

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

The TORKEl™ 900 series is used to perform load/discharge testing which is the only way to determine battery systems actual capacity. Together with the optional cell voltage logger, BVM, connected directly to the TORKEl 900, it becomes a complete, stand-alone, discharge test system.

TORKEl 930 is used for battery systems ranging from 12 to 300 V, often encountered in switchgear and similar equipment. The high discharge capacity of TORKEl gives the opportunity to shorten the test time. 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.

Testing can also be carried out without disconnecting the battery from the equipment it serves. Via a DC clamp-on probe, TORKEl measures the total battery current while regulating it at a constant level. Battery systems can be plus or minus grounded or free floating.

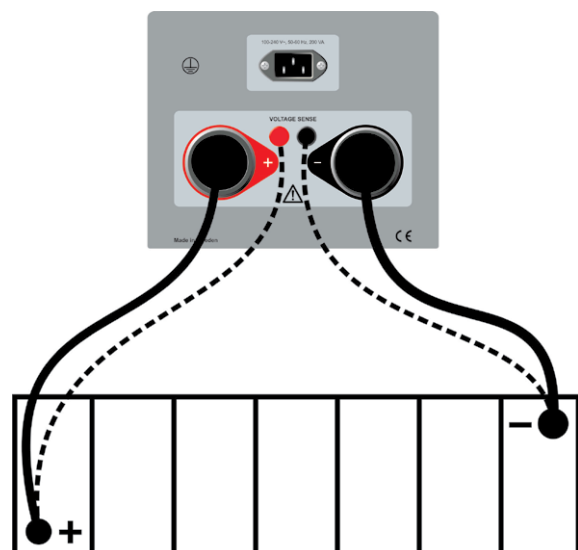
TORKEl 910 is very much the same as the TORKEl 930 but has lower charging current and some other limitations, see table below.

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

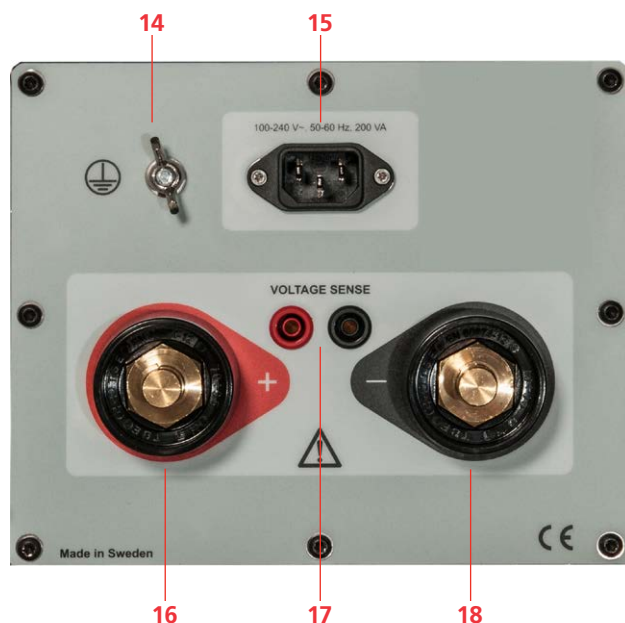
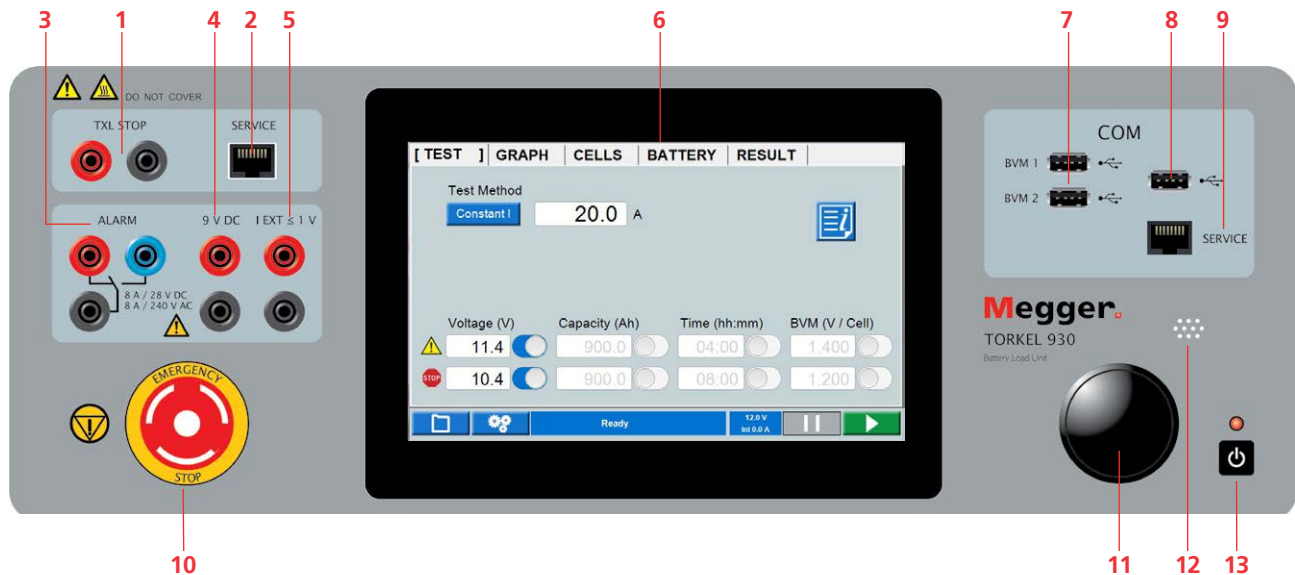
The TORKEl is connected to battery, the current and the voltage alarm levels are set. After starting the discharge, TORKEl keeps the current constant at the preset level. When the voltage drops to a level slightly above the final voltage, TORKEl issues an alarm. If the voltage drops so low that there 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.




Separate sensing cables (dashed lines) should be used to get accurate voltage measurements to offset the voltage drop caused by long current cables and/or high current.

FEATURES AND BENEFITS

1. **TXL STOP**
Output used for stop discharging from an external device (e.g. 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 probe 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 by turning it cloch-wise
11. **Control knob**
For entering settings etc. Press to confirm a setting.
12. **Buzzer**
For alarms.
13. **ON/OFF switch**



14.  Protective ground (earth) 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 TORKEl 900

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, Emergency stop button

Dimensions 519 x 315 x 375 mm, (20.5" x 12.4" x 14.7")

Weight 19.5 kg (43.0 lbs)

Display 7" LCD, Capacitive touch screen

Available languages English, French, German, Spanish, Swedish

Measurement section

Current measurement

Display range 0.0 to 2999.0 A

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 probe

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

Sample rate 10 Hz, Values are saved when change is >10mV

Time measurement

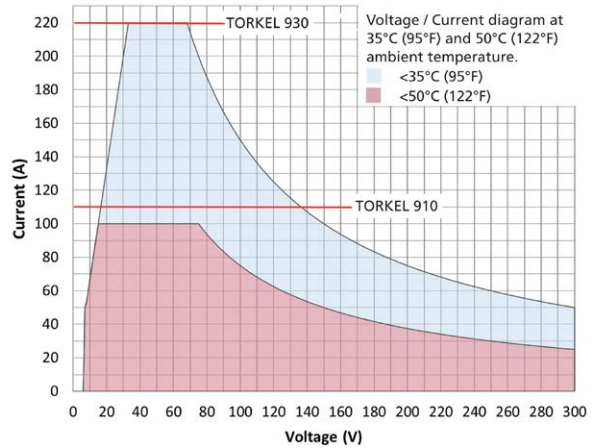
Inaccuracy ±0.1% of reading ±1 digit

Load section

Battery voltage 7.5 V to 300 V

Power 15 kW (max)

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



Maximal current at common battery voltages

Voltage	TORKEl 910	TORKEl 930
48 V	110 A	220 A
110 V	110 A	136 A
220 V	68 A	68 A

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



Four extra loads available:
TXL830, TXL850, TXL870 and
TXL890

SPECIFICATIONS TXL830/850/870/890

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 +40°C (32°F to +104°F)
Storage & transport -40°C to +70°C (-40°F to +158°F)

Humidity 5% – 95% RH, non-condensing

CE-marking

LVD 2006/95/EC
EMC 2004/108/EC

General

Mains voltage 100 – 240 V AC, 50/60 Hz
Power consumption 75 W (max)
Protection Thermal cut-outs, automatic overload protection

Dimensions
Instrument 210x353x600 mm (8.3" x 13.9" x 23.6")
Transport case 265x460x750 mm (10.4" x 18.1" x 29.5")
Weight 13 kg (29 lbs) 21.4 kg (47 lbs) with transport case

Cable sets
for TXL830/850 2 x 3 m (9.8 ft), 70 mm², 270 A, with cable lug. Max. 100 V. 5 kg (11 lbs)
for TXL870/890 2 x 3 m (9.8 ft), 25 mm², 110 A, with cable clamp/lug. Max. 480 V. 3 kg (6.6 lbs)

Load section

	Voltage (DC) max.	Current max.	Power max.
TXL830	28 V	300 A	8.3 kW
TXL850	56 V	300 A	16.4 kW
TXL870	280 V	112 A	15.8 kW
TXL890	480 V	62 A	15.4 kW

Internal resistance, 3-position selector

	Position 1	Position 2	Position 3
TXL830	0.275 Ω	0.138 Ω	0.092 Ω
TXL850	0.55 Ω	0.275 Ω	0.184 Ω
TXL870	4.95 Ω	2.48 Ω	1.24 Ω
TXL890	14.10 Ω	7.05 Ω	3.52 Ω

Maximal currents, 3-position selector

Position 1

	Current	Voltage	Cells	Cell voltage
TXL830	100 A	27.6 V	12	2.3 V
	78.5 A	21.6 V	12	1.8 V
TXL850	100 A	55.2 V	24	2.3 V
	78.5 A	43.2 V	24	1.8 V
TXL870	50.1 A	248.4 V	108	2.3 V
	39.2 A	194.4 V	108	1.8 V
TXL890	32.3 A	469.2 V	204	2.3 V
	26.0 A	367.2 V	204	1.8 V

Position 2

	Current	Voltage	Cells	Cell voltage
TXL830	200 A	27.6 V	12	2.3 V
	156 A	21.6 V	12	1.8 V
TXL850	200 A	55.2 V	24	2.3 V
	156 A	43.2 V	24	1.8 V
TXL870	50.1 A	124.2 V	54	2.3 V
	39.2 A	97.2 V	54	1.8 V
TXL890	35.2 A	248.4 V	108	2.3 V
	27.8 A	194.4 V	108	1.8 V

Position 3

	Current	Voltage	Cells	Cell voltage
TXL830	300 A	27.6 V	12	2.3 V
	235 A	21.6 V	12	1.8 V
TXL850	300 A	55.2 V	24	2.3 V
	235 A	43.2 V	24	1.8 V
TXL870	100 A	124.2 V	54	2.3 V
	74.8 A	97.2 V	54	1.8 V
TXL890	70.5 A	248.4 V	108	2.3 V
	55.2 A	194.4 V	108	1.8 V

BVM - Battery Voltage Monitoring



Cable sets



Sensing leads



Clamp-on-probes



INCLUDED ACCESSORIES – TORKEL 910

Cable set TORKEL 910

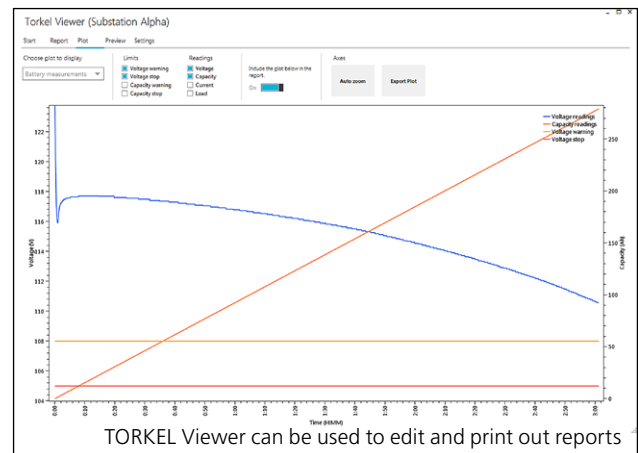


INCLUDED ACCESSORIES – TORKEL 930

Cable set



TORKEL Viewer



ORDERING INFORMATION

Item	Art. No.	Item	Art. No.
TORKEl 910 Incl. accessories:		Optional accessories	
Mains cable		Transport case Large for TORKEl and standard cables	GD-00955
Cable set, 2 x 3 m, 25 mm ²	GA-00550	TXL830 Extra load	
Soft case for cables	GD-00360	Incl. Cable set GA-09550, Control cables 2 x 2 m, Transport case	BS-59093
Transport case Standard Dimensions: 670x400x510 mm, (26.4" x 15.7" x 20.1") Weight including TORKEl (no cables) 31.9 kg (70 lbs)	GD-00954	TXL850 Extra load	
	CS-19190	Incl. Cable set GA-09550, Control cables 2 x 2 m, Transport case	BS-59095
Mains cable		TXL870 Extra load	
Cable set, 2 x 3 m, 25 mm ²	GA-00550	Incl. Cable set GA-00550, Control cables 2 x 2 m, Transport case	BS-59097
Transport case Large , with space for cable set GA-00550 Dimensions: 795x400x510 mm, (31.3" x 15.7" x 20.1") Weight including TORKEl and cables 35 kg (77 lbs)	GD-00955	TXL890 Extra load	
	CS-19191	Incl. Cable set GA-00550, Control cables 2 x 2 m, Transport case	BS-59099
TORKEl 930 Incl. accessories:		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-09550
Mains cable		Cable set for TXL870 and TXL890 2 x 3 m, 25 mm ² , with cable clamp. Max 480 V, 110 A. Weight: 3.0 kg (6.6 lbs)	GA-00550
Cable set, 2 x 3 m, 70 mm ²	GA-09550	Sensing lead set Cable set for measuring voltage at battery terminals. 2 x 5 m (16.4 ft)	GA-00210
Soft case for cables	GD-00360	DC clamp-on probe, 200 A To measure current in external circuit	XA-12992
TORKEl Viewer	CS-8010X	DC clamp-on probe, 1000 A To measure current in external circuit	XA-12990
USB memory stick	HF-10020	BVM <i>Including:</i> Dolphin clips, Power & signal connectors, Power supplies, Connection cables and Carrying case	
Transport case Standard Dimensions: 670x400x510 mm, (26.4" x 15.7" x 20.1") Weight including TORKEl (no cables) 31.9 kg (70 lbs)	GD-00954	BVM150 , System of 16 BVM units	CJ-59092
	CS-19390	BVM300 , System of 31 BVM units	CJ-59093
Mains cable		BVM600 , System of 61 BVM units	CJ-59096
Cable set, 2 x 3 m, 70 mm ²	GA-09550	BVM special 600 V , System of 46 BVM units <i>Including:</i> Dolphin clips, Power & signal connectors, Opto couplers, Power supplies, Connection cables and Carrying case	CJ-59198
TORKEl Viewer	CS-8010X	BVM, Single unit Incl. Control cable black RJ45 0.5m (1.6 ft)	CJ-59090
USB memory stick	HF-10020		
Transport case Large , with space for cable set GA-09550 Dimensions: 795x400x510 mm, (31.3" x 15.7" x 20.1") Weight including TORKEl and cables 37 kg (82 lbs)	GD-00955		
	CS-19391		