Because quality matters

April 2019
AFQm
Multifunction Active Filters
New technologies provide new advantages, but also new problems.

- More loads
- Further pollution through power lines
- Problems due to harmonics

Types of loads that generate harmonics:
- Air-conditioning systems
- Variable speed drives, converters...
- Cooling chambers
- PLC’s
- Electronic light ballasts (LED)
- Personal computers (PC’s)
- Pumping stations
Multifunction Active Filter

# Problems caused by harmonics

<table>
<thead>
<tr>
<th>CAUSE</th>
<th>EFFECT</th>
<th>PROBLEM</th>
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| Rise of the total current harmonic distortion rate (THD/%) | > Current increase in conductors  
> Temperature increase in conductors  
> Possible insulation loss in conductors  
> Malfunction in PLC | Economic losses due to production downtimes |
| Unwanted tripping of circuit breakers and residual current devices | Power cuts in production lines | Economic losses due to production downtimes |
| Increase in transformer temperature | Premature ageing of the transformer | Extra costs in maintenance |
| Decrease in UPS performance | Need to expand UPS | Installation extra costs and risk of production downtime and data loss |
| Decrease in motor performance | Premature ageing of motors | Extra costs in maintenance |
The solution

Active Filters

AFQm
The AFQm active filters are multifunction 3-in-1 units with multilevel technology that allow performing 3 different functions with a single unit.

In addition, these functions can be prioritised in the order required.
Multifunction Active Filter

Improve all aspects of your installation

3 functions in 1 ➔ Priority configurable by the user

1. Harmonic filtering
Eliminates harmonics to clean the installation's waveform.

Reduction of harmonic currents up to the fiftieth harmonic (2500 Hz). Possibility of selection of the harmonic frequencies to be filtered in order to achieve higher efficiency.
Response <20ms

2. Reactive power compensation
Helps avoid penalties due to reactive power consumption.

Power factor correction, in both consumption and generation of inductive and capacitive currents. 0.7 inductive ... 0.7 capacitive

3. Phase balancing
Reduces the circulation of neutral current, avoiding overheating, insulation loss and unwanted tripping.

Current balancing correction, improving the phase-to-phase consumption of an installation. The 4-wire model reduces the neutral current.
Easy to install

Various formats:
› Wall-mounted devices.
› Enclosure-fitted devices (rack type).
› For 3-wire networks (up to 400V) or 4-wire networks (up to 480V).
› 50 or 60 Hz

› Features handles for an easy and quick installation and removal of each module.
› Integrated communications on the front of the device to facilitate connectivity.
Easy to install

Three-step commissioning
- Local configuration via the touchscreen, saving time during commissioning.

Commissioning

Self-diagnostic system
- Internal self-diagnostic system during commissioning guaranteeing perfect operation.

Easier to install
- Allows installing transformers both on the mains side and on the load side.

Harmonic selection
- Individual selection of harmonics to be filtered to ensure maximum performance.
Easy to configure

Current transformer reversal
› Solves current transformers’ connection errors using its touchscreen.

Safe mode
› Avoids the filter from connecting automatically by setting a minimum start-up current, preventing injection when not required.
› Master / Slave system that allows connecting up to 100 filters in parallel managed by a single master.

› Save resources by avoiding the installation of current transformers for each slave.
› Safe Mode activation in the event of detecting a fault.

› Smart thermal management system:
  • Adjusts the internal fan speed according to filtering needs.
  • Adjusts the filtering rating when temperature is above the operating limit to ensure the device's life span.

› Alarm identification:
  • Records the last 5 seconds prior to triggering an alarm with a recording period of 1 second.
Features an internal protection system that avoids start-up in the event of a problem.

Includes an anti-resonance system.

- The device avoids operating in resonance frequencies (specific harmonics) and continues operating in the rest of the spectrum without affecting its operation.

Alarm monitoring from the display for easy identification and correction.

Designed according to the IEC-60730 standard, self-diagnosing the code and hardware executing it.
User-friendly

Touchscreen to monitor:

› Filter activation status:
  • Powers and harmonic distortion before and after the filter.

› Instantaneous values:
  • Values of voltages and currents; active, reactive and apparent power; THDU %, THDI % and cos ϕ.

› Voltage and current individual harmonics (before and after the filter)

› Phasor diagram.

› Waveform (voltage and current).
Integrated web server

- Real-time, online, website monitoring of instantaneous values.
- Data download without requiring any software.
- Ethernet: TCP/IP, Modbus TCP.
- Remote configuration of the device.

Remote comissioning and control

- Remote access via Ethernet port to perform commissioning, diagnoses of correct installation and operation (monitoring powers, THD’s, phasor diagrams, etc.)
**Datalogger**

- 2Gb internal memory to record load curves. (7 years of minute records for each variable).

**Integrable**

- Connection via Modbus RTU protocol to integrate with PowerStudio Scada software or other systems that operate using the Modbus RTU protocol (RS-485).
AFQm 30A
AFQm 60A
AFQm 100A

Models

AFQm 100A, 200A, 300A and 400A
Applications

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