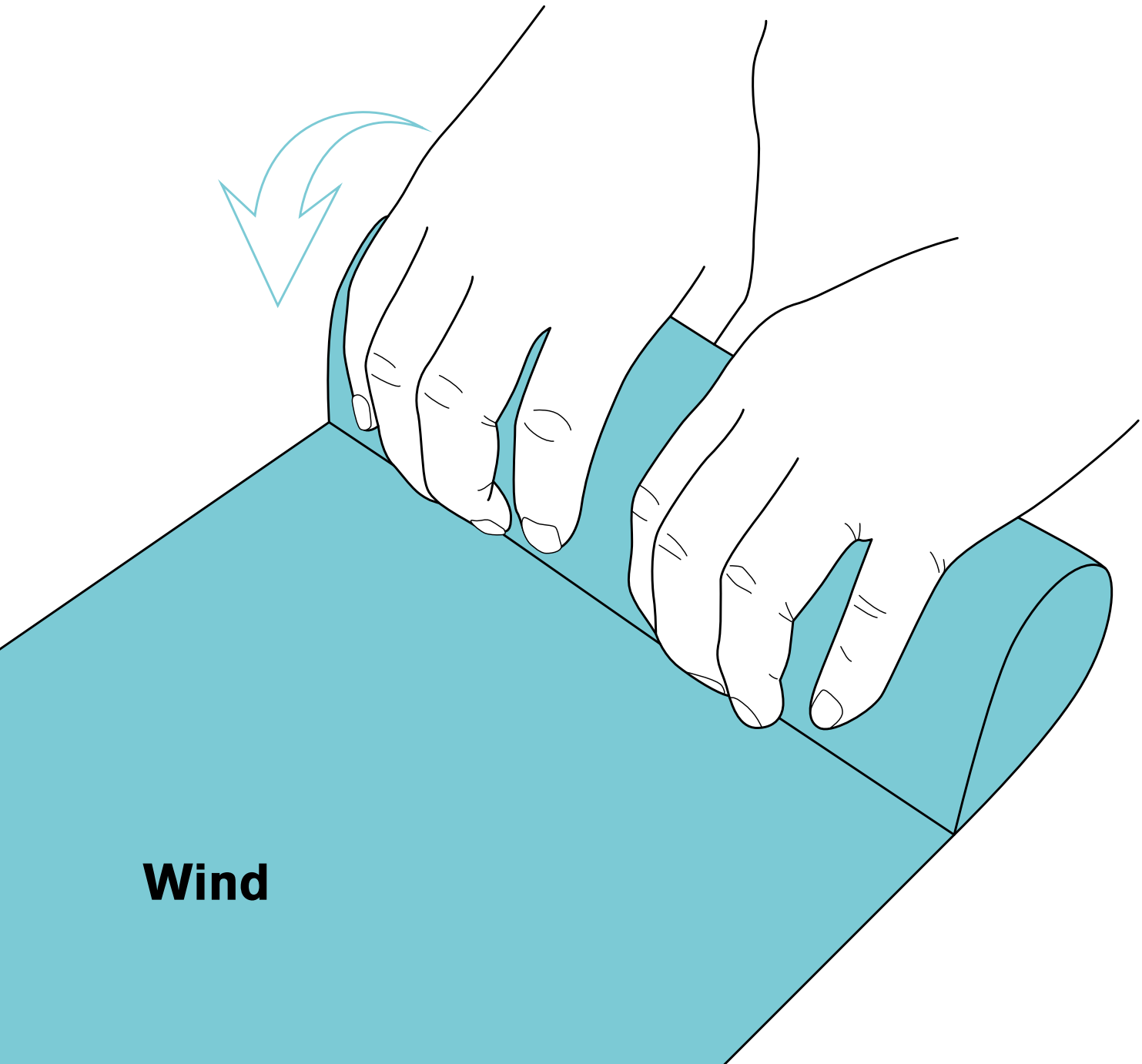
AIREX

AIR SHAFT

AIREX AIR SHAFTS

AIREX MECHANICAL SHAFTS

AIREX CORE CHUCKS



Wind

AIREX SHAFT is our product name for the air shaft used as a web winding & feeding shaft and a carrying shaft.
AIREX SHAFT was developed and commercialized in 1976. It is an air shaft that can respond to requests for winding & feedinag web, labor saving of carrying work, labor saving, rationalization, high speed, and high accuracy.
We are used in a wide range of fields such as film, paper making, paper processing, foil related, metal processing, printing industry and others.

Features of AIREX

This is an order product
We are designing and producing all orders, so we will deliver the best original products according to your wishes.

Variety is plentiful
You can choose the product according to the core material, machine to be used, use purpose etc.

High performance is demonstrated
It grips the inside of the core strongly, making it ideal for high tension, high torque, and high speed rotation applications.

Easy and accurate positioning is possible
Since the core is grasped from the inside without moving the reel in the axial direction, set it surely in the correct position.

Reduce working time
The core can be easily attached and removed, and work is completed in a few seconds.

Excellent safety
Our company has technological capabilities backed up with abundant experience and achievement in precision equipment production. We take advantage of this technical capability and design and manufacture safe products.

It is tough
High precision parts and structure lead to a long service life.

Maintenance inspection is easy
Replacement and repair of expendables can be done easily.

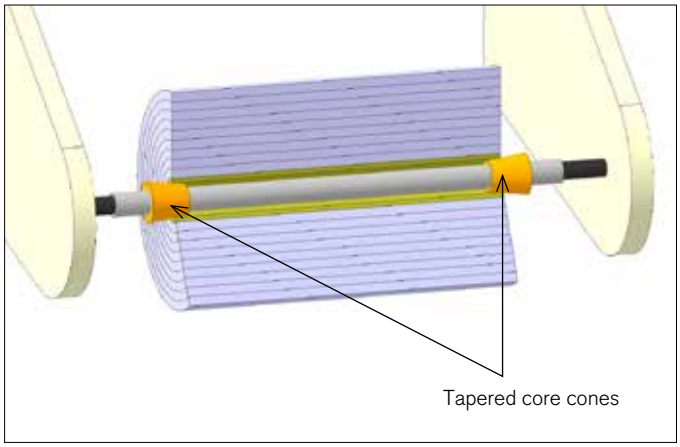
Types of AIREX

- **AIREX AIR SHAFTS**
  - **Rubber Tube Types**
    - **Air Shaft**
    - **Adaptor**
    - **Clean**
    - **Leaf**
    - **Hanger**
    - **Reel Position Adjustment**
    - **Donut Core Chuck**
    - **Roller Embedded**
    - **Slitter Shaft**
    - **Carbon Fiber**
  - **Flat Tube Type**
    - **Stripe Shaft**
- **AIREX MECHANICAL SHAFTS**
  - **Screw Type**
  - **Air-Cylinder Type**
- **AIREX CORE CHUCKS**
  - **Air Chuck**

Usage examples of AIREX

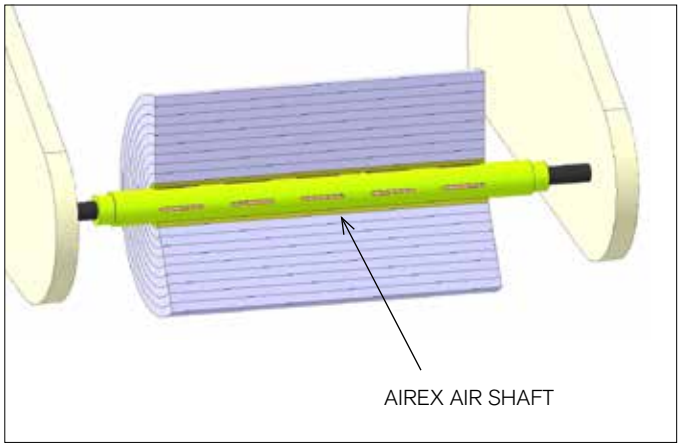
Shaft type

Tapered core cones



Tapered core cones system, takes the power and skill to tighten.
_ Damage to the cardboard end is intense
_ Dust is generated from the cardboard when slipping
_ Not suitable for repeated re-use of paper tube
_ Because the shaft diameter is small, the deflection is large and wrinkles are generated in the product

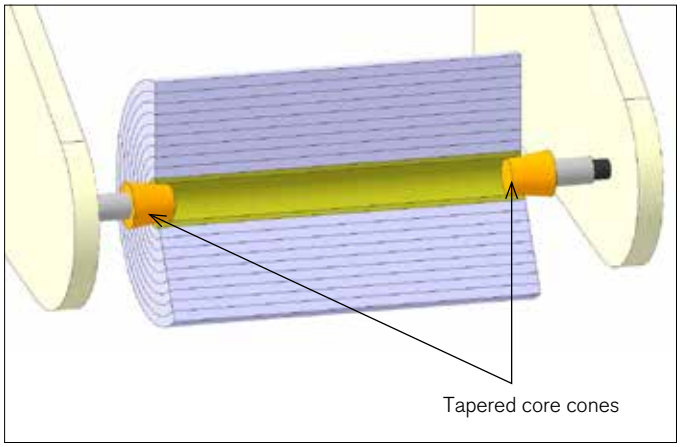
AIREX



umerous lugs protruding from the inside of the shaft clamp the core.
_ Damage to the core is small
_ No slip
_ Core reuse is possible
_ For about the same shaft diameter as the core inner diameter, a small deflection

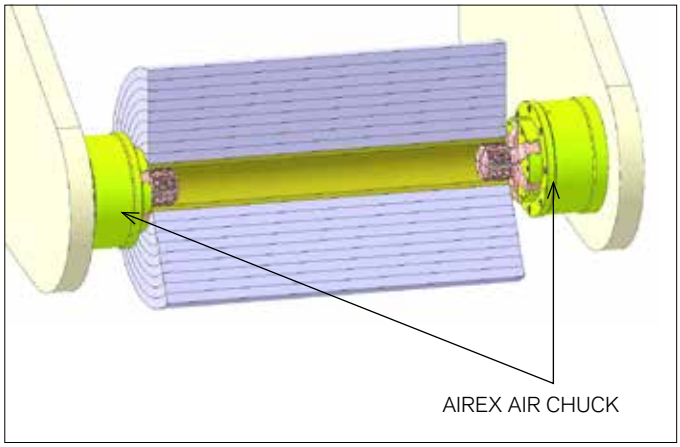
Core chuck type

Tapered core cones



In the taper cone method, a large lateral pressure must be applied to both ends of the core.
_ Damage to the core end is intense
_ Position shifted
_ Slip occurs
_ not suitable for repeated re-use of paper tube

AIREX

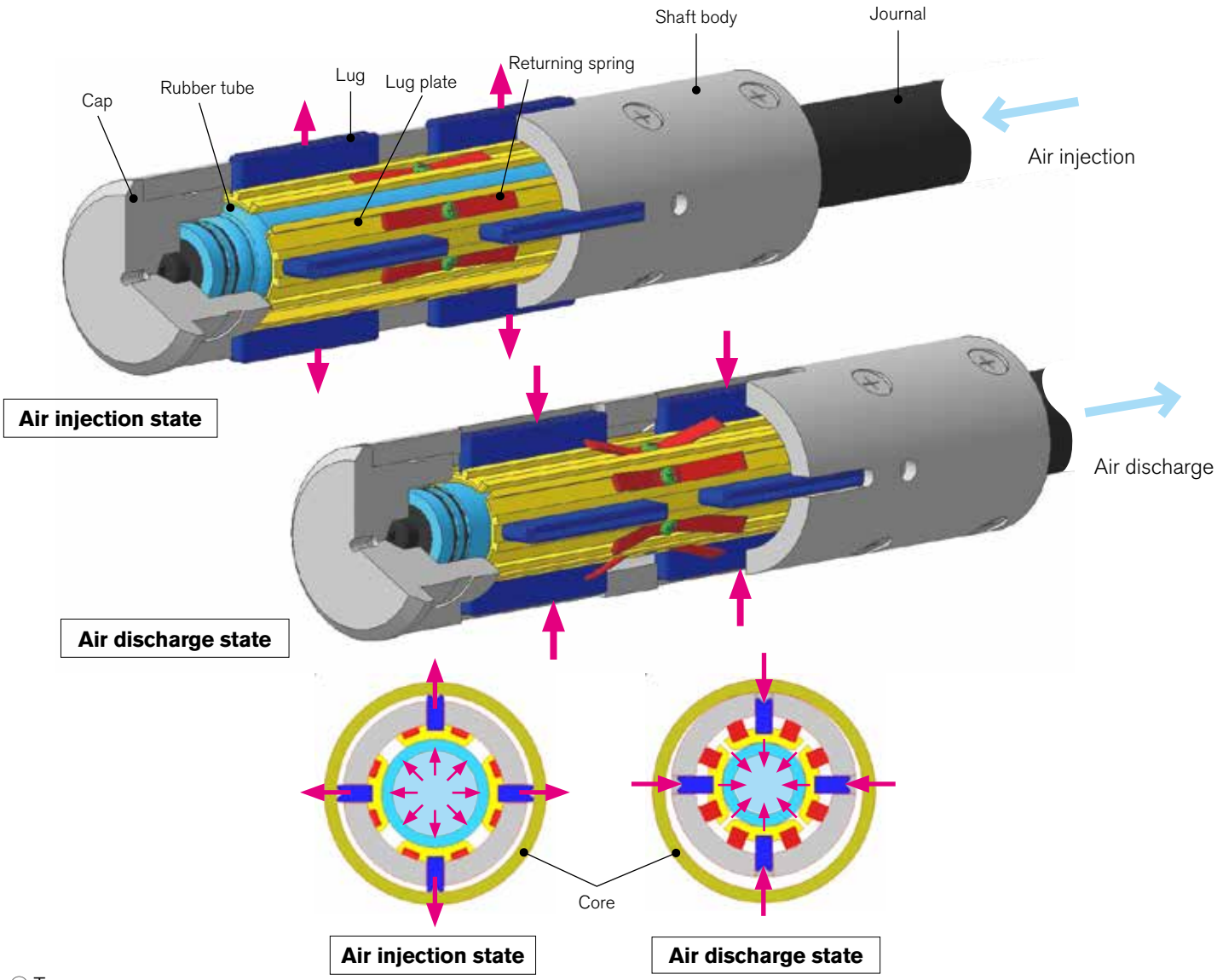


No thrust is required for clamping the core.
The lateral pressure may be small force enough to position the reel.
In addition, clamp operation from the control panel can be performed easily.

1. Structure and principle of operation

(1) Rubber tube type

It consists of journal, shaft body, lug, lug plate, rubber tube.
When air is injected, the rubber tube inside the shaft body expands.
When the expanded rubber tube pushes up the lug plate, the lug is pushed outside the shaft body and clamps the inner surface of the core.
When discharging the air, the rubber tube contracts, the lug is drawn into the shaft body by the return spring, and the core is free.



○ Type

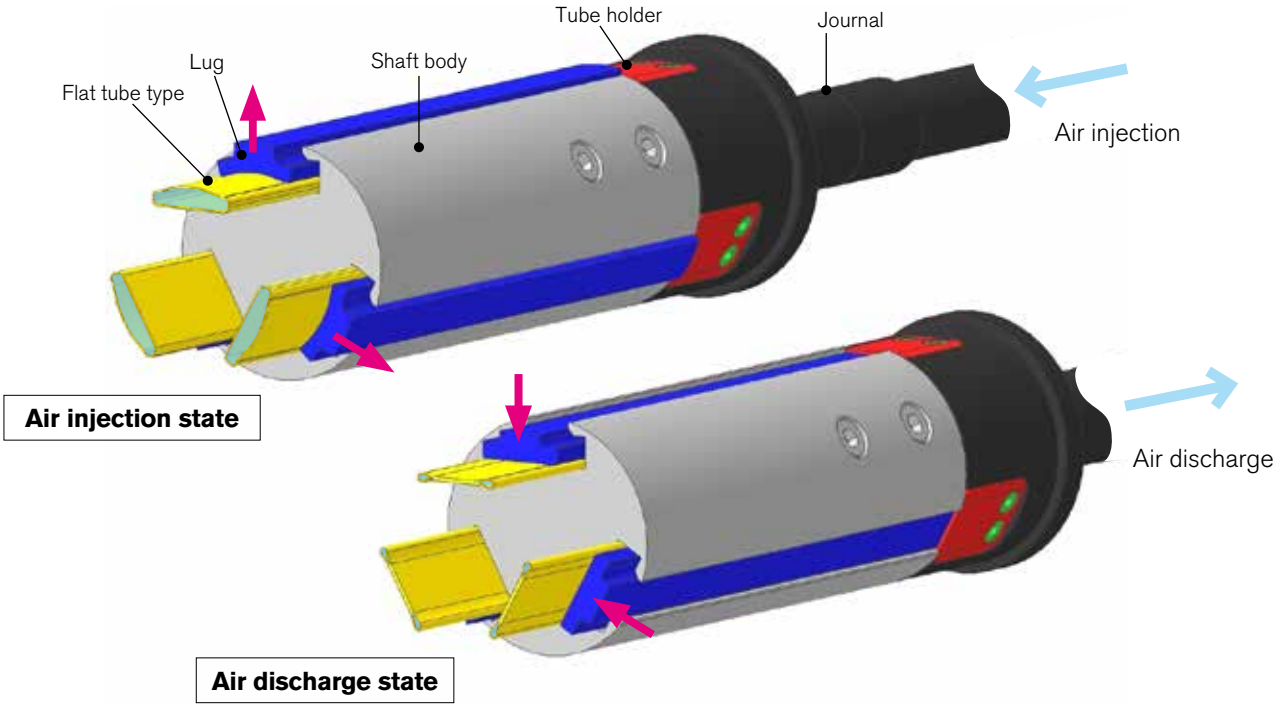
● Support typev
Both sides support type: Provide bearings on both journal
Cantilever type: Provide a bearing at one end

● Lugs arrangement
Parallel type: Wide web width
Zigzag type: Narrow web width
Leaf type: Thin core, Coreless

Parallel type　Zigzag type　Leaf type

(2) Flat tube type

It consists of shaft, shaft body, lug and flat tube.
When air is injected, the flat tube stored in the groove of the shaft body expands.
The lug extruded outside the shaft body by the expanded flat tube clamps the core.
When air is discharged, the flat tube contracts, the lug is drawn into the shaft body by the return mechanism, and the core is free.



○ Type

● Support type

Both sides support type:
Provide bearings on both journal

Cantilever type:
Provide a bearing at one end

● Lug material

	NBR(Hs70°)	Urethane (Hs90°)
Permanent strain resistance	○	◎
Abrasion resistance	○	◎
Tensile strength	○	◎
Conductivity	◎	×
Oil resistance	◎	◎
Water resistance	◎	×

2. Valve position

Circumference

Shaft end face

※ Continuous injection by rotary joint (optional) is also possible. Especially with the cantilever type, injection and discharging control is possible with the machine control panel.

AIREX AIR SHAFT Series

AIREX Air Shaft Both Sides Support Type

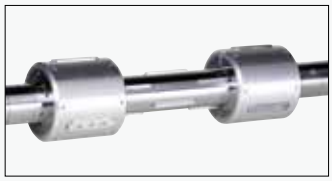
Representative of AIREX
–Trustworthy achievements over 40 years–

AIREX Air Shaft Cantilever Type

Reel set shaft of packaging machines

AIREX Adaptor

Size support for different diameter core



AIREX Air Shaft Clean Type

Air cleanliness class 1000

AIREX Air Shaft Leaf Type

For thin core and coreless winding

AIREX Air Shaft Reelposition Adjustment Type

Correction of web misalignment while driving

AIREX Air Shaft Donut Core Chuck Type

Normal axis changes to air shaft quickly

AIREX Air Shaft Roller Ball Embedded Type

Smooth insertion and removal of the reel

AIREX Air Shaft Slitter Shaft

High precision chucking
For fixing the separator plate and slitter lower blade

AIREX Air Shaft CFRP Type

Light weight, high strength, low deflection

AIREX Air Shaft Hanger Type

For hanging and transporting reel

○ Puncture repair unit
(Rubber tube unit)

(Note) When making a request,
be sure to inform AIREX No. (Carved seal).

AIREX STRIPE SHAFT Series

AIREX Stripe Shaft

AIREX's new model
Excellent maintenance
Chucking accuracy is greatly
improved compared with the past

◎ Replace expendable parts easily

Even if punk troubles happen
you can respond quickly
–Removing from the equipment
unnecessary!!
Exchange of one tube,
completed within 3 minutes–

○ Puncture repair unit
(Flat tube unit)

(Note) When making a request,
be sure to inform AIREX No. (Carved seal).

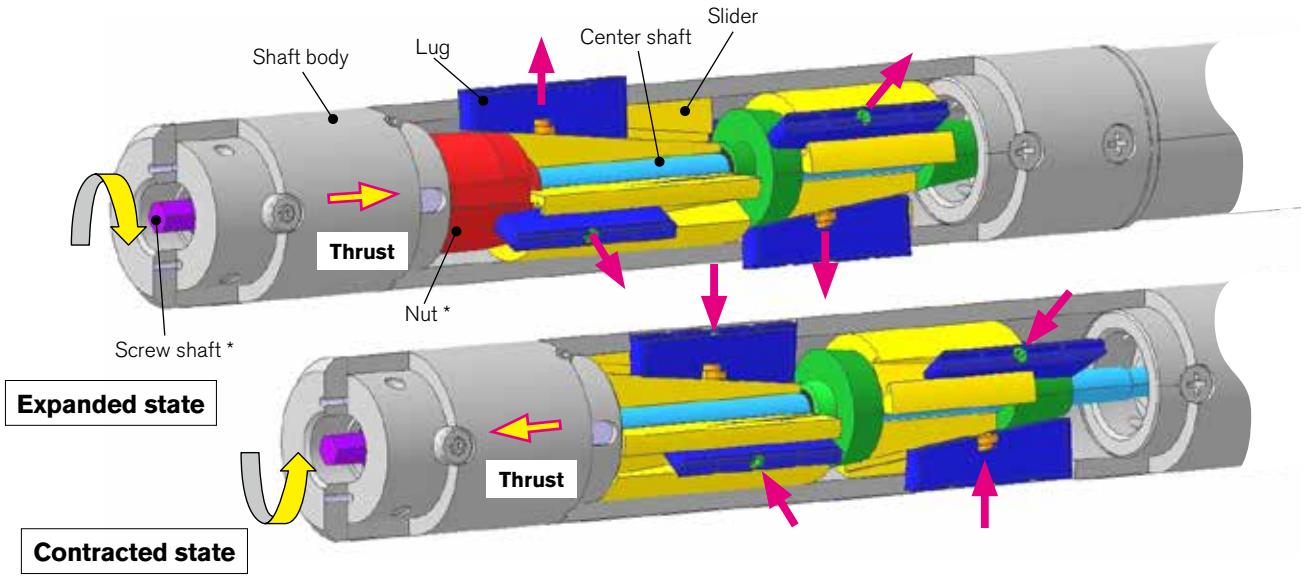
<Notes>

_ Operating temperature range 0 ° C to 50 ° C (no condensation)
_ Air pressure range used 0.4 MPa to 0.7 MPa
_ Air source
Be sure to use dry air and pass through a filter.
Water droplets and mist break the seal of the plug and cause the flat tube to degrade prematurely, causing trouble due to air leakage.
_ Please contact us when using in a special environment.

※ We design and manufacture shafts of customer's original specifications.
※ We will respond to consultation regarding lug type and special purpose.
※ Any request, please feel free to contact us.

1. Structure and principle of operation

It consists of shaft, shaft body, lug, center shaft and slider.
When thrust acts on the center shaft, the slider integrated with this will move in the direction of thrust.
As the slider moves in the thrust direction, the lug is pushed up along the tapered surface and expands to clamp the core.
When the thrust in the direction opposite to the clamp acts on the center shaft, the lug is pulled back inside the shaft body along the groove of the slider and contracts, and the core is free.
By mechanical mechanism, all the lugs protrude equally. For this reason, it is possible to perform coaxial chucking that was difficult with AIREX AIRSHAFT.



∗ This figure is "Screw type". Thrust is obtained by screw shaft and nut.
In the case of "cylinder type", the screw shaft and nut turn into an air cylinder composed of air injection port, piston and cylinder. Thrust is obtained by compressed air acting on the piston.

2. Power supply method

(1) Screw type: thrust generated by rotating torque of screw * Heavy load
(2) Cylinder type: Thrust generated by air cylinder * Light load

3. Power supply position

(1) Screw type (2) Cylinder type


Shaft end face

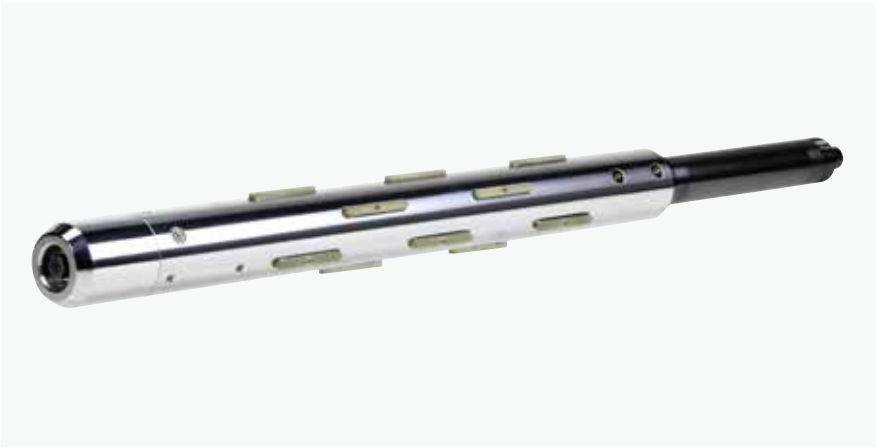

Circumferential surface


Shaft end face

AIREX MECHANICAL SHAFT Series

AIREX Mechanical Shaft Screw Type

Eliminating the trouble of center runout (for heavy load)



AIREX Mechanical Shaft Cylinder Type

Eliminating the trouble of center runout (for light load)

<Special Type>

AIREX Mechanical Shaft Screw Type For Vacuum Environment

Can be used up to ultrahigh vacuum of 10^{-6} Pa

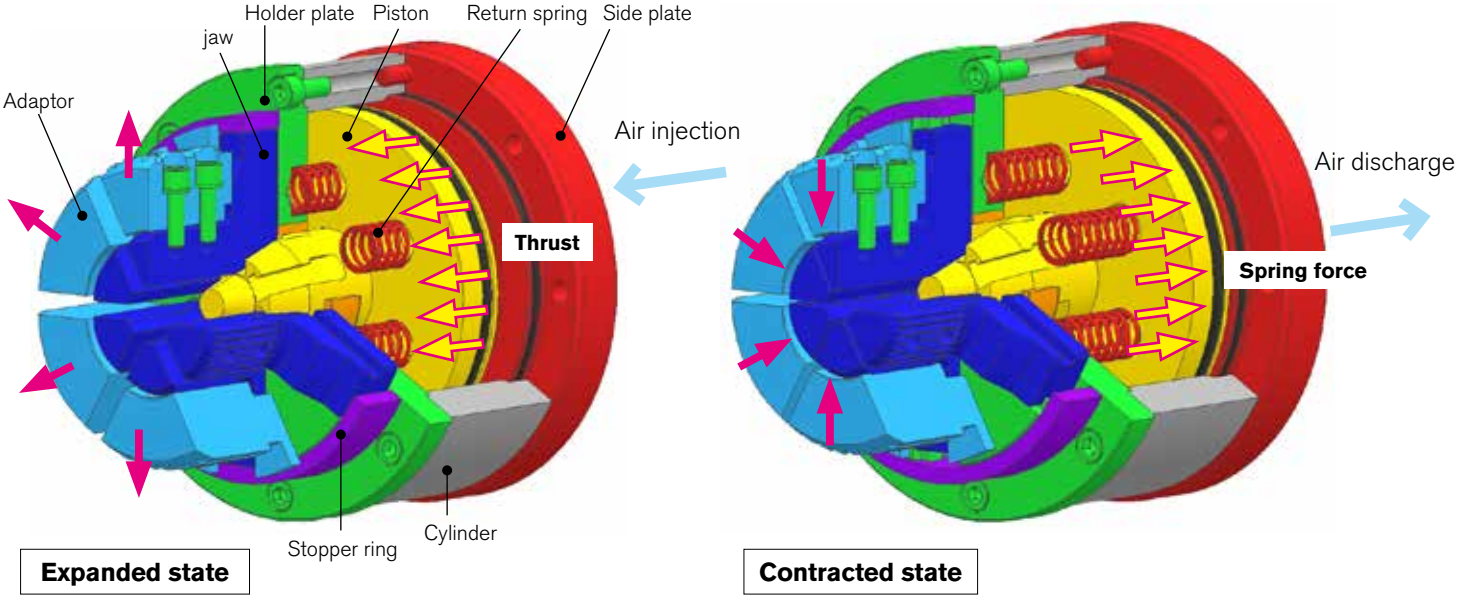
If you have any special type requirement, please feel free to contact us.

<Notes>

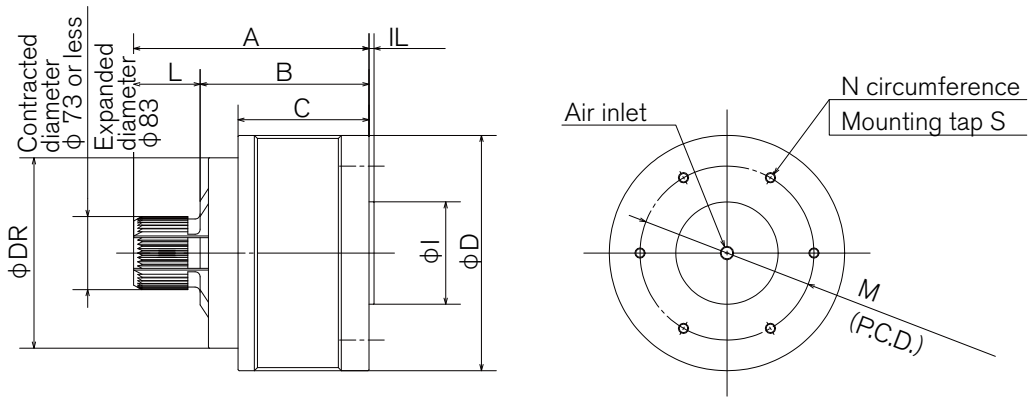
_ Operating temperature range 0 ° C to 50 ° C (no condensation)
_ Standard adaptation core inner diameter ϕ 74.5 to ϕ 80 mm
(standard shaft outer diameter ϕ 74, lug tension diameter ϕ 83)
_ Be sure to use dry air and pass through a filter.
Water droplets and mist may damage the seal portion of the plug or deteriorate it early, causing trouble due to air leakage.
_ Please contact us when using in a special environment.
_ In case of screw type, please observe the allowable torque described in the notes on the delivery specification drawing. Internal parts may be damaged.
_ Please contact us when using in a special environment.

1. Structure and principle of operation

All parts are made of high tensile strength steel.
When injecting air, the piston moves in the thrust direction.
As the piston moves in the thrust direction, the jaw is pushed up along the tapered surface and expands to clamp the core.
When discharging the air, the piston moves in the direction opposite to that at the time of clamping by the return spring. As the piston returns, the jaw contracts along its tapered groove and the core becomes free.



2. Type・Standard Dimensions



Type	Ability / per unit (0.5 MPa)		Weight (kg)	A	B	C	L	IL	ϕ I	ϕ D	ϕ DR	M	N	S
	Load (kgf)	Torque (N・m)												
For 0.25 ton	111	47	19	210	147	140	63	5	ϕ60h7	ϕ130	ϕ 146	100	4	M10×12
For 0.5 ton	265	142	25	225	162	154	63	5	ϕ80h7	ϕ160	ϕ 176	110	4	M10×20
For 1 ton	594	318	44	230	165	128	65	5	ϕ100h7	ϕ230	ϕ 186	170	6	M10×20
For 2 ton	1042	559	83	270	175	130	95	10	ϕ150h7	ϕ320	ϕ 230	230	6	M12×25

* The standard product is for core inner diameter ϕ 75. By using the adapter you can also handle large diameter.

<Notes>

_ Operating temperature range 0 ° C to 50 ° C (no condensation)
_ Air pressure 1.0 MPa or less
_ Dry air Always use, please pass through a filter.
Water droplets and mist may damage the seal and deteriorate it early, causing trouble due to air leakage.
_ Please contact us when using in a special environment.
_ Do not clamp the reel by tilting it. It may cause a return failure.

AIREX CORE CHUCK Series

AIREX Air Chuck

High power and eliminating the trouble of center runout

AIREX Adaptor

Size support for different diameter core

<Special Type>

AIREX UC Chuck

Compact shaft-less of air injection type
Easy repair even when punctured

Puncture repair unit

AIREX Mechanical Chuck

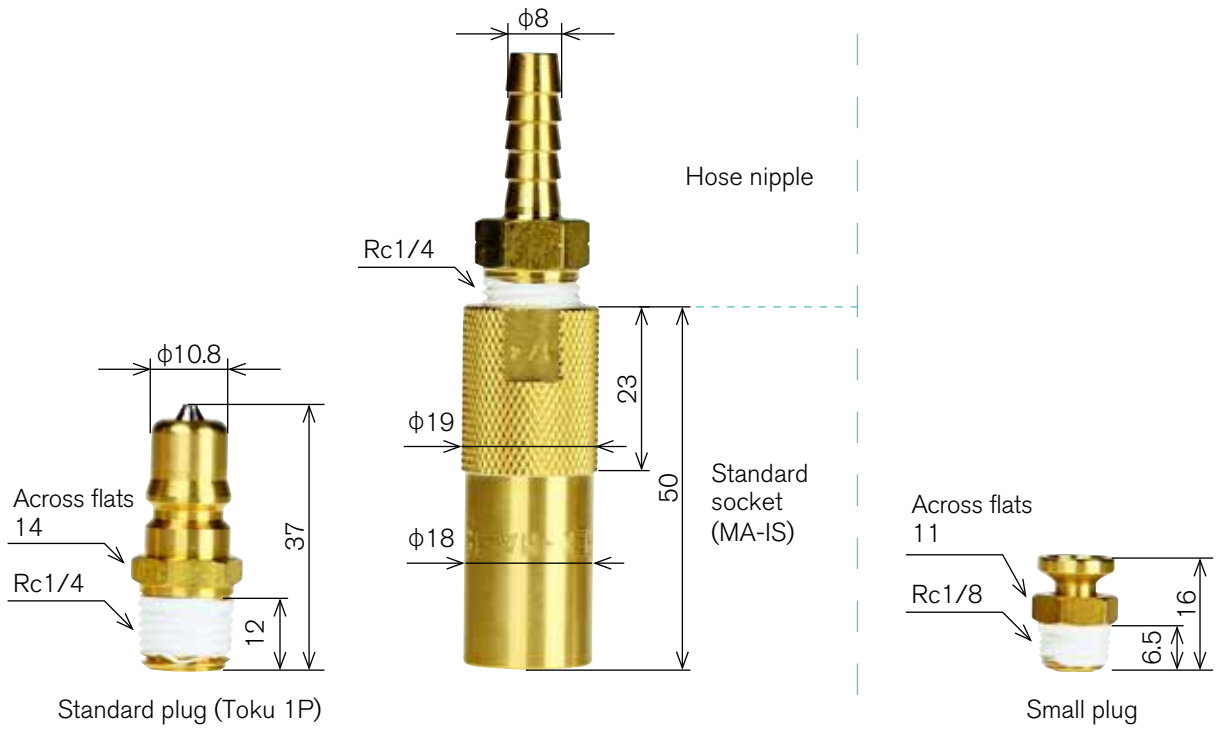
Chuck the core securely with thrust of the device

AIREX Rotary Chuck

Compact and eliminating the trouble of center runout
Using tension, high power with wedge effect

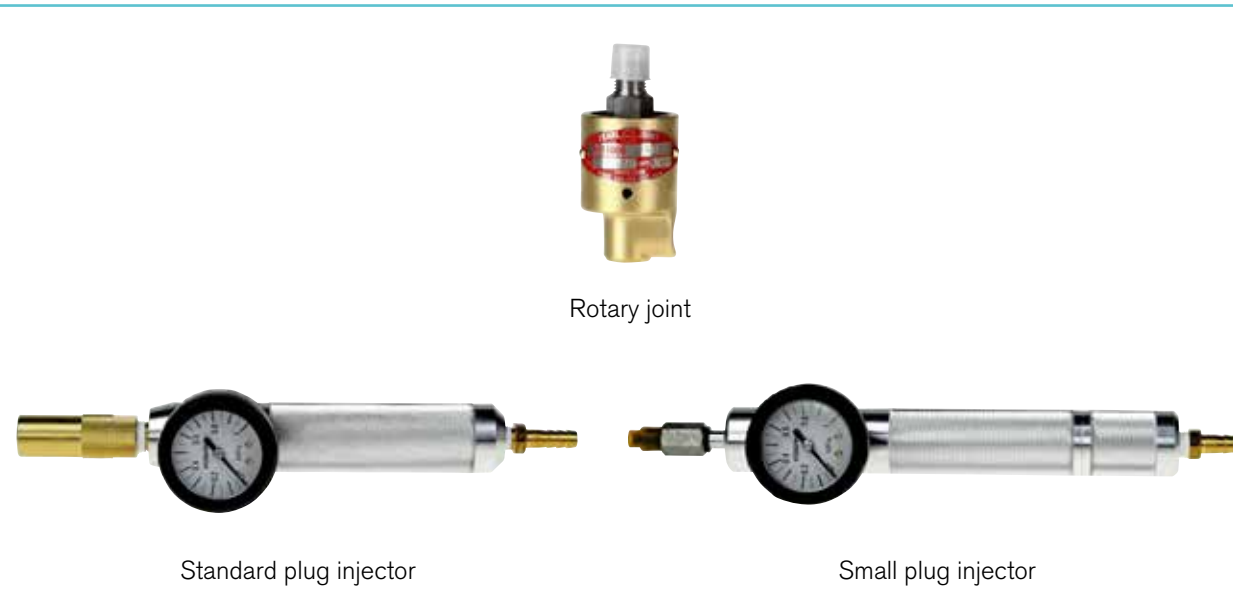
Standard accessories and optional parts

○Standard accessories



* SUS specification is also available

○ Optional parts



* Standard plug replacement socket wrench is also available.

【 Manufacturing factory of AIREX SHAFT 】

MITSUHASHI SUNBRIDGE

719-3101 610 Mitsuhashi Akano Maniwa Okayama

Home page of AIREX SHAFTS
http://www.mitsuhashi-corp.co.jp/wind/

MITSUHASHI CORPORATION

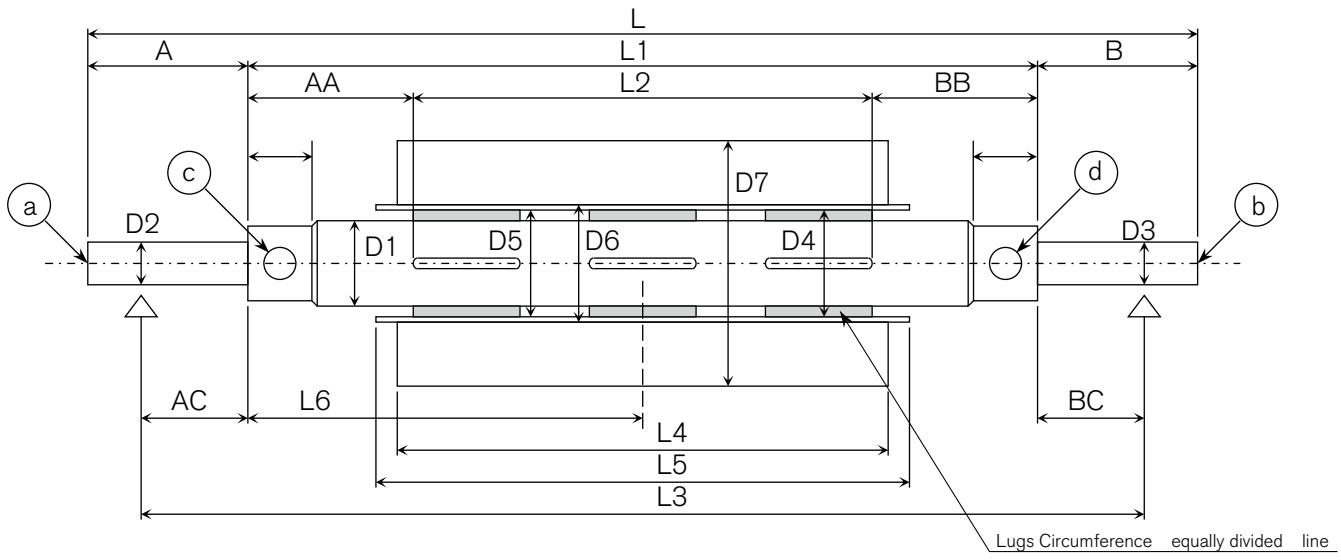
AIREX Estimated specifications

Company _____ Date _____

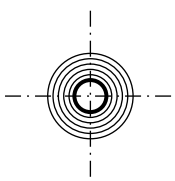
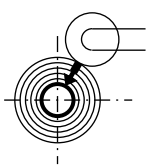
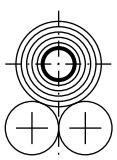
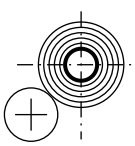
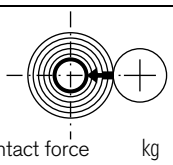
Contact person _____ Number _____ Desired delivery date _____

AIREX Type	AIREX Air shaft / Mechanical shaft / Shaft less/ ( )					
Core information	Core material	Cardboard/Steel/	Core inner diameter (D5)	ϕ ± mm	Core length(L5)	mm
	Core outside diameter(D6)	ϕ mm	Core thickness	t = mm	Core cap	No / Yes, Length mm
Reel specification	Reel material		Reel diameter (D7)	mm	Reel weight	kg
	Reel setting position	Center / Bias / Arbitrary	Reel width(L4)	(Single Core) min ～ ～max mm		
	Reference dimension(L6)	mm		Multiple Cores (Width×Number) min × 、max ×		
Shaft body	Shaft body diameter(D1)	ϕ mm	Lug expansion diameter(D4)	mm	Shaft body length(L1)	mm
	Length between lugs (L2)	mm	Lugs arrangement	Parallel / Zigzag	Lugs Number	Circum-ference equally divided line
	Total shaft length (L)	mm	Shaft body material	Steel or Aluminum alloy		
Maschine type	Sheet speed	m /min	tension	N	Bearing center(L3)	mm
	Air injection method	Encapsulation type / Continu	Valve position	a · b · c · d	Air pressure	0.4 0.5 0.6 0.7 MPa
	Support type	Both sides / Cantilever	Uses	Winding / Unwinding / Slitter winding / Lower blades fixed shaft / Other ( )		
Shaft Details	Journal length(A)	mm	Length(AA)	mm	Length(AC)	mm
	Journal length(B)	mm	Length(BB)	mm	Length(BC)	mm
	Bearing diameter(D2)	mm	Bearing diameter (D3)	mm	Scale	No / Yes *Required drawing
	Polishing	No/Yes (Journal/Shaft body/Lug)	Surface treatment	No / Yes *Required drawing	Heat treatment	No / Yes *Required drawing
Operating environmen	Temperature	～ ℃	Humidity		Dust	
	Corrosion resistance and rust resistance		Other			
Accessories	Embedded: Attachment:					

< Schematic>



<Winding method>

a) Centre winding (Unwinding)	b) Contact lay-on roller center winding	c) Double drum surface winding	d) Single drum surface winding	e) Contact lay-on roller surface winding
	 ·Contact force kg ·Direction	 ·Support method at the time of Roll removal	 ·Roll support direction ·Support method at the time of Roll removal	 ·Contact force kg ·Air-cylinder (Cylinder inner diameter mm Air pressure MPa)

MITSUHASHI CORPORATION

Lending “hands” to replace human hands.

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