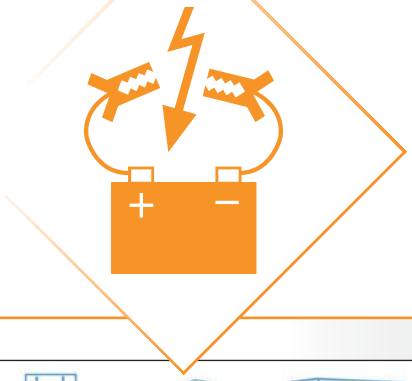
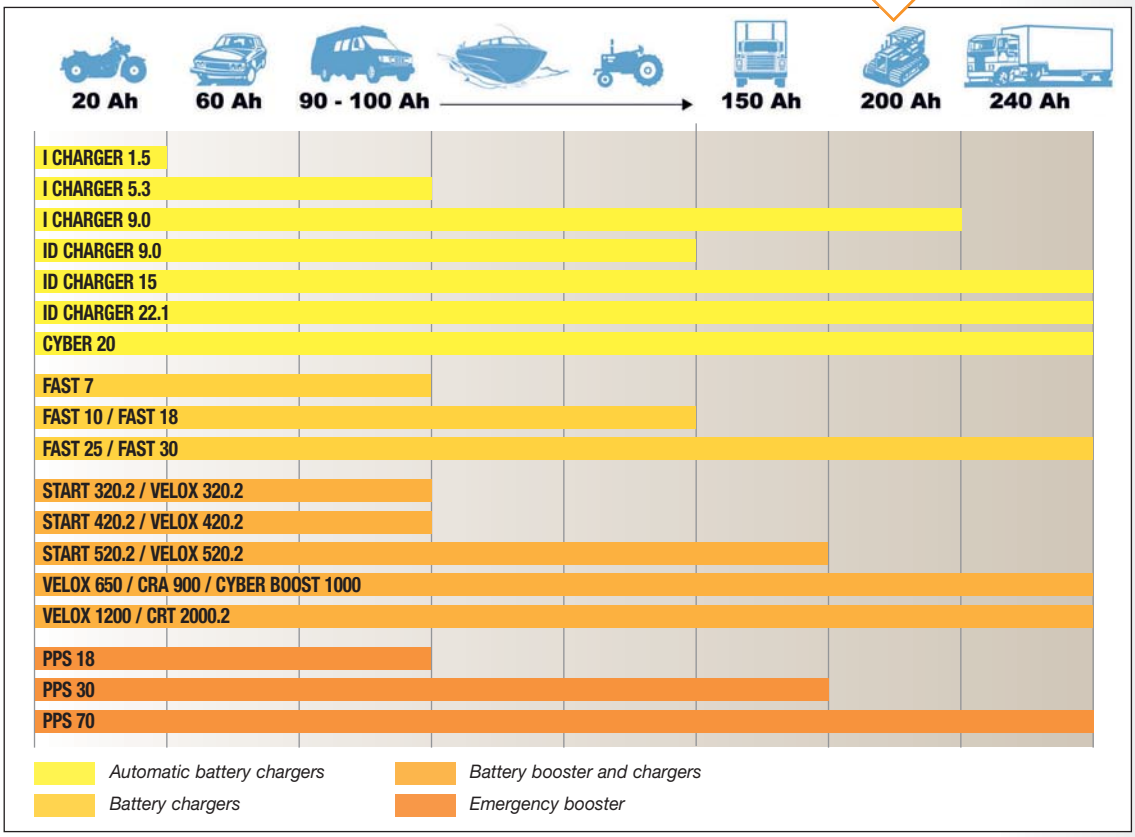
CEMONT

CHAPTER 1

Chargers/Boosters

CEMONT





Batteries and start-up

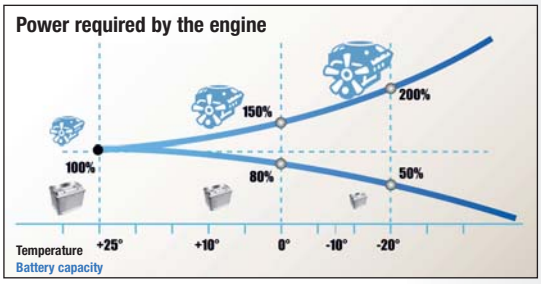
Much is said about how the battery, in modern vehicles, must supply a constantly increasing number of accessories (radio, satellite navigation system, air conditioning, pressure sensors, lighting system, windscreen wipers, window defroster, etc.).

This increases the speed of discharge of the battery while, on the other hand, the alternator charges the battery. If the trip is short (home-workplace, for example) then the energy supplied by the alternator is not enough to fully recharge the battery, especially if the battery is not a high performance type. In some cases this problem can be overcome by using a high capacity battery.
But if this unit is not properly maintained by the user then it inevitably leads to a loss of performance.

And even though modern batteries are designed to resist extreme climatic conditions it is inevitable that, during the winter, the battery performance drops.

This is caused both by a reduction of the chemical reactions in the battery and by a greater demand for energy from the starter motor.

The following chart shows the performance trend as the temperature changes. This is why engine ignition failure is generally a wintertime problem.



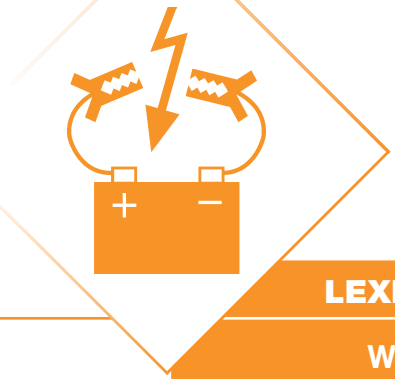
How a traditional electromechanical booster operates

Using a starter to start a vehicle becomes necessary every time the storage battery does not have enough energy to power the starter motor. In this case the energy that is required can be taken by connecting the starter to the mains power and setting it to start-up mode. To find which starter is suitable for the needs of our battery we just have to find the values given, on the battery rating plate, at “FAST COLD DISCHARGE CURRENT” and compare these with the values indicated under the item “Starting current 1 Volt/C EN 60335-2-29” on the starter. These values must be similar.

This is the case when the battery is fully discharged. If the battery is charged in advance then a less powerful starter can be selected.

AIR LIQUIDE WELDING

CEMONT



Why a battery discharges ?

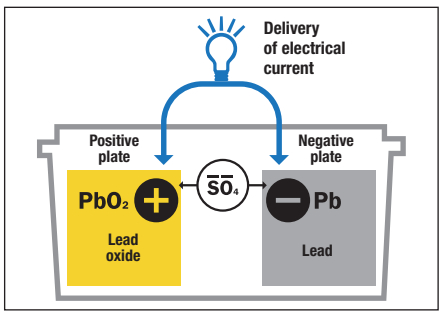
1. Car unused for a prolonged period.
2. Difficult or repeated starting.
3. Use of the car for short trips that do not permit the battery to recharge.
4. Inefficient dynamo or alternator.
5. Leaving lights or other parts of the electrical system on for long periods with the car ignition off.

All these causes make it necessary to check the battery in order to avoid difficult start-ups that help cause premature battery wear. It may happen that the battery is no longer able to store energy, usually caused by inadequate maintenance or incorrect use.
In this case one or more battery cells have short-circuited: recharging, in this case, is useless and the only thing to do is to replace the battery.

Electricity consumption by a car

Fans
Air conditioning
Audio system
Car radio
Engine heating
Mixed heating
Alternator cooling
Lighting system
Catalyst heater
Battery insulation
Windshield wiper
Heated sprayers
Heated seats
Heated locks
Pressure sensors
Alarm system
Defroster
Heated mirrors
Satellite navigation system
Various monitoring systems

Charging a battery



Battery charging can be done for different time periods depending on the capacity of the battery, its state of charge and the current we want the appliance to deliver.

Slow charges are made with fairly low currents that in any case do not exceed approximately 1/10th of the capacity of the battery.

Fast charges are made with higher currents, approximately 1/5th of the capacity of the storage battery. During fast charges the charging time is generally controlled by a timer to avoid battery overheating.

Slow charges are preferable for a longer battery life, preventing the battery from overheating. Note that the exact state of charge of the battery can only be determined by a hydrometer that can measure the specific density of the electrolyte.

Guideline electrolyte density values are: (kg/l at 20 °C):

- **1.28 = battery charged ;**
- **1.21 = battery half charged ;**
- **1.14 = battery discharged.**

The battery charging time can vary according to:

1. Ambient conditions (Cold/Hot) ;
2. State of the battery (Discharged/Very discharged);
3. Age of the battery (Old/New).

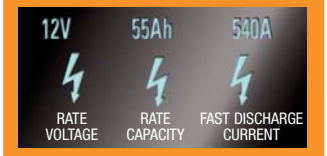
LEXICON

What is a battery ?

A battery is a device able to store electrical energy, supplied to it by a direct current generator during charging, in the form of chemical energy. It returns this energy, in the form of direct current electrical energy, during discharging. This energy storage and return process is repeated for the entire life of the battery. The main parameters that define batteries and their performance levels are:

- **Rated voltage**
- **Rated capacity**
- **Fast discharge current (at -18 °C).**

and are indicated on the rating plate that accompanies every battery:



Rate voltage
The voltage difference measured across the poles of the battery with the circuit open and after a minimum 4 hours stabilisation time.

Capacity (Ah)
The quantity of charge that can be achieved by discharging a storage battery at a specific discharge rate (current) down to a preset voltage.

Fast discharge current (A)
Indication of the power the battery is able to deliver. This value is measured by discharging a fully charged battery at -18 °C at a constant preset current.

INTELLIGENT ENERGY: I CHARGER & ID CHARGER

INTELLIGENT BATTERY CHARGERS WITH INVERTER TECHNOLOGY

- **SAFE**
  Will not damage your car's onboard electronics
- **FAST**
  Faster than traditional battery chargers
- **UNIVERSAL**
  Suitable for all types of batteries
- **REDUCED ENERGY CONSUMPTION**
  Considerably reduced energy consumption compared to traditional battery chargers
- **AUTOMATIC**
  When the charge is complete, automatically goes to float mode
- **FLOAT CHARGE**
  Keeps batteries charged even when they are not being used
- **LONGER LIFE**
  Battery is always charged to 100%, prolonging battery life
- **SPACE-SAVING**
  Small, lightweight, compact

I CHARGER

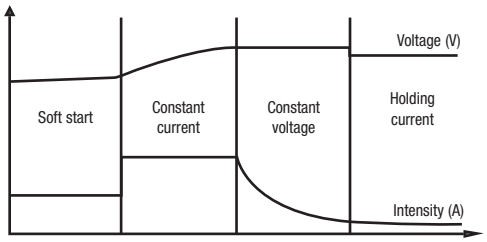
QUICK AND SAFE

WARRANTY 1 YEAR

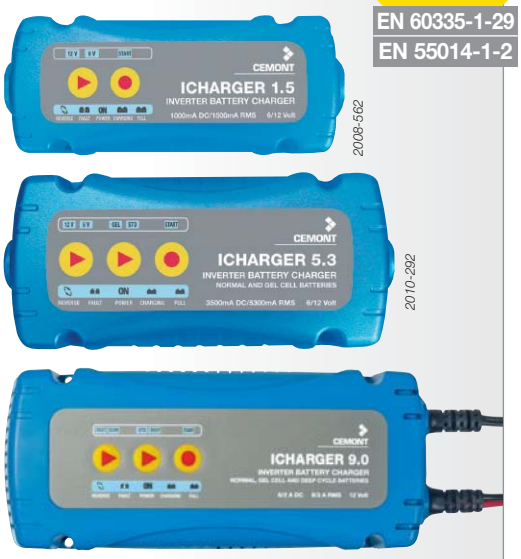
The I-charger is an “intelligent” battery charger that uses microprocessor-controlled inverter technology.

The holding function means the charger can remain connected to the battery for a long period of time.

Four phases optimize the charging process:

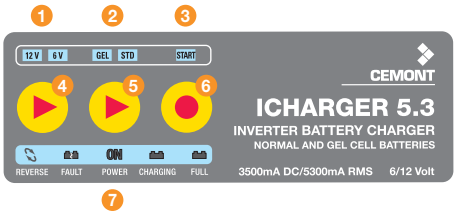


Standards
EN 60335-1-29
EN 55014-1-2



Avantages

- **Quick:** The I-charger takes less time to charge than traditional chargers.
- **Universal:** Suited to all batteries.
- **Intelligent:** Maximum safety for the electronics of vehicles.
- **Ready to use:** Connect and charge.
- **Safe:** Protected against reverse polarity, overcharge and short-circuiting.
- **Portable:** Light, compact and insulated, with IP65 protection.



FRONT PANEL

1. Charge voltage LED
2. Battery type LED
3. Charge start LED
4. Charge voltage selector
5. Battery type selector
6. Charge start consent
7. LED

ALARM LED

- Reverse polarity
- Battery fault
- Battery charge ON
- Charge indicator
- Charge complete indicator

TECHNICAL CHARACTERISTICS:

DESIGNATION		I CHARGER 1.5	I CHARGER 5.3	I CHARGER 9.0
Power supply	V	230 single-phase	230 single-phase	230 single-phase
Frequency	Hz	50 / 60	50 / 60	50 / 60
Charging/input voltage	V	6 - 12	6 - 12	12
Power consumption	W	21	65	180
Charging positions		-	2	2
Starting current	A	0.25	0.7	0.9
Charging current	A	1	3,5	6
Rated capacity - 15h	Ah	35	120	225
Dimensions	mm	55 x 32 x 130	75 x 40 x 160	90 x 50 x 210
Weigh	kg	0.40	0.55	0.70

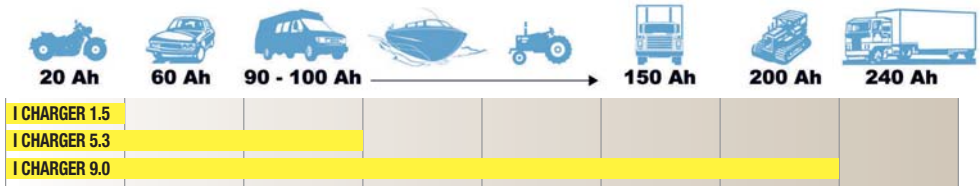
TO ORDER:

DESIGNATION	I CHARGER 1.5	I CHARGER 5.3	I CHARGER 9.0
Cat. number	W000276803	W000275878	W000276654

Delivered equipped with:

- a set of insulated crocodile clips with cables,
- safety instructions,
- user manual.

Applications I CHARGER

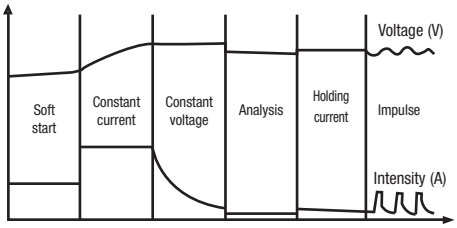


ID CHARGER

The ID-charger is an “intelligent” battery charger that uses microprocessor-controlled inverter technology. The holding function means the charger can remain connected to the battery for a long period of time.

The digital display permits constant control of the charge settings.

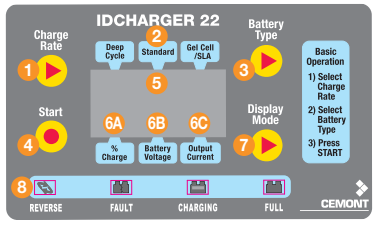
Complete charge cycle, 5 phases for each type of battery:



Standards
EN 60335-1-29
EN 55014-1-2

Benefits

- **Quick:** The I-charger takes less time to charge than traditional chargers
- **Universal:** Suited to all batteries
- **Intelligent:** Maximum safety for the electronics of vehicles
- **Display:** The digital display allows you to view the charge settings
- **Multi-current:** 3 charge levels, slow, normal and fast
- **Temperature compensation:** The charge current depends on the temperature of the battery
- **Energy savings:** The fan runs only when necessary
- **Safe:** Protected against reverse polarity, overcharge and short-circuiting
- **Portable:** Light, compact and insulated, with IP65 protection



FRONT PANEL

1. Charge Rate selection button
2. Battery selection LED
3. Battery selection button
4. Charge start button
5. Display
6. View mode LED:
   6A: Charge percentage
   6B: Battery voltage
   6C: Charge current
7. View mode button
8. Alarms

ALARM LED

- Reverse polarity
- Element short-cicuited
- Element broken
- Short-circuit

TECHNICAL CHARACTERISTICS:

DESIGNATION		ID CHARGER 15	ID CHARGER 22.1 AUTO
Power supply	V	230 single-phase	230 single-phase
Frequency	Hz	50 / 60	50 / 60
Charging/input voltage	V	12	6-12-24
Power consumption	W	460	460
Charging positions		3	3
Starting current	A	2	2.5
Charging current	A	10	15
Rated capacity - 15h	Ah	300	400
Dimensions	mm	250 x 175 x 150	250 x 175 x 150
Weight	kg	1.5	1.5

UNIVERSAL AND MULTI-CURRENT

TO ORDER:

DESIGNATION	ID CHARGER 15	ID CHARGER 22.1 AUTO
Cat. number	W000276655	W000377494

Delivered equipped with:

- a set of insulated crocodile clips with cables,
- safety instructions,
- user manual.

Applications ID CHARGER

ID CHARGER 9.0						
ID CHARGER 15						
ID CHARGER 22						

CYBER 20

WARRANTY 1 YEAR

CYBER 20 is a heavy-duty battery charger where battery charging is managed and optimised by a microprocessor. It has a smart charging technique suitable for modern vehicles with many electronic devices.

- No voltage or current peaks and consequently no damage to on-board electronics (airbags, ABS, telephone, etc.).
- Not necessary to remove the battery for recharging.
- Battery maintenance function.
- Digital ammeter and voltmeter.

I > U CHARACTERISTIC:

I > Recognises the state of charge of the battery with automatic charging in two phases without overheating.

U > During charging, voltage is limited to prevent the formation of flammable and noxious gases.

PROTECTIONS:

- Thermostatic protection.
- Protection against inverted polarity, overload and short circuit across terminals.
- Protection against mistaken setting of the storage battery parameters.
- Protection against overvoltage which could damage the vehicle's on-board electronics.
- Automatic shutdown when charging is terminated.
- Display state of charge.
- Possibility of charging completely flat batteries.

DIGITAL CONTROL AUTOMATIC & POWERFUL

Standards

EN 60335-1
EN 60335-2
EN 55014-1
EN 55014-2

Delivered equipped with:

- a set of insulated crocodile clips with cables,
- a primary cable,
- safety instructions,
- user manual.

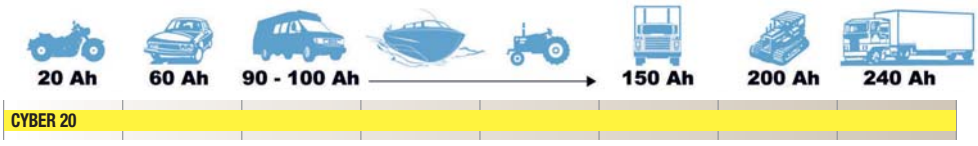
TECHNICAL CHARACTERISTICS:

DESIGNATION		CYBER 20
Power supply	V	230 single-phase
Frequency	Hz	50 - 60
Charging voltage	V	6 - 12 - 24
Absorbed power	W	1000
Average charging current	A	20
Maximum rechargeable battery	Ah	200
Dimensions	mm	310 x 190 x 290
Weight	kg	12

TO ORDER:

DESIGNATION	CYBER 20
Cat. number	W000267900

Applications **CYBER 20**



FAST

WARRANTY 1 YEAR

Single-phase heavy-duty battery charger, ideal for recharging 12/24 V high capacity batteries. A sturdy metal case makes it perfect for all work environments. Equipped with ammeter to display the charging current, protection against inverted polarity and overloads, thermal protection.

COMMERCIAL AND HEAVY VEHICLES

Standards
- EN 60335-1
- EN 60335-2
- EN 55014-1
- EN 55014-2

Delivered equipped with:
- a set of insulated crocodile clips with cables,
- a primary cable,
- safety instructions,
- user manual.

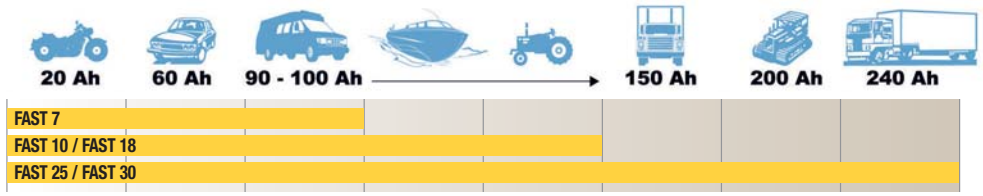
TECHNICAL CHARACTERISTICS:

DESIGNATION		FAST 7	FAST 10	FAST 18	FAST 25	FAST 30
Power supply	V	230 single-phase	230 single-phase	230 single-phase	230 single-phase	230 single-phase
Frequency	Hz	50 / 60	50 / 60	50 / 60	50 / 60	50 / 60
Charging voltage	V	12	12 - 24	12 - 24	12 - 24	12 - 24
Absorbed power	W	200	200	460	460	980
Charge positions		2	2	3	3	3
Absorbed current	A	0.86	0.86	2	2	3,4
Effective charging current	A	7	10 (12 V) - 8 (24 V)	15 (12 V) - 18 (24 V)	17 (12 V) - 25 (24 V)	22 (12 V) - 30 (24 V)
Average charging current EN 60335-2-29	A	5	8 (12 V) - 5 (24 V)	10 (12 V) - 13 (24 V)	12 (12 V) - 16 (24 V)	15 (12 V) - 25 (24 V)
Rate capacity	Ah	90	120	190	240	490
Dimensions	mm	320 x 230 x 195	330 x 230 x 220	345 x 235 x 225	345 x 235 x 225	370 x 250 x 250
Weight	kg	4	5	7.5	13.5	15

TO ORDER:

DESIGNATION	FAST 7	FAST 10	FAST 18	FAST 25	FAST 730
Cat. number	W000268307	W000268308	W000268309	W000268310	W000268311

Applications **FAST**



AIR LIQUIDE WELDING

START

Portable heavy-duty battery chargers/boosters for charging storage batteries and quick starting of vehicles. A wide range for all charging and start-up needs: scooters, motorcycles, cars, tractors, campers, vans, trucks with diesel and petrol engines. They are designed for: normal charging, fast charging and fast start-up. Equipped with: ammeter to display the state of charge and start-up, protection against overloads and inverted polarity.

WARRANTY 1 YEAR

Standards
- EN 60335-1
- EN 60335-2
- EN 55014-1
- EN 55014-2

PROFESSIONAL PORTABLE STARTERS

Delivered equipped with:
- a set of insulated crocodile clips with cables,
- a primary cable,
- safety instructions,
- user manual.

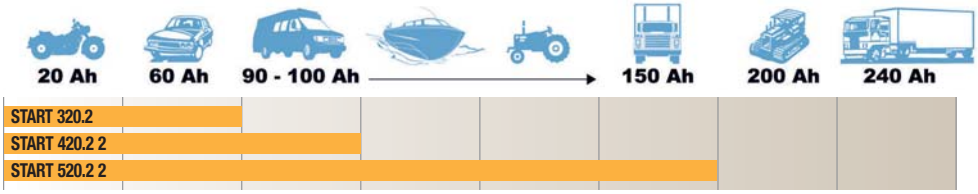
TECHNICAL CHARACTERISTICS:

DESIGNATION		START 320.2	START 420.2	START 520.2
Power supply	V	230 single-phase	230 single-phase	230 single-phase
Frequency	Hz	50 / 60	50 / 60	50 / 60
Charging and start-up voltage	V	12 - 24	12 - 24	12 - 24
RMS charging current	A	32	38	45
Average charging current EN 60335-2-29	A	28	34	40
Starting current 0 Volt	A	300	400	500
Starting current 1 Volt/C EN 60335-2-29	A	230	280	300
Maximum absorbed charge/ start-up power	kW	0.9/8	1/8.4	1.3/10
Rate capacity	Ah - 15h	355	430	560
Chargeable batteries min/max	Ah	20 - 35	35 - 50	45 -65
Chargeable batteries with min/max. pre-charge	Ah	45 - 65	65 - 100	80 - 150
Dimensions	mm	345 x 210 x 280	345 x 210 x 280	280 x 460 x 260
Weight	kg	10	13	16
Fuse	A	2 x 50	2 x 50	2 x 100

TO ORDER:

DESIGNATION	START 320.2	START 420.2	START 520.2
Cat. number	W000267888	W000267889	W000267891

Applications **START**



VELOX

WARRANTY 1 YEAR

Wheel-mounted heavy-duty battery chargers/boosters for charging storage batteries and quick starting of vehicles. A wide range for all charging and start-up needs: scooters, motorcycles, cars, tractors, campers, vans and trucks with diesel or petrol engines. They are designed for normal charging, fast charging and fast start-up. They are equipped with ammeters to display the state of charge and start-up and are protected against overloads and inverted polarity.

SPECIAL WORKSHOP

Standards
- EN 60335-1
- EN 60335-2
- EN 55014-1
- EN 55014-2

Delivered equipped with:
- a set of insulated crocodile clips with cables,
- a primary cable,
- safety instructions,
- user manual.

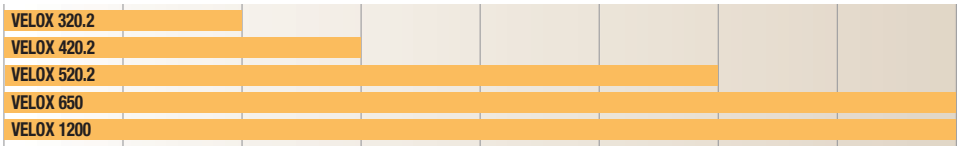
TECHNICAL CHARACTERISTICS:

DESIGNATION		VELOX 320.2	VELOX 420.2	VELOX 520.2	VELOX 650 CD2	VELOX 1200T-CD2
Power supply	V	230 single-phase	230 single-phase	230 single-phase	230 single-phase	230 - 400 three-phase
Frequency	Hz	50 / 60	50 / 60	50 / 60	50 / 60	50 / 60
Charging and start-up voltage	V	12 - 24	12 - 24	12 - 24	12 - 24	12 - 24
RMS charging current	A	32	38	45	66	165
Average charging current EN 60335-2-29	A	28	34	40	60	160
Starting current 0 Volt	A	300	400	500	650	1250
Starting current 1 Volt EN 60335-2-29	A	230	280	300	400	1000
Maximum absorbed charge/ start-up power	kW	0.9/8	1/8.4	1.3/10	1.8/15	5/29
Rate capacity	Ah - 15h	355	430	560	700	2200
Chargeable batteries min/max	Ah	20 - 35	35 - 50	45 - 65	65 - 120	120 - 200
Chargeable batteries with min/max. pre-charge	Ah	45 - 65	65 - 100	80 - 150	150 - 240	240
Dimensions	mm	360 x 670 x 380	360 x 670 x 380	350 x 750 x 320	350 x 750 x 320	470 x 800 x 360
Weight	kg	15	15	21	24	43
Fuse	A	2 x 50	1 x 50 + 1 x 80	2 x 100	2 x 100	4 x 100

TO ORDER:

DESIGNATION	VELOX 320.2	VELOX 420.2	VELOX 520.2	VELOX 650 CD2	VELOX 1200T-CD2
Cat. number	W000267893	W000267894	W000267895	W000267896	W000267897

Applications **VELOX**



AIR LIQUIDE WELDING

CRA / CRT

WARRANTY 1 YEAR

Wheel-mounted heavy-duty battery chargers and starters for fast charging storage batteries and fast starting of vehicles. Particularly suitable for big-engined vehicles such as tractors, trucks, etc. Equipped with: ammeter, voltmeter, insulated **DIN 72553** cables, protection against inverted polarity.

SPECIAL FOR BIG-ENGINE VEHICLES

Standards

- EN 60335-1
- EN 60335-2
- EN 55014-1
- EN 55014-2

Delivered equipped with:

- a set of insulated crocodile clips with cables,
- a primary cable,
- safety instructions,
- user manual.

TECHNICAL CHARACTERISTICS:

DESIGNATION		CRA 900CD	CRT 2000.2
Power supply	V	230 single-phase	230 - 400 three-phase
Frequency	Hz	50 / 60	50 / 60
Charging and start-up voltage	V	6 - 12 - 24	12 - 24
RMS charging current	A	47 - 79 - 51	135 - 145
Average charging current EN 60335-2-29	A	31 - 87 - 70	125 - 140
Starting current 0 Volt	A	500 (6 V) - 770 (12 V) 870 (24 V)	2000 (12 V) 1750 (24 V)
Starting current 1 Volt EN 60335-2-29		280 (6 V) - 440 (12 V) 460 (24 V)	1500 (12 V) 1500 (24 V)
Maximum absorbed charge/ start-up power	kW	3-20	3.6/37
Rate capacity	Ah - 15h	540 (6 V) 1140 (12 V)	2400 (12 V) 1870 (24 V)
Chargeable batteries min/max	Ah	80 - 150	240
Chargeable batteries with min/max. pre-charge	Ah	200 - 240	240
Dimensions	mm	570 x 900 x 520	570 x 900 x 520
Weight	kg	49	68
Fuse	A	3 x 100	7 x 100

TO ORDER:

DESIGNATION	CRA 900CD	CRT 2000.2
Cat. number	W000267898	W000267899

Applications **CRA / CRT**

CYBER BOOST

Heavy-duty battery boosters and boosters with charging and start-up processes controlled and optimised by a microprocessor. Equipped with three operating modes: charge, start-up, stand-by. Designed to charge and start storage batteries of the following types: lead-acid with liquid electrolyte, lead-acid with gel electrolyte, recombination, sealed and unsealed.

- Total protection against any voltage or current peaks during start up and charging, eliminating all danger for on-board electronics (airbags, ABS, telephone, etc.).
- No need to remove the battery from the vehicle when starting up or charging.
- Digital ammeter and voltmeter.
- “Stand-by” mode to power vehicle memories if the battery needs to be disconnected.
- Start-up and charging procedure managed and optimized by a microprocessor with automatic control of all parameters.
- Automatic choice of the charge program by inputting data related to the storage battery.
- Charging is done at constant voltage and current (IU characteristic) with two options: “normal charge” and “fast charge”.
- Designed to charge completely flat batteries.

POWERFUL FOR PROFESSIONALS

Standards
EN 60335-1
EN 60335-2
EN 55014-1
EN 55014-2

Delivered equipped with:

- a set of insulated crocodile clips with cables,
- a primary cable,
- safety instructions,
- user manual.

TECHNICAL CHARACTERISTICS:

DESIGNATION		CYBER BOOST 1000
Power supply	V	230 single-phase
Frequency	Hz	50 / 60
Charging and start-up voltage	V	6 - 12 - 24
RMS charging current	A	52
Average charging current EN 60335-2-29	A	40
Starting current 1 Volt EN 60335-2-29	A	400 (12 V) 300 (24 V)
Maximum absorbed charge/ start-up power	kW	11
Maximum rechargeable batterires	Ah	500
Dimensions	mm	330 x 270 x 500

TO ORDER:

DESIGNATION	CYBER BOOST 1000
Cat. number	W000267902

Applications **CYBER BOOST**

AIR LIQUIDE WELDING

Emergency jumpstart pack PPS 18 - PPS 30 - PPS 70

WARRANTY 1 YEAR

PPS 18

A 12-volt jump starter for professional use, reserved for dealers, roadside assistance.

- All materials used are of the highest quality.
- SUPERFLEX cables:
  - Very high conductivity for best performance;
  - Double insulation for extra safety;
  - Maximum flexibility even at subzero temperatures;
  - Hard wearing and resistant to kinks.
- Solid brass contact clips.
- Cigarette lighter socket.
- Peak current of 1400 amps.

PPS 30

A 12-volt jump starter for professional use, reserved for dealers, roadside assistance and agriculture.

- All materials used are of the highest quality.
- SUPERFLEX cables:
  - Very high conductivity for best performance;
  - Double insulation for extra safety;
  - Maximum flexibility even at subzero temperatures;
  - Hard wearing and resistant to kinks.
- Solid brass contact clips.
- Cigarette lighter socket.
- Peak current of 3500 amps.

PPS 70

A 12-volt / 24-volt jump starter for heavy professional use, reserved for starting commercial vehicles without battery or with a flat battery.

- All materials used are of the highest quality.
- SUPERFLEX cables:
  - Very high conductivity for best performance;
  - Double insulation for extra safety;
  - Maximum flexibility even at subzero temperatures;
  - Hard wearing and resistant to kinks.
- Solid brass contact clips.
- “Anderson type” voltage selection sockets.
- Ceramic fuses for protecting the vehicle battery.
- Cigarette lighter socket.
- Peak current of 7000 amps with 12 volts and 3500 amps with 24 volts.

AUTOMATIC CHARGERS - BOOSTERS FOR ENGINE STARTING

TECHNICAL CHARACTERISTICS:

DESIGNATION	PPS 18	PPS 30	PPS 70
Operating voltage	12 V	12 V	12-24 V
Peak current	1400 A. p	3500 A. p	7000/3500 A. p
Internal battery	12 V 23 Ah	12 V 23 Ah	12 V 46 Ah24 V 23 Ah
Starting current	250 A	1150 A	2300 A
Recharging voltage	230 V	230 V	230 V
Recharging supply	12 V 1,5 Ah	12 V 1,5 Ah	12 V 4 Ah
Charging voltage	max 14,9 V	max 14,9 V	max 14,9 V / 25,2 V
External fuse 500 A	-	-	1
Thermal cutout 20 A	-		
Number of batteries	1	1	2
Surge protection	-		
Sealed battery			
Shockproof ABS case			
Automatic charger			
Charging cables			
Insulated crocodile clips			
Diameter of cables	25 mm²	25 mm²	50 mm²
Length of cables	64 cm	110 cm	165 cm
Dimensions (LxPxH)	24x13x26 cm	27x21x34 cm	30x27x34 cm
Weight	5.8 kg	10.5 kg	19 kg

TO ORDER:

DESIGNATION	PPS 18	PPS 30	PPS 70
Cat. number	W000374864	W000372610	W000372611

Standards

EN 60335-1
EN 61558-1
EN 55014-1
EN 55014-2

Applications **PPS**