

TECHNICAL DATA

Fluke 3540 FC Three-Phase Power Monitor



THREE-PHASE MONITORING AND STREAMING

Monitor three-phase systems and stream data to the Fluke Connect Cloud

CONNECTED

The measurement data from the Fluke Connect Cloud is available on any connected device using the Fluke Connect mobile app or Fluke Connect Condition Monitoring software

EASY-TO-INSTALL AND MOVE

Powered from the measurement circuit, configuration checker can automatically correct connection errors

ALWAYS ON

The Monitor includes a mode to log measurements when no connection to the Fluke Connect Cloud is available

The 3540 FC Three-Phase Power Monitor is a compact device to monitor key electrical parameters at three-phase machinery (or equipment) and stream data to the Fluke Connect® Cloud. The measurement data is available on any connected device using Fluke Connect mobile app or Fluke Connect® Condition Monitoring software.

Graphs are available to show the trends and fluctuations of the measurements during the monitoring period. Alarm settings notify users immediately when measurement values are outside specified thresholds.

Monitoring the electrical parameters like current and distortion can reveal how the machinery (or equipment) is performing, for example:

- A baseline current or load at a critical pump is trending dangerously close to the motor's maximum current rating, taking service factor into account.
- The total power at an induction furnace appears to be fluctuating abnormally during a curing cycle.
- Determining how often a submersible or hydraulic pump is cycling on/off to maintain flow or pressures, in some cases simply validates their is power to the pump.

Immediate access to information about machinery performance can be the difference between preventing a production stoppage. Understanding a machines change in performance triggers the need to investigate further, the alternative is unknowingly letting the machine run to fail.

Measurement:

- Single or three phase loads
- Voltage, Current and Frequency
- Power including Active Power (VA), Non-active power (var) and Power Factor (PF)
- Total Harmonic Distortion (%)

The Monitor includes a mode to log measurements when no connection to the Fluke Connect® Cloud is available. You can transfer Logged data with the Fluke Connect mobile app.

The total number of measurements depends on the selected topology (wiring configurations), like wye, delta, or split phase.

Specifications

| General specifications | | |
|------------------------|--|---|
| Color LCD display | 4.3-inch active matrix color TFT, 480 pixels x 272 pixels, resistive touch panel | |
| Warranty | 3540 FC and built-in power supply | 2 years (battery not included) |
| | Accessories | 1 year |
| Calibration cycle | 2 years | |
| Dimensions (wxhxd) | 3540 FC | 19.8 cm x 16.7 cm x 5.5 cm (7.8 in x 6.6 in x 2.2 in) |
| | Detachable power supply | 13.0 cm x 13.0 cm x 4.5 cm (5.1 in x 5.1 in x 1.8 in) |
| | 3540 FC with power supply attached | 19.8 cm x 16.7 cm x 9 cm (7.8 in x 6.6 in x 4.0 in) |
| Weight | 3540 FC | 1.1kg (2.5 lb) |
| | Power Supply | 400 g (0.9 lb) |
| Tamper protection | Kensington lock | |

| Environmental specifications | |
|------------------------------|---|
| Operating temperature | 0 °C to 45 °C (32 °F to 113 °F) |
| Storage temperature | <20 °C to +60 °C (-4 °C to +140 °F), with battery: -20 °C to +50 °C (-4 °F to +122 °F) |
| Operating humidity | <10 °C (<50 °F) non condensing |
| | 10 °C to 30 °C (50 °F to 86 °F) ≤95 % |
| | 30 °C to 40 °C (86 °F to 104 °F) ≤75 % |
| | 40 °C to 45 °C (104 °F to 113 °F) ≤45 % |
| Operating altitude | 2000 m (6,500 ft) (up to 4,000 m derate to 1000 V CAT II/600 V CAT III/300 V CAT IV) |
| Storage altitude | 12,000 m (39,000 ft) |
| IP rating | IEC 60529:IP50, in connected condition with protection caps in place |
| Vibration | MIL-T-28800E, Type 3, Class III, Style B |

| Safety | | |
|-----------------|-------------------------------|---|
| IEC 61010-1 | IEC mains input | Overvoltage Category II, Pollution Degree 2 |
| | Voltage terminals | Overvoltage Category IV, Pollution Degree 2 |
| IEC 61010-2-033 | CAT IV 600 V / CAT III 1000 V | |

| Electromagnetic compatibility (EMC) | |
|-------------------------------------|---|
| International | IEC 61326-1: Industrial |
| Korea (KCC) | Class A Equipment (Industrial Broadcasting & Communication Equipment) |
| USA (FCC) | 47 CFR 15 subpart B. This product is considered an exempt device per clause 15.103. |

| Wireless radio with adapter | |
|-----------------------------|----------------------|
| Frequency range | 2412 MHz to 2462 MHz |
| Output power | <100 mW |

| Electrical specifications | | |
|--|---|--|
| Single and Three Phase Topologies | | |
| Wiring configurations | 1- Φ , 1- Φ IT, Split phase, 3- Φ wye, 3- Φ wye IT, 3- Φ wye balanced, 3- Φ delta, 3- Φ Aron/Blondel (2-element delta), 3- Φ delta open leg, 3- Φ high leg delta, 3- Φ delta balanced. Currents only (load studies) | |
| Voltage inputs | | |
| Number of inputs | 4 (3 phases and neutral) | |
| Maximum input voltage | 1000 Vrms (1700 Vpk) phase to neutral | |
| Input impedance | 10 M Ω each phase to neutral | |
| Bandwidth | 42.5 Hz to 3.5 kHz | |
| Scaling | 1:1, variable | |
| Current inputs | | |
| Number of inputs | 3, mode selected automatically for attached sensor | |
| Current sensor output voltage | Clamp | 500 mVrms / 50 mVrms; CF 2.8 |
| | Rogowski coil | 150 mVrms/15 mVrms at 50 Hz, 180 mVrms/18 mVrms at 60 Hz; CF 4; all at nominal probe range |
| Bandwidth (-3 dB) | 42.5 Hz to 3.5 kHz | |
| Scaling | 1:1 and variable | |
| Data acquisition | | |
| Resolution | 16-bit synchronous sampling | |
| Sampling frequency | 10.24 kHz at 50/60Hz, synchronized to mains frequency | |
| Input signal frequency | Mains 50/60 Hz (42.5 to 69 Hz) | |
| Data storage | Internal flash memory (not user replaceable) | |
| Memory size | Typical 1 offline logging session of 1 week with 1 second intervals. The number of possible logging sessions and logging period depends on user requirements. | |
| Measured parameters | Voltage, current, frequency, THD V, THD A, power, power factor, fundamental power, DPF | |
| Averaging interval | 1 s | |
| Total harmonic distortion | THD for voltage and current is calculated on 25 harmonics | |
| Calculated min/max values times | | |
| Voltage | Full cycle RMS (20 ms at 50 Hz, 16.7 ms at 60 Hz) | |
| Current | Half cycle RMS (10 ms at 50 Hz, 8.3 ms at 60 Hz) | |
| Power | 200 ms | |
| Interfaces | | |
| USB-A | Firmware updates, max. supply current: 120 mA | |
| WiFi | | |
| Supported modes | Direct connection and connection to infrastructure | |
| Security | WPA2-AES with pre-shared key | |
| Power supply | | |
| Voltage range | nominal 100 V to 500 V (85 V min to 550 V max) using safety plug input | |
| Mains power | nominal 100 V to 240 V (85 V min to 265 V max) using IEC 60320 C7 input | |
| Power consumption | Maximum 50 VA (max. 15 VA when powered using IEC 60320 input) | |
| Standby power | <0.3 W only when powered using IEC 60320 input | |
| Efficiency | $\geq 68.2\%$ (in accordance with energy efficiency regulations) | |
| Mains frequency | 50/60 Hz $\pm 15\%$ | |
| Battery power | Li-ion 3.7 V, 9.25 Wh, customer-replaceable | |
| On-battery runtime | Up to 4 hr (up to 5.5 hr in energy saving mode) | |
| Charging time | <6 hr | |

Accuracy at reference conditions

| Parameter | Range | Accuracy | | |
|-----------------|----------------------|-----------------|--|--------------------|
| | | Max. resolution | Intrinsic accuracy at reference conditions (% of reading + % of range) | |
| Voltage | 1000 V | 0.1 V | ± (0.2 % + 0.01 %) | |
| Current | | | | |
| Direct input | Rogowski Mode | 15 mV | 0.01 mV | ± (0.3 % + 0.02 %) |
| | | 150 mV | 0.1 mV | ± (0.3 % + 0.02 %) |
| | Clamp Mode | 50 mV | 0.01 mV | ± (0.2 % + 0.02 %) |
| | | 500 mV | 0.1 mV | ± (0.2 % + 0.02 %) |
| 1500 A iFlex | 150 A | | 0.01 A | ± (1 % + 0.02 %) |
| | 1500 A | | 0.1 A | ± (1 % + 0.02 %) |
| 3000 A iFlex | 300 A | | 1 A | ± (1.5 % + 0.03 %) |
| | 3000 A | | 10 A | ± (1 % + 0.02 %) |
| 6000 A iFlex | 600 A | | 1 A | ± (1.5 % + 0.03 %) |
| | 6000 A | | 10 A | ± (1.5 % + 0.03 %) |
| i40s-EL 40 A | 4 A | | 1 mA | ± (0.7 % + 0.02 %) |
| | 40 A | | 10 mA | ± (0.7 % + 0.02 %) |
| Frequency | 42.5 Hz to 69 Hz | | 0.01 Hz | ± (0.1 %) |
| Voltage Min/Max | 1000 V | | 0.1 V | ± (1 % + 0.1 %) |
| Current Min/Max | defined by accessory | | defined by accessory | ± (5 % + 0.2 %) |
| THD on voltage | 1000 % | | 0.1 % | ± (2.5 % ± 0.05 %) |
| THD on current | 1000 % | | 0.1 % | ± (2.5 % ± 0.05 %) |

Power/Energy

| Parameter | Direct Input ¹ | iFlex1500-12 | iFlex3000-24 | iFlex6000-36 | i40s-EL |
|--|--|-----------------|--------------|--------------|------------|
| Parameter | Clamp: 50 mV/500 mV | 150A/1500A | 300A/3000A | 600/6000A | 4A/40A |
| | Rogowski: 15 mV/150 mV | | | | |
| Power range W, VA, var | Clamp: 50 W/500 W | 150 kW/1.5 MW | 300 kW/3 MW | 600 kW/6 MW | 4 kW/40 kW |
| | Rogowski: 15 W/150 W | | | | |
| Max. resolution W, VA, var | 0.1 W | 0.01 kW/0.10 kW | 1 kW/10 kW | 1 kW/10 kW | 1 W/10 W |
| Max. resolution PF, DPfund. | 0.01 2.5 % of measured apparent power | | | | |
| Phase (voltage to current) of range ¹ | ± 0.2° | ± 0.28° | | | ± 1° |

¹ Only for calibration laboratories

| iFlex probe specifications | |
|---|--|
| Measuring range | |
| iFlex 1500-12 | 1 A ac to 150 A ac / 10 A ac to 1500 A ac |
| iFlex 3000-24 | 3 A ac to 300 A ac / 30 A ac to 3000 A ac |
| iFlex 6000-36 | 6 A ac to 600 A ac / 60 A ac to 6000 A ac |
| Nondestructive current | 100 kA (50/60 Hz) |
| Intrinsic error at reference condition ¹ | ± 0.7 % of reading |
| Accuracy 3540 FC + iFlex | |
| iFlex 1500-12 and iFlex 3000-24 | ± (1 % of reading + 0.02 % of range) |
| iFlex 6000-36 | ± (1.5 % of reading + 0.03 % of range) |
| Temperature Coefficient over operating temperature range | |
| iFlex 1500-12 and iFlex 3000-24 | 0.05 % of reading / °C (0.09 % of reading / °F) |
| iFlex 6000-36 | 0.1 % of reading / °C (0.18 % of reading / °F) |

| Positioning error with position of conductor in the probe window | | |
|---|--|--|
| | iFlex1500-12, iFlex3000-24 | iFlex6000-36 |
| Probe Window A | ± (1 % of reading + 0.02 % of range) | ± (1.5 % of reading + 0.03 % of range) |
| Probe Window B | ± (1.5 % of reading + 0.02 % of range) | ± (2.0 % of reading + 0.03 % of range) |
| Probe Window C | ± (2.5 % of reading + 0.02 % of range) | ± (4 % of reading + 0.03 % of range) |

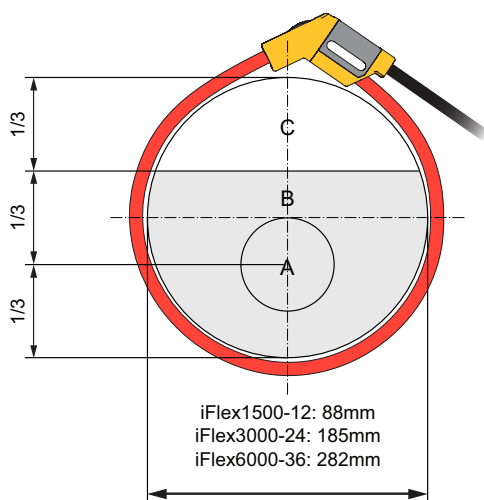


Figure. iFlex Probe Window

| iFlex probe specifications | |
|---|----------|
| External magnetic field rejection in reference to external current (with cable >100 mm from the head-coupling and r-coil) | 40 dB |
| Phase shift | < ± 0.5° |

| Transducer length | |
|---------------------------------|---|
| iFlex 1500-12 | 305 mm (12 in) |
| iFlex 3000-24 | 610 mm (24 in) |
| iFlex 6000-36 | 915 mm (36 in) |
| Transducer cable diameter | 7.5 mm (0.3 in) |
| Minimum bending radius | 38 mm (1.5 in) |
| Output cable length | |
| iFlex 1500-12 | 2 m (6.6 ft) |
| iFlex 3000-24 and iFlex 6000-36 | 3 m (9.8 ft) |
| Weight | |
| iFlex 1500-12 | 115 g (4 oz) |
| iFlex 3000-24 | 170 g (6 oz) |
| iFlex 6000-36 | 190 g (7 oz) |
| Material | |
| Transducer cable | TPR |
| Coupling | POM + ABS/PC |
| Output cable | TPR/PVC |
| Operating temperature | -20 °C to +70 °C (-4 °F to 158 °F) temperature of conductor under test shall not exceed 80 °C (176 °F) |
| Storage temperature | -40 °C to +80 °C (-40 °F to 176 °F) |
| Operating relative humidity | 15 % to 85 % noncondensing |
| IP Rating | IEC 60529:IP50 |
| Operating altitude | 2000 m (6,500 ft) up to 4000 m (13,000 ft) derate to 1000 V CAT II / 600 V CAT III / 300 V CAT IV |
| Storage altitude | 12 km (40,000 ft) |
| Warranty | 1 year |

| | |
|--------------------|--------------------------------|
| Bandwidth | 10 Hz to 23.5 kHz (probe only) |
| Frequency derating | I x f ≤ 385 kA Hz |
| Working voltage | 1000 V CAT III, 600 V CAT IV |

¹Reference condition:

- Environmental: 23 °C ± 5 °C, no external electrical/magnetic field, RH 65 %
- Primary conductor in center position



Preventive maintenance simplified. Rework eliminated.

Save time and improve the reliability of your maintenance data by wirelessly syncing measurements using the Fluke Connect® system.

- Eliminate data-entry errors by saving measurements directly from the tool and associating them with the work order, report or asset record.
- Maximize uptime and make confident maintenance decisions with data you can trust and trace.
- Access baseline, historical and current measurements by asset.
- Move away from clipboards, notebooks and multiple spreadsheets with a wireless one-step measurement transfer.
- Share your measurement data using ShareLive™ video calls and emails.
- The 3540 FC is part of a growing system of connected test tools and equipment maintenance software. Visit the website to learn more about the Fluke Connect® system.

Find out more at flukeconnect.com



All trademarks are the property of their respective owners. WiFi or cellular service required to share data. Smartphone, wireless service and data plan not included with purchase. First 5 GB of storage is free. Phone support details can be viewed at fluke.com/phones.

Smart phone wireless service and data plan not included with purchase. Fluke Connect is not available in all countries.

Ordering information

FLUKE-3540 FC Three-Phase Power Monitor

Included

Instrument, power supply, voltage test leads, dolphin clips (4x), 1500A flexible current probe (3x), magnetic hanging kit, WiFi to USB adapter, and color coding set

Fluke. *Keeping your world up and running.®*

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