Multidrom MLT FD-5

**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 feed-back signal generated by a high-precision hall effect position transducer.

**FEATURES**

- **Two Independent Proportional Valves**
- **Control Configuration:** bidirectional with MOTOR SPOOL center position for fail-safe return to neutral in case of power loss.
- **Flow Rate:** 0.2 to 0.5 lt/min. max. flow requirement under normal conditions.
- **Work Pressure:** 12 to 35 bar.

**Hall Effect/Contactless Spool Position Sensor**

- Excellent linear control on 100% of spool travel.
- 8 mm standard control stroke from each side of NEUTRAL/13 mm for FLOAT position in one direction only.
- No “Cross Talking” between adjacent work sections.

**Built-in Electronics**

MLT-FD5-D (digital): microprocessor-based actuator. Choice between different types of control:
- Analog or ratiometric control signal, with following auxiliary signals available:
  - spool position feedback.
  - 5V for external potentiometer or joystick.
- CANbus control (J1939 or CANopen protocols).

MLT-FD5-0 (on-off): 12 or 24V version.

**APPLICATIONS**

- High performance proportional control of stackable or monoblock directional control valves.
- Proportional control of variable displacement pumps and motors.
- Engine governor RPM controls.
**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.

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**HYDRAULIC SPECIFICATIONS**

- Max. supply pressure: 35 bar
- Min. supply pressure: 12 bar
- Max. back pressure: 1.5 bar
- Pilot flow requirement: 0.2 l/s
- Oil temperature range: -20/+95°C
- Oil viscosity range: 3-650 cSt
- Filtration: 18/15/10 (ISO 4406)

**ELECTRICAL SPECIFICATIONS**

- Operating voltage: 8-30 VDC
- Max. current consumption: 750mA/section
- Operating temperature: -40/+125°C
- Analog input impedance: >40 kOhm
- Typical ctrl pot. resistance: 1-10 kOhm
- Degree of protection: IP 68

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**CONNECTOR PINOUT (FRONT VIEW)**

<table>
<thead>
<tr>
<th>D/C0</th>
<th>D/A5</th>
<th>D/R0</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. CANL</td>
<td>2. +5V Aux. Supply voltage</td>
<td>2. Do not Connect</td>
</tr>
<tr>
<td>3. CANH</td>
<td>3. Control Signal</td>
<td>3. Control Signal</td>
</tr>
<tr>
<td>4. -Power Supply (GND)</td>
<td>4. -Power Supply (GND)</td>
<td>4. -V Power Supply (GND)</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>D/A0</th>
<th>D/AF</th>
<th>0/12 - 0/24</th>
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</thead>
<tbody>
<tr>
<td>2. Do not Connect</td>
<td>2. -Power Supply (GND) coil A</td>
<td>2. -Power Supply (GND) coil A</td>
</tr>
<tr>
<td>4. -Power Supply (GND)</td>
<td>4. -Power Supply (GND)</td>
<td>4. -Power Supply (GND) coil B</td>
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MLT-FD5 Closed Loop Proportional Actuator

**Actuators Selection Guide**

<table>
<thead>
<tr>
<th>MLT/FD5</th>
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</thead>
<tbody>
<tr>
<td>Actuator family</td>
<td>Electronic circuit</td>
<td>Type of control signal</td>
<td>Auxiliary function</td>
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</tr>
</tbody>
</table>

- **D** - Digital (microprocessor)
- **C** - CANbus
- **A** - Analog Voltage
- **R** - Ratiometric
- **12** - 12V On/Off
- **24** - 24V On/Off
- **0** - None
- **5** - 5V aux supply
- **F** - Feedback

**Available Configurations and Model Designation**

- **MLT/FD5-D/C0**
  - Proportional actuator
  - Digital electronics
  - CANbus control (J1939)

- **MLT/FD5-D/A0**
  - Proportional actuator
  - Digital electronics
  - Analog control signal (e.g. Potentiometer)

- **MLT/FD5-D/A5**
  - Proportional actuator
  - Digital electronics
  - Analog control signal (e.g. Potentiometer)
  - +5V auxiliary power supply for the control potentiometer

- **MLT/FD5-D/AF**
  - Proportional actuator
  - Digital electronics
  - Analog control signal (e.g. Potentiometer)
  - Feedback output (spool position): 0-5V

- **MLT/FD5-D/R0**
  - Proportional actuator
  - Digital electronics
  - Ratiometric control signal (% of supply voltage)

- **MLT/FD5-0-12**
  - On/Off actuator, 12V coils

- **MLT/FD5-0-24**
  - On/Off actuator, 24V coils

Digital Actuator
Black connector

On/Off Actuator
(without hall effect sensor)
Blue connector: 12V
Green connector: 24V
INSTALLATION OPTIONS

DIRECT FLANGED MOUNTING STYLE

BUCHER HDS34

TDV100LT

ADAPTER PLATE MOUNTING STYLE

BUCHER HDS34

ADAPTER PLATE WITH BUILT-IN D/A SERVO PISTON

BOSCH-REXROTH MOD. SX14

TECNORD
Via Malavolli, 36 - 41122 Modena - Italy - Tel. +39 (059) 254895 - Fax +39 (059) 253512
tecnord@tecnord.com - www.tecnord.com