

MANUALE DI INSTALLAZIONE E MANUTENZIONE INSTALLATION AND MAINTENANCE MANUAL

M/BWABLA/I/E

07

2016



TIPO - TYPE BWA



TIPO - TYPE BLA

Valvole a Farfalla Manuali Butterfly Manual Valves

Tipo / Type

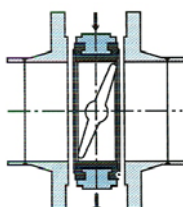
BWA - BLA



INSTALLAZIONE

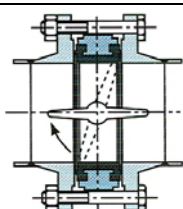
INSTALLATION

Lasciare tra le flange una distanza tale da permettere con facilità l'inserimento e l'estrazione della valvola



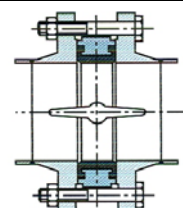
Leave enough distance between the flanges to make easy the insert and the extraction of the valve.

Prima di serrare le flange, **aprire completamente la valvola.**



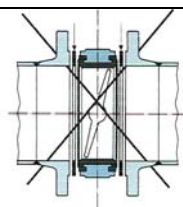
Before locking the flanges, **open the valve completely.**

Stringere i bulloni finché le flange non sono a contatto con il corpo valvola.



Lock the screws until the flanges are in contact with the valve body.

ATTENZIONE! Non inserire altre guarnizioni tra la flangia e la valvola.



WARNING! Do not insert any extra gasket between flange and valve.

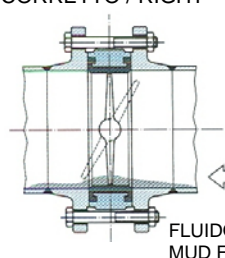
ATTENZIONE: con la valvola inserita tra le flange, saldare il tubo solo a punti. Prima di terminare la saldatura togliere la valvola per evitare che il calore deformi la guarnizione. Pulire accuratamente le saldature per evitare che le scorie danneggino la guarnizione.

WARNING: with the valve between the flanges, make a spot welding on the tube. Remove the valve before ending the welding: heat may damage the gasket. Clean the welding to avoid a gasket damage due to the slags.

ATTENZIONE: in presenza di fluidi fangosi, montare la valvola con l'asse di rotazione orizzontale per permettere ai sedimenti di defluire liberamente al momento dell'apertura. (Vedi sotto a sinistra).

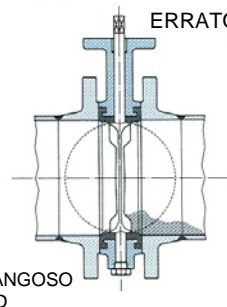
WARNING: with mud fluid, mount the valve with the rotation axis horizontal oriented, to allow the sediments passing through the valve easily during the start up (see below on the left).

CORRETTO / RIGHT

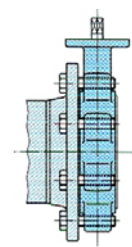


FLUIDO FANGOSO
MUD FLUID

ERRATO / WRONG



MONTAGGIO FINE TUBAZIONE / END PIPELINE MOUNTING



LUG Pmax 6 bar

1

CONFLOW s.p.a.

COMPANY WITH
QUALITY SYSTEM
CERTIFIED BY DNV GL
= ISO 9001 =

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Tel. 039/651.705 - 650.397
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www.conflow.it

MANUTENZIONE

Questo tipo di valvola non necessita di alcun intervento di manutenzione. Nel caso in cui dovesse danneggiarsi la guarnizione provvedere ad affidarsi tempestivamente al personale qualificato

INFORMAZIONI GENERALI

Prima dell'installazione o manutenzione intercettare la linea a monte e a valle della valvola accertandosi che non ci sia pressione.

Non superare mai la massima pressione e i limiti di temperatura indicati sulla marcatura dell'apparecchio.

Il prodotto non deve essere modificato, qualsiasi manomissione può rendere pericoloso l'apparecchio.

Il produttore non risponde per l'utilizzo improprio del prodotto; l'installazione e la manutenzione devono essere effettuate da personale specializzato.

Questo prodotto dovrà essere destinato solo per l'uso per il quale è stato espressamente prodotto, ogni altro utilizzo si considera potenzialmente pericoloso; in ogni caso il produttore non può essere considerato responsabile per eventuali danni derivanti da usi non conformi.

ISTRUZIONI GENERALI

Prima della spedizione le superfici delle guarnizioni di tenuta vengono lubrificate con grassi e/o oli silconici.

In caso di usi specifici, ad esempio idrogeno, ossigeno, cloro ecc., le guarnizioni ed il disco non devono portare traccia di silicone. L'eventuale silicone può essere asportato utilizzando opportuni solventi o altri adeguati prodotti per pulire o sgrassare.

Prima di installare la valvola pulire la tubazione dallo sporco e dai residui di saldatura al fine di evitare di danneggiare il seggio di tenuta.

Assicurarsi che le tubazioni non siano in tensione; in caso di presenza di correnti vaganti è necessario corredare la valvola di dispositivo antistatico.

Non usare la valvola come leva per allargare le flange, ne potrebbe conseguire un danno alla sede durante l'installazione o il funzionamento.

In caso di installazione su un sistema nuovo, utilizzare la valvola come elemento distanziatore. Fare una saldatura a punti di flangia e tubazione e, prima di ultimare la saldatura, rimuovere bulloni e valvola. **Non ultimare la saldatura delle flange alla tubatura con la valvola fissata con bulloni tra le flange, perché ciò porterà ad un serio danneggiamento da calore della sede.**

Sulle valvole a farfalla è presente una targhetta in cui sono riportati i dati che permettono di identificare il prodotto e le condizioni operative. La targhetta comprende inoltre le dichiarazioni CE di conformità.

STOCCAGGIO

Nel caso le valvole non fossero messe in servizio in breve tempo, si raccomanda di stocarle in ambienti riparati, puliti ed asciutti. Inoltre il tipo di imballo in scatola contribuisce a facilitare lo stoccaggio. Se la valvola rimane stoccata per lunghi periodi in magazzino o sulla tubazione in attesa di utilizzo, si consiglia di lasciare il disco semichiuso e di applicare sulle sedi in elastomero un lubrificante adatto (oli vegetali per EPDM; grassi silconici per tutte le altre tipologie).

MANUALI DI RIFERIMENTO PER BWP... - BLP...

Pistoni: n° M/PISTONI/I
Posizionatori analogici: n° M/PPR/EPR/I/E
Posizionatori SMART n° M/SS2L/SS2R/E

MAINTENANCE

This valve needs no maintenance. In case of gasket damage, contact immediately the qualified staff.

GENERAL INFORMATION

Before installation or maintenance, cut off the pipeline after and before the valve; be sure there is no pressure inside.

Never overtake the maximum pressure and the temperature limits indicated on the equipment mark.

Don't modify the product. Every tampering could make the product dangerous.

Constructor does not respond about a wrong product applications. Installation and maintenance must be done by qualified staff.

This product destination is suitable only for the use it has been planned. Every different application may be potentially dangerous. Anyway the constructor is not responsible about damages coming from not correct applications.

GENERAL INSTRUCTIONS

Before shipping all the gasket surface are lubricated with greases or silicone oils.

For specific media, for example hydrogen, oxygen, chlorine etc., gasket and disc must not have tracks of silicone. Silicone may be removed by suitable solvents.

Before installing the valve clean the pipeline; in case of dirty and welding residuals to avoid seat damages.

Be sure there is not voltage in the line pipes; with stray currents it's necessary to install an antistatic device on the valve.

Don't use the valve as a lever to expanding the flanges. This may cause a seat damage during the installation or the start up.

For installation on a new plant, use the valve as a spacer. Make a spot welding of flange and pipeline and, before ending the welding, remove nuts and valve. **Don't complete the flange welding to the pipeline with the valve fixed by the nuts between the flanges; this will damage seriously the seats due to the heat welding.**

On the butterfly valves there is a data label that tags the product and the operating conditions. The label even has the CE conformity declarations.

STORAGE

If the valves are not installed in a short time, it's recommended to storage them in a guard and in a clean and dry places. The type of packaging helps to make the storage easy. If the valve is stored for a long time waiting for the using, in store or on the pipeline, it's recommended to leave the disc not perfectly closed, and to apply on the seats a suitable lubricant (vegetal oils for EPDM; silicone greases for every other types).

REFERENCE MANUAL FOR BWP... - BLP...

Pistons: n° M/PISTONI/E
Analogue positioners: n° M/PPR/EPR/I/E
SMART positioners n° M/SS2L/SS2R/E

DICHIARAZIONE DI CONFORMITA'
AI SENSI DELL'ALLEGATO IV DIRETTIVA EUROPEA "PED" N° 2014/68/UE
*Declaration of Conformity according to PED DIRECTIVE N° 2014/68/UE annex IV***A. Descrizione Tipo / Description Type : BWA – BLA – BWP.. – BLP..****da DN 40 A DN 200 Massima pressione ammissibile / Max allowable pressure PS 16 bar**
materiale: ghisa EN-GJL-250 UNI EN 1561 / material: cast iron EN-GJL-250 UNI EN 1561**B. Tabella 7 – Tubazioni di cui all'art.4, paragrafo1, lettera c) punto i) Secondo trattino – GRUPPO 2**

Table 7 – Piping referred to in Article 4(1)(c)(i), second indent GROUP OF FLUID 2

C. Procedure di valutazione di conformità utilizzata : MODULO A

Conformity Assessment procedures followed : Module A

A. Descrizione Tipo / Description Type : BWA – BLA – BWP.. – BLP..**da DN 250 A DN 300 Massima pressione ammissibile / Max allowable pressure PS 16 bar**
materiale: ghisa EN-GJL-250 UNI EN 1561 / material: cast iron EN-GJL-250 UNI EN 1561**B. Tabella 7 – Tubazioni di cui all'art.4, paragrafo1, lettera c) punto i) Secondo trattino – GRUPPO 2**

Table 7 – Piping referred to in Article 4(1)(c)(i), second indent GROUP OF FLUID 2

C. Procedure di valutazione di conformità utilizzata - Conformity Assessment procedures followed - :**MODULO A2 – CAT. II - Module A2 - CAT. II****CERTIFICATO INTESTATO A – Certify to :**

AYVAZ Ataturk Sanayi Bolgesi Hadimkoy Mahallesi Mustafa Inan Caddesi No:44 Amavutkoy – Istanbul - Turkey

Dichiarazione di Conformità Declaration of Conformity

Disponibile in originale su richiesta / Available in the original form on request

Il monitoraggio è eseguito da TÜV SÜDDEUTSCHLAND Organismo Notificato con num. **0036**

Certificato N° P-IS-TGK-IST-14-07-12100124-001-15-B-00736

Monitoring by TÜV SÜDDEUTSCHLAND - Notified body num. **0036**

Certificate Number : N° P-IS-TGK-IST-14-07-12100124-001-15-B-00736

Per quanto esposto si dichiara che gli apparecchi descritti ai punti A e B verificati in accordo al punto C, soddisfano i requisiti essenziali di sicurezza previsti nell'allegato I della Direttiva 2014/68/UE e ad essa applicabili.

We declare that the equipments mentioned on above point A and B, verified according to point C, are conformed to the most essential safety requirements as required by Directive 2014/68/UE annex I.

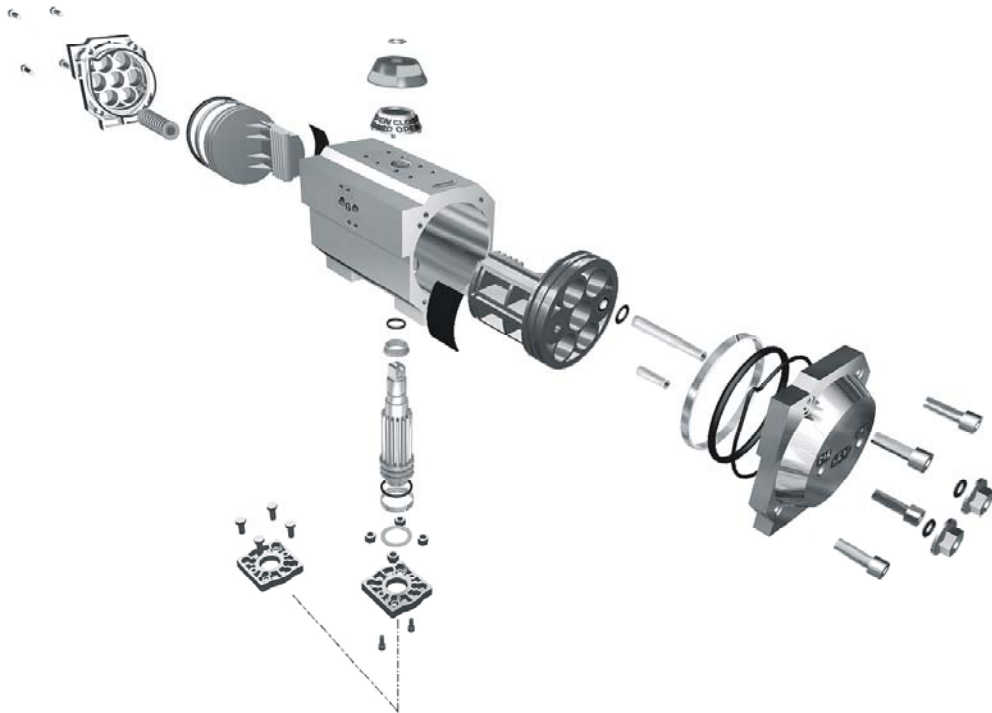
La scrivente CONFLOW SpA dichiara origine e nome del costruttore. CONFLOW SpA declares origin and manufacturer name:
AYVAZ Ataturk Sanayi Bolgesi Hadimkoy Mahallesi Mustafa Inan Caddesi No:44 Amavutkoy – Istanbul - Turkey**Gli eventuali accessori e/o varianti di attuatore sono conformi alle seguenti Direttive:**

Eventually accessories and actuator variations are conformed to following Directive:

Posizionatore elettropneumatico **Tipo EPR –SS2R 2014/30/UE**Electropneumatic Pilot Positioner **Type EPR – SS2R**Posizionatore elettropneumatico **Tipo EPR-EXATEX – SS2R-EXATEX Ex II 2G Ex ia IIC T5 (ATEX-IECEx)**Electropneumatic Pilot Positioner **Type EPR-EXATEX – SS2R-EXATEX**Posizionatore Elettropneumatico **Tipo EPR-EXD Ex md IIB T6**Electropneumatic Pilot Positioner **Type EPR-EXD**Box Fine corsa **Tipo LSB1000 Rotary 2014/30/UE**Position Monitoring Rotary Switches **Type ITS100 – ITS110 – ITS111**Elettrovalvole **Tipo EV3 – EV5 24V CC - 24V – 110V – 220V 50/60 Hz 2014/30/UE**Solenoid valves **Type EV3 – EV5 24V CC – 24V – 110V – 220V 50/60 Hz****CERTIFICATO DI CONFORMITA'**. I prodotti sono stati verificati e ispezionati rispetto al nostro Sistema Controllo Qualita' UNI EN ISO 9001. Noi certifichiamo che questo prodotto corrisponde alla Vostra richiesta e che le sue caratteristiche sono in conformita' con le nostre specifiche tecniche.**CERTIFICATE OF CONFORMITY** This product has been manufactured, tested and inspected in accordance with our Quality Assurance System UNI EN ISO 9001. We certify that it contents correspond to the order placed and its performance is in conformance with our technical specifications.

Max-Air TECHNOLOGY

Rack & Pinion Pneumatic Actuators



INSTALLATION, OPERATION & MAINTENANCE MANUAL

CONFLOW s.p.a.

COMPANY
WITH QUALITY SYSTEM
CERTIFIED BY DNV
== ISO 9001 ==

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CHAPTER 1: PRODUCT DESCRIPTION

Emme Technology offers a broad range of pneumatic rack & pinion actuators. **Emme Technology** actuators are designed to operate with dry or lubricated air media, but will function equally well with non-corrosive and inert gas or light hydraulic oil. The actuators are offered in two different configurations: double acting and spring return. Each actuator can be easily converted from double acting to spring return (or vice versa) by insertion (or removal) of spring cartridges.

Emme Technology actuators are equipped in the standard configurations with the following unique features:

- Double travel stops
- External open/closed indication
- Pre – loader springs of non – metallic material
- Stainless steel pinion up to UT20, carbon steel electroless nickel coated for larger sizes.
- Shaft bearings isolate the pinion gear from the housing and support the shaft for high cycle application.
- All bodies are internally lapped.
- All internal and external surfaces are anodized for corrosion resistance.
- End caps and pistons are epoxy powder coated for corrosion resistance.
- Angle of rotation: 90° - 120° - 135° - 150° - 180° (240° on request).
- All air line connections are ¼” GAS (or ¼” NPT).
- “NAMUR” VDI/VDE 3845 and ISO 5211 dimensions on all sizes.

CHAPTER 2: TECHNICAL FEATURES & DATA

2 – 1 METHOD OF OPERATION

AIR TO CLOSE CLOCKWISE ROTATION

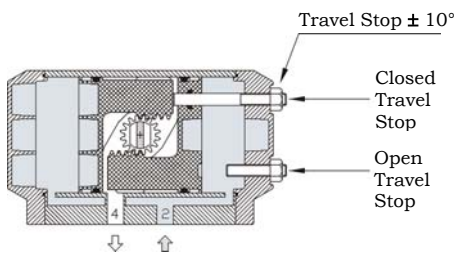


Figure 2.a

AIR TO OPEN COUNTER CLOCKWISE ROTATION

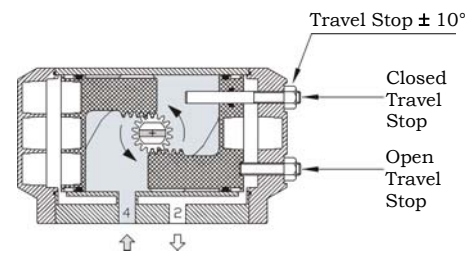


Figure 2.b

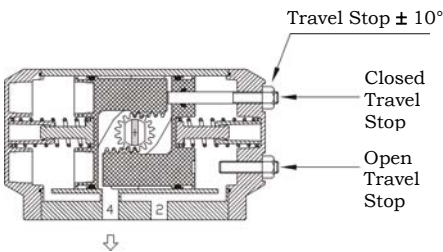


Figure 2.c

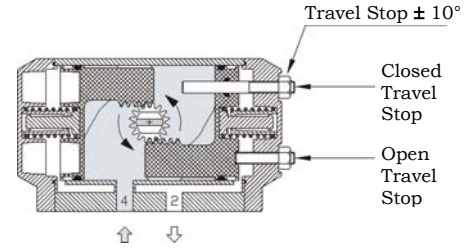


Figure 2.d

DOUBLE ACTING

Note: The bracketed numbers refer to the actuator exploded view – page 8.

Rotation occurs when compressed air is supplied to the actuator through Port 4, connected to the interior cavity between the pistons (ref. 7 & 12), or through Port 2, connected to the end cap area (ref. 2 & 16).

- As shown in **Figure 2.a**, pressure to Port 2 fills the outboard cavities pushing both pistons (ref. 7 & 12) inward and exhausting air through Port 4. As the pistons retract they rotate the pinion (ref. 22) clockwise (when viewed from the top of the actuator).

- Pressure to Port 4, as shown in **Figure 2.b**, fills the inboard cavity pushing both pistons (ref. 7 & 12) outward and exhausting air through Port 2. As the pistons extend they rotate the pinion (ref. 22) counter clockwise (when viewed from the top of the actuator)

SPRING RETURN

Note: The bracketed numbers refer to the actuator exploded view – page 8.

In this configuration the closed position occurs with spring cartridges (ref. 4), which are located between the pistons and end caps.

- Relieving pressure from the inboard cavity through Port 4, as shown in **Figure 2.c**, allows the spring cartridges (ref. 4) to push both pistons (ref. 7 & 12) inward. As the pistons retract they rotate the pinion (ref. 22) clockwise (when viewed from the top of the actuator).
- Pressure to Port 4, see **Figure 2.d**, fills the inboard cavity pushing both pistons outward and exhausting air through Port 2. As the pistons (ref. 7 & 12) extend they rotate the pinion (ref. 22) counter clockwise (when viewed from the top of the actuator) and compress all the spring cartridges (ref. 4).

Although **Max-Air** actuator typically operates counter clockwise to open and clockwise to close, it is possible to change this style of operation. **Figure 2.e** and **2.f** show the same double acting actuator with the piston orientation changed to convert the actuator from a fail clockwise actuator to a fail counter clockwise unit (as described in Chapter 4 – 5).



2 – 2 TECHNICAL DATA & WORKING CONDITIONS

- Operating Media – Dry or lubricated air, non-corrosive and inert gas or light hydraulic oil.
- Air supply: 2 Bar (30 PSIG) to 10 Bar (150 PSIG) maximum. *A safety valve is normally recommended.*
- Temperature: Standard from –20°C a +100°C (–10°F to +176°F) and –50°C +150°C available on request.
- Lubrication: Factory lubricated for life under normal working conditions with **Exxon CAZAR K2** or equivalent
- Application: Suitable for both indoor and/or outdoor applications.

2 – 3 SPECIAL CONDITIONS

- When the actuator is to be operated with oxygen, the actuator must be perfectly clean and specially lubricated.
- Operating the actuator beyond its designed temperature limitations may damage internal and external components and, therefore, could prove potentially dangerous for operating and maintenance personnel.
- Operating the actuator beyond its designated pressure limitations may result in either an actuator malfunction or an actuator explosion and, therefore, could prove potentially dangerous for operating and maintenance personnel.
- **Note:** Do not disassemble the actuator end caps when air pressure is applied to the actuator.

CHAPTER 3: INSTALLATION

Emme Technology actuators can be fitted on many styles of quarter-turn valves, including ball, butterfly and plug and dampers in accordance with the instructions contained in this chapter.

Emme Technology actuators are designed to be easy to install, for this reason a mounting flange (ref. 27 of the actuator exploded view page 8 and **Figure 3.a** and **3.b**) has been designed. The flange is an integral part of the body and is equipped with ISO 5211 drilling (**table a**) in order to allow a male/female or female/male coupling with the valve.




Figure 3.a

Bottom view of **Emme Technology** actuator

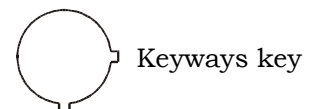
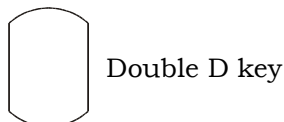
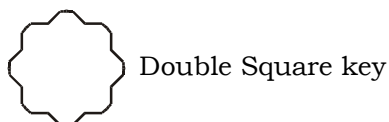
TYPE	DRILLING FLANGE			
	F03 (Ø36)	F04 (Ø42)		
UT05	F03 (Ø36)	F04 (Ø42)		
UT10	F03 (Ø36)	F04 (Ø42)		
UT13	F04 (Ø42)	F05 (Ø50)	F07 (Ø70)	Ø3.250"
UT15	F04 (Ø42)	F05 (Ø50)	F07 (Ø70)	Ø3.250"
UT17	F04 (Ø42)	F05 (Ø50)	F07 (Ø70)	Ø3.250"
UT18	F04 (Ø42)	F05 (Ø50)	F07 (Ø70)	Ø3.250"
UT20	F04 (Ø42)	F05 (Ø50)	F07 (Ø70)	Ø3.250"
UT25	F04 (Ø42)	F05 (Ø50)	F07 (Ø70)	Ø3.250"
UT30	F04 (Ø42)	F05 (Ø50)	F07 (Ø70)	Ø3.250"
UT35	F07(Ø70) + F10 (Ø102)	Ø3.250" + F12 (Ø125)	Ø3.250" + Ø5"	
UT40	F07(Ø70) + F10 (Ø102)	Ø3.250" + F12 (Ø125)	Ø3.250" + Ø5"	
UT45	F07(Ø70) + F10 (Ø102)	Ø3.250" + F12 (Ø125)	Ø3.250" + Ø5"	
UT50	F10 (Ø102)	F12 (Ø125)		
UT55	F10 (Ø102)	F12 (Ø125)		
UT60	F10 (Ø102)	F12 (Ø125)	F14 (Ø140)	
UT65	F10 (Ø102)	F12 (Ø125)	F14 (Ø140)	

Table a

 = Standard

Note: The bracketed numbers indicate the diameter between the holes.

The pinion presents a double – square female drive to allow a large flexibility in mounting; it allows the assembling on valves stem, or coupling, with square key at 45° or at 90° indifferently. On request, bottom pinion female key may be done as double D or cylindrical with one or two keyways.



On the top face of **Emme Technology** actuators there is a NAMUR standard mounting pattern for easy installation of accessories for position survey and/or control devices (Micro Switch Boxes, Positioners, ecc)

Figure 3.b shows an actuator in the normal position (closed) with the pinion flats and the indicator – drive milling perpendicular to the body

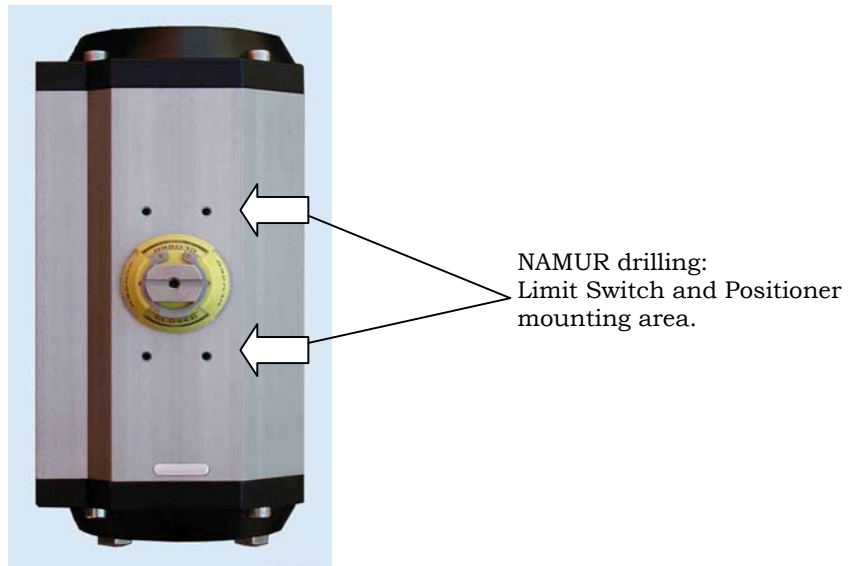


Figure 3.b
Top view of **Emme Technology** actuator

The Ports are NAMUR standard for easy solenoid valve connection

Installation procedure.

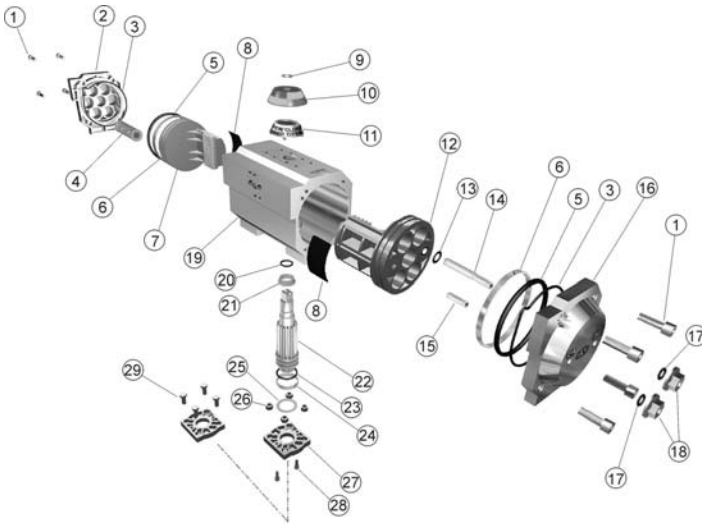
1. Check the coupling female pinion drive – valve stem.
2. Make sure that the valve and the actuator are both in the **closed** position before proceeding (see **Figure 3.b**).
3. Install mounting bracket on the valve and hand tighten all fasteners; be sure not to fully torque bolts until entire assembly is correctly aligned and installed.
4. a) **Mounting with brackets:** Place coupling on valve stem and the actuator on mounting bracket. Align valve and actuator in order to eliminate forces on the system; tighten all the assembly fasteners.
b) **Direct mounting:** Position the actuator on valve; use caution while inserting the valve stem into the double square female pinion drive. Insert the screws from the bottom side of flange and manually tighten them and align the assembly in order to eliminate the forces on the system; tighten all assembly fasteners.

5. Actuate the unit several times to ensure that it works properly. If the unit does not work properly, disassemble the unit and repeat steps 1 – 4. If the problem persists, contact your local **Emme Technology** representative.
6. After the completion of the mounting operations, it is necessary to set the actuator stroke through the travel stops to ensure that the valve works properly. **Emme Technology** actuators have a regulation range from -10° to $+10^{\circ}$ and from 80° to 100° ($\pm 10^{\circ}$ in both open and close directions). (See Chapter 4 – 3 for information on actuator positioning phase).
7. Rotate actuator and valve assembly to desired degree.

CHAPTER 4: MAINTENANCE

Maintenance instructions provide the end user with necessary information for standard examination of O-rings and soft parts for wear. Repair kits consisting of all soft parts are readily available.

EXPLODED VIEW



PARTS LIST

ITEM	DESCRIPTION	MATERIALS
1	END CAP SCREW	AISI 304 STEEL
2	LEFT END CAP	*
3	END CAP O-RING (x)	BUNA-N
4	SPRING CARTRIDGE	SPRING STEEL EPOXY COATED
5	PISTON O-RING (x)	BUNA-N
6	GUIDE RING (x)	TECHNO-POLYMER
7	LEFT PISTON	*
8	PISTON THRUST BLOCK (x)	TECHNO-POLYMER
9	INDICATOR SNAP RING	AISI 304 STEEL
10	INDICATOR (ROTATING PART)	TECHNO-POLYMER
11	INDICATOR (FIX PART)	TECHNO-POLYMER
12	RIGHT PISTON	*
13	REGULATION O-RING (x)	BUNA-N
14	INTERNAL REGULATION SCREW	AISI 304 STAINLESS STEEL
15	STOP BOLT	AISI 304 STAINLESS STEEL
16	RIGHT END CAP	DIE CAST ALUMINUM
17	WASHER	AISI 304 STAINLESS STEEL
18	STOP BOLT NUT	AISI 304 STAINLESS STEEL
19	ACTUATOR BODY	EXTRUDED ALUMINUM ASTM B210 (6063)
20	UPPER PINION O-RING (x)	BUNA-N
21	UPPER PINION BEARING (x)	TECHNO-POLYMER
22	PINION	ASTM A314 (303) STAINLESS STEEL or SAE 11L14 NICKEL PLATED acc. ASTM B733
23	LOWER PINION O-RING (x)	BUNA-N
24	LOWER PINION BEARING (x)	TECHNO-POLYMER
25	WASHER	QUENCHED and TEMPERED STEEL
26	NUTS	AISI 304 STAINLESS STEEL
27	FLANGE	**
28	FLANGE SCREWS	AISI 304 STAINLESS STEEL
29	BOLTS (optionals)	AISI 304 STAINLESS STEEL

LEGEND:

* = Techno-polymer thru UT15, die cast aluminium for larger sizes

** = Techno-polymer thru UT30, die cast aluminium for larger sizes

(x) wear parts

4 - 1 DISASSEMBLING PROCEDURE FOR THE SUBSTITUTION OF O-RINGS, BEARINGS, GUIDE RING AND THRUST BLOCK

CAUTION – PLEASE READ CAREFULLY:

- **BEFORE CARRYING OUT ANY MAINTENANCE ON EMME TECHNOLOGY ACTUATORS, IT IS ESSENTIAL THAT THE ACTUATOR IS NOT UNDER PRESSURE AND IS FREE OF ANY ACCESSORIES.**
- **FOR YOUR SAFETY, IT IS ABSOLUTELY NECESSARY, BEFORE DISASSEMBLING A SPRING RETURN ACTUATOR, THAT THE UNIT IS IN THE FAILSAFE POSITION (SPRINGS EXTENDED AND NOT COMPRESSED).**

1. Disconnect all electrical and air supplies from the actuator.
2. Remove the actuator from the mounting bracket and place in a clean environment.
3. After removing the end cap screws (ref. 1), remove the end caps (ref. 2 and 16).
4. Remove O-Rings (ref. 3) from the end caps and inspect their wear and lubrication.
5. Remove the internal regulation screw (ref. 14) and the stop bolt (ref. 15), located in the right end cap.
6. Using a wrench on the appropriate mill on the upper part of pinion (ref. 22), turn the pinion counter-clockwise until the pistons (ref. 7 & 12) protrude further out from the cylinder to be removed.
7. Remove the pistons by hand or with pliers, taking the pistons from the spring grooves and using caution not to damage the pistons' surfaces. **Note:** If actuator is fail counter-clockwise (**mounting B**), pinion must be rotated in the opposite direction.
8. Remove O-Rings (ref. 5), guide ring (ref. 6) and thrust block (ref. 8) from the left and right pistons.
9. Remove the screws (ref. 28) from the bottom side of the flange (ref. 27) and turn over the actuator. Firmly tap the upper part of the pinion on a wood surface, to prevent damage of the pinion. Remove the unit flange – pinion through the bottom of the body (ref. 19).
10. Remove the pinion from the flange.
11. Remove the washer (ref. 25).
12. Remove the O-Rings and the bearings (ref. 20, 21, 23 and 24) from the pinion.
13. Inspect and replace the following wearing parts as necessary:

<i>General</i>	<i>Reference</i>	<i>Detail</i>	<i>Qty.</i>
End cap (ref. 2 & 16)	3	End cap O-Rings	2
Piston (ref. 7 & 12)	5	Piston O-Ring	1
	6	Piston guide ring	2
	8	Piston thrust block	1
Travel stop (ref. 14 & 15)	13	Stop bolt O-Ring	1
	17		
Pinion (ref. 22)	20	Pinion O-Ring (upper)	1
	21	Pinion bearing (upper)	1
	23	Pinion O-Ring (lower)	1
	24	Pinion bearing (lower)	1

All these soft parts are included in **Emme Technology** repair kits.

4 – 2 LOW/ HIGH TEMPERATURE O-RINGS INSTALLATION

1. Disassemble the actuator as described in chapter 4 – 1.
2. Using a screw driver, remove the following O-Rings from the actuator:
 - a. Pistons (ref. 5).
 - b. End caps (ref. 3).
 - c. Upper pinion (ref. 20).
 - d. Lower pinion (ref. 23).
3. Using alcohol, or another mild solvents, remove the lubrication from each actuator parts and carefully clean all the surfaces before inserting a new set of O-Rings.
4. Divide the O-Rings and indicate their position of installation:
 - a. Piston O-Rings: they are the thickest O-Rings (ref. 5)
 - b. End cap O-Rings: they have the biggest diameter (ref. 3)
 - c. Pinion O-Rings: of the remaining O-Rings, the large diameter O-Rings goes on the Lower O-Ring groove (ref. 23) and the smaller diameter on the Upper O-Ring groove (ref. 20)
 - d. Stop bolt O-Ring (ref. 13)
5. Install the low/high temperature O-Ring set. If this operation is too difficult, the O-Rings can be slightly stretched and greased to ease installation. When installing the end cap O-Ring be sure to seat them properly, otherwise they might be pinched during the end cap installation (ref. 1 & 16).
6. Apply grease to the following internal part of actuator:
 - a. Inner bore of actuator
 - b. Piston wear surfaces (O-Ring, guide ring and thrust block)
 - c. Piston rack
 - d. Pinion gear teeth
 - e. Pinion wear surfaces and O-Rings

7. Assemble the actuator as described in chapter 4 – 3.

4 – 3 ASSEMBLY PROCEDURE

1. Insert O-Rings (ref. 20 & 23) and bearings (ref. 21 & 24) on pinion (ref. 22).
2. Insert nuts (ref. 26) and the washer (ref. 25) in the appropriate grooves of the flange (ref. 27): this operation reduces friction and wear.
3. Insert the pinion in the flange.
4. Insert the unit pinion–flange into the actuator body (ref. 19) pushing until the flange is completely inserted into the body.
5. Tighten the flange screws (ref. 28).
6. **Intermediate test:** using a wrench and acting on the appropriate mill on the upper part of the pinion. Manually rotate the pinion to make sure it freely rotates.
7. Insert the O-Rings (ref. 5), the guide ring (ref. 6) and the thrust block (ref. 8) on the left and right pistons (ref. 7 & 12).
8. **Piston insertion:** This operation can be performed in two different ways in order to obtain either a fail clockwise actuator (**mounting A - FCW**) or a fail counter clockwise actuator (**mounting B - FCCW**). “Right piston” is the piston which contains a hole, as opposed to the “left piston” which does not contain a hole. While facing the supply holes of the actuator body, insert the left piston on the left end of body and right piston on the right end.

8a. Mounting A:

Left piston insertion.

- Place the actuator in a stand up position on its right side with the flange facing you and the supply holes on your right.
- To obtain the counter clockwise rotation (mounting A) it is necessary to insert the rack of the piston to the left of the pinion.
- Insert the left piston applying pressure with hands until the piston is completely in the body.

Right piston insertion.

- Place the actuator in a stand up position on its left side with the flange facing you.
- Insert the rack of the piston to the left of the pinion.
- Insert the right piston applying pressure with hands until the piston is completely in the body.

- 8b. **Mounting B:** follow the same steps as above, but inserting the rack of both pistons on the right of the pinion.

9. Actuator positioning phase:

- 9a.** Place the actuator in a stand up position on a flat surface with the upper part of the pinion on the right side.
- 9b.** Manually apply pressure to the piston, as this will assist to compress the opposite piston.
- 9c.** While continuing to apply pressure, use a wrench on the appropriate mill of the upper portion of the pinion and rotate the pinion counter clockwise. At this point there must be clicking sound due to the interlocking between the piston rack and the pinion tooth. Make sure to create an individual sound per tooth.
- 9d.** After each individual sound, rotate the pinion clockwise; verify that the pinion Namur mill is about 10° beyond the perpendicular to the body axis. If problematic, repeat step 9c.
- 9e.** Double check the correct assembly of the actuator, confirming that the open position pistons are of equal distance from the cylinder border.

10. End cap mounting:

- 10a.** Insert the end cap O-Rings (ref. 3) into their grooves by following the shape of the grooves with a finger to ensure that the O-Rings are properly seated.
- 10b.** Insert the stop bolt (ref. 15) and the internal regulation screw (ref.14) into the right end cap (ref. 16) from the external side of the end cap. Screw clockwise until they appear inside the end cap.
- 10c.** Insert the O-Rings (ref. 13), the washer (ref. 17) and the nuts (ref. 18).
- 10d.** Insert the end cap screws (ref. 1) and tighten them in an alternating order to the factory torque standard (see Table b).

ACTUATOR TYPE	TORQUE Nm (In.Lbs)
UT15	8 (70)
UT20 - UT25	12 (106)
UT30 - UT35 UT40 - UT45	15 (133)
UT50 - UT55 UT60 - UT65	22 (193)

Table b**11. Adjustment:**

- Supply low pressure compressed air to Port 2 (see drawings Chapter 2 – 1). Using a hex key wrench, turn the internal regulation screw until the pinion shaft is perpendicular to the actuator axis (0° position); tighten the nut to the respective standard of the torque listed in **Table b**.
- Next, supply low pressure compressed air to Port 4 to open the actuator. The pinion shaft must be at a 90° position (with respect to the 0° position), aligned with the actuator axis. If it is not aligned, act on the stop bolt and tighten the nut to the respective standard of the torque listed in table b.

4 - 4 SPRING CARTRIDGE INSERTION

Emme Technology actuators can be easily converted from Double Acting to Spring Return by changing the spring number and configuration inside the end cap. **Emme Technology** actuators can accept up to **5 springs in the right end cap** and **7 in the left end cap**. We advise the insertion of at least two spring cartridges in each end cap in order to have a uniform distribution of forces on the pistons. The number of the springs loaded affects the torque value the actuator will be able to generate during its working cycle. See Chapter 5 and the **Emme Technology** data sheet to properly size a spring return actuator.

Springs Installation Procedure:

1. Remove the four end cap screws (ref. 1) from the right and left end caps;
2. Remove the end caps;
3. Insert the correct number of spring cartridges into **each** end cap (i.e. UT15-S4 = 4 + 4 springs) referring to **Table c**. It is strongly advised to insert the plastic part of the cartridge containing the deep hole into the appropriate end cap seat.

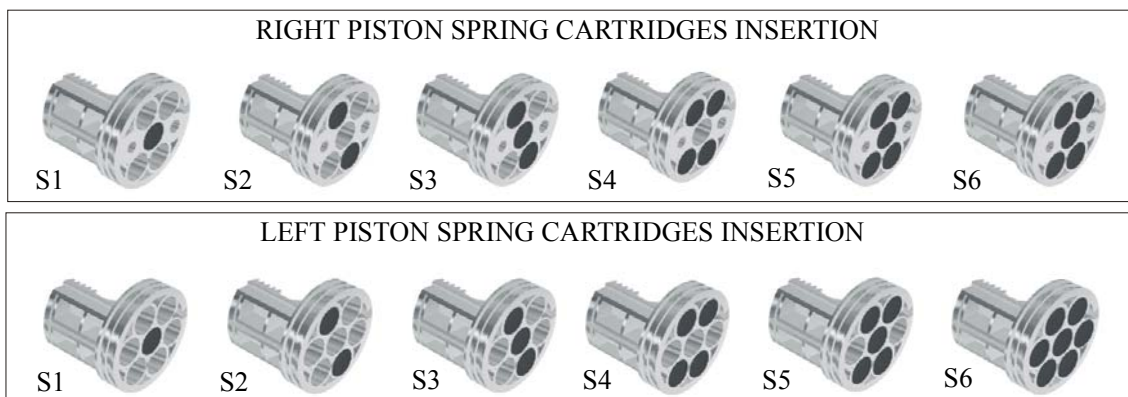


Table c

WARRANTY

Emme Technology provides the following warranty regarding products manufactured by it. Emme Technology warrants its products to be free from defects in materials and workmanship when these products are used for the purposes for which they were designed and manufactured. Emme Technology does not warrant its products against chemical or stress corrosion or against any other failure other than from defects in material or workmanship.

The warranty period is 12 (twelve) months from shipment date.

Any claim regarding this warranty must be in writing and received by Emme Technology before the last effective date of the warranty period. Upon Emme Technology's receipt of a warranty claim, Emme Technology reserves the right to inspect the product(s) in question either at the filed location or at Emme Technology manufacturing plant. If, after inspection of such product(s), Emme Technology determines that the purchaser's claim is covered by this warranty, Emme Technology's sole liability and the purchaser's sole remedy under this warranty is limited to the refunding of the purchase price or repair or replacement thereof a Emme Technology's option. Emme Technology will not be liable for any repairs, labor, material or other expenses that are not specifically authorized in writing by Emme Technology, and in no event shall Emme Technology be liable for any direct or consequential damages arising out of any defect from any cause whatsoever.

This warranty is null and void in the following cases:

- any Emme Technology product is disassembled, modified or altered at any location other than Emme Technology, Sesto San Giovanni (Milan) Italy
- improper installation
- if products are used for purposes for which they were not designed and manufactured.

Any product sold by Emme Technology but manufactured by companies other than Emme Technology, is not covered by this warranty. The warranty for such products shall be subject only to the warranty relief, if any, provided by the suppliers and/or manufactures of such products.

NOTE: in continuing research to improve and expand the range of its product, Emme Technology reserves the right to change or modify product design or construction without prior notice and without incurring in any obbligation to make such changes or modifications on products previously or subsequently sold.

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