User Guide

Vinten

FHR-35 Robotic Pan and Tilt Head

# FHR-35

## Robotic Pan and Tilt Head


Part No. V4096-0001

EN

www.vinten.com

Original Instructions: English



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# Contents

# Safety and Warnings

**For your personal safety, read these instructions. Do not operate the product if you do not understand how to use it safely. Save these instructions for future reference.**

Follow all warnings and instructions marked on the product and in this manual. Safety warnings are included in this manual. These safety instructions must be followed to avoid possible personal injury and damage to the product.

**WARNING!** Do not install this product onto a bracket, support or other equipment that is not designed to support the weight of the product and its payload. All supports must comply with local government regulations.

**WARNING!** The fitting of non-approved parts and accessories, or the carrying out of non-approved alterations or servicing can be dangerous and could affect the safety of the product. It may also invalidate the terms and conditions of the product warranty.

**WARNING!** Risk of personal injury. All personnel must be fully trained and adhere to correct manual handling techniques. It is the responsibility of the individual and the local organisation to enforce safe working practices at all times.

**WARNING!** Risk of personal injury or injury to others. All personnel must be fully trained and adhere to local health and safety laws and guidelines. It is the responsibility of the local organisation to enforce safe working practices at all times.

**CAUTION!** This product is designed for robotic use only and is operated remotely. Do not attempt to manually operate this product.

**Electrical Connection**

**WARNING!** This product must be connected to a power supply of the same voltage (V) and current (A) as indicated on the product and described in the specification section of this manual. To reduce the risk of electric shock, do not remove the covers. No user-servicable parts inside. Refer all servicing to qualified service personnel.

**WARNING!** The IEC connector is the primary disconnect device and must be accessible both during and after installation of the product.

**WARNING!** Inspect the AC cable regularly for signs of wear or damage. If the AC cable is damaged, the product must be returned to Vinten Radamec for repair.

**Basic Electrical Insulation (Class 1 equipment)**

**WARNING!** This product is Class 1 equipment. For safe operation this equipment must be connected to a power supply that has a protective earth connection (US: ground).

**Ventilation and Overheating**

**CAUTION!** Slots and openings are intended for ventilation purposes to ensure reliable operation of the product and protect it from overheating. Do not block or cover any slots and openings.

**Cleaning and Maintenance**

**CAUTION!** Do not use solvent or oil-based cleaners, abrasives or wire brushes to remove accumulations of dirt as these damage the protective surfaces. To clean mechanical surfaces, use only detergent-based cleaners.

**CAUTION!** Do not use oil or grease on any exposed part of the product. This is unnecessary and traps dirt which acts as an abrasive.

**CAUTION!** Risk of damage to equipment. Do not lift or carry the head by the top cover.

## Intended Use

This product is designed for use within television studios to support and balance a camera together with ancillary equipment weighing up to 16 kg (35 lb). Camera operators can remotely control camera zoom and focus and movements about the pan and tilt axes using Vinten control systems.

## Safe Working Environment

In normal operation, remote controlled equipment can move suddenly and without warning. Since audible warnings are not suitable for use within the studio environment, it is recommended that only trained personnel be allowed to work in the active areas where remote controlled heads and pedestals are located.

Personnel should be made aware of the potential hazards of working in a robotic environment. To avoid personal injury, personnel should always exercise caution when working in the vicinity of robotic equipment. The forces are sufficient to cause personal injury or injury to others and therefore caution is essential.

**Safe Operating Zone**

The safe operating zone for personnel is a minimum of 1 m (3 ft) outside of the footprint of the pan and tilt head. In most installations, the teleprompter (if installed) is mounted on to the head and protrudes the furthest beyond the base of the head. The footprint must take into account the overhang of the teleprompter and/or other payload equipment as the head moves about the pan axis.

Personnel need to be trained and aware of how far the head and pedestal can move, the speeds involved and the need to stay clear of robotic equipment at all times.

**Warning Signs**

Warning signs should be displayed prominently in the workplace alerting personnel that robotic equipment is in use and may move suddenly without warning.

If personnel are working on robotic or associated equipment, ensure a warning sign is placed at the controller (control panel) to alert operators that work is being carried out.

**Safety Notes for Operators**

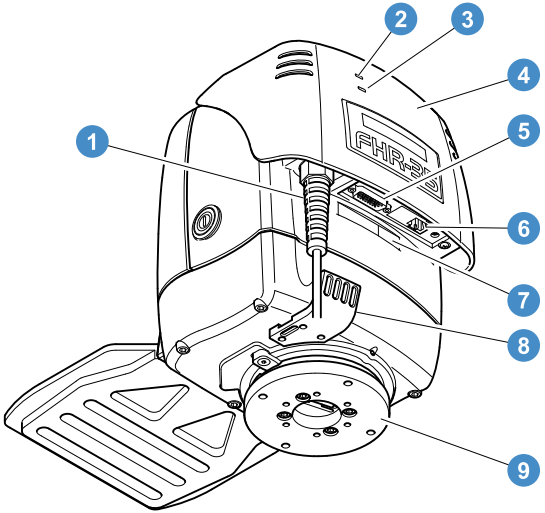
Each remote controlled head and/or pedestal in the system should remain within the view of the operator at all times. Do not operate a head and/or pedestal if it cannot be seen.

Before and during remote operation, the operator must verify visually that the active area is clear of hazards and personnel. If personnel are too close to a head or pedestal that is about to move, the operator should prevent the motion from starting or stop the motion after it has started.

Operators must familiarise themselves with the working footprint of the robotic head, including all associated equipment (lens, zoom and focus controls, viewfinder, prompter, etc.), to prevent inadvertent collisions or injury to personnel.

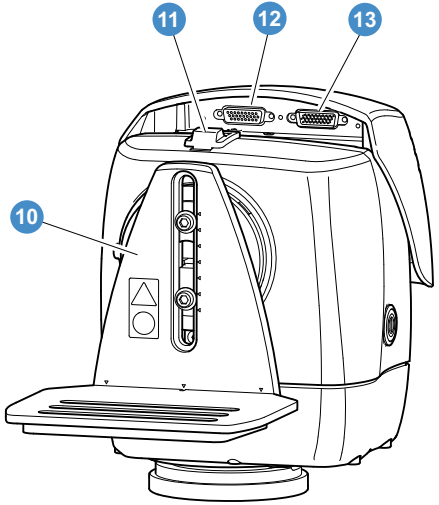
# Components and Connections

## Front View



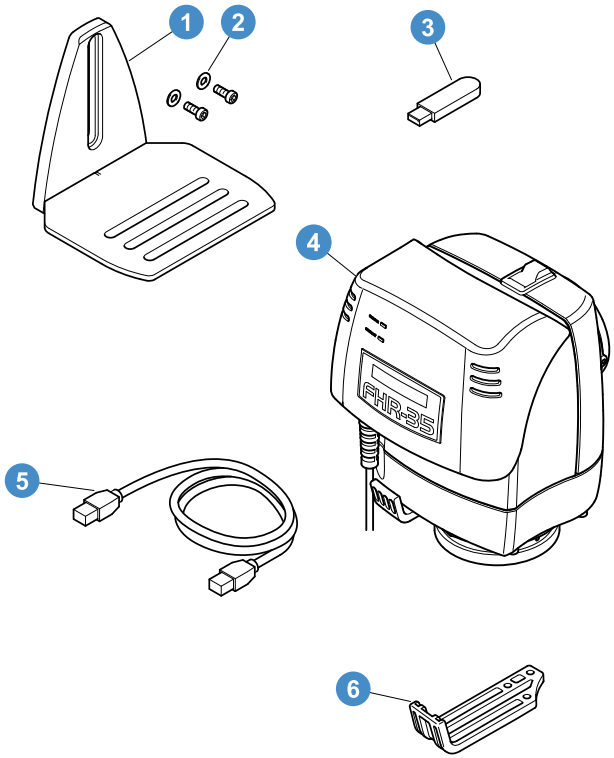

1 . . . . . Power cable with IEC connector
2. . . . . Data LED
3. . . . . Genlock LED
4. . . . . Top cover
5. . . . . Service port
6 . . . . . Ethernet port
7 . . . . . Network ID label
8 . . . . . Cable management bracket
9. . . . . Mounting plate

## Rear View




10 . . . . . Camera cradle
11 . . . . . Tilt lock
12 . . . . . General purpose connector
13 . . . . . Lens interface connector

## Box Contents

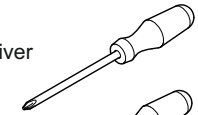



1 . . . . . Camera cradle
2. . . . . Cradle screws and washers
3 . . . . . USB stick
4 . . . . . FHR-35 Robotic pan and tilt head
5 . . . . . Ethernet cable
6. . . . . Large cable management bracket
NI . . . . . Installation and Configuration Guide
NI. . . . . Quick Setup Guide
NI . . . . . Cable ties x5
NI . . . . . 10-32 U x .625 in. pan head screws and washers x6
NI . . . . . M6 x 16 cap head screws and washers x4
NI . . . . . 3/8" BSW x 3/4" cap head screws and washers x2

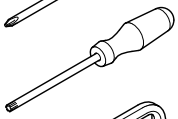
NI = Not Illustrated

## Tools required

Pozidriv® PZ-1 screwdriver



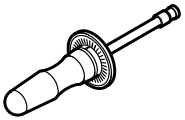
Torx® T10 screwdriver



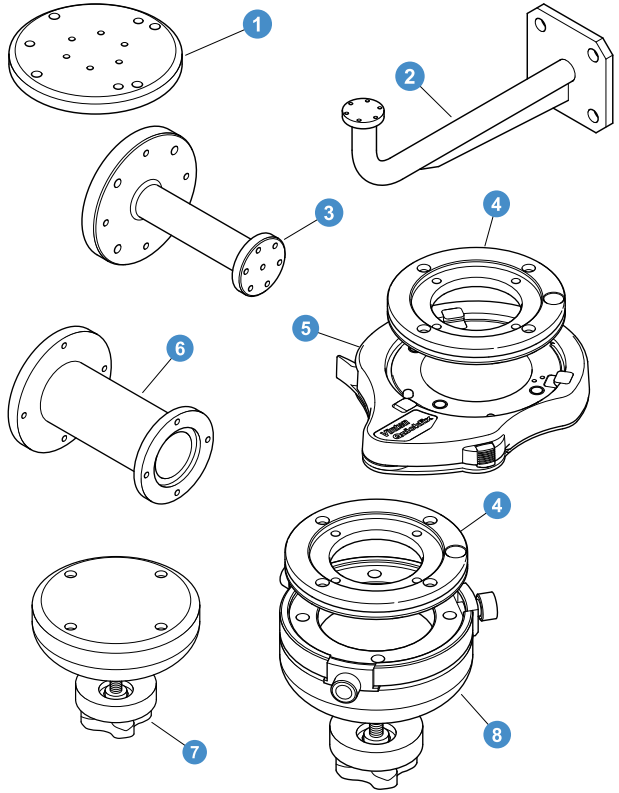
4 mm Allen key
5 mm Allen key
5/16" Allen key
5/32" Allen key



Torque screwdriver



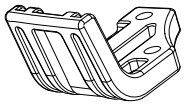
## Mounting Supports and Adaptors



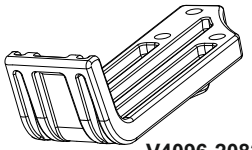

| NO. | MOUNTING SUPPORT OR ADAPTOR | PART NO. | MOUNT OPTION |
|---|---|---|---|
| 1 | VMA plate | AM-VMA-105 | HD tripod |
| 2 | Wall mounting bracket | AM-WBKT-102 | Wall |
| 3 | Ceiling mounting bracket | AM-CEIL-102 | Ceiling |
| 4 | Adaptor with Quickfix groove | V4096-1013 | Pozi Loc tripod<br>HD tripod |
| 5 | Quickfix adaptor | 3490-3 | HD tripod |
| 6 | Radamec adaptor column | 196-728-0044 | Ceiling<br>Pozi Loc tripod |
| 7 | 150 mm bowl adaptor | 3104-3 | Pozi Loc tripod |
| 8 | Quickfix 150 mm bowl adaptor | 3143-3 | Pozi Loc tripod |

## Cable Management Brackets

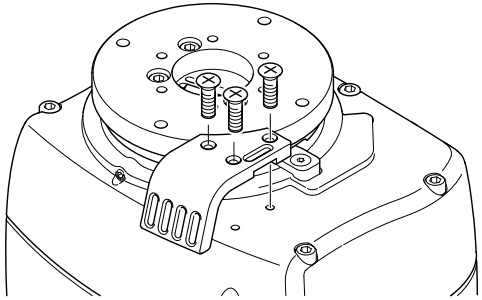
The FHR-35 is supplied with a cable management bracket fitted to the base. Camera and head connecting cables can be neatly secured to the bracket providing strain relief for the connectors. Depending on the camera and head setup, the larger cable management bracket can be fitted.



**V4096-2075**
Supplied fitted to the head



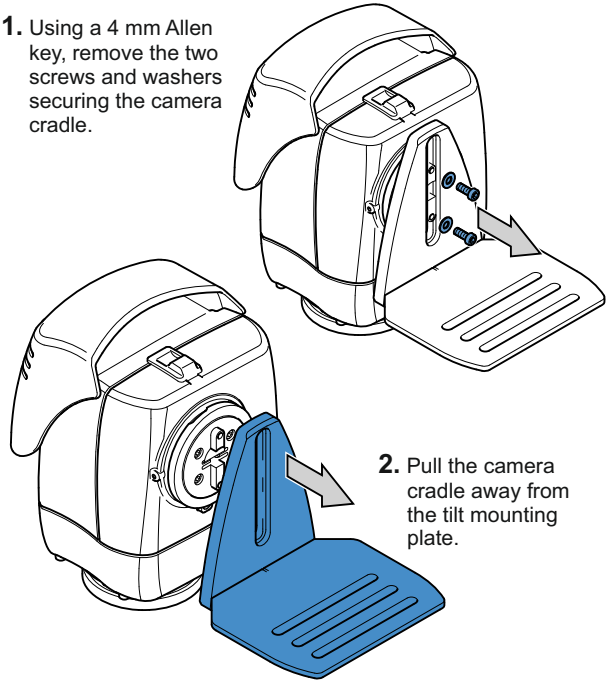
**V4096-2082**



## Removing the Camera Cradle

The first step in installing the head is to set the mechanical hard stops to limit the movement of the head about the pan and tilt axes. To set these limits, the camera cradle must be removed.

**1.** Using a 4 mm Allen key, remove the two screws and washers securing the camera cradle.



**2.** Pull the camera cradle away from the tilt mounting plate.

## Setting the Pan and Tilt Mechanical Hard Stops

The FHR-35 is fitted with adjustable mechanical hard stops that safely restrict the range of movement about the pan and tilt axes. The pan and tilt mountings have a fixed stop and two adjustable stop rings that are locked at the required maximum and minimum limits of movement.

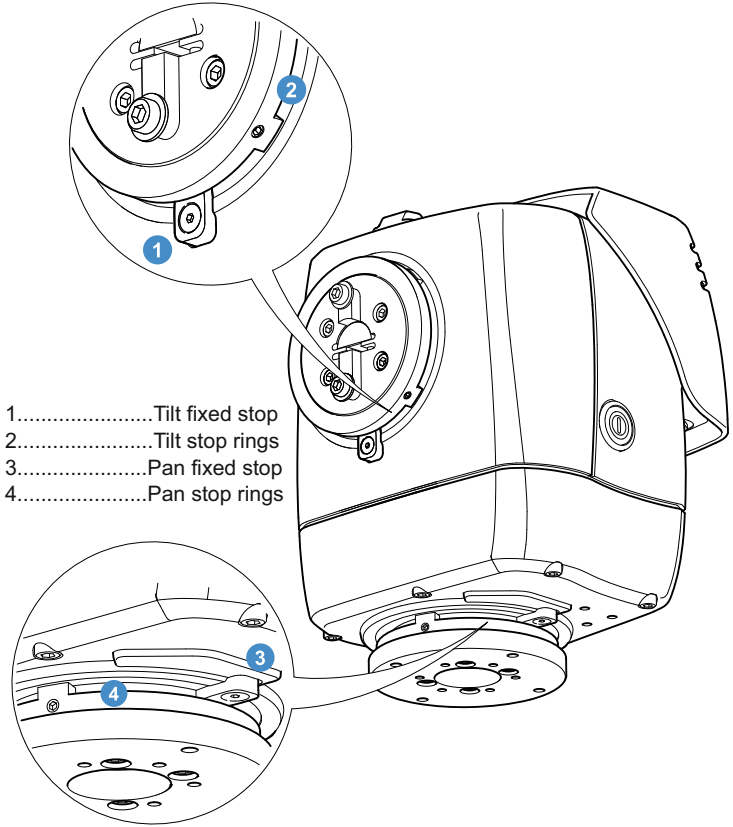
Setting the pan and tilt mechanical hard stops ensures that:

- The head and payload cannot collide with any fixed objects within the working robotic footprint of the head.

- The payload will not collide with the head or the mounting bracket or support.

- Undesirable areas of the studio are kept out of shot.

When the mechanical hard stops are locked in position, the head will not be able to drive beyond them. However, the head is still able to drive and collide into the mechanical hard stops. To prevent this, soft limits are programmed into the head at points within the range of the mechanical hard stops. This eliminates the risk of constant collision with the mechanical hard stops, and also restricts the head's movement range further whenever necessary. See the section **Setting the Zero Position and Soft Limits** for more details.




1.....Tilt fixed stop
2.....Tilt stop rings
3.....Pan fixed stop
4.....Pan stop rings

## Setting the Tilt Mechanical Hard Stops

**1.**(a) Place the camera cradle over the tilt mounting. Move the tilt mounting in a clockwise direction to the required maximum limit of movement.

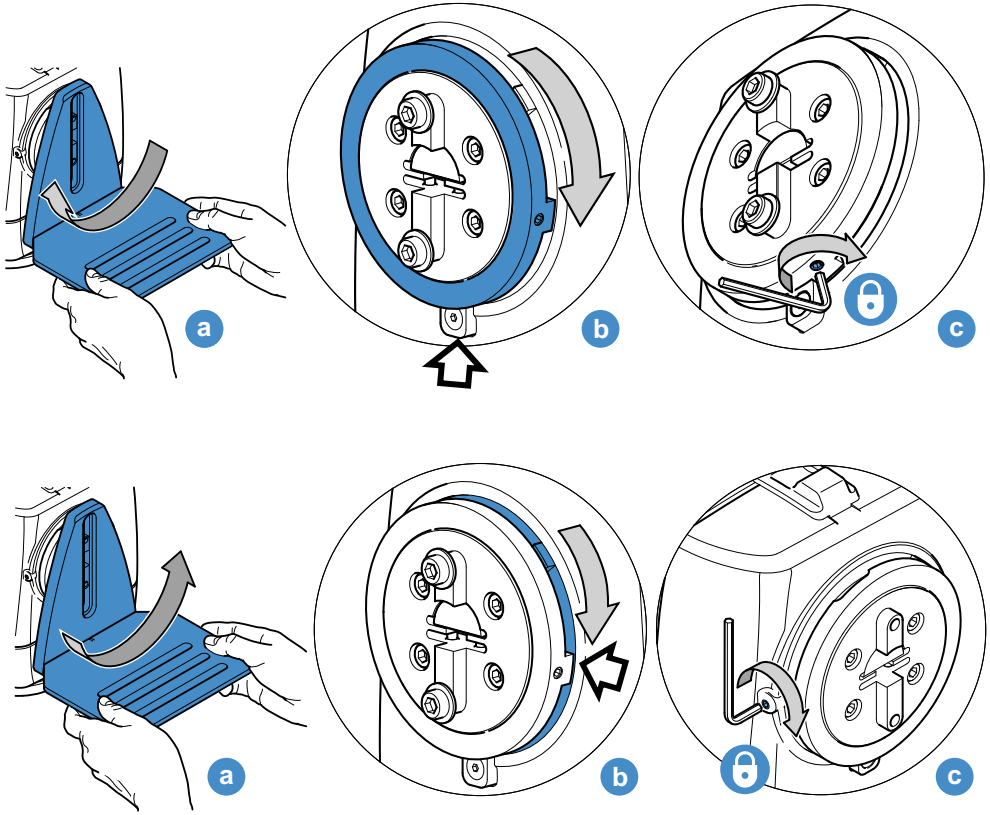
(b) Remove the camera cradle. Move the large outer ring clockwise until it rests on the fixed stop.

(c) Secure the grub screw into position using a 2.5 mm Allen key. Tighten the screw to a minimum of 1.5 Nm (13.3 lbf-in.).

**2.**(a) Place the camera cradle over the tilt mounting. Move the tilt mounting in a counterclockwise direction to the required minimum limit of movement.

(b) Remove the camera cradle. Move the inner ring clockwise until it rests on the large outer ring stop.

(c) Secure the grub screw into position using a 2.5 mm Allen key. Tighten the screw to a minimum of 1.5 Nm (13.3 lbf-in.).

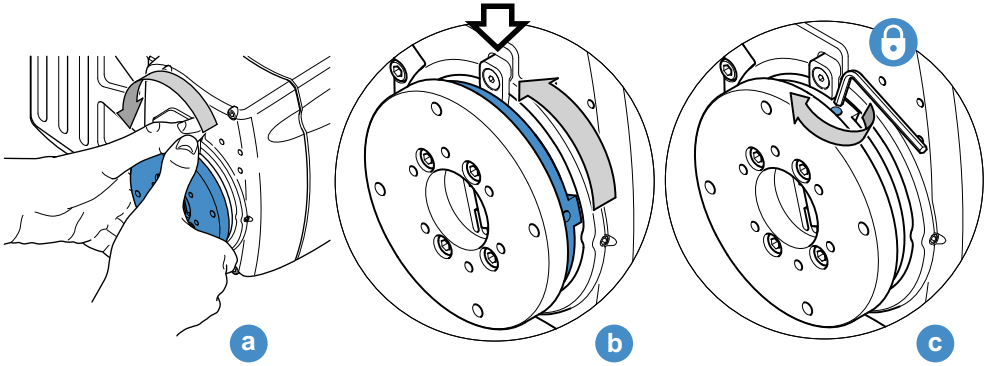


## Setting the Pan Mechanical Hard Stops

**3.**(a) Move the pan mounting in a counterclockwise direction to the required minimum limit of movement.

(b) Move the large outer ring counterclockwise until it rests on the fixed stop.

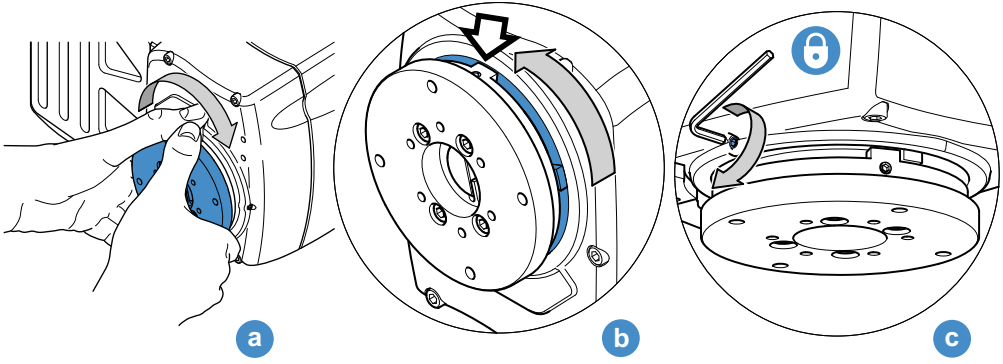
(c) Secure the grub screw into position using a 2.5 mm Allen key. Tighten the screw to a minimum of 1.5 Nm (13.3 lbf-in.).




**4.**(a) Move the pan mounting in a clockwise direction to the required maximum limit of movement.

(b) Move the inner ring counterclockwise until it rests on the outer ring stop.

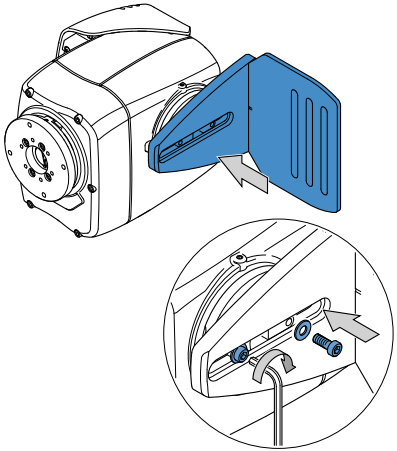
(c) Secure the grub screw into position using a 2.5 mm Allen key. Tighten the screw to a minimum of 1.5 Nm (13.3 lbf-in.).



## Ceiling Mounting

The FHR-35 can be mounted to the ceiling using either a column mount (part no. 196-728-0044) or a bracket (part no. AM-CEIL-102). When mounting the head to a ceiling support, the camera cradle must be inverted.

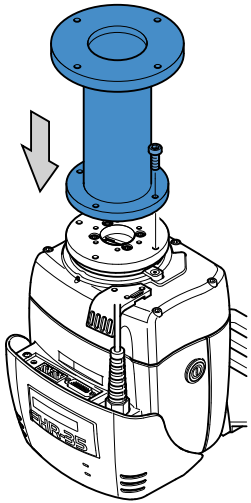
**1.** Refit the camera cradle to the tilt mounting in an inverted orientation. Using a 4 mm Allen key, secure in position using the two screws and washers.



**2.** Mount the head to the ceiling bracket or column.

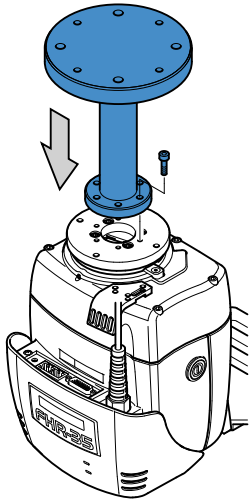
**Radamec Adaptor Column (196-728-0044)**

Using a 5 mm Allen key, attach the head to the column mounting using the four M6 cap head screws and washers provided.



**Ceiling Mounting Bracket (AM-CEIL-102)**

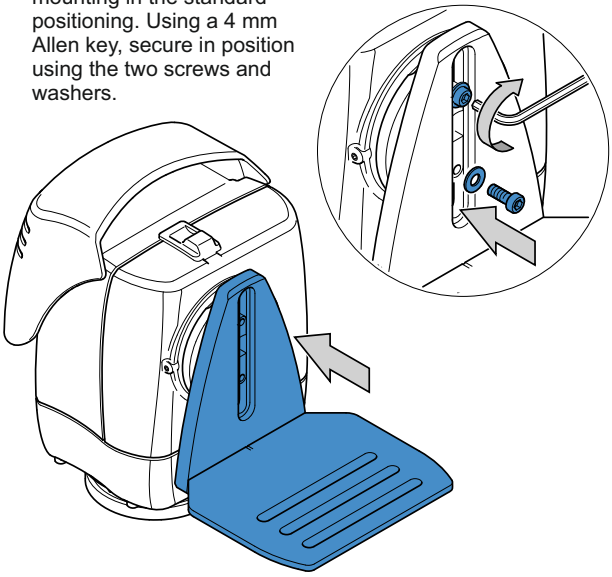
Using a 5/16" Allen key, attach the head to the ceiling mounting bracket using the six 10-32 cap head screws and washers provided.

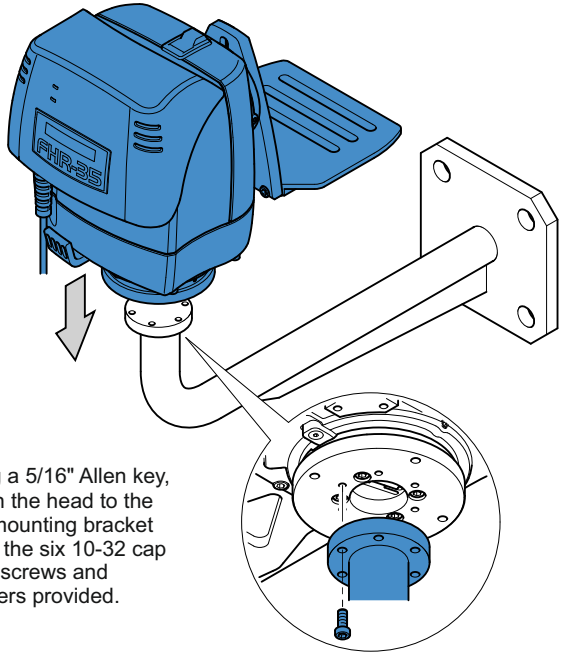


## Wall Mounting

The FHR-35 can be mounted to a wall using the wall mounting bracket (part no. 196-728-0044). When mounting the head to the wall, the cradle is fitted to the head in the standard position.

**1.** Fit the camera cradle to the tilt mounting in the standard positioning. Using a 4 mm Allen key, secure in position using the two screws and washers.






**2.** Using a 5/16" Allen key, attach the head to the wall mounting bracket using the six 10-32 cap head screws and washers provided.

## Pozi Loc Tripod Mounting Options

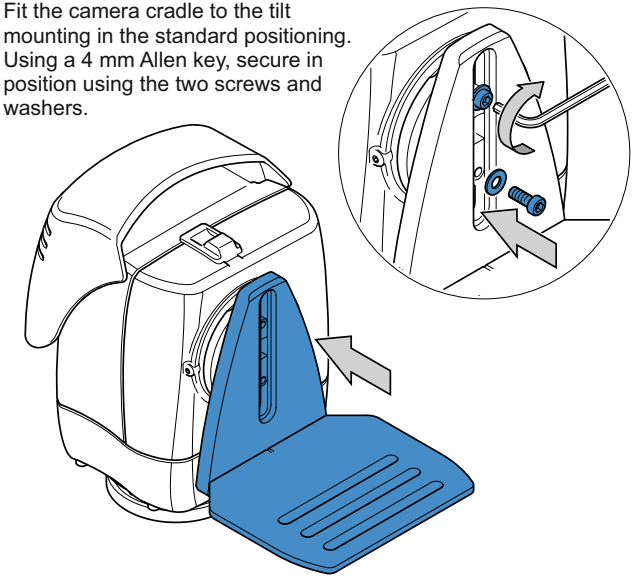
The FHR-35 can be mounted onto the following Pozi Loc tripods:

- Vinten two-stage aluminium EFP Pozi Loc tripod (part no. V4086-0001).

- Vinten two-stage carbon fibre EFP Pozi Loc tripod (part no. 3881-3).

When mounting the head to the tripod, the cradle is fitted to the head in the standard position.

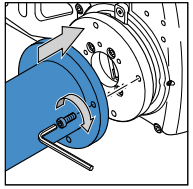
**1.** Fit the camera cradle to the tilt mounting in the standard positioning. Using a 4 mm Allen key, secure in position using the two screws and washers.

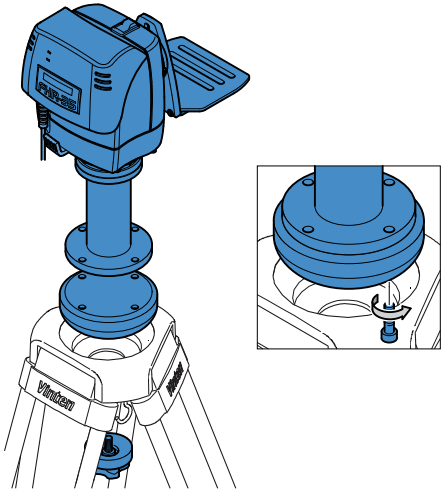


**2.** Mount the head to the Pozi Loc tripod using one of the following three mounting options.

**Radamec Adaptor Column (196-728-0044)**

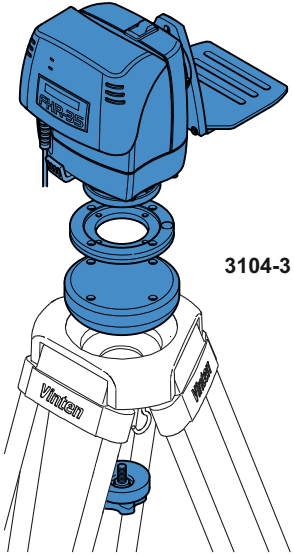
Using a 5 mm Allen key, attach the Radamec adaptor column to the head using the four M6 screws and washers provided. Mount onto the tripod using the 150 mm bowl adaptor.



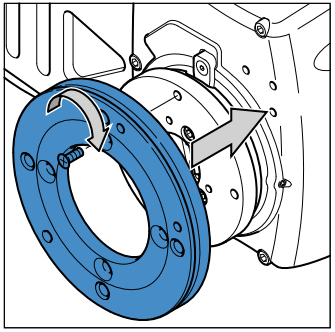


**Adaptor with Quickfix Groove (V4096-1013)**

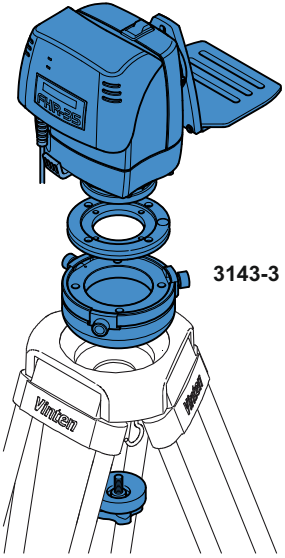
Using a 5 mm Allen key, attach the adaptor with Quickfix groove to the head using the four M6 screws and washers provided. Mount onto the tripod using either the 150 mm bowl adaptor or the Quickfix 150 mm bowl adaptor.




**3104-3** 150 mm bowl adaptor



**V4096-1013** Adaptor with Quickfix groove




**3143-3** Quickfix 150 mm bowl adaptor

## HD Tripod Mounting Options

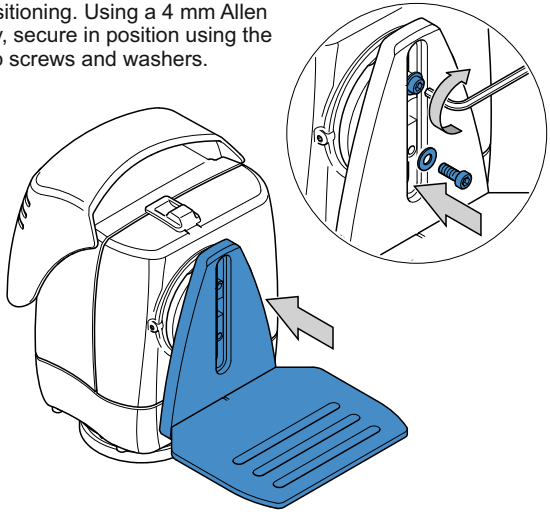
The FHR-35 can be mounted onto the following heavy-duty (HD) tripods:

- Vinten HDT-1 single-stage tripod (part no. 3901-3).

- Vinten HDT-2 two-stage tripod (part no. 3902-3).

When mounting the head to the tripod, the cradle is fitted to the head in the standard position.

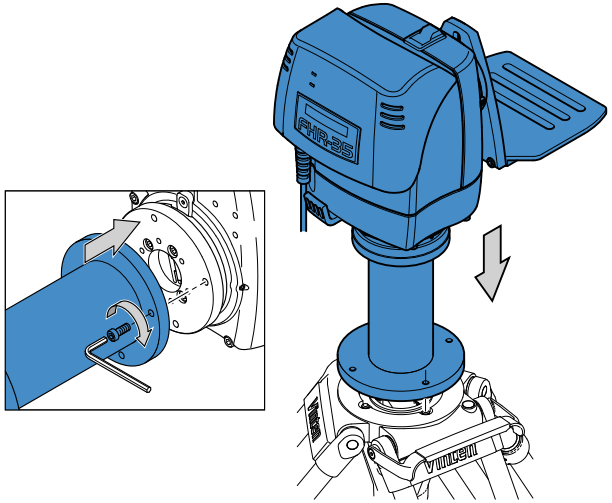
**1.** Fit the camera cradle to the tilt mounting in the standard positioning. Using a 4 mm Allen key, secure in position using the two screws and washers.



**2.** Mount the head to the HD tripod using one of the following three mounting options.

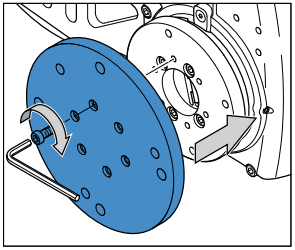
**Radamec Adaptor Column (196-728-0044)**

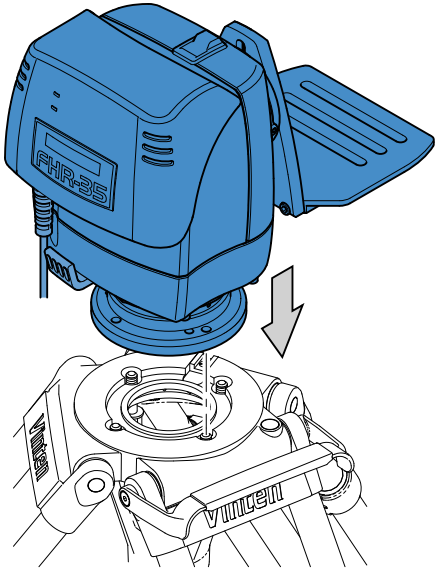
Using a 5 mm Allen key, attach the Radamec adaptor column to the head using the four M6 screws and washers provided. Attach the head and column onto the tripod using the four bolts retained underneath the tripod mount.



**VMA Plate (AM-VMA-105)**

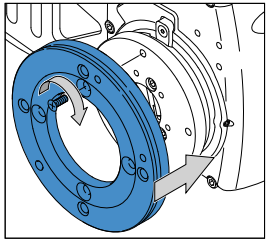
Using a 5/16" Allen key, attach the VMA plate to the head using the six 10-32 screws provided. The head can then be directly mounted on the tripod.

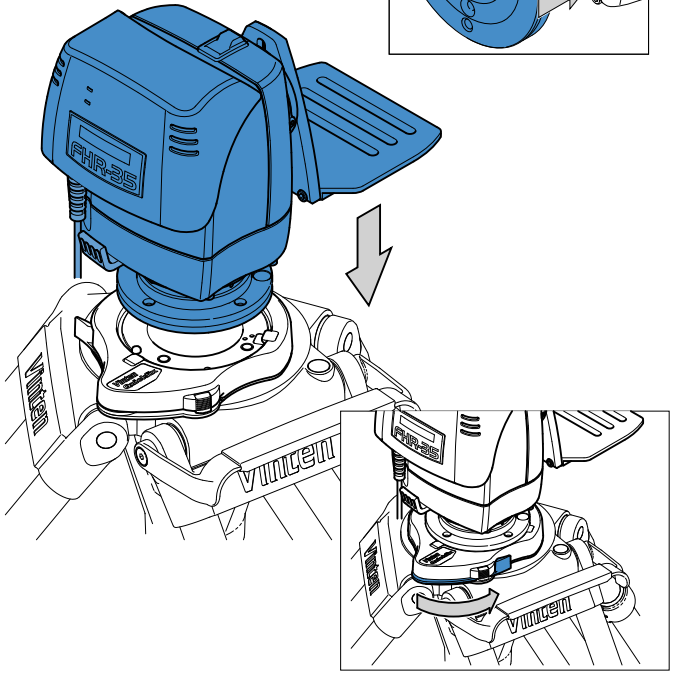





**Adaptor with Quickfix Groove (V4096-1013)**

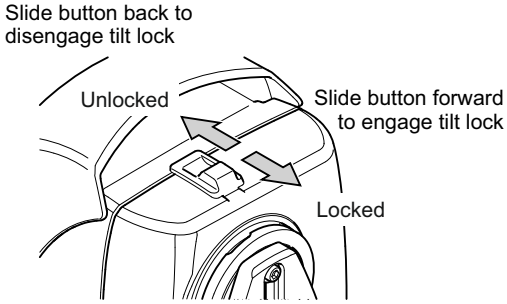
Using a 5 mm Allen key, attach the adaptor with Quickfix groove to the head using the four M6 screws and washers provided. Mount onto the tripod with a Quickfix adaptor.





## Locking/Unlocking the Camera Cradle

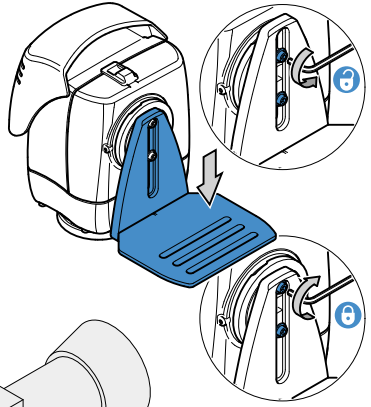
Before installing or adjusting the camera or payload, the tilt lock must be engaged. The tilt lock mechanism holds the camera cradle in the horizontal position, to provide a stable platform when making adjustments. The tilt lock is operated by a slider button located on the top of the head.

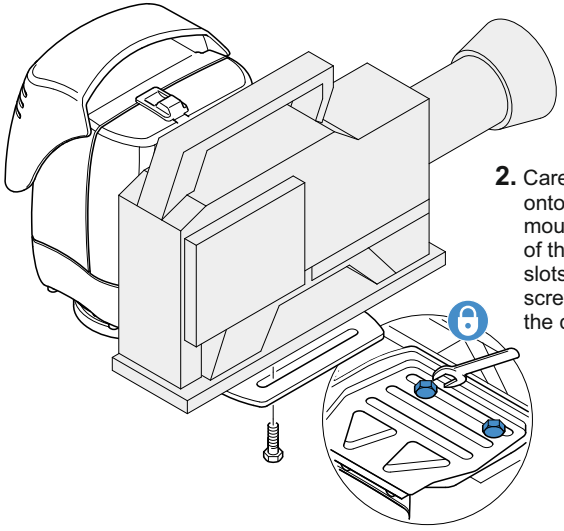



**Note:** The tilt lock only operates when the camera cradle is in the horizontal position.

## Mounting the Camera

**1.** Using a 4 mm Allen key, loosen the two screws securing the camera cradle enough to slide the camera cradle to its lowest position. Secure in position using the two screws.





**2.** Carefully position the camera onto the cradle. Align the mounting holes in the bottom of the camera with one of the slots on the cradle. Fit the two screws and tighten to secure the camera in position.

## Balancing the Head

The FHR-35 is designed to allow the camera and payload to swing about its own Centre of Gravity (C of G), as opposed to balancing with the use of springs or cams. The camera and payload are mounted onto the camera cradle so the resulting C of G aligns with the tilt-axis pivot point, providing true balance.

When the head is correctly balanced, the robotic drives will need the minimum amount of effort to move the head. A correctly balanced head and payload can be set to any tilt position and the head will maintain that position 'hands off'.

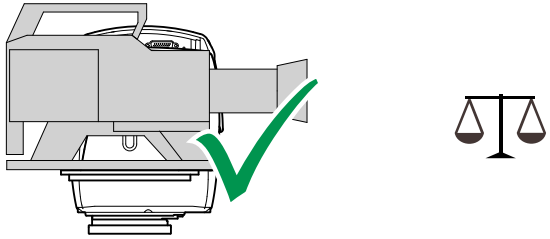
### Setting the Fore/Aft Balance

Ensure that the head and camera cradle are level before balancing. The camera and payload should be fitted on the cradle so that the load is balanced. This can be achieved by moving the camera forwards (Fore) or backwards (Aft) on the cradle.

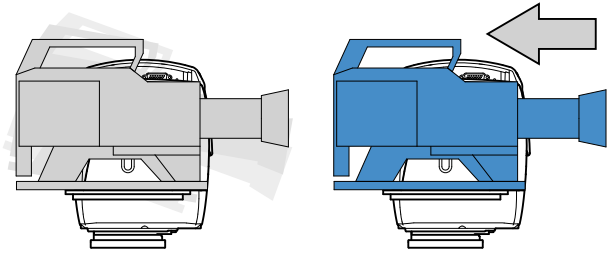
**CAUTION!** Risk of damage to equipment. Be prepared to prevent the camera and cradle from falling away suddenly.

1. Engage the tilt lock. Loosen the bolts securing the camera to the cradle just enough to be able to slide the camera and payload backwards and forwards.
2. Hold and steady the camera cradle, and disengage the tilt lock. Carefully release the camera cradle and observe how it moves and where it stops.

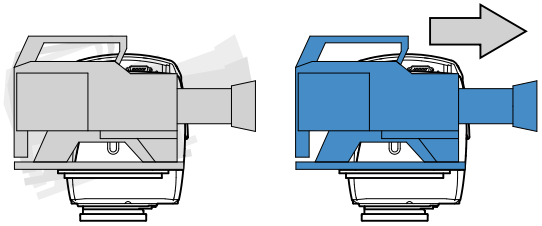
If the camera cradle stops in a horizontal position (camera pointing directly forward) the balance is correct.



If the camera cradle tilts forward (points downwards) then the camera must be moved towards the rear of the head (aft).



If the camera cradle tilts backwards (points upward) then the camera must be moved towards the front of the head (fore).



**3.** Reposition the camera as required on the camera cradle and secure in position. The horizontal balance is correct when the camera cradle comes to rest in a horizontal position.

**4.** Tighten the bolts securing the camera to the cradle and recheck the horizontal balance. Readjust if necessary.

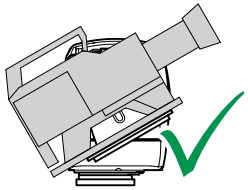
**Note:** If the camera has to be moved too far fore or aft to balance the head, you can remove the camera cradle base plate and refit it, using two screws, 50 mm further in the required direction.

### Adjusting the Centre of Gravity (C of G)

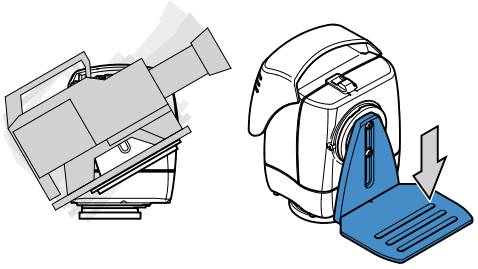
**CAUTION!** Risk of damage to equipment. Be prepared to prevent the camera and camera cradle from falling away suddenly.

**1.** Tilt the camera approximately 30° upward and release it.

If the camera stays in the same position when released, the payload is properly balanced with the C of G on the tilt axis.

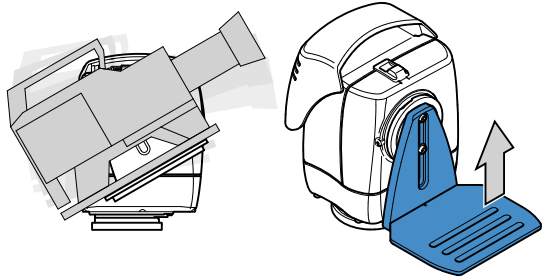


If the camera continues to move upwards after releasing the camera cradle, the payload is mounted too high—lower the camera cradle.



## Balancing the Head

If the camera moves back towards the horizontal position when released, the payload is mounted too low—raise the camera cradle.



**2.** Tilt the camera cradle through positive and negative angles of travel, checking that the head remains at the angle of tilt it is set to, unsupported.

If the camera cradle angle falls or rises, repeat the alignment procedure until balance is achieved.

**3.** After adjusting the C of G height it may be necessary to check that the fore and aft balance remains satisfactory. Readjust the position of the camera horizontally on the camera cradle as required.

**4.** After balancing, exercise the head through both axes to confirm that it operates smoothly.

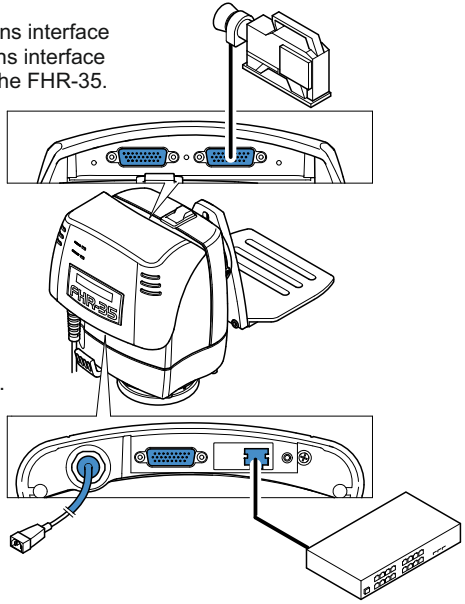
## Electrical Connections

**CAUTION!** Connect the head to the power source using the attached power cable only. Ethernet cables must be rated at Cat5e with screened RJ45 connectors.

**WARNING!** The IEC connector is the primary disconnect device and must be accessible both during and after installation of the product.

**1.** Connect the lens interface cable to the lens interface connector on the FHR-35.

**2.** Connect the power cable and the Ethernet cable.

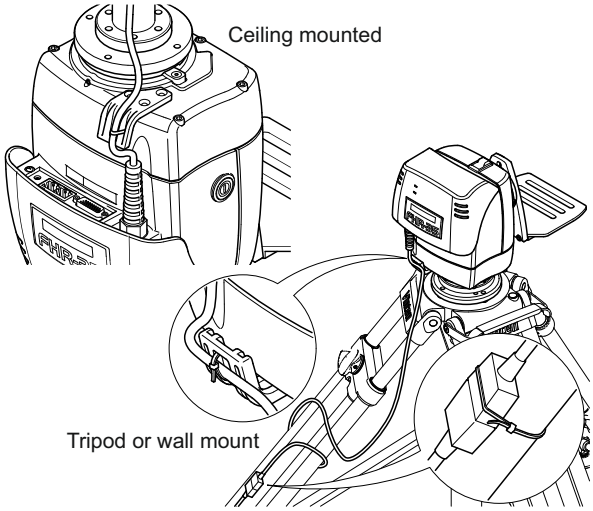


## Cable Management

To ensure a safe and tidy installation, all of the cables connected to the head can be secured neatly using the cable management bracket. Depending on the type of head mounting, the cables can also be secured to the tripod leg or mounting bracket using the cable ties provided.

**CAUTION!** Leave sufficient slack in the cables between the fixed mounting and the head for free and full range of movement.

**CAUTION!** Cables must be secured to the cable management bracket when head is mounted to a tripod.




## Powering Up

**WARNING!** Ensure that all personnel are clear from the robotic equipment before powering up.

**CAUTION!** Disengage tilt lock before powering up.

Before powering up the head, ensure that all external cable connections have been secured correctly.

To power up, press the power button located on the side of the head. The head will not move when powered up, but zoom and focus servos on the camera will take up their default positions on analogue lenses.

The LEDs located at the rear of the head, indicate that data communications (green LED) and a genlock signal (amber LED) is present.

If the LEDs do not illuminate on power up, refer to the **Troubleshooting** section of this manual.

## Regular Checks

### Routine Use

During use, check the following:

- Once a month check the balance of the camera and payload and adjust if necessary.

No further routine maintenance is required.

## Cleaning

**WARNING!** Disconnect and isolate the product from the power supply before cleaning.

We encourage regular cleaning of the product. During normal use the only cleaning required should be a regular wipe over with a lint-free cloth. External electrical connection ports should only be cleaned with a vacuum cleaner.

Cover the head when not in use. Dirt accumulated during storage or periods of non-use may be removed with a vacuum cleaner.

| Fault | Check | Action |
|---|---|---|
| Power supplied, but the camera cradle is not moving. | Check that the tilt lock is disengaged. | See **Locking/unlocking the Camera Cradle** |
| Head not operating. | Check that the power switch is ON. | See **Powering up** |
| | Ensure that the power and Ethernet cables are connected and secure. | See **Electrical Connections** |
| | Check mains power supply to head. | Check that power is being supplied from the pedestal, height drive or studio supply. |
| Camera and payload moving too far on the pan and/or tilt axis. | Check the setting of the hard and soft limits. | See **Setting the Pan and Tilt Hard Limit Stops** and **Setting Pan and Tilt Soft Limits** |
| Intermittent or no communications | Check Ethernet cable.<br>Check the Ethernet cable is CAT5E FTP. | If possible, try using another Ethernet cable. |

## Parts List

### Mounting supports and adaptors

Vinten 4-bolt adaptor (with Quickfix® groove) . . . . V4096-1013
VMA plate . . . . . AM-VMA-105
Radamec adaptor column . . . . . 196-728-0044
Autocam ceiling mounting bracket. . . . . AM-CEIL-102
Autocam wall mounting bracket . . . . . AM-WBKT-102
Vinten 4-bolt to 150 mm bowl adaptor . . . . . 3104-3
Vinten Quickfix® 150 mm bowl adaptor . . . . . 3143-3
Vinten HD Quickfix® adaptor . . . . . 3490-3
Vinten two-stage aluminium EFP Pozi Loc tripod . . V4086-0001
Vinten two-stage carbon fibre EFP Pozi Loc tripod . . . . . 3881-3
Vinten HDT-1 single-stage tripod . . . . . 3901-3
Vinten HDT-2 two-stage tripod . . . . . 3902-3

## Specification

### Physical data

Weight (with cradle) . . . . . 8 kg (18 lb)
Height . . . . . 247.4 mm (9.7 in.)
Length . . . . . 323.5 mm (12.7 in.)
Width . . . . . 193.5 mm (7.6 in.)
Maximum payload . . . . . 16 kg (35 lb)

### Operating data

Operating temperature range . . 0°C to +50°C (+32°F to +122°F)
Motor noise . . . . . Minimal
Tilt range . . . . . ±90°
Pan range, max. . . . . 359°
Pan range, max. (with mechanical end stops set) . . . . . 319°

Angular velocity (max) . . . . . 60°/s
Angular acceleration (typical) . . . . . 60°/s$^2$
Angular acceleration (peak) . . . . . 120°/s$^2$
Accuracy . . . . . 60 arcseconds

Robotic operation . . . . . Full
Manual operation . . . . . None

### Electrical data

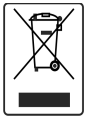
Power consumption . . . . . 100W

## Compliance

**Declaration of Conformity**

Vitec Production Solutions Limited declares that this product has been manufactured in accordance with BS EN ISO 9001:2008 and is in compliance with the essential requirements and other relevant provisions of the Machinery Directive 2006/42/EC. A copy of the Declaration of Conformity is available upon request.

**Waste of Electrical and Electronic Equipment (WEEE) Directive (2002/96/EC)**



This symbol marked on the product or its packing indicates that this product must not be disposed of with general household waste. In some countries or European Community regions, separate collection systems have been set up to handle the recycling of electrical and electronic waste products. By ensuring this product is disposed of correctly you will help prevent potentially negative consequences for the environment and human health. The recycling of materials helps conserve natural resources.

**In countries outside the EU:**

Dispose of this product at a collection point for the recycling of electrical and electronic equipment according to your local government regulations.
Visit our website for information on how to safely dispose of this product and its packaging.

**Pollution Degree 2**

This equipment is designed for operation in Pollution Degree 2 environments.


**FCC Notice**
This product complies with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna
- Increase separation between the equipment and receiver
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected
- Consult the dealer or an experienced radio/television technician for assistance.

**FCC Warning**
Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

**FCC Declaration of Conformity**
This product complies with Part 15 of the FCC Rules, Operation is subject to the following two conditions:
(1) This product may not cause harmful interference.
(2) This product must accept any interference received, including interference that may cause undesired operations.

## General Purpose Connector

The General Purpose Connector can be used to connect a Camera Control Unit (CCU) or for switching and powering other camera accessories. The pin outs of the connector are given in the following table.

**CAUTION:** Total power drawn from the 12V pins of this connector must NOT exceed 30W.

| Pin No. | Description | Pin No. | Description |
|---|---|---|---|
| 1 | Not connected | 14 | Not connected |
| 2 | Aux GND | 15 | CCU TXD422 |
| 3 | Aux +12V | 16 | CCU TXD232 |
| 4 | Aux +12V | 17 | Not connected |
| 5 | Not connected | 18 | GP I/O 1 |
| 6 | CCU RXD422 | 19 | GND |
| 7 | CCU RXD232 | 20 | Aux GND |
| 8 | GP I/O 3 | 21 | Aux +12V |
| 9 | GP I/O 0 | 22 | Not connected |
| 10 | GND | 23 | CCU TXD422 |
| 11 | Aux GND | 24 | CCU RXD422 |
| 12 | Aux GND | 25 | Not connected |
| 13 | Aux +12V | 26 | GP I/O 2 |

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