

# POWER AMPLIFIERS

## REM-S SERIES- POWER AMPLIFIERS



### REM-S

For Single Solenoid Proportional Valve



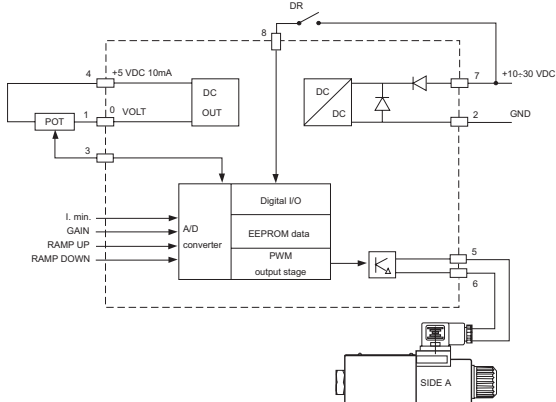
REM-SR-01-G003

Supply voltage (stabilized)	12VDC to 28VDC
Supply voltage (Maximum)	30VDC
Max. power	40W
Maximum output current	2.8 A
External potentiometer supply (output)	+5V/I <sub>max</sub> , 10mA
Reference (input)	0V to +5V, 0V to 10V
Polarization current adjustment (I <sub>min</sub> )	0 to 50%I <sub>max</sub>
Ramp time adjustments	0 to 10 sec
Output signal test point (Valve Current)	1Volt= 1Ampere ±5%
Ambient operating temperature	40-160°F (5°-70°C)
Weight	0.33 lb (0.15kg)

### REM-S Series Proportional Valve Amplifier

#### Electrical Circuit and Connections

Sup (2-7)	Power Supply
Out (1-4)	Output to external potentiometer
Ref (3)	Reference
SO (5-6)	Output at solenoid
DR (8)	Ramp off (closed contact= exclusion)
Pot	External reference potentiometer
CS	Feedback current
PS	Final Stage
SC	Cable Screen
VC	Current measure test point at solenoid
PWM	Pulse width modulate wave



The electronic control card type REM-S has been designed to drive single solenoid proportional valves without integral position transducer. The control card is enclosed in an "OCTAL" type housing, a typical (8 pin) 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.

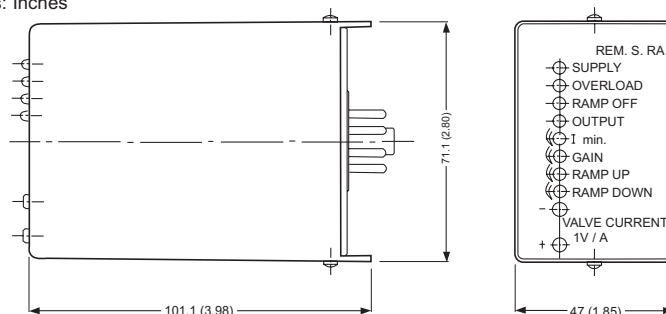
Gain, minimum current and rise and fall ramp time adjustments are possible through the corresponding front panel trimming potentiometers, while the output current to the solenoid can be measured via the Valve Current test points and the ramp operation can be excluded.

**Attention please: electronic regulators must be used in dampness and water protected places.**

#### Dimensional Data

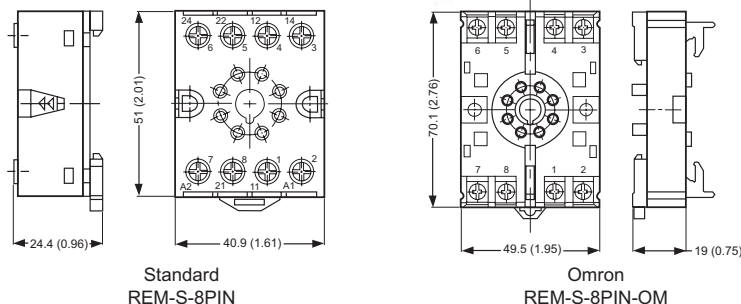
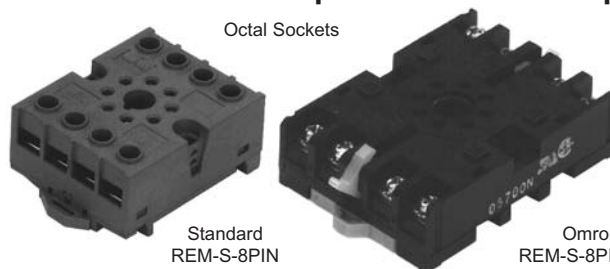
### REM-S Proportional Valve Amplifier

Units: Inches



### REM-S 8 PIN Socket Proportional Valve Amplifier

Octal Sockets



#### Adjustment Panel

- 12 to 28 VDC (green led)
- Overload protection (red led)
- Ramp off (red light)
- Output to solenoid (yellow led)
- Minimum current adjustment
- Max flow adjustment (ratio Q/I)
- Ramp up time adjustment
- Ramp down time adjustment
- Current at test point (1V=1A)



# POWER AMPLIFIERS

## REM-S SERIES- POWER AMPLIFIERS



### REM-S

#### For Single Solenoid Proportional Valve

#### Calibration procedure

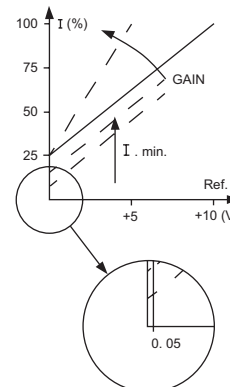
Connect the card in the proper way following the previous page diagram but without powering it. Turn completely anticlockwise the 4 trimming potentiometers and position the reference potentiometer on zero. Before powering the card, ensure that any unforeseen hydraulic system movement cannot cause material damage or injury to people. Power now the card; the green LED should light up.

#### Minimum current or polarization current adjustment

Turn slowly the minimum current trimming potentiometer clockwise ( $I_{min}$ ) until an actuator movement can be visually detected. Turn slowly anticlockwise the potentiometer: the minimum current setting will be adjusted correctly when the actuator movement stops. For the REMD model with minimum initial threshold current, turn the reference potentiometer up to a  $V_{ref}$  of 50mV

#### Maximum current GAIN Adjustment

Turn first the ramp time trimming potentiometers 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) potentiometer to its maximum setting 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. The GAIN setting could change the  $I_{min}$  current setting. For this reason it's better to recheck the  $I_{min}$  after GAIN setting.



#### Ramp time adjustment

The ramp time is the time taken to pass from the minimum to the maximum current valve, and vice versa. It's adjustable from a minimum of 0s up to a maximum of 10seconds (to reach the maximum current value set). Turning clockwise the trimming potentiometer, the ramp time increases.

#### Notes:

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

#### DIP switch table

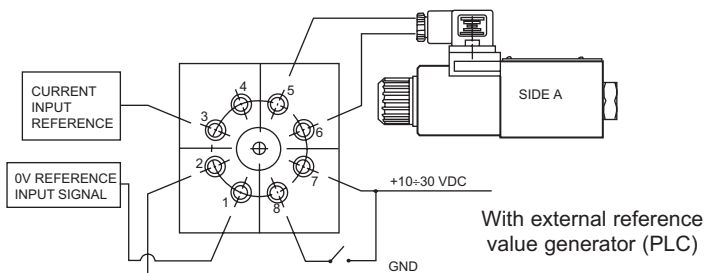
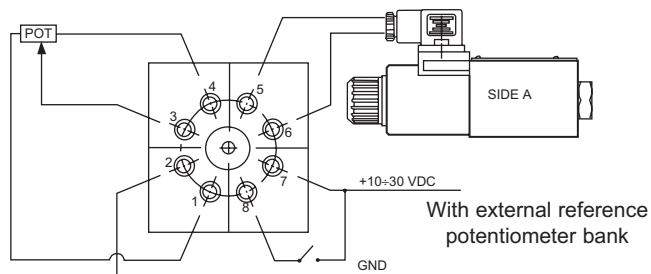
Six miniature switches are mounted internally on one of the REM sides. The REM configuration to suit any particular application can be implemented by setting these switches, which can be reached through the unit ventilating slots.

PWM frequency (100 to 330 Hz), minimum (continuous or step) current, reference voltage range and maximum current ( $I_{max}$ ) can thus be adjusted.

Switch #	Function		Dither (Hz)		Input ref. (Volts)		I <sub>max</sub> (Amps)		
	100	330	0 to 5	0-10	0.8	1.6	3.2		
1	off	on							
2			On Always						
3			on	off					
4			off	off					
5					off	on	off		
6					on	off	off		

On= Down Position  
Off- Up Position  
(Also marked on DIP switch board)

## Typical Connections



## Ordering Information

### REM-SRA\* - \*-G003

Max Output: X= 0.8A  
Y= 1.6A (std)  
Z= 2.8A

Input Reference: 0= 0-10 V (std)  
5= 0-5 V

Frequency Dither: 1= 100Hz (std)  
2= 330 Hz

REM-SRAY-01-G003= Standard Settings  
See DIP switch settings



# POWER AMPLIFIERS

## REM-D SERIES- POWER AMPLIFIERS

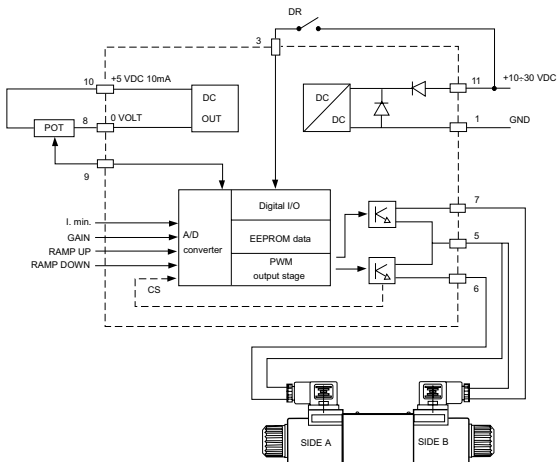


REM-DRAY-01-G003

### REM-D Series Proportional Valve Amplifier

#### Electrical Circuit and Connections

Sup (1-11)	Power Supply
Out (8-10)	Output to external potentiometer
Ref (9)	Reference
0V (4)	Common
SO A (5-6)	Output at solenoid A
SO B (5-7)	Output at solenoid B
DR (3)	Ramp off (closed contact= exclusion)
Pot	External reference potentiometer
CS	Feedback current
PS	Final Stage
VC	Current measure test point at solenoid
SC	Cable Screen
PWM	Pulse width modulate wave



**Adjustment Panel**  
 12 to 28 VDC (green led)  
 Overload protection (red led)  
 Ramp off (red light)  
 Output to solenoid (yellow led)  
 Minimum current adjustment  
 Max flow adjustment (ratio Q/I)  
 Ramp up time adjustment  
 Ramp down time adjustment  
 Current at test point (1V=1A)

### REM-D

For Double Solenoid Proportional Valve

Supply voltage (stabilized)	12VDC to 28VDC
Supply voltage (Maximum)	30VDC
Max. power	40W
Maximum output current	2.8 A
External potentiometer supply (output)	+5V/I <sub>max</sub> , 10mA
Reference (input)	-5V to +5V, -10V to 10V
Polarization current adjustment (I <sub>min</sub> )	0 to 50%I <sub>max</sub>
Ramp time adjustments	0 to 10 sec
Output signal test point (Valve Current)	1Volt= 1Ampere ±5%
Ambient operating temperature	40-160°F (5°-70°C)
Weight	0.44 lb (0.2kg)

The electronic control card type REM-D has been designed to drive double solenoid proportional valves without integral position transducer. The control card is enclosed in an "UNDECAL" type housing, a typical (11 pin) 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.

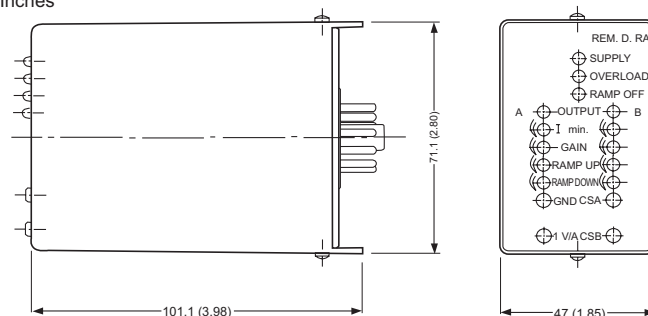
Gain, minimum current and rise and fall ramp time adjustments are possible through the corresponding front panel trimming potentiometers, while the output current to the solenoid can be measured via the Valve Current test points and the ramp operation can be excluded.

**Attention please:** electronic regulators must be used in dampness and water protected places.

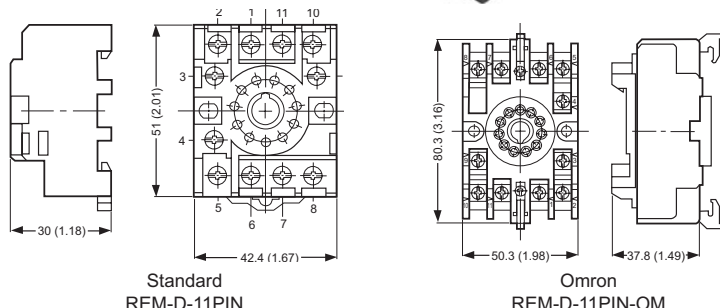
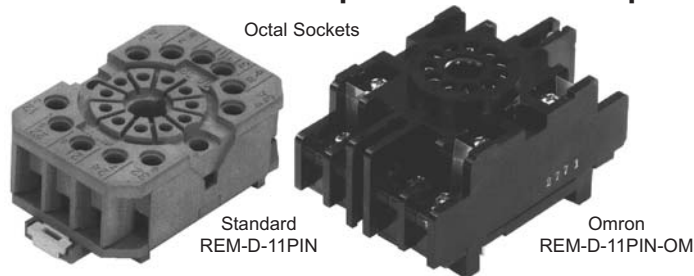
### Dimensional Data

#### REM-D Proportional Valve Amplifier

Units: Inches



#### REM-D 11 PIN Socket Proportional Valve Amplifier



# POWER AMPLIFIERS

## REM-D SERIES- POWER AMPLIFIERS



### REM-D

For Double Solenoid Proportional Valve

#### Calibration procedure

Connect the card in the proper way following the previous page diagram but without powering it. Turn completely anticlockwise the 4 trimming potentiometers 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.

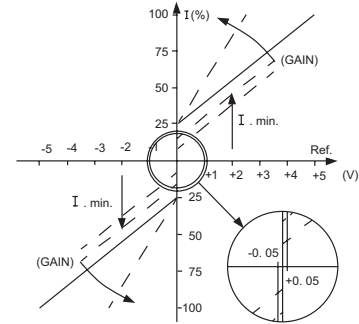
#### Minimum current or polarization current adjustment

Turn slowly the minimum current trimming potentiometer clockwise ( $I_{min}$ ) until an actuator movement can be visually detected. Turn slowly anticlockwise the potentiometer: the minimum current setting will be adjusted correctly when the actuator movement stops. For the REMS model with minimum initial threshold current, turn the reference potentiometer up to a  $V_{ref}$  of 50mV

#### Maximum current GAIN Adjustment

Turn first the ramp time trimming potentiometers 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) potentiometer to its maximum setting 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. The GAIN setting could change the  $I_{min}$  current setting. For this reason it's better to recheck the  $I_{min}$  after GAIN setting.



#### Ramp time adjustment

The ramp time is the time taken to pass from the minimum to the maximum current valve, and vice versa. It's adjustable from a minimum of 0s up to a maximum of 10seconds (to reach the maximum current value set). Turning clockwise the trimming potentiometer, the ramp time increases.

#### Notes:

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

#### DIP switch 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, which can be reached through the unit ventilating slots.

PWM frequency (100 to 330 Hz), minimum (continuous or step) current, reference voltage range and maximum current ( $I_{max}$ ) can thus be adjusted.

Switch #	Function	Dither (Hz)		Input ref. (Volts)		Imax (Amps)		
		100	330	0 to 5	0-10	0.8	1.6	3.2
1		off	on					
2				On Always				
3				on	off			
4				off	off			
5						off	on	off
6						on	off	off

On= Down Position  
Off- Up Position  
(Also marked on DIP switch board)

### Ordering Information

#### REM-DRA\* - \* -G003

Max Output: X= 0.8A Y= 1.6A (std) Z= 2.8A  
Input Reference: 0= 0-10 V (std) 5= 0-5 V  
Frequency Dither: 1= 100Hz (std) 2= 330 Hz

REM-DRAY-01-G003= Standard Settings  
See DIP switch settings

### Typical Connections

