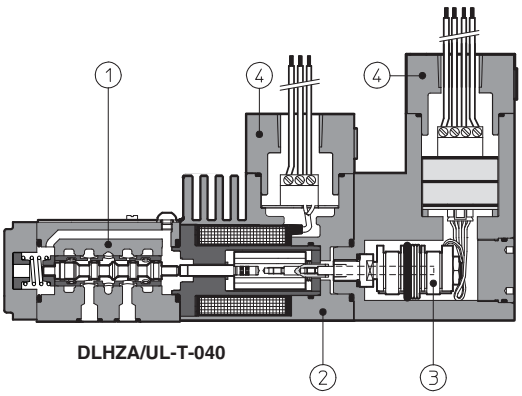
Explosion-proof solenoid valves

on/off and proportional controls - C UL US certification



DLHZA/UL-T-040

① valve body
② ex-proof solenoid
③ ex-proof transducer (only for proportional -T valves)
④ threaded connections for conduit pipe

Explosion-proof on/off and proportional solenoids certified C UL US according to UL 1002 and CSA 22.2 n°139-1982 Standard, Class I, Groups C&D (Groups IIA & IIB to NEC 505-7).

The solenoid case 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.

DHA and DLOH valves are conform to **SIL 3** safety level (TÜV approved).

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.

These solenoids are applied to hydraulic valves for application in explosion-hazardous environments.

1 EXPLOSION PROOF SOLENOIDS: MAIN DATA

SOLENOID TYPE			PROPORTIONAL without transducer	PROPORTIONAL with transducer	ON-OFF
Solenoid code			OZAUL-A	OZAUL-T	OAUL
Voltage code	VDC	±10%	**12 DC, 24 DC**	**12 DC**	**12DC, 24DC, 110DC, 125DC, 220DC**
	VAC 50/60 Hz	±10%	–		**12AC, 24AC, 110AC, 230AC (1)**
Power consumption			35W		12W
Coil insulation			Class H		
Protection degree			IP 67 According to IEC 144 when correctly coupled with the relevant conduit pipe		
Duty factor			100%		
Mechanical construction			Flame proof housing classified, according to UL 1002 and CSA 22.2 n°139-1982, class I, groups C&D (Groups IIA & IIB to NEC 505-7)		
Cable entrance and electrical wiring			Connection 1/2" NPT (ANSI B2.1) for conduit pipe The valves are supplied with 1,07 m (42 inches) cable lenght factory wired - cable size AWG 16		

(1) For alternating current supply a rectifier bridge is provided built-in the solenoid

2 EXPLOSION PROOF SOLENOIDS: TEMPERATURE DATA

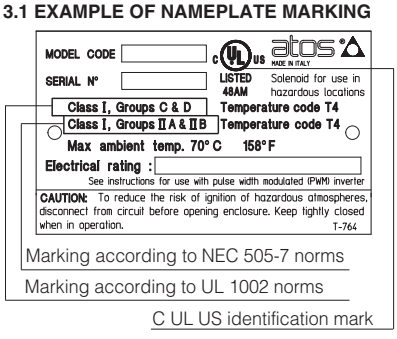
SOLENOID TYPE	PROPORTIONAL	ON/OFF
Metod of protection	Ex d	
Temperature class with +70°C ambient temp.	**T4**	**Not applicable**
Surface temperature	≤135 °C	≤ 85 °C
Ambient temperature	-40 ÷ +70 °C	

3 CERTIFICATIONS

In the following is resumed the valves marking according to UL 1002 and CSA 22.2 n° 139-1982 certification

Class I = Equipment for famable gas and vapours
Division 1 = Possibility of explosive atmosphere during normal functioning
Groups C&D = Gas group (according to UL 1002)
Groups IIA&IIB = Gas group (according to NEC 505-7)
T4 = Temperature class of solenoid surface referred to +70°C ambient temperature

3.1 EXAMPLE OF NAMEPLATE MARKING



4 MODEL CODE OF SPOOL TYPE ON-OFF DIRECTIONAL SOLENOID VALVES

DHA / UL – 0 63 1/2 / NPT / * 24DC ** /*

DHA = spool type - direct
DPHA = spool type - piloted

UL = C UL US certification

Valve size (ISO 4401)
for DHA **0** = 06
for DPHA **1** = 10 **2** = 16 **4** = 25 **6** = 32

Valve configuration, DHA see section 5 and DPHA see section 6

Spool type, DHA see section 5 and DPHA see section 6

Solenoid threated connection:
NPT = 1/2" NPT ANSI B2.1 (tapered)

Seals material:
omit for NBR (mineral oil & water glycol)
PE = FPM
Low temperature execution:
BT = low temperature -40°C

Series number

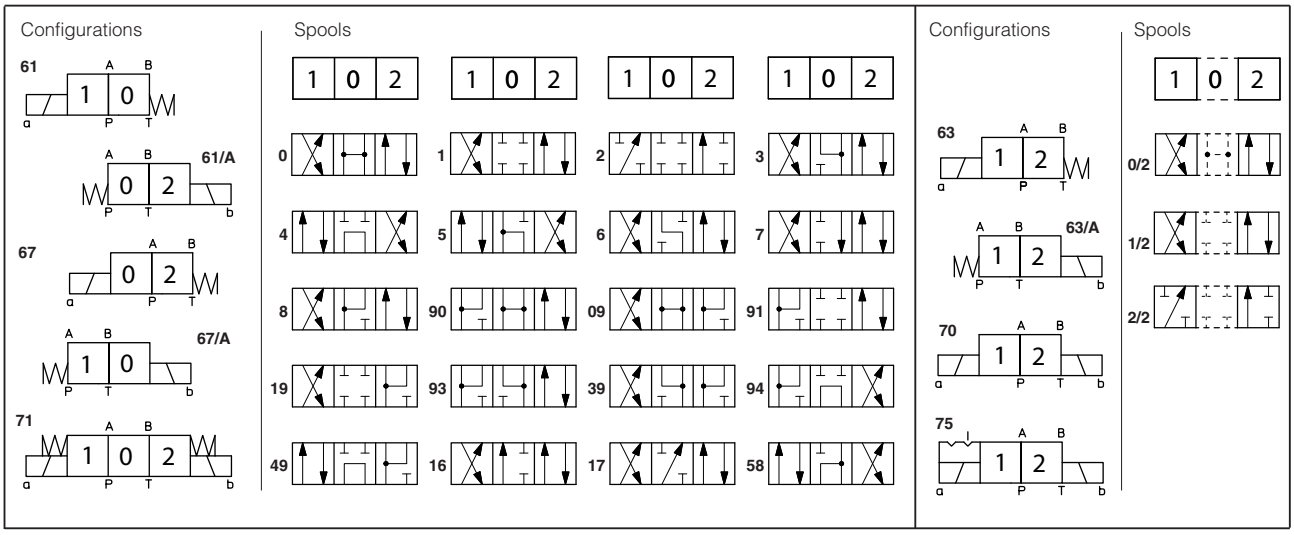
Voltage code - see section 1

Options:
A = solenoid at side of port B (for single solenoid valves)
O = horizontal cable entrance
MV = vertical hand lever (1)
WP = prolongued manual override protected by metallic cap

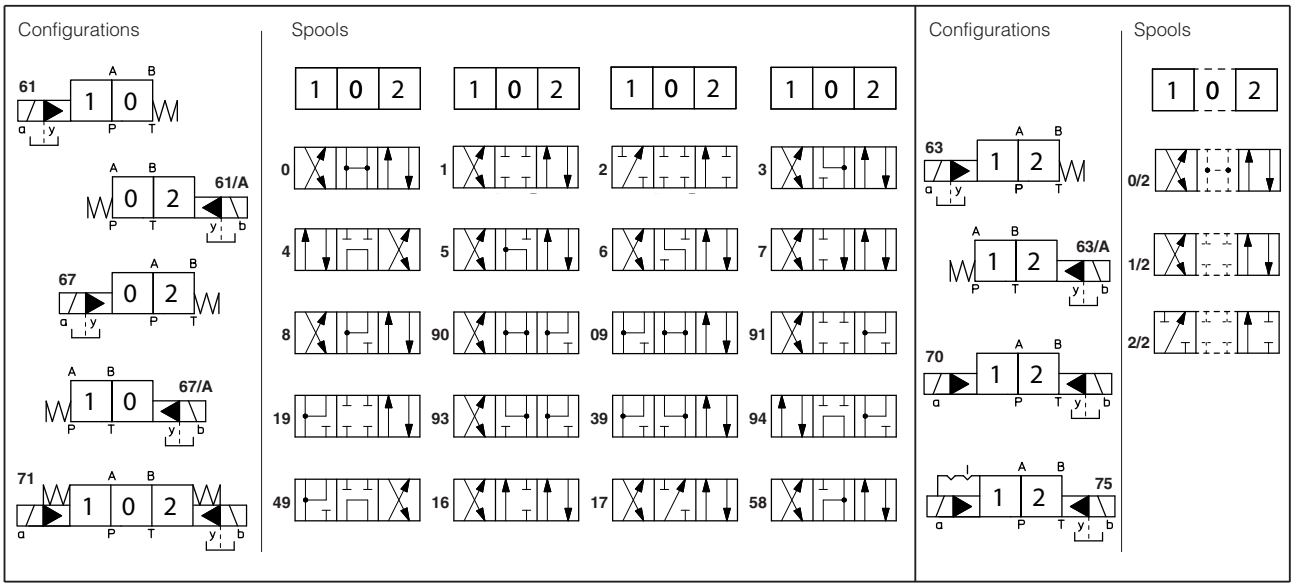
Only for DPHA:
/D =Internal drain
/E =External pilot pressure
/H =Adjustable chokes (meter-out to the pilot chambers of the main valve).
/H9 =Adjustable chokes (meter-in to the pilot chambers of the main valve)
/L9 =(only for DPHA-2 and DPHA-4) plug with calibrated restrictor on port P of pilot valve
/S = Main spool stroke adjustment (only for DPHA-2, -3)

(1) Option **/MV** available only for DHA, configuration 61, 63, 71 and spool type 0, 0/2, 1, 1P, 1/2, 1/2P, 3, 3P, 4, 7

5 CONFIGURATIONS and SPOOLS



6 CONFIGURATIONS and SPOOLS



NOTES:
- For **DP*-1** are available only spools: **0, 0/2, 1, 1/2, 3, 4, 5, 58, 6, 7**
- For **DP*-6** are available only spools: **0, 1, 2, 3, 4, 5, 58, 6, 7, 8, 19, 91**

7 MODEL CODE OF POPPET TYPE, LEAK FREE, DIRECTIONAL SOLENOID VALVES

DLO H – 2 A / NPT - AO/UL / * 24DC ** /*

Directional control valve poppet type, size 06

H = max flow 12 l/min
K = max flow 30 l/min

2 = two way (only for DLOH)
3 = three way

Valve configuration, see section 8
A = open in rest position
C = closed in rest position

Solenoid threated connection:
NPT = 1/2" NPT ANSI B2.1 (tapered)

AO/UL = C UL US certification

Options:
O = horizontal cable entrance
R = with check valve on port P (only for DLOH)
WP = prolongued manual override protected by metallic cap

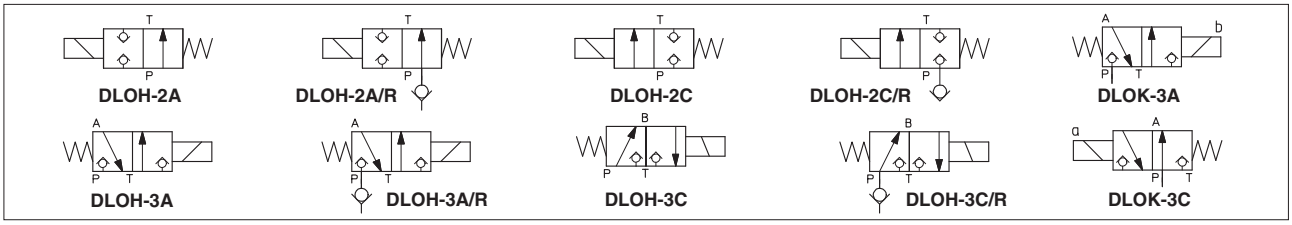
Voltage code - see section 1

Series number

Seals material (1):
omit for NBR (mineral oil & water glycol)
PE = FPM

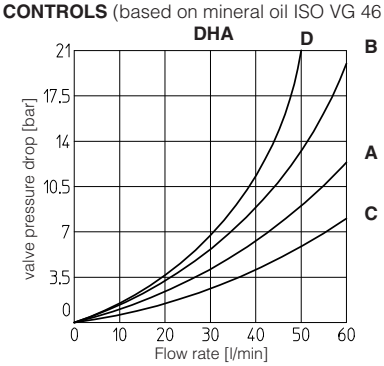
(1) Option **/BT** = low temperature -40°C also available on request

8 CONFIGURATION OF DLOH/AO/* AND DLOK/AO/*



9 Q/Δp DIAGRAMS OF ON/OFF DIRECTIONAL CONTROLS (based on mineral oil ISO VG 46 at 50°C)

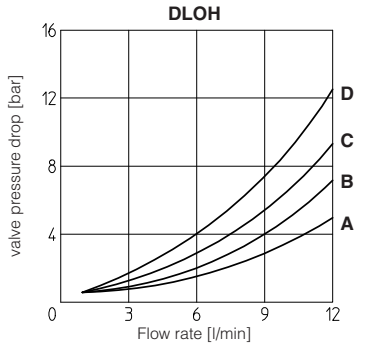
Spool type \ Flow direction	P→A	P→B	A→T	B→T	P→T
0	C	C	C	C	
0/2, 1, 1/2	A	A	A	A	
3	A	A	C	C	
4, 5	D	D	D	D	A
6	A	A	C	A	
7	A	A	A	C	
8	C	C	B	B	

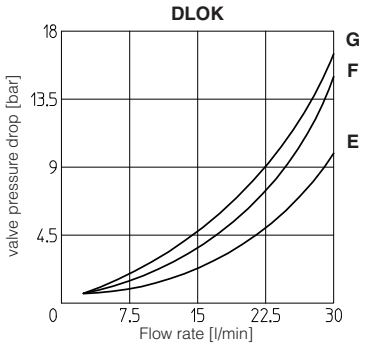


INTERNAL LEAKAGE of DLOH and DLOK less than 5 drops/min (0,36 cm³/min) at max pressure.

Valve type \ Flow direction	P → A (1) (P → B)	A → T (B → T)
DLOH-2A	B	–
DLOH-2C	C	–
DLOH-3A	D	C
DLOH-3C	C	A
DLOK-3A	G	F
DLOK-3C	F	E

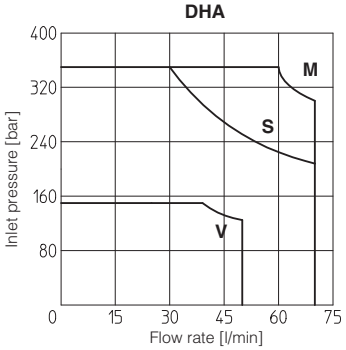
(1) For two-way valves pressure drop refers to P→T



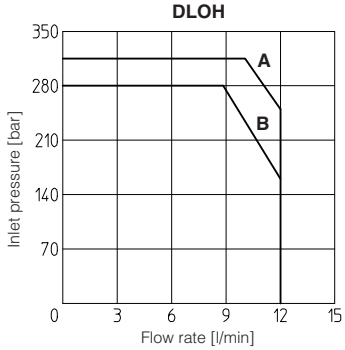


10 OPERATING LIMITS OF ON/OFF DIRECTIONAL CONTROLS (based on mineral oil ISO VG 46 at 50°C)

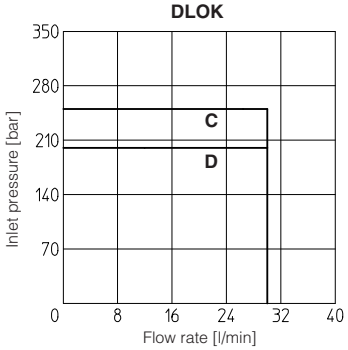
The diagram have been obtained with warm solenoids and power supply at lowest value (V_{nom}-10%). For DHA valves the curves refer to application with symmetrical flow through the valve (i.e. P → A and B → T). In case of asymmetric flow the operating limits must be reduced.



M = Spools 0, 1, 8; **V** = Spools 4, 5.
S = Spools 0/2,1/2, 3, 6, 7;



A = DLOH-3A;
B = DLOH-2A, DLOH-3C.



C = DLOK-3A;
D = DLOK-3C.

10.1 Max pressure in port T = 210 bar

11 MODEL CODE OF PRESSURE RELIEF VALVES

AGAM - 20 / 2 0 /210/100/100 / NPT - AO/UL / * 24 DC ** /*

AGAM = pressure relief valve: subplate mounting, see tab. C066
ARAM = pressure relief valve: threated connections, see tab. C045

Valve size
for AGAM: **10** (ISO 6264), **20** (ISO 6264), **32** (ISO 6264)
for ARAM: **20** = G 3/4", **32** = G 1 1/4"

Number of the different setting pressure values:
1 = one setting pressure
2 = two setting pressure
3 = three setting pressure

Valve configuration
0 = venting with de-energized solenoid
1 = venting with energized solenoid
2 = without venting

Max regulated pressure of first (second / third) setting see section 12

Solenoid threated connection:
NPT = 1/2" NPT ANSI B2.1 (tapered)

AO/UL = C UL US certification

Options:
E = external pilot
O = horizontal cable entrance
V = regulating handweel
WP = prolongued manual override protected by metallic cap
Y = external drain

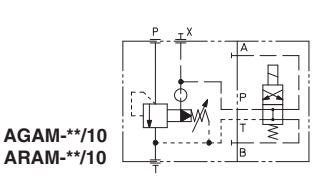
Voltage Code, see section 1

Series number

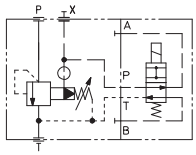
Seals material (1):
omit for NBR (mineral oil & water glycol)
PE = FPM

(1) Option **/BT** = low temperature -40°C also available on request

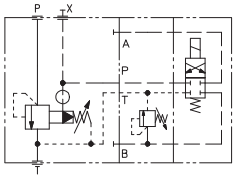
12 HYDRAULIC CHARACTERISTICS



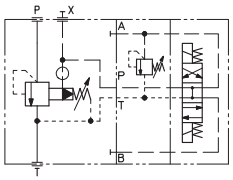
AGAM-/10**
ARAM-/10**



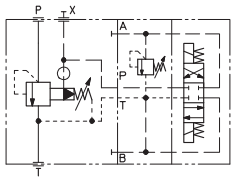
ARAM-/10**
AGAM-/11**



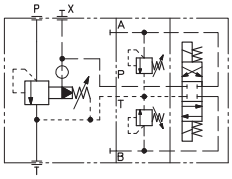
AGAM-/22**
ARAM-/22**



AGAM-/20**
ARAM-/20**



AGAM-/21**
ARAM-/21**



AGAM-/32**
ARAM-/32**

Valve model		Size 10	Size 20	Size 32
Setting			**50; 100; 210; 350**	
Max pressure port P	[bar]		350	
Pressure range	[bar]		4÷50; 6÷100; 7÷210; 8÷350	
Max flow **AGAM**	[l/min]	200	400	600
Max flow **ARAM**	[l/min]	-	350	500

13 MODEL CODE OF COVERS FOR CARTRIDGE VALVES

LIDEW - 1 / NPT - AO/UL - * 24DC ** /* *

Cover type:
LIDBH* = with solenoid valve and shuttle valve for pilot selection
LIDEW* = with solenoid valve for pilot selection
* = valve configuration (see H030 section 2)

Size (ISO 7368)
1 = 16; **2** = 25; **3** = 32; **4** = 40; **5** = 50; **6** = 63; **8** = 80 (only for LIDEW);

Solenoid threated connection:
NPT = 1/2" NPT ANSI B2.1 (tapered)

Certification type
AO/UL = C UL US certification

Options:
B = cartridge piloted via port "B" of solenoid pilot valve
E = external attachments X (1/4" GAS) and underneath port X supplied plugged (only forsizes 40...80)
O = horizontal cable entrance
WP = prolongued manual override protected by metallic cap

Voltage code - see section 1

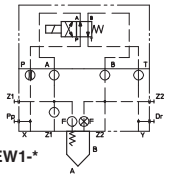
Series number

Seals material (1):
omit for NBR (mineral oil & water glycol)
PE = FPM

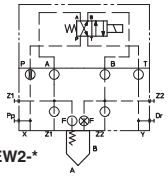
Optional different provision or setting of the calibrated plugs in the pilot channels see table H030 sect. 6

Note: for the code of the ISO cartridge to use with the above covers see tab. H003, section 2 and tab. H030, section 3.
(1) Option **/BT** = low temperature -40°C also available on request

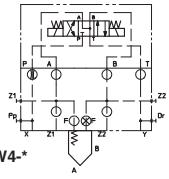
14 HYDRAULIC SYMBOLS



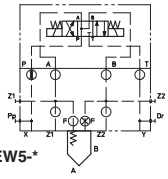
LIDEW1-*



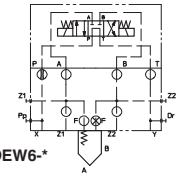
LIDEW2-*



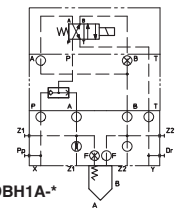
LIDEW4-*



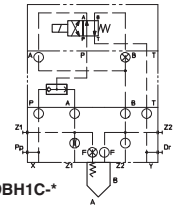
LIDEW5-*



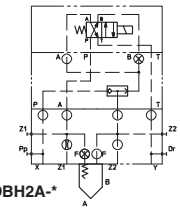
LIDEW6-*



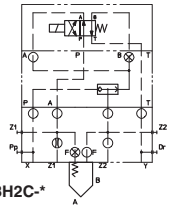
LIDBH1A-*



LIDBH1C-*



LIDBH2A-*



LIDBH2C-*

15 MODEL CODE OF PROPORTIONAL DIRECTIONAL VALVES

DHZA /UL - T - 0 7 1 - L 5 / NPT / * /* / ** /*

DHZA = size 06
DKZA = size 10
DPZA = size 10
= size 16
= size 25

UL = C UL US certification

A = without integral position transducer
T = with integral position transducer (not for DPZA)

Valve size (ISO 4401)

DHZA	DKZA	DPZA
0= size 06	**1**= size 10	**1**= size 10
		2= size 16
		4= size 25
		6= size 32

Configuration, DHZA and DKZA see section 16, DPZA see section 17
5 = external plus central position, spring centered
7 = 3 position, spring centered

Spool overlapping in central position, DHZA and DKZA see section 16, DPZA see section 17
1 = P, A, B, T positive overlapping
3 = P positive overlapping; A, B, T, negative

Spool type
L = linear; **S** = progressive; **D** = as **S**, but with P-A = Q, P-B = Q/2

Spool size: DHZA and DKZA see section 16, DPZA see section 17

Solenoid threated connection:
NPT = 1/2" NPT ANSI B2.1 (tapered)

Options:
B = solenoid at side of port A (only for single solenoid valves)
C = position transducer with current feedback 4÷20 mA (only for -T)
D = internal drain (only for DPZA)
E = external pilot (only for DPZA)
G = pressure reducing valve for piloting (only for DPZA)
MV = vertical hand lever (2)
O = horizontal cable entrance (only for -A)
WP = prolongued manual override protected by metallic cap (only for -A)
Y = external drain (only for DHZA and DKZA)

Omit for standard coil 12 VDC:
24 = with 24 VDC coils (only A version)

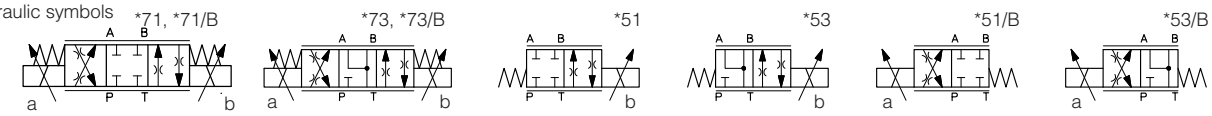
Series number

Seals material (1):
omit for NBR (mineral oil & water glycol)
PE = FPM

(1) Option **/BT** = low temperature -40°C also available on request
(2) Option **/MV** Available only for DHZA configuration 51, 53, 71, spool type S3, S5, D3, D5, L3, L5

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

Hydraulic symbols

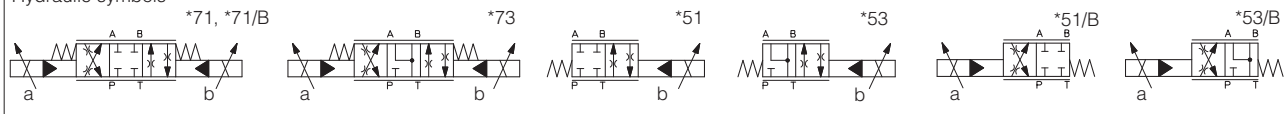


Valve model		DHZA-A DHZA-T					DKZA-A	DKZA-T
Spool overlapping		**1, 3**	**1, 3**	**1, 3**	**1, 3**	**1, 3**	**1, 3**	**1, 3**
Spool type and size		**L14**	**L1**	**S2**	**S3, L3, D3**	**S5, L5, D5**	**S3, L3, D3**	**S5, L5, D5**
Pressure limits	[bar]	ports P, A, B = 350; T = 160 (250 with external drain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

(1) Response times at step signal (0%→100%) are measured from 10% to 90% of step value and are strictly referred to the valve regulation.

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

Hydraulic symbols



Valve model		DPZA-1			DPZA-2					DPZA-3			DPZA-6		
Spool type and size (1)		**L5**	**S5**	**D5**	**S3**	**D3**	**L5**	**S5**	**D5**	**L5**	**S5**	**D5**	**L5**	**S5**	**D5**
Pressure limits	[bar]	Ports P, A, B, X = 350; T = 250; Y = 0													
Max flow	[l/min]														
at Δp = 10 bar		100	100	100 : 60	130	130 : 80	200	180	180 : 130	390	360	360 : 220	600	600	600:370
at Δp = 30 bar		160	160	160 : 100	225	225 : 135	340	310	310 : 225	680	620	620 : 380	1030	1030	1030:640
max permissible flow		180	180	180 : 110	550	550 : 300	760	640	640 : (460)	1450	1350	1350 : 820	1600	1600	1600:100
Response time (2)	[ms]	< 80			< 100					< 120					
Hysteresis	[%]	≤ 5%			≤ 5%					≤ 5%					
Repeatability		± 1%			± 1%					± 1%					

(1) Additional spools and configurations for -T execution, see table F172.
(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.

ELECTRONIC DRIVERS TO BE USED WITH EX-PROOF PROPORTIONAL VALVES
- Atos driver for proportional valves type **-A** (without transducer): **E-ME-AC**, see tab. G035
- Atos driver for proportional valves type **-T** (with transducer): **E-ME-T**, see tab. G140

18 MODEL CODE OF SERVOPROPORTIONAL VALVES

DLHZA /UL - T - 0 4 0 - L 7 3 / NPT / * ** /*

DLHZA = size 06
DLKZA = size 10

UL = C UL US certification

T = with integral position transducer

Valve size (ISO 4401)
0 = size 06 (DLHZA)
1 = size 10 (DLKZA)

Configuration, see section 19
4 = spring offset with fail safe
6 = spring offset

Spool overlapping in central position, see section 19
0 = P, A, B, T zero overlapping

Spool type
L = linear; **T** = not linear;

Spool size: see section 19

Fail safe configuration:
1 = A, B, P, T with positive overlapping **3** = P, positive overlapping; A, B, T negative

Solenoid threated connection:
NPT = 1/2" NPT ANSI B2.1 (tapered)

Options:
B = solenoid at side of port A
C = position transducer with current feedback 4÷20 mA
Y = external drain

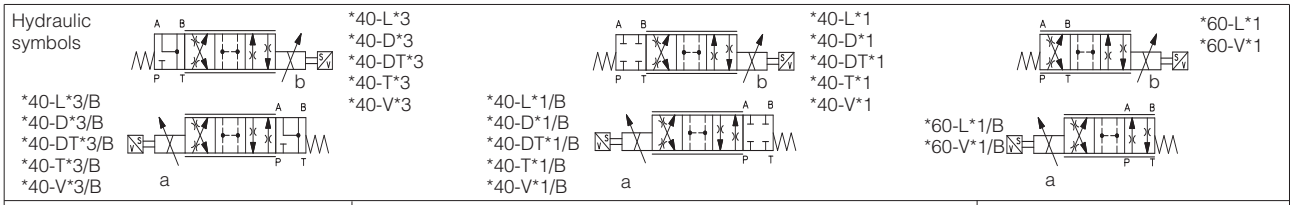
Series number

Seals material (1):
omit for NBR (mineral oil & water glycol)
PE = FPM

(1) Option **/BT** = low temperature -40°C also available on request

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

Hydraulic symbols



Valve model	DLHZA-T*												DLKZA-T*					
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	70												60					
Spool	**L0**	**L1**	**V1**	**L3**	**V3**	**L5**	**T5**	**L7**	**T7**	**V7**	**D7**	**DT7**	**L3**	**L7**	**T7**	**V7**	**D7**	**DT7**
Max flow [l/min] at Δp = 30 bar	2,5	4,5	5	9	13	18		26			26÷13		40	65			65÷33	
max permissible flow	4	7	8	14	20	28		40			40÷20		55	80			80÷40	
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
Response time [ms]	≤ 10												≤ 15					
Hysteresis [%]	≤ 0,1%												≤ 0,1%					
Thermal drift	zero point displacement < 1% at ΔT = 40°C																	

(1) Referred to spool in center position and 50°C oil temperature.

20 MODEL CODE OF PRESSURE COMPENSATED PROPORTIONAL FLOW CONTROL VALVES

QVHZA / UL - T - 06 / 12 / NPT / * /* ** /*

QVHZA = size 06
QVKZA = size 10

UL = C UL US certification

A = without position transducer
T = with integral position transducer

Valve size (ISO 4401)
QVHZA: **06** QVKZA: **10**

Max regulated flow:
QVHZA
3 = 3,5 l/min; **36** = 36 l/min;
12 = 12 l/min **45** = 45 l/min;
18 = 18 l/min;
QVKZA
65 = 65 l/min
90 = 90 l/min

Omit for standard coil 12 V_{DC}:
24 = with 24 V_{DC} coils (only A version)

Options:
C = current feedback signal 4÷20 mA (only for -T versions)
D = quick venting
O = horizontal cable entrace (only for -A versions)
WP = prolongued manual override protected by metallic cap (only for valves without transducer)

Solenoid threated connection:
NPT = 1/2" NPT ANSI B2.1 (tapered)

Series number

Seals material (1):
omit for NBR (mineral oil & water glycol)
PE = FPM

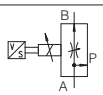
(1) Option **/BT** = low temperature -40°C also available on request

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

Hydraulic symbols

Note: In three-way versions port P is open. In two-way versions port P must be plugged. Port T must always be plugged.

QVHZA-A
QVKZA-A



QVHZA-T
QVKZA-T

Valve model	QVHZA-A					QVHZA-T					QVKZA-A		QVKZA-T	
Valve size	06					06					10		10	
Max pressure ports P, A, B [l/min]	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

Above performance data refer to valves coupled with Atos electronic drivers.
(1) Values are referred to 3-way configuration. In the 2-way configuration, the values of min regulated flow are higher

22 MODEL CODE OF PROPORTIONAL PRESSURE RELIEF AND COMPENSATOR VALVES

RZMA / UL – A – 010 / 250 / NPT / * /* ** /*

Pressure relief:
RZMA = subplate size 06
HZMA = modular size 06
AGMZA= subplate size 10, 20, 32
LIMZA = cartridge (1)
Pressure compensator:
LICZA = cartridge (1)

UL = C UL US certification

A = without integral pressure transducer

Valve size:
see section 23 for size code

Max regulated pressure:
see section 23

Seals material (2):
omit for NBR (mineral oil & water glycol)
PE = FPM

Series number

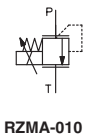
Omit for standard coil 12 VDC:
24 = with 24 VDC coils (only A version)

Options:
E = external pilot (only for AGMZA)
O = horizontal cable entrace
P = with integral mechanical pressure limiter (only for LI*ZA)
Y = external drain (only for AGMZA)

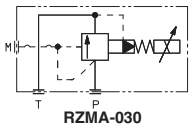
Solenoid threated connection:
NPT = 1/2" NPT ANSI B2.1 (tapered)

(1) For the code of the ISO cartridge to use with LIMZA and LICZA, see tab. F300 section 2.
(2) Option **/BT** = low temperature -40°C also available on request

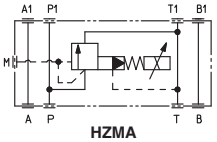
23 HYDRAULIC CHARACTERISTICS



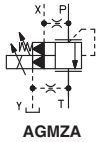
RZMA-010



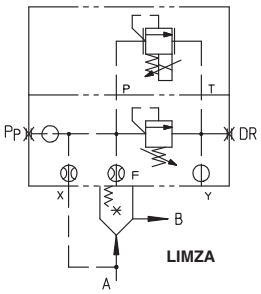
RZMA-030



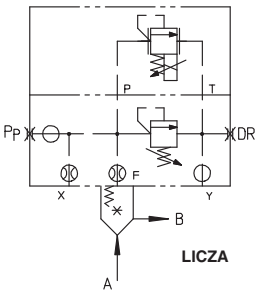
HZMA



AGMZA



LIMZA



LICZA

Valve model		RZMA		HZMA	AGMZA			LIMZA							LICZA				
Size code		010	030	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; 250																	
Max pressure at port P, A, B, X	[bar]	315																	
Max pressure at port T, Y	[bar]	210																	
Max flow	[l/min]	4	40	40	200	400	600	200	400	750	1000	2000	3000	4500	200	400	750	1000	2000

24 MODEL CODE OF PROPORTIONAL PRESSURE REDUCING VALVES

RZGA / UL – A – 010 / 250 / NPT / * /* ** /*

Pressure reducing:
RZGA = subplate size 06
HZGA = modular size 06
KZGA = modular size 10
AGRCZA = subplate size 10, 20
LIRZA = cartridge

UL = C UL US certification

A = without integral transducer

Valve size:
see section 25 for size code

Max regulated pressure:
see section 25

Seals material (1):
omit for NBR (mineral oil & water glycol)
PE = FPM

Series number

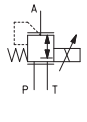
Omit for standard coil 12 VDC:
24 = with 24 VDC coils (only A version)

Options:
O = horizontal cable entrace (1)
P = with integral mechanical pressure limiter (only for AGRCZA and LIRZA)
R = with check valve (only for AGRCZA)

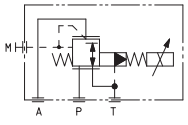
Solenoid threated connection:
NPT = 1/2" NPT ANSI B2.1 (tapered)

Note: for the code of the ISO cartridge to use with LIRZA, see tab. F300 section 2.
(1) Option **/BT** = low temperature -40°C also available on request

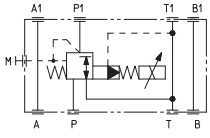
25 HYDRAULIC CHARACTERISTICS



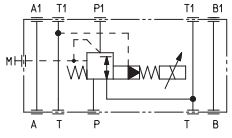
RZGA-A-010



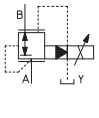
RZGA-A-033



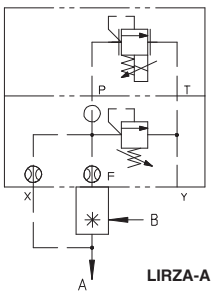
HZGA-A-031



KZGA-A-031



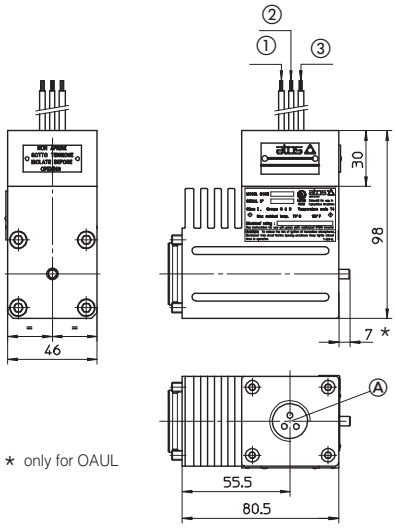
AGRCZA-A



LIRZA-A

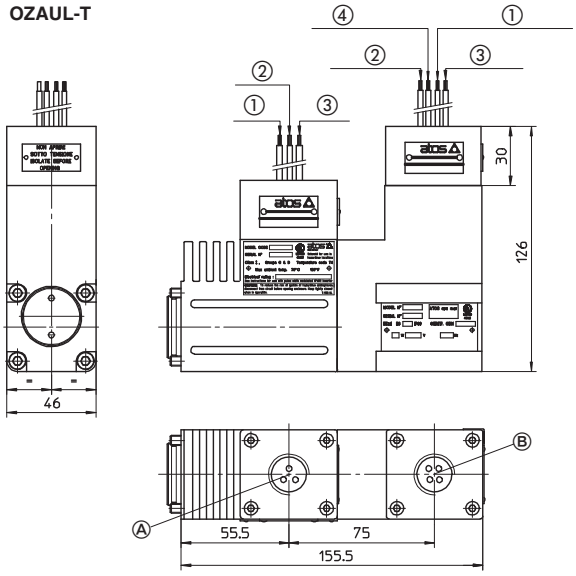
Valve model		RZGA		HZGA	KZGA	AGRCZA		LIRZA			
Size code		010	033	031	031	10	20	1	2	3	4
Valve size		06			10	10	20	16	25	32	40
Max regulated pressure	[bar]	32; 100; 210		80;			180;	250			
Min regulated pressure	[bar]	0,8	1	1	1	1	1	7	7	7	7
Max pressure at port P	[bar]	315									
Max pressure at port T	[bar]	210									
Max flow	[l/min]	12	40	40	100	160	300	160	300	550	800

OAUL
OZAUL-A

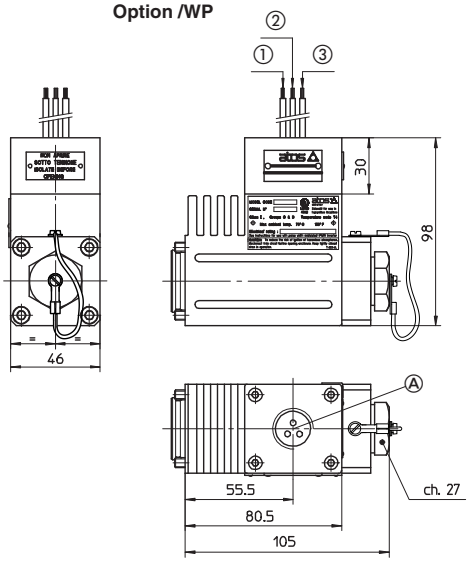


* only for OAUL

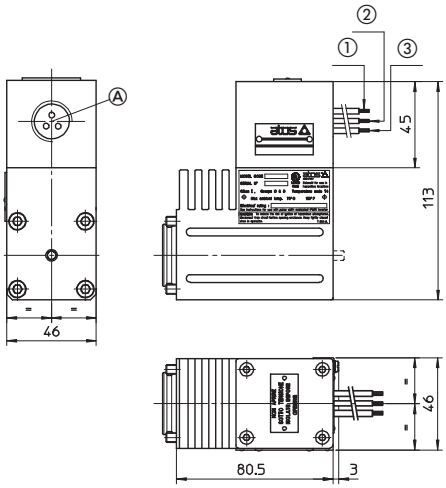
OZAUL-T



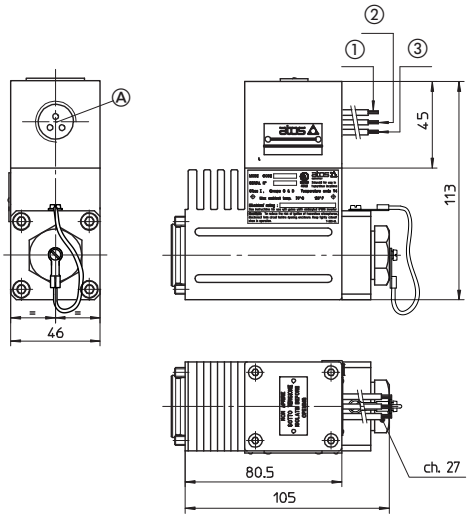
Option /WP



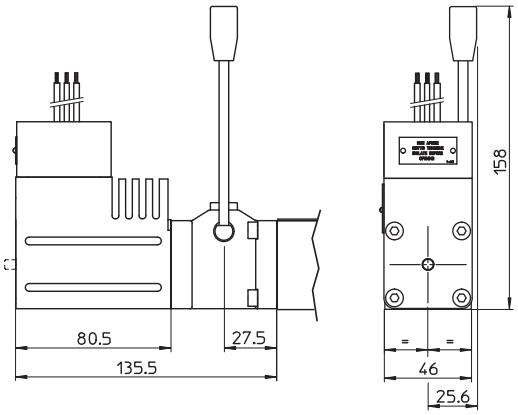
Option /O



Option /OWP



Option /MV



Ⓐ **Solenoid wiring (connection 1/2"NPT)**

OAUL-*AC	**OAUL-*DC**	**OZAUL**
① white = Coil (neutral)	① red = +	① red = Coil
② green = GND	② green = GND	② green = GND
③ black = Coil	③ black = -	③ black = Coil

Ⓑ **Position transducer wiring (connection 1/2"NPT)**

① white = Output signal
② black = Supply -15 V
③ red = Supply +15 V
④ yellow = GND

The valves are supplied with 1 m (42 inches) cable lenght, factory wired - cable size AWG 16