

# 1166 BUTTERFLY VALVES WITH AP RE PNEUMATIC ACTUATOR

## FEATURES

The 1166 butterfly valve is intended for the automatic opening/closing of corrosive (acid) fluid lines where a high resistance to corrosion and/or temperature is required. The two-parts body of the valve is made of cast iron GS, and the butterfly of stainless steel. The PTFE liner is in accordance with EC 1935/2004 regulation allowing its use on food applications. Lug type with threaded ears, mounting between PN10/16 flanges. This type of connection allows the dismantling of the downstream pipe without draining the installation. The ISO 5211 mounting pad allows the actuator to be directly assembled. The AP RE (adjustable stops) pneumatic motorization is available in double and spring-return with numerous options.



On request



## LIMITS OF USE

|                               |                                      |
|-------------------------------|--------------------------------------|
| Fluid pressure : PS           | 16 bar up to DN 150<br>10 bar beyond |
| Mounting at the end of a line | 6 bar                                |
| Fluid temperature : WT        | -25°C / +200°C                       |
| Ambiant temperature           | -15°C / +80°C                        |
| Motor compressed air          | mini 6 bar / maxi 10 bar             |



## AVAILABLE MODELS

DN 40 to DN 300.

Connection between flanges PN10/16.

Double and spring-return effect actuator.

## DIRECTIVES AND MANUFACTURING STANDARDS

| OBJECT                                  | Standard                       | ON   | OBJECT                           | Standard           |
|-----------------------------------------|--------------------------------|------|----------------------------------|--------------------|
| Pressure Equipment Directive 2014/68/EC | Cat. III modules H             | 0094 | Final test                       | ISO 5208           |
| ATEX Directive                          | II 2G/D Tx zones 1,2,21 and 22 | 0038 | Face to face dimension           | ISO 5752 séries 20 |
| Flange dimension                        | EN 1092-1                      |      | Actuator pilot connection        | NAMUR              |
| Connection Motorisation                 | ISO 5211                       |      | Switch box connection            | VDI/VDE 3845       |
|                                         |                                |      | SIL 3 level (the actuator alone) | NKS 61508          |

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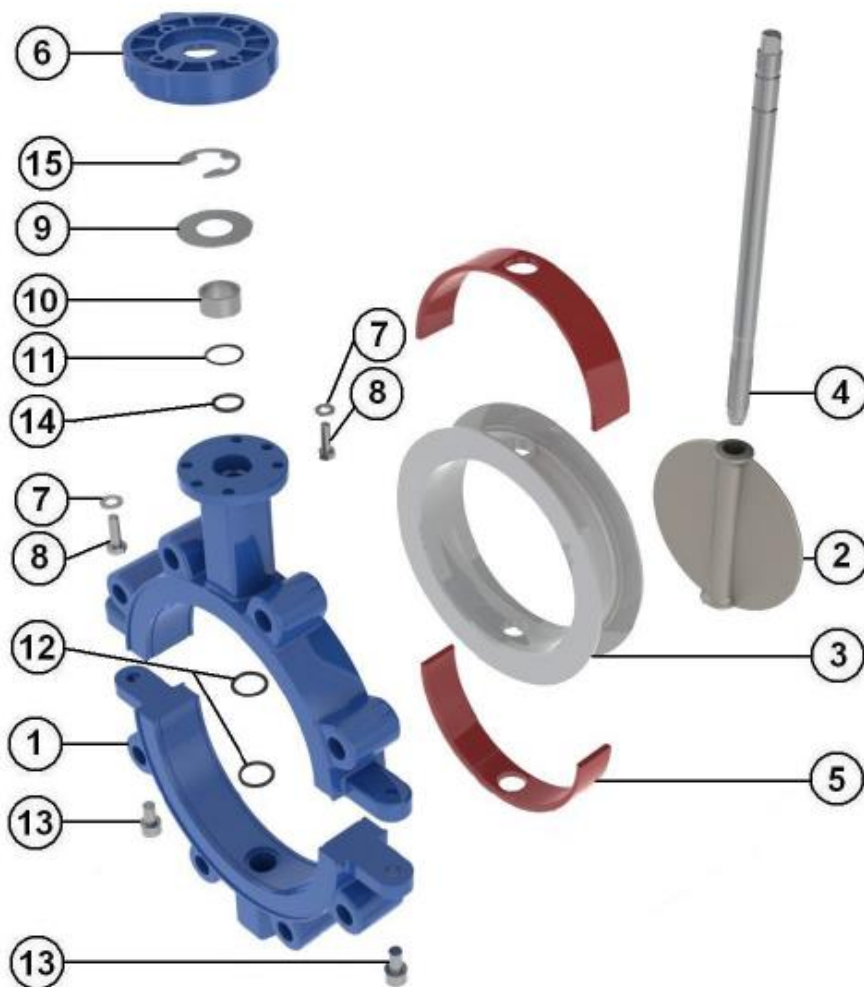


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## CONSTRUCTION



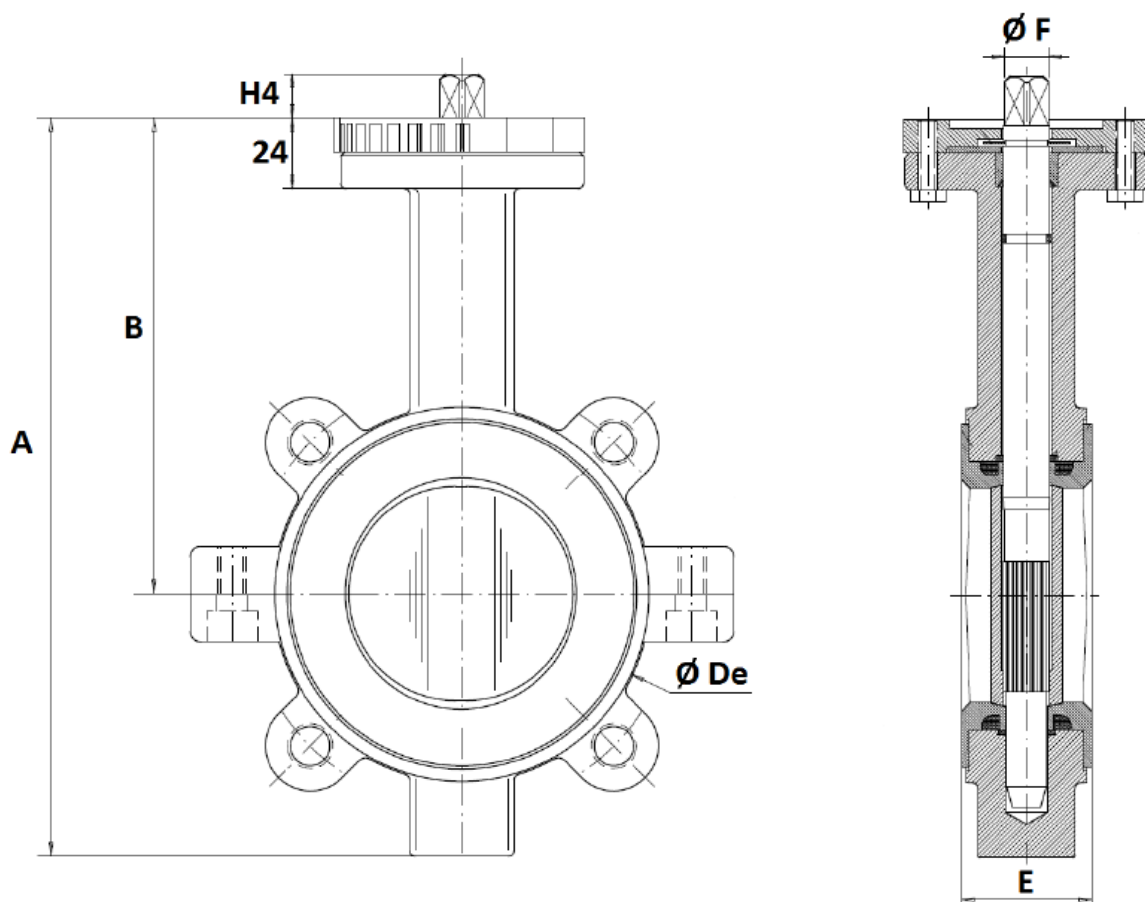
| No° | Name                      | Material                                                            |
|-----|---------------------------|---------------------------------------------------------------------|
| 1   | Body                      | 250-300 µ. Rilsan coated ductile iron EN GJS-500-7 - RAL 5024 color |
| 2   | Disc                      | ASTM A351 CF8M                                                      |
| 3   | Seat                      | PTFE                                                                |
| 4   | Stem DN 40-50 and 150-300 | SS 17 4-PH ( 630 )                                                  |
| 4   | Stem DN 65 - 125          | AISI 316                                                            |
| 5   | Insert                    | Silicone                                                            |
| 6   | Plate                     | Aluminium                                                           |
| 7   | Washer                    | A4                                                                  |
| 8   | Plate screw               | A4                                                                  |
| 9   | Ring                      | AISI 316                                                            |
| 10  | Socket                    | AISI 316                                                            |
| 11  | O ring                    | FKM                                                                 |
| 12  | O ring                    | FKM                                                                 |
| 13  | Screw                     | A4                                                                  |
| 14  | O ring                    | FKM                                                                 |
| 15  | Circlips                  | AISI 316                                                            |
|     | Handle                    | Aluminium ADC10 with epoxy painting 50µ thickness                   |

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## DIMENSIONS (mm) DN40 to DN65



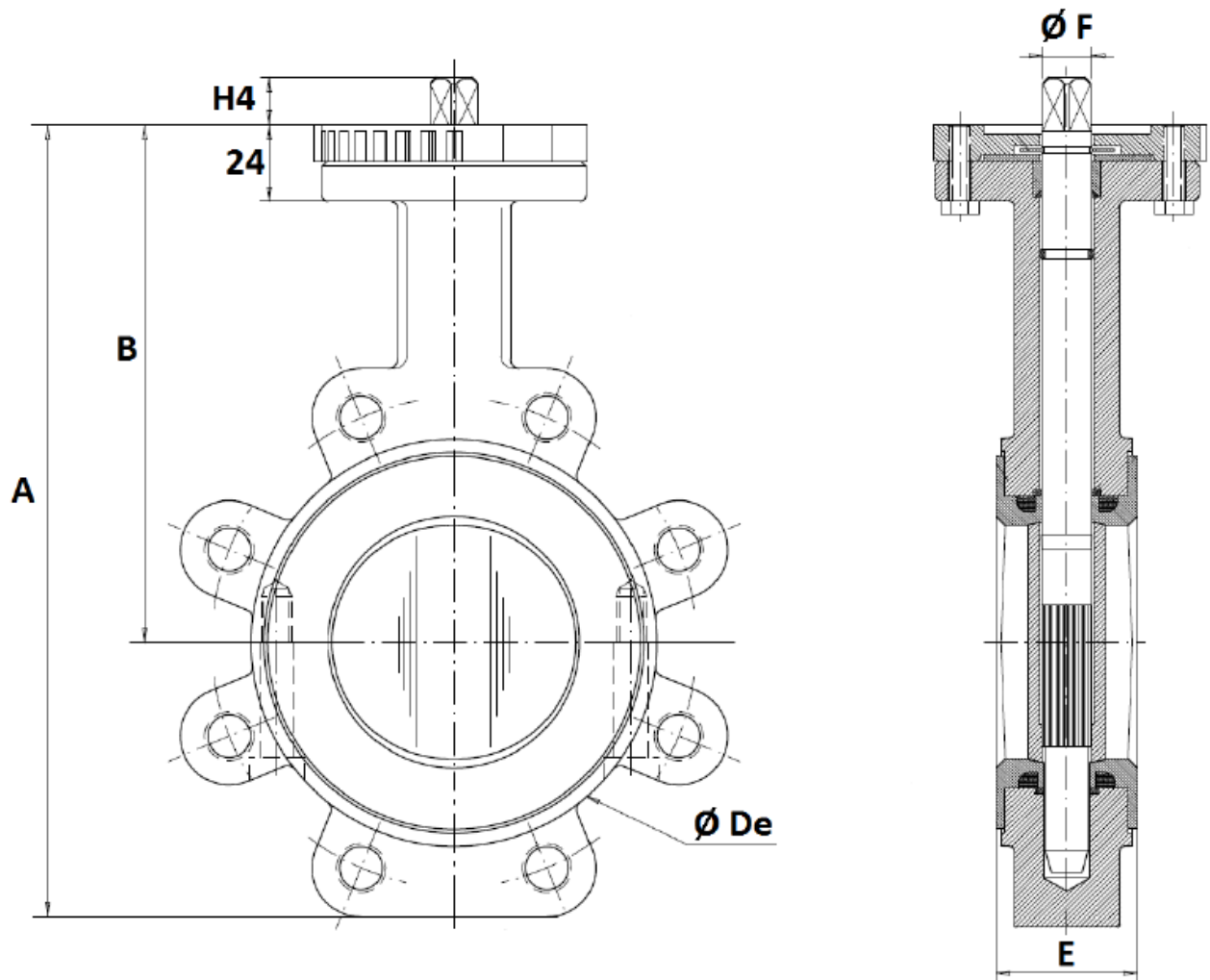
| DN          | 40  | 50  | 65  |
|-------------|-----|-----|-----|
| A           | 205 | 226 | 242 |
| B           | 140 | 156 | 161 |
| Ø De        | 82  | 103 | 116 |
| E           | 33  | 43  | 46  |
| Ø F         | 9,5 | 9,5 | 12  |
| H4          | 14  | 14  | 16  |
| Weight (kg) | 3   | 4   | 5   |

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## DIMENSIONS (mm) DN80 to DN200



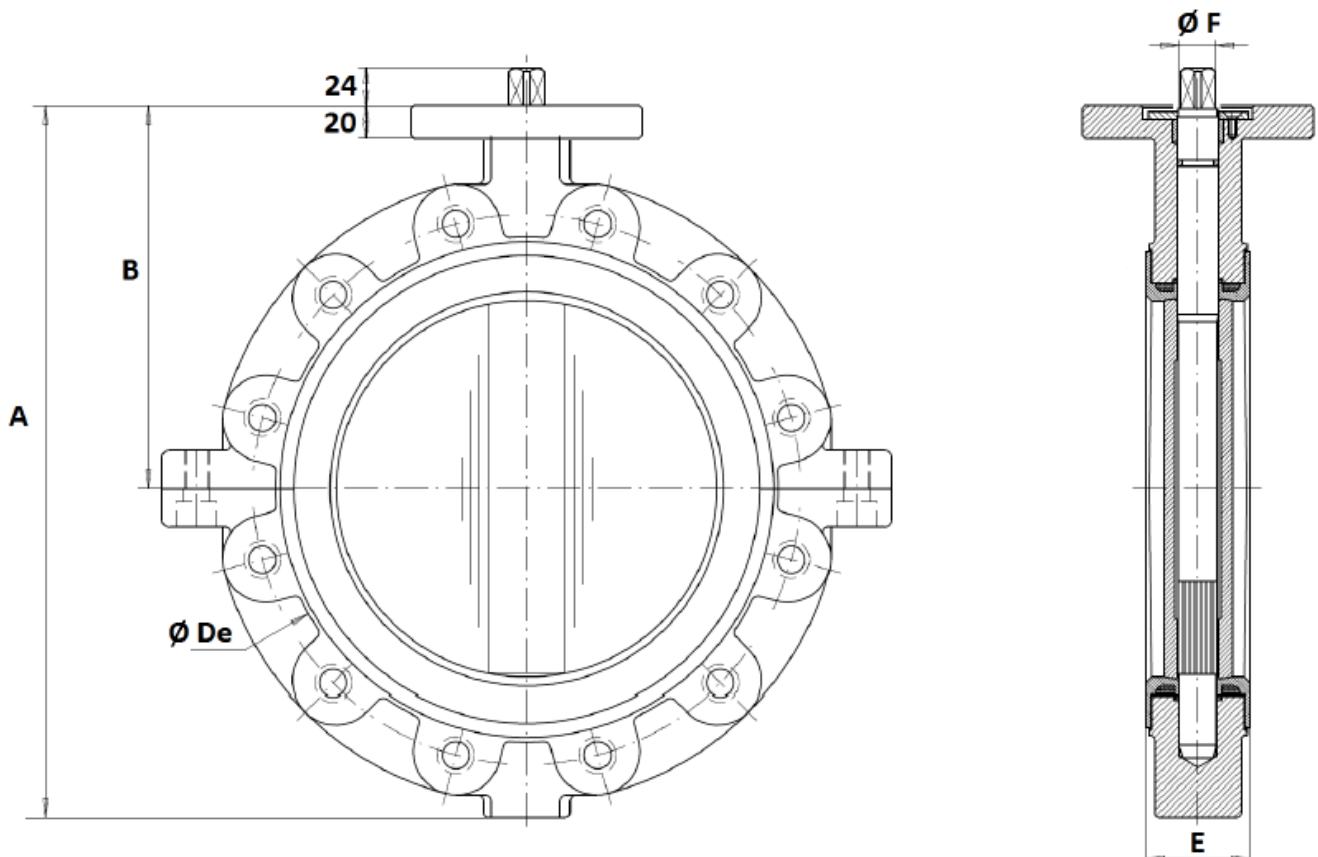
| DN          | 80  | 100 | 125 | 150 | 200 |
|-------------|-----|-----|-----|-----|-----|
| A           | 257 | 288 | 325 | 346 | 437 |
| B           | 167 | 184 | 207 | 215 | 257 |
| Ø De        | 134 | 153 | 185 | 208 | 270 |
| E           | 47  | 52  | 56  | 56  | 60  |
| Ø F         | 14  | 14  | 17  | 17  | 21  |
| H4          | 16  | 20  | 20  | 20  | 24  |
| Weight (kg) | 6,5 | 8   | 11  | 13  | 22  |

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## DIMENSIONS (mm) DN250 to DN300



| DN          | 250 | 300  |
|-------------|-----|------|
| A           | 448 | 514  |
| B           | 248 | 280  |
| Ø De        | 320 | 373  |
| E           | 68  | 78   |
| Ø F         | 23  | 26,5 |
| Weight (kg) | 37  | 58   |

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## FLOW-RATE COEFFICIENT Kv (m³/h)

| DN  | Opening Angle |     |     |     |      |      |      |      |      |
|-----|---------------|-----|-----|-----|------|------|------|------|------|
|     | 10°           | 20° | 30° | 40° | 50°  | 60°  | 70°  | 80°  | 90°  |
| 40  | 3             | 4   | 8   | 17  | 25   | 35   | 45   | 56   | 70   |
| 50  | 3             | 6   | 14  | 22  | 37   | 60   | 95   | 147  | 164  |
| 65  | 4             | 7   | 10  | 22  | 48   | 78   | 140  | 160  | 201  |
| 80  | 5             | 12  | 29  | 52  | 88   | 156  | 216  | 281  | 359  |
| 100 | 9             | 21  | 48  | 87  | 147  | 234  | 346  | 519  | 627  |
| 125 | 19            | 35  | 78  | 148 | 232  | 372  | 562  | 761  | 995  |
| 150 | 28            | 48  | 108 | 203 | 324  | 536  | 865  | 1211 | 1471 |
| 200 | 35            | 91  | 206 | 320 | 554  | 952  | 1427 | 2163 | 2509 |
| 250 | 43            | 143 | 329 | 562 | 865  | 1471 | 2336 | 3460 | 3936 |
| 300 | 69            | 216 | 476 | 770 | 1341 | 2206 | 3460 | 4758 | 5865 |

## Head loss calculations :

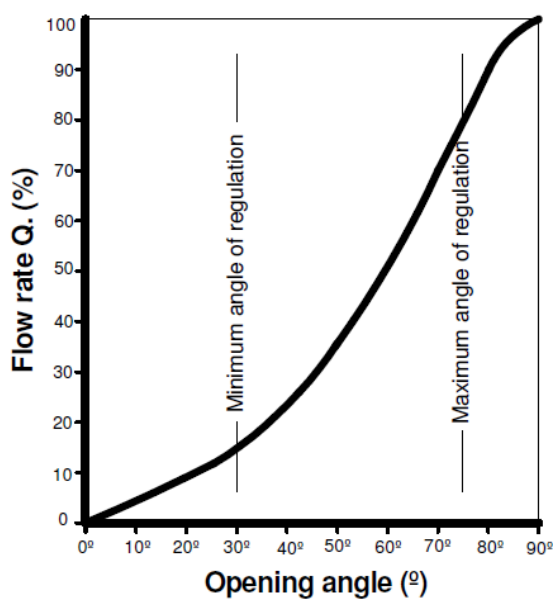
$$\Delta p = (Q / Kv)^2 \times SG$$

Q : flow in m³/h

Δp : head loss in bar

SG : Specific gravity (= 1 for water)

Kv : Volume of water in m³/h, that will flow through a given restriction or valve opening with a pressure drop of 1 bar at 20°C).



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# 1166 BUTTERFLY VALVES WITH AP RE PNEUMATIC ACTUATOR

## AP RE PNEUMATIC MOTORIZATION

The ALPHAIR RE motorisation proposed as standard comprises:

- rack and pinion actuator of anodised aluminium.
- a safety coefficient of 1.3 minimum compared to the nominal torque of the valve.
- air non-lubricated dry motor, minimum 6 bar pressure.
- an upstream / downstream pressure difference  $\Delta P=10$  bar max.

The actuator assembly is of the following types:

- direct assembly with DN 40 to DN 200 aluminium motorisation mounting pad.
- yoke + stainless steel drive according to the EN 15081 standard for DN 125 to DN 300 with RES.

| DN  | Double-effect | V (liters) | Time (s)* | Spring-return | V (liters) | Time (s)* |
|-----|---------------|------------|-----------|---------------|------------|-----------|
| 50  | RE 76         | 0,61       | 1         | RES 101/6     | 1,80       | 2         |
| 65  | RE 76         | 0,61       | 1         | RES 101/6     | 1,80       | 2         |
| 80  | RE 86         | 0,98       | 1         | RES 116/6     | 2,80       | 2         |
| 100 | RE 86         | 0,98       | 1         | RES 116/6     | 2,80       | 2         |
| 125 | RE 101        | 1,80       | 2         | RES 146/6     | 4,90       | 3         |
| 150 | RE 116        | 2,80       | 2         | RES 146/6     | 4,90       | 3         |
| 200 | RE 116        | 2,80       | 2         | RES 161/6     | 8,00       | 3         |

For any other operating conditions, please contact us.

\* indicative time of the no-load actuator for opening or closing.

## INSTALLATION IN AN ATEX ZONE

For 1166+AP RE automatic valves to be installed in ATEX 1, 2, 21 or 22 zones, this has to be specified when ordering. Our services will check of the assembly, the installation of an earthing braid, and will issue an assembly certificate. Our authorised technicians carry out these operations in the workshop. Please contact us.

The special assembly and maintenance instructions for motorised valves in the ATEX zones must be followed.

## OPTIONS DE MOTORISATION

|    |                                                                                                               |
|----|---------------------------------------------------------------------------------------------------------------|
| 1  | actuators dimensioned for a compressed air pressure of 3, 4 or 5 bar                                          |
| 2  | actuator dimensioned for an upstream / downstream pressure difference $\Delta P$ greater than 10 bar          |
| 3  | actuator with special coatings, stainless steel actuator                                                      |
| 4  | Actuator for very low ( $-60^{\circ}\text{C}$ ) or very high ( $+150^{\circ}\text{C}$ ) ambient temperatures. |
| 5  | manual override with declutchable gear box                                                                    |
| 6  | compressed air filter regulator                                                                               |
| 7  | All types of piloting solenoid valves                                                                         |
| 8  | all types of switch boxes                                                                                     |
| 9  | all types of positioner                                                                                       |
| 10 | rapid exhaust, flow-rate limiters - exhaust brakes                                                            |



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# 1166 BUTTERFLY VALVES WITH AP RE PNEUMATIC ACTUATOR

## 114x, 115x AND 116x VALVES + AP ACTUATOR ASSEMBLY AND MAINTAINANCE INSTRUCTIONS

### 1 / CAUTION

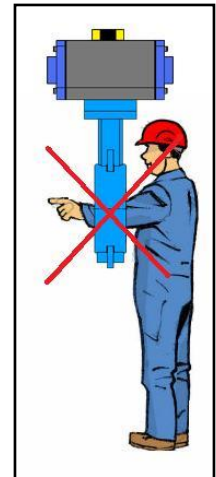


#### 1.1 - Cutting or crushing hazard

Never operate an automatic butterfly valve before its full assembly on the pipe installation. The accidental operation of the butterfly could lead to crushing or cutting of the operator's hand or arm.

#### 1.2 - Burn hazard

**114x, 115x and 116x +AP** automatic valves can include a pilot-operated solenoid valve coil. The coil is intended to be permanently powered. In such a case, the coil could become very hot, hence you should not touch the coil to avoid a burn hazard.



### 2/ CHECKS AT ACCEPTANCE

#### 2.1 - order number check

The valve code is shown on the SECTORIEL label affixed on the actuator. Check that the code is identical with that shown on the delivery slip and the acknowledgement of receipt of your order.

|                                    |                                                        |                      |       |                      |
|------------------------------------|--------------------------------------------------------|----------------------|-------|----------------------|
| <b>SECTORIEL</b><br>38290 - FRANCE | SERIAL NUMBER                                          | <input type="text"/> | VALVE | <input type="text"/> |
|                                    | CODE                                                   | <input type="text"/> | DN    | <input type="text"/> |
|                                    | ACTIO                                                  | <input type="text"/> | MO    | <input type="text"/> |
|                                    | Read the mounting and servicing instructions carefully |                      |       |                      |

#### 2.2 - valve diameter check

The valve code is also shown on the SECTORIEL label affixed on the actuator. Check that the diameter matches that of your pipe installation.

#### 2.3 - flange standard check

**114x and 115x +AP** valves have smooth lugs for mounting between PN10/16 flanges as per the EN 1092-1 standard and ANSI 150 as per the ANSI B16.5 standard. Check that the flanges of the pipe installation correspond to one of these standards.

The **1160-61-62-63-64** valves have internally threaded lugs. They are compatible with PN10/16 flanges up to DN150 and PN10 from DN200 to DN300 as per the EN 1092-1 standard. Check that the pipe installation is as per the standard.

#### 2.4 - power supply voltage check

The power supply voltage of the pilot solenoid valve is shown on the coil. Check that the voltage matches that expected for the control of the automatic valve.

#### 2.5 - compressed air supply pressure check

The supply pressure of the actuator is shown on the actuator's plate. Check that the compressed air network feeding the valve is indeed at this pressure. If need be, install a regulator filter upstream.

#### 2.6 - fluid and ambient temperature parameter check

The pressure and temperature limits for the valve in service are shown in the table below. Check that, for your service, the pressure and temperature are compatible with the limits.

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|                       |                                            |
|-----------------------|--------------------------------------------|
| Fluid pressure: WP    | 16 bar up to DN 200<br>10 bar up to DN 400 |
| Fluid temperature: WT | According to the table below               |
| Ambient temperature   | -15°C / +80°C                              |
| Motor compressed air  | minimum 6 bar / maximum 10 bar             |

## 3 / STORAGE INSTRUCTIONS

Follow our "IMESTOCK" instructions for storage.

## 4 / ASSEMBLY INSTRUCTIONS

### 4.1 - Place of installation

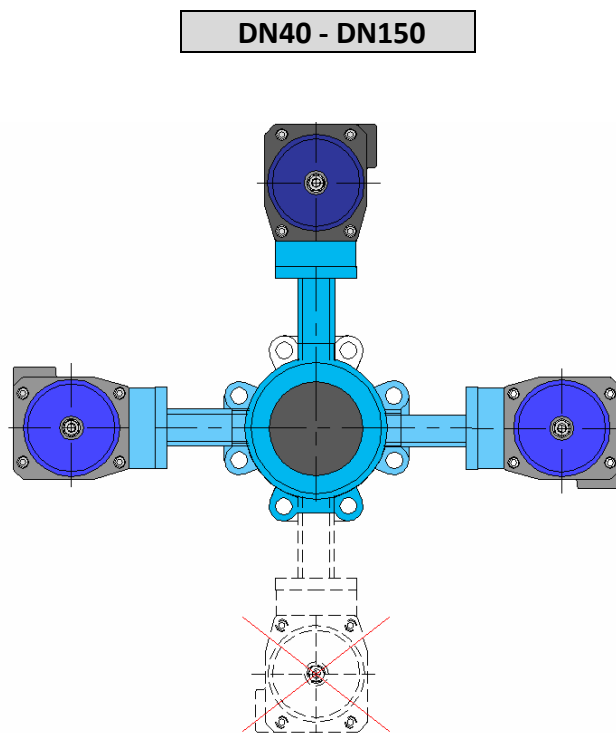
The 114x, 115x and 116x +AP automatic valves can be installed both indoors and outdoors, while complying with the limit temperatures given in § 3.6.

If the valve is equipped with accessories (switch box, pilot solenoid valve), check their service temperatures and their IP code depending upon the place of installation.

### 4.2. - Connection to the pipe installation

#### 4.2.1 - Mounting positions

The automatic valve has to be mounted either vertically or horizontal ly with an actuator, as shown in the diagram below:

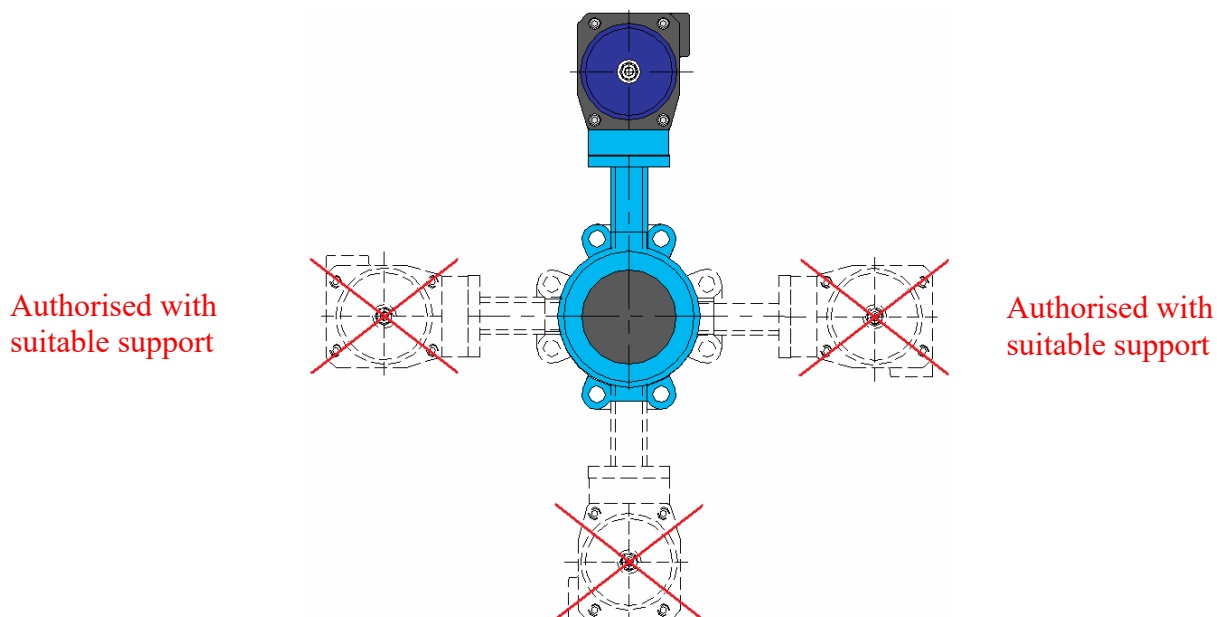


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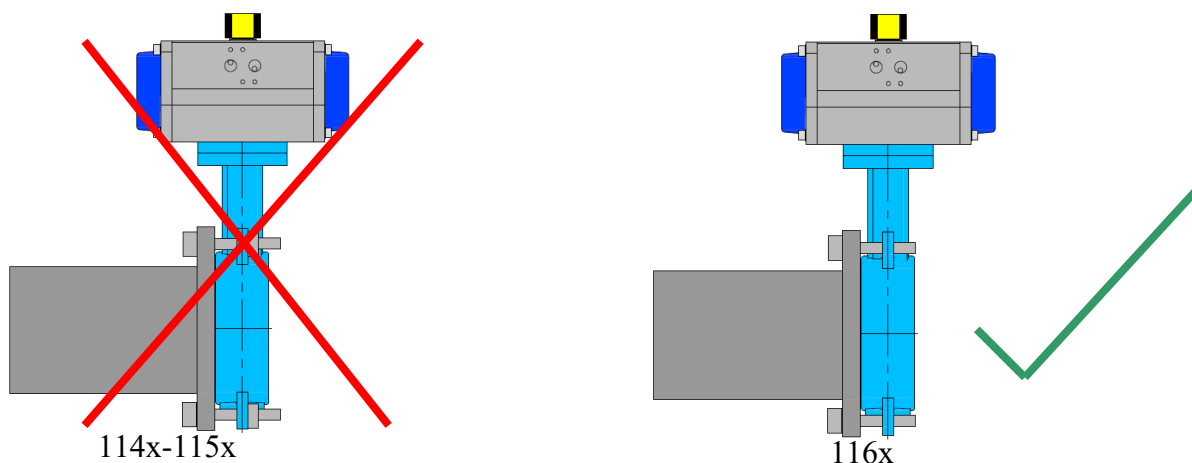
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DN200 - DN400



## 4.2.2 - Mounting at the end of a line

114x and 115x butterfly valves must not be installed at the end of a line. Only the 116x valves can be installed at the end of a line.



Possible blocking of the butterfly: protruding length.

At valve opening, the butterfly protrudes from the body according to the lengths shown in the table below.

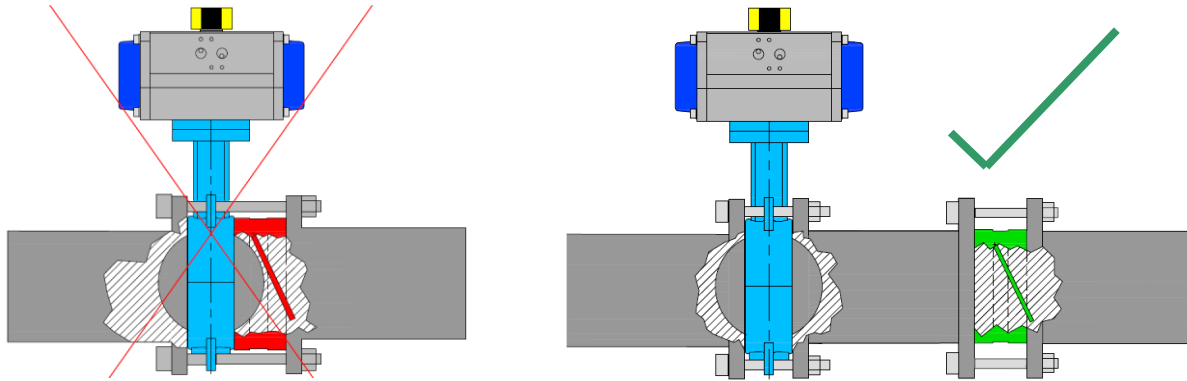
| DN              | 40  | 50  | 65  | 80 | 100 | 120  | 150  | 200 | 250 | 300   | 350 | 400 |
|-----------------|-----|-----|-----|----|-----|------|------|-----|-----|-------|-----|-----|
| Protrusion (mm) | 3,5 | 3,5 | 9,5 | 17 | 24  | 33,5 | 45,5 | 69  | 90  | 110,5 | 131 | 148 |

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## 1166 BUTTERFLY VALVES WITH AP RE PNEUMATIC ACTUATOR

You must take it into account at mounting and not abut another valve element immediately upstream and downstream which could block the movement of the butterfly (e. g. a swing valve).



### 4.2.3 - Mounting precautions:

Before any intervention on the valve, please follow the following indications:

Before installing the valve, clean the piping (brazing residues, metal swarf, sealing material, etc.).

Isolate the pipe installation upstream and downstream.

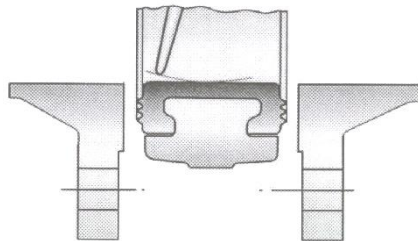
Bleed the pipe installation in order to bring it to ambient temperature and pressure.

Do not force the piping to align it so as to prevent applying stress on the valve body.

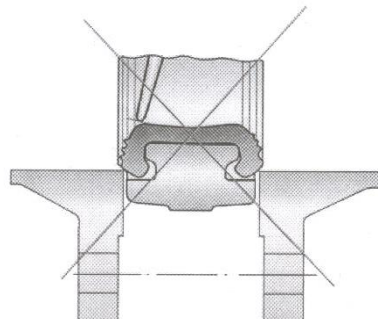
Wear the safety equipment required for this type intervention (gloves and goggles).

### 4.2.4 - Valve installation on the piping

For all asymmetrical devices, check their orientation with regard to the normal direction of flow, and you must mount them in their operating position.



The gap in-between flanges has to be large enough to allow the valve be inserted without the elastic liner getting caught. The butterfly has to be in an almost closed position.

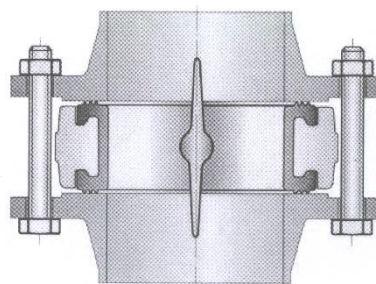


The liner can get damaged if the counter-flanges are not sufficiently spaced.

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# 1166 BUTTERFLY VALVES WITH AP RE PNEUMATIC ACTUATOR



The butterfly has to be in the fully open position after positioning the valve in-between the counter-flanges and before tightening the bolts, otherwise the elastic liner might be deformed or deteriorated during the tightening of the first manoeuvre.

## 4.2.5 - Installation of the double acting AP version

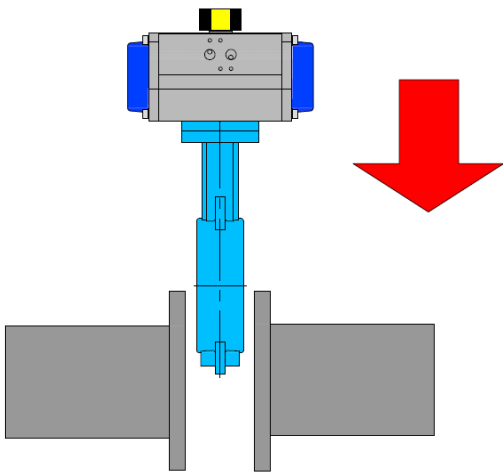
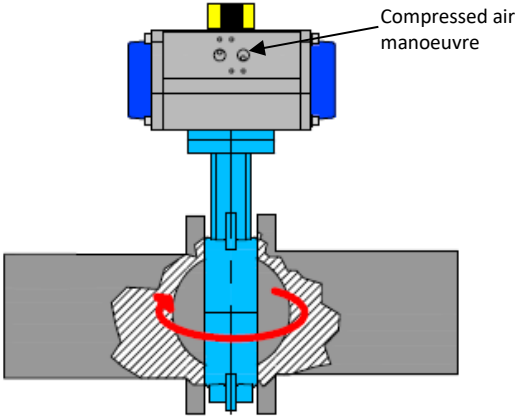
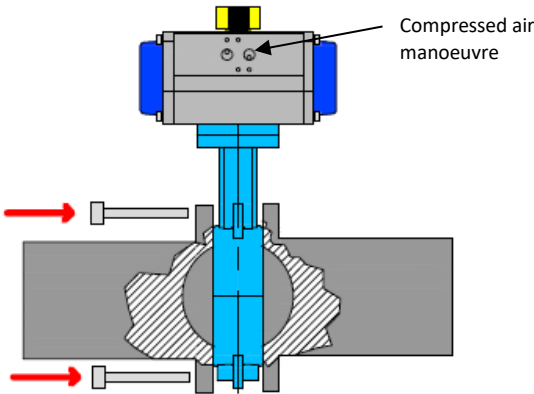
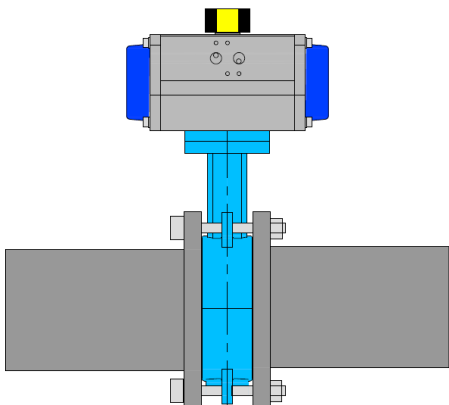
| 1                                                      | 2                                              |
|--------------------------------------------------------|------------------------------------------------|
|                                                        |                                                |
| Lowering of the valve along the pipe installation axis | Compressed air manoeuvre for opening the valve |
| 3                                                      | 4                                              |
|                                                        |                                                |
| Bolting Valve open                                     | Installed valve                                |

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|  |                                                                                                                                                                                                                                                                              |       |               |
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|  |                                                                                                                                                                                                                                                                              | Ref.  | TDS1166+AP-RE |
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# 1166 BUTTERFLY VALVES WITH AP RE PNEUMATIC ACTUATOR

## 4.2.6 - Installation of the single acting NC (normally closed) AP version

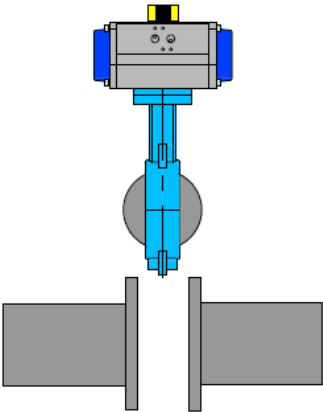
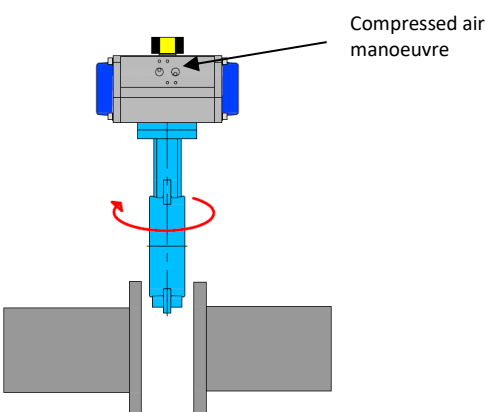
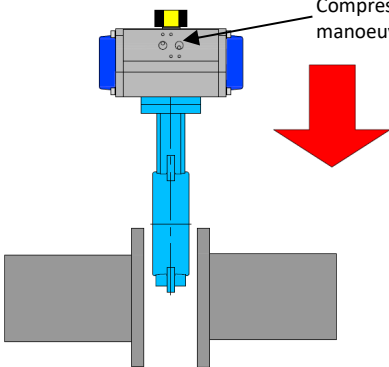
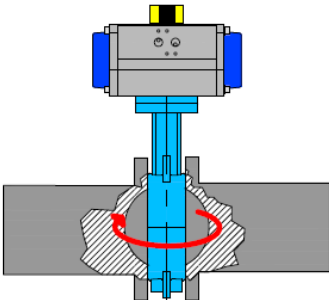
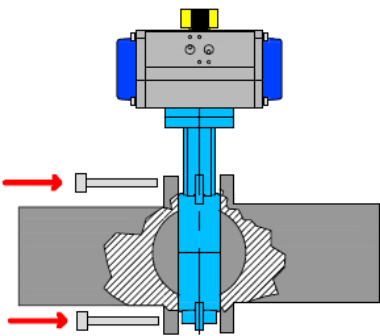
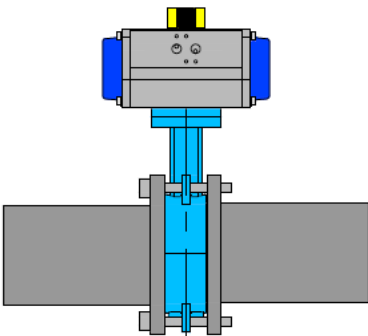
| 1                                                                                   | 2                                                                                                                                                                                          |
|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    |                                                                                                          |
| <p>Lowering of the valve along the pipe installation axis.</p>                      | <p>Compressed air manoeuvre throughout the installation, for opening the valve. Indeed, if the air supply is cut-off, the valve will be closed by the return of the actuator's spring.</p> |
| 3                                                                                   | 4                                                                                                                                                                                          |
|  |                                                                                                        |
| <p>Bolting Open valve</p>                                                           | <p>Installed valve</p>                                                                                                                                                                     |

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|                                                                                     |                                                                                                                                                                                                                                                                                         |              |                      |
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|                                                                                     |                                                                                                                                                                                                                                                                                         | <p>Ref.</p>  | <p>TDS1166+AP-RE</p> |
|                                                                                     |                                                                                                                                                                                                                                                                                         | <p>Rev.</p>  | <p>02</p>            |
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# 1166 BUTTERFLY VALVES WITH AP RE PNEUMATIC ACTUATOR

## 4.2.7 – Installation of the single acting NO (normally open) AP version

|                                                                                                                                    |                                                                                                                                    |
|------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>1</b></p>                                   | <p><b>2</b></p>  <p>Compressed air manoeuvre</p> |
| <p>Valve normally closed</p>                                                                                                       | <p>Compressed air manoeuvre for closing the valve</p>                                                                              |
| <p><b>3</b></p>  <p>Compressed air manoeuvre</p> | <p><b>4</b></p>                                 |
| <p>Lowering of the valve along the pipe installation axis</p>                                                                      | <p>Valve opening by the return of the AP's spring</p>                                                                              |
| <p><b>5</b></p>                                 | <p><b>6</b></p>                                |
| <p>Open valve bolting</p>                                                                                                          | <p>Installed valve</p>                                                                                                             |

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|                                                                                     |                                                                                                                                                                                                                                                                                         |              |                      |
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|                                                                                     |                                                                                                                                                                                                                                                                                         | <p>Date</p>  | <p>10/2025</p>       |

# 1166 BUTTERFLY VALVES WITH AP RE PNEUMATIC ACTUATOR

## 4.2.8 - connection to the pipe installation

Nuts and bolts for PN10/16 114x and smooth lug 115x

| DN  | ØD   |      | ØK   |      | Hole number |      | Nuts and bolts |      |
|-----|------|------|------|------|-------------|------|----------------|------|
|     | PN10 | PN16 | PN10 | PN16 | PN10        | PN16 | PN10           | PN16 |
| 40  | 150  |      | 110  |      | 4           |      | M16x90         |      |
| 50  | 165  |      | 125  |      | 4           |      | M16x100        |      |
| 65  | 185  |      | 145  |      | 4           |      | M16x110        |      |
| 80  | 200  |      | 160  |      | 8           |      | M16x110        |      |
| 100 | 220  |      | 180  |      | 8           |      | M16x120        |      |
| 125 | 250  |      | 210  |      | 8           |      | M16x130        |      |
| 150 | 285  |      | 240  |      | 8           |      | M20x140        |      |
| 200 | 340  |      | 295  |      | 8           | 12   | M20x140        |      |
| 250 | 395  | 405  | 350  | 355  | 12          | 12   | M20x160        | M24x |
| 300 | 445  | 460  | 400  | 410  | 12          | 12   | M20x160        | M24x |
| 350 | 505  | 520  | 460  | 470  | 16          | 16   | M20x170        | \    |
| 400 | 565  | 580  | 515  | 525  | 16          | 16   | M24x200        | \    |

Nuts and bolts for PN10/16 116x and threaded lug 118x

| DN  | ØD   |      | ØK   |      | Hole number |      | Nuts and bolts                 |         |
|-----|------|------|------|------|-------------|------|--------------------------------|---------|
|     | PN10 | PN16 | PN10 | PN16 | PN10        | PN16 | PN10                           | PN16    |
| 40  | 150  |      | 110  |      | 4           |      | Zinc-plated M16x30 steel screw |         |
| 50  | 165  |      | 125  |      | 4           |      | VAZ M16x35                     |         |
| 65  | 185  |      | 145  |      | 4           |      | VAZ M16x35                     |         |
| 80  | 200  |      | 160  |      | 8           |      | VAZ M16x40                     |         |
| 100 | 220  |      | 180  |      | 8           |      | VAZ M16x40                     |         |
| 125 | 250  |      | 210  |      | 8           |      | VAZ M16x45                     |         |
| 150 | 285  |      | 240  |      | 8           |      | VAZ M20x45                     |         |
| 200 | 340  |      | 295  |      | 8           | 12   | VAZ M20x45                     |         |
| 250 | 395  | 405  | 350  | 355  | 12          | 12   | VAZ 20x45                      | VAZ 24x |
| 300 | 445  | 460  | 400  | 410  | 12          | 12   | VAZ 20x60                      | VAZ 24x |
| 350 | 505  | 520  | 460  | 470  | 16          | 16   | VAZ 20x                        | \       |
| 400 | 565  | 580  | 515  | 525  | 16          | 16   | VAZ 24x                        | \       |

## 4.3 - connection to the compressed air supply network

The compressed air connection is performed through the port 1 – G 1/4" threaded – of the pilot solenoid valve.  
Exhausts 3 and 5 - G 1/8" threaded - are factory equipped with silencer filters.

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|                                                                                     |                                                                                                                                                                                                                                  |  |       |               |
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# 1166 BUTTERFLY VALVES WITH AP RE PNEUMATIC ACTUATOR

## 4.4 - pilot solenoid valve connection to the electrical control network

The electrical connection shall be performed by qualified personnel, as per the standards in vigour.

Depending upon the supply voltage, the components have to be earthed as per the standards and local regulations in vigour.

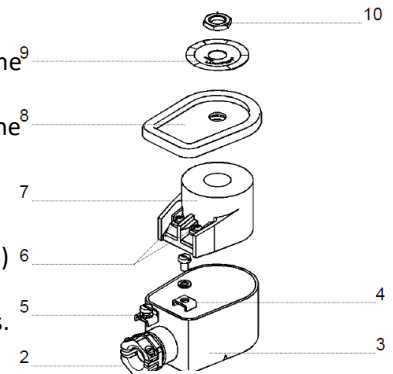
The coil must be wired with the power off.

Remove the coil of the pilot solenoid valve by unscrewing the upper nut.

Slip the cable through the cable clamp and the associated cable gland (M20x1.5)

Connect the cable wires to the coil terminals and to the earth crimp connector.

When the coil is well centred, tighten the cable gland and the cable holding jaws.



## 4.5 - switch box connection to the electrical control network

The electrical connection shall be performed by qualified personnel, as per the standards in vigour.

Depending on the supply voltage, the components



## 4.6 - operating test

Perform an operating test as follows after having made the pneumatic and electrical connections:

A / opening test

- power the coil of the pilot solenoid valve,
- visually check that the valve is open: the switch box indicator must show the OPEN position,

b / closing test

- turn off the power supply to the coil of the pilot solenoid valve,
- visually check that the valve closes instantaneously: the switch box indicator must show the CLOSED position.

## 5 / MAINTENANCE INSTRUCTIONS

### 5.1 - Before any intervention

5.1.1 - Depressurize, drain and bring to ambient temperature, the pipe installation on which the valve is mounted.

5.1.2 - Close the compressed air supply to the actuator and depressurize the actuator. The valve will then close automatically.

5.1.3 - Turn off the electrical supply to the pilot solenoid valve.

5.1.4 - Wear suitable protective equipment.

5.1.5 - Provide means of lifting and support appropriate for the maintenance operation.

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|                                                                                     |                                                                                                                                                                                                                                                                              |       |               |
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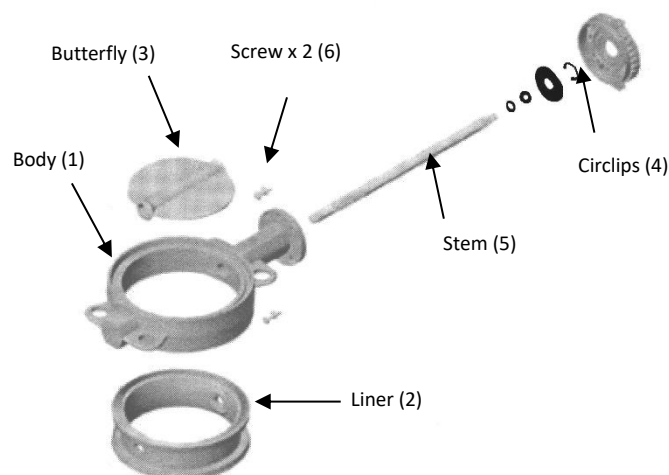
# 1166 BUTTERFLY VALVES WITH AP RE PNEUMATIC ACTUATOR

## Maintenance:

The absence of leak at the liner and at the valve stem should be regularly checked. If a leak occurs at the stem, replace the o-ring, if it occurs at the liner, the liner has to be replaced.

Important: All maintenance and servicing operations must be performed under the best safety conditions. Before any intervention, the valve has to be removed taking the above-mentioned precautions which apply both to mounting and removal.

## Worn part replacement:



Remove the motor actuator. Unscrew the screws (6), remove the circlips (4). This frees the shaft (5), thus enabling the liner (2) and the butterfly (3) to be taken out of the body (1). Replace the worn parts: To obtain the list of spare parts for every valve, please contact our technical department at: +33 (0)474 94 90 70

## 5.2 - Valve maintenance

In the event of a leak on the line, check the state of the butterfly (1) and of the liner (4). If need be, replace them.

### Codes of spare parts:

| DN  | Liner  |        |        |          |        | Butterfly |                 | Stem    |
|-----|--------|--------|--------|----------|--------|-----------|-----------------|---------|
|     | EPDM   | EPDM C | NBR    | SILICONE | FKM    | cast iron | Stainless steel |         |
| 40  | 985946 | 985966 | 985986 |          | 986026 | 9865030   | 9865020         | 9865040 |
| 50  | 985947 | 985967 | 985987 | 986007   | 986027 | 9865031   | 9865021         | 9865041 |
| 65  | 985948 | 985968 | 985988 | 986008   | 986028 | 9865032   | 9865022         | 9865042 |
| 80  | 985949 | 985969 | 985989 | 986009   | 986029 | 9865033   | 9865023         | 9865043 |
| 100 | 985950 | 985970 | 985990 | 986010   | 986030 | 9865034   | 9865024         | 9865044 |
| 125 | 985951 | 985971 | 985991 | 986011   | 986031 | 9865035   | 9865025         | 9865045 |
| 150 | 985952 | 985972 | 985992 | 986012   | 986032 | 9865036   | 9865026         | 9865046 |
| 200 | 985953 | 985973 | 985993 | 986013   | 986033 | 9865037   | 9865027         | 9865047 |
| 250 | 985954 | 985974 | 985994 | 986014   | 986034 | 9865038   | 9865028         | 9865048 |
| 300 | 985955 |        |        |          |        | 9865039   | 9865029         | 9865049 |

In the event of a leak at the stem, check the state of the o-rings of the stem.

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## 5.3 - Actuator maintenance

Refer to the actuator's IME.

## 6 / HELP TO TROUBLESHOOTING

|                                                |                                                                                   |
|------------------------------------------------|-----------------------------------------------------------------------------------|
| The valve stays in the closed position         | Check the electrical power supply to the pilot solenoid valve                     |
|                                                | Check the state of the coil of the pilot solenoid valve                           |
|                                                | Check the compressed air supply                                                   |
|                                                | Check the actuator's sealing                                                      |
| The valve stays in the open position           | Check the absence of power supply to the pilot solenoid valve                     |
|                                                | Check the absence of foreign bodies inside the slides of the pilot solenoid valve |
| No fluid flows in the open position            | Check for clogging of the filter                                                  |
|                                                | Check the upstream pressure on the pipe installation                              |
| Leak on the line when the valve is in position | Check the state of the valve seats.                                               |
| Leak at the valve packing gland                | Check the state of gaskets of the packing gland                                   |

## 7 / INSTRUCTION ON OUR PRODUCT DISPOSAL AND RECYCLING

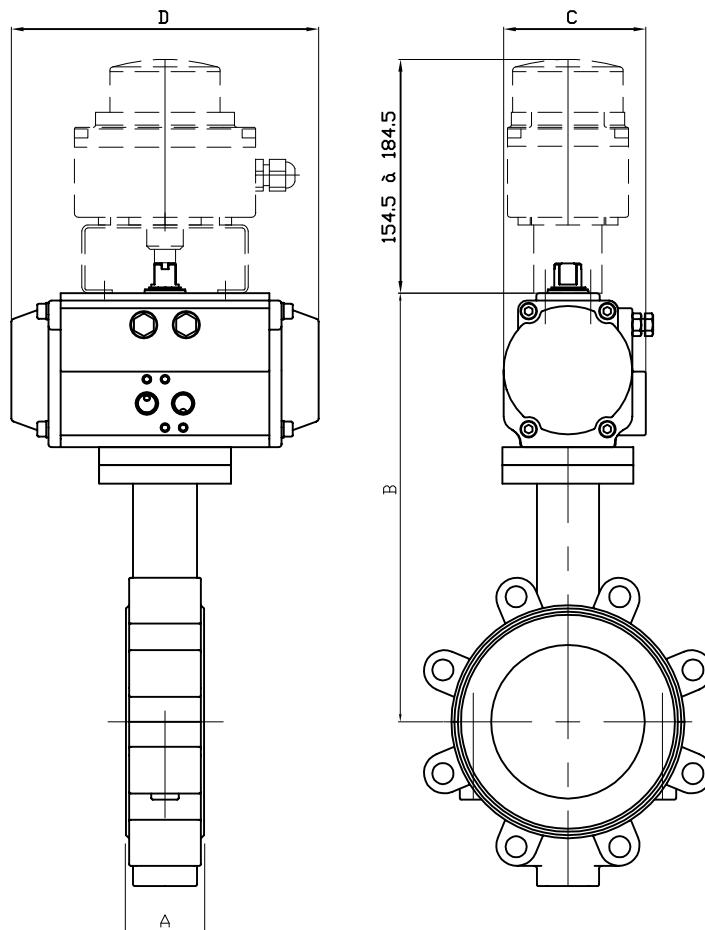
Our valve does not contain any hazardous substance. At the valve end of life, after removing the equipment, the user's obligation is to call a scrap metal collector who will sort and recycle the different parts of the equipment. For your information, the following families of metal are present in our product: steel, stainless steel and aluminium.

With regard to the electrical parts of the equipment, they have to be separated from the rest of the valve and given to a company specialised in recycling waste from electrical and electronic equipment, as per the directive 2002/96/EC.



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\* : montage avec platine H=80mm

| DN      | 50    |        | 65    |        | 80    |        | 100   |        | 125    |        |
|---------|-------|--------|-------|--------|-------|--------|-------|--------|--------|--------|
| ALPHAIR | 76 RE | 101RES | 76 RE | 101RES | 86 RE | 116RES | 86 RE | 116RES | 101 RE | 146RES |
| A       | 43    |        | 46    |        | 47    |        | 52    |        | 56     |        |
| B       | 258   | 283    | 263   | 288    | 279   | 312.5  | 296   | 329.5  | 334    | *464   |
| C       | 94    | 120    | 94    | 120    | 104   | 134    | 104   | 134    | 120    | 165    |
| D       | 203   | 261    | 203   | 261    | 239   | 304    | 239   | 304    | 261    | 398    |
| KG      | 7.08  | 10.84  | 7.9   | 11.64  | 10.83 | 16.73  | 13.33 | 18.23  | 16.84  | 29.19  |

| DN      | 150    |        | 200    |        |
|---------|--------|--------|--------|--------|
| ALPHAIR | 116 RE | 146RES | 116 RE | 161RES |
| A       | 56     |        | 60     |        |
| B       | 360.5  | *472   | 402.5  | *533   |
| C       | 134    | 165    | 134    | 182    |
| D       | 304    | 398    | 304    | 244    |
| KG      | 19.69  | 21.19  | 23.65  | 41.38  |

Informations données à titre indicatif et sous réserve de modifications éventuelles  
data subject to alteration

|                                                                                                                                          |                  |                    |                                |                   |      |      |
|------------------------------------------------------------------------------------------------------------------------------------------|------------------|--------------------|--------------------------------|-------------------|------|------|
| Ech: /                                                                                                                                   | Date :25/01/2023 | Dessiné par : E.D. | Tolérances générales : +/- 0.2 | Modifications     | Date | REV. |
| ROBINET A PAPILLON 1166/BUTTERFLY VALVE 1166 +<br>ACTIONNEUR ALPHAIR RE/PNEUMATIC ACTUATOR<br>ALPHAIR RE + BFC/LIMIT SWITCH BOX          |                  |                    |                                | Matière :         |      |      |
|                                                                                                                                          |                  |                    |                                | Poids (Kg) :      |      |      |
|                                                                                                                                          |                  |                    |                                | Traitement : SANS |      |      |
|  45, Rue du Ruisseau<br>38297 SAINT QUENTIN FALLAVIER |                  |                    |                                | Plan n° Ens 1484  |      |      |



# RE SERIES

**PNEUMATIC ACTUATORS  
WITH EXTERNAL ADJUSTMENT**

**ROTATION 90°**



English edition



**Alphaair**



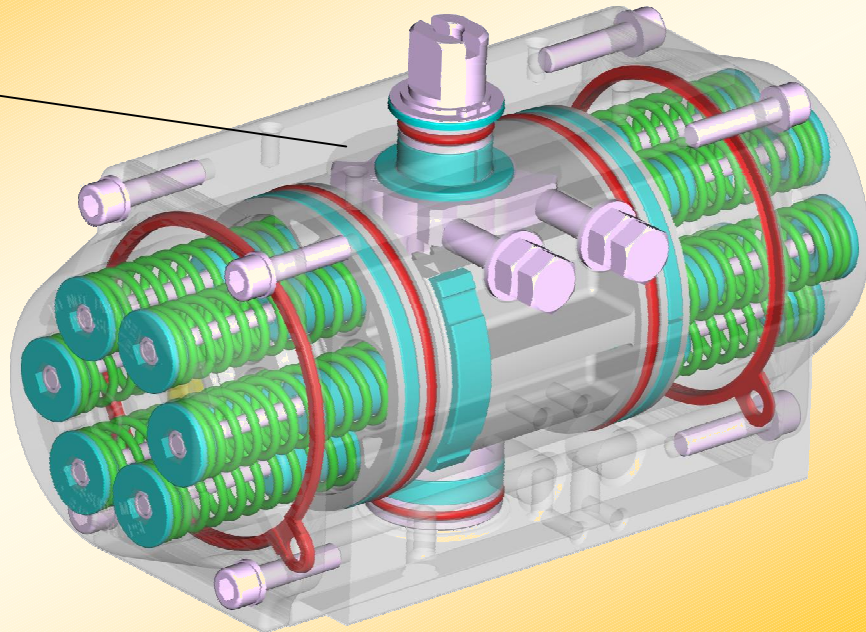
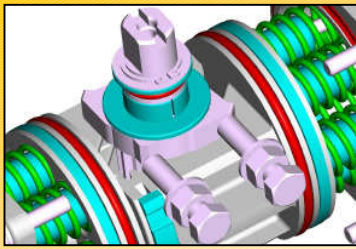
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**SECTORIEL**

**2017**

# ALPHAIR PNEUMATIC ACTUATORS

## EXTERNAL ADJUSTMENT

### New "RE" SERIES



The new series of ALPHAIR Pneumatic Actuators with special "External Adjustment" system meets every quality and precision requirement.

The new "External Adjustment" system guarantees maximum precision on rotation adjusting, for normal and heavy conditions, in any application field.

Suitable for every requirement, ALPHAIR Pneumatic Actuators with special "External Adjustment" system are carefully designed for maximum torque rating and maximum lifetime.

More compact, heavy and reliable, ALPHAIR Pneumatic Actuators with special "External Adjustment" system can be easily assembled on every kind of valve.

#### STANDARD VERSION FEATURES

- **EN AW 6063 extruded aluminium Body**, inside surface finishing Ra= 0,4-0,6. 25 µ Hard Anodizing.
- **EN AB 46100 die-cast aluminium alloy Pistons**, 15 micron Anodizing.
- **EN AB 46100 die-cast aluminium alloy Covers**, painted with 60-80 µ polyester powder.
- **Carbon steel Shaft**, 20 µ nickel-plated. Stainless Steel AISI 304 (A2) or AISI 316 (A4) as Optional.
- **External adjusting gear, made of Stainless Steel AISI 316 (A4).**
- **AISI 316 (A4) Stainless Steel Screws.**
- **NBR nitrile rubber seals.** FPM/FKM or SILICONE on request.
- Acetalic resin + 20% PTFE bearings, for low friction, easily replaceable for maintenance. PA66 or LEXAN on request.
- Pre-compressed Spring Cartridges, easily replaceable for maintenance, 60-80 micron polyester painted.
- High performances Syntetic Grease as standard grease. Special grease supplied for HIGH/LOW/VERY LOW temperatures.
- Several special protections available for chemical, pharmaceutical, food and industrial environments.
- Rotation adjustment  $\pm 5^\circ$  in both opening and closing position. Assembly precision  $\pm 1^\circ$ , made by electronic devices.
- Double lower drilling for valve fastening and centering, according to ISO 5211-DIN 3337 Standards.
- Double square lower female shaft key (starlike), according to ISO 5211-DIN 3337 Standards for assembly on valves with square key on line ( $0^\circ$ ) and diagonal key ( $45^\circ$ ).
- Solenoid connections according to NAMUR VDI/VDE-3845 Standards.
- Top drilling for accessories fastening, and upper shaft end according to NAMUR VDI/VDE-3845 Standards.
- Position indicator on request, enabling switch-box assembly on top.
- Aluminium adhesive nameplates, with progressive serial number punched.
- Lubrication carried out by the manufacturer, guaranteed for min. 1.000.000 operations.
- Running test and 100% seal test carried out with electronic equipment and certification of every individual product.
- Standard execution for temperatures from  $-20^\circ\text{C}$  to  $+80^\circ\text{C}$  (optional, special execution for extreme temperatures).
- Conformity for use in explosive environment; Ex II 2 GD "c" protection type.
- According to EN 15714-3 design and manufacture standard requirements.

| FEEDING                                               | TEMPERATURE RANGE                                                                                                                                                                                                                                                                                                  | SUPPLY PRESSURE                                                       | ROT. ADJUSTMENT                                          |
|-------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------|----------------------------------------------------------|
| Dry or lubricated<br>50 um filtered<br>compressed air | Standard $-20^\circ +80^\circ\text{C}$ ( $-4 +175^\circ\text{F}$ )<br>HIGH Temperature $-20^\circ +150^\circ\text{C}$ ( $-4 +300^\circ\text{F}$ )<br>LOW Temperature $-40^\circ +80^\circ\text{C}$ ( $-40 +175^\circ\text{F}$ )<br>VERY LOW Temperature $-60^\circ +80^\circ\text{C}$ ( $-76 +175^\circ\text{F}$ ) | 8 bar/120 psi<br>Continuous working<br>-<br>10 bar/142 psi<br>MAXIMUM | $\pm 5^\circ$<br>in both OPENING<br>and CLOSING position |

# DOUBLE ACTING TORQUES IN Nm

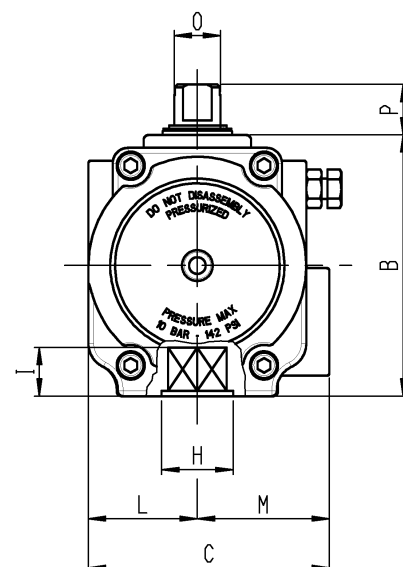
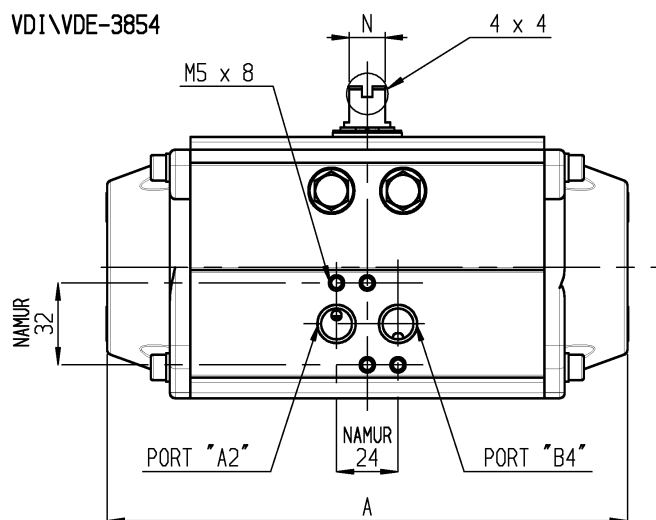
| TYPE   | AIR SUPPLY PRESSURE (bar) |       |       |       |       |       |       |       |       |       |
|--------|---------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|        | 1                         | 2     | 3     | 4     | 5     | 6     | 7     | 8     | 9     | 10    |
| RE 043 | -                         | -     | 6,5   | 8,7   | 10,9  | 13,0  | 15,2  | 17,3  | 19,5  | 21,7  |
| RE 051 | 3,3                       | 6,7   | 10,0  | 13,4  | 16,7  | 20,1  | 23,4  | 26,8  | 30,1  | 33,5  |
| RE 064 | 5,9                       | 11,8  | 17,8  | 23,7  | 29,6  | 35,5  | 41,4  | 47,4  | 53,3  | 59,2  |
| RE 076 | 11,8                      | 23,5  | 35,3  | 47,1  | 58,9  | 70,6  | 82,4  | 94,2  | 105,9 | 117,7 |
| RE 086 | 17,2                      | 34,5  | 51,7  | 68,9  | 86,1  | 103,4 | 120,6 | 137,8 | 155,0 | 172,3 |
| RE 101 | 27,5                      | 54,9  | 82,4  | 109,8 | 137,3 | 164,8 | 192,2 | 219,7 | 247,1 | 274,6 |
| RE 116 | 43,7                      | 87,4  | 131,1 | 174,9 | 218,6 | 262,3 | 306,0 | 349,7 | 393,4 | 437,1 |
| RE 126 | 56,6                      | 113,3 | 169,9 | 226,5 | 283,2 | 339,8 | 396,4 | 453,0 | 509,7 | 566,3 |
| RE 146 | 88,4                      | 176,7 | 265,1 | 353,4 | 441,8 | 530,1 | 618,5 | 706,9 | 795,2 | 883,6 |
| RE 161 | 114,9                     | 229,7 | 344,6 | 459,5 | 574,3 | 689,2 | 804,1 | 918,9 | 1034  | 1149  |
| RE 181 | 156,6                     | 313,1 | 469,7 | 626,3 | 782,9 | 939,4 | 1096  | 1253  | 1409  | 1565  |
| RE 201 | 215,3                     | 430,6 | 646,0 | 861,3 | 1077  | 1292  | 1507  | 1723  | 1938  | 2153  |
| RE 241 | 372,5                     | 745,0 | 1118  | 1490  | 1863  | 2235  | 2608  | 2980  | 3353  | 3725  |
| RE 271 | 539,2                     | 1078  | 1617  | 2157  | 2696  | 3235  | 3774  | 4314  | 4853  | 5392  |
| RE 331 | 911,5                     | 1823  | 2734  | 3646  | 4558  | 5469  | 6385  | 7292  | 8204  | 9115  |
| RE 421 | 1671                      | 3342  | 5013  | 6684  | 8354  | 10025 | 11696 | 13367 | -     | -     |

# SINGLE ACTING TORQUES IN Nm

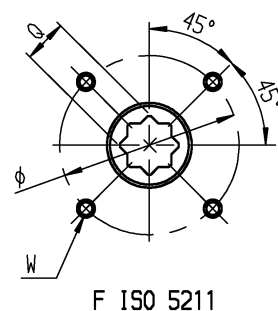
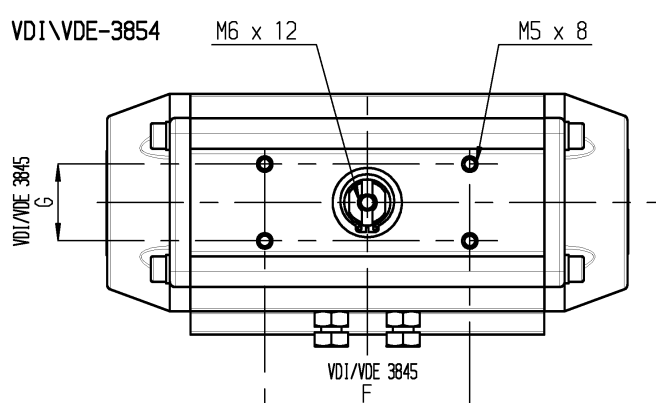
| TYPE          | SPRING SET | AIR SUPPLY PRESSURE (bar) |       |       |        |       |       |       |       |       |       |       |       | SPRING TORQUE     |       |
|---------------|------------|---------------------------|-------|-------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------------------|-------|
|               |            | 3                         |       | 4     |        | 5     |       | 6     |       | 7     |       | 8     |       |                   |       |
|               |            | 0°                        | 90°   | 0°    | 90°    | 0°    | 90°   | 0°    | 90°   | 0°    | 90°   | 0°    | 90°   | 90°               | 0°    |
| RE 043        | SR 3/3     | -                         | -     | -     | -      | 7,1   | 4,1   | 9,3   | 6,3   | 11,5  | 8,5   | 13,7  | 10,7  | 6,8               | 3,8   |
|               | SR 4/4     | -                         | -     | -     | -      |       |       | 8,1   | 4,1   | 10,2  | 6,2   | 12,4  | 8,4   | 9,0               | 5,0   |
| RE 051        | SR 3/3     | 5,8                       | 4,3   | 9,1   | 7,6    | 12,5  | 10,9  | 15,8  | 14,3  | 19,2  | 17,6  | 22,5  | 21,0  | 5,8               | 4,3   |
|               | SR 4/4     | 4,4                       | 2,3   | 7,8   | 5,7    | 11,1  | 9,0   | 14,4  | 12,3  | 17,8  | 15,7  | 21,1  | 19,0  | 7,8               | 5,7   |
|               | SR 5/5     |                           |       | 6,3   | 3,7    | 9,7   | 7,1   | 13,0  | 10,4  | 16,4  | 13,8  | 19,7  | 17,1  | 9,7               | 7,1   |
|               | SR 6/6     |                           |       |       |        | 8,2   | 5,1   | 11,6  | 8,5   | 14,9  | 11,8  | 18,3  | 15,2  | 11,6              | 8,5   |
| RE 064        | SR 3/3     | 10,7                      | 7,1   | 16,6  | 13,0   | 22,5  | 18,9  | 28,5  | 24,8  | 34,4  | 30,8  | 40,3  | 36,7  | 10,7              | 7,1   |
|               | SR 4/4     | 8,4                       | 3,5   | 14,3  | 9,4    | 20,2  | 15,4  | 26,1  | 21,3  | 32,0  | 27,2  | 38,0  | 33,1  | 14,3              | 9,4   |
|               | SR 5/5     |                           |       | 11,9  | 5,9    | 17,8  | 11,8  | 23,8  | 17,7  | 29,7  | 23,6  | 35,6  | 29,6  | 17,8              | 11,8  |
|               | SR 6/6     |                           |       |       |        | 15,5  | 8,2   | 21,4  | 14,1  | 27,3  | 20,1  | 33,2  | 26,0  | 21,4              | 14,1  |
| RE 076        | SR 3/3     | 21,1                      | 14,3  | 32,8  | 26,0   | 44,6  | 37,8  | 56,4  | 49,6  | 68,1  | 61,3  | 79,9  | 73,1  | 21,1              | 14,3  |
|               | SR 4/4     | 16,3                      | 7,2   | 28,1  | 19,0   | 39,8  | 30,8  | 51,6  | 42,5  | 63,4  | 54,3  | 75,2  | 66,1  | 28,1              | 19,0  |
|               | SR 5/5     |                           |       | 23,3  | 12,0   | 35,1  | 23,8  | 46,9  | 35,5  | 58,6  | 47,3  | 70,4  | 59,1  | 35,1              | 23,8  |
|               | SR 6/6     |                           |       |       |        | 30,3  | 16,7  | 42,1  | 28,5  | 53,9  | 40,3  | 65,6  | 52,0  | 42,1              | 28,5  |
| RE 086        | SR 3/3     | 33,8                      | 17,8  | 51,1  | 35,1   | 68,3  | 52,3  | 85,5  | 69,5  | 102,7 | 86,7  | 120,0 | 104,0 | 33,8              | 17,8  |
|               | SR 4/4     | 27,9                      | 6,6   | 45,1  | 23,8   | 62,3  | 41,0  | 79,6  | 58,2  | 96,8  | 75,5  | 114,0 | 92,7  | 45,1              | 23,8  |
|               | SR 5/5     |                           |       | 39,2  | 12,5   | 56,4  | 29,7  | 73,6  | 47,0  | 90,8  | 64,2  | 108,1 | 81,4  | 56,4              | 29,7  |
|               | SR 6/6     |                           |       |       |        | 50,4  | 18,5  | 67,7  | 35,7  | 84,9  | 52,9  | 102,1 | 70,1  | 67,7              | 35,7  |
| RE 101        | SR 3/3     | 50,1                      | 32,3  | 77,5  | 59,7   | 105,0 | 87,2  | 132,5 | 114,7 | 159,9 | 142,1 | 187,4 | 169,6 | 50,1              | 32,3  |
|               | SR 4/4     | 39,3                      | 15,6  | 66,8  | 43,0   | 94,2  | 70,5  | 121,7 | 98,0  | 149,2 | 125,4 | 176,6 | 152,9 | 66,8              | 43,1  |
|               | SR 5/5     |                           |       | 56,0  | 26,4   | 83,5  | 53,8  | 110,9 | 81,3  | 138,4 | 108,7 | 165,9 | 136,2 | 83,5              | 53,8  |
|               | SR 6/6     |                           |       |       |        | 72,7  | 37,1  | 100,2 | 64,6  | 127,6 | 92,0  | 155,1 | 119,5 | 100,2             | 64,6  |
| RE 116        | SR 3/3     | 80,7                      | 50,5  | 124,4 | 94,2   | 168,1 | 137,9 | 211,8 | 181,6 | 255,5 | 225,3 | 299,3 | 269,0 | 80,7              | 50,5  |
|               | SR 4/4     | 63,9                      | 23,5  | 107,6 | 67,3   | 151,3 | 111,0 | 195,0 | 154,7 | 238,7 | 198,4 | 282,4 | 242,1 | 107,6             | 67,3  |
|               | SR 5/5     |                           |       | 90,8  | 40,4   | 134,5 | 84,1  | 178,2 | 127,8 | 221,9 | 171,5 | 265,6 | 215,2 | 134,5             | 84,1  |
|               | SR 6/6     |                           |       |       |        | 117,7 | 57,2  | 161,4 | 100,9 | 205,1 | 144,6 | 248,8 | 188,3 | 161,4             | 100,9 |
| RE 126        | SR 3/3     | 105,0                     | 64,9  | 161,6 | 121,5  | 218,2 | 178,2 | 274,9 | 234,8 | 331,6 | 291,4 | 388,1 | 348,0 | 105,0             | 64,9  |
|               | SR 4/4     | 83,3                      | 29,9  | 140,0 | 86,5   | 196,6 | 143,2 | 253,2 | 199,8 | 309,9 | 256,4 | 366,5 | 313,0 | 140,0             | 86,6  |
|               | SR 5/5     |                           |       | 118,3 | 51,5   | 175,0 | 108,2 | 231,6 | 164,8 | 288,2 | 221,4 | 344,8 | 278,1 | 175,0             | 108,2 |
|               | SR 6/6     |                           |       |       |        | 153,3 | 73,2  | 210,0 | 129,8 | 266,6 | 186,4 | 323,2 | 243,1 | 210,0             | 129,8 |
| RE 146        | SR 3/3     | 162,5                     | 102,6 | 250,8 | 190,9  | 339,2 | 279,3 | 427,5 | 367,7 | 515,9 | 456,0 | 604,3 | 544,4 | 162,5             | 102,6 |
|               | SR 4/4     | 128,3                     | 48,4  | 216,6 | 136,8  | 305,0 | 225,1 | 393,3 | 313,5 | 481,7 | 401,9 | 570,1 | 490,2 | 216,6             | 136,8 |
|               | SR 5/5     |                           |       | 182,4 | 82,6   | 270,8 | 171,0 | 359,1 | 259,3 | 447,5 | 347,7 | 535,9 | 436,0 | 270,8             | 171,0 |
|               | SR 6/6     |                           |       |       |        | 236,6 | 116,8 | 324,9 | 205,2 | 413,3 | 293,5 | 501,7 | 381,9 | 325,0             | 205,2 |
| RE 161        | SR 3/3     | 202,7                     | 141,9 | 317,5 | 256,8  | 432,4 | 371,6 | 547,3 | 486,5 | 662,1 | 601,4 | 777,0 | 716,2 | 202,7             | 141,9 |
|               | SR 4/4     | 155,3                     | 74,3  | 270,2 | 189,2  | 385,1 | 304,1 | 499,9 | 418,9 | 614,8 | 533,8 | 729,7 | 648,7 | 270,2             | 189,2 |
|               | SR 5/5     |                           |       | 222,9 | 121,6  | 337,8 | 236,5 | 452,6 | 351,4 | 567,5 | 466,2 | 682,4 | 581,1 | 337,8             | 236,5 |
|               | SR 6/6     |                           |       |       |        | 290,4 | 168,9 | 405,3 | 283,8 | 520,2 | 398,6 | 635,0 | 513,5 | 405,3             | 283,8 |
| RE 181        | SR 3/3     | 281,6                     | 188,2 | 438,1 | 344,7  | 594,7 | 501,3 | 751,3 | 657,9 | 907,8 | 814,5 | 1064  | 971,0 | 281,6             | 188,2 |
|               | SR 4/4     | 218,8                     | 94,3  | 375,4 | 250,9  | 532,0 | 407,5 | 688,5 | 564,0 | 845,1 | 720,6 | 1002  | 877,2 | 375,4             | 250,9 |
|               | SR 5/5     |                           |       | 312,7 | 157,0  | 469,3 | 313,6 | 625,8 | 470,2 | 782,4 | 626,8 | 939,0 | 783,3 | 469,3             | 313,6 |
|               | SR 6/6     |                           |       |       |        | 406,5 | 219,8 | 563,1 | 376,3 | 719,7 | 532,9 | 876,2 | 689,5 | 563,1             | 376,3 |
| RE 201        | SR 3/3     | 386,2                     | 259,8 | 601,5 | 475,13 | 816,8 | 690,5 | 1032  | 905,8 | 1247  | 1121  | 1436  | 1336  | 386,2             | 259,8 |
|               | SR 4/4     | 299,6                     | 131,1 | 514,9 | 46,4   | 730,2 | 561,8 | 945,5 | 777,1 | 1160  | 992,4 | 1376  | 1208  | 514,9             | 346,4 |
|               | SR 5/5     |                           |       | 428,3 | 217,7  | 643,6 | 433,0 | 858,9 | 648,4 | 1074  | 863,7 | 1290  | 1079  | 643,6             | 433,0 |
|               | SR 6/6     |                           |       |       |        | 557,0 | 304,3 | 772,3 | 519,6 | 987,6 | 735,0 | 1203  | 950,3 | 772,3             | 519,6 |
| RE 241        | SR 3/3     | 664,0                     | 453,6 | 1037  | 826,2  | 1409  | 1199  | 1782  | 1571  | 2154  | 1944  | 2527  | 2316  | 664,0             | 453,6 |
|               | SR 4/4     | 521,8                     | 232,3 | 885,4 | 604,8  | 1258  | 977,4 | 1630  | 1350  | 2003  | 1722  | 2376  | 2095  | 885,4             | 604,8 |
|               | SR 5/5     |                           |       | 734,2 | 383,5  | 1107  | 756,0 | 1479  | 1129  | 1852  | 1501  | 2224  | 1874  | 1107              | 756,0 |
|               | SR 6/6     |                           |       |       |        | 955,5 | 534,7 | 1328  | 907,2 | 1701  | 1280  | 2073  | 1653  | 1328              | 907,2 |
| RE 271        | SR 3/3     | 912,5                     | 705,1 | 1452  | 1244   | 1991  | 1783  | 2530  | 2323  | 3069  | 2862  | 3608  | 3401  | 912,5             | 705,1 |
|               | SR 4/4     | 677,5                     | 400,8 | 1217  | 940,2  | 1756  | 1479  | 2295  | 2019  | 2834  | 2558  | 3373  | 3097  | 1217              | 940,1 |
|               | SR 5/5     |                           |       | 981,7 | 635,8  | 1521  | 1175  | 2060  | 1714  | 2599  | 2144  | 3138  | 2793  | 1521              | 1175  |
|               | SR 6/6     |                           |       |       |        | 1286  | 871,0 | 1825  | 1410  | 2364  | 1954  | 2903  | 2489  | 1825              | 1410  |
| RE 331        | SR 3/3     | 1626                      | 1108  | 2538  | 2020   | 3450  | 2931  | 4361  | 3843  | 5273  | 4755  | 6184  | 5666  | 1626              | 1108  |
|               | SR 4/4     | 1257                      | 565,8 | 2168  | 1477   | 3080  | 2389  | 3992  | 3301  | 4903  | 4212  | 5815  | 5123  | 2168              | 1477  |
|               | SR 5/5     |                           |       | 1799  | 935,2  | 2711  | 1847  | 3622  | 2759  | 4534  | 3670  | 5445  | 4582  | 2711              | 1847  |
|               | SR 6/6     |                           |       |       |        | 2341  | 1305  | 3253  | 2216  | 4165  | 3128  | 5076  | 4040  | 3253              | 2216  |
| RE 421        | SR 3/3     | 2999                      | 2014  | 4670  | 3685   | 6340  | 5356  | 8011  | 7026  | 9682  | 8697  | 11353 | 10368 | 2999              | 2014  |
|               | SR 4/4     | 2327                      | 1014  | 3998  | 2685   | 5669  | 4356  | 7340  | 6027  | 9011  | 7698  | 9369  | 8369  | 3998              | 2685  |
|               | SR 5/5     |                           |       | 3327  | 1685   | 4998  | 3356  | 6669  | 5027  | 8340  | 6698  | 8369  | 8369  | 4998              | 3356  |
|               | SR 6/6     |                           |       |       |        | 4327  | 2357  | 5997  | 4028  | 7668  | 5698  | 7369  | 7369  | 5997              | 4028  |
| Torque by air |            |                           |       |       |        |       |       |       |       |       |       |       |       | Torque by springs |       |

# DIMENSIONS – European Sizes in millimetres

VDI\UDE-3854



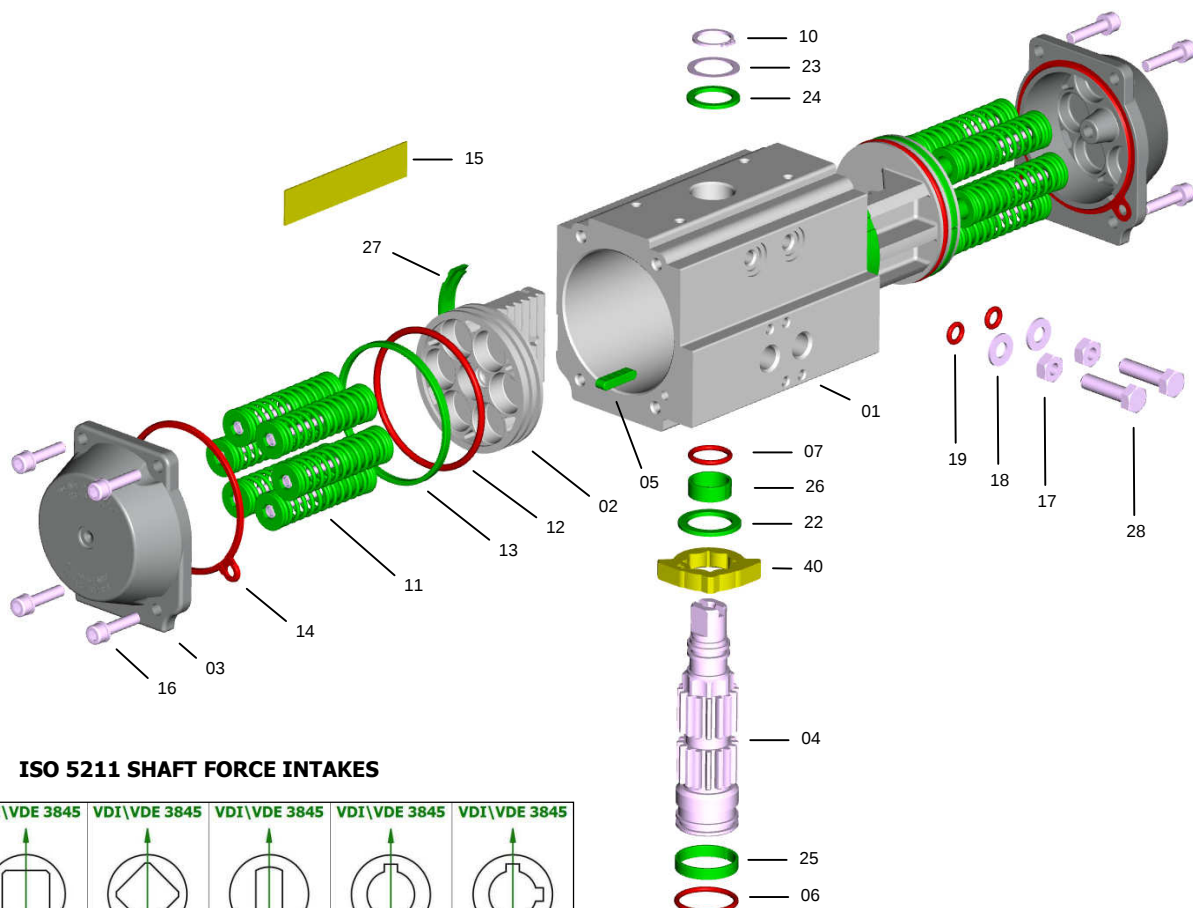
VDI\UDE-3854



| POSITION                    | TYPE               |                   |                              |                               |                    |                               |                     |                               |                    |                    |                    |                    |                    |                    |                     |                     |    |
|-----------------------------|--------------------|-------------------|------------------------------|-------------------------------|--------------------|-------------------------------|---------------------|-------------------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|---------------------|---------------------|----|
|                             | RE 043             | RE 051            | RE 064                       | RE 076                        | RE 086             | RE 101                        | RE 116              | RE 126                        | RE 146             | RE 161             | RE 181             | RE 201             | RE 241             | RE 271             | RE 331              | RE 421              |    |
| A                           | 141                | 138               | 155                          | 203                           | 239                | 261                           | 304                 | 333                           | 398                | 424                | 482                | 528                | 604                | 684                | 850                 | 940                 |    |
| B                           | 62                 | 69                | 86                           | 102                           | 112                | 127                           | 145,5               | 157,5                         | 177                | 196                | 220                | 246                | 298                | 332                | 414                 | 542                 |    |
| C                           | 63,5               | 75                | 86                           | 94                            | 104                | 120                           | 133,5               | 144,5                         | 164,5              | 182                | 203,5              | 222                | 300                | 352                | 400                 | 528                 |    |
| VDI/VDE<br>3845<br>F x G    | 80 x 30<br>50 x 25 | 80 x 30           |                              |                               |                    |                               | 80 x 30<br>130 x 30 |                               | 130 x 30           |                    |                    |                    |                    |                    |                     | 200 x 50            |    |
| L                           | 27                 | 33,5              | 38                           | 42,5                          | 49                 | 55                            | 63,5                | 69,5                          | 80,5               | 89                 | 99,5               | 110                | 150                | 176                | 190                 | 234                 |    |
| M                           | 36,5               | 41,5              | 48                           | 51,5                          | 55                 | 65                            | 70                  | 75                            | 84                 | 93                 | 104                | 112                | 150                | 176                | 210                 | 294                 |    |
| Port A<br>Port B<br>DIN 259 | 1/8" GAS-NPT       |                   | 1/4" GAS-NPT                 |                               |                    |                               |                     |                               |                    |                    |                    |                    | 1/2" GAS-NPT       |                    |                     |                     |    |
| N x O                       | 8 x 12             |                   |                              | 14 x 18                       |                    |                               | 27 x 36             |                               |                    |                    | 32 x 42            |                    | 42 x 60            | 55 x 80            |                     |                     |    |
| P                           | 20                 |                   |                              |                               |                    |                               | 30                  |                               |                    | 50                 |                    |                    |                    |                    |                     |                     | 80 |
| Q x I                       | 9 x 10<br>11 x 13  | 9 x 10<br>11 x 13 | 9 x 10<br>11 x 13<br>14 x 16 | 11 x 13<br>14 x 16<br>17 x 20 | 14 x 16<br>17 x 20 | 14 x 16<br>17 x 20<br>22 x 25 | 17 x 20<br>22 x 25  | 17 x 20<br>22 x 25<br>27 x 29 | 22 x 25<br>27 x 29 | 22 x 25<br>27 x 29 | 27 x 29<br>36 x 39 | 27 x 29<br>36 x 39 | 36 x 39<br>46 x 50 | 36 x 39<br>46 x 50 | *46 x 50<br>55 x 60 | *55 x 60<br>75 x 80 |    |
| F ISO 5211                  | F04                | F04               | F05/07                       | F05/07                        | F05/07             | F07/10                        | F07/10              | F07/10                        | F10/12             | F10/12             | F10/12             | F14                | F14                | F16                | F16/25              | F25/30              |    |
| Optional                    | F03/05             | F03/05            | F3/5/7                       |                               |                    | F5/7/10                       |                     | F7/10/12                      |                    |                    | F14                | F10/12             | F(12)/16           | F(12)/16           |                     | F(16)               |    |
| Volume DE                   | 0,180 lt           | 0,300 lt          | 0,500 lt                     | 0,700 lt                      | 1,000 lt           | 1,800 l                       | 2,900 lt            | 3,700 lt                      | 6,100 lt           | 7,900 lt           | 11,2 lt            | 14,4 lt            | 19,2 lt            | 32,2 lt            | 62,8 lt             | 131 lt              |    |
| Volume SE                   | 0,072 lt           | 0,120 lt          | 0,200 lt                     | 0,280 lt                      | 0,400 lt           | 0,720 l                       | 1,160 lt            | 1,480 lt                      | 2,440 lt           | 3,160 lt           | 4,480 lt           | 5,760 lt           | 7,680 lt           | 12,9 lt            | 25,1 lt             | 52,4 lt             |    |

| POSITION     | F ISO 5211     |                |                                  |                |                                   |                                                        |                                      |                                        |                   |                   |                               |                               |
|--------------|----------------|----------------|----------------------------------|----------------|-----------------------------------|--------------------------------------------------------|--------------------------------------|----------------------------------------|-------------------|-------------------|-------------------------------|-------------------------------|
|              | F03            | F04            | F03/05                           | F05            | F05/07                            | F5/7/10                                                | F07/10                               | F10/12                                 | F14               | F16               | F25                           | F30                           |
| <b>Ø (W)</b> | Ø 36<br>(M5x8) | Ø 42<br>(M5x8) | Ø 36<br>(M5x8)<br>Ø 50<br>(M6x9) | Ø 50<br>(M6x9) | Ø 50<br>(M6x9)<br>Ø 70<br>(M8x12) | Ø 50<br>(M6x9)<br>Ø 70<br>(M8x12)<br>Ø 102<br>(M10x15) | Ø 70<br>(M8x12)<br>Ø 102<br>(M10x15) | Ø 102<br>(M10x15)<br>Ø 125<br>(M12x18) | Ø 140<br>(M16x24) | Ø 165<br>(M20x30) | Ø 254<br>(M16x24)<br>N°8 FORI | Ø 298<br>(M20x35)<br>N°8 FORI |
| <b>H</b>     | 25             | 30             | 25                               | 35             | 35<br>(RE 086=40)                 | 40                                                     | 55                                   | 85<br>(RE 161=75)                      | 100               | 130               | 200                           | 200                           |

# CONSTRUCTION PARTS – SPECIFICATIONS



## ISO 5211 SHAFT FORCE INTAKES

| VDI\UDE 3845                   | VDI\UDE 3845 | VDI\UDE 3845 | VDI\UDE 3845 | VDI\UDE 3845 | VDI\UDE 3845 |
|--------------------------------|--------------|--------------|--------------|--------------|--------------|
|                                |              |              |              |              |              |
| STANDARD<br>ALPHAIR<br>S = L/D | L            | D            | H            | V            | W            |

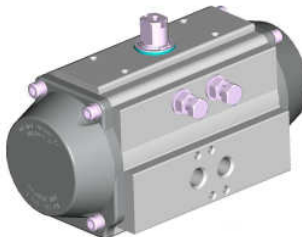
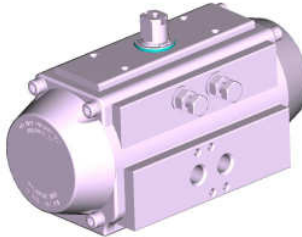
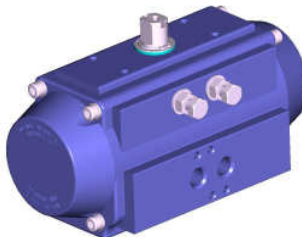
| PART | QUANTITY | DESCRIPTION               | MATERIAL                                   | SPECIFICATION                                | PROTECTION |
|------|----------|---------------------------|--------------------------------------------|----------------------------------------------|------------|
| 1    | 1        | Body                      | Extruded aluminium alloy                   | EN AW 6063 T6                                | A - N - TF |
| 2    | 2        | Piston                    | Aluminium alloy                            | EN AB 46100 T6                               | A          |
| 3    | 2        | Cover                     | Aluminium alloy                            | EN AB 46100 T6                               | N - V - TF |
| 4    | 1        | Shaft                     | Carbon steel<br>Stainless Steel – optional | ASTM A-105<br>AISI 304 (A2)<br>AISI 316 (A4) | N          |
| 5 *  | 2        | Antiejection key          | Acetalic resin – PA66 – PA66 – LEXAN       |                                              |            |
| 6 *  | 1        | Lower shaft O-Ring        | NBR – FPM\FKM – Silicone – Silicone        |                                              |            |
| 7 *  | 1        | Upper shaft O-Ring        | NBR – FPM\FKM – Silicone – Silicone        |                                              |            |
| 10 * | 1        | Seeger ring               | Carbon steel                               |                                              | N          |
| 11   | 0 ... 12 | Spring cartridge          | Carbon steel, PA 66, Stainless Steel       | C-98                                         | V          |
| 12 * | 2        | Piston O-Ring             | NBR – FPM\FKM – Silicone – Silicone        |                                              |            |
| 13 * | 2        | Piston head bearing       | Acetalic resin – PA66 – PA66 – LEXAN       |                                              |            |
| 14 * | 2        | Cover gasket              | NBR – FPM\FKM – Silicone – Silicone        |                                              |            |
| 15   | 1        | Nameplate                 | Aluminium                                  |                                              |            |
| 16   | 4 + 4    | Cover fastening screw     | Stainless Steel                            | AISI 304 (A2)                                |            |
| 17   | 2        | Nut                       | Stainless Steel                            | AISI 304 (A2)                                |            |
| 18   | 2        | Washer                    | Stainless Steel                            | AISI 304 (A2)                                |            |
| 19 * | 2        | O-Ring                    | NBR – FPM\FKM – Silicone – Silicone        |                                              |            |
| 22 * | 1        | Gear antifriction washer  | Acetalic resin – PA66 – PA66 – LEXAN       |                                              |            |
| 23 * | 1        | Shaft thrust washer       | Stainless Steel                            | AISI 304 (A2)                                |            |
| 24 * | 1        | Shaft antifriction washer | Acetalic resin – PA66 – PA66 – LEXAN       |                                              |            |
| 25 * | 1        | Lower shaft pilot ring    | Acetalic resin – PA66 – PA66 – LEXAN       |                                              |            |
| 26 * | 1        | Upper shaft pilot ring    | Acetalic resin – PA66 – PA66 – LEXAN       |                                              |            |
| 27 * | 2        | Piston bearing            | Acetalic resin – PA66 – PA66 – LEXAN       |                                              |            |
| 28   | 2        | Adjusting gear screw      | Stainless Steel                            | AISI 304 (A2)                                |            |
| 40   | 1        | Adjusting gear            | Stainless Steel                            | AISI 316 (A4)                                |            |

\* SPARE PARTS SET: Standard, Special HIGH Temperatures, Special LOW Temperatures, Special EXTRA LOW Temperatures

## PROTECTIONS

A = Anodizing N = chemical Nickel-plating V = Painting TF = Anodizing+PTFE

## COATINGS – MATERIAL TREATMENTS

|                                                                                   |                       | DESCRIPTION                           |                                       |           |                                                                                   | APPLICATION FIELD                                                                                                    |
|-----------------------------------------------------------------------------------|-----------------------|---------------------------------------|---------------------------------------|-----------|-----------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|
|                                                                                   |                       | Body                                  | Covers                                | Pistons   | Shaft                                                                             |                                                                                                                      |
|  | <b>AV</b><br>standard | Anodizing                             | Polyester painting                    | Anodizing | High phosphorous nickel-plating (12%)<br>opt. AISI 304 (A2)<br>opt. AISI 316 (A4) | - Industry, general use.                                                                                             |
|                                                                                   | Colour                | Gray                                  | Gray                                  | Brown     | Polished steel                                                                    |                                                                                                                      |
|                                                                                   | Thickness             | 25 µ                                  | 60/80 µ                               | 15 µ      | 20 µ                                                                              |                                                                                                                      |
|  | <b>NN</b>             | DESCRIPTION                           |                                       |           |                                                                                   | APPLICATION FIELD                                                                                                    |
|                                                                                   |                       | Body                                  | Covers                                | Pistons   | Shaft                                                                             |                                                                                                                      |
|                                                                                   |                       | High phosphorous nickel-plating (12%) | High phosphorous nickel-plating (12%) | Anodizing | High phosphorous nickel-plating (12%)<br>opt. AISI 304 (A2)<br>opt. AISI 316 (A4) |                                                                                                                      |
|                                                                                   | Colour                | Polished steel                        | Polished steel                        | Brown     | Polished steel                                                                    | - Industry, general use.<br>- Caustic soda.<br>- Detergents.<br>- Low alkaline solutions.                            |
|                                                                                   | Thickness             | 20 µ                                  | 20 µ                                  | 15 µ      | 20 µ                                                                              |                                                                                                                      |
|  | <b>TF TF</b>          | DESCRIPTION                           |                                       |           |                                                                                   | APPLICATION FIELD                                                                                                    |
|                                                                                   |                       | Body                                  | Covers                                | Pistons   | Shaft                                                                             |                                                                                                                      |
|                                                                                   |                       | Anodizing + PTFE coating              | Anodizing + PTFE coating              | Anodizing | High phosphorous nickel-plating (12%)<br>opt. AISI 304 (A2)<br>opt. AISI 316 (A4) |                                                                                                                      |
|                                                                                   | Colour                | Blue                                  | Blue                                  | Brown     | Polished steel                                                                    | - Industry, general use.<br>- Low alkaline and low acid solutions.<br>- Marine environments.<br>- High temperatures. |
|                                                                                   | Thickness             | Anodizing 25 µ<br>PTFE 15 µ           | Anodizing 15 µ<br>PTFE 15 µ           | 15 µ      | 20 µ                                                                              |                                                                                                                      |

### ANODIZING

Anodizing is an electrolytic process that produces anodic coating on aluminum, called alumine, with high thickness. Alumine is one of the most hard known materials, with resistance values up to 400-600 HV (45-65 HRC); properties and features of Anodizing (alumine thickness 25 micron) are well known and appreciated both for mechanical and chemical resistance.

- **Best friction and corrosion resistance, best surface hardness, good thermic and electrical insulation.**

### ELECTROLESS NICKEL-PLATING

Chemical nickel-plating is an electroless coating process that gives nickel layers at extremely constant thickness also on sharp angles, blind-holes, threads and grooves recess. During the process, nickel is combined with phosphor at a percentage of 12% (high-phosphor). The obtained surface hardness is about 400-480 HV (45-55 HRC).

- **Best friction and corrosion resistance, best surface hardness, best external appearance similar to S.S., increased resistance to alkali and detergents in sanitary and food applications.**

### POLYESTER PAINTING

Polyester painting is obtained through powder coatings on polarized parts, by means of light differences in electrical potentials. After applications, parts are baked in order to polymerize and let the painting be spread to avoid micro-porosity. The best elasticity can be obtained at 60/80 micron thickness; a satisfactory adhesion can be assured by sandblasting or brushing, and by special degreasing baths of the rough pieces to be treated.

- **Better corrosion resistance, protection against crashes, better external appearance and several available colours, resistance to chemicals.**

### ANODIZING + PTFE COATING

As further improvement of the hard anodising treatment on aluminium alloys, protective coatings made of PTFE are used; this material is known for its particular chemical and physical features. On these double treated surfaces, oxide hardness and low roughness (internal slipping parts) is summed to the chemical resistance and the excellent qualities as a thermic barrier of PTFE (external surface, subject to corrosion).

- **Better corrosion resistance, protection against high temperatures and crashes, extreme resistance to chemicals and in marine environments.**

### AISI 304 (A2) OR AISI 316 (A4) STAINLESS STEEL SHAFT - OPTIONAL

AISI 304 (A2) and AISI 316 (A4) Stainless Steel shafts, with their great corrosion resistance, are recommended for special applications such as: marine and chemical environments, food and pharmaceutical industry, high temperature applications.



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