technical documentation

pneumatic actuators

electric actuators

hydraulic actuators
1.4 SUMMARY OF OUR SALES PROGRAMME

1.4.1 Butterfly valves and check valves

| Eurovalve range, centric rubberlined butterfly valves, DN40 - DN2000 | Eurovalve range, double eccentric high-performance butterfly valves DN80 - DN600 | Centric, PTFE lined butterfly valves, DN25 - DN1200 | Euro check range, double disc wafer type, rubber seal, check valves DN50 - DN600 |

1.4.2 Manual operators

Wormgear operators for open/close and regulating purposes

| Lever operator for open/close and regulating purposes | Wormgear operators for open/close and regulating purposes |

NB: Detailed Technical Documentation of the above programme is available on request.

1.5 ACTUATION PHILOSOPHY

The Wouter Witzel product philosophy for actuation is being able to supply, out of a wide spectrum of brands and types, the optimum solution for each specific case of valve actuation, according to the requirements of different market segments and customers. In order to match the desired quality, specification, performance at the right price, we classify the actuators into three categories viz.:

- Economic category
- General purpose category
- Heavy duty category
### 1.5.1 Valve actuators

Wouter Witzel has carefully compiled a very complete and balanced programme of pneumatic, electric and hydraulic actuators with many optional ancillaries.

#### PNEUMATIC ACTUATORS

<table>
<thead>
<tr>
<th><strong>ECONOMIC</strong></th>
<th><strong>GENERAL PURPOSE</strong></th>
<th><strong>GENERAL PURPOSE</strong></th>
<th><strong>HEAVY DUTY</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Range AT</td>
<td>Range E/P</td>
<td>Range GT</td>
<td>Range TPN</td>
</tr>
<tr>
<td><img src="image1" alt="ECONOMIC AT" /></td>
<td><img src="image2" alt="GENERAL PURPOSE E/P" /></td>
<td><img src="image3" alt="GENERAL PURPOSE GT" /></td>
<td><img src="image4" alt="HEAVY DUTY TPN" /></td>
</tr>
<tr>
<td><strong>Design:</strong></td>
<td>Rack and pinion type, double and single acting (shown with solenoid valve)</td>
<td>Rack and pinion, double and single acting (shown with manual override)</td>
<td>Long stroke rack and pinion, double and single acting (shown with switchbox)</td>
</tr>
</tbody>
</table>

#### ELECTRIC ACTUATORS

<table>
<thead>
<tr>
<th><strong>ECONOMIC</strong></th>
<th><strong>GENERAL PURPOSE</strong></th>
<th><strong>GENERAL PURPOSE</strong></th>
<th><strong>HEAVY DUTY</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Range M</td>
<td>Range EL</td>
<td>Range DP</td>
<td>Range SA</td>
</tr>
<tr>
<td><img src="image5" alt="ECONOMIC M" /></td>
<td><img src="image6" alt="GENERAL PURPOSE EL" /></td>
<td><img src="image7" alt="GENERAL PURPOSE DP" /></td>
<td><img src="image8" alt="HEAVY DUTY SA" /></td>
</tr>
<tr>
<td><strong>Design:</strong></td>
<td>Quarter turn actuator, on/off and control duty. Lever for manual override</td>
<td>Quarter turn actuator, on/off and control duty. Handwheel for manual override</td>
<td>Quarter turn actuator, on/off and control duty, based on multi-turn actuator with worm gearbox. Handwheel for manual override</td>
</tr>
</tbody>
</table>

#### HYDRAULIC ACTUATORS

<table>
<thead>
<tr>
<th><strong>ECONOMIC</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Range BRC</td>
<td></td>
</tr>
<tr>
<td><img src="image9" alt="ECONOMIC BRC" /></td>
<td></td>
</tr>
<tr>
<td><strong>Design:</strong></td>
<td>Rotary type, double acting, on/off duty</td>
</tr>
</tbody>
</table>

*NB: The figures shown are examples only. Other configurations available.*
2 PRODUCT DATA: PNEUMATIC ACTUATORS

2.1 GENERAL
Pneumatic actuators use compressed filtered dry or lubricated air as energy power source.

Main features of pneumatic actuators are:
- Simple and reliable construction
- Compact design
- Short operation times
- Spring return actuators for fail-safe operation
- Suitable for control duty with a 100% duty rate
- Most economical way of power actuation for smaller sizes of butterfly valves

Wouter Witzel use both our own TPN actuator design and products from the world’s best known pneumatic actuator manufacturers.

2.2 PRODUCT CONFIGURATION
Most pneumatic actuators used by Wouter Witzel have an interface according VDI/VDE 3845 (NAMUR) for mounting solenoid valves and signal transmitters or positioners. Pneumatic actuators can be equipped with many ancillaries such as:

Ancillary: Function:
- Limit switches remote open/closed position monitoring of the valve
  (direct mounted to actuator or in a switchbox) (mechanical switches or inductive proximity sensors)
- Solenoid valve remote on/off operation of actuator
- Throttle valve / throttle block / hydraulic speed control speed control for increased operating times
- Positioner valve disc positioning based on a variable input signal
- Potentiometer continuous valve disc position feedback
  (resistance signal)
- Electronic position transmitter continuous valve disc position feedback (current signal)
- Worm gearbox manual operation after air failure / manual override
- Air tank operation after air failure (up to several operations)
- Lever manual operation after air failure (only for double acting actuators up to valve size DN200)
- Air filter regulator reducing pressure and filtering of supplied air
- Gauge(s) visual indication of actual air pressure

NB: Specific technical information on request
2.2.1 Product configuration pneumatic actuators for on/off duty

2.2.2 Product configuration pneumatic actuators for control duty
Product sheet

PNEUMATIC ACTUATOR, RANGE AT

Application
For pneumatic quarter turn on/off or control duty, both double acting (DA) and spring return (SR), of Wouter Witzel butterfly valves. Economic category. Compact design and low weight. Same dimensions for double and single acting actuator.

Product description
• Twin-piston / rack and pinion actuator type
• Body of hard anodised aluminium
• End caps of aluminium, polyester coated
• Adjustable travel stops for both directions
• Anti-blowout shaft
• Mechanical position indication
• Interface for solenoid valves acc. VDI/VDE 3845 (NAMUR)
• Interface for signal transmitters and positioners acc. VDI/VDE 3845 (NAMUR)
• Flange dimensions acc. to ISO 5211
• Lifetime lubricated under normal working conditions

Technical data
Stroke : 90° with ± 4° adjustment
Rotation : Clockwise closing
Operating medium : Dry or lubricated air
Temperature : -20° to +80° C
Coating colour : RAL 5015, blue (end caps only)
Air connection : DA/SR15: 2x G1/8"
DA/SR30-1200: 2x G1/4"
DA/SR3000: 2x G1/2"
Supply pressure : min. 2,5 bar up to max. 10 bar

Options
• Limit switches or switchbox
• Solenoid valve
• Speed control
• Position transmitter
• Positioner
• Wormgear for emergency manual operation
• Seals for other temperature range
• Chemical version: electroless nickel plated, polyester coated
• Indirect mounting (console and adaptor)
• Mounting parallel to pipeline (mounting position 2)

<table>
<thead>
<tr>
<th>Actuator type</th>
<th>ISO</th>
<th>Dimensions [mm]</th>
<th>Weight [kg]</th>
<th>Air consumption [l/stroke]</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>a</td>
<td>b</td>
<td>c</td>
<td>e</td>
</tr>
<tr>
<td>DA15 / SR15</td>
<td>F03</td>
<td>F04</td>
<td>67</td>
<td>20</td>
</tr>
<tr>
<td>DA30 / SR30</td>
<td>F03</td>
<td>F04</td>
<td>83</td>
<td>20</td>
</tr>
<tr>
<td>DA60 / SR60</td>
<td>F04</td>
<td>F05</td>
<td>100</td>
<td>20</td>
</tr>
<tr>
<td>DA100 / SR100</td>
<td>F05</td>
<td>F07</td>
<td>110</td>
<td>20</td>
</tr>
<tr>
<td>DA150 / SR150</td>
<td>F07</td>
<td>F10</td>
<td>125</td>
<td>20</td>
</tr>
<tr>
<td>DA220 / SR220</td>
<td>F10</td>
<td>F12</td>
<td>142</td>
<td>30</td>
</tr>
<tr>
<td>DA300 / SR300</td>
<td>F10</td>
<td>F12</td>
<td>155</td>
<td>30</td>
</tr>
<tr>
<td>DA450 / SR450</td>
<td>F10</td>
<td>F12</td>
<td>175</td>
<td>30</td>
</tr>
<tr>
<td>DA600 / SR600</td>
<td>F10</td>
<td>F12</td>
<td>196</td>
<td>50</td>
</tr>
<tr>
<td>DA900 / SR900</td>
<td>F12</td>
<td>F14</td>
<td>220</td>
<td>50</td>
</tr>
<tr>
<td>DA1200 / SR1200</td>
<td>F14</td>
<td></td>
<td>240</td>
<td>50</td>
</tr>
<tr>
<td>DA3000 / SR3000</td>
<td>F16</td>
<td></td>
<td>330</td>
<td>50</td>
</tr>
</tbody>
</table>

Figure
Product sheet

PNEUMATIC ACTUATOR, RANGE E / P

Application
For pneumatic quarter turn on/off or control duty, both double acting (ED/PD) and spring return (ES/PS), of Wouter Witzel butterfly valves. General purpose category. Compact design and low weight.

Product description
- Twin-piston / rack and pinion actuator type
- Body and end caps of aluminium, polyurethane coated
- Adjustable travelstop for only one end position
- Anti-blowout shaft
- Mechanical position indication
- Interface for solenoid valves acc. VDI/VDE 3845 (NAMUR)
- Interface for signal transmitters and positioners acc. VDI/VDE 3845 (NAMUR)
- Flange dimensions acc. to ISO 5211
- Lifetime lubricated under normal working conditions

Technical data
Stroke : 90° with + 1° / -10° adjustment
Rotation : Clockwise closing
Operating medium : Dry or lubricated air
Temperature : -20° to +80° C
Coating colour : RAL 1007, yellow
Air connection : 2x G 1/4"
Supply pressure : min. 3 bar up to max. 10 bar

Options
- Limit switches or switchbox
- Solenoid valve
- Speed control
- Position transmitter
- Positioner
- Wormgear for emergency manual operation
- Adjustable travel stops for both end positions
- Limit stop full-stroke (LF) for open or closed position
- Chemical version: CSR coating for corrosion resistance under extreme (chemical) conditions
- Indirect mounting (console with adaptor)
- Mounting parallel to pipeline (mounting position 2)

### Technical data table

<table>
<thead>
<tr>
<th>Actuator type</th>
<th>ISO</th>
<th>Dimensions [mm]</th>
<th>Weight [kg]</th>
<th>Air consumption [l/stroke]</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>a</td>
<td>b</td>
<td>c</td>
</tr>
<tr>
<td>ED25 / ES25</td>
<td>F04</td>
<td>80</td>
<td>20</td>
<td>159</td>
</tr>
<tr>
<td>ED40 / ES40</td>
<td>F05</td>
<td>93</td>
<td>20</td>
<td>180</td>
</tr>
<tr>
<td>ED65 / ES65</td>
<td>F05</td>
<td>105</td>
<td>20</td>
<td>199</td>
</tr>
<tr>
<td>ED100 / ES100</td>
<td>F05</td>
<td>118</td>
<td>20</td>
<td>221</td>
</tr>
<tr>
<td>ED200 / ES200</td>
<td>F07</td>
<td>143</td>
<td>20</td>
<td>283</td>
</tr>
<tr>
<td>ED350 / ES350</td>
<td>F07</td>
<td>181</td>
<td>20</td>
<td>305</td>
</tr>
<tr>
<td>ED600 / ES600</td>
<td>F10</td>
<td>220</td>
<td>30</td>
<td>387</td>
</tr>
<tr>
<td>ED950 / ES950</td>
<td>F10</td>
<td>259</td>
<td>30</td>
<td>424</td>
</tr>
<tr>
<td>ED1600 / ES1600</td>
<td>F16</td>
<td>297</td>
<td>30</td>
<td>516</td>
</tr>
<tr>
<td>PD2500 / PS2500</td>
<td>F16</td>
<td>356</td>
<td>30</td>
<td>378</td>
</tr>
<tr>
<td>PD4000 / PS4000</td>
<td>F16</td>
<td>380</td>
<td>30</td>
<td>502</td>
</tr>
</tbody>
</table>
Product sheet

PNEUMATIC ACTUATOR, RANGE GT

Application
For pneumatic quarter turn on/off or control duty, both double acting (GTD) and spring return (GTE), of Wouter Witzel butterfly valves. General purpose category. Compact design and low weight. Same dimensions for double and single acting actuator.

Product description
- Twin-piston / rack and pinion actuator type
- Body of anodised aluminium
- End caps of aluminium, polyurethane coated
- Adjustable travel stop for only one end position
- Mechanical position indication
- Interface for solenoid valves acc. VDI/VDE 3845 (NAMUR)
- Interface for signal transmitters and positioners acc. VDI/VDE 3845 (NAMUR)
- Flange dimensions acc. to ISO 5211
- Lifetime lubricated under normal working conditions

Technical data
- Stroke: 90° with +6° / -10° adjustment
- Rotation: Clockwise closing
- Operating medium: Dry or lubricated air
- Temperature: -20° to +95° C
- Coating colour: RAL 5015, blue (end caps only)
- Air connection: 2x G 1/4"
- Supply pressure: min. 2 bar up to max. 10 bar

Options
- Limit switches or switchbox
- Solenoid valve
- Speed control
- Position transmitter
- Positioner
- Wormgear for emergency manual operation
- Travel stops for both end positions
- Seals for other temperature range
- Chemical version: Body hard anodised (GC type)
- Stainless steel body AISI 304 (ET type)
- Indirect mounting (console with adaptor)
- Mounting parallel to pipeline (mounting position 2)

<table>
<thead>
<tr>
<th>Actuator type</th>
<th>ISO</th>
<th>Dimensions [mm]</th>
<th>Weight [kg]</th>
<th>Air consumption [l/stroke]</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>a</td>
<td>b</td>
<td>c</td>
<td>e</td>
</tr>
<tr>
<td>GTD65 / GTE65</td>
<td>F05 / F07</td>
<td>88</td>
<td>30</td>
<td>139</td>
</tr>
<tr>
<td>GTD77 / GTE77</td>
<td>F05 / F07</td>
<td>100</td>
<td>30</td>
<td>160</td>
</tr>
<tr>
<td>GTD83 / GTE83</td>
<td>F05 / F07</td>
<td>108</td>
<td>30</td>
<td>182</td>
</tr>
<tr>
<td>GTD93 / GTE93</td>
<td>F05 / F07</td>
<td>117</td>
<td>30</td>
<td>215</td>
</tr>
<tr>
<td>GTD110 / GTE110</td>
<td>F07 / F10</td>
<td>140</td>
<td>30</td>
<td>222</td>
</tr>
<tr>
<td>GTD115 / GTE115</td>
<td>F07 / F10</td>
<td>140</td>
<td>30</td>
<td>294</td>
</tr>
<tr>
<td>GTD127 / GTE127</td>
<td>F07 / F10</td>
<td>160</td>
<td>30</td>
<td>300</td>
</tr>
<tr>
<td>GTD143 / GTE143</td>
<td>F10 / F12</td>
<td>198</td>
<td>30</td>
<td>350</td>
</tr>
<tr>
<td>GTD163 / GTE163</td>
<td>F10 / F12</td>
<td>198</td>
<td>30</td>
<td>380</td>
</tr>
<tr>
<td>GTD210 / GTE210</td>
<td>F14</td>
<td>256</td>
<td>30</td>
<td>478</td>
</tr>
<tr>
<td>GTD250 / GTE250</td>
<td>F16</td>
<td>302</td>
<td>30</td>
<td>603</td>
</tr>
<tr>
<td>GTD254 / GTE254</td>
<td>F16</td>
<td>302</td>
<td>30</td>
<td>683</td>
</tr>
</tbody>
</table>

Figure

FOR GTD/GTE 45-93
VENTIL ADAPTOR (THICK 15 MM)

OPTIONS
SWITCHBOX
EMERG. MANUAL OPERATION
SOLENOID VALVE
POSITIONER
Product sheet

PNEUMATIC ACTUATOR, RANGE TPN A

Application
For pneumatic quarter turn on/off or control duty, double acting (TPN A), of Wouter Witzel butterfly valves. Heavy duty category.

Product description
- Gear rack / gear wheel actuator type
- Body of cast iron GG25, polyurethane coated
- End caps of aluminium
- Cylinders of bronze
- Adjustable travel stops for both end positions
- Mechanical position indication
- Interface for signal transmitters and positioners acc. VDI/VDE 3845 (NAMUR)
- Flange dimensions acc. to ISO 5211
- Lifetime lubricated under normal working conditions

Technical data
- Stroke: 90° with ± 10° adjustment
- Rotation: Clockwise closing
- Operating medium: Dry or lubricated air
- Temperature: -20° to +80° C
- Coating colour: RAL 2000, orange
- Air connection: 2x G 1/4"
- Supply pressure: min. 2 bar up to max. 10 bar

Options
- Limit switches or switchbox
- Solenoid valve
- Speed control
- Position transmitter
- Positioner
- Air connection G1/2"
- Wormgear for emergency manual operation
- Mounting parallel to pipeline (mounting position 2)

### Dimensions [mm]

<table>
<thead>
<tr>
<th>Actuator type</th>
<th>ISO</th>
<th>Dimensions [mm]</th>
<th>Weight [kg]</th>
<th>Air consumption [l/stroke]</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>a   b  c  d  e  f  g  h  k</td>
<td>TPN A</td>
<td>Port A  Port B</td>
</tr>
<tr>
<td>TPN 5A</td>
<td>F07</td>
<td>118 30 220 28 100 100 80 30 14</td>
<td>8</td>
<td>0.17 0.17</td>
</tr>
<tr>
<td>TPN 10A</td>
<td>F07</td>
<td>125 30 290 48 100 133 80 30 14</td>
<td>10</td>
<td>0.34 0.34</td>
</tr>
<tr>
<td>TPN 17A</td>
<td>F07</td>
<td>125 30 290 48 130 133 80 30 14</td>
<td>15</td>
<td>0.61 0.61</td>
</tr>
<tr>
<td>TPN 40A</td>
<td>F07 / F10 / F12</td>
<td>167 30 382 61 180 170 80 30 19</td>
<td>30</td>
<td>1.5 1.5</td>
</tr>
<tr>
<td>TPN 85A</td>
<td>F10 / F12 / F14</td>
<td>185 30 395 72 160 - 130 30 30</td>
<td>45</td>
<td>2.9 2.9</td>
</tr>
<tr>
<td>TPN 140A</td>
<td>F10 / F12 / F14 / F16</td>
<td>215 30 490 96 180 - 130 30 30</td>
<td>85</td>
<td>5.1 5.1</td>
</tr>
<tr>
<td>TPN 280A</td>
<td>F10 / F12 / F14 / F16</td>
<td>215 30 490 96 180 - 130 30 30</td>
<td>150</td>
<td>10.1 10.1</td>
</tr>
<tr>
<td>TPN 420A</td>
<td>F16 / F25</td>
<td>215 30 720 96 180 - 130 30 30</td>
<td>250</td>
<td>15 15</td>
</tr>
</tbody>
</table>
Product sheet

PNEUMATIC ACTUATOR, RANGE TPN B

Application
For pneumatic quarter turn on/off or control duty, spring return (TPN B), of Wouter Witzel butterfly valves. Heavy duty category.

Product description
• Gear rack / gear wheel actuator type
• Body of cast iron GG25, polyurethane coated
• End caps of aluminium
• Cylinders of bronze
• Adjustable travel stops for both end positions
• Mechanical position indication
• Interface for signal transmitters and positioners acc. VDI/VDE 3845 (NAMUR)
• Flange dimensions acc. to ISO 5211
• Lifetime lubricated under normal working conditions
• Available as spring to open (S.O.) and spring to close (S.C.) actuator

Technical data
Stroke : 90° with ± 10° adjustment
Rotation : Clockwise closing (ccw closing for TPN5B – TPN40B spring to open)
Operating medium : Dry or lubricated air
Temperature : -20° to +80° C
Coating colour : RAL 2000, orange
Air connection : G 1/4”
Supply pressure : min. 2 bar up to max. 10 bar

Options
• Limit switches or switchbox
• Solenoid valve
• Speed control
• Position transmitter
• Positioner
• Air connection G 1/2”
• Wormgear for emergency manual operation
• Mounting parallel to pipeline (mounting position 2)

<table>
<thead>
<tr>
<th>Actuator type</th>
<th>ISO</th>
<th>Dimensions [mm]</th>
<th>Weight [kg]</th>
<th>Air consumption [l/stroke]</th>
</tr>
</thead>
</table>
| TPN5B            | F07   | a  b  c  d  e  f  g  h  j  k | TPN B  
| TPN17B           | F07   | 118  30    -  28 100 100 80 30 310 14 12 0.17 |
| TPN40B           | F07 / F10 / F12 | 125  30    -  48 130 133 80 30 495 14 22 0.61 |
| TPN85B           | F07 / F10 / F12 | 167  30    -  61 180 170 80 30 590 19 45 1.5 |
| TPN140B          | F07 / F10 / F12 / F14 | 185  30  395  72 160 -  130 30 610 30 62 2.9 |
| TPN280B          | F07 / F10 / F12 / F14 / F16 | 215  30  490  96 180 -  130 30 815 30 100 5.1 |

Figure single acting TPN B
3 PRODUCT DATA: ELECTRIC ACTUATORS

3.1 GENERAL

Main features of electric actuators are:
- High torque output
- Self braking construction
- Low noise level
- Smooth operation over complete valve stroke
- Most economical way of power actuation for bigger sizes of butterfly valves

Electric actuators can be divided into two groups:
- Quarter turn actuators, can be directly mounted to a butterfly valve
- Multi-turn actuators, require a worm gearbox to convert to 90 degrees rotation

3.2 PRODUCT CONFIGURATION

All electric actuators used by Wouter Witzel are provided with at least two internal switches for switching off the motor in both end positions, a mechanical position indicator and a facility for emergency hand operation. Depending on make and/or type the actuators are standard also provided with:

- Torque switches protection of the valve /actuator against mechanical overload
- Thermo protection protection of motor windings against overheating
- Limit switches remote open/closed position monitoring of the valve
- Space heater protection of the actuator against condensation

Electric actuators can be equipped with many internal ancillaries such as:

**Ancillary:**

- Extra switches remote open/closed or intermediate position monitoring of the valve (for switching a single electrical circuit)
- Tandem switches remote open/closed or intermediate position monitoring of the valve (for switching two different electrical circuits by one switch)
- Potentiometer continuous valve disc position feedback (resistance signal)
- Electronic position transmitter continuous valve disc position feedback (current signal)
- Electronic positioner valve disc positioning based on a variable input signal
- Timer board increased operating times by means of pulse – pause operation
3.2.1 Electric actuators for on/off duty
The more sophisticated electric actuators can also be equipped with an integrated motor control unit with programmable controls including reversing contactors for motor controls and diagnose functions. The actuator can be remote controlled over potential-free contacts. Extra features of an integrated motor control unit can include a local control station.

3.2.2 Electric actuators for control duty
Control duty means that the actuator positions the valve disc according to an input signal. Based on this input signal, a positioner processes signals and sends them to the motor controls. The motor of the actuator is switched on and off by the motor controls in open or closed direction, only if a deviation arises between the input and feedback signals. As long there is no difference between the input and feedback signals the motor remains switched off. As an option a continuous valve disc position feedback can be supplied.

**External motor controls**
- External positioner receives input signal from master controller
- On/off switching in open or closed direction by external motor controls based on signal impulses processed by external positioner
- Valve position feedback to external positioner as an option

**Integrated motor controls**
- External positioner receives input signal from master controller
- On/off switching in open or closed direction by integrated motor controls based on signal impulses processed by external positioner
- Valve position feedback to external positioner as an option

**Integrated motor controls with internal positioner**
- Integrated positioner receives input signal from master controller
- On/off switching in open or closed direction by integrated motor controls based on signal impulses processed by internal positioner
- Valve position feedback to internal positioner is required. Feedback to master controller as an option
Product sheet

ELECTRIC ACTUATOR, RANGE M

Application
For electric quarter turn on/off or control duty of small sized Wouter Witzel butterfly valves. Economic category.

Product description
• Body of aluminium, cover of plastic
• Self-locking
• 2 Limit switches in both end positions: 1 for switching off the motor and 1 for remote position indication
• Auto / Manual selector switch
• Manual override by means of a lever
• Space heater
• Connection of motor and controls on terminal strip
• Mechanical position indicator
• Flange dimensions acc. to ISO 5211

Technical data
Stroke : 90° with ± 5° adjustment
Rotation : Clockwise closing
Voltages : Single phase 24, 110, 230VAC
Enclosure : IP54
Temperature : 0° to +50° C
Cable entry : 1x Pg13,5, 2x Pg11

Options
• Potentiometer for position feedback
• Positioner including electronic position transmitter (only in combination with motor 24VAC)
• Enclosure IP65 (aluminium cover)
• Mounting position 2

<table>
<thead>
<tr>
<th>Actuator type</th>
<th>ISO</th>
<th>Dimensions [mm]</th>
<th>Weight [kg]</th>
</tr>
</thead>
<tbody>
<tr>
<td>M138</td>
<td>F07</td>
<td>d 47</td>
<td>h 87</td>
</tr>
<tr>
<td>M140</td>
<td>F07</td>
<td>d 47</td>
<td>h 87</td>
</tr>
<tr>
<td>M150</td>
<td>F07</td>
<td>d 47</td>
<td>h 87</td>
</tr>
<tr>
<td>M180</td>
<td>F07</td>
<td>d 47</td>
<td>h 87</td>
</tr>
</tbody>
</table>
Product sheet

ELECTRIC ACTUATOR, RANGE EL

Application
For electric quarter turn on/off or control duty of Wouter Witzel butterfly valves. Economic category. Compact design and low weight.

Product description
• Body of aluminium, cover of steel, polyurethane coated
• Thermal protection of motor windings
• Self-locking
• 2 Limitswitches in both end positions: 1 for switching off the motor and 1 for remote position indication
• Torque switches for open and closed direction (except EL 55)
• Adjustable travel stops for both end positions
• Manual override by means of a handwheel
• Space heater
• Connection of motor and controls on terminal strip
• Mechanical position indicator
• Flange dimensions acc. to ISO 5211

Technical data
Stroke : 90° with ± 10° adjustment
Rotation : Clockwise closing
Duty rating : S2 - 30%, up to 60 starts per hour
Voltages : Single phase 24, 110/120, 220/240
VAC Three phase 380, 415, 460 VAC
Direct current 24VDC
Enclosure : IP65
Temperature : -20° to +80° C
Coating colour : RAL 1007, yellow
Cable entry : 3x Pg 13,5 (type EL55 - EL150)
3x Pg 21 (type EL200 - EL2500)

Options
• Speed control unit
• Potentiometer for position feedback
• Position transmitter, output 4 – 20 mA
• Positioner for control duty, input 4 ñ20 mA or 0 – 10V
• Local control unit
• Plug/socket connector
• Explosion proof actuator EEx d IIB T4, to EN 50018
• Enclosure IP67
• Mounting position 2 (handwheel shaft parallel to pipeline)

<table>
<thead>
<tr>
<th>Actuator type</th>
<th>ISO</th>
<th>Dimensions [mm]</th>
<th>Weight [kg]</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>d   h   j   k   l   m   m1  n</td>
<td></td>
</tr>
<tr>
<td>EL55</td>
<td>F05  / F07</td>
<td>70  95  60  60  130  212  145 43</td>
<td>6</td>
</tr>
<tr>
<td>EL100</td>
<td>F05  / F07</td>
<td>77  120  82  93  135  245  165 47</td>
<td>11</td>
</tr>
<tr>
<td>EL150</td>
<td>F05  / F07</td>
<td>77  120  82  93  135  245  165 47</td>
<td>11</td>
</tr>
<tr>
<td>EL200</td>
<td>F07  / F10</td>
<td>96  141  109 160  170  261  165 54</td>
<td>16.5</td>
</tr>
<tr>
<td>EL350</td>
<td>F07  / F10</td>
<td>96  141  109 160  170  261  165 54</td>
<td>17</td>
</tr>
<tr>
<td>EL500</td>
<td>F10</td>
<td>123 166  128 195  195  255  165 63</td>
<td>25.5</td>
</tr>
<tr>
<td>EL800</td>
<td>F12</td>
<td>123 166  128 195  195  255  190 63</td>
<td>26</td>
</tr>
<tr>
<td>EL1200</td>
<td>F14</td>
<td>123 175  128 350  263  304  110 74</td>
<td>37</td>
</tr>
<tr>
<td>EL2500</td>
<td>F16</td>
<td>160 232  220 600  320  280  125 105</td>
<td>75</td>
</tr>
</tbody>
</table>
Product sheet

ELECTRIC ACTUATOR, RANGE SD

Application
For electric quarter turn on/off or control duty of Wouter Witzel butterfly valves. General purpose category.

Product description
• Squirrel cage 3 phase induction motor (except Z3)
• Thermal protection of motor winding
• Self-locking
• Travel limit switches for both end positions
• Torque switches for open and closed direction (except Z3 and OA)
• Adjustable travel stops for both end positions
• Manual override by means of a handwheel
• Space heater
• Connection of motor and controls on terminal strip
• Mechanical position indicator
• Flange dimensions acc. to ISO 5211

Technical data
Stroke : 90° with ± 2° adjustment
Rotation : Clockwise closing
Voltages : Single phase 24, 110/120, 220/240
Three phase 380/415 (except Z3)
Direct current 24VDC
Enclosure : IP67
Temperature : -20° to +70° C
Coating colour : RAL 7001, grey
Cable entry : 2x Pg16 (cable glands included)

Options
• Extra limit switches for open and closed position
• Potentiometer 1 kOhm for position feedback
• Position transmitter, output 4-20 mA
• Integral motor control unit INTEGRAL+
• Explosion proof actuator EEx ed IIC T4, to EN 50014-20
• Mounting position 2 (handwheel shaft parallel to pipeline)

<table>
<thead>
<tr>
<th>Actuator type</th>
<th>ISO</th>
<th>Dimensions [mm]</th>
<th>Weight [kg]</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>d</td>
<td>d1</td>
<td>h</td>
</tr>
<tr>
<td>Z3</td>
<td>F05</td>
<td>90</td>
<td>-</td>
</tr>
<tr>
<td>OA6</td>
<td>F06 / F07</td>
<td>145</td>
<td>-</td>
</tr>
<tr>
<td>OA8</td>
<td>F06 / F07</td>
<td>145</td>
<td>-</td>
</tr>
<tr>
<td>OAP</td>
<td>F05 / F07</td>
<td>145</td>
<td>-</td>
</tr>
<tr>
<td>OA15</td>
<td>F07 / F10</td>
<td>145</td>
<td>-</td>
</tr>
<tr>
<td>AS18</td>
<td>F07 / F10</td>
<td>226</td>
<td>105</td>
</tr>
<tr>
<td>AS25</td>
<td>F07 / F10</td>
<td>226</td>
<td>105</td>
</tr>
<tr>
<td>ASP</td>
<td>F07 / F10</td>
<td>226</td>
<td>105</td>
</tr>
<tr>
<td>AS50</td>
<td>F07 / F10</td>
<td>226</td>
<td>105</td>
</tr>
<tr>
<td>AS80</td>
<td>F12</td>
<td>226</td>
<td>105</td>
</tr>
<tr>
<td>BS50</td>
<td>F12</td>
<td>284</td>
<td>65</td>
</tr>
<tr>
<td>BS100</td>
<td>F12 / F14</td>
<td>284</td>
<td>65</td>
</tr>
<tr>
<td>BS150</td>
<td>F14</td>
<td>284</td>
<td>65</td>
</tr>
</tbody>
</table>
Product sheet

ELECTRIC ACTUATOR, RANGE SG NORM

Application
For electric quarter turn on/off duty of all Wouter Witzel butterfly valves. General purpose category.

Product description
• Squirrel cage induction motor (3 phase)
• Thermal protection of motor winding
• Self-locking
• Travel limit switches for both end positions
• Torque switches for open and closed direction
• Adjustable travel stops for both end positions
• Manual override by means of a handwheel
• Space heater
• Plug/socket connection for motor and controls
• Mechanical position indicator
• Flange dimensions acc. to ISO 5211

Technical data
Stroke : 90° with ± 5° adjustment
Rotation : Clockwise closing
Duty rating : S2-15 min.
Voltages : 3 phase AC
Enclosure : IP67
Temperature : -25° to +80° C
Coating colour : RAL 9007, silver grey
Cable entry : 1x Pg 13,5 2x Pg 21

Options
• Single phase motor with adjustable motorspeed
• Tandem limit switches / torque switches
• Potentiometer for position feedback
• Electronic position transmitter, output 4-20 mA
• Integrated motor control unit (Auma Matic)
• Explosion proof actuator EEx ed IIC T4, to EN 50014
• Extra corrosion protection
• Enclosure IP68-6 (up to 6 m head of water for 72 hours)
• Mounting position 2 (handwheel shaft parallel to pipeline)

<table>
<thead>
<tr>
<th>Actuator type</th>
<th>ISO</th>
<th>Dimensions [mm]</th>
<th>Weight [kg]</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>d h h1 j k l m m1 n</td>
<td></td>
</tr>
<tr>
<td>SG05.1</td>
<td>F05 / F07</td>
<td>291 195 30 58 160 191 193 30 82</td>
<td>18</td>
</tr>
<tr>
<td>SG07.1</td>
<td>F07 / F10</td>
<td>291 195 30 58 160 191 193 30 82</td>
<td>18</td>
</tr>
<tr>
<td>SG10.1</td>
<td>F10 / F12</td>
<td>301 205 30 75 160 216 203 30 88</td>
<td>24</td>
</tr>
<tr>
<td>SG12.1</td>
<td>F12 / F14</td>
<td>301 205 30 75 160 233 211 30 102</td>
<td>28</td>
</tr>
</tbody>
</table>
Product sheet

ELECTRIC ACTUATOR, RANGE SG MATIC

Application
For electric quarter turn on/off duty of all Wouter Witzel butterfly valves. General purpose category.

Product description
• Squirrel cage induction motor (3 phase)
• Thermal protection of motor winding
• Self-locking
• Travel limit switches for both end positions
• Torque switches for open and closed direction
• Adjustable travel stops for both end positions
• Integrated motor control unit (Matic) with:
  - Reversing contactors with mechanical and electrical interlocks
  - Push buttons “open-stop-close”
  - Selector switch “local-off-remote” (padlockable)
  - Opto-couplers for remote control signals (24V DC, internal supply)
  - 4 signal relays “open-close-selector switch local-selector switch remote”
  - Phase discriminator
  - Programmable logic
  - Monitoring relay for collective fault signal
  - Plug/socket connection for motor and controls
• Manual override by means of a handwheel
• Space heater
• Mechanical position indicator
• Flange dimensions acc. to ISO 5211

Technical data
Stroke : 90° with ± 5° adjustment
Rotation : Clockwise closing
Duty rating : S2-15 min.
Voltages : 3 phase AC
Enclosure : IP67
Temperature : -25° to +70° C
Coating colour : RAL 9007, silver grey
Cable entry : 1x Pg 13,5 2x Pg 21

Options
• Single phase motor with adjustable motorspeed
• Tandem limit switches / torque switches
• Potentiometer for position feedback
• Electronic position transmitter, output 4-20 mA
• Indication lamps “open-fault-close” on motor control unit
• Fieldbus interface (Profibus DP, Profibus FMS, Interbus S, Modbus RTU)
• Extra corrosion protection
• Enclosure IP68-6 (up to 6 m head of water for 72 hours)
• Wall bracket for motor control unit
• Mounting position 2 (handwheel shaft parallel to pipeline)

<table>
<thead>
<tr>
<th>Actuator type</th>
<th>ISO</th>
<th>Dimensions [mm]</th>
<th>Weight [kg]</th>
</tr>
</thead>
<tbody>
<tr>
<td>SG05.1 - AM01.1</td>
<td>F05 / F07</td>
<td>d 291 h 340 j 220 k 30 l 160 m 191 m1 193 n 82</td>
<td>25</td>
</tr>
<tr>
<td>SG07.1 - AM01.1</td>
<td>F07 / F10</td>
<td>d 291 h 340 j 220 k 30 l 160 m 191 m1 193 n 82</td>
<td>25</td>
</tr>
<tr>
<td>SG10.1 - AM01.1</td>
<td>F10 / F12</td>
<td>d 301 h 350 j 220 k 30 l 160 m 216 m1 203 n 88</td>
<td>31</td>
</tr>
<tr>
<td>SG12.1 - AM01.1</td>
<td>F12 / F14</td>
<td>d 301 h 350 j 220 k 30 l 160 m 233 m1 211 n 102</td>
<td>35</td>
</tr>
</tbody>
</table>
**Product sheet**

**ELECTRIC ACTUATOR, RANGE AS / VM**

**Application**
For electric quarter turn on/off or control duty of all Wouter Witzel butterfly valves. General purpose category. Compact design and low weight.

**Product description**
- Electronically commutated motor with speed adjustment
- Thermal protection of motor winding
- Self-locking
- Hall-sensors for both end positions
- Patented sensor for torque measuring (except ASO models)
- Adjustable travel stops for both end positions
- Integrated motor control unit (Variomatic) with:
  - Push buttons “open-stop-close”
  - Selector switch “local-off-remote” (padlockable)
  - LEDs for “open-fault-close” indication
- Adjustable operating time
- Plug/socket connection for motor and controls
- Manual override by means of a handwheel
- Mechanical position indicator
- Flange dimensions acc. to ISO 5211

**Technical data**
- **Stroke:** 90° with ± 8° adjustment
- **Rotation:** Clockwise closing
- **Duty rating:** S2 - 15 min.
- **Voltages:** Single phase 220/240V AC
- **Enclosure:** IP67
- **Temperature:** -25° to +70° C
- **Coating colour:** RAL 9007, silver grey
- **Cable entry:** 1x Pg 13,5 2x Pg 21

**Options**
- Extra relays for open and closed position
- ASR actuator for control duty S5 - 40% ED (1800 starts/hour)
- Potentiometer for position feedback
- Electronic position transmitter, output 4 – 20 mA
- Positioner, input 4 – 20 mA
- Fieldbus interface (Profibus DP, Profibus FMS, Interbus S, Modbus RTU)
- Extra corrosion protection
- Enclosure IP68-6 (up to 6 meter head of water for 72 hours)
- Wall bracket for motor control unit
- Mounting position 2 (handwheel shaft parallel to pipeline)

<table>
<thead>
<tr>
<th>Actuator type</th>
<th>ISO</th>
<th>Dimensions [mm]</th>
<th>Weight [kg]</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASO3/VM</td>
<td>F04 / F05 / F07</td>
<td>d 199  h 118  j 259  k 100  l 157  m 96  m1 40  n 64</td>
<td>8</td>
</tr>
<tr>
<td>ASO6/VM</td>
<td>F04 / F05 / F07</td>
<td>d 199  h 118  j 259  k 100  l 157  m 96  m1 40  n 64</td>
<td>8</td>
</tr>
<tr>
<td>AS6/VM</td>
<td>F04 / F05 / F07</td>
<td>d 199  h 118  j 259  k 100  l 200  m 96  m1 40  n 64</td>
<td>8</td>
</tr>
<tr>
<td>AS12/VM</td>
<td>F05 / F07</td>
<td>d 199  h 118  j 269  k 125  l 203  m 108  m1 50  n 80</td>
<td>11</td>
</tr>
<tr>
<td>AS25/VM</td>
<td>F07 / F10</td>
<td>d 199  h 118  j 281  k 160  l 238  m 126  m1 80  n 99</td>
<td>18</td>
</tr>
<tr>
<td>AS50/VM</td>
<td>F10 / F12</td>
<td>d 199  h 118  j 296  k 200  l 237  m 142  m1 80  n 111</td>
<td>24</td>
</tr>
</tbody>
</table>
Product sheet

ELECTRIC ACTUATOR, RANGE DP

Application
For electric quarter turn on/off duty of Wouter Witzel butterfly valves. General purpose category.

Product description
• Squirrel cage induction motor (3 phase)
• Thermal protection of motor winding
• Self-locking
• Lifetime lubricated under normal working conditions
• Travel limit switches for both end positions
• Torque switches for open and closed direction
• Adjustable travel stops for both end positions
• Manual override by means of a handwheel
• Space heater
• Plug/socket connection for motor and controls
• Mechanical position indicator
• Flange dimensions acc. to ISO 5211

Technical data
Stroke: 90° with ± 5° adjustment
Rotation: Clockwise closing
Duty rating: S2 - 15 min.
Voltages: 3 phase AC
Enclosure: IP67
Temperature: -20° to +80° C
Coating colour: RAL 5015, blue
Cable entry: 1x Pg 13,5 2x Pg 29

Options
• Single phase motor
• Tandem limit switches/torque switches
• Potentiometer for position feedback
• Electronic position transmitter, output 4-20 mA
• DMI 002 Integral motor control unit
• Explosion proof actuator EEx ed IIC T4, to EN 50014
• Extra corrosion protection in combination with enclosure IP88-5 (up to 5 m water head for 24 hours)
• Mounting position 2 (handwheel shaft parallel to pipeline)

<table>
<thead>
<tr>
<th>Actuator type</th>
<th>ISO</th>
<th>Dimensions [mm]</th>
<th>Weight [kg]</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>d   h  j</td>
<td>j1 k  l</td>
</tr>
<tr>
<td>DP30 / DP59</td>
<td>F05 / F07</td>
<td>126 179 252</td>
<td>15 200 203</td>
</tr>
<tr>
<td>DP119</td>
<td>F05 / F07</td>
<td>126 179 252</td>
<td>15 200 203</td>
</tr>
<tr>
<td>DP319</td>
<td>F07 / F10</td>
<td>126 179 252</td>
<td>15 281 203</td>
</tr>
<tr>
<td>DP799</td>
<td>F10 / F12</td>
<td>126 179 252</td>
<td>15 281 203</td>
</tr>
<tr>
<td>DP1599</td>
<td>F12 / F14</td>
<td>126 179 252</td>
<td>15 281 203</td>
</tr>
<tr>
<td>DP3200</td>
<td>F14 / F16</td>
<td>129 205 262</td>
<td>15 250 324</td>
</tr>
</tbody>
</table>
Product sheet

ELECTRIC ACTUATOR, RANGE DPMC

Application
For electric quarter turn on/off duty of all Wouter Witzel butterfly valves. General purpose category.

Product description
• Squirrel cage induction motor (3 phase)
• Thermal protection of motor winding
• Self-locking
• Travel limit switches for both end positions
• Torque switches for open and closed direction
• Integrated motor control unit (Matic MC 002) with:
  • Reversing contactors with mechanical and electrical interlocks
  • Selector switch “open-stop-close”
  • Selector switch “local-off-remote” (lockable)
  • Opto-couplers for remote control signals (24V DC, internal supply)
• 4 signal relays “open-close-selector switch local-selector switch remote”
• Automatic correction of rotation direction
• Programmable logic
• Monitoring relay for collective fault signal
• Plug/socket connection for motor and controls
• Adjustable travel stops for both end positions
• Manual override by means of a handwheel
• Space heater
• Mechanical position indicator
• Flange dimensions acc. to ISO 5211

Technical data
Stroke : $90^\circ$ with $\pm 5^\circ$ adjustment
Rotation : Clockwise closing
Duty rating : S2 - 15 min.
Voltages : 3 phase AC
Enclosure : IP67
Temperature : -20° to +70° C
Coating colour : RAL 5015, blue
Cable entry : 1x Pg 13,5 2x Pg 29

Options
• Single phase motor
• MC 003: as MC 002 with extra electronic position transmitter 4 - 20 mA (internal supply)
• MC 004: as MC 002 with 2 extra electronic contacts for intermediate positions
• Indication lamps “open - failure -close”
• Fieldbus interface (Profibus DP, Profibus FMS, Interbus S)
• Explosion proof actuator EEx ed IIC T4, to EN 50014
• Extra corrosion protection
• Enclosure IP68-5 (up to 5 meter water head for 24 hours)
• Mounting position 2 (handwheel shaft parallel to pipeline)

<table>
<thead>
<tr>
<th>Actuator type</th>
<th>ISO</th>
<th>Dimensions [mm]</th>
<th>Weight [kg]</th>
</tr>
</thead>
<tbody>
<tr>
<td>DPMC30 / DPMC59</td>
<td>F05 / F07</td>
<td>d 126 h 179 j 252 j1 15 k 125 / l 160 m 201 m1 281 n 185</td>
<td>113 24</td>
</tr>
<tr>
<td>DPMC119</td>
<td>F05 / F07</td>
<td>d 126 h 179 j 252 j1 15 k 200 l 201 m 301 m1 205 n 129</td>
<td>24</td>
</tr>
<tr>
<td>DPMC319</td>
<td>F07 / F10</td>
<td>d 126 h 179 j 252 j1 15 k 125 l 281 m 281 m1 185 n 227</td>
<td>39</td>
</tr>
<tr>
<td>DPMC799</td>
<td>F10 / F12</td>
<td>d 126 h 179 j 252 j1 15 k 160 l 281 m 281 m1 185 n 227</td>
<td>39</td>
</tr>
<tr>
<td>DPMC1599</td>
<td>F12 / F14</td>
<td>d 126 h 179 j 252 j1 15 k 200 l 281 m 281 m1 185 n 253</td>
<td>48</td>
</tr>
<tr>
<td>DPMC3200</td>
<td>F14 / F16</td>
<td>d 129 h 205 j 262 j1 15 k 250 l 324 m 314 m1 205 n 290</td>
<td>82</td>
</tr>
</tbody>
</table>
**Product sheet**

**ELECTRIC ACTUATOR, RANGE SA NORM / GS(M)**

**Application**
For electric quarter turn on/off or control duty of Wouter Witzel butterfly valves. Heavy duty category.

**Product description**
- Squirrel cage induction motor (3 phase)
- Thermal protection of motor winding
- Self-locking
- Travel limit switches for both end positions
- Torque switches for open and closed direction
- Blinker transmitter
- Space heater
- Manual override by means of a handwheel
- Plug/socket connection for motor and controls
- Wormgear for reduction to 90° rotation with adjustable mechanical end stops for both end positions
- Mechanical position indicator on wormgear
- Flange dimensions acc. to ISO 5211

**Technical data**
- **Stroke**: 90° with ± 5° adjustment
- **Rotation**: Clockwise closing
- **Duty rating**: S2 - 15 min.
- **Voltages**: 3 phase AC
- **Enclosure**: IP67
- **Temperature**: -25° to +80° C
- **Coating colour**: RAL 9007, silver grey
- **Cable entry**: 1x Pg 13.5, 2x Pg 21

**Options**
- Single phase or direct current motor
- Motor for control duty S4 - 25% ED (1200 starts per hour)
- Tandem limit switches / torque switches
- Additional mechanical position indicator on motor unit
- Potentiometer for position feedback
- Electronic position transmitter, output 4-20 mA
- Explosion proof actuator EEx ed IIC T4, to EN 50014
- Extra corrosion protection
- Enclosure IP68-6 (up to 6 m head of water for 72 hours)
- Mounting position 2 (handwheel shaft parallel to pipeline)

---

<table>
<thead>
<tr>
<th>Actuator type</th>
<th>ISO</th>
<th>Dimensions [mm]</th>
<th>Weight [kg]</th>
</tr>
</thead>
<tbody>
<tr>
<td>SA07.1 - GSM40.3</td>
<td>F05 / F07</td>
<td>a 72 b 70 c 96 d 100 e 52 f 40 g 68 h 273 j 30 k 265 l 160 m 249 n 197</td>
<td>25</td>
</tr>
<tr>
<td>SA07.1 - GSM50.3</td>
<td>F07 / F10</td>
<td>a 80 b 80 c 96 d 100 e 63 f 50 g 77 h 273 j 30 k 265 l 160 m 249 n 197</td>
<td>27</td>
</tr>
<tr>
<td>SA07.5 - GSM63.3</td>
<td>F10 / F12</td>
<td>a 85 b 94 c 128 d 125 e 75 f 63 g 94 h 273 j 30 k 265 l 160 m 249 n 197</td>
<td>33</td>
</tr>
<tr>
<td>SA07.5 - GSM80.3</td>
<td>F12 / F14</td>
<td>a 97 b 107 c 139 d 138 e 88 f 88 g 111 h 273 j 30 k 265 l 160 m 249 n 197</td>
<td>39</td>
</tr>
<tr>
<td>SA07.5 - GSM100.0/V243</td>
<td>F14 / F16</td>
<td>a 115 b 142 c 187 d 259 e 105 f 100 g 148 h 273 j 30 k 265 l 160 m 249 n 197</td>
<td>58</td>
</tr>
<tr>
<td>SA07.5 - GSM125.3/V243</td>
<td>F16 / F25</td>
<td>a 115 b 145 c 192 d 264 e 125 f 125 g 173 h 273 j 30 k 265 l 160 m 249 n 197</td>
<td>70</td>
</tr>
<tr>
<td>SA10.1 - GSM125.0/V343</td>
<td>F16 / F25</td>
<td>a 125 b 145 c 192 d 264 e 125 f 125 g 173 h 273 j 30 k 265 l 160 m 249 n 197</td>
<td>80</td>
</tr>
<tr>
<td>SA07.5 - GSM160.3/GZ160.3</td>
<td>F25 / F30</td>
<td>a 130 b 155 c 290 d 275 e 165 f 160 g 218 h 273 j 30 k 265 l 160 m 249 n 197</td>
<td>115</td>
</tr>
<tr>
<td>SA10.1 - GSM160.3/GZ160.3</td>
<td>F25 / F30</td>
<td>a 140 b 155 c 290 d 275 e 165 f 160 g 218 h 275 j 30 k 282 l 200 m 254 n 197</td>
<td>120</td>
</tr>
</tbody>
</table>

*other sizes available on request*
Product sheet

ELECTRIC ACTUATOR, RANGE SA MATIC / GS(M)

Application
For electric quarter turn on/off or control duty of Wouter
Witzel butterfly valves. Heavy duty category.

Product description
• Squirrel cage induction motor (3 phase)
• Thermal protection of motor winding
• Self-locking
• Travel limit switches for both end positions
• Torque switches for open and closed direction
• Blinker transmitter
• Integrated motor control unit (Matic) with:
  - Reversing contactors with mechanical and electrical
    interlocks
  - Push buttons “open-stop-close”
  - Selector switch “local-off-remote” (lockable)
  - Opto-couplers for remote control signals (24V DC, internal
    supply)
  - 4 signal relays “open-close-selector switch local-selector
    switch remote”
  - Phase discriminator
  - Programmable logic
  - Monitoring relay for collective fault signal
  - Plug/socket connection for motor and controls
• Manual override by means of a handwheel
• Space heater
• Wormgear for reduction to 90° rotation with adjustable
  mechanical end stops for both end positions
• Mechanical position indicator on wormgear
• Flange dimensions acc. to ISO 5211

Technical data
Stroke : 90° with ± 5° adjustment
Rotation : Clockwise closing
Duty rating : S2 - 15 min.
Voltages : 3 phase AC
Enclosure : IP67
Temperature : -25° to +70° C
Coating colour : RAL 9007, silver grey
Cable entry : 1x Pg 13,5 2x Pg 21

Options
• Single phase motor
• Motor for control duty S4 - 25% ED (1200 starts per hour)
• Additional mechanical position indicator on motor unit
• Tandem limit switches / torque switches
• Potentiometer for position feedback
• Electronic position transmitter, output 4-20 mA
• Positioner, input 4 - 20 mA
• Indication lamps “open-fault-close” on motor control unit
• Fieldbus interface (Profinet, Profinet FMS, Interbus S,
  Modbus RTU)
• Extra corrosion protection
• Explosion proof actuator EEx ed IIC T4, to EN 50014
• Enclosure IP68-6 (up to 6 m head of water for 72 hours)
• Mounting position 2 (handwheel shaft parallel to
  pipeline)

Figure

![Actuator Diagram](image_url)
Product sheet

ELECTRIC ACTUATOR, RANGE SA NORM / M.F

Application
For electric quarter turn on/off or control duty of all Wouter Witzel butterfly valves. Heavy duty category.

Product description
• Squirrel cage induction motor (3 phase)
• Thermal protection of motor winding
• Self-locking
• Travel limit switches for both end positions
• Torque switches for open and closed direction
• Blinker transmitter
• Space heater
• Manual override by means of a handwheel
• Plug/socket connection for motor and controls
• Wormgear for reduction to 90° rotation with adjustable mechanical end stops for both end positions
• Mechanical position indicator on wormgear
• Flange dimensions acc. to ISO 5211

Technical data
Stroke : 90° with ± 5° adjustment
Rotation : Clockwise closing
Duty rating : S2 - 15 min.
Voltages : 3 phase AC
Enclosure : IP67
Temperature : -25° to +80° C
Coating colour : RAL 9007, silver grey
Cable entry : 1x Pg 13, 2x Pg 21

Options
• Single phase or direct current motor
• Motor for control duty S4 - 25% ED (1200 starts per hour)
• Tandem limit switches / torque switches
• Additional mechanical position indicator on motor unit
• Potentiometer for position feedback
• Electronic position transmitter, output 4-20 mA
• Explosion proof actuator EEx ed IIC T4, to EN 50014
• Extra corrosion protection
• Enclosure IP68-6 (up to 6 m head of water for 72 hours)
• Mounting position 2 (handwheel shaft parallel to pipeline)

<table>
<thead>
<tr>
<th>Actuator type</th>
<th>ISO</th>
<th>Dimensions [mm]</th>
<th>Weight [kg]</th>
</tr>
</thead>
<tbody>
<tr>
<td>SA07.1 - MFZ40</td>
<td>F07 / F10</td>
<td>a</td>
<td>72</td>
</tr>
<tr>
<td>SA07.5 - MYF40</td>
<td>F10 / F12</td>
<td>a</td>
<td>80</td>
</tr>
<tr>
<td>SA07.5 - MYF40/S3</td>
<td>F10 / F12</td>
<td>a</td>
<td>80</td>
</tr>
<tr>
<td>SA07.5 - MFB64</td>
<td>F14 / F16</td>
<td>a</td>
<td>88</td>
</tr>
<tr>
<td>SA07.5 - MFB64/S3</td>
<td>F14 / F16</td>
<td>a</td>
<td>88</td>
</tr>
<tr>
<td>SA07.5 - MCF72/S5</td>
<td>F14 / F16</td>
<td>a</td>
<td>110</td>
</tr>
<tr>
<td>SA07.5 - MFF57/S5</td>
<td>F16 / F25</td>
<td>a</td>
<td>106</td>
</tr>
<tr>
<td>SA10.1 - MJF50/S5</td>
<td>F25 / F30</td>
<td>a</td>
<td>115</td>
</tr>
</tbody>
</table>

other sizes available on request
Product sheet

ELECTRIC ACTUATOR, RANGE SA MATIC / M.F

Application

For electric quarter turn on/off or control duty of Wouter Witzel butterfly valves. Heavy duty category.

Product description

- Squirrel cage induction motor (3 phase)
- Thermal protection of motor winding
- Self-locking
- Travel limit switches for both end positions
- Torque switches for open and closed direction
- Blinker transmitter
- Space heater
- Integrated motor control unit (Matic) with:
  - Reversing contactors with mechanical and electrical interlocks
  - Push buttons “open-stop-close”
  - Selector switch “local-off-remote” (lockable)
  - Opto-couplers for remote control signals (24V DC, internal supply)
  - 4 signal relays “open-close-selector switch local-selector switch remote”
  - Phase discriminator
  - Programmable logic
  - Monitoring relay for collective fault signal
  - Plug/socket connection for motor and controls
- Manual override by means of a handwheel
- Worm gearbox for reduction to 90° rotation with adjustable mechanical end stops for both end positions
- Mechanical position indicator on wormgear
- Flange dimensions acc. to ISO 5211

Technical data

- Stroke : 90° with ± 5° adjustment
- Rotation : Clockwise closing
- Duty rating : S2 - 15 min. up to 60 starts per hour
- Voltages : 3 phase AC
- Enclosure : IP67 (worm gearbox IP65)
- Temperature : -25° to +70° C
- Coating colour : RAL 9007, silver grey
- Cable entry : 1x Pg 13.5, 2x Pg 21

Options

- Single phase current motor
- Motor for control duty S4 - 25% ED (1200 starts per hour)
- Additional mechanical position indicator on motor unit
- Tandem limit switches / torque switches
- Potentiometer for position feedback
- Electronic position transmitter, output 4-20 mA
- Positioner, input 4-20 mA
- Indication lamps open-fault-close on motor control unit
- Fieldbus interface (Profinbus DP, Profinbus FMS, Interbus S, Modbus RTU)
- Extra corrosion protection
- Explosion proof actuator EEex ed IIC T4, to EN 50014
- Enclosure IP68-6 (up to 6 m head of water for 72 hours)
- Mounting position 2 (handwheel shaft parallel to pipeline)

Figure

Figure showing actuator and control unit dimensions.

<table>
<thead>
<tr>
<th>Actuator type</th>
<th>ISO</th>
<th>Dimensions [mm]</th>
<th>Weight [kg]</th>
</tr>
</thead>
</table>

other sizes available on request
Product sheet

ELECTRIC ACTUATOR, RANGE D / M.F

Application
For electric quarter turn on/off or control duty of Wouter Witzel butterfly valves. Heavy duty category.

Product description
- Squirrel cage induction motor (3 phase)
- Thermal protection of motor winding
- Self-locking
- Travel limit switches for both end positions
- Torque switches for open and closed direction
- Plug/socket connection for motor and controls
- Blinker transmitter
- Space heater
- Manual override by means of a handwheel
- Wormgear for reduction to 90° rotation with 2 adjustable mechanical endstops for both endpositions
- Mechanical position indication on wormgear
- Flange dimensions acc. to ISO 5211

Technical data
- Stroke: 90° with ±5° adjustment
- Rotation: Clockwise closing
- Duty rating: S2 - 15 min.
- Voltages: 3 phase AC
- Enclosure: IP67 (wormgear IP65)
- Temperature: -20° to +80° C
- Coating colour: RAL 5015, blue
- Cable entry: 1x Pg 13, 5 2x Pg 29

Options
- Single phase motor
- Motor for control duty S4 - 25% ED (1200 starts per hour)
- Tandem limit switches / torque switches
- Additional mechanical position indicator on motor unit
- Potentiometer for position feedback
- Electronic position transmitter, output 4-20 mA
- Integrated motor control unit (Matic C)
- Explosion proof actuator EEx ed IIC T4, to EN 50014
- Extra corrosion protection
- Enclosure IP68-5 (up to 5 m head of water for 24 hours)
- Mounting position 2 (handwheel shaft parallel to pipeline)

### Actuator type ISO Dimensions [mm] Weight [kg]

```
D30 - M2F40  F07 / F10 a 130 71 63  b 95 67  c 60 92  d 280 105  e 252 15  f 125 80  g 224 24  h 24
D59 - M2F40  F10 / F12 a 138 92 76  b 148 82  c 77 127  d 280 105  e 252 15  f 160 80  g 224 34  h 22
D59 - M2F40/S3  F10 / F12 a 138 92 76  b 275 82  c -1 127  d 280 105  e 252 15  f 160 80  g 224 49  h 22
D59 - M2F64  F14 / F16 a 146 100 115  b 178 128  c 111 168  d 280 105  e 252 15  f 160 80  g 224 47  h 22
D59 - M2F64/S3  F14 / F16 a 146 100 115  b 306 128  c 33 168  d 280 105  e 252 15  f 160 80  g 224 62  h 22
D59 - M2F64/S5  F14 / F16 a 168 105 138  b 321 127  c 59 194  d 280 105  e 252 15  f 160 80  g 224 68  h 22
D59 - M2F64/S5  F16 / F25 a 164 128 143  b 331 158  c 60 195  d 280 105  e 252 15  f 160 80  g 224 81  h 22
D120 - M2F36/S5  F16 / F25 a 173 128 143  b 331 158  c 54 195  d 371 105  e 262 15  f 200 322  g 98 236  h 89
D120 - M2F36/D9  F16 / F25 a 173 128 143  b 425 158  c 138 195  d 371 105  e 262 15  f 200 322  g 98 236  h 102
D120 - M2F50/S5  F25 / F30 a 172 160 178  b 363 174  c 181 261  d 371 105  e 262 15  f 200 322  g 98 236  h 128
D120 - M2F50/D9  F25 / F30 a 172 160 178  b 425 174  c 181 261  d 371 105  e 262 15  f 200 322  g 98 236  h 141
```

other sizes available on request
Product sheet

**ELECTRIC ACTUATOR, RANGE DMC / M.F**

**Application**
For electric quarter turn on/off or control duty of Wouter Witzel butterfly valves. Heavy duty category.

**Product description**
- Squirrel cage induction motor (3 phase)
- Thermal protection of motor winding
- Self-locking
- Travel limit switches for both end positions
- Torque switches for open and closed direction
- Space heater
- Integrated motor control unit (Matic MC 002) with:
  - Reversing contactors with mechanical and electrical interlocks
  - Selector switch "open-stop-close"
  - Selector switch "local-off-remote" (lockable)
  - Opto-couplers for remote control signals (24V DC, internal supply)
  - 4 signal relays “open-close-selector switch local-selector switch remote”
  - Automatic correction of rotation direction
  - Programmable logic
  - Monitoring relay for collective fault signal
  - Plug/socket connection for motor and controls
- Manual override by means of a handwheel
- Blinker transmitter
- Worm gearbox for reduction to 90° rotation with adjustable mechanical end stops for both end positions
- Mechanical position indicator on wormgear
- Flange dimensions acc. to ISO 5211

**Technical data**
- **Stroke**: 90° with ± 5° adjustment
- **Rotation**: Clockwise closing
- **Duty rating**: S2 - 15 min.
- **Voltages**: 3 phase AC
- **Enclosure**: IP67 (worm gearbox IP65)
- **Temperature**: -20° to +70° C
- **Coating colour**: RAL 5015, blue
- **Cable entry**: 1x Pg 13,5 2x Pg 29

**Options**
- Motor for control duty S4 - 25% ED (1200 starts per hour)
- Additional mechanical position indicator on motor unit
- MC 003: as MC 002 with extra position transmitter 4 - 20 mA (internal supply) and mechanical position indicator
- MC 004: as MC 002 with 2 extra electronic contacts for intermediate positions
- MC 005: as MC 002 with extra positioner for control duty, input 4 - 20 mA, position transmitter 4 - 20 mA (internal supply) and mechanical position indicator
- Indication lamps "open - failure -close"
- Explosion proof actuator EEx ed IIC T4, to EN 50014
- Extra corrosion protection
- Enclosure IP68-5 (up to 5 m water head for 24 hours)
- Mounting position 2 (handwheel shaft parallel to pipeline)

**Figure**

![Diagram of actuator](image)

**Dimensions [mm]**

<table>
<thead>
<tr>
<th>Actuator type</th>
<th>ISO</th>
<th>Dimensions [mm]</th>
<th>Weight [kg]</th>
</tr>
</thead>
</table>

Other sizes available on request.
Product sheet

ELECTRIC ACTUATOR, RANGE IQ / M.F

Application
For electric quarter turn on/off or control duty of Wouter Witzel butterfly valves. Heavy duty category.

Product description
- Three phase Class F insulated squirrel cage motor
- Integrated motor control unit
- Thermostat for protection of motor windings
- Electronic torque control
- Four indication contacts, configurable by Infrared setting tool
- Local control station. Selector switch “local-remote”. Control knob “open-stop-close”
- Several interlock and monitoring facilities
- Lockable hand/auto lever to engage handwheel operation. Energisation of the motor automatically re-engages power operation
- Segregated connection of motor and controls on terminal block, located in separate sealed compartment
- Local LCD valve position indication (illuminated)
- Worm gearbox for reduction to 90° rotation with adjustable end stops for both end positions
- Mechanical position indicator on wormgear
- Flange dimensions acc. to ISO 5211

Technical data
- Stroke : 90° with ± 5° adjustment
- Rotation : Clockwise closing
- Duty rating : S2 – 20% ED, up to 60 starts per hour
- Enclosure : IP68 (up to 3 m head of water for 48 hrs.)
- Temperature : -30° to +70° C
- Coating : BS4800 00A13, charcoal grey
- Cable entry : 1x M40, 2x M25 or 1x Pg29, 2x Pg16 or 2x 1”, 1x 1½” ASA NPT

Options
- Set of alarm relays “battery low-thermostat tripped-remote selected”
- Additional status signal contacts
- Motor for control duty S4 - 50% ED (1200 starts per hour)
- Electronic position transmitter (CPT), output 4-20 mA
- Positioner (Folomatic), input 4 - 20 mA
- Interrupter timer
- Several explosion proof enclosures (CSA, FM, CENELEC)

Fieldbus interface (ie Pakscan, Modbus, Profibus, Fieldbus Foundation)
Mounting position 2 (handwheel shaft parallel to pipeline)

Figure

<table>
<thead>
<tr>
<th>Actuator type</th>
<th>ISO</th>
<th>Dimensions [mm]</th>
<th>Weight [kg]</th>
</tr>
</thead>
<tbody>
<tr>
<td>IQ10 - MZF40</td>
<td>F07 / F10</td>
<td>a 32 b 71 c 63 d 93 e 67 f 60 g 92 h 282 j 373 k 210 l 300 m 260 n 175</td>
<td>30 30 109 36</td>
</tr>
<tr>
<td>IQ12 - MYF40</td>
<td>F10 / F12</td>
<td>a 40 b 92 c 76 d 148 e 82 f 77 g 127 h 282 j 373 k 373 m 210 n 300</td>
<td>30 109 44</td>
</tr>
<tr>
<td>IQ12 - MBF64</td>
<td>F14 / F16</td>
<td>a 48 b 100 c 115 d 178 e 128 f 111 g 168 h 282 j 373 k 373 m 210 n 300</td>
<td>30 109 57</td>
</tr>
<tr>
<td>IQ12 - MTF72/S</td>
<td>F14 / F16</td>
<td>a 48 b 105 c 138 d 321 e 321 f 59 g 194 h 373 j 373 k 210 l 300 m 260 n 175</td>
<td>30 109 72</td>
</tr>
<tr>
<td>IQ12 - MFF50/D</td>
<td>F16 / F25</td>
<td>a 66 b 128 c 143 d 331 e 158 f 54 g 195 h 282 j 373 k 373 m 210 n 300</td>
<td>30 109 91</td>
</tr>
<tr>
<td>IQ12 - MFF36/D</td>
<td>F16 / F25</td>
<td>a 66 b 128 c 143 d 425 e 158 f 138 g 195 h 282 j 373 k 373 m 210 n 300</td>
<td>30 109 104</td>
</tr>
<tr>
<td>IQ12 - MJF50/D</td>
<td>F25 / F30</td>
<td>a 65 b 160 c 178 d 425 e 174 f 181 g 261 h 282 j 373 k 373 m 210 n 300</td>
<td>30 109 143</td>
</tr>
</tbody>
</table>

other sizes available on request
4 PRODUCT DATA: HYDRAULIC ACTUATORS

4.1 GENERAL
Hydraulic actuators use oil under high pressure as energy power source.

Main features of hydraulic actuators are:
• Compact and small design
• Smooth operation over complete valve stroke
• Spring return actuators for fail-safe operation
• Possibility for submerged or sub-sea operation

4.2 PRODUCT CONFIGURATION
Hydraulic actuators can be equipped with many ancillaries such as:

Ancillary: Function:
• Limit switches remote open/closed position monitoring of the valve (direct mounted to actuator or in a switchbox) (mechanical switches or inductive proximity sensors)
• Solenoid valves remote on/off operation of actuator
• Throttle block speed control for increased operating times
• Potentiometer continuous valve disc position feedback (resistance signal)
• Pilot operated check valves maintain valve disc position after hydraulic supply failure
• Lever or hand pump unit manual override or operation after hydraulic supply failure

NB: Specific technical information on request

4.2.1. Product configuration hydraulic actuators for on/off duty
Product sheet

HYDRAULIC ACTUATOR, RANGE BRC

Application
For hydraulic quarter turn on/off duty of Wouter Witzel butterfly valves. General purpose applications. Compact design.

Product description
• Body and piston of ductile iron (GGG40), alkyd coated
• Balanced rotary principle which eliminates side / bending forces on valve stem.
• Mechanical position indicator
• Easy adaption and mounting
• Flange dimensions acc. to ISO 5211
• Working pressure min. 30 bar, max. 210 bar

Technical data
Stroke : 90° with ± 1° adjustment
Rotation : Clockwise closing
Temperature : -20° to +80° C
Coating : Hempalin 53240, no. 50800 red
Hydraulic connection : 2x 3/8” BSPF

Options
• Reed limit switches RLS
• Current position transmitter CPI
• Multifunction blocks
• Solenoid valve
• Local operation by means of a lever (BRC002,BRC012)
• Local operation by means of a handpump (BRC022>)
• Local power unit (LPU)
• Version for submerged or subsea applications (epoxy coating)
• High temperature version (A2) (> 80°C)
• Low temperature version (A3) (down to -40°C)
• Single acting, spring return actuator BRCF

<table>
<thead>
<tr>
<th>Actuator type</th>
<th>ISO</th>
<th>Dimensions [mm]</th>
<th>Weight [kg]</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>a   b   c   d   e</td>
<td></td>
</tr>
<tr>
<td>BRC 002</td>
<td>F05 / F07</td>
<td>96   128  147  179  25</td>
<td>12.1</td>
</tr>
<tr>
<td>BRC 012</td>
<td>F10</td>
<td>128  153  182  218  25</td>
<td>20.2</td>
</tr>
<tr>
<td>BRC 022</td>
<td>F10 / F12 / F14</td>
<td>164  213  212  235  25</td>
<td>41.5</td>
</tr>
<tr>
<td>BRC 032</td>
<td>F14 / F16</td>
<td>203  243  270  318  30</td>
<td>69.5</td>
</tr>
<tr>
<td>BRC 052</td>
<td>F14 / F16 / F25</td>
<td>236  295  323  376  45</td>
<td>127</td>
</tr>
<tr>
<td>BRC 072</td>
<td>F16 / F25 / F30</td>
<td>290  334  378  440  60</td>
<td>203</td>
</tr>
<tr>
<td>BRC 092</td>
<td>F25 / F30 / F35 / F40</td>
<td>364  430  462  533  45</td>
<td>327</td>
</tr>
</tbody>
</table>
5 TECHNICAL INFO

5.1 DIRECT OR INDIRECT MOUNTING

<table>
<thead>
<tr>
<th>Direct mounting</th>
<th>Indirect mounting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Actuator directly mounted to the valve</td>
<td>Bracket between actuator and valve</td>
</tr>
</tbody>
</table>

**Typical applications:**
- Centric rubberlined valves with fluid temperatures up to 110 °C
- Centric rubberlined valves with fluid temperatures between 110 °C and 150 °C (with extra heat isolating gasket)
- Centric rubberlined butterfly valves for buried service (with extra sealing gasket between valve and actuator)

**Typical applications:**
- Centric rubber- or PTFE lined butterfly valves for (petro-) chemical industries
- Butterfly valves for high temperature service (≥ 150 °C)
- High performance butterfly valves with stuffing box and gland
- Actuator with different mounting flange size to valve

5.2 EXTENSIONS

Wouter Witzel supplies different and special types of extension spindles for remote mounting of actuators. The following are standard options:

**B3E:** Steel extension spindle between valve head and actuator (also suitable for buried or submerged duty of the valve)

**B3F:** Steel or stainless steel extension spindle between wormgear and electric actuator for operation from another floor level actuator mounted on a floor pedestal (extension spindle based on 2 universal joints and sliding bush which allows misalignment)

**B3H:** Steel extension spindle between wormgear and electric multi turn actuator
5.3 INTERFACE FLANGE DIMENSIONS AND TORQUES (ACCORDING ISO 5211)

* According ISO 5211: For materials with a proof stress \( R_{p0.2} = 200 \text{ N/mm}^2 \)

<table>
<thead>
<tr>
<th>Flange type ISO 5211</th>
<th>Maximum transmittable torque (Nm)</th>
<th>PCD [mm]</th>
<th>n x D Bolt</th>
<th>Threaded depth* [mm]</th>
<th>Figure</th>
</tr>
</thead>
<tbody>
<tr>
<td>F05</td>
<td>125</td>
<td>50</td>
<td>4 x M6</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>F07</td>
<td>250</td>
<td>70</td>
<td>4 x M8</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>F10</td>
<td>500</td>
<td>102</td>
<td>4 x M10</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>F12</td>
<td>1000</td>
<td>125</td>
<td>4 x M12</td>
<td>18</td>
<td></td>
</tr>
<tr>
<td>F14</td>
<td>2000</td>
<td>140</td>
<td>4 x M16</td>
<td>24</td>
<td></td>
</tr>
<tr>
<td>F16</td>
<td>4000</td>
<td>165</td>
<td>4 x M20</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>F25</td>
<td>8000</td>
<td>254</td>
<td>8 x M16</td>
<td>24</td>
<td></td>
</tr>
<tr>
<td>F30</td>
<td>16000</td>
<td>298</td>
<td>8 x M20</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>F35</td>
<td>32000</td>
<td>356</td>
<td>8 x M30</td>
<td>45</td>
<td></td>
</tr>
<tr>
<td>F40</td>
<td>64000</td>
<td>406</td>
<td>8 x M36</td>
<td>54</td>
<td></td>
</tr>
<tr>
<td>F48</td>
<td>125000</td>
<td>483</td>
<td>12 x M36</td>
<td>54</td>
<td></td>
</tr>
</tbody>
</table>

5.4 ADJUSTMENT AND TESTING

Wouter Witzel supply valve/actuator assemblies which are carefully adjusted and tested in the factory before dispatch. The assembly is ready for operation in the pipe line.

<table>
<thead>
<tr>
<th>Valve/actuator assembly</th>
<th>Adjustment</th>
<th>Testing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valve with pneumatic actuator</td>
<td>Adjustment of actuator’s mechanical end stop(s), when applied.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Adjustment of optional ancillaries e.g. limit switches, position transmitters, positioners</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Functional test, open / close at 5 bar supply pressure, unless otherwise specified</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Functional test of optional ancillaries</td>
<td></td>
</tr>
<tr>
<td>Valve with electric actuator</td>
<td>Adjustment of actuator’s mechanical end stops and limit switches</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Adjustment of the torque switches, when applicable</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Open direction: Set torque value is based on valve torque + 10%, unless otherwise specified</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Closed direction: 95% of the value for open direction</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Adjustment of optional ancillaries e.g. extra switches, position transmitters, positioners</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Functional test, open / close</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Functional test of optional ancillaries</td>
<td></td>
</tr>
<tr>
<td>Valve with hydraulic actuator</td>
<td>Adjustment of the actuator mechanical end stop(s), when applied.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Adjustment of optional ancillaries e.g. limit switches, position transmitters</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Functional test, open / close at 110 bar supply pressure, unless otherwise specified</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Functional test of optional ancillaries</td>
<td></td>
</tr>
</tbody>
</table>
### 5.5 ENVIRONMENTAL PROTECTION

#### 5.5.1 Requirements for actuators to be used in hazardous areas

Specific measures have been taken on an international level in order to avoid any material damage or the loss of human lives by an explosion caused by the accidental ignition of a gas in a hazardous area. Hazardous areas are places where the presence of explosive or ignitable gases do, or may, occur. A customer always has to specify area classification and requested type of protection.

**Area classification:**
- **Zone 0:** Continuously present (during long periods)
- **Zone 1:** Not likely to be present (regular service)
- **Zone 2:** Accidentally present (short time service - never in regular service)

**Marking conforming to the EN 50014 standard:**

<table>
<thead>
<tr>
<th>Types of protection</th>
<th>Zones</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>d</strong> Flameproof enclosure EN 50018</td>
<td>0</td>
<td>.</td>
<td>.</td>
</tr>
<tr>
<td><strong>e</strong> Increased safety EN 50019</td>
<td>1</td>
<td>.</td>
<td>.</td>
</tr>
<tr>
<td><strong>i</strong> Intrinsic safety “ia” or “ib” EN 50020</td>
<td>1a</td>
<td>.</td>
<td>.</td>
</tr>
<tr>
<td><strong>m</strong> Encapsulation EN 50028</td>
<td>2</td>
<td>.</td>
<td>.</td>
</tr>
</tbody>
</table>

### Groups of equipment

#### I
- Electrical apparatus intended for use in mines susceptible to firedamp (e.g. fuel tanks)

#### II
- Electrical apparatus for use in locations with explosive atmospheres other than mines for types of protection d and i
  - Group II is subdivided into IIA, IIB, IIC

### Groups

<table>
<thead>
<tr>
<th>Groups</th>
<th>Gas</th>
<th>Ignition temperature °C</th>
<th>Temperature class</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>methane (firedamp)</td>
<td>T1</td>
<td>T2</td>
</tr>
<tr>
<td>A</td>
<td>acetone</td>
<td>540</td>
<td>*</td>
</tr>
<tr>
<td></td>
<td>acetic acid</td>
<td>485</td>
<td>*</td>
</tr>
<tr>
<td></td>
<td>ammonia</td>
<td>630</td>
<td>*</td>
</tr>
<tr>
<td></td>
<td>ethane</td>
<td>515</td>
<td>*</td>
</tr>
<tr>
<td></td>
<td>methylene chloride</td>
<td>556</td>
<td>*</td>
</tr>
<tr>
<td></td>
<td>methane (CH₄)</td>
<td>595</td>
<td>*</td>
</tr>
<tr>
<td></td>
<td>carbon monoxide</td>
<td>605</td>
<td>*</td>
</tr>
<tr>
<td></td>
<td>propane</td>
<td>470</td>
<td>*</td>
</tr>
<tr>
<td></td>
<td>n-butane</td>
<td>385</td>
<td>*</td>
</tr>
<tr>
<td></td>
<td>n-butyl</td>
<td>370</td>
<td>*</td>
</tr>
<tr>
<td></td>
<td>hydrogen sulphide</td>
<td>270</td>
<td>*</td>
</tr>
<tr>
<td></td>
<td>n-hexane</td>
<td>240</td>
<td>*</td>
</tr>
<tr>
<td></td>
<td>acetaldehyde</td>
<td>140</td>
<td>*</td>
</tr>
<tr>
<td></td>
<td>ethyl ether</td>
<td>170</td>
<td>*</td>
</tr>
<tr>
<td></td>
<td>ethyle nitrite</td>
<td>90</td>
<td>*</td>
</tr>
<tr>
<td>B</td>
<td>ethylene</td>
<td>425</td>
<td>*</td>
</tr>
<tr>
<td></td>
<td>ethyl oxide</td>
<td>429-440</td>
<td>*</td>
</tr>
<tr>
<td>C</td>
<td>acetylene (C₂H₂)</td>
<td>305</td>
<td>*</td>
</tr>
<tr>
<td></td>
<td>carbon bisulphide (CS₂)</td>
<td>102</td>
<td>*</td>
</tr>
<tr>
<td></td>
<td>hydrogen (H₂)</td>
<td>560</td>
<td>*</td>
</tr>
</tbody>
</table>

(1): temperature of a hot surface able to ignite a gas mixture

(2): IIB certified products may be used as equipment of group IIA. Similarly, IIC certified products may be used as equipment of groups IIA and IIB.

### Maximum surface temperatures (°C)

<table>
<thead>
<tr>
<th>Temperature class</th>
<th>Maximum surface temperatures (°C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>T1</td>
<td>450 °C</td>
</tr>
<tr>
<td>T2</td>
<td>300 °C</td>
</tr>
<tr>
<td>T3</td>
<td>200 °C</td>
</tr>
<tr>
<td>T4</td>
<td>135 °C</td>
</tr>
<tr>
<td>T5</td>
<td>100 °C</td>
</tr>
<tr>
<td>T6</td>
<td>85 °C</td>
</tr>
</tbody>
</table>
5.5.2 IP classes
Protection of enclosures against ingress of dust and water. IP classes according IEC 529 and EN 60529.

<table>
<thead>
<tr>
<th>IP class</th>
<th>Dust and sand protection</th>
<th>Water protection</th>
</tr>
</thead>
<tbody>
<tr>
<td>IP 54</td>
<td>Dust protected. Ingress of dust is not totally prevented.</td>
<td>Protected against splashing from any direction</td>
</tr>
<tr>
<td>IP 55</td>
<td>Dust protected. Ingress of dust is not totally prevented.</td>
<td>Protected against water jets from any direction</td>
</tr>
<tr>
<td>IP 64</td>
<td>Dust tight.</td>
<td>Protected against splashing from any direction</td>
</tr>
<tr>
<td>IP 65</td>
<td>Dust tight.</td>
<td>Protected against water jets from any direction</td>
</tr>
<tr>
<td>IP 66</td>
<td>Dust tight.</td>
<td>Protected against powerfull water jets from any direction</td>
</tr>
<tr>
<td>IP 67</td>
<td>Dust tight.</td>
<td>Protected against temporarily immersion.</td>
</tr>
<tr>
<td>IP 68</td>
<td>Dust tight.</td>
<td>Protected against continuous immersion under specified conditions (eg. depth)</td>
</tr>
</tbody>
</table>

5.6 FIELDBUS SYSTEMS

5.6.1 General
Both manual operated and automated valves are often part of a remote controlled and / or monitored system. Therefore valve actuators and operators have to be provided with sensors and solenoid valves. Wouter Witzel can supply valve actuators with accessories suitable for fieldbus systems. Pneumatic actuators can be provided with limit switches (inductive proximity type) suitable for direct connection to the AS-i (Actuator Sensor Interface) fieldbus system including pre-wired solenoid valves (see figure 1). Also the more sophisticated electric actuators can be provided with interfaces for communication with higher level fieldbus systems such as Interbus S, Profibus FMS or Profibus DP fieldbus systems.

5.6.2 AS-i
Originally developed by a group of German sensor suppliers such as IFM, Pepperl & Fuchs and others, AS-i is designed as replacement for conventional field wiring particularly in on / off switching and contact status monitoring. It is capable of handling two discrete inputs - open and closed - and two discrete outputs for single and dual coil solenoid operation. It also has the facility for basic diagnostics and has power carrying capability to operate low power solenoids. Figure 2 shows the decrease of field wiring when AS-i fieldbus wiring is applied. The AS-i fieldbus can be simply integrated with PLC and PC-based control systems and higher level fieldbus systems.

Figure 1: Pneumatic actuator provided with proximity switches and solenoid valve in AS-i configuration
Figure 2: Conventional wiring and fieldbus wiring
6 INFORMATION ABOUT EUROPEAN DIRECTIVES AND CE MARKING

(Only applicable to valves / actuators to be used in the European Union)

All European Community countries have national laws concerning health, safety and environmental requirements, which are based on directives drawn up by the European Union.

Examples of European Directives which may be applicable to valves, actuators and ancillaries are:

- **Machinery Directive.**
  Machinery supplied in the EU must satisfy wide-ranging health and safety requirements for example on construction, moving parts and stability.
  - Manually operated valves (by lever or wormgear) are outside the scope of the machinery directive because of the hand operation and have no CE marking.
  - A power operated valve / actuator assembly does not require a CE mark because of the Machinery Directive. It has no independant function but is intended to be installed as a component into a piping system which should become certified and CE marked entirely. Wouter Witzel supplies a Declaration of Incorporation (IIIB) and a detailed user manual to support the end user in satisfying the requirements.
  - Valves and / or actuators to be used as a safety component according the Machinery Directive should be ordered by the purchaser accordingly.
  - Valves supplied by Wouter Witzel with bare shaft are usually provided with actuators by the purchaser. It is his responsibility to satisfy the requirements of the Directives where applicable.

- **Electro-Magnetic Compatibility Directive (EMC)**
  Covering the non-generation of electromagnetic disturbance and immunity from such disturbance.
  Applicable to eg. electric actuators and ancillaries. CE marking because of this directory is mandatory.

- **Low Voltage Directive.**
  Applicable to safety aspects of electric products for 50 – 1000 V AC and 75 – 1500 V DC supply.
  Applicable to eg. electric actuators. No CE marking required because of this Directive.