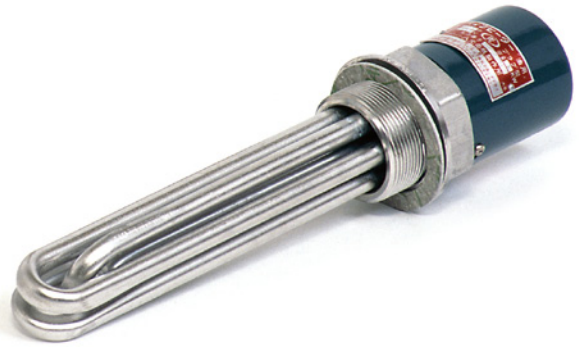


PLUG HEATER FOR OIL

INSTRUCTIONS MANUAL

Thank you for your choosing our product.
Read the instructions before use and keep it
in the convenient place for future reference.



FOR SAFE USE OF THIS PRODUCT

We use the following symbols for safety.



WARNING

Improper use may cause the danger of death or injury.



CAUTION

Improper use may cause the danger of light injury or property damage.

WARNING

- Turn off the heater immediately if oil is insufficient in the container.

Keep the heating part below oil surface constantly. Otherwise it may cause fire.



- Do not use broken or leaky containers.

Check the container carefully before turning on. Insufficient oil may cause fire or electric shock.



- Screw up the power cable tightly with the terminal part.

Otherwise it may cause fire, electric shock or failures.



- Connect the ground terminal with the container.

Otherwise it may cause electric leakage or shock.



- Do not use with any power voltage other than the indicated.

Otherwise it may cause fire, electric shock or failures.



- Do not alter or deform the heater.

It may cause fire, electric shock or failures.



- Use containers made of metals, not of plastic material.

It may cause fire and electric shock.



- Do not heat any other liquids than oil.

It may cause fire and electric shock.



WARNING

- **Do not use the heater for fuel oil, such as gasoline, light oil or kerosene.**

Otherwise it may cause explosion or fire.



- **Use the heater in oil at temperatures below 160 degree.**

It may cause fire, electric shock or failures.



- **Do not touch the heater with wet hands.**

It may cause electric shock.



- **Do not sink whole parts of the heater into oil.**

It may cause electric shock or failures.



CAUTION

- **Use the automatic oil feeding equipment.**

If you leave the heater for hours without oil feeding equipment, turn off the heater for safety.



- **Turn off and replace the heater.**

When you need to replace the heater, turn off and drain oil before replacement. Otherwise it may cause electric shock.



- **Do not cover the heating part when you fix the plug heater socket through the container.**

It may cause boil-dry or disconnection.



- **Keep the connecting part with power supply at temperatures below 110 degree.**

Otherwise it may cause fire, electric shock or failures.



- **Do not use the heater in the following condition. It may cause fire, electric shock or failures.**

- In case the heater merges into deposition in oil
- In case foreign substances attach on the heater
- In case the heating part is out of the oil surface
- In case the terminal part is below the oil surface
- In case the terminal part is contacted with oil



- **Do not mount the heater vertically in the container.**

Remember to mount the heater horizontally with the container, otherwise it may cause failures.



- **Do not touch the heater with bare hands just after turning off.**

Otherwise it may cause burns.

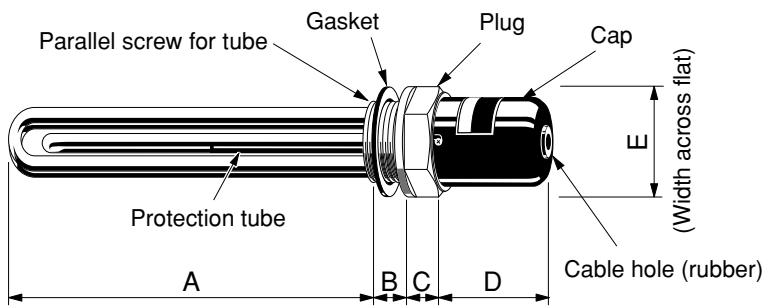


- **Do not use the impact driver for screwing the terminal of power cable.**

Too much torque strength may destroy the terminal.



THE NAMES AND DIMENSIONS OF PARTS



Stainless steel sheath type

Sheath:	Electropolished stainless steel (SUS316L)
Plug:	Electropolished stainless steel (SUS304)
Protection tube:	Electropolished stainless steel (SUS316L)
Cap:	Painted steel (SPCC)
Gasket:	asbestos-free (t1.0)

Iron sheath type

Sheath:	Nickel-plated steel tube (STKM11A)
Plug:	Nickel-plated cast-iron (FC)
Protection tube:	Nickel-plated steel tube (STKM11A)
Cap:	Painted steel (SPCC)
Gasket:	asbestos-free (t1.0)

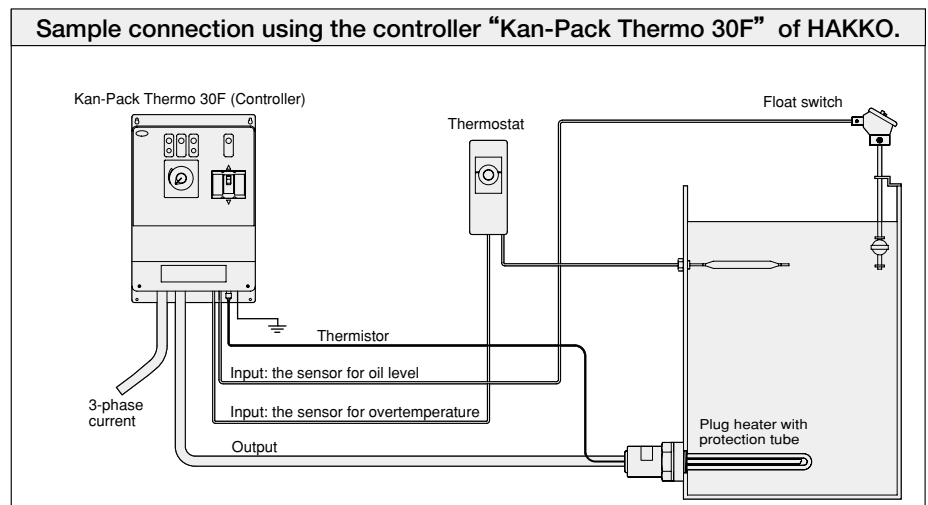
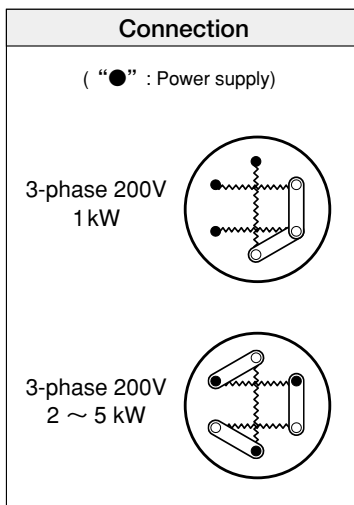
Maximum oil temperature 160 degree (2.5W/cm²)

Stainless steel sheath type		Iron sheath type		Voltage	Wattage	Dimensions (mm)					Outside diameter / Number of heaters	Protection tube (φ10mm)		Weight (kg)					
Model number	Product code	Model number	Product code			Nominal diameter of screw for tube	A	B	C	D		E	Effective length (mm)	Controller type	SUS Sheath type	Iron sheath type			
SPA3010	01543010	PAB3010	01140110	3-phase 200V	1kW	G2	220	23	17	73	71	φ12 / 3	115	B, ***	1.6	2.1			
SPA3020	01543020	PAB3020	01140120	3-phase 200V	2kW		340	(25)**	(25)**										2.0
SPA3030	01543030	PAB3030	01140130	3-phase 200V	3kW		540										C, ***	2.7	3.1
SPA3050	01543040	PAB3050	01140140	(Single phase) 200V*	5kW	G2 1/2	690	32	30	94	85	φ15 / 3			5.6	5.4			

* Single phase is available by the special order.

** Iron sheath type.

*** As shown in Hakko catalog.



INSTRUCTIONS FOR SAFE USE

- Keep the heating part into oil while turning on. Otherwise it is overheated and may cause fire or early burnout of wires.
- After long-term use, carbides or other substances are attached on the surface of the sheath. They may cause less capability of the heater, early burnout of wires, or corrosion of metal sheath. Check the heater periodically and remove them carefully.
- Screw up the power cable tightly with the terminal part.
- Do not use the heater for heating any liquids other than oil. When you need to heat other liquids, such as water, use proper heaters of HAKKO.
- Do not apply any paste or grease on the gasket. It may reduce friction force and break strength and cause leakage.

HOW TO USE

- ① Mount the heater horizontally in the container.

⚠ CAUTION

If you need to mount the heater vertically, the equipment must be highly designed for safety to control oil supply, temperature, and the position of sensors.

- ② Connect the heater with the controller and the sensors of proper capacity.

- ③ Put oil into the container mounted with the heater.

⚠ CAUTION

Confirm the whole heating parts are below oil surface.

⚠ CAUTION

Confirm the container and the connecting part of the heater have no leakage.

- ④ Screw up the power cable tightly with the terminal part.

⚠ CAUTION

When you heat oil at the temperatures above 100 degree, use heat resistance wire, such as glass fiber covered or silicone rubber insulated wire.

- ⑤ Adjust the dial of the controller to set temperature.

⚠ CAUTION

Set temperatures below 160 degree.

- ⑥ Turn on the circuit breaker and start heating.

- ⑦ Turn off the circuit breaker after finishing heating.

AFTER SALE SERVICE

If you have any questions about our products, contact with your distributors, or the Sales Head Office of HAKKO ELECTRIC CO., LTD. The addresses and phone numbers are as follows.

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