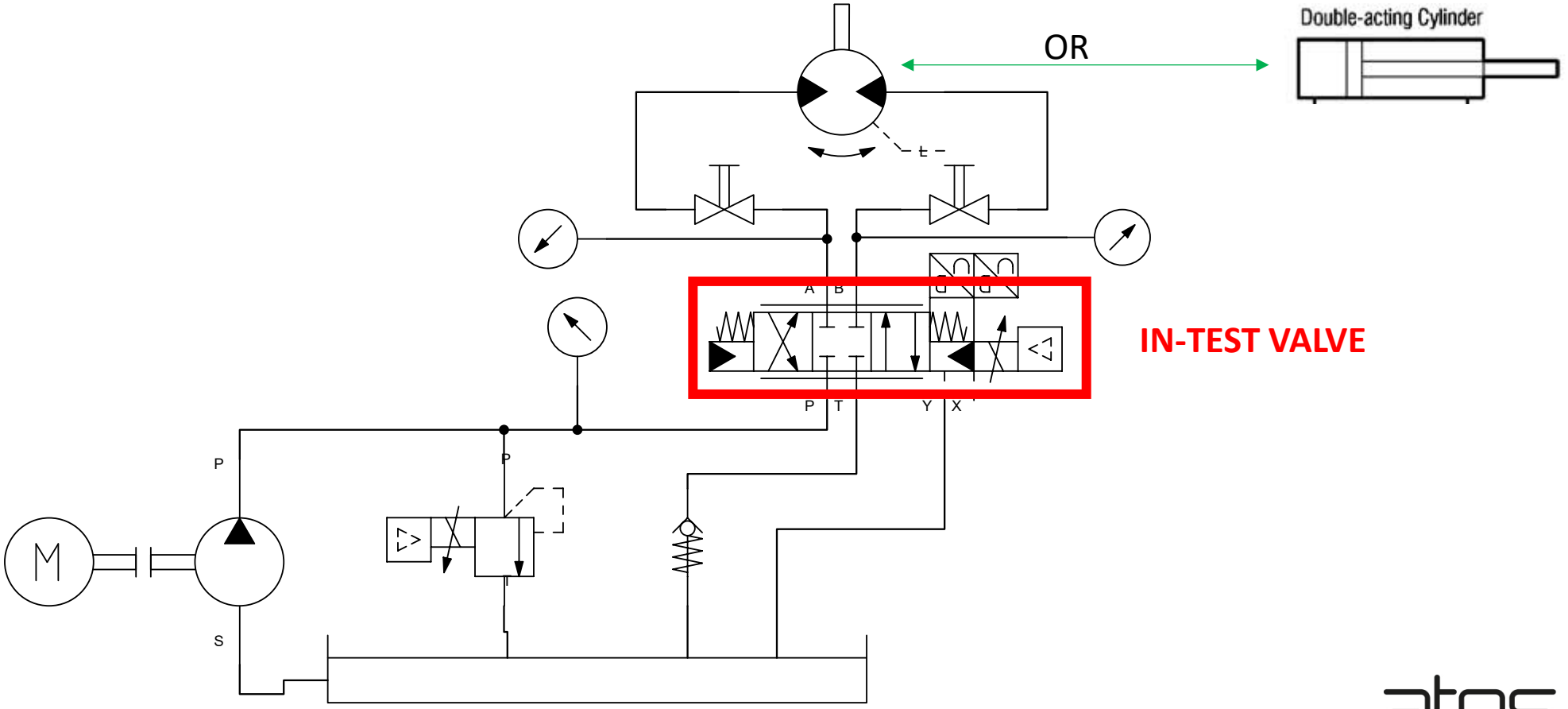
Service Center Training

Directional proportional valve AE / TID valves

HYDRAULIC TEST BENCH

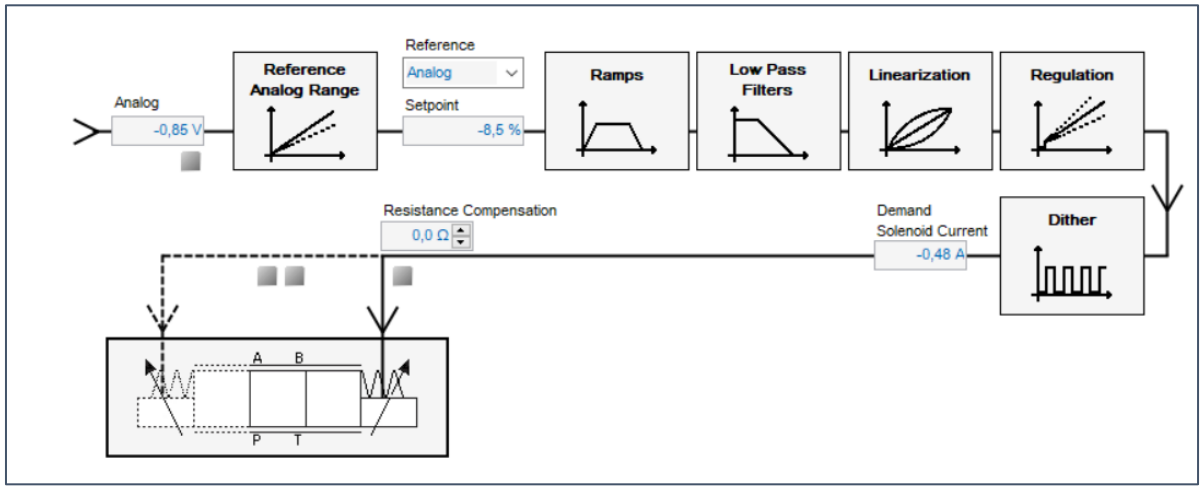


Open *A* / closed *T* loop proportional valve

-A

Open loop control – No feedback

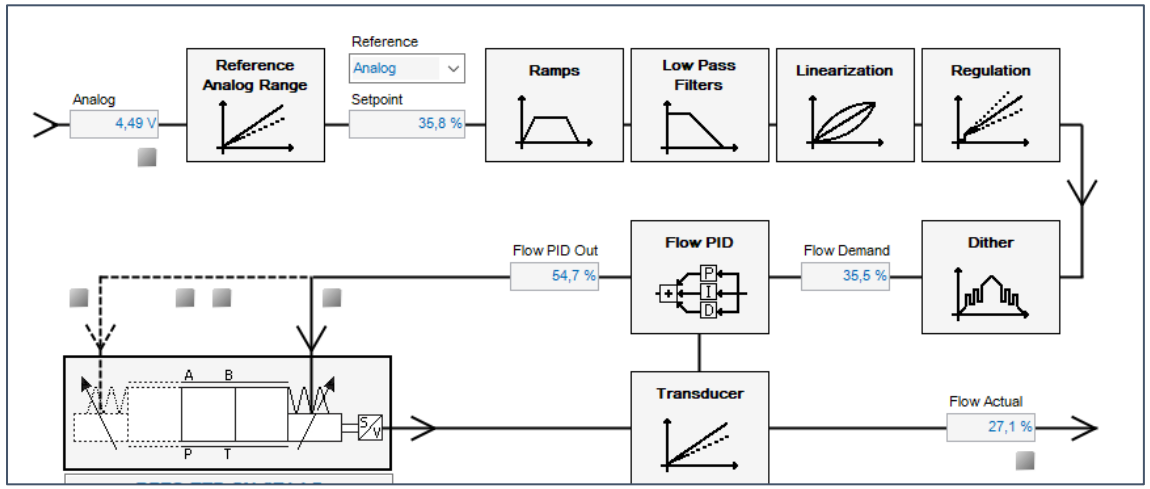
- Reference Signal proportional to Solenoid Current hence force.
- Less expensive
- Less accurate
- Flow forces dependent



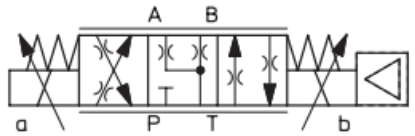
-T

Closed loop control – position transducer feedback

- Reference Signal proportional to spool stroke
- More expensive
- More accurate

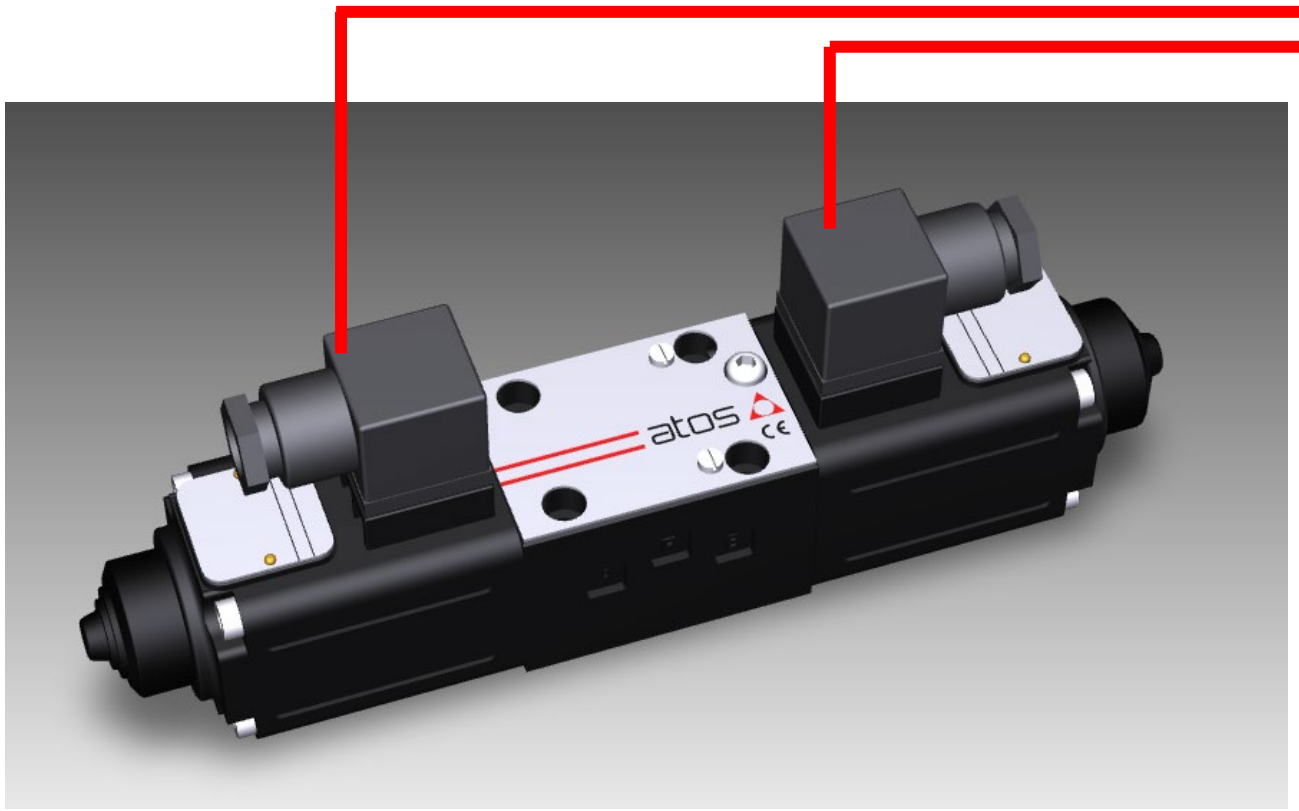


DHZO-A-073-L5 + E-BM-AES



Digital **proportional** valves **without position transducer** and with **positive spool overlap**, for open loop directional controls with off-board electronic and not compensated flow regulations.

Dither frequency	
Coil 12 V	200 Hz
Coil 24 V	130 Hz



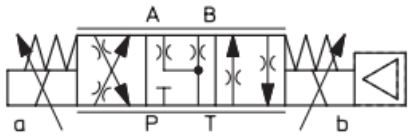
E-BM-AES

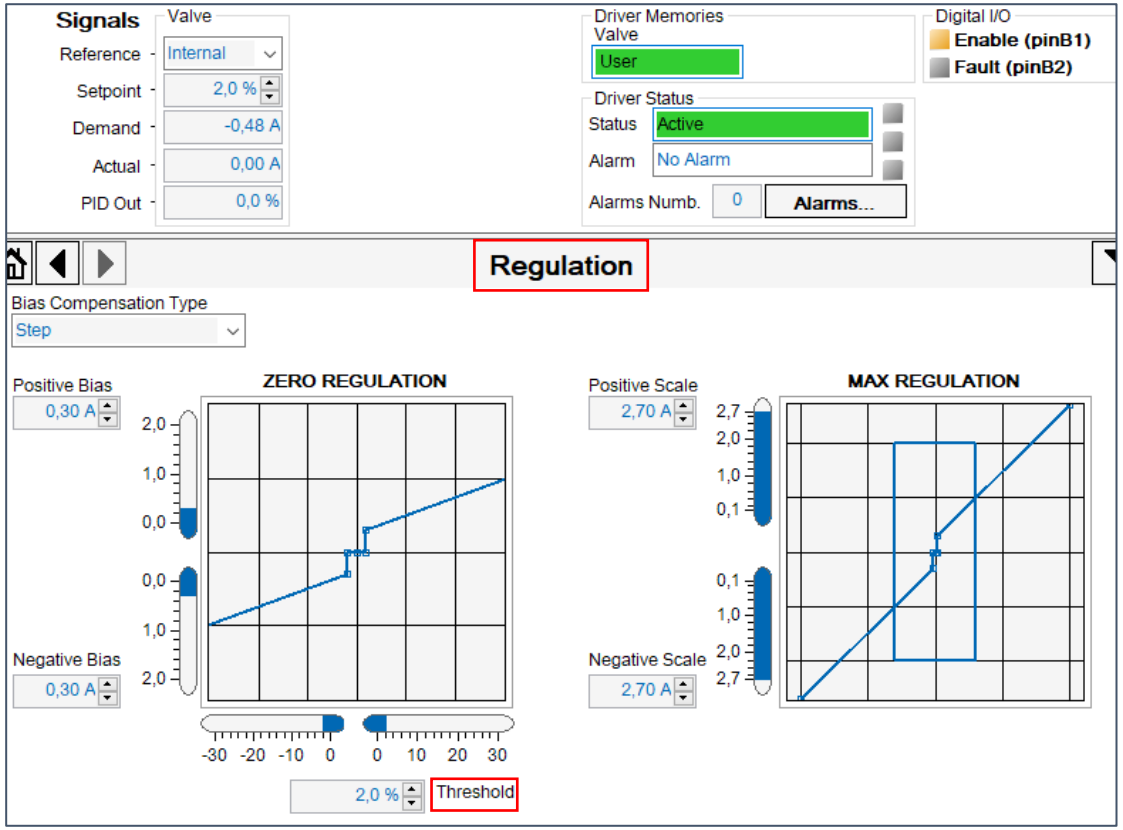
PIN-OUT

Digital drivers control the current to the solenoid of Atos proportional valves without transducer, according to the electronic reference input signal.

CONNECTOR	PIN	SIGNAL	TECHNICAL SPECIFICATIONS	NOTES
A	A1	**V+**	Power supply 24 Vdc (see 5.1)	Input - power supply
	A2	**V0**	Power supply 0 Vdc (see 5.1)	Gnd - power supply
	A3	**VL+**	Power supply 24 Vdc for driver's logic and communication (see 5.2)	Input - power supply
	A4	**VL0**	Power supply 0 Vdc for driver's logic and communication (see 5.2)	Gnd - power supply
B	B1	**ENABLE**	Enable (24 Vdc) or disable (0 Vdc) the driver, referred to VL0 (see 5.5)	Input - on/off signal
	B2	**FAULT**	Fault (0 Vdc) or normal working (24 Vdc), referred to VL0 (see 5.6)	Output - on/off signal
	B3	**VL0**	Ground for ENABLE and FAULT	Gnd - digital signals
	B4	**EARTH**	Connect to system ground	
C	C1	**SOL_S1-**	Negative current to solenoid S1	Output - power PWM
	C2	**SOL_S1+**	Positive current to solenoid S1	Output - power PWM
	C3	**SOL_S2-**	Negative current to solenoid S2	Output - power PWM
	C4	**SOL_S2+**	Positive current to solenoid S2	Output - power PWM
E available only for **/W** option	E1	**VF +24V**	Power supply +24 Vdc	Output - power supply
	E2	**TR+**	Positive pressure transducer input signal: ±10 Vdc / ±20 mA maximum range (see 5.7) Default are 0 ÷ 10 Vdc for standard and 4 ÷ 20 mA for /C option	Input - analog signal **Software selectable**
	E3	**NC**	Do not connect	
	E4	**AGND**	Common GND for transducer power, signals and external potentiometer	
F	F1	**+5V_REF**	External potentiometer power supply +5 Vdc @ 10mA (see 5.8)	Output - power supply
	F2	**INPUT+**	Positive reference input signal: ±10 Vdc / ±20 mA maximum range (see 5.3) Default are ±10 Vdc for standard and 4 ÷ 20 mA for /I option	Input - analog signal **Software selectable**
	F3	**INPUT-**	Negative reference input signal for INPUT+	Input - analog signal
	F4	**-5V_REF**	External potentiometer power supply -5 Vdc @ 10mA (see 5.8)	Output - power supply
G	G1	**EARTH**	Connect to system ground	
	G2	**AGND**	Analog ground for MONITOR and external potentiometer	Gnd - analog signal
	G3	**MONITOR2**	Only for /W option, 2nd monitor output signal: ±5 Vdc maximum range (see 5.4) Default is 0 ÷ 5 Vdc	Output - analog signal **Software selectable**
	G4	**MONITOR**	Monitor output signal: ±5 Vdc maximum range (see 5.4) Default is ±5 Vdc (1V = 1A)	Output - analog signal **Software selectable**
H	H1	**VL0**	Power supply 0 Vdc for digital input (see 5.2)	Gnd - power supply
	H2	**D_IN1**	Digital input 0 ÷ 24Vdc, referred to VL0	Input - on/off signal
	H3	**D_IN0**	Digital input 0 ÷ 24Vdc, referred to VL0	Input - on/off signal
	H4	**VL+**	Power supply 24 Vdc for digital input (see 5.2)	Output - power supply

DHZO-A-073-L5 + E-BM-AES



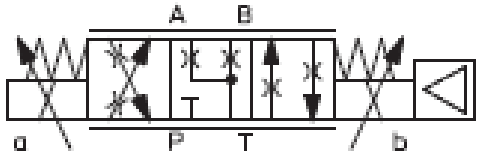


7 **HYDRAULIC CHARACTERISTICS** - based on mineral oil ISO VG 46 at 50 °C

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 Δp P-T [l/min] **(1)**	Δp= 10 bar	1	4,5	8	18	28	45	60
	Δp= 30 bar	1,7	8	14	30	50	80	105
	Δp= 70 bar	2,6	12	21	45	70	120	160
	Max permissible flow **(2)**	4	18	30	50	70	120	160
Leakage [cm³/min]		<30 (at p = 100 bar); <135 (at p = 350 bar)					<80 (at p = 100 bar); <600 (at p = 315 bar)	
Response time **(3)** [ms]		≤ 30					≤ 40	
Hysteresis		≤ 5 [% of max regulation]						
Repeatibility		± 1 [% of max regulation]						

Note: 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 10.2
(2) See detailed diagrams in section 10.3
(3) 0-100% step signal, see detailed diagrams in section 10.4

DHZO-AE-073-L5



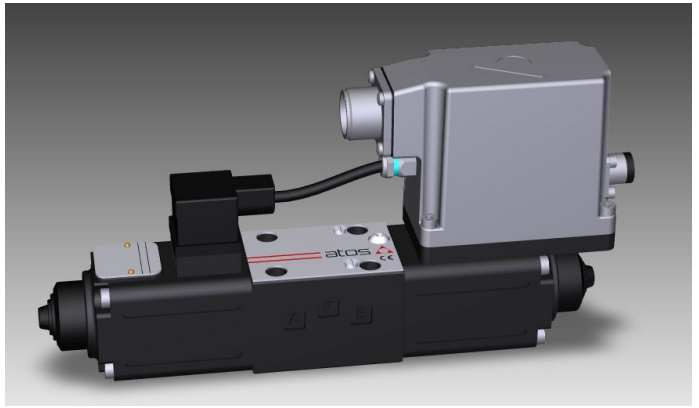
Digital proportional valves without position transducer and with positive spool overlap, for open loop directional controls and not compensated flow regulations.

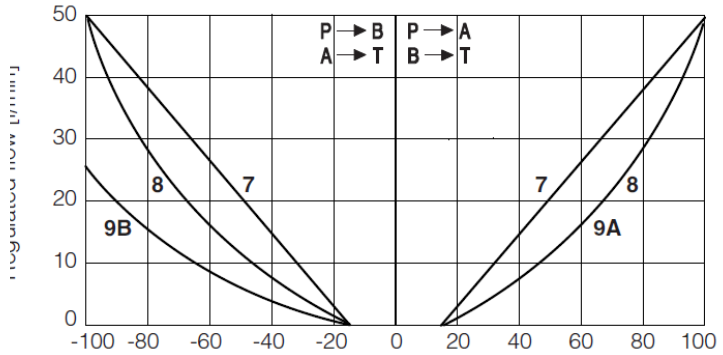
7 **HYDRAULIC CHARACTERISTICS** - based on mineral oil ISO VG 46 at 50 °C

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 Δp P-T [l/min] **(1)**							
Δp= 10 bar	1	4,5	8	18	28	45	60
Δp= 30 bar	1,7	8	14	30	50	80	105
Δp= 70 bar	2,6	12	21	45	70	120	160
Max permissible flow **(2)**	4	18	30	50	70	120	160
Leakage [cm³/min]	<30 (at p = 100 bar); <135 (at p = 350 bar)					<80 (at p = 100 bar); <600 (at p = 315 bar)	
Response time **(3)** [ms]	≤ 30					≤ 40	
Hysteresis	≤ 5 [% of max regulation]						
Repeatibility	± 1 [% of max regulation]						

Note: above performance data refer to valves coupled with Atos electronic drivers, see section 2

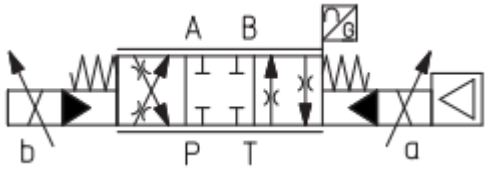
(1) For different Δp, the max flow is in accordance to the diagrams in section 10.2
(2) See detailed diagrams in section 10.3
(3) 0-100% step signal, see detailed diagrams in section 10.4





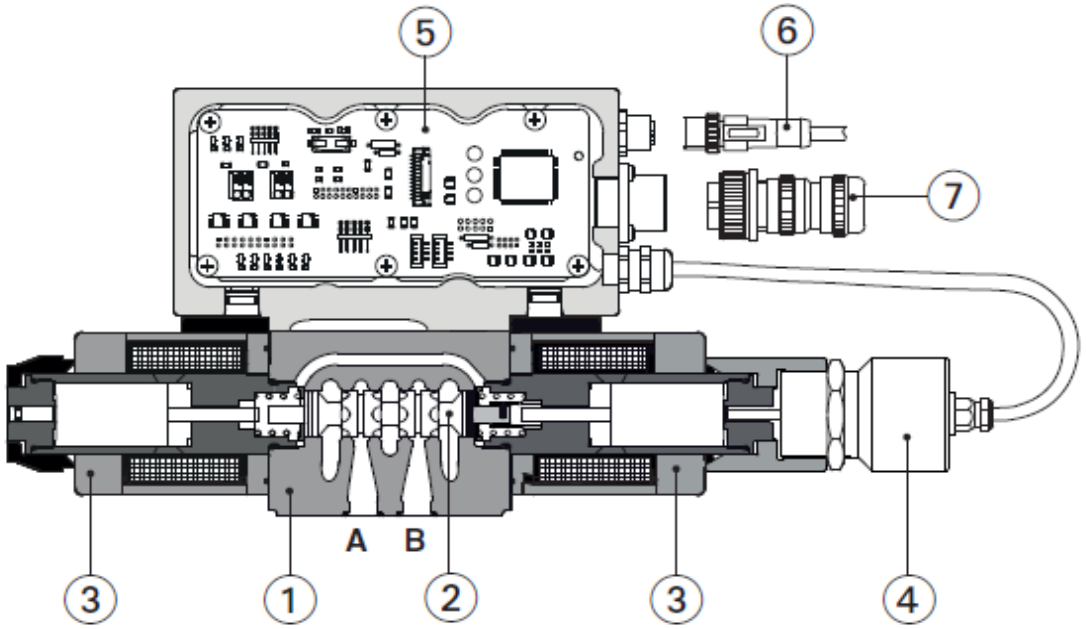
DHZO
7 = L5 **8** = S5 **9A** = D5 (P → A, A → T)
9B = D5 (P → B, B → T)

DKZE-TID-171-D5



Digital high performances **proportional** directional valves, **direct, with LVDT position transducer** and **positive spool overlap** for directional controls and not compensated flow regulations.

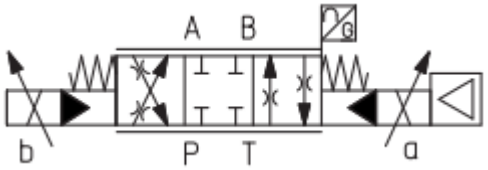
CE

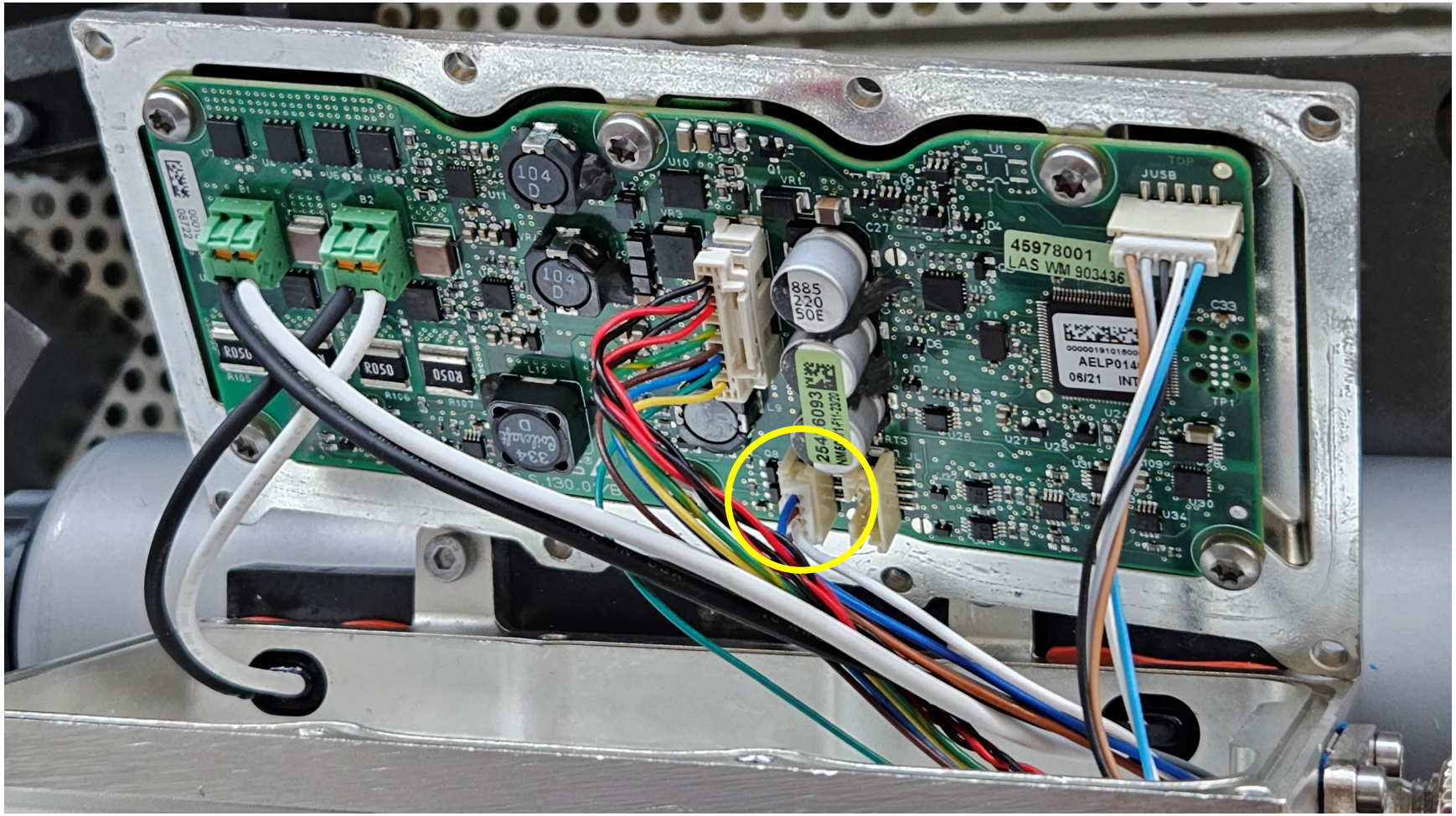


DKZE-TID-NP-17*

① Valve body
② Spool
③ Proportional solenoid
④ LVDT transducer
⑤ On-board digital driver
⑥ USB connector
⑦ Main connector

DKZE-TID-171-D5





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