



Report EU-type examination

Report belonging to EU-type examination certificate number	: NL17-400-1002-263-01
Date of issue of original certificate	: 17-11-2017
Certificate applies to	: Safety component
Revision number / date	: 6 / 26-11-2023
Assessment basis	 Lifts Directive 2014/33/EU Standards: EN 81-20:2020, EN 81-50:2020, EN 81-1:1998+A3:2009
Project number	: P230349

1. General specifications

Description of the product	:	Brake as Asc (ACOP) to pr movement of Movement Pr	event unco the car ar	ontrolled und as Unin	pward tended Car
Trademark	:	MONADRIVE	I		
Type no.	:	Brake type Brake torque Machines for 2:1 traction ratio Machines for 4:1 traction ratio	EMK7K 2x425 Nm MCK100	EMK9K 2x975 Nm MCK200; MCB100; MCB200 MCK200	EMK12K 2x2150 MCK300; MCK500 MCK300; MCK500
Name and address of the manufacturer	:	Suzhou Mona (Shanghai) No.66 Chang Wujiang Distr P.R. China.	fengdang	Road, Lili	Town,
Laboratory	:	SIOS, No.6, (Industrial par Longhua Dist	k, Qinghu	Dahe Roa	

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Address of examined safety component	 Suzhou Mona Drive Equipment Co.,Ltd. (Shanghai) No.66 Changfengdang Road, Lili Town, Wujiang District, Suzhou City, 215200 P.R. China.
Date of examination	: November 2023
Examination performed by	: E. Akcay/M. Issa

2. Description safety component

The Suzhou Mona Drive EMK7K-2x425 Nm, EMK9K-2x975 Nm and EMK12K-2x2150 Nm are brakes that consist of two independent electro-mechanical block brakes, which fulfils the requirements for lift brakes according to clause 5.9.2.2.2 of

EN 81-20:2020 mounted to gearless machines as displayed in the below table traction machine application data.

The brake parts act on the traction sheave (e.g. on the brake drum that is bolted to the traction sheave directly by bolts), connected to the drive shaft by key and keyway. In that case, the connections are proven to have built-in redundancy. The brakes are also used as holding brakes during normal lift operations. The brake lining is glued to the brake shoes and the shoes are bolted to the base.

ACOP

The Ascending Car Overspeed Protection shall be actuated by a governor overspeed contact or an equivalent EU-type tested device, which was no part of this investigation.

UCMP

The brake can be used as a braking element for Unintended Car Movement Protections according to clause 5.6.7 of EN 81-20:2020.

The brake torque for each type is pre-determined in the factory by the application of a fixed amount of guided compression springs. The torque is indicated on a label attached to the brake. This setting is sufficient until the air gap between magnetic core and brake lining exceeds 0,60 mm. Each brake part is separately provided with a monitoring contact. The controller of the lift in which these brakes are used, must check the signals from each brake contact according to clause 5.6.7.9 of EN 81-20:2020. If a failure is detected, the lift must be put out of service permanently.

The brake delay times t_{10} and/or t_{90} as indicated in this report shall be used to check by means of calculation that the stopping distance of the car fulfils the requirements. t_{10} means the time from activation until the moment that 10% of the nominal brake torque has been reached and t_{90} means the time from activation until the moment that 90% of the nominal brake torque has been reached.

A value of brake delay time between t₁₀ and t₉₀ can be interpolated if needed.

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The defined and calculated nominal torque per brake is the minimum guaranteed torque under the conditions which the manufacturer prescribes during the lifetime of the brake.

Brake Coil Connections

A brake connection box is mounted on top of the machine. It has a 110VDC input from a rectifier inside the lift control panel. Main contactors are on the DC side.

BRAKE DATA

Manufacturer	Suzhou	Mona Drive Equipm	ent Co.,Ltd.
Туре	EMK7K	EMK9K	EMK12K
Number of friction surfaces	2	2	2
Number of brake springs	2 x 10	2 x 4	2 x 8
Air gap between brake sheave and brake shoe [mm]	0,2-0,5	0,2-0,5	0,2-0,5
Max allowed tripping speed	278 rpm	308 rpm	257 rpm
Nominal torque	2 x 425 Nm	2 x 975 Nm	2 x 2150 Nm
Exciting / holding voltage [VDC]	110 / 110	110 / 110	110 / 110
t-10 (maximum value measured)	39 msec	53 msec	42 msec
t-90 (maximum value measured)	100 msec	147 msec	74 msec

TRACTION MACHINE APPLICATION DATA FOR TRACTION RATIO 2:1

Machine type Suzhou Mona Drive	MCK100	MCB100	MCK200	MCB200	MCK300	MCK500
Q=Nominal capacity range [kg]	320-630	320-630	320-1150	320-1150	630-1600	630-2000
P=Car mass range [kg]	400-1100	400-890	400-1600	400-1600	750-2280	750-2400
Rated torque [Nm]	340	320	780	780	1110	1660
Roping factor	2:1	2:1	2:1	2:1	2:1	2:1
Brake sheave diameter [mm]	398	509	525	680	667	667
Traction sheave diameter [mm]	320	320	400 / 450	400 / 480	400 / 480	480
Max. rpm traction sheave /speed lift	209 rpm / 1,75 m/s	209 rpm / 1,75 m/s	239 rpm / 2,5 m/s	239 rpm / 2,5 m/s	199 rpm / 2,5 m/s	199 rpm / 2,5 m/s
Max. tripping rpm / speed ACOP	278 rpm / 2,33 m/s	278 rpm / 2,33 m/s	308 rpm / 3,225 m/s	308/ 3,225 m/s	257 rpm / 3,225 m/s	257 rpm / 3,225 m/s
Bolted connection traction sheave - brake disc	8 x M12	6 x M10	8 x M12	6 x M12	6 x M16	6 x M16
Max. allowed lift inertia ACOP [kgm ²]	40	40	40	40	40	40

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Machine type Suzhou Mona Drive	MCK200	MCK200	MCK300	MCK500
Q=Nominal capacity range [kg]	1260-2300	1260-2000	1260-3200	1260-4000
P=Car mass range [kg]	1500-3200	1500-2800	1500-4560	1500-4800
Rated torque [Nm]	780	780	1110	1660
Roping factor	4:1	4:1	4:1	4:1
Brake sheave diameter [mm]	525	525	667	667
Traction sheave diameter [mm]	400	450	400 /450 /480	480
Rpm traction sheave /speed lift	239 rpm / 1,25 m/s	212 rpm / 1,25 m/s	199 rpm / 1,25 m/s	199 rpm / 1,25 m/s
Max. tripping rpm / speed ACOP	336 rpm / 1,76 m/s	299 rpm / 1,76 m/s	280 rpm / 1,76 m/s	280 rpm / 1,76 m/s
Bolted connection traction sheave - brake disc	8 x M12	8 x M12	6 x M16	6 x M16
Max. allowed lift inertia ACOP [kgm ²]	20	20	20	20

TRACTION MACHINE APPLICATION DATA FOR TRACTION RATIO 4:1

See annex 1 for a general overview of the product

3. Examinations and tests

The examination covered a check whether compliance with the Lifts Directive 2014/33/EU is met, based on the harmonized product standards EN 81-20:2020 and EN 81-50:2020.

The examination included:

- Examination of the technical file (See annex 2):
- Check of performed calculations according to EN 81-20:2020 and EN 81-50:2020.
- Examination of the representative model in order to establish conformity with the technical file.
- Inspections and tests to check compliance with the essential requirements of the EN 81-50:2020; clauses 5.7 and 5.8 at Shenzhen Institute of Special Equipment Inspection and Test (SIOS).

All results are described in the following SIOS Test Reports:

	EMK7K	EMK9K	EMK12K
ACOP	2022AF1076	2022AF0836	2022AF0837
UCMP	2022AF0798	2022AF1002	2022AF0977

Liftinstituut recognizes the tests and the results by this ISO 17025 accredited laboratory.

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- Tests to verify the required monitoring according to clause 5.6.7.3 of EN 81-20:2020.
- The machine was placed on a test stand with a coupling to an intermediate shaft with a torque meter. (See annex 1d). On the other side of this intermediate shaft is an electric driving motor with overrated power to the shaft. The torque is stored as a function of time with a digital oscilloscope.
- The torque meter was calibrated in advance by an ISO 17025 accredited laboratory.
- The test stand is provided with additional flywheels that can be coupled to the setup but the inertia of the test stand on its own (> 40 kgm²) was found to be more than the maximum inertia for the application range defined for the ACOP for these traction machines.
- The electromotor is run with high torque at the highest speed anticipated before deceleration occurs (tripping rpm's of the brake). These maximum tripping rpm's are calculated based on the maximum tripping speed of the applied overspeed governor, which overspeed tripping contact activates the brake as ACOP. After constant speed is reached, the brake holding voltage is cut and the brake set is applied until the machine has come to a full stop, while the electromotor continues giving the unbalance torque calculated from the maximum allowed unbalance for the applicable machine. This test is done 10 times in clockwise direction and 10 times in counter clockwise direction with the complete brake.
- The results of the torque measurement has been recorded and studied. From these results the dynamic torque and the reaction times t₁₀ and t₉₀ have been established. Also the functioning of the monitoring contacts has been tested. Immediately after each test the temperature of the brake housing and brake discs was checked.
- The test has been performed with brake contactors on the DC side. DC values for each brake are mentioned in chapter 2 of this report. The power to the brake shall always be interrupted on DC side to ensure the specified delay times.

4. Results

4.1 Calculations

Calculations of the maximum torque of the machine/system and brake torque were checked and found in order.

Brake clutch surface pressure calculations and brake spring calculations were checked and found in order.

The strength calculations of connecting bolts between the brake disc and traction sheave were checked and found in order.

Calculations of acceleration, retardation and stopping distances were checked and found in order.

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4.2. Measurements

The tests on the test bench showed that the measured torque of the brake was significantly higher than the calculated torque by the manufacturer and that the brake is capable of absorbing sufficient kinetic energy.

After the final examination the product and the technical file were found in accordance with the requirements.

5. Conditions

Additional to or in deviation of the applicable demands in the considered requirements / standards (see certificate and/or page 1 of this report), the following conditions shall be taken into account:

- The application of this certificate is limited to the brakes mentioned in chapter 2 used as brake set for lift applications. Each brake set consists of two independent electromechanical block brakes and fulfil the requirements for lift brakes according to clause 5.9.2.2.2 of EN 81-20:2020.
- Lifts to be built according EN 81-20:2020 shall fulfil clause 5.9.2.2.2.7 allowing that it is possible to test each brake set independently from outside of the well.
- This brake set can be used as braking element for an Ascending Car Overspeed Protection and as braking element for an Unintended Car Movement Protection according EN 81-20:2020.
- For Ascending Car Overspeed Protection the tripping speed of governor contact shall be according clause 5.6.6 of EN 81-20:2020.
- Any controller shall take the lift out of service when a fault in the correct lifting and dropping of the brake parts occurs.
- The Suzhou Mona Drive document "Installation and Maintenance manual" must be provided with every brake/machine, in order to make the correct installation and maintenance.
- The installer of the lift needs to define the final complete UCMP solution taking into account the key-parameters of the MCK100 machine with EMK7K brake, MCB100, MCB200 and MCK200 machine with EMK9K brake or the MCK300 and MCK500 machine with EMK12K brake as UCMP stopping means.
 An additional calculation shall be done to check whether the deceleration and stopping

An additional calculation shall be done to check whether the deceleration and stopping distance of the car is within the limits as required by EN 81-20:2020.

- In case of no releveling and no pre-door opening condition, there is no need of any additional safety devices for unintended car movement protection, but only where this brake is mounted on a gearless machine. The controller of the lift must check the signal from the brake monitoring contacts. If a failure is detected, the lift must be put out of service. Its release or the reset of the lift shall require the intervention of a competent person.
- The brake must be interrupted at the DC side of the brake connection to ensure the specified delay times t_{10} and t_{90} .
- The components are according to the descriptions of chapter 2 in this report.

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6. Conclusions

Based upon the results of the EU-type examination and the Test reports of SIOS, Liftinstituut B.V. issues an EU-type examination certificate.

The EU-type examination certificate is only valid for products which are in conformity with the same specifications as the type certified product. The certificate is issued based on the requirements that are valid at the date of issue. In case of changes of the product specifications, changes in the requirements or changes in the state of the art the certificate holder shall request Liftinstituut B.V. to reconsider the validity of the certificate.

7. CE marking and EU-Declaration of conformity

Every safety component that is placed on the market in complete conformity with the examined type must be provided with a CE marking according to article 18 of the Lift directive 2014/33/EU under consideration that conformity with eventually other applicable Directives is proven.

Also every safety component must be accompanied by an EU declaration of conformity according to annex II of the Directive in which the name, address and Notified Body identification number of Liftinstituut B.V. must be included as well as the number of the EU-type examination certificate.

An EU type-certified safety component shall be random checked e.g. according to annex IX of the Lift directive 2014/33/EU before these safety components may be CE-marked and may be placed on the market. For further information see regulation 2.0.1 'Regulations for product certification' on www.liftinstituut.com.

Prepared by:

Mohamed Issa Product Specialist Certification

Certification decision by:

P.J. Schaareman Product Manager C&S

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Annexes

Annex 1.a Outline drawing of EMK7K 2x425 Nm brake

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Annex 1.b Outline drawing of EMK9K 2x975 Nm brake

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- Page	5 30000ve 33.66	win w. Sign Date sureard: Material Walf scale	traction machine	Permanent magnet synchronous Sizio		Code Name	Dead plate(right) 1 Subassembly	Dead plate(left) 1 Subassembly	M929206012 Serie land screet 20X12 12	M944201000 Both sides \$10 8	M920210120 Sector and M0-120 8	M326201601 Spring seat 8 0235A	M326301602 Big spring B VDGrSi	M904201000 Steel ball of 8	M326501602 Cone spiral 2 VDGrSi	M953101000 Ilexason this M10 2	M942101000 Normal spring 10 2	Hoxagon mut M10 2	12 M326001601 Big gasket 2 45	13 M323301601 Israke-releasing 2 Q345B	14 M323601601 Support plate 4 0345B	Seeless cap across Mar 2 8	16 M952100600 Hexagon nut M6 8	17 M325901601 Flat snsket 16 45	18 M401901601 Disc Spring 32 GB/T1972-B14-1	19 M402301601 0nc-way ny ton 8	20 M402401601 Nylon screw 8	21 M402001601 Power module 2 MR-110. DC110V	22 M250701601 Vierosvitch 2	23 M926104027 Interest Mar27 4	24 M940100400 Gesket \$4 4	Anockout-pin 2 0235A	The second secon
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Annex 1.c Outline drawing of EMK12K 2x2150 Nm brake

3001	M25000300	Ľ	-	L			Audit			Outor hoysoon		_
		1	_			Approve	Check III	0 01 0.01	2	Hexagon nut M5 2	27 M952100500	
Machine j	Brake assembly(Machine room,		Relation Sealo	Vo. of res.	Date Haterial Vo.	andurdi-	Mark Him Him	0.01 0.02	+-	pair head some M6x10	28 M926106010	
20 20 20			traction machine	ction m		1 1	2	0.02 0.18	stainless steel	Knockout-pin 8	29 M326103601	
puipment Co	Suzhou WMA Drive Equipment Co., Ltd.		t synchrone	t magne	Permanent			12.56 25.12	2	Wovable plate 2	30 M250203601	1
		-						0.09 0.68	ω.	Guide holt module 8	31 M250601601	1
Note	Frs. Total Weight	_	Material	Quality	Name	Code	Serial Co	0.01 0.01	2 Adhesive Sticker	Ånti-scalding 2 mark	32 M350601601	1
	19 19		Subassemb1y		Dead plate(right)		1 M250103601	0.01 0.01	2 Adhesive Sticker	Adjustment warning 2	33 M350701601	
	19 19		Subassembly	-	Dead plate(left)		C10 M250103602	0.19 0.38	2	Release lever 2	34 M250501601	
	0.01 0.06	0		: 12	Boxsgon social counter- such head serves 36×12		2 M929206012	0.01 0.02	+-	Blastic cylindrical pin \$6X18	35 M937206018	
	0.01 0.04	0		8	Both sides lock washer \$10		3 M944201000	0.01 0.01 0+Machine No.	1 Adhesive Sticker	Brake nameplate	36 M350003601	
Grade 10.9	0.09 0.74	0.		8	Soche: cup MIDx120		4 M920210130	0.01 0.01 1+Machine No.	Adhesive Sticker	Brake nameplate	37 M350003602	
	0.02 0.16		Q235A	8	Spring seat		5 M326201601	0.01 0.02	+ -	pun head somes M5x6 4	38 M926105006	
	0.06 0.96		VDGrSi	16	Big spring		6 M326401601	0.32 0.64	2 Q235	Cover 2	39 M323403601	
	0.01 0.04	0		8	Steel ball of rolling bearing		7 M904201000	0.01 0.01	Adhesive Sticker	Brake wiring diagram 2	40 M350501601	
	0.01 0.03		VDGrSi	2	Cone spiral spring	1007500	8 M326501602	0.01 0.01	Adhe	ACO Nameplate 2	41 M350302601	
	0.01 0.01	0.		0 2	llexagon thim M10		9 M953101000	0.18 0.36	2 Q345B	Support plate 2	42 M323603602	
	0.01 0.01	0		0 2	Normal spring∉10 gasker ∲10		10 M942101000					
	0.01 0.01	0		2	llexagon nut M10		11 M952101000				169	T
	0.02 0.04	0.	45	2	Big gasket		12 M326001607			- 1.0~1.2		15
	0.25 0.5		Q345B	2	Brake-releasing rotating body		13 M32330160		_			-
	0.24 0.48		Q345B	2	Support plate		14 M32360360		/		لم	>
	0.01 0.04	0		2 8	incke- cap screws/M6x/2		15 M921206012		40			
	0.01 0.04	0		8	llexagon nut M6		16 M952100600		32		ما صر :	*
	0.01 0.08	0	5+	16	Flat gasket		17 M325901607		33 		100	
	0.01 0.16		GB/T1972-B14-	32	Disc Spring		18 M4-01901601					342 300 107
	0.01 0.04	0		8	One way nylon column		19 M402301601)	34			
	0.01 0.04	0		8	Nylon screw		20 M40240160	1	35		_	
	.01 0.02)(110V 0.	MR-110, DC110V 0.01 0.02	2	Power module)01601	21 M402001601		Albert .	30	13 [4	S
	0.02 0.04	0.		2	Microswitch		22 M25070160		37			•
	0.01 0.02	0		4	Orosa recess pun head screw M4x27		23 M926104.027		39			
	0.01 0.02	0		4	Gasket Ø 4		24 M940100400					5
	0.01 0.03		0235A	2	Knockout-pin device		25 M323501601		4	23 24 25 26 27 28		
±0.5	14 54 TOL ±0.2	=2.0 Intern	±1.2	±0.8	$\frac{1}{2} \sum_{n=1}^{2} \frac{1}{n} \sum_{n=1}^{2} \frac{1}$	$\frac{ \sin e^{-1} \sin^2 T 0 }{ \sin e^{-1} \sin^2 T 0 } \pm 0, 1 = \pm 0, 2$	Fust Ederate projectica Inference				L	M950003001

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Annex 1.d: Test setup with EMK12K-2x2150 Nm brake and MCK500 traction machine



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Annex 2. Documents of the Technical File which were subject of the examination

Title	Document number	Date	
Design calculations	Annex.1	15-11-2017	
	Annex.1 Additional Calculations	30-10-2023	
Technical drawings	Annex.2	15-11-2017	
Risk Analysis	Annex.3	15-11-2017	
Assessment drawings	Annex.4	15-11-2017	
Product description	Annex.5	15-11-2017	
ACOP test reports:	2022AF1076	13-10-2022	
	2022AF0836	23-08-2022	
	2022AF0837	23-08-2022	
UCMP test reports:	2022AF0798	16-08-2022	
	2022AF1002	27-09-2022	
	2022AF0977	21-09-2022	
Manual	M050050038	22-05-2018	
	M050050014	22-05-2018	
TCF		07-2020	
		11-2023	

Annex 3. Reviewed deviations from the standards

EN xx-x par.	Requirement	Accepted design
-	-	-

Annex 4. Revision of the certificate and its report

Rev.:	Date	Summary of revision	
-	17-11-2017	Original.	
1	24-05-2018	Small adding to company name.	
2	23-07-2020	Adding machines MCB100 & MCB200 for EMK9K brake,	
		Textual adaptions,	
3	20-10-2021	Textual adaptions,	
		Adapted test report number 2016AF0786	
4	23-03-2022	Updated to EN 81-20:2020 and EN 81-50:2020	
5	17-11-2022	Certification renewal.	
6	03-11-2023	Added new calculations for traction ratio 4:1,	
		Updated UCMP and ACOP test reports,	
		Updated manual.	

--- End of report ---

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