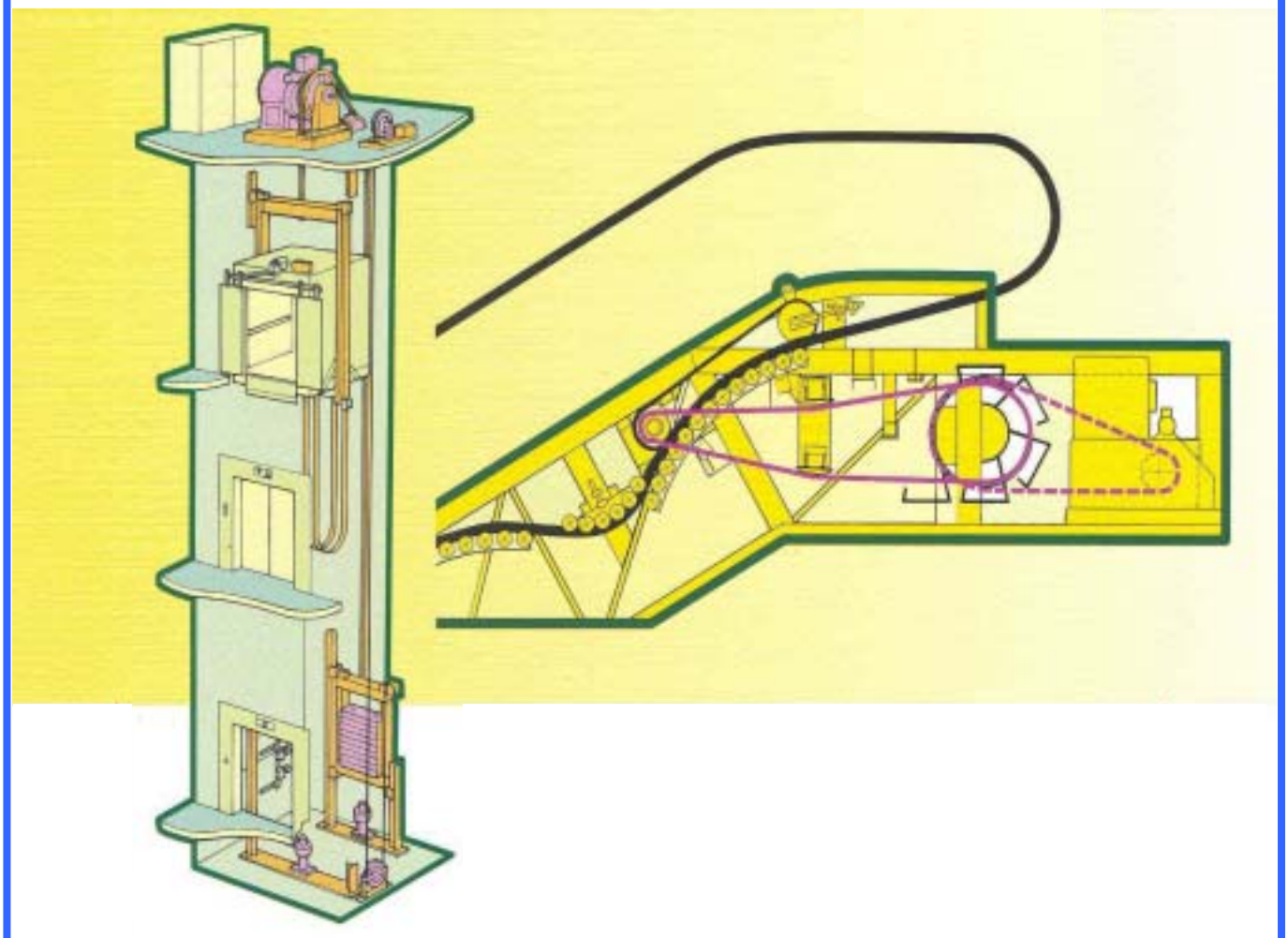
Code of Practice for

Energy Efficiency of Lift & Escalator Installations

2007 EDITION



EMSD

Foreword

The Code of Practice for Energy Efficiency of Lift & Escalator Installations aims to set out the minimum design requirements on energy efficiency of lift & escalator installations. It forms a part of a set of comprehensive ***Building Energy Codes*** that address energy efficiency requirements on building services installations. Designers are encouraged to adopt a proactive approach to exceed the minimum requirements.

The ***Building Energy Codes*** were developed by ad hoc task forces under the Energy Efficiency & Conservation Sub-committee of the Energy Advisory Committee. The set of comprehensive *Building Energy Codes* cover this Code, the Codes of Practice for Energy Efficiency of Lighting Installations, Air Conditioning Installations, and Electrical Installations, and the Performance-based Building Energy Code.

To promote the adoption of the ***Building Energy Codes***, the Hong Kong Energy Efficiency Registration Scheme for Buildings was also launched. The Registration Scheme provides the certification to a building complying with one or more of the ***Building Energy Codes***.

To supplement and further explain the codes, corresponding Guidelines were also published.

The Building Energy Codes and Registration Scheme documents are available for download at
http://www.emsd.gov.hk/emsd/eng/pee/eersb.shtml
Enquiry: hkeersb@emsd.gov.hk

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Amendments

The Code was first published in 2000. To suit changes in technological advancement and to cope with trade practices, there have been amendments to the first published edition, which were agreed in code review task forces with members from representative organizations in the building industry including professional institutes, trade associations and the academia.

In 2002, the maximum allowable electrical power requirements were relaxed, the maximum THD requirements were relaxed for motor drive systems with circuit fundamental current less than 40A, the requirement on maximum allowable lift decoration load was added, the total power factor requirement on escalator/conveyor motor drive systems being at upward direction was clarified, and the requirement on lift traffic design being applicable to non-domestic buildings only was clarified. In 2005, the requirement on lift handling capacity & traffic design was waived.

In 2007, the Maximum Allowable Electrical Power requirements are upgraded; and high speed fire service lifts or sky lobby shuttles serving a tall zone are exempted from the Maximum Allowable Electrical Power Requirements.

Acknowledgement

In the preparation of this Code, reference was made to the following publications: Guide D: 2000, Transportation Systems in Buildings, CIBSE; Barney, G.C., and Dos Santos, S.M., Elevator Traffic Analysis Design and Control, Peter Peregrinus, 1995; Stawinoga, Roland, "Designing for Reduced Elevator Energy Cost", ELEVATOR WORLD magazine, Jan 1994; Al-Sharif, Lutfi, Bunching in Lifts, ELEVATOR WORLD magazine, Jan 1996; Malinowski, John, Elevator Drive Technologies, ELEVATOR WORLD magazine, Mar 1998; and Guide Notes on Elevators (Lifts) Planning, Selection and Design, 1997, Department of Public Works & Services, Australia.

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CONTENTS

1. SCOPE

1.1 This Code shall apply to passenger lifts, freight lifts, lifts used for vertical transportation of motor vehicles, bed passenger lifts, escalators and passenger conveyors in all buildings, with the exclusion of the following installations :

a) *Builders' lifts used for vertical transportation of persons in a building construction site*

b) *Hoists used for vertical transportation of materials*

c) *Service lifts*

d) *Lifts and hoists installed in a performance stage*

e) *Lift equipment for building maintenance*

f) *Traction lift equipment with load > 5000kg and rated speed > 3m/s*

1.2 This Code shall apply to new installations and upgrading of motor drive and controller in relations to lifts, escalators and passenger conveyors.

2. DEFINITIONS

The expressions that appear in this Code are defined as follows:-

"Bed Passenger Lift" means a lift used for transportation of passenger and bed including stretcher.

"Building" has the meaning assigned to it in section 2 of the Buildings Ordinance (Cap. 123).

"Builders' Lift" means a lifting machine-

(a) that has a cage;
(b) the operating controls for which are located inside the cage;
(c) the cage of which is raised and lowered by means of a rack and pinion suspension system or rope suspension system;
(d) the direction of movement of which is restricted by guide or guides, and is used for construction work, and includes the supports, liftway and enclosures and the whole of the mechanical and electrical apparatus required in connection with the operation and safety of the builder's lift;

"Commercial Building" means a building, or that part of the building, constructed or intended to be used for business, trade or entertainment.

"Composite Building" means a building that is partly domestic and partly non-domestic.

"Domestic Building" means a building constructed or intended to be used for habitation and the expression "domestic purpose" shall be construed accordingly.

"Escalator" means an inclined, continuous stairway which is driven by mechanical power and used for raising or lowering passengers

"Freight Lift" means a lift mainly intended for the transport of goods, which are generally accompanied by persons handling the goods. A general freight lift is one which:-

- the loading in the lift will normally be evenly distributed over the floor of the car;
- the weight of any single piece of freight, or the weight of any single truck, which

may be used in the loading of the lift, and the load therein, will be not more than a quarter of the rated load of the lift;

- the lift will be loaded only manually or by means of trucks which are not driven by any form of power.

An industrial truck loaded freight lift is one which will be loaded and unloaded by industrial truck, and the loading is not necessarily evenly distributed over the floor, and the weight of any single piece of freight and its truck can exceed a quarter of the rated load of the lift.

"Hotel" means any building used wholly or in part primarily for the purpose of accommodation on a commercial basis.

"Hydraulic Lift" means a lift which the lifting power is derived from an electrically driven pump transmitting hydraulic fluid to a jack, acting directly or indirectly on the lift car.

"Lift" means a lifting machine or appliance having a car or platform the direction of movement of which is restricted by a guide or guides, but does not include an escalator.

"Lift Bank" means a lift system with two or more lift cars serving a zone.

"Passenger Conveyor" means a continuous walkway which is driven by mechanical power and used for the conveyance of passengers on the same or between different traffic levels.

"Passenger Lift" means a lift which is wholly or mainly used to carry persons.

"Rated Speed" of an escalator or a passenger conveyor means the speed of a no-load escalator or passenger conveyor in the direction of the moving steps, pallets or the belt at which the steps, pallets on the belt move and for which the escalator or passenger conveyor has been built and normal operation is guaranteed by the manufacturer.

"Service Lift" means a lift, used or intended to be used exclusively for carrying goods, having a rated load of not more than 250 kg and a car in which the area of the floor is not more than 1 m^2 and whose height is not more than 1200 mm.

"Total Power Factor" $= \dfrac{P}{\sqrt{P^2 + Q^2 + D^2}}$

where P = active power in kW of fundamental component
Q = reactive power in kVAr not including any harmonic component
D = distortion power in kVAd contributed from harmonic components

"Total Harmonic Distortion (THD)" $= \dfrac{\sqrt{\sum_{h=2}^{\infty} I_h^{\,2}}}{I_1}$

where I_1 = r.m.s. value of fundamental current (A)
I_h = r.m.s. value of current of the h^{th} harmonic order (A)

"Up Peak Traffic Condition" means the traffic condition when the dominant or only traffic flow is in an upward direction with all or the majority of passenger entering the lift system at the main terminal of the building.

"Vehicle Lift" means a lift which is suitably dimensioned and designed for carrying motor vehicles.

3. GENERAL APPROACH

This Code sets out the minimum requirements for achieving energy-efficient lift, escalator and passenger conveyor installations. The Code's requirements entail the following aspects :

a) Maximum allowable electrical power of lifts, escalators & passenger conveyors

b) Energy management of lifts, escalators & passenger conveyors, and

c) Total harmonic distortion and total power factor

If conflict(s) occur between the requirements of this Code of Practice and the latest edition of the following publications/Ordinances and their subsequent amendments, the requirements of the conflicting publications/Ordinances shall supersede the conflicting requirements of this Code of Practice:

- Code of Practice For The Electricity Wiring Regulation *published by Electrical & Mechanical Services Department, Government of The Hong Kong Special Administrative Region*
- Code of Practice On The Design and Construction of Lifts and Escalators *published by Electrical & Mechanical Services Department, Government of The Hong Kong Special Administrative Region*
- Code of Practice on the Examination, Testing and Maintenance of Lifts and Escalators, *published by Electrical & Mechanical Services Department, Government of The Hong Kong Special Administrative Region*
- Code of Practice on the Building Works for Lifts and Escalators, *published by Buildings Department, Government of The Hong Kong Special Administrative Region*
- Code of Practice for Minimum Fire Service Installations and Equipment and Inspection, Testing and Maintenance of Installations and Equipment *published by Fire Services Department, Government of The Hong Kong Special Administrative Region*
- Circular Letters relating to Lift and Escalator issued by the Electrical & Mechanical Services Department.
- The Building (Construction) Regulations and Building (Planning) Regulations, Cap. 123.
- The Lifts and Escalators (Safety) Ordinance, Cap.327.
- The Electricity Ordinance, Cap. 406.
- The Noise Control Ordinance, Cap. 400.

4. REQUIREMENTS ON LIFT

4.1 Maximum Allowable Electrical Power

4.1.1 Maximum Allowable Electrical Power of Traction Lifts

The running active electrical power of the motor drive of any traction lift system carrying a rated load at its rated speed in an upward direction shall be equal to or less than the maximum allowable values indicated in Table (4.1.1a), Table (4.1.1b) and Table (4.1.1c).

Rated Load (kg)	Maximum Allowable Electrical Power (kW) of Traction Lift Systems for various Ranges of Rated speed (Vc) in m/s				
	Vc < 1	1 ≤ Vc < 1.5	1.5 ≤ Vc < 2	2 ≤ Vc < 2.5	2.5 ≤ Vc < 3
L < 750	6.7	9.5	11.4	15.2	17.1
750 ≤ L < 1000	9.5	11.4	16.2	20	22.8
1000 ≤ L < 1350	11.4	16.2	20.9	25.7	30.4
1350 ≤ L < 1600	14.3	19	25.7	30.4	36.1
1600 ≤ L < 2000	16.2	23.8	30.4	37.1	43.7
2000 ≤ L < 3000	23.8	35.2	44.7	56.1	66.5
3000 ≤ L < 4000	31.4	45.6	59.9	74.1	87.4
4000 ≤ L < 5000	39.9	57	74.1	92.2	109.3
L ≥ 5000	0.0079L + 0.475	0.0112L + 0.95	0.0148L + 0.48	0.018L + 1.9	0.0217L+ 0.475

Table (4.1.1a) : Maximum Allowable Electrical Power of Traction Lifts (Vc < 3)

Rated Load (kg)	Maximum Allowable Electrical Power (kW) of Traction Lift Systems for various Ranges of Rated speed (Vc) in m/s				
	3 ≤ Vc < 3.5	3.5 ≤ Vc < 4	4 ≤ Vc < 5	5 ≤ Vc < 6	6 ≤ Vc < 7
L < 750	20	21.9	23.8	28.5	32.3
750 ≤ L < 1000	25.7	29.5	30.4	37.1	43.7
1000 ≤ L < 1350	34.2	38	42.8	49.4	57
1350 ≤ L < 1600	40.9	46.6	49.4	58.9	68.4
1600 ≤ L < 2000	50.4	57	61.8	71.3	83.6
2000 ≤ L < 3000	75.1	85.5	90.3	109.3	125.4
3000 ≤ L < 4000	98.8	114	123.5	142.5	166.3
4000 ≤ L < 5000	123.5	142.5	152	180.5	209

Table (4.1.1b) : Maximum Allowable Electrical Power of Traction Lifts (3 ≤ Vc < 7)

Rated Load (kg)	Maximum Allowable Electrical Power (kW) of Traction Lift Systems for various Ranges of Rated speed (Vc) in m/s		
	$7 \leq Vc < 8$	$8 \leq Vc < 9$	$Vc \geq 9$
$L < 750$	37.1	42.8	$4.643Vc + 0.0013Vc^3$
$750 \leq L < 1000$	49.4	57	$6.192Vc + 0.002\ Vc^3$
$1000 \leq L < 1350$	66.5	76	$8.357Vc + 0.002Vc^3$
$1350 \leq L < 1600$	78.9	90.3	$9.905Vc + 0.0025\ Vc^3$
$1600 \leq L < 2000$	99.8	114	$12.381Vc + 0.0013Vc^3$
$2000 \leq L < 3000$	147.3	166.3	$18.572Vc + 0.0029Vc^3$
$3000 \leq L < 4000$	194.8	223.3	$24.762Vc + 0.0036Vc^3$
$4000 \leq L < 5000$	242.3	275.5	$30.953Vc + 0.0046Vc^3$

Table (4.1.1c) : Maximum Allowable Electrical Power of Traction Lifts ($Vc \geq 7$)

Exception:

Lifts with rated speed not less than 9 m/s serving a zone of over 50-storey or over 175m between top/bottom-most landing and principal/ground landing, and designated as fire service lifts or sky lobby shuttles serving two principal stops.

4.1.2 Maximum Allowable Electrical Power of Hydraulic Lifts

The running active electrical power of the hydraulic oil pump motor of any hydraulic lift system carrying a rated load at its rated speed in an upward direction shall be equal to or less than the maximum allowable values indicated in Table (4.1.2).

Rated Load (kg)	Maximum Allowable Electrical Power (kW) under rated conditions
$L < 1000$ kg	26.6
$1000\ kg \leq L < 2000$ kg	50.4
$2000\ kg \leq L < 3000$ kg	71.3
$3000\ kg \leq L < 4000$ kg	92.2
$4000\ kg \leq L < 5000$ kg	115
$L \geq 5000$ kg	0.023L

Table (4.1.2) : Maximum Allowable Electrical Power of Hydraulic Lifts

4.1.3 Maximum Allowable Decoration Load

The maximum sole decoration load shall not be more than 50% of the rated load with a limitation of 600kg.

4.2 Energy Management of Lift Systems

a) Under normal operating status, at least one lift car of a lift bank shall operate under a *standby mode* during off-peak period when the traffic demand on the vertical transportation system is low.

b) Under a standby mode of operation, a lift car does not respond to passenger calls until it returns to the normal operation mode. If the lift is utilising DC M-G motor drive, the driving motor of the DC M-G motor drive system shall also be shut down during this standby mode operation.

c) Metering devices or permanent provisions (including suitable accessibility and sufficient space) for connection with such devices shall be provided for each electricity supply feeder for the vertical transportation systems, including the electrical load of the motor drive and the auxiliary loads such as ventilation and lightings, for measurement of voltages (phase-to-phase and phase-to-neutral), currents (line currents and neutral currents), total power factor, energy consumption (kWh), power (kW) and maximum demand (kVA) for the lift system.

d) For each lift car within a lift bank, when it has been idling for 2 minutes with the lift doors closed, the lift car's ventilation shall be shut off automatically until the lift car is activated again by passenger call.

4.3 Total Harmonic Distortion of Motor Drive Systems

At the moment a lift car is moving up with rated load at its rated speed, the *Total Harmonic Distortion (THD)* produced by the lift motor drive system measured at the isolator connecting the lift equipment to the feeder circuit of the building is limited to maximum allowable values specified in Table (4.3) :

Circuit Fundamental Current of Motor Drive	Maximum THD (%)
$I < 40A$	40
$40A \leq I < 80A$	35
$80A \leq I < 400A$	22.5
$400A \leq I < 800A$	15

Table (4.3) : Maximum Allowable THD for Lift Motor Drive Systems

4.4 Total Power Factor of Motor Drive Systems

The *Total Power Factor* of a motor drive circuit measured at the isolator connecting the lift equipment to the building's feeder circuit shall not be less than 0.85 when the lift car is carrying a rated load at its rated speed in an upward direction. In case the Total Power Factor is less than 0.85, design calculations are required at design stage of a building project to demonstrate adequate provision of power factor correction to achieve the minimum *Total Power Factor* of 0.85.

5. Requirements On Escalators & Passenger Conveyors

5.1 Energy Management of Escalators & Passenger Conveyors

Metering devices or permanent provisions (including suitable accessibility and sufficient space) for connection with such measuring devices shall be incorporated into each electricity feeder for the escalators or passenger conveyors for measurement of voltages (phase-to-phase and phase-to-neutral), currents (line currents and neutral currents), total power factor, energy consumption (kWh), power (kW) and maximum demand (kVA).

5.2 Maximum Allowable Electrical Power of Escalators & Passenger Conveyors

5.2.1 Escalators Other Than Public Service Escalators

When operating under *no-load condition*, the running active electrical power of the *steps driving motor* shall be equal to or less than the maximum allowable values shown in Table (**5.2a**).

Step Width (mm)	Rise of Escalator (m)	Maximum Allowable Electrical Power in Watt for various Ranges of Rated Speed (Vr) in m/s		
		Vr < 0.5	0.5 ≤ Vr < 0.6	0.6 ≤ Vr < 0.75
600	R < 3.5	1283	1473	1853
600	3.5 ≤ R < 5	1520	1805	2233
600	5 ≤ R < 6.5	1758	2138	2613
600	R ≥ 6.5	209R + 432	247R + 530	302R + 652
800	R < 3.5	1425	1615	1948
800	3.5 ≤ R < 5	1710	1995	2423
800	5 ≤ R < 6.5	1995	2375	2898
800	6.5 ≤ R < 8	2328	2755	3373
800	R ≥ 8	230R + 588	253.6R + 694	312.5R + 853
1000	R < 3.5	1520	1805	2185
1000	3.5 ≤ R < 5	1900	2185	2708
1000	5 ≤ R < 6.5	2214	2660	3230
1000	6.5 ≤ R < 8	2613	3040	3753
1000	R ≥ 8	268R + 653	349.6R + 771	346.7R + 997

Table (5.2a) : Maximum Allowable Electrical Power of Escalator other than public service escalator operating under no-load condition

5.2.2 Public Service Escalators

When operating under *no-load condition*, the running active electrical power of the *steps driving motor* shall be equal to or less than the maximum allowable values shown in Table (**5.2b**).

An escalator can be considered as a public service escalator when all the following conditions apply:

(i) They are part of a public traffic system including entrance and exit points (for example excalators connecting a traffic station and a premise); and

(ii) They are suitable for regularly operating for approximately 140 hours/week with a load reaching 100% of the brake load during periods lasting for at least 0.5 hour during any time interval of 3 hours.

During the planning stage it should be specified if it will be a public service passenger escalator.

Step Width (mm)	Rise of Escalator (m)	Maximum Allowable Electrical Power in Watt for various Ranges of Rated Speed (Vr) in m/s		
		Vr < 0.5	0.5 ≤ Vr < 0.6	0.6 ≤ Vr < 0.75
800	R < 3.5	1995	2375	2945
800	3.5 ≤ R < 5	2375	2850	3515
800	5 ≤ R < 6.5	2755	3278	4085
800	6.5 ≤ R < 8	3135	3705	4608
800	R ≥ 8	291.6R + 795	347.7R + 952	433R + 1183
1000	R < 3.5	2138	2518	3135
1000	3.5 ≤ R < 5	2518	3230	3705
1000	5 ≤ R < 6.5	2898	3468	4275
1000	6.5 ≤ R < 8	3278	3895	4893
1000	R ≥ 8	305.6R + 837	346.7R + 1109	456.9R + 1251

Table (5.2b) : Maximum Allowable Electrical Power of Public Service Escalators operating under no-load condition

5.2.3 Passenger Conveyors Other Than Public Service Passenger Conveyors

When operating under *no-load condition*, the running active electrical power of the *steps driving motor* shall be equal to or less than the maximum allowable values shown in Table (**5.2c**) and Table (**5.2d**).

Step Width (mm)	Nominal Length (L) of Conveyor (m)	Maximum Allowable Electrical Power in Watt for various Ranges of Rated Speed (Vr) in m/s		
		Vr < 0.5	0.5 ≤ Vr < 0.65	0.65 ≤ Vr < 0.75
800	L < 8	1093	1450	1900
800	8 ≤ L < 12	1568	2100	2750
800	12 ≤ L < 16	2043	2750	3500
800	16 ≤ L < 20	2518	3900	4400
800	L ≥ 20	120.6L + 97	186L+149	211L+169
1000	L < 8	1235	1650	1900
1000	8 ≤ L < 12	1995	2700	3050
1000	12 ≤ L < 16	2660	3550	4000
1000	16 ≤ L < 20	3278	4400	4950
1000	L ≥ 20	155.8L + 124	209L+168	237L+190

Table (5.2c): Maximum Allowable Electrical Power of Passenger Conveyor other than Public Service Passenger Conveyor operating under no-load condition (Vr < 0.75)

Step Width (mm)	Nominal Length (L) of Conveyor (m)	Maximum Allowable Electrical Power in Watt for various Ranges of Rated Speed (Vr) in m/s
		0.75 ≤ Vr < 0.90
800	L < 8	2138
800	8 ≤ L < 12	3088
800	12 ≤ L < 16	4085
800	16 ≤ L < 20	5035
800	L ≥ 20	240L + 192
1000	L < 8	2138
1000	8 ≤ L < 12	3468
1000	12 ≤ L < 16	4560
1000	16 ≤ L < 20	5653
1000	L ≥ 20	270.7L + 216

Table (5.2d): Maximum Allowable Electrical Power of Passenger Conveyor other than Public Service Passenger Conveyor operating under no-load condition (0.75≤ Vr < 0.90)

5.2.4 Public Service Passenger Conveyors

When operating under *no-load condition*, the running active electrical power of a *steps driving motor* shall be equal to or less than the maximum allowable values shown in Table (**5.2e**) and Table (**5.2f**). A passenger conveyor can be considered as a public service passenger conveyor when the conditions in clause 5.2.2 (i) & (ii) apply.

Step Width (mm)	Nominal Length of Conveyor (m)	Maximum Allowable Electrical Power in Watt for various Ranges of Rated Speed (Vr) in m/s		
		Vr < 0.5	0.5 ≤ Vr < 0.65	0.65 ≤ Vr < 0.75
800	L < 8	1283	1663	1900
800	8 ≤ L < 12	1568	1995	2612
800	12 ≤ L < 16	2043	2613	3325
800	16 ≤ L < 20	2518	3705	4180
800	L ≥ 20	120.6L + 96	176.7L + 141	200.4L + 160
1000	L < 8	1378	1758	1995
1000	8 ≤ L < 12	1995	2565	2898
1000	12 ≤ L < 16	2660	3373	3800
1000	16 ≤ L < 20	3278	4180	4703
1000	L ≥ 20	155.8L + 124	198.5L + 159	225L + 180

Table (5.2e): Maximum Allowable Electrical Power of Public Service Passenger Conveyors operating under no-load condition (Vr < 0.75)

Step Width (mm)	Nominal Length of Conveyor (m)	Maximum Allowable Electrical Power in Watt for various Ranges of Rated Speed (Vr) in m/s
		0.75 ≤ Vr < 0.90
800	L < 8	2233
800	8 ≤ L < 12	3088
800	12 ≤ L < 16	4085
800	16 ≤ L < 20	5035
800	L ≥ 20	240.3L + 192
1000	L < 8	2328
1000	8 ≤ L < 12	3 468
1000	12 ≤ L < 16	4560
1000	16 ≤ L < 20	5653
1000	L ≥ 20	270.7L + 216

Table (5.2f): Maximum Allowable Electrical Power of Public Service Passenger Conveyors operating under no-load condition (0.75 ≤ Vr < 0.90)

5.3 Total Harmonic Distortion of Motor Drive Systems

When an escalator/conveyor is operating with no load at its rated speed, the Total Harmonic Distortion (THD) produced by a motor drive system measured at the isolator connecting the escalator equipment to the building's feeder circuit is limited to a maximum allowable value specified in Table (5.3):

Circuit Fundamental Current of Motor Drive	Maximum THD (%)	
I < 40A	35, for electrical supply direct from building's feeder circuit	40, for electrical supply NOT direct from building's feeder circuit
40A ≤ I < 80A	35	
80A ≤ I < 400A	22.5	

Table (5.3) : Maximum THD of Motor Drive Systems for Escalators and Passenger Conveyors

5.4 Total Power Factor of Motor Drive Systems

The *Total Power Factor* of a motor drive measured/calculated at the isolator connecting the escalator/conveyor equipment to the power source shall not be less than 0.85 when the motor drive is operating under its *brake load* condition with rated speed in upward direction. Manufacturer's documentation are required to be submitted as proof. In case the Total Power Factor is less than 0.85 or manufacturer's documentation is not available, design calculations are required at design stage of a building project to demonstrate adequate provision of power factor correction to achieve the minimum Total Power Factor of 0.85.

6. SUBMISSION OF INFORMATION

The following standard forms are relevant to the provision of information in relation to this Code:-

FORM LE-G : Summary of Information on Lifts, Escalators & Passenger Conveyors

FORM LE-1 : Electrical Power, Total Harmonic Distortion and Total Power Factor of Traction Lifts

FORM LE-2 : Electrical Power, Total Harmonic Distortion and Total Power Factor of Hydraulic Lifts

FORM LE-3 : Electrical Power, Total Harmonic Distortion and Total Power Factor of Escalators

FORM LE-4 : Electrical Power, Total Harmonic Distortion and Total Power Factor of Passenger Conveyors

FORM LE-5 : (Not used)

FORM LE-6 : Energy Management of Lifts, Escalators & Passenger Conveyors

Ref. : _____
(for office use only)

Summary of Information on Lifts, Escalators & Conveyors — Form LE-G

Project/Building Name : _____

Type(s) of Installation : ☐ Traction Lifts ☐ Hydraulic Lifts ☐ Escalators
☐ Passenger Convetors (tick where applicable)

Submitted Forms, Drawings, Catalog etc. (tick where applicable)

	No. of Sheets
☐ Form LE-G series (Summary of Information on Lifts, Escalators & Passenger Conveyors)	
☐ Form LE-1 series (Electrical Power, Total Harmonic Distortion and Total Power Factor of Traction Lift)	
☐ Form LE-2 (Electrical Power, Total Harmonic Distortion and Total Power Factor of Hydraulic Lift)	
☐ Form LE-3 (Electrical Power, Total Harmonic Distortion and Total Power Factor of Escalator)	
☐ Form LE-4 (Electrical Power, Total Harmonic Distortion and Total Power Factor of Passenger Conveyor)	
☐ Form LE-6 (Energy Management of Lifts, Escalators & Passenger Conveyors)	
☐ Drawings (separate list to be provided)	
☐ Other supportive documents such as catalog, calculation etc. (separate list to be provided)	

Electrical Power, Total Harmonic Distortion and Total Power Factor of Traction Lifts — Form LE-1

Sheet __ of (__)

Lift Designation	Rated Load (kg)	Rated speed (m/s)	Circuit Current of Motor Drive (A)	Measured Running Active Power (kW)	Total Harmonic Distortion (%)	Total Power Factor	Decorative Load (kg)

All at rated load and at rated speed in the upward direction.

Electrical Power, Total Harmonic Distortion and Total Power Factor of Hydraulic Lifts

Form LE-2

Sheet __ of (__)

Lift Designation	Rated Load (kg)	Rated speed (m/s)	Circuit Current of Motor Drive (A)	Measured Running Active Power (kW)	Total Harmonic Distortion (%)	Total Power Factor	Decorative Load (kg)

All at rated load and at rated speed in the upward direction.

Electrical Power, Total Harmonic Distortion and Total Power Factor of Escalators

Form LE-3

Sheet __ of (__)

Escalator Designation	Rise of Escalator (m)	Step width (mm)	Rated Speed (m/s)	Motor Drive Circuit Current (A) #	Motor Drive Circuit Current (A) @	Measured Running Active Power (kW) #	Measured Running Active Power (kW) @	Total Harmonic Distortion (%) #	Supply from feeder circuit ? (yes or no)	Total Power Factor @
Non-public Service										
Public Service										

#: at no load and rated speed condition
@: at brake load condition

Ref. : _____
(for office use only)

Electrical Power, Total Harmonic Distortion and Total Power Factor of Passenger Conveyors Sheet __ of (__)										Form LE-4
Conveyor Designation	Rise of Conveyor (m)	Step width (mm)	Rated Speed (m/s)	Motor Drive Circuit Current (A) #	Motor Drive Circuit Current (A) @	Measured Running Active Power (kW) #	Measured Running Active Power (kW) @	Total Harmonic Distortion (%) #	Supply from feeder circuit ? (yes or no)	Total Power Factor @
Non-public Service										
Public Service										
#: at no load and rated speed condition @: at brake load condition										

Energy Management of Lifts, Escalators & Passenger Conveyors

Sheet __ of (__)

Form LE-6

LIFTS

(tick/delete as appropriate)

Zone Designation	Lift Bank with DC-MG motor drive	Energy Management	Provision of Metering Devices or provisions for connecting measuring devices for Lift Bank**
	Yes/No	☐ Standby mode ☐ Switch off Ventilation when idling more than 2 minutes	☐ Voltmeter ☐ Ammeter ☐ kWh ☐ Total Power Factor ☐ Power ☐ Maximum Demand ☐ Connection points for the above meters
	Yes/No	☐ Standby mode ☐ Switch off ventilation when idling more than 2 minutes	☐ Voltmeter ☐ Ammeter ☐ kWh ☐ Total Power Factor ☐ Power ☐ Maximum Demand ☐ Connection points for the above meters
	Yes/No	☐ Standby mode ☐ Switch off ventilation when idling more than 2 minutes	☐ Voltmeter ☐ Ammeter ☐ kWh ☐ Total Power Factor ☐ Power ☐ Maximum Demand ☐ Connection points for the above meters
	Yes/No	☐ Standby mode ☐ Switch off ventilation when idling more than 2 minutes	☐ Voltmeter ☐ Ammeter ☐ kWh ☐ Total Power Factor ☐ Power ☐ Maximum Demand ☐ Connection points for the above meters

ESCALATORS / CONVEYORS

(tick/delete as appropriate)

Group Designation	Number of Escalators/Passenger Conveyors in Group	Provision of Metering Devices or provisions for connecting measuring devices for Group of Escalators/Passenger Conveyors
		☐ Voltmeter ☐ Ammeter ☐ kWh ☐ Total Power Factor ☐ Power ☐ Maximum Demand ☐ Connection points for the above meters
		☐ Voltmeter ☐ Ammeter ☐ kWh ☐ Total Power Factor ☐ Power ☐ Maximum Demand ☐ Connection points for the above meters
		☐ Voltmeter .. ☐ Ammeter ☐ kWh ☐ Total Power Factor ☐ Power ☐ Maximum Demand ☐ Connection points for the above meters

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