SIEMENS

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Relay Selection Guide

Version 1.3

Answers for infrastructure and cities.

INDEX

Auxiliary Relays, Trip Relay & Trip Circuit Supervision Relays

		Description	Variants
	Auxiliary Relay	Auxiliary relay is an electro-mechanical relay that operates attracted armature principal designed to IEC60255. High speed of operation which suits the requirements like transmission and industrial applications. **Features:** • Suitable for signalling in protection and control systems where immunity to capacitance discharge is not required • Robust design for a long, reliable, service life • Pickup time at U_N 25ms • Heavy duty contacts ratings • Contacts available 3NO + 2 Change Over (CO) (Self Reset, Hand Reset) • Mechanical life 10,000 operations • High voltage insulation • Lower rated burden • Higher operation stability • Flag indication for the operated conditions • Flag HR-Hand Reset Type • Variants for auxiliary voltages 110V DC & 220V DC	**7PJ11**
	Trip Relay	Trip relay is an electro-mechanical relay that operates attracted armature principal designed to IEC60255. High speed of operation which suits the requirements like transmission and industrial applications. **Features:** • Suitable for tripping in protection and control systems where immunity to capacitance discharge is not required • Robust design for a long, reliable, service life • Pickup time at U_N 10ms • Heavy duty contacts ratings • Contacts available 3NO + 3 NC (Self Reset, Hand Reset - Low burden & 3NO + 2NC- High burden) • Mechanical life 10,000 operations • High voltage insulation • Lower rated burden • Higher operation stability • Flag indication for the operated conditions • Flag HR-Hand Reset Type • Variants for auxiliary voltages 110V DC & 220V DC	**7PJ12**
	Trip Circuit Supervision (TCS) Relay	The 7PJ13 relay is for supervision of the trip circuit of a circuit breaker with one trip coil. The trip circuit wiring is supervised from the positive supply to the negative supply whilst the circuit breaker is open or closed. The design, quality and rugged construction of the relay make it suitable for applications requiring high levels of reliability/dependability. The high degree of protection guarantees reliable operation over a wide temperature range, even under extreme environmental conditions. **Features:** • Universal auxiliary voltage range with very low burden i.e. 24 to 250 V AC/DC at 2 watts • Universal supervision voltage range i.e. 24 to 250 V DC • Supervision in pre-closed, post-closed condition and latched trip condition • Dual LED indications i.e. Trip / Healthy • Compact size with cut-out 48x96 mm • Relay has been type tested accordance with IEC60255 standards • Contacts available 2 Change Over (CO)	**7PJ13**

Numerical Feeder Protection

	Protection Ansi Codes	Description	Type
	50/51, 50N/51N	The 7SJ45 is a numerical overcurrent protection relay which is primarily intended as a radial feeder or transformer protection (backup) in electrical networks. It provides definite-time and inverse-time overcurrent protection according to IEC and ANSI standards. The 7SJ45 relay does not require auxiliary voltage supply. It imports its power supply from the current transformers. - 2-stage O/C protection with DT or IDMT (IEC/ANSI) tripping characteristic - Operation w/o auxiliary voltage via integrated CT powered power supply - Standard CT inputs (1 A / 5 A) - Low power CT required only (ca. 1,4 VA at IN) - Tripping with impulse output (24 V DC / 0,1 Ws) or conventional tripping relay (changeover contact) and auxiliary tripping CT - Trip impulse repetition for CB failure conditions (for devices with impulse output) - Integrated mechanical trip indication optionally	7SJ45
	50/51, 50N/51N	The 7SJ46 is a numerical overcurrent protection relay which is primarily intended as a radial feeder or transformer protection (backup) in electrical networks. It provides definite-time and inverse-time overcurrent protection according to IEC and ANSI standards. The 7SJ46 relay has an AC and DC auxiliary power supply with a wide range allowing a high degree of flexibility in its application. - 2-stage O/C protection with DT or IDMT (IEC/ANSI) tripping characteristic - Universal application due to integrated wide range AC/DC power supply. - Standard CT inputs (1 A / 5 A) - Low power CT required - Tripping with impulse output (24 V DC / 0,1 Ws) or conventional tripping relay (changeover contact) and auxiliary tripping CT - Trip impulse repetition for CB failure conditions - Integrated mechanical trip indication - One live contact for monitoring	7SJ46

Numerical Feeder Protection

	Protection Ansi Codes	Description	Type
	46BC, 46NPS, 49, 50, 50G/N, 50BF, 51, 51G/N, 81 HBL2, 86, 74TCS	Non- Communicable, Over-current protection relay **Features** - Two Settings Groups - Password Protection - User Defined Curve using REYDISP *Curve Editor* - User Programmable Logic - Self Monitoring - Circuit Breaker Trip and Maintenance Counter - Trip Timers - Cold Load Settings **User Interface** - 20 Character x 4 Line Backlit LCD - Menu Navigation Keys - 9 User Programmable Tri-colour LEDs - User Language Configuration **Communication Interface** - Front USB port - Time Synchronism - Viewing and Changing Settings **Data Storage** - 1000 events are stored and time tagged to 1ms resolution. - Event Records User Configurable - Last 15 fault records with time and date of trip, measured quantities and type of fault. - Upto 15 waveform records of 1 second duration **Monitoring Functions** - Primary/Secondary Current Phases and Earth - Positive Phase Sequence (PPS) Current - Negative Phase Sequence (NPS) Current - Trip circuit healthy/failure - Fault records - Event records - Circuit breaker trip counters - I^2t summation for contact wear **Hardware** - 4 CT; 3 Binary Inputs and 3 Binary Outputs - Auxiliary Supply 60 to 240V AC/DC	**7SR1002**

Numerical Feeder Protection

	Protection Ansi Codes	Description	Type
	46BC, 46NPS, 49, 50, 50G/N, 50BF, 51, 51G/N, 81 HBL2, 86, 74TCS	Communicable, Over-current protection relay **Features** - Two Settings Groups - Password Protection - User Programmable Logic - User Defined Curve using REYDISP *Curve Editor* - Self Monitoring - Circuit Breaker Trip and Maintenance Counter - Trip Timers - Cold Load Settings **User Interface** - 20 Character x 4 Line Backlit LCD - Menu Navigation Keys - 9 User Programmable Tri-colour LEDs - User Language Configuration **Communication Interface** - Front USB port + Rear Communication port RS-485 - Protocols - IEC60870-5-103, DNP3.0 or Modbus RTU (User Selectable at site) - Time Synchronism - Viewing and Changing Settings **Data Storage** - 1000 events are stored and time tagged to 1ms resolution. - Event Records User Configurable - Last 15 fault records with time and date of trip, measured quantities and type of fault. - Upto 15 waveform records of 1 second duration **Monitoring Functions** - Primary/Secondary Current Phases and Earth - Positive Phase Sequence (PPS) Current - Negative Phase Sequence (NPS) Current - Trip circuit healthy/failure - Fault records - Event records - Circuit breaker trip counters - I^2t summation for contact wear **Hardware** - 4 CT; 6 Binary Inputs and 6 Binary Outputs - Auxiliary Supply 60 to 240V AC/DC	7SR1003

Numerical Feeder Protection

	Protection Ansi Codes	Description	Type
	46BC, 50, 50G/N, 50BF, 51,51G/N, 64H, 60CTS, 74TCS, 86	The Argus C Type A is a numerical overcurrent protection relay intended for use on distribution and industrial networks. It provides a basic overcurrent function aimed at reducing engineering time by reducing complexity. Communication access to the relay functionality is via a front USB port for local PC connection or rear electrical RS485 port for remote connection. **Features** - Four Settings Groups - Password Protection - User Programmable Logic - Self Monitoring - Circuit Breaker Trip and Maintenance Counter - Trip Timers **User Interface** - 20 Character x 4 Line Backlit LCD - Menu Navigation Keys - 9 User Programmable Tri-colour LEDs - User Language Configuration **Communication Interface** - Front USB port + Rear RS485 port - Protocols - IEC60870-5-103, DNP3.0 or Modbus RTU (User Selectable at site) - Time Synchronism - Viewing and Changing Settings **Data Storage** - 1000 events are stored and time tagged to 1ms resolution - Event Records User Configurable - Last 10 fault records with time and date of trip, measured quantities and type of fault - 10 waveform records of 1 second duration each **Monitoring Functions** - Primary/Secondary Current Phases and Earth - Positive Phase Sequence (PPS) Current - Negative Phase Sequence (NPS) Current **Hardware** - 4 CT Inputs - 3 binary inputs and 5 binary outputs - Auxiliary Supply 80 to 250V DC or 24 to 60V DC	7SR11- Type A

Numerical Feeder Protection

	Protection Ansi Codes	Description	Type

	50, 50N, 51, 51N, 46, 49, 14/ 48, 74 TC, 51C
	
	79M (Optional)
		The 7SJ600 is a numerical overcurrent relay which, in addition to its primary use in radial distribution networks and motor protection, can also be employed as backup for feeder, transformer and generator differential protection.
		
		Features
		- DT/IDMT: I>, IE>>, I>>>; Ie>, Ie>> / Ip>, IEp>
		- Motor protection
		  o Overload protection
		  o Unbalance load protection
		  o Start-up monitoring
		- Reverse Interlocking
		- Trip circuit supervision
		- Cold load pickup (e.g. for energising transformers)
		
		User Interface
		- Control via keyboard
		- 6 LEDs (4 are independently programmable)
		- User Friendly and keys for front operation
		
		Communication Interface
		- Serial interface with IEC-protocol / DIGSI V3 Or DIGSI 4 ($\geq$ 4.3)
		- Via RS232 – RS485 converter
		- Via modem
		- IEC 60870-5-103 protocol, 2 kV-isolated
		- RS485 interface
		
		Data Storage
		- Fault event logging with time stamp (buffered)
		- 8 oscillographic fault records
		
		Monitoring Functions
		- Primary/Secondary Current Phases and Earth
		
		Hardware
		- 2 Alarm relays (independently programmable)
		- 3 Binary inputs (independently programmable)
		- 2 Trip contacts with 2 making contacts each (independently programmable)
		- OPEN/CLOSE test power circuit breaker
		- 3 CT Inputs : 1A or 5A (selectable via Jumper)
		- Auxiliary voltage: D.C. 60 - 125V, 110 - 250 V / A.C. 115 V (via Jumper), D.C. 24/48 V, A.C. 230 V
		- 1 Live Status contact
			7SJ600

Numerical Feeder Protection

	Protection Ansi Codes	Description	Type
	37, 46BC, 46NPS,49, 50 50G/N/ SEF, 50BF, 51, 51G/N/SEF, 64H, 81HBL2, 74TC, 60CTS, 86, 51C **Optional 79**	The 7SR11 is overcurrent protection relay developed to enhance the Argus family of products by providing a familiar product using the latest generation of hardware technology.The 7SR11 overcurrent and earth fault relays are available in single and four pole variants. **Features** - Four Settings Groups - Password Protection - User Programmable Logic - Self Monitoring - Circuit Breaker Trip and Maintenance Counter - Trip Timers **User Interface** - 20 Character x 4 Line Backlit LCD - Menu Navigation Keys - 9 User Programmable Tri-colour LEDs - User Language Configuration **Communication Interface** - Front USB port + Rear RS485 port - Protocols - IEC60870-5-103, DNP3.0 or Modbus RTU (User Selectable at site) - Time Synchronism - Viewing and Changing Settings **Data Storage** - 1000 events are stored and time tagged to 1ms resolution - Event Records User Configurable - Last 10 fault records with time and date of trip, measured quantities and type of fault - 10 waveform records of 1 second duration each **Monitoring Functions** - Primary/Secondary Current Phases and Earth - Positive Phase Sequence (PPS) Current - Negative Phase Sequence (NPS) Current **Hardware** - 1 CT 3 Binary Inputs 5 Binary Outputs - 4 CT 3 Binary Inputs 5 Binary Outputs - 4 CT 6 Binary Inputs 8 Binary Outputs - Auxiliary Supply 80 to 250V DC or 24 to 60V DC	**7SR11**

Numerical Feeder Protection

	Protection Ansi Codes	Description	Type

	50, 50N, 51, 51N, 46, 49, 74 TC, 50BF
	
	Optional
	79M, 50Ns, 51Ns, 64, 67Ns, 14/ 48, 37, 66/86
		The 7SJ602 is a numerical overcurrent relay which, in addition to its primary use in radial distribution networks and motor protection, can also be employed as backup for feeder, transformer and generator differential protection.
		
		Features
		- DT/IDMT: I>, I>>, I>>>; IE>, IE>> / Ip>, IEp>, IEE>, LEE>>, IEEp>
		- Motor protection
		   o Overload protection
		   o Unbalance load protection
		   o Start-up monitoring
		- Reverse Interlocking
		- Trip circuit supervision
		- Cold load pickup (e.g. for energising transformers)
		- Displacement voltage
		- Disk emulation
		
		User Interface
		- Control via keyboard
		- 6 LEDs (4 are independently programmable)
		- User Friendly and keys for front operation
		
		Communication Interface
		- Serial interface with IEC-protocol / DIGSI V3 Or DIGSI 4 ($\geq$ 4.3)
		- Via RS232 – RS485 converter
		- Via modem
		- IEC 60870-5-103 protocol, 2 kV-isolated
		- RS485 interface
		
		Data Storage
		- Fault event logging with time stamp (buffered)
		- 8 oscillographic fault records
		
		Monitoring Functions
		- Operational measured values I, V
		- Power measurement P, Q, S, Wp, Wq
		- Slave pointer
		- Mean values
		
		Hardware
		- 4 current transformers or
		- 3 current + 1 voltage transformers
		- 3 binary inputs
		- 4 output relays
		- CT Inputs 1A or 5A (selectable via Jumper)
		- Auxiliary voltage: D.C. 60 - 125V, 110 - 250 V / A.C. 115 V (via Jumper), D.C. 24/48 V, A.C. 230 V
		- 1 Live Status contact
			7SJ602

Numerical Feeder Protection

Protection Ansi Codes	Description	Type
37, 46BC, 46NPS,49, 50 50G/N/ SEF, 50BF, 51, 51G/N/SEF, 64H, 81HBL2, 74TC, 60CTS, 86, 27/59, 47, 51V, 59N, 67/50, 67/50G/N, 67/51, 67/51G/N, 51C, 60VTS, 81U/O Optional 79	The 7SR12 is overcurrent protection relay developed to enhance the Argus family of products by providing a familiar product using the latest generation of hardware technology.The 7SR12 overcurrent and earth fault directional relays are available in single and four pole variants. **Features** - Four Settings Groups - Password Protection - User Programmable Logic - Self Monitoring - Circuit Breaker Trip and Maintenance Counter - Trip Timers **User Interface** - 20 Character x 4 Line Backlit LCD - Menu Navigation Keys - 9 User Programmable Tri-colour LEDs - User Language Configuration **Communication Interface** - Front USB port + Rear RS485 port - Protocols - IEC60870-5-103, DNP3.0 or Modbus RTU (User Selectable at site) - Time Synchronism - Viewing and Changing Settings **Data Storage** - 1000 events are stored and time tagged to 1ms resolution - Event Records User Configurable - Last 10 fault records with time and date of trip, measured quantities and type of fault - 10 waveform records of 1 second duration each **Monitoring Functions** - Primary/Secondary Current Phases and Earth - Direction - Primary/Secondary Line and Phase Voltages - Apparent Power and Power Factor - Real and Reactive Power - W Hr & VAr Hr Forward and Reverse - Historical Demand Record - Positive Phase Sequence (PPS) Voltage & Current - Negative Phase Sequence (NPS) Voltage & Current - Zero Phase Sequence (ZPS) Voltage **Hardware** - 1 CT 3 VT 3 Binary Inputs 5 Binary Outputs - 4 CT 3 VT 3 Binary Inputs 5 Binary Outputs - 4 CT 3 VT 6 Binary Inputs 8 Binary Outputs - Auxiliary Supply 80 to 250V DC or 24 to 60V DC	**7SR12**

Numerical Feeder Protection

	Protection Ansi Codes	Description	Type

	50, 50N, 51, 51N, 46, 49, 74 TC, 50BF, 37, 86
	
	Optional
	79M, 50Ns, 51Ns, 64, 67Ns, 14/ 48, 64H/87N, 66/86, 51M
		The 7SJ61 relay can be used for line protection of high and medium voltage networks.When protecting motors, the 7SJ61 is suitable for asynchronous machines of all sizes. The relay performs all functions of backup protection supplementary to transformer differential protection.
		
		Features
		- DT/IDMT: I>,I>>, I>>>; IE>, IE>>, IE>>> / Ip>, IEp>; IEE>, IEE>>, IEEp>
		- Motor protection
		  o Overload protection
		  o Unbalance load protection
		  o Start-up monitoring
		- Reverse Interlocking
		- Trip circuit supervision
		- Cold load pickup (e.g. for energising transformers)
		- Disk emulation
		- Commands for control of a circuit-breaker and of isolators
		- Control via keyboard, binary inputs,
		- DIGSI 4 or SCADA system
		- User-defined logic with CFC (e.g. interlocking)
		- MIMIC Graphical Display (optional)
		
		User Interface
		- Control via keyboard
		- 8 LEDs (6 are independently programmable)
		- User Friendly and keys for front operation
		
		Communication Interface
		- System interface
		  o IEC 60870-5-103, IEC 61850
		  o PROFIBUS-FMS/-DP
		  o DNP 3.0/MODBUS RTU
		- Service interface for DIGSI 4 (modem)
		- Front interface for DIGSI 4
		- Time synchronization via IRIG B/DCF77
		
		Data Storage
		- Fault event logging with time stamp (buffered)
		- 8 oscillographic fault records
		
		Monitoring Functions
		- Operational measured values *I*
		- Circuit-breaker wear monitoring
		- Slave pointer
		- Time metering of operating hours
		- Motor statistics
		
		Hardware
		- 4 current transformers
		- 3/8/11 binary inputs
		- 4/8/6 output relays
		- CT Inputs 1A or 5A (selectable via Jumper)
		- Auxiliary voltage: 60 - 125 V DC, 110 - 250 V AC, 110-220 V DC, 24/48 V DC, 230 V AC
		- 1 Live Status contact
			7SJ61

Numerical Feeder Protection

Protection Ansi Codes	Description	Type
37, 46BC, 46NPS, 49, 50, 50G/N, 50BF, 51, 51G/N /SEF 64H, 74TC, 81HBL2 Optional 79M	The 7SR210 is a new generation of non-directional and directional overcurrent protection relays, built on years of numeric relay protection experience with the Argus family of products. Housed in 4U high, size E6 or E8 cases, these relays provide protection, control, monitoring, instrumentation and metering with integrated input and output logic, data logging & fault reports. **Features** - 8 Settings Groups - Password Protection – 2 levels - User Programmable Logic - Self Monitoring - Reverse Interlocking - Trip circuit supervision **User Interface** - Control via keyboard - 8 or 16 Programmable Tri-colour LEDs (Option) - Menu navigation and User Friendly keys for front operation - 6 Programmable Function Keys each with Tri-colour LED (Option) **Communication Interface** - 2 Rear ST fibre optic ports (2 x Tx/Rx) + IRIG-B port - 1 Rear RS485 + IRIG-B port - 1 Rear RS232 + IRIG-B port - 2 Rear RS485 Port + IRIG-B - 2 Rear RS232 Port +IRIG-B - IEC60870-5-103, Modbus RTU and optional DNP 3.0 protocols – User selectable with programmable data points - IEC 61850 **Data Storage** - Fault event logging with time stamp (buffered) - 10 oscillographic fault records - 5000 events time tagged to 1 ms resolution - Waveform storage is selectable from either 10 records of 1 second, 5 records of 2 seconds, 2 records of 5 seconds or 1 record of 10 seconds duration **Monitoring Functions** - Primary current phases and earth - Secondary current phases and earth - Positive Phase Sequence (PPS) Current - Negative Phase Sequence (NPS) Current - Zero Phase Sequence (ZPS) Current - Binary Input/Output status - Trip circuit healthy/failure - Time and date - Starters - Fault records - Event records - Frequency - Waveform records - Circuit breaker trip counters - I2t summation for contact wear - Demand metering **Hardware** - 4 CT, 9 Binary Inputs / 8 Binary Outputs - 4 CT, 19 Binary Inputs / 16 Binary Outputs - 4 CT, 19 Binary Inputs / 16 Binary Outputs - 1A or 5A (selectable) - Auxiliary voltage: 30 to 220V DC	7SR21

Numerical Feeder Protection

	Protection Ansi Codes	Description	Type
	37, 46BC, 46NPS, 49, 50, 50G/N, 50BF, 51, 51G/N /SEF 60CTS, 64H, 74TC, 81HBL2, 27, 59, 37G, 37SEF, 47, 51V, 59N, 60VTS, 67/50, 67/50G, 67/50N, 67/51, 67/51G, 67/51N, 81U/O **Optional 79M**	The 7SR220 is a new generation of non-directional and directional overcurrent protection relays, built on years of numeric relay protection experience with the Argus family of products. Housed in 4U high, size E6 or E8 cases, these relays provide protection, control, monitoring, instrumentation and metering with integrated input and output logic, data logging & fault reports. **Features** - 8 Settings Groups - Password Protection – 2 levels - User Programmable Logic - Self Monitoring - Reverse Interlocking - Trip circuit supervision - Cold Load Pickup **User Interface** - Control via keyboard - 8 or 16 Programmable Tri-colour LEDs (Option) - Menu navigation and User Friendly keys for front operation - 6 Programmable Function Keys each with Tri-colour LED (Option) **Communication Interface** - 2 Rear ST fibre optic ports (2 x Tx/Rx) + IRIG-B port - 1 Rear RS485 + IRIG-B port - 1 Rear RS232 + IRIG-B port - 2 Rear RS485 Port + IRIG-B - 2 Rear RS232 Port +IRIG-B - IEC60870-5-103, Modbus RTU and optional DNP 3.0 protocols – User selectable with programmable data points - IEC 61850 **Data Storage** - Fault event logging with time stamp (buffered) - 10 oscillographic fault records - 5000 events time tagged to 1 ms resolution - Waveform storage is selectable from either 10 records of 1 second, 5 records of 2 seconds, 2 records of 5 seconds or 1 record of 10 seconds duration. **Monitoring Functions** - Primary current phases and earth - Secondary current phases and earth - Positive Phase Sequence (PPS) Current - Negative Phase Sequence (NPS) Current - Zero Phase Sequence (ZPS) Current - Binary Input/Output status - Trip circuit healthy/failure - Time and date - Starters - Fault records - Event records - Frequency - Waveform records - Circuit breaker trip counters - I2t summation for contact wear - Demand metering **Hardware** - 5 CT, 4 VT, 3 Binary Inputs / 6 Binary Outputs - 5 CT, 4 VT, 13 Binary Inputs / 14 Binary Outputs - 5 CT, 4 VT, 13 Binary Inputs / 14 Binary Outputs - 1A or 5A (selectable) - 63.5/ 110V, 50/60 Hz - Auxiliary voltage: 30 to 220V DC	**7SR22**

Numerical Feeder Protection

	Protection Ansi Codes	Description	Type

	50, 50N, 51, 51N, 46, 49, 50Ns, 51Ns, 74 TC, 50BF, 37, 86, 64R/87N
	
	Optional
	79M, 67Ns, 27/59, 59N, 81U/O, 81R, 67, 67N, 67Ns, 25, 21FL, 47
		The 7SJ80 relays with removable current and voltage terminals, can be used for line/feeder protection of high and medium voltage networks.The relays have all the required functions to be applied as a backup relay to a transformer differential relay.
		
		Features
		- DT/IDMT: I>, I>>, I>>>; IE>, IE>>, IE>>> / Ip>, IEp>; IEE>, IEE>>, IEEp>>; Idir>, Idir>>, Ipdir; IEdir>, IEdir>>, IEpdir>
		- Motor protection
		   o Overload protection
		   o Unbalance load protection
		   o Start-up monitoring
		- Reverse Interlocking
		- Trip circuit supervision
		- Fault Locator
		- Sync Check
		- Cold load pickup (e.g. for energising transformers)
		- Displacement voltage
		- Control via keyboard, binary inputs
		- DIGSI 4 or SCADA system
		- User-defined logic with CFC (e.g. interlocking)
		- Pluggable current and voltage terminals
		
		User Interface
		- Control via keyboard
		- 10 LEDs (8 are independently programmable)
		- User Friendly and keys for front operation
		- User-defined PLC logic with CFC
		
		Communication Interface
		- System interface
		   o IEC 60870-5-103, IEC 61850
		   o PROFIBUS-FMS/-DP
		   o DNP 3.0/MODBUS RTU
		- Ethernet interface for DIGSI 4
		- USB front interface for DIGSI 4
		
		Data Storage
		- Fault event logging with time stamp (buffered)
		- 8 oscillographic fault records
		
		Monitoring Functions
		- Operational measured values *V, I, f*
		- Energy metering values *W*p, *W*q
		- Circuit-breaker wear monitoring
		- Slave pointer
		- Fuse failure monitor
		- Motor statistics
		
		Hardware
		- 4 current transformers
		- 0 / 3 voltage transformers
		- 3 / 7 binary inputs
		- 5 / 8 output relays
		- CT Inputs 1A or 5A (selectable)
		- Auxiliary voltage: 60 - 125V DC, 110 - 250 V A.C. 110-220V DC, 24/48 V DC, 230 V AC
		- 1 Live Status contact
			7SJ80

Numerical Feeder Protection

Protection Ansi Codes	Description	Type
27/59, 27Sag/59Swell, 37, 46BC, 46NPS, 47NPS, 49, 50BF, 51c, 51V, 59N, 60CTS, 60VTS, 64H, 67/50, 67/50G, 67/51, 67/51G, 67/50SEF, 67/51SEF, 74TCS, 79, 81, 81HBL2, 86 Optional - Loop Automation by Loss of Voltage - Single / Triple Pole Autoreclose for Three Single Pole Circuit Breakers - Synchronizing, Synchronizing Check (25)	The 7SR224 Recloser Controller is one of a range of devices providing comprehensive directional and non-directional overcurrent protection integrated with associated protection elements and Autoreclose scheme logic. It builds on the years of in-service experience gained from the Argus family of products. **Features** - 8 Settings Groups - Password Protection – 2 levels - User Programmable Logic - Self Monitoring - Reverse Interlocking - Trip circuit supervision - Cold Load Pickup **User Interface** - 20 character x 4 line backlit LCD - Menu navigation keys - 3 fixed function LEDs - 8 or 16 Programmable Tri-colour LEDs - 12 Programmable Function Keys with Tri-colour LEDs **Communication Interface** - 2 Rear ST fibre optic ports (2 x Tx/Rx) + IRIG-B port - 1 additional Rear RS485 + IRIG-B port - 1 additional Rear RS232 + IRIG-B port - IEC60870-5-103, Modbus RTU and DNP 3.0 protocols ~ User selectable with programmable data points - IEC 61850 **Data Storage** - Fault event logging with time stamp (buffered) - 10 oscillographic fault records - 5000 events time tagged to 1 ms resolution - Waveform storage is selectable from either 10 records of 1 second, 5 records of 2 seconds, 2 records of 5 seconds or 1 record of 10 seconds duration. **Monitoring Functions** - Primary current phases and earth - Secondary current phases and earth - Positive Phase Sequence (PPS) Current - Negative Phase Sequence (NPS) Current - Zero Phase Sequence (ZPS) Current - Binary Input/Output status - Trip circuit healthy/failure - Time and date - Starters - Fault records - Event records - Frequency - Waveform records - Circuit breaker trip counters - I^2t summation for contact wear - Demand metering **Hardware** - 4 CT, 6 VT, 13 Binary Inputs / 14 Binary Outputs - 4 CT, 4 VT, 13 Binary Inputs / 14 Binary Outputs - 4 CT, 4 VT, 23 Binary Inputs / 22 Binary Outputs - 4 CT, 4 VT, 33 Binary Inputs / 14 Binary Outputs - 4 CT, 6 VT, 23 Binary Inputs / 22 Binary Outputs - 4 CT, 4 VT, 33 Binary Inputs / 14 Binary Outputs - 4 CT, 4 VT, 33 Binary Inputs / 30 Binary Outputs - 4 CT, 4 VT, 43 Binary Inputs / 22 Binary Outputs - 1A or 5A (selectable) - 63.5 / 110V, 50/60 Hz - Auxiliary voltage: 30 to 220V DC	7SR224

Numerical Feeder Protection

Protection Ansi Codes	Description	Type

50, 50N, 51, 51N, 46, 49, 74 TC, 50BF, 37, 51V, 86, 59N, 47
 	
Optional
79M, 50Ns, 51Ns, 64, 67Ns, 27/59, 81U/O, 81R, 67, 67N, 67Ns, 87N/64R, 14/ 48, 64H/87N, 66/86, 51M, 25, 21FL
	The 7SJ62 relays can be used for line protection of high and medium voltage networks with earthed (grounded), low-resistance earthed, isolated or compensated neutral point. With regard to motor protection, the 7SJ62 is suitable for asynchronous machines of all sizes. The relay performs all functions of backup protection supplementary to transformer differential protection.
	
	Features
	- DT/IDMT: I>, I>>, I>>>; IE>, IE>>, IE>>> / Ip>, IEp>; IEE>, IEE>>, IEEp> / Idir>, Idir>>, Ipdir>; IEdir>, IEdir>>, IEpdir>
	- Motor protection
	   o Overload protection
	   o Unbalance load protection
	   o Start-up monitoring
	- Reverse Interlocking
	- Trip circuit supervision
	- Fault Locator
	- Sync Check
	- Cold load pickup (e.g. for energising transformers)
	- Displacement voltage
	- Disk emulation
	- Commands for control of a circuit-breaker and of isolators
	- Control via keyboard, binary inputs,
	- DIGSI 4 or SCADA system
	- User-defined logic with CFC (e.g. interlocking)
	
	User Interface
	- Control via keyboard
	- 8 LEDs (6 are independently programmable)
	- User Friendly and keys for front operation
	- 4 Freely assignable Function keys
	- MIMIC Graphical display (optional)
	
	Communication Interface
	- System interface
	   o IEC 60870-5-103, IEC 61850
	   o PROFIBUS-FMS/-DP
	   o DNP 3.0/MODBUS RTU
	- Service interface for DIGSI 4 (modem)
	- Front interface for DIGSI 4
	- Time synchronization via IRIG B/DCF77
	
	Data Storage
	- Fault event logging with time stamp (buffered)
	- 8 oscillographic fault records
	
	Monitoring Functions
	- Operational measured values V, I, f
	- Energy metering values Wp, Wq
	- Circuit-breaker wear monitoring
	- Slave pointer
	- Fuse failure monitor
	- Motor statistics
	
	Hardware
	- 4 current transformers
	- 3 / 4 voltage transformers
	- 8 /11 binary inputs
	- 8 / 6 output relays
	- CT Inputs 1A or 5A (selectable via Jumper)
	- Auxiliary voltage: 60 - 125V DC, 110 - 250 V A.C. 110-220V DC, 24/48 V DC, 230 V AC
	- 1 Live Status Contact
		7SJ62

Numerical Feeder Protection

Protection Ansi Codes	Description	Type

50, 50N, 51, 51N, 46, 49, 74 TC, 50BF, 37, 51V, 86, 59N, 47
 	
Optional
 	
79M, 50Ns, 51Ns, 64, 67Ns, 27/59, 81U/O, 81R, 67, 67N, 67Ns, 87N/64R, 14/ 48, 64H/87N, 66/86, 51M, 21FL
	The 7SJ63 can be used as a protective control and monitoring relay for distribution feeders and transmission lines of any voltage in networks that are earthed (grounded), low-resistance earthed, unearthed, or of a compensated neutral point structure. The relay is suited for networks that are radial or looped, and for lines with single or multi-terminal feeds. The 7SJ63 is equipped with motor protection applicable for asynchronous machines of all sizes. Motor protection comprises undercurrent monitoring, starting time supervision, restart inhibit, locked rotor.
	
	Features
	- DT/IDMT: I>, I>>; IE>, IE>>, / Ip>, IEp>; IEE>, IEE>>, IEEp> ; Idir>, Idir>>, Ipdir>; IEdir>, IEdir>>, IEpdir>
	- Motor protection
	   o Overload protection
	   o Unbalance load protection
	   o Start-up monitoring
	- Reverse Interlocking
	- Trip circuit supervision
	- Fault Locator
	- Sync Check
	- Cold load pickup (e.g. for energising transformers)
	- Displacement voltage
	- Commands for control of a circuit-breaker and of isolators
	- Control via keyboard, binary inputs
	- DIGSI 4 or SCADA system
	- User-defined logic with CFC (e.g. interlocking)
	User Interface
	- Control via keyboard
	- 16 LEDs (14 are independently programmable)
	- User Friendly and keys for front operation
	- 4 Freely assignable Function keys
	- Flexible number of switching devices
	- Position of switching elements is shown on the graphic display
	- Local/remote switching via key operated switch
	Communication Interface
	- System interface
	   o IEC 60870-5-103, IEC 61850
	   o PROFIBUS-FMS/-DP
	   o DNP 3.0/MODBUS RTU
	- Service interface for DIGSI 4 (modem)
	- Front interface for DIGSI 4
	- Time synchronization via IRIG B/DCF77
	Data Storage
	- Fault event logging with time stamp (buffered)
	- 8 oscillographic fault records
	Monitoring Functions
	- Operational measured values V, I, f
	- Energy metering values Wp, Wq
	- Circuit-breaker wear monitoring
	- Slave pointer
	- Fuse failure monitor
	- Motor statistics
	Hardware
	- 4 current transformers
	- 3 / 4 voltage transformers
	- 11/ 24/ 20/ 37/ 33 Binary Inputs
	- 2 measuring Transducer Inputs (Optional)
	- 8 / 11 output relays
	- CT Inputs 1A or 5A (selectable via Jumper)
	- Auxiliary voltage: 60 - 125V DC, 110 - 250 V A.C. 110-220V DC, 24/48 V DC, 230 V AC
	- 1 Live Status Contact
		7SJ63

Numerical Feeder Protection

Protection Ansi Codes	Description	Type
50, 50N, 51, 51N, 67, 67N, 67Ns, 87N, 50BF, 79M, 25, 46, 47, 48, 49, 14, 66/86, 37, 38, 27,59, 32, 55, 81U/O, 81R, 21FL, 51M	Multifunctional Over-current protection relay **Features** - Time-overcurrent protection - Directional time-overcurrent protection - Sensitive dir./non-dir. earth-fault detection - Displacement voltage - Intermittent earth-fault protection - High-impedance restricted earth fault - Inrush restraint - Motor protection - Overload protection - Temperature monitoring - Under-/overvoltage protection - Under-/overfrequency protection - Rate-of-frequency-change protection - Power protection (e.g. reverse, factor) - Breaker failure protection - Negative-sequence protection - Phase-sequence monitoring - Synchronization - Auto-reclosure - Fault locator - Lockout **User Interface** - Control via keyboard - 16 LEDs (14 are independently programmable) - User Friendly and keys for front operation - 4 Freely assignable Function keys - Flexible number of switching devices - Position of switching elements is shown on the graphic display - Local/remote switching via key operated switch **Communication Interface** - System interface - IEC 60870-5-103, IEC 61850 - PROFIBUS-FMS/-DP - DNP 3.0/MODBUS RTU - Service interface for DIGSI 4 (modem) - Front interface for DIGSI 4 - Time synchronization via IRIG B/DCF77 **Data Storage** - Fault event logging with time stamp (buffered) - 8 oscillographic fault records **Monitoring Functions** - Operational measured values V, I, f - Energy metering values Wp, Wq - Circuit-breaker wear monitoring - Slave pointer - Fuse failure monitor - Motor statistics - Trip circuit supervision **Hardware** - 4 current transformers - 4 voltage transformers - 15/13, 20/8, 33/11, 48/21 BI/BO - 2 measuring Transducer Inputs (Optional) - 4/8 output relays - CT Inputs 1A or 5A (selectable via Jumper) - Auxiliary voltage: 60 - 125V DC, 110 - 250 V A.C. 110-220V DC, 24/48 V DC, 230 V AC - 1 Live Status Contact	7SJ64

Numerical Motor Protection

	Protection Ansi Codes	Description	Type

	50, 50N, 51, 51N, 46, 49, 51C 14/ 48, 74 TC,
	
	 79M (Optional)
		The 7SJ600 is a numerical overcurrent relay which, in addition to its primary use in radial distribution networks and motor protection, can also be employed as backup for feeder, transformer and generator differential protection.
		
		 Features
		
		 - DT/IDMT: l>, I>>, I>>>; IE>, IE>> / Ip>, IEp>
		 - Motor protection
		   o Overload protection
		   o Unbalance load protection
		   o Start-up monitoring
		 - Reverse Interlocking
		 - Trip circuit supervision
		 - Cold load pickup (e.g. for energising transformers)
		
		 User Interface
		
		 - Control via keyboard
		 - 6 LEDs (4 are independently programmable)
		 - User Friendly and keys for front operation
		
		 Communication Interface
		
		 - Serial interface with IEC-protocol / DIGSI V3 Or DIGSI 4 (≥ 4.3)
		 - Via RS232 – RS485 converter
		 - Via modem
		 - IEC 60870-5-103 protocol, 2 kV-isolated
		 - RS485 interface
		
		 Data Storage
		
		 - Fault event logging with time stamp (buffered)
		 - 8 oscillographic fault records
		
		 Monitoring Functions
		
		 - Primary/Secondary Current Phases and Earth
		
		 Hardware
		
		 - 2 Alarm relays (independently programmable)
		 - 3 Binary inputs (independently programmable)
		 - 2 Trip contacts with 2 making contacts each (independently programmable)
		 - OPEN/CLOSE test power circuit breaker
		 - 3 CT Inputs : 1A or 5A (selectable via Jumper)
		 - Auxiliary voltage: D.C. 60 - 125V, 110 - 250 V / A.C. 115 V (via Jumper), D.C. 24/48 V, A.C. 230 V
		 - 1 Live Status contact
			7SJ600

Numerical Motor Protection

Protection Ansi Codes	Description	Type

50, 50N, 51, 51N, 46, 49, 51C 74 TC, 50BF
 	
Optional
79M, 50Ns, 51Ns, 64, 67Ns, 14/ 48, 37, 66/86
	The 7SJ602 is a numerical overcurrent relay which, in addition to its primary use in radial distribution networks and motor protection, can also be employed as backup for feeder, transformer and generator differential protection.
	
	Features
	- DT/IDMT: l>, l>>, l>>>; lE>, lE>>, / lp>, lEp>; lEE>, lEE>>, lEp>
	- Motor protection
	   o Overload protection
	   o Unbalance load protection
	   o Start-up monitoring
	- Reverse Interlocking
	- Trip circuit supervision
	- Cold load pickup (e.g. for energising transformers)
	- Displacement voltage
	- Disk emulation
	
	User Interface
	- Control via keyboard
	- 6 LEDs (4 are independently programmable)
	- User Friendly and keys for front operation
	
	Communication Interface
	- Serial interface with IEC-protocol / DIGSI V3 Or DIGSI 4 (≥ 4.3)
	- Via RS232 – RS485 converter
	- Via modem
	- IEC 60870-5-103 protocol, 2 kV-isolated
	- RS485 interface
	
	Data Storage
	- Fault event logging with time stamp (buffered)
	- 8 oscillographic fault records
	
	Monitoring Functions
	- Operational measured values I, V
	- Power measurement P, Q, S, Wp, Wq
	- Slave pointer
	- Mean values
	
	Hardware
	- 4 current transformers or
	- 3 current + 1 voltage transformers
	- 3 binary inputs
	- 4 output relays
	- CT Inputs 1A or 5A (selectable via Jumper)
	- Auxiliary voltage: D.C. 60 - 125V, 110 - 250 V / A.C. 115 V (via Jumper), D.C. 24/48 V, A.C. 230 V
	- 1 Live Status contact
		7SJ602

Numerical Motor Protection

	Protection Ansi Codes	Description	Type
	50, 51, 51, 49, 81B, 74 TC, 50BF, 60CTS, 50Ns, 37, 86, 48/66, 14, 46, 81, 32, 55 **Optional** **27/59, 55, 67, 67G/N, 81U/O, 81R, 47, 32**	**Features** - Advanced motor protection - for medium voltage motors - Easily programmable settings and user interface - CT supervision - 4 Settings Groups - Self Monitoring - Trip circuit supervision - Hot/ Cold Ratio Monitoring - Motor Statistics - Password Protection **User Interface** - 20 character x 4 line backlit LCD - Menu navigation keys - 10 Programmable Tri-colour LEDs (Option) - Menu navigation and User Friendly keys for front operation **Communication Interface** - IEC60870-5-103, Modbus RTU and optional DNP 3.0 protocols – User selectable with programmable data points - Modbus RTD Client for use with external temperature monitoring interface. **Data Storage** - Fault event logging with time stamp (buffered) - 10 oscillographic fault records - 1000 events time tagged to 1 ms resolution - Waveform storage is selectable from either 10 records of 1 second, 5 records of 2 seconds, 2 records of 5 seconds or 1 record of 10 seconds duration. **Monitoring Functions** - Phase, earth and sequence currents - Thermal equivalent and phase difference currents - Line, phase, neutral and sequence voltages - Power - Apparent, Real and Reactive. Power factor - Energy - WHr and VAr Hr - Demand metering - Number of Starts, Starts per hour - Start currents, voltages and power - Start method (Local/remote/comms) - Motor run / start / trip times, thermal status, - Binary Input / Output status - General Alarms inc. trip circuit healthy/failure - Starters - Fault data - CB trip and maintenance counters and Time to Trip - Temperature input (optional) values Time and Date **Hardware** - 4 CT, 6 Binary Inputs / 8 Binary Outputs - 4 CT, 3VT 6 Binary Inputs / 8 Binary Outputs - 1A or 5A (selectable) - Auxiliary voltage: 24-60 or 80-250 V DC	**7SR17**

Numerical Motor Protection

Protection Ansi Codes	Description	Type

50, 50N, 51, 51N, 46NPS, 49, 50Ns, 51Ns, 74TC, 50BF, 37, 86, 14/48, 66/86, 51M
 	
Optional
67Ns, 27/59, 59N, 67, 67N, 81U/O, 81R, 47, 32
	The 7SK80 is a multifunctional motor protection relay. It is designed for asynchronous induction-type motors of all sizes. The relays have all the functionality to be applied as a backup relay to a transformer differential relay.
	
	Features
	- DT/IDMT: I>, I>>; IE>, IE>>; Ip>, IEp>; IEE>, IEE>>, IEEp; Idir>, Idir>>, Ipdir>; IEdir>, IEdir>>, IEpdir>
	- Motor protection
	   o Overload protection
	   o Unbalance load protection
	   o Start-up monitoring
	- Reverse Interlocking
	- Trip circuit supervision
	- Inrush Restraint
	- Cold load pickup (e.g. for energising transformers)
	- Displacement voltage
	- Control via keyboard, binary inputs
	- DIGSI 4 or SCADA system
	- User-defined logic with CFC (e.g. interlocking)
	- Pluggable current and voltage terminals
	
	User Interface
	- Control via keyboard
	- 10 LEDs (8 are independently programmable)
	- User Friendly and keys for front operation
	- User-defined PLC logic with CFC
	
	Communication Interface
	- System interface
	   o IEC 60870-5-103, IEC 61850
	   o PROFIBUS-FMS/-DP
	   o DNP 3.0/MODBUS RTU
	- Ethernet interface for DIGSI 4
	- USB front interface for DIGSI 4
	
	Data Storage
	- Fault event logging with time stamp (buffered)
	- 8 oscillographic fault records
	
	Monitoring Functions
	- Operational measured values V, I, f
	- Energy metering values Wp, Wq
	- Circuit-breaker wear monitoring
	- Slave pointer
	- Fuse failure monitor
	- Motor statistics
	
	Hardware
	- 4 current transformers
	- 0 / 3 voltage transformers
	- 3 / 7 binary inputs
	- 5 / 8 output relays
	- 5 RTD Inputs (Optional)
	- CT Inputs 1A or 5A (selectable)
	- Auxiliary voltage: 60 - 125V DC, 110 - 250 V A.C. 110-220V DC, 24/48 V DC, 230 V AC
	- 1 Live Status contact
		7SK80

Numerical Transformer Protection

	Protection Ansi Codes	Description	Type
	87T (2Windings), 87HS, 50BF, 51, 64H, 74TC, 81HBL2, 81HBL5 **Optional 37,46NPS, 49, 50, 50G/N/SEF, 51G/N/SEF, 24, 27/59, 59N, 81 U/O**	The 7SR242 is a new generation of Integrated Transformer Protection Relay for 2 winding transformer differential protection. The relays utilise years of numeric relay protection experience with the 'Duobias' family of products. **Features** - 8 Settings Groups - Password Protection – 2 levels - User Programmable Logic - Self Monitoring - Inrush Restraint or Block **User Interface** - Control via keyboard - 16 or 24 user programmable tri-colour LED's (Option) - Menu navigation and User Friendly keys for front operation - 6 Programmable Function Keys each with Tri-colour LED (Option) **Communication Interface** - 2 Rear ST fibre optic ports (2 x Tx/Rx) + IRIG-B port - 1 Rear RS485 + IRIG-B port - 1 Rear RS232 + IRIG-B port - 2 Rear RS485 Port + IRIG-B - 2 Rear RS232 Port +IRIG-B - IEC60870-5-103, Modbus RTU and optional DNP 3.0 protocols – User selectable with programmable data points - IEC 61850 **Data Storage** - Fault event logging with time stamp (buffered) - 10 oscillographic fault records - 5000 events time tagged to 1 ms resolution - Waveform storage is selectable from either 10 records of 1 second, 5 records of 2 seconds, 2 records of 5 seconds or 1 record of 10 seconds duration **Monitoring Functions** - Secondary current phases and earth - Relay Operate and restraint currents - Positive Phase Sequence (PPS) Current - Negative Phase Sequence (NPS) Current - Zero Phase Sequence (ZPS) Current - Thermal status - Primary Single phase voltage* - Secondary single phase voltage* - Data logging and Demand Metering - Frequency & over-fluxing* - Binary Input/binary output and virtual I/O status - Trip circuit healthy/failure - Time and date - Fault records - Event records - Waveform records - Circuit breaker trip counters - I2t summation for contact wear * Optional voltage measurements from single phase VT input **Hardware** - 8 CT, 1 VT, 9 Binary Inputs / 6 Binary Outputs - 8 CT, 1 VT, 19 Binary Inputs / 14 Binary Outputs - 1A or 5A (selectable) - 63.5/ 110V, 50/60 Hz - Auxiliary voltage: 30 to 220V DC	**7SR242**

Numerical Transformer Protection

	Protection Ansi Codes	Description	Type

	87T (2Windings), 50, 51, 86, 49 , 81HBL2
	
	Optional 87N/ 64H, 46, 50BF, 74TC
		The 7UT6 differential protection relays are used for fast and selective fault clearing of short-circuits in transformers of all voltage levels and also in rotating electric machines like motors and generators, for short lines and busbars. The protection relay can be parameterized for use with three-phase and single-phase transformers.
		
		Features
		- Two Winding Differential Protection
		- Trip circuit supervision
		- Sensitive measuring for low-fault currents
		- Fast tripping for high-fault currents
		- Restraint against inrush of transformer
		- Control via keyboard, binary inputs
		- DIGSI 4 or SCADA system
		- User-defined logic with CFC (e.g. interlocking)
		- Selectable Binary Input Thresholds
		
		User Interface
		- Control via keyboard
		- 8 LEDs (6 are independently programmable)
		- User Friendly and keys for front operation
		- 4 Freely assignable Function keys
		- Flexible number of switching devices
		
		Communication Interface
		- System interface
		  o IEC 60870-5-103, IEC 61850
		  o PROFIBUS-FMS/-DP
		  o DNP 3.0/MODBUS RTU
		- Service interface for DIGSI 4 (modem)
		- Front interface for DIGSI 4
		- Time synchronization via IRIG B/DCF77
		
		Data Storage
		- Fault event logging with time stamp (buffered)
		- 8 oscillographic fault records
		
		Monitoring Functions
		- Operational measured values I
		- Circuit-breaker wear monitoring
		- Slave pointer
		
		Hardware
		- 8 current transformers
		- 3 Binary Inputs
		- 6 RTD Input Interface via. Thermo box (optional)
		- 4 output relays
		- CT Inputs 1A or 5A (selectable via Jumper)
		- Auxiliary voltage: 60 - 125V DC, 110 - 250 V A.C. 110-220V DC, 24/48 V DC, 230 V AC
		- 1 Live Status Contact
			7UT612

Numerical Transformer Protection

	Protection Ansi Codes	Description	Type
	87BD (3 Windings), 87HS Optional 50, 51, 50N, 51N, 50G, 51G, 86, 49 , 81HBL2, 87N/ 64H, 46, 50BF, 74TC, 27, 59, 81U/O, 32, 24	The 7SG14 Duobias-M is a transformer protection relay with biased differential transformer protection. It is capable of providing all necessary protection and alarm functions for protecting a 2 or 3 winding transformer. The main protection function is current differential with load bias and second harmonic restraining characteristic. This is supplemented with a number of additional functions to provide a comprehensive transformer protection management package.	**7SG14**

Features
- 4 Settings Groups
- User Programmable Logic
- Self Monitoring
- Inrush Restraint or Block
- Vector group compensation and ratio correction

User Interface
- Control via keyboard
- 16 or 32 user programmable tri-colour LED's (Option)
- Menu navigation and User Friendly keys for front operation
- 20 character x 2 line backlit LCD
- 1 fixed LED

Communication Interface
- Communication access to relay functionality is via a front RS232 port for local PC connection
- Two rear ST fibre optic ports (2 x Tx/Rx) and an IRIG-B are also provided
- IEC60870-5-103, Modbus RTU protocols – User selectable with programmable data points

Data Storage
- Fault event logging with time stamp (buffered)
- 10 oscillographic fault records
- 500 events time tagged to 1 ms resolution
- Waveform storage is selectable from either 5 records of 1 second, 1 sec of 5 records

Monitoring Functions
- Line currents for each winding
- Relay currents for each winding (after ratio and vector group
- compensation)
- Operate and restrain currents
- Binary inputs
- Output contacts

Hardware
- 17 CT, 0/1 VT
- 3 / 11/ 19/ 27 Binary Inputs
- 5 / 13, 21/ 29 Binary Outputs
- 1A or 5A (selectable)
- 63.5/ 110V, 50/60 Hz
- Auxiliary voltage: 30 to 220V DC

Numerical Transformer Protection

	Protection Ansi Codes	Description	Type

	87T (3 Windings), 50, 51, 50N, 51N, 50G, 51G, 86, 49, 81HBL2
	
	Optional 87N/ 64H, 46, 50BF, 74TC, 27, 59, 81U/O, 32, 24
		The 7UT6 differential protection relays are used for fast and selective fault clearing of short-circuits in transformers of all voltage levels and also in rotating electric machines like motors and generators, for short lines and busbars. The protection relay can be parameterized for use with three-phase and single-phase transformers.
		
		Features
		- Three Winding Differential Protection
		- Trip circuit supervision
		- Sensitive measuring for low-fault currents
		- Fast tripping for high-fault currents
		- Restraint against inrush of transformer
		- Control via keyboard, binary inputs,
		- DIGSI 4 or SCADA system
		- User-defined logic with CFC (e.g. interlocking)
		- Selectable Binary Input Thresholds
		
		User Interface
		- Control via keyboard
		- 16 LEDs (14 are independently programmable)
		- User Friendly and keys for front operation
		- 4 Freely assignable Function keys
		- Flexible number of switching devices
		
		Communication Interface
		- - System interface
		  o IEC 60870-5-103, IEC 61850
		  o PROFIBUS-FMS/-DP
		  o DNP 3.0/MODBUS RTU
		- Service interface for DIGSI 4 (modem)
		- Front interface for DIGSI 4
		- Time synchronization via IRIG B/DCF77
		
		Data Storage
		- Fault event logging with time stamp (buffered)
		- 8 oscillographic fault records
		
		Monitoring Functions
		- Operational measured values I
		- Metering Values, Energy Metering
		- Circuit-breaker wear monitoring
		- Slave pointer
		
		Hardware
		- 12 current transformers
		- 5 Binary Inputs
		- 6 RTD Input Interface via. Thermo box (optional)
		- 8 output relays
		- CT Inputs 1A or 5A (selectable via Jumper)
		- Auxiliary voltage: 60 - 125V DC, 110 - 250 V A.C. 110-220V DC, 24/48 V DC, 230 V AC
		- 1 Live Status Contact
			7UT613

Nomenclature for Protection Functions (ANSI Codes)

Ansi Code	Functions
14	Locked rotor protection
21	Distance protection
21 FL	With Fault locator
24	Overexcitation protection
25	Synchrocheck, synchronizing function
27	Undervoltage protection
27TN/59TN	Stator ground fault 3rd harmonics
32	Directional power supervision
32R	Reverse-power protection
32F	Forward-power protection
37	Undercurrent, underpower
38	Temperature supervision
40	Underexcitation protection
46/46BC	Unbalanced-load protection/broken conductor
46NPS	Negative phase sequence overcurrent
47	Phase-sequence-voltage supervision/Phase rotation
48	Start-time supervision
49	Thermal overload protection
50	Definite time-overcurrent protection
50Ns	Sensitive ground-current protection
50G/50N	Instantaneous earth fault
50SEF	Instantaneous sensitive earth fault
50L	Load-jam protection
50BF	Circuit-breaker failure protection
51	Inverse time-overcurrent protection
51M	Motor load-jam protection, motor statistics
51V	Voltage dependent overcurrent
51G/51N	Time delayed earth fault
51SEF	Time delayed sensitive earth fault
51C	Cold load pickup
55	Power factor
59	Overvoltage protection
59N	Neutral voltage displacement
59R, 27R	Rate-of-voltage-change protection
60FL	Fuse failure monitor
60CTS	CT Supervision
60VTS	VT supervision
64	Sensitive ground-fault protection (machine)

Ansi Code	Functions
64H	High impedance REF
64R	Rotor earth fault protection (1-3 Hz square wave voltage)
64G	100%-stator-earth-fault protection with 20-Hz-voltage
66	Restart inhibit
67	Directional overcurrent protection
67/50	Directional instantaneous phase fault overcurrent
67/51	Directional time delayed phase fault overcurrent
67/51G 67/51N	Directional time delayed earth fault
67/50G 67/50N	Directional instantaneous earth fault
67/51/SEF	Time delayed sensitive earth fault
67Ns	Sensitive ground-fault detection for systems with resonant or isolated neutral
68	Power-swing blocking
74TC	Trip-circuit supervision
74BF	Circuit breaker close fail
78	Out-of-step protection
79	Automatic reclosing
81 U/O	Frequency protection
81R	Rate of change of frequency
81LR	Load restoration
81HBL2	2nd harmonic block/inrush restraint
81HBL5	5th harmonic block/inrush restraint
85	Teleprotection
85 DT	Circuit-breaker intertripping function
86	Lockout
87	Differential protection
87N	Differential ground-fault protection
87BD	Biased current differential
87HS	Current differential highest
87REF	Restricted earth-fault
87L	Line differential protection
87Ns L	Ground-fault differential protection for isolated/resonance-earthed networks
90V	Automatic voltage control

Notes

Notes

Notes

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