

# 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 makes the valve spool achieve the desired position with an accuracy levels approaching the performance of a servo-valve, by continuously comparing the set-point of a remote control device (**Potentiometer, Joystick, Machine Management System**) with the feed-back signal generated by the internal 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:

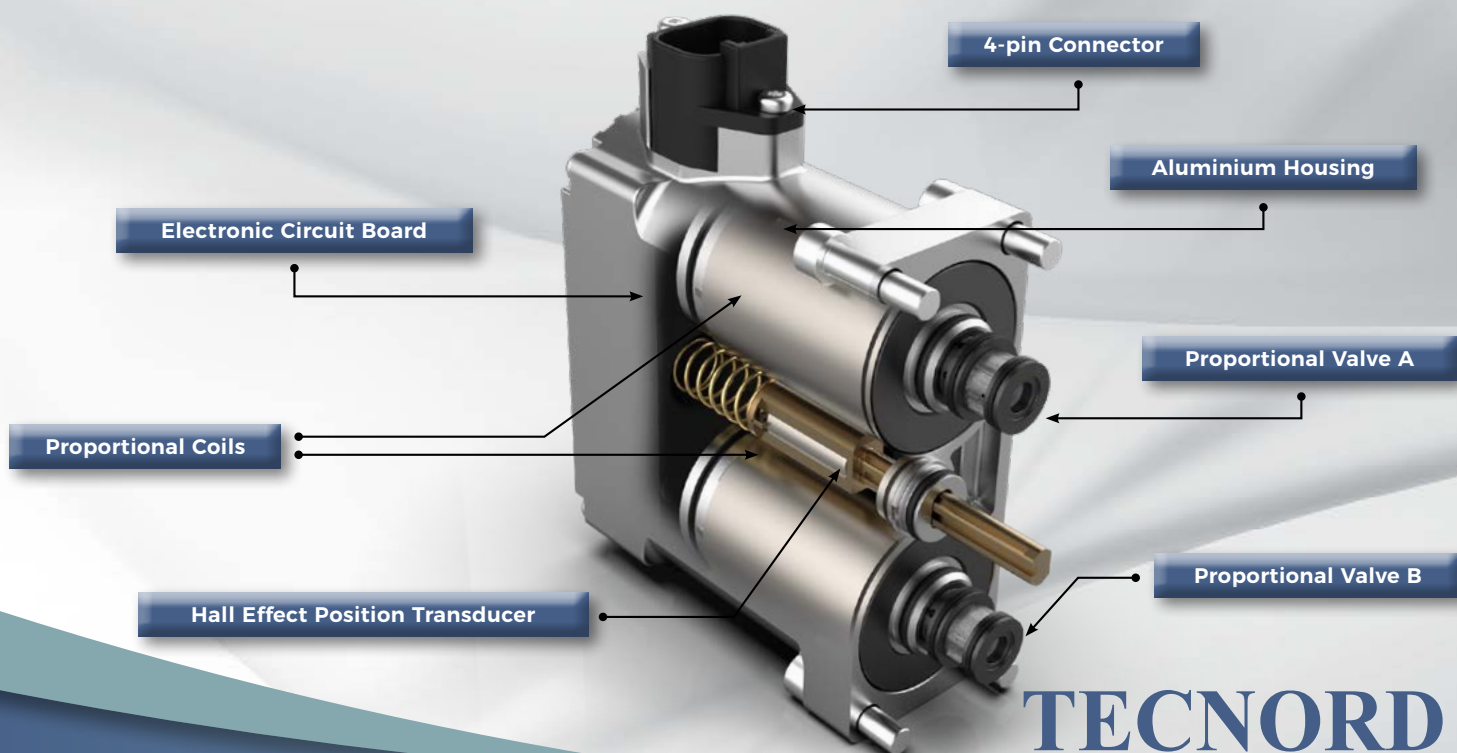
- ✓ spool position feedback.
- ✓ 5V for external potentiometer or joystick.

- 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.



TECNORD

## CONTROL CHARACTERISTIC OF MLT-FD5 PROPORTIONAL ACTUATOR (Analog Operating Mode)

### SPOOL STROKE A

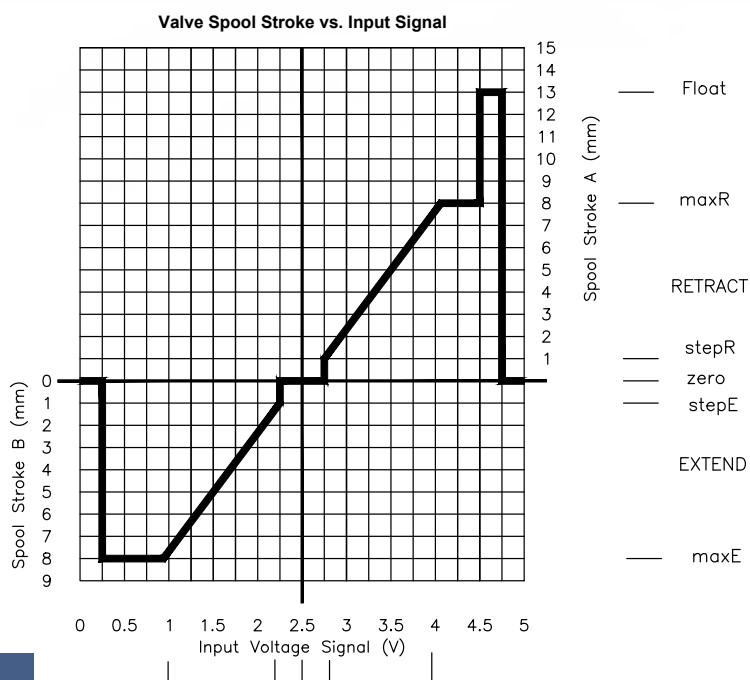
When the input voltage signal fed to the MLT-FD5 actuator is maintained within 2.25 and 2.75V, the directional valve spool is at rest (Neutral Dead Band). When  $V_{in} = 2.75V$ , the spool steps up from NEUTRAL to MINIMUM FLOW control position. A linear ramp from MIN. to MAX. spool stroke will follow by increasing  $V_{in}$  from 2.75 to 4.1V. At  $V_{in} = 4.50V$ , 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  $V_{in}$  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  $V_{in}$  is brought back to its nominal control range.



### HYDRAULIC SPECIFICATIONS

Max. supply pressure..... 35 bar  
 Min. supply pressure..... 12 bar  
 Max. back pressure..... 1.5 bar  
 Pilot flow requirement..... 0.2 lt/section  
 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

### CONNECTOR PINOUT (FRONT VIEW)

#### D/C0

1. +Power Supply
2. CANL
3. CANH
4. -Power Supply (GND)

#### D/R0

1. +V Power Supply
2. Sensor Feedback Output
3. Control Signal
4. -V Power Supply (GND)

#### D/A0

1. +Power Supply
2. Do not Connect
3. Control Signal
4. -Power Supply (GND)

#### 0/12 - 0/24

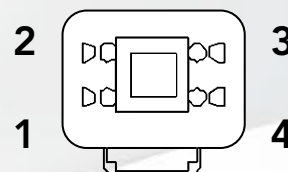
1. +Power Supply coil A
2. -Power Supply (GND) coil A
3. +Power Supply coil B
4. -Power Supply (GND) coil B

#### D/A5

1. +Power Supply
2. +5V Aux. Supply voltage
3. Control Signal
4. -Power Supply (GND)

#### D/AF

1. +Power Supply
2. Sensor Feedback Output
3. Control Signal
4. -Power Supply (GND)



## ACTUATORS SELECTION GUIDE

| MLT/FD5         | -                                        | X | /                                                                                        | X | X                                          |
|-----------------|------------------------------------------|---|------------------------------------------------------------------------------------------|---|--------------------------------------------|
| ACTUATOR FAMILY | ELECTRONIC CIRCUIT                       |   | TYPE OF CONTROL SIGNAL                                                                   |   | AUXILIARY FUNCTION                         |
|                 | ↓                                        |   | ↓                                                                                        |   | ↓                                          |
|                 | D= Digital (microprocessor)<br>0= On/Off |   | C= CANbus<br>A= Analog Voltage<br>R= Ratiometric<br><br>12= 12V On/Off<br>24= 24V On/Off |   | 0= None<br>5= 5V aux supply<br>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

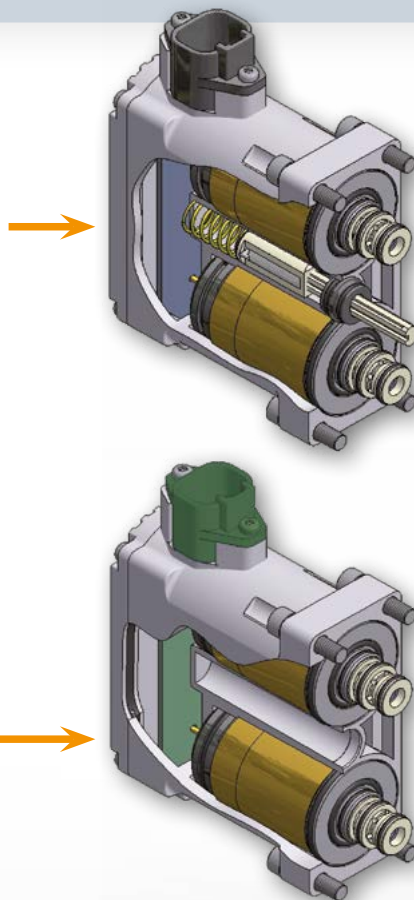
Proportional actuator  
Digital electronics  
Ratiometric control signal  
(% of supply voltage)

### MLT/FD5-O-12

On/Off actuator, 12V coils

### MLT/FD5-O-24

On/Off actuator, 24V coils



**Digital Actuator**  
Black connector

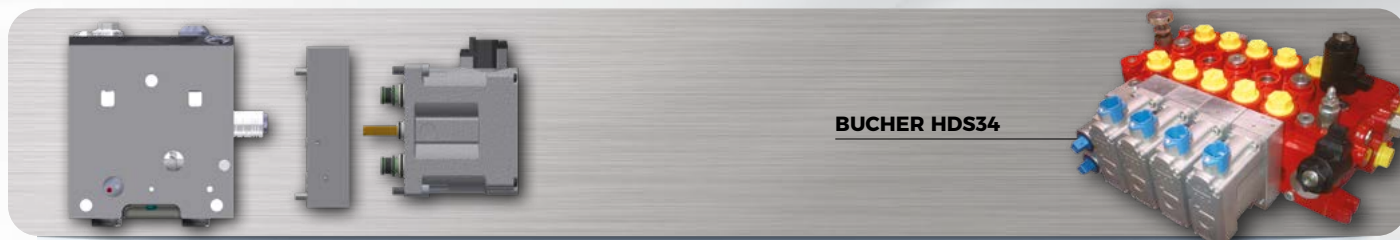
**On/Off Actuator**  
(without hall effect sensor)  
Blue connector: 12V  
Green connector: 24V

## INSTALLATION OPTIONS

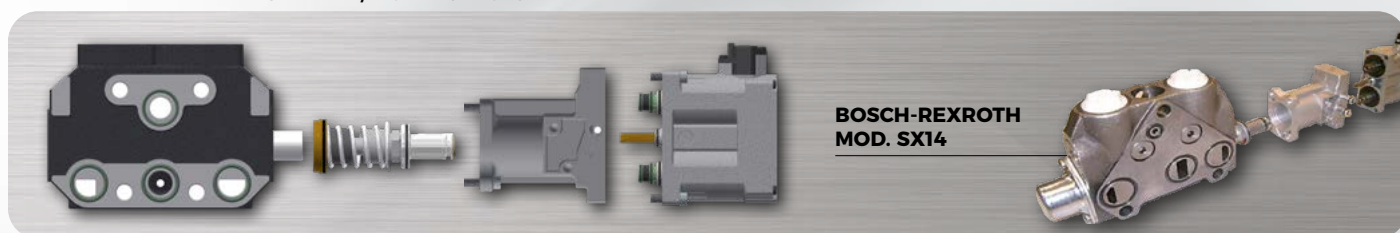
### DIRECT FLANGED MOUNTING STYLE



### ADAPTER PLATE MOUNTING STYLE



### ADAPTER PLATE WITH BUILT-IN D/A SERVO PISTON





### 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



### MACHINE MANAGEMENT SYSTEMS

Microprocessor-based MMS for the integrated control of electro-hydraulic and safety functions



### ECOMATIC

GPS ground-speed oriented salt spreader control systems



### 4/6 FUNCTIONS SHW RADIO

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



### 4/6 FUNCTIONS PTM RADIO

Multi-function proportional radio control with shoulder-strap transmitter and CANbus receiver



### ARM-REST CONTROLLER

Arm-rest control unit for hedge cutter