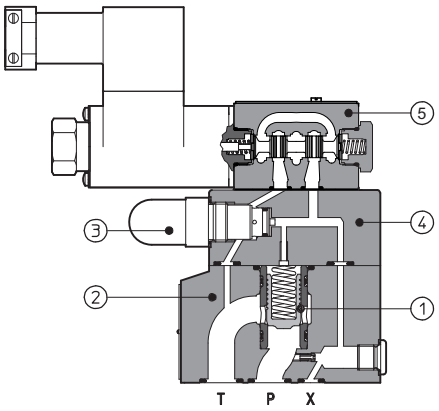
# Ex-proof pressure relief valves

piloted, subplate - **MA certification**




① main poppet
② valve main body
③ mechanical pressure limiter
④ cover
⑤ ex proof pilot valve

**SAGAM/MA-10/10/****

**SAGAM/MA**

Pressure relief valves equipped with explosion-proof solenoid pilot valve for venting certified according to **MA** Chinese mining certification, protection mode:

**Ex db I Mb** for surface, tunnel or mine plants

The solenoids are provided with cable glands (horizontally oriented) for cable entrance and internal terminal board for power supply coils connections.

The solenoid case classified **Ex db** 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.

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

## 1 MODEL CODE OF PRESSURE RELIEF VALVES TYPE SAGAM

| SAGAM | / | MA | - | 20 | / | 1 | 0 | / | 210 | - | * | / | 24DC | ** | / | * |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

**SAGAM** = pressure relief valve: subplate mounting

**Certification type**:
**MA** = Ex-proof Ma Chinese mining certification

**Valve size:** **10** (ISO 6264)
**20** (ISO 6264)
**32** (ISO 6264)

**1** = one setting pressure

Valve configuration, see section 2
**0** = venting with de-energized solenoid
**1** = venting with energized solenoid

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

**Option:**
**V** = regulating handweel for pressure adjustment

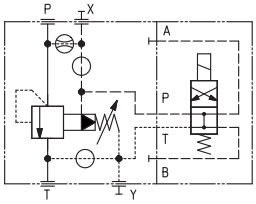
**Voltage code**, see section 5

Series number

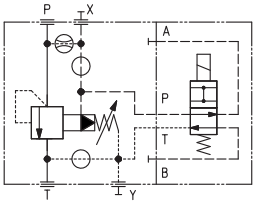
Seals material, see section 6:
**-** = NBR
**PE** = FKM

## 2 HYDRAULIC SYMBOL (representation according to ISO 1219-1)

**SAGAM-**/10**




**SAGAM-**/11**



## 3 GENERAL CHARACTERISTICS

| | |
|---|---|
| Assembly position / location | Any position |
| Subplate surface finishing to ISO 4401 | Acceptable roughness index, Ra ≤0,8 recommended Ra 0,4 - flatness ratio 0,01/100 |
| MTTFd values according to EN ISO 13849 | 75 years, for further details see technical table P007 |
| Ambient temperature | **Standard** = -20°C ÷ +70°C **/PE** option = -20°C ÷ +70°C |
| Storage temperature range | **Standard** = -20°C ÷ +80°C **/PE** option = -20°C ÷ +80°C |
| Compliance | Explosion proof protection, see section 7<br>-Flame proof enclosure Ex-db |

## 4 HYDRAULIC CHARACTERISTICS

| | | | |
|---|---|---|---|
| **Operating pressure** | P, X = **350 bar** | T, Y = **210 bar** | |
| **Maximuim flow** | SAGAM/MA-10 = **200 l/min;** | SAGAM/MA-20 = **400 l/min;** | SAGAM/MA-32 = **600 l/min;** |

## 5 ELECTRICAL CHARACTERISTICS

| | |
|---|---|
| **SOLENOID TYPE** | ON/OFF |
| **Voltage code** VDC ±10% | **12DC, 24DC, 110DC** |
| Power consumption | 16,5 W |
| Protection degree | IP 65 to DIN EN 60529 |
| Duty factor | 100% |

## 6 SEALS AND HYDRAULIC FLUID

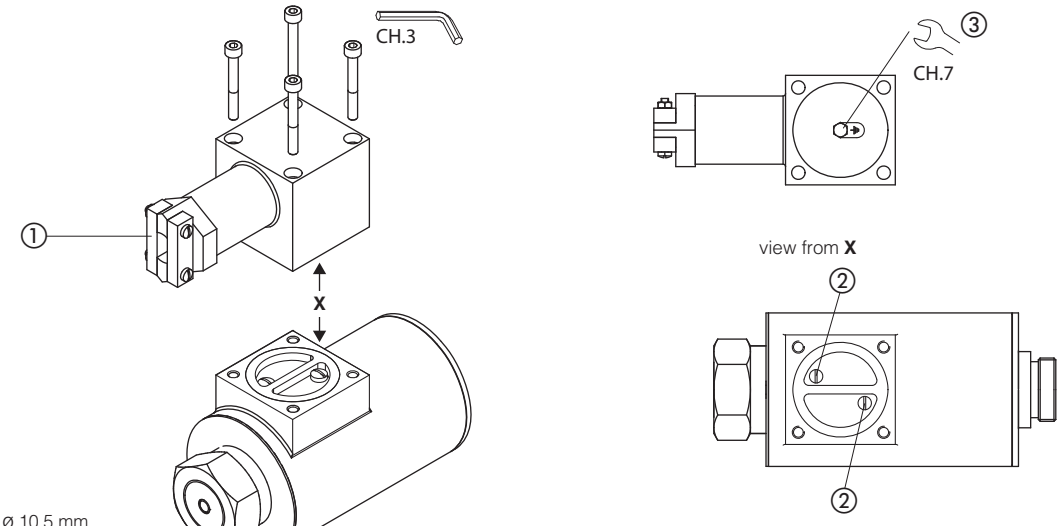
| | | | |
|---|---|---|---|
| Seals, recommended fluid temperature | NBR seals (standard) = -20°C ÷ +60°C, with HFC hydraulic fluids = -20°C ÷ +50°C<br>FKM seals (/PE option) = -20°C ÷ +80°C | | |
| Recommended viscosity | 15÷100 $mm^2/s$ - max allowed range 2.8 ÷ 500 $mm^2/s$ | | |
| Max fluid contamination level | ISO4406 class 20/18/15 NAS1638 class 9, see also filter section at www.atos.com or KTF catalog | | |
| **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 | |

## 7 CERTIFICATION DATA

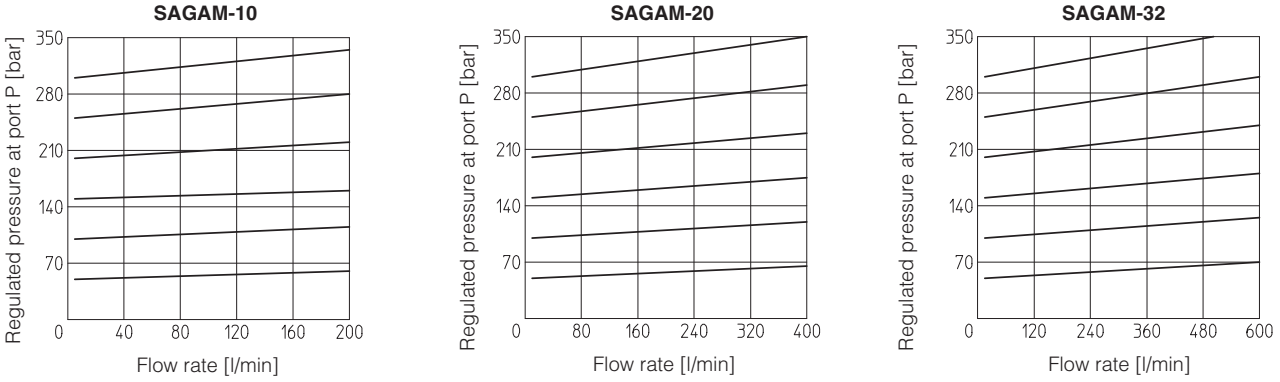
| | |
|---|---|
| Valve type | SAGAM**/MA** |
| Certification | MA mining |
| Solenoid certified code | **DTBZ12 - 37 FYC** |
| Type examination certificate | CNEx 22.7656X |
| Method of protection | Ex db I Mb |
| Ambient temperature | ≤ 135 °C |
| Ambient temperature | -20 ÷ +40 °C |
| Cable entrance: | cable entrance Ø =10.5mm |

⚠ **WARNING: service work performed on the valve by the end users or not qualified personnel invalidates the certification**

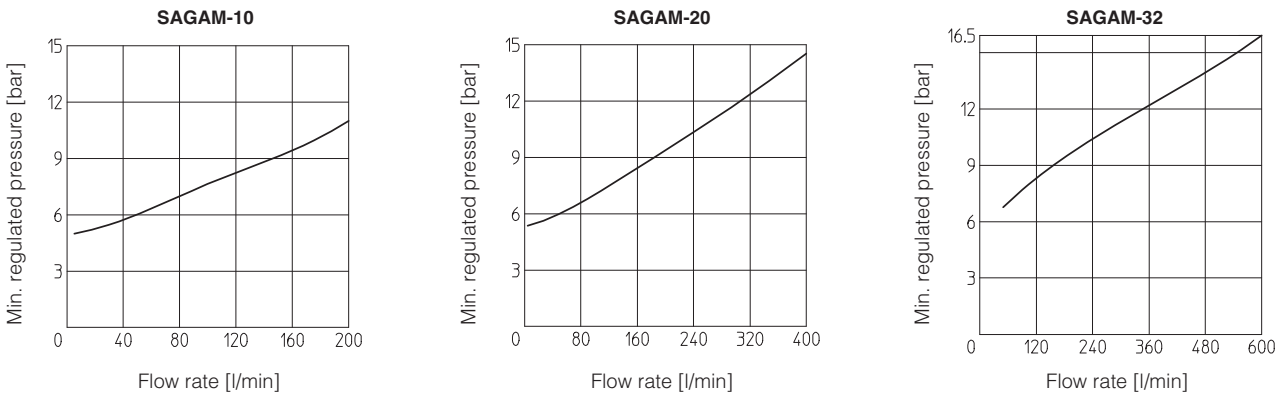
## 8 SOLENOID WIRING




## 9 REGULATED PRESSURE VERSUS FLOW DIAGRAMS based on mineral oil ISO VG 46 at 50°C

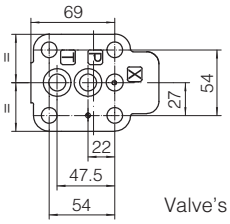



## 10 MINIMUM PRESSURE VERSUS FLOW DIAGRAMS based on mineral oil ISO VG 46 at 50°C

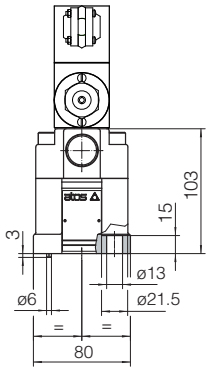


## SAGAM/MA-10

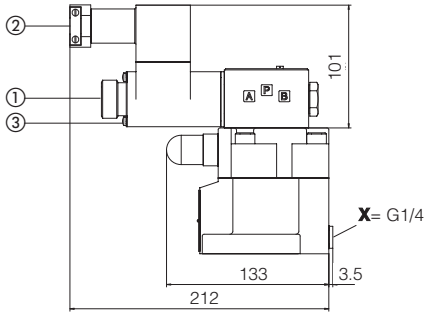
**ISO 6264: 2007**
**Mounting surface: 6264-06-09-1-97**
Fastening bolts:
4 socket head screws M12x35 class 12.9
Tightening torque = 125 Nm
Seals: 2 OR 123; 1 OR 109/70
Ports P, T: Ø = 14,5 mm
Ports X: Ø = 3,2 mm



Valve's bottom view



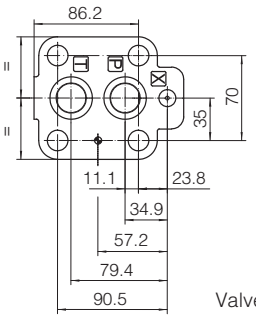

**SAGAM/MA-10/****



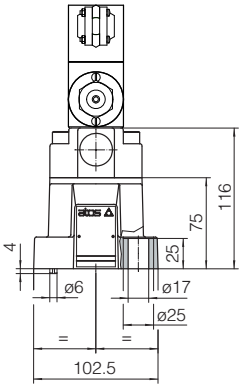

Mass: 5,1 Kg

## SAGAM/MA-20

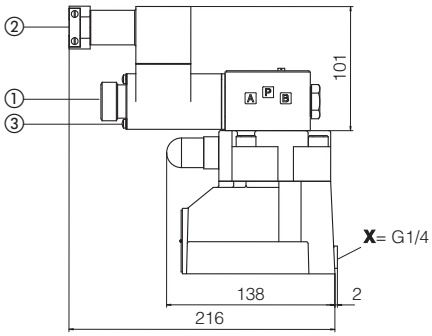
**ISO 6264: 2007**
**Mounting surface: 6264-08-11-1-97**
Fastening bolts:
4 socket head screws M16x50 class 12.9
Tightening torque = 300 Nm
Seals: 2 OR 4112; 1 OR 109/70
Ports P, T: Ø = 24 mm
Ports X: Ø = 3,2 mm



Valve's bottom view



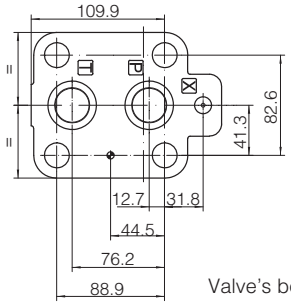

**SAGAM/MA-20/****



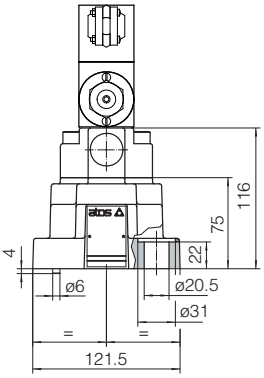

Mass: 6,3 Kg

## SAGAM/MA-32

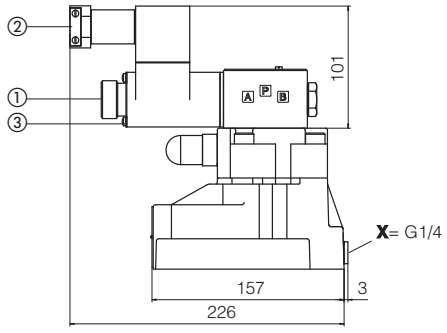
**ISO 6264: 2007**
**Mounting surface: 6264-10-17-1-97**
**(with M20 fixing holes instead of standard M18)**
Fastening bolts:
4 socket head screws M20x60 class 12.9
Tightening torque = 600 Nm
Seals: 2 OR 4131; 1 OR 109/70
Ports P, T: Ø = 28,5 mm
Ports X: Ø = 3,2 mm



Valve's bottom view




**SAGAM/MA-32/****




Mass: 7,7 Kg

① manual override
② horizontal cable gland, cable entrance = ø 10,5 mm
③ screw terminal for additional equipotential grounding