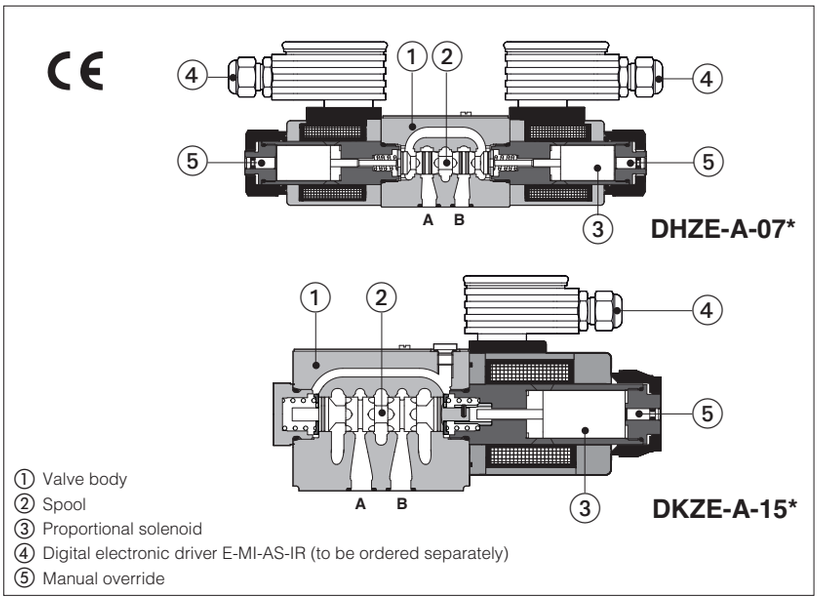
Proportional directional valves

direct operated, open loop



① Valve body
② Spool
③ Proportional solenoid
④ Digital electronic driver E-MI-AS-IR (to be ordered separately)
⑤ Manual override

DHZE-A, **DKZE-A**

Open-loop direct operated proportional directionalvalves with threaded type proportional solenoids, certified according to North American standard **cURus**.
They operate in association with electronic drivers, see section 2, which supply the proportional valves with proper current to align the valve regulation to the reference signal supplied to the electronic driver.
The spools are available with linear **L**, progressive **S** or differential **D** flow characteristics.
The valve body is 3 chambers type for DHZE and 5 chambers type for DKZE.
The solenoid coils are plastic encapsulated with insulation class H and they are available with different nominal resistances depending to the voltage supply (12 VDC or 24 VDC) and to the electronic driver type, see section 2 and 3.

Size: **06** and **10**
Max flow: up to **70** and **160 l/min**
Max pressure: **350 bar** (DHZE)
315 bar (DKZE)

1 MODEL CODE

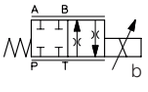
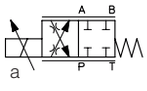
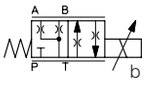
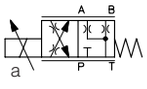
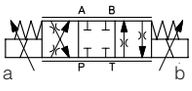
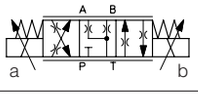
DHZE	-	A	-	0	71	-	S	5	/	*	-	*	/	*	**	/	*

DHZE = size 06
DKZE = size 10

A = open loop

Valve size - ISO 4401
0 = size 06 (DHZE)
1 = size 10 (DKZE)

Configuration:

	Standard	Option **/B**
51 =		
53 =		
71 =		
73 =		

Spool type - regulating characteristics:

L = linear 

S = progressive 

D = differential-progressive 
P-A = Q, B-T = Q/2
P-B = Q/2, A-T = Q

Seals material, see section 4:
- = NBR
PE = FKM
BT = HNBR

Series number

Coil option (only for -A execution)
see section 2 and 4:
- = standard coil for 24VDC Atos drivers
6 = optional coil for 12VDC Atos drivers
18 = optional coil for 24VDC low current drivers

Coils with special connectors, see section 10
- = omit for standard DIN connector
J = AMP Junior Timer connector
K = Deutsch connector
S = Lead Wire connection

Hydraulic options
B = solenoid side of port A (only for valve configuration 5)

Auxiliary hand lever
only for DHZE with spool type **S3, S5, D3, D5, L3, L5**
It allows to operate the valve in absence of electrical power supply, see tech. table E138
MO = horizontal hand lever
MV = vertical hand lever
BMO = horizontal hand lever installed at side of port A
BMV = vertical hand lever installed at side of port A

Spool size:	**14** (L)	**1** (L)	**3** (L,S,D)	**5** (L,S,D)
DHZE =	1	4,5	17	28
DKZE =	-	-	45	60

Nominal flow (l/min) at Δp 10 bar P-T

2 ELECTRONIC DRIVERS

Drivers model	E-MI-AC		E-MI-AS-IR		E-BM-AC		E-BM-AS-PS		E-BM-AES	E-ME-AC
Type	analog		digital		analog		digital		digital	analog
Voltage supply (V_{DC})	12	24	12	24	12	24	12	24	24	24
Valve coil option	/6	std	/6	std	/6	std	/6	std	std	std
Format	DIN 43650 plug-in to solenoid				DIN 43700 UNDECAL		DIN-rail panel			EUROCARD
Data sheet	G010		G020		G025		G030		GS050	G035

3 MAIN CHARACTERISTICS - based on mineral oil ISO VG 46 at 50 °C

Assembly position	Any position					
Subplate surface finishing	Roughness index, Ra 0,4 flatness ratio 0,01/100 (ISO 1101)					
MTTFd valves according to EN ISO 13849	150 years, see technical table P007					
Ambient temperature range	**standard** = -20°C ÷ +70°C, **/BT** option = -40°C ÷ +60°C					
Storage temperature range	**standard** = -20°C ÷ +80°C, **/BT** option = -40°C ÷ +70°C					
Coil code	**DHZE**			**DKZE**		
	standard	option /6	option /18	standard	option /6	option /18
Coil resistance R at 20°C	3 ÷ 3,3 Ω	2 ÷ 2,2 Ω	13 ÷ 13,4 Ω	3,8 ÷ 4,1 Ω	2,2 ÷ 2,4 Ω	12 ÷ 12,5 Ω
Max. solenoid current	2,2 A	2,75 A	1 A	2,6 A	3,25 A	1,2 A
Max. power	30W			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 to DIN EN60529	IP67					
Duty factor	Continuous rating (ED=100%)					
Certification	**cURus** North American Standard					

Valve model	**DHZE**				**DKZE**	
Pressure limits [bar]	ports **P, A, B** = 350; **T** = 210				ports **P, A, B** = 315; **T** = 210	
Spool type and size	**L14**	**L1**	**S3, L3, D3**	**S5, L5, D5**	**S3, L3, D3**	**S5, L5, D5**
Nominal flow **(1)** [l/min] at Δp = 10 bar (P-T)	1	4,5	18	28	45	60
at Δp = 30 bar (P-T)	2	8	30	50	80	105
at Δp = 70 bar (P-T)	3	12	45	70	120	160
Response time **(2)** [ms]	< 30				< 40	
Hysteresis [%]	≤ 5 [% of max regulation]					
Repeatability [%]	± 1 [% of max regulation]					

Notes: above performance data refer to valves coupled with Atos electronic drivers, see section 2.
the flow regulated by the directional proportional valves is not pressure compensated, thus it is affected by the load variations.To keep costant the regulated flow under different load conditions, modular pressure compensators are available (see tab. D150).

(1) For different Δp, the max flow is in accordance to the diagrams in sections 7.2 and 8.2

(2) 0-100% step signal

4 SEALS AND HYDRAULIC FLUID - 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		
Fluid contamination class	ISO 4406 class 20/18/15 NAS 1638 class 9, in line filters of 10 μm (β10 ≥75 recommended)		
Hydraulic fluid	**Suitable seals type**	**Classification**	**Ref. Standard**
Mineral oils	NBR, FKM, HNBR	HL, HLP, HLPD, HVLP, HVLPD	DIN 51524
Flame resistant without water	FKM	HFDU, HFDR	ISO 12922
Flame resistant with water	NBR, HNBR	HFC	

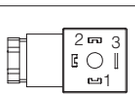
5 GENERAL NOTES

DHZE and DKZE proportional valves are CE marked according to the applicable Directives (e.g. Immunity/Emission EMC Directive and Low Voltage Directive).

Installation, wirings and start-up procedures must be performed according to the general prescriptions shown in table F003 and in the installation notes supplied with relevant components.

6 CONNECTIONS

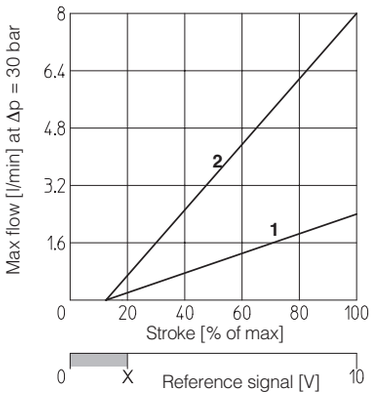
SOLENOID POWER SUPPLY CONNECTOR	
PIN	Signal description
1	SUPPLY
2	SUPPLY
3	GND

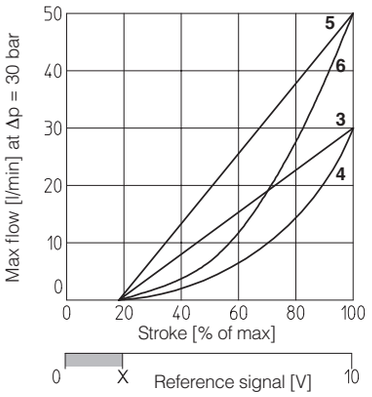


7 DIAGRAMS FOR DHZE (based on mineral oil ISO VG 46 at 50 °C)

7.1 Regulation diagrams

1 = linear spool L14
2 = linear spool L1
3 = linear spool L3
4 = progressive spool S3, D3
5 = linear spool L5
6 = progressive spool S5, D5

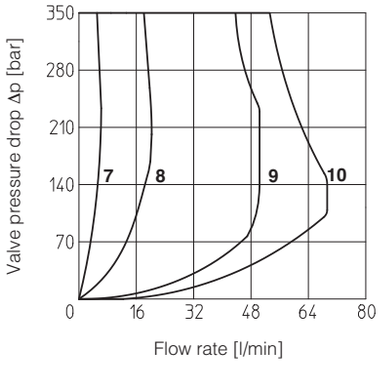




X = Threshold for bias activation depending to the valve type and amplifier type

7.2 Operating limits

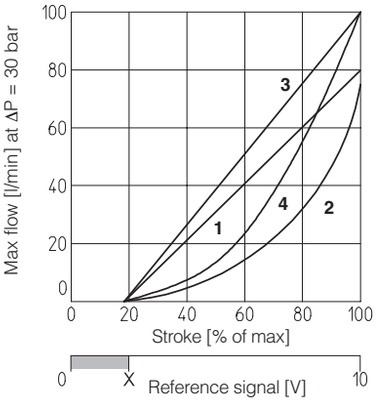
7 = spool L14
8 = spool L1
9 = spool L3, S3, D3
10 = spool L5, S5, D5



8 DIAGRAMS FOR DKZE (based on mineral oil ISO VG 46 at 50 °C)

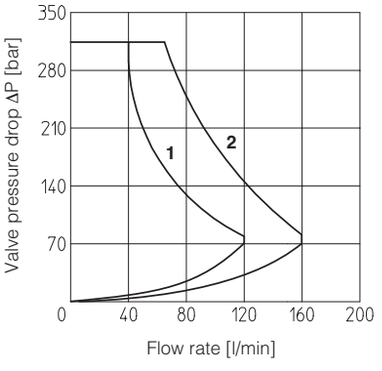
8.1 Regulation diagrams

1 = linear spool L3
2 = progressive spool S3, D3
3 = linear spool L5
4 = progressive spool S5, D5



8.2 Operating limits

1 = spool L3, S3, D3
2 = spool L5, S5, D5

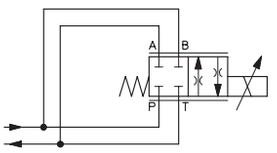


X = Threshold for bias activation depending to the valve type and amplifier type

9 OPERATION AS THROTTLE VALVE

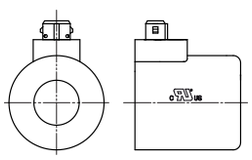
Single solenoid valves (DHZE-A-051 - DKZE-A-151) can be used as simple throttle valves:
Pmax = 210 bar

Max flow Δp= 30bar [l/min]	SPOOL TYPE					
	L14	**L1**	**L3**	**S3**	**L5**	**S5**
DHZE	4	16	60		100	
DKZE	-	-	120		150	

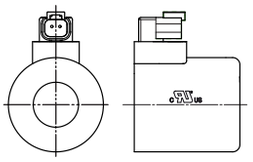


10 COILS WITH SPECIAL CONNECTORS

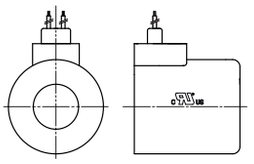
Options -J
Coil type COZEJ (DHZE)
Coil type CAZEJ (DKZE)
AMP Junior Timer connector
Protection degree IP67



Options -K
Coil type COZEK (DHZE)
Coil type CAZEK (DKZE)
Deutsch connector, DT-04-2P male
Protection degree IP67



Options -S
Coil type COZES (DHZE)
Coil type CAZES (DKZE)
Lead Wire connection
Cable lenght = 180 mm

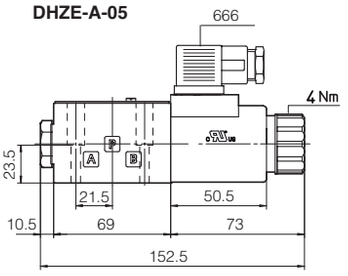


11 INSTALLATION DIMENSIONS FOR DHZE and DKZE [mm]

ISO 4401: 2005
Mounting surface: 4401-03-02-0-05 (see table P005)

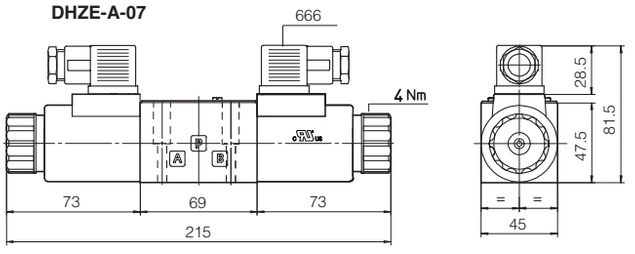
Fastening bolts: 4 socket head screws M5x30 class 12.9
Tightening torque = 8 Nm
Seals: 4 OR 108
Diameter of ports A, B, P, T: Ø 7,5 mm (max)

DHZE-A-05



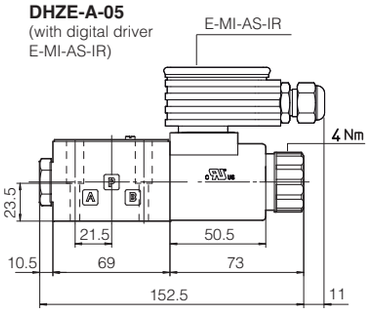
Mass: 1,5 kg

DHZE-A-07



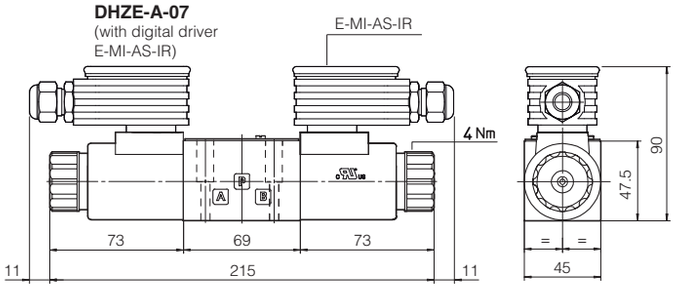
Mass: 2 kg

DHZE-A-05
(with digital driver E-MI-AS-IR)



Mass: 2 kg

DHZE-A-07
(with digital driver E-MI-AS-IR)

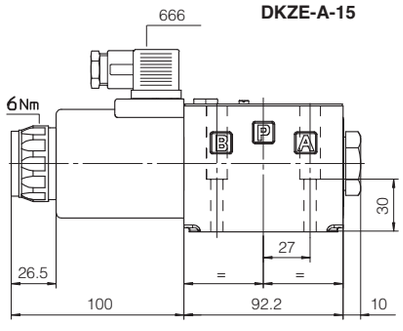


Mass: 3 kg

ISO 4401: 2005
Mounting surface: 4401-05-04-0-05 (see table P005)

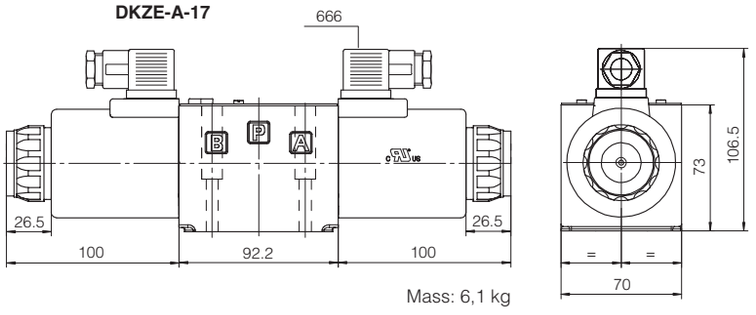
Fastening bolts: 4 socket head screws M6x40 class 12.9
Tightening torque = 15 Nm
Seals: 5 OR 2050
Diameter of ports A, B, P, T: Ø 11,2 mm (max)

DKZE-A-15



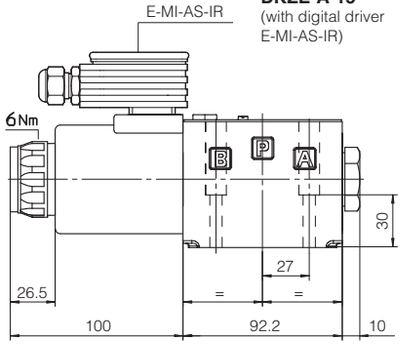
Mass: 4,5 kg

DKZE-A-17



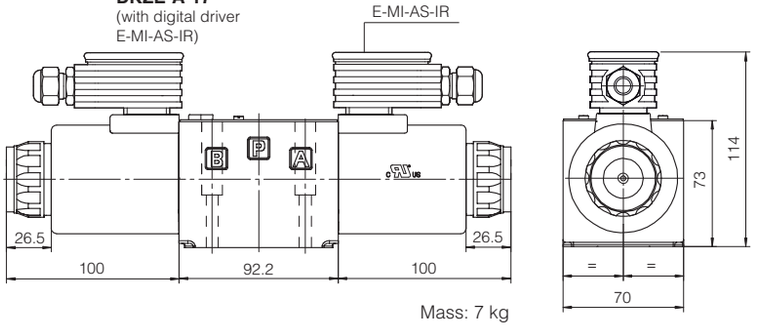
Mass: 6,1 kg

DKZE-A-15
(with digital driver E-MI-AS-IR)



Mass: 5 kg

DKZE-A-17
(with digital driver E-MI-AS-IR)



Mass: 7 kg

Note: for option /B the solenoid is at side of port A (only for DHZE-A-05 and DKZE-A-15)