

A590-0002 Revision D, October 2016

**HN-10-SP Headframe Systems
Installation and User Guide**

REVISION STATUS

Rev	Changes	Date
A	Duplicate of A590-0001RevE with references to TUFT25 changed to HN-10-SP	04-Sep-2006
B	Update Argus Address	30-July-2009
C	Update the Argus installation guide by adding the CommScope logo and related edits.	03-March-2014
D	Change drawing template to latest.	28-October-2016



Do not install near power lines. Power lines, telephone lines, and guy wires look the same. Assume any wire or line can electrocute you.



Do not install on a wet or windy day or when lightning or thunder is in the area. Do not use metal ladder.



Wear shoes with rubber soles and heels. Wear protective clothing including a long-sleeved shirt and rubber gloves.

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1 Introduction

1.1 System Type

The HN-10-SP System consists of a headframe to suit three single band 1710-2170MHz, dual diagonally-polarised, high-gain panel antennas. This integrated headframe provides coverage of three cells with a minimum size system. Each panel antenna can be independently panned in azimuth. Electrical down tilt can be adjusted manually or remotely if required. Provision has been made for the concealed fitting of Low Noise Amplifiers in the lower section of the headframe system. The unit has been designed to produce minimum visual impact with pleasing architectural lines. Provision is made for stacking two antenna systems where greater capacity or flexibility is required.

1.2 Application

A single HN-10-SP antenna system is potentially capable of replacing a triangular headframe with up to twelve high gain sector antennas in situations where such a headframe is not environmentally acceptable, or spatially allowed.

1.3 Antenna Types

Antenna types suitable for use with this HN-10-SP system along with their electrical and mechanical specifications can be found on the Commscope website at <http://www.CommScope.com>

2 Mechanical Interface

2.1 Mechanical Interface

The required mechanical interface to the headframe is shown in Figure 2.1.1. A similar flange plate with only 6 holes is integral to the top of the headframe to allow stacking of frames (two only).

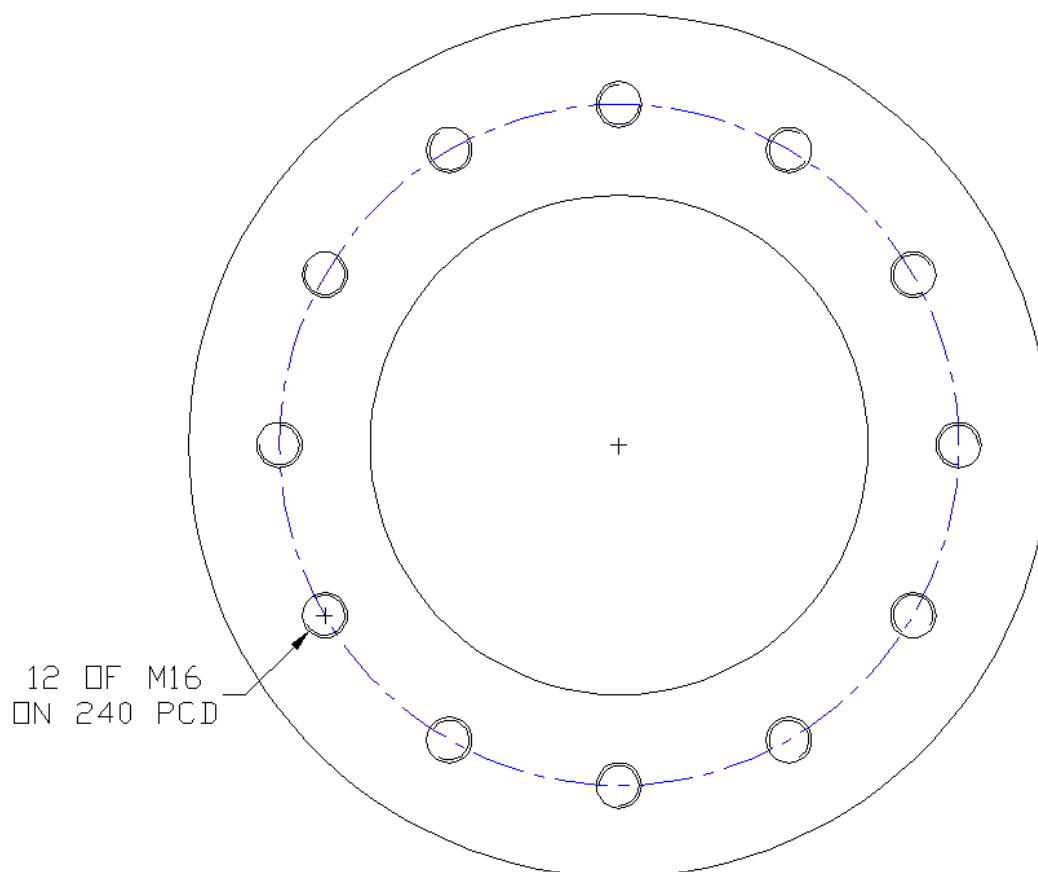


Figure 2.1.1 - Interface plate required for mounting the headframe.

3 Components

The HN-10-SP is a Headframe Kit only. Suitable antennas need to be ordered separately. The components comprising the kit and their purposes are listed in Appendix 2.

4 Installation

4.1 Fit antennas to headframe

- Attach the upper brackets to the top of the antennas. Fit both black sealing washers first then slide the bracket upper over both the black sealing washers at the same time. By applying pressure and turning, fit the two M8 dome screws (with DriLoc) and M8 wave washers. Attach the clamp bracket using the M4 screws and washers as shown in Figure 4.1.1. Ensure all screws are tight.
- Remove the transport bolt and plug the 2 unused lower holes using two M8 dome screws (with red DriLoc) and black Nylon sealing washers.
- Unscrew the three M6 button head socket screw on the bottom face of the antennas.
- Attach the lower bracket to the bottom of the antennas using two M6 countersunk screws and countersunk lock washers as shown in Figure 4.1.2.
- Remove the cover plate from the top of the headframe
- Open and/or remove the three covers at the lower section of the headframe for easier access to the amplifier compartment. Covers can be removed by lifting in the open position. If total removal of the covers from the frame is required disconnect the safety lanyard "D" shackle from the LNA brackets.
- Fit the M10 SS hex head screws, lock washers and tab washer loosely to the tapped hole on the underside of the top flange. The tabs on the tab washer must be pointing towards the underside of the top flange. Leave a gap of at approximately 4 mm between the tabs and the top flange with one tab pointing toward the outside diameter of the top flange.
- Place the antennas, one at a time, on the pan flange. Locating the antenna using the stud on the lower bracket. Push the top of the antenna into the headframe so the M10 bolt locates in the slot in the upper bracket and push the antenna back to the end of the slot so the antenna is vertical. Lightly nip it the M10 bolt to allow panning rotation and ensure the tab has engaged the upper mounting bracket.
- Fit the M6 cap head screws, flat washers and spring washers through the panning slot in the pan flange and into the bottom of the antenna. Leave the screw loose to allow for panning as shown in Fig 4.1.3.
- Pan the antenna to approximately the correct direction and nip the M6 screw (bottom).
- Fit infill joining panels using three M5 button head screws, flat and lock washers. M5 torque to 5.7 Nm.
- Remove one of the three adjustable amplifier brackets on the lower section of the frame.
- Attach the LNAs to the brackets using the M5 mounting bolts, flat washers and lock nuts supplied.
- Refit the third adjustable amplifier bracket and last four M5 mounting bolts, washers and lock nuts. Fig 4.1.4
- Fit R.F. tails between LNAs and antennas. Commscope recommends the use of ¼" cables for this purpose and will not warrant damage caused by use of larger diameter tails.

- Fit AISG "Y" cables (as required).
- Fit two rated collared M16 eye-bolts to the top of the headframe in opposite holes (eye-bolts not supplied).
- Raise the headframe using a crane and slings attached to the eye-bolts at the top of the headframe. Stand the headframe on its base on level, flat ground keeping the slings taut so that the headframe cannot fall.

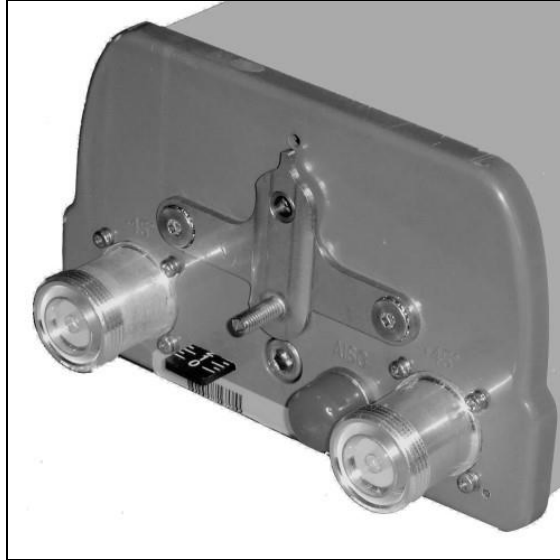


Fig. 4.1.1 Attachment of Upper Bracket **Fig. 4.1.2 Attachment of Lower Bracket**



Fig. 4.1.3 Pan Flange

Fig. 4.1.4 LNA Mounting

4.2 Mounting and Alignment

- Lift the headframe into position.
- With the lifting slings still in place, fit the six M16 high tensile bolts (grade 8.8) and load washers loosely. Note that the grade is embossed in the bolt head.
- Rotate the headframe until it is correctly oriented.
- Nip all bolts lightly.
- Check the verticality of the headframe with an engineering spirit level on each of the three vertical legs of the frame and fit any shims that are required between the headframe and pole to obtain verticality. Shims are fitted by loosening bolts and inserting them between the mating surfaces.
- Tighten all the M16 grade 8.8 bolts to snug tight and then another half turn as described in AS4100-SAA Steel Structures Code. The securing sling may now be removed from the eye bolts.

4.3 Fit feed cables

- By vertically adjusting the LNA mounting brackets, lower and connect the LNAs to the feed cables. Holes are provided in the pan flange to attach a feeder chain with D-shackles (not provided).
- Connect the remote downtilt control cables.
- Attach earth strap as required (not supplied). A 12.5mm diameter hole is provided in the pan flange for attachment.

4.4 Panning and Downtilt

- Loosen the M6 screw in the panning slot and adjust the pan angle using the scale on the side of the pan flange under each antenna.
- Tighten all the M10 and M6 SS antenna mounting screws to 35.0 and 7.2 Nm respectively.
- Remove eye-bolts from top of headframe and fit the cover plate, using M16 x 35 grade 4.6 bolts and washers supplied.
- Adjust the downtilt setting of each antenna by turning the adjusting screw on the base of the antenna so that the required downtilt angle is indicated by the scale at the base of the antenna. (Do not use a power drill)
- Downtilt adjustment can also be done remotely using the CTXD-30-H controller.
- Replace the covers back on to their hinges and secure them using the latches. Ensure covers are put back according to their sector designation. Latches must be under firm tension when closed. Ensure safety lanyards are attached to cover and LNA brackets.

4.5 Remote Control of Downtilt

- HN-10-SP systems fitted with remote antennas can be tilted using the appropriate AISG Remote Control Unit. Information on remote control units, remote accessories and tower top equipment enclosures is available on request.

5 Removing and Replacing Antennas

- Removal of the antennas can be achieved without the removal of the infill joining panels.
- Undo the cable tails at the connectors.
- Loosen the top M10 bolt allowing the tab washer to clear the bracket and remove the two M6 securing fasteners for the lower antenna bracket.
- Lift the antenna up and out of the headframe.
- Replace the antenna by reversing these steps.

6 Stacking

A maximum of **only two** HN-10-SP systems may be stacked because of wind loading on the interface flange. Please note that HN-10-SP head frames with Serial Numbers 34791001, 34791002 and 34791003 are not suitable for use in the lower position of a stacked system. The top of the HN-10-SP headframe is similar to the interface plate required. To stack two antenna systems, the lower one is installed as described in Section 4. The cover plate (supplied attached to the top of the headframe) and M16 gal bolts should be removed from the top of the lower headframe. Follow the instructions in Section 4 for the installation of the upper unit with the exception that only 3 bolts and load washers are required. The upper headframe should have a cover-plate fitted.

Appendix 1 - Headframe Specifications

Headframe Height	2000 mm
Diameter, unpanned	345 mm
Diameter, max pan	370 mm
Weight, without antenna	68 kg
Maximum Panning	±25°
Stacking	2 units
Wind Speed, 1 stack	295 km/h (region C) ultimate
Wind Speed, 2 stack	234 km/h (region B) ultimate
Lateral Thrust, 1 stack	1 kN at Vz = 55.56 m/s*
Lightning Protecting	Direct ground for all metal parts

*Lateral thrust forces are for HN-10-SP systems with antennas set to a zero degree pan angle.

Appendix 2 - Items Supplied with Package

Item	Qty	Description
Headframe Assembly	1	To support three NPX310R antennas & LNAs
Bracket Lower	3	Interface between antenna bottom and headframe
Bracket Upper	3	Interface between antenna top and headframe
Infill Panel Assembly	3	Infill joining panel between antennas
Cover Assembly	3	Amplifier enclosure cover
Cover Plate, M16 Bolts, M16 Washers Flat and Lock	1	Top cover for headframe
Shim	3	Vertical alignment adjustment plate
M8x16 Button Screw,	12	Fitting upper bracket to antenna / plug lower holes
M6x16 CSK Screw, M6 Countersunk Lock Washer	6	Fitting lower bracket to antenna
M10x20 Set Screw, M10 Lock Washer	3	Fitting upper bracket to frame
M6x25 SHC Screw, M6 Washers Flat & Lock	3	Fitting lower bracket to frame
M5x12 Button Screw, M5 Washers Flat & Lock	9	Fitting infill panels to frame
Load Washer	6	Bolting frame to pole
M16 Grade 8.8 Hardware	6	Bolting frame to pole
Tab Washer M10	3	Fitting upper bracket to frame
M8 Sealing Washer	12	Seal M8 mounting screws, (black nylon)
M4 "D" Shackle	3	Attach lanyard to frame
M5x20 Hex Head Screw, M5 Lock Nuts, M5 Flat Washers	12	Attach LNAs to Brackets
Clamp Bracket Upper	3	Clamp between antenna and bracket upper
M4 x 8 Cap Screw & Washer Flat	6	Attach clamp bracket upper
M8 Wave Washer	6	Fitting upper bracket to antenna