Compatibility for EMC, climate and mechanical load
for valve’s drivers, controllers and transducers

Electronic drivers and transducers are the most critical valve’s components concerning the risk of electromagnetic interferences, water entrance and mechanical stress. As per applicable International Standards, the following tables summarize the environmental resistance features of Atos electronic devices:

- remote or integral to valve’s drivers and controllers
- LVDT spool position transducers
- proximity or position inductive switches
- pressure transducers

1 EMC ELECTROMAGNETIC COMPATIBILITY according to Directive 2014/30/UE

The EMC Directive identifies the ability of a device, equipment or system to function in an electromagnetic environment in a satisfactory manner (immunity), without produce intolerable electromagnetic interferences into any equipment in same environment (emission).

<table>
<thead>
<tr>
<th>Table G004-5/E</th>
<th><a href="http://www.atos.com">www.atos.com</a></th>
</tr>
</thead>
<tbody>
<tr>
<td>MECHANICAL RESISTANCE TEST CONDITIONS</td>
<td>according to CEI EN 60068-2-6 (Vibrations, Sine &amp; Random) - CEI EN 60068-2-27 (Shock)</td>
</tr>
</tbody>
</table>

2 IP PROTECTION DEGREE CLASSIFICATION according to CEI EN 60529

IP (Ingress Protection) coding system indicates the degree of protection provided by an enclosure against access to hazardous parts, against ingress of solid foreign objects, ingress of water and to give additional information in connection with such protection. The minimum ensured IP protection reported for each component is intended with relevant connectors correctly installed.

<table>
<thead>
<tr>
<th>Ingress protection</th>
<th>Protection against solid objects</th>
<th>Protection against liquids penetration</th>
</tr>
</thead>
<tbody>
<tr>
<td>IP20</td>
<td>2 = protected against solid bodies of superior dimensions to 12 mm; protect against the access with a finger</td>
<td>0 = not protect</td>
</tr>
<tr>
<td>IP65</td>
<td>6 = totally protect against the powder; protect against the access with a wire</td>
<td>5 = protect against water jets</td>
</tr>
<tr>
<td>IP66</td>
<td>6 = protect against powerful water jets</td>
<td>6 = protect against powerful water jets</td>
</tr>
<tr>
<td>IP67</td>
<td>7 = protect against the effects of temporary immersion</td>
<td></td>
</tr>
</tbody>
</table>

3 MECHANICAL RESISTANCE TEST CONDITIONS according to CEI EN 60068-2-6 (Vibrations, Sine & Random) - CEI EN 60068-2-27 (Shock)

The Mechanical Resistance test determines the ability of components, equipment and other articles to withstand specified severities of sinusoidal/random vibration and shock.

<table>
<thead>
<tr>
<th>Sine test (old procedure)</th>
<th>0 = 63 Hz; 0.7 = 6 g</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Table G004-5/E</th>
<th><a href="http://www.atos.com">www.atos.com</a></th>
</tr>
</thead>
<tbody>
<tr>
<td>SINUSOIDE TEST CONDITIONS</td>
<td>according to CEI EN 60068-2-6 (Vibrations, Sine &amp; Random) - CEI EN 60068-2-27 (Shock)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Shock test</th>
<th>Half sine wave shock 30 g / 11 ms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tested on three axes X, Y, Z</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Shock test (old procedure)</th>
<th>Shock 50 g; impact time 11 ms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tested on three axes X, Y, Z</td>
<td></td>
</tr>
</tbody>
</table>
**ELECTRONIC DRIVERS TYPE** E-MI-AC analog, see table G010

- Minimum ensured protection: IP65
- Operating temperature: 0 °C to +50 °C (storage: -20 °C to +70 °C)

---

**ELECTRONIC DRIVER TYPE** E-MI-AS-IR digital, see table G020

- Minimum ensured protection: IP65
- Operating temperature: -20 °C to +50 °C (storage: -25 °C to +85 °C)

---

**ELECTRONIC DRIVERS TYPE** E-BM-AC analog, see table G025

- Minimum ensured protection: IP20
- Operating temperature: -10 °C to +60 °C (storage: -20 °C to +70 °C)

---

**ELECTRONIC DRIVER TYPE** E-BM-AS-IR digital, see table G030

- Minimum ensured protection: IP20
- Operating temperature: -20 °C to +60 °C (storage: -25 °C to +85 °C)
  - Operating temperature on 05H version for two single solenoid valves: -20 °C to +40 °C

---

**ELECTRONIC DRIVERS TYPE** E-BM-AES digital, see table GS050

- Minimum ensured protection: IP20
- Operating temperature: -20 °C to +60 °C (storage: -25 °C to +85 °C)

---

**ELECTRONIC DRIVER TYPE** E-BM-RES digital, see table GS203

- Minimum ensured protection: IP20
- Operating temperature: -20 °C to +60 °C (storage: -25 °C to +85 °C)

---

**INTEGRAL ELECTRONIC DRIVERS TYPE**

- E-RI-AE(AES) digital, see table GS115
- E-RI-ReB(RES) digital, see table GS205

- Minimum ensured protection: IP67
- AE: Operating temperature: -20 °C to +60 °C (storage: -20 °C to +70 °C)
- AEB(AES), REB(RES): Operating temperature: -40 °C to +60 °C (storage: -40 °C to +70 °C)

---

Notes:
- Use of metallic connectors is strongly recommended in order to fulfill EMC requirements.
- (1) for AEB(AES) and REB(RES)
- (2) only for AE
- (3) for AES and RES with EH fieldbus interface
INTEGRAL ELECTRONIC DRIVERS TYPE  E-RI-TE(LE) analog, see table G200  E-RI-TERS(AERS) digital, see table G205

- Minimum ensured protection: IP67
- E-RI-TE(LE) operating temperature: -20 ÷ +60 °C (storage: -20 ÷ +70 °C)
- E-RI-TERS(AERS) operating temperature: -20 ÷ +50 °C (storage: -20 ÷ +70 °C)

Note: use of metallic connectors is strongly recommended in order to fulfill EMC requirements.

INTEGRAL ELECTRONIC DRIVERS/CONTROLLERS TYPE  E-RI-TEB(LEB) digital, see table GS208  E-RI-TER (LES) digital, see table GS210  E-RI-TER (LES)-S digital, see table GS212  E-RI-PES digital, see table GS215  E-RI-TEZ(LEZ) digital, see table FS230

- Minimum ensured protection: IP66 & IP67
- Operating temperature: -40 ÷ +60 °C (storage: -40 ÷ +70 °C)
- E-RI-TE (LE) operating temperature: -20 ÷ +60 °C (storage: -20 ÷ +70 °C)
- E-RI-TER (LES) operating temperature: -20 ÷ +50 °C (storage: -20 ÷ +70 °C)

Note: use of metallic connectors is strongly recommended in order to fulfill EMC requirements.

EX-PROOF INTEGRAL ELECTRONIC DRIVERS TYPE  E-RA-AES, E-RA-TE(S)LES and E-RA-TERS(AERS) digitals, see table F650

- Minimum ensured protection: IP66
- Operating / storage temperature, refer to specific electronic driver type

Note: use of metallic connectors is strongly recommended in order to fulfill EMC requirements.
VALVE’S POSITION TRANSDUCERS

**ETH*-4** (only for T valves)
- Minimum ensured protection: IP65
- Operating temperature: -20 ÷ +70 °C (storage: -30 ÷ +60 °C)

Applied to valves:
- DHZ0, DKZ0, see table F165
- DLH20, DKLKZ0, see table F180
- QVH20, QVKZ0, see table F412

**ETH*-8**
- Minimum ensured protection: IP67
- Operating temperature: -20 ÷ +70 °C (storage: -30 ÷ +60 °C)

Applied to valves:
- DPZO-T*, see table FS172 and F172
- DPZO-L*, see table FS175 and F175

**E-THT-15**
- Minimum ensured protection: IP67
- Operating temperature: -40 ÷ +70 °C (storage: -40 ÷ +70 °C)

Applied to valves:
- DHI, DHE, DKE, see table ES010
- DPP*16, DPP*26, DPP*46, see table ES030
- LID A*, LID A S*, see table ES120

**E-THT-FV-10 (FI option)**
- Minimum ensured protection: IP67
- Operating temperature: -40 ÷ +60 °C (storage: -40 ÷ +70 °C)

Applied to valves:
- DH-06, DHE-06, DKE-16, see table ES010
- DPPH*16, DPPH*26, DPPH*46, see table ES030
- LID A*, LID A S*, see table ES120

**E-THT-FV-20 (FI option)**
- Minimum ensured protection: IP67
- Operating temperature: -40 ÷ +60 °C (storage: -40 ÷ +70 °C)

Applied to valves:
- DH-07, DHE-17, see table ES010
- DPPH*17, DPPH*27, DPPH*47, see table ES030

**ZBE -06**
- Cartridges: LIQZP-L (LEB, LES) 2-way, size 50 to 100, see table FS330
- LIQZP-L (LEB, LES) 3-way, size 50 to 80, see table FS340

**ZBE -08**
- Cartridges: LIQI, see table ES120
- JO-DL, see table ES100

**E-MC**:  
- EN 61326 emission (group 1, class B)  
- and immunity (industrial application)  
- Shock test: max 40 g / 6ms  
- Vibration: 30...2000Hz: max 25g

Applied to valves:
- REB, RES with integral electronics

VALVE’S PRESSURE TRANSDUCERS

**E-ATR-8** (see table G5465)
- Minimum ensured protection: IP67
- Operating temperature: -40 ÷ +100 °C (storage: -40 ÷ +100 °C)

EMC:  
- EN 61326 emission (group 1, class B)  
- and immunity (industrial application)  
- Shock test: max 40g / 6ms  
- Vibration: 30...2000Hz: max 25g

Applied to valves:
- REB, RES with integral electronics

**E-ATR-7** (see table G466)
- Minimum ensured protection: IP67
- Ambient temperature: -40 ÷ +60 °C (T6), -40 ÷ +75 °C (T5), -40 ÷ +102 °C (T4)  
- Compensated temperature: 0 ÷ +80 °C

EMC:  
- EN 61326 emission (group 1, class B)  
- and immunity (industrial application)  
- Shock test: max 1000g  
- Vibration: max 25g

Applied to valves:
- TERS with ex-proof integral electronics