

Delta-Q Technologies ICL Series

900W-1500W Battery Charger for Lithium Battery Chemistries

The ICL Series is Delta-Q Technologies' lithium-specific line of battery chargers for industrial and motive applications. Designed to optimally charge lithium battery systems with any chemistry (e.g. LCO, NCA, NMC, LMO, LFP, LTO). CAN bus communication, with the battery management system (BMS), ensures seamless machine integration to grant original equipment manufacturers (OEMs) wide flexibility in their design and deployment.



ICL1500

Available Models



ICL1200

57V 58V 85V 120V

ICL900 Models



ICL1200 Models



ICL1500 Models



Charger Features



High Reliability

IP66-rated, rugged, sealed aluminum die-cast enclosure protects against vibration, shock, dirt, chemicals, and fluids. Automotive reliability and tested to an 8-year service life.



Charge Quality

Charge algorithms to precisely charge lithium batteries while balancing charge time, battery life and application requirements.



Lithium Safety

Custom lithium algorithms providing the first line of safety for lithium battery charging; state-of-the-art battery labs and experts for testing and validating of battery packs and BMS.



Global + Efficient

Wide AC input voltage range capable of operating on any single-phase grid worldwide. 93% efficient and meets energy efficiency standards, such as CEC.



OEM System Integration

CAN bus enables OEMs to update the software of the charger, algorithms, and extract charger status, charger history, fault and error logs.



Global Standard Compliance (ICL 57V and 58V)







Compliance with North American, UNECE R10 and European touch-safe voltage regulations allows for easy integration into electric vehicles.

OEM Features







- CAN bus communication for machine BMS/telematics integration with CANopen and J1939 protocols
- Charge cycle data logging for insight into usage and troubleshooting
- OEM customizable, field replaceable cable design
- Optional multi-colored remote or charger mounted LED indicator for battery charging status, error and fault indication
- Interlock prevents vehicle from moving while charging

Application Examples



ICL900 ICL1200 Specifications				
DC Output	ICL900 57V	ICL1200 85V	ICL1200 120V	ICL1200 57V
Lithium final charging voltage	36-57 VDC	55-85 VDC	80-120 VDC	36-57 VDC
Lithium cells in series	9 to16	14 to 24	21 to 34	9 to 16
Max DC output voltage	57 VDC	85 VDC	120 VDC	57 VDC
Max DC output current. $V_{in} > 200$	27.0 A	20.0 A	15.0 A	33.3 A
Max DC output power. $V_{in} > 200$	900 W ($V_{out} > 36V$)	1200 W ($V_{out} > 60V$)	1200 W ($V_{out} > 80V$)	1200 W ($V_{out} > 36V$)
Max DC output current. $V_{in} < 200$	27.0 A	18.2 A	12.5 A	33.3 A
Max DC output power. $V_{in} < 200$	900 W ($V_{out} > 36V$)	1000 W ($V_{out} > 60V$)	1000 W ($V_{out} > 80V$)	1200 W ($V_{out} > 36V$)
Dry contact interlock current rating	0.3 A			
Reverse polarity	Poka-Yoke DC terminals and electronic protection with auto-reset			
Short circuit	Electronic current limit			
AC Input	ICL900 57V	ICL1200 85V	ICL1200 120V	ICL1200 57V
AC input voltage range	85-270 VAC			
Nominal AC input voltage range	100-240 VAC			
Nominal AC input frequency	50/60 Hz			
Max AC input current	10.5 A	11.5 A	11.5 A	14.0 A
Nominal AC input current	8.4 A @ 120 VAC	9.3 A @ 120 VAC	9.3 A @ 120 VAC	11.1 A @ 120 VAC
	4.4 A @ 230 VAC	5.7 A @ 230 VAC	5.7 A @ 230 VAC	5.7 A @ 230 VAC
Nominal AC power factor	>0.99 @ 120 VAC, >0.98 @ 230 VAC			
Mechanical	ICL900 57V	ICL1200 85V	ICL1200 120V	ICL1200 57V
Dimensions	300 x 179 x 80 mm (11.8 x 7.0 x 3.2")			
Weight	3.65 kg (8.0 lbs)	3.55 kg (7.8 lbs)		
AC input connector	IEC320/C14 with Delta-Q country-specific AC cord			
DC output connector	Poka-Yoke threaded fasteners for ring terminals. Negative: M6; Positive: M8			
Mounting holes	M6 diameter slots			
Cooling	Natural convection			Forced convection with variable speed fan
Regulatory	All Models			
Efficiency	93% peak efficiency; Natural Resources of Canada (NRCAN), California Energy Commission (CEC), and Department of Energy (DoE) compliant			
Safety	All Models: UL1564, EN 60335-2-29, AZ/NZS60335 (RCM) ICL900 57V and ICL1200 57V: Voltage Class A (less than 60 VDC)			
Emissions	FCC Part 15 / ICES 003 Class B, EN 61000-3-2, EN 61000-3-3, EN 61000-6-3, CISPR 14.1, UNECE R10			
Immunity	CISPR 14.2, EN 61000-6-2, UNECE R10			
Environmental	All Models			
Enclosure	IP66 (NEMA4)			
Thermal fatigue/ Shock/ Vibration	GMW 3172			
Operating temperature	-40°C to +65°C (-40°F to 149°F) Full nominal output power -35°Cto +40°C(-31°F to 104°F)			
Storage temperature	-40°C to +85°C (-40°F to 185°F)			
Regulatory	All Models			
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Please note the above specifications are subject to change.

ICL1500 Specifications			
DC Output	ICL1500 58V	ICL1500 85V	ICL1500 120V
Lithium final charging voltage	36-58 VDC	55-85 VDC	80-120 VDC
Lithium cells in series	9 to 16	14 to 24	21 to 34
Max DC output voltage	58.1 VDC	85 VDC	120 VDC
Max DC output current. $V_{in} > 200$	33.3 A	25.0 A	18.7 A
Max DC output power. $V_{in} > 200$	1500 W ($V_{out} > 36V$)	1500 W ($V_{out} > 60V$)	1500 W ($V_{out} > 80V$)
Max DC output current. $V_{in} < 200$	33.3 A	20.8 A	15.6 A
Max DC output power. $V_{in} < 200$	1200 W ($V_{out} > 36V$)	1200 W ($V_{out} > 60V$)	1200 W ($V_{out} > 80V$)
Dry contact interlock current rating	0.3 A	0.3 A	0.3 A
Reverse polarity	Poka-Yoke DC terminals and electronic protection with auto-reset		
Short circuit	Electronic current limit		
AC Input	ICL1500 58V	ICL1500 85V	ICL1500 120V
AC input voltage range	85-270 VAC		
Nominal AC input voltage range	100-240 VAC		
Nominal AC input frequency	50/60 Hz		
Max AC input current	14.0 A	13.0 A	13.0 A
Nominal AC input current	11.1 A @ 120 VAC	11.1 A @ 120 VAC	11.1 A @ 120 VAC
	7.2 A @ 230 VAC	7.2 A @ 230 VAC	7.2 A @ 230 VAC
Nominal AC power factor	>0.99 @ 120 VAC, >0.98 @ 230 VAC		
Mechanical	ICL1500 58V	ICL1500 85V	ICL1500 120V
Dimensions	300 x 179 x 80 mm (11.8 x 7.0 x 3.2")		
Weight	3.55 kg (7.8 lbs)		
AC input connector	IEC320/C14 with Delta-Q country-specific AC cord		
DC output connector	Poka-Yoke threaded fasteners for ring terminals. Negative: M6; Positive: M8		
Mounting holes	M6 diameter slots		
Cooling	Forced convection with variable speed fan		
Regulatory	All Models		
Efficiency	93% peak efficiency; Natural Resources of Canada (NRCAN), California Energy Commission (CEC), and Department of Energy (DoE) compliant		
Safety	All Models: UL1564, EN 60335-2-29, AZ/NZS60335 (RCM) ICL1500 58V: Voltage Class A (less than 60 VDC)		
Emissions	FCC Part 15 / ICES 003 Class B, EN 61000-3-2, EN 61000-3-3, EN 61000-6-3, CISPR 14.1, UNECE R10		
Immunity	CISPR 14.2, EN 61000-6-2, UNECE R10		
Environmental	All Models		
Enclosure	IP66 (NEMA4)		
Thermal fatigue/Shock/Vibration	GMW 3172		
Operating temperature	-40°C to +65°C (-40°F to 149°F) Full nominal output power -35°C to +40°C (-31°F to 104°F)		
Storage temperature	-40°C to +85°C (-40°F to 185°F)		
Regulatory	All Models		
	     		

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ICL 900 1200 1500 Specifications - Extended	
Environmental	All Models
Chemical	MIL Standard 810-G, Method 504.1: Withstands exposure to chemicals typically found in application (battery acid, salt, cleaners, fertilizers, oils, fuels, etc.)
Salt	Withstands 720 hours (30 days) salt spray test per GMW 3172 with 5% (w/w) salt solution (pH 6.5-7.2) at 35°C (95°F) without degradation of performance
Humidity	0 to 95% non-condensing
Altitude	< 15,000 feet derated above 20°C
Acoustic noise	<50 dB at 3m (only while charging, fan operation only as required)
Mechanical	All Models
Dimensions	Charger: 300 x 179 x 80 mm (11.8 x 7.0 x 3.2") Shipping carton: 38.7 x 23.0 x 20.0 cm (15.2 x 9.1 x 7.9")
Weight	Charger: 3.65 kg (8.0 lbs) Shipping Carton: 4.4 kg (9.7 lbs)
AC input connector	IEC320/C14 Receptacle with Delta-Q AC cord retention tabs
DC output connector	DC terminals with Poka-Yoke, Negative M6 and Positive M8 threaded fasteners Two conductors 10 to 12 AWG or four conductors 12 AWG (10mm)
Signal Connector	TE AmpSeal automotive connector (IP6K9K rated) - mates with TE Connectivity AmpSeal Plug (p/n: 776262-4): Signals for CAN bus (isolated); Remote status indicators; Signal Interlock
Mounting holes	6.4mm (1/4") dia. slots in each corner allow for safe installation on a shelf or on a wall or bulkhead
Cooling	Active cooling (Variable speed, Field serviceable, Field replaceable, Fan)
Operation	All Models
Long-term storage mode	Automatic restart to maintain battery state-of-charge
Charge control circuitry	Powered from AC input only
Standby AC power consumption	<3.25 W
Quiescent DC current (connected to battery only)	<0.125 mA <10 mW; less than 90 mAh/month
Communications/Signals	All Models
Interlock relay signal	Form C Relay with contacts isolated from all other charger signals. Normally-Closed (NC) to Common (COM) when AC not present. Normally Open (NO) to COM when AC present.
Remote Status LED	Tri-color RED/YELLOW/GREEN
CANbus	Isolated CAN-H, CAN-L, CAN-GND CANopen CiA 418 (battery) and CiA 419 (charger), J1939
Special Features	All Models
Service	No custom service tools needed. Software can be upgraded and logged charge cycle information can be downloaded using CAN bus.
Options	All Models
OEM-specific AC, DC & signal cords	Customized cords to suit OEM requirement, factory-installed for OEM convenience
AC cord	Delta-Q's sealed, IEC-compliant AC power cords provide a sealed, retained AC connection when mated with an IC Series Charger. Cords available for North America, Europe, Great Britain, China, Japan, and Australia. The sealed connection prevents damage from fluids, dirt or acid corrosion, as well as maintaining a firm connection between the power cord and inlet. The charger can also be connected to an off-the-shelf, country-specific AC cord which has a standard IEC320 C13 plug.
ICL series handle & rubber feet kit	Rubber feet easily insert into the charger's mounting holes to protect mounting surface and prevent the charger from sliding. Optional fan with handle for fan-cooled units. Attachable handle for convection-cooled units.

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