



**CURTIS**

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**CURTIS<sup>®</sup> MODEL FP-10**



53090 Rev B 6/18

Read Instructions Carefully!



# SAFETY INSTRUCTIONS

This product was manufactured and tested according to the applicable technical standards. It complies with all the safety regulations as shipped from the factory.

Installation and startup must be performed by skilled personnel.

Failure to install and operate the unit in accordance with these instructions may result in damage or injury.

If safe operation of the product can no longer be ensured, stop and secure it against accidental operation.

If product failure or malfunction may cause personal injury or material damage, use additional safety measures such as limit switches, guards, etc.

Read the Operating Instructions carefully before startup.

Note the safety instructions marked with this warning symbol in this manual!



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# 1. TECHNICAL SPECIFICATIONS



## 1.1 Electrical:

### Wiring

The Model FP-10 has a 1 meter long, nine circuit cable for ease of wiring into any system. The wiring assignment of the FP-10 is shown in Table 1:

Table 1: Wire Assignments

Signal Name	Wire Color
POT Low	Black
POT Wiper	White
POT High	Red
Neutral Switch	Green
Neutral Switch	Blue
Full Throttle Switch	Yellow
Full Throttle Switch	Brown
Spring 1 Detect Switch	Orange
Spring 2 Detect Switch	Purple

### Potentiometer

Resistance:  $5k\Omega \pm 10\%$   
Power Rating: 2W max.  
Rotational cycles: +1,000,000



### Neutral & Full Throttle Switches

Type: SPST – NO  
Current Rating: 10A @ 30Vdc (resistive load)  
Voltage Rating: 250V

### Spring Detect Switches

Type: SPST – NC  
Current Rating: 20mA  
Voltage Rating: 15V

Table 2: Operating Specifications

Pedal Position	Angle in degrees	Switch #1 (Neutral)	Switch #2 (Full Throttle)	Pot Output (Ohms)
A	0°	Open	Open	< 10
B	4° ±1°	Closed	Open	100 – 400
C	26° ±1°	Closed	Closed	4.5K – 5.0K
D	30° ±3°	Closed	Closed	4.5K – 5.5K

## 1.2 Mechanical

The molded housing is a glass filled nylon 6/6. It is sealed to IP-67. Refer to Outline & Installation Drawings for detailed specifications. The FP10 is designed to meet 1 million cycles of use.



## 1.3 Environmental

### Temperature

Operating:  $-40^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$

Storage:  $-40^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$

### Humidity

**Soak:** Designed to meet EN 60068-2-78. Test Cab: Damp Heat, Steady State, 10 days at 95% RH ( $\pm 3\%$ ), and  $30^{\circ}\text{C}$ .

**Cyclic:** Designed to meet EN 60068-2-30. Test Db: Damp Heat, Cyclic (12hr + 12hr cycle). Test method variant 1. 6 cycles (each cycle is 24hrs), 90% RH.

### Ingress Protection

Designed to meet EN 60529-IP67.

## Chemical Resistance

- Engine Oil
- Diesel Fuel
- Hydraulic Fluid
- Ethylene Glycol
- Urea Nitrogen 46%
- Liquid Lime
- NPK Fertilizer
- Ammonia
- Calcium Chloride



### Salt Spray

Designed to meet ASTM B117-09, 5% salt fog spray solution at 35 degrees C for 96 hours.

### Solar Radiation

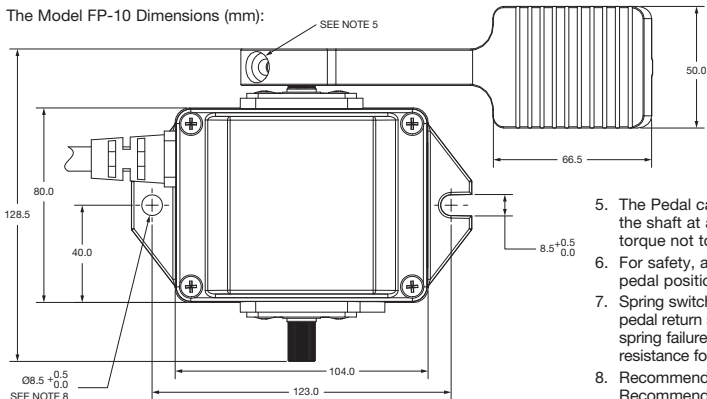
Designed to meet UV exposure per ASTM G155 Cycle 7A –  $0.55\text{W}/\text{m}^2$  at 340nm for 500 hours  $63^{\circ}\text{C}$  continuous temperature, no water spray.

### Shock

Designed to meet EN 60068-2-27: 3 shocks in all 3 axes in both directions (18 shocks in total),  $500\text{ m}/\text{s}^2$ , 11ms, half sine wave location 3.

## 2. INSTALLATION

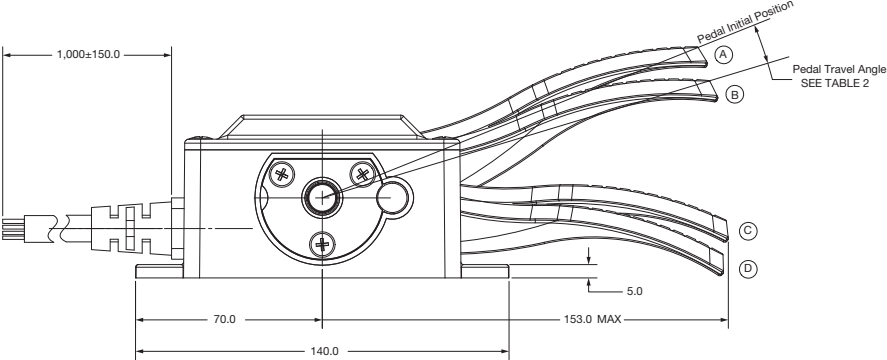
The Model FP-10 Dimensions (mm):

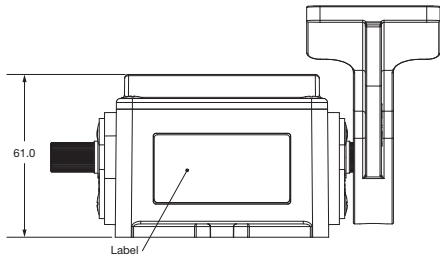


### NOTES:

1. Materials:  
Case, Cover & Pedal: Glass Filled PA66;  
Shaft: Stainless Steel.
2. Cable: #18AWG, 9 Wires, PVC Jacket, UL 80 C, 300V Rated.
3. Pedal Travel:  $30^\circ \pm 3^\circ$ .
4. Weight: 1Kg Max.
5. The Pedal can be mounted on either side of the shaft at any angle. Maximum tightening torque not to exceed 7.8 Nm (70 in-lbs)
6. For safety, a Mechanical Stop between the pedal positions C & D is recommended.
7. Spring switch can be used to detect failure of the pedal return springs. Check for the possibility of spring failure if the switch is open and/or pedal resistance force is reduced by 50%.
8. Recommended mounting hardware: M8 or 5/16. Recommended torque: 2.7 Nm (24 in-lbs).

FP-10 Dimensions cont'd





### 3. OPERATION

The Model FP-10 includes the following features:

- 0 – 5k potentiometer output which easily interfaces with motor controller throttle inputs and avoids the necessity of a dedicated power supply (Curtis 98191 potentiometer).
- Dual return springs to ensure safe operation. A sudden reduction of pedal resistance of more than 50% indicates a single spring failure.
- Return spring failure detection switches monitor each return spring and allow the vehicle designer to signal the user of a potential throttle fault. The spring failure detection switches can also be used to implement a limp-home mode to ensure that the vehicle can return to a safe location thereby eliminating stranding the vehicle.
- The foot pedal includes two micro-switches to indicate idle validation and full throttle further ensuring safe vehicle operation.

- Flexible design allows the foot pedal to be mounted on the floor or suspended on the firewall, to locate the pedal on the right or left side of the unit and adjust the pedal to any desired angle.
- The glass filled nylon housing enclosure is protected to IP67 and is rated for operation from  $-40^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$  to ensure reliable and safe use in harsh environments.
- The FP-10 is rated for 1 million cycle operation over its full specification thereby ensuring that it lasts for the life of the vehicle.
- The FP-10 is supplied with a 1 meter length cable which is terminated in flying leads, and a loose foot pedal.
- For safety, a mechanical stop between angular position 26 degrees and 30 degrees of travel is recommended.
- Throttle input can be configured from 0- 5K using the black and white wire or can be configured as a 5K – 0 using the red and white wire.

## 4. MAINTENANCE

Curtis Model FP-10 series is not field serviceable. Return defective units to your distributor for warranty coverage.





## 5. WARRANTY

Curtis Instruments' products and/or components are guaranteed against defects in workmanship and material for a period of one year, or as defined in the individual product literature, from date of shipment from our factory, when applied in a proper application within specified ratings. This guarantee is limited to repair or replacement F.O.B. our factory. There is no further warranty or implied representation, guarantee, promise or agreement as to any Curtis Instruments product and/or component. Curtis Instruments, Inc., cannot assume responsibility or accept invoices for unauthorized repairs to its products and/or components, even though defective. In no case will Curtis Instruments' responsibility extend to products, components or equipment not of its manufacture. Under no circumstances shall Curtis Instruments, Inc., be liable for any special or consequential damages or loss of profits or other damages. Returned goods will not be accepted unless identified by a Curtis Return Material Authorization (RMA).

**All specifications are subject to  
change without notice.**

