

CERTIFIED TRANSLATION FROM SWEDISH

*[The document consists of ten pages, the header of each page contains the RISE logo and the name of the document: TYPE TEST CERTIFICATE. The footer of each page contains information about the document "Certificate C900555 issue 1 2023-07-07 RISE Research Institutes of Sweden AB Certifiering. This certificate is the property of RISE and may only be reproduced in its entirety, unless RISE Certification has given its prior consent in writing. The translator's comments are enclosed in square supports and marked in italics].*

*[logo] RISE*

**TYPE EXAMINATION CERTIFICATE**

C900555

**Modular scaffolding**

**Issued for/manufacturer**

**Altrad-Mostostal Spółka z o.o.**

ul. Starzyńskiego 1, 08-110 Siedlce, Poland

Place of manufacture

as above

**Dealer**

Ställning Karlskoga AB, Gösta Berlingsväg 55, 691 38 Karlskoga

**Product name**

ROTAX Plus modular scaffolding

**Product description**

In accordance with pages 2-10 of this type examination certificate. Technical documentation consistent with the documentation for RISE, no. P103877.

**Type examination certificate**

RISE certifies that the product in accordance with this type examination certificate meets the requirements set out in the Swedish Working Environment Authority AFS 2013:4 Ställningar, § 10, (RISE Certification Rules SPCR 064 of 2021-10-25) and SS-EN 12810- 1:2004 with associated standards.

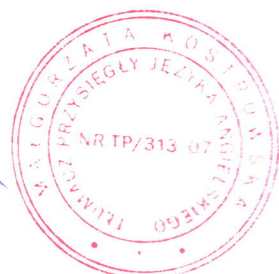
**Evaluated system configurations**

Load class 2 - 3 (1.5 - 2.0 kN/m<sup>2</sup>), with conditions in accordance with the product description.

**Marking**

All main components must be permanently marked with the letter A75, year of manufacture YY (2 digits) and month of manufacture M (one letter) according to A75 RRM. The code assigned to the year of production is 27 for 2021, 28 for 2022, 29 for 2023, etc. The code assigned to the month of production is A for January, B for February, C for March, etc. Products may also be equipped with RISE tests (example below).

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### Validity period

The type examination certificate is valid until 2033-07-07 at the latest. The validity of this type examination certificate can be checked on the RISE website.

### Other

RISE carries out an annual inspection of scaffolding components subject to type examination in accordance with Chapter 5 of SPCR 064. The type examination certificate was originally issued on 2023-07-07.

Martin Tillander (-) [illegible signature]

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P103877  
2023-05-16

[Logo] SWEDAC ACKREDITERING  
Accreditation No. 1002  
Product certification  
ISO/IEC 17065

[Logo] RI.SE

subjected to type examination requirements of the Swedish Working Environment Authority AFS 2013:4

### Product description of ROTAX Plus modular scaffolding

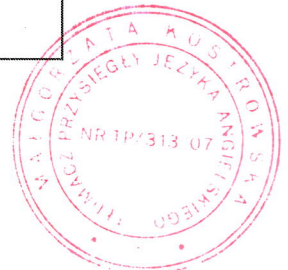
#### Construction

The ROTAX Plus modular scaffolding consists of racks, longitudinal and transverse bolts, horizontal bolts, vertical ties, platforms, safety railings, supports, etc. in accordance with the list of elements below. A rack connector consists of a sleeve rack connector, which is a spigot on the top of a rack on which another rack is placed. The node between the beams, ties and racks consists of a wedge connection that is attached to rings welded to the upright. The communication consists of stairs mounted on additional stands next to the scaffolding. The components can be seen in the list below. All components are made of steel unless otherwise stated in the table below.

The scaffolding can be built in various combinations of width, length and height.

Item name	Dimensions [m]	Index
Adjustable steel stand	0,4, 0,6, 0,8, 1,5	E511204 - E511208,
Adjustable steel stand		E511313
Steel rack	0,5, 1,0, 1,5, 2,0, 2,5, 3,0, 3,5, 4,0	E371405 — E371440
Stand without spigot connector	0,5, 1,0, 1,5, 2,0, 2,5, 3,0, 3,5, 4,0	E371505 — E371540
Horizontal steel bolt	0,73, 1,09, 1,57, 2,07, 2,57, 3,07	E371807 — E371830
U-bolt	0,73, 1,09	E372407 — E372411
Double U-bolt	1,57, 2,07, 2,57, 3,07	E373515 — E373530
Platform protection	0,36, 0,73, 1,09, 1,57, 2,07, 2,57, 3,07	E374503 — E374530
Steel platform 0.32 m - U	0,73, 1,09, 1,57, 2,07, 2,57, 3,07	E491307 — E491330
Aluminum platform 0.32 m - U	0,73, 1,09, 1,57, 2,07, 2,57, 3,07	E491507—E491530
Steel platform 0.32 m - U	0,73, 1,09, 1,57, 2,07, 2,57, 3,07	E491607—E491630

*[Handwritten signature]*



Steel platform 0.19 m U - ECO	0,73, 1,09, 1,57, 2,07, 2,57, 3,07	E491807 — E491830
Aluminum and plywood platform 0.61 m - U	1,09, 1,57, 2,07, 2,57, 3,07	E491910— E491930
Plus transition platform with ladder 0.61 m - U	2,57, 3,07	E492125 — E492130
Wooden curb	0,73, 1,09, 1,57, 2,07, 2,57, 3,07	E375107 — E375130
Steel curb	0,73, 1,09, 1,57, 2,07, 2,57, 3,07	E375507 — E375530
Vertical tie, height = 2.0	0,73, 1,09, 1,57, 2,07, 2,57, 3,07	E373107 — E373130
Steel support 0.39 m - U	0,39	E374103
Steel support 0.73 m - U	0,73	E374107
Transverse tie 1.77 m		E285179
Girder with U-profile	2,57, 3,07, 4,14, 5,14, 6,14	E376725 — E376761
Aluminum lattice girder	0,4 x 3,0, 4,0, 5,24, 6,0, 6,24 0,4 x 3,24, 4,24, 5,24, 6,24	E501230— E501262 E501330— E501360
Aluminum bridge traverse	0,6, 0,9, 1,2, 1,6, 1,9, 3,0, 4,0, 5,0, 6,0	E501006 — E501060
Aluminum stairs 1.22/1.0 - U		ZZA081
Aluminum stairs - U	2,57, 3,07	E286225 — E286230
External stair railing U	2,57, 3,07	E374925 — E374930
External stair railing	2,57, 3,07	E395025 — E395030
Internal stair railing		E283600
Spacer anchor connector with hook	0,4, 0,5, 0,8, 1,1, 1,3, 1,5, 1,9	E286504 — E286519
Elevator wheel to support		E552100
Elevator wheel support		E552000
Stair railing		E286305
Mounting post		E206600
Telescopic handrail	1,5-2,07, 2,07-3,07	<b>E206800</b> , E206700
Disc connector		E371200

Other accessories: Connector for lattice girder, U connector for lattice girder, pipe connector with O adapter, handrail holder, anchor bolt with eye .

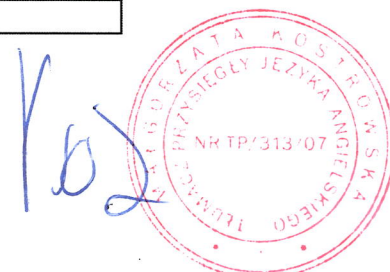
#### Dimensions

Item name	Dimensions [mm]
Steel rack	Ø 48,3 3,2
Horizontal steel bolt	Ø 48,3x2,7
Transverse U- bolt	U 53x48x2,5
Vertical tie	Ø 48,3x2,6
Adjustable steel stand	Round thread Ø38

#### Assessed system configurations

1. The assessed system configurations are shown in the table below.

System configuration	(1)
Load class	3



Usable load [kN/m <sup>2</sup> ]	2,0
Field length [m]	3,07
Field width [m]	1,09
Scaffolding level	Steel platform 0.32 m on all levels
Height between levels [m]	2,0
Construction height [m]	
-without supports	24,5
-with 0.39 m support on all levels	24,5
-with girder 1)	24,5

Note. Each individual load-bearing element must meet at least the load class shown above for the appropriate system configuration.

1) Version with beam, see drawing on page 6.

2. When assessing the system configuration, the maximum load capacity of the scaffolding was determined, i.e. the load capacity at a structure height of 25 m or higher and in the event of a scaffold break. This rating provides rack loads that can be used in simplified calculations, see Conditions of Use point 1.

3. The scaffolding is anchored to the wall in accordance with the conditions of use point 8.

The maximum design anchoring force perpendicular to the façade is 3.3 kN.

The maximum design anchorage forces in anchors that can transfer horizontal forces (V-shaped anchorage) are 3.1 kN and 3.1 kN parallel and perpendicular to the façade, respectively.

4. The maximum design force acting on the ground is 20 kN/rack in the version with or without supports. With the girder creating an opening in the scaffolding, the maximum design force acting on the ground is 23 kN/rack.

5. The calculations were carried out assuming that work is carried out only on one level.

6. During the type examination, the assembly instructions "Rotax" modular steel scaffolding, version 2023-07, in Swedish were checked.

#### 24 m system configurations

[Sketch]

Scaffolding without supports in accordance with the table in point 1.

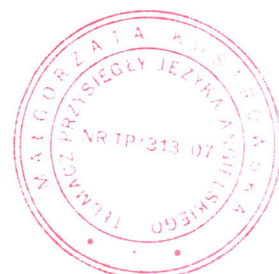
[Sketch]

Scaffolding with supports according to the table in point 1.

[Sketch]

Scaffolding with girders in the table in point 1. Additional wall supports are placed at a height of 2.5 m on each side of the opening and above the internal girder at a level of 6 m according to the above sketch. In addition, wall supports according to point 3. Additional vertical ties on the left side of the opening as shown in the sketch above. In addition, vertical ties in accordance with the Terms of Use section.

*Koz*



## Terms of use

1. In the case of simplified dimensioning, the permissible load on the rack may be applied in accordance with the table below, provided that the remaining conditions below are met. In the case of simplified dimensioning according to the partial factor method, the dimensional load capacity is calculated by multiplying the permissible load of the rack by 1.5.

	Permissible load on the rack
<b>Without supports</b>	10,1
<b>With 0.39 m supports on all levels, under the support*</b>	13,4*
<b>With 0.39 m supports on all levels, not under the support</b>	11,7

\* Refers to the maximum load of the rack under the support

2. The height of the clearance between the working area should correspond to the H2 height class, which means the height of the clearance between the working area and the transverse bolt of at least 1.90 m, alternatively between the working area and the longitudinal bolt when widening the scaffolding with supports. The clearance height between the working plane and any horizontal bracing must be at least 1.90 m, regardless of the height class.
3. Each working area must be equipped with a horizontal or transverse bolt both from the inside and outside. The lowest layer of the working area must always be placed at the lowest possible level.
4. The working area lined with platforms should be equipped with two-piece guardrails or guardrail frames and curbs if the fall height is two meters or more.
5. Vertical diagonal ties, parallel to the façade, should be placed at least in every 5th bay and always in the outer bays with a bay length of 2.57 m. In the case of longer bays, vertical diagonal braces parallel to the façade must be placed at least in every 4th field and always in the outer fields.
6. 2.0 m long stands may only be used at the top of the scaffolding and never higher than the upper half of the height. However, even shorter stands can only be used at the top of the scaffolding.
7. The maximum length of the unscrewed stand is 0.5 m.
8. The scaffolding should be anchored to the wall at a height of every 4 meters to the internal stand at the point where the stand is connected to the transverse bolt. The lowest anchorage can be placed at a maximum height of approximately 4.5 m above ground level.

Anchorage that can absorb horizontal forces should be used at least every 5 stands in a row at each anchor level.

For scaffolding covered and/or at a height greater than 24 m, higher wind loads and therefore higher anchoring forces may occur.



9. If supports are used, the space between the main plane and the surface of the support should be covered, usually with a longitudinal bolt or other means.
10. The communication system consists of stairs mounted on two additional racks on the outside of the scaffolding, together with the elements intended for this purpose. The passage should be equipped with a two-piece stair railing both on the outside and inside, two-piece handrails on the front surfaces and a curb on the lower front surface. The top level should be equipped with a shorter stair handrail. On planes where there are no adjacent platforms, the resting planes should be supplemented with two-piece safety railings for the scaffolding.
11. System-independent components used, such as beams, stairs and pipe connections, must be type tested.

### Installation instructions

Assembly instructions must be attached to the scaffolding when it is handed over to the user.

### Application

The type examination certificate applies to scaffoldings manufactured by manufacturers in accordance with the type examination certificate and whose materials, dimensions and structure correspond to the type examination standard.

You must not build a scaffolding using elements from another scaffolding without carrying out a detailed load-bearing test.

### Load capacity of elements

#### Bolts

The following permissible loads apply to the O-bolt.

	Length (m)					
	3,07	2,57	2,07	1,57	1,09	0,73
<b>Evenly distributed loads (kN/m)</b>	1,4	2,0	3,1	5,2	11,5	22,5
<b>Concentrated load (kN)</b>	2,0	2,3	2,8	3,6	5,6	7,1

The following permissible loads and load classes apply to the U-bolt.

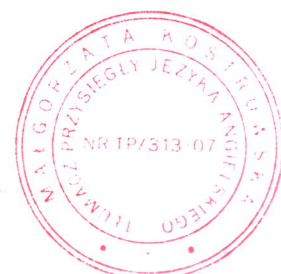
	Length (m)					
	3,07 <sup>1)</sup>	2,57 <sup>1)</sup>	2,07 <sup>1)</sup>	1,57 <sup>1)</sup>	1,09	0,73
<b>Evenly distributed loads (kN/m)</b>	<b>4,0</b>	5,7	9,7	16,3	9,3	23,2
<b>Concentrated load (kN)</b>	5,3	6,2	8,9	9,6	5,4	7,4

<sup>1)</sup> U- double bolt

#### Supports

When using supports, the following load classes apply.

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Type	Field length	Distributed load	Load class
Steel support 0.39 m - U	3,07	7,2	3
	2,57		3
	2,07		4
	1,57		4
	≤1,09		6
Steel support 0,73 m - U	3,07	7,9	3
	2,57		3
	2,07		4
	1,57		5
	≤1,09		6
Steel support 0,73 m — U with transverse tie 1,77 m	3,07	23,6	6
	2,57		6
	2,07		6
	1,57		6
	≤1,09		6

### Platforms

The following load classes and permissible loads with evenly distributed loads apply to platforms.

Type	Length cc - distance (m)	Width (m)	Load class	Maximum permissible distributed load (kN/m <sup>2</sup> )
Aluminum and plywood platform 0.61 m - U	≤3,07	0,61	3	2,0
Plus transition platform with ladder 0.61 m - U	2,57 - 3,07	0,61	3	2,0
Aluminum platform 0.32 m -	≤3,07	0,32	3	2,0
Steel platform 0.32 m - U	3,07	0,32	4	3,0
	2,57		5	4,5
	2,07		6	6,0
	1,57		6	6,0
Steel platform 0.32 m U - ECO	3,07	0,32	3	2,0
	2,57		4	3,0
	2,07		5	4,5
	1,57		6	6,0
Steel platform 0.19 m U - ECO	≤3,07	0,19	6	6,0

### Input values for dimensioning

The following values obtained from component tests can be used as input values when dimensioning the scaffolding load capacity in accordance with the SS-EN 12811-1 standard. All values given are calculated values, Rd.

[drawing]

[drawing]

Bending moment  $M_{y,d}$  and  $M_{z,d}$  Transverse force  $V_{z,d}$  and  $V_{y,d}$  Normal force  $N_d$



**Node - Bending moment in the vertical direction  $M_{y,r,d}$**

	Moment [kNcm]		Stiffness [kNcm/row]
Horizontal steel bolt	80,30		$7945.40\alpha/(1+51.52\alpha)$
		-87,45	$3417.68\alpha/(1+14.09\alpha)$
Transverse U-bolt	77,55		$13313.97\alpha/(1+90.44\alpha)$
		-83,08	$10367.16\alpha/(1+62.90\alpha)$

**Node - Bending moment in the horizontal direction  $M_{z,d}$**

Moment [kNcm]	Stiffness [kNcm/ row]
+15,56	$1343,87\alpha/(1+51.52\alpha)$

**Node- Vertical transverse force  $V_{z,d}$**

±45,0 kN

**Node - Horizontal transverse force  $V_{v,d}$**

±14,3 kN

**Node - Horizontal normal force  $N_d$**

±31,1 kN

**Disc connector**

When using a disc connector, the following dimensions apply. The disc connector does not replace disc racks, but can be used as a extension.

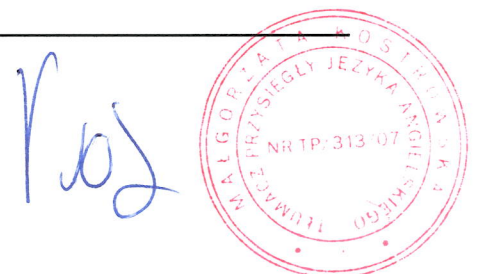
	Calculated values
Moment in the vertical direction, $M_{y,d}$	886,8 Nm
Bending moment in the vertical direction	57238 Nm/row
Transverse force in the vertical direction, $V_{z,d}$	A7,5 kN

**Vertical tie - stiffness relationship**

Modeled as a bar with articulated mounting

**Bridge - horizontal relationship of rotational stiffness**

In case of the input values of horizontal rotational stiffness specified for the component platforms of the scaffolding system, the certificate holder shall provide them.





I hereby certify that the above translation is consistent with the scan of the document in Swedish.

Izabela Zajac, sworn translator of Swedish, number on the list (of the Minister of Justice of the Republic of Poland) TP/14/23.

Ponice, Poland 14/05/2024

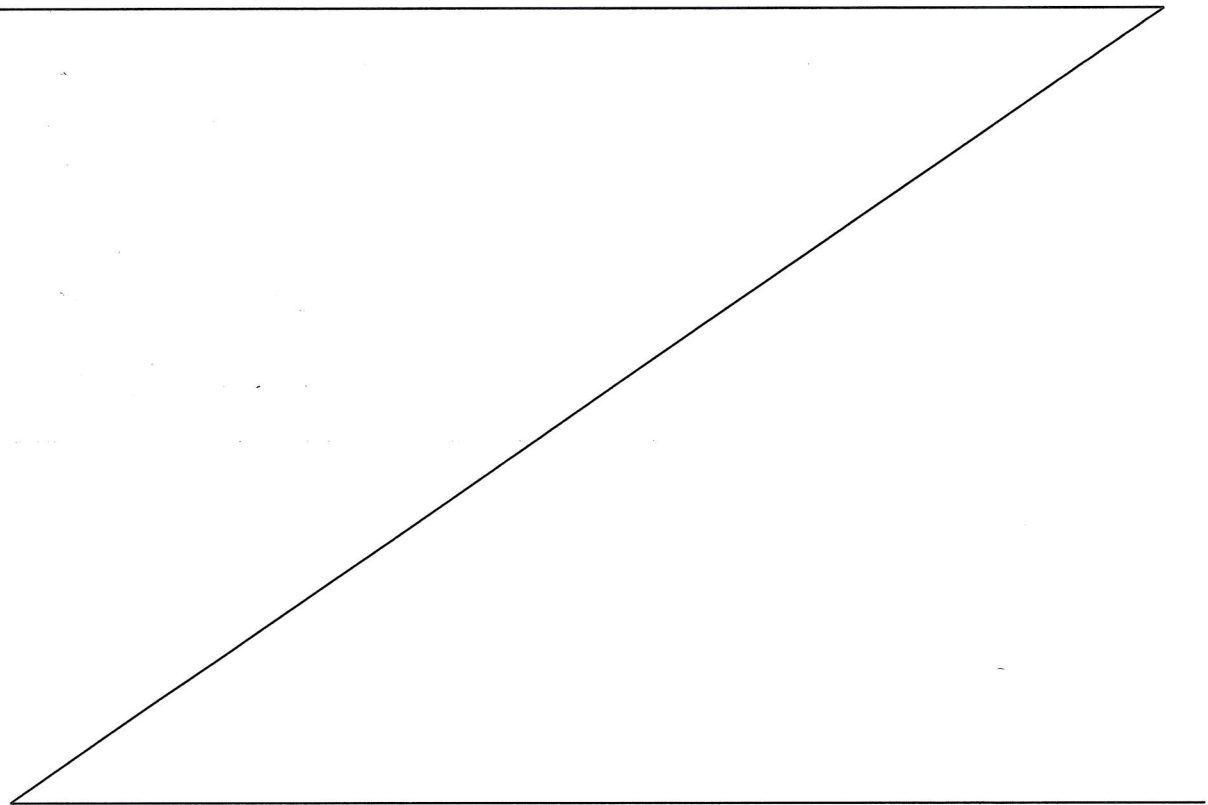
Number in the repertory: 45/24.

[at the bottom of each page there is a round stamp reading]:

Izabela Zajac, sworn translator of Swedish

No. TP/14/23

[and signature of Izabela Zajac]



*I, Małgorzata Kostrowska, Sworn English Translator, entered into the list of sworn translators kept by the Minister of Justice Entry No. TP/313/07, do hereby certify that the above document is a true and lawful translation of the original document prepared in Polish.*

*Translation No. 1685/2024*

*Date: 16.05.2024*

