

VANDERBILT



FP50B

**Phoenix™ Explosion-proof
Pan-and-Tilt Unit**

Installation Guide

Vanderbilt International (IRL) Ltd

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1 Safety

1.1 Target readers

The instructions in this document are designed only for the following target readers:

Target readers	Qualification	Activity	Condition of the product
Installer	Has appropriate technical training for building or electrical installations in the explosion-proof sector.	Installs the product or individual components of the product .	Components of the product are not yet installed.

1.2 Work safety information

- Read the general safety precautions before installing and operating the device.
- Follow all warnings and instructions marked on the device.
- Keep this document for reference.
- Always pass this document on together with the product.
- Please also take into account any additional country-specific, local safety standards or regulations concerning installation, operation and disposal of the product.

Liability claim

- Do not connect the device if it is damaged or any parts are missing.
- Do not make any changes or modifications to the device unless they are expressly mentioned in this manual and have been approved by the manufacturer.
- Use only spare parts and accessories that have been approved by the manufacturer.

Danger of electrical shock on the open device

- Only qualified personnel should open the unit.

1.2.1 Transport

Damage during transport

- Keep the packaging material for future transportation.
- Do not expose the device to mechanical vibrations or shocks.

1.2.2 Installation

Damage due to unsuitable mounting location

- The environmental conditions recommended by the manufacturer must be observed. See Section 3 Technical data.

Damage due to incorrect installation

- The mounting surface must be sufficiently solid and strong to take the complete weight of the unit. See Section 3 Technical data. Take into account environmental aspects such as exposure to strong wind and rain.
- Use only mounting materials that are suitable for the particular mounting surface.

Explosion hazard due to inappropriate tools/accessories

- Use only tools that are appropriate for the task. Specific tools may be required for installation purposes dependent upon the site in which the unit is to be installed.
- Make sure to use only cable types and glands that are approved for the environmental requirements.

Danger of bodily injury by moving equipment

- The assembly may be subject to remote control and therefore may pan and tilt. Mount the unit such that nobody will be injured. When working on the equipment, take appropriate precautions to eliminate the risk of injuries (e.g. by disconnecting from the supply voltage).

Explosion hazard/damage to the device due to incorrect connection to the power source

- Connect the device only to power sources with the voltage specified on the rating plate.
- Make sure the device is permanently connected to the electricity supply; a readily accessible disconnect device must be provided.
- Make sure the circuit the device is connected to is protected with a 13 A or 16 A (max.) fuse. Do not connect any devices from other systems to this fuse.
- Electrical grounding must meet the customary local safety standards and regulations.
- Do not open the unit when an explosive atmosphere may be present.
- The installation must comply with EN 60079-14 standards as well as with the national regulations.

Risk of cable damage due to stress

- Make sure that all outgoing cables and wires are sufficiently strain-relieved.
- Make sure that cables are not under stress, kinked or damaged.

1.2.3 Service and maintenance

Danger of electrical shock during maintenance

- Maintenance work and modifications to this device must only be carried out by trained specialists.
- Always disconnect the power cable and other cables from the main power supply before performing maintenance.
- Ensure the power cannot be reconnected while the unit is being worked upon.

1.3 Meaning of the written warning notices

The severity of a hazard is indicated by the following written warning notices.

Signal word	Type of risk
DANGER	Imminent danger of death or severe bodily injury
CAUTION	There is a risk of minor to medium injuries or damage to property

1.4 Meaning of the hazard symbols

The nature of the hazard is indicated by icons.



Warning of a hazard



Warning of an explosion hazard

2 Standards and guidelines

2.1 Certification

The product complies with the requirements of the following EU directives. The EU declaration of conformity is available from:

Vanderbilt International (IRL) Ltd.
Clonshaugh Business and Technology Park
Clonshaugh
Dublin 17
Ireland

2.1.1 European Directive 2004/108/EC „Electromagnetic Compatibility”

Compliance with the European Directive 2004/108/EC has been proven by testing according to the following standards:

Electromagnetic compatibility emissions:	EN 61000-6-3 EN 55022 class B
Interference resistance:	EN 50130-4

2.1.2 European Directive 2006/95/EC „Low-Voltage Directive”



Compliance with the European Directive 2006/95/EC has been proven by testing according to the following standard:

Safety:	EN 60950-1
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2.1.3 EC (ATEX) Directive 94/9/EC

The equipment is intended for use in hazardous (explosive) atmospheres and certified to:

 1180  II 2 GD Ex d IIB T6 Gb Ex tb IIIC T85°C Db

	CE marking according to 94/9/EC
1180	Accredited test centre: Baseefa (2001) Ltd., Buxton, UK
	Specific explosion protection mark

EC (ATEX) Directive 94/9/EC certification is to:

Code	Description
II	Equipment group II - comprises equipment intended for use in areas in which explosive atmospheres caused by mixtures of air and gases, vapours or mists or by air/dust mixtures are present. NB: not intended for mining applications.
2	Equipment category 2 – high protection
G	Gases - Zone 1
D	Dust - Zone 21
Ex d	For use in gas atmospheres – flameproof; pressure-resistant casing
IIB	Gas Group (representative test gas: Ethylene). Also includes Gas Group IIA
T6	Temperature Class – maximum surface temperature: +85°C
Gb	Equipment Protection Level – Zone 1
Ex tb	For use in dust atmospheres - flameproof; pressure-resistant casing
IIIC	Protection against conductive dust
T85°C	External surface temperature not to exceed +85°C, maximum
Db	Protection Level – Zone 21

This product complies with the following European Standards:

EN 60079-0:2009 EN 60079-1:2007 EN 60079-31:2009,

EC-Type Examination certificate

Baseefa (2001) Ltd., Buxton, UK, notified body number 1180, certifies compliance of the equipment with the EC (ATEX) Directive 94/9/EC.

EC-Type Examination Certification Number:

Baseefa 03ATEX 0731X + Supplementary certificates.

Special conditions for safety use according to the EC-Type examination certificate

- The maximum permitted flame path gaps are smaller than the maximum gap shown in EN50018, the equipment manufacturer must be consulted before any maintenance operation that may affect the flameproof integrity of the unit
- If the unit is intended for use in a dust atmosphere the threads of the cable entry devices must be sealed in accordance with the relevant codes of practice to ensure that the IP6X rating is maintained.

European Harmonised Standard EN 60529:1992 certification is to:

IP67 Ingress Protection

IP6X	Dust tight. No ingress of dust at normal temperature and pressure.
IPX7	Protected against the effects of temporary immersion in water. Immersed for 30 minutes at a depth of ≤ 1 m.

Abtest Limited, Abercynon, UK certifies compliance of the equipment to the Standard EN 60529:1992, with an IP67code.

Environmental Test Report No: EQ8921, dated 16th December 2003.

2.2 Certification requirements for the camera housing

Any camera housing (including the camera/lens) to be fitted to the FP50B series pan-and-tilt unit should be certified to the EC 'ATEX' Directive 94/9/EC Equipment-group II, Category 2, or an equivalent standard.

The maximum load of all the equipment to be fitted to the Side Platform, including cabling, must not exceed 40 kg.

3 Technical data

3.1 Specifications

	FP50B	FP50B/L	FP50B/U
Application	Hazardous (explosive) atmospheres (Gas Ex zone 1 / Dust Ex zone 21)		
Power requirements	230 V AC, 50 Hz	24 V AC, 50/60 Hz	110 V AC, 60 Hz
Supply current	0.16 A	1.5 A	0.33 A
Dimensions (W x H x D)	167 x 286 x 448 mm		
Cable entry	Internal terminal block, 1 threaded hole (M20x1.5) for certified gland		
Finish and colour	Housing: Polyester powder coat RAL1021 (yellow). End caps: clear anodised		
Construction	Housing: machined aluminium casting; End Caps (tilt & pan): machined aluminium; Tilt and pan discs: machined aluminium; Side mount platform: machined aluminium casting		
Ambient temperature, operating	-20 to +40 °C		
Protection rating	IP67 BS EN 60 529		
Weight	18.40 kg		
Max. load	40 kg – side mount only		
Max. rotation	Pan: 346°. Tilt: ±172°		
Rotation speed	Pan + tilt: 4.5 °/sec (50 Hz), 5.4 °/sec (60 Hz)		

3.2 Mechanical dimensions

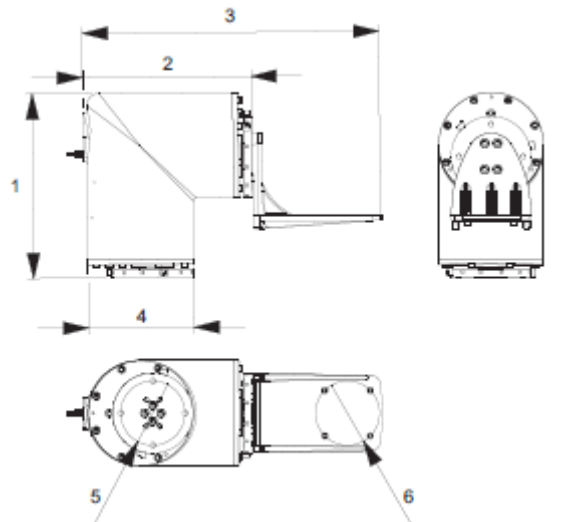


Fig. 1 Pan-and-tilt unit – Mechanical dimensions

1	291 mm
2	266 mm
3	471 mm
4	∅167 mm
5	4 x M8 mounting holes on a 101.6 mm PCD
6	4 x M6 mounting holes on a 101.6 mm PCD

4 Details for ordering

Type	Part no.	Designation	Weight
FP50B	V54561-C910-A1	FP50B Explosion-proof pan-and-tilt unit ATEX IIB 230 V AC	18.40 kg
FP50B/U	V54561-C910-A2	FP50B/U Explosion-proof pan-and-tilt unit ATEX IIB 110 V AC	18.40 kg
FP50B/L	V54561-C910-A3	FP50B/L Explosion-proof pan-and-tilt unit ATEX IIB 24 V AC	18.40 kg

5 Scope of delivery

- FP50B series pan-and-tilt unit
- Installation guide
- Declaration of conformity
- Packing kit comprising:
 - Side platform
 - 4x M8x16 mm cap head screw
 - 3x M5x60 mm M5 hex head special – end cap removal screw
 - 2x M6x70 cap head – end cap fitting guide screw
 - Cable gland (Hawke cable gland type 501/421) incl. sealing washer
 - Cable ties

6 Product description

6.1 Areas of application

The pan-and-tilt unit is suitable for use in hazardous areas. A hazardous area is defined as an area in which explosive atmospheres are, or may be expected to be, present in quantities such as to require special precaution for the construction and use of electrical equipment. An explosive atmosphere consists of a mixture of flammable substances with air at a certain proportion in the form of gas, vapour, mist or dust. The mixture can be exploded by excessive temperatures, arcs, sparks or flames.

6.2 Pan-and-tilt unit

Equipment is housed in an enclosure into which gas may gain access. Should this gas be ignited within the enclosure, the resulting explosion will not reduce the pressure integrity of the enclosure and will not be transmitted to any flammable atmosphere external to the enclosure.



DANGER

Explosion hazard

The unit may contain an ignition source even after disconnection.

- Do not open when an explosive atmosphere may be present.

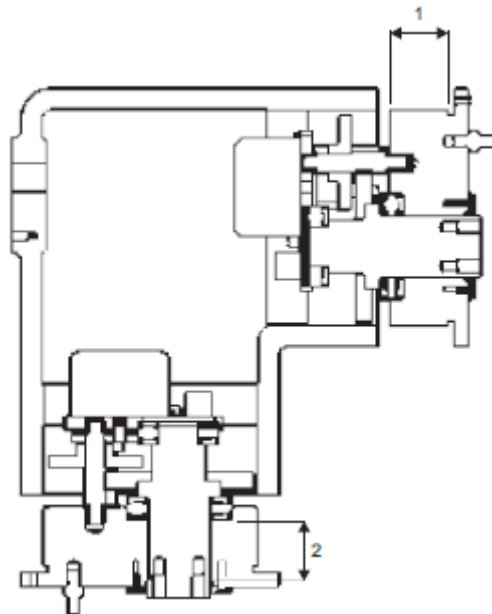


Fig. 2 Detail showing flame path zone locations

1	End cap flamepath (applies to both pan-and-tilt gearboxes)
2	Driveshaft flamepath (applies to both pan-and-tilt gearboxes)

- The pan-tilt unit is manufactured using a cast and machined aluminium body (Polyester powder coated) with clear anodised aluminium (side and bottom) end caps.
- The pan motor is connected, via a gear box, to a clear anodised aluminium rotating pan plate. The tilt motor is connected, via a gear box, to a clear anodised aluminium rotating tilt plate.
- Units are provided with an aluminium (polymer powder coated) side platform, which is fixed to the tilt plate only in a side mount configuration.
- The pan-and-tilt unit also includes one M20 x 1.5 screw thread cable entry.
- The pan-and-tilt units are available in three ac mains input voltages (230 V AC, 110 V AC and 24 V AC).
- The pan-and-tilt units are provided with a preset position feedback facility. Potentiometers feedback both pan and tilt positional information to an external control system and may be left unconnected when this type of feedback is not required.
- An internal Terminal Block Assembly is used for the connection of external electrical equipment.
- Units are provided with an external earth bonding stud.
- A detailed product specification is provided in section 3.1: Specifications.

7 Installation

Suggested tools

The following tools are suggested for the installation of the pan-and-tilt unit:

- 5 mm A/F (across flats) Allen key
- 10 mm A/F (across flats) Allen key
- 8 mm A/F (across flats) ring spanner
- Torque wrench set to 4.5 and 20 Nm
- Rubber hammer
- Flat-bladed screwdriver
- 24 mm open-ended spanner



Suitable tools will also be required for fixing a FP50B series pan-and-tilt unit to a suitable mounting surface (e.g. bracket).

Suitable tools will also be required for fixing a suitable explosion-proof camera housing (e.g. Vanderbilt FH07B series) to an FP50B series pan-and-tilt unit.

Prerequisites

Ensure that the contents of the package are correct.

See Section 5: Scope of delivery.

Ensure that the complete assembly is tested in the workshop, prior to installation on site.

Power supply

Ensure that the AC power supply is stable and within the rated voltage of the unit. Use an uninterruptable power supply (UPS) to ensure continuous functioning of the unit in the event of power dips in the AC mains supply.

Installation steps



DANGER	Explosion hazard The unit may contain an ignition source even after disconnection. <ul style="list-style-type: none">● Do not open when an explosive atmosphere may be present.
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To install the device proceed as follows:

1. Set the pan limits. See Section 7.1: Setting the pan limits.
2. Set the tilt limits. See Section 7.2: Setting the tilt limits.
3. Connect the cables. See Section 7.4: Pre-installation wiring.
4. Fit the side platform to the pan-and-tilt unit. See section 7.5: Fitting the side platform to the pan-and-tilt unit.
5. Fit a camera housing to the pan-and-tilt unit. See section 7.6: Fitting a camera housing to the pan-and-tilt unit.
6. Locate and mount the unit. See Section 7.7: Mounting the unit.

7.1 Setting the pan limits



This procedure should only be performed in the workshop.

The unit has no built-in automatic pan limit control. The pan operation is limited mechanically.

The outer edge of the Pan Plate has 12 holes drilled and tapped to M6.

1. Screw into the desired “stop” positions the two M6 x 12 mm cap head screws provided.
 - When the unit is driven to either of its pan stop positions, the head of the screw strikes against the “End Stop Pin” and as a result the unit is limited to this position. See Fig. 3.



A maximum pan rotation angle of 346° can be achieved.

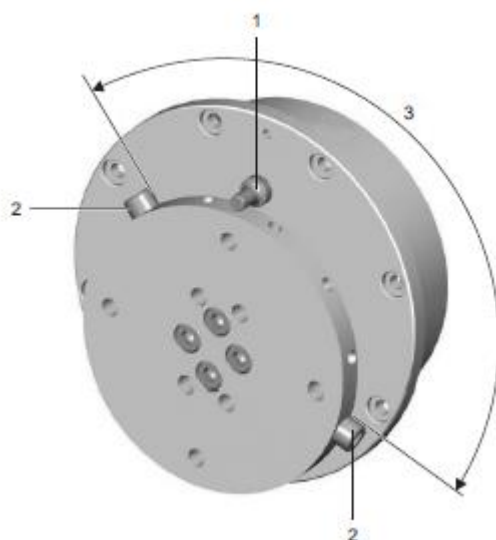


Fig. 3 Setting the pan and tilt limits

1	End stop pin
2	Limit screws
3	Rotation angle

7.2 Setting the tilt limits



This procedure should only be performed in the workshop.

The unit has no built-in automatic tilt limit control. The tilt operation is limited mechanically.

The outer edge of the Tilt Plate has 12 holes drilled and tapped to M6.

1. Screw into the desired “stop” positions the two M6 x 12 mm cap head screws provided.
 - When the unit is driven to either of its tilt stop positions, the head of the screw strikes against the “End Stop Pin” and as a result the unit is limited to this position. See Fig. 3.
-



A maximum tilt rotation angle of $\pm 172^\circ$ can be achieved.

7.3 Preset position feedback facility

The pan-and-tilt unit is fitted with high grade servo potentiometers to provide feedback of both the pan and the tilt positions to an external pre-position control system.



Care should be taken to ensure the correct electrical connections are made to the preset position feedback facility, as shown in the wiring diagram (see Section 7.4: Pre-installation wiring).

Particular attention should be made to:

- Ensure that the wiper of the potentiometer is not connected to a supply voltage, since this will cause damage.
 - Check the polarity of the reference voltage to ensure that the pan and tilt movements of the unit cause the feedback voltage from the potentiometer wiper to operate in the correct polarity for the control system. If this is not correct, the unit will not find its correct position and will not operate!
-



On systems where positional feedback from the pan-and-tilt unit is not required, no connections to the potentiometers are required.

7.4 Pre-installation wiring



- Work on the unit should only be performed in the workshop.
- It is recommended that the pan gear box assembly should not be removed at any time.
- Use only cable suitable for the application and that meets the standards required by the installation. The conductor size must be at least 0.75 mm². The maximum recommended conductor size is 2.5 mm².
- For safety purposes use crimped ferrules when terminating Live & Neutral mains wires.
- A readily accessible all-pole disconnect device with at least 3 mm contact separation shall be incorporated in the building installation wiring. This disconnection device shall disconnect both poles simultaneously. As part of the building installation protect this device via a 3 A fuse or 3 A circuit breaker for 230 V and 110 V units or a 5 A fuse or 5 A circuit breaker for 24 V units.

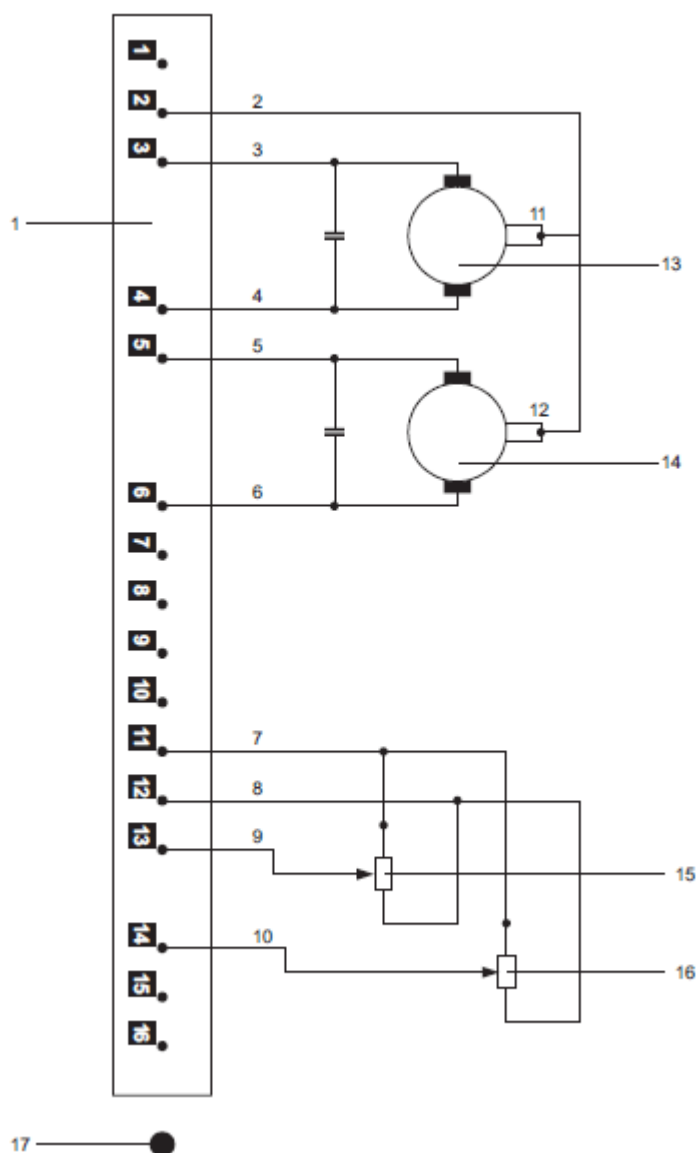


Fig. 4 Wiring diagram

1	Tilt gearbox terminal block assembly
2	Yellow
3	White [pan left]
4	Grey [pan right]

5	Red [tilt up]
6	Blue [tilt down]
7	Black
8	Orange
9	Brown [pan]
10	Violet [tilt]
11	Yellow
12	Yellow
13	Pan motor
14	Tilt motor
15	Pan position preset feedback potentiometer
16	Tilt position preset feedback potentiometer
17	Earth stud



It is recommended that the pan-and-tilt unit is controlled by a telemetry receiver with suitably limited outputs (see section 3.1: Specifications). Consideration should be given to the explosive atmosphere protection of this receiver.

1. Ensure that the cable length from the telemetry receiver is less than 10 metres.
2. The pan-and-tilt unit has one cable entry (M20x1.5 threaded) in the body. The threaded entry hole must be fitted with a suitable explosion-proof entry device (cable gland) certified to the EC 'ATEX' Directive 94/9/EC or local standards, where relevant. To maintain the IP protection level, especially IP6X for use in dust environments, ensure that the sealing washer supplied with the gland is used.



Inside the Packing Kit (see Section 5: Scope of delivery) is supplied one ATEX certified explosion-proof cable gland which can be used by installers only when the cable going through the gland is between 8.0 and 11.9 mm in diameter and is non-armoured elastomer and plastic insulated.

The gland is manufactured by Hawke Cable Glands Ltd., part reference A501/421/O/M20. EC-Type Examination Certification Number: BAS01ATEX2070X. The gland must be fitted using Hawke Assembly Instructions AI 307.

A suitable ATEX certified alternative gland to suit different cable specifications may also be used, if necessary.



Electrical installation methods should comply with current site, local and national regulations. Only personnel who are qualified to the appropriate level should carry out installation.

3. When routing and connecting cables for the electrical supply always ensure that power conductors are separated from Low voltage (e.g. telemetry etc.) data conductors. This will reduce potential problems that can arise through electrical noise and interference.
4. An earth bonding stud is provided on the outside of the unit.
5. A terminal block assembly is provided to aid electrical installation. It is mounted on the tilt gear box assembly.

6. The cable earth wire (E) must always be fitted as the protective earth directly to the internal earth stud (see Fig. 5).
7. An earth bonding stud is provided on the outside of the housing (see Section 6.2 Pan-and-tilt unit). The housing should be earthed additionally via this stud according to the local conditions (conductor cross-section, etc.).



The protective earthing conductor should be the last conductor to be strained when the supply cable is pulled.

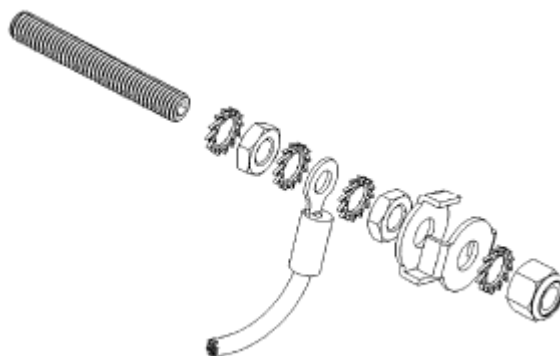


Fig. 5 Internal earth stud



All electrical connections to any external equipment must be via the internal earth stud or the terminal block assembly; both are fitted to the tilt gear box assembly (see Fig. 10).

Removing the tilt gear box assembly

To provide access to the internal earth stud and the terminal block assembly, the tilt gear box assembly has to be removed (see Fig. 6 to Fig. 9).



Retain the plate and the screws for future use.

1. Remove the four M8 x 16 mm cap head screws from the tilt plate.

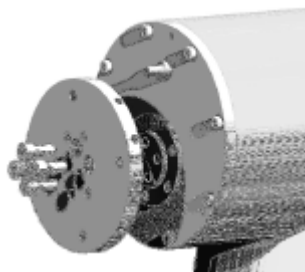


Fig. 6 Removing the tilt plate

2. Remove the eight M6 x 25 mm cap head screws and paint cutting washers from the end cap.

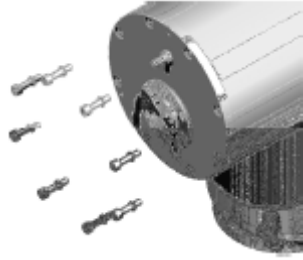


Fig. 7 Removing the gearbox end cap screws

3. Screw the three M5 special end cap removal screws into the special screw holes and gradually tighten in sequence to withdraw the end cap, maintaining an equal gap between the cap and the unit body. Initial resistance will be provided by the 'O' ring seal.



Fig. 8 Withdrawal of the gearbox

4. Withdraw the tilt gear box assembly from the body.
5. Remove the three M5 rear cap removal screws from the rear cap assembly and retain for future use.

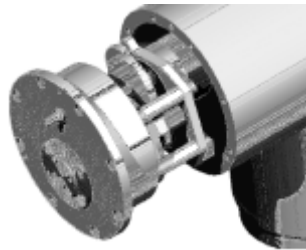


Fig. 9 Gearbox assembly after withdrawal

6. Remove all the nine factory fitted 'test' wires from the terminal block assembly.

Feeding the cable

A suitable cable (minimum of 10 wires) must be fed through the cable gland into the body.

1. The earth wire (E) must be connected as the primary earth directly to the earth stud on the tilt gear box assembly (see Fig. 10). The wire is fed through a hole in the gear plate and secured to the adjacent pillar using the tie wrap provided (see Fig. 10).

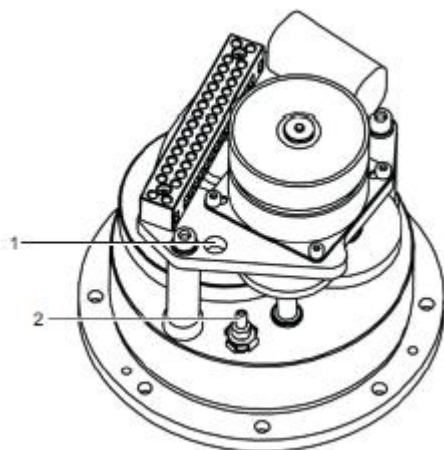


Fig. 10 Tilt gear box assembly

1	Hole for earth wire
2	Earth stud

2. The 'control' wires should be connected to the terminal block assembly as shown in the circuit diagram. Record the colour of the cable wiring terminations next to Tab. 1.

Terminal Block	Wiring	Function
1	NC	-
2	Yellow	Neutral
3	White/Red	Pan left
4	Grey/Blue	Pan right
5	Red	Tilt up
6	Blue	Tilt down
7	NC	-
8	NC	-
9	NC	-
10	NC	-
11	Black	Pot 0V
12	Orange	Pot supply
13	Brown	Pan pot wiper
14	Violet	Tilt pot wiper
15	NC	-
16	NC	-

Tab. 1 Terminal block assembly connections

3. Feed any excess cable back through the cable gland.

Refitting the tilt gear box assembly

1. Take care that the 'O' ring seal is free from grit and dirt. Lightly grease the 'O' ring and the flame path zone (shoulder/neck) of the rear cap assembly with clean general purpose grease.
2. Insert the tilt gear box assembly into the body.
3. Fit the two end cap fitting guide screws into a diagonal pair of fixing holes (say 3 and 4) to ensure that all the fixing holes line up.
4. Partially insert the gear box assembly into the body until the eight M6 x 25 screws can engage.
5. Remove the two cap fitting guide screws and retain for future use.



Care should be taken to avoid damage to the flame path zone (see Fig. 2). It is essential that only A4-80 screws be used.

6. Refit the eight M6 x 25 mm cap head A4-80 screws and the paint cutting washers and tighten evenly to a torque rating of 4.5 Nm, in the order as shown in Fig. 11.
7. Tighten the cable gland to grip the cable correctly, as per the manufacturer's instructions, ensuring that the cable is not pulled tight against the terminal block assembly or the earth stud. Ensure that no excess cable has been left inside the unit.
8. Refit the tilt disc with the four M8x16 mm cap head screws (torque: 20 Nm). Apply Loctite 242 or 243 to these screws before inserting.

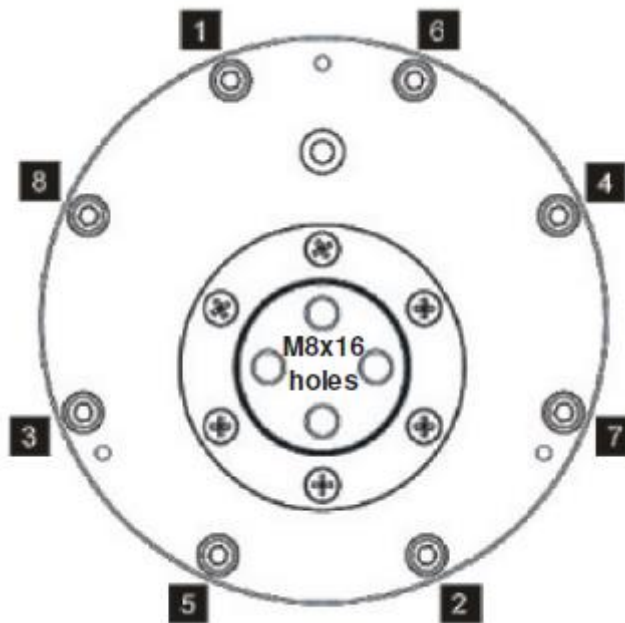


Fig. 11 Screw tightening sequence

7.5 Fitting the side platform to the pan-and-tilt unit

1. Secure the side platform to the pan-and-tilt unit by screwing the four M8x16 mm cap head screws into the tilt plate of the unit (torque: 20 Nm).
2. The side platform must only be fitted in a side mount configuration (see Fig. 12).



Fig. 12 Fitting the side platform

7.6 Fitting a camera housing to the pan-and-tilt unit

A suitable camera housing (e.g. Vanderbilt FH07B series) can be fitted to a FP50B series pan-and-tilt unit in either orientation to suit the requirements of the installation. Fig. 13 shows a typical installation.



Fig. 13 Fitting a camera housing

1. Care must be taken to ensure that the unit is driven in the expected pan and tilt directions.
2. The camera housing must be bolted directly to the side platform of the pan-and-tilt unit. The use of additional spacers is not recommended.
3. The side platform has four 7 mm diameter mounting holes for fitting a camera housing. These holes are equi-spaced on a 4" (101.6 mm) p.c.d (pitch circle diameter).



It is the responsibility of installers to ensure that fixing screws are selected that are suitable for the specific camera housing. It is recommended that dimensional checks be performed to determine the correct length of the fixing screws.

7.7 Mounting the unit

General notes:

- Ensure that all equipment is suitable for the application and the environment for which it is intended.
 - Take particular care that the inter-connected equipment is fully compatible with each other and is suitable for such use.
 - This equipment is to be installed out of reach of the user, or anyone who will come into casual contact with the installation.
 - It is recommended that a prominent warning notice be affixed near to all pan-and-tilt units indicating that sudden unexpected movement of the equipment may occur.
 - Be sure to provide suitable access equipment to ensure the safety of the installation or the service personnel working on the equipment.
1. The pan-and-tilt unit must be mounted properly and securely.
 2. The pan-and-tilt unit can be mounted to a bracket, or directly to a suitable structure.



Because of the weight of the overall assembly, it is recommended that additional spacers should not be used.

3. Four M8 screw mounting holes, equi-spaced on a 4" (101.6 mm) p.c.d. (pitch circle diameter), are provided on the pan plate of the unit.
4. The pan-and-tilt unit will be subject to remote control and therefore may move at any time. Persons working on the equipment should take appropriate precautions to ensure that unexpected movement does not occur.
5. As the mounting surface to which this pan-and-tilt unit could be attached is site dependent, Vanderbilt does not supply fixings for securing the base of the unit to its mounting surface. It is the responsibility of installers to ensure that fixings are selected that are fit for the specific purpose required.
6. An appropriate disconnection device must be included in the installation.



Energisation time

It is recommended that the on/off ratio of the duty cycle should not exceed 50 %.

8 Maintenance

The following guidelines for maintenance should be observed:

1 month after installation	All external fastenings and cables should be thoroughly checked for tightness, security and wear.
6-monthly checks	<ol style="list-style-type: none"> 1. All external fastenings and cables should be thoroughly checked for tightness, security and wear. 2. Perform checks to ensure that cables are not fouling on any obstruction. 3. Check cables for signs of wear. Replace as necessary.
5-yearly checks	<p>If the unit is exposed to very severe weather conditions or other harsh environments, the four 'O' ring rubber weather seals (1 on each end cap and 1 on each shaft) should be replaced. The unit should be returned to Williams Electronics for 'O' ring replacement:</p> <p>Williams Electronics Ltd., Unit 34, Nine Mile Point Industrial Estate CWMFELINFACH Gwent NP11 7HZ UK</p>

9 Troubleshooting

Unit will not drive, both functions	<p>The common cause of this problem is faulty wiring from the control system to the pan-and-tilt unit.</p> <p>The neutral connection between the supply and the pan-and-tilt unit should be checked. The usual cause of this problem is the connection of the telemetry receiver. If the control receiver is fitted with a separate fuse for the pan-and-tilt unit, this should also be checked.</p> <p>Some receivers are capable of being linked to enable separate supply rails to be used for different functions. These links should be checked to ensure that they are in the correct position (refer to receiver manual).</p>
Pan will not drive	<p>Check that the voltage from the control system is present on either pan right or pan left input.</p> <p>A quick test to check if the fault lies with the pan-and-tilt unit or the supply, is to bypass the control system and apply the rated supply voltage directly to the pan and tilt input connector, between neutral and pan left or pan right.</p> <p>It is advisable to try both pan left and right to ensure that the unit is not at an end stop position. If the unit will not pan drive with direct voltage application it should be returned to Vanderbilt for investigation.</p> <p>On control systems which utilise potentiometer feedback from the pan-and-tilt unit, check that this wiring is correctly connected.</p>

Tilt will not drive	<p>Check that the voltage from the control system is present on either tilt up or tilt down input.</p> <p>A quick test to check if the fault lies with the pan-and-tilt unit or the supply, is to bypass the control system and apply the rated supply voltage directly to the pan and tilt input connector, between neutral and tilt up or tilt down.</p> <p>It is advisable to try both tilt up and down to ensure that the unit is not at an end stop position. If the unit will not tilt drive with direct voltage application it should be returned to Vanderbilt for investigation.</p> <p>On control systems which utilise potentiometer feedback from the pan-and-tilt unit, check that this wiring is correctly connected.</p>
Unit tries to move in both directions or goes the wrong way	<p>This problem can be caused by:</p> <ul style="list-style-type: none"> ● A faulty motor capacitor. Although it is possible for capacitors to fail as components, the failure is usually due to some external influence. Checks should be made to ensure that the control system is stable and that relay "chatter" or rapid on/off switching is not occurring. This is particularly a problem on preset-position systems, where the control deadband is set too narrow. Seek advice from Vanderbilt. ● Both motor drive functions being activated simultaneously. This will be as a consequence of a wiring fault. Check that only one input on each motor is activated at any one time. ● Excessive drive torque demand on the motor. Check that the cables are free to move and are not fouling or obstructing the unit.

10 Disposal



All electrical and electronic products should be disposed of separately from the municipal waste stream via designated collection facilities appointed by the government or the local authorities.

This crossed-out wheeled bin symbol on the product means the product is covered by the European Directive 2002/96/EC.

The correct disposal and separate collection of your old appliance will help prevent potential negative consequences for the environment and human health. It is a precondition for reuse and recycling of used electrical and electronic equipment. For more detailed information about disposal of your old appliance, please contact your city office, waste disposal service or the shop where you purchased the product.

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