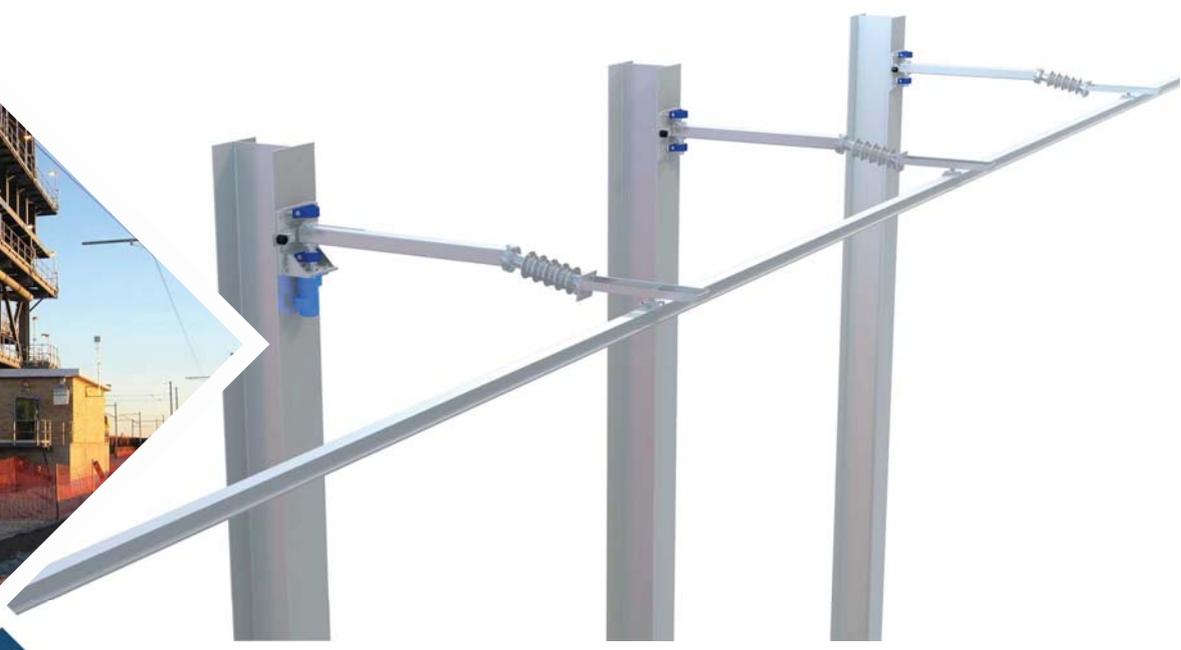




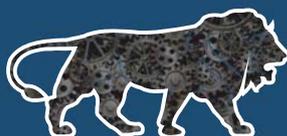
# Rigid Overhead Catenary System (ROCS)



# Retractable Rigid Catenary System (RRCS)



We Support



“Make In India”



**PPS International**

([www.ppsinternational.in](http://www.ppsinternational.in))

**IRIS**<sup>TM</sup>  
Certified



# Rigid Overhead Catenary System (ROCS)



PPS International has successfully developed with 100% home grown technology under “Make In India”, Rigid Overhead Catenary System (ROCS) and Rigid Retractable Catenary system (RRCS) with the highest quality standards complying all the latest International standards.

Several metros like DMRC, LMRC, CMRL and RRTS in India are operating on 25KV AC traction system on both viaduct as well as in the underground tunnels.

To avoid making large tunnels to accommodate the conventional flexible OHE (FOCS), now a days ROCS is being used, which reduces the size of the tunnel.

## Sailent Feature

- High current carrying capacity.
- Maintenance free and long life.
- High short-circuit withstand capability due to large cross section.
- Suitable upto the speed of 250 KMPH

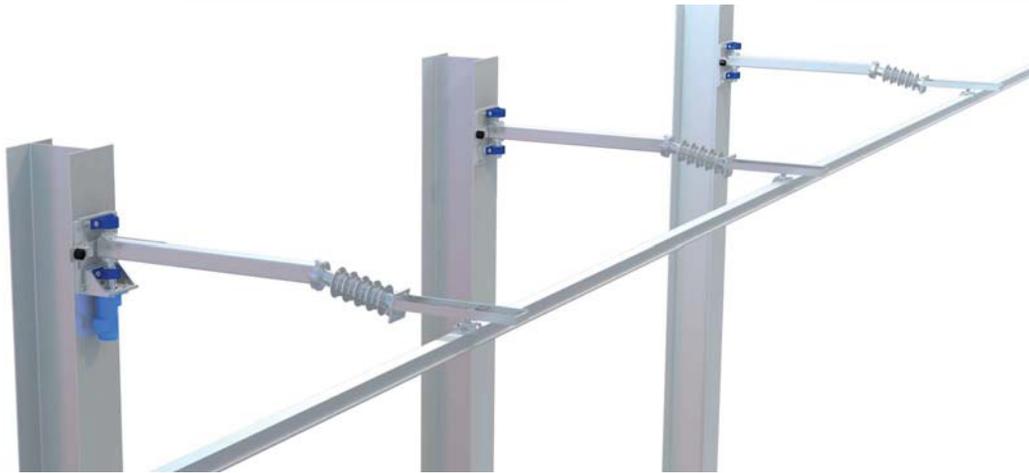
## Advantages of ROCS over FOCS

- No catenary wire is needed.
- No dropper are needed.
- No tensioning device is needed.
- No separate Neutral section is needed.
- No separate Light weight section insulator is needed.
- No steady arm is needed to hold the contact wire.
- No Moduler cantilever is needed.
- No Guy rod is needed.

### Regular values

Nominal voltage	[V DC] [kV AC]	Upto 3000 Upto 25Kv
Permanent current	[A]	2,900
Short-circuit current	[kA]	45
Max. temperature of conductor	[°C]	90
Length of conductor rails	[m]	up to 12
Max. running speed	[km/h]	Suitable Upto 250
Conductor rail cross section without contact wire	[mm <sup>2</sup> ]	2,300
Conductor rail material		Aluminium Alloy
Clampable contact wire	[Sq.mm]	107/150
Max. permissible half section length	[m]	up to 400
Specific mass of conductor rail without contact wire	[kg/m]	6.2

# Rigid Retractable Catenary System (RRCS)



## Introduction

By using the conductor rails of ROCS, PPS International has developed the Retractable Rigid catenary system (also known as RRCS) for the use in metro car sheds, Railway Workshops and loco sheds for obstruction free inspection & maintenance work on the roof of the Rolling stocks.

It is sometimes necessary to have some area without any OHE line above the train for the movement of people over the train for the use of crane for heavy lifting, or to fill the empty wagons from the top like coal, iron, ore loading over SILO or container loading on ports.

The Retractable rigid catenary system is designed to have a reliable power supply by an overhead contact line and once it move aside, train roof gets free for inspection & maintenance work and heavy lifting loading / unloading.

The retractable nature of the catenary reduces the risk of accident as there is no need for trains to travel under live wires while maintenance or loading / unloading work is being carried out.

The RRCS can save time and money, as it eliminates the need for additional hauling systems to move trains in and out of the depot/shed.

The RRCS can be adapted to meet the specific needs of each depot/shed and can be customized with trains of different lengths.

## Description

The conductor rail is suspended in approx. every 8 to 10mtr. at support provided with insulators. The supports have been clamped directly to the mast or columns of shed / workshops.

The retractable conductor rail is equipped with motorized and non-motorized moving arms.

The system allows a horizontal rotation of the conductor Rail upto approx 85°. The maximum length from the centerline of track to the supporting column is limited to about 4 meters and can be customised as per the site requirements.

**In-Rail position** – the conductor rail position is above the centre of the track (in Pantograph Zone), the train can move with the help of electric power via overhead conductor rail and train Pantograph.

**Out-Rail position or Parking position** – the conductor rail position is outside of the track closed to the supporting poles so that the maintenance work can be done without hindrance by conductor rails. During parking position, OHE power is switched off and rails are earthed.

Interlocking is provided to keep all cranes etc in locked position when the OHE is charged. Similarly when RRCS is in parking position, then it is interlocked properly to ensure there it doesn't move accidentally

## Application Of RRCS



SILO



Ports



Loco Shed



Washing Line

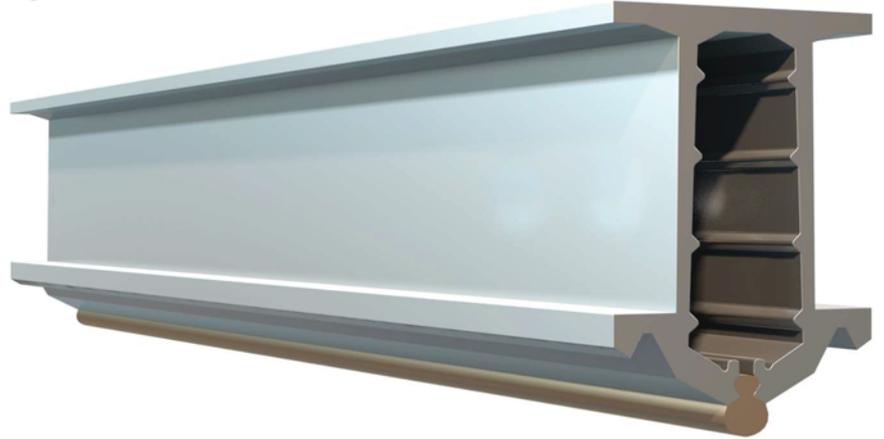


# Components

## Conductor Rail

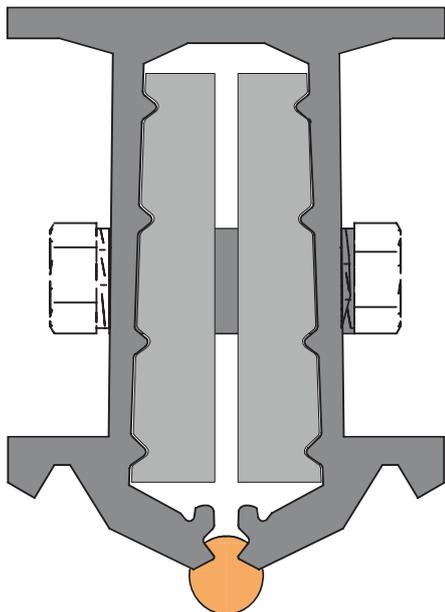
Conductor Rail is produced through extrusion processes and made out of special "Aluminum Alloy", having large conductivity and elasticity properties.

Each Conductor rail is produced up to 12 Meters of length for the ease of handling and transportation.



## Conductor Inter-Locking Joints

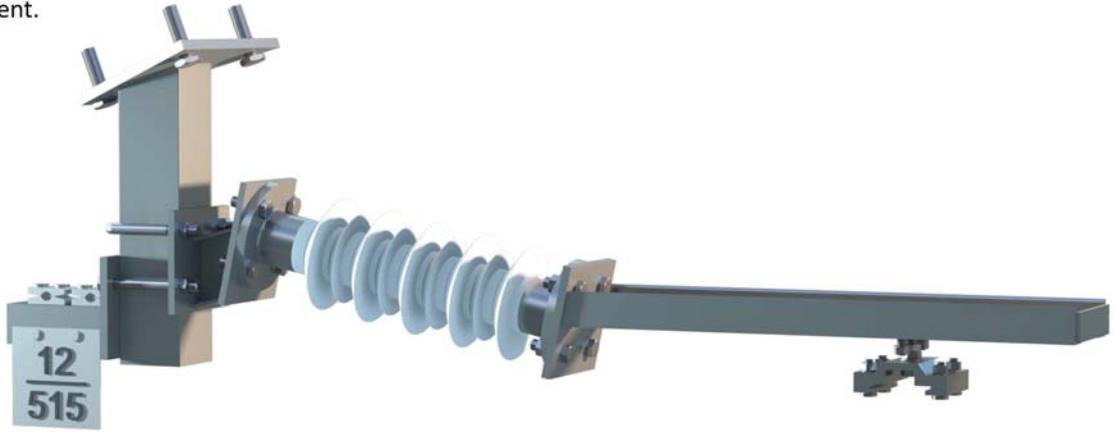
Interlocking joints are produced through extrusion process from the same aluminum alloy as for conductor rails and with inner matching profile of conductor rail to join the conductor rail together to make the longer length.



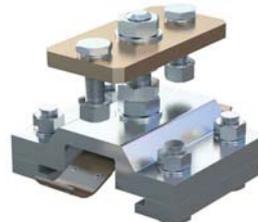
## Support & Clamps

Depending upon the location, different types of supports are made.

Silicon insulator with creepage distance from 1050-1600 mm is used as per customer requirement.



Swivel Head  
Option-1



Swivel Head  
Option-2

## Movable Arms



Motorised



Non-Motorised

## Transition Element

To integrate the Rigid Catenary System with the flexible OHE system, a transition element of 5-6 meter is used.

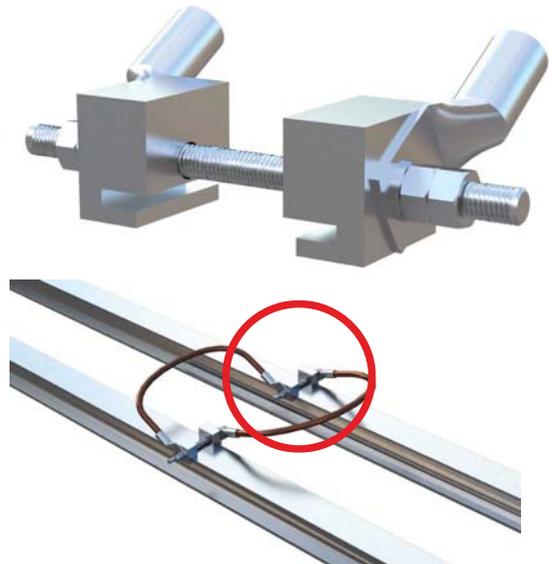
Conductor rail is cut progressively in the direction of flexible OHE to reduce movement of inertia and to match elasticity with flexible OHE.



## Electrical Connection Clamp

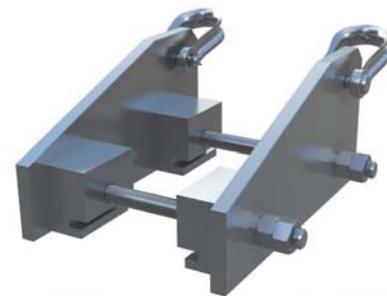
Electrical connection are provided to feed the power to the conductor rails, through flexible jumper wire.

Electrical connections are produced through the extrusion process from the same Aluminum Alloy as used in production ROCS to have better conductivity .



## Anti Creep Clamp

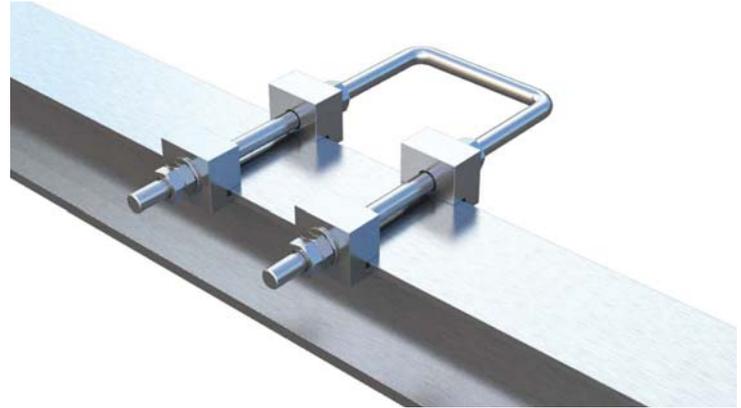
Anti creep clamps are provided to fix the movement of conductor rails at the centre.



## Earthing Clamp

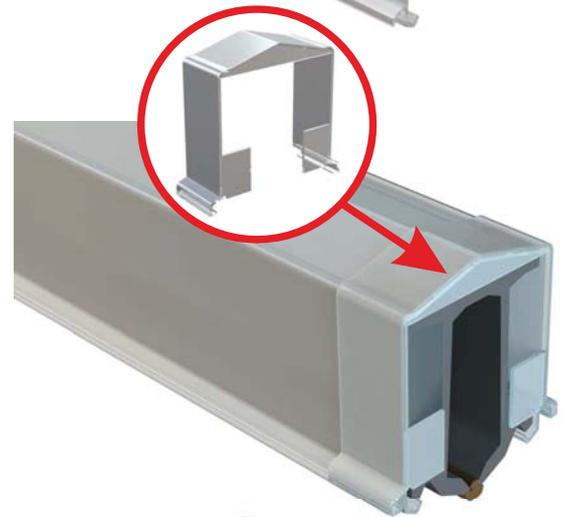
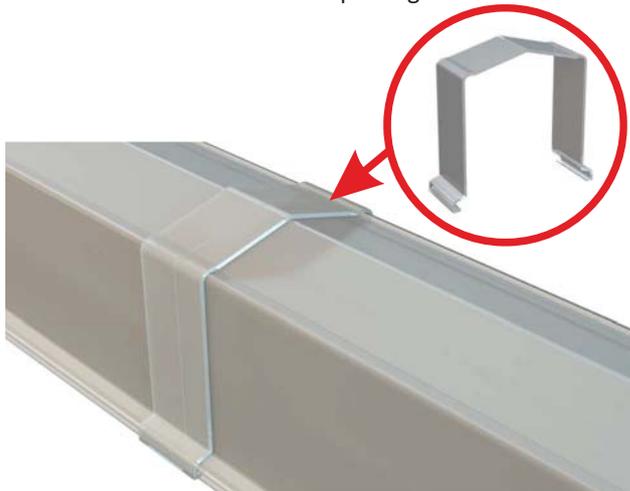
Earthing clamps are provided at different places throughout the ROCS enabling earthing equipment to be attached for maintenance purpose to discharge the current.

Electrical connections are produced through the extrusion process from the same Aluminum Alloy as used in production ROCS to have better conductivity.



## Protection Cover, Joint & End Cap

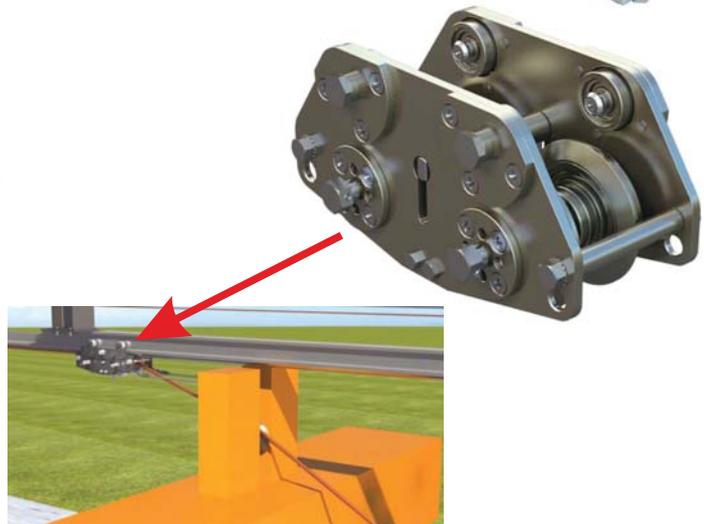
To protect the rigid rails from the contaminated / polluted water dropping on it through tunnel ceiling, a protection cover is used, which is made up from very high grade transparent, halogen free, fire retardant polycarbonate material. It is also sealed with special glue.



## Paying Machine/Wire Insertion tool

Paying machine / Wire insertion tool is a special tool used to insert contact wire into the conductor rail by placing paying machine at any position on rail.

It is pulled by a tower car to insert the contact wire into the profile.





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Revision:- 2  
09/2023