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# DATA-SHEET



Nationwide Low Call  
**0333 6000 600**

**WHY BUY**  
WHEN YOU CAN HIRE

# 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 comes in three models, 910, 930 and 950, see table below.

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.

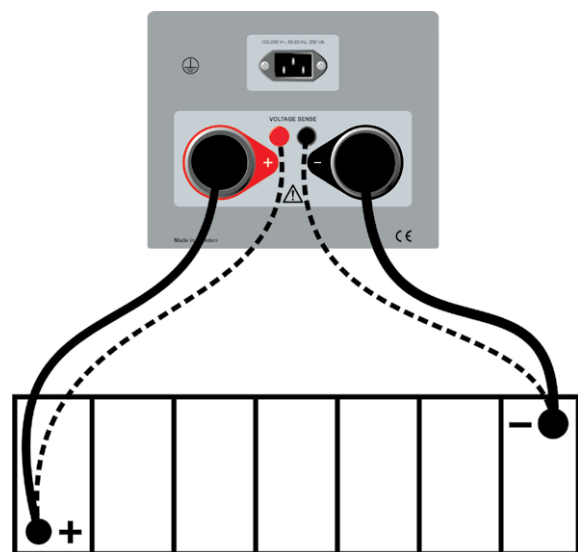
Testing can also be carried out without disconnecting the battery from the equipment it serves. Via a DC clamp-on probe, TORKEl measures the total battery current while regulating it at a constant level. Battery systems can be plus or minus grounded or free floating.

## MODEL OVERVIEW

TORKEl	910	930	950
Current (max)	110 A	220 A	220 A
Voltage (max)	300 V	300 V	500 V
BVM functionality	No	Yes	Yes
Charging measurement	No	Yes	Yes
Full report functionality	No	Yes	Yes

## APPLICATION EXAMPLE

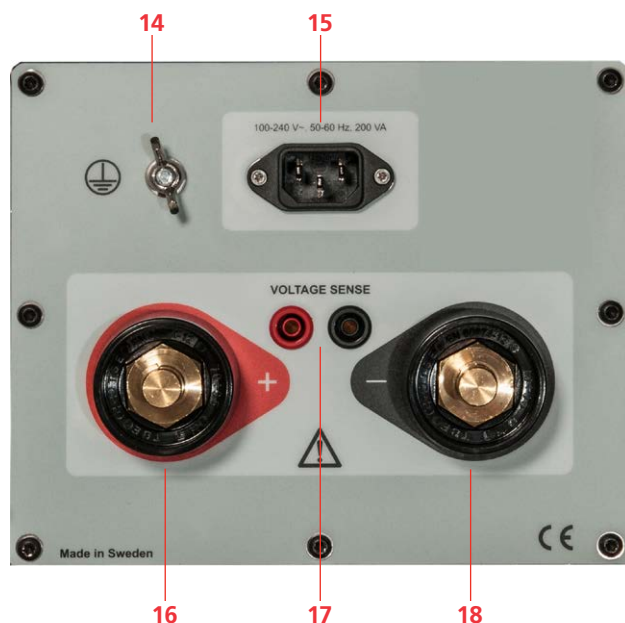
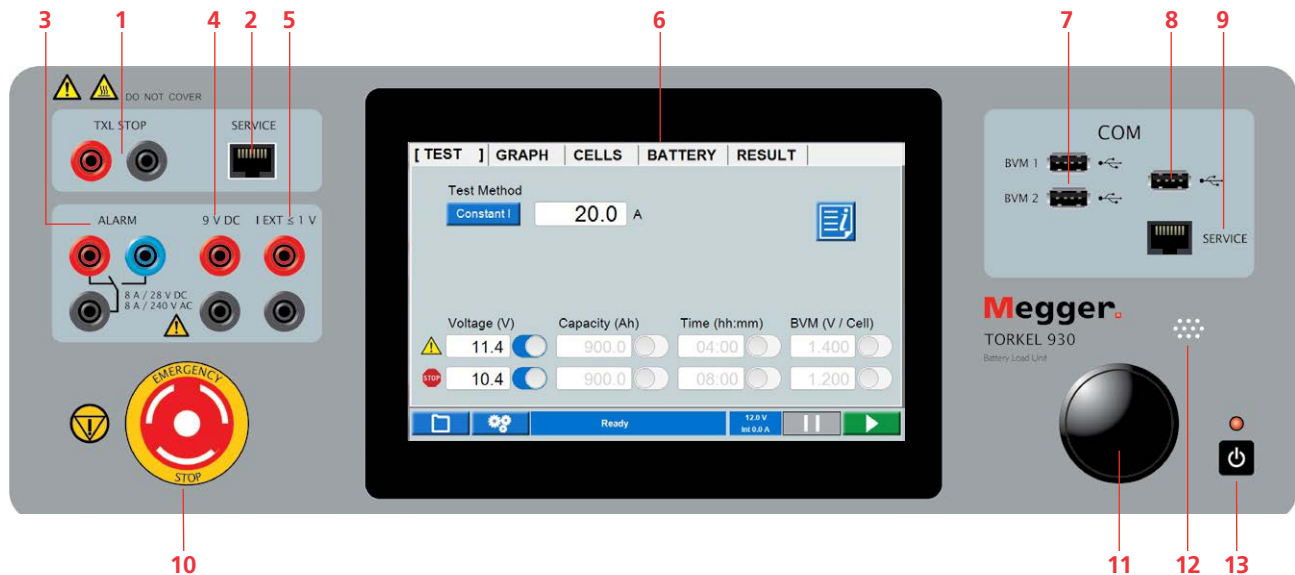
The TORKEl is connected to battery, the current and the voltage alarm levels are set. After starting the discharge, TORKEl keeps the current constant at the preset level. When the voltage drops to a level slightly above the final voltage, TORKEl issues an alarm. If the voltage drops so low that there 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 TOR KEL 900-SERIES**

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) instrument  
31.9 kg (70.3 lbs) incl. standard transport case  
37 kg (82 lbs) incl. large 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 A

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

*Resolution* 0.1 A

**Internal current measurement**

**Range**

*TOR KEL 910* 0 to 110 A

*TOR KEL 930/950* 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 500 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**

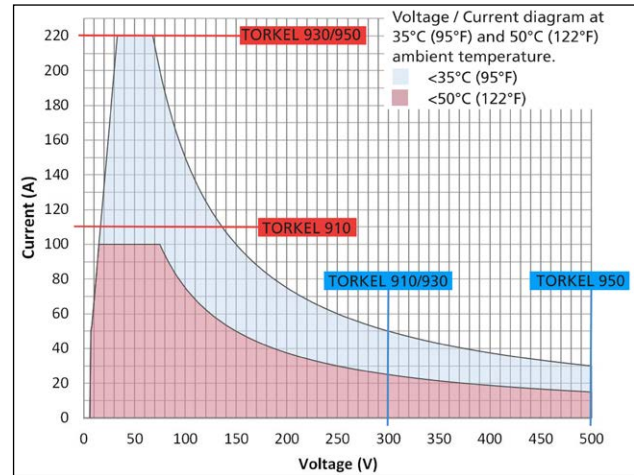
*Inaccuracy* ±0.1% of reading ±1 digit

**Load section**

*Battery voltage* 7.5 V to 300 V<sup>1)</sup>/500 V<sup>2)</sup>

*Power* 15 kW (max)

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



**Constant I**

**Range**

*TOR KEL 910* 0 to 110.0 A

*TOR KEL 930/950* 0 to 220.0 A

*Inaccuracy* ±(0.5% +0.2 A)

*Resolution* 0.1 A

*Ripple* max 0.5 A peak

**Constant R**

*Range* 300 mΩ to 3 kΩ

*Inaccuracy* ±1% typical

*Resolution* 100 mΩ

**Constant P**

*Range* 0 to 15 kW

*Inaccuracy* ±1% typical

*Resolution* 10 W

**Inputs**

**+** 7.5 to 300 V<sup>1)</sup> 7.5 to 500 V<sup>2)</sup>

**-** 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 V DC, 0.28 A, 28 V DC, 8 A, 250 V AC, 8 A

**9 V DC** 9 V DC, ±7% max 100 mA

**Communication ports**

**BVM1 BVM2** USB connection for BVM units

 USB connection for USB memory

**SERVICE** For service of the instrument

1) TOR KEL 910 and 930

2) TOR KEL 950

**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* 210 x 353 x 600 mm (8.3" x 13.9" x 23.6")  
*Transport case* 265 x 460 x 750 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 mm<sup>2</sup>, 270 A, with female plug/clamp. Max. 100 V. 5 kg (11 lbs)  
*for TXL870/890* 2 x 3 m (9.8 ft), 25 mm<sup>2</sup>, 110 A, with female plug/lug. Max. 480 V. 3 kg (6.6 lbs)

**Load section**

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

**Internal resistance, 3-position selector**

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

**Maximal currents, 3-position selector**

**Position 1**

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

**Position 2**

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

**Position 3**

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

**OPTIONAL ACCESSORIES**

**BVM - Battery Voltage Monitoring**



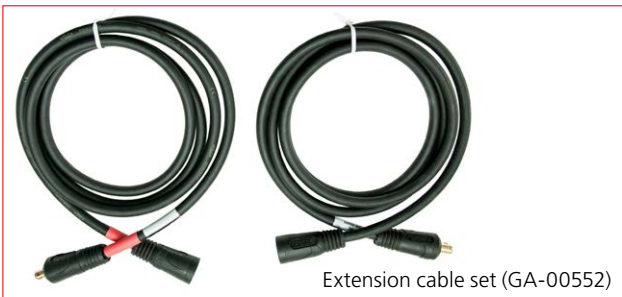
**Sensing leads**



**Clamp-on-probes**

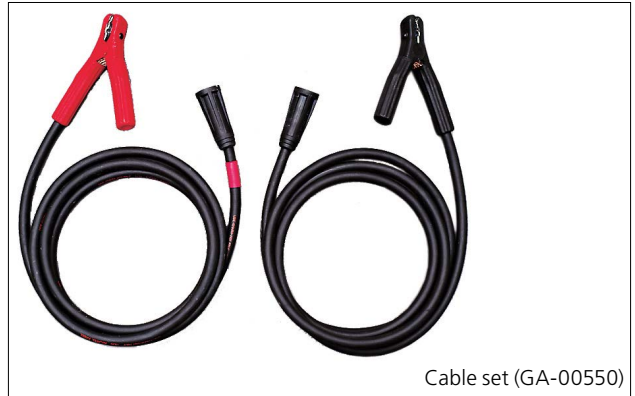


**Extension cables**



**INCLUDED ACCESSORIES – TORKEL 910**

**Cable set**

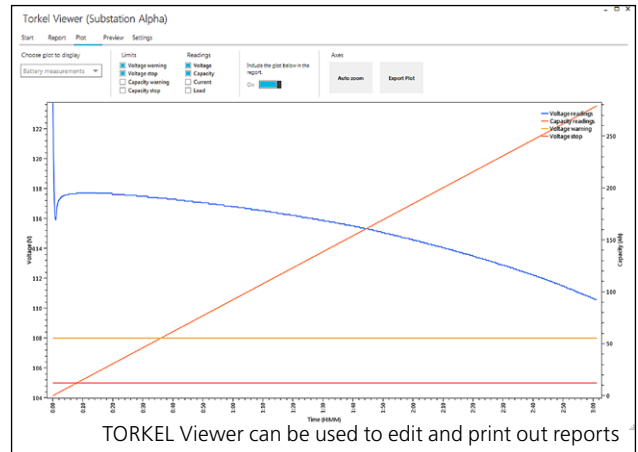


**INCLUDED ACCESSORIES – TORKEL 930/950**

**Cable set**



**TORKEL Viewer**



**ORDERING INFORMATION**

Item	Art. No.
<b>TORTEL 910</b>	
Incl. transport case <b>Standard</b> <sup>1)</sup> and accessories:	
Mains cable	
Cable set, 2 x 3 m, 25 mm <sup>2</sup>	GA-00550
Soft case for cables	GD-00360
	CS-19190
Incl. transport case <b>Large</b> <sup>2)</sup> and accessories:	
Mains cable	
Cable set, 2 x 3 m, 25 mm <sup>2</sup>	GA-00550
	CS-19191
<b>TORTEL 930</b>	
Incl. transport case <b>Standard</b> <sup>1)</sup> and accessories:	
Mains cable	
Cable set, 2 x 3 m, 70 mm <sup>2</sup>	GA-09550
Soft case for cables	GD-00360
TORTEL Viewer	CS-8010X
USB memory stick	HF-10020
	CS-19390
Incl. transport case <b>Large</b> <sup>2)</sup> and accessories:	
Mains cable	
Cable set, 2 x 3 m, 70 mm <sup>2</sup>	GA-09550
TORTEL Viewer	CS-8010X
USB memory stick	HF-10020
	CS-19391
<b>TORTEL 950</b>	
Incl. transport case <b>Standard</b> <sup>1)</sup> and accessories:	
Mains cable	
Cable set, 2 x 3 m, 70 mm <sup>2</sup>	GA-09550
Soft case for cables	GD-00360
TORTEL Viewer	CS-8010X
USB memory stick	HF-10020
	CS-19590
Incl. transport case <b>Large</b> <sup>2)</sup> and accessories:	
Mains cable	
Cable set, 2 x 3 m, 70 mm <sup>2</sup>	GA-09550
TORTEL Viewer	CS-8010X
USB memory stick	HF-10020
	CS-19591
<b>Optional accessories</b>	
Transport case <b>Large</b> for TORTEL and standard cables	GD-00955
<b>TXL830 Extra load</b>	
Incl. Cable set GA-09550, Control cables 2 x 2 m,	
Transport case	BS-59093
<b>TXL850 Extra load</b>	
Incl. Cable set GA-09550, Control cables 2 x 2 m,	
Transport case	BS-59095
<b>TXL870 Extra load</b>	
Incl. Cable set GA-00550, Control cables 2 x 2 m,	
Transport case	BS-59097
<b>TXL890 Extra load</b>	
Incl. Cable set GA-00550, Control cables 2 x 2 m,	
Transport case	BS-59099

Item	Art. No.
<b>Cable set</b> 2 x 3 m, 25 mm <sup>2</sup> , female/clamp. 110 A. 3.0 kg (6.6 lbs)	GA-00550
<b>Extension cable</b> Extension for GA-00550, 2x3m, 25mm <sup>2</sup> , male/female	GA-00552
<b>Cable set, high rating</b> 2 x 3 m, 70 mm <sup>2</sup> , female/fork. 270 A. 5.0 kg (11 lbs)	GA-09550
<b>Extension cable, high rating</b> Extension for GA-09550, 2x3m, 70mm <sup>2</sup> , male/female	GA-09552
<b>Sensing lead set</b> For measuring voltage at battery terminals. 2 x 5 m (16.4 ft)	GA-00210
<b>DC clamp-on probe, 200 A</b> To measure current in external circuit	XA-12992
<b>DC clamp-on probe, 1000 A</b> To measure current in external circuit	XA-12990
<b>BVM</b>	
Incl. Dolphin clips, Power & signal connectors, Power supplies, Connection cables and Carrying case	
<b>BVM150</b> , System of 16 BVM units	CJ-59092
<b>BVM300</b> , System of 31 BVM units	CJ-59093
<b>BVM600</b> , System of 61 BVM units	CJ-59096
<b>BVM special 600 V</b> , System of 46 BVM units Incl. Dolphin clips, Power & signal connectors, Opto couplers, Power supplies, Connection cables and Carrying case	CJ-59198
<b>BVM, Single unit</b> Incl. Control cable black RJ45 0.5m (1.6 ft)	CJ-59090

- 1) Transport case **Standard**, GD-00954  
Size: 670x400x510 mm, (26.4x15.7x20.1")
- 2) Transport case **Large**, GD-00955, with space for cable set GA-00550  
Size: 795x400x510 mm, (31.3x15.7x20.1")



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## OUR COMMITMENT TO YOU

### A wealth of knowledge and experience.

You can take advantage of expert advice to ensure you get the best, most appropriate and cost effective equipment for the job. We supply a wide variety of industries, so if there is another way to do the job or save you time and money we'll pass on the benefit of our experience for free.

### Honest advice, just a phone call away.

If we don't have a particular item, rather than hiring you something that won't do the job, we would rather direct you to an alternative supplier. You will always be provided with full instructions and if you still need help, call our technical team on Nationwide Low Call 0333 6000 600. Our aim is to save you time, frustration and money.

### Top quality equipment from major manufacturers.

With Inlec you'll get the most accurate, reliable and well-maintained equipment available. Prices are regularly reviewed to ensure you always enjoy the best value for money. We have made a significant investment in test equipment so we ensure that it's well packed to minimise damage and delay.

### We really do listen to you.

You won't waste your time contacting Inlec. Every request for equipment is logged and carefully considered. Listening to our customers helps keep our product range up to date and relevant. If you are unhappy about any aspect of our service please let us know so we can put it right.

## YOUR 5 WAY GUARANTEE

### 1 GUARANTEE SAME DAY DESPATCH

We understand why prompt delivery is important to you. So, if we confirm your order before 3pm, you are guaranteed same day despatch.

### 2 OUR PRICE GUARANTEE

Inlec guarantee you real value for money. Our price match policy is simple - if you can hire the same product for less elsewhere, we guarantee to match that price and reduce it by a further 10% of the difference - and still deliver our industry leading technical and customer support.

For full details check our price-match guarantee online

### 3 TOP QUALITY GUARANTEED

All equipment is thoroughly checked prior to dispatch to ensure you receive it in full, safe working order. Your shipment will be securely packed and include manufacturer's instructions, accessories or consumables and a valid calibration certificate where appropriate. In addition, Inlec offer a 24 hour replacement service if you decide the equipment is not suitable for your application\*.

### 4 FRIENDLY, KNOWLEDGEABLE ADVICE GUARANTEED

Inlec are happy to provide you with free advice, from an unbeatable team of experienced, knowledgeable and friendly engineers and hire experts.

### 5 YOUR GUARANTEE OF THE BEST CUSTOMER SERVICE

Throughout your hire we will work hard to ensure you enjoy the very best in support and service from Inlec. We guarantee you won't find better service anywhere in the industry.

\*subject to availability and conditions

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