

Power Plugs for Proportional Valves

EHH-AMP-702-D/J/K; 2* Series

For use with valve types:

- KDG4V-3(S)-H*-6*
- KTG4V-3(S)-H*-6*
- KDG4V-5-H*-3*
- KTG4V-5-H*-3*
- KCG-3/6/8-H1-1*
- KX(C)G-6/8-H1-1*
- KDG5V-5/7/8-H1-1*
- CMX***-E-G
- EPV**-12D-1*
- ERV1/2**-12D-1*
- EPFR1**-12D-1*

General Description

Three types of plugs, conforming to ISO 4400/DIN 43650 interface, with integral amplifiers and necessary adjustment potentiometers, are designed for use with non-feedback hydraulic valves.

This plug/valve combination offers very low cost solutions to many hydraulic control problems requiring proportional control.

Type D is controlled with a 0-10V command signal, and has adjustable gain, ramp, deadband compensation and dither.

Type J, designed for closed-loop applications, is controlled with a 0-10V command signal, and has no ramp function.

Type K is controlled with a 4-20 mA command signal, and has an adjustable ramp time of 50 ms to 5s.

Features and Benefits

- Integral amplifier provides essential functions for control of proportional valves
- Adjustable ramp time (types D and K), gain, deadband compensation and dither
- Ease of installation, with reduced cost
- Fully short-circuit and reverse-polarity protected
- Differential voltage command signal (types D and J)

- Adjustable dither
- EMC to latest European standards
- Protection to IP67

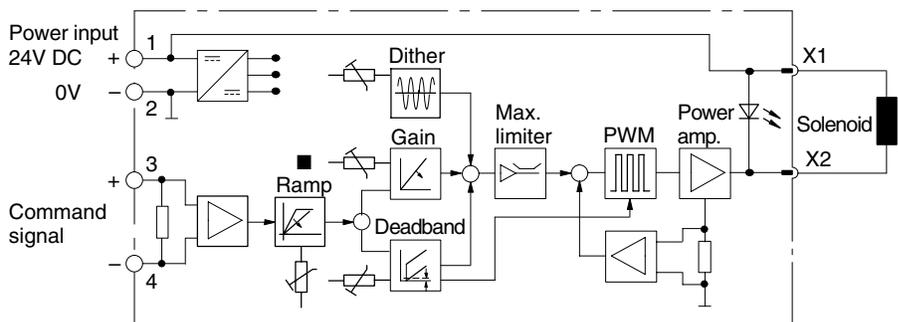
Application

Primary applications are in the control of directly operated, non-feedback proportional valves where the cost of more sophisticated electronic controls can be avoided.

Type J is for closed-loop applications.

Electrical Block Diagram

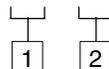
EHH-AMP-702-D/J/K-2*



■ Type J does not have the ramp function.

Model Code

EHH-AMP-702- * - 2*



1 Adjustment range

- D = Proportional plug: 50 ms to 5s
- J = Proportional plug without ramp function
- K = Proportional plug: 4-20 mA

2 Design number, 20 series

Subject to change. Installation dimensions unaltered for design numbers 20 to 29 inclusive.



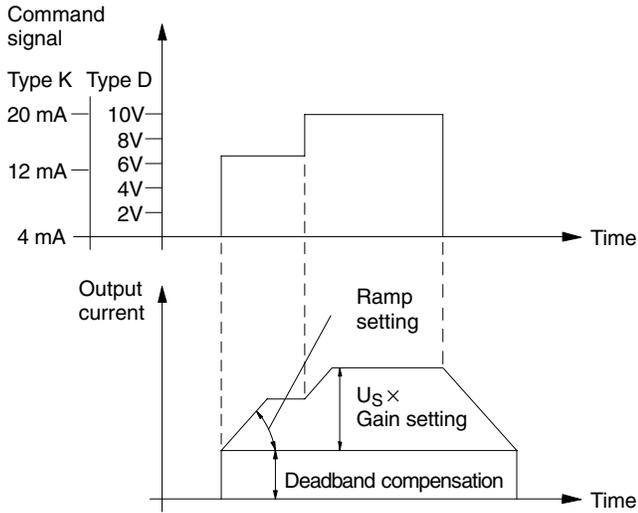
This product has been designed and tested to meet specific standards outlined in the European Electromagnetic Compatibility Directive (EMC) 89/336/EEC, amended by 91/263/EEC, 92/31/EEC and 93/68/EEC, article 5. For instructions on installation requirements to achieve effective protection levels, see 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

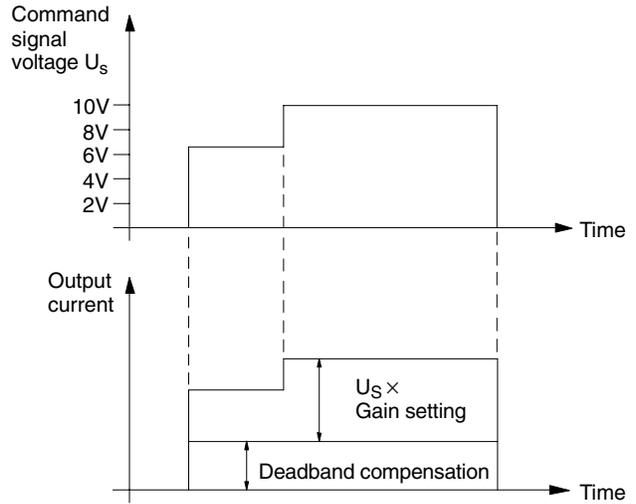
| Electrical | | |
|---|---|------------------------|
| | Types D and J | Type K |
| Connections | | |
| 1 | 24V DC | |
| 2 | 0V (power and signal) | |
| 3 | Positive command signal | |
| 4 | Negative command signal | |
| Power (input) supply | 20-30V DC including $\pm 10\%$ maximum ripple (peak-to-peak) 24V DC nominal | |
| Absolute maximum voltage | 40V | |
| Max. power consumption incl. solenoid | 35W | |
| Reverse polarity protected | Yes | |
| Short circuit protected | Yes | |
| Maximum output current | 1,6A | |
| Max. output voltage typical (1,6A output current) | Typically 1,5V below supply voltage | |
| Command signal | 0-10V (10 kohms) | 4-20 mA (250 ohms) |
| Deadband triggering | 200 mV | 4 mA |
| For output (LED ON) | 200 mV to 10V | 4-20 mA |
| For no output (LED OFF) | 0 mV to 100 mV | 0-4 mA |
| Deadband adjustment range | 100 to 1000 mA | |
| Gain adjustment range | 0.02 A/V to 0.16 A/V | 0.01 A/mA to 0.08 A/mA |
| Dither adjustment range | 0 to 500 mA | |
| Ramp time (types D and K only) | 50 ms to 5s | |
| PWM frequency | 1200 Hz $\pm 10\%$ | |
| Dither frequency | 120 Hz $\pm 10\%$ | |
| Protection | IEC 529: IP67 (when correctly installed with interface seal in place) Fully short-circuit and reverse-polarity protected | |
| Isolation to VDE 0110 | Group "B" | |
| Electromagnetic compatibility (EMC): | | |
| Emission | EN 50081-2 | |
| Immunity | EN 50082-2 | |
| Mechanical | | |
| Housing | PA6 glass-reinforced plastic (conforming to UL-94HB). Color: gray | |
| Mounting interface | ISO 4400 (DIN 43650) | |
| Cable clamp | Pg9 screw type | |
| Cable diameter | \varnothing 5 to 10 mm (0.197 to 0.394" dia) | |
| Wire section | 0,5 to 1,0 mm ² (20 AWG-17 AWG) | |
| Temperature, ambient range | -20° to +70°C (-4° to +158°F) | |
| Mass | 0,07 kg (0.154 lb) | |

Input/Output Characteristics

Types D and K

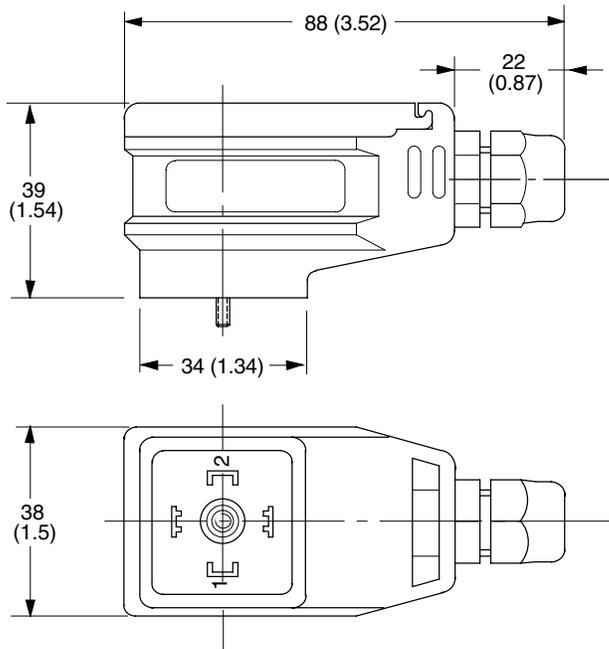
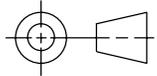


Type J

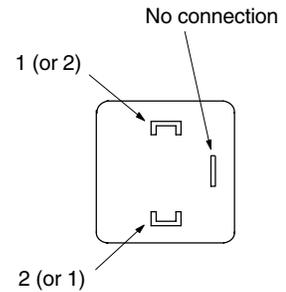


Installation Dimensions in mm (inches)

3rd angle projection

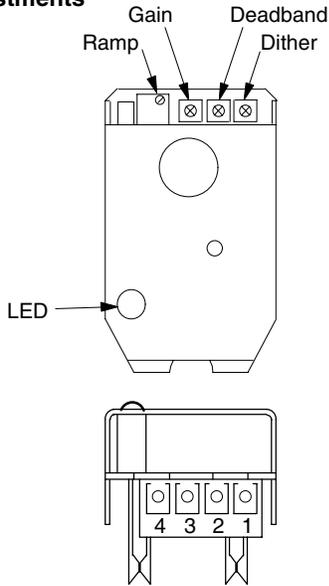


Solenoid Connections



Installation Data

Adjustments



Ramp time:
Turn clockwise to increase ramp time.
(Only types D/K)

Gain:
Turn clockwise to increase gain.

Deadband compensation:
Turn clockwise to increase deadband compensation current.

Dither:
Turn clockwise to increase the dither current.

Terminal 1:
Power supply 20V-30V DC, positive.

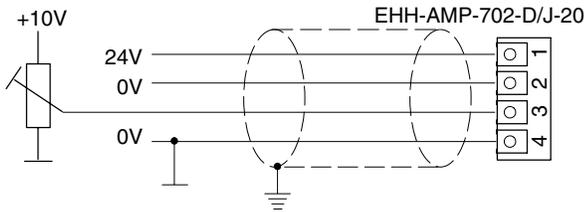
Terminal 2:
Power supply 0V.

Terminal 3:
Command signal positive (see "Operating Data").

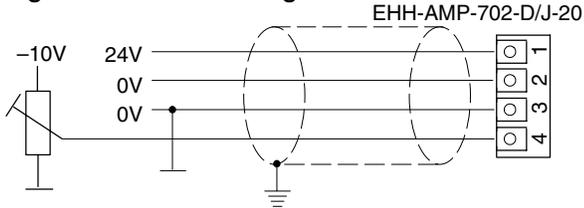
Terminal 4:
Command signal negative (see "Operating Data").

Installation Wiring Options

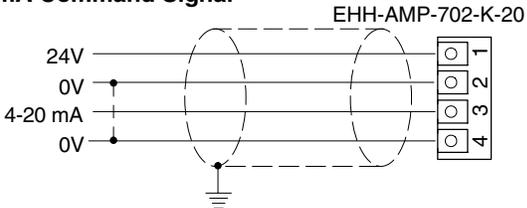
Positive Command Voltage



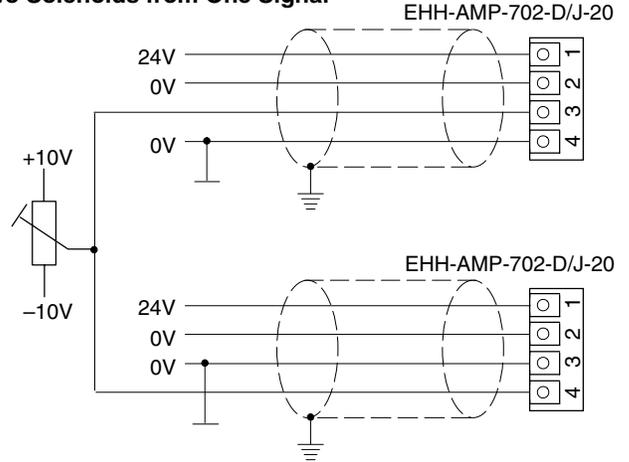
Negative Command Voltage



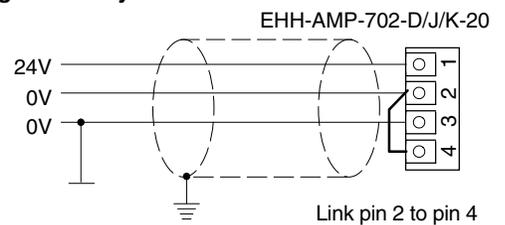
4-20 mA Command Signal



Bi-polar Command Voltage for Operating Two Solenoids from One Signal



Connections when replacing -10 design power plug with -20 design and only 3 wires exist



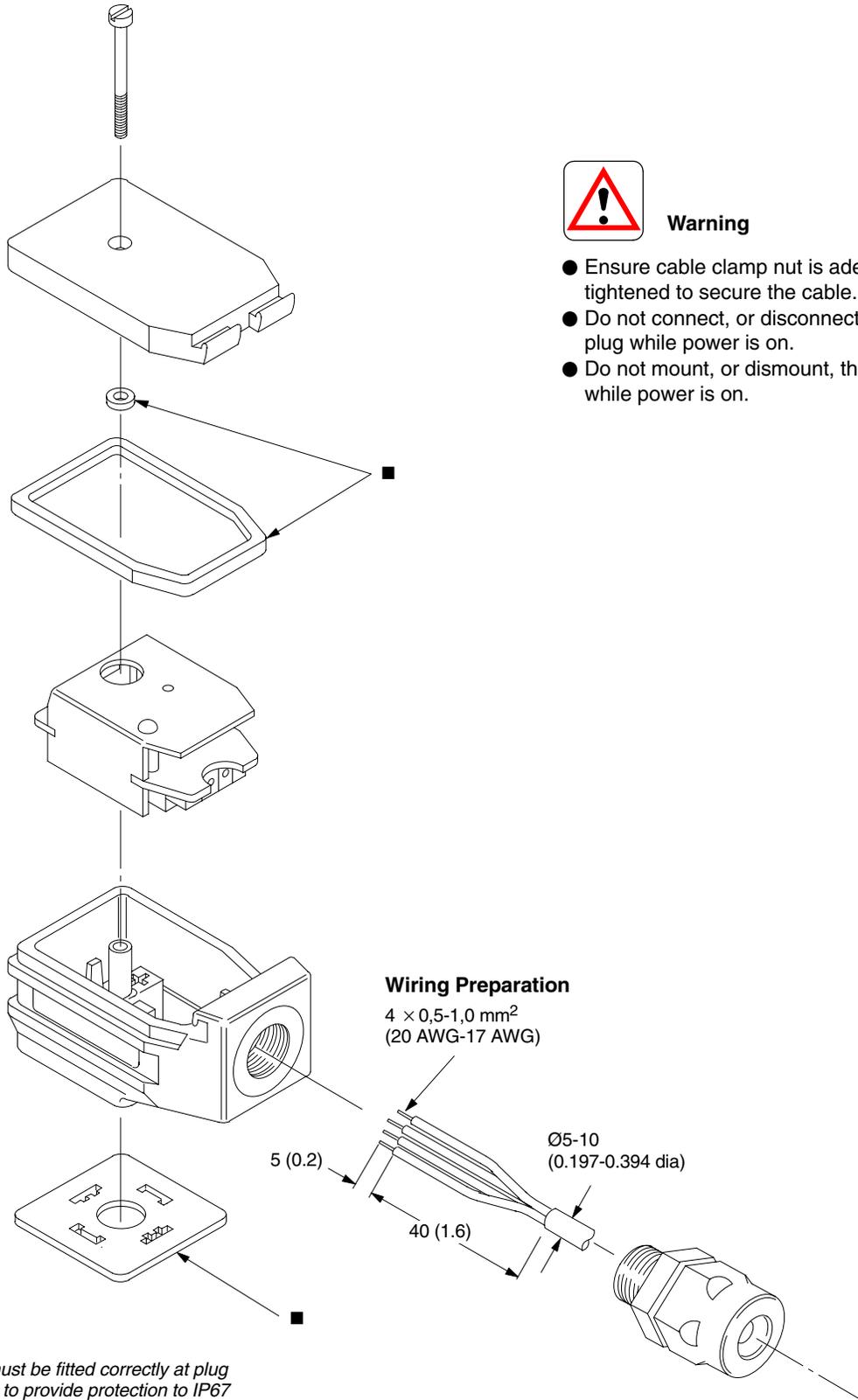
Customer's protective ground connection.



Warning: Electromagnetic Compatibility (EMC)
Screened cables should be used and particular attention paid to the grounding of the screens as shown in the above diagrams.

Installation Data

Assembly Showing Wiring Connection Points



Start-Up Procedure

- Correctly wire the plug and, before mounting it on the valve solenoid, apply 24V DC (20 to 30V limits) to the “power input” terminals.
- Check for correct plug function by illumination/non-illumination of the LED. The LED should illuminate when the demand applied to the “signal input” terminal is between 200 mV and 10V (or 4 mA and 20 mA) and should not be illuminated when the applied demand is less than 100 mV (4 mA). If there is a malfunction a new plug must be fitted.
- Switch off power supply and command/input signal and then install plug on solenoid. Ensure that all seals are fitted correctly and clamped as the retaining screw is tightened: *this is essential in providing IP67 protection.*
- *Ensure that the hydraulic system will not cause any erratic movement of actuators, then:*
 - Switch on power supply again.
 - Repeat LED/function check as in 2.An LED malfunction now indicates a short circuit at the load.
- Successful completion of these checks means that the plug and load are ready for use.

Spare Parts

The only spare part available is the interface seal, part number 732100.

Ordering Procedure

Order plug by full model code, and spare interface seals by part number 732100.