AKIRA - SEIKI®

isotop machineries

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Mass Production Machinery Line Up

PMC-APR-2015-ENG

www.akiraseiki.com

Worldwide support in 46 countries

Always keep moving to advance your future success.

< Quoted from website of LICHRON Sweden, the primary agent of AKIRA-SEIKI >

Customer's Recommendation

AUTO Verdi in Sweden has mechanical knowledge, technical development and the highest level of precision machinery available. After many years of supporting top European engine builders with connecting rods and other engine parts they developed their own dry sump oil pump for racing cars 1995.

AUTO Verdi has made investment in a fast vertical machining centre from AKIRA-SEIKI APC model. Machine model is a 2-pallet swing type with very good specification. Auto Verdi has chosen some special options, for example: Coolant through spindle 120 bar.

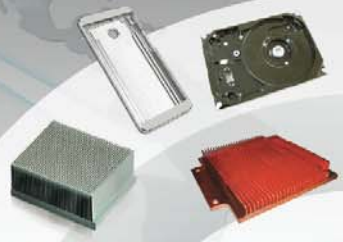
Patents

Core Technology only available by AKIRA - SEIKI®

AKIRA-SEIKI integrate the technical patents in the internationals with practical application approved by international famous I/T manufacturers to save the best processing efficiency and benefit customers!

AKIRA - SEIKI®

Target Jobs



Mobile device · Computer · IT Components

Mobile phone case / Hard disc seat / Heat sink
HD write / read heads / Optical parts
CD、DVD panels

Automotive parts

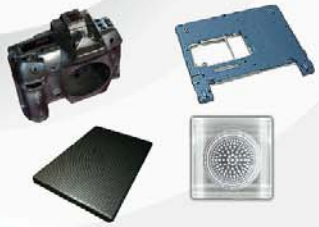
Cylinder case / Cam case / Engine body
Engine housing / Brake master cylinder / Motor cap

Light alloy formed parts

Pneumatic valve / Hydraulic throttle / Bicycle parts
Pneumatic tool housing / Sewing machine parts
Remote helix parts

Special material · Multiple micro-holes · Non metal material

Carbon fiber / I/T parts / Magnesium casting
Watch case / Titanium engraving
Medical device

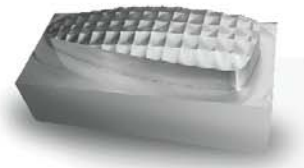


Cost-effective !

PC460 / PC500 / PC700

High speed、High rigidity
Compact floor Space

Spindle Max. Speed	12,000rpm (Standard) 24,000rpm (Option)
Rapid feed	60 m/min
Max. Acceleration / Deceleration	1.2G
Tapping Max. Speed	6,000 rpm / M2 (Depth: 6mm) It depends on the material and tools conditions.
Tapping Retract	→ Max. 10 times



★ High speed & Delicate 3D cut
(Lamp mould)

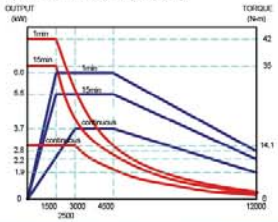
Material: Mould steel 100 mm x 43 mm x 65 mm
Tool: R3 Ball end mill
Spindle Speed: 8,000 rpm / G01 2,000 mm/min

Spindle Feature

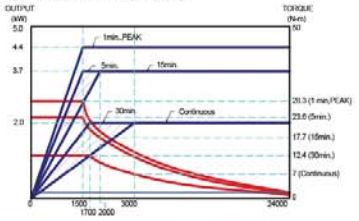
Direct drive spindle provides greater super-smooth cutting surface within high speed and high rigidity.

Output & Torque

Spindel speed: 12,000rpm (STD)

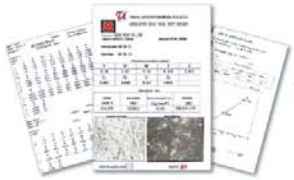


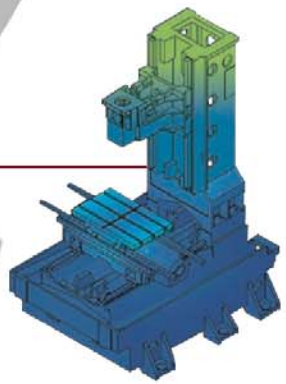
Spindel speed: 24,000rpm (DPT)



MEEHANITE

Rigid Physical Foundation

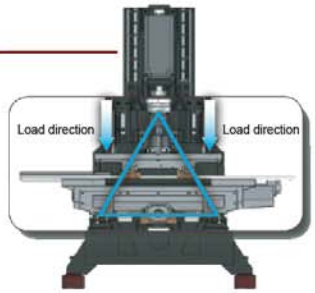




MEEHANITE high quality casting iron assures permanent rigidity and accuracy. Physical rigidity are ensured for AKIRA-SEIKI strong in the primary design progress by advanced digital assay tool. All structural frames apply COSMOS system for analysis to optimize rigid mechanism foundation. Digital FEA(Finite Element Analysis) scientifically demonstrates rigid structure and approves excellent dynamic accuracy and vibration absorption while rapid cutting. The Certificate of MEEHANITE casting follows each AKIRA-SEIKI machine.

Steady Rigidity

The internal ribs of each key casting elements like base, column, head-cartridge and saddles are enforced for deformation-resistant and anti-dumping vibration. Golden triangular frame in optimum span of bed base and guide ways supports the superior acceleration and deceleration movement.



High speed & reliable servo magazine

Tool storage : BT-30 14T (Standard)
21T Servo drive (Option)

▶PC700

Flexible working area

Capable of fitting 4th axis rotary or fixture to satisfy different jobs requirement.

All specification subject to change without notice.

For light chips、Non-ferrous metal、Composite material !

RMV500APC / RMV700APC

★ Compact floor space with twin pallet

Fast twin pallet Saving Total Cycle

Spindle Max. speed	24,000 rpm (Option)
Max. Rigid Tapping	8,000 rpm (Option)
Max. Rapid Traverse	96 m/min
Max. Acceleration	1.6~2.0G
Fastest tool change T to T time	0.6 sec. (T to T)
Pallet change time	1.5 sec. / 180 Degree
Related model	RMV500T / RMV500APC

Quick Tapping Cycle

★ Basic demonstration by 289 holes

Machine model : RMV500T / RMV500APC
Material : Aluminum (AL6061A6)
Tapping Speed : 4,000 rpm
Tool used : M2 x 0.4P x Tap
Effective thread : 5 mm
Machining time for 1 hole :
0.88 sec. / hole (Tapping motion only)

Factory Production *Process*

★ **Save cycle time = Save profit**

Previous Production Process		Fast Twin Pallet Production
	Nos. of machines	
	Nos. of programs	
	Tools	
20 sec.	Loading / unloading	5 sec.
	Nos. of operations	
big	Floor space	small BEST
High cost High maintenance Occupy floor space	Benefit	Non-cutting time reduce around 30% Save loading/unloading time Save energy、save floor space

All specification subject to change without notice.

RMV500APC / RMV700APC

Accurate Pallet Changer

More precision for pallet positioning

Big-scaled coupling teeth to the ensured pallet location in highest positioning accuracy. The repeatability pallet positioning at 1 μm.

No hydraulic components are used for pallet clamp/unclamp that reduced additional maintenance cost.

◀ No hydraulic components! Patent

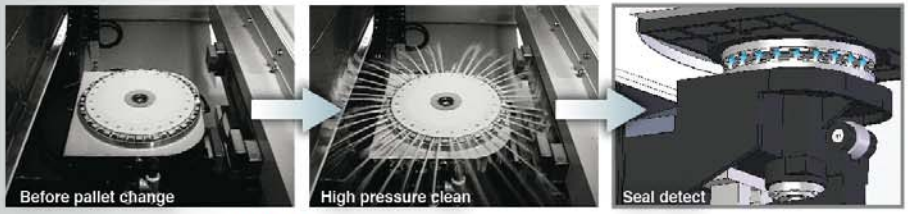
Flexible application

Adding 4th-axis rotary tables on twin pallet and quick mould change system, especially for small-volume production of a wide range of different jobs with high accuracy required.

▲ EROWA Quick mould change system

▲ Compact floor space to add robot system

Optimum Chip Proof and Immediate Detect!–AKIRA A+ Guarder



AKIRA-SEIKI RMV-APC models **AKIRA A+** Guarder design double protection for high volume machining stability. Gap between-locating contact taper. The active strong pressure clean and immediate detect absolutely ensure light chip-stuck concern.

Fast Twin Pallet

▲ RMV500APC

- Allows use rotary table for complex shapes and multi-side machining. that boosts your productivity and reduces setups.
- Reduce chip build-up, surrounding the inner guarding for immediate chip moving away by chip flushing.

All specification subject to change without notice.

Multi-faces Production !

RMV 160 RT / RMV 250 RT

Efficiency、Availability、Optimal chip disposal

Related model	RMV160 RT	RMV250 RT
Table size of C-axis	∅160mm	∅ 250mm
Rapid traverse	60,60,96 M/min	48,60,72 M/min
Spindle Max. speed	15,000 rpm (Standard)	12,000 rpm (Standard)
	24,000 rpm (Option)	15,000 rpm (Option)
B axis rapid traverse	75 rpm	75 rpm
C axis rapid traverse	100 rpm	100 rpm
Tool storage	24T	24T、40T (Option)

One catch-up, saving more accuracy

Advance optimum machine tool for multi-faces productive jobs with high accuracy required and save cost.

High efficient tilting rotary table completes all the processing in one catch-up.Free-interference or various fixture application and easier.

Table indexing angle

B-axis：+30° ~ -120°

C-axis：360°

Factory Production *Process*

★ **Automotive parts**

Multi-faces productive jobs with High Accuracy & Efficiency.

Previous Production Process		Multi-faces Production
	Nos. of machines	
	Tools	
	Nos. of fixtures	
	Nos. of operations	
big	Floor space	small BEST
High cost High maintenance Occupy floor space	Benefit	Non-cutting time reduce around 30% One catch up，Save more accuracySave loading/unloading time Save energy、save floor space

RMV 160 RT / RMV 250 RT

Attentive to operator's Easy to set up

Easy to use and maintain

Closest approach

- Add robot system.
- Easy tooling set up is conrenient, either from front door or side door.

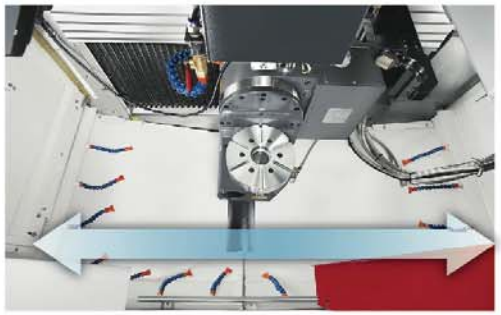
Convenient control operation

Allow 0-100 degree rotate, easy for operation.

Optional automation

Best Factory management, Small footprint to add robot system.

Optimal flexibility

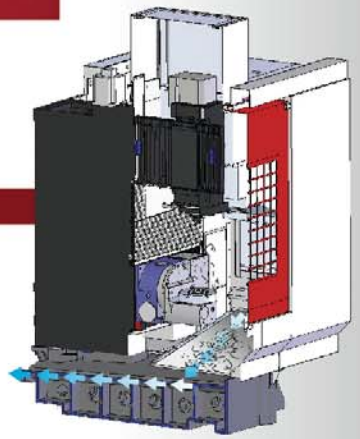


Flexible working area

Flexible fixture arrangement completes all the processing in one catch up, save cost and high efficiency.

No Cover Break-down

- X,Y and Z axes are completely isolated from chips by unique design of RMV models, high quality one piece sliding cover used on X and Z axes, this prevents breakdowns due to telescopic cover damage caused by high rapid traverse.
- Chips direct fall down, the tilting and wide drainage way at the base allow the effective chip flushed to the rear chip tray.
- Chip disposal within high pressure coolant system.
- Small footprint better than others on the market.



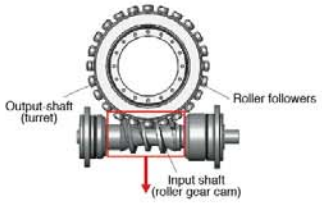
All specification subject to change without notice.

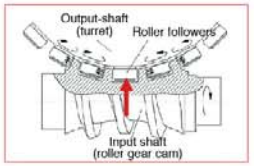
RMV 160 RT / RMV 250 RT

Innovation of rotary table

Faster and more accurate rotary gear cam

Zero-backlash Technology Delivers Unsurpassed Motion





General B/C axes

B/C axes of RMV-RT

+200%

Efficiency Increased

- No more frictional drive of worm gear drive, the application of roller gear cam drive of rotary axes advance the higher indexing accuracy and efficiency for in best longevity.
- The cam follower hold the tapered ribs of the roller cam under well-preload to eliminate backlash. This mechanism ensures smooth indexing and rigid stops for precision machining operations.
- The eternal well contact of roller cams and cam followers work on principle in no wear out nor clearance adjustments needed. This means the original accuracy stays for longer periods without maintenance.

B/C axis transmission character comparison

No.	Item	Conventional transmission	Roller CAM Driver ™
	Drive type		
1	Drive status	Slide contact	Rolling contact
2	Material of the contact part	Worm shaft : Hardening steel、HRC60 Worm gear : Phosphor bronze、HB90	Cam shaft : Hardening steel、HRC60 Cam followers : Bearing steel、HRC60
3	Perload	No	Yes
4	Transmission efficiency	★★★ Slow	★★★★★ Excellent
5	Backlash	Necessary for rub stroke	0 backlash
6	Indexing accuracy	20 sec. (When new produce)	Under 15 sec.
7	High speed possibility	★★ Slow	★★★★★ Excellent
8	Thermal	High	Low
9	Rigidity	Low	High
10	Durability	★★★ Regular maintenance is necessary	★★★★★ Excellent
11	Backlash adjustment	Unnecessary	Necessary

Outstanding technology

RT APC

Axial Feed, Fastest Accelerations as F1 racing

RMV Series patented relative movement technology enables highest acceleration 1.6-2.0G(RMV500T/RMV500APC/RMV160RT) for each tooling spindle and job feeding, to act the perfect axial feedrate 96m/min(Z-axis) for chip-chip movement like F1 racing car performance.

When reaching machining coordinate in the fastest cycle, the axial movement is absolutely free from mechanism inertia matter. The opposite feed force is counteracted and machine body stays sable as a rock.

Low service expense ➡ Consuming effective

- For the same travel as standard machine, AKRIA-SEIKI RMV series transmission travel only 50% of the distance. It therefore ensures 200% longevity of motion for components such as ballscrews and linear guideways.
- The opposite thrust of Z axis RMV models, no any counter balance applied and reduce at least 50% loading and wear down for Z-axis.

Feature of axial movement

Enhance high speed cutting rigidity and 100% laser track and ball bar collaboration test to ensure geometry accuracy. For efficiency and durability, The axial ball bearing use SKF and NSK, the coupling use KTR.

Superior Well Balance High Speed Spindle

Absolute direct drive spindle prevents radial load of spindle bearings and results long bearing life, least noise and save efficient power transmission.

Super low inertia main motor to achieve spindle speed from 0 to max speed 24,000 rpm within 0.45 seconds.
(only available features for RMV500T/RMV500APC/RMV160RT)

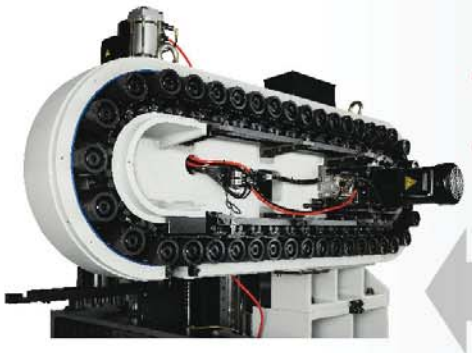
All specification subject to change without notice.

RT APC

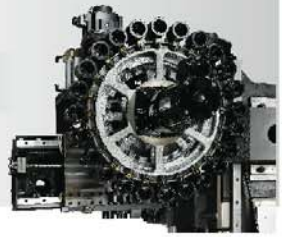
Reliable Tool Change

Quick Tool Selection & Durability

Servo drive tool magazine, minimum non-cutting time



- For quickest and most precise tool select, Electrical precise clamp for ATC brake ensures precise tool change in short period.
- Tool magazine with full cover to prevent and reduce metal chips entering tool pots. (Only available for RMV series).
- Servo magazine 24T (Standard)
  Servo magazine 40T (Option)
  (Only available for RMV700APC / RMV250RT)

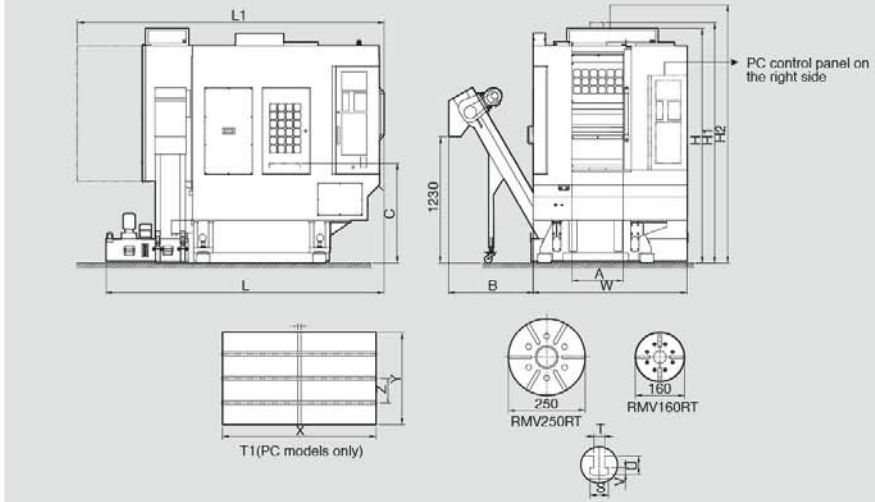


Easy Tool Set up

One - button features ease the often used functions instead of multi-steps procedure. Only by one-button command to complete tool offset, selecting tool, ATC home return, ATC restore and so on.

Fast tool change, saving total cycle

- High speed tool changer has tool to tool change time of 0.6 second. More than 1.8 million reliable & practical operation ATC tests had been done.



	PC460	PC500	PC700	RMV500T	RMV500APC	RMV700APC	RMV160RT	RMV250RT
W	1250	1560	2100	1600	1500	1900	1600	1900
L	2495	2470	2470	2322	2777	3144	2322	2677
H	2205	2120	2120	2285	2285	2525	2285	2395
L1	2535	2640	2640	2880	2990	3350	2500	2880
H1	2560	2620	2620	2345	2345	2725	2400	2750
H2	2565	2520	2520	2515	2515	2900	2410	2750
A	650	540	800	670	495	690	515	670
B	950	765	495	740	820	740	740	740
C	838	796	796	900	970	950	810	780
S	23	23	23	24	24	30	19	21
T	14	14	14	14	14	18	12	12
U	19	23	23	24	24	30	20	18.5
V	9	9	9	9	9	12	8	9
T1	12	N/A	N/A	N/A	N/A	N/A	N/A	N/A
X	520	650	850	600	500	700	N/A	N/A
Y	320	400	400	300	300	400	N/A	N/A
Z	100	125	125	80	80	125	N/A	N/A

H1: Height of motor or cable/tube H2: Height of top cover (Standard)

All specification subject to change without notice.

Specification

		Tapping Center			Mass Production (Fast Twin Pallet)			Multi-faces Production	
		PC460	PC500	PC700	RMV 500T	RMV 500APC	RMV 700APC	RMV 160RT	RMV250RT
CONTROL SYSTEM		AKIRA M/745 (Fanuc G code compatible)							
TRAVEL									
X-axis	mm/inch	460 / 18.11	500 / 19.69	700 / 27.56	500 / 19.69	500 / 19.69	700 / 27.56	380 / 14.96	500 / 19.69
Y-axis	mm/inch	320 / 12.6	400 / 15.75	400 / 15.75	300 / 11.81	300 / 11.81	400 / 15.75	160 / 6.3	250 / 9.84
Z-axis	mm/inch	300 / 11.81	330 / 12.99	330 / 12.99	280 / 11.02	280 / 11.02	400 / 15.75	380 / 14.96	400 / 15.75
Spindle nose to table surface	mm/inch	180 - 480 / 7.09 - 18.9	150 - 480 / 5.91 - 18.9	150 - 480 / 5.91 - 18.9	150 - 430 / 5.91 - 16.93	150 - 430 / 5.91 - 16.93	200 - 600 / 7.87	100 - 480 / 3.94 - 18.9	125 - 525 / 4.92 - 20.67
TABLE									
Table size (L x W)	mm/inch	520 x 320 / 20.47 x 12.6	650 x 400 / 25.59 x 15.75	850 x 400 / 33.46 x 15.75	500 x 300 / 19.69 x 11.81	500 x 300 / 19.69 x 11.81	700 x 400 / 27.56 x 15.75	ø160	ø250
C-axis rotation	degree	-	-	-	-	-	-	360°	360°
B-axis swing	degree	-	-	-	-	-	-	+ 30 / - 120	+ 30 / - 120
Max. loading capacity	kgs/lbs	250 / 551.26	300 / 661.39	300 / 661.39	100 / 220.46	100 / 220.46	160 / 352.74	30 / 66.14	60 / 132.28
SPINDLE									
Spindle motor output (Peak)	HP	9	9	9	20	20	15	20	15
Spindle Max. speed	rpm	12,000 (STD) 24,000 (OPT)	12,000 (STD) 24,000 (OPT)	12,000 (STD) 24,000 (OPT)	15,000(STD) 24,000(OPT)	15,000(STD) 24,000(OPT)	12,000(STD) 15,000(OPT)	15,000(STD) 24,000(OPT)	12,000(STD) 15,000(OPT)
Spindle taper	-	BT30	BT30	BT30	BT 30 / HSK40(OPT)	BT 30 / HSK40(OPT)	BT 40 / HSK63(OPT)	BT 30 / HSK40(OPT)	BT 40 / HSK63(OPT)
Method of spindle cooling	-	Air cooling	Air cooling	Air cooling	Air cooling	Air cooling	Air cooling	Air cooling	Air cooling
FEED									
Rapid feed of X/Y/Z	M/min ipm	60 / 60 / 60 2362 / 2362 / 2362	60 / 60 / 60 2362 / 2362 / 2362	60 / 60 / 60 2362 / 2362 / 2362	60 / 60 / 96 2362 / 2362 / 3779	60 / 60 / 96 2362 / 2362 / 3779	48 / 60 / 72 1889 / 2362 / 2834	60 / 60 / 96 2362 / 2362 / 3779	48 / 60 / 72 1889 / 2362 / 2834
Cutting feed of X/Y/Z	G	1.2 / 1.2 / 1.0	1.0 / 1.0 / 1.0	1.0 / 1.0 / 1.0	1.2 / 1.2 / 1.6	1.2 / 1.2 / 1.6	1.0 / 1.0 / 1.2	1.2 / 1.2 / 1.6	1.0 / 1.0 / 1.2
ACCURACY									
Positioning (+/-)	mm/inch	0.005 / 0.00016	0.005 / 0.00016	0.005 / 0.00016	0.006 / 0.0002	0.006 / 0.0002	0.006 / 0.0002	0.006 / 0.0002	0.006 / 0.0002
Repeatability (+/-)	mm/inch	0.004 / 0.00013	0.004 / 0.00013	0.004 / 0.00013	0.003 / 0.00018	0.003 / 0.00018	0.003 / 0.00018	0.003 / 0.00018	0.003 / 0.00018
ATC									
Tool storage	-	14T Servo 21T(OPT)	14T Servo 21T(OPT)	14T Servo 21T(OPT)	Servo 24T+1	Servo 24T+1	Servo 24T+1 Servo 40T+1(OPT)	Servo 24T+1	Servo 24T+1 Servo 40T+1(OPT)
Max. tool diameter	mm/inch	50 / 1.97	80 / 3.15	80 / 3.15	50 / 1.97	50 / 1.97	75 / 2.95	50 / 1.97	75 / 2.95
Max. tool length	mm/inch	160 / 6.3	200 / 7.87	200 / 7.87	175 / 6.89	175 / 6.89	200 / 7.87	175 / 6.89	200 / 7.87
Max. tool weight	kgs/lbs	3 / 6.61	3 / 6.61	3 / 6.61	2.5 / 5.51	2.5 / 5.51	4.5 / 9.92	2.5 / 5.51	4.5 / 9.92
Tool change time	sec.	T-T: 1.4 C-C: 2.3	T-T: 1.4 C-C: 2.3	T-T: 1.4 C-C: 2.3	T-T: 0.7 C-C: 1.9	T-T: 0.7 C-C: 1.9	T-T: 1.2 C-C: 2.9	T-T: 0.7 C-C: 1.9	T-T: 0.7 C-C: 2.9
GENERAL									
Coolant tank capacity	Liters/gal	100 / 26.42	200 / 52.83	200 / 52.83	160 / 42.27	160 / 42.27	160 / 42.27	160 / 42.27	160 / 42.27
Power requirement	KVA	10	10	10	11	11	25	12	12
Air pressure requirement	Kgf/cm2	5	5	5	6	6	6	6	6
Floor space (W x L)	mm/inch	1200 x 2300 / 47.24 x 90.55	1560 x 2530 / 61.42 x 99.61	2100 x 2530 / 82.68 x 99.61	1600 x 2322 / 62.99 x 91.42	1500 x 2777 / 59.06 x 109.33	1900 x 3144 / 74.8 x 123.78	1600 x 2322 / 62.99 x 91.42	1900 x 2677 / 74.8 x 105.39
Weight	kgs/lbs	2000 / 4409.24	2300 / 5070.63	2500 / 5511.55	4000 / 8818.48	4200 / 9259.41	5600 / 12345.88	4000 / 8818.48	5000 / 11023.11

* Rated acceleration is peak. (For RMV models)

* See AKIRA-SEIKI technical bulletin for additional details.

All specification subject to change without notice.

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