Pan and Tilt Head
CDD2416-T

Installation guide

Before attempting to connect or operate this product, please read these instructions completely

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1 Safety

1.1 Important Notes

SELECT SUITABLE EQUIPMENT!
Please ensure that all equipment is suitable for the application and the environment for which it is intended. Ensure all applicable specifications are adhered to. Please take particular care that inter-connected equipment is fully compatible with each other and suitable for such use. Check load ratings, dimensions, etc.

SECURELY MOUNT THE ASSEMBLY!
Ensure that each part of the assembly is securely attached. Always use the recommended or supplied fixing screws. Failure to comply with the aforementioned could result in the unit coming loose from the supporting structure and falling, with resultant damages or injury to anyone or anything struck by the falling unit.

INSTALL OUT OF REACH!
This equipment is designed to be installed out of reach of the user, or anyone who will come into casual contact with the installation. Be sure to provide suitable access equipment to ensure the safety of installation or service personnel working on the equipment. It is recommended that all possible work be carried out in a workshop prior to final installation.

INSTALL CORRECTLY!
The installation should be made by a qualified installer. Specific tools may be required for installation purposes dependant upon the site in which the assembly is to be installed. Use the appropriate tools. Refer to local and national standards for wiring and follow recommendations. The installation should be in compliance with local codes. Check that correct cable types are used.

1.2 Meaning of the signal words

The severity of a hazard is indicated by the following signal words. Ignoring these hazards may lead to the consequences indicated.

Signal word	**Type of hazard**
CAUTION	Danger of minor bodily injury or property damage.
IMPORTANT	Danger of malfunctions

2 Standards and guidelines

2.1 EU Directives

The product meets the requirements of:

EU Directive 2014/30/EU on electromagnetic compatibility

Conformity with the European Directive 2014/30/EU is demonstrated by compliance with the following standards:

Emitted interference:	EN 61000-6-3
Resistance to interference:	EN 50130-4

EU Directive 2014/35/EU "Low-Voltage Directive"

Compliance with the European Directive 2014/35/EU has been proven by testing according to the following standard:

Safety:	EN 60950-1

2.2 FCC Compliance

This equipment has been tested and found to comply 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 when the equipment is operated in a commercial environment.

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the installation guide, may cause harmful interference to radio communications.

Operation of this equipment in a residential area is likely to cause harmful interference and the user may be required to correct this. Shielded cables should be used with this unit to ensure compliance with class A limits.

3 Technical data

3.1 Specifications

Nominal Voltage	24 V DC
Maximum Current	2A
Speed Ranges	Pan: 48°/s (variable), Tilt: 24°/s (variable)
Driving Torques	Pan: 10 Nm, Tilt: 20 Nm
Holding Torques	Pan: 20 Nm, Tilt: 40 Nm
Maximum pan rotation	365° ± 2°
Maximum tilt rotation	Over the Top Mount: +20° -90°
Load rating	16 kg
Backlash	Typically < ± 0.1°
Stall protection	DC: Over-current shutdown in stall condition
Usable temp. Range (at 70% max. duty cycle)	-40 to +60 °C -20 to +60 °C without heaters connected
Heater - fitted as standard	On at +10°C when temp falling Off at +20°C when temp rising
Relative humidity	95% non-condensing
Protection rating	IP67, BS EN 60 529
Shock	30G max. (packed product)
Limit switches	Better than 10,000,000 operations
MTTR	Better than 1 hour
Plug connection	DC: 7-Pin IP67 Screw-Locking Industrial Connector Presets : 4-Pin IP67 Screw-Locking Industrial Connector
Construction	Die-cast aluminium body and brackets, machined stainless steel and aluminium components, stainless steel fixings.
Finish	Polyester powder coat, full gloss, RAL 9006 white aluminium.
Weight	7 kg

4 Mechanical dimensions

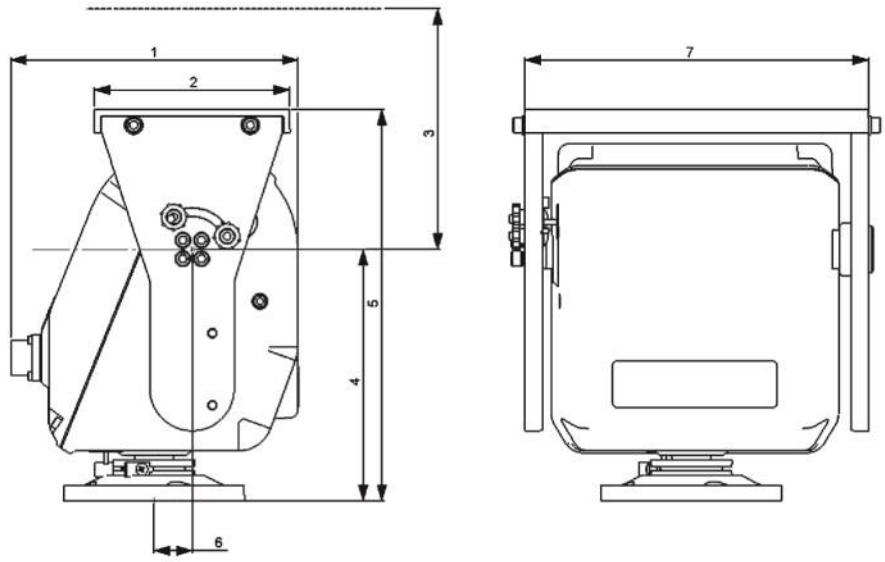

Fig. 1 Mechanical dimensions

1	185 mm
2	125 mm
3	155 mm (to centre-line of load)
4	162 mm (to axis of rotation)
5	255 mm
6	25 mm (to axis of rotation)
7	223 mm

5 Details of ordering

Type	Designation	Weight
CDD2416-T	Pan and Tilt Head	8.0 kg

6 Scope of delivery

- Motor/base assembly with top mount plate
- 4 x M8 nuts
- 8 x plain washers for M8 screws
- 4 x M8 x 30 mm hex. head screws
- 1 x 7 pin cable assembly
- 1 x 4 pin cable assembly
- Installation Guide

7 Description of equipment

The Pan and Tilt unit is designed to meet most outdoor applications (IP67, BS EN 60 529 weatherproof rating) and is supplied with Heaters and Preset Position Feedback capability as standard.

Preset Position Feedback should always be used on DC units.

The drive unit is powered by high power variable speed 24 V DC motors.

All units are fitted with externally adjustable end-stop limits, which can be used to limit the travel range of both pan and tilt functions to suit the customers' application.

The units are supplied with pre-wired cables that are designed to be wired from the Pan and Tilt unit into the camera housing that is mounted on it.

The unit is designed to be powered and controlled by a suitable CCTV telemetry receiver.

8 Mounting

Over the Top models – platform load

Average centre line of load 155 mm (65 mm above platform) 16Kg (balanced)

IMPORTANT	Always fit the camera housing assembly directly to the pan and tilt unit. Do not use additional spacers, as this may result in overloading of the pan and tilt unit. Use suitable screws to affix the camera housing. Refer to the appropriate housing manual.

8.1 Mounting the Unit

The Over the Top Pan and Tilt unit has a removable mounting plate for ease of installation of a camera housing. A column spacer can be used to offer greater installation flexibility

Fig. 2 Typical Over the Top assembly

1	Camera housing
2	Pan & tilt unit
3	Column spacer

8.2 Mounting a Camera Housing to the OTT Platform

The mounting plate has a set of eight Ø7 mm holes equally spaced on a 101.6 mm (4”) PCD and seven other Ø7 mm holes.

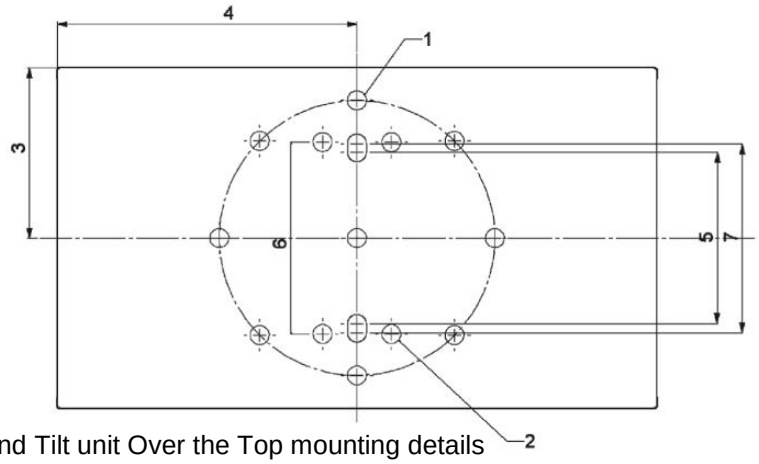

Fig. 3 Pan and Tilt unit Over the Top mounting details

1	8 x Ø 7 mm holes equally spaced at 101.6 mm PCD
2	7 x Ø 7 mm holes (two slotted)
3	62.75 mm
4	110.5 mm
5	63.50 mm (Slotted Hole)
6	71 mm (Through Hole)
7	70 mm (Slotted Hole)

To install a camera housing

1. Remove the four M6 screws (3) using the 5mm Allen Key, remove the washers.

➔ You can now remove the Mounting Plate from the Pan and Tilt unit.

2. Secure the mounting plate to the base of the camera housing using suitable mounting camera housing screws. Refer to the appropriate housing manual.

3. Refit the Top Plate and camera housing to the Pan and Tilt unit using the screws and washers removed earlier, tighten the screws fully.

➔ The camera housing is now mounted on the Pan and Tilt unit.

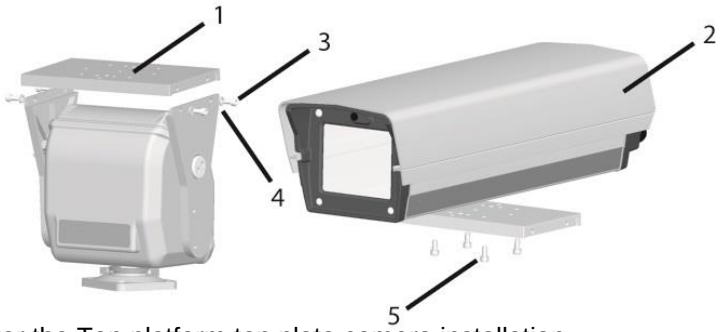

Fig. 4 Over the Top platform top plate camera installation

1	Removable Mounting Plate for ease of installation
2	Camera housing
3	4 x M6 screws to secure Top Plate
4	4 x plain washers for M6 screws
5	4 x screws suitable for mounting camera housing

8.3 Mounting to a bracket or column spacer

The following is a reference guide to brackets and the weights that they support. (Refer to the technical specifications for further information.)

Suitable Fixed Brackets:

- CDBS4540 – 40 kg fixed bracket, CDBS6699 – 100 kg fixed bracket
- CADC1599 – column spacer, CADC3099 – column spacer

The unit is supplied with a kit of parts for mounting the Pan and Tilt to a suitable bracket. It is the installer's responsibility to ensure suitable fixings are used to secure the assembly to the primary surface.

The Pan and Tilt base has 4 holes equally spaced on a 4" (101.6 mm) P.C.D, which line up with the bracket mounting holes, (see Fig. 5).

1. Mount the Pan and Tilt unit onto the bracket (or column spacer) using the four M8 x 30 Hex. Head screws, washers for M8 screws and the M8 nuts provided in the packing kit.
2. Place one washer on the screw, pass through the bracket and then the base plate of the Pan and Tilt unit.
3. Place another M8 washer over the fixing screw and secure by tightening the M8 nuts from the top of the Pan and Tilt unit base plate.

IMPORTANT	The maximum recommended tightening torque for the supplied M8 stainless steel fixings is 21.4 Nm (15.8 lb/ft). Ensure that the correct bracket for the application is used and that it is securely mounted to the prime surface. Ensure the surface to which the unit is being mounted is solid and that there is no risk of the bracket becoming loose due to crumbling brick or mortar. Ensure that all fixing screws and securing bolts are tight. Where required fit suitable anti-vibration fastenings.

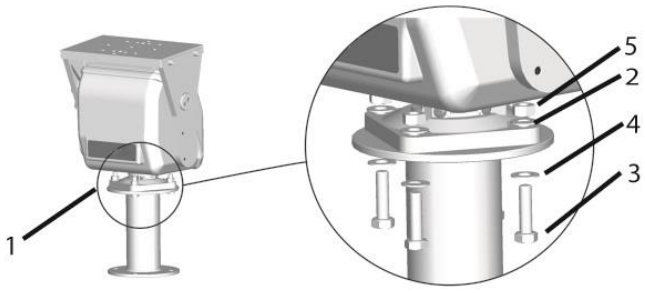

Fig. 5 Base mounting

1	Pan and Tilt base
2	Bracket mounting holes
3	M8 x 30 hex. head screws
4	Washers for M8 screws
5	M8 nuts

9 Connecting the cables

9.1 DC Control Cable Assembly

CAUTION	The power input connector fitted to the unit is the all-pole disconnect device, ensure it is accessible at all times. As part of the building installation, protect the unit via a suitable fuse or circuit breaker. 5 A anti-surge for 24 V DC units.
IMPORTANT	This unit CDD2416-T must only be supplied using an SELV supply.

The unit comes supplied with a 2 metre pre-wired cable assembly

The pan and tilt unit is supplied with a pre-wired DC control connector assembly. The supplied cable is suitable for general CCTV installations. If specifying cables other than those supplied, ensure that the specifications meet those of the original cables plus any special requirements for the installation and any required local and national standards. See below for the specification of the supplied control cable.

DC Control Cables: 7 cores (six numbered white on black, one yellow/green), 0.75mm^2 conductor area per core, flexible stranded cores, 300 V working voltage, grey flexible UV resistant weatherproof outer jacket, -40 to +90°C working temperature range.

The DC connector gland can accept cables with an overall diameter of 8-10mm. Make sure the gland is assembled and tightened correctly to ensure a weatherproof seal.

Pin No.	Wire ident No.	DC function
1 / A	1	* Heater
2 / B	2	Pan right
3 / C	3	Pan left
4 / D	4	Tilt up
5 / E	5	Tilt down
6 / F	6	* Heater
Earth / Earth	Earth wire	Ground

* Optional – only connect if required

10 Heater

The heater is used to allow the unit to operate down to a lower minimum ambient temperature (-40 °C) than it would without any heating (-20 °C). The heater is controlled by a built-in thermostat which switches on when the temperature falls below +10 °C and switches off again when it rises above +20 °C.

If heating is not required do not make any connection to the heater terminals.

The maximum current required for the 24V DC heater is 1 A

11 Preset Feedback Cable Assembly

⚠	**CAUTION**	Preset pan and tilt limits must be set before controlling the unit; failure to set limits could result in a collision with surrounding surfaces or objects.

Pan and tilt position recall is achieved by having high-grade potentiometers fitted to the pan and tilt axes. These potentiometers are used to feedback positional information to an external control system, allowing preset positions to be recorded and recalled (the control system must be preset position capable). These potentiometers are fitted as standard on all versions.

The pan and tilt is supplied with a pre-wired preset connector assembly. The supplied cable is suitable for general CCTV installations. If the installation requires a different cable to be fitted, it must meet the specification of the supplied cable plus any special requirements for the installation and any required local and national standards. See below for the specification of the supplied preset cable.

Preset Cable: 4 cores (Red, Blue, Yellow, Green), 0.5mm^2 conductor area per core, flexible stranded cores, 300 V working voltage, braid shield, grey flexible UV resistant weatherproof outer jacket, -40 to +90°C working temperature range.

The preset connector gland can accept cables with an overall diameter of 6-12 mm. Make sure the gland is assembled and tightened correctly to ensure a weatherproof seal.

Fig. 6 Preset connector

Pin-No.	Wire colour	Function
1	Red	Potentiometer +VE
2	Blue	Potentiometer –VE
3	Yellow	Pan wiper
4	Green	Tilt wiper

1. Ensure that the wiper of the potentiometer is not connected to a supply voltage, since this will damage the components.
2. Fit the water proof cap to cover the preset connector if a preset cable is not used.
3. Check the polarity of the reference voltage connection to the Pan and Tilt to ensure that movement of the unit causes feedback voltage from the wiper to operate in the correct polarity of the control system.

12 Setting the Pan and Tilt end-stops

The unit is fitted with two adjustable end-stop switches which need to be set to limit the angle of travel to suit the site conditions or to the maximum specified travel. The switch actuators are placed externally; there is no need to open the unit.

NOTE

The end-stop switches should be set to the required limits of travel to ensure that the camera housing does not foul on any obstructions that may be present, or cause tension on the control cables.

CAUTION

Danger of damage to the unit

Do not attempt to use force to manually move the pan or tilt mechanisms as this can cause damage to the gearboxes. The unit should only be moved by driving it correctly, as described in this guide.

12.1 Setting the Pan end-stops

1. Drive the unit to the required pan stop positions to adjust the strikers (see Fig. 7).
2. Loosen the M4 screws to free the pan strikers.
3. Adjust the strikers so that they strike the microswitch actuator, at the required positions.
4. Tighten the M4 screws to secure the pan strikers.

NOTE

If one of the end-stops is removed, it is possible to achieve a maximum 365° of pan rotation.

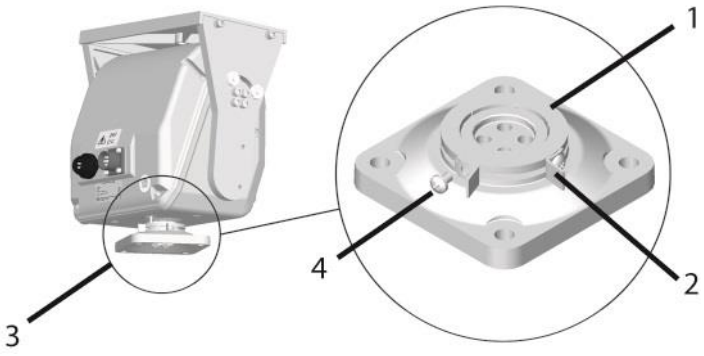

Fig. 7 Setting the Pan end-stops

1	Pan and Tilt base
2	Adjustable strikers
3	Pan and Tilt assembled base and switch
4	M4 screws

12.2 Setting the Tilt end-stops

1. Drive the unit to the required tilt stop positions to adjust the strikers.
2. Release the screw locks (4).
3. Adjust the strikers (3) until they are at the position to strike the microswitch actuator.
4. Retighten the screw locks once in position.

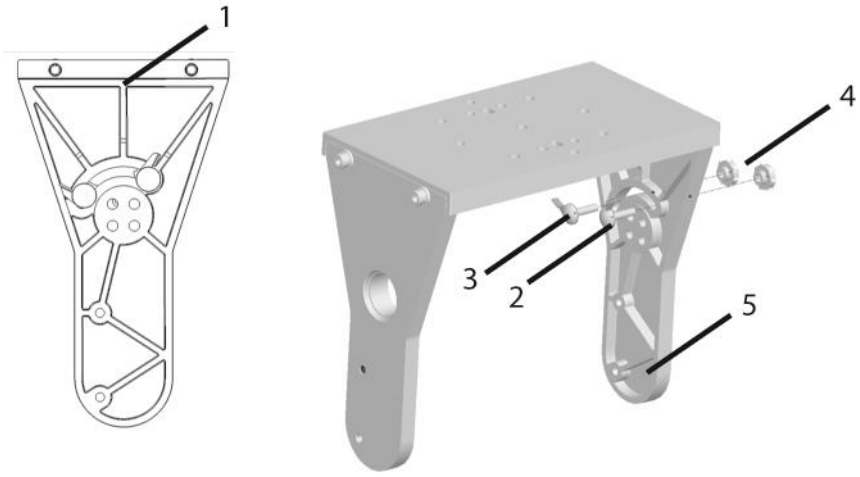

Fig. 8 Over the Top tilt limit adjustment

1	Detail showing approximate striker positions
2	Nylon coach bolts
3	Tilt limit strikers
4	Adjustable plastic screw locks
5	Tilt platform

13 Maintenance and service

The following maintenance guidelines should be observed.

6 monthly checks	**1.** All fastenings and cables should be checked for tightness and wear. **2.** Regular checks should be performed to ensure that the outer sheaths of the cables are not damaged and that the cables are not fouling on any obstruction.
5 yearly checks	If the unit is exposed to severe weather conditions or other harsh environments, the rubber weather seals should be replaced.

14 Troubleshooting

Fault	**Possible cause**	**Possible solution**
Unit will not drive, both functions	Faulty wiring from the control system to the Pan and Tilt unit.	Check the neutral connection between the supply and the Pan and Tilt unit. Check the connection of the telemetry receiver If a separate fuse is fitted for the Pan and Tilt, check it has not blown. 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 they are in the correct position (refer to receiver manual).
Pan will not drive	Electrical failure	Check the voltage from the control system is present on either the pan right or pan left input. A quick test to check if the fault lies with the Pan and Tilt unit or the supply is: 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. It is advisable to try both left and right to ensure that the unit is not at an end-position limit switch. For units with presets, check preset wiring as some preset receivers will not drive unless they receive feedback from preset pots. If the Pan and Tilt unit will not drive with direct voltage application, the unit should be returned for service.
Tilt will not drive	Electrical failure	Check the voltage from the control system is present on either the tilt up or tilt down input. A quick test to check if the fault lies with the Pan and Tilt unit or the supply is: 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. It is advisable to try both up and down to ensure that the unit is not at an end-position limit switch. For units with presets, check preset wiring as some preset receivers will not drive unless they receive feedback from preset pots. If the Pan and Tilt unit will not drive with direct voltage application, the unit should be returned for service.
DC Unit will not pan and tilt at full speed OR Preset positions, preset sequences or preset tour do not function correctly	If the head is being driven from a Molynx DC receiver, re-initialise the receiver.	Send a 'Camera Reset' command from the control keyboard to the receiver. Any preset positions previously stored in the receiver may need to be re-stored (dependant upon model of receiver).

15Disposal

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.

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.