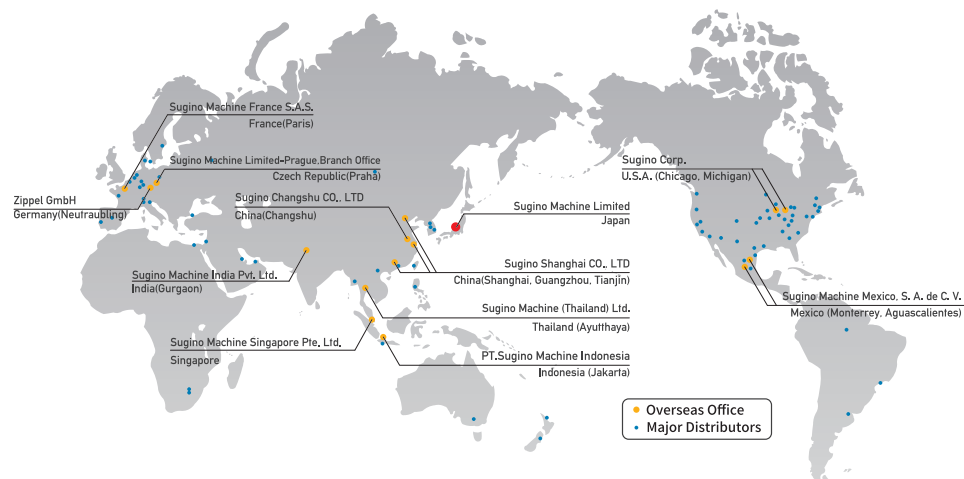


Sugino Global Network



SUGINO
SUPER! TECHNOLOGY

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Q2425E

Multipurpose Highly Efficient Washing System

JCC series



SUGINO
SUPER! TECHNOLOGY

Total Solutions for Cleaning Systems

Since its introduction in 1998, JCC (the Jet Clean Center) has been well received among many worldwide customers. Now, Sugino is proud to introduce a New and Improved JET CLEAN CENTER family with increased washing accuracy achieved by pursuit of water jet and machining technologies. We offer total solutions for cleaning systems with serialization of equipment including open-air washing machines, submerged washing machines, dryers, and measuring devices as well as implementation of automatic transfer.



MC-Based, Easy to Introduce Washing Machine

Considering the basic operation is similar to a vertical machining center, minimal training is required and operators will be ready to run the machine shortly after installation.

High-Pressure Pump with Automatic Pressure Correction Function

A new pump model was developed based on our 50 years of high pressure washing experience. The automatic pressure correction function is installed as a standard to eliminate washing defects caused by pressure fluctuation. This pump allows for setting and automatically changing the optimum pressure for specific areas within a workpiece.

No Limit to Conveyor System

In addition to offering fully automated production lines with gantry and/or automatic conveyor systems, we have also accumulated knowledge of stand-alone batch and random production of multiple part numbers. This experience allows us to offer the most effective solution for each of our customer's washing and deburring applications.



Applicable to a Wide Variety of Workpieces

Looking for a system that offers the versatility to deburr or remove chips? We would suggest the best system covering a wide variety of customer applications within the automotive and many other industries.

Washing Sample / ABS Body
Material of Workpiece : Aluminum
Pressure : 50 MPa



Washing Sample / Hydraulic Valve Body
Material of Workpiece : Aluminum
Pressure : 30 MPa



Satisfying After-Sales Support

We have a worldwide network of service and support locations. Since all of our products, from the base machine to the high pressure pumps and related components are produced inhouse we can offer service for the complete machine from a single Sugino location.

A Variety of Cleaning Series

This series of equipment responds to a wide range of cleaning applications and offers excellent cost performance achieved by using common components across multiple machine types.

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Cleanliness Evaluation Device

CLEANRISER

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Deburring and Cleaning with Ultrahigh-Pressure Water

Highly Efficient CNC Robotic-Hand-Type Washing Machine

JCC 603 ROBO



A high-efficiency washing machine capable of transferring, washing and drying, all in a single unit. The use of a highly rigid robotic hand helps to reduce cycle time and decrease installation space. The world's first 245 MPa ultrahigh-pressure water jet enables deburring of steel materials that had previously been difficult to clean up.

Applicable Work

Assembly components such as common rail, brakes, engine and transmission components, hydraulic manifold, and other parts having difficulties in deburring



Features

Deburring with a 245 MPa Ultrahigh-Pressure Water Jet

Unparalleled deburring with an ultrahigh-pressure Mach 2 water jet helps give customer products a new sense of value.

Newly Developed Drive Shaft PAT.P.

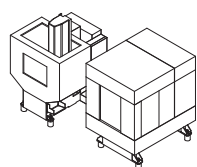
The use of a new 2-axes joint developed to make targeting small workpieces easier, combined with XYZ 3-axes high-speed, high positioning accuracy allows flexible and efficient hole and edge targeting.



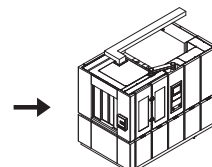
Built in Robotic Hand Changer

Consolidated Machining

A single machine covers applications that previously required separate processes and machines for deburring and washing. This helps to cut back machining processes.



Deburring Process + Washing Process



Deburring & Washing Process

Specifications

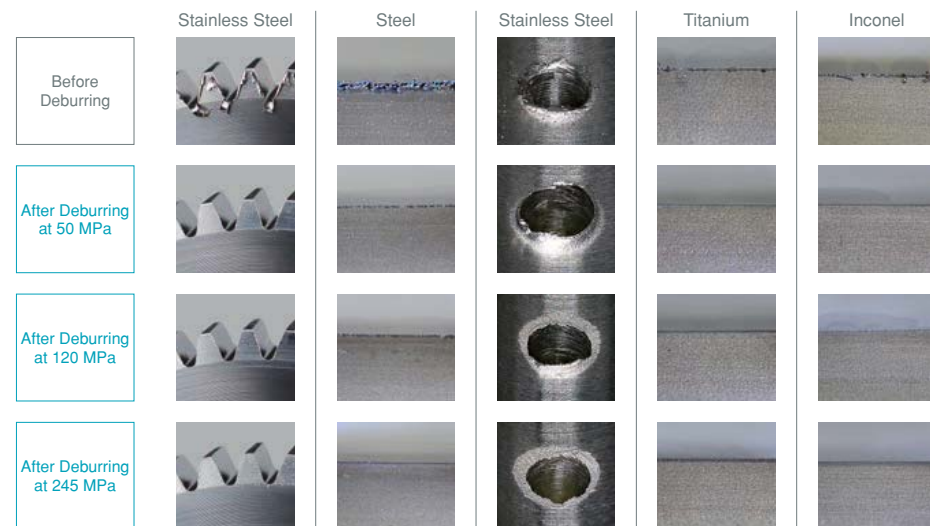
Item	Model	JCC 603 ROBO
Pressure x Flow Rate	MPa x L/min	245 x 4
Stroke	X-axis	650
	Y-axis	500
	Z-axis	500
Rapid Feed Rate (X, Y, Z-axis)	m/min	48
Positioning Accuracy	mm	0.08 (Total Stroke)
Repeatability	mm	±0.05
Machine Dimensions (W x D x H)	mm	(Machine) 1,600 x 2,660 x 2,250 (Tank Station) 1,500 x 2,000 x 2,150
Machine Weight	kg	(Machine) 4,000 (Tank Station) 2,000
Controller	-	FANUC Oi-MF
Power Capacity	kVA	49

◆Videos of JCC 603 ROBO are available on our website. Access from the QR code on the right.



Deburring Applications

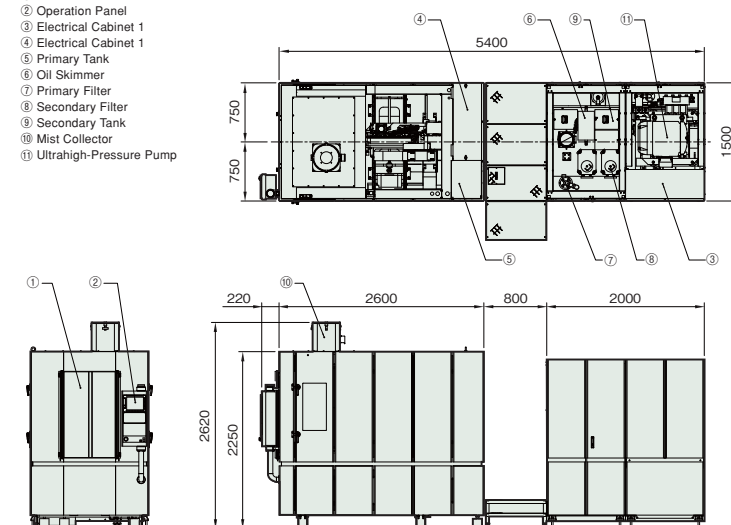
Deburring around cross-holes in cast iron and stainless steel parts, removal of tough edge burrs due to milling, removal of oxidation scale after hardening, etc.



Reference Dimension Drawing

JCC 603 ROBO

- ① Slide Door
- ② Operation Panel
- ③ Electrical Cabinet 1
- ④ Electrical Cabinet 1
- ⑤ Primary Tank
- ⑥ Oil Skimmer
- ⑦ Primary Filter
- ⑧ Secondary Filter
- ⑨ Secondary Tank
- ⑩ Mist Collector
- ⑪ Ultrahigh-Pressure Pump



Submerged/Open-Air Washing and Deburring

Highly Efficient CNC Robotic-Hand-Type Washing Machine

JCC 503 ROBO



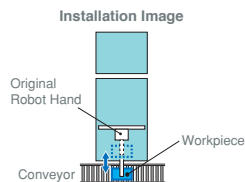
Features

CNC Robot-Hand Washing PAT.P.

High rigidity and precision are realized with three orthogonal and two articulated shafts! A function to automatically switch robot hands is available as an option allowing adjustment to multi-product mixed production lines and making the JCC 503 ROBO suitable for flexible production.

Compact Machine with No Need for Transfer Equipment

JCC 503 ROBO is a cell-type machine with a built-in robotic hand used to transfer the workpiece. This makes it easy to install or relocate the machine. It is smaller than the previous model with an external transfer device combined, so you can readily add the machine to an existing production line.



Reduction of Cycle Time

Moving from the transfer position to the washing position, washing, and drying are all done automatically with the highly-rigid robot hand. The cycle time can be reduced significantly from the previous model.

Comparison of Washing Time



Note: This is an example where a cylinder head was washed. The washing time varies depending on the shape of the workpiece. Please contact us for detailed information.

◆Videos of JCC 503 ROBO are available on our website. Access from the QR code on the right.



Applicable Work

Engine parts such as cylinder heads, blocks and transmission parts like cases and housings



Flexible and Versatile Washing

JCC 503 ROBO increases the overall efficiency as a result of a larger washing area, more nozzles, and increased stroke. A single JCC 503 ROBO unit performs both submerged and openair washing, allowing the removal of debris that is hidden and trapped within complex shaped parts. This machine enables precision washing of various workpieces without requiring separate pieces of equipment.

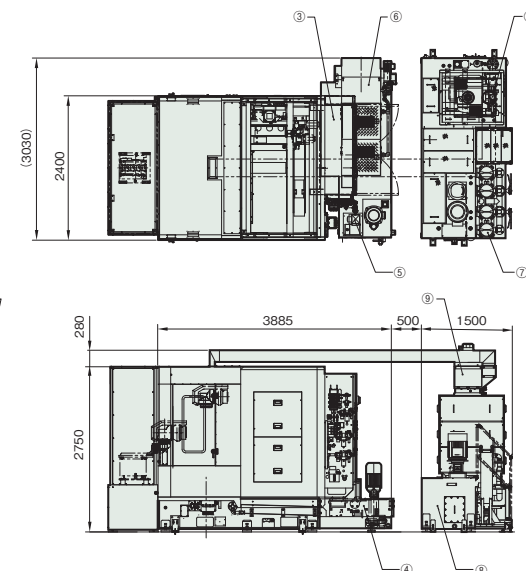
Specifications

Item		Model	JCC 503 ROBO
High-Pressure Washing	Washing Pressure	MPa	35 - 50 MPa (for Deburring), 6.5 - 20 MPa (for Washing) Capable up to 100 MPa (Optional)
	Flow Rate	L/min	18 (at 50 MPa) - 120 (at 6.5 MPa)
Low-Pressure Washing (for Rinse Washing)	Washing Pressure	MPa	0.6 - 1 MPa
	Flow Rate	L/min	100 - 350 L/min
Stroke	X-axis	mm	1,200
	Y-axis	mm	700
	Z-axis	mm	900
Rapid Feed Rate	X-axis/Y-axis	m/min	48
	Z-axis	m/min	30
Shaft (Lance/Multi) Rotation Quantity		min ⁻¹	1,000
Positioning Accuracy		mm	0.08
Repeatability		mm	±0.05
Machine Weight	kg		14,000 (Including the Main Unit and Water Treatment)
Controller	-		FANUC 32i-B
Power	V		AC200V (Possible to Adjust for Different Voltages)

Reference Dimension Drawing

JCC 503 ROBO

- ① Slide Door
- ② Operation Panel
- ③ Electrical Cabinet
- ④ Primary Tank
- ⑤ Oil Skimmer
- ⑥ Chip Conveyor
- ⑦ Bag Filter
- ⑧ Secondary Tank
- ⑨ Mist Collector
- ⑩ High-Pressure Pump



Open-Air Washing and Deburring

CNC Turret Type High-Pressure Washing and Deburring Machine

JCC 102 WIDE / JCC 202 SLIM

Features

Highly Accurate Target Washing

CNC control enables positioning precision of 0.08 mm, contributing to highly accurate and efficient washing.

Total Removal of Any Chips and Burrs

This machine is capable of jetting high-pressure water up to 50 MPa from a nozzle positioned by CNC and completely removing chips and burrs from cross holes, deep holes and tapped holes.

Fully Compatible with Automatic Transfer

This is a cell type washing machine suitable for gantry loader, conveyor, and robot transfer.

Varied Options

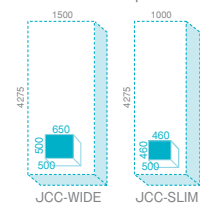
We offer a wide range of options meant to optimize the washing/ deburring process such as deburring tools, filtration, etc.



Various Washing Nozzle Attachments

Two Models Available: Wide and Slim

Users can choose from two models: Slim and Wide depending on the installation space and workpiece size.



Applicable Work

JCC 102 WIDE Cylinder Head, Crankshaft, Stator Housing for EV, Transmission Parts, etc.



JCC 202 SLIM ABS Housing, Valve Body, Pump Body, Brake Calipers, etc.



This CNC turret type washing and deburring machine removes chips and burrs remaining inside workpieces by jetting high-pressure water of up to 50 MPa.



JCC 102 WIDE
CE



JCC 202 SLIM

(Special-cover specification)

Submerged Washing

CNC Turret Type Submerged Washing Machine

JCC 402 U-JET



This CNC submerged washing machine efficiently and effectively removes debris from complex features within a part by the synergistic effect between the 7 MPa high-pressure jet and cavitation.



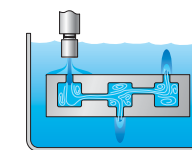
JCC 402 U-JET

CE
(Special-cover specification)

Features

Best Suited for Complex-Shaped Workpieces

Submerged washing is effective for addressing internal passages of a workpiece. By the synergistic effect of a high-pressure jet and cavitation, residual chips are completely removed from complex locations within a part such as the Water Jacket in a Cylinder Head.



Open-air washing only targets the specific areas of the part where the water stream is focused. However, submerged washing will clean the entire part both internal and external.

Target Washing at High Accuracy

CNC control enables positioning precision of 0.08 mm, contributing to highly accurate and efficient washing.

Both Submerged & Open-Air Washing Available

This model is capable of both submerged and open-air washing. The optimum method can be selected according to each workpiece structure.

Horn Nozzle for Submerged Washing

Cavitation bubbles are effectively created by Sugino's original Horn Nozzle design.



Underwater Jetting Captured by High-Speed Camera

Applicable Work

Cylinder Head, Cylinder Block, Hydraulic Manifold, etc.



Washing Sample / Cylinder Head

Material of Workpiece : Aluminum
Pressure : 5 MPa



Before Washing



After Washing



Specifications

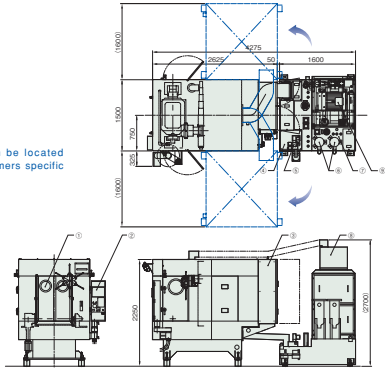
Item	Model	JCC 102 WIDE	JCC 202 SLIM	JCC 402 U-JET
		JCC-W6650	JCC-S6450	JCC-W6635UE
Pressure	MPa	Max.50		
Flow Rate	L/min	18 (at 50 MPa)		
Stroke	X-axis	650	460	650
	Y-axis	500	460	500
	Z-axis	500	500	350
Rapid Feed Rate(X, Y, Z-axis)	m/min	48		
Main Spindle Speed	min ⁻¹	Max.1,000		
Positioning Accuracy	mm	0.08 (Total Stroke)		
Repeatability	mm	±0.05		
Number of Tools	—	Max.6		
Indexing Time	s	0.5 (Random Shortest Approach by CNC Control)		
Machine Dimensions (W×D×H)	mm	1,500 × 4,275 × 2,700	1,000 × 4,275 × 2,700	1,500 × 4,725 × 2,800
Machine Weight	kg	4,000	3,000	5,000
Controller	—	FANUC 0i-MD		
Power Capacity	kVA	45		

Reference Dimension Drawing

JCC 102 WIDE

- ① Slide Door
- ② Operation Panel
- ③ Electrical Cabinet
- ④ Primary Tank
- ⑤ Oil Skimmer
- ⑥ Bag Filter
- ⑦ Secondary Tank
- ⑧ Mist Collector
- ⑨ High-Pressure Pump

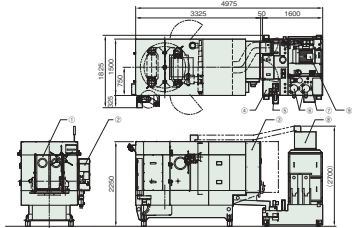
The pump station can be located according to the customers specific installation needs.



* Only the dimensional drawing of JCC 102 WIDE is shown above. Layout change with the pump station is also available with JCC 202 SLIM and JCC 402 U-JET. Contact a nearby sales office for details.

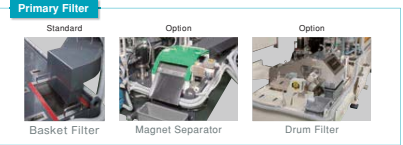
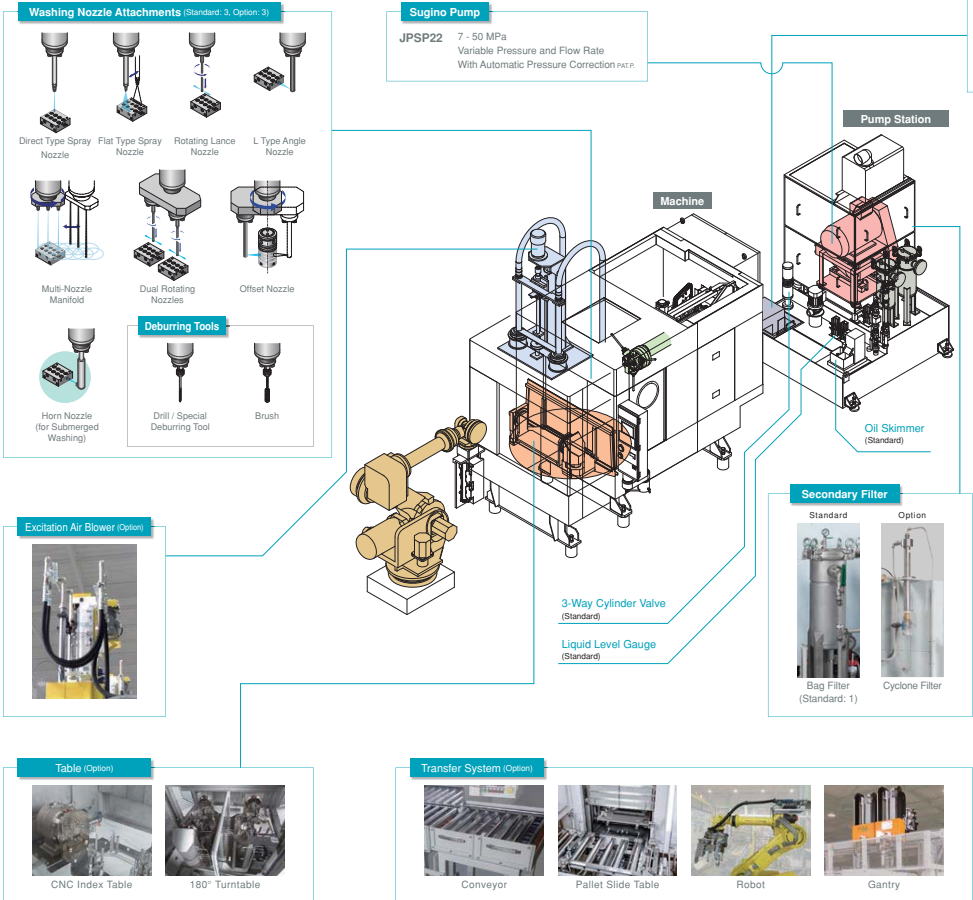
JCC 302 TT (Turntable)

- ① Slide Door
- ② Operation Panel
- ③ Electrical Cabinet
- ④ Primary Tank
- ⑤ Oil Skimmer
- ⑥ Bag Filter
- ⑦ Secondary Tank
- ⑧ Mist Collector
- ⑨ High-Pressure Pump



Modularized Configuration

* Available Products: JCC 102 WIDE, JCC 202 SLIM, JCC 402 U-JET



Machine Body	● Included as Standard ○ Option Items		
	JCC 102 WIDE JCC 202 SLIM	JCC 302 TT (Turntable)	JCC 402 U-JET
◆ Tooling		● Standard: 3 ○ Option: 3	
◆ Table			
..... CNC Index Table		○	
..... Pallet Slide Table		○	
..... 180° Turntable	—	○	—
◆ Mist Collector		●	
◆ Air Blow Unit			
..... Fixed Simple Air Blower		○	
..... Nozzle Transfer Air Blower	—	○	—
..... Excitation Air Blower	—	○	—
◆ Auto Lube Device		●	
◆ Slide Door		○	
◆ Area Sensor		○	
◆ Ceiling Auto Door		○	
◆ Fixture and Clamp Device		○	
◆ Auto Loader		○	
◆ Part Type Detector		○	
◆ Specified Paint		○	
◆ Revolving Light / Signal Light		○	
◆ Inside Light		○	
◆ Air Gun		○	
◆ Coolant Gun		○	
◆ Standard Cover		●	
◆ Special Cover		○	

Pump Station	JCC 102 WIDE JCC 202 SLIM	JCC 302 TT (Turntable)	JCC 402 U-JET
◆ High-Pressure Pump		●	
..... 7~35 MPa × 29 L/min		●	
..... 50 MPa × 18 L/min		●	
..... 20 MPa × 50 L/min		●	
..... 7 MPa × 50 L/min		●	
◆ Low-Pressure Washing Pump		○	
◆ Filter Pump		●	
◆ 3-Way Cylinder Valve		●	
◆ Primary Tank (200 L/ 880 L)	● (200 L)		● (880 L)
◆ Secondary Tank (450 L/ 550 L)	● (550 L)		● (450 L)
◆ Primary Filter			
..... Basket Filter		●	
..... Rotary Filter		○	
..... Magnet Separator		○	
..... Drum Filter		○	
◆ Secondary Filter			
..... Bag Filter		● Standard: 1 ○ Option: 1	
..... Cartridge Filter		○	
..... Cyclone Filter		○	
◆ Oil Skimmer		●	
◆ Liquid Level Gauge		○	
◆ Washing Coolant Heater		○	
◆ Washing Coolant Chiller		○	

* External dimensions vary depending on options purchased. Contact a nearby sales office for dimension details.

Dry

Air Blow Dryer
JCC 802 BLOW



This is an air blow dryer that can effectively dry workpieces by combination of air blow from three directions and an index table.

Vacuum Dryer
JCC 812 VCD / Compact Vacuum Dryer
EVADRY™

Moisture remaining on workpieces after washing is evaporated utilizing vacuum in these compact dryers. They can thoroughly dry even the innermost area of intricate workpieces.

Features
Simple and Thorough Drying to Consolidate Processes
Simply load a workpiece and press a button, and the machine will dry it thoroughly. This process frees you from manual drying. Moreover, heat from evaporation cools down the workpiece, eliminating the need for a separate cooling process and thus reducing the overall process requirements.



Compact, Yet Capable of Drying Workpieces of Various Shapes
Despite its compact body, these models deliver an extraordinary drying performance thanks to its capability for vacuum drying at 1.3kPa or lower. It can dry workpieces of various shapes, including the inside of oil jackets and deep holes, without the need for any other equipment.

*Contact a nearby sales office for details.

Features
Highly Efficient Drying
Double drying is enabled by high-speed index table and air blow from three directions.
Energy Saving
This model is an energy saving type equipped with a single blower.
Low Acoustic Noise
A sealed structure limits noise levels to less than 80dB creating a safer working environment.

JCC 802 BLOW
(Special-cover specification)



JCC 812 VCD
(Special-cover specification)

EVD-22

Specifications		EVADRY	EVADRY-WIDE
Item	Model	EVD-22	EVD-55
Vacuum Pump	kW	2.2	5.5
Ultimate Vacuum	kPa	1.3 or less	
Vacuum Chamber Dimension (WxDxH)	mm	300 × 300 × 150	600 × 517 × 300
Manual Door	—	Manual Door	Auto Door with Safety Light Curtain
Model Settings	—	Operating time can be set for up to 9 models.	
External Dimensions (WxDxH)	mm	600 × 1,100 × 1,000	1,020 × 1,700 × 1,370
Machine Weight	kg	400	1,000



Cleanliness Evaluation System

Cleanliness Evaluation Machine CLEANRISER™

This machine automatically measures and evaluates residue collected on a filter patch, that realized by fusing our cleaning and measuring technologies accumulated over the years.

Reduces Man-Power and Inspection Time
Conventional visual inspection required a long time and multiple man-hours. Using a CLEANRISER, there is a significant reduction in time and man-power.



Specifications	
Subject to be Measured	— Washing Residuals Collected on a Filter (e.g., Chips)
Applicable Filter Size	mm Φ47 (Measurement View Dimension: 50 SQ)
Resolution	μm/pixel 7
Minimum Detection Dimension	μm 50
Detector	— High-Resolution CCD Color Line Sensor (Equivalent to Approximately 55 Million Pixels in 50 x 50 mm Area)
Analysis Items	— Dimension, Quantity, and Area of Residuals
Data Output	— Measurement Report: Excel Format* Measurement Data: CSV Format
External Dimensions (WxLxH)	mm 1,200 x 750 x 1,564 (Including the Work Desk)
Weight	kg 80 (Excluding the Work Desk)
Power Consumption	W 500 (AC100-240 V)

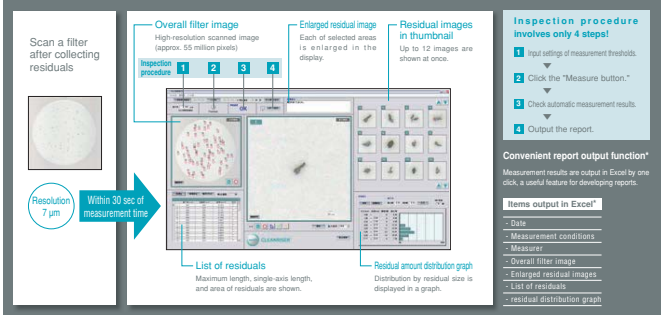


A residue collection unit is also available.



*Contact a nearby sales office for details.

Enriched Functions
Inspection efficiency is drastically improved by user-friendly interface, simplified operation procedures, and convenient output functions.



*Microsoft Excel and Excel are registered trademarks of Microsoft Corporation in the United States and other countries.

SUGINO

Integrated Handling Line from Precision Component Machining through to Washing

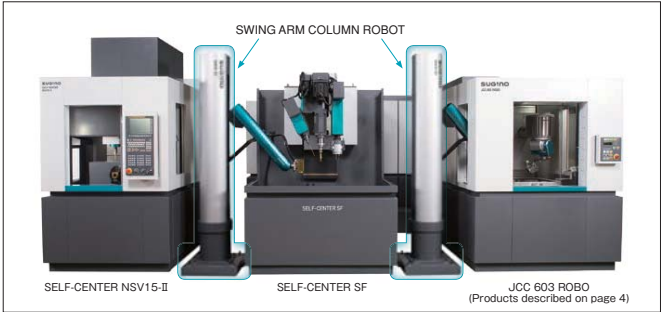
Machining, Transferring, Washing.
An Integrated Solution from Machining Through to Washing.

To differentiate ourselves from conventional dedicated production lines, we can combine cutting, machining, deburring, washing, drying, and conveyance into an integrated processing line that is made up entirely of our machines.

◆ Videos are available on our website.
Access from the QR code on the right.



The value of an integrated processing line
Significant reduction in man-power required to run the production line
Sugino can manage the entire process and provide a turn-key solution. From the selection of equipment, to test processing/evaluation, to building the machines to spec, to installation, to after-market and maintenance; Sugino is a one-stop shop.
Optimum Proposal Considering Whole Process
Optimum proposals are possible in the entire process, with regard to the quality required by customers, cost, etc.
Highly flexible and functional - changeovers, new parts, and multiple part runs are easily handled with minimal cost
Apparatus used totally consist of high-quality, highly-functional general-purpose machines, and flexibly dealing with a change in the contents of production is also possible.



#30 Compact, Vertical Machining Center
SELF-CENTER NSV15-II
A 30-taper class compact machining center with 40-taper class machining capabilities.

Drilling and Tapping Machine
SELF-CENTER SF
SUGINO's dedicated "Self-feeder" drilling and tapping machine.

Industrial Robot
SWING ARM COLUMN ROBOT
A space-saving, transfer robot can be installed to efficiently handle the parts and provide positional accuracy.

Customized Dedicated Washing Machine

Dedicated Submerged Washing Machine JCC 402 U-JET

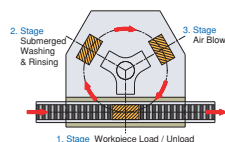
3,4 Index Washing Machine

It is the most suitable submerged washing machine to reduce cycle times by processing the maximum of 4 processes simultaneously.

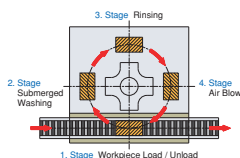
Applicable Work Cylinder Head, Cylinder Block, etc.

Example of System Schematic Diagram

▶ 3 Index



▶ 4 Index



Open-Air High-Pressure Washing

SPA-CLEAN JET

This open-air washing machine can wash a large component and 6 surfaces even with the machine width at 1,180 mm.

Applicable Work Cylinder Head, Cylinder Block, etc.



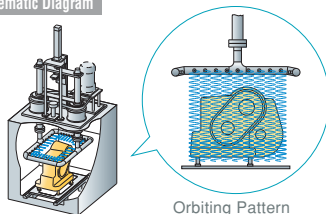
Open-Air Washing

Spiral Jet Washing Machine

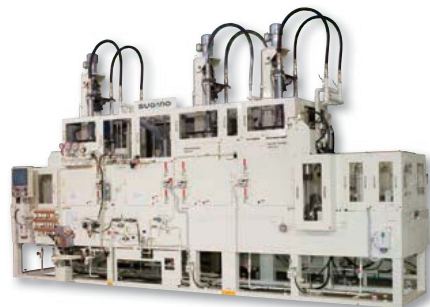
This open-air washing machine can wash entire part by spiraling and reciprocating (back and forth) nozzles which are arranged around the part.

Applicable Work Transmission Case, etc.

Example of System Schematic Diagram



Orbiting Pattern



Washing Systems

We offer total solutions for processes from washing to drying.

We suggest conveyor solution and system that will fit your production plan.

Example 1

Combination of JCC 402 U-JET and JCC 812 VCD (Vacuum Dryer) with a Conveyor System

This combination of JCC 402 U-JET and JCC 812 VCD (vacuum dryer) is equipped with an automatic conveyor and retractable system. It realizes thorough drying after completely removing residual chips and burrs inside the workpiece. This is particularly effective with cylinder blocks, cylinder heads, and valves for construction machines.



Example 2

Combination of JCC 402 U-JET and JCC 802 BLOW (Air Blow Dryer) with a Gantry Loader

This is a combination of a gantry loader, JCC 402 U-JET, and JCC 802 BLOW (air blow dryer). By adding extra JCC units, it can be applied to a line tact time of less than 30 seconds.



Example 3

Combination of JCC 102 WIDE and JCC 812 VCD (Vacuum Dryer) by a Robot

This combination of an articulated robot, JCC 102 WIDE, and JCC 812 VCD (vacuum dryer) can flexibly respond to changes in production plans due to model changes and/or layout modification associated with relocation. By adding extra JCC units, it can be applied to line tact time of less than 30 seconds.



Example 4

Large Part Washing Device with JCC 102 WIDE (Super Wide Type) and JCC 812 VCD (Vacuum Dryer)

Cylinder heads, blocks, and crankshafts for large engines can be washed precisely using basic JCC functions. We suggest the optimum washing method for any special workpieces from our abundant experience in designing special equipment.

