BVM
Battery Voltage Monitoring

- **Enables automatic battery cell voltage measurements during capacity tests**
- **"Daisy-chain" design allows expandability up to 2x120 cells**
- **High accuracy and stability for precise data collection**
- **Wide voltage range**
- **Easy set-up with many options for connecting the BVM system to a battery bank**

DESCRIPTION

The BVM equipment is a battery cell/block voltage measurement system performed on battery banks. It can be used in conjunction with a load device such as the TORKEL. It can also be used to measure cell/block voltages from a PC with TORKEL Win or PowerDB. The BVM system is designed in modular form where one BVM unit is used for each cell or block in the battery string to be tested. One BVM unit for each cell or block connects to the next in a daisy chain fashion.

The included dolphin clip can easily be removed and exchanged with different styles of standard banana plug clamps and/or extension cables to accommodate any battery connection requirement.

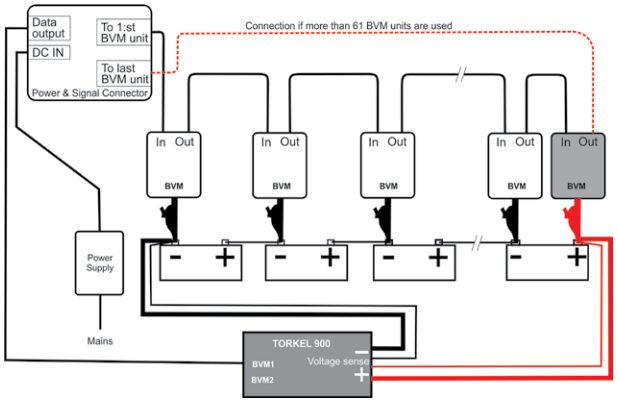
Up to 2 x 120 BVMs can be daisy chained in a single battery bank under test that is used for the capacity testing of large, industrial battery banks commonly found in electrical power substations, telecom facilities and UPS systems generally. When used in conjunction with a load device (e.g. Megger TORKEL) and test data management software (TORKEL Viewer, PowerDB or TORKEL Win) the BVM system facilitates the execution of a automated battery bank capacity test, according to IEC and IEEE standards. The test also meet NERC/FERC requirements. The BVM-system is designed in modular form where one BVM device is used for each battery cell or "jar" in the string to be tested. One BVM for each battery connects to the next in a "daisy-chain" fashion, thereby providing easy and economical expandability to meet the testing requirements for small-to-large battery bank systems.

Setting up the BVM system for a test is quick and easy. Each BVM unit is identical and can be connected in any battery test position, thus providing maximum flexibility and interchangeability of the BVMs. The BVM "Auto Discovery" feature enables the host device to automatically determine the number of batteries under test and provide sequential identification of each BVM unit in the test string.

APPLICATION

Each BVM unit is identical and can be connected in any battery test position. A single cable connects the first BVM unit in the string to a Power & signal connector. The BVM system data output is connected via an Ethernet cable to the BVM USB port on TORKEL 900 or to a PC with data managements SW, e.g. PowerDB or TORKEL Win. The BVM system can also be used together with older Megger TORKEL versions, or any battery load bank. This will require the use of a separate PC with test management SW e.g. PowerDB or TORKEL Win.

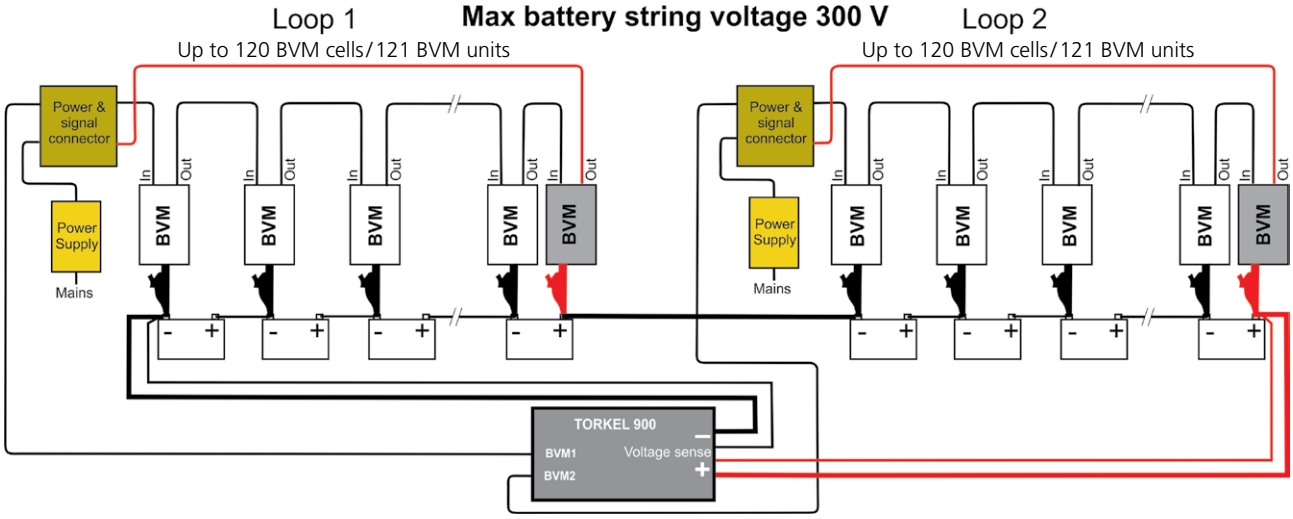
Connection example with TORKEL 900



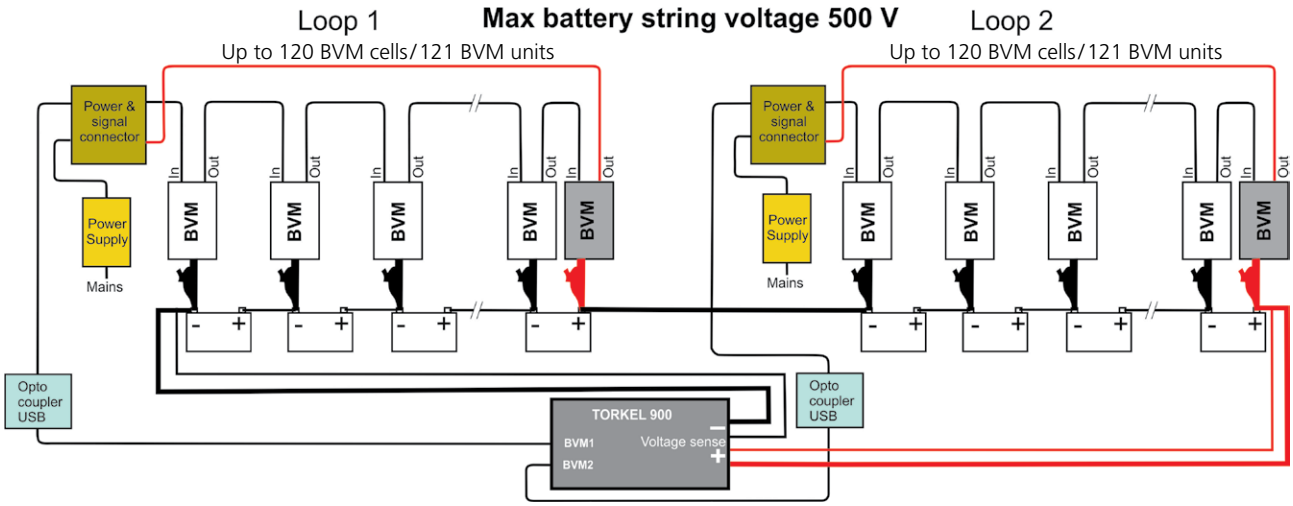
The red dolphin clip in the chain should be connected to the most positive battery pole in the battery bank.
The voltage over each BVM device will be logged throughout the complete discharge test.

CONNECTION EXAMPLES

With TORKEL 900

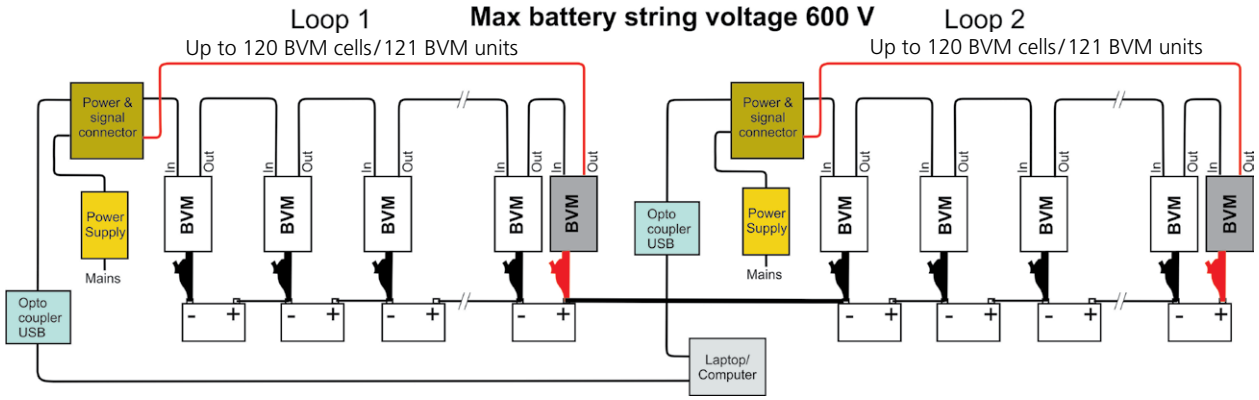


When the battery bank exceeds 120 cells, this connection with 2 BVM loops shall be used.
Connect the first loop to the BVM1 USB port on TORKEL 900 and the second loop to the BVM2 USB port on TORKEL 900.



The connection shown above must be used when the battery bank voltage is between 300 V and 500 V.
It includes two opto couplers and two ungrounded power supplies.

Without TORKEL 900



When the total battery voltage exceeds 500 V, TORKEL cannot be used as a load bank. Instead other load banks, or the existing UPS load can be used for doing battery capacity tests.

ACCESSORIES FOR CONNECTION OF BVM TO BATTERY

Included connectors for BVM unit to battery

Dolphin clips	

Optional connections for BVM to battery

Extension lead for connecting BVM unit, via clips or similar, to battery 04-30050	
Cable with M8 ring connector, 0.3 m (1 ft) KG-00690	
Cable with 6.3 mm insulated female flat connector, 0.3 m (1 ft) KG-00692	
Battery pole bolt M8, screw connection M4 40-06300	
Ground washer B1457-H8 45-10046	

OPTIONAL ACCESSORIES

PowerDB

PC software for BVM and TORKEL 800/900-series. For BVM and TORKEL 800 series it works for controlling, data management and report handling, for TORKEL 900-series only for data management and reporting.

BVM Cal Kit

Calibration system for BVM units (CJ-90090)

Opto coupler USB

When the battery bank voltage exceeds 300 V the BVM system must be used with opto couplers.

ADDITIONAL EQUIPMENT

For complete information on additional products see appropriate data sheets.

TORKEL 900-series

Family of battery load units with automatic and dynamic discharge technology. The TORKEL family is extremely flexible and scalable for various voltages and currents required. Please see separate data sheet for details.

SPECIFICATIONS

Specifications are valid at an ambient temperature of +25°C, (77°F). Specifications are subject to change without notice.

Environment

Application field	The instrument is intended for use in battery rooms found in electric power generating and substations as well as in telecommunication infrastructure and UPS applicatiuons in general Altitude <2000 m (6500 ft) above sea level.
Temperature	
Operating	5°C to +50°C (41°F to +122°F)
Storage & transport	0°C to +60°C (32°F to +140°F)
Humidity	5% – 95% RH, non-condensing

CE-marking

LVD	2014/35/EU
EMC	2014/30/EU
RoHS	2011/65/EU

General

Mains voltage	100–240 V AC, 50/60 Hz
Power consumption	50 VA *(max)*
Protection	Overvoltage, reverse voltage, voltage transients, ESD
Dimensions	
BVM unit	75 x 64 x 25 mm (3" x 2.5" x 1")
Carrying case	575 x 470 x 205 mm (22.6" x 18.5" x 8.1")
Weight	
BVM unit	0.07 kg (0.15 lbs)
With accessories and carrying case	BVM system of 31 units 8.8 kg (19 lbs) BVM system of 61 units 12.5 kg (27 lbs)

Measurement section

Maximum number of BVM units	240 (2 x 120)
Voltage ranges	0–20 V DC
Resolution	1.00 mV
Inaccuracy	< 0.1% of full scale ±0.01 V DC
Battery string voltage	300 V DC (max per loop)
Measurement input impedance	1 MΩ

BVM600 (CJ-59096)

ORDERING INFORMATION

Item	Cat. No.
BVM *Including*: Dolphin clips, Power & signal connector, Power supply, Connection cables and Carrying case On request: TORKEL Win	
BVM150 System of 16 BVM units	CJ-59092
BVM300 System of 31 BVM units	CJ-59093
BVM600 System of 61 BVM units	CJ-59096
BVM special 600 V System of 46 BVM units[1)] Incl. Dolphin clips, Power & signal connectors, Opto couplers, Power supplies, Connection cables and Carrying case.	CJ-59198
BVM Single unit	CJ-59090
Optional accessories	
PowerDB PC software for BVM and TORKEL 800/900-series. BVM and TORKEL 800 series: Control and report TORKEL 900-series: Only report Free to download from www.powerdb.us	
Opto coupler When battery bank voltage exceeds 300 V	HC-50040
Extension cable Extension lead for connecting BVM unit to battery, 0.5 m (1.6 ft)	04-30050
Cable with ring connector Cable with M8 ring connector, 0.3 m (1 ft)	KG-00690
Cable with insulated flat connector Cable with 6.3 mm insulated female flat connector, 0.3 m (1 ft)	KG-00692
Battery bolt adapter Battery pole bolt M8, screw connection M4	40-06300
Ground washer B1457-H8	45-10046
BVM Cal Kit Calibration system for BVM units	CJ-90090

1) The TORKEL 950 can handle a maximum of 500 V. Battery systems over 500 V and up to 600 V can be tested with BVM and PowerDB or TORKEL Win application on a computer.

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