

## Buffer Modules with Capacitor Storage

The PULS DC-UPS with integrated electrochemical double layer capacitors (Ultracaps) are fully maintenance free and guarantee uninterrupted power from seconds to minutes. Buffer modules with electrolytic capacitors can bridge power failures for 24V or 48V bus for milliseconds to seconds (see graphs on opposite page).

Unlike DC-UPS systems that utilize batteries, regular replacement of the capacitors is not necessary. In buffer mode, the output voltage is regulated and the change from normal to buffer mode occurs without interruptions. All modules are protected against overload and short-circuit.



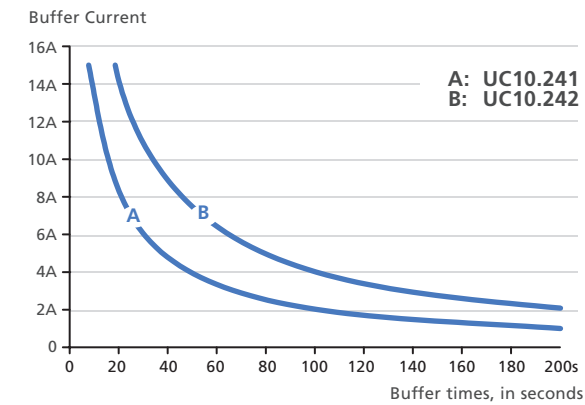
Nominal Voltage	24V	24V	48V	24V	
Storage Element	Electrolytic Capacitors			UltraCapacitor (EDLC) <sup>b)</sup>	
Storage Capacity	0.2 kW	0.32 kW	0.2 kW	6 kW	12 kW
Buffer Current (max.)	20A	40A	20A	15A	15A
Output Voltage in Buffer mode	22.5V <sup>a)</sup>	22.5V <sup>a)</sup>	45V <sup>a)</sup>	22.5V	22.5V
Input Separated from Output	No	No	No	Yes	Yes
Charging Time	20 Seconds	29 Seconds	22 Seconds	16 Minutes	32 Minutes
Buffer Time @ Full Load (typical)	310ms	250ms	150ms	9s	18s
Power Losses (Typical)	1.9W in Stand-by	1.9W in Stand-by	1.9W in Stand-by	4.6W at 10A	4.6W at 10A
Operating Temperature Range	-25°C to +70°C	-25°C to +70°C	-25°C to +70°C	-40°C to +60°C	-40°C to +60°C
Connection Terminals	Spring Clamp	Screw	Spring Clamp	Spring Clamp	Spring Clamp
Dimensions (WxHxD)	64x124x102mm	64x124x142	64x124x102mm	126x124x117mm	198x124x117mm
Weight	740g	1040g	740g	1150g	1720g
Signals	Ready, Buffering, Inhibit			Ready, Buffering, Inhibit, PC-Mode	
List Price (USD)	\$390.00	\$510.00	\$390.00	\$800.00	\$1,200.00
Product Family	DIMENSION			DIMENSION	
Catalog Number	UF20.241	UF40.241	UF20.481	UC10.241	UC10.242

a) Or selectable 1V (UF20.241 & UF40.24) or 2V (UF20.481) lower than input voltage  
 b) UltraCapacitors (EDLC) are common references for Electrochemical Double Layer Capacitors

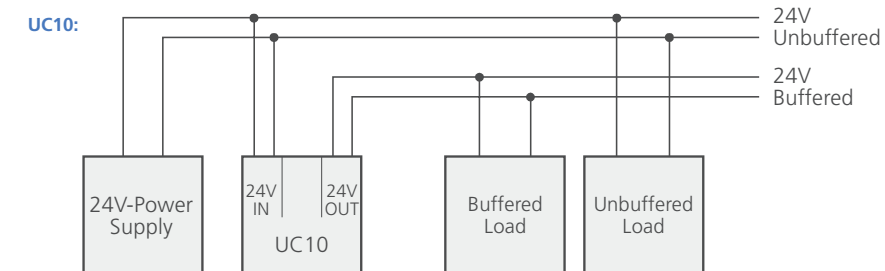
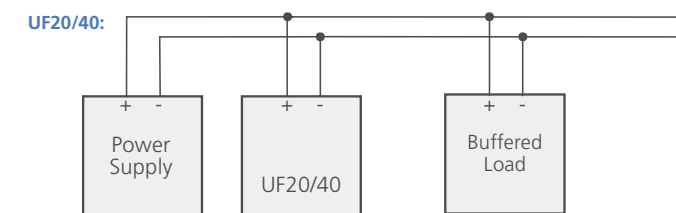
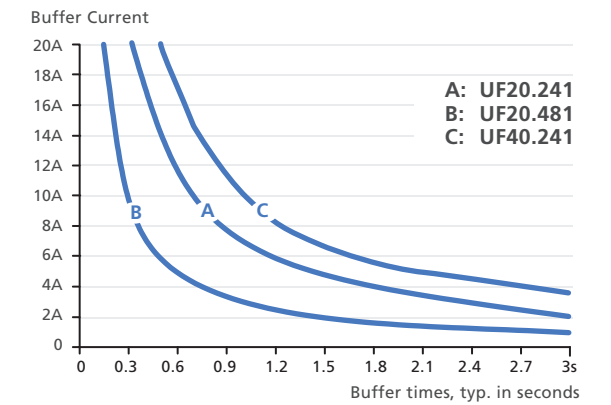
## Buffer Times

Buffer current	0.5A	1A	3A	5A	7A	10A	15A	20A	30A	40A
UF20.481	6.4s	3.2s	1s	660ms	470ms	300ms	220ms	150ms	-	-
UF20.241	12.7s	6.5s	2.2s	1.3s	950ms	670ms	450ms	310ms	-	-
UF40.241	20s	10.6s	3.6s	2.1s	1.5s	1s	730ms	500ms	350ms	250ms
UC10.241	340s	200s	68s	39s	26s	16.5s	9s	-	-	-
UC10.242	680s	400s	136s	78s	53s	33s	18s	-	-	-

Buffer time with UltraCapacitor (EDLC):



Buffer time with electrolytic capacitors:



## DC-UPS with Batteries

The installation of a DC-UPS system requires three essential elements; a power supply, a DC-UPS Controller and a battery. The DC-UPS Controller is responsible for monitoring and charging the battery, as well as controlling the seamless transition between normal and buffer mode.

Advantages of the PULS DC-UPS Controllers:

- 1-Battery-Concept: Each Battery is Individually Charged & Monitored to Maximize Battery Life
- No Need for Matched Batteries
- Output De-coupled from the Input Allowing Buffered & Unbuffered Branches
- Fixed Output Voltage in Buffer Mode
- 22.5-26V Adjustable Output Voltage in Buffer Mode for the UB20.241
- Selectable Buffer Time Limiter to Extend Battery Life

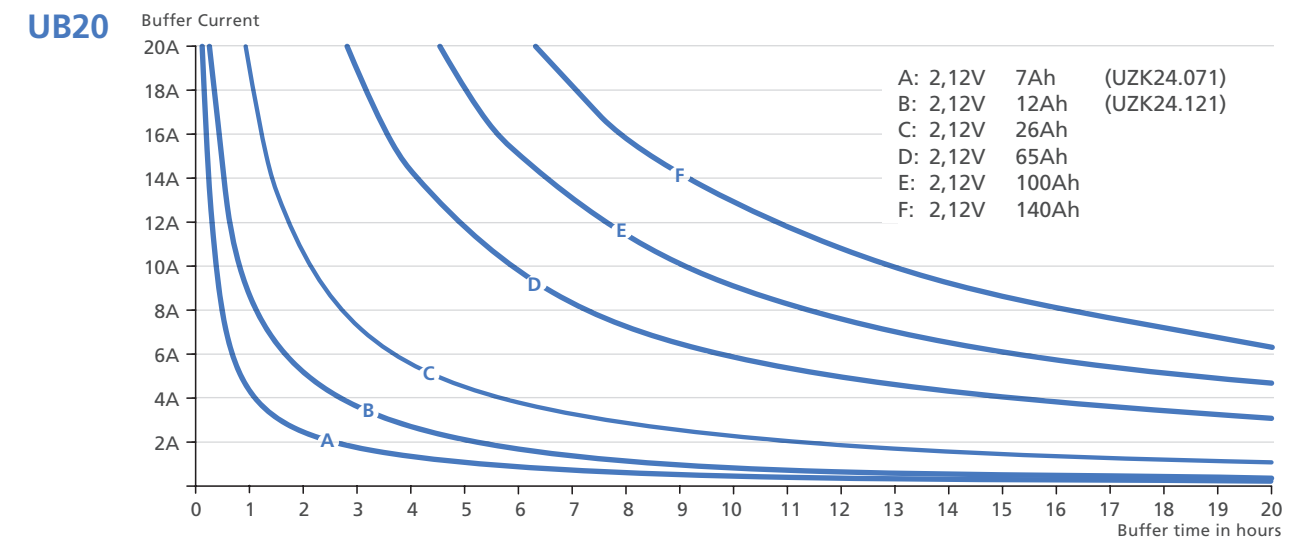
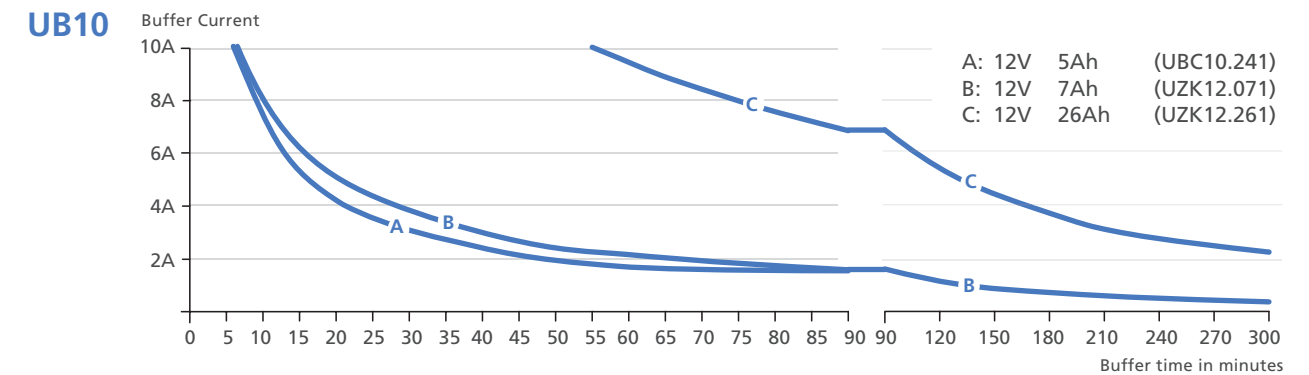


Nominal Current	10A	10A	10A	10A	20A
Nominal Voltage	24V	24V	24V	24V/12V	24V
Storage Element	Integrated Battery	External Battery	External Battery	External Battery	External Batteries
Allowed Battery Size	12V 5Ah	12V 3.9 to 40Ah	12V 17 to 130Ah	12V 3.9 to 40Ah	(2) 12V 3.9 to 150Ah
Buffer-mode (Continuous)	10A	10A	10A	10A/5A	20A
Buffer-mode (5s Bonus Power)	15A	15A	15A	15A/-	30A
Output Voltage in Buffer mode	22.5V	22.5V	22.5V	Regulated to 22.5V and 12V	Selectable: 22.5V/24V/25V/26V
Temperature Tracking of the End-of-Charge Voltage	Automatic	Manual Select	Manual Select	Manual select	Automatic with Temp. Sensor a)
Battery Charging Current	1.5A	1.5A	3.0A	1.5A	1.5A/3.0A b)
Operating Temperature Range	0°C to +40°C	-25°C to +70°C	-25°C to +50°C	-25°C to +70°C	-40°C to +70°C
Dimensions (WxHxD)	123x124x119mm	49x124x117mm	49x124x117mm	49x124x117mm	46x124x127mm
Weight	2.85kg	530g	545g	650g	700g
Connection Terminalss	Spring Clamp	Spring Clamp	Spring Clamp	Spring Clamp	Screw
Signals	Ready, Buffering, Inhibit, Replace Battery				
List Price (USD)	\$565.00	\$450.00	\$460.00	\$525.00	\$600.00
Product Family	DIMENSION				
Catalog Number	UBC10.241 UBC10.241-N1 c)	UB10.241	UB10.242	UB10.245	UB20.241

a) With PULS temp sensor UZS24.100  
 b) Adjustable using <10Ah / >10Ah battery size selector  
 c) Battery not included & different list price

## Buffer Times

Buffer Current	0.5A	1A	3A	5A	7A	10A	15A	20A
UBC10.241	3h 50min	2h	30min	16min	11min	6min	5s	-
UB10 + 7Ah Battery (12V)	5h 10min	2h 30 min	38min	20min	13min	6min	5s	-
UB10 + 12Ah Battery (12V)	10h 41min	5h 17min	1h 40min	46min	28min	16min	5s	-
UB10 + 26Ah Battery (12V)	23h 6min	11h 23min	3h 40min	2h 10min	1h 30min	55min	5s	-
UB10.242 + 65Ah Battery (12V)	2d 11h	1d 5h	9h 53min	5h 51min	4h	2h 45min	5s	-
UB10.242 + 100Ah Battery (12V)	3d 19h	1d 21h	14h 53min	8h 41min	6h	4h 7min	5s	-
UB10.242 + 130Ah Battery (12V)	4d 23h	2d 11h	19h 21 min	11h 18min	7h 48min	5h 21min	5s	-
UB20 + 7Ah Battery (2,12V)	9h 26min	5h 16min	1h 30min	46min	30min	19min	10min	6min
UB20 + 12Ah Battery (2,12V)	17h 13min	9h 51min	3h 29min	2h 2min	1h 23min	46min	27min	16min
UB20 + 26Ah Battery (2,12V)	1d 13h	21h 34min	7h 32min	4h 26min	3h 7min	2h 10min	1h 17min	55min
UB20 + 65Ah Battery (2,12V)	3d 19h	2d 4h	20h 5min	11h 56min	8h 25min	5h 50min	3h 49min	2h 49min
UB20 + 100Ah Battery (2,12V)	6d 3h	3d 11h	1d 6h	18h 30min	13h 10min	9h 11min	6h 3min	4h 31min
UB20 + 140Ah Battery (2,12V)	8d 12h	4d 21h	1d 19h	1d 1h	18h 26min	12h 52min	8h 27min	6h 19min

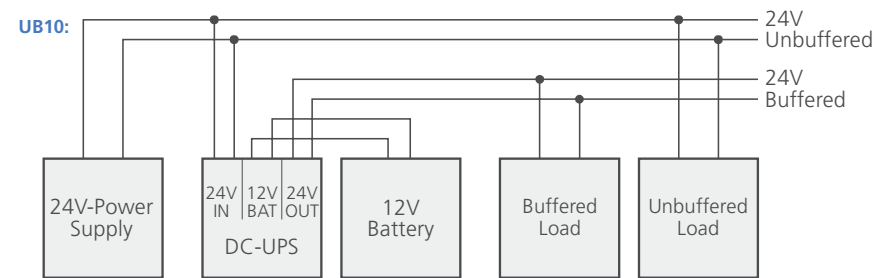


The tables above show typical buffer times of new battery modules without the aging effect included. PULS recommends adding 30-50% battery capacity to account for battery wear and aging.

## Battery Modules for DC-UPS

Battery modules use maintenance-free VRLA batteries (valve regulated lead-acid). Battery modules can be ordered with a battery (UZK series) or without a battery (UZO series). All battery modules from PULS support the 1-Battery-Concept. The 24V battery modules for use with the UB20 series are equipped with a center-tap, which are protected against over-current, and with an integrated temperature sensor.

Users who opt for using their own batteries should use a high quality VRLA, Gel Cell or Glass Mat battery. When using non PULS battery modules for the UB20 series, it is recommended to use the UZS24.100 sensor board with a PT1000 temperature sensor included and a center-tap fuse to take advantage of the PULS-1-Battery-Concept.



UZK12.071

Catalog Number	Description	Dimensions (WxHxD)	List Price (USD)
UZB12.051	12V, 5Ah replacement battery for UBC10.241	90x106x70mm	\$140.00
UZB12.071	12V, 7Ah replacement battery for UZK12.071 and UZK24.071 a)	151x100x65mm	\$185.00
UZB12.121	12V, 12Ah replacement battery for UZK24.121 a)	151x100x98mm	\$200.00
UZB12.261	12V, 26Ah replacement battery for UZK12.261	175x166x125mm	\$390.00
UZK12.071	12V, 7Ah battery module for UB10	155x124x112mm	\$270.00
UZK12.261	12V, 26Ah battery module for UB10	214x179x153mm	\$480.00
UZK24.071	24V, 7Ah battery module for UB20	137x186x124mm	\$380.00
UZK24.121	24V, 12Ah battery module for UB20	203x186x124mm	\$500.00
UZO12.07	Mounting Bracket for use with 7Ah Battery	155x124x112mm	\$95.00
UZO12.26	Mounting Bracket for use with 26Ah Battery	214x179x153mm	\$95.00
UZO24.071	Mounting Bracket for use with 7Ah Battery Pair	137x186x124mm	\$150.00
UZO24.121	Mounting Bracket for use with 12Ah Battery Pair	203x186x124mm	\$160.00
UZS24.100	Sensorboard with PT1000 temperature sensor and center-tap fuse for use with UB20.241	23x110.5x15mm	\$40.00

a) Two required for UZK24 battery modules

## Mounting Brackets

Mounting brackets for panel mounting without the need for DIN-rail. Other brackets are for sideways installation of the power supplies with or without DIN-rail for control cabinets which do not have the required installation depth.



Catalog Number	Wall mounting bracket	List Price (USD)
ZM1.WALL	for light DIMENSION units	\$20.00
ZM2.WALL	for QS20, QS40, QT40, CPS20, units	\$35.00
ZM3.WALL	for ML60, PISA11 and MLY	\$12.00
ZM4.WALL	for CP10 units	\$35.00
ZM5.WALL	for CP20 units	\$35.00
ZM10.WALL	for CP5 units	\$35.00
ZM1.UBC10	for UBC10	\$35.00

Catalog Number	Side mounting bracket	List Price (USD)
ZM11.SIDE	for CS3, CS5, QS3, YR2, YRM2 units	\$30.00
ZM12.SIDE	for CP10, CT5, QS5 units	\$30.00
ZM13.SIDE	for CS10, CT10, QS10, CPS20 units	\$30.00
ZM14.SIDE	for QT20, QTD20, UF20 units	\$35.00
ZM15.SIDE	for QS20 units (except QS20.244)	\$35.00