REMDRA... TYPE ELECTRONIC REGULATORS

DOUBLE SOLENOID PROPORTIONAL CONTROL VALVES

The electronic control card type REMDRA has been designed to drive the double solenoid proportional valves series "XD.*.C...and XDP.3.C" without integral position transducer. The control card is enclosed in an "UNDECAL" type housing, a typical relay mounting standard. The output stage operates on the pulse width modulation principle (P.W.M.) and is provided with current feedback in order to obtain a solenoid output current proportional to the reference input signal.

Output short circuit and supply polarity inversion protection is provided. Gain, minimum current and rise and fall ramp time adjustments are possible through the corresponding front panel trimming potentiometers, while the output current to the solenoid can be measured via the Valve Current test points, and the ramps can be excluded.

The product incorporates a serial interface for adjustment of parameters.

Pay attention please: electronic regulators must be used in dampness and water protected places.

Manuals and software
The user and installation manual, the manual for variants DJ/JU and the software DG are available on "products" section of www.brevinifluidpower.com website (put REMD on internal search engine).

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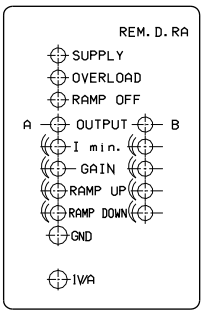
ORDERING CODE

REM	Miniaturized electronic regulator in Undecal type container
D	Double solenoid
RA	Asymmetrical ramp
*	Maximum output current $I_{MAX.}$ (JU variant) **X** = 0.88 A (0.80 A) **Y** = 1.76 A (1.20 A) **Z** = 2.8 A
*	Input reference (V) see note (*) below **2** = -2 ÷ +2 V **5** = -5 ÷ +5 V 0 ÷ +5 V **0** = -10 ÷ +10 V **A** = -20mA ÷ +20mA 0 ÷ +20mA
*	Frequency Dither **1** = 100 Hz (standard, JU var.) **2** = 330 Hz
G	Minimum initial current can only be adjusted in steps
**	**00** = No variant **DJ** = Duble setpoint gain **JU** = for MHPF and MSPF modules (proportional valves HPV)
4	Serial No.

(*) If the input reference is a current signal (mA) the regulator has to be pre-setted in the factory.

• CE registered mark for industrial environment with reference to the electromagnetic compatibility. European norms:
- EN61000-6-2 general safety norm - industrial environment
- EN61000-6-4 emission general norm - residential environment
• Product in accordance with **RoHS** 2011/65/UE Europe Directive.



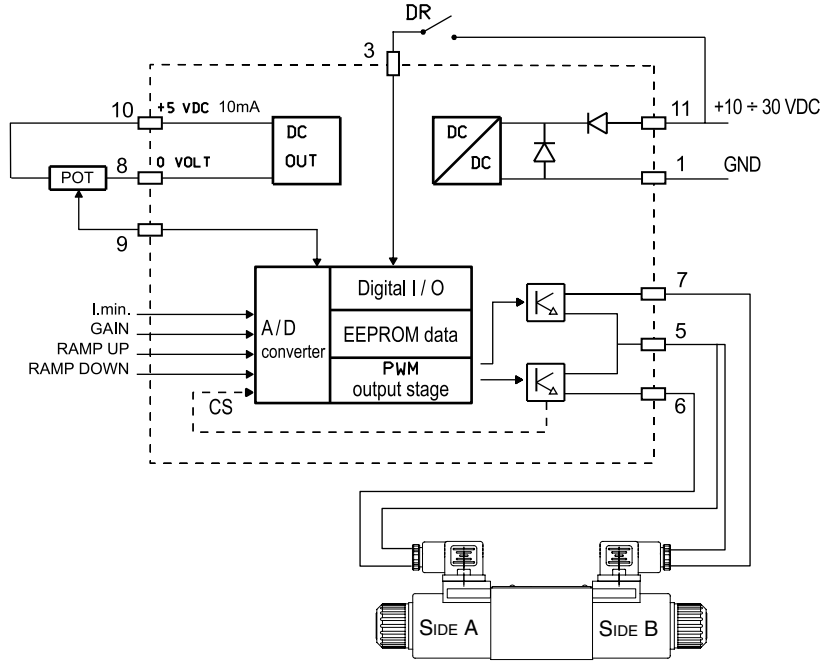
ADJUSTMENT PANELL

Supply	10Vdc ÷ 30Vdc (green led)
Overload	Protection against over (red led)
Ramp off	Ramp off (red led)
Output	Output (current at solenoid A/B, yellow led)
I. min.	Minimum current adjustment A/B
Gain	A/B gain adjustment
Ramp up	A/B rump up adjustment time
Ramp down	A/B rump down adjustment time
GND	Ground
1V/A	Current test point at solenoid

If any field is missing from the ordering code the standard setting is as follows:
- Input ref. = -5 ÷ +5V
- Dither = 100Hz
- $I_{max.}$ = 0.8A

ELECTRICAL CIRCUIT AND CONNECTIONS

Sup (1-11)	Power supply
Out (8-10)	Output external potentiometer
Ref (9)	Reference
SO A (5-6)	Output at solenoid A
SO B (5-7)	Output at solenoid B
DR (3)	Ramp off (contact = exclusion)
Pot	External reference potentiometer
CS	Feedback current
PWM	Pulse width modulated wave



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Power supply	10 ÷ 30 VDC
Maximum supply voltage	36 V
Power absorption	40 W
Current output setting by dip switches	Imax = 2.8A Imax = 1.76A Imax = 0.88A
External potentiometer supply output short circuit protected	+5V I.max.10mA
Reference input signal setting by dip switches	-2V ÷ +2V -5V ÷ +5V -10V ÷ +10V -20A ÷ +20mA (*)
Signal input reference (pin n° 9) setting by dip switches	0V ÷ +5V 0 ÷ +20mA (*)
Polarization current adjustment	Imin = 0 ÷ 50% Imax
Current gain adjustment	50% ÷ 100% Imax
Ramp time adjustment	0 ÷ 20 sec
Ambient operating temperature	-20 ÷ +70°C
Current test point	1 Volt = 1 Ampere
Weight	0.120 Kg

(*) For the current signal (mA) the regulator has to be pre-setted in the factory.

REMDRA... INSTRUCTIONS FOR USE

CALIBRATION PROCEDURE

Connect the card in the proper way followingthe next page "Typical connections" but without powering it. Turn completely anticlockwise (20 turns about) the trimming potentiometers of Minimu Current (I_{min}) and Ramp Time (Ramp-up and Ramp-down), and position the reference potentiometer on zero. Before powering the card, ensure that any unforeseen hydraulic system movement cannot cause material damage or injury to people. Power now the card; the green LED should light up

TWO CHANNEL MINIMUM CURRENT (I_{MIN}) ADJUSTMENT (DEAD BAND)

Set the reference signal of approx. Vref +150mV. Than turn clockwise the trimmer until an actuator movement can be visually detected (A channel Output LED lights up). Than turn the same trimmer anticlockwise until the movement stops. Repeat the I_{min} calibration for the other channel B. Set the reference signal of approx. Vref -150mV (B channel Output LED lights up).

GAIN ADJUSTMENT

Turn first the ramp time trimming potentiometers (RAMP UP) clockwise by at least 10 turns, if the system could be damaged by a too fast solenoid operation (evaluate the application carefully). The maximum actuator speed can now be adjusted. Turn the reference signal to the maximum positive setting value and rotate slowly the gain trimming potentiometer (GAIN) until the maximum required speed is obtained. The speed can now be varied by moving the potentiometer lever. Repeat the above operations for the other channel after turning the reference signal to the maximum negatif value.

RAMP TIME ADJUSTMENT

The ramp time is the time taken to pass from the minimum to the maximum current value, and vice versa. It's adjustable from a minimum of 0s up to a maximum of 20s (to reach the maximum current value setted) separately for channel A and B. Turning clockwise the trimming potentiometer, the ramp time increases.

NOTES

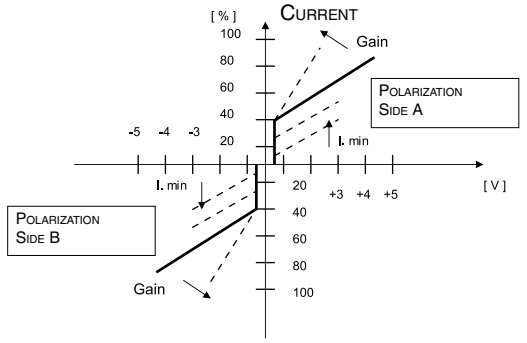
1) The ramp fall time affects the actuator stop position. Moving the reference potentiometer to zero Volt, the actuator goes on moving till the setted ramp time is elapsed. Therefore it's necessary to adjust it properly.

2) When the overload red LED lights up, it will be necessary to switch off the power to the card, switching it on again after having eliminated the cause of overload.

SIGNALS INPUT REFERENCE

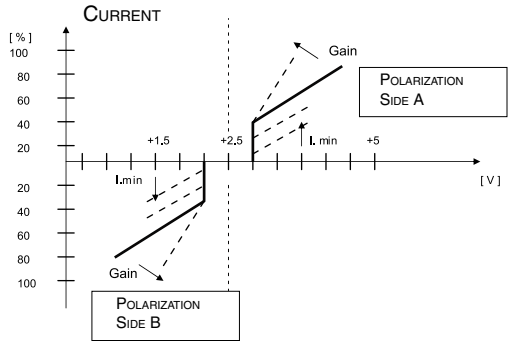
The REMD can recive two kinds of command signal inputs, differential input (non inverting, inverting voltage –5V ÷ +5V), or positive voltage (0V ÷ +5V).

DIFFERENTIAL INPUT REFERENCE



For being able to command a proportional valve double solenoid with a differential input command voltage in income at contact 9 of REMD **is necessary not to connect the contact 10** of REMD.

POSITIVE INPUT REFERENCE



For being able to command a proportional valve double solenoid with a positive command voltage in income at contact 9 of REMD **is necessary to connect the contact 10** of REMD a resistive load:

- potentiometer (minimum 1000, max 5000 Ohm) [with external potentiometer command signal, pin n° 9]

- resistor (minimum 1000, max 5000 Ohm) [with external reference value generator, e.g. by a PLC , pin n° 9].

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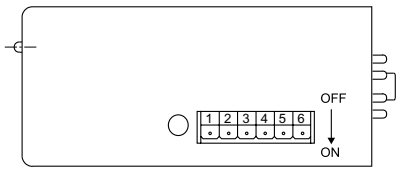
REMDRA... DIP SWITCHE TABLE

Six miniature switches are mounted internally on one of the REM sides. The REM configuration to suit any particular application can be implemented by setting these switches. PWM frequency (100 to 330 Hz), reference voltage range and maximum current (I_{max}) can thus be adjusted.

For our proportional valves are recommended the following settings:

G XD3C DITHER =100Hz $I_{max.}$ = 2.35A with 9V coils
G XDP3C DITHER =100Hz $I_{max.}$ = 2.35A with 9V coils
G XD2C DITHER =100Hz $I_{max.}$ = 1.4A with 12V coils
G XD3C DITHER =100Hz $I_{max.}$ = 1.76A with 12V coils
G XDP5C DITHER =100Hz $I_{max.}$ = 2.5A with 12V coils
G XDP3C DITHER =100Hz $I_{max.}$ = 1.76A with 12V coils
G XD2C DITHER =100Hz $I_{max.}$ = 0.7A with 24V coils
G XD3C DITHER =100Hz $I_{max.}$ = 0.88A with 24V coils
G XDP5C DITHER =100Hz $I_{max.}$ = 1.25A with 24V coils
G XDP3C DITHER =100Hz $I_{max.}$ = 0.88A with 24V coils

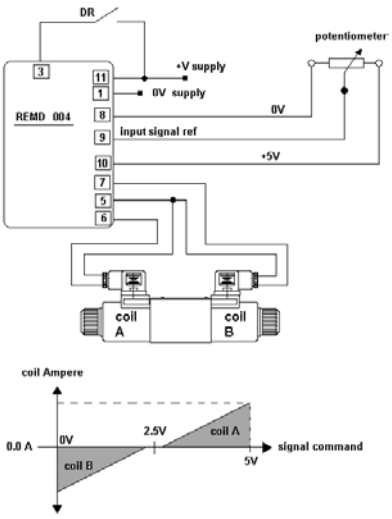
For the version with reference signal in current it needs to be preset in-factory.



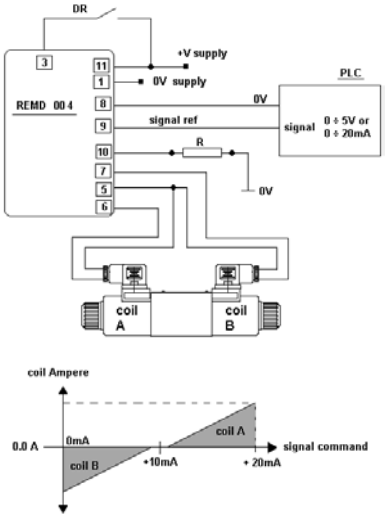
Function	DITHER		I min	Input ref.						I.max.		
DIP sw	100 Hz	330 Hz	G	-10÷10 V	-5÷5 V	-2÷2 V	-20mA ÷20mA	0÷5 V	0 ÷20mA	2.8 A	1.76 A	0.88 A
1	OFF	ON										
2			ON									
3				OFF	ON	OFF	ON	ON	ON			
4				OFF	OFF	ON	OFF	OFF	OFF			
5										OFF	ON	OFF
6										OFF	OFF	ON

TYPICAL CONNECTIONS

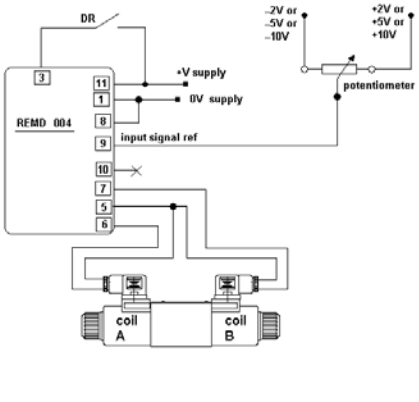
command signal from potentiometer supplied by REMD card
- 0 ÷ 2.5V ÷ 5V



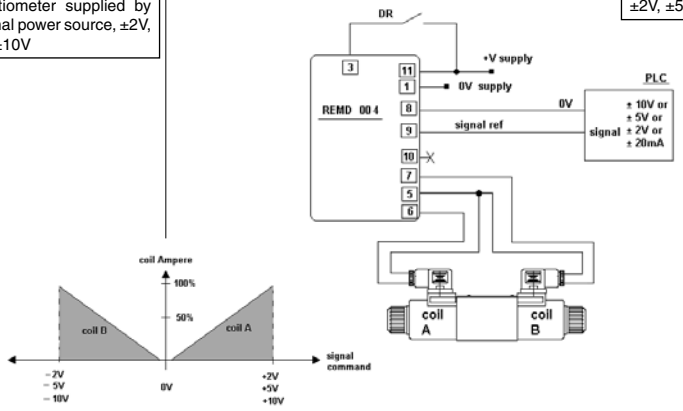
signal command from PLC, 0 ÷ 5V, 0 ÷ 20mA



command signal from potentiometer supplied by external power source, ±2V, ±5V, ±10V



signal command from PLC, ±2V, ±5V, ±10V, ±20mA



- The connection between REM and the solenoid must be direct
- The common one of return to proportional solenoid must not' be shared between other valve connections or electrical equipment worker.

R = 1000 ÷ 5000 Ω
POT = 1000 ÷ 5000 Ω

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