San-Ei AIR WINCHES

OPERATING MANUAL

READ THIS OPERATING MANUAL CAREFULLY BEFORE USE.
HANDLE THIS OPERATING MANUAL WITH CARE SO IT CAN BE REFERENCED WHEN NEEDED.

San-Ei SEIKI SEISAKUSHO CO., LTD., JAPAN
(Machinery Manufacturing Co., Ltd.)

CAUTIONS FOR SAFETY USE

CAUTIONS described here are for you to use the product safely and to prevent injury to yourself and others.

CAUTIONS are classified as **DANGER, WARNING or CAUTION which mean :**

⚠ DANGER : WRONG HANDLING MAY LEAD TO THE IMMINENT DANGER OF SERIOUS INJURY OR DEATH OF THE USER.

⚠ WARNING : WRONG HANDLING MAY LEAD TO POSSIBLE SERIOUS INJURY OR DEATH OF THE USER OR PROPERTY DAMAGE.

⚠ CAUTION : WRONG HANDLING MAY LEAD TO INJURY OR THE OCCURRENCE OF PROPERTY DAMAGE. THE POSSIBILITY OF SERIOUS INJURY TO THE USER IS SMALL. ※

※ The items described CAUTION may lead to serious results depending on the situation. All describe important safety issues and must be observed at all times.

CONTENTS

INSTALLATION RECORD

PURCHASE FROM _____

PURCHASE DATE _____

SERIAL NO. _____ MODEL _____

PLACE OF INSTALLATION _____

INSTALLATION DATE _____

1 . CAUTIONS

1-1 CAUTION BEFORE INSTALLATION

⚠ **WARNING**

Wipe off oil contaminants completely from the winch and its place of installation. Possible injury can occur due to the winch slipping or falling.

⚠ **CAUTION**

DO NOT ride on, beat, drop or press on the winch, which may cause malfunction, breakage or air leakage.

1-2 CAUTION DURING INSTALLATION

⚠ **DANGER**

(1) Install the winch using bolts strong enough to screw it to its place of installation.

(2) Fasten the winch using all necessary bolts.

⚠ **WARNING**

(1) Installation, detachment or piping of the winch should be done by those who have proper technical knowledge.

(2) When installing the winch, make sure that the air pressure in the piping is "zero".

(3) Select the correct rope for use.

⚠ **CAUTION**

(1) Mounting holes and mounting surfaces must be cleaned. Possible breakage, air leakage, etc. can occur due to bolt tightening failure and seal breakage.

(2) Use the bolts specified to install the winch and fasten them tightly at the specified torque , or malfunction, breakage or air leakage may occur.

1-3 CAUTION DURING OPERATION

⚠ **DANGER**

(1) DO NOT use flash or poisonous any as supply source.

(2) Use air pressure at 0.6 MPa maximum.

(3) Keep body and clothing away from the drum or the rope while in opration to prevent them from being wound accidentally.

(4) When wiring job is needed, make sure that it is performed by a lincensed operator.

(5) Before operating winch, check for safety around the winch. Always be aware of the safety of surroundings during operation.

⚠ **WARNING**

(1) When something abnormal occurs such as abnormal sound, air leakage, etc., **STOP** operation of the winch and perform necessary stops to prevent breakage or injury.

(2) DO NOT use the winch in any manner other than by the specifications mentioned in our catalogue, drawing, etc..

(3) Take care when the winch is ON-Load as the lowering speed will become faster.

⚠ CAUTION

(1) When operating the winch, make sure of that air circuit is correct and the connections are not loose.

(2) Use proper lubricant, or the winch may cause malfunction or breakage.

1-4 CAUTION FOR MAINTENANCE AND STORAGE

⚠ WARNING

(1) DO NOT modify any model of the winch.

(2) Do perform a routine check-up on the winch, whenever operation starts.

⚠ CAUTION

(1) During transportation or storage of the winch, make sure of environmental conditions such as ambient temperature / humidity to prevent dust accumulation and rusting.

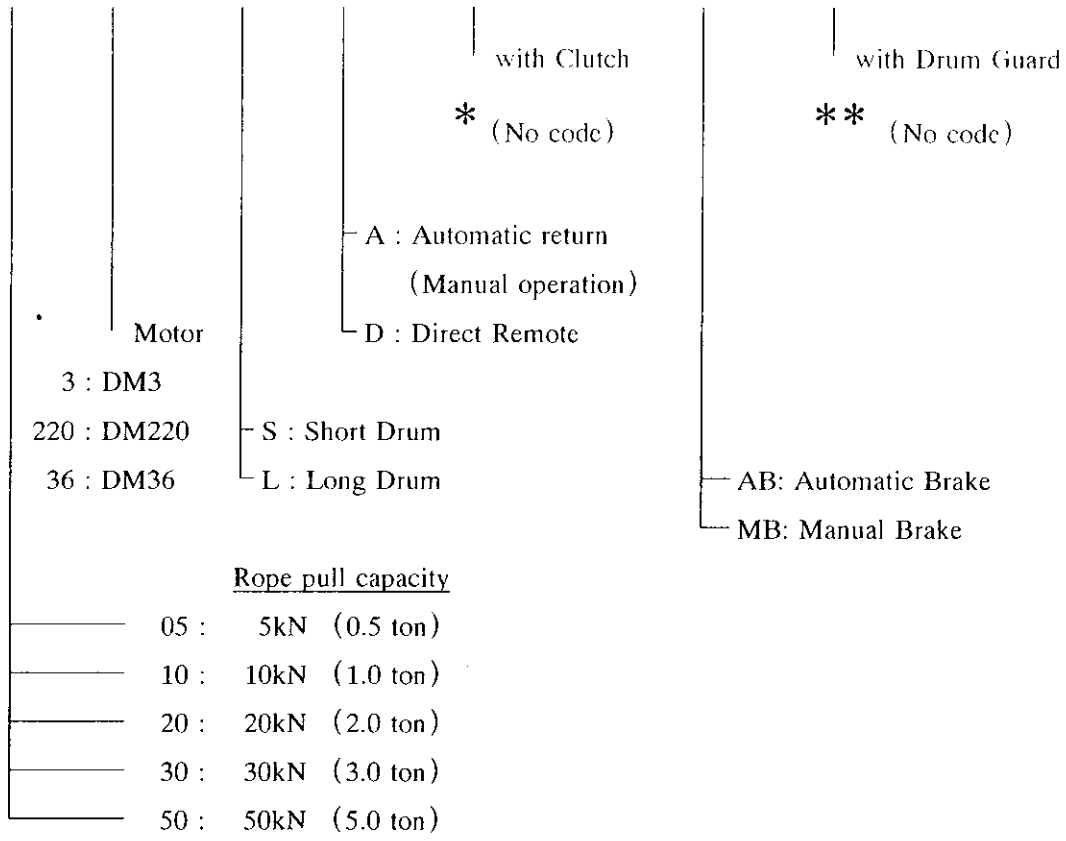
(2) When the winch is operated after a long time in storage, it may be necessary to replace seals, etc.

(3) A skilled technician is required when the winch is disassembled or assembled. Contact our staff or dealer if an overhaul is needed or abnormal motor is found.

PLEASE FEEL FREE TO CONTACT US IF THERE IS ANYTHING UNCLEAR WITH OUR AIR WINCHES.

2. MODEL No. Identification

W-10 - 220 - S A C - AB - G



[REMARKS]

* **WITHOUT Clutch**

** **WITHOUT Drum Guard**

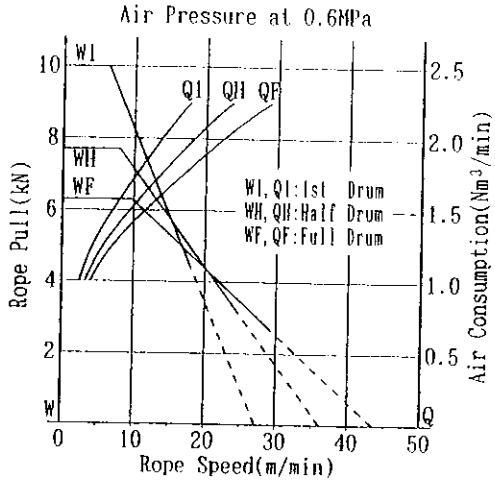
3. Specifications

Max. output figures are shown with supply Air Pressure at 0.6 MPa.

M O D E L	W-05	W-10	W-20	W-30	W-50
Motor output (kW)	1.73	7.15	7.15	12.00	12.00
Rope pull (kN)	5	10	20	30	50
Rope speed (m/min)	19	37	19	19	11
Air consumption(Nm3/min)	2.0	5.4	5.4	9.0	9.0
Drum capacity [Short drum](Ø mm. x m)	8x45	10x175 12.5x115	12.5x115	16x160	22.4x115
[Long drum] "	8x90	10x350 12.5x230	12.5x230	16x320	22.4x230
Weight, Manual Brake					
[Short drum] kg	55	257	266	470	—
[Long drum] "	60	276	287	513	—
Weight, Automatic Brake					
[Short drum] kg	59	267	276	484	780
[Long drum] "	64	288	297	527	873

※ The compressor, air tank and piping diameter must be used so that a sufficient quantity of air can be sent.

4. PERFORMANCE and DIMENSION



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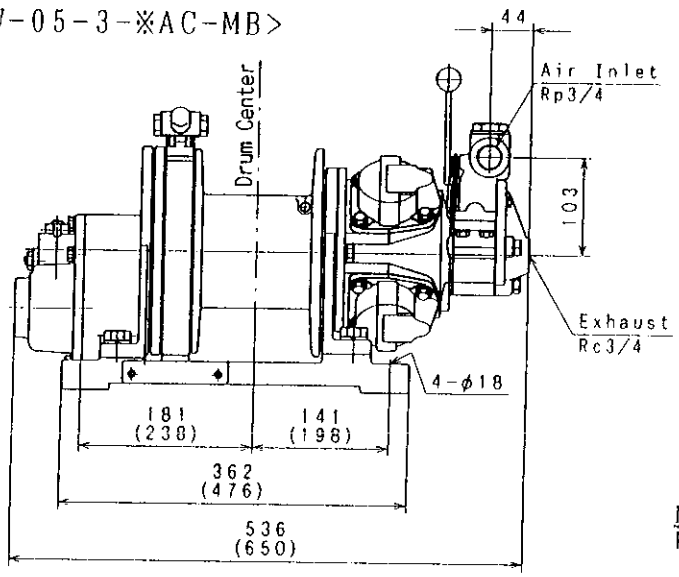

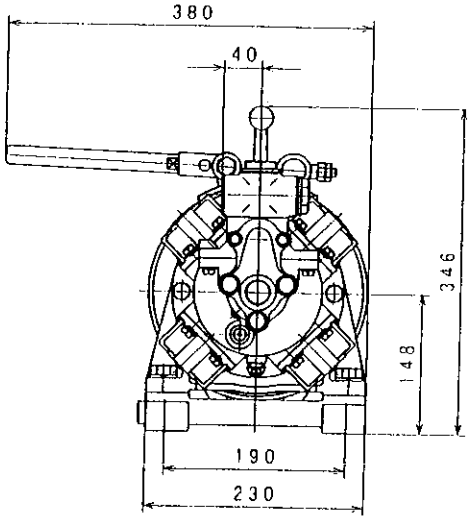

Note
Bruckets( )are Long Drum Size.

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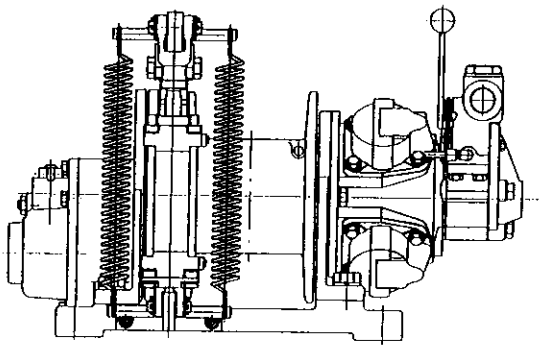

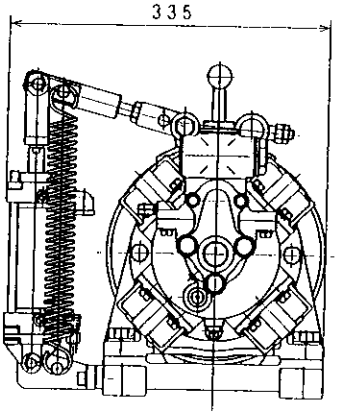

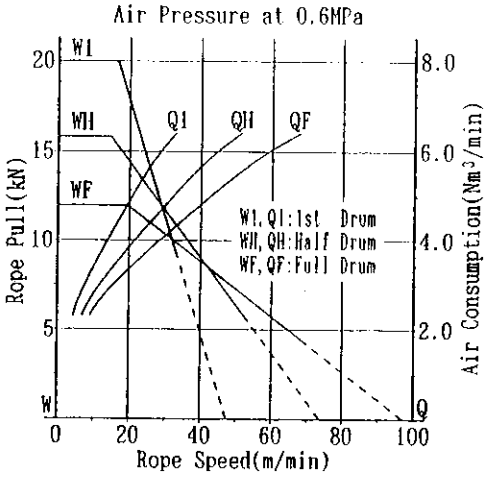

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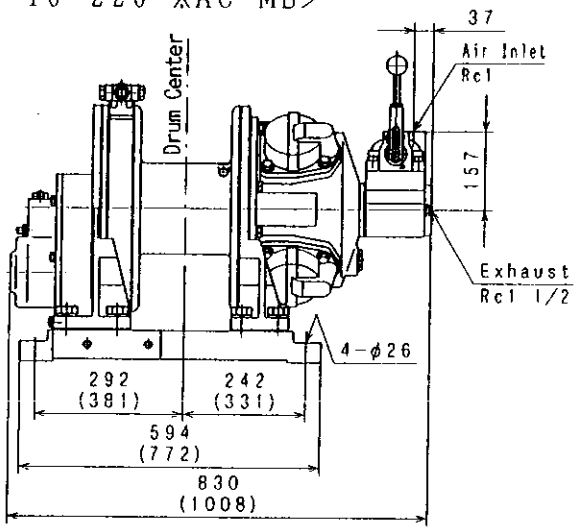

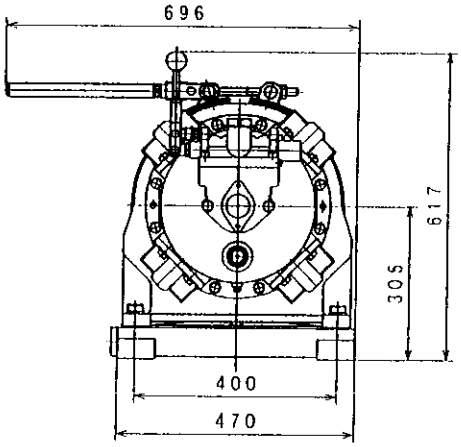

Note
Bruckets( )are Long Drum Size.

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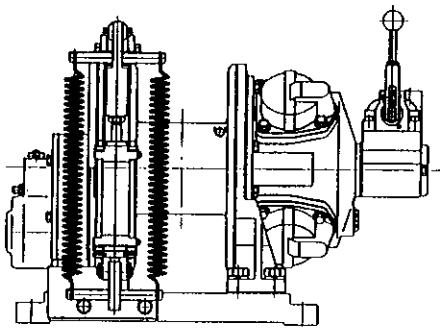

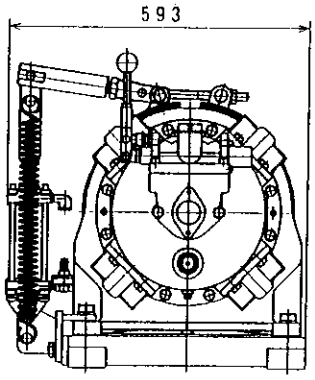

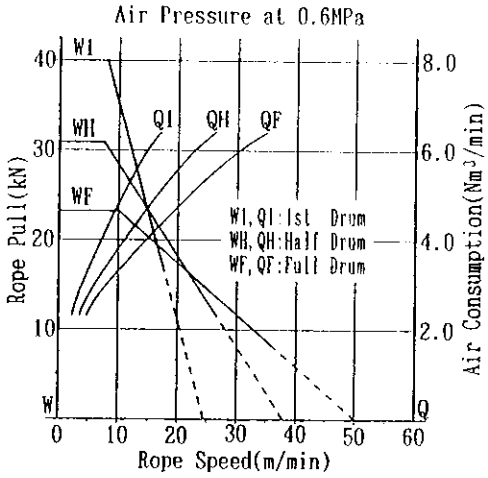

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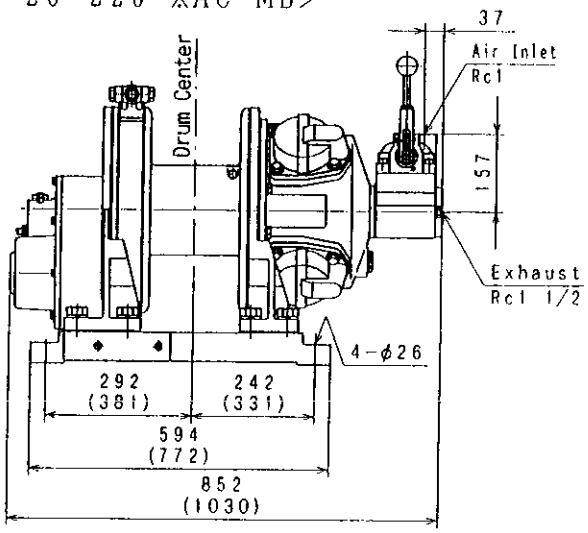

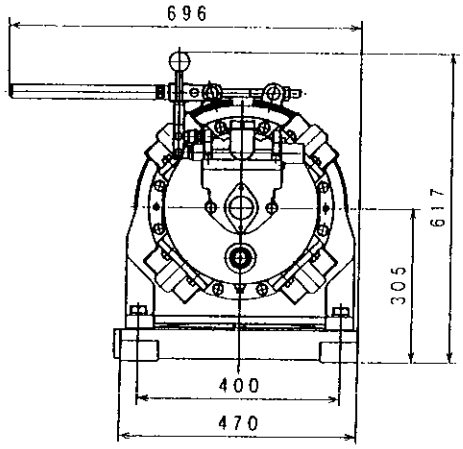

Note
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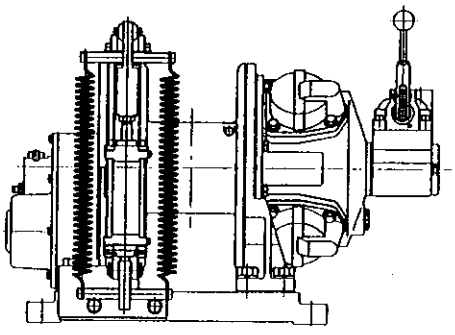

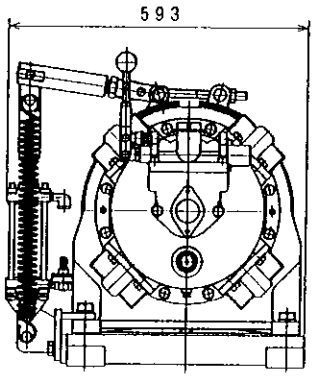

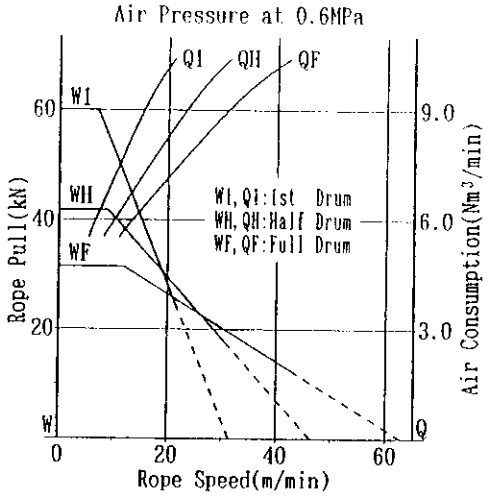

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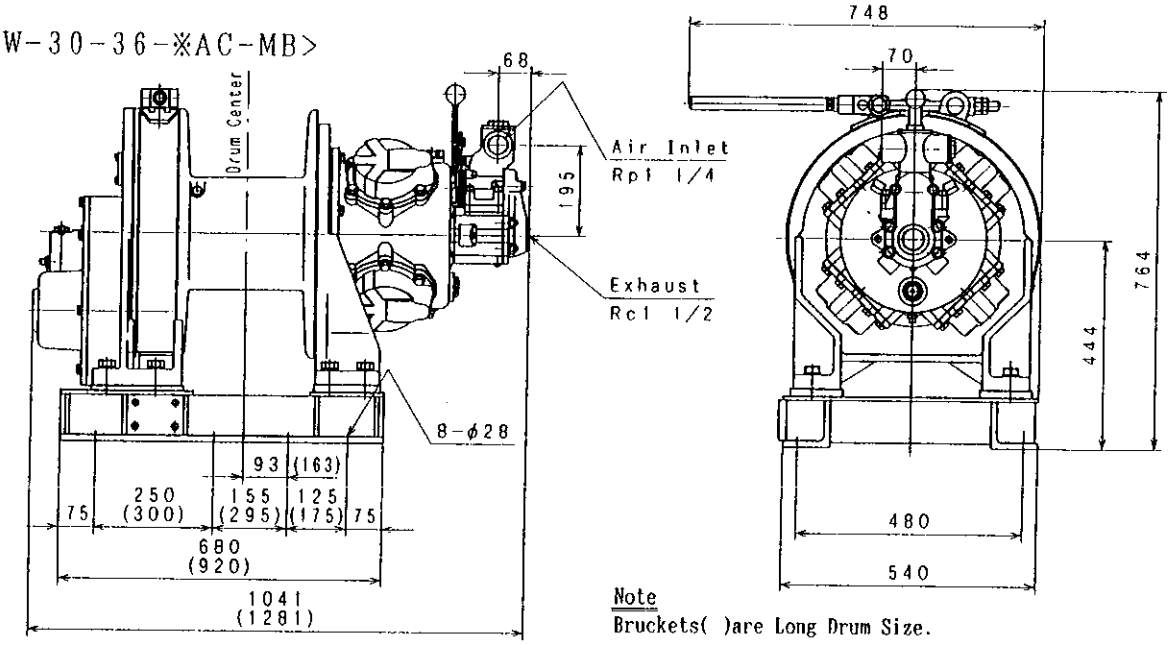

Note
Bruckets( )are Long Drum Size.

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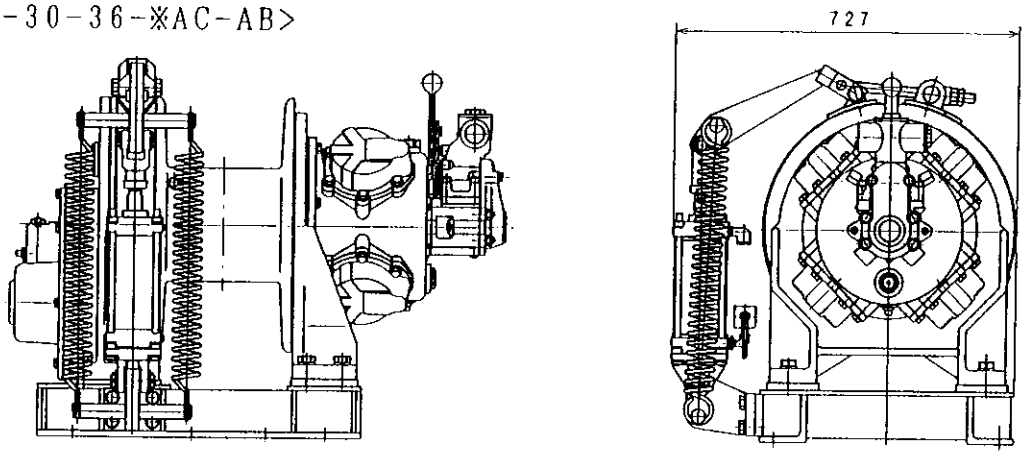

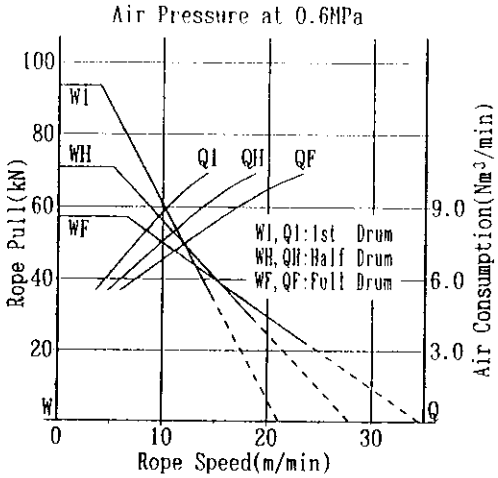

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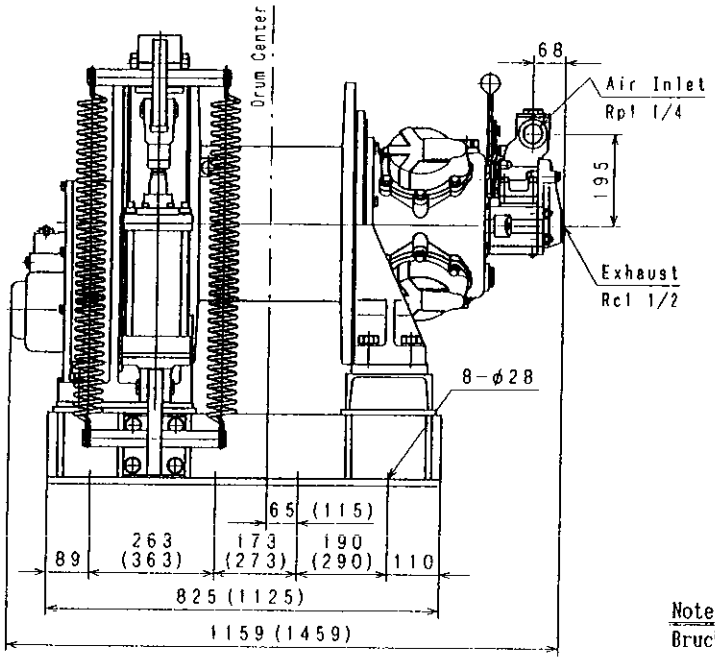
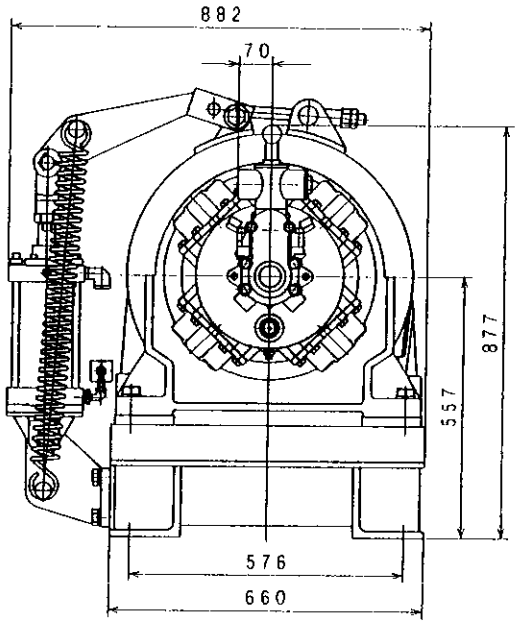




Note
Bruckets( )are Long Drum Size.

5. INSTALLATION

(1) Install the winch by sufficiently tightening bolts. Make sure bolts are not bent.

(2) The winch should be installed in a flat and dry location.

> ⚠ DANGER
>
> Install the winch on a place that is strong enough sustain assembly.
>
> Use all of the supplied bolts to fasten the winch.

> ⚠ CAUTION
>
> Clear the bolt holes and the suface where the winch is installed.
>
> Otherwise, breakage or air leakage may occur due to loosened bolts or damaged seal.
>
> Use the specfied bolts and specified torque (See below table)., when installing the winch, otherwise malfunction, breakage or air leakage may occur.

Specified bolts and torque

SAN-EI 's registration No.SIS 11-001

Metric coarse screw thread and bolt at materials of S20C

(Strength ISO classification 4.8)

Model	W-05	W-10	W-20	W-30	W-50
Bolt size(mm)	M16	M24	M24	M24	M24
Torque(kgf-m)	6.7	23	23	23	23

Lubricate bolt with oil or MoS2 Paste.

Fasten bolts slowly with Torque Wrench without slack to the shown torque.

6. ROPE ATTACHMENT

Fig. 6-1

(1) DO NOT use defective rope that is rusted, kinked, or with severe breakage or rope that is severely bent.

KINK

BREAKAGE

Severely BENT

Fig. 6-2

(2) Insert the rope ① into the drum holes and fasten it with screws ② .

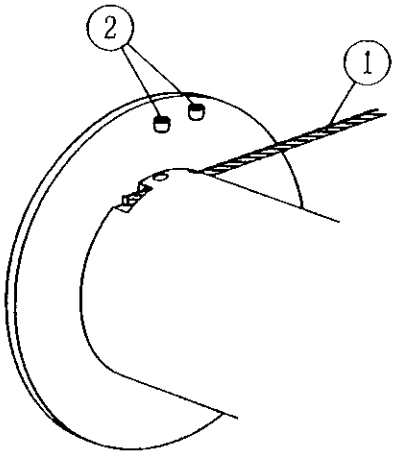
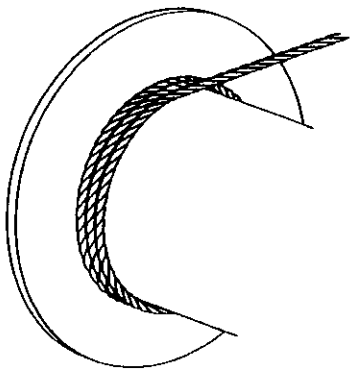


Fig. 6-3

(3) Wind up the rope not less than the length of 2.5 drums.



7. PIPING

(1) Before piping the winch, make sure to blow dirt and dust from the pipe with air. Dirt and dust as well as moisture may cause damage.

(2) If pipe diameter is too small or pipeline is too long, the winch will not up to rated capacity due to air pressure loss.
Select the same size as inlet port of the winch or a little bit larger.
The quick coupler with check valve may not receive sufficient power due to the big loss of air pressure.

(3) Rubber hose and air inlet section of piping should be free from improper force. Be aware of this particularly in fixed piping.

(4) Measure the air pressure at air inlet port of the motor during operation.
The air pressure is lower when not oeprating due to lower air flow.

(5) Adjustment of the lifting and lowering speed is done by speed controller.
Select air tools that are of equivalent size or slightly bigger than the port size of the winch.

8. LUBRICATION

(1) Lubricate the center of gauge before operation, as motor oil is exhausted during shipment. (Fig. 8-1)
It is not necessary to grease reduction gear box ; it is greased before shipment.

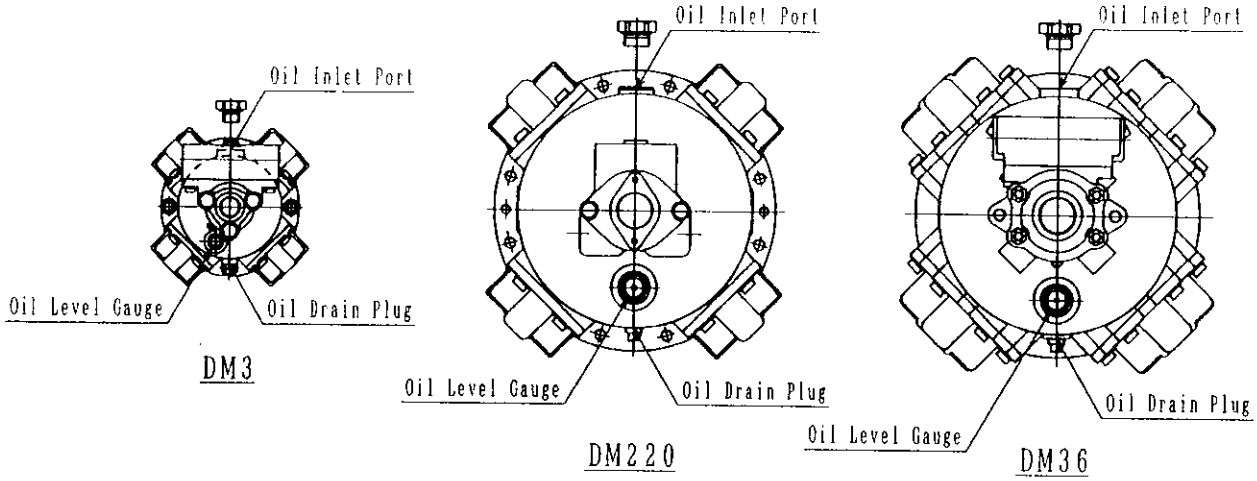
(2) Line oiler optional parts are required for lengthy serial operation.

(3) Use motor lubricant JIS K2213 TURBINE OIL No.2 (ISO VG32 ~ 56) or equivalent (Cross reference).
For Line Oiler, use only oil VG32 or equivalent.

LUBRICANT CROSS REFERENCE CHART

JIS \ Maker	IDEMITSU	NISSEKI	MITSUBISHI	SHELL
JIS TURBINE OIL NO.2 (ISO VG32 ~ 56)	DUFFNIE TURBINE 32	FBK TURBINE 32	DIAMOND TURBINE 32	TURBO OIL T32

(Fig. 8-1)



9. OPERATION

(1) Routinely check the oil level in the motor before operation.
The oil is consumed and decreased gradually.

(2) Following the first twenty hour break-in operation period replace the total volume of oil. Then, only replenishment of oil is necessary for operation less than 3 hours.

(3) Since the oil in the motor is consumed, it should be replenished periodically. The oil deteriorates due to moisture contained in the air. Change oilly after every 200 hours of use or earlier.

(4) If the winch is operated with air containing moisture during the winter season, ice may come out of the exhaust port or the drain cleaner may be frozen. Moisture should be removed by attaching an air filter, etc. in the air inlet.

(5) The ambient temperature should be in the range of -10 ℃ to +70℃.

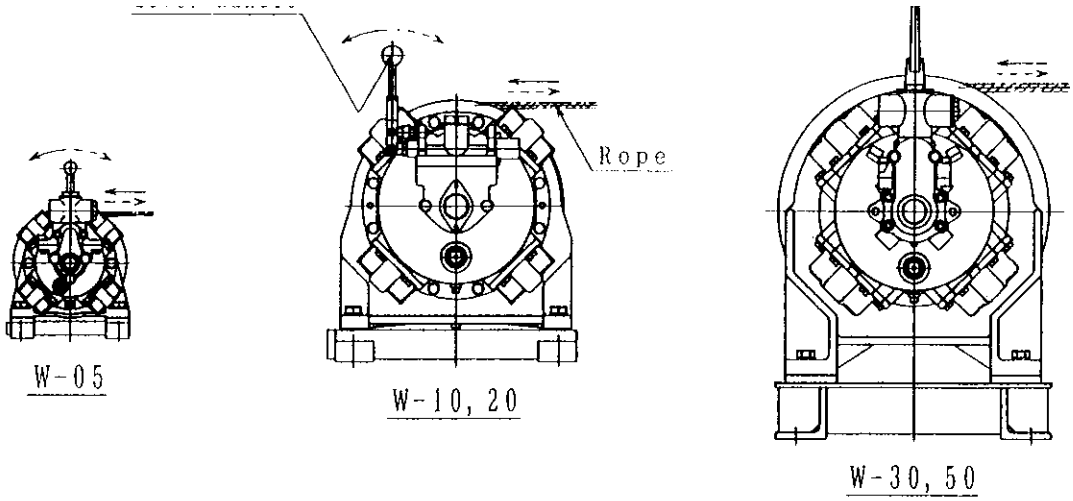
Our air winches are set up for two methods of operaton so the users can make a choice as to which method best meets their needs.

< **Automatic Return type Manual Operation Handle** >

Control lever handle manually operated can adjust the lifting or lowering speed of the winch. It automatically reverts to the 'STOP' position.

How to get lever handle direction of operation / drum revolution is shown in Fig. 9.1

Fig. 9.1



< Direct Remote Control type Operation >

Remote control operation is available due to the four-way valve air system.

The revolution speed is adjusted freely. Automatic brake should be built-in.

In this direct remote operation the reference between direction of drum revolution and air inlet differs from each model as well as motor reduction ratio. Confirm them by looking at the drawing in this operation manual or catalogue (MODEL CONFIGURATION).

⚠ DANGER

Never use flammable or noxious items as the air source.

The maximum working air pressure of the winch is 0.6MPa. (6 kgf./cm2).

If it is higher than 0.6 MPa., reduce the pressure.

Keep body and clothing away from the drum or rope of the winch during operation to prevent them from being wound accidentally.

⚠ WARNING

DO NOT lift any load heavier than the rated capacity.

Make sure the lowering speed is up when the winch is ON- Load.

⚠ CAUTION

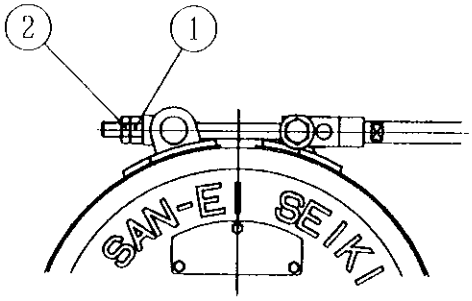
When the operation is started for the first time or after a long stoppage, the lubrication is not fully supplied to the parts. If full-speed operation is done, scuffing or seizure may occur. Low-speed operation should be done under NO-Load operation for 1 or 2 minutes before the load operation is started.

Before the operation of the clutch, make sure of NO-Load and operate the winch at low speed. If the clutch is operated in ON-Load or high speed, damage may occur.

Contorol lever handle should be operated slowly. The quick operation may cause a strong impact to the winch and rope that will shorten the life of the winch.

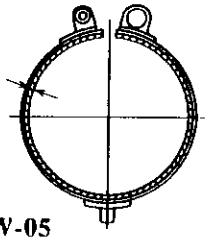
10. Brake Adjustment

(1) Brake is adjusted before shipment. After long-term usage, brake lining will wear and brake power should be shortened. In this case, install the brake nut ① and fasten it by lock nut ②. (Fig. 10-1)

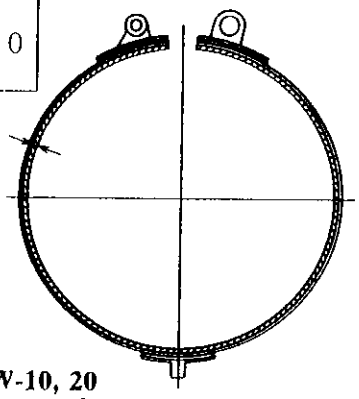


(2) Replace the brake lining when its thickness is less than 70% of **a new lining** :

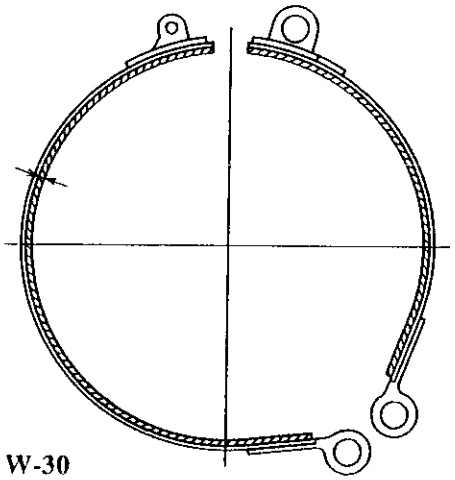
Model	W-05	W-10	W-20	W-30	W-50
Thickness (mm.)	6．0	6．0	6．0	8．0	10．0



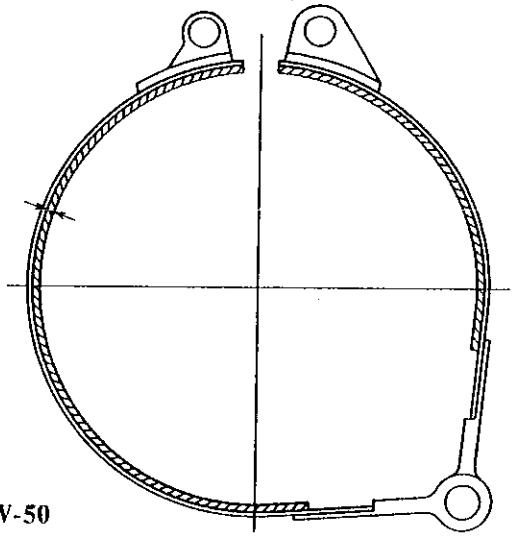
W-05



W-10, 20



W-30



W-50

⚠ CAUTION

For the air pressure to release the automatic brake of the winch, minimum 0.4 MPa is required. If it is used at lower than 0.4 MPa, the brake will not release completely and will overheat resulting in abnormal wear or damage to the brake lining.

11. MAINTENANCE

11-1. ROUTINE CHECK BEFORE OPERATION

Before operation, make sure of the following :

(1) No obstacles to operation around the winch.

(2) No abnormality on the appearance of the winch.

(3) Sufficiently lubricated.

(4) Air pressure well supplied.

11-2. STORAGE

When the operation is stopped for a long period or time, pay attention to the following :

(1) Pour the lubricating oil into the motor and plug the air inlet and exhaust ports to prevent entry of dust.

(2) If the winch is not operated for a long period or time, detach the piping and pour the lubricant oil(50 to 100 cc) into the inlet port of motor.
Do several low speed operations under No-Load, and then plug the air inlet and exhaust ports. This is effective for preventing rust in the internal components. (Fig. 11-2)

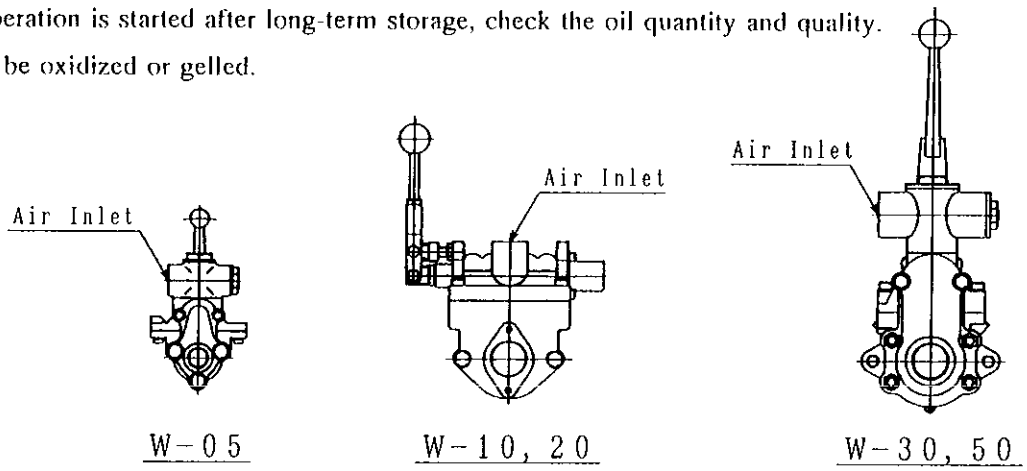
(3) Store the winch in a place with less humidity.

(4) DO NOT leave the winch in a place exposed to rain or dew.

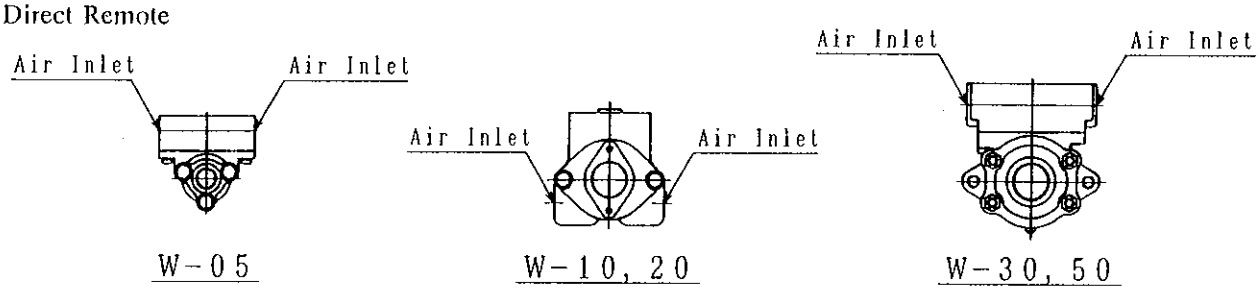
(5) When the operation is started after long-term storage, check the oil quantity and quality. The oil may be oxidized or gelled.

(Fig. 11-2)

Manual Operation



Direct Remote



11-3. DISASSEMBLY

Skilled technicain is required when the winch is disassembled. Contact our staff or dealer if an overhaul is needed or an abnormality is found in the winch.

12. TROUBLESHOOTING

	CONDITION	POSSIBLE CAUSE	ACTION
1	Motor does not run	· Air is not supplied.	* Check air and air hose/joint.
		· Overload.	* Reduce the load.
		· Seizure, scuffing.	* Overhaul required.
		· Brake not released.	* Check if brake releasing air is supplied.
2	Motor runs but stops	· Valve seizure.	* Overhaul required.
		· Piston seizure.	* "
3	Motor runs but output is not sufficient	· Air pressure is low.	* Check if air pressure at motor is same as that in 3.Specifications.
		· Air hose is too long and narrow.	* "
		· Joint passage area is insuffcient.	* Change the joint.
		· Seizure due to oil shortage.	* Add sufficient oil and operate slowly under No-Load.
		· Scuffing due to rust or dust.	* Overhaul required.
		· Muffler frozen.	* Attach the air dryer or after-cooler in the piping line.
4	Oil and air through oil supply port	· Excessive oil supply.	* Check oil level in gauge.
		Worn valve, piston ring.	* Overhaul required.
5	Control lever handle is heavy	· Valve rust.	* Overhaul required.
		· Valve body bent due to forced piping.	* Reassemble piping.
6	Brake does not work properly	· The brake lining worn.	* Fasten the brake nuts. If the lining thickness is not to specified thickness [See TABLE 10.(2)], install a new lining.
		· Lining is wet with oil.	* Change the lining.
		· Lining is wet with water.	* Operate at half-brake position to dry.
7	Brake is not released	· Air pressure is low.	* Air pressure should be over 0.4 MPa when in operation.
		· Air cylinder damage.	* Overhaul required.
		· Piping breakage.	* "