

## Warner Electric Tension Control Systems

Warner Electric offers the most complete line of tensioning products available. Several different types of electric and pneumatic brakes designed specifically for tension applications range in torque ratings from 1 oz.in. through 1785 lb.ft. Controls vary from simple manual adjust models through sophisticated closed loop dancer systems.

Whether tensioning wire, film, foil, paper, kraft stock, or steel, Warner Electric offers the right tension system for your application. Let our tension specialists help you design the ideal system for your needs.

### About This Catalog

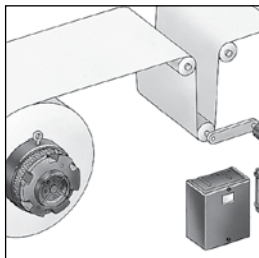
This Warner Electric Master Tension Systems Catalog provides the designer with a complete design guide. Matching system component performance characteristics to your application is made easier through the extensive "Design Considerations & Selection" section and product comparison charts. In addition to selection information, the catalog includes product specifications, dimensions, a glossary of terms, and an application data form. It is the most complete tensioning catalog and design guide available.

### Warner capabilities:

- Control technologies from manual operation to closed loop dancer control
- Multiple technologies – Electric, pneumatic and electronic
- Full roll to core control
- Consistent tension, even during flying splices and emergency stops
- Web flutter eliminated to allow better registration control
- Reduction of material waste, downtime and maintenance
- Material flexibility – Thin films, heavy mylar, rolled metals, newsprint, paperboard, laminate foils, wire
- Global distribution
- Local, professional service.



## Tension Control Systems



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## Tension Controls



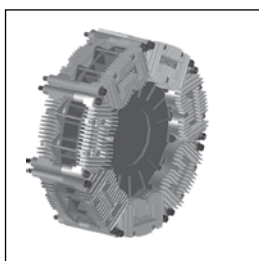
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# Warner Electric

## Products for Controlling Tension

### Modular Control Units



#### **BXCTRL** **Web Tension Control**

The BXCTRL Web Tension Control is a solid state electronic control that receives a signal from dancer input sensors or two load cells (customer supplied). It integrates two separate Digital PID Controllers and two separate Open Loop controls.

- All set-up is done via SD card or computer
- When wired to dancer feedback, provides closed loop control with linear or auto compensation
- Easily integrated with BX2DRV driver for electric brake control

### Modular Control Drivers



#### **BX2DRV** **Modular Control Driver**

Double channel driver provides output for 24 volt electric brakes when combined with BXCTRL



#### **MCS 2000 DRV2** **Modular Control Driver**

Dual channel/ dual voltage driver provides output for 24 volt brakes with 48 volt E-stop braking requirements.

### Analog Controls



#### **TCS Series Analog/Manual Controls**

The TCS-200 is a manual analog control for the Electro Disc Tensioning Brake. The control is a constant-current output type that uses a front panel or remote potentiometer to adjust the output. The TCS-200-1/-1H is a manual analog control for any 24 VDC tension brake. It can also accept a 0-10 VDC or 4-20mA analog input for adjusting the output. See page 46.

#### **TCS-200**

- Input: 24–30 VAC, 50/60 Hz
- Output: 0-270 mA continuous per magnet up to 12 electro disc magnets, adjustable 3.24 amps
- Torque adjust, brake on, run, brake off switch on front panel
- Remote torque adjust, roll follower inputs

#### **TCS-200-1 Selectable Voltage**

- Input: 115/230 VAC, 50/60 Hz
- Output: 0-24 VDC adjustable, 4.25 amps continuous
- Torque adjust, brake on/off, run switch
- Remote torque adjust, roll follower inputs

#### **TCS-200-1H**

- Input: 115/230 VAC, 50/60 Hz
- Output: 0-24 VDC adjustable, 5.8 amps continuous
- Torque adjust, brake on/off, run switch
- Remote torque adjust, roll follower, analog voltage or current option



#### **TCS-220 Analog Tension Control**

The TCS-220 operates an Electro Disc or other electromagnetic tension brake from an analog input (customer supplied) or the manual setting of the "Torque Adjust" dial on the control face. See page 48.

- Input: 48 VDC. 1.6 amps continuous, 6 amps intermittent. Analog inputs from roll follower or current loop.
- Output per magnet is 0–270 mA running, 270–500 mA stopping
- Cabinet mounting enclosure with exposed wiring or wall/shelf mounting enclosure with conduit entrance.



#### **MCS-204** **Analog Tension Control**

The MCS-204 is a solid-state control designed for manual or analog input to operate one or two 24 VDC tension brakes. It is designed for use with the MCS-166 power supply. See page 47.

- Input 24–28 VDC @ 3 amps
- Operates from torque adjust control knob on front, remote potentiometer, roll follower, or current loop
- Panel mount with exposed wiring or wall/shelf mount enclosure with conduit entrance.

### Dancer Controls



#### MCS-203 Dancer Control

The MCS-203 automatically controls web tension through a dancer roll and sensor. It has 24 VDC output for use with TB, ATTB & ATTC, and Magnetic Particle clutches and brakes. See page 49.

- Operates two 24 VDC tension brakes in parallel when using dual MCS-166 power supplies
- Full P-I-D loop adjustment and system gain adjustment for optimum control.
- Available in panel mount or enclosed wall/shelf mount enclosure.

#### TCS-210 Dancer Control

The TCS-210 automatically controls web tension through a dancer roll and position sensor. It outputs to an Electro Disc or other electro-magnetic tension brake. See page 50.

- Input: 48 VDC, 1.6 amps continuous, 6 amps intermittent
- Output per magnet: 0–270 mA running, 270–500 mA stopping
- Cabinet mounting enclosure with exposed wiring or wall/shelf mounting enclosure with conduit entrance.

#### MCS-207 Pneumatic Dancer Control

This control provides automatic web tensioning using a dancer roll and pivot point sensor. See page 51.

- Operates most pneumatic clutches and brakes
- Automatic control for precise tensioning with minimal operator involvement
- Full P-I-D loop and system gain adjustments for optimum control
- Switch selectable output operates E to P transducers (0–10VDC) or I to P transducers (1–5mA, 4–20mA, 20–50mA) with zero and span adjustments.

#### TCS-310 Dancer Splicer Control

The TCS-310 is an automatic splicer control that operates two Electro Disc or other electromagnetic tension brakes, one brake controlling and one brake holding, or two tension brakes operating simultaneously. It can also be used as a dual brake control operating up to 24 MTB brake magnets. See page 52.

- Input: 48 VDC, 3.2 amps continuous, 12 amps intermittent
- Output per magnet is 0–270 mA running, 270–500 mA stopping, 0–90 mA holding
- Available with NEMA 4 enclosure

### Power Supplies



#### MCS-166 Power Supply Module

The MCS-166 Power Supply Module provides power for the MCS-203, MCS-204, MCS-207 control modules. See page 53.

- 120V/220V/240 VAC, 50/60 Hz
- 24 VDC, 1.5 amp output
- May be connected in parallel for increased current capacity.

#### TCS-167 Power Supply

The TCS-167 Power Supply provides power for either the TCS-210 or TCS-220 control modules. See page 53.

- 120V/240 VAC, 50/60 Hz operation, switch selectable
- Output: 9 VDC @ 1.5 amps and 48 VDC @ 1.6 amps continuous, 6 amps intermittent
- Internally fused for protection.
- Available in enclosed wall/shelf mount enclosure.

#### TCS-168 Power Supply

The TCS-168 Power Supply provides power to either the TCS-310 dancer tension controls. See page 53.

- Input switch selectable for 120 or 240 VAC, 50/60Hz
- Output 3.2 amps continuous, 12 amps intermittent

### Electric Brakes & Clutches



#### TB Series Basic Tension

Annular style 24 VDC tension brakes for light to medium duty unwind tension applications.

- Sizes: 1.7" to 15.25" diameter
- Torque range: 0.50 lb.ft. to 256 lb.ft.
- Thermal range: .019 HP to 1.09 HP



#### ATT Series Advanced Technology

Designed for intermediate web tension ranges. Three size ranges.

- One piece clutch design for easy shaft mounting
- Brakes are flange mounted and the armature is the only rotating member
- Clutch torque ranges 7 to 41 lb.ft. Brake torque ranges from 8 to 62 lb.ft.
- Replaceable friction faces and armature rings.



#### MTB Series Modular Tension

Modular Tension Brakes (Electro-Disc) are modular caliper type electric brakes used for unwind tensioning. Torque is varied by disc diameter and by changing the number of magnets on the friction disc(s).

- 10", 13", 15" and 20" diameters
- Torque ranges to 750 lb.ft.
- Thermal capacities to 6 HP
- Brakes rebuildable by changing only friction pads and armature disks.

#### M Series Permanent Magnet



Permanent magnet brakes and clutches are ideal for light tensioning applications, such as film and fine wires. They require no external power, have a wide range of torque adjustment, have no friction surfaces to wear, and offer chatter-free torque control even at very low speeds.

- Torque range from 1 oz.in. through 65 lb.in.
- Manual torque adjustment
- Constant torque with varying speeds.



#### Magnetic Particle

Self-contained magnetic particle clutches and brakes for a wide range of unwind/rewind applications offer smooth operation at very low speed and electronic control compatibility.

- Torque range from 2 lb.in. through 578 lb.ft.
- Shaft or flange mounting
- Fan cooled in largest sizes.

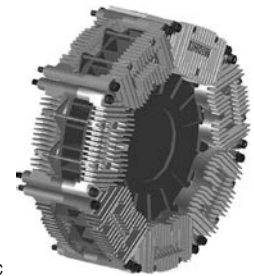
### Pneumatic Brakes & Clutches



#### Mistral

Mistral Pneumatic Tension Brakes' compact design meets the special needs of the corrugating industry.

- Fan cooled for longer life
- Three sizes for multiple applications
- Torque range: 1 lb.ft. to 442.5 lb.ft.
- Thermal capacity to 3.5 HP
- Three sizes from 9" to 16" diameter. Eases handling small roll ends.



#### ModEvo

Modular Pneumatic Tension Brake allows for a wide range of tension applications with the modular design. Actuator configuration with different friction material coefficients allow for much greater range capabilities.

- Torque range from 16 lb.ft. to 3180 lb.ft.
- Optional guards and cooling fan assemblies
- Thermal capacities to 18 HP
- Optional high speed armatures

### Sensing Devices

#### Ultrasonic Sensors

- Analog outputs with selectable 0–10V – 4–20mA
- Input voltage 20–30VDC
- Range control zero and span
- Short circuit protected
- 80" max. distance
- Response time 50 mSec



#### Pivot Point Sensors

The TCS-605-1 and TCS-605-5 pivot point sensors close the feed back loop to the tension control by sensing dancer roll position.

- TCS-605-1 is a single turn potentiometer with a resistance of 1K $\Omega$  for normal dancer operating ranges within 60° of arm rotation.
- TCS-605-2 is a single-turn potentiometer with a resistance of 5K $\Omega$  for normal dancer operating within a 60° range used with AC & DC drives.
- TCS-605-5 is a five-turn potentiometer with a resistance of 1K $\Omega$  for festooned dancer systems, with a 300° rotational range.
- BTCS 620 is a European style pivot point sensor. Includes switch for signal inversion.

