User's Guide

of

WILTOP air jet loom

Hangzhou Wiltop Textile Machinery Co., Ltd.

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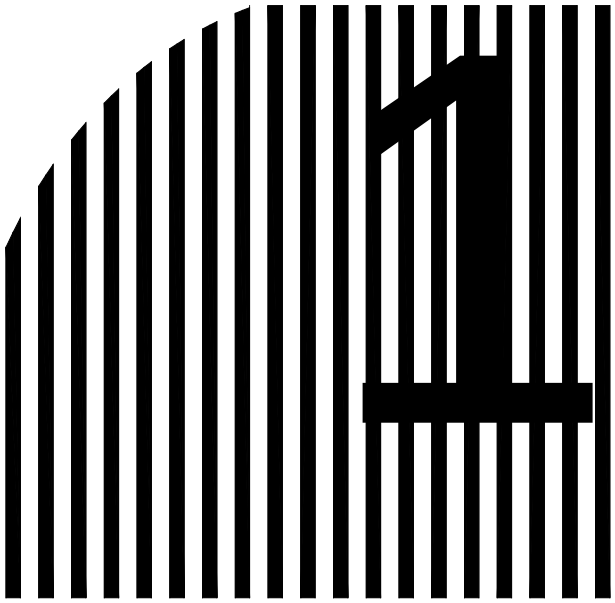


Chapter 1

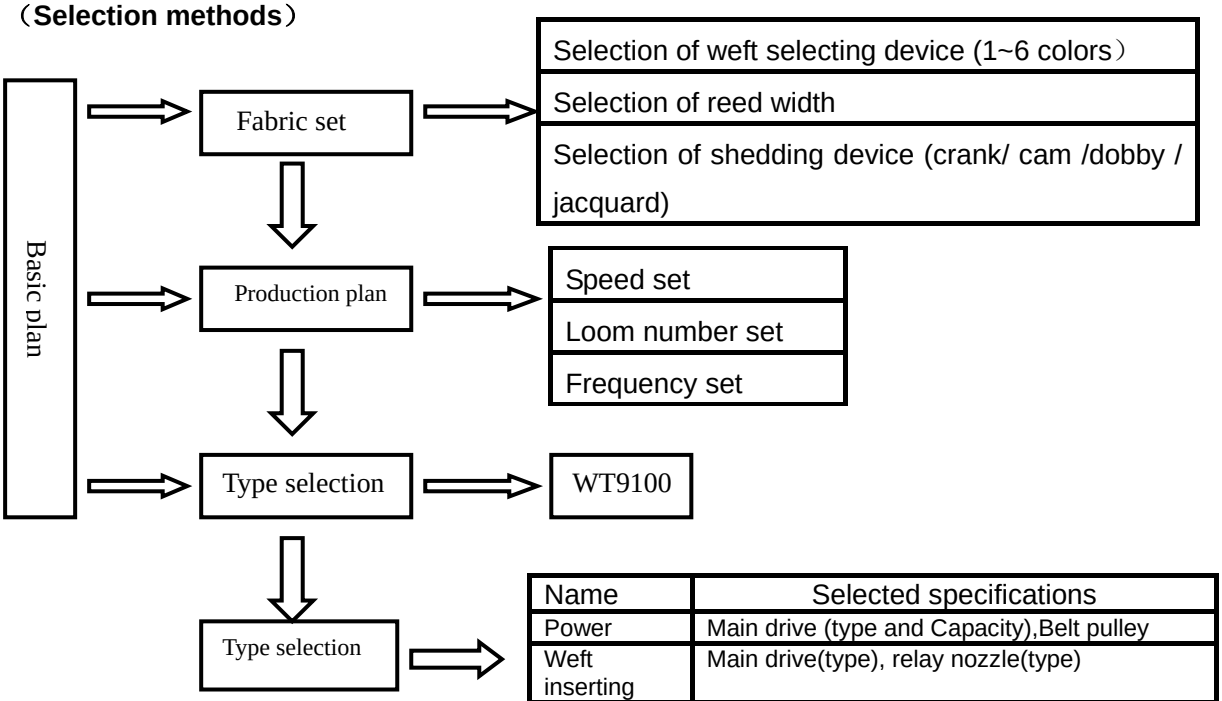
●Specification andperformanceof Wiltop loom

1 **Selection of specification**
2 **Weaving range**
3 **Representational weaving example**
4 **Length of cloth and loom speed**
5 **Consumption quantity of air.**
6 **Loss of weft**

1 Selection of specification

WILTOP loom with different devices has various specifications. The fabric which the clients want can be manufactured by combination of devices. The plenary discussion with our salesman is suggested strongly for selecting the optimal loom.

（Selection methods）



Name	Selected specifications
Power	Main drive (type and Capacity),Belt pulley
Weft inserting	Main drive(type), relay nozzle(type)
Shedding	type, number of heddle frame, dimension of heddle
Let-off	Dia. of selvage disc, positive Let-off
Take-up	Control type, beating range,Take-up roller,counter,temple type
Weft beating	Travel,Specification of reeds
Weft checker	type,Drum type
Weft supply	Number of weft storing device, power supply box and supporter of weft storing device
Selvage	Type （Star,leno, selvage, center selvage)
Selvage	Type,Number of package
electric	Weft detector
Supplied device	Warp stop type,central lubrication
Supplied parts	Main drive Belt pulley,Number of spare parts and tool,detector

Note: The specifications in detail will be shown in the leaflet.

2. Weaving range

2-1 Type and count of weft

Type	count of yarn
Staple	100~5S/1 (Ns) (Nm170-8.5)
Filament	50-600d (Ndem)(55.6-667dtex)

2-2 Pick density

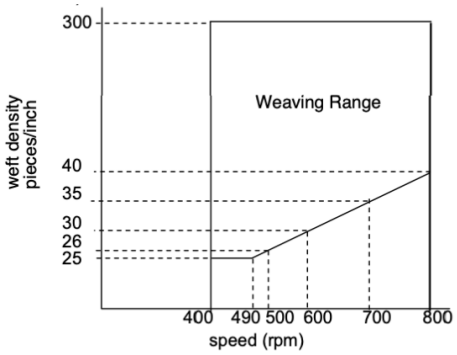
1） During electronic take-up process,

(1) The pick density range is from 25 to 300 pieces /inch, and it can be set in the unit of 0.1 pieces/inch.

Note) the fabric shrinkage varies with different fabrics. The fabric shrinkage is not considered here. Therefore, when inputting weft density parameters, the weft densityshould be reduced according to the weaving shrinkage (about 1 ~ 4%).

The minimal density varies with different speeds of loom.

During main speed process, the min Pick density (pieces /inch)is shown:



(1) minimal density is different according to different speed
ex. 490rpm: 25 pieces/in
800rpm: 40 pieces/in

(2) The maximum weft density is 300 pieces/in

Note: The weft beating number is calculation value without shrinkage and thickness of fabric.

2） During electronic take-up process, there are four pick densities for selection. The four pick densities can be switched under the guiding of density selecting device during weaving.

2-3 Weight of cloth

Weight of cloth	unit
500 (jean) ------ 30 (gauze)	g/m^2
14.75 (jean) ------ 0.88(gauze)	ounce/square yard

3. Representational weaving example

3-1 Type of cloth

Type	Purpose	Weight	Name
			Base cloth、cotton gauze、gauze、heart cloth
		Heavy weight	Jaconet、white-back duck、down cloth、cotton hair、corduroy、gabardine、weather cloth、covert coat
		Middle weight	Poplin、check cord、oxford cloth、sleek、raised cloth、bed-sheeting、jaconet、thin coat cloth、pure wool cloth、flannel、cotton warp shirting textures、terry
		Light weight	Crepe、upper fine cloth、bast fabric、gauze cloth
filament Acetate fiber Cuprammonium fiber Artificial silk Nylon Polyester fiber			Interlining fabric、dress cloth、window-blind、（taffeta、satin weave、twill)
Inter weave			Sport face fabric、shirting、livery cloth
Glass fiber			Curtain、electric thread

3-2 Example of weaving

1）Type of yarn

mark	Type of yarn
C	common yarn
CM	combed yarn
CVC	Cotton mixed fiber（ratio50/50）
P/C	polyester/cotton
P/R	polyester/Artifical silk
P/W	polyester/wool
PE	polyester
PEW	Polyester fiber
CSY	Core-spun yarn
PU	Polyure thane

mark	Type of yarn
N	nylon
AC	Acetate fiber
BB	Cuprammonium rayon
R	Artifical silk
W	pure wool
G	Glass fiber
SF	Synthetic fiber
VS	vinylon（staple）
AL	acrylic

2）Specification of cloth $\frac{\text{warp} \times \text{weft}}{\text{Warp density/inch} \times \text{weft density/inch}}$

3) Expression of loom specification R

WT9100－190 －2 — MTU — NC10

type width colour take-up shed →

MTU：mechanical take-up
ETU：electronical take-up

S： Crank shaft
PC：Positive cam
NC：Negative cam
PD：Positive dobby
ND：Negative dobby
J： Jacquard
E: Electronical shedding
number： number of heald frame

4)Example of weaving

Grouping	Name of cloth	Specification	Reed width（mm）	Type of loom
Staple	Base cloth	SF30S/1×SF30S/1 45/inch×35/inch	1340	WT9100-170-S4
	Cooling cloth	SF30S/1×SF30S/1 8/inch×7/inch	1300	WT9100-150-S4
	Gauze	C30S/1×C30S/1 20/inch×12/inch	1165	WT9100-150-S2
	Chip	VS20S/1×VS20S/1 20/inch×12/inch	1620	WT9100-170-S4
	Bast fabric	hemp35S/1×hemp35S/1 18/inch×16inch	2050	WT9100-230-NC6
	资材	VS20S/1×VS20S/1 15/inch×15/inch	1670	WT9100-190-S4
	Base cloth	hemp10S/1×hemp10S/1 18/inch×16inch	2332	WT9100-280-S4
	Grinding cloth	P/C20S/2×P/C20S/2 81/inch×46/inch	1790	WT9100-190-NC8
	Poplin	P/C45S/1×P/C45S/1 110/inch×76/inch	1670	WT9100-190-NC4
	Clear muslin	P/C45S/1×P/C45S/1 136/inch×72/inch	1650	WT9100-190-NC4
	Zephyr	P/C50S/1×P/C50S/1 94/inch×68/inch	1626	WT9100-190-NC4
	Down quilt	CM40S/1×CM40S/1 120/inch×110/inch	1775	WT9100-190-NC4
	Down-filled sheeting	CM40S/1×CM40S/1 110/inch×155/inch	1706	WT9100-190-NC7
	Down-filled sheeting	CM60S/1×CM40S/1 200/inch×134/inch	*1670	WT9100-190-NC7
	Gingham	CVC45S/1×CVC45S/1 110/inch×70/inch	1620	WT9100-190-S4
	Sleek	P/C45S/1×P/C45S/1 122/inch×70/inch	1367	WT9100-150-NC8
	High-quality cloth	CM60S/1×CM60S/1 104/inch×105/inch	1345	WT9100-150-NC4
	Fine cloth	CM80S/1×CM100S/1 91/inch×89/inch	*1109	WT9100-150-NC4

Grouping	Name of cloth	Specification	Reed width（mm）	Type of loom
Staple	Cotton crepe	C40S/1×C40S/1，1200T/M 67/inch×53/inch	1500	WT9100-170-S4
	Corduroy	P/C16S/1×P/C13S/1,C16S/1 60.5/inch×128/inch	*1892	WT9100-190-NC6
	Woolen over coating	CM60S/2×CM60S/2 160/inch×95/inch	1574	WT9100-170-NC4
	Painter canvas	C40S/1×C40S/1 68/inch×61/inch	1067×2 pieces	WT9100-230-S4
	Nylon woolen blanket	AL1/48S×AL1/10S 35/inch×35/inch	*1700	WT9100-190-NC4
	Brushed denim	P/C12S/1×P/C12S/1 76.5/inch×48/inch	*1750	WT9100-190-NC8
	Elastic jean	C 7S/1×CSY 16S/1 60/inch×40/inch	1524	WT9100-170-NC8
	Elastic gabardine（2/2）	P/R40S/2×PW150d/2 91/inch×57/inch	1895	WT9100-190-NC8
	Cotton gabardine（2/2）	C Nep12S/1×C Nep 12S/1 C12S/1×C12S/1 39.6inch×37/inch	1727	WT9100-190-NC4
	Face fabric（2/2）	P/W2/40S×P/W2/40S 54/inch×54/inch	1610	WT9100-190-NC6
	Striped fabric	P/C45S/1×P/C45S/1，1890T/M 62/inch×52/inch	1626	WT9100-170-NC4
	Gauze	CM40S/1×C40S/1 20/inch×12/inch	*1359×2 pieces	WT9100-280-S4
	Linen cotton shirting	hemp20S/1×C20S/1 100/inch×50/inch	1270	WT9100-150-NC4
	270 plain cloth	CM50S/1×CM60S/1 150/inch×120/inch	1750	WT9100-190-NC4
	Crepe georgette	carding1/30S×carding1/30S 80/inch×52inch	1740	WT9100-190-ND6
	Suitings	P/W 2/36S×P/W 2/36S 41/inch×42/inch	1733	WT9100-190-NC4
	Army cloth	P/C20S/1×P/C16S/1 120/inch×58/inch	1470	WT9100-190-NC6
	Twilled satin	C60S/1×C60S/1 173/inch×113/inch	1760	WT9100-190-NC7
	Bed-sheeting	C40S/1×C30S/1 100/inch×93/inch	*2580	WT9100-280-NC4
	Bed-sheeting	C24S/1×C24S/1 65/inch×62/inch	2220	WT9100-280-NC4
	Clear muslin	C40S/1×C40S/1 133/inch×72/inch	1750	WT9100-190-NC4
	14.75ounce jean	C7S/1×C6S/1 66/inch×45/inch	1690	WT9100-190-NC6

Grouping	Name of cloth	Specification	Reed width（mm）	Type of loom
Staple	Bed-sheeting	P/C35S/1×P/C35S/1 92/inch×82/inch	2665	WT9100-280-NC4
	Bed-sheeting	C34S/1×C37S/1 104/inch×92/inch	3120	WT9100-340-NC4
	Jean	P/C45S/1×P/C16S/1 96/inch×50/inch	1700	WT9100-190-S4
	Engineer cloth	C20S/1×C20S/1 100/inch×50/inch	1740	WT9100-190-NC5
	Pencil jean	C80S/2×C80S/2 160/inch×60/inch	1700	WT9100-190-S4
	Pencil jean	C50S/1×C50S/1 144/inch×78/inch	1273	WT9100-150-S4
Spun yarn	Elastic cloth	C80S/2×N78dtex+PU44dtex 100/inch×90/inch	2120	WT9100-230-ND16
	Elastic cloth	C20S/1×CSY16S/1 102/inch×50/inch	1800	WT9100-190-NC6
Glass fiber	PCB basic cloth	G450 1/0×G450 1/0 60/inch×47/inch	1295	WT9100-150-S4

Note:The number of marking "*" is width of gray cloth.(mm)

Grouping	Name of cloth	Specification	Reed width（mm）	Type of loom
Filament	Cellulose acetate taffeta	AC84dtex×AC84dtex 102/inch×83/inch	1250	WT9100-150-S4
	Cuprammonium silk taffeta	BB56dtex×BB84 dtex 120/inch×84/inch	1250	WT9100-150-S4
	Rayon taffeta	R84dtex×R135dtex 102/inch×83/inch	1250	WT9100-150-S4
	Nylon affeta（210piece）	N78dtex×N78dtex 118 /inch×86/inch	1220	WT9100-150-S4
	Polyester fiber taffeta	PE56 dtex×PE167 dtex 102/inch×76/inch	1700	WT9100-190-S4
	Rayon satin	R84dtex×R135dtex 192/inch×67/inch	1235	WT9100-150-ND12
	Acetate satin weave	AC84dtex×AC135 dtex 265/inch×87/inch	1700	WT9100-190-ND16
	NCsatin weave	N78 dtex×CM50S/1 190/inch×90/inch	1620	WT9100-190-NC7
	Chambray	PE110 dtex×C60S/2 138/inch×56/inch	1600	WT9100-190-S4
	Corduroy	PE56dtex ×PE84dtex，SZ3000T/M 197/inch×110/inch	1760	WT9100-190-S4
	Corduroy	PE56dtex ×PE84dtex，SZ3000T/M 184/inch×91/inch	1340	WT9100-150-S4
	Crepe georgette	PE84dtex,SZ2500T/M×PE84dtex，SZ2500T/M 142/inch×76/inch	1818	WT9100-190-ND16
	Carriage cloth	PE600dtex +PE11dtex /2×PEW1220dtex 132/10 ㎝×120/10 ㎝	1600	WT9100-190-ND16
	Poplin of shandong	PEW84dtex×PEW84dtex 91/inch×71/inch	1790	WT9100-190-S4
	Chip	PEW33dtex×PEW33dtex 116/inch×53 /inch	1850	WT9100-190-S4
	Luggage cloth	N220dtex×N220dtex 48/inch×46/inch	1500	WT9100-190-NC4
	Gas cell cloth	N470dtex×N470dtex 52/inch×52/inch	1700	WT9100-190-NC4
	T bag cloth	PE28dtex×PE28dtex 97/inch×97/inch	1650	WT9100-190-S4
	New synthetic	PE240dtex,1500T/M×PE240dtex,SZ1500T/M 99/inch×90/inch	1715	WT9100-190-ND16
	New synthetic	PE84dtex×PE167dtex/2,SZ1500T/M 200/inch×55/inch	1700	WT9100-210-ND16
	Muslin wool crepe	PE183dtex,SZ1800T/M×PE183dtex,SZ1800T/M 135/inch×90/inch	1735	WT9100-190-ND16
	Pear cloth	PE167dtex/2,SZ1200T/M×PE167dtex/2,SZ1200T/M 54/inch×53/inch	1735	WT9100-210-ND16
	Muslin	PE167dtex,S800T/M×P/C42/2 84/inch×54/inch	1688	WT9100-210-S4

Grouping	Name of cloth	Specification	Reed width（mm）	Type of loom
Filament	Computer silk ribbon	N44dtex,300T/M×N44dtex,300T/M 154 /inch×109/inch	1830	WT9100-190-S4
	Composition cloth	N470dtex×N470dtex 18/inch×20/inch	1710	WT9100-190-S4
	Palace	PE84dtex,280T/M×PE84dtex,2500T/M 151/inch×90/inch	1280	WT9100-150-S4
	Women dress shell fabric	PEW215dtex ,1200T/M×PEW215dtex ,1200 T/M 133/inch×70/inch	1870	WT9100-190-ND16
	interweave	PE84dtex×R30S/1 112 /inch×65/inch	1700	WT9100-190-S4

5)Example of weaving terry

(1) Type of terry

（P）pile warp（G）ground warp×（G）weft

Warp density/inch（Warp density/K）×weft density/inch

Note:P of warp stands for pile warp,G is ground warp,G is the weft of weaving pile warp K is pile warp density add ground warp density.

(2) Specification of loom

a. WT9100-230-D16（with electronic dobby）or jacquard

b. WT9100-280-D16（with electronic dobby）or jacquard

c. WT9100-340-D16（with electronic dobby）or jacquard

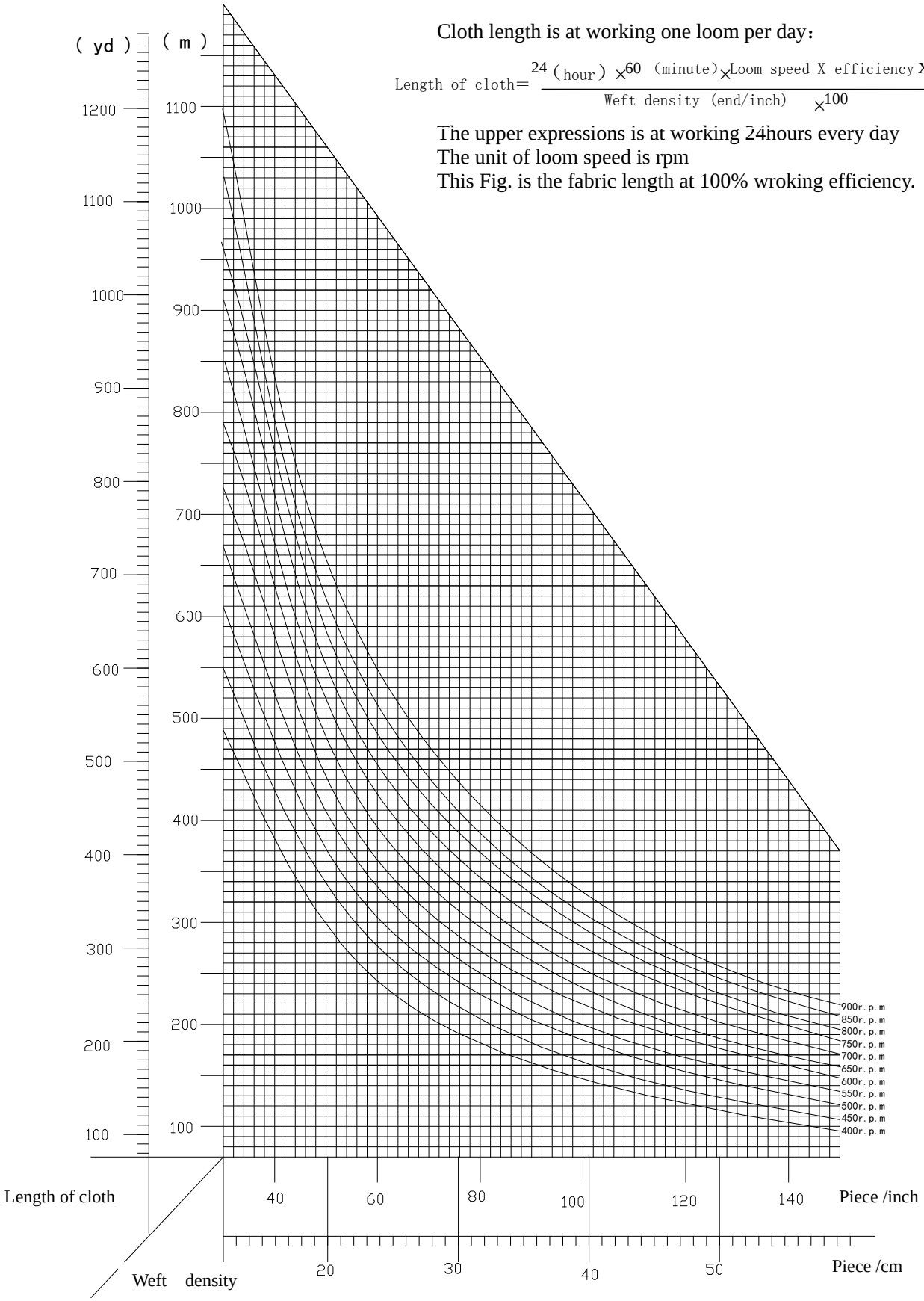
Name of cloth	weave	**Specification**	Reed width（mm）	piece	Number of heald frame	width（cm）
Bath towel	General	(P)C20/1(G)C20/1×(G)C16/1 47/inch(70/K)×35/inch	2155	5	16	230
	Weft rib weave	(P)C20/1(G)C20/1×(G)C20/1 51/inch(76/K)×43.5/inch	2063	5	14	230
	Insect –eaten tissue	(P)C20/1(G)C20/1×(G)C20/1 56.4/inch(84/K)×33.5/inch	2040	5	16	230
	General	(P)C20/1(G)C20/1×(G)C20/1 67.1/inch(100/K)×43/inch	2030	5	16	230
	General	(P)C20/1(G)C20/1×(G)C16/1 53.6/inch(80/K)×42/inch	2520	5	14	280
Bath towel	Warp rib weave	(P)C20/1(G)C20/1×(G)C20/1 57.7/inch(86/K)×40/inch	2260	3	16	230
	General	(P)C20/1(G)C20/1×(G)C20/1 63.8/inch(95/K)×45/inch	2080	2	12	230
	General	(P)C18/1(G)C14/1×(G)C16/1 53.6/inch(80/K)×46/inch	1900	2	12	230
	General	(P)C18/1(G)C14/1×(G)C20/1 53.6/inch(80/K)×46/inch	2310	3	14	280
	General	(P)C13.5/1(G)C10/1×(G)C12/1 61/inch(91/K)×48/inch	3400	4	16	340
Towel	General	(P)C12/1(G)C10/1×(G)C10/1 59/inch(88/K)×36/inch	2118	4	16	230
	General	(P)C12/1(G)C10/1×(G)C10/1 64/inch(95/K)×40/inch	2056	4	16	210
Piece-cloth	Insect –eaten tissue	(P)C20/1(G)C20/1×(G)C20/1 76.5/inch(114/K)×43/inch	2100	2	14	230

4. Length of cloth and loom speed

Cloth length is at working one loom per day:

$$\text{Length of cloth} = \frac{24\,(\text{hour}) \times 60\ (\text{minute}) \times \text{Loom speed X efficiency X2.54}}{\text{Weft density (end/inch)} \times 100}$$

The upper expressions is at working 24hours every day
The unit of loom speed is rpm
This Fig. is the fabric length at 100% wroking efficiency.



5. Consumption quantity of air

The air consumption of weft insertion is different for the difference of loom's model type ,fabric and speed.if wanting to know the anticipated air consumption and electric power consumption for some fabric ,please make clear the below factors first.

1） （condition）

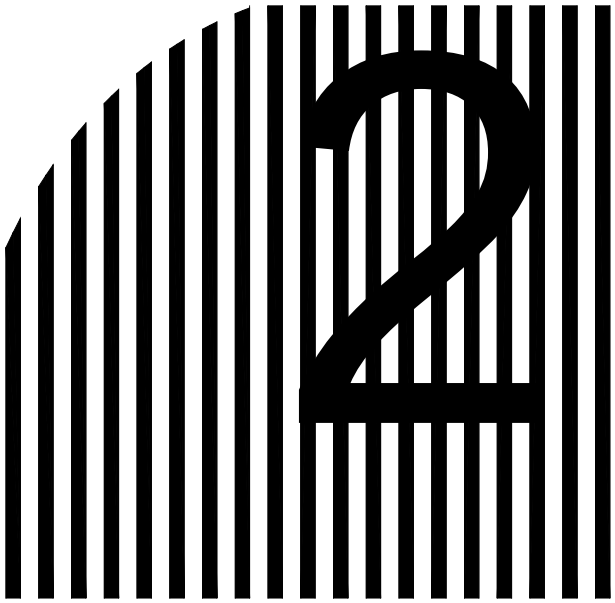
$$\frac{Warp、coarseness \times weft、coarseness}{warpdensity \times weftdensity}$$

2） Reed Width
3） Shed
4） Selectin of weft（Single or double、other）
5） Weave
6） Loom speed

6. Loss of wefts

Due to weft loss on the opposite side of weft creels, the consideration should be taken during preparation of wefts.

Type of weft	Loss of wefts（mm）
P/C45S/1、 cotton 40S/1、 Chemical fiber staple 30S/1 Acetate fiber 84~167dtex, Artifical silk84~135dtex Cuprammonium fiber 84~135dtex ， Elastic yarn167dtex	40±10
Thicker than cotton20S/1 （330dtex）	50±10
Glass fiber ECG 75 1/0 ECD 450 1/0	70±10 60±10



Chapter 2

●Air quality and compressor suitable for WILTOP air jet loom

1 Air quality suitable for WILTOP loom

2 Choice of compressor device

3 Key point of tubing

4 Method of tubing and amount of WILTOP loom

1. The Air Quality Suitable for WILTOP Loom

To assure the proper function of WILTOP jet-loom, it is essential to provide high quality compressed air used for wefting and to choose appropriate equipment. The air quality assurance is not only important for the wefting performance but also for the hygiene of the operational environment.

1-1 Water Content

1）The liquid water content shall be indeed removed.

2）The gas water content shall be removed as much as possible and the pressure dew point shall be kept under 10℃.

3）If the removal of the water content in compressed air is inadequate,

a. The metallic part of the machine or piping, etc. will be eroded.

b. The foreign matters like dust will adhere to the wall of compressed-air piping, which will increase the air resistance inside tubes, worsen the pressure loss, and incur pinholes on the pipe wall which is the main cause of air leakage.

c. The reeds will be stained, which worsens the wefting operation, deceases the efficiency of the loom and affect the fabrics.

1-2 Oil Content

1）The oil content larger than the oil aerosol (the oil particle at 0.8～0.01μ) shall be removed.

2）If the removal of the oil content is inadequate,

a. The metallic part of the machine or piping, etc. will be eroded.

b. The foreign matters will adhere to the wall of piping.

c. The fabrics in operation will be stained.

d. The reeds will be stained, which worsens the wefting operation. Some kinds of oil may also damage the reeds.

e. It will lead to the adverse operational and sanitary environment.

1-3 Dust & Carbon Content

1) The dust and carbon content larger than 0.3～1.0μ shall be removed.

2) If the removal of the dust and carbon content is inadequate,

a. It will adversely affect the nozzle.

b. It will disable the valve.

c. It will lead to the mixture of oil and water content, the filth on reeds and the lower performance of the machine.

2. Choice of the Air Compressor

2-1 Classification of Air Compressor

1）Air compressor can be classified into the piston type, the screw type and the turbo type.

Name	Feature	Remarks
Piston Type	boosted by the reciprocating motion of piston	
Crew Type	boosted by the rotation of screw	Recommended
Turbo Type	boosted by the high-speed rotation of guide vane	

2）Air compressor can be divided into the oil-free type and the oil type.

Name	Feature	Remarks
Oil-free Type	the exhausted air contains no oil.	Recommended
Oil Type	the exhausted air contains oil.	

3）The cooling of air compressor can be divided into the water-cooling type and the air-cooling type.

Name	Feature	Remarks
Water-cooling Type	the body of air compressor is cooled by water.	Recommended
Air-cooling Type	the body of air compressor is cooled by air.	

2-2 Recommended Air Compressor

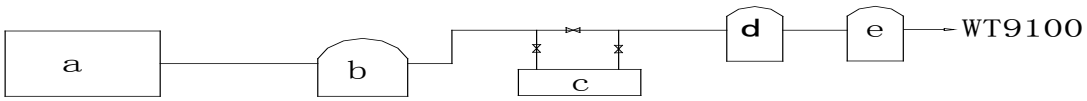
1）The oil-free-type screw (water cooling) air compressor is the best choice for WILTO jet-loom, which is especially suitable to produce the filament fabrics.

2）Although, compared with the oil-free screw air compressor, the oil-type screw air compressor needs less investment and more widely adopted to produce staple-fiber fabrics, it shall be equipped with the oil-removing atomized micro-powder filter which needs stricter maintenance and management.

Note: different from air cooling, the water cooling shall be equipped with cooling-water tower and cooling-water pump.

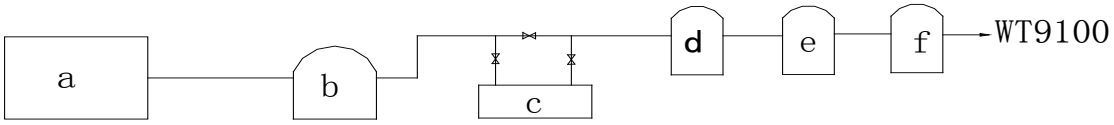
2-3 Recommended Air Compressor Equipment

1）Oil-free Screw Air Compressor (or Oil-free Piston Air Compressor)



a. air compressor b. gas tank c. air dryer d. filter for main pipe e. ultra-micro particle filter

2) Oil-type Screw Air Compressor (or Oil-type Piston Air Compressor)



a. air compressor b. gas tank c. air dryer d. filter for main pipe e. ultra-micro particle filter f. atomized micro-powder filter

Annex: Properties of Air Compressor Equipment

Name		Properties
b	Gas Tank	As the source of air pressure, it stores the compressed air. It can prevent the pressure pulse from the air compressor and enable the separation of impurities, oil and water from the air.
c	Air Dryer	The freeze-type air dryer is mainly adopted to remove the water content in the air. The pressure dew point shall be kept at 4~10℃.
d	Filter for Main Pipe	Filter fineness: 3~5μ, it can remove the large dust and scale particles in the compressed air.
e	Ultra-micro Particle Filter	Filter fineness: 0.3μ, it can remove solid substance like tar or carbon content.
f	Atomized Micro-powder Filter	Filter fineness: 0.01μ, it can remove oil content.

2-4 Determination of Air Compressor Capacity

Air Compressor Capacity≥ Unit Loom Consumption×Number of Looms×（1.2~1.4）

Here, the Unit Loom Consumption is on the basis of the value at 20 ℃ and 1 atmosphere.

Notes:

1） If the temperature of the intake air to the air compressor is high, the actual air displacement will decrease.

[Example] When the intake air temperature is 45℃, compared with 20°C,
（273+20）/273+45）=0.92 , about 8% less.

Therefore, the air compressor capacity shall be calculated on the basis of the intake temperature in summer.

2） The higher the elevation of the air compressor, the less actual air displacement.
(Example) at the elevation of 500m, there will be 5% less and at 1000m, there will be 10% less.

3）The future expansion of the loom workshop shall be adequately considered, which includes air compressor equipment like standby air compressor panel.

2-5 Pressure Setting

The air compressor with the output air pressure at or over 7 kgf/cm2 shall be chosen. Generally, the inlet pressure (the, but this value varies according to the specifications of the loom , the type of the fabrics, the revolutions of the initial pressure entering the loom) for WILTOP jet-loom shall be calculated by the following formula and the tuning method of the machine.

The relation between the initial pressure into the loom and the air pressure required for loom wefting as followed:

Initial Pressure into Loom （kgf/cm^2）≥ Air Pressure Required for Wefting（kgf/cm^2）+1 kgf/cm^2

The discharge pressure setting of the air compressor:

Discharge Pressure of Air Compressor（kgf/cm^2）≥Initial Pressure into Loom （kgf/cm^2）+1 kgf/cm^2 (Pressure Loss of Piping)

For example: when the max. applied pressure required by WILTOP is 4.5 kgf/cm2, the min. initial pressure into loom shall be 5.5 kgf/cm2.

At that time, the discharge pressure of air compressor shall be set at 6.5 kgf/cm^2.

2-6 Setting Conditions for Air Compressor

1) The setting of the air compressor room shall facilitate the adequate ventilation. Some machines, especially the air-cooling air compressor or air dryer, will become less capable when the ambient temperature is too high. Thus, the ventilation of the air compressor room plays an important role.
2) The air compressor shall be prevented from absorbing the dust, flyings and moisture, etc. in air as much as possible. In the area where air contains much dust, it is recommended to install filter on the air inlet at high place.
3) If a boiler near the loom workshop is possible to produce soot, it is necessary to install the ultra-micro fine-particle filter to remove the carbon content.
4) For the convenience of safety and inspection, it shall be set at a spatial place.

2-7 Calculation of Air Consumption

According to the running efficiency of air compressor, the consumed air can be calculated which is expressed as the percentage of the discharge capacity of air compressor.

[Example of Calculation]

1） Preconditions

a. Air Storage Tank Pressure: Start Loading (6 kgf/cm^2 , pressure starts rising)
Start Unloading (7 kgf/cm^2 , pressure starts falling)

b. Loading time (pressure starts rising from 6 kgf/cm^2 to 7 kgf/cm^2): 40 seconds
Unloading time (pressure starts falling from 7 kgf/cm^2 to 6 kgf/cm^2): 20 seconds

c. The discharge capacity of air compressor: 2m^3/minute=120m^3/hour

2） Calculation

Air consumption =120（m^3/hour）×40 /（40+20）=80（m^3/hour） （67%）

Note) The compressor with calculable loading and unloading usually belongs to oil-free piston or screw air compressor or oil piston air compressor.
The loading and unloading of oil screw air compressor are usually unknown.

2-8 Energy Efficiency of Air Compressor

1） Research is conducted on whether the discharge pressure of air compressor can be reduced according to the max. applied air pressure of the WILTOP. When the discharge pressure of air compressor is reduced by 1 kgf/cm^2, about 5% energy can be saved.

2） The pressure loss from the air compressor to the loom piping shall be minimized, 〖below 0.01Mpa(0.1kgf/cm^2)〗, and it is vital to select the air compressor equipment (air dryer, filter) with less loss 〖below 0.04Mpa(0.4kgf/cm^2)〗. Therefore, please set the total pressure loss from the air compressor to the loom piping below 0.05Mpa(0.5kgf/cm^2).

3) When several air compressors are in parallel operation with shared air discharge pipe, the automatic start/stop of air compressor will be enabled according to air consumption.

3. Key Points in Air Piping

Because the compressed air is costly, it shall be used economically. In addition, in order to keep the air clean, it is important to conduct reasonable design and construction. The piping inside plant can be divided into ceiling piping and underground piping. Considering the operating conditions and the installation of hoist on the ceiling, the underground buried pipe is widely adopted.

The key points for the piping inside the plant include:

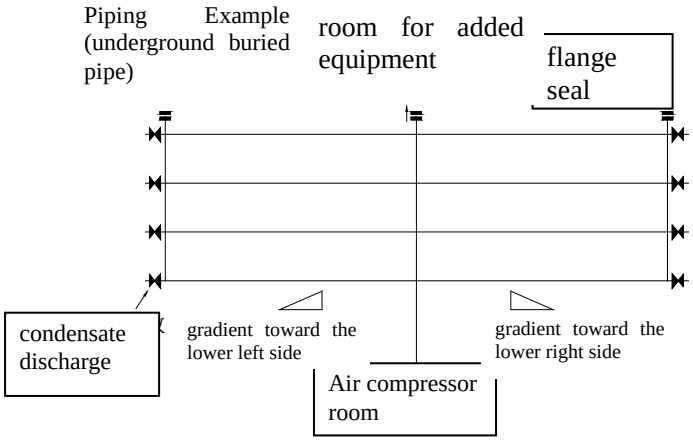
1） The piping shall adopt the piping-purposed carbon steel pipe Q235B (white pipe, galvanized pipe inside).

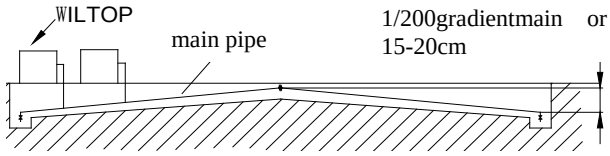
2） For purpose of keeping the pressure loss and pressure fluctuation at the minimal limit, the cyclic piping shall be adopted.

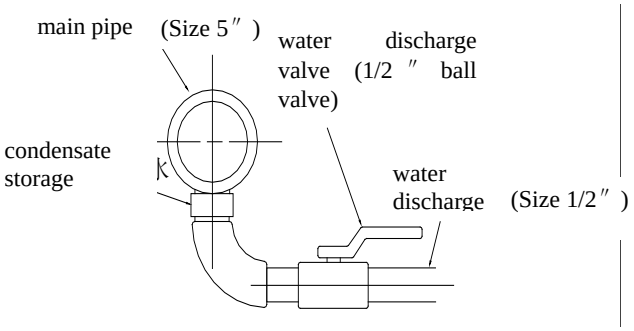
3） The piping length shall be minimized.

4） The piping diameter shall be suitable for the flow rate. If it is possible, it is better to be 1 size bigger than the actual size, which can not only effectively reduce the pressure loss but also enable the buffering effect.

5） The pipeline shall be designed with less throttles or bended parts.







(Reference Example for Condensate Discharge)

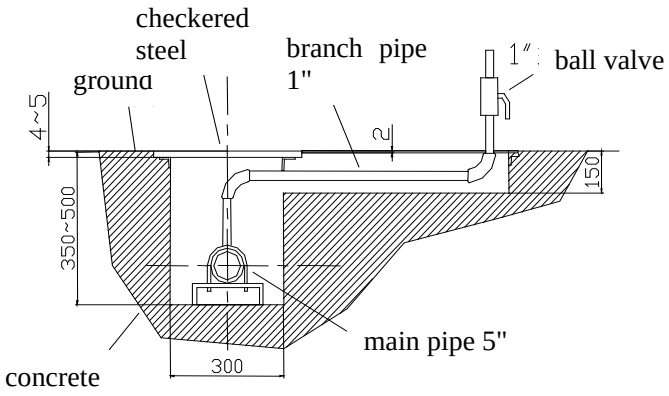
6） When there is a plan to add loom, the terminal of piping shall be sealed by flange for the convenience of future additional equipment.

7） For discharging condensate, the main pipe shall be equipped with water storage section and water discharge valve. With the gradient at 1/200, the slope is mainly intended to form 15-20cm height difference between the two ends of the workshop. When sourcing the branch pipe from the main pipe, the operation shall be from the upper side to prevent water from flowing in the branch pipe.

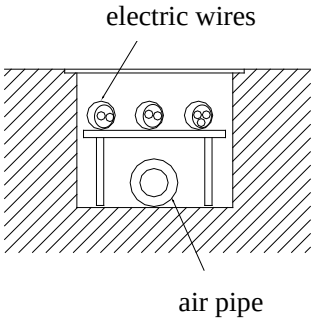
8） The connecting part for piping shall be cautiously dealt with to prevent the condensate storage.

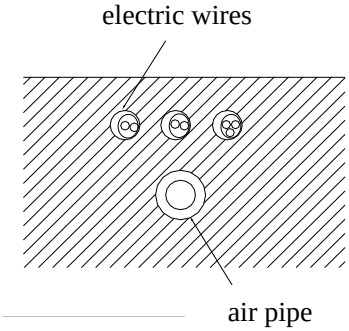
9 ） When burying pipes underground, for the convenience of future maintenance, it’s better to properly cover the pipe channel with serious consideration of condensate discharge.

10) To prevent the erosion and scaling inside the pipe, proper connector shall be used at all connecting parts among the pipe sections. The butt welding shall be avoided. In addition, the bended parts shall be applied with connectors and the preheating shall be avoided for processing bended pipe. If welding is adopted, the inside of the welded part shall be protected from erosion.



Reference Example for Piping Channel
(when the main pipe is at the size of 5 ")





11）Please refer to the lower left figure for the location relation between air piping and electric wires

12) After finishing piping construction, it is necessary to adequately rinse the piping (for inside cleaning), to ensure there are no remains like dust inside the piping. It shall also be fully rinsed before connecting to loom.

13) The bypass pipe shall be installed where there is main filter, air dryer or pressure-releasing valve for the future maintenance or emergency cases.

14）Manometer shall be installed at some places in the workshop to timely collect the pressure information of piping inside the workshop.

15) Finally, all pipe section shall be fully checked to ensure no air leakage. The underground channel pipe can be checked by filling it with water.

16）The pressure drop will result in the defects in fabrics, so it is advisable to install pressure switch on the pipeline to enable the alarming in case of pressure drop in plant.

17）Please refer to the base diagram offered by our company for the pull-out location from ground of the related pipes.

Caution

The hose used to connect branch pipe and loom shall be fastened by hose hoop. If the hose is unplugged, the compressed air will be released.

4. Number Setting and Piping Method of WILTOP Loom

The followings specify the pipe size, number setting and piping method for WILTOP loom.

4-1 Table of Piping-purposed Carbon Steel Pipe Sizes

Pipe Type		Outer Diameter (mm)	Inner Diameter (mm)	Area Inside Pipe (cm^2)
A	B			
15	1/2 (inch)	21.7	16.1	2.04
25	1	34.0	27.6	5.98
40	1 1/2	48.6	41.6	13.6
50	2	60.5	52.9	22.0
65	2 1/2	76.3	67.9	36.0
80	3	89.1	80.7	51.0
100	4	114.3	105.3	87.3
125	5	139.8	130.8	134.0
150	6	165.2	155.2	189.0
200	8	216.3	204.7	329.0
250	10	267.4	254.2	508.0
300	12	318.5	304.7	730.0
350	14	355.6	339.8	906.0
400	16	406.4	390. 6	1197.7
450	18	457.2	440.4	1529.5
500	20	508.0	492.2	1901.8

4-2 Number Setting and Air Pipe Size for WILTOP

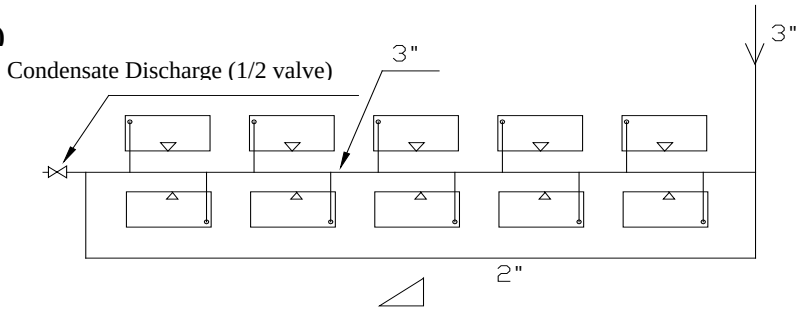
The following shows the number setting, piping method and air pipe size for WILTOP.

All following air pipe sizes can be applied to the cases where the loom reed width is 150~230cm. If the reed width is above 250cm, the pipe diameter shall be 1 size larger。（however, to prevent the pipe channel becoming oversized, proper piping method shall be adopted to keep the max. size of pipe in front of the loom within 5″ .）

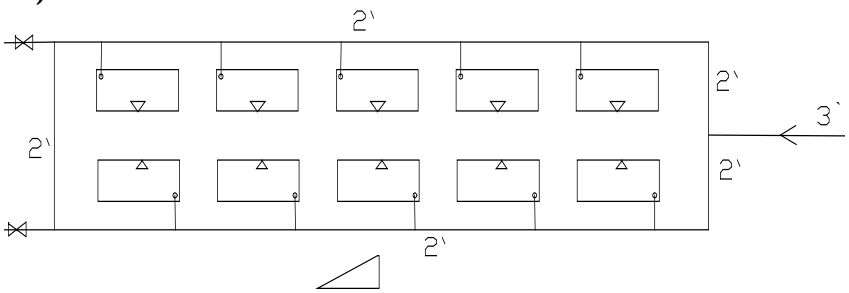
(The symbol ▽in the diagram means the front side of the machinel

1） 10 sets

(Piping Example A)

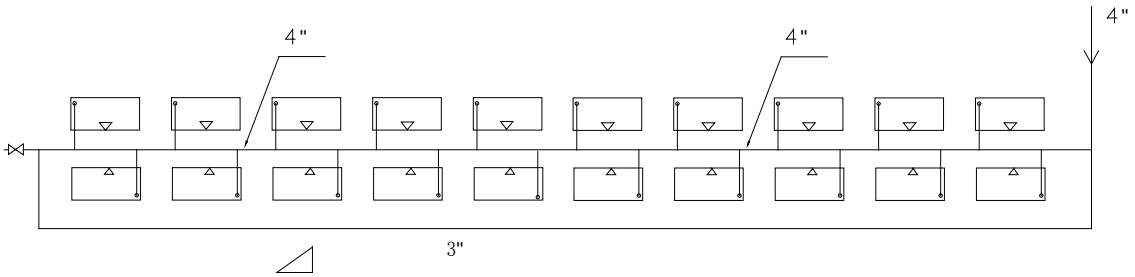


(Piping Example B)

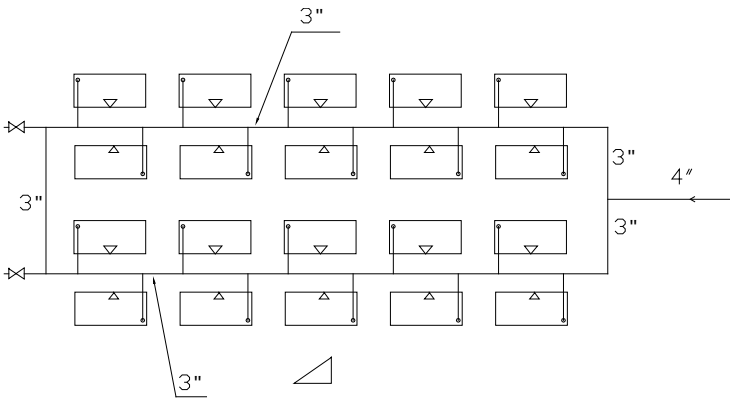


2） 20 sets

(Piping Example A)

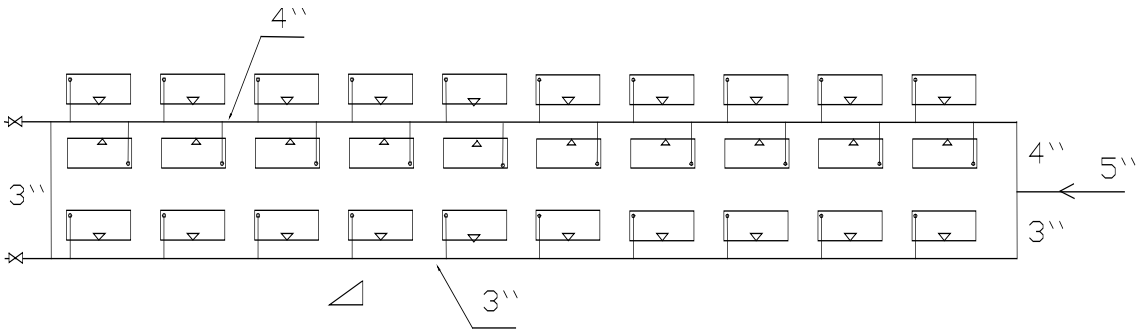


(Piping Example B)

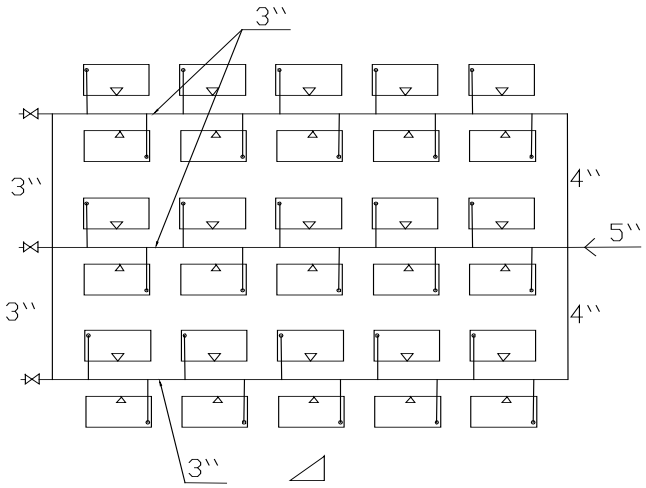


3）30sets

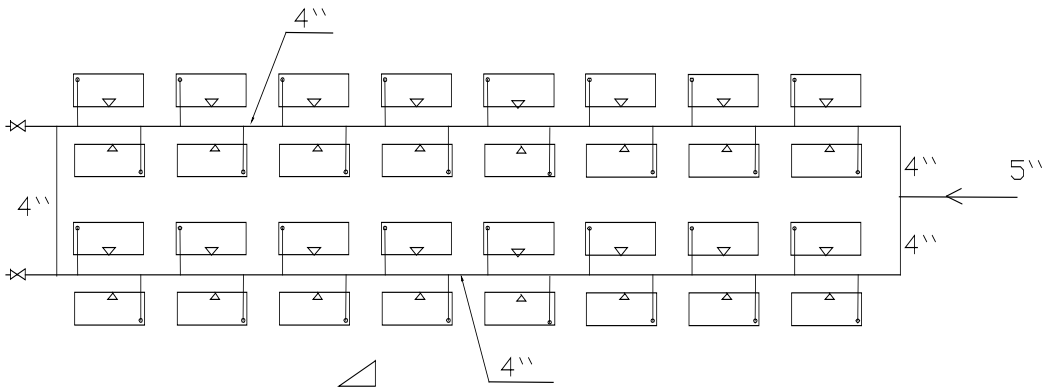
（Piping Example A）



（Piping Example B）

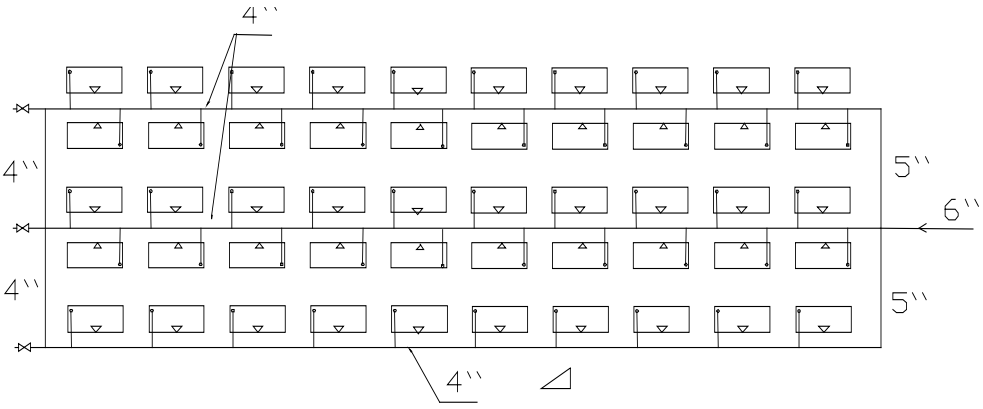


（Piping Example C）（32sets）

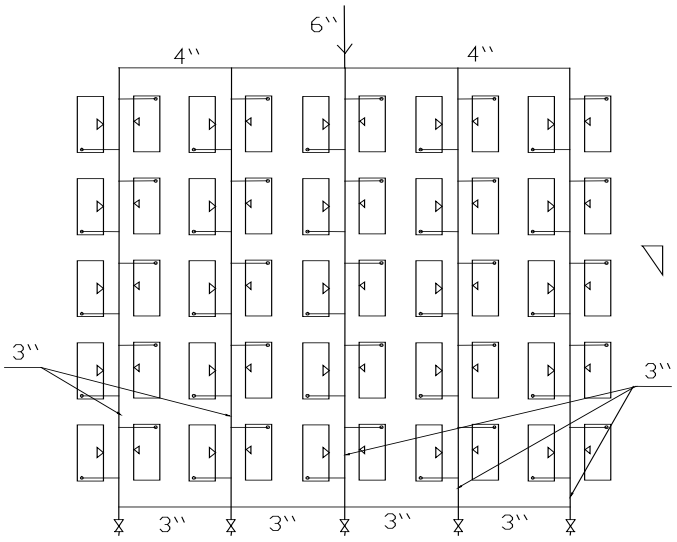


4）50 sets

（Piping Example A）



（Piping Example B）



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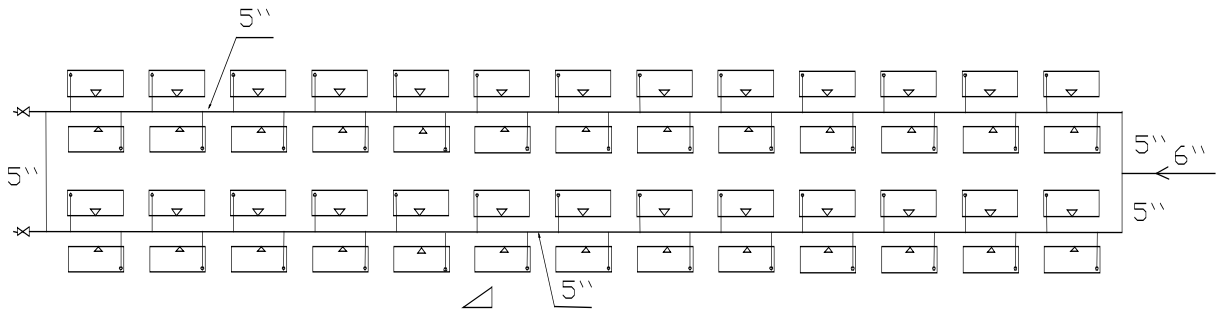
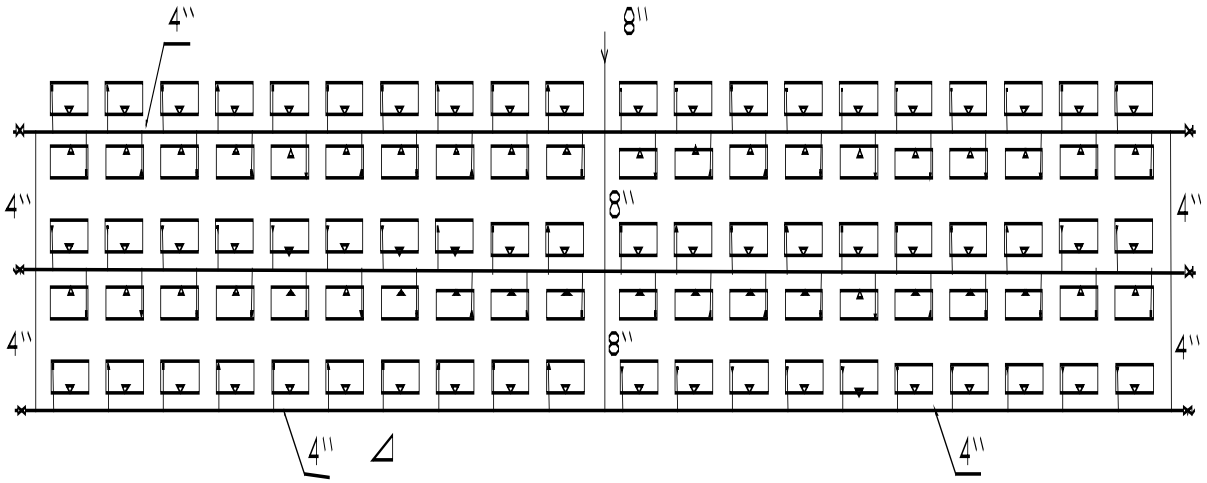
（Piping Example C）（52sets）

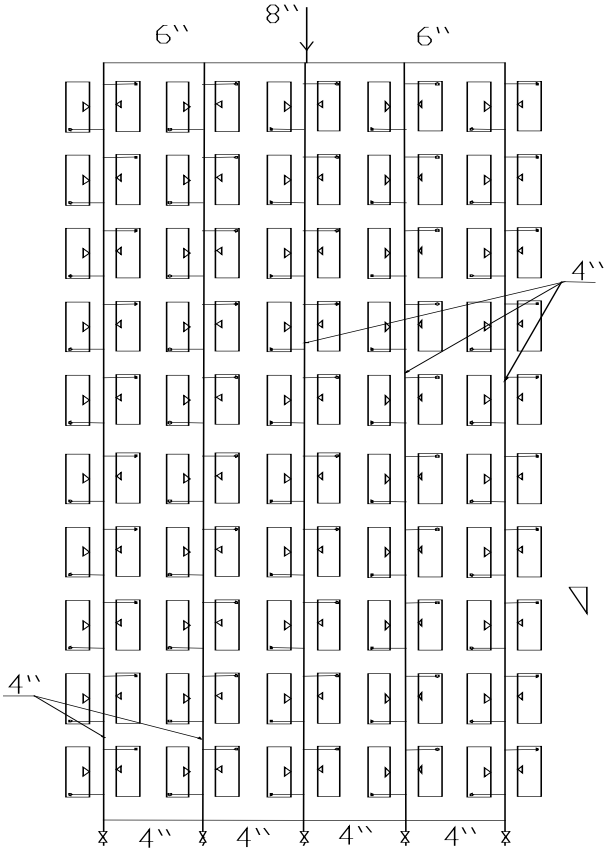


5）100 sets

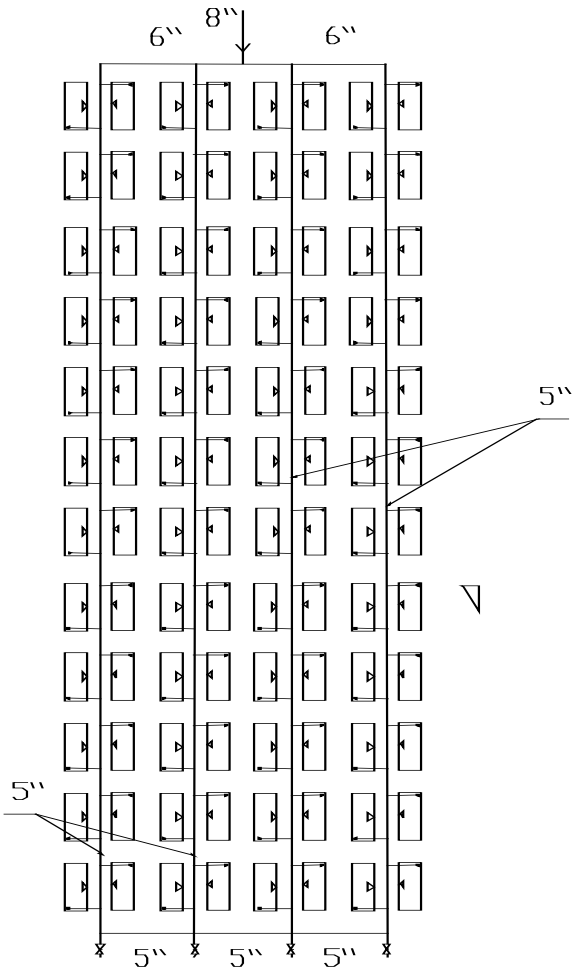
（Piping Example A）

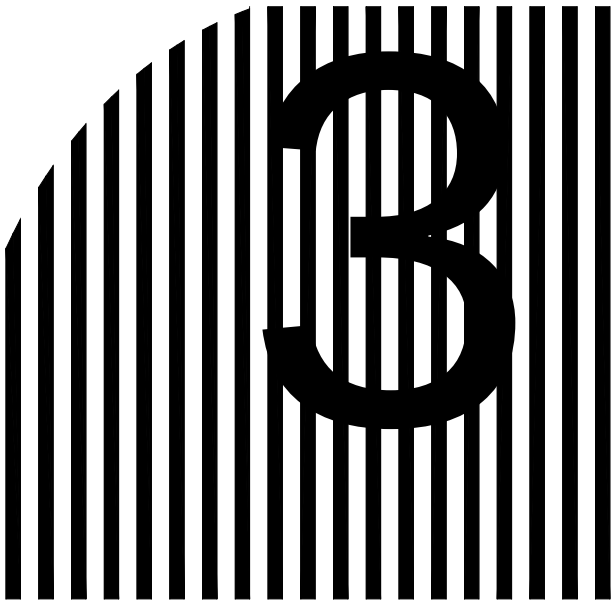


（Piping Example B）



（Piping Example C）（96sets）





Chapter 3

●Design of workshop

1 Layout of weaving workshop
2 Installation and basic drawings
3 Groundwork and installation method of device
4 Noise and vibration
5 Electric devices
6 Air conditioner and surroundings
7 Flying-proof measures
8 Fire-proof devices

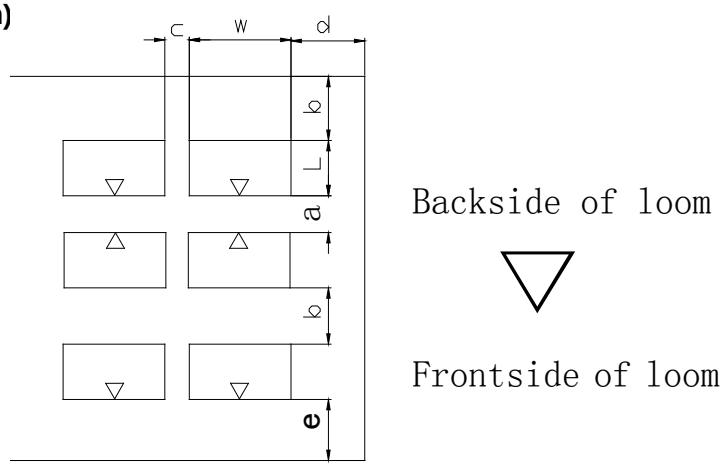
1. Layout of weaving workshop

1-1 Notes of layout

Notes of layout:

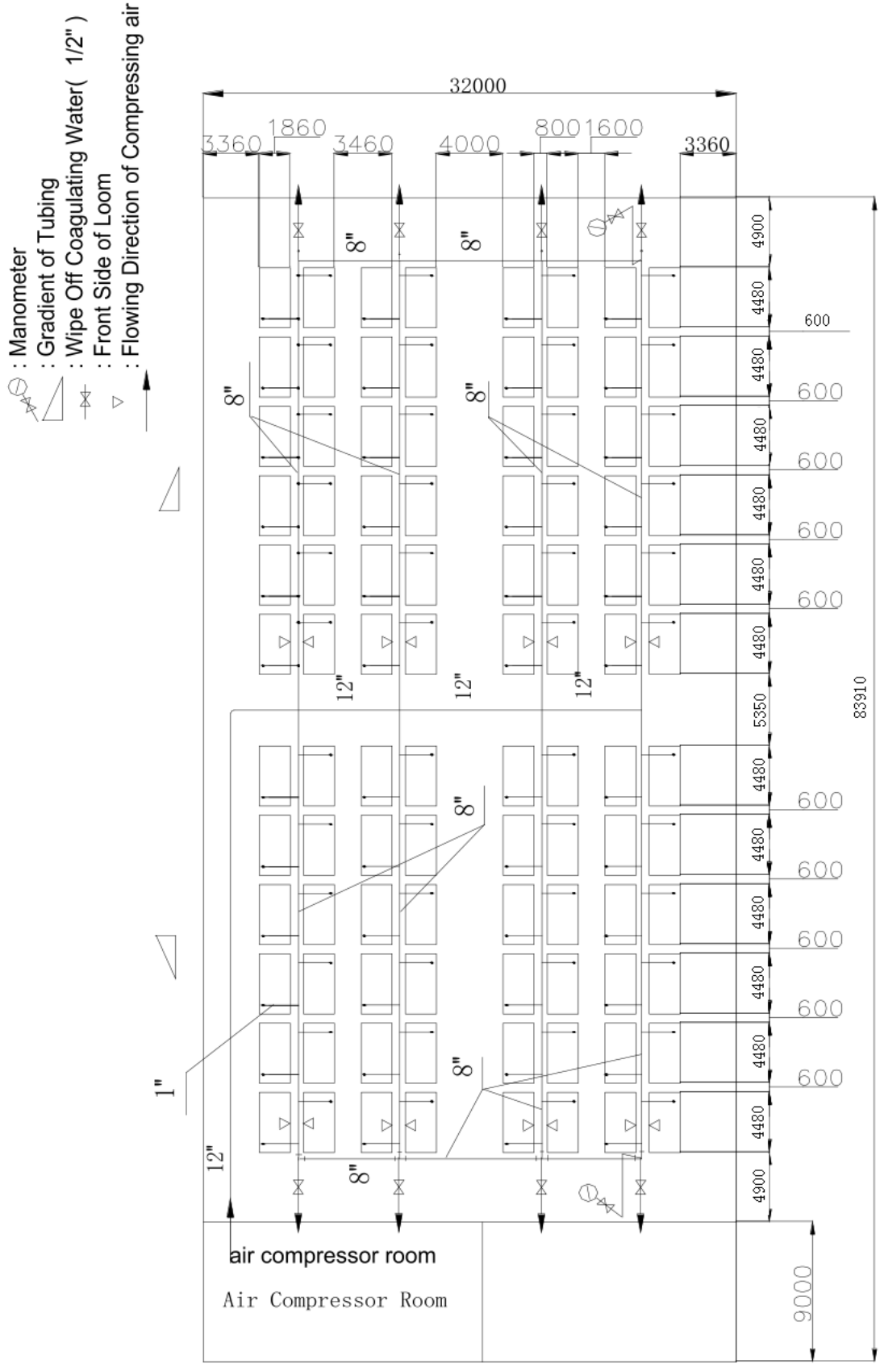
Item	Notes
Tubing	Relation for tubing and rowing of loom (refer to 2,Air quality and compressor suitable for WILTOP loom)
Moving passage	Passage for move-in or move-out of warp beam and cloth roller and passage to other processes
Loom space	Consider walking distance of maintenance persons and operators and number of machine operated by maintenance persons and operators.
Air conditioner	Efficiency, investment and running cost of air conditioner
Air compressor device	Consider the number of loom and adding device in the future
Flying removing device	Take it into consideration during weaving with short fiber.
Fire-proof measure	Structure of walls and windows

1-2 Key points of layout (loom)

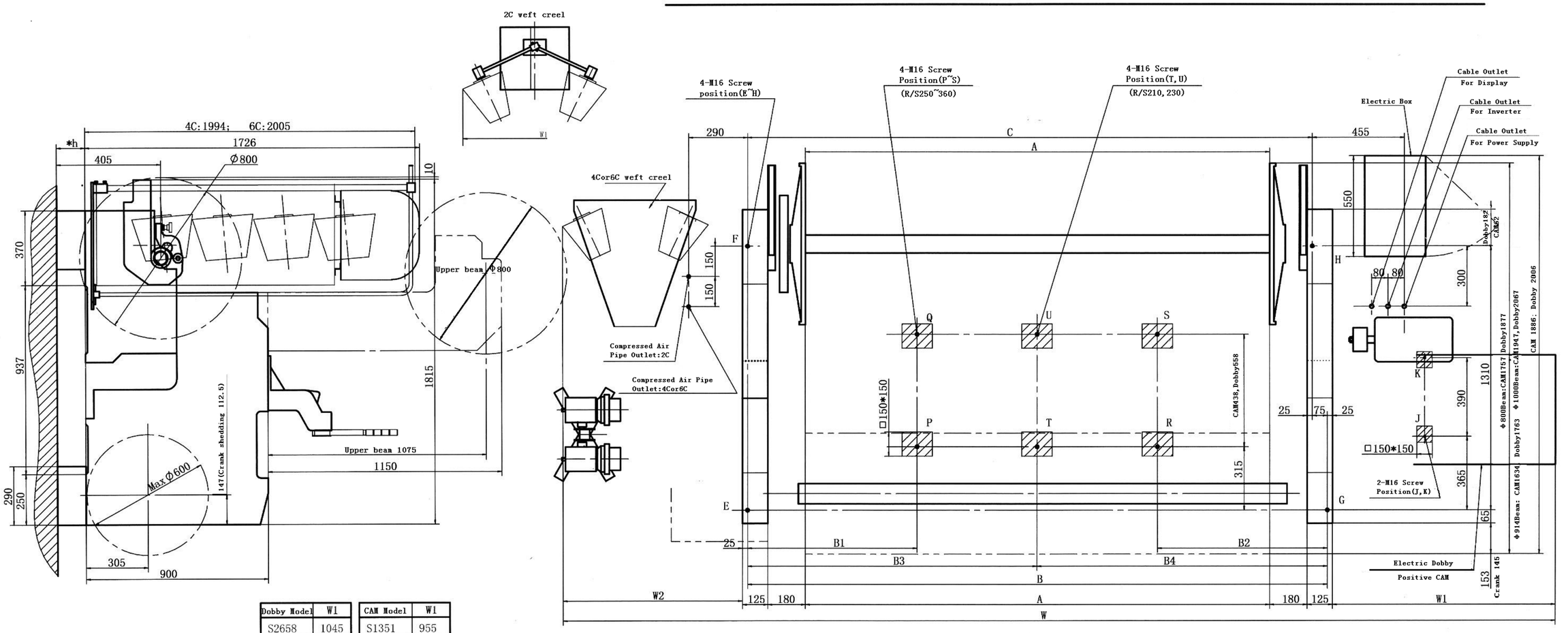


	Normal dimensions（mm）	Remarks	
a	More than 800	It is necessary to arrange the space for moving cloth roll. It is the emergent safety passage and should be equal to or more than 800.	
b	More than1300	φ800 selvage disc	It is necessary to arrange the space for moving warp beam. If it is designed in the minimal dimension, the moving rail should be installed in the center for moving easily and avoiding the damage of loom during moving.
	More than 1500	Φ914 selvage disc	
	More than 1600	Φ1000 selvage disc	
c	More than 600	The door of control cabinet of loom can not be opened completely if its dimension is less than 600.	
d	More than max. reed width + 2000	It is necessary to arrange the space for rotating warp beam by 90°. The dimension d varies with different reed width and type of warp beam. D should be 1000 when only one side is taken as special passage for operator.	
e	More than 1000	It should be a little wider than dimension a if one side is wall.	
w	Refer to installation drawing	It varies with different reed width of loom.	
L	Refer to installation	It varies with different diameters of selvage discs of warp beam and shedding types.	

1-3 Configuration of 96 sets and piping of WILTOP (shedding with cam、190W、2 colour 、 Φ 800 flange)



2. Installation drawing and basic drawing of WILTOP loom



Double Beam	h*
Φ914 flange	100
Φ1000 flange	185

Color Choice	W2
2C,4C	1015
6C	1045

Dobby Model	W1
S2658	1045
S2678	1059
S2881	1089
S3060	1045
S3220	1114
S3260	1114

CAM Model	W1
S1351	955
BT6810A	1100

Note:

1、 With ▭ marked loom base position (E~U), the height difference should be within 2mm, the unevenness on surface should be within 0.5mm (especially position E~H, required polishing correction with grinding wheel)

2、 Base screw with mark(P~U) should be chosen according to R/S specification.

3、 When the beam flange is Φ914 or Φ1000, the loom is required to be elevated. (*h above refers to height of pad)

4、 The maximum depth is different based on specifications, according to the end of beam flange or the end of electric box.

Dobby Shedding:

R/S	A	B	C	W								B1	B2	B3	B4
				2C 4C				6C							
				2658	2678	3060	3220	2861B	2881	3060	3220				
150cm	1500	2060	1985	4170	4217	4170	4239	4211	4244	4200	4269	—	—	—	—
170cm	1700	2260	2185	4370	4417	4370	4439	4411	4444	4400	4469	—	—	—	—
190cm	1900	2460	2385	4570	4617	4570	4639	4611	4644	4600	4669	—	—	—	—
210cm	2100	2660	2585	4770	4817	4770	4839	4811	4844	4800	4869	—	—	1330	1330
230cm	2300	2860	2785	4970	5017	4970	5039	5011	5044	5000	5069	—	—	1430	1430
250cm	2500	3060	2985	5170	5217	5170	5239	5211	5244	5200	5269	1035	1035	—	—
260cm	2600	3160	3085	5270	5317	5270	5339	5311	5344	5300	5369	1060	1060	—	—
280cm	2800	3360	3285	5470	5517	5470	5539	5511	5544	5500	5569	1160	1160	—	—
300cm	3000	3560	3485	5670	5717	5670	5739	5711	5744	5700	5769	1260	1260	—	—
340cm	3400	3960	3885	6070	6117	6070	6139	6111	6144	6100	6169	1355	1355	—	—
360cm	3600	4160	4085	6270	6317	6270	6339	6311	6344	6300	6369	1455	1455	—	—

CAM Shedding :

R/S	A	B	C	W								B1	B2	B3	B4
				2C 4C				6C							
				S1351	BT6810A			S1351	BT6810A						
150cm	1500	2060	1985	4080	4225			4140	4255			—	—	—	—
170cm	1700	2260	2185	4280	4425			4340	4455			—	—	—	—
190cm	1900	2460	2385	4480	4625			4540	4655			—	—	—	—
210cm	2100	2660	2585	4680	4825			4740	4855			—	—	1330	1330
230cm	2300	2860	2785	4880	5025			4940	5055			—	—	1430	1430
250cm	2500	3060	2985	5080	5225			5140	5255			1035	1035	—	—
260cm	2600	3160	3085	5180	5325			5240	5355			1060	1060	—	—
280cm	2800	3360	3285	5380	5525			5440	5555			1160	1160	—	—
300cm	3000	3560	3485	5580	5725			5640	5755			1260	1260	—	—
340cm	3400	3960	3885	5980	6125			6040	6155			1355	1355	—	—
360cm	3600	4160	4085	6180	6325			6240	6355			1455	1455	—	—

Specifications:

Reed width R/S:150~360cm

Color selection: 2C,4C,6C

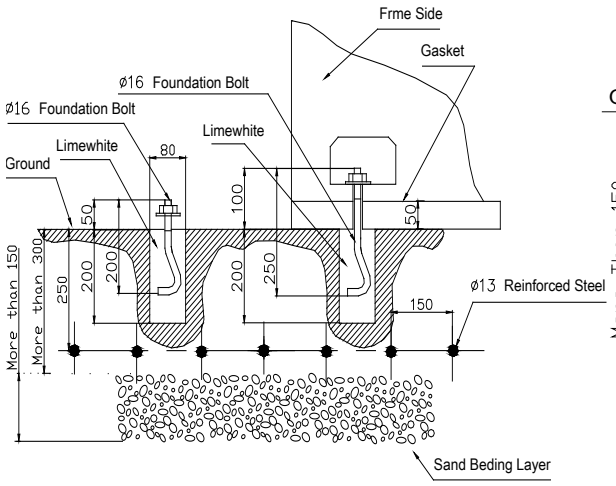
Shedding: Crank, Dobby, CAM, Jacquard

Beam Flange: Φ800, optional Φ914, Φ1000; single beam

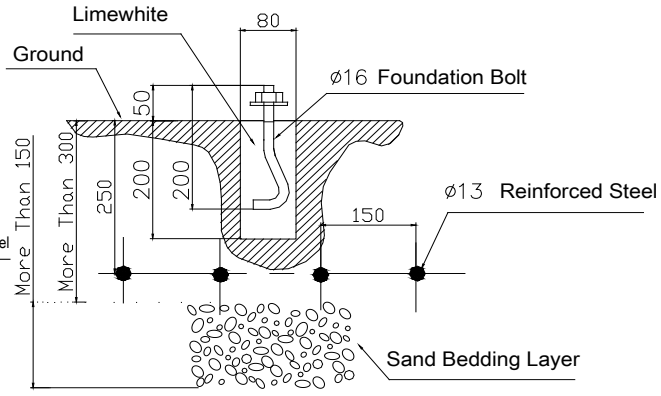
WT9100 AIR JET LOOM

HANGZHOU WILTOP TEXTILE MACHINERY CO., LTD.

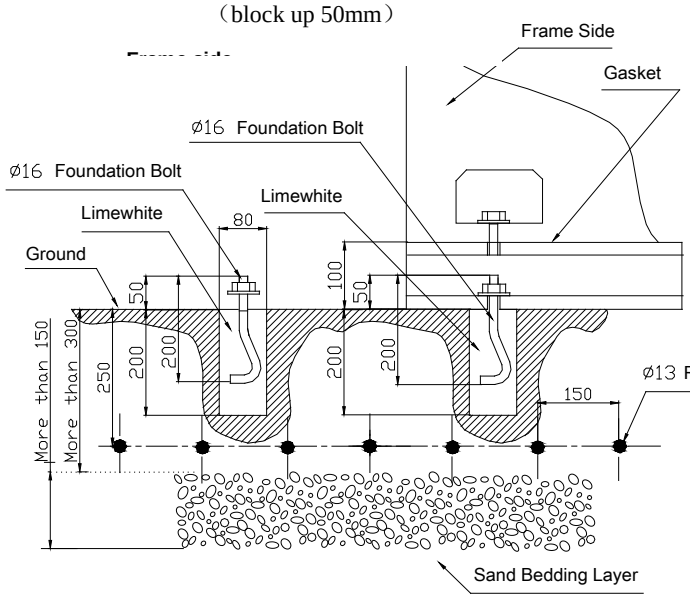
2-2 Basic dwawing of WILTOP loom



Section drawing of groundwork
（block up 50mm）

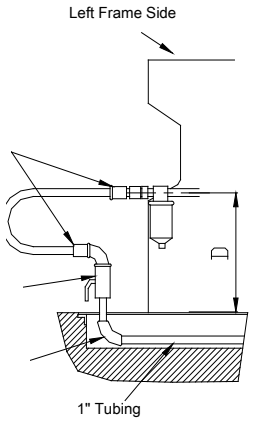


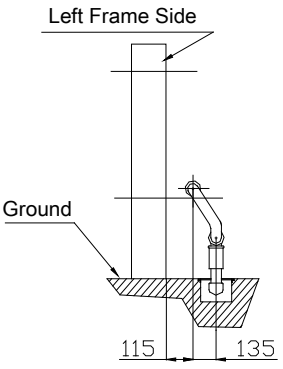
Section drawing of groundwork
（no block up）



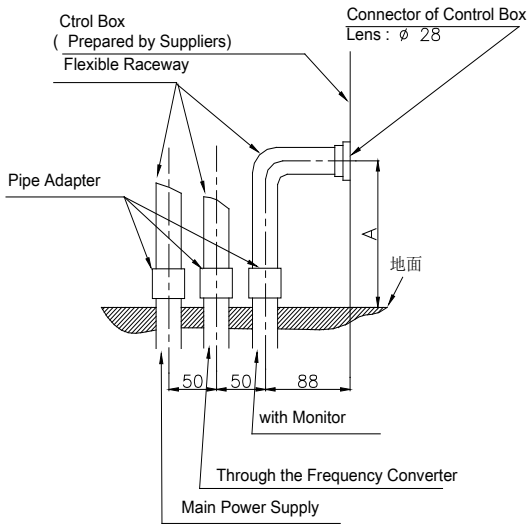
Section drawing of groundwork
（block up 100mm）

Flexible screwed link
Width 150-230 3/4"
Width more than 250 1"





Out of Tubing shoude be
Prepared by Users



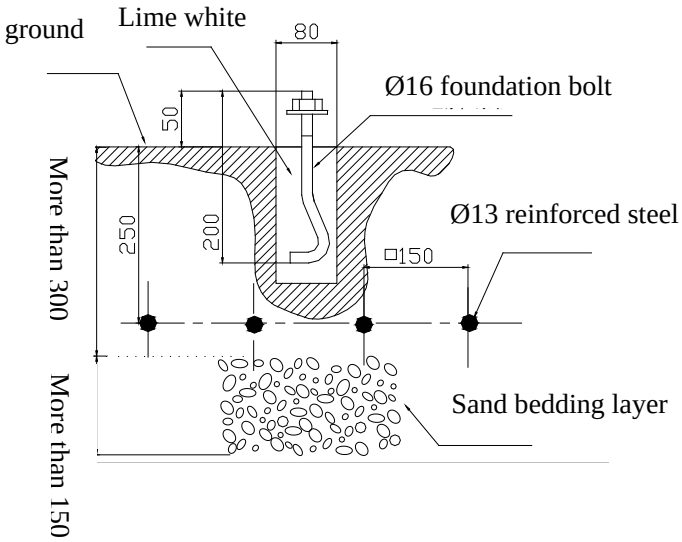
Out of Wire
Should be Prepared by Users

Notes：

1） The strength of concrete should is above 21N/mm^2(210kgf/cm^2)。The resonance of machines will happen if the strength of groundwork is not enough. The thickness of concrete and sand bedding layer should be increased according to the situation of groundwork. You should discuss it in detail with the construction department.
2） The wire should be 2800mm from ground.
3） The instruction of electric engineering is shown in the Electric Manual.
4） Monitoring wire conduit can be used if it is needed.
5） Dimension A\D is different according to block up.

3. Groundwork and installation method of devices

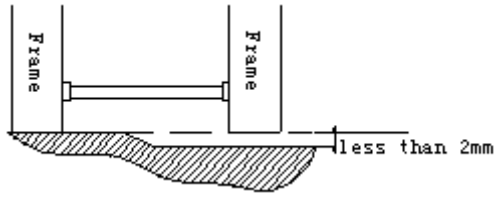
（Section of groundwork）



The higher speed of WILTOP air jet loom should be taken into consideration. If the groundwork is not enough, the vibration of loom will be increased, the parts will be damaged, the efficiency of loom will be decreased and the quality of fabric will be lowered.

For better performance of loom, smooth production and manufacture of high-level cloth, the following key points for groundwork should be seen carefully.

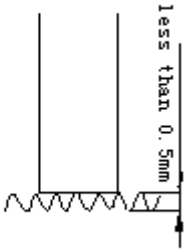
3-1. Key points of groundwork



1) The groundwork varies with the different geologic structures and compressional resistance situations. The thickness of concrete should be more than 300mm and the strength of concrete is more than 210kgf/cm^2. Please do it as shown in the figure.

2) Levelness of installation surface

The tolerance in levelness of installation surface of frames should be less than 2mm as shown in the figure.



Grind the convex part with a sand wheel to meet the requirements. If the lime white is used to cover the surface, the lime white will be taken off after running for long time and then the vibration will be much higher. This method should be avoided to be used for this reason.

3) Levelness of installation surface

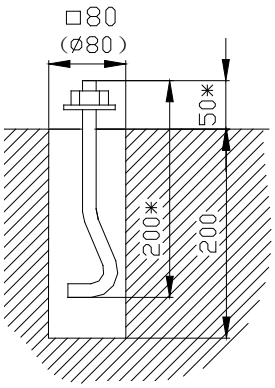
The tolerance in levelness of installation surface of frames is less than 0.5 ㎜ as shown in the figure.

4）Species of base bolt and installation of bolt eyelet

Base bolt includes L and I types, the former is recommended by company.

Base bolt	Base bolt eyelet	Remark
Φ16 bolt	□ 80×200 ㎜ Or Φ80×200 ㎜	Using for the body installation of air jet loom

（1） For L type of base bolt



ø16 bolt

Note 1：The diameter of base bolt eyelet should not exceed 80 mm, Otherwise the level of machine is not attained to the standard in installation.

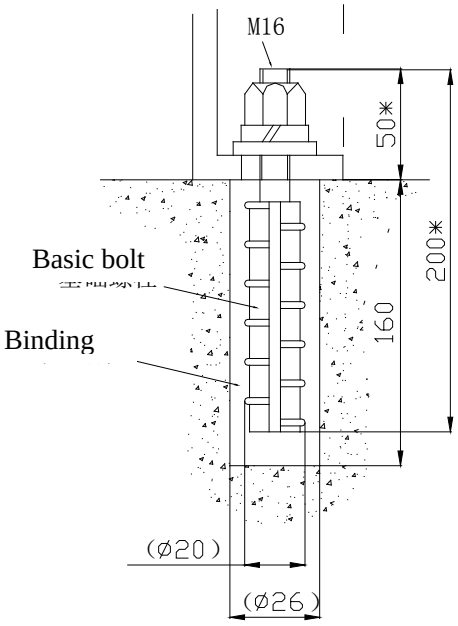
Note 2: The size signed * represents one of XX without pad usage.

（2） For I type of base bolt

It is a kind of bolt that is fixed using binding. During installation of I type of base bolt, it is compulsory to be on the base of the construction manual issued by binding factory and to strictly comply with attentive items, thus insuring enough strength

A. A specific auger for composite soil (concussion auger etc.) is used to make base bolt eyelet. Dust adhering to the inside of base bolt is swept using a steel brush and then removed using an inhaler.

Note) Diameter of bolt is determined according to the request of construction manual of binding factory.



Note1)dimension in () is referenced.
Note 2)The dimension marked * is the size without washer.

B. Recommended bindings as follows

Company	Name
Zhejiang Cixi Tiandong Binding factory	KD-504A

Note）Binding is prepared by consumer supplied.

C. Mix ratio of binding (wt.%)

Mix ratio of Master binding (A liquid)/ Stiffen binding (B liquid)

A:B=2:1

D. Notes for installation

a) Please degrease the basic bolt with banana oil.
b) Completely stirring master bindings and stiffen bindings.
c) Fixing base bolt after their completely stiffening (2~3days) .
d) Removing bindings on the ground before their stiffening

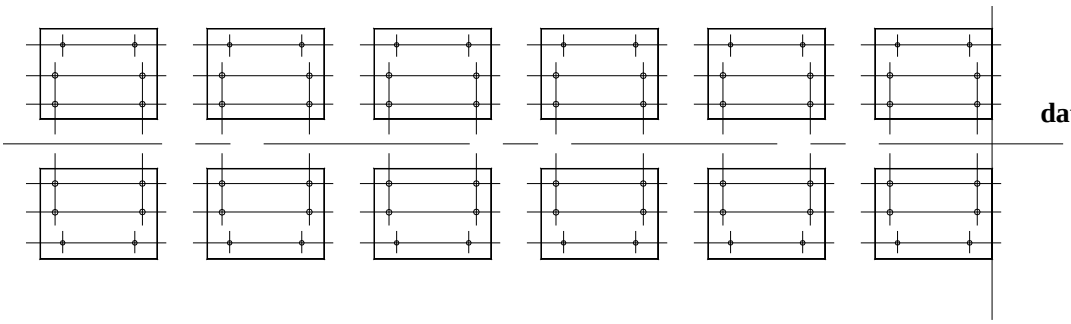
3-2. Drawing datum line

1） The **datum line**

According to layout drawing of loom,the standard lines on the installation ground are drawn in vertical/horizontal directions .

2）The **datum line of** base eyelet

Size is found from the **datum line**s according to the Installation drawing and basic drawing .And the **datum lines are drawn on the position of every basic bolt.**



Confirming the sites of base eyelet and adjusting it if there is any incorrectness.

Note) When I type of base bolts are used in the installation of loom, the specific auger for composite soil is chosed to drill a hole in the sites of base bolts where the **datum lines are drawn.**

3-3.level installation of loom

（1） Level standard of loom

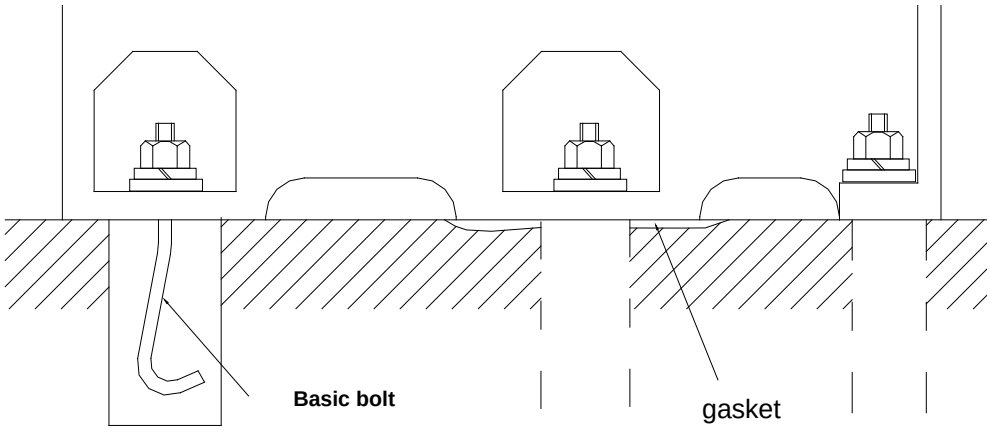
Loom should be installed under the guiding of our technician normally. The installation of loom also can be down by users themselves but the following standards must be met.

Levelness of loom：0.5/1000	（The tolerance is 0.5 mm /m）

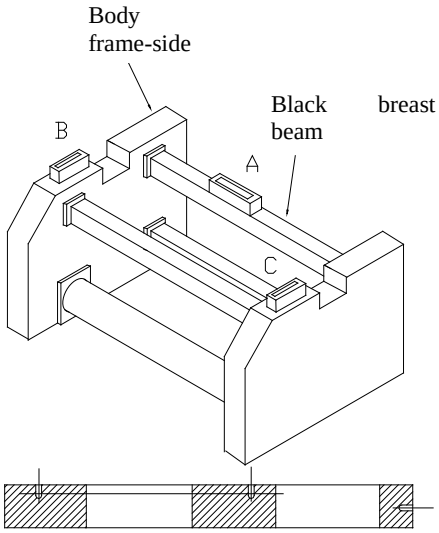
Note1: The tolerance of used leveling device is in 1/4 grade. The loom can not be deformed.

Note2: Two kinds of spacers of 0.5,1.0, and 2.0mm are supplied with loom.

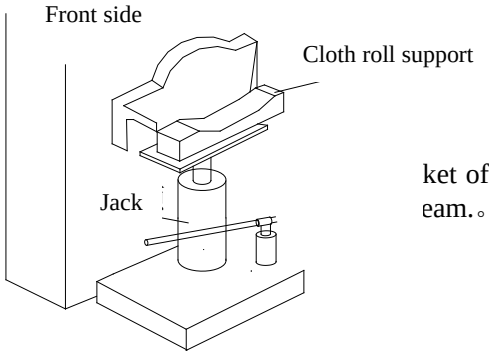
The spacers should be inserted into the gap between the frame of loom and ground to level it.

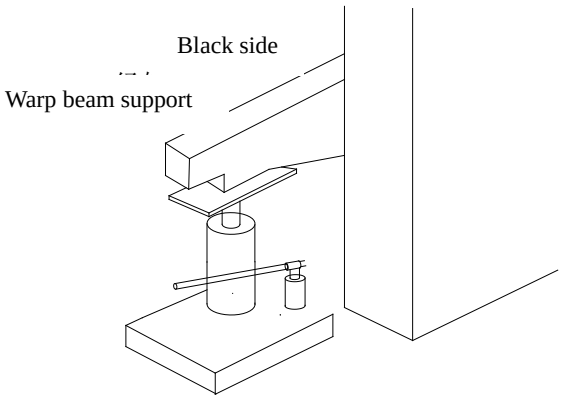


3-4 Leveling sequence



Sequence	Contents
（1）	Please measure the levelness on the position A .
（2）	Please measure the levelness on the position A and B and find the highest point.
（3）	Put the leveling unit on higher frame.
（4）	Put spacers under lower frame and level frames.
（5）	Put the leveling unit on the opposite side of frame, which is mentioned in item 3.
（6）	Put spaces under the foundation to level frames.
（7）	Put the leveling unit on the position A .
（8）	Put spacers under the foundation of frame until the levelness is met, which is measured on position A .
（9）	Take loom aim at the basic line.
（10）	Put the gasket between the ground and footing
（11）	Put gaskets and spring washers & nuts on the base bolts, and screw the nut, then put into the base hole.





1.Put the gasket according to the left drawing.

2.A small jack should be used to posit gasket. As showing in ket of cloth roller on the front side of loom; and on the back side of eam.。

In order to avoid bracket broken, a wooden board should put between bracket and jack.

Dimension of block：

thickness：more than 10 ㎜

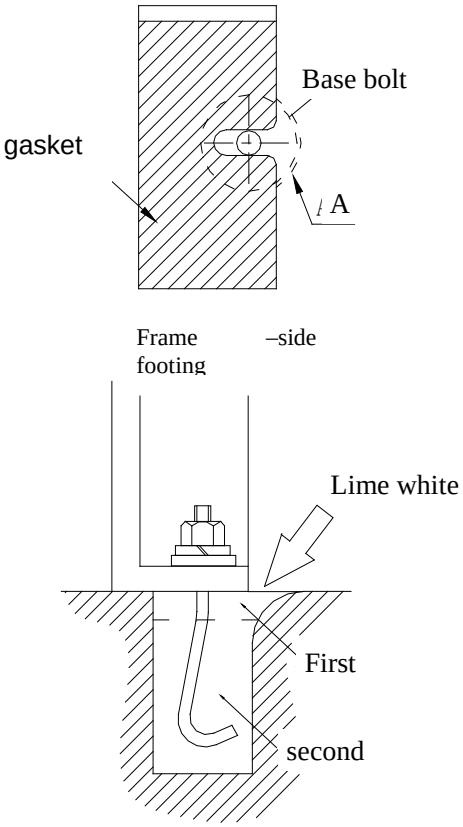
length :about 100 ㎜

width：about50 ㎜

3.When the loom is levelling , washers are bound with its bottom using KD-504A binding.

4) Mats can be bound using binding when their quantities are larger.

3-5 Sequence of fixing bolt



No,	content
（1）	Completely wetting the inside of base bolt hole .
（2）	Pouring mixed mortar into base bolt hole (about 80~90%) and then stirring it using a wood stick to avoid possible occurrence of air.
（3）	1～2 hours later, again pouring somewhat stiffer mortar than above one into the remaining spaces of hole. Sequent burying the mat used for the level determination of machine.
（4）	2~3 days later than completely stiffening of mortar, again screwing the base bolts. The right screwing torsional moment being 90N.m(900 kg.cm).

N

Note 1) If it is difficult for mortar to be poured into the base bolt hole due to its site deviation, part A in left figure should be somewhat enlarged.

Note 2) Attentions are paid to whether interspaces between mortar and frame-side footing(or mats) occur if all mortar is poured into hole one time.

Note 3) If a large quantities of mats are placed under frame-side footing, the interspaces between mat and frame-side footing should be crammed with mortar.

4. Noise and vibration

4-1Noise

1）Noise level of WILTOP loom

Noise level for each WILTOP loom varies with different specifications (reed width and shedding type) of loom and fabrics, which ranges from 82~90dB (A). The value is measured at the position 1m away from loom and 1.6 m high from loom.

2）Noise after usage of sound-insulation measures

Noise is decreased greatly after usage of sound-insulation measures.

The followings are the sound-insulation materials and sound-insulation construction methods that you can take into consideration when new workshop is built.

Sound-insulation material	Glass window	Iron door	Block hole from both sides with concrete	Concrete brick	Asbestos ripple sheet	Laminated board（thickness:13mm）Sheet inserted with concrete（thickness:19mm）
Noise decrement（dB）	6~8	10~14	34~36（thickness: 100mm）	20~23 (thickness: 100mm)	16~18（thickness:6.5mm）	24~26

4-2 Hazard vibration

1）vibration level of WT9100 loom

The vibration level of WT9100 loom varies with different geologic situation, specification (reed width and shedding) of loom and speed of loom. Contact with our salesmen to discuss the hazard vibration.

2）Vibration-proof measures

Vibration-proof measures are not so easy as the sound-insulation measures. It is very important to build the solid groundwork to lower the vibration.

More and more factories put looms on the vibration-proof platform with springs to lower vibration recently.

5. Electric devices

5-1 Electric devices in factory

In order to make best of performance of loom, the electric devices should meet the following requirements:

Electric device			Contents
(1)	Power supply	Voltage	3-phase A.C. power ranges from 330～430V.slow motion make use of frequency transformer
		Fluctuation ratio of voltage	Less than ±10%（The voltage should not be decreased by 20% during loom starts.）
		Frequency	50Hz
		Fluctuation ratio of frequency	Less than ±5%
(2)	Surroundings	Temperature	5～30 ℃
		Relative humidity	Less than 85%
(3)	Vibration		Vibration maybe damage the connection of wires if the basic construction can not meets the requirements during installation of loom so that it is very important to build the solid groundwork.（reference to 3-1 item of key points of basic construction）
(4)	Earth connection		Earth connection operation for loom should accord with the state stipulates. Earth wire should be connected onto the earth terminal (marked with E) in control cabinet.
(5)	Leakage breaker		The power circuit should be equipped with a breaker to avoid the casualty caused by leakage. More information about leakage breaker will be seen in item 3 of leakage check under the item 5-4 of wiring.
(6)	Wiring of power supply		The more coarse the power wire is, the less the voltage fluctuation will be during starting of loom and the less the stop marks will be. The information about wiring will be seen in item 5-5 of electric wiring.

Notes: Use ultra-start motor to start loom and the starting current will be 20 times as the rated current of main motor so the breaker maybe is tripped sometimes. For this reason, the current of breaker on the switchboard should be more than four times as the rated current of main motor.

5-2 Operating Instructions of Switches and Buttons for IACA200 Series Air Jet Loom Electronic Control System

- Appearance of the cabinet

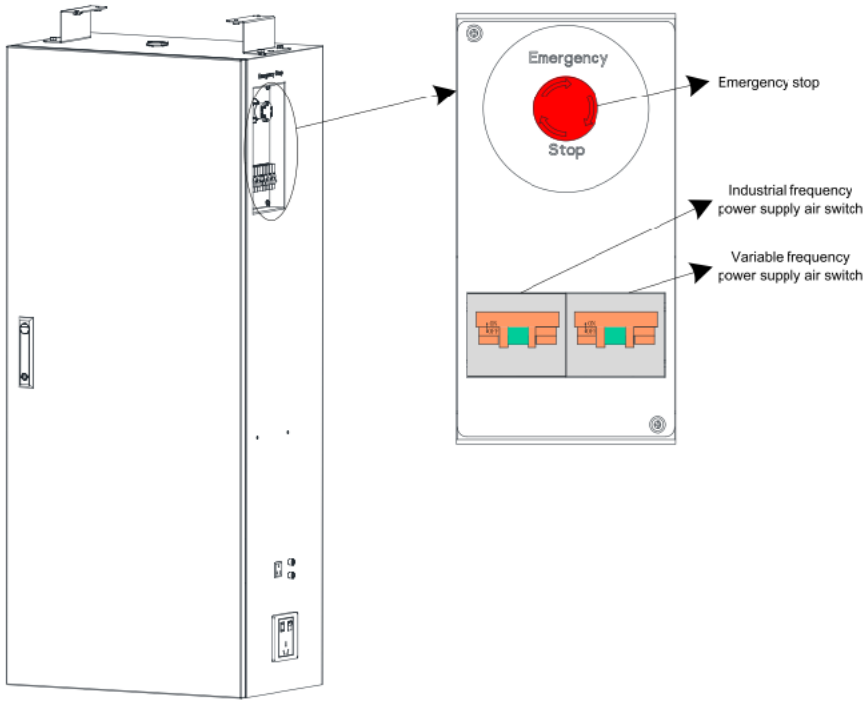


Figure 3-8 Diagram of the External Buttons of the Cabinet

- Operation panel:

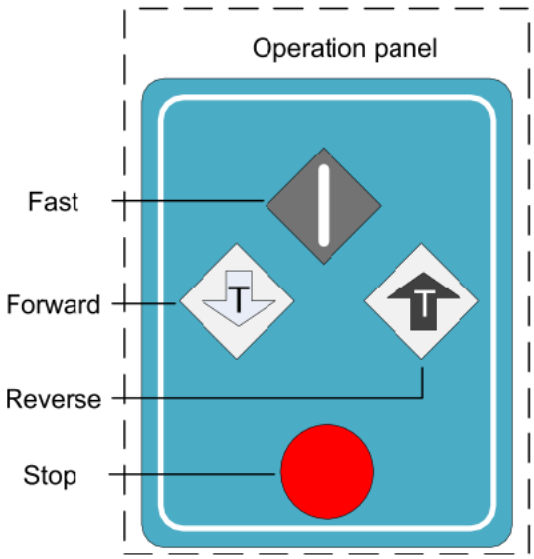
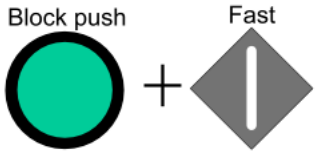
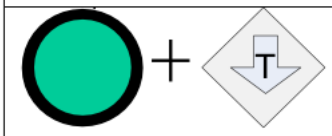
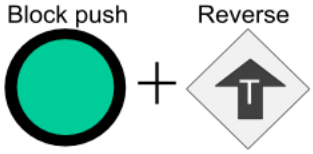
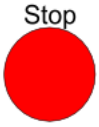


Figure 3-9 Diagram of the Operation Panel of the Cabinet

Fast, Forward and Reverse buttons shall be used simultaneously with the Block Push button to enable the corresponding action. For details, please

see below table:

Table 3-4 Functional Description of External Buttons of the Cabinet

Type	Button	Function
Button Combination		If all startup conditions are met and the loom is shown as normal on the main page of the touch screen, press the Fast button and the Block Push button so that the loom will rotate first to the warp stop or weft stop angle, and then enter into a fast running state after warp compensation when red, yellow, blue and green lights are on. Pay attention to safety operations.
		Press the Forward button and the Block Push button so that the loom will be in idle forward running.
		Press the Reverse button and the Block Push button so that the loom will be in reverse idle running. Press the Reverse button so that the loom is in reverse running until it stops at the orientation angle of the opening. Then press the button again until the loom stops at the orientation angle of the heald level through reverse running. Release the button and the loom stops reverse running. Weft can be located with this button.
Single-handed button		Press this button and the loom will immediately enter into high-voltage brake stop and all operations will stop. In that case, the servo drive will still be connected to the power supply. Therefore, press this button to prevent from error operation during repairing.
		Press this button and the loom will stop and rotate forward to 300°. Press this button for long and the loom will stop without any further idle operation. Press this button can also stop and interrupt all operations.

Foundation	The cabinet shall be installed on a flat and dry surface which can bear the weight of the cabinet to prevent from shaking.
Space	Sufficient clearance shall be left on all sides (front, back, left, right and upper) except the lower side of the cabinet for heat radiation, maintenance and evacuation.
Altitude	10% load running is acceptable at somewhere below 2000m.
Temperature	-25℃～40℃
Humidity	<95%, without condensation

3.1.2 Appearance and Installation Dimensions

Installation Precautions	
CAUTION	◆ Make sure that the cabinet is installed on a surface with a levelness less than 0.5 mm; ◆ For installation of the servo motor, please strictly follow the requirements of Appendix D.

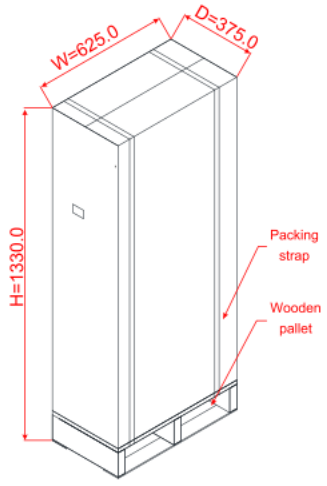
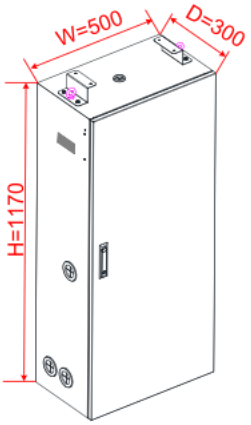
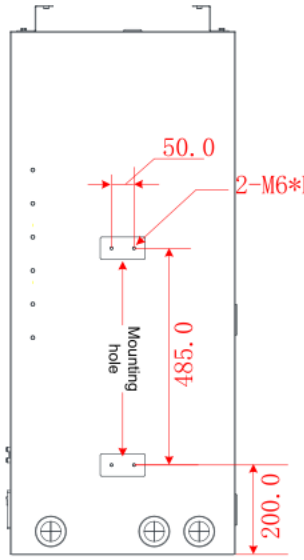
Dimensions with Package	Dimensions without Package
	

Figure 3-1 External Dimensions

Dimensions of the Mounting Hole at the Back	Dimensions of the Mounting Hole at the Bottom
Use M6 screws to fasten the product at the back with a torsion of 35-45kgf-cm	Use M10 screws to fasten the product at the bottom with a torsion of 180-200kgf-cm



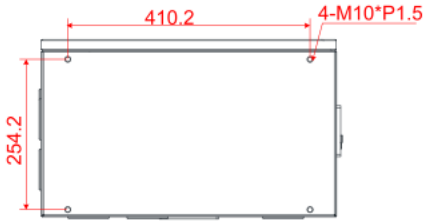


Figure 3-2 Dimensions and Positions of the Mounting Holes

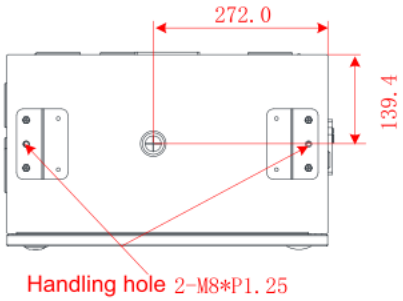
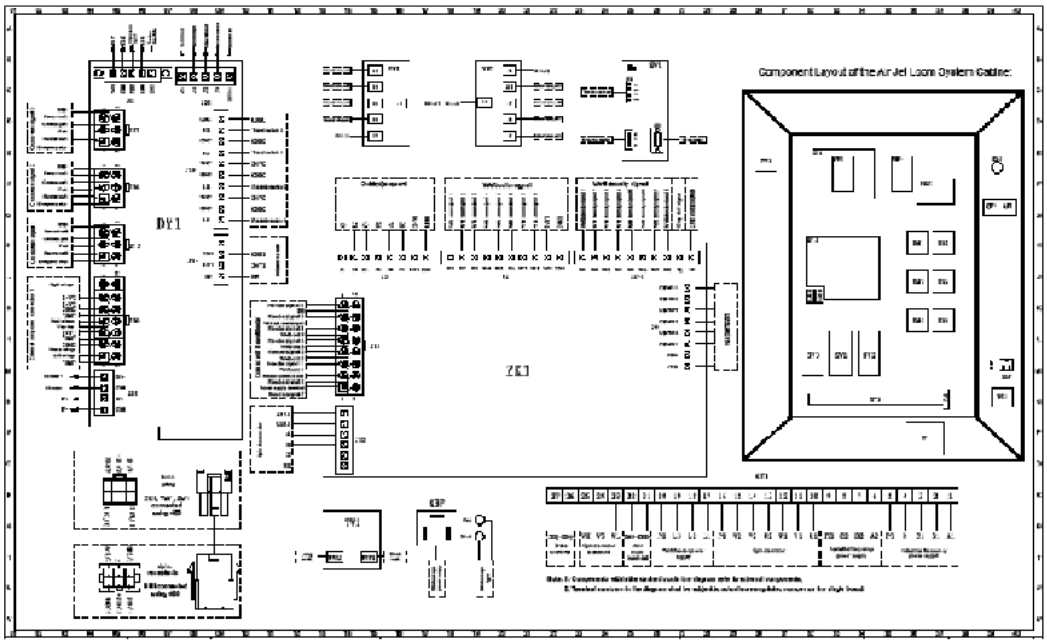


Figure 3-3 Dimensions of the Handing Hole

System Connection Diagram



5-3 Frequency converter for inching turning (the loom equipped with A300 electric control box from Hokuetsu Denken, the electric control box with the independent transducer.)

During normal and reverse inching turning, the loom shall run with the speed of 1/10 of the general speed for safe and proper operations.

1) During inching turning, it is necessary to provide the special frequency converter for the loom.
The frequency converter and the loom shall be installed separately and the special wiring construction shall be carried out for every loom.

2) If there is the inching combination specification (option) in the transducer box for speed control, 5Hz power cable for inching turning is not needed.

3) For Wiltop towel specification and the loom equipped with A300 electric control box from Hokuetsu Denken, the frequency converter is arranged on the control box, so 5Hz power cable for inching turning is not needed.

5-4Capacity of electric devices for each loom

Main drive power(kw)	1.8	2.2	2.7	3.0	3.7	5.5
Capacity （KVA）	2.9	3.5	4.3	4.8	5.9	8.8

Note）The capacity showing the above table do not include the capacity of jacquard mechanism. Please consult with its supplier if necessary.

5-5. Electric wiring

1） Specification of wires

Please do not use the wires that are finer than the following specifications.

(I)Voltage of Power supply is 220(special)

Rated power of main drive	50Hz main circuit			5Hz frequency transformer circuit		
	Bus Note1）	Branch wire （BVR）		Bus Note1）	Branch wire(BVR)	
		≦10m	＞10m Note 3）		≦10m	＞10m Note 3）
1.8KW	10 mm^2	4 mm^2	6 mm^2	16 mm^2	2.5 mm^2	4 mm^2
2.2	16	6	6	16	4	4
2.7	25	6	10	16	4	6
3.0	25	10	10	16	6	6
3.7	35	10	25	25	6	10
5.5	35	25	25	25	10	10

(2)Voltage of Power supply is 380(common)

Rated power of main drive	50Hz main circuit			5Hzfrequency transformer circuit		
	Bus Note1）	Branch wire		Bus Note1）	Branch wire	
		≦10m	＞10m Note3）		≦10m	＞10m Note3）
1.8KW	6 mm^2	1.5 mm^2	2.5 mm^2	6 mm^2	1.5 mm^2	2.5 mm^2
2.2	10	1.5	2.5	6	1.5	2.5
2.7	10	2.5	4	6	2.5	2.5
3.0	16	4	6	10	2.5	2.5
3.7	16	4	6	10	4	4
5.5	25	6	10	10	4	6

Note 1）The bus is the branch wire from 6P breaker without fuse in distributor disc to five looms.

Note 2）If the bus is too long and the voltage declination is more than 2%, the coarser wires should be used.

Note 3）If the length of branch wire exceeds 10m, the coarser wire should be adopted according to its length.

Note 4）If the length of branch wire from frequency transformer box to 6P breaker without fuse in distributor disc exceeds 50m,the coarser wire should be adopted.

Note 5）The above mentioned specifications is suitable for the wire conduit that contains less than three wires.

2） Connection of wiring

The wiring from loom to loom should be avoided (connection of wiring).

3） leakage check

（1） Arrange the leakage checking circuit for safety.

（2） The leakage breaker and leakage alarming device, which are used in electric devices in workshop, should be suitable for high harmonic wave.

Note）Inverter is characterized by that it has high harmonic wave at the electric changing part. Due to the high harmonic wave, there is leakage current and leakage breaker and leakage alarming

device maybe work incorrectly. Please pay attention to the above-mentioned during purchase.

4) conduit arrangement

The wire of 50Hz main circuit and 5Hz frequency transformer circuit should be in each conduit arrangement.

5）lead-out wiring

The lead-out position of wiring and conduit arrangement between wiring and control cabinet of loom should accord with the basic draw and installation drawing.

5-6 Notices when arranging the phase-leading capacitor for power improvement

When the loom is the inching turning specification, the arrangement of the phase-leading capacitor on the side of the main motor shall be avoided. Please be sure to arrange it on the side of the power in the factory in order to prevent the transducer for inching turning from damage.

In addition, do not make the capacitor enter the load side of the transducer in this case.

5-7 Frequency converter for inching turning

(For WILTOP towel specification and the air-jet loom equipped with A300 electric control box from Hokuetsu Denken, the frequency converter is built in the control box. So this item can not be considered.)

•This is a device supplying the 5Hz AC power needed for automatic reverse turning and manual normal and reverse inching turning.

• It is composed of the transducer box with the transducer built in it and 3P+3P non-fuse breaker.

1) Transducer box

(1) Models and scope of application

Transducer box	Number of Looms
WT9100-48	below 48
WT9100-72	48-72
WT9100-96	72-96

(2) Power voltage

For models WT9100-48/WT9100-72/WT9100-96, the reactor installed varies with the individual power. So it shall be confirmed that the terminal of the primary side of the reactor installed is consistent with the power voltage. In the standard ex-factory status, the input of the frequency conversion cabinet is the power of 3P AC 380V.

(3) Transducer installed

In the transducer box of models WTBP-48/WTBP-72/WTBP-96, there is one transducer installed and the input voltage generally is the power of 3P AC 380V. If the user needs the special power supply, it is necessary to notify our company otherwise for the special design plan.

(4) Fault emergency disposal

After some abnormity appear in the transducer within the frequency conversion cabinet, it shall be disposed as general faults according to the operation instructions of the transducer. If it cannot be solved in this way, please consult the after-sale service department of our company promptly.

(5) Notices for installation

a. The transducer box shall be placed at the room temperature of 30℃ or below.
b. The places with flyings and moisture shall be avoided as possible.
c. Two sides of the transducer box shall be more than 10cm from the articles nearby to improve the heat release effect.
d. Please do not put any article on the transducer box.
e. The maintenance and servicing must be performed strictly according to the operation instructions of the frequency conversion cabinet.

(6) Wiring diagram and operation instructions

The internal wiring diagram for the transducer box and the operation instructions of the transducer are enclosed in the box. The wiring plan for the frequency conversion cabinet is also covered in the operation instructions of the cabinet. Please refer to them as needed.

(7) For other matters not mentioned, please refer to the operation instructions of the frequency

conversion cabinet carefully and the installation, wiring, debugging, maintenance and servicing shall be performed strictly according to the operation instructions.

2) 3P＋3P non-fuse breaker

(1) The three electrodes on the left are for circuit protection of the 50Hz main power and the three electrodes on the right are for circuit protection of the 5Hz power for inching turning.

(2) Number of looms

Five looms at most can be connected for a set of (3P+3P) non-fuse breakers.

(3) Rated current

The value of the rated current varies with the power voltage.

Power voltage	Rated current
AC220V	100A
Above AV380V	50A

(4) Non-fuse breaker box

Please the user prepare the box for the non-fuse breaker. For the installation dimension, please refer to the drawing of the 3P＋3P non-fuse breaker.

6. Air conditioner and surroundings

6-1 Air conditioner

1） Temperature and humidity

The management of temperature and humidity in weaving shop is very important during processes of weaving. The better management of temperature and humidity can prevent the warp hairiness and warp break and improve the operation efficiency.

（1）Loom workshop

Warp		Temperature（℃）	Humidity（%）
Staple	Cotton	25～28	68～73
	P/C		65～70
Filament		20～25	65～70

Note）If the humidity is low than 65%, it is tendency to have static electricity and hairiness.

If the humidity is high than 85%, it is subject to cause the wrong action of electric parts in loom.

（2）Winding machine, warping, drawing-in and cloth checking workshop

Temperature（℃）	Humidity （%）
20～25	60～70

2）Efficiency of air conditioner

In order to improve the efficiency of air conditioner, the loom workshop should be constructed without a window and the heat-insulation material should be used for walls and roofs of the workshop. In addition ,please pay more attention to effect from the air inserting weft. when using the WILTOP air jet loom .because humidity of the air inserting weft is low ,it is necessary to humidify in the workshop. In addition , temperature of the air liberated from the loom is about 25℃ through the air drying machine.(please pay more attention :this condition will change with the strike of air pipe and the air temperature around .it is necessary to consider using heat barrier material especially installing air pipe outdoor.)

The below are examples adopted with cooled air drying machines.it's for reference.

Item		setting	Note
Blow in condition of air drier	pressure	0.7Mpa(7kgf/㎝ ^{2})	It is decided according to compressor and cooler,etc.
	Temperature of entrance	35℃	
	dew point of pressure	35℃	
Air state of processing	pressure	0.68Mpa(6.8kgf/㎝ ^{2})	The parameters can be the reference to conclude air condition. The temperature at the exit will be changing as per the different air temperature around air drying machine and different air consumption.
	Temperature of entrance	25℃	
	dew point of pressure	Below 10℃ （ atmospheric dew point：-17℃）	

3）Wetting method

There are two kinds of wetting devices, the spray wetting device and the no-drop wetting device. The no-drop wetting device is suggested to be used.

The spray wetting device makes air stagnant and reeds dirty and lower the running efficiency. For this reason, spray wetting device is not suggested to be used.

6-2 Height of roof of workshop

The height of devices, room of workshop and efficiency of air conditioner should be considered when the roof is constructed. The lower roof of workshop can reduce the cost of air conditioner while worse air circulation makes the operators feel uncomfortable and hard to breathe. The higher roof increases the space of workshop while it also increases the expenditure of air conditioner and running cost.

Normal condition：

Specification of loom	Height of roof （m）
Shedding with crank	3.0
Shedding with cam and dobby	3.5

Please consult with the supplier the height of roof during installation of flyings removing device (automatic travelling clearner).

Note 1: height of loom (with dobby)

Type	Height of loom (㎜)	Remarks
WILTOP	2004	Height of topest part of dobby
	2153	Height of topest part of terry warp beam （φ1000）with dobby
	2333	Height of topest part of terry warp beam （φ1100）with dobby

6-3 Color in workshop

The color can influence illumination, improve the physiology and psychology of workers. Additionally, supply the paint on the ground of workshop, which can avoid the accumulation of dust and improve the operation surrounding.

The following colors are used mostly:

Site	Roof	Upper part of wall	Lower part of wall	Ground	Passage line
color	while	white, milky white	white, milky white	grey, green, milky white	While, yellow

Additionally, the paint covered on ground after move-in of loom can prevent ground from being scratched.

6-4 illumination

The light must be enough to see the smallest hairiness on cloth.

The illumination relatived to the processes of weaving is shown as follow:

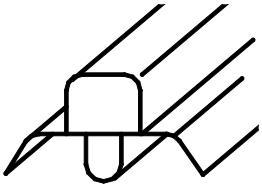
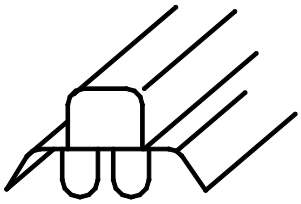
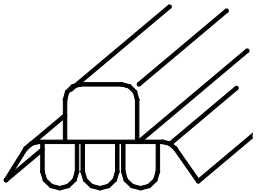
Process	winding	Warping	Sizing	Drawing-in	weaving	Finishing	Checking

illuminance （lux）	150～300	150～300	150～300	300～700	300～700	70～150	300～1000

6-5 Illumination of fluorescent light

Illumination of fluorescent light varies with wattage and distance. Please refer to the illumination of lighting device in the following table and confirm the position of fluorescent light.

Illumination (white fluorescent light)

Height （m）	One light			Two light			Three light
							
	20W	30W	40W	20W	30W	40W	40W
1	160	260	440	365	580	995	1435
2	39	63	110	90	145	250	375
3	18	28	50	40	63	110	158

7. Flying-proof measure

Use the blower device or supply cover on yarn guide part and tension part. It is not enough and the measure should be taken for whole workshop.

The automatic traveling cleaner for loom introduced following is an efficient device to improve the environment in workshop, especially, in workshop weaving with short fiber.

1）Use automatic traveling cleaner to improve the environment of workshop:

（1） Avoid the insertion of waste end into woven fabric and improve the quality of fabric and weaving efficiency of loom.

（2） Save the clean working for loom and ground.

（3） Make the working environment in workshop more comfortable.

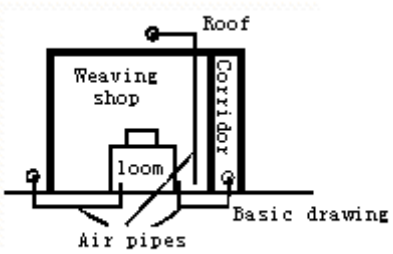
（4） Lessen the fire possibility.

2）The traveling cleaner and its specifications are shown in the instruction manual from suppliers.

8. Fire-proof equipment

Fire-proof equipment is very important for mills.

1）The fire-proof equipment should be suitable for prevent spread of fire by flyings.



a. The air pipe and exhaust pipe (for fire fighting and temperature regulation) should be mounted outside of loom (aisle, in roof or under ground) and the flyings should not be accumulated around the pipes.

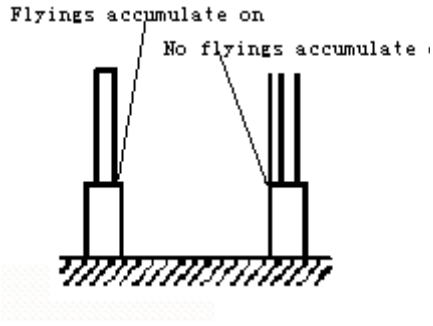
b. The base of wall should not be convex.

c.The building should be without windows or no flyings is accumulated on the window frames. Additionally, the double-window is suggested to be used in order to avoid noise and vibration.

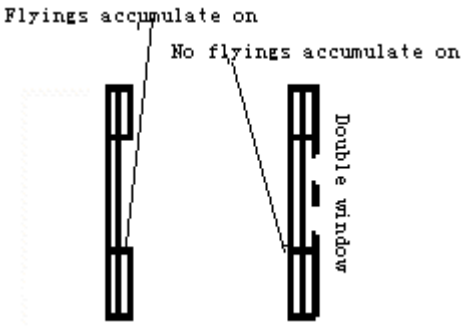
d. The illumination device should be mounted in the roof.

e. Blow and take-in accumulated flyings by automatic traveling cleaner.

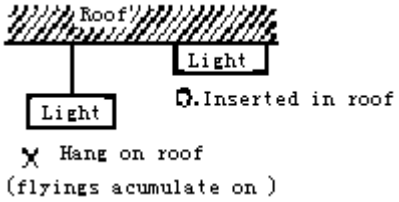
f. Install fans on hanger to remove the flyings on hanger and rails.



〖window〗



〖roof〗



2）The store keeping the flammable solvent and oil should be outside of weaving workshop.

3）During fire, the control or extinguishing measures should be taken to avoid the fire spread.

A. Shut off the weaving workshop from outside during fire to prevent the spread of fire and hot air.

a. The fire-proof door, which does not have clearance in the structure, should be installed at entry and exit.

b. The window should be as small as possible or do not design windows for workshop.

c. The pipes (for suction and air conditioner) should be equipped with the close device (for fire fighting).

B. The material for roof, ground and wall should be no-flammable or difficult flammable material.

C. The difficult flammable coating should be supplied.

D. Weaving workshop should be in fireproof construction (reinforced concrete construction) to avoiding the collapse due to higher temperature of fire

4）The fire alarm is suggested to use for early detection of fire.
There are two kinds of sensor, heat sensor and smoke sensor. In order to watch the whole workshop, please use and make best of the sensor.

5）Fire fighting device

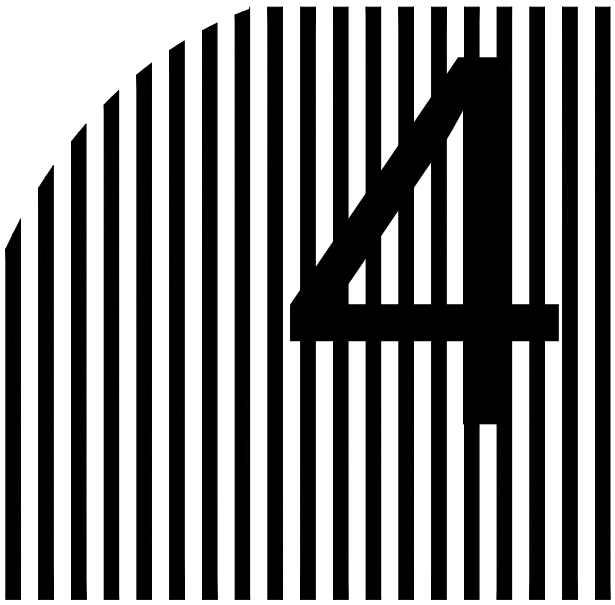
A．Spray device

It is installed on the roof, which is aligned with the center of loom. It is said that its successful percentage of fire fighting is up to 96%.

B．Powder fire extinguisher

C．Fire hydrant

6）Install the leakage alarm device to prevent the fire caused by leakage.



Chapter4

●Parts and tools of WILTOP loom

1 Reed
2 Heddle
3 Drop wire
4 Warp beam
5 Take-up roller
6 Temple

1. Reed

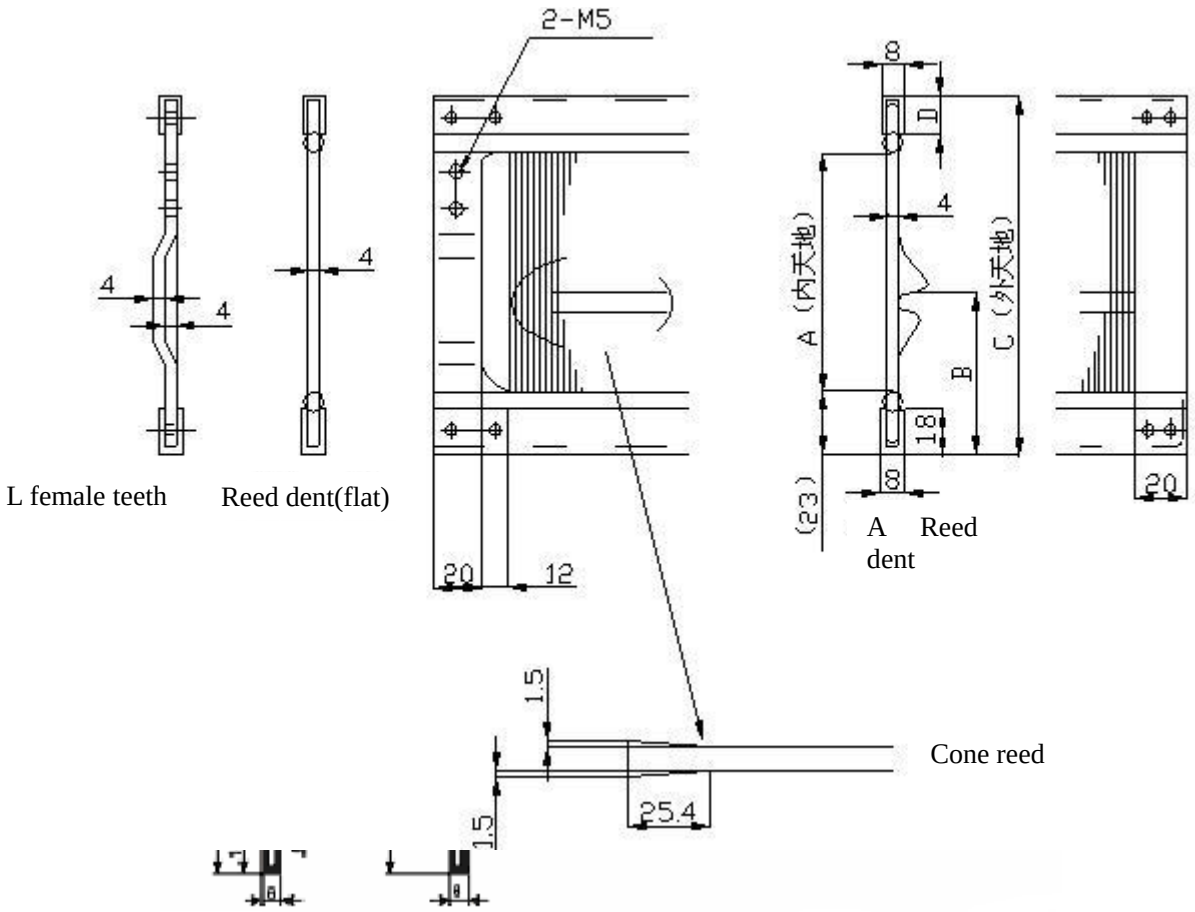
1-1Quality

Wiltop air jet loom adopts profile which used with air-slot.

The quality of the reed has a great influence functioning running or the loom and quality of fabric.

During the selection of reed, you should pay attention to that the surface of reed should be smooth and without corner, burr and rust spots.

1-2 Diagram and specifications of reed



L female teeth

Reed dent(flat)

A Reed dent

Cone reed

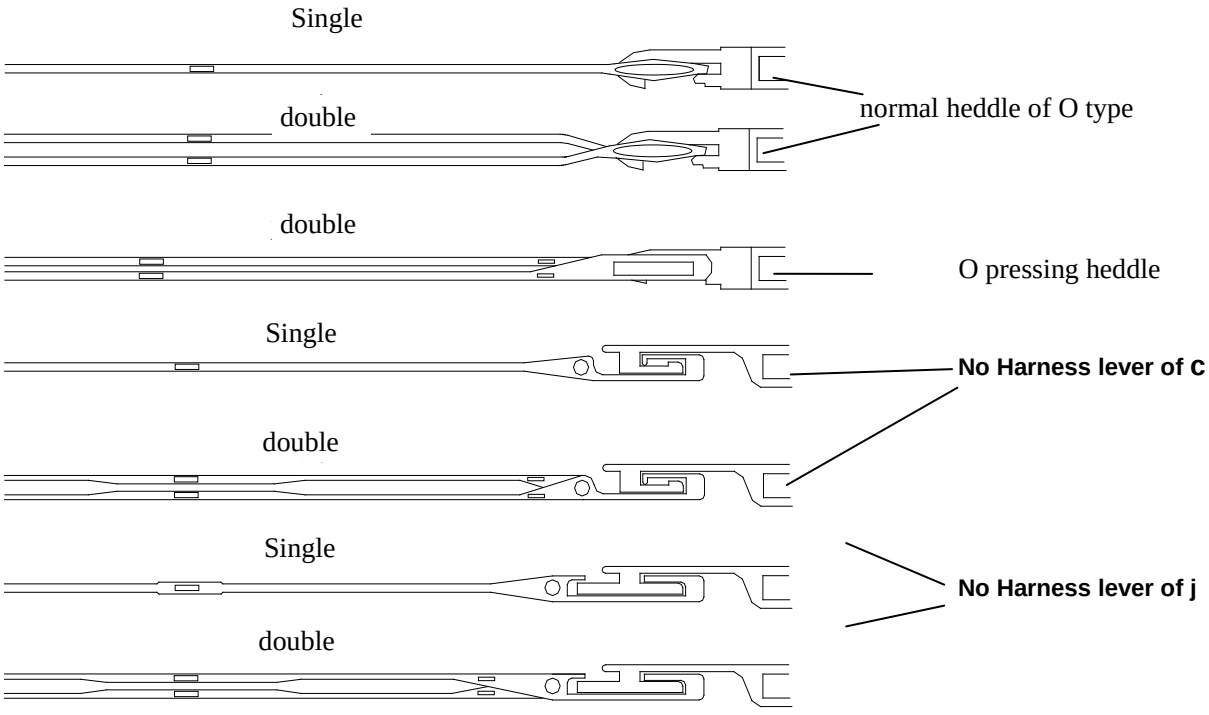
Cloth Mark	filament Standard	staple Standard	staple Ring height R 1	staple Ring height R 2
A	67	71	82	76
B	51	51	56	56
C	111.5	111.5	122	122
D	16	12	12	12

2. Heddle

2-1Used heddle

Shedding	Length of heddle	Heddle type	Distance between heddles
Crank	280,(302),330	Harness lever,center	14,16 ㎜
	280,331	J,upper 5mm,no Harness lever	
	331	C,center,no Harness lever	
Cam	280,330	Harness lever,center	12,14 ㎜
	280,331	J,upper 5mm,no Harness lever	
	331	C,center,no Harness lever	
Dobby	330	J,upper 5mm,no Harness lever	12 ㎜
	331	C,center,no Harness lever	

Note）Please confirm the information from suppliers again before the usage of heddles.



2-2 heddle and the count of yarn

1)using Harness lever

Type	Section （㎜）	Dimension of hole of heddle （㎜）	single		double		dtex (denier)	Yarn count
			piece/ ㎝	piece/ inch	piece /㎝	piece/ inch		
O common heddle	2.0×0.25	5.0×1.0	16	40	24	60	167	40
	2.2×0.3	5.5×1.2	12	30	20	50	330	20
	2.5×0.35	6.0×1.5	10	25	17	43	590	10
	2.8×0.4	6.5×1.8	9	22	14	35	720	8
O pressing heddle	5.5×0.25	5.5×1.2	—	—	20	50	330	20
	5.5×0.30		—	—	18	45	330	20

Note）Shedding with dobby or cam and Loom speed more than 500rpm ,you should be used O pressing heddle.

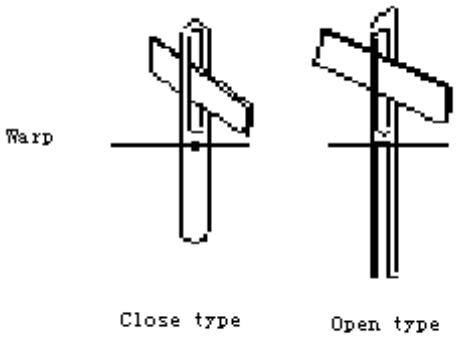
2)No Harness lever

Type	Section （㎜）	Dimension of hole of heddle （㎜）	single		double		dtex (denier)	Yarn count
			piece/ ㎝	piece/inch	piece /㎝	piece/ inch		
J，C no Harness lever	5.5×0.25	5.5×1.2	14	35	20	50	330	20
	5.5×0.30		12	30	18	45		
	5.5×0.30	6.5×1.8	8	20	—	—	720	8
	5.5×0.38		7	17	—	—		

Note 1）The heddle of stainless steel is suggested for weaving fabric.
Note 2）Actual density is 80% as shown in the above table.
Note 3）The heddle of O,J,C which Dimension of hole of 6.5X1.8 is suggested for Wiltop terry loom.

3. Drop wire

3-1 Type of drop wire



1)Open type

The dropper pinning machine can be used.

2)Close type

The automatic warp threading device can be used.

3-2 Selection of drop wire

1） Warp count and optimal weight of drop wire

Weight of drop wire（g）	Warp count	
	Ne	Denier
1.0～1.5	66～42	90～140
1.5～2.0	42～30	140～200
2.0～2.5	30～24	200～250
2.5～3.0	24～18	250～320
3.0～4.0	18～10	320～580
4.0～6.0	10～6	580～960
6.0～10.0	6～4	960～

Note）The drop wire of 0.15~0.2 in thickness is suggested for Wiltop.

2） Dimension and weight of drop wire

Close type				Open type			
Weight（g）	Length（mm）	Width（mm）	Thickness（mm）	Weight（g）	Length（mm）	Width（mm）	Thickness（mm）
1.2	145	8	0.2	1.1	145	8	0.2
1.9			0.3	1.7			0.3
1.9	145	11	0.2	1.7	145	11	0.2
2.9			0.3	2.5			0.3
3.8			0.4	3.3			0.4
4.8			0.5	4.2			0.5
2.2	165	11	0.2	1.9	165	11	0.2
3.3			0.3	2.9			0.3
4.4			0.4	3.8			0.4
5.5			0.5	4.8			0.5

Note: Drop wires from different suppliers are in different shape for warp threading device.

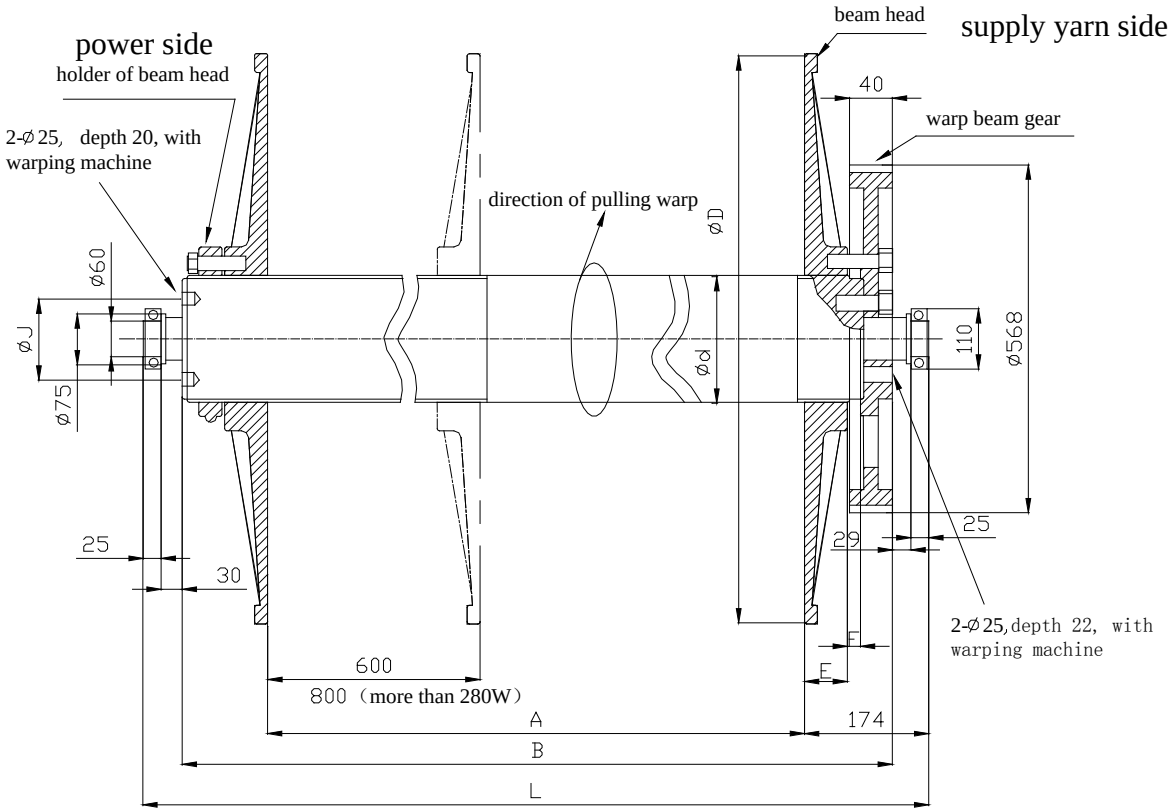
3-3 Permitted paratactic pieces of drop wire

Thickness of drop wire（mm）		0.15	0.2	0.3	0.4	0.5
Permitted paratactic pieces	piece/line·cm	23	20	14	10	7
	piece/line·inch	59	50	36	26	18

Note）The permitted paratactic pieces varies with warp count as shown in the above table.

4. Warp beam

4-1Single warp beam(beaming and warping length)



Dimension of flange（D）	Warp beam（d）	E	F	Quality of flange	
				With 178	With 214
ϕ800	AL178，AL214	60	31	20	21
★ϕ800stronger	AL178	80	11	36.5	—
ϕ914	AL178，AL214			38	35.5
ϕ914stronger	AL214，			—	35.5
ϕ1000	AL178，AL214			34	42
ϕ1000stronger	AL214			—	42

d	J	Fixer of flange	Warp beam gear（140T）
★AL178	138	2kg	20kg
AL214	150	2.5kg	21kg

Reed width	A	B	L	Quality of beam pipe（kg）		Quality of beam assembling（kg）			
				AL178	AL214	ϕ800 AL178（140T）	ϕ800stronger AL178（140T）	ϕ914 AL178（140T）	ϕ1000 AL214（140T）
190 ㎝	1900	2140	2249	41	52	104.5	137.5	140.5	161
210 ㎝	2100	2340	2449	44	55	107.5	140.5	143.5	164
230 ㎝	2300	2540	2649	47	58	110.5	143.5	146.5	167
250 ㎝	2500	2740	2849	50	61	113.5	146.5	149.5	170
280 ㎝	2800	3040	3149	54	84	117.5	150.5	153.5	193
340 ㎝	3400	3640	3749	62	97	126	159	162	206

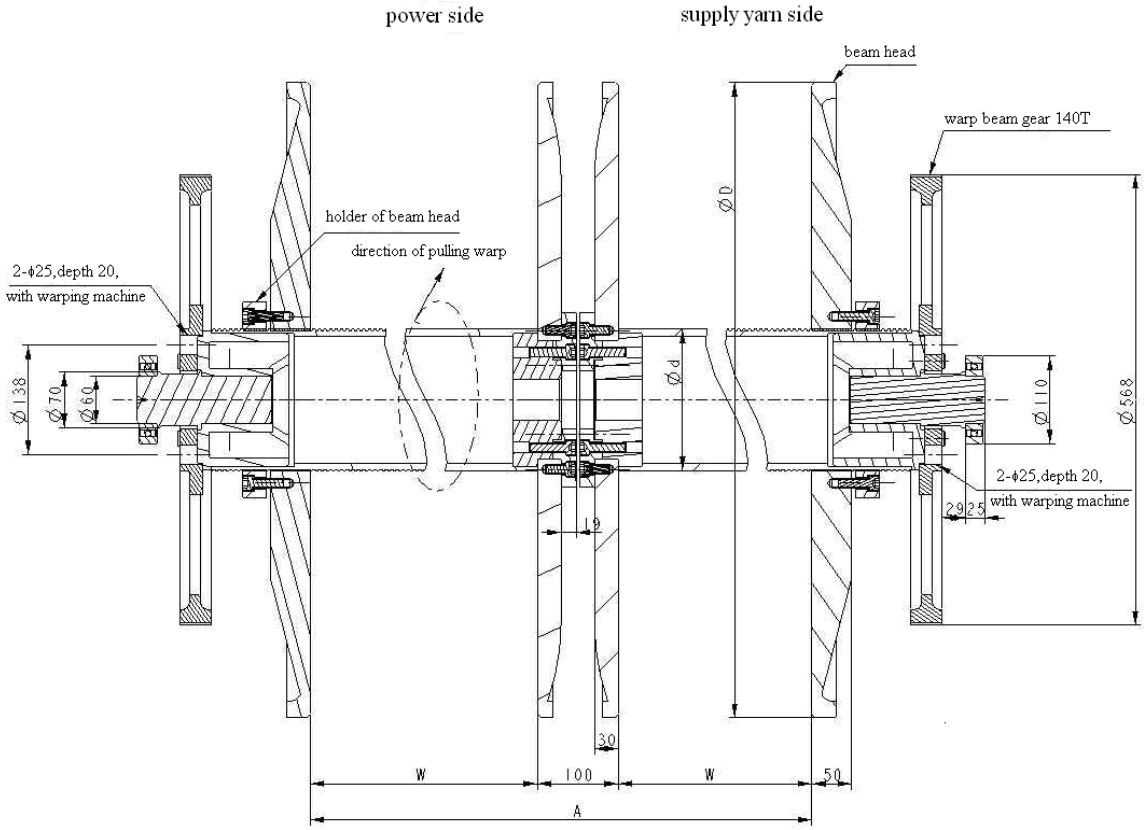
Note 1):AL stands for aluminum

Note 2):Dimension A is inner side of the edge when reeding with the maximum working reed width(the beaming width).

Note 3):Quality of beam assembling includes Quality of bearing

Note 4):The method of Installation of selvage disc refers to chapter 2

4-2 twin warp beam



Dimension of flange（D）	**Warp beam**（d）	**Quality of** flange（kg /piece）	
		With 178	With 214
φ800	AL178,AL214	20	21
φ914	AL178,AL214	38	35.5

d	J	**Fixer of** flange	**Warp beam gear**
AL178	138	2kg	16kg
AL214	150	2.5kg	

Reed width	A （mm）	Warping widthW		Total L	**Quality of beam assembling**（kg）
		Max	Min		φ800 **selvage disc**
250 cm	1900～2500	1200	900	1745	292
280 cm	2200～2800	1350	1050	1895	296
340 cm	2800～3400	1650	1350	2195	303

Note) Dimension A in the list is inner side of the edge.

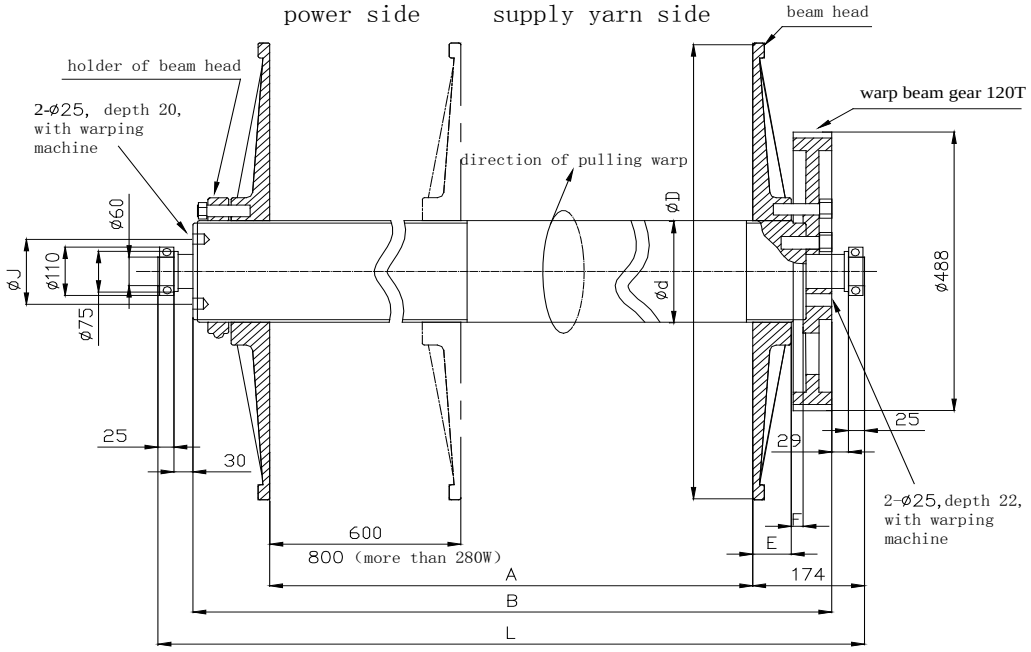
Dimension A equals to reed width ,that is A=normal width~(normal width-600)(mm)

Dimension W of beaming width are shown under the formula：

W=（A—100）/2

4-3 twin warp beam（terry）

1） **warp beam of ground**



Dimension of flange（D）	Warp beam（d）	E	F	Quality of flange（kg /piece）	
				With 178	With 214
ф800	AL178,AL214	60	31	20	21
ф914	AL178,AL214	80	11	38	35.5

d	J	Fixer of flange	Warp beam gear
AL178	138	2kg	16kg
AL214	150	2.5kg	

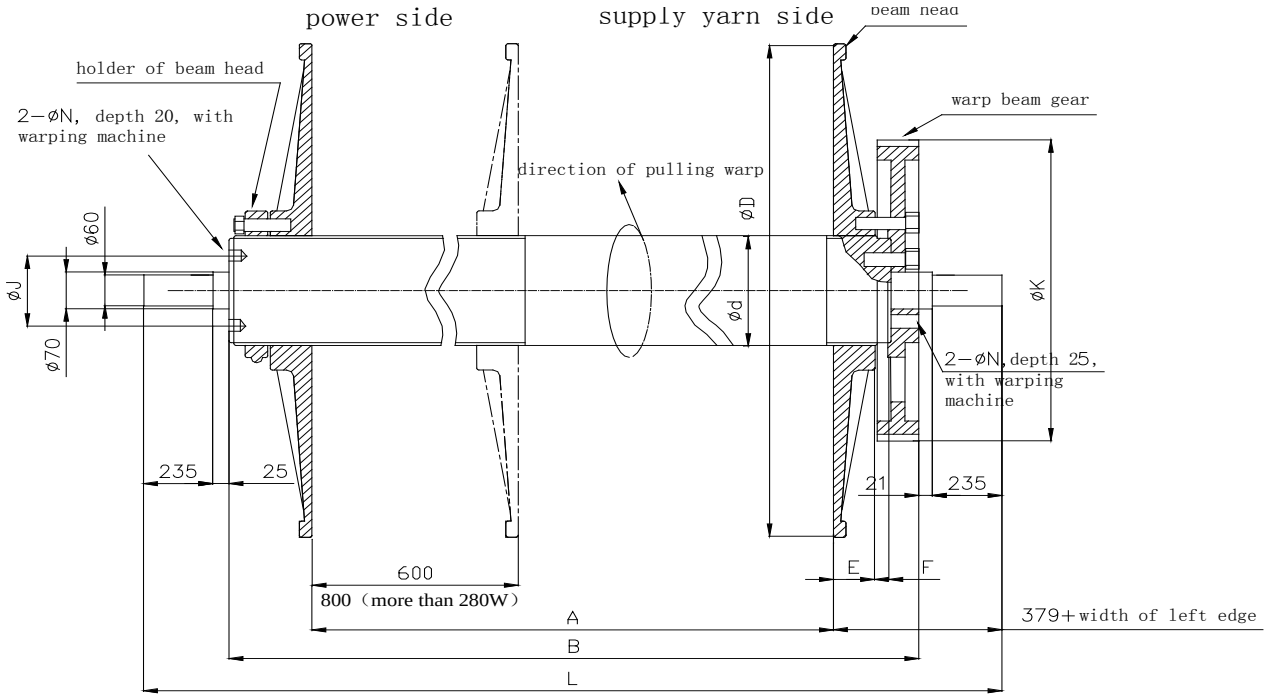
Reed width	A	B	L	Quality of beam pipe（kg）		Quality of beam assembling（kg）	
				AL178	AL214	ф800 AL178 （120T）	ф914 AL178 （120T）
190 cm	1900	2140	2249	41	52	100	136
210 cm	2100	2340	2449	44	55	103	139
230 cm	2300	2540	2649	47	58	106	142
250 cm	2500	2740	2849	50	61	109	145
280 cm	2800	3040	3149	54	84	113	149
340 cm	3400	3640	3749	63	97	122	157.5

Note 1）**Material of Warp beam of AL is aluminum**

Note 2）**Dimension A is inner side of the edge when reeding with the maximum working reed width(the beaming width).**

Note 3）**Quality of beam assembling includes Quality of bearing**

2） **warp beam of pile**



Dimension of flange（D）	Warp beam（d）	E	F	K（constant）	Quality of flange（kg /piece）	
					With 178	With 214
φ800	AL178,AL214	60	31+left selvage width	488(120T)	20	21
φ914	AL178,AL214	80	11+left selvage width		38	35.5
φ1000	AL214				—	42
φ1100	AL214			568（140T）	—	46

d	J	N	Fixer of flange	Warp beam gear
AL178	100	22	2kg	（120T）16 kg
AL214	150	25	2.5kg	140T（with 214） 21 kg

Reed width	A	B	L	Quality of beam pipe（kg）		Quality of beam assembling（kg）			
				AL178	AL214	φ800 AL178（120T）	φ914 AL178（120T）	φ1000 AL214（120T）	φ1100 AL214（140T）
190 cm	1900—left selvage width	2140	2249	49	60	108	144	164	177
210 cm	2100—left selvage width	2340	2449	52	63	111	147	167	180
230 cm	2300—left selvage width	2540	2649	55	66	114	150	170	183
250 cm	2500—left selvage width	2740	2849	58	69	117	153	173	186
280 cm	2800—left	3040	3149	63	92	122	158	196	209

	selvage width								
340 ㎝	3400－left selvage width	3640	3749	72	102	131	167	206	219

Note 1）**Material of Warp beam of AL is aluminum**
Note 2）**Dimension A is inner side of the edge when reeding with the maximum working reed width(the beaming width).**
Note 3）**Quality of beam assembling includes Quality of bearing**

4-4 Warping and length of warp

Name of cloth		**Specification**	ϕ 800	ϕ 914	ϕ 1000	Winding density（ASG）
staple	Jean	C6.6S/1×C5.7S/1 59piece/inch×34piece/inch ×1715 ㎜	1150m～1300	1500m～1700	1800m～2050	0.54 (g/cm^3)
	Corduroy	C22S/1×C14S/1 72piece/inch×120piece/in ×1810	2400～2600	3150～3400	3750～4100	0.41
	P/C poplin	P/C45S/1×P/C45S/1 113piece/inch×73piece/in ×1240	3600～3800	4750～4950	5650～6000	0.46
	Jean	P/C45S/1×P/C45S/1 100piece/inch×50piece/inch ×1181	4500～4700	5900～6200	7000～7400	0.51
	down cloth	CM40S/1×CM40S/1 120piece/inch×110piece/inch ×1760	2800～3000	3700～4000	4400～4750	0.41
	down cloth	CM60S/1×CM60S/1 170piece/inch×110piece/inch ×1220	3350～3500	4400～4600	5200～5550	0.47
	High-quality cloth	CM60S/1×CM60S/1 92piece/inch×86piece/inch ×1194	6000～6200	8000～8200	9450～9800	0.46
	Cotton poplin	C40S/1×C40S/1 90piece/inch×60piece/inch ×1372	3600～3800	4800～5000	5700～6000	0.41
	Five-heddle satin	C40S/1×C40S/1 80piece/inch×130piece/inch ×1140	5500～5700	7200～7400	8500～8800	0.53
	Mixed taffeta	N70d×C30S/1 ×1610 134piece/inch×71piece/inch	11400～11600	15100～15300	17900～18300	0.98 (filament)
filament	Glass fiber cloth	ECG75 1/0×ECG75 1/0 43.9piece/inch×33piece/inch ×1290	5450 5600	7150～7350	8500～8800	1.33
	Cupramonium twill cloth	BB75d×BB100d 160.8piece/inch×80.4piece/inch ×1828	7300 7450	9600～9800	11400～11700	0.82
	Cellulose acetatetaffeta	AC75d×AC75d 102piece/inch×84piece/inch ×1280	12100～12300	16000～16200	19000～19400	0.85
	Polyester poplin of shandong	PW75d×PW75d 79piece/inch×76piece/inch ×1290	13100～13500	17600～18200	20600～21600	0.72
	Cupramonium silk taffeta	BB50d×BB75d 122piece/inch×76piece/inch ×1290	16000～16500	21000～22000	25000～26000	0.90

Note 1)the length of warp yarn in upon list is speculation when dia. of take-up is maximum ,there is a

little difference from the fabric,so only for reference.

Note 2) The method of calculating the length of warp is according to winding density（ASG）.

a.**Specification of warp yarn is shown as den:**

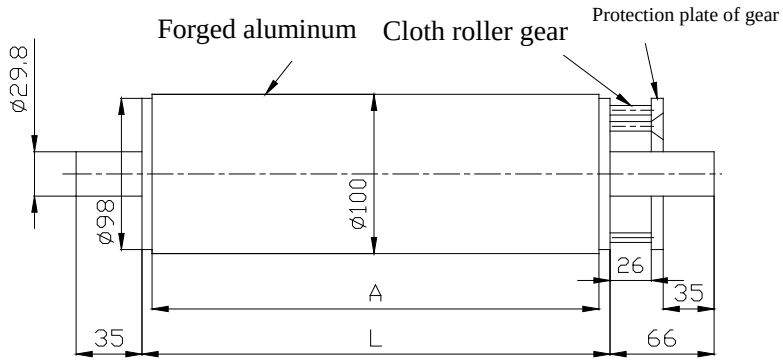
$$L=\frac{(D_0^{\ 2}-d_0^{\ 2})\pi\times 25.4\times 10\times ASG}{4\times d_t\times N}[m]$$

b.**Specification of warp yarn is shown as count:**

$$L=\frac{(D_0^{\ 2}-d_0^{\ 2})\pi\times 25.4\times 9000\times S\times ASG}{4\times 10^3\times 5315\times N}[m]$$

D_0	Dimension of warping（mm）
d_0	Dimension of warp beam（mm）
d_t	Specification of warp（denier）
N	Warp density（piece/inch）
S	Specification of warp（count）

5. Cloth roller

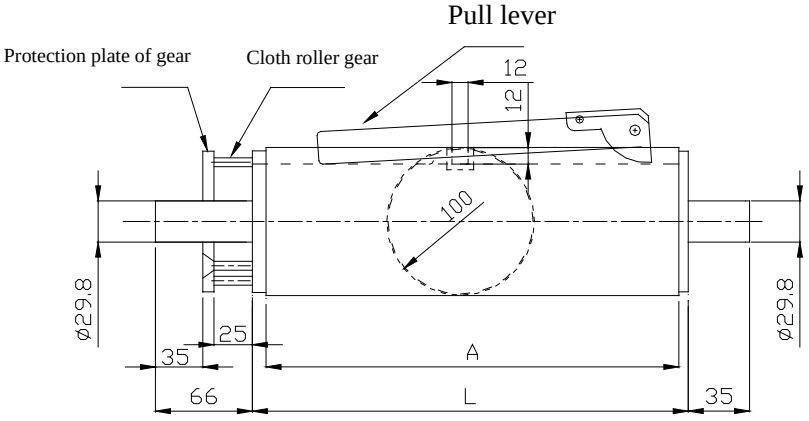


1）WILTOP

Max dimension of roller:

ϕ600（shedding with cam and dobby）

width	A	L	quality（kg）
190	2041	2051	8.5
210	2241	2251	9.0
230	2441	2451	11.5
250	2641	2651	12.0
280	2941	2951	13.0
340	3541	3551	18.0

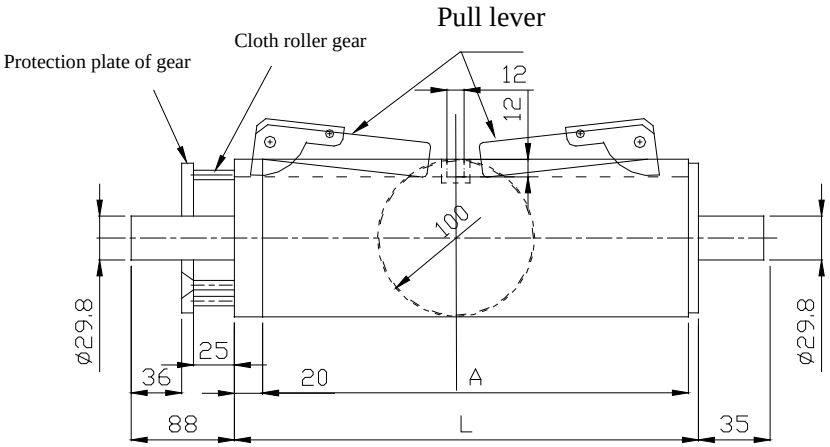


Less than 250W

2）WILTOP（terry）

Max dimension of roller：ϕ600

Width	A	L	quality（kg）
190	2041	2051	6.8
210	2241	2251	7.2
230	2441	2451	7.6
250	2641	2651	8.0
280	2941	2951	8.7
340	3341	3351	10.0



More than 280W

6. Temple

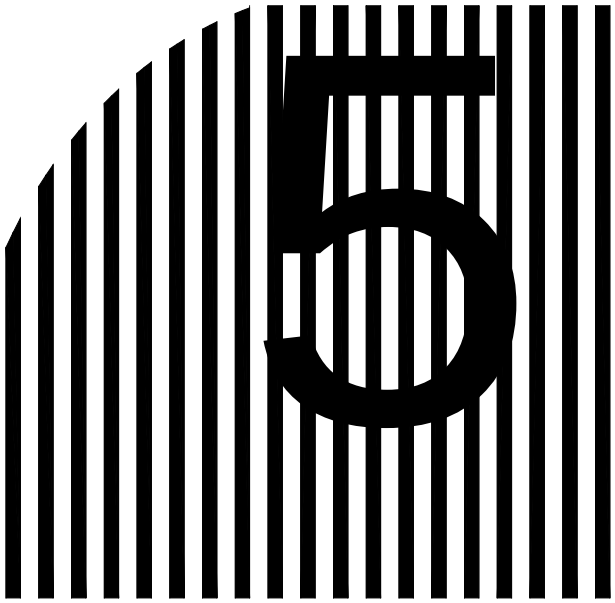
The temples should be up to the yarn type, yarn count, density and fabric structure.

1）The model of planet leno selvage and up-mounted temple cloth-fell incline

temple \ cloth		Gauze Base cloth Paint cloth zephyr Fine cloth crepe	Jean gingham	Jean Twin yarn cloth Thick twills Wool cloth	Bed-sheeting（broad width）	Poplin Clear muslin Printed gray goods Fine cloth	30 S/1～50 S/1 high density clot h plain down cloth 、corduroy	50 S/1～100 S/1 high density cloth Satin down cloth bed-sheeting
2 lines needle 15 loops	Thin eye	◎						
	Middle eye	○		○				
2 lines needle 20 loops	Micro-eye							
	Thin eye		○					
	Middle eye		◎	◎		○		
3 lines needle 30loops	Micro-eye		○		○	○	○	○
	Thin eye					◎	○	○
	Middle eye			○	○	○	◎	○
1 line needle 42loops	Micro-eye				◎	○	◎	◎
	Thin eye							

2）below temple

temple \ cloth		Gauze Base cloth Paint cloth zephyr Fine cloth crepe	Jean gingham	Twin yarn cloth Thick twills Corduroy Jean	Bed-sheeting （ broad width）	Poplin Clear muslin Printed gray goods Fine cloth	Thicker than 40Shigh density cloth	Thinner than 40S high density cloth
3 lines needle 15 loops	Micro-eye	○	○					
	Thin eye	○	○					
3 lines needle 24 loops	Micro-eye	○	○					
	Thin eye					○		
	Middle eye			○		○		
3 lines needle 30loops	Micro-eye			○	○	○		
	Thin eye			○	○		○	
	Middle eye				○		○	○
1 lines needle 47 loops	Micro-eye				○			○
	Thin eye						○	



Chapter 5

●Preparation before production of WILTOP loom

1 Yarn suitable for Air jet loom
2 Preparation of warp
3 Preparation of weft
4 Selvage yarn
5 Waste selvage yarn
6 Other things

1. Yarn suitable for Air jet loom

The running situation has close relations with the yarn quality and preparation before weaving.

Please notice the following matters for the selection of yarns.

<table>
<tr><th>Yarns</th><th>Essentials</th></tr>
<tr><td>Synthetic filaments</td><td>Currently, yarns used in the air-jet loom include acetate fiber, cuprammonium fibre and rayon etc. All yarns used are supplied by every silk reeling factory. Good effects can be obtained by using this kind of yarns.</td></tr>
<tr><td>Staples</td><td>Staples are required to meet the following quality requirements:
(1) Staples shall have a large tensile strength and a proper elongation.
Yarns with medium or above tensile strength at break and elongation at break circulating in the market shall be used according to different revolutions of the loom.
[When the confirmation of the specific yarn quality is necessary, it is recommended that the local industrial laboratory is commissioned to conduct the inspection based on Uster statistic values.]
Medium or above yarns refer to yarns of which the characteristics list the top 50% in the yarns of the same specification produced in the world.
(2) Yarns with small coefficient of variation of the tensile strength or with small nep, slub, size error (average deviation coefficient, U%) and twist error are the best. Yarns of which the Uster statistic value can enter 50% from the best in the above conditions shall be selected.
[If the strength error is too large, warp broken ends can be caused and woofs can be broken by air flow. So attention shall be paid to this.]
(3) Yarns with few cottonseeds shall be used as possible.
(4) The length of yarn knots shall be controlled in the ranges specified in the table below.
<table>
<tr><td>Number of yarns</td><td>Knot length</td></tr>
<tr><td>Fine yarns</td><td>Below 3 mm</td></tr>
<tr><td>Coarse yarns</td><td>Below 5 mm</td></tr>
</table>
(5) If there are knots in warps, broken ends may occur at knots. Moreover, end yarns at knots may contact adjacent warps and broken ends are caused and shedding motions are disturbed, consequently affecting greatly the operation of the loom. So, knot lengths that "shortest knots can not be untwined" are the best. In this sense, it is recommended to use knot-less yarns with no need knotting for warps.
Use of rayon (dull rayon, semi-dull rayon) for warps can cause early wear on reeds, heddles, drop wire. So sufficient attention shall be paid to this.</td></tr>
</table>

2. Warp preparation

2-1Key points of warp preparation

Warps should be of less broken end and clear shedding.

Key points of warp preparation：

Item	Key points
Filament preparation	Reduce bad sheddings as less as possible, which are caused by hairiness, torque and uneven tension. During preparation of warps, the suitable warping and sizing device should be used.
Staple preparation	（1） It is important to inverse-cohere hairiness for clear shedding. 〖The yarns, whose hairiness is less than 10mm, should be used and the hairiness should be inverse-cohered enough in sizing process. 〗 （2） The yarn should be of suitable strength, elongation and flexibility to sustain the high speed shedding. The yarns should be smooth also for better shedding. For this reason, the above-mentioned should be considered during preparation of sizing mixture and sizing amount. （3） During warping and sizing, the warp tension and sizing amount should be kept evenly. （4） Before sizing process, flyings and waste ends should be removed. （5） During warping, the broken ends should be repaired to avoid the shortage of warps. （6）The sizing press device of middle pressure with multiply sizing slots and wet leasing per-drying device, which can inverse-cohere hairness efficiently, are suggested for sizing machine.

2-2 Notes for sizing preparation

1）Bad leasing

Bad leasing maybe cause hairiness that will leads to broken ends and defects in fabric, e.g. warp streak, tightening warps and loosing warps.

Additionally, bad leasing maybe happened in all following processes after warping. The main reason is the mis-manipulation that should be paid more attention to.

2）Residual yarn

Bad warp preparation maybe cause bad leasing and residual yarn that maybe lead to troubles in

weaving, which should be paid more attention to.

3）Yarn quality for sizing

The yarn for sizing process should be soft and slick.

If the yarn for sizing is very hard or rough then the shedding of the air jet loom is not clean.

In addition , the yarn may make heald wires and sub-nozzle and reed worn out quickly.

3. Weft preparation

3-1Key points of weft preparation

The quality of wefts and cheeses can affect the stability of wefts insertion.

The following notes should be paid attention to during weft preparation：

Item	Key points
Filament preparation	Cheese especial for air-jet loom supplied by mills should be used.
Staple preparation	1） Cheese should be cone cheese with tail-end. 2） The high grade cheese with little fluctuation in under winding resistance should be used. The shape of cheese (taper, traverse length and winding amount) is determined by the inserting speed and weft count. Additionaly, overlap winding cheese and backwinding cheese maybe lead to bad winding and broken end, so that the shape of cheese should be paid more attention to. 3） The underwinding resistance fluctuation of cheese with short traverse length is small, which ensures the smooth weft inserting. (The cheese with long traverse distance should not be used.) 4） During high speed insertion, the cheese with large tension fluctuation should not be used. 5） Pay attention to that whether the flyings or waste end is taken into cheese. 6） Should avoid to oil or cere yarn, otherwise, there will be short weft as any oil or cere will make the yarn flying difficlut. Meanwhile, the oil and cere can pollute the yarn guiders and main nozzles. 7） If twisted yarns are used, they should be shaped sufficiently. And their kr value should be less than 2.

3-2 Selection of winding machine (for staple)

1） Cone winding machine can be divided into two types, direct spindle driving type and friction driving drum type. The friction driving drum type is better for staples. The traverse drum type can be divided into two, quick-traverse yarn guider with split (QT) and traverse fluted drum (rotating traverse drum / RT). In most cases, the PT type is used.

2） The winding machine with flying removing blower should be used.

3） The winding machine with anti-ribboning device should be used.

4. Selvage yarn

The selvage yarn is very important for weaving the beautiful selvage and so solid selvage that can endure the following processes.

4-1 Selection of planetary yarn

The nature of planetary yarn normal is same as the warp yarn and fineness is lower than the 1/2 of the ground warp yarn's fineness.if planetary yarn and ground warp yarn are different nature ,there is defect mark such as uneven dying, selvage too tight and thick on the fabric.if planetary yarn is synthetic fibre, stretchyarn or monofilament is suitable.the yran twisting between power side and feeding side is retrorse, so if it need use the spun yarn,there is different type yarn on the power side and feeding side.normally one-ply yarn for feeding side and double-ply yarn for power side. Besides, the one-ply yarn is the long stapled yarn is better.

4-2 cloth and commendatory planetary yarn

Cloth	commendatory planetary yarn		
	Filament	Staple	
		Supply yarn side	Power side
Staple 、cotton cloth、gingham、jean	Polyester elastic yarn 50d、75d	40S/1	80S/2
2/2twill 30S/2)、dress material（20S/1）	Polyester elastic yarn 50d、75d	60S/1	120S/2
Woolen over coating satin weave （265piece）	Polyester elastic yarn 50d、75d	60S/1	120S/2
Down quilt（satin weave、platin）	Polyester elastic yarn 30d、50d	60S/1	120S/2
208 piece clear muslin	Polyester elastic yarn 30d、50d	60S/1	100S/2
180 piece poplin	Polyester elastic yarn 30d、50d	60S/1	100S/2
165 piece poplin、150 piece poplin	Polyester elastic yarn 75d	60S/1	100S/2
Fine cloth	Polyester elastic yarn 75d	60S/1	100S/2
Acetate fiber	Mixed silk（Polyester/acetate）55 (PE30d/AC25d)		
Cuprammonium fiber	Cuprammonium 50d gum yarn		
rayon filament fiber	Cuprammonium fiber or rayon filament yarn 50d		
Nylon	Nylon 30d single yarn		
Polyester	Polyester elastic yarn 50d、75d		
Glass fiber（PCB base cloth）	Glass fiber ECD450 1/0、ECD900 1/2、ECD900 1/0、ECD1800 1/2		

4-3 Length of yarn of bobbin

yarn	Diameter	length
Elastic yarn （50d）	Φ45 ㎜	Some 5000m
Elastic yarn （75d）		Some 3000m
Cotton yarn（80S/2）		Some 1900m
Cotton yarn（120S/2）		Some 3000m
Glass fiber（D225 1/0）		Some 2500 m

Note ）Dimension of bobbin

Diameter flange of bobbin：Ø50 ㎜

Diameter of pipe：Ø19 ㎜

Width of pipe：30 ㎜

4-4 Leno

It is better to select cotton warps(120Tex)to weave selvage.

In this case ,you should use more stronger yarn.

5. Catch cord

5-1 catch cord (yarn for waste weft removal) is special products of air jet loom ,there are two factor below:

1).the weft length is based on the side of feeding stand, it will show on the opposite side (power side) measurement error of weft length and weft stretch .the redundant weft yarn is caught by it and cut from fabric by the scissors ,then is sent outside of loom.

2). adding the pressure to the weft by the catch cord can make the selvage and around fabric more tight and perfect, preventing relaxed selvage.

5-2 catch cord

Catch cord is catching the waste weft and removing to the cask,it is waste ,so cheap double ply yarn with some strength is good choice.

1） Commendatory Catch cord

Staple	Cotton yarn	20～40S/2
	P/C	45S/2
Filament	P/R	30～40S/2
	Mixed yarn	20S/2
Glass fiber	P/R	30～40S/2
	Mixed yarn	20S/2
	Glass fiber	ECG75 1/0

2）Number of Catch cord

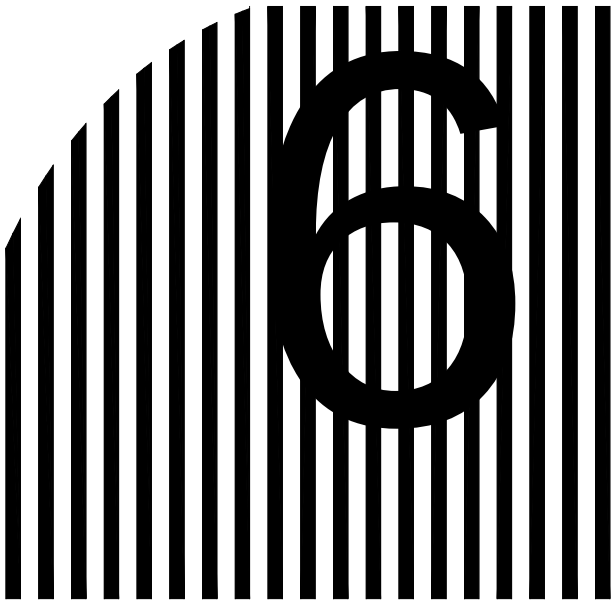
Staple	4～6 pieces/set
Filament	6～8 pieces/set
Glass fiber	6～8 pieces/set

6. Other things

The above items are the main devices that should be prepared by clients and the followings are the things that should be prepared before move-in of loom.

No.	Name	Application	Quantity	Remarks
（1）	Tube	For wefts	2-8 piece/set	Please prepare the suitable tube for cone cheese and weft pirn.
		For yarn with processed end	4-8piece/set	
（2）	Lubricant			Refer to Maintenance of Loom in Instruction
（3）	Oil tank	For oil bath For manual oiling	1piece/100set 1piece/25set	5 liters
（4）	Butter pump		1piece/50set	Supply butter for concentrated oiler
（5）	Looming cloth	Looming		
（6）	Cutter	Cutter for Weaving Cutter for cutting	1piece/person 1piece/50set	Repair yarn during weaving. It is used during looming and doffing.
（7）	Brush	For finishing warps For supply butter with brush	1piece/50set 1piece/100set	Width of brush：about 300 ㎜ Brushing length：15～20 ㎜, horsehair is better. Paint brush
（8）	Stroboscope	For timing and adjustment	1piece/50set	
（9）	multimeter		1～2piece	
（10）	Thermohygrograph		1 piece	
（11）	Densimeter	Checking density of fabric	1～2piece	
（12）	Manometer	For adjustment of inserting		Type :0.6MPa(6Kgf/㎝ ^{2})
（13）	Tension meter	Adjustment and	1～2piece	For adjustment of timing belt

		maintenance		and belt
（14）	Installation tool	Adjustment and maintenance		
（15）	Leveling meter	Adjustment and maintenance		
（16）	lever	Leveling	2pieces	Dia：40～50 ㎜, length：2m
（17）	Bench clamp and installation support	Adjustment and maintenance	1set	
（18）	Air-jet gun	Clearing		Prepare as the needed.
（19）	Dust collector	Clearing		
（20）	Broken threads	Clearing and maintenance		
（21）	Footboard			
（22）	Footboard of winding machine			Height:about 60 cm(star device)
（23）	Oscillometer	For adjustment of weft detector	1set	
（24）	sclerometer	Checking rigidity of fabric	1piece	
（25）	Tension meter	Measure the tension of yarn.	1piece	
（26）	Photoelectric weft feeler	For Filament		Prepare as the needed for filament
（27）	Electricity removing rod	Remove state electricity of warps		
（28）	Oil pump	Adjustment and maintenance		Pump out the oil in oil bath of cam box.
（29）	Grinding disc of cutter	Maintenance		Grind blade of cutter.



Chapter6

●Move-in and trial running of loom

1 Weight and volume of loom
2 Inlet width and move-in of loom
3 Installation and trial running of loom

1. Weight and volume of loom (packing with wood)

The following weight and outline dimension of loom should be taken as reference during move-in of loom. In addition , Only one example is shown below the sheet. if you need other detailed parameters please contact us.

1-1 WILTOP loom with mail nozzle of single or double

Width（cm）	Negative cam				
	Net weight（kg）	Dimension of outer packaging（mm）			volume（m^3）
		width	Depth	Height	
190	3000	3750	1900	2030	14.502
210	3100	3960			15.274
230	3200	4400			16.971

Width（cm）	Positive cam（1600）				
	Net weight（kg）	Dimension of outer packaging（mm）			volume（m^3）
		width	Depth	Height	
190	3000	3990	1900	1750	13.267
210	3100	4190			13.932
230	3200	4690			15.395
250	3300	4830			16.060
280	3400	5130			17.057
340	3600	5730			19.052

Width（cm）	Shedding with crank				
	Net weight（kg）	Dimension of outer packaging（mm）			volume（m^3）
		width	Depth	Height	
190	2700	3650	1900	1750	12.136
210	2800	3850			12.801
230	2900	4290			14.264
250	3000	4490			14.929
280	3100	4790			15.927

Note 1) The dimension of depth is without beam flange or is Φ800 and Φ914.（with Φ1000 is 1950mm）
Note 2)about WILTOP cam loom
When the width of loom is 150～230W ,normal shedding with negative cam
When the width of loom is 250～340W,normal shedding with positive cam （1600）。
Note 3)Specifications of positive cam and negative cam in upon list are value of loom with cam.
Note 4)Weight of legs isn't in the net weight.(Weight of legs is about 130-150Kg)

1-2 WILTOP terry loom with mail nozzle of 4 or 6 dobby

Width（cm）	Dobby						
	Net weight（kg）	Dimension of outer packaging(mm)				volume（m^3）	
		Width	Depth	Height			
				Less than flange ϕ 1000	More than flange ϕ 1100	Less than flange ϕ 1000	More than flange ϕ 1100
190	3700	4300	2000	2040	2123（2020）	17.544	17.372
210	3800	4500				18.360	18.180
230	3900	4700				19.176	18.988
250	4000	4900				19.992	19.796
280	4150	5200				21.216	21.008
340	4600	5800				23.664	23.432

Note 1) The dimension of the deepth and height is without beam flange.

Note 2) In the ( ) it is the suitable dimension for container transportation purpose for the loom with beam flange dia more thanϕ1100mm.

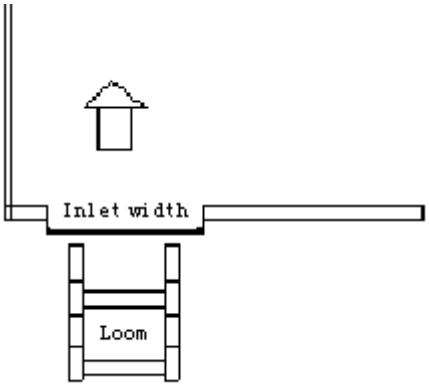
Note 3) The dimension of machine width of jacquard loom is less 350mm than dobby loom.

2. Inlet width and move-in of loom

Inlet dimension (height and width) of loom varies with specification of loom and moving method. The following instruction should be taken during move-in of loom.

2-1 Move-in of loom

Figure（A）

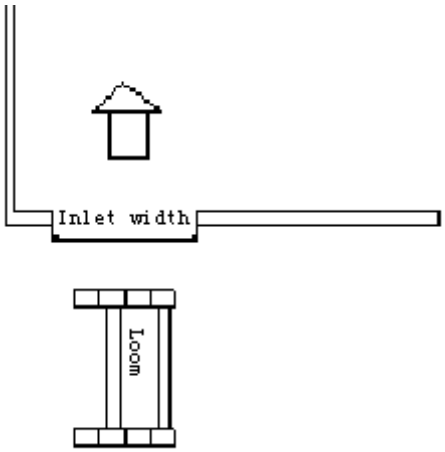


1) Method A：As shown in fig.（A）, the reed width of loom faces the inlet. If the inlet is wider, loom can be moved in by fork life truck.

Move-in width=package width （or loom width）+400～500 ㎜

2）Method B：As shown in fig.（B）, the longitudinal section of loom faces the inlet. If the width of inlet is not so wider, this method should be used.
Use hand lifting cart to move the end facing the inlet and fork life truck to move the other end. This method should be paid more attention to for it is not so stable.

Fig.（B）



Inlet width=package longitudinal depth (or loom longitudinal depth)+600 ㎜

2-2 Width of inlet

The space needed for move-in of loom is shown in following table. Enough space should be arranged for the inlet during construction.

Inlet		Needed dimension
Width	Method A（inlet：wide）	Package width（or loom width）+（400～500）
	Method B（inlet：narrow）	2500（2200）
Height		2700（2500）

Note: The numbers in brackets are the permitted minimum dimension.

2-3 Transport device and tool

The following transport device and tool should be prepared during moving and installation.

Item	Quantity	Remarks
Fork lifting device Hand lifting cart Small-size jack Level Hanging tool	1set 1~2set 2set 2pieces 4pieces	 More than 3 tons More than 3 tons Diameter:40～50 ㎜，length：2m They are used during hanging and moving in.

2-4 Notes during move-in

Lifting by fork lifting device and hand lifting cart：

1） Insert the fork in the front part of loom and support stably the front stay and back stay. The rubber pad and wood plate should be put on the contact surface between fork and loom.

2） Prevent loom from inclination and impact.

3） Pay more attention to the balance of loom.

4） Do not lift loom more than 20cm away from ground during move-in of loom.

5） A guiding person must be arranged during move-in of loom.

2-5 Move to installation position

Lay down loom at the installation position and move the loom with level to align with installation line.

3. Installation and trial running of loom

The installation and trial running of loom is done by our technician normally. If the client wants to do it by themselves, please refer to the following table.

3-1 Installation sequence

Sequence	Sequence	Remarks
1	Installation air pipe is ready	Refer to "2-3 key-points of tubing"
	Installation Electric wiring is ready	Refer to "3-5Electric devices"
	Installation groundwork and base bolt are ready	Refer to "3-3，1)Key points of basic construction,2)installation line.
2	Positioning of loom	Align with mounting line.
3	Make loom level.	Refer to "3-3，3）level base of loom, and 4）leveling sequence"
4	Put base bolt and fill in mortar	Refer to "3-3，5）Locking sequence of basic bolt
5	Install the parts of loom. （The parts is dismounted during transport）	Creel of weft storing device ,Waste selvage device and temple
6	wipe off coagulating water in the pipe	
7	Connect tube with loom.	
	Connect electric wirings with loom.	Refer to power wiring drawing and electric wiring diagram. （Please confirm the inching direction and running direction, during trial running.）
8	wipe off sundries in the auxiliary gas tank	
9	Confirm the oil level in side frame and control box.	
10	Fixing the base bolt and Install the cover after limewhite completely stiffening .	

3-2Check item during trial running

1）Confirm

（1） Confirm whether there are something unnecessary on the loom (especially on the moving parts).

（2） Rotate loom by hands and confirm whether there is abnormal sound or incorrect contact in loom.

2）Oiling

Loom has been oiled during trial running before delivery. Confirm the oil level and oil it again after installation.In addition,oil of cam box has been transfered after trial running before delivery.

(1) Check the oil level in each oil bath.

(2) Oil all the oiling position besides oil bath or cover butter on them.

Note)The method of oiling refers to 〖oiling〗 of mechanical operation instruction.

3）Checking and adjusting

Sequence	Name	Checking items
（1）	Drive	a. Whether the tension of V-belt is suitable. Please refer to mechanic operation manual. b. Whether brake works after main switch is on. Whether the voltage on both ends of braking circuit reaches to defined value. Please refer to electric operation manual.
（2）	Take-up	a. Check installation and mesh (clearance) of take-up translating gear during mechanic take-up process. b. Check the operation of hand wheel. c. Check whether the tension of timing belt is suitable.
（3）	Let-off	a. Height of tension roll of rear beam b. Let-off amount and let-off angle c. Adjustment of initial point of electronic let-off
（4）	Shedding	a. Shedding amount b. Shedding angle c. Height of heddle frame
（5）	Temple and cutter	a. Position (left and right, back and front）of temple and rotation of temple ring b. Height of temple rod c. Mesh angle of cutter and position of cutter
（6）	pressure	Setting of air pressure
（7）	Weft insertion	Confirm the height of relay nozzle and angle of nozzle
（8）	Weft storing device	a.Confirm the rotation direction of FDP b.Confirm the fixing position of catch yarn pin
（9）	Electric parts	a.Power on the main switch and check all the buttons. b.Check the action of selvage yarn ,weft detector and drop wire. c.Set all the data with the keyboard.
（10）		Confirm the stop position of loom.
（11）		Check whether there is abnormal sound during running of loom.

3-3 Power-on

Our technician will explain the power-on sequence.

You can see the detail in the instruction.

3-4 Running–in

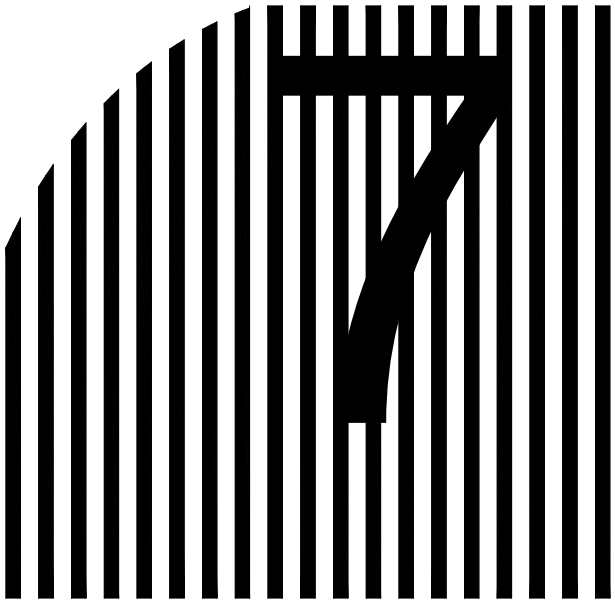
The lower speed running in initial stages is so called running-in.

The running-in makes all parts work harmoniously and is better for the service life of loom.

（1） Running–in time: 2 months

（2） Speed of loom during running-in

E.g. the running-in speed should be 550rpm, if the speed in the contract is 550, 600,650rpm.



Chapter7

●Designning example of weaving workshop

1 Designning example of weaving workshop
2 Example of compressor
3 A sheet of needed equipment
4 Setting of personnel
5 Power device
6 Necessary equipment

1. Designning example of weaving workshop（loom 100 set）

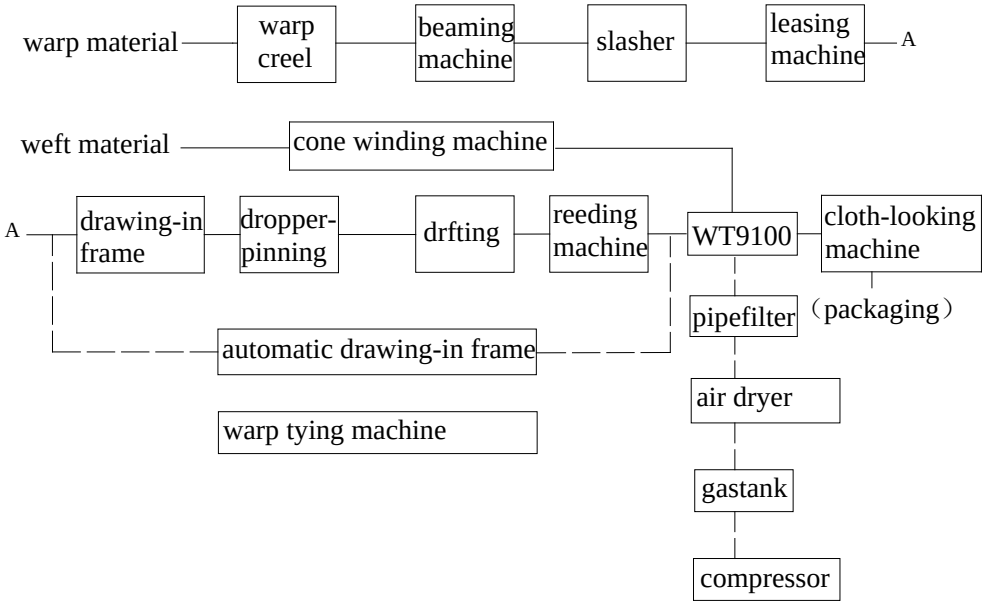
1-1 working procedure

1）cloth：polyester cotton poplin

P/C45S/1×P/C45S/1 ×66inch
110ends/inch×76ends/inch

Loom WT9100, width 190cm 100 sets
shedding with cam

【process】

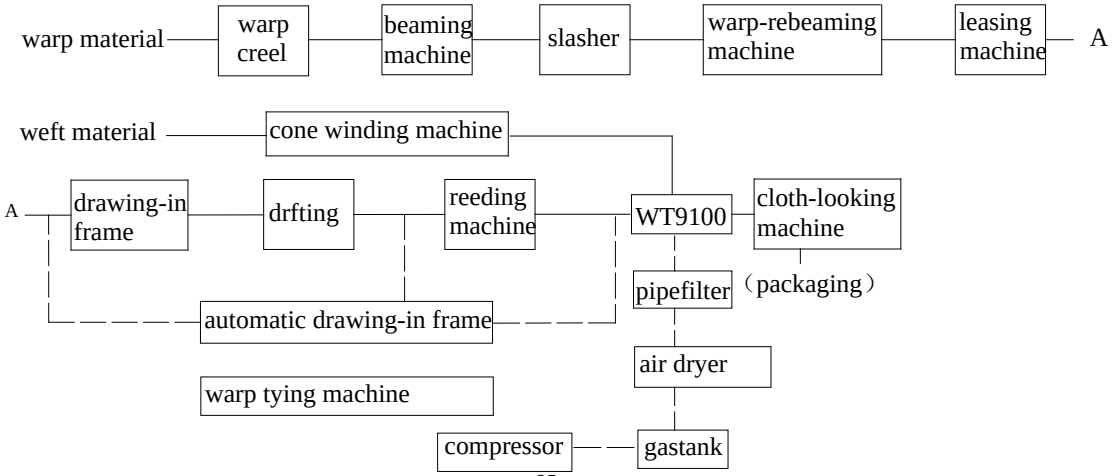


2）cloth：cellulose acetate taffeta

AC84dtex×AC84dtex ×67inch
102piece/inch×83piece/inch

Loom WT9100, width 190cm 100 sets
shedding with cam

【process】



1-2.weaving efficiency

Item	calculational expressions	polyester cotton poplin	cellulose acetate taffeta
Type of cloth	$\frac{warp \times weft}{warpdensity \times weftdensity} \times width$	$\frac{P/C45S/1 \times P/C45S/1}{110ends/inch \times 76ends/inch} \times 66inch$	$\frac{AC84dtex \times AC84dtex}{102ends/inch \times 83ends/inch} \times 67inch$
Model of loom		WT9100-190-cam	WT9100-190-cam
set		100 sets	100 sets
speed	rpm	650	650
Loom efficiency	ER (%)	94%	98%
Efficiency	ET (%)	92%	96%
Cloth length /every month （m/set）	$\frac{rpm \times min \times hr \times day \times 0.0254 \times ET}{\text{Weft density}}$	$\frac{650 \times 60 \times 24 \times 25 \times 0.0254 \times 0.92}{76}$ =7195 m/set	$\frac{650 \times 60 \times 24 \times 25 \times 0.0254 \times 0.96}{83}$ =6875 m/set
Winding quality of warp	$\frac{\text{Warp volume} \times \text{winding density} \times 10}{\text{denier} \times \text{warp ends/inch}}$ （assume「diameter disk-40 ㎜」）	$\frac{[(800-40)^2-178^2] \times \pi \times 0.46 \times 25.4 \times 45 \times 9000}{4 \times 10^3 \times 110 \times 5315}$ =3470m	$\frac{[(800-40)^2-178^2] \times \pi \times 0.85 \times 25.4 \times 10}{4 \times 84 \times 102}$ =10800m
Number of days of changing warp beam	$\frac{\text{Winding quality of warp} \times \text{weft density}}{rpm \times min \times hr \times 0.0254 \times ER}$	$\frac{3470 \times 76}{650 \times 60 \times 24 \times 0.0254 \times 0.94}$ =11.8day	$\frac{10800 \times 83}{650 \times 60 \times 24 \times 0.0254 \times 0.98}$ =38.5day

1-3 Assistant equipment

1） Calculating number of sets of preparative device and Cloth looking machine

	Item	calculational expressions	polyester cotton poplin	cellulose acetate taffeta
warping machine	Quality of warp	Gray width×warp density of gray	7260 ends	6834
	Quality of warp beam	warp totality of gray/Quality of spindle	7260 ends/660 spindles=11pieces	6834ends/980 spindles=6.97pieces →7pieces
	yarn speed	m/min	500m/min	350m/min
	efficiency	%	50%	50%
	Needful sets	$\frac{\text{Cloth length /every month （set）} \times (1+\text{crimp percentage}) \times \text{quality of warp beam} \times \text{loom sets}}{\text{Speed of warp} \times min \times hr \times \text{number of days} \times \text{efficiency}}$	$\frac{7195 \times (1+0.08) \times 11 \times 100}{500 \times 60 \times 24 \times 25 \times 0.5}$ =0.95→1 set	$\frac{6875 \times (1+0.09) \times 7 \times 100}{350 \times 60 \times 24 \times 25 \times 0.8}$ =0.52→1 set
sizing machine	Speed of yarn	m/min	60m/min	250m/min
	Efficiency	%	50%	78%
	Number of sizing machine	$\frac{\text{Cloth length /every month （set）} \times (1+\text{crimp percentage}) \times \text{quality of warp beam} \times \text{loom sets}}{\text{Speed of warp} \times min \times hr \times \text{number of days} \times \text{efficiency}}$	$\frac{7195 \times (1+0.08) \times 100}{60 \times 60 \times 24 \times 25 \times 0.5}$ =0.72→1 set	
		$\frac{\text{Cloth length /every month （set）} \times (1+\text{crimp percentage}) \times \text{quality of warp beam} \times \text{loom sets}}{\text{Speed of warp} \times min \times hr \times \text{number of days} \times \text{efficiency}}$		$\frac{6875 \times (1+0.09) \times 7 \times 100}{250 \times 60 \times 24 \times 25 \times 0.78}$ =0.75→1set
	Speed of	m/min		80m/min

warp-rebeaming machine	yarn			
	Efficiency	%		80%
	Number of warp-rebeaming machine	Cloth length /every month（set）×（1+crimp percentage）×quality of warp beam×loom sets / Speed of warp × min×hr×number of days × efficiency		6875×(1+0.09)×100 / 80×60×24×25×0.6 =0.43→1set
Warp beam	Needful quality every day	Cloth length /every month（set）×（1+crimp percentage）×number of loom / Winding quality of one warp beam×25days	7195 ×(1+0.08)×100 / 3470×25 =8.96pieces	6875×(1+0.09)×100 / 10800×25 =2.78 pieces
Empty Warp handing equipment	Number	Number of needing beam per day×time of working running time ×efficiency	8.96×1 / 16×0.2 =2.8sets→3sets	2.78×1 / 16×0.2 =0.87set→1set
cloth looking machine	Number	Cloth length /every month / （set）×number of loom speed（m/min）×min×hr×day×efficiency	7195×100 / 25×60×16×25×0.6 =2sets	6875×100 / 25×60×16×25×0.6 =1.91sets→2sets
twisting-in frame	Number	Total warp ends×Number of needing beam per day / speed（end/min）×min×hr×efficiency	7260×8.96 / 280×60×16×0.3 =0.81set→1set	6834×2.78 / 280×60×16×0.3 =0.24set→1set
leasing machine	Number	Total warp ends×Number of needing beam per day / speed（end/min）×min×hr×efficiency	7260×8.96 / 160×60×16×0.5 =0.85set→1set	6834×2.78 / 160×60×16×0.5 =0.25set→1set
drawing-in frame	Number	Total warp ends×Number of needing beam per day / speed（end/min）×min×hr×efficiency	7260×8.96 / 12×60×16×0.7 =8.07sets→8set	6834×2.78 / 12×60×16×0.7 =2.36sets→3sets
reeding machine	Number	Total warp ends×Number of needing beam per day / speed×reeding ends×min×hr×efficiency（speed：tooth 齿/min）	7260×8.96 / 50×2×60×16×0.5 =1.36sets→2sets	6834×2.78 / 50×2×60×16×0.5 =0.40set→1set
Automatic drawing-in frame	Number	Total warp ends×Number of needing beam per day / speed（endmin）×min×hr×efficiency	7260×8.96 / 130×60×16×0.6 =0.87set→1set	6834×2.78 / 130×60×16×0.6 =0.25set→1set

Note 1) In the sheet the running time of looms and provision machines is 24 hours per day, and the running time of other accessory equipment is 16 hours per day, and it is calculated as per 25 day per month.

Note 2) According to the need each equipment is should configure .

2. Example of air compressor

2-1 Capacity of compressor

Supposing to weave P/C poplin and cellulose acetate taffeta with WT9100（100sets）, air consumption is 20m3/h（650rpm every set）。

Capacity of compressor≥20（m^3/H）×100（sets）×1.2=2400（m^3/h）

〖please refer to chapter 2「choice of compressor device」〗

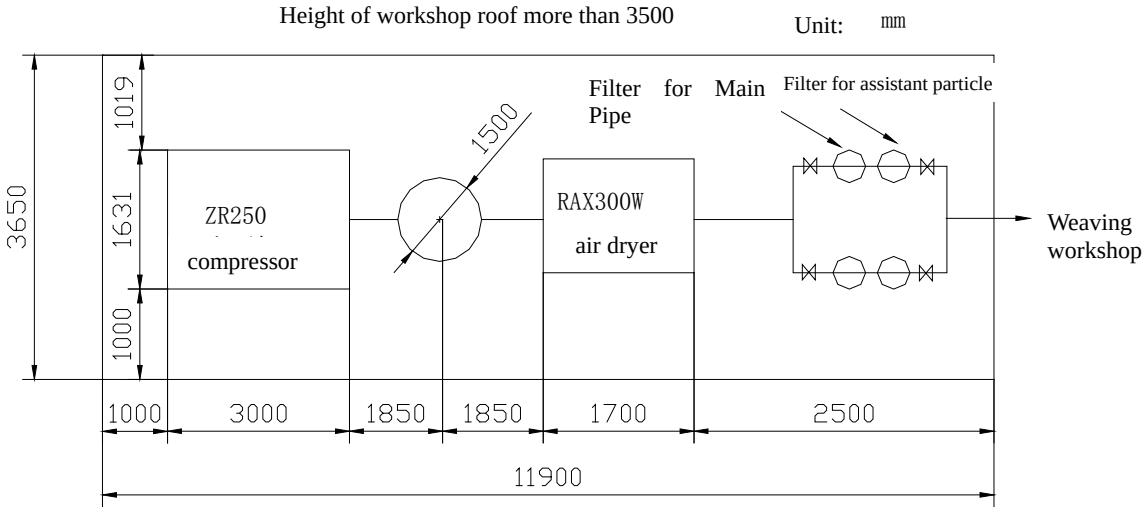
According to the above calculation, if use ATLA COPCO air expressor, adopt water cooling system, air pressure less than 7.5 bar, opt for ZR250 model.。

In addition ,The air consumption is different for the difference of loom's width,fabric and speed.please considered before it.

2-2 Example of compressor

Name	Screw compressor	Turbine compressor
compressor	Oil-free screw compressor of Atlas Copco Type ： ZR-250 Exhausting capacity：43.1 m^3/min Motor rated power：250KW	Turbine compressor of IHI Type：IHI TEA 18-250 Exhausting capacity：41.7 m^3/min Motor rated power ： 250KW
	Taiwan fusheng company Type：SA-250W/A Exhausting capacity：42.0 m^3/min Motor rated power：250KW	
air dryer	Cooling air dryer of Atlas Copco	
	Type ： FD700（W） Power consumption：6.8kw	Type ： RAX240W Power consumption ： 6.0kw
gas holder	5 m^3	10 m^3
cooling tower	60ton、Motor rated power：2.2kw	80ton 、 Motor rated power：3.7kw
cooling water pump	Motor rated power：5.5kw	
Filter for Main Pipe	CKD 1128-64C-MD（Filter precision：3μ） Managing capacity of air ： 60 m^3/min（In0.7Mpa）	
Ultra-micro Particle Filter	CKD 1154-32C-MD（Filter precision：3μ） Managing capacity of air ： 57 m^3/min（In 0.7Mpa）	

〖Example of compressor layout〗



3. Equipment table of necessary

3-1 Weaving plant of P/C poplin

№	Name of device	Factory	Model	sets	Remark
1	Air jet loom	Hangzhou Wiltop textile machinery Co., Ltd.	WT9100	100	Width 190 cm , shedding with cam
2	Warper creel	Switzerland benninger		1	
3	Beaming machine	Switzerland benninger		1	
4	slasher	Germany zuk	S432	1	
5	Warp tying machine	Japan tengtang		1	
6	Leasing machine	Japan tengtang		1	
7	Reeding machine	Handan textile plant		4	
8	Automatic drawing-in frame	Staubli		1	
9	Warp handing equipment	Xi'an xinfang industry device company			
10	Empty Warp handing equipment	Xi'an xinfang industry device company		2	
11	plaiter	Xi'an xinfang industry device company		2	
12	Cloth looking machine	Handan textile plant		1	
13	compressor	Atlas Copco	ZR250	2	Oil-free screw Type
14	Drying in frozen machine	Atlas Copco	FD50	1	
15	Gas tank	Xiangfan jieli chemical plant		2	$5m^3$
16	Cooling device	Changzhou south galss-steel	DBNL 3	2	spare 1 set
17	boiler	changsha boiler factory		1	
18	air-condition	jiangsu shuangliang			60ton

Note 1) The upper supplied machines are only for customers' reference.

Note 2) Using of handan reeding machine，it can reeding drafting and dropping at the same device.
Note 3) It doesn't need leasing machine if the twisting-in frame with leasing founction.

3-2 Weaving plant of cellulose acetate taffeta

№	Name of device	Factory	Model	sets	Remark
1	Air jet loom	Hangzhou Wiltop textile machinery Co., Ltd.	WT9100	100	Width 190 cm , shedding with cam
2	Warper creel	Switzerland benninger		1	
3	Beaming machine	Switzerland benninger		1	
4	slasher	Germany zuk	S432	1	
5	Warp- rebeaming machine	Tsudakoma		1	
6	Winding machine	Xi;an		1	With Star selvage
7	Warp tying machine	Staubli		1	
8	Leasing machine	Japan tengtang		1	
9	Reeding machine	Handan textile plant		4	
10	Automatic drawing-in frame	Staubli		1	
11	Warp handing equipment	Xi'an xinfang industry device company			
12	Empty Warp handing equipment	Xi'an xinfang industry device company		2	
13	plaiter	Xi'an xinfang industry device company		2	
14	Cloth looking machine	Handan textile plant		1	
15	compressor	Atlas Copco	ZR250	2	Oil-free screw Type
16	Drying in frozen machine	Atlas Copco	FD50	1	
17	Gas tank	Xiangfan jieli chemical plant		2	$5m^3$
18	Cooling device	Changzhou south galss-steel		2	spare 1 set
19	boiler	changsha boiler factory		1	
20	air-condition	jiangsu shuangliang			60ton

Note 1) The upper supplied machines are only for customers' reference.

Note 2) Using of handan reeding machine，it can reeding drafting and drppping at the same device.
Note 3) It doesn't need leasing machine if the twisting-in frame with leasing founction.

4. Collocation of personnel

Example of collocating personnel of A plant and B plant refer to under the list.

	A plant	B plant
Cloth	poplin	cellulose acetate
Number of loom	100 sets	100 sets
Weaver （ supplier of yarn and cloth doffer）	Woman 3×2 shift Man 3×1 shift	Woman2×2 shift Man 1×1 shift
Cone winding machine	Woman1×1 shift	（and cloth examiner）
Heddler,loomer	Woman4×1 shift	Woman2×2 shift

cloth looking	Woman2×2 shift	Woman2×2 shift
Maintenance worker、adjuster of loom	Man 1×2 shift	Man 1×1 shift
Setter of warp beam （knotting）	Man 1×2 shift Woman1×1 shift	Man 1×1 shift
Total	Man 7 • Woman16 total 23	Man 3 • Woman12 total 15

5. Power device

5-1 Weaving plant of P/C poplin

Name of equipment	sets	Capacity of power supply equipment（KVA）	
		Capacity/set	Total
WT9100 air jet loom	100	4.8	480
warping machine	1	20	20
sizing machine	1	35	35
cloth looking machine	2	1	2
air compressor	1	250	250
freezer dryer	1	9	9
cooling tower	1	2	2
cooling water pump	1	8	8
Total			806

Note 1)The total power supply should include the consumption for lighting and air-condition.in addition ,considering improvement of the power consumption is perfect before it.
Note 2)Capacity of power supply of loom is different according to the output of motor.

5-2 Weaving plant of cellulose acetate taffeta

Name of equipment	sets	Capacity of power supply equipment（KVA）	
		Capacity/set	Total
WT9100 air jet loom	100	4.8	480
warping machine	1	15	15
sizing machine	1	105	105
warp-rebeaming machine	1	35	35
cloth looking machine	2	1	2
air compressor	1	250	250
freezer dryer	1	9	9
cooling tower	1	2	2
cooling water pump	1	8	8
Total			906

Note 1)The total power supply should include the consumption for lighting and air-condition.in addition ,considering improvement of the power consumption is perfect before it.
Note 2)Capacity of power supply of loom is different according to the output of motor.

6. Preparing equipment

The below suppliers and their models of concerned machines are only for customers' reference; please check with the suppliers to get all the details of these machines.

1）leasing machine（Automatic warp leasing machine）
Manufacturer：tengtang manufacturing place

Type	Max width at work	Applicable yarn	Take-up speed	motor	Leasing ends
TC-103F，C	1905 ㎜（75 inch）	Man-made 、synthetic、Plain silk、cotton、Man-made staple	70 ～ 300 ends/minute	single-phase AC100V 40W	C model：2 ends leasing（cotton,mixed fiber spinning） F model： 3 ends leasing（Man-made,synthetic ,Plain silk）
TC-104F，C	2160 ㎜（85 inch）				
TC-105F，C	2413 ㎜（95 inch）				
TC-106F，C	2667 ㎜（105 inch）				
TC-107F，C	2794 ㎜（110 inch）				
TC-108F，C	3302 ㎜（130 inch）				
TC-300F	75～130 inch	Man-made 、synthetic、Plain silk	70 ～ 400 ends/minute	single-phase AC100V -50W	3 ends leasing
TC-300C		cotton 、mixed fiber spinning、			2 ends leasing

2） Drawing-in frame〖Applicable drawing-in（dropper、heddle、reed）〗
Manufacturer：tengtang manufacturing place

Type	separatting speed	Motor	Applicable yarn	count or yarn
R model	5000 ends/hour	single-phase AC100V-3W	Cotton 、synthetic	80S（thicker than80S）
NL-100 model	3000 ends/hour	single-phase AC100V-10W	Cotton 、synthetic、combing、filament、jute	Up to 80S or more than 33dtex

3） Reeding machine
（1）Manufacturer：tengtang manufacturing place

Type	Speed	Applicable reed	Motor	power
BE7-V	50 ～ 130 teeth/minute	20 ～ 75 teeth/minute	DC24V	single-phase AC100，110，130，200，220V

（2）Manufacturer：Staubli

Type	Applicableree d
WEA	4～40teeth/㎝

4）Reed cleaning machinery
（1）Manufacturer：Tianjin textile machinery equipment graduate school tong tuo Co

Type	Cleaning object	Cleaning capacity	Motor
GU251	Steel heddle Dropper Reed	2 pieces/every time,10pieces/every team，about 50minutes /every time	9.87kw（total）

（2）Manufacturer：japan mudi reed

Name	Type		Remark	
Automatic air jet loom Reed cleaning machine	KN-57-AJ	Model:150	Length of flume：1900 ㎜	With ultrasonic
		Model:190	Length of flume：2300 ㎜	
		Model:280	Length of flume：3200 ㎜	
		Model:330	Length of flume：3600 ㎜	
Automatic heddlecleaning machine	KN-60		Brushing （heddle of cord lever）	

7-8

5）twisting-in frame

（1）Manufacturer：Staubli

Name	Type	Knotting speed	Remark
TOPMATIC	TPM	Max 600 ends/minute	PC control
TOPMATIC PC	TPM—PC		

6）warp beam mounting card

（1）Manufacturer：Wuxi golden sun new textile corollary equipment co.,LTD

Max carrying capacity	Carrying model	Lifting power	Applicable disk
1000 kg	cantalever	hydraulic	ϕ800（ϕ1000）mm

（2）Manufacturer：Xi'an new textile instruty mining device company

Max carrying capacity	Carrying model	Lifting power	Remark
1000 kg	cantalever	hydraulic	All three-wheel

7）Hydraulic lifting plaiter（cloth roller transport trolley）

（1） Manufacturer：Xi'an new textile instruty mining device company

（2） Manufacturer：Wuxi golden sun new textile corollary equipment co.,LTD

8）warp beam Storage shelves

(1) Manufacturer：Xi'an new textile instruty device company

Type of warp beam	Storage capacity	Overall size			Layer
		Length	Width	Height	
Φ800×190	26	8100	2820	4300	4
	30	9300	2820	4300	
	40	12000	2870	4300	
	50	15000	2870	4300	
	60	18000	2870	4300	
	70	14100	3000	6490	6
	102	20300	3450	6490	
	110	22400	3450	6490	
Φ800×280	50	15000	3900	4300	4
	60	18000	3900	4300	
Φ1000×190	62	21200	3040	5200	4
Φ950×62″	50	19300	2400	4560	4

9）Cloth looking machine

Manufacturer：Handan textile machinery factory

Nantong textile machinery factory