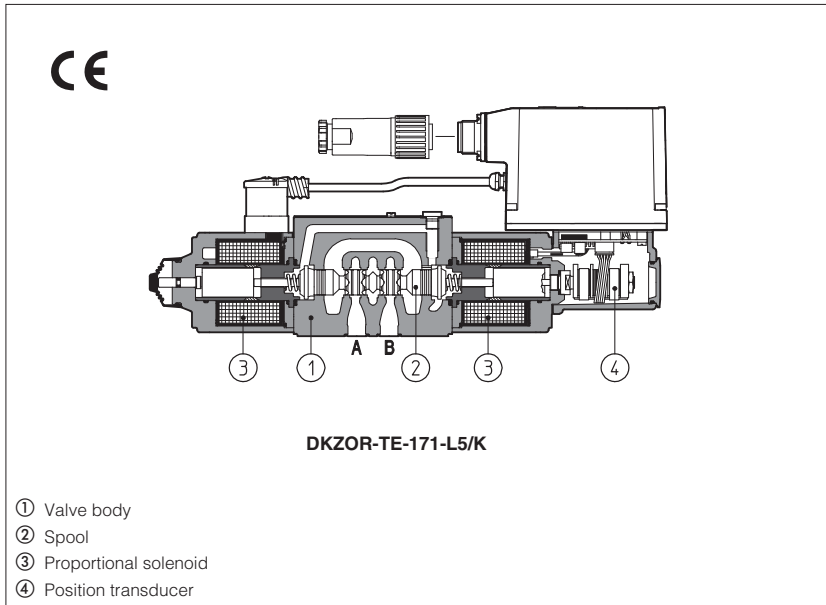


# Proportional directional valves with logic state signals

direct operated, with position transducer, ISO 4401 size 06 and 10



DHZO-TE/K and DKZOR-TE/K are proportional valves, direct operated, with LVDT position transducer and integral analog driver with logic state signals which provides the real time monitor of the spool position and thus of the valve's hydraulic regulation (P-A, P-B or central) plus the solenoid energizing status.

Sizes **06** and **10**

Max flow **74 l/min** and **170 l/min**

Max pressure: **350 bar** for DHZO;  
**315 bar** for DKZOR.

## 1 MODEL CODE

<b>DHZO</b>	-	<b>TE</b>	-	<b>0</b>	<b>7</b>	<b>1</b>	-	<b>S</b>	<b>5</b>	/	<b>K</b>	/	<b>**</b>	/	<b>*</b>
<p><b>DHZO</b> = size 06 <b>DKZOR</b> = size 10</p>		<p><b>TE</b> = with position transducer plus integral analog electronics</p>		<p>Valve size <b>0</b> = ISO 4401 size 06 <b>1</b> = ISO 4401 size 10</p>		<p>Configuration, see section 3 <b>7</b> = 3 position, spring centered</p>		<p>Spool overlapping in central position, see section 3 <b>1</b> = P,A,B,T positive overlapping (20% of spool stroke)</p>		<p>Spool size: <b>14, 1, 2, 3, 5</b> = see section 3</p>		<p><b>K</b> = with logic state signals, see section 5 <b>Hydraulic options</b>, see section 3: <b>Y</b> = external drain <b>Electronics options</b>: <b>I</b> = current reference input and monitor (4÷20mA)</p>		<p>Seals material - = NBR <b>PE</b> = FKM</p> <p>Series number</p>	

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

Hydraulic symbols

Valve model	DHZO-T*					DKZOR-T*	
	L14	L1	S2	S3, L3, D3	S5, L5, D5	S3, L3, D3	S5, L5, D5
Spool type and size							
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)	
Max flow (1) [l/min]							
at Δp = 10 bar (P-T)	1	4,5	8	17	28	45	75
at Δp = 30 bar (P-T)	2	8	14	30	50	80	130
at Δp = 70 bar (P-T)	3	12	21	45	74	120	170
Response time (2) [ms]	< 15					< 20	
Hysteresis [%]	≤ 0,2%					≤ 0,2%	
Repeatability [%]	± 0,1%					± 0,1%	
Thermal drift	zero point displacement < 1% at ΔT = 40°C						

**Note:** for technical characteristics, performance diagrams and overall dimensions, see tech. table F165

### 3 HYDRAULIC OPTIONS

**3.1 Option /Y** External drain advisable when the valve is used in double flow path, see section 13.5 and 14.5. Option /Y is mandatory if the pressure in port T exceeds 160 bar.

### 4 GENERAL NOTES

DHZO and DKZOR 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.

The electrical signals of the valve (e.g. monitor signals) must not be directly used to activate safety functions, like to switch-ON/OFF the machine's safety components, as prescribed by the European standards (Safety requirements of fluid technology systems and components-hydraulics, EN-892).

**Power supply** - 24V<sub>DC</sub> must be appropriately stabilized or rectified and filtered; a 2,5 A safety fuse is required in series to the 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 V<sub>dc</sub> nominal range (pin D,E), proportional to desired valve spool position

**Monitor output signal** - analog output signal proportional to the actual valve's spool position with ±10 V<sub>dc</sub> nominal range

### 5 LOGIC STATE SIGNALS - CODE K

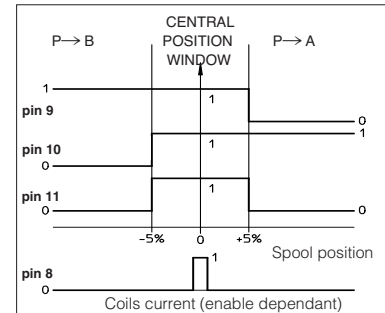
This option provides, by means of four ON/OFF output signals, a real time monitor of the valve's hydraulic regulation (P-A, P-B or Central) and of the solenoid energizing status.

It can be used to improve the system safety level, by interfacing the four signals to a specific CE certified electronics: beside the standard safety valves the machine CNC can also recognize the proportional valve regulation during the working cycle.

The valve regulation is identified by the contemporaneous status on the four signals, as shown in the beside diagram. The central position indicates no hydraulic regulation: "central position window" is located across the valve's mechanical zero within ± 5% of the total stroke and it provides a reliable information about the actuator stopped condition (valve's spools have a nominal positive overlap of ± 20% of total stroke). The signal on pin 8 identifies the solenoid energizing status and depends on enable signal status (see 6.3): "0" = coil current active and "1" = coil current zero (enable signal must be 0V<sub>dc</sub>).

For all signals, the logic state "0" produces an output voltage signal ≤ 1 V<sub>dc</sub> while the logic state "1" produces an output voltage signal ≥ 22 V<sub>dc</sub>.

State Signals



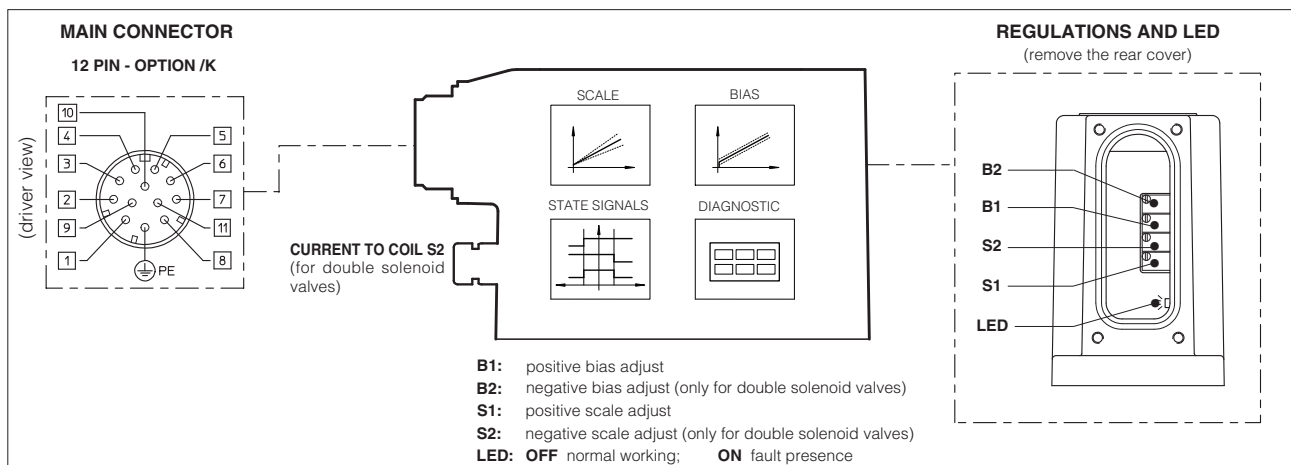
### 6 ELECTRONIC OPTIONS

#### 6.1 Option /I

It provides the 4÷20 mA current reference and monitor signals instead of the standard ±10 V<sub>dc</sub>

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.

### 7 ANALOG INTEGRAL DRIVERS -TE - MAIN FUNCTIONS AND ELECTRONIC CONNECTIONS



#### 7.1 ELECTRONIC CONNECTIONS - 12 PIN MAIN CONNECTOR

/Z option 12pin	SIGNAL	TECHNICAL SPECIFICATIONS	NOTES
1	V+	Power supply 24 V <sub>dc</sub> for solenoid power stage and driver logic	Input - power supply
2	V0	Power supply 0 V <sub>dc</sub> for solenoid power stage and driver logic	Gnd - power supply
3	ENABLE	Enable (24 V <sub>dc</sub> ) or disable (0 V <sub>dc</sub> ) the driver	Input - on/off signal
4	INPUT+	Reference analog differential input: ±10 V <sub>dc</sub> maximum range (4 ÷ 20 mA for /I option) For single solenoid valves the reference input is 0÷+10 V <sub>dc</sub> (4 ÷ 20 mA for /I option)	Input - analog signal
5	INPUT -	For double solenoid valves the reference input is ±10 V <sub>dc</sub> (4 ÷ 20 mA for /I option)	
6	MONITOR	Monitor analog output: ±10 V <sub>dc</sub> maximum range (4 ÷ 20 mA for /I option)	Output - analog signal
7	AGND	Ground - signal zero for MONITOR signal	Input - analog signal
8	COIL OFF	Coils current logic signal	Output - on/off signal
9	P → B	P → B position logic signal	Output - on/off signal
10	P → A	P → A position logic signal	Output - on/off signal
11	ZERO	ZERO position logic signal	
PE	EARTH	Internally connected to the driver housing	

**Note:** a minimum time of 50ms to 100ms have be considered between the driver energizing with the 24 V<sub>dc</sub> power supply and when the valve is ready to operate. During this time the current to the valve coils is switched to zero.