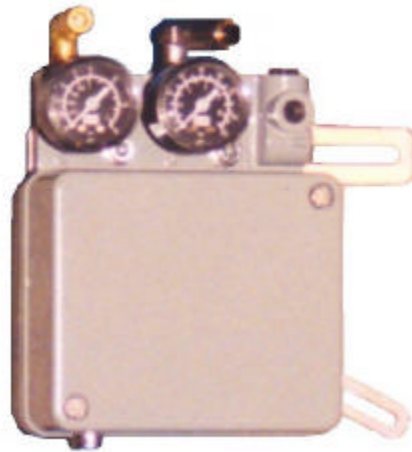


# TECHNICAL MANUAL PNEUMATIC POSITIONER



**Type: SGA96C**

## INSTRUCTIONS FOR PNEUMATIC POSITIONER SERIES SGN96C/SGA96C

### 1) APPLICATION.

- For attachment to final control elements.
- For elimination of positioning errors.
- For high positioning forces and short positioning times.
- For assigning direction of movement and action to safety condition of the final control element.

### 2) FUNCTIONAL DIAGRAM

The positioner SGN96C / SGA96C is a force balance instrument which compares the control element (servomotor) position, turned in force by the range spring (7) and the pressure value of the input signal applied to bellows (3). The position of stem of servomotor is transmitted to range spring through the system feedback (or coupling) lever (29), cam (9), internal lever (11). The action of the forces of the range spring and bellows on the lever (4) causes a pressure variation in the relay section of pneumatic power amplifier (26) by means the amplification system flapper-nozzle (5). In its turn the relay section of pneumatic amplifier drives the split valve that supply the final control element. Fig.1 shows positioner linked with a control valve equipped with single acting and direct action servomotor but the considerations are valid also for the other foreseen uses.

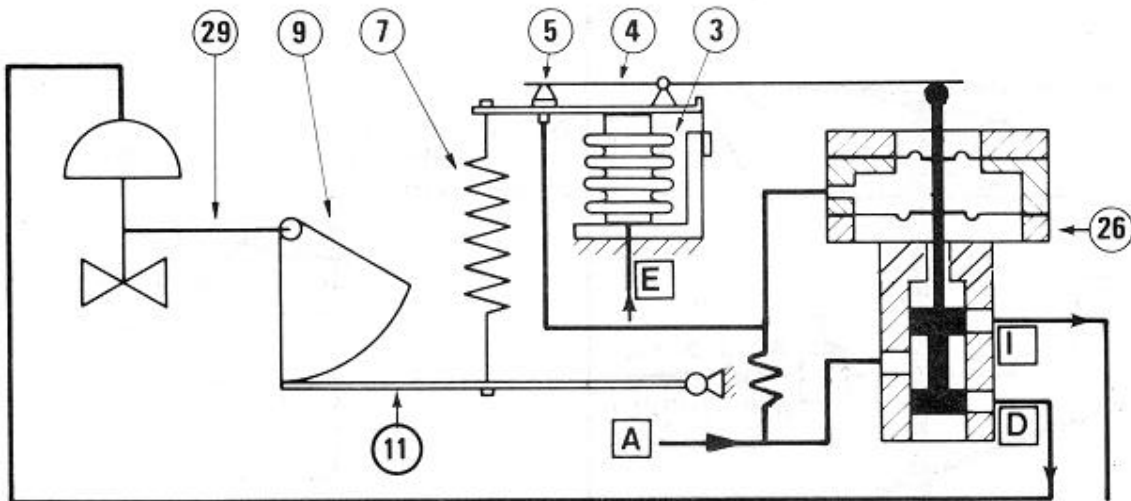


Fig.1

### 3) ADJUSTMENTS AND CONNECTIONS

- 7 Range spring.
- 8 Range spring force adjusting or zeroing.
- 9 Cam.
- 12 Feeler roll.
- 24 Restriction cleaner.
- 29 Feedback lever.
- 30 Fixing screws to attachment bracket.

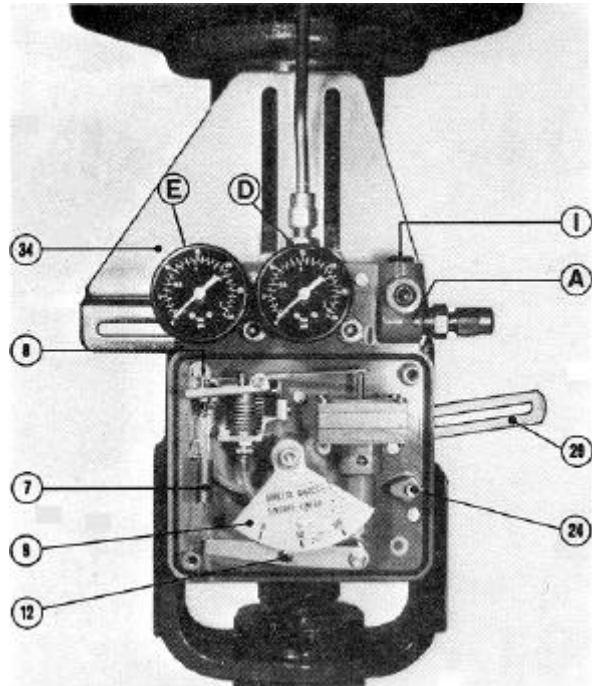


Fig.2

- 33 Locking plate.
- 34 Attachment bracket.
- 37a Coupling arm.
- 37b Vice.
- A Air supply.
- E Input signal.
- D Direct output (control pressure for drive).
- I Inverse output (control pressure for drive).

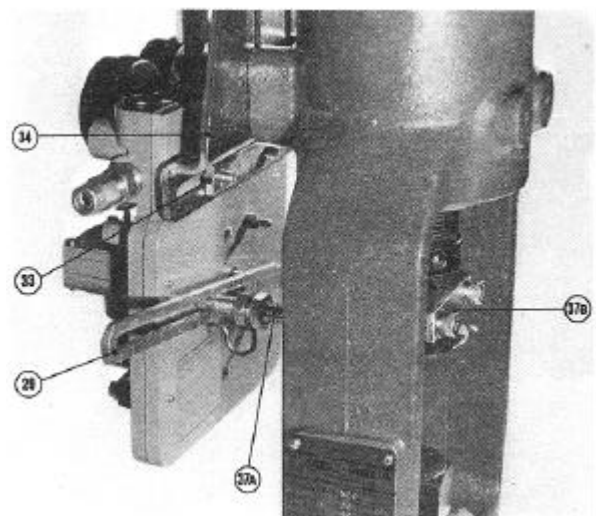


Fig.3

### 4) ASSEMBLING PROCEDURE.

- 4.1 - Referring to Figs. 4, 5, 6, and 7 attach to the positioners the fittings or the plugs on respective connections.
- 4.2 - Assembly the vice (37b) with the coupling arm (37a) to the servomotor stem.
- 4.3 - Mount the attachment bracket (34) on the yoke of servomotor and fix the bracket at middle of vertical slats.
- 4.4 - Mount the positioner on the attachment bracket and fix them at middle of horizontal slots with the screws (30) and the locking plate (33).
- 4.5 - Bring the stem to 50 percent of stroke sending a pressure into servomotor or operating the manual handwheel.
- 4.6 - Carry out the linkage between arm (37a) and feedback lever. If that the case move vertically the attachment bracket (34).

- 4.7 - Release screws (30) and move horizontally the positioner as far as the arm(37a) coincides with the notch engraved on the feedback lever corresponding to the stroke value of servomotor. Then lock screws (30).
- 4.8 - Check the position of feeler roll (12) it must be at 50 percent of cam. If this is not the case move the bracket (34) vertically.
- 4.9 - Bring the valve stem to 0 percent of the stroke venting the air or operating the handwheel.
- 4.10 - Make the connections between positioner and servomotor and between positioner and air supply filter regulator (see point 5). Use copper tube, aluminium or plastic tube 4x6 mm or 6x8 mm; than put the system into operation.

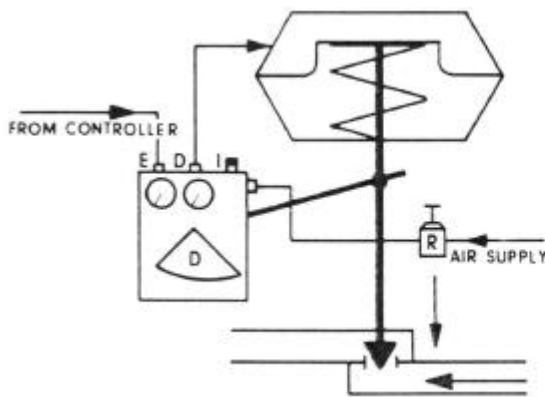


Fig.4

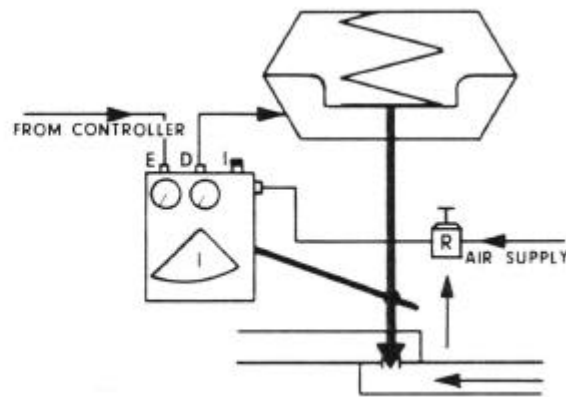


Fig.5

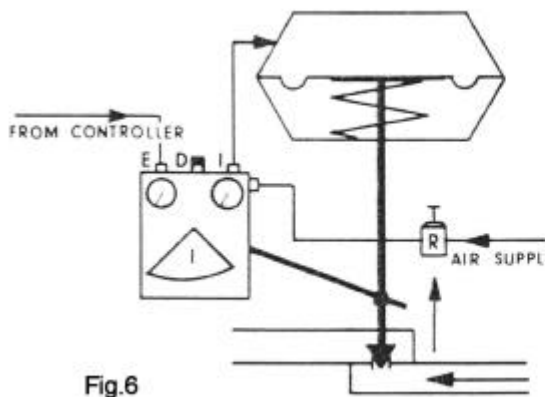


Fig.6

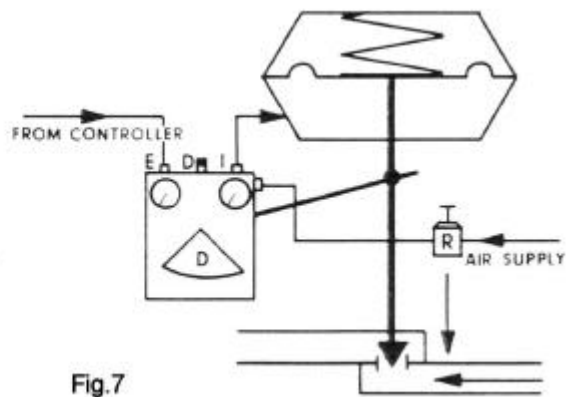


Fig.7

## 5) AIR SUPPLY

It is important that the air supply is clean, dry and oil free. The air supply pressure should be chosen in accordance with the maximum working pressure and the response speed of the servomotor, from 1.4 bar (20 psi.) minimum to 4 bar (60 psi) maximum for positioner series SGN96C and 4 bar (60 psi) minimum and 7 bar (105 psi) maximum for positioner series SGA96C. An air-filter regulator with a minimum delivery of 4 Nm<sup>3</sup>/h must be used. The models FR64 + 68 are recommended for supply up to 2.5 bar (35 psi); they can be mounted directly on the actuator.

## 6) PUTTING INTO SERVICE OPERATIONS AND ADJUSTMENTS

- 6.1 - Supply the positioner with air following the instructions of point 5.
- 6.2 - Connect a pressure regulator to input signal connection (E) and apply a pressure equal to 50 percent of control signal range. For standard control signal range from 0.2 to 1 bar: 0.6bar ; 3 to 15 psi : 9 psi.
- 6.3 - Check :
  - The coupling arm (37a) must be corresponding with the notch engraved on the feedback lever (29), in accordance with the stroke value of the servomotor (in millimetres). If it is not the case move the positioner horizontally to obtain the synchronisation.
  - The feeler roll (12) must correspond with the value of 50 percent engraved on the cam. If it is not the case move the positioner vertically to obtain the proper connection.
- 6.4 - Supply the air following the same directions of point 6.2 at a pressure equal to 10 percent of the control signal range. For the standard control signal range from 0.2 to 1 bar : 0.28 bar ; 3 to 15 psi : 4.2 psi.
- 6.5 - Check the corresponding stroke of the servomotor: this should be 10 percent of the max. stroke. If it is not the case adjust the range spring force (screw 8) so far that the exact stroke value is obtained.
- 6.6 - Supply the air following the same directions of point 6.2 a pressure equal to 90 percent of control signal range. For standard control signal range from 0.2 to 1 bar: 0.96bar ; 3 to 15 psi : 13.8 psi.
- 6.7 - Check the corresponding stroke of the servomotor which must be 90 percent of the max. stroke. If it is not the case move the positioner horizontally (toward left or right) so far that the exact stroke value is obtained.
- 6.8 - Repeat operations of points 6.4, 6.5, 6.6, 6.7, until span and zero are OK.
- 6.9 - Attach the actuator to the controller.

**NOTE: Not required if the positioner is supplied together with and attached to the valve.**

## 7) MAINTENANCE.

If the air supply is normally clean, the only regular maintenance necessary is the periodic blowing of the drip well pet-cock to remove moisture from the air supply system and remove the dirt from restriction pushing the plunger of the restriction cleaner (24).

## 8) SPARE PARTS (fig. 8)

- 1\* Pressure gauges Code MA41
  - range 0 / 2 Bar , 0 - 30 psi
  - range 0 / 4 Bar , 0 - 60 psi
  - range 0 / 11 Bar , 0 - 160 psi
- 2\* Assembly bellows-force lever, complete Code 79/6
- 3 Bellows
- 4 Force lever with Baffle
- 5 Ugello
- 6 Bellows force lever assembly fixing screws
- 7\* Range spring
  - standard 0/2 Bar, 0-30 psi Code 25/7/C
  - range 0.2/0.6 Bar, 3/9 psi Code 25/7/A
  - range 0.6/1 Bar, 9/15 psi Code 25/7/B
- 8 Range spring adjusting
- 9\* Cam
  - linear (standard) Code 43 75
  - fast Code 43 76
  - slow Code 43/77
  - to cut (virgin) Code 43-Y/2
- 11 Internal lever
- 12\* Feeler roll Cod. PR 6/5.
- 13\* Base.
- 14\* Base gasket Cod. 21/44.
- 15 Base fixing screws.
- 16 Base plate.
- 17\* Cover gasket – Neoprene diam. 2.5 x 0.5 am, 0.5 M.
- 18 Bellows and nozzle connection (not visible).
- 20 Retaining plate (not visible).
- 21 Retaining plate fixing screw (not visible).
- 22\* Tubing springs Cod. 25/14593.
- 23\* Silicone rubber tubing diam. 4xl mm, 0.5 m.
- 24 Restriction cleaner.
- 25 Restriction cleaner fixing screw.
- 26\* Pneumatic power amplifier Code 79/21.
- 27 Amplifier fixing screws.
- 29 Feedback lever.
- 30 Fixing screws to attachment bracket.
- 31 Lock washers.
- 32 Washers.
- 33 Locking plate.
- 34 Attachment bracket.
- 35 Threaded plugs
  - 1/ 8" NPT
  - 1/ 4" NPT
- 36\* Air filter (into connections) Code 74/4
- 37 Vice complete with coupling arm, nuts, spring, fixing screws and washer (not visible)
- 38\* O-Ring assortment Code PR 6/1
- \* RECOMMENDED SPARE PARTS.

( 2 gauges for single acting application and 3 gauges for double acting application )

