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Published in Apr. 2024

Printed in Japan 11405E2.1-24000

Touch-roll type Thickness Measurement System

VND Series

High accuracy eddy current, touch-roll type thickness measurement system

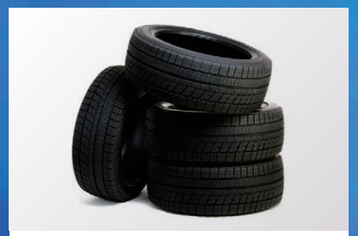
VND Series

SHINKAWA

High accuracy digital thickness measurement system with high stability and reliability

VND converter improves yield, gives a production process speed.

The VND converter, in combination with an eddy current type displacement sensor and the touch-roll attachment, provides a system that measures the thickness of the non-conductive sheets with high accuracy.
Use of eddy current method makes the system superior to any other measurement systems based on optical, ultrasonic or radiological principles because it can provide highly accurate measurements of thickness of polymer films and rubber sheets continuously without being affected by ambient atmosphere with water, oil or dust etc.



●Rubber

●Non-woven fabric

●Non-conducting sheets

Easy adjustment by (SET) button !

When in the field, simply provide a mock thickness with a spacer of regulated pitches (10% or 20%), and press (SET) button to adjust characteristics.

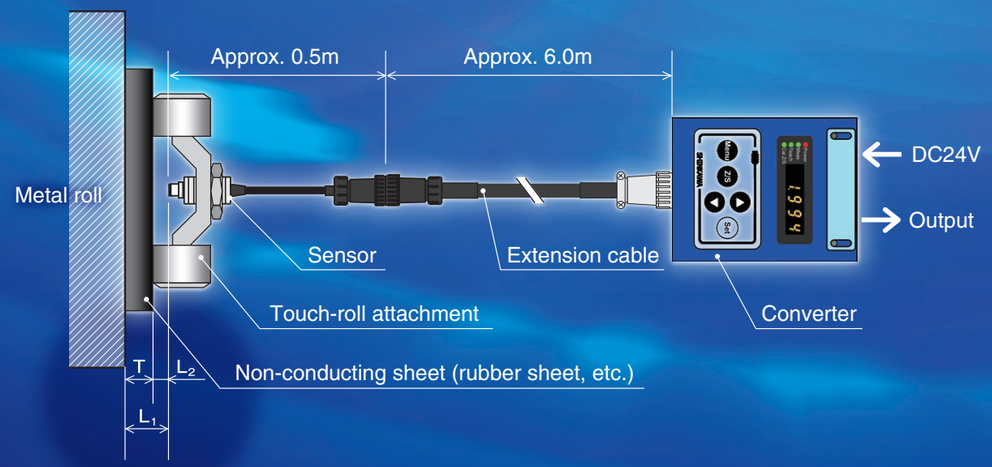
Excellent temperature characteristics !

Sensor, extension cable and converter have superior temperature characteristics, provide stable measurements.

High stability and low run-out !

Run-out effects from target (rotor) are kept low just as that of our conventional VN series models.

System configuration



Features

Digital display on the converter for thickness measurement

No testers are required in the field to measure converter's output voltage.

Smooth zero-shift function (Approx. ±20% of F.S.)

Smooth zero-shift adjustment with the up/down (▲) (▼) keys on the converter.
Zero-shift function doesn't affect sensitivity and linearity (accuracy) of the measurement.

High accurate thickness measurement

The use of 6-point adjustment (20% pitches) or 11-point adjustment (10% pitches) to match with the actual target (rollers) has achieved the linearity of within ±0.5% of F.S. (with the field adjustments, linearity as much as ±0.2% of F.S. (typical value) is also possible.)

Flexible installation

An installation direction and a position can select freely.

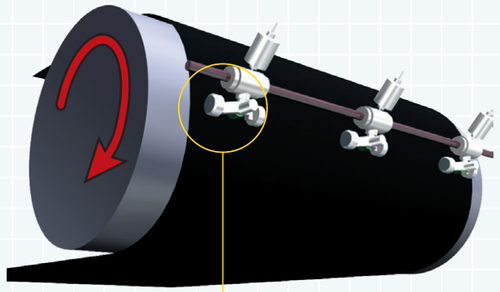
Compact

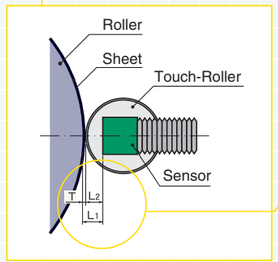
Downsized by half from the conventional VN converter.

CE marking

VND is compliant with CE marking.

Applications



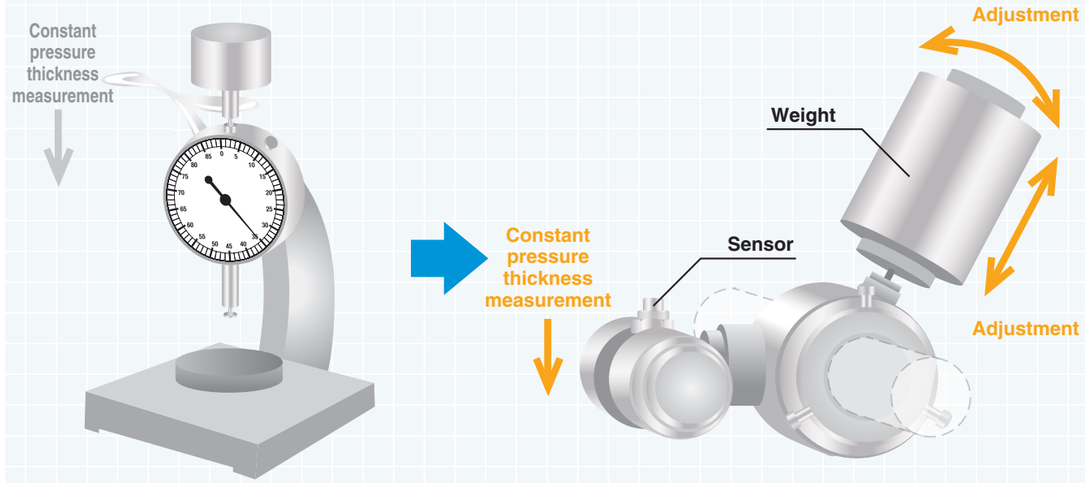


$$T = L_1 - L_2$$

T = Non-conducting sheet thickness
L_1 = Distance to the metal roll from the sensor tip surface
L_2 = Sensor offset gap (0.8mm)

※Typically, with the use of Zero-Shift function of VND, L2 value is electrically set to zero, enabling the device to output in proportional to its thickness.

In-line of constant pressure thickness measurement



Specifications

		1 mm Range	2 mm Range	5 mm Range	10 mm Range
Thickness measurement range (Actual gap)		0 mm ~ 1.0 mm (0.8 mm ~1.8 mm)	0 mm ~ 2.0 mm (0.8 mm ~2.8 mm)	0 mm ~ 5.0 mm (0.8 mm ~5.8 mm)	0 mm ~ 10.0 mm (0.8 mm ~10.8 mm)
Converter		VND-010A-□	VND-020A-□	VND-050A-□	VND-100A-□
Extension cable		NW-100□		NW-100□	NW-100□
Sensor		NS-020□		NS-050□	NS-100□
Touch-roll attachment		NT-020A /AG□		NT-050A /AG□	NT-100A
Calibration material		Chilled steel (flat)			
Output voltage [V]		0~1, 0~5, 0~10	0~2, 0~10	0~5, 0~10	0~10
Linearity		±0.5 % of F.S. (for 6 points or 11 points adjustment)			
Resolution [μm]		1			
Accuracy of digital display [mm]		±0.005			±0.03
Frequency response (-1dB typ.)		DC~20 Hz			
Operating temperature range	Sensor	-30 ℃~+130 ℃ (Connector part: -25℃~ +85℃)			
	Extension cable	-25 ℃~+85 ℃			
	Converter	0 ℃~+50 ℃			
Temperature characteristics	Sensor	±2.5 % of F.S.*1	±1.5 % of F.S.*1		
	Extension cable	±1.5 % of F.S.*2			
	Converter	±1.5 % of F.S.*3			
Power supply		+24 VDC ± 10%, ripple (p-p)10 % or lower			
Current consumption		Max. of 120 mA			
Mass	Sensor	Approx. 0.3 kg			Approx. 0.7 kg
	Extension cable	Approx. 1.3 kg			
	Converter	Approx. 1.0 kg			

Specifications, outline drawings and other written information can be changed without notice.
*1 Condition gap: 50 % of the thickness measurement range, Target: Chilled steel (flat), Temperature: +25 ℃ is the normal temperature, Range is 0 ℃ to +100 ℃
*2 Condition gap: 50 % of the thickness measurement range, Target: Chilled steel (flat), Temperature: +25 ℃ is the normal temperature, Range is 0 ℃ to +80 ℃
*3 Condition gap: 50 % of the thickness measurement range, Target: Chilled steel (flat), Temperature: +25 ℃ is the normal temperature, Range is 0 ℃ to +50 ℃

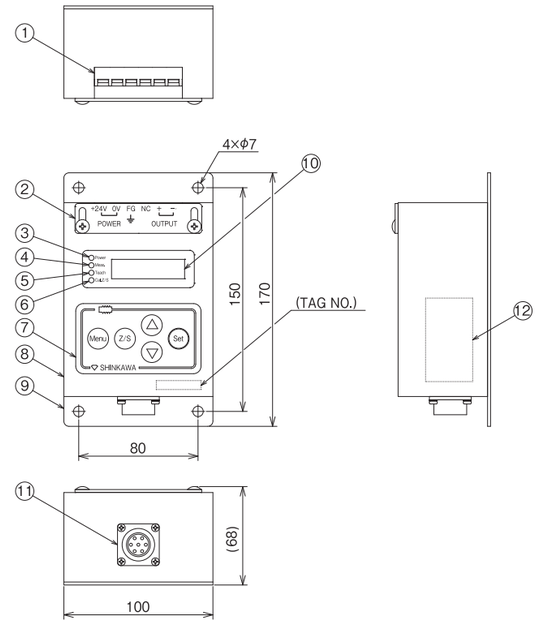
Drawing

Converter

Unit:mm

VND-010A-□ : 1.0mm Range
VND-020A-□ : 2.0mm Range
VND-050A-□ : 5.0mm Range
VND-100A-□ : 10.0mm Range

No.	Name
1	Terminal block
2	Terminal block cover
3	Power lamp (Power LED)
4	Measurement range lamp (Meas. LED)
5	Adjustment mode lamp (Teach. LED)
6	Calibration mode lamp (Cal. Z/S LED)
7	Button panel
8	Body
9	Base plate
10	LED display panel
11	Connector
12	Name plate



Touch-roll attachment

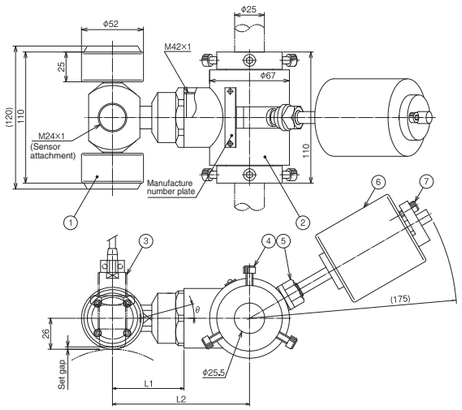
Unit:mm

1.0 mm, 2.0 mm Range
NT-020A / AG□

No.	Name
1	Roller
2	Body
3	Sensor
4	Clamp screw
5	Adjust screw of angle
6	Weight
7	Clamp screw

Additional spec.
/AG□: Specify the angle θ
/SGL: Roller oscillation

The model number above does NOT include the sensor.
The sensor model number is listed on the right.

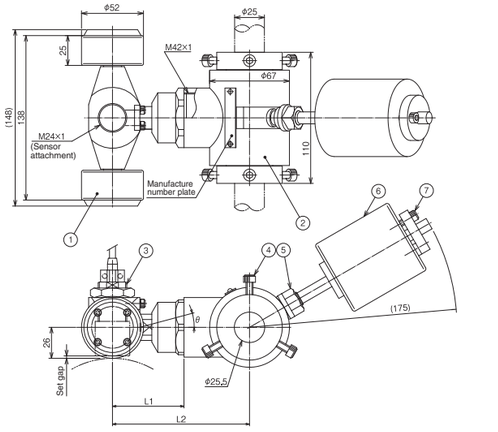


5.0 mm Range
NT-050A / AG□

No.	Name
1	Roller
2	Body
3	Sensor
4	Clamp screw
5	Adjust screw of angle
6	Weight
7	Clamp screw

Additional spec.
/AG□: Specify the angle θ
/SGL: Roller oscillation

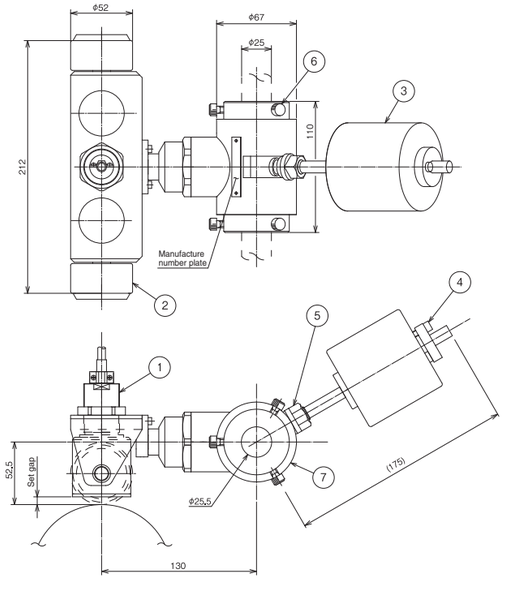
The model number above does NOT include the sensor.
The sensor model number is listed on the right.



10.0 mm Range
NT-100A

No.	Name
1	Sensor
2	Roller
3	Weight
4	Clamp screw
5	Adjust screw of angle
6	Clamp screw
7	Body

The model number above does NOT include the sensor.
The sensor model number is listed on the right.



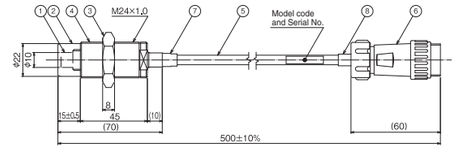
Sensor

Unit:mm

NS-020□

No.	Name
1	Sensor top
2	Sensor cover
3	Jam nut
4	Threaded portion
5	Sensor cable
6	Connector
7	Cable protective tube
8	Cable protective tube

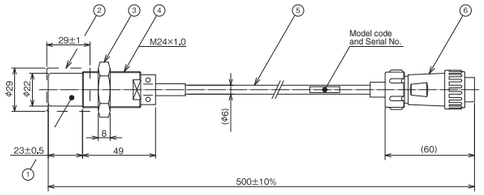
NS-020A: without thermocouple
NS-020B: with thermocouple



NS-050□

No.	Name
1	Sensor top
2	Sensor cover
3	Jam nut
4	Threaded portion
5	Sensor cable
6	Connector

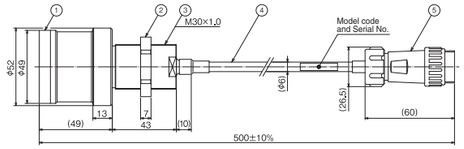
NS-050A: without thermocouple
NS-050B: with thermocouple



NS-100□

No.	Name
1	Sensor top
2	Jam nut
3	Threaded portion
4	Sensor cable
5	Connector

NS-100A: without thermocouple
NS-100B: with thermocouple



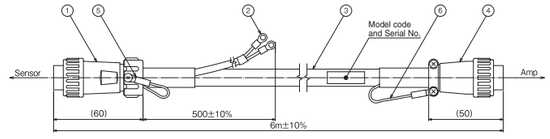
Extension cable

Unit:mm

NW-100A / NW-100B

No.	Name
1	Connector
2	Thermocouple cable
3	Extension cable
4	Connector
5	Earth cable
6	Earth cable

NW-100A: without thermocouple
NW-100B: with thermocouple



Replacement kit

Unit:mm

No.	Name
1	Base plate
2	DIN rail
3	DIN rail fastener
4	AC/DC converter

This is a replacement kit of installation dimensions same as VN converter.
Input: 85VAC ～ 264VAC (50Hz/60Hz)
Output: 24VDC (Rated current 1.3A)