





Technical data

Traction chargers

overview traction chargers



HF	operation	options						
		Air circulation (AE)	charge programm for cold store applic.	protection mode IP54	auxiliary contacts	control for automatic water refill	special voltage mains / battery	remote display
 <p>powertron E</p>	<p>single and multi shift (charging time 7-14h) (charging time 5,5-13h with AEM) PzS & PzB / PzV & AGM</p>	●	●	●	●	●	●	●
 <p>powertron vario powertron E Onboard</p>	<p>single and multi shift (Ladezeit 7 - 14h) Ladezeit 4,5 - 13h with AEM) PzS & PzB / PzV & AGM</p> <p>onboard single and double shift (charging time 7 - 14h) PzS & PzB / PzV & AGM</p>	●	●	●	●	●	●	●

50Hz

operation

options						
Air circulation (AE)	charge programm for cold store applic.	protection mode IP54	auxiliary contacts	control for automatic water refill	special voltage mains / battery	remote display
●	●	●	●	●	●	●
●	●	●	●	●	●	●

single and multi shift
 (charging time 7,5 - 14)
 (charging time 5,5 - 12h with AEM)
 PzS & PzB / PzV & AGM

double shift
 (charging time 7,5 - 12h)
 (charging time 6,5 - 12h with AEM)
 PzS & PzB

single / double shift
 (charging time 7,5-12h)
 PzS & PzB

single shift
 (charging time 10-14h)
 PzS & PzB



miditron top



intronic D puls



charger one D puls



flexy plus

HF-chargers for universal traction battery applications









Your benefits

- ▶ **Graphic display** with menu function for display of information and settings new
 - Display of charger data and state of charge
 - Setting of language, date and time
 - Delay of start programmable
 - Display of charging data of the last 10 cycles
- ▶ **Even higher availability** due to
 - Unique ventilation system with forced ventilation through a separate air duct, resulting in lower sensitivity to dust
- ▶ **Reduction of energy costs up to 25%** through
 - Higher efficiency up to 95%
 - Very little reactive power, $\cos \varphi > 0,95$
 - Low backlashes into mains
- ▶ **Clear information about state of charge** through Large coloured LED-display
- ▶ **Analysis** of stored data via USB-interface
- ▶ **Housing** suitable for wall and floor mounting

- ▶ For single and multi shift operation
- ▶ For opportunity charge of batteries with air circulation (AEM)
- ▶ To charge all types of standard PzS, PzV and VRLA traction batteries

Charger type	Battery type	Charging time (h)
powertron E	Standard PzS	7 – 14h
powertron E	Standard PzS with AEM	5,5 – 13h
powertron E	PzV + VRLA types	11 – 14h

Standard features

-  Pulse charge characteristic
-  Large LED-display
-  USB-interface and data memory
-  PFC-Filter (>700W)
-  Automatic equalising charge
-  Automatic maintenance charge

Technology and characteristics

- ▶ Fully regulated charging programme with pulse charging curve
- ▶ Energy saving due to HF-technology + pulse characteristic (charg.fact. 1,1)
- ▶ Balanced charging process
- ▶ Guaranteed recharge times in case of mains voltage variations +/- 10%
- ▶ Sinusoidal mains current due to active power factor correction (PFC) (>700W)
- ▶ Completely smoothed charge current (100% DC), therefore reduced increase of the battery temperature (approx. -5°C) during the charging process
- ▶ Suitable for industrial and household applications, respecting EMC-guideline and EN-standards
- ▶ Automatic equalising and maintenance charge
- ▶ Data memory and analysis of stored data via USB-interface






Operation and display

- ▶ **Fully automatic:**
 - Soft start
 - Adjustment of charge parameter
 - Secured full charge & termination of charging programme
- ▶ **Simple operation:**
 - Just connect battery with charger
 - No adjustment of parameter settings or manual switching
 - Display of operation state by large LED-display





Safety

- ▶ Reverse polarity protection
- ▶ Automatic battery parameter check prior to start of charging process
- ▶ Permanent control of the charging programme on errors and safety switch-off parameters
- ▶ Thermal monitoring to protect the charger
- ▶ If a pressure fault in the air circulation system is detected, switch over to the standard charging programme

Options

-  Charger plug
-  Air circulation (AEM)
-  Control for automatic water refill
-  Auxiliary contacts
-  Charge programme for batteries in cold store application

Option Graphic Display

- ▶ **from housing H2**
 -  LCD with display of plain text and symbols
 -  Settings and data read out by menu buttons
 -  Data storage in real time
 -  Delay of start

Type table

powertron E								HF-Ladegerät / HF-charger / chargeur-HF							
Ladezeit je Batterie-Kapazität (Ah/5h) in Stunden ca. Charging time according to battery capacity (Ah/5h) in hours ca. Temps de charge selon capacité (Ah/5) de la batterie en heures env.								Gerätedaten / Charger data / Données du chargeur							
Batteriespannung	Traktionsbatterie PzS, PzB, GIS mit puls			Traktionsbatterie PzS, PzB, GIS mit EU (Elektrolytumwälzung)			PzV, GiV, AGM wartungsfreie Batterie *	Gerätetyp	Netzspannung	Netzleistung	Netzstrom	Netzleitung u. Netzstecker	Netz-sicherung (träge)	Gehäuse (mit EU und/oder Display)	Gewicht brutto
Voltage	Traction battery PzS, PzB, GIS with puls			Traction battery PzS, PzB, GIS with AEM (air electrolyte mixing)			PzV, GiV, AGM for sealed, M.F.battery *	Charger type	Mains voltage	Mains power rating	Mains current	Power line Plug	Mains fuse (slow)	Housing (with AEM and/or Display)	Gross weight
V	Batterie traction Pzs, PzB, GiS avec puls			Batterie traction Pzs, PzB, GiS avec BE (brassage d'électrolyte)			Batterie PzV, GiV, AGM - étanche S.E.*	Type de chargeur	Secteur voltage	Puissance secteur	Courant secteur	Câble et prise	Fusible secteur (lent)	Armoire (avec BE et/ou écran)	Poids brut
	7 - 8,5h	8,5 - 11,5h	11,5 - 14h	5,5 - 6,5h	6,5 - 9,5h	9,5 - 13h	V / A	V	kVA	A	mm²	A		ca. kg	
24V	85-130	130-150	150-200	—	—	—	85-125	E 24/ 15	E 230 V	0,5	1,8	1,5 Schuko	10	H01	4
	110-180	180-200	200-270	—	—	—	110-160	E 24/ 20	E 230 V	0,6	2,2	1,5 Schuko	10	H01	4
	145-225	225-250	250-340	—	—	—	140-200	E 24/ 25	E 230 V	0,8	2,8	1,5 Schuko	10	H01	4
	175-260	260-300	300-400	—	—	—	160-240	E 24/ 30	E 230 V	0,9	3,1	1,5 Schuko	10	H01	4
	235-350	350-400	400-525	170-235	235-360	360-500	220-320	E 24/ 40	E 230 V	1,2	4,2	1,5 Schuko	10	H02 (H12)	5 (8)
	280-440	440-500	500-640	230-300	300-450	450-625	280-400	E 24/ 50	E 230 V	1,5	5,6	1,5 Schuko	10	H02 (H12)	5 (8)
	380-575	575-625	625-875	320-375	375-575	575-840	360-520	E 24/ 65	E 230 V	1,8	7,5	1,5 Schuko	10	H10 (H2)	13 (19)
	470-710	710-800	800-1050	340-470	470-720	720-1000	450-640	E 24/ 80	E 230 V	2,2	9,3	1,5 Schuko	16	H10 (H2)	13 (19)
	580-875	875-1000	1000-1260	450-575	575-900	900-1200	560-800	E 24/ 100	E 230 V	2,8	11,6	1,5 Schuko	16	H3	38
	700-980	980-1200	1200-1550	575-700	700-1085	1085-1550	700-960	E 24/ 120	E 230 V	3,3	13,9	1,5 Schuko	16	H3	38
	850-1240	1240-1550	—	700-875	875-1350	1350-1550	840-1150	D 24/ 150	D 400 V	4,4	6,4	1,5 CEE 16	10	H3	46
	980-1395	—	—	775-1000	1000-1450	—	945-1260	D 24/ 170	D 400 V	5,2	7,7	1,5 CEE 16	10	H3	56
	1150-1500	—	—	900-1150	1150-1550	—	1100-1400	D 24/ 200	D 400 V	6,2	8,9	1,5 CEE 16	10	H3	56
36V	85-130	130-150	150-200	—	—	—	85-125	E 36/ 15	E 230 V	0,6	2,7	1,5 Schuko	10	H01	4
	110-180	180-200	200-270	—	—	—	110-160	E 36/ 20	E 230 V	0,8	3,3	1,5 Schuko	10	H01	4
	145-225	225-250	250-340	—	—	—	140-200	E 36/ 25	E 230 V	1,0	4,2	1,5 Schuko	10	H02	5
	200-300	300-350	350-465	160-205	205-320	320-450	200-280	E 36/ 35	E 230 V	1,4	6,1	1,5 Schuko	10	H02 (H12)	5 (8)
	280-440	440-500	500-640	230-300	300-450	450-625	280-400	E 36/ 50	E 230 V	2,0	8,7	1,5 Schuko	10	H10 (H2)	13 (19)
48V	200-300	300-350	350-465	160-205	205-320	320-450	200-280	E 48/ 35	E 230 V	1,9	8,1	1,5 Schuko	10	H10 (H2)	13 (19)
	280-440	440-500	500-640	230-300	300-450	450-625	280-400	E 48/ 50	E 230 V	2,7	11,6	1,5 Schuko	16	H3	38
	350-525	525-600	600-800	290-350	350-540	540-775	325-480	E 48/ 60	E 230 V	3,2	13,9	1,5 Schuko	16	H3	38
	470-710	710-800	800-1050	340-470	470-720	720-1000	450-640	D 48/ 80	D 400 V	4,9	7,0	1,5 CEE 16	10	H3	46
	580-875	875-1000	1000-1260	450-575	575-900	900-1200	560-800	D 48/ 100	D 400 V	6,1	8,6	1,5 CEE 16	10	H3	46
	700-980	980-1200	1200-1550	575-700	700-1085	1085-1550	700-960	D 48/ 120	D 400 V	7,3	10,3	1,5 CEE 16	16	H3	46
	850-1240	1240-1550	—	700-875	875-1350	1350-1550	840-1150	D 48/ 150	D 400 V	9,1	12,9	1,5 CEE 16	16	H3	56
	980-1395	—	—	775-1000	1000-1450	—	945-1260	D 48/ 170	D 400 V	10,2	14,6	1,5 CEE 16	16	H3	56
	1150-1500	—	—	900-1150	1150-1550	—	1100-1400	D 48/ 200	D 400 V	12,2	17,2	2,5 CEE 32	20	H3	56
	1400-1550	—	—	1150-1400	1400-1550	—	1400-1550	D 48/ 240	D 400 V	14,8	21,1	2,5 CEE 32	25	**	
80V	145-225	225-250	250-340	—	—	—	140-200	E 80/ 25	E 230 V	2,6	9,7	1,5 Schuko	16	H10	13
	200-300	300-350	350-465	160-205	205-320	320-450	200-280	E 80/ 35	E 230 V	3,6	13,5	1,5 Schuko	16	H3	38
	280-440	440-500	500-640	230-300	300-450	450-625	280-400	D 80/ 50	D 400 V	5,1	7,2	1,5 CEE 16	10	H3	46
	380-575	575-625	625-875	320-375	375-575	575-840	360-520	D 80/ 65	D 400 V	6,6	9,3	1,5 CEE 16	16	H3	46
	500-750	750-850	850-1125	340-500	500-775	775-1050	480-690	D 80/ 85	D 400 V	8,7	12,2	1,5 CEE 16	16	H3	46
	580-875	875-1000	1000-1260	450-575	575-900	900-1200	560-800	D 80/ 100	D 400 V	10,2	14,3	1,5 CEE 16	16	H3	56
	700-980	980-1200	1200-1550	575-700	700-1085	1085-1550	700-960	D 80/ 120	D 400 V	12,8	17,2	2,5 CEE 32	20	H3	56
	850-1240	1240-1550	—	700-875	875-1350	1350-1550	840-1150	D 80/ 150	D 400 V	15,3	21,5	2,5 CEE 32	25	H4	87
	980-1395	—	—	775-1000	1000-1450	—	945-1260	D 80/ 170	D 400 V	17,3	24,3	4,0 CEE 32	35	H4	87
	1150-1500	—	—	900-1150	1150-1550	—	1100-1400	D 80/ 200	D 400 V	20,5	29,9	6 mm² --	35	**	
	1400-1550	—	—	1150-1400	1400-1550	—	1400-1550	D 80/ 240	D 400 V	24,7	35,5	10 mm² --	50	**	
Abm. / Dim. / Dim. [mm]				E 230 V: Einphasenwechselstrom, single phase, monophasé 1 x 230V 50Hz				Wand-/Standgeräte, wall / floor mounted charger, Installation murale / au sol							
Gehäuse	Höhe	Breite	Tiefe	D 400 V: Dreiphasenwechselstrom, three phase, triphasé 3 x 400V 50Hz											
Housing	Height	Width	Depth												
Armoire	Hauteur	Largeur	Profondeur	Option: Grafikdisplay ab Gehäuse H2 / display from housing H2 / écran à partir de l'armoire H2				** auf Anfrage on demand sur demande							
H01	235 mm	175 mm	105 mm												
H02	255 mm	265 mm	105 mm	* Richtwerte, Vorschriften der Batteriehersteller sind zu beachten.											
H12	270 mm	450 mm	105 mm	* Standard values, observe recommendations of battery manufacturer.											
H10	260 mm	450 mm	150 mm	* Respectez les consignes du fabricant de la batterie.				* Technische Änderungen vorbehalten							
H2	360 mm	450 mm	200 mm	* Schutzrechte nach DIN 34 Absatz 2.1 werden beansprucht				* Rights reserved for technical changes							
H3	560 mm	520 mm	260 mm	* Copyright protected acc. DIN 34 section 2.1				* Modifications techniques réservées.							
H4	960 mm	520 mm	260 mm	* Protection des copyrights acc. DIN 34 section 2.1											










The highly flexible HF charging system



Your benefits

- ▶ **Compact and modular construction**
 - Reduced need of space due to integration of two different chargers in one rack
 - Combination of two chargers freely selectable:
Voltage: 24V, 48V, 80V
Charger current: 85A – 300A (see type table)
- ▶ **Ideal for charging of big batteries in multi shift**
– charger up to 300A
- ▶ **Quick charge**
 - Special charging programme for quick charge from 4.5 hours with AEM
 - No spare battery and battery change
- ▶ **High availability due to**
unique ventilation system with forced ventilation through a separate air duct, resulting in lower sensitivity to dust
- ▶ **Clear information about state of charge**
through large coloured text-display











Standard features

-  Pulse charge characteristic
-  Soft start
-  Coloured text-display with info about state of charge
-  Data check via menu button
-  IrComm-interface and data memory
-  PFC-Filter
-  Automatic equalising charge
-  Automatic maintenance charge
-  Delay of start

- ▶ Quick charge from 4,5h with AEM
- ▶ Ideal for charging of big batteries – charger up to 300A
- ▶ Charging technology for flooded and Li-Ion (*liflex*) batteries

Charger type	Battery type	Charging time (h)
powertron vario	Standard PzS	7 – 14h
powertron vario	Standard PzS with AEM	4,5 – 13h

Options

-  Charger plug
-  Air circulation (AEM)
-  Control for automatic water refill
-  External ON / OFF
-  Remote display
-  Temperature driven recharge
-  Special charging characteristics
-  External signalling
-  Battery controller-capability
-  AGV-application

Type table

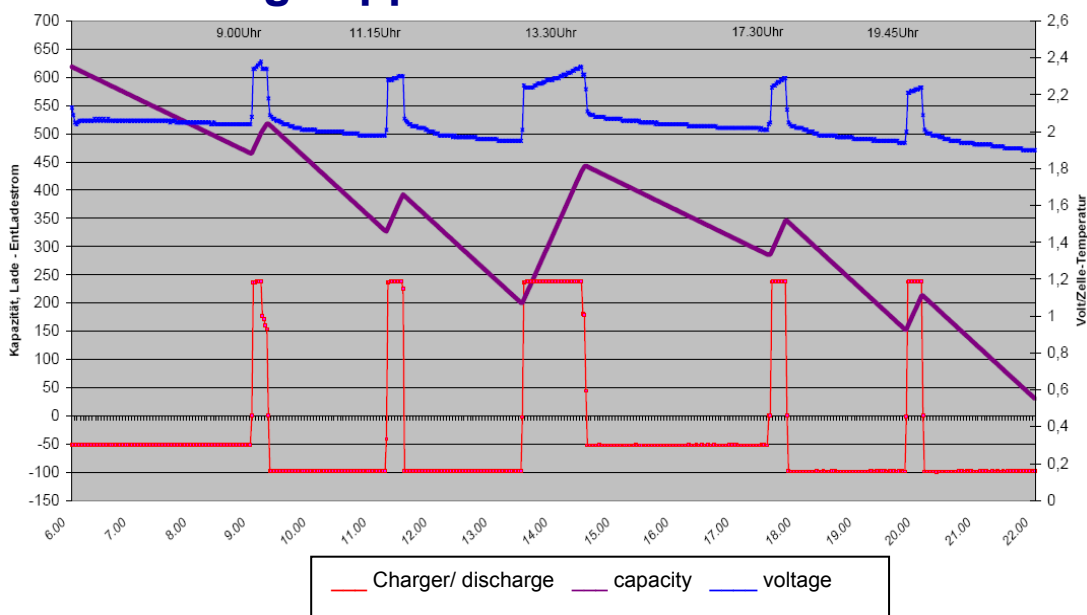
Voltage	Charging time 4,5 - 13h PzS with AEM	Charging time 7,0 - 14h PzS with Puls	Charger typ V / A	case
24V	280 – 1050 Ah	500 – 1125 Ah	E 24V / 85A	G40 (G50)
	500 – 1925 Ah	875 – 1950 Ah	D 24V / 150A	
	665 – 2300 Ah	1130 – 2450 Ah	D 24V / 200A	
	775 – 2800 Ah	1400 – 2900 Ah	D 24V / 240A	
	1000 – 3500 Ah	1700 – 3700 Ah	D 24V / 300A	
48V	280 – 1050 Ah	500 – 1125 Ah	D 48V / 85A	G40 (G50)
	400 – 1500 Ah	700 – 1550Ah	D 48V / 120A	
	500 – 1925 Ah	875 – 1950 Ah	D 48V / 150A	
	665 – 2300 Ah	1130 – 2450 Ah	D 48V / 200A	
	775 – 2800 Ah	1400 – 2900 Ah	D 48V / 240A	
	1000 – 3500 Ah	1700 – 3700 Ah	D 48V / 300A	
80V	280 – 1050 Ah	500 – 1125 Ah	D 80V / 85A	G40 (G50)
	400 – 1500 Ah	700 – 1550Ah	D 80V / 120A	
	560 – 2100 Ah	975 – 2200 Ah	D 80V / 170A	
	775 – 2800 Ah	1400 – 2900 Ah	D 80V / 240A	
	1000 – 3500 Ah	1700 – 3700 Ah	D 80V / 300A	G50

Dimensiona

case	Width [mm]	Height [mm]	Depth [mm]
G40	575	660	570
G50	575	1200	570

Code letter E = Single phase 1x230V 50Hz
Code letter D = Three phase 3x400V 50Hz

Quick charge application



HF onboard battery charger for traction application new











Your benefits

- ▶ Charging flexible – power from the wall at every Schuko socket
- ▶ Low volume and weight
- ▶ Easy installation in the truck
- ▶ No classic charging station needed
- ▶ Shock- and vibration proof design
- ▶ Short circuit proof by PCB coating

- ▶ For single and multi-shift operation
- ▶ To charge all types of standard PzS, PzV and VRLA traction batteries
- ▶ Range: Single phase 12V/24V up to 50A, 36V up to 35A, 48V up to 25A

Charger type Onboard	Battery type	Charging time (h)
<i>powertron E</i>	Standard PzS	7 – 14h
<i>powertron E</i>	PzV + VRLA types	11 – 14h

Standard features

-  Pulse characteristic
-  Softstart
-  LED-display
-  USB-interface and data memory
-  PFC-Filter
-  Automatic equalising charge
-  Automatic maintenance charge
-  Drive off protection (Changer)

Technology and characteristics

- ▶ Fully regulated charging programme with pulse characteristics
- ▶ Energy saving due to HF-technology + pulse characteristics (charging fact.1,1)
- ▶ Balanced charging process
- ▶ Guaranteed recharge times in case of mains voltage variations +/- 10%
- ▶ Sinusoidal mains current due to active power factor correction (PFC)
- ▶ Completely smoothed charger current (100% DC), therefore reduced increase of the battery temperature (approx. -5°C) during the charging process
- ▶ Suitable for industrial and household applications, respecting EMC-guideline and EN-Standards
- ▶ Data memory, read out and analysis of stored data by USB-interface
- ▶ Protection mode IP20

Operation and display

- ▶ Fully automatic:
 - Softstart
 - Adjustment of charge parameter
 - Secured full charge and switch-off
- ▶ Simple operation:
 - Only insert Schuko mains plug
 - No adjustment of parameters settings or manual operation
 - Display of operation state by LEDs

Safety

- ▶ Reverse polarity protection
- ▶ Automatic battery parameter check prior to start the charging process
- ▶ Permanent control of the charging programme on errors and safety switch-off if required
- ▶ Thermal monitoring to protect the charger
- ▶ With drive-off protection for traction motor break

Options

-  Charger plug

Type table

powertron E Onboard					HF-Ladegerät / HF-charger / chargeur HF								
Ladezeit je Batterie-Kapazität (Ah/5h) in Stunden ca.					Gerätedaten / Charger data / Données du chargeur								
Batterie-spannung	Traktionsbatterie PzS, PzB, GiS mit Puls				PzV, GiV, AGM wartungsfreie Batterie *	Gerätetyp	Netzspannung	Netzleistung	Netzstrom	Netzleitung u. Netzstecker	Netz-sicherung (träge)	Gehäuse	Gewicht brutto
Voltage	Traction battery PzS, PzB, GiS with pulse				PzV, GiV, AGM for sealed, M.F.battery *	Charger type	Mains voltage	Mains power rating	Mains current	Power line Plug	Mains fuse (slow)	Housing (with AEM)	Gross weight
Voltage	Batterie traction Pzs, PzB, GiS avec puls				Batterie PzV, GiV, AGM - étanche S.E.*	Type de chargeur	Secteur voltage	Puissance secteur	Courant secteur	Câble et prise	Fusible secteur (lent)	Armoire (avec BE)	Poids brut
V	7 - 8,5h	8,5 - 11,5h	11,5 - 14h	11 - 14h		V / A	V	kVA	A	mm ²	A		ca. kg
12V	85-130	130-150	150-200	85-125	E 12/ 15	E 230 V	0,5	1,8	1,5 Schuko	10	ON 01	4	
	110-180	180-200	200-270	110-160	E 12/ 20	E 230 V	0,6	2,2	1,5 Schuko	10	ON 01	4	
	145-225	225-250	250-340	140-200	E 12/ 25	E 230 V	0,8	2,8	1,5 Schuko	10	ON 01	4	
	175-260	260-300	300-400	160-240	E 12/ 30	E 230 V	0,9	3,1	1,5 Schuko	10	ON 01	4	
	235-350	350-400	400-525	220-320	E 12/ 40	E 230 V	1,2	4,2	1,5 Schuko	10	ON 02	5	
	280-440	440-500	500-640	280-400	E 12/ 50	E 230 V	1,5	5,6	1,5 Schuko	10	ON 02	5	
24V	85-130	130-150	150-200	85-125	E 24/ 15	E 230 V	0,5	1,8	1,5 Schuko	10	ON 01	4	
	110-180	180-200	200-270	110-160	E 24/ 20	E 230 V	0,6	2,2	1,5 Schuko	10	ON 01	4	
	145-225	225-250	250-340	140-200	E 24/ 25	E 230 V	0,8	2,8	1,5 Schuko	10	ON 01	4	
	175-260	260-300	300-400	160-240	E 24/ 30	E 230 V	0,9	3,1	1,5 Schuko	10	ON 01	4	
	235-350	350-400	400-525	220-320	E 24/ 40	E 230 V	1,2	4,2	1,5 Schuko	10	ON 02	5	
	280-440	440-500	500-640	280-400	E 24/ 50	E 230 V	1,5	5,6	1,5 Schuko	10	ON 02	5	
36V	85-130	130-150	150-200	85-125	E 36/ 15	E 230 V	0,6	2,7	1,5 Schuko	10	ON 01	4	
	110-180	180-200	200-270	110-160	E 36/ 20	E 230 V	0,8	3,3	1,5 Schuko	10	ON 01	4	
	145-225	225-250	250-340	140-200	E 36/ 25	E 230 V	1,0	4,2	1,5 Schuko	10	ON 02	5	
	200-300	300-350	350-465	200-280	E 36/ 35	E 230 V	1,4	6,1	1,5 Schuko	10	ON 02	5	
48V	85-130	130-150	150-200	85-125	E 48/ 15	E 230 V	0,9	3,1	1,5 Schuko	10	ON 02	5	
	110-180	180-200	200-270	110-160	E 48/ 20	E 230 V	1,2	4,2	1,5 Schuko	10	ON 02	5	
	145-225	225-250	250-340	140-200	E 48/ 25	E 230 V	1,5	5,6	1,5 Schuko	10	ON 02	5	
Abm. / Dim. / Dim. [mm]					E 230V: Einphasenwechselstrom, single phase, monophasé 1x230V 50Hz								
Gehäuse	Höhe	Breite	Tiefe	IP 20: Schutzart, Protection mode, Mode de protection									
Housing	Height	Width	Depth										
Armoire	Hauteur	Largeur	Profondeur	* Richtwerte, Vorschriften der Batteriehersteller sind zu beachten.					* Technische Änderungen vorbehalten				
ON 01	77 mm	260 mm	167 mm	* Standard values, observe recommendations of battery manufacturer.					* Rights reserved for technical changes				
ON 02	77 mm	312 mm	200 mm	* Respectez les consignes du fabricant de la batterie.					* Modifications techniques réservées.				

The robust regulated 50Hz charging system for all battery types



- ▶ For single and multi shift operation
- ▶ Suitable for opportunity charging with air circulation (AEM)
- ▶ Charging technology for flooded and sealed batteries
- ▶ Compatible to battery controller- and management systems
- ▶ Universal adjustment for all traction applications

Charger type	Characteristics	Charging time
miditron top	IUIa IUIa with air mix (AEM)	7,5 – 14 h 5,5 – 12 h
miditron top	IUIa E-Pulse®	7,5 – 14 h
miditron top	Special charging characteristics for flooded and sealed batteries	Battery dependent

Technology and characteristics

- ▶ Regulated IUIa characteristic in 50Hz thyristor technology
- ▶ Charging characteristic independent of mains voltage variation
- ▶ Improved charge in cold store application
- ▶ Low energy and maintenance costs due to E-Pulse®-characteristic
- ▶ Ampere hour balanced charging process
- ▶ Automatic and manual equalising charge
- ▶ Automatic maintenance charge during longer periods of nominal usage
- ▶ Adaption to voltage behaviour of sulphated batteries during charge
- ▶ Memory and analysis of the last of the last 62 data accessible via InfraComm
- ▶ Electromagnetic compatibility and safety in accordance to EMC guidelines
- ▶ Acid resistant front label

Operation and display

- ▶ Automatic start, charging process and shut-off
- ▶ Fully automatic charging process
- ▶ Clear display of the charging and operational state by LC-Display and LEDs
- ▶ Flexible configuration via InfraComm









Safety

- ▶ Reverse polarity protection
- ▶ Automatic battery and charge parameter check prior to start of charging process
- ▶ Automatic start of charge after a safety delay
- ▶ Charge procedure check in the event of irregular battery behaviour
- ▶ Automatic shut-off of the charger after disconnecting the battery
- ▶ Thermal monitoring of the transformer
- ▶ Control for electrolyte circulation. Switch over to a standard charging factor if a pressure fault is detected.











Your benefits

- ▶ Charging characteristic independent of mains voltage variation
- ▶ Long lasting due to robust built
- ▶ Energy saving due to high power efficiency
- ▶ Special diagrams and free programmable charging characteristics
- ▶ Storage and analysis of charge data with InfraComm
- ▶ Using for AGV-application

Standard features

-  Softstart^(DGBM)
-  LED-operation status
-  LC-Display with clear text manager
-  Menu button included
-  InfraComm^{®(DGBM)}-Interface
-  E-Pulse[®]-characteristic
-  Automatic equalising charge
-  Maintenance charge

Options

-  Battery plug
-  Air mix (AEM)
-  Special charging characteristic
-  Automatic water refill
-  External ON / OFF
-  Remote display
-  Characteristic for cold store operation
-  External signalling
-  BICaT-capability
-  Management capability
-  AGV-application

Type table

U _{Nenn}	PzS Batteries						PzV(*) Sealed battery	Charger type	Power rating	Power line plug	Hou- sing type	Weight gross
	Standard IUI-charge procedure			E-Pulse charge procedure								
AEM	Charging time acc. to battery capacity (Ah) ⁽¹⁾			Charging time acc. to battery capacity (Ah) ⁽¹⁾			Charge time		app. kVA			app. kg
	7,5-8,5 h 5,5-6,5 h	9 - 11 h 7- 9 h	12 - 14 h 10- 12 h	7,5-8,5 h	9 - 11 h	12 - 14 h						
24V	140-179	200-259	330-379	200-259	256-339	345-379	210-279	E 24/30	1,6	1,5 Schuko	G2-3	40
	180-234	260-329	380-459	260-329	340-429	380-529	280-359	E 24/40	2,2	1,5 Schuko		43
	235-284	330-419	460-549	330-399	430-529	530-649	360-449	E 24/50	2,7	1,5 Schuko		47
	285-349	420-499	550-649	400-499	530-659	650-799	450-559	E 24/60	3,2	1,5 Schuko		47
	350-479	500-679	650-949	500-659	660-859	800-1099	560-719	D 24/80	4,3	1,5 CEE 16	G4-3	60
	480-584	680-849	950-1149	660-799	860-1069	1100-1349	720-899	D 24/100	5,4	1,5 CEE 16		65
	585-739	850-999	1150-1449	800-999	1070-1299	1350-1649	900-1099	D 24/125	6,8	1,5 CEE 16		70
	740-849	1000-1149	1450-1759	1000-1199	1300-1599	1650-1999	1100-1299	D 24/150	8,1	1,5 CEE 16		80
	850-1049	1150-1299	1760-1999	1200-1399	1600-1799	2000-2299	1300-1499	D 24/180	9,7	1,5 CEE 16		90
	1050-1200	1300-1700	2000-2200	1400-1600	1800-2160	2300-2550	1500-1800	D 24/200	10,8	1,5 CEE 16		105
36V	140-179	200-259	330-379	200-259	256-339	345-379	210-279	E 36/30	2,4	1,5 Schuko	G2-3	48
	180-234	260-329	380-459	260-329	340-429	380-529	280-359	E 36/40	3,2	1,5 Schuko		53
	235-284	330-419	460-549	330-399	430-529	530-649	360-449	D 36/50	4,1	1,5 CEE 16		61
	285-349	420-499	550-649	400-499	530-659	650-799	450-559	D 36/60	4,9	1,5 CEE 16	G4-3	65
	350-479	500-679	650-949	500-659	660-859	800-1099	560-719	D 36/80	6,5	1,5 CEE 16		70
	480-584	680-849	950-1149	660-799	860-1069	1100-1349	720-899	D 36/100	8,1	1,5 CEE 16		85
	585-739	850-999	1150-1449	800-999	1070-1299	1350-1649	900-1099	D 36/125	10,2	1,5 CEE 16		100
	740-849	1000-1149	1450-1759	1000-1199	1300-1599	1650-1999	1100-1299	D 36/150	12,2	4,0 CEE 32		115
	850-1049	1150-1299	1760-1999	1200-1399	1600-1799	2000-2299	1300-1499	D 36/180	14,6	4,0 CEE 32		120
	1050-1200	1300-1700	2000-2200	1400-1600	1800-2160	2300-2550	1500-1800	D 36/200	16,2	4,0 CEE 32		125
48V	140-179	200-259	330-379	200-259	256-339	345-379	210-279	E 48/30	3,2	1,5 Schuko	G2-3	48
	180-234	260-329	380-459	260-329	340-429	380-529	280-359	D 48/40	4,3	1,5 CEE 16		56
	235-284	330-419	460-549	330-399	430-529	530-649	360-449	D 48/50	5,4	1,5 CEE 16	G4-3	61
	285-349	420-499	550-649	400-499	530-659	650-799	450-559	D 48/60	6,5	1,5 CEE 16		65
	350-479	500-679	650-949	500-659	660-859	800-1099	560-719	D 48/80	8,7	1,5 CEE 16		104
	480-584	680-849	950-1149	660-799	860-1069	1100-1349	720-899	D 48/100	10,8	1,5 CEE 16		106
	585-739	850-999	1150-1449	800-999	1070-1299	1350-1649	900-1099	D 48/125	13,5	4,0 CEE 32		124
	740-849	1000-1149	1450-1759	1000-1199	1300-1599	1650-1999	1100-1299	D 48/150	16,2	6,0 CEE 32		126
	850-1049	1150-1299	1760-1999	1200-1399	1600-1799	2000-2299	1300-1499	D 48/180	19,5	6,0 CEE 32		130
	1050-1200	1300-1700	2000-2200	1400-1600	1800-2160	2300-2550	1500-1800	D 48/200	21,7	6,0 CEE 32		135
80V	140-179	200-259	330-379	200-259	256-339	345-379	210-279	D 80/30	5,4	1,5 CEE 16	G4-3	90
	180-234	260-329	380-459	260-329	340-429	380-529	280-359	D 80/40	7,2	1,5 CEE 16		95
	235-284	330-419	460-549	330-399	430-529	530-649	360-449	D 80/50	9,0	1,5 CEE 16		98
	285-349	420-499	550-649	400-499	530-659	650-799	450-559	D 80/60	10,8	1,5 CEE 16		106
	350-479	500-679	650-949	500-659	660-859	800-1099	560-719	D 80/80	13,3	4,0 CEE 32		125
	480-584	680-849	950-1149	660-799	860-1069	1100-1349	720-899	D 80/100	18,0	6,0 CEE 32		130
	585-739	850-999	1150-1449	800-999	1070-1299	1350-1649	900-1099	D 80/125	21,9	6,0 CEE 32	160	
	740-849	1000-1149	1450-1759	1000-1199	1300-1599	1650-1999	1100-1299	D 80/150	22,0	6,0 CEE 32	GU-06	250
	850-1049	1150-1299	1760-1999	1200-1399	1600-1799	2000-2299	1300-1499	D 80/180	26,4	10,0 ohne	GU-08	270
	1050-1200	1300-1700	2000-2200	1400-1600	1800-2160	2300-2550	1500-1800	D 80/200	29,3	10,0 ohne		280

Code letter E: Single phase AC 230V, 50/60Hz (1/N/PE)
Code letter D: Three phase AC 400V, 50/60Hz (3N/PE)

(1) Standard values, observe recommendations of battery manufacturers

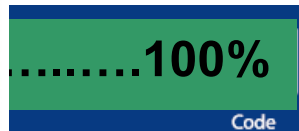
(*) Depending on the specification of the battery manufacturer

Technical modifications reserved

Housing	Dimensions		
	Height	Width	Depth
G2-3	370 mm	575 mm	380 mm
G4-3	680 mm	575mm	530mm
GU-06	1425 mm	600 mm	600 mm
GU-08	1425 mm	800 mm	600 mm

Housings G2-3 up to G4-3 suitable for floor and wall mounting
Housings GU-06 and GU-08 for floor installation only
Customer solutions and higher output power on request

The 50Hz charging technology for universal applications



Coloured
text-display

- ▶ For single and multi shift operation
- ▶ For opportunity charge of batteries with air circulation (AEM)
- ▶ Suitable for charging standard lead acid traction batteries

Charger type	Charge characteristic	Charging time (h)
intrinsic D puls	Wsa-puls	7,5 –12h
intrinsic D EU	Wsa EU	6,5 –12h

Technology and product features

- ▶ Wsa-puls characteristic for a quick and energy saving battery charge
- ▶ Softstart (single phase chargers)
- ▶ Ah balanced charging process
- ▶ Improved charging process for batteries with low temperature
- ▶ Automatic equalising charge
- ▶ Automatic maintenance charge
- ▶ Adaption to the voltage behaviour of sulphated batteries
- ▶ Data memory in real time, read out and analysis of stored data via IrComm-interface
- ▶ Programmable starting time of charging process to avoid power peaks in the mains.
- ▶ Electromagnetic compatibility and safety in accordance to EMC guideline and EN-standards
- ▶ Acid resistant front label
- ▶ Protection mode IP21

Operation and display

- ▶ Automatic start, charging process and shut off
- ▶ Simple operation:
 - Just connect battery with charger
 - No adjustment of parameter settings or manual switching
 - Display of operation state by coloured text-display and Jumbo-LEDs
 - Data check via buttons and IrComm











Safety

- ▶ Reverse polarity protection
- ▶ Automatic battery parameter check prior to start of charging process
- ▶ Automatic start of charge after a safety delay
- ▶ Charge procedure check in the event of irregular battery behaviour
- ▶ Automatic shut-off of the charger after disconnecting the battery
- ▶ Thermal monitoring for charger protection
- ▶ In case of pressure fault in the AEM standard charging programme works.






Your benefits

- ▶ Far visible coloured text-display with info about residual charge time in h, progress of charge and state of charge
- ▶ Operation state far visible by super bright Jumbo-LEDs
- ▶ Data display via menu and info button
- ▶ Use of night electricity tariffs by programming the start of the charge with real time clock

Standard features

-  Softstart (single phase charger)
-  Real time clock
-  Jumbo-LED operation state
-  Coloured text-display with residual charge time, progress of charge and state of charge
-  Data display via menu and info button
-  IrComm-interface and data memory in real time
-  Wsa-puls charge characteristic
-  Automatic equalising charge
-  Automatic maintenance charge
-  Charger function test

Options

-  Charger plug
-  Air circulation (AEM)
-  Control for automatic water refill
-  External ON/OFF
-  Remote display

Type table

		intronic D puls			intronic D EU			Ladegerät / charger / chargeur						
		Charging time according to battery capacity (Ah/5h) in hours ca						Gerätedaten / Charger data / Données du chargeur						
Voltage	Traction battery PzS, PzB, GiS with Wsa puls			Traction battery PzS, PzB, GiS with AEM (air electrolyte mixing)			Charger type	Mains voltage	Mains power rating	Mains current	Mains fuse (slow)	Power line Plug	Housing	Gross weight
	V	7,5 - 8,5h	8,5 - 10h	10 - 12h	6,5 - 8h	8 - 10h	10 - 12h	V / A	V	kVA	A	A	mm ²	() = EU
24V	190-214	215-244	245-280	170-199	200-245	246-280	E 24/ 30	E 230 V	1,1	4,7	10	1,5 Schuko	C1-3(G2-3)	20(31)
	215-244	245-279	280-330	200-224	225-280	281-330	E 24/ 35	E 230 V	1,3	5,5	10	1,5 Schuko	C1-3(G2-3)	21(31)
	245-279	280-320	321-380	225-259	260-320	321-380	E 24/ 40	E 230 V	1,5	6,5	10	1,5 Schuko	C1-3(G2-3)	22(33)
	280-320	321-369	370-430	260-289	290-360	361-430	E 24/ 45	E 230 V	1,6	7,0	10	1,5 Schuko	C1-3(G2-3)	25(38)
	321-369	370-429	430-480	290-329	330-420	421-480	E 24/ 50	E 230 V	1,9	8,2	16	1,5 Schuko	C1-3(G2-3)	25(38)
	370-429	430-499	500-570	330-399	400-490	491-570	E 24/ 60	E 230 V	2,2	9,5	16	1,5 Schuko	C1-3(G2-3)	26(39)
	430-499	500-564	565-660	400-449	450-560	561-660	E 24/ 70	E 230 V	2,6	11,3	16	1,5 Schuko	G2-3	40(41)
	500-564	565-639	640-750	450-509	510-630	631-750	E 24/ 80	E 230 V	3,1	13,4	16	1,5 Schuko	G2-3	46(47)
	565-639	640-759	760-850	510-589	590-720	721-850	D 24/ 90	D 400 V	3,3	4,7	10	1,5 CEE 16	G4-3	54(55)
	640-759	760-899	900-950	590-689	690-880	881-950	D 24/ 100	D 400 V	3,8	5,4	10	1,5 CEE 16	G4-3	55(56)
	760-899	900-1049	1050-1200	690-799	800-1050	1051-1180	D 24/ 125	D 400 V	4,8	6,9	10	1,5 CEE 16	G4-3	67(68)
	900-1049	1050-1200	1201-1400	800-989	990-1200	1201-1400	D 24/ 150	D 400 V	5,9	8,5	16	1,5 CEE 16	G4-3	86(87)
1050-1200	1201-1380	1381-1550	990-1100	1101-1380	1380-1600	D 24/ 170	D 400 V	7,0	10,1	16	1,5 CEE 16	G4-3	91(92)	
36V	190-214	215-244	245-280	170-199	200-245	246-280	E 36/ 30	E 230 V	1,7	7,4	10	1,5 Schuko	G2-3	38(39)
	215-244	245-279	280-330	200-224	225-280	281-330	E 36/ 35	E 230 V	2,0	8,7	16	1,5 Schuko	G2-3	38(39)
	245-279	280-320	321-380	225-259	260-320	321-380	E 36/ 40	E 230 V	2,4	10,0	16	1,5 Schuko	G2-3	45(46)
	280-320	321-369	370-430	260-289	290-360	361-430	E 36/ 45	E 230 V	2,6	11,3	16	1,5 Schuko	G2-3	46(47)
	321-369	370-429	430-480	290-329	330-420	421-480	E 36/ 50	E 230 V	2,9	12,6	16	1,5 Schuko	G2-3	47(48)
	370-429	430-499	500-570	330-399	400-490	491-570	D 36/ 60	D 400 V	3,6	5,2	10	1,5 CEE 16	G4-3	65(66)
	430-499	500-564	565-660	400-449	450-560	561-660	D 36/ 70	D 400 V	4,2	6,0	10	1,5 CEE 16	G4-3	66(67)
	500-564	565-639	640-750	450-509	510-630	631-750	D 36/ 80	D 400 V	4,8	6,9	10	1,5 CEE 16	G4-3	67(68)
	565-639	640-759	760-850	510-589	590-720	721-850	D 36/ 90	D 400 V	5,2	7,5	10	1,5 CEE 16	G4-3	68(69)
	640-759	760-899	900-950	590-689	690-880	881-950	D 36/ 100	D 400 V	5,9	8,5	16	1,5 CEE 16	G4-3	78(79)
	760-899	900-1049	1050-1200	690-799	800-1050	1051-1180	D 36/ 125	D 400 V	7,4	10,7	16	1,5 CEE 16	G4-3	83(84)
	900-1049	1050-1200	1201-1400	800-989	990-1200	1201-1400	D 36/ 150	D 400 V	8,9	12,8	16	1,5 CEE 16	G4-3	95(96)
1050-1200	1201-1380	1381-1550	990-1100	1101-1380	1380-1600	D 36/ 170	D 400 V	10,5	15,1	20	2,5 CEE 32	G4-3	106(107)	
48V	190-214	215-244	245-280	170-199	200-245	246-280	E 48/ 30	E 230 V	2,2	9,5	16	1,5 Schuko	G2-3	51(52)
	215-244	245-279	280-330	200-224	225-280	281-330	E 48/ 35	E 230 V	2,6	11,2	16	1,5 Schuko	G2-3	53(54)
	245-279	280-320	321-380	225-259	260-320	321-380	E 48/ 40	E 230 V	3,2	13,9	16	1,5 Schuko	G2-3	55(56)
	280-320	321-369	370-430	260-289	290-360	361-430	D 48/ 45	D 400 V	3,4	5,0	10	1,5 CEE 16	G4-3	59(60)
	321-369	370-429	430-480	290-329	330-420	421-480	D 48/ 50	D 400 V	3,6	5,2	10	1,5 CEE 16	G4-3	60(61)
	370-429	430-499	500-570	330-399	400-490	491-570	D 48/ 60	D 400 V	4,4	6,3	10	1,5 CEE 16	G4-3	61(62)
	430-499	500-564	565-660	400-449	450-560	561-660	D 48/ 70	D 400 V	5,2	7,5	10	1,5 CEE 16	G4-3	63(64)
	500-564	565-639	640-750	450-509	510-630	631-750	D 48/ 80	D 400 V	6,0	8,6	16	1,5 CEE 16	G4-3	65(66)
	565-639	640-759	760-850	510-589	590-720	721-850	D 48/ 90	D 400 V	6,9	10,0	16	1,5 CEE 16	G4-3	70(71)
	640-759	760-899	900-950	590-689	690-880	881-950	D 48/ 100	D 400 V	7,4	10,6	16	1,5 CEE 16	G4-3	73(74)
	760-899	900-1049	1050-1200	690-799	800-1050	1051-1180	D 48/ 125	D 400 V	9,0	13,0	16	1,5 CEE 16	G4-3	84(85)
	900-1049	1050-1200	1201-1400	800-989	990-1200	1201-1400	D 48/ 150	D 400 V	11,9	17,2	20	2,5 CEE 32	G4-3	99(100)
1050-1200	1201-1380	1381-1550	990-1100	1101-1380	1380-1600	D 48/ 170	D 400 V	14,9	21,5	25	2,5 CEE 32	G4-3	110(111)	
80V	190-214	215-244	245-280	170-199	200-245	246-280	D 80/ 30	D 400 V	4,2	6,0	10	1,5 CEE 16	G4-3	58(59)
	215-244	245-279	280-330	200-224	225-280	281-330	D 80/ 35	D 400 V	4,5	6,3	10	1,5 CEE 16	G4-3	60(61)
	245-279	280-320	321-380	225-259	260-320	321-380	D 80/ 40	D 400 V	5,2	7,5	10	1,5 CEE 16	G4-3	62(63)
	280-320	321-369	370-430	260-289	290-360	361-430	D 80/ 45	D 400 V	5,7	8,1	16	1,5 CEE 16	G4-3	67(68)
	321-369	370-429	430-480	290-329	330-420	421-480	D 80/ 50	D 400 V	6,2	8,9	16	1,5 CEE 16	G4-3	73(74)
	370-429	430-499	500-570	330-399	400-490	491-570	D 80/ 60	D 400 V	7,4	10,7	16	1,5 CEE 16	G4-3	75(76)
	430-499	500-564	565-660	400-449	450-560	561-660	D 80/ 70	D 400 V	8,9	12,8	16	1,5 CEE 16	G4-3	79(80)
	500-564	565-639	640-750	450-509	510-630	631-750	D 80/ 80	D 400 V	10,0	14,4	16	1,5 CEE 16	G4-3	85(86)
	565-639	640-759	760-850	510-589	590-720	721-850	D 80/ 90	D 400 V	11,2	16,1	20	2,5 CEE 32	G4-3	93(94)
	640-759	760-899	900-950	590-689	690-880	881-950	D 80/ 100	D 400 V	12,3	17,7	20	2,5 CEE 32	G4-3	99(100)
	760-899	900-1049	1050-1200	690-799	800-1050	1051-1180	D 80/ 125	D 400 V	15,2	21,6	25	2,5 CEE 32	G4-3	104(105)
	900-1049	1050-1200	1201-1400	800-989	990-1200	1201-1400	D 80/ 150	D 400 V	19,8	28,6	35	4,0 CEE 32	G4-3	123(124)
Abm. Dim./ Dim. [mm]				E 230 V: Einphasenwechselstrom, single phase, monophasé, 1 x 230V 50Hz (1/N/PE) D 400 V: Dreiphasenwechselstrom, three phase, triphasé, 3 x 400V 50Hz (3/PE)								Wand-/Standgeräte, wall /floor mounted charger, Installation murale /au sol		
Gehäuse	Höhe	Breite	Tiefe	* Richtwerte, Vorschriften der Batteriehersteller sind zu beachten. * Standard values, observe recommendations of battery manufacturer.										
Housing	Height	Width	Depth	* Respectez les consignes du fabricant de la batterie.										
Armoire	Hauteur	Largeur	Profondeur	* Schutzrechte nach DIN 34 Absatz 2.1 werden beansprucht * Copyright protected acc. DIN 34 section 2.1 * Protection des copyrights acc. DIN 34 section 2.1										
C1-3	260 mm	410 mm	260 mm	* Technische Änderungen vorbehalten * Rights reserved for technical changes * Modifications techniques réservées.										
G2-3	370 mm	575 mm	380 mm											
G4-3	680 mm	575 mm	540 mm											

charger one D puls

The 50Hz charging technology for standard applications



- ▶ Ideal for single and double shift operation
- ▶ Suitable for charging standard lead acid traction batteries

Charger type	Charge characteristic	Charging time (h)
charger one D puls	Wsa-puls	7,5 – 14 h

Technology and product features

- ▶ Wsa-puls charge characteristic, reduces the influence of mains voltage variations, for a quick and energy saving battery charge
- ▶ Soft start (single phase chargers)
- ▶ Ah balanced charging process
- ▶ Automatic equalising charge
- ▶ Automatic maintenance charge
- ▶ Adaptation to voltage behaviour of sulphated batteries
- ▶ Data memory, read out and analysis of stored data via IrComm-interface
- ▶ Electromagnetic compatibility and safety in accordance to EMC-guideline and EN-standards
- ▶ Acid proof front label
- ▶ Protection mode IP21

Operation and display

- ▶ Automatic start, charging process and shut off
- ▶ Simple operation:
 - Just connect battery with charger
 - No adjustment of parameter settings or manual switching
 - Display of operation state by super bright Jumbo-LEDs
 - Data check is possible via IrComm









Safety

- ▶ Reverse polarity protection
- ▶ Automatic battery parameter check prior to start of charging process
- ▶ Permanent control of the charging programme on errors and safety switch-off parameters
- ▶ Automatic shut-off of the charger after disconnecting the battery
- ▶ Thermal monitoring for charger protection




Your benefits

- ▶ For quick charging times from 7,5h
- ▶ Operation state far visible by super bright Jumbo-LEDs
- ▶ Information panel for fast diagnostics
- ▶ Data memory
- ▶ Read out and analysis of stored data
- ▶ Suitable for wall and floor mounting

Standard features

-  Soft start (single phase chargers)
-  Super bright Jumbo-LEDs
-  Information panel
-  IrComm-Interface and data memory
-  Wsa-puls charge characteristic
-  Automatic equalising charge
-  Automatic maintenance charge
-  Charger function test

Optionen

-  Charger plug
-  Remote control
-  Remote display

charger one D puls

Type table

charger one D puls						Ladegerät / charger / chargeur									
Ladezeit je Batterie-Kapazität (Ah/5h) in Stunden ca.						Gerätedaten / charger data / Données du chargeur									
Batterie- spannung	Traktionsbatterie PzS, PzB mit Wsa-puls				Gerätetyp	Netz- spannung	Netz- leistung	Netzstrom	empf. Netz- sicherung träge bzw. K	Netz- leitung u. Netzstecker	Lade- leitung	Gehäuse	Gewicht brutto ca.		
	V	7,5 - 8,5h	8,5 - 10h	10 - 12h										12- 14h	V / A
24 V	65 - 70	70 - 85	85 - 95	95 - 125	E 24 / 10	E 230 V	0,4	1,6	10	1,5 Schuko	6	C0-2	14		
	95 - 105	105 - 125	125 - 145	145 - 160	E 24 / 15		0,6	2,3	10	1,5 Schuko	6	C0-2	15		
	125 - 145	145 - 160	160 - 195	195 - 220	E 24 / 20		0,8	3,2	10	1,5 Schuko	6	C0-2	16		
	155 - 175	175 - 215	215 - 245	245 - 270	E 24 / 25		0,9	3,9	10	1,5 Schuko	6	C0-2	16		
	190 - 215	215 - 245	245 - 280	280 - 315	E 24 / 30		1,1	4,7	10	1,5 Schuko	6	C0-2	17		
	215 - 245	245 - 280	280 - 330	330 - 370	E 24 / 35		1,3	5,5	10	1,5 Schuko	6	C0-2	18		
	250 - 280	280 - 320	320 - 380	380 - 420	E 24 / 40		1,5	6,5	10	1,5 Schuko	10	C1-2	22		
	280 - 320	320 - 370	370 - 430	430 - 475	E 24 / 45		1,6	7,0	10	1,5 Schuko	10	C1-2	25		
	320 - 370	370 - 430	430 - 480	480 - 540	E 24 / 50		1,9	8,2	16	1,5 Schuko	16	C1-2	25		
	370 - 430	430 - 500	500 - 570	570 - 625	E 24 / 60		2,2	9,5	16	1,5 Schuko	16	C1-2	26		
	430 - 500	500 - 560	560 - 640	640 - 750	E 24 / 70		2,6	11,3	16	1,5 Schuko	25	C10-2	34		
	500 - 560	560 - 640	640 - 760	760 - 860	E 24 / 80		3,1	13,4	16	1,5 Schuko	25	C10-2	40		
	560 - 640	640 - 760	760 - 850	850 - 950	D 24 / 90		3,3	4,7	10	1,5 CEE 16	25	E4-2	49		
	640 - 760	760 - 900	900 - 950	950 - 1150	D 24 / 100		3,8	5,4	10	1,5 CEE 16	25	E4-2	50		
	760 - 900	900 - 1050	1050 - 1200	1200 - 1350	D 24 / 125		4,8	6,9	10	1,5 CEE 16	25	E4-2	62		
	900 - 1050	1050 - 1200	1200 - 1400	1400 - 1550	D 24 / 150		5,9	8,5	16	1,5 CEE 16	35	E4-2	81		
1050 - 1200	1200 - 1350	1350 - 1550		D 24 / 170	7,0	10,1	16	1,5 CEE 16	50	E4-2	86				
36 V	125 - 145	145 - 160	160 - 195	195 - 220	E 36 / 20	E 230 V	1,2	5,0	10	1,5 Schuko	6	C1-2	24		
	155 - 175	175 - 215	215 - 245	245 - 270	E 36 / 25		1,4	6,1	10	1,5 Schuko	6	C1-2	24		
	190 - 215	215 - 245	245 - 280	280 - 315	E 36 / 30		1,7	7,4	10	1,5 Schuko	6	C1-2	25		
	215 - 245	245 - 280	280 - 330	330 - 370	E 36 / 35		2,0	8,7	16	1,5 Schuko	10	C10-2	32		
	250 - 280	280 - 320	320 - 380	380 - 420	E 36 / 40		2,4	10,0	16	1,5 Schuko	10	C10-2	39		
	280 - 320	320 - 370	370 - 430	430 - 475	E 36 / 45		2,6	11,3	16	1,5 Schuko	10	C10-2	40		
	320 - 370	370 - 430	430 - 480	480 - 540	E 36 / 50		2,9	12,6	16	1,5 Schuko	10	C10-2	41		
	370 - 430	430 - 500	500 - 570	570 - 625	D 36 / 60		3,6	5,2	10	1,5 CEE 16	10	E4-2	60		
	430 - 500	500 - 560	560 - 640	640 - 750	D 36 / 70		4,2	6,0	10	1,5 CEE 16	16	E4-2	61		
	500 - 560	560 - 640	640 - 760	760 - 860	D 36 / 80		4,8	6,9	10	1,5 CEE 16	16	E4-2	62		
	560 - 640	640 - 760	760 - 850	850 - 950	D 36 / 90		5,2	7,5	10	1,5 CEE 16	16	E4-2	63		
	640 - 760	760 - 900	900 - 950	950 - 1150	D 36 / 100		5,9	8,5	16	1,5 CEE 16	25	E4-2	73		
	760 - 900	900 - 1050	1050 - 1200	1200 - 1350	D 36 / 125		7,4	10,7	16	1,5 CEE 16	25	E4-2	78		
	900 - 1050	1050 - 1200	1200 - 1400	1400 - 1550	D 36 / 150		8,9	12,8	16	1,5 CEE 16	35	E4-2	90		
	1050 - 1200	1200 - 1350	1350 - 1550		D 36 / 170		10,5	15,1	20	2,5 CEE 32	50	E4-2	101		
	48 V	155 - 175	175 - 215	215 - 245	245 - 270		E 48 / 25	E 230 V	1,8	7,8	16	1,5 Schuko	10	C10-2	43
190 - 215		215 - 245	245 - 280	280 - 315	E 48 / 30	2,2	9,5		16	1,5 Schuko	10	C10-2	45		
215 - 245		245 - 280	280 - 330	330 - 370	E 48 / 35	2,6	11,2		16	1,5 Schuko	10	C10-2	47		
250 - 280		280 - 320	320 - 380	380 - 420	E 48 / 40	3,2	13,9		16	1,5 Schuko	10	C10-2	49		
280 - 320		320 - 370	370 - 430	430 - 475	D 48 / 45	3,4	5,0		10	1,5 CEE 16	10	E4-2	54		
320 - 370		370 - 430	430 - 480	480 - 540	D 48 / 50	3,6	5,2		10	1,5 CEE 16	10	E4-2	55		
370 - 430		430 - 500	500 - 570	570 - 625	D 48 / 60	4,4	6,3		10	1,5 CEE 16	10	E4-2	56		
430 - 500		500 - 560	560 - 640	640 - 750	D 48 / 70	5,2	7,5		10	1,5 CEE 16	16	E4-2	58		
500 - 560		560 - 640	640 - 760	760 - 860	D 48 / 80	6,0	8,6		16	1,5 CEE 16	16	E4-2	60		
560 - 640		640 - 760	760 - 850	850 - 950	D 48 / 90	6,9	10,0		16	1,5 CEE 16	16	E4-2	65		
640 - 760		760 - 900	900 - 950	950 - 1150	D 48 / 100	7,4	10,6		16	1,5 CEE 16	25	E4-2	68		
760 - 900		900 - 1050	1050 - 1200	1200 - 1350	D 48 / 125	9,0	13,0		16	1,5 CEE 16	25	E4-2	79		
900 - 1050		1050 - 1200	1200 - 1400	1400 - 1550	D 48 / 150	11,9	17,2		20	2,5 CEE 32	35	E4-2	94		
1050 - 1200		1200 - 1350	1350 - 1550		D 48 / 170	14,9	21,5		25	2,5 CEE 32	50	E4-2	105		
80V		155 - 175	175 - 215	215 - 245	245 - 270	E 80 / 25	E 230 V		3,0	13,0	16	1,5 Schuko	10	C10-2	40
		190 - 215	215 - 245	245 - 280	280 - 315	D 80 / 30			4,2	6,0	10	1,5 CEE 16	10	E4-2	53
	215 - 245	245 - 280	280 - 330	330 - 370	D 80 / 35	4,5		6,3	10	1,5 CEE 16	10	E4-2	55		
	250 - 280	280 - 320	320 - 380	380 - 420	D 80 / 40	5,2		7,5	10	1,5 CEE 16	10	E4-2	57		
	280 - 320	320 - 370	370 - 430	430 - 475	D 80 / 45	5,7		8,1	16	1,5 CEE 16	10	E4-2	62		
	320 - 370	370 - 430	430 - 480	480 - 540	D 80 / 50	6,2		8,9	16	1,5 CEE 16	10	E4-2	68		
	370 - 430	430 - 500	500 - 570	570 - 625	D 80 / 60	7,4		10,7	16	1,5 CEE 16	10	E4-2	70		
	430 - 500	500 - 560	560 - 640	640 - 750	D 80 / 70	8,9		12,8	16	1,5 CEE 16	16	E4-2	74		
	500 - 560	560 - 640	640 - 760	760 - 860	D 80 / 80	10,0		14,4	16	1,5 CEE 16	16	E4-2	80		
	560 - 640	640 - 760	760 - 850	850 - 950	D 80 / 90	11,2		16,1	20	2,5 CEE 32	16	E4-2	88		
	640 - 760	760 - 900	900 - 950	950 - 1150	D 80 / 100	12,3		17,7	20	2,5 CEE 32	25	E4-2	94		
	760 - 900	900 - 1050	1050 - 1200	1200 - 1350	D 80 / 125	15,2		21,6	25	2,5 CEE 32	25	E4-2	99		
	900 - 1050	1050 - 1200	1200 - 1400	1400 - 1550	D 80 / 150	19,8		28,6	35	4,0 CEE 32	35	E4-2	118		
	Abm./ Dim./ Dim. [mm]							E 230 V: Einphasenwechselstrom, single phase, monophasé, 1 x 230V 50Hz (1/N/PE) D 400 V: Dreiphasenwechselstrom, three phase, triphasé, 3 x 400V 50Hz (3/PE)							
	Gehäuse	Höhe	Breite	Tiefe	* Richtwerte, Vorschriften der Batteriehersteller sind zu beachten										
	Housing	Height	Width	Depth	* Standard values, observe recommendations of battery manufacturer										
Armoire	Hauteur	Largeur	Profondeur	* Respectez les consignes du fabricant de la batterie											
C0-2	205 mm	328 mm	235 mm	Wand-/Standgeräte wall / floor mounted charger Installation murale / au sol											
C1-2	260 mm	410 mm	260 mm												
C10-2	285 mm	500 mm	315 mm	* Schutzrechte nach DIN 34 Absatz 2.1 werden beansprucht											
E4-2	715 mm	500 mm	450 mm	* Copyright protected acc. DIN 34 section 2.1											
						* Protection des copyrights acc. DIN 34 section 2.1									
						* Technische Änderungen vorbehalten									
						* Rights reserved for technical changes									
						* Modifications techniques réservées.									

The 50Hz charging technology for basic applications



- ▶ Single shift operation
- ▶ Suitable for charging standard lead acid traction batteries

Charger type	Charge characteristic	Charging time (h)
flexy plus	Wsa acc. ZVEI	10 – 14 h

Technology and product features

- ▶ Wsa-charge characteristic; reduces the influence of mains voltage variations
- ▶ Soft start (single phase chargers)
- ▶ Balanced charging process
- ▶ Automatic equalising charge
- ▶ Automatic maintenance charge
- ▶ Adaptation to voltage behaviour of sulphated batteries
- ▶ Electromagnetic compatibility and safety in accordance to EMC-guideline and EN-standards
- ▶ Acid resistant front label
- ▶ Protection mode IP21

Operation and display

- ▶ Automatic start, charging process and shut off
- ▶ **Simple operation:**
 - Just connect battery with charger
 - No adjustment of parameter settings or manual switching
 - Display of operation state by LEDs






Safety

- ▶ Reverse polarity protection
- ▶ Automatic battery parameter check prior to start of charging process
- ▶ Permanent control of the charging programme on errors and safety switch-off parameters
- ▶ Automatic shut-off of the charger after disconnecting the battery
- ▶ Thermal monitoring for charger protection

Your benefits

- ▶ Economic
- ▶ Proven technology
- ▶ Compact and handy construction
- ▶ Suitable for wall and floor mounting

Standard features

-  Soft start (single phase chargers)
-  LED-operation state
-  Automatic equalising charge
-  Automatic maintenance charge
-  Charger function test

Options

-  Charger plug

Type table

flexy plus				Ladegerät / charger / chargeur Wsa							
Ladezeit je Batterie-Kapazität (Ah/5h) in Stunden ca. Charging time acc. to battery capacity (Ah/5h) in (h) approx. Temps de charge selon capacité (Ah/5h) de batterie en (h) env.				Gerätedaten / Charger data / Données du chargeur							
Batterie- spannung	Traktionsbatterie PzS, PzB mit Wsa		Gerätetyp	Netz- spannung	Netz- leistung	Netz- strom	Netz- sicherung (träge)	Netz- leitung u. Netzstecker	Ladeleitung	Gehäuse	Gewicht brutto
Voltage	Traction battery PzS, PzB with Wsa		Charger type	Mains voltage	Mains power rating	Mains current	Mains fuse (slow)	Power line Plug	charger cable	Housing	Gross weight
Voltage	Batterie traction PzS, PzB avec Wsa		Type de chargeur	Secteur voltage	Puissance secteur	Courant secteur	Fusible secteur (lent)	Câble du secteur et prise	Câble de charge	Armoire	Poids brut
V	10 - 12 h	12- 14 h	V / A	V	kVA	A / Phase	A	mm ²	mm ²		ca. kg
24 V	121 - 160	161 - 199	E 24 / 20	E 230 V	0,8	3,2	10	1,5 Schuko	6	C0-4	16
	161 - 199	200 - 255	E 24 / 25	E 230 V	0,9	3,9	10	1,5 Schuko	6	C0-4	16
	200 - 255	256 - 290	E 24 / 30	E 230 V	1,1	4,7	10	1,5 Schuko	6	C0-4	17
	256 - 290	291 - 320	E 24 / 35	E 230 V	1,3	5,5	10	1,5 Schuko	6	C0-4	18
	291 - 320	321 - 375	E 24 / 40	E 230 V	1,5	6,5	10	1,5 Schuko	10	C1-4	22
	321 - 375	376 - 420	E 24 / 45	E 230 V	1,6	7,0	10	1,5 Schuko	10	C1-4	25
	376 - 420	421 - 480	E 24 / 50	E 230 V	1,9	8,2	16	1,5 Schuko	16	C1-4	25
	421 - 480	481 - 560	E 24 / 60	E 230 V	2,2	9,5	16	1,5 Schuko	16	C1-4	26
	481 - 560	561 - 680	E 24 / 70	E 230 V	2,6	11,3	16	1,5 Schuko	16	C10-4	34
	561 - 680	681 - 750	E 24 / 80	E 230 V	3,1	13,4	16	1,5 Schuko	25	C10-4	40
	681 - 750	751 - 870	D 24 / 90	D 400 V	3,3	4,7	10	1,5 CEE 16	25	E4-4	49
	751 - 870	871 - 1000	D 24 / 100	D 400 V	3,8	5,4	10	1,5 CEE 16	25	E4-4	50
871 - 1000	1001 - 1200	D 24 / 125	D 400 V	4,8	6,9	10	1,5 CEE 16	25	E4-4	62	
48 V	200 - 255	256 - 290	E 48 / 30	E 230 V	2,2	9,5	16	1,5 Schuko	6	C10-4	45
	256 - 290	291 - 320	E 48 / 35	E 230 V	2,6	11,2	16	1,5 Schuko	6	C10-4	47
	290 - 320	321 - 375	E 48 / 40	E 230 V	3,2	13,9	16	1,5 Schuko	10	C10-4	49
	321 - 375	376 - 420	D 48 / 45	D 400 V	3,4	5,0	10	1,5 CEE 16	10	E4-4	54
	376 - 420	421 - 480	D 48 / 50	D 400 V	3,6	5,2	10	1,5 CEE 16	10	E4-4	55
	421 - 480	481 - 560	D 48 / 60	D 400 V	4,4	6,3	10	1,5 CEE 16	10	E4-4	56
	481 - 560	561 - 680	D 48 / 70	D 400 V	5,2	7,5	10	1,5 CEE 16	16	E4-4	58
	561 - 680	681 - 750	D 48 / 80	D 400 V	6,0	8,6	16	1,5 CEE 16	16	E4-4	60
	681 - 750	751 - 870	D 48 / 90	D 400 V	6,9	10,0	16	1,5 CEE 16	16	E4-4	65
	751 - 870	871 - 1000	D 48 / 100	D 400 V	7,4	10,6	16	1,5 CEE 16	25	E4-4	68
871 - 1000	1001 - 1200	D 48 / 125	D 400 V	9,0	13,0	16	1,5 CEE 16	25	E4-4	79	
80 V	200 - 255	256 - 290	D 80 / 30	D 400 V	4,2	6,0	10	1,5 CEE 16	10	E4-4	53
	256 - 290	291 - 320	D 80 / 35	D 400 V	4,5	6,3	10	1,5 CEE 16	10	E4-4	55
	291 - 320	321 - 375	D 80 / 40	D 400 V	5,2	7,5	10	1,5 CEE 16	10	E4-4	57
	321 - 375	376 - 420	D 80 / 45	D 400 V	5,7	8,1	16	1,5 CEE 16	10	E4-4	62
	376 - 420	421 - 480	D 80 / 50	D 400 V	6,2	8,9	16	1,5 CEE 16	10	E4-4	68
	421 - 480	481 - 560	D 80 / 60	D 400 V	7,4	10,7	16	1,5 CEE 16	10	E4-4	70
	481 - 560	561 - 680	D 80 / 70	D 400 V	8,9	12,8	16	1,5 CEE 16	16	E4-4	74
	561 - 680	681 - 750	D 80 / 80	D 400 V	10,0	14,4	16	1,5 CEE 16	16	E4-4	80
	681 - 750	751 - 870	D 80 / 90	D 400 V	11,2	16,1	20	2,5 CEE 32	16	E4-4	88
	751 - 870	871 - 1000	D 80 / 100	D 400 V	12,3	17,7	20	2,5 CEE 32	25	E4-4	94
Abm./ Dim./ Dim. [mm]				E 230 V: Einphasenwechselstrom, single phase, monophasé, 1 x 230V 50Hz (1/N/PE) D 400 V: Dreiphasenwechselstrom, three phase, triphasé, 3 x 400V 50Hz (3/PE)							
Gehäuse	Höhe	Breite	Tiefe	* Richtwerte, Vorschriften der Batteriehersteller sind zu beachten * Standard values, observe recommendations of battery manufacturer * Respectez les consignes du fabricant de la batterie * Schutzrechte nach DIN 34 Absatz 2.1 werden beansprucht * Copyright protected acc. DIN 34 section 2.1 * Protection des copyrights acc. DIN 34 section 2.1							
Housing	Height	Width	Depth								
Armoire	Hauteur	Largeur	Profondeur								
C0-4	205 mm	328 mm	235 mm								
C1-4	260 mm	410 mm	260 mm								
C10-4	285 mm	500 mm	315 mm								
E4-4	700 mm	500 mm	450 mm	* Technische Änderungen vorbehalten * Rights reserved for technical changes * Modifications techniques réservées							
Wand-/Standgeräte, wall /floor mounted charger, Installation murale /au sol											

**Ihre Ansprechpartner für Traktionsladegeräte und FTS-Anlagen /
Your contacts for traction chargers and systems /
Vos contacts pour les chargeurs de traction et projets AGV**

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