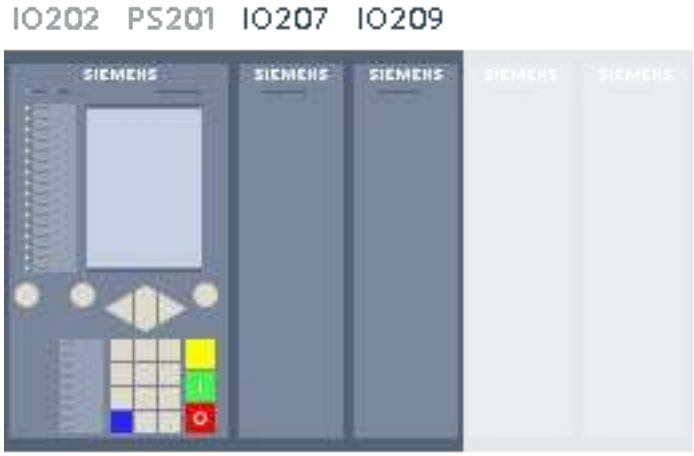
Device: 7SA86 Distance Prot. 3-pole

Product code

Short: P1A676779
Long: 7SA86DAAAAA00AAAA0AT011113113BBBA000000AC0CB1BA1CG0CJ0



Technical Data:

Firmware:	Current version
Binary inputs:	35
Binary outputs:	21 Relays (11 Standard, 6 Fast, 4 High-Speed, 0 Power)
Current transformers:	4 for protection
Voltage transformers:	4 standard
Measuring-transducer inputs:	0 (20 mA or 10 V, fast) 0 (20 mA, standard) 0 (DC 300 V) 0 (20 mA, fast) 0 (temperature)
Housing width:	2/3 x 19"
Housing type:	Flush mounting
Modules in 19" row 1:	IO202, PS201, IO207, IO209
LEDs/Push-buttons:	16 LEDs
Operation Panel:	Integrated
Key switch:	Without
Display type:	Large display
Front Design:	Standard
Power Supply:	DC 60 V-250 V, AC 100 V-230 V

Redundant Power Supply:	No

Note on module selection

Devices ordered with the latest firmware will be delivered with ETH-BA-2EL/ETH-BB-2FO Rev2 module and can't be downgraded to a firmware version less than V09.6x. To order devices with ETH-BA-2EL/ETH-BB-2FO Rev1 modules, select a specific firmware version less than V09.6x.

Communication/Plug-in modules:

Communications encryption:	Normal
Integrated Ethernet port J:	DIGSI 5 and IEC 61850/Goose
Plug-in module position E:	ETH-BB-2FO: 2x optical Ethernet 100 Mbit/s, 1300 nm, duplex LC connector , 2 km over 50/125 um or 62.5/125 um multimode optical fiber Communication Protocols: applicable for DIGSI 5, IEC 61850-8-1 MMS and GOOSE, IEC 60870-5-104, DNP3 TCP, Modbus TCP, Synchrophasor (IEEE C37.118 - IP), Profinet IO, SUP, DHCP, SNTP, SNMP, etc. Redundancy protocols: Line Mode, RSTP, HSR, PRP
Plug-in module position F:	ETH-BA-2EL: 2x electric Ethernet 100 Mbit/s, RJ45 Communication Protocols: applicable for DIGSI 5, IEC 61850-8-1 MMS and GOOSE, IEC 60870-5-104, DNP3 TCP, Modbus TCP, Synchrophasor (IEEE C37.118 - IP), Profinet IO, SUP, DHCP, SNTP, SNMP, etc. Redundancy protocols: Line Mode, RSTP, HSR, PRP

Functions:

Function points class:	Base + 350 function points

Note on function-points class

The function-points class results from the sum of the function points of the selected functions. You can apply these functions according to the selected function-points class. The device also allows each other selection of functions if the sum of the required function points is within the selected function-points class.

From Version V9.3 on the function-points class "1400+" is withdrawn. With this class function-points exceeding the limit of 1400 were free of charge. The maximum function-points class is now 1400. If a function-points budget of more than 1400 points is required for a device the application Function-Point-Manager need to be applied. All function points are liable to cost.

In the engineering phase DIGSI 5 checks that the selected configuration is suitable (capable of running in the device) before loading it to the device.

Miscellaneous:

Warranty:	5 years
Special Approvals:	Without

Firmware:	Current version

7SA86 Distance Protection - Overview Function points calculation

(P1A676779)

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	✓
50HS	Instantaneous high-current tripping	I>>>	✓
50/51 TD	Overcurrent protection with positive-sequence current I1 (from V7.9)	I1>	20 X ✓
50N/ 51N TD	Overcurrent protection, ground	IN>	✓
50N/ 51N TD	Overcurrent protection, 1-phase	IN>	✓
74TC	Trip-circuit supervision	TCS	✓
85/21	Universal teleprotection scheme for distance protection (from V9.20)		✓
85/27	Weak or no infeed: echo and tripping	WI	✓
85/67N	Universal teleprotection scheme for directional ground fault protection (from V9.20)		✓
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		0	200	0
	Process Bus Client function (Note: This function requires a ETH-BD-2FO plug-in module)	PB client		0	100	0
	Subscription of redundant IEC 61850-9-2 Sampled Value streams, with automatic and manual switching capabilities between Main and Redundant measuring point (Note: Requires PB Client functionality, not applicable for 7SS85 CU) (from V9.90)	Redundant SV		0	25	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
21/21N	Distance protection	Z<, V<	1 X ✓	0	95	0
21GT	Impedance protection for transformers	Z<		0	25	0
25	Synchrocheck, synchronization function	Sync		0	60	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
	Undervoltage-controlled reactive power protection	Q>/V<		0	15	0
32, 37	Power protection active/reactive power	P<>, Q<>		0	10	0
37	Undercurrent	I<		0	10	0
46	Negative-sequence overcurrent protection	I2>		0	10	0
46	Negative-sequence overcurrent protection with direction			0	15	0
47	Overvoltage protection, negative-sequence system	V2>		0	5	0
49	Thermal overload protection	θ, I^2t		0	10	0
50/51 TD	Overcurrent protection, phases	I>	2 X ✓	0	30	0
50Ns/ 51Ns	Sensitive ground-current detection for systems with resonant or isolated neutral systems incl. a) 3I0>, b) admittance Y0>, c) 3I0-harm> (from V7.8)	INs>		0	15	0
	Ground-fault detection via pulse pattern detection; Note: this stage additionally requires the function 50Ns/51Ns or 67Ns "Sensitive ground-fault detection for systems with resonant or isolated neutral"	IN-pulse		0	15	0
	Intermittent ground-fault protection	Iie>		0	20	0
50BF	Circuit-breaker failure protection, 3-pole	CBFP		0	15	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
51V	Overcurrent protection, voltage dependent	t=f(I,V)		0	10	0

59, 59N	Overvoltage protection: "3-phase" or "zero-sequence system V0" or "universal Vx"	V>		0	5	0
60	Voltage-comparison supervision	ΔU>		0	5	0
67	Directional overcurrent protection, phases			0	40	0
67N	Directional overcurrent protection for ground faults in grounded systems			0	30	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
	Directional stage with a harmonic; Note: this stage additionally requires the function "67Ns Dir. sensitive ground-fault detection for systems with resonant or isolated neutral"			0	10	0
	Directional intermittent ground-fault protection	Iie dir>		0	20	0
68	Power-swing blocking	ΔZ/Δt		0	25	0
78	Out-of-step protection	ΔZ/Δt		0	55	0
74CC	Closed-circuit supervision (from V7.9)	CCS		0	5	0
79	Automatic reclosing, 3-pole	AR		0	45	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
	Vector-jump protection	Δφ>		0	20	0
	Subsynchronous Resonance Detection (from V9.90)	SSR		0	1000	0
87N	Restricted ground-fault protection	ΔIN		0	15	0
87 STUB	Stub-fault differential protection (for breaker-and-a-half scheme)			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
FL	Fault locator, single-sided	FL-one	1 X ✓	0	25	0
FL	Fault locator plus (from V7.9)	FL plus		0	45	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
	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
	Region France: Overload protection for lines 'PSL-PSC'			0	10	0
	Region France: Overcurrent protection 'MAXI-L'			0	10	0
	Region France: Power-system decoupling protection 'PDA'			0	10	0
	Region France: Overload protection for transformers			0	10	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