

## CWT Ultra-mini

A wide-band AC current probe with BNC output to connect to most types of oscilloscope or data acquisition devices.

**The CWT Ultra-mini (CWTUM) has an extremely thin, clip-around coil of typically 1.6mm cross section.** With such a thin coil it is possible to access even the most difficult to reach parts of a power electronic converter with negligible disruption to the circuit under test.



Coil on legs of TO-220



Different coil lengths available



### Key Features

- Wide operating temperature **-40°C to +125°C.**
- (-3dB) bandwidth from a **few Hz** to **30MHz.**
- Loads the circuit under test by only a **few pF.**
- Coil insulation **1.2kV pk.**
- Standard coil length (circumference) of **80mm.**  
*Longer coil lengths readily available.*
- **1.7mm** (max) cross section diameter.
- Peak di/dt capabilities up to **100kA/μs.**
- Current ratings from **30A pk** to **30kA pk.**



### Applications

- Switching current waveforms in power electronic circuits:
  - MOSFET or IGBT devices as small as TO-220 or TO-247.
  - Measuring power losses in semiconductor bond wires in power devices.
  - Monitoring currents in small inductors, capacitors, snubber circuits, etc.
- Measuring small AC currents in the presence of large DC currents (e.g. monitoring capacitor ripple).
- Power converter development and diagnostics.
- Measuring high frequency sinusoidal, pulsed or transient currents in power frequency to rf applications.

Model	Sensitivity (mV/A)	Peak Current (A)	Noise* <sup>1</sup> (mVp-p)	Droop (%/ms)	LF (-3dB) (Hz)	Peak di/dt (kA/μs)	HF (-3dB) Bandwidth* <sup>2</sup> (MHz)
CWTUM/015	200	30	20	80	116	2.0	30
CWTUM/03	100	60	20	65	67	4.0	30
CWTUM/06	50	120	15	35	34	8.0	30
CWTUM/1	20	300	15	9.0	9.2	20	30
CWTUM/3	10	600	10	6.0	6.2	40	30
CWTUM/6	5.0	1.2k	10	3.0	3.2	70	30
CWTUM/15	2.0	3.0k	5.0	2.0	2.0	70	30
CWTUM/30	1.0	6.0k	5.0	1.5	1.5	70	30
CWTUM/60	0.5	12.0k	5.0	1.0	1.0	100	30
CWTUM/150	0.2	30.0k	5.0	1.0	1.0	100	30

\*1 'Noise' is the internally generated integrator noise, this is predominantly the same frequency as the LF (-3dB) bandwidth.

\*2 The HF(-3dB) is specified for a 1m cable and 80mm coil, we can supply longer coils and cables on request.

#### di/dt ratings

These are 'Absolute maximum di/dt ratings' and values must not be exceeded.

Type	Abs. Max. peak di/dt	Abs. Max. rms di/dt
CWTUM 015   03   06	70kA/μs	1.0kA/μs
CWTUM 1   3   6   15   30	70kA/μs	1.2kA/μs
CWTUM 60   150	100kA/μs	1.2kA/μs



## Output

±6V pk corresponding to 'Peak Current' into  $\geq 100\text{k}\Omega$  (recommended e.g. DC1M $\Omega$  oscilloscope).  
±2V pk, Sensitivity is half the nominal value into 50 $\Omega$ .

## Accuracy

Calibrated to  $\pm 0.2\%$  reading with conductor central in the Rogowski coil loop.  
Conductor position in the coil (for a 2mm dia. conductor) typically  $\pm 2\%$  reading.  
Conductor position in the coil (for a 10mm dia. conductor) typically  $\pm 1\%$  reading.  
Linearity (with current magnitude) 0.05% reading.

## DC offset

±3mV max. at 25°C

## Temperature

Coil and cable -40°C to +125°C  
Integrator electronics 0°C to +40°C

## Coil voltage

1.2kV pk  
Safe peak working voltage to earth.  
Rating established by a 3kV rms, 50Hz, 60 sec flash test.

## Cable length

1m (length of cable from coil to electronics).  
**Longer cables are available on request.**

## Coil length

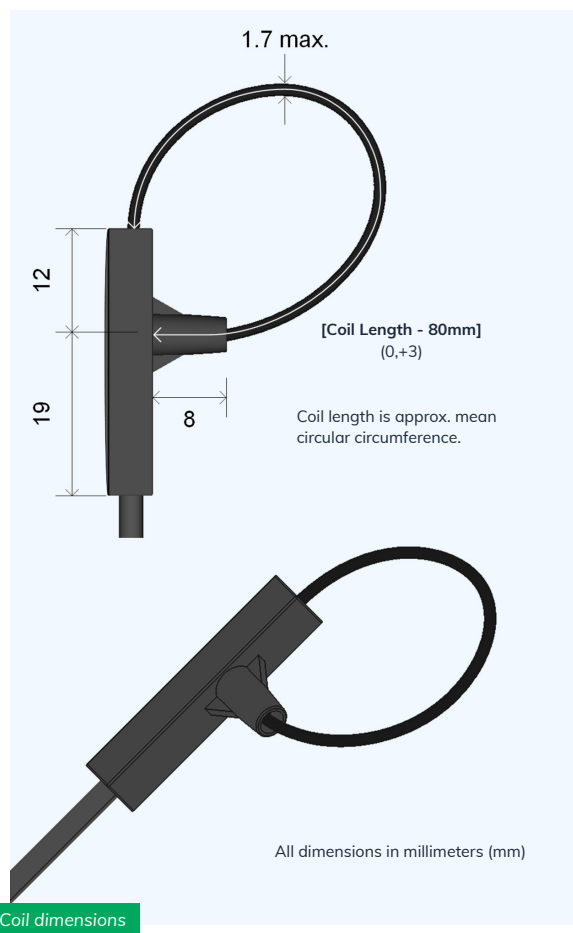
80mm  
**Longer coils are available on request.**

## Battery Options

**B Alkaline Batteries** -- 4 x 1.5V AA alkaline batteries, 25 hour life.  
External power adaptor disconnects batteries and powers unit.

**R Rechargeable Batteries** -- 4 x 1.2V NiMH batteries, 10 hour life.  
External power adaptor trickle charges batteries and powers unit

External power adaptor available in **US, EURO, UK & AUS** versions as an optional extra.



**1** **2** **3** **4** **5**  
**CWTUM / 015 / R / 1 / 80**

### Example part codes

#### **CWTUM/015/R/1/80**

CWT Ultra-mini peak current 30A, Rechargeable batteries, 1m cable, 80mm coil.

### Enquire about a custom coil / cable length

#### **CWTUM/6/B/2/300**

CWT Ultra-mini peak current 1200A, Alkaline batteries, 2m cable, 300mm coil.

### Generating the part code

- 1 Model**
- 2 Range**
- 3 Battery Option**
- 4 Cable Length (m)**
- 5 Coil Length (mm)**



#### Included as standard

- ✓ Carry Case
- ✓ Unit Model
- ✓ Batteries (B or R)
- ✓ 0.5m BNC Output Cable
- ✓ Calibration Certificate

#### Optional Extras

- + Longer Cable
- + Longer Coil
- + Power Adaptor (UK, EU, US, AU)



More detailed technical notes, dimensioned drawings, CAD files and quotation request for this product are available online.

**PENI**  
Power Electronic Measurements

+44 (0)115 946 9657  
[info@pemuk.com](mailto:info@pemuk.com)

Power Electronic Measurements Ltd  
Gloucester House  
162 Wellington Street  
Long Eaton  
Nottingham  
NG10 4HS  
United Kingdom

[www.pemuk.com](http://www.pemuk.com)

Rev. 11/24

