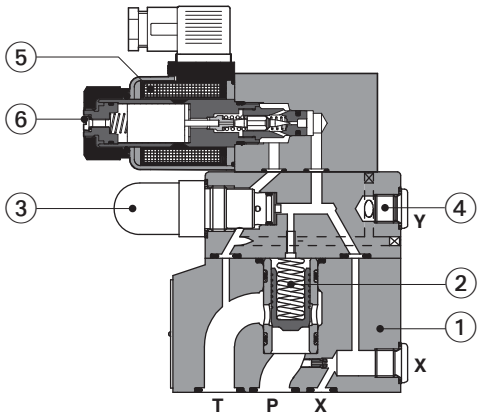
# Proportional relief valves

piloted, without transducer




① Valve main body
② Main poppet
③ Mechanical pressure limiter
④ Drain port G 1/4" (option /Y)
⑤ Proportional solenoid
⑥ Screw for air bleeding

**AGMZE-A-10**

### AGMZE-A

Poppet type, piloted, proportional pressure relief valves for open loop pressure controls.

They operate in association with off-board driver, which supply the proportional valves with proper current to align the valve regulation to the reference signal supplied to the driver.

The solenoids are certified according to North American standard **cURus**.

Size: **10**, **20**, **32** - ISO 6264
Max flow: **200**, **400**, **600 l/min**
Max pressure: **350 bar**

## 1 MODEL CODE

| AGMZE | - | A | - | 10 | / | 315 | / | * | - | * | / | * | * | / | * |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

**AGMZE**: Proportional pressure relief valve, piloted

**A** = for off-board driver, see section 3

**Valve size** ISO 6264: **10, 20, 32**

**Max regulated pressure:**
**50** = 50 bar
**100** = 100 bar
**210** = 210 bar
**315** = 315 bar
**350** = 350 bar

**Hydraulic options (1)**:
**E** = external pilot
**Y** = external drain (only pipe connection G 1/4")

**Coil with special connectors**, see section 16 :
**-** = omit for standard DIN connector
**J** = AMP Junior Timer connector
**K** = Deutsch connector
**S** = Lead Wire connection

**Coil voltage,** see section 12 :
**-** = standard coil for 24 VDC Atos drivers
**6** = optional coil for 12 VDC Atos drivers
**18** = optional coil for low current drivers **(2)**

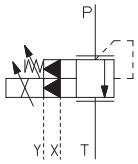
Series number

**Seals material,** see section 8 :
**-** = NBR
**PE** = FKM
**BT** = HNBR

**(1)** Possible combined options: /EY
**(2)** Select valve's coil voltage **/18** in case of electronic drivers not supplied by Atos, with power supply 24 VDC and with max current limited to 1A

## 2 HYDRAULIC SYMBOL

**AGMZE-A**




## 3 OFF-BOARD ELECTRONIC DRIVERS

| Drivers model | E-MI-AC-01F | | E-MI-AS-IR | | E-BM-AS-PS | | E-BM-AES |
|---|---|---|---|---|---|---|---|
| Type | Analog | | Digital | | | | |
| Voltage supply (VDC) | 12 | 24 | 12 | 24 | 12 | 24 | 24 |
| Valve coil option | /6 | std | /6 | std | /6 | std | std |
| Format | plug-in to solenoid | | | | DIN-rail panel | | |
| Tech table | G010 | | G020 | | G030 | | GS050 |

## 4 GENERAL NOTES

Atos digital proportionals valves are CE marked according to the applicable directives (e.g. Immunity and Emission EMC Directive).
Installation, wirings and start-up procedures must be performed according to the general prescriptions shown in tech table **FS900** and in the installation notes supply with relevent components.

## 5 GENERAL CHARACTERISTICS

| | |
|---|---|
| Assembly position | Any position |
| Subplate surface finishing to ISO 4401 | Acceptable roughness index: Ra ≤ 0,8, recommended Ra 0,4 – Flatness ratio 0,01/100 |
| MTTFd valves according to EN ISO 13849 | 75 years, see technical table P007 |
| Ambient temperature range | **Standard** = -20°C ÷ +70°C **/PE** option = -20°C ÷ +70°C **/BT** option = -40°C ÷ +60°C |
| Storage temperature range | **Standard** = -20°C ÷ +80°C **/PE** option = -20°C ÷ +80°C **/BT** option = -40°C ÷ +70°C |
| Surface protection | Zinc coating with black passivation |
| Corrosion resistance | Salt spray test (EN ISO 9227) > 200 h |
| Conformity | CE according to EMC directive 2014/30/EU (Immunity: EN 61000-6-2; Emission: EN 61000-6-3)<br>RoHS Directive 2011/65/EU as last update by 2015/863/EU<br>REACH Regulation (EC) n°1907/2006 |

## 6 HYDRAULIC CHARACTERISTICS

| Valve model | | **AGMZE-A-10** | **AGMZE-A-20** | **AGMZE-A-32** |
|---|---|---|---|---|
| Max regulated pressure | [bar] | 50; 100; 210; 315; 350 | | |
| Max pressure at port P | [bar] | 350 | | |
| Max pressure at port T | [bar] | 210 | | |
| Min regulated pressure | [bar] | see min. pressure / flow diagrams at section 11 | | |
| Max flow | [l/min] | 200 | 400 | 600 |
| Response time 0-100% step signal (depending on installation) **(1)** | [ms] | ≤ 120 | ≤ 135 | ≤ 150 |
| Hysteresis | | ≤ 2 [% of max pressure] | | |
| Linearity | | ≤ 3 [% of max pressure] | | |
| Repeatability | | ≤ 2 [% of max pressure] | | |

**Note:** above performance data refer to valves coupled with Atos electronic drivers, see section 3

**(1)** Average response time values; the pressure variation in consequence of a modification of the reference input signal to the valve is affected by the stiffness of the hydraulic circuit: greater is the stiffness of the circuit, faster is the dynamic response

## 7 ELECTRICAL CHARACTERISTICS

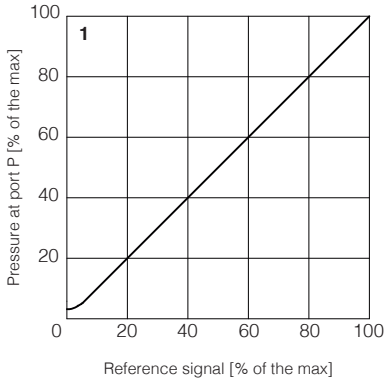
| | | | |
|---|---|---|---|
| Power supplies | Nominal : +24 VDC<br>Rectified and filtered : VRMS = 20 ÷ 32 VMAX (ripple max 10 % VPP) | | |
| Coil voltage code | standard | option /6 | option /18 |
| Max. solenoid current | 2,5 A | 3 A | 1,2 A |
| Coil resistance R at 20°C | 3,1 Ω | 2,1 Ω | 13,1 Ω |
| Insulation class | H (180°) Due to the occuring surface temperatures of the solenoid coils,<br>the European standards ISO 13732-1 and EN982 must be taken into account | | |
| Protection degree to DIN EN60529 | IP65 with mating connectors | | |
| Duty factor | Continuous rating (ED=100%) | | |
| Certification | **cURus** North American Standard | | |

## 8 SEALS AND HYDRAULIC FLUIDS - for other fluids not included in below table, consult our technical office

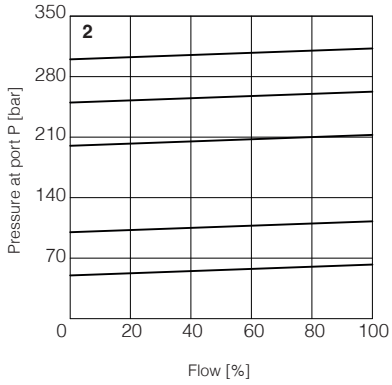
| | | | | |
|---|---|---|---|---|
| Seals, recommended fluid temperature | | NBR seals (standard) = -20°C ÷ +80°C, with HFC hydraulic fluids = -20°C ÷ +50°C<br>FKM seals (/PE option) = -20°C ÷ +80°C<br>HNBR seals (/BT option) = -40°C ÷ +60°C, with HFC hydraulic fluids = -40°C ÷ +50°C | | |
| Recommended viscosity | | 20 ÷ 100 mm²/s - max allowed range 15 ÷ 380 mm²/s | | |
| Max fluid contamination level | normal operation | ISO4406 class 18/16/13 NAS1638 class 7 | | see also filter section at www.atos.com or KTF catalog |
| | longer life | ISO4406 class 16/14/11 NAS1638 class 5 | | |
| **Hydraulic fluid** | | **Suitable seals type** | **Classification** | **Ref. Standard** |
| Mineral oils | | NBR, FKM, HNBR | HL, HLP, HLPD, HVLP, HVLPD | DIN 51524 |
| Flame resistant without water | | FKM | HFDU, HFDR | ISO 12922 |
| Flame resistant with water | | NBR, HNBR | HFC | |

## 9 DIAGRAMS (based on mineral oil ISO VG 46 at 50 °C)

**1 = Regulation diagrams**
with flow rate Q = 50 l/min

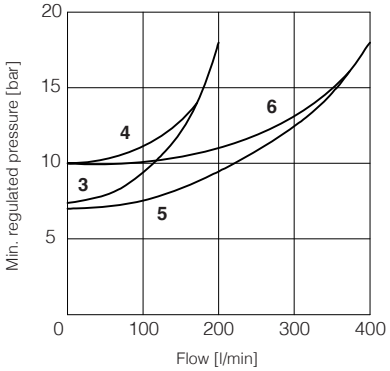


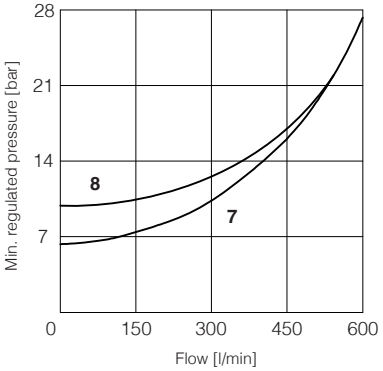

**2 = Pressure/flow diagrams**
with reference signal set at Q = 50 l/min




**3-8 = Min. pressure/flow diagrams**
with zero reference signal

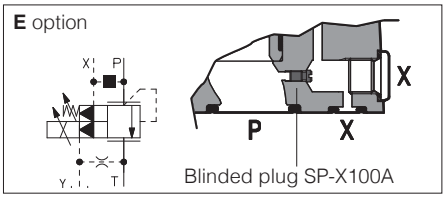
**3 =** AGMZE-A-10/50, 100, 210, 315
**4 =** AGMZE-A-10/350
**5 =** AGMZE-A-20/50, 100, 210, 315
**6 =** AGMZE-A-20/350
**7 =** AGMZE-A-32/50, 100, 210, 315
**8 =** AGMZE-A-32/350



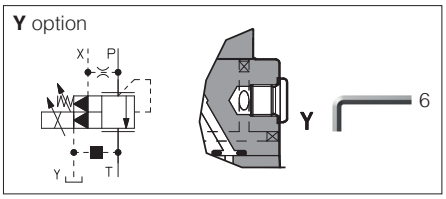




## 10 HYDRAULIC OPTIONS

**E** = External pilot option to be selected when the pilot pressure is supplied from a different line respect to the P main line.
With option E the internal connection between port P and X of the valve is plugged.
The pilot pressure must be connected to the X port available on the valve's mounting surface or on main body (threaded pipe connection G ¼").




**Y** = The external drain is mandatory in case the main line T is subjected to pressure peaks or it is pressurized.
The Y drain port has a threaded connection G ¼" available on the pilot stage body.




## 11 POSSIBLE COMBINED OPTIONS

/EY

## 12 COIL VOLTAGE OPTIONS

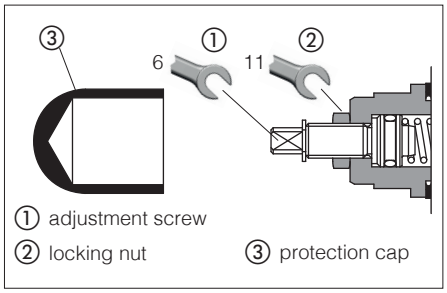
**6** = Optional coil to be used with Atos drivers with power supply 12 VDC.

**18** = Optional coil to be used with electronic drivers not supplied by Atos, with power supply 24 VDC and with max current limited to 1A.

## 13 MECHANICAL PRESSURE LIMITER

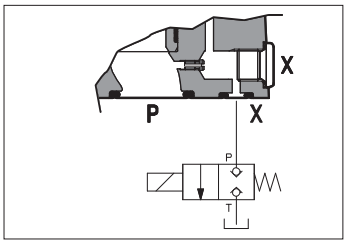
The AGMZE are provided with mechanical pressure limiter acting as protection against overpressure. For safety reasons the factory setting of the mechanical pressure limiter is fully unloaded (min pressure). At the first commissioning it must be set at a value lightly higher than the max pressure regulated with the proportional control.
For the pressure setting of the mechanical pressure limiter, proceed according to following steps:

- apply the max reference input signal to the valve's driver. The system pressure will not increase until the mechanical pressure limiter remains unloaded.
- turn clockwise the adjustment screw ① until the system pressure will increase up to a stable value corresponding to the pressure setpoint at max reference input signal.
- turn clockwise the adjustment screw ① of additional 1 or 2 turns to ensure that the mechanical pressure limiter remains closed during the proportional valve working.



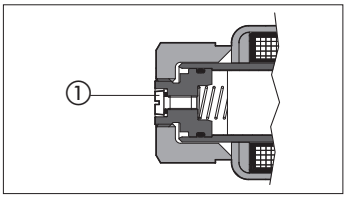

## 14 REMOTE PRESSURE UNLOADING

The **P** main line can be remotely unloaded by connecting the valve X port to a solenoid valve as shown in the below scheme (venting valve).
This function can be used in emergency to unload the system pressure by-passing the proportional control.



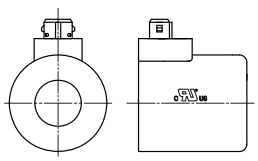

## 15 AIR BLEEDING

At the first valve commissioning the air eventually trapped inside the solenoid must be bled-off though the screw ① located at the rear side of the solenoid housing.
The presence of air may cause pressure instability and vibrations.

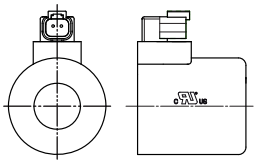



## 16 COILS WITH SPECIAL CONNECTORS

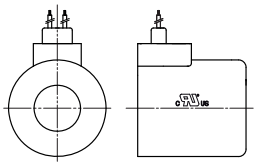
**J** option
Coil type COZEJ
AMP Junior Timer connector
Protection degree IP67



**K** option
Coil type COZEK
Deutsch connector, DT-04-2P male
Protection degree IP67

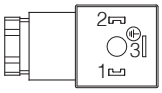


**S** option
Coil type COZES
Lead Wire connection
Cable lenght = 180 mm

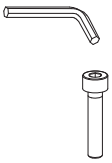


## 17 SOLENOID CONNECTION

| PIN | SIGNAL | TECHNICAL SPECIFICATION | Connector code 666 |
|---|---|---|---|
| 1 | **COIL** | Power supply | |
| 2 | **COIL** | Power supply | |
| 3 | **GND** | Ground | |




## 18 FASTENING BOLTS AND SEALS

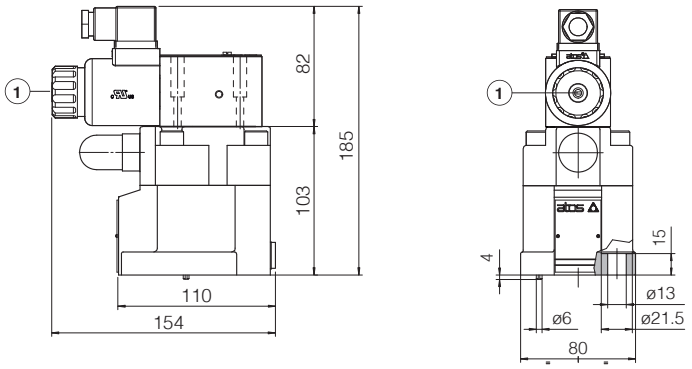
| | AGMZE-A-10 | AGMZE-A-20 | AGMZE-A-32 |
|---|---|---|---|
|  | **Fastening bolts:**<br>4 socket head screws M12x35 class 12.9<br>Tightening torque = 125 Nm | **Fastening bolts:**<br>4 socket head screws M16x50 class 12.9<br>Tightening torque = 300 Nm | **Fastening bolts:**<br>4 socket head screws M20x60 class 12.9<br>Tightening torque = 600 Nm |
| | **Seals:**<br>2 OR 123<br>Diameter of ports P, T: Ø 14 mm<br>1 OR 109/70<br>Diameter of port X: Ø 3,2 mm | **Seals:**<br>2 OR 4112<br>Diameter of ports P, T: Ø 24 mm<br>1 OR 109/70<br>Diameter of port X: Ø 3,2 mm | **Seals:**<br>2 OR 4131<br>Diameter of ports P, T: Ø 28 mm<br>1 OR 109/70<br>Diameter of port X: Ø 3,2 mm |

## SIZE 10

**ISO 6264: 2007**
**Mounting surface: 6264-06-09-1-97**
(see table P005)

| Mass [kg] | |
|---|---|
| AGMZE-A-10 | 5,4 |

**AGMZE-A-10**

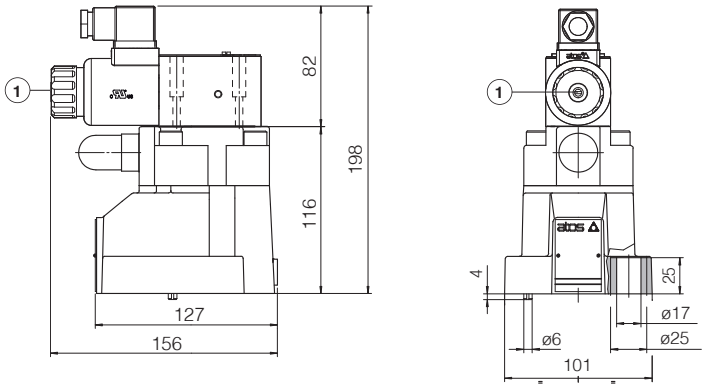



## SIZE 20

**ISO 6264: 2007**
**Mounting surface: 6264-08-13-1-97**
(see table P005)

| Mass [kg] | |
|---|---|
| AGMZE-A-20 | 6,6 |

**AGMZE-A-20**

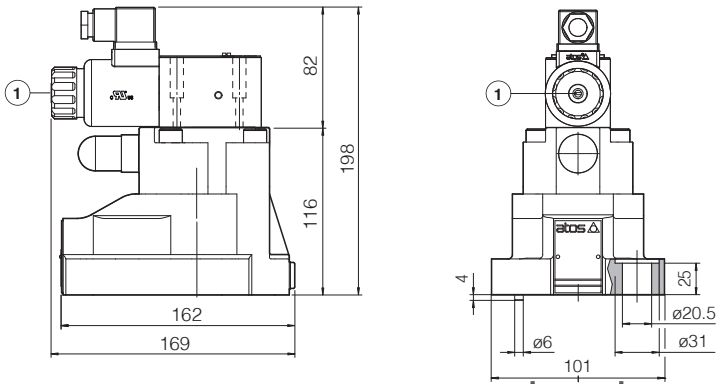



## SIZE 32

**ISO 6264: 2007**
**Mounting surface: 6264-10-17-1-97**
(see table P005)
**(with M20 fixing holes instead of standard M18)**

| Mass [kg] | |
|---|---|
| AGMZE-A-32 | 8 |

**AGMZE-A-32**




(1) = Air bleeding, see section 15