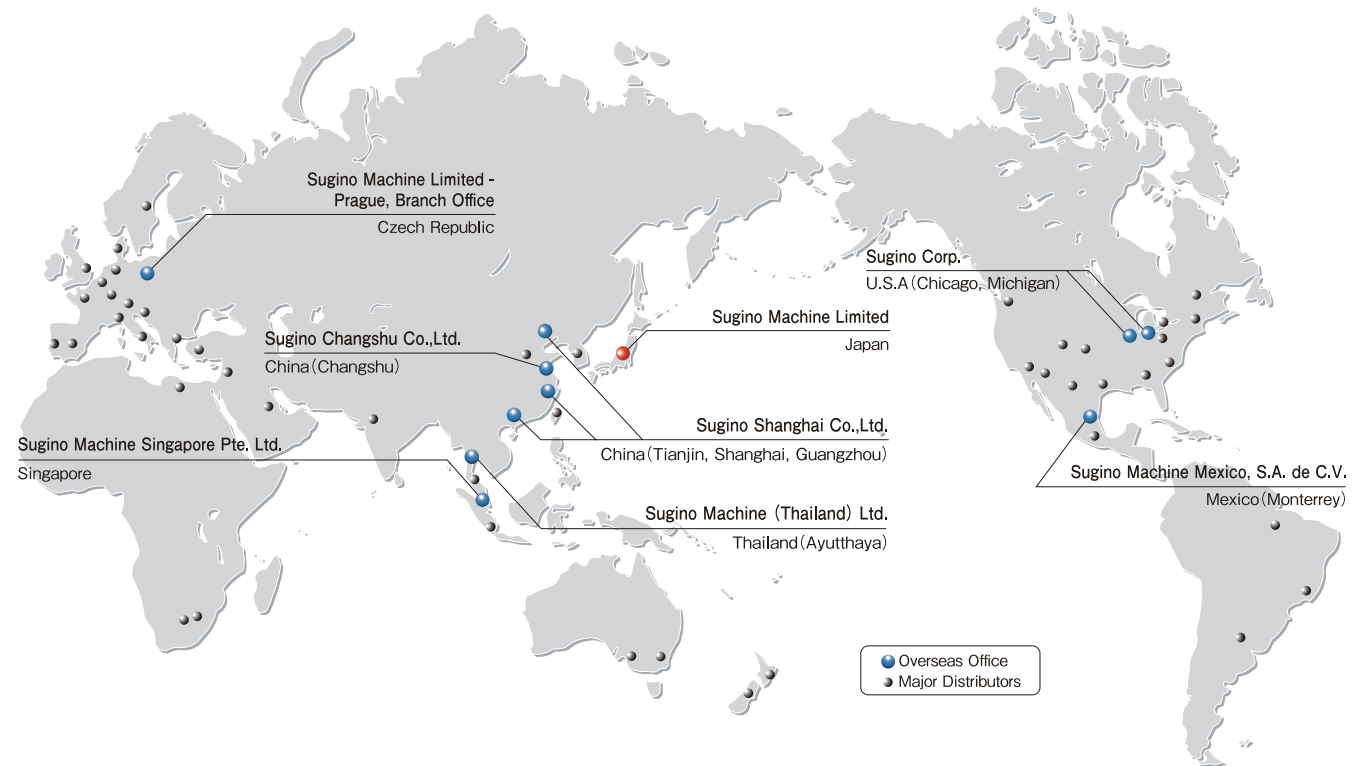


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Maintenance Tool



Maintenance Tool

Sugino Machine designs and manufactures equipment and auxiliary tools, which are required for maintenance of machines such as heat exchangers and condensers. The wide range of products will satisfy requirements for any type of tube maintenance, such as cleaning, cutting and pulling.



C O N T E N T S

Tube Cutting

| | |
|---------------------|---|
| Rolling Tube Cutter | 4 |
| Tube Cutter | 5 |

Tube Pulling

| | |
|----------------------|----|
| Tube Puller | 6 |
| Smart Puller | 8 |
| Quick Puller | 10 |
| Tube Extracting Tool | 11 |

Tube Cleaning

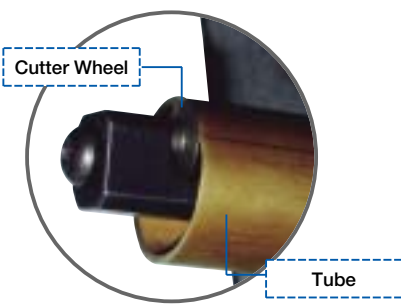
| | |
|------------------|----|
| Tube Cleaner | 12 |
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| | |
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| Inquiry Sheet | 17 |
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TUBE CUTTING

Rolling Tube Cutter

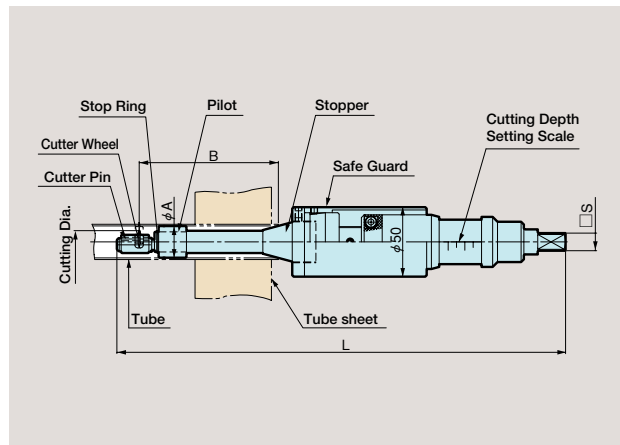
Cuts tubes promptly by pressing a cutter wheel to the tube inner surface.
It does not create any chips that need to be collected, so man-hours are reduced.



Specifications (mm)

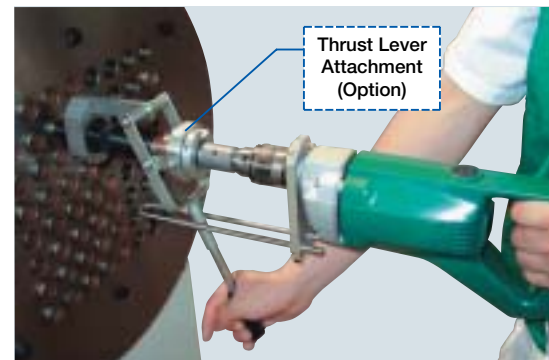
| Model No. | Tube size | | Cutting Dia. | | Distance from tube end B | Tool Length L | Shank □S | Pilot φA |
|---------------------|-----------|-----------|------------------------------------|------|-------------------------------------|---------------|----------|--|
| | O.D. | Thickness | Min. | Max. | | | | |
| RC-16×0.5-1.25 | 16 | 0.5~1.25 | 12.7 | 17.5 | Max.150 ⁰ ₋₁₀ | 410 | 12.7 | Custom make as per application tube size and dimension of expansion area. Please provide us tube size information. |
| RC-16×0.5-1.25-75L | | | Max.75 ⁰ ₋₁₀ | 335 | | | | |
| RC-19×0.5-2.1 | 19 | | 13.8 | 20.0 | Max.150 ⁰ ₋₁₀ | 410 | | |
| RC-19×0.5-2.1-75L | | | Max.75 ⁰ ₋₁₀ | 335 | | | | |
| RC-25.4×0.5-2.1 | 25.4 | 0.5~2.1 | 20.1 | 27.4 | Max.150 ⁰ ₋₁₀ | 410 | | |
| RC-25.4×0.5-2.1-75L | | | Max.75 ⁰ ₋₁₀ | 335 | | | | |
| RC-31.8×0.5-2.1 | 31.8 | | 26.5 | 33.8 | Max.150 ⁰ ₋₁₀ | 410 | | |
| RC-31.8×0.5-2.1-75L | | | Max.75 ⁰ ₋₁₀ | 335 | | | | |

Dimensions (mm)



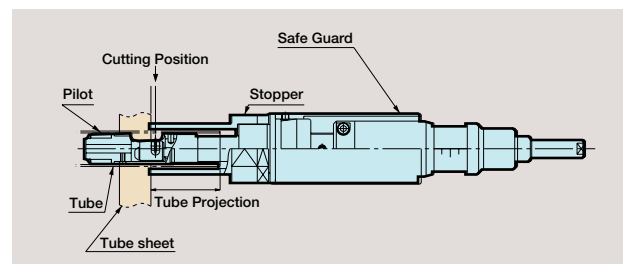
Thrust Lever Attachment (Option)

Attaches to the driving unit.
Leverage increases thrust and reduces the operator burden.



Note: When ordering, please state the name of the manufacturer and the product number of the driving unit.

Dimensions



Special Rolling Tube Cutter for Tube Projection Cutting

Tube projection can be cut without generating cutting chips, which traditionally could only be done by grinding.



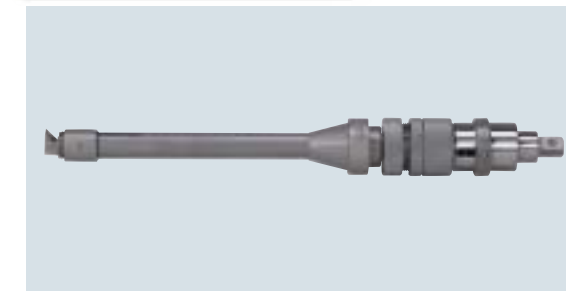
●Suitable Tube Size (mm): OD φ 22~33 Thickness t0.5~2.1

Please refer to page 17 when ordering Rolling Tube Cutter.

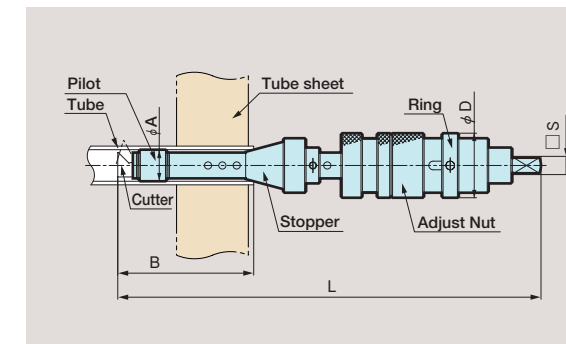
Tube Cutter

Cuts tubes to allow removal of defective and deteriorated tubes from condensers and heat exchangers, without damaging their tube sheets. Two types of tube cutters depending on the differences in tube size are available.

Tube Cutter TC type



Dimensions (mm)



Specifications (mm)

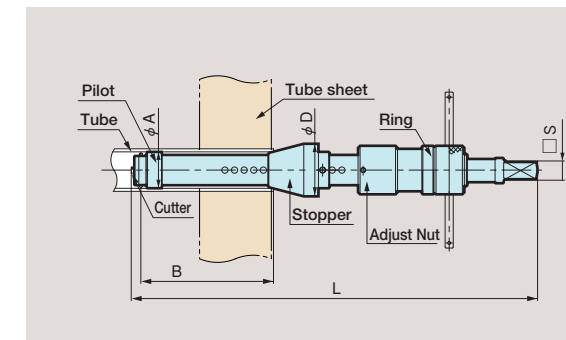
| Model No. | Tube I.D. | Cutting Dia. | | Distance from tube end B | Tool Length L | Tool Dia. D | Shank □S | Pilot φA | | |
|----------------------|-----------|-------------------|------|--------------------------|---------------|-------------|----------|----------|-----|------|
| | | Min. | Max. | | | | | | | |
| TC-φ10×75LN (150LN) | 10 | 10 | 17 | Max.75 (Max.150) | 201 (276) | 31 | 9.5 | 10 | 9.5 | |
| TC-φ11×75LN (150LN) | 11 | 10 | 17 | | 11 | | | 10.5 | | |
| TC-φ12×75LN (150LN) | 12 | 12 | 20 | | 12 | | | 11.5 | | |
| TC-φ13×75LN (150LN) | 13 | 12 | 20 | | 13 | | | 12.5 | | |
| TC-φ14×75LN (150LN) | 14 | 14 | 24 | | 14 | | | 13.5 | | |
| TC-φ15×75LN (150LN) | 15 | 14 | 24 | | 15 | | | 14.5 | | |
| TC-φ16×75LN (150LN) | 16 | 16 | 27 | | 16 | | | 15.5 | | |
| TC-φ17×75LN (150LN) | 17 | 16 | 27 | | 17 | | | 16.5 | | |
| TC-φ18×75LN (150LN) | 18 | 18 | 30 | | 18 | | | 17.5 | | |
| TC-φ19×75LN (150LN) | 19 | 18 | 30 | | 19 | | | 18.5 | | |
| TC-φ20×100LN (200LN) | 20 | Max.100 (Max.200) | 38 | 295 (395) | 45 | 12.7 | 20 | 19.5 | | |
| TC-φ21×100LN (200LN) | 21 | | | | | | 20 | 33 | 21 | 20.5 |
| TC-φ22×100LN (200LN) | 22 | | | | | | 20 | 33 | 22 | 21.5 |
| TC-φ23×100LN (200LN) | 23 | | | | | | 20 | 33 | 23 | 22.5 |
| TC-φ24×100LN (200LN) | 24 | | | | | | 23 | 38 | 24 | 23.5 |
| TC-φ25×100LN (200LN) | 25 | | | | | | 23 | 38 | 25 | 24.5 |

Notes 1. Amount in bracket is for long reach type.
2. As a standard pilot, one each of dimension A is attached.
3. If a pilot is required that does not have the standard dimensions, please state the required dimension.

Tube Cutter TB type



Dimensions (mm)



Specifications (mm)

| Model No. | Tube I.D. | Cutting Dia. | | Distance from tube end B | Tool Length L | Tool Dia. D | Shank □S | Pilot φA | |
|--------------------|-----------|--------------|------|--------------------------|---------------|-------------|----------|----------|------|
| | | Min. | Max. | | | | | | |
| TB-φ26×150L (300L) | 26 | 26 | 36 | 343 (493) | 44 | 12.7 | 26 | 25.5 | |
| TB-φ27×150L (300L) | 27 | 27 | | | | | 27 | 26.5 | |
| TB-φ28×150L (300L) | 28 | 28 | | | | | 28 | 27.5 | |
| TB-φ29×150L (300L) | 29 | 29 | | | | | 29 | 28.5 | |
| TB-φ30×150L (300L) | 30 | 30 | | | | | 30 | 29.5 | |
| TB-φ31×150L (300L) | 31 | 31 | | | | | 31 | 30.5 | |
| TB-φ32×150L (300L) | 32 | 32 | | | | | 32 | 31.5 | |
| TB-φ33×150L (300L) | 33 | 33 | | | | | 33 | 32.5 | |
| TB-φ34×150L (300L) | 34 | 34 | | | | | 34 | 33.5 | |
| TB-φ36×150L (300L) | 36 | 36 | | | | | 50 | 36 | 35.5 |
| TB-φ38×150L (300L) | 38 | 38 | 58 | 400 (550) | 52 | 19 | 38 | 37.5 | |
| TB-φ40×150L (300L) | 40 | 40 | | | | | 40 | 39.5 | |
| TB-φ42×150L (300L) | 42 | 42 | | | | | 42 | 41.5 | |
| TB-φ44×150L (300L) | 44 | 44 | | | | | 44 | 43.5 | |
| TB-φ46×200L (400L) | 46 | 46 | | | | | 46 | 45.5 | |
| TB-φ48×200L (400L) | 48 | 48 | | | | | 48 | 47.5 | |
| TB-φ50×200L (400L) | 50 | 50 | | | | | 68 | 50 | 49.5 |

Notes 1. Amount in bracket is for long reach type.
2. As a standard pilot, one each of dimension A is attached.
3. If a pilot is required that does not have the standard dimensions, please state the required dimension.

Please refer to page 17 when ordering Tube Cutter.

TUBE PULLING

Tube Puller

Pulls out condenser and heat exchanger tubes. The components of the unit consist of hydraulic pump, cylinder, hose and attachments.



Puller Head Cylinder and Accessories

Clamps a tube and pulls it out.



Spear



Adaptor

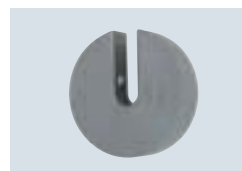


Cylinder (PU30CY model)

Collar



Horse shoe Lock



Specifications

| Model No. | Max. Pulling Force | Pulling Stroke | Dimensions | Weight |
|-----------|--------------------|----------------|---------------|--------|
| | kN | mm | mm | kg |
| PU30CY | 300 | 150 | φ 135×319×185 | 17.5 |

List of Items (Connection parts excluded)

- ① Cylinder (PU30CY, Coupler 2 pcs included)
- ② Pump (PU30P, Couplers excluded)
- ③ High Pressure Hose 2 pcs (5m, Coupler and NPT Adapters included)

- Notes
1. Couplers are not included to the Pump.
 2. Couplers attached with High Pressure Hose are for connecting High Pressure Hose and Cylinder. When attaching High Pressure Hose and Pump, connect them directly with NPT Adapters.
 3. In case of connecting High Pressure Hose and Pump by Couplers, special spec. High Pressure Hose will be needed.

Please refer to page 17 when ordering Tube Puller.

Accessory Combinations

Accessory for Tube Puller.
Suitable accessory can be supplied as per application tube size.

Selection Guide (mm)

| Applicable Tube I.D. | Spear | Collar | Adaptor | Horse shoe Lock |
|----------------------|--------------------|------------------------|------------------------|------------------------|
| | Model No. | Model No. | Model No. | Model No. |
| 9~10 | ID. 9 (PUY09) | | | |
| 10~11 | ID.10 (PUY10) | | | |
| 11~12 | ID.11 (PUY11) | | | |
| 12~13 | ID.12 (PUY12) | | | |
| 13~14 | ID.13 (PUY13) | | | |
| 14~15 | ID.14 (PUY14) | | | |
| 15~16 | ID.15 (PUY15) | O.D.11-25 (PUC1125) | O.D.11-25 (PUA1125) | O.D.11-25 (PUT1125) |
| 16~17 | ID.16 (PUY16) | | | |
| 17~18 | ID.17 (PUY17) | | | |
| 18~19 | ID.18 (PUY18) | | | |
| 19~20 | ID.19 (PUY19) | | | |
| 20~21 | ID.20 (PUY20) | | | |
| 21~22 | ID.21 (PUY21) | | | |
| 22~23 | ID.22 (PUY22) | | | |
| 22~24 | ID.22-24 (PUY2224) | O.D.25-30 (PUC2530) | O.D.25-40 (PUA2540) | O.D.25-40 (PUT2540) |
| 24~26 | ID.24-26 (PUY2426) | | | |
| 26~28 | ID.26-28 (PUY2628) | | | |
| 28~30 | ID.28-30 (PUY2830) | | | |
| 30~32 | ID.30-32 (PUY3032) | O.D.30-40 (PUC3040) | | |
| 32~34 | ID.32-34 (PUY3234) | | | |
| 34~36 | ID.34-36 (PUY3436) | | | |
| 36~38 | ID.36-38 (PUY3638) | | | |
| 38~40 | ID.38-40 (PUY3840) | O.D.40-50 (PUC4050) | O.D.40-50 (PUA4050) | O.D.40-50 (PUT4050) |
| 40~42 | ID.40-42 (PUY4042) | | | |
| 42~44 | ID.42-44 (PUY4244) | | | |
| 44~46 | ID.44-46 (PUY4446) | | | |
| 46~48 | ID.46-48 (PUY4648) | | | |
| | | | | |

Notes 1. For further dimension details, please feel free to contact us at your nearest Sugino office.
2. Part Code of the Accessories is indicated in ().

Pump

This is a hydraulic pump unit to control tube pulling force.



EPU-30 model

Pump Specifications

| Model No. | Pressure | Dimensions | Weight |
|-------------------|----------|--------------------------------|--------|
| | MPa | mm | kg |
| EPU-30 (PU30P) | 70 | 156W × 203L × 406H | 13 |

Electric Motor Specifications

| Output kW | No.of Poles P | Voltage V | Rated Current | |
|--------------|---------------------|------------------------|---------------|-----------|
| | | | 50Hz A | 60Hz A |
| 0.37 | Commutator motor | Single phase 100 | Max.13.8 | |
| | | Single phase 115 | Max.12 | |

Note : Voltage transformer is required when operating in the area where input voltage is different from motor's standard specification.

Please refer to page 17 when ordering Tube Puller.

Smart Puller

Extracts the deteriorated tube efficiently from a heat exchanger and condenser by a simple button operation. By clamping the tube inner surface to pull out the tube, no spear screwing or removing is necessary, so the working time is reduced significantly.



Tube Puller Head

This head clamps the tube inner surface tightly and pulls out the tube.

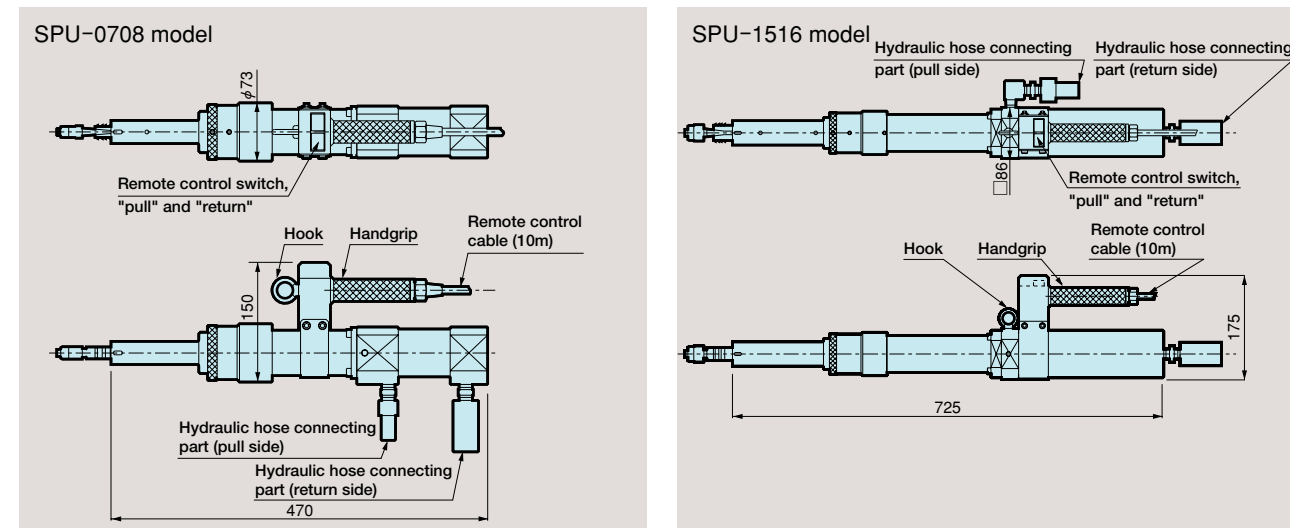


Specifications

| Model No. | Applicable Tube O.D. | | Max. Pulling force | Pulling speed | Pulling Stroke | Dimensions | Weight |
|-----------|----------------------|--------|--------------------|---------------|----------------|--------------|--------|
| | Steel | Copper | | | | | |
| | mm | | kN | mm/s | mm | mm | kg |
| SPU-0708 | 16~38 | | 75 | 17 | Max.80 | φ 73×470×150 | 8 |
| SPU-1516 | 16~38 | | 150 | 9 | Max.160 | □86×725×175 | 15 |

Note : Applicable tube dimension is from 0.5 mm to 1.6 mm in tube wall thickness, and 50 mm in tube-expansion length. The choice of tube puller head will change depending on the fixative status of the tube-expanded part.

Dimensions (mm)



Please refer to page 17 when ordering Smart Puller

Power Controller

Works as a hydraulic pressure unit to control the tube pulling power.



Specifications

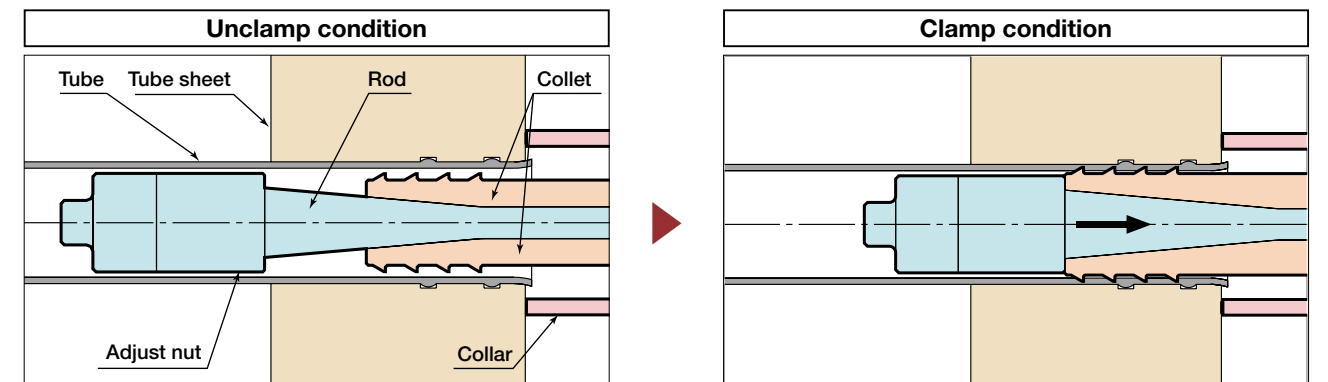
| Model No. | Pressure | | Tank capacity | Output No. of poles P | Electric Motor | | Dimensions | Weight |
|------------|----------|-----|---------------|-----------------------------|--------------------------------|------------------------|--------------------------------|--------|
| | High | Low | | | voltage V | Rated Current A | | |
| | MPa | L | mm | kg | | | | |
| SPC-70M1-S | 70 | 5 | 9.5 | 0.84 kW Commutator Motor | 1-phase 200 V 1-phase 200 V | Max.14.3 A Max.13 A | 350W × 390L × 550H | 39 |

Note : Voltage transformer is required when operating in the area where input voltage is different from motor's standard specification.

A complete set

| | | | |
|---|--------|--------------------|--------|
| ① Tube Puller Head | 1 set | ⑥ Disassembly Tool | 1 set |
| ② Power Controller | 1 set | ⑦ Ground Wire (5m) | 1 pcs. |
| ③ Hydraulic hose (10m long) | 2 pcs. | ⑧ Tool box | 1 set |
| ④ Adaptor for release residual pressure (male & female) | 1 set | | |
| ⑤ Accessories (Refer to the following figure) | 1 set | | |

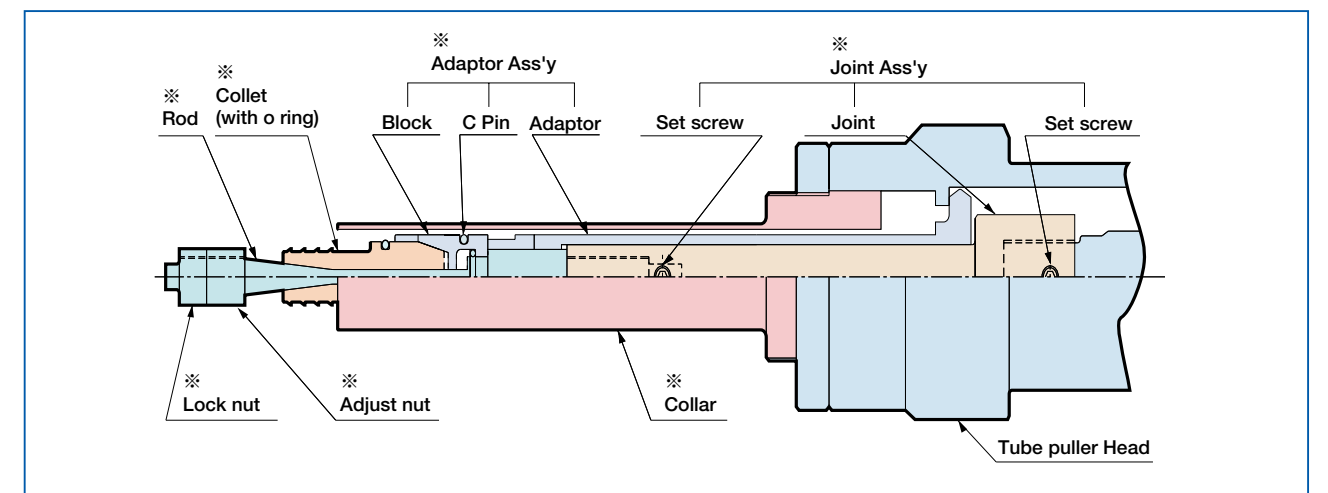
Pulling mechanism of tubes by Smart Puller



A collet of the tube puller head is being inserted.

If the PULL switch on the remote controller is pressed, the collet will expand and clamp the tube inner surface tightly to extract the tube in the direction of the arrow as shown in the illustration above.

Accessories for Smart Puller



Note : ※ mark shows the accessories. These accessories are supplied according to the tube specifications to be pulled out.

Please refer to page 17 when ordering Smart Puller

Quick Puller

Continuously pulls out the corroded tubes of heat exchangers and condensers. It screws a spear into the tube and is operated by a button in the controller panel. With a maximum pulling force to 300 kN, it can extract a large tube easily.

Tube Puller Head

This head clamps a tube and pulls it out.



QPU-30N model



Patent Number
KR:0261661

Specifications

| Model No. | Applicable Tube O.D. | | Initial Pulling | | Quick Pulling | | Air pressure | Air consumption | Dimensions | Weight |
|-----------|----------------------|----------|-----------------|---------------|---------------|---------------|--------------|-----------------|----------------|--------|
| | Steel | Copper | Pulling force | Pulling speed | Pulling force | Pulling speed | | | | |
| | mm | | kN | m/min | kN | m/min | MPa | L/min (ANR) | mm | kg |
| QPU-30N | 9.5~25.4 | 9.5~30.0 | 150 | 0.7 | 75 | 4.3 | 0.5 | 500 | 479W×358L×209H | 19 |
| QPU-50N | 9.5~45.0 | 9.5~50.8 | 300 | 0.4 | 150 | 2.8 | | | 565W×422L×253H | 42 |

Power Controller

This is a hydraulic control unit to regulate pulling force and pulling speed of tubes.



Specifications

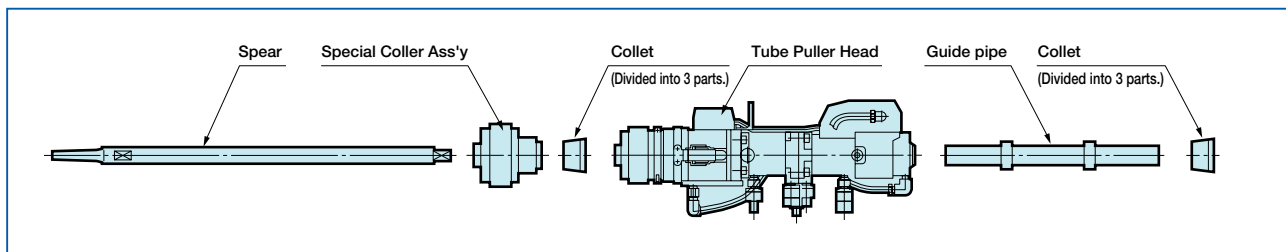
| Model No. | Pump | | | Electric Motor | | | | Dimensions | Weight |
|-----------|--|---|--------|----------------|-------------|---------------|---------------|----------------|--------|
| | Pressure | Rate | Output | No. of Poles | Voltage | Rated Current | Rated Current | | |
| | MPa | L/min | kW | P | V | 50Hz | 60Hz | mm | kg |
| QPC-350 | 35 for initial pulling, 5 for quick pulling | 5 for initial pulling, 38 for quick pulling (60Hz) | 3.7 | 4 | 3-phase 200 | 14.8 | 14.2 | 996W×500L×900H | 280 |
| | | | | | | 3-phase 220 | — | | |

Note : Voltage transformer is required when operating in the area where input voltage is different from motor's standard specification.

A complete set

| | | | |
|----------------------------|--------|---|--------|
| ① Tube Puller Head | 1 set | ⑥ Primary-side power cable | 1 pc. |
| ② Power Controller | 1 set | ⑦ Spear | 1 pc. |
| ③ Special Coller Ass'y | 1 set | ⑧ Collet | 2 pcs. |
| ④ Hydraulic hose(10m long) | 4 pcs. | ⑨ Guide pipe | 1 pcs. |
| ⑤ Air Hose(10m long) | 1 pc. | Note : Impact Wrench is available as an option. | |

Accessories for Quick Puller



Please refer to page 17 when ordering Quick Puller.

Tube Extracting Tool

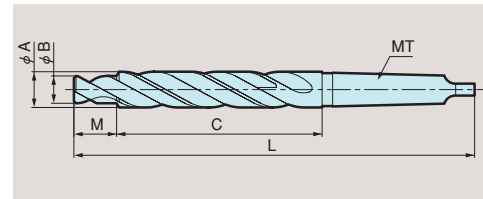
Extracts tubes from a tube sheet. It is the simplest tube extracting tool devoid of bulky equipment or devices.

Tube Drill

Used for reducing the tube wall thickness for easy knockout, or pullout. Manufactured upon minimum quantity basis.



Dimensions (mm)



Specifications (mm)

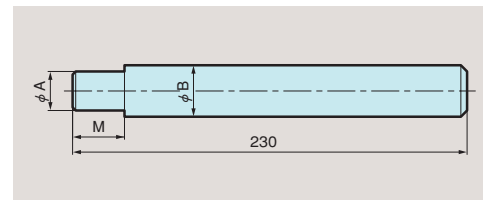
| Model No. | Tube size | | | A | B | C | M | L | Shank |
|-----------|-----------|-----------|-------|------|-------|-----|----|-----|-------|
| | O.D. | Thickness | B.W.G | | | | | | |
| TD-515 | 15.9 | 1.8 | 15 | 15.6 | 11.85 | 117 | 20 | 230 | MT2 |
| TD-516 | | 1.6 | 16 | | | | | | |
| TD-517 | | 1.5 | 17 | | | | | | |
| TD-518 | | 1.2 | 18 | | | | | | |
| TD-519 | | 1.1 | 19 | | | | | | |
| TD-616 | 19.0 | 1.6 | 16 | 18.7 | 15.42 | 132 | 25 | 250 | |
| TD-617 | | 1.5 | 17 | | | | | | |
| TD-618 | | 1.2 | 18 | | | | | | |
| TD-619 | | 1.1 | 19 | | | | | | |
| TD-716 | 22.2 | 1.6 | 16 | 21.8 | 18.60 | 144 | 30 | 266 | |
| TD-717 | | 1.5 | 17 | | | | | | |
| TD-718 | | 1.2 | 18 | | | | | | |
| TD-719 | | 1.1 | 19 | | | | | | |
| TD-816 | 25.4 | 1.6 | 16 | 24.9 | 21.77 | 285 | 30 | 266 | |
| TD-817 | | 1.5 | 17 | | | | | | |
| TD-818 | | 1.2 | 18 | | | | | | |
| TD-819 | | 1.1 | 19 | | | | | | |

Knockout Tool

After reducing the tube wall thickness, the knockout tool is used to remove the tube.



Dimensions (mm)



Specifications (mm)

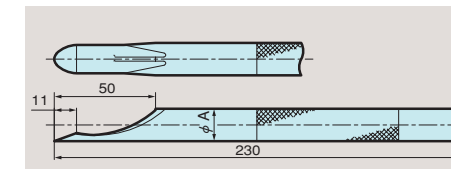
| Model No. | Tube size | | | A | B | M |
|-----------|-----------|-----------|-------|------|------|----|
| | O.D. | Thickness | B.W.G | | | |
| KT-515 | 15.9 | 1.8 | 15 | 11.9 | 15.5 | 25 |
| KT-516 | | 1.6 | 16 | | | |
| KT-517 | | 1.5 | 17 | | | |
| KT-518 | | 1.2 | 18 | | | |
| KT-519 | | 1.1 | 19 | | | |
| KT-616 | 19.0 | 1.6 | 16 | 15.4 | 18.6 | |
| KT-617 | | 1.5 | 17 | | | |
| KT-618 | | 1.2 | 18 | | | |
| KT-619 | | 1.1 | 19 | | | |
| KT-716 | 22.2 | 1.6 | 16 | 18.6 | 21.7 | |
| KT-717 | | 1.5 | 17 | | | |
| KT-718 | | 1.2 | 18 | | | |
| KT-719 | | 1.1 | 19 | | | |
| KT-816 | 25.4 | 1.6 | 16 | 21.8 | 24.8 | |
| KT-817 | | 1.5 | 17 | | | |
| KT-818 | | 1.2 | 18 | | | |
| KT-819 | | 1.1 | 19 | | | |

Collapsing Tool

To collapse the expanded portion of light gauge tubes, or heavy gauge tubes up to O.D.25mm after the wall thickness has been reduced with the tube drill.



Dimensions (mm)



Specifications (mm)

| Model No. | Tube size | | | A |
|-----------|-----------|-----------|-------|------|
| | O.D. | Thickness | B.W.G | |
| CT-1/2 | 12.7 | 0.5~1.8 | 25~15 | 9.6 |
| CT-5/8 | 15.9 | | | 14.5 |
| CT-3/4 | 19.0 | | | 16.6 |
| CT-7/8 | 22.2 | | | 20.0 |
| CT-1 | 25.4 | | | 22.0 |

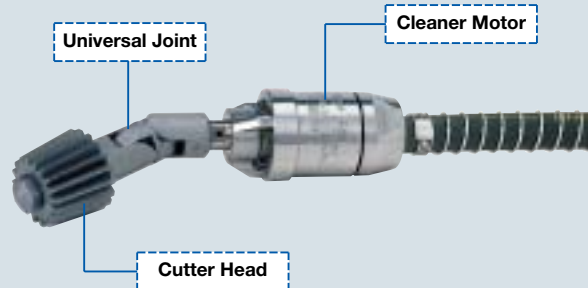
TUBE CLEANING

Tube Cleaner

Works as an automated cleaner for the tube inner surface to remove scale and compounds, which are deposited on the inside of the tube. Sugino provides various types of tube cleaners and attachments, depending on the type and quantity of the scale deposit.

Water driven Tube Cleaner 4000 type

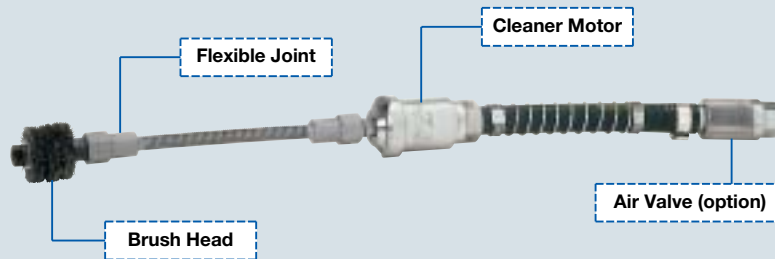
Works as a water-powered cleaner for both straight and curved-tubes. In the case of overloading, it stops the rotation to prevent damaging the tube inner surface and biting into the bending part. By pressurizing water that passes through the cleaner motor and then transferring it to the cutter head, this tool can discharge scale from the tube, and at the same time, cool the connecting head.



Application Example Scale removal from boiler tubes, coolers, heat exchangers, service pipelines.

Air driven Tube Cleaner 7000 type

Works as a compressed air-powered cleaner for both straight and curved-tubes. Because the rotation part is an air-cooled, air-driven rotary motor, this cleaner does not create heat generation after long and continuous use. In the case of overloading, it stops the rotation to prevent damaging the tube inner surface. With the efficient use of exhaust air, this tool clears away loose scale from the tube, and cools the connecting head at the same time.

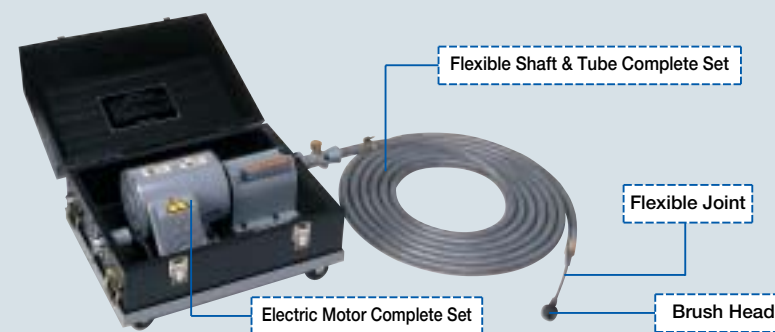


Application Example Scale removal from boilers, condensers, heat exchangers, super heaters, service pipelines.

Electrically driven EG type·EF type

Electric driven Tube Cleaner suitable for both straight and bent tubes. Because of electric type, power supply can be easily obtained. For easy transfer, this electric motor can be stored in a wheeled container.

- Flexible Shaft & Tube Complete Standard Length (selectable)
EG type : 6m/8m/10m
EF type : 10m/15m



Application Example Cleaning of boilers, air conditioning and piping for hospitals, hotels, schools, buildings, department stores.

Selection Guide

Water driven Tube Cleaner 4000type

Water Pressure:0.8MPa

| Tube I.D. mm | Cleaner No. | Connecting Tools | | Cleaning Heads | | | Water Consumption L /min | Min. Curve Radius mm | Hose Size mm |
|-----------------|-------------|------------------|----------------|----------------|----------------|---------------|-----------------------------|-------------------------|-----------------|
| | | Universal Joint | Flexible Joint | Drill Head | Cutter Head | Brush Head | | | |
| 32 | 4010 | U-1010 | X-1010 | D-9 | SP-9 | B-9 BF-9 | 40 | 300 | 9 |
| 35 | 4011 | U-1212 | X-1212 | D-10 | SP-10 | B-10 BF-10 | | 320 | |
| 38 | 4012 | | | D-11 | SP-11 SC-12 | B-11 BF-11 | 50 | 330 | |
| 41 | 4013 | | | D-12 | SP-12 SC-14 | B-12 BF-12 | | 340 | |
| 45 | 4014 | U-1414 | X-1414 | D-14 | SP-14 SC-16 | B-14 BF-14 | 80 | 360 | 15 |
| 48 | 4015 | | | | | B-15 BF-15 | | | |
| 51 | 4016 | U-1614 | X-1614 | D-16 | SC-18 SA-16 | B-16 BE-16 | 100 | 370 | 19 |
| 54 | 4017 | | | | | B-17 BE-16 | | | |
| 57 | 4018 | | | | | B-18 BE-18 | | | |
| 60 | 4019 | U-1816 | X-1816 | D-18 | SA-18 | B-19 BE-18 | 110 | 390 | |
| 64 | 4020 | | | | | B-20 BE-20 | | | |
| 67 | 4021 | U-2018 | X-2018 | D-20 | SA-22B | B-20 BE-20 | 150 | 420 | 25 |
| 70 | 4022 | | | | | | | | |

Air driven Tube Cleaner 7000type

Air Pressure:0.6MPa

| Tube I.D. mm | Cleaner No. | Connecting Tools | | Cleaning Heads | | | Air Consumption L/min (ANR) | Min. Curve Radius mm | Hose Size mm | Air Valve |
|-----------------|-------------|------------------|----------------|----------------|----------------|---------------|--------------------------------|-------------------------|-----------------|-----------|
| | | Universal Joint | Flexible Joint | Drill Head | Cutter Head | Brush Head | | | | |
| 19 | 7006 | U-77 | X-77 | DF-5A | S-5A | B-5A BF-5A | 240 | 230 | 6 | VR-2 |
| 22 | 7007 | U-88 | X-88 | DF-6 | S-6 | B-6 BF-6 | 280 | 250 | | |
| 25 | 7008 | | | DF-7 | S-7 | B-7 BF-7 | 360 | 280 | | |
| 29 | 7009 | U-1010 | X-1010 | D-8 | SP-8 | B-8 BF-8 | 450 | 290 | 9 | VR-3 |
| 32 | 7010 | | | D-9 | SP-9 | B-9 BF-9 | 550 | 300 | | |
| 35 | 7011 | | | D-10 | SP-10 | B-10 BF-10 | 660 | 320 | | |
| 38 | 7012 | U-1212 | X-1212 | D-11 | SP-11 SC-12 | B-11 BF-11 | 780 | 330 | 12 | VR-4 |
| 41 | 7013 | | | | | | | | | |
| 45 | 7014 | U-1414 | X-1414 | D-12 | SP-12 SC-14 | B-12 BF-12 | 900 | 340 | 15 | VR-5 |
| 48 | 7015 | | | | | B-13 BF-12 | | | | |
| 51 | 7016 | | | | | B-14 BF-14 | | | | |
| 54 | 7017 | U-1614 | X-1614 | D-14 | SP-14 SC-16 | B-15 BF-14 | 1,070 | 360 | 19 | VR-6 |
| 57 | 7018 | | | | | B-16 BE-16 | | | | |
| 60 | 7019 | U-1816 | X-1816 | D-16 | SC-18 SA-16 | B-17 BE-16 | 1,210 | 370 | | |
| 64 | 7020 | | | | | B-18 BE-18 | | | | |
| 67 | 7021 | U-2016 | X-2016 | D-18 | SA-18 | B-19 BE-18 | 1,450 | 390 | | |
| 70 | 7022 | | | | | B-20 BE-20 | | | | |

Electrically driven Tube Cleaner EGtype·EFtype

| Tube I.D. mm | Straight | Curved | Cleaner No. | Connecting Tools | | Cleaning Heads | | | Motor Complete | | | | Flexible Shaft & Tube Complete | | | | |
|-----------------|----------|--------|-------------|------------------|----------------|----------------|-------------|------------|----------------|--------------|-------------------|----------------|--------------------------------|------------------|-----------------|-------------------------|-----|
| | | | | Universal Joint | Flexible Joint | Drill Head | Cutter Head | Brush Head | Model No. | Output kW | No. of Poles P | Voltage V | Rated Current 50Hz 60Hz | Shaft Dia. mm | Tube Dia. mm | Min. Curve Radius mm | |
| 17 | | 19 | EG-6N | U-77 | X-77 | DF-5A | S-5A | B-5A | MC-2020 | 1.5 | 2 | 3 phase 200 | 6.2 | 6.0 | 6 | 12 | 150 |
| 19 | | 22 | EG-7N | U-88 | X-88 | DF-6 | S-6 | B-6 | | | | | | | 8 | 16 | 180 |
| 22 | | 25 | EG-8N | | | DF-7 | S-7 | B-7 | | | | | | | 10 | 20 | 230 |
| 25 | | 29 | EG-9N | U-1210 | X-1210 | D-8 | SP-8 | B-8 | | | | | | | 11 | 22 | 250 |
| 29 | | 32 | EG-10N | | | D-9 | SP-9 | B-9 | | | | | | | | | |
| 32 | | 35 | EG-11N | U-1212 | X-1212 | D-10 | SP-10 | B-10 | | | | | | | 13 | 26 | 400 |
| 35 | | 38 | EG-12N | | | D-11 | SP-11 | B-11 | | | | | | | | | |
| 38 | | 45 | EF-14 | U-1614 | X-1614 | D-12 | HC-12 | B-12 | | | | | | | | | |
| 45 | | 51 | EF-16 | | | D-14 | HC-14 | B-14 | | | | | | | | | |
| 51 | | 57 | EF-18 | U-1616 | X-1616 | D-16 | HC-16 | B-16 | | | | | | | | | |
| 57 | | 64 | EF-20 | | | D-18 | HC-18 | B-18 | | | | | | | | | |

- Refer to page 14 & 15 for details of the connecting tools and cleaning heads.
- These cleaners can not be used for the cleaning of blocked tubes.
- For electric driven type, EG and EF type, please use with the designated voltage. Voltage transformer must be used if the input voltage is different from above table.

Please refer to page 17 when ordering Tube Cleaner.

Connecting Tools

Attaches a cleaning head (drill Head, cutter head or brush head) to the tube cleaners .

Universal Joint

Attaches a drill head, cutter head or brush head to the water-driven or air-driven tube cleaner, or electrically driven tube cleaner.



Note : Available for various sizes depending on the type of main body to be attached.

Flexible Joint

Attaches a brush head to the tube cleaners. It has a wide range of usages, for example, it is convenient for a small bending radius tube.



Cleaning Heads

Selectable according to scale type and condition.

Cutter Head

For thin but hard scale.

S type

For small diameter tubes.



| Model No. | Tube I.D. | |
|-----------|-----------|--------|
| | Straight | Curved |
| | mm | |
| S-5A | 17 | 19 |
| S-6 | 19 | 22 |
| S-7 | 22 | 25 |

SP type

For straight and curved tubes.



| Model No. | Tube I.D. | |
|-----------|-----------|--------|
| | Straight | Curved |
| | mm | |
| SP-8 | 25 | 29 |
| SP-9 | 29 | 32 |
| SP-10 | 32 | 35 |
| SP-11 | 35 | 38 |
| SP-12 | 38 | 45 |
| SP-14 | 45 | 51 |

SC type

For tubes with curves of small radii. 3 freely pivoted arms activated centrifugally swing out to give cutters access to any part of tube wall.



| Model No. | Tube I.D. Straight & Curved mm | Cutter Head Size | |
|-----------|--------------------------------------|------------------|------|
| | | Min. | Max. |
| | mm | mm | |
| SC-12 | 38 | 35 | 48 |
| SC-14 | 45 | 40 | 52 |
| SC-16 | 51 | 46 | 60 |
| SC-18 | 57 | 52 | 68 |

SA type

For large diameter tubes. A large version of the SC type. 3 to 4 freely pivoted arms activated centrifugally swing out to give cutters access to any part of tube wall.



| Model No. | Tube I.D. | | Cutter Head Size | |
|-----------|-----------|--------|------------------|------|
| | Straight | Curved | Min. | Max. |
| | mm | | mm | |
| SA-16 | 51 | 57 | 46 | 64 |
| SA-18 | 57 | 64 | 51 | 70 |
| SA-20 | 64 | — | 56 | 76 |
| SA-22B | 70 | 70 | 60 | 83 |

HC type

Usually attached to the electrically driven tube cleaner for cleaning of the curve tubes of boiler. It also works for the removal of rust and film coating on ship's hull.



| Model No. | Tube I.D. | |
|-----------|-----------|--------|
| | Straight | Curved |
| | mm | |
| HC-12 | 38 | 45 |
| HC-13 | 41 | 48 |
| HC-14 | 45 | 51 |
| HC-15 | 48 | 54 |
| HC-16 | 51 | 57 |
| HC-17 | 54 | 60 |

| Model No. | Tube I.D. | |
|-----------|-----------|--------|
| | Straight | Curved |
| | mm | |
| HC-18 | 57 | 64 |
| HC-19 | 60 | 67 |
| HC-20 | 64 | 70 |
| HC-21 | 67 | 73 |
| HC-22 | 70 | 76 |

Drill Head

For general use on hard scale and deposits.

DF type

For a small diameter tube with hard scale.



| Model No. | Tube I.D. | |
|-----------|-----------|--------|
| | Straight | Curved |
| | mm | |
| DF-5A | 17 | 19 |
| DF-6 | 19 | 22 |
| DF-7 | 22 | 25 |

D type

For a midsize diameter tube with hard scale.



| Model No. | Tube I.D. | | Model No. | Tube I.D. | |
|-----------|-----------|--------|-----------|-----------|--------|
| | Straight | Curved | | Straight | Curved |
| | mm | | | mm | |
| D-8 | 25 | 29 | D-14 | 45 | 51 |
| D-9 | 29 | 32 | D-16 | 51 | 57 |
| D-10 | 32 | 35 | D-18 | 57 | 64 |
| D-11 | 35 | 38 | D-20 | 64 | 70 |
| D-12 | 38 | 45 | D-22 | 70 | 76 |

Brush Head

Goods for removing soft scale and deposits, or final finishing after use of a drill or cutter head.

B type

For polishing tube walls, removing soft deposits, or final finishing after use of a drill or cutter head.



| Model No. | Tube I.D. | | Model No. | Tube I.D. | |
|-----------|-----------|--------|-----------|-----------|--------|
| | Straight | Curved | | Straight | Curved |
| | mm | | | mm | |
| B-5A | 17 | 19 | B-13 | 41 | 48 |
| B-6 | 19 | 22 | B-14 | 45 | 51 |
| B-6A | 21 | 24 | B-15 | 48 | 54 |
| B-7 | 22 | 25 | B-16 | 51 | 57 |
| B-7A | 24 | 27 | B-17 | 54 | 60 |
| B-8 | 25 | 29 | B-18 | 57 | 64 |
| B-9 | 29 | 32 | B-19 | 60 | 67 |
| B-10 | 32 | 35 | B-20 | 64 | 70 |
| B-11 | 35 | 38 | B-21 | 67 | 73 |
| B-12 | 38 | 45 | B-22 | 70 | 76 |

BF type

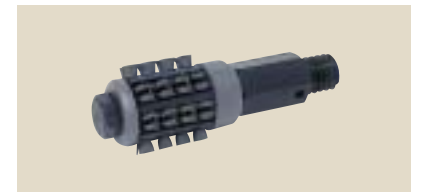
For light cleaning work or final polishing after cleaning by cutter or drill head. The wire tufts swing out centrifugally, and are replaceable.



| Model No. | Tube I.D. | |
|-----------|---------------|-------------|
| | Straight Tube | Curved Tube |
| | mm | |
| BF-5 | 16 | |
| BF-5A | 17.5 | |
| BF-6 | 19 | |
| BF-7 | 22 | |
| BF-8 | 25 | |
| BF-9 | 29 | |
| BF-10 | 32 | |
| BF-11 | 35 | |
| BF-12 | 38 | |
| BF-14 | 45 | |

BE type

Applicable to larger tubes than the BF type, but otherwise the same.



| Model No. | Tube I.D. | |
|-----------|---------------|-------------|
| | Straight Tube | Curved Tube |
| | mm | |
| BE-16 | 51 | |
| BE-18 | 57 | |
| BE-20 | 64 | |
| BE-22 | 70 | |

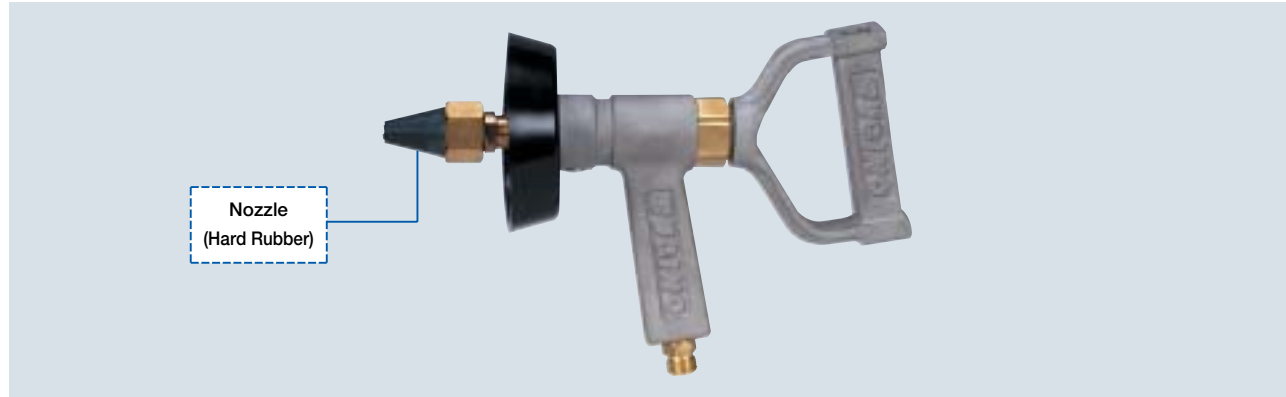
Blow Gun Cleaner

A quick and fast way of cleaning muddy deposits and light scale from tube walls of between 10 and 25mm I.D. straight tube.

Blow gun fires nylon brush or rubber plug along tubes by compressed air or water pressure of 0.4~0.5MPa.

2 types nozzles (hard rubber and copper alloy) are provided.

The simplest cleaning method for regular maintenance of tubes.

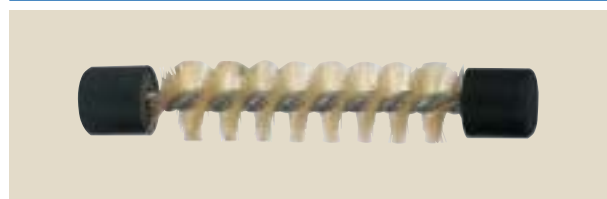


Application Example Removing muddy deposits and light scales of condensers, heat exchangers and oil coolers.

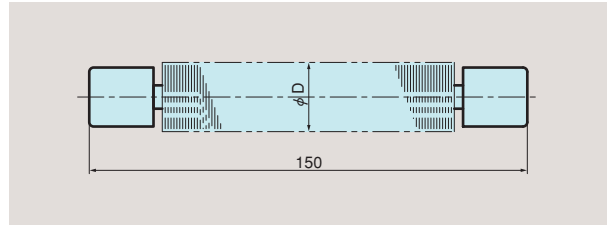
Cleaning Tools

Scales can be removed instantly with nylon brush or rubber plug pushed by compressed air or water.

Nylon Brush



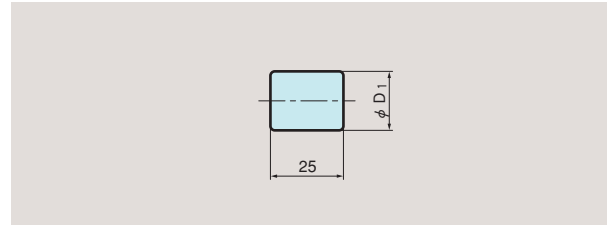
Dimensions (mm)



Rubber Plug



Dimensions (mm)



Selection Guide(mm)

| Tube I.D. | Nozzle No. | Nylon Brush | | Rubber Plug | | Tube I.D. | Nozzle No. | Nylon Brush | | Rubber Plug | |
|-----------|------------|-------------|------|-------------|----------------|-----------|------------|-------------|------|-------------|----------------|
| | | Model No. | D | Model No. | D ₁ | | | Model No. | D | Model No. | D ₁ |
| 8.8~9.4 | ID-10-20 | BN-2C | 9.4 | P-2C | 8.3 | 15.8~16.5 | ID-10-20 | BN-5 | 16.5 | P-5 | 14.8 |
| 9.5~10.1 | | BN-3 | 10.1 | P-3 | 9.0 | 16.6~17.3 | | BN-5B | 17.3 | P-5B | 15.6 |
| 10.2~10.9 | | BN-3B | 10.9 | P-3B | 9.7 | 17.4~18.1 | | BN-5A | 18.1 | P-5A | 16.4 |
| 11.0~11.7 | | BN-3A | 11.7 | P-3A | 10.5 | 18.2~18.9 | | BN-5C | 18.9 | P-5C | 17.2 |
| 11.8~12.5 | | BN-3C | 12.5 | P-3C | 11.3 | 19.0~20.5 | | BN-6 | 20.5 | P-6 | 18.0 |
| 12.6~13.3 | | BN-4 | 13.3 | P-4 | 12.1 | 20.6~22.1 | | BN-6A | 22.1 | P-6A | 19.6 |
| 13.4~14.1 | | BN-4B | 14.1 | P-4B | 12.9 | 22.2~23.7 | | BN-7 | 23.7 | P-7 | 21.2 |
| 14.2~14.9 | | BN-4A | 14.9 | P-4A | 13.7 | 23.8~25.3 | | BN-7A | 25.3 | P-7A | 22.8 |
| 15.0~15.7 | | BN-4C | 15.7 | P-4C | 14.5 | 25.4~26.9 | | BN-8 | 26.9 | P-8 | 24.4 |

Note : These cleaners can not be used for the cleaning of blocked tubes.

Inquiry Sheet

Desirable Reply Date

●Please provides us following information.
(Please make sure that you fill in your details for the fields marked *.)

| | | | |
|-------------------|--|-----------------------|--|
| * Name | | * Interested Products | |
| * Company Name | | * Phone | |
| Company Division | | Fax | |
| * Company Address | | E-mail Address | |
| Postal Code | | | |

●Please fill in the contents of inquiry.
(Please make sure that you fill in your details for the fields marked *.)

| | | | |
|---------|---|----------------|---|
| | * Tube Size | D | t |
| | * Tube Material | | |
| | * Tube Sheet Hole Pitch and Arrangement | P1 | P2 P3 P4 α° |
| | * Tube Sheet Thickness | T1 | T2 |
| | * Tube Sheet Material | | |
| | * Tube Sheet Hole Diameter | H | Tolerance |
| | * Quantity of Tube | | |
| | * Expansion Length | A1 | A2 |
| | * Tube Wall Reduction Rate | % | |
| | * Tube end welded to the tube sheet | Yes* | No |
| | * In case of welding, is it before or after the tubes are expanded? | (Before) | (After) |
| | * Type of Lubrication Used for Tube Expansion? | Yes (Type:) | No |
| | Tube Projection | E | |
| | Tube end shape | Round | Flat |
| | Distance between Double Tube Sheet | C | F |
| | Flare Angle | θ° | |
| | Length of straight tube part | S | |
| | Curve Radius of Bent Tube Part | R | |
| | Groove Size and Distance | l ₁ | l ₂ l ₃ l ₄ h |
| | Sketch of Expansion Section (Yes or No) | | |
| Remarks | | | |

Sugino Pump

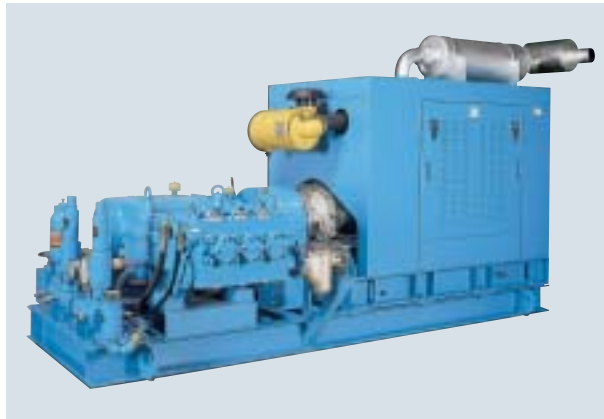
Works as a triplex plunger pump for the cleaning and removing of scale deposit from heat exchangers, piping, tanks and various plant equipment, with high-pressure water. It is durable and easy to maintain. Sugino offers various Sugino Pump with various attachments, depending on uses.

High-Pressure Pump

Includes various types of pumps depending on the specifications required.

High/Low Switching Pump

This pump can switch from high pressure with low flow rate to low pressure with large flow rate by a simple selection switch according to the scale type and condition.



High-pressure /Large-flow pump

This is the most effective pump for cleaning of heat exchangers, condensers, service pipelines, etc. The compact designed pumps can be mounted on the 4.5 ton motor truck.



Flex Reel

Cleans scale deposits on a tube inner surface precisely. The removed scale and waste water are collected from the drain outlet of the hand piece, so the working environment is improved, and also curing process is simplified.



Inner surface cleaning of heat exchanger tubes by Flex Reel.

Application Example Scale removal from the tube inner surface of a heat exchanger, condenser, etc.

Specifications

| Model No. | Pressure | Flow rate | Max. stroke | Feed rate | Air pressure | Air consumption | Applicable Tube I.D. | Dimensions | Recommended Nozzle |
|-----------------|----------|-----------|-------------|-----------|--------------|-----------------|----------------------|------------------|--------------------|
| | MPa | L/min | m | m/min | MPa | L/min (ANR) | mm | mm | |
| JFLXR-12-45N-W | 45 | 40 | 16 | 10~60 | 0.45 | 500 | 19~40 | 610W×950L×1,280H | Spin Nozzle |
| JFLXR-12-120N-W | 120 | 12 | 6 | | | | | | |

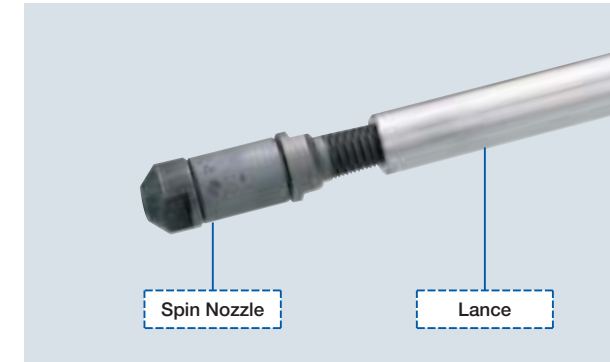
Note : Flex Reel with 2 guns may be manufactured upon request. Please contact your local dealer.

Nozzle

Includes various types of nozzles depending on the cleaning uses.

Spin Nozzle

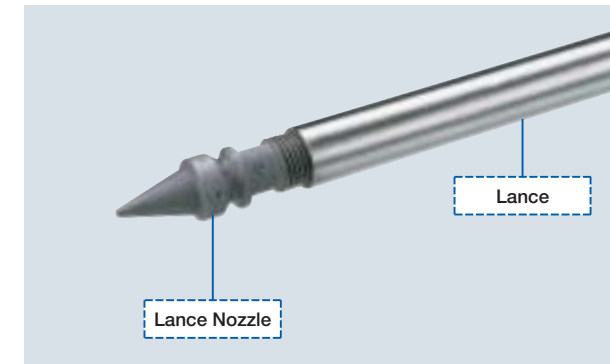
Cleans the heat exchanger's tube inner surface powerfully and precisely. The reaction force from the discharged high-pressure water makes the nozzle rotate at high speed and cleans 360° all over.



Cleaning of heat exchanger with Spin Nozzle.

Lance Nozzle

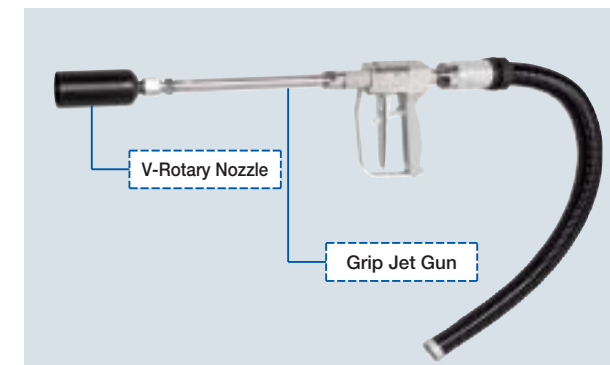
Cleans heat exchanger tubes powerfully. 8-types of nozzles are available, which are provided according to the high-pressure water jetting angle and direction.



Cleaning of heat exchanger with Lance Nozzle.

V-Rotary Nozzle

Cleans scale, rust and film deposited on the outer surface of a heat exchanger. The nozzle rotates while discharging high-pressure water at a specific angle, so that cleaning efficiency is improved significantly with the wide discharge angle.



Outer surface cleaning of heat exchanger by Grip Jet Gun with V-Rotary Nozzle.