LIFT

TRANSPORT BEAM

R120

WLL - 120t, L_{max} = 12m

Manufacturer: ANDARON

Contractor:
CALMTEC
Przemysław Krochmal
Ul. Katowicka 11
42-530 Dąbrowa Górnicza

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1. Related standards and technical conditions

1. PN-EN 13155+A2:2009	Cranes. Safety. Non-fixed load lifting attachments.
2. PN-EN 1990:2004	Eurocode – Basic design rules of structures.
3. PN-EN 1991-1-1:2004	Eurocode 1: Actions on structures. Part 1-1 General actions. Densities, self-weight, imposed loads for buildings.
4. PN-EN 1993-1-1:2006	Eurocode 3: Design of steel structures. Part 1-1: General rules and rules for buildings.
5. PN-EN 1993-1-8:2006	Eurocode 3. Design of steel structures. Part 1-8. Design of joints.
6. PN-EN 1090-1:2010	Execution of steel structures and aluminium structures. Part 1: Requirements for conformity assessment of structural components.
7. PN-EN 1090-2:2009	Execution of steel structures and aluminum structures. Part 2: Technical requirements for the execution of steel structures.

2. Dokumentacja związana

PL-1804-01 Comparison
PL-1804-02 Element: RK120/1
PL-1804-03 Element: R120/1; R120/2; R120/3; R120/4; R120/0,5

3. Static-resistance calculations

Calculations made in accordance with the following standards:
PN-EN 13155 + A2:2009, PN-EN 1993-1-1 and PN-EN 1993-1-8.
Steel design strength:
according to Table 3.1 of the PN-EN 1993-1-1 standard:

steel: S355JR: $t \leq$ 40mm → f_y = 355 MPa
→ f_u = 510 MPa

Coefficients in accordance with PN-EN 1993-1-1 and PN-EN 1993-1-8:

- partial factors: $\gamma_{M0}=1,0$; $\gamma_{M1}=1,0$; $\gamma_{M1}=1,25$

- correlation coefficient: $\beta_w=0,9$

During the mechanical strength test without static tests (based on PN-EN 13155+A2:2009 Appendix A sec. A.1.1), the following load was taken into account:

$$X = S + 2 \times S_{DOR}$$

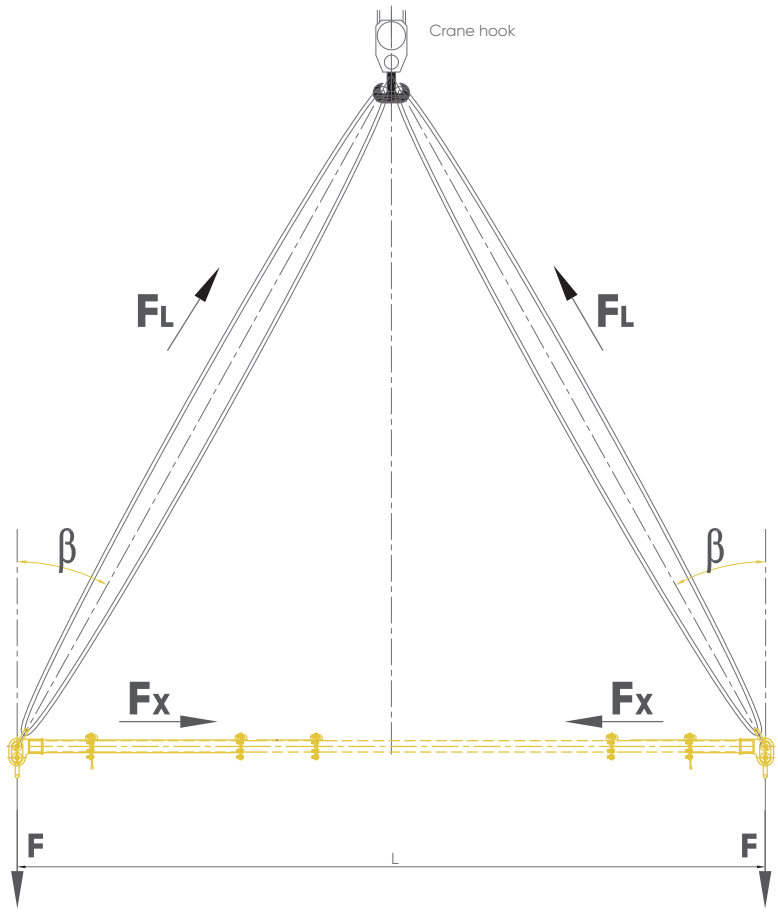
where: S_{DL} - load resulting from cross-bar weight
S_{DOR} - load resulting from working load limit

Coefficient 2 takes into account dynamic impacts generated during lifting and the static test

O-1804 Calculations ' R120, transport beam, WLL-120t, Lmax = 12m' available at the company headquarters: Andaron Sp. z o.o. ul. Katowicka 11, 42-530 Dąbrowa Górnicza.

4. Technical data of the R30 transport beam

Transport beam – diagram (see fig. PL-1804-01):



Marks:

L - length of spreader beam

WLL - capacity - working load limit

β - tilt angle

$L_{z(min)}$ - min. lenght of the sling

WLL_z - min. working load limit of the sling

Available transport beam configurations (see fig. PL-1804-01):

Length of the transport beam (m)	**Beam elements**	**Screws: M24x75 - 8.8** (pcs)	**Beam weight**(kg)
12	2xRK120/1; R120/2; R120/4; R120/3; R120/1	40	1609,6
11,5	2xRK120/1; R120/2; R120/3; R120/4; R120/0,5	40	1570,1
11	2xRK120/1; R120/4; R120/3; R120/2	32	1448,0
10,5	2xRK120/1; R120/1; R120/3; R120/4; R120/0,5	40	1491,4
10	2xRK120/1; R120/4; R120/3; R120/1	32	1369,3
9,5	2xRK120/1; R120/3; R120/4; R120/0,5	32	1329,8
9	2xRK120/1; R120/4; R120/3	24	1207,7
8,5	2xRK120/1; R120/2; R120/4; R120/0,5	32	1251,1
8	2xRK120/1; R120/2; R120/4	24	1129,0
7,5	2xRK120/1; R120/1; R120/4; R120/0,5	32	1172,4
7	2xRK120/1; R120/1; R120/4	24	1050,3
6,5	2xRK120/1; R120/4; R120/0,5	24	1010,8
6	2xRK120/1; R120/4	16	888,7
5,5	2xRK120/1; R120/3;R120/0,5	24	931,9
5	2xRK120/1; R120/3	16	809,8
4,5	2xRK120/1; R120/2; R120/0,5	24	853,2
4	2xRK120/1; R120/2	16	731,1
3,5	2xRK120/1; R120/1; R120/0,5	24	774,5
3	2xRK120/1; R120/1	16	652,4
2,5	2xRK120/1; R120/0,5	16	612,9
2	2xRK120/1	8	490,8

5. Working load table

Length of the transport beam	β = 30°			β = 15°			β = 45°		
L (m)	WLL (t)	$L_{Z(min)}$ (m)	WLL_Z (t)	WLL (t)	$L_{Z(min)}$ (m)	WLL_Z (t)	WLL (t)	$L_{Z(min)}$ (m)	WLL_Z (t)
12	120	12	69	140	23,2	73	68	8,5	48
11,5	120	11,5	69	140	22,2	73	68	8,1	48
11	120	11	69	140	21,3	73	68	7,8	48
10,5	120	10,5	69	140	20,3	73	68	7,4	48
10	120	10	69	140	19,3	73	68	7,1	48
9,5	120	9,5	69	140	18,4	73	68	6,7	48
9	124	9	72	140	17,4	73	70	6,4	50
8,5	124	8,5	72	140	16,4	73	70	6,0	50
8	128	8	74	140	15,5	73	72	5,7	51
7,5	128	7,5	74	140	14,5	73	72	5,3	51
7	132	7	76	140	13,5	73	76	4,9	54
6,5	132	6,5	76	140	12,6	73	76	4,6	54
6	136	6	79	140	11,6	73	78	4,2	55
5,5	136	5,5	79	140	10,6	73	78	3,9	55
5	140	5	81	140	9,7	73	80	3,5	57
4,5	140	4,5	81	140	8,7	73	80	3,2	57
4	140	4	81	140	7,7	73	80	2,8	57
3,5	140	3,5	81	140	6,8	73	80	2,5	57
3	140	3	81	140	5,8	73	80	2,1	57
2,5	140	2,5	81	140	4,8	73	80	1,8	57
2	140	2	81	140	3,9	73	80	1,4	57

RECOMMENDED CONFIGURATION

Symbols:

WLL (t) – working load limit
L (m) – length of the transport beam
β – inclination angle
WLL_Z (t) – minimum working load limit of the sling
$L_{Z(min)}$ (m) – min. sling length

6. Force values

Length of the transport beam	β = 30°			β = 15°			β = 45°		
L (m)	F (Kn)	F_X (Kn)	F_L (Kn)	F (Kn)	F_X (Kn)	F_L (Kn)	F (Kn)	F_X (Kn)	F_L (Kn)
12	600,0	346,4	693,7	700,0	187,6	725,5	340,0	340,0	482,0
11,5	600,0	346,4	693,7	700,0	187,6	725,5	340,0	340,0	481,9
11	600,0	346,4	693,7	700,0	187,6	725,4	340,0	340,0	481,9
10,5	600,0	346,4	693,7	700,0	187,6	725,5	340,0	340,0	481,9
10	600,0	346,4	693,6	700,0	187,6	725,4	340,0	340,0	481,8
9,5	600,0	346,4	693,6	700,0	187,6	725,4	340,0	340,0	481,8
9	620,0	358,0	716,6	700,0	187,6	725,3	350,0	350,0	495,8
8,5	620,0	358,0	716,6	700,0	187,6	725,3	350,0	350,0	495,9
8	640,0	369,5	739,7	700,0	187,6	725,3	360,0	360,0	509,9
7,5	640,0	369,5	739,7	700,0	187,6	725,3	360,0	360,0	509,9
7	660,0	381,1	762,7	700,0	187,6	725,2	380,0	380,0	538,1
6,5	660,0	381,1	762,7	700,0	187,6	725,2	380,0	380,0	538,1
6	680,0	392,6	785,7	700,0	187,6	725,2	390,0	390,0	552,2
5,5	680,0	392,6	785,7	700,0	187,6	725,2	390,0	390,0	552,2
5	700,0	404,1	808,8	700,0	187,6	725,1	400,0	400,0	566,3
4,5	700,0	404,1	808,8	700,0	187,6	725,1	400,0	400,0	566,3
4	700,0	404,1	808,7	700,0	187,6	725,1	400,0	400,0	566,2
3,5	700,0	404,1	808,7	700,0	187,6	725,1	400,0	400,0	566,2
3	700,0	404,1	808,7	700,0	187,6	725,0	400,0	400,0	566,1
2,5	700,0	404,1	808,6	700,0	187,6	725,0	400,0	400,0	566,1
2	700,0	404,1	808,6	700,0	187,6	724,9	400,0	400,0	566,0

7. Requirements concerning operation of the device

- The transport beam is used to lift and transport loads of up to 120t for the following configuration: L=2m, every half a meter up to L=12m in accordance with this manual;
- The beam should be used only in combination with a lifting device equipped with appropriate sling (rope or chain);
- The load should be suspended symmetrically, so as the center of gravity is situated halfway between suspension eyebolts on the beam. Lifting hooks should be equipped with protection gear holding the eyebolts in place; the gear should be kept in good repair.
- Do not leave the loaded beam unsupervised;
- The load should be lifted vertically;
- Do not lift loads attached to the floor;
- Do not hang on the beam or the load;
- Do not place your hands under the sling, do not move the sling during lifting, transport, and lowering the load. The position of the sling may only be corrected when the load is securely placed on the floor;
- Identify all risks of collision of the beam with other objects or persons and prevent them.
- During transport of the cross bar or a large-size element using the cross bar, remember that at least 2 safety lines should be fixed to 2 opposite ends of the beam or the lifted element.
- The weight of the lifted load should be known and adjusted to the cross bar's working load limit in accordance with the tables.

8. Guidelines for operating the transport beam

In order to use the transport beam in a safe and correct manner, follow these instructions:

- Read the manual before operating the device;
- Follow the guidelines included in the load table;
- Follow the instructions for transport beam operators;
- Always use great care and work safely, trying to prevent risks;
- All defects and failures occurring during operation of the transport beam should be notified to the person responsible for the device;
- Do not resume work until the defect/failure is eliminated;
- Do not remove plates or signs from the beam; damaged plates and signs should be replaced with new ones.
- Make sure to store the transport beam in a place free of risk of mechanical damage to the beam;
- After each use, inspect the device and check its technical condition;
- The beam may be stored in an open-field yard.

9. Conditions of operation and use

The transport beam may only be used by an operator who has read this manual. Make sure the beam is used in accordance with safety regulations. Carry out regular inspections within dates provided, and record the results.

10. Health and safety at work regulations

Employees operating the beam must have the required qualifications. They are responsible for application of safe working methods and operation of the beam in accordance with its intended use and working load limits. In life- or health-threatening situations, the beam should be deactivated. You may reactivate it once the threat has been eliminated.

In particular, it is forbidden to:

- operate the device when sick or intoxicated;
- lift the load over people;
- leave the device, even for a short time, when load is suspended under the beam;
- operate the transport beam when the device is not working correctly.

In special cases, not provided for in local regulations and these recommendations, instructions of the management of the facility operating the device shall apply.

11. Operating and Maintenance Manual

Before operating the device:

- View the condition of the load-bearing structure of the transport beam;
- Check the overall condition of the beam, hooks, screws, and lifting gear (slings);
- Assemble the beam according to your needs, by connecting or disconnecting the beam parts you need. Non-preloaded connection should be made in accordance with PN-EN 1090-2. Screws should be tightened until first resistance is felt, successively from the middle of each multi-bolt joint, but they should not be overloaded. The 'first resistance' means tightening using manual force and a normal wrench (without extensions) or the point in which the impact wrench starts to block. The tightened screw should not move or visibly vibrate when tapped with a hammer. Screws should be tightened evenly on both sides of the joint.
- Place the sling of the lifting device in the suspension eyebolts of the beam
- Move the beam over the load. Operating the drive of the lifting device, place the beam close to the hooks of the transport sling. Put the sling hooks in place. Lift the load to approx. 500 mm and observe its movement. In case of any irregularities, lower the load and secure the load-bearing ties on the hook or the beam hooks;
- If there are no irregularities, continue transporting the load to the desired spot.

Follow these instructions when working with the transport beam:

- Stop its operation as soon as you detect any failure that may pose a risk to your health or safety;
- If danger occurs, slowly lower the load;
- Before operating the beam, identify and assess all risks of collision with objects, electrical wires, hydraulic or gas hoses, etc. Furthermore, take into account the risk of collision of the beam with other devices, and eliminate the risk as much as possible;

- The beam operator should be able to control the suspended load at all times. It is forbidden to operate the device in limited visibility situations;
- Do not operate the beam outdoors if the wind speed exceeds 10km/h..

Please follow the general health & safety at work regulations; all recommendations, provisions, and manuals referring to operation and use of lifting devices.

- After operation: transport the beam to the place of storage.

All malfunctions should be notified to the management.

12. Maintenance inspections

Maintenance inspections – every 90 days; they consist in a regular, planned inspection of operation of mechanisms and beam elements, as well as their technical condition and repair.

Inspections should include:

- the load-bearing structure – cracks and distortions of the structure are unacceptable;
- beam suspension eyebolts – cracks, distortions and wear exceeding 20% of the nominal diameter are unacceptable;
- connecting screws - cracks, distortions and wear under 95% of the nominal diameter are unacceptable (please note: M24 class screws, not lower than 8.8, D25 washers)
- plates and signs – their absence or illegibility is unacceptable;
- chain or rope slings – cracks, distortions or incompleteness of elements is unacceptable.
- rope slings – in accordance with PN-EN 13414.
  Inspections may be carried out exclusively by a person authorized to perform maintenance of cranes.

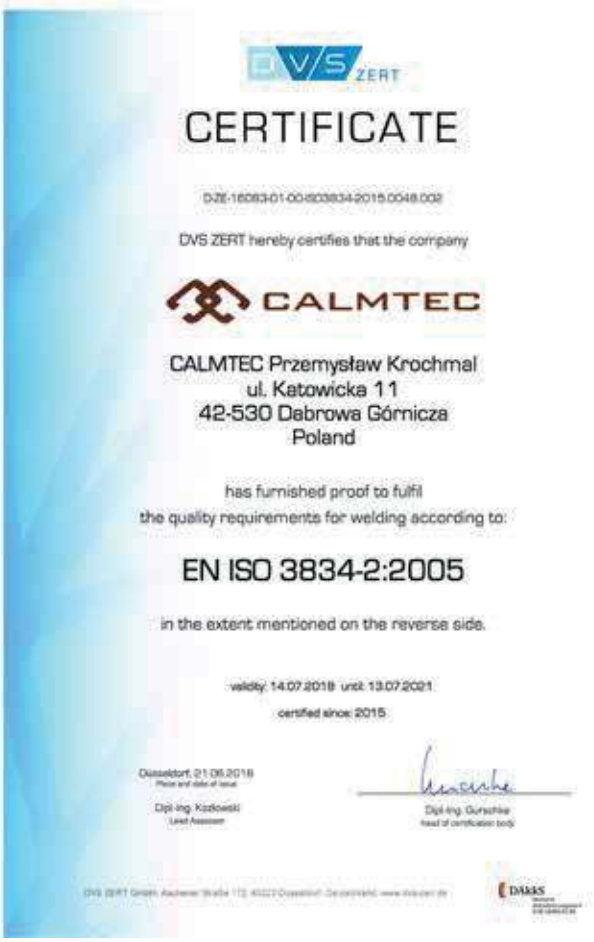
Results of the inspection should be entered into the crane maintenance book.
Beam maintenance consists in keeping it clean, complete, and protected against corrosion. During the inspection, check the condition of anti-corrosion coating and use paints to fill any gaps. The load-bearing parts of the beam may be repaired only by the manufacturer.

13. Disposal

The device does not contain any substances or materials harmful to human health or the environment. Disposal of the worn product should be carried out without contamination of the environment, in accordance with all the local and national regulations, i.e. as follows:

- metal parts – selected and used as scrap metal for the steel industry.

14. Certificates



CERTIFICATE

DZE-16083-01-00-ISO3834-2015.0048.002

DVS ZERT hereby certifies that the company

CALMTEC

CALMTEC Przemysław Krochmal
ul. Katowicka 11
42-530 Dabrowa Górnicza
Poland

has furnished proof to fulfil
the quality requirements for welding according to:

EN ISO 3834-2:2005

in the extent mentioned on the reverse side.

validity: 14.07.2018 until: 13.07.2021

certified since: 2015

Düsseldorf, 21.06.2018
Place and date of issue

Dipl.-Ing. Kozlowski
Lead Assessor

Dipl.-Ing. Gurschke
Head of certification body

DAkkS

CERTYFIKAT

D-ZE-16083-01-00-ISO3834-2015.0048.002

DVS ZERT potwierdza niniejszym, że firma

CALMTEC

CALMTEC Przemysław Krochmal
ul. Katowicka 11
42-530 Dabrowa Górnicza
Polska

Spełnia wymagania jakości według:

EN ISO 3834-2:2005

w zakresie podanym na odwrocie.

Okres ważności: 14.07.2018 do 13.07.2021

certyfikowana od: 2015

Dusseldorf, 21.06.2018
Miejsce i data wystawienia

Dipl.-Ing. Kozlowski
Audytor wiodący

Dipl.-Ing. Gurschke
Kierownik jednostki certyfikującej

DAkkS

CERTYFIKAT

zgodności zakładowej kontroli produkcji

0035-CPR-1090-1.00277.TÜVRh.2017.006

Zgodnie z Rozporządzeniem (UE) nr 305/2011
Parlamentu Europejskiego i Rady z dnia 9 marca 2011 r. (Rozporządzenie w sprawie wyrobów budowlanych - CPR)
niniejszy certyfikat obowiązuje dla następującego wyrobu budowlanego:

Wyrób budowlany	**Elementy nośne oraz ich zestawy wykonane ze stali do klasy EXC3 według EN 1090-2**
Zastosowanie	dla konstrukcji nośnych we wszystkich typach budowli
Oznakowanie CE	ZA.3.2 i ZA.3.4 według EN 1090-1:2009+A1:2011
	wyprodukowane przez lub dla
Producent	**CALMTEC Przemysław Krochmal**
	Katowicka, 11 **42-530 Dabrowa Gornicza** **Polska**
Zakład produkcyjny Miejsce produkcji/ Producenta	CALMTEC Przemysław Krochmal Katowicka, 11 42-530 Dabrowa Gornicza Polska
Potwierdzenie	Niniejszy certyfikat potwierdza, że zastosowano wszystkie postanowienia dotyczące oceny i weryfikacji stałości procesów opisane w załączniku ZA normy zharmonizowanej **EN 1090-1:2009+A1:2011** zgodnie z systemem 2+ oraz, że Zakładowa Kontrola produkcji spełnia wszystkie wymagania określone w powyższej normie
Data wystawienia	05.08.2013
Następny audit nadzorczy	04.08.2020
Okres ważności	Niniejszy certyfikat zachowuje swoją ważność, dopóki nie zmienią się określone w normie zharmonizowanej metody badań i/lub wymagania zakładowej kontroli produkcji do oceny deklarowanych właściwości użytkowych oraz nie ulegną istotnej zmianie wyrób i warunki produkcyjne w zakładzie.
Uwagi	patrz na odwrocie
Miejsce wystawienia / data	Köln, 18.08.2017 L. Zadroga

Dipl.-Ing. Makowska
Kierownik jednostki certyfikującej

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INSPECTION CARD

DATE OF INSPECTION	LIST OF ACTIONS PERFORMED AND DEFECTS DETECTED	MAINTENANCE TECHNICIAN'S ASSESSMENT	DATE OF THE NEXT INSPECTION	SIGNATURE AND STAMP OF THE MAINTENANCE TECHNICIAN

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