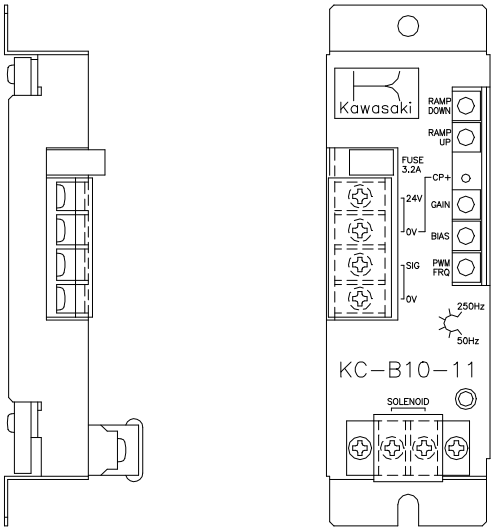
Kawasaki Proportional Amplifier

KC-B10-11

Specification



CE

Before using this product please read this manual and make yourself aware of the various features.

Contents

Features

- Compact and light weight design.
- Ramp function.
- Easy installation and adjustments.
- Pulse width modulated output for good response, resolution and reduced heat effect.
- CE Marked.

Model code and part number.

Model code KC-B10-11

Part number V0006227553

Specifications.

Current control pulse width modulated	50 ~ 250Hz adjustable.
Supply input voltage	24V DC +/- 20%
Command input signal voltage	0 ~ 5V DC, Max.7.5V DC
Rated output current	0.8A (at 5V DC signal input)
Maximum output current	1.2A
Power requirement	Maximum 20VA
Load resistance	14 ~ 21Ω
Input impedance	100KΩ
Ambient temperature range	0 ~ + 50 degree Celsius
Maximum humidity	90% RH (No dew permissible)
Vibration resistance JIS C50250 Type A,	Amplitude 1.5 mmp-p, Frequency 10 ~ 55 Hz
Insulation	100MΩ minimum at 500V DC
Current monitor output	0.47V/1A
Mass	90g
Gain adjustment range	0.8A +/- 0.2A at 5V input.
Bias adjustment range	0 ~ 0.4A
Ramp time adjustment range	(0.1 ~ 5s for ramp up from 0 ~ 0.8 A) (0.1 ~ 5s for ramp down from 0.8 A ~ 0)
Linearity	Up to 2% FS
Current stability	Up to 1.5% FS(ambient temperature change50^{oC}) Up to 2% FS (for supply voltage change +/-20%) Up to 2% FS (load resistance change 14 ~ 21Ω)
Supply fuse	3.2 A Anti surge plug type PCB mounted.

For Kawasaki proportional valve types which can be used with this amplifier please see figure 5 page 7 for details.

EMC considerations

To meet the CE requirements all cables should be screened.
The screen should be earthed correctly at the instrument or control panel only.
Fig 8 Shows a typical layout.

Electrical installation

See fig 1 for actual location of the connections.

Power supply input, terminals [0V] and [24V].

The 0 V of power source and 0 V of signal input must be separately connected.

Signal input

Command signal input voltage between terminals (SIG) and [0V].

Output

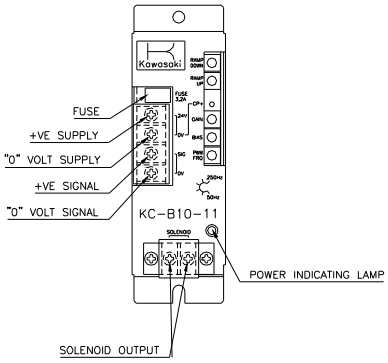
Connect a solenoid between output terminals marked solenoid.
The solenoid has no polarity.

Supply fuse removal

The supply fuse can be removed by gently pulling the fuse outwards from the amplifier panel.

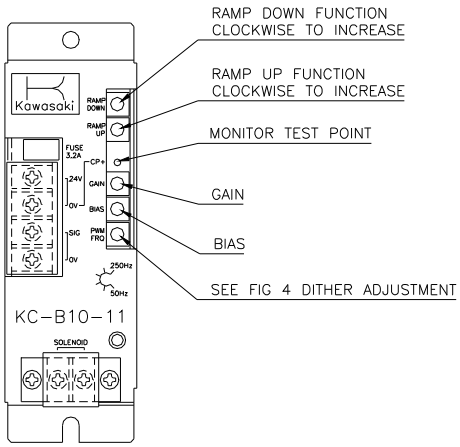
Note: This device does not have short circuit protection.
If the solenoid output terminals are shorted together, this will result in permanent damage to the amplifier.
Replacement of the amplifier will be necessary.

Fig 1



Adjustment location

Fig 2



Adjustment procedure

Dither adjustment

The oscillation of PWM (Pulse width modulated control) operates at the same frequency as the dither.

The approximate dither adjustment range is from 50Hz to 250Hz.

Fig 4 shows the typical potentiometer adjustment position in relation to the approximate frequency.

Fig 3 shows the typical dither effect on the mean value of the amplifier output.

Fig 3

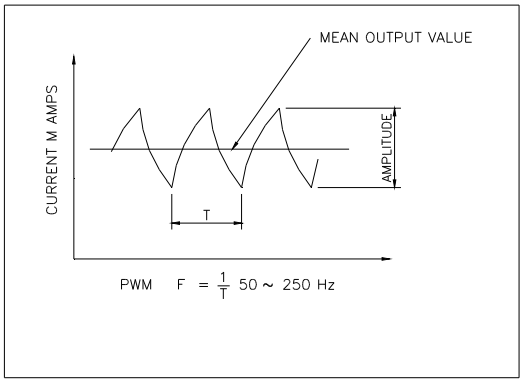
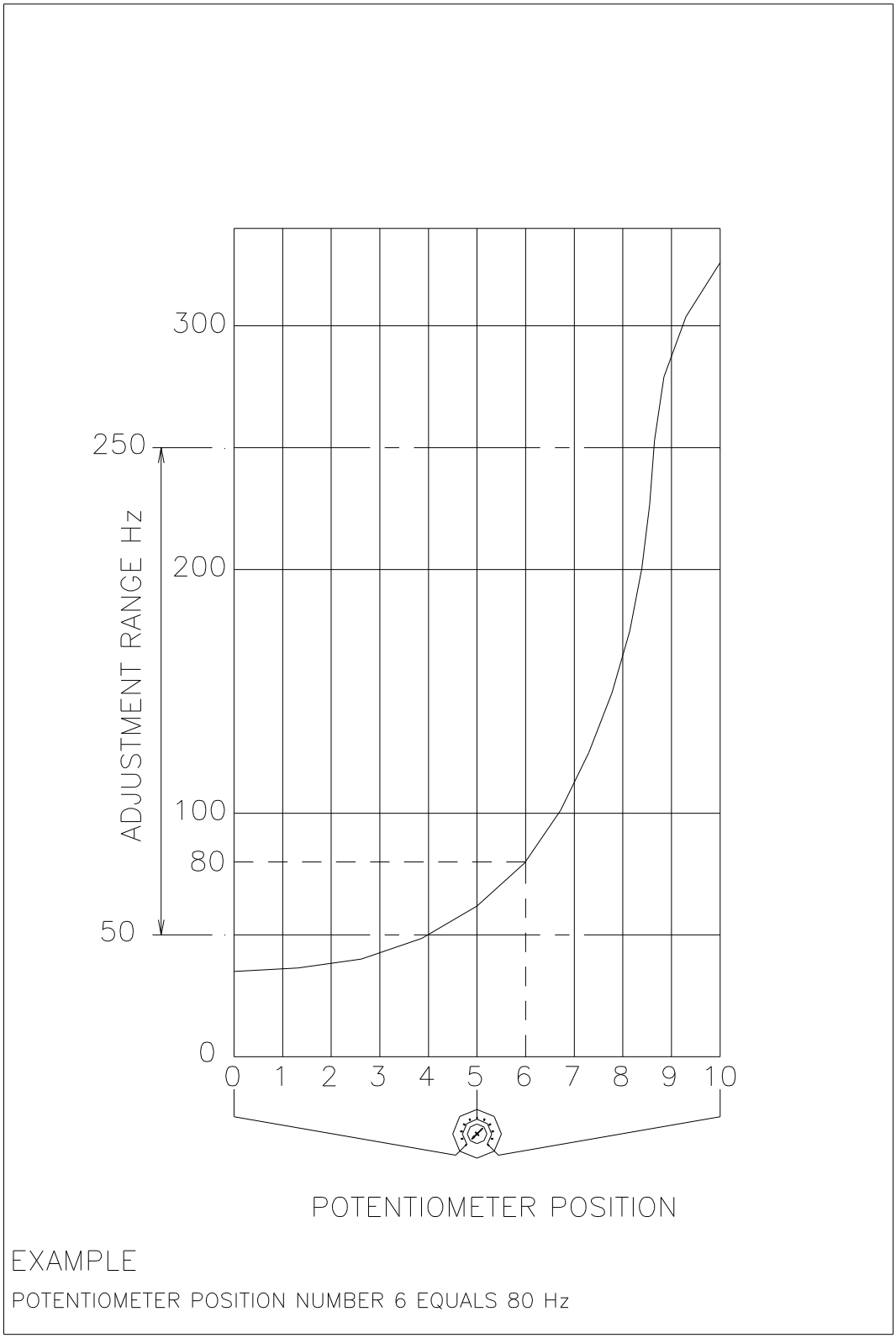


Fig 4



See Fig 5 for the actual setting required in relation to the proportional valve type being used.

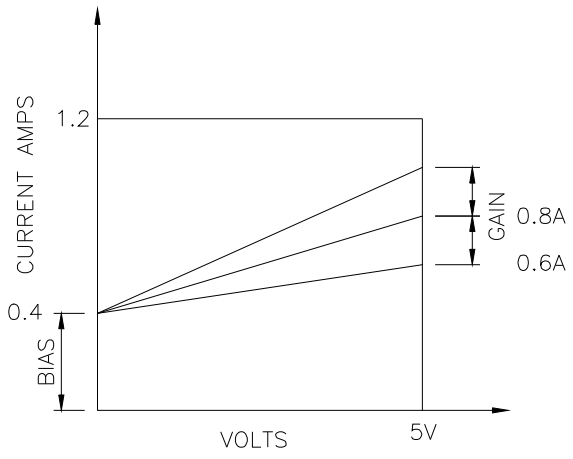
Fig 5

APPLICATION	PROPORTIONAL VALVE MODEL	OPTIMUM DITHER FREQUENCY Hz
PROPORTIONAL RELIEF	RDPV5	200
PROPORTIONAL RELIEF	RBP10 ~ 35	200
PROPORTIONAL REDUCER	PRBP10 ~ 30	200
K3VG TYPE "E" CONTROL	KDRDE5K-20	80
PROPORTIONAL REDUCER	KDRDE5K-30	80

Bias adjustment

The Bias adjustment is located as in Fig 2, it allows the output of the amplifier to be non-zero for zero input voltage.
Fig 6 shows the effect of the Gain and Bias adjustment.

Fig 6



Gain adjustment

This adjustment will allow the output of the amplifier to be spanned over a given range for a maximum input to the amplifier.
By adjusting the Gain and Bias it is possible to achieve the best sensitivity for a given amplifier input.

To enable accurate setting of the Gain and Bias it is possible to use the following procedure.

Use a voltmeter with input impedance of over 10KΩ and measure the voltage between terminals CP+ and 0V. (See Fig 2 for location of the connections.)

The current can then be calculated by the equation as shown below.

CURRENT (A) = MEASURED VOLTAGE (V) / 0.47

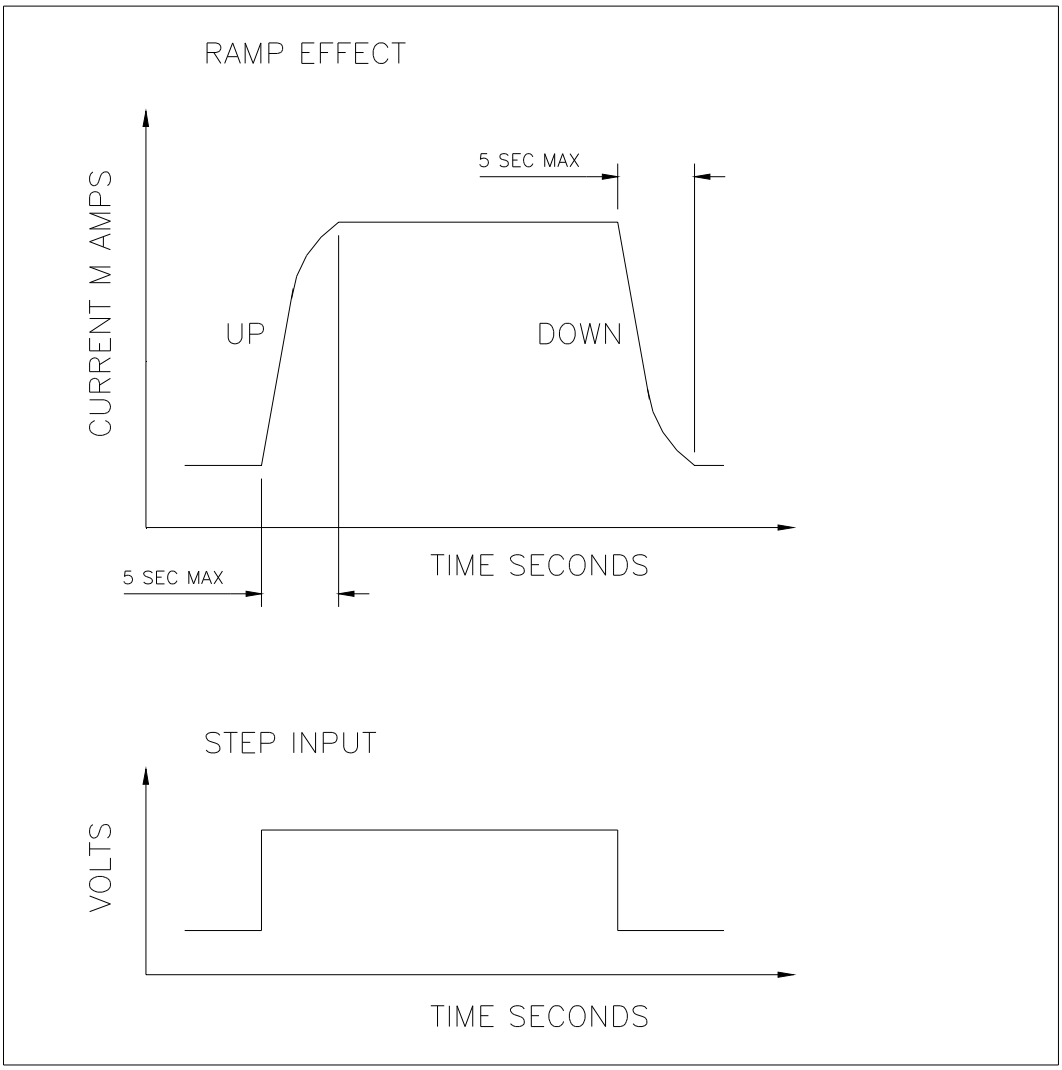
Use an analogue volt meter for the above measurement, this will serve to eliminate the voltage fluctuation which will be seen if using a digital meter.

At the same time as measuring the above condition, measure the input voltage to the amplifier with another volt meter this will serve to speed up the process of setting up the Gain and Bias.

Ramp function adjustment.

The ramp up or ramp down time can be adjusted individually. See Fig 2 for the location of the ramp adjustments.
Fig 7 shows the effect of the Ramp adjustment.

Fig 7

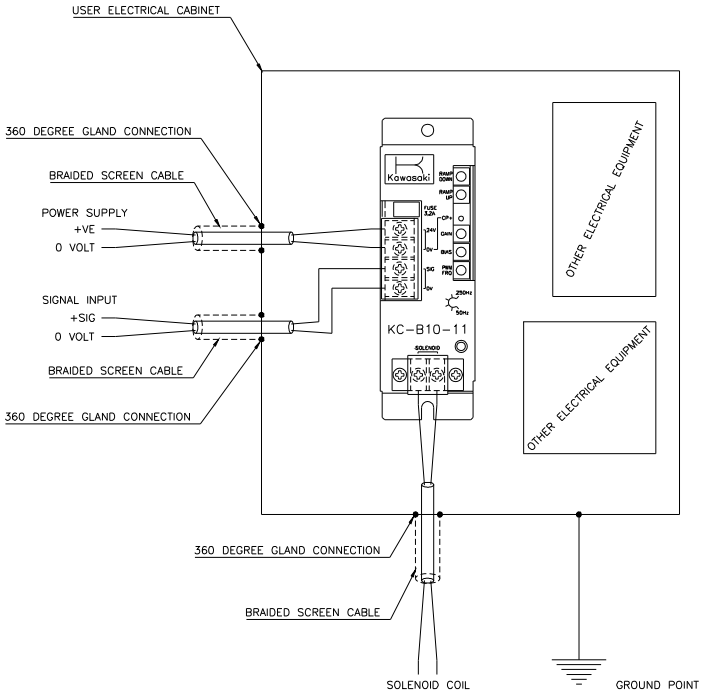


As can be seen for a given step input to the amplifier the output of the amplifier can be adjusted to give a gradual step response.

Connection layout

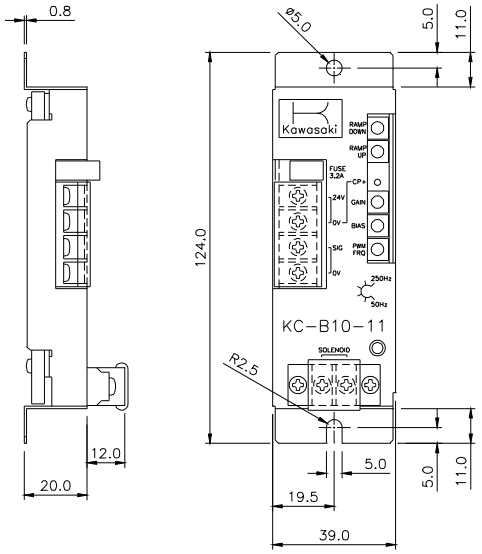
Fig 8 Shows a typical layout for the amplifier connections and user electrical cabinet.
It is recommended that screened braided cables are used for all cable runs, with the screen connected to an efficient earth ground point as shown.

Fig 8



Installation dimensions

Fig 9 sizes in mm.



Note:
Specifications are subject to change with or without notice owing to improvements that may be introduced after publication of this manual.

Appendix

Frequency Hertz cycles / second	Hz
Direct current	DC
Voltage	V
Amps	A
Milli Amp	mA
Relative humidity	RH
Millimetre peak to peak	mmp-p
Gram	g
Full scale	FS
Seconds	s
Mega	M
Volts Amps	VA
Kilo	k
Resistance	Ω
Printed circuit board	PCB