BUCHER hydraulics

Amplifier Unit for Proportional Valves

1-channel for valves with one solenoid
Series PBS - 3A

- **Pulsed and current-stabilised output**
- **Supply voltage 10…30 V**
- **I_{min} / I_{max} pulse frequency all adjustable by integral potentiometers**
- **With reverse-polarity protection**
- **Sustained short-circuit proof**
- **Thermal overload cut-out**
- **Output currents up to 2500 mA**
- **Plug-in electrical connector**
- **Auxiliary potentiometers, or other external voltage sources can be used for control, the output current is proportional to the demand signal voltage**

1 Description

The PBS-3A is a pulse width modulation device. The pulse frequency is adjustable between 100…300 Hz to ensure optimum performance in each application. The PI controller compensates for variations in supply voltage and for variations in output current resulting from thermal resistance changes. The unit will operate with supply voltages of 8…35 V (Peak) which should ideally be ripple-free (ripple exceeding 5% reduces stability.
I_{min}, I_{max} and pulse frequency (f) are all adjustable by integral potentiometers which are accessed by removing the front covers. The full scale range 0…10 of the main potentiometer is always available for control, regardless of I_{min} and I_{max} settings. In other words, pot. 0 $\neq$ I_{min} and pot. 10 $\neq$ I_{max}, and the potentiometer resolution changes automatically if the difference between I_{max} and I_{min} changes. The control effect is linearly proportional to the angular rotation of the potentiometer knob. For applications in which only external potentiometers (or other external voltage sources) will be used for control, the main potentiometer can be disabled by removing an internal link. We strongly recommend that either the main potentiometer or an external source is used for control purposes but not both. The unused control element should always be set to zero.

2 Applications

The PBS-3A is a “low-cost” current-stabilised control unit for proportional solenoids or similar devices.It provides stable force control of proportional solenoids and compensates for thermal resistance changes in their coil windings.

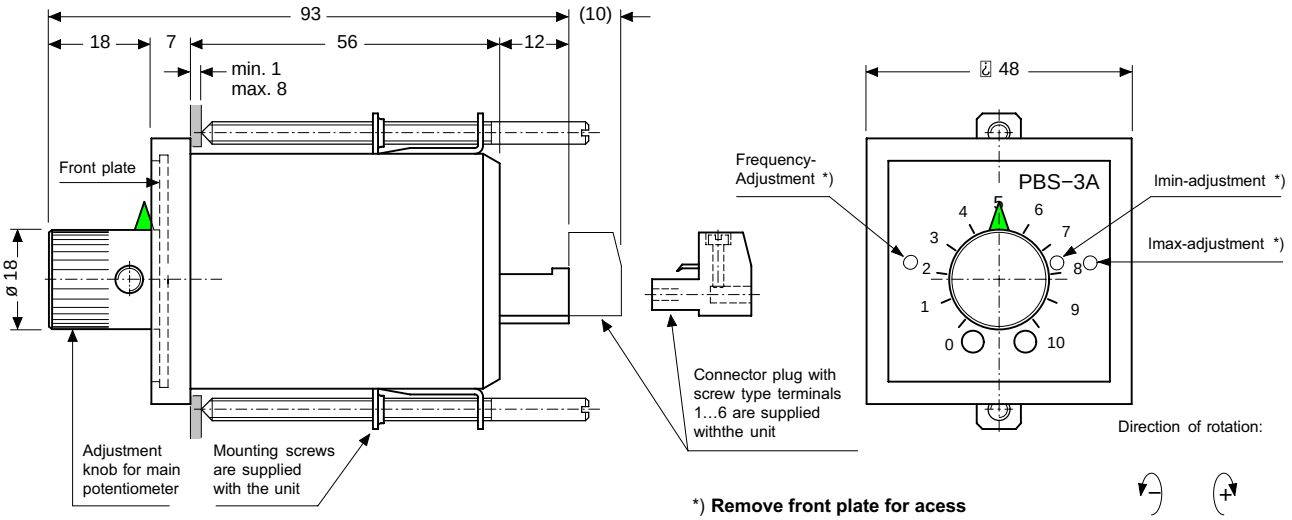
3 Technical data

General characteristics	Description, value, unit
Supply voltage	10…30 V DC (10 % ripple max.)
Load	4…40 Ω
Output current I_{max} 1)	0…2500 mA (2200 mA at 60 °C ambient temperature)
Output current I_{min} 1)	0…500 mA
PWM-frequency	~ 100…300 Hz
External Potentiometers	5…10 kΩ
Operating temperature range	-20…+60 °C

General characteristics	Description, value, unit
Input resistance, terminal 2	approx. 180 kΩ and be earth-referenced
Input at terminal 2	max. 10 V
Connections	Plug-in, with screw-type terminals
Panel cut-out dimensions	45 x 45 mm
Weight	~ 140 g

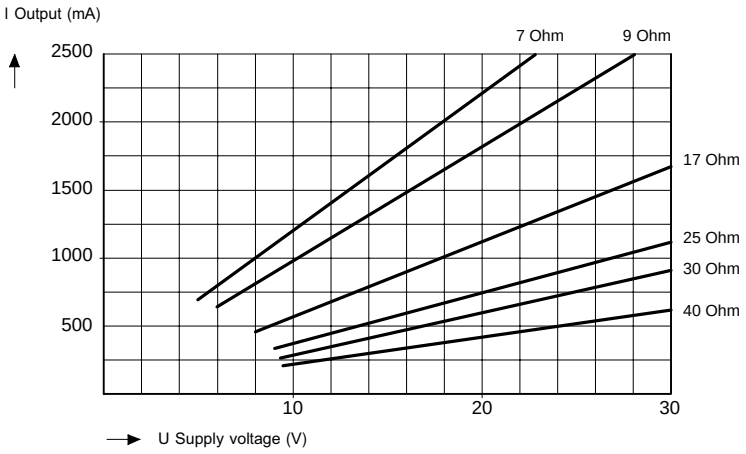
1) Units are shipped with standard settings of I_{min} = 150 mA and I_{max} = 1300 mA.
Please specify alternative requirements on your order

4 Dimensions



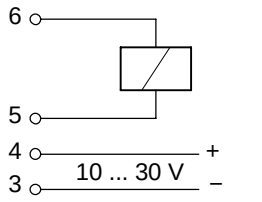
IMPORTANT!
Panel cut-out dimensions: 45 x 45 mm

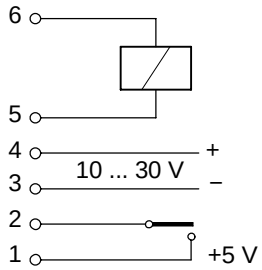
Verhältnis U-Eingang zu I-Ausgang



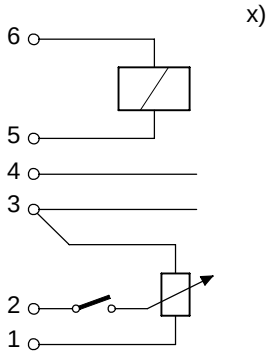
5 Connection diagrams

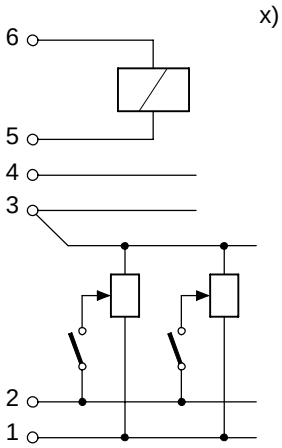
Main (on board) potentiometer only	1 external potentiometer	2 or more external potentiometers	Other demand signal source

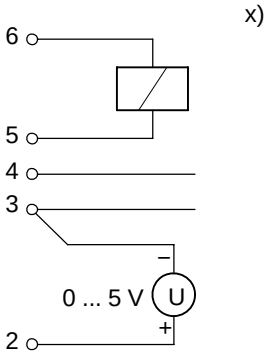




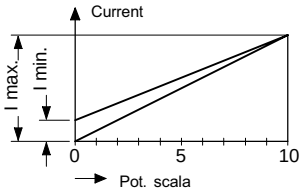
Connection	Effect
None	Output controlled by potentiometer
1 → 2	Output = Imax







x) Set main (on board) potentiometer to zero or disable



The effects of the main potentiometer and external potentiometers (or other demand signal) are additive. To prevent unwanted interactions, it is recommended that either the main potentiometer or the external signal is chosen for control purposes, and that the other is set to zero. The active control element will provide linear-proportional output over the range Imin. to Imax.
Important: Imax. must not exceed 2500 mA, otherwise the thermal cut-out will operate.

For supplying external potentiometers, an auxiliary 5 V, 0.5 mA source is available at terminal 1 (max. current 2 mA). The PBS-3A will not operate if anti-surge diodes are fitted to the load solenoids. To prevent unwanted operation of the thermal cut-out, particular attention should be given to providing adequate air circulation in installations with sustained high outputs. The PBS-3A is completely protected against reverse-polarity supply connection and against overloads and sustained short-circuits. The unit shuts down automatically in the event of high temperature or if the supply voltage drops below approx. 7 V. A number of external potentiometers can be used, and by suitable relay circuitry can be selected in many permutations (e.g. 3 potentiometers can provide a maximum of 7 different demand signals). External demand signal sources, infinitely variable 0…5 V or 0…10 V, can be modulated or stepped between a number of values. The source must be earth-refe-renced (terminal 3).

IMPORTANT!

For larger volumes we can supply customised control arrangements - please contact BHFRU.

6 Instructions for commissioning

Setting-up should be done before mounting the unit in a control panel since access to the set-up potentiometers involves the removal of the front flange, potentiometer knob and scale division plate.

- Set main pot. (and ext. signals) to 0
- Adjust I_{min} (this influences I max.)
- Set main pot. (or ext. signal) to max.
- Adjust I_{max} (this does not infl. I min.)
- Set pulse frequency f. This is very stable and unaffected by changes in I_{min} and I_{max}.

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Classification: 470.710.710