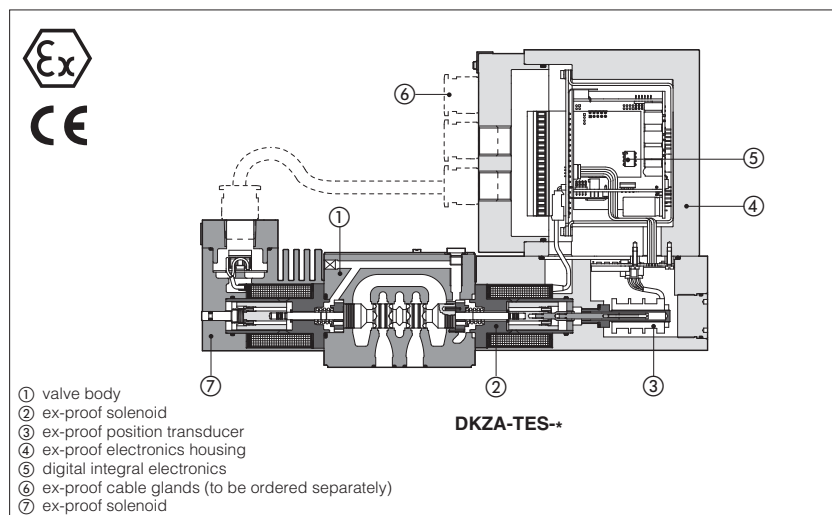


Ex-proof proportional valves with integral digital drivers

with or without integral position or pressure transducer - ATEX or IECEx certification



Ex-proof ZA valves are proportional valves equipped with specific solenoids and integral digital electronic drivers available with following certifications and protection mode:

- ATEX 94/9/CE
Ex II 2 G Ex d IIC T6/T5/T4/T3 (group II for surface plants with gas or vapours environment, category 2, zone 1 and 2)
- IECEx worldwide recognized safety certification, Ex d IIC T6/T5/T4/T3 Gb IP66

The solenoid and the electronics housing are 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.

The integral digital drivers in explosion proof construction provides consistent advantages respect to the separated analog drivers for ex-proof valves:

- compact execution
- simplified valve wiring
- reduced risk of electromagnetic disturbances on the valve's transducer feedback signal
- possibility to exploit in hazardous environment all the advantages provided by the standard digital electronics: software setting of the main functional parameters as bias, ramps, scale, linearization of the hydraulic regulation characteristic
- complete diagnostics of the driver status, and fault condition.

Following communication interfaces are available:

- PS, Serial communication interface for configuration, monitoring and firmware updating through Atos PC software.
 - BC, CANopen interface
 - 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 ex-proof digital integral electronics is available for the full range of proportional valves, as shown in the following pages.

1 EXPLOSION PROOF CERTIFICATION MAIN DATA

ATEX certification	Ex II 2G Ex d IIC T6/T5/T4/T3			
IECEx certification	Ex d IIC T6/T5/T4/T3 Gb IP66			
VALVE TYPE	DOUBLE SOLENOID VALVES (with or without transducer)		SINGLE SOLENOID VALVES (with or without transducer)	
Temperature class (only for Group II)	T4	T3 (option /7)	T6	T5 (option /7)
Surface temperature	≤ 135 °C	≤ 200 °C	≤ 85 °C	≤ 100 °C
Ambient temperature	-20 ÷ +40 °C	-20 ÷ +60 °C	-20 ÷ +45 °C	-20 ÷ +60 °C
Protection degree	IP66 According to IEC 144 when correctly coupled with the relevant cable gland see section 20			
Mechanical construction	Flame proof housing classified Ex d, according to EN 60079-0: 2006, EN 60079-1: 2007			
Cable entrance and electrical wiring	Internal terminal board for cable connections M20x1.5 threaded connection for cable entrance			

Note: This technical table contains information about ex-proof certification data, model codes, dimensions and wiring of the ex-proof proportional valves with integral digital electronics.

For detailed information about:
- valve's functional characteristics and mounting surface dimensions
- digital drivers technical data and functional parameters setting
see the relevant technical tables of the standard proportional valves and digital drivers.

2 MAIN CHARACTERISTICS OF EX-PROOF PROPORTIONAL VALVES

Assembly position	Any position
Subplate surface finishing	Roughness index, Ra 0,4 flatness ratio 0,01/100 (ISO 1101)
Ambient temperature	See section 11
Fluid	Hydraulic oil as per DIN 51524 ... 535 for other fluids see model code sections
Recommended viscosity	15 ÷ 100 mm ² /s at 40°C (ISO VG 15÷100)
Fluid contamination class	ISO 4406 class 20/18/15 NAS 1638 class 9, in line filters of 10 µm (β ₁₀ ≥ 75 recommended)
Fluid temperature	-20°C +60°C (standard seals) -20°C +80°C (/PE seals)

3 CERTIFICATION

In the following are resumed the valves marking according to ATEX 94/9/CE and IECEx

3.1 GROUP II, ATEX

Ex = ATEX identification for explosive atmospheres

II = Group II for surfaces plants

2 = High protection (equipment category)

G = For gas and vapours

d = Flame proof housing

IIC = Gas group

T6/T5/T4/T3 = Temperature class of solenoid surface referred to the max ambient temperature

Zone 1 = Possibility of explosive atmosphere during normal functioning

Zone 2 = Low probability of explosive atmosphere



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

3.2 GROUP II, IECEx

Ex = Equipment for explosive atmospheres

d = Flame proof housing

IIC = Gas group

T6/T5/T4/T3 = Temperature class of solenoid surface

Gb = Equipment protection level, high level protection for explosive Gas atmospheres

IP66 = Protection degree

4 MODEL CODE OF EX-PROOF PROPORTIONAL DIRECTIONAL VALVES DIRECT OPERATED

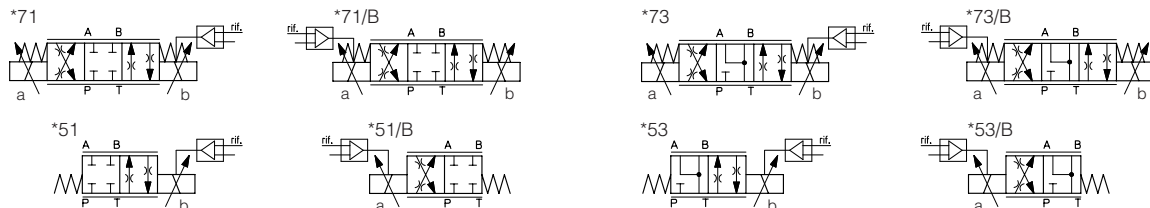
DHZA / IE - TES - PS - 0 7 1 - L 5 / M / 7 ** / *	<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>DHZA = size 06 DKZA = size 10</p> <p>Certification (omit for ATEX) IE = IECEx</p> <p>AES = without integral position transducer TES = with integral position transducer</p> <p>Communication interfaces PS = Serial (1) BC = CANopen BP = PROFIBUS DP</p> <p>Valve size (ISO 4401) DHZA DKZA 0 = size 06 1 = size 10</p> <p>Configuration: DHZA and DKZA see section [5] 5 = external plus central position, spring centered 7 = 3 positions, spring centered</p> <p>Spool overlapping in central position, DHZA and DKZA see section [5] 0 = zero overlapping (only for -TES) 1 = P, A, B, T positive overlapping 2 = only for DKZA-TES-172-S5 (2) 3 = P positive overlapping; A, B, T, negative</p> </div> <div style="width: 50%;"> <p>Seals material: omit for NBR (mineral oil & water glycol) PE = FPM</p> <p>Series number</p> <p>Options: 7 = for ambient temperature up to 60°C B = solenoid with integral digital electronics at side of port A I = current reference 4 ÷ 20mA (only for TES) (3) Y = external drain W = power limitation function (only AES)</p> <p>Cable entrance threaded connection: M = M20x1,5 (6H/6g)</p> <p>Spool size: see section [5]</p> <p>Spool type L = linear; S = progressive; D = as S, but with P-A = Q, P-B = Q/2</p> </div> </div>
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- (1) Serial interface always present for AES-BC and AES-BP.
 (2) The configuration type 2 provides the same characteristic of type 1, but avoiding the pressurization of A and B ports with spool in rest position.
 (3) Software selectable for AES.

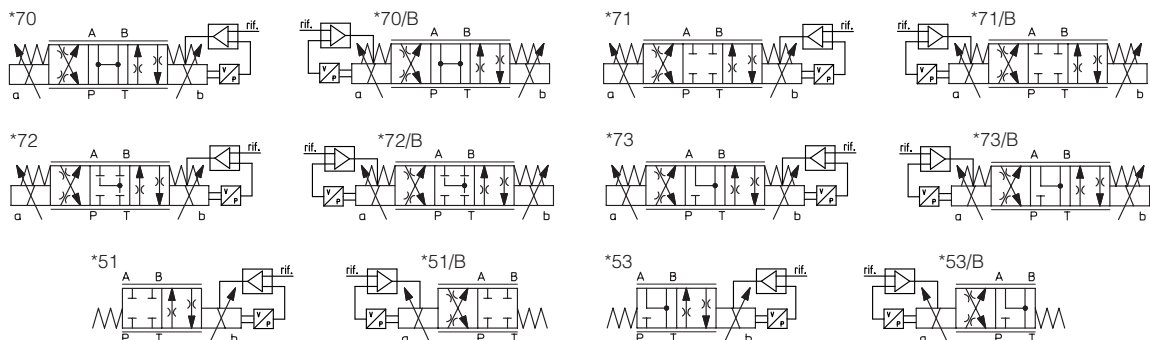
Note: For the valves functional characteristics see:
 table **F160** (DHZA-AES, DKZA-AES); table **F165** (DHZA-TES, DKZA-TES)
 For mounting surface dimensions see table **P005**
 For the digital drivers technical data and functional parameters setting, see:
 table **G115** (-AES); **G210** (-TES)

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

Hydraulic symbols of **-AES** version



Hydraulic symbols of **-TES** version



Valve model	DHZA-AES					DHZA-TES					DKZA-AES					DKZA-TES							
Spool overlapping	1, 3		1, 3			1, 3		0			1, 3		1, 3		0		0		2		1, 3		
Spool type and size (1)	L14		L1		S2		S3, L3, D3		L5, D5		S5, L5, D5		S3, L3, D3		L3		L5, D5		S5		S5, L5, D5		
Pressure limits [bar]	ports P, A, B = 350; T = 160 (250 with external drain /Y)											ports P, A, B = 315; T = 160 (250 with external drain /Y)											
Δp max P-T [bar]	70		70		50		50		40		40		40		40		40		40		40		
Max flow [l/min]	1		4,5		8		17		28		45		60		45		80		105		60		
at Δp = 10 bar (P-T)	2		8		14		30		50		80		105		80		105		105		105		
at Δp = 30 bar (P-T)	3		12		21		45		60		90		120		90		120		120		120		
at Δp max (P-T)																							
Response time (2) [ms]	< 30 (-AES) < 15 (-TES)											< 40 (-AES) < 20 (-TES)											
Hysteresis [%]	≤ 5%(-AES) ≤ 0,2% (-TES)											≤ 5%(-AES) ≤ 0,2% (-TES)											
Repeatability	± 1% (-AES) ± 0,1% (-TES)											± 1% (-AES) ± 0,1% (-TES)											
Thermal drift (only -TES)	zero point displacement < 1% at ΔT = 40°C																						

- (1) Spool type S2 only for -AES version; spool type 0L5, 0D5, 0L3 only for -TES version
 (2) Response times at step signal (0%→100%) are measured from 10% to 90% of step value and are strictly referred to the valve regulation.

6 MODEL CODE OF EX-PROOF PROPORTIONAL DIRECTIONAL VALVES PILOT OPERATED

DPZA		/ IE	- LES	- PS	- 2	7	1	- L	5	/ M	/ 7	**	/	*
DPZA = size 10 = size 16 = size 25		Seals material: omit for NBR (mineral oil & water glycol) PE = FPM												
Certification (omit for Atex) IE = IECEx		Series number												
AES = without integral position transducer LES = with double integral position transducer		Options: 7 = for ambient temperature up to 60°C B = solenoid with integral digital electronics at side of port A of main stage for -AES version and at side of port B for -LES version D = internal drain E = external pilot G = pressure reducing valve for piloting (2) standard for DPZA-LES-1 I = current reference 4±20mA (only for -LES) (3) W = power limitation function (only AES)												
Communication interfaces PS = Serial (1) BC = CANopen BP = PROFIBUS DP		Cable entrance threaded connection: M = M20x1,5 (6H/6g)												
Valve size (ISO 4401) 1 = size 10 2 = size 16 4 = size 25		Spool size: see section 7												
Configuration: see section 7 5 = external plus central position, spring centered 7 = 3 positions, spring centered		Spool type L = linear; S = progressive; D = as S , but with P-A = Q, P-B = Q/2												
Spool overlapping in central position, see section 7 0 = zero overlapping (only for -LES with spool type L) 1 = P, A, B, T positive overlapping 3 = P positive overlapping; A, B, T, negative														

- (1) Serial interface always present for AES-BC and AES-BP.
 (2) Pressure reducing valve with fixed setting (40 bar for DPZA-1 and -2; 100 bar for DPZA-3) installed between pilot valve and main body. It is advisable for valves with internal pilot in case of system pressure higher than 200 bar. This option is standard for DPZA-LES-1
 (3) Software selectable for AES

Note: For the valves functional characteristics see: table **F170** (DPZA-AES); table **F175** (DPZA-LES)
 For mounting surface dimensions see: table **P005**
 For the digital drivers technical data and functional parameters setting, see: table **G115** (-AES); **G210** (-LES)

7 HYDRAULIC CHARACTERISTICS OF DPZA-AES AND DPZA-LES (based on mineral oil ISO VG 46 at 50 °C)

Hydraulic symbols of **-AES** version

Hydraulic symbols of **-LES** version

Valve model	DPZA-1						DPZA-2						DPZA-4													
Spool overlapping	0, 1, 3	1, 3	0, 1, 3	0, 1, 3	1, 3	1, 3	0, 1, 3	1, 3	0, 1, 3	1, 3	0, 1, 3	0, 1, 3	0, 1, 3	1, 3	0, 1, 3	0, 1, 3										
Spool type and size (1)	L5 (2)	S5	D5	DL5 (3)	L3 (3)	S3	D3	L5 (2)	S5	D5	DL5 (3)	L5 (2)	S5	D5	DL5 (3)	DL5 (3)										
Max flow: [l/min]																										
at Δp = 10 bar	100		100:60		130		130:80	200	180	180:130	200:145	390	360	360:220	390:240											
at Δp = 30 bar	160		160:100		225		225:130	340	310	310:225	340:250	680	620	620:380	680:410											
max permissible flow	180		180:110		550		550:300	760	640	640:460	680:500	1450	1350	1350:820	1450:880											
Pressure limits [bar]	ports P, A, B, X = 350; T = 250 (5 for option /D); Y = 5																									
Response spool overlapping 0	<80 (AES); <50 (LES)						<100 (AES) <70 (LES)						<120 (AES) <75 (LES)													
time [ms] (4) spool overlapping 1-3	<80 (AES); <50 (LES)						<100 (AES) <70 (LES)						<120 (AES) <75 (LES)													
Hysteresis [%]	≤ 5% (AES) ≤ 0,1% (LES)																									
Repeatability	± 1% (AES) ± 0,1% (LES)																									
Thermal drift	zero point displacement < 1% at ΔT = 40°C																									

- (1) Additional spool for -LES, see table F175
 (2) For zero overlapping spool **0L5**, the valve offset position (with switch-off power supply) is 1 ÷ 6% P-B/A-T
 (3) Only for LES version
 (4) Response times at step signal (0%→100%) are measured from 10% to 90% of step value and are strictly referred to the valve regulation.

8 MODEL CODE OF EX-PROOF SERVOPROPORTIONAL VALVES

DLHZA / IE - TES - PS - 0 6 0 - L 5 3 / M / 7 ** / *	DLHZA = size 06 DLKZA = size 10	Certification (omit for Atex) IE = IECEx	TES = with integral position transducer	Communication interfaces PS = Serial BC = CANopen BP = PROFIBUS DP	Valve size (ISO 4401) 0 = size 06 (DLHZA) 1 = size 10 (DLKZA)	Configuration, see section 9 4 = external plus central position, spring centered 6 = 3 position, spring centered	0 = zero overlapping	Seals material: omit for NBR (mineral oil & water glycol) PE = FPM	Series number	Options: 7 = for ambient temperature up to 60°C B = solenoid at side of port A I = current reference 4 ÷ 20mA Y = external drain	Cable entrance threaded connection: M = M20x1,5 (6H/6g)	Fail safe configuration: 1 = A, B, P, T with positive overlapping 3 = P positive overlapping; A, B, T negative	Spool size 1, 3, 5, 7 see section 9	Spool type L = linear regulation ; T = not linear regulation
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Note: For the valves functional characteristics see:
 table **F180** (DLHZA, DLKZA)
 For mounting surface dimensions see table **P005**
 For the digital drivers technical data and functional parameters setting, see:
 table **G210** (-TES)

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

Hydraulic symbols																					
*40-L*3/B *40-D*3/B *40-DT*3/B *40-T*3/B *40-V*3/B				*40-L*1/B *40-D*1/B *40-DT*1/B *40-T*1/B *40-V*1/B				*40-L*1 *40-D*1 *40-DT*1 *40-T*1 *40-V*1				*60-L*1 *60-V*1									
Valve model				DLHZA-T*										DLKZA-T*							
Pressure limits [bar]				ports P, A, B = 350; T = 210 (250 with external drain /Y)										ports P, A, B = 315; T = 210 (250 with external drain /Y)							
Spool				L0	L1	V1	L3	V3	L5	T5	L7	T7	V7	D7	DT7	L3	L7	T7	V7	D7	DT7
Max flow [l/min]				2,5	4,5	5	9	13	18		26			26÷13		40		60		60÷33	
at Δp = 30 bar				4	7	8	14	20	28		40			40÷20		60		100		100÷50	
at Δp = 70 bar				8	14	16	30	40	50		70			70÷40		90		160		160÷80	
max permissible flow																					
Leakage [cm³/min] at P = 100 bar (1)				<100	<200	<100	<300	<150	<500	<200	<900	<200	<200	<700	<200	<1000	<1500	<400	<400	<1200	<400
Fail safe connections				P → A					P → B					A → T					B → T		
Leakage [cm³/min] Fail safe 1				50					70					70					50		
at P = 100 bar (2) Fail safe 3				50					70					70					50		
Flow [l/min] (3)				DLHZA					-					15÷30					10÷20		
DLKZA				-					-					40÷60					25÷40		
Response time [ms]				≤ 10										≤ 15							
Hysteresis [%]				≤ 0,1%										≤ 0,1%							
Thermal drift				zero point displacement < 1% at ΔT = 40°C																	

Notes:
 (1) Referred to spool in neutral position and 50°C oil temperature.
 (2) Referred to spool in fail safe position and 50°C oil temperature.
 (3) Referred to spool in fail safe position at Δp = 35 bar per edge and 50°C oil temperature.

10 MODEL CODE OF EX-PROOF PROPORTIONAL PRESSURE RELIEF AND COMPENSATOR VALVES

RZMA

/ IE - TERS - PS - 010

/ 250

/ M

/ *

**

/ *

Pressure relief:

RZMA = subplate size 06

AGMZA = subplate size 10, 20, 32

LIMZA = cartridge type see section 12

Pressure compensator:

LICZA = cartridge type see section 12

Certification (omit for ATEX)

IE = IECEx

AES = without integral pressure transducer (1)

TERS = with integral pressure transducer (2)

AERS = as TERS but with remote pressure transducer (2)
(to be ordered separately), see tab. G466

Communication interfaces

PS = Serial

BC = CANopen

BP = PROFIBUS DP

Valve size:

see section 11 for size code

(1) Serial interface always present for AES-BC and AES-BP.

(2) Integral or remote pressure transducer with current feedback 4 ÷ 20 mA.

(3) Software selectable for AES.

Note: For the valves functional characteristics see:

table **F007, F010** (RZMA-*010); table **F065, F067** (RZMA-*030); table **F035, F040** (AGMZA); table **F300, F305** (LIMZA, LICZA)

For mounting surface dimensions see table **P005**

For the digital drivers technical data and functional parameters setting, see:

table **G115** (-AES); table **G205** (-AERS, TERS)

Seals material:
omit for NBR (mineral oil
& water glycol)
PE = FPM

Series number

Options:

7 = for ambient temperature up to 60° C

E = external pilot (only for AGMZA)

I = current reference 4 ÷ 20mA (only TERS, AERS) (3)

P = with integral mechanical pressure limiter (only for LI*ZA)

Y = external drain (only for AGMZA)

Cable entrance threaded connection:

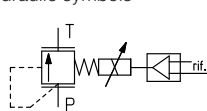
M = M20x1,5 (6H/6g)

Max regulated pressure:

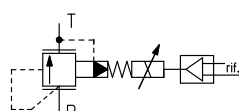
see section 11

11 HYDRAULIC CHARACTERISTICS

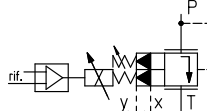
Hydraulic symbols



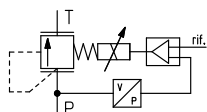
RZMA-AES-010



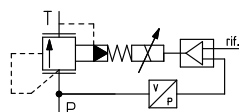
RZMA-AES-030



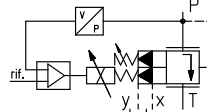
AGMZA-AES



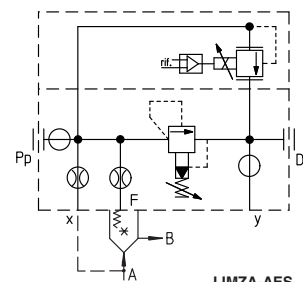
RZMA-TERS-010
RZMA-AERS-010



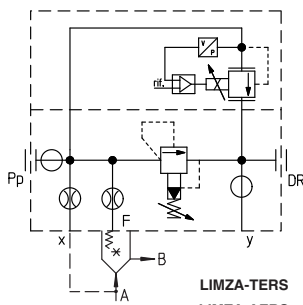
RZMA-TERS-030
RZMA-AERS-030



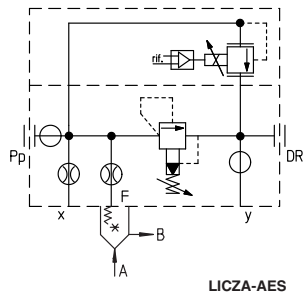
AGMZA-TERS
AGMZA-AERS



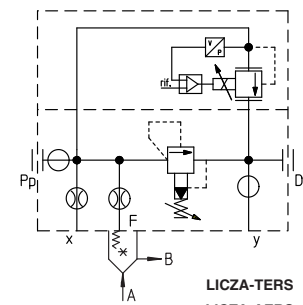
LIMZA-AES



LIMZA-TERS
LIMZA-AERS



LICZA-AES



LICZA-TERS
LICZA-AERS

Valve model	RZMA			AGMZA			LIMZA								LICZA				
Size code	010	030		10	20	32	1	2	3	4	5	6	8		1	2	3	4	5
Valve size	06			10	20	32	16	25	32	40	50	63	80		16	25	32	40	50
Max regulated pressure [bar]							80								180				
Max pressure at port P, A, B, X [bar]															315				
Max pressure at port T, Y [bar]															210				
Max flow [l/min]	4	40		200	400	600	200	400	750	1000	2000	3000	4500		200	400	750	1000	2000

12 MODEL CODE OF CARTRIDGES (for LIMZA and LICZA)

SC LI

- 32

31

2

**

/ *

Cartridge according to ISO 7368

Size:

16; 25; 32;

40; 50; 63 and 80 (only for LIMZA)

Type of cartridge

31 = for LIMZA and LICZA **36** = for LICZA

Note: For mounting surface dimensions see table **P006**

Seals material:
omit for NBR (mineral oil
& water glycol)
PE = FPM

Series number

Spring cracking pressure:

2 = 1,5 bar for poppet 31

3 = 3 bar

4 = 4 bar

6 = 6 bar for poppet 31 and 36

TYPICAL FUNCTIONS OF CARTRIDGES

Type	Functional sketch (hydraulic symbol)	Typical section	Area ratio (1)
31			1:1
36			1:1

(1) It is the ratio of the area A to the area on which the pilot pressure is applied.

13 MODEL CODE OF EX-PROOF PROPORTIONAL PRESSURE REDUCING VALVES

RZGA / IE - TERS - PS - 033 / 250 / M / * ** / *	<div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> Pressure reducing: RZGA = subplate size 06 AGRCZA = subplate size 10, 20 LIRZA = cartridge type see sect. 14 </div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> Certification (omit for Atex) IE = IECEx </div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> AES = without integral pressure transducer TERS = with integral pressure transducer (2) AERS = as TERS but with remote pressure transducer (2) (to be ordered separately), see tab. G466 </div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> Communication interfaces PS = Serial (1) BC = CANopen BP = PROFIBUS DP </div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> Valve size: see section 14 for size code </div>	<div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> Seals material: omit for NBR (mineral oil & water glycol) PE = FPM </div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> Series number </div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> Options: 7 = for ambient temperature up to 60° C E = external pilot (only for AGRCZA) I = current reference 4 ÷ 20mA (only TERS, AERS) (3) P = with integral mechanical pressure limiter (only for AGRCZA and LIRZA) R = with check valve (only for AGRCZA) </div> <div style="border: 1px solid black; padding: 5px;"> Cable entrance threaded connection: M = M20x1,5 (6H/6g) </div>
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Max regulated pressure:
see section 14

- (1) Serial interface always present for AES-BC and AES-BP.
 (2) Integral or remote pressure transducer with current feedback 4 ÷ 20 mA.
 (3) Software selectable for AES.

Note: For the valves functional characteristics see:
 table **F015, F020** (RZGA-*010); table **F070, F075** (RZGA-*033); table **F050, F055** (AGRCZA); table **F300, F305** (LIRZA)
 For mounting surface dimensions see table **P005**
 For the digital drivers technical data and functional parameters setting, see:
 table **G115** (-AES); table **G205** (-AERS, TERS)

14 HYDRAULIC CHARACTERISTICS

Hydraulic symbols

RZGA-AES-010

RZGA-AES-033

AGRCZA-AES

RZGA-TERS-010
RZGA-AERS-010

RZGA-TERS-033
RZGA-AERS-033

AGRCZA-TERS
AGRCZA-AERS

LIRZA-AES



LIRZA-TERS
LIRZA-AERS

Valve model	RZGA		AGRCZA		LIRZA			
Size code	010	033	10	20	1	2	3	4
Valve size	06		10	20	16	25	32	40
Max regulated pressure [bar]	32; 100; 210		80		180	250		
Min regulated pressure [bar]	0,8	1	1	1	7	7	7	7
Max pressure at port P, A, B, X [bar]	315							
Max pressure at port T, Y [bar]	210							
Max flow [l/min]	12	40	160	300	160	300	550	800

15 MODEL CODE OF CARTRIDGES (for LIRZA)

SC LI - 25 37 4 ** / *	<div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> Cartridge according to ISO 7368 </div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> Size: 16; 25; 32; 40; </div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> Type of cartridge 37 = for LIRZA </div>	<div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> Seals material: omit for NBR (mineral oil & water glycol) PE = FPM </div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> Series number </div> <div style="border: 1px solid black; padding: 5px;"> Spring cracking pressure: 4 = 4 bar; 7 = 7 bar </div>
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TYPICAL FUNCTIONS OF CARTRIDGES

Type	Functional sketch (hydraulic symbol)	Typical section	Area ratio (1)
37			1:1

(1) It is the ratio of the area A to the area on which the pilot pressure is applied.

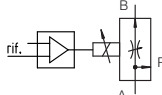
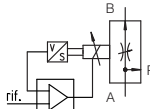
16 MODEL CODE OF EX-PROOF PRESSURE COMPENSATED PROPORTIONAL FLOW CONTROL VALVES

QVHZA		/ IE	TES	-	PS	-	06	/	12	/	M	/ *	**	/ *			
QVHZA = size 06 QVKZA = size 10		Certification (omit for Atex) IE = IECEX		AES = without integral position transducer TES = with integral position transducer		Communication interfaces PS = Serial (1) BC = CANopen BP = PROFIBUS DP		Valve size (ISO 4401) QVHZA: 06 QVKZA: 10		Max regulated flow: QVHZA 3 = 3,5 l/min; 12 = 12 l/min; 18 = 18 l/min; 36 = 36 l/min; 45 = 45 l/min;		65 = 65 l/min 90 = 90 l/min		Seals material: omit for NBR (mineral oil & water glycol) PE = FPM			
Options: 7 = for ambient temperature up to 60° C D = quick venting (only for -AES versions) I = current reference 4 ÷ 20mA (only TES) (2) W = power limitation function (only AES)																	
																Cable entrance threaded connection: M = M20x1,5 (6H/6g)	

- (1) Serial interface always present for AES-BC and AES-BP.
 (2) Software selectable for AES.

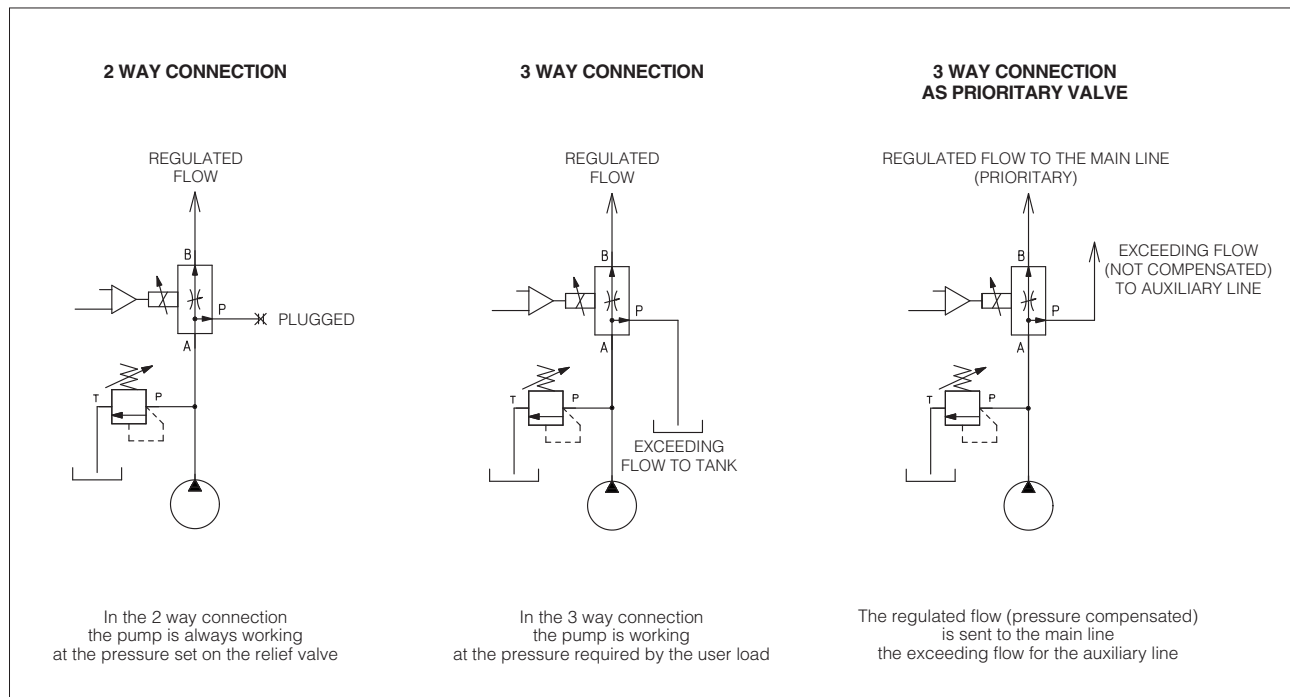
Note: For the valves functional characteristics see:
 table **F410, F412** (QVHZA-*, QVKZA-*)
 For mounting surface dimensions see table **P005**
 For the digital drivers technical data and functional parameters setting, see:
 table **G115** (-AES); table **G210** (-TES)

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

Hydraulic symbols		<div><div></div><div>QVHZA-AES QVKZA-AES</div></div> <div><div></div><div>QVHZA-TES QVKZA-TES</div></div>															
Note: In three-way connection port P is open. In two-way connection port P must be plugged. Port T must always be plugged.																	
Valve model		QVHZA-AES						QVHZA-TES						QVKZA-AES		QVKZA-TES	
Valve size		06										10					
Max pressure ports P, A, B [bar]		210															
Max regulated flow [l/min]		3,5	12	18	36	45	3,5	12	18	35	45	65	90	65	90		
Min regulated flow (1) [cm³/min]		15	20	30	50	60	15	20	30	50	60	85	100	85	100		
Regulating Δp [bar]		4 - 6		10 - 12		15	4 - 6		10 - 12		15	6 - 8	10 - 12	6 - 8	10 - 12		
Max flow on port A [l/min]		40		35	50	55	50				60	70	100	70	100		

- (1) Values are referred to 3-way configuration. In the 2-way configuration, the values of min regulated flow are higher.

17.1 TYPICAL APPLICATIONS



18 ELECTRONICS WIRING

18.1 MAIN CONNECTIONS FOR ALL MODELS

PIN	CABLE ENTRANCE	DESCRIPTION	TECHNICAL SPECIFICATION
1	3	ENABLE	Enabling input, normal working = 24 Vdc
2	3	VL0	Power supply (logic stage)
3	3	VL+	Stabilized +24 Vdc Filtered and rectified: Vrms 21-33 (ripple max 2Vpp)
4	3	FAULT	Alarm = 0 Vdc Correct functioning = +24Vdc
5	4	COIL S2	Coil connection only for double solenoid valves
6	4	COIL S2	
7	3	INPUT-	Reference signal ± 10 Vdc or $0 \div 10$ Vdc (2) (3)
8	3	MONITOR	± 10 Vdc or $0 \div 10$ Vdc ± 5 Vdc (only for -AES) (1) (3)
9	3	INPUT+	Reference signal ± 10 Vdc or $0 \div 10$ Vdc (2) (3)
10	3	V0	Power supply (power stage)
11	3	V+	Stabilized +24 Vdc Filtered and rectified: Vrms 21-33 (ripple max 2Vpp)
PE	3	EARTH	Earth connection

(1) referred to pin 2 (VL0)

(2) differential mode input


(3) current reference and monitor ($4 \div 20$ mA) for option /I (not for -AES)

18.2 TRANSDUCER CONNECTIONS FOR -TERS, -LES (factory wired), -AERS, -AES/W (to be wired)

PIN	CABLE ENTRANCE	VERSION	DESCRIPTION	TECHNICAL SPECIFICATION
12	4	-AES/W	Monitor 2	2 nd Monitor ± 5 Vdc
		-TERS -AERS	NC	Not connected
		-LES	AGND	Power supply and signal = 0 Vdc
13	4	-AES/W	AGND	Power supply and signal = 0 Vdc
		-TERS -AERS	VT+	Transd. supply +24 Vdc
		-LES	VT+	Transd. supply +15 Vdc
14	4	-AES/W	TR	Pressure transducer signal
		-TERS -AERS	NC	Not connected
		-LES	VT-	Transd. supply -15 Vdc
15	4	-AES/W	VT+	Transd. supply +24 Vdc
		-TERS -AERS	TR	Pressure transd. signal
		-LES	TR	Position transd. signal

N.B. For -AES and -TES versions the pins 12-13-14-15 are not connected

18.3 -PS COMMUNICATION INTERFACE (M8 connector)

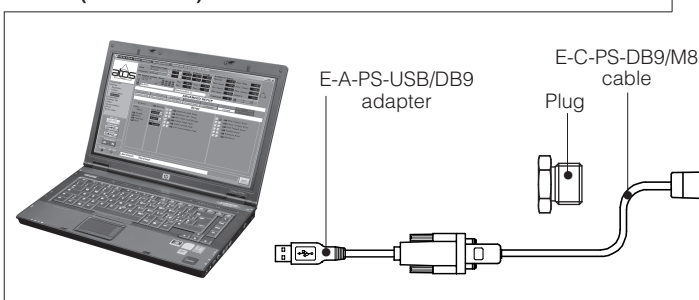
PIN	CABLE ENTRANCE (4)	SIGNAL	WIRE COLOUR	CONNECTOR INTERFACE
1	1	RS_RX	brown	 Front view
3		RS_TX	blue	
4		RS_GND	black	

(4) For AES-BC and AES-BP versions, the Serial communication interface is always available for eventual valve's parameter setting through the E-SW programming software; M8 connector available inside the electronic box, see Fig.1

18.4 -BC and -BP COMMUNICATION INTERFACE CONNECTIONS

PIN	CABLE ENTRANCE	DESCRIPTION	
		-BC	-BP
16	1 / 2	NC do not connect	+5V BUS
17	1 / 2	SHIELD	SHIELD
18	1 / 2	CAN_H	B_LINE
19	1 / 2	CAN_L	A_LINE
20	1 / 2	BUS GND	BUS GND

Fig. 2 PC connection to the valve's serial communication interface (version -PS)



18.5 CABLE ENTRANCE (see Fig.1)

① Cable entrance for -PS, -BC, -BP communication interfaces:

The Ex-proof integral digital electronics is provided with serial (-PS) or CANopen (-BC) or PROFIBUS DP (-BP) communication interface, depending to the selected model code

For -PS version the communication connector is used for the software setting of the functional parameters. It is installed in the cable entrance pos. ① (factory plugged). For the electronics parameter setting, remove the threaded metal plug and connect the PC communication cable to the connector -see Fig.2



WARNING:

The above operation must be performed in a safety area.

After having completed the parameter setting, disconnect the communication cable and close the cable entrance with the proper threaded plug.

For -BC and -BP versions the valve is directly driven through the fieldbus interface, which connections are available on the terminal board internal to the electronics housing.

Depending to the type of connection to the fieldbus network, one or two cable entrances can be used (see section 20 TAB.I)

- "Via stub" connection, cable entrance ① to be used

- "Daisy chain" connection, cable entrance ① and ② to be used

② Additional cable entrance for -BC, -BP communication interfaces

③ Cable entrances for power supply and main connections

④ Cable entrances for remote pressure transducer connections (for -AERS or -AES/W)

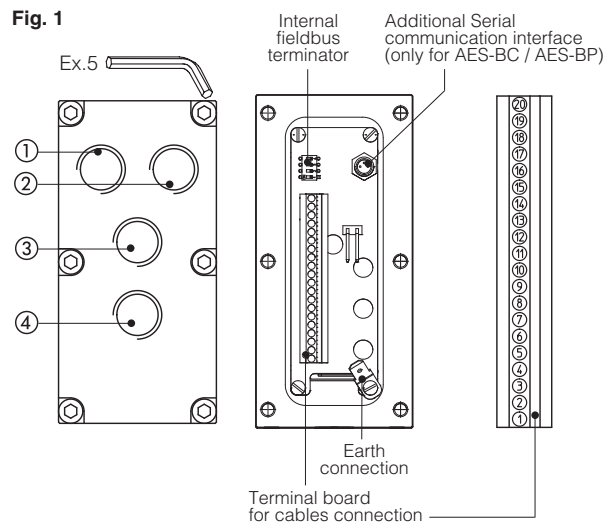
The cable entrance ④ is factory wired for:

-TERS (pressure transducer)

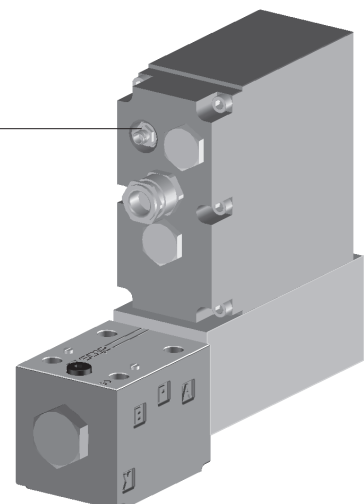
-LES (position transducer)

-AES and TES double solenoid version

Fig. 1



M8 Serial communication connector



19 SOFTWARE TOOLS

The driver configuration and parameters can be easily set with the Atos E-SW programming software.

The programming software is available in three different versions according to the driver's communication interfacing:

E-SW-PS (Serial), **E-SW-BC** (CANopen) and **E-SW-BP** (PROFIBUS DP).

A proper connection is required between the PC and the electronic driver communication port (-PS, -BC or -BP).

For a more detailed description of software interface, PC requirements and adapter/cable/terminator characteristics please refer to technical table **G500**.

Programming software, must be ordered separately :

E-SW-* (mandatory - first supply) = Dvd including E-SW-* software installer, operator manuals, registration form for Atos digital service

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

USB Adapters, Cables and Terminators, can be ordered separately

E-A-PS-USB/DB9 and **E-C-PS-DB9/M8** = USB adapter and cable for -PS drivers

E-A-PS-USB/DB9 adapter is required only if a RS232 serial port is not available on the PC

E-A-BC-USB/DB9, E-C-BC-DB9/RA and **E-TRM-BC-DB9/DB9** = USB adapter, cable and terminator for -BC drivers

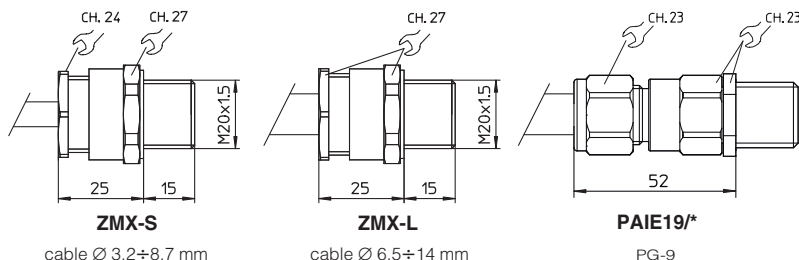
E-A-BP-USB/DB9, E-C-BP-DB9/RA and **E-TRM-BP-DB9/DB9** = USB adapter, cable and terminator for -BP drivers

E-TRM-BC-DB9/DB9 (CANopen) and E-TRM-BP-DB9/DB9 (PROFIBUS DP) fieldbus terminators are required when the adapter is directly connected to the digital driver or to one end of the fieldbus network.

20 MODEL CODE OF CABLE GLANDS AND THREADED PLUGS

Atos can supply different kind of cable glands, depending to the valve's certification, and to the cable's diameter used by the customer.

The cable glands and the threaded plugs (to be ordered separately) are available ATEX certified according to EN 60079-0 and EN 60079-1, or IECEx certified, according to the following standards: IEC 60079-0, IEC 60079-1, IEC 60079-7, IEC 61241-0, IEC 61241-1



Depending to the model code, the valves are supplied with:

- Atex certified cable gland code ZMX-S for factory wired connections
- Atex and IECEx certified threaded plugs code ZMX-T (for connections not to be used)
- IECEx certified cable gland code PAIE19/M for factory wired connections

Following codes have to be specified for spare cable glands (IP66), or plug:

ZMX-T = brass threaded plug, threaded connection M20x1,5 (6H/6g).

ZMX-S = brass cable gland, threaded connection M20x1,5 (6H/6g). Cable size 3,2 ÷ 8,7 mm

ZMX-L = brass cable gland, threaded connection M20x1,5 (6H/6g). Cable size 6,5 ÷ 14 mm

PAIE19/M = with threaded connection M20x1,5 UNI-4535 (6H/6g). Cable size PG-9

The cable gland PA*/M must be blocked with loctite or similar or with a locking nut.

For connections available for the customers, the cable glands and the threaded metal plug have to be ordered separately. The quantity and the mounting position of the cable glands and threaded plugs is depending to the selected connection of the of communication interface, as shown in the following **TAB. I**

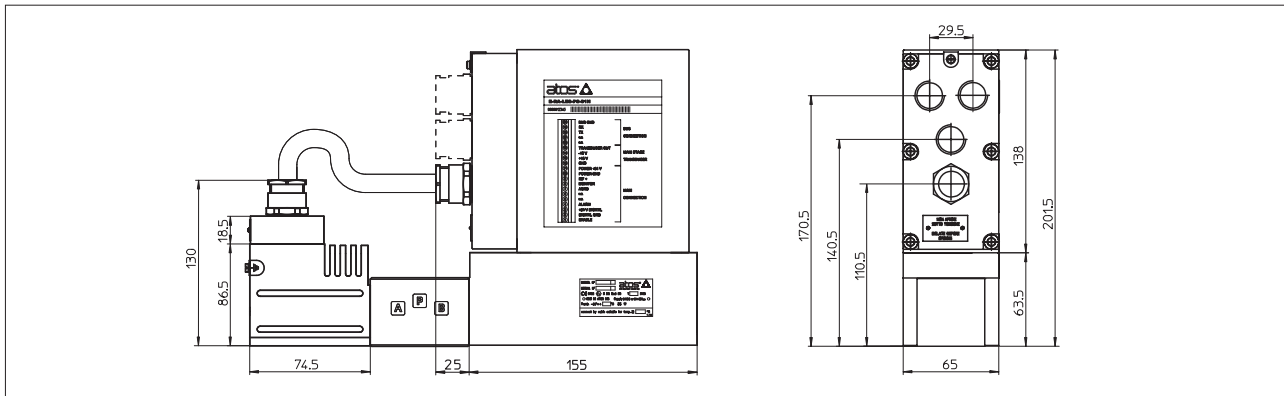
TAB. I

Valve's communication interfaces	To be ordered separately				Scheme	Notes
	Cable gland quantity	Cable gland position	Threaded plug quantity	Threaded plug position		
-PS	1	3	none	none		Cable entrance 1 and 2 are factory plugged Cable entrance 3 is open for customers Cable entrance 4 is factory plugged or wired depending to the valve model
-BC, -BP "via stub" connection	2	1, 3	1	2		Cable entrance 1, 2 and 3 are open for customers Cable entrance 4 is factory plugged or wired depending to the valve model
-BC, -BP "daisy chain" connection	3	1, 2, 3	none	none		Cable entrance 1, 2 and 3 are open for customers Cable entrance 4 is factory plugged or wired depending to the valve model

21 MASS

VALVE TYPE	MASS (Kg)	VALVE TYPE	MASS (Kg)	VALVE TYPE	MASS (Kg)	VALVE TYPE	MASS (Kg)	VALVE TYPE	MASS (Kg)	VALVE TYPE	MASS (Kg)
DHZA-*-05	8,2	DPZA-*-27	18,7	AGMZA-*-10	12,2	LIMZA-*-5	19,2	RZGA-*-010	9	QVHZA	8,6
DHZA-*-07	9	DPZA-*-35	22	AGMZA-*-20	16	LIMZA-*-6	28	RZGA-*-033	9,6	QVKZA	9,5
DKZA-*-05	9	DPZA-*-37	23	AGMZA-*-32	18,5	LICZA-*-1	13,6	AGRCZA-*-10	13,6		
DKZA-*-07	9,6	DLHZA	8,5	LIMZA-*-1	10,3	LICZA-*-2	14,6	AGRCZA-*-20	14,6		
DPZA-*-15	13,6	DLKZA	10,2	LIMZA-*-2	10,8	LICZA-*-3	17,7	LIRZA-*-1	17,7		
DPZA-*-17	14,6	RZMA-*-010	9	LIMZA-*-3	12	LICZA-*-4	8,2	LIRZA-*-2	8,2		
DPZA-*-25	17,7	RZMA-*-030	9,3	LIMZA-*-4	15,7	LICZA-*-5	9	LIRZA-*-3	9		

22 DIMENSIONS OF EXPLOSION PROOF SOLENOIDS WITH INTEGRAL DIGITAL ELECTRONICS [mm]



23 DIMENSIONS OF EXPLOSION PROOF VALVES WITH INTEGRAL DIGITAL ELECTRONICS [mm]

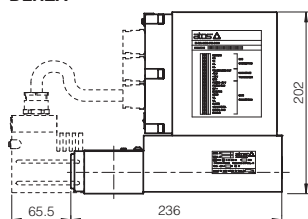
DIRECTIONAL VALVES

dotted line = double solenoid version

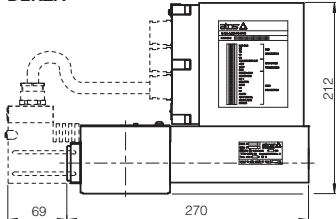
PRESSURE CONTROL VALVES

dotted line = -TERS version

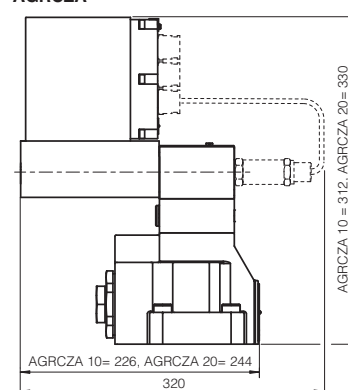
DHZA DLHZA



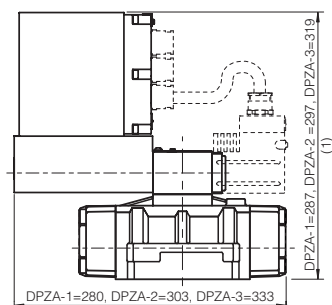
DKZA DLKZA



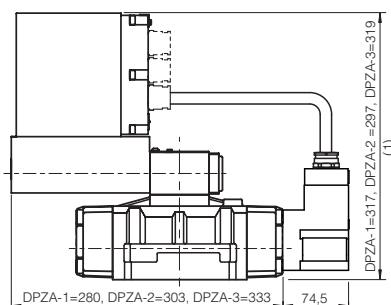
AGRCZA



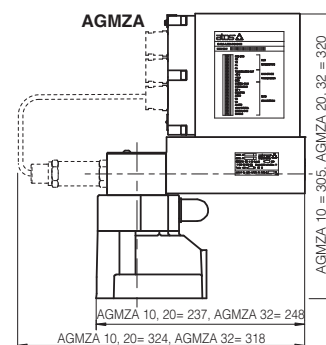
DPZA -AES



DPZA -LES

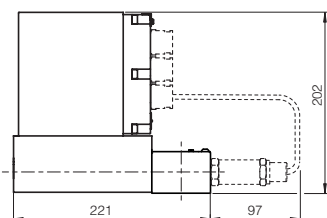


AGMZA

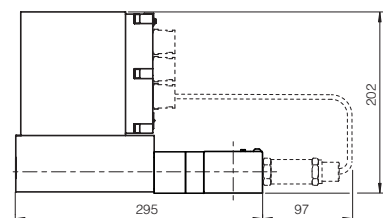


(1) For DPZA-LES-1 the height in the drawing includes the pressure reducing valve (option /G standard)
For DPZA-AES-1, DPZA-2 and -3, in case of option /G the height in the drawings must be increased of 30 mm

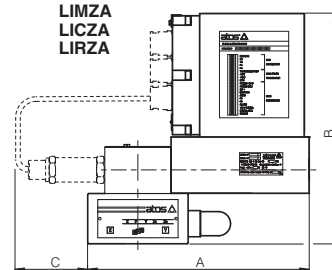
RZMA-010 RZGA-010



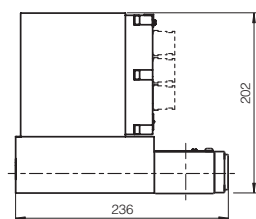
RZMA-030 RZGA-033



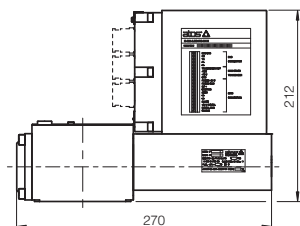
LIMZA LICZA LIRZA



QVHZA



QVKZA



LIMZA, LICZA, LIRZA							
size	16	25	32	40	50	63	80
dimension							
A	228	230	238	253	261	281	361,5
B *	243	243	252	261,5	271,5	281,5	311,5
C	90	88	80	68	60	37	-

* for option /H add 40mm to the dimension