

*Your specialist for synchronous belt technology*



Model series: **IGAT** TECO-PRO

➔ ***Belt tension gauge***

# General notes

The **IGAT TECO-PRO** gauge provides a simple way of measuring the pretension of conventional belt systems. Thanks to the very latest microprocessor technology, the device facilitates the exact adjustment of all synchronous, flat and V-belts that have to be pretensioned within the measuring range 10 to 600 Hz.

Neither the belt construction, color or material, nor light sources can influence the reading because the gauge relies on acoustic signals.

It is designed for user-friendly one-handed operation consistent with ergonomic principles. The relatively small measuring head is mounted on a flexible gooseneck to allow measurements to be taken in otherwise inaccessible places.



- 1. Gauge with gooseneck
- 2. USB charging cable
- 3. European 2-pin connector
- 4. Hard shell case

# Technical data

Measuring range:	10 – 600 Hz
Measuring accuracy:	10 – 400 Hz $\pm$ 1%; > 400 Hz $\pm$ 2%
Resolution:	10 – 99.9 Hz: 0.1 Hz; > 100 Hz: 1 Hz
Measuring method:	contactless, acoustic, with noise cancellation
Power supply:	rechargeable lithium polymer power pack 3.7 V / 850 mAh
Runtime:	approx. 16 h continuous
Power consumption:	< 50 mA
Sensor:	acoustic, with electronic noise cancellation
Display:	OLED 37 x 19.5 mm
Dimensions:	130 mm x 60 mm x 30 mm, gooseneck length approx. 165 mm
Weight:	approx. 125 g

# Device description

The acoustic gauge **IGAT TECO-PRO** measures belt tension quickly and easily. It is an all-electronic device equipped with the very latest microprocessor technology for taking measurements simply and highly accurately. Striking the belt causes it to vibrate at a natural frequency, which is measured in Hertz (Hz) and displayed on the device.

## Display and menu

In the default setting the buttons emit a sound when pressed. The sound can be disabled in the sub-menu.

### F1 Lock

Press button (F1) to save the reading so that it cannot be altered by the influence of ambient noise.

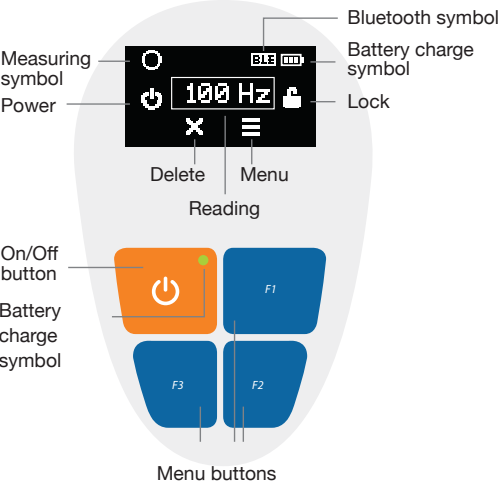
### F2 Menu

Press button (F2) to open the sub-menu. Button (F3) toggles between sound off and on each time it is pressed. Press Return (F2) to go back to the home screen with the main menu. Press Scroll (F1) to move down to the next tier of the sub-menu. Here you can view the serial number of the device and the firm-ware version. Press Return (F2) to go back to the home screen with the main menu.

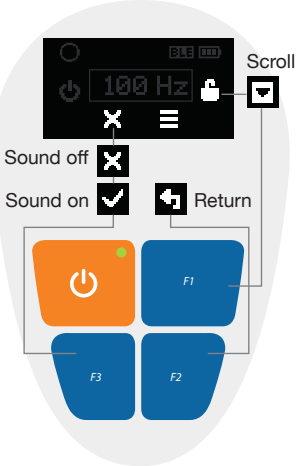
### F3 Delete

You can delete the saved reading in order to take another measurement. If you did not save the reading using the Lock function, you can take another reading immediately without pressing any buttons.

Home screen with main menu



Menu function buttons F1, F2 and F3



F1 center right function button  
F2 bottom right function button  
F3 bottom left function button

## Powering up and measuring

### **! Never take a measurement while the drive is running !**

Press the On/Off button to power up the device. The display briefly shows the Welcome message. It then switches to the home screen with the main menu; a brief signal indicates that the device is ready for measuring.

### **The measurement should be taken at the mid-point of the belt span.**

Hold the sensor head at a distance of min. 1 cm to max. 3 cm from the belt; a greater clearance can give rise to a false reading. Strike the belt at the mid-point of the free span with your hand or a suitable tool.

The successful completion of a measurement is indicated by the ring at the top left of the display becoming a solid circle. The reading in Hertz (Hz) is shown in the box in the center of the display.

We recommend that the Lock function is activated after each measurement, otherwise the measured value can be overwritten in response to loud machinery, background noise or inadvertent contact between the sensor and another object.

In order to eliminate the influence of the belt's transverse rigidity, the tension of synchronous belts should be measured where **the span is at least 20 times greater than the belt pitch.**

When not in use, the device switches to an energy economy mode; the display goes dark. This standby mode ends automatically when a function button is pressed or acoustic signals are transmitted. In order to conserve battery power, the device automatically shuts down approx. 2 minutes after entering the standby mode.

### **Note on re-installing belts**

After installing a belt, rotate the drive by hand a few times to allow the belt to settle completely so that any tension differences in the free span are eliminated before a measurement is taken.

### **Measuring problems**

Interference and background noise can falsify the reading. For this reason, ensure that there is as little ambient noise as possible while taking a measurement. There are several reasons why a reading may not be shown even after striking the belt multiple times:

- Vibration of the belt outside the measurable frequency range of 10 – 600 Hz.
- A source of noise in the same frequency range within the measuring environment.
- The belt is capable of vibrating only a little or cannot vibrate at all because of its coating or nubs etc..
- pretension is too low.
- The distance between the belt and sensor is too great.

# Calculation of measured natural frequency f [Hz]

The frequency f to be set for the belt drive is calculated on the basis of the specific drive data by applying the following formula:

$$f = \frac{1}{2 \cdot L} \cdot \sqrt{\frac{F_v}{m}}$$

Fv	=	Pretension force [N]
m	=	Belt mass per meter [kg/m]
L	=	Vibrating belt length [m]
f	=	Belt vibration frequency [Hz]

## Calculation of pretension force Fv (N)

Depending on the belt material (neoprene or polyurethane), one of the following formulas applies:

### RPP (HTD) pitch, neoprene

$$F_v = K \cdot \frac{P}{v} + m \cdot v^2$$

### Standard / T / AT pitch, polyurethane

$$F_v = K \cdot \frac{P}{v}$$

Load type	Service factor K
Normal operation	675
Frequent start-up	750
Impact loading	875

**Key:**  
P: Power transmission (kW)  
K: Service factor  
v: Belt velocity (m/s)

## Mass per meter m

Please refer to the table alongside for the mass per meter, as required to calculate the frequency.

For other masses per meter, for V-ribbed and flat belts, please consult our application engineers.

Please contact us if you are measuring the tension of coated belts or belts with cleats or nubs.

## Mass per meter m [kg/m]

Pitch	Mass per meter in kg/25 mm belt width		
	RPP	T	AT
2.5		0.054	
3	0.058		
5	0.108	0.050	0.085
8	0.144		
10		0.108	0.138
14	0.263		
20	0.335	0.210	0.265

## Safety instructions

- **! Never take a measurement while the drive is running !** Before taking a measurement, make certain that the drive unit is switched off and cannot be switched on unintentionally.
- Never use the measuring device in areas subject to explosion hazards.
- Protect the device against shaking, impact and severe vibration.
- Do not allow the device to come into contact with water, solvents or other liquids.
- Protect the device against dust and contaminants.
- Please note that the OLED display operates only at temperatures between + 4 °C and + 60 °C. If measuring takes place outside this temperature range, the display may remain blank.
- The device contains a lithium polymer battery. For this reason it must not be exposed to high temperatures or direct sunlight.
- If treated improperly, lithium polymer batteries can explode or ignite and release toxic gases, as well as cause caustic injury or poisoning.
- When shipping a device containing a lithium polymer battery, it is essential that the applicable shipping regulations and warnings are observed.

- The device must not undergo any technical modifications. If the safety instructions are not followed, there is a risk of injury to the operator and damage to the device, for which **IGAT** does not accept any liability.

## Calibration

The device is calibrated before leaving the factory. Its performance is examined at defined points within the measuring range, and the results are recorded in a calibration log for validation purposes. If internal regulations call for a recalibration, you can ask us to perform the factory calibration again.

## Disposal instructions

Lithium polymer batteries contain toxic substances and must not enter the household waste stream. The end-user has a statutory obligation to dispose of or return these items correctly.

## Zertifikate



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