SIEMENS

SIPROTEC 7UM61 and 7UM62

The protection for small and medium-sized power generators

Perfect protection for power generators

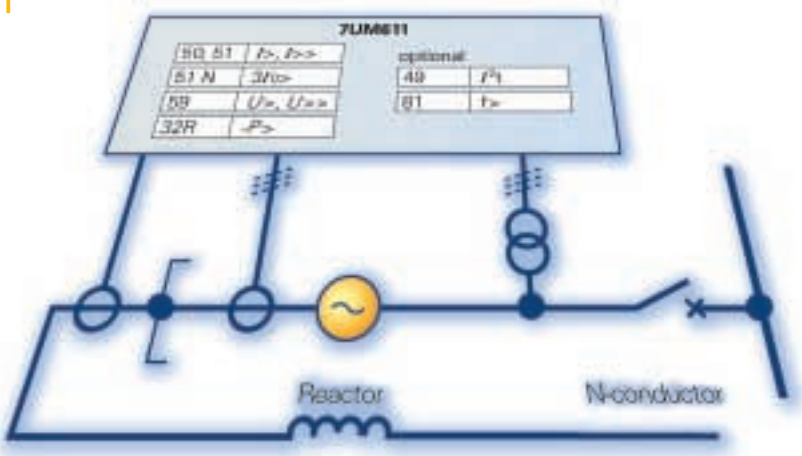
Whether it be earth faults, short circuits, overloads, over-voltage, over-frequency or under-frequency, protection devices assure continued operation of power stations. The 7UM61 and 7UM62 protective devices are compact units which were specially developed and designed for the protection of small and medium-sized machines. They integrate all the necessary protection functions and are particularly suited to the protection of

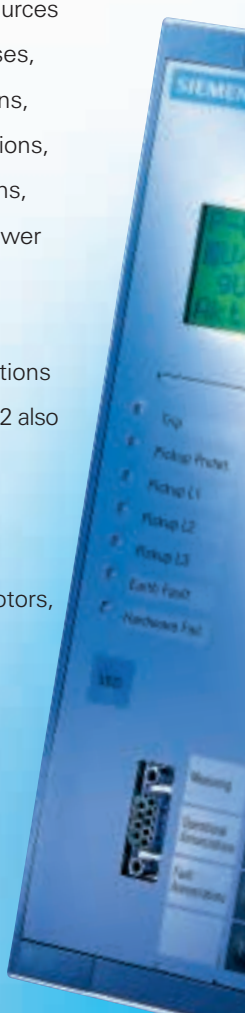
- hydro and pumped-storage generators,
- co-generation stations,
- private power stations using regenerative energy sources such as wind or biogases,
- diesel generator stations,
- gas-turbine power stations,
- industrial power stations,
- conventional steam power stations.

The combination of functions incorporated in the 7UM62 also offers excellent all-round protection for

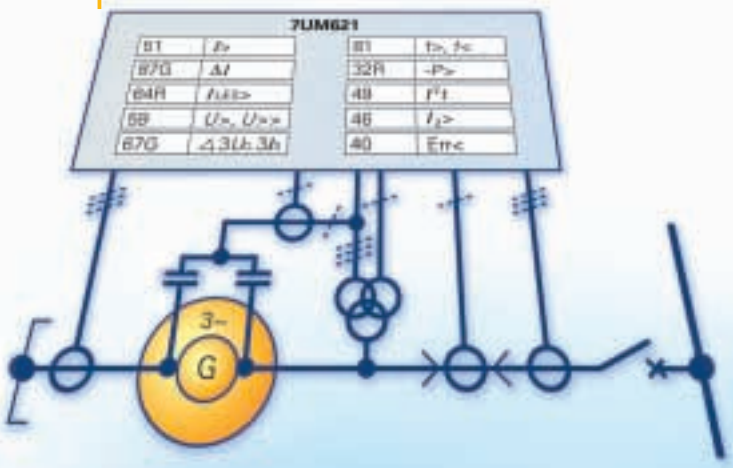
- transformers,
- large asynchronous motors,
- synchronous motors.

Protection of a small generator





Protection of a generator directly connected to the busbar



Systematic use of past experience

Siemens has years of experience in the erection of power stations and in electrical unit protection. More than 7,000 such numerical protective devices have been supplied so far.

New developments are based on this positive experience, with the requirements and ideas of our customers also being integrated. Such developments include:

- Proven measurement techniques, e.g. high measuring accuracy over a wide frequency range (10 Hz–70 Hz);
- Expansion of the scope of protective and additional functions;
- Consistent redundancy concepts by combination of 7UM61 and 7UM62;
- Easy integration into the power station control system (interfaces: PROFIBUS-DP, Modbus RTU, IEC 60870-5-103) with open communication;
- High reliability and availability by virtue of self-diagnosis and the uniform SIPROTEC® 4 hardware and software platform;
- Device prices are scaled in accordance with the selected software packages providing ideal adaption of the equipment to the plant requirements.

More than just **protection**

The SIPROTEC 7UM61 and 7UM62 devices can, however, do more than just protect. They also offer numerous additional functions. These include:

- **Measured values with high accuracy**
  Measurement of all relevant electrical values (secondary, primary and per unit).

- **Metering**
  The four-quadrant meter provides an accurate overview of the power output of the generator.

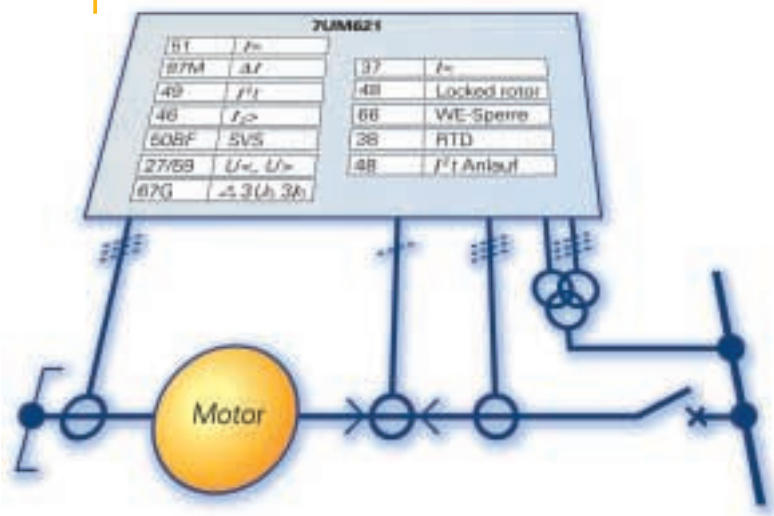
- **Real-time and fault messages**
  Every event is stored, in a non-volatile manner, with a time tag by a synchronizable real-time clock. In the event of a pickup or a trip, the reaction of the protective functions will be logged with a resolution of one millisecond. In addition, the relevant measured values are stored in the event of tripping.

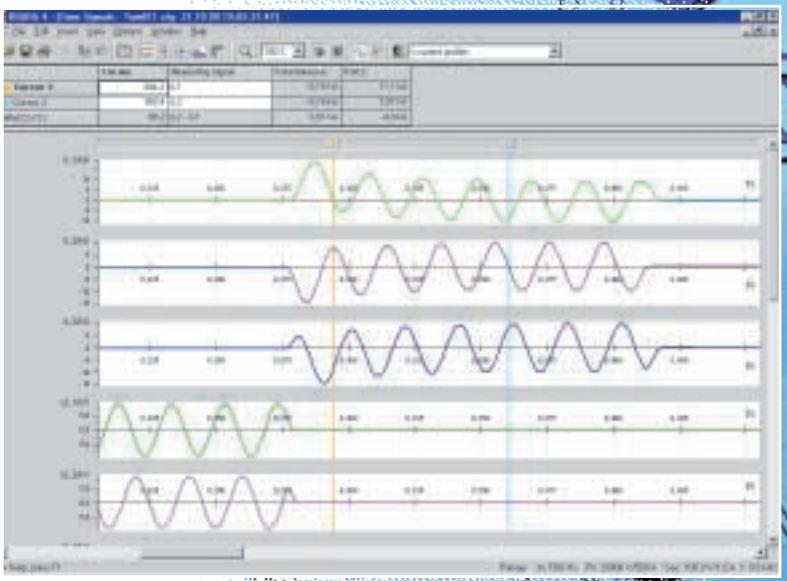
- **Fault recording**
  Depending on the application, either instantaneous values (every 1.25 ms; max. 5 s long) or RMS values (every 20 ms; max. 80 s) can be recorded. External fault recorders are no longer necessary.

- **Flexible communication**
  Communication modules make it easy to integrate the protective devices into a control system. Messages and measured values can be requested online. Combined with the PC operating program (DIGSI 4) and a modem, this is the perfect solution for unmanned power stations.

- **Programmable logic**
  Programmable logic functions allow free and easy adaptation to the plant conditions and special solutions without additional hardware.

Protection of a large asynchronous motor





As simple as never before

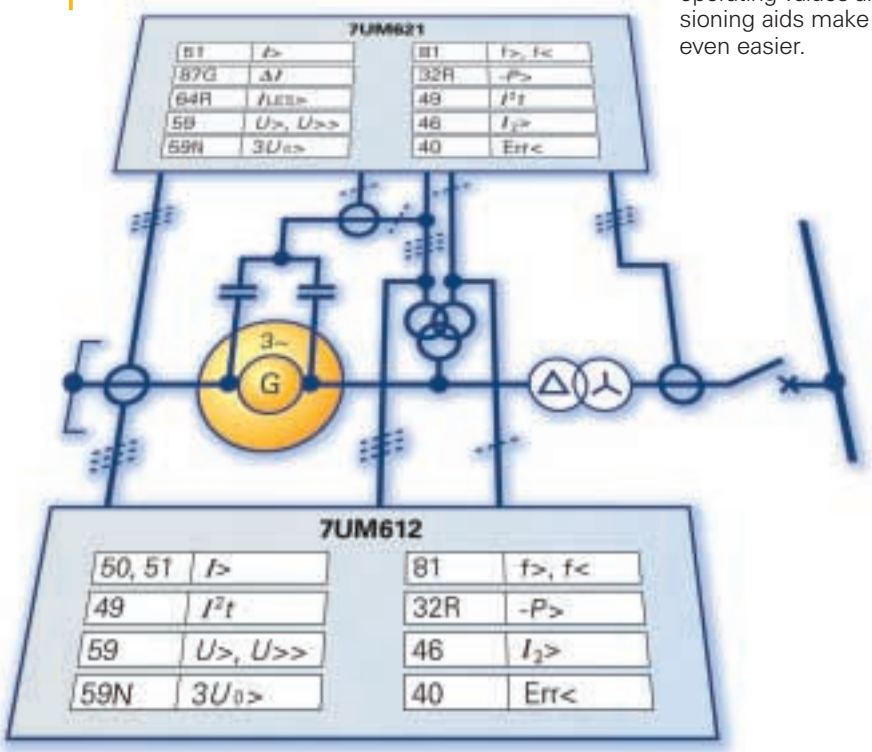
The new devices make plant integration, protection setting and commissioning as simple as never before – the SIPROTEC 7UM61 and 7UM62 can be put in operation quickly.

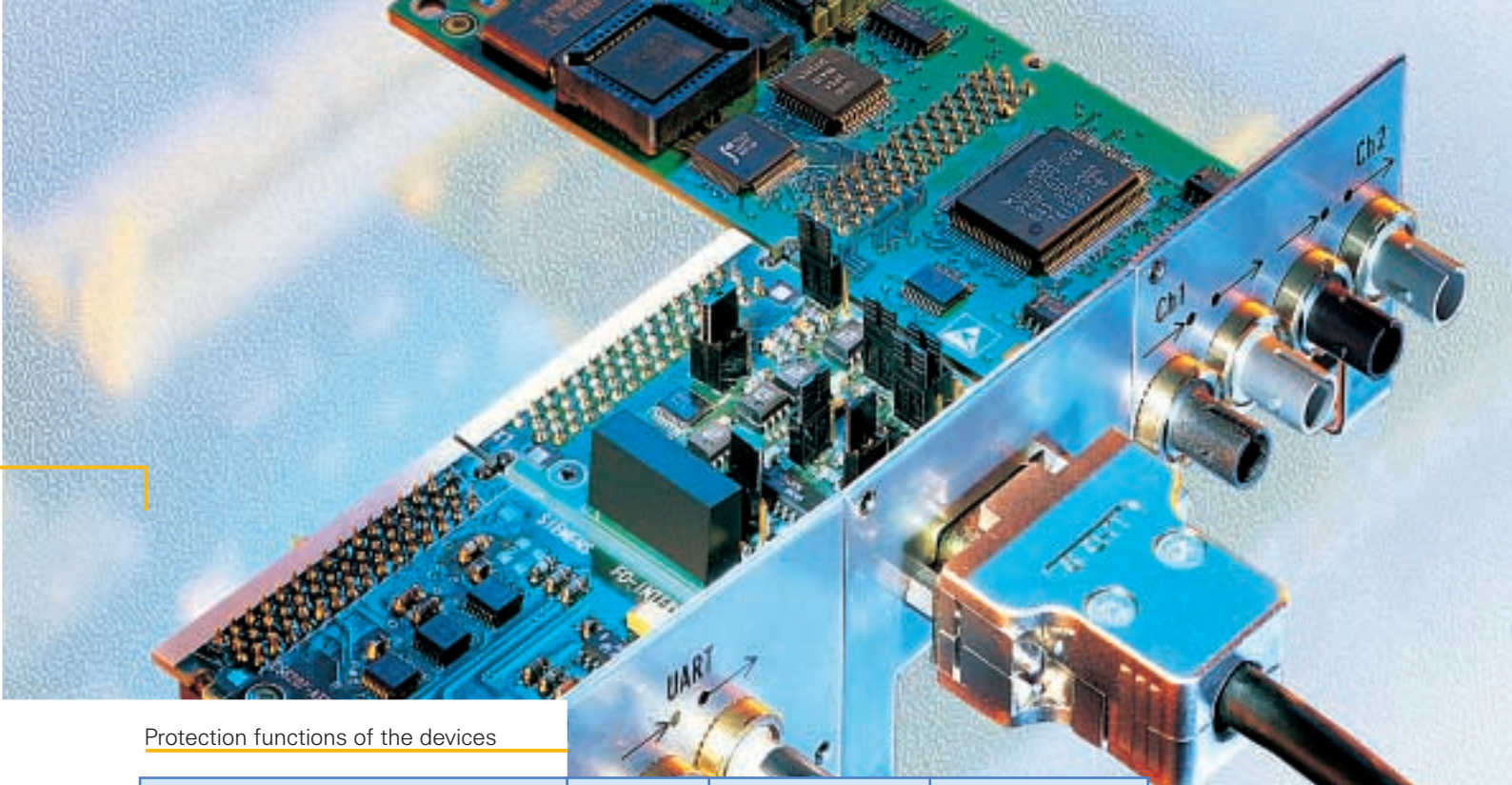
Just one or two devices
Because they are multi-functional, the number of required protective devices is reduced to just one or two. The analog inputs (U, I) are fixed and the internal logic information can be assigned to binary inputs and outputs.

Protection setting with DIGSI 4
The PC operating program DIGSI 4 allows offline setting of the protection in the office. Setting with primary values related to the protected object makes additional calculation unnecessary and allows for appropriate default settings independent of the generator data. Planning and design of the station and the derived marshalling smoothly follow each other.

Everything set
Complete systems leave the production line pre-tested and pre-set with the plant settings. The primary test is therefore reduced to a check of the plant wiring and a check of selected setting parameters. Measured operating values and commissioning aids make this work even easier.

Block unit with redundancy





Protection functions of the devices

		7UM611, 7UM612		7UM621	
Protection function	**ANSI No.**	**Basic**	**Full**	**Motor**	**Generator**
Earth-fault protection non-directional, directional	59 N 67 G	X	X	X	X
Earth overcurrent-time protection	50 N / 51 G	X	X	X	X
Overload protection	49	X	X	X	X
Overcurrent-time protection with undervoltage seal-in	51, 51 V	X	X	X	X
Overcurrent-time protection, directional	50 / 51 / 67	X	X	X	X
Inverse time overcurrent protection	51 V	X	X	X	X
Overvoltage protection	59	X	X	X	X
Undervoltage protection	27	X	X	X	X
Frequency protection, 4-stage	81	X	X	X	X
Reverse-power protection	32 R	X	X	X	X
Overexcitation protection (U/f)	24	X	X		X
Fuse failure monitor	60 FL	X	X	X	X
Binary inputs		2	4	4	4
Trip circuit supervision	74		X	X	X
Forward-power protection	32 F		X	X	X
Underexcitation protection	40		X		X
Unbalance load protection	46		X		X
Circuit-breaker failure protection	50 BF		X	X	X
Inadvertent energizing protection	50 / 27		X		X
100%-stator earth-fault protection (20 Hz injection)	51 GN (20 Hz)				X
Stator earth-fault protection with 3rd harmonic	59 3.H		X		X
Rotor earth-fault protection (50 Hz/60 Hz)	64 R				X
Differential protection	87 G, 87 T			X	X
Impedance protection	21		X		X
Start-up time monitoring	48			X	
Start inhibit for motors	49 Rotor			X	
External temperature monitoring through serial interface	38			X	

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Power to the Point

Siemens Aktiengesellschaft

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