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HAKKO FR-300

DESOLDERING TOOL

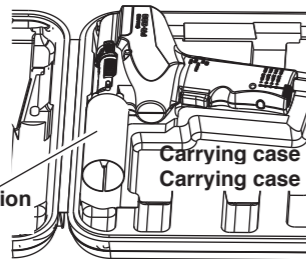
Desoldering Tool

Instruction Manual

Thank you for purchasing the HAKKO FR-300 Desoldering Tool.
Please read this manual before operating the HAKKO FR-300.
Keep this manual readily accessible for reference.

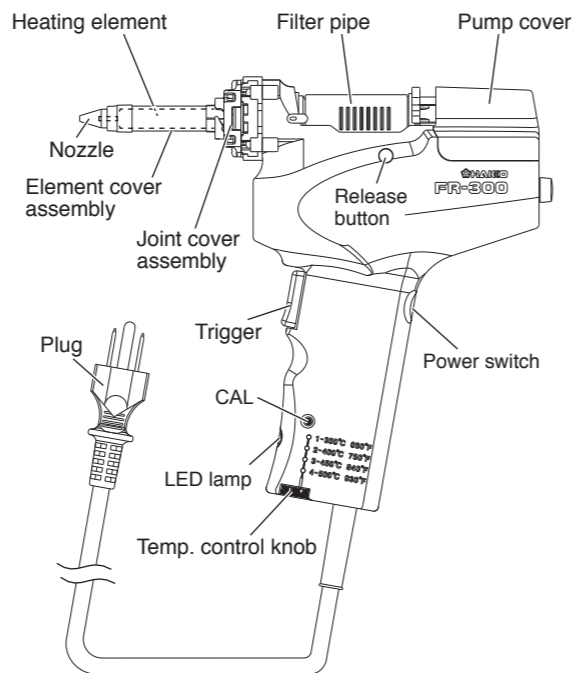
PACKING LIST

- HAKKO FR-300 × 1
- Pre-filter (ALUM) × 1
- Iron holder (Simple type) × 1
- Ceramic paper filter (L) × 2
- Cleaning pin for ø1 nozzle × 1
- Nozzle changing tool × 1
- Cleaning pin for heating core × 1
- Instruction manual × 1
- Protection cover × 1



* Before storing the unit in the carrying case, be sure to insert the nozzle into the protection cover to prevent risk of a burn and melting the carrying case.

PART NAMES



SPECIFICATIONS

Power consumption	100V 98W (50/60Hz) 110V 122W (50/60Hz) 120V 140W (60Hz) 220V 105W (50/60Hz) 230V 118W (50/60Hz) 240V 130W (50/60Hz)
Temperature range	350 - 500°C (660 - 930°F)
Nozzle to ground potential	< 2 mV
Nozzle to ground resistance	< 2 Ω
Vacuum generator	Diaphragm pump
Vacuum pressure	81kPa (610mmHg)
Suction flow	11L / min
Dimensions	226 (H) × 210 (W)mm / 8.9 × 8.3 in.
Weight	0.52 kg / 1.1 lb.
Standard nozzle	ø1.0 mm / 0.04 in. (Part No. N50-04)

*Specifications and design are subject to change without notice.

WARNINGS AND CAUTIONS

Warnings, cautions and notes are placed at critical points in this manual to direct the operator's attention to significant items. They are defined as follows:

- ⚠ **WARNING:** Failure to comply with a WARNING may result in serious injury or death.
- ⚠ **CAUTION :** Failure to comply with a CAUTION may result in injury to the operator, or damage to the items involved. Two examples are given below.

NOTE : A NOTE indicates a procedure or point that is important to the process being described.

⚠ WARNING

■ Safety considerations.

Be very careful when handling the desoldering tool.

During operation, the tip of the nozzle will rise to a temperature of 350 - 500°C / 660 - 930°F, and the surrounding areas will become extremely hot.

- After use, remove the cord from the power outlet.
- Never leave a plugged-in desoldering tool next to flammable materials.
- Never wave or swing the desoldering tool around, as hot solder from the tip may fly off and cause injury.
- Be especially careful when other people are in the area. Warn them of the danger of being burned by the hot desoldering tool.

• This appliance can be used by children aged from 8 years and above and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge if they have been given supervision or instruction concerning use of the appliance in safe way and understand the hazards involved.

• Children shall not play with the appliance.

• Cleaning and user maintenance shall not be made by children without supervision.

• **Wait until the desoldering tool has cooled completely before putting it away.**

● To prevent accidents or damage to the HAKKO FR-300, be sure to observe the following:

⚠ CAUTION

- The HAKKO FR-300 is an electrical tool used to melt and absorb solder in order to free components from the printed circuit boards, etc. The desoldering tool should not be used for any other purpose as this may damage the product or cause an accident or injury.
- Be careful when handling the desoldering tool. Do not drop it or otherwise subject it to excessive shocks as this may impair its performance or cause damage or failure.
- Because the desoldering tool is extremely hot during normal use, proper maintenance is essential. Read the "MAINTENANCE" section of these instructions and clean the designated areas and/or replace parts when necessary.
- Use only genuine HAKKO FR-300 replacement parts. The use of other replacement parts may impair performance of cause damage or injury.
- If the pump does not operate, immediately clean the nozzle and heater.
- The unit is for counter or workbench use only.

※ 各言語（日本語、英語、中国語、フランス語、ドイツ語、韓国語）の取扱説明書は以下のURL、HAKKO Document Portalからダウンロードしてご覧いただけます。
（商品によっては設定の無い言語がありますが、ご了承ください）
* 各言語（日本語、英語、中文、法語、ドイツ語、韓国語）的使用説明書可以通过以下网站的HAKKO Document Portal 下载参阅。
（有一部分的产品没有设定外语对应，请见谅）
* Instruction manual for the language, Japanese, English, Chinese, French, German and Korean can be downloaded from the following URL, HAKKO Document Portal.
(Please note that some language may not be available depending on the product.)

<https://doc.hakko.com>

中國RoHS: 產品中有毒有害物質或元素的名稱及含量

部件名稱	有毒有害物質或元素					
	鉛(Pb)	汞(Hg)	鎘(Cd)	六價鉻(Cr(VI))	多溴聯苯(PBB)	多溴二苯醚(PBDE)
泵組件	×	○	○	○	○	○
護脣	×	○	○	○	○	○
插頭	×	○	○	○	○	○

○ : 表示該有毒有害物質在該部件所有均質材料中的含量均在SJ/T 11363-2006標準規定的限量要求以下。
× : 表示該有毒有害物質至少在該部件的某一均質材料中的含量超出SJ/T 11363-2006標準規定的限量要求。

■ OPEARATION

A. Preparation

1. Insert the plug of the power cord into an outlet.
2. Turn the power switch ON.
3. Wait for a few minutes until the nozzle will melt solder, then apply a generous coating of your solder to the end of the nozzle. This prepares the nozzle for use and helps reduce the chance of oxidation. Be sure to wait for at least 5 minutes after tuning the tool on so that the heating core can heat up.

B. Desoldering

⚠ CAUTION

- If the pump does not operate, immediately clean the nozzle & heating element and replace the filter if necessary.
- Do not remove the pump cover during use. The pump rotates at a high speed and can be dangerous.

1. Place the nozzle over the lead wire of the part to be desoldered and begin heating.

Be careful to heat the lead wire and the solder, not the land. Placing the nozzle directly in contact with the land may cause the land to peel off. You may apply a small amount of solder to form a heat bridge to help the heating process.

2. Check to make sure all of the solder on the joint has melted.

With the nozzle still in place over the lead wire, slowly move the lead wire, being careful not to apply too much force. If the lead wire moves easily, all of the solder has melted.

3. Pull the trigger to remove the melted solder.

Make sure that a filter has been inserted in the desoldering tool. Desoldering without a filter may damage the pump.

4. If the solder was not removed, re-solder the part using new solder and then repeat the desoldering process.

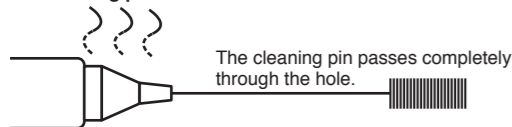
C. Cleaning

Cleaning is extremely important and should be done frequently during the desoldering process. Parts should be checked periodically for wear and should be replaced if necessary. See the MAINTANCE section of these instructions.

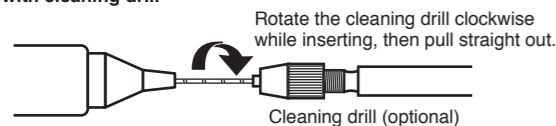
- Clean the nozzle as you would clean a soldering tip: wipe away any excess solder with a sponge moistened with de-ionized or distilled water, or using a wire tip cleaner. Before putting the desoldering tool away, apply a new coat of solder on the tip.
- Using a cleaning pin that matches the diameter of the nozzle, clean the inside of the nozzle opening. This must be done while the nozzle and heating core are still hot, so be careful.
- Discard any solder that has collected in the filter pipe. Do this carefully, as the solder will still be extremely hot.
- Replace the filter. See the MAINTANCE section of these instructions.

The ceramic paper filter (L) should be replaced immediately when a stain appears or vacuum decreases. Failure to do this will reduce the performance of the pump and may damage it.

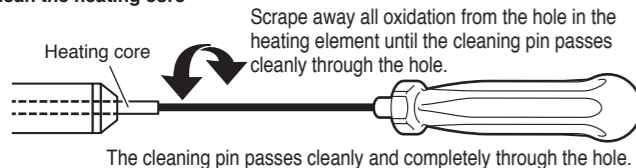
● Cleaning with cleaning pin



● Cleaning with cleaning drill



● Clean the heating core



D. Temperature setting

The temperature of the HAKKO FR-300 can be adjusted between 350 - 500 °C / 660 - 930°F. Set the temperature in accordance with the requirements of the job being done. Although the temperature needed for desoldering cannot be determined merely by the type of board to be desoldered, the values in the table below may be used as a general guide:

⚠ CAUTION
Change the temperature only with the "TEMP" adjustment dial. Do not use the "CAL" trim pot.

Type of board	Approximate setting (on scale)
Single-sided P.W.B.	1
Through-hole P.W.B.	2
Multilayer P.W.B.	3~4

- In general, the greater the temperature, the more quickly the nozzle will oxidize and wear out.
- As nozzle oxidation and wear increases, the nozzle temperature will decrease. In such cases, increasing the set temperature will only accelerate oxidation and hasten wear. Replace worn nozzles as soon as possible.

E. After use

1. Turn the power switch OFF.
2. Disconnect the plug of the power cord from an outlet.

■ MAINTANCE

The frequency of cleaning and part replacement greatly depends on a variety of factors, including the temperature at which the desoldering tool is operated, and the types of solder and flux used. Using the table below as a general guide, clean and replace parts in accordance with use conditions.

	Maintenance
During use	Clean nozzle Discard solder that has collected Clean nozzle and heating core
When necessary	Replace parts
Periodically	Clean pump

A. A general guide to replacement part

Use the table below as a general guide to replacement part. Use only genuine HAKKO FR-300 replacement parts as the use of other parts may impair performance, or cause damage or injury.

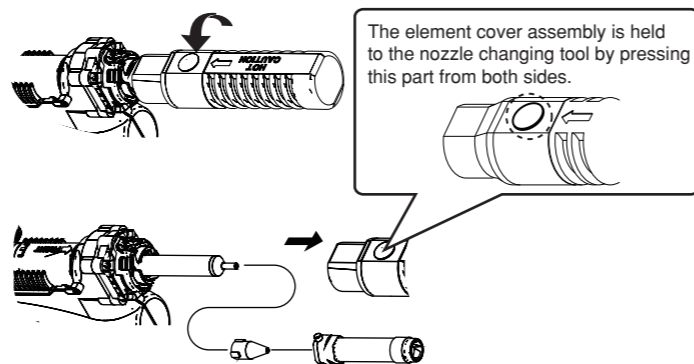
Part Name	Signs that replacement is needed
Pre-filter	Cannot hold solder Warping
Ceramic paper filter (L)	Hardened by flux staining
Front holder	Hole has become enlarged Hardening has reduced air tightness
Filter holder	Hardening had reduced air tightness
Nozzle	Repels solder Solder plating on tip is gone Clogging Hole has corroded and is larger Temperature is low

B. Replacing parts

● Nozzle

NOTE: Be careful since the areas around the nozzle and heating element are very hot.

1. Remove the element cover assembly and the nozzle with the attached wrench.



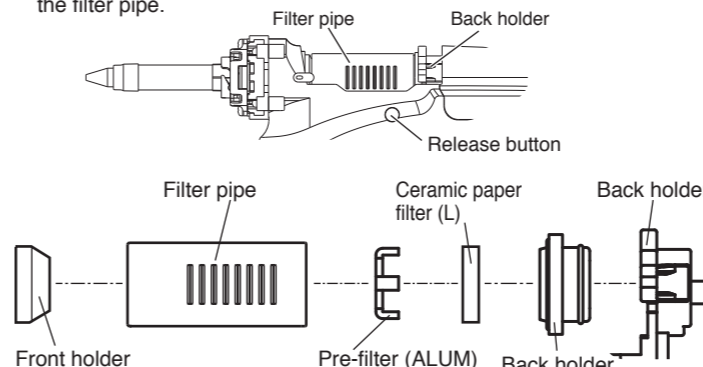
⚠ CAUTION

The nozzle is not held to the nozzle changing tool. Be careful when removing them.

● Filter Pipe and related parts

Be careful since the area around the filter pipe is extremely hot.

1. Pull the rear holder back until it clicks (locks into place) and remove the filter pipe.

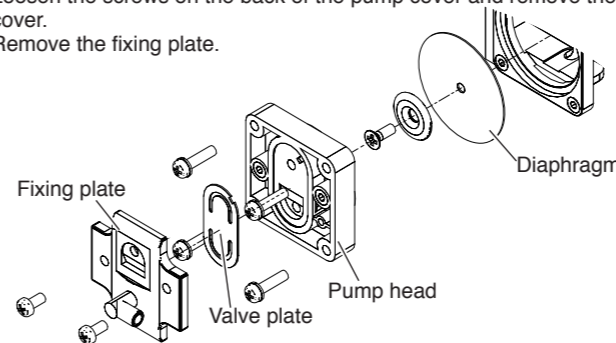


2. Inspect the parts shown in the diagram above. Clean and/or replace as needed.
3. During assembly, be sure to insert the filter. Failure to do so may damage the unit. After the parts have been assembled, place the filter pipe assembly into position and press the release button. The back holder will spring forward and secure the filter pipe while creating a vacuum seal.

● Pump

Turn off the tool, remove the power plug from the power outlet and wait until the unit has cooled completely.

1. Loosen the screws on the back of the pump cover and remove the pump cover.
2. Remove the fixing plate.

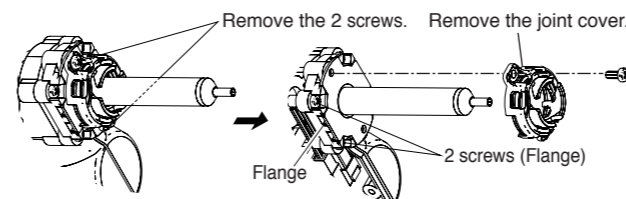


3. Clean the valve plate, fixing plate and pump head with isopropyl alcohol. Align the notch on the pump head with the corresponding notch on the valve plate. Match the notch on the outside of the pump head with the one on the fixing plate. Mount the diaphragm so that it is smooth and taut.

● Replacing the heating element (heating core)

Turn off the tool, remove the power plug from the outlet and wait until the unit has cooled completely.

1. Remove the nozzle and element cover assembly with the nozzle changing tool and remove the joint cover.

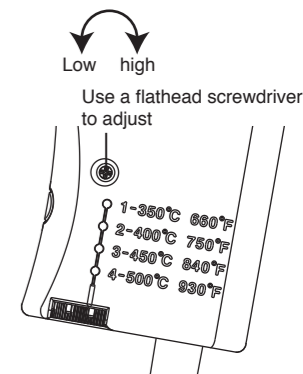


2. Loosen the screw at the back of the pump cover and remove the pump cover.
3. Remove the 6 screws from the handpiece (including 2 screws at the flange) and carefully separate the housing.
4. Disconnect the heating element terminal and replace the heating element.
5. Assemble using the same procedure in reverse.
6. Calibrate the nozzle temperature.

Be sure to calibrate the nozzle temperature after replacing the heating element. Failure to do this may result in a heater temperature that is much higher or lower than the previous one, and can contribute to accelerated oxidation and/or wear of the nozzle, or premature failure of the heating element.

C. Calibrating the temperature

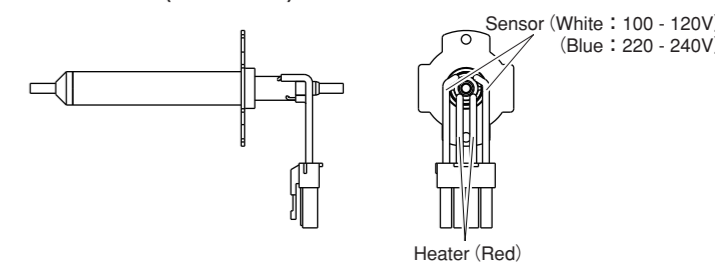
1. Install a new nozzle. The nozzle being used may have already started to wear, so use a new nozzle.
2. Insert the power plug into the outlet.
3. Set the temperature to 400°C / 750°F.
4. Wait for a few minutes.
5. Use a soldering iron tip thermometer to measure the temperature at the end of the nozzle. Do not apply suction, as this will cause the temperature to drop.
6. Adjust the CAL trim pot with a calibration screwdriver or similar tool until the temperature is 400°C / 750°F. Turn the CAL trim pot clockwise to increase the temperature and counter-clockwise to decrease temperature.
 - It may take several minutes for the nozzle temperature to stabilize after CAL is adjusted.
 - During CAL adjustment, make sure the set temperature does not go above 500°C / 930°F, as this may damage the desoldering tool.



■ TROUBLESHOOTING

	Problem cause	Procedure
Tool does not heat up	Tool is not connected properly to power outlet	Connect properly
	Heating element burnout*	Replace heating element
	Sensor is broken*	
Temperature is low	Temperature is set too low	Reset
	Temperature has not been calibrated properly	Calibrate properly
	Nozzle is worn out	Replace nozzle
Pump does not operate	Nozzle or heating core (in heating element) is clogged	Clean
	Too much solder or flux has collected in the filter	Replace filter
Suction force is weak	Too much solder or flux has collected in the filter or inner hose	Replace filter or inner hose
	Vacuum leakage	Inspect nozzle, area around filter and pump hose
	Pump valve or diaphragm is broken	Replace valve or diaphragm

* Heater lead (Sensor lead)



*At 23°C/73°F,
Normal heater resistance value : 35Ω (100 - 120V models) 160Ω (220 - 240V models)
Normal sensor resistance value : 50Ω (100 - 120V, 220 - 240V models)

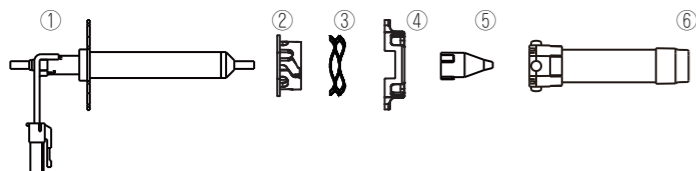
NOTE:
Use of the tool when the nozzle, heating core, or filter is clogged may cause the pump to lock up and render operation impossible. Clean or otherwise eliminate the blockage before attempting to use the tool.

Repairs
When repair becomes necessary, check the following and then bring the desoldering tool to a HAKKO sales outlet or HAKKO dealer.

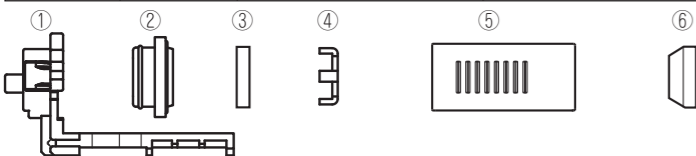
1. Is the nozzle or heating core clogged?
2. Is the valve plate cracked or missing?
3. Is the front holder or filter holder warped or cracked?
4. Is the pre-filter or ceramic paper filter dirty or warped?

REPLACEMENT PARTS/OPTION

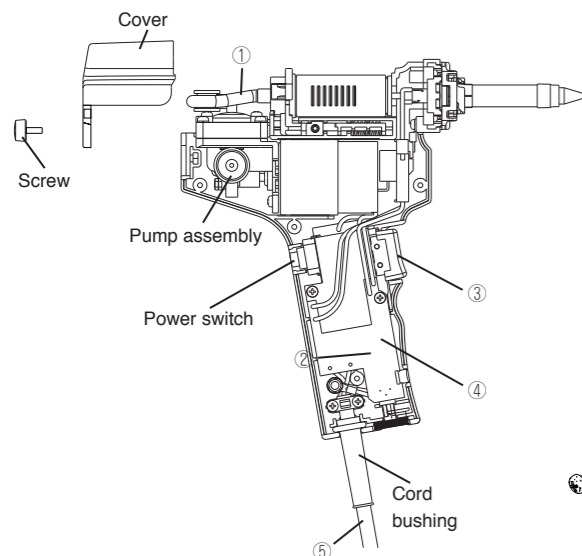
Item No.	Part No.	Part Name	Specifications
①	A5025	Heating element	100V - 110V
	A5000	Heating element	120V
	A5021	Heating element	127V
	A5001	Heating element	220V - 240V
②	B5063	Movable joint	
③	B5064	Wave spring	
④	B5062	Joint cover	
⑤	N50-01	Nozzle S	ø0.8 mm (0.03 in.)
	N50-02	Nozzle S	ø1.0 mm (0.04 in.)
	N50-03	Nozzle	ø0.8 mm (0.03 in.)
	N50-04	Nozzle	ø1.0 mm (0.04 in.)
	N50-05	Nozzle	ø1.3 mm (0.05 in.)
	N50-06	Nozzle	ø1.6 mm (0.06 in.)
⑥	B5014	Element cover	



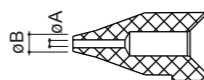
Item No.	Part No.	Part Name	Specifications
①	B5019	Back holder	
②	B5020	Back holder bushing	
③	A1033	Ceramic paper filter (L)	10pcs.
④	B5016	Pre-filter (ALUM)	5pcs.
⑤	B5017	Filter pipe	
⑥	A1217	Front holder	



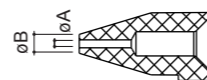
Item No.	Part No.	Part Name	Specifications
①	B5018	Inner hose	
②	B5021	Housing	
③	B5022	Trigger	
④	B5010	P.W.B. / 100 - 110V	
	B5011	P.W.B. / 120V	
	B5012	P.W.B. / 220 - 230V	
	B5013	P.W.B. / 240V	
⑤	B5026	Power cord, 3-wire cord & American plug	With cord bushing
	B5027	Power cord, 3-wire cord but no plug	With cord bushing
	B5028	Power cord, 3-wire cord & European plug	With cord bushing
	B5029	Power cord, 3-wire cord & SI plug	With cord bushing
	B5030	Power cord, 3-wire cord & BS plug	With cord bushing
	B5031	Power cord, 3-wire cord & Australian plug	With cord bushing
	B5033	Power cord, 3-wire cord & American plug	With cord bushing UL
	B5034	Power cord, 3-wire cord & BS plug	With cord bushing CE



Part No.	Part Name	Specifications
B1085	Cleaning pin	For heating element
B1086	Cleaning pin	For ø0.8 mm (0.03 in.) nozzle
B1087	Cleaning pin	For ø1.0 mm (0.04 in.) nozzle
B1088	Cleaning pin	For ø1.3 mm (0.05 in.) nozzle
B1089	Cleaning pin	For ø1.6 mm (0.06 in.) nozzle
B1302	Cleaning drill	For ø0.8 mm (0.03 in.) nozzle
B1303	Cleaning drill	For ø1.0 mm (0.04 in.) nozzle
B1304	Cleaning drill	For ø1.3 mm (0.05 in.) nozzle
B1305	Cleaning drill	For ø1.6 mm (0.06 in.) nozzle
B1306	Drill holder	For ø0.8 mm (0.03 in.)/1.0 mm (0.04 in.) nozzle
B1307	Drill holder	For ø1.3 mm (0.05 in.)/1.6 mm (0.06 in.) nozzle
B1308	Drill bit	For ø0.8 mm (0.03 in.) nozzle (set of 10)
B1309	Drill bit	For ø1.0 mm (0.04 in.) nozzle (set of 10)
B1310	Drill bit	For ø1.3 mm (0.05 in.) nozzle (set of 10)
B1311	Drill bit	For ø1.6 mm (0.06 in.) nozzle (set of 10)
B1356	Adapter	
B5015	Nozzle changing tool	
C5000	Carrying case	
C5003	Iron holder	Simple type
C1100	Iron holder	Optional
A1042	Cleaning sponge	



Part No.	øA	øB
N50-01	0.8 mm (0.03 in.)	2.0 mm (0.08 in.)
N50-02	1.0 mm (0.04 in.)	2.0 mm (0.08 in.)



Part No.	øA	øB
N50-03	0.8 mm (0.03 in.)	2.5 mm (0.10 in.)
N50-04	1.0 mm (0.04 in.)	2.5 mm (0.10 in.)
N50-05	1.3 mm (0.05 in.)	3.0 mm (0.12 in.)
N50-06	1.6 mm (0.06 in.)	3.0 mm (0.10 in.)

Item No.	Part No.	Part Name	Specifications
①	B5023	Valve plate	
②	B5024	Diaphragm	

