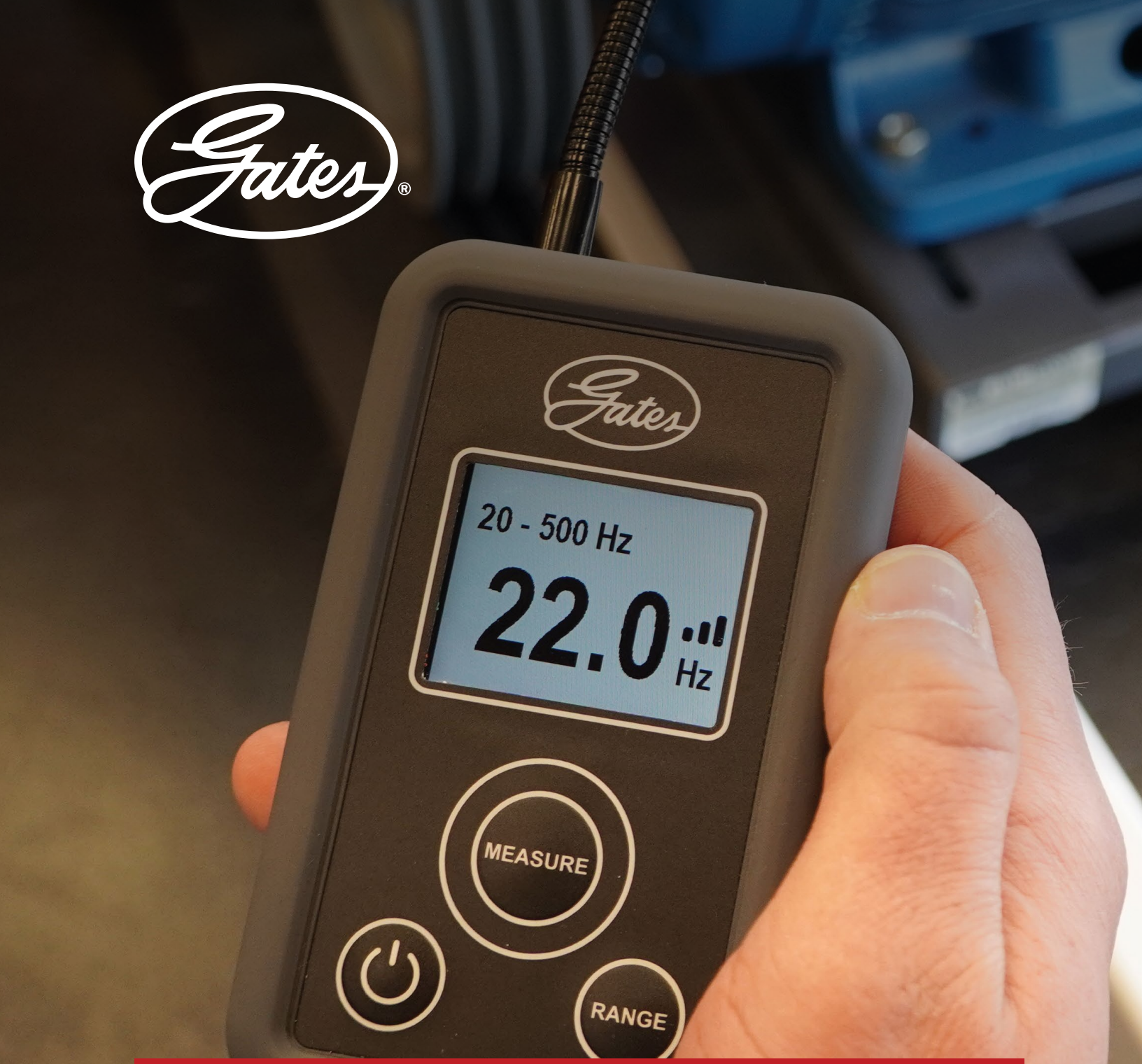


SONIC TENSION METER

MANUAL · MODEL 350C

TABLE OF CONTENTS

THANK YOU FOR PURCHASING
THE GATES SONIC TENSION METER.

PLEASE READ THIS MANUAL
THOROUGHLY TO FULLY UTILIZE
ALL THE FUNCTIONS OF THIS METER.

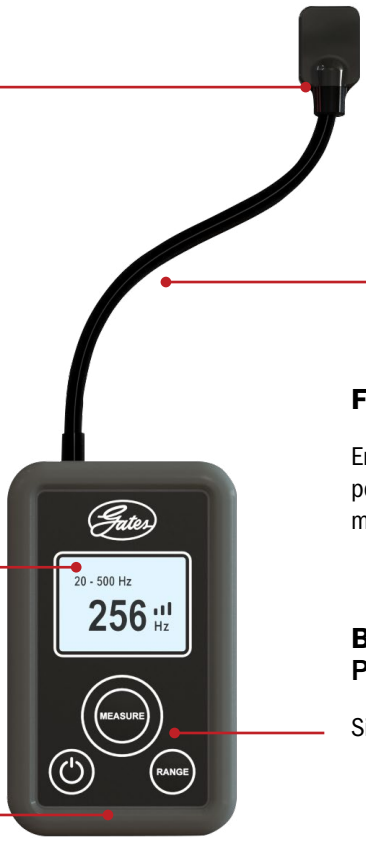
WARNINGS

- **DO NOT** twist the gooseneck more than 90 degrees.
- **DO NOT** drop this unit. Impact of any kind can result in damage.
- **DO NOT** put water, solvent or any other liquids on this unit.
- **DO NOT** leave this unit in a dusty environment.
- **DO NOT** leave this unit where it will get hot, such as in a car or in direct sunlight.
- **DO NOT** use volatile solvents to clean this unit.
- **DO NOT** use this in an area where a spark could cause an explosion.
- **DO NOT** pull hard on the cord of the sensor (microphone) from either end.
- **DO NOT** use this unit outside during a thunderstorm, turn off power and seek a safe place. Non-compliance could result in electric shock from thunderbolt.
- **DO NOT** bend the flexible arm sensor (microphone) within 20 mm (3/4 inch) of either end, because the construction is tubular, and the flexible arm sensor should not be bent at sharp angles.

350C SONIC TENSION METER

MICROPHONE HEAD:

Two small holes on rear side should be directed towards belt.



FLEXIBLE GOOSENECK:

Enables convenient and effective positioning of microphone for measurement.

BACKLIT DISPLAY:

Bright display, suitable for all light conditions.

BUTTONS POWER, MEASURE, RANGE:

Simple and intuitive interface.

POWER SUPPLY 2 X AAA BATTERIES

Supplied with silicone case for comfortable grip.

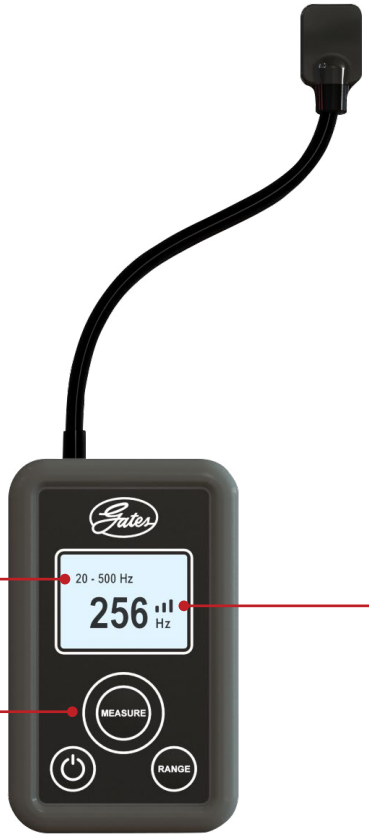
OPERATING INSTRUCTIONS

TAKING A MEASUREMENT

TO TAKE A BELT RESONANT FREQUENCY MEASUREMENT:

1. Press “MEASURE”, to initiate measurement mode on the 350C Sonic Tension Meter.
2. Position microphone head <1cm from the center of the belt span. The small holes in the microphone head should be directed towards the belt.
3. Tap or pluck the belt in the center of the belt span so that it oscillates up and down relative to its direction of travel.
4. The belt resonant frequency shall appear on the display.

Below diagram shows the user interface elements for taking a measurement.



FREQUENCY READING AREA:

FLASHING BARS = measurement mode
i.e. currently ‘listening’ for belt resonance
SOLID BARS = on standby
VALUE = most recent measured value, Hz.

MEASURE BUTTON:

Press once to start measurement.
The device will continue to listen for a belt resonance until detected.
To exit measurement mode, press “MEASURE”.

SIGNAL STRENGTH:

Shows the quality of the received signal used to identify the belt resonant frequency. All three bars are filled when signal quality is highest. Improve signal quality by following “Tips on Using the Gates Belt Frequency Meter”.

OPERATING INSTRUCTIONS

MEASUREMENT RANGE AND ON/OFF

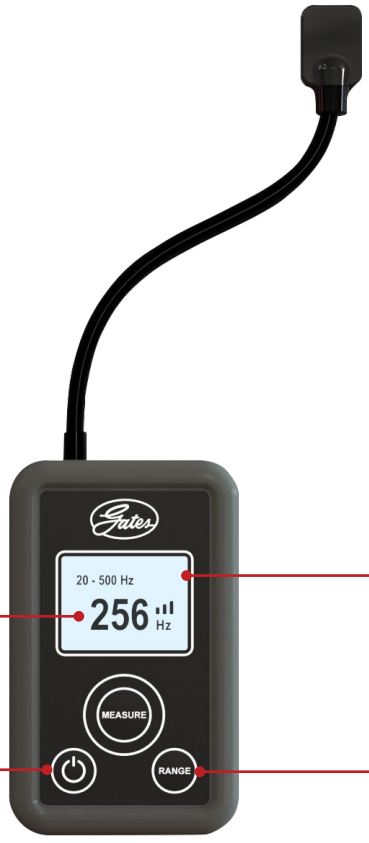
BELOW DIAGRAM SHOWS THE USER INTERFACE ELEMENTS FOR CHANGING THE MEASUREMENT RANGE AND SWITCHING THE DEVICE ON/OFF.

CURRENT MEASUREMENT RANGE:

Range of frequencies within which the belt resonance is expected. Frequencies outside this range will not be reported.

RANGES:

- Low = 10-50 Hz
- Standard = 50-500 Hz
- High = 500-5000 Hz
- Default = “Standard”



LOW BATTERY:

A low battery icon will appear when ~1 hour of constant usage remains.

POWER BUTTON:

To switch on, press once.
To switch off, press and hold for 2 seconds.

If inactive for 5 minutes, the device will switch off automatically.

RANGE BUTTON:

Press to cycle through 3 different ranges (Low, Standard, High).

TIPS ON USING THE SONIC TENSION METER

The Gates Sonic Tension Meter is capable of measuring belt tension with greater accuracy and consistency than traditional methods. It should not, however, be expected to produce exacting results in every case. While numerous factors can be found to influence the accuracy of the meter's output, one must remember that traditional methods of belt tensioning such as force/deflection or belt elongation are approximate.

The following suggestions are provided to help you achieve a high level of accuracy with the Gates Sonic Tension Meter:

CONSISTENT READINGS

- Take at least three readings to confirm that results are consistent and the meter is not erroneously reading background noise.

MINIMUM BELT SPAN LENGTH

- When measuring the tension in synchronous belts, use spans that are more than 20 times the length of the tooth pitch. Using spans shorter than this may result in readings that are higher than the actual tension due to belt cross-sectional stiffness.
- When measuring the tension in V-belts, use spans that are more than 30 times the belt top width. Using spans shorter than this may result in readings that are higher than the actual tension due to belt cross-sectional stiffness.

MINIMUM BELT TENSION

- There are limits as to how low a span tension value the meter can measure depending upon the belt type and cross section. Minimum recommended installation tension values are available for all belt sections from either drive design manuals or Gates Product Application Engineering. Attempting to measure belt tensions below these minimum recommended values should be avoided, as the meter may provide inaccurate results. If the belt span tension is low, and a tension reading cannot be obtained, try increasing the belt tension and then take another reading.

NEW BELT INSTALLATION

- Before measuring belt installation tension, turn the drive over by hand for several revolutions to fully seat the belt and equalize tension in all of the belt spans. Factors such as sprocket/shaft eccentricity, belt/sheave groove irregularity, etc., can influence belt tension as the sprockets or sheaves rotate. If the measured belt tension changes significantly as the drive is rotated, and accurate measurements are needed, determine the low and high values and average them together.

WINDY ENVIRONMENT

- Wind can adversely affect the ability of the meter to make a reading by creating excessive background noise.

SUMMARY OF FEATURES

- Model 350C, Product no. 7420-0350
- Max Frequency of 5000 Hz
- Variable Frequency Range Filters
- Auto Shut Off - The meter will automatically shut off after 5 minutes of inactivity. Power can be shut off manually by pressing and holding the “POWER” button for 1-2 seconds.
- Batteries - 2 each; AAA. The battery compartment can be found on the backside of the meter.
- Supplied with silicon case for comfortable grip
- CE, UKCA

TROUBLESHOOTING

SYMPTOM	CAUSE	TO CORRECT
METER WON'T TURN ON	Batteries are dead	Replace Batteries
	Battery contacts are corroded	Clean contacts and replace batteries
	Meter has sustained damage	Consider meter repair or replacement
		Gates certification / evaluation / repair service
CAN'T OBTAIN A BELT TENSION READING	Sensor is too far away from belt surface	Move sensor as close as possible without interfering with vibrating belt span
	Belt is too loose to generate frequency signal	Tighten belt
	Background noise is excessive	Temporarily eliminate background noise
	Meter is set in the incorrect frequency range	"Standard" frequency range is generally best
		"Range" to select the correct frequency
		Low (L) = 10 – 50 Hz Standard = 20 - 500 Hz High (H) = 500 – 5000 Hz
	Belt span frequency is less than 30 Hz	Microphone performance is reduced considerably at frequencies less than 30 Hz
	Excessive wind is blowing across Microphone	Shield or shelter microphone
	Belt span is long and frequency very low	Tighten belt
		Check to see if calculated belt frequency is below 30 Hz
		Artificially reduce belt span length using a block, etc.
MULTIPLE BELT TENSION READINGS ARE SIGNIFICANTLY DIFFERENT	Belt tension is near absolute minimum threshold	Tighten belt and see if reading variation is reduced
	Some tension reading variation is normal	It is normal for the meter to detect slightly different fundamental span frequencies
		Take at least three tension readings and average the results
	The drive has been rotated between readings	Belts must fully seat on pulleys / sheaves and equalize for tension to stabilize
		Pulley / shaft eccentricity can change belt tension significantly; establish minimum / average / maximum tension level limits and set belt tension accordingly
METER READINGS SEEM INCORRECT	Belt span length may be too short	The minimum span length recommended for synchronous belts is 20X the belt pitch
		The minimum span length recommended for V-type belts is 30X the belt or rib top width
METER BATTERY LIFE IS SHORT	Meter usage is heavy	Fresh alkaline batteries provide approximately 15 hours of meter usage
	Non-alkaline type batteries are being used	Use only alkaline type batteries

WARRANTY

GATES WARRANTS THE METER TO SUCCESSFULLY OPERATE FOR A PERIOD OF TWO YEARS FROM THE DATE OF MANUFACTURE:

- Gates will repair or replace meters, at our discretion, at no charge within the warranty period.
- Meters damaged by misuses or abuse, at Gates discretion, are not covered by the warranty.

IN ORDER TO RETURN METERS FOR WARRANTY REPLACEMENT:

- Contact an authorized Gates distributor for assistance.
- Do not return meters to Gates without prior approval and an RMA (Return Materials Authorization) in the box.
- Gates takes no responsibility for any meters returned to the wrong address or without an RMA issued by a Gates authorized distributor.
- www.gates.com/distributors

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