



DOVER FLECO ELECTRONICS, INC.

STEADYWEB™ MICROPROCESSOR AUTOMATIC TENSION CONTROLLER



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DATA SHEET 9609SWM

GENERAL DESCRIPTION

SteadyWeb Controllers of both the analog and microprocessor series take tension input signals from Dover's tension transducers and automatically provide a corrective output signal to a machine's tensioning mechanism. This capability improves product quality and productivity on a web processing line. A large selection of features make the SteadyWeb automatic tension controllers the most advanced and versatile in the industry.

The zone(s) in which you desire tension control, and the drive device or tensioning mechanism used in each tension zone determine the specific SteadyWeb model required. The controller has three outputs

available for operating pneumatic or electric brakes and clutches, eddy current clutches, or DC and AC drives.

Adjusting tension is simple. The machine operator sets the desired tension on the controller display panel while a pair of tension transducers continuously senses actual tension. The controller compares *actual* tension with *desired* tension and adjusts the torque output of a brake or clutch, or the drive speed on a DC or AC drive, so that actual tension matches the tension setpoint. The SteadyWeb automatically compensates for speed changes, roll diameter changes and other factors to maintain desired tension.

THE MICROPROCESSOR ADVANTAGE

The capabilities of the SteadyWeb MicroProcessor Tension Controller encompass those of the analog series of SteadyWeb. The microprocessor-based version was designed to provide special digital features for our customers who can benefit from them.

Advantages derived from the microprocessor design include ease of calibration and changing settings, the convenience of storing and recalling sets of complex operating parameters as setups, and the versatility of being able to choose, at the turn of a dial, a preferred setting for a given function. There are 10 different measurement units to choose from when expressing a tension reading on the digital display.

Operation of the SteadyWeb MicroProcessor requires no special skills or training. Switches on the front control panel are grouped into two distinct sections: a user-friendly alphanumeric keyboard with a function selector knob, and an operator control panel with keys dedicated to routine access of operating functions. Adjustment of parameters for a given function is accomplished in-

tuitively--similar to tuning a station on a digital FM radio dial--by turning the SELECTOR knob. No awkward "shift" or "secondary function" keys are used. Web tension is displayed on a large analog meter (and if desired, on a digital display) so the operator can view it at a glance. SteadyWeb controllers feature soft start and bumpless auto/manual switching. Sample/hold and multiply/divide circuits provide smooth operation during flying splices on either unwind or rewind applications.

The SteadyWeb MicroProcessor allows the user to adjust up to 70 operating parameters for precision performance. A series of commands and settings can be selected, stored under the user's choice of names, and retrieved at the operator's discretion for running a process with a specific set of control parameters. Up to 25 set-ups can be stored and recalled. This makes the SteadyWeb MicroProcessor especially suited for controlling tension on machines where a variety of web materials are processed.

ADVANTAGES:

- Wide tension control range without recalibration.
- Fast and easy to install--quick start up.
- Compatible with automated factory systems.
- Automatic tension control--no manual adjustments needed.
- Allows for wide range of user selectable parameters. i.e. tension units, roll diameter, taper value, tension limit values, tuning values, line speed display;
- Storage of setup and operating parameters for up to 25 sets of instructions.
- Large, easy-to-read analog tension meter reads out actual web tension.
- All operating adjustments are made from the front panel. The unit never needs to be opened.
- Controller can download system setups or status information to a host computer via RS485 or RS232 interface. A host computer can upload system setups to the controller and/or it can download status information from the controller.
- A large, backlit (green) LCD display with 2 x 16 character lines and digital multi-function readout. Reads out actual tension in default mode; shows full text items, status and commands. The display is illuminated continuously for operator convenience.
- Separate keypads for operation and data entry.
- Status lights indicate important conditions.

STANDARD FEATURES:

- 0-10 VOLT TENSION OUTPUT. Used to interface with computers or other control systems.
- 4-20mA TENSION OUTPUT - Used to interface with computers or other control systems.
- EMERGENCY STOP - Stops the tension controlled device quickly in an emergency situation. Upon a contact closure, the controller goes to full or to zero output.
- METER DAMPING - Eliminates rapid tension meter fluctuations and displays an average tension.
- OUTPUT DIRECTION SELECTION - Select between normal and reverse output.
- RATIO OUTPUT UP OR DOWN - Multiplies or divides the control output during flying splice applications.
- REMOTE TENSION ON/OFF - Accommodates additional tension On/Off buttons in remote locations.
- REMOTE TENSION SET POT - Allows for use of a remotely located Auto tension set pot.
- SAMPLE & HOLD - Upon a contact closure, output is maintained at a constant level until the contact is opened.
- SOFT START - Used on unwinds only, insures control output is low when machine starts. Actuated in 3 ways: Tension Level, Remote Contact Closure, and Speed Tachometer Signal.
- TAPER TENSION by roll follower or external 0-10 VDC.
- STANDARD METER SCALES - 0-1, 5, 10, 25, 50, 100, 150, 250, 500, or 1000.

OUTPUT VERSIONS:

16P

0-75 psi output for use with pneumatic brakes and clutches. Most commonly used in the unwind and rewind zones. System includes internal air filter and regulator (80-120 psi input pressure).

16V

0-90 VDC output. For use with all types of electrical brakes and clutches including eddy current clutches. Also available with 24 and 45 VDC output. Commonly used in the unwind or rewind zones.

16D

0-10 VDC compensated output for use with adjustable speed DC and AC drives. The output is electrically isolated for compatibility and reliability. Used in all tension zones; unwind, rewind, and intermediate.

OPTIONS:

- (230V) 230V Power Input
- (24V) 24V Output (16V only)
- (45V) 45V Output (16V only)
- (180V) 180V Output (only with 230V power) 16V only.
- (H6) REMOTE OPERATOR DEVICES - Enclosure with no cover, 6 foot harness (different lengths optional) to the legend plate with all operator devices.
- (2E) REMOTE PNEUMATIC ASSEMBLY - A separate bracket housing the pneumatic components (16P only).
- (DTI) DUAL TRANSDUCER INPUT - Accepts tension inputs from two different transducer sources.
- (XR) EXTENDED RANGE - Makes the transducers twice as sensitive (transducer must also have XR option).
- (8MM) METRIC AIR TUBING - 8mm (5/16") air input fitting (16P only).
- (NMS) NON-STANDARD METER SCALE - Any non-standard meter with single scale or dual scale.
- (RO) REVERSE OUTPUT - Increases output when tension exceeds set point. Used in intermediate applications where transducers are located after nip rolls.
- (RTA) REMOTE TENSION AMPLIFIER (RTA) - Usually used with an intrinsically safe amplifier.
- SPEED FOLLOW - Uses a DC tach signal (STT) or pulse tach signal (STE) to maintain speed control in most intermediate applications. Tachometers not included.
- (TLS) TENSION LIMIT SWITCH - Relay actuates at a pre-set adjustable trip point. Can be used as a web break detector.
- TAPER TENSION - Using DC tachs (TTDCT), pulse tachs (TTPT). Tachometers not included

All option cards are available in kits and may be purchased separately. A kit includes mounting hardware and instructions.

SPECIFICATIONS

Power Input:	16P and 16D 16V	120/230 Volts 60/50Hz Single Phase @ 1 amp 120/230 Volts 60/50Hz Single Phase @ 5 amps
Output Control Range:	16P 16V 16D	0 to 75 psi (0 to 5,17 bar) 90 Volts DC, 45 VDC, 24 VDC, all @ 4 amps 0-10 Volts DC (isolated)
Tension Signal Output		0 to 10 VDC 4 to 20mA with 500 Ohm maximum load
Enclosure		NEMA Type 1, Steel
Weight		26 lbs. (11.8 kg)
Air Connections:	16P	In: 3/8" (9.5 mm) compression fitting for plastic tubing (5/16", 8 mm optional) Out: 1/4" (6 mm) compression fitting for plastic tubing
Internal Air Filter:	16P	5 micron with 1/2 pint bowl and automatic drain
Transducer Power Supply		5 VDC, regulated, 10 VDC with extended range
Transducer Signal		500 millivolts DC per pair at rated load, 1 VDC with extended range
Mating Transducer Cable Connectors		Amphenol MS3106A-10SL-3S
Zero Range		95% of transducer rating, minimum
Calibration Range		25:1
Temperature Range		32°F to 104°F (0°C to 40° C)
System Accuracy		1% to 3% typical
Tension Meter		Heavy-duty, 2% accuracy with flame proof front
Display		Backlit LCD (green) with 16 characters, 2 lines
Maximum Output Adjustment Range		0%-100%
Manual Output Range		0% to 100% of rated output
Output Multiplier Range (ratio)		1:10
Output Divider Range (ratio)		10:1
Tension Limit Switch relay contacts (option)		N.O., N.C., rated at 1A 30V
Taper Tension Range (option)		0%-100% adjustable
Taper Tension Inputs code TTDCT (using DC tachs) code TTPT (using Pulse tachs) code TTF (option-roll follower)		Maximum of 3 VDC to 250 VDC switch selectable 300Hz to 40,000Hz at maximum line speed 10k Ohm minimum potentiometer
Microprocessor Type		RS232 or RS485

TO ORDER:

Specify version, options, and meter scale. Also indicate the tension zone.

This is an example of an order code:

16P - 2E - XR - 0-250
Unwind Zone

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Calibration Range		25:1
Temperature Range		32°F to 104°F (0°C to 40° C)
System Accuracy		1% to 3% typical
Tension Meter		Heavy-duty, 2% accuracy with flame proof front
Display		Backlit LCD (green) with 16 characters, 2 lines
Maximum Output Adjustment Range		0%-100%
Manual Output Range		0% to 100% of rated output
Output Multiplier Range (ratio)		1:10
Output Divider Range (ratio)		10:1
Tension Limit Switch relay contacts (option)		N.O., N.C., rated at 1A 30V
Taper Tension Range (option)		0%-100% adjustable
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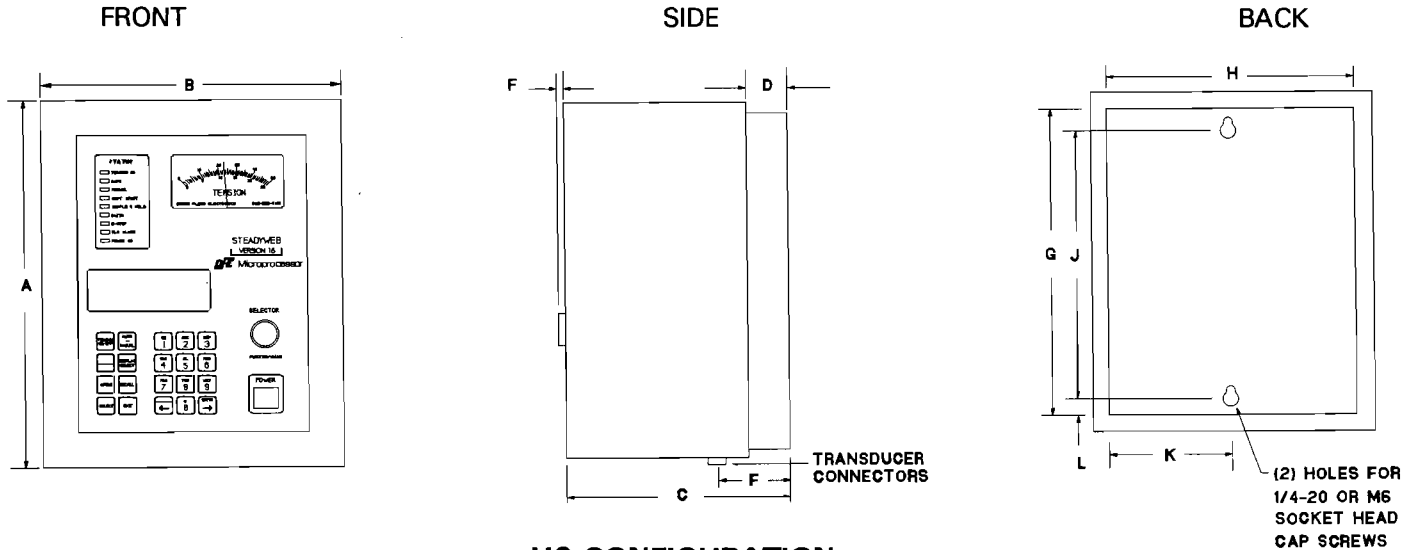
DIMENSIONS

UNITS	A	B	C	D	E	F	G	H	J	K	L	M	N
inch	12.44	10.42	7.75	1.42	2.41	.24	11.78	9.41	10.54	4.71	.42	11.24	10.60
mm	316	265	197	36	61	6	299	239	268	120	11	285	269

UNITS	P	Q	R	S	T	U	V	W	X	Y	Z	AA
inch	10.51	9.31	8.78	8.09	.163 Dia Typ 2	.19 Dia Typ 2	.40	.65	1.41	.28	1.58	7.35
mm	267	236	223	205	4,1	4,8	10	17	31	7	40	184

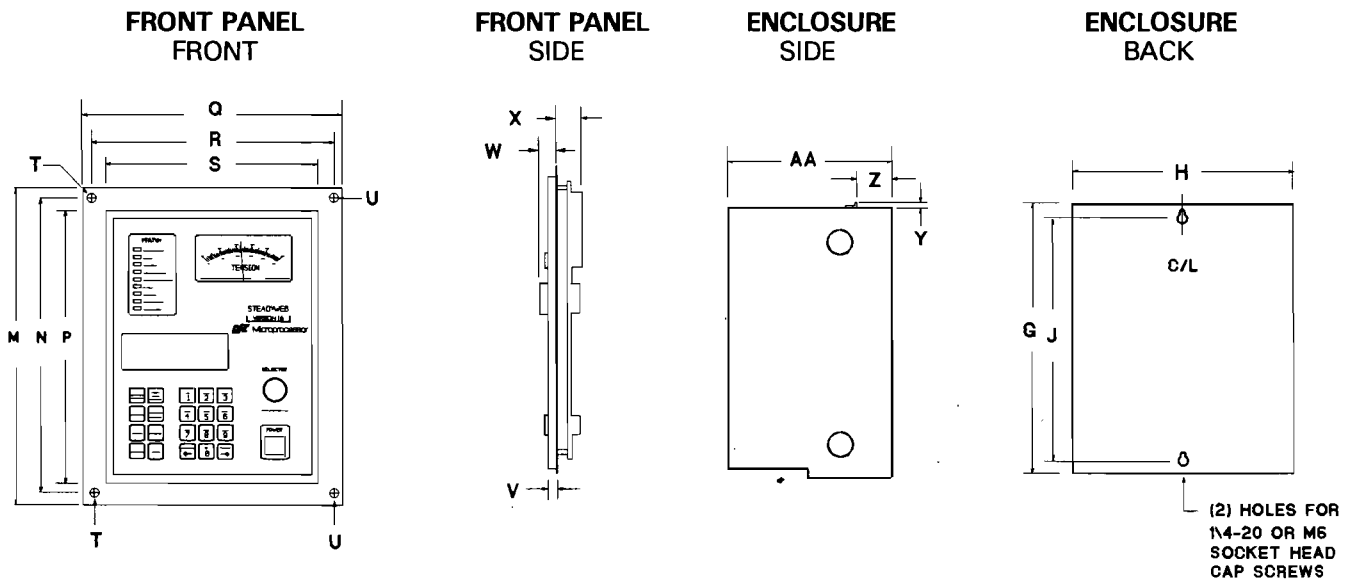
Note: Allow 5" (127mm) clearance on the left side for the controller to open completely.

STANDARD STEADYWEB 16P, 16V, 16D



H6 CONFIGURATION

H6 includes Front Panel and Enclosure with cable connecting the two



THE TENSION CONTROL SPECIALISTS
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