VERSATEC® Versatile Tension Control

- Unwind
- Rewind
- Dancer
- Free Loop
- Ranger

The VERSATEC Versatile Tension Control is a multi-function automatic tension or process controller. It uses the US-2 Ultrasonic Sensor to measure distance and roll diameter, and has selectable operating modes for Unwind, Rewind, Dancer, Free Loop, or Ranger applications. This flexibility eliminates the need to learn the operation of different controls for different tension zones.

The multi-line alphanumeric menu driven display simplifies setup and operation. Any selected parameter and its value are displayed simultaneously, and can be changed at the touch of a finger. From the keypad and display, you can control all operating parameters for any operating mode; including tension, distance, dancer position, loop position, alarm setpoints, security, language and units, and setup selection.

Standard control outputs interface with AC & DC drives, and with air brakes and clutches through a current-to-pressure transducer. An optional power amplifier is used to control magnetic particle brakes and clutches, and mounts inside either enclosure model. The PA-2 will operate either 24 or 90 VDC brakes and clutches, and the PA-90 will operate 90 VDC brakes and clutches. The VERSATEC accepts remote inputs from a PLC or remotely mounted push buttons to adjust the tension setpoint or change the operating setup.

For international installations the VERSATEC provides selectable operating languages of English, French, German, Italian or Spanish, and inch or metric operating units. The desired language and operating units can be selected from the keypad.

Features

- Versatile, automatic, and easy to use control system
- Unwind, Rewind, Dancer, Free Loop, and Ranger Control all in one package
- Multi-line alphanumeric display simplifies setup and operation by displaying real words and values
- Backlit display for viewing in any light condition
- Stores four setups for quick, precise changeovers
- Program security prevents unauthorized changes
- Language selectable in English, French, German, Italian or Spanish
- Selectable inch or metric units of measure
- 4 to 20 mADC, 0 to 10 VDC, -10 to +10 VDC outputs all standard
- Interfaces directly to a PLC for remote operation
- Piezoelectric sensor and control enclosure are IP65 splash proof protected
- VERSATEC and US-2 are UL listed and CE compliant for safety and electrical noise immunity
VERSATEC® Keypad and Display

Environmentally sealed, electrostatically protected touch keypad for setting tension and inputting data

The VERSATEC keypad and display provide an intuitive, user-friendly operator interface in any operating mode. The control is versatile and powerful, yet very easy to set up and operate. All setup and operating screens are indicated directly on the multi-line display in real words, not codes, with the corresponding value or status indicated. The screens are accessible from easy to follow scroll-through menus. Changing screens and the displayed information is as easy as pushing a button. It does not get any easier than this.

The control needs only minimal setup information to start. For example, in Tension Control mode you need to enter only the full roll and core diameters, distance to roll centerline, input a desired tension level, and the control is ready to use. Setup in the other operating modes is just as easy.

Accessible operator adjustments are minimal and require very little system knowledge. For example, in Tension Control mode the operator may adjust the desired level of tension by pushing the + and - keys. The control does the rest. The VERSATEC is truly automatic.

<table>
<thead>
<tr>
<th>Parts and Ordering Information</th>
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<tr>
<td>VTC</td>
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<td>VTC-E</td>
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<td>US-2</td>
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<td>PA-90</td>
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<tr>
<td>PA-2</td>
</tr>
<tr>
<td>RAA</td>
</tr>
</tbody>
</table>
VERSATEC® Ultrasonic Tension Control Mode

**Push Button Setup and Operation**
Operation & Alphanumeric Display
Menu driven operation and setup with online help

### System Status
- **1 TENSION 64.5%**
  - A DIA φ 48.6IN
  - Home screen displays present diameter and tension setpoint. Adjust Tension using +/- keys

### Display Actual Output
- **1 OUTPUT LEVEL**
  - A 53.4%
  - Displayed as percent of maximum

### Adjustable Taper Tension
- **TAPER PERCENT**
  - 24.0%
  - Direct input of desired rewound taper

### Add Stopping Torque
- **STOP MULTIPLIER**
  - 2.50
  - Helps stop unwind rolls

### Manual Operation
- **MANUAL LEVEL**
  - 46.8%
  - Output can be controlled manually during roll changes

### SETUP NUMBER

### DISPLAYS TENSION SETPOINT AND PRESENT DIAMETER

### MENU-DRIVEN OPERATION

### TACTILE FEEDBACK KEYPAD

### Select Application
- Choose unwind or rewound

### Easy Setup: Step 1
- **FULL ROLL DIA**
  - 48.0 IN
  - Enter maximum roll diameter

### Select Language
- Choose English, French, German, Italian or Spanish

### Select Units
- Choose English or metric units

### Core and Full Roll Detect
- **MINIMUM DIAMETER**
  - DETECT 3.2 IN
  - Core and full roll alarms flash on the display and trip external indicators

### Copy Setups
- **COPY TO SETUP 1 FROM SETUP 4**
  - Setup information can be copied between four setups

### Program Security
- **ENTER CODE TO LOCK ****
  - Personalized code prevents unauthorized changes to setup parameters

### Ignore Spool Flanges
- **ECHO REJECT DIST**
  - 6.0 IN
  - For narrow web spools, enter distance to flanges to be ignored

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**Setup Information**

- **System Status**
- **Display Actual Output**
- **Adjustable Taper Tension**
- **Add Stopping Torque**
- **Manual Operation**
- **Select Application**
- **Easy Setup: Step 1**
- **Select Language**
- **Select Units**
- **Core and Full Roll Detect**
- **Copy Setups**
- **Program Security**

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**Troubleshooting Tips**
- **Check Tension Setpoint**
- **Adjust Tape Tension**
- **Monitor Torque Levels**
- **Inspect Roll Surface**
- **Maintain Calibration**
The VERSATEC is a fully automatic ultrasonic tension control for unwind and rewind applications. It offers simple setup and operation at the touch of a finger, and conveniently displays operating and setup information on a multi-line alphanumeric backlit display.

By simply entering the core diameter, the full roll diameter, the distance to the roll centerline, and the desired tension from the front keypad, the VERSATEC is ready to use. It then measures the roll diameter, and commands the required torque to control tension. Tension adjustments and setup selections may be made from the keypad, from remotely mounted push buttons, or through a PLC.

In unwind applications the Stop Multiplier feature can be used to increase torque during machine stops to provide smooth stops and prevent slack webs. In rewind applications Taper Tension prevents telescoping rolls and insures good roll edges by reducing tension as the roll diameter increases. Core and Full Roll alarms can be adjusted to give the operator a signal before reaching the end of the roll. This signal appears on the display and can also be connected to an external indicator.

The Inverse Diameter Output is provided to reduce the speed of the rewind clutch input motor or the differential shaft overspeed as the roll diameter increases, thus reducing the slip rpm and extending the life of the clutch or the differential shaft.

Features

- Fully automatic unwind or rewind tension control improves process quality
- Multi-line alphanumeric display simplifies setup and operation
- Simultaneously displays tension setpoint and roll diameter so operator can monitor progress
- Ultrasonic non-contact sensor never touches the web
- Control electric or pneumatic brakes and clutches, or AC and DC drives
- Inverse Diameter Output reduces clutch slip for longer life
- Adjustable Taper Tension for winding optimum rolls
- Inertia Compensation for stopping large rolls
- Core and Full Roll Alarms alert operator for roll changes
- Local or remote tension adjustment and setup selection
VERSATEC® Dancer Control Mode

Push Button Setup and Operation
Operation & Alphanumeric Display
Menu driven operation and setup with online help

System Status
1 OUTPUT 56.8%
A DIA φ 24.1IN
Home screen displays output, setup number, and operating mode simultaneously (when US-2 sensor is used)

Push Button Tuning
DYNAMIC TUNING
Two-step dynamic tuning of system response

System Status
1 OUTPUT LEVEL A 53.4 %
Home screen displays output, setup number and operating mode simultaneously (without diameter sensor)

Direct Data Access
INTEGRATOR TIME .125 SEC
Results of dynamic tuning can be accessed and recorded

Select Control Method
CONTROL DEVICE TORQUE
Optimized method for control of brake, clutch or drive in torque mode

Direct Data Input
PROPORTIONAL GAIN 1.49
Parameters can be accessed and input directly

Select Control Method
CONTROL DEVICE SPEED
Optimized method for control of drive in speed mode

Select Language
LANGUAGE ESPANOL
Choose English, French, German, Italian or Spanish

Added Stopping Torque
STOP MULTIPLIER 2.50
Helps stop unwind rolls with additional torque at machine stop

Select Units
UNITS METRIC (MM)
Choose English or metric units

Use US-2 Ultrasonic Sensor
DIA SENSOR?
Yes
Improves stability with large roll ratios, allows rewound taper and full roll and core detection

Control Dancer Loading
TENSION OUTPUT?
Yes
Tension Output sets Dancer loading for remote adjustment

Push Button Data Entry
ROLL DIMENSIONS
Input minimum and maximum diameter and distance to axis

Adjustable Taper Tension
TAPER PERCENT 24.0 %
Input desired rewound taper when using Tension Output and diameter sensor

Core and Full Roll Detect
MINIMUM DIAMETER DETECT 3.2 IN
Core and full roll alarms flash on the display and trip external indicators when diameter sensor is used
VERSATEC® Dancer Control Applications

Control Magnetic Particle Clutches and Brakes

Control Air Brakes and Clutches, or AC and DC Drives

The VERSATEC provides closed loop tension control of a moving web in any dancer application. It measures the position of the dancer arm using a MAGPOWR DFP or DFP-2 Position Sensor, and commands the required output adjustment to achieve and maintain the desired position. It offers simple setup and operation at the touch of a finger, and conveniently displays operating and setup information on a multi-line alphanumeric display.

The VERSATEC program is optimized for torque or speed control applications, and will control a brake, clutch, AC or DC drive, or servo to maintain the dancer position. A simplified two-step tuning method provides stable operation through the entire roll. Use of the optional US-2 Ultrasonic Sensor allows diameter compensation for optimum control response through the entire roll, even with large roll ratios. This is an important new feature, since controllability changes dramatically with roll diameter changes. This feature is not available in other dancer controls.

Dancer position adjustments may be made through the VERSATEC keypad, through remotely mounted buttons, or through a PLC. Automatic centering maintains the desired dancer arm position automatically through the entire roll. Stop Multiplier and Inertia Compensation provide additional stopping torque during machine stops to prevent slack webs. And, the Tension Output can be used to adjust dancer loading, allowing taper tension in rewind dancer applications and automatic tension changes as you change setups.

Features

- Provides closed loop control of tension in any dancer application
- Optimized for torque or speed control operation
- Simple two-step tuning provides stable operation through the entire roll
- Automatic centering maintains dancer arm position through the entire roll
- Optional ultrasonic sensor allows diameter compensation for optimum response even with large roll ratios
- Multi-line display indicates actual output level and diameter simultaneously
- Inertia Compensation stops large unwind rolls
- Tension Output provides remote control of dancer loading
- Provides adjustable taper tension in rewind applications
VERSATEC® Free Loop Control Mode

Push Button Setup and Operation
Operation & Alphanumeric Display
Menu driven operation and setup with online help

System Status
Home screen displays loop setpoint, actual position, setup number and operating mode

Display Actual Output
Displayed as percent of maximum

Push Button Adjustment
Input loop position and limits

Easy Setup
Enter desired distance for maximum output

Easy Setup
Enter desired distance for minimum output

Push Button Tuning
Easy tuning of system response

Direct Data Access
Results of dynamic tuning can be accessed and recorded

Direct Data Input
Parameters can be accessed and input directly

Select Language
Choose English, French, German, Italian or Spanish

Select Units
Choose English or metric units

Setup Assistance
On-screen sensor alignment indicator

Copy Setups
Setup information can be copied between four setups

Program Security
Personalized code prevents unauthorized changes to setup parameters
The VERSATEC is a fully automatic non-contact Free Loop control. The machine operator simply enters the desired distance for the minimum and maximum outputs and the desired loop position using the keypad. The VERSATEC then controls the loop position by ultrasonically measuring the actual position and commanding the necessary output to achieve and maintain the desired position.

The VERSATEC program is optimized for speed control applications, and will control an AC or DC drive or servo to maintain the loop position. The multi-line display indicates the setpoint and actual position simultaneously, and simplifies setup and operation.

Position adjustments may be made from the VERSATEC keypad, through remotely mounted push buttons, or through a PLC. Its responsiveness to position changes is easily optimized for any system. Two alarm outputs can be adjusted to alert the operator before an out of range condition occurs, and an adjustable hysteresis feature prevents the alarms from chattering due to small changes in loop position.

Standard opto-isolated control inputs and outputs allow the VERSATEC to interface with PLCs, and AC & DC drives.

Features

- Provides closed loop control of Free Loops for tension isolation
- Optimized for speed control applications
- Controls an AC or DC drive or servo to maintain loop position
- Multi-line display indicates setpoint and actual loop position simultaneously
- Loop position is controlled to an adjustable setpoint
- Ultrasonic sensor never touches the web
- Two alarm setpoints alert the operator when the loop reaches preset limits
**VERSATEC® Ranger Mode**

**Push Button Setup and Operation**
Operation & Alphanumeric Display
Menu driven operation and setup with online help

- **System Status**
  - 1 DIST 46.9IN
  - H OUTPUT 75.8%
  - Home screen displays measured distance, output, setup number and operating mode

- **Easy Setup**
  - TARGET DIST ±
  - Input distances and output is automatically scaled

- **Easy Setup: 1**
  - DIST FOR MAX OUTPUT 60.0 IN
  - Enter distance for maximum output

- **Easy Setup: 2**
  - DIST FOR MIN OUTPUT 6.0 IN
  - Enter distance for minimum output, setup is complete

- **Ignore Close Objects**
  - ECHO REJECT DIST 6.0 IN
  - Ignore stationary objects between sensor and target

- **Two Adjustable Alarms**
  - ALARM 1 ON DIST 60.0 IN
  - On-screen indicator and output for external indicator

- **Two Adjustable Alarms**
  - ALARM 1 OFF DIST 59.5 IN
  - Adjustable alarm off distance

- **Two Adjustable Alarms**
  - ALARM 2 ON DIST 6.0 IN
  - On-screen indicator and output for external indicator

- **Two Adjustable Alarms**
  - ALARM 2 OFF DIST 6.5 IN
  - Adjustable alarm off distance

- **Setup Assistance**
  - ECHO DETECT 46.9 IN
  - On-screen sensor alignment indicator

- **Select Language**
  - LANGUAGE ITALIANO
  - Choose English, French, German, Italian or Spanish

- **Select Units**
  - UNITS METRIC (MM)
  - Choose English or metric units

- **Select Units**
  - UNITS ENGLISH (IN)
  - Choose English or metric units

- **Copy Setups**
  - COPY TO SETUP 1 FROM SETUP 4
  - Setup information can be copied between setups

- **Program Security**
  - ENTER CODE TO LOCK ****
  - Personalized code prevents unauthorized changes to setup parameters
The VERSATEC is an accurate ultrasonic ranging control and proximity detector featuring ease of operation in a wide range of applications. When used with the US-2 Ultrasonic Sensor, the VERSATEC provides an output proportional to the distance of an object from the sensor. The VERSATEC ranging control can be used anywhere proportional control, setpoint control, on-off control, or one or two level proximity switch control is needed. All of these operating modes are available and set from the keypad. The multi-line display provides easy setup and operation by displaying any parameter and its value simultaneously.

Two common modes of operation are: the Ranger mode, where the control output is proportional to distance, and the Bang-Bang mode, where the control operates like two proximity or limit switches. In all modes a proportional voltage or current, and two alarm outputs are available. Adjustable hysteresis prevents chatter of relays at the setpoint.

The control output is automatically scaled when the distance for minimum output and distance for maximum output are entered. The opto-isolated inputs and outputs can be connected directly to a PLC, AC or DC drive, computer system, pump control, or a MAGPOWR current-to-pressure transducer.

**Features**
- Fully automatic control for a variety of process applications
- Selectable and reversible outputs control many types of equipment
- Control output is automatically ranged for easy setup
- Multi-line display indicates actual distance and output simultaneously
- Ultrasonic sensor never touches the object being sensed
- Minimum and maximum alarms signal when preset limits are reached
### VERSATEC® Specifications

#### Inputs

<table>
<thead>
<tr>
<th>Input</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power</td>
<td>115/230 VAC +/- 10%, 50/60 Hz, switch selectable, 24 VA</td>
</tr>
<tr>
<td>Ultrasonic Sensor</td>
<td>MAGPOWR US-2 Ultrasonic Sensor Sensor range: 6 inches to 60 inches (152 mm to 1524 mm)</td>
</tr>
<tr>
<td>Beam Spread</td>
<td>±10°</td>
</tr>
<tr>
<td>Dancer Position Sensor</td>
<td>1-10 kΩ Potentiometer Sensor MAGPOWR DFP or DFP-2 Sensor 0 to 5 VDC Signal</td>
</tr>
<tr>
<td>Run/Stop, Tension</td>
<td>Switch closure, or 5 or 24 VDC</td>
</tr>
<tr>
<td>On/Off, Remote Setup Select</td>
<td></td>
</tr>
<tr>
<td>Select, Reset Hold</td>
<td></td>
</tr>
</tbody>
</table>

#### Outputs

<table>
<thead>
<tr>
<th>Output</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>0 to 10 VDC, 1 mA max</td>
</tr>
<tr>
<td>Tension Reference</td>
<td>4 to 20 mA, 500 Ω max</td>
</tr>
<tr>
<td>Inverse Diameter</td>
<td>0 to 10 VDC, 1 mA max</td>
</tr>
<tr>
<td>Meter</td>
<td>0 to 1 mA, 500 Ω max</td>
</tr>
<tr>
<td>Alarm 1 &amp; 2</td>
<td>DC solid state relay; 100 mA, 30 VDC max</td>
</tr>
<tr>
<td>Tension On/Off</td>
<td>DC solid state relay; 100 mA, 30 VDC max</td>
</tr>
</tbody>
</table>

#### Temperature

<table>
<thead>
<tr>
<th>Temperature</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>E-Operating</td>
<td>0 to 40°C (0-60°C for US-2)</td>
</tr>
<tr>
<td>Storage</td>
<td>-30 to 80°C</td>
</tr>
</tbody>
</table>

#### Certifications

<table>
<thead>
<tr>
<th>Certification</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>UL 508C Listed</td>
<td></td>
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</tbody>
</table>

#### Weight

<table>
<thead>
<tr>
<th>Weight</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>VTC</td>
<td>3.2 kg (7 lb)</td>
</tr>
<tr>
<td>VTC-E</td>
<td>5 kg (11 lb)</td>
</tr>
</tbody>
</table>

#### Enclosure

<table>
<thead>
<tr>
<th>Enclosure</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>VTC Front Panel Enclosure</td>
<td>IP65 (IEC529), IP20 (IEC529)</td>
</tr>
<tr>
<td>VTC-E &amp; US-2</td>
<td>IP65 (IEC529)</td>
</tr>
</tbody>
</table>
VERSATEC® Dimensions

Model VTC

Model VTC-E

Note: Measurements in parenthesis are metric.
US2 Ultrasonic Sensor

Specifications

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<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Range</td>
<td>152 to 1,524 mm</td>
</tr>
<tr>
<td>Resolution</td>
<td>.025% of span, or 0.18 mm (0.007 inch) whichever is larger</td>
</tr>
<tr>
<td>Rewind Taper</td>
<td>Adjustable from 0 to 100%</td>
</tr>
<tr>
<td>Enclosure</td>
<td>IP65</td>
</tr>
</tbody>
</table>

Notes:
Measurements in parenthesis are metric.
Face of roll cannot be closer than 152.4 mm (6 inches) or further than 1.524 m (60 inches) away from the face of sensor.
PA-90 & PA-2  Current Regulated Power Amplifiers For Versatec

The PA-2 and PA-90 Power Amplifiers are designed to be used with the VERSATEC to control magnetic particle brakes and clutches in tension control applications. Either model can be mounted inside any VERSATEC enclosure, and receives its control signals directly from the tension control.

The PA-90 is used to control 90 VDC brakes and clutches only, while the PA-2 can be used to control either 24 or 90 VDC units. With 115 VAC input, either power amplifier will provide a -3.6 to 90 VDC, current regulated output to accurately control a 90 VDC brake or clutch. With a 24 VDC input, the PA-2 will provide a -1.2 to 24 VDC, current regulated output to accurately control a 24 VDC unit.

Specifications

PA-2 (24 VDC Brakes and Clutches)

<table>
<thead>
<tr>
<th>Input</th>
<th>24 VDC ±10%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output</td>
<td>-1.2 to 24 VDC, with selectable current ranges 1/8, 1/4, 1/2, 1, 2 amp max</td>
</tr>
</tbody>
</table>

PA-2 (90 VDC Brakes and Clutches)

<table>
<thead>
<tr>
<th>Input</th>
<th>115 VAC ±10%, 50/60 Hz</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output</td>
<td>-3.6 to 90 VDC, with selectable current ranges 1/8, 1/4, 1/2 amp max</td>
</tr>
</tbody>
</table>

Features

- Control any size magnetic particle brake or clutch
- Output is current regulated for better system response
- Selectable operating current ranges for optimum controllability
- Mounts inside either VERSATEC enclosure
- Reverse current to extend torque range is standard

PA-90

<table>
<thead>
<tr>
<th>Input</th>
<th>115 VAC ±10%, 50/60 Hz</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output</td>
<td>-3.6 to 90 VDC, with selectable current ranges 1/8, 1/4, 1/2 amp max</td>
</tr>
</tbody>
</table>

Certifications

UL 508C Listed