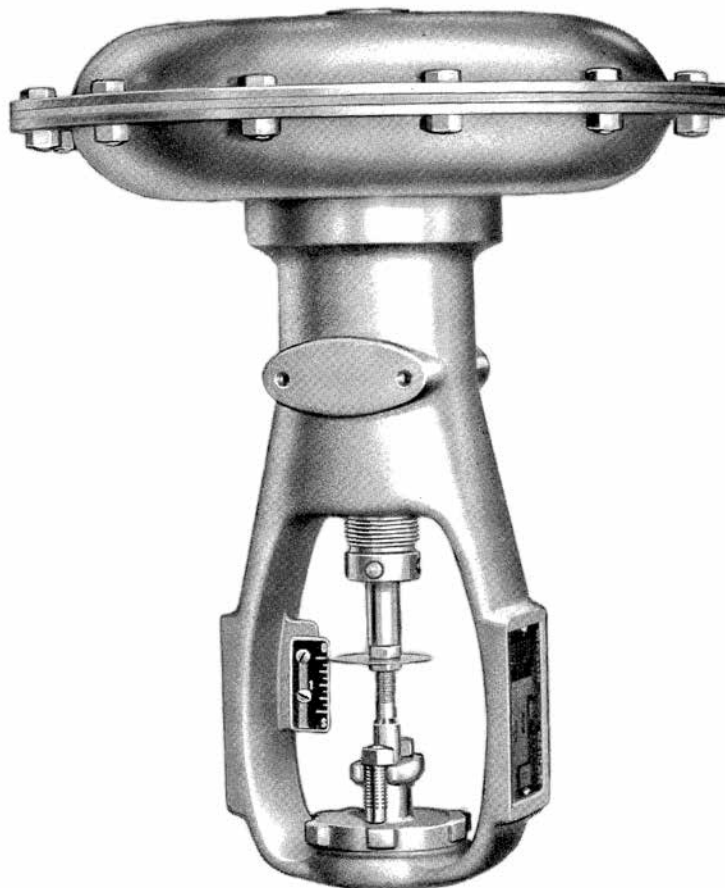


GE Oil & Gas

# Model 37/38

Masoneilan\* Spring-Diaphragm Actuators  
Instruction Manual





THESE INSTRUCTIONS PROVIDE THE CUSTOMER/OPERATOR WITH IMPORTANT PROJECT-SPECIFIC REFERENCE INFORMATION IN ADDITION TO THE CUSTOMER/OPERATOR'S NORMAL OPERATION AND MAINTENANCE PROCEDURES. SINCE OPERATION AND MAINTENANCE PHILOSOPHIES VARY, GE (GENERAL ELECTRIC COMPANY AND ITS SUBSIDIARIES AND AFFILIATES) DOES NOT ATTEMPT TO DICTATE SPECIFIC PROCEDURES, BUT TO PROVIDE BASIC LIMITATIONS AND REQUIREMENTS CREATED BY THE TYPE OF EQUIPMENT PROVIDED.

THESE INSTRUCTIONS ASSUME THAT OPERATORS ALREADY HAVE A GENERAL UNDERSTANDING OF THE REQUIREMENTS FOR SAFE OPERATION OF MECHANICAL AND ELECTRICAL EQUIPMENT IN POTENTIALLY HAZARDOUS ENVIRONMENTS. THEREFORE, THESE INSTRUCTIONS SHOULD BE INTERPRETED AND APPLIED IN CONJUNCTION WITH THE SAFETY RULES AND REGULATIONS APPLICABLE AT THE SITE AND THE PARTICULAR REQUIREMENTS FOR OPERATION OF OTHER EQUIPMENT AT THE SITE.

THESE INSTRUCTIONS DO NOT PURPORT TO COVER ALL DETAILS OR VARIATIONS IN EQUIPMENT NOR TO PROVIDE FOR EVERY POSSIBLE CONTINGENCY TO BE MET IN CONNECTION WITH INSTALLATION, OPERATION OR MAINTENANCE. SHOULD FURTHER INFORMATION BE DESIRED OR SHOULD PARTICULAR PROBLEMS ARISE WHICH ARE NOT COVERED SUFFICIENTLY FOR THE CUSTOMER/OPERATOR'S PURPOSES THE MATTER SHOULD BE REFERRED TO GE.

THE RIGHTS, OBLIGATIONS AND LIABILITIES OF GE AND THE CUSTOMER/OPERATOR ARE STRICTLY LIMITED TO THOSE EXPRESSLY PROVIDED IN THE CONTRACT RELATING TO THE SUPPLY OF THE EQUIPMENT. NO ADDITIONAL REPRESENTATIONS OR WARRANTIES BY GE REGARDING THE EQUIPMENT OR ITS USE ARE GIVEN OR IMPLIED BY THE ISSUE OF THESE INSTRUCTIONS.

THESE INSTRUCTIONS ARE FURNISHED TO THE CUSTOMER/ OPERATOR SOLELY TO ASSIST IN THE INSTALLATION, TESTING, OPERATION, AND/OR MAINTENANCE OF THE EQUIPMENT DESCRIBED. THIS DOCUMENT SHALL NOT BE REPRODUCED IN WHOLE OR IN PART WITHOUT THE WRITTEN APPROVAL OF GE.

## Description

The Masoneilan 37/38 spring-diaphragm actuator is a simple, powerful, mechanical device. There are two general types: *Air-to-Extend Stem* and *Air-to-Retract Stem*. Actuators are designated by case size: Nos. 9, 11, 13, 15, 18 and 18L.

The nominal range of a spring-diaphragm actuator is the air pressure range in pounds per square inch (psi) for rated stroke under no load. Common ranges are 3–15 psi and 6–30 psi. The spring range and maximum allowable supply pressure are marked on the serial plate. For a 3–15 psi nominal range, the stem will start to stroke when the air pressure reaches 3 psi, and will complete the stroke when the pressure reaches 15 psi (plus or minus 5%).

In the air-to-extend actuator, conformation of the molded diaphragm to the diaphragm plate serves as a flexible upper guide for the actuator stem (26). The lower guide is an oil-impregnated bronze bushing (37) located in the spring adjustor (36). The air-to-retract actuator differs from the air-to-extend unit in that the spring (22), spring barrel (71) and spring adjustor (36) are located *above* the diaphragm plate (40) and diaphragm (39) which are inverted. A gasket (19) at the joint of the diaphragm case and yoke and a packing box around the actuator stem prevents air leakage. The diaphragm acts as a flexible upper guide and the packing box assembly as the lower guide for the actuator stem.

Air connections are 1/4" NPT. Connections are located in the upper diaphragm case (air-to-extend actuators) or yoke (air-to-retract actuators).

Standard Actuator Size	Effective Diaphragm Area (sq. in.)	Maximum Stroke (in.)
9	45	¾
11	71	1
13	105	1 ½
15	145	2
18	200	2 ½
18L	200	4

## Life Period

The current estimated useful life period for the Masoneilan 37/38 actuator is 25+ years. To maximize the useful life of the product it is essential to conduct annual inspections, routine maintenance and ensure proper installation to avoid any unintended stresses on the product. The specific operating conditions and environmental conditions will also impact the useful life of the product. Consult the factory for guidance on specific applications if required prior to installation.

## Maintenance

### Air-to-Extend Actuators (Type 37)

#### Diaphragm Replacement

Before disassembling the actuator, all spring compression should be relieved by turning the spring adjustor (36), to prevent the upper case popping up when the cap screws (45) are removed. This is especially important on actuators with a high initial spring setting. Remove cap screws (45), nuts (46) and upper diaphragm case (43). Remove nut (30) and washer (41) to release the diaphragm (39). If possible, the replacement diaphragm should be of the molded type supplied by GE Masoneilan, but in an emergency a diaphragm may be cut from flat sheet stock for up to and including No. 15 actuators. To allow sufficient stroke without restriction due to flatness of the diaphragm, the diaphragm bolt circle should be about 10% greater than that of the diaphragm case.

Replace washer (41), nut (30) and upper diaphragm case.

#### Spring Adjustment

An air supply, with a gauge and regulator, should be piped to the upper diaphragm case for this adjustment. Adjust spring compression so that the actuator stem (26) just begins to move when air pressure reaches minimum pressure of the range stamped on the serial plate. This movement is most easily detected by feeling the stem as air pressure is applied.

**Note:** *Adjust spring compression only when there is no air pressure on diaphragm.*

## Air-to-Retract Actuators (Type 38)

### Diaphragm Replacement

The procedure is the same as for air-to-extend actuators except that the entire upper case assembly (including spring barrel (71), spring (22), spring seats (33 and 34), nut (30) and diaphragm plate (40) must be removed to release the diaphragm. Install a new diaphragm and reassembly the above parts.

### Spring Adjustment

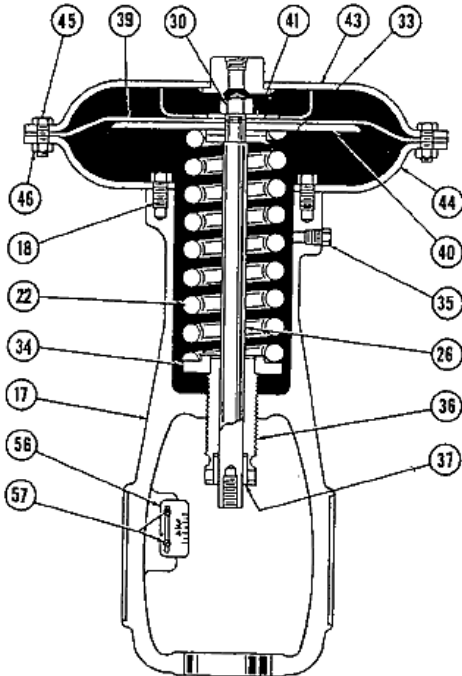
The procedure is identical with that for air-to-extend actuators except that supply air is piped to the 1/4" port in the yoke.

### Packing Box

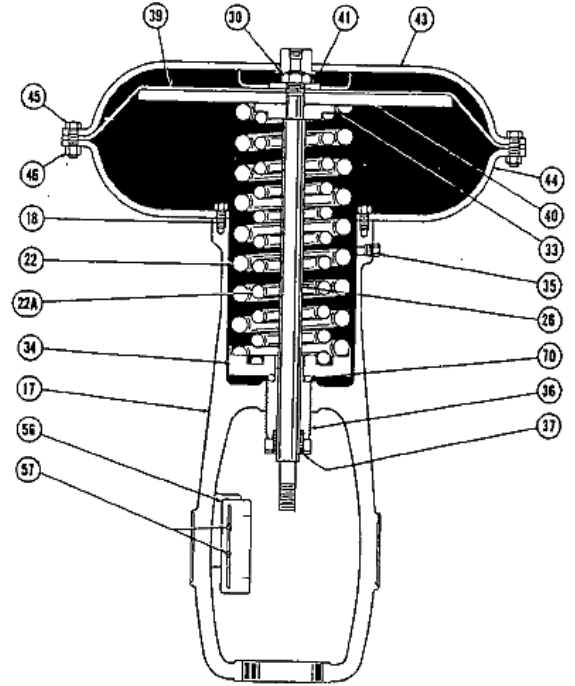
The packing box is subject to low air pressure only and requires minimum maintenance.

The packing rings have a square section and are made of carbon core with braided PTFE jacket. The packing may be added to or completely replaced without disassembling either the actuator or the mechanism (or valve) to which it is attached. Be sure to tighten packing nut (20) lightly. Over-tightening will cause excessive friction, resulting in sluggish performance.

### Air-to-Extend Actuators (Type 37)

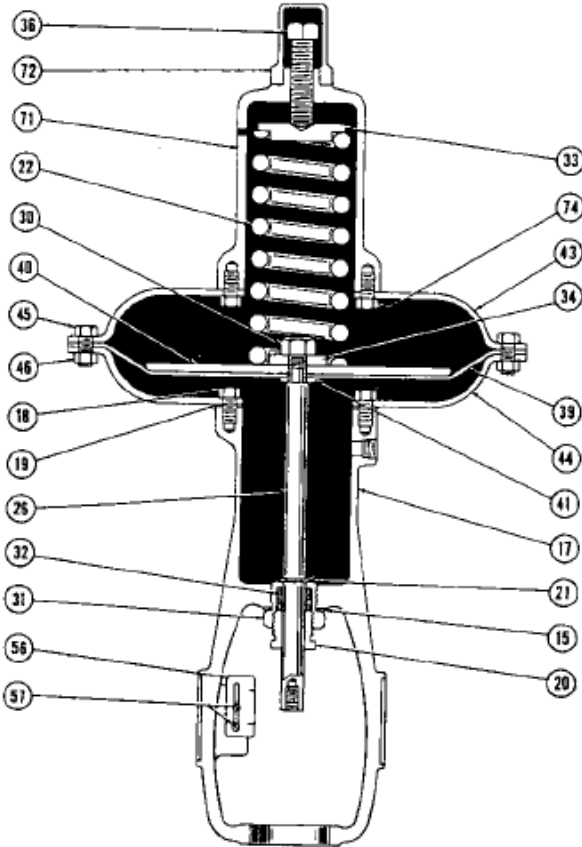


Case Nos. 9, 11 & 13

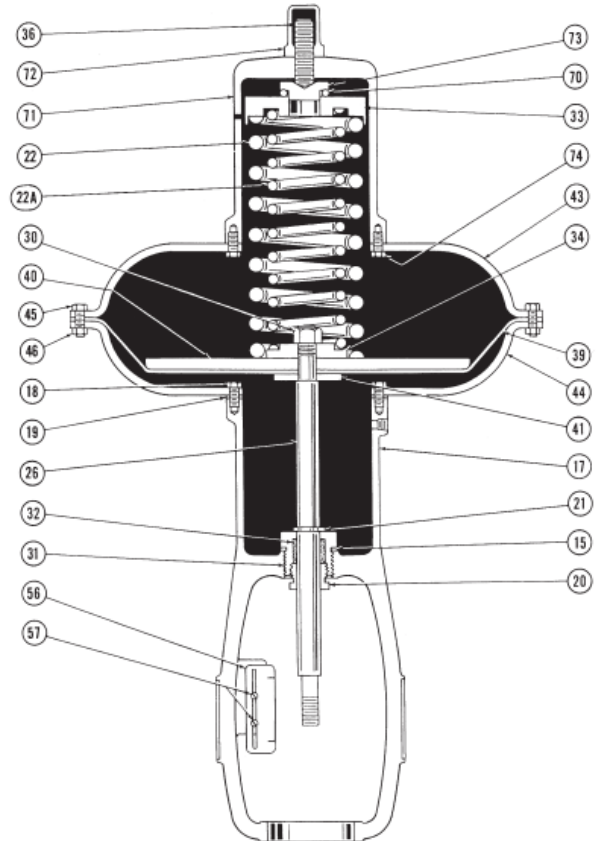


Case Nos. 15, 18 & 18L

### Air-to-Retract Actuators (Type 38)



Case Nos. 9, 11 & 13



Case Nos. 15, 18 & 18L

## Parts Reference

Ref. No.	Part Name	Computer Abbrev.	Ref. No.	Part Name	Computer Abbrev.	Ref. No.	Part Name	Computer Abbrev.
**15	Gasket (packing box)	GASKET	**32	Packing	PACKING	45	Cap Screw (diaph. case)	CAP SCR
17	Yoke	YOKE	33	Spring Seat (upper)	USPR ST	46	Nut (diaph. case)	NUT
18	Cap Screw (L case to yoke)	CAP SCR	34	Spring Seat (lower)	LSPR ST	56	Travel Indicator Scale	T I SCL MCN
**19	Gasket (L case to yoke)	GASKET	35	Pipe Plug	PIP PLG	57	Machine Screw	SCR BALL &
20	Packing Nut	PKG NUT	36	Spring Adjustor	SPR ADJ	70	Ball and Retainer	RTN SPR
21	Snap Ring	SNP RNG	37	Bushing (spring adjuster)	BUSHING	71	Spring Barrel	BRL
22	Actuator Spring	ACT SPR	**39	Diaphragm	DIAPHRM	72	Spring Barrel Cap	SBL CAP
22A	Actuator Spring	ACT SPR	40	Diaphragm Plate	DPH PLT	73	Ball Bearing Race	BBG RCE
26	Actuator Stem	ACT STM	41	Diaphragm Washer	PDH WSH	74	Cap Screw (SBL to U D CSE)	CAP SCR
30	Nut (actuator stem)	NUT	43	Upper Diaphragm Case	U D CSE			
31	Packing Box	PKG BOX	44	Lower Diaphragm Case	L D CSE			

\*\*Recommended spare parts

# DISTRIBUTOR

## **E.P. & S. - FRANCE**

24 bis rue de Picpus

75012 PARIS

Tel: +33 (0)9 83 01 21 01

ventes@fr-eps.com

## **E.P. & S. - CAMEROON**

Immeuble Carré d'Or, Rue Njo-Njo

Bonapriso, DOUALA

Tel: +237 6 52 12 70 95

ventes@fr-eps.com

Visit our web-site:  
**[www.fr-eps.com](http://www.fr-eps.com)**



\* Trademark of the General Electric Company.  
Other company names and product names used in this document are  
the registered trademarks or trademarks of their respective owners.

© General Electric Company. All rights reserved.