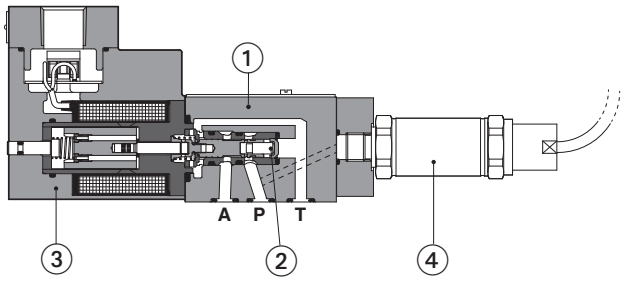
Ex-proof proportional reducing valves high performance

direct or piloted, with on-board pressure transducer - **ATEX, IECEx, EAC**



RZGA-R-P-010-*

① Valve body
② Spool
③ Ex-proof solenoid
④ Ex-proof pressure transducer

RZGA-R, AGRCZA-R

Ex-proof digital, high performance proportional reducing valves, direct or piloted, with on-board pressure transducer for pressure closed loop controls.

They are equipped with ex-proof pressure transducer and proportional solenoid certified for safe operations in hazardous environments with potentially explosive atmosphere.

- Multicertification **ATEX**, **IECEx**, **EAC** for gas group **II 2G**

The flameproof enclosure of solenoid and transducer, prevents the propagation of accidental internal sparks or fire to the external environment.

The solenoid is also designed to limit the surface temperature within the classified limits.

RZGA, direct or piloted:
Size: **06** - ISO 4401
Max flow: **12** and **40 l/min**

AGRCZA, piloted:
Size: **10** and **20** - ISO 5871
Max flow: **160** and **300 l/min**

Max pressure: **250 bar**

1 MODEL CODE

RZGA	-	R	-	P	-	010	/	210	/	M	/	*	*	/	*

RZGA Ex-proof proportional pressure reducing valves
RZGA = subplate size 06
AGRCZA = subplate size 10, 20

R = for off-board driver, see section 3

P = on-board ex-proof pressure transducer

Valve size and configuration:
RZGA: direct **010** = Qmax 12 l/min
RZGA: piloted **033** = Qmax 40 l/min
AGRCZA: piloted **10, 20** = Qmax 160, 300 l/min

Max regulated pressure:
only for RZGA-010
32 = 32 bar **100** = 100 bar **210** = 210 bar
only for RZGA-033 and AGRCZA
80 = 80 bar **180** = 180 bar **250** = 250 bar

Hydraulic options (1):
O = horizontal cable entrance
P = with integral mechanical pressure limiter **(2)**
R = with integral check valve for free reverse flow **(2)**

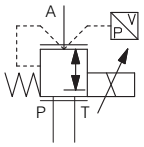
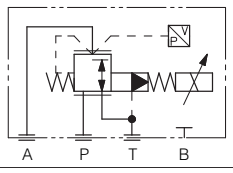
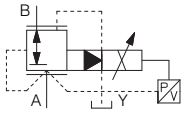
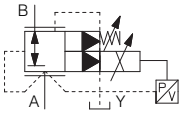
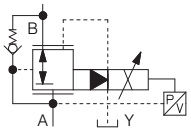
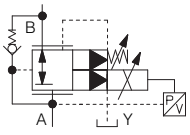
Solenoid threaded connection for cable gland fitting:
GK = GK-1/2" **(3)**
M = M20x1,5
NPT = 1/2" NPT

Series number

Seals material, see section 7 :
- = NBR
PE = FKM
BT = HNBR

(1) Possible combined options: all combinations are possible
(2) Only for AGRCZA
(3) Approved only for the italian market

2 CONFIGURATIONS AND HYDRAULIC SYMBOLS (representation according to ISO 1219-1)

RZGA-R-P-010	RZGA-R-P-033	AGRCZA-R-P	AGRCZA-R-P-*/P	AGRCZA-R-P-*/R	AGRCZA-R-P-*/PR
					

3 OFF-BOARD ELECTRONIC DRIVERS

Electronic drivers are factory set with max current limitation for ex-proof valves.
Please include in the driver order also the complete code of the connected ex-proof proportional valve.

Drivers model	E-BM-RES-*/A
Type	Digital
Format	DIN rail panel format
Tech table	GS203

4 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	RZGA-010 150 years, RZGA-033 and AGRCZA 75 years see technical table P007
Ambient temperature range	**Standard** = -20°C ÷ +70°C **/PE** option = -20°C ÷ +70°C **/BT** option = -40°C ÷ +70°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) > 200h
Compliance	Explosion proof protection, see section 8 -Flame proof enclosure “Ex d” RoHs Directive 2011/65/EU as last update by 2015/863/EU REACH Regulation (EC) n°1907/2006

5 HYDRAULIC CHARACTERISTICS - based on mineral oil ISO VG 46 at 50 °C

Valve model		RZGA					AGRCZA	
Size code		010			033		10	20
Valve size		06			06		10	20
Max regulated pressure	[bar]	32	100	210	80		180	250
Max pressure at port P, A, B, X	[bar]	315						
Max pressure at port T, Y	[bar]	210						
Min regulated pressure	[bar]	0,8			2,5		1,0	
Max flow	[l/min]	12			40		160	300
Response time 0-100% step signal (depending on installation) **(1)**	[ms]	≤ 50					≤ 60	
Hysteresis	[% of the max pressure]	≤ 0,3						
Linearity	[% of the max pressure]	≤ 1,0						
Repeatability	[% of the max pressure]	≤ 0,2						

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

(1) Average response time value; 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

6 ELECTRICAL CHARACTERISTICS

Max. power	35W
Insulation class	H (180°) Due to the occuring surface temperatures of the solenoid coils, the European standards ISO 13732-1 and EN982 must be taken into account
Protection degree with relevant cable gland	IP66/67 to DIN EN60529
Duty factor	Continuous rating (ED=100%)
Voltage code	standard
Coil resistance R at 20°C	3,2 Ω
Max. solenoid current	2,5 A

7 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 ÷ +60°C, with HFC hydraulic fluids = -20°C ÷ +50°C FKM seals (/PE option) = -20°C ÷ +80°C 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 **(1)**		NBR, HNBR	HFC	

⚠ The ignition temperature of the hydraulic fluid must be 50°C higher than the max solenoid surface temperature

(1) Performance limitations in case of flame resistant fluids with water:
-max operating pressure = 210 bar
-max fluid temperature = 50°C

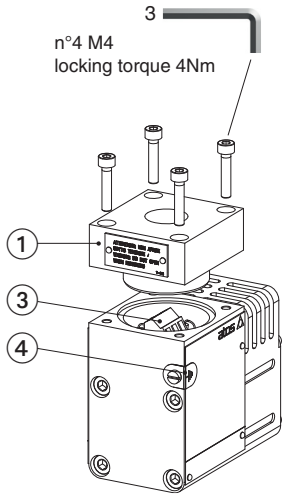
8 CERTIFICATION DATA

Valve type	RZGA, AGRCZA			
Certifications	**Solenoid data**		**Pressure transducer data**	
	Multicertification Group II **ATEX IECEx EAC**		Multicertification **ATEX IECEx EAC**	
Certified code	**MZA-A**		**Pressure transmitter, Series E-10**	
Type examination certificate **(1)**	ATEX: CESI 02 ATEX 014 IECEx: IECEx CES 10.0010x EAC:RU C - IT.AЖ38.B.00425/21		ATEX: KEMA 05 ATEX 2240 X IECEx: IECEx DEK 15.0048X EAC: C-DE.AA71.B.00162/19	
Method of protection	• ATEX Ex II 2G Ex d IIC T4/T3 Gb Ex II 2D Ex tb IIIC T135°C/T200°C Db • IECEx Ex d IIC T4/T3 Gb Ex tb IIIC T135°C/T200°C Db • EAC 1Ex d IIC T4/T3 Gb X Ex tb IIIC T135°C/T200°C Db X		• ATEX, EAC Ex II 2G Ex db IIC T6...T1 Gb • IECEx Ex db IIC T6...T1 Gb	
Temperature class	**T4**	**T3**	**T6**	**T5**
Surface temperature	≤ 135 °C	≤ 200 °C	≤ 135 °C	≤ 200 °C
Ambient temperature **(2)**	-40 ÷ +40 °C	-40 ÷ +70 °C	-40 ÷ +40 °C	-40 ÷ +70 °C
Applicable standards	EN 60079-0 EN 60079-1 EN 60079-31	IEC 60079-0 IEC 60079-1 IEC 60079-31	EN 60079-0 EN 60079-1	IEC 60079-0 IEC 60079-1
Cable entrance: threaded connection vertical (standard) or horizontal (option /O)	**GK** = GK-1/2" **M** = M20x1,5 **NPT** = 1/2" NPT		-	

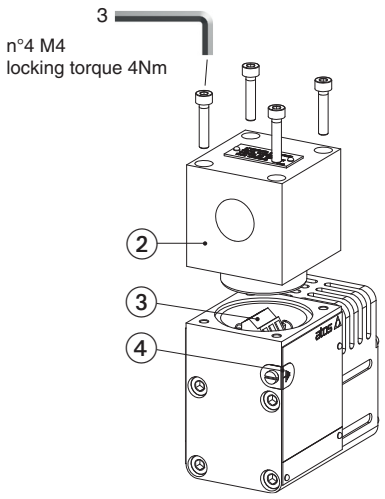
(1) The type examinator certificates can be downloaded from www.atos.com
In case the complete valve must withstand with minimum ambient temperature of -40°C, select **/BT** in the model code

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

9 EX PROOF SOLENOIDS WIRING



Standard version



Option /O

① cover with threaded connection for vertical cable gland fitting
② cover with threaded connection for horizontal cable gland fitting
③ terminal board for cables wiring
④ screw terminal for additional equipotential grounding

1 = Coil
2 = GND
3 = Coil

PCB 3 poles terminal board
suitable for wires cross sections
up to 2,5 mm² (max AWG14)

10 CABLE SPECIFICATION AND TEMPERATURE - Power supply and grounding cables have to comply with following characteristics:

Power supply: section of coil connection wires = 2,5 mm²

Grounding: section of internal ground wire = 2,5 mm²
section of external ground wire = 4 mm²

10.1 Cable temperature

The cable must be suitable for the working temperature as specified in the "safety instructions" delivered with the first supply of the products.

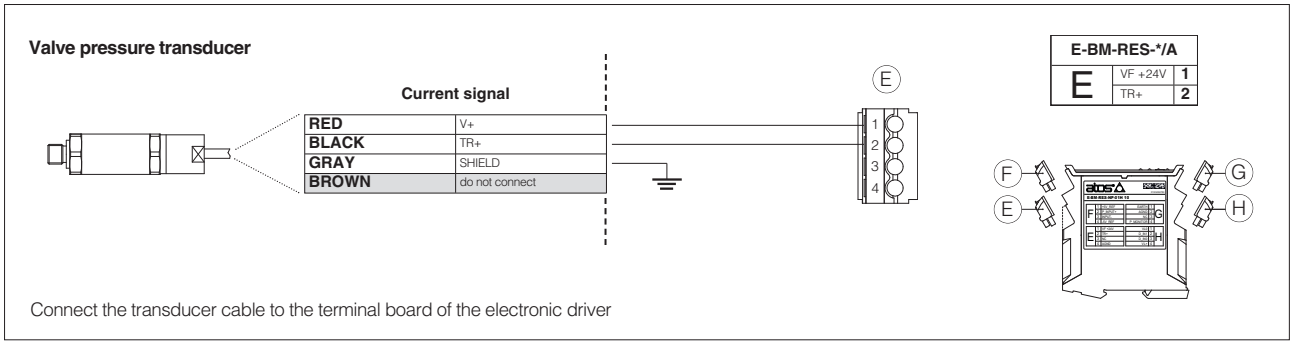
Max ambient temperature [°C]	Temperature class	Max surface temperature [°C]	Min. cable temperature [°C]
	Goup II	Goup II	Goup II
40 °C	T4	-	-
45 °C	T4	135 °C	90 °C
55 °C	T3	200 °C	110 °C
60 °C	-	-	-
70 °C	T3	200 °C	120 °C

11 CABLE GLANDS

Cable glands with threaded connections M20x1,5 for standard or armoured cables have to be ordered separately, see tech table **KX800**

Note: a Loctite sealant type 545, should be used on the cable gland entry threads

12 EX- PROOF PRESSURE TRANSDUCER WIRING



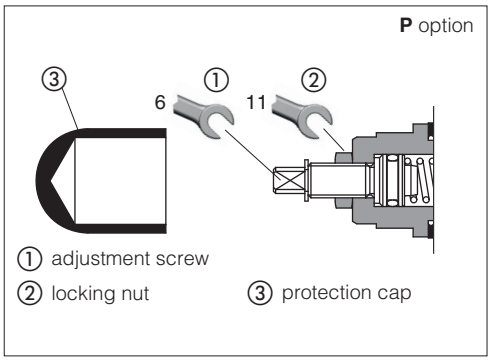
Connect the transducer cable to the terminal board of the electronic driver

13 HYDRAULIC OPTIONS

O = Horizontal cable entrance, to be selected in case of limited vertical space.

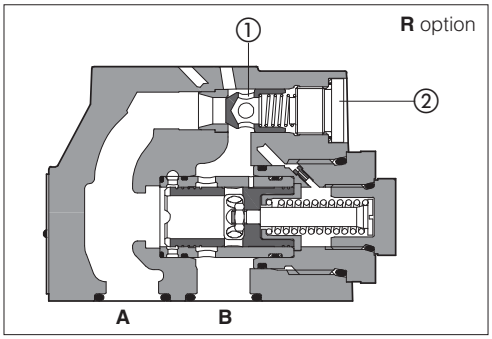
P = AGRCZA are provided with mechanical pressure limiter acting as protection against overpressure. For safety reasons the factory setting of the mechanical pressure limiter is fully unloaded (min pressure).
At the first commissioning it must be set at a value lightly higher than the max pressure regulated 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



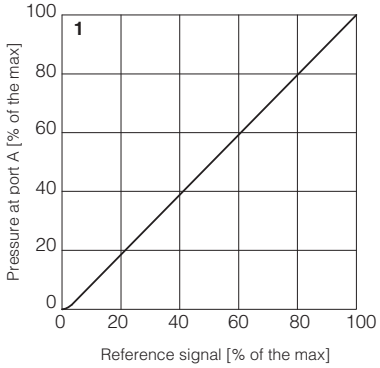
R = AGRCZA are provided with integral check valve for free reverse flow A→B

① Check valve - cracking pressure = 0,5 bar
② Plug

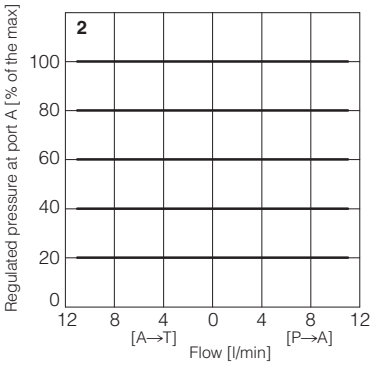


14 DIAGRAMS RZGA-010 (based on mineral oil ISO VG 46 at 50 °C)

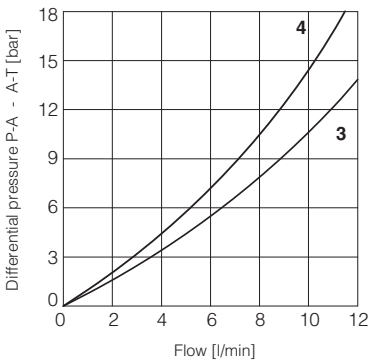
1 Regulation diagrams
with flow rate Q = 1 l/min



2 Pressure/flow diagrams
with reference signal set at Q = 1 l/min



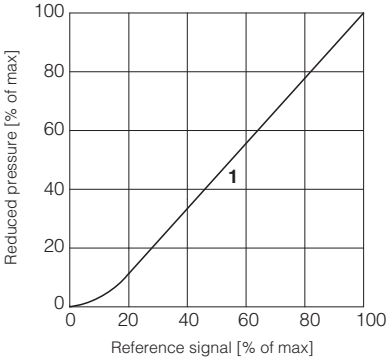
3-4 Min. pressure/flow diagrams
with zero reference signal



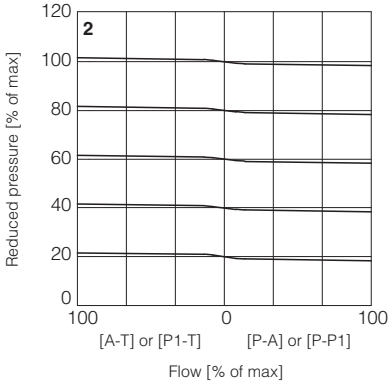
3 = Pressure drops vs. flow P→A
4 = Pressure drops vs. flow A→T

15 DIAGRAMS RZGA-033 (based on mineral oil ISO VG 46 at 50 °C)

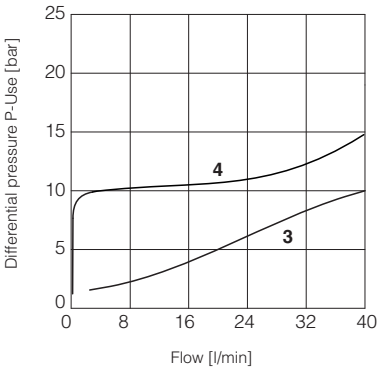
1 Regulation diagrams
with flow rate Q = 10 l/min



2 Pressure/flow diagrams
with reference pressure set with Q = 10 l/min



3-4 Pressure drop/flow diagram

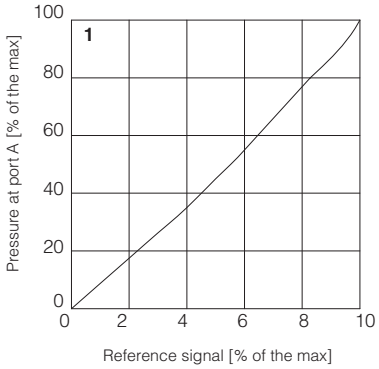


3 = A-T or P1-T (dotted line /350)
4 = P-P1 or P-A

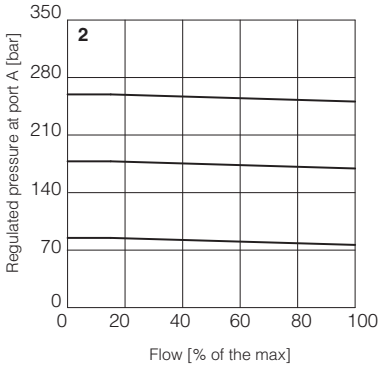
Note: the presence of counter pressure at port T can affect the effective pressure regulation

16 DIAGRAMS AGRCZA (based on mineral oil ISO VG 46 at 50 °C)

1 Regulation diagrams
with flow rate Q = 10 l/min

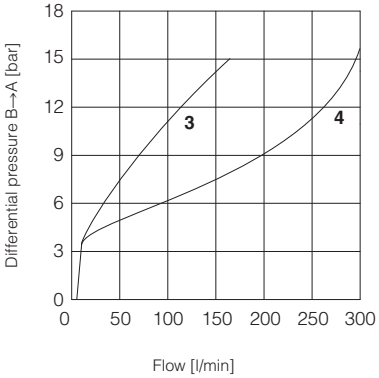


2 Pressure/flow diagrams
with reference pressure set with Q = 10 l/min

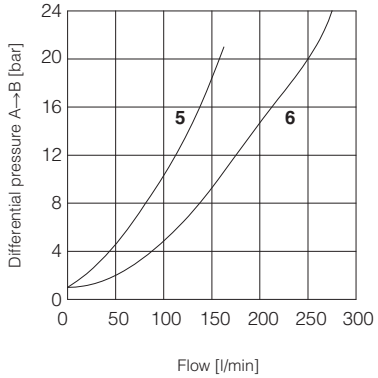


3-6 Pressure drop/flow diagrams
with zero reference signal

Differential pressure B→A
3 = AGRCZA-*-10
4 = AGRCZA-*-20

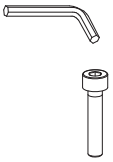


Differential pressure A→B
(through check valve)
5 = AGRCZA-*-10/*/R
6 = AGRCZA-*-20/*/R

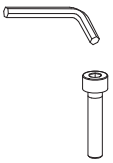


17 FASTENING BOLTS AND SEALS

17.1 RZGA valves

	RZGA-R-P-010	RZGA-R-P-033
	**Fastening bolts:** 4 socket head screws M5x50 class 12.9 Tightening torque = 8 Nm	**Fastening bolts:** 4 socket head screws M5x50 class 12.9 Tightening torque = 8 Nm
	**Seals:** 4 OR 108 Diameter of ports P, T: Ø 5 mm	**Seals:** 4 OR 108 Diameter of ports P, T: Ø 7,5 mm

17.2 AGRCZA valves

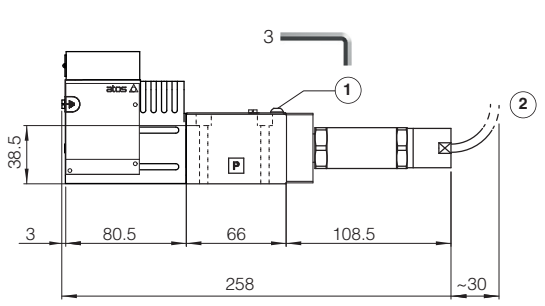
	AGRCZA-R-P-10	AGRCZA-R-P-20
	**Fastening bolts:** 4 socket head screws M10x45 class 12.9 Tightening torque = 70 Nm	**Fastening bolts:** 4 socket head screws M10x45 class 12.9 Tightening torque = 70 Nm
	**Seals:** 2 OR 3068 Diameter of ports A, B: Ø 14 mm 2 OR 109/70 Diameter of port X, Y: Ø 5 mm	**Seals:** 2 OR 4100 Diameter of ports A, B: Ø 22 mm 2 OR 109/70 Diameter of port X, Y: Ø 5 mm

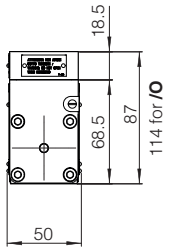
18 INSTALLATION DIMENSIONS FOR RZGA [mm]

RZGA-R-P-010

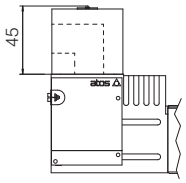
ISO 4401: 2005
Mounting surface: 4401-03-02-0-05 (see table P005)
(port B not used)

Mass [kg]	
RZGA-R-P-010	3.2





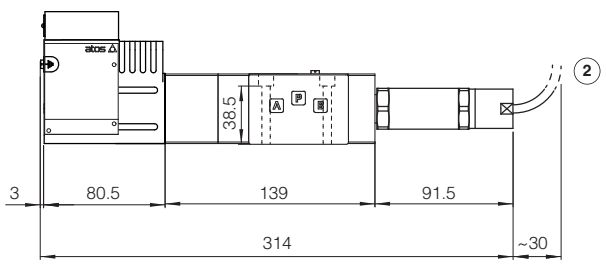
option /O

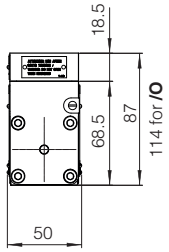


RZGA-R-P-033

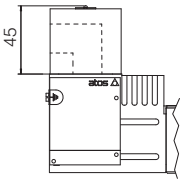
ISO 4401: 2005
Mounting surface: 4401-03-02-0-05 (see table P005)
(port B not used)

Mass [kg]	
RZGA-R-P-033	4.2





option /O



(1) = Air bleed off

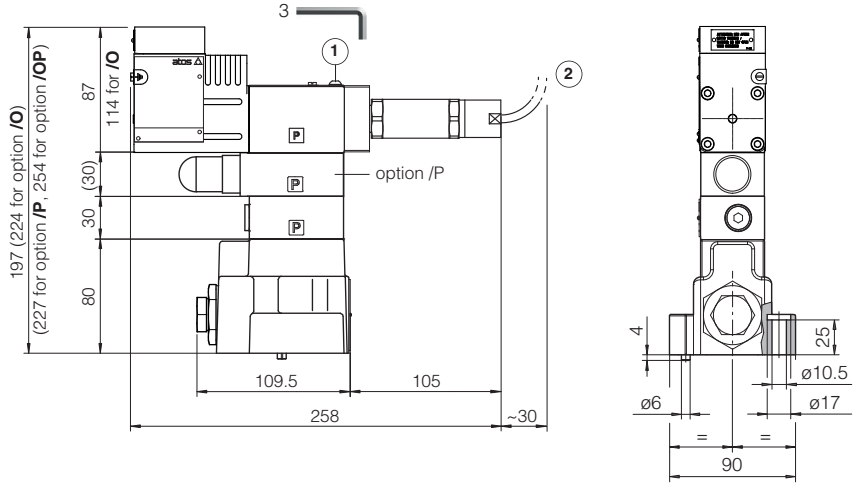
(2) = Cable lenght 5m

19 INSTALLATION DIMENSIONS FOR AGRCZA [mm]

AGRCZA-R-P-*-10

ISO 5781: 2000
Mounting surface: 5781-06-07-0-00 (see table P005)

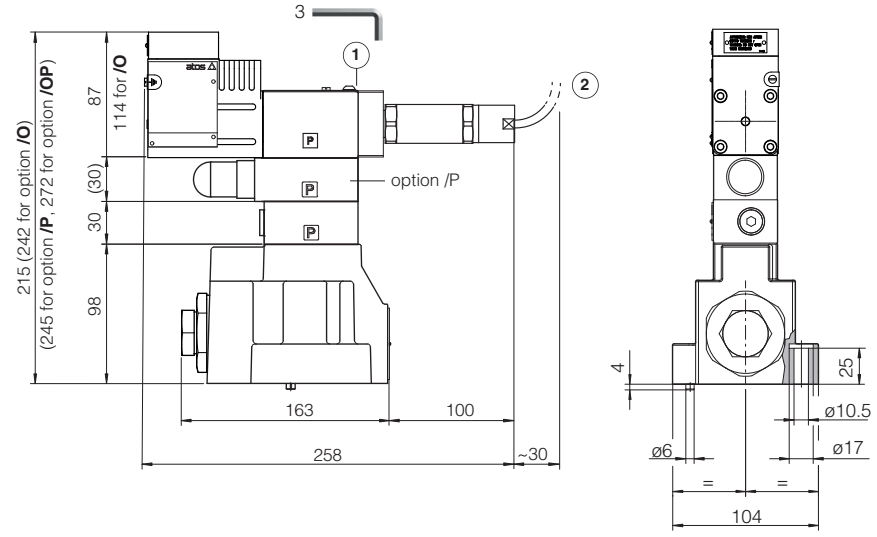
Mass [kg]	
AGRCZA-R-P-*-10	6.2
Option /P	+0.5



AGRCZA-R-P-*-20

ISO 5781: 2000
Mounting surface: 5781-08-10-0-00 (see table P005)

Mass [kg]	
AGRCZA-R-P-*-20	8.7
Option /P	+0.5



(1) = Air bleed off

(2) = Cable lenght 5m

20 RELATED DOCUMENTATION

X010	Basics for electrohydraulics in hazardous environments	**GX800**	Ex-proof pressure transducer type E-ATRA-7
X020	Summary of Atos ex-proof components certified to ATEX, IECEx, EAC, PESO	**KX800**	Cable glands for ex-proof valves
FX900	Operating and manintenance informationfor ex-proof proportional valves	**P005**	Mounting surfaces for electrohydraulic valves