



Energy solutions

LI-ION BATTERIES AND CHARGERS

90 V

Ideal for all kind of applications

- State of the art technology to reduce energy costs (up to 30 %)
- Multilevel safety concept on cell, module and battery level
- Emission and maintenance free battery technology
- Intermediate and fast charging for increased truck availability
- Constant CAN bus communication that guarantees a fully harmonized overall system



Here you can find more content via your smartphone: [Linde Augmented Reality App](#)



TECHNICAL DATA Li-ION 90 V BATTERIES

E-TRUCKS

Nominal voltage	Available trucks	Energy content	Capacity	Weight (± 5 %)	Dimensions (l × w × h) in mm	IP protection class	Full-charging time with on-board charger 80 V/120 A/10 kW ³⁾	Full-charging time with charger 80 V/110 A/9 kW ³⁾
90 V	E20, E25, E30, E25 L*, E30 L*, E25 HL/600*, E30 HL/600*, E35 L*, E35 HL*	24.1 kWh	268 Ah	1210 kg	1028 × 708 × 632	IP 6k9k	2 h 00 min	3 h 15 min
		60.3 kWh	670 Ah				4 h 54 min	8 h 00 min
		84.6 kWh	940 Ah				6 h 54 min	11 h 15 min
	E20/600 H, E25/600 H, E30/600 H, E20/600 RH, E25/600 RH, E30/600 RH	24.1 kWh	268 Ah	1558 kg	1028 × 711 × 692		2 h 00 min	3 h 15 min
		60.3 kWh	670 Ah				4 h 54 min	8 h 00 min
		84.6 kWh	940 Ah				6 h 54 min	11 h 15 min
	E40/600 HL, E45/600 HL, E50/600 HL, E50/500 HL, E40/600 L, E45/600 L, E50/600 L, E50/500 L	36.2 kWh	402 Ah	2178 kg	1028 × 999 × 724		3 h 00 min	4 h 50 min
		66.3 kWh	737 Ah				5 h 24 min	8 h 50 min
		118.4 kWh	1316 Ah				9 h 42 min	16 h 00 min
	E35 H/600*, E40 H/600*, E45 H/600*	60.3 kWh	670 Ah	1210 kg	1028 × 708 × 632		4 h 54 min	8 h 00 min
		84.6 kWh	940 Ah				6 h 54 min	11 h 15 min
	E60, E70, E80, E80/900	66.3 kWh	737 Ah	2178 kg	1028 × 999 × 724		5 h 24 min	8 h 50 min
		118.4 kWh	1316 Ah				9 h 42 min	16 h 00 min

Nominal voltage	Available trucks	Full-charging time with charger 80 V/210 A/17 kW ³⁾	Full-charging time with charger 80 V/375 A/30 kW ³⁾	Chemical system	Charging temperature ¹⁾	Operating temperature	Storage temperature ²⁾
90 V	E20, E25, E30, E25 L*, E30 L*, E25 HL/600*, E30 HL/600*, E35 L*, E35 HL*	1 h 40 min	1 h 00 min	Nickel-Mangan-Cobalt-Oxide	-20 °C to +45 °C	-35 °C to +60 °C	-30 °C to +40 °C
		4 h 15 min	2 h 25 min				
		5 h 40 min	3 h 25 min				
	E20/600 H, E25/600 H, E30/600 H, E20/600 RH, E25/600 RH, E30/600 RH	1 h 40 min	1 h 00 min				
		4 h 15 min	2 h 25 min				
		5 h 40 min	3 h 25 min				
	E40/600 HL, E45/600 HL, E50/600 HL, E50/500 HL, E40/600 L, E45/600 L, E50/600 L, E50/500 L	2 h 35 min	1 h 30 min				
		4 h 25 min	2 h 40 min				
		8 h 30 min	4 h 45 min				
	E35 H/600*, E40 H/600*, E45 H/600*	4 h 15 min	2 h 25 min				
		5 h 40 min	3 h 25 min				
	E60, E70, E80, E80/900	4 h 25 min	2 h 40 min				
		8 h 30 min	4 h 45 min				

VNA

Nominal voltage	Available trucks	Energy content	Capacity	Weight (± 5 %)	Dimensions (l × w × h) in mm	IP protection class	Full-charging time with charger 80 V/110 A/9 kW ³⁾	Full-charging time with charger 80 V/210 A/17 kW ³⁾
90 V	K-modular	24.1 kWh	268 Ah	1558 kg	1028 × 711 × 692	IP 6k9k	3 h 15 min	1 h 40 min
		36.2 kWh	402 Ah	2178 kg	1028 × 999 × 724		4 h 50 min	2 h 35 min
		60.3 kWh	670 Ah	1558 kg	1028 × 711 × 692		8 h 00 min	4 h 15 min
		84.6 kWh	940 Ah	1558 kg	1028 × 711 × 692		11 h 15 min	5 h 40 min
		118.4 kWh	1316 Ah	2178 kg	1028 × 999 × 724		16 h 00 min	8 h 30 min

Nominal voltage	Available trucks	Full-charging time with charger 80 V/375 A/ 30 kW ³⁾		Chemical system	Charging temperature ¹⁾	Operating temperature	Storage temperature ²⁾
90 V	K-modular	1 h 00 min		Nickel-Mangan-Cobalt-Oxide	-20 °C to +45 °C	-35 °C to +60 °C	-30 °C to +40 °C
		1 h 30 min					
		2 h 25 min					
		3 h 25 min					
		4 h 45 min					

¹⁾ At temperatures below 0 °C the charging time will increase

²⁾ Constant storage below -10 °C/over 40 °C will have negative effects on the lifetime of the battery

³⁾ At ambient/battery temperature 20 °C

* CO process requested

In cases of usage in a cold store application the highest battery capacity should always be chosen.

TECHNICAL DATA Li-ION 90V READY CHARGERS

Manufacturer		Linde	Linde	Linde	Linde
Model		80 V 120 A 10 kW*	80 V 110 A 9 kW	80 V 210 A 17 kW	80 V 375 A 30 kW
Mains voltage		3-NPE 400 V (-15 % / +10 %)	3~ 400 V (±10 %)	3~ 400 V (±10 %)	3~ 400 V (±10 %)
Grid frequency	(Hz)	50 / 60	50 / 60	50 / 60	50 / 60
Mains fuse protection	(A)	16	16	32	63
Leakage current	(mA)	< 3.5	< 3.5	< 3.5	360 VAC - 3.1 mA a.c. 400 VAC - 4.0 mA a.c. 440 VAC - 3.6 mA a.c.
Minimum mains cross section	(mm² (in²))	2.5 (0.0039)	2.5 (0.0039)	6 (0.0093)	10 (0.0155)
Length mains cable (AC)	(m)	-	3	3	3
Duty cycle	(%)	100	100	100	100
EMC device class		B	B	B	B
RCD Type		B	B	B	B
Protection class		I	I	I	I
Degree of protection	(IP)	65	20	20	20
Overvoltage Category		III	III	III	III
Operating Temperatur	(°C (°F))	-25 / +60 (-13 / 140)	-20 / +40 (-4 / 104)	-20 / +40 (-4 / 104)	-20 / +40 (-4 / 104)
Storage Temperatur	(°C (°F))	-45 / +80 (-49 / 176)	-25 / +80 (-13 / 176)	-25 / +80 (-13 / 176)	-25 / +80 (-13 / 176)
Maximum Relative Humidity	(%)	95	85	85	85
Maximum Altitude above MSL	(m (ft.))	2000 (6561)	2000 (6561)	2000 (6561)	2000 (6561)
Product Standard		EN 61000, EN 62477-1	EN 62477-1	EN 62477-1	EN 62477-1
Dimensions	(mm)	450 × 300 × 161	633 × 180 × 344	647 × 247 × 392	780 × 369 × 1090
Weight	(kg (lb))	20 (44.09)	25 (55.12)	38 (83.78)	104 (229.28)
Pollution Level / degree		3	3	3	3
Maximum AC current	(A)	15.5	15.1	30.6	54.3
Maximum AC Power	(W)	10700	9710	18110	31970
Nominal DC voltage	(V)	80	80	80	80
Maximum DC current	(A)	120	110	210	375
PF λ (Uac Nom, 50 Hz, Udc Nom, Idc max)		0.98	0.947	0.918	0.908
THDi (Uac Nom, 50 Hz, Udc Nom, Idc max)	(%)	5	32.2	45.86	49.59
Efficiency	(%)	95	93	94	94

* On-board charger

STANDARD AND OPTIONAL EQUIPMENT

Model		Li-ION On-board charger	Li-ION charger 9 kW housing	Li-ION charger 17 kW housing	Li-ION charger 30 kW housing
Safety	External start/stop - Preventing sparking, if the charging lead is disconnected while charging is in progress	●	●	●	●
	Fully harmonized system via CAN bus communication	●	●	●	●
Service	Calendar function - For time-controlled charging	—	●	●	●
	Current peak avoidance - System managing power consumption and charging periods to avoid peak load	—	●	●	●
	Dealer text - Display of service contact when error arises	—	●	●	●
	USB interface - For software updates and analysis	—	●	●	●
Comfort	LED strip, charging status indicator - Easy and fast status identification	—	○	○	○
	Operate directly from the device - Through intuitive display	—	●	●	●
	Remote display	—	○	○	○
Workplace	Air pre-filter - Protecting the inside of the charger from contamination	—	○	○	○
	Standard charging cable 3 m	—	●	●	●
	Charging cable 5 m	—	○	○	○
	Charging housing rental	—	○	○	○
	Charging module small (600)	—	○	○	○
	Charging module large (1500) - Only in combination with wall bracket	—	○	○	○
	Wall and floor brackets - For simple and secure intallation on the wall or on the floor	—	○	○	○

● Standard equipment ○ Optional equipment — Not available

CHARACTERISTICS



Highest protection in case of accident

Safety

- 25 millimeter thick steel tray protects cells and modules from damage even when exposed to massive external forces (48 V and 90 V)
- Multi-stage safety system at cell, module and battery level ensures smooth operation
- Battery management monitors and harmonizes vehicle use, charging processes and battery system and thus protects against damage
- No hazardous gases are produced during operation and charging



E25 equipped with Li-ION battery

Efficiency

- Short charging times and the possibility of intermediate charging, e.g. during breaks, significantly increase vehicle availability for multi-shift operation
- 2500 complete charge cycles with 80 % (48 V and 90 V) or 75 % (24 V) residual capacity are guaranteed
- Li-ION battery system enables up to 30 % higher utilization of electrical energy
- Up to 95 % of the total capacity of the battery can actually be used
- Hardly noticeable voltage drop at low charge level



Quick access to charge

Handling

- Elimination of the costly charging infrastructure with separate battery room and gas extraction system
- Chargers can be set up flexibly, e.g. for short intermediate charging near break rooms or close to the area of use
- Elimination of battery change due to battery capacities and charging capacities adapted to the application



Easy service access

Service

- Harmonized CAN bus communication between vehicle, Li-ION battery and charger, ensures safe and smooth operation and extends the service life of the components
- Maintenance, cleaning or refilling of distilled water is completely unnecessary

Subject to modification in the interest of progress. Illustrations and technical details could include options and not binding for actual constructions. All dimensions subject to usual tolerances.

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