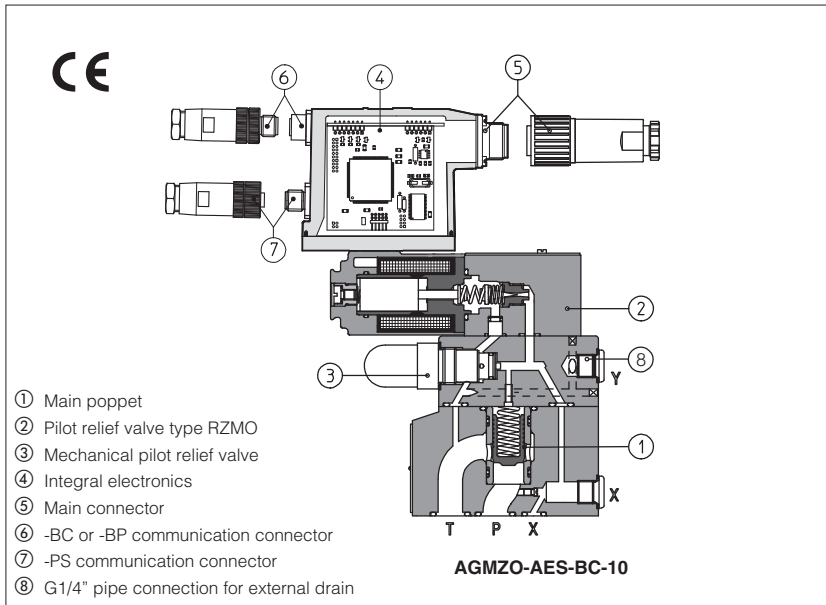


Proportional relief valves type AGMZO-A*

two stage, without integral pressure transducer, ISO 6264 size 10, 20 and 32



1 MODEL CODE

AGMZO	- AES	- PS	- 10 / 315 / *	** /	*
Proportional pressure relief valve					Synthetic fluids WG = water-glycol PE = phosphate ester
A = without integral transducer AE = as A plus integral electronics AES = as A plus integral digital electronics				Series number	
Communication interfaces (only for AES): PS = Serial (1) BC = CANopen BP = PROFIBUS DP				Hydraulic options: E = external pilot Y = external drain (only pipe connection G1/4") (1)	
Size: 10, 20, 32				Options for -A execution, see section 5: 6 = with 6 V _{DC} coil instead of standard 12V _{DC} coil 18 = with 18 V _{DC} coil instead of standard 12V _{DC} coil	
Pressure range: 50 = 50 bar 210 = 210 bar 100 = 100 bar 315 = 315 bar				Electronics options for -AE execution, see section 7: I = current reference input (4÷20 mA) Q = enable signal	
				Electronics options for -AES execution, see section 9: Q = enable signal Z = adds double power supply, enable and fault signals (12 pin connector)	

(1) Serial interface always present, also for -BC and -BP options

AGMZO are poppet type proportional pressure relief valves, pilot operated without integral pressure transducer, which provide pressure regulation proportional to electronic reference signal.

They operate in association with electronic drivers, see section 2, which supply the proportional valve with proper current to align valve regulation to the reference signal supplied to the electronic driver.

They are available in different executions:

- -A, without integral pressure transducer.
- -AE, -AES, as -A plus analogue (AE) or digital (AES) integral electronics 4.

The piloting pressure to the poppet 1 is modulated by a proportional relief valve type RZMO 2, see table F007.

The pilot relief valve 3 with manual adjustment is installed to limit the max pressure value.

The integral electronics 4 ensures factory presetting, fine functionality plus valve-to-valve interchangeability and simplified wiring and installation.

The electronic main connector 5 is fully interchangeable for -AE and -AES executions. Standard 7 pin connector is used for power supply, analog input reference and monitor signals.

12 pin connector is used option /Z (AES).

Following communication interfaces 6, 7 are available for the -AES execution:

- standard -PS, Serial communication interface for configuration, monitoring and firmware updating through Atos PC software - always present
- optional -BC, CANopen interface
- optional -BP, PROFIBUS-DP interface

The valves with -BC and -BP interfaces can be integrated into a fieldbus communication network and thus digitally operated by the machine control unit.

The coils are fully plastic encapsulated (insulation class H), and the valves have antivibration, antishock and weather-proof features.

Mounting surface: ISO 6264 size 10, 20 and 32.

Max flow: 200, 400, 600 l/min

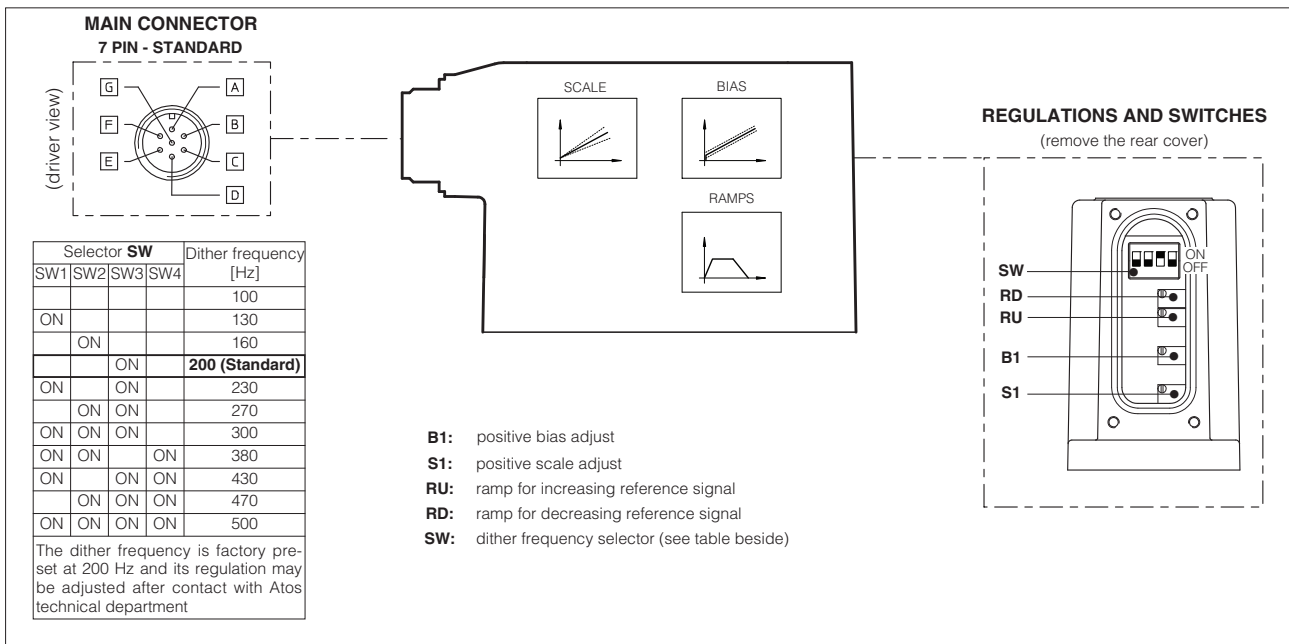
Max pressure: 315 bar.

2 ELECTRONIC DRIVERS FOR AGMZO

Valve model	-A					-AE	-AES	
Drivers model	E-MI-AC-01F	E-MI-AS-IR	E-BM-AC-01F	E-BM-AS-PS	E-ME-AC-01F	E-RP-AC-01F	E-RI-AE	E-RI-AES
Data sheet	G010	G020	G025	G030	G035	G100	G110	G115

Note: for power supply and communication connector see section 15

8 ANALOG INTEGRAL DRIVERS -AE - MAIN FUNCTIONS AND ELECTRONIC CONNECTIONS



8.1 ELECTRONIC CONNECTIONS - 7 PIN MAIN CONNECTORS

PIN	SIGNAL	TECHNICAL SPECIFICATIONS	NOTES
A	V+	Power supply 24 Vdc for solenoid power stage and driver logic	Input - power supply
B	V0	Power supply 0 Vdc for solenoid power stage and driver logic	Gnd - power supply
C ⁽¹⁾	AGND	Ground - signal zero for MONITOR signal	Gnd - analog signal
	ENABLE	Enable (24 Vdc) or disable (0 Vdc) the driver (for /Q option)	Input - on/off signal
D	INPUT+	Reference analog input: 0÷+10 Vdc maximum range (4 ÷ 20 mA for /I option)	Input - analog signal
E	INPUT -	Normal working range 0÷+10 Vdc (4 ÷ 20 mA for /I option)	
F	MONITOR	Monitor analog output: 0÷+5 Vdc maximum range; 1 V = 1 A	Output - analog signal
G	EARTH	Internally connected to the driver housing	

Note: (1) with /Q option ENABLE signal replaces AGND on pin C; MONITOR signal is referred to pin B.

A minimum time of 60ms to 160ms have to be considered between the driver energizing with the 24 Vdc power supply and when the valve is ready to operate. During this time the current to the valve coils is switched to zero

9 DIGITAL INTEGRAL DRIVERS -AES - OPTIONS

Standard driver execution provides on the 7 pin main connector:

Power supply - 24Vdc must be appropriately stabilized or rectified and filtered; a 2,5 A safety fuse is required in series to each driver power supply. Apply at least a 10000 µF/40 V capacitance to single phase rectifiers or a 4700 µF/40 V capacitance to three phase rectifiers.

Reference input signal - analog differential input with 0÷+10 Vdc nominal range (pin D, E), proportional to desired coil current (4÷20 mA with cable break detection, ± 10 mA, ± 20 mA or 0÷20 mA software selectable)

Monitor output signal - analog output signal proportional to the actual valve's coil current (1V monitor = 1A coil current)

Following options are available to adapt standard execution to special application requirements:

9.1 Option /Q

To enable the driver, supply 24Vdc on pin C referred to pin B: when the enable signal is set to zero the valve status is software selectable, by factory default the valve functioning is disabled (zero current to the solenoid) but the driver current output stage is still active. For the complete list of selectable status, see tab. G115.

9.2 Option /Z

It provides, on the 12 pin main connector, the following additional features:

Logic power supply

Separated power supply for the solenoid (pin 1, 2) and for the digital electronic circuits (pin 9, 10).

Cutting solenoid power supply allows to interrupt the valve functioning but keeping energized the digital electronics thus avoiding fault conditions of the machine fieldbus controller. This condition allows to realize safety systems in compliance with European Norms EN13849-1 (ex EN954-1).

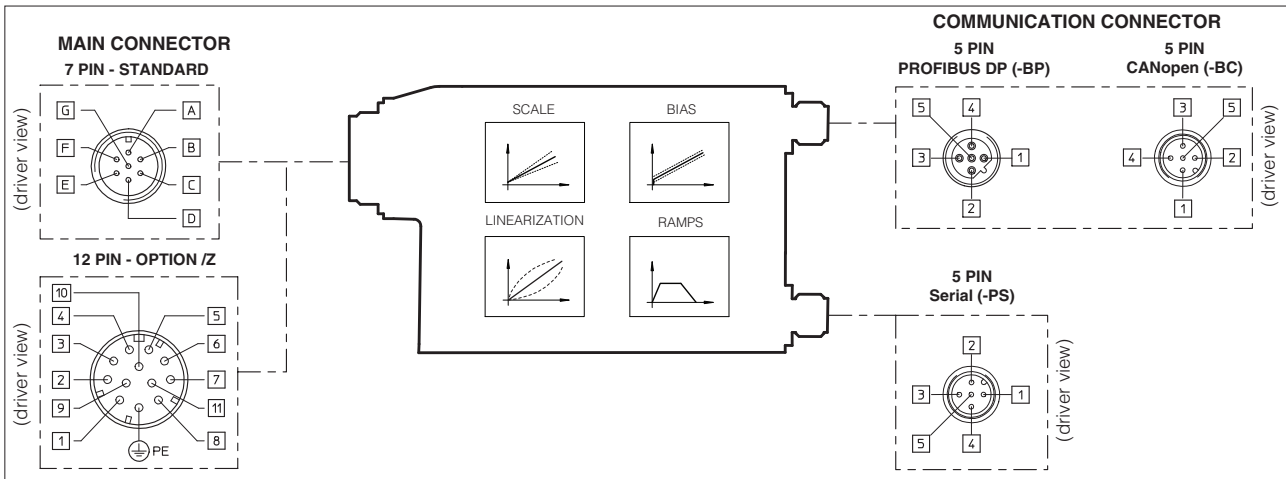
Enable Input Signal

To enable the driver, supply 24Vdc on pin 3 referred to pin 2: when the enable signal is set to zero the valve status is software selectable, by factory default the valve functioning is disabled (zero current to the solenoid) but the driver current output stage is still active. For the complete list of selectable status, see tab. G115.

Fault Output Signal

Fault output signal indicates fault conditions of the driver (solenoid short circuits/not connected, reference signal cable broken for 4÷20mA input, etc.). Fault presence corresponds to 0 Vdc, normal working corresponds to 24Vdc (pin 11 referred to pin 2): Fault status is not affected by the Enable input signal.

10 DIGITAL INTEGRAL DRIVERS -AES - MAIN FUNCTIONS AND ELECTRONIC CONNECTIONS



10.1 ELECTRONIC CONNECTIONS - 7 & 12 PIN MAIN CONNECTORS

Standard 7pin	/Z option 12pin	SIGNAL	TECHNICAL SPECIFICATIONS	NOTES
A	1	V+	Power supply 24 Vdc for solenoid power stage (and for driver logic on 7 pin connection)	Input - power supply
B	2	V0	Power supply 0 Vdc for solenoid power stage (and for driver logic on 7 pin connection)	Gnd - power supply
D	4	INPUT+	Reference analog input: ± 10 Vdc / ± 20 mA maximum range software selectable Default setting 0+ +10 Vdc differential input /Z option: common mode INPUT+ referred to AGND	Input - analog signal
E	-	INPUT -		
C	3	ENABLE	Enable (24 Vdc) or disable (0 Vdc) the driver	Input - on/off signal
	5	AGND	Ground - signal zero for MONITOR signal signal zero for INPUT+ signal (only for /Z option)	Gnd - analog signal
F	6	MONITOR	Monitor analog output: 0+ +5 Vdc maximum range; 1 V = 1 A	Output - analog signal
-	7	NC	do not connect	
-	8	NC	do not connect	
-	9	VL+	Power supply 24 Vdc for driver logic	Input - power supply
-	10	VL0	Power supply 0 Vdc for driver logic	Gnd - power supply
-	11	FAULT	Fault (0 Vdc) or normal working (24 Vdc)	Output - on/off signal
G	PE	EARTH	Internally connected to the driver housing	

Note: A minimum time of 270 to 340 ms have to be considered between the driver energizing with the 24VDC power supply and when the valve is ready to operate. During this time the current to the valve coils is switched to zero.

10.2 ELECTRONIC CONNECTIONS - 5 PIN COMMUNICATION CONNECTORS

PIN	-PS Serial		-BC CANopen		-BP PROFIBUS DP	
	SIGNAL	TECHNICAL SPECIFICATION	SIGNAL	TECHNICAL SPECIFICATION	SIGNAL	TECHNICAL SPECIFICATION
1	NC	do not connect	CAN_SHLD	Shield	+5V	for termination
2	NC	do not connect	NC	do not connect	LINE-A	Bus line (high)
3	RS_GND	Signal zero data line	CAN_GND	Signal zero data line	DGND	data line and termination Signal zero
4	RS_RX	Valves receiving data line	CAN_H	Bus line (high)	LINE-B	Bus line (low)
5	RS_TX	Valves transmitting data line	CAN_L	Bus line (low)	SHIELD	

11 SOFTWARE TOOLS

The driver configuration and parameters can be easily set with the Atos E-SW programming software, available in three different versions according to the driver's communication execution: E-SW-PS (Serial), E-SW-BC (CANopen) and E-SW-BP (PROFIBUS DP). Programming software E-SW-BC and E-SW-BP, for BC and BP drivers, can be also used to modify the valve's parameterization through the serial communication interface, without disconnecting the valve from the machine's bus line.

For a more detailed description of software interface, PC requirements, adapters, cables and terminators, please refer to technical table G500.

Programming software, must be ordered separately:

E-SW-* (mandatory - first supply) = Dvd including E-SW-* software installer and operator manuals; it allows the registration to Atos digital service

E-SW*-N (optional - next supplies) = as above but not allowing the registration to Atos digital service

On first supply of the E-SW-* software, it is required to apply for the registration in the Atos download area: www.download.atos.com.

Once the registration is completed, the password will be sent by email.

The software remains active for 10 days from the installation date and then it stops until the user inputs his password.

With the password you can also download, in your personal area, the latest releases of the Atos software, manuals, drivers and configuration files.

12 MAIN CHARACTERISTICS OF PROPORTIONAL RELIEF VALVES

Assembly position	Any position
Subplate surface finishing	Roughness index, $\sqrt{0.4}$ flatness ratio 0,01/100 (ISO 1101)
Ambient temperature	-20°C ÷ +70°C for -A execution; -20°C ÷ +60°C for -AE and -AES executions
Fluid	Hydraulic oil as per DIN 51524 ... 535 for other fluids see section T
Recommended viscosity	15 ÷ 100 mm ² /s at 40°C (ISO VG 15÷100)
Fluid contamination class	ISO 18/15 achieved with in line filters of 10 μ m and $\beta_{10} \geq 75$ (recommended)
Fluid temperature	-20°C +60°C (standard and /WG seals) -20°C +80°C (/PE seals)
Coil resistance R at 20°C	3 ÷ 3.3 Ω for standard 12 V _{dc} coil; 2 ÷ 2.2 Ω for 6 V _{dc} coil; 13 ÷ 13,4 Ω for 18 V _{dc} coil
Max solenoid current	2,6 A for standard 12 V _{dc} coil; 3,25 A for 6 V _{dc} coil; 1,5 A for 18 V _{dc} coil
Max power	40 Watt
Protection degree (CEI EN-60529)	IP65 for -A execution; IP67 for -AE and AES executions
Duty factor	Continuous rating (ED=100%)

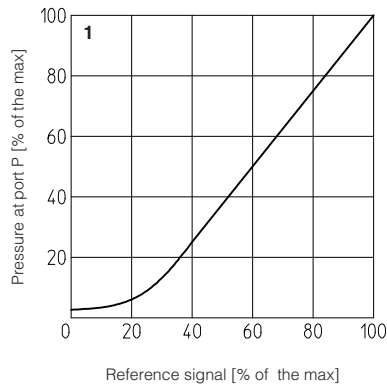
13 **DIAGRAMS** (based on mineral oil ISO VG 46 at 50 °C)

13.1 Regulation diagrams
with flow rate Q = 50 l/min

1 = AGMZO-A, AGMZO-AE, AGMZO-AES

Notes:

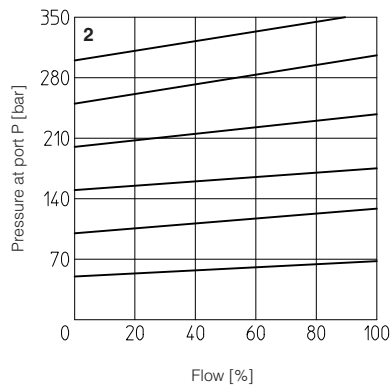
The presence of counter pressure at port T can alter the effective pressure regulation.



13.2 Pressure/flow diagrams

with reference pressure set at Q = 50 l/min

2 = AGMZO-A, AGMZO-AE, AGMZO-AES



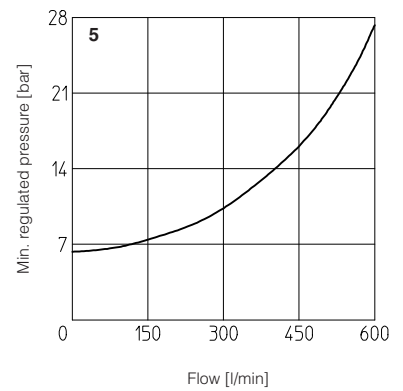
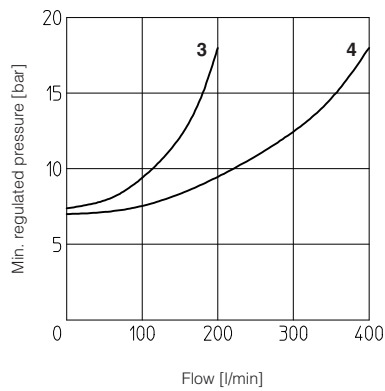
13.3 Min. pressure/flow diagrams

with zero reference signal

3 = AGMZO-*-10

4 = AGMZO-*-20

5 = AGMZO-*-32

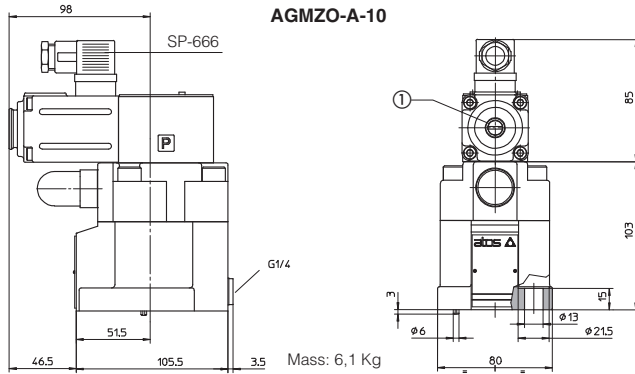


AGMZO-A* -10

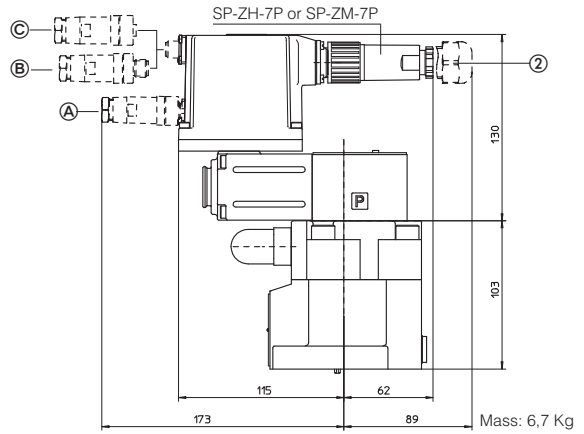
ISO 6264: 2007

Mounting surface: 6264-06-09-0-97 (see table P005)

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: $\varnothing = 14$ mm Port X: $\varnothing = 3,2$ mm



AGMZO-AE-10 (-AES* dotted line)

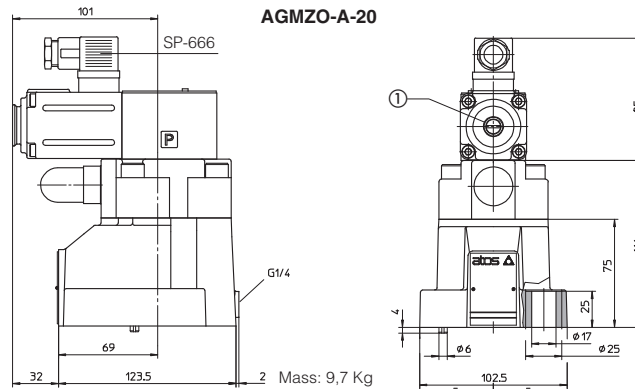


AGMZO-A* -20

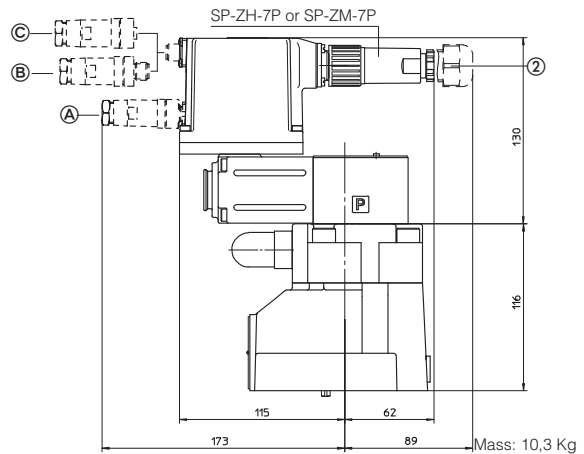
ISO 6264: 2007

Mounting surface: 6264-08-13-0-97 (see table P005)

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: $\varnothing = 24$ mm Port X: $\varnothing = 3,2$ mm



AGMZO-AE-20 (-AES* dotted line)

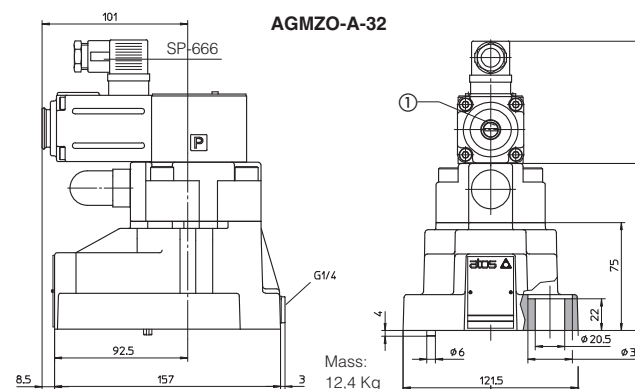


AGMZO-A* -32

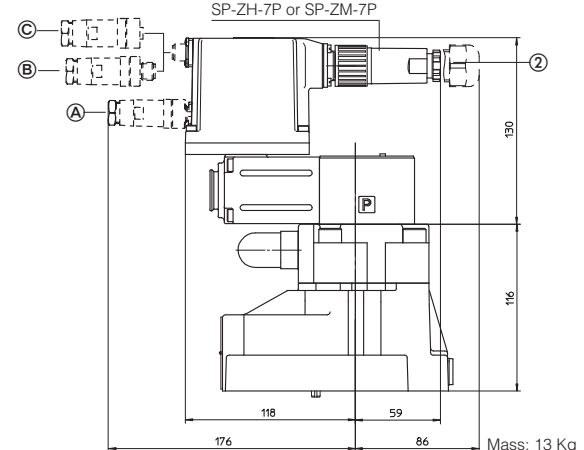
ISO 6264: 2007

Mounting surface: 6264-10-17-0-97 (see table P005)
 (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: $\varnothing = 28$ mm Port X: $\varnothing = 3,2$ mm



AGMZO-AE-32 (-AES* dotted line)



- ① = screw for air bleeding
- ② Dotted line = 12 pin connector SP-ZH-12P for option /Z
- Ⓐ -PS communication interface, SP-ZH-5P connector
- Ⓑ -BP communication interface, SP-ZH-5P/BP connector
- Ⓒ -BC communication interface, SP-ZH-5P connector

15 MODEL CODES OF POWER SUPPLY AND COMMUNICATION CONNECTORS (to be ordered separately)

VALVE VERSION	-A	-AE, -AES		-AES/Z	-Serial (-PS) or CANopen (-BC)	PROFIBUS DP (-BP)
CONNECTOR CODE	SP-666	SP-ZH-7P	SP-ZM-7P	SP-ZH-12P	SP-ZH-5P	SP-ZH-5P/BP
PROTECTION DEGREE	IP65	IP67	IP67	IP67	IP67	IP67
DATA SHEET	K500	G110, G115, K500			G115, K500	

connectors supplied with the valve