



# User Manual

PCE-CBA 20 Car Battery Tester



User manuals in various languages (français, italiano, español, português, nederlands, türk, polski, русский, 中文) can be found by using our product search on: [www.pce-instruments.com](http://www.pce-instruments.com)

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## 1 Safety notes

Please read this manual carefully and completely before you use the device for the first time. The device may only be used by qualified personnel and repaired by PCE Instruments personnel. Damage or injuries caused by non-observance of the manual are excluded from our liability and not covered by our warranty.

- The device must only be used as described in this instruction manual. If used otherwise, this can cause dangerous situations for the user and damage to the meter.
- The instrument may only be used if the environmental conditions (temperature, relative humidity, ...) are within the ranges stated in the technical specifications. Do not expose the device to extreme temperatures, direct sunlight, extreme humidity or moisture.
- Do not expose the device to shocks or strong vibrations.
- The case should only be opened by qualified PCE Instruments personnel.
- Never use the instrument when your hands are wet.
- You must not make any technical changes to the device.
- The appliance should only be cleaned with a damp cloth. Use only pH-neutral cleaner, no abrasives or solvents.
- The device must only be used with accessories from PCE Instruments or equivalent.
- Before each use, inspect the case for visible damage. If any damage is visible, do not use the device.
- Do not use the instrument in explosive atmospheres.
- The measurement range as stated in the specifications must not be exceeded under any circumstances.
- Non-observance of the safety notes can cause damage to the device and injuries to the user.
- Only test batteries the parameters of which you can set.

We do not assume liability for printing errors or any other mistakes in this manual.

We expressly point to our general guarantee terms which can be found in our general terms of business.

If you have any questions please contact PCE Instruments. The contact details can be found at the end of this manual.

## 2 Specifications

Specification	Description
Measurement object	12 V / 24 V starter batteries
Battery standards	DIN, JIS, EN, SAE
Test time	3 ... 10 s
Cold cranking ampere CCA	100 ... 1700 A
Display	2.75" LCD
Power supply	9 ... 35 V DC via test voltage
Connection	Kelvin terminals
Dimensions	185 x 95 x 41 mm
Cable length	approx. 70 cm
Weight	approx. 250 g

### 3 Delivery contents

1 x car battery tester PCE-CBA 20  
1 x user manual

### 4 System description



- |                 |                         |
|-----------------|-------------------------|
| ① Display       | ⑥ Test lead red plus    |
| ② Up $\Delta$   | ⑦ Test lead black minus |
| ③ Back „ESC“    | ⑧ Crocodile clamps      |
| ④ Down $\nabla$ |                         |
| ⑤ ENTER         |                         |

### 5 Operation

You can make the following battery tests

- Battery capacity
- Battery voltage at engine start
- Charge voltage at maximum load
- Charge voltage

Please always ensure that the contact surfaces for the alligator clips are clean. Contamination can lead to incorrect measurement results.

Always connect the black crocodile clip to the negative terminal first and then the red crocodile clip to the positive terminal of the battery.

## 5.1 Battery capacity

Switch off the engine and the ignition.

If the vehicle was in operation immediately before the battery test, the battery voltage is still at charging voltage level. In this case, switch on the vehicle lights for approx. 3 minutes to bring the battery voltage up to normal level.

### Measuring procedure

1. First connect the black crocodile clip to the negative terminal and then the red crocodile clip to the positive terminal of the battery.
2. The meter switches on when connected to the battery.
3. If necessary, change the setting to battery voltage with the "Up/Down" keys and confirm the selection with "ENTER".
4. Select function 1 with the "Up / Down" keys and confirm with "ENTER".



5. Use the "Up / Down" keys to select the battery standard of the battery to be tested and confirm this with the "ENTER" key. (Sticker or imprint on the battery)



6. Now enter the respective number using the "Up / Down" keys. Confirm the selection with "ENTER". Press and hold the key to accelerate the search.



Examples:

12V 280A 60Ah DIN      480 EN/SAE  
 12V 70Ah CCA(SAE) 570A  
 410 Cold Cranking Amps

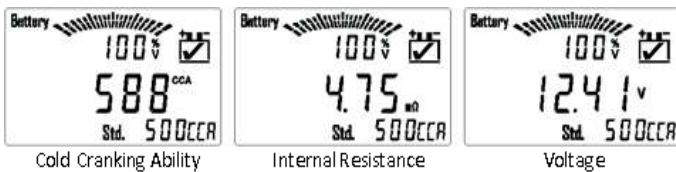
Setting: EN 480  
 Setting: CCA 570  
 Setting: CCA 410

- Confirm the selection and start the measurement with "ENTER".  
After completion of the test, the following results are available:  
cold cranking amperage, internal resistance of the battery and battery voltage.  
Use the "Up / Down" keys to view the results.



- Notes on the test results

Battery capacity normal



Battery voltage – Battery capacity

Charge level

100 % 12.78 V

75 % 12.54 V

50 % 12.30 V

25 % 12.12 V

Flat 11.94 V

Battery capacity	
>80 %	Good
>60 %	OK
>45 %	Condition must be monitored
<45 %	Replace battery

In case of the 24 V measurement (two batteries connected in series), CCA corresponds to the average value of the two batteries.

Internal resistance

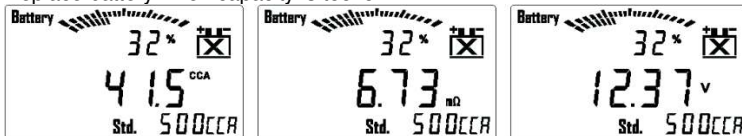
As a rule, the higher the CCA value, the lower the internal resistance of the battery. There is no standard value for the internal resistance.

Depending on the battery manufacturer, the value can vary. Batteries from the same manufacturer should have approximately the same internal resistance.

For the 24 V measurement (two batteries connected in series), the internal resistance corresponds to the sum of the two batteries.

## Examples

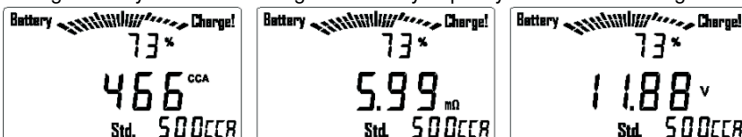
- Replace battery when capacity is too low



- Charge battery when the battery capacity is OK and the voltage is too low



- Charge battery and measure again if battery capacity is 75 % and voltage is too low



9. You can return to the function selection by pressing the "ESC" key.

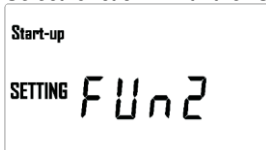
## 5.2 Battery voltage at engine start

Turn off the engine and the ignition.

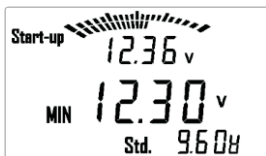
If the vehicle was in operation immediately before the battery test, the battery voltage is still at charging voltage level. In this case, switch on the vehicle lights for approx. 3 minutes to bring the battery voltage up to the normal level.

### Measuring procedure

1. First connect the black crocodile clip to the negative terminal and then the red crocodile clip to the positive terminal of the battery.
2. The meter switches on when connected to the battery.
3. If necessary, change the setting to battery voltage with the "Up/Down" keys and confirm the selection with "ENTER".
4. Select function 2 with the "Up / Down" keys and confirm with "ENTER".



5. Start the engine. The unit displays the battery voltage before and the lowest voltage during the start-up process.



The lowest voltage during the start-up process should not fall below 9.6 V for one battery (12 V) and 16 V for two batteries (24 V).

6. Reference chart starting voltage

>10.7 V	good	Can still be used
10.2 ... 10.7 V	normal	Watch the condition
9.6 ... 10.2 V	critical	Replace soon
<9.6 V	poor	Replace immediately

7. With the "ESC" key, you can return to the function selection.

### 5.3 Charging voltage at maximum load

Start the engine.

#### Measuring procedure

1. First connect the black crocodile clip to the negative terminal and then the red crocodile clip to the positive terminal of the battery. Make sure that you and the meter do not get in contact with moving parts.
2. The meter switches on when connected to the battery.
3. If necessary, change the setting to battery voltage with the "Up/Down" keys and confirm the selection with "ENTER".
4. Switch on all electrical appliances in the car (lighting, ventilation/air conditioning, etc.).
5. Increase the engine speed to 2000 rpm.



6. Select function 3 with the "Up / Down" keys and confirm with "ENTER".



The unit displays the current charging voltage, the minimum measured charging voltage and the target voltage at maximum load.



The minimum charging voltage at maximum load should not fall below 12.80 V for one battery (12 V system) and 25.60 V for two batteries (24 V system). If the voltage falls below this value, check the V-belt / tooth belt and the alternator for damage and function.

7. With the "ESC" key, you can return to the function selection.

## 5.4 Charging voltage

Start the engine.

### Measuring procedure

1. First connect the black crocodile clip to the negative terminal and then the red crocodile clip to the positive terminal of the battery. Make sure that you and the meter do not get in contact with moving parts.
2. The meter switches on when connected to the battery.
3. If necessary, change the setting to battery voltage with the "Up/Down" keys and confirm the selection with "ENTER".
4. Increase the engine speed to 3000 rpm.
5. Switch off all electrical appliances in the vehicle.
6. Select function 4 with the "Up / Down" keys and confirm with "ENTER".

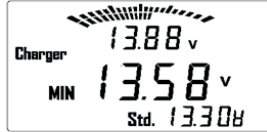




7. After completion of the test, the following results are available:  
 Target value charging voltage, maximum value charging voltage and maximum limit value and target value charging voltage, minimum value charging voltage and minimum limit value.  
 Use the "Up / Down" keys to view the results.



Maximum Output Of Charging System



Minimum Output Of Charging System

The maximum charging voltage should not exceed 15.00 V for one battery (12 V system) and 30.00 V for two batteries (24 V system).

The minimum charging voltage should not fall below 13.30 V for one battery (12 V system) and 36.60 V for two batteries (24 V system).

The target charging voltage should be 13.88 V for one battery (12 V system) and 27.76 V for two batteries (24 V system).

If the max / min values are undercut or exceeded, check the voltage regulator and the alternator for damage and function.

8. With the "ESC" key, you can return to the function selection.

## 6 Comparison charts

### 6.1 JIS

Battery		CCA			Battery		CCA		
JIS new	JIS old		MF*	CMF*	JIS new	JIS old		MF*	CMF*
26A17R		200			55B24RS	NT 80-S6S	430	420	500
26A 17L		200			55B24LS	NT80-S6LS	430	420	500
26A19R	12N24-4	200	220	264	55D26R	N50Z	350	440	525
26A19L	12N24-3	200	220	264	55D26L	N5 0ZL	350	440	525
28A19R	NT50-N24	250			60D23R		520		
28A19L	NT5 0-N24L	250			60D23L		520		
32A 19R	NX60-N24	270	295		65D23R		420	540	580
32A19L	NX60-N24L	270	295		65D23L		420	540	580
26B17R		200			65D26R	NS70	415	520	625
26B17L		200			65D26L	NS70L	415	520	625
28B17R		245			65D31R	N70	390	520	630
28B17L		245			65D31L	N70L	390	520	630
28B19R	NS40S	245			70D23R	35-60	490	540	580

28B19L	NS40LS	245			70D23L	25-60	490	540	580
32B20R	NS40	270			75D23R		500	520	580
32B20L	NS40L	270			75D23L		500	520	580
32C24R	N4 0	240	325	400	75D26R	F10 0-5	490		
32C24L	N40L	240	325	400	75D26L	F100 -5L	490		
34B17R		280			75D31R	N70Z	450	540	735
34B 1 7L		280			75D31L	N70ZL	450	540	735
34B19R	NS40ZA	270	325	400	80D23R		580		
34B19L	NS40ZAL	270	325	400	80D26L		580		
36B20R	NS40Z	275	300	360	85B60K				500
36B20L	NS40ZL	275	300	360	85BR60K				500
36B20RS	NS40ZS	275	300	360	95D31R	NX1 20-7	620	660	850
36B20LS	NS40ZLS	275	300	360	95D31L	NX12 0-7L	620	660	850
38B20R	NX60-N24	330	340	410	95E41R	NI00	515	640	770
38B20RS	NT60-N24S	330	340	410	95E41L	NI00L	515	640	770
38B20L	NX60-24L	330	340	410	105E41R	NI00 Z	580	720	880
38B20LS	NX60-24LS	330	340	410	105E41L	NI00ZL	580	720	880
40B20L		330			105F51R	NI00 Z	580		
40B20R		330			105F51L	NI00ZL	580		
42B20R		330			115E41R	NS120	650	800	960
42B20L		330			115E41L	NS120L	650	800	960
42B20RS		330			115F51R	N1 20	650	800	960
42B20LS		330			115F51L	N120L	650	800	960
46B24R	NS60	325	360	420	130E41R	NX200-10	800		
46B24L	NS60L	325	360	420	130E41L	NX200-10L	800		
46B24RS	NS60S	325	360	420	130F51R			800	
46B24LS	NS60LS	325	360	420	130F51L			800	
46B26R		360			145F51R	NS150	780	920	
46B26L		360			145F51L	NS150L	780	920	
46B26RS		360			145G51R	N150	780	900	1100
34B19RS	NS40ZAS	270	325	400	80D26R	NX10-5	580	580	630

34B19LS	NS40ZALS	270	325	400	80D26L	NX110-5L	580	580	630
46B26LS		360			145G51L	N150L	780	900	1100
48D26R	N50	280	360	420	150F51R	NT200-12	640		
48D26L	N50L	280	360	420	150F51L	NT200-12L	640		
50D20R		310	380	480	165G51R	NS200	935	980	
50D20L		310	380	480	165G51L	NS200L	935	980	
50D23R	85BR60K	500			170F51R	NX250-12	1045		
50D23L	85B60K	500			170F51L	NX250-12L	1045		
50B24R	NT80-S6	390			180G51R	NT250-15	1090		
50B24L	NT80-S6L	390			180G51L	NT250-15L	1090		
50D26R	50D20R		370		195G51R	NX300-51	1145		
50D26L	50D20L		370		195G51L	NX300-51L	1145		
55D23R		355	480	500	190H52R	N200	925	1100	1300
55D23L		355	480	500	190H52L	N200L	925	1100	1300
55B24R	NX100-S6	435	420	500	245H52R	NX400-20	1530	1250	
55B24L	NX100-S6L	435	420	500	245H52L	NX400 20L	1530	1250	

\* MF = maintenance free, CMF = closed maintenance free

## 6.2 DIN / EN

Model	Same model		DIN	EN	Model	Same model		DIN	EN
52805	25815		180	240	56420	56322	88066	300	510
53517			175	300	56530	56618	56638	300	510
53520	53512	53522	175	240	56618	56619	56620	300	510
53625	53638	53836	175	300	56633	56647	56641	300	510
53646	53621	88038	175	300	56820	56821	56828	315	540
53653	53624	53890	175	300	57024	57029		315	540
54038	54039		175	300	57113	57539		400	680
54323			175	300	57114	56821	88074	400	680
54313	54324	54464	220	330	57218	57219		420	720
54317	54312	88146	210	360	57220	57217		420	720
54437	54466	54459	210	360	57230			380	640
54459	54434	88064	210	360	57412	57413	57412	400	680

54469	54449	54465	210	360	57512	57513	57521	350	570
54519	54533	54612	210	360	58515	58424		450	760
54523	54524		220	300	58521	58513		320	540
54537	54545	54801	190	300	58522	58514		320	540
54551	54580		220	300	58815	58821		395	640
54533	54577	54579	220	300	58820	58515	58527	395	640
54584	54578		220	300	58827			400	640
54590			210	330	58838	58833	88092	400	680
54827			240	360	59040	59017	59018	360	600
55040	88056		265	450	59218	59219		290	480
55041	55042		220	360	59226	59215		450	760
55044	55414	88056	265	450	59514			320	540
55046			300	510	59518	59519		395	640
55056			320	540	59615	59616		360	600
55057	54827	88156	320	540	60018	60019		250	410
55068	55069	55548	220	390	60026	58811		440	720
55218			255	420	60044	60038		500	760
55414	55415	55421	265	450	60527	60528		410	680
55422	55566	55040	265	450	61017	61018		400	680
55428	55423	55427	300	510	61023	62529		450	760
55457			265	450	61047	61048		450	760
55529			220	360	62034	62038	62045	420	680
55531	55545	55559L	255	420	63013			470	680
55559	55530	88056	255	420	63545	63549		420	680
55564	55552	55563	255	420	64020	64317	6431 8	325	550
55564	55565	55548	255	420	64028	64035		520	760
55570	55567	55565L	255	420	64036			460	760
56012			230	390	64317	64318	64323	540	900
56048	56068	56069	250	390	65513			540	900
56049	56069	56073	250	390	65514	65515		570	900
56077	56030		300	510	67043	67045		600	1000
56091	55811		360	540	68032	68034		600	1000



56111	55048		300	540	70029	70038	70027	630	1050
56218	56092		300	510	70036	68040	68021	570	950
56219	56216		300	510	71014	71015		700	1150
56220			280	510	72512			680	1150
56225	56323		300	510	73011			740	1200
56318	56312	56311	300	510					

## 7 Contact

You can read our Contact terms in our General Business Terms which you can find here: <https://www.pce-instruments.com/english/terms>.

## 8 Disposal

For the disposal of batteries in the EU, the 2006/66/EC directive of the European Parliament applies. Due to the contained pollutants, batteries must not be disposed of as household waste. They must be given to collection points designed for that purpose.

In order to comply with the EU directive 2012/19/EU we take our devices back. We either re-use them or give them to a recycling company which disposes of the devices in line with law.

For countries outside the EU, batteries and devices should be disposed of in accordance with your local waste regulations.

If you have any questions, please contact PCE Instruments.



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