NEW!
BAT 490

The Professionals for **Testing, Charging** and **Starting** Battery service devices

BOSCH
Invented for life

Battery service:
by Bosch

- **BAT 110** – **Portable battery tester**
- **BAT 121** – **Portable battery tester**
- **BML 2415** – **Electronic charger**
- **BML 2415 FW** – **Electronic charger (fire service version)**
- **BAT 415 / 430** – **High-frequency charger**
- **New! BAT 490** – **High-frequency charger**
- **BSL 2470** – **Rapid-start charger**
- **W 200 S** – **Workshop charger**
- **BAT 250** – **Non-system-connected start-assist measure**
- **BAT 251** – **Non-system-connected start-assist measure**

Battery service: by Bosch

Modern test technology boosts expertise in workshops

With each new generation of vehicles, the scope of electrical and electronic systems widens. They increasingly replace mechanical and hydraulic components.

Features that delight customers with more driving comfort and product quality are making completely new demands to the capacities of workshops.

Innovations in automotive technology like the CAN data bus and new legal requirements call for ever more qualified diagnostics in repairs and maintenance.

System networks define the workshop business of tomorrow

In tomorrow's cars, complex systems are linked up with each other. Thus, the replacement of spare parts is only possible using qualified diagnostics information.

The battery: The center of power supply for innovative car components

Battery services make top demands to testing devices in use these days as well. The charging process has to be free of voltage peaks that cause sensors to malfunction. Bosch battery chargers allow starter batteries to be charged in a protective manner even while they are in place. Large power reserves provide successful start assistance under all temperature conditions.

When testing the state of a battery, flexible use is of utmost importance: Bosch battery testers allow 12 V batteries as well as alternators with 12 V nominal voltage to be tested quickly and easily anywhere.

Battery testers: Test with the best

Battery tester BAT 110 **0 986 AT0 550**

The BAT 110 is a fast, reliable and easy to use battery tester for all 12 V-lead-acid-batteries (standard, maintenance-free, gel batteries and fleece batteries / AGM). In addition to performing battery diagnosis and displaying the battery status, BAT 110 is capable of testing 12 V starter and charging systems.

The four digit numerical display as well as the three LED indicators and scrollable arrow keys enable an easy and intuitive handling of the device (no language output required). In addition, the BAT 110 offers a wide range of testing norms, such as SAE, EN, DIN, IEC, CCA and JIS.
A convertion table for the JIS norm is attached on the backside of the device. The battery tester furthermore distinguishes itself by a robust and solid housing, suitable for any workshop.

Technical data	
Battery nominal voltage	12 V
Scope of test	200 A to 900 A complying with SAE/EN 120 A to 550 A complying with DIN/IEC 200 A to 850 A complying with CCA JIS conversion table on the back of the device
Dimensions (W x H x D)	197 x 98 x 40 mm (7.6″ x 3.9″ x 1.6″)
Weight	approx. 295 g

Battery tester BAT 121 (with printer) **0 684 400 701**

Portable, cordless battery tester for testing 12 V starter batteries (standard, maintenance free, gel batteries and fleece batteries / AGM). Load-free test process, test time 10 sec.
The low-temperature test current is adjustable to IEC, DIN, SAE, EN or JIS. Display of battery voltage, starting power and battery status. Additional application for alternators with 12 V nominal voltage, display of regulator voltage and diode status. The tester is fed from the battery to be tested. Clear, 8-line LCD display with illuminated background. Documentation of test results on a thermal printer. Protection from vertically falling water drops (Protection degree IP 31).

Technical data	
Battery nominal voltage	12 V
Adjustable low-temperature test current	50 A to 1,000 A complying with IEC 50 A to 900 A complying with DIN 85 A to 1,550 A complying with SAE 80 A to 1,500 A complying with EN complying with JIS
Dimensions with printer (W x H x D)	130 x 98 x 312 mm
Weight with printer	approx. 0.9 kg

Special accessories	Order number
Clock module for unambiguous documentation for the customer	1 687 023 340

Recommended by Varta and ADAC.

Electronic chargers: full charge, full power

BML 2415 **0 687 000 025**

Output voltage is free of interference and voltage peaks and allows battery charging directly on the vehicle electrical system without disconnecting the battery (DIN 40839, interference emission level I). Electrical components like airbags, ECUs and others are protected against damage during charging. The device is safe against over charging and overflow. Display for charge status, interference and reverse polarity. Switch for 12 V / 24 V. Switch for temperature range of the battery.

- Suitable for trickle charging and floating-mode operation
- Charging of exhaustive-discharge batteries possible
- Battery charge current continuously adjustable
- Charging cable 4 mm², with insulated charging clamps, approx. 2 m long

Technical data	
Power input	280 W
Mains voltage	230 V / 50–60 Hz
Rated current 12 V 24 V	 15 A arithmetical / 22.5 A effective 10 A arithmetical / 15.0 A effective
Charging characteristic	WU
Voltage limitation 12 V 24 V	 13.8 V warm / 14.4 V cold 27.6 V warm / 28.8 V cold
Dimensions (W x H x D)	260 x 165 x 283 mm
Weight	7.4 kg

BML 2415 FW **0 687 000 013**

Technical equipment like BML 2415. Additionally comes with a 5-m-long charging cable and plug based on DIN 14 690 as well ceiling mounting fixture.

Technical data	
Power input	330 W
Mains voltage	230 V / 50–60 Hz
Rated current 12 V 24 V	 12 A arithmetical / 18 A effective 10 A arithmetical / 15 A effective
Charging characteristic	WU
Voltage limitation 12 V 24 V	 13.8 V warm / 14.4 V cold 27.6 V warm / 28.8 V cold
Fitting dimension (without ceiling mounting fixture)	260 x 160 x 250 mm
Weight	9.3 kg
Charging cable	maximum 5 m length, 2.5 mm² cross-section
Connector	complying with DIN 14690
Ceiling mounting fixture	1.5 kg

High-frequency chargers: compact and multifunctional

BAT 415	**0 687 000 015**
BAT 430	**0 687 000 016**

Compact and solidly built high-frequency charger with multifunctional applications.

The fact that the BAT 415 / BAT 430 is suitable for charging conventional batteries as well as batteries with fixed electrolytes makes it the all-rounder for every car workshop.

The BAT 415 / BAT 430 comes with numerous safety features and makes it possible to charge installed batteries without having to worry about damage to the board electronics.

Product features of high-frequency chargers BAT 415/430

- BAT 415, charging mode for 12 V
- BAT 430, charging mode 12 V / 24 V with automatic switchover
- Microprocessor-controlled charge control, suitable for lead-acid batteries of any type (maintenance-free batteries, standard batteries, gel batteries and fleece batteries / AGM)
- Reduced charge time thanks to optimized charge process
- Continuously adjustable, regulated charge current
- Charge on vehicle electrical system
- Floating and backup mode
- Saw tooth preservation charge
- Overcharge protection
- Reverse-polarity protection only allows charging with correct connection
- Protective charge of exhaustive-discharge batteries
- LEDs for system status display
- Temperature switch (warm/cold)
- Comprehensive documentation in 8 languages
- Device for cable storage
- Solid housing

High-frequency chargers: technical data

Technical data	BAT 415	BAT 430
Battery types	Maintenance-free batteries, standard batteries, gel batteries, fleece batteries (AGM)	Maintenance-free batteries, standard batteries, gel batteries, fleece batteries (AGM)
Power input	280 W	950 W
Mains voltage	230 V / 50–60 Hz	230 V / 50–60 Hz
Rated current in the 12 V mode Rated current in the 24 V mode	15 A	30 A 30 A
Charge current	continuously adjustable, regulated by microprocessors	continuously adjustable, regulated by microprocessors
Charging characteristic	$I_1U_1I_2aI_3aI_3$...	$I_1U_1I_2aI_3aI_3$...
Voltage limitation in the 12 V mode Voltage limitation in the 24 V mode	14.0 V warm / 14.4 V cold	14.0 V warm / 14.4 V cold 28.0 V warm / 28.8 V cold
Dimensions (W x H x D)	260 x 160 x 250 mm	260 x 160 x 250 mm
Length of charge cable	2 m	2.5 m
Charge clamps	fully insulated	fully insulated
Charging on vehicle electrical systems	yes	yes
Trickle charging	yes, “saw tooth preservation”	yes, “saw tooth preservation”
Floating-mode operation in the 12 V mode Floating-mode operation in the 24 V mode	13.5 V / 15 A max.	13.5 V / 30 A max. 27.0 V / 30 A max.
Backup mode in the 12 V mode Backup mode in the 24 V mode	12.0 V / 3 A max.	12.0 V / 2 A max. 24.0 V / 2 A max.
Overcharging protection	overflow and overcharge protection	overflow and overcharge protection
Reverse-polarity protection	Operates only when charging clamps are connected with correct polarity	Operates only when charging clamps are connected with correct polarity
Charging of exhausted batteries	Protective pre-charging	Protective pre-charging
Weight	4.0 kg	5.0 kg

New! The multitalent: **BAT 490**

BAT 490 230 V **0 687 000 049**
BAT 490 100 V **0 687 000 050**

Compact and solid high-frequency charger with versatile application. An “all-rounder” for the workshop, service station, and battery retail outlets.

The powerful battery charger is suitable for charging all 12 V- or 24 V- lead-acid batteries, particularly batteries with fixed electrolyte gel batteries or fleece batteries / AGM).
The floating-mode operation of the BAT 490, with intensities of current up to 90 A, stabilizes the vehicle electrical system during diagnosis and reprogramming of control units, this making the device essential in every modern workshop.

Product features of high-frequency charger BAT 490

- Charging mode for 12 V- / 24 V- lead-acid batteries
- Automatic detection of 12 V- or 24 V- System
- Variable charge current intensity in the expert mode (0–90 A)
- Shorter charging times due to optimized charging process
- Infinitely variable, regulated charging current
- Charging at vehicle electrical system
- Floating-mode operation and backup mode
- Sawtooth trickle charge
- Protection against polarity inversion, overcharge and short circuits
- Solid housing

Efficient work is enabled by the new working modes:

- Standard program for simple and rapid charging
- Expert program with flexible charge parameters

Radio codes and control unit programming remain unaffected.

Technical data	
Charge current intensity	Max. 90 A
Length of the charging cable	2 x 3 m
Cross-section charging cable	10 mm²
Power input	1,600 W
Weight	10.5 kg
Charging characteristic “Standard”	$I_1U_1I_2aI_3aI_3$...
Charging characteristic “Expert”	IU_1oU_2
Final charge voltage, standard (temperature-controlled) 12 V 24 V	 14.0 V – 14.4 V 28.0 V – 28.8 V
Backup mode	12.0 V / 24.0 V max. 10 A
Floating-mode operation	13.5 V / 27.0 V max. 90 A / 45 A
Function temperature range	0°C – 40°C
Mains voltage / density	230 V, 50 / 60 Hz (0 687 000 049) 100 V, 50 / 60 Hz (0 687 000 050)
Battery nominal voltage	12 V / 24 V
Protection type (DIN 40050)	IP 20 D
Safety class (DIN 40530)	I
Dimensions (W x H x D)	300 x 200 x 390 mm
Emitted interference level	DIN 40839 emitted interference level I

Battery service:
Accessories

Transport cart **1 687 012 102**

Fig. top left: with three shelves, free-running rollers, brake.

Technical data	
Color	black
Dimensions (W x H x D)	685 x 1,135 x 550 mm
Weight	approx. 20.0 kg

Crocodile clips **Red handle** **8 787 955 003**
Blue handle **8 787 955 004**

Without Fig.: Load current up to 1,000 A. Connection to charging cable up to 50 mm² via threaded bushing. Particularly solid clip made of red bronze, fully insulated. Copper wire for improved conductivity.

Technical data	
Dimensions (W x H x D)	155 x 130 x 30 mm
Weight	0.45 kg

Crocodile clips **Red handle** **8 784 490 027**
Black handle **8 784 490 026**

Fig. top center: Load current up to 20 A. Connection to charging cable up to 4 mm² soldered. Nickel-coated surface.

Technical data	
Dimensions (W x H x D)	90 x 55 x 15 mm
Weight	0.05 kg

Crocodile clips **Red handle** **8 787 955 013**
Blue handle **8 787 955 014**

Fig. top right: Load current up to 600 A. Connection to charging cable up to 25 mm² via cable lugs A 6. Clip made of sheet steel, reinforced jaws, leaded surface, fully insulated. Copper wire for improved conductivity.

Technical data	
Dimensions (W x H x D)	155 x 130 x 20 mm
Weight	0.3 kg

Rapid-start chargers: BSL 2470

BSL 2470 **0 687 000 101**

Rapid-start charger for charges and starts. Electrical components are protected against damage during starts and charges (DIN 40839, interference emission level I). Voltage selection switch for 12 V and 24 V. Continuously adjustable charge current. Switch for exhaustive-discharge batteries. Switch for temperature-compensated charges. Charges based on WU charging characteristic. Ampere meter, charging cable 3 m, with fully insulated charging clamps, overcharge protection.

Technical data			
	Battery voltage	Rated current arithm.	Rated current effective
Charging	at 12 V at 24 V	140 A 88 A	210 A 132 A
Start assist at 1 V / cell	at 12 V at 24 V	250 A 220 A	375 A 330 A
Power input	2,800 W		
Mains voltage	230 V / 50 Hz		
Dimensions (W x H x D)	400 x 725 x 265 mm (without handle) 400 x 930 x 330 mm (with handle)		
Weight	approx. 29 kg		

Workshop chargers:
W 200 S

W 200 S **7 780 100 018**

With combination switch for normal- and rapid-charge start assist and 5-stage charge current setting. Charging time continuously adjustable with automatic switch (2 h max). Ampere meter, charging cable 2.7 m, with charging clamps, safety device against overcharging. Complies with the accident prevention regulations (UVV) of the German trade association.

Technical data			
	Battery voltage	Rated current arithm.	Rated current effective
Rapid charging	at 12 V at 24 V	40 A 20 A	56 A 28 A
Normal charging	at 12 V at 24 V	20 A 10 A	28 A 14 A
Start assist at 1 V / cell	at 12 V at 24 V	130 A 100 A	150 A 125 A
Power input	1,700 W		
Mains voltage	230 V / 50–60 Hz		
Dimensions (W x H x D)	280 x 500 x 250 mm		
Weight	14.0 kg		

Non-mains-operated **start-assist device**: BAT 250 and BAT 251

BAT 250 **0 687 000 020**

Non-mains-operated start assist with intelligent electronics safety for 12 V vehicle electrical systems to start automobile engines.

Product features

- Start assist is free of interference and voltage peaks
- Reverse-polarity protection
- Non-mains-operated start assist
- Backup mode up to 50 A
- Starts even if battery is removed or defective
- Protection from overcharge / exhaustive discharge
- BAT 250 can be charged with 12 V car outlet

Technical data	
Nominal voltage	12 V
Start-assist current	700 A
Cross-section of startassist cables	25 mm^2
Length of startassist cables	2 m
Weight	approx. 15.0 kg

Delivery includes

Basic device including start assist cable, 220 V charge cable and charge cable for 12 V car outlet.

BAT 251 **0 687 000 021**

Non-mains-operated start assist with intelligent electronics safety for 12 V vehicle electrical systems, to start large diesel engines, even at extremely low temperatures.

Product features

- Start assist is free of interference and voltage peaks
- Reverse-polarity protection
- Non-mains-operated start assist
- Backup mode up to 50 A
- Starts even if battery is removed or defective
- Protection from overcharge / exhaustive discharge

Technical data	
Nominal voltage	12 V
Start-assist current	1,400 A
Cross-section of startassist cables	35 mm^2
Length of startassist cables	2 m
Weight	approx. 26.0 kg

Delivery includes

Basic device including start assist cable and 220 V charge cable.

Special accessories	Order number
Transport trolley with solid-rubber tires suitable for BAT 250 and BAT 251	1 688 003 196

Battery service:
Program overview

Model	Charging at veh. elec. system	Start assist (auxiliary starting)	Floating-mode operation	Trickle charging	Backup mode	Overcharging protection	Rapid charging	Reverse-polarity protection	Charging of exhausted batteries	Battery voltage V	Rated current at 12 V/24 V arithm. A	Rated current at 12 V/24 V effective A	Characteristic at 12 V Ah	Battery capacity
Electronic chargers														
BML 2415 FW	●		●	●		●		●	●	12/24	12	18	WU	12...150
BML 2415	●		●	●		●		●	●	12/24	15	22.5	WU	12...180
High-frequency chargers														
BAT 415	●		●	●	●	●		●	●	12	15	–	$I_1U_1I_2aI_3aI_3$...	12...150
BAT 430	●		●	●	●	●		●	●	12/24	30	–	$I_1U_1I_2aI_3aI_3$...	15...300*
BAT 490														
- Standard	●		●	●	●	●	●	●	●	12/24	90/45	–	$I_1U_1I_2aI_3aI_3$...	15...450
- Expert	●		●	●	●	●	●	●	●	12/24	90/45	–	IU_1oU_2...	15...450
Rapid-start chargers														
BSL 2470	●	●	●	●		●	●	●	●	12/24	140/88	210/132	WU	12...400
Workshop chargers														
W 200 S		●					●		●	12/24	40	56	W	36...210

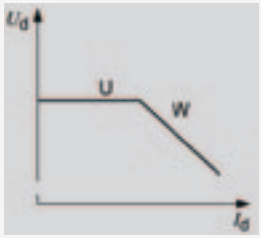
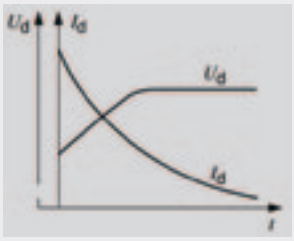
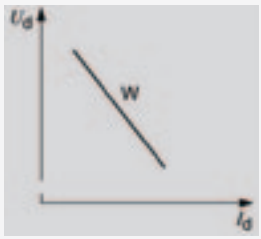
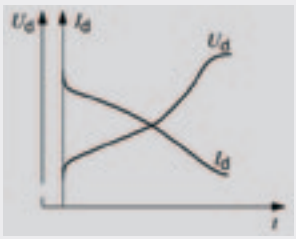
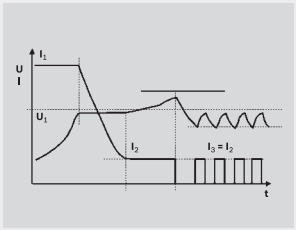
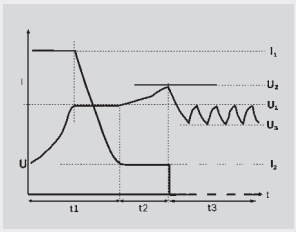
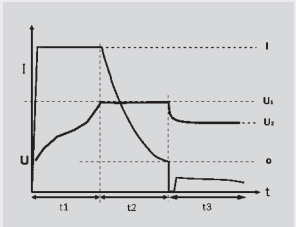
* 15...300 Ah (wet batteries); 15...200 Ah (gel and glass mat batteries)

Model	Battery voltage V	Start-assist current A	Electronic protection (starting without voltage peaks)	Reverse-polarity protection	Overload protection	Exhaustive discharge protection	Starting without, or with exhaustive-discharged, battery	Backup mode
Non-mains-operated start-assist device								
BAT 250	12	700	●	●	●	●	after manual release	●
BAT 251	12	1,400	●	●	●	●	after manual release	●

Model	Nominal voltage V	Low-temperature test current A En	DIN	SAE	IEC	CCA	JIS	Printer	Dimensions (W x H x D)	Weight
Battery testers										
BAT 110	12	200 – 900	120 – 550	200 – 900	120 – 550	200 – 850	●		197 x 98 x 40 mm	approx. 295 kg
BAT 121**	12	80 – 1,500	50 – 900	85 – 1,550	50 – 1,000		●	●	130 x 98 x 312 mm	approx. 900 kg

** Recommended by VARTA and ADAC

Bosch Battery Chargers and their **Characteristics**

Battery charger	Charging characteristics	Simplified representation	Course of charging over time
	Abbreviation at 12 V/ 24 V		
BML 2415 FW BML 2415 BSL 2470	WU BSL 2470		
W 200 S	W		
BAT 415 / BAT 430	$I_1U_1I_2aI_3aI_3$...		
BAT 490 “Standard”	$I_1U_1I_2aI_3aI_3$...		
BAT 490 “Expert”	IU_1oU_2...		

I Constant current characteristic curve
U Constant voltage characteristic curve
W Falling characteristic curve

a Automatic shutoff
e Automatic reactivation
t Charging time (resistance characteristic curve)
0 Autonomous switchover

Battery charging technology from **A to Z**

Direct battery charging on the vehicle electrical system
More and more electrical consumers provide a major degree of safety and comfort in motor vehicles. As a result, highly sensitive components, such as airbags, ECUs, alternators, car phones, CD players, etc., need to be protected from voltage peaks when the battery is being charged. Up until now, the battery had to be disconnected from the vehicle electrical system for that purpose. The electronic and high-frequency chargers by Bosch enable the charging of batteries on the vehicle electrical system without any impairment of the vehicle electronics. This translates into significantly improved safety and convenience for workshop services.

- No more cumbersome battery removals or disconnecting
- The data memories of car radios, ECUs, phones, board computers, etc., are preserved
- Electrical consumers (airbags, ECUs, etc.) are protected
- No hazardous battery gassing even during trickle charging
- Batteries can be charged when electrical consumers are connected (floating mode)
- Brief charging time due to large power reserves with IU / IWU characteristic

Trickle charging
A battery is connected to the charger for charging over a prolonged period of time, e. g., for preserving camper and motorcycle batteries during winter.

Gassing voltage
For 12 V batteries, this voltage limit is approximately 14.4 V. If the gassing voltage is exceeded during charging, the battery significantly begins to gas. This leads to water losses in the battery resulting in the risk of detonating gas. In order to prevent this, the charge voltages of the charger have to be limited to 14.4 V (2.4 V / cell) or 13.8 V (2.3 V / cell) for 12 V batteries.

Reverse-polarity protection
The purpose of reverse-polarity protection is to prevent reverse polarity of the crocodile clips of the charger. Usually a minimum voltage in the battery is required for reverse-polarity protection to work. Refer to the instruction manual of the charger before using it.

Floating mode
In floating mode, both chargers and consumers are connected to the battery. That means that, during the charge process, consumers receive power from the battery at the same time. The electronics of the charger prevent the battery from overcharging.

Start assist
The start assist function supports the battery when the vehicle is started. The high amount of current necessary is generated by the increased short-term power of the charger. Caution: The start assist is only possible for vehicles whose manufacturers do not discourage it in the instruction manual.

Rapid charging / fast charging
A battery is charged with high initial charge current. Once the gassing voltage (2.4 V / cell) is reached, the device either has to be shut off or the current has to be lowered.

Backup mode
When a battery is replaced or removed, the charger initiates storage to preserve the data memories of car radios, car phones and others. In this case, current output is limited.

Exhaustive-discharge batteries
Batteries with a cell voltage of less than 1 V are called exhaustive-discharge batteries. If they are not immediately recharged, they become subjected to damage as time goes by.

Bosch: bringing you the workshop of the future

Professional testing, starting, and charging with the battery service devices from Bosch

- Comprehensive program for testing, starting, charging
- The optimal solution for all workshop requirements, today and in future
- Rugged design and simple operability

Workshop tip:
Professional battery service is rounded off by the comprehensive range of batteries from Bosch.
The right battery and optimal starting power for every vehicle type, also for commercial vehicles and motorcycles.

Diagnostics and parts: you only find both at Bosch.

Bosch batteries S3–S4–S5 with PowerFrame technology
Always the right battery technology that meets the high quality demands of international original equipment for cold start and capacity.

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