TECNORD
SERVOCOMANDI E REGOLAZIONE

TDV100
Directional/Proportional Sectional Valve with Load Sense

Manufacturers of Hydraulics and Electronic Management Systems
The TDV100 is a closed center, load sensing, sectional control valve with pre-compensation. The TDV100 can be configured with 1 to 10 working sections and can be used either with fixed displacement or with pressure/flow compensated variable displacement pumps. When multiple functions are selected, the TDV100 will automatically resolve the highest function load pressure which is then transmitted to the pump or inlet unloader/by-pass compensator and drained to tank once all spools are returned to neutral. The load sensing system maintains the delta P constant through spool control notches by means of the pressure compensation principle (spool sections are equipped with local 2 ways pressure compensator). Each TDV100 sectional valve is crossed by a pilot pressure supply line and a return rail to feed around 20-25 bar to the MULTIDROM electro-hydraulic actuators system or proportional pilot pressure valves.

**SPECIFICATIONS**

- Max. operating flow ..................................... 120 lt/min
- Max. operating flow per section .................. 110 lt/min
- Max. working pressure................................. 320 bar
- Min. stand-by & pilot pressure ............... 14 bar
- Spool stroke ................................................. 6 mm
- Section width ............................................... 42 mm
- P & T Ports .............................................. 3/4"- BSP
- A & B work ports size ....................... 1/2"- BSP
- Fluid.............................................................. Mineral based oil
- Fluid temperature range.................. -25°C/+95°C
- Optimum fluid viscosity range .......... 3cSt<648
- Max. fluid contamination level........ 18/15/10 (ISO 4406)
- Seals ............................................................. Buna-N (Std.) / Viton (Opt.)

**MANUAL AND ELECTRO-HYDRAULIC CONTROLS**

- TDV102-LM00  Manual control lever.
- TDV102-LMPP  Electro-hydraulic, open loop proportional control,
- TDV102-00PP  with or without manual lever.
- TDV102-00PO  Electro-hydraulic, ON-OFF control / PO type,
- TDV102-LMPO  with or without manual lever.
- TDV102-LMFD  Electro-hydraulic, closed loop proportional control,
- TDV102-00FD  with or without manual lever.

**PRODUCT FEATURES AND BENEFITS**

- Load-independent simultaneous control of two or more functions, within pump's flow saturation limits.
- Proportional flow control extended to 95% of spool stroke.
- MULTIDROM proportional actuators have built-in electronics requiring only variable voltage signals from a joystick.
- Internal closed loop position control configuration makes the valve spool achieving the desired position with accuracy levels approaching the performance of a servo valve.
- Built-in CANbus interface working on SAE J1939 protocol.
- Non-feedback proportional and ON-OFF pilot pressure control actuators available.
- Electro-hydraulic, pressure compensated meter-in control of pump flow is available for cost-effective applications.
- Special “craning” spool configuration for overhung load control in conjunction with counterbalance valves.
**POSITION** | **DESCRIPTION**
---|---
TDV101 | LH INLET SECTION
CP3 | By-pass pressure compensator
GT | Blank plug / Tp to T connection
SD | Pressure Compensated Bleed off orifice
G1 | Orifice (fixed displacement pumps)
B2 | Blank plug (fixed displacement pumps)
G2 | Orifice (variable displacement pumps)
B1 | Blank plug (variable displacement pumps)
RF | LS signal relief valve (system relief valve)
EV39 | 2W2P N.O. solenoid op. LS venting valve
RPM | Mechanical pilot pressure reducing valve
EV9 | 3W2P solenoid op. pilot pressure dump valve
FLT | Pilot pressure line filter screen

**TDV102** | WORK SECTION
---|---
CP2 | Pressure compensator/Reducer
SP | Directional spool
ASC-A/B | Anti-shock/Anti-cavitation valves A/B ports
LSR-A/B | LS relief valve A/B lines
LSS-L | LS shuttle valve - LS common line
LCH | Load check
LSS-A/B | LS Shuttle valve A/B lines
LM | Manual lever control
SCB | Spring cover block w/o manual lever mechanism
NLA | No-leak valve - Port A only
EP | End plate/Blank
PP | Proportional pressure control
PO | ON-OFF control/PO type
FDC | Closed loop control/CAN version
FDA | Closed loop control (5V aux supply)
FDF | Closed loop control (position sensor output)
FDR | Closed loop control/Ratiometric version
FO | ON-OFF control (12 or 24 VDC)

**TDV103** | RH END SECTION
---|---
ESR | End section/Blank
TR | Tie rods
### INLET SECTION VARIANTS AND OPTIONS

**DIMENSIONAL CHARACTERISTICS**

<table>
<thead>
<tr>
<th>POS.</th>
<th>ORDERING INFORMATION</th>
<th>AVAILABLE OPTIONS</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>Inlet Section Model</td>
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<tr>
<td>2</td>
<td>Configuration and Work Ports Size</td>
<td><strong>TDV101-LT</strong></td>
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<tr>
<td>3</td>
<td>System Relief Valve Setting</td>
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<tr>
<td>4</td>
<td>Mechanical Pressure Reducing Valve</td>
<td><strong>RPM14</strong></td>
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<tr>
<td>5</td>
<td>2W2P N.O. Solenoid Operated LS Signal Venting Valve</td>
<td><strong>EV39</strong></td>
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<tr>
<td>6</td>
<td>3W2P Solenoid Operated Pilot Pressure Cut-Off Valve</td>
<td><strong>EV9</strong></td>
</tr>
<tr>
<td>7</td>
<td>Voltage and Solenoid Valves Coil Termination</td>
<td><strong>TC9</strong></td>
</tr>
<tr>
<td>8</td>
<td>Last 3-digits of the 9-digits Tecnord P/N and Design Level</td>
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</table>

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**HYDRAULIC SCHEMATIC**

Note: slim inlet section has same hydraulic scheme as standard inlet without valves EV9 and EV39

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**PERFORMANCE CURVES**

Pressure drop across pressure compensated CP3 (bar) vs. pump flow (lt/min)

---
## Work Section Configuration

<table>
<thead>
<tr>
<th>POS.</th>
<th>ORDERING INFO.</th>
<th>TDV102-LT</th>
<th>00CP</th>
<th>LMFDA</th>
<th>STL</th>
<th>YO80</th>
<th>F</th>
<th>A18/B15</th>
<th>LSA15/B12</th>
<th>NLA</th>
<th>12VDT</th>
<th>G12</th>
<th>XXX/Y</th>
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<td>00CH</td>
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<td>7</td>
<td>Anti-Shock/Anti-Cavitation Valves (see Tab. B)</td>
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<td>ASC valve on A port / No ASC valve on Port B</td>
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<td>A00/Byy</td>
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<td>Axx/Byy</td>
<td>ASC valve on A&amp;B ports</td>
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<td>ATC/BTC</td>
<td>ASC cavity plugs on A and/or B ports</td>
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<td>LS Relief Valves on A and/or B port (see Tab. C)</td>
<td>LSA00/B00</td>
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<td>LSAxx/Byy</td>
<td>Load sensing relief valve on Ports A &amp; B (Factory Pre-setting)</td>
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<td>9</td>
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<td>Voltage &amp; Terminations</td>
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<td>12VDC - Deutsch DT04 connector for ON-OFF control only</td>
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<td>24VDT</td>
<td>24VDC - Deutsch DT04 connector for ON-OFF control only</td>
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<td>Ports Size</td>
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<td>A&amp;B ports: 1/2&quot;- BSP</td>
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<td>S10</td>
<td>A&amp;B ports: 7/8&quot;-14UNF (SAE10) Option available on request</td>
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### Tab. A - Spool Metering Characteristics

<table>
<thead>
<tr>
<th>Valuing</th>
<th>Spool Metering Characteristics</th>
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<tbody>
<tr>
<td>10=</td>
<td>0 to 10 lt/min</td>
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<tr>
<td>20=</td>
<td>0 to 20 lt/min</td>
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<tr>
<td>40=</td>
<td>0 to 30 lt/min</td>
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### Tab. B - Anti-Shock Valves Setting

<table>
<thead>
<tr>
<th>Valuing</th>
<th>Anti-Shock Valves Setting</th>
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<td>A00=</td>
<td>No port relief</td>
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<tr>
<td>A07=</td>
<td>Port A/70 bar</td>
</tr>
<tr>
<td>B28=</td>
<td>Port B/280 bar</td>
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### Tab. C - LSA/LSB Relief Valves Setting

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<tr>
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<th>LSA/LSB Relief Valves Setting</th>
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<tbody>
<tr>
<td>LSA00</td>
<td>No LSA relief</td>
</tr>
<tr>
<td>LSA12</td>
<td>120 bar</td>
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<tr>
<td>LSA25</td>
<td>250 bar</td>
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</tbody>
</table>

Port relief valve standard settings: 70-100-120-140-160-180-200-220-240-260-280 Different settings available on request
**TDV102 WORK SECTION CONTROL OPTIONS**

**TDV102-LM00**
Directional valve section with manual control

**TDV102-LMFD**

**TDV102-LMPP**
Directional valve section with dual proportional pilot pressure reducing valves for PWM open loop control of spool stroke and manual lever

**OPTIONAL FEATURES**

- **ASC**: anti-shock / anticavitation valves
  - Axx/B00: ASC valve on port A
  - Axx/Bxx: ASC valve on port B
- **ATC/BTC**: cavity plug on ports A and B
- **LSR A/B**: Load Sensing Relief Valves
  - LSRA: load sensing relief valve on line A
  - LSRB: load sensing relief valve on line B
- **NLA**: no-leak valve on port A
- **F**: 4th position FLOAT

**Work port flows vs. spool travel & various control parameters**

**Spool flows vs. differential pressure**

- FLOW (l/min)
  - Pilot Pressure (bar)
  - PWM CURRENT 8/12V (A)
  - PWM CURRENT 8/24V (A)
- WORK PORT FLOW (l/min)
  - LS DIFFERENTIAL PRESSURE (bar)
**PRINCIPLE OF OPERATION**
The MLT-FD5/D electro-hydraulic proportional actuator has been designed to shift a directional control valve spool either directly (FL version) or by means of a servo-piston mechanically connected to it (SP version). The internal closed loop position control configuration of the MLT-FD5/D makes the valve spool achieve the desired position with accuracy levels approaching the performance of a servo-valve, by continuously comparing the set-point of a remote control device (e.g. potentiometer, joystick, Machine Management System controller) with the feedback signal generated by a high-precision Hall effect position transducer.

**SPOOL STROKE A**
When the input voltage signal fed to the MLT-FD5 actuator is maintained within 2.25 and 2.75V, the directional valve spool is at rest (Neutral Dead Band). When Vin = 2.75V, the spool steps up from NEUTRAL to MINIMUM FLOW control position. A linear ramp from MIN. to MAX. spool stroke will follow by increasing Vin from 2.75 to 4.1V. At Vin = 4.50V, the spool is brought into its FLOAT POSITION, if present. By decreasing the input voltage from 4.1 to 2.75V, the spool stroke is linearly reduced and after the oil flow is fully shut-off, a step-down from MINIMUM FLOW to NEUTRAL position takes place.

**SPOOL STROKE B**
Same as for STROKE A, by varying Vin from 2.25 to 0.9V, the spool will go from NEUTRAL to MAX. STROKE in the opposite direction.

**ALARM / FAIL - SAFE MODE**
An input voltage variation beyond the calibration range (<0.25V or >4.75V) will bring the system into an ALARM mode, urging the spool to return to its NEUTRAL position until Vin is brought back to its nominal control range.
TECNORD

COMPREHENSIVE RANGE OF REMOTE CONTROL ELECTRONICS

**EC-PWM-A1-MPC1**
Microprocessor-based PWM electronic drivers

**FINGERTIP PROPORTIONAL LEVERS**
Potentiometric and hall effect single-axis control levers and roller switches

**ERGONOMIC GRIPS**
Multi-function ergonomic grips with on-off and proportional switches

**HEAVY DUTY JOYSTICKS**
Potentiometric and hall effect multi-axes control joysticks

**EC - MMS**
Microprocessor-based Machine Management Systems for the integrated control of electro-hydraulic and safety functions

**ECOMATIC**
GPS ground-speed oriented salt spreader control systems

**RC - SHW**
Combined on-off and proportional radio control system with single hand wander

**RC - PTM**
Multi-function proportional Radio Control with shoulder-strap transmitter and CANbus receiver

**ARM-REST CONTROLLER**
Arm-rest control unit for Hedge Cutter

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