

667/HB/46644/000

USER MANUAL

**Sapa Hinged Traffic Signal Pole
including the Raise and Lower Tool**

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Document References

External Document References	
MEN.03.28.006	Sapa Manual

Table 1 - Document References

Key Terms and Abbreviations

	Key Terms and Abbreviations
Hinged Pole	Sapa Hinged Traffic Signal Pole
Tool	Raise and Lower Tool for Sapa Hinged Traffic Signal Pole
BMS	Business Management System (Siemens Electronic Document Storage Tool for Process Documents)

Table 2 - Key Terms and Abbreviations

Health and Safety Protection



Installation and Maintenance Personnel

When installing, using or servicing this equipment the following instructions must be noted and adhered to:

- (1) Only skilled and trained personnel with the required competencies, knowledge and experience may work with the Hinged Pole and Lifting Tool.
- (2) Personnel must take heed of all relevant notes, cautions and warnings in this Handbook and any other Document or Handbook associated with the equipment including, but not restricted to, the following:
 - i. The equipment must be correctly installed.
 - ii. The Pole and Lifting Tool must be regularly inspected and tested.
 - iii. Any personnel working on site must use appropriate PPE, including reflective clothing, gloves, safety footwear and hard hat.
- (3) The use of the Raise and Lower Tool is mandatory for 6 metre Hinged Poles.



Road Users

It is important that all personnel are aware of the dangers to road users that could arise during installation and operation of the Sapa Hinged Pole and Tool.

Ensure that the required Signing and Guarding is in place creating a Safe Working Area as necessary to keep motorists and pedestrians away from the Working Area of the Hinged Pole and Tool.



Hinge Bolts

It is important that after work on the Sapa Hinged Pole, the anti rotation washers for the hinge bolts are in place, and that the hinge bolts are tightened to 50 Nm with a suitable torque wrench.

1. Introduction

The purpose of this manual is to provide instructions so that traffic signal installers and service operatives can competently use the Sapa Hinged Pole and Lifting Tool, hereafter referred to as the Tool, to operate the Sapa Hinged Pole, and can maintain the Tool.

2. Permitted Users

Traffic signal installers and service operatives must have the required competencies, knowledge and experience to safely work on traffic signal equipment and operate mechanical tooling prior to deployment of the Tool.

3. When to Use the Tool

- The Tool is designed for use with the Sapa Hinged Pole only.
- Use of the Tool is mandatory with 6 metre Hinged Poles. As the Tool is heavy and not easy to deploy, its use with 4 metre poles may on balance not be beneficial. In the case of 4 metre poles an individual assessment should be made to assess whether using the Tool or a ladder access presents less overall risk

4. Before Deploying the Tool

- Only trained personnel are to use the lifting tool.
- Appropriate PPE is to be used, including reflective clothing, gloves, safety footwear and hard hat. A Siemens risk assessment must be completed before deploying the Tool.
- Normal Siemens site safety precautions are to be used, especially concerning traffic and pedestrian management.
- Pedestrian and vehicular access to *the entire length of the lowered pole plus one metre* must be prevented.

5. Moving and Deploying the Tool

- The Tool is heavy.
- Two persons are required to move the Tool in its box and to attach it to the pole.
- As the Tool has some sharp edges, gloves are to be worn when handling it.
- The Tool has some finger traps. Care is to be exercised to avoid these.
- There must be a gap of at least 260 mm between the upper and lower parts of the Tool.
- The Tool must not be attached to any tapered part of the pole.
- Slack must be taken out of the winch cable before the wedge (Figure 9 – Hinged Pole Wedge Removal) in the Hinged Pole is removed.
- Once lowered, two persons are required to fit and remove signal heads underneath the pole.

6. General Considerations

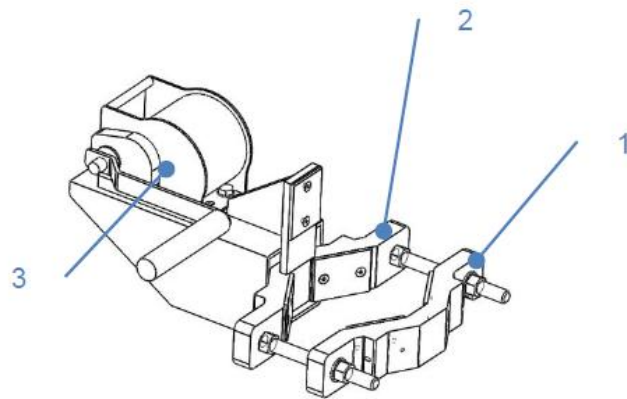
- The pole may have to be rotated in the ground socket so that it can be lowered into the Safe Working Area.
- Nearside combined units cannot be used.
- The nearside unit must be installed on the top part of the hinged pole, so it is slightly higher than recommended, see Figure 5 - Bracket Assembly Arm Fitted Above Demand Unit.

7. General Description

The Tool is made up of the following components:

- Winch and Bracket Assembly

1. Clamp
2. Clamp with bracket
3. Winch



Winch and Bracket Assembly

- Bracket Arm Assembly

4. Clamp
5. Bracket arm
6. Studs
7. Winch Attachment Point

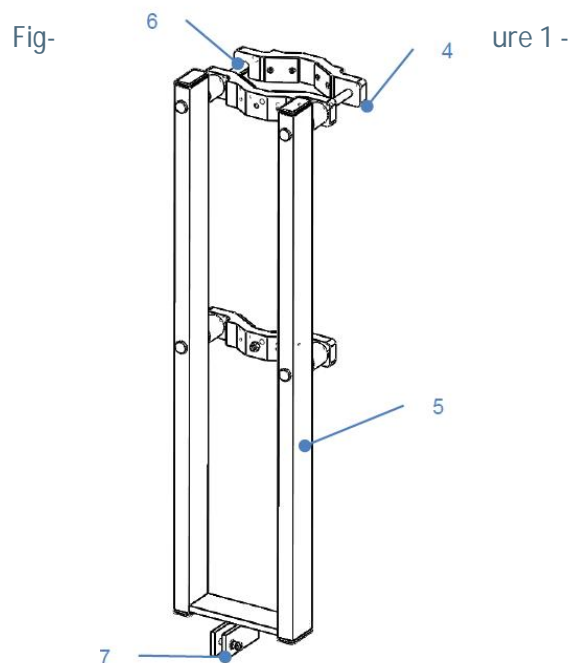


Figure 2 - Bracket Arm Assembly

8. Sapa Hinged Pole Load Limits

The maximum capacity of the Tool about the hinge of the Hinged Pole is: 182 kgm

Reference		114 – 145 R&L	114 – 145 R&L	165-145 R&L	165-145 R&L
Length of post	m	4,1	4,1	6,1	6,1
Height above ground "h"	mm	3650	3650	5420	5420
Insertion length	mm	450	450	680	680
Max. no. of signal heads per position (see calc.-criteria below)	LOW	--	--	2	2
	HIGH	4	4	1	1
Hinged direction	°	90	270	90	270
Article numbers:					
RAL 7037		28015037010002	28015037010003	28015054910001	28015054920001
RAL 9005		28015037010004	28015037010005	28015054910002	28015054920002

Table 2 Loads - Pole/Signal Head Load Configurations

Therefore, the load generated as a result of the combined weight of the Hinged Pole itself, plus the equipment mounted upon it must not exceed 182 kgm.

This maximum load equates to the pole/signal head configurations seen in Table 2 Loads - Pole/Signal Head Load Configurations below:

If in doubt contact the Siemens Engineering Department in Poole.

9. Lowering the Sapa Hinged Pole

Before each use make a complete visual check of all parts including the welds for damage, wear and cracking.

Step 1 - Unlock both door locks with the Sapa door key, and remove the door as shown in Figure 3 - Sapa Hinged Pole Door Removal.



Figure 3 - Sapa Hinged Pole Door Removal

Step 2 - Mount the Winch Bracket Assembly including clamp onto the parallel part of the Hinged Pole as shown in Figure 4 - Winch Bracket Installation (A). Tighten the two M16 bolts. As a visual guide, the Winch Bracket Assembly should be in line with the centre of the wedge as per Figure 4 - Winch Bracket Installation Error! Reference source not found.(B).

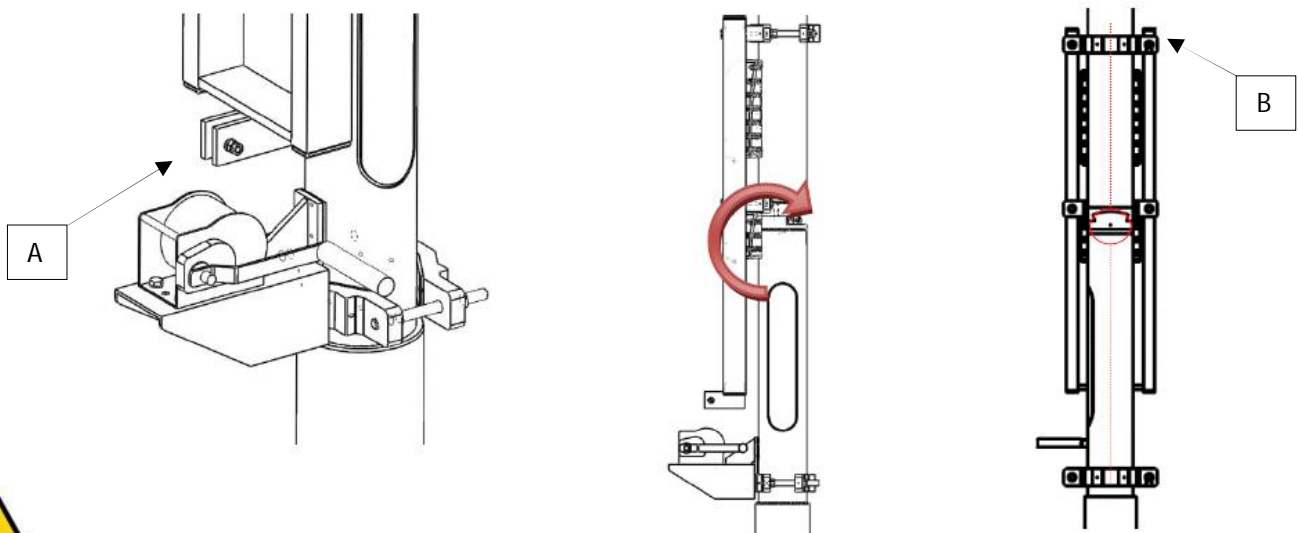


Figure 4 - Winch Bracket Installation

- If the column is wet, wipe it dry before attaching the Tool.
- Make sure that the winch is positioned as shown, rotated 180 degrees with respect to the lowering direction of the Lifting Pole.

Step 3 - Mount the Bracket Assembly Arm in line with the winch bracket so that the cable runs vertically, reference Figure 4 - Winch Bracket Installation (A).

Make sure that there is enough space sufficient distance (approximately 260 mm) between the top of the winch and the bottom of the Bracket Assembly Arm to allow fitting of the winch cable.

The lowest support of the cable attachment arm must be above the hinge, reference Figure 4 - Winch Bracket Installation (B). If equipment such as a nearside unit or demand unit is fitted, the lower support of the cable attachment arm must be above the equipment as per

Ensure that the wedge (Figure 4 - Winch Bracket Installation Error! Reference source not found.(B)) in the Hinged Pole hinge is clear for operation.

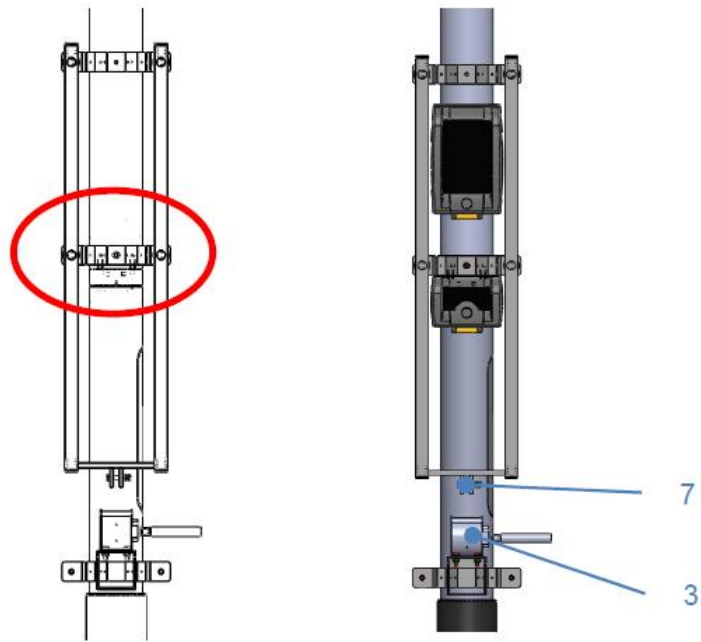


Figure 5 - Bracket Assembly Arm Fitted Above Demand Unit

Step 4 - Slide the Clamp (Figure 2 - Bracket Arm Assembly Item 6) over the studs as per Figure 6 - Bracket Assembly Arm Installation.

Step 5 - Tighten the two M16 bolts.

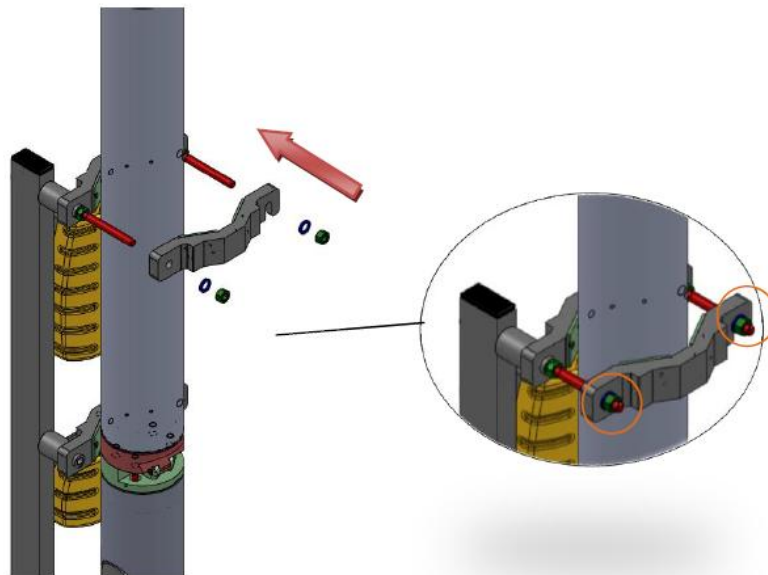


Figure 6 - Bracket Assembly Arm Installation

Step 6 – Attach the Winch Cable with the supplied bolt and nut, reference Figure 7 - Winch Cable Attachment



Figure 7 - Winch Cable Attachment



Note: Check all fastenings are secure. Ensure that the Winch Cable is securely attached. Ensure the cable is slightly tensioned prior to loosening captive bolts.

Step 7 – Ensure that the Winch Cable is under tension. Loosen all 3 (145mm diameter pole) or 4 (165 mm diameter pole) M12 socket head cap screws with a ratchet and 10 mm across flats hexagon key.

NOTE: The M12 bolts in the Hinged Pole are captive to prevent complete removal.



Figure 8 - Hinged Pole Bolt Removal

Step 8 - Screw the M6 eye bolt into the hole on the outside of the wedge and pull out the wedge, reference Figure 9 – Hinged Pole Wedge Removal.



Note: If the wedge sticks, it can be freed by alternatively pushing and pulling the top section of the Pole and simultaneously pulling the wedge.

When the bolts are removed, the upper section of the Hinged Pole is supported only on the winch, and is ready to be lowered. Stand clear of the area where the hinged top section of the Hinged Pole could fall.



Figure 9 – Hinged Pole Wedge Removal

Step 9 – Ensure that the area under the upper part of the Hinged Pole is clear, and lower the Hinged Pole by rotating the Winch handle anti-clockwise until the pole is at the desired angle as per Figure 10 - Hinged Pole Lowered . Note – the Tool is removed in this image for clarity.

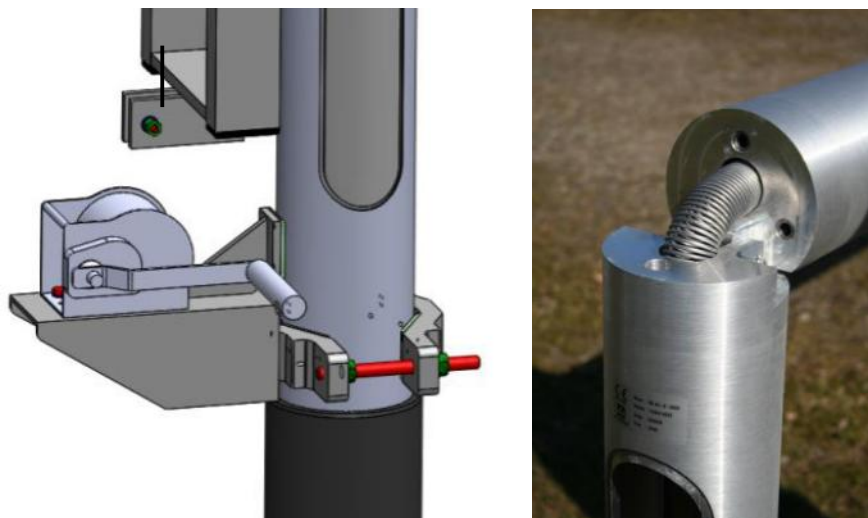


Figure 10 - Hinged Pole Lowered

Step 10 - Carry out necessary work.

10. Raising the Sapa Hinged Pole

Step 1 - Carry out Section 9, Steps 7 through 9, in reverse order.

Step 2 – With the Wedge fully inserted, install the three (145mm dia. Pole) or four (165mm dia. Pole) M12 Hinge Bolts.

Step 3 – Using a suitable torque wrench, ensure that the M12 Hinge Bolts are tightened to 50Nm.

Step 4 – Carry out Section 9, Steps 1 through 6, in reverse order taking care to support the Bracket Assembly Arm and Winch Bracket Assembly sufficiently during removal.

11. Condition of Sapa Hinged Pole and Bolts

The condition of the Pole and hinge should be noted. In particular the following should be immediately reported to the Siemens engineering department in Poole:

- Loose or damaged M12 Hinge Bolts
- Excessive clearance in the hinge
- Powder coat damaged or lifting off the surface around the hinge
- Corrosion. In particular, bimetallic corrosion near the M12 Hinge Bolts or hinge, and anaerobic corrosion of the aluminium. This may take the form of black corrosion products which in extreme cases may run down the outside of the Pole.

An example of the white products of bimetallic corrosion can be seen in Figure 11, and the black products of anaerobic corrosion of aluminium can be seen in Figure 12. The signs of incipient anaerobic corrosion can also be seen in Figure 11. In the event that corrosion of this nature is seen, photograph and report this information to the Siemens Engineering Department in Poole.



Figure 11 – White Hinge Bolt Corrosion and Incipient Black Anaerobic Corrosion



Figure 12 - Black Anaerobic Corrosion

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