

## AC/DC Current Probes

### TCP0020, TCP2020, TCP202A Datasheet



#### Features & benefits

- Easy-to-use and accurate AC/DC current measurements
- DC to >50 MHz bandwidth
- Core jaw diameter of 5 mm (0.2 in.)
- Accurately measures current levels as low as 10 mA per division
- High accuracy with typically less than 1% DC gain error
- Split-core construction allows easy circuit connection
- Low noise and DC drift
- TCP0020
  - 20 A<sub>RMS</sub> maximum current capability
  - 100 A peak pulse current capability
  - Connects directly to oscilloscopes with the TekVPI™ probe interface
  - Provides automatic units scaling and readout on the oscilloscope display
  - One-button degauss and AutoZero control for ease of use

- Easy access to scope-displayed probe menu for probe setup control and operating status information
- Remote control capability through TekVPI oscilloscope
- TCP2020
  - 20 A<sub>RMS</sub> maximum current capability
  - 100 A peak pulse current capability
  - 10 mA/mV sensitivity
  - BNC output connects to most oscilloscopes and other measurement equipment (>100 kΩ termination required)
  - Degauss button and thumbwheel for DC offset adjustment
  - Powered by an AC adapter
- TCP202A
  - 15 A<sub>DC</sub> + Peak AC maximum current capability
  - 50 A peak pulse current capability
  - Connects directly to oscilloscopes with the TekProbe™ interface
  - Provides automatic units scaling and readout on the oscilloscope display
  - Degauss button and thumbwheel for DC offset adjustment
- Safety Certified

#### Applications

- Power supplies
- Semiconductor devices
- Electronic ballasts
- Industrial/consumer electronics
- Mobile communications
- Motor drives
- Transportation systems

#### TCP0020, TCP2020 and TCP202A

The TCP0020, TCP2020, and TCP202A are a family of high-performance, easy-to-use AC/DC current probes designed for use with a variety of oscilloscopes. The TCP0020 is designed for direct connection to oscilloscopes with the TekVPI™ probe interface and the TCP202A is designed for direct connection to oscilloscopes with the TekProbe™ probe interface. The TCP2020 is designed for use with any instrument with BNC inputs and >100 kΩ input termination.

These AC/DC current probes provide sufficient performance to support 50 MHz measurement system bandwidth. The TCP0020 and TCP2020

provide a maximum 20 A<sub>RMS</sub> measurement range, while the TCP202A provides a maximum 15 A<sub>DC + Peak AC</sub> measurement range. These probes also provide excellent accuracy to current levels as low as 10 mA, important for meeting today's challenging current measurement needs.

## Specifications

All specifications apply to all models unless noted otherwise.

### Characteristics

#### General

| Characteristic         | Description                                                                         |
|------------------------|-------------------------------------------------------------------------------------|
| Bandwidth              | DC to $\geq 50$ MHz                                                                 |
| Rise time              | 20 A <sub>RMS</sub> (TCP0020 and TCP2020)<br>15 A <sub>DC</sub> + Peak AC (TCP202A) |
| Max peak pulse current | 100 A (TCP0020 and TCP2020)<br>50 A (TCP202A)                                       |
| Maximum sensitivity    | 10 mA (on oscilloscopes that support 1 mV/div setting)                              |
| Max bare-wire voltage  | 150 V CAT II (300 V CAT II insulated wire)                                          |

#### Typical

| Characteristic        | Description                                                                    |
|-----------------------|--------------------------------------------------------------------------------|
| DC accuracy           | $\pm 1\%$ typical, $\pm 3\%$ warranted                                         |
| Max amp-secon product | 1000 A* $\mu$ s (TCP0020 and TCP2020)<br>500 A* $\mu$ s (TCP202A)              |
| Insertion impedance   | 0.036 $\Omega$ at 1 MHz<br>0.117 $\Omega$ at 10 MHz<br>0.54 $\Omega$ at 50 MHz |
| Signal delay          | 17 ns                                                                          |

#### Environmental

| Characteristic | Description                                                                                                |
|----------------|------------------------------------------------------------------------------------------------------------|
| Temperature    |                                                                                                            |
| Operating      | 0 °C to +50 °C                                                                                             |
| Non-operating  | –40 °C to +75 °C                                                                                           |
| Humidity       |                                                                                                            |
| Operating      | 5% to 95% RH, tested up to +30 °C (+86 °F)<br>5% to 85% RH, tested at +30 °C to +50 °C (+86 °F to +122 °F) |
| Non-operating  | 5% to 95% RH, tested up to +30 °C (+86 °F)<br>5% to 85% RH, tested at +30 °C to +75 °C (+86 °F to +167 °F) |
| Regulatory     |                                                                                                            |
| Safety         | CSA1010.1:1997, CSA1010.2.032-96, IEC61010-1:2001, IEC61010-2-032                                          |

**Physical characteristics**

| Probe head size | mm    | in.          |
|-----------------|-------|--------------|
| Height          | 30.5  | 1.2          |
| Width           | 15.2  | 0.6          |
| Length          | 148   | 5.8          |
| Cable length    | 2     | 79           |
| Weight          | kg    | lb.          |
| Probe only      | 0.227 | 0.5          |
| Shipping        | 1.22  | 2 lb. 11 oz. |

**Power requirements**

TCP0020 is powered directly by oscilloscopes with the TekVPI™ probe interface.

TCP2020 is powered by AC adapter. (Specify power plug option when ordering.)

TCP202A is powered directly by oscilloscopes with the TekProbe™ probe interface or through the TekVPI™ probe interface when used with the TPA-BNC adapter.

**Standard warranty**

One-year parts and labor.

## Ordering information

|                |                                                                                                                                                                                                                               |
|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>TCP0020</b> | AC/DC current probe.<br><b>Includes:</b> Instruction manual (English) (071-3002-xx), Probe ground lead – 6 in. length (196-3120-xx), Nylon carrying case (016-1952-xx).                                                       |
| <b>TCP2020</b> | AC/DC current probe.<br><b>Includes:</b> Instruction manual (English) (071-3002-xx), Probe ground lead – 6 in. length (196-3120-xx), Nylon carrying case (016-1952-xx), AC adapter (specify power plug option when ordering). |
| <b>TCP202A</b> | AC/DC current probe.<br><b>Includes:</b> Instruction manual (English) (071-3002-xx), Probe ground lead – 6 in. length (196-3120-xx), Nylon carrying case (016-1952-xx).                                                       |

### Power Plug Options (TCP2020 Only)

| Option   | Description                          |
|----------|--------------------------------------|
| Opt. A0  | North America Power, 115 V, 60 Hz    |
| Opt. A1  | Universal Euro Power, 220 V, 50 Hz   |
| Opt. A2  | United Kingdom Power, 240 V, 50 Hz   |
| Opt. A3  | Australia Power, 240 V, 50 Hz        |
| Opt. A5  | Switzerland Power, 220 V, 50 Hz      |
| Opt. A6  | Japan Power, 100 V, 110/120 V, 60 Hz |
| Opt. A10 | China Power, 50 Hz                   |
| Opt. A11 | India Power, 50 Hz                   |
| Opt. A12 | Brazil Power, 60 Hz                  |
| Opt. A99 | No Power Cord                        |

### Service options

|                  |                                                                                                                         |
|------------------|-------------------------------------------------------------------------------------------------------------------------|
| <b>Opt. C3</b>   | Calibration Service 3 Years                                                                                             |
| <b>Opt. C5</b>   | Calibration Service 5 Years                                                                                             |
| <b>Opt. CA1</b>  | Single Calibration or Functional Verification                                                                           |
| <b>Opt. D1</b>   | Calibration Data Report                                                                                                 |
| <b>Opt. D3</b>   | Calibration Data Report 3 Years (with Opt. C3)                                                                          |
| <b>Opt. D5</b>   | Calibration Data Report 5 Years (with Opt. C5)                                                                          |
| <b>Opt. G3</b>   | Complete Care 3 Years (includes loaner, scheduled calibration, and more)                                                |
| <b>Opt. G5</b>   | Complete Care 5 Years (includes loaner, scheduled calibration, and more)                                                |
| <b>Opt. IF</b>   | Upgrade Installation Service                                                                                            |
| <b>Opt. R3</b>   | Repair Service 3 Years (including warranty)                                                                             |
| <b>Opt. R3DW</b> | Repair Service Coverage 3 Years (includes product warranty period). 3-year period starts at time of instrument purchase |
| <b>Opt. R5</b>   | Repair Service 5 Years (including warranty)                                                                             |
| <b>Opt. R5DW</b> | Repair Service Coverage 5 Years (includes product warranty period). 5-year period starts at time of instrument purchase |

|              |                                               |
|--------------|-----------------------------------------------|
| Opt. S1      | On-site Service 1 Year                        |
| Opt. S3      | On-site Service 3 Years (with R or C options) |
| Opt. SILV100 | Standard warranty extended to 5 years         |
| Opt. SILV200 | Standard warranty extended to 5 years         |
| Opt. SILV400 | Standard warranty extended to 5 years         |
| Opt. SILV600 | Standard warranty extended to 5 years         |
| Opt. SILV900 | Standard warranty extended to 5 years         |

Probes and accessories are not covered by the oscilloscope warranty and Service Offerings. Refer to the datasheet of each probe and accessory model for its unique warranty and calibration terms.

## Recommended accessories

| Accessory   | Description                                                                            |
|-------------|----------------------------------------------------------------------------------------|
| 067-2396-xx | Current loop, 1 turn, 50 $\Omega$ with BNC connector used for performance verification |
| 067-1686-xx | Deskew/calibration fixture                                                             |



Tektronix is ISO 14001:2015 and ISO 9001:2015 certified by DEKRA.

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**For Further Information.** Tektronix maintains a comprehensive, constantly expanding collection of application notes, technical briefs and other resources to help engineers working on the cutting edge of technology. Please visit [www.tek.com](http://www.tek.com).

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