

**REX**

COPPER TUBE TOOL

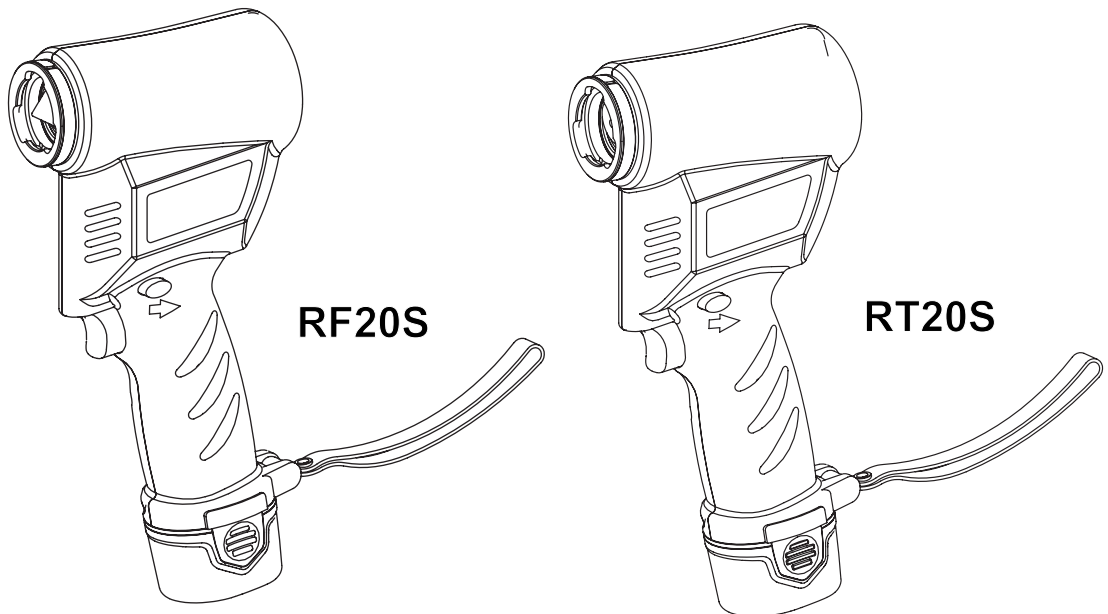
# CORDLESS FLARE RF20S

STAINLESS FLEXIBLE TUBE TOOL

# CORDLESS FLANGE RT20S

## OPERATION MANUAL

### ORIGINAL INSTRUCTIONS



**CE**



Be sure to read this  
Operation Manual before  
using the product.

**- Note -**

- Be sure to hand this operation manual to the user.
- To ensure safe and efficient use, read the manual thoroughly before using the product.
- Be sure to keep the manual where the operator can refer to it whenever necessary.

Date of purchase:

Year

Month

Distributor:

Thank you for purchasing a REX product.

Our product will give you years of reliable service if you simply follow the instructions in this manual carefully.

Before using the product, therefore, make sure you read the manual from start to finish,

paying particular attention to the Safety Considerations on pages 3 & 4 and Precautions on pages 5 & 6.

To avoid accident and injury, never use for any purposes other than those described in this manual.

Should you need further advice, contact your distributor or REX Industries Co., Ltd.

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### Definitions of WARNING and CAUTION

In this operation manual, warnings are divided into  WARNING and  CAUTION .

 **WARNING** : indicates actions which could possibly result in death or severe injury to the user if the product is used incorrectly.

 **CAUTION** : indicates actions which could possibly result in injury to the user, or physical damage, if the product is used incorrectly.

Even items labelled  **CAUTION** could have serious results under certain conditions.

Be sure to observe these warnings carefully as they greatly affect safety.

- If this operation manual is lost or damaged, promptly order a replacement from your distributor or our sales department.
  - Parts and specifications are subject to change, without prior notice, due to improvements in quality, performance or safety standards. In such cases, the contents, photographs, illustrations etc. in this manual may be different to the product you have purchased.
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# General Power Tool Safety Warnings

## ⚠ WARNING

**Read all safety warnings and all instructions.** Failure to follow the warnings and instructions may result in electric shock, fire and/or serious injury. **Save all warnings and instructions for future reference!** The term "power tool" in the warnings refers to your mains-operated (corded) power tool or battery-operated (cordless) power tool.

### 1. Work area safety.

- Keep work area clean and well lit. Cluttered or dark areas invite accidents.
- Do not operate power tools in explosive atmospheres, such as in the presence of flammable liquids, gases or dust. Power tools create sparks which may ignite the dust or fumes.
- Keep children and bystanders away while operating a power tool. Distractions can cause you to lose control.

### 2. Electrical safety

- Power tool plugs must match the outlet. Never modify the plug in any way. Do not use any adapter plugs with earthed (grounded) power tools. Unmodified plugs and matching outlets will reduce risk of electric shock.
- Avoid body contact with earthed or grounded surfaces, such as pipes, radiators, ranges and refrigerators. There is an increased risk of electric shock if your body is earthed or grounded.
- Do not expose power tools to rain or wet conditions. Water entering a power tool will increase the risk of electric shock.
- Do not abuse the cord. Never use the cord for carrying, pulling or unplugging the power tool. Keep cord away from heat, oil, sharp edges or moving parts. Damaged or entangled cords increase the risk of electric shock.
- When operating a power tool outdoors, use an extension cord suitable for outdoor use. Use of a cord suitable for outdoor use reduces the risk of electric shock.
- If operating a power tool in a damp location is unavoidable, use a residual current device (RCD) protected supply. Use of an RCD reduces the risk of electric shock.

### 3. Personal safety.

- Stay alert, watch what you are doing and use common sense when operating a power tool. Do not use a power tool while you are tired or under the influence of drugs, alcohol or medication. A moment of inattention while operating power tools may result in serious personal injury.
- Use personal protective equipment. Always wear eye protection. Protective equipment such as dust mask, non-skid safety shoes, hard hat, or hearing protection used for appropriate conditions will reduce personal injuries.
- Prevent unintentional starting. Ensure the switch is in the off-position before connecting to power source and/or battery pack, picking up or carrying the tool. Carrying power tools with your finger on the switch or energising power tools that have the switch on invites accidents.
- Remove any adjusting key or wrench before turning the power tool on. A wrench or a key left attached to a rotating part of the power tool may result in personal injury.
- Do not overreach. Keep proper footing and balance at all times. This enables better control of the power tool in unexpected situations.
- Dress properly. Do not wear loose clothing or jewellery. Keep your hair, clothing and gloves away from moving parts. Loose clothes, jewellery or long hair can be caught in moving parts.
- If devices are provided for the connection of dust extraction and collection facilities, ensure these are connected and properly used. Use of dust collection can reduce dust-related hazards.

### 4. Power tool use and care.

- Do not force the power tool. Use the correct power tool for your application. The correct power tool will do the job better and safer at the rate for which it was designed.
- Do not use the power tool if the switch does not turn it on and off. Any power tool that cannot be controlled with the switch is dangerous and must be repaired.
- Disconnect the plug from the power source and/or the battery pack from the power tool before making any adjustments, changing accessories, or storing power tools. Such preventive safety measures reduce the risk of starting the power tool accidentally.
- Store idle power tools out of the reach of children and do not allow persons unfamiliar with the power tool or these instructions to operate the power tool. Power tools are dangerous in the hands of untrained users.
- Maintain power tools. Check for misalignment or binding of moving parts, breakage of parts and any other condition that may affect the power tool's operation. If damaged, have the power tool repaired before use. Many accidents are caused by poorly maintained power tools.

# General Power Tool Safety Warnings

## ⚠ WARNING

- Keep cutting tools sharp and clean. Properly maintained cutting tools with sharp cutting edges are less likely to bind and are easier to control.
- Use the power tool, accessories and tool bits etc. in accordance with these instructions, taking into account the working conditions and the work to be performed. Use of the power tool for operations different from those intended could result in a hazardous situation.

### 5. Battery tool use and care.

- Recharge only with the charger specified by the manufacturer. A charger that is suitable for one type of battery pack may create a risk of fire when used with another battery pack.
- Use power tools only with specifically designated battery packs. Use of any other battery packs may create a risk of injury and fire.
- When battery pack is not in use, keep it away from other metal objects, like paper clips, coins, keys, nails, screws or other small metal objects, that can make a connection from one terminal to another. Shorting the battery terminals together may cause burns or a fire.
- Under abusive conditions, liquid may be ejected from the battery; avoid contact. If contact accidentally occurs, flush with water. If liquid contacts eyes, additionally seek medical help. Liquid ejected from the battery may cause irritation or burns.

### 6. Service

- Have your power tool serviced by a qualified repair person using only identical replacement parts. This will ensure that the safety of the power tool is maintained.

# Safety Considerations

## ⚠ WARNING

### 1. Ensure you use the correct voltage.

- Be sure to use the voltage indicated on the name plate of the product or in the operation manual. Using a voltage different from that indicated can result in overheating, smoke or fire.

### 2. Check the switch is OFF before inserting the plug into the power supply socket.

- If the plug is inserted into the power supply when the switch is ON, the product may start operating abruptly and is liable to cause accidents. Be sure to check the switch is OFF.

### 3. Be sure to avoid electric shock.

- Do not touch the plug with wet hands.
- Do not use the product in rain or in places where moisture can easily get into it.
- Be sure to ground the product to avoid electric shock.

### 4. Take notice of conditions at the work site.

- Do not use the product in rain, humid or damp places, or places where moisture can easily get into it. Humidity will lower insulation of the motor and cause electric shock.
- Do not use close to flammable fluids or gases, such as gasoline and thinner. Fire or explosion might occur.

### 5. Use designated accessories and attachments.

- Do not use accessories and attachments other than those designated in the operation manual or our catalogues. Accidents or injuries might result.

### 6. In the following cases, turn the product OFF and pull the plug out of the power supply socket.

- When the product is not in use or parts are changed, repaired, cleaned or inspected.
- When accessories are changed.
- When hazards are expected (including electric power failure).  
If the product is plugged in, it may start operating unexpectedly, causing accidents.

### 7. If any abnormality is noticed, stop operation immediately.

- If the product does not operate smoothly, or abnormalities such as unusual odours, vibration or noise are detected, stop operating it immediately.
- Check symptoms against the items in the section entitled, "Troubleshooting" at the end of this manual and observe the corresponding instructions.  
Using the product continuously may result in overheating, smoke or fire, causing accident or injury.
- If it overheats or smoke is detected, do not attempt an overhaul yourself but ask for an inspection and repair.

### 8. Keep the work site clean.

- Ensure you keep the work table and the work site in good order and well lit.
- A cluttered site and work table are liable to cause accidents.

### 9. Do not let unauthorised personnel near the product.

- Do not let anyone other than authorised personnel touch the product or the power cord.
- Do not let anyone other than authorised personnel enter the work site, especially children. Doing so may lead to injury.

### 10. Do not use with excessive force.

- To ensure safe and efficient operation, use within the capacity of the product.  
Applying force may not only cause damage to the product but could also result in accident or injury.
- Do not use in any way that could cause the motor to lock, or cause smoke or fire.

### 11. Use the flaring/flanging tool only for its designated purpose.

- Do not use the product on tubes not specified in this manual. Using the product for any purpose other than flaring /flanging tubes, such as fastening the tube to a joint etc., will not only damage the product and/or motor but could also lead to accident or injury.

## ⚠ WARNING

### 12. Wear appropriate clothing.

- Do not wear neckties, clothes with unbuttoned sleeves, loose clothing, accessories such as necklaces, etc. Do up buttons and zippers which could get caught in the rotating parts and result in serious accident or injury.
- When working outdoors, it is recommended that you wear rubber gloves and non-slip shoes. Slippery gloves and shoes are liable to cause injuries.
- Do not wear scarves and cover long hair with caps or hair nets to prevent them getting caught in rotating parts.
- Wear safety caps, safety shoes, etc. according to the working environment.
- Wear hearing protection.

### 13. Do not work in an unnatural posture.

- Keep a firm footing and balance to avoid falling over and injuring yourself.

### 14. Remove tools such as wrenches.

- Before turning the switch ON, check that tools used for inspection and adjustment have been removed. If you use the product before other tools are removed, accidents and injuries may occur.

### 15. Operate with great care.

- Always work with great attention to how you handle and operate product and to the surrounding conditions. Carelessness may result in accident or injury.
- Do not operate the product when concentration is lowered such as when tired, after drinking alcohol, when sick, affected by medicines, etc.

### 16. Do not handle the power cord carelessly.

- Do not carry the product by the cord, or pull the plug out of the socket with the cord.
- Do not place the cord near heated objects, fats & oils, cutters and objects with sharp edges.
- Take care not to tread on the cord, pull the cord or apply unnecessary force resulting in damage to the cord. Electric shock or short-circuit may occur, causing fire.

### 17. Perform careful maintenance daily.

- When changing accessories and parts, follow the operation manual. Periodically inspect the power supply cord and plug. If damaged, ask your distributor or our sales department for repairs.
- If an extension cord is used, inspect the cord periodically and, if damaged, replace it.
- If extension cords are used outdoors, use extension cords designed for outdoor use to prevent electric shock, short-circuit or fire.
- Keep parts used for gripping dry and clean, and free of oil and grease. If your hands slip, you may be injured.

### 18. Check for damaged parts.

- Before using the product, carefully check for damage to the protective cover and other parts, and check both normal operation and specified functions.
- Check for any abnormalities such as in adjustment of movable parts, tightening, damage to and installation of parts and all parts affecting operation.
- Do not use power cord or plug if damaged. Doing so may cause electric shock or a short circuit leading to fire.
- Do not use if the stop and start switches do not work properly. In replacing or repairing a broken protective cover and other parts, follow the operation manual. If no instructions are specified in the operation manual, ask your distributor or our sales department for repairs.

### 19. Store carefully when not in use.

- Store in a dry place away from children and locked with a key.

### 20. For overhaul and repair, ask an appointed REX agent.

- Our products comply with corresponding safety standards. Do not remodel.
- Be sure to ask your distributor or our sales department for any repairs. If repairs are carried out by unskilled or unqualified personnel, the performance will be adversely affected and may result in accident or injury.

# Precautions

## ⚠ WARNING

### 1. Hold securely.

- When switched on and the flare cone starts rotating, the hand you hold the product with may be jarred; take care not to hit any objects around you.
- NOTE: Do not keep the switch fixed in position deliberately.

### 2. Always use the charger designed exclusively for the product.

- It is dangerous to use any charger other than the one provided, so never attempt to do so. Do not attempt to use the charger for charging other products or batteries, or for any other purpose.

### 3. Never use boosters or other transformers for charging.

- This can damage the charger; always use with a 220V supply.

### 4. Never charge with an engine generator or DC power source.

- Do not use an engine generator or DC power source for charging. The charger may be damaged.

### 5. Always charge indoors.

- When charging, do not let the battery or charger get wet; charge indoors.
- Do not place the charger close to an open flame.
- Keep all inflammable materials away from the charger.
- The battery or the charger may get slightly hot when charging; choose a dry and well-ventilated place that is not exposed to direct sunlight.

### 6. Moisture can cause accidents.

- Do not try to charge or use this product in the rain or in wet or damp places. In addition to weakening the insulation of the charger or the motor, moisture can cause electric shock. Always avoid dampness.

### 7. Unplug the charger once the battery is charged.

- Remove the plug from the mains once charging is finished. Also, if there is a power failure, always remove the plug from the mains.

### 8. Charge within a range of 0°C to 40°C.

- This product employs a special charging circuit for fast charging (about 1 hour); always charge within a temperature range of 0 to 40°C. Below 0°C, it may overcharge, shortening the life of the charger. Above 50°C, charging may not be possible.

### 9. Do not charge continuously with the same charger.

- If the same charger is used to charge a number of products continuously, it could overheat and be damaged. Once charging is finished, leave the charger to cool for about 15 minutes before charging again.

### 10. Do not immediately recharge a battery that has been used up quickly.

- A storage battery that has been exhausted quickly due to continuous operation becomes abnormally hot. Therefore, when such a battery is placed in the charger, a red pilot lamp comes on, either preventing a recharge, or resulting in an insufficient charge. Always charge the battery after it has cooled down.

### 11. Do not charge for more than 2 hours.

- If the green pilot lamp stays on even after charging for 2 hours, the charger may be faulty. Stop charging and consult your nearest distributor.

### 12. Charge once every three months.

- It is recommended that even if you do not use them, lithium-ion batteries should be charged about once every three months in order to prevent over-discharge.

### 13. Do not store fully-charged batteries for long periods of time.

- If you need to store batteries for long periods of time, store at room temperature and at about 50% of their capacity.

## WARNING

### **14. Keep the battery-mounting socket clean.**

- The battery-mounting socket on the charger has charging terminals. If this socket is contaminated with metal chips, water or other foreign bodies, the terminals may be short-circuited, causing damage to the charger.

### **15. Do not attempt to disassemble either the storage battery or the charger.**

- The battery houses a special device designed for quick charging (about 1 hour). Disassembly could result in electric shock or damage to the charger; never try to disassemble it!
- The charger houses condensers and electronic parts. Disassembling could result in electric shock or damage to the charger; never try to disassemble it.

### **16. Avoid short-circuiting the terminals on a lithium-ion battery.**

- A short can result in a surge in current that creates heat intense enough to cause burns or malfunction.

### **17. Never throw lithium-ion batteries on a fire.**

- Lithium-ion batteries will explode if thrown on a fire or into an incinerator.

### **18. Take care when working in high places.**

- When working high up, make sure that there is nobody below you.

### **19. Keep the ventilation hole on the charger clean.**

- Keep the ventilation hole on the charger clear of metal chips and inflammable materials as they may cause electric shock or damage. Avoid using the charger in dusty places.

### **20. Stop charging if any abnormality is detected.**

- If you detect excessive heat or any other abnormality while charging, stop immediately and have the charger repaired.

### **21. Store the charger properly.**

- Store the charger and the storage battery in a dry place out of the reach of children and where the temperature does not exceed 40°C. Never store under the eaves of a house, for example, where rain might get in. Deterioration of the electrical insulation can result in electric shock.

### **22. To prevent short circuits**

- To prevent short circuits, wrap the terminals on used lithium-ion batteries in insulating tape and dispose of in accordance with local laws and regulations governing such items.

## CAUTION

1. The flanging tool is designed exclusively for making flanges on SUS304, SUS316L flexible stainless steel water tubes. Do not use for any other purpose.
2. Use for water tubes only. Never use for paraffin or gas tubing.
3. Make sure clamps and tubes are mounted securely or else they could come apart, resulting in accident or injury.



# Main Parts, Specifications For RF20S

## Main Parts

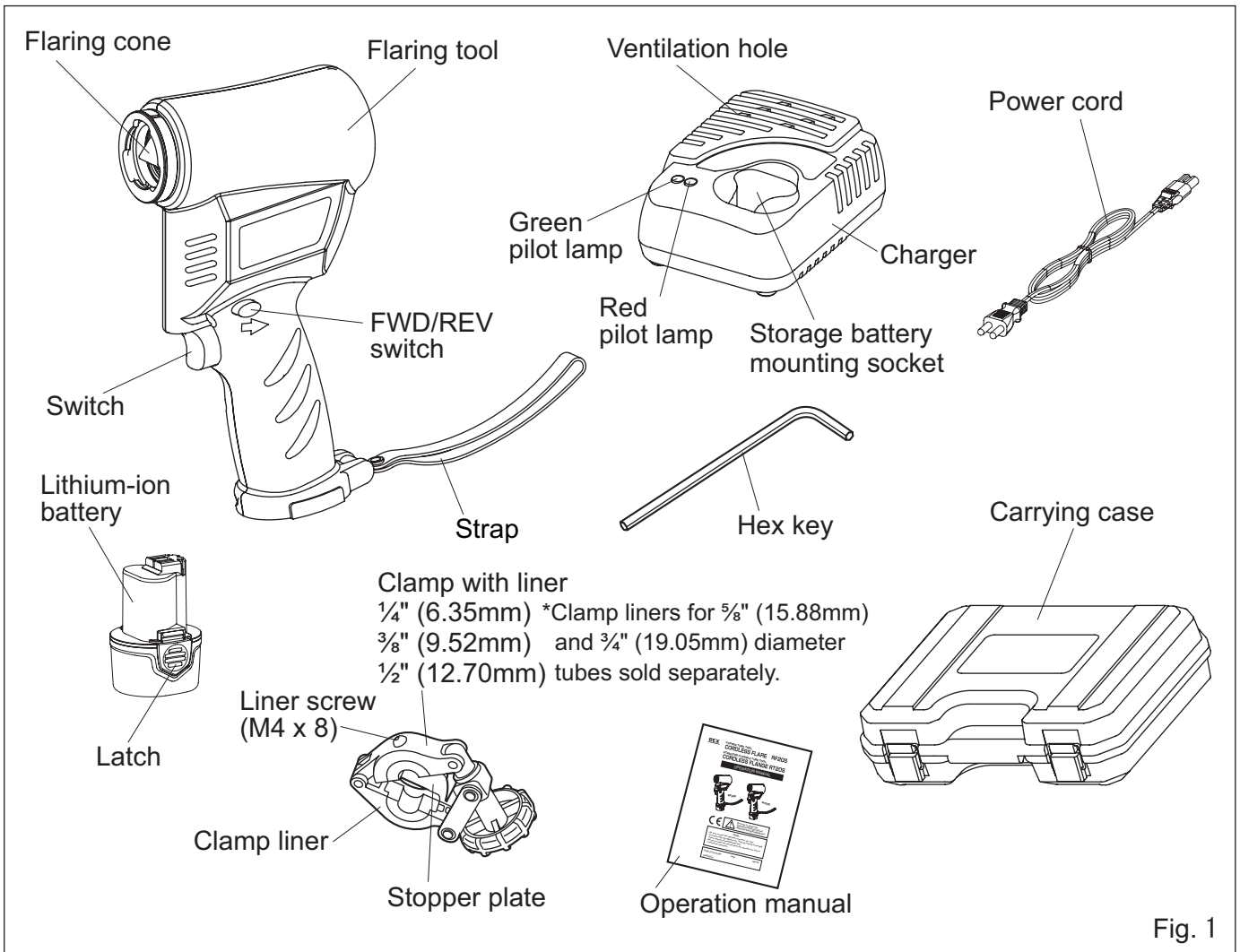


Fig. 1

## Specifications

### Flaring tool RF20S

Applicable tube	Copper tube (O/OL material) JIS H 3300 C1220T					
Applicable tube size	Nominal diameter	1/4"	3/8"	1/2"	5/8"	3/4"
	Outer diameter (mm)	6.35	9.52	12.70	15.88	19.05
Flare	Supports Class 2 refrigerant (Supports R410A) Complies with shapes described in JIS B 8607. (Referred to elsewhere.)					
Processing method	Eccentric cone (constant-pressure plunge rotation)					
Switch	Stepless speed control with FWD/REV switch					
Cone speed	0 - 280/min (rpm)					
Power	DC motor					
Potential no. of flares	1/2": Approx. 100 tube ends per fully charged battery. (May vary depending on usage.)					
Processing time	Approx. 5 sec.					
Vibration	0.667m/s <sup>2</sup> *Warning: The vibration emission during actual use of the power tool can differ from the declared total value depending on the ways in which the tool is used.					
Uncertainty (K)	1.5m/s <sup>2</sup>					

# Main Parts, Specifications For RT20S

## Main Parts

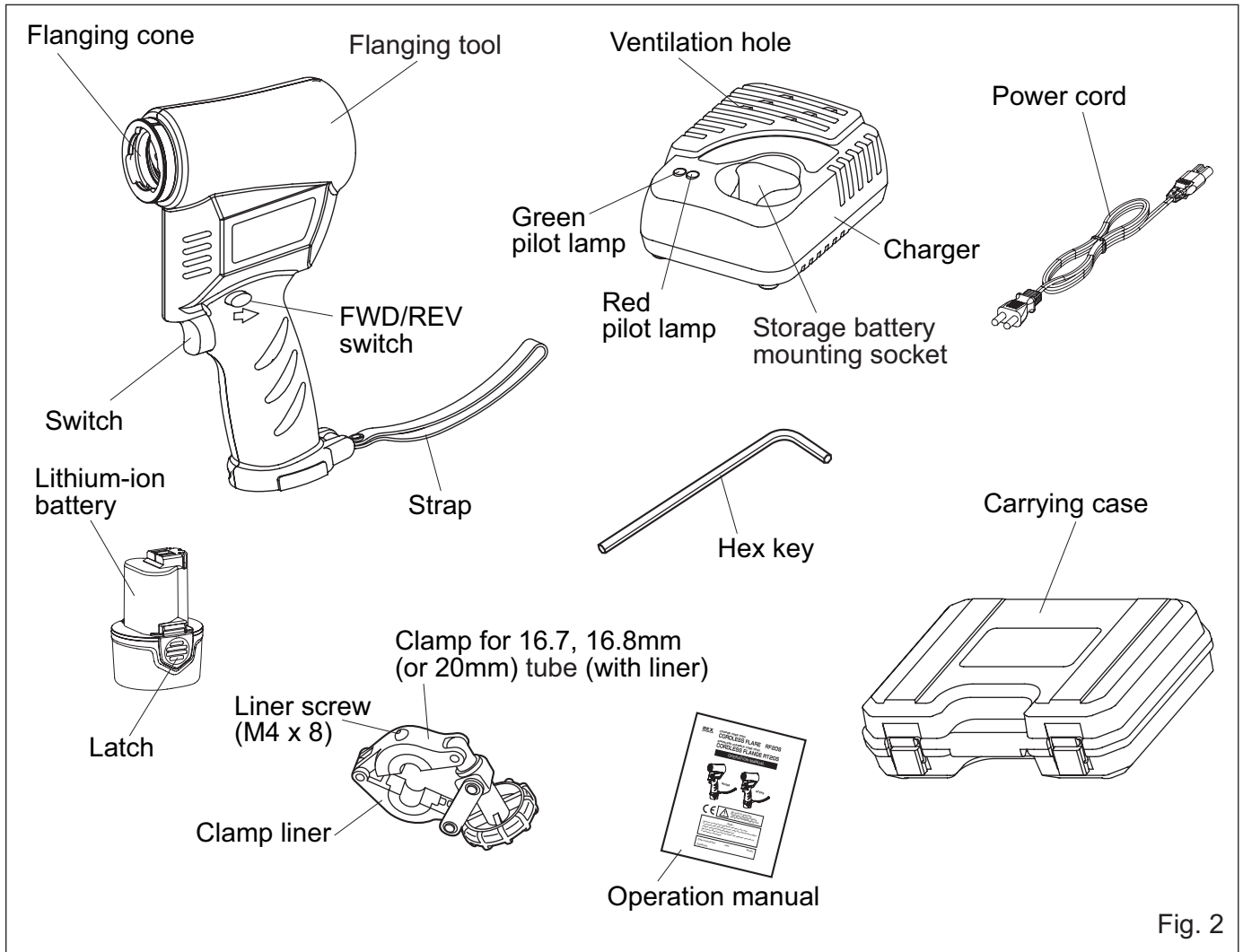


Fig. 2

## Specifications

### Flanging tool RT20S

Applicable tube	Flexible stainless steel water tube SUS304, SUS316L (for mains water supply)
Applicable tube size	M-13 (1/2") Outer diameter 16.7- 16.8mm M-15 (3/4") Outer diameter 20mm
No. of flange threads	2 or 3 threads
Processing method	Eccentric cone (constant-pressure plunge rotation)
Switch	Stepless speed control with FWD/REV switch
Cone speed	0 – 280/min (rpm)
Power	DC motor
Potential no. of flanges	3/4" (3 threads): Approx. 100 tube ends per fully charged battery. (May vary depending on usage.)
Processing time	Approx. 5 sec.
Vibration	0.667m/s <sup>2</sup> *Warning: The vibration emission during actual use of the power tool can differ from the declared total value depending on the ways in which the tool is used.
Uncertainty(K)	1.5m/s <sup>2</sup>

Table 2

# Standard Accessories, Use (For RF20S/RT20S)

## Battery

Battery type	Lithium-ion battery
Voltage	10.8V
Capacity	1500m A h
Charging time	Approx. 60 minutes (depending on use) * Charge is approx. 80% complete in first 30 min.
No. of recharges	Approx. 500 times (depending on use)
Charging temperature	0-50°C
Circuit protector	Over-discharge protection (Discharging stops when any one cell is reduced to 2.5V) Temperature protection (battery cannot be charged below 0°C or above 50°C)

Table 3


	Sound pressure level at operator's position	81.5dB (A)
	Noise level	92.5dB (A)
	Uncertainty (K)	3dB

Table 4

## Charger

Model	Lithium-ion battery
Voltage	AC220V (50/60Hz) 60VA
Charging system	Constant current and constant voltage system
Charging voltage	10.8V
Charging current	2000mA
Operating temperature	0-40°C
Circuit protector	Overcharge protection (4.25V/cell) Overcurrent protection (7A fuse)

Table 5

## Standard Accessories (Size / Weight)

		Size (W x D x H mm)	Weight	Qty.
1	RF20S Flaring/RT20S Flanging tool	131 × 66 × 230 (with batteries inserted: 131 × 66 × 264)	1220 (1405)	1
2	Battery	60 × 54 × 85	185	1
3	Charger (without power supply cord)	146 × 109 × 61	335	1
4	Power cord	2000	85	1
5	Clamp (with 1/4" liner)	84 × 84 × 45	Approx. 350	1
6	Clamp (with 3/8" liner) *RF20S only			1
7	Clamp (with 1/2" liner)			1
8	Carrying case	440 × 366 × 113	1600	1
9	Hex key (Diameter: 2.5 mm)	18 × 63 × 3	4	1
10	Operation Manual	210 × 90 × 1	30	1

Table 6

## Use

- RF20S: Flaring copper tube. Flanging flexible stainless steel tube.  
(requires flanging tool set sold separately; refer to P.18).
- RT20S: Flanging flexible stainless steel tube.

## Getting Ready: Charging the battery

1. Remove the battery from the main unit by pressing the latch on the battery. (Fig. 3)

### ⚠ CAUTION

- Hold the main unit firmly and remove the battery.
  - Recharge the battery once the tool starts to lose power.
- If the battery is completely drained, it may not be possible to fully-recharge it, resulting in shortened battery life.

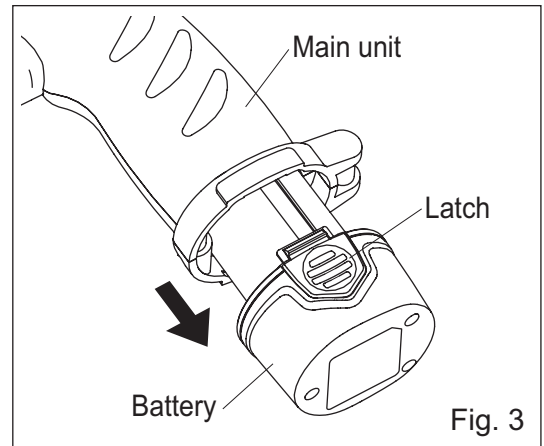


Fig. 3

2. Connect the power cord and charger, and then insert the plug into the mains. Check that the green lamp is slowly flashing on and off. This indicates that the battery is being charged. (Fig. 4)

### ⚠ CAUTION

- Note: The input voltage is AC220V (50/60Hz).
- Do not use a generator to recharge the battery.
- Do not carry the charger with the power cord in case it drops off.

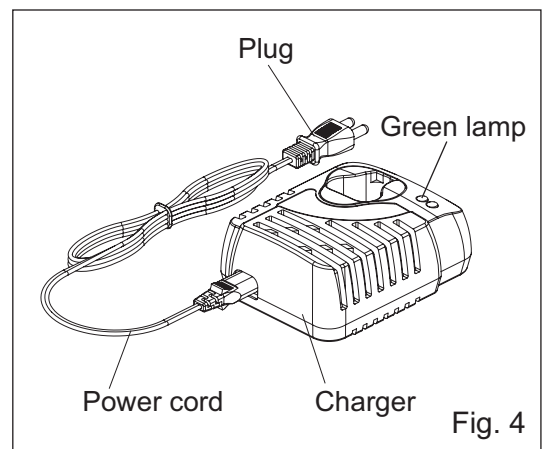


Fig. 4

3. Insert the storage battery as far as it will go into the mounting on the charger. (Fig. 5)
  - The red lamp indicates that charging has started.
  - After approximately 30 minutes, the green lamp starts flashing on and off quickly (indicating it is 80% charged).
  - The battery is fully charged when the lamp stops flashing but remains on. A full charge takes about 60 minutes in total. (Fig. 5)

You can check the status of the storage battery and charger from the red and green lamps. (Table 6)

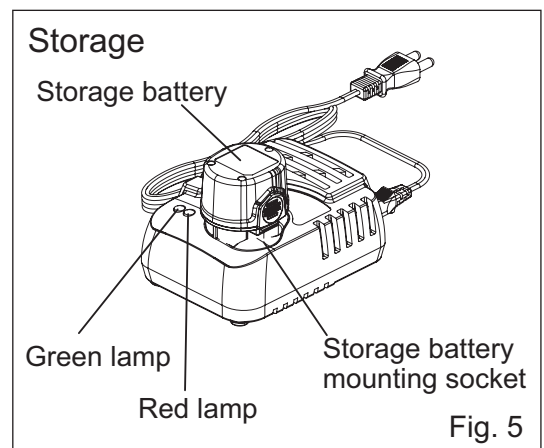


Fig. 5

Mark	Green lamp	Red lamp	Charger status
	Flashes slowly	Off	Rechargeable
	Off	On	Charges the battery 0-80% of its capacity (about 30 minutes)
	Flashes quickly	Off	Charges the battery 80-100% of its capacity (about 30 minutes)
	On	Off	Fully charged
	Off	Flashes slowly	The temperature of the battery is outside the acceptable range (below 0°C, or above 50°C)
	On	On	Unable to charge (Defective battery etc.)

Table 7

# Operation Guide (Flaring copper tube)

## ⚠ CAUTION

- Ensure the battery is attached the correct way round.
- Charge within a range of 0°C to 40°C.  
If you charge beyond this range, it may degrade the performance and life of the battery and may even cause a leakage or generate excessive heat.
- The battery or the charger may get slightly hot during charging; choose a dry and well-ventilated place that is not exposed to direct sunlight.
- If you intend to charge another battery, leave the charger to cool for at least 15 minutes before charging the next one.
- If the temperature of the battery is below 0°C or above 50°C, you cannot charge it.

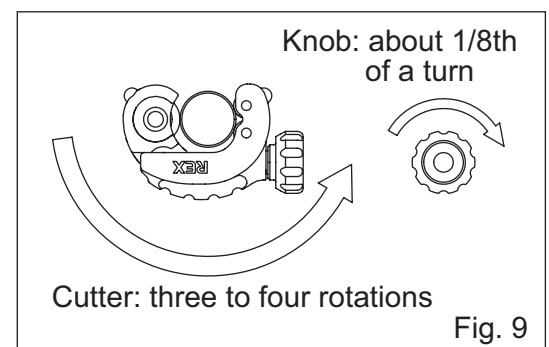
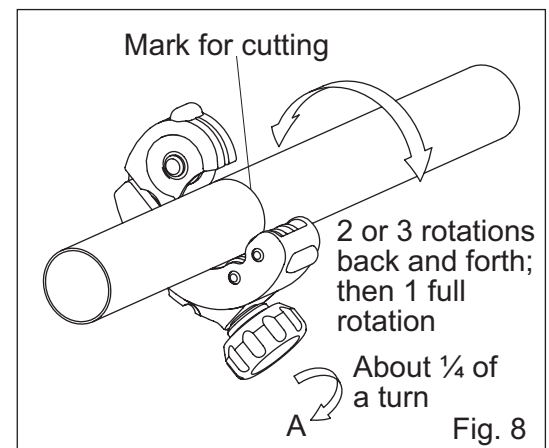
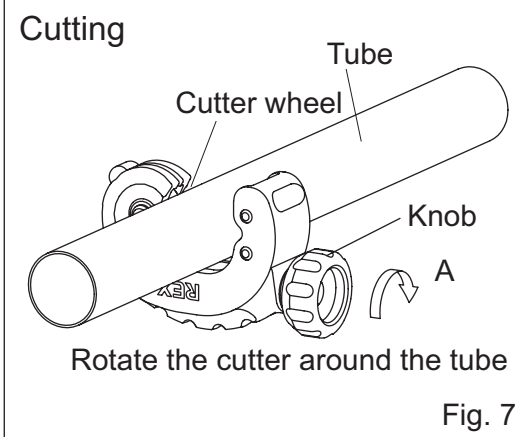
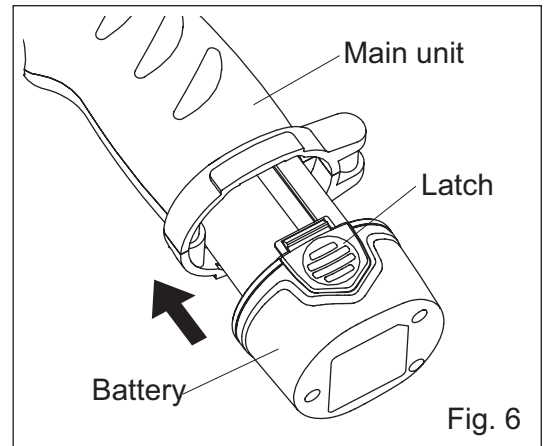
4. Remove the battery from the charger, and then attach it to the main unit. (Fig. 6)

## ⚠ CAUTION

- If the battery cannot be fully recharged even after following the correct procedure, the battery may be dead.  
Attempting to charge a dead battery may damage the charger.

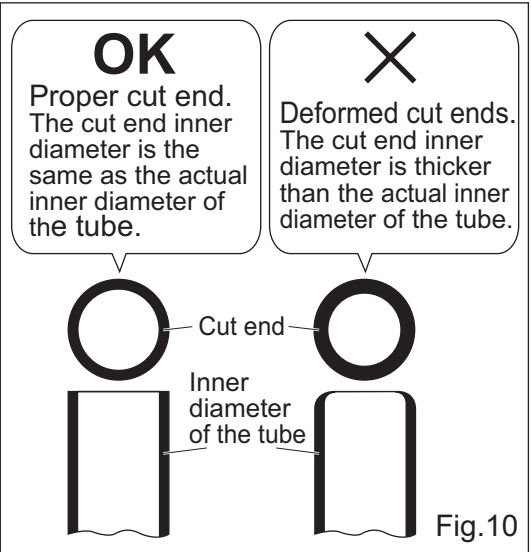
### (1) Cutting and scraping the tube

1. Mark a line where you wish to cut the tube, and then place the tube on the cutter. (Fig. 7)
  - \* Tighten the cutter so that the blade lightly presses against the tube.
  - \* Cut the tube where it is least flat or bent. Tubes that are flat or have lots of bends will affect the flare.
2. From where the cutter blade is placed on the tube, turn the knob  $\frac{1}{4}$  of a turn in the direction of A in the diagram and then rotate the unit 2 or 3 times back and forth through 90°. Then score the tube by turning the unit one full rotation around the tube to make a mark for cutting. (Fig. 8)
3. When feeding the cutter blade, the knob should be turned slowly at a rate of approximately 3 to 4 rotations of the tube cutter. (Fig. 9)



## ⚠ CAUTION

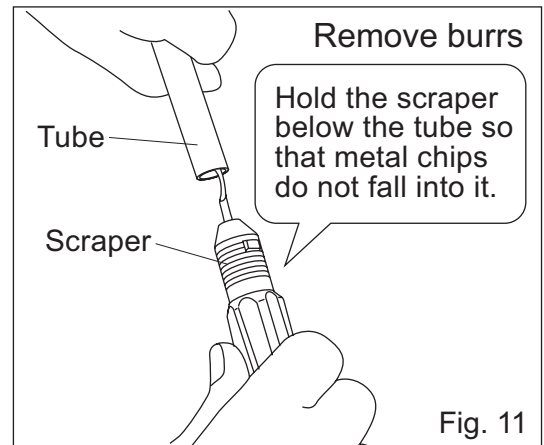
- If you feed the blade too quickly, the tube may be deformed and the tube cannot be flared properly. (Fig. 10 right)
- When you use a tube without first cutting it, check that the tube is not deformed.



4. Use a scraper to remove burrs from the end of the tube. (Fig. 11)

## ⚠ CAUTION

- Hold the cut end facing downward so that metal chips do not fall into the tube.
  - If the cut end has not been properly scraped, the tube cannot be flared properly, and a gas leak may result.
  - Do not make any scratches on the inner surface of the tube to be flared.
- Damage or scratches may remain even after the tube is flared.

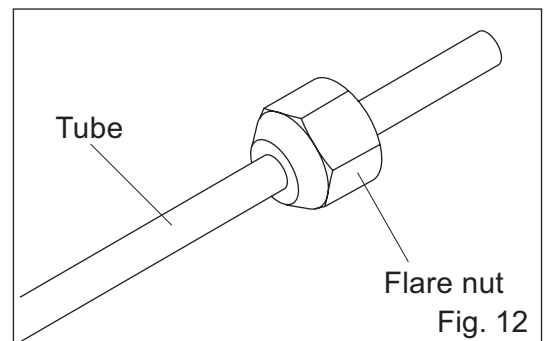


## (2) Clamping the tube

1. Slide a flare nut that is compatible with the tube size over the tube. (Fig. 12)

## ⚠ CAUTION

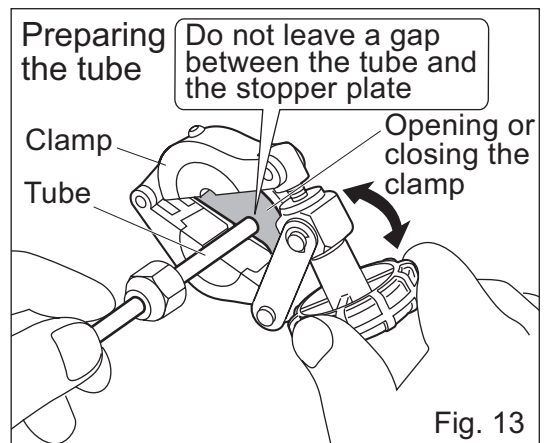
- Be careful of the orientation of the nut.
  - Confirm that there are no burrs left on/in the copper tube.
- Note that if any burrs remain, the surfaces that are flared may become dented and cause a gas leak.



2. Choose a clamp that is compatible with the tube size, and then place the tube. (Fig. 13)

## ⚠ CAUTION

- If there is a space between the tube and the stopper plate, the resulting flare diameter will be smaller.
- Remove any metal chips from the liner, the flare cone and the tube.



- \*To open or close the clamp, turn the knob as indicated by the arrow and then lift or lower the clamp accordingly. (Fig. 13)

# Operation Guide (Flaring copper tube)

3. Check that the tube is placed correctly and then clamp it. (Figs. 13-14)

## ⚠ CAUTION

- To confirm that the stopper plate is in perfect contact with the tube, try to raise the stopper plate slightly with your finger. If the stopper plate is easy to shift, it implies that there is a space between the stopper plate and the tube, so reset the tube. (Fig. 14)

\*Turn the clamp knob until the clamps are closed firmly. (Fig. 15)

Be careful to avoid gaps in the liner as they will cause protrusions in the flare, which will result in leakages. (Fig. 16)

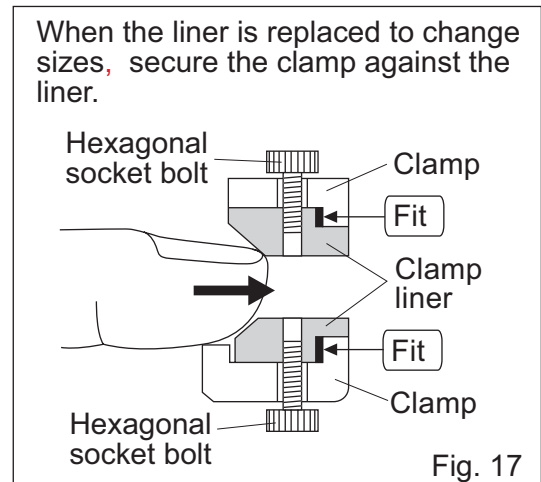
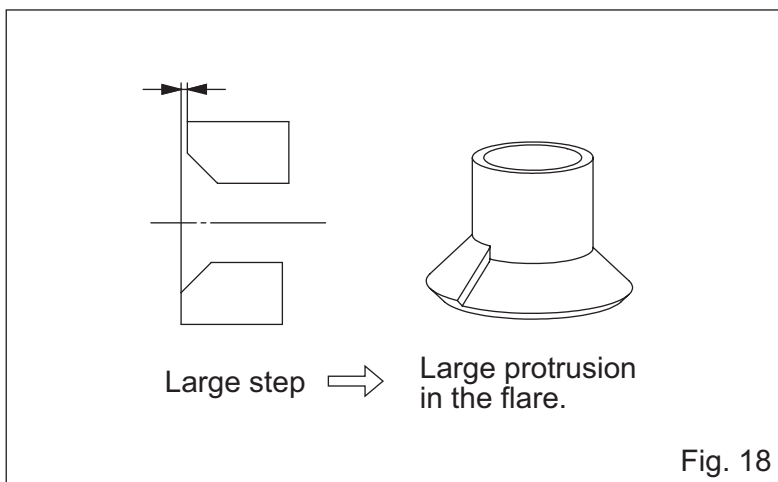
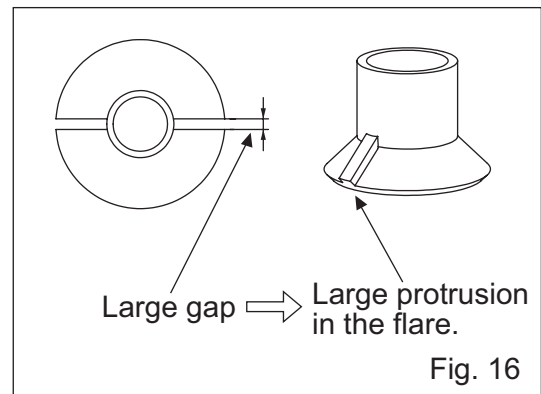
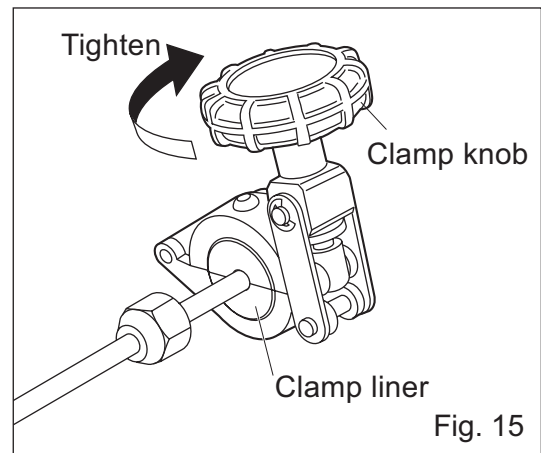
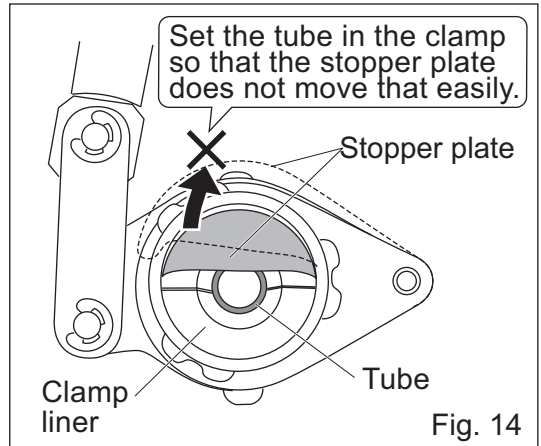
\*The distance between the liners is set slightly smaller than the external diameter of the tube so that the tube will not become loose or slip. Therefore, when clamping the tube, the exterior of the tube will be scratched, but this will not pose any problem.

4. When the liner is replaced to change sizes, be sure to fit the new liner properly in the clamp before securing it with the socket bolt. (Fig. 17)

\*Secure the clamp against the liner using the 2.5 mm hex key provided and hexagonal socket bolt (M4x8).

## ⚠ CAUTION

- If there is a large step in setting the liner then there will also be a large step in the flare which will cause a gas leak. (Fig. 18)



## (3) Flaring

1. Attach the clamp, with the tube in it, to the flaring tool. (Figs. 19-20)

\*Attach the clamp to the flaring tool by aligning the joints on the clamp with the recesses in the flaring tool, and then turn the flaring tool in the direction of the arrow until you hear a click. (Fig. 20)

### ⚠ CAUTION

- You cannot set the clamp unless the flare cone is fully retracted.
- When the cone is out, press REV on the FWD/REV switch and then pull the trigger. The flare cone will retract while rotating in reverse. When the flare cone is fully retracted, you will hear a clank. (Fig. 20)
- Remove any foreign matter (metal chips, etc.) from the flare cone, as these could cause scratches on the inner surface of the flare or a gas leak.

2. Start flaring by pressing FWD on the FWD/REV switch and pull the trigger.

The amount you pull the trigger affects the rotation speed, but you should pull the trigger back all the way.

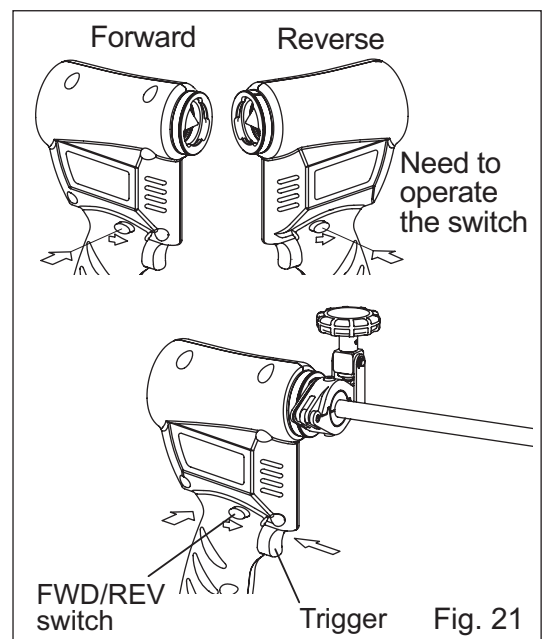
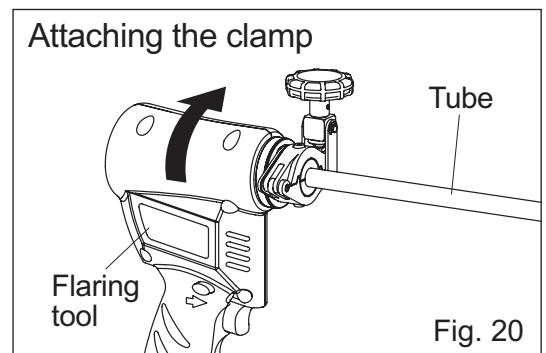
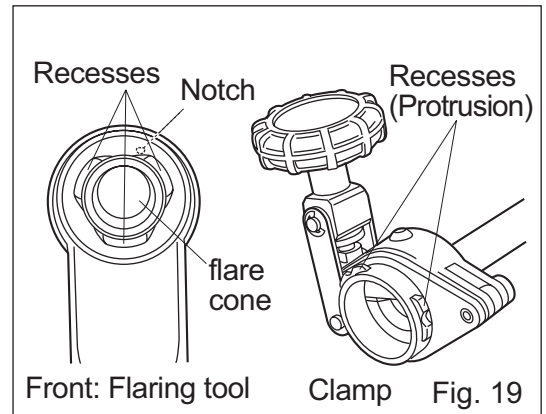
If you don't pull the trigger back enough, there may not be enough torque.

Flaring should be completed within 3 seconds from when you hear the clutch make a clanking sound.

Release the switch to stop the tool rotating. (Fig. 21)

### ⚠ CAUTION

- If the time for idling (from when the clutch starts operating until you release the switch) is too short, it may sometimes result in insufficient flaring.
- If the time for idling is too long, it may cause a gas leak resulting from a protrusion or steps in the flare's exterior (refer to page 13.), or reduce the thickness of the flared tube.





# Operation Guide (Flaring copper tube)

3. Press and hold down REV on the FWD/REV switch.

- The flare cone will be retracted while rotating in reverse.

The amount you pull the trigger affects the rotation speed, but you should pull the trigger back all the way.

If you don't pull the trigger back enough, there may not be enough torque.

When you hear the clutch make a clanking sound, release the trigger to stop the flaring tool rotating.

## ⚠ CAUTION

- When the battery is on the verge of running out, flaring will exhaust the power needed for reverse rotation, thus preventing the flare cone from returning to its retracted position. Therefore, be sure to recharge the battery before it becomes weak.

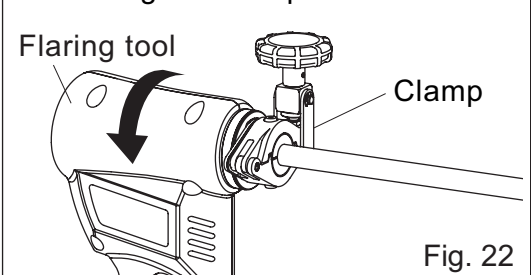
### (4) Removing the tube

1. Detach the clamp from the flaring tool by reversing the steps for installation. (Fig. 22)

## ⚠ CAUTION

- The clamp cannot be removed unless the flare cone is fully retracted. Avoid removing it forcibly, otherwise the tool may be damaged.

### Removing the clamp



### 2. Removing the tube

- Loosen the knob to open the clamp, and then remove the tube. (Fig. 23)

- Check the shape and dimensions of the finished flare are acceptable and not like those shown in Fig. 24 below.

For information on how to deal with each of these cases, refer to Troubleshooting. (Pg. 18)

### Removing the tube

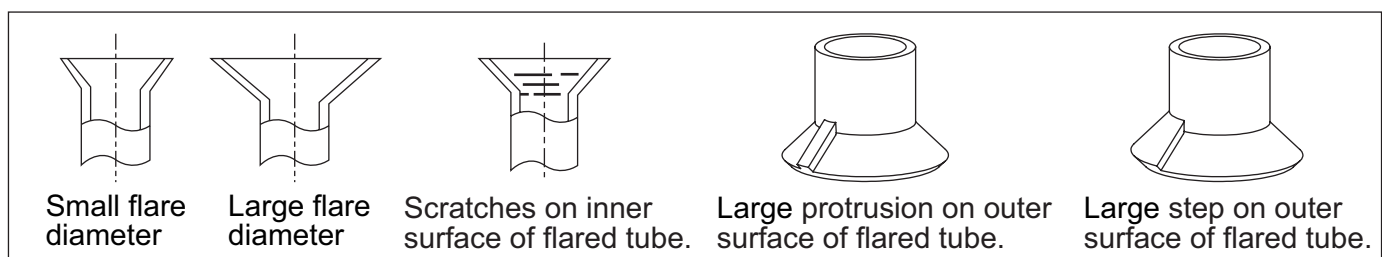
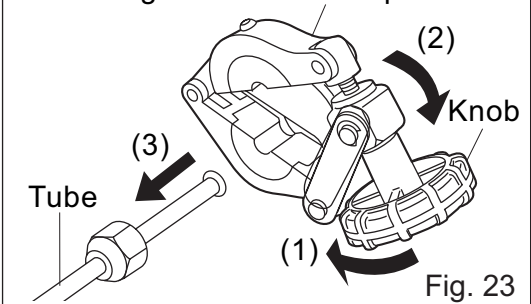


Fig. 24

Points to note when connecting flare nuts on refrigerant tubes  
- Note the following when connecting flared nuts.

1. When connecting a flare nut, coat the flare thread or taper with refrigerating oil and make the first 3 or 4 turns of the nut by hand.
2. Use Table 8 opposite as a guide to the torque that should be applied when connecting a flare nut.
3. To prevent gas leaks, ensure the nut is tightened correctly.

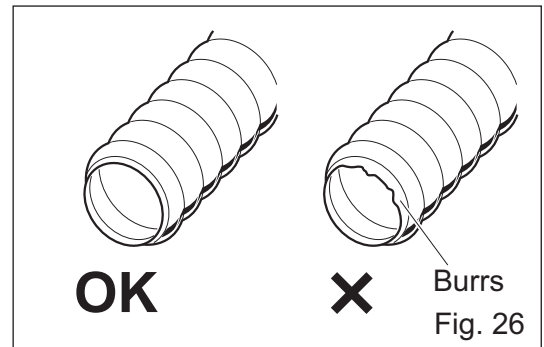
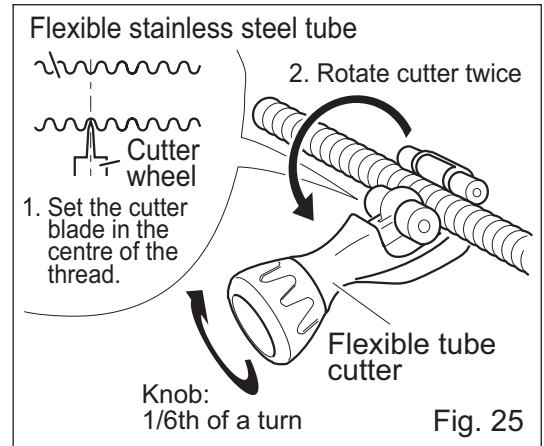
### “Torque used for connecting flare nuts”

Nominal diameter	Actual outer diameter (mm)	Tightening torque (Nm)
1/4"	6.35	14 - 20
3/8"	9.52	40 - 44
1/2"	12.70	57 - 62
5/8"	15.88	70 - 77
3/4"	19.05	98 - 120

Table 8

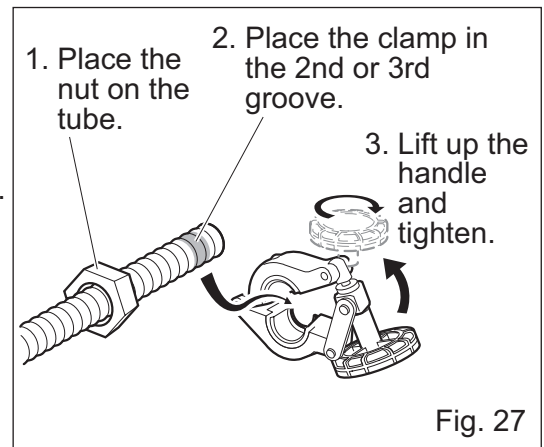
## (1) Cutting flexible tubes (Figs. 25-26)

1. Set the flexible tube cutter wheel in the centre of the recess in the tube.
2. Turn the cutter knob to advance the cutter blade slowly until it engages the tube. Rotate the cutter twice around the tube and then turn the knob to 1/6 of a turn. Repeat this procedure until the tube is cut.
3. Check that there are no burrs or deformation where the tube has been cut.  
If there are, then normal flanging will not be possible, which could result in leakages. (Fig. 26)



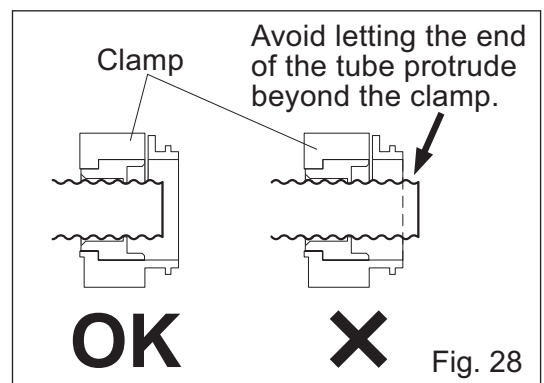
## (2) Setting the clamp (Figs. 27-28)

1. Set the clamp so that you place the liner over the second or third groove from the end of the tube.
2. Lift the handle and tighten by turning in a clockwise direction.
3. While looking from the side, check that the end of the tube does not protrude from the clamp.



### ⚠ CAUTION

- If the end of the tube protrudes beyond the clamp, the position of the clamp is incorrect. Correct the position of the clamp.
- If the end of the tube is deformed and sticks out beyond the clamp, cut off the deformed section of the tube and attach the clamp again.
- If the end of the tube sticks out beyond the clamp, the flanging cone will not move forward.

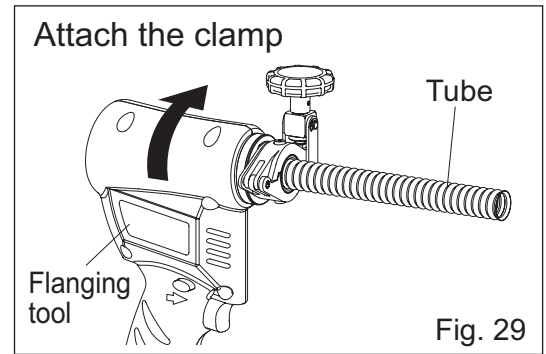


# Operation Guide (Flanging)

## (3) Flanging (Figs. 29-31)

1. Attach the clamp, with the tube in it, to the flanging tool. (Figs. 29-31)

\*Attach the clamp to the flanging tool by aligning the joints on the clamp with the recesses in the flanging tool, and then turn the flanging tool in the direction of the arrow until you hear a click. (Fig. 29)



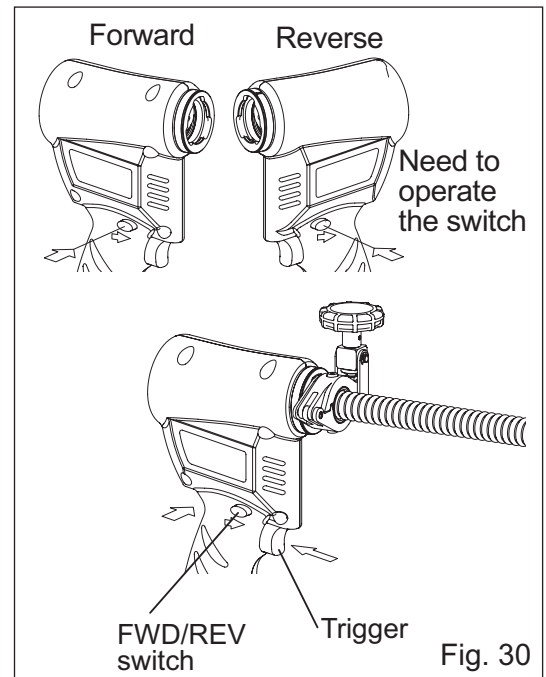
2. To start flanging, press FWD on the FWD/REV switch and pull the trigger.

The amount you pull the trigger affects the rotation speed, but you should pull the trigger back all the way.

If you don't pull the trigger back enough, there may not be enough torque.

Flanging should be completed within 3 seconds from when you hear the clutch make a clanking sound.

Release the switch to stop the tool rotating. (Fig. 30)



3. Press and hold down REV on the FWD/REV switch and pull the trigger.

The flanging cone will retract while rotating in reverse.

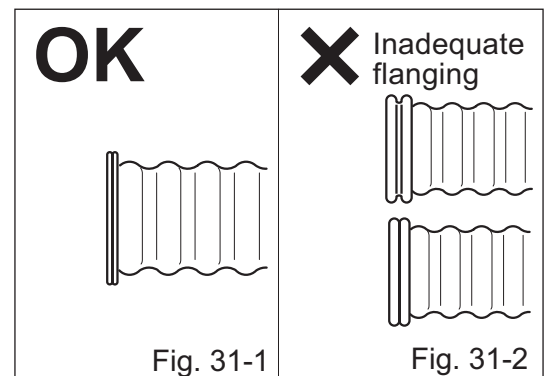
As in 2 above, the amount you pull the trigger can affect the rotation speed, but you should pull the trigger back all the way.

If you don't pull the trigger back enough, there may not be enough torque.

Release the switch to stop the tool rotating.

4. Remove the clamp in the reverse order to attaching it.

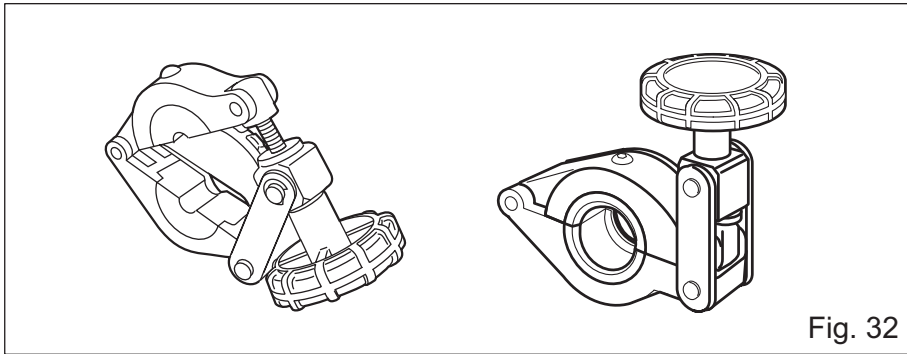
5. Make sure the tube has been flanged correctly. If it isn't, it can lead to water leaks or electrolytic corrosion. (Fig.31)



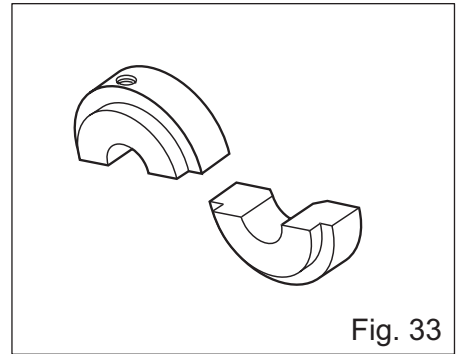
# (Replacing the flaring or flanging cone) Operation Guide

The RF20S flaring tool can be used to flare flexible tube by attaching special (optional) accessories. Also the RT20S flanging tool can be used to flare copper tube by attaching special (optional) accessories.

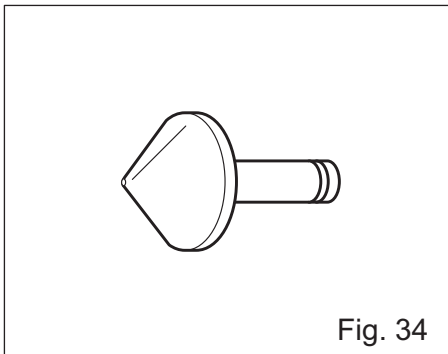
Special accessories (For details, refer to pages 22-23.)



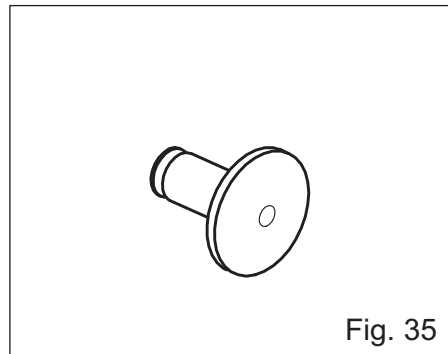
1. Clamps (for RF20S / for RT20S)



2. Liners



3. Flaring cone



4. Flanging cone

## Replacing the flaring or flanging cone (Fig. 36)

1. Press the FWD / REV switch forward, pull the trigger, and move the flaring or flanging cone forward as far as it will go.
2. Remove the battery.
3. Insert a flat-head screwdriver between the flaring or flanging cone and the body of the tool and take out the cone while taking care not to lose the thrust bearing.
4. Insert the cone until you hear it click into place.
5. Replace the battery.

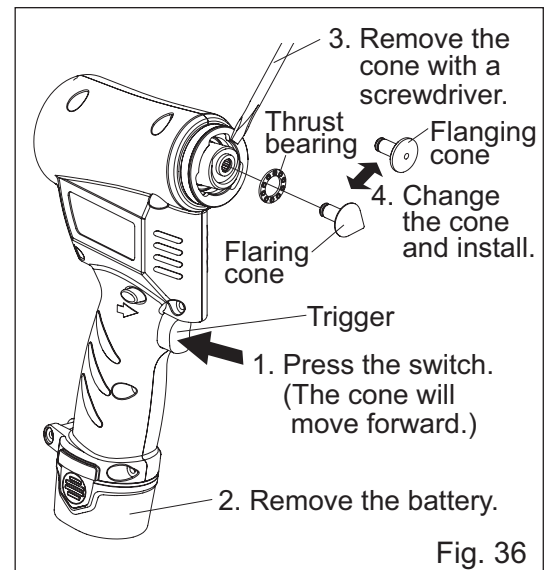


Fig. 36

### ⚠ WARNING

- When replacing the cone, remove the battery from the tool, otherwise there could be an accident if the tool starts up suddenly.

# Maintenance and Care

## ⚠ CAUTION

- Before inspection or maintenance, be sure to turn OFF the switch and also remove the battery. If the battery is not removed, it may start unexpectedly, causing serious injury.
- When an abnormality is found during inspection or maintenance, identify the problem referring to the descriptions in “Before Asking for Repairs or Servicing” and then follow the relevant instructions. Using the product as is, without correcting the abnormality, may generate excessive heat, fumes, or fire, causing serious accidents or injury.

### 1. Check all screws

- Check all screws on a regular basis and tighten any that are loose. Using the product if any screws are loose can be dangerous.

### 2. Keep surfaces clean

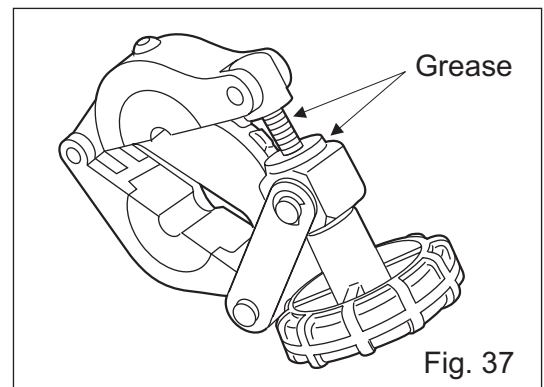
- Clean the outside of the charger with a dry, soft cloth or with a cloth dampened in soapy water. Do not use chlorine-based solvents, gasoline or paint thinner as they may dissolve the plastic.

### 3. Store properly after work

- After the job is finished, store in a dry place where the temperature does not exceed 40°C and with the battery separated from the charger. Keep out of the reach of children.

### 4. Care of the clamp

- If the knob is stiff when you tighten it, apply oil, grease, etc. as shown in the figure on the right. (Fig. 37)



## Servicing and Repairs

This product is produced with great precision; therefore, should it fail to operate normally, do not repair it by yourself; contact your distributor or REX INDUSTRIES CO., LTD.

If parts are required or if you have any questions, please contact us at your earliest convenience.

### Availability of Replacement Parts

Replacement parts are maintained for a period of 7 years after production of this model has been terminated.

Electrical parts, however, will remain available for a period of 5 years.

# Before Asking for Repairs or Servicing

If an abnormality occurs with the product, check the following and then contact your distributor or REX INDUSTRIES CO., LTD.

## ⚠ CAUTION

- If there is no description of, or instructions regarding, the problem in question in the following table, never try to disassemble or repair the product by yourself.
- If any problems are not dealt with below or if there are any instructions that indicate repair or servicing are needed, be sure to contact the manufacturer or the distributor from whom you purchased the product.
- If the product is repaired by personnel without the proper knowledge or skills, it may cause serious accidents or injury, as well as adversely affecting the performance.

## Troubleshooting

Problem	Cause	Remedy
The diameter of the flare is too small.	The tube end was pinched due to feeding the blade too quickly when the tube was cut.	Feed the cutter blade more slowly to cut the tube. (Refer to page 11.)
	Burrs were left on the tube end.	Remove the burrs. (Refer to page 12.)
	There was a space between the tube end and the stopper plate.	Place the tube, taking care not to leave a space between the tube end and the stopper plate. (Refer to page 12.)
	The idling time from when the clutch started operating was too short.	Increase the idling time. (Refer to page 14.)
	Flaring pressure is diminished.	Ask for inspection or repairs. (Refer to page 19.)
The diameter of the flare is too large.	Tube end is poking out from the stopper plate.	Place the tube so that the tube end is in contact with the stopper plate. (Refer to page 12.)
	The idling time from when the clutch started operating was excessive.	Decrease the idling time. (Refer to page 14.)
Ring-shaped flaws occur on the inside of the flare. (If the flaws are superficial, this does not pose a problem.)	Large burrs were left on the tube end.	Remove the burrs. (Refer to page 12.)
	The idling time from when the clutch started operating was too short.	Make the idling time longer. (Refer to page 14.)
	Flaring pressure is diminished.	Ask for inspection or repairs. (Refer to page 19.)
Flaws other than ring-shaped ones (vertical flaws, dents, etc.) occur on the flared inner surface of the tube.	Flaws were made while removing burrs inside the tube.	Remove the burrs without making any flaws on the inside of the tube. (Refer to page 12.)
	Dirt or scrap adhered to the flare cone or the inside of the tube.	Remove any dirt or scrap. (Refer to page 12.)
	Flaring pressure is diminished.	Ask for inspection or repairs. (Refer to page 19.)
A larger protrusion (0.3 mm or more) can be seen on the external surface of the flare.	The clamp knob wasn't tightened enough leaving too much clearance between the liners.	Tighten the clamp knob until there is no space between the liners.
A larger step (0.3 mm or more) can be seen on the external surface of the flare.	The liner was attached with steps in it.	Attach the liner without steps. (Refer to page 13.)
	There was a step (0.3 mm or more) on the surface of the clamp where the liner was installed.	Ask for inspection or repairs. (Refer to page 19.)
The flare is not symmetric.	Flaring was done on a tube that was cut at an angle.	Cut at right angles to the tube.
	Flaring was done on a tube that was too flat or bent.	Flare the tube where it is not too flat or bent.

Table 9

# Before Asking for Repairs or Servicing

Problem	Cause	Remedy
Unsatisfactory shape of the flange.	The idling time from when the clutch started operating was too short.	Increase the idling time. (Refer to page 11.)
You cannot attach the clamp with the tube in it to the flanging tool.	The end of the tube is sticking out of the clamp. (The number of threads is wrong or the tube is deformed.)	Check the number of threads and see if the tube is deformed. (Refer to page 16.)
You can hear the sound of the motor but the flanging tool won't flange even when the trigger is pulled ON.	The end of the tube is sticking out of the clamp. (The number of threads is wrong or the tube is deformed.)	Check the number of threads and see if the tube is deformed. (Refer to page 16.)
	The internal mechanism of the flanging tool is damaged.	Ask for inspection or repairs. (Refer to page 19.)
The flaring/flanging tool does not work even when the trigger is pulled ON.	The battery has run out.	Recharge the battery. (Refer to page 10.)
	There are insulators, such as dirt, between the battery and the contacts on the tool.	Remove the insulators.
	The wiring or the motor is faulty.	Ask for inspection or repairs. (Refer to page 19.)
The green lamp does not flash on and off slowly even if connected to the power. (Storage battery has not been set up properly)	The power cord is broken.	Replace the power cord.
	Fault with the power supply (breaker etc.).	Check the power supply.
	The charger is out of order.	Ask for inspection or repairs. (Refer to page 19.)
The red lamp on the charger is flashing slowly.	The temperature of the storage battery is outside the proper range.	Ensure that you operate within the correct temperature range for the storage battery. (0 - 50°C)
The red lamp on the charger does not light up. (Charging is not possible.)	There are insulators, such as dirt, between the battery and the contacts on the flanging tool.	Remove the insulators.
The red and green lamps on the charger are lit at the same time.	The storage battery is out of order.	Replace the battery.
The green lamp does not light up even if you charge it for more than two hours. (Charging is not completed)	The charger is out of order.	Ask for inspection or repairs. (Refer to page 19.)

Table 10

# Optional Accessories For RF20S

\*Optional accessories are also sold separately as below.

## 1) Clamp for flaring (Fig. 38)

Part No. 424950

(Same as the current model; Part No. 424760)

Used when flaring copper tube.

Liners and cones for flaring copper tube are required.

Although it is possible to cope with different tube sizes by replacing just the liner with an appropriate one, we recommend you flare  $\frac{1}{4}$ ",  $\frac{3}{8}$ ",  $\frac{1}{2}$ ",  $\frac{5}{8}$ " or  $\frac{3}{4}$ " diameter copper tubes using a clamp with a suitable liner as one set.

## 2) Liners for flaring (Fig. 39)

(Same as the conventional ones.)

Part No.	Model
424850	New refrigerant class 2 liner $\frac{1}{4}$ " (6.35 mm)
424852	New refrigerant class 2 liner $\frac{3}{8}$ " (9.52 mm)
424853	New refrigerant class 2 liner $\frac{1}{2}$ " (12.70 mm)
424854	New refrigerant class 2 liner $\frac{5}{8}$ " (15.88 mm)
424855	New refrigerant class 2 liner $\frac{3}{4}$ " (19.05 mm)

These liners are used for  $\frac{1}{4}$ ",  $\frac{3}{8}$ ",  $\frac{1}{2}$ ",  $\frac{5}{8}$ " and  $\frac{3}{4}$ " copper tubes, respectively.

Purchasing a liner together with a clamp as a set saves labour when replacing liners.

## 3) Batteries (Lithium-ion batteries) (Fig. 40)

Part No. 424982

For convenience, keep a spare battery.

No other manufacturer's battery can be used.

## 4) Charger for 220V (Fig. 41)

Part No. 424981

No other manufacturer's charger can be used.

## 5) Carrying case (Fig. 42)

Part No. 424959

## 6) Flanging tool set (Fig. 43)

Part No. 424980

(Same as the current model.)

\*By using the tool sets, the RF20S can be used as flanging tool. These sets are used for flanging stainless flexible tubes for water supply, respectively.

Contents:

Flanging cone	1
Clamp for flanging	2
Liner for $\frac{1}{2}$ "	1 Set
Liner for $\frac{3}{4}$ "	1 Set
Hex key	1

\*Cone is compatible with previous models.

## 7) RB tube cutter Model N28 (Fig. 44)

Part No. 427128

### 1) Clamp

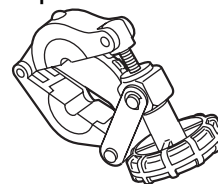


Fig. 38

### 2) Liners

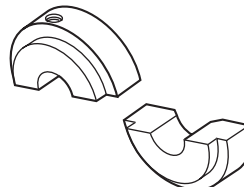


Fig. 39

### 3) Batteries (Lithium-ion batteries)

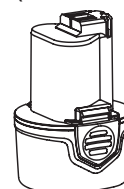


Fig. 40

### 4) Charger

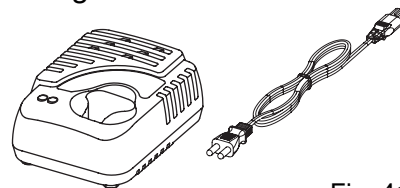


Fig. 41

### 5) Carrying case

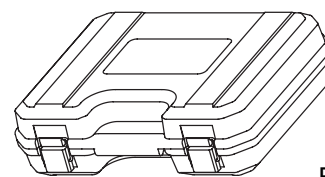


Fig. 42

### 6) Flanging tool set

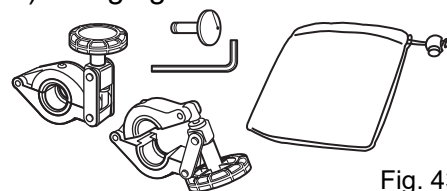


Fig. 43

### 7) RB tube cutter Model N28

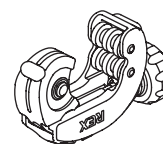


Fig. 44



# Optional Accessories For RT20S

\*Optional accessories are also sold separately as below.

## 1) Clamp for flanging (Fig. 45)

Part No. 424975

(Same as the current model.)

Used when flanging stainless flexible tube.

Liners and cones for flanging stainless flexible tube are required.

## 1) Clamp

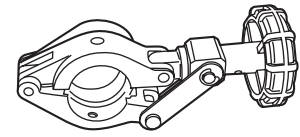


Fig. 45

\*When flaring copper tube with the RT20S, separate clamps, liners and cones for flaring copper tube are required. (Refer to Figs. 38-39, Fig.50)

Although it is possible to cope with different tube sizes by replacing just the liner with an appropriate one, we recommend you flange 1/2", and 3/4" diameter stainless flexible tubes using a clamp with a suitable liner as one set.

## 2) Liners for flanging (Fig. 46)

(Same as the conventional ones.)

Part No.	Model
424777	Liner 1/2" (16.8 mm)
424778	Liner 3/4" (20 mm)

These liners are used for 1/2" and 3/4" stainless flexible tubes, respectively.

Purchasing a liner together with a clamp as a set saves labour when replacing liners.

## 2) Liners

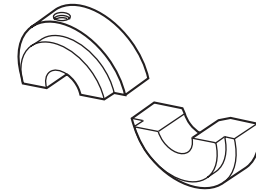


Fig. 46

## 3) Batteries (Lithium-ion batteries)

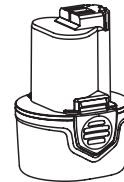


Fig. 47

## 4) Charger

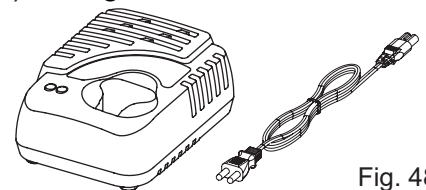


Fig. 48

## 3) Batteries (Lithium-ion batteries) (Fig. 47)

Part No. 424982

For convenience, keep a spare battery.

No other manufacturer's battery can be used.

## 4) Charger for 220V (Fig. 48)

Part No. 424981

No other manufacturer's charger can be used.

## 5) Carrying case

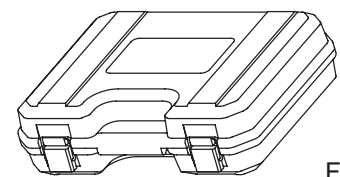


Fig. 49

## 5) Carrying case (Fig. 49)

Part No. 424984

## 6) Flare cone (Fig. 50)

Part No. DF14

Flare cone used for flaring copper tube.

Refer to Pg. 16 for replacing flare cones.

## 6) Flare cone



Fig. 50

## 7) Flexible tube cutter (Fig. 51)

Part No. 1703F2

## 7) Flexible tube cutter 20

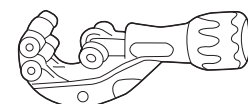


Fig. 51

## **Guarantee and Exemption from Liability**

1. Should the product happen to break down for no apparent reason, despite normal and correct use, repairs and service parts shall be provided free of charge as outlined below.

Repairs shall be provided free of charge for a period of one year from date of purchase. Dates, procedures and methods for providing repairs and service parts shall be decided in consultation with the customer.

After the one-year guarantee period, all repairs and service parts will be charged.

Repairs may be charged even within the guarantee period under the following circumstances:

- if the product has not been used according to the instructions in the Operation Manual
- if it has been used for anything other than its intended purpose
- if it has not been repaired according to the Operation Manual or if it has been remodeled
- if consumables need replacing
- if it has been handled in an inappropriate way.

2. REX will accept no responsibility under the following circumstances:

- if a malfunction or accident occurs as a result of fire, abnormal fluctuations in voltage, damage from flood, earthquakes, lightning or other natural disasters, war, conflict, riot, terrorism or pollution, etc.
- when the product has not been operated according to the Operation Manual
- when the product has been used incorrectly, repaired or remodelled inappropriately
- when a malfunction or accident results from using a workpiece made on the product, or leaving it lying around and/or if it is exposed to the elements
- when a malfunction or accident results from using a workpiece produced on the product either while or after connecting it.

3. Any costs incurred by the manufacturer shall not exceed the purchase price of the product.



The terminals on used lithium-ion batteries should be wrapped in insulating tape to prevent short circuits, and should be disposed of in accordance with the relevant, prevailing laws of the country of use.

## **Environmental Protection**

Observe national regulations on environmentally compatible disposal and on the recycling of disused machines, packaging and accessories.

Battery packs must not be disposed of with regular waste. Return faulty or used battery packs to your Rex dealer!

Do not allow battery packs to come into contact with water!



Only for EU countries: Never dispose of power tools in your household waste!

In accordance with European Guideline 2002/96/EC on used electronic and electric equipment and its implementation in national legal systems, used power tools must be collected separately and handed in for environmentally compatible recycling. Before disposal, discharge the battery pack in the power tool. Prevent the contacts from short circuiting (e. g. by protecting them with adhesive tape).

# REX

[www.rexind.co.jp](http://www.rexind.co.jp)

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