



Sonic Belt Tension Meter

U-507 Operation Manual

Thank you for purchasing our Gates Unitta Asia Company's
Sonic Belt Tension Meter U-507.

This manual describes operation procedure of U-507.

Please read this manual thoroughly before
use in order to make full use of functions.




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1. Note on safety

Be sure to observe them.





- Read this "Note on safety" well enough before use in order to use the unit properly. Keep this manual carefully after reading through.
- Note described here is for preventing danger to user or other people and damage to property, so be sure to observe.
- Classified marking below describes the degree of danger and damage caused when you do not observe the description and use the unit in a wrong mann

 Danger	 Warning	 Caution
This marking shows that "imminent danger is present which leads to death or serious injury" when the unit is used in a wrong mann	This marking shows that "possibility is present which leads to death or serious injury" when the unit is used in a wrong manne	This marking shows that "possibility of injury is present and only physical damage is likely" when the unit is used in a wrong mann

- The classified pictorial marking below shows description to be observed

	This marking shows "prohibition" of what must not be performed
	This marking shows "forcing" of what must be performed.

Warning

	Do not give strong shock and do not throw the unit. • Incompliance may lead to failure and fire.		Do not disassemble or modify the unit. • Incompliance may lead to fire, injury, and electric shock.
	Do not use the unit in a place where inflammation or explosion is possible. • When this unit is used in a place where inflammable gas such as propane gas or gasoline or dust is generated, it may lead to explosion or fir		Never expose the unit to any liquid such as water and solvent. Do not use the microphone in an environment where water or grease may depos



In measuring the tension, always make sure that the machine is stopped by turning off motor power supply or the lik



When it starts thundering while using this unit outdoors, turn off power at once and move to a safe place.

- Incompliance may lead to thunderbolt and electric shock.

Caution



Do not store the unit in a place of much moisture or dust or place of high temperature.

- Incompliance may lead to trouble.



Do not use solvent (such as thinner and benzene) in taking care of the main body.



Do not place the unit on any unstable place such as shaky table or tilted place.

- The unit may drop and cause injury and trouble.



The arm of flexible arm microphone is a universal pipe, but must not be bent at an acute angle. In addition, do not bend the pipe within 20 mm from the top of microphone and at the root of connector. Further, do not hold and pull strongly or turn the microphone (sensor) and the arm. Do not hold and pull strongly or turn the microphone (sensor) of cord type microphone and electromagnetic sensor.



Do not use or leave the unit in a place of high temperature exposed to direct sunlight or in a vehicle under the hot sun.

- Incompliance may lead to deformation or trouble of equipment

2. Overview, note, and checking item in defective measurement


Overview

The sonic belt tension meter (U-507) enables non-contact, simple, and accurate measurement of installation tension which is greatly related to belt function by analyzing sonic wave.

Sonic wave is generated by flipping the belt span with the belt standing still, and it is captured by the sensor and processed by high performance computer, and belt tension is displayed in digital mode.

Overview & checked item in measurement malfunction (when unsuccessful)

[Measurement mode is not established or data fluctuates significantly.]

Item	Phenomenon	Estimated cause (Assumed causes)	Checked item
"Error" is displayed or Measurement mode is not established, or LED (red) is on.	<ul style="list-style-type: none"> ● Tension value doesn't come out despite a few of trials. Otherwise, only "Measurement standby" is displayed after the 3rd time and on. (In case of frequency mode) 	<ul style="list-style-type: none"> ● "0" is entered to the entry parameters (unit mass, width, and span). ● Tension value has 6 digits or more. ● Measurement frequency range is incorrect. ● Measurement frequency exceeds 5000 Hz. ● Exhaustion of battery 	<ul style="list-style-type: none"> ● Check the detail of entry item. (Enter an appropriate value to the item that "0" is input.) ● Tension is not measured although frequency is displayed. ● Change of measurement frequency range (switching LOW and STANDARD, switching STANDARD and HIGH) ● Check whether measurement frequency is in excess of 5000 Hz or not. ● Indication of battery life (When the battery display is as shown on the right: )
Output fluctuates greatly.	<ul style="list-style-type: none"> ● The value changes greatly in every measurement. ● The value responds sensitively to the noise around (background noise) other than measured value. 	<ul style="list-style-type: none"> ● Microphone is in contact with the belt for a moment during measurement. ● Automatic gain adjustment is insufficient. 	<ul style="list-style-type: none"> ● Try measurement again at a appropriate distance where microphone is not in contact. ● Turn off power once at a measurement place, and turn on again. (Turn on power with microphone installed, and press "MEASURE" button over one second later.)

* If measurement is still unsuccessful after retrieval of the procedure above, contact us or the dealer you purchased this unit.

3.Measurement principle of U-507

When a belt tensed between pulleys is subjected to impact and vibrated, it oscillates first with an irregular waveform containing high frequency component and impact component as shown in figure 1, but soon oscillates with a intrinsic regular waveform.

U-507 tension meter was created in consideration of well-known phenomenon described above, but the belt and wire attenuate in a very short time, and no simple device has existed which captures the cycle of such basic waveform. However, a unique data processing method was developed which captures oscillation frequency making full use of microcomputer, and an attempt was successful to catch the cycle of such waveform rather easily.

This system detects oscillation waveform with a microphone, and the microcomputer processes the data and converts to characteristic frequency. "Horizontal oscillation of string" set on the tension meter described on the right in calculating the belt tension.

Calculation formula "To = 4 x M x W x S² x f² x 10⁻⁹ "

- Where, To: Tension (N)
 M: Unit mass (g/mm wide x m long)
 W: Belt width or number of ribs (wires) (mm/R)
 S: Measured span length (mm)
 f: Horizontal characteristic frequency (Hz)

Here, the belt and the wire have a rigidity, which is different from the string, therefore U-507 measurement displayed is somewhat higher than the actual tension under the affected condition.

Therefore it is allowed to obtain correction factor by strict calibration test and incorporate it to the data input, thereby displaying more accurate tension. An example of calibration result of U-507 measurement and actual tension is shown below:

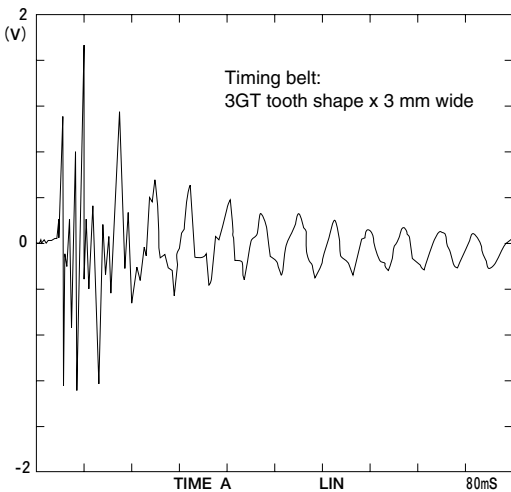


Fig. 1 Oscillation attenuation of timing belt

Therefore, it is required to input the length of span to be measured and the mass of belt (unit mass x width) by use of numeric key

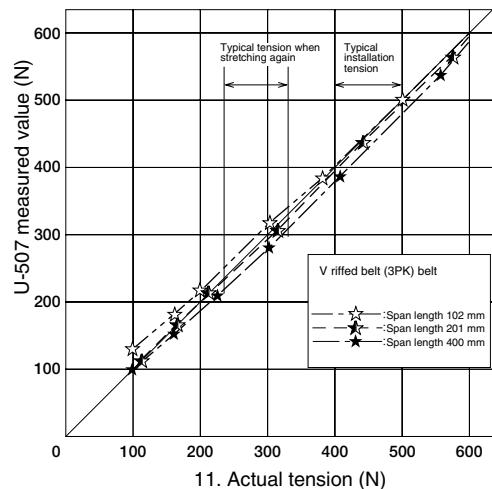
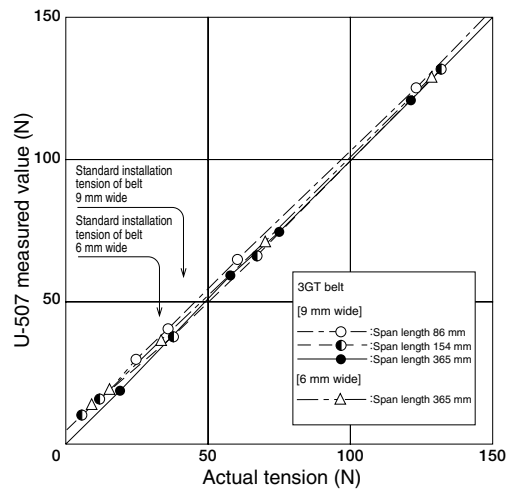
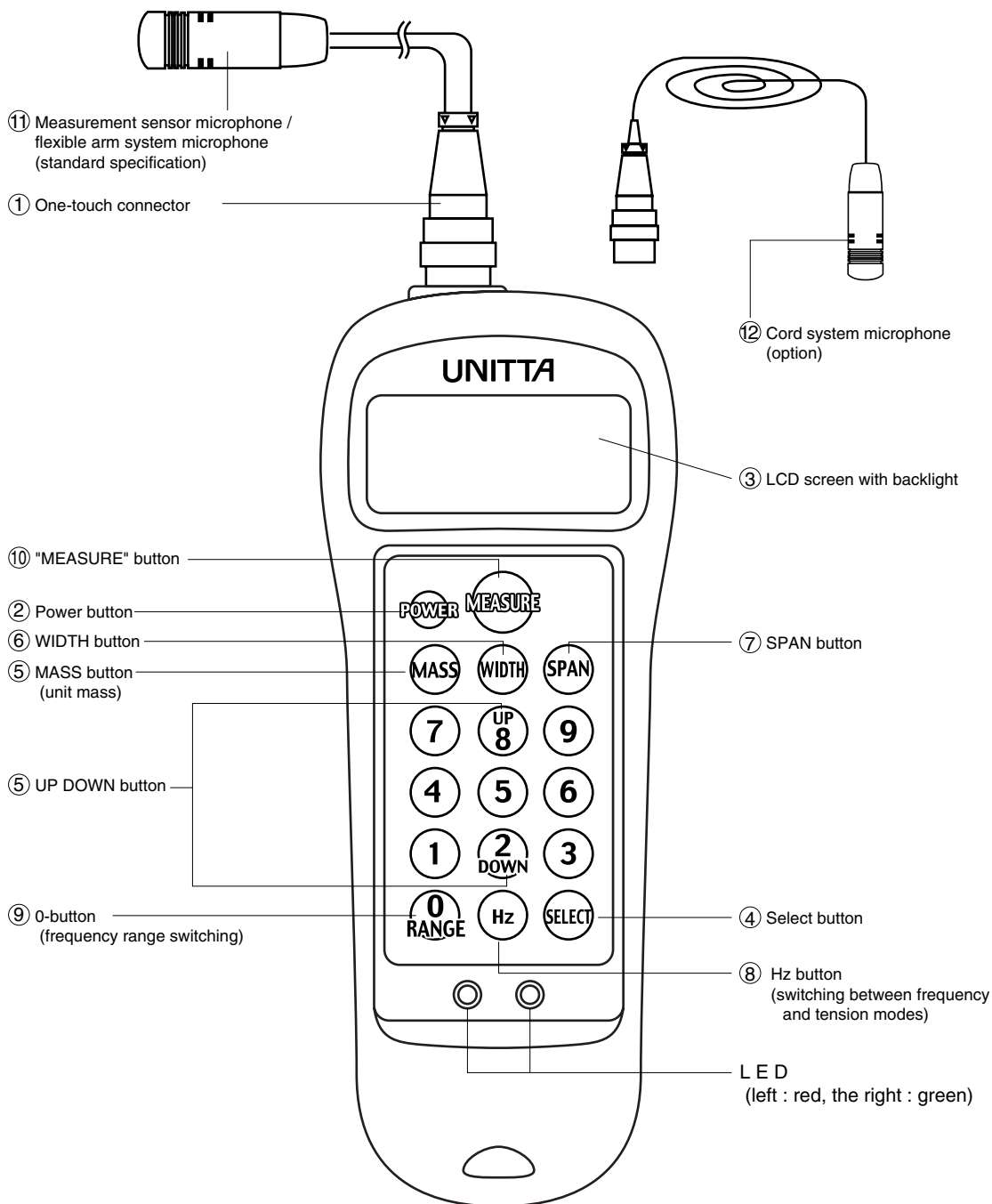


Fig. 2 U-507 relation between measured value and actual tension

4.Explanation of each part of U-507

Main part

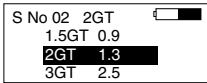





Power supply:AAA type x 2 pieces)

<p>① One-touch connector</p>	<p>Concave and convex connector has a slit mark and easily snaps into place when pushed in with such mark aligned. In disconnecting, hold the collar of connector on sensor side and pull, and it can be disconnected in one-touch simple operation.</p>
<p>② Power button</p>	<p>When "POWER" button is pressed, power is turned on. In turning off power, continue to press "POWER" button about one second. This instrument employs auto power-off function to turn off power in about five minutes from the last measurement, so if power is off during use, press "POWER" button again.</p>

<p>③ LCD screen with backlight</p>	<ul style="list-style-type: none"> ● Displays tension value, etc. ● Displays tension by three significant digits from 0.01 to 99900. ● Displays frequency by three significant digits from 10.0 to 5000 Hz. ● When the tension measurement result is out of the standard specification, LED (red) turns on and "ERROR" is displayed. <p>* When tension exceeds its range after measurement result is displayed, the value for the last 2times are displayed, and retrial is prompted by "peep" sound.</p> <ul style="list-style-type: none"> ● Battery mark is displayed when battery is consumed. (When remaining voltage is low, the battery mark blinks, as well as "LOW BATT" blinks.) ● Backlight is always on. However, it will turn off if it not in use is not used for one minute, and will resume when operated again. 	<p>[Overview of LCD indication pattern]</p> <p>Example of display indication unit mass, belt width, so span.</p>
<p>④ Select button</p>	<ul style="list-style-type: none"> ● Press SELECT button to choose any desired input number displayed in power-on. 20 memory functions selectable from No. 0 to 19 * Call out numbers sequentially forward by pressing SELECT button, and press any number to jump to designated number. Here, when you call out No. 10 or larger, press the number continuously. 	
<p>⑤ MASS button (unit mass) UP DOWN button</p>	<ul style="list-style-type: none"> ● Belt type and unit mass are displayed when this button is held down one second or longer. Choose a desired belt type by use of "UP" and "DOWN" button, and determine by "MEASURE" button. (See page 9 for preinstalled unit mass.) * Display unit : g/m. * CAT (rough standard), tension, and frequency are displayed only when belt type is chosen by MASS button. 	
<p>⑥ WIDTH button</p>	<ul style="list-style-type: none"> ● Choosing "WIDTH" button enables input of belt width with use of numeric key. Allowed input capacity: 000.1 - 999.9 mm/R * Enter the number of ribs for V belt. 	
<p>⑦ SPAN button</p>	<ul style="list-style-type: none"> ● Choosing "SPAN" button enables input of measurement span length with use of numeric key. 	
<p>⑧ Hz button (switching between frequency and tension modes)</p>	<ul style="list-style-type: none"> ● Pressing "Hz" button enables choosing between measurement tension display and measurement frequency display. * Display changes every time this button is pressed. ● In addition, holding down Hz button enables dual display with tension and frequency. However, CAT display is available only when inputting from preinstalled data. (Displays only for timing belt.) * Displayed CAT value for tension and frequency are slightly different from standard installation tension of toothed belt on page11. Use them as a rough standard. 	
<p>⑨ 0-button (frequency range switching)</p>	<p>Hold down "0" button one second or longer to change measurement frequency range.</p> <p>HIGH.....500~5000Hz STANDARD.....10~600Hz LOW.....10~50Hz</p> <p>Choose a range with UP and DOWN button, and determine with "MEASURE" button. In selecting 600Hz or above, the range must be switched to "HIGH range". Determine with "MEASURE" button.</p>	
<p>⑩ "MEASURE" button</p>	<ol style="list-style-type: none"> Press "MEASURE" button to set up auto trigger mode. <ul style="list-style-type: none"> * Initial display status is —— Measurement thereafter is started by receiving signals from the sensor. <ul style="list-style-type: none"> * Displays during measurement. * After turning on power, allow an interval of 1 second or longer before pressing "MEASURE" button for automatic gain adjustment. When the belt type is changed, press "MEASURE" button to start measurement. When measurement frequency range is changed, press "MEASURE" button to start measurement in changed frequency range. 	
<p>⑪ Measurement sensor microphone/flexible arm system microphone (standard specification)</p>	<p>The following two types are available.</p> <p>The microphone itself has a small diameter of 12.5 mm attaching flexible pipe system, and can be positioned with single hand from the main body, and it is useful in a place where the main body cannot be placed on floor such as a manufacturing site. Compatible with entire measurable frequency band: 10 - 5000Hz.</p> <p>Note: Do not hold and twist the microphone and connector area.</p>	
<p>⑫ Cord system microphone (option)</p>	<p>The microphone itself has a small diameter of 12.5mm attaching cord system. It enables measurement in any use such as in congested places hard to measure. Compatible with entire measurable frequency band: 10 - 5000Hz.</p>	

5.Operation procedure of U-507

Procedure	Description	Operation	Display screen
1	Set up the microphone.	Choose an optimum microphone and fix in the main body with one-touch connector.	
2	Turn on power.	"POWER" button - PUSH	No.□
3	Choose an input number with the select button and numeric key. Ex: Choose one from No. 0 to No. 2.	"SELECT" button - PUSH [Number is forwarded sequentially every time "SELECT" button is pressed. 0 → 1 → · · · 18 → 19 → 0 → 1 → 2. In addition, you can jump to any designated number by pressing a number with numeric key.] 1. Selecting procedure "SELECT" button - PUSH (1st time) "SELECT" button - PUSH (2nd time) 2. Selecting procedure "2" button - PUSH When "SELECT" button is pressed during the following procedure (during display of unit mass, belt width, span length input, and measured value), the number being chosen is displayed.	No.□ No.0→No.1 No.1→No.2 No.0→No.2
4-1	When inputting a unit mass manually Ex: Input 2.5g/mm wide x meter long [See page 9 for input data.]	"MASS" button - PUSH [Input the unit mass (g/mm W x m L) in the order of blinking position on display screen by use of numeric key. If input is mistaken, press "MASS" button again to return the cursor to the first.] "0" button - PUSH "0" button - PUSH "2" button - PUSH "5" button - PUSH	M=□□□.□g/m "Allowable input capacity: 0.1 - 999.9 g/mm x m) M=0□□.□g/m M=00□.□g/m M=002.□g/m M=002.5g/m
4-2	When inputting the unit mass from belt type. Ex: Select 3GT.	"MASS" button, PUSH (holding down for one second or more) [Have belt types displayed on screen, and choose a belt type with "UP" button and "DOWN" button.] "DOWN" button - PUSH Place highlighted portion on 3GT. Press "MEASURE" button for selecting. 3GT is displayed on screen.	
5	Input the belt width. Ex: Input 25.4 mm. [See page 8 for input data.]	"WIDTH" button - PUSH [Do the same as described above. When data above allowable capacity is input, the cursor returns to the first, and input of data is requested again.] "0" button - PUSH "2" button - PUSH "5" button - PUSH "4" button - PUSH	W=□□□.□mm/R "Allowable input capacity: 000.1 - 999.9 mm" W=0□□.□mm/R W=02□.□mm/R W=025.□mm/R W=025.4mm/R
6	Input the span length. [See page 8 for input data.]	"SPAN" button - PUSH [Do the same as described above.]	S=□□□□mm "Allowable input capacity: 0001 - 9999 mm"
7	Start measurement.	1. Bring the measurement microphone closer in the vicinity of span center of measurement target as far as it is out of contact with the belt (measurement target). 2. "MEASURE" button - PUSH: LED (green) blinks and LCD displays  . 3. Flip the belt span with a finger etc. to vibrate the wire: LCD displays  . The following measurement is performed by the microphone receiving sound without use of measure button for the 2nd time and on. Since measurement is started by the microphone receiving sound, measurement is started as well even by a noise if it has a relatively stable sound pressure. Result is displayed as well as peep sound emitted and LED (green) turns on in 1.5 sec after reception of belt vibration sound.	 In measurement for the 2nd time and after, previous data is displayed first. Intorn the measurement data is renewed at the same time as peep sound.]
8-1	Displays tension.	Result is displayed as well as peep sound emitted and LED (green) turns on in 1.5 sec after reception of belt vibration sound. * When LED (red) turns on, see "checking item" in measurement malfunction on page 3.	T = 122N "Displays from 0.01 to 99900N in three significant digits"
8-2	Displays frequency. Displays frequency after measurement of tension.	"Hz" button - PUSH [Displays frequency corresponding to the measured tension. When "Hz" button is pressed once again, the display returns to tension mode.]	f=235Hz "Displays from 10.0 to 5000 Hz in three significant digits"

6. Input procedure of data

6-1. Input of unit mass [See table-1, table-2, and table-3.]

● Timing flat belt

Input the mass per width (mm) x length (m) in "g/mm W x m L" for unit mass.

Data of capacity can be input by four significant digits, i.e. three digits of integer and one digit below decimal point from 000.1 up to 999.9 g/mm W x m L.

● Timing V-belt (Input of belt unit mass from preinstalled data)

When "MASS" button is held down (longer than one second), belt type is displayed on LCD. Scroll the display with UP button ("2") or DOWN button ("8") until the letter of desired belt type is highlighted. Then press "MEASURE" button for determining.

● V, V-ribbed belt and wire

Input the mass per meter of length in "g/m length" for unit mass. Data of capacity can be input by four significant digits, i.e. three digits of integer and one digit below decimal point from 000.1 up to 999.9 g/m L. Unit mass corresponds to one piece for V-belt and wire, and one rib for V-ribbed belt.

Note) Unit mass of U-507, U-505, and U-305 is 10 times the input of conventional type U-303 since the input unit has been changed.

Therefore, when a value is input in conventional unit mass (g/cm²), measured tension is displayed in 1/10. (Display of measured frequency is not changed.)

6-2. Input of belt width or the number of belts (ribs)

● Timing flat belt

Data of belt width can be input by four significant digits, i.e. three digits of integer and one digit below decimal point in millimeters from 000.1 to 999.9 mm.

● V, V-ribbed belt and wire

Input one (piece) of V-belt and wire.
Input the number of ribs of V-ribbed belt.

6-3. Input of span length

Span length is a distance between contacts with pulley, and can be calculated by the following equation accurately. Alternatively, measure the distance between pulley contacts with a measuring tape for facilitation.

$$S = \sqrt{C^2 - \frac{(D_p - d_p)^2}{4}}$$

where,

s: Span length (mm)

C: Distance between axes (mm)

D_p: Large pulley pitch outer diameter (mm)

d_p: Small pulley pitch outer diameter (mm)

7. List of preinstalled belt type unit mass

Table-1: List of unit mass of toothed belt and V-belt

See the description of MASS button on page 5 and 6 for selecting. Input a value manually by use of unit mass list on the next page as for special pitch and special belt which are not described below.

Timing belt (Standard construction)							
Display	Unit mass	Display	Unit mass	Display	Unit mass	Display	Unit mass
MXL	1.2	3M	2.4	1.5GT	0.9	14MGT	8.0
XL	2.1	D3M	2.3	2GT	1.3	EV8M	5.1
DXL	1.9	5M	3.8	3GT	2.5	EV14M	8.7
L	3.1	D5M	4.2	D3GT	2.5		
DL	3.3	8M	6.1	5GT	4.0		
H	3.8	D8M	6.3	D5GT	4.3		
DH	4.4	14M	10.0	8YU	5.2		
XH	11.1	D14M	11.9	D8YU	5.4		
XXH	14.8	20M	12.8	8MGT	4.7		

(unit:g/mm width x m length)

V belt			
Display	Unit mass	Display	Unit mass
3VX	59.8	D (V)	534.6
5VX	165.6	E (V)	734.4
8VX	525.6	3VXPB	75.7
J (V)	8.6	5VXPB	210.9
K (V)	20.0	5MPF	10.5
L (V)	30.4	7MPF	25.7
A (V)	103.2	11MRF	52.1
B (V)	166		
C (V)	298.8		

unit mass: Mass per meter length of one rib(g/m length)

Display	Belt type	Display	Belt type	Display	Belt type	Display	Belt type
8MGT	Polychain GT2 8M	3VXPB	3VX Power band	5MPF	Polyflex 5M	11MRF	Polyflex 11M
14MGT	Polychain GT2 14M	5VXPB	5VX Power band	7MPF	Polyflex 7M		

8. Unit mass list of timing belt made by Gates Unitta Asia

Table-2: Unit mass only for U-507/505 and U-305

Data of unit mass can be input by four significant digits, i.e. three digits of integer and one digit below decimal point in g/mm W x m L from 0.1 to 999.9 g/mm W x m L.

List of timing belt unit mass specified as standard configuration

① Timing belt

Tooth type	MXL	XXL(50)	XL	DXL	L	DL	H	DH	XH	XXH
Pitch (mm)	2.032	3.175	5.080	5.080	9.525	9.525	12.700	12.700	22.225	31.750
Unit mass (g/mm with x m length)	1.2	1.4	2.1	1.9	3.1	3.3	3.8	4.4	11.1	14.8

② HTD belt

Tooth type	3M-HTD	D3M-HTD	5M-HTD	D5M-HTD	8M-HTD	D8M-HTD	EV14M	14M-HTD	D14M-HTD	20M-HTD
Pitch (mm)	3.000	3.000	5.000	5.000	8.000	8.000	14.000	14.000	14.000	20.000
Unit mass (g/mm with x m length)	2.4	2.3	3.8	4.2	6.1	6.3	8.7	10.0	11.9	12.8

③ GT belt

Tooth type	1.5GT	2GT	3GT	D3GT	5GT	D5GT	EV8YU	8YU	D8YU
Pitch (mm)	1.500	2.000	3.000	3.000	5.000	5.000	8.000	8.000	8.000
Unit mass (g/mm with x m length)	0.9	1.3	2.5	2.5	4.0	4.3	5.1	5.2	5.4

④ Polychain GT2 belt

Tooth type	8M-GT	14M-GT
Pitch (mm)	8.000	14.000
Unit mass (g/mm with x m length)	4.7	8.0

⑤ Carryflex timing belt

Tooth type	XL	L	H	T5	T10	C8YU
Pitch (mm)	5.080	9.525	12.700	5.000	10.000	8.000
Unit mass (g/mm with x m length)	1.7	2.6	3.4	1.8	3.6	5.2

⑥ Non standard pitch belt

Tooth type	101	102	103	104	111	109	181	25	9109
Pitch (mm)	1.5875	2.0320	2.1167	2.8222	1.4111	2.1167	2.8222	6.3500	15.4473
Unit mass (g/mm with x m length)	1.0	1.3	1.3	1.0	1.1	1.1	0.9	1.7	3.0

⑦ Urethane belt

Tooth type	UMXL	UXL
Pitch (mm)	2.032	5.080
Unit mass (g/mm with x m length)	0.9	1.6

Note) Input a value 10 times the unit mass list value (g/cm) used for present U-303.

9. Unit mass list of V-belt made by Gates

■ Table-3: Unit mass only for U-507/505 and U-305

V-belt has a rather high rigidity, and difference is generated between the actual tension and measured value which requires correction in the range of standard installation tension. Therefore multiply the mass per meter length of one rib of belt by tension correction factor obtained by calibration by use of the formula below, and employ the resultant value as a WEIGHT value.

[M (g/m length) = Mass per meter length of one rib (g/m length) x Tension correction factor]

① Super HC type

Input item	3VX Single	3VX Power band	5VX Single	5VX Power band	8V Single
WEIGHT (Mass x compensation coefficient per 1 rib 1m length)	68.0×0.88=59.8	87.0×0.87=75.7	182.0×0.91=165.6	237.0×0.89=210.9	657.0×0.8=525.6

② Polyflex type

Input item	5M	7M	11M
WEIGHT (Mass x compensation coefficient per 1 rib 1m length)	11.0×0.95=10.5	27.0×0.95=25.7	56.0×0.93=52.1

③ Micro V type

Input item	J section	PK section	L section
WEIGHT (Mass x compensation coefficient per 1 rib 1m length)	9.0×0.95=8.6	21.0×0.95=20.0	32.0×0.95=30.4

④ Standard V type

Input item	A	B	C	D	E
WEIGHT (Mass x compensation coefficient per 1 rib 1m length)	120.0×0.86=103.2	200.0×0.83=166.0	360.0×0.83=298.8	660.0×0.81=534.6	1020.0×0.72=734.4

*Contact us for unit mass of toothed belt for automobile engine and V-ribbed belt for driving automobile engine auxiliary equipment.

10. List of standard installation tension of timing belt made by Gates Unitta Asia

① Timing belt

Tooth type	width (mm)	3.2	4.8	6.4	7.9	9.5	12.7	19.1	25.4	38.1	50.8	63.5	76.2	101.6	127.0	152.4	177.8	203.2	228.6	254.0	
				(25)	(31)	(37)	(50)	(75)	(100)	(150)	(200)	(250)	(300)	(400)	(500)	(600)	(700)	(800)	(900)	(1000)	
MXL	N	2.9	5.0	7.6	10.3	11.8	16.2														
XL	N			13.7	19.2	24.5	34.3	54.9	75.0	116											
L	N						52.0	89	128	203	280	344	412								
H	N							217	312	486	668	851	1030	1390	1760	2110					
XH	N										909		1410	2000	2540	3050	3560	4120	4670	5200	
XXH	N										1110		1760	2480	3190	3830	4460	5100	5770	6430	

② GT&HTD belt

Tooth type	width (mm)	1.5	2.0	2.5	3.0	4.0	6.0	9.0	12	15	20	25	30	40	50	55	60	70	85	100	115	130	150	170	
		1.5GT	N	2.3	3.4	4.4	5.6	7.8	12.4	19.7															
2GT	N		4.3	5.5	6.4	9.4	15.8	25.2	34.6	44.1															
3GT-3M	N					20	29	44	59	74	98	123	147	196											
5GT-5M	N							55	76	96	137	178	220	302	373										
8YU-8M	N										235	294	343	500	637	701	765	892	1100		1480				
EV8YU	N								210	280	350	420	600	760		920	1100	1300							
14M	N											441	618	775	902		1190	1470	1790	2090	2380	2780	3190		
EV14M	N											560	740		1100		1400	1800	2100	2500	2900	3400	3800		

* Contact us as for 20M type.

③ Carryflex timing belt

Tooth type	width (mm)	12.7	19.1	25.4	31.8	38.1	50.8	63.5	76.2	101.6
		(50)	(75)	(100)	(125)	(150)	(200)	(250)	(300)	(400)
XL	N	25	37	49	62	83	98	123	147	196
L	N	44	67	88	111	132	177	221	265	353
H	N		162	216	270	324	431	539	647	863

③ Carryflex timing belt

Tooth type	width (mm)	10	15	20	25	30	40	50	60	75	80	100
		T5	N	20	29	39	49	59	78	98		147
T10	N		129	173	216	259	345	431		647		863
CF8YU	N			235	294	343	500	637	765		1025	1290

④ Polychain GT2 belt

Shown below are standard tensions. Use them when working condition (actual load) is unknown.

Tooth type	width (mm)		12	15	20	25	30	40	50	60	70	80	100	115	130
		8MGT	N	MIN	125	155	210	260	310	410	520	625	730	830	
		MAX	260	325	440	545	650	860	1090	1310	1530	1740			
14MGT	N	MIN			530		795	1060	1325	1590	1855	2120	2650	3050	3445
		MAX			1110		1670	2230	2780	3340	3895	4450	5565	6405	7235

Recommended installation tension Calculate the installation tension by the following each time depending on working condition (actual load).

Recommended installation tension calculation formula: T_{st} (N)

Pm: Load power (kW)

V: Belt speed (m/s)

$$T_{st} = 405 \times Pm / V + m \times V^2$$

m: Correction factor

s: Span length (mm)

L: Belt length (mm)

Correction factor (m) list

width (mm)	12	15	20	25	30	40	50	60	70	80	100	115	130
8MGT	0.057	0.071	0.095	0.119	0.143	0.190	0.283	0.285	0.333	0.380			
14MGT			0.158		0.237	0.316	0.395	0.474	0.553	0.632	0.790	0.909	1.027

As for installation tension of our toothed belt, no difference is generated between the measured value of U-507 and actual tension in the measurement range of note 1) - 3) below, and it is not necessary to set any tension correction factor.

Note 1) In measuring the installation tension, basically set the belt on the machine and turn it several times to make the machine familiar, and measure the tension of 2 spans on belt tension side and loosening side and take the average. When tension of 2 spans is different more than 30% approx, adjust them almost equal and measure again.

Note 2) Measure with a span having the length more than 20 times the tooth pitch.
(Because a value higher than actual tension is displayed when the span is so short as to be affected by rigidity of belt itself.)

Note 3) Set the tension range more than 1/3 of standard installation tension.
(Because a value higher than actual tension is displayed when the tension is so low as to be affected by rigidity of belt itself.)
Measurement in an extremely low tension range is sometimes impossible as is seen from the measurement principle of this tension meter.

Note 4) It is reasonably estimated that some difference from actual tension is generated as for special belt such as wide belt for transport and back-ribbed belt, so that simple calibration is required for checking tension which needs precision comparatively.

As for experienced machine, install the belt by a procedure provided for corresponding machine, certify the frequency with U-507 tension meter, and set the same frequency thereafter, thus controlling the tension.

11. List of U-507 specification

■ Body of tension meter

- Power supply: (AAA type x 2 pieces) Alkaline dry cell is recommended.
- Outer dimension: 160 (H) x 59 (W) x 26 (D)
- Mass: 120 g
- Use and storage temperature range: -10°C to 50°C, below 80% (free from condensation)

■ Accessory

- 1) Flexible arm type microphone
 - Microphone outer diameter: 12.5 mm
 - Total length: 170 mm
 - Measurable frequency band: 10 Hz - 5000 Hz
 - * Common to present U-303, 305, and 505
- 2) Carrying soft case
 - Capable of containing the body of tension meter, flexible arm type microphone, etc.
- 3) Alkaline dry cell: AAA type x 2 pieces
- 4) U-507 operation manual
- 5) Inspection acceptance certificate
- 6) Certificate

[Option]

- 1) Cord type microphone
 - Microphone diameter: 12.5 mm
 - Total length: 1m
 - Measurable frequency band: 10 Hz - 5000 Hz

12. Guarantee and after-sales service

Thanks for purchasing our sonic wave belt tension meter (U-507).

This instrument (body) is guaranteed for 1 year (6 months as for sensor), and any failure found during this period attributed to us will be repaired free of charge.

Contact our sales department or agency for repairing failure. (Use the enclosed certificate.)

When certification is required, direct the sensor to the transmitter which emits stable frequency sound from 10 to 5000 Hz, and measure in the same way as measurement of tension, which enables certification easily.

Tension meter certifying device (U-305-OS1) is also in market.

If you contact our sales department, we will certify the unit with charge.

Contact the following for inquiry and order.

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