

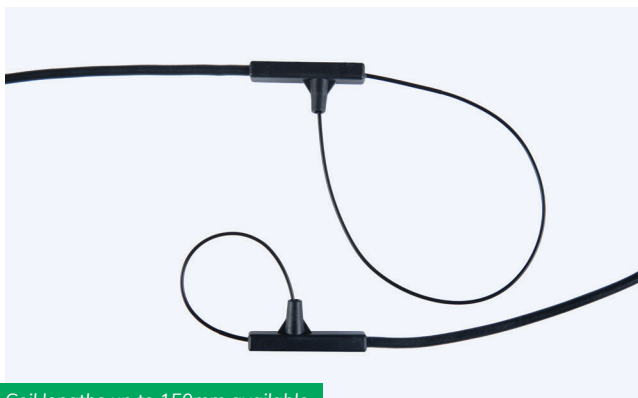
## CWTUM-S

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

**The CWTUM-S is an even thinner version of the original CWT Ultra-mini probe from PEM.** The Rogowski coil cross-section diameter is **just 1.2mm** without compromising operating temperature, high frequency performance or insulation voltage. Such a thin coil provides another solution for measuring current in tight spaces without disrupting the circuit under test.



Coil on a D<sup>2</sup>PAK



Coil lengths up to 150mm available



## Key Features

- Wide operating temperature **-40°C to +125°C**.
- High frequency (-3dB) **30MHz**.
- Loads the circuit under test by only a **few pH**.
- Standard coil length (circumference) of **80mm**.  
*Longer coil lengths readily available.*
- Coil insulation **1.2kV pk**.
- **1.2mm** cross section diameter.  
*Thinner coils available at lower insulation ratings*
- 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, D<sup>2</sup>PAK and other SMT power devices.
  - 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<br>(mV/A) | Peak Current<br>(A) | Noise* <sup>1</sup><br>(mVp-p) | Droop<br>(%/ms) | LF (-3dB)<br>(Hz) | Peak di/dt<br>(kA/μs) | HF (-3dB)<br>Bandwidth* <sup>2</sup><br>(MHz) |
|-------------|-----------------------|---------------------|--------------------------------|-----------------|-------------------|-----------------------|---|
| CWTUM-S/015 | 200                   | 30                  | 20                             | 85              | 150               | 2.0                   | 30  |
| CWTUM-S/03  | 100                   | 60                  | 18                             | 78              | 100               | 4.0                   | 30  |
| CWTUM-S/06  | 50                    | 120                 | 12                             | 70              | 75                | 8.0                   | 30  |
| CWTUM-S/1   | 20                    | 300                 | 10                             | 53              | 50                | 20                    | 30  |
| CWTUM-S/3   | 10                    | 600                 | 12                             | 11              | 12                | 40                    | 30  |
| CWTUM-S/6   | 5.0                   | 1.2k                | 12                             | 5.5             | 6.0               | 80                    | 30  |
| CWTUM-S/15  | 2.0                   | 3.0k                | 10                             | 2.8             | 3.0               | 100                   | 30  |
| CWTUM-S/30  | 1.0                   | 6.0k                | 10                             | 1.5             | 1.5               | 100                   | 30  |
| CWTUM-S/60  | 0.5                   | 12.0k               | 8.0                            | 1.0             | 1.0               | 100                   | 30  |
| CWTUM-S/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-S | 100kA/μs             | 1.0kA/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

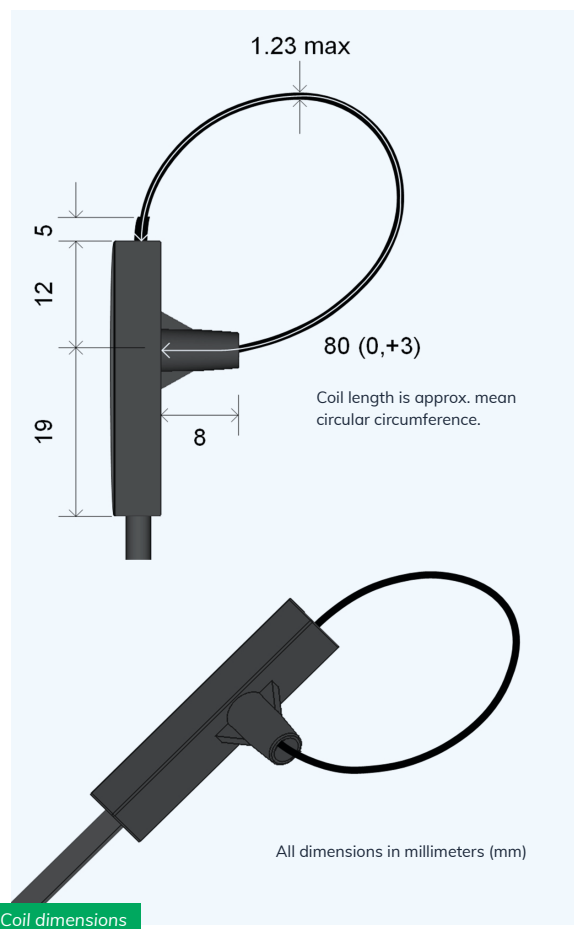
**B Alkaline Batteries** -- 4 x 1.5V AA alkaline batteries, 25 hour life.

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-S / 015 / R / 1 / 80**

### Example part codes

#### CWTUM-S/015/R/1/80

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

#### CWTUM-S/6/B/1/80

CWT Ultra-mini (S), peak current 1200A, Alkaline batteries, 1m cable, 80mm 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

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