

TORKEL 900-series Battery Load Unit



- **Batteries can be tested in service**
- **Dynamic discharge technology – full power at all voltages**
- **Safety in all details, e.g. detection of blocked airflow**
- **Real time monitoring during test**
- **Quick report**
- **Easily expandable for larger battery banks using TXL extra load units**
- **BVM cell monitor control integrated in the system**

DESCRIPTION

Batteries in power plants and transformer substations must provide the equipment they serve with standby power in the event of a power failure. Unfortunately, however, the capacity of such batteries can drop significantly for a number of reasons before their calculated life expectancy is reached. This is why it is so important to check batteries at regular intervals, and the only reliable way of measuring battery capacity is to conduct a discharge test.

TORKEL™ 930 is used for battery systems ranging from 12 to 300 V – often encountered in switchgear and similar equipment. Discharging can take place at up to 220 A, and if higher current is needed, two or more TORKEL units or extra load units, TXL, can be linked together. Tests can be conducted at constant current, constant power, constant resistance or in accordance with a pre-selected load profile.

TORKEL 910 is very much the same as the TORKEL 930 but has lower charging current and some other limitations, see table below.

MODEL OVERVIEW

| | TORKEL 910 | TORKEL 930 |
|----------------------------------|------------|------------|
| Current (max) | 110 A | 220 A |
| BVM functionality | No | Yes |
| Charging measurement | No | Yes |
| Full report functionality | No | Yes |

APPLICATION EXAMPLE

Testing can be carried out without disconnecting the battery from the equipment it serves. Via a DC clamp-on ammeter, TORKEL measures total battery current while regulating it at a constant level.

The TORKEL is connected to battery, the current and the voltage alarm level are set. After starting the discharge TORKEL keeps the current constant at the preset level. When the voltage drops to a level slightly above the final voltage, TORKEL issues an alarm.

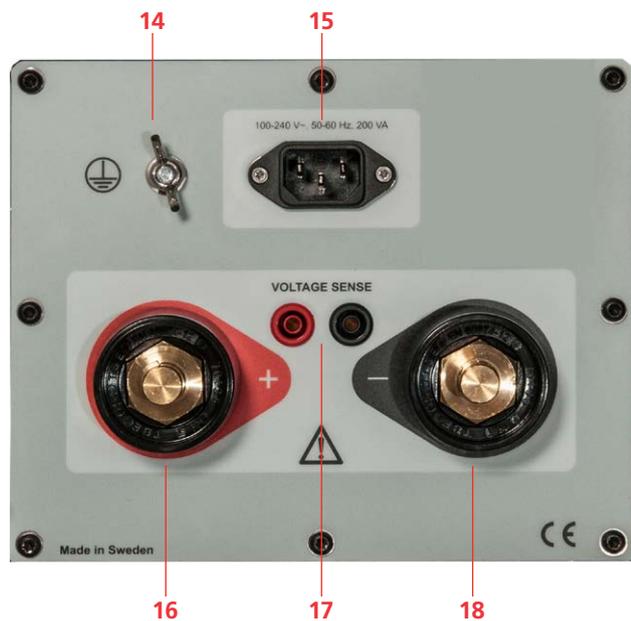
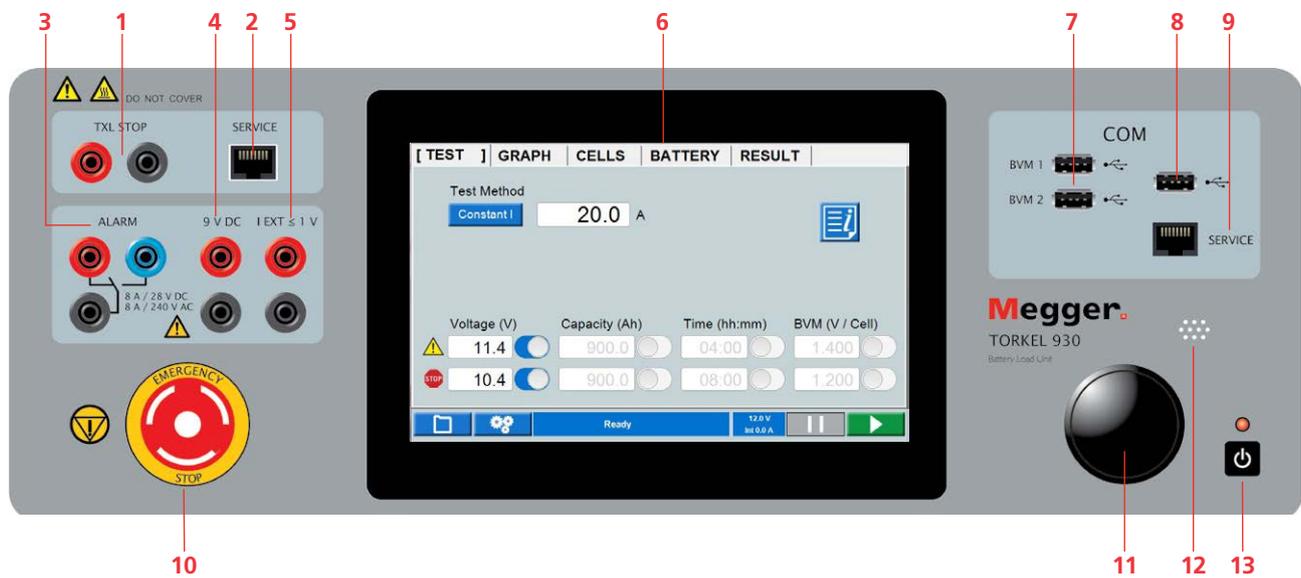
If the voltage drops so low that there is a risk for deep discharging the battery, TORKEL shuts down the test.

If the power supply is interrupted the test will continue when power is restored.

All values are stored in TORKEL and can easily be transferred via a USB-stick to a PC for evaluation and print out.

FEATURES AND BENEFITS

- 1. TXL STOP**
Output used for stop discharging from an external device (TXL). Galvanically isolated.
- 2. SERVICE**
Connector for service purposes only.
- 3. ALARM**
Output equipped with a relay contact for triggering an external alarm device.
- 4. DC OUT**
9 V output for external current clamp.
- 5. IEXT ≤ 1V**
Input used to measure current in an external path by means of a clamp-on ammeter or a current shunt.
- 6. Display**
Touch screen 7"
- 7. BVM1, BVM2**
USB connections for BVM units.
- 8. USB connection**
For USB memory stick.
- 9. Ethernet connection**
For service of the instrument.
- 10. EMERGENCY STOP**
Push to stop.
Reset the by turning it right
- 11. Control knob**
For entering settings etc. Press to confirm a setting.
- 12. Buzzer**
For alarms.
- 13. ON/OFF switch**



- 14.**  Protective conductor terminal
- 15. MAINS**
Connector for mains supply.
- 16. +**
Connection terminal (+) for the battery (or other DC source).
- 17. VOLTAGE SENSE**
Input for sensing voltage at the battery terminals. Impedance to the battery current terminals is >1 MΩ.
- 18. -**
Connection terminal (-) for the battery (or other DC source).

SPECIFICATIONS

Specifications are valid at nominal input voltage and 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 high-voltage substations and industrial environments.

Temperature

Operating 0°C to +50°C (32°F to +122°F)
Power derating at temperatures over +35°C (+95°F)

Storage & transport -40°C to +70°C (-40°F to +158°F)

Humidity 5% – 95% RH, non-condensing

Shock/Vibration/Fall

Instrument only ETSI EN 300 019-2-7 class 7M2

Instrument in transport case ISTA 2A

Altitude

Operating 3000 m (10000 ft)

Storage 10000 m (33000 ft)

Encapsulation class IP20

CE-marking

LVD IEC61010-1:2010 & IEC61010-2-030

EMC IEC61326-1

General

Mains voltage 100 – 240 V AC, 50/60 Hz

Power consumption 200 W (max)

Power interruption 40 ms (max)

Protection Thermal cut-outs, automatic overload protection

Dimensions

Instrument 519x315x375 mm, (20.5" x 12.4" x 14.7")

Transport case 670x400x510 mm, (26.4" x 15.7" x 20.1")

Weight 19.5 kg (43.0 lbs)
31.9 kg (70.3 lbs) with transport case

Display 7" LCD, Capacitive touch screen

Available languages English, French, German, Spanish, Swedish

Measurement section

Current measurement

Display range 0.0 to 2999.0 Arms

Basic inaccuracy ±(0.5% of reading +0.1 A)

Resolution 0.1 A

Internal current measurement

Range

TORKEl 910 0 to 110 A

TORKEl 930 0 to 220 A

Input for clamp-on ammeter

Range 0 to 1000 mV DC

mV/A-ratio 0.30 mV/A to 100.00 mV/A

Input impedance >1 MΩ

Voltage measurement

Voltage 0 to 300 V DC

Inaccuracy ±(0.5% of reading +0.1 V DC)

Resolution 0.1 V

Time measurement

Basic inaccuracy ±0.1% of reading ±1 digit

Storage of measured values

Time >24 h

Time interval Automatic at voltage change

Load section

Battery voltage 12 to 270 V (min 7.5 V, max 300 V)

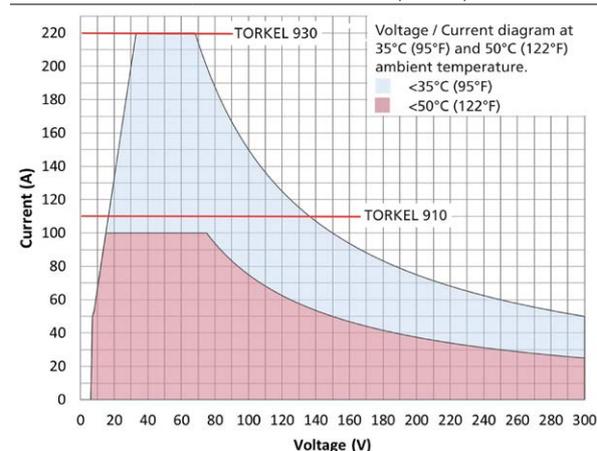
Max. current

TORKEl 910 110 A

TORKEl 930 220 A

Max. power 15 kW

Load patterns Constant current, constant power, constant resistance, current or power profile



Constant I

Range

TORKEl 910 0 to 110.0 A

TORKEl 930 0 to 220.0 A

Inaccuracy ±(0.5% +0.2 A)

Resolution 0.1 A

Ripple ±0.4 A

Constant R

Range 300 mΩ to 3 kΩ

Inaccuracy ±0.5%

Resolution 100 mΩ

Constant P

Range 0 to 15 kW

Inaccuracy ±1% + 50 W

Resolution 10 W

Ripple ±200 W

Inputs

+ 300 V

- 0 V

I EXT ≤ 1 V 1 V DC, 300 V DC to ground

VOLTAGE SENSE Impedance to the current terminals is >1 MΩ

Outputs

ALARM

Relay contact 28 V DC, 8 A, 240 V AC, 8 A
Devices higher than Cat II must not be attached

TXL STOP

Relay contact 250 VDC, 0.28 A, 28VDC, 8A, 250 VAC, 8A

9 V DC 9 V DC, 100 mA

Communication ports

BVM1 and BVM2 USB connection for BVM units

USB USB connection for USB memory

SERVICE For service of the instrument

OPTIONAL ACCESSORIES

Extra loads



- Three extra loads available: TXL830, TXL850 and TXL870

Cables



- Cable set (GA-00554)

BVM



- Automates battery voltage measurement during capacity tests
- "Daisy-chain" design allows expandability up to 120 units
- High accuracy and stability for precise data collection
- For complete information see the BVM data sheet

Sensing leads



- Sensing lead set (GA-00210)

Clamp-on ammeters



- Clamp-on ammeters, 200 A DC and 1000 A DC
- To measure current in circuit outside TORHEL

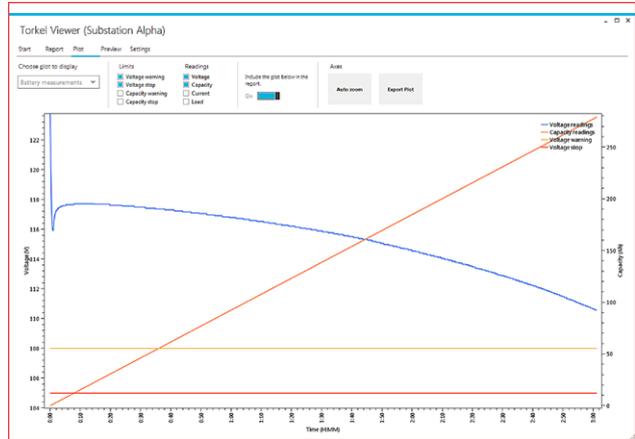
INCLUDED ACCESSORIES

Cable set



- Cable set GA-09550

TORTEL Viewer



- The included PC software TORTEL Viewer can be used to edit and print out reports.

ORDERING INFORMATION

| Item | Art. No. |
|--|----------|
| TORTEL 910 | CS-19190 |
| TORTEL 930 | CS-19390 |
| Included accessories | |
| Mains cable | |
| Cable set, 2 x 3 m, 70 mm ² , GA-09550 | |
| TORTEL Viewer (Not for TORTEL 910) | |
| USB memory stick | |
| Transport case | |
| Optional accessories | |
| TXL830 Extra load | |
| Incl. Cable set GA-00554 (max 28 V), Transport case | BS-59093 |
| TXL850 Extra load | |
| Incl. Cable set GA-00554 (max 56 V), Transport case | BS-59095 |
| TXL870 Extra load | |
| Incl. Cable set GA-00550 (max 280 V), Transport case | BS-59097 |
| Cable set for TXL830 and TXL850 | |
| 2 x 3 m, 70 mm ² , with cable lug. Max 100 V, 270 A | |
| Weight: 5.0 kg (11 lbs) | GA-00554 |
| Cable set for TXL870 | |
| 2 x 3 m, 25 mm ² , with cable clamp. Max 480 V, 110 A. Weight: 3.0 kg (6.6 lbs) | GA-00550 |

| Item | Art. No. |
|--|----------|
| Sensing lead set | |
| Cable set for measuring voltage at battery terminals. 2 x 5 m (16.4 ft) | GA-00210 |
| DC clamp-on ammeter, 200 A | |
| To measure current in circuit outside TORTEL | XA-12992 |
| DC clamp-on ammeter, 1000 A | |
| To measure current in circuit outside TORTEL | XA-12990 |
| BVM | |
| <i>Including:</i> Dolphin clips, Power & signal connector, Power supply, Connection cables and Carrying case | |
| BVM150 , System of 16 BVM units | CJ-59092 |
| BVM300 , System of 31 BVM units | CJ-59093 |
| BVM600 , System of 61 BVM units | CJ-59096 |

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