

# SIPROTEC 5 Devices and Fields of Application

## Busbar Protection – SIPROTEC 7SS85

ANSI	Function	Abbr.	Available	Application Templates
				1
	Protection functions for 3-pole tripping	3-pole	■	
	Protection functions for 1-pole tripping	1-pole	■	
	Expandable hardware quantity structure	I/O	■	
	Process bus client protocol (hint: PB client requires a separate ETH-BD-2FO plug-in module, from V8.0)	PB client	■	
	IEC61850-9-2 Merging Unit Stream (hint: Each stream requires a separate ETH-BD-2FO plug-in module, from V8.0)	MU	■	
21T	Impedance protection for transformers	Z<	■	
27	Undervoltage protection: "3-phase" or "positive-sequence system V1" or "universal Vx"	V<	■	
38	Temperature supervision	$\theta$ >	■	
47	Overvoltage protection, negative-sequence system	V2>	■	
50/51 TD	Overcurrent protection, phases	I>	■	
50N/ 51N TD	Overcurrent protection, ground	IN>	■	
50BF	Circuit-breaker failure protection, 3-pole	CBFP	■	
50BF	Circuit-breaker failure protection 1-pole/3-pole	CBFP	■	
50BF	Inherent circuit-breaker failure protection	CBFP	■	
50EF	End-Fault Protection		■	
59, 59N	Overvoltage protection: "3-phase" or "zero-sequence system V0" or "positive-sequence system V1" or "universal Vx"	V>	■	
67	Directional overcurrent protection, phases	I>, $\angle(V, I)$	■	
67N	Directional overcurrent protection, ground	IN>, $\angle(V, I)$	■	
74TC	Trip-circuit supervision		■	
81	Frequency protection: "f>" or "f<" or "df/dt"	f<>; df/dt<>	■	
87B	Busbar differential protection	$\Delta I$	■	
87B	Bus coupler differential protection	$\Delta I$	■	
	Bay		■	
	Cross Stabilization		■	
86	Lockout		■	
	Broken-wire detection for differential protection		■	
87 STUB	Stub fault differential protection (for breaker-and-a-half layouts)		■	
PMU	Synchrophasor measurement	PMU	■	
AFD	Arc protection (only with plug-in module ARC-CD-3FO)		■	
	Measured values, standard		■	
	Measured values, extended: Min, max, average		■	
	Switching statistics counter		■	
	PQ – Basic measured values: THD (Total Harmonic Distortion) and harmonic component (starting with V8.01) and THD voltage average values (starting with V8.40)		■	
	PQ – Basic measured values: Voltage unbalance (starting with V8.40)		■	
	PQ – Basic measured values: Voltage changes – monitoring of voltage dips, overvoltages and voltage interruptions (starting with V8.40)		■	
	PQ – Basic measured values: TDD - Total Demand Distortion (starting with V8.40)		■	
	CFC (standard, control)		■	
	CFC arithmetic		■	

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				1
	Circuit-breaker wear monitoring	$\Sigma I_x, I^2t, 2P$	■	
	Switching sequence function		■	
	Inrush-current detection		■	
	External trip initiation		■	
	Control		■	
	Circuit breaker		■	
	Disconnectors/grounding conductor		■	
	Fault recording of analog and binary signals		■	
	Monitoring		■	
	Protection interface, serial		■	
	Cyber security: Role-Based Access Control (from V7.8)		■	
	Temperature recording via communication protocol		■	
	Cyber security: Authenticated network access using IEEE 802.1X (starting from V8.3)		■	
Function point class:				0
The configuration and function point class for your application can be determined in the SIPROTEC 5 order configurator at <a href="http://www.siemens.com/siprotec">www.siemens.com/siprotec</a> .				

**Table 2.15/4** SIPROTEC 7SS85 – Functions, Application Templates

(1) Standard busbar

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## Busbar Protection – SIPROTEC 7SS85

Standard Variants for SIPROTEC 7SS85		
V1	1/2, 15 BI, 13 BO, 12 I	
	Housing width 1/2 x 19" 15 binary inputs 13 binary outputs (1 life contact, 2 standard, 10 fast), 12 current transformers Contains the following modules: Base module with PS201 and IO203 Expansion module IO201	
V2	1/2, 11 BI, 11 BO, 16 I	
	Housing width 1/2 x 19" 11 binary inputs 11 binary outputs (1 life contact, 2 standard, 8 fast) 16 current transformers Contains the following modules: base module with PS201 and IO203 Expansion module IO203	
V3	2/3, 15 BI, 15 BO, 24 I	
	Housing width 2/3 x 19" 15 binary inputs 15 binary outputs (1 life contact, 2 standard, 12 fast) 24 current transformers Contains the following modules: base module with PS201 and IO203 2 expansion modules IO203	
V4	1/3, 19 BI, 11 BO	
	Housing width 1/3 x 19" 15 binary inputs 11 binary outputs (1 life contact, 10 standard, 0 fast) 0 current transformers 1 communication module ETH_BD_2FO	

**Table 2.15/5** Standard Variants for SIPROTEC 7SS85

You can find the technical data in the manual  
[www.siemens.com/siprotec](http://www.siemens.com/siprotec).

2.15

Standard Variant for SIPROTEC 6MU85		
AJ1	1/3, 11 BI, 9 BO, 4 I	
	Housing width 1/3 11 binary inputs 9 binary outputs (1 life contact, 2 standard, 6 fast) 4 current transformers Contains the following modules: base module with PS201 and IO201 1 communication module ETH-BD-2FO	

**Table 2.15/6** Standard Variant for Decentralized Busbar Protection SIPROTEC 6MU85

**7SS85 Busbar Protection - Overview Function points calculation**

(P1E79903)

*Functions Free of Charge*

ANSI	Function	Abbr.	Included
	Protection functions for 3-pole tripping	3-pole	✓
	Protection functions for 1-pole tripping	1-pole	✓
	Hardware quantity structure expandable	I/O	✓
	Process Bus Client function (Note: This function requires a ETH-BD-2FO plug-in module)	PB client	✓
	IEEE 1588v2/PTP Grandmaster Clock (Note: This function requires a ETH-BD-2FO, with V9.20)	GMC	✓
38	Temperature supervision	$\theta >$	✓
50N/ 51N TD	Overcurrent protection, ground	IN>	✓
50BF	Inherent circuit-breaker failure protection	CBFP	✓
74TC	Trip-circuit supervision	TCS	✓
87B	Busbar differential protection	$\Delta I$	✓
86	Lockout		✓
	Broken-wire detection for differential protection		✓
87 STUB	Stub-fault differential protection (for breaker-and-a-half scheme)		✓
AFD	Arc-protection (only with plug-in module ARC-CD-3FO)		10 X ✓
	Measured values - standard		✓
	Switching statistic counters		✓
	PQ-Basic measured values: THD (Total Harmonic Distortion) and harmonics (from V8.01) THD voltage aggregation values (from V8.40)		✓
	CFC (Standard, control)		✓
	Inrush current detection		✓
	External trip initiation		✓
	Control		✓

	Circuit-breaker		✓
	Disconnecter/Grounding switch		✓
	Protection interface, serial		✓
	Monitoring and supervision		✓
	Fault recording of analog and binary signals		✓
	Temperature acquisition via communication protocol		✓

*Functions with Costs*

<b>ANSI</b>	<b>Function</b>	<b>Abbr.</b>	<b>Included</b>	<b>Quantity</b>	<b>Value</b>	<b>Points</b>
	IEC 61850-9-2 Merging Unit function (Note: Max. 2 streams per MU function, each MU function requires a ETH-BD-2FO plug-in module)	MU		0	200	0
21GT	Impedance protection for transformers	Z<		0	130	0
27	Undervoltage protection: "3-phase" or "positive-sequence system V1" or "universal Vx"	V<		0	5	0
47	Overvoltage protection, negative-sequence system	V2>		0	5	0
50/51 TD	Overcurrent protection, phases	I>		0	30	0
50BF	Circuit-breaker failure protection, 3-pole	CBFP		0	15	0
50BF	Circuit-breaker failure protection, 1-/3-pole	CBFP		0	25	0
50EF	End-fault protection			0	5	0
52PD	Circuit-breaker pole discrepancy	CBPD		0	5	0
59, 59N	Overvoltage protection: "3-phase" or "zero-sequence system V0" or "universal Vx"	V>		0	5	0
67	Directional overcurrent protection, phases			0	30	0
67N	Directional overcurrent protection, ground			0	30	0
81	Frequency protection: "f>" or "f<" or "df/dt"	f<>; df/dt<>		0	5	0

87B	Bus coupler differential protection	$\Delta I$		0	50	0
	Bay for busbar differential protection		4 X ✓	0	50	0
	Cross stabilization			0	250	0
PMU	Synchrophasor measurement	PMU		0	40	0
	Measured values - extended: Min, Max, Avg			0	3	0
	PQ-Basic measured values: Voltage unbalance (from V8.40)			0	20	0
	PQ-Basic measured values: Voltage variations - voltage dips, swells and interruptions (from V8.40)			0	30	0
	PQ-Basic measured values: TDD - Total Demand Distortion (from V8.40)			0	10	0
	CFC arithmetic			0	40	0
	Circuit-breaker monitoring (from V9.20)	$\Sigma I_x$ , $I^2t$ , 2P, tO, tC, pole scatter, discrepancy		0	10	0
	Disconnecter monitoring (from V9.50)	tO, tC		0	5	0
	Switching sequences function			0	5	0
	Multiplexing of protection interface			0	50	0
SSR	Slow-scan recorder (Mod.: from V8.80, Non-Mod.: from V9.40)	SSR	1 X ✓	0	40	0
CR	Continuous recorder (Mod.: from V9.20, Non-Mod.: from V9.40)	CR	1 X ✓	0	25	0
	PQ-10/12 cycle values for continuous recorder (from V9.20)	CR		0	25	0
TR	Trend recorder (Mod.: from V9.30, Non-Mod.: from V9.40)	TR	1 X ✓	0	25	0
	PQ-Trend value for Trend Recorder (from V9.30)	TR		0	25	0
	PQ-Flicker values for Trend Recorder (from V9.30)	TR		0	25	0
	Cyber Security: Role-Based Access Control (from V7.8)			0	25	0

	Cyber Security: IEEE 802.1x based network authentication (from V8.3)			0	10	0
Total:						0