Notes on Installation

Installation

1. Orientation

Jacks can be installed horizontally, perpendicularly or inclined. Before installing, however, be sure to select the correct (lifting or suspending) jack type.

Provide oil pans for suspending jacks to prevent oil leaks.

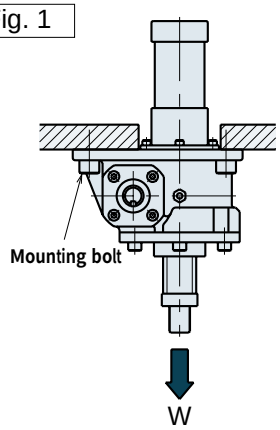
2. Installation Method

Tighten bolts into the 4 mounting holes in the gear case (mounting bolts are not provided). See Table 1 for bolt sizes. Strength class 8.8 or 10.9 bolts are usually used for mounting. Use 10.9 when load applies directly to the mounting bolts as in Fig. 1.

Table 1. Bolt Sizes

Frame No.	Mounting Hole	Bolt Size
JW002	4-φ7	M6
JW005	4-φ7	M6
JW010	4-φ9	M8
JW025	4-φ11	M10
JW050	4-φ18	M16
JW100	4-φ22	M20
JW150	4-φ22	M20
JW200	4-φ26	M24
JW300	4-φ33	M30
JW500	4-φ42	M39
JW750	4-φ42	M39
JW1000	6-φ42	M39

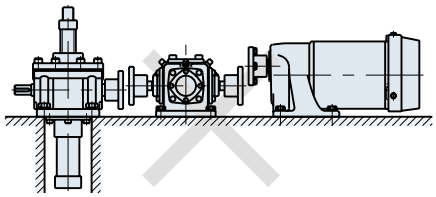
Fig. 1



3. Installing Motor, Reducer

Installing a motor and reducer to the jack should be carried out on a stable counter to ensure safety as well as accuracy, especially for those with heavy loads. Make sure the input and transmission shafts are aligned accurately (Fig. 2). When using a floating shaft, verify its rigidity and the coupling backlash to prevent vibration and failure.

Fig. 2



4. Rotation Prevention

The jack's thrusting force may cause the shaft (or nut, if used) to rotate, in which case a rotation prevention is required. For operations where a shaft end is not fixed, or a pulley is being used to pull a rope, rotation prevention specification M must be used.

5. Shaft End

Attach shaft end by applying an adhesive agent to its setscrew. It is possible for the shaft end to become detached by the rotational torque applied to the shaft. To avoid this, use one of the following adhesives:

<Tightening Agents>

Use the following brands or their equivalent.

Read instructions and safety precautions provided with each product before applying.

Tightening Agents

Maker	Brand
Nihon Lock Tight	#262, 271
Three Bond	#1307N

6. Setting the Limit Switch

Consider maximum possible inertia before setting the limit switch. This means calculating the maximum coasting distance affected by specific load and installation conditions. Also, install a mechanical stopper within the stroke range in case of emergencies.

7. Setting the Position Detection Unit

An optional position detection unit (internal LS, potentiometer or rotary encoder) is not factory adjusted. Be sure to adjust stroke prior to operation. Do not allow screw shaft to rotate while the input shaft is fixed. Also, do not rotate screw shaft (or nut) after stroke adjustment. When adjusting internal LS, operate jack manually or by inching very cautiously so as not to exceed the maximum stroke. If the jack exceeds its stroke limit, screw shaft may fall off and bellows may be destroyed.

8. Caution

(1) Jacks that range under the standard capacity of 49kN {5tf} are provided with screw covers made ⚠ of hard vinyl chloride pipe. Never suspend or carry a jack by its cover.

(2) Be certain that the jack rating exceeds the maximum possible stroke. If the stroke capacity is ⚠ exceeded, the shaft may disengage from the unit or fail to function. Preventative devices for such situations are not provided for JWMs (Machine Screw Type) so over stroke must be avoided. Shaft protection provided for JWBs (Ball Screw Type) and JWHs (High Lead Ball Screw Type) is solely for the purpose of preventing shaft rotation during installation. When installing, be sure that the shaft does not rotate or move. When rotation cannot be avoided, use a rotation prevention type.

(3) Do not operate input shaft manually while loaded. Load pressure will rotate the shaft.

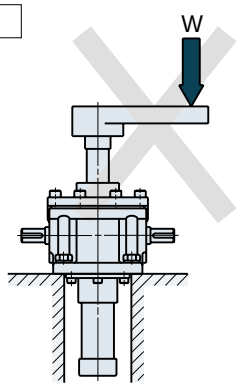
⚠ (4) Do not use mechanical stops. This will cause major internal damage.

⚠ (5) Provide oil pans for food manufacturing machines to prevent oil from leaking into food products.

(6) To install a screw shaft or cover to the base, avoid drilling large holes so as not to reduce the surface area of contact between the jack and the base.

(7) Apply load in the same direction as that of the screw shaft. Load from inappropriate angles can bend the shaft (Fig. 3). For side load, make sure to use guides so the load or bending momentum do not apply directly to the jack.

Fig. 3



Maintenance and Inspection

1. Screw shaft and reducer unit are factory greased. See Table 1 for the type of grease used.

2. Regular lubrication intervals for the shaft screw are as recommended in Table 2. For the amount of grease, see Table 3. To regrease, expand the shaft to full stroke, remove old grease and apply using a grease gun or brush.

3. Reducer units should be greased based on the lubrication intervals shown in Table 2. However, these intervals may vary depending on operation frequency and conditions. For amount of grease, see Table 3.

Table 1. Recommended Grease

Part	Maker	Grease
Shaft Reducer Unit	Idemitsu	* Daphne Eponex Grease SR No.1
	Nippon Grease	Niglube EP-1K
	Exxon Mobil	Mobilux EP
	Cosmo	Cosmo Grease Dynamax EP
	Showa Shell	Shell Alvania EP Grease

* Factory filled with this grease.

Table 2. Lubrication Intervals

Operation Frequency	Lubrication Intervals		
	JWM	JWB	JWH
50～100/day	1 month	3 months	3 months
10～50/day	3 months	3 months～6 months	3 months～6 months
1～10/day	6 mo.s～1 yr.	6 mo.s～1 yr.	6 mo.s～1 yr.

Table 3. Amount of Grease

Frame No.	Amount of Grese	
	Shaft (Stroke 100mm)	Reducer Unit
JW002	5g	35g
JW005	5g	35g
JW010	5g	80g
JW025	10～15g	170g
JW050	10～15g	370g
JW100	20～30g	470g
JW150	20～30g	700g
JW200	40～50g	830g
JW300	40～50g	2600g
JW500	50～100g	5500g

4. Reducer units for jacks JW025 and above are provided with grease nipples and plugs (hexagonal holes). Remove the plugs and pour grease through the nipples until it seeps from the openings. Then, firmly seal the openings with tape.

5. Grease upper bearings for JWB (Ball Screw Type) and JWH (High Lead Ball Screw Type) using the grease nipple set attached to their housings, at 6-month intervals. Not necessary for jacks JWB/JWH010 and below.

6. Inspect regularly for general backlash and screw unit condition. Jack life and replacement timing are determined by the following:
   - JWM･･･Backlash in the direction of screw shaft and nut hits 1/4 of the screw pitch.
   - JWB・JWH･･･Visible particles due to wear and tear of the screw unit.
   - All types･･･Replace gear when its input shaft exceeds 30 rpm with backlash at H speed, or exceeds 60 rpm at L speed.

⚠ Generally, continuous use without lubrication at recommended intervals may cause inefficiency of shafts and failure of travel nuts.

7. Adjust brake gaps for brake and gearmotors before their gaps reach their maximum capacities. Gap adjustment is not possible for gearmotors with outputs 25W or 40W. For details, see respective instruction manuals.

General Notes

1. Carefully consider jack ratings before making a selection. Make sure that all anticipated loads, whether static, dynamic or shock, fall within the rated capacity of the jack at reasonable safety levels (See page 114, No. 1).

2. Carefully consider the combination of screw shaft rpm and rated load. Also, take extra care in verifying rated buckling load, overhang load and shaft rpm. Exceeding the data provided in this catalog can cause major damage to the system.

3. Confirm that the operating temperature of the jack is within −15～80°C. To measure, check the surface temperature of input shaft (or nut, if used). Make sure that all rotating parts are completely stopped before proceeding to measure.

4. Do not exceed the maximum rpm of 1800/min.

5. Continuous operation is not possible. Duty cycle at 30 minute intervals for JWM is within 20% ED, JWB and JWH are within 30% ED.

$$\text{Duty cycle (\%ED)} = \frac{\text{1 Duty cycle}}{\text{1 Duty cycle + 1 Rest cycle}} \times 100\%$$

6. Be sure not to exceed the maximum input torque for multiple jack systems by verifying the rated input torque for each jack.

7. Activating torque should be maintained at 200% above the required torque.

8. If operating in freezing temperatures, a change in viscosity may reduce the efficiency of the grease. Set the drive unit so as to accommodate this change.

⚠ 9. Although JWM is equipped with a self-locking device, vibration and shock may affect its efficiency, in which case a brake unit is required. Because of their extremely high efficiencies, JWB and JWH must have sufficient brake units that over power their holding torques.

⚠ 10. Evaluate operating environment based on the following:

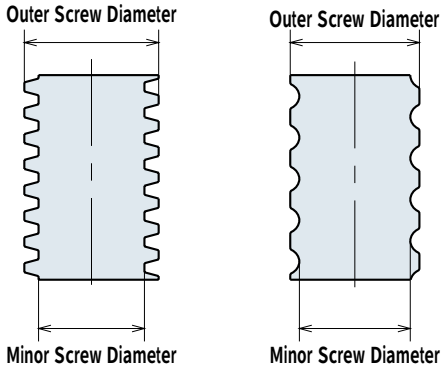
Location	Indoors where rain and moisture are not present
Room Condition	Dust Volume - Normal
Ambient Temperature	−15°C～80°C (See General Notes No.3)
Relative Humidity	Below 85% (No condensation)

11. When dust level is high, protect shaft with a bellows. (For outdoor use, place a cover to protect jack from factors such as rain and wind).

Glossary

① **Basic Capacity**
The maximum possible load sustained or lifted by a jack. Must be calculated by using the safety rate Sf.

② **Outer Screw Diameter / Minor Screw Diameter**
As illustrated below.



③ **Screw Lead**
Distance the shaft (or nut, if used) advances in one revolution of worm wheel.

④ **Stroke**
Possible distance traveled by screw shaft (or nut). Derived from XMAX-XMIN.

⑤ **Worm Ratio**
Number of input shaft revolutions required to complete one worm wheel revolution. (Gear ratio of input shaft and worm wheel.)

⑥ **Overall Efficiency**
Total efficiency of the jack including those of the screw and the worm wheel.

⑦ **Maximum Allowable Input Capacity**
Input capacity that can regulate the balance between load and screw shaft speed or input rpm.
Operate within the rated capacity of duty cycle (%ED) and reducer unit surface temperature (max.80°C).

⑧ **Tare Drag Torque**
Torque required to rotate the input shaft of an unloaded jack.

⑨ **Holding Torque**
Input torque required for sustaining basic load capacity.

⑩ **Allowable Input Shaft Torque**
Maximum possible torque allowed for input shaft only. For multiple jack systems, it is the sum of total torque required for synchronous drive, and the actual amount of torque transferred from one jack to another.

⑪ **Required Input Torque of Basic Capacity**
Input torque required at the input shaft to lift load of basic capacity.

⑫ **Screw Movement Per Revolution of Input Shaft**
Distance the screw shaft (or nut) advances in one revolution of the input shaft.

⑬ **Maximum Input rpm for Basic Capacity**
Maximum possible rpm applied to the input shaft to lift load of basic capacity.

⑭ **Screw Shaft Rotational Torque for Basic Capacity**
Torque generated when the screw (or nut) auto-rotates to lift load of basic capacity. Rotation prevention must be installed either on the machine or the jack to prevent screw and nut from rotating simultaneously.

⑮ **Rated Load**
Load derived from the maximum allowable input capacity once the input screw shaft rpm is determined.

⑯ **Buckling**
Buckling is produced when the jack rapidly bends from excessive thrusts. Buckling load varies depending on installation condition and/or position.

⑰ **Rated Screw Shaft rpm**
Screw shaft may resonate and vibrate when its rpm comes close to the eigen frequency. It is important that the rpm is lower than the resonance point or the rated screw shaft rpm. Must confirm this for travel nut types.

⑱ **Coasting Distance (Inertia)**
Distance traveled after the motor is switched off. System inertia results in over travel depending on the load, brake size and operation circuit.

⑲ **Stopping Accuracy**
Range of positions where the screw shaft stops after each operation.

⑳ **Self-lock**
The ability to maintain load with no brake unit. Self-lock applies to all frame numbers for JWM (Machine Screw Type) 002～1000.

㉑ **Duty Cycle**
The ratio of run time to total cycle time.

$$\text{Duty cycle (\%ED)} = \frac{\text{1 Duty cycle}}{\text{1 Duty cycle + 1 Rest cycle}} \times 100\%$$

㉒ **Thrust**
Power converted from rated torque that is used to lift maximum loads for motored or geared jacks. Motors must be selected carefully when used to run a jack with another motored jack. Also, select thrust for motored jacks with care.

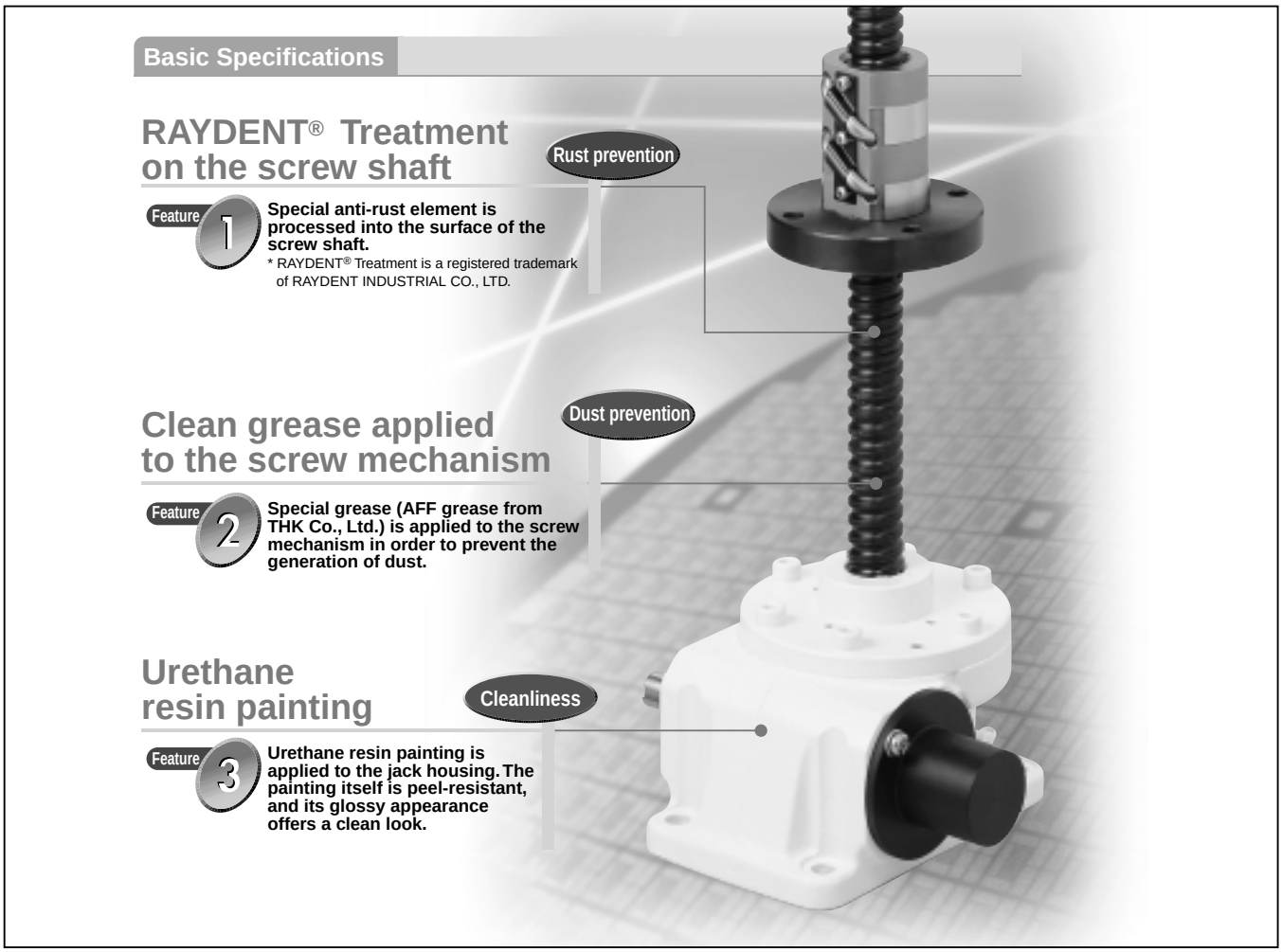
㉓ **Ball Screw Wear Life**
Ball screw wear life is determined by the distance advanced by the screw nut until the ball "flakes" from friction and fatigue. This distance varies even when operated under similar conditions. If the system runs without this "flaking" of the nut for more than 90% of the time, this is considered L10 or the rated ball screw wear life.

Product Information

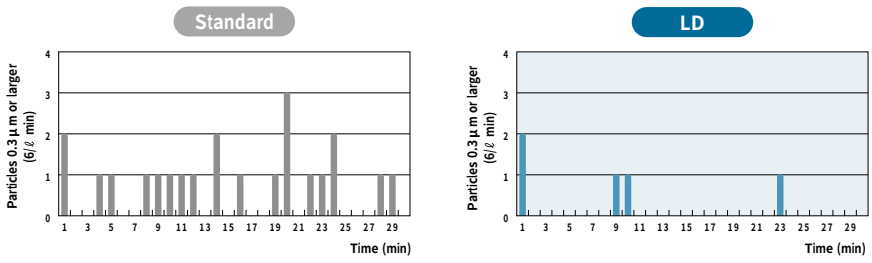
Linipower Jack LD Type

Excellent choice for clean room systems such as FDP (Liquid Crystal/PDP). This model regulates dust generation caused by wear as well as rust produced from the screw. Factory tested for dust volume, it is highly reliable for clean room operations.

Basic Model



Dust Emission Comparison Graphs (Our test results)



Test Conditions

Heading	Contents
Frame no.	JWBO25URH5D (Travel nut type)
Speed	40mm/s (Fixed nut, lift/lower repetition, no load)
Location	Clean Room Clean Bench
Portion	Bottom of screw
Equipment	Laser Dust Monitor
Flow	6 ℓ /min
Measured dia. of particles	0.3 µm and larger

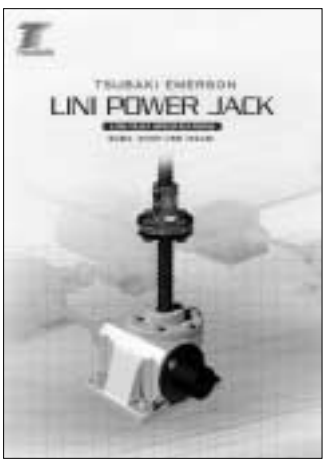
* The above data is based on dust emitted from the screw portion. Use a safety cap to prevent dust from the oil seal in the input shaft portion. Dust is collected in this cap and prevented from entering into the atmosphere.

Options

The following options are available with Linipower Jack LD Type:
(Select according to specific requirements)

- Input shaft .....Electroless nickel plating
- Shaft end.....Electroless nickel plating
- Steel pipe .....Metallic screw cover
- Safety cap .....Plastic

*See page 107 for details



〈Catalog No.985S001〉

Individual Catalog

Request "Linipower Jack LD Type" catalog for more information.

Linipower Jack Inquiry Form

Company Name		**Tel.**	
		Fax	
		Equipment Name	

Equipment or Load Condition	Equip. Description._____ • No Shock Light Load • Moderate Shock Medium Load • Severe Shock Heavy Load
Overall Equip. Weight/No.of Jacks	Equip. Max Load ____kN { tf} / Jacks____ (Equip. Min. Load kN { tf}/ Jacks)
Options	Basic Use (Lift/Suspend) With / Without Rotation prevention Travel Nut (Lift/Suspend)
Installation Condition (Buckling Safety Rate SF)	A. Fixed Base Shaft end free B. Clevis-Both End (Clevis) C. Fixed Base Fixed shaft end (Sf=) Leave open if no buckling load applies on screw shaft.
Screw Type	Machine Screw Type Ball Screw Type High Lead Ball Screw Type

Load Requirements	Load /Jack based on the above the information ____kN { tf}____
Speed	____ ~ ____ mm/s (____ ~ ____ mm/min)
Stroke	Actual Stroke ____mm____ Max. stroke____mm____

Operation	____times/min × ____min/hrs. × ____hrs./day × ____days/yr. × ____yrs. **(Back and forth count as 2)**
Reducer Unit **Power** **Input R.P.M**	**Motor with brake (Gearmotor with brake)** ____kW (1/____) Others____ ____V ____Hz ____r/min
Ambient Temperature	____℃
Equipment Condition	Mounting Location ____ with/without guides
Dust	Average High with / without bellows
Control Device	Counter LS • Internal LS K2 • K4 • Potentiometer • Rotary Encoder • Others____
Others	Shaft end (B • I • M type end fitting) • Hand wheel • Clevis Others____

System Layout

Memo

Memo

Memo

SAFETY

Warning Observe the following safety precautions to prevent serious injuries.

- Do not release the brake while jack is loaded. If the brake is released under loaded conditions, suspended objects may fall and lead to accidents.
- Make sure the jack is not loaded when manually operated. Operate jack according to the instruction manual.
- During suspending operations, provide safety guards to prevent load from falling and never stand under the jack.
- Observe the Labor Safety & Hygiene Regulations, General Criteria, Paragraph 1, Chapter 1, Edition 2, or your local regulations.
- Installation, removal, maintenance and inspection:
  - Carry out operation according to the instruction manual.
  - While performing electrical wiring, observe laws and regulations such as Electricity Equipment Criteria and Extension Rules, as well as the cautions (e.g. direction, space, operating conditions, etc.) indicated in the manual. Be especially careful in following the instructions on grounding to prevent electric shocks.
  - Turn off the power and make sure that it does not reconnect accidentally.
  - Wear appropriate clothing and protective gears (safety glasses, gloves, safety shoes, etc.).

Caution Observe the following safety precautions to prevent accidents.

- Always operate within the allowable stroke range. Operating a jack outside its allowable stroke range may result in accidents.
- Before switching on the jack, make sure the limit switches have been wired correctly and the stroke has been adjusted appropriately.
- The motor must be driven within the correct electrical voltage range to prevent motor burnout or fire.
- Efficiencies of parts may decrease with wear and age. Carry out periodic inspections as set forth in the manual.
  When the parts are no longer functioning or are ineffective, please contact a Tsubaki Emerson distributor for repair.
- Read the manual provided with the product thoroughly before operating and refer to it as necessary. If the instruction manual is misplaced, request a replacement copy from Tsubaki Emerson or your Tsubaki Emerson distributor, indicating the product name, series, and model number.
- The instruction manual must be delivered to the final user.

Warranty

1. Warranty period without charge

18 months effective the date of shipment or 12 months effective the first use of Goods, including installation of Goods to Buyer's equipment or machine - whichever comes first.

2. Warranty coverage

Should any damage or problem with the Goods arise within the warranty period, given that the Goods were operated and maintained according to the instructions provided in the manual, Seller will repair and replace at no charge once the Goods are returned to the Seller. This warranty does not cover the following:

1) Any costs related to removal of Goods from the Buyer's equipment or machine to repair or replace parts.
2) Cost to transport Buyer's equipment or machine to the Buyer's repair shop.
3) Costs to reimburse any profit loss due to any repair or damage and other consequential losses caused by the Buyer.

3. Warranty with charge

Seller will charge any investigation and repair of Goods caused by:

1) Improper installation by failing to follow the instruction manual.
2) Insufficient maintenance or improper operation by the Buyer.
3) Incorrect installation of Goods to other equipment or machine.
4) Any modifications or alterations of Goods by the Buyer.
5) Any repair by engineers other than the Seller or those designated by the Seller.
6) Operation in an inappropriate environment not specified in the manual.
7) Force Majeure or forces beyond the Seller's control such as natural disasters and injustices done by a third party.
8) Secondary damage or problem incurred by the Buyer's equipment or machine.
9) Defected parts supplied, or specified by the Buyer.
10) Incorrect wiring or parameter setting by the Buyer.
11) The end of life cycle of the Goods under normal usage.
11) Loss or damage not liable to the Seller

4. Dispatch service

Service to dispatch a Seller's engineer to investigate, adjust or trial test Seller's Goods is at the Buyer's expense.

Caution This catalog does not include operating instructions. Read the actual manual thoroughly before installing or operating the product.

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