



TECHNICAL INFORMATION

FOR

TRANSISTOR-FOUR-QUADRANT

SERVO-AMPLIFIER

SERIE

MAR 25/2

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Dear customer,

we always try to guarantee for an optimum of security measures and to inform ourselves about the latest developments in technical research. However, it is necessary that we pass on the following further information to you as the user of our components:

The appliances are supply parts meant for processing by industry, trade or other factories specialised in electronics.

Safety precaution!!

Attention - do not touch! The appliances have unprotected live parts. The voltage may be highly dangerous.

We also have to inform you that, **for your own security**, only an expert should work on the appliances.

In order to comply with the safety precautions, open connections must be protected against contact with cases, coverings or anything similar. Even after the appliance had been disconnected, there may still be a dangerous voltage (charged capacitors).

Due to an error in handling or unfavourable conditions, the electrolytic capacitors may explode. If you have to work on the open appliances do protect your body (hands!) And your face.

Make sure that there is enough ventilation because of the fire risk in case of overheating.

Transistorized analogue servo amplifier MAR 25-2

The transistorized amplifier MAR 25-2 serves the purpose of maintaining constant servomotor shaft speed where the speed is strictly proportional to the speed setpoint value. Influences from motor load, temperature or mains voltage variations will be strongly suppressed. The speed setpoint value is represented as a voltage in the range from -10 V ... +10 V.

Principle of speed control. The (outer) loop performing the comparison between the speed setpoint value and the DC signal from the tachogenerator running at motor shaft speed generates an output signal, time-shaped in a characteristic way. This signal in turn steers the (inner) current control loop, acting to increase or decrease the motor current. The action of the speed mismatch therefore always tends to reduce the mismatch itself, leading to constant speed. The overload protection performed by the current control loop limits the current to a value corresponding to the nominal torque of the motor.

So, both amplifier and motor will be protected against common faults (short circuit, blocking the motor shaft, oscillations).

If your application can't afford a tachogenerator, be it for cost reasons or because space is at a premium, on-board auxiliary circuitry can extract the speed information (IxR mode). This circuitry "calculates" the (current-free) EMF which is proportional to the speed by "looking at" the voltage across the motor terminals, taking ohmic losses (IxR) in subtraction ($EMF = U_{mot} - IxR$).

Note however, that this mode will be less precise than the tacho mode for omnipresent variations in motor specs. Select mode by soldering the configuring strap from the middle to the appropriate side (solder side marked).

Factory default settings are routinely made to adopt the Faulhaber motor 3557K024C plus tacho T505 (4.3 V/1000rpm), but other motors with similar electrical specs (e.g. Fuba G-DM75) may be used as well. This, however, requires adjusting P2 (assuming that the tachogenerator is missing). Similarly, when using a different type of tachogenerator, P1 should be used to attenuate, e.g., a too large tacho voltage.

Speed setpoint voltages in excess of 10 V will drive the inputs into saturation, jeopardizing regulation. On the other hand, setpoint voltages that are too small fail to effectively use the full dynamic range and would limit the dynamics. The amplifier comes as a Euro-size (100x160mm), with 32-pin connector to standard DIN41612 subtype D, board. Including dissipator, the height is 55 mm.

After mounting the device, absolute care should be taken to have the fins of the dissipator orientated vertically to ensure maximum air convection effect and that air circulation is not obstructed. Never tamper with the powering leads while the amplifier is powered: leave the motor connected if it is connected and unconnected if it is unconnected then. Connection to the mains supply requires a suitable transformer which can be provided by us.

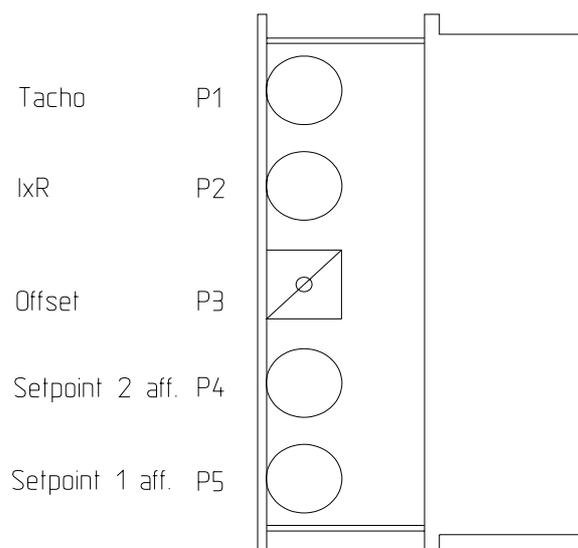
Technical Data:

Nominal voltage	: ± 30 V DC, max. 2 A or (± 15 V DC, max. 3 A)
Output voltage	: ± 25 V (12 V)
Output current	: ± 2 A (3 A)
Speed setpoint voltage, full scale	: ± 10 V
Reference voltage	: ± 10 V, ± 5 %, max. 5 mA
Ambient temperature, max.	: 40° C

Operating characteristics:

Input sensitivity, pin 28 a	: 1000 UpM / 3 V
Minimum speed at ± 10 % precision, tacho mode	: 3 U/min
Transformer specs	: sec. 24-0-24 V, 2 A or : sec. 12-0-12 V, 3 A

Side view MAR 25/2



Test Circuit MAR 25/2

