



Test Report

Report No. INT NET 25-071

Name of product: Traction machine brake
Model of product: BLS
Applicant: Shenyang Bluelight Drive Technology
Co., Ltd.
Manufacturer: Shenyang Bluelight Drive Technology
Co., Ltd.

**National Elevator Inspection and Testing Center
NETEC Inspection and Testing (Beijing) Co., Ltd.**

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Name of product		Traction machine brake	
Model of product		BLS	
Product number		S25050009	Manufacturing date 2025-04-05
Applicant	Name	Shenyang Bluelight Drive Technology Co., Ltd.	
	Address	No.37 Shiji Road, Hunnan New District, Shenyang, China	
Manufacturer	Name	Shenyang Bluelight Drive Technology Co., Ltd.	
	Address	No.37 Shiji Road, Hunnan New District, Shenyang, China	
Manufacturing address		No.37 Shiji Road, Hunnan New District, Shenyang, China	
Test place	NETEC Laboratory		
Receiving date	2025-12-23	Sample No.	Y2025-1213
Sample state	No abnormality observed	Sample amount	1
Test date	2026-01-19		
Test condition	Ambient temperature: 12.8 °C, relative humidity: 21%		
Test basis	EN 81-20: 2020 Safety rules for the construction and installation of lifts — Lifts for the transport of persons and goods Part 20: Passenger and goods passenger lifts EN 81-50: 2020 Safety rules for the construction and installation of lifts — Examinations and tests Part 50: Design rules, calculations, examinations and tests of lift components		
Test conclusions	The test results of traction machine brake comply with the requirements of the standards in the test basis.		
Tested and reported by:		王红格	Date: 2026-04-07
Verified by:		苏建	Date: 2026-04-07
Approved by:		苏建	Date: 2026-04-07

1. Technical parameters and configuration of the sample

Name of product	Traction machine brake	Model of product	BLS
Product application	The traction machine brake can serve as a braking device acting on the traction sheave, forming part of the protection device against overspeed for the car moving in the upwards direction and serving as the braking element for protection against unintended car movement. For protection against ascending car overspeed, this traction machine brake shall be used in combination with a speed monitoring element to constitute a complete ascending car overspeed protection means. For protection against unintended car movement, this traction machine brake shall be used in combination with the detection subsystem and the self-monitoring subsystem to constitute a complete unintended car movement protection means.		
Type of the brake components	Traction machine brake	Suspension ratio	2:1
System total mass range	900 kg~14400 kg	Rated load range	320 kg~3000 kg
Balance coefficient range	0.40~0.50	Car mass range	386 kg~6450 kg
Traction machine brake	Model	BLS	
	Structure type	Disc type	
	Action position	Traction sheave shaft	
	Quantity	2 sets	
	Diameter of brake wheel (disc)	361 mm	
	Pitch diameter of traction sheave	400 mm	
	Material of friction element	Asbestos free composite material	
	Tripping mode	Trigger when losing power	
	Type of elastic element	Helical spring	
	Rated braking torque	$2 \times 2500 \text{ N} \cdot \text{m}$	
	Type and quantity of spring for brake	Material outer diameter $\times$ inner diameter $\times$ height: 3.2 mm $\times$ 9.7 mm $\times$ 43 mm Number of springs per brake: 28	
Ascending car overspeed protection means	Rated speed range	0.50 m/s~3.50 m/s	
	Tripping speed range	0.58 m/s~4.40 m/s	

1. Technical parameters and configuration of the sample (continued)

Unintended car movement protection means	Anticipated highest speed before deceleration occurs ^{Note1}	1.33 m/s
	Response time of stopping elements	≤210 ms
	Response time of detecting subsystem ^{Note2}	≤60 ms
	Response time of the cut-off brake power supply device ^{Note3}	≤68 ms
	Test speed for final inspection	0.25 m/s
	The distance limit corresponding to the test speed under the condition that the moving distance of the lift car does not more than 1.2 m	≤ 0.112 m (stopping distance, excluding moving distance before deceleration); or: ≤0.213 m (including the moving distance within the response time of the cut-off brake power supply device); or: ≤0.228 m (including the moving distance within the response time of the detection subsystem and the cut-off brake power supply device).
Note 1: When calculating the expected maximum speed of the car before deceleration, the distance between the selected detection device and the installed landing station is 0.12 m, which refers to the distance the car leaves the landing station when unexpected movement is detected; Note 2: The response time of the detection subsystem does not include the response time of the cut-off brake power supply device; Note 3: This device can be of the types of contactors, safety circuits containing electronic components that cut off the brake current, etc.		

2 Test items and results

No.	Standard No./ Items No.	Test contents and requirements	Test result
1	EN 81-20: 2020 §5.6.6.2	The means shall be capable of performing as required in 5.6.6.1 without assistance from any lift component that, during normal operation, controls the speed or retardation, or stops the car, unless there is built-in redundancy and correct operation is self-monitored. In the case of using the machine brake, self-monitoring could include verification of correct lifting or dropping of the mechanism or verification of the braking force. If a failure is detected, the next normal start of the lift shall be prevented.	Comply with requirement
2	EN 81-20: 2020 §5.6.6.3	The means shall not allow a retardation of the empty car in excess of 1 g _n during the stopping phase.	Maximum retardation: 9.151 m/s ² Comply with requirement
3	EN 81-20: 2020 §5.6.6.4	The means shall act on: a) the car; or b) the counterweight; or c) the rope system (suspension or compensating); or d) The traction sheave; e) The same shaft as the traction sheave provided the shaft is only statically supported in two points.	Acting on traction sheave shaft Comply with requirement
4	EN 81-20: 2020 §5.6.6.5	The means shall operate an electric safety device in conformity with 5.11.2 if it is engaged.	Triggered by the overspeed governor Comply with requirement
5	EN 81-20: 2020 §5.6.6.6	The release of the means shall not require access to the well.	Comply with requirement
6	EN 81-20: 2020 §5.6.6.8	After its release, the means shall be in a condition to operate.	Comply with requirement
7	EN 81-20: 2020 §5.6.6.9	If the means requires external energy to operate, the absence of energy shall cause the lift to stop and keep it stopped. This does not apply for guided compression springs.	Compression spring with guide applies pressure Comply with requirement

No.	Standard No./ Items No.	Test contents and requirements	Test result
8	EN 81-20: 2020 §5.6.6.11	The ascending car overspeed protection means is regarded as a safety component and shall be verified according to the requirements in EN 81-50:2020, 5.7.	Comply with requirement
9	EN 81-20: 2020 §5.6.6.12	On the ascending car overspeed protection means a data plate shall be fixed indicating: a) the name of the manufacturer; b) the type examination certificate number; c) the actual tripping speed for which it has been adjusted; d) the type of ascending car overspeed protection means.	Comply with requirement
10	EN 81-20: 2020 §5.6.7.3	The means shall be capable of performing as required without assistance from any lift component that, during normal operation, controls the speed or retardation, stops the car or keeps it stopped, unless there is built-in redundancy and correct operation is self-monitored. In the case of using the machine brake, self-monitoring could include verification of correct lifting or dropping of the mechanism or verification of the braking force. If a failure is detected, car and landings doors shall be closed and the normal start of the lift shall be prevented.	Comply with requirement
11	EN 81-20: 2020 §5.6.7.4	The stopping element of the means shall act on: a) the car, or b) the counterweight, or c) the rope system (suspension or compensating), or d) the traction sheave, or e) the same shaft as the traction sheave provided the shaft is only statically supported in two points, or f) the hydraulic system (including the motor/pump in up direction by isolation of the electrical supply). The stopping element of the means, or the means keeping the car stopped may be common with those used for: — preventing overspeed in down direction, — preventing ascending car overspeed (5.6.6).	Acting on traction sheave shaft Comply with requirement

No.	Standard No./ Items No.	Test contents and requirements	Test result
12	EN 81-20: 2020 §5.6.7.6	During the stopping phase, the stopping element of the means shall not allow a retardation of the car in excess of: — 1 g _n for unintended movements in up direction with empty car; — the values accepted for devices for protecting against free fall in the down direction.	Comply with requirement
13	EN 81-20: 2020 §5.6.7.8	The means shall operate an electric safety device in conformity with 5.11.2 if it is engaged.	Triggered by the detecting subsystem Comply with requirement
14	EN 81-20: 2020 §5.6.7.10	The release of the means shall not require the access to the car or the counterweight or balancing weight.	Comply with requirement
15	EN 81-20: 2020 §5.6.7.11	After its release, the means shall be in a condition to operate.	Comply with requirement
16	EN 81-20: 2020 §5.6.7.12	If the means requires external energy to operate, the absence of energy shall cause the lift to stop and keep it stopped. This does not apply for guided compression springs.	Compression spring with guide applies pressure Comply with requirement
17	EN 81-20: 2020 §5.6.7.13	The unintended car movement with open doors protection means is regarded as a safety component and shall be verified according to the requirements in EN 81-50:2020, 5.8.	Comply with requirement
18	EN 81-20: 2020 §5.6.7.14	On the unintended movement protection means, either for the complete system or subsystems in accordance with EN 81-50, 5.8.1 a data plate shall be fixed indicating: a) the name of the manufacturer of the unintended movement protection means; b) the type examination certificate number; c) the type of unintended movement protection means.	Comply with requirement

No.	Standard No./ Items No.	Test contents and requirements	Test result
19	EN 81-50: 2020 §5.7.1 General provisions	5.7.1.1 This specification applies to ascending car overspeed protection means which are not using overspeed governors, or programmable electronic systems which are subject to verifications according to 5.4 and 5.6. Test results of safety gears which have been verified according to 5.3 may be taken into account for verification of permissible application range. 5.7.1.2 The applicant shall state the range of use provided: a) minimum and maximum masses, or torque; b) minimum (if applicable) and maximum rated speed; c) use in installations with compensating ropes. 5.7.1.3 The following documents shall be attached to the applications: a) detailed and assembly drawings showing the construction, operation, materials used, the dimensions and tolerances on the construction components; b) if necessary, also a load diagram relating to elastic parts; c) detailed information on the materials used, the type of part on which the ascending car overspeed protection means acts, and its surface condition (drawn, milled, ground, etc.).	Comply with requirement
20	EN 81-50: 2020 §5.7.2.1	The applicant shall state for what mass (in kilograms) and tripping speed (in meters per second) the test will be carried out. If the device shall be certified for various masses, the applicant shall specify them and indicate in addition whether adjustment is by stages or continuous.	Comply with requirement

No.	Standard No./ Items No.	Test contents and requirements	Test result
21	EN 81-50: 2020 §5.7.2.2	As defined between applicant and the laboratory: —either a complete assembly consisting of both elements, braking device and speed monitoring device; or —only that device which was not subject to verifications according to 5.3, 5.4 and 5.6; shall be provided by the applicant. The number of sets of gripping elements necessary for all the tests shall be attached. The type of part on which the device acts, shall also be supplied with the dimensions agreed with the laboratory.	Comply with requirements
22	EN 81-50: 2020 §5.7.3.1 Method of test	The method of test shall be defined between applicant and test laboratory, depending on the device and its functioning to achieve a realistic function of the system. Measurements shall be made of: a) the acceleration and speed; b) the braking distance; c) the retardation. Measurements shall be recorded as a function of the time.	Comply with requirements
23	EN 81-50: 2020 §5.7.3.2.3 Device certified for different masses	Adjustment in stages or continuous adjustment. A series of tests shall be carried out for the maximum value applied for and a series for the minimum value. The applicant shall supply a formula, or a chart, showing the variation of the braking force as a function of a given parameter. The laboratory shall verify by suitable means (in the absence of anything better, by a third series of tests for intermediary points) the validity of the supplied formula.	Maximum system mass representing an empty car in up direction, maximum tripping speed: 4 tests, minimum tripping speed: 1 test; Minimum system mass representing an empty car in up direction, maximum tripping speed: 4 tests, minimum tripping speed: 1 test. See Table 1 and Table 2. Comply with requirement

No.	Standard No./ Items No.	Test contents and requirements	Test result
24	EN 81-50: 2020 §5.7.3.3 Checks after the test	After the test: a) the hardness of the gripping element shall be compared with the original values quoted by the applicant; b) if there is no fracture, deformations and other changes shall be examined (for example, cracks, deformations or wear of the gripping elements, appearance of the rubbing surfaces); c) if necessary, photographs shall be taken of the gripping elements and the parts on which the device acts for evidence of deformations or fractures; d) it shall be checked that the retardation with the minimum mass has not exceeded 1 g_n.	No abnormality after the test Comply with requirement

25	EN 81-50: 2020 §5.8.1 General provisions	The unintended car movement protection means shall be type tested as a complete system or the subsystems for detection, activation and stopping may be submitted to an individual type examination. The type examination of subsystems shall define interface conditions and the relevant parameters of each subsystem if integrated in a complete system. The applicant shall state the key parameters for use of the system or subsystem that form part of the type examination: — minimum and maximum masses; — minimum and maximum force or torque or fluid pressure, if applicable; — individual response times of detector, control circuit and stopping element(s); — highest speed anticipated before deceleration occurs; — distance from the floor at which the detector device will be installed; — test speed(s); — limits of temperature and humidity of the design and any other relevant information agreed between the applicant and test laboratory. In case of electric failure it can be assumed for traction lifts due to internal control means the acceleration which can be achieved is not greater than 2.5 m/s². The distance the car is permitted to move during unintended movement is defined in the requirements laid down in the standards calling for the use of this standard (e.g. EN 81-20, 5.6.7.5). The following documents shall be attached to the application: a) Detailed and assembly drawings showing the construction, operation, the dimensions and tolerances of the components; b) If necessary, also a load diagram relating to elastic parts; c) Detailed information of the materials used, the type of part on which the means acts, and its surface condition, if relevant (drawn, milled, ground, etc.).	Comply with requirement
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No.	Standard No./ Items No.	Test contents and requirements	Test result
26	EN 81-50: 2020 §5.8.2 Statement and test sample	5.8.2.1 The applicant shall state for what duty the means is intended. 5.8.2.2 Test samples shall be supplied as agreed between applicant and the laboratory consisting of, as appropriate, a complete assembly of unintended car movement detection device, control circuit (actuator), stopping elements and any monitoring device(s) if applicable. The number of sets of gripping elements necessary for all the tests shall be attached. The type of part on which the device acts, shall also be supplied with the dimensions specified by the laboratory.	Comply with requirement
27	EN 81-50: 2020 §5.8.3.1 Method of Test	The method of test shall be defined between applicant and test laboratory, depending on the device and its function to achieve a realistic operation of the system. Measurements shall be made of: — the stopping distance; — the average retardation; — the response time of the detection, actuation, stopping element and control circuits; — the total distance travelled (sum of acceleration and stopping distances). Test shall also include: — operation of the unintended car movement detection device and — any automatic monitoring system, if applicable.	Comply with requirement
28	EN 81-50: 2020 §5.8.3.2.1 General	Twenty tests shall be made on the stopping element with: — no result outside the specification, — each result within ± 20 % of the average value. Average value shall be stated on the certificate.	Comply with requirement

No.	Standard No./ Items No.	Test contents and requirements	Test result
29	EN 81-50: 2020 §5.8.3.2.3 Device certified for different masses or torques or fluid pressures	A series of tests shall be carried out for the maximum value applied for and a series for the minimum value. The applicant shall supply a formula or a chart, showing the calculated variation of the braking force or torque or fluid pressure as a function of a given adjustment. The results being expressed in distance travelled. The laboratory shall verify the validity of the formula or chart.	Maximum system mass representing an empty car in up direction: 10 tests; Maximum system mass representing a car carrying the rated load in down direction: 10 tests; Minimum system mass representing an empty car in up direction: 10 tests; Minimum system mass representing a car carrying the rated load in down direction: 10 tests; See Table 3 to Table 7. Comply with requirement
30	EN 81-50: 2020 §5.8.3.3 Checks after the test	After the test: a) The mechanical characteristics of the stopping element(s) shall be compared with the original values quoted by the applicant. Other analyses may be carried out in special cases; b) It shall be checked that there are no fractures or deformations or any other changes (e.g. cracks, deformations or wear of the gripping elements, appearance of the rubbing surfaces); c) If necessary, photographs shall be taken of the gripping elements and the parts on which the device acts for evidence of deformations or fractures.	No abnormality after the test Comply with requirement

3 Test data

3.1 Test data for ascending car overspeed protection means

Table 1 Maximum system mass representing an empty car in up direction

Time \ Item	Tripping speed (m/s)	Maximum retardation (m/s ²)	Braking distance (m)
1	4.421	3.031	4.203
2	4.422	3.235	3.980
3	4.421	3.302	3.976
4	4.418	3.328	3.969
5	0.578	2.994	0.099

Table 2 Minimum system mass representing an empty car in up direction

Time \ Item	Tripping speed (m/s)	Maximum retardation (m/s ²)	Braking distance (m)
1	4.419	9.151	2.738
2	4.421	8.956	2.707
3	4.419	8.433	2.673
4	4.417	9.000	2.709
5	0.577	6.335	0.077

3.2 Test data for unintended car movement protection means

Table 3 Maximum system mass representing an empty car in up direction

Time	t	d	V_{max}	a_{max}	a_{ave}	t_{10}	t_{50}	t_{90}
1	0.185	0.467	1.344	3.104	2.222	0.157	0.228	0.399
2	0.194	0.461	1.343	3.288	2.258	0.155	0.231	0.429
3	0.190	0.476	1.345	3.247	2.185	0.150	0.226	0.468
4	0.187	0.463	1.344	3.273	2.252	0.146	0.223	0.433
5	0.195	0.462	1.343	3.122	2.218	0.154	0.230	0.435
6	0.193	0.461	1.344	3.099	2.234	0.152	0.229	0.418
7	0.189	0.472	1.344	3.320	2.211	0.152	0.228	0.451
8	0.186	0.481	1.344	3.130	2.158	0.154	0.227	0.445
9	0.192	0.473	1.343	3.241	2.187	0.154	0.227	0.467
10	0.194	0.471	1.343	3.189	2.183	0.153	0.228	0.464
Arithmetical mean	0.191	0.469	1.344	3.201	2.211	0.153	0.228	0.441
Maximum deviation from arithmetical mean (%)	-2.9	+2.6	-0.1	+3.7	-2.4	-4.4	-2.1	-9.5

Key

t	Response time of stopping elements, s
d	Stopping distance, m
V_{max}	Highest speed, m/s
a_{max}	Maximum retardation during braking process, m/s ²
a_{ave}	Average retardation during braking process, m/s ²
t_{10}	Time between the drop of the braking power until establishing 10% of the nominal brake torque, s
t_{50}	Time between the drop of the braking power until establishing 50% of the nominal brake torque, s
t_{90}	Time between the drop of the braking power until establishing 90% of the nominal brake torque, s

Table 4 Maximum system mass representing a car carrying the rated load in down direction

Time	t	d	V_{max}	a_{max}	a_{ave}	t_{10}	t_{50}	t_{90}
1	0.200	0.592	1.345	2.490	1.743	0.154	0.240	0.583
2	0.198	0.590	1.345	2.423	1.735	0.155	0.238	0.586
3	0.200	0.590	1.346	2.494	1.747	0.158	0.240	0.572
4	0.202	0.592	1.346	2.431	1.727	0.158	0.240	0.612
5	0.198	0.590	1.345	2.451	1.741	0.153	0.240	0.583
6	0.199	0.599	1.345	2.510	1.725	0.152	0.236	0.600
7	0.197	0.598	1.345	2.463	1.722	0.154	0.238	0.626
8	0.199	0.606	1.345	2.485	1.704	0.156	0.237	0.644
9	0.198	0.601	1.346	2.449	1.705	0.153	0.238	0.612
10	0.201	0.598	1.344	2.383	1.712	0.160	0.242	0.609
Arithmetic mean	0.199	0.596	1.345	2.458	1.726	0.155	0.239	0.603
Maximum deviation from arithmetic mean (%)	+1.4	+1.7	-0.1	-3.0	-1.3	+3.0	+1.3	+6.9

Key

t	Response time of stopping elements, s
d	Stopping distance, m
V_{max}	Highest speed, m/s
a_{max}	Maximum retardation during braking process, m/s^2
a_{ave}	Average retardation during braking process, m/s^2
t_{10}	Time between the drop of the braking power until establishing 10% of the nominal brake torque, s
t_{50}	Time between the drop of the braking power until establishing 50% of the nominal brake torque, s
t_{90}	Time between the drop of the braking power until establishing 90% of the nominal brake torque, s

Table 5 Minimum system mass representing an empty car in up direction

Time	t	d	V_{max}	a_{max}	a_{ave}
1	0.125	0.279	1.344	9.298	4.207
2	0.124	0.279	1.343	9.232	4.195
3	0.129	0.275	1.342	9.330	4.189
4	0.126	0.282	1.345	9.756	4.212
5	0.126	0.276	1.342	9.005	4.179
6	0.125	0.281	1.343	9.438	4.205
7	0.132	0.274	1.342	9.339	4.231
8	0.130	0.276	1.343	9.401	4.203
9	0.127	0.279	1.342	9.628	4.161
10	0.130	0.271	1.343	9.095	4.183
Arithmetic mean	0.127	0.277	1.343	9.352	4.197
Maximum deviation from arithmetic mean (%)	+3.6	-2.2	+0.2	+4.3	-0.8
Key t Response time of stopping elements, s d Stopping distance, m V_{max} Highest speed, m/s a_{max} Maximum retardation during braking process, m/s ² a_{ave} Average retardation during braking process, m/s ²					

Table 6 Minimum system mass representing a car carrying the rated load in down direction

Time	t	d	V_{max}	a_{max}	a_{ave}
1	0.133	0.307	1.344	7.423	3.805
2	0.122	0.318	1.347	8.187	3.772
3	0.131	0.301	1.346	7.686	3.865
4	0.128	0.312	1.346	8.304	3.827
5	0.124	0.314	1.344	7.924	3.774
6	0.133	0.302	1.347	7.380	3.856
7	0.125	0.313	1.344	7.902	3.764
8	0.124	0.313	1.345	7.981	3.800
9	0.126	0.315	1.347	7.928	3.786
10	0.124	0.316	1.347	7.877	3.802
Arithmetic mean	0.127	0.311	1.346	7.859	3.805
Maximum deviation from arithmetic mean (%)	+4.7	-3.2	-0.1	-6.1	+1.6
Key t Response time of stopping elements, s d Stopping distance, m V_{max} Highest speed, m/s a_{max} Maximum retardation during braking process, m/s ² a_{ave} Average retardation during braking process, m/s ²					

Table 7 Maximum system mass representing an empty car in up direction, test-speed with relevant parameters for final inspection use

Time	V_{max} (m/s)	d (m)
1	0.497	0.076
2	0.497	0.074
3	0.497	0.076

4 Sample photo



5 Test photo



6 List of test equipment

No.	Model	Test equipment	Equipment No.	Next calibration
1	Testo 608-H2	Thermohygrometer	7721	2026-08-21
2	CABR-JDYY-V4.0	Traction machine test equipment	0302080	2026-11-11

END OF TEST REPORT