

Power Amplifiers

Models with Command Logic Module and 2 Ramps
EEA-PAM-5**-B-32 Series

General Description

The EEA-PAM-5**-B-32 Eurocards are power amplifiers with a four-input (demand signal) module and ramp function generator with quadrant detection for separate adjustment of acceleration and deceleration.

The type of EEA-PAM-5**-B-32 amplifier used depends on the type of proportional valve, see "Model Codes" on next page.

Features and Benefits

- Includes all features of "A" amplifiers
- 2 ramp times set by front-panel potentiometers; can be varied by external voltage signals
- 4 adjustable command pre-sets selectable by 24V logic signal
- Polarity of 10V reference voltage selectable by 24V logic signal

Front Panel

LEDs

- [1] 24V power supply input, green
- [2] ± 15V control supply output, green
- [3] Drive (solenoid) enabled, yellow
- [4] Overload, red
- [5] LVDT failure, red ▼ ▲
- [6] Drive to solenoid, yellow

Potentiometers

- [7] Deadband compensation, flow from port P to B ◆ ▲
- [8] Deadband compensation, flow from port P to A ◆ ▲

LED

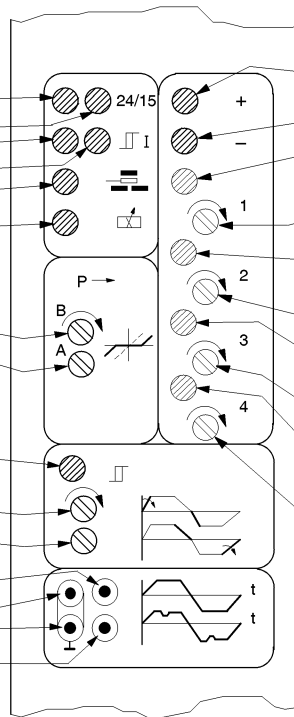
- [9] Ramps enabled, yellow

Potentiometers

- [10] Spool acceleration, flow from port P to B or A ▲
- [11] Spool deceleration, flow from port P to B or A ▲

Monitor points ■

- [12] Conditioned command signal
- [13] Common ground 0V
- [14] ●



LEDs

- [15] Positive input polarity ON, yellow
- [16] Negative input polarity ON, yellow
- [17] Input 1 ON, yellow

Potentiometer

- [18] Input 1 adjustment

LED

- [19] Input 2 ON, yellow

Potentiometer

- [20] Input 2 adjustment

LED

- [21] Input 3 ON, yellow

Potentiometer

- [22] Input 3 adjustment

LED

- [23] Input 4 ON, yellow

Potentiometer

- [24] Input 4 adjustment

▼ LED and symbol not on EEA-PAM-513/523/525 amplifiers.

▲ Main-stage spool in the case of K*DG5V valves.

◆ In the case of EEA-PAM-523/525 amplifiers, one of these relationships may not apply if two single solenoid valves are connected.

● Of solenoid current in the case of EEA-PAM-513/523/525 models, of spool position for others.

■ Ø2,0 mm (0.0787" dia.) sockets.

Model Codes

Amplifier model	For valves
EEA-PAM-513-B-32	
EEA-PAM-523-B-32	KCG-3; KCG-6/8
EEA-PAM-525-B-32	KX(C)G-6/8
EEA-PAM-533-B-32	K*G4V-3; KDG5V-5/7/8
EEA-PAM-535-B-32	K*G4V-5
EEA-PAM-561-B-32	KF*G4V-3
EEA-PAM-568-B-32	KF*G4V-5
EEA-PAM-571-B-32	KFDG5V-5/7
EEA-PAM-581-B-32	KFDG5V-8
	CVU-**-EFP1
	KHDG5V-5/7/8

} With type "H" coils only

Operating Data

Power requirements		See appropriate base amplifier, e.g. for EEA-PAM-535-B-32 see EEA-PAM-535-A-32
Control (output) supplies	z22	+15V for LVDTs only
Output voltages for control: At pin z2 At pin b2 At pins z2 and b2		+10V ($\pm 1\%$) x 5 mA -10V ($\pm 1\%$) x 5 mA Ripple <20 mV pk.-to-pk. Temperature drift <1 mV/°C (<0,5 mV/°F) thru' 0-50°C (32-122°F) range All outputs short-circuit protected
Command signal inputs: Direct-voltage pins Inverting-voltage pin Voltage range Input impedance (voltage) Current pin Current range Input impedance (current)	b8, b6, z8, b10 z10 z6	$\pm 10V$ 47 k Ω ± 20 mA 100 Ω
Command voltage source	d20	$\pm 10V$ x 10 mA
Command voltage polarity selection: For flow from (main) port P to A▲ For flow from (main) port P to B▲ Input impedance Warning: Loss of signal at pin d2 causes polarity reversal and possible erratic motion. ▲ In the case of EEA-PAM-523/525 amplifiers, one of these relationships may not apply if two single-solenoid valves are connected.		Pin d2 at 0 to +5V Pin d2 at +10 to +40V 47 k Ω
Logic inputs: Switch-on voltage Switch-off voltage Input current	d10, d12, d14 or d18	+10 to +40V <+5V ≤ 10 mA
Command voltage inputs: Voltage and source Input impedance External command potentiometer	d22, d24, d26 and d28	+10V gives valve flow from port P to B, or -10V gives flow from P to A◆ Four 50 k Ω pots 5 k Ω ; 0,25W minimum Part no. 714127; see catalog 2460 ◆ Not applicable when using EEA-PAM-523/525 amplifiers to drive two single-solenoid valves.

Continued on next page

Voltage-controlled ramp generator:		
Acceleration pin	d6	± 10V
Deceleration pin	d8	± 10V
		Note: At any ramp pot. setting, positive voltages increase ramp times and negative voltages decrease them. With pot. set at zero, 0 to +10V equates to a ramp time range of 50ms to 5s. With pot. set at max., 0 to -10V equates to a ramp time of 5s to 50 ms.
Input impedance	d6 or d8	10 kΩ
Drive enabled (power available to solenoid)	z24	Apply >9,8V to <40V (22kΩ)
Drive disabled (no power to solenoid)	z24	Apply open circuit or up to 4,5V
Alarm output:	z12	
Set alarm		Enable amplifier (on pin z24) when switching power on
Signal		HIGH when alarm is activated Output = Supply minus 2V I = 50 mA max. LOW when solenoid overload has occurred. (Maintained until reset.) Output = 0 to ± 2 volts Output resistance = 50 ohms Disable and re-enable on pin z24
Reset after failure		
Ramps enabled (valve switching rate limited by ramp potentiometers)	b24	Apply >9,8V to <40V (22 kΩ)
Ramps disabled (fastest valve switching; ramp circuit bypassed)	b24	Apply open circuit or up to 4,5V
Ramp active indicator:	b12	
Drive ramping up		Output >10V
Drive ramping down		Output <-10V
Drive not ramping		Output 0V (± 2V ripple)
Output resistance		10 kΩ
Drive signal zero indicator:	b20	
Drive signal at null (within deadband limits)		Output = Supply minus 1,5V I = 50 mA max. Output = 0 ± 2V 50Ω
Drive active		
Output resistance		
Ambient temperature range		0 to 50° C (32 to 122° F)
Storage temperature range		-25 to +85° C (-12 to +185° F)
Edge connectors		DIN 41612 F48 male type on board. Mating connector must be an F48 female type
Installation dimensions and panel display		Dimensions are the same as for the corresponding base amplifier but the panel display is different; see first page
Mass		0,40 kg (0.88 lb) approx.
Other characteristics		See catalog 2464 for the relevant base amplifier EEA-PAM-5**-A-32.
Installation and start-up guidelines (supplied with product)		9166
Installation wiring requirements for Vickers electronic products		2468
Application notes (available on request)		9060
Supporting products:		See catalogs:
Power unit options		2419
Electronic accessories		2460
Portable test equipment		2462 and 2315

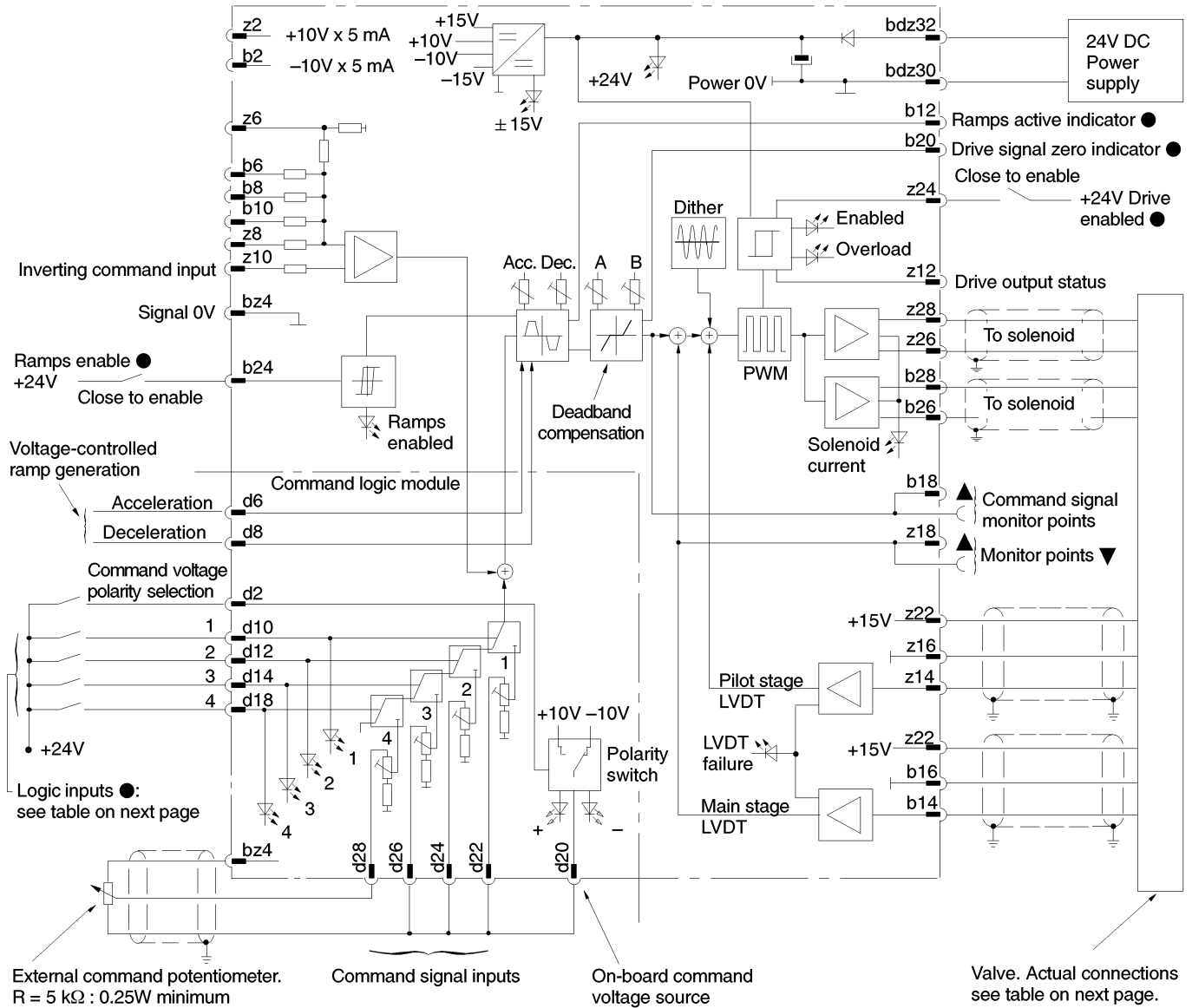
Circuit and Connections

EEA-PAM-5**-B-32

Shown with command logic module. Individual ramp adjustments of spool acceleration and deceleration, independent of direction of movement, are on the base amplifier. Additionally, acceleration and deceleration can be controlled by variable voltage inputs to

pins d6 and d8 respectively. The circuit here includes the essential characteristics of all amplifiers listed in the "Model Codes" section, two pages back; actual amplifiers omit certain sub-circuits to those connection pins not needed for the valves concerned.

Read circuit in conjunction with that for relevant base amplifier EEA-PAM-5**-A



- ⊥ Customer's protective earth connection.
- ▼ Solenoid current for 523/525-B models; LVDT position for all others.
- ▲ On front panel.
- See under this heading in "Operating Data" table, on previous two pages.

Logic Selection Inputs

Logic input pin	Command pot.	Secondary pin	Voltage to pin d2	Valve flow
d10	1	bdz30	0 +24V	P-A P-B } ■
d12	2	bdz30	0 +24V	P-A P-B } ■
d14	3	bdz30	0 +24V	P-A P-B } ■
d18	4	bdz30	0 +24V	P-A P-B } ■

■ In the case of EEA-PAM-523/525-B models, one of these relationships may not apply if two single-solenoid valves are connected.

Solenoid and LVDT Connections for Proportional Valves

Amplifier type	Solenoid with LVDT and/or for flow P to B	Solenoid without LVDT, or on pilot valve	Pilot-stage LVDT, (black plug):				Main-stage LVDT, (gray plug):			
			Pin 1	Pin 2	Pin 3	Pin 4	Pin 1	Pin 2	Pin 3	Pin 4
EEA-PAM-513-B-32	b26/b28	–	–	–	–	Not connected	–	–	–	Not connected
EEA-PAM-523-B-32	b26/b28	z26/z28	–	–	–	Not connected	–	–	–	Not connected
EEA-PAM-525-B-32	b26/b28	z26/z28	–	–	–	Not connected	–	–	–	Not connected
EEA-PAM-533-B-32	b26/b28	z26/z28	–	–	–	Not connected	b14	z22	b16	Not connected
EEA-PAM-535-B-32	b26/b28	z26/z28	–	–	–	Not connected	b14	z22	b16	Not connected
EEA-PAM-561-B-32	–	z26/z28	–	–	–	Not connected	b14	z22	b16	Not connected
EEA-PAM-568-B-32	–	z26/z28	–	–	–	Not connected	b14	z22	b16	Not connected
EEA-PAM-571-B-32	–	z26/z28	–	–	–	Not connected	b14	z22	b16	Not connected
EEA-PAM-581-B-32	–	z26/z28	z14	z22	z16	Not connected	b14	z22	b16	Not connected



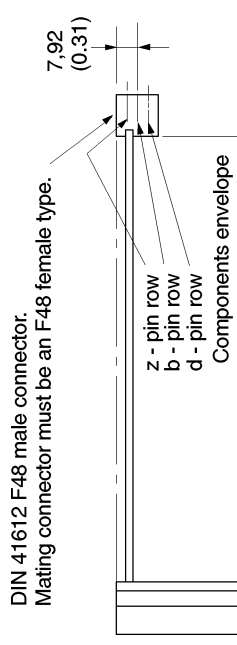
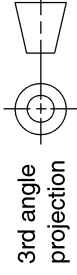
Warning: Electromagnetic Compatibility (EMC)

It is necessary to ensure that the valve is wired up in accordance with the connection arrangements shown in this leaflet. For effective protection, the user's electrical cabinet, the valve subplate or manifold and the cable screens should be connected to efficient earth (ground) points. The metal 7-pin connector part no. 934939 should be used for the integral amplifier.

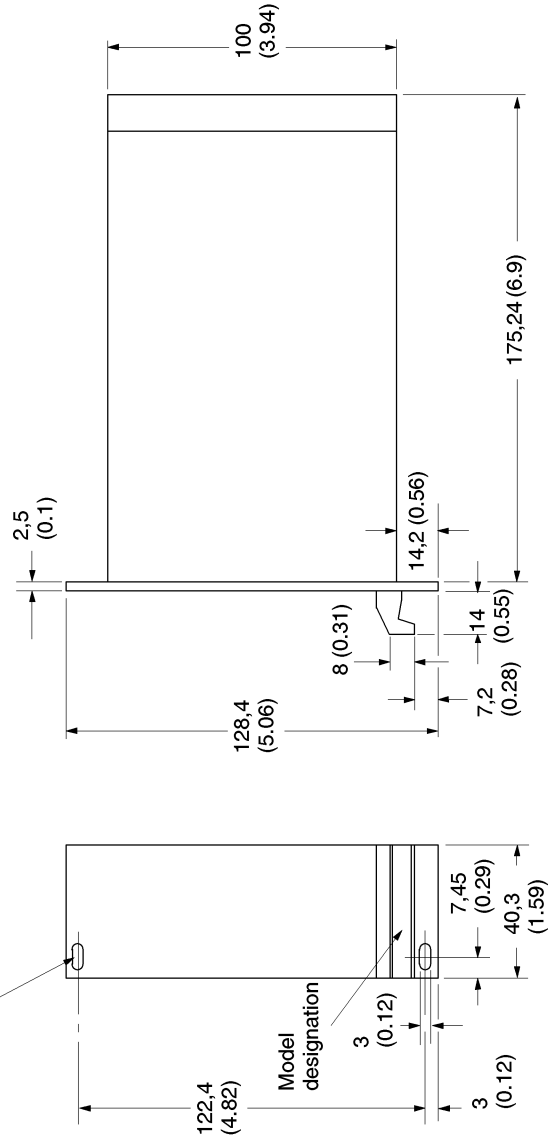
In all cases, both valve and cable should be kept as far away as possible from any source of electromagnetic radiation such as cables carrying heavy current, relays and certain kinds of portable radio transmitters, etc. Difficult environments could mean that extra screening may be necessary to avoid the interference.

Installation Dimensions in mm (inches)

Plug-in Unit of 3U Height, to IEC 297



M2,5 x 11 (0.43) long collar screws supplied with panel for fixing



Eaton
14615 Lone Oak Road
Eden Prairie, MN 55344
USA
Tel: 952 937-9800
Fax: 952 974-7722
www.hydraulics.eaton.com

Eaton
20 Rosamond Road
Footscray
Victoria 3011
Australia
Tel: (61) 3 9319 8222
Fax: (61) 3 9318 5714

Eaton
46 New Lane, Havant
Hampshire PO9 2NB
England
Tel: (44) 23 92 486 451
Fax: (44) 23 92 487 110



Vickers