



Heavy Duty Rotator

DXE-RT4500HD

US Patent No. 11,652,268 B2

DXE-RT4500HD-INS Revision 2



© DX Engineering 2025

1200 Southeast Ave. - Tallmadge, OH 44278 USA

Phone: (800) 777-0703 - Tech Support and International: (330) 572-3200

E-mail: DXEngineering@DXEngineering.com

DX Engineering RT-4500HD Rotator

Introduction

The RT4500HD Heavy-Duty Rotator (US Patent No. 11,652,268 B2) has capabilities that surpass most rotators available on the Amateur Radio market. In addition to an impressive list of features and benefits, it is especially noteworthy that this rotator does not have mechanical limit switches. Soft rotation limits are set as desired in the controller, to the limits of the installed antenna cables. Total maximum antenna wind area handling of the DX Engineering RT4500HD is expected to be approximately 25 sq. ft., with maximum torque of over 4400 in-lbs., for very well-balanced antenna systems, while also using the appropriate torque calculations that account for total antenna system size and weight. If the antenna or the mast ever slips, simply reset the controller to the new center of rotation and recalibrate the rotational range. Climbing or antenna mast repositioning is not immediately required.

Install the DX Engineering RT4500HD Heavy-Duty Rotator in your tower to take advantage of these features and benefits:

- Superior Rotational Torque > 4,400 in. lbs. with high ratio worm gear drive powered by an extra heavy-duty 24VDC motor
- Exceptional Braking Torque >18,500 in. lbs. by high ratio gear reduction that prevents rotation of the mast mounted antenna system due to wind
- Very High Vertical Load Capacity — internal needle thrust bearing handles up to 2,000 lbs.
- High-compression Heavy-Duty Top Mount Mast Clamps available for 2-inch OD or 3-inch OD masts
- Precision Movement — accuracy within +/-0.1 degrees with high resolution magnetic pulse sensor controller
- Easy Maintenance — access panel allows service of the magnetic pulse sensor assembly without removing the rotator from the tower
- Built for Longer Life — all steel gears are hardened; high-load gears are welded onto their shafts to prevent slippage; larger main gear provides increased strength
- Weather-Protected — sloped powder coated cast aluminum alloy body sheds water; seals at the output shaft, intermediate plate and access panel keep moisture out; weep holes make sure it stays dry
- Worry-Free Installation — four-bolt standard mount; this triangular-shaped rotator is ideally sized to fit inside any G-series ROHN tower, including 25G (but the RT4500HD easily handles larger antenna systems than 25G will withstand). **Note: Recommended for Rohn 45G and larger towers. This rotator may overload a Rohn 25G tower.**
- Works with High-Quality Controllers — Optional DX Engineering Green Heron Rotator Controller **DXE-RT21DXE** or other 24VDC, Pulse Counting Programmable Controllers including Green Heron and the **MOH-ARCO-115V** microHAM ARCO Advanced Rotator Controller
- Fully bench tested prior to packing to ensure rotator is functioning within design specifications



General Information

The DX Engineering rotator is designed to rotate large tower mounted amateur and professional antenna arrays under control from the station operating position.

The internal motor is variable DC coupled to a series of hardened gears to provide the turning power. A magnetic pulse sensor sends the appropriate information to the rotator controller to indicate speed and positioning. There are no starting capacitors, limit switches or positioning potentiometers that are normally prone to failure in the DX Engineering rotator.

In the event of a nearby lighting strike, the pulse sensor may be damaged. Unlike other rotators, the DX Engineering pulse sensor can be easily replaced by opening the pulse sensor assembly access panel without having to remove the rotator from the tower.

The DX Engineering rotator is designed to fit Rohn 25*, 45, 55 and other large towers as well.

*** Note: Recommended for Rohn 45G and larger towers. This rotator may overload a Rohn 25G tower.**

The rotator should be mounted approximately 10 feet inside from the top of the tower with an optional thrust bearing (**DXE-TB-300** or **DXE-TB-400**) mounted on a thrust bearing shelf – or flat tower top.

The rotator mounting shelf must be installed so it is level and centered to the tower which will then be in-line with the rotator to eliminate any undue stress. The Rotator is attached to the Rotator Shelf using four single-use patch bolts for secure mounting.

An optional RTMC Mast Clamp (**DXE-RTMC-2A** or **DXE-RTMC-3A**) is required to be mounted to the rotator top plate using four bolts with single-use Nyloc hex nuts and flat washers.



Installed at K3LR with optional parts

An Important Note About Rotator Capacity – Total maximum antenna wind area handling of the DX Engineering RT4500HD is expected to be approximately 25 sq. ft., with maximum torque of over 4400 in-lbs., for very well-balanced antenna systems, while also using the appropriate torque calculations that account for total antenna system size and weight.

If the antenna(s) used is (are) rated at a total of 18 square feet wind load or more, it is highly recommended that a three inch mast be used.

PLEASE – Read the entire manual before starting installation to get familiar with the procedure and to ensure you have the required tools and supplies needed for a successful and **Safe** installation.

IMPORTANT SAFETY INFORMATION

The installation of a rotatable antenna system on a tower is a dangerous and potentially life-threatening task if due care is not taken. DX Engineering shall not be held liable for any accident or injury involved in the installation or operation of the RT4500HD rotator. It is the responsibility of the customer to ensure the installation is completed by an experienced and reliable installation company complying with standard safety practices and using the best practices for working on or near a tower.

SAFELY working on a tower system is THE **MOST IMPORTANT** thing. Your installation team **must** follow all safety requirements to avoid any injury or possible death from an accident. If you and your team do not have the experience or safety equipment required, you should contact a qualified tower/antenna installation team.

The **DXE-RT4500RT** weighs approximately 22 pounds – ensure no one is located below the tower working area either on the ground or on the tower. If the rotator is accidentally dropped while working on the tower injury or death may occur if someone is struck by the falling rotator.

NOTE: The lifting handle must always be used when transporting the rotator and when raising it up the tower.

Do NOT lift the rotator by the top round rotator plate.

A snap ring holds the top plate in position and it is not designed to hold the weight of the rotator. If you hold the rotator by the top plate, you risk having the snap ring fail and the rotator will then drop away from the top plate.

A tower must never be installed in a position where it could fall across power lines in the event of a catastrophic failure during a windstorm or other environmental disaster. Follow all safety related items when installing or working on a tower – Safety First.

The control cable attached to the DX Engineering rotator could, in the event of a nearby or direct lightning strike carry lethal voltages down the cable and into your radio room. DX Engineering strongly recommends the installation of suitable lightning arrestors on all rotator control lines and coaxial cables entering your radio room from your antenna installation. Additionally a thrust bearing by-pass kit and lightning rod should be installed to further help mitigate lightning damage.

If an electrical storm should be approaching your area, quickly disconnect the control cable from the rear of the rotator's control box and disconnect the AC cable from the wall outlet. Disconnect the coaxial cables from the antennas as well. Only do this if the lightning is NOT in your immediate area, as you could be killed instantly if lightning should strike while you are holding a cable.

NOTE: If you have *any* doubts about your ability to install this rotator, seek out the services of a professional antenna – tower installation company.

Combinations Available

DXE Combination Part Numbers	DXE-RT4500HD Rotator	DXE-RTMC-2A 2" Mast Clamp	DXE-RTMC-3A 3" Mast Clamp	DXE-RT21-DXE Green Heron Controller	MOH-ARCO-115V microHAM Controller
DXE-RT4500HD-2	X	X			
DXE-RT4500HD-3	X		X		
DXE-RT4500HD-2DX	X	X		X	
DXE-RT4500HD-3DX	X		X	X	
DXE-RT4500HD-2MH	X	X			X
DXE-RT4500HD-3MH	X		X		X



Included Parts List

Part Number	Description	Qty
DXE-RT4500HD	Rotator ⁽¹⁾	1
DXE-ROT-MTG-HWK	Patch Bolt ⁽²⁾ , 5/16-18 (18-8) x 3/4" Stainless Steel	4
	Flat Washer, #18, Stainless Steel	4
DXE-LP20-F	4 pin control female cable connector with 6mm and 8-12mm water tight grommet	1
-	Rotator Lift Strap – Aluminum ⁽³⁾ 5-1/4" x 1" x 1/4"	1
-	Rotator Lift Strap Bolt ⁽³⁾ 5/16-18 x 3/4", Socket Head Cap, Stainless Steel	2
-	Rotator Lift Strap Flat Washer ⁽³⁾ 5/16", Stainless Steel	2
-	Rotator Top Plate Snap Ring, spare, External 3/4" shaft, .704 groove, Black Phosphate	1
DXE-RT-UB-INS	Unboxing Information Sheet	1
DXE-RT4500HD-INS	Instruction Manual	1

⁽¹⁾ Rotator Weight: With no mounting hardware and no clamp: Approximately 22 pounds
 With all mounting hardware and 2" mast clamp: Approximately 27 pounds

⁽²⁾ Single-Use Thread Lock Patch Bolts

⁽³⁾ For transport only – will be removed when rotator is installed

Required Parts

JTL-12555 - Jet-Lube® SS-30™ Anti Seize – for all stainless steel hardware to avoid galling

LCT-37477 - Loctite® - 242 Medium Strength Threadlocker (blue)

TES-06143 – 3M Scotch® Super 88 Premium Vinyl Electrical Tape – to secure the rotator control cable to a tower leg as needed and also to weatherproof the rotator cable connectors

TES-2155 – 3M Temflex™ 2155 Rubber Splicing Tape - to weatherproof the rotator cable connectors

Rotator Control Box – Select One

DXE-RT-21DXE - Digital Universal Controller, manufactured by Green Heron

MOH-ARCO-115V – MicroHam ARCO Rotor Controller

Tower Accessory Shelf – Select One

DXE-AS25G – Tower Accessory Shelf for Rohn 25 tower

DXE-AS455G – Tower Accessory Shelf for Rohn 45 and 55 tower

Mast Clamp – Select One*

DXE-RTMC-2A – DX Engineering Rotator Top HD Mast Clamp for 2 in. OD mast

DXE-RTMC-3A – DX Engineering Rotator Top HD Mast Clamp for 3 in. OD mast

DXE-SDMC-2 – DX Engineering Rotator Top – 2 Super Duty Clamps for 2 in. OD mast

DXE-SDMC-2HD – DX Engineering Rotator Top – 3 Super Duty Clamps for 2 in. OD mast

DXE-SDMC-2-5 – DX Engineering Rotator Top – 2 Super Duty Clamps for 2.5 in. OD mast

DXE-SDMC-2-5HD – DX Engineering Rotator Top – 3 Super Duty Clamps for 2.5 in. OD mast

DXE-SDMC-3 – DX Engineering Rotator Top – 2 Super Duty Clamps for 3 in. OD mast

DXE-SDMC-3HD – DX Engineering Rotator Top – 3 Super Duty Clamps for 3 in. OD mast



**Install at K3LR with
DXE-SDMC-2HD**

Thrust Bearing – Select One*

DXE-TB300 – Advanced Design Thrust Bearing for 2 in. OD masts

DXE-TB400 – Advanced Design Thrust Bearing for 3 in. OD masts

DX Engineering Chrome-Moly Mast – Select one*

DXE-ST200CM-22 - 2 in. OD Mast, Chrome-Moly 4130 Steel Tube, 100K PSI Min. Yield, 0.250 in Wall, 22 ft. L

DXE-ST300CM-22 - 3 in. OD Mast, Chrome-Moly 4130 Steel Tube, 100K PSI Min. Yield, 0.250 in Wall, 22 ft. L

Bearing By-Pass Kit – Select One

DXE-BBGK-2-25-P - Bearing Bypass Ground Kit, for 2 in. OD Mast, 25G/45G Tower Leg

DXE-BBGK-3-25-P - Bearing Bypass Ground Kit, for 3 in. OD Mast, 25G/45G Tower Leg

DXE-BBGK-3-55-P - Bearing Bypass Ground Kit, for 3 in. OD Mast, 55G Tower, Leg

*** NOTE: If the antenna(s) used is (are) rated at a total of 18 square feet wind load or more, it is highly recommended that a three-inch mast be used.**

Lightning Rod Kit – Select One

DXE-LRMM-2-434 - Lightning Rod Kit, for Mast Top, Incl. Clamps for 2 in. OD Mast, Fasteners, 3/4 in. D. x 4 ft. L. Rod

DXE-LRMM-2-458BS - Lightning Rod Kit, for Mast Top, Incl. Clamps for 2 in. OD Mast, Fasteners, 5/8 in. D. x 4 ft. L. Rod

DXE-LRMM-2-458B - Lightning Rod Kit, for Mast Top, Incl. Clamps for 2 in. OD Mast, Fasteners, 5/8 in. D. x 4 ft. L. Rod

DXE-LRMM-2-834 - Lightning Rod Kit, for Mast Top, Incl. Clamps for 2 in. OD Mast, Fasteners, 3/4 in. D. x 8 ft. L. Rod

DXE-LRMM-3-434 - Lightning Rod Kit, for Mast Top, Incl. Clamps for 3 in. OD Mast, Fasteners, 3/4 in. D. x 4 ft. L. Rod

DXE-LRMM-3-458B - Lightning Rod Kit, for Mast Top, Incl. Clamps for 3 in. OD Mast, Fasteners, 5/8 in. D. x 4 ft. L. Rod

DXE-LRMM-3-458BS - Lightning Rod Kit, for Mast Top, Incl. Clamps for 3 in. OD Mast, Fasteners, 5/8 in. D. x 4 ft. L. Rod

DXE-LRMM-3-834 - Lightning Rod Kit, for Mast Top, Incl. Clamps for 3 in. OD Mast, Fasteners, 3/4 in. D. x 8 ft. L. Rod

DXE-CW1812OR – DXE Engineering CW1812OR Rotator Control Cable – two 12 AWG and three 18 AWG wires, Tinned Stranded Copper wires, Foil Shield Direct-Bury, UV Resistant Black PE Jacket

DXE-LP20-F – Cable Connector, female – (included with the rotator) to connect to the RT4500HD Rotator Pigtail

And / Or

Pre-Made Rotator Control Extension Cables – Select as needed

DXE-RTC4-010PE – Pre-made Rotator Control Extension Cable assembly with connectors installed – 10 feet long

DXE-RTC4-025PE – Pre-made Rotator Control Extension Cable assembly with connectors installed – 25 feet long

DXE-RTC4-050PE – Pre-made Rotator Control Extension Cable assembly with connectors installed – 50 feet long

DXE-RTC4-075PE – Pre-made Rotator Control Extension Cable assembly with connectors installed – 75 feet long

DXE-RTC4-100PE – Pre-made Rotator Control Extension Cable assembly with connectors installed – 100 feet long

DXE-RTC4-125PE – Pre-made Rotator Control Extension Cable assembly with connectors installed – 125 feet long

DXE-RTC4-150PE – Pre-made Rotator Control Extension Cable assembly with connectors installed – 150 feet long

DXE-RTC4-200PE – Pre-made Rotator Control Extension Cable assembly with connectors installed – 200 feet long

DXE-RTC4-250PE – Pre-made Rotator Control Extension Cable assembly with connectors installed – 250 feet long

DXE-RTC4-300PE – Pre-made Rotator Control Extension Cable assembly with connectors installed – 300 feet long

Suggested Parts

DXE-MASTLOCK - Mast Anti Rotation Assembly for Use on Antenna Towers

DXE-RT-PULSE-ASM - Pulse Sensor Assembly, Sensor, Door Cover and Gasket, Kit - or -

DXE-RT-SENSOR - Pulse Sensor Component, Sensor Only Replacement

Tools Required

Torque Wrench – capable of 12 foot pounds with 9/16", 1/2" sockets

Socket set and Wrench set – will use: 7/16", 1/2", 9/16"

Small Carpenter Square

Straight Slot Screwdriver

Box Cutter or Knife

Sharpie type marker

Control Cable Information

Included with the DX Engineering rotator is a control cable plug (**DXE-LP20-F**) that mates to the rotator cable pigtail (**DXE-LP20-M**). This plug may be used to assemble your own rotator control cable. DX Engineering also offers pre-made control cables with the connector installed in various lengths (see information above).

The cable needed for controlling the DX Engineering Rotator uses four wires. Two 12AWG wires for DC supply to the motor and two 18AWG wires for the Pulse Sensor. For cable runs over 300 feet, use larger diameter wire as needed to supply the rotator with 24 VDC at 3.1 amps nominal operating requirements.



DXE-LP20-F

Unpacking the DXE-RT4500HD Rotator from the custom made shipping box

Please review the important unpacking instructions that are included in the box to avoid damage or injury when handling the DXE-RT4500HD Rotator.



Installation of the DXE-RT4500HD Rotator

NOTE: If you are replacing an existing Rotator – you must verify rotator mounting holes in your existing rotator shelf, and your existing mast OD does not exceed the OD specification on the chosen Mast Clamp (2 or 3 inch OD).

Additionally, you may want to use two of the **DXE-MASTLOCK** - Mast Anti Rotation Assemblies for Use on existing Antenna Towers to hold your existing 2 or 3 inch OD mast in place while the old rotator is removed and the **DXE-RT4500HD** rotator is installed.

If you are using a non-DX Engineering rotator shelf, ensure the rotator bolt pattern is correct (see Reference Information later in this manual) and there is an opening on the bottom to allow moisture drainage from the weep holes on the bottom of the **DXE-RT4500HD**.

The following installation example uses a **Rohn 45G** tower, **DXE-AS455G** Rotator Shelf, **DXE-RTMC-2A** Two Inch Mast Clamp, **DXE-TB300** Thrust Bearing. A temporary 2" aluminum tube to simulate a mast (it will be replaced with the steel mast in a later step),
DXE-ST200CM-22 Two Inch OD Mast
and **JTL-12555** Jet-Lube® SS-30™ Anti Seize

NOTE: Your installation may vary – this is only one example of the installation.

The **Thrust Bearing (DXE-TB300)** is installed on the upper flat bearing plate on the Rohn 45 tower.

The four bolts holding the TB-300 in place should be fully and properly tightened in place and use Jet-Lube® SS-30™ to avoid galling and Loctite® - 242 Medium Strength Threadlocker (blue).

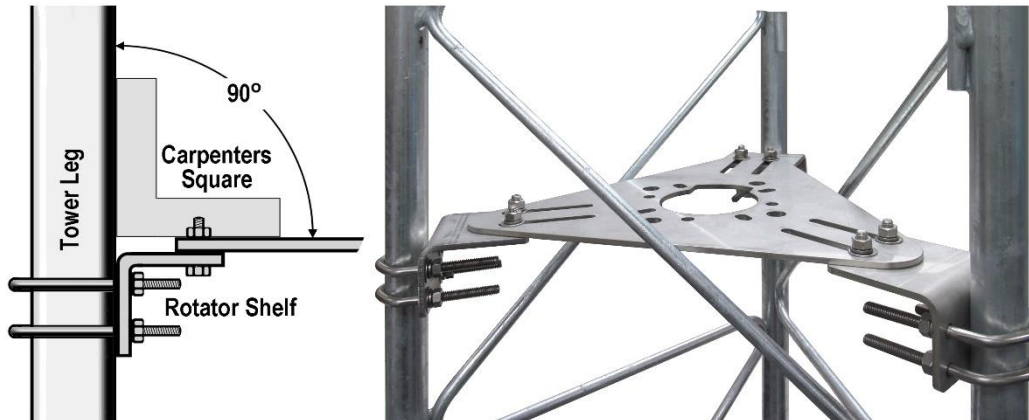


The three bolts that snug against the mast should be evenly loose to allow the 2 inch mast to pass through. These bolts will be tightened in a later step.

The **Rotator Mounting Shelf (DXE-AS455G)** should be installed in the tower approximately 8-10 feet below the Thrust Bearing.

Assemble and install the Rotator shelf per its instruction sheet.

Ensure the Rotator Mounting shelf is properly mounted to the tower and not tilted. A small carpenter square can assist in making sure the shelf is mounted square to the tower.



The V-Bolts and shelf extension bolts should be snug (not tight). Adjustment may be needed for centering the rotator with the mast clamp when the mast is ready to be inserted in the mast clamp. The clamps will be fully tightened when the final shelf alignment is completed.

Rotator Connections to the Rotator Control Box

The RT4500HD uses four wires. Two 12AWG wires for DC supply (White Pin 1 and Black Pin 2) to the motor and two 18AWG wires for the Pulse Sensor (Red Pin 3 and Green Pin 4). For cable runs over 300 feet, use larger diameter wire as needed to supply the rotator with 24 VDC at 3.1 amps nominal operating requirements.



Rotator Control Box Connections are detailed in the Appendix.

Testing the Rotator

Set up the **DXE-4500HD** Rotator and controller box on the bench. The uninstalled and unloaded RT4500HD Rotator may have elevated reduction gear noise when tested on the bench which is *COMPLETELY NORMAL*. This noise is *NOT* a defect. This gear noise will be dissipated and not easily heard when the rotator is installed.

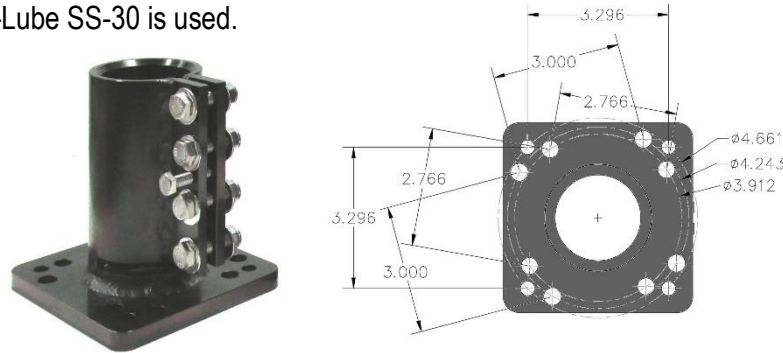
Connect the rotator control cable from the rotator to the rotator control box

Test for a full 360 degrees of rotation and make any adjustments that are necessary to the controller box.

RTMC Mast Clamp

The RTMC Mast Clamps have multiple holes for mounting to the rotator top plate. Place the RTMC Mast Clamp that will be used on the rotator top plate. Move it around to locate the four holes that align with the top plate and the mast clamp. Mark the four holes with a Sharpie style marker on the mast clamp that are used. This will make it a bit easier once you are on the tower and installing the mast clamp to the rotator.

The chosen mast clamp should already have the clamping hardware loosely installed per the mast clamp instructions. Ensure Jet-Lube SS-30 is used.



(DXE-RTMC-2A Two Inch Mast Clamp used in this installation example.)

Installing the Rotator and Mast in the Tower

There are two ways to accomplish the installation and alignment of the mast to the rotator in the tower.

- Using a Gin Pole raise the mast to the point that it can pass through the Thrust Bearing for existing towers. Keep in mind, there is not a lot of play between the Thrust Bearing and Mast so alignment between the Thrust Bearing and Mast is critical.

Allow the mast to be lowered through the Thrust Bearing and stop about **14-1/4" inches** above the Rotator Shelf. This allows room for the rotator and the 2 inch mast clamp.

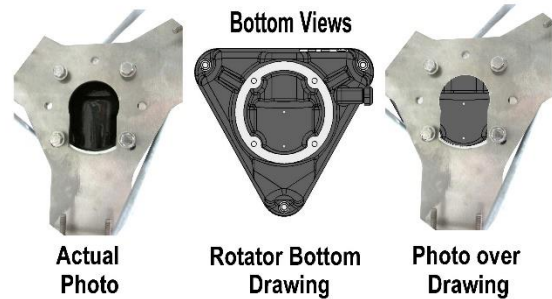
- The alternative for a new installation is to use a 2 inch OD aluminum tube, long enough to go from the just above the Thrust Bearing to the Rotator Shelf in place of the steel mast. When everything (rotator shelf, rotator alignment, mast clamp alignment) is properly adjusted, remove the temporary aluminum mast and install the steel mast. Doing it this way avoids any concerns about the heavy steel mast moving things around when mast-rotator shelf-tower alignment adjustments are made.

NOTE - For this example: A temporary 2 inch OD aluminum tube will be used for alignments. Once alignments are completed, the aluminum tube will be removed and the 2" OD steel mast will then be installed.

NOTE: If you are using a non-DX Engineering rotator shelf, ensure the rotator bolt pattern is correct (see Reference Information later in this manual) and there is an opening on the bottom to allow moisture drainage from the weep holes on the bottom of the **DXE-RT4500HD**.

Rotator Installation on Rotator Shelf

When installing the rotator into the tower, align the rotator so the motor bulge (looking at the bottom) is aligned as shown in this photo (Looking up from the bottom of the rotator shelf).



Once the rotator is in position to be installed, remove the two temporary hex head bolts and temporary lifting strap.

Slip the **DXE-4500HD** rotator through the Rohn RG45 tower legs. Align the rotator bottom 4 mounting holes with the rotator shelf holes.

Install the four washers and four hex head patch bolts.

Tighten the four mounting patch bolts securely in place. These bolts do not require Jet-Lube® SS-30™ since the bolts are being threaded into the bottom rotator case that is cast aluminum. The yellow patch you see on the threads of the four bolts is a ready-to-use thread locking compound (no Loctite® is needed). Torque specs for the patch bolts are actually 12 foot pounds, BUT because of the patch compound this will vary considerably. It is up to the installer to insure they are actually tight.



NOTE: The patch bolts are single-use.
If for any reason you remove the patch bolts, you **must** replace the patch bolts with new patch bolts.

The RTMC Mast Clamp should already have the clamping bolts loosely installed per the instruction manual for the mast clamp.



NOTE: Ensure the Mast Clamp is open just wide enough to allow the aluminum tube to slide in place. There is one bolt on the mast clamp that is used to open the clamp (when the other four bolt sets are loose).

Using the four hex head bolts, eight stainless steel washers and four Nyloc nuts install the Mast Clamp to the rotator top plate using the previously identified four holes that match up. Use Jet-Lube® SS-30™ on the hex head bolts. Double check the tension after all four bolts are tightened.

NOTE: The Nyloc nuts in this application are considered single-use.
If for any reason you remove or loosen the Nyloc nuts, you **must** replace them with new Nyloc Nuts.

Alignment of Mast to Rotator

Carefully lower the 2 inch OD aluminum tube (temporary mast) to the top of the mast clamp.

Carefully adjust the rotator shelf brackets as needed to center the tube with the mast clamp. Do not loosen the clamps too far or the rotator shelf may drop down. Once the shelf is verified as properly aligned, tighten all of the rotator shelf bolts securely in place.

Installing the Steel Mast

Remove the temporary 2 inch OD aluminum tube.

Carefully install the 2 inch OD steel mast through the Thrust Bearing and fully seat the steel mast in the Mast Clamp.



Note: Some installations may want the start/stop point to be at 180 degrees (South).
ENSURE you have a proper coax loop to allow the 360 degree turning of the rotator.

Tighten the three Thrust Bearing to Mast bolts as needed.

Antenna Alignment and Final Mast Clamp Tightening

Loosen the one hex bolt in the Mast Clamp that spreads the clamp apart.

Tighten the Mast Clamp Hex Head Bolts securely in place to hold the Mast in place. The four bolts squeeze the clamp securely around the steel mast.

Torque for the clamp bolts is 11 foot pounds tightening from the inside to the outside, and double check the tension after all four bolts are torqued.

Connect the rotator cable to the rotator cable pigtail and test the rotation and coax loop clearance. Make any adjustments as needed. Ensure the control unit for the rotator is properly set for the antenna direction. Since there are no limit switches in the rotator, verify North and South are in sync to the rotator, controller, coax loop and antenna(s) all rotate properly.

NOTE: Since there are no limit switches if adjustments are made in positioning – ensure a team member is visually watching the rotation to verify the rotator loop is not getting too tight. The rotation beyond the loop limits will damage the rotator/antenna coax cable loop.

The rotator control cable connectors are rated to IP65/IP67. It is still recommended to add further weatherproofing. Use Temflex™ tape and Scotch® 88 tape for weatherproofing this connection.

Use Scotch® 88 tape for securing the control cable to the tower leg.

Lightning Protection

As with any tall structure a tower is subject to being a target for lightning. Although a direct hit is catastrophic, local nearby strikes can also cause equipment failures. Your tower must be properly grounded to help avoid any damage to your home or radio gear. This includes the rotator control lines and coaxial cables. Consult other publications with details concerning lightning protection, bonding and grounding.

Any thrust bearing could be welded in place from lightning. To help avoid this problem it is strongly suggested a lightning rod and bearing by-pass be installed. Reference the following products:

Bearing By-Pass Kit

DXE-BBGK-2-25-P - Bearing Bypass Ground Kit, for 2 in. OD Mast, 25G/45G Tower Leg

DXE-BBGK-3-25-P - Bearing Bypass Ground Kit, for 3 in. OD Mast, 25G/45G Tower Leg

DXE-BBGK-3-55-P - Bearing Bypass Ground Kit, for 3 in. OD Mast, 55G Tower, Leg

Lightning Rod Kit

DXE-LRMM-2-434 - Lightning Rod Kit, for Mast Top, Incl. Clamps for 2 in. OD Mast, Fasteners, 3/4 in. D. x 4 ft. L. Rod

DXE-LRMM-2-458BS - Lightning Rod Kit, for Mast Top, Incl. Clamps for 2 in. OD Mast, Fasteners, 5/8 in. D. x 4 ft. L. Rod

DXE-LRMM-2-458B - Lightning Rod Kit, for Mast Top, Incl. Clamps for 2 in. OD Mast, Fasteners, 5/8 in. D. x 4 ft. L. Rod

DXE-LRMM-2-834 - Lightning Rod Kit, for Mast Top, Incl. Clamps for 2 in. OD Mast, Fasteners, 3/4 in. D. x 8 ft. L. Rod

DXE-LRMM-3-434 - Lightning Rod Kit, for Mast Top, Incl. Clamps for 3 in. OD Mast, Fasteners, 3/4 in. D. x 4 ft. L. Rod

DXE-LRMM-3-458B - Lightning Rod Kit, for Mast Top, Incl. Clamps for 3 in. OD Mast, Fasteners, 5/8 in. D. x 4 ft. L. Rod

DXE-LRMM-3-458BS - Lightning Rod Kit, for Mast Top, Incl. Clamps for 3 in. OD Mast, Fasteners, 5/8 in. D. x 4 ft. L. Rod

DXE-LRMM-3-834 - Lightning Rod Kit, for Mast Top, Incl. Clamps for 3 in. OD Mast, Fasteners, 3/4 in. D. x 8 ft. L. Rod

Maintenance

The DX Engineering RT4500HD Rotator is a factory sealed and lubricated unit and does not require any additional lubrication.

Routine maintenance would be to verify all bolts are properly tightened and nothing has shaken loose over time from wind/weather vibrations and the bottom weep holes are not clogged.

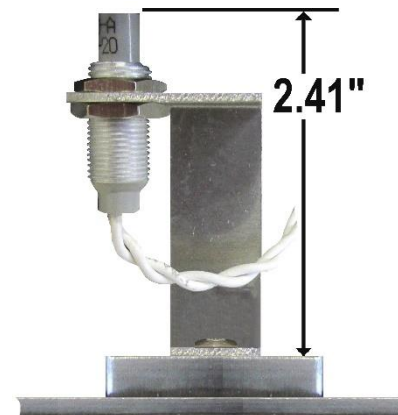
Magnetic Pulse Sensor Replacement

In the event that the magnetic pulse sensor is damaged from a nearby lightning strike it is easy to replace. Unlike other rotators, the **DXE-RT4500HD** does not have to be removed from the tower to replace the magnetic pulse sensor. You can order and keep on hand a spare magnetic pulse counter from DX Engineering.

DXE-RT-PULSE-ASM – Magnetic Pulse Sensor Assembly Kit: Includes Magnetic Sensor Component, Door Cover and Gasket.



The pulse sensor in the assembly is factory preset.
However, you should verify it is the same setting (distance)
as the existing assembly in your rotator.



DXE-RT-SENSOR – Magnetic Pulse Sensor Component (Gasket included), Replacement for RT4500HD Rotator



1. On the side of the rotator body, you will notice an aluminum hatch or door.
2. Using a straight slot screwdriver, rotate the 1/4 turn screw counter-clockwise to open the door.
3. You can then carefully pull out the magnetic pulse sensor assembly until you see the green connector.
4. Unplug and remove the old pulse sensor assembly.



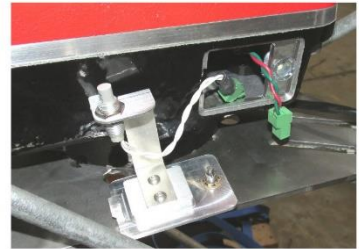
1



2



3



4

5. Position the new replacement Pulse Assembly (with gasket) as shown.
6. Plug in the new replacement pulse sensor assembly.
7. When tucking the connector and wires into the rotator, push them toward the right side (as you are looking at the opening in the rotator). This ensures the wires are kept away from any moving parts inside the rotator,
8. Carefully push the assembly in place and use a straight slot screwdriver and turn the 1/4 turn door screw clockwise to lock it and the gasket in place.



5



6



7



8

Specifications

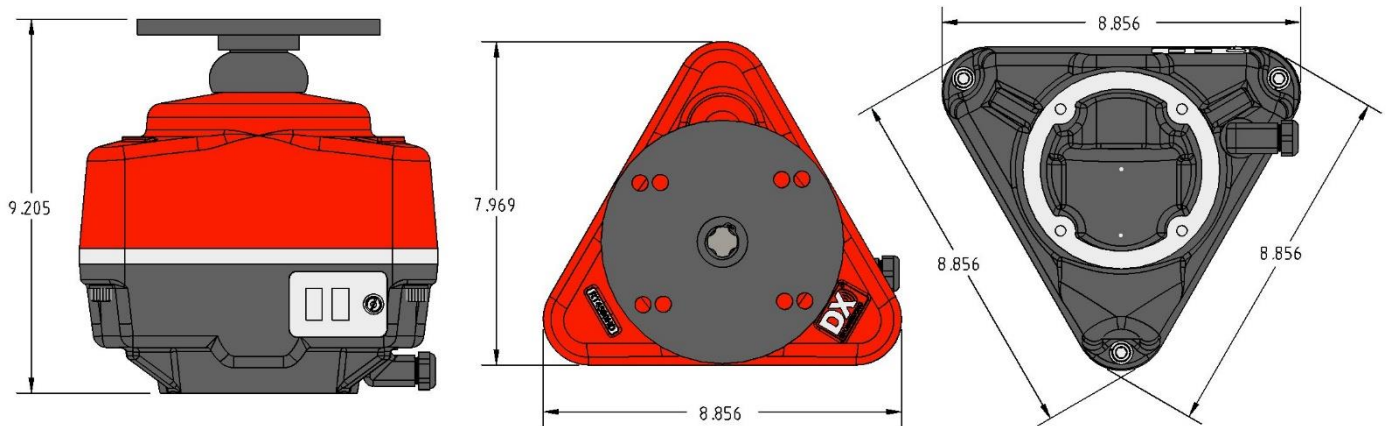
- **Maximum Torque:** Over 4,400 in-lbs. @ 24VDC
- **Braking Torque:** Over 18,500 in-lbs.
- **Vertical Load:** 2,000 lbs., maximum
- **Rotating Range:** Unlimited (limited by the range of installed coaxial cables)
- **Rotational Speed:** 61 seconds/revolution (360 degrees) @ 24VDC, max.
- **Resolution:** 0.1 degree, nominal (dependent upon controller)
- **Travel Accuracy:** 0.1 degree
- **Pulse Counter Ratio:** 4,814 pulses per revolution (required for third-party controller programming)
- **Antenna Mast Clamp:** For 2 in. OD - **DXE-RTMC-2A** or for a 3 in. OD - **DXE-RTMC-3A**, available with rotator and separately. Other Super Duty Mast Clamps available in 2, 2.5 and 3" mast sizes, standard and heavy duty. See listing and the DX Engineering website for more information
- **Voltage:** 24VDC
- **Current:** 3.1 Amps, nominal, during rotation
- **Control Wire:** 4 Cond. Cable, 2 @ 12 AWG (motor) + 2 @ 18 AWG (pulse counter) for controller to rotator total length up to 400 ft., 4-Cond. Male weatherproof locking shielded connector installed on rotator pigtail; Female cable-mount mating connector supplied. Extension cables available separately. For runs over 300 feet, use appropriate size wire for 24 VDC at 3.1 Amps operation power requirements at the rotator.
- **Weight:** 22 lbs. without hardware or mast clamp; 27 lbs. with hardware and 2 in. RTMC Mast clamp
- **Width:** 7.970 in. apex to side; 8.855 in. apex to apex (fits inside Rohn 25G and larger) (not recommended for Rohn 25G – the rotator can overstress the 25G tower)
- **Height, without clamp:** 9.205 in. from base to top of mast clamp platform
- **Operating Temperature Range:** -10 degrees F to +140 degrees F

An Important Note About Rotator Capacity – Total maximum antenna wind area handling of the DX Engineering RT4500HD is expected to be approximately 25 sq. ft., with maximum torque of over 4400 in-lbs., for very well-balanced antenna systems, while also using the appropriate torque calculations that account for total antenna system size and weight.

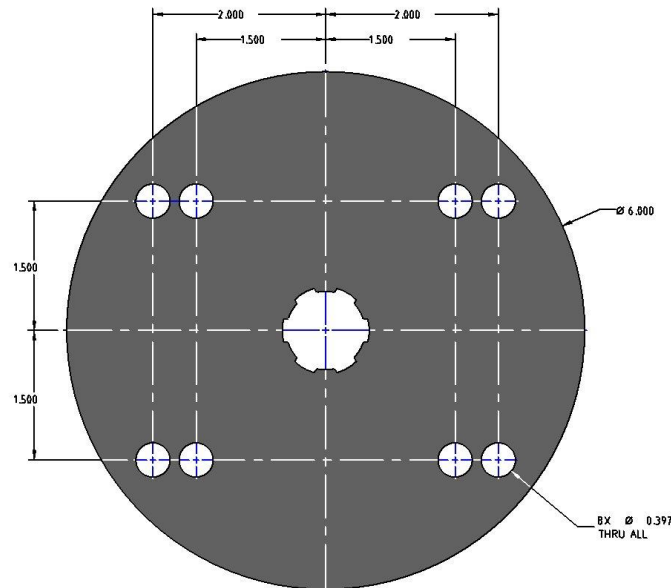
If the antenna(s) used is (are) rated at a total of 18 square feet wind load or more, it is highly recommended that a three inch mast be used.

Appendix - Reference Information

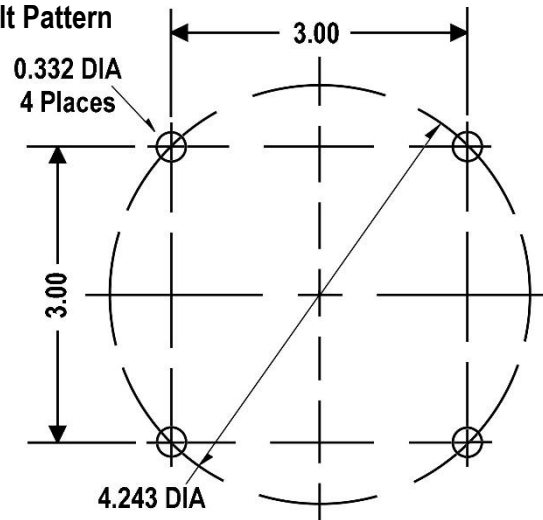
Overall dimensions of Rotator



Top Plate Dimensions



Bottom Rotator Mounting Bolt Pattern



=====

DXE RT4500HD Setup for RT-21 - Refer to the Green Heron RT-21 manual for details.

SETUP/OPTION = DXE (Forces Pulse Divider to **4814**)

If older version RT-21 controller use the SET/OPTION = ORION and set Pulse Divider to **4814**.

DC Motor	
Jumper	Position
J10	2-3
J14	2-3
J12	2-3

Transformer Taps		
Transformer	J9 Connection	NOTE
Brown	J9-3	
Orange	J9-4	

Position Feedback	
Jumper	Position
J5	2-3
J6	2-3
J16	1-2

Rotator Connections		
Function	DXE-RT4500HD	RT-21
MOT CW	1 (White)	1
MOT CCW	2 (Black)	2
GND	3 (Green)	3
POS	4 (Red)	4
Optional: cable shield to 6-32 ground stud (if shield is used) (Shielded rotor cable is not required with the DXE-RG4500HD)		

Green Heron suggested starting information					
Divide Hi	48	Bright	4	Max Speed	10
Divide Lo	14	Calibrate	42	CCW Limit	180
Knob Time	40	Offset	180	CW Limit	180
Mode	Normal	Delays	4	Option	DX ENG
Ramp**	5	Min Speed*	4		

* Minimum Speed may need to be higher for larger loads.

** Ramp will need to be adjusted based on inertial load. Faster ramps (Lower Setting) can be used for smaller loads. See RT-21 Controller Manual for more information.

If after entering these settings you get an error message – reset the control box and all should be fine.

Calibration Procedure

1. Install antenna if not already installed. Since there are no hard limit switches in the DXE-RT4500HD, you can point the antenna at any known direction to complete the calibration. The rotator does not need to be in the center of Rotation. Likewise, if the mast clamp or any part of the system gets out of calibration, just point the antenna at a known heading and continue with the calibration procedure below.
2. Look at the current direction of the antenna and note the true heading. Then press SETUP until the displays says "Setup", then let go and you will be in the "Calibrate" item. Turn the knob until NEW VALUE is equal to the current true heading. Press CHANGE, then press SAVE.

DXE RT4500HD Setup for the microHAM ARCO Advanced Rotator Controller - Refer to the microHAM ARCO Advanced Rotator Controller manual for complete details.

General	Appearance	Rotator	Heading	LAN	System	EXIT
<div>Settings Link</div>						
MODEL CUSTOM		SENSOR REED 4814 p/360°				
MOTOR <input type="radio"/> AC <input type="radio"/> AC+CAP <input checked="" type="radio"/> DC (reversible) <input type="radio"/> DC+COM						
POWER <input type="radio"/> 12V <input type="radio"/> 18V <input checked="" type="radio"/> 24V <input type="radio"/> 48V						
BRAKE <input type="checkbox"/> HOLD DELAY 2.0 s		INERTIA COMPENSATION 0.0°				
TOTAL ROTATION 365.0°		LIMIT SWITCHES <input type="checkbox"/>		COASTING 1.0°		
MOTOR SPEED MIN 40 %		AUTO <input checked="" type="checkbox"/>		MAX 100 %		— s/360°
RAMPS <input checked="" type="checkbox"/> UP 5 s		DOWN 5 s		READY CCW		CW

* Minimum Speed may need to be higher for larger loads.

** Ramp will need to be adjusted based on inertial load. Faster ramps can be used for smaller loads. See ARCO Controller Manual for more information.

Note: The speed settings are dependent on your installation and how much you want to tolerate overshoot and sway

DX Engineering: RT4500HD

Rotator tab settings:

PARAMETER	VALUE
SENSOR	REED
P/360°	4814
MOTOR	DC (reversible)
POWER	24 V
BRAKE	NO
TOTAL ROTATION	365
LIMIT SWITCHES	NO

Rotator connection:

ROTATOR		ARCO	
WIRE	PIN	NAME	PIN
CW	1 (White)	MOTOR C + D	4 + 5
CCW	2 (Black)	MOTOR A + B	6 + 7
REED A	3 (Red)	SENSOR C + HI	2 + 3
REED B	4 (Green)	SENSOR LO	1

- pins 2 and 3 connected together in parallel
- pins 4 and 5 connected together in parallel
- pins 6 and 7 connected together in parallel

Technical Support

If you have questions about this product, or if you experience difficulties during the installation, contact DX Engineering at (330) 572-3200. You can also e-mail us at: DXEngineering@DXEngineering.com
For best service, please take a few minutes to review this manual before you call.

Warranty

All products manufactured by DX Engineering are warranted to be free from defects in material and workmanship for a period of one (1) year from date of shipment. DX Engineering's sole obligation under these warranties shall be to issue credit, repair or replace any item or part thereof which is proved to be other than as warranted; no allowance shall be made for any labor charges of Buyer for replacement of parts, adjustment or repairs, or any other work, unless such charges are authorized in advance by DX Engineering. If DX Engineering's products are claimed to be defective in material or workmanship, DX Engineering shall, upon prompt notice thereof, issue shipping instructions for return to DX Engineering (transportation-charges prepaid by Buyer). Every such claim for breach of these warranties shall be deemed to be waived by Buyer unless made in writing. The above warranties shall not extend to any products or parts thereof which have been subjected to any misuse or neglect, damaged by accident, rendered defective by reason of improper installation, damaged from severe weather including floods, or abnormal environmental conditions such as prolonged exposure to corrosives or power surges, or by the performance of repairs or alterations outside of our plant, and shall not apply to any goods or parts thereof furnished by Buyer or acquired from others at Buyer's specifications. In addition, DX Engineering's warranties do not extend to other equipment and parts manufactured by others except to the extent of the original manufacturer's warranty to DX Engineering. The obligations under the foregoing warranties are limited to the precise terms thereof. These warranties provide exclusive remedies, expressly in lieu of all other remedies including claims for special or consequential damages. SELLER NEITHER MAKES NOR ASSUMES ANY OTHER WARRANTY WHATSOEVER, WHETHER EXPRESS, STATUTORY, OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS, AND NO PERSON IS AUTHORIZED TO ASSUME FOR DX ENGINEERING ANY OBLIGATION OR LIABILITY NOT STRICTLY IN ACCORDANCE WITH THE FOREGOING.

©DX Engineering 2025

DX Engineering®, DXE®, DX Engineering, Inc.®, Hot Rodz®, Maxi-Core®, DX Engineering THUNDERBOLT®, DX Engineering Yagi Mechanical®, EZ-BUILD®, TELREX®, Gorilla Grip® Stainless Steel Boom Clamps, Butternut®, SkyHawk™, SkyLark™, OMNI-TILT™, RF-PRO-1B®, AFHD-4® are trademarks of PDS Electronics, Inc. No license to use or reproduce any of these trademarks or other trademarks is given or implied. All other brands and product names are the trademarks of their respective owners.

Specifications subject to change without notice



DXE-RT4500HD-INS