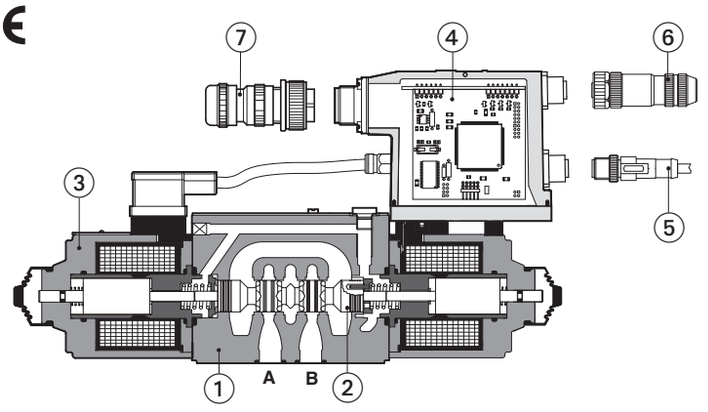
Proportional directional valves

digital, direct operated, open loop, with **positive spool overlap**



DKZOR-AES-BC-171

① Valve body
② Spool
③ Proportional solenoid
④ Integral electronics
⑤ USB connector
⑥ Fieldbus connector
⑦ Main connector

DHZO-A, DHZO-AEB, DHZO-AES
DKZOR-A, DKZOR-AEB, DKZOR-AES

Direct operated digital proportional valves without position transducer and with positive spool overlap, for open loop directional controls and not compensated flow regulations.

Executions:
- **A** without integral driver, to be coupled with separated drivers, see section 2.
- **AEB** with basic integral digital electronic driver, analog reference signals and USB port for software functional parameters setting.
- **AES** with full integral digital electronic driver and fieldbus interface for functional parameters setting, reference signals and real-time diagnostics.

The integral digital electronic driver performs the valve's hydraulic regulation according to the reference signal and assures valve-to-valve interchangeability thanks to the factory presetting

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

1 MODEL CODE for STANDARD SPOOLS

DHZO	-	A	ES	-	BP	-	0	71	-	L	5	/	*	/	*	*	/	*

DHZO = size 06
DKZOR = size 10

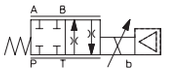
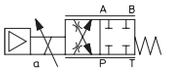
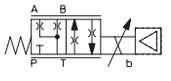
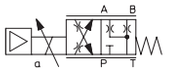
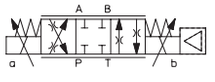
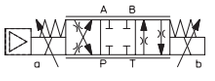
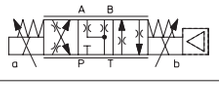
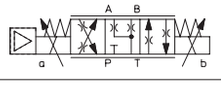
A = open loop

- = omit for execution with separated driver see section 2
EB = basic integral driver
ES = full integral driver

Fieldbus interfaces - USB port always present **(1)**:
NP = Not present **BC** = CANopen
BP = PROFIBUS DP **EH** = EtherCAT

Valve size - ISO 4401: **0** = 06 **1** = 10

Configuration (2):

	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 sect. 5, 6:
- = NBR
PE = FKM
BT = HNBR

Series number

Coil voltage only for **A** - see sect. 10 :
- = standard coil for 24V$_{DC}$ Atos drivers
6 = optional coil for 12V$_{DC}$ Atos drivers
18 = optional coil for low current drivers

Hydraulic options - see sect. 9:
B = solenoid and integral electronics at side of port A **(3)**
Y = external drain

Hand lever options, only for **A** - see sect. 10 :
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

Electronic options, only for **AEB, AES** - see sect. 11:
C = current feedback 4÷20 mA for remote transducer, only in combination with option **W**
I = current reference input 4÷20 mA (omit for standard voltage reference input ±10 V)
Q = enable signal
Z = double power supply, enable, fault and monitor signals - 12 pin connector
W = Power limitation function - 12 pin connector

Spool size:	**14** (L)	**1** (L)	**2** (S)	**3** (L,S,D)	**5** (L,S,D)
DHZO =	1	4,5	8	18	28
DKZOR =	-	-	-	45	60

Nominal flow (l/min) at Δp 10bar P-T

(1) Omit for **A** execution; **AEB** available only in version **NP**; **AES** available only in version **BC**, **BP**, **EH**
(2) Hydraulic symbols are rapresented with integral digital driver
(3) In standard configuration the solenoid (config. 51 and 53) and integral electronics (AEB, AES) are at side of port B
Special DHZO execution with max pressure **420 bar** available on request

2 ELECTRONIC DRIVERS

Valve model	A										AEB	AES
Drivers model	E-MI-AC-01F		E-BM-AC-01F		E-ME-AC-01F	E-MI-AS-IR		E-BM-AS-PS		E-BM-AES	E-RI-AEB	E-RI-AES
Type	Analog					Digital						
Voltage supply (V_{DC})	12	24	12	24	24	12	24	12	24	24	24	
Valve coil option	/6	std	/6	std	std	/6	std	/6	std	std	std	
Format	plug-in to solenoid		DIN 43700 UNDECAL		EUROCARD	plug-in to solenoid		DIN-rail panel			Integral to valve	
Data sheet	G010		G025		G035	G020		G030		GS050	GS115	

Note: For main and communication connector see sections 13 , 14

3 GENERAL NOTES

DHZO-A* and DKZOR-A* 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.

4 FIELDBUS - only for **AES**

Fieldbus allows the direct communication of the proportional valve with machine control unit for digital reference signal, diagnostics and settings of functional parameters. Analog reference signal remain available on the main connector for quick commissioning and maintenance. For detailed information about fieldbus features and specification see tech table **GS510**.

5 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	**A**: **standard** = -20°C ÷ +70°C, **/BT** option = -40°C ÷ +60°C **AEB, AES**: **standard** = -20°C ÷ +60°C, **/BT** option = -40°C ÷ +60°C					
Storage temperature range	**A**: **standard** = -20°C ÷ +80°C, **/BT** option = -40°C ÷ +70°C **AEB, AES**: **standard** = -20°C ÷ +70°C, **/BT** option = -40°C ÷ +70°C					
Coil code	**DHZO**			**DKZOR**		
	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	**A** = 30W **AEB, AES** = 50W			**A** = 35W **AEB, AES** = 50W		
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	IP66/67 with mating connectors					
Tropicalization	Tropical coating on electronics PCB					
Duty factor	Continuous rating (ED=100%)					
EMC, climate and mechanical load	See technical table G004					
Communication interface	USB Atos ASCII coding	CANopen EN50325-4 + DS408		PROFIBUS DP EN50170-2/IEC61158	EtherCAT IEC 61158	
Communication physical layer	not insulated USB 2.0 + USB OTG	optical insulated CAN ISO11898		optical insulated RS485	Fast Ethernet, insulated 100 Base TX	

Valve model		DHZO					DKZOR	
Pressure limits [bar]		ports **P**, **A**, **B** = 350; **T** = 210 (250 with external drain /Y); **Y** = 10					ports **P**, **A**, **B** = 315; **T** = 210 (250 with external drain /Y); **Y** = 10	
Spool type		**L14**	**L1**	**S2**	**L3,S3,D3**	**L5,S5,D5**	**L3,S3,D3**	**L5,S5,D5**
Nominal flow [l/min] **(1)**	Δp= 10 bar	1	4,5	8	18	28	45	60
Δp P-T	Δp= 30 bar	1,7	8	14	30	50	80	105
max	Δp= 70 bar	2,6	12	21	45	70	120	160
permissible flow **(2)**		4	18	30	50	70	120	160
Response time [ms] (0-100% step signal) **(3)**		30					40	
Leakage [cm^3/min]		<30 (at p = 100 bar); <135 (at p = 350 bar)					<80 (at p = 100 bar); <600 (at p = 315 bar)	
Hysteresis		≤ 5 [% of max regulation]						
Repeatability		± 1 [% of max regulation]						

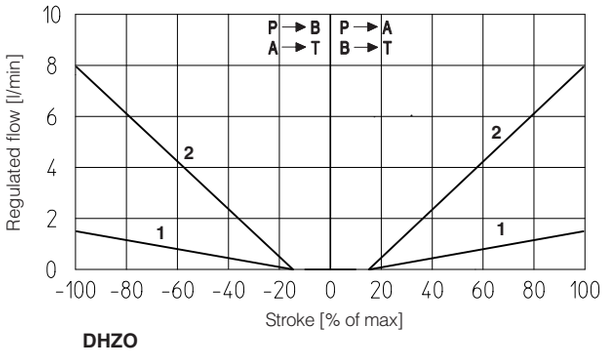
Notes: above performance data refer to valves coupled with Atos electronic drivers, see section 2
(1) for different Δp, the max flow is in accordance to the diagrams in section 7.2 **(2)** see detailed diagrams in section 7.3
(3) see detailed diagrams in section 7.4

6 **SEALS AND HYDRAULIC FLUID** - for other fluids not included in below table, consult our technical office

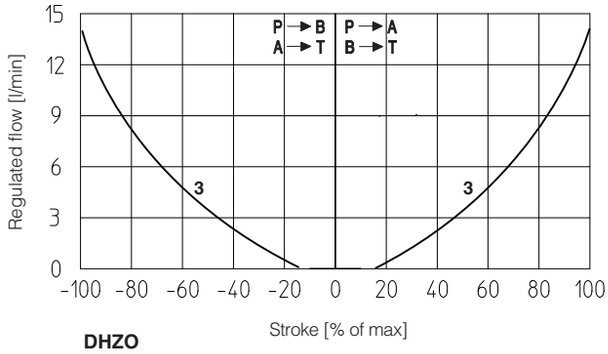
Seals, recommended fluid temperature	NBR seals (standard) = -20°C ÷ +60°C, with HFC hydraulic fluids = -20°C ÷ +50°C FKM seals (/PE option) = -20°C ÷ +80°C HNBR seals (/BT option) = -40°C ÷ +60°C, with HFC hydraulic fluids = -40°C ÷ +50°C		
Recommended viscosity	20 ÷ 100 mm²/s - max allowed range 15 ÷ 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	

7 **DIAGRAMS** - based on mineral oil ISO VG 46 at 50 °C

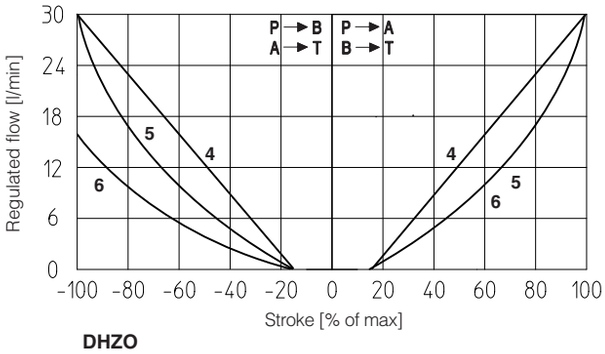
7.1 **Regulation diagrams** - values measure at Δp 30 bar P-T



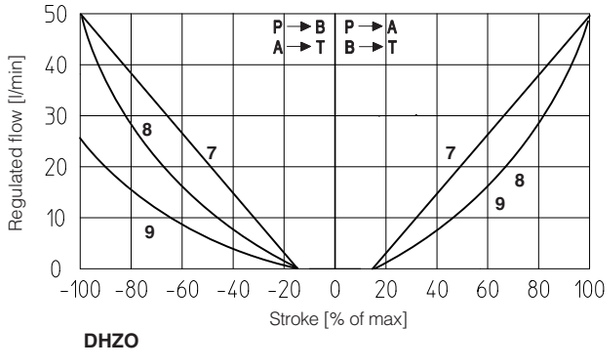
DHZO
1 = L14 **2** = L1



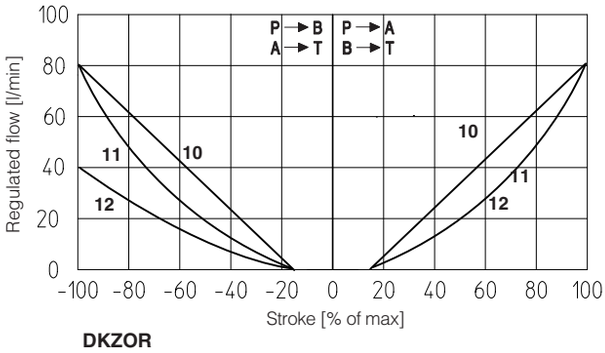
DHZO
3 = S2



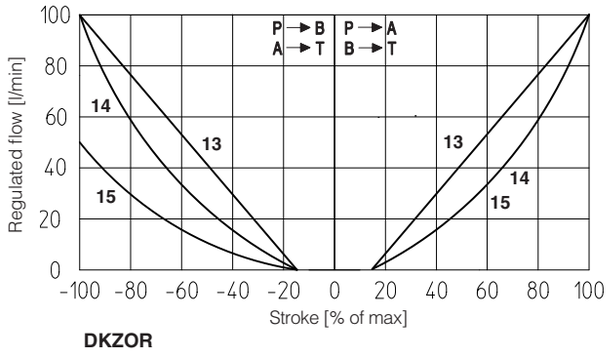
DHZO
4 = L3 **5** = S3 **6** = D3



DHZO
7 = L5 **8** = S5 **9** = D5



DKZOR
10 = L3 **11** = S3 **12** = D3



DKZOR
13 = L5 **14** = S5 **15** = D5

Note: Hydraulic configuration vs. reference signal for configurations 71 and 73 (standard and option /B)

Reference signal $\left.\begin{matrix}0 \div +10\ V\\ 12 \div 20\ mA\end{matrix}\right\}$ P → A / B → T Reference signal $\left.\begin{matrix}0 \div -10\ V\\ 12 \div 4\ mA\end{matrix}\right\}$ P → B / A → T

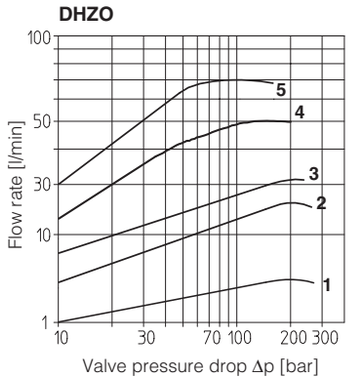
7.2 Flow /Δp diagrams
stated at 100% of valve stroke

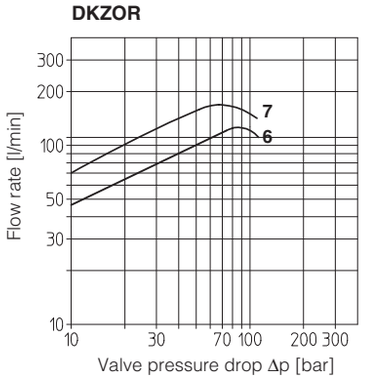
DHZO

1 = spool L14
2 = spool L1
3 = spool S2
4 = spool L3, S3, D3
5 = spool L5, S5, D5

DKZOR

6 = spool S3, L3, D3
7 = spool S5, L5, D5





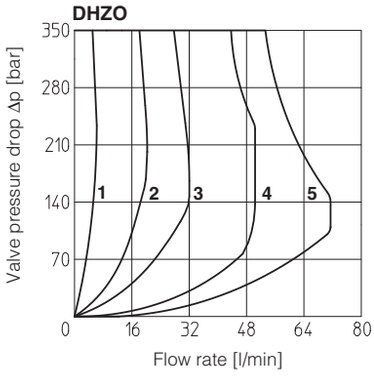
7.3 Operating limits

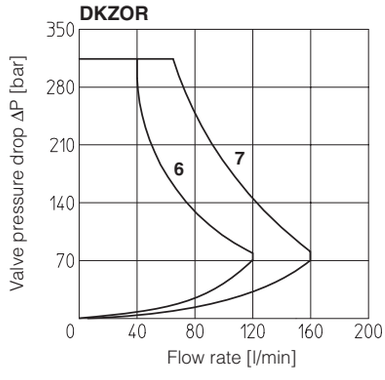
DHZO

1 = spool L14
2 = spool L1
3 = spool S2
4 = spool L3, S3, D3
5 = spool L5, S5, D5

DKZOR

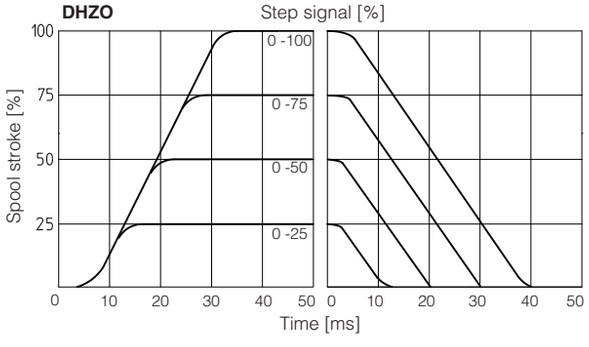
6 = spool S3, L3, D3
7 = spool S5, L5, D5

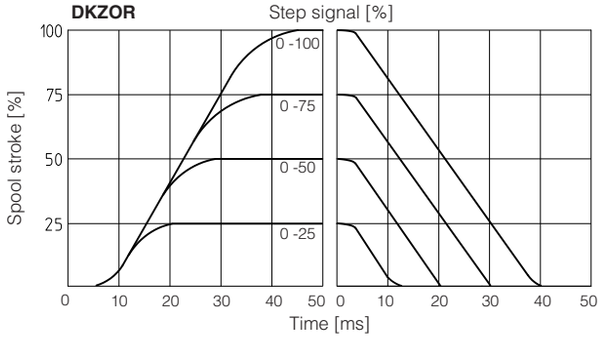




7.4 Response time

The response times in below diagrams are measured at different steps of the reference input signal. They have to be considered as average values. For the valves with digital electronics the dynamics performances can be optimized by setting the internal software parameters.

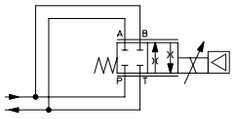




7.5 Operation as throttle valve

Single solenoid valves configuration 51 and 53 can be used as simple throttle valves:
Pmax = 250 bar (option /Y advisable)

Max flow Δp= 30bar [l/min]	SPOOL TYPE				
	L14	**L1**	**S2**	**L3 S3**	**L5 S5**
DHZO	4	16	28	60	100
DKZOR				130	170



8 **PROGRAMMING TOOLS** - see tech table **GS500**

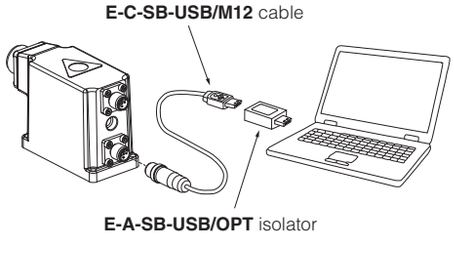
Valve's functional parameters and configurations, can be easily set and optimized using Atos E-SW programming software connected via USB port to the digital driver. For fieldbus versions, the software permits valve's parameterization through USB port also if the driver is connected to the central machine unit via fieldbus.

The software is available in different versions according to the driver's options:

E-SW-BASIC	support:	NP (USB)	PS (Serial)	IR (Infrared)
E-SW-FIELDBUS	support:	BC (CANopen)	BP (PROFIBUS DP)	EH (EtherCAT)
		EW (POWERLINK)	EI (EtherNet/IP)	
E-SW-*/PQ	support:	valves with SP, SF, SL alternated control (e.g. E-SW-BASIC/PQ)		

WARNING: drivers USB port is not isolated!
The use of isolator adapter is highly recommended for PC protection (see table **GS500**)

USB connection



9 HYDRAULIC OPTIONS

9.1 Option /B

DHZO-05 and DKZOR-15: solenoid and integral electronics at side of port A of the main stage.
DHZO-07 and DKZOR-17: integral electronics at side of port A of the main stage.

9.2 Option /Y

External drain advisable when the valve is used in double flow path, see section 7.5. Option /Y is mandatory if the pressure in port T exceeds 210 bar.

10 OPTIONS for -A

10.1 Coil voltage

Option /6 optional coil to be used with Atos drivers with power supply 12 VDC
Option /18 optional coil to be used with electronic drivers not supplied by Atos

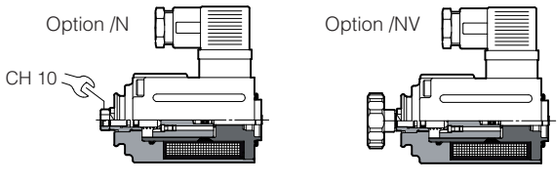
10.2 Hand lever

This option is available only for DHZO-A with spool type S3, S5, D3, D5, L3, L5.
It allows to operate the valve in absence of electrical power supply. For detailed description of DHZO-A with hand lever option see tech. table E138

Option /MO horizontal hand lever
Option /BMO horizontal hand lever installed at side of port A
Option /MV vertical hand lever
Option /BMV vertical hand lever installed at side of port A

The following supplementary options allow to operate the valve in absence of electrical power supply by means of a micrometric screw replacing the standard solenoid manual override, see tech. table TK150

Option /N manual micrometric adjustment
Option /NV as /N plus handwheel and graduated scale



11 ELECTRONIC OPTIONS for AEB and AES

Standard driver execution provides on the 7 pin main connector:

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

Reference input signal - analog differential input with ±10 VDC nominal range (pin D, E), proportional to desired coil current

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

Note: a minimum booting time of 500 ms has be considered from the driver energizing with the 24 VDC power supply before the valve has been ready to operate. During this time the current to the valve coils is switched to zero.

11.1 Option /I

It provides 4 ÷ 20 mA current reference signal, instead of the standard ±10 V.

Input signal can be reconfigured via software selecting between voltage and current, within a maximum range of ±10 V or ±20 mA.

It is normally used in case of long distance between the machine control unit and the valve or where the reference signal can be affected by electrical noise; the valve functioning is disabled in case of reference signal cable breakage.

11.2 Option /Q

To enable the driver, supply 24 VDC on pin C referred to pin B: Enable input signal allows to enable/disable the current supply to the solenoid, without removing the electrical power supply to the driver; it is used to maintain active the communication and the other driver functions when the valve has to be disabled. This condition does not comply with European Norms EN13849-1 (ex EN954-1).

11.3 Option /Z

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

Enable Input Signal

To enable the driver, supply 24 VDC on pin 3 referred to pin 2: Enable input signal allows to enable/disable the current supply to the solenoid, without removing the electrical power supply to the driver; it is used to maintain active the communication and the other driver functions when the valve has to be disabled. This condition does not comply with European Norms EN13849-1 (ex EN954-1).

Fault Output Signal

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

Power supply for driver's logics and communication

Separate power supply (pin 9,10) allow to cut solenoid power supply (pin 1,2) while maintaining active diagnostics, USB and fieldbus communication.
A safety fuse is required in series to each driver power supply: 500 mA fast fuse.

11.4 Option /W - only for valves coupled with pressure compensator type HC-011 or KC-011 (see tab. D150).

It provides, on the 12 pin main connector, the above option /Z features plus the hydraulic power limitation function.
The driver receives the flow reference signal by the analog input INPUT+ and a pressure transducer, installed in the hydraulic system, has to be connected to the driver's analog input TR.
When the actual requested hydraulic power **p**x**Q** (TR x INPUT+) reaches the max power limit (p1xQ1), internally set by software, the driver automatically reduces the flow regulation of the valve. The higher is the pressure feedback the lower is the valve's regulated flow:

$$\text{Flow regulation} = \text{Min}\left(\frac{\text{PowerLimit [sw setting]}}{\text{Transducer Pressure [TR]}}\ ;\ \text{Flow Reference [INPUT+]}\right)$$

For detailed information on hydraulic power limitation, see tab. GS115

11.5 Option /C - only in combination with option **/W**

Option /C is available to connect pressure transducer with 4 ÷ 20 mA current output signal, instead of the standard 0 ÷ 10V .
Input signal can be reconfigured via software selecting between voltage and current, within a maximum range of ±10 V or ±20 mA.

11.6 Possible combined options: /IQ, /IZ, /IW, /CW and **/CWI**

12 ELECTRONIC CONNECTIONS

12.1 Main connector signals - 7 pin - **standard** and **/Q** options - **AEB** and **AES** (A1)

PIN	Standard	/Q	TECHNICAL SPECIFICATIONS	NOTES
A	**V+**		Power supply 24 VDC Rectified and filtered: VRMS = 20 ÷ 32 VMAX (ripple max 10 % VPP)	Input - power supply
B	**V0**		Power supply 0 VDC	Gnd - power supply
C	**AGND**		Analog ground	Gnd - analog signal
		ENABLE	Enable (24 VDC) or disable (0 VDC) the driver, referred to V0	Input - on/off signal
D	**INPUT+**		Reference input signal: ±10 VDC / ±20 mA maximum range Defaults are ±10 VDC for standard and 4 ÷ 20 mA for /I option	Input - analog signal **Software selectable**
E	**INPUT-**		Negative reference input signal for INPUT+	Input - analog signal
F	**MONITOR** referred to: AGND / V0		Monitor output signal: ±5 VDC maximum range Default is ± 5 VDC (1V = 1A)	Output - analog signal **Software selectable**
G	**EARTH**		Internally connected to driver housing	

12.2 Main connector signals - 12 pin - **/Z** and **/W** options - **AEB** and **AES** (A2)

PIN	/Z	/W	TECHNICAL SPECIFICATIONS	NOTES
1	**V+**		Power supply 24 VDC Rectified and filtered: VRMS = 20 ÷ 32 VMAX (ripple max 10 % VPP)	Input - power supply
2	**V0**		Power supply 0 VDC	Gnd - power supply
3	**ENABLE**		Enable (24 VDC) or disable (0 VDC) the driver, referred to V0	Input - on/off signal
4	**INPUT+**		Reference input signal: ±10 VDC / ±20 mA maximum range Defaults are ±10 VDC for standard and 4 ÷ 20 mA for /I option	Input - analog signal **Software selectable**
5	**INPUT-**		Negative reference input signal for INPUT+	Input - analog signal
6	**MONITOR**		Monitor output signal: ±5 VDC maximum range, referred to VL0 Default is ± 5 VDC (1V = 1A)	Output - analog signal
7	**NC**		Do not connect	
8	**NC**		Do not connect	
		MONITOR2	2nd monitor output signal: ±5 VDC maximum range, default is 0 ÷ 5 VDC	Output - analog signal
9	**VL+**		Power supply 24 VDC for driver's logic and communication	Input - power supply
10	**VL0**		Power supply 0 VDC for driver's logic and communication	Gnd - power supply
11	**FAULT**		Fault (0 VDC) or normal working (24 VDC), referred to V0	Output - on/off signal
PE	**EARTH**		Internally connected to driver housing	

12.3 Communication connectors - **AEB** (B) and **AES** (B) - (C)

(B) **USB connector - M12 - 5 pin** always present		
PIN	**SIGNAL**	**TECHNICAL SPECIFICATION (1)**
1	**+5V_USB**	Power supply
2	**ID**	Identification
3	**GND_USB**	Signal zero data line
4	**D-**	Data line -
5	**D+**	Data line +

(C1) **BC fieldbus execution, connector - M12 - 5 pin (2)**		
PIN	**SIGNAL**	**TECHNICAL SPECIFICATION (1)**
1	**CAN_SHLD**	Shield
2	**NC**	do not connect
3	**CAN_GND**	Signal zero data line
4	**CAN_H**	Bus line (high)
5	**CAN_L**	Bus line (low)

(C2) **BP fieldbus execution, connector - M12 - 5 pin (2)**		
PIN	**SIGNAL**	**TECHNICAL SPECIFICATION (1)**
1	**+5V**	Termination supply signal
2	**LINE-A**	Bus line (high)
3	**DGND**	Data line and termination signal zero
4	**LINE-B**	Bus line (low)
5	**SHIELD**	

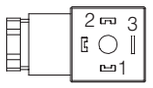
(C3) (C4) **EH fieldbus execution, connector - M12 - 4 pin (2)**		
PIN	**SIGNAL**	**TECHNICAL SPECIFICATION (1)**
1	**TX+**	Transmitter
2	**RX+**	Receiver
3	**TX-**	Transmitter
4	**RX-**	Receiver
Housing	**SHIELD**	

Notes: (1) shield connection on connector's housing is recommended **(2)** only for **AES** execution

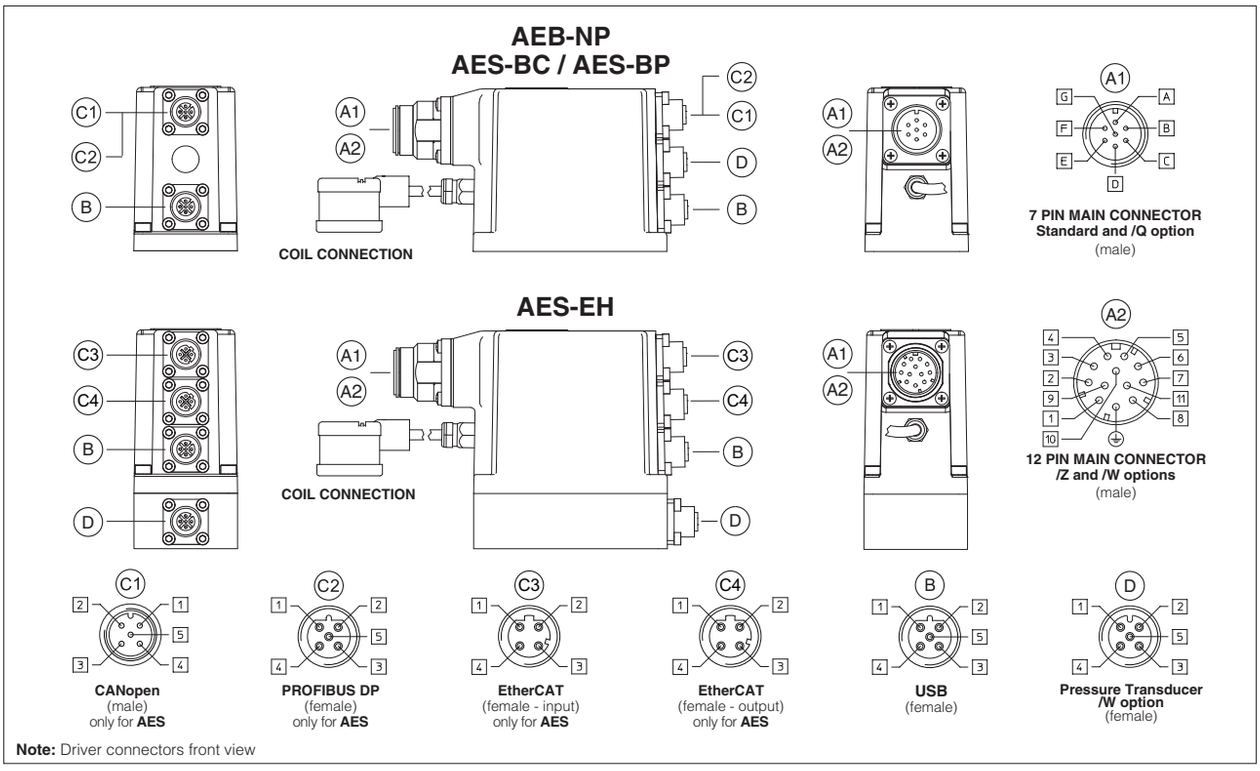
12.4 Pressure transducer connector - **M12 - 5 pin** - only for **/W** option (D)

PIN	SIGNAL	TECHNICAL SPECIFICATION	Voltage	Current
1	**VF +24V**	Power supply +24VDC	Connect	Connect
2	**TR**	Signal transducer maximum range ±10 VDC / ±20 mA, software selectable Defaults are 0 ÷ 10 VDC for standard and 4 ÷ 20 mA for /C option	Connect	Connect
3	**AGND**	Common GND for transducer power and signals	Connect	/
4	**NC**	Not Connect	/	/
5	**NC**	Not Connect	/	/

12.5 Solenoid connection - only for **A**

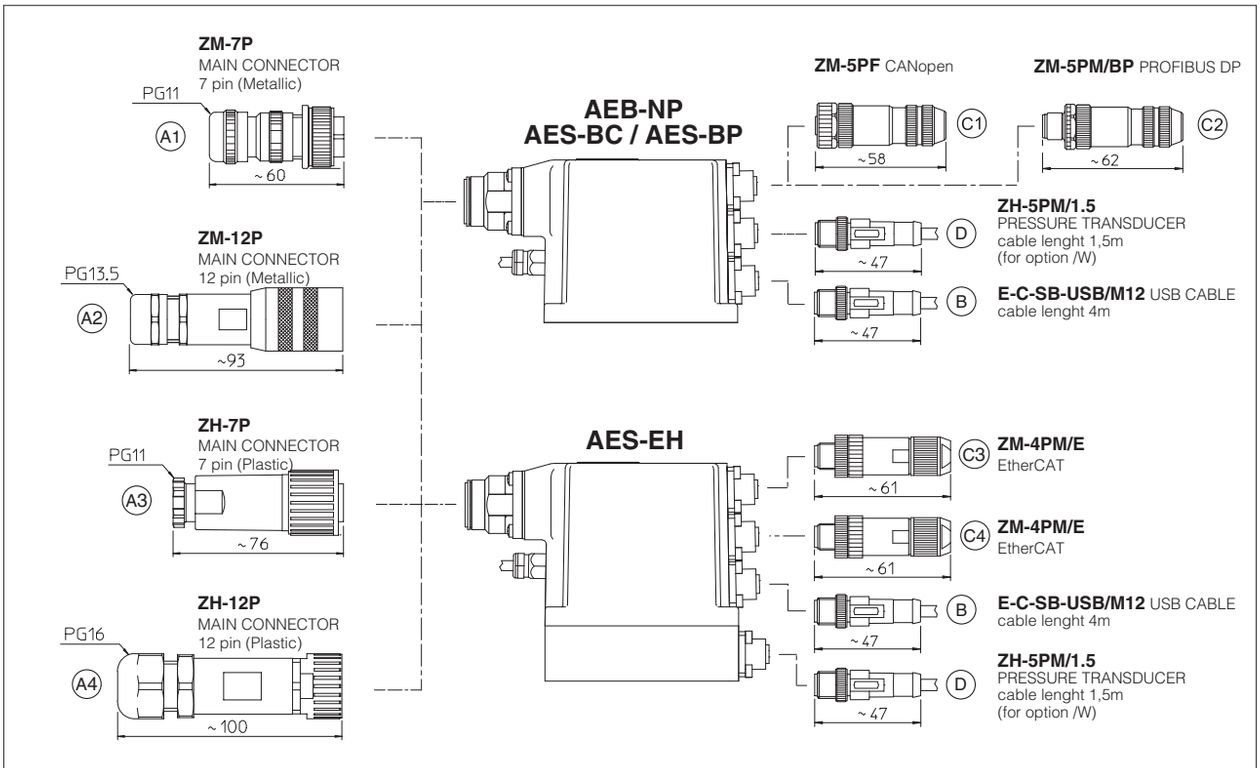
PIN	SIGNAL	TECHNICAL SPECIFICATION	Connector code 666
1	**COIL**	Power supply	
2	**COIL**	Power supply	
3	**GND**	Ground	

12.6 Connections layout - only for **AEB** and **AES**



Note: Driver connectors front view

13 CONNECTORS



Note: use of metallic connectors is strongly recommended in order to fulfill EMC requirements

14 MODEL CODES OF MAIN CONNECTORS AND COMMUNICATION CONNECTORS - to be ordered separately

VALVE VERSION	A (1)	AEB, AES std and /Q	AEB, AES /Z and /W	AEB, AES /W	BC - CANopen	BP - PROFIBUS DP	EH - EtherCAT
CONNECTOR CODE	666	ZM-7P (A1)	ZM-12P (A2)	ZH-5PM/1.5 (D)	ZM-5PF (C1)	ZM-5PM/BP (C2)	ZM-4PM/E (C3)
		ZH-7P (A3)	ZH-12P (A4)				ZM-4PM/E (C4)
PROTECTION DEGREE	IP67	IP67					
DATA SHEET	K500	GS115, K500					

(1) Connector supplied with the valve

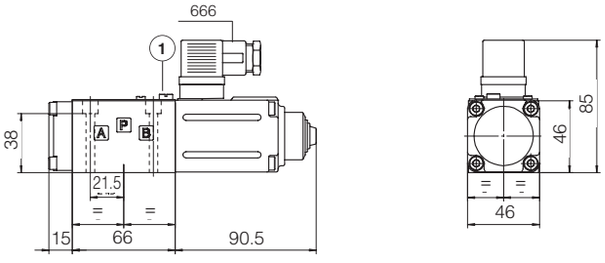
only for **AES**

15 INSTALLATION DIMENSIONS FOR DHZO [mm]

ISO 4401: 2005
Mounting surface: 4401-03-02-0-05 (see table P005)
(for /Y version, surface 4401-03-03-0-05 without X port)

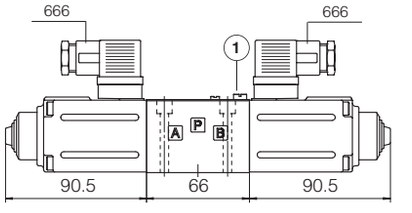
Fastening bolts: 4 socket head screws M5x50 class 12.9
Tightening torque = 8 Nm
Seals: 4 OR 108; 1 OR 2025
Diameter of ports A, B, P, T: Ø 7,5 mm (max)
Diameter of port Y: Ø = 3,2 mm (only for /Y option)

DHZO-A-05



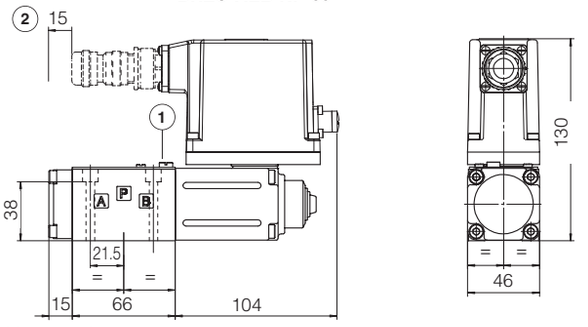
Mass: 1,9 kg

DHZO-A-07



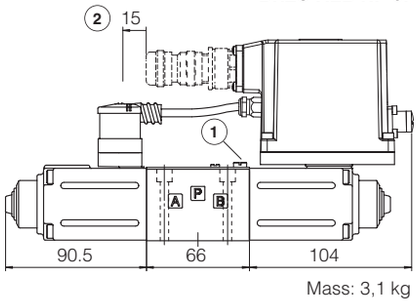
Mass: 2,6 kg

DHZO-AEB-NP-05



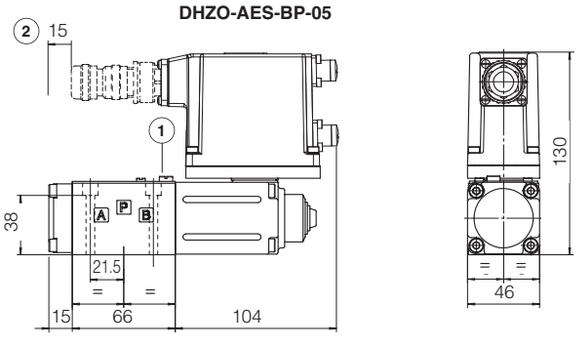
Mass: 2,3 kg

DHZO-AEB-NP-07



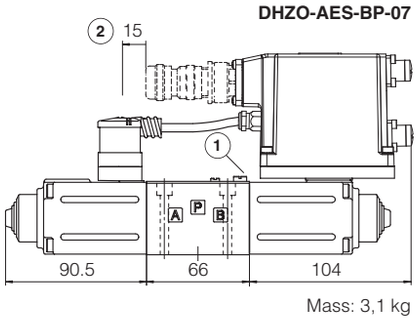
Mass: 3,1 kg

DHZO-AES-BC-05
DHZO-AES-BP-05



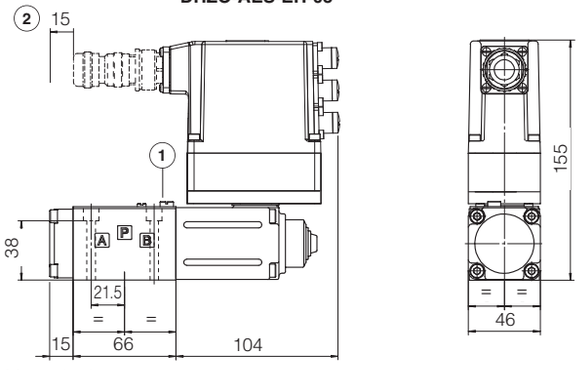
Mass: 2,3 kg

DHZO-AES-BC-07
DHZO-AES-BP-07



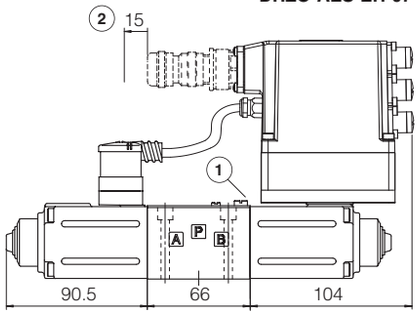
Mass: 3,1 kg

DHZO-AES-EH-05



Mass: 2,4 kg

DHZO-AES-EH-07



Mass: 3,2 kg

(1) = Screw for air bleeding: at the first valve commissioning the air eventually trapped inside the solenoid must be bled-off through the screw (1)

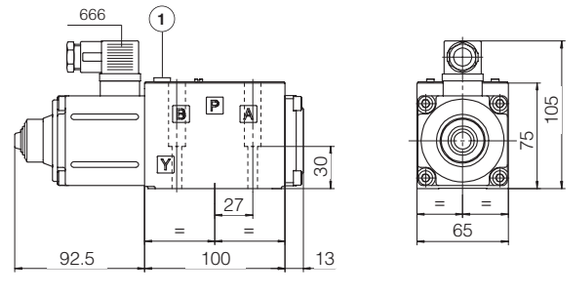
(2) = Space to remove the 7 or 12 pin main connector. For main and communication connectors see section 13, 14

16 INSTALLATION DIMENSIONS FOR DKZOR [mm]

ISO 4401: 2005
Mounting surface: 4401-05-04-0-05 (see table P005)
(for /Y version, surface 4401-05-05-0-05 without X port)

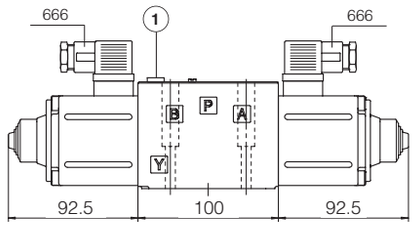
Fastening bolts: 4 socket head screws M6x40 class 12.9
Tightening torque = 15 Nm
Seals: 5 OR 2050; 1 OR 108
Diameter of ports A, B, P, T: Ø 11,2 mm (max)
Diameter of port Y: Ø = 5 mm (only for /Y option)

DKZOR-A-15



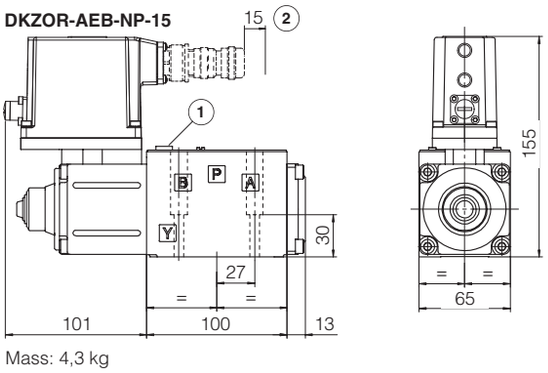
Mass: 3,8 kg

DKZOR-A-17



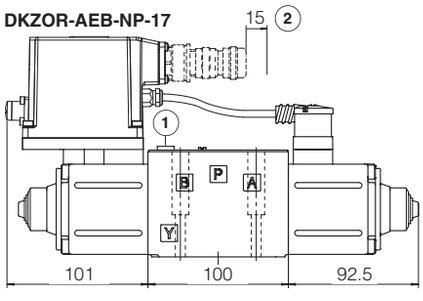
Mass: 4,5 kg

DKZOR-AEB-NP-15



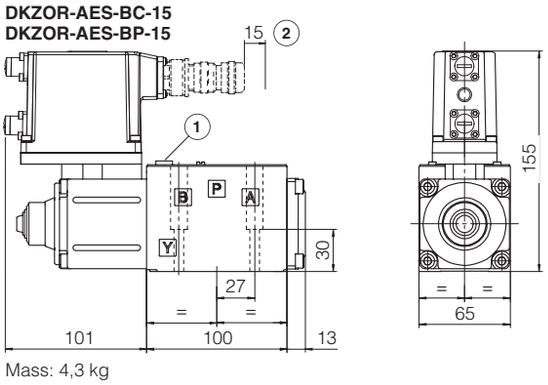
Mass: 4,3 kg

DKZOR-AEB-NP-17



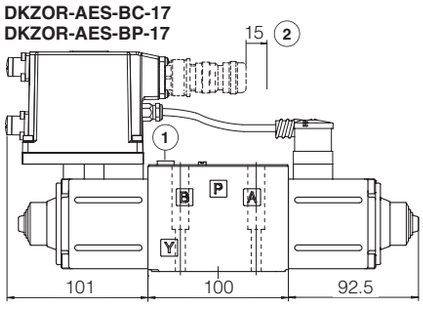
Mass: 5,0 kg

DKZOR-AES-BC-15
DKZOR-AES-BP-15



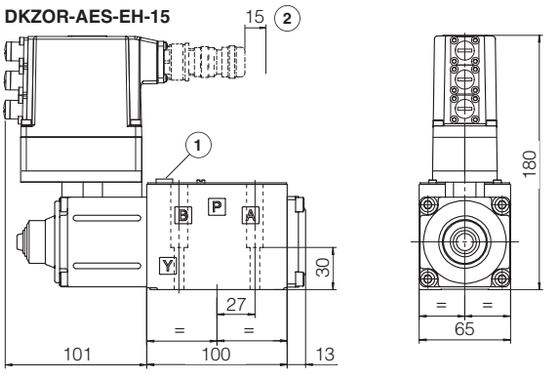
Mass: 4,3 kg

DKZOR-AES-BC-17
DKZOR-AES-BP-17



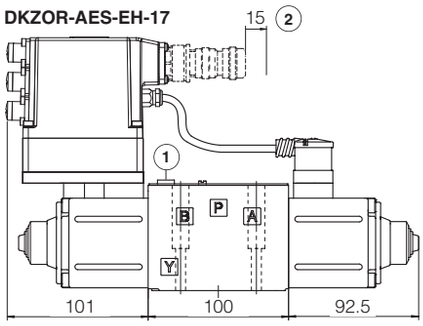
Mass: 5,0 kg

DKZOR-AES-EH-15



Mass: 4,4 kg

DKZOR-AES-EH-17



Mass: 5,1 kg

(1) = Screw for air bleeding: at the first valve commissioning the air eventually trapped inside the solenoid must be bled-off through the screw (1)

(2) = Space to remove the 7 or 12 pin main connector. For main and communication connectors see section 13, 14