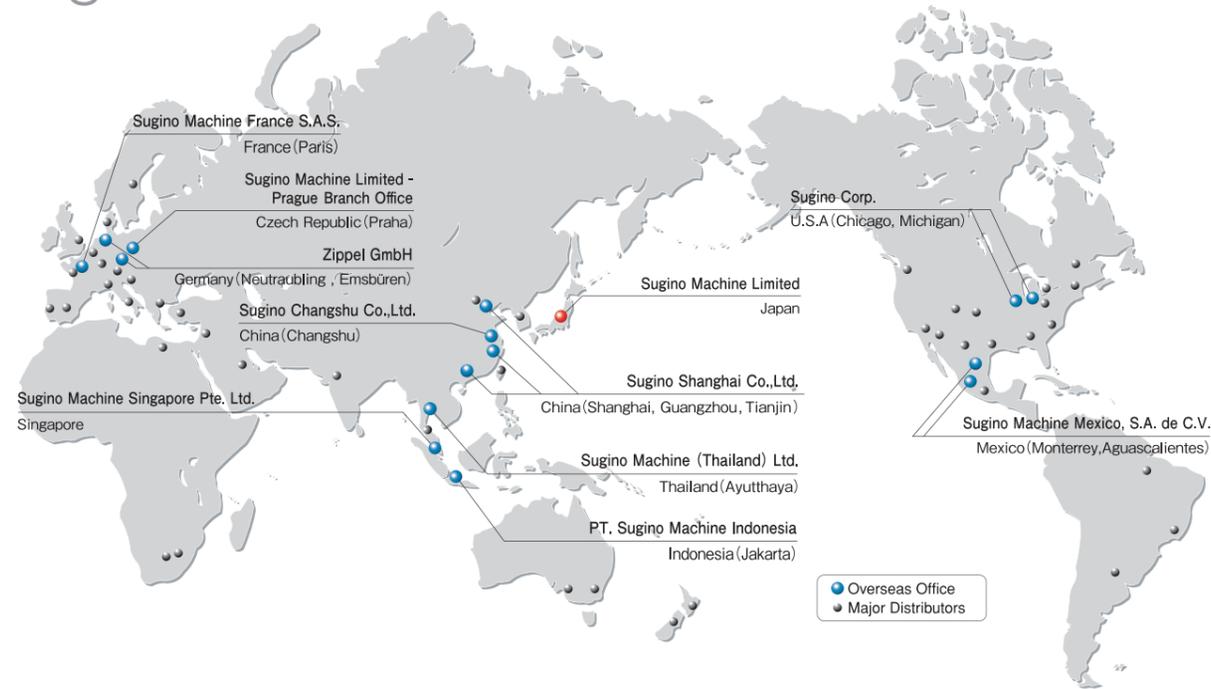


# Sugino Global Network



<http://www.sugino.com>

1-9-13, Nihonbashi-Honcho, Chuo-ku, Tokyo, 103-0023 JAPAN  
 ☎+81-3-5201-5974 FAX +81-3-5201-5978  
 e-mail: export@sugino.com

**Overseas Office**

<b>U.S.A.</b>	Sugino Corp. [Chicago]	☎ +1-630-250-8585 e-mail : mach@suginocorp.com	FAX +1-630-250-8665
	[Michigan]	☎ +1-630-250-8585	FAX +1-630-250-8665
<b>Mexico</b>	Sugino Machine Mexico, S.A. de C.V. [Monterrey]	☎ +52-81-1100-0108 e-mail : ventas@sugino.com.mx	FAX +52-81-1100-0318
	[Aguascalientes]	☎ +52-449-912-3133	
<b>Czech Rep.</b>	Sugino Machine Limited-Prague Branch Office	☎ +420-257-950-228 e-mail : info@sugino.cz	FAX +420-257-950-044
<b>France</b>	Sugino Machine France S.A.S.	☎ +33-1-84-17-49-87 e-mail : contact@sugino.eu	FAX +33-1-84-17-58-86
<b>China</b>	Sugino Shanghai Co., Ltd. [Shanghai]	☎ +86-21-5385-5031 e-mail : sh@sugino.cn	FAX +86-21-5385-5032
	[Guangzhou]	☎ +86-20-8363-4719	FAX +86-20-8363-4992
	[Tianjin]	☎ +86-22-5879-1321	FAX +86-22-5879-1322
<b>Thailand</b>	Sugino Machine (Thailand) Ltd.	☎ +66-3572-9351 e-mail : contact@sugino.th.com	FAX +66-3572-9355
<b>Singapore</b>	Sugino Machine Singapore Pte. Ltd.	☎ +65-6458-9544 e-mail : sales@sugino-singapore.com.sg	FAX +65-6456-7789
<b>Indonesia</b>	PT. Sugino Machine Indonesia	☎ +62-21-2949-6235 e-mail : contact@sugino.co.id	FAX +62-21-2949-6236
<b>Overseas Manufacturing Plant</b>	<b>China</b> Sugino Changshu Co., Ltd.	TEL +86-512-8158-1111	FAX +86-512-8158-1112
<b>Overseas Group Company</b>	<b>Germany</b> Zippel GmbH	☎ +49-9401-9210-0 e-mail : info@zippel.com	FAX +49-9401-9210-25

- Specifications in this catalogue are subject to change without prior notice for further improvement.
- This product and other related technology (include the program) are subject to the terms and conditions of the relevant foreign trade acts depending on end users and their applications. All the relevant forms must be submitted to the Japanese government, including the application to export technology.
- The content of this catalogue is as of July 2014.
- Any unauthorized use, copying or reprinting of the contents or part thereof in this catalogue is prohibited.

# SUGINO



# 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

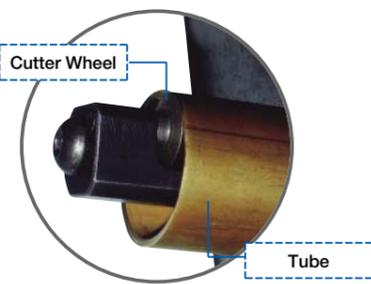
Tube Cleaner	12
Blow Gun Cleaner	16
Sugino Pump	18

Inquiry Sheet	17
---------------	----

# TUBE CUTTING

## Rolling Tube Cutter

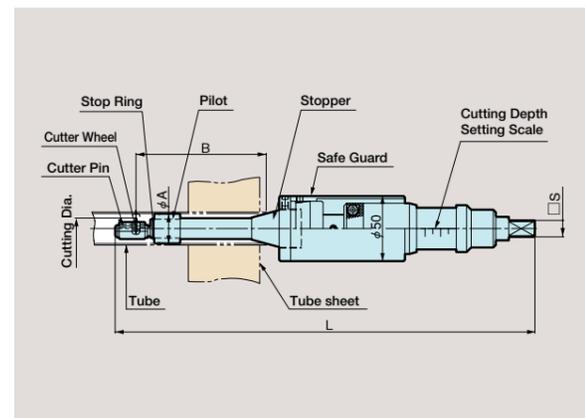
Cuts tubes promptly by pressing a cutter wheel to the tube inner surface. It does not create any chips while cutting the tube. Since there is no cutting chips to clean, it saves working time.



Specifications (mm)

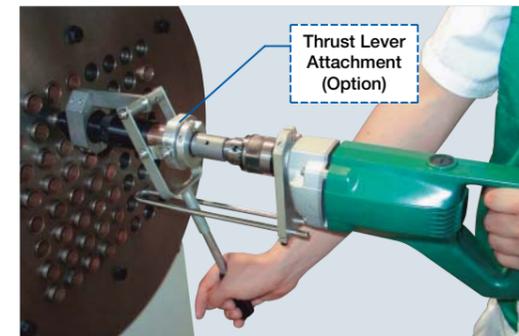
Model No.	Tube size		Cutting Dia.		Distance from tube end B	Tool Length L	Shank □S	Pilot φA
	O.D.	Thickness	Min.	Max.				
RC-16×0.5-1.25	16	0.5~1.25	12.7	17.5	Max.150 <sup>0</sup> <sub>-10</sub>	410	12.7	Custom make as per application tube size and dimension of expansion area. Please provide us tube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

Dimensions (mm)



## Thrust Lever Attachment (Option)

Is attached 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.

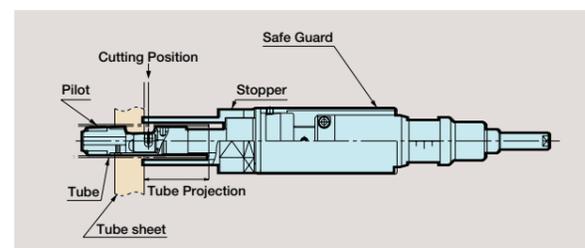
## Special Rolling Tube Cutter for Tube Projection Cutting

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

Dimensions



Please refer to page 17 when ordering Rolling Tube Cutter.

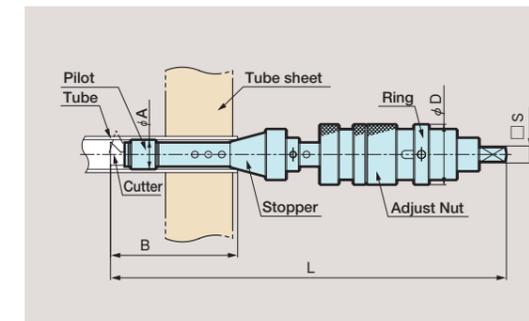
## Tube Cutter

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

### Tube Cutter TC type



Dimensions (mm)



Specifications (mm)

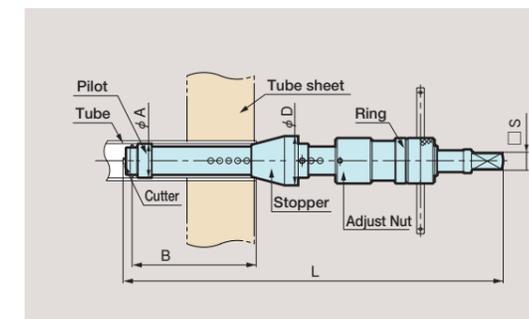
Model No.	Tube I.D.	Cutting Dia.		Distance from tube end B	Tool Length L	Tool Dia. D	Shank □S	Pilot φA	
		Min.	Max.						
TC-φ10×75LN (150LN)	10	10	17	Max.75 (Max.150)	201 (276)	31	9.5	10	9.5
TC-φ11×75LN (150LN)	11	10	17		11			10.5	
TC-φ12×75LN (150LN)	12	12	20		12			11.5	
TC-φ13×75LN (150LN)	13				13			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				17			16.5	
TC-φ18×75LN (150LN)	18	18	30		18			17.5	
TC-φ19×75LN (150LN)	19				19			18.5	
TC-φ20×100LN (200LN)	20			Max.100 (Max.200)	295 (395)	45	12.7	20	19.5
TC-φ21×100LN (200LN)	21	20	33		21			20.5	
TC-φ22×100LN (200LN)	22				22			21.5	
TC-φ23×100LN (200LN)	23				23			22.5	
TC-φ24×100LN (200LN)	24	23	38		24			23.5	
TC-φ25×100LN (200LN)	25				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						42	Max.150 (Max.300)	52	34	33.5
TB-φ36×150L (300L)	36	36									36	35.5
TB-φ38×150L (300L)	38	38		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		68	Max.200 (Max.400)	57	46				45.5	
TB-φ48×200L (400L)	48	48					48				47.5	
TB-φ50×200L (400L)	50	50					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	
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)	O.D.11-25 (PUC1125)	O.D.11-25 (PUA1125)	O.D.11-25 (PUT1125)
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)			
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)	O.D.30-40 (PUA3040)	O.D.30-40 (PUT3040)
32~34	ID.32-34 (PUY3234)			
34~36	ID.34-36 (PUY3436)			
36~38	ID.36-38 (PUY3638)	O.D.40-50 (PUC4050)	O.D.40-50 (PUA4050)	O.D.40-50 (PUT4050)
38~40	ID.38-40 (PUY3840)			
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	
EPU-30 (PU30P)	70	156W × 203L × 406H	13

### Electric Motor Specifications

Output	No. of Poles	Voltage	Rated Current	
			50Hz	60Hz
kW	P	V	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.

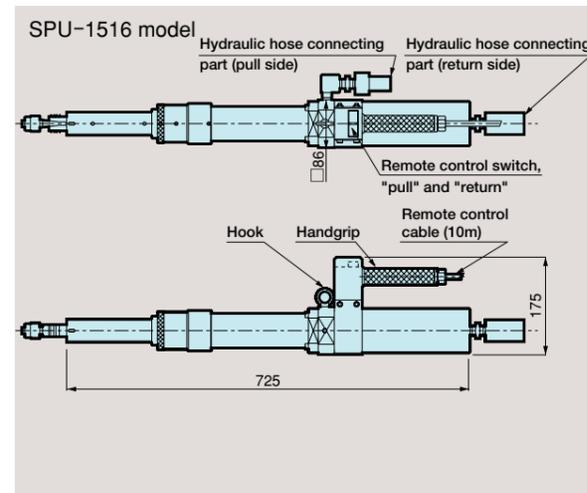
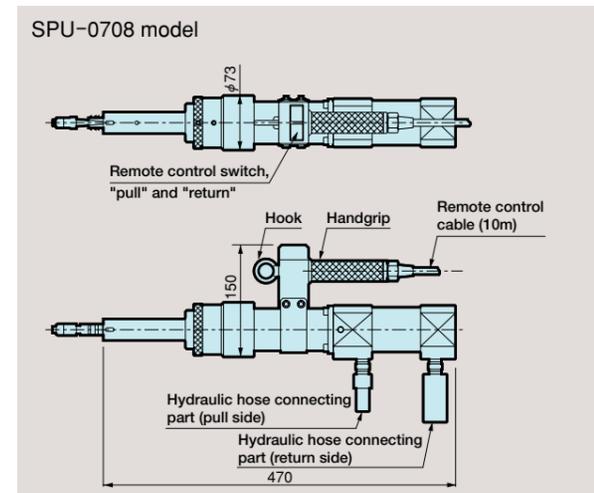


### Specifications

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			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

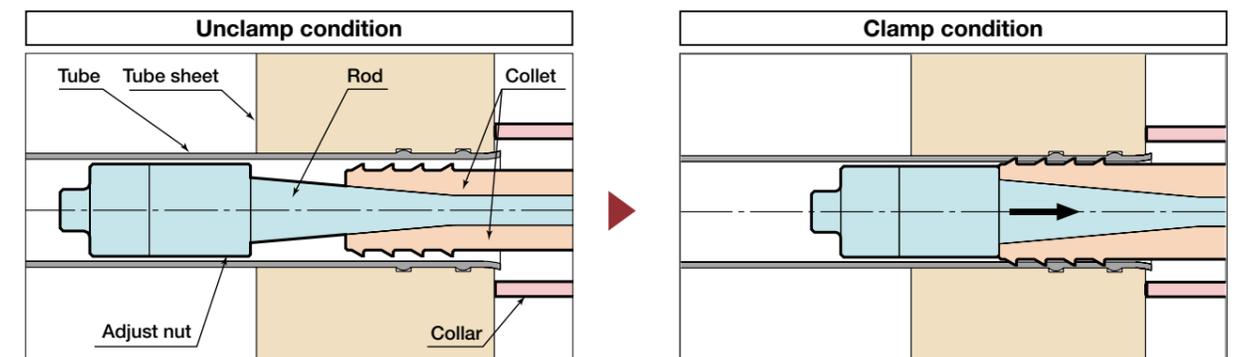
Model No.	Pressure		Tank capacity	Output No. of poles P	Electric Motor		Dimensions	Weight
	High	Low			voltage	Rated Current		
	MPa	L	V	A			mm	kg
SPC-70M1-S	70	5	9.5	0.84 kW	1-phase 200	Max.14.3	350W	39
				Commutator Motor	1-phase 200	Max.13	390L	
							550H	

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		

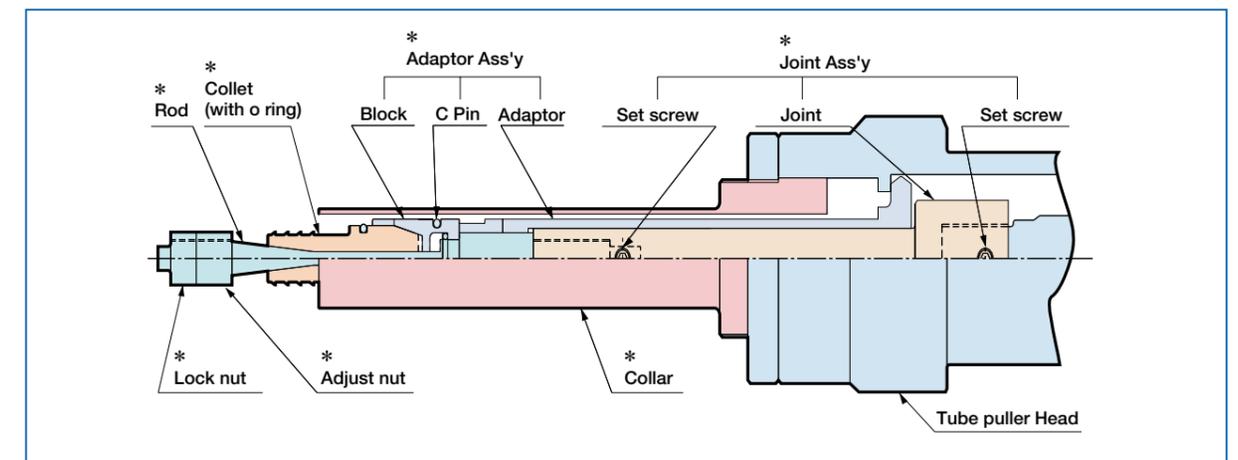
### Pulling mechanism of tubes by Smart Puller



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	

#### 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			
	MPa	L/min	kW	P	V	A	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	—	13.4		

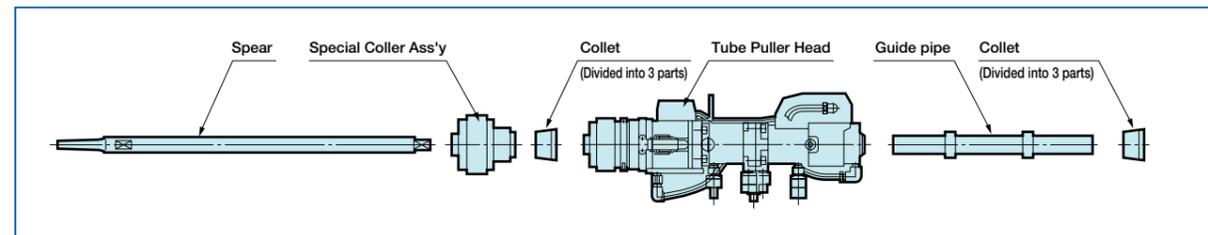
Note : Voltage transformer is required when operating in the area where input voltage is different from motor's standard specification.

#### 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

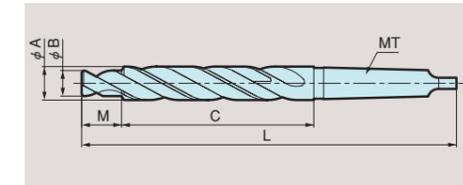
Extracts tubes from a tube sheet. It is the simplest tube extracting tool devoid of bulky equipment or devices.

#### Tube Drill

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



#### Dimensions (mm)



#### Specifications (mm)

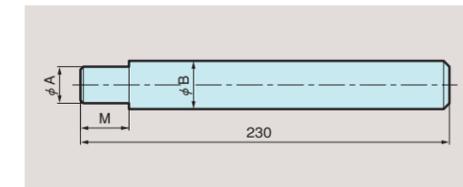
Model No.	Tube size			A	B	C	M	L	Shank
	O.D.	Thickness	B.W.G						
TD-515	15.9	1.8	15	15.6	11.85	117	20	230	MT2
TD-516		1.6	16						
TD-517		1.5	17						
TD-518		1.2	18						
TD-519		1.1	19						
TD-616	19.0	1.6	16	18.7	15.42	132	25	250	
TD-617		1.5	17						
TD-618		1.2	18						
TD-619		1.1	19						
TD-716	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		285	
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)

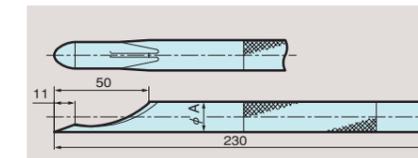
Model No.	Tube size			A	B	M
	O.D.	Thickness	B.W.G			
KT-515	15.9	1.8	15	11.9	15.5	25
KT-516		1.6	16			
KT-517		1.5	17			
KT-518		1.2	18			
KT-519		1.1	19			
KT-616	19.0	1.6	16	15.4	18.6	
KT-617		1.5	17			
KT-618		1.2	18			
KT-619		1.1	19			
KT-716	22.2	1.6	16	18.6	21.7	
KT-717		1.5	17			
KT-718		1.2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

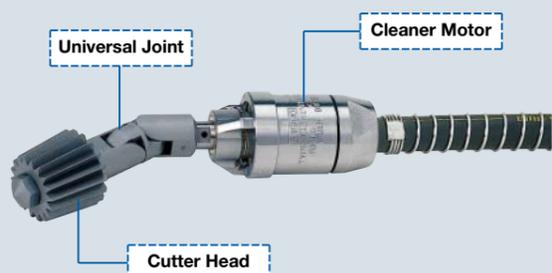
# TUBE CLEANING

## Tube Cleaner

Works as an automated cleaner for the tube inner surface to remove scale and compounds, which are deposited 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

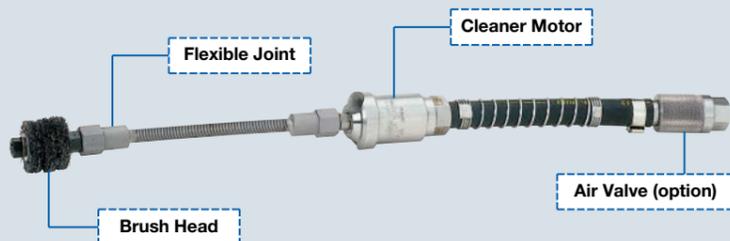
Works as a water-powered cleaner for both straight and curved-tubes. In the case of overloading, it stops the rotation to prevent damaging the tube inner surface and biting into the bending part. By pressurizing water that passes through the cleaner motor and then transferring it to the cutter head, 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 4000 type

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			U-1414	X-1414	D-11	SP-11 SC-12	B-11 BF-11	50
41	4013	330							
45	4014	U-1614	X-1614	D-12	SP-12 SC-14	B-12 BF-12	60	340	15
48	4015								
51	4016	U-2016	X-2016	D-16	SC-18 SA-16	B-16 BE-16	100	370	19
54	4017								
57	4018	U-2018	X-2018	D-20	SA-22B	B-18 BE-18	150	420	25
60	4019								
64	4020	U-2018	X-2018	D-20	SA-22B	B-20 BE-20	150	420	
67	4021								U-2018
70	4022	U-2018	X-2018	D-20	SA-22B	B-20 BE-20	150	420	

### Air driven Tube Cleaner 7000 type

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			U-1010	X-1010	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
32	7010			U-1212	X-1212	D-9	SP-9	B-9 BF-9	550	300
35	7011	U-1212	X-1212			D-10	SP-10	B-10 BF-10	660	320
38	7012			U-1414	X-1414	D-11	SP-11 SC-12	B-11 BF-11	780	330
41	7013	U-1414	X-1414							
45	7014			U-1614	X-1614	D-14	SP-14 SC-16	B-14 BF-14	1,070	360
48	7015	U-1614	X-1614							
51	7016			U-1816	X-1816	D-18	SA-18	B-16 BE-16	1,450	390
54	7017	U-2016	X-2016							
57	7018			U-2016	X-2016	D-20	SA-22B	B-18 BE-18	1,710	420
60	7019	U-2016	X-2016							
64	7020			U-2016	X-2016	D-20	SA-22B	B-20 BE-20	1,710	420
67	7021	U-2016	X-2016							
70	7022			U-2016	X-2016	D-20	SA-22B	B-20 BE-20	1,710	420

### Electrically driven Tube Cleaner EG type·EF type

Tube I.D. Straight mm	Tube I.D. Curved mm	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							13	26	400
45	51	EF-16			D-14	HC-14	B-14									
51	57	EF-18	U-1616	X-1616	D-16	HC-16	B-16							13	26	400
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	
	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	
	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.

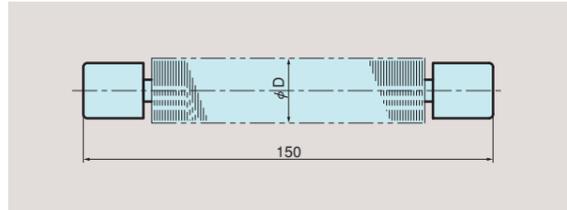
### Cleaning Tools

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

#### Nylon Brush



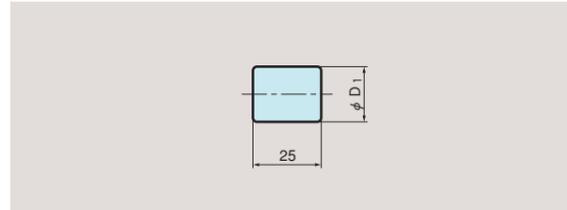
Dimensions (mm)



#### Rubber Plug



Dimensions (mm)



#### Selection Guide(mm)

Supply Air / Water Pressure:0.4~0.5MPa

Tube I.D.	Nozzle No.	Nylon Brush		Rubber Plug		Tube I.D.	Nozzle No.	Nylon Brush		Rubber Plug	
		Model No.	D	Model No.	D <sub>1</sub>			Model No.	D	Model No.	D <sub>1</sub>
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

Please provide us following information ( \* must be filled in )

\* Your Name \_\_\_\_\_

\* Company Name \_\_\_\_\_

Division \_\_\_\_\_

\* Company Address \_\_\_\_\_

Postal Code: \_\_\_\_\_

Date to reply (if desired)

\* Items you are interested in \_\_\_\_\_

\* Phone \_\_\_\_\_

Fax \_\_\_\_\_

E-mail Address \_\_\_\_\_

Please fill in the below chart for your inquiry ( \* must be filled in )

	* Tube Size	D	t
	* Tube Material		
	* Tube Sheet Hole Pitch and Arrangement	P1	P2 α°
		P3	P4
	* 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 the welding case) Did it happen before/after tube expansion?	Before / After	
	* Type of Lubrication used for Tube Expansion	Type:	
	* 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 and Angle of Bent Tube Part	R	β°
	Groove Size and Distance	ℓ <sub>1</sub>	ℓ <sub>2</sub>
		ℓ <sub>3</sub>	ℓ <sub>4</sub> h
	Drawing of Expanded Area		
	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						

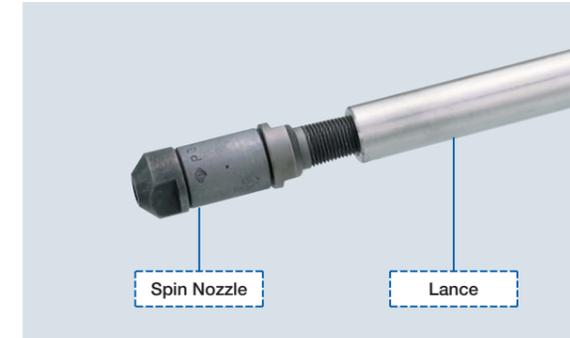
Note : Flex Reel with 2 guns may be manufactured upon request. Please contact your local dealer.

## Nozzle

Includes various types of nozzles depending on the cleaning uses.

### Spin Nozzle

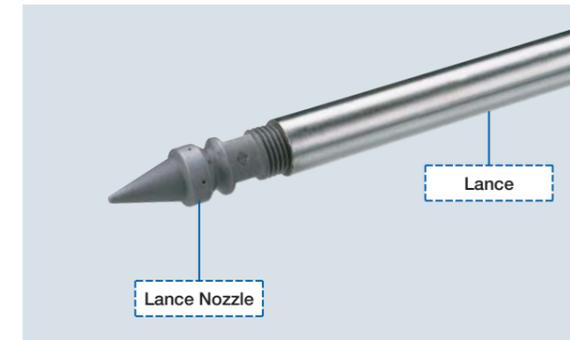
Cleans the heat exchanger's tube inner surface powerfully and precisely. The reaction force from the discharged high-pressure water makes the nozzle rotate at high speed and cleans 360° all over.



Cleaning of heat exchanger with Spin Nozzle.

### Lance Nozzle

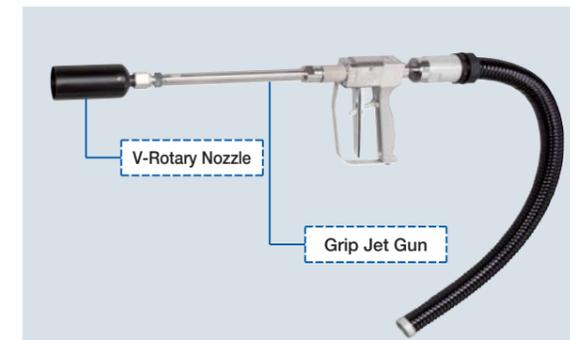
Cleans heat exchanger tubes powerfully. 8-types of nozzles are available, which are provided according to the high-pressure water jetting angle and direction.



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.