



中国认可  
国际互认  
检测  
TESTING  
CNAS L0916

## TYPE-EXAMINATION CERTIFICATE ANNEXED TABLE (LIFT)

Certificate No.	TSX F35003820160038		
Equipment Type	Lift Ascending Car Overspeed Protection Means(speed reducing element)		
Product Name	Traction machine brake	Model/Type	EMK7K
No-load system mass range	928kg-2515kg	Rated load range	320kg-630kg
Structure type	Straightly driving electromagnetic drum (Two dividedly installed)	Rated speed range	0.25m/s-1.75m/s
Quantity	2	Working condition	Indoor
Explosion-proof method	Not applicable	Action part	Traction Sheave Shaft
Triggering Mode	Electric Trigger	Friction element material	non-asbestos friction pad
Elastic element type	Cylindrical helical compression spring		
<p>Note:</p> <p>The range of the system mass, rated load and rated speed are determined according to the type-test sample with the suspension ratio of 2:1, the values of other actual suspension ratios can be obtained by the following formulas:</p> <p>1) the applicable system mass=type-test system mass×actual suspension ratio÷suspension ratio in type test;</p> <p>2) the applicable rated load=type-test rated load×actual suspension ratio÷suspension ratio in type test;</p> <p>3) the applicable rated speed=type-test rated speed range÷actual suspension ratio×suspension ratio in type test.</p>			





中国认可  
国际互认  
检测  
TESTING  
CNAS L0916

# TYPE-EXAMINATION CERTIFICATE OF SPECIAL EQUIPMENT (LIFT)

No.TSX F35003820160038

A

Name of Applicant: Shanghai Mengtenali Drive Equipment Co.,Ltd.  
Registered Address of Applicant: No.575 Taogan Road,Sheshan Subarea,Songjiang Industrial Area,Shanghai  
Name of Manufacturer: Shanghai Mona Drive Equipment Co.,Ltd.  
Manufacturing address: No.575 Taogan Road,Sheshan Subarea,Songjiang Industrial Area,Shanghai  
Product category: Lift Safety Protection Device      Equipment Type: Lift Ascending Car Overspeed Protection Means(speed reducing)  
Product Name: Traction machine brake      Model/Type: EMK7K  
Initial Inspection Report No. 2016AF0786      The Verification Report No. /

With the type-test, it is confirmed that the product is compliance with the Regulation for Type Test of Lifts (TSG T7007-2016).

The sample is in compliance with Regulation of GB 7588-2003 Safety Rules for the Construction and Installation of Electric Lift (Including No.1 amending list) and EN81-1+A3:2009 Safety rules for the construction and installation of lifts-part 1:Electric lifts.

The certificate covers the following different products mentioned below: EMK7K

Please refer to the annex for the specific parameters and configuration about the covered products.



Date for Recertification: (电子)

Next Verification Before: 2018-07-15

## SHENZHEN INSTITUTE OF SPECIAL EQUIPMENT INSPECTION AND TEST GUANGDONG STATION OF ELEVATOR QUALITY SUPERVISION AND TEST

Notes: 1. The applicant has the responsibility to ensure the products being in compliance with standard and also ensure the consistence of product and type tested sample.

2. The certificate cannot apply to products produced after next verification date.

## Annex 3. Reviewed deviations from the standards

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

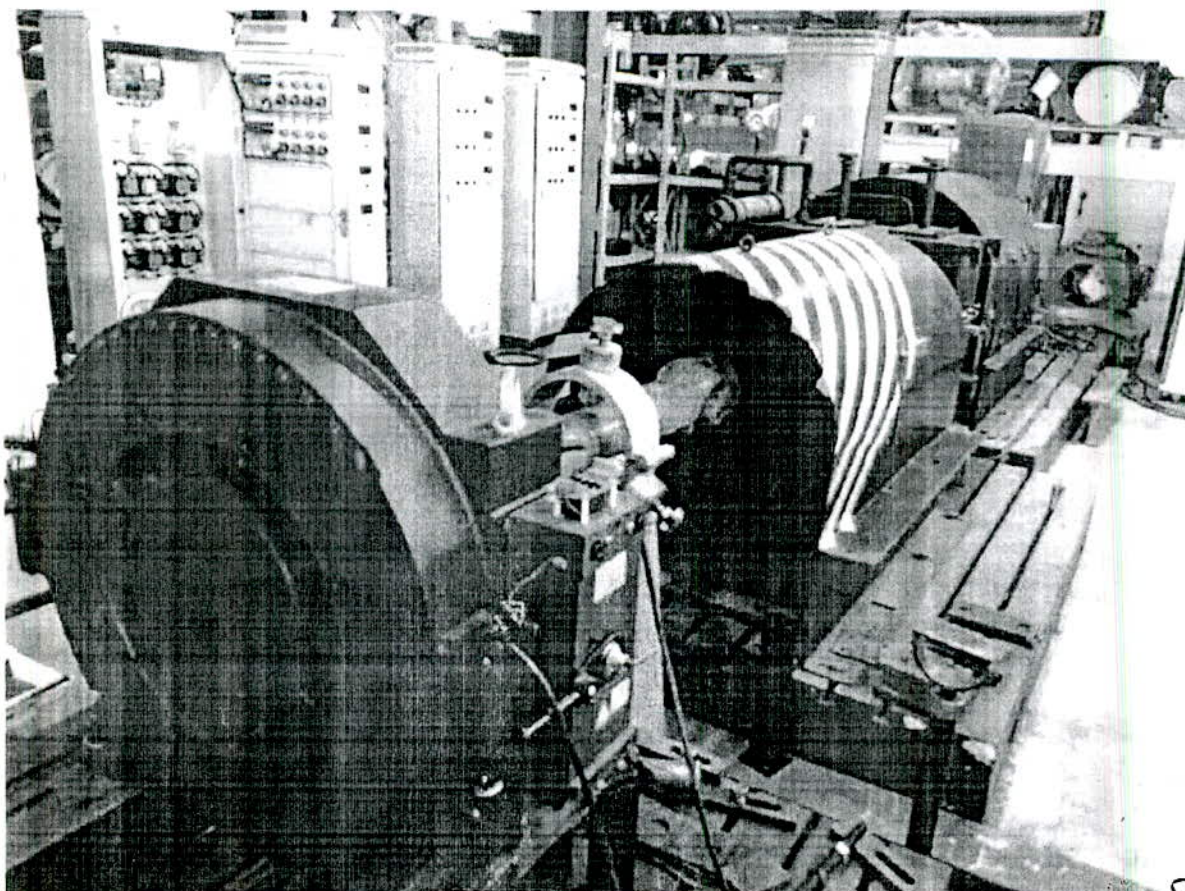
## Annex 4. Revision overview

### REVISIONS OF THE CERTIFICATE AND REPORT

Rev.:	Date	Summary of revision
-	17-11-2017	Original



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

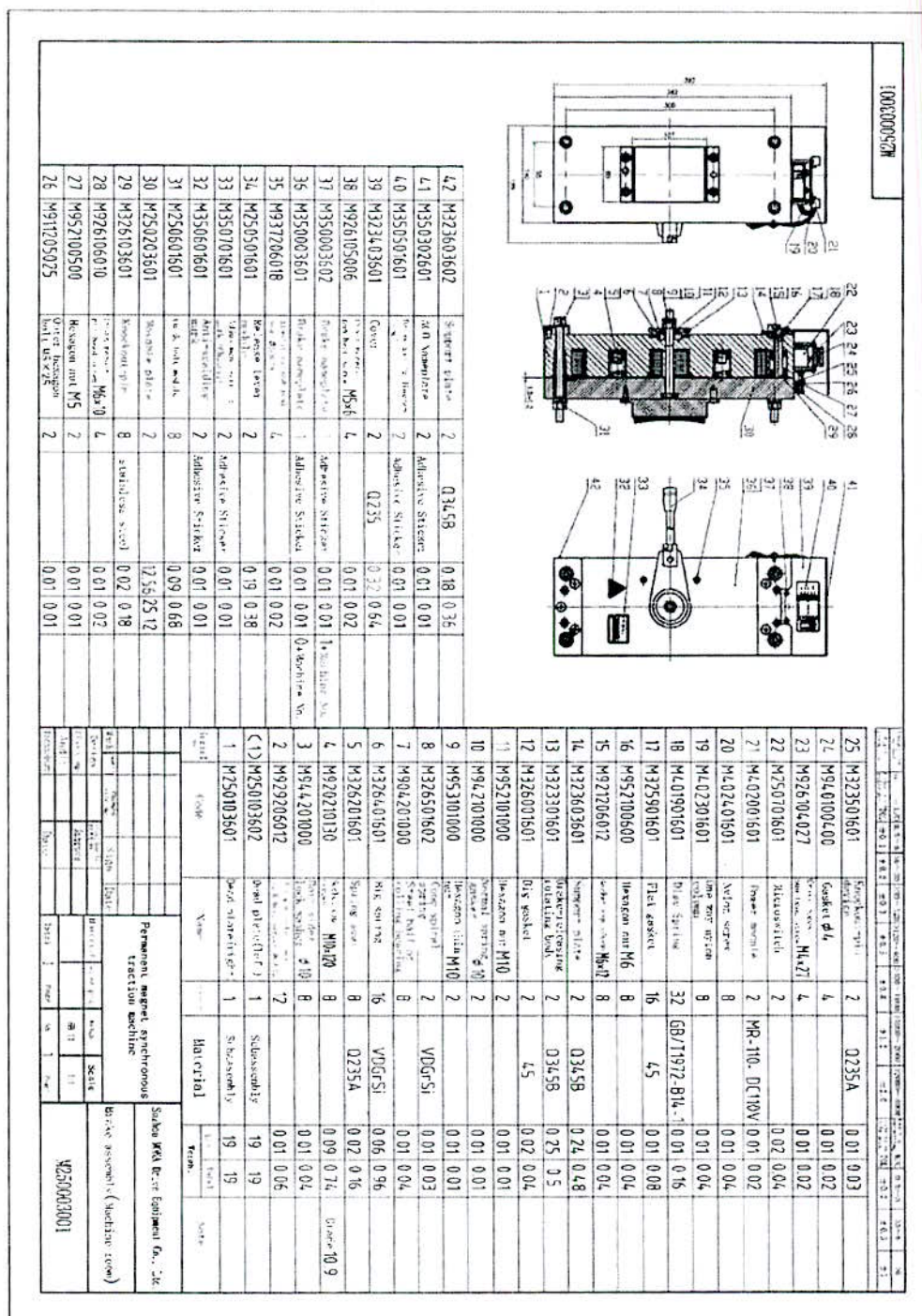


Annex 2. : Documents of the Technical File which were subject of the examination

title	document number	date
Design calculations	Annex.1	15-11-2017
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:	2016AF0768	16-07-2016
	2017AF0458	16-05-2017
	2016AF1298	30-11-2016
UCMP test reports:	2017AF0951	31-08-2017
	2016AF0707	06-07-2016
	2017AF0758	19-07-2017
Manual	Annex.10	15-11-2017

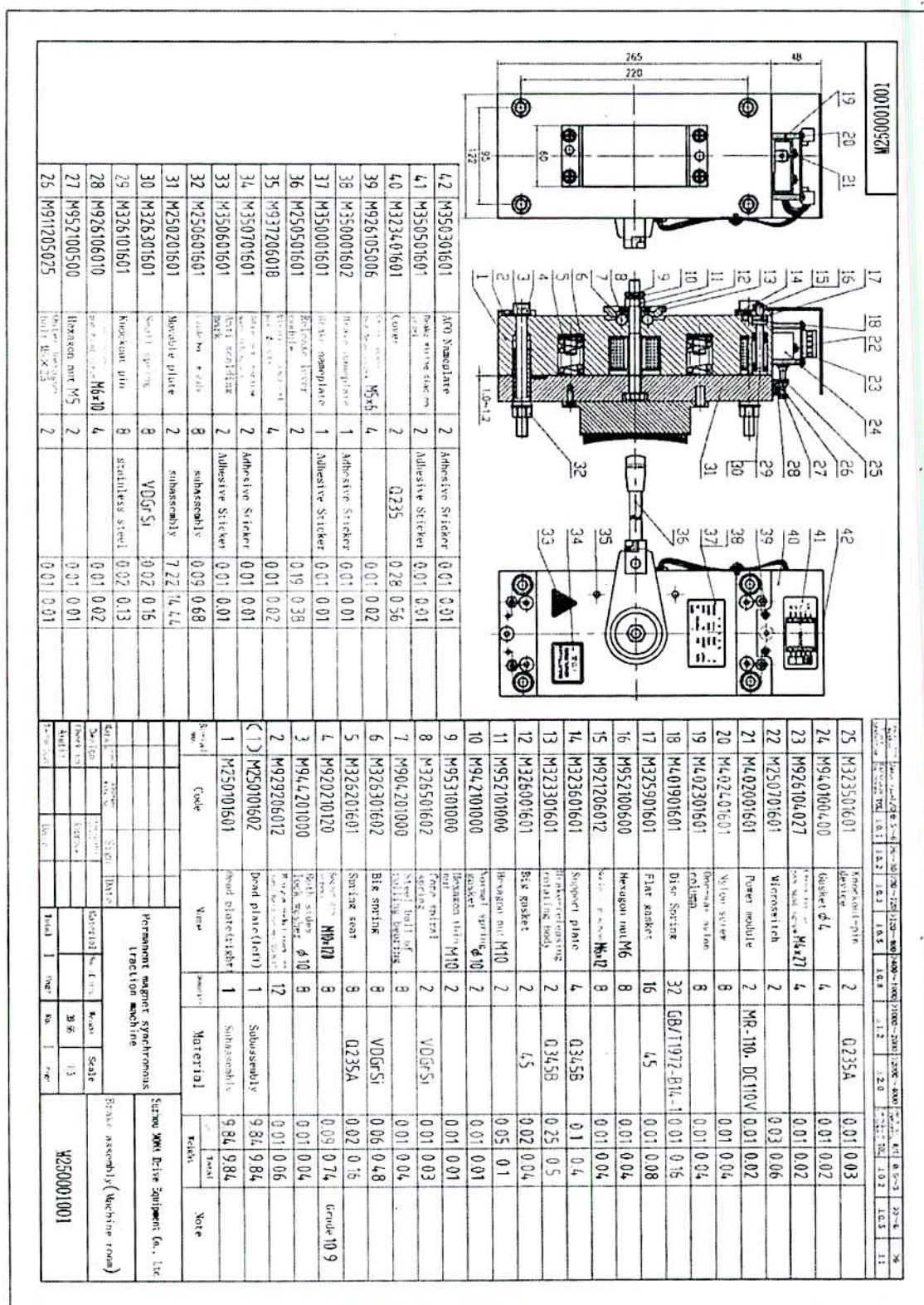


Annex 1c : Outline drawing of EMK12K 2x2150 Nm brake





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







## Annexes

## Annex 1a : Outline drawing of EMK7K 2x450 Nm brake

10002-1700A											
17	18	19	15	16	20	21	22	23	24	25	26
27	28	29	30	31	32	33	34	35	36	37	38
39	40	41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60	61	62
63	64	65	66	67	68	69	70	71	72	73	74
75	76	77	78	79	80	81	82	83	84	85	86
87	88	89	90	91	92	93	94	95	96	97	98
99	100	101	102	103	104	105	106	107	108	109	110
111	112	113	114	115	116	117	118	119	120	121	122
123	124	125	126	127	128	129	130	131	132	133	134
135	136	137	138	139	140	141	142	143	144	145	146
147	148	149	150	151	152	153	154	155	156	157	158
159	160	161	162	163	164	165	166	167	168	169	170
171	172	173	174	175	176	177	178	179	180	181	182
183	184	185	186	187	188	189	190	191	192	193	194
195	196	197	198	199	200	201	202	203	204	205	206
207	208	209	210	211	212	213	214	215	216	217	218
219	220	221	222	223	224	225	226	227	228	229	230
231	232	233	234	235	236	237	238	239	240	241	242
243	244	245	246	247	248	249	250	251	252	253	254
255	256	257	258	259	260	261	262	263	264	265	266
267	268	269	270	271	272	273	274	275	276	277	278
279	280	281	282	283	284	285	286	287	288	289	290
291	292	293	294	295	296	297	298	299	300	301	302
303	304	305	306	307	308	309	310	311	312	313	314
315	316	317	318	319	320	321	322	323	324	325	326
327	328	329	330	331	332	333	334	335	336	337	338
339	340	341	342	343	344	345	346	347	348	349	350
351	352	353	354	355	356	357	358	359	360	361	362
363	364	365	366	367	368	369	370	371	372	373	374
375	376	377	378	379	380	381	382	383	384	385	386
387	388	389	390	391	392	393	394	395	396	397	398
399	400	401	402	403	404	405	406	407	408	409	410
411	412	413	414	415	416	417	418	419	420	421	422
423	424	425	426	427	428	429	430	431	432	433	434
435	436	437	438	439	440	441	442	443	444	445	446
447	448	449	450	451	452	453	454	455	456	457	458
459	460	461	462	463	464	465	466	467	468	469	470
471	472	473	474	475	476	477	478	479	480	481	482
483	484	485	486	487	488	489	490	491	492	493	494
495	496	497	498	499	500	501	502	503	504	505	506
507	508	509	510	511	512	513	514	515	516	517	518
519	520	521	522	523	524	525	526	527	528	529	530
531	532	533	534	535	536	537	538	539	540	541	542
543	544	545	546	547	548	549	550	551	552	553	554
555	556	557	558	559	560	561	562	563	564	565	566
567	568	569	570	571	572	573	574	575	576	577	578
579	580	581	582	583	584	585	586	587	588	589	590
591	592	593	594	595	596	597	598	599	600	601	602
603	604	605	606	607	608	609	610	611	612	613	614
615	616	617	618	619	620	621	622	623	624	625	626
627	628	629	630	631	632	633	634	635	636	637	638
639	640	641	642	643	644	645	646	647	648	649	650
651	652	653	654	655	656	657	658	659	660	661	662
663	664	665	666	667	668	669	670	671	672	673	674
675	676	677	678	679	680	681	682	683	684	685	686
687	688	689	690	691	692	693	694	695	696	697	698
699	700	701	702	703	704	705	706	707	708	709	710
711	712	713	714	715	716	717	718	719	720	721	722
723	724	725	726	727	728	729	730	731	732	733	734
735	736	737	738	739	740	741	742	743	744	745	746
747	748	749	750	751	752	753	754	755	756	757	758
759	760	761	762	763	764	765	766	767	768	769	770
771	772	773	774	775	776	777	778	779	780	781	782
783	784	785	786	787	788	789	790	791	792	793	794
795	796	797	798	799	800	801	802	803	804	805	806
807	808	809	810	811	812	813	814	815	816	817	818
819	820	821	822	823	824	825	826	827	828	829	830
831	832	833	834	835	836	837	838	839	840	841	842
843	844	845	846	847	848	849	850	851	852	853	854
855	856	857	858	859	860	861	862	863	864	865	866
867	868	869	870	871	872	873	874	875	876	877	878
879	880	881	882	883	884	885	886	887	888	889	890
891	892	893	894	895	896	897	898	899	900	901	902
903	904	905	906	907	908	909	910	911	912	913	914
915	916	917	918	919	920	921	922	923	924	925	926
927	928	929	930	931	932	933	934	935	936	937	938
939	940	941	942	943	944	945	946	947	948	949	950
951	952	953	954	955	956	957	958	959	960	961	962
963	964	965	966	967	968	969	970	971	972	973	974
975	976	977	978	979	980	981	982	983	984	985	986
987	988	989	990	991	992	993	994	995	996	997	998
999	1000	1001	1002	1003	1004	1005	1006	1007	1008	1009	1010
1011	1012	1013	1014	1015	1016	1017	1018	1019	1020	1021	1022
1023	1024	1025	1026	1027	1028	1029	1030	1031	1032	1033	1034
1035	1036	1037	1038	1039	1040	1041	1042	1043	1044	1045	1046
1047	1048	1049	1050	1051	1052	1053	1054	1055	1056	1057	1058
1059	1060	1061	1062	1063	1064	1065	1066	1067	1068	1069	1070
1071	1072	1073	1074	1075	1076	1077	1078	1079	1080	1081	1082
1083	1084	1085	1086	1087	1088	1089	1090	1091	1092	1093	1094
1095	1096	1097	1098	1099	1100	1101	1102	1103	1104	1105	1106
1107	1108	1109	1110	1111	1112	1113	1114	1115	1116	1117	1118
1119	1120	1121	1122	1123	1124	1125	1126	1127	1128	1129	1130
1131	1132	1133	1134	1135	1136	1137	1138				



## 6. Conclusions

Based upon the results of the EU-type examination and the Test reports of SISE, 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 Lifts 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 Lifts 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](http://www.liftinstituut.com).

Prepared by:



W. Visser  
Product Specialist Certification  
Liftinstituut B.V.

Certification decision by:





#### 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

On the EU-type examination certificate the following conditions apply:

- 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 electro-mechanical block brakes and fulfil the requirements for lift brakes according article 5.9.2.2.2 of EN 81-20:2014.
- Lifts to be built according EN 81-20 shall fulfil Art. 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 81-20:2014.
- For Ascending Car Overspeed Protection the tripping speed of governor contact shall be according Art. 5.6.6 of EN 81-20:2014.
- 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, 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 distance of the car is within the limits as required by EN 81-20:2014.

- In case of no releveing 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 the descriptions of chapter 2 in this report.



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

- Tests to verify the required monitoring according to Art. 5.6.7.3 of EN 81-20.
- 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 ( $> 40 \text{ kgm}^2$ ) 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 clock wise 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  $T_{10}$  and  $T_{90}$  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.



**BRAKE DATA**

Manufacturer	Suzhou Mona Drive Equipment Co., Ltd.		
Type	EMK7K	EMK9K	EMK12K
Number of friction surfaces	2	2	2
Number of brake springs	2 x 10	2 x 4	2 x 8
Brake drum diameter [mm]	398	525	667
Air gap between brake drum 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**

Machine type Suzhou Mona Drive	MCK100	MCK200	MCK300	MCK500
Q=Nominal capacity range [kg]	320-630	320-1150	630-1600	630-2000
P=Car mass range [kg]	400-1100	400-1600	750-2280	750-2400
Rated torque [Nm]	340	780	1110	1660
Roping factor	2:1	2:1	2:1	2:1
Traction sheave diameter [mm]	320	400 / 450	400 / 480	480
Max. rpm traction sheave / speed lift	209 rpm / 1,75 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	308 rpm / 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	8 x M12	6 x M16	6 x M16
Max. allowed lift inertia ACOP [kgm <sup>2</sup> ]	40	40	40	40

### 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 EN81-20:2014 and EN81-50:2014. The examination included:

- Examination of the technical file (See annex 2):
- Check of performed calculations according to EN81-20 and EN81-50.
- 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 Art. 5.7 and 5.8 at Shenzhen Institute of Special Equipment Inspection and Test (SISE). All results are described in the following SISE Test Reports:

	EMK7K	EMK9K	EMK12K
ACOP	2016AF0768	2017AF0458	2016AF1298
UCMP	2017AF0951	2016AF0707	2017AF0758



EN81-20:2014, mounted to a MCK100, MCK200, MCK300 or MCK500 gearless machine.

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 operation of the lift. The brake material 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 braking element for Unintended Car Movement Protections according Art. 5.6.7 of EN 81-20:2014.

The brake torque for each type is pre-determined in the factory by 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 Art. 5.6.7.9 of EN 81-20:2014. 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  $T_{10}$  and  $T_{90}$  can be interpolated if needed.

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.



## Report EU-type examination

Report belonging to EU-type examination certificate no. : NL17-400-1002-263-01  
 Date of issue of original certificate : November 17, 2017  
 Concerns : Safety component  
 No. and date of revision : -  
 Requirements : Lifts Directive 2014/33/EU  
 Standards: EN81-20:2014, EN81-50:2014  
 EN 81-1:1998+A3:2009  
 Project no. : P171018

### 1. General specifications

Name and address manufacturer : Suzhou Mona Drive Equipment Co.,Ltd.  
 No.66 Changfengdang Road, Lili Town,  
 Wujiang District, Suzhou City, 215200  
 P.R. China.  
 Description of safety component : Brake as Ascending Car Overspeed  
 protection (ACOP) to prevent uncontrolled  
 upward movement of the car and as  
 Unintended Car Movement Protection  
 (UCMP) means  
 Type : EMK7K-2x425 Nm to be used on MCK100  
 machine.  
 EMK9K-2x975 Nm to be used on MCK200  
 machine.  
 EMK12K-2x2150 Nm to be used on  
 MCK300 and MCK500 machine.  
 Laboratory : SISE, No.6, Chuangye Road, near  
 Shunchengji Industrial park, Qinghu Dahe  
 Road, New Longhua District, Shenzhen,  
 P.R. China  
 Data of examination : August - November 2017  
 Examination performed by : W.Visser

### 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

# EU-TYPE EXAMINATION CERTIFICATE

Issued by Liftinstituut B.V.  
identification number Notified Body 0400,  
commissioned by Decree no. 2016-0000038870

Certificate no.	: NL17-400-1002-263-01	Revision no.:	-
Description of the product	: Brake as Ascending Car Overspeed protection (ACOP) to prevent uncontrolled upward movement of the car and as Unintended Car Movement Protection (UCMP) means		
Trademark, type	: Suzhou Mona Drive, EMK7K-2x425 Nm to be used on MCK100 machine, EMK9K-2x975 Nm to be used on MCK200 machine, EMK12K-2x2150 Nm to be used on MCK300 & MCK500 machine.		
Name and address of the manufacturer	: Suzhou Mona Drive Equipment Co., Ltd. No.66 Changfengdang Road, Lili Town, Wujiang District, Suzhou City, 215200 P.R. China.		
Name and address of the certificate holder	: Suzhou Mona Drive Equipment Co., Ltd. No.66 Changfengdang Road, Lili Town, Wujiang District, Suzhou City, 215200 P.R. China.		
Certificate issued on the following requirements	: Lifts Directive 2014/33/EU		
Certificate based on the following standard	: Parts of: EN 81-20:2014, EN 81-50:2014, EN 81-1:1998+A3:2009		
Test laboratory	: SISE, No.6, Chuangye Road, near Shunchengji Industrial park, Qinghu Dahe Road, New Longhua District, Shenzhen, P.R. China		
Date and number of the laboratory report	: 2016AF0768, 16-07-2016 2017AF0951, 31-08-2017 2017AF0458, 16-05-2017 2016AF0707, 06-07-2016 2016AF1298, 30-11-2016 2017AF0758, 19-07-2017		
Date of EU-type examination	: August – November 2017		
Additional document with this certificate	: Report belonging to the EU-type examination certificate no.: NL17-400-1002-263-01		
Additional remarks	: See chapter 2 and 5 of the report belonging to this EU- type examination certificate.		
Conclusion	: The safety component meets the requirements of the Lifts Directive 2014/33/EU taking into account any additional remarks mentioned above.		

Amsterdam

Date : 17-11-2017  
Valid until : 17-11-2022

ing. P.J. Peeters  
Manager

Certification decision by