

# BaSyTec MRS

Regenerative Battery Test System



**Battery  
Cell  
and  
Module  
Test  
System**

up to 70V  
up to 1000A  
up to 14kW  
with energy  
recovery

saves energy / reduces heat generation

# BaSyTec MRS Regenerative Battery Test System

## Main Features

The BaSyTec MRS Regenerative Module Test System is a cost effective solution for the test of battery cells up to 900A (up to 2500A in parallel mode) or modules up to 70V/14kW and 570A (up to 36kW/1500A in parallel mode).

Because of the innovative switched design with energy recovery heat generation is much reduced which results in low working expenses. The discharged energy will be fed back into the grid.

Nevertheless the system offers high precision and speed and is controlled by the well known BaSyTest Software.

| Level | Label | Command     | Parameter            | Termination        | Action                 | Registration | Comment   |
|-------|-------|-------------|----------------------|--------------------|------------------------|--------------|---|
| 1     |       | Start       |                      |                    |                        |              | Terminate cycle life test if the battery capacity falls below 90% of initial capacity |
| 2     |       | Calculate   | C80=8*As_D[DIS_1]/10 |                    |                        |              | Calculate 80% of the battery capacity measured in line 4. As_D is always positive     |
| 3     |       | Charge      | I=0.5A               | t=3h<br>UMax=Us5mV |                        | t=10s        | Charge the battery to 100% SOC  |
| 4     | DIS_1 | Discharge   | I=0.25A              | U<1.0V             |                        | t=10s        | Measurement of the reference capacity   |
| 5     |       | Cycle-start |                      |                    |                        |              | cycle with 100% dod   |
| 6     |       | Charge      | I=0.5A               | t=3h<br>UMax=Us5mV |                        | t=10s        | Charge the battery to 100% SOC  |
| 7     |       | Pause       |                      |                    |                        | t=10s        |   |
| 8     |       | Discharge   | I=0.25A              | Ah<C80<br>U<1.0V   | Goto Go_on<br>Goto EoL | t=10s        | Discharge 80% if not 80% resched -> EOL   |
| 9     | GO_ON | Discharge   | I=0.25A              | U<1.0V             |                        | t=10s        | Go On discharging for 100% discharge  |
| 10    |       | Pause       |                      |                    |                        | t=1s         |   |
| 11    |       | Cycle-end   | Count=10000          |                    |                        |              | max. 10000 cycles   |
| 12    | EOL   | Pause       |                      |                    |                        | t=10s        | EOL End Of Life   |
| 13    |       | Stop        |                      |                    |                        |              |   |

## Applications

- Parameter Tests
- Endurance Tests
- Abuse Tests
- BMS Tests

## Technical Data

|                        |   |  |
|------------------------|---|--|
| Charge Voltage         | 3-70V   | 0-6V   |
| Discharge Voltage      | 3-70V   | 1-6V   |
| Voltage resolution     | 3mV   | 200uV  |
| Voltage precision      | 15mV  | 1mV  |
| Meas. U                | 4-wire  |  |
| Current precision      | 0.05% FS  |  |
| Current ripple         | < 0.3%FS  |  |
| Current rise time      | 1ms   |  |
| Min. pulse length      | 1ms   |  |
| Current ranges         | Optional, up to 3   |  |
| Range switching        | automatic   |  |
| Parallel operation     | Up to 4 channels  |  |
| Standard measurement   | Voltage<br>Current<br>2* Temperature Pt100/4W<br>2* Aux Voltage (+/-10V)  |  |
| Time resolution        | 1µs   |  |
| Channel configurations | 70A / 1.5kW<br>140A / 3kW<br>210A / 4.5kW<br>280A / 7kW<br>360A / 9kW<br>500A / 12kW<br>570A / 14kW   | 100A<br>200A<br>300A<br>...<br>600A<br>800A<br>1000A |
| Control mode           | Current (analog)<br>voltage, power, resistance<br>and combinations (digital)  |  |
| Options                | CAN Interface<br>BSD (Battery Safety Device)<br>CMU Cell Voltage Inputs<br>CMU Type-K, Pt100/4W, NTC<br>SSMS Interface<br>Digital-IO<br>Relay Outputs |  |
| Cooling                | Air, temp regulated fans  |  |
| Power supply           | 400V / 3 phases, N, GND   |  |
| Power Factor           | > 0.99  |  |
| Efficiency Charge      | Up to 90%   | Up to 80%  |
| Efficiency Discharge   | Up to 87%   | Up to 70%  |
| Software               | BaSyTest  |  |
| Interface              | Ethernet  |  |

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