6MU85 Merging Unit - Overview Function points calculation

(P1M1799)

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	θ>	✓
	Instantaneous tripping at switch onto fault	SOTF	✓
74TC	Trip-circuit supervision	TCS	✓
86	Lockout		✓
AFD	Arc-protection (only with plug-in module ARC-CD-3FO)		5 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		✓
	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	1 X ✓	0	100	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	95	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 "positive-sequence system V1" or "universal Vx"	V<		0	5	0
27R, 59R	Rate-of-voltage-change protection (from V8.30)	dV/dt		0	5	0
47	Overvoltage protection: "negative-sequence V2" or "negativ-sequence V2/positiv-sequence V1"	V2>; V2/V1>		0	5	0
49	Thermal overload protection	θ, I^2t		0	10	0
49	Thermal overload protection, user-defined characteristic	θ, I^2t		0	10	0
49H	Hot spot calculation	θh, I^2t		0	20	0
50/51 TD	Overcurrent protection, phases	I>		0	20	0
50N/ 51N TD	Overcurrent protection, ground	IN>		0	20	0
50BF	Circuit-breaker failure protection, 3-pole	CBFP		0	5	0
50BF	Circuit-breaker failure protection, 1-/3-pole	CBFP		0	25	0
50RS	Circuit-breaker restrike protection	CBRS		0	20	0

50EF	End-fault protection (Note: Only useable for distributed busbar protection with 7SS85 CU with V8.40)			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	35	0
67N	Directional overcurrent protection, ground			0	35	0
67Ns	Dir. sensitive ground-fault detection for systems with resonant or isolated neutral incl. a) 3I0>, b) V0>, c) Cos-/SinPhi, d) Transient ground-fault fct., e) Phi(V,I), f) admittance			0	30	0
74CC	Closed-circuit supervision (from V7.9)	CCS		0	5	0
79	Automatic reclosing, 1-/3-pole	AR		0	55	0
79	Automatic reclosing, 3-pole	AR		0	35	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)	ΣIx, I^2t, 2P, tO, tC, pole scatter, discepancy		0	10	0
	Disconnector monitoring (from V9.50)	tO, tC		0	5	0
	Switching sequences function			0	5	0
PoW	Point-on-wave switching (from V7.90)	PoW		0	425	0
	Point-on-wave with residual flux estimation (from V9.80)	PoW		0	465	0
	Circuit-breaker		4 X ✓	0	3	0
	Disconnector/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

Merging Unit – SIPROTEC 6MU85

ANSI	Function	Abbr.	Available	Application Templates
				1
	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 "positive-sequence system V1" or "universal Vx"	V<	■	
27R, 59R	Voltage change protection (starting with V8.30)	dV/dt	■	
38	Temperature supervision	θ>	■	
47	Overvoltage protection: "Negative-sequence system V2" or "negative-sequence system V1/positive-sequence system V1"	V2>; V2/V1>	■	
50/51 TD	Overcurrent protection, phases	I>	■	
	Instantaneous tripping at switch onto fault	SOTF	■	
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	■	
50EF	End-fault protection (hint: For use only in decentralized busbar protection with a 7SS85 CU starting with V8.40)		■	
50RS	Circuit breaker restrike monitoring	CBRM	■	
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>, ∠(V, I)	■	
67N	Directional overcurrent protection, ground	IN>, ∠(V, I)	■	
74TC	Trip-circuit supervision		■	
74CC	Single circuit monitoring (from V7.9)		■	
79	Automatic reclosing, 1-pole/3-pole	AREC	■	
79	Automatic reclosing, 3-pole	AREC	■	
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		■	

ANSI	Function	Abbr.	Available	Application Templates
				1
	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	ΣIx, I²t, 2P	■	
	Switching sequence function		■	
	Inrush-current detection		■	
	External trip initiation		■	
	Control		■	■
PoW	Point-on-wave switching (starting with V7.90)	PoW	■	
	Circuit breaker		■	■
	Disconnector/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
The configuration and function point class for your application can be determined in the SIPROTEC 5 order configurator at *www.siemens.com/siprotec*.				

Table 2.18/1 SIPROTEC 6MU85 – Functions, Application Templates

(1) Merging Unit