

# LCA – 1.6

## Power Amplifier

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### 1. Introduction

The LCA-1.6 power amplifier unit has been developed in order to provide a reliable and low-cost solution for control applications. It contains a pulse width modulated (PWM) power amplifier with additional 10 VDC voltage reference  $V_{ref}$  and is an appropriate tool for controlling electromagnetic components such as proportional valves for hydraulic systems. The power supply voltage  $V_s$  ranges from  $V_s = 12$  to 36 VDC. Furthermore, the output current  $I_{out}$  is extremely stable and temperature independent. Moreover, due to the closed loop current control  $I_{out}$  is, to a large extent, independent from the connected coil and can be set by the input signal. The upper limit of the output current is specified to be 3 A, whereas minimal and maximal output current,

$I_{min}$  and  $I_{max}$ , and, additionally, the PWM frequency  $\nu$  can be adjusted individually using the assigned potentiometers. Furthermore, the unit can be mounted in a destined plastic housing, which allows a straightforward installation onto mounting rails of type DIN 46277/1 and DIN 462277/3. The extremely low heat dissipation of the pulse width modulated power amplifier also permits an unproblematic installation into a closed housing.

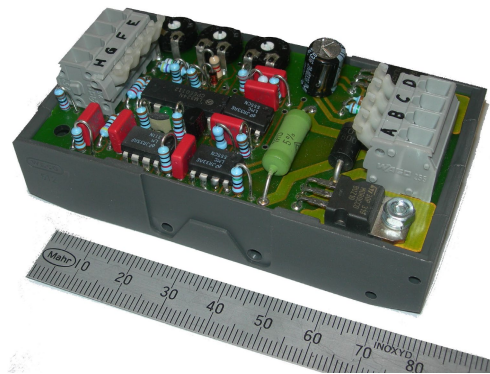


Figure 1: LCA-1.6 power amplifier

## 2. Electrical and Mechanical Data

### 2.1. Electrical data and terminal assignment

Electrical data and terminal assignment are listed in table 1 and 2, respectively. Additionally, the terminal assignment is depicted in the block diagram of figure 4.

**Table 1:** Electrical Data

| Description                | Value  |
|----------------------------|--|
| Power supply voltage $V_s$ | 12 – 36 VDC  |
| Control signal $V_c$       | 0 – 10 VDC   |
| Output current $I_{out}$   | $\leq 1.6 \text{ A}^{1)}$<br>$\leq 3 \text{ A}^{2)}$   |
| Minimal current $I_{min}$  | $0 \leq I_{min} \leq 500 \text{ mA}^{1)}$<br>$0 \leq I_{min} \leq 1 \text{ A}^{2)}$  |
| Maximal current $I_{max}$  | $I_{min} + 0.2 \text{ A} \leq I_{max} \leq 1.6 \text{ A}^{1)}$<br>$I_{min} + 0.4 \text{ A} \leq I_{max} \leq 3 \text{ A}^{2)}$ |
| Enable input               | $U_c < 0.8 \text{ V} \rightarrow$ aus<br>$U_c > 1.5 \text{ V} \rightarrow$ ein   |
| PWM-frequency $\upsilon$   | 90 – 400 Hz  |

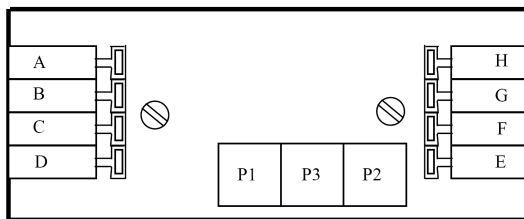
**Table 2:** Terminal assignment

| Bezeichnung   | Klemme |
|---------------|--------|
| + $V_s$       | C      |
| Power ground  | D      |
| + 10 VDC      | G      |
| Signal ground | F      |
| Enable        | E      |
| $U_c$         | H      |
| + Output      | A      |
| - Output      | B      |

<sup>1)</sup> Standard version

<sup>2)</sup> High current version

### 2.2. Terminals and potentiometers

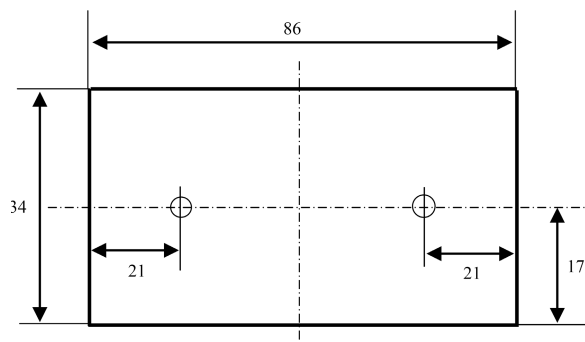


**Figure 2:** Potentiometer arrangement and terminal assignments

**Table 3:** Potentiometer numbering

| Number | Function                          |
|--------|-----------------------------------|
| P1     | PWM-frequenz $\upsilon$           |
| P2     | Maximale output current $I_{max}$ |
| P3     | Minimale output current $I_{min}$ |

### 2.3. Mechanical dimensions



**Figure 3:** Mechanical dimensions of the amplifier unit

Maximal height  $h$  of the unit and drill diameter  $d$  of the mounting holes are  $h = 10 \text{ mm}$  and  $d = 3.5 \text{ mm}$ , respectively.

### 3. Block Diagram

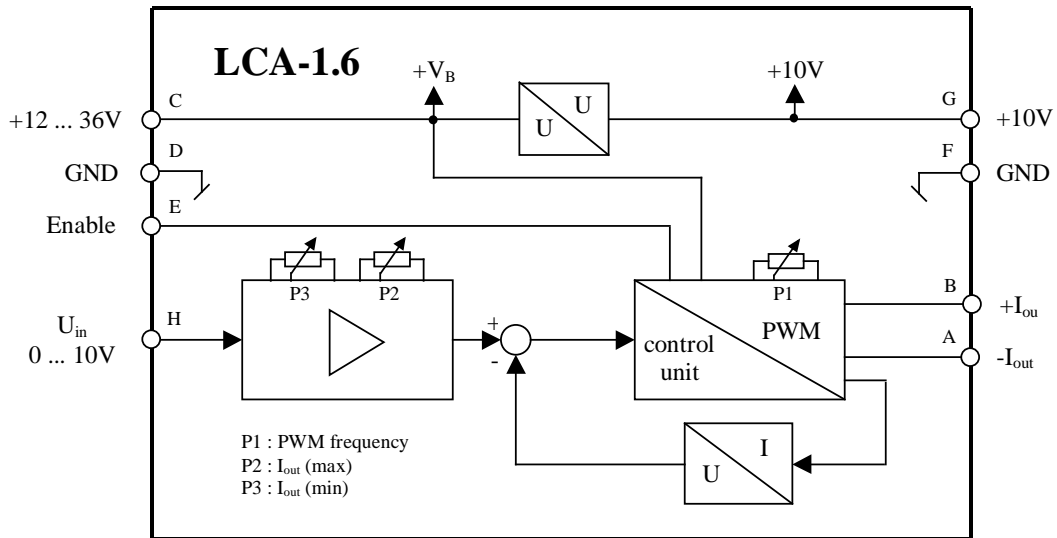


Figure 4: Block diagram of the amplifier unit

### 4. Typical Application

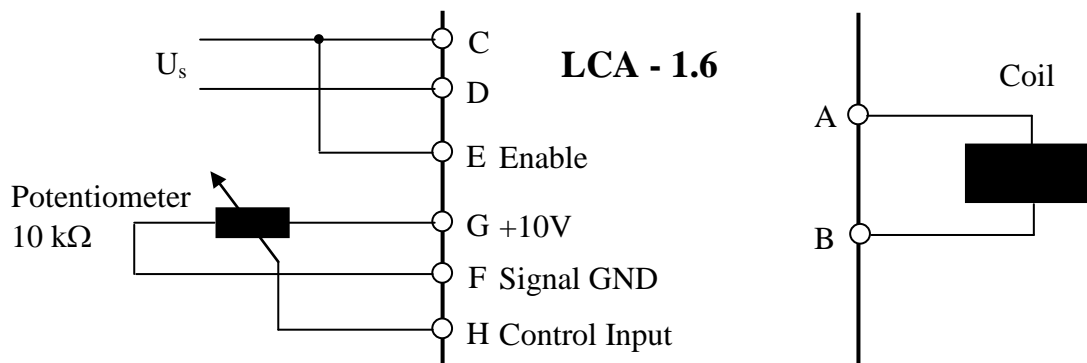


Figure 5: Typical application using internal voltage reference and potentiometer