

# TENSION MANAGER™

The TensionManager™ is a flexible, digital control system, built to be easily configured for any web press or process machinery application. Its base version is an efficient single-board control module in an enclosure. Additional compact, DIN-rail modules can extend the Control Modules's functionality and are connected as add-ons if required.

Designed specifically to reduce cost and optimize existing space for machinery builders and OEM's, the TensionManager™ is the perfect alternative to full-featured, integrated tension controllers that come in a single enclosure with a built-in operator interface.

The TensionManager™ has three standard output versions:

- D Version - 10Vdc. Control Module only.
- P Version - 75psi. Control Module and Pneumatic output Module.
- V Version - 90Vdc. Control Module and High Voltage Module.

The Tension Manager™ may be set up and operated through a variety of available user interfaces including DFE's PCLink™ software running on a PC or a laptop. The controller requires a minimum of tuning and operator adjustment.

The Tension Manager™ is covered by DFE's tension-free 5 Year Warranty.



## STANDARD FEATURES

- Closed-loop tension control using tension transducer input
- For use in Unwind, Intermediate, and Rewind zones.
- Choose one of four operator interfaces - including PC or laptop.
- Store/recall up to 10 job setups.
- Taper by external diameter input (0 to 10V input)
- Soft start by tension, speed\*, or switch
- TLS (tension limit switch) for web break detection

- Taper by rider
- Taper by diameter calculation\*
- Line speed follower with tension trim\*
- Diameter-compensated line speed follow with tension trim by diameter calc or rider\*

\* These features are standard if the tach signals used are 0 to 10V. Speed Module will be needed if the tach signal is other than 0 to 10V.

## THE CONTROL MODULE



**Control Module** is the base version of the TensionManager™. It is also the **"D" Version**. Provided in a metal enclosure with a DIN clip for DIN rail mounting. Specifications:

- **Input Power:** 24Vdc @ 0.20 to 0.50 Amps depending on number of modules. (Power source not supplied).
- **Output Signal:**  
0 to 10 Vdc proportional to tension,  
0 to 10 Vdc compensated, non-isolated control output.  
0 to 1 mA tension output
- **Input Signals Accepted:**  
0 to 10 Vdc **roll diameter** signal,  
0 to 10 Vdc **roll speed** signal,  
0 to 10 Vdc **line speed** signal, and  
0 to 10 Vdc **remote tension** signal.
- **Operator Interfaces:**
  1. Remote Control Terminal (TRC), or
  2. User Interface\*, or

3. Customer provided interface (auto and manual set potentiometers)\*, or
4. PC or PC laptop with minimum 133 MHz, Windows 9x, 2000, or NT 4.0, or
5. Host Computer or PLC.

- **Standard Features:**  
Automatic and manual control modes  
Emergency Stop  
Reversible Output Direction  
RS232 Communications Protocol  
Sample and Hold  
Set-up Storage and Recall\*  
Soft Start, Ratio  
Transducer Excitation Voltage Selection
- **Options:**  
Isolated 10V Control Output (**I10**)  
RS485 Communications Protocol
- **Weight:** 5 lbs. (2.27 kg)

\* Setup storage and recall feature not accessible with User interface or Customer provided interface.

## STANDARD OUTPUT MODULES

No additional output modules are required if the “D” Version output is selected for a control Module. The I10 option provides isolated output if desired. If either pneumatic or 0-90Vdc outputs are desired, then the pneumatic (P version) or High Voltage (V Version) output modules will be packaged as part of the Tension Manager™ with the Control Module.

### HIGH VOLTAGE OUTPUT MODULE (V VERSION)

Puts out the line voltage typically used to drive an eddy current drive or a magnetic particle or hysteresis brake or clutch.

#### Outputs:

115Vac input: 0 to 90Vdc @ 4 Amps standard,  
0 to 24Vdc or 0 to 45Vdc @ 4 amps optional

Optional 230Vac input: 0 to 45V, 90V, or 180Vdc @  
4 Amps,

- **Power Input:** 115/230 Vac 50/60 Hz single Phase @ 5 Amps, ± 15Vdc from control module & 24 Vdc for relay
- **Weight:** 5 lbs. (2.27 kg.)

## OPTIONAL MODULES

**DUAL TRANSDUCER MODULE (TDT)** Connects to the Control Module and provides switching between two pairs of tension transducers.

- **Weight:** 2.32 lbs. (1.04 kg.)

### MEDIUM VOLTAGE OUTPUT MODULE (MVO-OPTION TO “V” VERSION)

Provides 0 to +24Vdc output from a +24Vdc input, and is typically used to drive a magnetic particle clutch or a low voltage electric clutch.

- **Power Input:** 24 Vdc @ 2 Amps, ± 15Vdc from control module
- **Output:** 0 to 24Vdc @ 2 Amps, Compensated
- **Weight:** 2.5 lbs. (1.13 kg.)

### SPEED MODULE (TSP)

Accepts the output from up to two pulse or DC tachometers and one rider roll, and is typically used for line speed followers, diameter calculation, or when roll diameter information needs to be obtained from a rider potentiometer.

- **Weight:** 2.36 lbs. (1.09 kg)



SPEED MODULE

### PNEUMATIC OUTPUT MODULES (P VERSIONS)

Provide a pneumatic output from a TensionManager™ system. Mounts near clutch or brake and has optional tension on/off switch and Tension On (RTS) indicator.

- **Remote Pneumatic Assembly in Enclosure:** DFE Servo valve in steel enclosure. Air filter and regulator to be provided by customer.
- **Dual Valve Servo Pneumatics (DVS):** Non-DFE Servo valve in enclosure with bracket.

#### SPECIFICATIONS:

- **Input:** 125psi (13.8 bar) Max.
- **Output:** 0.5 to 75 psi (0.03 to 5.17 bar)
- **Servo valve drive signal:** 0 to 100 mA (from control module)
- **Air connections:** In = 3/8 in. plastic tubing (5/16 in., 8 mm optional), Out = 1/4 in. plastic tubing (6mm)
- **Weight:** 12.2 lbs.(5.53 kg.) in enclosure

**TENSION-ON MODULE (TTO).** The module connects to the Control Module and provides a single NO or NC relay contact when tension is on.

- **Weight:** 2.3 lbs.(1.04 kg.)

### TENSION LIMIT SWITCH MODULE (TLS)

This module is normally used for web break detection. The module connects to the Control Module and provides a single NO or NC relay contact.

- **Weight:** 2.3 lbs. (1.04 kg.)



TENSION LIMIT SWITCH MODULE

## USER INTERFACES

### REMOTE CONTROL TERMINAL

**(TRC).** The handheld Remote Control Terminal communicates with the control module over a serial interface and may be used to set up the controller system, as a diagnostic interface, or as a permanent operator interface. Available with Anti-Tamper switch option to keep your settings secure.



**PERSONAL COMPUTER INTERFACE.** For customers needing a PC or laptop interface, **PCLink™** is the interface software which can be used to configure and operate the TensionManager™ system over a serial link. PCLink™ is Windows®-based user interface software included with the purchase of a Control Module. Available on a 3.5" floppy disc and from DFE via email.

### HOST INTERFACE

For customers who need an interface to a host computer or PLC. The Control Module comes standard with RS232 host interface. Choose optional RS485 interface if needed.

### USER INTERFACE (TUI).

Provides a basic user interface for the system with a tension meter, auto and manual pots, a tension on/off switch with a tension-on LED, an auto/manual switch with an auto LED, and a TLS reset switch with a TLS LED. This assembly consists of a PC board mounted to a rectangular face plate. When TUI is selected as the main user interface, either a TRC, or a laptop PC, must be used to initially configure the TensionManager™ system. The standard TUI panel assembly is designed to mount from the front to an opening on the machine frame, or control panel. An optional TUI panel is designed to mount to the machine from behind a cutout in the machine frame.



## TENSION TRANSDUCERS

Dover tension transducers are the direct-sensing devices that output an accurate tension measurement signal from a roller in the web path to the transducer inputs on the TensionManager's Control Module.

Dover Flexo produces tension transducers for almost any web press or process machinery application to measure actual tension in moving web or filament.

All Dover transducers are built with superior overload protection and have rugged stainless steel and aluminum construction for reliability and corrosion resistance.

Shown here are just a few of the different styles of tension transducers available from DFE. If you don't see a transducer that fits your needs exactly, please call or e-mail us. We manufacture custom transducers to fit almost any tension measurement application.

Items shown with the CE mark have been tested, and have met the requirements of the Low Voltage Directive (73/23/EEC) and the EMC Directive (89/336/EEC) established by the member states of the European Union.

Please refer to your DFE catalog binder or ask for data sheets on the individual tension transducer products shown here.



MODEL C TRANSDUCERS  
CE



RIBBON FILAMENT TRANSDUCERS  
CE



TENSION ROLL™ TRANSDUCERS  
CE



LOW TENSION TRANSDUCERS  
CE



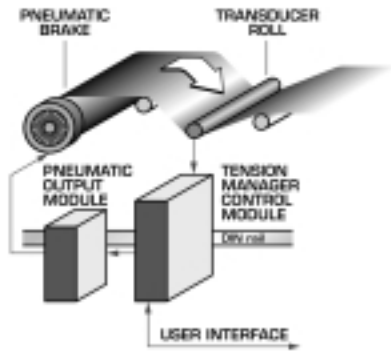
NARROW WEB TRANSDUCERS  
CE



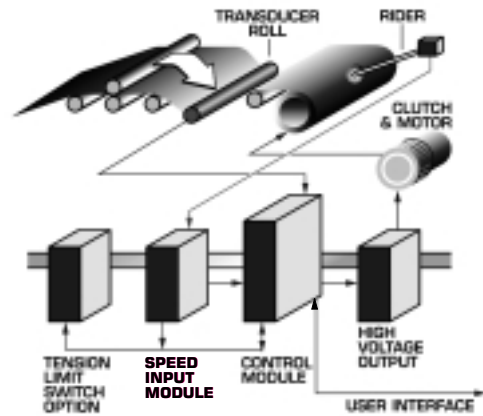
UPBH & UPBV TRANSDUCERS  
CE

# APPLICATIONS

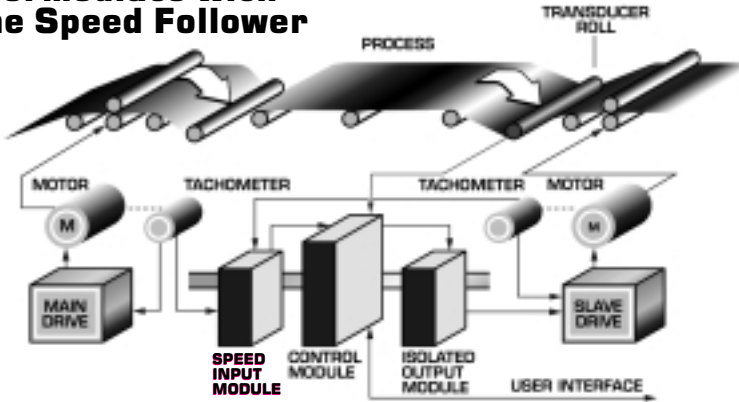
## Unwind



## Rewind with Taper and Web-Break Detector



## Intermediate with Line Speed Follower



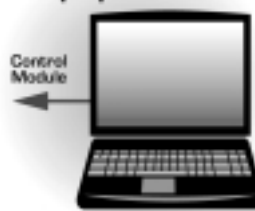
# INTERFACE EXAMPLES



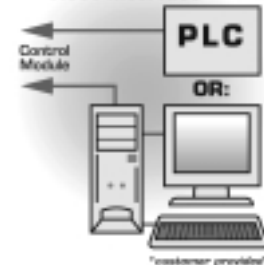
RCT Interface



Laptop Interface\*



Host Interface\*



# SYSTEM SPECIFICATIONS

- **Transducer Signal:** 500 mVdc per pair at rated load, 1.0 Vdc with Extended Range Option.
- **Zero (tare)Range:** 95% of transducer rating, minimum
- **Calibration Range:** 25:1
- **Temperature Range:** 32° to 104° F (0 to 40°C)
- **System Accuracy:** 1 to 3% Typical
- **Output Range:** 0 to 100% Maximum
- **Taper Tension Range (Option):** 0 to 100%

# TO ORDER

1. Select the Control Module (one for each tension zone needing control). 2. Select output module(s) and option module(s) based on your application requirements. 3. Select a user interface(s) based on your user access and setup needs. 4. Indicate your feature choices in place of the X's in the product code shown below. *Example: TMV-U - 24, TLS.*

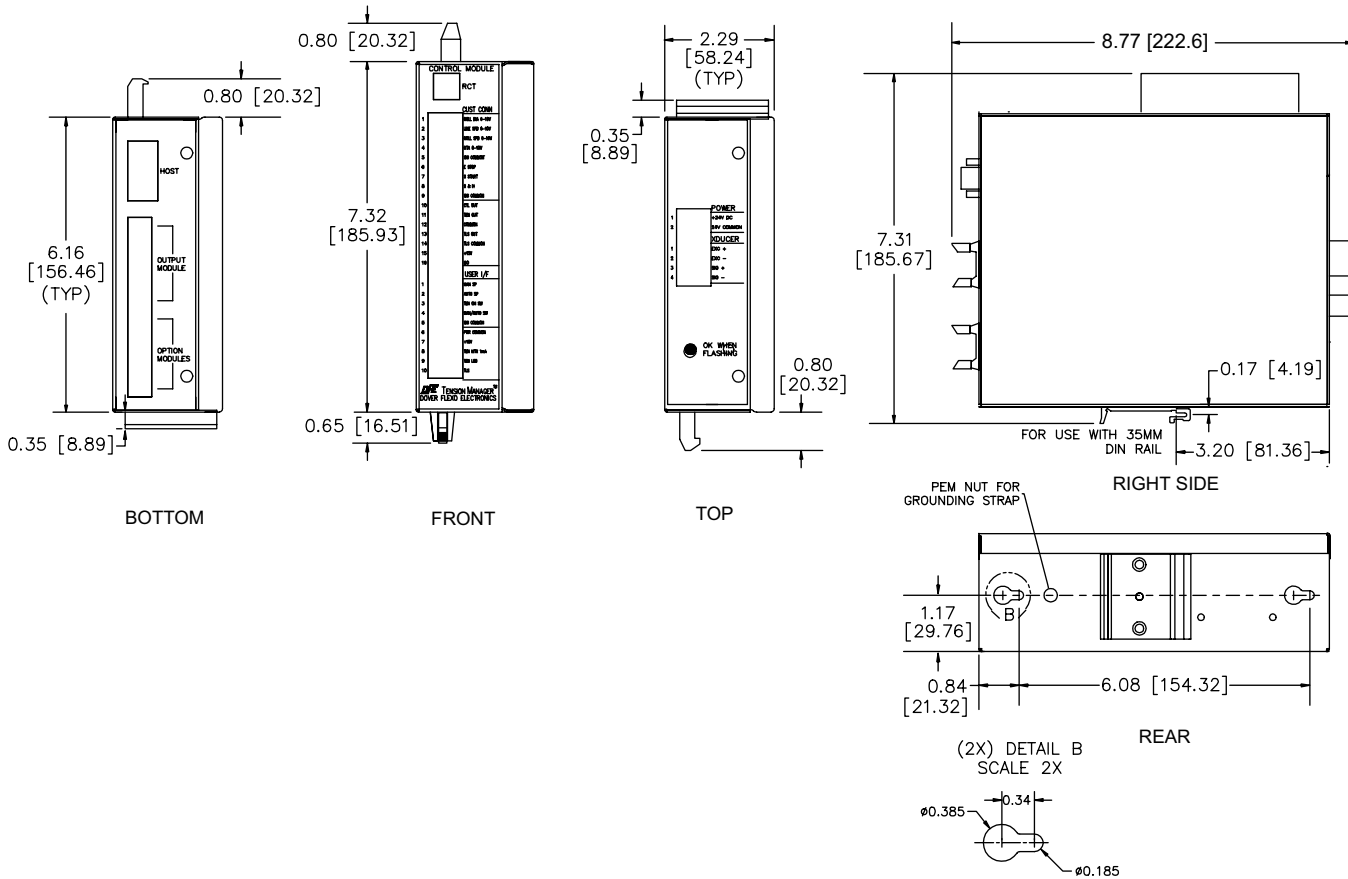
**TM** **X** - **X** - **OPTIONS** (Separated by commas)

VERSION	ZONE	OPTIONS	
D = 0-10Vdc compensated, non-isolated output U = 0-90Vdc output P = 75psi	R - Rewind U - Unwind I - Intermediate	24 = 24Vdc Output <sup>(1)</sup> 45 = 45 Vdc Output <sup>(1)</sup> 230 = 230V Power Input <sup>(1)</sup> ATSW = Anti-Tamper Switch <sup>(5)</sup> B10 = Bipolar 10 Volt Output DVS = Dual Valve Servo 110 = Isolated 10V Output MVO = Medium Voltage Output Module <sup>(3)</sup> RO = Reverse Output RS48 = RS485 Interface SFD = Speed Follow by DC Tach <sup>(4)</sup> SFP = Speed Follow by Pulse Tach	TDT = Dual Transducer Input Module <sup>(4)</sup> TLS = Tension Limit Switch TRC = Remote Control Terminal TSP = Speed Input Module TTD = Taper Tension by DC Tach <sup>(4)</sup> TTF = Taper Tension by Follower Roll <sup>(4)</sup> TTO = Tension-On Relay Module TTP = Taper Tension by Pulse Tach <sup>(4)</sup> TUI = User Interface Module <sup>(2)</sup> XRE = Extended Range <sup>(6)</sup> Z = Special (SPR)

**NOTES:** 1. Applies to V output module only. 2. Must use PCLink™ software or remote control terminal (TRC) to set up the unit. No setup capability on the user interface panel. 3. Uses 24Vdc power input to produce 0-24Vdc output. 4. Require TSP option. 5. Applies to the TRC option only. 6. Transducers need to have extended range (XR) option also.

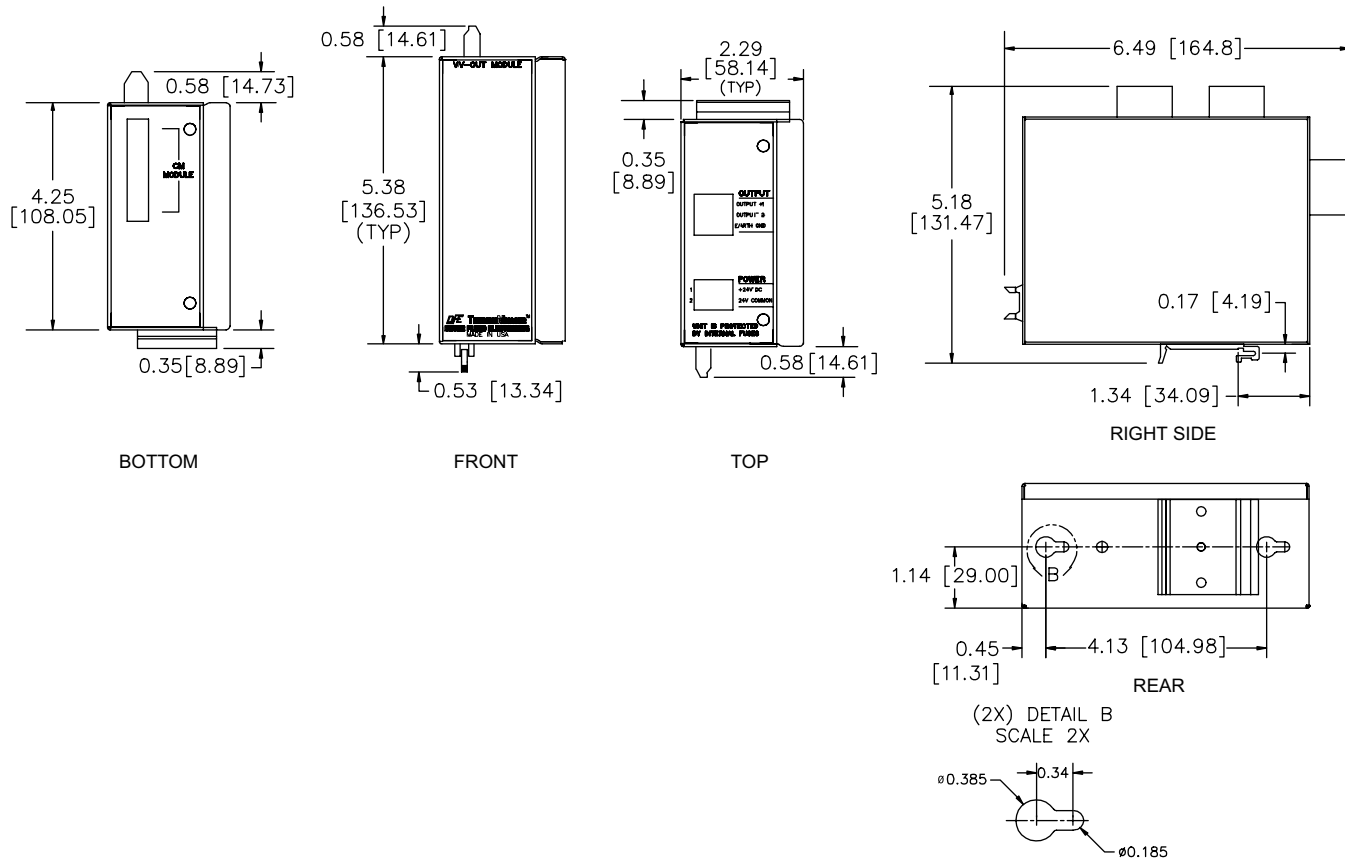
## LARGE MODULE DIMENSIONS inches [mm]

Modules in this group: Control Module and High Voltage Output Module.



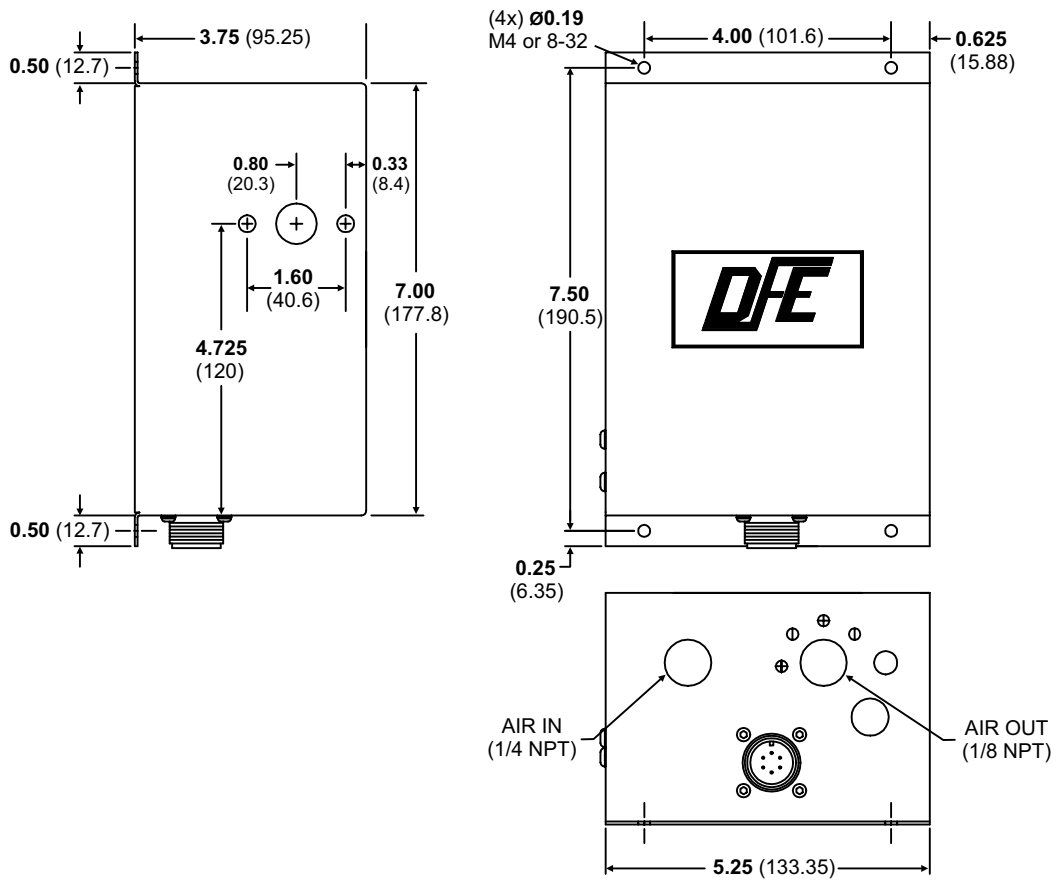
## SMALL MODULE DIMENSIONS inches [mm]

Modules in this group: Tension-On, Med. Volt. Output, Dual Transducer, Tension Limit Switch, and Speed Module.

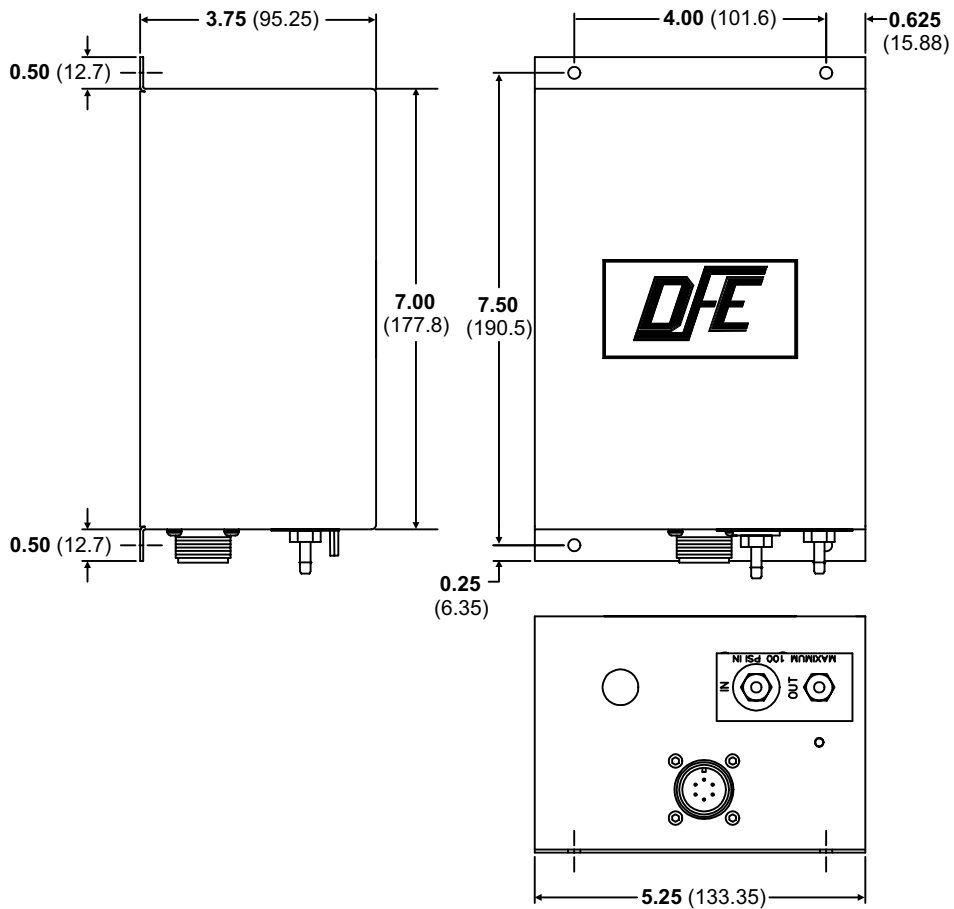


# REMOTE PNEUMATICS inches (mm)

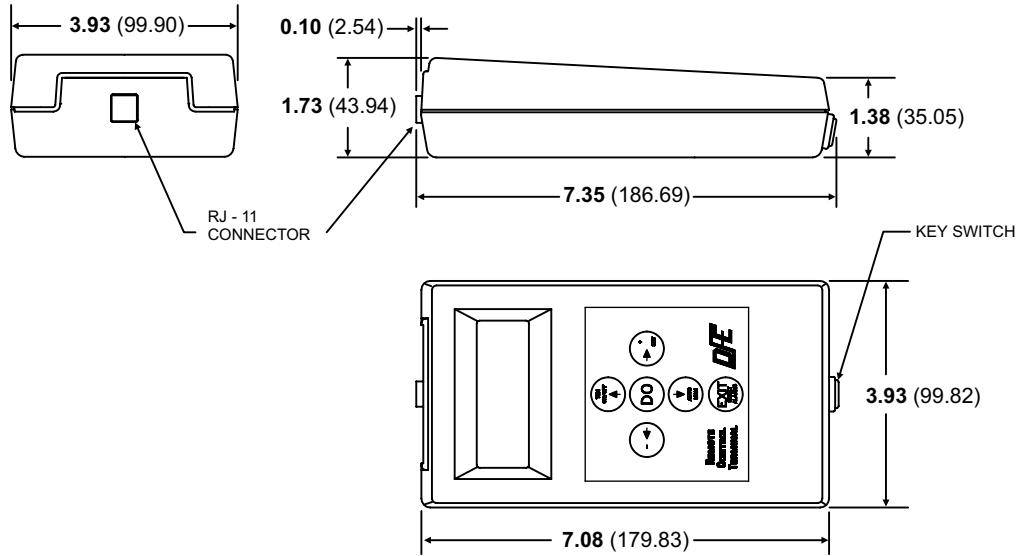
## REMOTE PNEUMATIC ASSEMBLY (Standard with P Version)



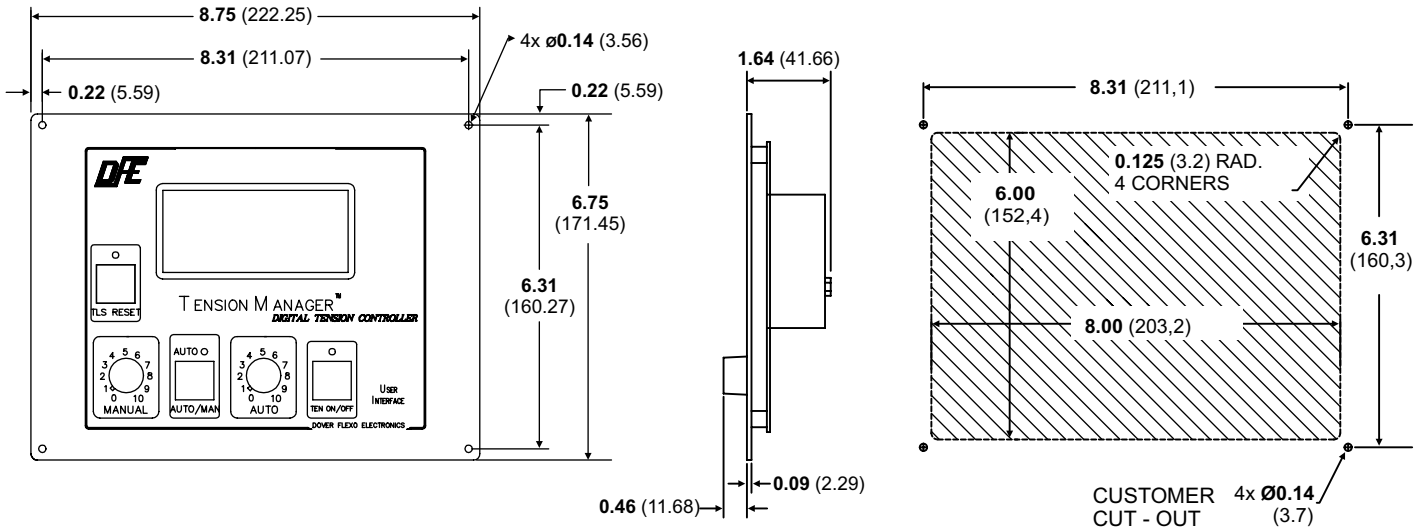
## DUAL VALVE SERVO PNEUMATIC ASSEMBLY (Option DVS for P Version)



# REMOTE CONTROL TERMINAL DIMENSIONS inches (mm)



# USER INTERFACE DIMENSIONS inches (mm)



**DFE** THE TENSION CONTROL SPECIALISTS  
**DOVER FLEXO ELECTRONICS, INC.**  
 217 PICKERING ROAD, ROCHESTER, NH 03867 USA • 603-332-6150 • FAX 603-332-3758  
 E-Mail: info@dfec.com • Internet: www.dfec.com • ISO 9001 Certified