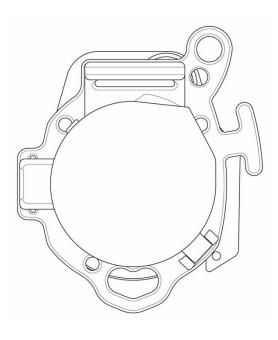


# **NSC** Power Ascender PRO™ User Manual

# Modular Multi-Purpose Device by Kentech Systems



Necessary Equipment	2
Accessories/Parts Sold Separately	4
Safety Instructions	5
Pre-use Inspection	9
Preparation	10
Operational Check and Descent Procedure	12
Procedure for Lifting/Lowering Equipment or Personnel	15
Periodic	
Inspection/Maintenance/Storage	16
Technical Specifications	18
Warranty and After-Sales Service	19

- · Thank you for purchasing this product.
- This device is designed for professionals experienced in the use of cordless driver drills. Inexperienced persons should undertake training before use.
- · Do not use impact drivers to power this device.
- · This device is specialist equipment for rope access professionals.
- Combine with an IPX6-rated cordless driver drill for use in rainy weather. However, the one-way-clutch bit is not water-proof. For use in rainy weather, always attach a cordless driver drill modified to prevent clockwise rotation directly to the device's shaft.
- · This user manual explains the correct procedures for the use and inspection of this device.
- · Read the user manual and learn correct usage procedures before using. Use correctly and safely.
- · Check regularly for the latest information and supplementary information at www.kentechsystems.net
- It is the user's responsibility to heed warnings and instructions and to use the device correctly. Misuse creates additional dangers.
- · Makita DF001GZ Cordless Driver Drill in conjunction with a 40V Max Li-ion battery is used for illustrative purposes in this manual.

# **Nomenclature**

Forward rotation: Clockwise Reverse rotation: Anti-clockwise

Use the cordless driver drill's anti-clockwise rotation for as-

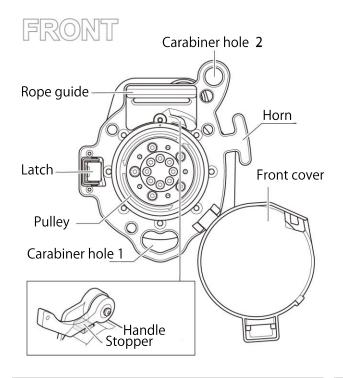
cending/lifting.

#### **NSC Power Ascender PRO™**

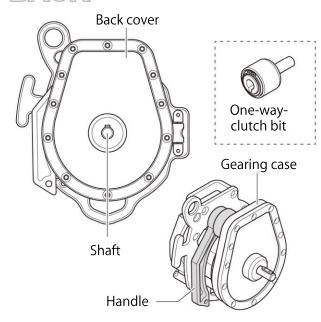
This product is a modular multi-purpose device.

Use with a cordless driver drill to lift equipment and personnel.

Use without a cordless driver drill to lower equipment and personnel.



### BACK



#### **Principal Materials**

· Principal components: Duralumin A7075

· Decelerator: Steel

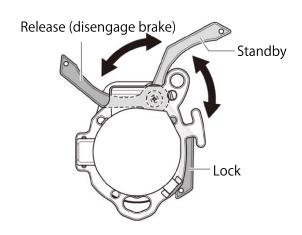
Front cover: Polycarbonate

#### Working Load Limit (WLL)

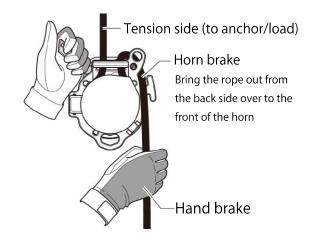
• 1.35kN

\*Apply a maximum load of 1.35kN to this device. This does not mean that 135kg can be raised in all circumstances.

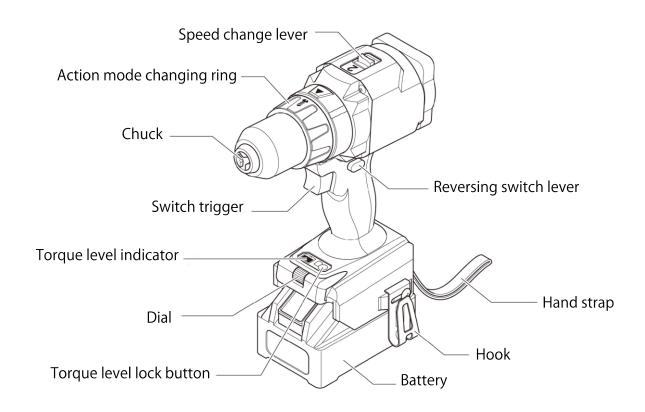
#### **Handle Position**



#### **Rope Position and Brake**



For further details, refer to the manufacturer's user manual.



# Necessary Equipment/ Accessories/Parts Sold Separately

Necessary Equipment	No.
NSC Power Ascender PRO™ (including One-way-clutch bit)	1
Cordless Driver Drill	1
SRT (Single rope technique) ascent/descent system	1
Fall Arrest System (including mobile fall arrestor with energy absorber and safety line)	1
Lanyard	1

Accessories	No.
One-way-clutch bit	1
Pulley spacer (two sizes are available: 1.0mm and 1.5mm)  • The 11.0mm diameter version of the device ships with a 1.5mm pulley spacer inserted into the pulley.  • The 10.5mm diameter version of the device ships with a 1.0mm pulley spacer inserted into the pulley.  (If the pulley does not wind up the rope, remove the 1.0mm pulley spacer.)  The clockwise-rotation-prevention ring is a safety measure installed onto the cordless driver drill when used without the one-way-clutch bit. See the following YouTube video for installation instructions: https://www.youtube.com/watch?v=IfNPx9DD334	1
User manual    *Available for download from Kentech Systems website.	1

<sup>\*</sup>See the cordless driver drill manufacturer-supplied user manual for cordless driver drill accessories.

# Safety Instructions

- These instructions are to ensure safe, correct use and prevent damages or harm to users or others.
- Important information and instructions are marked with a warning symbol.
- Important information and instructions are divided into the following categories. All information is important and must be observed.

#### **Symbols Indicating Degree of Danger or Damage**



Failure to heed these instructions may result in bodily injury or death due to a severed rope or a fall.



Failure to heed these instructions may result in bodily injury or permanent disability.



Failure to heed these instructions may result in bodily injury, permanent disability, or damage to this device.

#### **Safety Symbols**



This example of misuse is prohibited



This example of correct use is mandatory

- This manual contains examples of techniques and uses of this device.
- It is impossible to list all potential hazards.
- Activities involving the use of this device are hazardous.
- Users must be aware of the hazards.
- Users are responsible for their own safety, decisions, actions and the consequences thereof.
- Do not use it if unable to or not in a position to accept responsibility. Do not use it if you do not understand the contents of this manual.
- Before using, read this manual thoroughly. Understand the device's operational capabilities and limitations.
- Train in its handling at a height of less than 2m above ground.
- If you are unsure how to use this device, contact Kenz (k-ogura@kentechsystems.net) for proper instructions on correct use
- This device is only for use by responsible, competent persons familiar with its use, or those under a competent person's visual supervision and direct instruction.
- · Ignorance or disregard of the instructions in this manual may result in permanent disability and/or death.

# **A** Danger



 Do not use if the front cover is open

The rope may detach from the pulley resulting in a fall.



tory

 Set up additional safety line and mobile fall arrestor

This device is not Personal Protective Equipment (PPE)...

 Always carry out a pre-use inspection. Check that bolts, etc are securely fastened

The rope may detach resulting in a fall.

 Before using, adjust the cordless driver drill's torque level to a suitable value

Correct control of the torque level ensures the cordless driver drill stops winding up the rope if forces above the specified torque level are applied. Incorrect control of the torque level or use in 'drill mode' may result in the device winding up rope until the user is injured, the device is damaged or the rope is severed.

 Formulate an emergency plan before using this device

Users losing consciousness or becoming immobile during use may cause severe disability or death within three minutes. (Pulmonary embolism or crush syndrome)

 If users detect any abnormalities (unusual sounds, vibrations, or irregular rotations) during use, discontinue use immediately

Contact Kenz.

(email: k-ogura@kentechsystems.net)

# **Marning**



 Do not wear loose clothing, necklaces, or fashion accessories

It may catch in rotating parts and strangle the user.



 Bunch up long hair and secure inside the helmet

Long hair may catch in the pulley and cause head injury.

### **⚠** Caution



- Follow the instructions for cordless driver drills in the manufacturer-supplied user manual
- Keep away from third parties during use
- Do not use in excessively dusty areas or underwater

This device is designed to minimize the effects of dust and water (IP5/6 dustproof/waterproof rating), but not guaranteed against malfunction.

(Examples of IP protection classes)
IP5X: No dust can enter the device to the extent that harmful effects may occur (dust-proof)

IPX6: No harmful effects caused by strong direct jets of water from any direction (waterproof)



#### Keep a record of the device's service hours

This device must be overhauled after every 800 hours/2 years. Keep a record of service hours and date of first use.

#### Control torque level according to the cordless driver drill used

[Calculation of torque levels]

- 1. Weigh the user wearing a full body harness with the device and cordless driver drill attached. (For example, 80 kg)
- 2. Attach the cordless driver drill to the device, set the torque level to one (minimum value), and wind up the rope. (It will not wind up at level one)
- 3. Increase the torque level one by one until the device winds up the rope.
- 4. Assuming the device winds up the rope at torque level three, torque level one winds up approximately 27 kg. (80 kg  $\div$  3 = 26.66 kg)

Device's working load limit (WLL)  $1.35 \text{ kN} \div 0.27 = 5 \text{ suggests that } 1.35 \text{ kN lifts}$  at torque level five. Use at torque level six or over is prohibited.

 Keep slings or ropes away from the cordless driver drill's chuck

Frictional heat may melt and sever slings or ropes.

 Ensure operation of other ascent/descent systems is not obstructed



- Ensure other ascent/descent equipment and fall arrest systems (excluding this device), comply with current standards in the user's country
- Use within approved Working Load Limit

Failure to do so may cause the device to overheat, causing malfunction and/or damage to the rope. \*The WLL for this device is 1.35 kN.

#### • Use a compatible rope

Ropes compliant with; EN1891 Type A standard for semi-static ropes (10.5 mm to 11.0 mm with elongation of less than 3%) and ANSI Z359.15 standard for static ropes (11.0 mm) are compatible with this device.

Ropes with an aramid cover are suitable due to their excellent durability. Marlow Ropes PROTEC 500 and Blue Water Ropes Armor Tech® are two examples.

Ropes with high elongation stretch under load, losing diameter. (Ropes that lose over 10% diameter slip in the pulley and won't wind up.) Under some circumstances, 11mm ropes may not be compatible. This could be due to; the use of rope, load applied, manufacturer, or condition of rope (wet, frozen, muddy, soiled.)

Kenz has not tested all ropes on the market. Using ropes whose cover breaks at loads below 4 kN may be dangerous. Before using, check the rope's manufacturer-supplied user manual.

Ropes deteriorate and lose strength over time. It is the user's responsibility to replace ropes.

#### Always keep ropes clean

Using ropes soiled with sand or contaminants accelerates wear and tear on the device.

This device's components are principally aluminum. During use, aluminum powder may adhere to the rope and darken it. This does not affect its usage.

 For continuous usage, observe the approved continuous-operation distance value specified in the specifications table

Before exceeding the approved continuous-operation distance value, take a 15-minute break for cooling.

#### Observe specified descent speed

The maximum descent speed is 1 m/s. Descending faster than this may overload the built-in brake system and one-way clutch, resulting in malfunction

Observe the specified braking procedure

## **⚠** Caution



 When descending, draw rope behind and over the rope guide to the front side of the horn. Grip and secure the rope with the right hand. Control descent speed with friction on the horn and grip of the right hand on the braking side of the rope

Adjusting descent speed with the handle position causes overheating and shortens service life.

- If the device is dropped, discontinue use and send to Kenz for inspection
- Use cordless driver drills according to the manufacturer's instructions
- Do not use cordless driver drills at low RPM for over three minutes

Using cordless driver drills continuously at low RPM causes overheating and automatic interruption. In this case, wait for it to cool and reinitiate ascent.

 When attaching the cordless driver drill directly to the device (without the one-wayclutch bit), always use a cordless driver drill with a clockwise-rotation-prevention modification

Without a clockwise-rotation-prevention modification, it may rotate during use. This may twist the wrist or strike the body, causing injury.

 When attaching directly, always attach the device's shaft straight in the chuck's center

If the shaft is off-center, the cordless driver drill may spin out of control. This may twist the wrist or strike the body, causing injury.

Wear protective gloves

Protective gloves should be of thin leather construction.



 Take care to avoid hitting walls or obstacles during use

# **Pre-use Inspection**

\*If users discover any abnormalities during the pre-use inspection, discontinue use immediately.

NSC Power Ascender Pro™ Body	Check	Judgement
Damage to NSC Power Ascender PRO™ body		
Unusual sounds when shaken		
Condition of gear cover and base plate attachment points (no play)		
Condition of back cover attachment points (no play)		
Condition of shaft and key (no play)		
Wear on the horn (not to exceed 20%)		
Closing and opening of the front cover (no play)		
Condition of the front cover (no cracks)		
Wear on the front cover (no areas of excessive wear)		
Condition of the front cover hinge (no play)		
Closing of latch (front cover closes and does not open)		
Wear on pulley sheave (no extreme abrasion or scratches)		
Condition of rope guide attachment points (no play)		
Wear on rope guide (not to exceed 20%)		
One-way-clutch bit rotation		
(Is rotation smooth in one direction and restricted in the opposite direction?)		
Condition of handle attachment point (no play)		
Condition of handle movement (does it rotate and return to its original position smoothly?)		
Attach cordless driver drill and test rotation (no unusual noise or irregular rotation)		
Cordless Driver Drill	Check	Judgement
Battery (is the battery fully charged?)		
Installation of one-way-clutch bit in chuck (no deviation)		
Drop prevention tool lanyards (are securely attached in over two places?)		

# **Preparation**

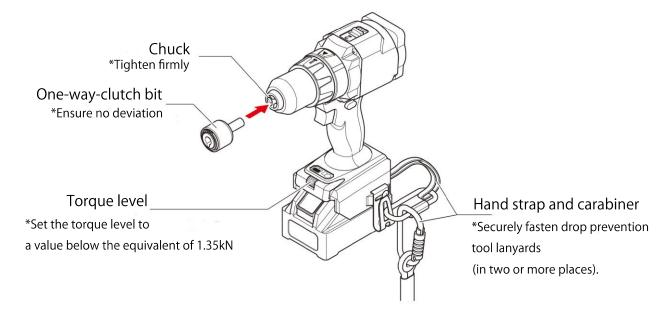
### Cordless Driver Drill Preparation

- · Secure drop prevention tool lanyards in over two places.
- Install the one-way-clutch bit into the chuck and tighten firmly.

Seat the one-way-clutch bit in the center of the chuck without deviation. (If the one-way-clutch bit is off-center, the cordless driver drill may spin out of control and cause injury.)

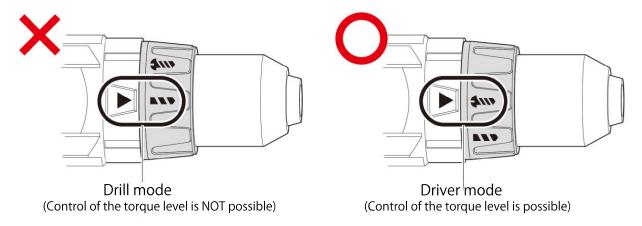
Tighten the chuck firmly and monitor the chuck's tightness regularly during use. (The one-way-clutch bit detaching and falling from height may cause a serious accident.)

- Do a test rotation and ensure no deviation in the one-way-clutch bit.
- Set the torque level of the cordless driver drill to a value below the equivalent of 1.35 kN.



• Ensure the cordless driver drill is in driver mode.

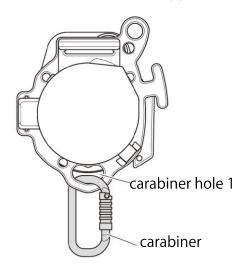
\*Control of the torque level is not possible in drill mode.



# 2 Preparing NSC Power Ascender PRO™

· Attach a carabiner to carabiner hole one.

\*Use only carabiners with locking gates.



### 3 Formulate an Emergency Plan

- Formulate an emergency plan.
- · Formulate an emergency plan.

\*In the event of a difficulty, be prepared to deal with it quickly.

## 4 Double Check Ropes

- Before using a rope, two competent persons must visually and manually inspect it.
- Always tie a stopper knot in the loose end of the rope.

### 5 Double Check Equipment

• Double check all equipment on the user's person.

# 6 Inspect Anchor Points and Knot Condition

- Always carry out a dynamic load test after setting anchor points.
  - \*Select anchor points that are strong enough to withstand loads of over 15kN.
- Always check that working lines and safety lines are secured to anchors with a minimum breaking strength (MBS) of over 15kN.
- Check that the rope is securely fastened to an anchor with a suitable knot. (Equivalent to or stronger than a double figure of eight knot.)

# 7 Check for Edges and Abrasion Points

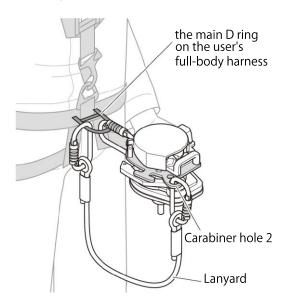
- If there are edges or abrasion points in the line of the rope, always protect the ropes from abrasion.
- Use edge guards with high-efficiency bearings if operation causes the loaded rope to move. Using textile or metal edge guards on moving rope may double the load applied to the device.

# Operational Check and Descent Procedure

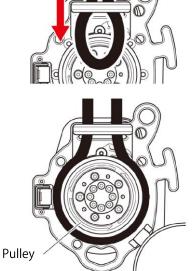
Operational Check

### Attach the Device to the Harness

- Attach the device to the main D ring on the user's full-body harness.
- \*Attach a lanyard to carabiner hole two to prevent dropping.

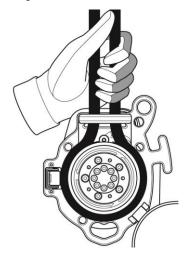


## 2 Install the Rope into the Pulley



# Insert the Rope into the Pulley Sheave

 Draw the braking side of the rope up and out and put weight onto the device.

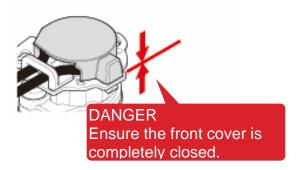


 Use fingers to further seat the rope into the pulley near the front cover mounting.



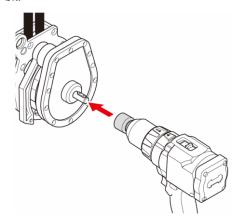
### 4 Close the Front Cover

\* The front cover will be damaged if closed without the rope sufficiently inserted into the pulley sheave.



### 5 Attach Cordless Driver Drill

 Insert the device's shaft into the one-way-clutch bit.



# 6 Reverse Rotate the Cordless Driver Drill for One Second whilst Loading the Device

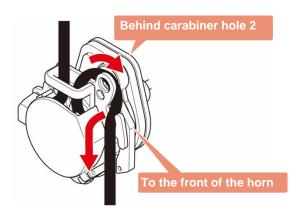
 Ensure that the device winds up the rope correctly. (Ascend until both feet are raised off the ground slightly.)

# Remove the Cordless Driver Drill from the Device

 Check that the device does not descend automatically.

## 8 Wrap the Rope Around the Brake

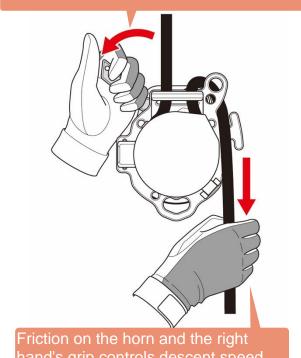
 Draw the braking side of the rope behind the rope guide and over the top of the horn to the front side.



### Assume the Descent Position

 Assume the descent position by firmly gripping the braking side of the rope in the right hand and pulling the handle down with the left hand until it touches the stopper.

Pull the handle down until it touches the stopper.



### 10 Descend

 Gently loosen the right hand's grip and feed the fixed rope out of the device until the load is completely released.

# 1 Attach Cordless Driver Drill to the Device and Ascend

# 2 Complete Ascent and Remove the Cordless Driver Drill from the Device

### Wrap the Rope Around the Brake

 Draw the braking side of the rope behind the rope guide and over the top of the horn to the front side.

### 4 Assume the Descent Position

 Assume the descent position by firmly gripping the braking side of the rope in the right hand and pulling the handle down with the left hand until it touches the stopper.

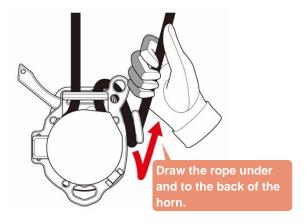
## Descend to the Desired Point at Less than 1M/S.

• Gently loosen the right hand's grip and feed the braking side of the rope out of the device.

\*Do not use the handle to adjust descent speed.

#### For Heavy Loads

Increase friction by taking the rope drawn over the front side of the horn under the horn to the back side.



# 6 Remove the Left Hand from the Handle

• Ensure the handle returns to the lock position.

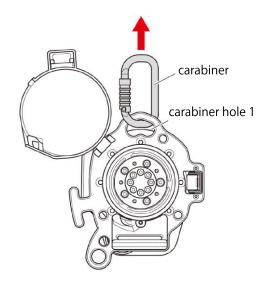
# Remove the Right Hand from the Rope

\*Ensure the handle returns to the lock position before removing the right hand from the rope.

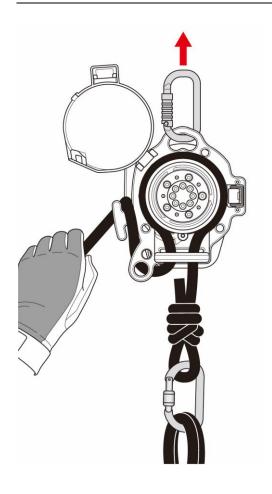
# Procedure for Lifting/Lowering Equipment and Personnel

### 1 Attach the Device

 Attach the carabiner (in carabiner hole one) to the anchor point.



## 2 Install the Rope into the Device



# 3 Lift and Lower Following the Ascent and Descent Procedure

 Attach the device to the anchor point and securely attach the equipment/personnel to the load side of the rope.

# Periodic Inspection/Maintenance/Storage

### Periodic Inspection

- Inspect this device every 3 months per the following instructions:
- Periodic inspection (including an overhaul of brake mechanism) by Kenz and companies authorised by Kenz is required every 2 years or within every 800 hours of accumulated use. (This device incorporates the latest one-way clutch and brake mechanisms. The brake mechanism must be overhauled at least once every two years.)

once every two years.	Inspector's name:	pector's name:	
NSC Power Ascender Pro™ Body	Check	Judgement	
Damage to NSC Power Ascender PRO™ body			
Unusual sounds when shaken			
Condition of gear cover and base plate attachment points (no play)			
Condition of back cover attachment points (no play)			
Condition of shaft and key (no play)			
Wear on the horn (not to exceed 20%)			
Closing and opening of the front cover (no play)			
Condition of the front cover (no cracks)			
Wear on the front cover (no areas of excessive wear)			
Condition of the front cover hinge (no play)			
Closing of latch (front cover closes and does not open)			
Wear on pulley sheave (no extreme abrasion or scratches)			
Condition of rope guide attachment points (no play)			
Wear on rope guide (not to exceed 20%)			
One-way-clutch bit rotation			
(Is rotation smooth in one direction and restricted in the opposite direction?)			
Condition of handle attachment point (no play)			
Condition of handle movement (does it rotate and return to its original position smoothly	(?)		
Attach cordless driver drill and test rotation (no unusual noise or irregular rotation)			
Cordless Driver Drill	Check	Judgement	
Battery (is the battery fully charged?)			
Installation of one-way-clutch bit in chuck (no deviation)			
Drop prevention tool lanyards (are securely attached in over two places?)			

#### Maintenance

#### \*See the manufacturer's user manual.

- · Remove all dirt and wipe with a dry cloth
- Flush gently with tap water if mud or other debris enters the device. (No pressure washing.)
- Do not use thinners, ethanol, benzene, parts cleaner, or any other chemical cleaning agent.
- Do not disassemble this device or its decelerator. (Decelerator is maintenance-free for 8000 hours.)

#### Storage

- Store the device in a strong case.
- If wet, completely dry the device before storing it.
- Store away from the reach of children, direct sunlight, vehicles, areas with water or high humidity, areas with high levels of dust or dirt, areas with fuel such as gasoline or diesel oil, and areas with chemicals.

**Technical Specifications** 

	Specification	Value	Notes
Body	Weight	2.4kg	Not including cordless driver drill
	Size	145 mm × 170 mm × 125 mm	Not including cordless driver drill
	Compatible rope	<ul> <li>EN1891 Type A Semi static rope</li> <li>(10.5 - 11.0mm with less than 3% elongation)</li> <li>ANSI Z359.15 Static rope (11.0mm)</li> </ul>	Ropes that lose over 10% diameter under load slip in pulley and won't wind up.)
	Compatible rope diameter	10.5mm $\sim$ 11.5mm (Available for 10.0mm rope by special order)	Accommodates 10.5mm - 11.0mm ropes (10.5mm type includes additional pulley spacer)5mm~
	Motive power	Sold separately	Cordless driver drill  *Use of impact drivers is strictly prohibited
	Recommended cordless driver drill	Cordless drivers with a battery capacity of 36 V 2.5 Ah or higher and waterproof to IPX6 or higher	2000rpm or higher
		150m, 2000rpm, 40Vmax 4.0Ah battery	100% battery charge, 1.00kN load, 20°C air temperature
	Operational distance	180m, 2000rpm, 40Vmax 5.0Ah battery	100% battery charge, 1.00kN load, 20°C air temperature
		300m, 2000rpm, 40Vmax 8.0Ah battery	100% battery charge, 1.00kN load, 20°C air temperature
	Practical speed limit for gearing	3000rpm	-
Capacity	Working load limit (WLL)	1.35kN	-
		10.8m/minute, 2000rpm, 20°C air temperature	1.00kN load
	Ascent speed	14.0m/minute, 2600rpm, 20°C air temperature	1.00kN load
		16.2m/minute, 3000rpm, 20°C air temperature	1.00kN load
	Descent speed	60.0m/minute (MAX 1m/second)	1.00kN load, 20°C air temperature
	Waterproof/dustproof specifications	IP56 (use with IPX6 cordless driver drill in rainy conditions)	IEC60529、JISC0920
	Minimum breaking strength	25kN	-
	Sound level	76dB	In-house testing with sound level meter
	Lifetime	Unspecified	-

NSCPA-PRO-JPN November 2023



Kentech Systems Ltd. 1-24-3 Minamiōtsuka, Kawagoe, Saitama 350-1162

TEL: (+81) 049-241-8364 FAX: (+81) 049-265-6120

FAX: (+81) 049-265-6120 https://e.nsc-power-ascender.kentechsystems.net/

Contact

	Specification	Value	Notes
	Warranty period	1 year	Warranty details contained in this manual
	Operating temperature range	-10 to 45°C	-
	Accessories	One-way-clutch bit x 1, User manual x 1	-
Addi- tional in- for- mation	Approved continuous- operation distance	1 battery life cycle (when used with maximum load)	A 15 minute cooling break is necessary after each battery life cycle. (Cordless driver drill handling precaution.)
	Overheating protection	None	-

<sup>\*</sup>Control the cordless driver drill's torque level to prevent the application of loads exceeding the working load limit.

# Warranty and After-Sales Service

#### Repairs

- · This device requires a periodic overhaul by the manufacturer (Kentech Systems) depending on its condition.
- For advice on repairs, handling, and care, contact your dealer.
- This device can be repaired by Kenz and companies authorized by Kenz only. Users should not attempt repairs themselves.
- Kenz repairs repairable products upon request. (Products out of warranty repaired at cost.)
- Contact Kenz (e-mail: k-ogura@kentechsystems.net) for any questions.

#### Warranty

- · Warranty period: 1 year from the date of purchase
- The service life of this device is approximately ten years under correct usage, correct inspection, and maintenance.
- The service life of the built-in one-way clutch is shortened by overloading or use at higher than permissible speeds. In particular, note that descending at speeds over 1m/s will shorten the life of the one-way clutch dramatically.
- Failures resulting from material or manufacturing defects and defects occurring under correct use only are covered by the warranty.
  - (The warranty does not cover failure due to normal wear and tear, scratches, oxidation, improper storage, lack of maintenance, damage caused by accident or negligence, improper or incorrect use, disassembly, modification, dropping, liquid or foreign objects inside the unit, overloading, improper adjustment or misuse per the user manual.)

NSCPA-PRO-JPN November 2023



Kentech Systems Ltd. 1-24-3 Minamiōtsuka, Kawagoe, Saitama 350-1162

TEL: (+81) 049-241-8364

FAX: (+81) 049-265-6120

https://e.nsc-power-ascender.kentechsystems.net/

Telephone support is available in Japanese only.

Contact

<sup>\*</sup>Data on technical specifications sheet changes depending on the manufacturer of the cordless driver drill and battery.

<sup>\*</sup>Data on the technical specifications sheet is subject to change.

- Under extreme circumstances, this device may be damaged and have to be retired after one use. This is not covered by the warranty. (For example, poor operating conditions, use near the sea, submersion in water, contact with sharp edges, use or storage at extremely high or low temperatures, contact with chemicals, contact with high-voltage electrical cables, etc.)
- Do not disassemble this device.
   If disassembled, discontinue use immediately.
   (Any disassembly of the product confirmed by Kenz voids all warranty coverage.)
- The one-way-clutch bit is a component that wears out and must be replaced regularly.

#### **Certifications and Patents**

- This device does not comply with any national standards.
   (As of November 2023, the NSC Power Ascender PRO does not comply with any national standards.)
- This device is partly patented and partly patent pending in Japan, the U.S., the E.U., Korea, and Taiwan.

#### **Privacy Policy**

• Your personal data will be managed and handled in accordance with our Privacy Policy.

NSCPA-PRO-JPN November 2023



Kentech Systems Ltd. 1-24-3 Minamiōtsuka, Kawagoe, Saitama 350-1162

TEL: (+81) 049-241-8364

FAX: (+81) 049-265-6120

https://e.nsc-power-ascender.kentechsystems.net/

Telephone support is available in Japanese only.