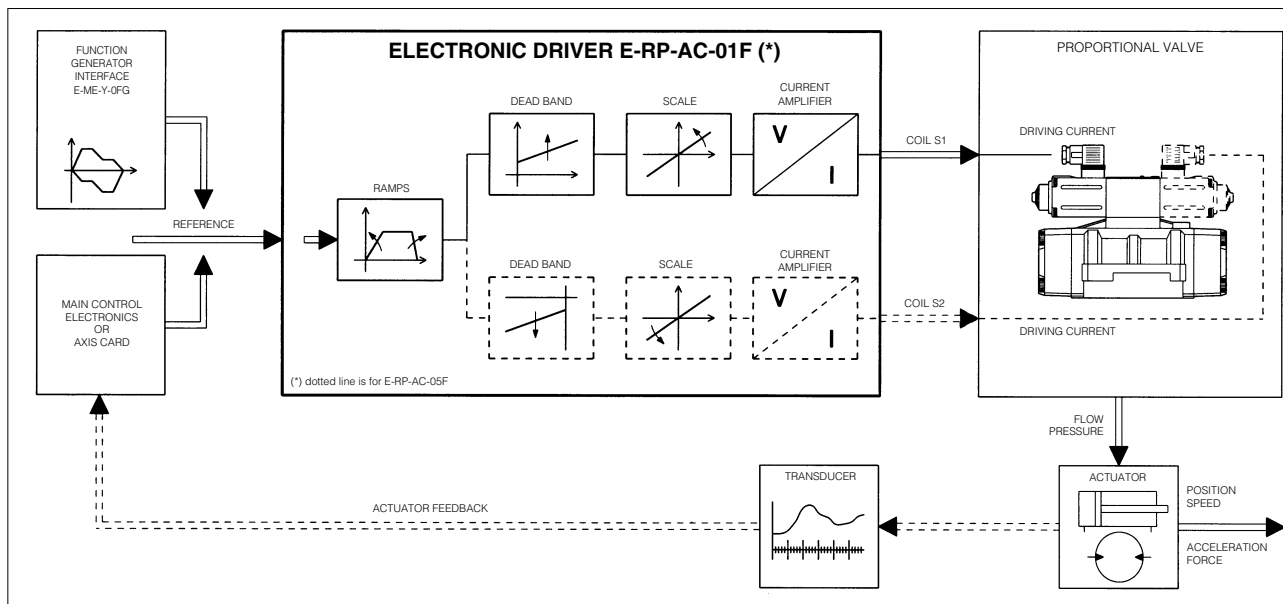
This new version includes the following improved features:

- electronic filters on input and output lines
- CE marking granting the conformity to the EMC Directive (Electromagnetic compatibility).

## 1 MODEL CODE



## 2 BLOCK DIAGRAM



### 3 MAIN CHARACTERISTICS OF E-RP-AC ELECTRONIC DRIVERS

Power supply (positive at contacts 1) (negative at contacts 2)	Stabilized : 24V <sub>DC</sub> (12 V <sub>DC</sub> ± 10% for 12 DC option) Rectified & filtered : V <sub>RMS</sub> = 21 ÷ 33 (max ripple = 2V <sub>pp</sub> )
Max power consumption	50 W
Current supplied to solenoid	I <sub>max</sub> = 3.3A square wave PWM type; (for ex-proof valves I <sub>max</sub> = 2,5A)
Nominal reference signal, factory preset	E-RP-AC-01F: : 0 +5V at contact 10 (GND on 11) E-RP-AC-05F: : ± 5V at contact 10 (GND on 11) 4-20 mA for /I : at contacts 10 (+) and 11 (-)
Reference signal variation range, (scale adjustment)	± 10V max ± 2,5 V min
Input signal impedance	Voltage R <sub>i</sub> > 50 KOhm - (/I option R <sub>i</sub> = 316 Ohm)
Potentiometers supply	+5V / 50 mA at contact 8 and -5V / 10mA at contact 9
Ramp time	5 or 90 sec. max (0 ÷ 100% of reference signal) see [8]
Enabling signal	V = 5 ÷ 24V <sub>DC</sub> on contact 7
Electrical wiring	Coil: 2 x 1 mm <sup>2</sup> to 20 m 2 x 1,5 mm <sup>2</sup> shielded to 40 m
Card format	Sealed box IP 65
Connections	14 contacts - terminal strip
Cable Clamp	Dimension PG7 - water proof - Cable Ø 5 ÷ 6,5
Operating temperature	0 ÷ 50°C (storage -20° ÷ +70°C)
Box dimensions	175 x 80 x 57 mm
Weight	940 gr.
Features	Rapid solenoid excitation and switching off Outputs to solenoids protected against accidental short circuits.

### 4 GENERAL SPECIFICATIONS

#### 4.1 Power supply and wirings

The power supply must be appropriately stabilized or rectified and filtered. If the power supply is generated by a single phase rectifier, use a 10000µF/40V capacitor; if pulse voltage is generated by a three phase rectifier connect a 4700µF/40V capacitor (see table [9] Wirings block diagram). It is always recommended to use shielded cables with earthed shield for connections to the reference generators. The use of E-RP-AC-0\*F electronic regulators with supply voltage of 12 V<sub>DC</sub> has to be verified according with the performance required to the proportional valve and after checking with Atos engineering office.

#### 4.2 Reference signal

The electronic driver is designed to receive voltage or current reference signals, see table [5]

Note that drivers suitable to receive current reference (option /I) have signal values in the range 4 to 20mA. It is possible to use current option also for double channels drivers type E-RP-AC-05F using the reference inversion signal on contact 12.

#### 4.3 Set code

Basic calibration of the electronic driver is factory pre-set according to proportional valve it has to be coupled with. These pre-calibrations are identified by a standard number in the model code as follows:

1 = RZGO, KZGO      2 = RZMO, AG\*ZO, LI\*ZO  
3 = DHZO, DKZOR    4 = DPZO-A-\*5, DPZO-A-\*7  
6 = QV\*ZO(R), LIQZO

For ex-proof valves, insert an "A" before the code of adjustment.

For example, the code of adjustment for RZGA is A1.

For more details see table E120.

#### 4.4 Calibrations accessible to the user, see [7], [8], [9].

##### - Scale

The relation between driving current and reference signal can be regulated with the Scale adjustment. For single solenoid valves with two external operating positions, the reference signal is the same as the double solenoid driver. Separate Scale potentiometer for solenoid S1 and S2 enable the electronic driver to be set for different output currents, obtaining differential hydraulic operations.

##### - Bias (dead band)

Regulation of dead band adjusts the hydraulic zero of the valve (adjustment of starting position) to the corresponding electrical zero. The electronic driver is factory preset for the valve it is coupled according to the set code (see section 4.3). For double solenoid driver E-RP-AC-05F/\* a step function generator becomes active at an input reference voltage signal greater than ± 100 mV enabling start current set by Bias potentiometers S1 and S2 for independent solenoid Dead Band regulation.

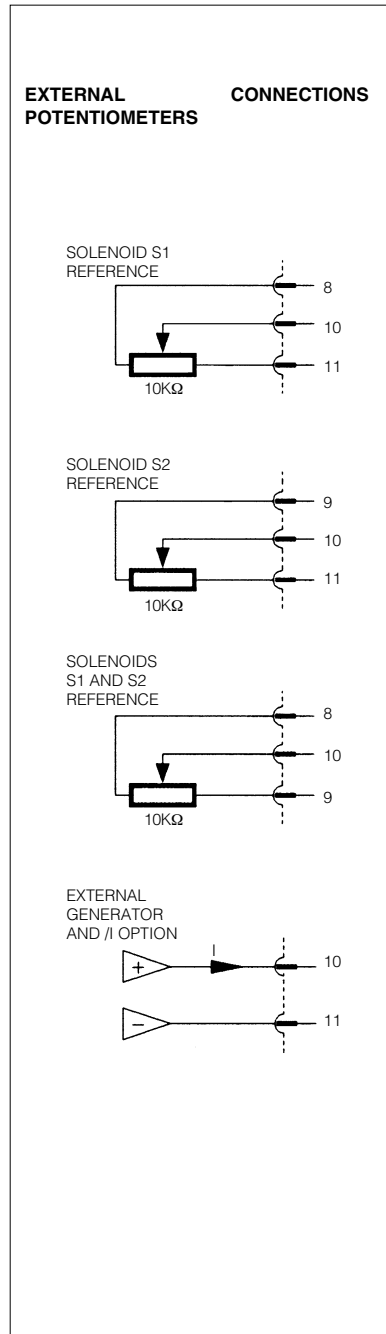
##### - Ramps, see [7], [8], [9].

The internal ramp generator circuit converts a step input signal into a slowly increasing output signal (solenoid current).

The rise/fall time of the current is set via potentiometer P1, to a maximum time of 5 or 90 sec (switch SW1) for 0 - 100% of reference signal. The option /RR provides dissymmetrical ramps, (P2) /RRE allows external ramp setting as shown in table [7].

To switch off the ramp circuit connect contacts 13 and 14 on the electric connector.

### 5 EXTERNAL REFERENCE SIGNALS



## 6 INSTALLATION AND START-UP

It is advisable to perform calibration procedures in the order given below.

### 6.1 Warning

- Never insert or remove the driver connector while the electronic system is powered on.
- Voltages must always be measured with reference to GND (connector contact 11) or test point.
- Refer to [8] "topographic view" to identify components mentioned in calibration procedures.

### 6.2 Start-up

Factory preset adjustments may not meet the desired requirements for the specific application and performances can be optimized by on-site re-adjustments of bias, scale and ramps potentiometers, in sequence.

- Connect the electronic driver according to the desired connection diagram (see [10])

The current supplied to the coil can be measured by a voltmeter connected between test point (current monitor and GND)

For E-RP-AC-05F the drive enabled led (S1 or S2) shows the supplied coil.

- **Enabling signal**, see [9], [10].

The electronic driver operate when the contact 7 is supplied with an enabling signal (usually 24 V<sub>dc</sub>). It could be useful in emergency conditions to inhibit the driver by zeroing this signal

- **Bias adjustment** (Dead band compensation), see [7], [8], [9].
- Supply a reference signal voltage (0V<sub>dc</sub> for E-RP-AC-01F and ±0,1 V<sub>dc</sub> for E-RP-AC-05F).
- Gradually turn bias potentiometer(s) until a movement of the controlled actuator is obtained.
- Turn in the opposite direction, until the actuator is stopped.

- **Scale adjustment** see [7], [8], [9].

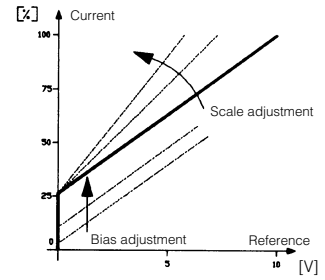
Supply max reference signal voltage (for E-RP-AC-05F driver repeat for max negative voltage) in the specified range and turn scale potentiometer(s) until the actuator speed reaches the desired value.

**Ramps** (see [7], [8]).

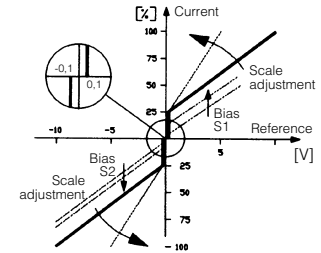
- Turning ramp potentiometer(s) clockwise acceleration(s) and deceleration(s) can be reduced to obtain optimization of the complete system.

## 7 RAMP AND SETTINGS

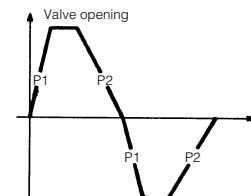
### E-RP-AC-01F ADJUSTMENT



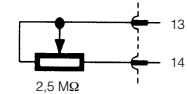
### E-RP-AC-05F ADJUSTMENT



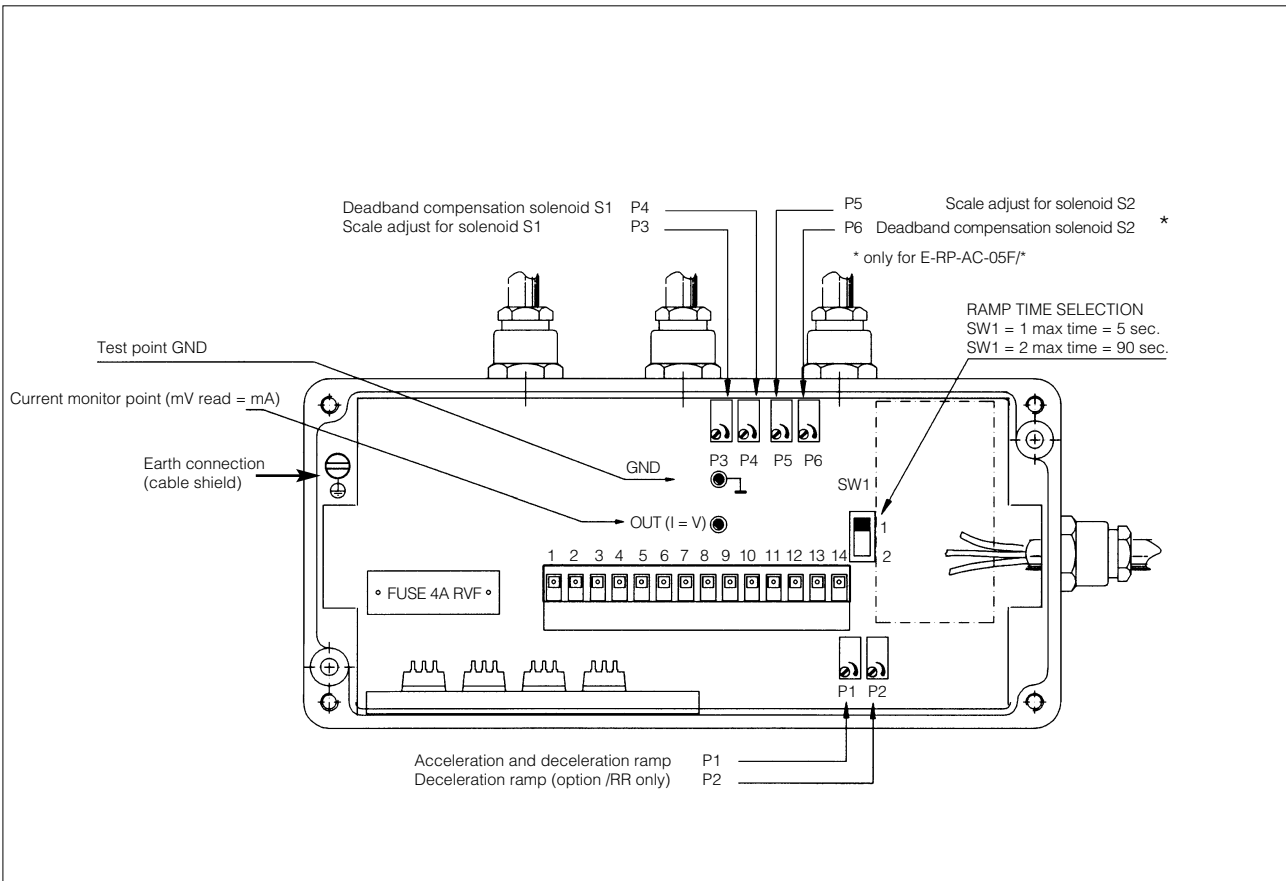
### /RR OPTION - UP AND DOWN RAMP



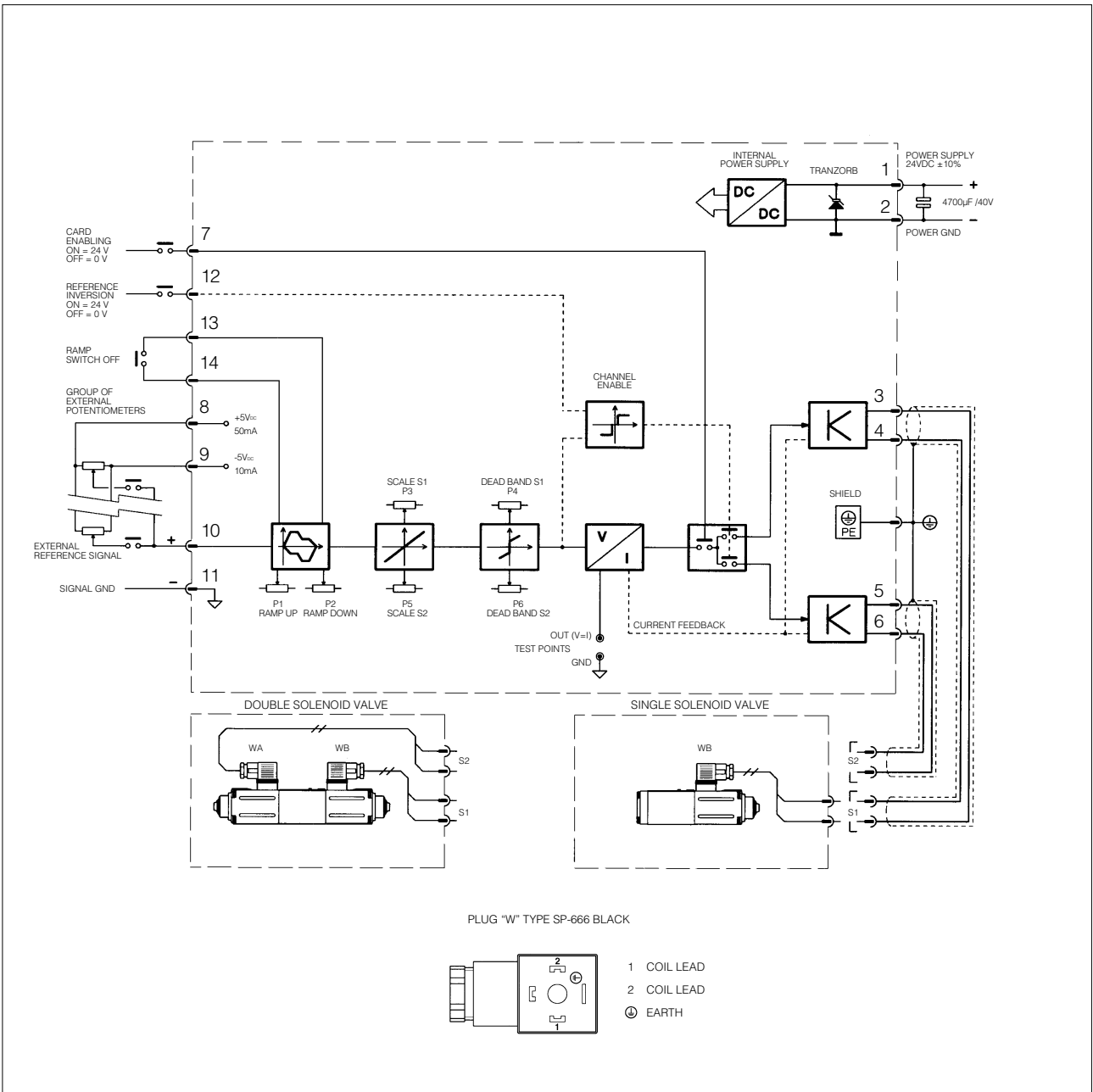
### /RRE OPTION - EXTERNAL RAMP



## 8 E-RP-AC-05F TOPOGRAPHICAL VIEW OF REGULATIONS



**9 WIRING BLOCK DIAGRAM**



**10 GENERAL CONNECTIONS AND DIMENSIONS (mm)**

Note: for maximum EMC protection, extra screening cables may be necessary.

