MEGADYNE DTM-MICRO

INSTRUCTIONS MANUAL

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The MEGADYNE DTM - MICRO is used to check the static tension of drive belts by means of frequency measurement. It is fully electronic and equipped with the latest microprocessor technology. This results in an easy handling and a high measurement precision. The device uses acoustic measurements and can be used for all kinds of V-Belts, Poly-V-Belts and Timing Belts independent on the pitch, color or elastic body material. The DTM - MICRO works on the principle of enforced lateral vibration. The vibration frequency is proportional to the belt tension. This means the higher the vibration frequency, the higher the belt tension.

SAFETY INSTRUCTIONS:

Do not attempt to make measurements on running drives. Before measurement begins, switch off the drive and follow lockout/tag out procedures. All other safety instructions should also be observed.

DISPLAY

The measurement device is equipped with an easily readable 2 x 8 lines LCD display.

SENSOR

The sensor plugs into the case connector, which makes it an easy-handling, one-piece unit. For inaccessible positions an extension cable can be installed between device and measuring head.

POWER REQUIREMENTS

Two standard batteries (type AAA cells) are needed.

OPERATING INSTRUCTIONS

Push the left button to switch on the meter. An "A" appears on the display and the device is ready to operate. When an "m" appears on the display a measurement can be taken. If "L.B." appears on the display, batteries are too discharged and need to be replaced. Battery life is approx. 4 hours.

Auto-power off: the device turns off automatically after 2 minutes to minimize battery consumption. To restart the device the "ON" button has to be pushed.

CALCULATION OF THE STATIC TENSION

The measurement frequency f [Hz] is converted into tension T [N] according to the following formula:

$$T=4 \times k \times l^2 \times f^2$$

T = Static tensioning force	[N]
k = weight per meter of the belt	[kg/m]
I = span length	[m]
f = belt vibration frequency	[Hz]

To calculate the required frequency:

$$f = \sqrt{T /(4 k l^2)}$$

The values of the weight factor for Megadyne belts are provided in tables at the end of this manual. The measured frequency [Hz] should be compared with the calculated value [Hz]. The belt tension should be reduced or increased until the calculated frequency is reached.

MEASURING

Only one pulley should be fixed when measurement takes place. All other pulleys should rotate freely. When installing a new belt, rotate the belt at least twice to distribute the tension evenly between the spans and guarantee a correct measurement. Hold the sensor above the center of the belt span so that during vibration the sensor is never touched by the vibrating belt.
Strum the belt by hand or gently tap it with a tool such as a screw driver, hammer handle, etc, The meter will begin measuring the frequency automatically.
The measured value is displayed after a successful measurement. The quality of the result is evaluated with a figure between 1 and 4. This number represents the number of successful measurement cycles:
1 means that only one measuring cycle was carried out successfully. Additional measurements should be made.
2 or more means that several measurements were carried out successfully and averaged statistically. These measurements are very accurate and reliable.
E after a number means that the measurement was out of the tolerance limits. This measurement should be repeated.
Press the reset key ("ON") to erase the readout and reset the meter.

TENSION MEASURING ON SPECIAL BELTS

Measuring the static tension for belts with special constructions (for example reinforced back, special rubber mixture, etc.) may lead to inaccurate results if the calculation of the frequency is based on the unit weight of standard belts. A simple calibration method can be used in these cases.
If the construction is symmetrical, the belt can be weighed and the weight factor calculated.
If the belt has irregularities such a cleats, place the belt between two fixed points such as two rolls. Apply different known tensions (for example by hanging on weights). From the known tensions, determine a correction factor for the frequency readout. The values determined in this way are specific for the belt and must not be transferred to drives with other belts or span lengths.

SPECIAL INFORMATION

Wind may cause excessive background noise. If wind or other excessive background noise is a problem it will need to be eliminated (for example by the use of a windscreen) when taking measurements.
Very long free spans lead to low vibration frequencies with high amplitudes that may be difficult to measure or outside of the measuring range.
If there is no readout in spite of exciting the belt several times, this may have several reasons:
- the belt oscillation is outside of the indicated frequency range.
-there is background noise within the measuring range of the instrument and is in the frequency range of the measurement.
-the belt is not able to vibrate or only to a slight extent.

WARNINGS

The MEGADYNE - DTM - MICRO is not approved or certified for use in explosion risk areas.
Dropping the meter may cause damages.
Keep the meter out of water, solvents, or other liquids.
Do not clean with solvents.
Protect the unit from dust and other contamination.
Don't expose the unit to high temperatures (for example when keeping it in a car).

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TECHNICAL DATA	
Range of measurement:	10 - 600 Hz
Measuring precision	10 - 400 Hz +~- 1 % 401 - 600 Hz +/- 2%
Resolution	10 - 99,9 Hz: 0.1 Hz > 100 Hz:1.0 Hz
Measuring method	non contact acoustic with background noise suppression
Power supply	2 x 1.5V AAA batteries
Working time	> 48 hours continuous measurement (depending on the quality of the batteries)
Power consumption	< 12 mA
Display	LCD 2 lines of 8 characters
Dimensions	approx. 90 mm x 50 mm x 27 mm
Weight	approx. 100 g (without batteries and microphone)

CALIBRATION

The instrument is calibrated at the final inspection. Further calibrations are normally not necessary.

SPECIFIC WEIGHT OF MEGADYNE BELTS

TYPE	WEIGHT (kg/m/cm)	TYPE	WEIGHT (kg/m)
RPP 3	0.028	Z	0.060
RPP 5	0.043	A	0.100
RPP 8	0.057	AX	0.114
RPP 14	0.116	B	0.175
RPP 5 DD	0.04	BX	0.162
RPP 8 DD	0.069	C	0.300
RPP 14 DD	0.123	CX	0.297
		D	0.610
SILVER 5	0.040	DX	0.594
SILVER 8	0.057	E	0.930
SILVER 14	0.101		
SILVER 5 DD	0.044	SPZ	0.070
SILVER 8 DD	0.069	SPA	0.120
SILVER 14 DD	0.107	SPB	0.195
		SPC	0.365
GOLD 8	0.055		
GOLD 14	0.101	XPZ	0.073
		XPA	0.122
PLATINUM 8	0.048	XPB	0.200
PLATINUM 14	0.089	XPC	0.355
MXL	0.015	3V	0.090
XL	0.022	3VX	0.077
L	0.033	5V	0.210
H	0.043	5VX	0.207
XH	0.125	8V	0.620
XXH	0.148	8VX	0.569
XL DD	0.017		
L DD	0.032	AA	0.150
H DD	0.048	BB	0.238
		CC	0.429

TYPE	WEIGHT (kg/m/rib)	TYPE	WEIGHT (kg/m/rib)
PV H	0.0045	PV H PU	0.0036
PV J	0.0085	PV J PU	0.0073
PV K	0.0177	PV TB2	0.0037
PV L	0.0354		
PV M	0.1171		

Kg/m/rib: Kilograms per length in meters per rib. Multiply by belt width in ribs to get weight factor.