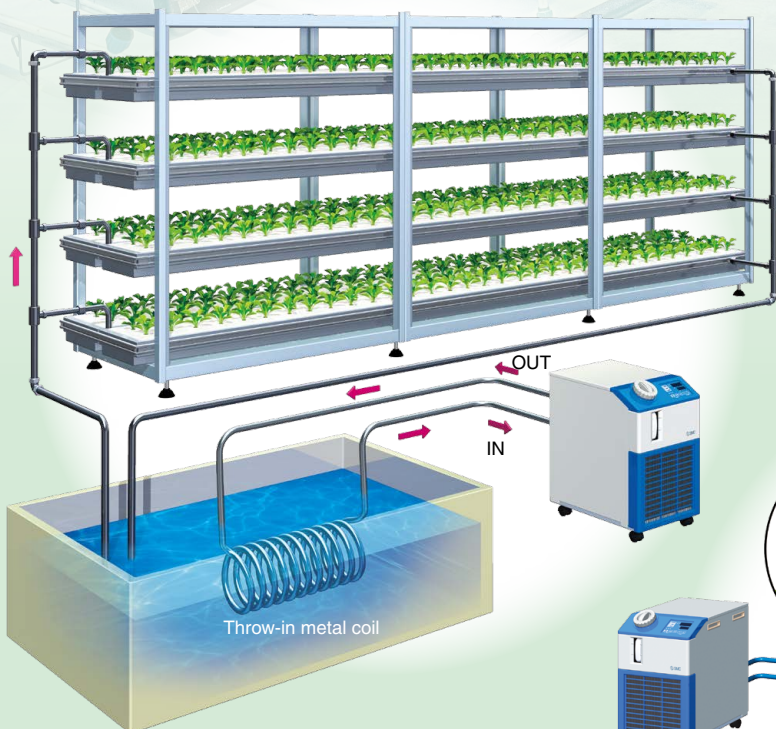




SMC-made chillers can be used in a wide range of applications!

Plant Factory

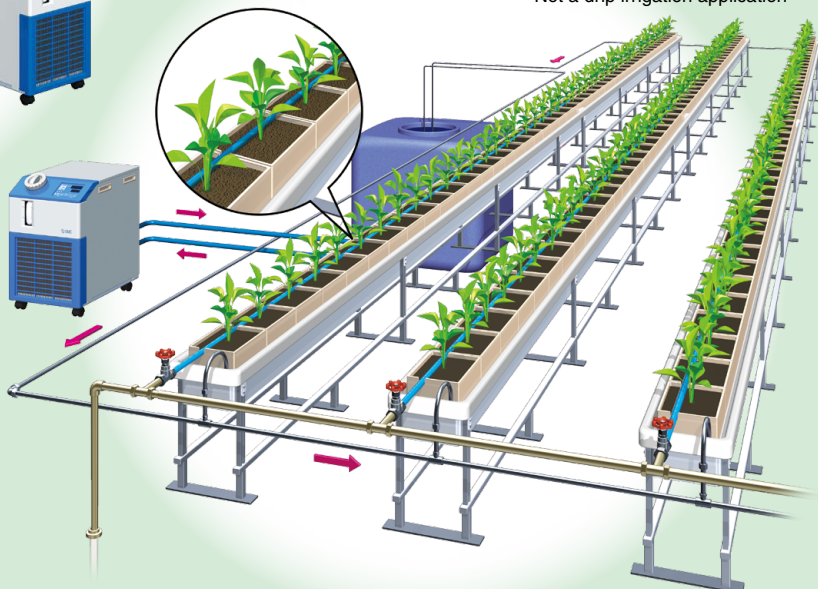
For the temperature control of nutrient solution in tanks



Facility Cultivation

For the partial temperature control of cultivation areas

* Not a drip irrigation application





1 Select by set temperature range

2 Select by cooling capacity and temperature stability

Series	Temperature range setting °C	Temperature stability	Cooling capacity kW																								
			0.1	0.2	0.3	0.4	0.5	0.6	0.8	1.0	1.2	1.8	2.4	3	4	5	6	9	10	15	20	25	26	30			
Thermo-chiller Standard type HRS Series	0 to 60 (5 to 40°C)	±0.1°C														●	●	●	●	●	●						
Thermo-chiller Environmentally resistant type Standard type HRS-R Series	0 to 60 (5 to 40°C)	±0.1°C															●		●		●						
Thermo-chiller Standard type HRS090 Series	0 to 60 (5 to 35°C)	±0.5°C																			●						
Thermo-chiller Standard type HRS100/150 Series	0 to 60 (5 to 35°C)	±1.0°C																				●	●				
Thermo-chiller Inverter type HRS H090 Series	0 to 60 (5 to 40°C)	±0.1°C																			●						
Thermo-chiller Inverter type HRSH Series	0 to 60 (5 to 35°C)	±0.1°C																				●	●	●	●	●	
Thermo-chiller Basic type HRSE Series	0 to 60 (10 to 30°C)	±2.0°C															●	●	●								
Thermo-chiller Dual channel refrigerated HRL Series	[CH1] 0 to 60 (15 to 25°C) [CH2] 0 to 60 (20 to 40°C)	CH1 ±0.1°C																							●	●	
		CH2 ±0.5°C												●													

Not sure which size to choose? Try this calculation method.



Required cooling capacity formula $Q [kW] = V \times \rho \times c \times \Delta T/t$

Ex. Problem: The nutrient solution temperature in a 31-tonne system (including an 8-tonne tank) rises by 2°C after 16 hours of LED-lighting.

$$Q = 31000 [dm^3] \times 1 [kg/L] \times 2 [K] \times 4.2 [kJ/kg \cdot K] / 57600 [s] \times 1.2 [\text{Safety factor } 20\%] = 5.42 [kW]$$

→ Selection of the HRS090-A-20 (Cooling capacity: 8.0 kW)

- * Ambient temperature: 25°C, Circulating fluid: Tap water, Circulating fluid temperature: 20°C, Circulating fluid flow rate: Rated flow, Power supply: 200 VAC
- * Calculation based on a situation in which the pure water temperature has been changed.

Ex. Goal: To bring a 1200 L tank from 26°C to 20°C in 1 hour.

$$Q = 12000 [dm^3] \times 1 [kg/L] \times 6 [K] \times 4.2 [kJ/kg \cdot K] / 3600 [s] \times 1.2 [\text{Safety factor } 20\%] = 10.1 [kW]$$

→ Selection of the HRSH100-A-20 (Cooling capacity: 10.5 kW)

- * Ambient temperature: 32°C, Circulating fluid: Tap water, Circulating fluid temperature: 20°C, Circulating fluid flow rate: Rated flow, Power supply: 200 VAC
- * Calculation based on a situation in which the pure water temperature has been changed.



To select a model, you can also use the thermo-chiller selection software in the model selection program on the SMC website.

⚠ Safety Instructions Be sure to read the "Handling Precautions for SMC Products" (M-E03-3) and "Operation Manual" before use.