AEMC® INSTRUMENTS

Correctly Sizing Electrical Installations

To measure all the overcurrents, a single solution: True *InRush*® function

The Situation

When an installation or machine is started up or used intensively, it usually causes a significant variation of the current in the electricity supply circuit.

- When it starts up, a motor may require several times the full-load current. This starting current is called the Inrush.
- A transformer is another device which may cause overloads on its own. When a transformer is powered up, there is an Inrush current of approximately 25 times the rated current for approximately 10 ms.
- Electronically-controlled power supplies are a source of overcurrents caused by the capacitors used to store energy.
- The same principle is used in many mass-consumer electronic appliances by means of a switching power supply. These devices may cause very strong current surges which may sometimes lead to a spark when they are powered up.

As a result, electricians often have difficulty determining the right sizing of electrical installations in terms of both the conductors and the protective systems used.

- It becomes more complex to choose the overcurrent protection systems, such as fuses and circuit-breakers when high Inrush currents have to be tolerated.
- The overcurrent protection must react quickly to any overload or short-circuit, but must not trip in the event of a high overcurrent resulting from normal use rather than from a fault.

The AEMC Instruments solution: **integration of the True *InRush*® function in all the clamps in the 200, 400 and 600 Series.**

Industry

Factory

Maintenance

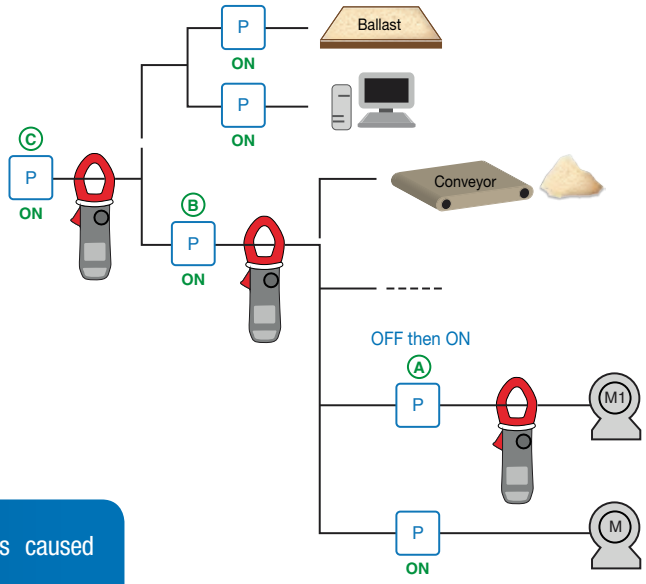
TrueInRush

Diagram of an installation in normal operation

When the motor M1 starts up:

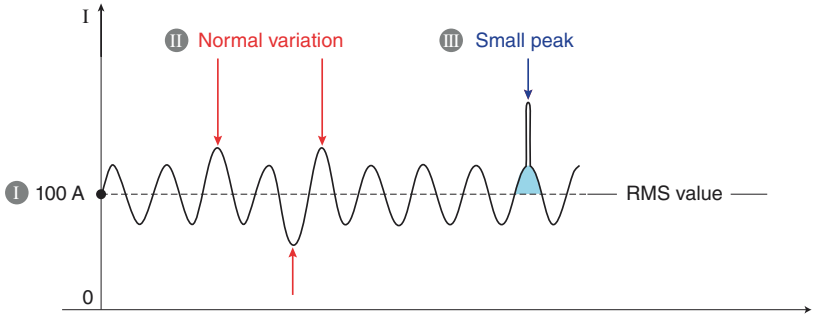
- protection Ⓐ may be activated and may be tripped (start-up Inrush)
- protection Ⓑ may or may not be activated
- protection Ⓒ may or may not be activated

To prevent tripping of protections Ⓑ and Ⓒ, it is not enough simply to find out the Inrush current of motor M1.

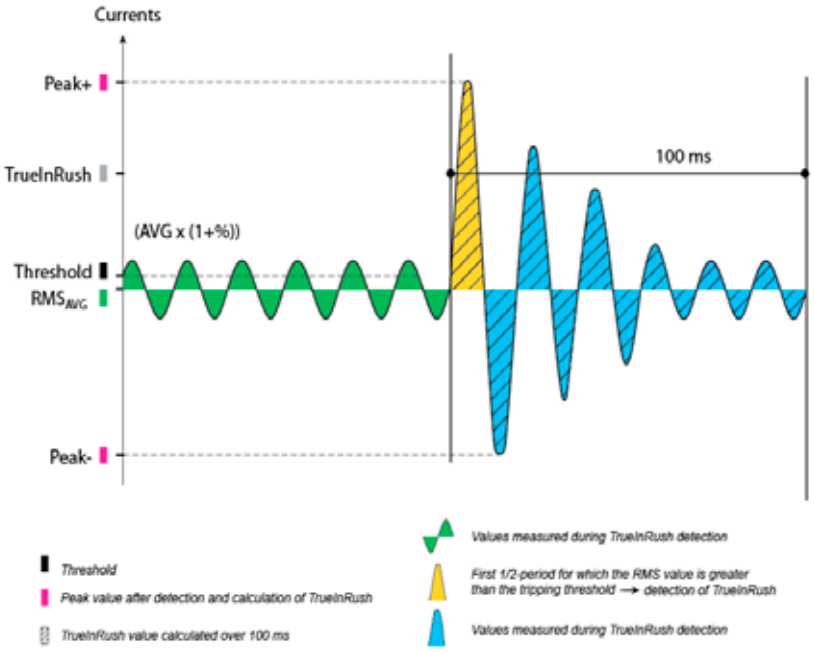


Most products on the market can only measure the Inrush currents caused by powering up an installation or machine.
Only the TrueInrush function allows you to capture an overcurrent on an installation in operation, both at startup Ⓐ and at Ⓑ and Ⓒ.

The TrueInRush function involves:



- Ⅰ Acquisition of the average steady-state current value on the installation
- Ⅱ Adjustment of the sensitivity to filter out the normal variations inherent to any installation in operation
- Ⅲ ½-period monitoring to include the energy and heat aspects when the protective systems are tripped and to exclude spurious peaks
- A TRMS measurement over a 100 ms period and the peak amplitudes of the overcurrent



To deal with the problems involving untimely tripping of the protective systems,

the Clamp-on Meters 200, 400, and 600 Series offer a simple means of diagnosis

In practice…

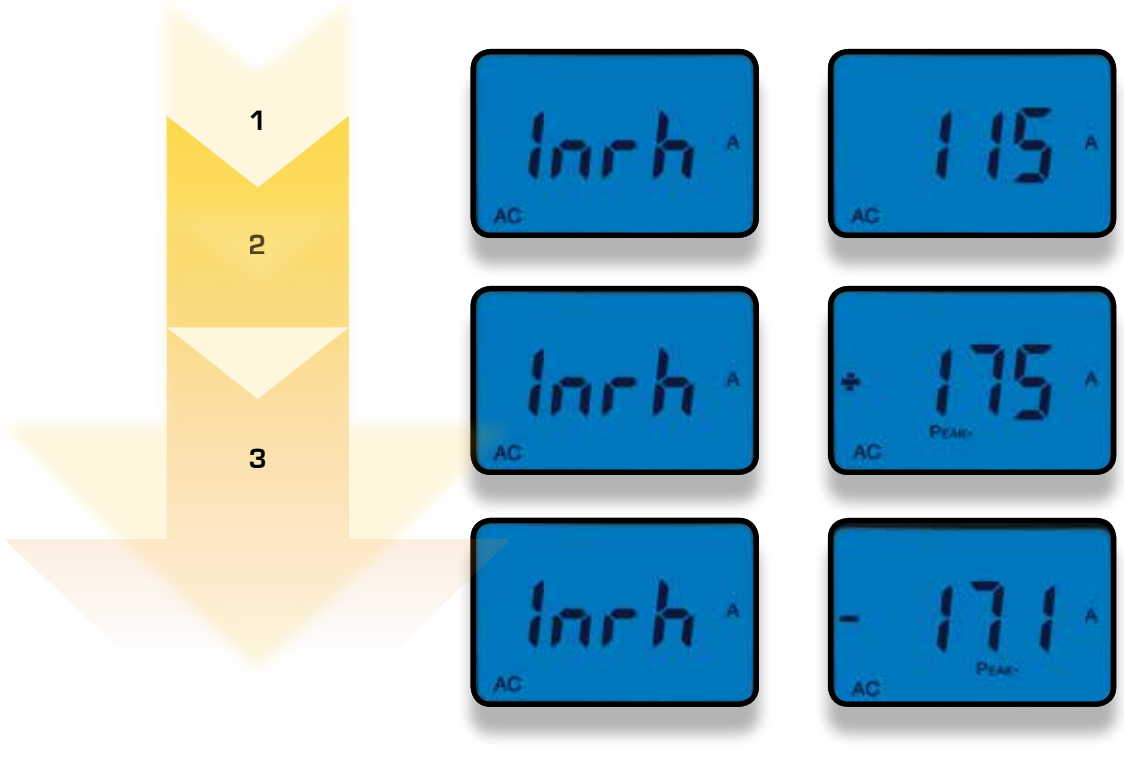
A few very simple steps are all it takes.

1. Clamp the meter around the conductor using the "Ampere" setting; the clamp automatically determines the type of signal (alternating or direct current) and calculates the average value of the current consumed by the installation.

2. Start TrueInRush acquisition.
   The clamp then displays the trigger threshold and begins the monitoring phase.

...In practice

3. As soon as an overcurrent is detected, the clamp displays the RMS value and the maximum instantaneous amplitudes of the waveform (peak values)..



The True *InRush*® function is designed to deal with a recurrent problem linked to the sizing of electrical installations, in terms of both the conductors and protective systems implemented.

All the overcurrents that occur on an installation, machine or group of machines subject to heavy use **are captured with the** True *InRush*® **function.**

This makes it simpler to size complex installations correctly, thus saving considerable time.

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