

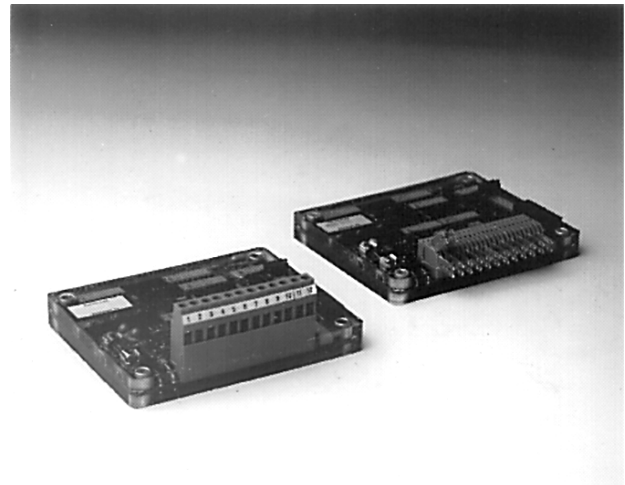
**MANNESMANN  
REXROTH**

**MDSD (Series 2X)  
Mobile Dual Solenoid Driver**

**RA  
29 864/06.98**  
Replaces 11.97

The MDSD amplifier provides control of components that use proportional solenoids without LVDTs for actuation. The MDSD incorporates the following features:

- Wide supply voltage range: 10–28 VDC
- On board, replaceable fuse
- Reverse voltage protection
- Pulse Width Modulated (PWM) outputs
- PWM frequency adjustable from 75–275 Hz
- Max. and min. current separately adjustable for both solenoids
- High current driver, regulated to within 1.0%, continuous operation
- Infinite duration short circuit protection on both outputs
- Reference voltage provided for control via an external potentiometer (>1K Ohm)
- Differential inputs for external voltage sources (+/- 2.5 or +/- 5.0 VDC)
- Neutral position deadband for joysticks
- Ramp time 0.2 to 10.0 sec., separately adjustable for both solenoids (A = up/down; B = up/down)



MDSD Mobile Dual Solenoid Driver

- All adjustments are made via multi-turn potentiometers
- EMI/RFI resistant
- Rugged, environmental packaging
- Temperature range: -13 to 176 °F (-25 to 80 °C)

**Functional description**

The MDSD is a high current amplifier that controls proportional valves with one or two force solenoids. Applications include the EL and EP controls on A2, A4, A7, A11 pumps and A6 motors. Also included are pressure and directional valves FT-DRE2K, DRE4K, DBE, DBET, MP, SM, SP, 4WRA, 4WRZ. All 12 Volt solenoids can be controlled over the entire 10 to 28 VDC power

supply range to simplify design. Of course, 24 Volt solenoids can be used in 24 Volt power systems. The rugged, compact design is environmentally protected by a potting compound (Concap: EN-21 Conathane). The MDSD has good insusceptibility to electromagnetic interference (EMI) and has a wide temperature range.

**Ordering code**

**MDSD 1 - 2X/ \***

**Mobile Dual Solenoid Driver**

**Electrical deadband**  
+/- 10% neutral deadband, = No code for joysticks  
No deadband = 1  
(\*for other applications)

**Connector**  
Flat tabs (standard) = No code  
Screw terminals = K  
Flying leads = L

**Design series**  
Series 20 to 29 = 20 to 29

\* Minimum pots P5, P6 can be adjusted to eliminate spool overlap on MDSD 1 cards.

**Preset Adjustments**

	P1, P2	P5, P6	P3, P4	P7
1 =	2 sec.	700 mA	1800 mA	180 Hz
2 =	2 sec.	400 mA	1200 mA	100 Hz
3 =	2 sec.	300 mA	800 mA	180 Hz
4 =	2 sec.	200 mA	600 mA	100 Hz
0 =	don't care			

Only applies to MDSD-2X/1, MDSD-2X/2, MDSD-2X/3, and MDSD-2X/4.

Further details to be written in clear text

**Adjustment option for MDSD-2X/**  
All other models See preset adjustment table

0 =  
1, 2, 3, 4 =

No code =  
R60 =  
R120 =  
R240 =

**Ramp time**  
0.2 – 10 sec.  
1.2 – 60 sec.  
2.4 – 120 sec.  
4.8 – 240 sec.

No code =  
W =

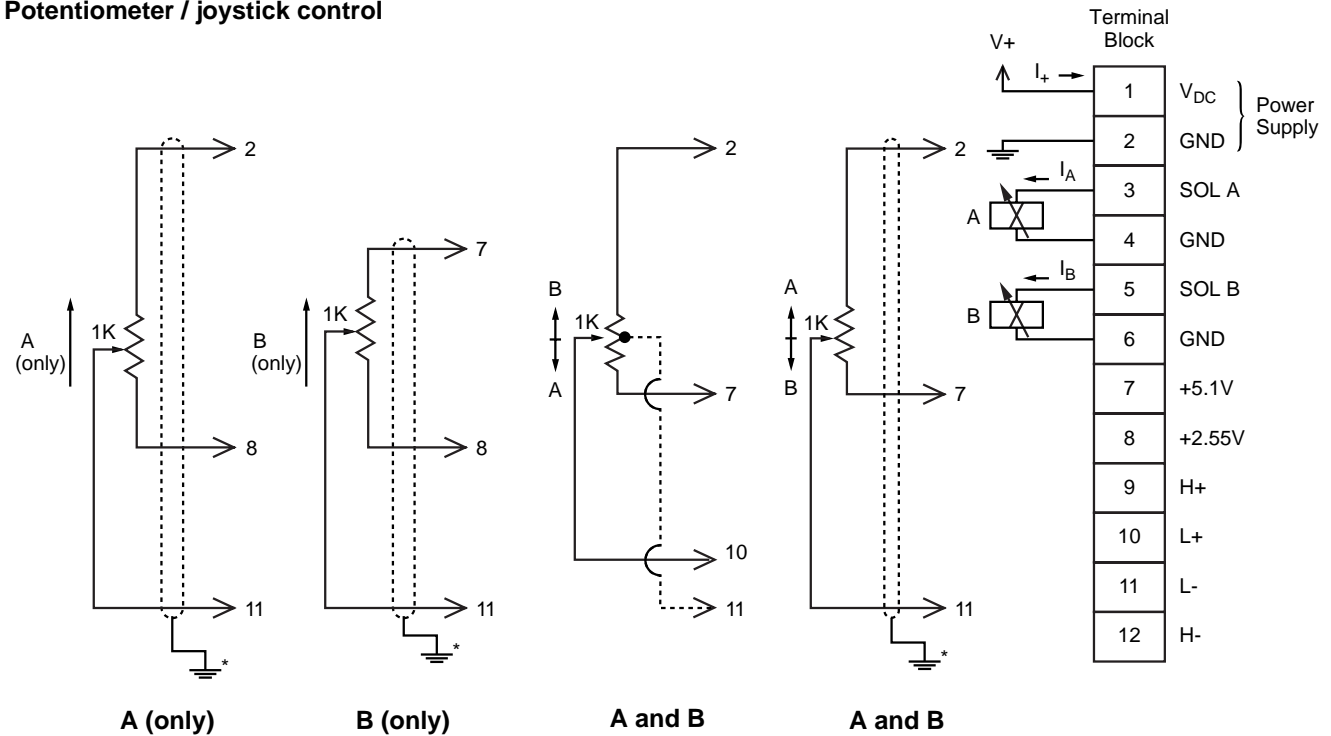
**Ramp type**  
A/B solenoid ramp  
Up/down ramp

**Technical data** (for operation outside these parameters, please consult us!)

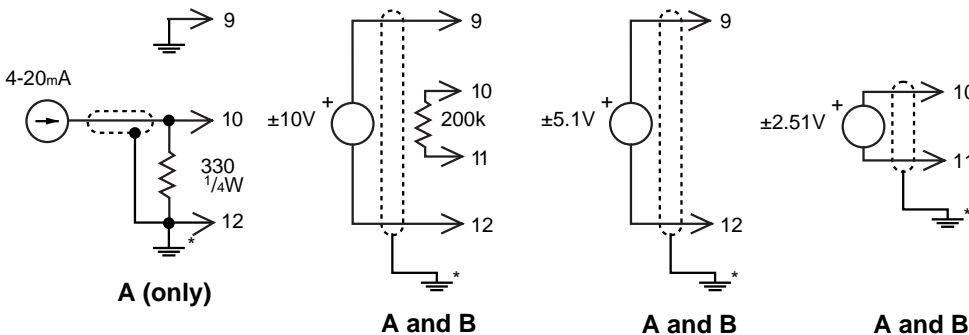
Power supply voltage	VDC	$V_{DC} = 10 \text{ to } 28$	
Power requirement	W	$P = I_{max}^2 \cdot R_{SOL} \cdot 1.2$ (Refer to valve or pump data sheet for max. solenoid current and hot solenoid resistance)	
Power supply current	Amp	$I = \frac{P}{V_{DC}}$	
Ramp time	sec.	0.2 to 10 (standard) 1.2 to 60 (R60) 2.4 to 120 (R120) 4.8 to 240 (R240)	
Control potentiometer	K $\Omega$	1 to 10	
Pulse frequency	P7	Hz	75 to 275
Fuse – 5x20 mm fast acting	Amp	4	
Ambient temperature	$^{\circ}F$ ( $^{\circ}C$ )	-13 to 176 (-25 to 80)	
Weight	lbs	0.36	

**Terminal block connections**

**Potentiometer / joystick control**

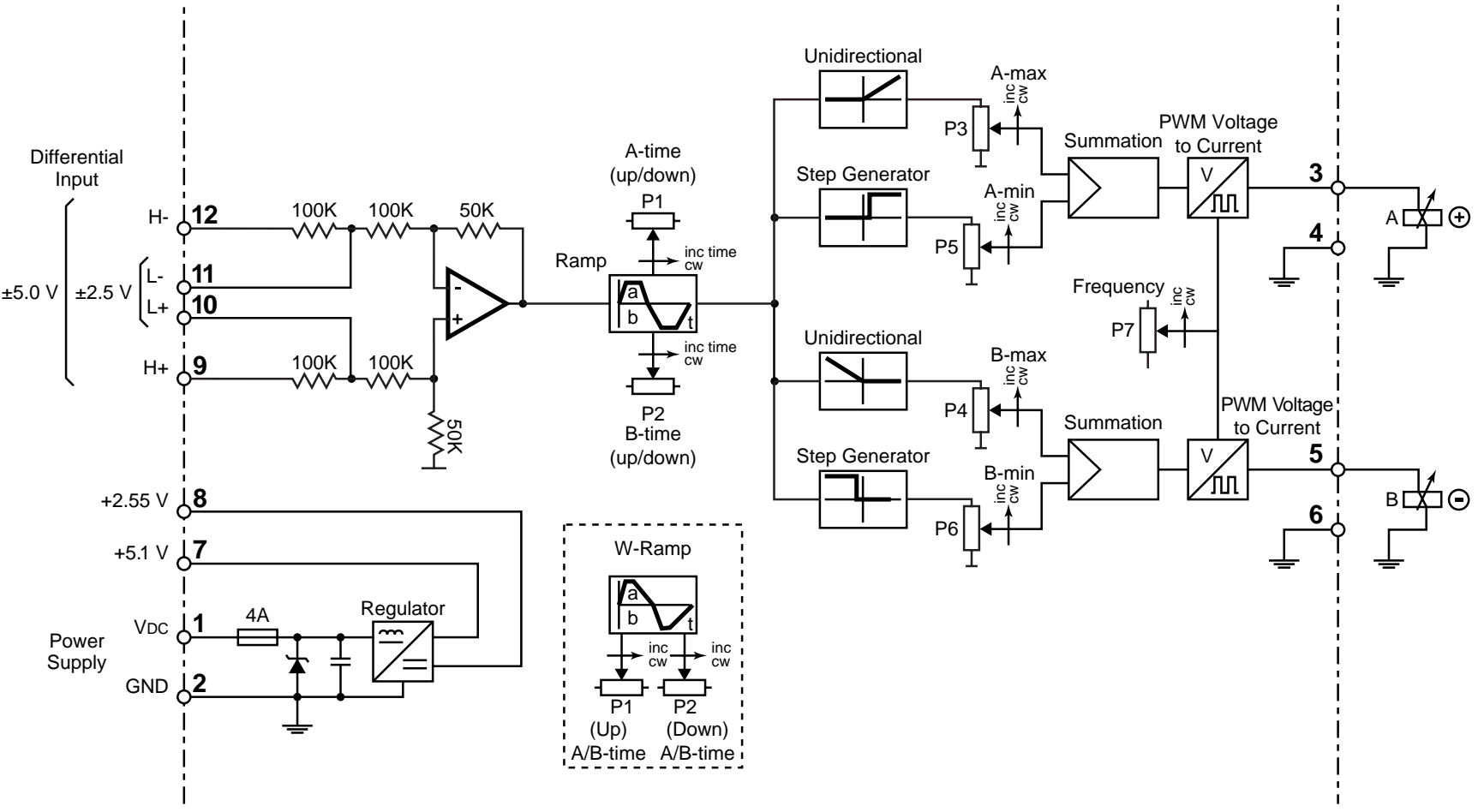


\* Ground shield at one end only



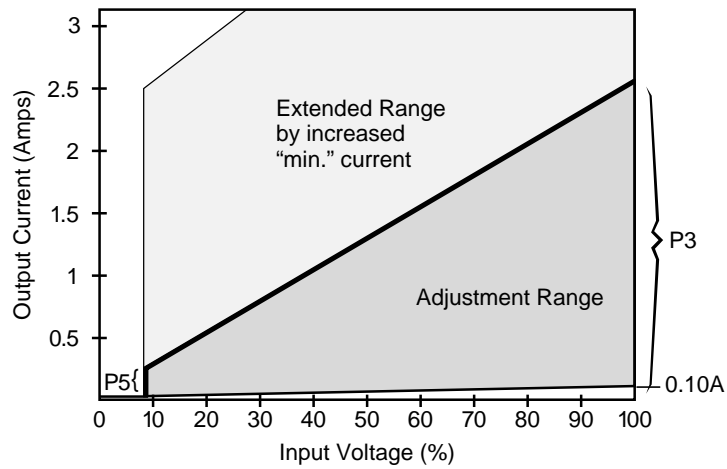
**External voltage commands:**

- $\pm 2.5V$  use terminals 10 and 11,  $V_{10} > V_{11}$  for Sol A
- $\pm 5.0V$  use terminals 9 and 12,  $V_9 > V_{12}$  for Sol A
- $\pm 10V$  use terminals 9 and 12, add 200 K $\Omega$  resistor between 10 and 11,  $V_9 > V_{12}$  for Sol A

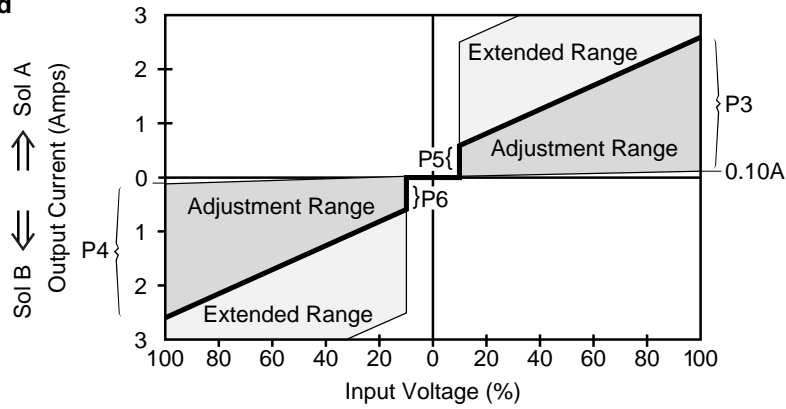


## Output curves

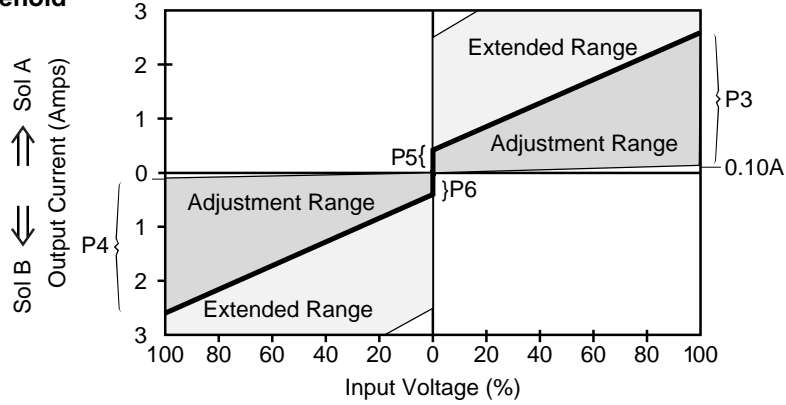
### MDSD Solenoid A



### MDSD Dual Solenoid



### MDSD - 1 Dual Solenoid

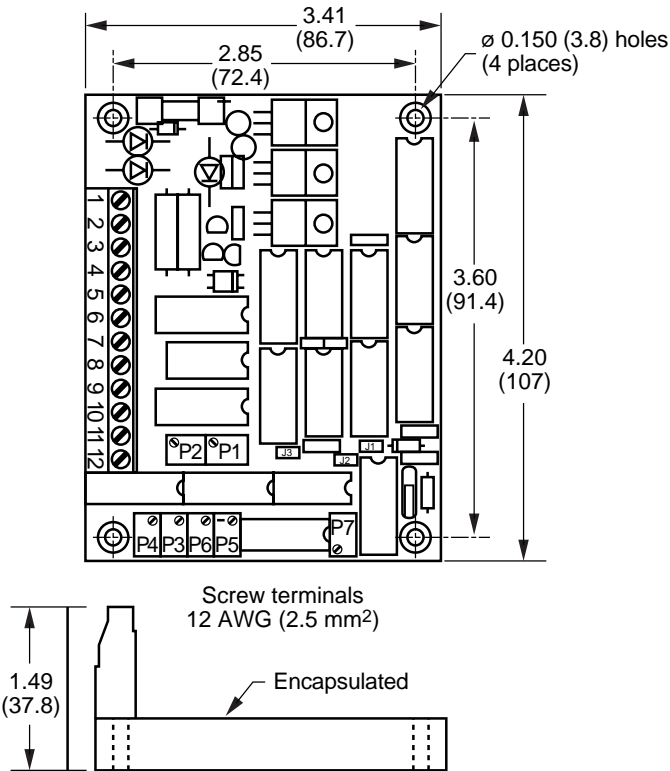


### Potentiometer Adjustments

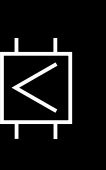
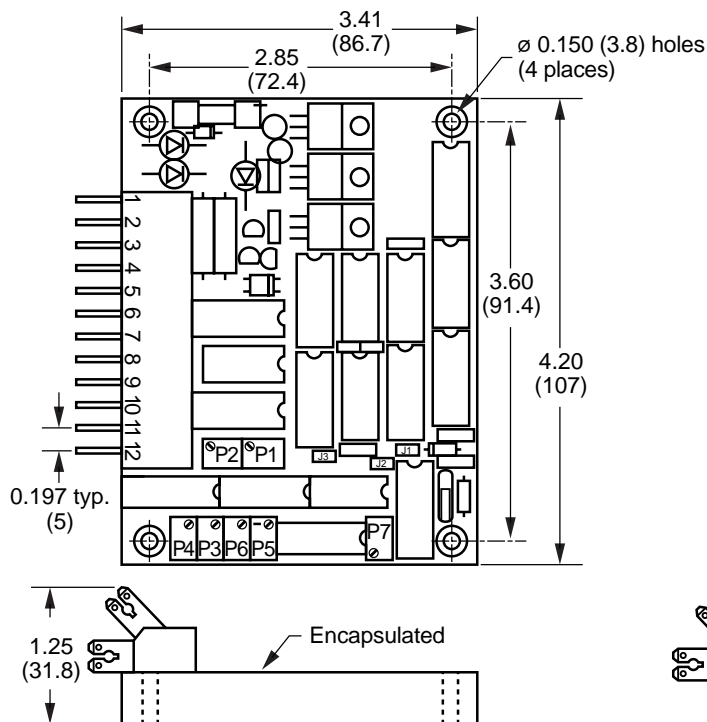
P1	Ramp time (std.)	Sol A	
P2	Ramp time (std.)	SolB	0.2  10 sec.
P3	Max. current	Sol A	
P4	Max. current	SolB	0  2.5 A
P5	Min. current	Sol A	
P6	Min. current	SolB	0.1  2.5 A
P7	PWM frequency		75  275 Hz

**Unit dimensions:** dimensions in inches (millimeters)

**MDSD...K; Screw Terminals**

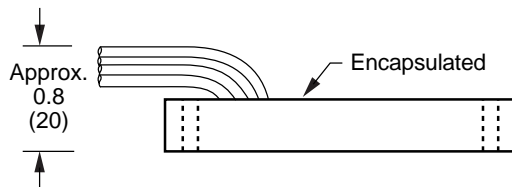
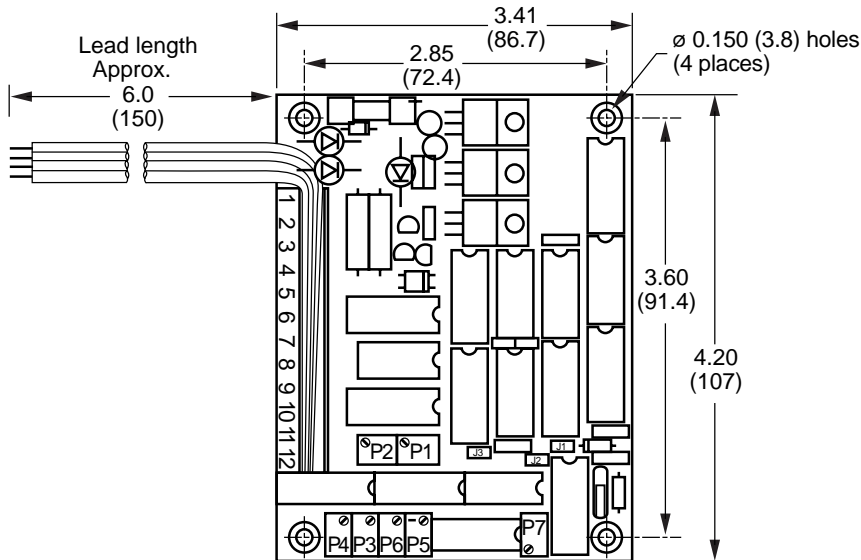


**MDSD...; Flat Tabs**



**Unit dimensions: dimensions in inches (millimeters)**

**MDSD...L; Flying Leads**



Drawing not to scale

Board	Wire Color
1	Red
2	Black
3	Blue
4	White/Blue
5	Brown
6	White/Brown
7	Yellow
8	Orange
9	Violet
10	Gray
11	White/Gray
12	White/Violet

Leads are 18 AWG stranded  
UL style 1429 or equivalent,  
Irradiated PVC



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