

# *Ortlinghaus*

Winding Technique



**Technical Product Information No. 811**

**CONTREX**

**Measuring unit for registering the  
tension in running lines of material**

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## About this technical product information note (TPI)

### To whom is this TPI addressed?

This technical product information note is addressed to

- the final manufacturer's methods engineers and fitters
- and the final customer's works fitters and machine operators.

### What will you find in the TPI?

The TPI offers you all the important information needed for the installation and operating of the measuring unit Ortlinghaus-CONTREX

0-087-455-01-005-003	measurement amplifier
0-087-456-02-000	measuring unit (max. tension 100 N)
0-087-456-02-001	measuring unit (max. tension 200 N)
0-087-456-02-002	measuring unit (max. tension 300 N)
0-087-456-02-003	measuring unit (max. tension 500 N)
0-087-456-02-004	measuring unit (max. tension 1000 N)

### What will you not find in the TPI?

The TPI does not provide information to support you in design work. You will find such information in the catalogue and in the prospectuses.

### Significance of the symbols accompanying the text

There is a danger of injury during installation and in the course of production!



There is a danger of damage to materials during installation and in the course of production!



Please pass on this TPI to your customers  
You can order further copies of it from us for your customers.  
You may also make copies of this TPI to pass on to your customers.

## On the product

The measuring unit Ortlinghaus CONTREX is designed for registering the tension in moving lines of material. The line of material is led around the measuring unit which is deflected eccentrically by the tension vector. A force transducer registers the tension and delivers a proportional voltage signal to the measurement amplifier. The tension is displayed digitally at the measurement amplifier.

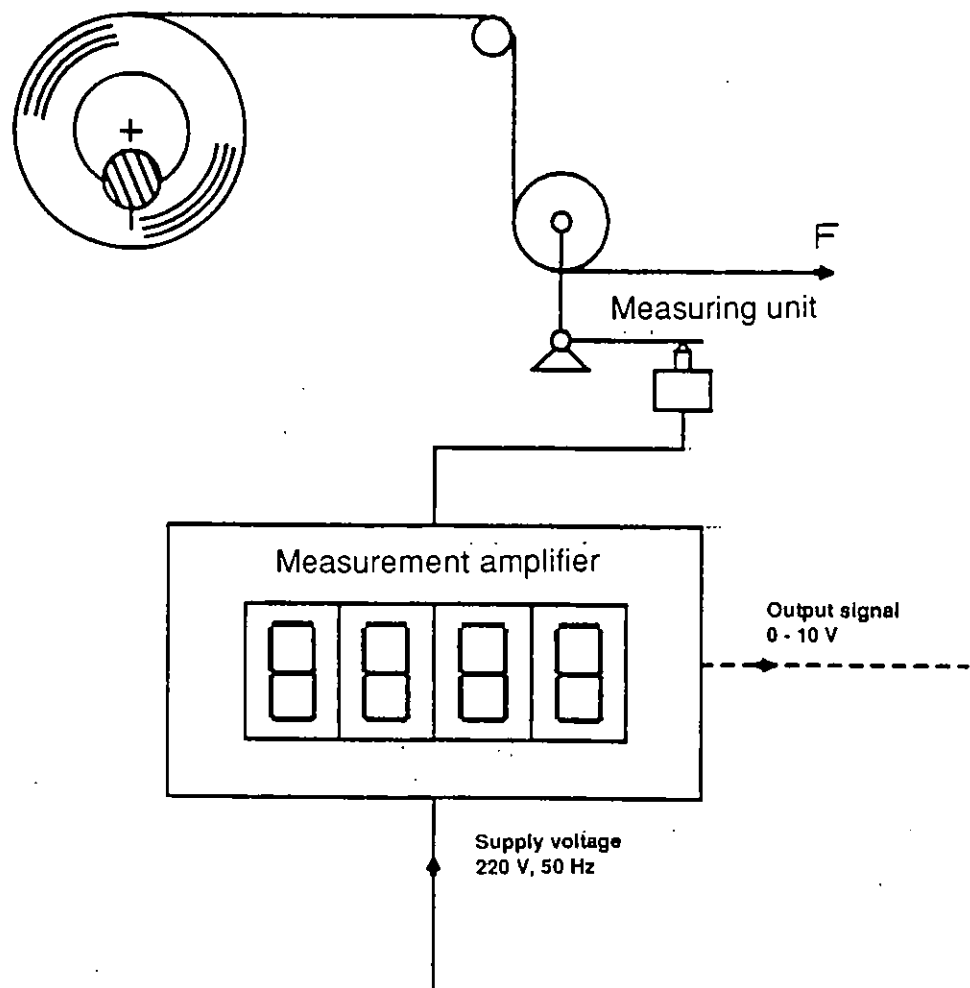


Fig. 1: Measurement amplifier

Initial mounting

Measuring unit	0-087-456-02-000	rated force	100 N
	0-087-456-02-001	rated force	200 N
	0-087-456-02-002	rated force	300 N
	0-087-456-02-003	rated force	500 N
	0-087-456-02-004	rated force	1000 N

Consider the line the material will follow before fitting the measuring unit. Only the vectorial component of the tension in the material acting in the measuring direction of the measuring unit acts on the measuring unit. The tension range stated for the different measuring units applies only when the material is deflected by 90° when passing around the measuring unit and when the measuring direction and the direction of force are the same (Fig. 2).

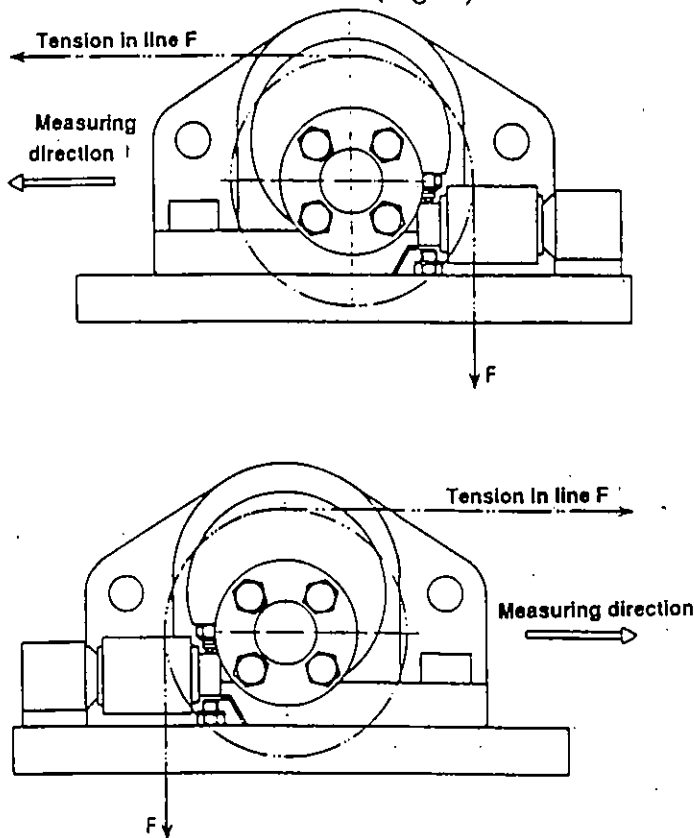


Fig. 2: Measuring direction

When the above conditions are not fulfilled, the max. tensile force registered can be calculated in accordance with the following relationship:

$$F_{max} = \frac{F_{nom}}{\cos \alpha + \cos \beta}$$

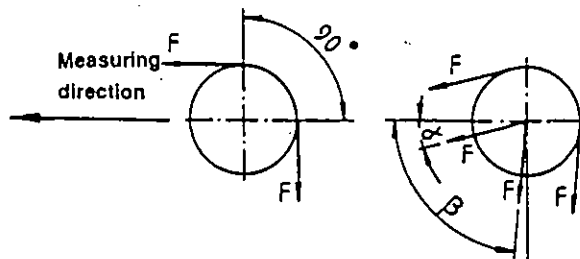


Fig. 3: Max. tensile force

Secure the measuring unit to the machine frame as a pedestal bearing (Fig. 4A) or as a flange bearing (Fig. 4B).  
Observe the direction of measurement!

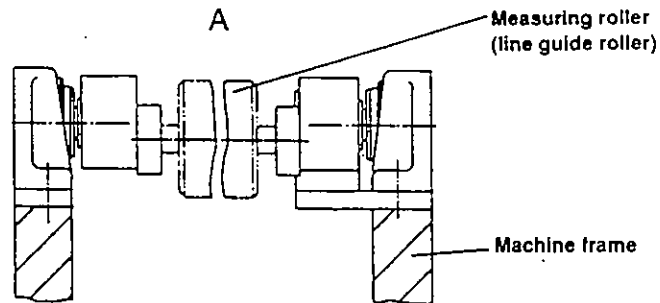


Fig. 4A: Pedestal bearing

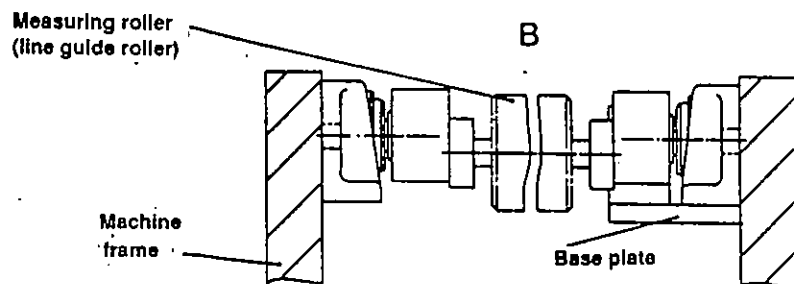


Fig. 4B: Flange bearing

Connect the two bearing points with the line guide roller (= measuring roller).  
Align the measuring roller carefully.



**Max. alignment error (axial offset) = 2 - 4°**

Secure the axle journals with clamping elements.

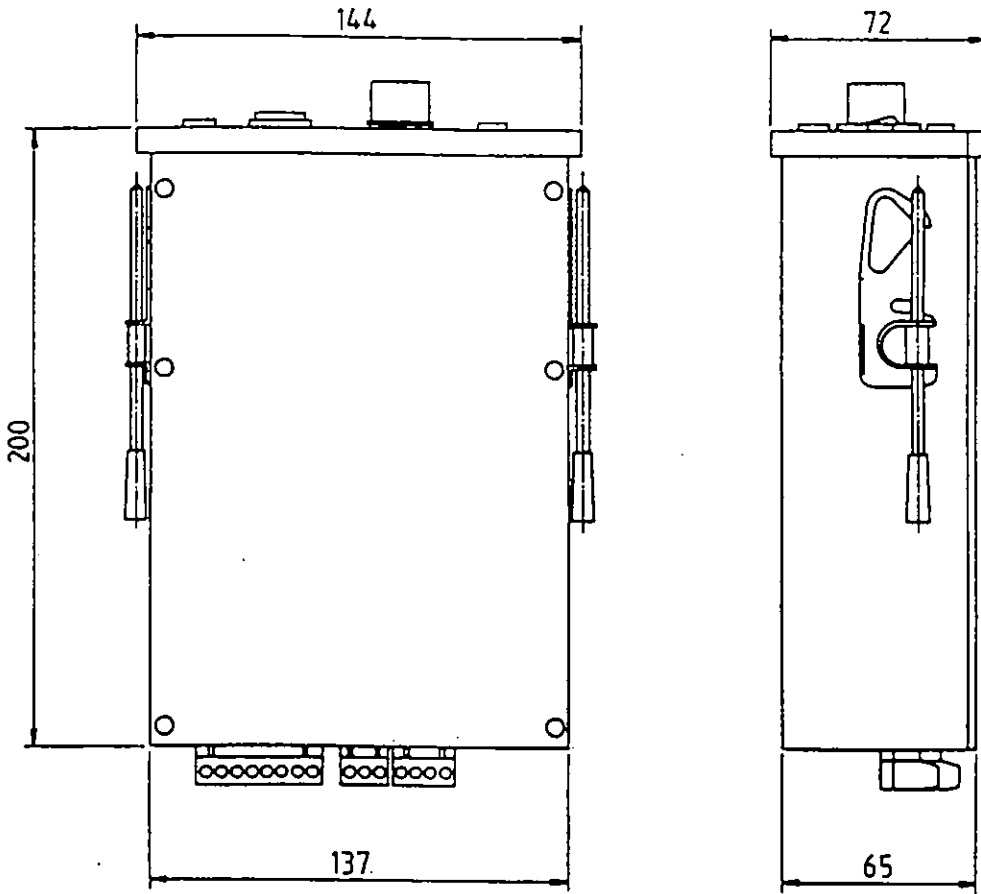
**Max. axial play 0.5 mm**

Attention: It must be possible for the small oscillating movement of the measuring roller to take place freely and without resistance.

Observe the measuring direction when leading the material around the measuring roller!

**Measurement amplifier 0-087-455-01-005-003**

The measurement amplifier can be integrated into an existing operating console/control desk on the machine as a complete slide-in module. It is secured with the securing brackets clipped on to it.



**Fig. 5: Measurement amplifier**

## Setting the range of measurement

Measuring direction

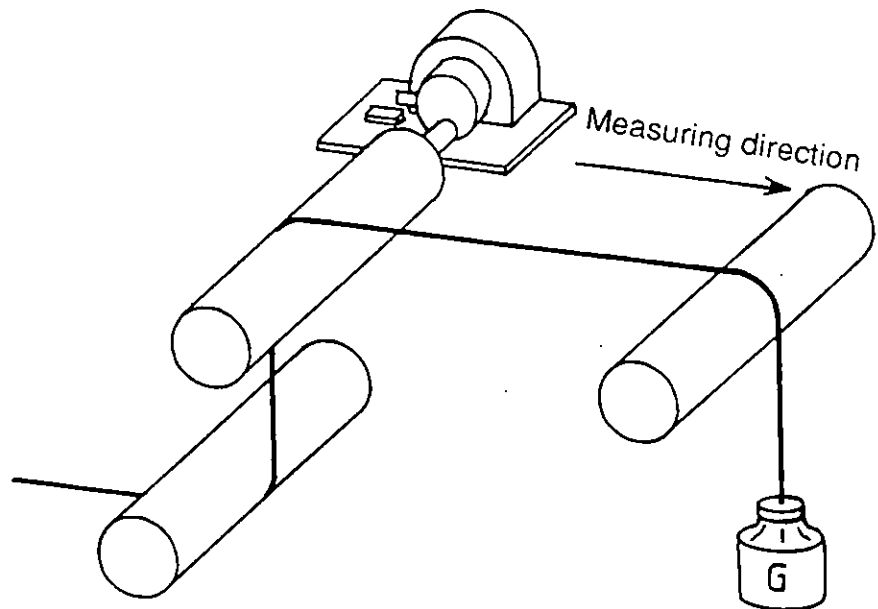


Fig. 8: Simulating the line

The measurement amplifier is preset in our works to the sensitivity of the force measuring bush of the measuring unit (3 mV/V). Fine setting is carried out with potentiometer 1. For this it is recommended that the line that the material will take is simulated with a rope loaded with weights (Fig. 8). **It is important here that the rope passes over the centre of the guide rollers.**

Load the rope with an object of known weight. The weight should be equal to the max. line tension expected.



Attention: Observe the permitted range of measurement!

If there is a controller in circuit downstream of the measurement amplifier, it is recommended that the output voltage between terminals 8 and 9 on the measurement amplifier is aligned with the input of the controller.



Attention: The connection terminals are live.

Change the amplification with trimmer 1 until the desired value is reached. Then set the digital display to the weight on the rope with trimmers 7 (fine) and 8 (rough).

Remove the weight. Lift the rope away from the measuring roller a little. Check the zero-point position and re-align the zero point if necessary. Repeat the measuring range setting again with the weight.

The measuring unit is now ready for use.

### Electrical connections

The measuring unit is connected on the back of the measurement amplifier (Fig. 6). The terminal strip can be removed from the measurement amplifier to facilitate wiring.



Attention: Have the measuring unit connected only by a qualified person.

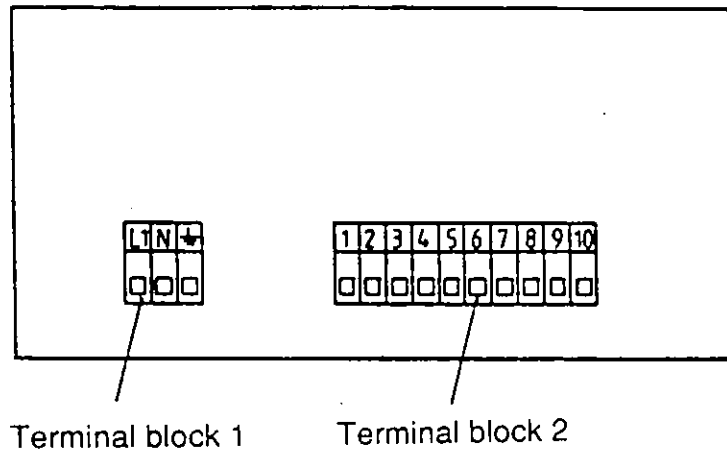


Fig. 6: Back of the measurement amplifier

Terminal block 1			
Potential	Terminal	Function	Status
L1 220 V	1	Supply voltage	Input
N 50 Hz	2		
PE	3		
Terminal block 2			
- U bridge	1 black	Bridge supply voltage*	Output
- U <sub>in</sub>	2 red	- bridge voltage*	Input
GND	3 clear	Screen*	
+ U <sub>in</sub>	4 white	+ bridge voltage*	Input
+ U bridge	5 green	Bridge supply voltage*	Output
n.c.	6	Analog output	Output
n.c.	7		
0...10V	8		
GND	9		
GND	10		

\* Use only screened cable if lengthening a cable.

### Aligning the measurement amplifier

After the measuring unit and measurement amplifier have been properly mounted and connected, the measurement amplifier must be aligned.

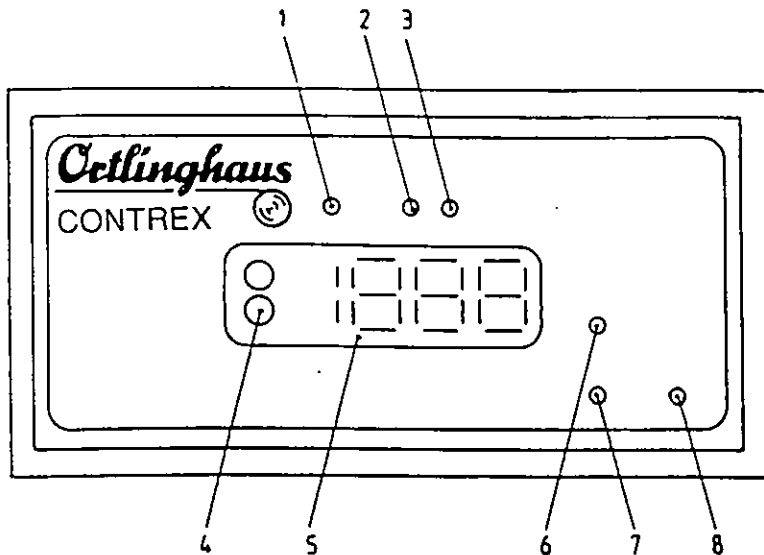


Fig. 7: Measurement amplifier

### Zero-point alignment

Ensure that the measuring unit is not loaded.

Set the zero point on the measurement amplifier with trimmers 3 (rough) and 2 (fine). If there is a controller in circuit downstream of the measurement amplifier, it is recommended that the voltage on the analog output is checked.

**Attention:** The connection terminals are live.



Measure the voltage between terminals 8 and 9 with a voltmeter and correct the zero point if necessary with trimmer 2 (fine).

**Faultfinding table**

Attention: Faults may only be eliminated by trained personnel.

Fault	Possible cause	Remedy
Unit does not work	Fuse defective	Disconnect unit from power supply. Draw off plug strip. Remove measurement amplifier from the securing bracket. Lift off the housing lid after removing the 6 plug screws. Lift the front panel upwards out of the housing. Draw the slide-in module forwards out of the housing. Replace fuse. See the loading plan in the appendix for the position of the fuse.
	Cable connection defective	Disconnect unit from power supply. Check cable and connections and secure if necessary.

Contact customer service in all other cases.

