EWIKON electric drive valve gate technology

Full process control with high precision
The benchmark for electric valve gate technology

The EWIKON electric valve gate technology sets benchmarks in process control and precision. All relevant process parameters can be set individually according to the specific application requirements and fine-adjusted during production as well. Thus, the injection moulder gains full control of the valve pin movements. Additionally, the powerful control technology enables sequential gating as well as to approach several valve pin positions within one moulding cycle. This makes the technology the ideal solution for demanding injection moulding applications in the field of technical parts. Furthermore, the drive concept works emission-free and can be used in cleanroom applications for the medical industry without any restriction.
Advantages

- Full control of the valve pin movement
- Clean drive concept, emission-free and absolutely cleanroom compatible
- Valve pin positioning with high precision, increment: 0.01 mm. Individual adjustment for each valve pin as well as shutdown of selected valve pins possible when using single drives.
- Individual setting of process parameters such as valve pin stroke, valve pin speed and opening and closing time
- Complex movement profiles of the valve pin for special applications can be realised easily
- High process reliability and reproducibility
- Easy integration into the mould

Drive unit types

**Linear step motor as drive unit for standard valve gate systems**
- Available in 3 versions
- Linear force of drive units: max. 800 N / 1600 N
- Valve pin speed: 1 - 20 mm/s
- Valve pin stroke: up to 16 mm
- Encoder for permanent monitoring of valve pin position with an accuracy of 1/100 mm. Automatic readjustment of valve pin in case of deviation, valve pin is deactivated when problems occur permanently

**Linear servo motor as drive unit for systems with pull rail actuated synchronous plate**
- Available in 3 versions
- Linear force of drive units: max. 8000 N / 16000 N / 30000 N
- Valve pin speed: 1 - 30 mm/s
- Valve pin stroke: up to 10 mm
- Permanent monitoring and (if required) automatic readjustment of valve pin positions. Fine adjustment of the valve pin position in the gate area
Powerful valve pin actuation

The closing force of the step motor drive remains constant at all times, independently from the valve pin stroke. It can be further enlarged by the possibility to vary the valve pin speed. The slower the movement of the valve pin the higher the force generated. The intelligent valve pin control allows to start the valve pin closing movement with high speed and then decrease the speed just before closing the gate. An almost doubled closing force is the result. This makes the step motor drive also suitable for processing demanding, rapidly freezing materials like polycarbonate where high closing forces are required for a proper gate sealing.
Precise and comfortable control

The external **EDC-PRO** (E Drive Control) touch screen control unit allows a comfortable operation for up to 32 linear step motors. For synchronous plate systems with linear servo motors the **SDC** (Servo Drive Control) controller is available. This control unit contains a technically advanced servo control system with multiple functions. A simple adjustment to different injection moulding machine controls is possible by using digital signals (+24 V DC).
Demanding applications made easy

The extensive options the valve pin control offers open up new approaches to injection moulding applications and contribute to the growing tendency of integrating additional functions into the mould.

<table>
<thead>
<tr>
<th>Function</th>
<th>Field of application</th>
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</thead>
<tbody>
<tr>
<td>Several valve pin positions are approached within one moulding cycle</td>
<td>Multi-component applications where both components can be gated without the need to move the part to another cavity</td>
</tr>
<tr>
<td></td>
<td>Ejector function; the valve pin acts as demoulding aid after the filling process</td>
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<tr>
<td></td>
<td>During injection the valve pin fixes an insert part or a core</td>
</tr>
<tr>
<td></td>
<td>Before injection the valve pin punctures an insert part which is then back-injected</td>
</tr>
<tr>
<td>Delayed opening and closing of the valve pins</td>
<td>Sequential injection moulding, cascade injection moulding without flow lines</td>
</tr>
<tr>
<td></td>
<td>Multi-gating of parts: Shifting of weld lines into uncritical areas of the structure</td>
</tr>
<tr>
<td></td>
<td>Family moulds: Precise filling of parts with different shot weights</td>
</tr>
</tbody>
</table>

Example: multi component application

Tubes and inner seals of plastic fittings are two-component injection-moulded within one cycle. The EWIKON electric valve gate system approaches three valve pin positions in this application. The valve pin is not only used to seal the gate, but also acts as a moveable mould core while the PP component for the tube wall is injected.

Valve pin position 1
The valve pin moves into the cavity and touches the inner core with a defined pressure. The first component for the tube wall is injected. The valve pin keeps a channel in the tube wall open. The inner core retracts and the cavity for the soft component of the seal can be filled.

Valve pin position 2
The valve pin opens and the soft component for the inner seal is injected through the open channel in the tube wall.

Valve pin position 3
The valve pin moves to its closing position at the outer edge of the part and the finished product can be demoulded.
Linear step motor – Drive unit types

Linear step motor with encoder

- for nozzles with valve pin Ø 2 mm
  - 19858
- for nozzles with valve pin Ø 3 mm
  - 19888
- for nozzles with valve pin Ø 4 mm
  - 22888

- Valve pin opening speed
  - 1 - 20 mm/s
- Valve pin closing speed
  - 1 - 20 mm/s
- Maximum valve pin stroke
  - 11 mm
- Maximum valve pin closing force
  - 800 N
- Maximum permissible environmental temperature for drives
  - 70 °C / 158 °F
- Resolution
  - 0.01 mm
- Dimension A
  - 56.4 mm
- Dimension B
  - 61.8 mm
- Dimension C
  - 76.2 mm

- Motor connection socket
  - 4-zone
  - 63050.001
  - 63050.002
- Encoder connection socket
  - 4-zone, incl. cables
  - 63050.003
- EDC-PRO master / slave control units 16-zone to 32-zone (8-zone steps) with accessories

- 8-zone controller
  - 68151.108
- Master
  - 68151.108
  - 60070.043
  - 60070.024
  - 60070.027
  - 60070.031
  - 60070.031
- Slave
  - 68151.118
  - 60070.024
  - 60070.027
- Fault registration cable 6 m
  - 60070.031
- Signal cable, analogue, 3/6 m
  - 60070.038-V03/V06

Required connecting plugs for mould:

- Motor connection socket
  - 4-zone
  - 63050.001
  - 63050.002
- Encoder connection socket
  - 4-zone, incl. cables
  - 63050.003

EDC-PRO master / slave control units 16-zone to 32-zone (8-zone steps) with accessories

- Motor connection socket
  - 4-zone
  - 63050.001
  - 63050.002
- Encoder connection socket
  - 4-zone, incl. cables
  - 63050.003

High performance systems
Linear servo motor – Drive unit types and controllers

### Drive unit types

<table>
<thead>
<tr>
<th>Linear servo motor</th>
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<tbody>
<tr>
<td>18255</td>
<td>18253</td>
<td>18266</td>
</tr>
<tr>
<td>Maximum valve pin stroke</td>
<td>10 mm</td>
<td>10 mm</td>
</tr>
<tr>
<td>Valve pin speed</td>
<td>1 - 30 mm/s</td>
<td>1 - 30 mm/s</td>
</tr>
<tr>
<td>Maximum closing force of synchronous plate *</td>
<td>8000 N</td>
<td>16000 N</td>
</tr>
<tr>
<td>Resolution</td>
<td>&lt; 0.01 mm</td>
<td>&lt; 0.01 mm</td>
</tr>
<tr>
<td>Dimension A</td>
<td>260 mm</td>
<td>340 mm</td>
</tr>
<tr>
<td>Dimension B</td>
<td>74 mm</td>
<td>97 mm</td>
</tr>
<tr>
<td>Dimension C</td>
<td>150 mm</td>
<td>195 mm</td>
</tr>
<tr>
<td>Dimension D</td>
<td>78 mm</td>
<td>98 mm</td>
</tr>
</tbody>
</table>

* System design by EWIKON according to the specific application requirements

### SDC-PRO controller with accessories

<table>
<thead>
<tr>
<th>1-zone controller</th>
<th>2-zone controller</th>
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<tr>
<td>68151.301</td>
<td>68151.302</td>
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</table>

| Signal cable 3 m, 6-pin | 1 piece 60070.043 | 1 piece 60070.043 |
| Motor connection cable M23 servo drive unit 3/6 m | 1 piece 63050.110-V03/V06 | 2 pieces 63050.110-V03/V06 |
| Resolver cable M23 servo drive unit 3/6 m | 1 piece 63050.120-V03/V06 | 2 pieces 63050.120-V03/V06 |
| Fault registration cable 6 m | 1 piece 60070.031 | 1 piece 60070.031 |
| Signal cable, analogue, 3/6 m | 1 piece 60070.038-V03/V06 | 1 piece 60070.038-V03/V06 |

EWikon
Heißkanalsysteme GmbH
Siegener Straße 35
35066 Frankenberg / Germany
Tel: +49 6451 501-0
E-Mail: info@ewikon.com
www.ewikon.com