COMPONENTS FOR ELECTRIC VEHICLE CHARGING STATIONS

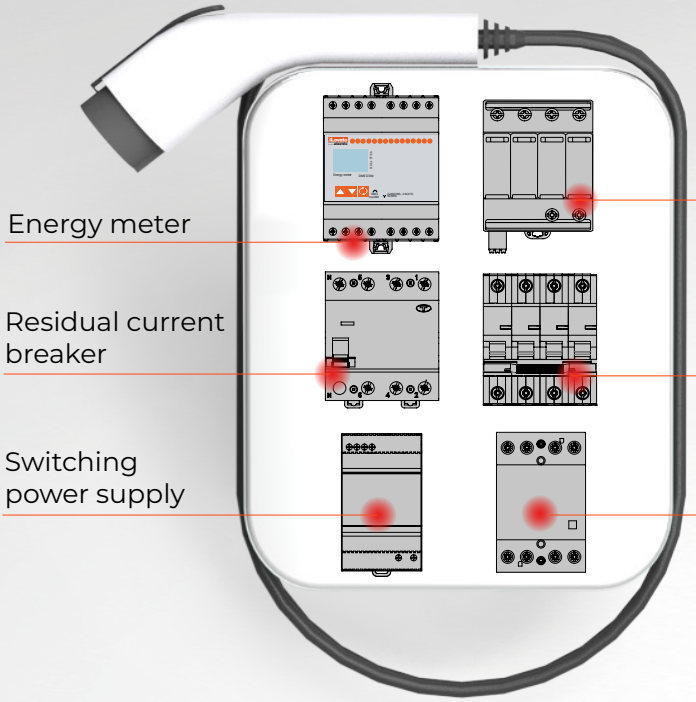
Lovato electric

ENERGY AND AUTOMATION

AC WALL BOXES

Wall boxes are devices for the domestic charging of plug-in electric and hybrid vehicles, featuring a compact footprint and usually wall-mounted.

Along with its styling and compact dimensions, the most important requirements for a wall box are safety, robust construction and long service life, which are typically obtained by using modular or domestic versions of **industrial electrical components**, like those offered by LOVATO Electric.



SINGLE-PHASE AC WALL BOX

Power output	Surge protection device		Therm+magnetic circuit breaker	Residual current breaker	Modular contactor	Energy meter	
[kW]	Type 1+2 limp: 12.5kA	Type 2 In: 20kA	Available curves: B, C, D ❶	Type A 30mA ❷	Auxiliary power: 230VAC AC1 (≤40°C) ❸	MID (+55°C)	MID (+70°C)
2.2	SA0B1NA320R	SG21NA300 (R)	P1MB2P...10	P1RD2P25A030	CN2020220	DMED111MID	DMED111MID7
3.7			P1MB2P...16				
7.4			P1MB2P...32	P1RD2P40A030	CN4001220		

THREE-PHASE AC WALL BOX

Power output	Surge protection devices		Therm+magnetic circuit breaker	Residual current breaker	Modular contactor	Energy meter	
[kW]	Type 1 +2 limp: 12.5kA	Type 2 In: 20kA	Available curves: B, C, D ❶	Type A 30mA ❷	Auxiliary power: 230VAC AC1 (≤40°C) ❸	MID (+70°C)	Eichrecht (+70°C)
11	SA0B3NA320R	SG23NA300 (R)	P1MB4P...16	P1RD4P25A030	CN2510220	DMED301MID7	DMED341MID7E ❹
22			P1MB4P...32	P1RD4P40A030	CN4010220		
43			P1MB4P...63	P1RD4P63A030	CN6310220		

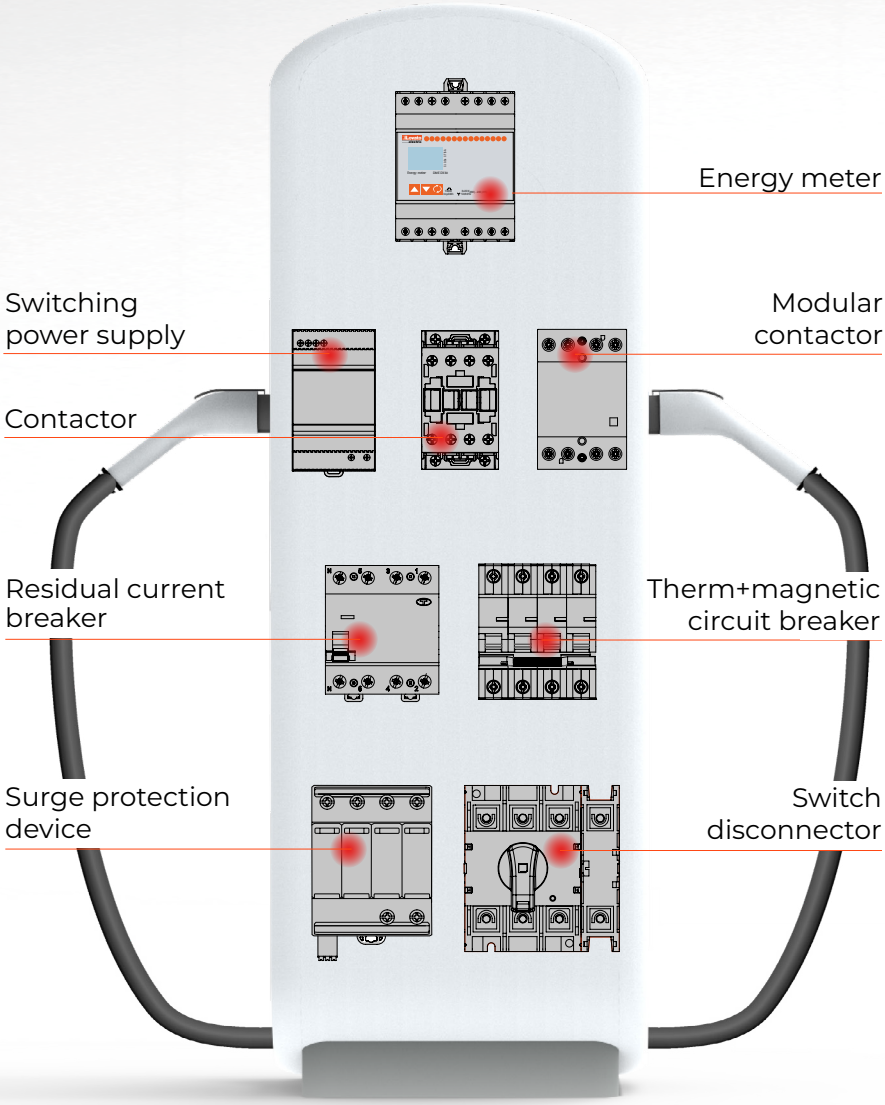
❶ Full order code, specifying the curve (e.g. P1MB2PC10 for curve C).

❷ Use of a type A residual current breaker is envisaged by IEC 61851-1 in combination with a device to cut off power in case of DC current leakage in excess of 6mA. **The LOVATO Electric range includes type B four-pole residual current breakers rated 40A, 63A and 80A, with rated trip current of 30 or 300mA.**

❸ Other auxiliary power voltages are available.

❹ Version with MID certified energy production (export) is also available.

AC CHARGING STATION



AC **charging stations** are devices for the public and semi-public charging of plug-in electric and hybrid vehicles.

They differ from wall boxes in that they are designed for **outdoors installation**; they are therefore exposed to even more aggressive atmospheric conditions and are thus required to be **extremely reliable** to ensure continuity of service. This is why the electrical command and control components in charging stations must be **derived from industrial applications**.

Since the cost of the charging transaction is commensurate with the consumption of electrical energy, the latter must be measured with equipment certified to local standards to safeguard the user of the service.

COMPONENTS FOR AC CHARGING STATIONS

Power	Switch disconnector		Surge protection device		Therm+magnetic circuit breaker	Residual current breaker	Contactor ❺	Modular contactor	Energy meter	
[kW]	Handle (AC21A 690V)	Modular, toggle operated (AC22A 440V)	Type 1+2 limp: 12.5kA	Type 2 In: 20kA	Available curves: B, C, D ❶	Type A 30mA ❷	Auxiliary power: 230 VAC AC1 (≤70°C)	AC1 (≤40°C) ❸	MID (+70°C)	Eichrecht (+70°C)
11	GA016A + GAX42040A	P1MS4P032	SA0B3NA320R	SG23NA300 (R)	P1MB4P…16	P1RD4P25A030	BF09T4A230	CN2510220	DMED301MID7	DMED341MID7E ❻
22	GA032A + GAX42040A				P1MB4P…32	P1RD4P40A030	BF26T4A230	CN4010220		
2x22	GA080A + GAX42080A	P1MS4P100			2x P1MB4P…32	2x P1RD4P40A030	2x BF26T4A230	-	2x DMED301MID7	2x DMED341MID7E ❻

❺ "Mirror contacts" pursuant to EN60947-4-1: operation of auxiliary contacts in relation to power contacts. The NC auxiliary contact does not close if the power contacts are open. This characteristic applies to all LOVATO Electric contactors. "Mechanically linked contacts" pursuant to EN60947-5-1: applies only between auxiliary contacts. The NC auxiliary contact does not open if the NO auxiliary contacts are open. This characteristic applies to auxiliary contacts BFX10... and BFX12... when combined with contactors up to BF38 and BF40….150 with electronic coils. ❻ Version with MID certified energy production (export) is also available.

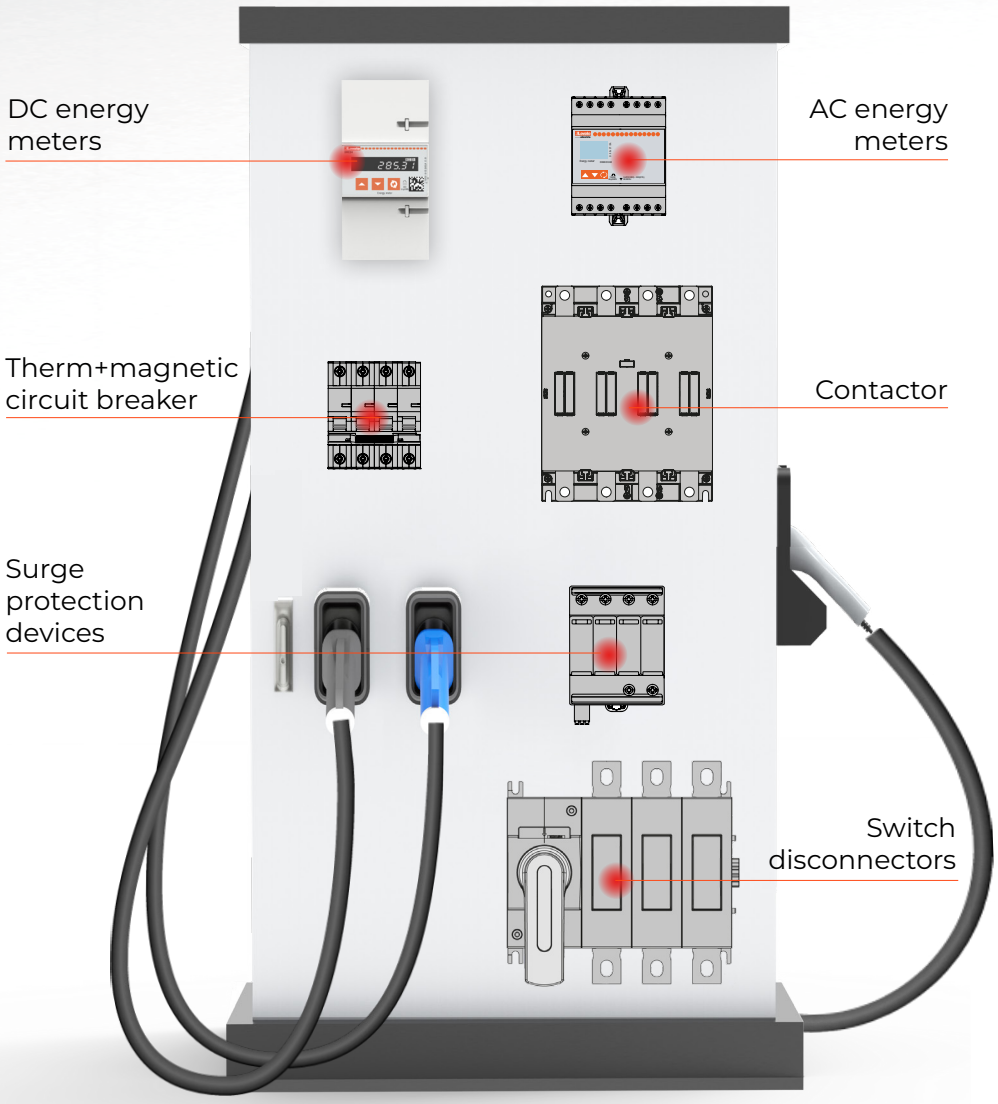
DC CHARGING STATION

DC charging stations are devices for the **fast and ultrafast** public and semi-public charging of plug-in electric and hybrid vehicles and heavy vehicles.

Transforming the power supply from AC to DC **increases the efficiency and power of the charging station**. The result is that charging times are very much shorter. These stations are typically installed outdoors, exposed to aggressive atmospheric conditions. **Reliability is also an essential requirement** for ensuring continuity of service.

The power of such units is very high and the electrical command and control components must be **rated for industrial applications and high performance**.

Since the cost of the charging transaction is commensurate with the consumption of electrical energy, the latter must be measured with equipment certified to local standards to safeguard the user of the service.



DMED4... DC ENERGY METERS

DMED4... is the new series of energy meters specified and designed for DC electrical vehicle charging stations. The maximum currents **up to 600A with 1500V** maximum voltage make the meters **suitable for fast charging applications.**

Certification and compliance

- IEC62053-41, EN50470-4 (class B) for accuracy
- VDE-AR-E 2418-3-100 (German market, Eichrecht)
- cURus (UL61010-1, UL61010-2-30) ❶
- LNE(Décision n° 22.00.570.001.1 du 1er mars 2022) ❶

Connection to the EVCS mail board

- 2 models: RS485 o RS485 + Ethernet
  Modbus slave with digital signature included
- API over http protocol

❶ Pending

Model	DMED...0150	DMED...0400	DMED...0600
Max voltage	1500V	1500V	1500V
I Max	150A	400A	600A
Max bar size	M10 ring terminal	40x10mm	
		2x 40x5mm	
I Transition	3A	8A	12A
I Minimum	1.5A	4A	6A
I Start	120mA	320mA	480mA

DC CHARGING STATION







COMPONENTS FOR DC CHARGING STATIONS

Total power DC+AC	Switch disconnector	Surge protection device		Contactor ❶	DC energy meter*		AC energy meter	Emergency stop button Ø40mm	
[kW]	4P (AC21A 690V)	Type 1+2 limp: 12,5kA	Type 2 In: 20kA	Auxiliary power: 230VAC 4P AC1 (≤70°C) ❷	RS485 built in	RS485 + Ethernet built in	MID	Ø22mm metal	Ø22mm plastic
20	GA032A + GAX42040A	SA0B3NA320R	SG23NA300 (R)	BF26T4A230	DMED403❸0150	DMED404❸0150	DMED301MID7 (+70°C)	LPSB6644 + LPXAU120M +LPXC...	LPCB6644 + LPXAU120 +LPXC...
25	GA040A + GAX42040A			BF38T4A230					
30	GA063A + GAX42063A			BF40T4A230					
40				BF50T4A230					
50	GA080A + GAX42080A			BF80T4A230					
60	GA100A + GAX42100A			BF95T4A230			DMED330MID +3x DM...T...❹		
75	GA125A + GAX42125A			BF115T4A230					
80				BF150T4A230					
90…100	GL0160C1 + GLX420315			BF160T4E230	DMED403❸0400	DMED404❸0400			
120	GL0200C1 + GLX420315								
125				BF195T4E230					
140…160	GL0250C1 + GLX420315			BF230T4E230					
175	GL0315C1 + GLX420315			BF265T4E230					
180…200				BF265T4E230					
210				BF330T4E230					
225…250	GL0400C1 + GLX420400								
270				11B500400220	DMED403❸0600	DMED404❸0600			
300	GL0500C1 + GLX420500								
350…360	GL0630C1 + GLX420630			11B630400220					
375…400				11B6301000400220					
450…480									
500…600				11B1250424220					
675…750				11B1600424220					

* Coming soon



COMPONENTS FOR SINGLE TRANSFORMER UNITS (STACK)

Stack power	Therm+magnetic circuit breaker	Contactor ❶	Modular contactor
[kW]	Available curves: B, C, D ❸	Auxiliary supply voltage:	
		230VAC 3P AC1 (≤70°C) ❷	230VAC AC1 (≤40°C) ❷
20	P1MB3P…32	BF2600A230	CN3201220
25	P1MB3P…40	BF3200A230	CN4001220
30	P1MB3P…50	BF4000A230	CN6301220
50	-	BF8000A230	-
75		BF11500A230	
100…120		BF16000E230	

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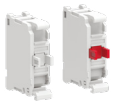
❷ Other coil power supply voltages are available. ❸ Choose **D** (certified imported energy) or **R** (certified exported/exchange energy) to complete the code.

❹ Up to +55°C. ❺ Full order code, specifying the curve (e.g. P1MB2PC10 for curve C).


GAX10...


GLX10...

For switch disconnectors GA... and GL...

Order code	Specifications
Auxiliary contacts with closure simultaneous with the switch disconnector.	
GAX1011A	1NA+1NC for disconnector GA...
GAX1020A	2NA for disconnector GA...A
GLX1001	1NC for disconnector GL
GLX1010EA	1NAA for disconnector GL

For therm+magnetic and residual current breakers P1...

Order code	Specifications
Auxiliary contact.	
P1X1011	1 switching contact
Actuation signalling contact.	
P1X1311	1 switching contact
Undervoltage trip release.	
P1X14230	230V 50/60Hz
Shunt trip release.	
P1X16024	12...24VDC 50/60Hz
P1X16230	110...415VAC 50/60Hz


P1X1011 P1X16...


DMED4DC

For DMED4... energy meters

Order code	Specifications
Data concentrator and display	
DMED4DC *	12-24VDC (9…31VDC)

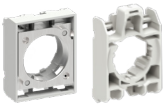
* Coming soon


BFX10... BFX12...

For contactors

Order code	Specifications	
Centre-mounting auxiliary contacts.		
BFX1002❶	2NC	for BF09...150
BFX1011❶	1NA + 1NC	for BF09...150
BFX1020❶	2NA	for BF09...150
BFX10C10	1NA	for BF09...150
BFX10C01	1NC	for BF09...150
Side-mounting auxiliary contacts.		
BFX1202❷	2NC	for BF160...230
BFX1211❷	1NA + 1NC	for BF160...230
BFX1222❷	2NA	for BF160...230
11G350 ❸	2NA+1NC or 1NA +2NC reversible	for 11B...
11G354 ❸	1NA+1N	for 11B...
Auxiliary contacts for CN modular contactors. ❹		
CNH11 ❺	1NA+1NC	
CNH20 ❺	2NA	


11G35... CNH...


LPXAU120...


LPXC10...

For emergency stop buttons

Order code	Specifications
Fixing base.	
LPXAU120M	for metal operators
LPXAU120	for plastic operators
Screw-mounting contact elements.	
LPXC10	1NA
LPXC01	1NC

❶ Adapter G358 makes it possible to also install these contacts on series B contactors. ❷ High conductivity contacts.
❸ Only for contactors B250-B310-B400-B500-B630-B6301000. ❹ Not suited for installation to modular contactors CN20..., CN3211..., CNM20..., CNM3220...
❺ Only installs to compatible contactors. Contact our Technical Support service at Tel +39 035 4282422 - Email: service@lovatoelectric.com

The North American market for electric vehicle charging stations is booming, above all due to the growing demand for fast charging infrastructure. This market has its own **safety standards**; and there is thus a growing requirement for cULus certification of charging station components. The majority of LOVATO Electric products are **cULus** certified.

Models **DMED111MID7** (direct insertion single-phase up to 40A in 1 DIN module), **DMED301MID7** and **DMED341MID7E...** (direct insertion three-phase up to 80A in 4 DIN modules) are designed specifically for use in electric vehicle recharging stations.

- suited to applications with extended ambient temperature ranges
- MID certified in observance of legal metrology and commercial transaction requirements
- integrated RS485 communications port running the Modbus RTU protocol.

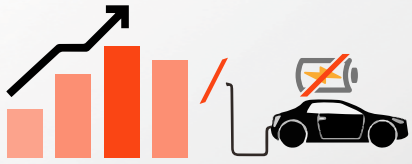
GERMAN CALIBRATION STANDARD - EICHRECHT

In particular, the **DMED341MID7E** is also conforming with the requirements of VDE-AR-E 2418-3-100, 2020 edition, the standard used by recharging station vendors to comply with the German calibration standard (Eichrecht), MessEG (Mess und Eichgesetz) and MessEV (Mess und Eichverordnung).

Finally, the **DMED341MID7ER** is MID certified not only for its energy consumption (import) but also for its energy production (export), an essential requirement for grid parity, as well as being conforming with German law.

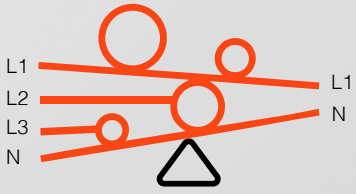
DYNAMIC LOAD BALANCING

The wall boxes can have an integrated **load balancing function** which:



prevents overloading and hence power failure

optimises the vehicle's charging power



converts the charging mode from three-phase to single-phase depending on the available energy

MODBUS ADDRESS TABLE

ADDRESS	MEASURE	WORD	UOM
1A20h	Active Energy - Import	2	kWh/1000
1A22h	Active Energy - Export	2	kWh/1000
1A24h	Reactive Energy - Import	2	kvarh/1000
1A26h	Reactive Energy - Export	2	kvarh/1000
1A2Ah	Partial Active Energy - Import	2	kWh/1000
1A2Ch	Partial Active Energy - Export	2	kWh/1000
1A2Eh	Partial Reactive Energy - Import	2	
1A30h	Partial Reactive Energy - Export		
1A34h	L1 Active Energy		
1A36h	L1		

To implement this function, the wall boxes must be connected to an external energy meter. LOVATO Electric energy meters feature standard Modbus communications mapping. LOVATO Electric can assess the feasibility of custom mapping to suit the requirements of the charging station manufacturer.

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PD151 GB 03 24

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