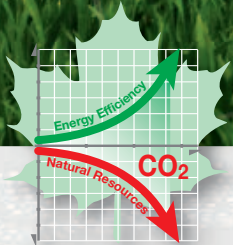


Excellent Technology, Efficiency and Quality



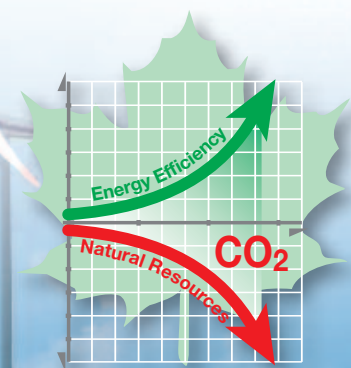
Tebetron

Intelligent charging systems
for your traction batteries





Tebetron *the energy-efficient charging technology for your traction batteries*



Economic and efficient

Battery-powered electric drives for industrial trucks have been established for decades and are distinguished by high reliability and excellent economy.

The economy of battery-powered trucks is further improved by the use of energy-efficient Tebetron charging systems.

The new Tebetron generation works with a modern, efficient charging characteristic in which the gassing phase (necessary to fully charge the battery) has been optimised.

This optimisation shortens the gassing phase and reduces the amount of gas produced. This saves electrical energy and reduces the amount of water consumed by the battery every time it is charged.

Reducing the amount of electrical energy required for charging not only reduces operating costs but also reduces CO₂ emissions.

Every kilowatt hour saved makes a contribution to climate protection.

Reduced water consumption extends the battery maintenance interval further minimising operating costs.

Tebetron chargers can be used for all PzS and PzS-B wet-cell batteries. The charging times range from 7.5 - 14 hours and are determined by the choice of rated current.

These units are suitable for shift operation, i.e. for charging times of 7.5 - 9 hours.

Tebetron Chargers

efficient and user-friendly

Wa pulse charging characteristic

Tebetron chargers work with a Wa pulse characteristic (see Fig. 1).

In the main charging phase, the charging characteristic corresponds to a W-characteristic, i.e. the charge current reduces as the battery voltage increases.

In the gassing phase, the electrolyte is mixed by means of highly effective short current pulses which lead to signifi-

cantly less gas production than with conventional Wa chargers with fixed gassing currents.

The pulsing technique reduces the temperature rise, lowers battery water consumption and uses less electrical energy.

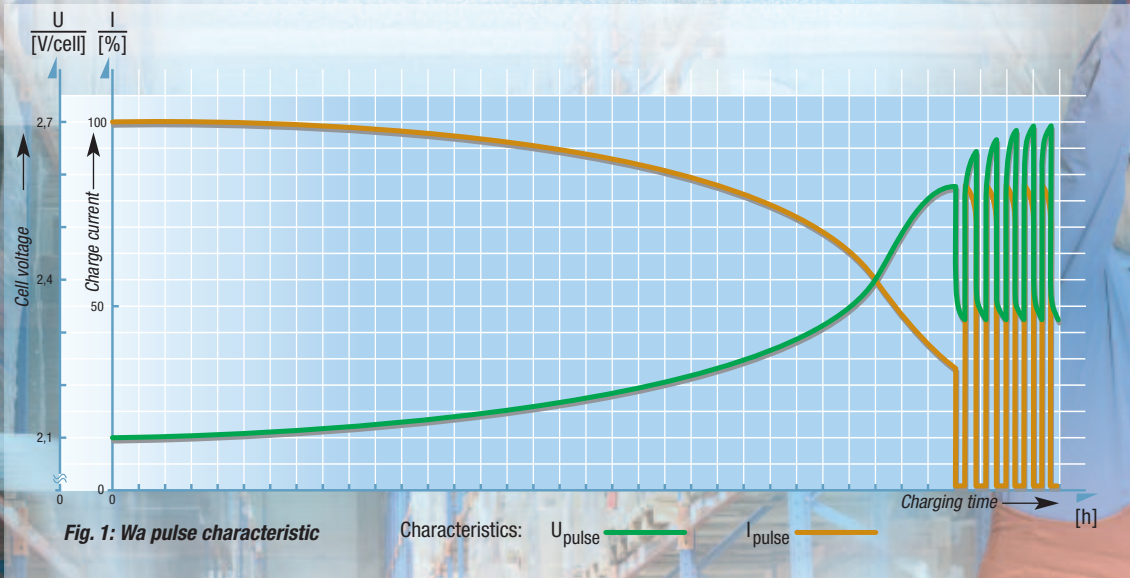


Fig. 1: Wa pulse characteristic

Characteristics: U_{pulse} I_{pulse}



Charge state traffic lights

In order to enable the charge and operating state to be clearly seen even from a distance, Tebetron chargers are equipped with charge state traffic lights in the form of a large coloured illuminated display.

The "Charge/Gassing" state is indicated by the colour yellow, "Charging complete" by the colour green and a possible fault by the colour red (see picture above).



Tebetron fully automatic chargers with energy-efficient charging technology

The particular advantages of the new Tebetron charger generation

1. Less overloading of the battery due to optimisation (shortening) of the gassing phase:

- Reduction of operating costs by saving electrical energy (and therefore reducing CO₂ emissions)
- Reduction of maintenance costs and extension of maintenance intervals thanks to reduced gas venting and reduced battery water consumption

2. Wider range of applications:

- Tebetron chargers are suitable for all PzS and PzS-B wet-cell batteries, with charging times ranging from 7.5 - 14 hours including shift operation.

3. Large-format, coloured and illuminated display:

- Clear identification of charge and operating state even from a distance thanks to large, easily visible charge state traffic lights

4. USB interface and data memory for recording important charging and statistical data:

- Important operating data can be retrieved using a Laptop or in the case of a large number of chargers, via a network with central PC. Analysing the data enables faults or deviations in the individual charging operations to be immediately detected.

Tebetron Traction-Monitor-Software rapid retrieval of operational data

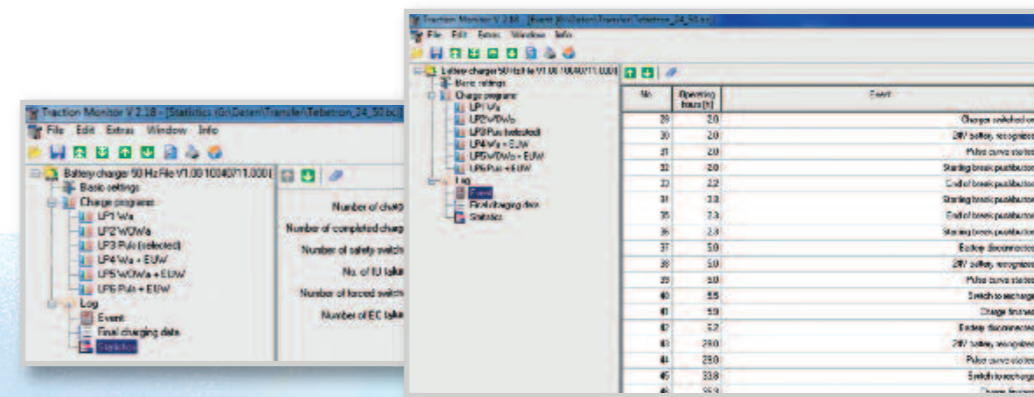
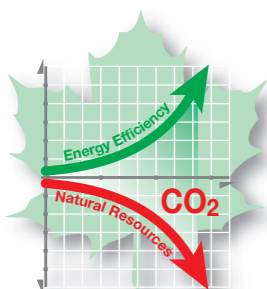


Fig. 2: Software display options



Fig. 3: Tebetron charger system 24 V - 30 A

Fig. 4: Tebetron charger system 24 V - 100 A



Tebetron *plug and play*

simple communication by USB interface

USB port

Tebetron chargers have a USB port for the retrieval of important operational data (see Fig. 3 and 4).

With the help of a standard USB cable and a laptop, the operating data shown in Fig. 2 can be accessed or transmitted to a central PC via a network.

Individual chargers can be quickly and thoroughly analysed with the help of the charging and statistical data.

As well as various other events, the charger saves the last 200 sets of charging data.



Fig. 5: Direct USB connection to a laptop for example

Fig. 6: Remote monitoring on site or from a NOC

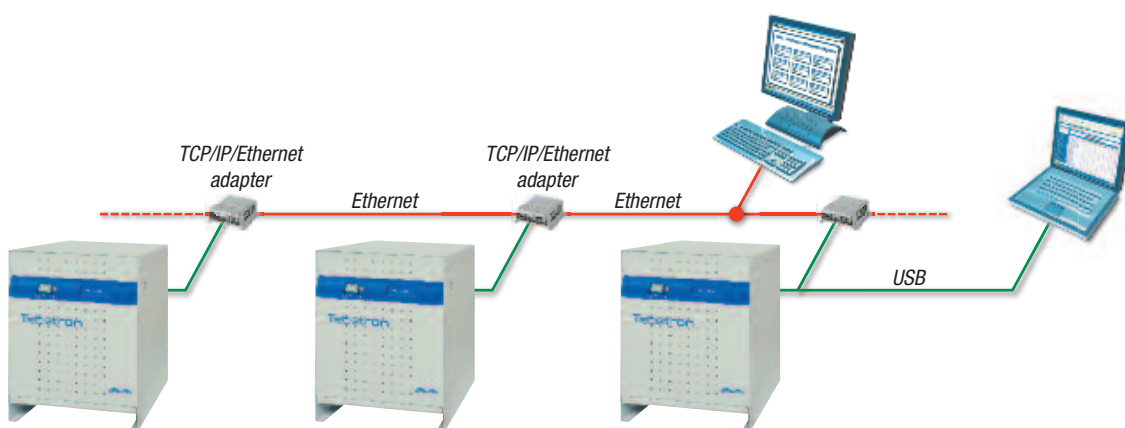
Remote monitoring and analysis

The monitoring software makes comprehensive monitoring, control and remote maintenance of the charging systems possible, both on site and from a remote location. Connection can be via the Internet or LAN/WLAN.

Using this software enables all chargers plus maintenance and service personnel, to be deployed efficiently and effectively.

Overview of all charging events

- Optimum use of charging resources
- Remote readout of charging parameters
- Notification in case of charge state change
- Remote maintenance



Type table

Output voltage [V]	Battery capacity [Ah]* Charging times		Unit rated current [A]	Mains-voltage [V]	Mains fuse [A]	Housing type	Weight [kg]	Unit type
	7,5 – 9 h	11 – 14 h						
24	85 – 110	120 – 160	12	230	16	FWT 1	9	E 230 G 24/ 12 B-FT
	110 – 130	160 – 200	16	230	16	FWT 1	10	E 230 G 24/ 16 B-FT
	126 – 160	200 – 260	20	230	16	FWT 1	12	E 230 G 24/ 20 B-FT
	150 – 190	240 – 310	25	230	16	FWT 1	13	E 230 G 24/ 25 B-FT
	180 – 230	280 – 375	30	230	16	FWT 1	16	E 230 G 24/ 30 B-FT
	210 – 270	315 – 420	35	230	16	FWT 2	19	E 230 G 24/ 35 B-FT
	240 – 300	360 – 495	40	230	16	FWT 2	24	E 230 G 24/ 40 B-FT
	260 – 330	400 – 525	45	230	16	FWT 2	25	E 230 G 24/ 45 B-FT
	315 – 400	500 – 620	50	230	16	FWT 2	25	E 230 G 24/ 50 B-FT
	380 – 460	560 – 735	60	230	16	FWT 2	26	E 230 G 24/ 60 B-FT
	440 – 540	640 – 840	70	230	16	FWT 2	27	E 230 G 24/ 70 B-FT
	500 – 600	735 – 950	80	230	16	FWT 2	27	E 230 G 24/ 80 B-FT
	550 – 675	805 – 1085	90	230	16	FWT 2	31	E 230 G 24/ 90 B-FT
	650 – 805	1000 – 1240	100	400	16	FWT 2	36	D 400 G 24/100 B-FT
	800 – 945	1240 – 1550	125	400	16	FST 1	50	D 400 G 24/125 B-FT
	930 – 1125	1395 –	150	400	16	FST 1	63	D 400 G 24/150 B-FT
1085 – 1260	–	170	400	16	FST 1	68	D 400 G 24/170 B-FT	
48	110 – 130	160 – 200	16	230	16	FWT 1	17	E 230 G 48/ 16 B-FT
	126 – 160	200 – 260	20	230	16	FWT 2	19	E 230 G 48/ 20 B-FT
	150 – 190	240 – 310	25	230	16	FWT 2	21	E 230 G 48/ 25 B-FT
	180 – 230	280 – 375	30	230	16	FWT 2	22	E 230 G 48/ 30 B-FT
	210 – 270	315 – 420	35	230	16	FWT 2	25	E 230 G 48/ 35 B-FT
	240 – 300	360 – 495	40	230	16	FWT 2	28	E 230 G 48/ 40 B-FT
	260 – 330	400 – 525	45	230	16	FWT 2	29	E 230 G 48/ 45 B-FT
	315 – 400	500 – 620	50	400	16	FWT 2	36	D 400 G 48/ 50 B-FT
	380 – 460	560 – 735	60	400	16	FST 1	48	D 400 G 48/ 60 B-FT
	440 – 540	640 – 840	70	400	16	FST 1	58	D 400 G 48/ 70 B-FT
	500 – 600	735 – 950	80	400	16	FST 1	65	D 400 G 48/ 80 B-FT
	550 – 675	805 – 1085	90	400	16	FST 1	65	D 400 G 48/ 90 B-FT
	650 – 805	1000 – 1240	100	400	16	FST 1	66	D 400 G 48/100 B-FT
	800 – 945	1240 – 1550	125	400	16	FST 1	77	D 400 G 48/125 B-FT
930 – 1125	1395 –	150	400	20	FST 1	87	D 400 G 48/150 B-FT	
1085 – 1260	–	170	400	25	FST 1	90	D 400 G 48/170 B-FT	
80	126 – 160	200 – 260	20	230	16	FWT 2	25	E 230 G 80/ 20 B-FT
	150 – 190	240 – 310	25	230	16	FWT 2	27	E 230 G 80/ 25 B-FT
	180 – 230	280 – 375	30	400	16	FWT 2	31	D 400 G 80/ 30 B-FT
	210 – 270	315 – 420	35	400	16	FST 1	38	D 400 G 80/ 35 B-FT
	240 – 300	360 – 495	40	400	16	FST 1	40	D 400 G 80/ 40 B-FT
	260 – 330	400 – 525	45	400	16	FST 1	47	D 400 G 80/ 45 B-FT
	315 – 400	500 – 620	50	400	16	FST 1	63	D 400 G 80/ 50 B-FT
	380 – 460	560 – 735	60	400	16	FST 1	66	D 400 G 80/ 60 B-FT
	440 – 540	640 – 840	70	400	16	FST 1	69	D 400 G 80/ 70 B-FT
	500 – 600	735 – 950	80	400	20	FST 1	76	D 400 G 80/ 80 B-FT
	550 – 675	805 – 1085	90	400	20	FST 1	81	D 400 G 80/ 90 B-FT
	650 – 805	1000 – 1240	100	400	25	FST 1	84	D 400 G 80/100 B-FT
	800 – 945	1240 – 1550	125	400	35	FST 1	116	D 400 G 80/125 B-FT
	930 – 1125	1395 –	150	400	35	FST 1	131	D 400 G 80/150 B-FT
1085 – 1260	–	170	400	50	FST 1	147	D 400 G 80/170 B-FT	

*Guide values; refer to battery manufacturer's specifications
Subject to technical changes



Free-standing housing FST 1



Wall/desk-top housing FWT 2



Wall/desk-top housing FWT 1

Housing

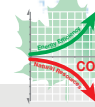
Type	Dimensions [mm]		
	Height	Width	Depth
FWT 1	223	364	268
FWT 2	263	505	324
FST 1	690	505	490

BENNING worldwide

ISO
9001

ISO
14001

SCC



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