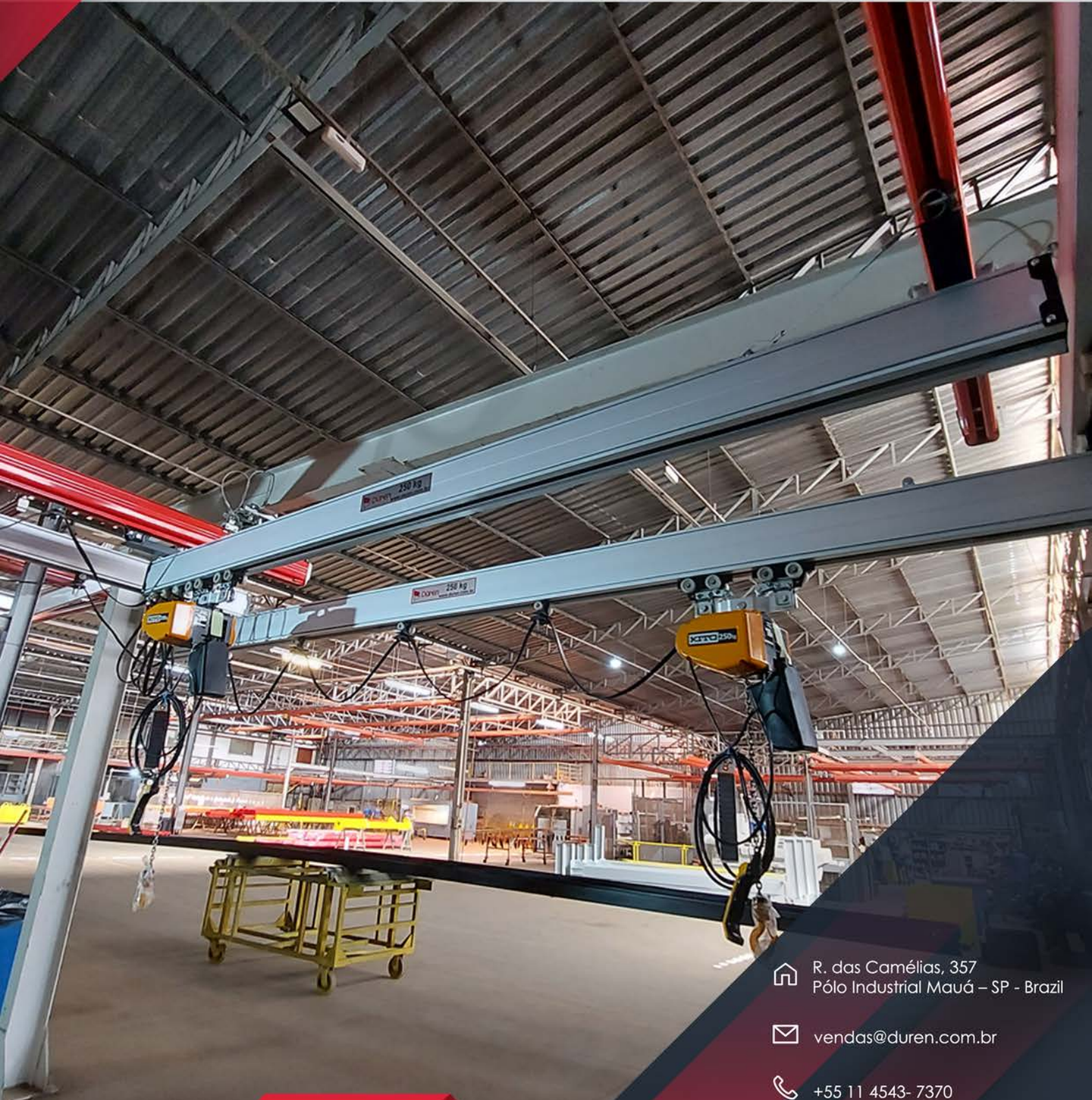




MATERIALS HANDLING SOLUTIONS

CATALOG


DR-AL MODULAR SYSTEM



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1 GENERAL PRESENTATION

DR-AL MODULAR SYSTEM: “A set of modular and standardized components developed for the overhead movement of light loads.”

Aiming to meet a current global market trend and need, seeking innovative solutions in ergonomics and productivity for material handling, Duren Industrial Equipment Ltda. complements its “core business” and ventures to be the first company in the segment to manufacture 100% Brazilian-made Modular Aluminum Systems, under real application conditions due to technical and economic feasibility, and immediate delivery availability.

The main elements of the DR-AL Modular Aluminum System are special extruded profiles, in two section sizes, designed to meet the vast majority of needs in overhead material handling, offering excellent characteristics of strength, rigidity, and reduced self-weight compared to other Aluminum Modular Systems. The other components, such as the suspension assembly, bridge suspension eyebolts, and trolleys, being forged and/or stamped, also possess high strength characteristics.

2 MAIN PRODUCT ADVANTAGES

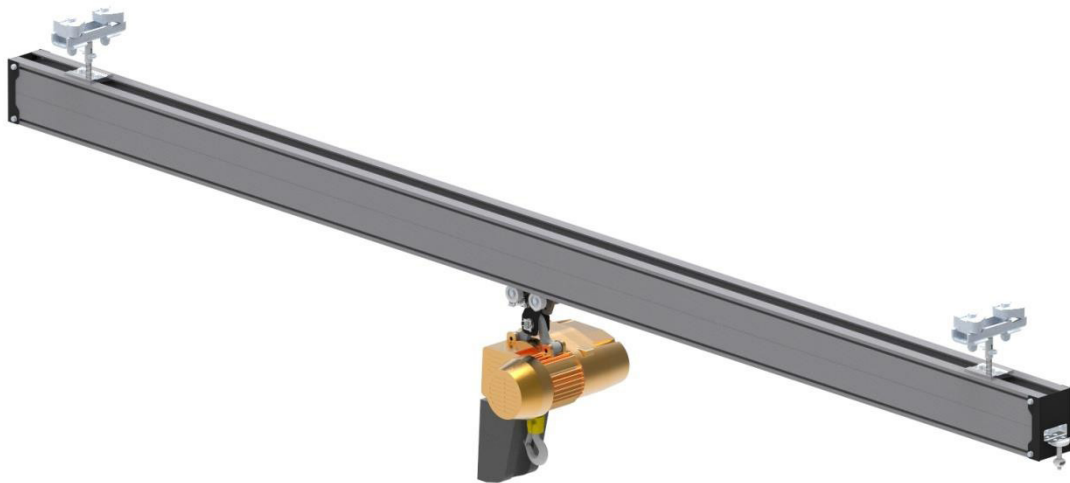
Below are the main advantages of the DR-AL Modular Aluminum System compared to similar products on the market:

- 100% Brazilian-made product;
- Structured and extruded aluminum profile, with differentiated mechanical properties for supporting loads up to 500 kg in the DR-AL120 model, featuring reduced self-weight and lightness in movements;
- Structured and extruded aluminum profile, with differentiated mechanical properties for supporting loads up to 1,000 kg in the DR-AL180 model, featuring reduced self-weight and lightness in movements;
- Compatibility with most components of the Steel Modular System, such as Hangers (suspension), Suspension Eyebolt, Trolley Connecting Crossbeam, Double Girder Bridge Trolley, thus optimizing parts to be allocated for replacement;
- Differentiated and accessible price compared to similar products on the market.

3 MAIN PRODUCT APPLICATIONS

DR – AL Monorail System

Applications in straight paths and/or with the use of curves, direction changes.

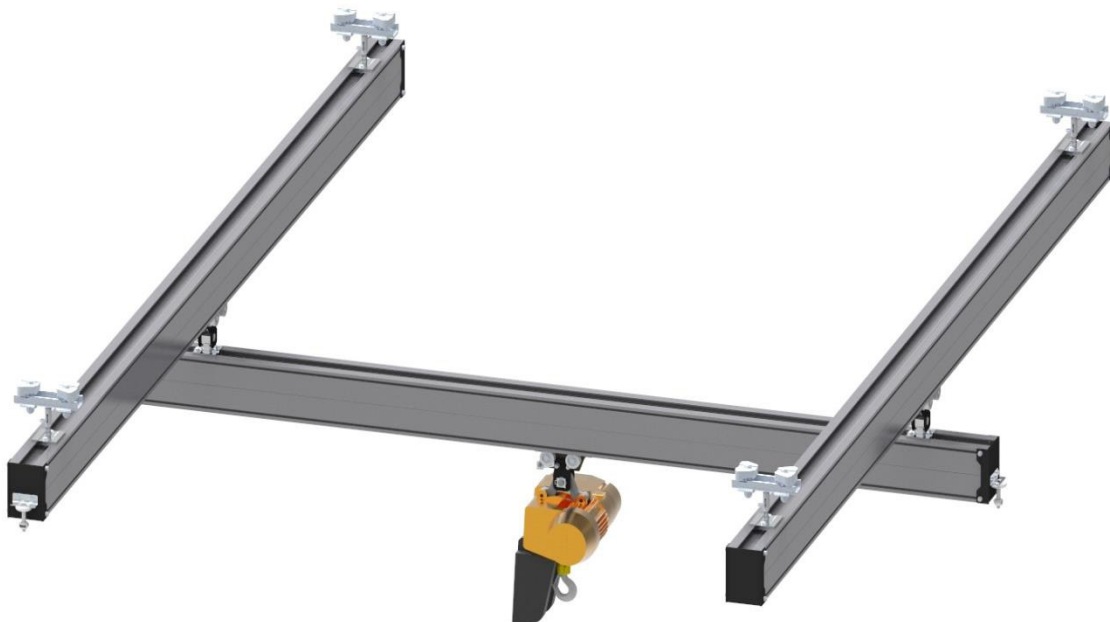


Crane bridge lengths up to 6,000mm with minimum load capacity.

3 MAIN PRODUCT APPLICATIONS

DR – AL Single Girder Overhead Crane System

Agile, light, and safe movement for material positioning, making it possible to cover specific areas. The crane runways (fixed by hangers) can be suspended directly from the building's roof structure, roof slab, or auxiliary metal structures.



Crane bridge lengths up to 6,000mm with minimum load capacity.

3 MAIN PRODUCT APPLICATIONS

DR - AL Double Girder Overhead Crane System



Overhead crane beam lengths up to 5,000mm for maximum load capacity.

3 MAIN PRODUCT APPLICATIONS

DR – AL Telescopic Overhead Crane System

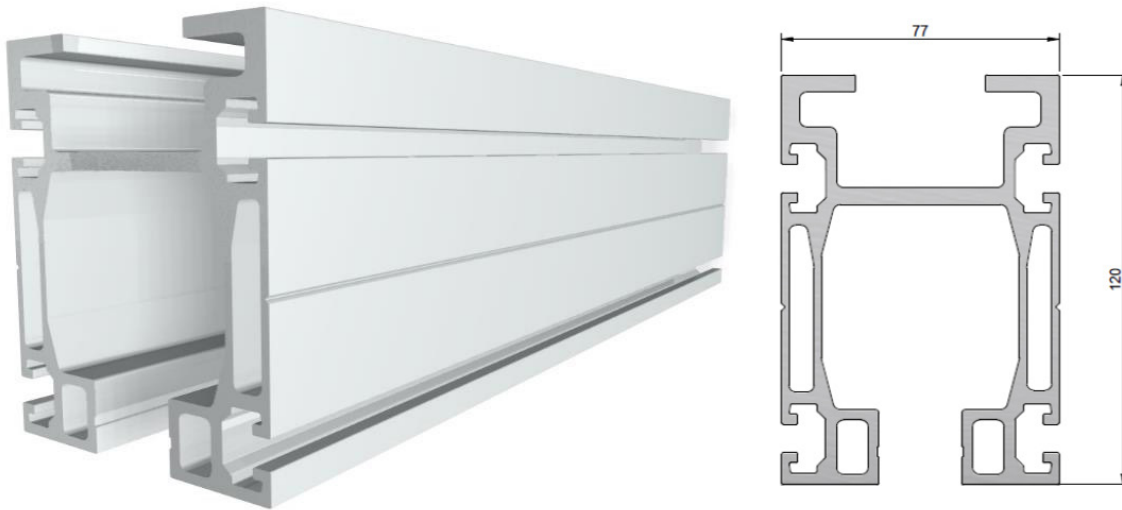


Telescopic extensions up to 2,000mm for minimum load capacity.

4 MAIN COMPONENTS

DR – AL120 Profile

Profile with Anodized finish.

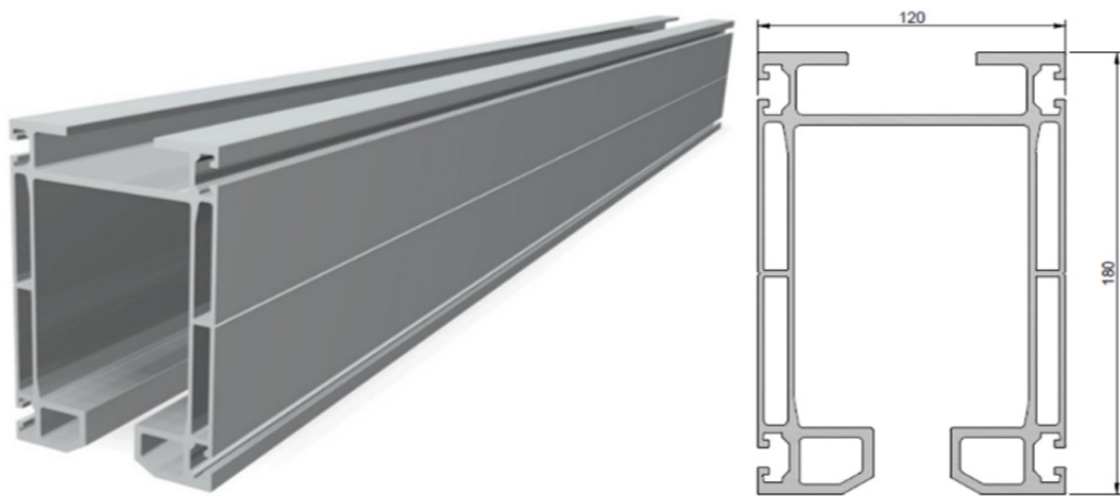


DR-AL120 Profile	L profile (mm)	Weight (kg)
05-120-01-01	1000	5,97
05-120-01-02	2000	11,94
05-120-01-03	3000	17,91
05-120-01-04	4000	23,88
05-120-01-05	5000	29,85
05-120-01-06	6000	35,82
05-120-01-07	7000	41,79
05-120-01-08	8000	47,76

4 MAIN COMPONENTS

DR – AL180 Profile

Profile with Anodized finish - DR-AL180.

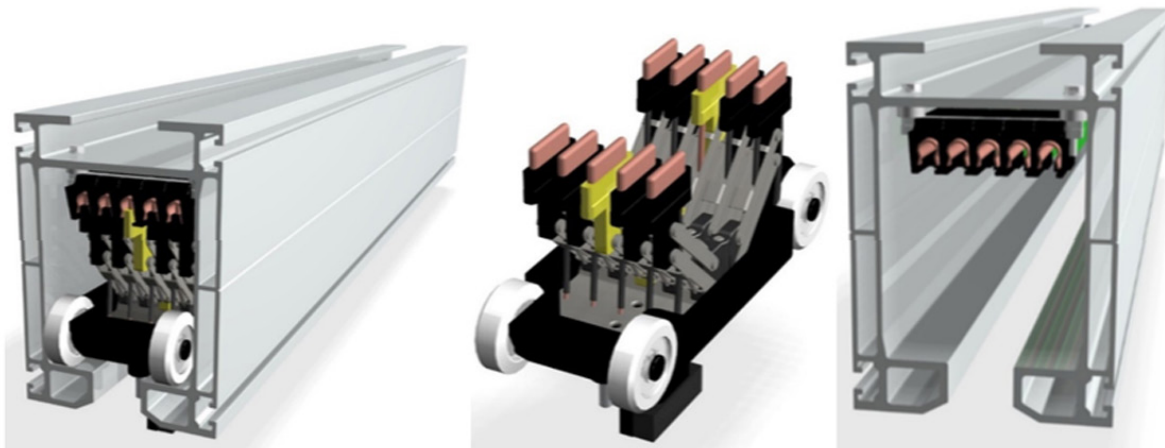


DR-AL180 Profile	L profile (mm)	Weight (kg)
05-180-01-01	1000	9,70
05-180-01-02	2000	19,40
05-180-01-03	3000	29,10
05-180-01-04	4000	38,80
05-180-01-05	5000	48,50
05-180-01-06	6000	58,20
05-180-01-07	7000	67,90
05-180-01-08	8000	77,60

4 MAIN COMPONENTS

DR – AL180 V Profile

Profile with Anodized finish with electrical busbar DR-AL180V.



DR-AL180V Profile	L profile (mm)	Weight (kg)
05-180-01-01V	1000	11,35
05-180-01-02V	2000	22,70
05-180-01-03V	3000	34,05
05-180-01-04V	4000	45,40
05-180-01-05V	5000	56,75
05-180-01-06V	6000	68,10
05-180-01-07V	7000	79,45
05-180-01-08V	8000	90,80

DR-AL180 Collector Trolley-	Weight (kg)
05-180-05V	0,98

4 MAIN COMPONENTS

DR – AL120 Curve



DR-AL120 Profile	Radius (mm)	Curve (°)	Weight (kg)
05-120-01-01C15	1750	15°	5,23
05-120-01-01C30	1750	30°	8,34
05-120-01-01C45	1750	45°	11,17
05-120-01-01C60	1750	60°	14,14
05-120-01-01C90	1750	90°	20,10

Other Radius upon request.

4 MAIN COMPONENTS

DR – AL180 Curve and DR – AL180 V Curve



DR-AL180 Profile	Radius (mm)	Curve (°)	Weight (kg)
05-180-01-01C15	1750	15°	8,95
05-180-01-01C30	1750	30°	14,02
05-180-01-01C45	1750	45°	19,10
05-180-01-01C60	1750	60°	24,18
05-180-01-01C90	1750	90°	34,34

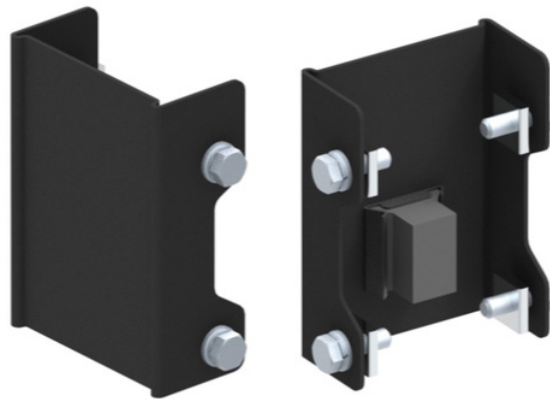
DR-AL180V Profile	Radius (mm)	Curve (°)	Weight (kg)
05-180-01-01C15V	1750	15°	10,43
05-180-01-01C30V	1750	30°	16,34
05-180-01-01C45V	1750	45°	22,26
05-180-01-01C60V	1750	60°	28,17
05-180-01-01C90V	2000	90°	40,00

Other radius upon request.

4 MAIN COMPONENTS

DR – AL120 End Cap

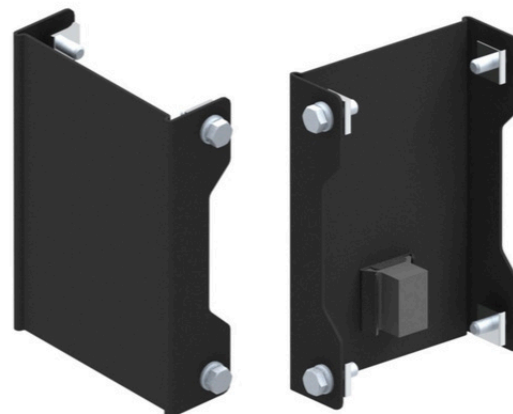
Component responsible for closing the DR AL120 structural profiles and providing a travel end stop with damping rubber.



DR – AL120 End Cap	Weight (kg)
05-120-02	0,44

DR – AL180 End Cap

Component responsible for closing the DR AL180 structural profiles and providing a travel end stop with damping rubber.

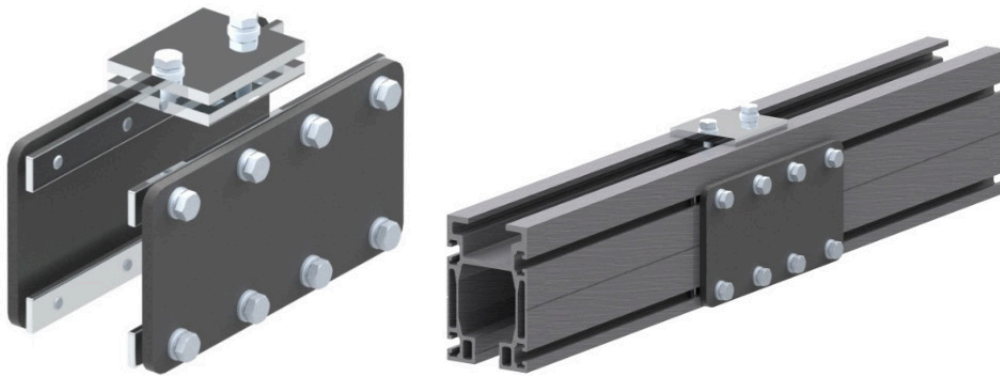


DR – AL180 End Cap	Weight (kg)
05-180-02	0,68

4 MAIN COMPONENTS

DR – AL120 Profile Joint

Used to connect two DR AL120 profiles.



DR – AL120 Profile Joint	Weight (kg)
05-120-03	3,25

DR – AL180 Profile Joint

Used to connect two DR AL180 profiles.

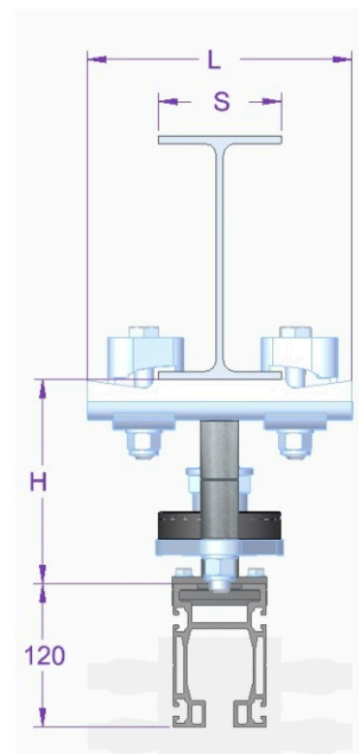
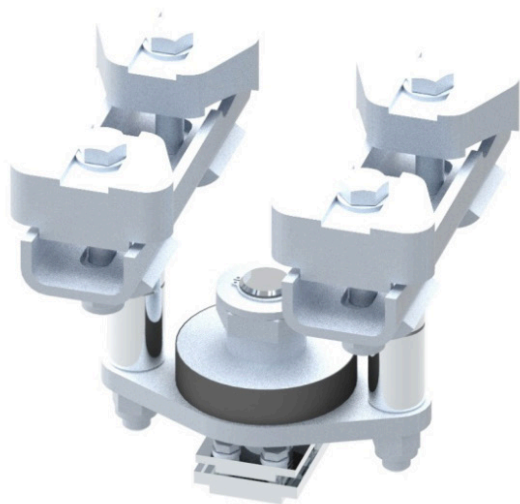


DR – AL180 Profile Joint	Weight (kg)
05-180-03	3,80

4 MAIN COMPONENTS

ERGO DR – AL120 Stabilizer Hanger

The hanger is the component responsible for suspending the DR AL120 structural profile, designed to ensure system stability and rigidity.

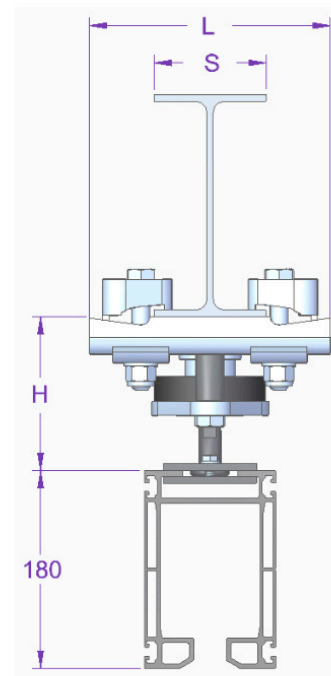
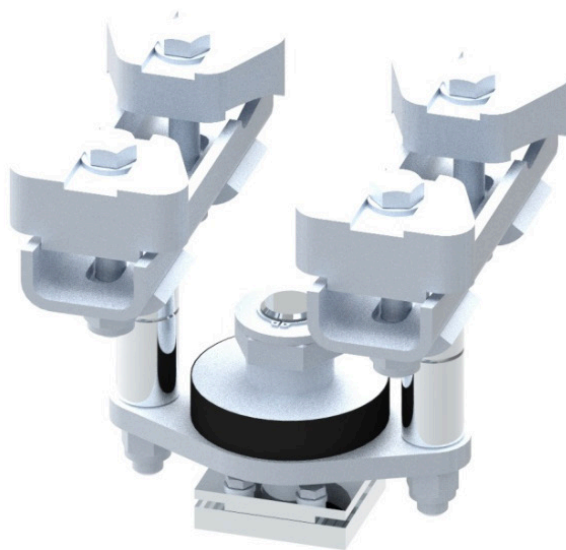


ERGO DR – AL 120 Hanger-	S (mm)	L (mm)	H (mm)	Rod adjustment (mm)	Weight (kg)
05-120-04-EH140A	62 ~ 138	220	140	10	10,42
05-120-04-EH140B	92 ~ 168	250	140	10	10,74
05-120-04-EH140C	142 ~ 218	300	140	10	11,26

4 MAIN COMPONENTS

ERGO DR – AL180 Stabilizer Hanger

The hanger is the component responsible for suspending the DR AL180 structural profile, designed to ensure system stability and rigidity.



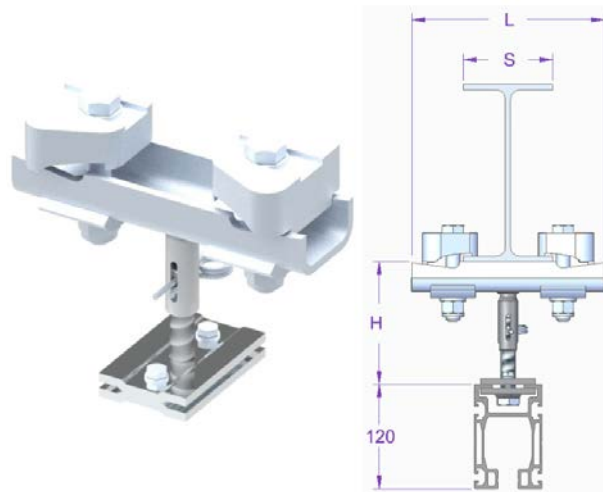
ERGO DR – AL 180 Hanger	S (mm)	L (mm)	H (mm)	Rod adjustment (mm)	Weight (kg)
05-180-04-EH140A	62 ~ 138	220	140	10	7,63
05-180-04-EH140B	92 ~ 168	250	140	10	7,96
05-180-04-EH140C	142 ~ 218	300	140	10	8,76

4 MAIN COMPONENTS

DR – AL120 Hanger

The hanger is the component responsible for suspending the DR AL120 structural profile, using the support structure as an anchorage.

It features a height adjustment mechanism between the base structure and the structural profile, via a threaded rod with semi-spherical nuts and locking by a steel clip.



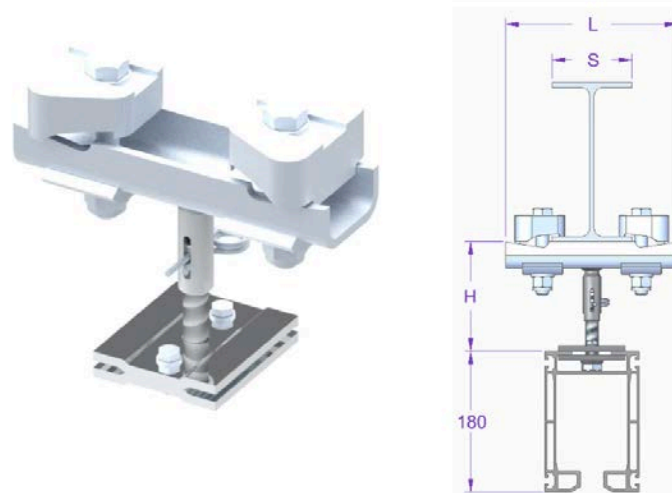
DR – AL 120 Hanger	S (mm)	L (mm)	H (mm)	Rod adjustment (mm)	Weight (kg)
05-120-04-H140A	62 ~ 138	220	140	10	3,70
05-120-04-H140B	92 ~ 168	250	140	10	3,87
05-120-04-H140C	142 ~ 218	300	140	10	4,15
05-120-04-H170A	62 ~ 138	220	170	10	3,76
05-120-04-H170B	92 ~ 168	250	170	10	3,92
05-120-04-H170C	142 ~ 218	300	170	10	4,20
05-120-04-H250A	62 ~ 138	220	250	10	3,88
05-120-04-H250B	92 ~ 168	250	250	10	4,05
05-120-04-H250C	142 ~ 218	300	250	10	4,32
05-120-04-H450A	62 ~ 138	220	450	10	4,20
05-120-04-H450B	92 ~ 168	250	450	10	4,36
05-120-04-H450C	142 ~ 218	300	450	10	4,63
05-120-04-H750A	62 ~ 138	220	750	10	4,67
05-120-04-H750B	92 ~ 168	250	750	10	4,83
05-120-04-H750C	142 ~ 218	300	750	10	5,10

4 MAIN COMPONENTS

DR – AL180 Hanger

The hanger is the component responsible for suspending the DR AL180 structural profile, using the support structure as an anchorage.

It features a height adjustment mechanism between the base structure and the structural profile, via a threaded rod with semi-spherical nuts and locking by a steel clip.



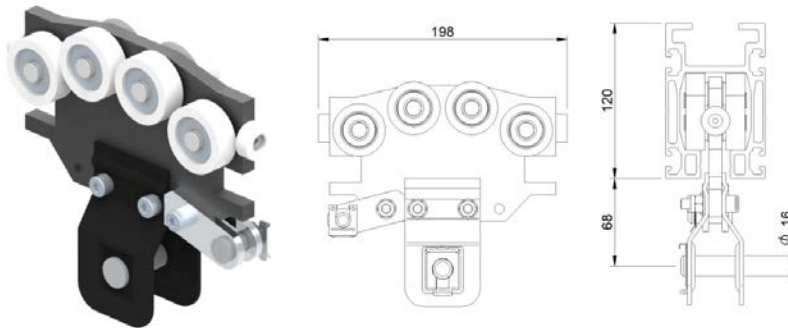
DR – AL 180 Hanger	S (mm)	L (mm)	H (mm)	Rod adjustment (mm)	Weight (kg)
05-180-04-H140A	62 ~ 138	220	140	10	3,92
05-180-04-H140B	92 ~ 168	250	140	10	4,08
05-180-04-H140C	142 ~ 218	300	140	10	4,36
05-180-04-H170A	62 ~ 138	220	170	10	3,97
05-180-04-H170B	92 ~ 168	250	170	10	4,13
05-180-04-H170C	142 ~ 218	300	170	10	4,40
05-180-04-H250A	62 ~ 138	220	250	10	4,10
05-180-04-H250B	92 ~ 168	250	250	10	4,26
05-180-04-H250C	142 ~ 218	300	250	10	4,53
05-180-04-H450A	62 ~ 138	220	450	10	4,41
05-180-04-H450B	92 ~ 168	250	450	10	4,57
05-180-04-H450C	142 ~ 218	300	450	10	4,85
05-180-04-H750A	62 ~ 138	220	750	10	4,88
05-180-04-H750B	92 ~ 168	250	750	10	5,04
05-180-04-H750C	142 ~ 218	300	750	10	5,32

4 MAIN COMPONENTS

DR – AL120 Trolley – Load

Assembly for translational and transversal movements of DR AL120, for quiet and interference-free operation.

High-strength forged aluminum body, very low drag forces, robust and smooth operation, includes protective buffers.

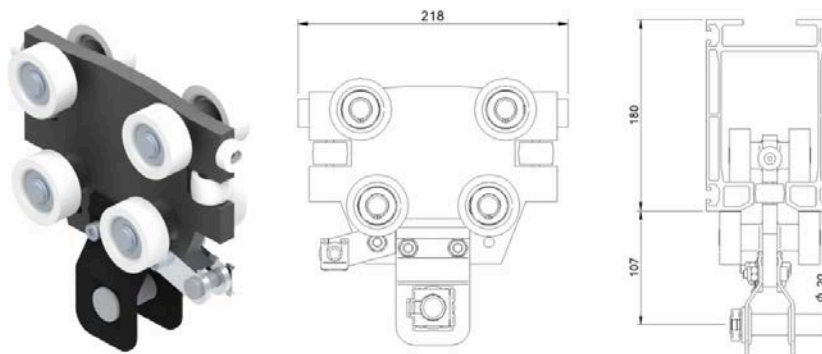


DR-AL120 Trolley - Load	Weight (kg)	Load Capacity (kg)
05-120-05	1,57	300

DR – AL180 Trolley – Load

Assembly for translational and transversal movements of DR AL180, for quiet and interference-free operation.

High-strength forged aluminum body, very low drag forces, robust and smooth operation, includes protective buffers.



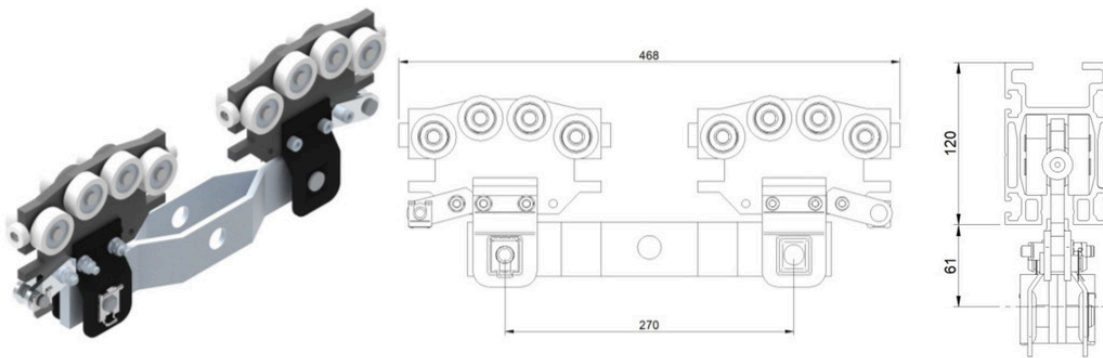
DR-AL180 Trolley - Load	Weight (kg)	Load Capacity (kg)
05-180-05	2,70	600

4 MAIN COMPONENTS

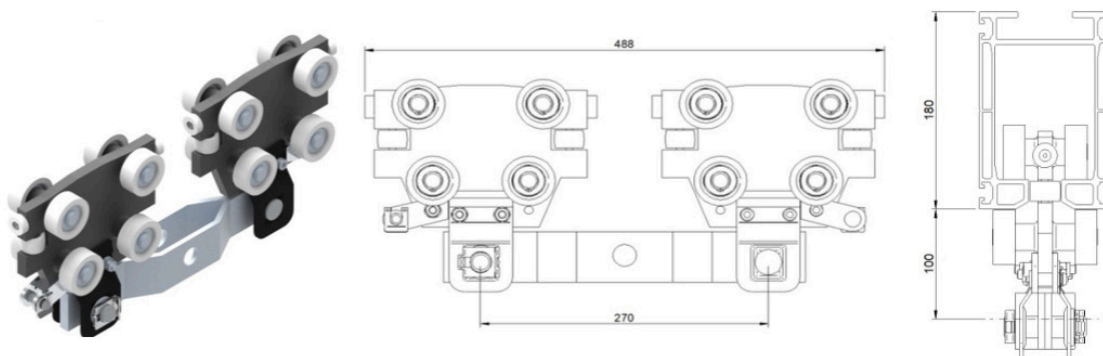
Trolley Connection Beam DR-AL120 and DR-AL180

This mechanism allows the connection between two movement trolleys, enabling the distribution of load between the interconnected trolleys.

Constructed from stamped steel plate and fixed between the trolleys using pins. Hoists or load suspension devices can be attached to the center of the element.



DR-AL120 Trolley Connection Beam	Weight (kg)
05-120-06	1,67



DR-AL180 Trolley Connection Beam	Weight (kg)
05-120-06	1,67

4 MAIN COMPONENTS

DR – AL Suspension Eye

Component for suspending profiles.



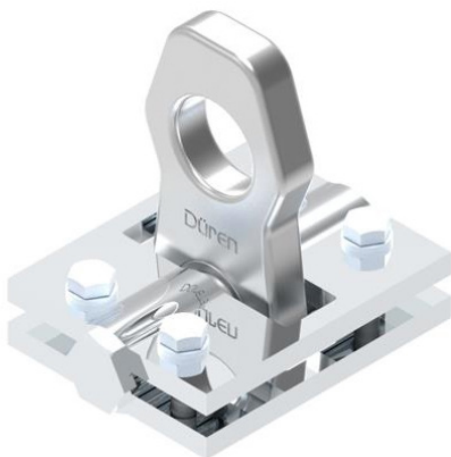
DR-AL120 Suspension Eye	Weight (kg)
05-120-07A	0,70



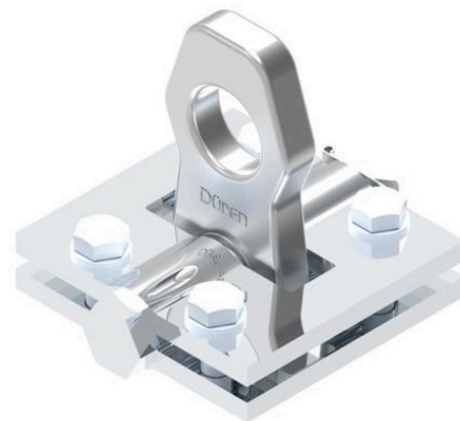
DR-AL180 Suspension Eye	Weight (kg)
05-120-07A	0,92

DR – AL Semi-Articulated Suspension Eye

Component for suspending profiles equipped with a swivel joint for alignment compensation.



DR-AL120 Articulated Eye	Weight (kg)
05-120-07B	0,95

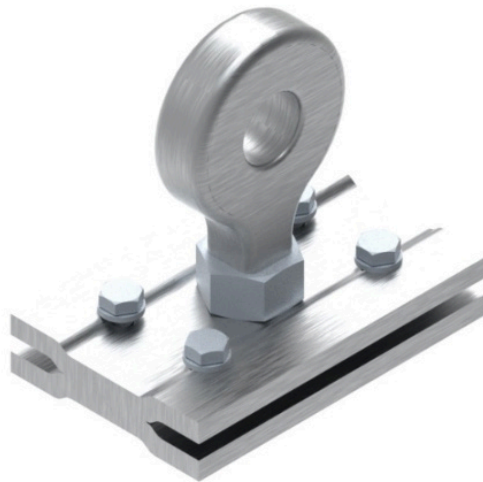


DR-AL1820 Articulated Eye	Weight (kg)
05-180-07B	1,34

4 MAIN COMPONENTS

DR – AL Articulated Suspension Eye

Articulated profile suspension element using semi-spherical nuts..



DR-AL120 Connection Beam Eye	Weight (kg)
05-120-07C	1,14



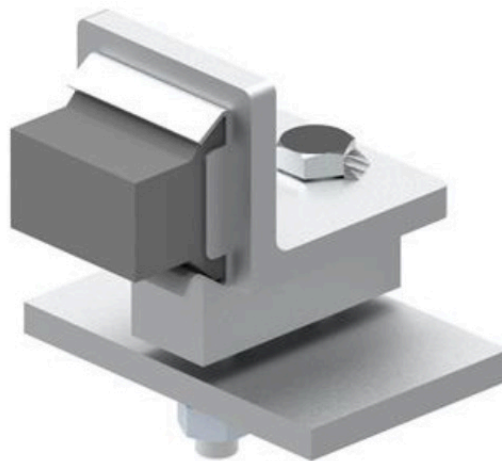
DR-AL180 Connection Beam Eye	Weight (kg)
05-120-07C	1,42

4 MAIN COMPONENTS

DR – AL Simple Adjustable Stop

These devices are designed as travel limiters in the rolling path, whether in overhead cranes or monorails, preventing collisions between trolleys. They are used as a redundant safety item, installed before the end stop cap.

Constructed from stamped steel plate (galvanized) with rubber for impact absorption, it is fixed by two fastening elements through the rolling path profile.



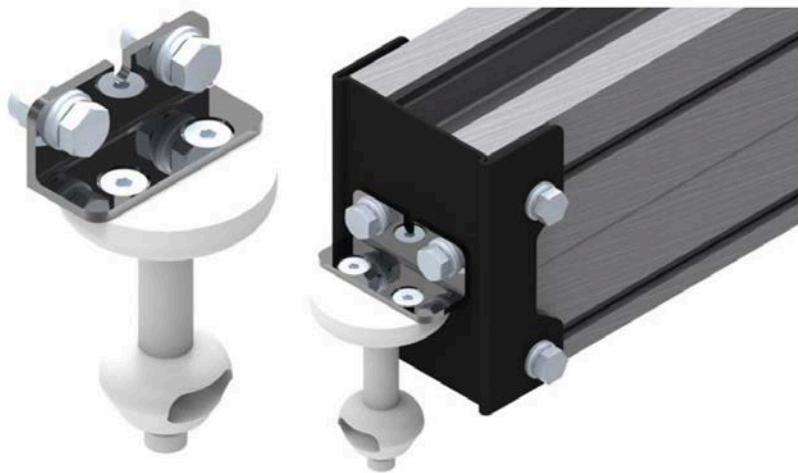
BDR-AL120 Adjustable Stop	Weight (kg)
05-120-08B	0,60



DR-AL180 Adjustable Stop	Weight (kg)
05-180-08B	0,93

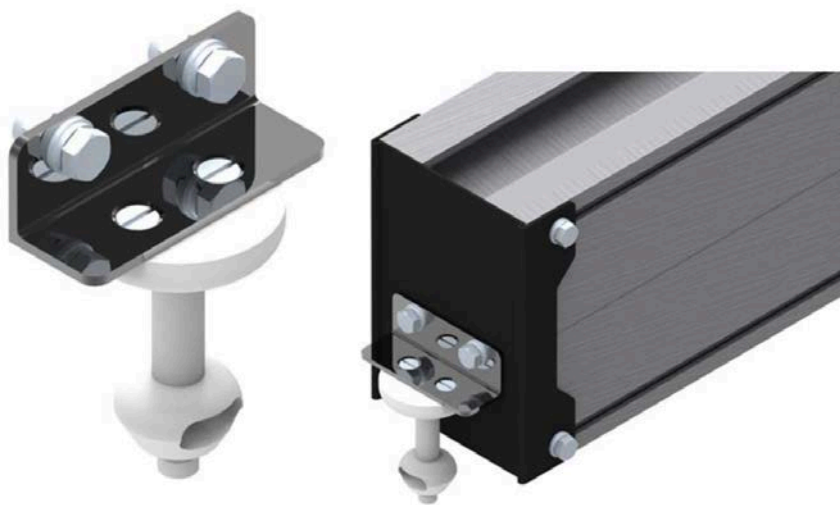
4 MAIN COMPONENTS

Flat Cable Fixation on DR – AL120 End Cap



Flat Cable Fix. on DR-AL120 End Cap	Weight (kg)
05-120-12	0,30

Flat Cable Fixation on DR – AL180 End Cap



Flat Cable Fix. on DR-AL180 End Cap	Weight (kg)
05-180-12	0,70

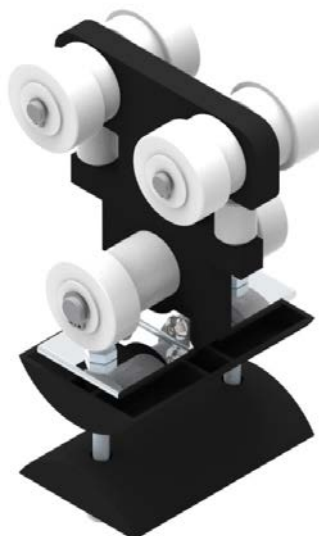
4 MAIN COMPONENTS

DR – AL120 Cable Carrier Trolley



DR – AL120 Cable Carrier Trolley	Weight (kg)
05-120-09	0,47

DR – AL180 Cable Carrier Trolley



DR – AL180 Cable Carrier Trolley	Weight (kg)
05-180-09	0,61

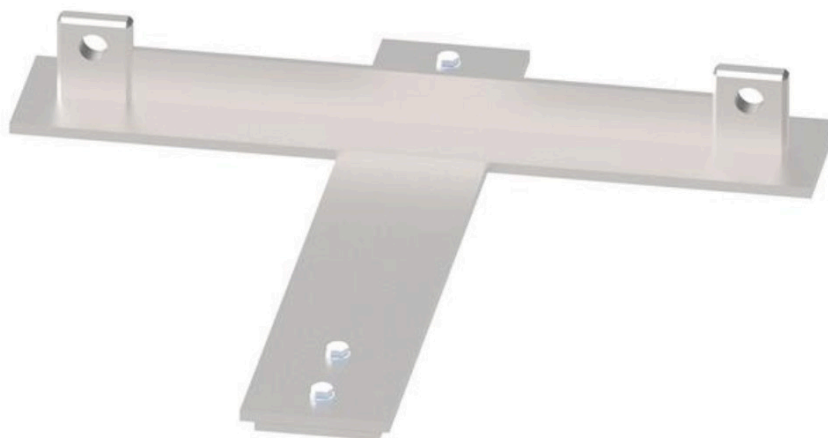
4 MAIN COMPONENTS

DR – AL120 Simple Rigid End Carriage



DR – AL120 Simple Rigid End Carriage	Weight (kg)
05-120-10	7,23

DR – AL180 Simple Rigid End Carriage



DR – AL180 Simple Rigid End Carriage	Weight (kg)
05-180-10	9,26

4 MAIN COMPONENTS

DR – AL Safety Accessories

In single-girder/double-girder overhead crane systems and monorails, additional safety accessories can be included in the installation.

These are considered redundant safety items, acquired as optional extras and applied to specific assemblies within the overhead crane or monorail system.

They can be divided into: Steel cables and Fixing bars.

Steel Cable Safety Kit: Braided steel cables fixed by three metal clamps at the ends of the cable.



Safety Kit for DR-AL120 Hanger	Weight (kg)
05-120-24	0,30

Safety Kit for DR-AL120 Crane	Weight (kg)
05-120-25	0,65



Safety Kit for DR-AL180 Hanger	Weight (kg)
05-180-27	1,10

Safety Kit for DR-AL180 Crane	Weight (kg)
05-180-28	0,95

4 MAIN COMPONENTS

DR – AL180 Upper Inspection Window

Quick access to Trolleys and Electrical Busbars in straight rolling sections.

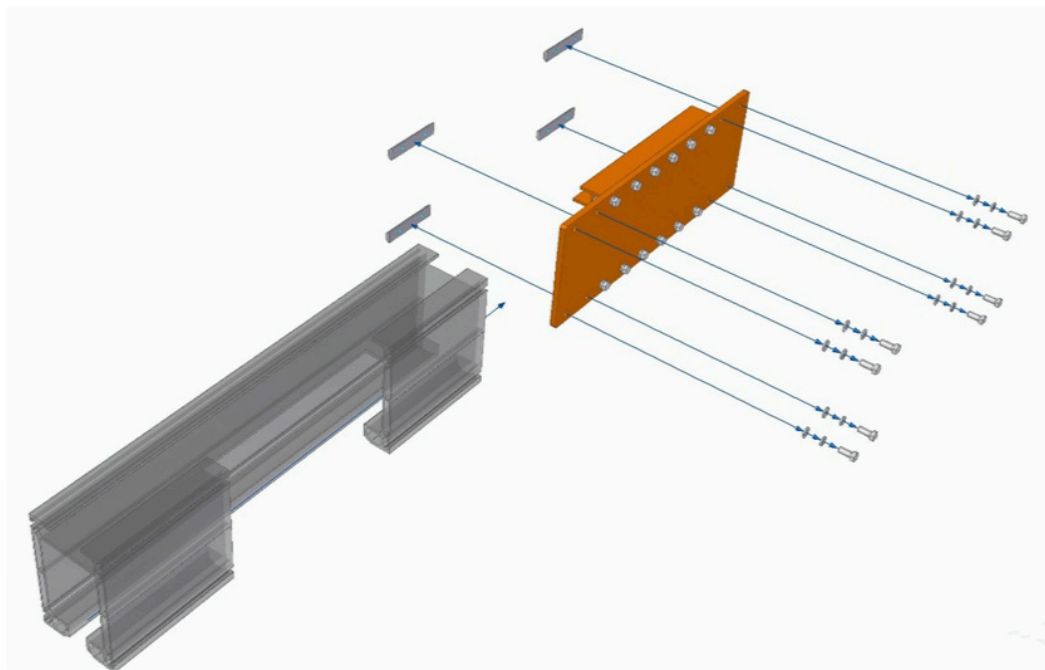
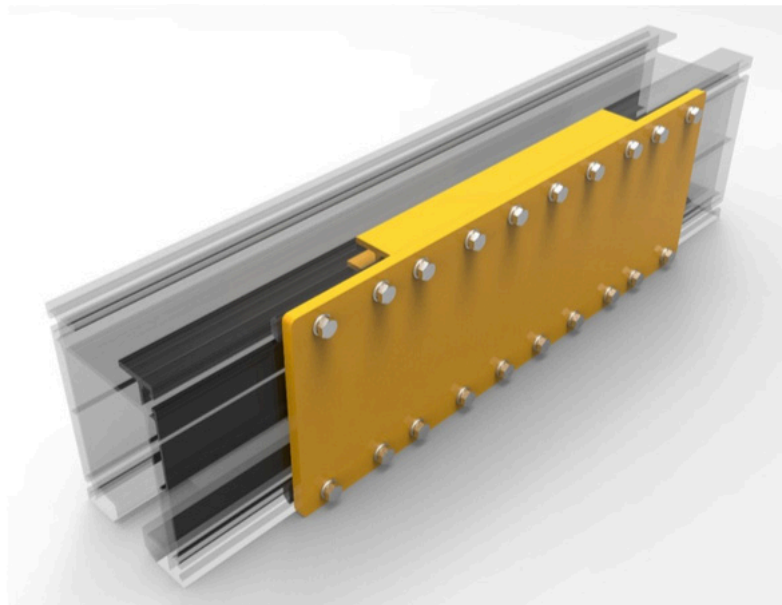


DR-AL180 Upper Insp. Window	Weight (kg)
05-180-21	4,21

4 MAIN COMPONENTS

DR – AL180 Side Inspection Window

Quick access to Trolleys and Electrical Busbars in straight rolling sections.



DR-AL180 Side Insp. Window	Weight (kg)
05-180-22	6,42

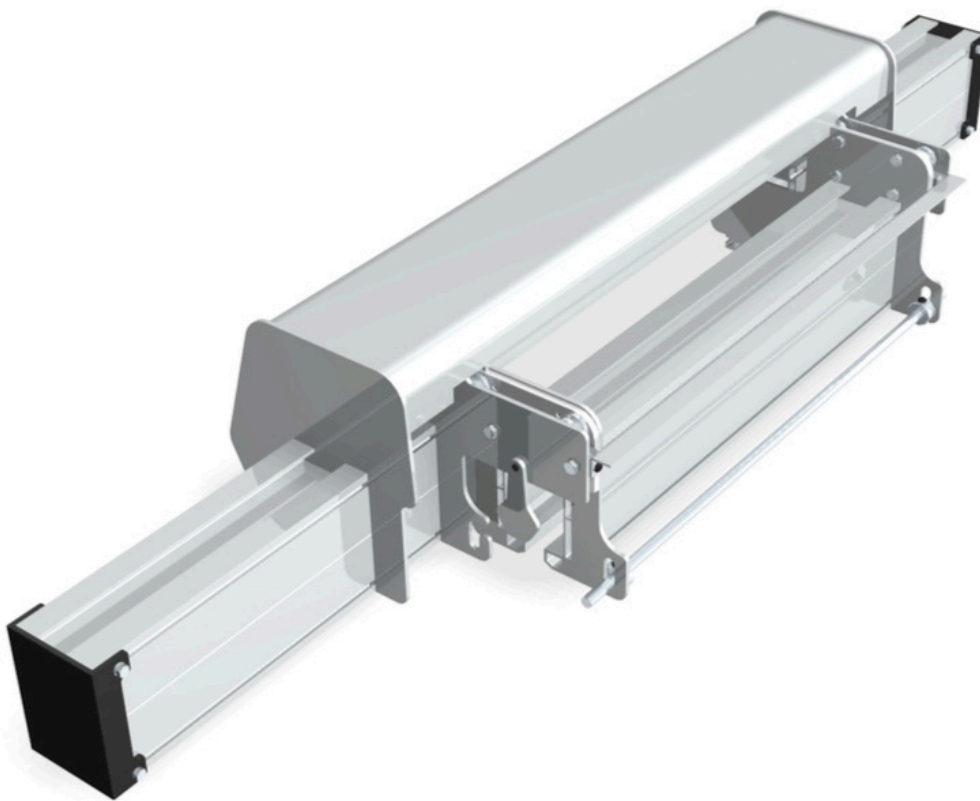
4 MAIN COMPONENTS

DR – AL180 Inspection Box

The inspection drawer is a component used in straight rolling sections, allowing quick access to trolleys and/or electric hoists, facilitating the removal of these components for periodic inspections and maintenance. Through manual operation, the internal structural profile is disconnected from the rolling path (the trolley must be positioned within the travel of the inspection drawer).

This component has protection devices against operating errors if the installation has other trolleys that travel the same rolling path, blocking the passage of trolleys when the drawer is actuated.

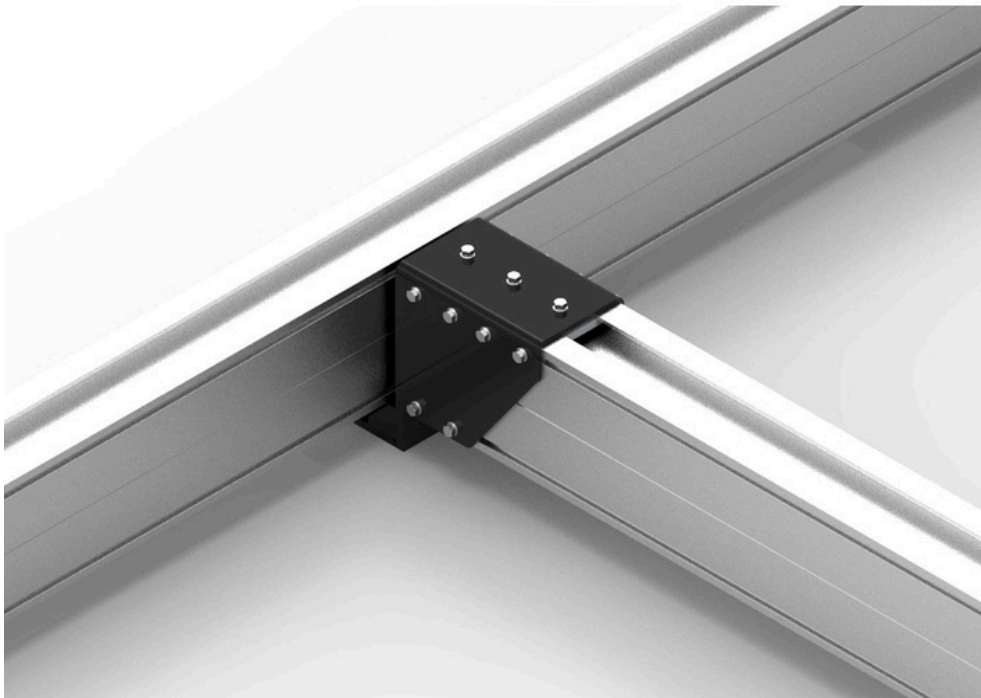
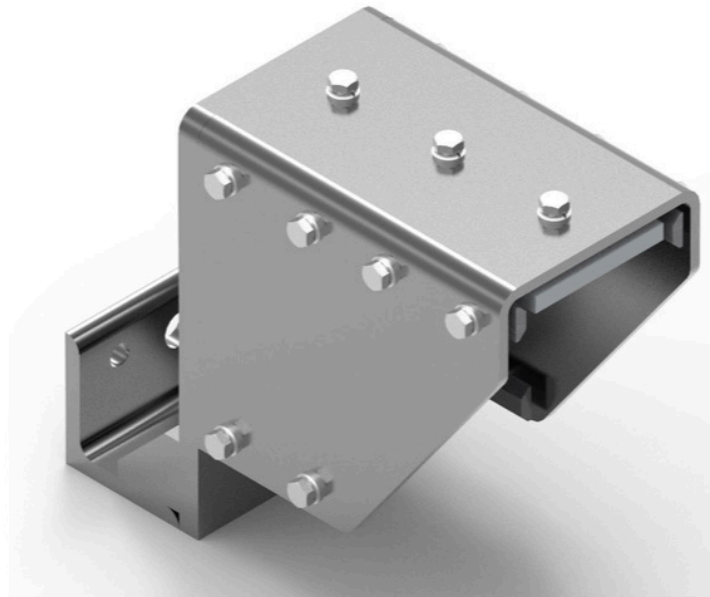
Protection box constructed from A-36 structural steel, with internal assembly of DR-AL180 structural profiles.



DR-AL180 Inspection Box	Weight (kg)
05-180-23	12,56

4 MAIN COMPONENTS

End Cap with Stop for Gantry Crane DR – AL180



End Cap with Stop for Gantry Crane DR-AL180

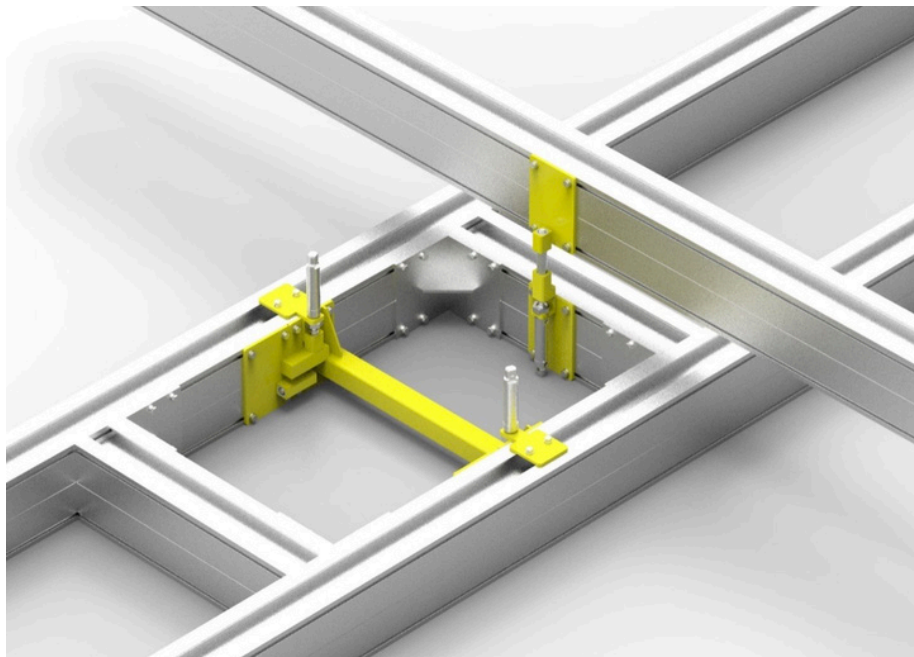
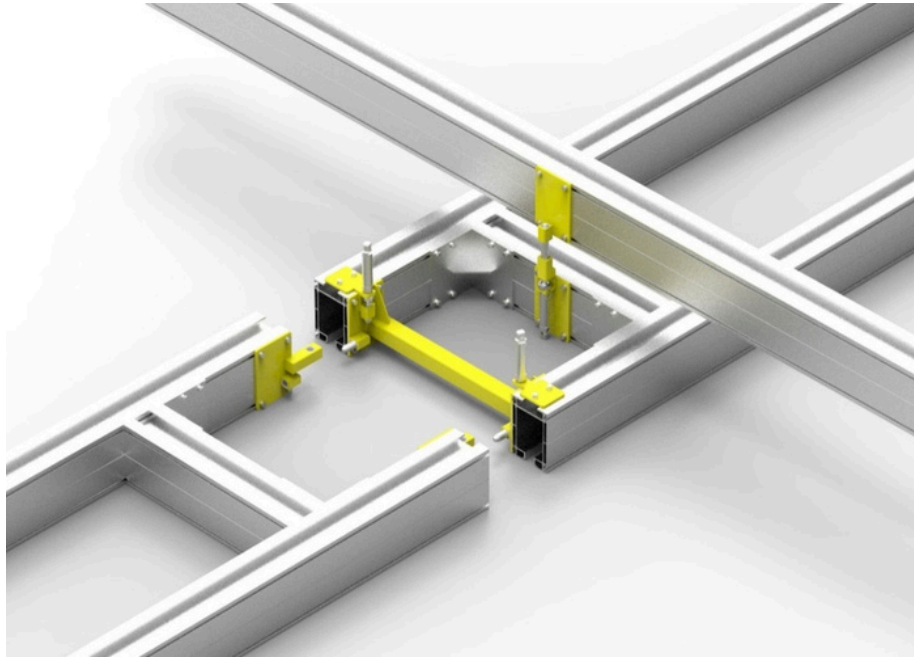
Weight (kg)

05-180-24

4,70

4 MAIN COMPONENTS

DR – AL180 Interlock System

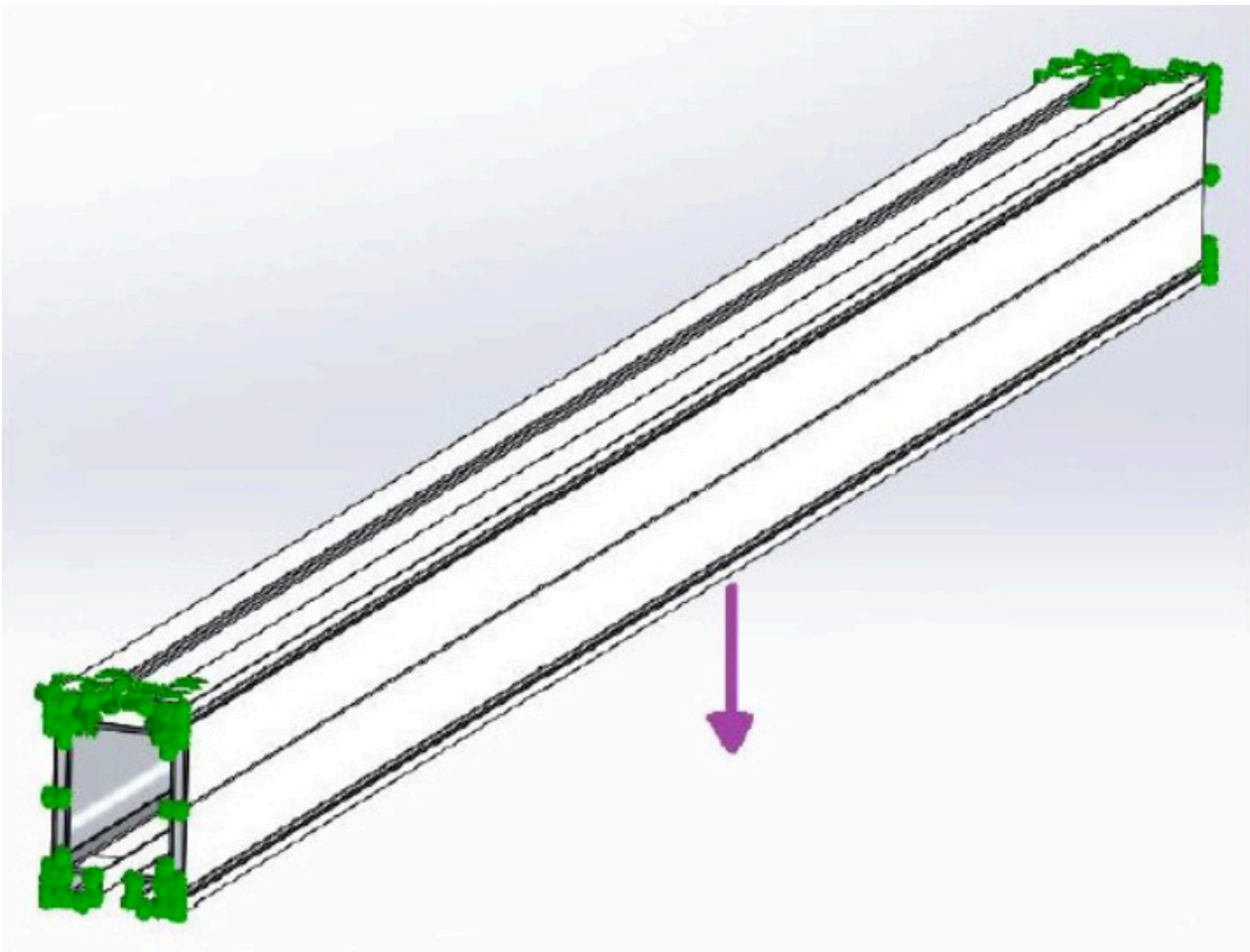


DR – AL180 Interlock System	Weight (kg)
05-180-25	00,00

Equipment available upon request.

5 TESTS

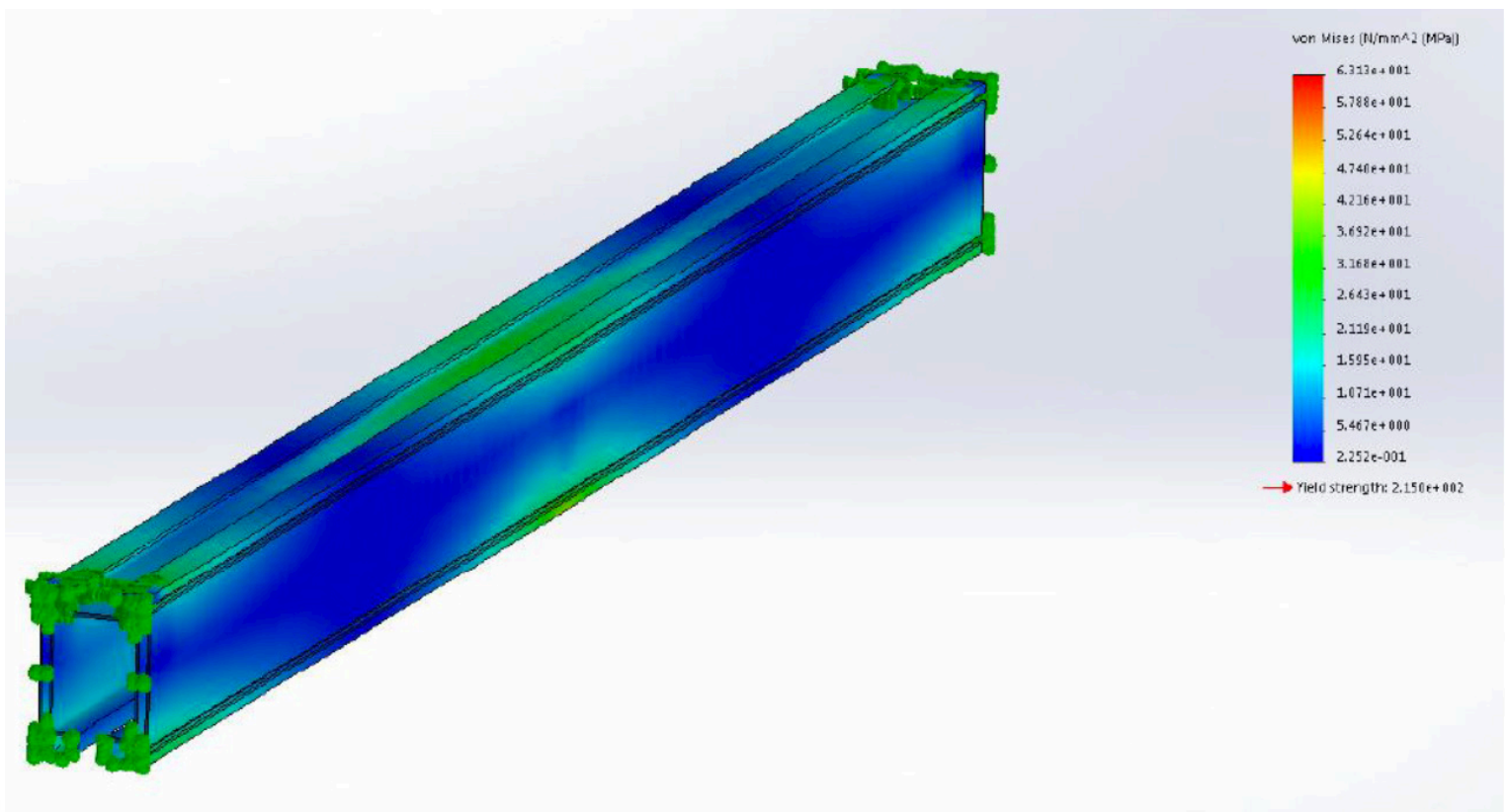
Rail Loading



A static load of 1200kg is applied to the center of the 2500mm long and double-fixed profile.

5 TESTS

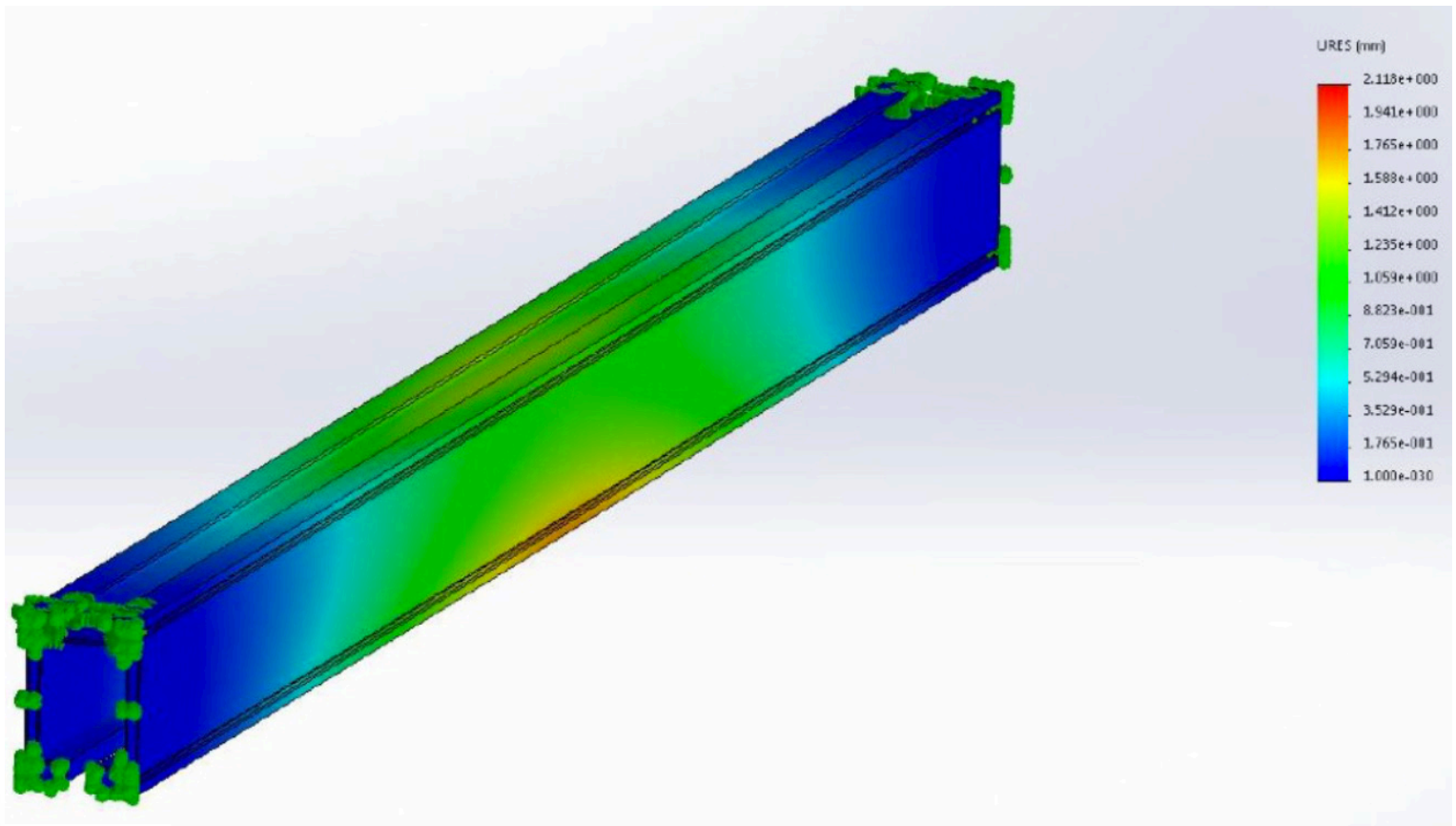
Stress



63,131MPa
FS=2,69 (6063 T6)

5 TESTS

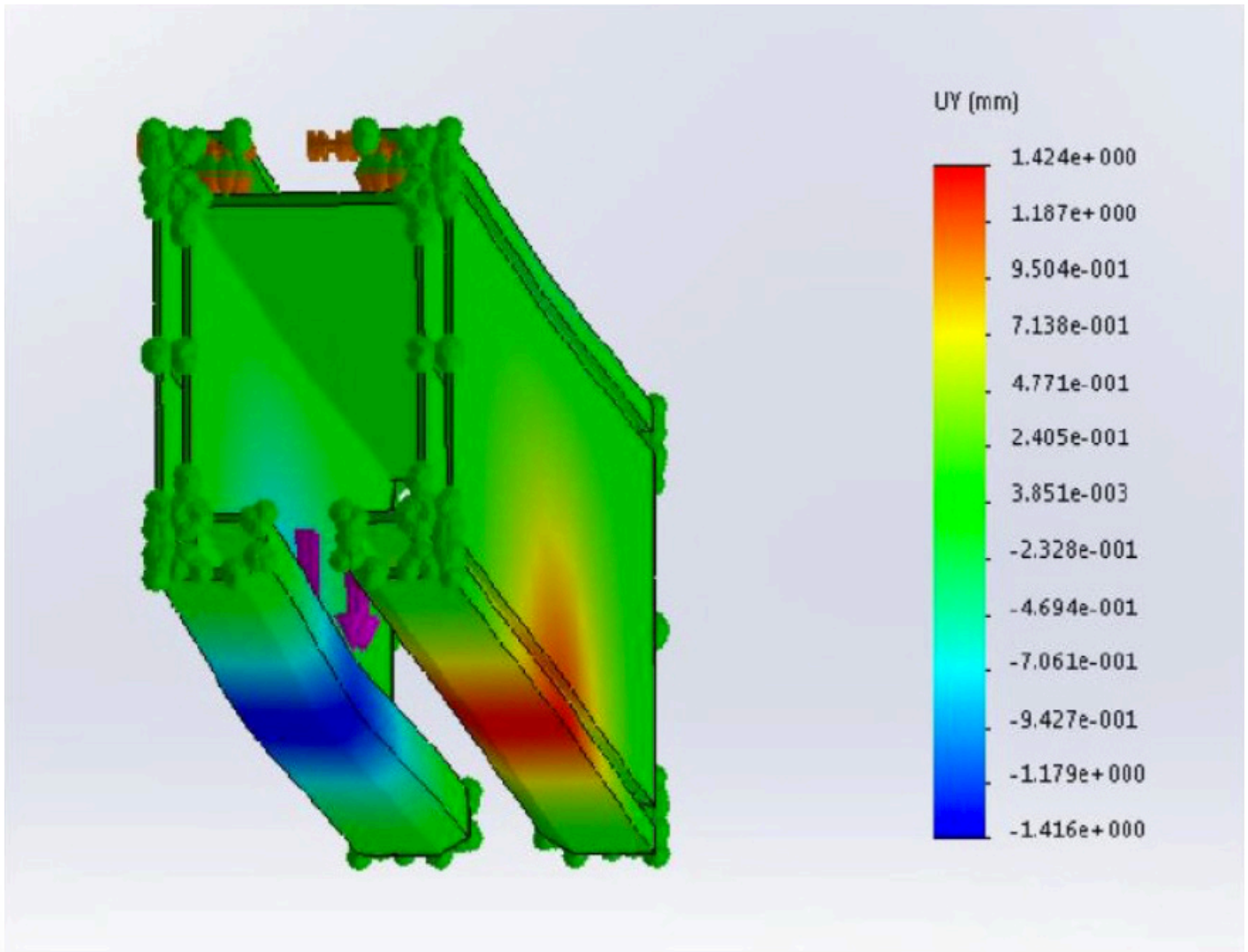
Total Displacement



2118mm

5 TESTS

Y-Displacement



The Y-displacement shows us the “opening” limit of the rail channel during loading, totaling approximately 2.84mm.

5 TESTS

Tension



Relatório de Ensaio nº MEC-012.589/17
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RELATÓRIO DE ENSAIO Nº MEC-012.589/17

CHAPA METÁLICA

INTERESSADO: DUREN EQUIPAMENTOS INDUSTRIAIS LTDA
Rua das Camélias, 357 – Loteamento Industrial Coral
Cep: 09372-080 – Mauá - SP
Ref.: (PJ100-023212)

1. IDENTIFICAÇÃO DA(S) AMOSTRA(S)

01 (uma) amostra identificada pelo interessado como: Perfil de alumínio e pendural, recebida no laboratório em 30/05/2017.
Identificação Interna: AM-12-JUN-17-016585.

2. METODOLOGIA(S) UTILIZADA(S)

Conforme solicitação do interessado, o corpo de prova foi fixado à máquina de ensaios, por meio de um dispositivo metálico apropriado e submetido ao esforço de tração, até atingir a carga máxima de resistência.

3. RESULTADOS OBTIDOS

Ensaio de tração

Parâmetro	Unidade	Obtido
Carga máxima de resistência	kgf	6 000
Ocorrências	---	Apresentou ruptura da aba de fixação do dispositivo



Fotografia 1 – Amostra antes do ensaio

Os resultados apresentados no presente documento referem-se exclusivamente a(s) amostra(s) ensaiada(s).
A reprodução deste documento somente poderá ser feita na íntegra e sua utilização para fins promocionais depende de autorização prévia.

SÃO PAULO: Rua Aquinos, 111 - S.P. - CEP 05036-070 - FONE (11) 3611-0833 - FAX (11) 3611-0170
Filiais: SP: Bauru - Campinas - Santos - São José dos Campos - RJ: Macaé - Rio de Janeiro
www.falcaobauer.com.br - bauer@falcaobauer.com.br

5 TESTS

Traction



Relatório de Ensaio nº MEC-012.589/17
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Fotografia 6 – Amostra após o ensaio

4. DATA DO(S) ENSAIO(S)

Ensaio realizado no período de junho/2017.

São Paulo, 19 de junho de 2017.

L.A. FALCÃO BAUER LTDA.
Centro Tecnológico de Controle da Qualidade



DANIEL MARTINS MANCINI
SUPERVISOR DE LABORATORIO

L.A. FALCÃO BAUER LTDA.
Centro Tecnológico de Controle da Qualidade



ENGº EDUARDO MARQUES
GERENTE DE UNIDADE
CREA nº 0601066201

NHP

5 TESTS

Comparison Table between Aluminum Profile and Steel Profile.

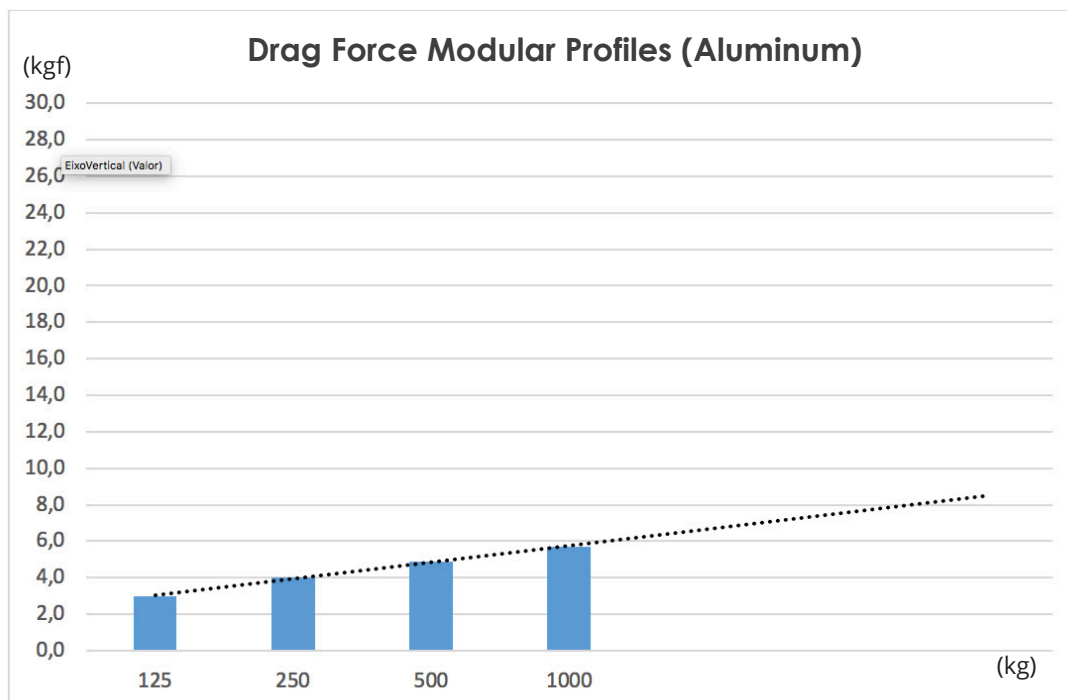
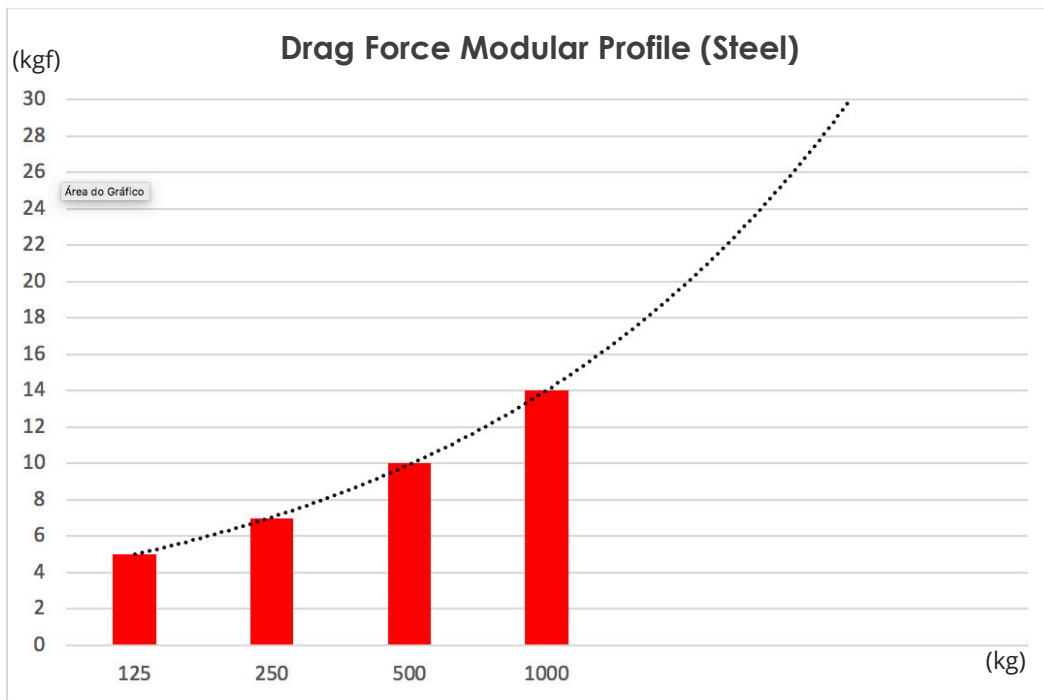
Input Data:

- Bridge Profile: DR11 / DR AL-180
- Rolling Path Profile: DR11 / DR AL-180
- Trolley Model: DR11 / DR AL-180
- Bridge Span: 4.10 m
- Bridge Type: Single
- Bridge End: Simple Trolley

Drag Force of Modular Profiles				
Load	Steel Modular Profile		Aluminum Modular Profile	
	Inertia	In Motion	Inertia	In Motion
125	5	4	3,7	3,0
250	7	5,5	5,0	4,0
500	10	9	6,0	4,9
1000	14	11	7,5	5,7

5 TESTS

Drag Force



6 SIZING TABLE

Sizing Table for DR – AL120/ AL180 Overhead Crane Systems.

	Dpr	125kg						250kg					
		Single-Girder			Double-Girder			Single-Girder			Double-Girder		
		Dc	Dp		Dc	Dp		Dc	Dp		Dc	Dp	
			AL120	AL180		AL120	AL180		AL120	AL180		AL120	AL180
AL120	1	0,75 - 0,90	3,55	7,70	-	-	-	0,80 - 0,90	2,70 ¹	5,80	-	-	-
	2	1,7 - 1,90	3,50	7,60	1,10 - 1,90	3,35	6,90	1,75 - 1,90	2,65 ¹	5,80	1,15 - 1,90	2,60	5,50
	3	2,6 - 2,90	3,45	7,50	1,90 - 2,90	3,20	6,80	-	-	-	2,00 - 2,90	2,55	5,45
	4	3,4 - 3,55	3,40	7,40	2,65 - 3,90	3,15	6,70	-	-	-	2,85 - 3,75	2,55	5,35
	5	-	-	-	3,35 - 4,85	3,05	6,55	-	-	-	3,65 - 3,75	2,50	5,30
	6	-	-	-	4,00 - 4,85	2,95	6,25	-	-	-	-	-	-
AL180	1	0,75 - 0,90	3,55	7,60	-	-	-	0,80 - 0,90	2,65 ¹	5,75	-	-	-
	2	1,65 - 1,90	3,40	7,40	-	-	-	1,70 - 1,90	2,60 ¹	5,70	-	-	-
	3	2,45 - 2,90	3,30	7,20	1,60 - 2,90	2,95	6,25	2,60 - 2,90	2,60 ¹	5,60	1,75 - 2,90	2,45	5,15
	4	3,15 - 3,90	3,25	7,05	2,25 - 3,90	2,85	6,05	3,40 - 3,90	2,55 ¹	5,50	2,50 - 3,90	2,40	5,05
	5	3,80 - 4,90	3,15	6,90	2,80 - 4,90	2,75	5,85	4,20 - 4,90	2,50 ¹	5,45	3,20 - 4,90	2,35	4,90
	6	4,45 - 5,90	3,10	6,75	3,30 - 5,90	2,65	5,60	4,95 - 5,90	2,50 ¹	5,35	3,80 - 5,90	2,25	4,75
	Dpr	500kg						1000kg					
		Single-Girder			Double-Girder			Single-Girder			Double-Girder		
		Dc	Dp		Dc	Dp		Dc	Dp		Dc	Dp	
			AL120	AL180		AL120	AL180		AL120	AL180		AL120	AL180
AL120	1	0,75 - 0,90 ²	2,05 ¹	4,45	-	-	-	-	-	-	-	-	-
	2	1,55 - 1,90 ²	1,90 ¹	4,15	1,30 - 1,90	2,00	4,20	-	-	-	-	-	-
	3	-	-	-	2,45 - 2,75	2,00	4,20	-	-	-	-	-	-
AL180	1	0,80 - 0,90	1,90 ¹	4,15	-	-	-	0,75 - 0,90 ²	1,15 ¹	3,30 ¹	-	-	-
	2	1,75 - 1,90	2,20 ¹	4,10 ¹	-	-	-	1,55 - 1,90 ²	0,95 ¹	3,00 ¹	-	-	-
	3	2,70 - 2,90	2,15 ¹	4,05 ¹	1,85 - 2,90	-	3,95	2,50 - 2,90 ²	0,95 ¹	3,00 ¹	2,00 - 2,90	-	3,00
	4	3,60 - 3,90	2,15 ¹	4,05 ¹	2,90 - 3,90	-	3,85	-	-	-	3,00 - 3,90	-	3,00
	5	-	-	-	3,55 - 4,90	-	3,80	-	-	-	4,10 - 4,35	-	3,00
	6	-	-	-	4,30 - 5,85	-	3,75	-	-	-	-	-	-

- 1- Two trolleys joined by a connecting beam on each side of the overhead crane (runway)
- 2- Two trolleys joined by a connecting beam (onboard)

