



INDUSTRIAL PRODUCTS

10/09/2014

**5 CHANNELS VOLTAGE - CURRENT CONVERTER
for ServoValves**

E502

T E C H N I C A L I N S T R U C T I O N S

1 PRINCIPLE

E502 converter is fitted for ServoValves control, to convert a voltage of ± 10 V in a current of ± 10 mA, ± 20 mA or ± 40 mA on 5 independent channels.

Each channel is equipped with a logical input to activate the output current. On deactivation of the input control, the output current turn to a fallback value. The sign and the value of the fallback current are adjustable via a resistors Rx+ & Rx-.

When the control is active (+24 V), the output works normally.
Each 24v input control is galvanically isolated by opto-coupler.

Adjustable gain for each channel by trimmer.

E502 card is supplied by 24V DC with protection by fuse and protection against the reversals of polarity. The output levels are supplied by (± 24 V) which allows short times rise upon fast current rising on inductive charge.

A relay watches voltage, is energized when the card is supplied. This allows detecting a default supply's voltage. This output switches a reverser dry contact.

A green LED when supply voltage ON.

The module card is suited in a plastic rail to be mounted on a DIN or Omega rail.

Connections are made by pluggable and lockable connectors with screw.

1.1 Input level

All inputs have a common point at 0V.

The amplifier is reverser. For +10V of input, output will be at - x mA. Take care of this inversion of sign during the assembly of the ServoValve module. With the polarity as indicated on the synoptic, we can consider the stage as non-inverter.

1.2 Output level

Contrary to E389 card, outputs toward electrovalves haven't any common point.

The value of output current is determined according the position of matched jumper.

Output values of ± 10 mA, ± 20 mA & ± 40 mA are given for ± 10 V input.

Output power is provided by 2 transistors on heat sink. Two diodes protect the output stage against over-voltages due to the ServoValves' inductance.

1.2.1 Output charge

Maximal charge according to the selection of the output current:

| | |
|-------------|--------------|
| ± 10 mA | 1 k Ω |
| ± 20 mA | 500 Ω |
| ± 40 mA | 250 Ω |

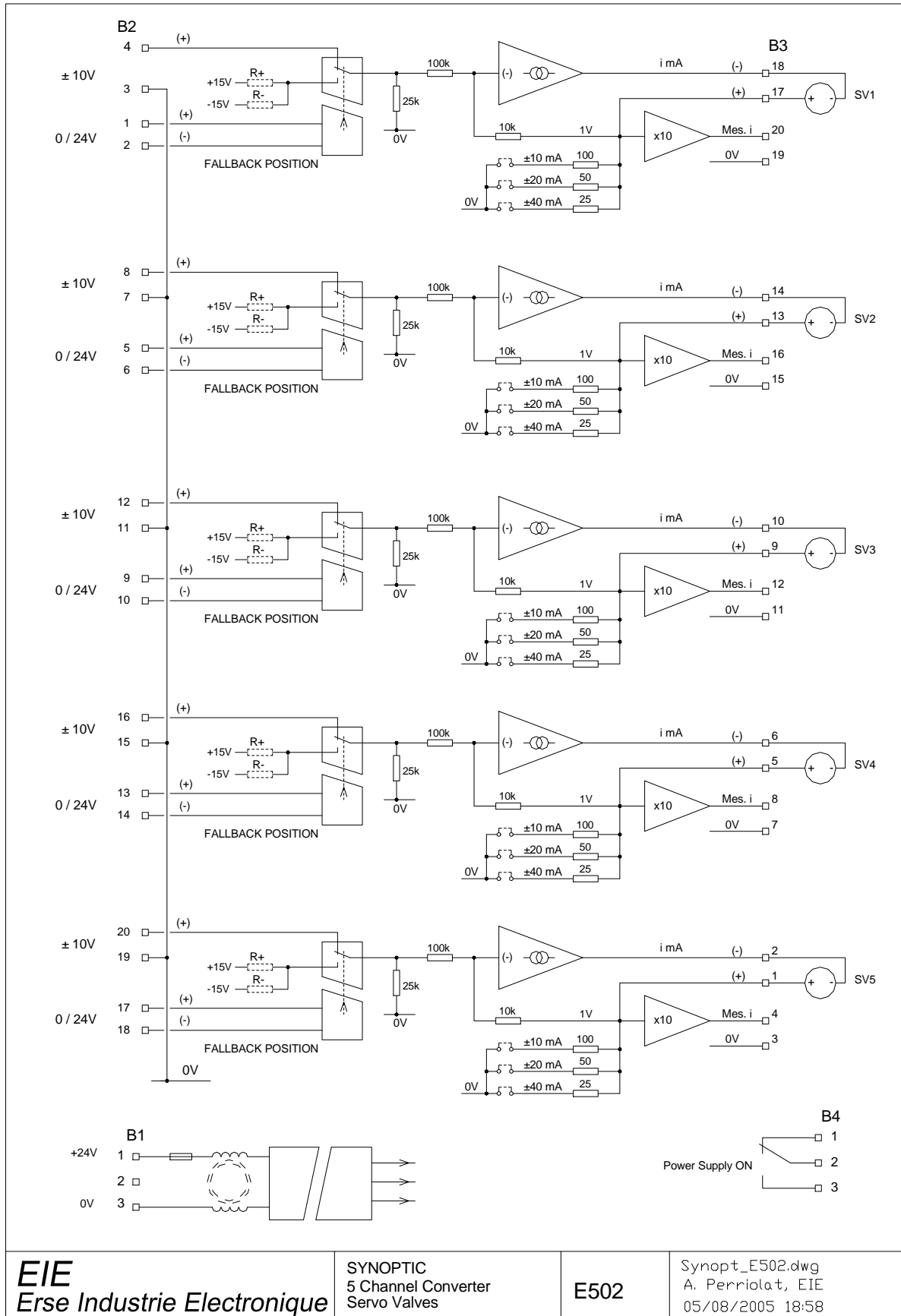
Comment : On inductive charge, during fast variations, the output level will supply a high step voltage to ± 24 V during the transient current. After this period, the current turn to the correspondent value of input voltage level.

To reduce setting time of the current, it is possible to wire 2 ServoValves in parallel.

1.3 Measuring output current

The measure of output current (± 1 V at terminals of the selected resistor) is amplified with by 10. This output can be used by a signal recorder.

2 **SYNOPTIC**



EIE
Erse Industrie Electronique

SYNOPTIC
5 Channel Converter
Servo Valves

E502

Synopt_E502.dwg
A. Perriolat, EIE
05/08/2005 18:58

3 Fallback polarization

The value of fallback current of each channel is determined by 2 resistors (R+ & R-).

3.1 Polarization of fallback resistor

According to the wanted current sign, we'll choose to set R+ or R-.

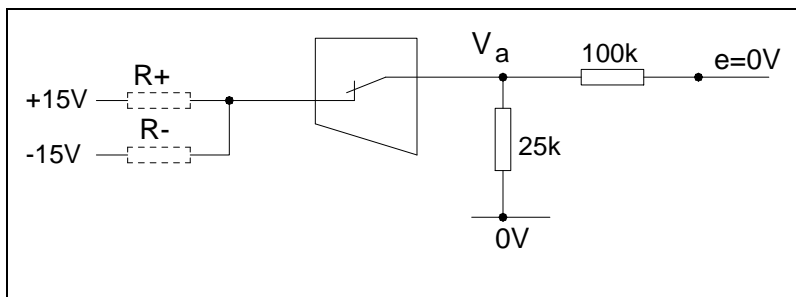
The resistor R+ is connected at +15V. As ServoValve polarity specified on the synoptic, a R+ will supply a positive current into the ServoValve.

On the same principle, the resistor R- is connected at -15V. and will supply a negative current into the ServoValve.

3.2 Fallback value resistor

According to $\pm 10V$ input value, a coefficient of 1.5 is set for the calculation of fallback resistors due to the fact that it's connected at $\pm 15V$.

Equivalent resistor of input load :



Equivalent resistor:

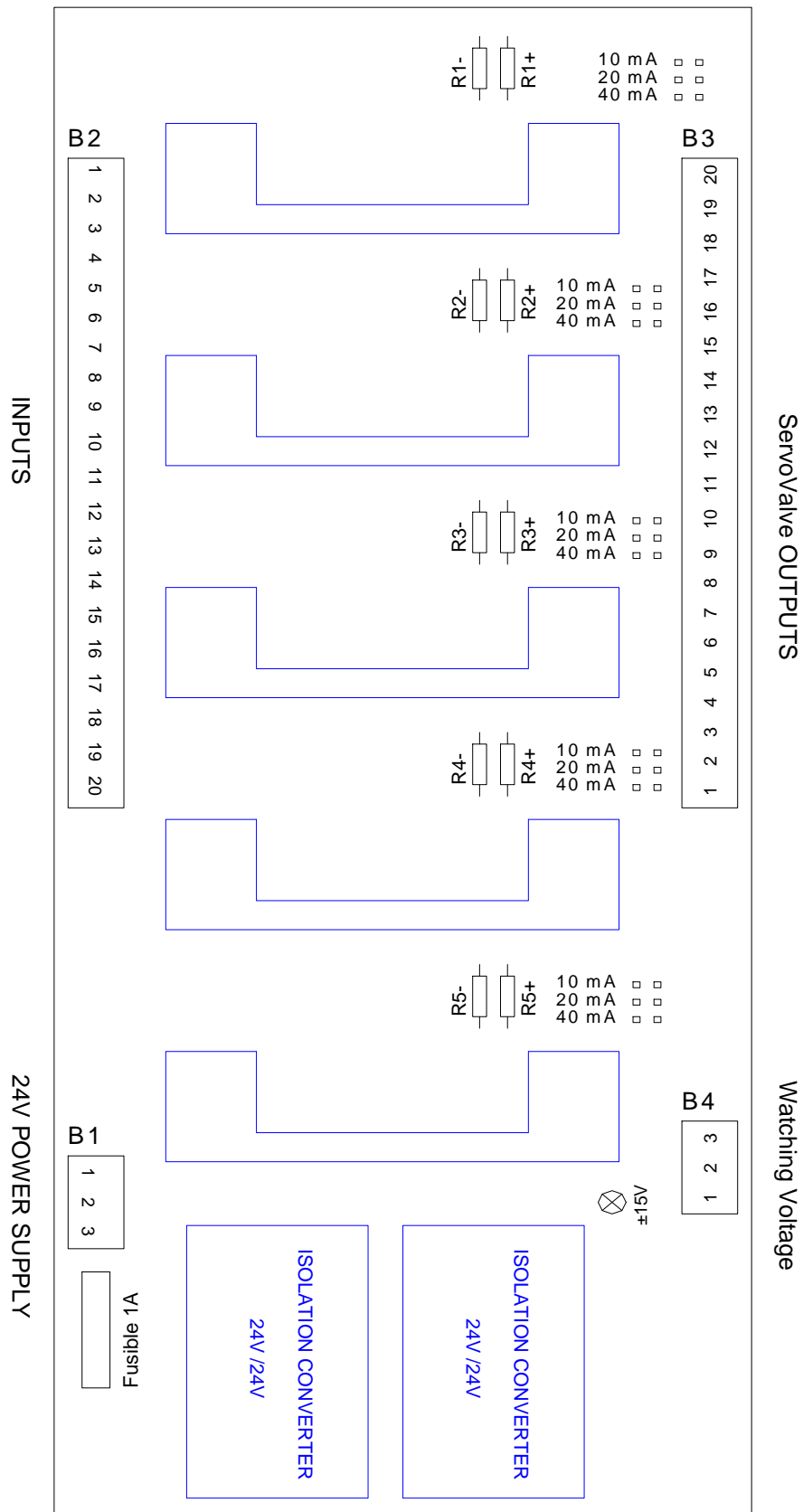
$$25k\Omega // 100k\Omega = 20k\Omega$$

Calculation of the resistor to be connect on +15V or on -15V according to the case:

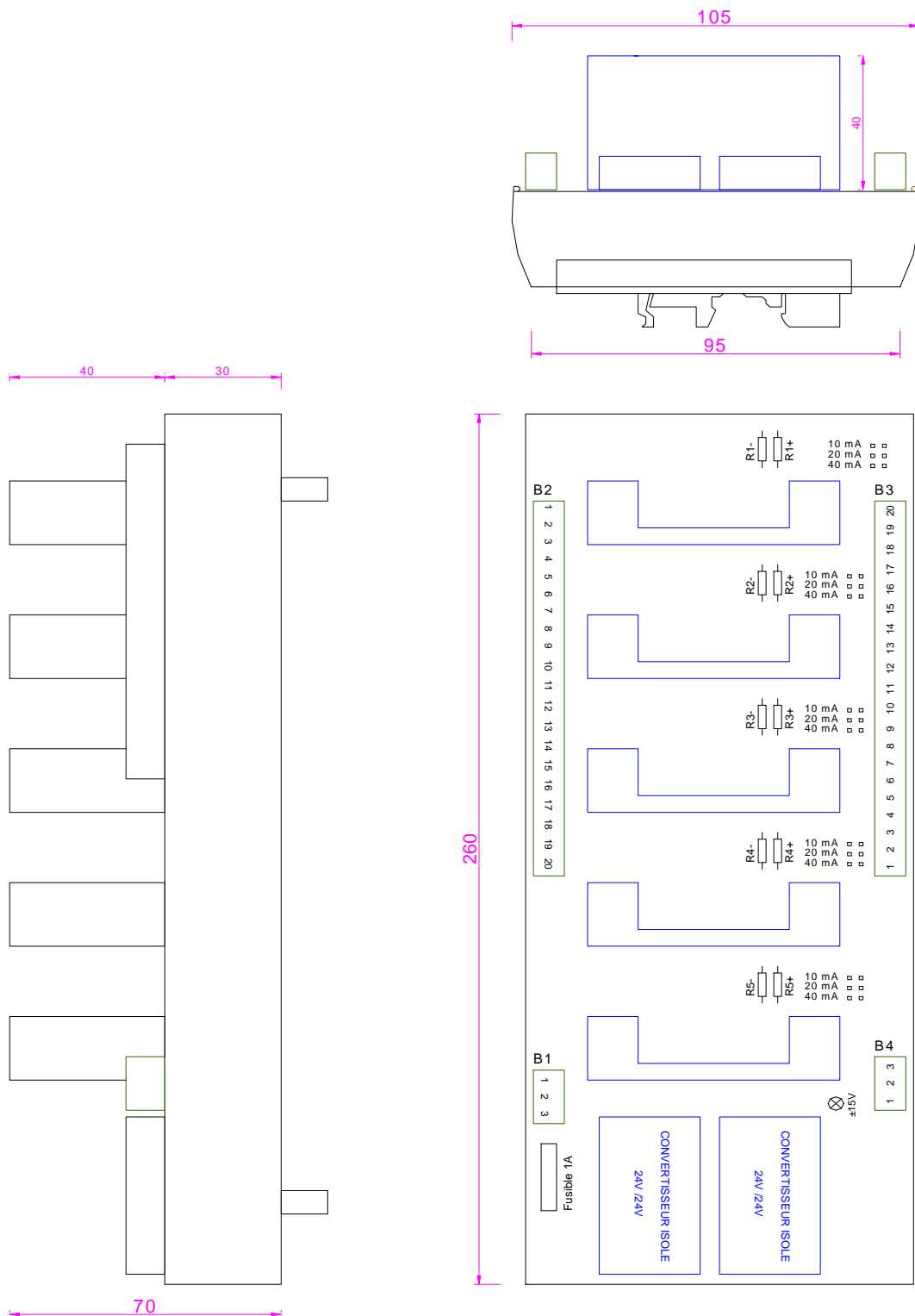
$$R = \frac{15V \times 20k}{V_a} - 20k = \frac{300}{V_a} - 20k$$

V_a = fallback voltage in V & R expressed in $K\Omega$.

4 LAYOUT



5 **DIMENSIONS**



All dimensions in mm.

6 TECHNICAL CHARACTERISTICS

Supply:

Supply: +24V, DC $\pm 20\%$ + static filter of EMC immunity.

Primary protection: 1A delayed fuse on card.

Maximum current: 1A

Input voltage:

Input toward the 0V of supply, common to all channels.

Max input voltage: ± 12 Volts.

Input impedance: 20 K Ω .

Logic control inputs:

Five independent inputs, isolated by opto-couplers.

Low threshold voltage: 16 V.

Maxi voltage: 28 V.

Input current at 24V: 3 mA.

Outputs for measures: ± 10 V under 5 K Ω maxi.

Outputs current:

Maxi output current: ± 50 mA (under ± 24 V)

Precision: 2%

Operating Temperature: 0 to +50°C ambient.

Dimensions: 260 mm x 100 mm.