

INSTALLATION, OPERATION & MAINTENANCE MANUAL



Digital Positioning System to Electric quarter turn Actuator Single Phase (Type J4C)

Ref. GENE BRE: 5810 00

INSTRUCTIONS FOR INSTALLATION, OPERATION & MAINTENANCE MANUAL

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1. Product Description

The Digital Positioner is a fitting the electric actuator to convert the actuator in a self-control valve positioner.

The Digital Positioner is a modulus with a microprocessor (CPU) which manages digitally the analogical input and output and compare them with the position of the actuator to establish an uniform relation.

The analogical inputs are sent to CPU where they are processed for his continuous comparison with the position of the actuator, this allows to obtain a very high sensitivity next to a very high repetitivity of the position (see characteristics).

The Digital Positioner in communication with the electronic system of the actuator provides an integral management of the motion on the actuator.

Sign position input is converted to a digital numerical value and is continuously compared with the position of potentiometer which is mechanically fitted to the valve shaft.

The programme in the microchip makes all the necessary calculations to determine which way the motor should turn so that the potentiometer position and the valve corresponds to the position, it keeps the motor in stopped position until it receives an input signal.

2. Technical Features & Data

| General Features | |
|---------------------------------------|---|
| <i>Input Signal</i> | 4 – 20 mA / 0 – 10 V / 1 – 10 V (NC or NO) |
| <i>Output Signal</i> | 4 – 20 mA / 0 – 10 V / 1 – 10 V |
| <i>Precision</i> | 3 % F.S. |
| <i>Linearity</i> | 2 % F.S. |
| <i>Hysteresis</i> | 3 % F.S. |
| <i>Steps at 4-20 mA</i> | Min. 150 steps 90° |
| <i>Steps at 0-10 V</i> | Min. 98 steps 90° |
| <i>4-20 mA Input signal impedance</i> | 100 Ohm |
| <i>0-10 V Input signal impedance</i> | 25 KOhm |

3. Safety Instructions

The scope of this manual is to enable a competent user to install, operate, adjust and inspect a Digital Positioning System to GE quarter turn electric actuator. These instructions must be observed, otherwise a safe operation of the actuator is no longer warranted.



As electric device, during electrical operation certain parts inevitably carry lethal voltages and currents (**ELECTRICAL RISKS**). Work on the electrical system or equipment must only be carried out by a skilled electrician himself or by specially instructed personnel, in accordance with the applicable electrical engineering rules, health and safety Directives and any other national legislation applicable.



Under no circumstances should any modification or alteration be carried out on the actuator as this could very well invalidate the conditions which the device was designed.

4. Transport and Storage

- All products are packed in sturdy packing. During transport measures should be adopted in order to prevent impacts, hits.
- Storage must be off the floor, covered with a sealed dust protector.
- While commissioning, Genebre, S.A. recommend a visual inspection in order to detect any anomaly caused during the transport, handling or during the storage.

5. Pre-Installation Inspection

- Verify the product nameplate to insure correct model number, before installation or use.
- **Verify that the Kit is compounded from all parts (see Figure 1).**
- If there is any discrepancy, please contact with our local distributor, or Genebre, S.A., to solve that discrepancy.

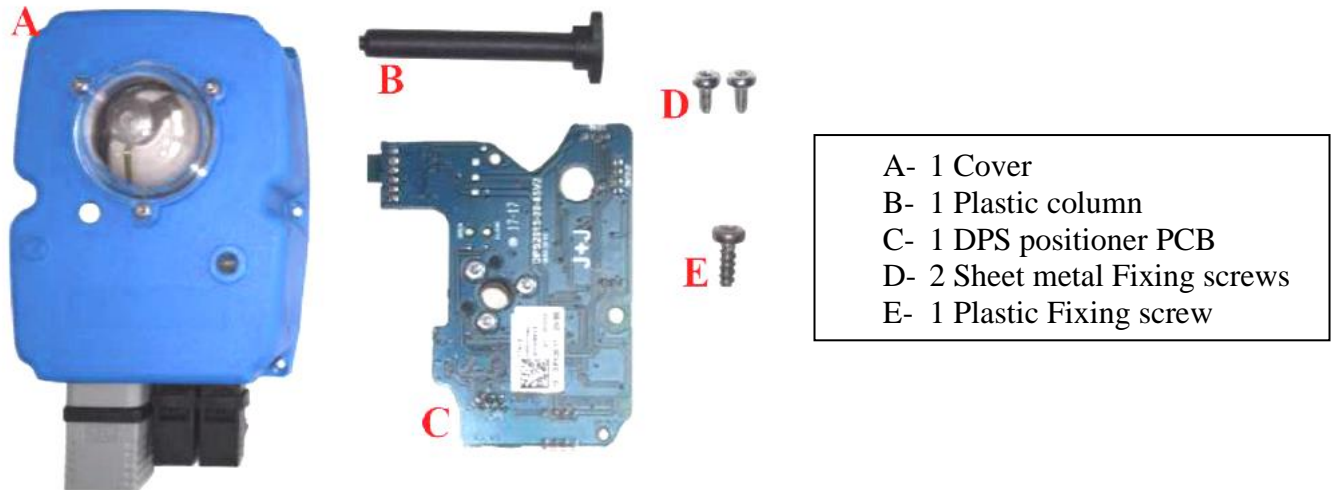


Figure 1

6. Positioner Mounting



VERY IMPORTANT NOTICE: Follow these instructions carefully to avoid damage.

- Reserve the space for maintenance routines and tasks.

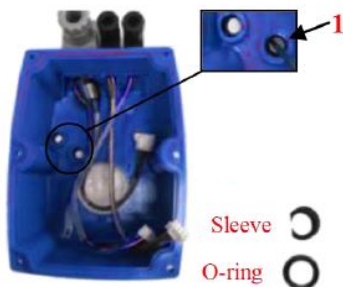
Safety instructions on chapter 3 must be observed. Work on electrical system or equipment must only be carried out by skilled electrician.

6.1 Preparing the Cover

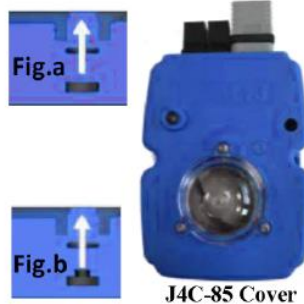
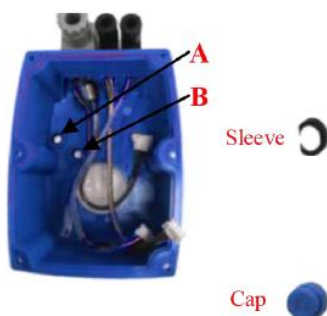
The cover of the kit is for a **GE-0. GE-05 y GE-1** models. In case you want to mount a kit on **GE-15**, follow the instructions:



Remove the Cap and leave the o'ring inside the hole



Remove the Sleeve leave the o'ring inside the hole



Introduce the Sleeve in hole A and press it until is fully inside (Fig.a).

Introduce the Cap in hole B and press it until is fully inside (Fig.b).



VERY IMPORTANT NOTICE: The unit must be disconnected from any electrical power or signal before installing.

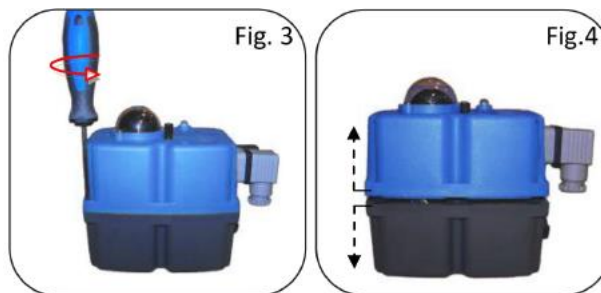
To convert a standard (ON-OFF) J4C electric actuator into a modulating function with positioner, proceed as follows:

6.2 Remove the hand wheel:

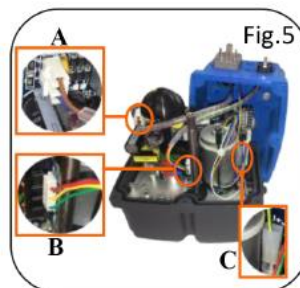
- Remove the screw, which are fixing the hand wheel (Fig.2):



6.3 Remove the 6 screws, which are fixing the body to the cover of actuator and remove carefully it (Fig.3 y 4):



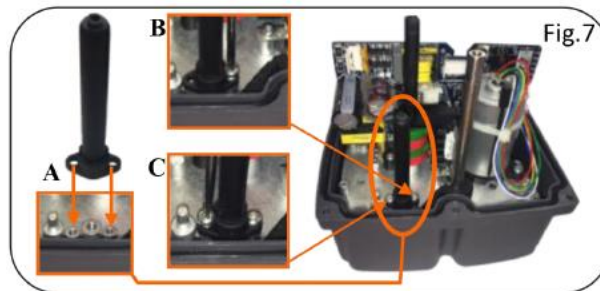
6.4 Remove the cables (from the cover) connected to the actuator (Fig.5A,B,C):



6.5 Carefully remove the visual position indicator (Fig.6):



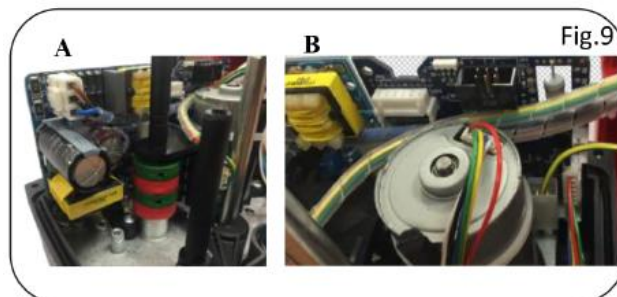
6.6 Fix the plastic column (B) on the base plate, by using 2 sheet metal fixing screws (D). (Fig.7A, B, C):



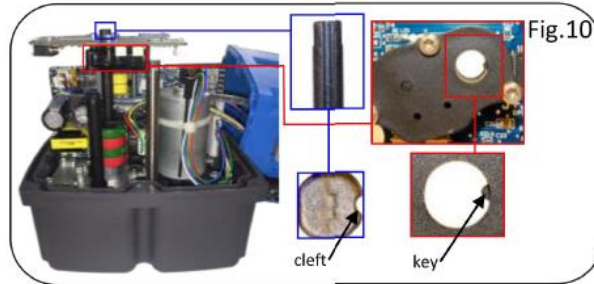
6.7 Take the DPS cover (A) and connect its cables following (Fig.8A, B y C):



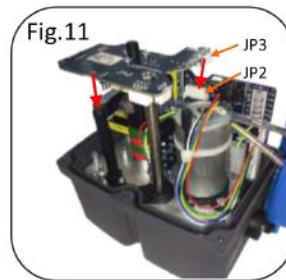
6.8 Place the mentioned cables as per (Fig.9A y B):



6.9 Mount the DPS positioner PCB (C), matching the cleft of the shaft with the key inside the DPS gear (Fig.10):

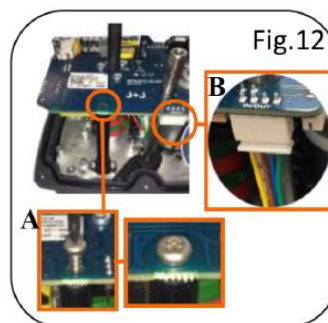


6.10 Press the DPS positioner along the shaft until PCB connector (JP3) is plugged in the actuator PCB connector (JP2) (Fig.11):

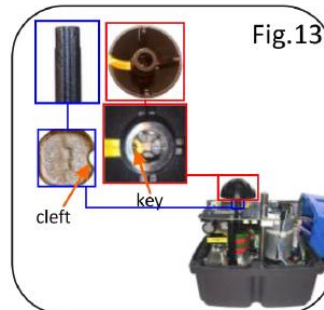


6.11 Fix the DPS positioner PCB (C) to the plastic column (B) with the plastic fixing screw (E) (Fig.12A):

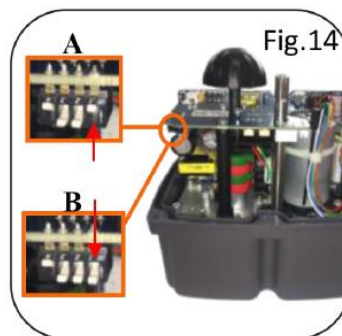
6.12 Connect the remaining cable (A) to the connector base on the DPS PCB (C) (Fig.12B):



6.13 Carefully insert the position indicator, matching its inner key with the cleft of the shaft (Fig.13):



6.14 Put DIP 1 in ON position, connect the grey connector to the power supply, put DIP 1 back to the prior position. Wait until the actuator make a complete maneuver (Fig.14A and B):

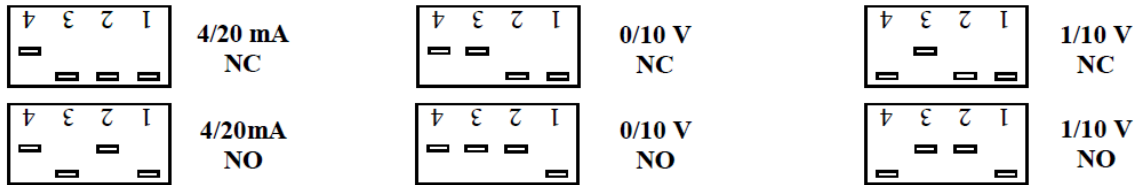


6.15 Disconnect the grey connector from the power supply.

6.16 Use the configuration you need by moving the DIPs, according to the instrumentation signal (Fig.15):



Different configurations:



6.17 Carefully mount the cover, minding the cables not to be pressed (Fig.16):



6.18 Fix the cover to the body by using the 6 screws (Fig.17):



6.19 Mount the hand wheel on the shaft and fix it by using the screw (Fig.18):



6.20 Mount the 3 outer connectors together with its rubber joints and fix them to the cover, by using the screws (Fig.19):

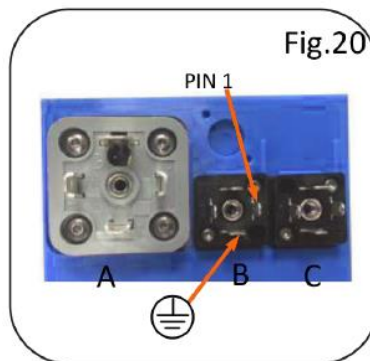


The unit is ready to work.

6.21 Outer Set-Up (only if necessary):

- B plug: Connect a cable between PIN 1 and PIN Earth (Fig.20).
- A plug: Connect it to the power supply.
- B plug: Disconnect the cable between PIN 1 and PIN Earth.

The actuator will make a complete maneuver.

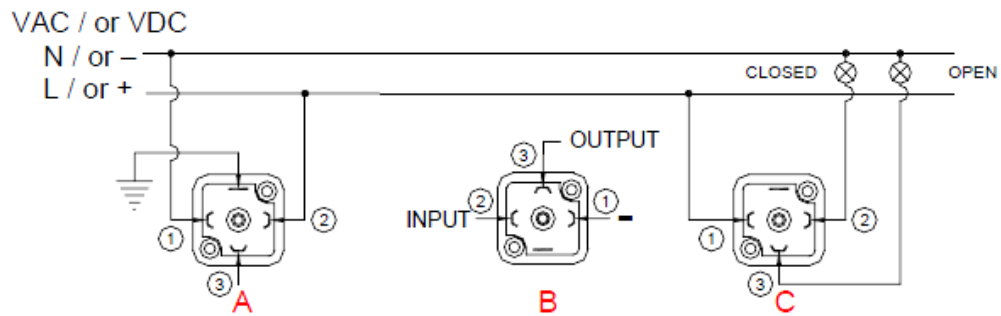


7. External Electrical Connections



WARNING: Make all connections as shown on the wiring diagram affixed to the new cover.

External Electric Wiring



A = Alimentación Eléctrica / *Power supply plug*

A = VCA 2 CABLES (Conector gris) / *VAC 2 WIRES (Grey plug)*

PIN 1 = Neutro // PIN 2 = Fase = Alimentación Eléctrica / *Power supply*

A = VCC 2 CABLES (Conector gris) / *VDC 2 WIRES (Grey plug)*

PIN 1 = (-) Negativo // PIN 2 = (+) Positivo = Alimentación Eléctrica / *Power supply*

B = Señal de Instrumentación / *Control Signal*

PIN 1 = (-) Negativo // PIN 2 = (+) Positivo = Señal de Entrada / *Input Signal*

PIN 1 = (-) Negativo // PIN 3 = (+) Positivo = Señal de Salida / *Output Signal*

C = Contactos Auxiliares / *Volt free contact plug*

PIN 1 // PIN 2 = Cerrado / *Closed*

PIN 1 // PIN 3 = Abierto / *Open*

8. Preliminary Test and Settings

- It is recommended that only qualified electrical engineers be allowed to connect or adjust these devices. Always ensure that the power supply is disconnected prior to removing the top cover by disconnecting the DIN power input plug.

The LED status light provides visual communication between the actuator and the user



| ACTUATOR WITH DPS | ACTUATOR OPERATIONAL STATUS | | | | | | | | | | | |
|--|-----------------------------|--------|--------|-------|-------|-------|--------|--------|--------|-------|-------|-------|
| Without power supplied | | | | | | | | | | | | |
| Motor stop | Blue | Blue | Blue | Blue | Blue | Blue | Blue | Blue | Blue | Blue | Blue | Blue |
| Opening | Blue | Green | Blue | Green | Blue | Green | Blue | Green | Blue | Green | Blue | Green |
| Closing | Blue | Red | Blue | Red | Blue | Red | Blue | Red | Blue | Red | Blue | Red |
| Self adjusting configuration | Red | Red | Blue | Green | Green | Blue | Red | Red | Blue | Green | Green | Blue |
| Torque limiter function on, moving from close to open | Green | Green | Green | | | | Green | Green | Green | | | |
| Torque limiter function on, moving from open to close | Red | Red | Red | | | | Red | Red | Red | | | |
| Instrum. Signal overpassed. Blocked actuator. Need a re-set. | Blue | Blue | Cyan | | | | Blue | Blue | Cyan | | | |
| Actuator in MANUAL mode (exceeded time) | Yellow | Yellow | Yellow | | | | Yellow | Yellow | Yellow | | | |
| No Instrum. Signal pick-up. 4-20mA and 1-10V only. | Blue | Blue | Blue | | | | Blue | Blue | Blue | | | |

9. Maintenance

These actuators are free maintenance, but when conditions are more severe, more frequent inspections may be advisable.

- Ensure valve actuator alignment.
- Insure wiring is insulated, connected and terminated properly.
- Insure all screws are present and tight.
- Insure conduit connections are installed properly and are dry.
- Verify declutch mechanism.