B&R X20AP3131

01 Energy Measurement Module / system role

Product function

B&R X20AP3131 combines electrical consumption data with power-quality information so that a machine controller can relate energy use to its operating state.

Selected configuration

The module measures three voltage phases and four AC currents. The selected 3131 variant uses 5 A secondary current transformers; the current-transformer ratio must be configured for meaningful primary-current and energy values.

Functional path

Three-phase circuit	Voltage and CT inputs	Power/energy analysis	Controller process image

Inputs	Three voltages and four 5 A CT channels
Analysis	Power, energy and harmonics
Capture	Seven-channel 8 kHz trace

Voltage measurement supports up to 480 V AC between phases and 277 V AC phase-to-neutral at nominal 50/60 Hz, with a 45–65 Hz measurable frequency range. The displayed 655 V limit is not a normal input-rating target.

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02 Technical operating envelope

Voltage phases	3
Current inputs	4 AC inputs
CT secondary rating	5 A
Phase-to-phase voltage	480 V AC maximum
Phase-to-neutral voltage	277 V AC maximum
Nominal frequency	50/60 Hz
Frequency range	45–65 Hz

Voltage input impedance	1.68 MΩ
Current-input burden	20 mΩ
Voltage resolution	10 mV with direct voltage connection
Frequency resolution	0.01 Hz
Harmonic analysis	Through 31st harmonic
Trace sampling	8 kHz for 3 voltage and 4 current channels

X20AP3131 uses 5 A current-transformer secondary inputs. The X20AP3132 grounded-current-transformer arrangement is a different variant; accuracy depends on revision and stated test conditions.

Operating interpretation

CT ratio and polarity errors affect several derived quantities simultaneously. Establish the primary scaling and phase assignment before evaluating metering accuracy.

Configuration boundary

Match the 5 A 3131 input variant, CT insulation, phase wiring and module revision; do not transfer grounded-CT wiring or revision-specific accuracy from another option.

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03 System integration and applications

Machine energy management

Relate active, reactive and apparent energy to the machine operating cycle.

Three-phase load monitoring

Observe phase currents, voltages and power with correctly configured transformer scaling.

Power-quality analysis

Assess harmonic content, phase sequence and voltage disturbances within the supported functions.

Waveform capture

Record the voltage and current channels through the 8 kHz trace and FIFO mechanism.

System and supply context

B&R X20AP3131 operates within the following defined system context. Match X20AP3131, 5 A CT inputs and the installed transformer arrangement.

Application boundary

The applications below describe its technical role. Select associated hardware and configuration for the actual installation.

Why must the transformer ratio be configured for X20AP3131?

The secondary measurement must be converted to the actual primary current. An incorrect ratio propagates into power and energy calculations.

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04 Engineering selection decisions

Which current-transformer secondary rating does X20AP3131 require?

The X20AP3131 variant uses 5 A secondary inputs. The 20 mA and 1 A variants have different order numbers.

Does a 655 V displayed value make X20AP3131 a 655 V rated input module?

No. The nominal limit is 480 V AC phase-to-phase and 277 V AC phase-to-neutral. A maximum displayed value requires checking for an exceeded measurement range.

Why does current-transformer polarity matter for X20AP3131?

Polarity and phase assignment affect the relationship between voltage and current, including power sign, phase angle and energy-flow direction.

Which frequency range can X20AP3131 measure?

It supports a measurable frequency range of 45–65 Hz around nominal 50/60 Hz systems.

Review harmonic and trace data	Use the harmonic analysis and 8 kHz trace for their intended diagnostic purpose. Keep sample timing and FIFO behavior in mind when comparing a recorded disturbance with controller events.
Retain the metering configuration	Save CT ratios, polarity, phase map, voltage arrangement, module revision and verification results. Keep the exact variant's insulation and wiring requirements with the service record.

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05 Configuration boundary and references

Lifecycle and support

The current manufacturing and factory-support phase of X20AP3131 is unconfirmed. Apter Power availability is assessed separately from manufacturer lifecycle status.

Replacement assessment

Match the 5 A 3131 input variant, CT insulation, phase wiring and module revision; do not transfer grounded-CT wiring or revision-specific accuracy from another option.

Document roles

Use the original manufacturer excerpt for its preserved technical tables and drawings. This product brief explains selection and system context. The separate installation guide covers preparation, connection, tests and handover; use it together with the applicable manufacturer instructions.

Technical basis

B&R X20(c)AP31xx Data Sheet, V2.70.

Related product navigation

- B&R X20AI2437
- B&R X20SM1446-1

These are related references, not confirmed substitutes or an automatically approved assembly.

Product enquiries