

SIPROTEC 5 Devices and Fields of Application

Bay Controllers – SIPROTEC 6MD85

ANSI	Function	Abbr.	Available	Application Templates		
				1	2	3
	Protection functions for 3-pole tripping	3-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	■			
	IEC61850-9-2 Merging Unit Stream 7SS85 CU (hint: Only for communication with a 7SS85 CU. A separate ETH-BD-2FO plug-in module is required starting with V8.40)	MU	■			
25	Synchrocheck, synchronization function	Sync	■			
27	Undervoltage protection: "3-phase" or "universal Vx"	V<	■			
27R, 59R	Voltage change protection (starting with V8.30)	dV/dt	■			
32, 37	Power protection active/reactive power	P<>, Q<>	■			
38	Temperature supervision	θ>	■			
46	Negative-sequence system overcurrent protection	I2>	■			
49	Thermal overload protection	θ, I²t	■			
50/51 TD	Overcurrent protection, phases	I>	■			
	Instantaneous tripping at switch onto fault	SOTF	■			
50HS	Instantaneous high-current tripping	I>>>	■			
50N/ 51N TD	Overcurrent protection, ground	IN>	■			
50EF	End-fault protection (hint: For use only in decentralized busbar protection with a 7SS85 CU starting with V8.40)		■			
51V	Voltage-controlled overcurrent protection	t=f(I, V)	■			
59	Overvoltage protection: "3-phase" or "positive-sequence system V1" or "universal Vx"	V>	■			
67	Directional overcurrent protection, phases	I>, ∠(V, I)	■			
67N	Directional overcurrent protection, ground	IN>, ∠(V, I)	■			
74TC	Trip-circuit supervision		■			
74CC	Single circuit monitoring (from V7.9)		■			
81	Frequency protection: "f>" or "f<" or "df/dt"	f<>; df/dt<>	■			
81U	Underfrequency load shedding	f<(ULS)	■			
86	Lockout		■			
90 V	Voltage controller for two-winding transformer		■			
90 V	Voltage controller for two-winding transformer with parallel control		■			
	Number of two-winding transformers with parallel control (hint: only together with the function "voltage controller for two-winding transformer with parallel control")		■			
90 V	Voltage controller for three-winding transformer		■			
90 V	Voltage controller for grid coupling transformer		■			
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		■	■		■

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ANSI	Function	Abbr.	Available	Application Templates		
				1	2	3
	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		■			
	Circuit-breaker wear monitoring	$\Sigma Ix, I^2t, 2P$	■			
	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		■			
	Frequency group tracking (from V7.8)		■			
	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	0	20
The configuration and function point class for your application can be determined in the SIPROTEC 5 order configurator at www.siemens.com/siprotec .						

Table 2.16/2 SIPROTEC 6MD85 – Functions, Application Templates

- (1) Standard
- (2) Not preconfigured
- (3) Control expanded

SIPROTEC 5 Devices and Fields of Application

Bay Controllers – SIPROTEC 6MD85

Standard Variants for SIPROTEC 6MD85		
J1	1/3, 11 BI, 9 BO, 4 I, 4 V Housing width 1/3 x 19" 11 binary inputs 9 binary outputs (1 life contact, 2 standard, 6 fast) 4 sensitive current-transformer inputs 4 voltage-transformer inputs Contains the following modules: base module with PS201 and IO202	
J2	1/2, 27 BI, 17 BO, 4 I, 4 V Housing width 1/2 x 19" 27 binary inputs 17 binary outputs (1 life contact, 10 standard, 6 fast) 4 sensitive current-transformer inputs 4 voltage-transformer inputs Contains the following modules: base module with PS201 and IO202 Expansion module IO207	
J4	2/3, 43 BI, 25 BO, 4 I, 4 V Housing width 2/3 x 19" 43 binary inputs 25 binary outputs (1 life contact, 18 standard, 6 fast) 4 sensitive current-transformer inputs 4 voltage-transformer inputs Contains the following modules: base module with PS201 and IO202 Expansion modules 2 x IO207	
J5	5/6, 59 BI, 33 BO, 4 I, 4 V Housing width 2/3 x 19" 59 binary inputs 33 binary outputs (1 life contact, 26 standard, 6 fast) 4 sensitive current-transformer inputs 4 voltage-transformer inputs Contains the following modules: base module with PS201 and IO202 Expansion modules 3 x IO207	
J7	1/1, 75 BI, 41 BO, 4 I, 4 V Housing width 1/1 x 19" 75 binary inputs 41 binary outputs (1 life contact, 34 standard, 6 fast) 4 sensitive current-transformer inputs 4 voltage-transformer inputs Contains the following modules: base module with PS201 and IO202 Expansion modules 4 x IO207	

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Table 2.16/3 Standard Variants for Bay Controllers SIPROTEC 6MD85

You can find the technical data of the devices in the manual
www.siemens.com/siprotec

6MD85 Bay Controller Unit - Overview Function points calculation

(P1G94027)

Functions Free of Charge

ANSI	Function	Abbr.	Included
	Protection functions for 3-pole tripping	3-pole	✓
	Hardware quantity structure expandable	I/O	✓
38	Temperature supervision	$\theta >$	✓
49	Thermal overload protection	θ, I^2t	✓
	Instantaneous tripping at switch onto fault	SOTF	✓
50HS	Instantaneous high-current tripping	$I >>>$	✓
74TC	Trip-circuit supervision	TCS	✓
86	Lockout		✓
AFD	Arc-protection (only with plug-in module ARC-CD-3FO)		✓
	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		✓
	Protection interface, serial		✓
	Monitoring and supervision		✓
	Fault recording of analog and binary signals		✓
	Frequency-tracking groups (from V7.8)		6 X ✓
	Temperature acquisition via communication protocol		✓

Functions with Costs

ANSI	Function	Abbr.	Included	Quantity	Value	Points
	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
	Process Bus Client function (Note: This function requires a ETH-BD-2FO plug-in module)	PB client		0	100	0
	IEC 61850-9-2 Merging Unit function for 7SS85 CU (Note: Only for communication with a 7SS85 with Significant properties: "CU: ...". This function requires a ETH-BD-2FO plug-in module)	MU (7SS85 CU)		0	295	0
	IEEE 1588v2/PTP Grandmaster Clock (Note: This function requires a ETH-BD-2FO, with V9.20)	GMC		0	200	0
25	Synchrocheck, synchronization function	Sync		0	50	0
27	Undervoltage protection: "3-phase" or "universal Vx"	V<		0	5	0
27R, 59R	Rate-of-voltage-change protection (from V8.30)	dV/dt		0	5	0
32, 37	Power protection active/reactive power	P<>, Q<>		0	10	0
46	Negative-sequence overcurrent protection	I2>		0	10	0
50/51 TD	Overcurrent protection, phases	I>		0	20	0
50N/ 51N TD	Overcurrent protection, ground	IN>		0	20	0
50EF	End-fault protection (Note: Only useable for distributed busbar protection with 7SS85 CU with V8.40)			0	5	0
51V	Overcurrent protection, voltage dependent	t=f(I,V)		0	10	0
59	Overvoltage protection: "3-phase" or "positive-sequence system V1" or "universal Vx"	V>		0	5	0
67	Directional overcurrent protection, phases			0	35	0

67N	Directional overcurrent protection, ground			0	35	0
74CC	Closed-circuit supervision (from V7.9)	CCS		0	5	0
81	Frequency protection: "f>" or "f<" or "df/dt"	f<>; df/dt<>		0	5	0
81U	Underfrequency load-shedding	f<(UFLS)		0	15	0
90V	Automatic voltage controller for two-winding transformer			0	150	0
90V	Automatic voltage controller for two-winding transformer with parallel operation			0	180	0
	Number of two-winding transformers with parallel operation (Note: only together with the function "Automatic voltage controller for two-winding transformer with parallel operation")		2 X ✓	0	5	0
90V	Automatic voltage controller for three-winding transformer			0	200	0
90V	Automatic voltage controller for grid coupling transformer			0	175	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)	ΣI_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
	Circuit-breaker		4 X ✓	0	3	0

	Disconnecter/Grounding switch		4 X ✓	0	3	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