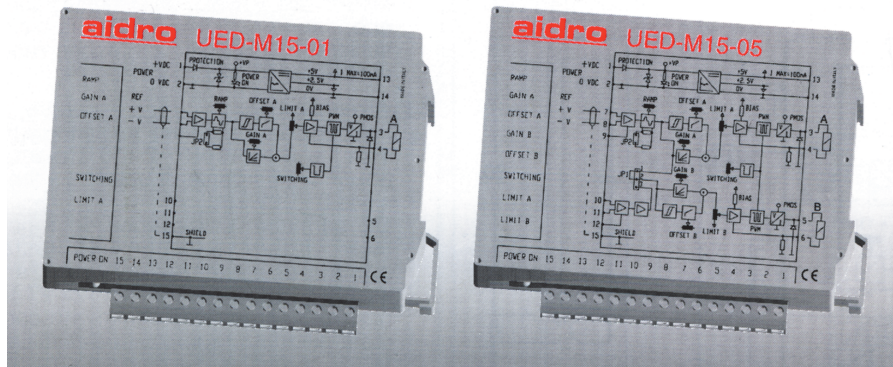


UNIVERSAL ELECTRONIC DRIVES type UED-M15 FOR SOLENOID OPERATED PROPORTIONAL VALVES



2 CHARACTERISTICS OF STANDARD UED-M15-*

Voltage supply: 10 to 28V DC.

Max ripple: $\pm 10\%$ V supply

Currents: limit "A" = 2,5A
 limit "B" = 2,5A
 bias = 50mA

Offset "A": 0 to 50% of limit "A"

Offset "B": 0 to 50% of limit "B"

Switching: dither frequency 110Hz

Auxiliary V: VR=5V $\pm 1\%$ (max 100 mA)

Ref. signals:
 UED-M15-01 : 0 \rightarrow +10V
 (or 2,5V \rightarrow +5V)
 UED-M15-05: -10V \leftarrow 0 \rightarrow +10V
 (or 0 \leftarrow 2,5 \rightarrow +5V)

Ramp time:
 from 0,02 sec to 5 sec

Gain "A":
 scale from 0,25A/V to "0" A/V
 (or from 1A/V to "0" A/V)

Gain "B":
 scale from 0,25A/V to "0" A/V
 (or from 1 A/V to "0" A/V)

Temperature:
 permissible range from 25°C to 75°C

EMC protection:
 CE "heavy industrial"

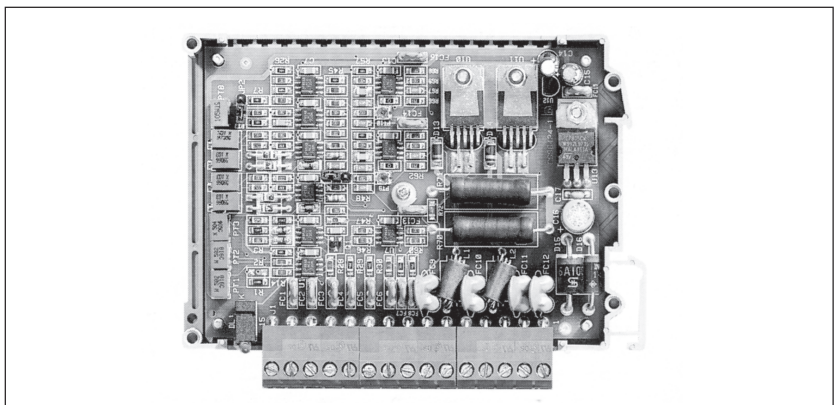
Container:
 IP-30 protection

Technology:
 SMD, on one card.

1 HOW TO READ THE MODEL CODE FOR UED-M15-*

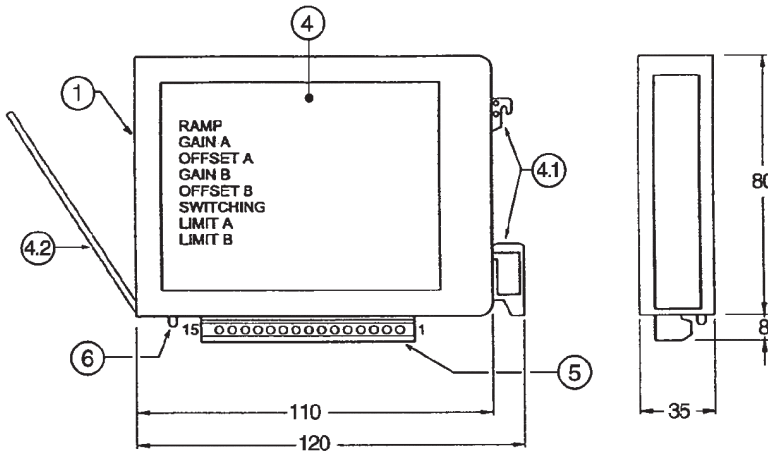
UED - M15 - (05) (R) - * - * / 10

- ① UED : universal electronic driver (see 2)
- ② M15 : wiring by a 15 (screw) terminals strip
- ③ (05) : channels
 01 : 1 channel "A"
 05 : 2 channels "A" and "B" for bisolenoid valves
- ④ (R) : ramp
 - : standard ramp with adjustable time from 0,02 sec to 5 sec.
 R: reduced time ramp, adjustable from 0,01 sec to 1 sec.
- ⑤ - : current limit "A":
 - : standard at 2,5A
 20 : limited at 2,0A
 10 : limited at 1,0A
 08 : limited at 0,8A
- ⑥ - : current limit "B": see ⑤
- ⑦ 10 : design number (progressive) of the universal electronic driver



UED-M15-**

- ① Types : UED-M15-01 for 1 monosolenoid valve
UED-M15-05 for 1 bisolenoid valve
- ④ Housing : box (approx 110x80x35 mm) with profiles for installation on DIN EN 50.022 guide ④ with door ② access to calibration trimmers
- ⑤ Connections : by a 15 (screw) terminals strip
- ⑥ Power supply : 10 to 28 V DC. Power on is signalled by a Green LED ⑥



All dimensions are mm

INSTALLATION OF DRIVERS TYPE UED-M15-**

- 1) Mechanical installation of UED-M15-** - Universal electronic drivers - can be made on guide EN 50.022 or otherwise. The container box is made of polyamide 6.6, can stand max temperature of 80°C, with flammability grade UL 94V-0 and gives protection IP30. Keep the box far from source of heat.

- 2) Wiring:
Wiring of the UED-M15-** to the valve, power source etc... is made by the 15 terminals strip by use of wires of appropriate sections.

- 2.1) Power supply:
Connections are made from terminal 1 (+) and terminal 2 ("0") to a suitable source of power at 0→10V/28V (ripple included). This permit the use of UED-M15 with a wide choice of source like 12-14V, 24-27V batteries, DC generators and rectified filtered alternate current.
When power is on, a green LED is activated.

- 2.2) Valve solenoid(s):
Channel "A" is wired from terminal 3 (+) and terminal 4 (-) to the connector of the valve's solenoid.
Channel "B" (on UED-M15-05) is wired from terminal 5 (+) and terminal 6 (-) to the connector of the second solenoid.

- 2.3) External reference signal
External reference signal, coming from a voltage generator, PLC, etc... :

- on UED-M15-01:
0→+10V wired at terminal 7 (+) and 8 (-)

- on UED-M15-05:
-10V← 0→+10V wired at terminal 7 (+) and 8 (-).
0→+10V activate channel "A"
-10V←0 activate channel "B"

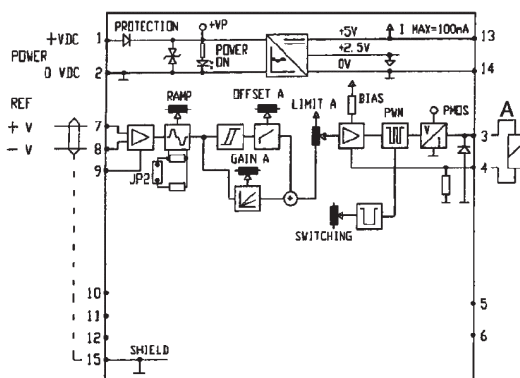
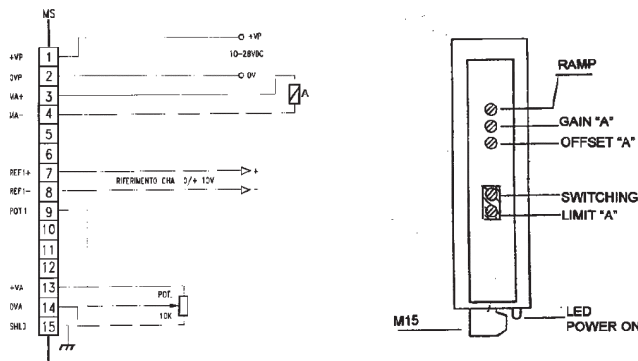
In case of "single ended" reference, (same ground for reference system and driver), terminals 8 (channel "A") and 11 (channel "B") must be connected to 14 (OVA).

- 2.4) Reference signal from potentiometer(s)
This is alternative to the external reference signal and it can be obtained from the 0+5V (VR) auxiliary source available at terminal 13 (+) and 14 ("0") by use of potentiometer(s) of suggested 10 KΩ resistance.
The potentiometer(s) extremes are wired to terminal 13 (+) and terminal 14 ("0") and the slider(s) are to be wired:

- on UED-M15-01:
at terminal 9 with a "significant" signal of 2.5V→5V for channel "A"

- on UED-M15-05:
at terminal 9 with a "significant" signal

UED-M15-01 FOR MONOSOLENOID PROPORTIONAL VALVES connections and adjustments



of 2,5V→5V for channel "A" and 0← 2,5V for channel "B".

- On UED-M15-11:
at terminal 9 with a "significant" signal of 2,5V→5V for channel "A"
at terminal 12 with a "significant" signal of 2,5V→5V for channel "B"

- 2.5) Ground
Terminal 15 must be connected or wired to ground.
- 2.6) Wiring of external reference source or potentiometer must be made by shielded cables.

MEASURING OF ELECTRIC PARAMETERS

A simple voltmeter is enough to make the elementary tests that normally are required:

Voltage of the power source (1-2); level of the external reference signal (7-8 and, eventually, 10-11); level of the auxiliary voltage source (13-14); level of the potentiometer reference signal (9-14 and, eventually, 12-14); level of current to the solenoids, according to the relation $1V=2A$, can be measured with a voltmeter :

for channel "A" between 2 ("0") and 4 (MA-)

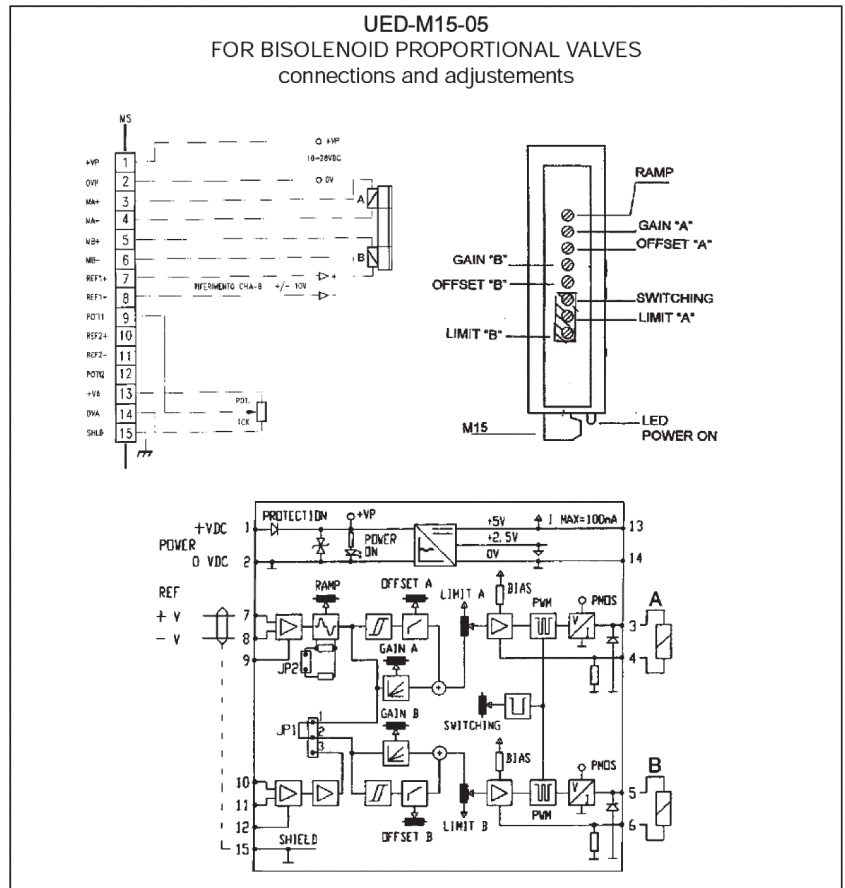
for channel "B" between 2 ("0") and 6 (MB-)

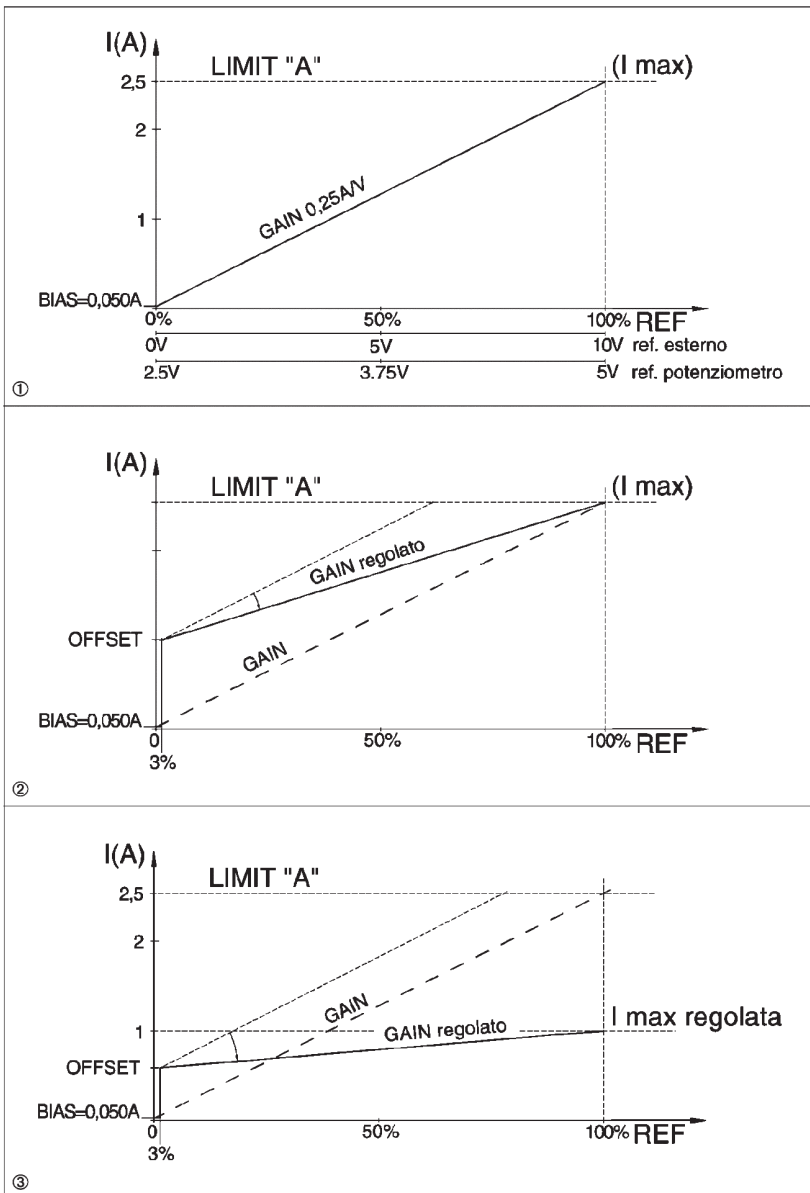
CALIBRATION PROCEDURES FOR STANDARD DRIVERS TYPE UED-M15-**

- A) UED-M15-01 = channel "A"
- B) UED-M15-05 = channels "A" and "B" for 2- solenoid valves

1) UED-M15-** universal electronic drivers are "factory set" at the following values:

- 1.1) Limit "A" (and Limit "B"): max current on channel "A" is limited at 2,5A (max current on channel "B" is limited at 2,5 A).
- 1.2) Switching: Dither frequency is set at 110 Hz
- 1.3) GAIN "A" (and GAIN "B"): adjusted to give on channel "A" current of 2,5 A with 100% reference signal (similar adjustment of channel "B")
Note: 100% reference for channel "A" is 0→+10V on terminal 7/8 (GAIN of 0,25 A/V) or 2,5→5V on terminal 9/14 if given by a 10 KΩ potentiometer (gain of 1A/V)
- 1.4) Bias current " A" (and Bias current "B"): not adjustable, fixed at 50 mA (to keep the solenoid magnetic field)
- 1.5) Offset "A" (and Offset "B"): set at "zero"
- 1.6) Ramp: set at minimum value (0,02 sec)
These conditions are shown in diagram ①





2) Calibration:

2.1) The following parameters normally should not be adjusted:

2.1.1) Limit "A" (and Limit "B"): can be changed by operating the one turn, sealed potentiometer.

By clock wise rotation, current is increased (from 0,5 A to 4 A) giving a new limit value.

2.1.2) Switching: can be changed by operating the one turn, sealed potentiometer.

By clock wise rotation the Dither frequency is increased (from 50 Hz to 420 Hz)

2.2) The following parameters normally must be adjusted

2.2.1) Offset "A" (and Offset "B").

This is the current needed to have the required prompt "reaction" of the valve when the reference signal changes around its 0% value, thus reducing the effects of spool overlapping, spring resistance, etc...

This current is adjusted by multiturn potentiometer; by clock wise rotation the offset current is increased (from 0% to 50% of limit current).

Offset current is always in addition to the 50 mA bias current and it is "triggered" when the reference signal overcomes 3% of the full reference signal (300 mV with reference 0 → 10V or 150 mV with reference 2,5 V → V from potentiometer).

When reference signal is at 0%, the offset current does not flow and the valve is stabilized at its rest position.

2.2.2) Gain "A" (and Gain "B"): this gives the "Scale" of the channel, that is how much the current increases (or decreases) for a given variation of the reference signal: factory set is at 0,25A/V with reference 0 → 10V (or 1A/V with reference 2,5V → 5V from potentiometer).

The Gain is adjusted by multiturn potentiometer; by clockwise rotation the Gain is increased.

The effects of those adjustments are shown in diagram ②.

This calibration of the electronic driver gives the best conditions for scale sensitivity, proptness etc... when the current I max required by the valve is coincident with, or close to, limit "A" (2,5 A).

In the case that the valve requires a max current value which is lower than limit "A" (example: I max = 1A) and it is important to save a good sensitivity of scale, the suggested procedure is shown on diagram ③; where first is made the offset calibration and then the gain adjustment, to have the required I max (adjusted) when 100% of the reference signal is applied.

2.2.3) Ramp: gives a slope current response to a step change of the reference signal. Ramp is active (up and down) on channel "A" of UED-M15-01 and -11; on both channels "A" and "B" of UED-M15-05.

Ramp is adjusted by one turn potentiometer; by clock wise rotation ramp time is increased from 0.02 sec to 5 sec. for a 100% step change of the reference signal (or from 0,01 sec to 1 sec for version "R").