Numerical relay selection table for MV power products

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Please note before using selection table!

number = Number of stages, shots, inputs or outputs
X = Function supported
O = Function available as option
S = Secondary function / application

Show Result = Hides relays that doesn't include needed function
Show all relays = Shows all relays available
Clear "My choices" = Clears all your selected functions

My Choice = Mark needed functions with "x"

Show Result | Show all relays | Clear "My choices"

ANSI Code	IEC Symbol	IEC 61850 LN Class	Definition	My choice	SPAM 150 C	SPAJ 140 C	SPAJ 160 C	SPAU 140 C	SPAF 140 C	REA 101	REC 501	REJ 521	REJ 523	REJ 525	REJ 527	REU 523	REU 610	REM 610	REF 610	SPAU 341 C	SPAD 346 C	REF615 (std conf A)	REF615 (std conf B)	REF615 (std conf C)	REF615 (std conf D)	REF615 (std conf E)	REF615 (std conf F)	REF615 (std conf G)	REF615 (std conf H)	RED615 (std conf A)	RED615 (std conf B)	RED615 (std conf C)	REM615 (std conf A)	REM615 (std conf B)	REM615 (std conf C)	RET615 (std conf A)	RET615 (std conf B)	RET615 (std conf C)	RET615 (std conf D)	RET615 (std conf E)	RET615 (std conf F)	RET615 (std conf G)	RET615 (std conf H)	REU615 (std conf A)	REU615 (std conf B)	REX 521B01	REX 521B02	REX 521M01	REX 521M02	REX 521H01	REX 521H02	REX 521H03	REX 521H04	REX 521H05	REX 521H06	REX 521H07	REX 521H08	REX 521H09	REX 521H50	REX 521H51	REF630	REM630	RET630	REM 543 MOTOR	REM 543 GENERATOR	REM 545 MOTOR	REM 545 GENERATOR	RET 54_ CONTROL	RET 54_ BASIC	RET 54_ MULTI	REF 54_ CONTROL	REF 54_ BASIC	REF 54_ MULTI	REC 523	REF 542plus BASIC LOW	REF 542plus BASIC	REF 542plus MULTI LOW	REF 542plus MULTI	REF 542plus DIFFERENTIAL	REF 542plus DISTANCE
					Basic Range															Middle Range																																										High Range																			
Applications																																																																																
			Feeder (incomer)		S	X		X											X	S	X			X	X	X	X	X	X	X	X	X	X	X	X															X	X	X	X	X	X	X	X	X	S		X	X	X		X										X	X		X	X	X	X		X
			Feeder (outgoing)		S	X		X											X	S	X			X	X	X	X	X	X	X	X	X	X	X	X															X	X	X	X	X	X	X	X	X	S		X	X	X		X										X	X		X	X	X	X		X
			Measurement cubicle																																																							X						X										X	X		X	X	X	X		X
			Bay control and measurement																																																												X										X	X	X		X	X	X	X	X	X
			Capacitor bank protection				X																																																																		X	X					X		X
			Motor protection		X				X									X			X											X	X	X									X													X				X		X		X	X	X	X					X	X					X		X
			Generator protection						X												X																							X																					X		X														
			Transformer protection		S														S				X														X	X	X	X	X	X	X	X											S		S				S			X							X	X										X	X
			Voltage regulation																		X																									X																						X	X	X										
			Back-up protection			X							X	X	X	X	X			X																											S	S	S	S	S	S	S	S	S			S	S			X										X	X							X
			Arc protection							X								O			O	O	O	O	O	O	O	O				O	O	O	O	O	O	O	O	O	O	O	O	O																																			
			Feeder Automation								X																																																															X							
Protection functions																																																																																
50/51/51B	3I >	PHLPTOC	Three-phase non-directional overcurrent		2	2				S			2	2				2	3		3	4	4	4	4	4	1	1	4	4	4	4	2	2	2	6	6	6	6	6	6	6	6		3	3	3	3	3	1	2	3	3	3	2	3	3	3	3	3	4	2	6	3	3	3	3		4	4		3	3	2	3	3	3	3	3	3
67	3I > ->	PTOC, PDIR	Three-phase directional o/c																								3	3																								2	2		1						2	1	3		3		3		3			3		3	3	2		2	2	2	2	2
51V	I(U) >	PVOC	Voltage dependent overcurrent																																																												2	2	2	2														
87G/87M	3ΔI >	MHZPDIF	High-impedance/flux-balace based diff. protection for motors/generators																																																											X		X	X	X	X														
87G/87M	3ΔI >, 3ΔI >>	PDIF, MPDIF	Stabilized three-phase differential protection for generators																																																											X			X		X												
87T	3ΔI >, 3ΔI >>	PDIF, PHAR	Stabilized three-phase differential protection for transformers																		X															X	X	X	X	X	X	X	X																				X						X	X									X	
87L	3ΔI >	PDIF	Line differential protection																											2	2	2																																															
87NL	DIo Lo >	PNDF	Numerical stabilized low impedance restricted earth-fault																																	X	X			X	X																							2																
87NH	DIo Hi >	PDIF	High impedance based restricted earth-fault																																			X	X			X	X																					2																
21G	Z<	UZPDIS	Three-phase underimpedance protection																																																												2		2		2			2									
50N / 51N	I_0 >	EFLPTOC	Non-directional earth-fault		1	2				S		2		2	2			2	2		2			3	3				3			4	2			2	2	2	2	2	2	2	2			3	3						3	3		2	3	3	2	2	3	3	4	3	3	3	3		3	3		3	3	2	2	2	2	2	2	2
51N	I_0 >	EFLPTOC	Non-directional earth-fault sensitive																						1	1				1																																																		
51N-2	I_0 >>	EFLPTOC	Non-directional (cross country) earthfault, using calculated Io																			X	X			X	X	X			X			X	X																									X																		
67N-IEF	I_0 > -> IEF	INTRPTEF	Transient / intermittent earth-fault												X						X	X			X	X				X																													X																		
21YN	Y_0> ->	EFPADM	Admittance based Earth-fault protection																			3	3			3	3	3			3																													3																		
32N	Ie*cos(phi)	WPWDE	Wattmetric earth-fault protection																																																									3																		
64R	R<	MREFPTOC	Rotor earth-fault protection																																																										X			X		X												
67N/51N	I_0 > SEF ->	PTOC, PDIR	Directional earth-fault												2						3	3			3	3	3			3			1	1														3	3	3	3	3	3			2			2	2	4	2	3	2	2	2	2				2		2	2	2		2	2	2	2	2
67N	I_0 > SEF ->	PSDE	Directional earth-fault sensitive																													X																																	X	X	X	X			X		X	X			X	X	X	X	X
87N	DI_0 >, REF	PDIF	High-impedance based restricted earth-fault protection																		2																																											X		X		X	X										
87N	DI_0 >, REF	PDIF	Low impedance based restricted earth-fault protection																		2																																															2	2									1	1
59N	U_0 >	PTOV	Residual overvoltage												2		2						3	3			3	3	3	3		3									2	2	2	2	3										3	3		3	3	2	1	3	3	3	3	3	3	3			3		3	3			2	2	2	2	2
46	I2 >	PTOC	Negative-phase-sequence current protection															X				2	2	2	2	2	2	2	2	2	2	2				2	2	2	2	2	2	2	2													2				1	2		4	2	2	2	2		2	2								1	1	1	1
46	DI >	PTOC	Phase discontinuity		X									X				X	X		X	X	X	X	X	X	X	X	X		X	X														X	X	X	X	X	X	X	X									X											X	X	X					
46R	3I↻ , 3I↺	PTOC	Phase reversal protection		X														X																	X	X	X																					X						X		X	X	X	X												
46M	I2>M	PTOC	Negative-phase-sequence overcurrent protection for motors																																2	2																										2																	
SOTF	SOTF	RSOF	Automatic Switch onto fault logic																																																									2																		
SOTF	SOTF	RSOF	Switch-onto-fault																																																																							X	X	X	X	X	X
59	3U >	PTOV	Three-phase overvoltage													2	2										3	3	3											2	2	2	2	3	3										2	2	2	2	2	2	1	3	2	2	2	2	2	2				2			2				3	3	3	3
27	3U <	PTUV	Three-phase undervoltage													2	2										3	3	3					1	1						2	2	2	2	3	3										2	2	2	2	2	2	1	3	2	2	2	2	2	2				2			2	2			3	3		3
21	Z <	PDIS	Distance protection																																																									1																			X
81U/81O	f< / f> / df/dt	PTUF, PTOF, PFRC	Underfrequency or overfrequency inc. rate of change						4																					3					2	2										6							1		1		2	1		2	2	2	10	6	6		5		5				5			5					6		6
81R	df/dt>	PFRC	Frequency gradient																																																									5	6	6																
81LSH	UFLS/R	PFRQ	load shedding																																											5																		6																		
32P/32Q	P> -> / Q > ->	PDOP, DOPPDPR	Three-phase directional overpower protection																																																										3			3		3												1		1
32	P< / P> <-	PDUP	Three-phase directional underpower protection																																																															3		3												
24	U/f>	OEPVPH	Overexcitation protection																																																											2		2		2			2									
40	X<	PDUP, UEXPDIS	Three-phase underexcitation protection																																																										2			2		2												
79	O -> I	RREC	Auto-reclosure																3			O	O	O	O	O	O	O	O		O	O																5		5	5	5	5	5					5	5		5											5	5	5	5	5	5	5	5		5
25	SYNC	RSYN	Synchro-check/voltage check					X																				X																X						1		1										X		X		2		2				2	2	2		1	1	1	1		1
68	3I2f >	PHAR	Three-phase inrush detector																		X	X	X	X	X	X	X	X	X	X	X	X															X	X	X	X	X	X	X	X	X			X	X	X		X		X	X	X	X	X		X	X		X	X	X	X	X	X	X	X	X
60	FUSEF	-	Fuse failure supervision																								X	X	X	X					X	X					X	X	X	X		X												X				X	X	X			X		X			X				X	X	X							
37	3I<	PTUC	Three-phase non-directional undercurrent protection		1		X											1																X	X	X																							1					X		2	2	2	2													1	1	1
62BF	CBFP	RBRF	Circuit breaker failure		X	X				X		X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X				X	X	X	X		X	X	X	X	X	X				X	X	X
51BF/51NBF	3I>/Io>BF	RBRF	Circuit breaker failure																																																									2	2	2																
66	Ith	-	Cumulative start-up time counter		X														X															X	X	X																							X							X	X	X	X												X	X	X
49F	3Ith>	PTTR	Three-phase thermal overload (feeders & cables)		X														X	X			X	X	X	X	X	X	X			X	X															X	X	X	X	X	X	X	X									X										X	X					X	X	X
49G	3Ith>	PTTR	Three-phase thermal overload protection for generators																																																					X		X	X			X				X	X	X	X							X	X					X	X	X
49M	3Ith>	PTTR	Three-phase thermal overload protection for motors		X														X															X	X	X																			X		X	X			X		X		X	X	X	X							X	X					X	X	X
49T	3Ith>	PTTR	Three-phase thermal overload protection for transformers		S														S																		X	X	X	X	X	X	X	X		X								X		X	X			X			X	X	X	X	X		X	X		X	X					X	X	X
49/38		PTTR	Thermal protection by RTDs or thermistors																X																																													O	O	O	O						O	O								
48/14		PMRI, PMSS	Motor start-up supervision, Is2 x ts		X														X																																				X				X				X	X	X	X							X	X					X	X	X
49/66/48/51LR		PMSU	Motor start-up supervision, Is2t n<																																X	X	X																											X																		
14		-	Speed switch support		X														X																																													X	X	X	X							X	X					X		X
51LR		PMSS, PTOC	Locked rotor		X														X															X	X	X																											X		X	X	X	X							X	X					X	X	X
51MS		PMRI	Motor start		X														X																																													X	X	X	X							X	X					X	X	X
27, 47, 59	U1< & U2> & U1>	PTUV, PTOV, PTOV	Three-phase positive/negative sequence voltage protection													1	X									X	X						X	X									2/2														X			X	X	6	6	6	2	2	2	2			2		2	2							
86		-	Eletrically latched lockout relay		X	X	X					X	X	X	X	X	X	X	X			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X		X	X		X	X	X	X	X	X
		-	Emergency start															X															X	X	X																											X																		
		PTOC	Three-phase overload protection for shunt capacitor banks																																																																					O	O								
		PTOC	Current unbalance protection for shunt capacitor				X																																																																			O	O								
		PTOC	Three-phase current U/B protection for H-bridge shunt capacitors																																																																					O	O								
		-	Switching resonance protection																																																																													X		X
21FL			Fault locator																																																									X										O	O		X	X	X	X	X	X
		-	High harmonic protection																																																																													X		X
BST			Binary signal transfer																											X	X	X																																																
			Pilot wire support																											X	X	X																																																
MAP	MAP	GAPC	Multi-purpose protection																														O	O		O	O	O	O						O																																		
			Arc protection																			O	O	O	O	O	O	O	O				O	O	O	O	O	O	O	O	O	O	O	O																												O	O								
Control functions																																																																																
		CSWI	Circuit Breaker 1 (2 state inputs / 2 control outputs)																			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
		CSWI	Circuit Breaker 2 (2 state inputs / 2 control outputs)																																																									X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
		CSWI	Disconnector (2 state inputs / 2 control outputs)								X																																																	8	8	8	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
		CSWI	Disconnector 3-state (3 state inputs / 4 control outputs)																																																												X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X
		-	Object indication (2 state inputs)								X											X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
		-	MIMIC dynamic data point on HMI (single-line diagram)																			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X															X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X
		-	Alarm LEDs on HMI (alarm view)														8	8	8			11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	45	45	45	8	8	8	8	8	8	8	8	8	8	8	21	32	32	32	32	32	32
		-	On/Off switch on HMI (single-line diagram)																																																												4	4	4	4	4	4	4	4	4	4	4						
		-	Direct open CBs via HMI																																																									X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X
		-	Local/remote selector																			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
		-	Configurable Interlocking																				X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X															X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
		-	PLC logics (AND, OR, timers etc.)																			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X															X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
		-	Number of setting groups		2	2	2	2	2	1	1	2	2	2	2	2	2	2	2	2	2	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	4	4	4	2	2	2	2	2	2	2	2	2	2	1	2	2	2	2	2	2
		-	Remote setting		X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
		-	Self-supervision		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
		-	Annunciating, event generating and value recording		X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
		-	Graphical display																			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X															X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X
		ARCO	Power factor controller																																																																			O	O	O	X	X	X	X	X	X	X
90V		ATCC, OLATCC	Voltage regulator																		X																									X																		X					X	O	O									
Measurement functions																																																																																
	3I	MMXU	Three-phase current		X	X	X						X	X				X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	3I	MMXU	Three-phase current, B stage																																		X	X	X	X	X	X	X	X																					X					X	X	X	X	X	X	X	X	X	X	X	X	X
	I_0	MMXU	Neutral current		X	X						X		X	X			X	X		X	X	X	X	X	X	X	X	X		X	X	X	X	X	X		X		X		X				X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	I_0	MMXU	Neutral current, B stage																																			X		X		X		X																				X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
			Differential current																											X	X	X																																																
			Current sequence components																			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X															X	X	X																
	3U	MMXU	Three-phase voltage													X	X			X							X	X	X	X					X	X						X	X	X	X	X	X					X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	3U	MMXU	Three-phase voltage, B stage					X																																																															X	X	X	X	X	X	X	X	X	X	X	X	X
	U_0	MMXU	Residual voltage												X		X						X	X			X	X		X		X				X					X	X	X	X	X						X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	U_0	MMXU	Residual voltage, B stage																																																				X	X										X	X	X	X	X	X	X	X	X	X	X	X	X
			Voltage sequence components													X						X	X	X	X	X	X	X	X					X	X					X	X	X	X	X	X																X	X	X																
	E / P / Q / pf	MMXU	Three-phase power and energy (incl. cos j)																								X	X	X	X					X	X					X	X	X	X		X					X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	f	MMXU	Frequency						X																					X					X	X										X						X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
		RDRE	Disturbance recorder									X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
		-	Measurement of RTD/analogue inputs, general measurement															X															O	O		O	O	O	O						O																X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X
		-	Measurement to analogue output																																																									X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X
			Battery voltage								X																																																															X						
			Temperature								X																																																					O	O	O	O	O	O		O	O		X						
			Pulse counter for energy metering																																																									4	4	4																
Condition monitoring functions																																																																																
	CBCM	-	CB electric wear 1																					X		X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	CBCM	-	CB electric wear 2																																																									X			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	CBCM	-	CB Operate Time Counter 1																					X		X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X														X				X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	CBCM	-	CB Operate Time Counter 2																																																									X			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	CBCM	SIMG	Gas pressure supervision																																																												X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	CBCM	SIMG	Gas pressure supervision for three poles																					X		X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X																			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	CBCM	-	Spring charging control 1																					X		X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X																			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	CBCM	-	Breaker travel time 1																					X		X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X																			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	CBCM	-	CB Scheduled maintenance																					X		X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X																			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	TCS	-	Trip circuit supervision 1														X	X	X			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X
	TCS	-	Trip circuit supervision 2																			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X															X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X
	TCS	-	Trip circuit supervision 3																																																									X	X	X																
	MCS	-	Supervision of the energizing current input circuit																							X	X	X	X	X	X	X	X	X	X										X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X
	MCS	-	Supervision of the energizing voltage input circuit																																															X	X	X	X	X	X	X	X	X	X	X				X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
		-	Local and remote phase currents (protection co-ordinated)																											X	X	X																																																
PCS	PCS	-	Protection communication supervision																											X	X	X																																																
OPTM	OPTS	SOPT	Runtime counter for machines and devices																														X	X	X	X	X	X	X	X	X	X	X																																				
	U<>	U<>	Station battery supervision																																																									X	X	X																
	E	E	Energy monitoring																																																									X	X	X																
	TPOSM	TPOSM	Tap changer position indication																																	X	X	X	X	X	X	X	X		X																	X					X	X	X									
Power quality functions																																																																																
		PHQVVR	Voltage sags and swells																																																									X										O	O	O							
		VSQUB	Voltage unbalance																																																									X																		
		MHAI, CMHAI	Current waveform distortion measurement																																												X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X										O	O	O	X						
		MHAI, VPP-, VPH-	Voltage wafeform distortion measurement																																																X	X	X	X	X	X	X	X	X	X	X	X										O	O	O	X						
Communication protocols																																																																																
			SPA bus		X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X																									X	X	X	X	X	X	X	X	X	X	X	X	X	X	X				X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
			LON bus									X	O	O	O	O	O				S	X																									X	X	X	X	X	X	X	X	X	X	X	X	X	X	X				X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
			IEC 60870-5-103										X	X	X	X	X	X	X	X			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X					X	X	X	X	X	X		X	X	X	X	X	X
			IEC 61850-8-1		O	O	O	O	O		O						O	O	O	O	O	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	X	X	X	O	O	O	O	O	O	O	O	O	O	O	X	X	X	X	X	X
			Modbus RTU/ASCII								X						X	X	X			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X				X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
			PROFIBUS		O	O	O	O	O		O						O	O	O	O	O																										O	O	O	O	O	O	O	O	O	O	O	O	O	O	O				O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O
			DNP 3.0								X						X		X			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X					X	X	X	X	X	X	X						
			IEC 60870-5-101								X																																																																X						
			Modbus over TCP/IP								O						O	O	O			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O				O	O	O	O	O	O	O	O	O	O	O	X	X	X	X	X	X
			Second Ethernet bus/Self-healing ring support																				O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O																																				
			SPA over TCP/IP		O	O	O	O	O		O						O	O	O	O	O																										O	O	O	O	O	O	O	O	O	O	O	O	O	O	O				O	O	O	O	O	O	O	O	O	O	O						
Inputs / Outputs																																																																																
			Sensor channels		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6	6	6	6	6	6	6	-	-	-	-	-	-	-	9	9	9	9	-	-	-	9	9	9	9	0-8	0-8	0-8	0-8	0-8	0-8
			Analog input (1/5A)		4	4	4	-	-	3	-	0-1	3	3-4	0-1	-	-	4	4	3	8	4	4	4	4	4	4	1	4	4	4	4	4	4	4	7	7	7	7	7	7	7	7	-	4	4	4	4	4	1	4	4	4	4	4	4	4	4	4	4	3-4	4-7-8	7-8	4-8	4-8	4-8	4-8	6-8	6-8	6-8	4	4	4	3-6	0-8	0-8	0-8	0-8	0-8	0-8
			Analog input (0.2/1A)		-	-	-	-	-	-	-	0-1	-	0-1	0-1	-	-	-	-	-	-	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-	1	1	1	1	1	1	1	1	1	1	1	1	1	0-1	0-1	0-1	0-1	0-1	0-1	0-1	-	-	-	1	1	1	-	0-2	0-2	0-2	0-2	0-2	0-2
			Analog input (100V)		-	-	-	3	1	-	-	-	-	-	1	3	4	-	-	1	-	1	1	-	-	5	5	-	5	-	1	-	-	3	5	-	-	-	-	5	5	5	5	5	3	-	-	1	1	1	4	4	4	4	4	4	4	4	4	4	4-5	4-3-2	2-3	1-4	1-4	1-4	1-4	1-3	1-3	1-3	4	4	4	3-6	0-6	0-6	0-6	0-6	0-6	0-6
			RTD/mA inputs (option)		-	-	-	-	-	-		-	-	-	-	-	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6/2	6/2	-	6/2	6/2	6/2	6/2	-	-	-	-	-	6/2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8/8/-/8/-	8/8/-/8/-	8/8/-/8/-	8	8	8	8	8/8/-	8/8/-	8/8/-	8/8/-	8/8/-	8/8/-	-	6	6	6	6	6	6
			mA outputs (option)		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4/4/-/4/-	4/4/-/4/-	4/4/-/4/-	4	4	4	4	4/4/-	4/4/-	4/4/-	4/4/-	4/4/-	4/4/-	-	4	4	4	4	4	4
			Digital inputs		1	1	1	4	4	1	5	1	1	1	1	1	5	5	5	7	5	3	11-17	4	12-18	16	16	8	16	12-18	11-17	12-18	4-12	8-14	16	8-14	8-14	8-14	8-14	12	12	12	12	12	8-14	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	14/23/32/41/50	14/23/32/41/50	14/23/32/41/50	15	15	25	25	15/25/34	15/25/34	15/25/34	15/25/34	15/25/34	15/25/34	15	42	42	42	42	42	42
			Trip circuit supervision		-	-	-	-	-	-	-	-	-	-	-	-	1	1	1	-	-	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3	3	3	2	2	2	2	2	2	2	2	2	2	-	3	3	3	3	3	3
			Power outputs		2	2	2	2	2	3	-	2	2	2	2	2	3	3	3	2	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	6/9/12/15/18	6/9/12/15/18	6/9/12/15/18	5	5	11	11	5/11/14	5/11/14	5/11/14	5/11/14	5/11/14	5/11/14	2	18	18	18	18	18	18
			Signal outputs		3	3	3	2	1	-	4	2	2	2	2	2	5	5	5	4	4	2	6-9	2	6-9	6	6	6	6	6-9	6-9	6-9	2-6	6-9	6	6-9	6-9	6-9	6-9	6	6	6	6	6	6-9	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3/9/15/21/27	3/9/15/21/27	3/9/15/21/27	7	7	7	7	7/7/12	7/7/12	7/7/12	7/7/12	7/7/12	7/7/12	7	6	6	6	6	6	6
			Self-supervision outputs (IRF)		1	1	1	1	1	1	-	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3	3	3	3	3	3
			Battery Charger (24V)		-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-
Languages																																																																																
			English									X	X	X	X	X	X	X	X			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X
			German									X	X	X	X	X	X	X	X			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X
			French									X	X	X	X	X	X	X	X																											X	X	X	X	X	X	X	X	X	X	X	X	X	X	X																				
			Italian									X	X	X	X	X	X	X	X																																																																				
			Spanish									X	X	X	X	X	X						X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X							X	X	X	X	X	X								
			Portugese														X	X	X			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X							X	X	X	X	X	X								
			Russian																			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X																						X	X	X	X	X	X		X	X	X	X	X	X
			Polish														X	X	X																										X	X	X	X	X	X	X	X	X	X	X	X	X	X	X							X	X	X	X	X	X								
			Czech																																																																			X	X	X								
			Swedish									X	X	X	X	X	X	X	X			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X				X	X	X	X	X	X	X	X	X	X								
			Finnish									X	X	X	X	X	X	X	X																											X	X	X	X	X	X	X	X	X	X	X	X	X	X	X				X	X	X	X	X	X	X	X	X	X								
			Chinese																																													X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X														X	X	X	X	X	X
Certifications																																																																																
			Det Norske Veritas (DNV)																			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X															X	X	X	X	X	X	X				X	X	X		X	X	X	X	X	X
			Registro Italiano Navale (RINA)		X	X															X																																										X	X	X	X				X	X	X							
			Germanischer Lloyd (GL)																		X																																										X	X	X	X				X	X	X							
			Lloyd's Register of Shipping (LR)																																																												X	X	X	X				X	X	X							
			UL Recognition																																																												X	X	X	X				X	X	X							
			ATEX		X																																																																						X	X	X	X	X	X
			Russian Maritime Register of Shipping																																																												X	X	X	X	X	X	X	X	X	X						
Other																																																																																
			Height (in units)		4	4	4	4	4	6	6	6	6	6	6	6	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	4/6	4/6	4/6	6	6	6	6	6	6	6	6	6	6	6	4	4	4	4	4	4
			Internet link (Click marker to access the link)		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

My choice | SPAM 150C | SPAJ 140 C | SPAJ 160 C | SPAU 140 C | SPAF 140 C | REA 101 | REC 501 | REJ 521 | REJ 523 | REJ 525 | REJ 527 | REU 523 | REU 610 | REM 610 | REF 610 | SPAU 341 C | SPAD 346 C | REF615 (std conf A) | REF615 (std conf B) | REF615 (std conf C) | REF615 (std conf D) | REF615 (std conf E) | REF615 (std conf F) | REF615 (std conf G) | REF615 (std conf H) | RED615 (std conf A) | RED615 (std conf B) | RED615 (std conf C) | REM615 (std conf A) | REM615 (std conf B) | REM615 (std conf C) | RET615 (std conf A) | RET615 (std conf B) | RET615 (std conf C) | RET615 (std conf D) | RET615 (std conf E) | RET615 (std conf F) | RET615 (std conf G) | RET615 (std conf H) | REU615 (std conf A) | REU615 (std conf B) | REX 521B01 | REX 521B02 | REX 521M01 | REX 521M02 | REX 521H01 | REX 521H02 | REX 521H03 | REX 521H04 | REX 521H05 | REX 521H06 | REX 521H07 | REX 521H08 | REX 521H09 | REX 521H50 | REX 521H51 | REF630 | REM630 | RET630 | REM 543 MOTOR | REM 543 GENERATOR | REM 545 MOTOR | REM 545 GENERATOR | RET 54_ CONTROL | RET 54_ BASIC | RET 54_ MULTI | REF 54_ CONTROL | REF 54_ BASIC | REF 54_ MULTI | REC 523 | BASIC LOW | BASIC | MULTI LOW | MULTI | DIFFERENTIAL | DISTANCE | REF 542plus
Basic Range | Middle Range | High Range

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