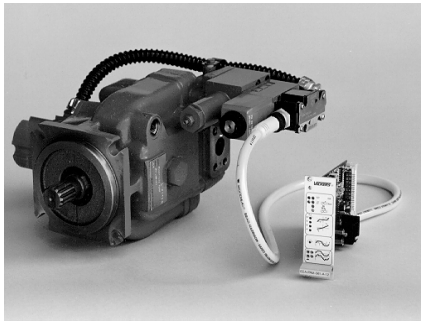
# Power Amplifiers for PVH-EDC Pumps

## 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.

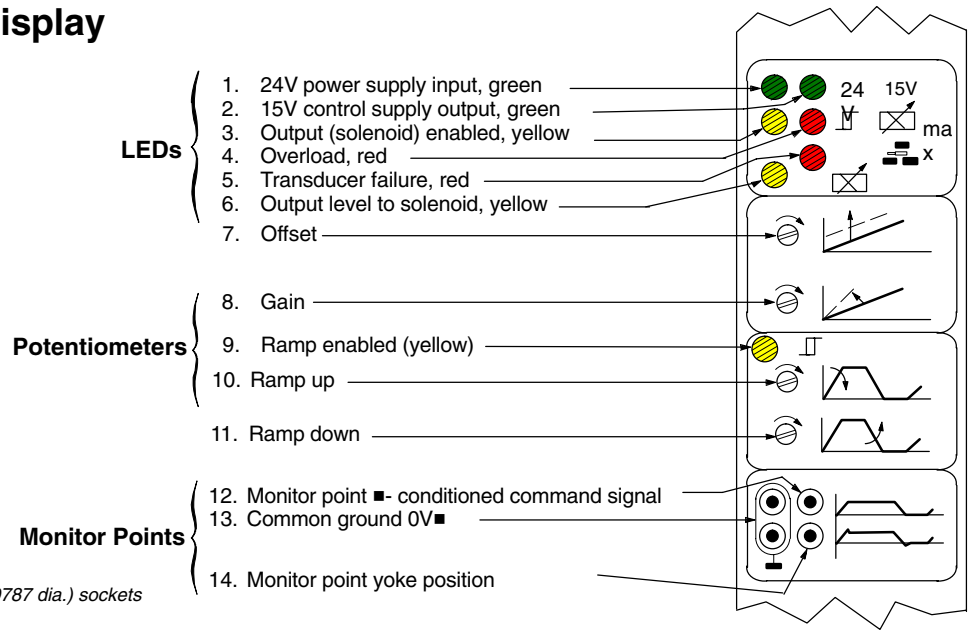
Analog command input signals can be non-inverting current, or non-inverting, inverting or differential voltages. The amplifier requires a power supply of 24V DC and is enabled by a 24V logic signal. The ramps are also enabled by a separate 24V signal.

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




■ ∅2,0 (0.0787 dia.) sockets

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

***WARNING***

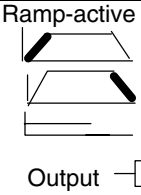
*The control card disables the pump's function whenever an internal function fault or external interface electrical fault is detected. The card automatically re-enables itself whenever the fault ceases. This can lead to a sudden and unexpected actuator motion when the fault clears with the potential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

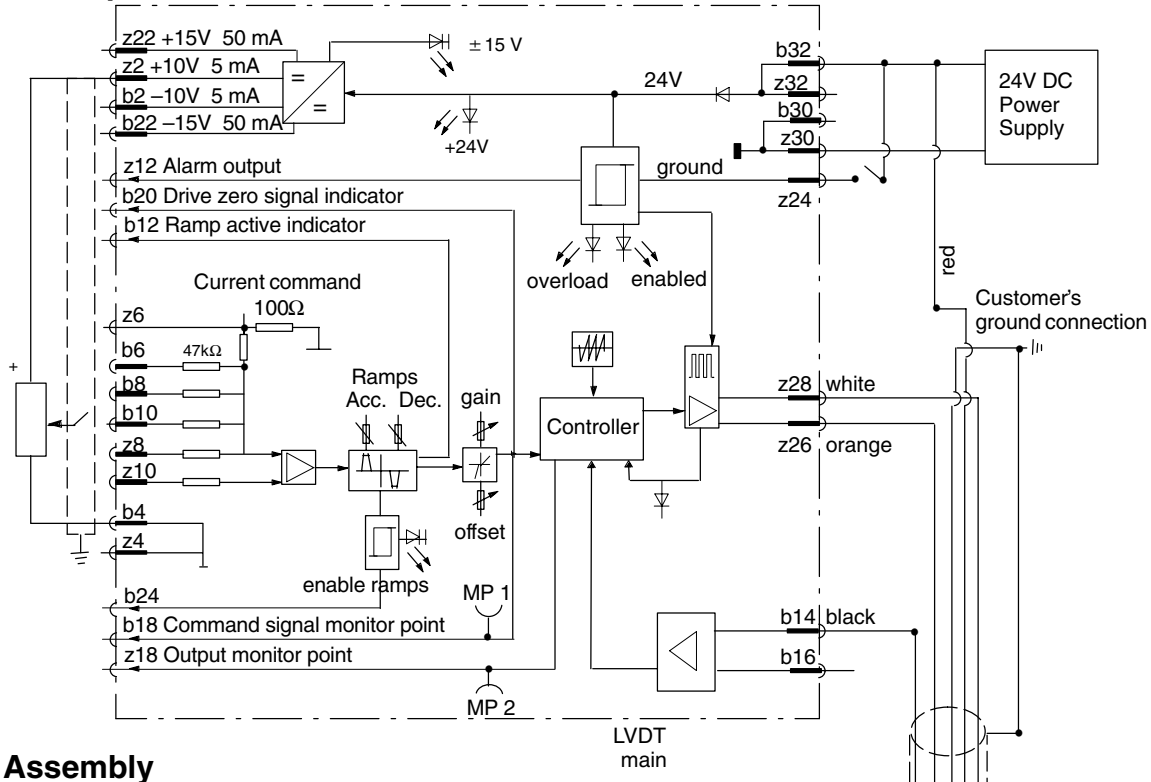
| | |
|---|---|
| Overload protection, factory-set | Automatic reset when fault removed |
| Ouput enable<br>Enabled<br>Disabled<br>Input impedance (voltage) | <br>Apply 9,8 to 40V<br>Apply ≤4,5V or open circuit<br>(22 kΩ) |
| Ramps:<br>Enabled<br>Disabled<br>Input impedance (voltage) | <br>Apply 9,8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

# Operating Data (Amplifier) (continued)

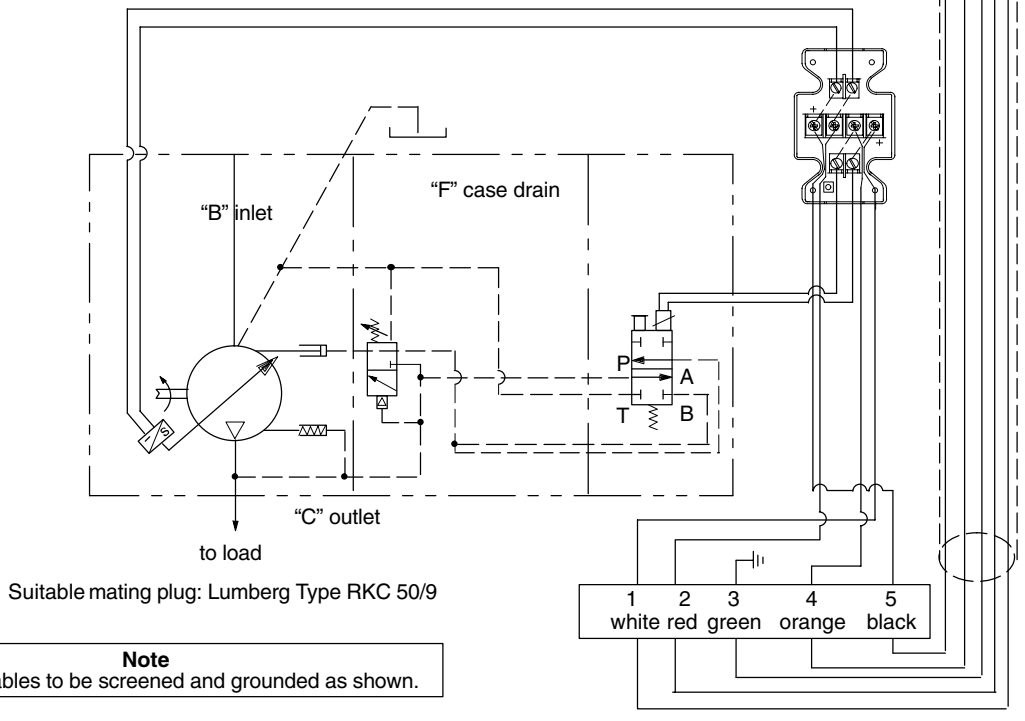
| | | |
|---|---|---|
| Ramp-active indicator: —○ b12   | | Output > +10V<br>Output < –10V<br>Output = 0V (± 2V ripple)<br>10 kΩ |
| Drive signal zero indicator —○ b20<br>Drive signal at null<br>Drive active<br>Output resistance — z — | | <br>Output = Supply minus 1,5V; I = 50mA max.<br>Output = 0 ±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

# Circuit and Connections

## Eurocard Amplifier




## Pump Assembly




Suitable mating plug: Lumberg Type RKC 50/9

**Note**
All cables to be screened and grounded as shown.

***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

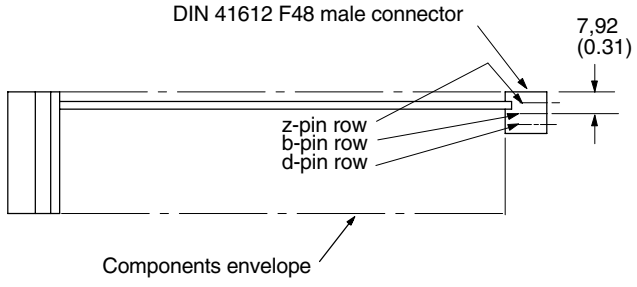
| Type | Input pins | Signal polarity | Secondary pins ref. |
|---|---|---|---|
| Non-inverting voltages | b6/8/10 or z8 | + | bz4 |
| Non-inverting current | z6 | + | |
| Inverting voltage | z10 | – | Link *one* of b6/8/10 or z8 to bz4 |
| Differential voltage | | | *One* of b6/8/10 or z8 |
| | *One* of b6/8/10 or z8 | + | z10 and link *one* of b6/8/10 to bz4 |

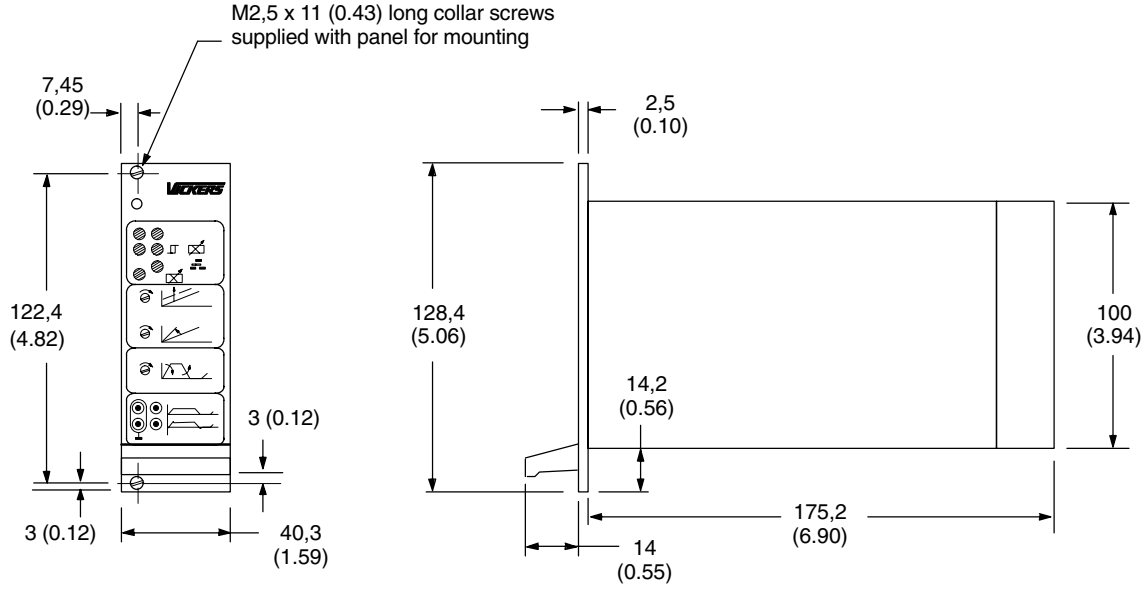
## Installation Dimensions

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

mm (inch)

3rd angle projection

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