

SOLUTIONS FOR ELECTRIC VEHICLE CHARGING STATIONS

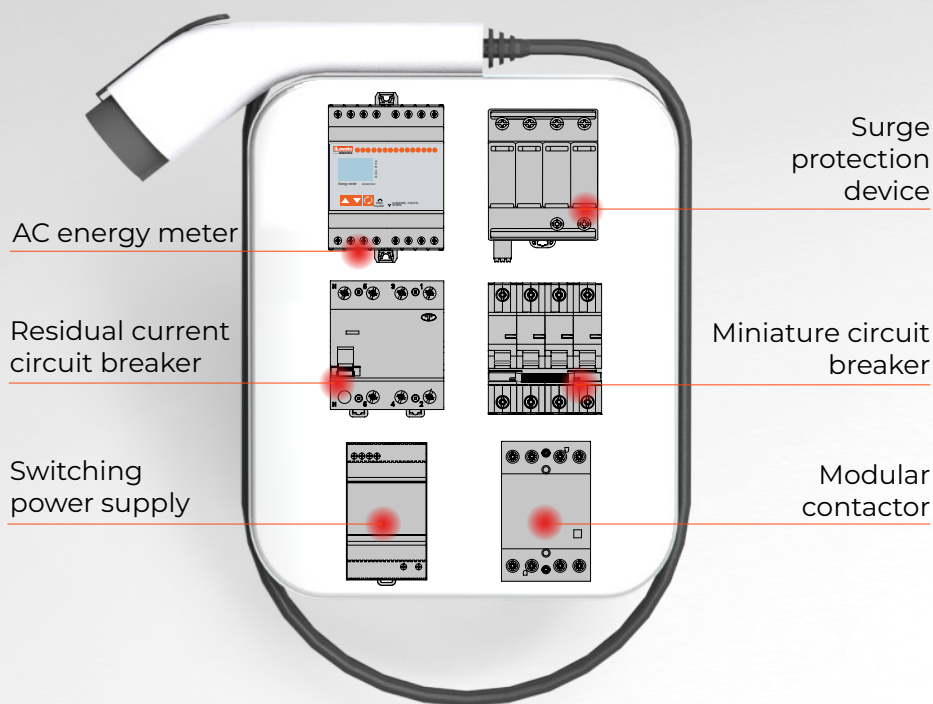


electric

ENERGY AND AUTOMATION

Wall boxes are devices for the **domestic charging** of electric and plug-in hybrid vehicles, with compact dimensions and usually wall-mounted.

In addition to aesthetic and dimensional aspects, the most important requirements for a wall box are **safety, robustness and long service life**, typically achieved through the use of **industrial electrical components**, such as those offered by LOVATO Electric.



COMPONENTS FOR SINGLE-PHASE AC WALL BOX

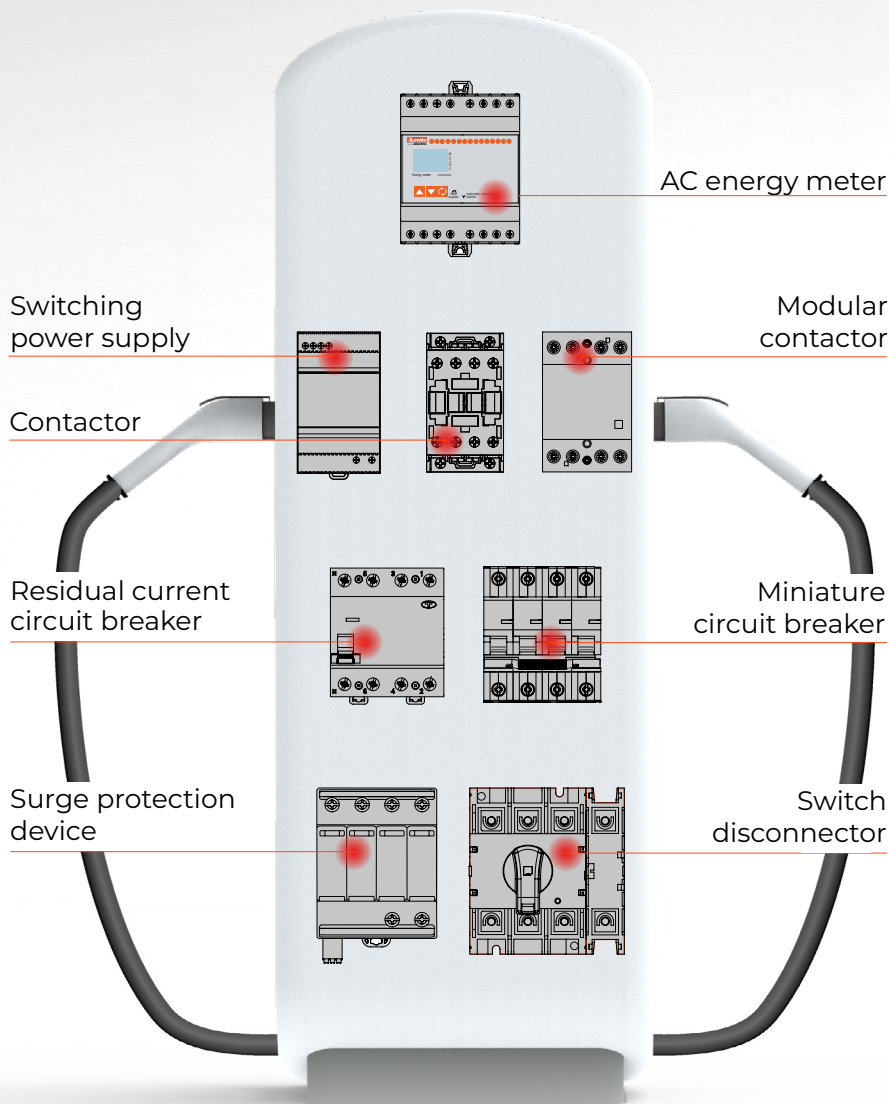
Power	Surge protection device		Miniature circuit breaker	Residual current breaker	Modular contactor	AC energy meter	
[kW]	Type 1+2 Iimp 12.5kA	Type 2 In 20kA	Available curves: B, C, D ❶	Type A 30mA ❷	Coil voltage 230VAC AC1 (≤40°C) ❸	MID (+55°C)	MID (+70°C)
2.2	SA0B1NA320R	SG21NA300 (R)	P1MB2P...10	P1RD2P25A030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



COMPONENTS FOR THREE-PHASE AC WALL BOX

Power	Surge protection device		Miniature circuit breaker	Residual current breaker	Modular contactor	AC energy meter	
[kW]	Type 1+2 Iimp 12.5kA	Type 2 In 20kA	Available curves: B, C, D ❶	Type A 30mA ❷	Coil voltage 230VAC AC1 (≤40°C) ❸	MID (+70°C)	MID + Eichrecht (+70°C)
11	SA0B3NA320R	SG23NA300 (R)	P1MB4P...16	P1RD4P25A030	CN2510220	DMED341MID7	DMED341MID7E ❹
22			P1MB4P...32	P1RD4P40A030	CN4010220		
43			P1MB4P...63	P1RD4P63A030	CN6310220		

- ❶ Order code to be completed specifying the curve (e.g. P1MB2PC10 for curve C).
 ❷ Use of a type A residual current breaker is allowed by the standard IEC 61851-1 in combination with a device to cut off power in case of DC current leakage greater than 6mA. **The LOVATO Electric range includes four-pole type B residual current breakers with rated current 40A, 63A and 80A, with rated trip current of 30mA or 300mA.**
 ❸ Other coil voltages are available.
 ❹ Version with MID certified energy production (export) is also available, code DMED341MID7ER (V2G - Vehicle to Grid ready).



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

They differ from wall boxes in that they are designed for **outdoors installation**; they are therefore exposed to **extreme weather conditions** and require high reliability to ensure continuity of service. For this reason the electrical command and control components within the charging stations must be **of industrial-grade**.

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.



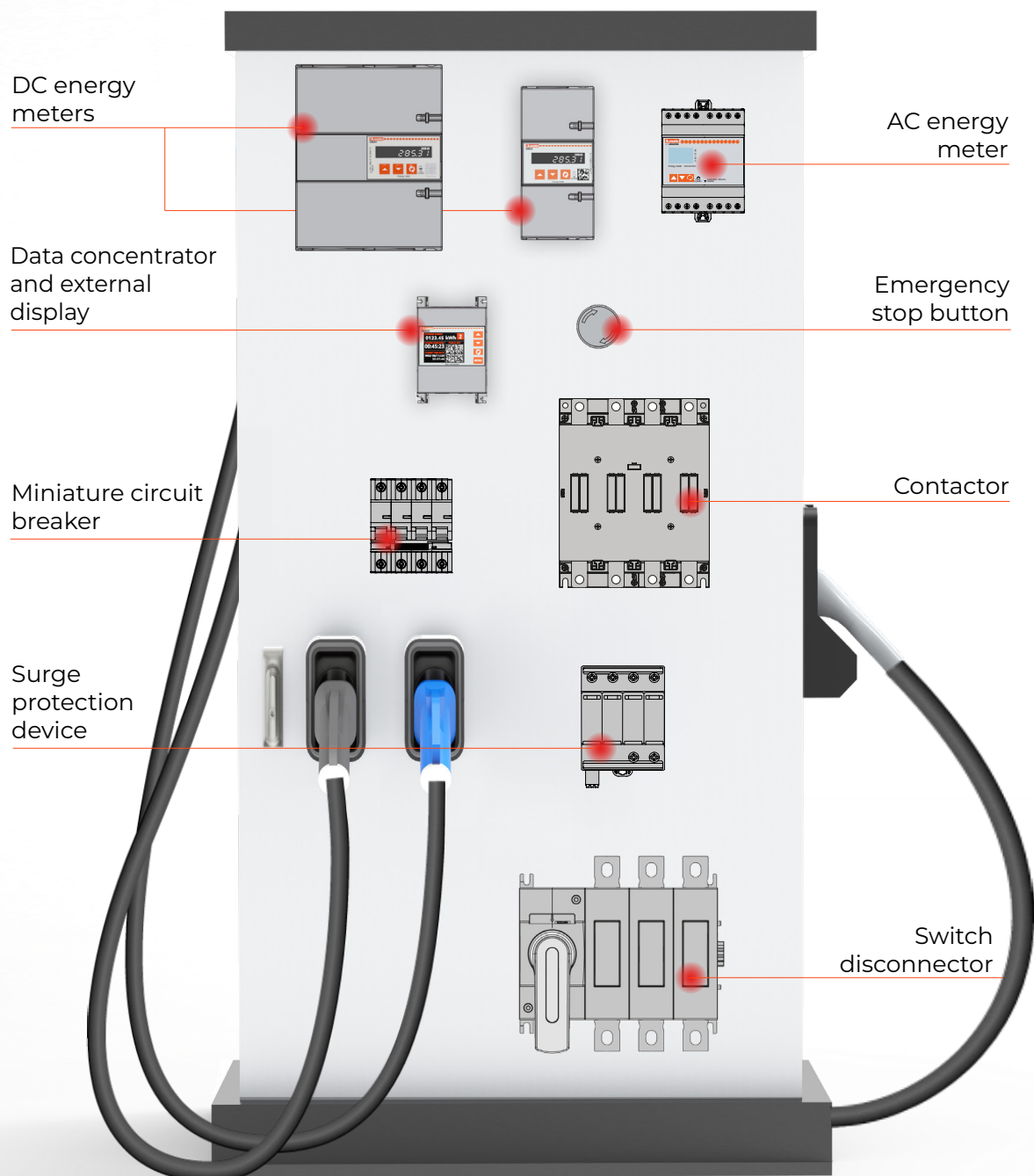
COMPONENTS FOR THREE-PHASE AC CHARGING STATIONS

Power	Switch disconnector		Surge protection device		Miniature circuit breaker	Residual current breaker	Contactor ⑤	Modular contactor	AC energy meter	
[kW]	Rotary handle (AC21A 690V)	Modular, toggle operated (AC22A 440V)	Type 1+2 limp 12.5kA	Type 2 In 20kA	Available curves: B, C, D ①	Type A 30mA ②	Coil voltage: 230 VAC ③ AC1 (≤70°C)	AC1 (≤40°C)	MID (+70°C)	MID + Eichrecht (+70°C)
11	GA016A + GAX42040A	P1MS4P032	SA0B3NA320R	SG23NA300 (R)	P1MB4P...16	P1RD4P25A030	BF09T4A230	CN2510220	DMED341MID7	DMED341MID7E ⑥
22	GA032A + GAX42040A				P1MB4P...32	P1RD4P40A030	BF26T4A230	CN4010220		
2x22	GA080A + GAX42080A	P1MS4P100			2x P1MB4P...32	2x P1RD4P40A030	2x BF26T4A230	-	2x DMED341MID7	2x DMED341MID7E ⑥

⑤ "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...BF150 with electronic coils.

⑥ Version with MID certified energy production (export) is also available, code DMED341MID7ER (V2G - Vehicle to Grid ready).

DC charging stations are devices for the **fast, ultrafast** (included the Megawatt Charging Systems, **MCS**) **public or semi-public** charging of electric and plug-in hybrid cars and heavy vehicles. The transformation of the power supply voltage from AC to DC **increases the efficiency and power of the charging station**. As a result, **charging times are drastically reduced**. These stations are typically installed in outdoor environments, exposed to even extreme weather conditions. **Reliability is also an essential requirement** for ensuring service continuity. The power levels of such units are very high and the **electrical command and control device** must be **rated for industrial applications with 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.



DC CHARGING STATION



COMPONENTS FOR DC CHARGING STATIONS

Total power DC+AC	Switch disconnecter	Surge protection device		Contactor ①	DC energy meter		AC energy meter	Emergency stop button Ø40mm		
[kW]	4P (AC21A 690V)	Type 1+2 Iimp 12.5kA	Type 2 In 20kA	Coil voltage 230VAC ② 4P AC1 (≤70°C)	MID + Eichrecht RS485 built-in	MID + Eichrecht RS485 + Ethernet built-in	MID	Ø22mm metal	Ø22mm plastic	
20	GA032A + GAX42040A	SA0B3NA320R	SG23NA300 (R)	BF26T4A230	DMED403③0150	DMED404③0150	DMED341MID7 (+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						
75	GA125A + GAX42125A			BF115T4A230						
80				BF150T4A230						
90...100	GL0160C1 + GLX420315			BF160T4E230	DMED403③0400	DMED404③0400	DMED330MID +3x DM...T...			
120	GL0200C1 + GLX420315			BF195T4E230						
125	GL0315C1 + GLX420315			BF230T4E230						
140...160				GL0250C1 + GLX420315						BF265T4E230
175				BF265T4E230						
180...200	GL0400C1 + GLX420400			BF330T4E230						DMED403③0600
210				BF500T4E230						
225...250	GL0630C1 + GLX420630			BF630T4E230	DMED403③1500	DMED404③1500				
270				11B6301000400220						
300				11B1250424220						
350...360				GL0500C1 + GLX420500	11B1600424220					
375...400										
450...480										
500...600										
675...750										



COMPONENTS FOR SINGLE TRANSFORMER UNITS (STACK)

Stack power	Miniature circuit breaker	Contactor ①	Modular contactor
[kW]	Available curves: B, C, D ④	Coil voltage: 230VAC ②	
		3P AC1 (≤70°C)	AC1 (≤40°C)
20	P1MB3P...32	BF2600A230	CN3201220
25	P1MB3P...40	BF3200A230	CN4001220
30	P1MB3P...50	BF4000A230	CN6301220
50	-	BF8000A230	-
75		BF11500A230	
100...120		BF16000E230	

① "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...BF150 with electronic coils.

② Other coil voltages are available. ③ Complete the code with letter **D** (certified imported energy) or **R** (certified exported/exchange energy). (V2G ready).

④ Order code to be completed specifying the curve characteristics (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...
GLX1001	1NC for disconnector GL...
GLX1010EA	1NAA for disconnector GL...

For miniature and residual current circuit breakers P1...

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



P1X1011

P1X16...



BFX10...



BFX12...

CNH...

For contactors

Order code	Specifications
Centre-mounting auxiliary contacts. ①	
BFX1002	2NC for BF09...BF150
BFX1011	1NA + 1NC for BF09...BF150
BFX1020	2NA for BF09...BF150
BFX10C10	1NA for BF09...BF150
BFX10C01	1NC for BF09...BF150
Side-mounting auxiliary contacts. ①	
BFX1202	2NC for BF160...BF630
BFX1211	1NA + 1NC for BF160...BF630
BFX1222	2NA for BF160...BF630
Auxiliary contacts for CN modular contactors. ②	
CNH11 ③	1NA+1NC
CNH20 ③	2NA

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



LPXAU120...



LPXC10...

- ① High conductivity contacts. ② Not suitable for installation on modular contactors CN2020..., CN3211...
 ③ It can only be mounted on compatible contactors. Contact our Technical Support at Tel +39 035 4282422 - Email: service@lovatoelectric.com.



The North American market for electric vehicle charging stations is constantly increasing, especially due to the growing demand for fast charging infrastructure. **Dedicated safety standards** are required for this market; therefore the cULus certification of components included in EV charging stations is increasingly demanded. Most of **LOVATO Electric** products are **cULus** certified.



AC ENERGY METERS

Energy meters type **DMED11MID7** (direct insertion single-phase up to 40A in 1 DIN module) and **DMED34MID7...** (direct insertion three-phase up to 80A in 4 DIN modules) are AC energy meters designed for use in electric vehicle charging stations.

- Suitable for fast charging application and MCS (Mega Charging Stations)
- MID certified in observance of legal metrological requirements and commercial transaction
- integrated RS485 communication port with Modbus-RTU protocol.

German calibration standard - Eichrecht

In particular, the **DMED34MID7E** energy meter is also compliant with the requirements of VDE-AR-E 2418-3-100, 2020 edition, the standard used by charging station vendors to comply with the German calibration standard (Eichrecht), MessEG (Mess und Eichgesetz) and MessEV (Mess und Eichverordnung).

Finally, the **DMED34MID7ER** is MID certified not only for the energy consumed (imported) but also for the energy produced (exported), an essential requirement in case of grid parity, in addition to being compliant with the German law.

All meters are multi-measurement (kWh, kvarh, kW with average and max demand kvar, V, I, Hz, PF, total and partial hour counter).

DC ENERGY METERS

DMED4 is the series of DC energy meters **specifically designed for electrical vehicle charging stations**. The maximum current **up to 1500A with 1500V** maximum voltage makes the energy meters **suitable for fast, ultrafast and MCS charging applications**. Energy meters are **V2G - Vehicle to Grid ready**.

Certifications

- MID class B
- MessEG (Mess uns Eichgesetz),
MessEV (Mess und Eichverordnung), Eichrecht
- cURus
- LNE (France, pending).

Main characteristics

- Rated current from 150 to 1500A
- Maximum voltage 1500VDC
- Operating temperature -40...+85°C
- Connection to the EVCS main board with RS485 or Ethernet, via Modbus or API over http protocol with digital signature.

DC energy meters

Model	DMED4...0150	DMED4...0400	DMED4...0600	DMED4...1500
Max DC voltage	1500V	1500V	1500V	1500V
I Max	150A	400A	600A	1500A
Measuring range	0.12...150A	0.32...400A	0.48...600A	1.2...1500A
Max bar size	M10 ring terminal	40x10mm		100x5mm
		2x40x5mm		2x80x5mm

Accessories

Order code	Specifications
Data concentrator and external display	
DMED4DC1	Data concentrator and external display for connecting 1 to 4 energy meters type DMED4... or DMED341..., 12-24VDC power supply, DIN rail or panel mounting.
Cables	
DMED4XC1	Cable kit for DMED4... for voltage and auxiliary power supply connection
DMED4XC2	Cable for connection of DMED4... with DMED4DC1
DMED4XC3	Ethernet cable 1500VDC 85°C
DMED4XC4	Cable for connection of DMED4... to RS485 network



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ENERGY AND AUTOMATION

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The products described in this document are subject to update and modification at any time. The descriptions, technical and functional information, illustrations and instructions in the leaflet are to be considered as purely illustrative and consequently have no contractual relevance. Remember also that the products themselves must be used by qualified personnel in compliance with current plant engineering and installation standards, in order to avoid injury to persons or damage to property.