Proportional directional valves type DHZO-T* and DKZOR-T*
direct operated, with position transducer, ISO 4401 size 06 and 10

DHZO-T* and DKZOR-T* are proportional valves, direct operated, with LVDT position transducer, which provide both directional and non-compensated flow control according to the electronic reference signal. They operate in association with electronic drivers, see section 8, which supply the proportional valves with proper current to align valve regulation to the reference signal supplied to the electronic driver. They are available in different executions:
- T, with integral position transducer 
- -TE, -TES as T plus analog (TE) or digital (TES) integral electronics.

The 4-way spool, sliding into a 5-chambers body, is directly operated by solenoids and it is controlled in closed loop position by means of the LVDT position transducer.
The integral electronics ensures factory presetting, fine functionality plus valve-to-valve interchangeability and simplified wiring and installation.
The electronic main connector is fully interchangeable for -TE and -TES executions.
Standard 7 pin main connector is used for power supply, analog input reference and monitor signals.
12 pin connector is used for options (K, IZ and S*).
The special S* options add a closed loop control of pressure (ISP) or force (ISF and /SL) to the basic closed loop spool position one.
Following communication interfaces are available for the digital -TES execution:
- -PS, Serial communication interface. The valve reference signal is provided with analogue commands
- -BC, CANopen interface
- -BP, PROFIBUS DP interface
The valves with -BC and -BP interfaces can be integrated into a fieldbus communication network and thus digitally operated by the machine control unit.
The coils are fully plastic encapsulated (insulation class H) and the valves have antivibration, antishock and weather-proof features.
Mounting surface: ISO 4401 sizes 06 and 10. Max flow respectively up to 50 l/min and 130 l/min with valve differential pressure Δp = 30 bar, see table 8.
Max pressure = 350 bar for DHZO; 315 bar for DKZOR.

DKZOR-TE-PS-171

1. Valve body
2. Spool
3. Proportional solenoid
4. Position transducer
5. Main connector
6. Communication connector
7. Integral electronics

Series number

1. MODEL CODE

<table>
<thead>
<tr>
<th>DHZO</th>
<th>-TES</th>
<th>PS</th>
<th>0</th>
<th>7</th>
<th>1</th>
<th>S</th>
<th>5</th>
<th>/</th>
<th>*</th>
<th>/</th>
<th>**</th>
<th>/</th>
<th>*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>-TE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>-BP</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

DHZO = size 06
DKZOR = size 10

Communication interfaces (only for TES):
- PS = Serial
- BC = CANopen
- BP = PROFIBUS DP

Valve size:
- G140 = ISO 4401 size 06
- G200 = ISO 4401 size 10

Configuration:
- 0 = 3 position, spring centered
- 1 = external plus central position, spring centered

Spool overlapping in central position, see section 8:
- 0 = zero overlap (0 to 5 % spool stroke)
- 1 = P, A, B, T positive overlapping (20% of spool stroke)
- 2 = P, A, B, T positive overlapping with A-B draining (1)
- 3 = positive overlapping (20% of spool stroke); A, B, T, negative

Spool size: 14, 1, 2, 3, 5, 9 = see section 8

Notes:
1. Only for DKZOR-T* the spool overlapping type 2 provides the same characteristic of type 1, but in central position the internal leakages from P to A and B are drained to tank, avoiding the drift of cylinders with differential areas.
2. The spool type V is available only in size 9 for additional closed loop pressure controls, see section 13.1 and 14.1

2. ELECTRONIC DRIVERS

<table>
<thead>
<tr>
<th>Valve model</th>
<th>-T</th>
<th>-TE</th>
<th>-TES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drivers model</td>
<td>E-ME-T</td>
<td>E-RI-TE</td>
<td>E-RI-TES</td>
</tr>
<tr>
<td>Data sheet</td>
<td>G140</td>
<td>G200</td>
<td>G210</td>
</tr>
</tbody>
</table>

Note: For power supply and communication connector see section 8 and 9
3 HYDRAULIC CHARACTERISTICS (based on mineral oil ISO VG 46 at 50 °C)

4 ANALOG INTEGRAL DRIVERS -TE- OPTIONS

7.4 Option /Z

7.6 Possible combined options: /E, /I, /K and /JZ

4 HYDRAULIC OPTIONS

4.1 Option /B

4.2 Option /Y

5 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).

7 CONNECTIONS FOR -T EXECUTION

Position transducer connector

State signals

State Signals

P→B

CENTRAL POSITION WINDOW

P→A

pin 9

1

pin 10

0

pin 11

0

pin 8

0

Spool position

Coulomb current (enable dependent)

Standard driver execution provides on the 7 pin main connector:

Power supply
- 24VDC must be appropriately stabilized or rectified and filtered; a 2.5 A safety fuse is required in series to the driver power supply.

Reference input signal
- analog differential input with ±10 VDC 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 VDC nominal range

Following options are available to adapt standard execution to special application requirements:

7.1 Option /F
It provides a Fault output signal in place of the Monitor output signal, to indicate fault conditions of the driver (cable interruption of spool transducers or reference signal - for /I option). Fault presence corresponds to 0 VDC, normal working corresponds to 24 VDC.

7.2 Option /I
It provides the 4÷20 mA current reference instead of the standard ±10 VDC

7.3 Option /Q
It provides the possibility to enable or disable the valve functioning without cutting the power supply (the valve functioning is disabled but the driver current output stage is still active). To enable the driver supply a 24VDC on the enable input signal.

7.4 Option /Z
This option includes /F and /Q features, plus the Monitor output signal.

When the driver is disabled (0 VDC on enable signal) Fault option is forced to 0 VDC.

7.5 Option /K (only for DHZO-TE-071* and DKZOR-TE-171*)

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 logic board.

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 0 VDC).

For all signals, the logic state “0” produces an output voltage signal ≤ 1 Vdc, while the logic state “1” produces an output current signal ≥ 22 Vdc.

7.6 Possible combined options: /E, /I, /K and /JZ

Notes:
• Above performance data refer to valves coupled with Atos electronic drivers, see sections 4.

• The flow regulated by the directional proportional valves is not pressure compensated, thus it is affected by the load variations. To keep constant the regulated flow under different load conditions, modular pressure compensators are available (see tab. D150).
8 ANALOG INTEGRAL DRIVERS -TE - MAIN FUNCTIONS AND ELECTRONIC CONNECTIONS

8.1 ELECTRONIC CONNECTIONS - 7 & 12 PIN MAIN CONNECTORS

<table>
<thead>
<tr>
<th>Standard 7pin</th>
<th>Z/K option 12pin</th>
<th>SIGNAL</th>
<th>TECHNICAL SPECIFICATIONS</th>
<th>NOTES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>1</td>
<td>V+</td>
<td>Power supply 24 Vcc for solenoid power stage and driver logic</td>
<td>Input - power supply</td>
</tr>
<tr>
<td>B</td>
<td>2</td>
<td>V0</td>
<td>Power supply 0 Vcc for solenoid power stage and driver logic</td>
<td>Gnd - power supply</td>
</tr>
<tr>
<td>C</td>
<td>7</td>
<td>AGND</td>
<td>Ground - signal zero for MONITOR signal (for standard, /Z and /K options)</td>
<td>Input - analog signal</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>ENABLE</td>
<td>Enable (24 Vcc) or disable (0 Vcc) the driver (for /Q, /Z and /K options)</td>
<td>Input - off/on signal</td>
</tr>
<tr>
<td>D</td>
<td>4</td>
<td>INPUT+</td>
<td>Reference analog differential input: ±10 Vcc maximum range</td>
<td>Input - analog signal</td>
</tr>
<tr>
<td>E</td>
<td>5</td>
<td>INPUT-</td>
<td>For single solenoid valves the reference input is 0+÷10 Vcc (4 ÷ 20 mA for /I option)</td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>6</td>
<td>MONITOR Monitor analog output: ±10 Vcc maximum range</td>
<td>Output - analog signal</td>
<td></td>
</tr>
<tr>
<td></td>
<td>11</td>
<td>FAULT</td>
<td>Fault (0V) or normal working (24V)</td>
<td>Output - off/on signal</td>
</tr>
<tr>
<td></td>
<td>8</td>
<td>P_ENABLE Repeat Enable - output repetition of Enable input</td>
<td>Output - off/on signal</td>
<td></td>
</tr>
<tr>
<td></td>
<td>9</td>
<td>NC</td>
<td>do not connect</td>
<td>Output - off/on signal</td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>NC</td>
<td>do not connect</td>
<td>Output - off/on signal</td>
</tr>
<tr>
<td>G</td>
<td>PE</td>
<td>EARTH</td>
<td>Internally connected to the driver housing</td>
<td></td>
</tr>
</tbody>
</table>

Notes
(1) with /Q option ENABLE signal replaces AGND on pin C; MONITOR signal is referred to pin B
(2) with /F option FAULT signal replaces MONITOR on pin F.

* A minimum time of 50ms to 100ms have been considered between the driver energizing with the 24 Vcc power supply and when the valve is ready to operate. During this time the current to the valve coils is switched to zero.

9 DIGITAL INTEGRAL DRIVERS -TES - OPTIONS

Standard driver execution provides on the 7 pin main connector:

- Power supply: 24Vcc must be appropriately stabilized or rectified and filtered; a 2.5 A safety fuse is required in series to each driver power supply.
- Reference input signal: Apply at least a 10000 μF/40 V capacitance to single phase rectifiers or a 4700 μF/40 V capacitance to three phase rectifiers.
- Monitor output signal: analog output signal proportional to the actual valve's spool position.

Following options are available to adapt standard execution to special application requirements:

9.1 Option /I
It provides 4 ÷ 20 mA current reference and monitor signals instead of the standard ±10 V.

9.2 Option /Z
It provides a separate power supply for the solenoid (pin 1, 2) and for the digital electronic circuits (pin 9, 10).

9.3 Options /SP, /SF and /SL
These options add the closed loop control of pressure (/SP) or force (/SF and /SL) to the basic functions of proportional directional valves: a dedicated software alternates pressure (force) and valve’s spool position controls depending on the actual hydraulic system conditions.

9.4 Options /C
Options /CSP, /CSF and /CSL are available to connect pressure (force) transducers with 4 ÷ 20 mA current output signal.

9.5 Possible combined options: /CSP, /CISF, /CSL, /CISP, /CISF, /CISL and /IZ
10 DIGITAL INTEGRAL DRIVERS - TES - MAIN FUNCTIONS AND ELECTRONIC CONNECTIONS

10.1 ELECTRONIC CONNECTIONS - 7 & 12 PIN MAIN CONNECTORS

<table>
<thead>
<tr>
<th>Standard 7pin</th>
<th>Z option 12pin</th>
<th>SIGNAL</th>
<th>TECHNICAL SPECIFICATIONS</th>
<th>NOTES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>1</td>
<td>V+</td>
<td>Power supply 24 VDC for solenoid power stage (and for driver logic on 7 pin connection)</td>
<td>Input - power supply</td>
</tr>
<tr>
<td>B</td>
<td>2</td>
<td>V0</td>
<td>Power supply 0 VDC for solenoid power stage (and for driver logic on 7 pin connection)</td>
<td>Gnd - power supply</td>
</tr>
<tr>
<td>-</td>
<td>3</td>
<td>ENABLE</td>
<td>Enable (24 VDC) or disable (0 VDC) the driver</td>
<td>Input - on/off signal</td>
</tr>
<tr>
<td>D</td>
<td>4</td>
<td>INPUT+</td>
<td>Reference analog input: ±10 Vdc maximum range (4 + 20 mA for /I option)</td>
<td>Input - analog signal</td>
</tr>
<tr>
<td>E</td>
<td>-</td>
<td>INPUT-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>C</td>
<td>5</td>
<td>AGND</td>
<td>Ground - signal zero for MONITOR signal</td>
<td>Gnd - analog signal</td>
</tr>
<tr>
<td>F</td>
<td>6</td>
<td>MONITOR</td>
<td>Monitor analog output: ±10 Vdc maximum range (4 + 20 mA for /I option)</td>
<td>Output - analog signal</td>
</tr>
<tr>
<td>-</td>
<td>7</td>
<td>NC</td>
<td>Do not connect (pressure/force input for /SP, /SF and /SL options, see 9.3)</td>
<td>-</td>
</tr>
<tr>
<td>-</td>
<td>8</td>
<td>NL</td>
<td>Do not connect (pressure/force monitor for /SP, /SF and /SL options, see 9.3)</td>
<td>-</td>
</tr>
<tr>
<td>-</td>
<td>9</td>
<td>VL+</td>
<td>Power supply 24 VDC for driver logic</td>
<td>Input - power supply</td>
</tr>
<tr>
<td>-</td>
<td>10</td>
<td>VL0</td>
<td>Power supply 0 VDC for driver logic</td>
<td>Gnd - power supply</td>
</tr>
<tr>
<td>-</td>
<td>11</td>
<td>FAULT</td>
<td>Fault (6V) or normal working (24V)</td>
<td>Output - on/off signal</td>
</tr>
<tr>
<td>G</td>
<td>PE</td>
<td>EARTH</td>
<td>Internally connected to the driver housing</td>
<td>-</td>
</tr>
</tbody>
</table>

Note: A minimum time of 300 to 500 ms have be considered between the driver energizing with the 24 VDC power supply and when the valve is ready to operate. During this time the current to the valve coils is switched to zero.

10.2 ELECTRONIC CONNECTIONS - 5 PIN COMMUNICATION CONNECTORS

<table>
<thead>
<tr>
<th>PIN</th>
<th>SIGNAL</th>
<th>TECHNICAL SPECIFICATION</th>
<th>TECHNICAL SPECIFICATION</th>
<th>TECHNICAL SPECIFICATION</th>
<th>NOTES</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>NC</td>
<td>do not connect</td>
<td>CAN_SHLD Shield</td>
<td>+5V for termination</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>NC</td>
<td>do not connect</td>
<td>NC</td>
<td>LINE-A Bus line (high)</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>RS_GND</td>
<td>Signal zero data line</td>
<td>CAN_GND</td>
<td>DS_GND data line and termination Signal zero</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>RS_RX</td>
<td>Valves receiving data line</td>
<td>CAN_H Bus line (high)</td>
<td>LINE-B Bus line (low)</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>RS_TX</td>
<td>Valves transmitting data line</td>
<td>CAN_L Bus line (low)</td>
<td>SHIELD</td>
<td></td>
</tr>
</tbody>
</table>

Note: A minimum time of 300 to 500 ms have be considered between the driver energizing with the 24 VDC power supply and when the valve is ready to operate. During this time the current to the valve coils is switched to zero.

11 SOFTWARE TOOLS

The functional parameters of the digital valves, as the bias, scale, ramp and linearization of the regulation characteristic, can be easily set and optimized with graphic interface by using the Atos E-SW software and the relevant USB adapters, cable and terminators, see tab. G500.

Valves with fieldbus communication interface (-BC and -BP) can be completely managed by the machine control unit; it is required to implement in the machine control the standard communication as described in the user manuals supplied with the relevant programming software.

For detailed description of available fieldbus features, see tab. G510.

12 MAIN CHARACTERISTICS OF PROPORTIONAL DIRECTIONAL VALVES

<table>
<thead>
<tr>
<th>Assembly position</th>
<th>Any position</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subplate surface finishing</td>
<td>Roughness index, ( \sqrt{\text{R}} ) flatness ratio 0.01/100 (ISO 1101)</td>
</tr>
<tr>
<td>Ambient temperature</td>
<td>-20°C + 70°C for -T execution; -20°C + 60°C for -TE and TES executions</td>
</tr>
<tr>
<td>Fluid</td>
<td>Hydraulic oil as per DIN 51524; 535 for other fluids see section 1</td>
</tr>
<tr>
<td>Recommended viscosity</td>
<td>15 – 100 mm²/s at 40°C (ISO VG 15-100)</td>
</tr>
<tr>
<td>Fluid contamination class</td>
<td>ISO 18/15 achieved with in line filters of 10 ( \mu )m and ( \beta &gt; 75 ) (recommended)</td>
</tr>
<tr>
<td>Fluid temperature</td>
<td>-20°C + 60°C (standard and (WG seals) - 20°C + 80°C (PE seals)</td>
</tr>
<tr>
<td>Valve model</td>
<td>DHZO-T*</td>
</tr>
<tr>
<td>Coil resistance R at 20°C</td>
<td>( 3 \pm 3.3\Omega )</td>
</tr>
<tr>
<td>Max. solenoid current</td>
<td>2.6 A</td>
</tr>
<tr>
<td>Max. power</td>
<td>35 Watt</td>
</tr>
<tr>
<td>Insulation class</td>
<td>H (180°C) Due to the occurring surface temperatures of the solenoid coils, the European standards ISO 13732-1 and EN982 must be taken into account</td>
</tr>
<tr>
<td>Protection degree (CEI EN-60529)</td>
<td>IP65 for -T execution; IP66-67 for -TE and TES executions, depending to the connector type (see sect.</td>
</tr>
<tr>
<td>Duty factor</td>
<td>Continuous rating (ED=100%)</td>
</tr>
</tbody>
</table>
13.1 Regulation diagrams

1 = linear spool L14
2 = linear spool L1
3 = progressive spool S2
4 = linear spool L3
5 = progressive spool S3, D3
6 = linear spool, zero overlapping OL3
7 = linear spool L5
8 = linear spool, zero overlapping OL5
9 = progressive spool S5, D5

Note: Hydraulic configuration vs. reference signal for double solenoid valves (also for option /B).

Reference signal
0 ÷ +10 V
12 ÷ 20 mA
P → A / B → T
Reference signal
0 ÷ -10 V
4 ÷ 12 mA
P → B / A → T

10 = differential - linear spool V9

V9 spool type is specific for alternate P/Q controls in combination with option /SP of digital integral drivers, see tab. G210 section 13.

13.2 Flow /Δp diagrams

stated at 100% of valve stroke

1 = spool L14
2 = spool L1
3 = spool S2
4 = spool L3, S3, D3
5 = spool L5, S5, D5, V9

13.3 Bode diagrams

6 = 10% ± 90% nominal stroke
7 = 50% ± 5% nominal stroke

13.4 Operating limits

1 = spool L14
2 = spool L1
3 = spool S2
4 = spool L3, S3, D3
5 = spool L5, S5, D5, V9

13.5 Operation as throttle valve

Single solenoid valves (DHZO-*051) can be used as simple throttle valves:

Pmax = 250 bar (option /Y advisable)

13.6 Dynamic response

The response times in section 3 and the frequency responses in the bode diagrams 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.
14.1 Regulation diagrams

1 = linear spool L3
2 = progressive spool S3, D3
3 = linear spool, zero overlapping OL3
4 = linear spool L5
5 = linear spool, zero overlapping OL5
6 = progressive spool S5, D5

Note:
Hydraulic configuration vs. reference signal for double solenoid valves (also for option /B)
Reference signal 0 ÷ +10 V P → A / B → T
Reference signal 0 ÷ -10 V P → B / A → T

7 = differential - linear spool V9

V9 spool type is specific for alternate P/Q controls in combination with option /SP of digital integral drivers, see tab. G210 section 13.

14.2 Flow /Δp diagrams

stated at 100% of valve stroke
1 = spool S3, L3, D3
2 = spool S5, L5, D5, V9

14.3 Bode diagrams

3 = 10% → 90% nominal stroke
4 = 50% ± 5% nominal stroke

14.4 Operating limits

1 = spool L3, S3, D3
2 = spool L5, S5, D5, V9

14.5 Operation as throttle valve

Single solenoid valves (DKZOR-*-*151) can be used as simple throttle valves:
Pmax = 250 bar (option /Y advisable)

14.6 Dynamic response

The response times in section [3] and frequency responses in the bode diagrams 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.
ISO 4401: 2000
Mounting surface: 4401-03-02-0-05 (see table P005)
(for /Y 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 106; 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-05**
- Mass: 1.9 kg
- Mass: 2.3 kg

**DHZO-07**
- Mass: 2.6 kg

**Note:** for option /B the solenoid and the position transducer are at side of port A

**-TE EXECUTION**
1. Dotted line = 12 pin connector SP-ZH-12P for options /K and /Z

**DHZO-TE-05**
- SP-ZH-7P or SP-ZM-7P

**DHZO-TE-07**
- SP-ZH-7P or SP-ZM-7P

**-TES EXECUTION**
1. Dotted line = 12 pin connector SP-ZH-12P for options /SF, /SL, /SP, /Z
2. Dotted line = M8 connector SP-ZH-4P-M8 moulded on cable 5 mt length for pressure or force transducer (options /SL, /SP)
   - M8 connector SP-ZH-4P-M8/2 moulded with 2 cables, 2 mt length for 2 pressure transducers (options /SF)

**DHZO-TE-05**
- SP-ZH-7P or SP-ZM-7P

**DHZO-TE-07**
- SP-ZH-7P or SP-ZM-7P

**Note:** for option /B the solenoid, the position transducer and the integral electronics are at side of port A

### MODEL CODES OF POWER SUPPLY AND COMMUNICATION CONNECTORS (to be ordered separately)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>CONNECTOR CODE</td>
<td>SP-666</td>
<td>SP-345</td>
<td>SP-ZH-7P</td>
<td>SP-ZM-7P</td>
<td>SP-ZH-12P</td>
<td>SP-ZH-5P</td>
<td>SP-ZH-5P</td>
</tr>
<tr>
<td>PROTECTION DEGREE</td>
<td>IP65</td>
<td>IP65</td>
<td>IP67</td>
<td>IP67</td>
<td>IP65</td>
<td>IP67</td>
<td>IP67</td>
</tr>
<tr>
<td>DATA SHEET</td>
<td>K500</td>
<td>G200, G210, K500</td>
<td>G210, K500</td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

1. M8 connector SP-ZH-4P-M8 moulded on cable 5 mt length for pressure or force transducer (options /SL, /SP)
2. M8 connector SP-ZH-4P-M8/2 moulded with 2 cables, 2 mt length for 2 pressure transducers (options /SF)

- connectors supplied with the valve

**V** = Air bleed off
ISO 4401: 2000
Mounting surface: 4401-05-04-0-05 (see table P005)
(for Y surface 4401-05-05-0-05 without X port)
Fastening bolts: 4 socket head screws M8x40 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-T-15

Note: for option /B the solenoid and the position transducer are at side of port A

DKZOR-T-17

Note: for option /B the solenoid and the position transducer and the integral electronics are at side of port A

**-TE EXECUTION**

① Dotted line = 12 poles connector SP-ZH-12P for options /K and /Z

**-TES EXECUTION**

① Dotted line = 12 pin connector SP-ZH-12P for options /SF, /SL, /SP, /Z

② Dotted line = M8 connector SP-ZH-4P-M8/5 moulded on cable 5 mt length for pressure or force transducer (options /SL, /SP)

M8 connector SP-ZH-4P-M8/2-2 moulded with 2 cables, 2 mt length for 2 pressure transducers (options /SF)

**MODEL CODES OF POWER SUPPLY AND COMMUNICATION CONNECTORS (to be ordered separately)**

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<tr>
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<tbody>
<tr>
<td>CONNECTOR CODE</td>
<td>SP-666</td>
<td>SP-345</td>
<td>SP-ZH-7P</td>
<td>SP-ZM-7P</td>
<td>SP-ZI-12P</td>
<td>SP-ZH-5P</td>
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<td>PROTECTION DEGREE</td>
<td>IP65</td>
<td>IP65</td>
<td>IP67</td>
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<td>DATA SHEET</td>
<td>K500</td>
<td>G200, G210, K500</td>
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</table>

(1) M8 connector SP-ZH-4P-M8/5 moulded on cable 5 mt length for pressure or force transducer (options /SL, /SP)

M8 connector SP-ZH-4P-M8/2-2 moulded with 2 cables, 2 mt length for 2 pressure transducers (options /SF)

= Air bleed off

Connectors supplied with the valve