

Power Amplifiers for PVH-EDC Pumps

EEA-EDC-436-A*-32 Design

- A1 - For use with PVH57 & 74
- A2 - For use with PVH98
- A3 - For use with PVH131



General Description

These amplifiers are designed for controlling Vickers PVH pumps with electronic displacement control.

The pulse-width-modulated power output stage drives a single solenoid proportional spool valve which hydraulically controls the pump yoke position. Feedback of the yoke position and pump output is from a rotary feedback transducer which closes the control loop and ensures accurate pump output flow.

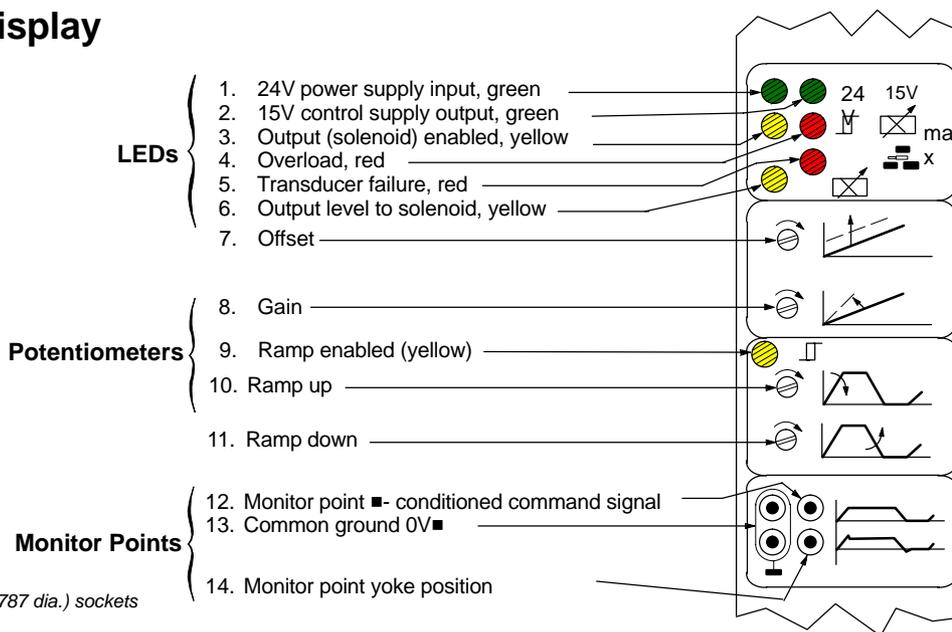
Analog command input signals can be non-inverting current, or non-inverting, inverting or differential voltages. The amplifier requires a power supply of 24V DC and is enabled by a 24V logic signal. The ramps are also enabled by a separate 24V signal.

The amplifier front panel contains LEDs showing the status of power, control supply and outputs. Potentiometers for adjusting the two ramps, the gain and the offset are also mounted in the front panel.

Features

- Constant current amplifier
- Voltage or current command signals
- Two separate ramps for acceleration and deceleration
- 24V DC power supply
- Pulse-width-modulated coil drive
- Wide supply voltage range and tolerance to ripple
- Low supply voltage protection
- Ramp setting unaffected by gain adjustment.

Panel Display



This product has been designed and tested to meet specific standards outlined in the European Electromagnetic Compatibility Directive (EMC) 89/336/EEC, amended by 91/263/EEC, 92/31/EEC and 93/68/EEC, article 5. For instructions on installation requirements to achieve effective protection levels, see this leaflet and the Installation Wiring Practices for Vickers Electronic Products leaflet 2468. Wiring practices relevant to this Directive are indicated by Electromagnetic Compatibility (EMC).

Operating Data (Amplifier)

Power (input) supply:	24V DC nominal x 50W 20 to 40 VDC (incl. pk-to-pk ripple \pm 10% max.)
Amplifier shut down Protection	<18V Reverse-polarity
Control (output) supply:	\pm 15V x 50 mA max. (pk.-to-pk. ripple 50 mV)
Temperature drift	\pm 10V (\pm 1%) x 5 mA max. (pk.-to-pk. ripple 20 mV) <1 mV/ $^{\circ}$ C (<0,5 mV/ $^{\circ}$ F) 0-50 $^{\circ}$ C (32-122 $^{\circ}$ F) All outputs short-circuited protected
Command inputs:	
Direct voltage pins	b8, b6, z8, b10
Inverting voltage pin	z10
Current pin	z6
Voltage range	\pm 10V (b6, b8, b10 or z8) or -10V (z10)
Input impedance (voltage)	47 k Ω
Current range	0 - 20 mA (z6)
Input impedance (current)	100 Ω
Standing solenoid current at zero command signal	0.8A
Gain adjustment	2,5% yoke angle/volt to 10% yoke/angle volt
Ramp-time adjustment:	Min. = 50 ms
Factory setting	Minimum time
Adjustment range	50 ms to 5s
Dither	Factory-set
Feedback from yoke transducer to b14	4 to 20 mA (100 Ω)



WARNING

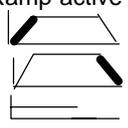
The control card disables the pump's function whenever an internal function fault or external interface electrical fault is detected. The card automatically re-enables itself whenever the fault ceases. This can lead to a sudden and unexpected actuator motion when the fault clears with the potential of severe personal injury to the operator or maintenance personnel.

1. DO NOT operate the machine if it is experiencing intermittent electrical faults or otherwise functioning in an unreliable manner until the condition has been fully corrected.

2. Ensure that operator and maintenance personnel remain clear of any components actuated by the pump when system/machine troubleshooting is conducted with either or both electrical and hydraulic power available to the system.

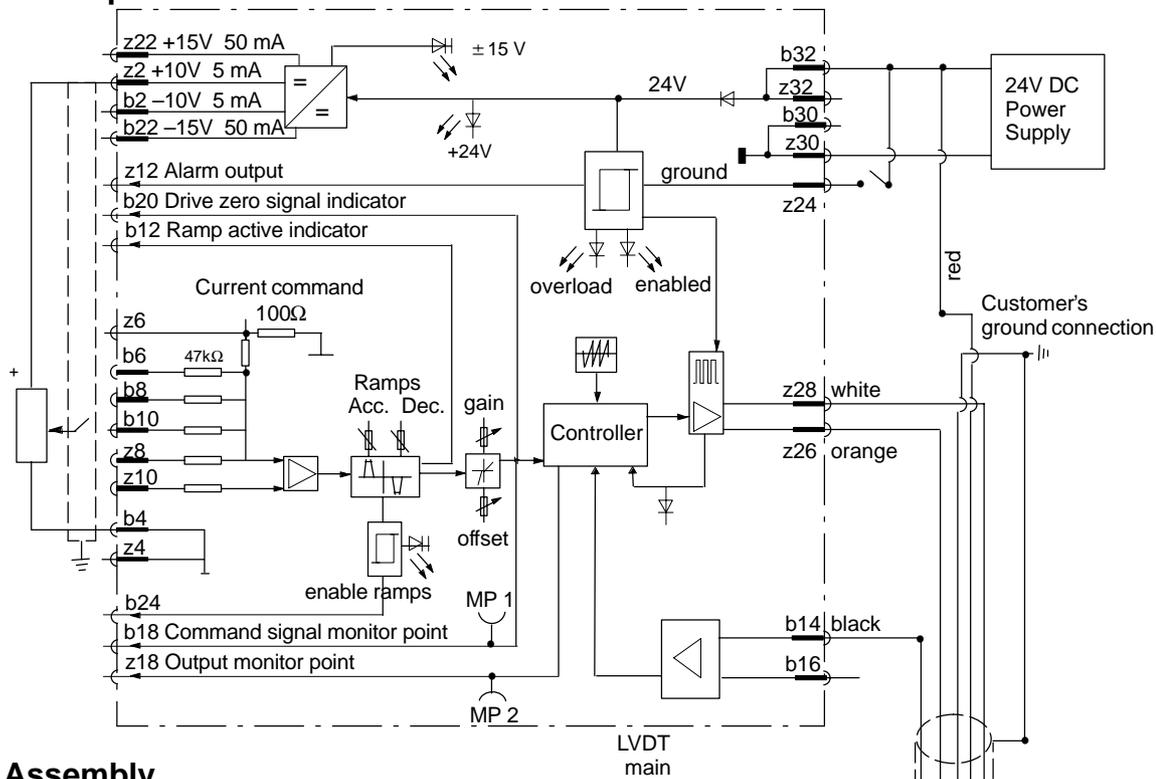
Overload protection, factory-set	Automatic reset when fault removed
Output enable	
Enabled	Apply 9,8 to 40V
Disabled	Apply \leq 4,5V or open circuit
Input impedance (voltage)	(22 k Ω)
Ramps:	
Enabled	Apply 9,8 to 40V
Disabled	Apply \leq 4,5V or open circuit
Input impedance (voltage)	(22 k Ω)
Power drive	PWM short-circuit protected
Maximum solenoid current	1.6A
Zero offset	0-25% of full range
Command signal monitor point:	
Front panel (MP1 & \circ b18)	Monitor signal after gain and ramps:
Output \square z \square	0-10V (10V = $I_{max.}$) 10 k Ω short circuit protected
Yoke position monitor point:	
Front panel (MP2 & \circ z18)	0 to 10 volts for full range
Output \square z \square	10 k Ω short circuit protected

Operating Data (Amplifier) (continued)

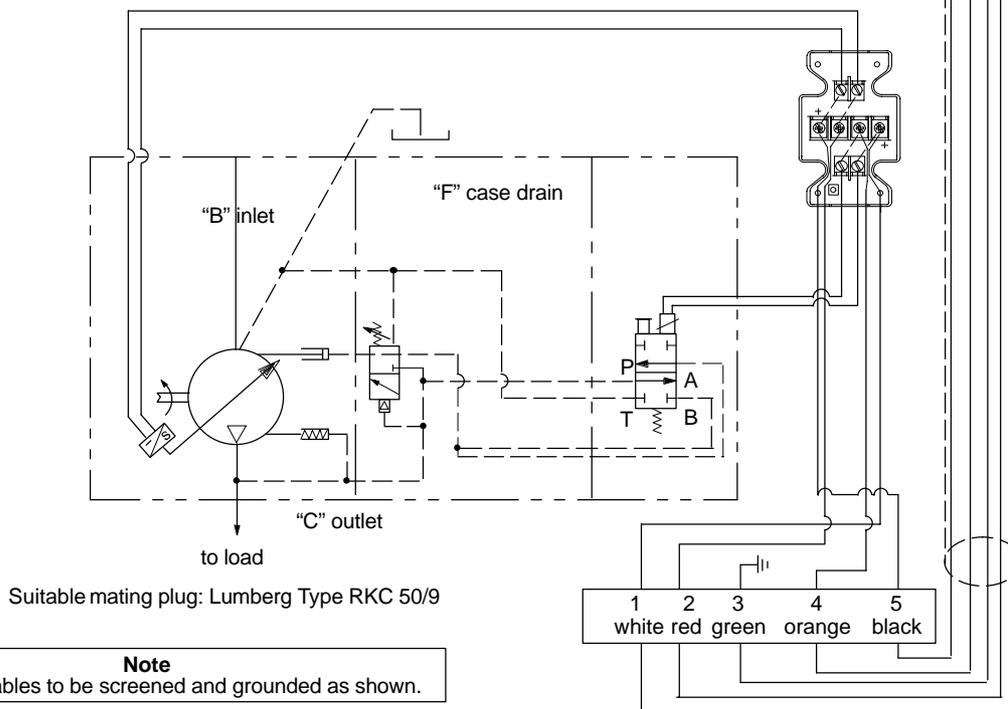
<p>Ramp-active indicator: —○ b12</p>  <p>Output — <input type="checkbox"/> z —</p>	<p>Output > +10V Output < -10V Output = 0V (± 2V ripple) 10 kΩ</p>																											
<p>Drive signal zero indicator —○ b20 Drive signal at null Drive active Output resistance — <input type="checkbox"/> z —</p>	<p>Output = Supply minus 1,5V; I = 50mA max. Output = 0 ± 2V 50Ω</p>																											
<p>Alarm output —○ b12 Set alarm Signal</p> <p>Reset after failure</p>	<p>Enable amplifier (on pin z24) when switching power on HIGH when alarm is activated: Output= Supply volts minus 2 volts; I=50 mA max. LOW when solenoid overload has occurred (maintained until reset): Output=0 to +/-2 volts; Output impedance = 50Ω Disable and re-enable on pin z24</p>																											
<p>Ambient temperature range</p>	<p>0 to 50°C (32 to 122°F) full specification</p>																											
<p>Edge connectors DIN 41612</p>	<p>—○ F48 on board for card holder)— F32 or F48</p>																											
<p>Weight</p>	<p>330g (0.15 lb)</p>																											
<p>Installation recommendations leaflet, packed with amplifier</p>	<p>ML-9160</p>																											
<p>Supporting products (see appropriate catalog):</p> <table border="0"> <tr> <td>Power supply</td> <td>3,5A</td> <td>EHA-PSU-704-A3-20</td> </tr> <tr> <td></td> <td>5,0A</td> <td>EHA-PSU-704-A5-20</td> </tr> <tr> <td></td> <td>10,0 A</td> <td>EHA-PSU-704-A10-20</td> </tr> <tr> <td>Test adaptor</td> <td></td> <td>EBA-TEQ-706-A-10</td> </tr> <tr> <td>Portable test equipment</td> <td></td> <td>EHA-TEQ-700-A-20</td> </tr> <tr> <td>Cardholder</td> <td>D32</td> <td>02-104806</td> </tr> <tr> <td></td> <td>F32</td> <td>02-104807</td> </tr> <tr> <td></td> <td>F48</td> <td>02-104808</td> </tr> <tr> <td>Edge connector</td> <td>F48</td> <td>732683</td> </tr> </table>	Power supply	3,5A	EHA-PSU-704-A3-20		5,0A	EHA-PSU-704-A5-20		10,0 A	EHA-PSU-704-A10-20	Test adaptor		EBA-TEQ-706-A-10	Portable test equipment		EHA-TEQ-700-A-20	Cardholder	D32	02-104806		F32	02-104807		F48	02-104808	Edge connector	F48	732683	
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<p>Other related products: Power amplifier for PVH-EDC pumps with single ramp control Power amplifier for PVH-EDC pumps with PID module</p>	<p>EEA-EDC-436-A*-14 EEA-EDC-436-D*-32</p>																											

Circuit and Connections

Eurocard Amplifier



Pump Assembly



Notes for Wiring: Electromagnetic Compatibility (EMC)

- 1) Screened cables should be used for the command signals and the solenoid connections.
- 2) Particular attention should be paid to the grounding of the screens as shown in the diagrams.
- 3) The amplifiers should be mounted in a metal enclosure which is connected to an efficient ground point.

Command Signals/Installation Dimensions for Amplifier

Command Signals

Type	Input pins	Signal polarity	Secondary pins ref.
Non-inverting voltages	b6/8/10 or z8	+	bz4
Non-inverting current	z6	+	
Inverting voltage	z10	-	Link <i>one</i> of b6/8/10 or z8 to bz4
Differential voltage		One of b6/8/10 or z8	+

Installation Dimensions

Plug-in unit of 3U height, to IEC 297

mm (inch)

