

Specification for

Lifts, escalators, passenger conveyors and paternosters —

Part 7: Testing and inspection

UDC 621.876.3

Co-operating organizations

The Mechanical Engineering Industry Standards Committee, under whose supervision this British Standard was prepared, consists of representatives from the following Government departments and scientific and industrial organizations:

Associated Offices' Technical Committee*	Institution of Civil Engineers
Association of Consulting Engineers	Institution of Gas Engineers
Association of Mining Electrical and Mechanical Engineers	Institution of Heating and Ventilating Engineers
Board of Trade	Institution of Mechanical Engineers*
British Chemical Plant Manufacturers' Association	Institution of Mechanical Engineers (Automobile Division)
British Compressed Air Society	Institution of Production Engineers
British Electrical and Allied Manufacturers' Association*	Locomotive and Allied Manufacturers' Association of Great Britain
British Gear Manufacturers' Association	London Transport Executive*
British Internal Combustion Engine Manufacturers' Association	Machine Tool Trade Association
British Mechanical Engineering Confederation*	Ministry of Defence
British Pump Manufacturers' Association	Ministry of Defence, Army Department
British Steel Industry	Ministry of Public Building and Works*
Crown Agents for Oversea Governments and Administrations	Ministry of Technology*
Department of Employment and Productivity*	Ministry of Technology — National Engineering Laboratory
Electricity Council, the Central Electricity Generating Board and the Area Boards in England and Wales	Ministry of Transport
Engineering Equipment Users' Association*	National Coal Board
Gas Council	National Physical Laboratory (Ministry of Technology)
	Royal Institute of British Architects
	Water-tube Boilermakers Association

The Government departments and scientific and industrial organizations marked with an asterisk in the above list, together with the following, were directly represented on the committee entrusted with the preparation of this British Standard:

British Railways Board	Fire Offices' Committee
County Councils Association	Greater London Council
Department of Health and Social Security	Institution of Electrical Engineers
Draughtsmen's and Allied Technicians' Association	Institution of Municipal Engineers
Electrical, Electronic, Telecommunications and Plumbing Trades Union	Mechanical Handling Engineers Association
Engineers Surveyors' Association	Ministry of Housing and Local Government
Federation of Wire Rope Manufacturers of Great Britain	National Association of Lift Makers
	Post Office
	Retail Trading Standards Association

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Foreword

This standard makes reference to the following British Standard:

BS 2613, *The electrical performance of rotating electrical machinery*.

This British Standard, prepared under the authority of the Mechanical Engineering Industry Standards Committee, is a revision of and supersedes the 1958 edition, which was entitled “Electric lifts”.

The new title reflects the extension of the scope of this British Standard. Amendments to Parts 2 and 3 of this standard have been published, and implement the change in title. The revised Part 1 and additional new parts are being published separately and, together with Parts 2 and 3, are as follows:

Part 1: General requirements for electric, hydraulic and hand-powered lifts. This Part is basically a revision of the 1958 edition of BS 2655-1, without the building requirements and list of definitions, and extended to cover the engineering and safety requirements for new hydraulic and hand-powered lifts as well as for new electric lifts.

Part 2: Single speed polyphase induction motors for driving lifts. This Part covers the type of electric motor specially designed for driving lifts. It should be used in conjunction with BS 2613¹⁾ and gives additional requirements including the class of lift rating and special limits of temperature rise.

Part 3: Arrangements of standard electric lifts. This part gives standard dimensions for lift wells and machine rooms in relation to life capacity and platform sizes, for seven classes of lifts.

Part 4: General requirements for escalators and passenger conveyors. This Part specifies engineering and safety requirements for escalators and passenger conveyors. The latter may be described as machines in which the passenger carrying surface remains parallel to the direction of motion and are uninterrupted.

Part 5: General requirements for paternosters. This Part specifies engineering and safety requirements for paternosters which may be described as machines where series of cars are continuously running in closed loops, and are characterized by the car floors remaining substantially horizontal when the direction of motion is reversed at the extremities of car travel.

Part 6: Building construction requirements. This Part specifies structural and fire resistance requirements for the equipment covered by Parts 1, 4 and 5.

Part 7: Testing and inspection. This Part specifies tests, examination and certification of new and modified equipment covered by Parts 1, 4 and 5.

Part 8: Modernization or reconstruction of lifts. This Part specifies engineering and safety requirements.

Part 9: Definitions. This Part gives definitions of terms used in the remainder of the standard.

Part 10: General requirements for guarding. This part specifies requirements for the guarding of moving parts and protection against hazards from electrical equipment. It relates to equipment covered in Parts 1, 4 and 5.

CP 407:1972, *British Standard Code of Practice for electric, hydraulic and hand-powered lifts*. The code gives general information and guidance for planning, purchasing, installation and maintenance of passenger, goods and service lifts.

In case of difficulty in classifying any equipment in accordance with the headings of Parts 1, 4 and 5, reference should be made to the relevant definitions in Part 9.

This part of the standard covers examination and certification of new [see Amendment No. 2 (May 1979)] and modified equipment covered by Parts 1, 4 and 5. It is principally concerned with safety.

¹⁾ BS 2613, “*The electrical performance of rotating electrical machinery*”.

It extends the scope of the tests which were included in the 1958 edition of the standard, and the types of certificate now included require that assurances of satisfactory performance from certain aspects be given together with certain contract and performance data. The certificates also require that the equipment to which they relate shall comply with all the relevant requirements of the standard. However, an “Exemption” clause is included for non-compliance where this is acceptable to the Certification Authority and other affected parties, such as the user.

It is envisaged that a Central Certification Authority might be set up, but in the interim the authority for signing the certificate will be one acceptable to the parties concerned (such as the manufacturer, user, insurance company and appropriate safety authority). In many cases this will in practice be a representative of the manufacturer.

Appendix A and Appendix F of this Part of this standard are rendered obsolescent concurrently with the publication of BS 5655 “*Lifts and service lifts*” Part 1:1979 “*Safety rules for the construction and installation of electric lifts*”, under the conditions stated below.

- 1) This standard is no longer applicable to all new lifts installed in such new buildings as are designed after the date of publication of BS 5655-1 (31 May 1979).
- 2) All new lifts ordered after 31 May 1979, for installation in such buildings as have not yet been commenced but for which final plans existed before 31 May 1979, should be constructed preferably in accordance with BS 5655-1 or, if space considerations make it necessary, in accordance with this standard. If, however, such lift installations are scheduled for commissioning after 31 May 1984, the requirements of BS 5655-1 only are applicable.
- 3) All new lifts ordered after 31 May 1979, for installation in such new buildings as were under construction or completed before that date, are permitted to be constructed in accordance with either this standard or BS 5655-1. If, however, such lift installations are scheduled for commissioning after 31 May 1984, the requirements of BS 5655-1 only are applicable unless it can be shown that, owing to space limitations, compliance is not reasonably practicable.
- 4) Such new replacement lifts and major modifications to existing lifts as are commissioned before 31 May 1984, for use in existing buildings that were built before 31 May 1979, are permitted to be in accordance with either this standard or BS 5655-1. After 31 May 1984, the requirements of BS 5655-1 only are applicable unless it can be shown that, owing to space limitations, compliance is not reasonably practicable. Special provisions are permissible to meet certain site conditions often present in buildings that have been in use for many years. It is intended that the use of new equipment should not automatically be restricted because certain site conditions are now more rigorous than formerly.

Appendix F of BS 2655-7:1970 will, however, continue to be applicable to the future maintenance and inspection of existing electric lift installations constructed in accordance with BS 2655.

Appendix A and Appendix F. Appendix A and Appendix F of this Part of this standard should be endorsed:

This appendix is rendered obsolescent under the conditions stated in the foreword (See Amendment No. 2).

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, pages i to iv, pages 1 to 27 and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

1 Scope

This Part of this British Standard specifies requirements for the testing and examination of new and modified equipment covered by Parts 1, 4 and 5 of the standard. The standard differentiates between testing and examination at the time of commissioning, and subsequent periodic examinations.

The types of certificate to show compliance with the standard are included, and cover construction, certain aspects of performance, and contract data. Evidence of test certificates relating to certain components of the equipment is also specified.

2 Test and examination

2.1 Test and examination after installation

2.1.1 The performance of certain tests, as required to complete the appropriate test and examination certificate (see **2.1.2**), shall be undertaken for every installation before it is put into normal service, i.e. at the time of commissioning. Tests, as specified in Clauses 3 and 4 shall also be undertaken. A thorough inspection of all the equipment shall also be undertaken at this stage, and the appropriate certificate shall be completed in *all* respects.

2.1.2 For each type of equipment covered by this standard, the form of the appropriate test and examination certificate referred to in **2.1.1** shall be as follows:

- | | |
|--|-------------------------|
| 1) Electric lifts for passengers and goods | Appendix A ^a |
| 2) Hydraulic lifts for passengers and goods | Appendix B |
| 3) Power operated and hand-powered service lifts | Appendix C |
| 4) Escalators and passenger conveyors | Appendix D |
| 5) Paternosters | Appendix E |

^a Rendered obsolescent under the conditions stated in the foreword (See Amendment No. 2).

2.2 Periodic examination

2.2.1 Every installation shall be examined within six months of commissioning, and thereafter at intervals not exceeding six months, the examinations being adequate to complete the appropriate certificate (see **2.2.2**) in *all* respects.

2.2.2 For each type of equipment covered by this standard, the form of the appropriate examination certificate referred to in **2.2.1** shall be as follows:

- | | |
|--|-------------------------|
| 1) Electric, hydraulic and hand-powered lifts and paternosters | Appendix F ^a |
| 2) Escalators and passenger conveyors | Appendix G |

^a Rendered obsolescent under the conditions stated in the foreword (See Amendment No. 2).

2.3 Component testing. Evidence of test certificates relating to some components is required to complete certain parts of the certificates dealing with static examinations, and these test certificates may relate to individual or type tests carried out by the component manufacturer, or the lift, escalator, passenger conveyor or paternoster manufacturer, or an independent body.

2.4 Availability of certificates. Copies of certificates appropriate to each type of equipment covered by this standard, as referred to in **2.1.2** and **2.2.2**, shall be available for inspection at all times at the location of the equipment.

2.5 Test facilities. All test weights, instruments and personnel to complete the testing and inspection after installation (see **2.1**) shall be provided by the manufacturer. A power supply, at the declared voltage and frequency, for test and adjustment purposes, shall be provided by the purchaser.

3 High voltage test (at makers' works)

The dielectric of electrical apparatus (excluding motors, generators, transformers, electronic apparatus and instruments, which should be tested in accordance with the appropriate British Standard), shall be capable of withstanding a test voltage of ten times the working voltage, with a maximum of 2 000 V, when applied as follows:

- 1) Between the live parts and the case or the frame with all circuits completed.
- 2) Between main terminals or equivalent parts with all circuits open.
- 3) Between any live parts of independent circuits.

The test voltage should be alternating of approximately sine wave form with a frequency of approximately 50 Hz (50 c/s). This should be applied for one minute.

NOTE Owing to the impracticability of applying the tests specified in 1), 2) and 3) on controllers and similar apparatus after controller wiring has been completed, these tests shall be made at convenient stages of manufacture, and a test certificate issued by the manufacturer is acceptable.

4 Electrical tests (after installation)

All test equipment and instruments shall be provided by the manufacturer. The power supply, at the declared voltage and frequency, required for adjusting and testing shall be supplied by the purchaser. All installations shall be certified as detailed in the respective "Certificate of examination and test after installation". Electrical installations, excluding electronic equipment, shall be subjected to tests, by instruments, as follows:

- 1) A d.c. voltage not less than twice the operating voltage (r.m.s. value of an a.c. supply) shall be applied for the measurement of insulation resistance, provided that for tests on medium voltage circuits the test voltage need not exceed 500 V d.c. The insulation resistance to earth shall be not less than 1 M Ω .

The dampness in a new building may prevent a reading of 1.0 M Ω from being obtained. In this event the equipment may be provisionally accepted with an insulation resistance of 0.25 M Ω , but the retest when conditions improve shall be not less than 1.0 M Ω .

- 2) Test to determine that the earthing of all conduit, trunking, switch casings and similar metal work is continuous and does not exceed 0.5 Ω impedance.

Appendix A Type of certificate required for test and examination after installation of electric lifts for passengers and goods

(For service lifts see Appendix C)

A.1 Description

Location
Manufacturer
Lift identification No. **Contract power supply**
Length of travel **Levels served**
Contract load **Contract speed**
Details of power supply at time of test

A.2 Static examination

- (1) Is the rope/chain test certificate available and in order?
- (2) Have the ropes/chains and their anchorages been examined and found to comply with Part 1 of BS 2655?
- (3) Does the mechanical safety gear operate correctly?
- (4) Where buffers are used, is the test certificate available and in order?
- (5) Does the brake sustain the car with contract load plus 25 %?
- (6) Does reversal and phase failure device (if fitted) operate correctly?

A.3 Lift motor current and speed tests

A.3.1 A.C. lifts only

Lift motor manufacturer **Serial number**

	At mid-travel	
	Running current	Running speed
	A	rev/min
1. Full load up		
2. No load down		

Form of protection: 3-phase circuit breaker^a
overloads in each phase^a
timing relay^a

	Rotor	Measured current	Measured tripping time
		A	s
1. High speed winding D.O.L. ^b	Locked		
2. High speed rheostatic (with max. impedance) in circuit	Locked		
3. Slow speed winding D.O.L. ^c	Locked		
^a Strike out that which is inapplicable. ^b D.O.L. = Direct on line. ^c Two speed systems only.			

A.3.2 V.V. lifts only

Lift motor manufacturer..... Serial number.....

M.G. set manufacturer..... Serial number.....

(Motor and generator)

	M.G. set motor		Lift motor	
	At mid-travel			
	Running current	Running speed	Running current	Running speed
1. Full load up	A	rev/min ^a	A	m/s or ft/min ^a
2. No load down				

^a Rev/min applies to geared machines; m/s or ft/min applies to gearless machines.

Form of protecting M.G. set:

With 3 phase circuit breaker.....coil..... setting

With overloads in each phase.....A seconds

A.4 Door tests

A.4.1 Landing and car door operator

(1) Does the equipment comply with Part 1 of BS 2655?

(2) Maximum force at mid-point of travel

A.4.2 Protection

Operating current A **Fuse or circuit breaker rating** A
Rotating motor type:

When additional electrical protection is fitted in association with rotating motor type:

	Measured current	Measured tripping time when fitted
	A	s
1. Running		
2. Doors stalled		
3. Single phasing		

A.5 Time delays

Car hold delay seconds

A.6 Control circuit voltage

Full load V

A.7 Insulation resistance to earth

Power system M Ω **Safety circuits** M Ω

A.8 Earthing

- (1) Is all metalwork enclosing conductors bonded to earth?
- (2) Is the car connected to earth by a separate conductor?
- (3) Is the maximum continuity resistance to earth less than 0.50 Ω ?

A.9 Governor test. For V.V. machines, Tests A.9 and A.11 are carried out simultaneously.
 For a.c. machines, Test A.9 is carried out independently.

Contact	Particulars m/s or ft/min	Measured trip m/s or ft/min
1. Electrical 1		
2. Electrical 2		
3. Mechanical		