MAXPULL WINCH®

Hand Winch Catalog

RoHS CE

- ●Both Directions Pulling Endless Winch • Twin-Drum ME Series
- ●Stainless Steel Rotating-Handle • Buffing SB Series • Electropolishing ESB Series • Metallic Painting ST Series
- ●Stainless Steel Ratchet-Handle • Buffing RSB Series • Electropolishing ERSB Series • Metallic Painting RST Series
- ●Steel Hot-Dip Galvanizing • Rotating-Handle GS Series
- ●Steel • Rotating-Handle GM Series • Ratchet-Handle MR Series • Capstan-Drum MC Series
- ●Mini MAXPULL Winch ●Large Hand Winch for Industrial Use ●Special Hand Winch

MAXPULL MACHINERY & ENGINEERING CO.,LTD.
マックスプル工業株式会社

Gravity is our only rival !

We are currently in the 21st century. More and more multistory buildings have been increased in a city, and great depth underground development is about to begin under it. MAXPULL extends its range of activities in various fields as a specialist for lifting and pulling. One of them, MAXPULL Special Electric winch MAW-1100 has been adopted in "Deep Ice Coring Project at Dome Fuji, Antarctica" that solves wonder of the science, such as environmental issues and the mystery of the birth of the universe. The project finally succeeded in drilling of 3,035m at Dome Fuji, Antarctica on January 26, 2007, and collected ice core of 720,000 years ago. We participated in the grand national project that examines the global climate change from 720,000 years ago. The challenge spirit to mechanism of nature like this becomes our energies that have the vistas on the future.

Antarctic Research "Electric winch MAW-1100 for deep ice coring system"

"Shallow ice coring system" for the 29th and 30th Japanese Antarctic Research Expedition

Acknowledgment

We received a great deal of advice and assistance for our excavating test that was carried out using the snow ice surface layer mechanical drill and the development of the deep ice core drill system. We received very valuable advice from professor Yoshio Suzuki of the Institute of Low Temperature Science, Hokkaido University regarding conceptual design and testing of ice core drill for liquid-filled holes. We learned the basics about cutting theory from assistant professor Katsumi Sakakida of the Department of Mining at Akita University. Theoretical consideration presented here are based on the concept created by assistant professor Katsumi Sakakida. The member of Maxpull energetically engaged in manufacture of the surface layer mechanical drill and winches, and performed outdoor tests before lab tests. I appreciate their efforts and cooperation.

Prof. Yoshiyuki Fujii, Department of Snow and Ice, National Institute of Polar Research

Beauty is strength! Therefore Stainless

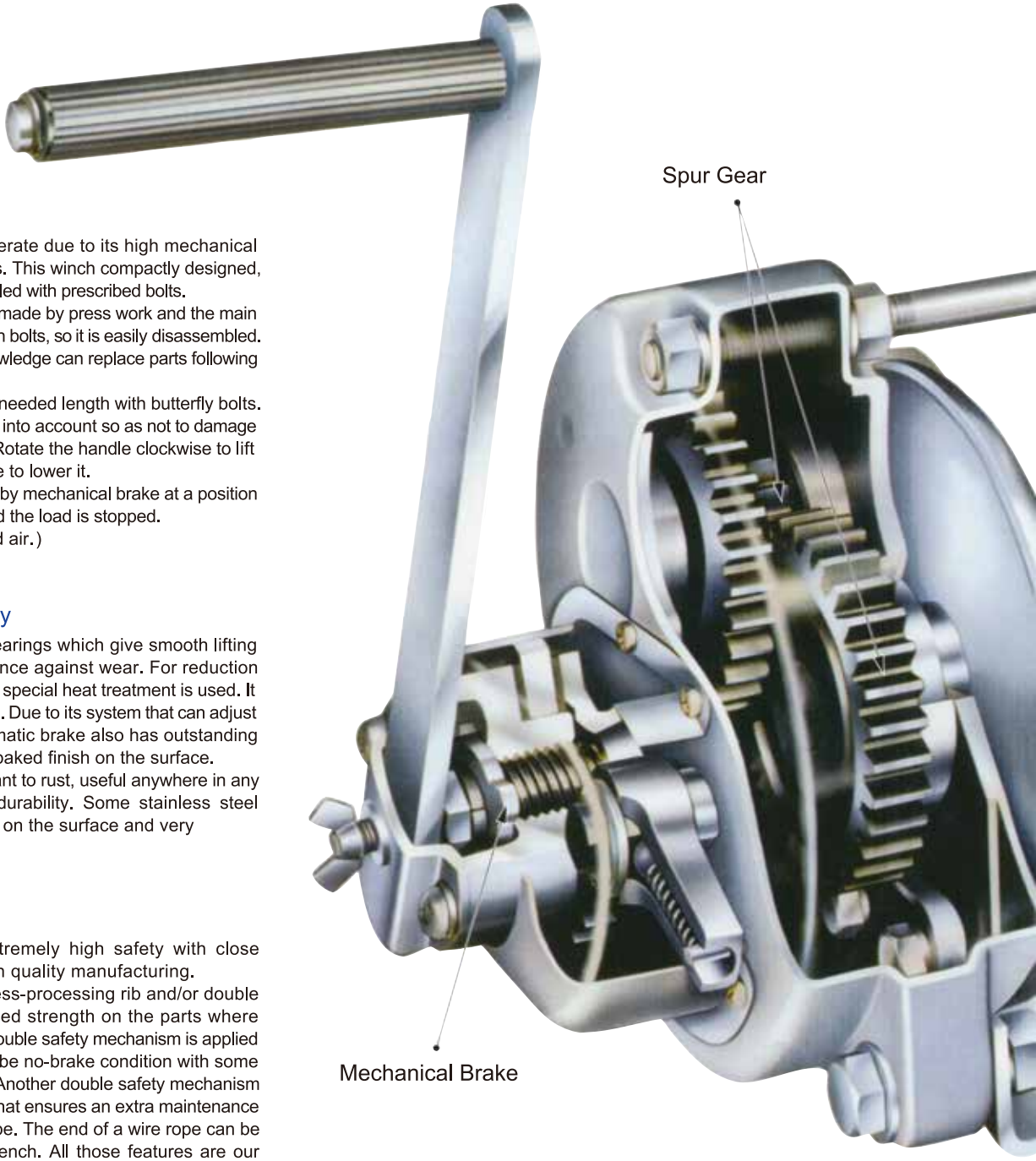
"Rust-prevention brightly" suited to harsh environments.

The environment that looks beautiful is often harsh to the mechanism. Beach that sea breeze is blowing. Highland that a temperature difference between night and day is large and it is prone to condensation. Factory or research facility that the possibility to touch chemicals and steam cannot be lost even if it is highly automated. MAXPULL stainless steel winch will demonstrate the outstanding reliability and excellent durability in such harsh environments. Unique beauty of stainless steel is excellent in salinity tolerance and rust-prevention. A result of pursuing the high-performance that have enough durability in harsh environments, it was selected inevitably. Stainless steel type is thorough pursuit of the practical beauty for strength. This is MAXPULL stainless steel winch.

■ Primary use

- Cargo handling operation of port facilities
- On the premises of nuclear power plant etc.
- At the chemical plant, pharmaceutical factory
- For clean room
- In Refrigeration plant etc.
- Marina facilities and for cruiser
- In addition to the above, for all applications that require strength, safety, salt tolerance and chemical resistance

LOOK AT THIS MECHANISM ··· An Original Design Backed by Long



■ Easy Operation

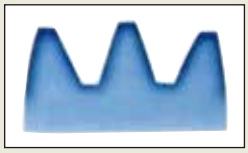
Our winch is very easy to operate due to its high mechanical efficiency compare with others. This winch compactly designed, is light to carry and easily installed with prescribed bolts.
In addition, the main parts are made by press work and the main parts of winch is assembled with bolts, so it is easily disassembled. Anyone who has technical knowledge can replace parts following this manual.
The handle is adjusted to the needed length with butterfly bolts. A plastic grip have been taken into account so as not to damage the hand during the rotation. Rotate the handle clockwise to lift the load and counterclockwise to lower it.
Brake is applied automatically by mechanical brake at a position to stop rotating the handle, and the load is stopped.
(The load is suspended in mid air.)

■ Outstanding Durability

Ball bearings are used for bearings which give smooth lifting and offer outstanding resistance against wear. For reduction unit, our original gear that has special heat treatment is used. It allows you to work with margin. Due to its system that can adjust the gap as desired, the automatic brake also has outstanding durability. Steel winch has a baked finish on the surface.
Stainless steel winch is resistant to rust, useful anywhere in any conditions and outstanding durability. Some stainless steel winch has a metallic painting on the surface and very durable.

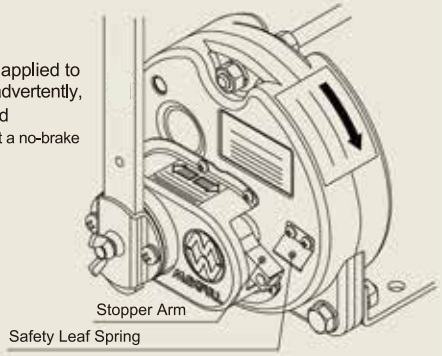
■ Reliable Safety

The winch provides the extremely high safety with close examined materials and high quality manufacturing.
By combining a precision press-processing rib and/or double plate, the winch has enhanced strength on the parts where load is intensively applied. A double safety mechanism is applied to the automatic brake not to be no-brake condition with some impact onto the stopper arm. Another double safety mechanism is applied to the special drum that ensures an extra maintenance winding for anchoring wire rope. The end of a wire rope can be anchor with attached hex wrench. All those features are our original and designed with high safety.



If gear subjected to large forces to concentrate forces is worn or damaged easily, reduction mechanism of the winch does not hold.
In MAXPULL Winch, profile-shifted gears of original design have been incorporated to provide extra rugged teeth, which are made of chromium molybdenum steel, and further carburized and quenched along the surface, as shown in the illustration. The carburized layer extends only to a depth of 0.7mm from the gear tooth surface (effective thickness of the carburized layer). This ensures a hard wear-resistant tooth surface combined with tough impact-resistant tooth body because engaging parts of the tooth are hard, and to retain toughness inside the substance of the tooth body.

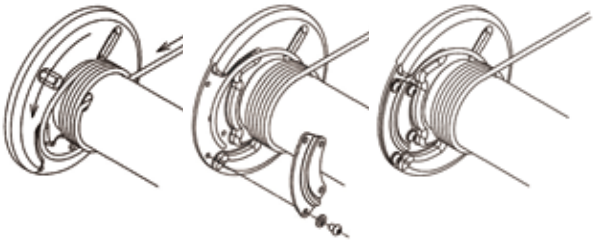
Even if force is applied to stopper arm inadvertently, it is not released
(protection against a no-brake condition).



Born of a Unique Concept and Years of Experience …

MAXPULL WINCH

Double Safety Mechanism for Wire Rope Locking



The double locking mechanism, consisting of a special drum that keeps extra maintenance winding and our unique anchoring plate of wire rope, ensures the safety and soundness.

- On Models GM-30 and MR-30, the mechanism for wire rope locking is a slightly different from others.
- Models other than GM-30 and MR-30, the wire rope locking part is located at the gear case side.

Operation of the Mechanical Brake

The state before start of winding is illustrated in Fig 1, and Fig 2 shows that the winch in operation or the brake mechanism is engaged. Rotating the handle in clockwise direction, the triple thread screw will tighten the clutch ⑳ and the clutch pinion ⑭, the brake lining ㉑ will be stuck on the ratchet gear ⑱ integrally and the lifting the load will be started as shown in the Fig 2.
When lowering the load, the force of free fall will work on the clutch pinion ⑭ and loosen the triple thread screw. Rotating the handle in counterclockwise direction will loosen the triple thread screw, the proper gap (A) will be created between the brake lining ㉑ and ratchet gear ⑱ as Fig 1, and it is possible to lower the load at whatever speed you want.
During lifting or stop lowering, mechanical brake becomes the state shown in the Fig 2, the stopper ㉓ is engaged with the ratchet gear ⑱ as Fig 3 and stop the movement at any point. Triple thread screw used for clutch ⑳ and clutch pinion ⑭ provides efficient tightening with smaller pitch. In addition, the lead is three times larger, and the speed for tightening and loosening the screw is fast, so it ensures momentary actions of mechanical brake.

Mechanical Brake Parts List

No.	Part Name	Qty.
⑩	Clutch Cover	1
⑭	Clutch Pinion	1
⑱	Ratchet Gear	1
⑲	Back Plate	1
⑳	Clutch	1
㉑	Brake Lining	2
㉒	Dodecagon Hole Tongued Washer	1
㉓	Stopper	1
㊼	Hexagon Nut (With Lock Washer Helspr)	1

Adjusting the Brake Gap

P1 is the position of dodecagon hole tongued washer ㉒ when the mechanical brake is disengaged. P is the engaged position. If the movement angle of P1 and P is within 10 to 15 degrees, the position is appropriate. (See Fig 3.)
When the mechanical brake is engaged, the dodecagon hole tongued washer ㉒ might be located in the position of P2. This behavior occurs when the brake linings ㉑ are worn. In such a case, remove the M10 hexagon nut ㊼ and the dodecagon hole tongued washer ㉒ once, tighten the clutch ⑳ fully, and set the dodecagon hole tongued washer ㉒ in the position of P. This will ensure appropriate gap of the brake lining (A) when disengaged.

Description of Mechanical Brake Mechanism

Fig 1

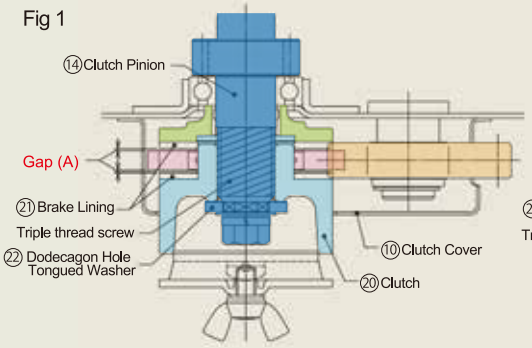


Fig 2

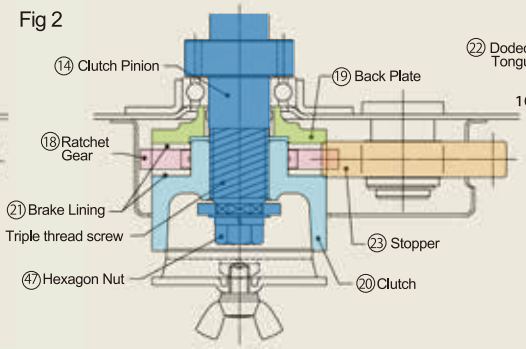
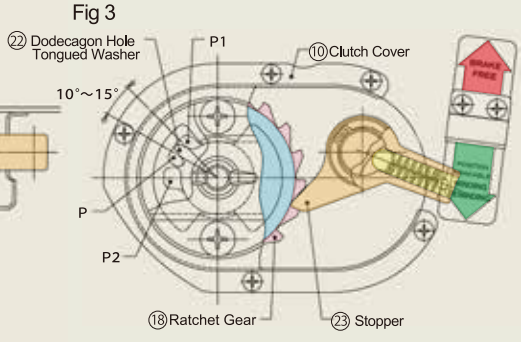


Fig 3



Technical Documents

Calculation Formula of the Drum Capacity (For reference)

Winding length of wire rope

Fig 1 shows the conventional thinking about the wire rope that is wound onto a drum, and over the second layer, the overlapped wire rope of the upper layer fits into the groove between the adjacent wire rope of the lower layer, however, as shown in Fig 2, the calculation is performed by closely aligned winding because it is suitable for the current state and facilitates calculation. (The following formula is for reference in design criteria of an electric winch, and it is not a regulation.)

Fig 1

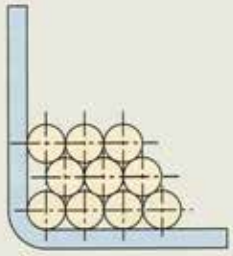
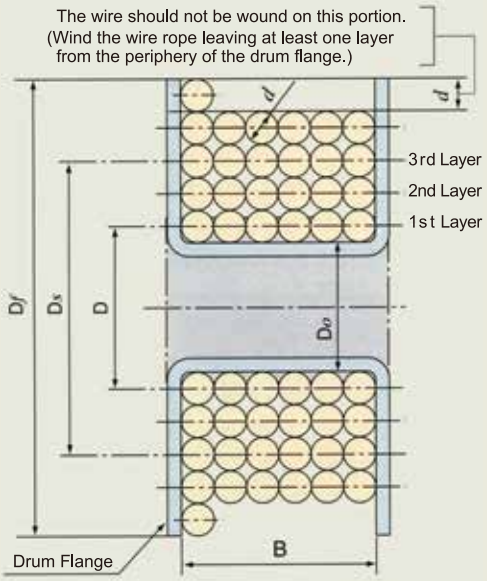


Fig 2

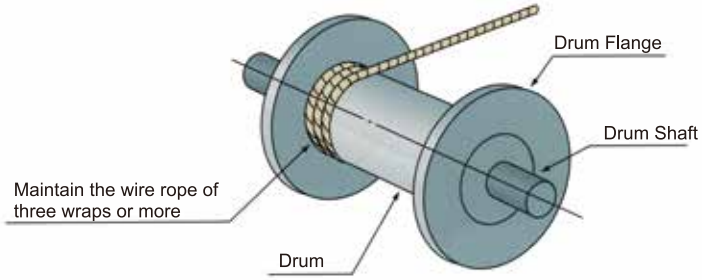


Drum Diameter	D_o mm
Wire Rope Diameter	d mm
Pitch Circle Diameter of the Wire Rope on the 1st Layer	$D = (D_o + d)$ mm
Pitch Circle Diameter of the Wire Rope on the i-th Layer	$D_i = D_o + (2 \times i - 1) \times d$ mm
Drum Width	B mm
Winding Length of Wire Rope	L mm
Drum Flange Diameter	D_f mm
Standard Layer	$D_s = \frac{D_o + D_f}{2}$ mm

The standard layer is defined by the pitch circle diameter (D_i) of the wire rope that the calculated value (D_s) is the closest to the whole number.

Length of wound wire rope on the 1st layer (m)	$L_1 = \pi \times (\frac{B}{d} - 1) \times (D_o + d) \div 1{,}000$
Length of wound wire rope on the 2nd layer (m)	$L_2 = \pi \times (\frac{B}{d} - 1) \times (D_o + 3 \times d) \div 1{,}000$
Length of wound wire rope on the i-th layer (m)	$L_i = \pi \times (\frac{B}{d} - 1) \times \{D_o + (2 \times i - 1) \times d\} \div 1{,}000$
Length of wound wire rope on the n-th layer (m)	$L_n = \pi \times (\frac{B}{d} - 1) \times \{D_o + (2 \times n - 1) \times d\} \div 1{,}000$
Outermost Layer (number)	$n = \frac{D_f - D_o}{d} - 1$ (Truncate to the whole number)
Winding Length of Wire Rope (m)	$L = L_1 + L_2 + \cdots\cdots + L_n$

Therefore, the winding length of a wire rope represents the overall length of the wire rope including the extra maintenance winding.
Extra maintenance winding is to maintain at least three wraps of wire rope on the drum for anchoring the end of the wire rope securely when unwinding entire wire rope.



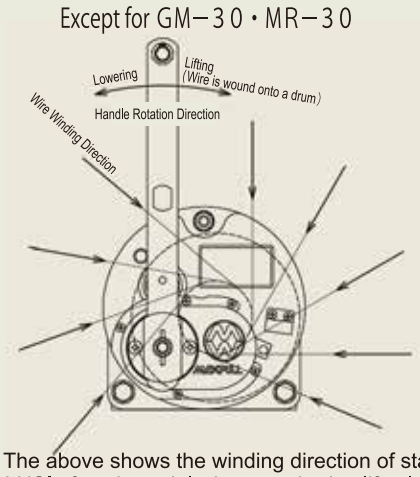
Case of Model GM-10

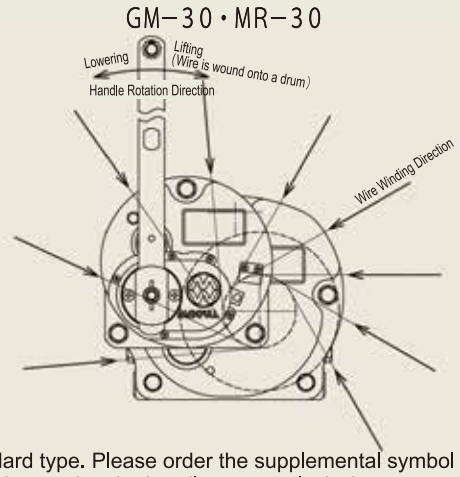
Wire Rope Diameter	d = 8mm
Drum Diameter	D_o = 76.3mm
Drum Flange Diameter	D_f = 175mm
Drum Width	B = 170mm
Rated Wire Rope Tension	Wr = 9,800mm (1,000kgf)

Winding Layer	Pitch Circle Diameter D mm	Maximum Wire Rope Tension N (kgf)	Winding Length of Wire Rope m		Remarks
			on Each Layer	Cumulative Total	
1	84.3	9,800 (1,000)	5.36	5.36	Pitch Circle Diameter of the Wire Rope on the Drum D
2	100.3	9,800 (1,000)	6.38	11.74	
3	116.3	9,800 (1,000)	7.39	19.13	Rated Wire Rope Tension on Standard Layer Wr
4	132.3	8,614 (879)	8.41	27.54	
5	148.3	7,683 (784)	9.43	36.97	Winding Length L

Caution : Under the standard layer, the maximum wire rope tension should not exceed rated wire rope tension.
Over the standard layer, the maximum wire rope tension is reduced to less than rated wire rope tension.
In the case of this calculation, the standard layer is the 3rd and the rated wire rope tension is 9,800N.

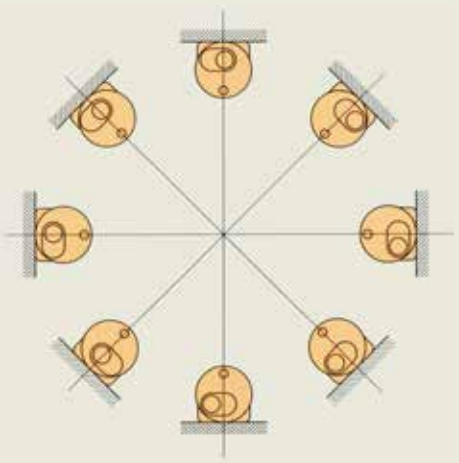
The following arrow indicates the winding direction of wire rope.





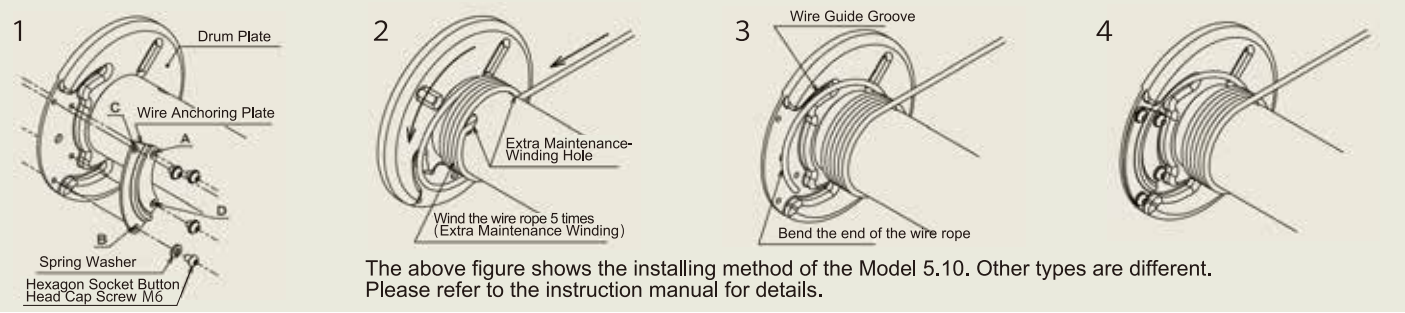
The above shows the winding direction of standard type. Please order the supplemental symbol LUSI of each model when required to lift a load by rotating the handle counterclockwise.
(The winding direction of wire rope changes to the opposite direction shown in the above figure.)

Example of Installation



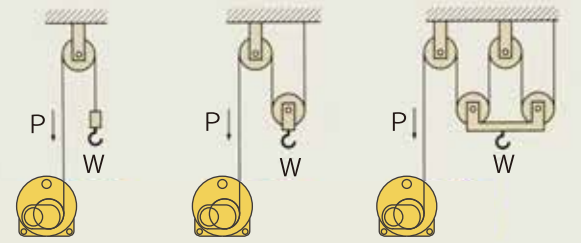
As shown in the figure, MAXPULL Winch can be installed at any angle up to 360 degrees.

Installing a Wire Rope

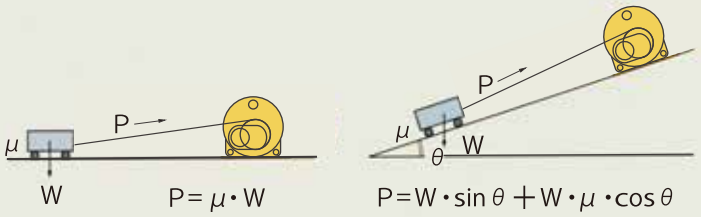


The above figure shows the installing method of the Model 5.10. Other types are different. Please refer to the instruction manual for details.

Calculation of Wire Rope Tension by Using MAXPULL Winch



$P = \frac{W}{\eta}$ $P = \frac{W}{2\eta^2}$ $P = \frac{W}{4\eta^4}$



$P = \mu \cdot W$

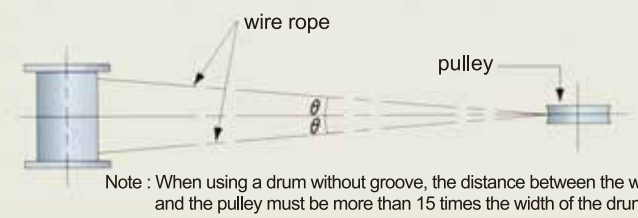
$P = W \cdot \sin\theta + W \cdot \mu \cdot \cos\theta$

P : Wire Rope Tension
W : Load
η : Sheave Efficiency
μ : Friction Factor
θ : Gradient (Degree)

Fleet Angle

The fleet angle is an angle (θ) formed with a perpendicular line from the pulley to the drum and the line between the center of the pulley and the drum plate. When using a drum without groove, set this angle (θ) to 2 degrees or less.

※ If the angle is larger than above-mentioned, the wire rope is wound unevenly or overlapped when it approaches to the edge of the drum.



Note : When using a drum without groove, the distance between the winch and the pulley must be more than 15 times the width of the drum.

Wind the extra maintenance winding of 3 wraps or more.

The extra maintenance winding is specified for 2 wraps or more by JIS (Japanese Industrial Standard), but it is necessary at least 3 wraps or more. If possible, it is preferred more than 5 wraps. Insufficient extra maintenance winding may cause an accident due to inadequate frictional force.

Relationship between the number of times in extra maintenance winding and the force applied to the end of the wire rope anchored to the drum

Number of times in extra maintenance winding	0	1	2	3	4
Force applied to the end of the wire rope anchored to the drum (When wire rope tension is 1)	1	0.534	0.285	0.152	0.081

■ Table of Model Selection & Contents

Type \ Item	Characteristics	Model	Capacity*1	Supplemental Symbol	Page
Hand Winch For Each Purpose	Brake Releasable	—	—		10
	Dust proof and Drip-Proof of Brake Mechanism	—	—	SIC	10
	Noiseless	—	—	NSIL	10
	Counterclockwise Rotation	—	—	LUSI*2	10
 Both Directions Pulling Endless	It provides a stable pulling power in both directions and prevent loosing of wire rope with only one main body. This winch is effective in the pulling of left and right directions on the horizontal place. It is also possible to pull in one direction such as towing.	ME	5, 10	B Mechanical Brake Type	11
				L Latching Brake Type	11
 Stainless Steel (Buffing)	The surface is buffing. Stainless surface is polished with a buffing compound by hand, and it has the unique beauty of stainless steel and excellent chemical resistance.	SB Rotating	1, 3, 5, 10	SI, SIC, LUSI	14
		RSB Ratchet	1, 3, 5, 10	SI, SIC, LUSI	15
		SBC*2 Capstan	1, 3, 5, 10	SI, SIC, LUSI	—
 Stainless Steel (Electropolishing)	Electropolishing is done. The surface of the stainless steel parts that is immersed in the electrolyte solution is dissolved by the power of electricity, and the lustrous film is formed. It have excellent rust-proof and salt tolerance, and excellent chemical resistance than buffing.	ESB Rotating	1, 3, 5, 10	SI, SIC, LUSI	14
		ERSB Ratchet	1, 3, 5, 10	SI, SIC, LUSI	15
		ESBC*2 Capstan	1, 3, 5, 10	SI, SIC, LUSI	—
 Stainless Steel (Metallic Painting)	Metallic painting is painted. After the surface of the stainless steel is washed, the baking finish is applied. It have excellent rust-proof.	ST Rotating	1, 3, 5, 10	SI, SIC, LUSI	16
		RST Ratchet	1, 3, 5, 10	SI, SIC, LUSI	17
		STC*2 Capstan	1, 3, 5, 10	SI, SIC, LUSI	—

Type \ Item	Characteristics	Model	Capacity*1	Hop Dip Galvanizing	Supplemental Symbol	Page
 Steel (Hot Dip Galvanizing)	It has excellent rust-proof and salt tolerance, and lower cost than stainless steel.	GM Rotating	1, 3, 5, 10, 20, 30	GS	SI, NSIL SIC, LUSI	18～19

■ It is possible to manufacture ratchet-handle type and capstan-drum type.
■ The parts performed hot dip galvanizing are gear case, gear case cover, drum, side frame, bed, clutch cover and handle arm.
■ Stay bolt, bolts, screws, nuts, retaining ring and spring are made of SUS-304.
■ Stopper, clutch and handle holder with chromate plating are painted in paints for zinc plating repair.
■ Only the tip of shaft with chromate plating are painted in paints for zinc plating repair.

■Table of Model Selection & Contents

Item / Type	Characteristics	Model	Capacity*1	Supplemental Symbol	Page
 Steel (Melamine Baked finish)	The surface is Melamine baked finish. It is standard type and excellent in rust-proof.	GM Rotating	1, 3, 5, 10, 20, 30	SI, SIC, NSIL, LUSI	20～21
		MR Ratchet	1, 3, 5, 10, 20, 30	SI, SIC, LUSI	22～23
		MC Capstan	1, 3, 5, 10, 20	SI, SIC, NSIL, LUSI	24～25
Mini Winch	Light weight and compact mini winch for limited space	GM Rotating	1	LH-SI	26
Large Winch for Industrial Use	Large Winch for Industrial Use	GM Rotating	50*2, 100*2	SI, SIC, NSIL, LUSI	26

*1 1:100kgf、3:300kgf、5:500kgf、10:1000kgf、20:2000kgf、30:3000kgf、50:5000kgf、100:10000kgf

*2 Order Production

■ Notation of Model Code

Model ─ Capacity ─ (Galvanized) ─ (Supplemental Symbol)

- (Supplemental Symbol): (SI, SIC, NSIL, LUSI)
- (Galvanized): (GS)
- Capacity: 1, 3, 5, 10, 20, 30, 50, 100
- Model: SB, RSB, SBC, ESB, ERSB, ESBC, ST, RST, STC, GM, MR, MC

e.g. SB-1 SB-3-SI GM-5-GS-SI GM-10 GM-20-SI

※ Brake Releasable type does not include the supplemental symbol.

■ Safety Information

(General Operation)

⚠DANGER

- Only qualified personnel authorize by the supervisor can operate the winch. Anybody unqualified, unskilled for the winch operation or lacking in knowledge for safe operation should not operate the winch.
  Ignoring this instruction could result in death or serious injury.
- Carefully read this manual to understand the contents before starting operation.
  Keep this manual at a designated place at all times to have quick access when required.
- This hand winch is designed for load lifting only. Do not use it to lift people or to move lifted people laterally.
  This winch is not appropriate for lifting people on the law, structure and safety.
- Operated with hand power only.
  This winch should not be operated with a motor of any kind. (Electric motor, pneumatic motor, hydraulic motor etc.)
- Never alter or modify the winch in any way. (Welding, Machining etc.)
- Never attempt to load exceeding the rated load.

※ MAXPULL takes no responsibility for the winch failure and accident that caused by alteration or modification outside MAXPULL and not following the manual or catalog.

【Safety Precautions】

- ◆ When this winch is used for the usage that causes a significant effect on life and property, be sure to install a danger detection unit and an emergency brake other than the winch brake on device side where this winch is mounted.
- ◆ Observe the essential safety regulations of installation location and using equipment.
- ◆ Attach the oil pan etc. against grease leakage, if the winch is used in the place where the oil leak is forbidden. (food factory, clean room etc.)
- ◆ Refer to the applicable regulations in the country or the region where the winch is installed, and perform the inspection and maintenance when operating the winch.

Hand Winch for Each Purpose

● MAXPULL Special Winch addresses the needs of dust proof, rust-prevention and noiseless

Brake Releasable

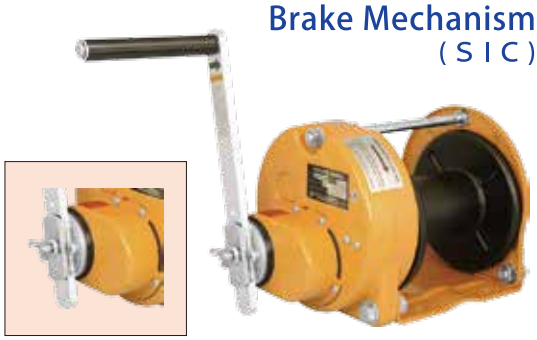
Safety design and convenient structure for lifting and pulling

The brake is released by disengaging the stopper with no load. The wire rope can be easily pulled out because the drum is idle. When lifting vertically, we recommend using the SI type which cannot release the brake in situations where an accident may occur because of misoperation.

※ Please refer to the exploded view at the end of the book (Page 28).

It is possible to manufacture each models of all stainless steel and steel.
To order, please specify as for example GM-5 or ESB-5.

Dust proof and Drip-proof Brake Mechanism (SIC)



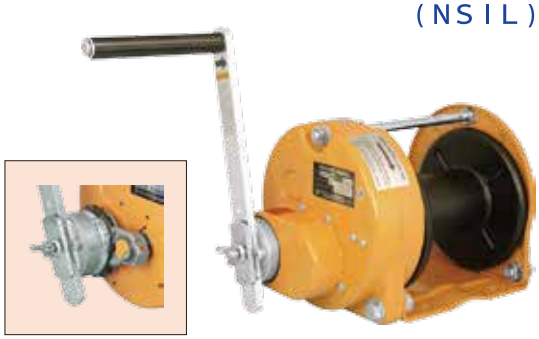
Protection design of dust proof and drip-proof

Same as SI, the stopper arm ㉓ for releasing of the brake and being able to idle the drum is removed, and the stopper mechanism is covered with the closed-type special clutch cover ⑩. In order to make the entire brake mechanism dust proof and drip-proof, rubber gasket is used for the mounting flange of clutch cover ⑩ and the rubber seal is used in the sliding portion with the clutch ⑳. Noise from the brake mechanism is low, and the action is extremely smooth even if the maintenance cycle is set at a longer period than that of other models.

※ Please refer to the exploded view at the end of the book (Page 28).

It is possible to manufacture each models of all stainless steel and steel.
To order, please specify as for example GM-5-SIC, ESB-5-SIC.

Noiseless (NSIL)



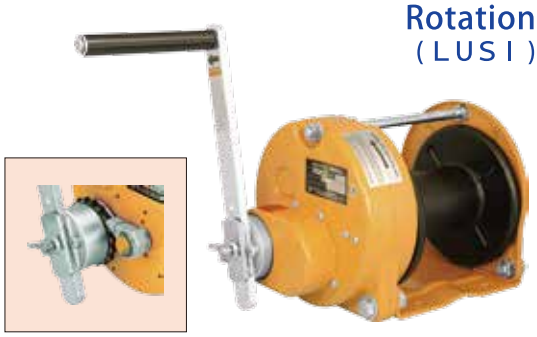
Noiseless design that eliminates ratchet sound

It equipped with noiseless braking that has been developed to prevent the noise from breaking the tense atmosphere in the theater at the rise of the curtain or making a din in a quiet living environment. Two magnet yoke and an anisotropic permanent magnet release the brake while the handle is operated, and it enabled noiseless lifting and lowering. The automatic brake is activated at the same time as handle operation stopping. If the magnet or linkage plate loss of function in an unexpected accident, it is the safety design that spare spring operates immediately and brake works. In this way, it is not possible to idle the drum by the brake release from the outside.

It is possible to manufacture each models of GM and MC of steel.
To order, please specify as for example GM-5-NSIL.

※ Noiseless type (NSIL) of Stainless steel and MR are not available.
※ We also manufacture noiseless type (SIL) that one-way clutch is incorporated.

Counterclockwise Rotation (LUSI)



Lift by counterclockwise and lower by clockwise

Rotate the handle to the left (counterclockwise) to lift and to the right (clockwise) to lower.
Shape and dimensions are the same as normal winch (Lift by clockwise).
(It is not a meaning of the mirror image in shape).

It is possible to manufacture each models of all stainless steel and steel.
To order, please specify as for example GM-5-LUSI, ESB-5-LUSI.

Stopper Armless

The stopper arm for releasing the brake and idling the drum has been removed. The stopper mechanism has been built in a closed-type special clutch cover ⑩ which makes it possible to perform lifting and lowering operations without the risk of misoperation.

To order, please specify as for example, GM-5-SI or ESB-5-SI.

Notice) This winch is designed as manual operation. Do not operate it with a motor of any kind. (Electric motor, pneumatic motor, hydraulic motor etc.)
Never alter or modify the winch in any way. It could cause major accident by the structure of the brake.

Both Directions Pulling Endless Winch

MAXPULL WINCH

●This is an epochal endless hand winch for both direction pulling equipped with unique functions.

This winch have two drums that rotate the same direction at the same time with several special wire rope grooves, and two pressure rollers attached on the each drum. It provides a stable pulling power in both directions and prevent loosing of wire rope with only one main body.

It is easy to wind a wire rope onto the drum from any portion of the endless wire rope.

This winch is effective in the pulling of left and right directions on the horizontal place. It is also possible to pull in one direction such as towing because the synergistic effect of the drum with special wire rope grooves and the pressure rollers have a firm grip on the wire rope. Moreover, it is small and lightweight, so it can be used in various places.

ME-5 (500kgf)

RoHS CE

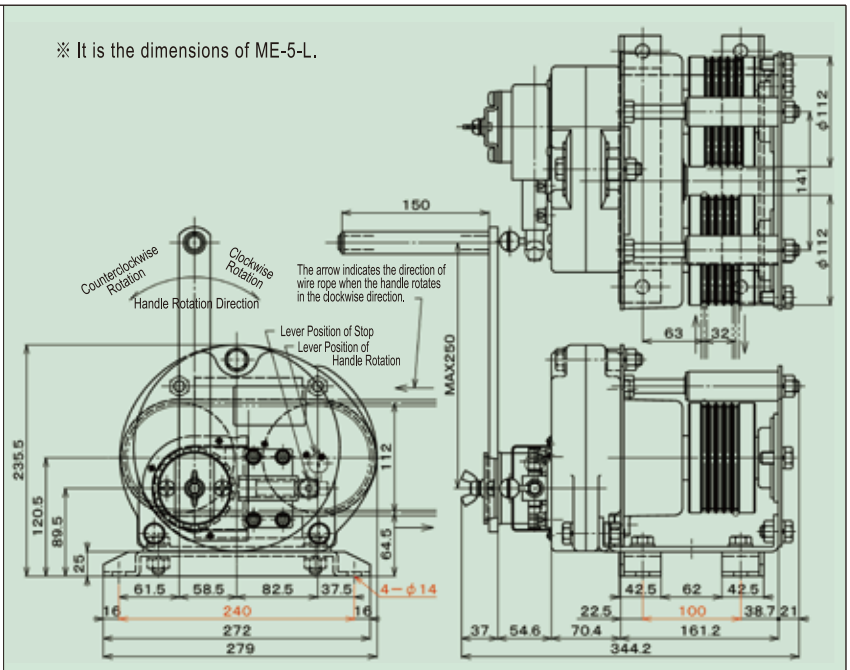
ME-5-SI

Mechanical Brake Type

ME-5-L

Latching Brake Type

※ It is the dimensions of ME-5-L.



Model	ME−5	Wire Rope	φ6mm	Handle Force Handle Length (Effective Max.) 250mm	97N (9.9kgf)	Gear Ratio	1／13.3
Wire Rope Tension	4,900N (500kgf)	Winding Wire Rope	4Wraps			Weight (Body + Handle)	30.0kg

ME-10 (1,000kgf)

RoHS CE

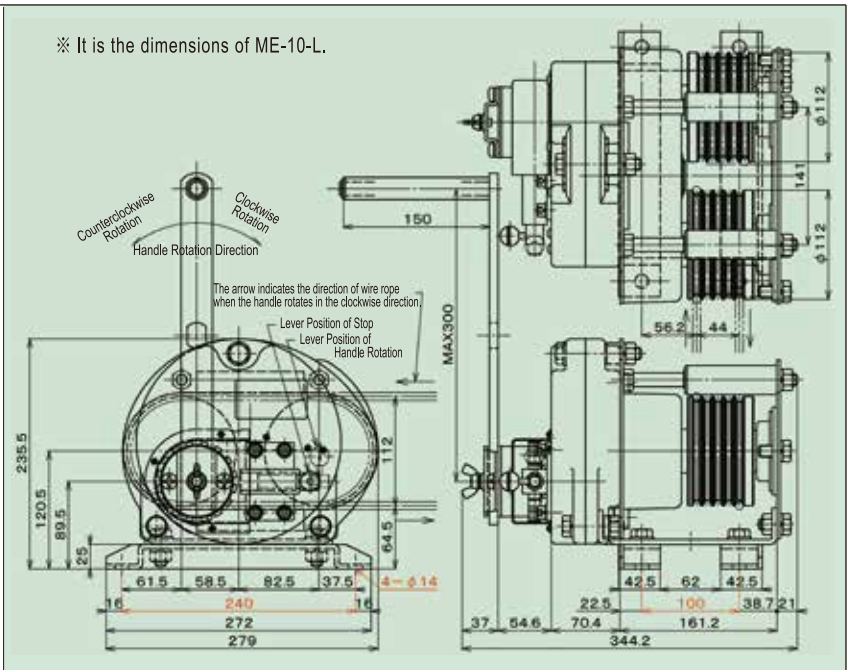
ME-10-SI

Mechanical Brake Type

ME-10-L

Latching Brake Type

※ It is the dimensions of ME-10-L.



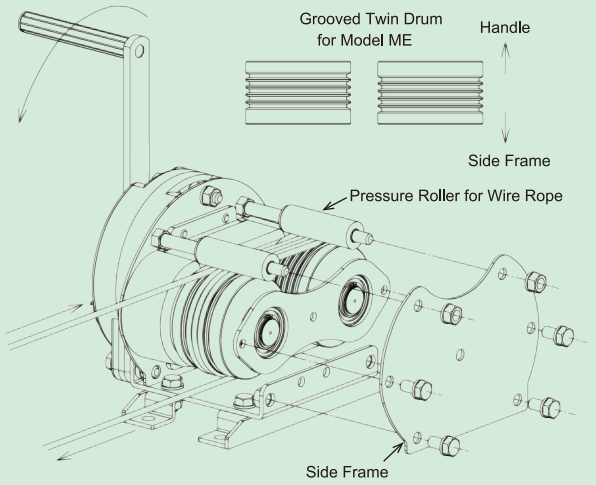
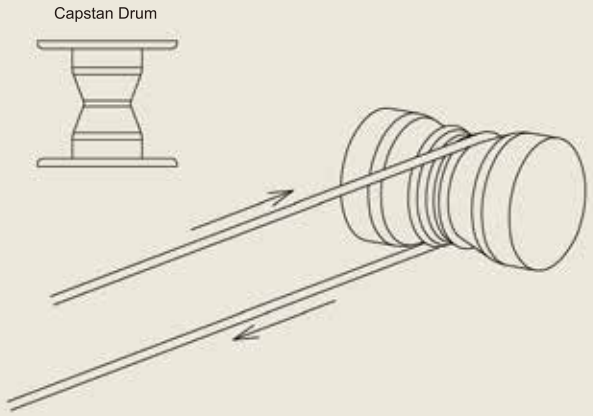
Model	ME−10	Wire Rope	φ8mm	Handle Force Handle Length (Effective Max.) 300mm	114N (11.6kgf)	Gear Ratio	1／19
Wire Rope Tension	9,800N (1,000kgf)	Winding Wire Rope	4Wraps			Weight (Body + Handle)	30.0kg

Notice) Pull the wire rope that is sent out and apply the tension to prevent loosening the wire rope between the drums when the wire rope is not used as the endless type.

Brake Selection

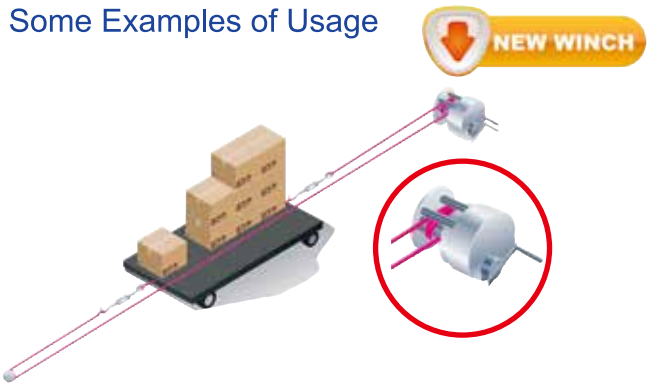
Mechanical Brake Type	Latching Brake Type
It is screw type mechanical brake that is used the weight of the load. Brake automatically works only in the operation of the handle. It is effective for the lifting work and it is an automatic brake in one direction. In the horizontal endless pulling, however, the mechanical brake does not work when the external force toward the winch acts on the pulling load because the mechanical brake does not work by the direction of the torque that applied to the drum. Therefore, in general pulling work, it is recommended to select the latching brake type.	It is a brake system to keep the state of the winch intact when the brake is applied. While the brake is being applied, it is impossible to move in both (lifting and lowering) directions. It is useful when the load should not be moved by external factors. When the brake is being released, the winch cannot be used for lifting work because it is the free state.

Difference between Our Unique Grooved Twin Drum and General Capstan Drum

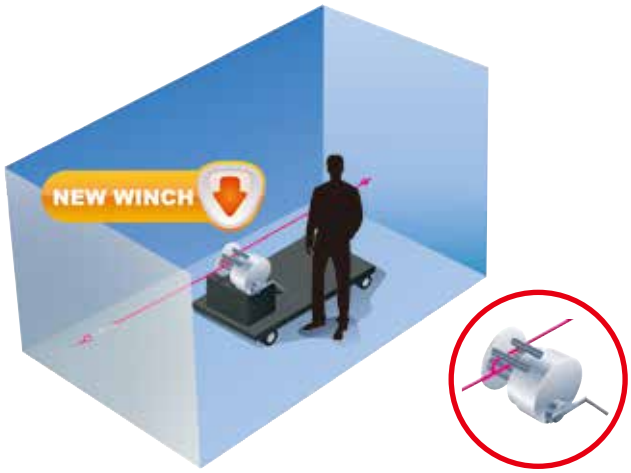
Our Unique Grooved Twin Drum	General Capstan Drum
	
① Wire Rope Installation	
Side frame is removable. It will be the cantilevered state when removing the it. It is easy to wind the wire rope to the drum from any portion.	It is necessary to wind 5 or 7 wraps of wire rope onto the drum and apply the tension to the wire rope being hauled in to avoid slipping of the drum and wire rope wound on the drum.
② Pressure Roller for Wire Rope	
Pressure roller that is pressed against the wire rope to keep the wire rope onto the groove of drum when the wire rope is stretched or tension is missing are standard.	The drum is in the shape of hourglass shape to gather the wire rope to the center of drum. On its structure, it is impossible to attach the pressure roller for wire rope.
③ Slack of Wire Rope	
Higher frictional resistance occurs between the wire rope and the drum by fitting the wire rope into the special groove. And furthermore, the wire is surely prevented from loosening because the pressure roller for wire rope is attached on each drum.	Tension is always necessary and wire rope loosens easily by the drum shape of hourglass. Frictional resistance of the drum and the wire rope cannot be maintained except that the tension is applied. Tension cannot be kept when the wire rope is stretched, the frictional resistance of the drum and the wire rope is reduced and it is likely to run idle.
④ Wear of Wire Rope	
Several special groove that was designed from the optimum friction coefficient is engraved on the two drums. It has a structure that the wire rope is not in contact with each other because the groove is independent and parallel. There is no damage to the wire rope by contacting with each other.	As the load is applied, the wire rope gathers in the center of the drum by the drum shape of hourglass and the wire rope rubs with each other. The wire rope always slips and rubs on the drum, and it wear down easily.

Notice) Pull the wire rope that is sent out and apply the tension to prevent loosening the wire rope between the drums when the wire rope is not used as the endless type.

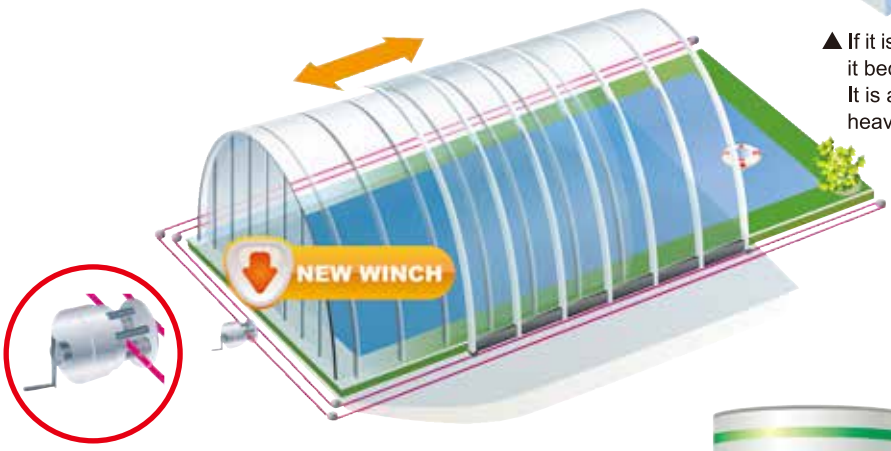
Some Examples of Usage



▲ It is suitable for both directions pulling of truck.
If the pulley is used effectively, the handle can be operated from any



▲ If it is integrated into the large mechanical equipment, it becomes movable at the time of maintenance.
It is also suitable for the horizontal movement of the heavy machinery.



▲ The horizontal movements such as dome-shaped tents, accordion-type hoods and arcades are possible.

◀ It is possible to open and close the lid of the chimney or the discharge port of the silo by both directions pulling.

▲ It is possible to open and close the gate by anchoring the wire rope at both ends of it.

This is quite useful not ▶ only lifting work of the survey equipment and the cleaning machine in the chimney but also pullout work if the power cable is connected with the wire rope.

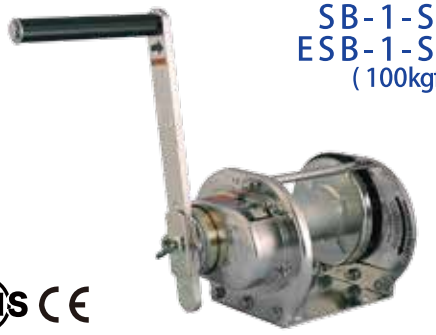
▲ If the safety nets is moved horizontally, it is possible to partition in the gymnasium and athletic park.
Additionally, the both directions pulling of the curtain for the window is also possible.

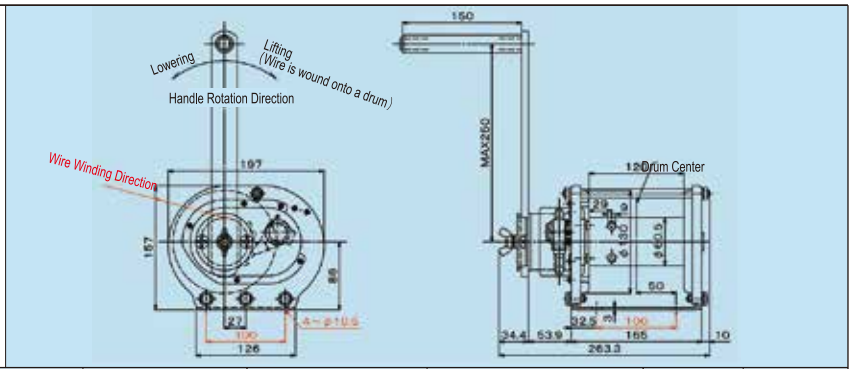
Notice) Pull the wire rope that is sent out and apply the tension to prevent loosening the wire rope between the drums when the wire rope is not used as the endless type.

Stainless Steel (Rotating) Winch Buffing (SB)・Electropolishing (ESB)

※ To order, please specify either buffing or electrolytic polishing. Because there is a difference in the price, please contact us for details.
●Select this type when the handle can rotate 360 degrees on mounting position.

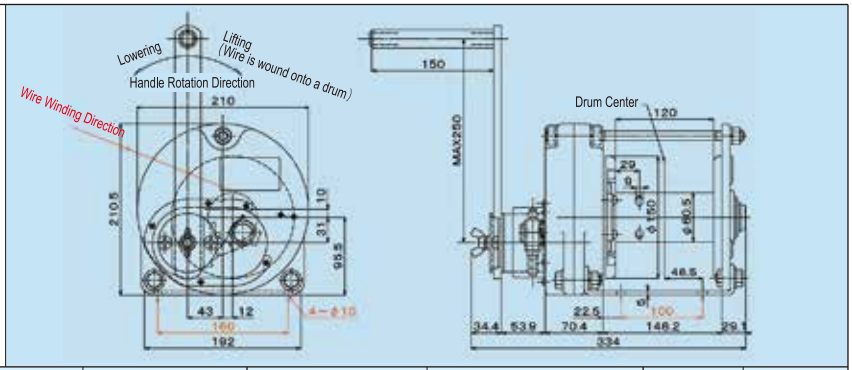
SB-1-SI / ESB-1-SI (100kgf)





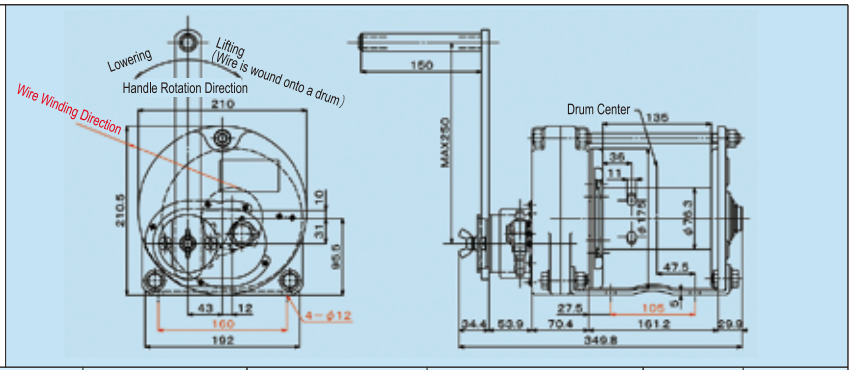
Model	SB-1-SI / ESB-1-SI	Drum Capacity	φ5mm × 35m (6 Layers Winding)	Handle Force Handle Length (Effective Max.) 250mm	Winding Layer Number of Wire Rope: 1st Layer: 143N (14.6kgf) 3rd Layer: 187N (19.0kgf) 4th Layer: 208N (21.2kgf)	Gear Ratio	1/1
Wire Rope Tension	980N (100kgf) 4th Layer or Less					Weight (Body + Handle)	7.4kg

SB-3-SI / ESB-3-SI (300kgf)



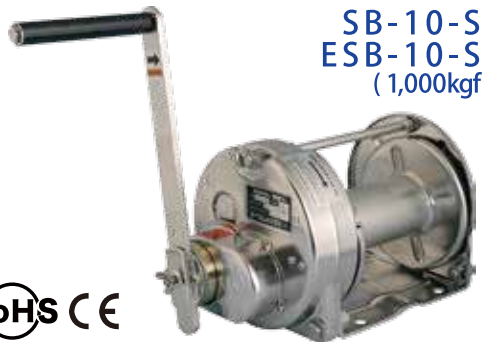
Model	SB-3-SI / ESB-3-SI	Drum Capacity	φ6mm × 32m (6 Layers Winding)	Handle Force Handle Length (Effective Max.) 250mm	Winding Layer Number of Wire Rope: 1st Layer: 76N (7.7kgf) 3rd Layer: 103N (10.5kgf) 5th Layer: 131N (13.3kgf)	Gear Ratio	1/6.25
Wire Rope Tension	2,940N (300kgf) 5th Layer or Less					Weight (Body + Handle)	14.3kg

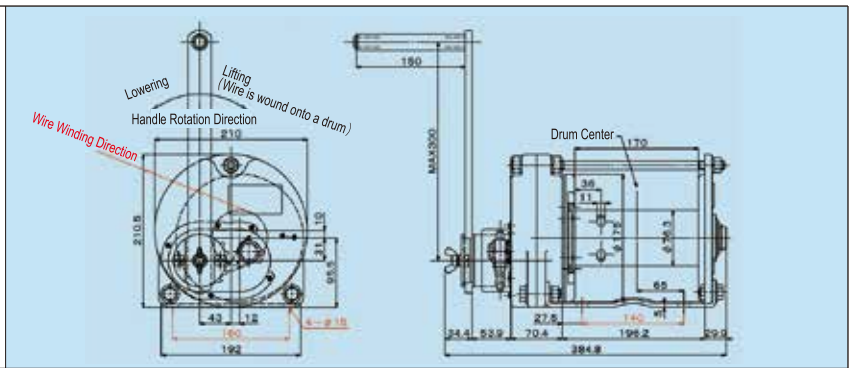
SB-5-SI / ESB-5-SI (500kgf)



Model	SB-5-SI / ESB-5-SI	Drum Capacity	φ6mm × 40m (6 Layers Winding)	Handle Force Handle Length (Effective Max.) 250mm	Winding Layer Number of Wire Rope: 1st Layer: 109N (11.1kgf) 3rd Layer: 142N (14.4kgf) 5th Layer: 174N (17.7kgf)	Gear Ratio	1/8.9
Wire Rope Tension	4,900N (500kgf) 5th Layer or Less					Weight (Body + Handle)	15.6kg

SB-10-SI / ESB-10-SI (1,000kgf)





Model	SB-10-SI / ESB-10-SI	Drum Capacity	φ8mm × 35m (5 Layers Winding)	Handle Force Handle Length (Effective Max.) 300mm	Winding Layer Number of Wire Rope: 1st Layer: 133N (13.5kgf) 2nd Layer: 157N (16.0kgf) 3rd Layer: 182N (18.5kgf)	Gear Ratio	1/12.6
Wire Rope Tension	9,800N (1,000kgf) 3rd Layer or Less					Weight (Body + Handle)	16.6kg

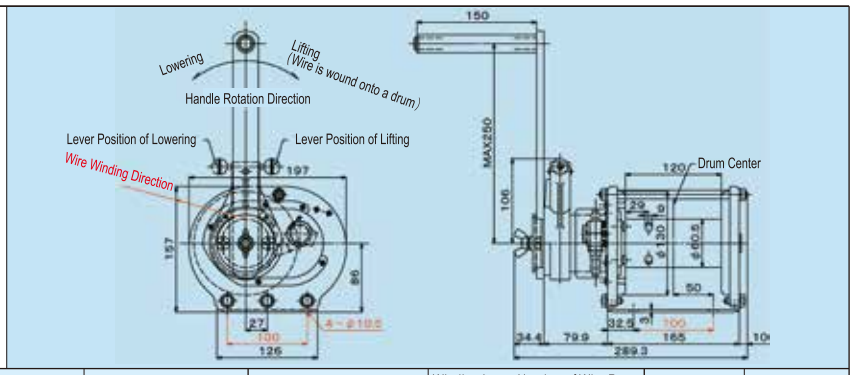
※ Drum capacity include the length of extra maintenance winding.
※ Wire rope tension is the value of standard layer or less. If the winding layer number exceeds the standard layer, decrease the wire rope tension according to the ratio.

Stainless Steel (Ratchet) Winch Buffing (RSB) · Electropolishing (ERSB)

MAXPULL WINCH

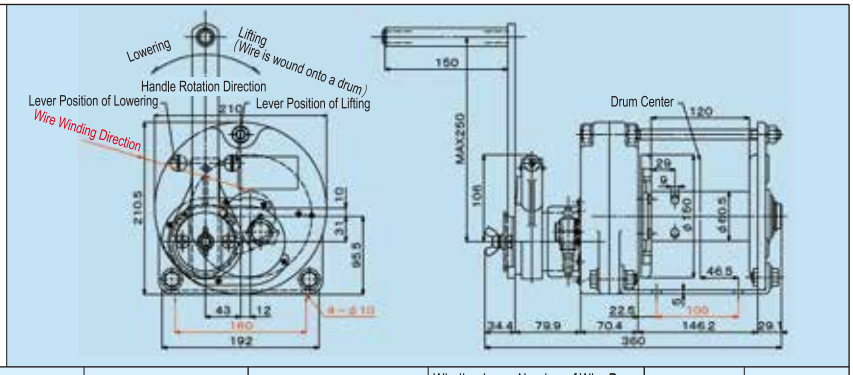
●It permits reciprocating handle movement in both direction for lifting and lowering load, and accommodates installation in cramped locations such as wall and floor. It can be used by rotating the handle a full 360 degrees in addition to the above-mentioned.

RSB-1-SI / ERSB-1-SI (100kgf)



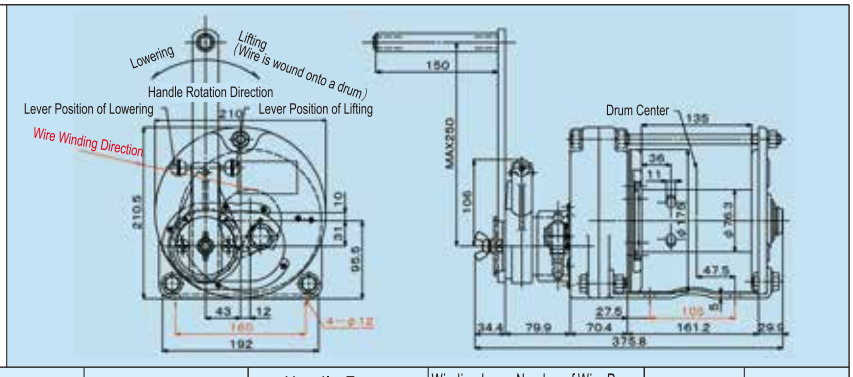
Model	RSB-1-SI / ERSB-1-SI	Drum Capacity	φ5mm × 35m (6 Layers Winding)	Handle Force Handle Length (Effective Max.) 250mm	Winding Layer Number of Wire Rope 1st Layer : 143N (14.6kgf) 3rd Layer : 187N (19.0kgf) 4th Layer : 208N (21.2kgf)	Gear Ratio	1/1
Wire Rope Tension	980N (100kgf) 4th Layer or Less					Weight (Body + Handle)	9.0kg

RSB-3-SI / ERSB-3-SI (300kgf)



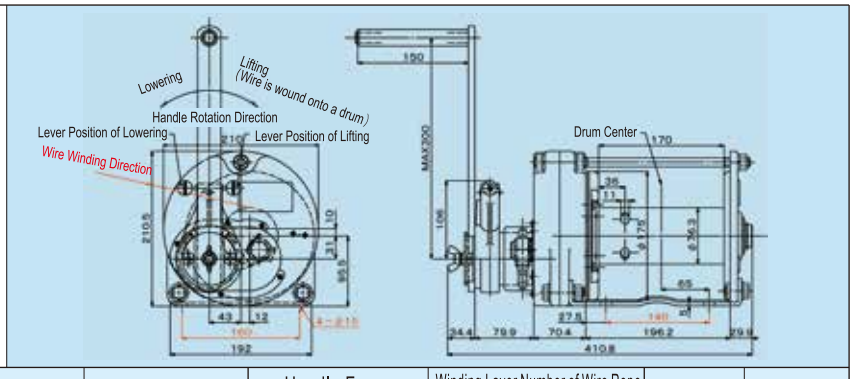
Model	RSB-3-SI / ERSB-3-SI	Drum Capacity	φ6mm × 32m (6 Layers Winding)	Handle Force Handle Length (Effective Max.) 250mm	Winding Layer Number of Wire Rope 1st Layer : 76N (7.7kgf) 3rd Layer : 103N (10.5kgf) 5th Layer : 131N (13.3kgf)	Gear Ratio	1/6.25
Wire Rope Tension	2,940N (300kgf) 5th Layer or Less					Weight (Body + Handle)	15.9kg

RSB-5-SI / ERSB-5-SI (500kgf)



Model	RSB-5-SI / ERSB-5-SI	Drum Capacity	φ6mm × 40m (6 Layers Winding)	Handle Force Handle Length (Effective Max.) 250mm	Winding Layer Number of Wire Rope 1st Layer : 109N (11.1kgf) 3rd Layer : 142N (14.4kgf) 5th Layer : 174N (17.7kgf)	Gear Ratio	1/8.9
Wire Rope Tension	4,900N (500kgf) 5th Layer or Less					Weight (Body + Handle)	17.2kg

RSB-10-SI / ERSB-10-SI (1,000kgf)

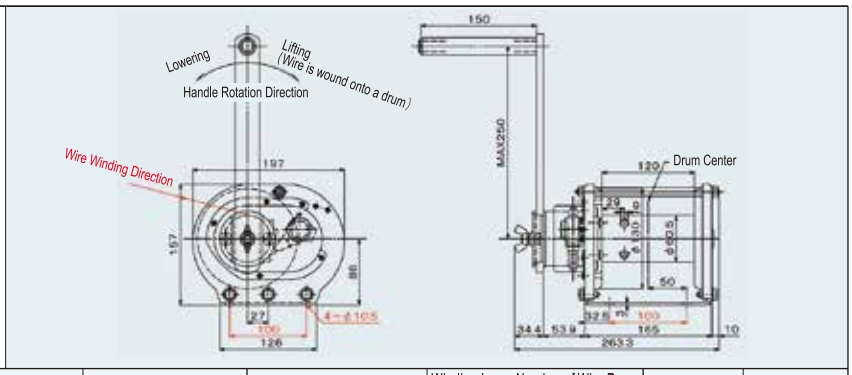


Model	RSB-10-SI / ERSB-10-SI	Drum Capacity	φ8mm × 35m (5 Layers Winding)	Handle Force Handle Length (Effective Max.) 300mm	Winding Layer Number of Wire Rope 1st Layer : 133N (13.5kgf) 2nd Layer : 157N (16.0kgf) 3rd Layer : 182N (18.5kgf)	Gear Ratio	1/12.6
Wire Rope Tension	9,800N (1,000kgf) 3rd Layer or Less					Weight (Body + Handle)	18.2kg

Stainless Steel (Rotating) Winch Metallic Painting (ST)

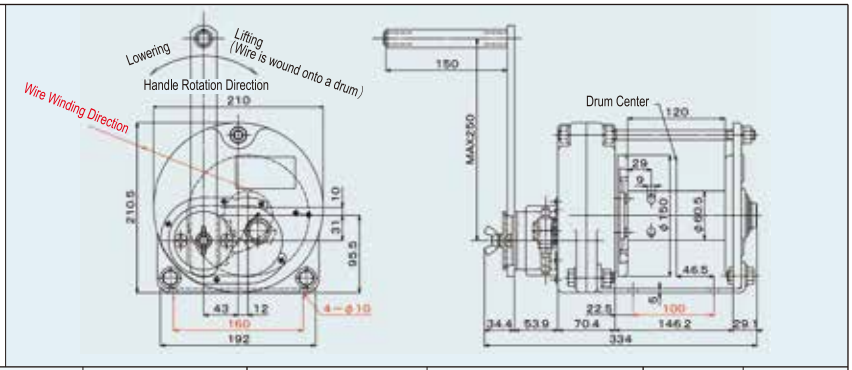
●Select this type when the handle can rotate 360 degrees on mounting position.

ST-1-SI (100kgf)



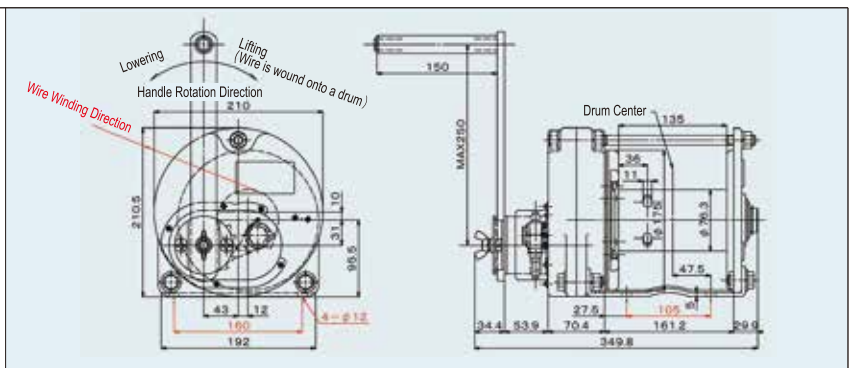
Model	ST−1−SI	Drum Capacity	φ5mm × 35m (6 Layers Winding)	Handle Force Handle Length (Effective Max.) 250mm	Winding Layer Number of Wire Rope 1st Layer : 143N (14.6kgf) 3rd Layer : 187N (19.0kgf) 4th Layer : 208N (21.2kgf)	Gear Ratio	1/1
Wire Rope Tension	980N (100kgf) 4th Layer or Less					Weight (Body + Handle)	7.4kg

ST-3-SI (300kgf)



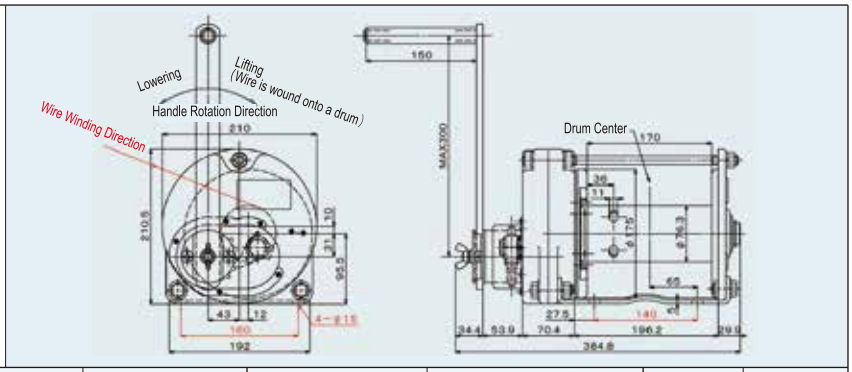
Model	ST−3−SI	Drum Capacity	φ6mm × 32m (6 Layers Winding)	Handle Force Handle Length (Effective Max.) 250mm	Winding Layer Number of Wire Rope 1st Layer : 76N (7.7kgf) 3rd Layer : 103N (10.5kgf) 5th Layer : 131N (13.3kgf)	Gear Ratio	1/6.25
Wire Rope Tension	2,940N (300kgf) 5th Layer or Less					Weight (Body + Handle)	14.3kg

ST-5-SI (500kgf)



Model	ST−5−SI	Drum Capacity	φ6mm × 40m (6 Layers Winding)	Handle Force Handle Length (Effective Max.) 250mm	Winding Layer Number of Wire Rope 1st Layer : 109N (11.1kgf) 3rd Layer : 142N (14.4kgf) 5th Layer : 174N (17.7kgf)	Gear Ratio	1/8.9
Wire Rope Tension	4,900N (500kgf) 5th Layer or Less					Weight (Body + Handle)	15.6kg

ST-10-SI (1,000kgf)



Model	ST−10−SI	Drum Capacity	φ8mm × 35m (5 Layers Winding)	Handle Force Handle Length (Effective Max.) 300mm	Winding Layer Number of Wire Rope 1st Layer : 133N (13.5kgf) 2nd Layer : 157N (16.0kgf) 3rd Layer : 182N (18.5kgf)	Gear Ratio	1/12.6
Wire Rope Tension	9,800N (1,000kgf) 3rd Layer or Less					Weight (Body + Handle)	16.6kg

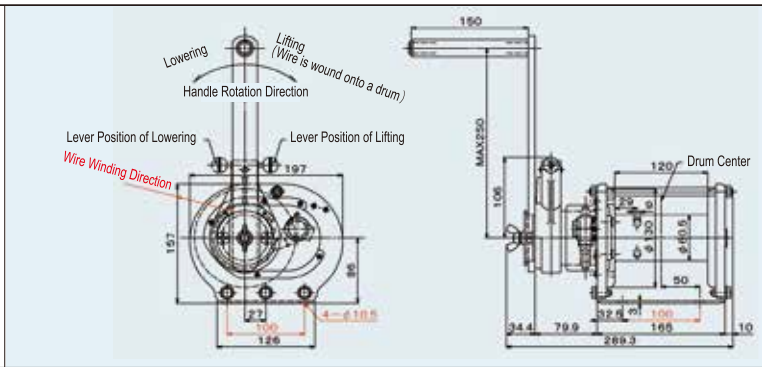
※ Drum capacity include the length of extra maintenance winding.
※ Wire rope tension is the value of standard layer or less. If the winding layer number exceeds the standard layer, decrease the wire rope tension according to the ratio.

Stainless Steel (Ratchet) Winch

MAXPULL WINCH
Metallic Painting (RST)

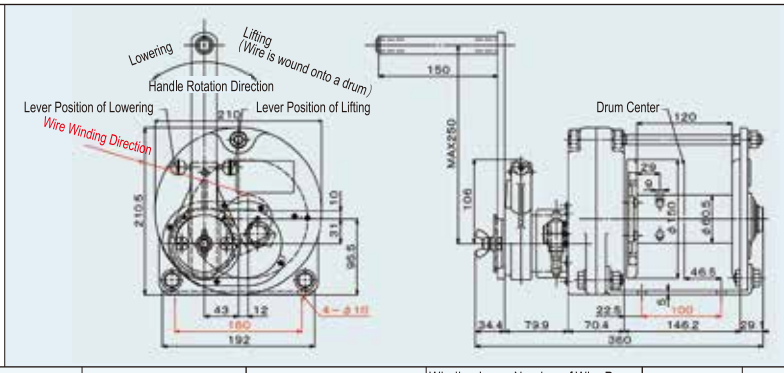
●It permits reciprocating handle movement in both direction for lifting and lowering load, and accommodates installation in cramped locations such as wall and floor. It can be used by rotating the handle a full 360 degrees in addition to the above-mentioned.

RST-1-SI (100kgf)



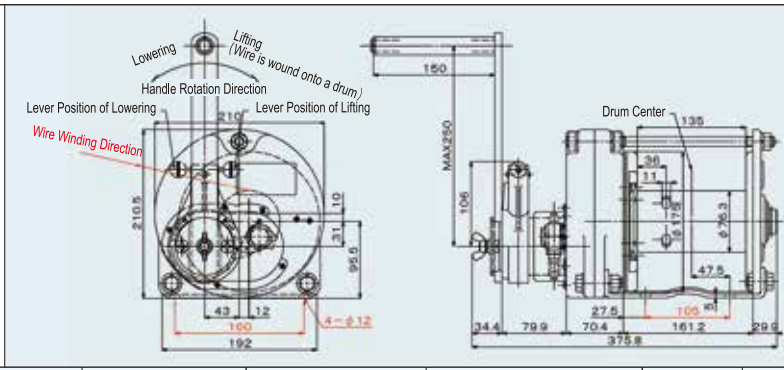
Model	RST-1-SI	Drum Capacity	φ5mm × 35m (6 Layers Winding)	Handle Force Handle Length (Effective Max.) 250mm	Winding Layer Number of Wire Rope	Gear Ratio	1/1
Wire Rope Tension	980N (100kgf) 4th Layer or Less				1st Layer : 143N (14.6kgf) 3rd Layer : 187N (19.0kgf) 4th Layer : 208N (21.2kgf)	Weight (Body + Handle)	9.0kg

RST-3-SI (300kgf)



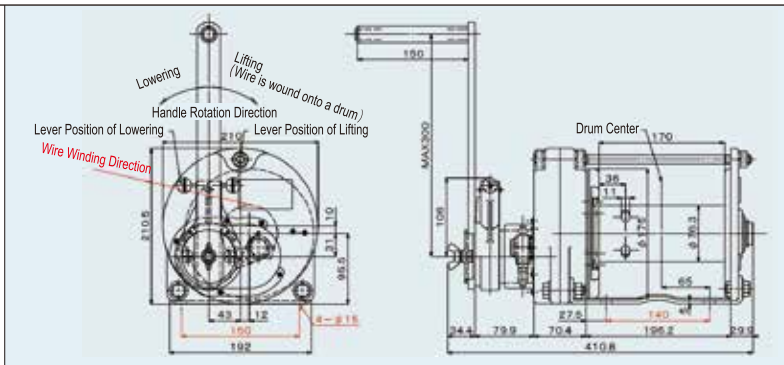
Model	RST-3-SI	Drum Capacity	φ6mm × 32m (6 Layers Winding)	Handle Force Handle Length (Effective Max.) 250mm	Winding Layer Number of Wire Rope	Gear Ratio	1/6.25
Wire Rope Tension	2,940N (300kgf) 5th Layer or Less				1st Layer : 76N (7.7kgf) 3rd Layer : 103N (10.5kgf) 5th Layer : 131N (13.3kgf)	Weight (Body + Handle)	15.9kg

RST-5-SI (500kgf)



Model	RST-5-SI	Drum Capacity	φ6mm × 40m (6 Layers Winding)	Handle Force Handle Length (Effective Max.) 250mm	Winding Layer Number of Wire Rope	Gear Ratio	1/8.9
Wire Rope Tension	4,900N (500kgf) 5th Layer or Less				1st Layer : 109N (11.1kgf) 3rd Layer : 142N (14.4kgf) 5th Layer : 174N (17.7kgf)	Weight (Body + Handle)	17.2kg

RST-10-SI (1,000kgf)

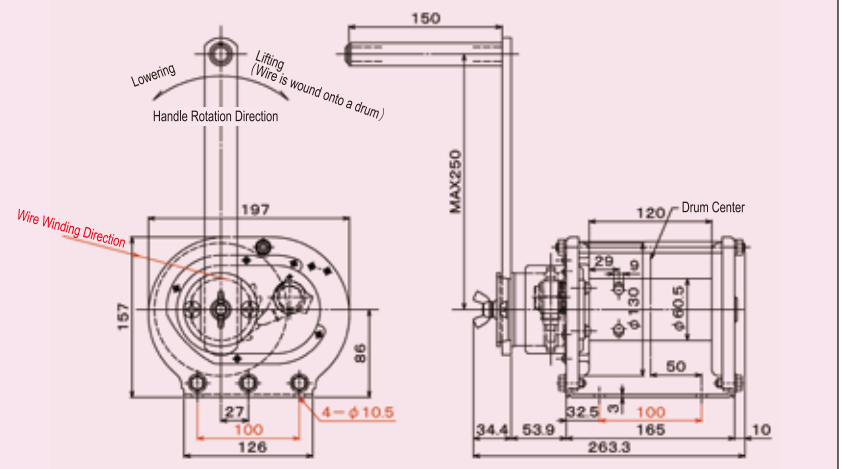


Model	RST-10-SI	Drum Capacity	φ8mm × 35m (5 Layers Winding)	Handle Force Handle Length (Effective Max.) 300mm	Winding Layer Number of Wire Rope	Gear Ratio	1/12.6
Wire Rope Tension	9,800N (1,000kgf) 3rd Layer or Less				1st Layer : 133N (13.5kgf) 2nd Layer : 157N (16.0kgf) 3rd Layer : 182N (18.5kgf)	Weight (Body + Handle)	18.2kg

Steel Hot Dip Galvanizing (Rotating) Winch

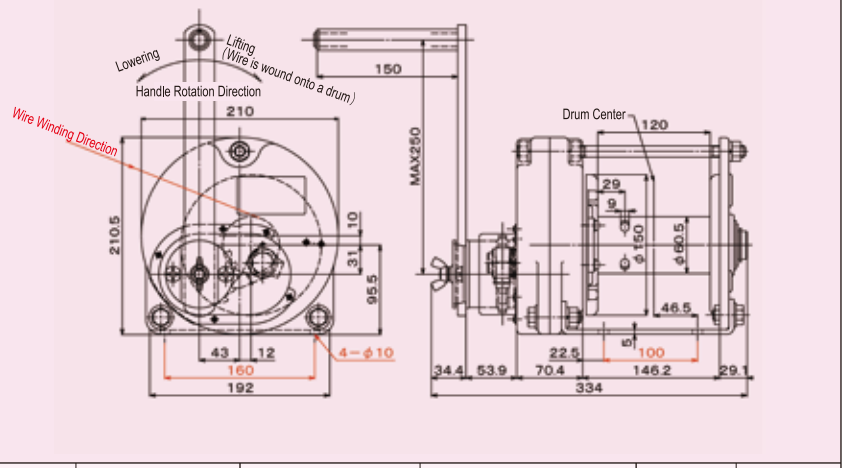
●Select this type when the handle can rotate 360 degrees on mounting position.
●It has excellent rust-proof, salt tolerance, and lower cost than stainless steel.

GM-1-GS-SI (100kgf)



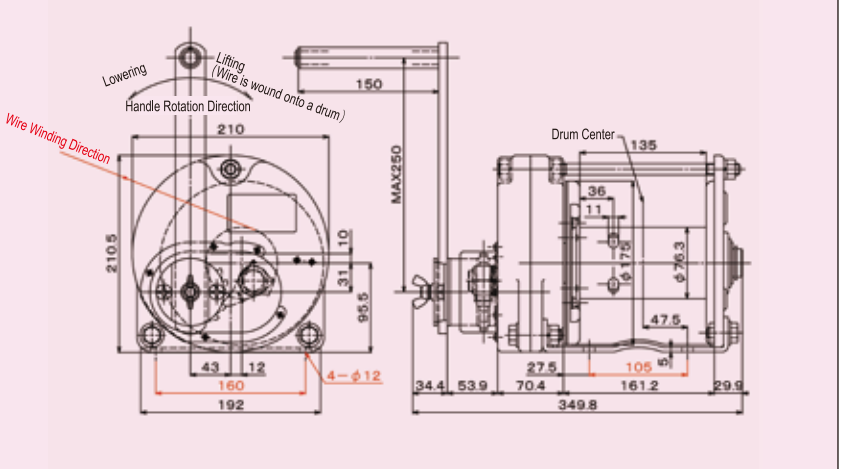
Model	GM−1−GS−SI		Drum Capacity	φ5mm × 35m (6 Layers Winding)	Handle Force Handle Length (Effective Max.) 250mm	Winding Layer Number of Wire Rope	Gear Ratio	1／1
Wire Rope Tension	980N (100kgf)	4th Layer or Less				1st Layer : 143N (14.6kgf) 3rd Layer : 187N (19.0kgf) 4th Layer : 208N (21.2kgf)	Weight (Body + Handle)	7.2kg

GM-3-GS-SI (300kgf)



Model	GM−3−GS−SI		Drum Capacity	φ6mm × 32m (6 Layers Winding)	Handle Force Handle Length (Effective Max.) 250mm	Winding Layer Number of Wire Rope	Gear Ratio	1／6.25
Wire Rope Tension	2,940N (300kgf)	5th Layer or Less				1st Layer : 76N (7.7kgf) 3rd Layer : 103N (10.5kgf) 5th Layer : 131N (13.3kgf)	Weight (Body + Handle)	14.1kg

GM-5-GS-SI (500kgf)

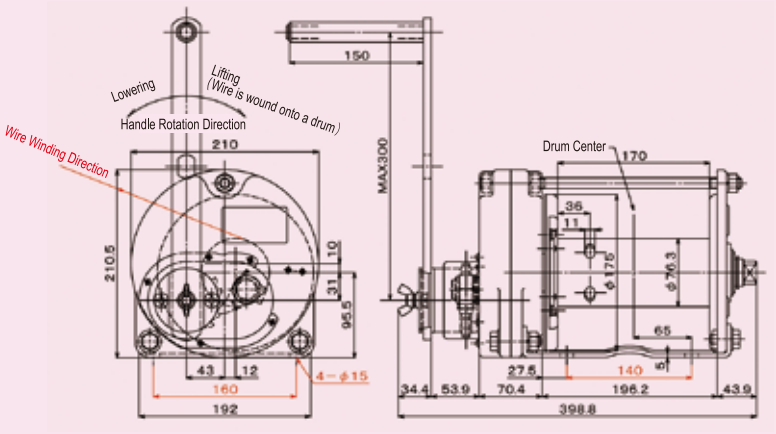


Model	GM−5−GS−SI		Drum Capacity	φ6mm × 40m (6 Layers Winding)	Handle Force Handle Length (Effective Max.) 250mm	Winding Layer Number of Wire Rope	Gear Ratio	1／8.9
Wire Rope Tension	4,900N (500kgf)	5th Layer or Less				1st Layer : 109N (11.1kgf) 3rd Layer : 142N (14.4kgf) 5th Layer : 174N (17.7kgf)	Weight (Body + Handle)	15.4kg

※ Drum capacity include the length of extra maintenance winding.
※ Wire rope tension is the value of standard layer or less. If the winding layer number exceeds the standard layer, decrease the wire rope tension according to the ratio.

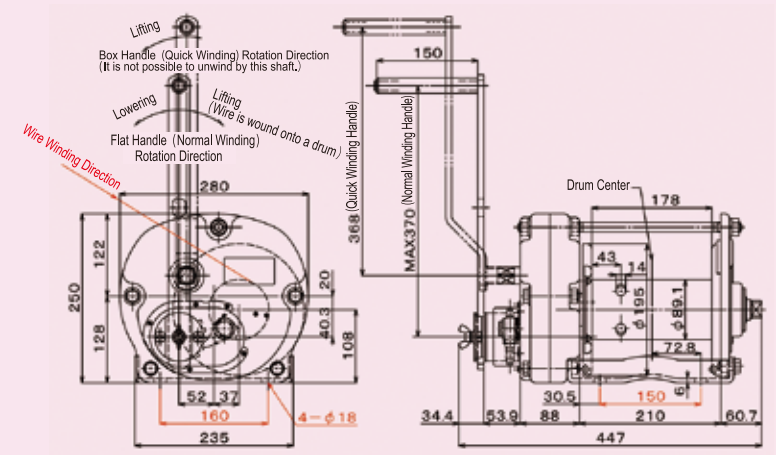
※It is possible to manufacture ratchet-handle type and capstan-drum type. To order, please specify as for example MR-5-GS-SI, MC-5-GS-SI.
※The parts performed hot dip galvanizing are gear case, gear case cover, drum, side frame, bed, clutch cover and handle arm.
※Stay bolt, bolts, screws, nuts, retaining ring and spring are made of SUS-304.

GM-10-GS-SI (1,000kgf)



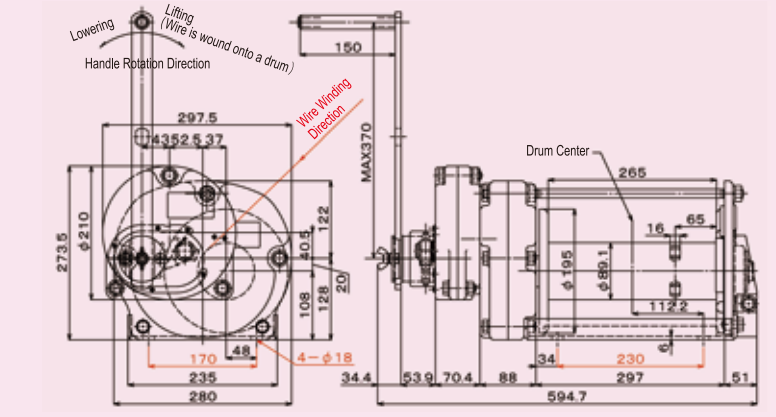
Model	GM−10−GS−SI	Drum Capacity	ϕ8mm × 35m (5 Layers Winding)	Handle Force Handle Length (Effective Max.) 300mm	Winding Layer Number of Wire Rope	Gear Ratio	1/12.6
Wire Rope Tension	9,800N (1,000kgf) 3rd Layer or Less				1st Layer : 133N (13.5kgf) 2nd Layer : 157N (16.0kgf) 3rd Layer : 182N (18.5kgf)	Weight (Body + Handle)	16.4kg

GM-20-GS-SI (2,000kgf)



Model	GM−20−GS−SI	Drum Capacity	ϕ9mm × 38m (5 Layers Winding)	Handle Force Handle Length (Effective Max.) 370mm	Winding Layer Number of Wire Rope	Gear Ratio	Quick Winding : 1/4 Normal Winding : 1/20
Wire Rope Tension	Normal Winding : 3,920N (400kgf) 3rd Layer or Less Quick Winding : 19,600N (2,000kgf)				1st Layer : 157N (16.0kgf) 2nd Layer : 186N (18.9kgf) 3rd Layer : 214N (21.8kgf)	Weight (Body + Handle)	28.2kg

GM-30-GS-SI (3,000kgf)

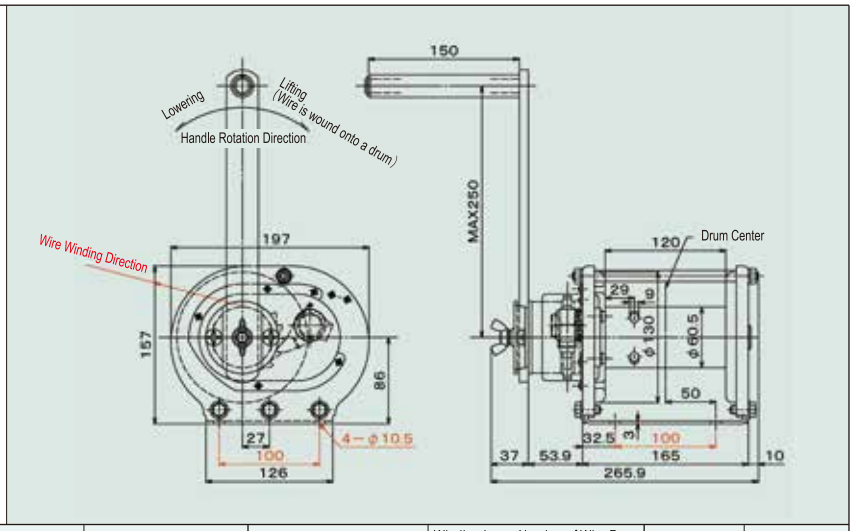


Model	GM−30−GS−SI	Drum Capacity	ϕ12mm × 35m (4 Layers Winding)	Handle Force Handle Length (Effective Max.) 370mm	Winding Layer Number of Wire Rope	Gear Ratio	1/35.5
Wire Rope Tension	29,400N (3,000kgf) 3rd Layer or Less				1st Layer : 137N (13.9kgf) 2nd Layer : 169N (17.2kgf) 3rd Layer : 201N (20.5kgf)	Weight (Body + Handle)	37.7kg

Steel (Rotating) Winch

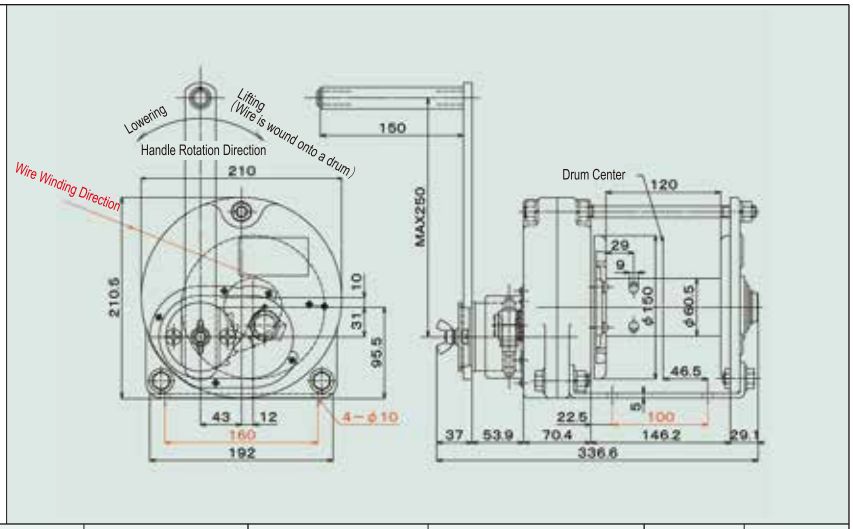
●Select this type when the handle can rotate 360 degrees on mounting position.

GM-1-SI (100kgf)



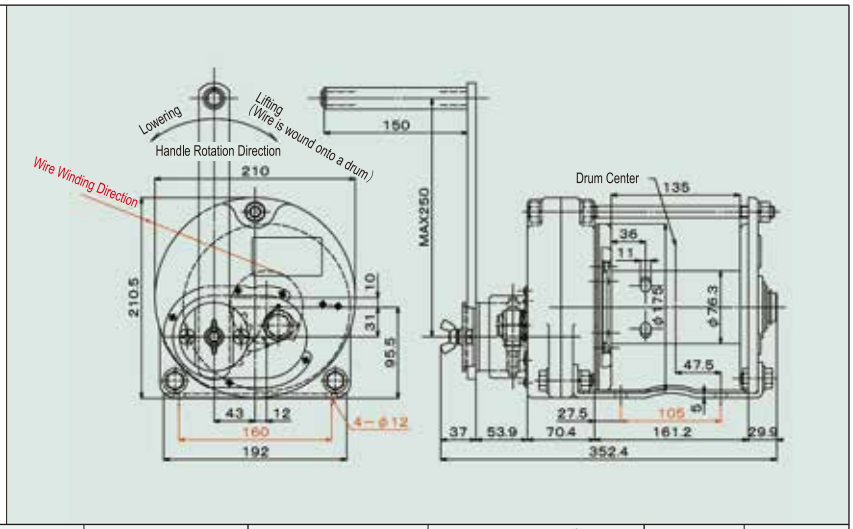
Model	GM−1−SI		Drum Capacity	φ5mm × 35m (6 Layers Winding)	Handle Force Handle Length (Effective Max.) 250mm	Winding Layer Number of Wire Rope	Gear Ratio	1／1
Wire Rope Tension	980N (100kgf)	4th Layer or Less				1st Layer : 143N (14.6kgf) 3rd Layer : 187N (19.0kgf) 4th Layer : 208N (21.2kgf)	Weight (Body + Handle)	7.2kg

GM-3-SI (300kgf)



Model	GM−3−SI		Drum Capacity	φ6mm × 32m (6 Layers Winding)	Handle Force Handle Length (Effective Max.) 250mm	Winding Layer Number of Wire Rope	Gear Ratio	1／6.25
Wire Rope Tension	2,940N (300kgf)	5th Layer or Less				1st Layer : 76N (7.7kgf) 3rd Layer : 103N (10.5kgf) 5th Layer : 131N (13.3kgf)	Weight (Body + Handle)	14.1kg

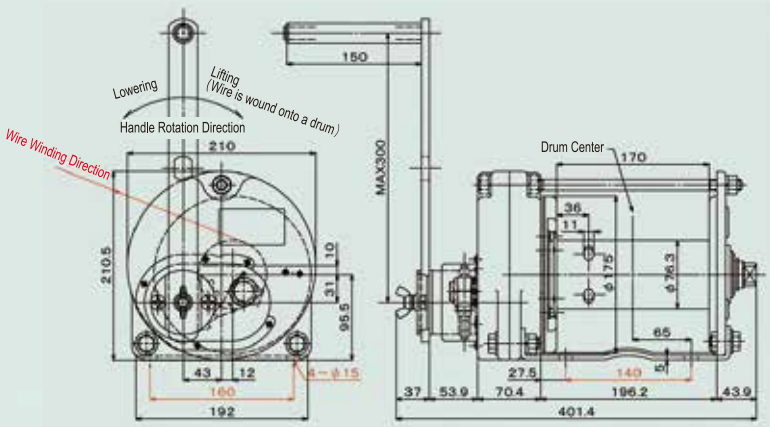
GM-5-SI (500kgf)



Model	GM−5−SI		Drum Capacity	φ6mm × 40m (6 Layers Winding)	Handle Force Handle Length (Effective Max.) 250mm	Winding Layer Number of Wire Rope	Gear Ratio	1／8.9
Wire Rope Tension	4,900N (500kgf)	5th Layer or Less				1st Layer : 109N (11.1kgf) 3rd Layer : 142N (14.4kgf) 5th Layer : 174N (17.7kgf)	Weight (Body + Handle)	15.4kg

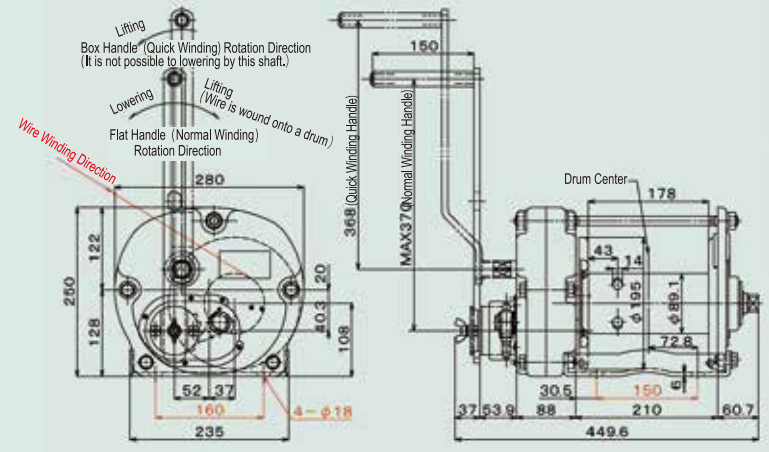
※ Drum capacity include the length of extra maintenance winding.
※ Wire rope tension is the value of standard layer or less. If the winding layer number exceeds the standard layer, decrease the wire rope tension according to the ratio.

GM-10-SI (1,000kgf)



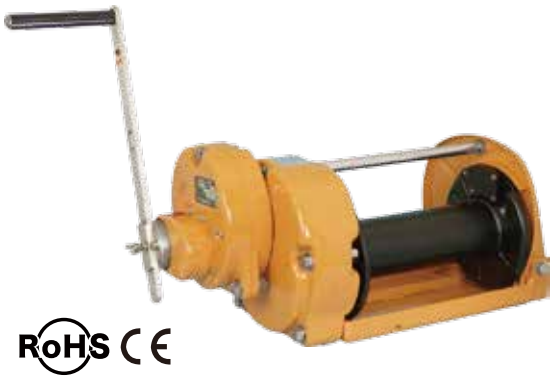
Model	GM-10-SI	Drum Capacity	φ8mm × 35m (5 Layers Winding)	Handle Force Handle Length (Effective Max.) 300mm	Winding Layer Number of Wire Rope 1st Layer : 133N (13.5kgf) 2nd Layer : 157N (16.0kgf) 3rd Layer : 182N (18.5kgf)	Gear Ratio	1/12.6
Wire Rope Tension	9,800N (1,000kgf) 3rd Layer or Less					Weight (Body + Handle)	16.4kg

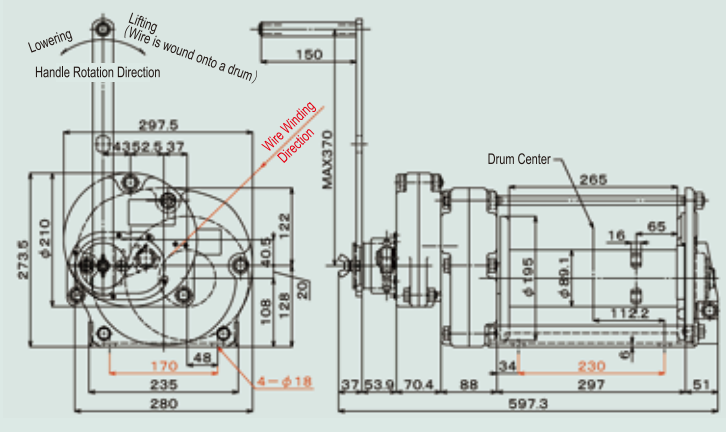
GM-20-SI (2,000kgf)



Model	GM-20-SI	Drum Capacity	φ9mm × 38m (5 Layers Winding)	Handle Force Handle Length (Effective Max.) 370mm	Winding Layer Number of Wire Rope 1st Layer : 157N (16.0kgf) 2nd Layer : 186N (18.9kgf) 3rd Layer : 214N (21.8kgf)	Gear Ratio	Quick Winding : 1/4 Normal Winding : 1/20
Wire Rope Tension	Quick Winding : 3,920N (400kgf) Normal Winding : 19,600N (2,000kgf) 3rd Layer or Less					Weight (Body + Handle)	28.2kg

GM-30-SI (3,000kgf)



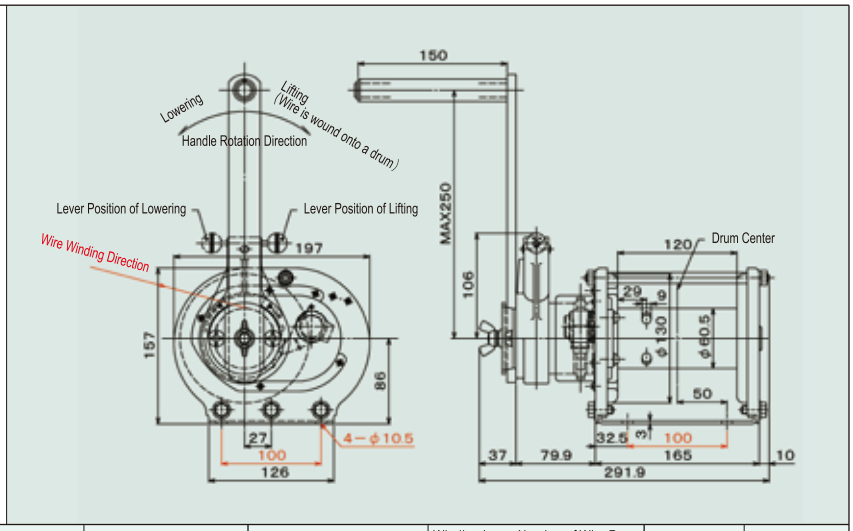


Model	GM-30-SI	Drum Capacity	φ12mm × 35m (4 Layers Winding)	Handle Force Handle Length (Effective Max.) 370mm	Winding Layer Number of Wire Rope 1st Layer : 137N (13.9kgf) 2nd Layer : 169N (17.2kgf) 3rd Layer : 201N (20.5kgf)	Gear Ratio	1/35.5
Wire Rope Tension	29,400N (3,000kgf) 3rd Layer or Less					Weight (Body + Handle)	37.7kg

Steel (Ratchet) Winch

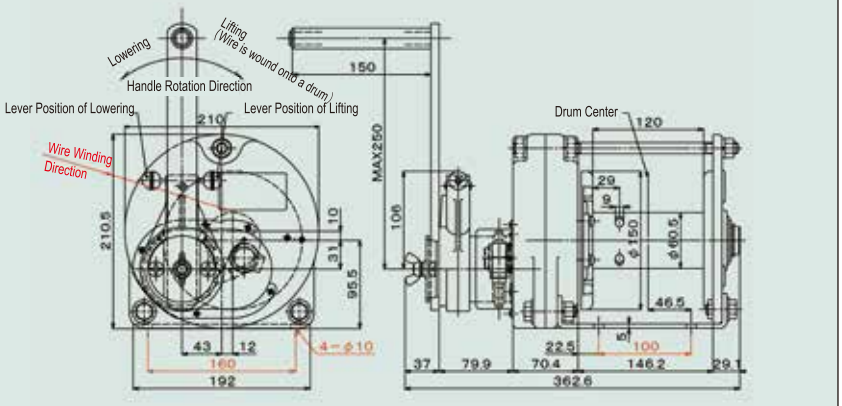
● It is a ratchet handle winch and using left-right motion of the handle to perform lifting and lowering, and can be installed directly in cramped locations where handle cannot be rotated such as wall and floor.

MR-1-SI (100kgf)



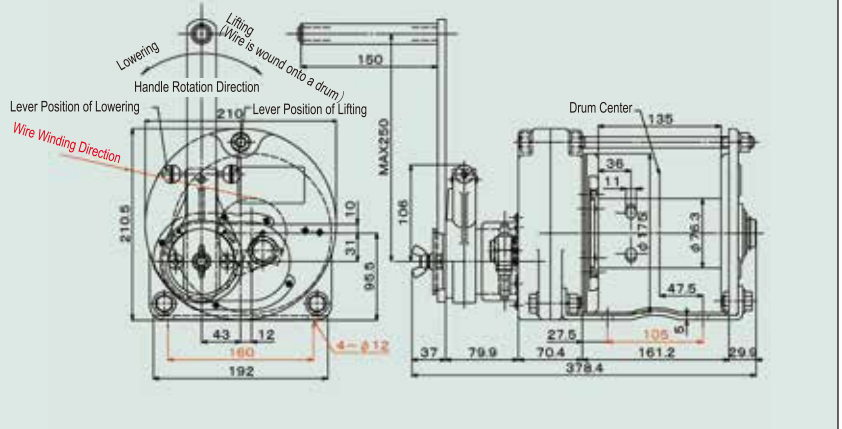
Model	MR−1−SI		Drum Capacity	φ5mm × 35m (6 Layers Winding)	Handle Force Handle Length (Effective Max.) 250mm	Winding Layer Number of Wire Rope	Gear Ratio	1/1
Wire Rope Tension	980N (100kgf)	4th Layer or Less				1st Layer : 143N (14.6kgf) 3rd Layer : 187N (19.0kgf) 4th Layer : 208N (21.2kgf)	Weight (Body + Handle)	8.1kg

MR-3-SI (300kgf)



Model	MR−3−SI		Drum Capacity	φ6mm × 32m (6 Layers Winding)	Handle Force Handle Length (Effective Max.) 250mm	Winding Layer Number of Wire Rope	Gear Ratio	1/6.25
Wire Rope Tension	2,940N (300kgf)	5th Layer or Less				1st Layer : 76N (7.7kgf) 3rd Layer : 103N (10.5kgf) 5th Layer : 131N (13.3kgf)	Weight (Body + Handle)	15.0kg

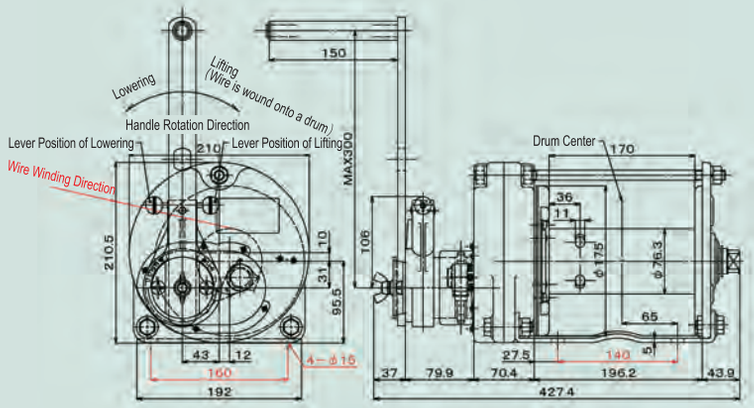
MR-5-SI (500kgf)



Model	MR−5−SI		Drum Capacity	φ6mm × 40m (6 Layers Winding)	Handle Force Handle Length (Effective Max.) 250mm	Winding Layer Number of Wire Rope	Gear Ratio	1/8.9
Wire Rope Tension	4,900N (500kgf)	5th Layer or Less				1st Layer : 109N (11.1kgf) 3rd Layer : 142N (14.4kgf) 5th Layer : 174N (17.7kgf)	Weight (Body + Handle)	16.3kg

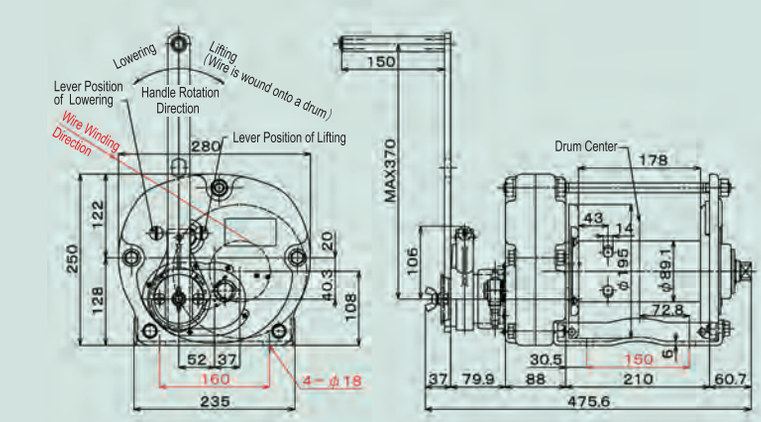
※ Drum capacity include the length of extra maintenance winding.
※ Wire rope tension is the value of standard layer or less. If the winding layer number exceeds the standard layer, decrease the wire rope tension according to the ratio.

MR-10-SI (1,000kgf)



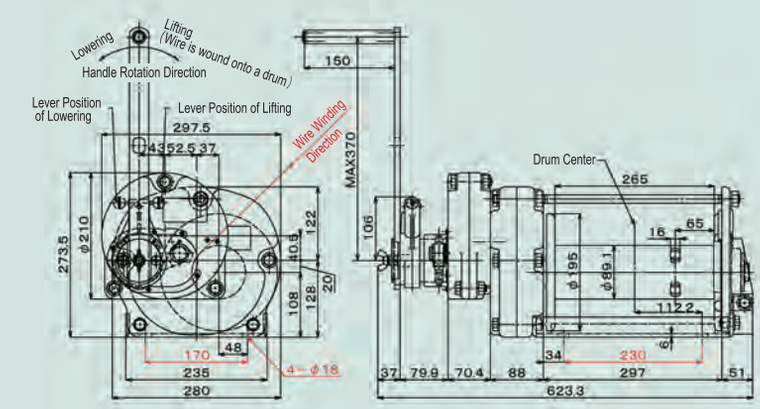
Model	MR−10−SI	Drum Capacity	ϕ8mm × 35m (5 Layers Winding)	Handle Force Handle Length (Effective Max.) 300mm	Winding Layer Number of Wire Rope	Gear Ratio	1／12.6
Wire Rope Tension	9,800N (1,000kgf) 3rd Layer or Less				1st Layer : 133N (13.5kgf) 2nd Layer : 157N (16.0kgf) 3rd Layer : 182N (18.5kgf)	Weight (Body + Handle)	17.3kg

MR-20-SI (2,000kgf)



Model	MR−20−SI	Drum Capacity	ϕ9mm × 38m (5 Layers Winding)	Handle Force Handle Length (Effective Max.) 370mm	Winding Layer Number of Wire Rope	Gear Ratio	1／20
Wire Rope Tension	19,600N (2,000kgf) 3rd Layer or Less				1st Layer : 157N (16.0kgf) 2nd Layer : 186N (18.9kgf) 3rd Layer : 214N (21.8kgf)	Weight (Body + Handle)	29.1kg

MR-30-SI (3,000kgf)

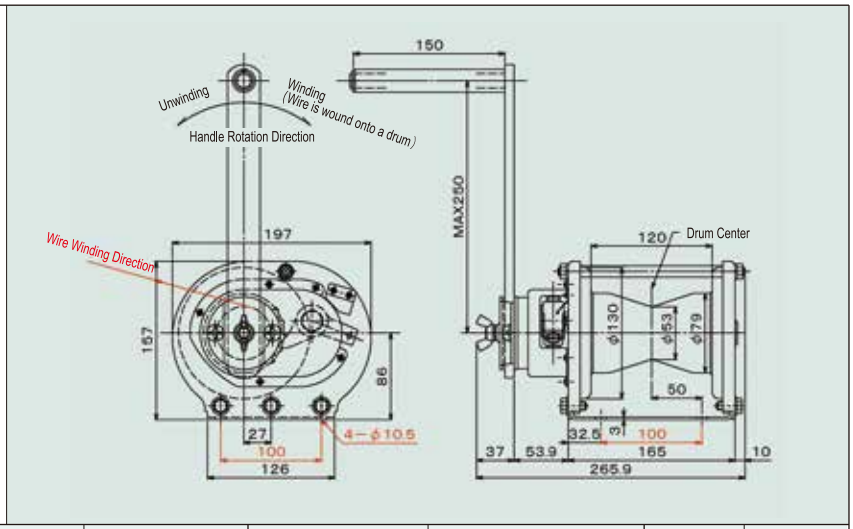


Model	MR−30−SI	Drum Capacity	ϕ12mm × 35m (4 Layers Winding)	Handle Force Handle Length (Effective Max.) 370mm	Winding Layer Number of Wire Rope	Gear Ratio	1／35.5
Wire Rope Tension	29,400N (3,000kgf) 3rd Layer or Less				1st Layer : 137N (13.9kgf) 2nd Layer : 169N (17.2kgf) 3rd Layer : 201N (20.5kgf)	Weight (Body + Handle)	38.6kg

Steel (Capstan) Winch

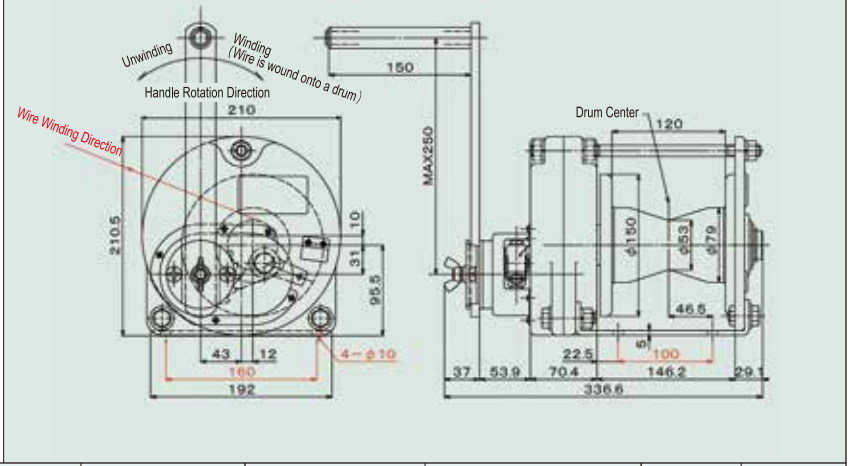
● Wind 5 or 7 wraps of wire rope onto the drum, and haul in the same length as the wire rope wound on the drum while rotating the handle. To do this, apply tension to the wire rope being hauled in to avoid slipping of the drum and wire rope wound on the drum. (The length of the wire

MC-1 (100kgf)



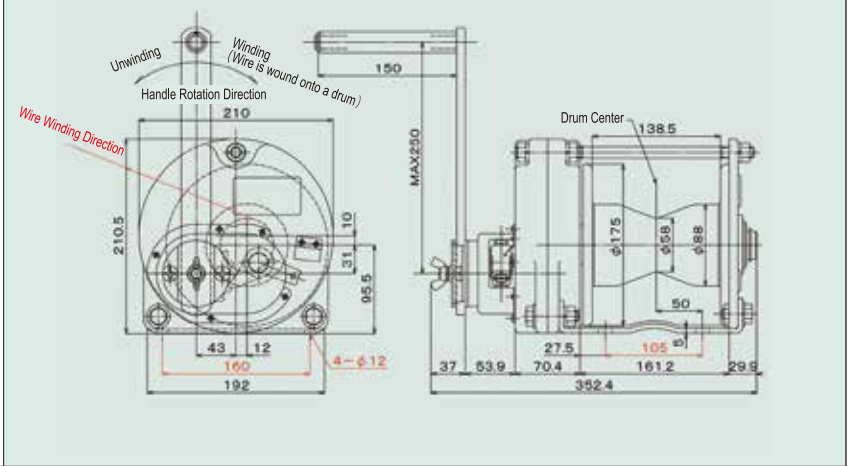
Model	MC−1	Wire Rope	φ5mm	Handle Force Handle Length (Effective Max.) 250mm	122N (12.4kgf)	Gear Ratio	1/1
Wire Rope Tension	980N (100kgf)	Winding Wire Rope	5 or 7 Wraps			Weight (Body + Handle)	8.9kg

MC-3 (300kgf)



Model	MC−3	Wire Rope	φ6mm	Handle Force Handle Length (Effective Max.) 250mm	64N (6.5kgf)	Gear Ratio	1/6.25
Wire Rope Tension	2,940N (300kgf)	Winding Wire Rope	5 or 7 Wraps			Weight (Body + Handle)	15.8kg

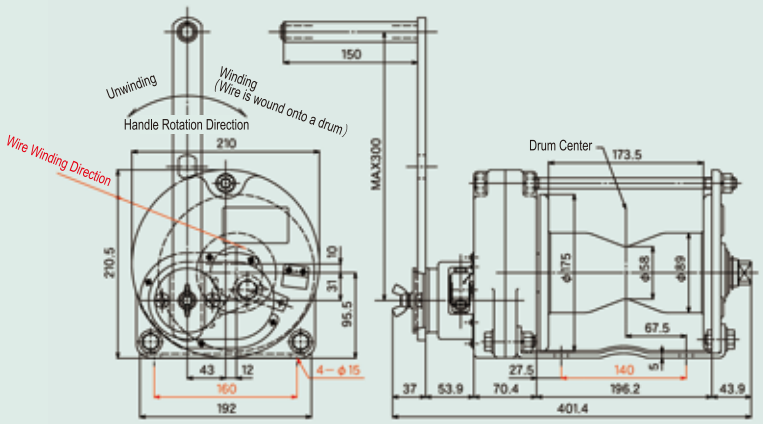
MC-5 (500kgf)



Model	MC−5	Wire Rope	φ6mm	Handle Force Handle Length (Effective Max.) 250mm	84N (8.5kgf)	Gear Ratio	1/8.9
Wire Rope Tension	4,900N (500kgf)	Winding Wire Rope	5 or 7 Wraps			Weight (Body + Handle)	17.8kg

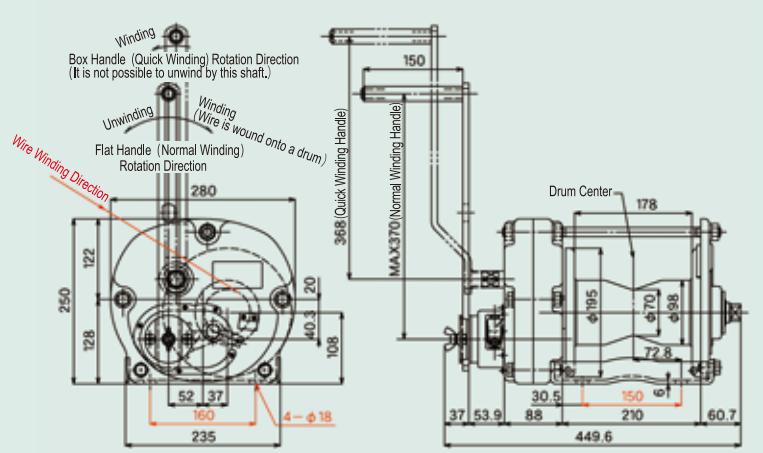
Rope to be used is endless.)

MC-10 (1,000kgf)



Model	MC−10	Wire Rope	φ8mm	Handle Force Handle Length (Effective Max.) 300mm	106N (10.8kgf)	Gear Ratio	1/12.6
Wire Rope Tension	9,800N (1,000kgf)	Winding Wire Rope	5 or 7 Wraps			Weight (Body + Handle)	20.1kg

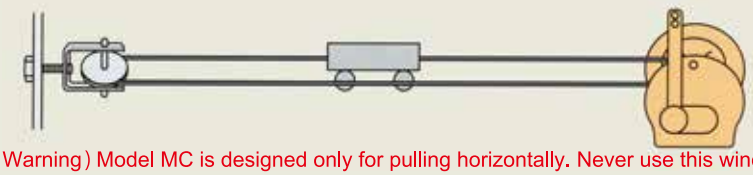
MC-20 (2,000kgf)



Model	MC−20	Wire Rope	φ9mm	Handle Force Handle Length (Effective Max.) 370mm	128N (13.0kgf)	Gear Ratio	Quick Winding : 1/4 Normal Winding : 1/20
Wire Rope Tension	Normal Winding : 3,920N (400kgf) Quick Winding : 19,600N (2,000kgf)	Winding Wire Rope	5 or 7 Wraps			Weight (Body + Handle)	31.3kg

Capstan winch is mainly used in the following cases :

1. Movement of Truck
2. Opening and Closing of Stage Setting
3. Device for Opening / Closing Arcade
4. Stretching a Safety Net for Training of Fire Department



Warning) Model MC is designed only for pulling horizontally. Never use this winch for lifting vertically. It may cause accident and failure.

■ Please refer to the following table to find the amount of tension required.

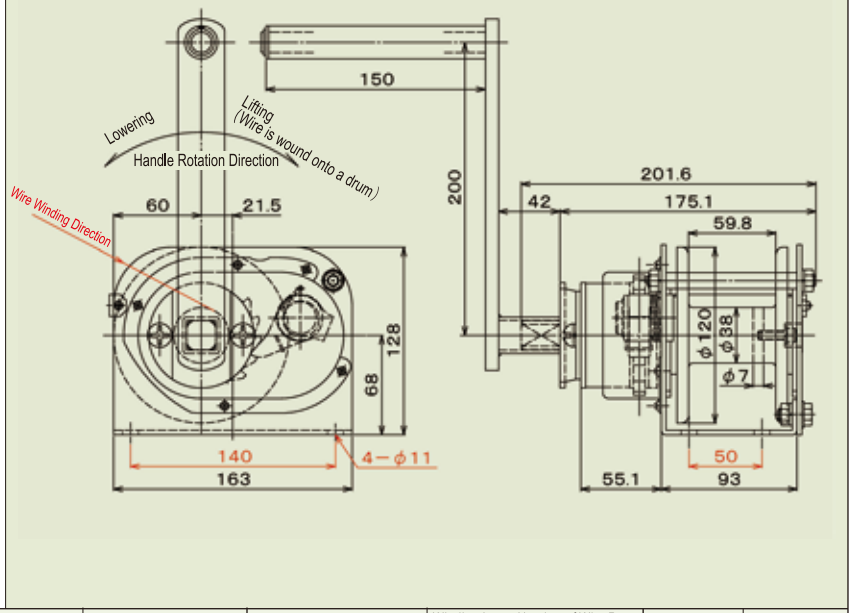
Model	MC−1	MC−3	MC−5	MC−10	MC−20
Tension for Hauling in the Wire Rope	20N or more (2kgf or more)	40N or more (4kgf or more)	69N or more (7kgf or more)	128N or more (13kgf or more)	245N or more (25kgf or more)

※ The value shown on the diagram is the value of wound the wire rope around the center of the capstan drum 7 times.

Mini MAXPULL Winch

● Important parts such as mechanical brake are made with model GM common parts to making it robust, but mounting pitch is 140 mm × 50 mm, super compact design with weight of 5 kg. It is the best winch for customers who place importance on safety and reliability even in small size.

GM-1LH-SI (100kgf)



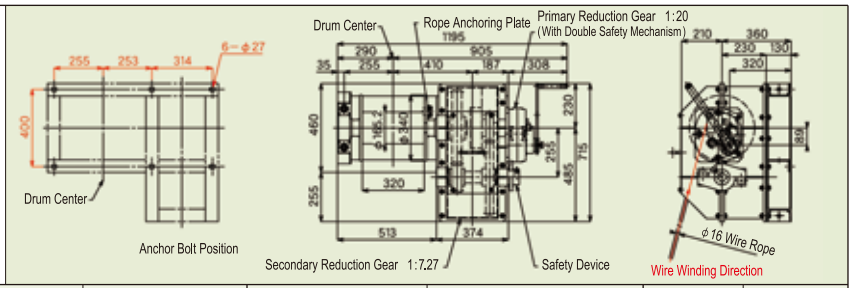
Model	GM−1LH−SI	Drum Capacity	φ4mm × 22m (8 Layers Winding)	Handle Force Handle Length 200mm	Winding Layer Number of Wire Rope	Gear Ratio	1/1
Wire Rope Tension	980N (100kgf) 5th Layer or Less				1st Layer : 112N (11.4kgf) 3rd Layer : 155N (15.8kgf) 5th Layer : 197N (20.1kgf)	Weight (Body)	5.0kg

※ An automatic brake is used. (Rotating the handle clockwise when lifting, and counterclockwise when lowering.)

Large Manual Winch for Industrial Use

● Winches in this series are widely used for ships, large equipment and devices, maintenance of plants, opening and closing of floodgates, and other applications.

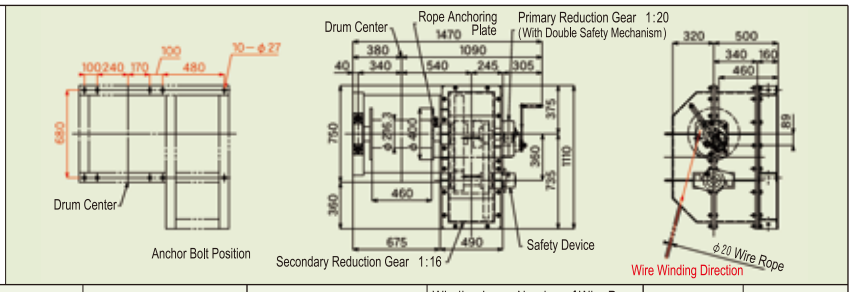
GM-50 (5,000kgf)



Model	GM−50	Drum Capacity	φ16mm × 52m (4 Layers Winding)	Handle Force Handle Length (Effective Max.) 370mm	Winding Layer Number of Wire Rope	Gear Ratio	1/145
Wire Rope Tension	49,000N (5,000kgf) 3rd Layer or Less				1st Layer : 119N (12.1kgf) 3rd Layer : 160N (16.3kgf)	Weight	Approx. 400kg

※ Winding Length per Handle Rotation 1st Layer Approx. 3.9mm MAX Approx. 6.3mm

GM-100 (10,000kgf)



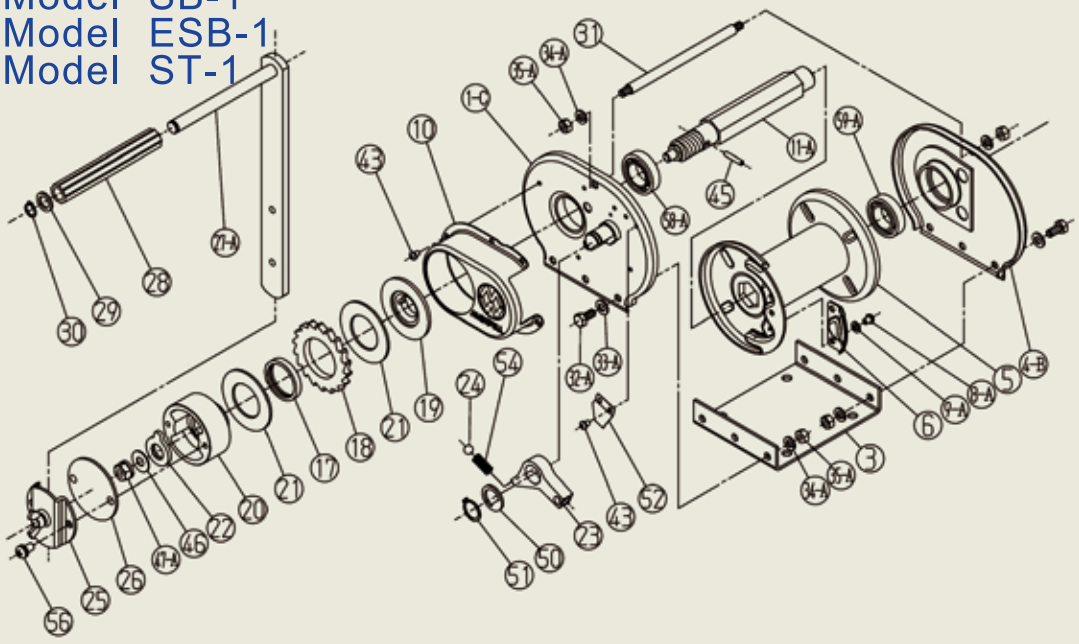
Model	GM−100型	Drum Capacity	φ20mm × 55m (3 Layers Winding)	Handle Force Handle Length (Effective Max.) 370mm	Winding Layer Number of Wire Rope	Gear Ratio	1/320
Wire Rope Tension	98,000N (10,000kgf) 3rd Layer or Less				1st Layer : 141N (14.3kgf) 3rd Layer : 188N (19.1kgf)	Weight	Approx. 750kg

※ Winding Length per Handle Rotation 1st Layer Approx. 2.3mm MAX Approx. 3.4mm

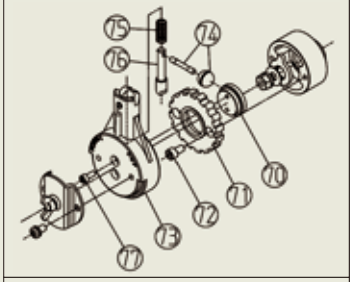
Notice) Please contact us if you' d like to request for custom-made winch of "GM-50" and "GM-100" .

Exploded View (Stainless Steel)

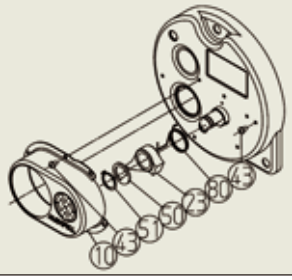
Model SB-1
Model ESB-1
Model ST-1



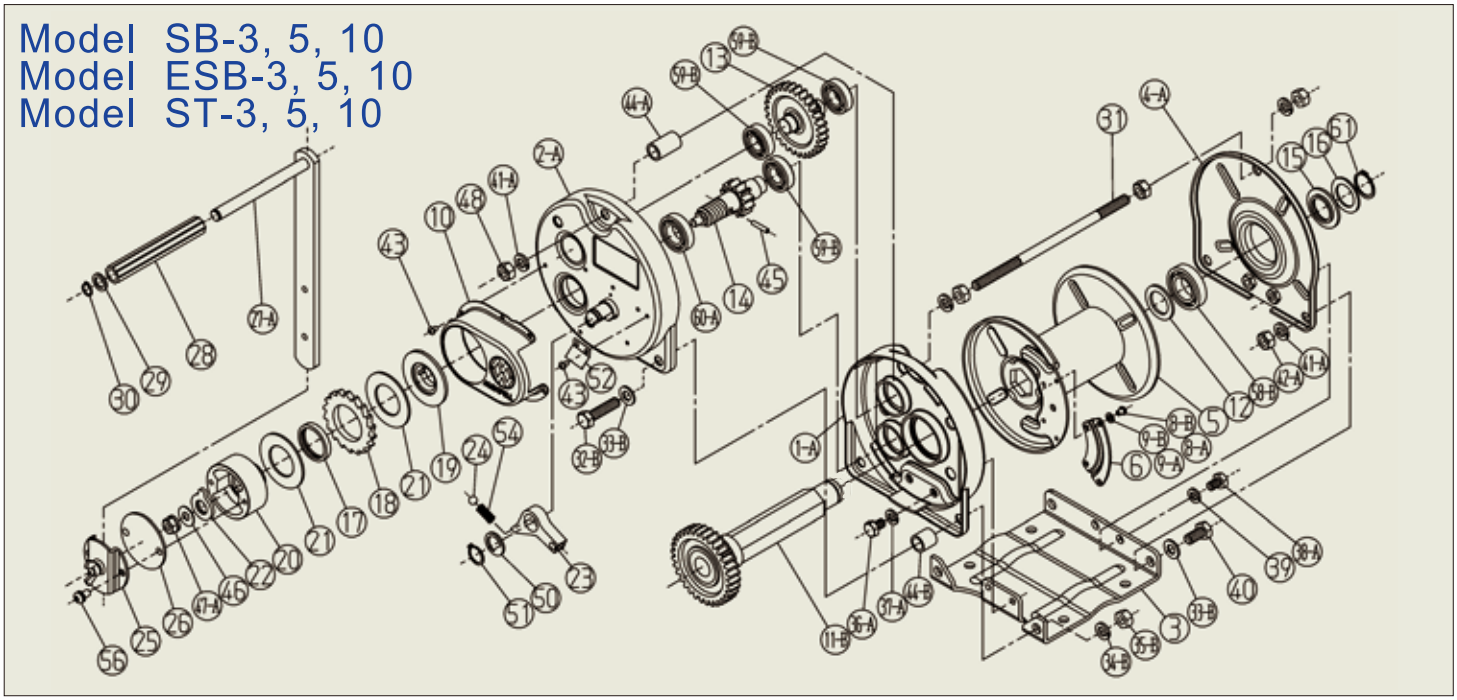
Model MR (Ratchet Type)
Parts of Ratchet Handle



Model SI (Stopper Armless Type)
Parts of Stopper



Model SB-3, 5, 10
Model ESB-3, 5, 10
Model ST-3, 5, 10

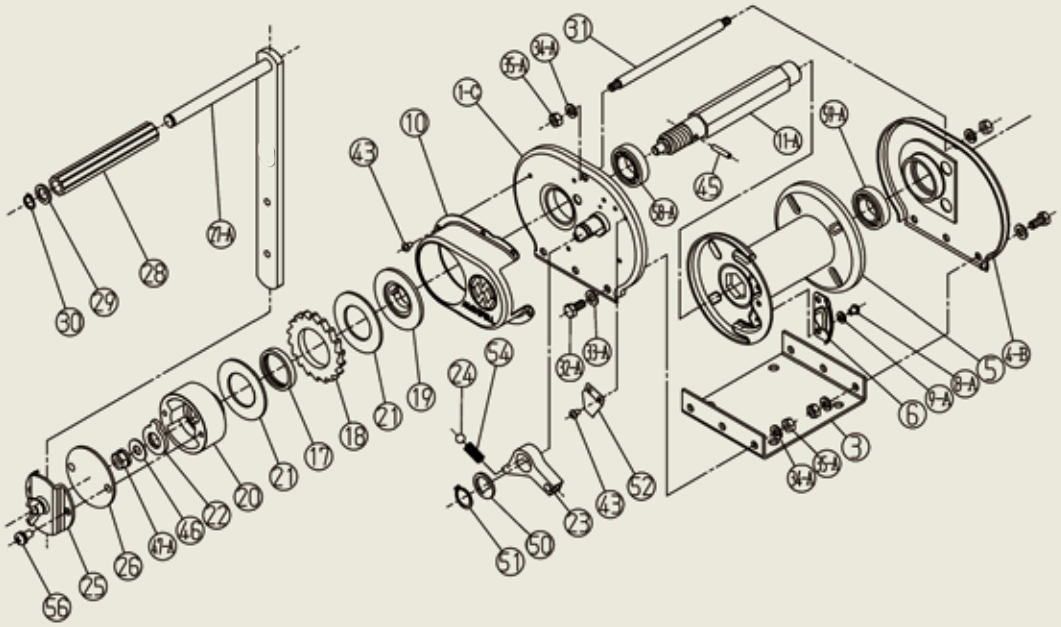


Part No.	Part Name	Qty.	Part No.	Part Name	Qty.	Part No.	Part Name	Qty.	Part No.	Part Name	Qty.
1-A	Gear Case	1	16	Shaft Washer B	1	44-A	Spacer	1	70	Axis Ratchet Type	1
1-C	Side Frame	1	17	Ratchet Metal	1	44-B	Spacer	2	71	Ratchet Wheel Ratchet Type	1
2-A	Gear Case Cover	1	18	Ratchet Gear	1	45	Parallel Pin	1	73	Ratchet Handle Ratchet Type	1
3	Bed Plate	1	19	Back Plate	1	46	Washer	1	74	Switch Lever Ratchet Type	1
4-A	Side Frame	1	20	Clutch	1	50	Hinge Pin Washer	1	75	Coil Spring Ratchet Type	1
4-B	Side Frame B	1	21	Brake Lining	2	52	Safety Leaf Spring	1	76	Switch Pin Ratchet Type	1
5	Drum	1	22	Dodecagon Hole Tongued Washer	1	54	Coil Spring	1			
6	Wire Anchoring Plate	1	23	Stopper	1	56	Pan Head Screw with Lock Washer Helspr	2	80	Torsion Spring Model SI	1
10	Clutch Cover	1	24	Steel Ball	1	58-A	Bearing Model -1	1			
11-A	Drum Shaft	1	25	Handle Holder with Butterfly Bolt	1	58-B	Bearing Model -3, -5, -10	1			
11-B	Drum Shaft Main Gear	1	26	Clutch Shield Plate	1	59-A	Bearing Model -1	1			
12	Shaft Distance Piece	1	27-A	Handle Arm	1	59-B	Bearing Model -3, -5, -10	3			
13	Spur Gear Pinion	1	28	Handle Grip	1	60-A	Bearing Model -3, -5, -10	1			
14	Clutch Pinion	1	29	Handle Washer	1						
15	Shaft Washer A	1	31	Stay Bolt	1						

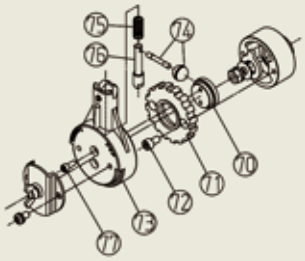
※ The bolts, nuts and retaining ring are made of SUS304, and the dimensions are same as standard type. Please refer to the dimension table of a standard type.
※ Main material of the ball bearing is SUS440C.

Exploded view (Steel)

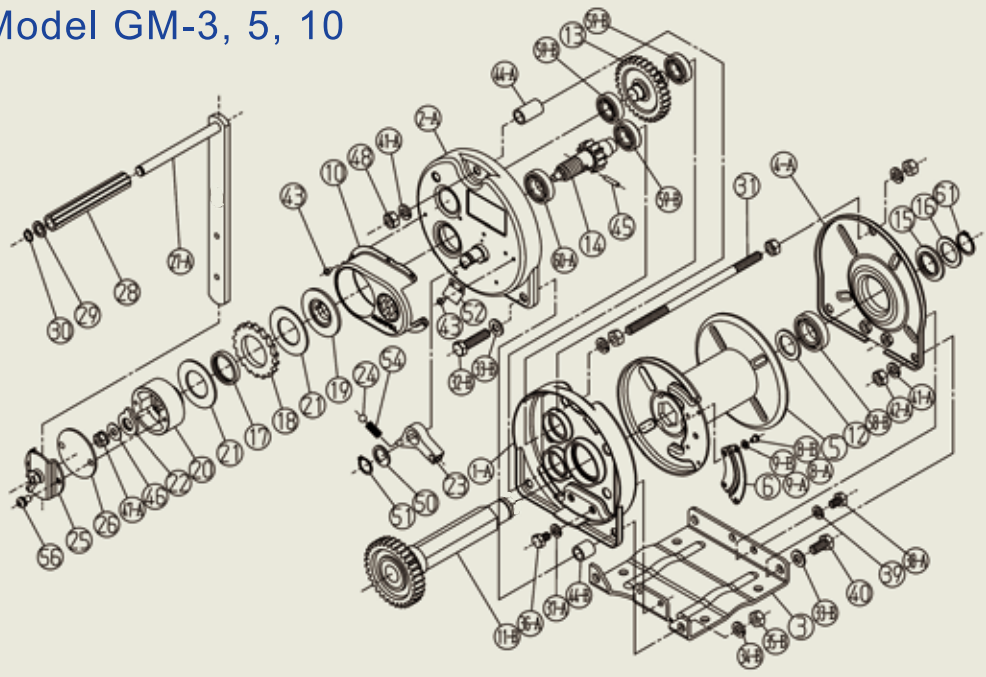
Model GM-1



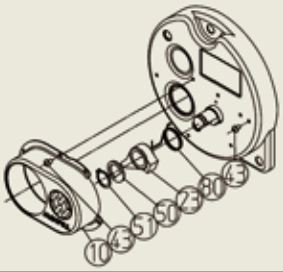
Model MR (Ratchet Type)
Parts of Ratchet Handle



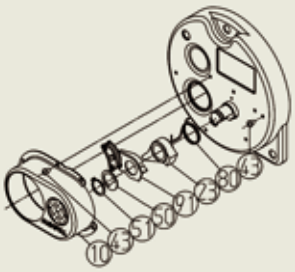
Model GM-3, 5, 10



Model SI (Stopper Armless Type)
Parts of Stopper

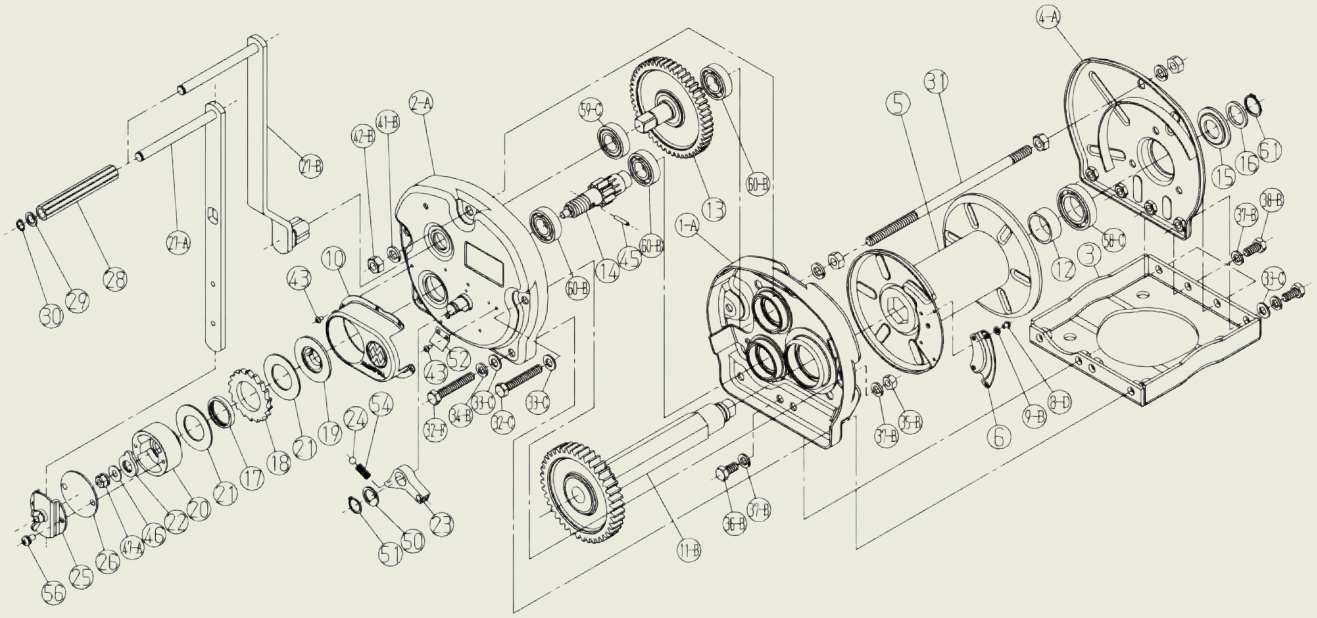


Model NSIL (Noiseless Type)
Parts of Stopper

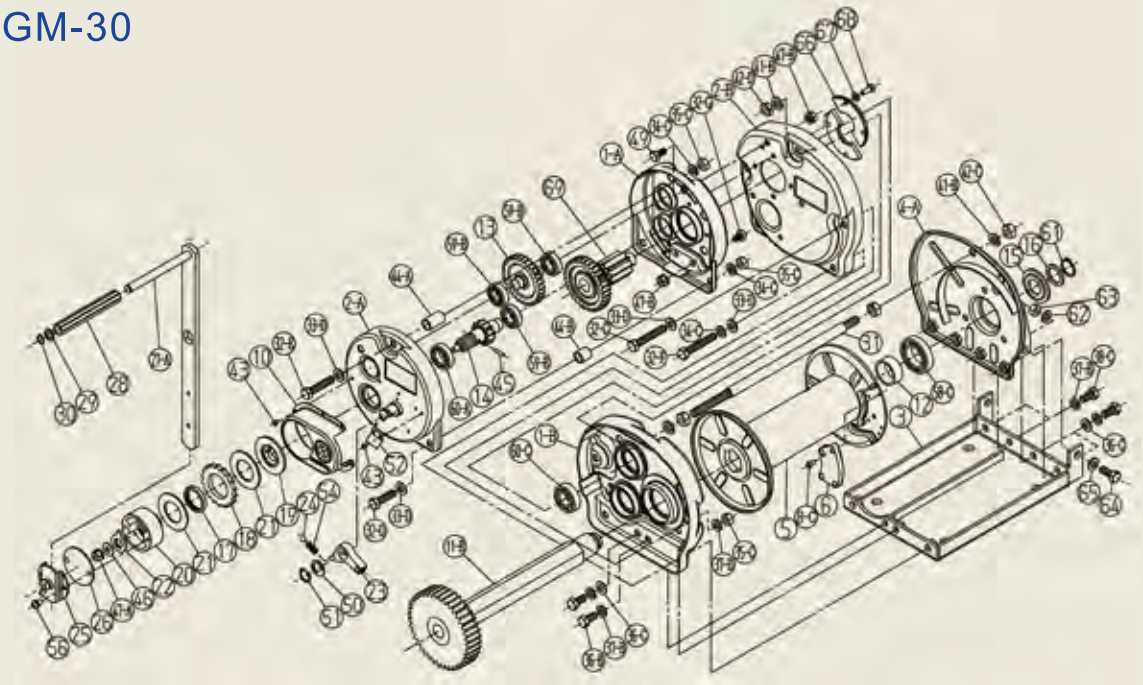


Part No.	Part Name	Qty.	Part No.	Part Name	Qty.	Part No.	Part Name	Qty.	Part No.	Part Name	Qty.
1-A	Gear Case	1	9-B	Spring Washer GM-5, 10, 20	4	23	Stopper	1	32-F	Hexagon Head Bolt GM-20, 30	2
1-B	Gear Case	1	10	Clutch Cover	1	24	Steel Ball	1	32-G	Hexagon Head Bolt GM-30	2
1-C	Side Frame A	1	11-A	Drum Shaft	1	25	Handle Holder with Butterfly Bolt	1	33-A	Plain Washer GM-1	6
2-A	Gear Case Cover	1	11-B	Drum Shaft Main Gear	1	26	Clutch Shield Plate	1	33-B	Plain Washer GM-3, 5, 10	4
2-B	Gear Case Cover	1	12	Shaft Distance Piece	1	27-A	Handle Arm	1	33-C	Plain Washer GM-20	5
3	Bed Plate	1	13	Spur Gear Pinion	1	27-B	Handle Arm GM-20	1	33-D	Plain Washer GM-30	7
4-A	Side Frame	1	14	Clutch Pinion	1	28	Handle Grip	1 - 2	34-A	Spring Washer GM-1	8
4-B	Side Frame B	1	15	Shaft Washer A	1	29	Handle Washer	1 - 2	34-B	Spring Washer GM-3, 5, 10, 20	2
5	Drum	1	16	Shaft Washer B	1	30	Retaining Ring C Type	1 - 2	34-C	Spring Washer GM-30	5
6	Wire Anchoring Plate	1	17	Ratchet Metal	1	31	Stay Bolt	1	35-A	Hexagon Nut GM-1	8
8-A	Hexagon Socket But -ton Head Cap Screw GM-1, 3	2	18	Ratchet Gear	1	32-A	Hexagon Head Bolt GM-1	6	35-B	Hexagon Nut GM-3, 5, 10, 20	2
8-B	Hexagon Socket But -ton Head Cap Screw GM-5, 10 , 20	4	19	Back Plate	1	32-B	Hexagon Head Bolt GM-3, 5, 10	2	35-C	Hexagon Nut GM-30	5
8-C	Hexagon Socket Head Cap Screw GM-30	4	20	Clutch	1	32-C	Hexagon Head Bolt GM-20, 30	2	36-A	Hexagon Head Bolt GM-3, 5, 10	2
8-D	Hexagon Socket But -ton Head Cap Screw GM-20	4	21	Brake Lining	2	32-D	Hexagon Head Bolt GM-30	2	36-B	Hexagon Head Bolt GM-20, 30	2
9-A	Spring Washer GM-1, 3 M6	2	22	Dodecagon Hole Tongued Washer	1	32-E	Hexagon Head Bolt GM-30	1	36-C	Plain Washer GM-30	3

Model GM-20



Model GM-30



Part No.	Part Name	Qty.	Part No.	Part Name	Qty.	Part No.	Part Name	Qty.	Part No.	Part Name	Qty.
37-A	Spring Washer GM-3, 5, 10	2	44-B	Spacer	2	59-A	Bearing GM-1	1	70	Axis Model MR	1
37-B	Spring Washer GM-20, 30	8	45	Parallel Pin	1	59-B	Bearing GM-3, 5, 10, 30	3	71	Ratchet Wheel Model MR	1
38-A	Hexagon Head Bolt GM-3, 5, 10	2	46	Washer	1	59-C	Bearing GM-20	1	72	Hexagon Socket Head Cap Screw Model MR	2
38-B	Hexagon Head Bolt GM-20	4	47-A	Hexagon Nut with Lock Washer Helspr	1	60-A	Bearing GM-3, 5, 10, 30	1	73	Ratchet Handle Model MR	1
38-C	Hexagon Head Bolt GM-30	4	47-B	Hexagon Nut GM-30	5	60-B	Bearing GM-20	3	74	Switch Lever Model MR	1
39	Spring Washer GM-3, 5, 10	2	48	Hexagon Nut	4	60-C	Bearing GM-30	1	75	Coil Spring Model MR	1
40	Hexagon Head Bolt GM-3, 5, 10	2	49	Hexagon Head Bolt GM-30	3	61	Retaining Ring C Type	1	76	Switch Pin Model MR	1
41-A	Spring Washer GM-3, 5, 10	5	50	Hinge Pin Washer	1	62	Spring Washer GM-30	2	77	Hexagon Socket Head Cap Screw Model MR	2
41-B	Spring Washer GM-20, 30	3	51	Retaining Ring C Type	1	63	Hexagon Nut GM-30	2			
42-A	Hexagon Head Bolt GM-3, 5, 10	2	52	Safety Leaf Spring	1	64	Hexagon Head Bolt GM-30	2	80	Torsion Spring Model SI, NSIL	1
42-B	Hexagon Head Bolt GM-20	4	54	Coil Spring	1	65	Plain Washer GM-30	2	91	Magnetic Plate Model NSIL	1 set
42-C	Hexagon Head Bolt GM-30	3	56	Phillips Pan Head Screw	2	66	Division Disc GM-30	1 set			
42-D	Hexagon Head Bolt GM-30	1	58-A	Bearing GM-1	1	67	Spring Washer GM-30	4			
43	Tapping Screw	7	58-B	Bearing GM-3, 5, 10	1	68	Hexagon Head Bolt GM-30	4			
44-A	Spacer	1	58-C	Bearing GM-20, 30	1	69	Main Gear Pinion GM-30	1			

Whatever the request, please contact us.
We will manufacture the most suitable winch with the capacity, type, size and uses of your desired.

Special Hand Winches

In addition to the standard products, our unique custom-made products are used in various fields. The uses, capacity, method and size are many and varied.
Our unique design responds adequately to customer expectations.
We are manufacturing various winches according to the number of demands.
For example, there is a winch such as for clean room and lifting the stage setting.
Please contact us if your business idea requires that something be "moved".

Winch for lifting the floodgate
(with universal joint)
Capacity : 75kgf + 75kgf = 150kgf (1,470N)
Model : GM-3-SI-WGD

Gear Ratio 1/1.2 endless winch for light load
Capacity : 50kgf (490N)
Model : ME-05SI-R1. 2-F8

Short drum winch
(For jib crane)
Capacity : 300kgf (2,940N)
Model : GM-3-LD60

Winch for fixing the rotary shaft of industrial equipment
(Latching brake)
Capacity : 4.5kgf m (44N m)
Model : ESBH-1-SE

Winch with wire holding unit
Capacity : 3,000kgf (29,400N)
Model : GM-30-FSPW

Stainless winch for nuclear power plant
Capacity Maximum : 150kgf (1,471N)
Minimum : 50kgf (490N)
Model : ESB-3-SDG138-Ⅱ

Winch for jib crane in chemical manufacturer
Dust proof and drip-proof type
Capacity : 300kgf (2,940N)
Model : ESB-3-SIC-LD60

4 ropes stainless winch for lifting precision lens
Capacity : 250kgf × 4 = 1,000kgf (9,800N)
Model : ERSB-10SI-4GD265

Winch for boat davit
Anti-rust painting specification
Capacity Normal : 2,400kgf (23,600N)
Proof Stress : 6,000kgf (58,800N)
Wire Rope : ϕ12.5mm × 16m × 2
Model : GM-60-OSN-C

4 ropes noiseless type stainless winch for lifting the drop curtain
Capacity : 125kgf × 4 = 500kgf (4,900N)
Model : GM-5SE-FGD-1

Winch with chain sprocket for winding the screen axis
Capacity : 70kgf (686N)
Model : ESB-07-SI-SH4030

Winch for lifting the basketball backboard
(Chain Link)
Capacity : 1,000kgf (9,800N)
Model : GM-10-SI-KS

Stainless steel winch for clean room
(A special fiber is used for rope)
Capacity Normal : 450kgf (4,410N)
Proof Stress : 1,000kgf (9,800N)
Model : ERSB-10-SI-GD165-Ⅱ

2 ropes stainless winch for optical manufacturer
(Fine adjustment is possible)
Capacity : 500kgf (4,900N)
Model : MNW-5-SUDWG165-R200

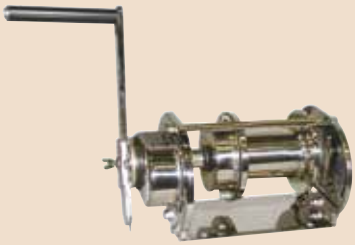
Winch for vertical banner
Capacity : 100kgf (980N)
Model : GM-1LH-SI-JY

Stainless winch for aircraft production line
Capacity : 60kgf (588N)
Model : ESB-06-D76PW

Winch for vessel fan damper
(With emergency lock release device)
Capacity : 1,000kgf (9,800N)
Model : ESB-10-LSTP

Winch with rotary counter and grooved drum
Capacity : 1,000kgf (9,800N)

Stainless winch with torque keeper
Capacity 1st Layer : 24.6kgf (241N)
4th Layer : 18.6kgf (176N)
Wire Rope : ϕ5mm × 20m
Model : SB-T1



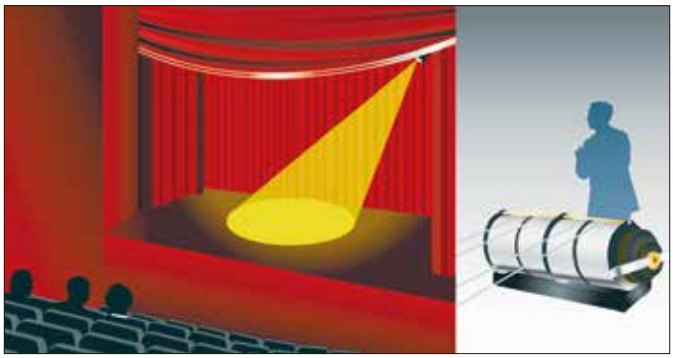
Noiseless type winch for lifting the drop curtain in National Bunraku Theater
Capacity : 300kgf (2,940N)
Wire Rope : ϕ6mm

Hot dip galvanizing winch with dog clutch type
Capacity : 250kgf (2,450N)
Model : GM-2.5-GSSI-SCB-DSU-140

Winch for Koinobori (carp streamer) event
Capacity : 1,000kgf (9,800N)
Model : GM-30YS6T-D165

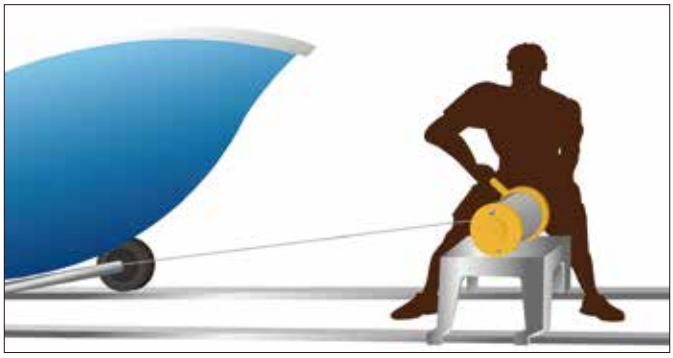
Some examples of thousand ways to use MAXPULL winches

Adaptability meets height adjustment of the working table like as conveyor.



Stage equipment (Drop curtain, lighting equipment, projection screen etc.) is lifted using several wire rope while maintaining synchronization.

Small winch is used in the lifting equipment of vertical banner. It never spoils the landscape because it is not visible from the outside.



Horizontal pulling of small boat, car or dolly in factory is easily.

Stainless steel winch is ideal for the place where sanitation is needed. (food factory, chemical plant, clean room, etc.)

Maxpull winches help to lift and lower various safety nets for baseball field, golf driving range, etc.

⚠ WARNING Read the manual before using these products in order to use correctly and safety.

Manufacturer

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E-mail : info@maxpull.co.jp

Quality Certificate CE

http://www.maxpull.co.jp

●Because of continued product improvement, we change the specifications, dimension and appearance without notice.

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