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## CKAS V4 6DOF Motion System (400kg / 880lb Payload)



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### Introduction

The CKAS V4 6DOF Motion System is specifically directed at **light weight professional motion simulator applications**, such as commercial and industrial simulators, operator manned arcade entertainment simulators or custom built flight simulators which require the **highest level of fidelity** available.

### Target Applications

- **Medium Scale Light Weight Professional Fidelity Flight Training Simulators for up to 1 person**
- **Medium Scale Military Training Simulators for up to 1 person**
- **Medium Scale Professional Fidelity Commercial Vehicle and Truck Driver Training Simulators**
- **Medium Scale Mining Equipment Simulators and Heavy Earth Moving Equipment Simulators**
- **Medium Scale Professional Fidelity Train Driver Simulators for up to 1 person**
- **Medium Scale Professional Fidelity Research Platforms**

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## General Description and Capabilities

The CKAS V4 6DOF Motion System is Ideal for OEM manufacturers of existing simulator products or home builders who are looking for a cost effective method to add professional motion to an existing or new design. This unit is built to CKAS standards, and is USB plug and play straight out of the box. The only assembly required is to bolt on whatever goes on top of the motion system.

The CKAS V4 6DOF Motion System is the lightest duty full motion 6DOF unit, and features a lightweight RHS frame structure, can carry 380kg, can swing a massive 24° in any axis, make an excursion of 150mm in any direction, and a high enough architecture to take a 2.5m size payload. The technology used on this professional 6DOF system is “best in class”, incorporating industry leading electronics, encoders and actuators.

The expected life of the V4 is extremely high, and the maintenance requirements are minimal, especially important in commercial or military based applications.

As an indicator of the fidelity, reliability and quality of these units, CKAS V Series 6DOF Motion Systems are used by military contractors such as NASA USA to train Astronauts and Cosmonauts.

Also, CKAS V Series 6DOF Motion Systems are the only motion systems worldwide which carry prestigious full flight simulator credits with the aviation authorities, when couple to a synthetic trainer. This is a true testament to the accuracy and fidelity of our Washout System and onset cueing algorithms.

The CKAS V4 6DOF motion system comes with the following key features:

- Fully Electric Actuation
- USB 2.0 plug and play
- Washout filters and acceleration onset cueing algorithms for:
  - Microsoft Flight Simulator FSX / 2004
  - Microsoft ESP
  - Lockheed Martin Prepar3D
  - X-Plane
  - rFactor (v1.255 or higher) and rFactor2
  - iRacing
  - Generic UDP interface for custom user program or other systems
- Very high speed update 100Hz motion controller for extremely smooth high fidelity response

## General Specifications

(Subject to change without notification)

Product Name	CKAS V4 6DOF Motion System
Product Code	V4MP
Product Number	01.0001.11
Product Description	Medium Scale 6 degree of freedom electric motion system
Harmonization Code (HS)	854370 or 854380 or 8543.70.96.50 (depending on Harmonisation system)

## Mechanical Specifications

Architecture	6 Degree of Freedom Modified Stewart Hybrid
Actuation	Fully Electric
Nominal Width (Parked)	2275 mm (89.6")
Nominal Length (Parked)	2020 mm (79.5")
Nominal Height (Parked)	770 mm (30.3")
Approx unit weight	300 kg (660 lb)
Anchoring Specification	6 places 13mm holes distributed to be anchored with 10-13mm fasteners

## Performance Specifications

Payload Mass Limit	400 kg (880lb)
Payload Moment of Inertia	130 kg.m <sup>2</sup> (3,100 lb.ft <sup>2</sup> )
Payload CG horizontal offset	Less than 100mm from Centroid of Flying Platform
Payload CG Vertical offset	Less than 600mm high from top of Flying Platform
Payload Max Floor Size	Diameter 2500mm (98")
Indep. Surge (disp. / vel. / accel.)	±150mm , ±300mm/s , 0.5G
Indep. Sway (disp. / vel. / accel.)	±150mm , ±300mm/s , 0.5G
Indep. Heave (disp. / vel. / accel.)	±150mm , ±300mm/s , 0.5G
Indep. Yaw (disp. / vel. / accel.)	±24° , ±40°/s , ±500°/s <sup>2</sup>
Indep. Pitch (disp. / vel. / accel.)	±24° , ±40°/s , ±500°/s <sup>2</sup>
Indep. Roll (disp. / vel. / accel.)	±24° , ±40°/s , ±500°/s <sup>2</sup>
Max Motion Excitation Frequency	50 Hz

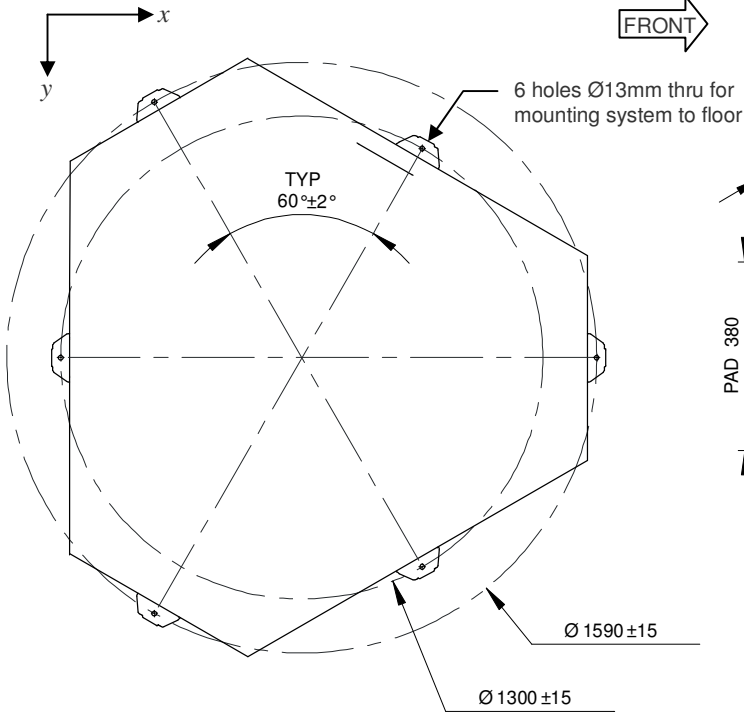
## Electrical Specifications

Power Supply Requirements	200 – 250V AC Single Phase @ 12 Amps <b>hard wired (no RCD)</b>
Safety Interlocks	External User Park and Current Position Freeze on Power Fail
PC Connectivity	USB 2.0
Controller Update Frequency	100 Hz

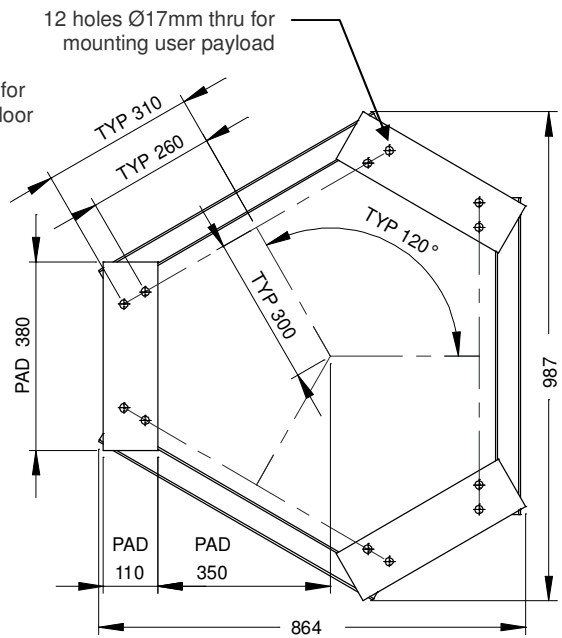
## Software Specifications

PC Interface Protocol	Serial over USB
Washout Algorithm Drive	Modified Classical Washout System with 2DOF optimisations for: <ul style="list-style-type: none"><li>• Microsoft FSX / FS2004 / ESP</li><li>• Lockheed Martin Prepar3D</li><li>• X-Plane</li><li>• rFactor (v1.255 or higher) and rFactor2</li><li>• iRacing</li><li>• Generic UDP interface for custom user program</li></ul>
Direct Drive	Serial Direct Motor Position Commands

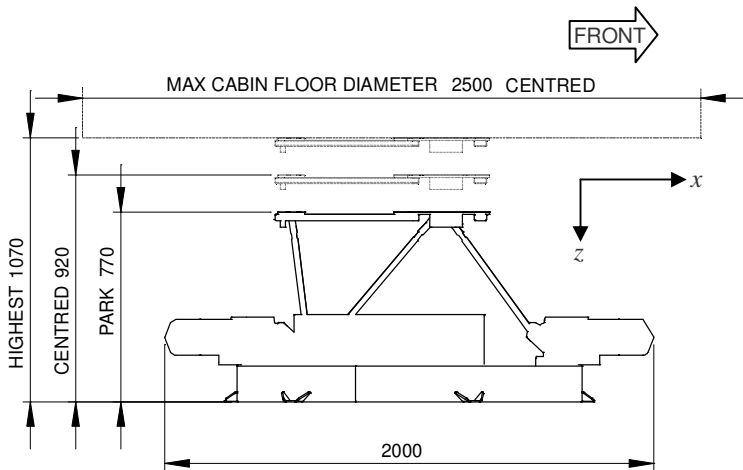
View of Base Mounting Holes from TOP



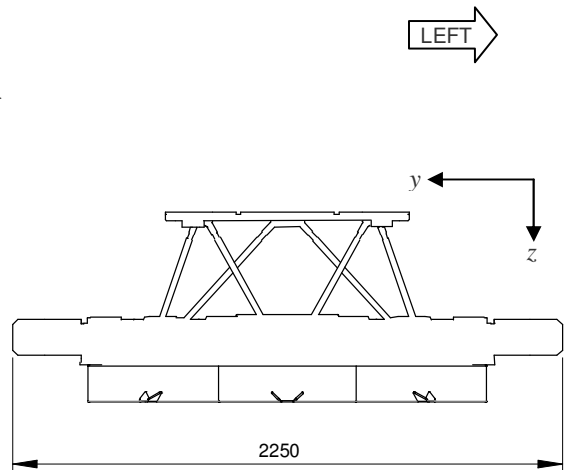
View of Flying Platform from TOP



View of Motion System from RIGHT



View of Motion System from FRONT



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## CKAS V7 6DOF Motion System (650kg / 1430lb Payload)



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### Introduction

The CKAS V7 6DOF Motion System is specifically directed at **mid weight professional motion simulator applications**, such as commercial and industrial simulators, operator manned arcade entertainment simulators or custom built flight simulators which require the **highest level of fidelity** available.

### Target Applications

- **Medium Scale Professional Fidelity Flight Training Simulators for up to 2 people**
- **Medium Scale Military Training Simulators for up to 2 people**
- **Medium Scale Professional Fidelity Commercial Vehicle and Truck Driver Training Simulators**
- **Medium Scale Mining Equipment Simulators and Heavy Earth Moving Equipment Simulators**
- **Medium Scale Professional Fidelity Train Driver Simulators for up to 2 people**
- **Medium Scale Professional Fidelity Research Platforms**

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## General Description and Capabilities

The CKAS V7 6DOF Motion System is Ideal for OEM manufacturers of existing simulator products or home builders who are looking for a cost effective method to add professional motion to an existing or new design. This unit is built to CKAS standards, and is USB plug and play straight out of the box. The only assembly required is to bolt on whatever goes on top of the motion system.

The CKAS V7 6DOF Motion System is full motion unit, and features a lightweight RHS frame structure, can carry 650kg, can swing a massive 24° in any axis, make an excursion of 150mm in any direction, and a high enough architecture to take a 2.5m size payload. The technology used on this professional 6DOF system is “best in class”, incorporating industry leading electronics, encoders and actuators.

The expected life of the V7 is extremely high, and the maintenance requirements are minimal, especially important in commercial or military based applications.

As an indicator of the fidelity, reliability and quality of these units, CKAS V Series 6DOF Motion Systems are used by military contractors such as NASA USA to train Astronauts and Cosmonauts.

Also, CKAS V Series 6DOF Motion Systems are the only motion systems worldwide which carry prestigious full flight simulator credits with the aviation authorities, when couple to a synthetic trainer. This is a true testament to the accuracy and fidelity of our Washout System and onset cueing algorithms.

The CKAS V7 6DOF motion system comes with the following key features:

- Fully Electric Actuation
- USB 2.0 plug and play
- Washout filters and acceleration onset cueing algorithms for:
  - Microsoft Flight Simulator FSX / 2004
  - Microsoft ESP
  - Lockheed Martin Prepar3D
  - X-Plane
  - rFactor (v1.255 or higher) and rFactor2
  - iRacing
  - Generic UDP interface for custom user program or other systems
- Very high speed update 100Hz motion controller for extremely smooth high fidelity response

## General Specifications

(Subject to change without notification)

Product Name	CKAS V7 6DOF Motion System
Product Code	V7MP
Product Number	02.0001.11
Product Description	Medium Scale 6 degree of freedom electric motion system
Harmonization Code (HS)	854370 or 854380 or 8543.70.96.50 (depending on Harmonisation system)

## Mechanical Specifications

Architecture	6 Degree of Freedom Modified Stewart Hybrid
Actuation	Fully Electric
Nominal Width (Parked)	2370 mm (93.3")
Nominal Length (Parked)	2120 mm (83.5")
Nominal Height (Parked)	770 mm (30.3")
Approx unit weight	380 kg (840 lb)
Anchoring Specification	6 places 13mm holes distributed to be anchored with 10-13mm fasteners

## Performance Specifications

Payload Mass Limit	650 kg (1430lb)
Payload Moment of Inertia	270 kg.m <sup>2</sup> (6,400 lb.ft <sup>2</sup> )
Payload CG horizontal offset	Less than 100mm from Centroid of Flying Platform
Payload CG Vertical offset	Less than 600mm high from top of Flying Platform
Payload Max Floor Size	Diameter 2500mm (98")
Indep. Surge (disp. / vel. / accel.)	±150mm , ±300mm/s , 0.5G
Indep. Sway (disp. / vel. / accel.)	±150mm , ±300mm/s , 0.5G
Indep. Heave (disp. / vel. / accel.)	±150mm , ±300mm/s , 0.5G
Indep. Yaw (disp. / vel. / accel.)	±24° , ±40°/s , ±500°/s <sup>2</sup>
Indep. Pitch (disp. / vel. / accel.)	±24° , ±40°/s , ±500°/s <sup>2</sup>
Indep. Roll (disp. / vel. / accel.)	±24° , ±40°/s , ±500°/s <sup>2</sup>
Max Motion Excitation Frequency	50 Hz

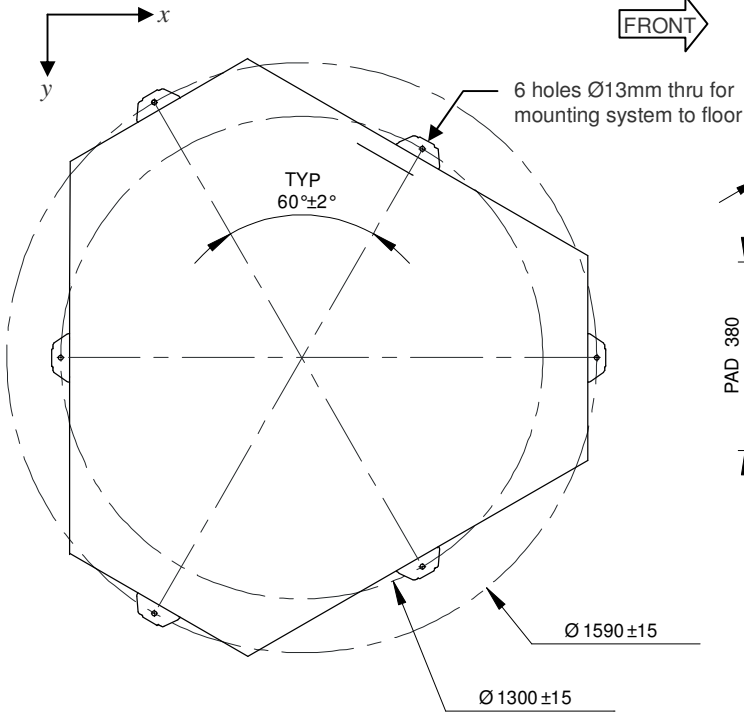
## Electrical Specifications

Power Supply Requirements	200 – 250V AC Single Phase @ 18 Amps <b>hard wired (no RCD)</b>
Safety Interlocks	External User Park and Current Position Freeze on Power Fail
PC Connectivity	USB 2.0
Controller Update Frequency	100 Hz

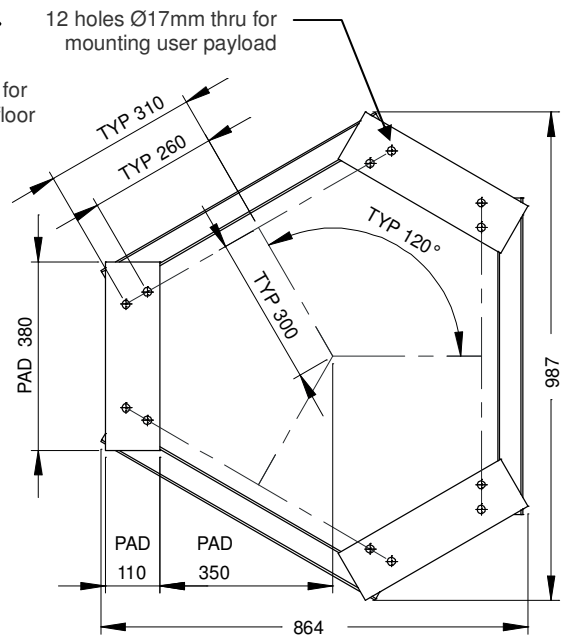
## Software Specifications

PC Interface Protocol	Serial over USB
Washout Algorithm Drive	Modified Classical Washout System with 2DOF optimisations for: <ul style="list-style-type: none"><li>• Microsoft FSX / FS2004 / ESP</li><li>• Lockheed Martin Prepar3D</li><li>• X-Plane</li><li>• rFactor (v1.255 or higher) and rFactor2</li><li>• iRacing</li><li>• Generic UDP interface for custom user program</li></ul>
Direct Drive	Serial Direct Motor Position Commands

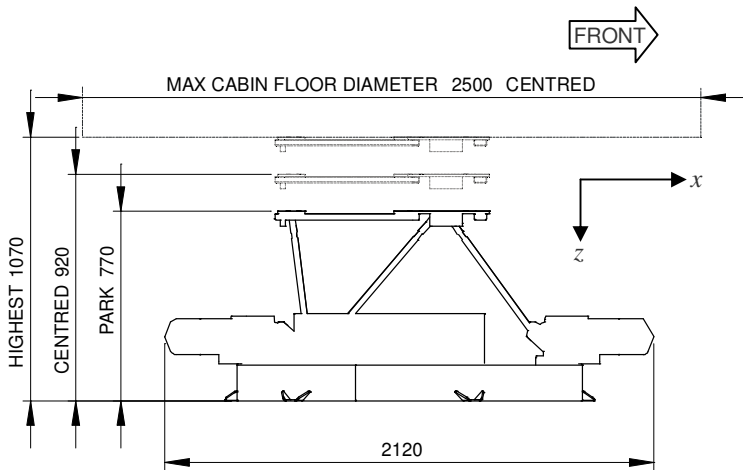
View of Base Mounting Holes from TOP



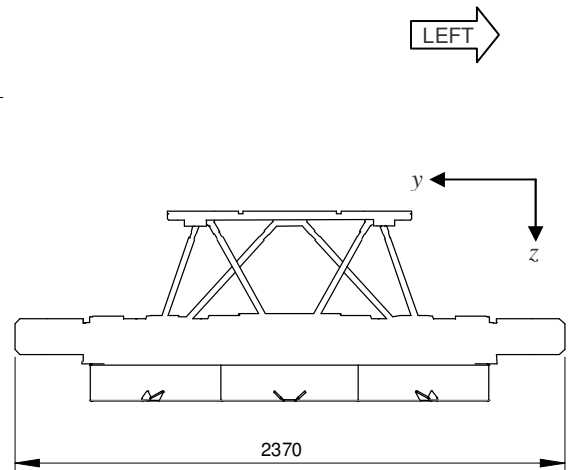
View of Flying Platform from TOP



View of Motion System from RIGHT



View of Motion System from FRONT





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## CKAS V10 6DOF Motion System (1000kg / 2200lb Payload)



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### Introduction

The CKAS V10 6DOF Motion System is specifically directed at **mid weight professional motion simulator applications**, such as commercial and industrial simulators, operator manned arcade entertainment simulators or custom built flight simulators which require the **highest level of fidelity** available.

### Target Applications

- **Medium Scale Professional Fidelity Flight Training Simulators for up to 3 people**
- **Medium Scale Military Training Simulators for up to 3 people**
- **Medium Scale Professional Fidelity Commercial Vehicle and Truck Driver Training Simulators**
- **Medium Scale Mining Equipment Simulators and Heavy Earth Moving Equipment Simulators**
- **Medium Scale Professional Fidelity Train Driver Simulators for up to 3 people**
- **Medium Scale Professional Fidelity Research Platforms**

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## General Description and Capabilities

The CKAS V10 6DOF Motion System is Ideal for OEM manufacturers of existing simulator products or home builders who are looking for a cost effective method to add professional motion to an existing or new design. This unit is built to CKAS standards, and is USB plug and play straight out of the box. The only assembly required is to bolt on whatever goes on top of the motion system.

The CKAS V10 6DOF Motion System is full motion unit, and features a lightweight RHS frame structure, can carry 1000kg, can swing a massive 24° in any axis, make an excursion of 150mm in any direction, and a high enough architecture to take a 2.5m size payload. The technology used on this professional 6DOF system is “best in class”, incorporating industry leading electronics, encoders and actuators.

The expected life of the V10 is extremely high, and the maintenance requirements are minimal, especially important in commercial or military based applications.

As an indicator of the fidelity, reliability and quality of these units, CKAS V Series 6DOF Motion Systems are used by military contractors such as NASA USA to train Astronauts and Cosmonauts.

Also, CKAS V Series 6DOF Motion Systems are the only motion systems worldwide which carry prestigious full flight simulator credits with the aviation authorities, when couple to a synthetic trainer. This is a true testament to the accuracy and fidelity of our Washout System and onset cueing algorithms.

The CKAS V10 6DOF motion system comes with the following key features:

- Fully Electric Actuation
- USB 2.0 plug and play
- Washout filters and acceleration onset cueing algorithms for:
  - Microsoft Flight Simulator FSX / 2004
  - Microsoft ESP
  - Lockheed Martin Prepar3D
  - X-Plane
  - rFactor (v1.255 or higher) and rFactor2
  - iRacing
  - Generic UDP interface for custom user program or other systems
- Very high speed update 100Hz motion controller for extremely smooth high fidelity response

## General Specifications

(Subject to change without notification)

Product Name	CKAS V10 6DOF Motion System
Product Code	V10MP
Product Number	03.0001.11
Product Description	Medium Scale 6 degree of freedom electric motion system
Harmonization Code (HS)	854370 or 854380 or 8543.70.96.50 (depending on Harmonisation system)

## Mechanical Specifications

Architecture	6 Degree of Freedom Modified Stewart Hybrid
Actuation	Fully Electric
Nominal Width (Parked)	2500 mm (98.4")
Nominal Length (Parked)	2230 mm (87.8")
Nominal Height (Parked)	790 mm (31.1")
Approx unit weight	550 kg (1210 lb)
Anchoring Specification	6 places 13mm holes distributed to be anchored with 10-13mm fasteners

## Performance Specifications

Payload Mass Limit	1000 kg (2200lb)
Payload Moment of Inertia	450 kg.m <sup>2</sup> (10,700 lb.ft <sup>2</sup> )
Payload CG horizontal offset	Less than 100mm from Centroid of Flying Platform
Payload CG Vertical offset	Less than 600mm high from top of Flying Platform
Payload Max Floor Size	Diameter 2500mm (98")
Indep. Surge (disp. / vel. / accel.)	±150mm , ±300mm/s , 0.5G
Indep. Sway (disp. / vel. / accel.)	±150mm , ±300mm/s , 0.5G
Indep. Heave (disp. / vel. / accel.)	±150mm , ±300mm/s , 0.5G
Indep. Yaw (disp. / vel. / accel.)	±24° , ±40°/s , ±500°/s <sup>2</sup>
Indep. Pitch (disp. / vel. / accel.)	±24° , ±40°/s , ±500°/s <sup>2</sup>
Indep. Roll (disp. / vel. / accel.)	±24° , ±40°/s , ±500°/s <sup>2</sup>
Max Motion Excitation Frequency	50 Hz

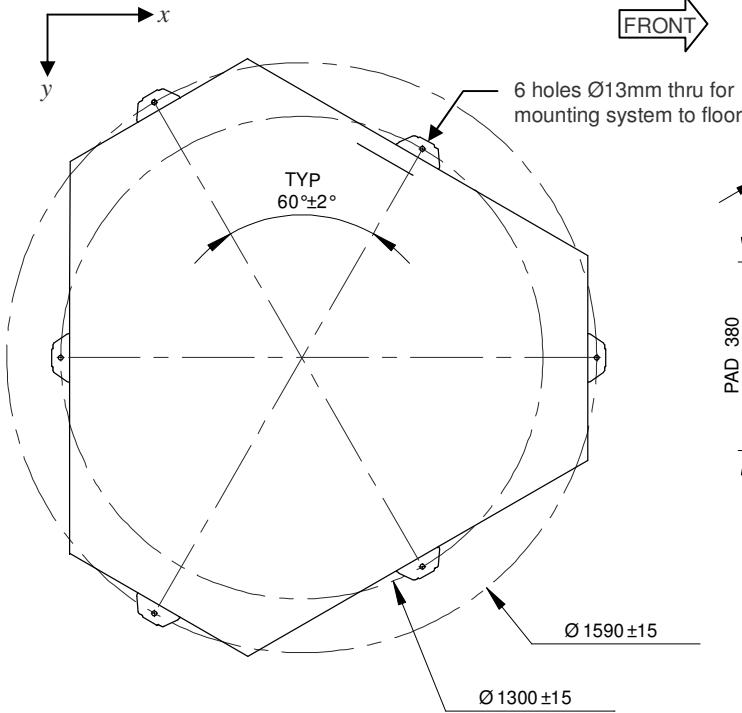
## Electrical Specifications

Power Supply Requirements	200 – 250V AC Single Phase @ 25 Amps <b>hard wired (no RCD)</b>
Safety Interlocks	External User Park and Current Position Freeze on Power Fail
PC Connectivity	USB 2.0
Controller Update Frequency	100 Hz

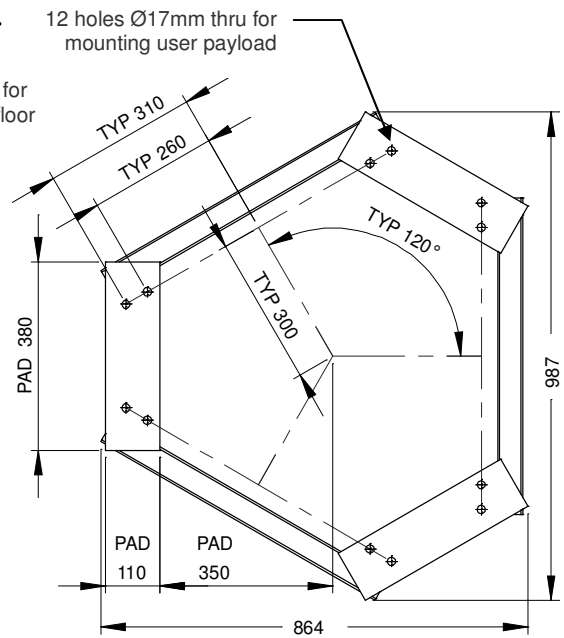
## Software Specifications

PC Interface Protocol	Serial over USB
Washout Algorithm Drive	Modified Classical Washout System with 2DOF optimisations for: <ul style="list-style-type: none"><li>• Microsoft FSX / FS2004 / ESP</li><li>• Lockheed Martin Prepar3D</li><li>• X-Plane</li><li>• rFactor (v1.255 or higher) and rFactor2</li><li>• iRacing</li><li>• Generic UDP interface for custom user program</li></ul>
Direct Drive	Serial Direct Motor Position Commands

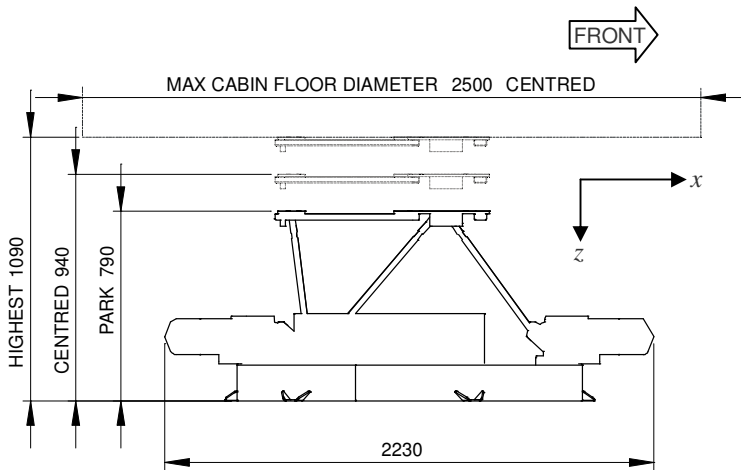
**View of Base Mounting Holes from TOP**



**View of Flying Platform from TOP**



**View of Motion System from RIGHT**



**View of Motion System from FRONT**

