

SIEMENS



Optimize the motor utilization

SIPROTEC motor protection

Protection, automation and monitoring

Integrated
motor
differential
protection



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SIPROTEC motor protection

Innovative, effective and high-quality

SIPROTEC – innovative solutions for motors of all sizes

- Protection
- Automation
- Monitoring

Protect your motors against overloading

The thermal overloading of motors has an impact mainly to the stator and rotor. Excessively high stressing leads to premature ageing of these components, which in turn considerably reduces the life span of the motor.

Increase the service life of your motors – with proven high-performance SIPROTEC motor protection devices.

Benefit from SIPROTEC motor protection:

- Provide safety for personnel using proven protection functions, e.g. arc flash protection
- Avoid motor damage by sensitive fault protection
- Use thermal elements to maximize asset utilization
- Directly connect temperature sensors
- Achieve high sensitivity and short reaction times through differential protection function – also functional during motor start-up
- Record and monitor all current and voltage transformers
- Control and monitor all circuit-breakers
- Save money on initial investment, spare parts inventory, maintenance, expansion and adapting of plants thanks to individually configurable devices

Smart motor protection – our SIPROTEC devices



Precisely tailored protection functions

Optimize the motor utilization

Thermal overloading
of the rotor
(ANSI 48, 66, 49R)

Thermal overloading
of the stator
(ANSI 49S)

Undervoltage
(ANSI 27)

Short-circuit
(ANSI 50, 51, 87M)

Mechanical faults
in the process
(ANSI 50L)

Field failure with
synchronous motors
(ANSI 40)

Asynchronous running with
synchronous motors
(ANSI 40)

Ground fault
(ANSI 51Ns, 67N)

Overstressing of drives
running with no load
(ANSI 37, 32U)



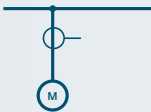


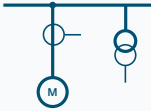


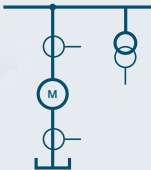
Overheating of bearings
(ANSI 38)

Voltage unbalance,
phase failure
(ANSI 46)



Your SIPROTEC motor protection

Selection of devices for asynchronous motors

Preferred	Options	Classification	Options
 <p>SIPROTEC 7SK80</p>	 <p>SIPROTEC 7SK82</p>	<p>Small (100 kW – 500 kW)</p> 	<p>SIPROTEC 7SK82: higher number of binary inputs and outputs, graphical display, more communication interfaces</p>
 <p>SIPROTEC 7SK82</p>	 <p>SIPROTEC 7SK85</p>	<p>Medium (500 kW – 2 MW)</p> 	<p>SIPROTEC 7SK85: higher number of binary inputs and outputs, graphical display, remote control unit, core communications interfaces</p>
 <p>SIPROTEC 7SK85</p>	 <p>Synchronous motors SIPROTEC 7UM85*</p>	<p>Large (> 2 MW)</p> 	<p>SIPROTEC 7UM85: for synchronous motors</p>

* in preparation

Motor protection assessment

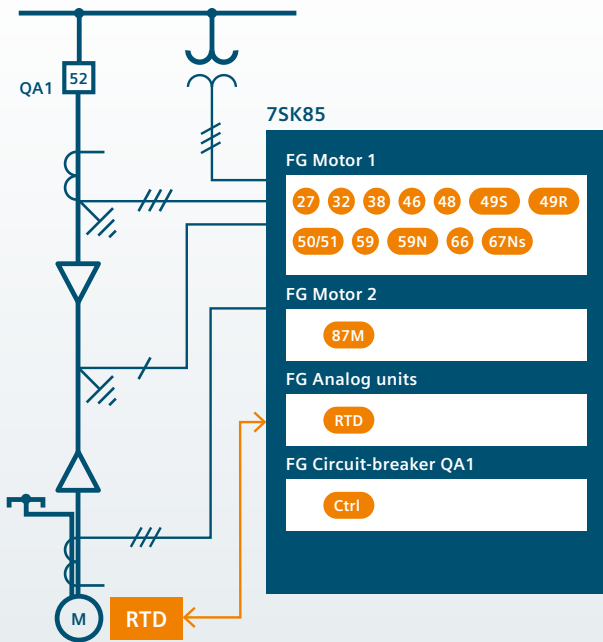
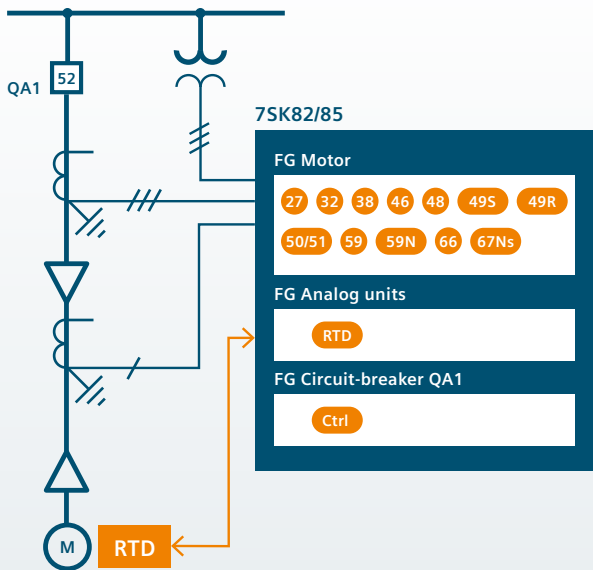
Our sample applications

Induction motors

- Lower investment: Protection and control in one device
- Reliable monitoring: Thermal motor protection functions
- Integrated function: Temperature sensors for thermal motor protection

Motor protection and simplified differential protection

- High sensitivity, short reaction timers: Differential protection function
- Cost saving: Integration of the differential protection function in one relay system

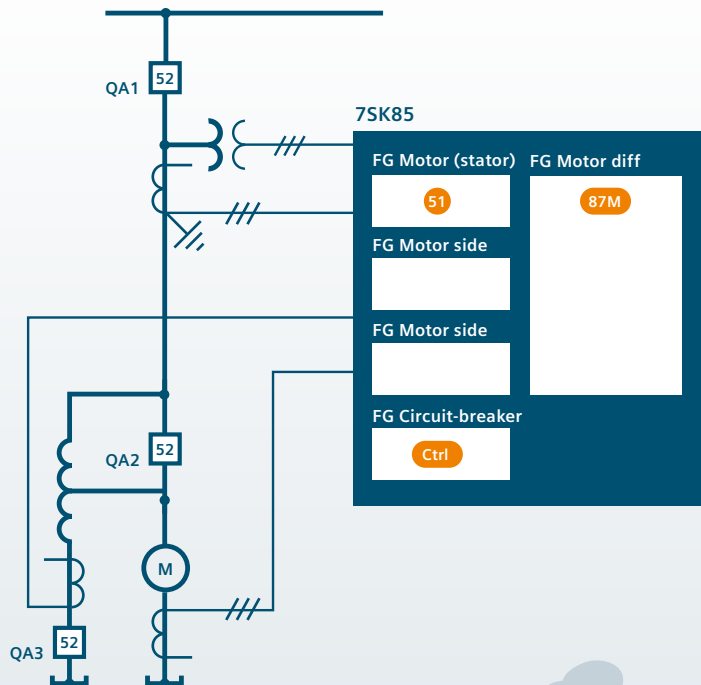
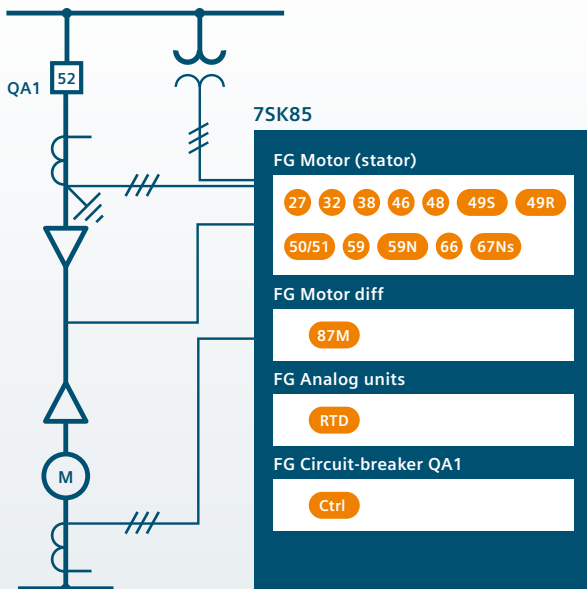


Motor protection with differential protection

- Independence: Differential protection functions as separate function group
- High sensitivity, high speed: Differential protection function
- Reliable monitoring: Separate recording of every current transformer

Motor differential protection with Krondorfer starter

- Comprehensive overview: Recording, monitoring and control of all circuit-breakers
- Continuous protection: Differential protection function already available in the start-up phase



Protection function	ANSI	7SK80	7SK82	7SK85	7UM85*
Analog inputs (optional) ±: scalable		3I, lee (3U)	3I, lee (4U)	3I+, lee+ 4U+	3I+, lee+ 4U+ (+4 MU)
Stator overload protection	49	x	x	x	x
Starting time supervision, brake locking protection	48	x	x	x	x
Restart inhabit	66	x	x	x	x
Rotor overload protection	49R	x	x	x	x
Load jam protection	50L	x	x	x	x
Unbalanced load protection	46	x	x	x	x
Unbalanced load protection (thermal)	46	–	x	x	x
Temperature supervision via thermobox	38	x	x	x	x
Temperature supervision via integrated inputs	38	5	12*	–	–
Undercurrent protection	37	x	x	x	x
Active power protection	32	x	x	x	x
Ground-fault protection non-directional	50Ns	x	x	x	x
directional	51Ns 67Ns	x x	x x	x x	x x
Overcurrent protection	50, 51	x	x	x	x
Motor differential protection	87M	–	–	x	x
Undervoltage protection independent	27	x	x	x	x
dependent		x –	x x*	x x*	x x
Overvoltage protection	59, 59N	x	x	x	x
Underexcitation protection (asynchronous running protection)	40	–	–	–	x
Rotor ground-fault protection	64R	–	–	–	x
Frequency protection	81	x	x	x	x
Circuit-breaker failure protection	50BF	x	x	x	x
Arc protection		–	x	x	x
Logic editor (CFC)		x	x	x	x
Control functionality		x	x	x	x
Display small/large		x/–	x/x	x/x	x/x
Slots for communication modules		1	2	5	5
Frequency operating range (10 Hz – 80 Hz)		–	x	x	x
Operational measured values		x	x	x	x
Operational and fault logs		x	x	x	x
Fault recording		x	x	x	x
Communication protocols		Modbus Profibus DP Profinet DNP3 serial DNP3 TCP IEC 60870-5-103 – IEC 61850	Modbus – Profinet ¹⁾ DNP3 serial DNP3 TCP IEC 60870-5-103 IEC 60870-5-104 IEC 61850	Modbus – Profinet ¹⁾ DNP3 serial DNP3 TCP IEC 160870-5-103 IEC 60870-5-104 IEC 61850	Modbus – Profinet ¹⁾ DNP3 serial DNP3 TCP IEC 60870-5-103 IEC 60870-5-104 IEC 61850

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