Explosion-proof solenoid valves
on/off and proportional controls - ATEX or Rostechnadzor Russian certification

On/off and proportional valves equipped with explosion-proof solenoids certified according to ATEX 94/9/EC, protection mode:
- Ex II 2 G Ex d IIC T6/T4/T3 (solenoids group II for surface plants with gas or vapours environment, category 2, zone 1 and 2);
- Ex I M2 Ex d I (solenoids group I for surface, tunnels or mining plants).
- Rostechnadzor Russian Certification, available for Group II solenoids.
The solenoid case is designed to contain the possible explosion which could be caused by the presence of the gas mixture inside the housing, thus avoiding dangerous propagation in the external environment.
They are also designed to limit the external temperature according to the certified class to avoid the self ignition of the explosive mixture present in the environment.
DHA and DLOH valves conform to SIL 3 safety level (TÜV approved).
These solenoids are applied to hydraulic valves for application in explosion-hazardous environments.

1 EXPLOSION PROOF SOLENOIDS: MAIN DATA

<table>
<thead>
<tr>
<th>SOLENOID TYPE</th>
<th>PROPORTIONAL</th>
<th>ON-OFF</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>without transducer</td>
<td>with transducer</td>
</tr>
<tr>
<td>Group II, ATEX</td>
<td>OZA-A</td>
<td>OZA-T</td>
</tr>
<tr>
<td>Group I, ATEX (mining)</td>
<td>OZAM-A</td>
<td>OZAM-T</td>
</tr>
<tr>
<td>Group II, Rostechnadzor</td>
<td>OZA/RU-A</td>
<td>OZA/RU-T</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Voltage code</th>
<th>VDC</th>
<th>±10%</th>
<th>12 DC, 24 DC</th>
<th>12 DC</th>
<th>12DC, 24DC, 28DC, 48DC, 110DC, 125DC, 220DC</th>
</tr>
</thead>
<tbody>
<tr>
<td>coil insulation</td>
<td>Class H</td>
<td>Protection degree</td>
<td>IP 66 According to IEC 144 when correctly coupled with the relevant cable gland SP-PA*, see section</td>
<td>Duty factor</td>
<td>100%</td>
</tr>
<tr>
<td>Mechanical construction</td>
<td>Flame proof housing classified Ex d, according to EN 60079-0: 2006, EN 60079-1: 2007</td>
<td>Cable entrance and electrical wiring</td>
<td>Internal terminal board for cable connection</td>
<td>Threaded connection for cable entrance, vertical (standard) or Horizontal (option /O). See section</td>
<td></td>
</tr>
<tr>
<td>Voltage</td>
<td>12 DC, 24 DC</td>
<td>12 DC</td>
<td>12DC, 24DC, 28DC, 48DC, 110DC, 125DC, 220DC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>code</td>
<td>VDC</td>
<td>±10%</td>
<td>12 DC, 24 DC</td>
<td>12 DC</td>
<td>12DC, 24DC, 28DC, 48DC, 110DC, 125DC, 220DC</td>
</tr>
</tbody>
</table>

(1) For alternating current supply a rectifier bridge is provided built-in the solenoid.

2 EXPLOSION PROOF SOLENOIDS: TEMPERATURE DATA

<table>
<thead>
<tr>
<th>SOLENOID TYPE</th>
<th>PROPORTIONAL</th>
<th>ON-OFF</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(with and without transducer)</td>
<td></td>
</tr>
<tr>
<td>Method of protection</td>
<td>Ex d</td>
<td>Temperature class (only for Group II)</td>
</tr>
<tr>
<td>Surface temperature</td>
<td>Group II, ATEX</td>
<td>≤135 °C</td>
</tr>
<tr>
<td>Group I, ATEX (mining)</td>
<td>≤135 °C</td>
<td>≤200 °C</td>
</tr>
<tr>
<td>Group II, Rostechnadzor</td>
<td>≤150 °C</td>
<td></td>
</tr>
<tr>
<td>Ambient temperature</td>
<td>Group II, ATEX</td>
<td>-40 +40 °C (2)</td>
</tr>
<tr>
<td>Group I, ATEX (mining)</td>
<td>-20 +60</td>
<td>-40 +70 °C</td>
</tr>
<tr>
<td>Rostechnadzor</td>
<td>-40 +40 °C</td>
<td>-40 +70 °C</td>
</tr>
<tr>
<td>Ambient temperature</td>
<td>Group II, ATEX</td>
<td>-40 +40 °C (2)</td>
</tr>
<tr>
<td>Group I, ATEX (mining)</td>
<td>-20 +60</td>
<td>-40 +70 °C</td>
</tr>
<tr>
<td>Rostechnadzor</td>
<td>-40 +40 °C</td>
<td>-40 +70 °C</td>
</tr>
</tbody>
</table>

(2) The group II solenoids are ATEX certified for minimum temperature -40 °C. Select /BT in the valve code for application with minimum ambient temperature -40 °C.

3 CERTIFICATIONS

In the following are resumed the valves marking according to ATEX group I, Group II and Rostechnadzor certification.

3.1 GROUP II, Atex and Rostechnadzor
Ex = Equipment for explosive atmospheres
II = Group II for surfaces plants
2 = High protection (equipment category)
G = For gas and vapours
d = Flame proof housing
IC = Gas group
T6/T4/T3 = Temperature class of solenoid surface referred to +40 °C ambient temperature
Zone 1 = Possibility of explosive atmosphere during normal functioning (low probability of explosive atmosphere)

3.2 GROUP I (mining), Atex
Ex = Equipment for explosive atmospheres
I = Group I for mines and surface plants
M2 = High protection (equipment category)
d = Flame proof housing
I = Gas group (Methane)

3.3 EXAMPLE OF NAMEPLATE MARKING

Notified body and certificate number
Marking according to ATEX Directive
**Model code of spool type on-off directional solenoid valves**

**DHA**

<table>
<thead>
<tr>
<th>DHA</th>
<th>GK</th>
<th>24DC</th>
<th>Voltage code - see section 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>0/2</td>
<td>63</td>
<td>1/2</td>
<td>74DC ** -750/2 (1)</td>
</tr>
</tbody>
</table>

**Optional certifications (omit for Group II ATEX)**

M = Group I, ATEX (mining)

RU = Group II, Rostechnadzor (Russian)

**Valve configuration, DHA see section 5 and DPHA see section 6**

**Spool type, DHA see section 5 and DPHA see section 6**

**Optional cable gland**

PA = with threaded cable gland, see section 8

(1) Not for Group I, ATEX (mining)

---

**Configuration of DHA valves**

Where the symbol doesn’t show the hydraulic connection (*), it depends on the central configuration of the spool;

**Spools for DHA valves**

For all size

<table>
<thead>
<tr>
<th>0/2</th>
<th>1/2</th>
<th>2/2</th>
</tr>
</thead>
<tbody>
<tr>
<td>XH1</td>
<td>XH4</td>
<td>XH7</td>
</tr>
<tr>
<td>XH3</td>
<td>XH4</td>
<td>XH7</td>
</tr>
<tr>
<td>XH1</td>
<td>XH4</td>
<td>XH7</td>
</tr>
</tbody>
</table>

Only for DPHA-2, DPHA-3

<table>
<thead>
<tr>
<th>2/2</th>
<th>3/2</th>
<th>4/2</th>
</tr>
</thead>
<tbody>
<tr>
<td>XH1</td>
<td>XH4</td>
<td>XH7</td>
</tr>
<tr>
<td>XH3</td>
<td>XH4</td>
<td>XH7</td>
</tr>
<tr>
<td>XH1</td>
<td>XH4</td>
<td>XH7</td>
</tr>
</tbody>
</table>

---

**Configuration of DPHA valves**

Where the symbol doesn’t show the hydraulic connection (*), it depends on the central configuration of the spool;

**Spools for DPHA valves**

For all size

<table>
<thead>
<tr>
<th>0/2</th>
<th>1/2</th>
<th>2/2</th>
</tr>
</thead>
<tbody>
<tr>
<td>XH1</td>
<td>XH4</td>
<td>XH7</td>
</tr>
<tr>
<td>XH3</td>
<td>XH4</td>
<td>XH7</td>
</tr>
<tr>
<td>XH1</td>
<td>XH4</td>
<td>XH7</td>
</tr>
</tbody>
</table>

Only for DPHA-2, DPHA-3

<table>
<thead>
<tr>
<th>2/2</th>
<th>3/2</th>
<th>4/2</th>
</tr>
</thead>
<tbody>
<tr>
<td>XH1</td>
<td>XH4</td>
<td>XH7</td>
</tr>
<tr>
<td>XH3</td>
<td>XH4</td>
<td>XH7</td>
</tr>
<tr>
<td>XH1</td>
<td>XH4</td>
<td>XH7</td>
</tr>
</tbody>
</table>
MODEL CODE OF POPPET TYPE LEAK FREE DIRECTIONAL SOLENOID VALVES

**DLO**

- **H**: max flow 12 l/min
- **K**: max flow 30 l/min
- **2**: two way (only for DLOH)
- **3**: three way

**PA**: open in rest position

**C**: closed in rest position

Optional cable gland: see section 7

Solenoid threatened connection:

- **GK**: GK-1/2" ISO/UNI-6125 (tapered)
- **NPT**: 1/2" NPT ANSI B2.1 (tapered)
- **M**: M20x1.5 UNI-4535 (6H/6g)

Special throttle connection:

- **S**: Spools 0, 1, 8
- **O**: Spools 0/2, 1/2, 3, 6, 7

Flow direction:

- **P** → **A**: low temperature -40°C also available on request (not for group I Atex mining)

**8** CONFIGURATION OF DLOH/AO/* AND DLOK/AO/*

**9** Q/Δp DIAGRAMS OF ON/OFF DIRECTIONAL CONTROLS (based on mineral oil ISO VG 46 at 50°C)

**10** OPERATING LIMITS OF ON/OFF DIRECTIONAL CONTROLS (based on mineral oil ISO VG 46 at 50°C)

The diagrams have been obtained with warm solenoids and power supply at lowest value (V nom-10%). For DHA valves the curves refer to application with symmetrical flow through the valve (i.e. P → A and B → T). In case of asymmetric flow the operating limits must be reduced.

**Synthetic fluids (1):**
- **WG**: water-glycol
- **PE**: phosphate ester

**Certification type:**
- **AO**: Group II, ATEX
- **AO/M**: Group I, ATEX (mining)
- **AO/RU**: Group II, Rostechnadzor (Russian)

**Voltage code - see section 1:**

**Options:**
- **T**: for ambient temperature up to 70°C
- **D**: horizontal cable entrance (not for group I Atex)
- **R**: with check valve on port P
- **WP**: prolonged manual override protected by metallic cap
11 MODEL CODE OF PRESSURE RELIEF VALVES

AGAM = pressure relief valve: subplate mounting, see tab. C066
ARAM = pressure relief valve: threatened connections, see tab. C045

Valve size for AGAM:
- 10 (ISO 6264) 20 = G 3/4"
- 20 (ISO 6264) 32 = G 1 1/4"

Valve size for ARAM:
- G 3/4"
- G 1 1/4"

Number of the different setting pressure values:
- 1 = one setting pressure
- 2 = two setting pressure
- 3 = three setting pressure

Valve configuration:
- 0 = venting with de-energized solenoid
- 1 = venting with energized solenoid
- 2 = without venting

Max regulated pressure of first (second / third) setting see section

Optional cable gland:
PA = with threatened cable clamp, see section

(1) Option BT = low temperature -40°C also available on request (not for group I Atex -mining-)

12 HYDRAULIC CHARACTERISTICS

13 MODEL CODE OF COVERS FOR CARTRIDGE VALVES

LIDEW - 1 / PA - GK - AO - O 24DC ** /*

Valve model Size 10 Size 20 Size 32

Max pressure port P [bar]:
- 50: 100: 210: 350

Pressure range [bar]:
- 4÷50: 6÷100: 7÷210: 8÷350

Max flow AGAM [l/min]:
- 200 400 600

Max flow ARAM [l/min]:
- 800 500

Synthetic fluids (1):
WG = water-glycol
PE = phosphate ester

Options:
7 = for ambient temperature up to 70°C
O = horizontal cable entrance (not for group I Atex)
V = regulating handwheel
WP = prolonged manual override protected by metallic cap
Y = external drain

Certification type:
AO = Group II, ATEX
AO/M = Group I, ATEX (mining)
AO/RU = Group II, Rostechnadzor (Russian)

Solenoid threatened connection:
GK = GK-1/2" ISO/UNI-6125 (tapered)
NPT = 1/2" NPT ANSI B2.1 (tapered)
M = M20x1,5 UNI-4535 (6H/6g)

Note: for the code of the ISO cartridge to use with the above covers see tab. H003, section [2] and tab. H030, section [3].
(1) Option BT = low temperature -40°C also available on request (not for group I Atex -mining-)

14 HYDRAULIC SYMBOLS
## 15 MODEL CODE OF PROPORTIONAL DIRECTIONAL VALVES

**DHZA**

<table>
<thead>
<tr>
<th>Series</th>
<th>Valve size (ISO 4401)</th>
<th>Configuration, DHZA and DKZA see section</th>
<th>Spool overlapping in central position, DHZA and DKZA see section</th>
<th>Optional certifications (omit for Group II. ATEX)</th>
</tr>
</thead>
<tbody>
<tr>
<td>L</td>
<td>= size 06</td>
<td>= external plus central position, spring</td>
<td>= positive overlapping, A, B, T, negative</td>
<td>- without integral position transducer</td>
</tr>
<tr>
<td></td>
<td></td>
<td>centered</td>
<td></td>
<td>- with integral position transducer (not for DPZA)</td>
</tr>
</tbody>
</table>

### Spool type
- L = linear
- S = progressive
- D = as S, but with P, A = D, P, B = Q2

### Optional cable gland:
- PA = with threated cable gland, see section

### Spool size:
- DHZA and DKZA see section | DPZA see section

### Spool size:
- DHZA and DKZA see section | DPZA see section

### Spool type:
- 1 or PA, B, T positive overlapping
- 2 = size 16
- 3 = size 25
- 4 = P positive overlapping
- 5 = P, A, B, T positive overlapping

### Spool overlapping in central position:
- DHZA and DKZA see section | DPZA see section

### Optional certifications (omit for Group II. ATEX)
- M = Group I. ATEX (mining)
- RU = Group II. Rostechnadzor (Russian)

### Options:
- T = for ambient temperature up to 70°C
- B = solenoid at side of port A (only for single solenoid valves)
- C = position transducer with current feedback 4÷20 mA (only for -T)
- D = internal drain (only for DPZA)
- E = external pilot (only for DPZA)
- G = pressure reducing valve for piloting (only for DPZA)
- MV = horizontal lever (only for DHZA)
- W = horizontal cable entrance (only for -A, not for group I. ATEX)
- WP = prolonged manual override protected by metallic cap (only for -A)
- Y = external drain (only for DHZA and DKZA)

### Omit for standard coil 12 Vdc:
- 24 = with 24 VDC coils (only A version)

---

## 16 HYDRAULIC CHARACTERISTICS of DHZA and DKZA (based on mineral oil ISO VG 46 at 50 °C)

### Hydraulic symbols

#### DHZA

![DHZA Symbols]

#### DKZA

![DKZA Symbols]

### Valve model

**DHZA**

<table>
<thead>
<tr>
<th>Spool type and size</th>
<th>Pressure limits [bar]</th>
<th>Max flow at P-T [l/min]</th>
<th>Response time [ms]</th>
<th>Hysteresis [%]</th>
<th>Repeatability [%]</th>
</tr>
</thead>
<tbody>
<tr>
<td>L14</td>
<td>ports P, A, B, X = 350; T = 160 (250 with external drain /Y)</td>
<td>70</td>
<td>1</td>
<td>15</td>
<td>± 1% (-A) / ± 0.1% (-T)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>50</td>
<td>17</td>
<td>30</td>
<td>± 1% (-A) / ± 0.1% (-T)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>50</td>
<td>28</td>
<td>60</td>
<td>± 1% (-A) / ± 0.1% (-T)</td>
</tr>
</tbody>
</table>

### Options:
- T = prolongued manual override protected by metallic cap (only for -A)
- WP = prolonged manual override protected by metallic cap (only for -A)
- Y = external drain (only for DHZA and DKZA)

### Omit for standard coil 12 Vdc:
- 24 = with 24 VDC coils (only A version)

---

## 17 HYDRAULIC CHARACTERISTICS of DPZA (based on mineral oil ISO VG 46 at 50 °C)

### Hydraulic symbols

#### DPZA-1

![DPZA-1 Symbols]

#### DPZA-2

![DPZA-2 Symbols]

#### DPZA-3

![DPZA-3 Symbols]

### Valve model

**DPZA**

<table>
<thead>
<tr>
<th>Spool type and size</th>
<th>Pressure limits [bar]</th>
<th>Max flow at P-T [l/min]</th>
<th>Response time [ms]</th>
<th>Hysteresis [%]</th>
<th>Repeatability [%]</th>
</tr>
</thead>
<tbody>
<tr>
<td>L5</td>
<td>Ports P, A, B, X = 350; T = 250; Y = 0</td>
<td>100</td>
<td>&lt; 80</td>
<td>5%</td>
<td>± 1%</td>
</tr>
<tr>
<td>S5</td>
<td></td>
<td>100</td>
<td>&lt; 80</td>
<td>5%</td>
<td>± 1%</td>
</tr>
<tr>
<td>D5</td>
<td></td>
<td>100</td>
<td>&lt; 80</td>
<td>5%</td>
<td>± 1%</td>
</tr>
</tbody>
</table>

### Options:
- T = prolongued manual override protected by metallic cap (only for -A)
- WP = prolonged manual override protected by metallic cap (only for -A)
- Y = external drain (only for DHZA and DKZA)

### Omit for standard coil 12 Vdc:
- 24 = with 24 VDC coils (only A version)

---

## ELECTRONIC DRIVERS TO BE USED WITH EX-PROOF PROPORTIONAL VALVES

- Atos driver for proportional valves type = A (without transducer): E-ME-AC, see tab. G035
- Atos driver for proportional valves type = T (with transducer): E-ME-T, see tab. G140
## 18 MODEL CODE OF SERVOPROPORTIONAL VALVES

**DLHZA**

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>/ * - T - 0 4 0 - L 7 3 / PA - GK / 7 ** / *</td>
<td></td>
</tr>
</tbody>
</table>

**Options:**
- **T** = with integral position transducer
- **M** = Group I, ATEX (mining)
- **RU** = Group II, Rosechradur (Russian)
- **G** = Group I, ATEX (mining)
- **PA** = with cable gland
- **PA** = with threated cable gland

**Valve size:** (ISO 4401)
- **0** = size 06 (DLHZA)
- **1** = size 10 (DLKZA)

**Optional certifications (omit for Group II ATEX):**
- **M** = size 06 (DLHZA)
- **M** = size 10 (DLKZA)

**Configuration:**
- **T** = external plus central position, spring centered
- **4** = position transducer with current feedback
- **5** = with integral position transducer

**Spool overlapping in central position:**
- **3** = linear
- **5** = with integral position transducer

**Spool type:**
- **L** = linear
- **T** = not linear

**Synthetic fluids:**
- **PF** = water-glycerol
- **PE** = phosphate ester

**Series number:**
- **PA** = with cable gland

**Max regulated flow:**
- **QVHZA:**
  - **Valve size (ISO 4401):**
    - **06**
    - **10**

**Optional cable gland:**
- **PA** = with threated cable gland

**Notes:**
1. **Option BM** = low temperature -40°C also available on request (not for group I ATEX - mining)
2. **Option BM** = prolongued manual override protected by metallic cap

## 19 HYDRAULIC CHARACTERISTICS (based on mineral oil ISO VG 46 at 50 °C)

<table>
<thead>
<tr>
<th>Valve model</th>
<th>DLHZA-T</th>
<th>DLKZA-T</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pressure limits</td>
<td>ports P, A, B = 350; T = 160 (250 with external drain)</td>
<td>ports P, A, B = 315; T = 160 (250 with external drain)</td>
</tr>
<tr>
<td>Spool</td>
<td>L1</td>
<td>L3</td>
</tr>
<tr>
<td>Δp max P-T</td>
<td>70</td>
<td>70</td>
</tr>
<tr>
<td>Max flow</td>
<td>(l/min)</td>
<td>at Δp = 30 bar</td>
</tr>
<tr>
<td>Leakage</td>
<td>(cm³/min) at P = 100 bar (1)</td>
<td>&lt; 200</td>
</tr>
<tr>
<td>Response time</td>
<td>(ms)</td>
<td>&lt; 10</td>
</tr>
<tr>
<td>Thermal drift</td>
<td>zero point displacement</td>
<td>&lt; 1% at AT = 40°C</td>
</tr>
</tbody>
</table>

1. **(1)** Referred to spool in center position and 50°C oil temperature.
2. **(2)** Response times at step signal (0%→100%) are measured from 10% to 90% of step value and are strictly referred to valve regulation.

## 20 MODEL CODE OF PRESSURE COMPENSATED PROPORTIONAL FLOW CONTROL VALVES

**QVHZA**

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>/ * - T - 06 / 12 / PA - GK / * / * / *</td>
<td></td>
</tr>
</tbody>
</table>

**Options:**
- **T** = external plus central position
- **M** = Group I, ATEX (mining)
- **RU** = Group II, Rosechradur (Russian)

**Valve size:** (ISO 4401)
- **QVHZA:**
  - **06**
  - **QVKZA:**
  - **10**

**Max regulated flow:**
- **QVHZA:**
  - **QVKZA:**
  - **Max flow** | 3 = 3.5 l/min; 12 = 12 l/min; 18 = 18 l/min |
  - **Max regulated flow** | 35 = 35 l/min; 45 = 45 l/min; 50 = 50 l/min |

**Optional cable gland:**
- **PA** = with threated cable clamp

**Notes:**
1. **(1)** Also available on request (not for group I ATEX - mining)
2. **(2)** With 24 VDC coils (only A version)

## 21 HYDRAULIC CHARACTERISTICS (based on mineral oil ISO VG 46 at 50 °C)

<table>
<thead>
<tr>
<th>Valve model</th>
<th>QVHZA-A</th>
<th>QVHZA-T</th>
<th>QVKZA-A</th>
<th>QVKZA-T</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valve size</td>
<td>QVHZA-A</td>
<td>QVHZA-T</td>
<td>QVKZA-A</td>
<td>QVKZA-T</td>
</tr>
<tr>
<td>Max pressure ports P, A, B</td>
<td>350</td>
<td>250</td>
<td>315</td>
<td>250</td>
</tr>
<tr>
<td>Max regulated flow</td>
<td>(l/min)</td>
<td>3.5</td>
<td>12</td>
<td>18</td>
</tr>
<tr>
<td>Min regulated flow</td>
<td>(l/min)</td>
<td>15</td>
<td>20</td>
<td>30</td>
</tr>
<tr>
<td>Regulating Δp</td>
<td>(bar)</td>
<td>4</td>
<td>6</td>
<td>10</td>
</tr>
<tr>
<td>Max flow on port A</td>
<td>(l/min)</td>
<td>40</td>
<td>35</td>
<td>50</td>
</tr>
</tbody>
</table>

**Above performance data refer to valves coupled with Atos electronic drivers.**
1. **(1)** Values are referred to 3-way configuration. In the 2-way configuration, the values of min regulated flow are higher.
### 22 MODEL CODE OF PROPORTIONAL PRESSURE RELIEF AND COMPENSATOR VALVES

**Pressure relief:**

- **RZMA** = subplate size 06
- **HZMA** = modular size 06
- **AGMZA** = subplate size 10, 20, 32
- **LIMZA** = cartridge (1)

**Pressure compensator:**
- **LICZA** = cartridge (1)

**Optional certifications (omit for Group II ATEX):**
- **M** = Group I, ATEX (mining)
- **RU** = Group II, Rostechnadzor (Russian)

- **A** = without integral pressure transducer

**Valve size:**

- see section [ ] for size code

**Max regulated pressure:**

- see section [ ]

**Valve model**

- **PA** = with threaded cable clamp, see section

**Optional cable gland**

- **PA** = with threaded cable clamp, see section

(1) For the code of the ISO cartridge to use with LIMZA and LICZA, see tab. F300 section [ ].

(2) Option /BT = low temperature -40°C also available on request (not for group I Atex - mining -)

### 23 HYDRAULIC CHARACTERISTICS

<table>
<thead>
<tr>
<th>Valve model</th>
<th>RZMA</th>
<th>HZMA</th>
<th>AGMZA</th>
<th>LIMZA</th>
<th>LICZA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size code</td>
<td>010</td>
<td>030</td>
<td>031</td>
<td>20</td>
<td>32</td>
</tr>
<tr>
<td>Valve size</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max regulated pressure [bar]</td>
<td>80</td>
<td>180</td>
<td>250</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max pressure at port P, A, B, X [bar]</td>
<td>315</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max pressure at port T, Y [bar]</td>
<td>210</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max flow [l/min]</td>
<td>4</td>
<td>40</td>
<td>200</td>
<td>400</td>
<td>600</td>
</tr>
</tbody>
</table>

### 24 MODEL CODE OF PROPORTIONAL PRESSURE REDUCING VALVES

**Pressure reducing:**

- **RZGA** = subplate size 06
- **HZGA** = modular size 06
- **KZGA** = modular size 10
- **AGRCZA** = subplate size 10, 20
- **LIRZA** = cartridge

**Optional certifications (omit for Group II ATEX):**
- **M** = Group I, ATEX (mining)
- **RU** = Group II, Rostechnadzor (Russian)

- **A** = without integral pressure transducer

**Valve size:**

- see section [ ] for size code

**Max regulated pressure:**

- see section [ ]

**Valve model**

- **PA** = with threaded cable clamp, see section

(1) For the code of the ISO cartridge to use with LIRZA, see tab. F300 section [ ].

(2) Option /BT = low temperature -40°C also available on request (not for group I Atex - mining -)

### 25 HYDRAULIC CHARACTERISTICS

<table>
<thead>
<tr>
<th>Valve model</th>
<th>RZGA</th>
<th>HZGA</th>
<th>KZGA</th>
<th>AGRCZA</th>
<th>LIRZA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size code</td>
<td>010</td>
<td>031</td>
<td>031</td>
<td>10</td>
<td>20</td>
</tr>
<tr>
<td>Valve size</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max regulated pressure [bar]</td>
<td>32</td>
<td>100</td>
<td>210</td>
<td>80</td>
<td>180</td>
</tr>
<tr>
<td>Min regulated pressure [bar]</td>
<td>0,8</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Max pressure at port P [bar]</td>
<td>315</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max pressure at port T [bar]</td>
<td>210</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max flow [l/min]</td>
<td>12</td>
<td>40</td>
<td>40</td>
<td>100</td>
<td>160</td>
</tr>
</tbody>
</table>

---

**Synthetic fluids (1):**
- **WG** = water-glycol
- **PE** = phosphate ester

**Options:**
- **7** = for ambient temperature up to 70°C
- **E** = external pilot (only for AGMZA)
- **G** = horizontal cable entrace (not for group I Atex)
- **P** = with integral mechanical pressure limiter (only for LIRZA)
- **Y** = external drain (only for AGMZA)

**Solenoid threatened connection:**
- **GK** = GK-1/2" ISO/UNI-6125 (tapered)
- **NPT** = 1/2" NPT ANSI B2.1 (tapered)
- **M** = M20x1.5 UNI-4535 (6H/6g)

**Note: for the code of the ISO cartridge to use with LIRZA, see tab. F300 section [ ].

(1) Option /BT = low temperature -40°C also available on request (not for group I Atex - mining -)**
Following codes have to be specified for spare cable glands:

- **SP-PA(M)19/GK** = with threaded connection GK-1/2" ISO/UNI-6125 (tapered)
- **SP-PA(M)19/NPT** = with threaded connection 1/2" NPT ANSI B2.1 (tapered)
- **SP-PA(M)19/M** = with threaded connection M20x1.5 UNI-4535 (6H/6g).

This cable gland must be blocked with Loctite or similar or with a lock nut.

Note: special cable clamps PA112 (PG12) available on request only as spare parts.

The valves must be connected to the power supply using the terminal board inside the solenoid. The cable must be suitable for the working temperature as specified in the “safety instructions” delivered with the first supply of the products.

Additional equipotential grounding can be also performed by the user on the external facility provided on the solenoid case.

Minimum section of external ground wire = 4 mm².

Minimum section of internal ground wire = the same of supply wire.

In order to reach the terminal board inside the solenoid, the top plate of the solenoid must be removed.

Minimum section of external ground wire = 105 mm².

Solenoids are provided with threaded connection for cable entrance:

- GK-1/2" GAS (ISO/UNI 6125)
- M20x1.5 (UNI-4535)
- 1/2"NPT (ANSI B2.1)

The cable glands are available on request certified ATEX according to EN 60079-0 and EN 60079-1.

PA19 cable size 7-9,5 mm
PA12 cable size 9-12 mm

Note: special cable clamps PA112 (PG12) available on request only as spare parts.

The valves must be connected to the power supply using the terminal board inside the solenoid. The cable must be suitable for the working temperature as specified in the “safety instructions” delivered with the first supply of the products.

Additional equipotential grounding can be also performed by the user on the external facility provided on the solenoid case. Minimum section of external ground wire = 4 mm².

Minimum section of internal ground wire = the same of supply wire.

In order to reach the terminal board inside the solenoid, the top plate of the solenoid must be removed. Solenoids are provided with threaded connection for cable entrance:

- GK-1/2" GAS (ISO/UNI 6125)
- M20x1.5 (UNI-4535)
- 1/2"NPT (ANSI B2.1)