

# COLUMBIA

## WINCHES & HOISTS

*Manufactured by Allied Power Products, Inc.*

# Pneumatic CERTO Series Owner's Manual

## Installation and Operating Instructions

**Model:**

**CFM**

**Serial Number:**

**PSI**

**ALLIED POWER PRODUCTS, INC.**

**THE WINCH & HOIST SPECIALISTS**

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### **CAUTION**

The final determination as to the suitability of this product for any purpose is solely that of the user.  
Columbia products are not to be used to lift people or to lift anything over people.

# READ THIS FIRST.

The information in this manual is intended to help ensure your Columbia product is properly installed, operated and maintained.

Although every effort has been made to make this manual complete and understandable, it is not a definitive guide to every possible situation or circumstance.

The proper installation, operation and maintenance of this product is solely the responsibility of the owner.

Safe operation of this product is directly dependent on the operator's skill, knowledge and judgment before, during and after the use of the product.

To avoid hazardous situations, every operator must be knowledgeable about appropriate safety guidelines, codes and regulations related to rigging, wire rope, and winch / hoist usage. Remember that an uninformed or careless operator can make the operation of any equipment dangerous.

Ultimately, the owner / operator must make the final decision as to how this product will be used and whether that intended use is safe.

If, after reading this manual, you have any questions regarding the installation or use of this Columbia product, contact your dealer or the Customer Service Manager of Allied Power Products, Inc. for an answer to your question.

Replacement manuals are available free of charge by writing:

**Allied Power Products, Inc.  
6590 SW Fallbrook Place  
Beaverton, OR 97008**

**THIS MANUAL CONTAINS EXTREMELY IMPORTANT INFORMATION ABOUT THE INSTALLATION AND OPERATION OF YOUR COLUMBIA PRODUCT. FOR YOUR OWN SAFETY, READ THIS MANUAL COMPLETELY PRIOR TO PRODUCT INSTALLATION AND / OR OPERATION.**



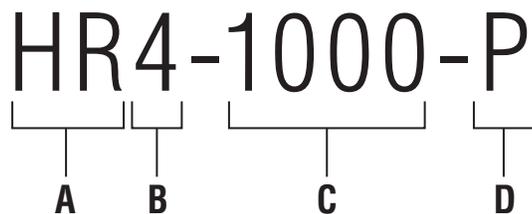
**⚠ WARNING**

**COLUMBIA PRODUCTS ARE NOT TO BE USED FOR LIFTING PEOPLE OR THINGS OVER PEOPLE.**

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## Sample Model Number



<b>A</b>	HR = Hoist, rated for hoisting
<b>B</b>	Drum Size
<b>C</b>	Model Specification
<b>D</b>	P = Pneumatic Power Source

## Model Number Information

When instructions in this manual refer to specific specifications on different models, identify your unit by referring to the model number as shown on the unit nameplate and the front of this manual.

# General Information

Columbia CERTO Series hoist assemblies consist of a gearbox, pneumatic motor and drum assembly.

## Drum

The drum is attached to the motor through planetary gear reductions to deliver the required pulling capacity and performance. The drum consists of three basic assemblies:

1. Drum with integral ring gear
2. Output planetary gear set
3. Primary planetary gear set

## Ratings and Suitability

Columbia products are not to be used to lift, pull, support or otherwise transport people or loads over people. Line pull ratings represent the maximum load that can be placed on a new unit. This load rating varies with the amount of wire rope wound on the drum and is affected by the age and condition of the unit.

### **WARNING**

#### **DO NOT ATTEMPT TO MOVE LOADS GREATER THAN THE RATED CAPACITY.**

Even if the unit appears to be able to handle the load, it can cause the unit to fail or create undetectable damage that could cause the unit to fail while using the unit within its rated capacity.

## Factors of Operation

Harsh environments decrease the load rating of the unit and make it more susceptible to damage. Avoid installation in extreme temperatures, dirty surroundings and wet environments.

Improper installation can create excessive wear or failure of any of the component parts or fasteners in the unit. Be sure that the unit is properly installed, the fasteners checked for tightness and the mounting inspected for damage on a periodic basis.

Use of the unit will create wear in the components. The more frequently it is used and the heavier the load, the greater the strain and wear on the components. This may result in damage that causes a failure over a period of time. Periodic inspection of the unit is the only way to ensure its continued operating capability.

### **CAUTION**

The amount of wire rope on the drum affects the performance of the unit. Line-pull decreases with each additional layer of wire rope wound on the drum. Line-speed increases with each additional layer of wire rope wound on the drum.

# Installation Guidelines

The safe installation of this product is solely dependent upon the owner and/or operator's skill, knowledge and judgment. Installation must be done only by those qualified and familiar with all operating guidelines, safety codes and regulations related to rigging, wire rope and hoist usage. The determination of suitability for this product for any specific use is the responsibility of the owner and/or operator. The following guidelines are to be used only as a reference.

## Location

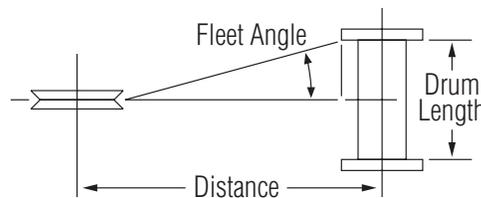
When selecting a location for the unit, the following guidelines must be met:

1. An unobstructed area that keeps the operator and others out of the path of the unit and the path of broken wire rope. Broken wire rope can snap back and cause serious injury to personnel and machinery.
2. A location where it will not interfere with or be damaged by other objects or machinery.
3. A location with adequate lighting and heat for both the operator and unit. Although the unit is rated for operation in temperatures ranging from  $-50^{\circ}$  to  $+104^{\circ}$  Fahrenheit, extremes in temperature will affect the performance of the unit.
4. Accessibility to the drain, level and breather plugs.
5. A location that permits proper fleet angle. Maintaining proper fleet angle allows the wire rope to spool uniformly onto the drum and prevents damage to the wire rope.

## Fleet Angle

Proper fleet angle is less than  $0.5^{\circ}$  to  $1.5^{\circ}$  measured as illustrated below (Diagram 1). For example, with a drum width of 10 inches, the minimum distance to a fixed sheave should be 15 to 45 feet.

Diagram 1



## Mounting

Initial hoist mounting is critical for safe operation and optimum performance. Prevent distortion of the hoist's centerline by mounting as follows:

- Verify that the hoist mounting support structure is adequately designed and constructed to withstand the intended loads with minimal deflection.
- Verify that the mounting surface and the underside of the hoist are clean of rust, scale, loose paint, dirt, oil and grease.
- Position the hoist on the mounting structure.
- Use SAE grade 5 steel washer between mounting bolt and the cast base.
- Mounting hardware is to be grade 5 or better, and all fasteners are to be of the same size, length, grade and thread percentage.

Inspect each of the four hoist feet for contact with the mounting surface. If one of the feet does not contact the mounting surface, correct as follows:

- Install the mounting bolts on the three mounting feet that are in contact with the mounting surface. Lightly tighten until snug.
- Use shim stock to securely fill the gap beneath the fourth mounting foot.
- Install the fourth mounting bolt.
- Fully tighten all four mounting bolts to torque recommended for particular connection design.

**Important: For proper lubrication of the internal gear components, mount the hoist horizontally.**

**⚠ WARNING**

Do not weld any fastener used for attaching the unit or mounting plate. Welding makes the fasteners brittle and subject to failure even in a no-load situation.

## Lubrication

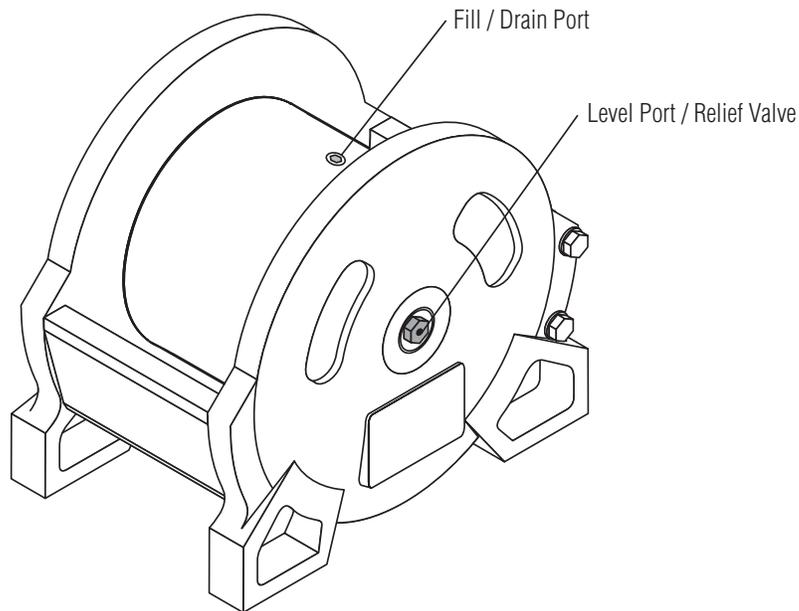
### ***Hoist Drum and Gears***

The hoist is shipped from the factory without lubrication oil. To prevent major hoist component failure, add gear lubrication oil prior to running the hoist.

**⚠ WARNING**

The procedure for gear oil filling and replacement is the same for all CERTO Series hoists and must be performed in a horizontal position.

Diagram 2



Add gear lubricating oil as follows:

- Remove the pipe plug located on the wire rope drum barrel and the relief valve located on the outside of the final base.
- Pour high quality SAE 90 gear lubricant oil into the wire rope drum through the plug port. In severe applications, gear tooth wear can be reduced by using a high performance gear lubricant such as Swepco #201 Multi-Purpose Gear Lube.
- Fill the cable drum until gear oil level appears at the final Base Relief Valve Port. The drum is now properly half filled.
- Install the Relief Valve and drum pipe plug, using Loctite #565 Thread Sealant to seal threads.

**⚠ CAUTION**

When carrying out a gear oil change, there may be a risk of burning due to hot gear oil.

Hoist Size	Gear Oil Quantity	
	Oil Change	Complete New Filling
HR1	0.60 liters (0.16 gal US)	0.70 liters (0.19 gal US)
HR2	0.65 liters (0.17 gal US)	0.80 liters (0.21 gal US)
HR3	2.45 liters (0.65 gal US)	2.70 liters (0.71 gal US)
HR4	3.20 liters (0.85 gal US)	3.50 liters (0.93 gal US)
HR5		

### **Pneumatic Guidelines**

This Columbia unit is driven by pneumatic power. Max pressure and flow guidelines are printed on the cover of this manual.

#### ***Air Supply and Circuit***

The air supply must be clean and relatively dry. An airline filter and lubricator should be fitted in the air supply line and located before the first control valve of the system.

If the rated performance of the motor and unit is to be obtained, all valves and pipe work of the air supply must be of adequate size. Valves should be located as close as possible to the motor.

For short length pipe runs up to 6 feet, the supply lines should be the same size as the inlet and exhaust ports, and larger for longer runs.

Before final connection to the motor, blow out the airlines to remove any loose scale, swarf or abrasive dust that may be present, and squirt a few drops of oil in to the inlet ports.

<b>⚠ CAUTION</b>
Make sure hose pressure is at 0 PSI when making connection to existing power sources.

Supplied compressed air is to be filtered to a minimum of 64 micron and lubricated with a suitable pneumatic or hydraulic oil. Oil viscosity of ISO VG32 is recommended for ambient temperatures between 0° – 32° Celsius (32° – 90° Fahrenheit). If the unit is plumbed to a system without an air drying system, it is strongly recommended that an additional water separator be added to the pneumatic circuit.

Typical oil supply rate is 8-12 drops/min, this amount may be adjusted outside of these limits as required.

The filter bowl should be drained regularly and the element examined for signs of clogging.

#### ***Safety Precautions***

1. Regularly check the water separator, regulator and air supply lubricator prior to running and during operation.
2. All hose assemblies should be checked regularly for leaks, abrasion, kinks, cover blisters or any other damage. Any assembly showing signs of wear or damage must be replaced before further use.

# Operating Instructions

The safe operation of this product is solely dependent upon the owner and/or operator's skill, knowledge and judgment. Only those qualified and familiar with all operating guidelines, safety codes and regulations related to rigging, wire rope and winch and/or hoist usage should operate this unit.

The determination of suitability for this product for any specific use is the responsibility of the owner and/or operator. The following guidelines are to be used only as a reference.

## Preparing for Operation

Inspect the condition of all components, including mounting bolts, pneumatic connections, sheaves, wire rope, hook, rigging, etc.

Verify the line pull required to move your desired load and make sure you do not exceed the load rating of the unit. Test for proper forward and reverse operation without a load.

## Duty Cycle

All Columbia pneumatic winches and hoists are rated for continuous duty.

## Braking System

Any time the unit is stopped, the brake will automatically engage against the load. Never leave any load unattended without properly securing it.

## Operating the Unit

Ensure that the load is free of objects around it. Connect the load to hook with a sling or other approved device. Never hook the wire rope around a load and onto itself.

Use the control switch on the pendant intermittently to take up wire rope slack to avoid shock-loads, which can momentarily exceed the unit and wire rope rating. Move the load slowly at first to make sure the load is securely attached to the hook.

Do not allow the hook to be any closer than two feet from the drum to prevent damage to the unit and wire rope.

Always inspect and carefully rewind the wire rope after each use. Improperly spooled, kinked or tangled wire rope will damage and shorten the life of the wire rope.

## Remote Pendant Control

The remote pendant control is used to "power in" and "power out" the wire rope. Depressing the power in button will cause wire rope to wind on the drum and depressing the power out button will cause wire rope to wind off the drum. Each button is spring-loaded and will automatically return to the 'OFF' position when released.

Do not attempt to push both buttons at the same time. If the buttons do not work properly, ***stop using the unit immediately*** and contact your dealer. ***Do not operate the unit*** until the problem is corrected.

## Operating Safety Precautions

1. Never touch the wire rope or rigging while another person is at the control switch or at anytime while operating the unit.
2. Never attempt to pull a load with less than five wraps of wire rope around the drum. Fewer wraps could cause the wire rope anchor to break and release the wire rope and load.
3. Keep the operator, assistants and spectators at a safe distance from the wire rope and rigging and out of the path of the load during the lifting operation. If the wire rope breaks or pulls loose under load, it can lash back with enough force to cause property damage, injury or even death.
4. Keep hands away from wire rope and hook while operating the unit. Never let the wire rope slide through your hands. Always wear heavy leather gloves when handling wire rope.
5. Never touch the wire rope or hook while they are under load.

## Installation Inspection

### ⚠ WARNING

Hoisting the load with an improperly installed hoist could result in hoist failure and allow the load to drop, causing property damage, severe injury or death. Inspect and test hoist installation before hoisting heavy loads to potentially dangerous heights.

Verify proper hoist installation by slowly lifting and lowering a full test load to a safe height several times before lifting a heavy load to potentially dangerous heights.

## Wire Rope

### ⚠ WARNING

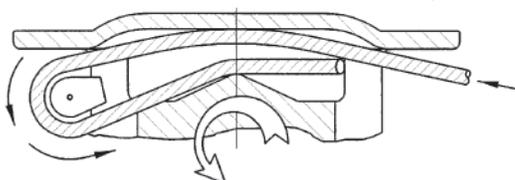
Improper wire rope connection could allow the load to drop, causing property damage, severe injury or death. Read and understand the following instruction before installing the wire rope.

The wire rope drum has a single pocket that allows the wire rope to be connected for either counter clockwise or clockwise hoisting. When shipped from the factory, a rotation label indicating direction of hoisting and connection instructions is attached to the wire rope drum.

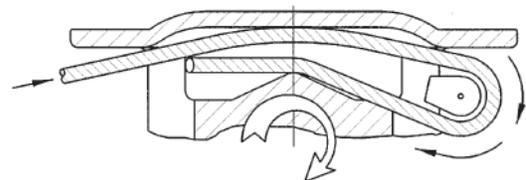
Connect the wire rope to the drum as follows:

- Identify the appropriate direction of rotation from the rotation label.
- Pass the wire rope through the wire rope slot. Bring the loose end around and back into the slot to form a large loop.
- Push the loose end of the wire rope through the slot until it is even with the opening. Do not let it protrude from the drum barrel.
- Insert the wire rope wedge tapered end first, into the slot at the center of the wire rope loop. Tighten the wire rope while maintaining the wedge in position.
- As the wire rope is pulled tight, ensure that the end of the wire rope stays even with the slot opening.
- Wind at least five complete wraps of wire rope onto the wire rope drum before connecting the load.

Diagram 3



Cable Connection for Counter Clockwise Hoisting Winch



Cable Connection for Clockwise Hoisting Winch

## ⚠ WARNING

Wire rope must be spooled on under tension before initial use of this unit. Factory installed wire rope is not spooled on under load.  
***Never lift a load with less than five wraps on the drum.***

To correctly spool the wire rope, it is necessary to unwind the wire rope and then rewind the wire rope under load. It is recommended that during the initial tensioning of the wire rope, a load of approximately 15% of the rated first layer line pull be used. In the event that tension is taken off the line, the wire rope must be retensioned according to the above guidelines.

Hoist Type	Compatible Wire Rope Size
HR1	Ø3/16" to Ø3/8" [5mm to 9mm]
HR2	Ø5/16" to Ø7/16" [8mm to 11mm]
HR3	Ø7/16" to Ø5/8" [11mm to 16 mm]
HR4	
HR5	

\*Based on standard wire rope wedge. Contact APPI for other wire rope sizes.

## General Maintenance

Columbia hoists are designed for easy field repair. If a fault is isolated to one of the major assemblies, that assembly can be immediately replaced in its entirety and the failed assembly repaired when time permits or returned for factory service.

Maintenance of this product is the sole responsibility of the owner and/or operator. The determination of suitability for this product for any specific use is the responsibility of the owner and/or operator.

The following guidelines are to be used only as a reference.

Periodically inspect the unit for general wear and tear. Immediately determine the cause of any change in performance or sound during operation and take corrective action as required. Keep unit, wire rope and remote control free from contaminants. Use a clean rag or towel to remove any dirt and debris. If necessary, unwind unit completely, wipe clean, and rewind properly before storage.

Perform service of internal components in a clean, well lit, shop area. Discard all O-rings and shaft seals when servicing the hoist. Do not attempt to re-use seals.

### Adhesive Procedure

Adhesive technology is used throughout Columbia CERTO hoists to structurally secure fasteners and other components. Cleanliness is critical for the successful application of adhesives. Oily contamination from a dirty work area, tools or hands will reduce the strength of adhesive bonds.

## Drum

### CAUTION

The drum portion of the assembly is shipped with a minimum amount of lubricating oil. Lubricating oil must be added to the drum prior to operation.

Gear oil changes are recommended for every 1000 hours or six (6) months of use. Use recommended type of gear oil for prevailing ambient temperature. Annual disassembly and inspection of all wear items in compliance with American National Standards Institute (ANSI) specification B30.5c 1987 and American Petroleum Institute (API) recommended practice RP 2D section 3 is recommended.

The gear oil level should be checked every 500 operating hours or three (3) months, whichever occurs first. The oil should be level with the bottom of this opening.

The gear oil should be changed after the first one hundred (100) hours of operation, then every 1,000 operating hours or six (6) months, whichever occurs first. The gear oil must be changed to remove wear particles that erode bearings, gears and seals. The gear oil should also be changed whenever the ambient temperature changes significantly and an oil from a different temperature range would be more appropriate.

See **Installation Guidelines: Lubrication** for more details.

## Wire Rope

Inspect the wire rope before and after each operation. The life of the wire rope is directly related to the care and use it receives. Wire rope must be replaced when it has one or more of the following defects as defined in the American National Standards Industry Handbook A10.5 or as defined by OSHA:

- Corrosion
- Frayed or broken wire
- Abrasions
- Kinking
- Heat damage
- Any apparent reduction of wire rope diameter

***STOP USING THE UNIT AND REPLACE THE WIRE ROPE*** if any of the defects listed above are discovered.

Using light oil on the wire rope and hook can keep rust and corrosion from forming.

# Troubleshooting Guide

General Symptom	Potential Cause
Unit will not produce line pull/line speed as listed.	1. Inadequate air pressure/flow.
	2. Air motor is not properly lubricated.
	3. Air is restricted (line, mufflers, etc.)
	4. Unit is mounted to an uneven surface.
	5. Cable sheaves or block purchase not turning freely.
	6. Load is constrained.
Unit will lower load, but will not raise load.	1. Load is beyond rated capacity.
	2. Load is constrained.
	3. Upper limit switch contact is OPEN.
Unit does not respond to control input.	1. Limit switch contacts are OPEN.
	2. Unit is not correctly connected to power source.
Wire rope stacks against flanges.	1. Unit is not level.
	2. Line leads to a point not in line with the drum.
	3. Distance to wire rope sheaves, block purchase or load inadequate for proper fleet angle.
Wire rope spools poorly.	1. Wire rope tension was lost.
	2. Wire rope is not installed properly.
	3. Tension not adequate to spool wire rope on tightly.
	4. Distance to wire rope sheaves, block purchase or load inadequate for proper fleet angle.







# LIMITED WARRANTY

Allied Power Products, Inc. (APPI) warrants the products it manufactures to be free from defects in material and workmanship to the original buyer for a period of 24 MONTHS from the date of shipment from APPI. All warranties for products sold but not manufactured by APPI are solely that of the manufacturer.

This warranty and liability of APPI is limited to the replacement or repair of any product manufactured by APPI if the product is found – upon examination at our facility – defective due to materials or workmanship. All freight, removal and/or installation charges shall be borne by the Buyer.

This warranty does not cover failures or malfunctions found by APPI to result from:

- Improper installation, operation and/or maintenance of the product.
- Replacements, repairs and/or alterations made by or on behalf of the buyer without written approval from APPI.
- Use of accessories and/or other components in conjunction with the product without written approval from APPI.

APPI SHALL NOT IN ANY EVENT BE HELD LIABLE FOR ANY CONSEQUENTIAL OR INCIDENTAL DAMAGE OR FOR EXPENSES OR DELAY CAUSED BY DEFECTIVE MATERIAL OR WORKMANSHIP.

Except for the above warranty, APPI makes no other express or implied warranties and NO WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

This warranty shall be governed by and construed in accordance with the laws of the State of Oregon and enforced in Oregon courts. If any portion of this limited warranty and limitation on damages is determined to be invalid or unenforceable, the remainder of the warranty shall remain in full force and effect.

All warranty claims must be submitted to APPI in writing to:

**Allied Power Products, Inc.**  
**6590 SW Fallbrook Place**  
**Beaverton, OR 97008**



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