

# The optimal heat treatment process was achieved using stable tension and temperature control in a furnace

For ultra-fine wire

## Two-line-type Heat Treatment Machine **SD-RW2F**



## High-precision control technique and advanced gold furnace

### Lower tension control

The adoption of a single dancer-type tension control, which is simple and smart, makes it possible to provide the lower tension required for delivery in the furnace.

### Speed control

With high precision speed feedback control, the winding speed can be maintained at the optimal speed for heat treatment from beginning to end without being affected by the winding thickness.

### Advanced gold furnace

The gold furnace adopted for heat treatment insulates and maintains the heat using gold mirrors that reflect more than 95 % of the heat rays from heaters. The efficient reflection of heat radiation from the heating elements enables a rapid temperature rise with less power. In addition, the heat insulation material has a much smaller heat capacity compared to conventional products, and also has excellent falling temperature characteristics and heat response.

### Temperature control

The temperature is controlled at three separate zones (top, middle, and bottom) within the furnace to ensure thermal uniformity throughout the entire furnace.

### Winding control

Various winding shapes are supported, including trapezoidal, wide-pitch, and flat windings using a precise traverse control technique.

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## Vertical arrangement of the electric furnace

To improve the setting performance and reduce the vibration of the wires in the furnace, the electric furnace is installed vertically. A top-to-bottom wire direction reduces the wire contact with the furnace core tube, and therefore the furnace core tubes can be kept clean.

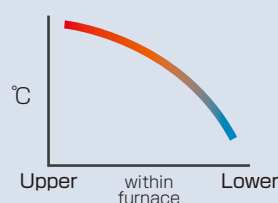


## Temperature control at three zones within the furnace

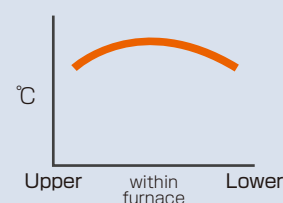
The thermal uniformity is improved by the three-zone control, while the temperature tends to be high at the top area and low at the bottom area in the case of installing an electric furnace vertically.

### Temperature is uniform within the furnace (excellent thermal uniformity)

<Single-zone control>  
One heater in the furnace



<Three-zone control>  
Three heaters in the furnace



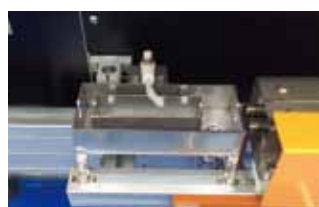
## Setting with touch screen

The various settings, including the tension, speed, winding pitch, winding shape, and temperature can be managed by entering numeric values on touch screens. In addition, various settings for each product can be stored (preset) using an installed recipe function.



## Rinse function

When coating with rinse agents to prevent wires from sticking together, a drop method or recirculating method can be selected. A heater for drying the rinse agent is also featured in each line as a standard.



Drop method



Recirculating method

## Specification of transportation system

Unwinding spindle control system	Speed control by constant dancer roll position control
Winding spindle control system	Constant encoder feedback peripheral speed control
Traverse control system	Bobbin traverse control
Speed	~300m/min
Unwinding tension	0.5cN~7.0cN
Traverse pitch	0.001mm~10mm * The pitch will be limited according to the winding speed.

●Please note that the appearance, specifications, capability of this product may change without notice due to the improvements.

## Specification of thermal treatment furnace

Structure	Gold furnace
Length of furnace	600mm
Temperature control system	3-zone PID control
Temperature control range	300℃~800℃
Temperature sensor	Thermocouple
Pipe in furnace	Quartz glass pipe
Insert gas charging	Enabled

Inquiry