

## Hawker Water Less® (PzM/PzMB) / Hawker Water Less® 20

### TOPPING UP INTERVALS

Interval	with charger/ Charging factor
<b>2 weeks</b> in three-shift operation <sup>2)</sup>	50 Hz, Cf* 1.2
<b>4 weeks</b> in one-shift operation <sup>1)</sup>	50 Hz, Cf* 1.2
<b>5 weeks</b> in three-shift operation <sup>2)</sup>	HF, Cf* 1.10
<b>8 weeks</b> in one-shift operation <sup>1)</sup>	HF, Cf* 1.10
<b>in three-shift operation<sup>2)</sup></b>	HF+EC <sup>3)</sup> , Cf* 1.07
<b>12 weeks</b> in three-shift operation <sup>2)</sup>	50 Hz, HF, Wi-iQ, Cf* 1.04
<b>13 weeks</b> in one-shift operation <sup>1)</sup>	HF+EC <sup>3)</sup> , Cf* 1.07
<b>20 weeks</b> in one-shift operation <sup>1)</sup>	50 Hz, HF, Wi-iQ, Cf* 1.04

\* Charging factor  
<sup>1)</sup> With 80% DOD, 5 days/week and mean battery temperatures of 30°C  
<sup>2)</sup> In three-shift operation at high battery temperatures, this cycle number can be less  
<sup>3)</sup> Electrolyte circulation



**1 Battery disconnect**  
Disconnect the electrical connection between the battery and the vehicle by separating the plugs.



**2 Remove battery cover!**  
Leave vent plugs closed.



**3 Level indicator**  
Check level sensor. See table!

Level indicator	Action
<b>Grey housing: (2 - 3)... PzMB:</b>	
Green LED is lit continuously	Electrolyte level is OK
Green LED is off	Add water!
<b>Blue housing: (2 - 10)... PzM and (4 - 11)...PzMB:</b>	
Green LED flashing	Electrolyte level is OK
Green/orange LED flashing	Warning status
Red LED flashing	Add water!

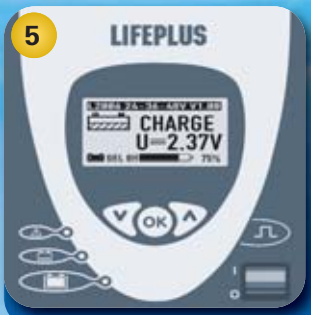


**Easyplus Level indicator**  
Check electrolyte level sensor and temperature LEDs on the easyplus. See table!  
 \*\* only for easyplus for flooded battery

Level indicator	Definition	Action	Reset condition
OFF	No power	Check connection & in-line fuse	
Green LED flashing (slowly)	Power and hardware OK		
Fixed green LED	Charging complete		Discharge
Fixed red LED	Battery over discharged	Check the voltage, charge immediately	Charge
	Battery unused for a long time (> 8 weeks)	Check the voltage, charge immediately	Manual reset or after a couple of cycles
Red LED flashing	Excessive temperature	Cool down until normal temperature is reached	Normal temperature
Blue LED flashing	Voltage imbalance	Contact Hawker Service for intervention	Manual reset
Blue LED ON**	Low electrolyte level	Top-up the battery when the battery is fully charged	Normal electrolyte level



**4 Connect charger plug!**  
If applicable, connect (EC) electrolyte circulation system (if connector w/o integrated air supply).



**5 Switch on charger**  
Check if charger has switched on! Charge battery!



**6 Add water**  
Add water if necessary. See item 3 and table for water level indication.  
Water topping up should be carried out 20 min before the end of charge or immediately after charging.



**7 Switch off charger**  
Switch off charger or check if charger has switched off. Disconnect charger. Disconnect EC, if connected. Check final values if applicable.



**8 Visually inspect for dirt**  
Visually inspect daily; clean battery if dirty!



**9 Visually inspect for damage**  
Visually inspect all battery components for mechanical damage (particularly charging plug and cables).



**10 Equalizing charge**  
Carry out weekly equalizing charge!



**11 Measure cell voltages!**



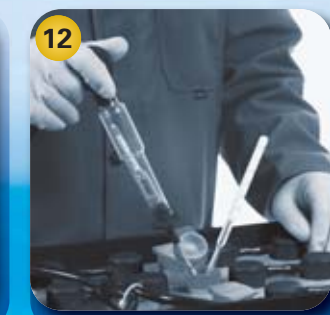
**12 Measure electrolyte specific gravities and temperature!**



**13 Measure insulation value!**  
Must be at least 50 Ω per V of nominal voltage.



**14 Clean battery**  
If insulation values are too high: Clean battery and extract liquid from inside the container!



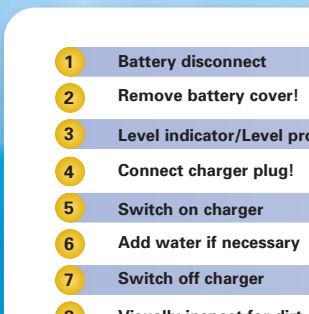
**15 Repair damage**  
Repair any damage to the container insulation!



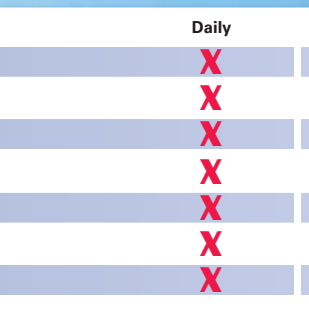
**16 Exchange aeromatic filter!**  
Check air pump function.



**17 Repair damage**  
Repair any damage to the container insulation!



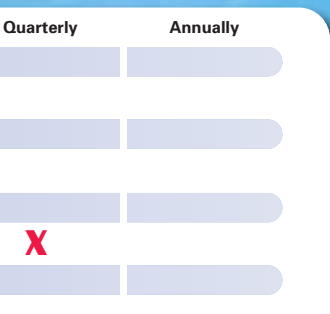
**18 Exchange aeromatic filter!**  
Check air pump function.



**19 Repair damage**  
Repair any damage to the container insulation!



**20 Exchange aeromatic filter!**  
Check air pump function.



**21 Repair damage**  
Repair any damage to the container insulation!

	Daily	Weekly	Monthly	Quarterly	Annually
1 Battery disconnect	X				
2 Remove battery cover!	X				
3 Level indicator/Level probe	X				
4 Connect charger plug!	X				
5 Switch on charger	X				
6 Add water if necessary	X	X	X	X	
7 Switch off charger	X				
8 Visually inspect for dirt		X			
9 Visually inspect for damage		X			
10 Equalizing charge		X			
11 Measure cell voltages!			X		
12 Measure electrolyte specific gravities and temp.!			X		
13 Measure insulation value!					X
14 Clean battery					X
15 Repair damage					X
16 Exchange aeromatic filter!					X

# Less is More

## Less watering – More customer benefits