

ZAX^{Professional}9100

AIR JET LOOM



TSUDA  KOMA

ZAX^{Professional}9100 AIR JET LOOM

The spectacular debut will lead the new era of weaving.

The pioneer for the Weave Navigation.

Tsudakoma introduces the new model ZAX9100 Professional, integrating their advanced technology and vast expertise of air jet weaving.



Energy savings

Careful attention has been paid to design the ZAX9100 for energy saving. The offset rocking shaft with less moment of inertia, the hollow reed holder, and a lower load in the driving oil bath save energy. Air consumption was also reduced 10% by adopting newly designed solenoid valves for every two sub-nozzles and realizing a shorter air passage. (Compared with our conventional model)

Ultimate weaving support! We incorporated the world's first "Weave Navigation System."

We provided the ZAX9100 with the world's first "Weave Navigation System." Tsudakoma has embodied their accumulated wealth of weaving expertise in this system. Simple operation on the "Navi-Board" reproduces professional

weaving technology with ease. Tsudakoma's original systems guide the ZAX9100 to the best weaving condition even during operation.

With the newly designed air jet loom, anyone can easily weave high-quality fabric using the Weave Navigation System. In pursuit of the ultimate user-friendly loom, Tsudakoma developed the new ZAX9100 air jet loom.

The ZAX9100 is completely new. We re-thought all the basics. We redesigned each section of the loom from the ground up including the frame structure, the shedding, the beating, the weft insertion, the let-off and the take-up motion. Our accumulated experience has given form to a very new air jet loom.

The ZAX9100 appropriately deals with tasks like productivity, versatility, and product development in a competitive weaving market.

Outstanding ultra high-speed and low vibration

High productivity is an essential factor of air jet looms. The ZAX9100 enjoys a synergy of weaving geometry optimized for a smooth warp shed, a well-balanced beating system, the world's best weft insertion system, and a newly designed robust structure. Consequently, the ZAX9100 is successful in three conflicting tasks: ultra-high speed, low vibration, and energy savings.

Easy operation

Easy operation is an indispensable factor for high productivity. The ZAX9100 design supports customers by simplifying weaving. Ease of operation was one goal in our development. Based on Tsudakoma's years of experience, we have created a user-friendly loom in both software and hardware.



Pursuit of quality fabric

We thoroughly pursue quality. Enhancement of the PSS Programmable Start System and the Weave Navigation System works to adjust the settings to minimize stop marks.

Expanding the world of air jet weaving

The ZAX9100 can run with all kinds of shedding motion. Even while weaving fabrics conventionally woven on rapier looms like those using different kinds and thicknesses of wefts, worsted fabric, and technical fabrics woven at high speed, the ZAX9100 maintains superior quality.

Harmony with the environment

In addition to low vibration and energy savings Tsudakoma aims to harmonize with the environment. We continue investigating noise and vibration reductions, and promote practical applications.

ZAX^{Professional}9100

Outstanding features for ultra high-speed and low vibration

The robust frame structure, stable weft insertion, optimized shedding mechanism, well-balanced beating structure increased speed by about 20%. (Compared with our conventional model)



Ultra high-speed

The essential factor of air jet looms is productivity.

Our air jet looms have led the era in ultra-high speed operation.

At SHANGHAITEX 2003, the ZAX9100 showed its super ultra high-speed operation at 1900 rpm, never realized before.



FDP-AIII free drum pooling system

Stable weft insertion

Tsudakoma's stable weft insertion system accelerates weft at low pressure to prevent yarn damage. Furthermore, we enhance the speed by combining the FDP-AIII free drum pooling system provided with the yarn-advancing reel as standard. It stabilizes insertion with less yarn breakage even at high-speed weaving or extra-wide weaving.

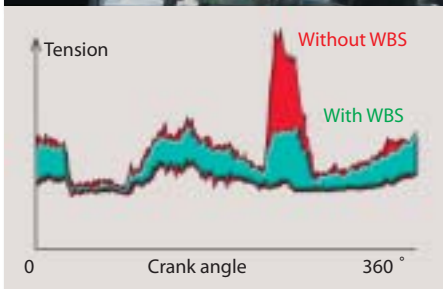


WBS Weft Brake System (Option)

The WBS sharply reduces the peak tension that occurs at the end of weft insertion in order to prevent weft breakage and looseness. This system is best for extra-wide weaving which invites higher peak tension. It is also helpful for yarns which may cause broken picks. Tsudakoma's unique pullback function equipped with the WBS system as standard prevents tip troubles drastically. The WBS contributes to stable high-speed operation and fabric quality. Automatic setting is available through the Weave Navigation system.

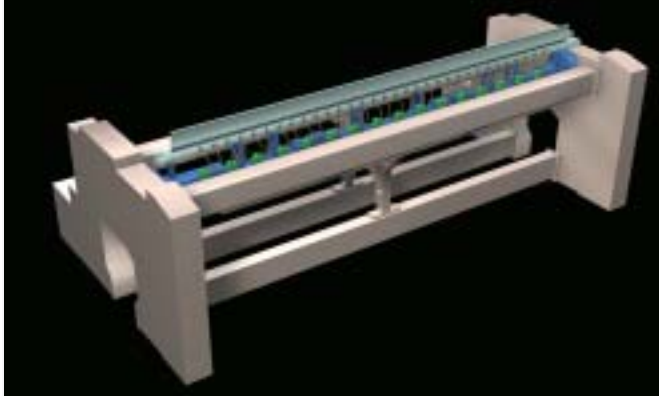
Smooth shedding, kind to warp

The weaving geometry optimized for smooth warp shedding reduces warp abrasion. The properly balanced tension of the upper and lower warp sheets during shedding realizes clear warp shedding and high pick density. The enlarged inclination of the cloth passage toward the loom front promotes a stable cloth fell.

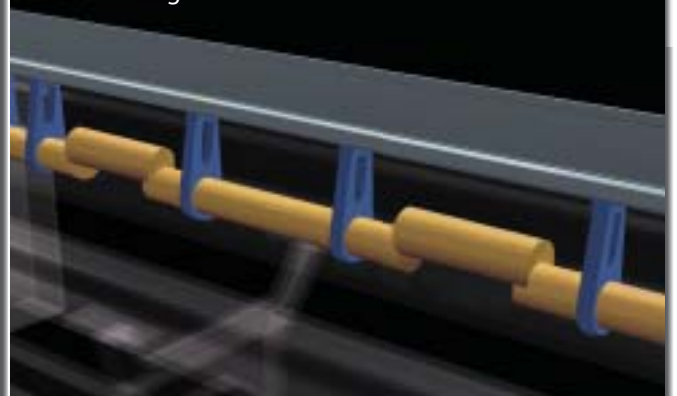


WBS Weft Brake System

Robust frame structure

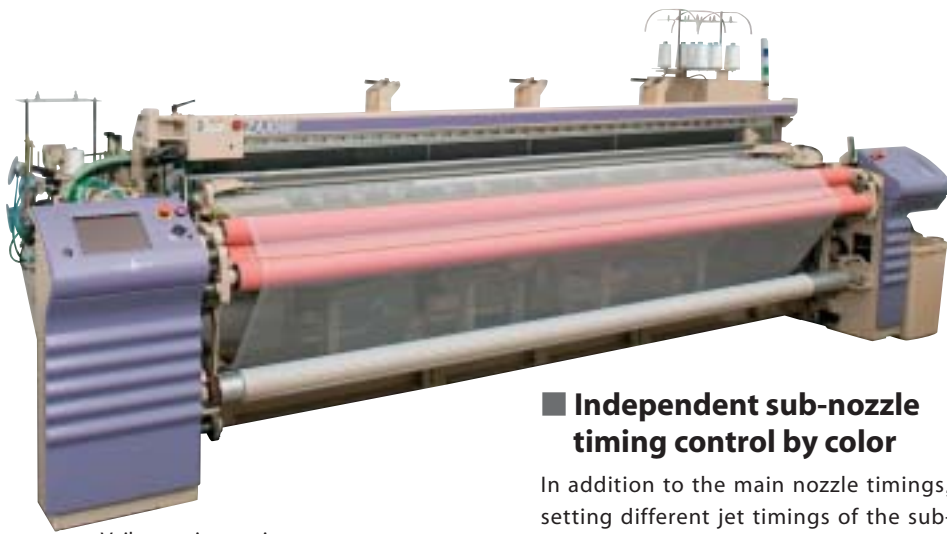


Offset rocking shaft



Advanced energy-savings

The ZAX9100 is compatible with the conflicting tasks of ultra high-speed, low vibration, and energy savings.



Voile curtain weaving

■ Dynamic balanced beating system

Using CAE analysis, we designed a new robust frame structure. By employing the offset rocking shaft with less moment of inertia and a hollow reed holder, beating is well-balanced. Exciting force is prevented and about a 35% decrease of floor vibration is attained. (Compared with our conventional model)

■ Independent sub-nozzle timing control by color

In addition to the main nozzle timings, setting different jet timings of the sub-nozzles by color according to weft yarn kind when using weft of different kind or different thickness contributes to stable performance, improvement in fabric quality, and energy savings.

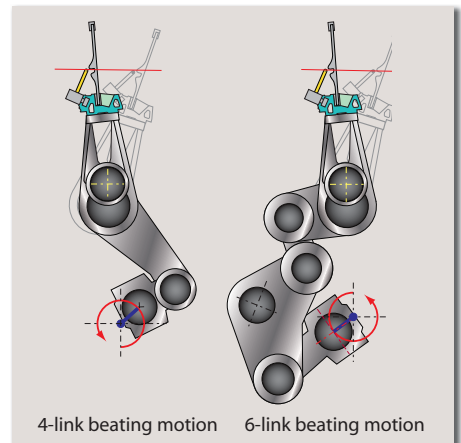
■ Sub-nozzle boosting system

The sub-nozzle jetting time is increased only when the yarn supply package is replaced, when the loom restarts or when the weft arrival timing is greatly changed. This stabilizes weft insertion and keeps fabric quality high.

■ Soft weft insertion at high speed

Proven benefit based on actual operation.

A 4-link beating motion that works excellently at ultra-high speed is used for narrow looms. A 6-link beating motion with more time allowance for weft insertion is used for wider looms, thus achieving more stable weft insertion.

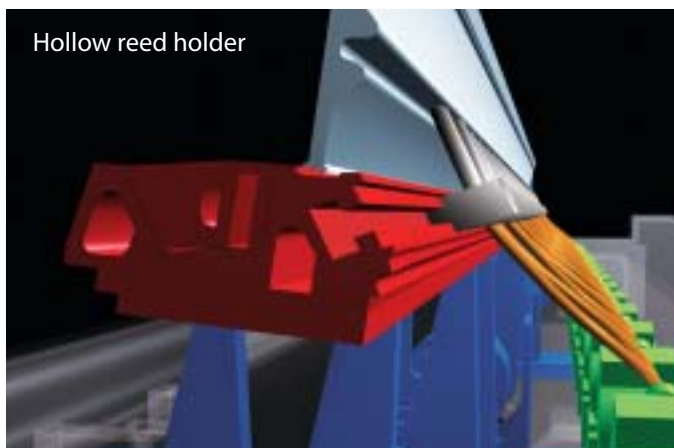


■ Reduction in air consumption

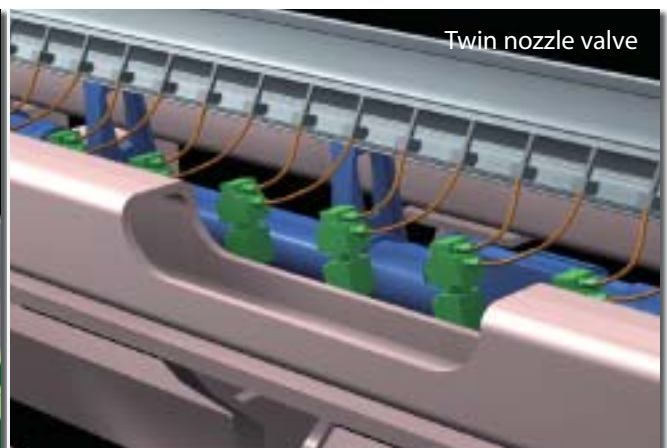
“Twin Nozzle Valve” newly developed for the sub-nozzles feeds compressed air to every two sub-nozzles.

This allows high response to speed that makes sharp air jetting possible and contributes to reduction in air consumption.

We designed the secondary chamber of the Twin Nozzle Valve, reduced by 40% of the previous model. Thus, air consumption is reduced by about 10%. (Compared with our conventional model)



Hollow reed holder



Twin nozzle valve

ZAX9100 Professional

Ultimate weaving support

For ultimate weaving support, the world's first "Weave Navigation System" developed from conventional expert systems is incorporated.

The World's First! Weave Navigation System

The ZAX9100 expands and enhances automatic setting functions for more detailed and easier operation. Enter a minimum number of items. Conditions to control weaving are set automatically, and our recommended mechanical values are shown.

This new system navigates up through real time weaving for optimum operation. As a first step toward a loom free from measuring equipment, various loom data are indicated.

Network Application

The TLM Tsudakoma Loom Monitoring system can be installed without difficulty based on the Ethernet through a LAN port, standard on the ZAX9100. A special computer is not necessary for the installation.



Weave Navi

The Weave Navi monitors loom operation while the loom is in operation. It gives advice to improve the operation in various situations, navigating you to the best weaving possible.

Auto Cruise

Automatic adjustment for the loom's setting according to the ever-changing weft insertion status provides you with a comfortable auto cruise in weaving.



Self-Navigation

Excellent self-diagnosis and maintenance information results in easy maintenance. Weft insertion adjustment does not need measuring equipment.



Weave Navigation System



(Navi-Board)

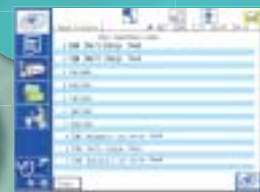
Tune Navigation

The best setting values are automatically entered for your fabric and loom specifications. Automatic setting for the warp tension is available in addition to the conventional automatic setting function for weft insertion. Optimum mechanical settings are recommended for the tension roll position, easing amount, and various pressure settings according to the fabrics to be woven.



Trace Navigation

When solving a problem like a stop mark, which needs to adjust multiple setting items, you have only to adjust one pointer to change all the related set values to the optimum setting based on Tsudakoma's accumulated weaving experience.



Weave Tips

We advise weaving expertise according to the fabrics.



Easy operation

The ZAX9100 was designed for enhancing easy operation.



Improvement in operation

We re-engineered the loom frame height and depth for the ZAX9100 for easier access during operation and maintenance.

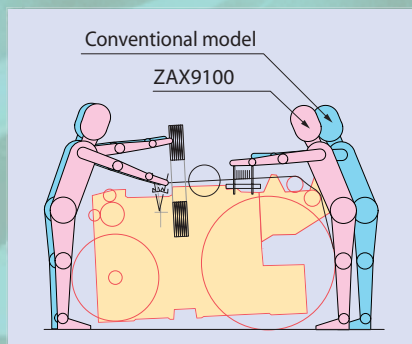
For optimum maintenance and operation environment, we moved the air regulators to a higher, more accessible position. These changes drastically reduce the number of tools required. The driving elements for positive easing motion are located outside the main frame to simplify adjustment and maintenance.

The ETU Electronic Take-Up motion is now standard. Pick density can be changed through the Navi-Board without changing pick change gears. In addition, ETU can accommodate multiple pick density as well as reducing stop marks for quality fabrics.

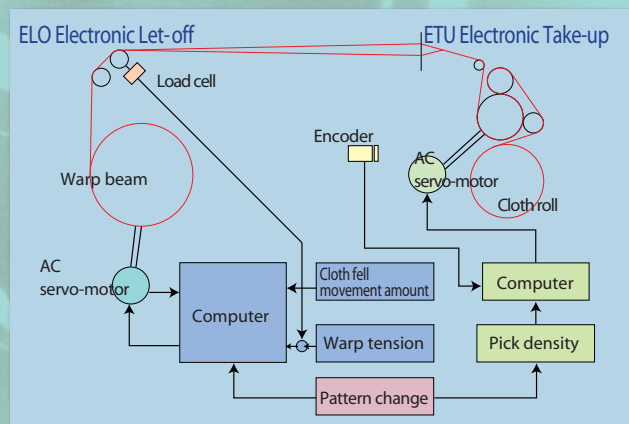
All these improvements reduce time for style changes by about 20%.

Easy maintenance

On the Navi-Board, the ZAX9100 with the Weave Navigation System displays information about maintenance, such as the position and parts for periodic replacement.



Positive easing motion



Pressure control arranged in the higher positions



Take-up roll lift up with a simple handle operation



ETU Electronic Take-Up

ZAX9100 Professional

Expanding the world of air jet weaving

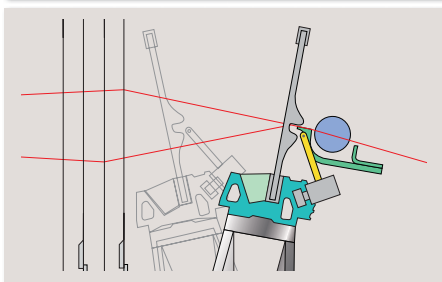
The ZAX9100 can run with any shedding motion. Even fabrics in the rapier field like various kinds and thickness yarns, worsted, technical fabrics woven at high speed. Fabric quality remains high.



■ FDP-AIII free drum pooling system

The FDP-AIII free drum pooling system is superior in responding to high-speeds. Its advancing reel system separates weft yarns positively and is useful in weaving even long hairy yarns like worsted yarns without difficulty. Thus, the ZAX9100 can weave a much wider range of wefts.

The number of pre-wind on the feeder is about 3 times that of our conventional measuring system. Minimizing damage on weft yarns during pick-at-will weft insertion stabilizes operation.



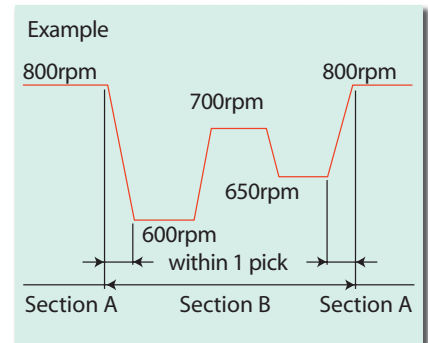
■ Stabilized cloth fell

The top-mounted temple with a larger inclined angle toward the loom front and the guide bar mounted close to the cloth fell stabilize the cloth fell even in weaving a fabric with many upper warps, a double weave, a triple weave, a Jacquard cloth, and a high-density fabric.

■ PSC Programmable Speed Control



Up to eight kinds of loom RPM can be independently set. Formerly the loom RPM was restricted in case of difficult weft yarns. The PSC automatically adjusts the RPM to the optimum for each yarn kind. Thus, productivity is dramatically increased. The loom RPM is changed within one pick.



Upholstery weaving



This photo includes optional equipment.

Excellent performance for weaving stretch fabric and high-density fabric



■ **ESS Electronic Shedding System** Option

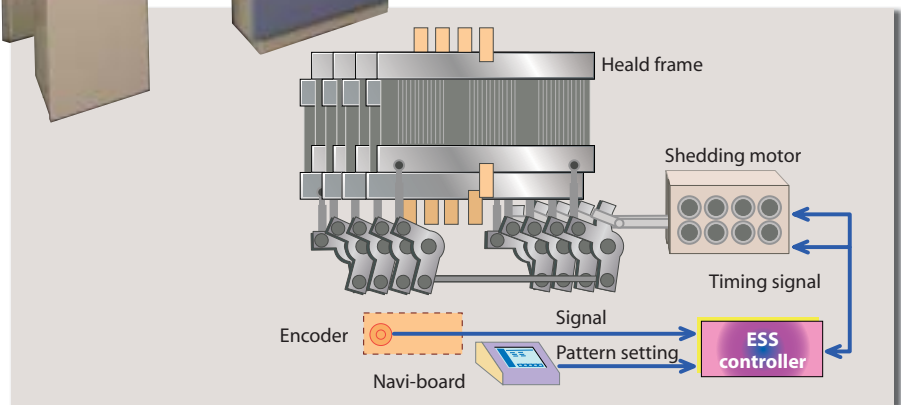
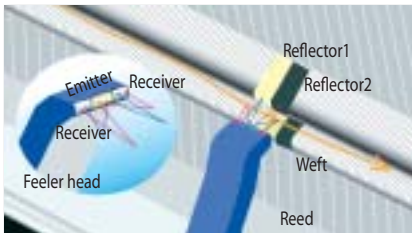
Tsudakoma developed the ESS Electronic Shedding System, the first in the world. Its dwell angle and phase difference can be programmed freely from the Navi-board.

The completely re-engineered driving mechanism, including a servomotor, allow higher speed running.

A maximum of 16 heald frames are available. Fabric construction can be changed immediately to realize quick style changes.

■ **3-eyed feeler** Option

The 3-eyed feeler, a reflective sensor, detects any colored spun and filament yarns ensuring stable weft insertion. This feeler does not require a special reed whose overall length is determined according to the reeding width.



■ **ZTN needle-less tuck-in device** Option

For tuck selvage formation, wefts are tucked in the edge by the force of air. Damage on the reed by a tuck-in needle is prevented, and wear and tear of the mechanical parts is eliminated. Maintenance becomes easier. The tuck-in device can be adjusted by entering values on the Navi-board. Fine tucked selvage can be formed without difficulty.



Worsted weaving with the ESS Electronic Shedding System



This photo includes optional equipment.

ZAX9100^{Professional}

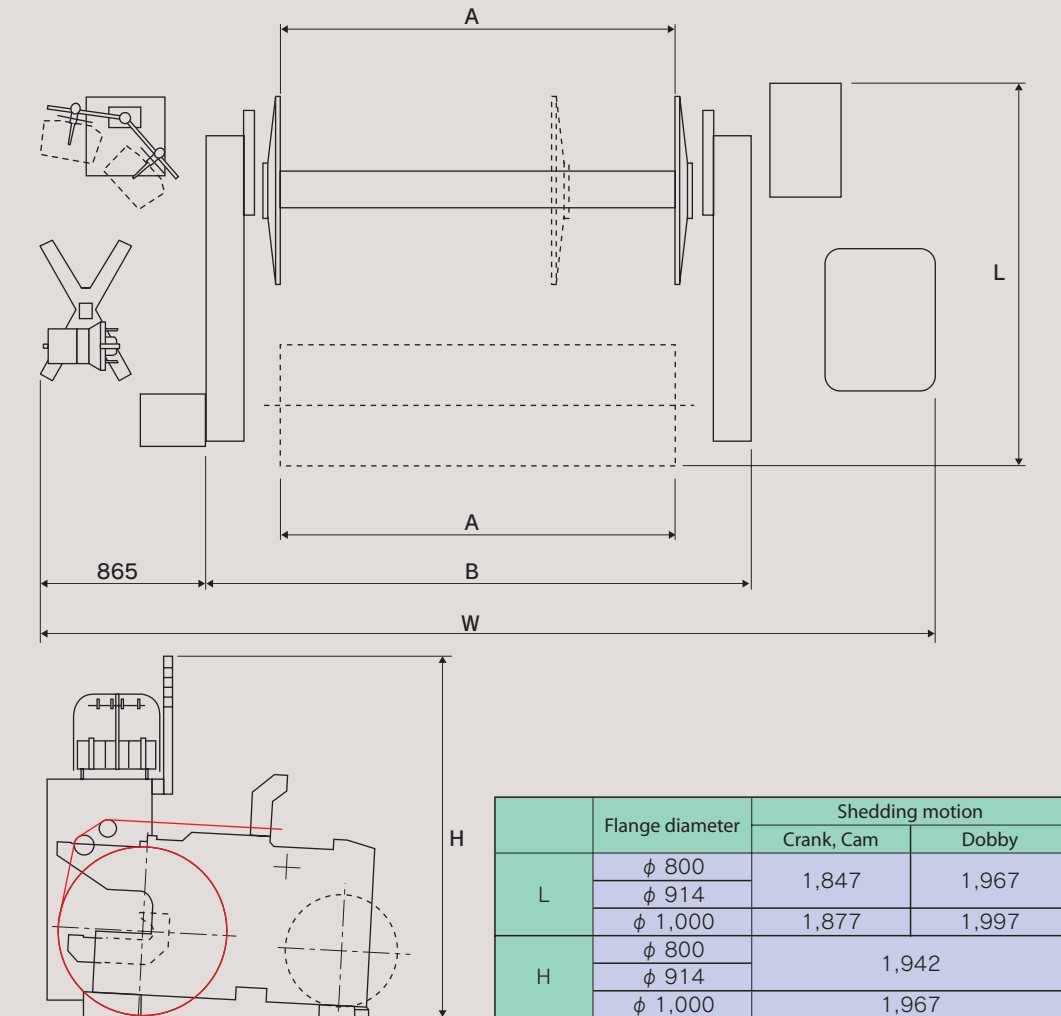
■ Specifications

Item		Specification	Option
Reed space	Nominal (cm)	150, 170, 190, 210, 230, 250, 280, 340, 360, 390	
	Useful reeding width	Same as nominal width. Maximum reduction: 60 cm (for 150 ~ 250 cm loom) 80 cm (for 280 cm or wider loom)	Maximum reduction: 80 cm (for 150 ~ 250 cm)
Weavable range		Spun: Ne100 ~ Ne 2.5 Filament: 22 dtex ~ 1350 dtex	
Weft selection		2 colors, 4 colors, 6 colors	
Driving	Starting method	Direct start of rush-start motor drive PSS Programmable Start Push-button operation with both hands Slow inching with an inverter (Forward, reverse)	PSC Programmable Speed Control
	Motor capacity	2.7kW, 3.0 kW, 3.7kW, 5.5 kW (Jacquard shedding)	
Weft insertion		Main and sub-nozzles combined system Auxiliary main nozzle Stretch nozzle	Independent auxiliary main nozzle timing control WBS Weft Brake System FIC Fuzzy Insertion Control Main nozzle clamper
	Weft insertion control	New solenoid valve with built-in manifolds (Two sub-nozzles/valve) Independent sub-nozzle timing control by color Sub-nozzle boosting system AJC Auto Jet Controller, First pick control	
	Measuring & storage	FDP-AIII Free Drum Pooling (With advancing reel system)	Balloon breaker
Shedding		Crank plain shedding: Shaft number: 4 Positive cam shedding: Shaft number up to 8 Positive dobby shedding (Electronic, Floor-mounted): Shaft number up to 16 Jacquard shedding	ESS Electronic Shedding System Auto-leveling (Positive cam) Positive cam shedding: Shaft number up to 10 Selvage name Jacquard
Let-off		Double roll electronic let-off (ELO), with kickback function With negative easing or positive easing	Euro beam Twin beam
	Flange diameter	800 mm, 914 mm, 1000 mm	1100 mm
Take-up		ETU Electronic Take-up, with automatic density change function (8 kinds of densities)	
	Maximum on-loom take-up diameter	600 mm (Cam, dobby, Jacquard shedding), 520 mm (Crank shedding)	
	Pick density	Standard type: 9.8 ~ 118.1 picks/cm (25 ~ 300 picks/inch) Coarse type: 5.9 ~ 118.1 picks/cm (15 ~ 300 picks/inch)	
	Woven length counter Temple	Display on Navi-Board (meter, yard), with preset counter function Top-mounted type (Inclined cloth passage toward loom front)	Low-mounted type
Beating		Press roll lift up with a handle operation	
		Crank type beating, multiple sley sword beating: 4 links (Reed space up to 230 cm) 6 links (Reed space 250 cm or more)	
Weft supply stand		Offset Rocking shaft with intermediate supporter	
Selvage formation		Floor mounted for 4 packages (2 colors), Floor mounted for 8 packages (4 colors), Floor mounted for 10 packages (6 colors)	ZTN needle-less tuck-in device (Left & right, intermediate) 2/2 selvage motion, Center leno, Electric leno
Waste weft removal		Planetary gear motion	Independent shedding motion for catch cord
Cutter		Catch cord type (2-roll type), catch cord type (Gear type)	Electrical cutter
Lubrication		Mechanical cutter	Centralized lubrication (Automatic grease)
Stop motion		Oil bath system for main driving parts, centralized lubrication (Manual grease)	Centralized lubrication (Automatic grease)
	Weft yarn	Reflective weft feeler One-head system, two-head system	Package sensor, pick-tail sensor 3-eyed feeler
	Warp yarn	Electric 6-row contact bar system	Row number indication function, left & right area indication function Rotary sensor
	Others Stop cause indication	Stop motion for selvage and catch cord yarn Indication by message on Navi-Board 4-color multi-function indication lamps	SGS safety guard sensor
Weave Navigation System	Navi-Board	Automatic data setting, recommended setting indication, optimum weaving condition information Automatic control, troubleshooting, self-diagnosis function Operating data indication, maintenance data indication	
	Network application	Weaving advice, operation manual & parts catalog browse TLM Tsudakoma Loom Monitoring system	TCCS Tsudakoma Computer Control System APR-C Automatic defective Pick Remover
Automation			

For special designs, please contact a Tsudakoma dealer or our sales staff.

■ Dimensions

Unit:mm



Reed space cm		150	170	190	210	230	250	280	340	360	390
W	Crank shedding	3,550	3,750	3,950	4,150	4,350	4,550	4,850	5,450	5,650	5,950
	Positive cam	3,930	4,130	4,330	4,530	4,730	4,930	5,230	5,830	6,030	6,330
	Floor-mounted positive dobbie	4,030	4,230	4,430	4,630	4,830	5,030	5,330	5,930	6,130	6,430
A		1,500	1,700	1,900	2,100	2,300	2,500	2,800	3,400	3,600	3,900
B		2,110	2,310	2,510	2,710	2,910	3,110	3,410	4,010	4,210	4,510

Note 1: For details of other specifications, please ask Tsudakoma.

Note 2: When the flange diameter is 914 mm or more, liners are required.

Note 3: Figures in the "W" section are the dimensions for a 2-color loom without the WBS. For other specifications, please ask Tsudakoma.

Note 4: Photographs, drawings, and data in this brochure are subject to change for improvement without notice.

Note 5: Photos in this brochure partially include optional equipment.



The Weave Navigator



Since its founding in 1909, Tsudakoma has been a vigorous pioneer in weaving technology.

While achieving higher productivity, improving fabric quality, and saving energy, Tsudakoma has poured its energy into satisfying the demands of multi-colored, wide, and value-added fabrics. As a result, Tsudakoma is the leader in cutting-edge weaving technology.

Tsudakoma, as the Weave Navigator, continues creating excellent textile machinery, opening the door to a new era of weaving.



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