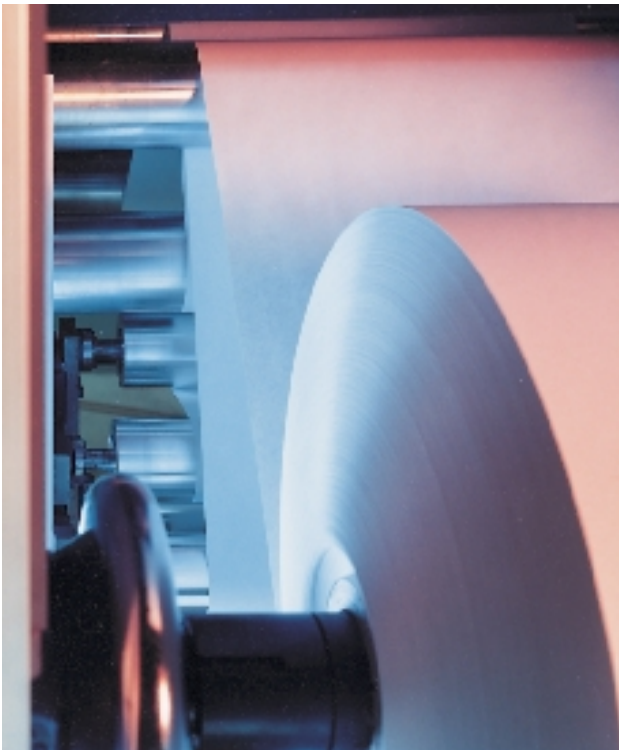


■ **Winding technology,
pneumatically actuated tension brakes**
web tension open-loop and feedback control systems



■ Winding technology - pneumatically actuated tension brakes, web tension open-loop and feedback control systems



In the section "winding technology" you will find all the equipment necessary to control the unwinding forces, and thereby the web tension on unwinding lines of every type. These consist primarily of tension brakes, transducers, and the devices for open-loop and feedback control systems.

In particular, control systems have found wide application in the processing of rolled material in sheet form such as paper, cardboard, plastic film, metal foil and textiles.

If unwinding processes are to run in a fault free manner, it is necessary that the web tension remains more or less constant regardless of changes resulting from the operating conditions. The requirements, in terms of the degree to which the line tension and winding speed operating parameters must be kept constant, vary with the particular application.

To satisfy these differing requirements, Ortlinghaus has available a flexible winding technology system. You will always find in the range the optimum combination of dry or wet-running tension brakes, transducers and pneumatic or electronic control systems to produce the unwinding control system that is precisely matched to your particular application, being both reliable and cost effective.

Thanks to the modular design, a system can be extended in stages to a high level of automation including fully automatic "flying" roll changes.

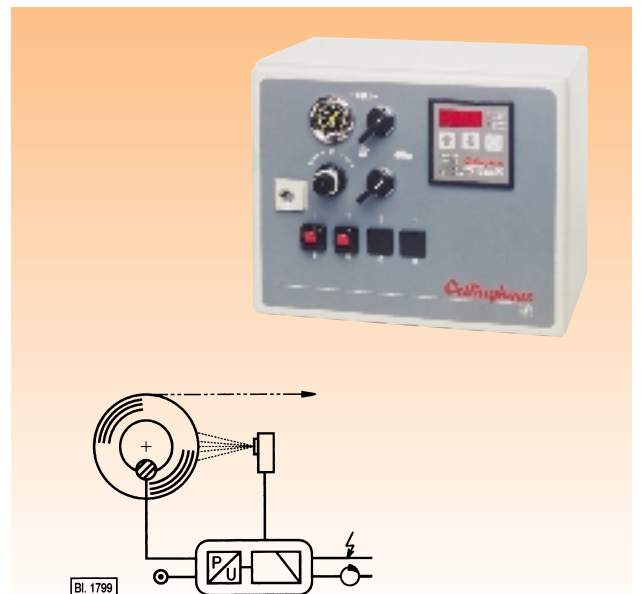
Electronic-pneumatic web tension open-loop and feedback control systems for unwinding devices with pneumatically actuated tension brakes

1 **Series 0-087**

ORTLINGHAUS-TENSIONOR

Electronic web tension open-loop control with ultrasonic sensor consisting of the following components:

- Control device with ultrasonic sensor
- Operating console,



- Pneumatically actuated tension brake.
This system holds the unwinding tension at a preselected constant level.

Operation: The ultrasonic sensor senses the roll diameter. The control device processes the sensor's signal and outputs a signal to adjust the air pressure for the brake in accordance with the decreasing roll diameter and the preset command value for the line tension.

The control device is offered in two different versions:

- "TENSIONOR I" as standard version with the basic functions, namely setting of the command value, releasing of the brake and display components.
- "TENSIONOR II" with additional functions including gradual ramp increase of the brake pressure, the gradient of the ramp being preset, digital displays for brake pressure, together with roll and residual diameter, warning signals when a roll has been fully unwound, automatic or manual mode.

ORTLINGHAUS-TENSIOPAR®

Fully pneumatic web tension feedback control system consisting of the following components:

- Measuring device,
- Operating console,
- Pneumatically actuated tension brake.

Thanks to its robust design, this web tension feedback control system is suitable for difficult operating conditions including use in locations

with an explosion hazard.

Operation: The measuring device is also the bearing for a line guiding roller. The actual web tension, measured at the measuring device, is compared with the preset command value. Each variation found is compensated for by an appropriate adjustment being made to the operating pressure of the brake.

Particular advantages are: Simple operating, almost no maintenance, sensitive feedback, repeatable control.

Possible enhancements: Emergency stop circuit, switching over to different brake torque and command value ranges, feedback control for flying roll changes.

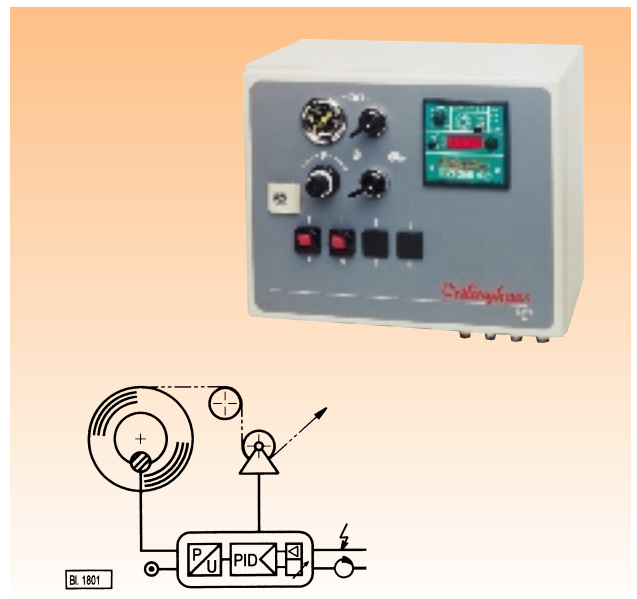
ORTLINGHAUS-TENSIODYN®M

Electronic web tension feedback control for measuring roller systems consisting of the following components:

- Ortlinghaus-CONTREX measuring device with electronic transducer,
- PID regulator with measuring amplifier,
- Operating console
- Pneumatically actuated tension brake.

This system is particularly suitable for unwinding lines where the requirements are ease of operation, repeatable, automation, large regulating range and optimum facilities for integration into the particular process.

Operation: The effective tensile force is monitored with the CONTREX measuring device



or another equivalent bearing. After the measured value has been processed in the PID controller, the regulated brake pressure is applied to the brake via a U-P transducer.

Particular advantages are:

- PID regulating function
- Simple setting of the regulating behaviour, fine alignment by the P, I and D components possible.
- Ability to adjust the parameters of the ramped increase in the brake torque at line start-up.
- Automatic switch-over to holding pressure when the line stops,
- External setting of command values possible.

Enhancement possibilities: Automatic switching off of brake calipers during the unwinding process, automatic switching on of brake calipers in the case of rapid or emergency stops.

ORTLINGHAUS-CONTREX

A device for monitoring the tension in lines of material electronically, consisting of:

- Electronic measuring device based on extension measuring strips,
- Measuring amplifier with digital display.

When used with the Ortlinghaus TENSIODYN-M web tension feedback control system, the measuring amplifier is located in the PID regulator. The mechanical subassembly contains the "pathless" sensor and two bearing points for a line guiding roller. The bearing housing can be fitted either as a pedestal bearing or as a flange bearing.

ORTLINGHAUS-TENSIODYN®T

Electronic web tension feedback control system for jockey roller systems consisting of the following components:

- PUD regulator with ultrasonic sensor,
- Operating console,
- Pneumatically actuated tension brake.

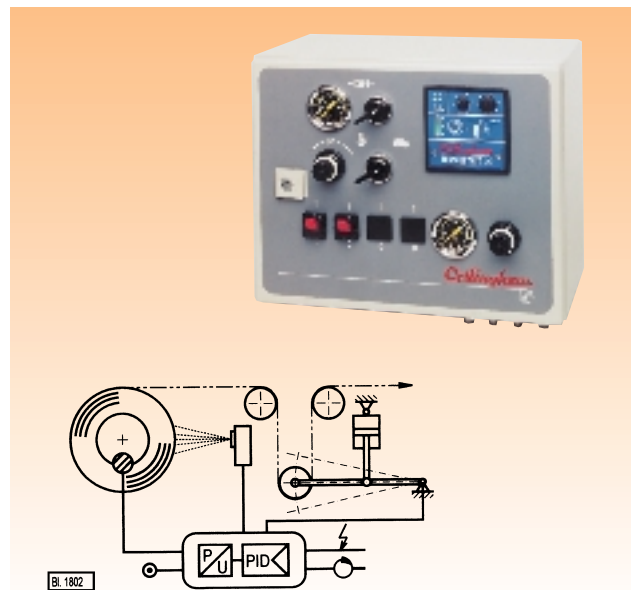
This system is recommended when it is important that the line tension is kept constant even during dynamic process such as when the line is started up or when its speed is changed.

Operation: The changes in position of the jockey roller are measured with a potentiometer. The PID regulator adjusts the brake pressure via a U-P transducer. At equilibrium the jockey roller is in the preset middle position regardless of the command value that has been set for the line tension.

Particular advantages are:

- PID regulating function
- Fine alignment by the P,I and D components possible,
- Ultrasonic measurement of the roll diameter permitting automatic matching of the regulated valve in order to prevent the jockey roller oscillating,
- Ability to adjust the parameters of the ramped increasing of the brake torque at line start-up,
- Automatic switch over to holding pressure when the line stops,
- Jockey roller position and regulator output displays.

Enhancement possibilities: Automatic switching on of brake calipers at rapid or emergency stops, switching over of the brake torque ranges.



Pneumatically actuated, dry-running tension brakes with internally air cooled brake disc

2 Series 0-454

These brakes are particularly well suited for regulated process control in which braking has to be carried out continuously, for example, in unwinding processes.

This is achieved due to the following characteristics:

- Low actuation friction and low hysteresis leading to sensitive torque control,
- Modular design with up to six brake calipers; this enables the torque range to be selected and individual calipers to be switched in or out,
- High thermal capability due to the excellent heat disipation from the internally air cooled brake disc,
- Actuation on both sides of brake disc balancing the load on the centre hub,
- Increased thermal load with the aid of additional air cooling.

Area of application: 5 kW thermal output at nominal braking torques of 9 to 1,800 Nm.

Pneumatically actuated, wet-running high performance brakes (patent applied for)

3 Series 0-444

A fully enclosed multiplate brake with a two piston system in which the plates are immersed in circulating cooling oil; the brake contains components which have been in use for many years; these include for example the friction combination steel/high performance lining.

Together with an effective cooling oil system, these brakes offer the user the following advantages:

- Compact design
- High thermal capacity,
- Almost unlimited service life of the friction linings,
- No contamination from lining dust,
- No lining noise.

Thanks to the two piston system, three torque ranges are available on each brake.

The following versions can be supplied: Brakes in housings, push on brakes, internal hubs with keys or locking assemblies.

4 Accessories

- Pressure regulating valves for jockey roller systems,
- Control circuit for "flying" roller changes,
- Fans for additional air cooling of dry running brakes,
- Cooling oil system for wet-running tension brakes

Many different factors and variations must be taken into account when designing a line tension control system. For this reason we suggest that you make use of our many years of experience in this field and consult our engineers.



Web tension open-loop and feedback control system

Electronic-pneumatic open-loop and feedback control systems

1

Series 0-087



Brakes

Pneumatically actuated tension brakes

Dry-running tension brake with internally air-cooled brake disk

2

Series 0-454

Wet-running high performance brake

3

Series 0-444

Accessories for winding applications

4

Fax questionnaire

Winding technology

Please complete in block capitals!

Ortlinghaus 1898 - 1998

THE TECHNOLOGY OF CONTROLLED TORQUE

Sender:

Name, first name

Company

Department

Telephone (extension)

Fax

Recipient:

Ortlinghaus-Werke GmbH
Kenkhauser Straße 125 · Postfach 14 40
D-42907 Wermelskirchen
Tel. (0) 21 96/85-0
Fax (0) 21 96/9 36 25

for the attention of (if known)

Fax-Nr. (0) 21 96 - 9 36 25

Project designation

Machine type (transverse cutter, reroller, laminating line etc.)

Machine data:

max. roll diameter D [mm] min _____ max _____
 Diameter of the sleeve d [mm] min _____ max _____
 Line speed v [m/min] min _____ max _____
 Unwinding tension F [N] min _____ max _____
 Working width B [mm] min _____ max _____
 Material being unwound (paper, film, foil etc.) _____
 Thickness of material or s [mm] _____
 areal weight in the case of paper a [g/m²] _____
 Weight of the largest roll m [kg] _____
 Desired braking time t [s] at rapid stop _____ at emergency stop _____
 Number of brakes per unwinding axle _____
 Cooling water circuit available _____

Line tension open-loop and feedback control systems

TENSIONOR

Version I
 Ultrasonic web tension open-loop control Version II

TENSIOPAR®

Pneumatic web tension feedback control

TENSIODYN®M

Electronic line tension feedback control
 Operating console with integrated PID regulator
 Operating console and external PID regulator

CONTREX measuring device

Measuring bearing
 Existing measuring bearing: Please state type _____
 Feed voltage _____ V
 Sensitivity _____ mV/V
 Resistance _____ Ω

TENSIODYN®T

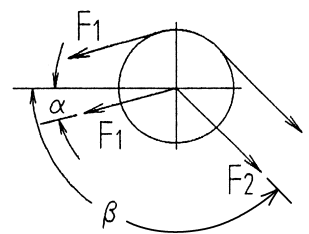
Electronic web tension feedback control for jockey roller systems
 Operating console with integrated PID regulator
 Operating console and external PID regulator
 Command value adjuster with digital display
 Command value adjuster with digital display and U-P transducer

Pressure regulating valve

for pneumatic regulation by means of jockey roller
 Are **flying roll** changes envisaged
 yes
 no
 Existing supply voltage 24 V DC
 115 V, 60 Hz
 230 V, 50 Hz

Angle of contact of the material around the measuring roller (for TENSIOPAR, CONTREX, measuring bearing)

$\alpha =$ _____ °
 $\beta =$ _____ °



Other conditions or safety regulations

