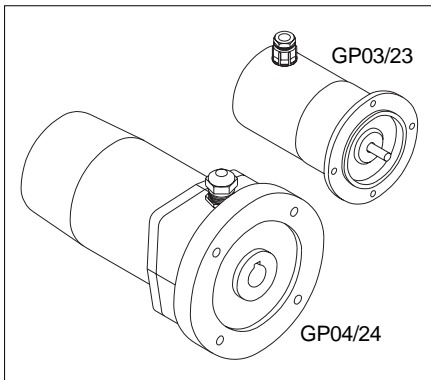


GP03/04/23/24

Geared Potentiometer



ENGLISH

1. Warranty information

- In order to carry out installation correctly, we strongly recommend this document is read very carefully. This will ensure your own safety and the operating reliability of the device.
- Your device has been quality controlled, tested and is ready for use. Please observe all warnings and information which are marked either directly on the device or specified in this document.
- Warranty can only be claimed for components supplied by SIKO GmbH. If the system is used together with other products, the warranty for the complete system is invalid.
- The guarantee period is 6 months starting with the date of invoice.
- Repairs should be carried out only at our works. If any information is missing or unclear, please contact the SIKO sales staff.

2. Identification

Please check the particular type of unit and version number from the identification plate. Type number and the corresponding version are indicated in the delivery documentation.

e.g. GP03-0023
 _____ version number
 _____ type of unit

3. Summary description

The geared potentiometers are of very robust design and compact size.

The gear mechanism / potentiometer combination adapts the mechanical rotating angle of the 1 or 10-turn potentiometer to the measuring range. A slipping clutch between the gear mechanism and the potentiometer prevents irreparable mechanical damage to the potentiometer, if the end stop is overtravelled (only valid for 10-turn potentiometer; 1-turn potentiometers do not have an end stop).

The geared potentiometers GP23/24 is equipped with an R-I transformer. The resistance values relating to the potentiometer position are converted into a loop current in the range 4 to 20 mA. This allows a measuring value transmission independently from the transmission line's resistance.

4. Mounting instructions

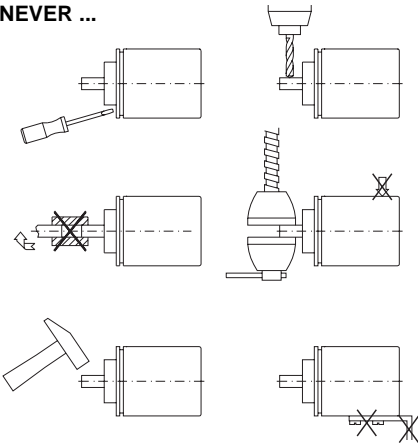
Please handle the encoder carefully as it is a high-precision device.

Especially do not:

- disassemble or open the encoder (unless stipulated in this brochure).
- link encoder's shaft with rigid couplings as this would expose the encoder's shaft bearing to high forces. For solid shaft encoders we recommend the use of SIKO flexible shaft coupling type AK18.
- knock the housing and the shaft, because this will damage the encoder or internal parts.
- machine (bore, mill ...) flange or shaft. This could lead to severe damage inside the encoder.
- exceed the values for the maximum axial and radial shaft load.
- mount the encoder incorrectly.

Otherwise manufacturer's warranty will be invalidated!

NEVER ...



5. Installation

The unit should be used only according to the protection level provided. Protect the unit, if necessary, against environmental influences such as sprayed water, dust, knocks, extreme temperatures.

Mounting of the encoder

- Use the frontal bores to fix the encoder. Mount encoder without force.
- Forces must not be transmitted via the housing, but only via the shaft.
- Do not exceed the values for the maximum axial and radial shaft load.
- Ensure accurate shaft alignment. If shaft and flange are not correctly aligned, strain on the bearings will result, which will overheat and be irreparably damaged.

6. Electrical connection

- **Switch power off before any plug is inserted or removed !!**
- Wiring must only be carried out with power off.
- Provide stranded wires with ferrules.
- Check all lines and connections before switching on the equipment.

Interference and distortion

All connections are protected against the effects of interference. **The location should be selected to ensure that no capacitive or inductive interferences can affect the encoder or the connection lines!** Suitable wiring layout and

choice of cable can minimise the effects of interference (eg. interference caused by switching power supplies, motors, cyclic controls and contactors).

Necessary steps:

- Only screened cable should be used. Screen should be connected to earth at both ends. Wire cross section is to be at least 0,14 mm², max. 0,5 mm².
- Wiring to screen and to ground (0V) must be via a good earth point having a large surface area for minimum impedance.
- The unit should be positioned well away from cables with interference; if necessary **a protective screen or metal housing must be provided**. The running of wiring parallel to the mains supply should be avoided.
- Contactor coils must be linked with spark suppression.


Supply voltage of the instrument transformer

Operating voltage depends on execution and is indicated in the delivery documentation or on the identification plate.

20 ... 28 VDC

6.1 How to open and close the device

For opening GP03/23:

Do **not** open the unit, if it has protection class IP65. Alignment of the instrument transformer and cable connection will then be made by SIKO. 

- Remove the grub screws in the cap for opening the unit.

For opening GP04/24:

- To open the unit, remove fastening screws on the cap.
- Ensure that the sealing is not damaged or lost.

For closing GP03/23:

- Put the cap onto the flange.
- Tighten the grub screws.

For closing GP04/24:

To easily close the unit and to avoid cable damage, we recommend securing the inner strands with an adhesive tape. The adhesive tape should be insensitive to temperature and ageing.

- Put the cap onto the flange. Washer must be properly fitted into the nut.
- Tighten the fastening screws.

6.2 Cable connection

- Prepare wire accord. to fig. 2
- Open the device (see chapter 6.1) and unscrew the PG-screws.

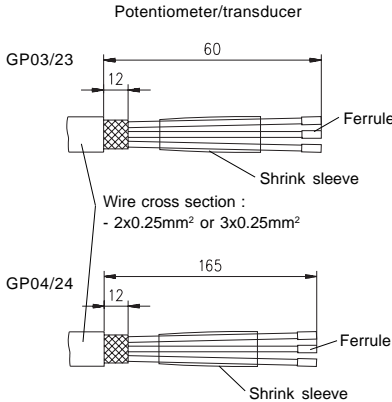


Fig. 1 : Cable preparing

With PG7 (fig. 3) :

- Push the nut (1) and the plastic bushing (2) onto the cable.
- Put the wire screening (3) over the plastic bushing (2).
- Slide strands through screw hole (4). Insert plastic bushing (2) into the screw fitting.
- Fix nut (1) and then fix the complete PG-screw to the casing.

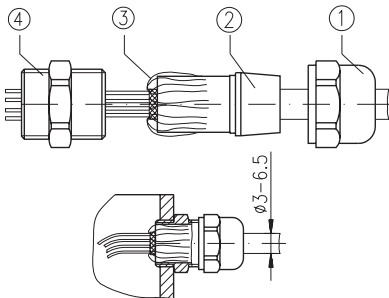


Fig. 2 : Cable connection PG7

With PG9 (fig. 4) :

- Push nut+gasket (1), washer (2) (inner- \varnothing > washer's inner- \varnothing (4)) and washer (4) onto the cable.
- Put the wire screening (3) over the washer's (2) outer surface.
- Push strands through the screw hole (5). Insert parts (4), (3) and (2) into the screw hole (5).
- Fix nut (1) and then fix the complete PG-screw to the casing.

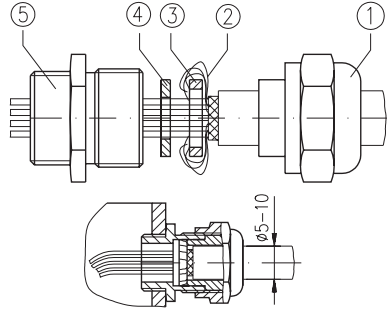


Fig. 3 : Cable connection PG9

- Connect strands to the clip terminals (fig. 5 and 6).
- Close the geared potentiometer (see chapter 6.1).

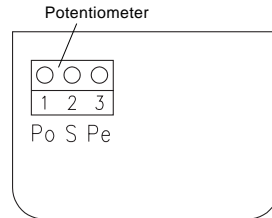


Fig. 4 : Pin connection GP03/04

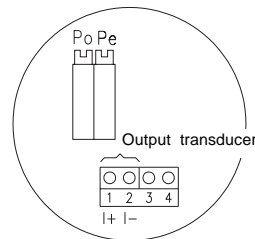


Fig. 5 : Pin connection GP23/24 with Instrument transformer

7. Adjustment and alignment

7.1 General information

Definition of the counting directions:

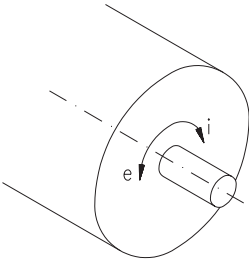


Fig. 6 : Definition of the counting directions

For GP03/04:

By direction of rotation "i" and turn the shaft in direction "e" up to the limit stop, the value of the moving contact (S) and the start point (Po) value are 0 Ohm. The value increases – related to Po – with clockwise rotation "i".

By direction of rotation "e" and turn the shaft in direction "i" up to the limit stop, the value of the moving contact (S) and the start point (Po) value are 0 Ohm. The value increases – related to Po – with anti-clockwise rotation "e".

For GP23/24:

...the same as for GP03/04, but the current of the transducer starts at low values and increases towards the end point (see also chapter 7.3).

7.2 Potentiometer setting

When correctly connected and switched on, the unit displays the current actual value.

7.3 Alignment of the instrument transformer (only for GP23/24)

The unit GP23/24 comprises a resistance current converter. The potentiometer's resistance is converted into a current of 4 ... 20mA (twin-core cable). The measuring current is also used for feeding the instrument transformer.

The instrument transformer is preset to standard values 4mA for potentiometer's start position (Po) and 20mA for end position (Pe). **Via two trimmpotentiometer's Po and Pe (see fig. 6) these values can be adjusted to the application's actual start and end position:**

Alignment:

- Trimpotentiometer's Po is used to adjust a

current of 4 mA to potentiometer values of 0 to 15% of the total range.

- Trimpotentiometer's Pe is used to adjust a current of 20 mA to potentiometer values of 90 to 100% of the total range.

The smallest available potentiometer range, in which 4 to 20 mA are delivered, is hence 15% to 90% of the potentiometer's resistance range.

Alignment

- 1) Move axis to start position.
- 2) Turn left potentiometer (Po) until start value (4mA) is measured.
- 3) Move axis to end position.
- 4) Turn right potentiometer (Pe) until end value (20mA) is measured.

The steps 1 to 4 are to be repeated until the values are counterbalanced.

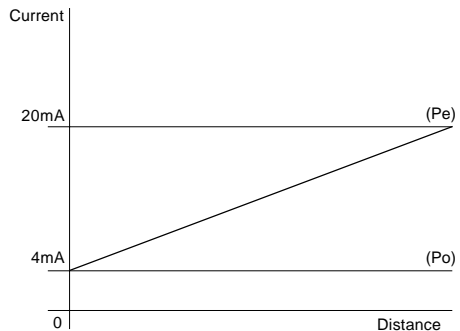


Fig. 7 : Alignment

7.4 What to do if... (Instrument transformer) ...the counting direction is wrong?

You can:

- either mechanically change the counting direction (by ordering / modifying the counting direction at SIKO),
- or by inverted interpretation of the 4 to 20 mA current (4 mA would then correspond to the end position; can be achieved via software programming).

... if the instrument transformer's start / end value cannot be set to 4 / 20 mA?

- the potentiometer's setting range is perhaps too small.

- check, whether you can do with a smaller current range; otherwise adjust the gear's input ratio accordingly (by ordering / changing the counting direction at SIKO).

8. Starting

Please ensure that the instructions given in chapter 5 and 6 regarding mechanical and electrical connection are followed. This will ensure correct installation and the operating reliability of the device.

Before starting check again:

- correct polarity of the supply voltage
- correct cable connection
- correct mounting of the device

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