SIEMENS

Overcurrent Protection 7SJ80
SIPROTEC Compact

Application examples

Busbar protection by overcurrent relays with reverse interlocking

Applicable to distribution busbars without substantial (< 0.25 x I_N) backfeed from the outgoing feeders.

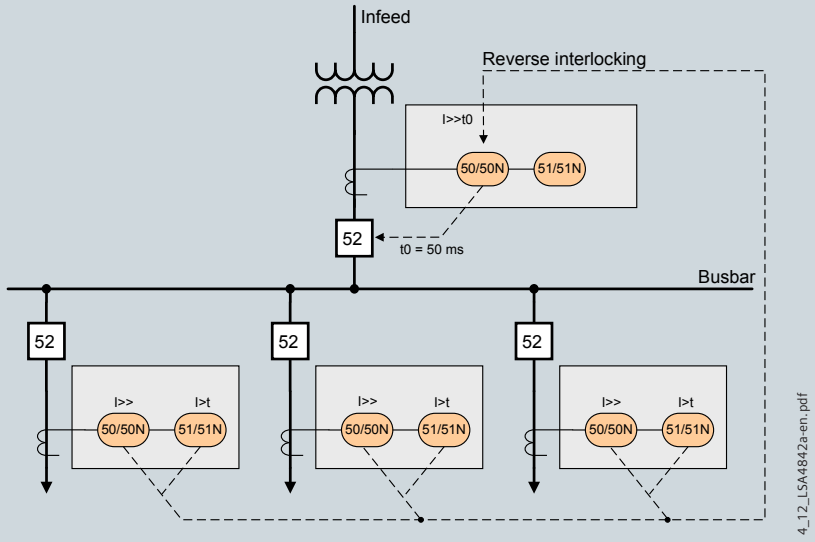

Fig. 4/12 Busbar protection via overcurrent relays with reverse interlocking

Line feeder with load shedding

In unstable power systems (e.g. solitary systems, emergency power supply in hospitals), it may be necessary to isolate selected consumers from the power system in order to protect the overall system. The overcurrent-time protection functions are effective only in the case of a short-circuit.Overloading of the generator can be measured as a frequency or voltage drop.

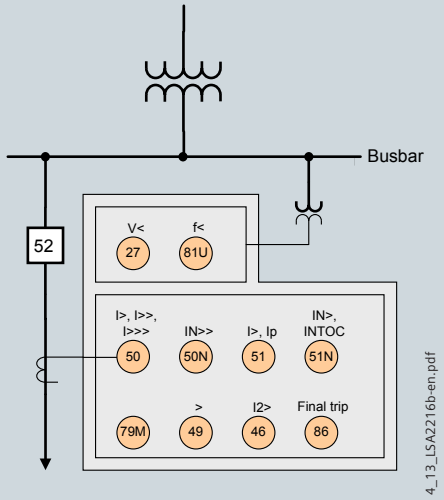

Fig. 4/13 Line feeder with load shedding

Application examples

Synchrocheck

Where two system sections are interconnected, the synchrocheck determines whether the connection is permissible without danger to the stability of the power system. In the example, load is supplied from a generator to a busbar through a transformer. The vector group of the transformer can be considered by means of a programmable angle adjustment, so that no external adjustment elements are necessary. Synchrocheck can be used for auto-reclosure, as well as for control functions (local or remote).

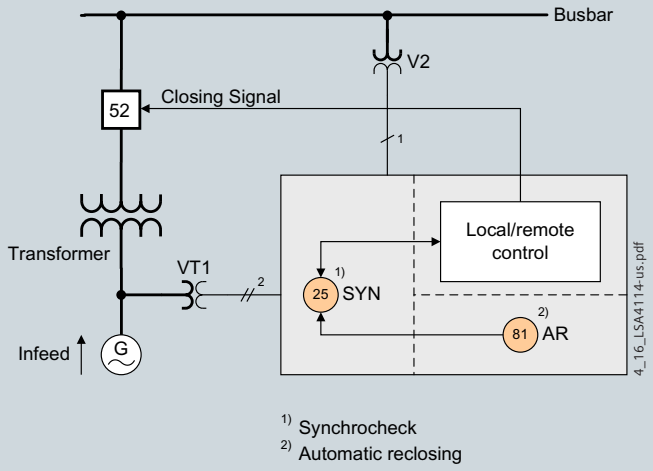

Fig. 4/16 Measurement of busbar and feeder voltage for synchronization

Protection of a transformer

The high-current stage enables a current grading, the overcurrent stages work as backup protection to subordinate protection devices, and the overload function protects the transformer from thermal overload. Low-current, single-phase faults on the low-voltage side, which are reproduced in the opposite system on the high-voltage side, can be detected with the unbalanced load protection. The available inrush blocking prevents pickup caused by the inrush currents of the transformer.

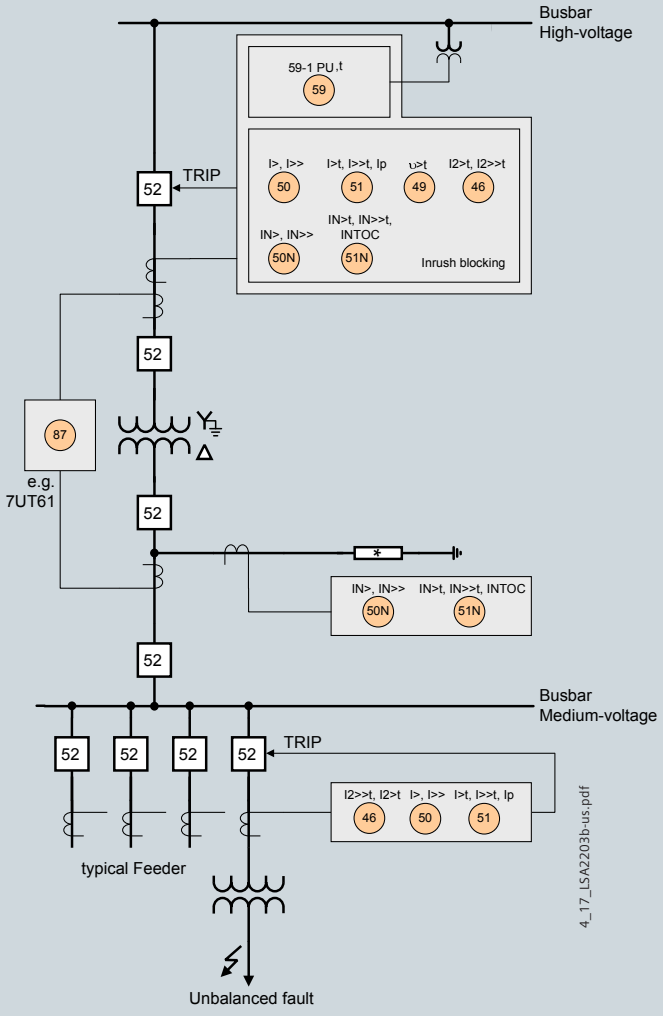

Fig. 4/17 Typical protection concept for a transformer

Overcurrent Protection SIPROTEC 7SJ80

Selection and ordering data

Product description	Order No.	Short code
	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19	
Overcurrent Protection SIPROTEC 7SJ80 V4.74	**7SJ80** □□-□□□□□-□□□□+□□□	
Measuring inputs, binary inputs and outputs		
Housing 1/6 19"; 4 x I, 3 BI, 5 BO (2 Changeover/Form C), 1 life contact	**1**	
Housing 1/6 19"; 4 x I, 7 BI, 8 BO (2 Changeover/Form C), 1 life contact	**2**	
Housing 1/6 19"; 4 x I, 3 x V, 3 BI, 5 BO (2 Changeover/Form C), 1 life contact	**3**	
Housing 1/6 19"; 4 x I, 3 x V, 7 BI, 8 BO (2 Changeover/Form C), 1 life contact	**4**	
Housing 1/6 19"; 4 x I, 11 BI, 5 BO (2 Changeover/Form C), 1 life contact	**7**	
Housing 1/6 19"; 4 x I, 3 x V, 11 BI, 5 BO (2 Changeover/Form C), 1 life contact	**8**	
Measuring inputs, default settings		
I_{ph} = 1 A/5 A, I_E = 1 A/5 A	**1**	
I_{ph} = 1A / 5A, I_{EE} (sensitive) = 0,001 to 1,6A / 0,005 to 8A	**2**	
Auxiliary voltage		
DC 24 V/48 V	**1**	
DC 60 V/110 V/125 V/220 V/250 V, AC 115 V, AC 230 V	**5**	
Construction		
Surface-mounting case, screw-type terminal	**B**	
Flush-mounting case, screw-type terminal	**E**	
Region specific default and language settings		
Region DE, IEC, language German (language changeable), standard front	**A**	
Region World, IEC/ANSI, language Englisch (language changeable), standard front	**B**	
Region US, ANSI, language US-English (language changeable), US front	**C**	
Region FR, IEC/ANSI, language French (language changeable), standard front	**D**	
Region World, IEC/ANSI, language Spanish (language changeable), standard front	**E**	
Region World, IEC/ANSI, language Italian (language changeable), standard front	**F**	
Region RUS, IEC/ANSI, language Russian (language changeable), standard front	**G**	
Region CHN, IEC/ANSI, language Chinese (language not changeable), Chinese front	**K**	
Port B (at bottom of device, rear)		
No port	**0**	
IEC60870-5-103 or DIGSI4/Modem, electrical RS232	**1**	
IEC60870-5-103 or DIGSI4/Modem, electrical RS485	**2**	
IEC60870-5-103 or DIGSI4/Modem, optical 820nm, ST connector	**3**	
PROFIBUS DP Slave, electrical RS485	**9**	**L 0 A**
PROFIBUS DP Slave, optical, double ring, ST connector	**9**	**L 0 B**
MODBUS, electrical RS485	**9**	**L 0 D**
MODBUS, optical 820nm, ST connector	**9**	**L 0 E**
DNP 3.0, electrical RS485	**9**	**L 0 G**
DNP 3.0, optical 820nm, ST connector	**9**	**L 0 H**
IEC 60870-5-103, redundant, electrical RS485, RJ45 connector	**9**	**L 0 P**
IEC 61850, 100Mbit Ethernet, electrical, double, RJ45 connector	**9**	**L 0 R**
IEC 61850, 100Mbit Ethernet, optical, double, LC connector	**9**	**L 0 S**
DNP3 TCP + IEC 61850, 100Mbit Ethernet, electrical, double, RJ45 connector	**9**	**L 2 R**
DNP3 TCP + IEC 61850, 100Mbit Ethernet, optical, double, LC connector	**9**	**L 2 S**
PROFINET + IEC 61850, 100Mbit Ethernet, electrical, double, RJ45 connector	**9**	**L 3 R**
PROFINET + IEC 61850, 100Mbit Ethernet, optical, double, LC connector	**9**	**L 3 S**
IEC 60870-5-104 + IEC 61850, 100Mbit Ethernet, electrical,double, RJ45 connector	**9**	**L 4 R**
IEC 60870-5-104 + IEC 61850, 100Mbit Ethernet, optical, double, LC connector	**9**	**L 4 S**
MODBUS TCP + IEC 61850, 100 Mbit Ethernet, electrical, double, RJ45 connector	**9**	**L 5 R**
MODBUS TCP + IEC 61850, 100 Mbit Ethernet, optical, double, LC connector	**9**	**L 5 S**
Port A (at bottom of device, in front)		
No port	**0**	
With Ethernet interface (DIGSI, I/O-Unit connection, not IEC61850), RJ45 connector	**6**	
Measuring/Fault recording		
With fault recording	**1**	
With fault recording, average values, min/max values	**3**	

see next page

You will find a detailed overview of the technical data (extract of the manual) under: http://www.siemens.com/siprotec

ANSI No.	Product description	Order No.	Short code
		1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19	
Overcurrent Protection SIPROTEC 7SJ80 V4.74		**7SJ80** □□-□□□□□-□□□□+□□□	
	Basic version	**F A**	[3]
50/51	Time-overcurrent protection, phase $I>$, $I>>$, $I>>>$, I_p		
50N/51N	Time overcurrent protection, ground $I_E>$, $I_E>>$, $I_E>>>$, I_{Ep}		
50N(s)/51N(s)[1]	Sensitive ground fault protection $I_{EE}>$, $I_{EE}>>$, I_{EEp}		
	Intermittent ground fault protection		
87N[2]	High impedance REF		
49	Overload protection		
74TC	Trip circuit supervision		
50BF	Circuit-breaker failure protection		
46	Negative-sequence system overcurrent protection		
37	Undercurrent monitoring		
86	Lockout		
	Parameter changeover		
	Monitoring functions		
	Control of circuit breaker		
	Flexible protection functions (current parameters)		
	Inrush restraint		
	Basic functionality + Directional sensitive ground fault, voltage and frequency protection	**F B**	[4]
51V	Voltage dependent inverse-time overcurrent protection		
67N	Directional time-overcurrent protection, ground, $I_E>$, $I_E>>$, $I_E>>>$, I_{Ep}		
67Ns[1]	Directional sensitive ground fault protection, $I_{EE}>$, $I_{EE}>>$, I_{EEp}		
64/59N	Displacement voltage		
27/59	Under/Overvoltage		
81U/O	Under/Overfrequency, $f<$, $f>$		
47	Phase rotation		
	Flexible protection functions (current and voltage parameters)): Protective function for voltage,		
27R/32/55/59R/81R	power, power factor, rate-of-frequency change, rate-of-voltage change		
	Basic functionality + Directional phase & ground overcurrent, directional sensitive ground fault, voltage and frequency protection	**F C**	[4]
51V	Voltage dependent inverse-time overcurrent protection		
67	Directional time-overcurrent protection, phase, $I>$, $I>>$, $I>>>$, I_p		
67N	Directional time-overcurrent protection, ground, $I_E>$, $I_E>>$, $I_E>>>$, I_{Ep}		
67Ns[1]	Sensitive ground-fault protection, $I_{EE}>$, $I_{EE}>>$, I_{EEp}		
64/59N	Displacement voltage		
27/59	Under/Overvoltage		
81U/O	Under/Overfrequency, $f<$, $f>$		
47	Phase rotation		
	Flexible protection functions (current and voltage parameters): Protective function for voltage,		
27R/32/55/59R/81R	power, power factor, rate-of-frequency change, rate-of-voltage change		
	Basic functionality + Directional phase & ground overcurrent, directional sensitive ground fault, voltage and frequency protection + Undervoltage controlled reactive power protection + Directional intermittent ground fault protection	**F F**	[4]
51V	Voltage dependent inverse-time overcurrent protection		
67	Directional overcurrent protection, phase, $I>$, $I>>$, $I>>>$, I_p		
67N	Directional overcurrent protection, ground, $I_E>$, $I_E>>$, $I_E>>>$, I_{Ep}		
67Ns[1]	Directional sensitive ground fault protection, $I_{EE}>$, $I_{EE}>>$, I_{EEp}		
67Ns[2]	Directional intermittent ground fault protection		
64/59N	Displacement voltage		
27/59	Under/Overvoltage		
81U/O	Under/Overfrequency, $f<$, $f>$		
	Undervoltage controlled reactive power protection, Q>/V<		
47	Phase rotation		
	Flexible protection functions (current and voltage parameters)): Protective function for voltage,		
27R/32/55/59R/81R	power, power factor, rate-of-frequency change, rate-of-voltage change		

see next page

1) Depending on the ground current input the function will be either sensitive (I_{EE}) or non-sensitive (I_E)

2) Function only available with sensitive ground current input (Position 7=**2**)

3) Only if position 6 = **1**, **2** or **7**

4) Only if position 6 = **3**, **4** or **8**

Selection and ordering data

ANSI No.	Product description	Order No.	Short code
		1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16	17 18 19 20
Overcurrent Protection SIPROTEC 7SJ80 V4.74		**7SJ80** □□-□□□□□-□□□□+	□□□□
	Basic functionality + Directional phase overcurrent, voltage and frequency protection + synchrocheck	**F Q** [5]	
51V	Voltage dependent inverse-time overcurrent protection		
67	Directional time-overcurrent protection, phase, $I>$, $I>>$, $I>>>$, I_p		
27/59	Under/Overvoltage (phase-to-phase)		
81U/O	Under/Overfrequency, $f<$,$f>$		
47	Phase rotation		
25	Synchrocheck		
27R/59R/81R	Flexible protection functions (current and voltage parameters)): Protective function for voltage, rate-of-frequency change, rate-of-voltage change		
	Automatic Reclosing (AR), Fault Locator (FL)		
	Without	**0**	
79	With automatic reclosure function	**1**	
FL	With FL (only with position 6 = 3, 4 or 8)	**2**	
79/FL	With automatic reclosure function and FL (only with position 6 = 3, 4 or 8)	**3**	
	Conformal Coating		
	for 7SJ801, 7SJ803		**Z Y 1 5**
	for 7SJ802, 7SJ804, 7SJ807, 7SJ808		**Z Y 1 6**

5) Only with position 6 = **3** or **4** and position 16 = **0** or **1**

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Connection diagrams

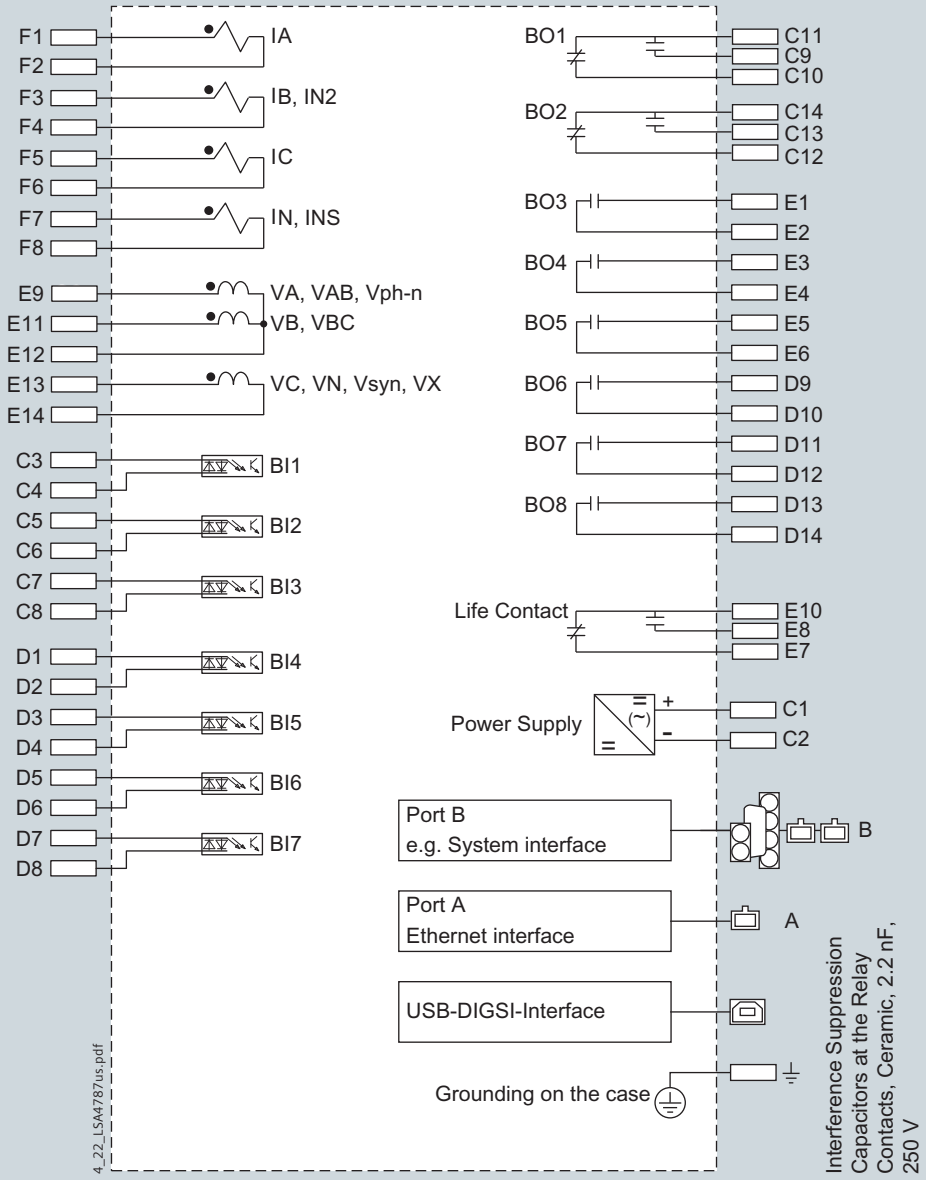

Fig. 4/22 Multifunction protection SIPROTEC 7SJ804