

DIN EN 81-20:2020-06 (E)

Safety rules for the construction and installation of lifts - Lifts for the transport of persons and goods - Part 20: Passenger and goods passenger lifts

Contents

Page

European foreword	6
0 Introduction	8
0.1 General	8
0.2 General remarks	8
0.3 Principles	9
0.4 Assumptions	9
1 Scope	13
2 Normative references	14
3 Terms and definitions	16
4 List of significant hazards	23
5 Safety requirements and/or protective measures	25
5.1 General	25
5.2 Well, machinery spaces and pulley rooms	25
5.2.1 General provisions	25
5.2.2 Access to well and to machinery spaces and pulley rooms	30
5.2.3 Access and emergency doors - Access trap doors - Inspection doors	31
5.2.4 Notices	32
5.2.5 Well	33
5.2.6 Machinery spaces and pulley rooms	46
5.3 Landing doors and car doors	54
5.3.1 General provisions	54
5.3.2 Height and width of entrances	54
5.3.3 Sills, guides, door suspension	54
5.3.4 Horizontal door clearances	55
5.3.5 Strength of landings and car doors	56
5.3.6 Protection in relation to door operation	60
5.3.7 Local landing lighting and "car here" signal lights	62
5.3.8 Locking and closed landing door check	63
5.3.9 Locking and emergency unlocking of landing and car doors	63
5.3.10 Requirements common to devices for proving the locked condition and the closed condition of the landing door	66
5.3.11 Sliding landing doors with multiple, mechanically linked panels	66
5.3.12 Closing of automatically operated landing doors	67
5.3.13 Electric safety device for proving the car doors closed	67
5.3.14 Sliding or folding car doors with multiple, mechanically linked panels	67
5.3.15 Opening the car door	68
5.4 Car, counterweight and balancing weight	68
5.4.1 Height of car	68
5.4.2 Available car area, rated load, number of passengers	68
5.4.3 Walls, floor and roof of the car	74
5.4.4 Car door, floor, wall, ceiling and decorative materials	75
5.4.5 Apron	76
5.4.6 Emergency trap doors and emergency doors	76
5.4.7 Car roof	77
5.4.8 Equipment on top of the car	81

5.4.9	Ventilation	81
5.4.10	Lighting	81
5.4.11	Counterweight and balancing weight	82
5.5	Suspension means, compensation means and related protection means	82
5.5.1	Suspension means	82
5.5.2	Sheave, pulley, drum and rope diameter ratios, rope/chain terminations	82
5.5.3	Rope traction	83
5.5.4	Winding up of ropes for positive drive lifts	83
5.5.5	Distribution of load between the ropes or the chains	84
5.5.6	Compensation means	84
5.5.7	Protection for sheaves, pulleys and sprockets	85
5.5.8	Traction sheaves, pulleys and sprockets in the well	87
5.6	Precautions against free fall, excessive speed, unintended car movement and creeping of the car	87
5.6.1	General provisions	87
5.6.2	Safety gear and its tripping means	90
5.6.3	Rupture valve	96
5.6.4	Restrictors	97
5.6.5	Pawl device	98
5.6.6	Ascending car overspeed protection means	99
5.6.7	Protection against unintended car movement	100
5.7	Guide rails	103
5.7.1	Guiding of the car, counterweight or balancing weight	103
5.7.2	Permissible stresses and deflections	103
5.7.3	Combination of loads and forces	107
5.7.4	Impact factors	107
5.8	Buffers	109
5.8.1	Car and counterweight buffers	109
5.8.2	Stroke of car and counterweight buffers	110
5.9	Lift machinery and associated equipment	111
5.9.1	General provision	111
5.9.2	Lift machine for traction lifts and positive drive lifts	111
5.9.3	Lift machine for hydraulic lifts	117
5.10	Electric installations and appliances	126
5.10.1	General provisions	126
5.10.2	Incoming supply conductor terminations	128
5.10.3	Contactors, contactor relays, components of safety circuits	128
5.10.4	Protection of electrical equipment	129
5.10.5	Main switches	130
5.10.6	Electric wiring	131
5.10.7	Lighting and socket outlets	132
5.10.8	Control of the supply for lighting and socket outlets	132
5.10.9	Protective earthing	133
5.10.10	Electrical identification	133
5.11	Protection against electric faults; failure analysis; electric safety devices	133
5.11.1	Protection against electric faults; failure analysis	133
5.11.2	Electric safety devices	134
5.12	Controls - Final limit switches - Priorities	139
5.12.1	Control of lift operations	139
5.12.2	Final limit switches	146
5.12.3	Emergency alarm device and intercom system	147
5.12.4	Priorities and signals	148
6	Verification of the safety requirements and/or protective measures	148
6.1	Technical compliance documentation	148
6.2	Verification of design	148
6.3	Examinations and tests before putting into service	152
6.3.1	Braking system (5.9.2.2)	152
6.3.2	Electric installation	153
6.3.3	Checking of the traction (5.5.3)	153
6.3.4	Car safety gear (5.6.2)	153
6.3.5	Counterweight or balancing weight safety gear (5.6.2)	154

6.3.6	Pawl device (5.6.5)	154
6.3.7	Buffers (5.8.1, 5.8.2)	155
6.3.8	Rupture valve (5.6.3)	155
6.3.9	Restrictor/one-way restrictor (5.6.4)	155
6.3.10	Pressure test	156
6.3.11	Ascending car overspeed protection means (5.6.6)	156
6.3.12	Stopping of the car at landings and levelling accuracy (5.12.1.1.4)	156
6.3.13	Protection against unintended car movement (5.6.7)	156
6.3.14	Protection against falling/shearing (5.3.9.3.4)	157
7	Information for use	157
7.1	General	157
7.2	Instruction manual	157
7.2.1	General	157
7.2.2	Normal use	157
7.2.3	Maintenance	157
7.2.4	Examinations and tests	158
7.3	Logbook	158
Annex A(normative) List of the electric safety devices		160
Annex B(informative) Technical compliance documentation		163
Annex C(informative) Periodic examinations and tests, examinations and tests after an important modification or after an accident		164
C.1	Periodic examinations and tests	164
C.2	Examinations and tests after an important modification or after an accident	164
Annex D(informative) Machinery spaces - Access		166
Annex E(informative) Building interfaces		167
E.1	General provisions	167
E.2	Support of Guide Rails	167
E.3	Ventilation of car, well and machine rooms	167
E.3.1	General	167
E.3.2	Ventilation of the well and car	168
E.3.3	Ventilation of machine rooms	169
Annex F(normative) Pit access ladder		170
F.1	Types of pit access ladder	170
F.2	General provisions	170
F.3	Ladder uprights and rungs	170
F.3.1	Ladder uprights	170
F.3.2	Ladder rungs	171
F.4	Specific provisions for non fixed type ladders	171
F.5	Location of the ladder in the pit	171
Annex ZA(informative) Relationship between this European Standard and the essential requirements of Directive 2014/33/EU aimed to be covered		173
Bibliography		178