For all W-group three-phase reclosers; Types GW and GWC sectionalizers; and Type VRV oil switch

KA146W5 single pole-mounting hanger; KA146W2 tank lifting windlass assembly and installation instructions
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The instructions in this manual are not intended as a substitute for proper training or adequate experience in the safe operation of the equipment described. Only competent technicians who are familiar with this equipment should install, operate, and service it.

A competent technician has these qualifications:

- Is thoroughly familiar with these instructions.
- Is trained in industry-accepted high and low-voltage safe operating practices and procedures.
- Is trained and authorized to energize, de-energize, clear, and ground power distribution equipment.
- Is trained in the care and use of protective equipment such as arc flash clothing, safety glasses, face shield, hard hat, rubber gloves, clampstick, hotstick, etc.

Following is important safety information. For safe installation and operation of this equipment, be sure to read and understand all cautions and warnings.

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Hazard Statement Definitions

This manual may contain four types of hazard statements:

- **DANGER**
  Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

- **WARNING**
  Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

- **CAUTION**
  Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

- **CAUTION**
  Indicates a potentially hazardous situation which, if not avoided, may result in equipment damage only.

Safety instructions

Following are general caution and warning statements that apply to this equipment. Additional statements, related to specific tasks and procedures, are located throughout the manual.

- **DANGER**
  Hazardous voltage. Contact with hazardous voltage will cause death or severe personal injury. Follow all locally approved safety procedures when working around high-and low-voltage lines and equipment.

- **WARNING**
  Before installing, operating, maintaining, or testing this equipment, carefully read and understand the contents of this manual. Improper operation, handling or maintenance can result in death, severe personal injury, and equipment damage.

- **WARNING**
  This equipment is not intended to protect human life. Follow all locally approved procedures and safety practices when installing or operating this equipment. Failure to comply can result in death, severe personal injury and equipment damage.

- **WARNING**
  Power distribution and transmission equipment must be properly selected for the intended application. It must be installed and serviced by competent personnel who have been trained and understand proper safety procedures. These instructions are written for such personnel and are not a substitute for adequate training and experience in safety procedures. Failure to properly select, install or maintain power distribution and transmission equipment can result in death, severe personal injury, and equipment damage.
Product information

Introduction
This manual contains assembly and installation instructions for Eaton’s Cooper Power™ series KA146W5 single pole-mounting hanger and the KA146W2 tank-lifting windlass.

Read this manual first
Read and understand the contents of this manual and follow all locally approved procedures and safety practices before installing or operating this equipment.

Additional information
These instructions cannot cover all details or variations in the equipment, procedures, or process described, nor to provide directions for meeting every possible contingency during installation, operation, or maintenance. For additional information, contact your Eaton representative.

Acceptance and initial inspection
This product is completely assembled, tested, and inspected at the factory. It is carefully calibrated, adjusted and in good condition when accepted by the carrier for shipment.

Upon receipt, inspect the carton for signs of damage. Unpack the contents and inspect them thoroughly for damage incurred during shipment. If damage is discovered, file a claim with the carrier immediately.

Handling and storage
Be careful during handling and storage of this equipment to minimize the possibility of damage.

Quality standards
ISO 9001 Certified Quality Management System

Description of operation
The KA146W5 suspension-type hanger enables the mounting of Eaton’s Cooper Power series three-phase reclosers, GW and GWC sectionalizers, and VRV oil switches on single poles. No crossarms are required.

The KA146W2 tank-lifting windlass is easily attached as a unit to the back of the mounting hanger with only two bolts. The windlass simplifies lowering the recloser tank for inspection and maintenance, but can not be used for lowering the entire recloser.
KA146W5 single pole-mounting frame

The apparatus can be mounted broadside toward the pole in either direction. When installing three bushing current transformers on a recloser, it is recommended that the recloser be mounted with the current transformers on the outboard side. If a recloser must be mounted with the bushing current transformers on the inboard side, the interconnecting conduit and wiring (shown by dashed lines in Figure 1) must be assembled after the recloser has been installed in the mounting frame.

A grounding connector is furnished to ground the complete equipment through the KA146W5 mounting frame. Reclosers with line-to-ground closing coil connections must use the ground connector on the recloser head casting to help assure proper operation.

### Table 1. Mounting Hanger and Clearance Dimensions

<table>
<thead>
<tr>
<th>Unit Type</th>
<th>Bushing Creepage</th>
<th>Dimension (in.)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>VW, VWE, W, WE</td>
<td>Std. or 17&quot;</td>
<td>8-1/2</td>
</tr>
<tr>
<td>VW, VWE, W, WE</td>
<td>Std. or 17&quot; w/ BCTs</td>
<td>13-1/4</td>
</tr>
<tr>
<td>VW, VWE, VWV27, VWVE27</td>
<td>Std.</td>
<td>13</td>
</tr>
<tr>
<td>VW, VWE, VWV27, VWVE27, WW, WVE, WVE27</td>
<td>Std. w/bcts</td>
<td>17-1/2</td>
</tr>
<tr>
<td>VW, VW27, WV27, WV27, WV38, WV27, WV38, WW, WVE27, WVE27, WVE38</td>
<td>26-1/2&quot;</td>
<td>17-1/8</td>
</tr>
<tr>
<td>WV38X, WVE38X, VW38X, VWVE38X</td>
<td>26-1/2&quot;</td>
<td>13-1/4</td>
</tr>
<tr>
<td>GW, GWC, VRV</td>
<td>Std.</td>
<td>13</td>
</tr>
<tr>
<td>RX, RXE</td>
<td>Std. or 17&quot;</td>
<td>7-7/8</td>
</tr>
<tr>
<td>RX RXE</td>
<td>Std. or 17&quot; w/bcts</td>
<td>12-5/8</td>
</tr>
<tr>
<td>RV, RVE</td>
<td>Std.</td>
<td>13</td>
</tr>
<tr>
<td>RV, RVE</td>
<td>Std. w/BCTs</td>
<td>17-1/2</td>
</tr>
</tbody>
</table>

Figure 1. Outline dimensions of KA146W5 pole-mounting hanger and KA146W2 tank-lifting windlass.
Assembling the mounting hanger

To minimize space for customer stocking and transport, the KA146W5 hanger is shipped disassembled and banded. For easier installation and to save mounting time aloft, it is recommended that the hanger be assembled to the recloser on the ground.

For reference, a parts list is provided giving each item a number and indicating the quantity used (Figure 2). Thru-bolts, 3/4 inch in diameter with nuts and washers, which are dependent on choice of pole size, must be furnished by the customer.

1. Dismantle the shipping bundle and check the components against the bill of material and the exploded view diagram and parts (Figure 2).

2. Initially, assemble all hardware just finger-tight. Begin by fastening the two support angles (1) to the tapped bosses on the switchgear head casting. Fasten with 1/2-13 x 1-1/2 inch bolts (14) and lockwashers (15).

3. Attach support channels (2 and 3) to outboard support angle (1), against side to be located away from pole. Insert a round spacer (4) between angle and channels. Fasten with 1/2-13 x 2 inch bolts (13), beveled washers (12), lockwashers (15), and nuts (16).

4. Inboard support
   A. All reclosers except VWV38X, WV38X, WVE38X and VWVE38X reclosers
      1. Attach support channels (2 and 3), on inboard side, use holes marked A. Insert a round spacer (4) between angle and channels. Fasten with 1/2-13 x 2 inch bolts (13), beveled washers (12), lockwashers (15), and nuts (16).
      2. Fasten braces (5 and 6) to holes marked B. Fasten with 1/2-13 x 1-1/2 inch bolts (14), beveled washers (12), lockwashers (15), and nuts (16).
   B. VWV38X, WV38X, WVE38X and VWVE38X reclosers
      1. Align support channels (2 and 3), on inboard side, with holes marked B. Insert tabs on braces (5 and 6) between angle (1) and channels (2 and 3), and align assembly with holes marked B.
      2. Fasten assembly with 1/2-13x1-1/2 inch bolts (14), beveled washers (12), lockwashers (15), and nuts (16).

5. Attach two vertical angles (7 and 8) to support channels. Fasten with 1/2-13 x 1-1/2 inch bolts, lockwashers, and nuts (14,15, and 16).

6. Fasten braces (5 and 6) to inside surfaces of vertical angles, with 1/2-13 x 1-1/2 inch bolts, lockwashers, and nuts (14,15, and 16).

7. Attach upper pole mount (9, with keyhole slot) and lower pole mount (10) to the vertical angles (7 and 8). Fasten with 14,15, and 16.

8. Assemble ground connector to vertical angle (7). Fasten with 14,15, and 16.

9. With all frame members assembled, tighten each nut and bolt securely using an alternating pattern so frame squares properly.

10. Drill pole at desired height (on 26-7/8-inch centers) for mounting hardware. Hoist frame and apparatus to the mounting point and secure to the pole. Be sure to include the two spur-type curved washers (11) under the hardware on the back side of the pole.

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### CAUTION

Falling equipment. Use the lifting lugs provided and follow all locally approved safety practices when lifting and mounting the equipment. Lift the unit smoothly and do not allow the unit to shift. Improper lifting can result in severe personal injury, death, and/or equipment damage.

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Lifting the hanger and recloser/switchgear

When hoisting the recloser (switchgear) and KA146W5 hanger assembly aloft, lift only at the four 1-3/8-inch diameter lifting holes in the two support channels.

Never lift the entire assembly at the two lugs bolted to the switchgear head; they are for lifting the device only. Use a four-point lift, as shown in the illustration below, to maintain as much load balance as possible. To avoid damaging porcelain bushings, be careful when attaching lifting chains.

Follow all approved safety practices for rigging and lifting. Lift the load smoothly, and do not allow it to shift.
### Table 2. Parts List for KA146W5 Pole-Mounting Hanger

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Part No.</th>
<th>Qty</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Support angle</td>
<td>KP308W</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td>Support channel, right-hand</td>
<td>KP134WV</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>Support channel, left-hand</td>
<td>KP135WV</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>Washer</td>
<td>KP2028A61</td>
<td>4</td>
</tr>
<tr>
<td>5</td>
<td>Brace, right-hand</td>
<td>KP306W</td>
<td>1</td>
</tr>
<tr>
<td>6</td>
<td>Brace, left-hand</td>
<td>KP307W</td>
<td>1</td>
</tr>
<tr>
<td>7</td>
<td>Vertical angle, right-hand</td>
<td>KP277W</td>
<td>1</td>
</tr>
<tr>
<td>8</td>
<td>Vertical angle, left-hand</td>
<td>KP292W</td>
<td>1</td>
</tr>
<tr>
<td>9</td>
<td>Pole mount, upper</td>
<td>KA174W1</td>
<td>1</td>
</tr>
<tr>
<td>10</td>
<td>Pole mount, lower</td>
<td>KA174W2</td>
<td>1</td>
</tr>
<tr>
<td>11</td>
<td>Washer for pole bolts (not shown)</td>
<td>DT28X</td>
<td>2</td>
</tr>
<tr>
<td>12</td>
<td>Bevel washer</td>
<td>KP448R1</td>
<td>6</td>
</tr>
<tr>
<td>13</td>
<td>Hex bolt, 1/2-13 x 2 in.</td>
<td>K730101150200Q</td>
<td>6</td>
</tr>
<tr>
<td>14</td>
<td>Hex bolt, 1/2-13 x 1-1/2 in.</td>
<td>K730101150150Q</td>
<td>23</td>
</tr>
<tr>
<td>15</td>
<td>Lockwasher, 1/2-in.</td>
<td>K900801050000Z</td>
<td>29</td>
</tr>
<tr>
<td>16</td>
<td>Hex nut, 1/2-13 UNC-2B</td>
<td>K880201113050Q</td>
<td>21</td>
</tr>
<tr>
<td>17</td>
<td>Ground connector</td>
<td>KP1596R</td>
<td>1</td>
</tr>
<tr>
<td>18</td>
<td>Lifting decal</td>
<td>KP310W</td>
<td>2</td>
</tr>
</tbody>
</table>

![Figure 2. Exploded view and parts list for KA146W5 pole-mounting hanger.](image)
KA146W2 tank-lifting windlass

Table 3. Parts List for KA146W2 Tank-Lifting Windlass

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Part No.</th>
<th>Qty</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Hex bolt, 1/2—13 x 1 inch</td>
<td>KP1085</td>
<td>4</td>
</tr>
<tr>
<td>2</td>
<td>1/2-inch lockwasher</td>
<td>KP1107</td>
<td>4</td>
</tr>
<tr>
<td>3</td>
<td>Hex nut, 1/2—13</td>
<td>KP1214</td>
<td>2</td>
</tr>
<tr>
<td>4</td>
<td>Gear box and spool assembly</td>
<td>KA151W</td>
<td>1</td>
</tr>
<tr>
<td>5</td>
<td>Spool and cable clamp assembly</td>
<td>KA15CE1</td>
<td>1</td>
</tr>
<tr>
<td>6</td>
<td>Pipe</td>
<td>KP1054CE11</td>
<td>1</td>
</tr>
<tr>
<td>7</td>
<td>Roll pin, 7/32 x 1-1/4-inch</td>
<td>KP1313</td>
<td>4</td>
</tr>
<tr>
<td>8</td>
<td>Support angle</td>
<td>KP294W</td>
<td>1</td>
</tr>
<tr>
<td>9</td>
<td>Flat washer between sheave brackets and head-casting flange</td>
<td>KP3015A28</td>
<td>2</td>
</tr>
<tr>
<td>10</td>
<td>Sheave bracket assembly, right hand</td>
<td>KA148W</td>
<td>1</td>
</tr>
<tr>
<td>11</td>
<td>Sheave bracket assembly, left hand</td>
<td>KA147W</td>
<td>1</td>
</tr>
<tr>
<td>12</td>
<td>Adapter (for upper sheave bracket when ground connector is on recloser head)</td>
<td>KP293W</td>
<td>1</td>
</tr>
<tr>
<td>13</td>
<td>Sheave assembly</td>
<td>KA121 R</td>
<td>2</td>
</tr>
<tr>
<td>14</td>
<td>Cable assembly</td>
<td>KA592R3</td>
<td>2</td>
</tr>
<tr>
<td>15</td>
<td>Crank</td>
<td>KP1031 R</td>
<td>1</td>
</tr>
<tr>
<td>16</td>
<td>Hex bolt, 1/2—13 x 1-1/2 inch</td>
<td>KP1354</td>
<td>2</td>
</tr>
</tbody>
</table>

Figure 3. Exploded view and parts list for KA146W2 tank-lifting windlass.
Installation of the windlass

CAUTION

Falling equipment. Use the lifting lugs provided and follow all locally approved safety practices when lifting and mounting the equipment. Lift the unit smoothly and do not allow the unit to shift. Improper lifting can result in severe personal injury, death, and/or equipment damage.

The windlass simplifies lowering the recloser tank for inspection and maintenance, but cannot be used for lowering the entire recloser. Refer to the exploded view and parts list (see Figure 3) during assembly and installation of the tank-lifting windlass. The final assembly is diagrammed in Figure 4.

**Note:** Because of lack of clearance, this windlass cannot be used with a Type GW or GWC electronic sectionalizer or a Type VRV oil switch.

1. The gear box and spool (4), spool assembly (5), pipe (6), and roll pins (7) may already be assembled to the support angle (8). If not, assemble as shown in Figure 3. Use two 1-inch bolts (1) and lockwashers (2) to fasten the gear box to the support angle. The spool assembly includes hardware.

2. Attach support angle (8) to bottom back portion of vertical angles on KA146W5 frame with 1/2-13 x 1-1/2 inch bolts (16), lockwashers (2), and nuts (3).

3. Using 1-inch bolts (1) and flat washers (9), attach the upper sheave brackets (10 and 11) to the head casting flange at the tapped hole on each end of the recloser. The flat washer should be placed under the sheave bracket between the bracket and the head casting flange.

   If a ground connector is assembled in one of the tapped holes, remove the connector, fasten the sheave bracket with the threaded adapter (12) provided, and thread the connector into the tapped hole on the adapter.

4. Hook lower sheaves (13) onto the lug on each end of the recloser tank. Be sure the spring-loaded pin snaps into the hole on the tank lug.

5. Loosen the capscrews on the upper sheave brackets (10 and 11). Install the looped ends of the cable assemblies (14) onto the pulleys. Retighten the capscrews.

6. Remove the hex nut from the stud end of each cable. Thread the cables down through the tank sheaves, up over the upper sheaves, and down to the windlass spools (4 and 5). Fasten the stud end of the cables at the spools with the previously removed hex nuts.

7. Take up the slack in the cables by operating the windlass crank (15) while directing both cables in an even wind around the spools.

8. When the windlass operation is complete, install the two cable clamps (5) over the cable spools. This helps keep cable from unwinding when tension is released.

Figure 4. KA146W2 tank-lifting windlass installed on a hanger.