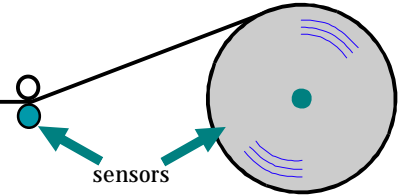


Non-Contact Tension Controller for

← Unwinds & Rewinds →



A Tension Control based on radius computation

Dynaspede CTC is a cost-effective tension controller, adequate for most centre-winding or unwinding applications. Since its first introduction into the market in 1978, Dynaspede CTC has undergone continual refinements to occupy a pride of place in applications as varied as **Wire drawing, Textiles, Paper, Films and Foil converting industries.**

This versatile controller is adaptable for use with a variety of torque control devices such as **Eddy Current or DC drives, Magnetic Particle or pneumatic clutches-brakes.**



307 series
Centrewind Tension Controllers

Introduction

Precise control of winding tension in centre-driven spoolers or coilers is essential to eliminate loose coils, material breakage and telescoping. In many applications, direct contact with the material (for the purpose of sensing the roll diameter) is also not desirable. Positioning of tension transducers or dancers for direct tension sensing and control may also pose fitment problems.

The complexity of an acceptable system depends on many factors such as the degree of tension accuracy, nature of the material, build-up (or turn down) ratio, and tension range. Speed match during acceleration, deceleration or line speed changes is also necessary to compensate for the effects of roll inertia. Further it is desirable to have a controlled "taper tension" to avoid telescoping of the material during winding.

Dynaspede CTC is specifically offered for such applications as a reliable, cost-effective and easy means of tension control with many attractive features and add-ons.

Standard Features

- **Nothing touches the web...** system is completely automatic over 12:1 build-up ratio. Set the running tension, stalling tension and taper... and the control takes care of the rest.
- **Built-in flexibility...** can be adapted to control most torque devices... brakes or clutches exercising electrical control of torque, such as eddy current or magnetic particle devices, pneumatic or hydraulic clutches - brakes or torque control through DC motors.
- **Versatile...** same models can be used for winders and un-winders.
- **Compact design...** suitable for stand alone or panel mounting applications.

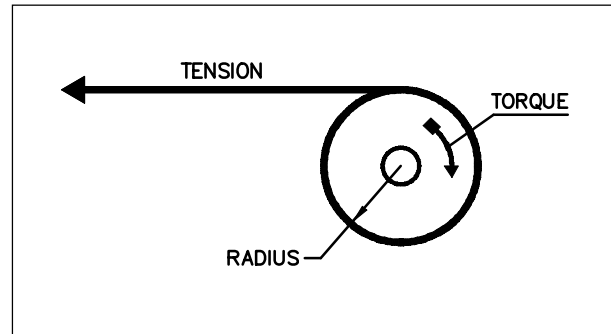
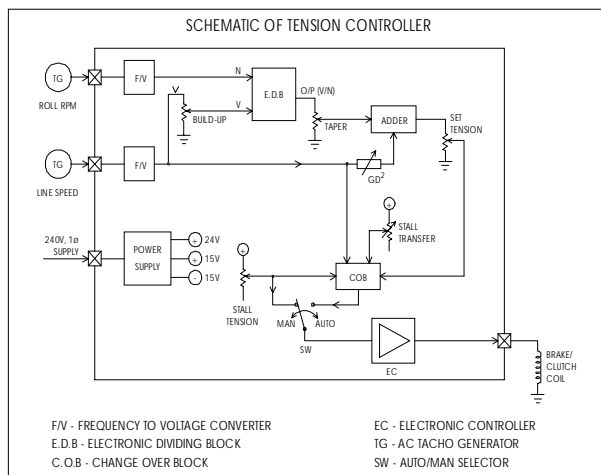
Principle of Operation

Dynaspede Tension Controller, operates on the principle of electronic computation of the roll diameter, at every instant during the winding process and controls the shaft torque to maintain the desired web tension. The operation of a tension reeler is defined by the following relationship.

$$\text{Tension (T)} = \frac{\text{shaft torque (Tq)}}{\text{radius of roll (R)}}$$

or **Torque = Radius x Tension**

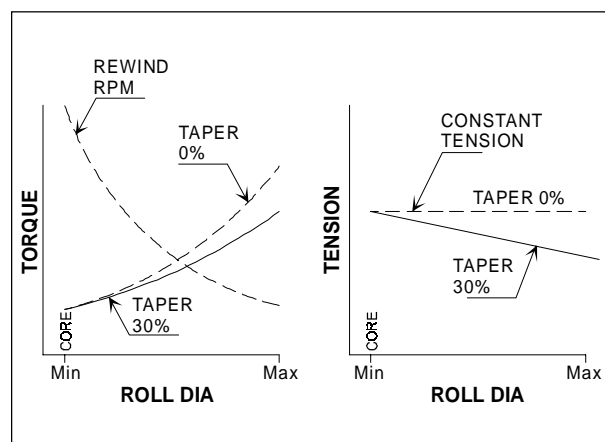
Therefore, as the diameter of the roll keeps changing during the winding process, the torque (Tq) must be varied proportionately in order to maintain a constant web tension. For a given linear speed (V), the mandrel rpm (N) must reduce proportionately with the roll diameter (D), governed by the relationship $V = \pi \cdot D \cdot N$. Therefore, the radius of the roll, can be calculated by electronically dividing the line speed signal (V) by the roll rpm signal (N).



These signals are made available to the controller from separate speed sensors (Tachogenerators) that monitor the line speed and roll rpm.

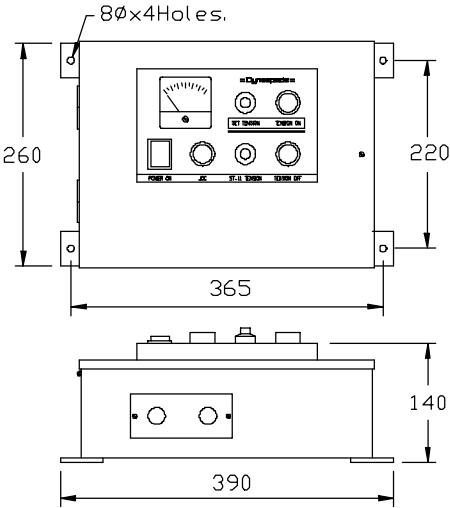
At any given line speed, therefore, we need to provide a constant horsepower control to the mandrel ($N \times Tq$ is kept constant) in order to maintain the operating tension. Further, for given roll diameter, the shaft torque that must be applied for a desired tension is constant, regardless of the line speed. Thus the applied horsepower must vary in direct proportion to the line speed. During changes in line speed, additional torque must be added or subtracted depending on whether the line speed is increasing or decreasing, in order to compensate for the inertia of the roll and other transmission elements.

In most winding applications it is desirable to have the web tension gradually tapering down with increasing build up to avoid telescoping. Constant torque winding refers to the case of 100% taper and constant tension is achieved under conditions of zero taper. An infinite adjustment between these limits is therefore desirable to cater to all winding applications.



The schematic alongside gives the functional blocks and modes of control incorporated in Dynaspede Centre-wind Tension Controller. Electronic dividing block (E.D.B) outputs a signal proportional to the instantaneous roll diameter and controls the torque in proportion to maintain the set tension.

Technical Specifications

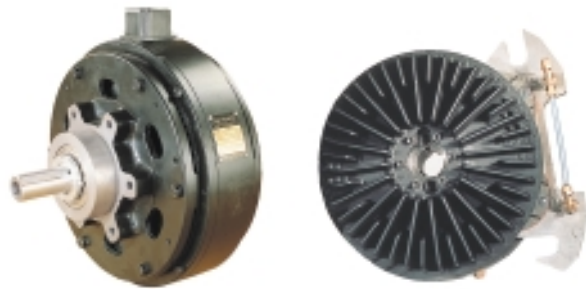
Electrical	Mechanical
<p>Input : 240 V AC ; $\pm 10\%$, 1ϕ</p> <p>Output: 90 V DC (max) , 5 A</p> <p>Standard features:</p> <ul style="list-style-type: none"> ➤ ON/OFF switch with Indicator ➤ Auto/Manual selector switch ➤ Stall/Run Tension... Separate potentiometers for setting "Run" & "Stall" tension ➤ Excitation Indicator... Analogue 2 1/2" ➤ Taper Tension ...adjustable 0-100% ➤ Cross over... automatic transfer from Stall to Run ➤ GD²... Moment-of-inertia compensation ➤ Web Break Trip <p>Protection Class: IP40</p> <p>Ambient: 40 °C</p> <p>Construction: Wall mounting</p>	 <p>8Øx4Holes.</p> <p>260</p> <p>220</p> <p>365</p> <p>140</p> <p>390</p>

Tension Control Systems

307 series can be mated with a variety of torque controlling devices and transducers to form a complete tension control system. These elements are selected based on considerations of machine speed, tension range and build-up (or turn-down) ratio. Dynaspede offers a wide choice of torque controlling devices and transducers.

Dynaspede Range of Brakes, Clutches and Drives

- Magnetic Particle Clutches & Brakes
- Pneumatic Clutches & Brakes
- Eddy Current Clutches & Brakes
- DC motors in driving or braking modes



A Choice of Speed Transducers

- AC Tachogenerators 1 ϕ , for high speeds
- AC Tachogenerators 3 ϕ , for low line speeds
- Proximity sensors and pulse resolvers



Widest choice in tension control schemes

Dynaspede offers a **wide variety of tension control schemes** to suit the demands of any application... simple open loop **torque controls**, ...**tension controls based on electronic computation** ... **dancer controls**, ... **load cell based and more...** with a choice of **Powder Clutches and Brakes, or Pneumatic, DC or Eddy Current based** ... for a cost-effective solution that works!

Web Management is our Business

In the year 1990, Dynaspede introduced **Magnetic Particle Brakes & Clutches**, for the first time in India... thus setting **new industry standards** for tension control in paper, film and foil converting industries. Matching the industry growth of the ensuing years, was the task, set before our **Web Management Group...** Today, we offer **Total Solutions** with the right mix of analogue & digital DC drives, digital AC drives, Eddy Current drives, pneumatic or particle brakes - clutches, PLCs, sensors, and corona treaters ... for a winning combination of **world class products from Dynaspede, Magtorq, Montalvo & Enercon.**

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Dynaspede Integrated Systems (P) Limited

Web Products Division

136-A, Sipcot Industrial Complex, Hosur - 635 126.
Tamil Nadu, INDIA

Tel. 91-4344-276915 (5 Lines)

Fax. 91-4344-276841

e-mail: mail@dynaspede.com

web: www.dynaspede.com

● Bangalore ● Baroda ● Calcutta ● Chennai ● Delhi ● Lucknow ● Mumbai ● Secunderabad