



Rehab Care DK ApS
Avnvej 10
DK-7400 Herning

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Test report

Material: Model Mary 250
Mobile hoist ISO classification 12.36.03

Type:	Mobile hoist	Height actuator:	Item No 34320F+3L400141
SWL:	250 kg	Series no.	565
Weight:	45 kg	Date 2012-04-10	Materials:
			Welded steel profiles

See Appendix 2.

Sampling The test material was sampled by the client and received at the Danish Technological Institute on 05.11.2013.

Method: EN/ISO 10535:2006 Hoist for the transfer of disabled persons – Requirements and test methods.
4. General requirements and test methods
5. Mobile hoists
with the exception of the clauses 4.1.3: “Sound level”, 4.3.1.2: “Electrical safety”, 4.3.1.4: “Biocompatibility”, 4.3.1.23: “Electrical safety”, 4.11 “Hydraulic components” and 4.12 “Pneumatic components”.

The testing was carried out under normal indoor conditions.

Period: The testing was carried out in the period 05.11.2013-18.08.2014.

Result: Mary 250 meets the requirements in EN/ISO 10535:2006

Individual results appear from Appendix 1

Storage: The test material will be returned after 1 month, unless otherwise agreed.

Terms: The test was performed according to the attached conditions, which are according to the guidelines laid down by DANAK (The Danish Accreditation). The testing is only valid for the tested specimen. The test report may only be extracted, if the laboratory has approved the extract.

28-08-2014, Danish Technological Institute, Wood Technology, Taastrup

Test responsible

Verifier

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4. General Requirements

Section	Test	Comments	Results
4.1.1	Risk analysis	A risk analysis was not included in the testing.	
4.1.2	Ergonomics:		
	a) The distance between any handle (part intended to be grabbed) requiring an operating force of more than 10 N and any construction part of the hoist shall not be less than 35 mm.		Passed
	b) The distance between any upper surface of a pedal (in its operating position) and any other part of the hoist shall have a toe clearance of not less than 75 mm	No pedals	N/A
	c) The diameter of operating handles and/or knobs requiring an operating force of more than 10 N shall be between 19 mm and 43 mm	D= 28 mm	Passed
	d) For hoists operated from a standing position, pedals shall be placed not more than 300 mm above the surface of the floor		N/A
	e) For hoists operated from a standing position, hand operated controls shall be placed at a height from 800 mm to 1200 mm above the floor	Remote hand control – any height	Passed
	f) Handles for pushing and/or pulling shall be placed at a minimum height of 900 mm	Midpoint of handle placed at 1160 mm above ground -	
4.1.3	Sound level	Not included.	-

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4.3 GENERAL SAFETY

Section	Test	Comments	Results
4.3.1.1	Safe Working Load (SWL)	250 kg	-
4.3.1.2	Electrical safety	Not included	-
4.3.1.3	Materials	Welded and painted steel tubes – Normally used for these products	Passed
4.3.1.4	Biocompatibility	Not included.	-
4.3.1.5	Fasteners:	Load bearing fasteners are locked	Passed
4.3.1.6	Self-tapping screws:	Not used for said purposes	Passed
4.3.1.7	Handgrips:	Fixed handgrips.	N/A
4.3.1.8	Edges and corners:	All accessible edges, corners and surfaces are smooth	Passed
4.3.1.9	Correct assembly:		N/A
	Horizontally movement of load:		N/A
4.3.1.10	Shearing and crushing:	There are no points of shearing or crushing within normal reach	Passed
4.3.1.11	Limiting the load on the disabled person – vertical movement:	A built-in safety mechanism will limit the load on the disabled person to the mass of part of the lifting arm, which is app. 40 N.	Passed
4.3.1.12	Limiting the load on the disabled person – horizontal movement:		N/A
4.3.1.13	When operated, the means provided in 4.3.1.11 shall not allow the hoist to become unsafe	The hoist will not become unsafe.	Passed
4.3.1.14	Accessibility of controls:	Hand held control box – easily accessible	Passed
4.3.1.15	Emergency stop:	There is an emergency device at the battery box. Activated by pushing and deactivated by rotating.	Passed

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Section	Test	Comments	Results
		The device is coloured red	
4.3.1.16	Battery warning device:	Battery lamp both on the hand control and battery holder. Audible signal too. When operating, there is still more than one full lifting cycle available	Passed
4.3.1.17	“Hold to run” controls:	All controls are “hold to run” type	Passed
4.3.1.18	Limiting the lifting force:	The hoist is not able to lift more than 300 kg.	Passed
4.3.1.19	Safety device:	According to the supplier, there is a safety nut in the actuator	Passed
4.3.1.20	Flexible lifting devices:		N/A.
4.3.1.21	Inadvertent detachment of slings etc.:	The connection points are designed to prevent inadvertently detachment of the slings	Passed
4.3.1.22	Protection against inadvertent falling form the body support unit:	A body support unit was not included in the testing	N/A
4.3.1.23	Electrical safety:	Not included	-
4.3.1.24	IPxx class: Any electrical component that can be splashed during normal operation shall have an IP rating of at least IPx4. Any electrical component that can be submerged during normal operation shall have an IP rating of at least IPx7.	IPx4	Passed N/A
4.3.1.25	Connection points for body support units:		Passed
4.3.1.26	Stretchers:	No stretcher	N/A
4.4	Requirements for body support units:	No body support unit	N/A
4.5	Central suspension point		Passed
4.6	Requirements for the spreader bar:		
4.6.1.1	Safety device for adjustable spreader bar		N/A
4.6.1.2	Spreader bar supporting at least 1,5xSWL		Passed
4.6.1.3	In the instructions for use, information shall be given about the type(s) and design(s) of body support units, e.g. number of connection points, dimension and material of connections means,		Passed

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Section	Test	Comments	Results
	which can be used in combination with the spreader bar.		
4.6.1.4	Detachable spreader bars shall be marked with the maximum load of the hoist.		N/A

4.7 PERFORMANCE

Section	Test	Comments	Results
4.7.1.1	Field of application:	The hoist is designed for the purpose of lifting, transferring and positioning a disabled person. When used in accordance with the manufacturer's instructions, the hoist will fulfil these purposes	Passed
4.7.1.2	Cavities:	The hoist contains no cavities, in which water can accumulate	Passed
4.7.1.3	Stopping distance:	Distance measured < 10 [mm]	Passed
4.8	Rate of lifting and lowering		
4.8.1.1	Rate of lifting and lowering when loaded:	<u>Lifting:</u> s = 475 [mm] - t = 21,7 [s] v = 22 [mm/s] <u>Lowering:</u> s = 275 [mm] - t = 15,3 [s] v = 31 [mm/s]	Passed
4.8.1.2	Rate of lifting and lowering when unloaded:	<u>Lifting:</u> s = 275 [mm] - t = 8,8 [s] v = 31 [mm/s] <u>Lowering:</u> s = 318 [mm] - t = 10,0 [s] v = 32 [mm/s]	Passed

4.9 Operating forces/torques

4.9.1	Operating forces: The operating forces of those parts of the hoist that are designed to be operated by fingers, hands/arms or feet shall not exceed the following figures: <ul style="list-style-type: none"> • operation by using a finger 5 N • operation by using a hand/arm 105 N • operation by using a foot 300 N • operation by a turning 1.9 Nm 	Operating forces are measured as indicated in the table below Ref. table below. N/A. N/A. N/A.
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Application	1	2	3	4	5	Mean
Handheld control box	3,4	2,5	2,6	2,2	2,9	2,7

4.10 Durability

Section	Test	Comments	Results
4.10.1	<p>Durability:</p> <p>The durability testing took place as follows:</p> <p>1.000 cycles in the upper end without load</p> <p>1.000 cycles in the lower end.</p> <p>1.000 cycles in the upper end.</p> <p>8.000 cycles in the middle of the lifting area.</p>	<p>Duty cycle 10%</p> <p>The battery pack was parallel coupled by a stabilised 24 VDC power supply.</p> <p>No maintenance was done during the testing.</p> <p>Test with PLC driven control unit: 221</p>	Passed

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INFORMATION SUPPLIED BY THE MANUFACTURER

Section	Test	Comments	Results
4.13.2	Marking:		
	All operating controls shall be marked for their intended functions.		Passed
	Every hoist (and any main part of a multi-purpose hoist) shall be fitted with a permanently fixed identification plate which shall contain the following information as a minimum:		Passed
a)	Name and address of the manufacturer		Passed
b)	Model definition		Passed
c)	Lot or batch and serial number		Passed
d)	Year and month of manufacture		Passed
e)	Electrical details including protection class		Passed
f)	Details of any other energy source		N/A
g)	Maximum load	250 kg.	Passed
h)	The product IP rating (where applicable, see 4.3.1.24)	IPx4	Passed
4.13.3	Instructions for use:		
a)	Name address and telephone number		Passed
b)	Check list before use.		Passed
c)	The intended use of the hoist		Passed
d)	Expected lifetime of the product.		Passed
e)	Sufficient drawings/illustrations in order to show the key dimensions described in i) below.		Passed
f)	Name, address and telephone to contact for service.		Passed
g)	Method of cleaning and disinfection		Passed
h)	Details for trouble shooting/assistance.		Passed
i)	Technical specifications: <ul style="list-style-type: none"> • Dimensions • Maximum load • Safety precautions • Total mass of the unloaded hoist • The A-weighted sound power level (see 4.1.3) • Operating forces of controls • The designs and types of body support units 		Passed Passed Passed Passed Passed Passed Passed
j)	Electrical information in accordance with IEC 60601 – 1		Passed
k)	Limits of accuracy of any measuring device	No device	N/A
l)	All the information needed to verify		N/A
m)	A list of replaceable spare parts shall be available		Passed
n)	Any warning according to the risk assessment		Passed
o)	An indication of the forward direction of travel.		Passed

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5. – MOBILE HOISTS - SPECIFIC REQUIREMENTS

5.2 STATIC STRENGTH

Section	Test	Comments	Results
5.2.1	Requirements for static strength		Passed

5.2.2 TEST RESULTS

Loading and deformations are made as indicated in the table below:

Loading	Deformation before load	Deformation during load	Deformation after load
125 % SWL for 5 minutes tilted 10° forwards	Tested – deformations not measured. 1)		
125 % SWL for 5 minutes tilted 10° backwards			
125 % SWL for 5 minutes tilted 5° to the left side			
125 % SWL for 5 minutes tilted 5° to the right side			
150 % SWL for 20 min. on a horizontal surface	0 mm	65 mm	5 mm

Comments:

1) Clamped to inclined surface.

5.3 STATIC STABILITY

Section	Test	Comments	Results
5.3.1	Requirements for static stability: a) Forwards and backwards directions 10° with the base in the intended travelling position. b) Forwards and backwards directions 7° with the base in its most adverse condition. c) Any other direction, 5°		Passed Passed Passed

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5.3 TEST RESULTS

Tipping angles are measured as indicated in the table below.

Adjustment of hoist	TIPANGLE Loaded	TIPANGLE Unloaded
Forward stability: <ul style="list-style-type: none"> Horizontal lifting arm, narrow base Horizontal lifting arm, wide base 	>10 ° 9,9 °	> 15.0° > 15.0°
Left side stability: <ul style="list-style-type: none"> Horizontal lifting arm, narrow base Max. height, narrow base 	5,4 ° 5,6 °	> 15.0° > 15.0°
Right side stability: <ul style="list-style-type: none"> Horizontal lifting arm, narrow base Max. height, narrow base 	5,7° 6,2°	> 15.0° > 15.0°
Backward stability: <ul style="list-style-type: none"> Max. height, wide base 	8,5 °	> 15.0°

5.4 Immobilizing device (brakes)

Section	Test	Comments	Results
5.4.1	Immobilising devices	Movement<10mm	Passed

5.5 Moving forces

Section	Test	Comments	Results
5.5.1	Starting 160 N	Moving forces are measured as indicated in the table below	Passed
	Driving (pushing/pulling) 105 N		Passed

Application	1	2	3	4	5	Mean
Starting forwards	142	113	94	112	91	110
Starting backwards	101	87	81	79	77	85
Driving forwards	61	53	76	73	73	67
Driving backwards	56	77	52	71	59	63

5.6 Instructions for use

Section	Test	Comments	Results
	a) Functional dimensions as given in figures 1, 12 and 14.	2700 mm	Passed Passed Passed Passed
	b) The turning diameter.		
	c) The total mass of the hoist excluding body support unit.		
	d) The number of parts and the identification of those parts into which the hoist can be disassembled.		
	e) The mass of the heaviest part of the hoist.		

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Photo



Mary 250

The general conditions pertaining to assignments accepted by Danish Technological Institute shall apply in full to the technical testing and calibration at Danish Technological Institute and to the completion of test reports and calibration certificates within the relevant field.

Danish Accreditation (DANAK)

DANAK was established in 1991 in pursuance of the Danish Act No. 394 of 13 June 1990 on the promotion of Trade and Industry.

The requirements to be met by accredited laboratories are laid down in the "Danish Agency for Trade and Industry's ("Erhvervsfremme Styrelsens") Statutory Order on accreditation of laboratories to perform testing etc. and GLP inspection. The statutory order refers to other documents, where the criteria for accreditation are specified further.

The standards DS/EN ISO/IEC 17025 "General requirements for the competence of testing and calibration laboratories" and DS/EN 45002 "General criteria for the assessment of testing laboratories" describe fundamental criteria for accreditation. DANAK uses guidance documents to clarify the requirements in the standards, where this is considered to be necessary. These will mainly be drawn up by the "European co-operation of Accreditation (EA)" or the "International Laboratory Accreditation Co-operation (ILAC)" with the purpose of obtaining uniform criteria for accreditation. In addition, DANAK draws up Technical Regulations with specific requirements for accreditation that are not contained in the standards.

In order for a laboratory to be accredited it is, among other things, required:

- that the laboratory and its personnel are not subject to any commercial, financial or other pressures, which might influence their technical judgement

- that the laboratory operates a documented quality system
- that the laboratory has at its disposal all items of equipment, facilities and premises required for correct performance of the service that it is accredited to perform
- that the laboratory management and personnel have technical competence and practical experience in performing the service that they are accredited to perform
- that the laboratory has procedures for traceability and uncertainty calculations
- that accredited testing or calibration is performed in accordance with fully validated and documented methods
- that the laboratory keeps records, which contain sufficient information to permit repetition of the accredited test or calibration
- that the laboratory is subject to surveillance by DANAK on a regular basis
- that the laboratory shall take out an insurance, which covers liability in connection with the performance of accredited services

Reports carrying DANAK's logo are used, when reporting accredited services and show that these have been performed in accordance with the rules for accreditation.