Nidec Drives

Elevator E300

2.2 kW – 250 kW (3 - 400 hp)

200 V | 400 V | 575 V | 690 V

Elevator Drive E300 Highlights

- Elevator specific menu structure
- Ride comfort optimization
- Stationary autotune
- Contactorless operation
- Flexible DC bus voltage to support rescue operation

Key functions

Function		Function	
Creep-to-floor operation	✓	Active thermal management	✓
Direct-to-floor positioning	✓	Variable speed cooling fan	✓
Selectable speed reference	10	Supply loss detection	✓
Start optimizer	✓	Low DC link operation	✓
Start locking & pre-torquing	✓	24 Vdc backup	✓
Selectable switching frequencies	Up to 16 kHz	Simple UPS connection with load direction signal	✓
Skip frequency dead bans	✓	Analogue input control	3
Local/Remote keypad	✓	Analogue output control	2
High resolution S-ramp	✓	Temperature monitoring	✓
Acceleration Rates	8	Digital input control	3
Deceleration Rates	8	Digital I/O programmable control	3
Control mode: analogue reference	✓	Safe Torque Off input	1
Control mode: digital binary	✓	Relay control	1
Control mode: control word	✓	Mechanical Brake Controller	✓
Control mode: analouge reference over comms	✓	Brake contact monitoring	✓
Control mode: DCP3 & DCP4	✓	Adjustable break delays	✓
Control mode: CANopen-Lift	✓	Logic function control	✓
Stator resistance compensation	✓	Timer function control	✓
Slip compensation	✓	Limit switch control	✓
Selectable roping ratios	✓	Variable selector	✓
Auto-tune static	✓	Energy meter	✓
Auto-tune rotating	✓	Trip time stamping	✓
Tunable start, run & stop gains	✓	Trip logging	8
Fast stop	✓	Run time log	✓
Floor sensor correction	✓	Cloning	✓
DC injection braking	✓	Universal feedback port on-board	✓
Programmable braking	✓	Speed feedback via options	✓

Nidec Drives

Specification

Feature	Description
Items supplied with the drive	Safety Information, Quality Certificate, Control signal connectors, 24V power supply connector (frames 6 to 11), Grounding bracket, Surface mounting brackets, DC connection grommets (frames 3 to 6), Supply and motor connectors (frames 3 to 5), Nuts for supply and motor terminals (frames 6 to 11)
Storage temperature	-40°C to 55°C, -40°F to 131°F
Operating temperature without de-rate	-20°C to 40°C, -4°F to 104°F
Operating temperature with de-rate	40°C to 55°C, 104°F to 131°F
Supply requirements	AC supply voltage: 200 V drive: 200 V to 240 V ±10 % 400 V drive: 380 V to 480 V ±10 % 575 V drive: 500 V to 575 V ±10 % 690 V drive: 500 V to 690 V ±10 % Number of phases: 3 Maximum supply imbalance: 2 % negative phase sequence (3 % voltage imbalance between phases). Frequency range: 45 to 66 Hz For UL compliance only, the maximum supply symmetrical fault current must be limited to 100 kA
Switching frequency range	2,3,4,6,8,12,16kHz (Factory default = 8kHz Open-loop/RFC-A/RFC-S)
Approvals	CE approval – Europe RCM regulatory compliance mark – Australia UL / cUL approval – USA & Canada RoHS compliant – Europe Functional safety – USA & Canada Eurasian conformity – Eurasia
Product safety standard	EN 61800-5-1:2016 Adjustable speed electrical power drive systems - Part 5-2: Safety requirements – Functional EN 61800-5-1:2016 (in extracts) Adjustable speed electrical power drive systems - Part 5-1: Safety requirements - Electrical, thermal and energy EN 61800-3: 2004+A1:2012 Adjustable speed electrical power drive systems - Part 3: EMC requirements and specific test methods EN ISO 13849-1:2015 Safety of Machinery, Safety-related parts of control systems, General principles for design EN 62061:2005 + AC:2010 + A1:2013 + A2:2015 Safety of machinery, Functional safety of safety related electrical, electronic and programmable electronic control systems IEC 61508 Parts 1 - 7:2010 Functional safety of electrical/ electronic/programmable electronic safety-related systems
Altitude	1000m – No de-rate. 1000m to 3000m - 1% de-rate/100m
Humidity	95% Non-condensing at 40 °C (104 °F)
Pollution	Degree 2. Dry, non-conducting pollution only
IP Rating	IP20 / NEMA1 / UL TYPE 1 (UL open class as standard, additional kit needed to achieve Type 1) IP65 / NEMA4 / UL TYPE 12 rating on the rear of drive when through panel mounted (Frames 3 to 8) IP55 / NEMA4 / UL TYPE 12 rating on the rear of drive when through panel mounted (Frames 9 to 11)

Vibration	Reference standard IEC60068-2-27, IEC60068-2-29 bump test, IEC60068-2-64 random vibration test, IEC60068-2-6, EN61800-5-1 sinusoidal vibration test. Tested to Environmental Category ENV3.
Mounting methods	Frame 3 to 11 – Surface mount (supplied mounting brackets) or through-panel mount (optional mounting brackets). Frame 3 to 5 – Tile mount (optional mounting brackets)
Output frequency/speed range	599Hz (Open-loop), 560Hz (RFC-A, RFC-S)
Braking	In-built braking transistor for use with external braking resistor (all frames)
Operating modes	Open-loop: Open-loop vector, fixed V/F RFC-A: Rotor Flux Control for Asynchronous motors, with or without position feedback RFC-S: Rotor Flux Control for Synchronous motors, with or without position feedback
Overload capability	Heavy duty: Open-loop 150% overload, RFC 175% overload with CT profile, RFC 200% max overload.
Overvoltage category	Evaluated for Over Voltage Category III.
Corrosive environments	Concentrations of corrosive gases must not exceed the levels given in: Table A2 of EN 50178:1998, Class 3C2 of IEC 60721-3-3 This corresponds to the levels typical of urban areas with industrial activities and/or heavy traffic, but not in the immediate neighbourhood of industrial sources with chemical emissions.
Immunity Compliance	IEC EN 61000-4-2 Electrostatic discharge IEC EN 61000-4-3 Radio frequency radiated field IEC EN 61000-4-4 Fast transient burst IEC 61000-4-5 Surges IEC EN 61000-4-6 Conducted radio frequency IEC EN 61000-4-11 Voltage dips, short interruptions & variations IEC EN 61000-6-1 Electromagnetic compatibility residential, commercial and light-industrial environments IEC EN 61000-6-2 Electromagnetic compatibility for industrial environments IEC 61800-3 Adjustable speed electrical power drive systems - Part 3: EMC requirements EN12016:2013 Electromagnetic compatibility standard for lifts, escalators and moving walks Immunity with the recommended external filters and line reactors.
Emission compliance	Meets requirements of Equipment Category C3, C4 without external filters or line reactors. Meets requirements of Equipment Category C2 with the recommended external filters and line reactors. IEC 61800-3 Electromagnetic compatibility (EMC) requirements for power drive systems IEC EN 61000-3-2 Electromagnetic compatibility - Limits for harmonic current emissions IEC EN 61000-3-3 Electromagnetic compatibility Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems ≤ 16 A IEC EN 61000-3-11 Electromagnetic compatibility Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems < 16 A < 75 A IEC EN 61000-3-12 Electromagnetic compatibility Limits for harmonic currents produced by equipment connected to public low-voltage systems > 16 A and ≤ 75 A per phase IEC EN 61000-6-4 Electromagnetic compatibility (EMC) Emission standard for industrial environments EN 12015:2014, Electromagnetic compatibility standard for lifts, escalators and moving walks Emmission with the recommended external filters and line reactors.
Cooling	Variable speed forced controlled heatsink cooling fans
Safe Torque Off	Single STO channel. SIL 3
Communications	Onboard: RS485, Modbus/TCP SI Options: Ethernet, CANopen, DCP , EtherCAT
Control I/O	3 x Analogue input (1 x differential, 2 x single ended), 2 x Analogue output, 3 x Digital I/O programmable, 3 x Digital input (including 2 x high speed – 250µs), 1 x NO relay 250Vac Max., 6 x 0V common, 1 x 24V supply input (additional digital input), 1 x 24V user output (additional digital output), 1 x 10V user output, 1 x Safe Torque Off input. Additional I/O also available with SI-I/O option module.

Supported Feedback Devices	Supports a combination of main encoder feedback and a simulated encoder output from a single high-density connector: AB (0) Quadrature incremental encoders with or without marker pulse AB Servo (3) Quadrature incremental encoders with UVW commutation signals for absolute position for permanent magnet motors with or without marker pulse FR (2) Forward / reverse incremental encoders with or without marker pulse FR Servo (5) Forward / reverse incremental encoders with UVW commutation signals for absolute position for permanent magnet motors with or without marker pulse FD (1) Frequency and direction incremental encoders with or without marker pulse FD Servo (4) Frequency and direction incremental encoders with UVW commutation signals for absolute position for permanent magnet motors with or without marker pulse SC (6) Sincos incremental encoders SC Servo (12) Sincos incremental with commutation signals SC EnDat (9) Heidenhain sincos encoders with EnDat comms for absolute position SC Hiperface (7) Stegmann sincos encoders with Hiperface comms for absolute position SC SSI (11) Sincos encoders with SSI comms for absolute position SC BiSS (17) Sincos encoders with BiSS (type C) comms for absolute position SC SC (15) Sincos incremental with absolute position from single sin and cosine signals SSI (10) SSI encoders (Gray code or binary) EnDat (8) EnDat communication only encoders BiSS (13) BiSS (type C) communication only encoders Resolver (14) Resolver Commutation only (16) UVW commutation only encoders* * This feedback device provides very low-resolution feedback
Resolution and Accuracy	Frequency/speed accuracy: 0.01% (preset speed) Open loop resolution – Preset reference: 0.1 Hz, Precision reference: 0.001 Hz Closed loop resolution: Preset reference: 0.1 rpm, Precision reference: 0.001 rpm Differential Analog input 1: 12 bit (11 bit plus sign) Single ended Analog input 2 & 3: 12 bit (11 bit plus sign)
Onboard advanced motion controller	N/A
On-Board user program capability	N/A
Optional Second Processor (PLC / Motion)	SI-Applications Plus: allows application programming to be used MCi200: Advanced Machine Controller using industry standard IEC61131-3 programming languages MCi210: Extended Advanced Machine Controller using industry standard IEC61131-3 programming languages with simultaneous connectivity to 2 separate Ethernet networks
Keypad	Remote-Keypad RTC with real-time clock
Parameter backup and cloning	Smartcard and NV Media Card (using NV Media Card adapter)
PC Tools	Connect: Commissioning and cloning tool CT Scope: Oscilloscope Machine Control Studio: Second processor programming Drive Profiling Tool: Drive estimated thermal profiling
Warranty	5 Years (warranty terms and conditions apply)
Supported options	Remote-Keypad RTC, KI-485 Adapter, RS485-Communications lead, SI-Ethernet, SI-CANopen, SI-DCP, SI-I/O, SI-Encoder, SI -Universal Encoder, SI-Applications Plus, SI-Applications Compact, SI-EtherCAT, MCi200, MCi210, Smartcard, NV Media Card (using NV Media Card adapter), KI-Keypad Plus
Accessories	Through-hole IP65 mounting kit, UL type conduit kits, SP Retrofit mounting brackets, External EMC filters, Grounding bracket (supplied with the drive)

Dimensions

Frame size	Dimensions H x W x D mm (in)	Weight kg (lb)	DC Bus Choke/AC Line Choke	
			Internal	External
3	365 x 83 x 200 (14.4 x 3.3 x 7.9)	4.5 (9.9)	✔	-
4	365 x 124 x 200 (14.4 x 4.9 x 7.9)	6.5 (14.3)	✔	-
5	365 x 143 x 200 (14.4 x 5.6 x 7.9)	7.4 (16.3)	✔	-
6	365 x 210 x 227 (14.4 x 8.3 x 8.9)	14 (31)	✔	-
7	508 x 270 x 280 (20 x 10.6 x 11.0)	28 (62)	✔	-
8	753 x 310 x 290 (29.7 x 12.2 x 11.4)	52 (115)	✔	-
9A	1049 x 310 x 290 (41.3 x 12.2 x 11.4)	66.5 (147)	✔	-
10E	1010 x 310 x 290 (39.7 x 12.2 x 11.4)	46 (101)	-	✔
11E	1190 x 310 x 312 (46.9 x 12.2 x 12.3)	63 (139)	-	✔

Documentation & Downloads

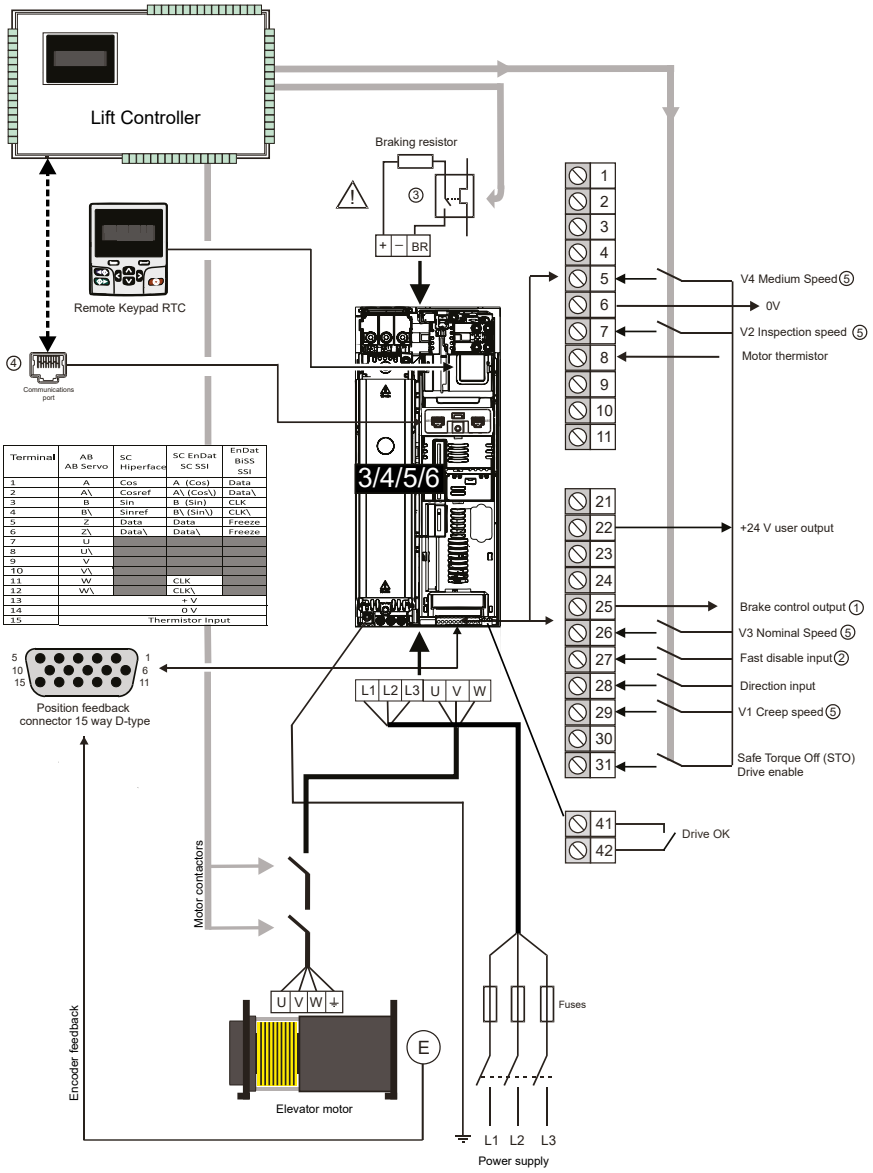
Product documentation and PC tools available for download from:
www.controltechniques.com/support

Connections

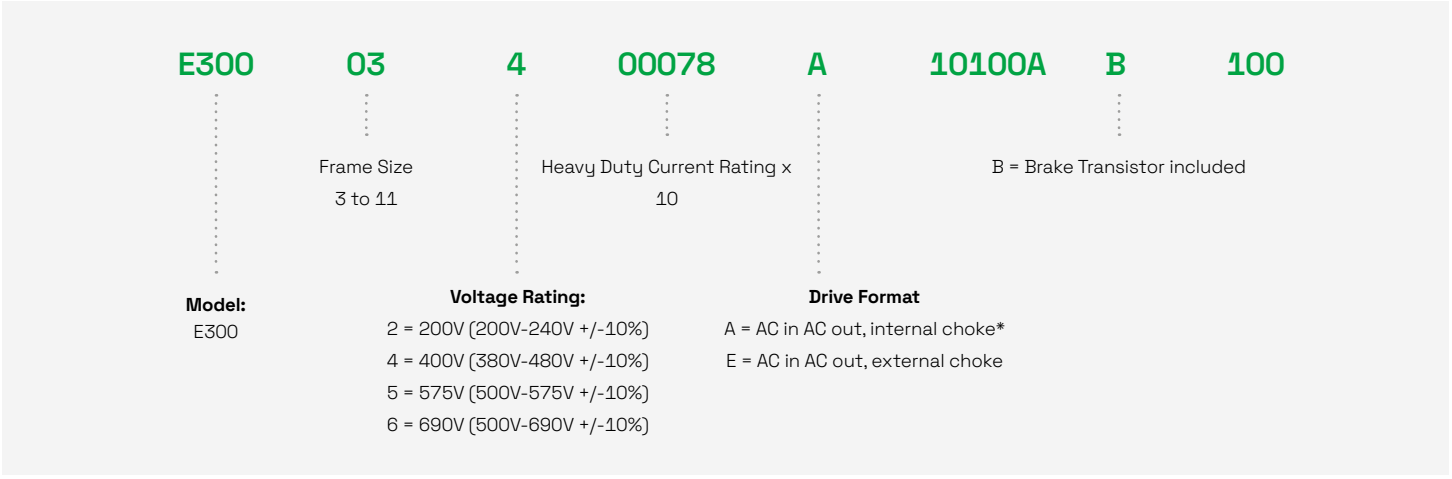
Typical Power Connections & Default Control Connections

Example for E300 Elevator drive Frame 3, 4, 5 or 6

- Brake control optional from drive or Elevator controller.
- Fast disable input only required for systems using output shorting contactor.
- External protection for the braking circuit and the braking resistor.
- Communications port E300 Elevator drive.
- Speeds V1 to V4 are shown as examples.



Part numbers



*Frame 9 and below

Model number and ratings

Model	Heavy Duty				
	Rated Current	Motor Shaft Power		Peak Current Open Loop	Peak Current RFC
	A	kW	hp	A	A
200V Rated Drives					
E300-3200050	5	0.75	1	7.5	10
E300-3200066	6.6	1.1	1.5	9.9	13.2
E300-3200080	8	1.5	2	12	16
E300-3200106	10.6	2.2	3	15.9	21.2
E300-4200137	13.7	3	3	20.55	27.4
E300-4200185	18.5	4	5	27.75	37
E300-5200250	25	5.5	7.5	37.5	50
E300-6200330	33	7.5	10	49.5	66
E300-6200440	44	11	15	66	88
E300-7200610	61	15	20	91.5	122
E300-7200750	75	18.5	25	112.5	150

Model	Heavy Duty				
	Rated Current	Motor Shaft Power		Peak Current Open Loop	Peak Current RFC
	A	kW	hp	A	A
E300-7200830	83	22	30	124.5	166
E300-8201160	116	30	40	174	232
E300-8201320	132	37	50	198	264
E300-9201760	176	45	60	264	308
E300-9202190	219	55	75	328.5	383.25
E300-10202830	283	75	100	424.5	495.25
E300-10203000	300	90	125	450	525
400V Rated Drives					
E300-3400062	6.2	2.2	3	9.3	12.4
E300-3400078	7.8	3	5	11.7	15.6
E300-3400100	10	4	5	15	20
E300-4400150	15	5.5	10	22.5	30
E300-4400172	17.2	7.5	10	25.8	34.4
E300-5400220	22	9	12	33	38.5
E300-5400270	27	11	20	40.5	54
E300-5400300	30	15	20	45	60
E300-6400350	35	15	25	52.5	70
E300-6400420	42	18.5	30	63	84
E300-6400470	47	22	30	70.5	94
E300-7400660	66	30	50	99	132
E300-7400770	77	37	60	115.5	154
E300-7401000	100	45	75	150	200
E300-8401340	134	55	100	201	268
E300-8401570	157	75	125	235.5	314
E300-9402000	200	90	150	300	350
E300-9402240	224	110	150	336	392
E300-10402700	270	132	200	405	472.5
E300-10403200	320	160	250	480	560
E300-11403770	377	185	300	565.5	659.75
E300-11404170	417	200	350	625.5	729.75
E300-11404640	464	250	400	696	812

575V and 690V ratings are also available on request.

CONTROL TECHNIQUES

KB