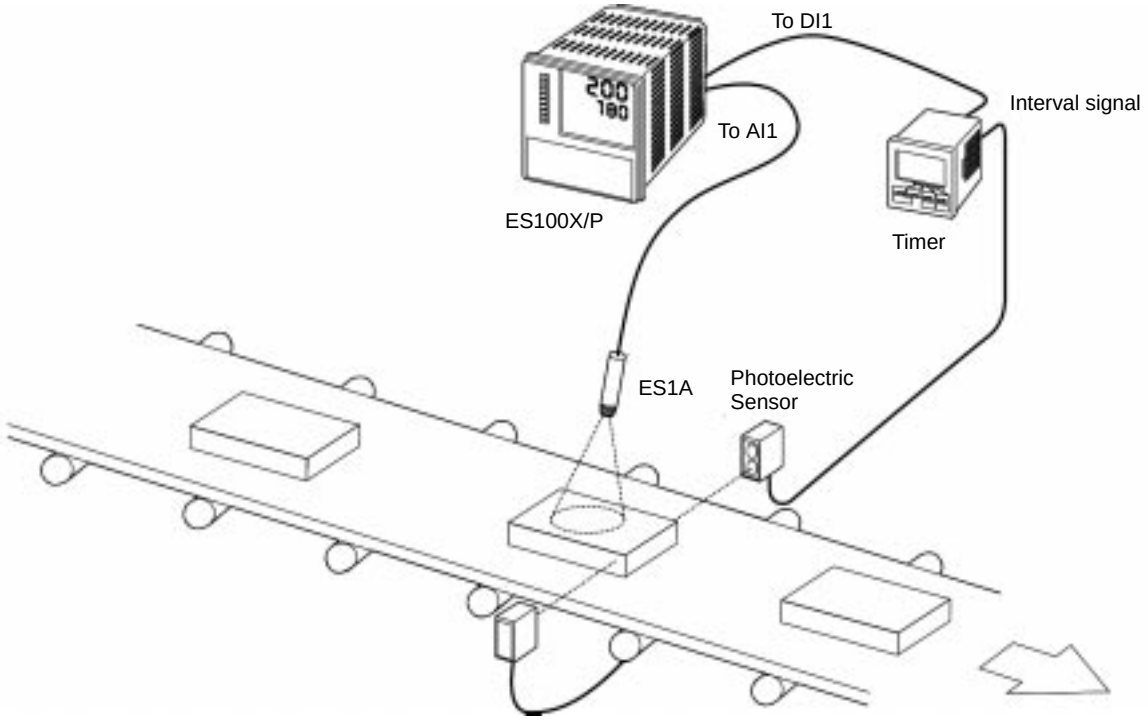
SECTION 7
Application Examples

This section provides various application examples.

7-1 Detection of Workpieces Conveyed Intermittently

7-1-1 Example with ES100X/P



When the Photoelectric Sensor detects the workpiece, the Photoelectric Sensor will transmit a signal to the timer. The timer receives the signal and transmits an interval signal to DI1 of the ES100X/P. Temperature input from the ES1A is enabled for a period set in the timer after the signal is turned ON.

Note Set the temperature input timing by considering the thermal response of the ES1A and the input response speed of the ES100X/P.

Analog Operation Assignment Table

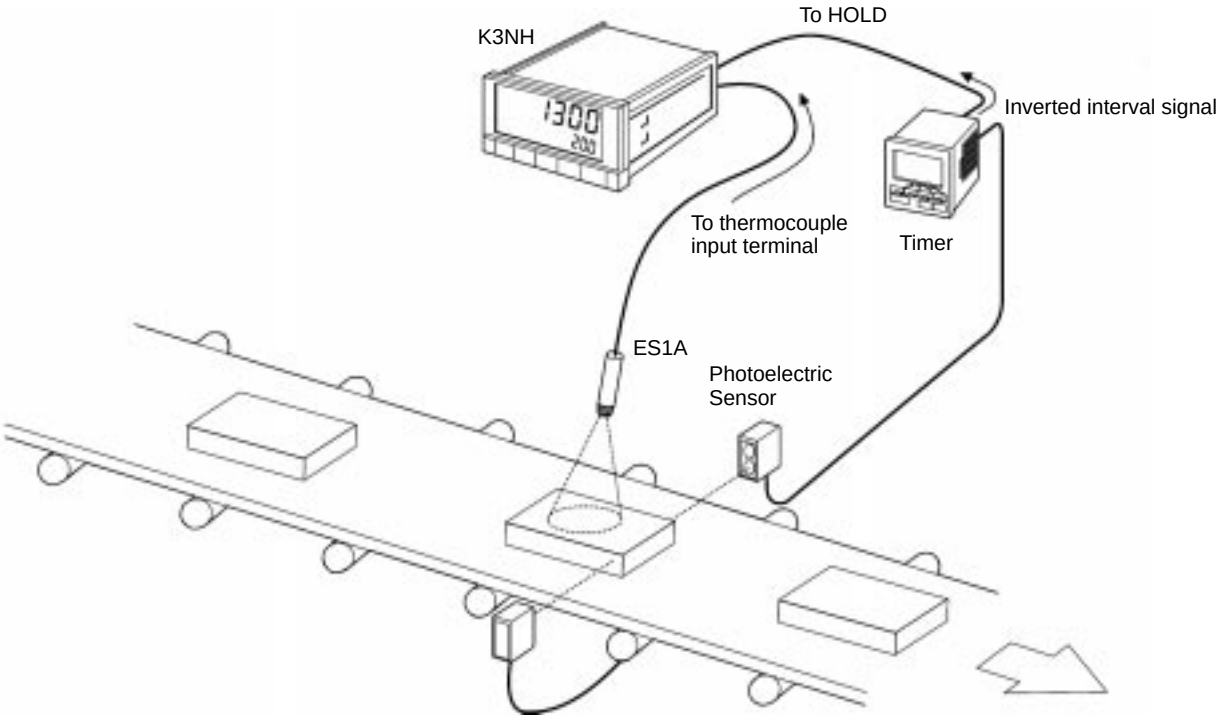
Allocation	PV	AU1
Process 1	MOV	SW1
Argument 1	AU1	AI1
Argument 2	---	AU1
Process 2	END	END
Argument 1	---	---
Argument 2	---	---

Digital Operation Assignment Table

Allocation	DA1
Process 1	BUF
Argument 1	DI1
Argument 2	---
Process 2	END
Argument 1	---
Argument 2	---

Note The value in the analog user buffer AU1 will be refreshed only when the DI1 is ON. The PV always reflects the value in the analog user buffer. The PV will be kept on hold until the value in the analog user buffer is refreshed by temperature input that is turned ON by the next workpiece.

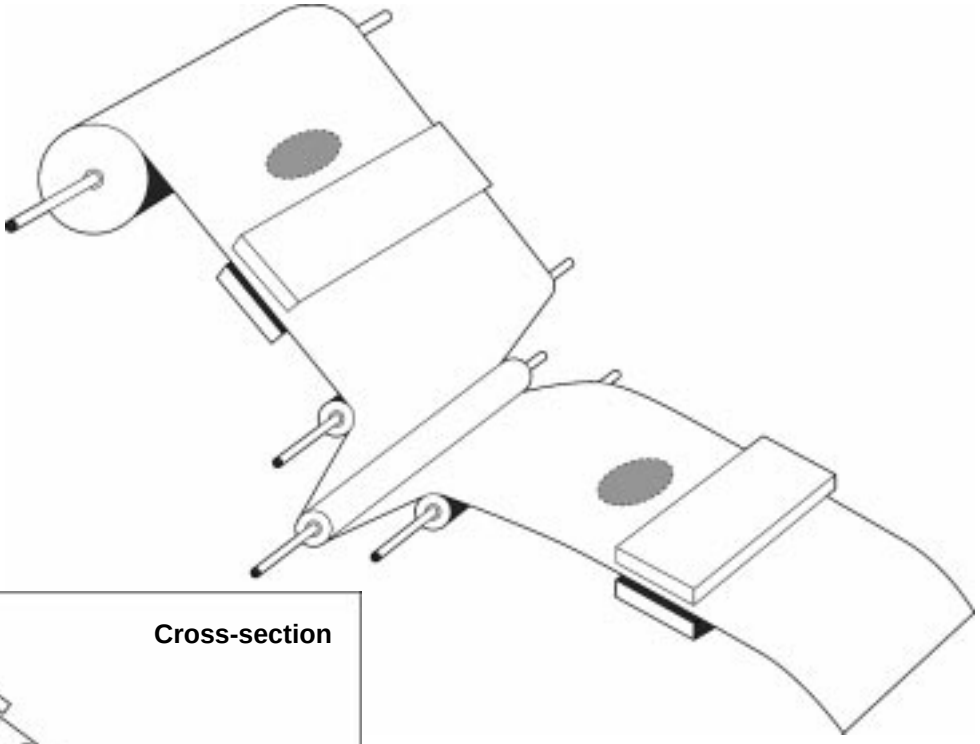
7-1-2 Example with K3NH

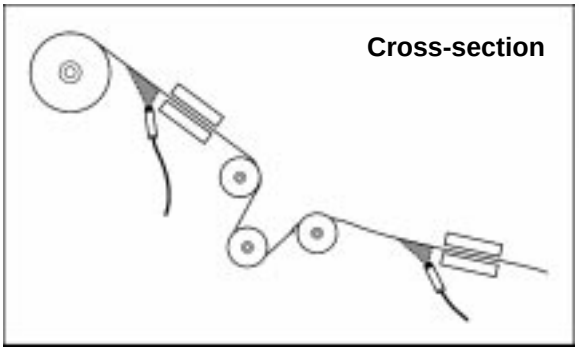


When the Photoelectric Sensor detects the workpiece, the Photoelectric Sensor will transmit a signal to the timer. The timer receives the signal and transmits an inverted interval signal to the HOLD terminal of the K3NH. Temperature input from the ES1A is enabled for a period set in the timer after the signal is turned ON due to the clearing of the on-HOLD status of the K3NH.

Note Set the temperature input timing by considering the thermal response of the ES1A and the input response speed of the K3NH.

7-2 Continuous Furnace (Thermal Treatment of Sheets)

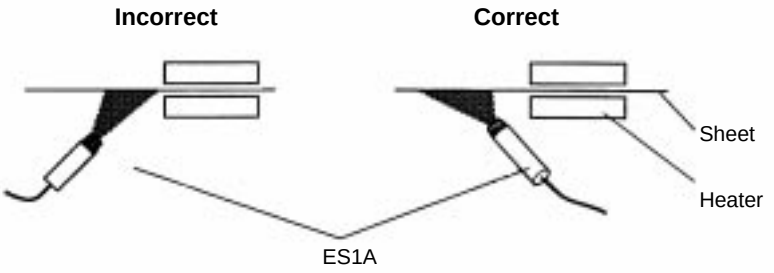




The Sensor is located under the heater so that the Sensor will not be influenced by ambient temperature changes that may be caused by the air convection caused by the heater.

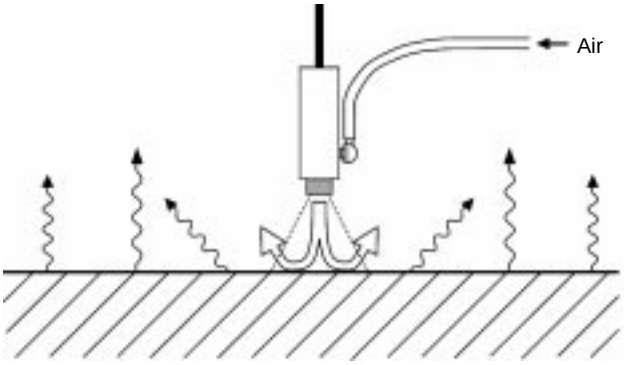
Sheet Temperature Monitoring after Thermal Treatment with Heater

Mount the Sensor as shown below so that it will not be influenced by the heat radiated by the heater.



7-3 Air Purge

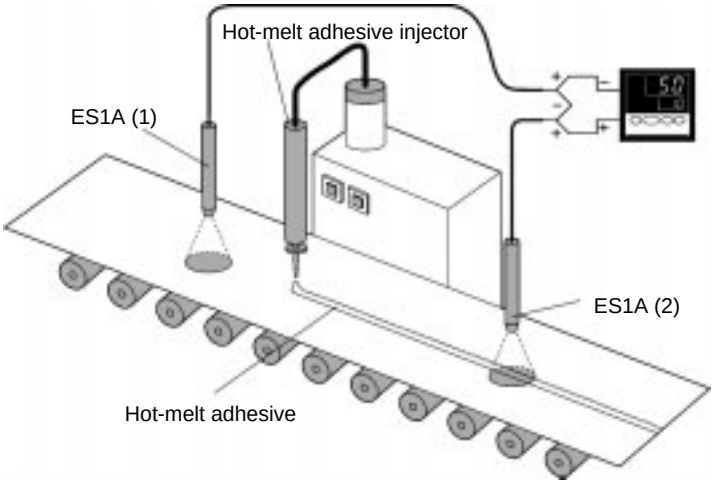
An air purge not only cools down the Sensor but also keeps the Sensor free of condensation and dust and eliminates all foreign matter that obstructs temperature measurement from the sensing range.



Note Carefully consider the location of the ES1A and the quantity of air provided so that the sensing object will not be cooled down by the air blowing from the Sensor.

7-4 Monitoring Hot-melt Adhesive Application

In the following system that uses two ES1A Units, the temperature difference of sensing spots is measured. This system makes it possible to monitor the application of hot-melt adhesive.



7-4-1 Example with E5□N

1, 2, 3...

1. When signals from the Sensor are input into the range of thermocouple input or non-contact temperature sensor input, the room temperature will be added to the detected difference in temperature by the built-in cold junction compensating circuit of the Temperature Controller. To prevent this, use the 0-to-50 mV input range of the E5□N.
2. A potential range between 0 and 50 mV generated by the K-type thermocouple is equivalent to a temperature range between 0°C and approximately 1,232°C. By converting the 0-to-50 mV range into this temperature range, the difference in temperature can be easily displayed. The potential range of the K-type thermocouple is, however, not converted linearly. The displayed difference in temperature, therefore, should be used for reference only.

3. Theoretically, the displayed difference in temperature will be 0 if there is no difference between the ES1As in monitored temperature (i.e., no hot-melt adhesive has been applied). There will be a difference in temperature when hot-melt adhesive is applied in normal operation. By setting the upper-limit alarm value to the mid-point between the two temperatures, an alarm will turn ON if the normal operation of hot-melt adhesive application fails.

Note

1. In the previous system, the temperature of the adhesive itself is not measured. The difference between the sensing spots of the ES1As in temperature will be detected instead. Therefore, the hot-melt adhesive need not be in the central part of each sensing spot.
2. As shown in the previous illustration, be sure to connect the ES1A on the high-temperature side to the positive terminal of the Temperature Controller and the ES1A on the low-temperature side to the negative terminal, otherwise a sensor error may result.