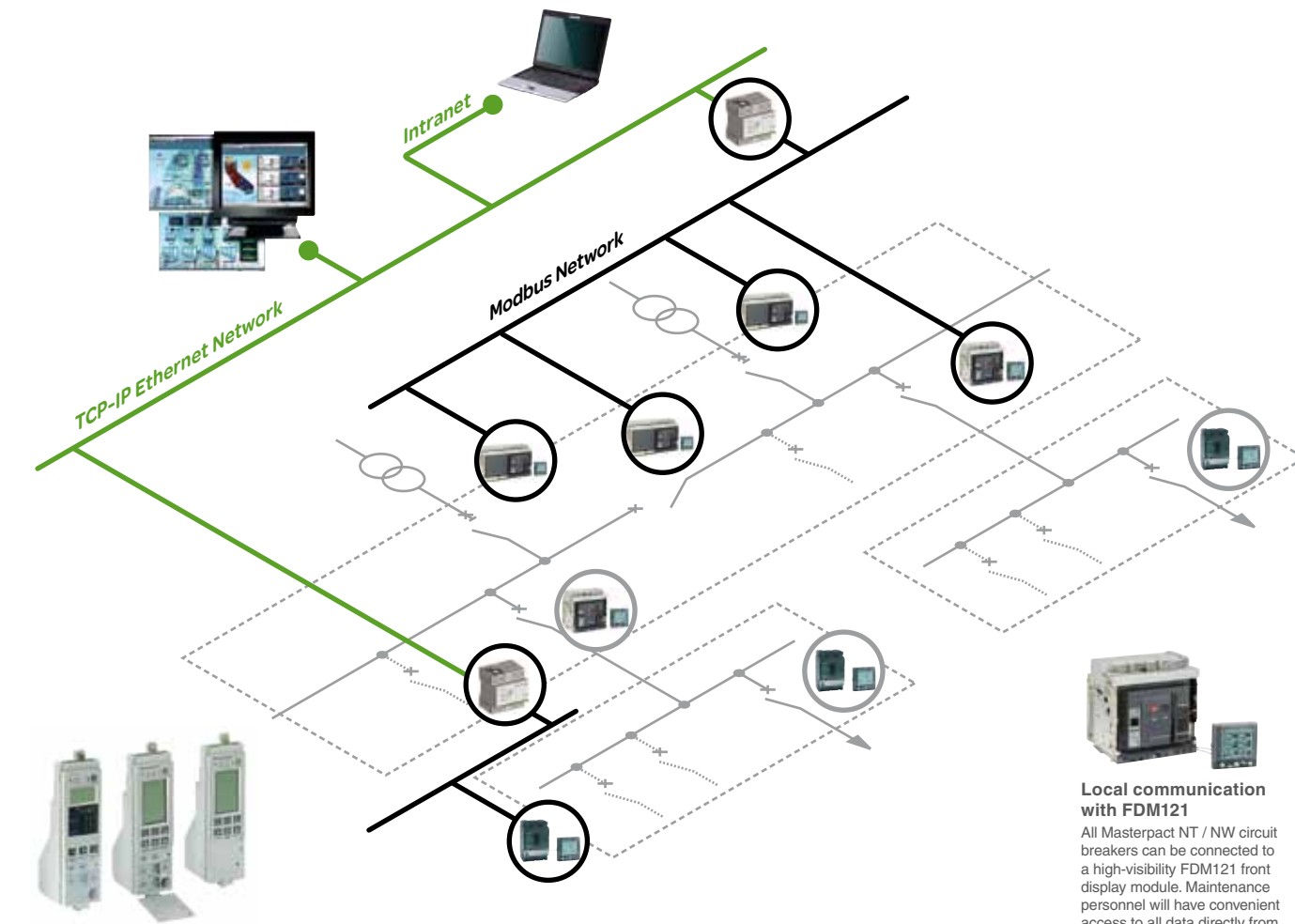


Monitoring and protecting your low voltage network

Masterpact can be integrated in a general supervision system to optimise your electrical installation.



Micrologic Control Units
All Masterpact are equipped with a Micrologic electronic control unit that offers a complete set of protections and state of the art measurements.



The new Micrologic E control unit puts energy metering at key points across your electric power grid.
 • Smart with energy measurement in every circuit breaker
 • Safe: protection functions are safely separated from measurement functions
 • Simple: connection of an FDM121 high-visibility panel display with the new BCM ULP communications option.
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Optimising the management of your electrical installation

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- reduce energy and operations costs;
- improve power quality, reliability and uptime;
- optimise equipment use.

Maximising continuity of service

Because a LV power supply interruption is unacceptable especially in critical power applications, an automatic system is required for LV transfer switching. For your peace of mind, Masterpact enables automatic control and management of power sources in your low voltage distribution network guaranteeing the hi-reliability of your installation.



Local communication with FDM121
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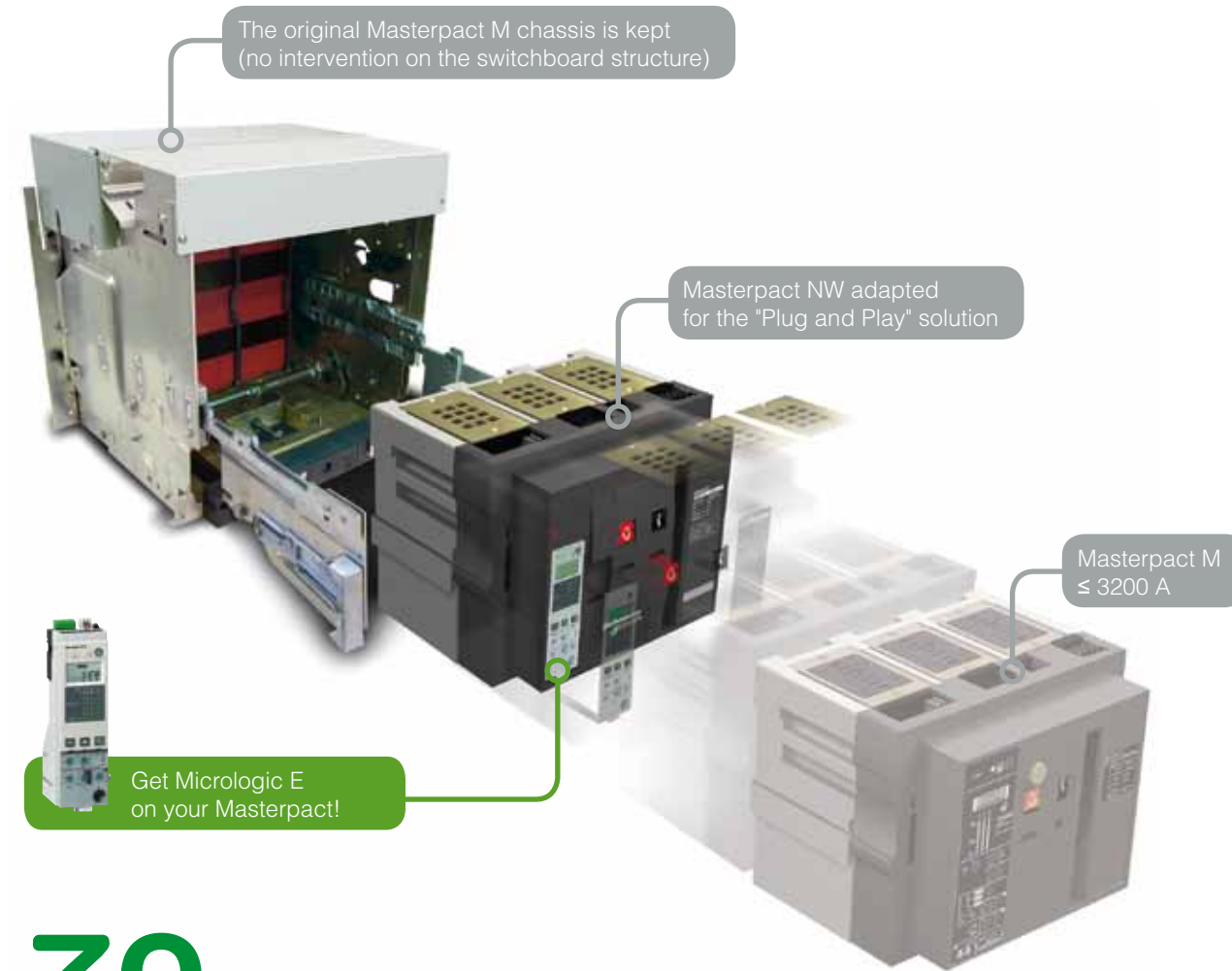
EGX300 gateway-server or IRIIO RTU
The EGX300 web-enabled gateway-server or the IRIIO RTU (remote terminal unit) can both be used as Ethernet coupler for the PowerLogic System devices and for any other communicating devices operating under Modbus RS485 protocol. Data is viewable via a standard web browser.



PowerLogic ION Enterprise
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"Plug and Play" retrofit solution

Schneider Electric proposes a fast and simple implementation with considerably reducing on-site intervention time and get the performance of last generation device.



30 minutes and 2 easy operations

The retrofit solutions use a factory modified and adapted Masterpact NW which is installed in the Masterpact M's original chassis.

Schneider Electric Industries SAS
35, rue Joseph Monier
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F- 92506 Rueil Malmaison Cedex

RCS Nanterre 954 503 439
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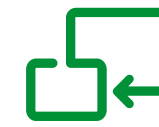
05-2012

Masterpact NT and NW

LV power circuit breakers 630 to 6300 A



Network protection



Compact

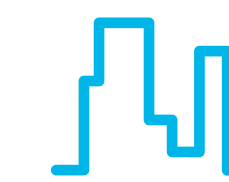


Supervision



Covering all your applications

Masterpact meets the needs of all types of LV electrical distribution networks.



Building

- Hotels
- Hospitals
- Offices
- Retailers



Data Centres and Networks



Industry

- Mining and minerals
- Automotive
- Food and beverage
- Chemical industry



Energy and Infrastructures

- Airports
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Masterpact provides an answer to specific applications.

- 1000 V for mines
- Direct current networks
- Corrosion protection
- Switch-disconnectors and earthing switches
- Automatic transfer switching equipment (ATSE) for emergency power systems
- High electrical endurance applications: Masterpact NT H2 is a high performance device offering high breaking capacity (Icu: 50 kA/480 V) and a high level of discrimination, all in a small volume.

Masterpact UR

Whenever high short circuit is involved

Masterpact UR is a low voltage ultra rapid opening circuit breaker. Its fault detection rate and its reaction speed mean that it will stop a short circuit from developing. As a result, this is the key component in very high power installations equipped with a number of power sources connected in parallel.

Masterpact UR truly comes into its own when short circuit currents can reach very high levels and when continuity of service is a must: **offshore installations, cement plants, petrochemical industry.** It is also especially suited to electrical installations on board **merchant ships.**

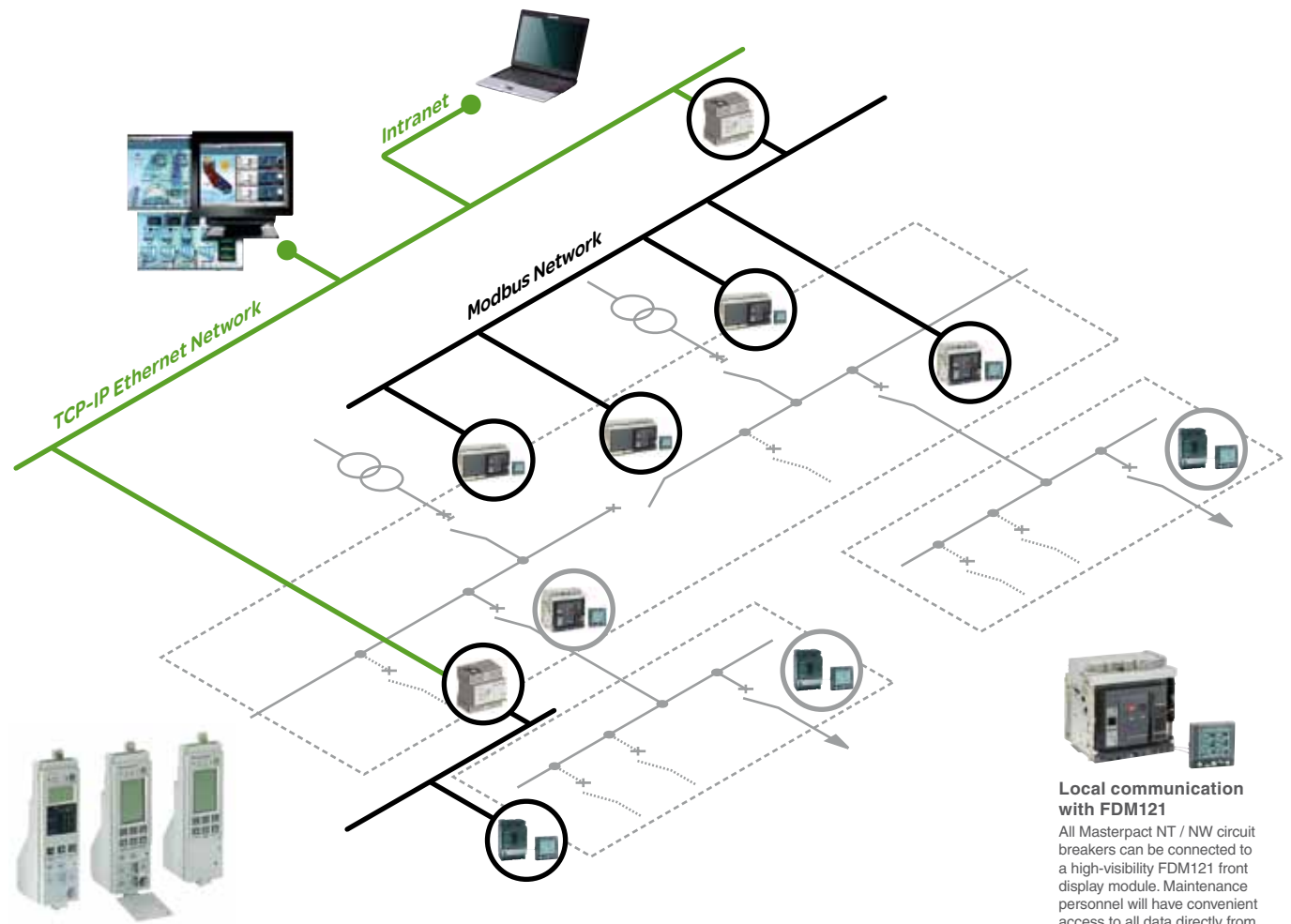


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ABTED103158EN

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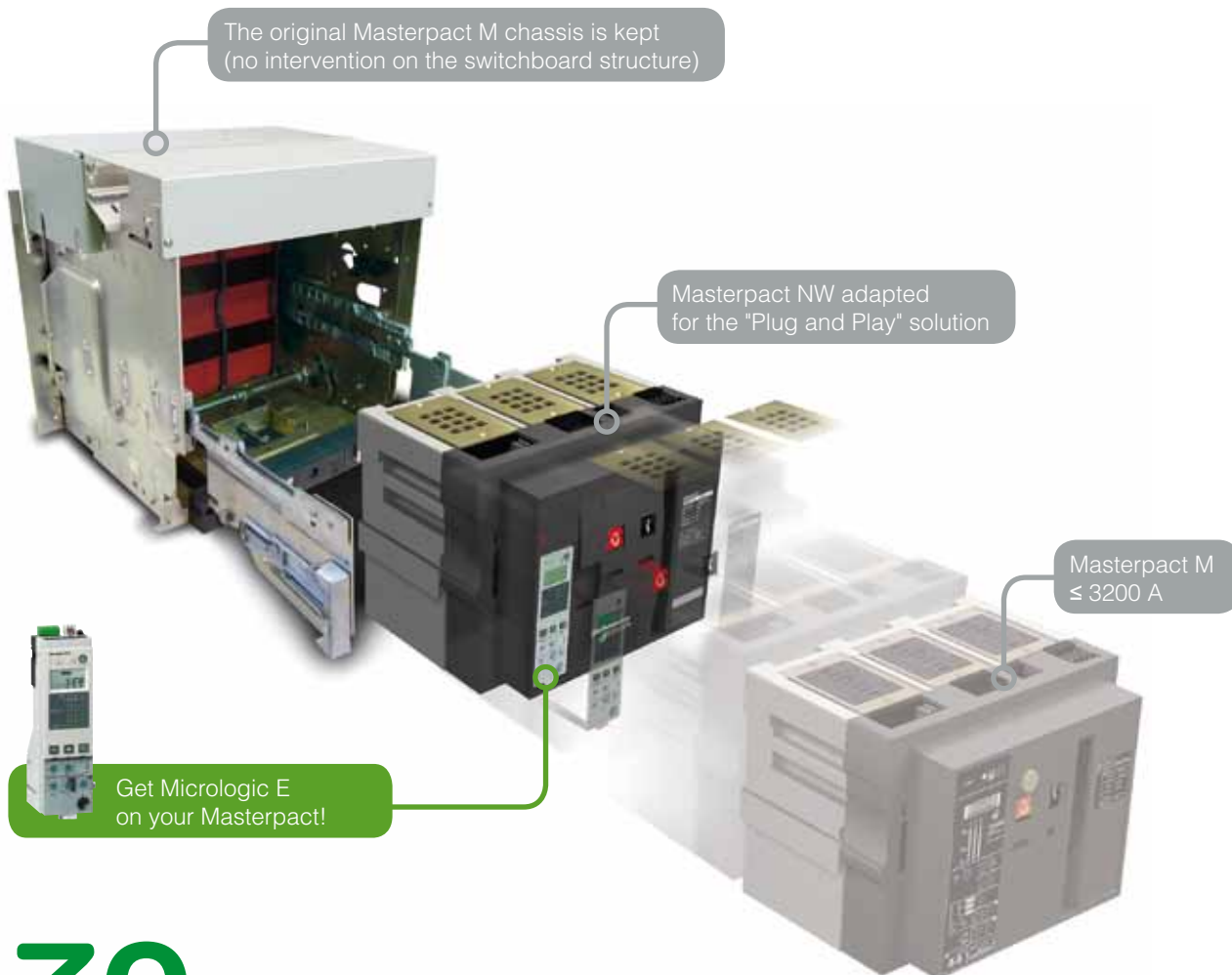


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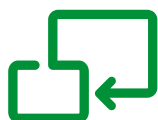
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Network
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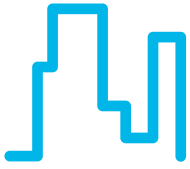


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Circuit breakers and switch-disconnectors

NT06 to NT16

Common characteristics			Sensor selection							
Number of poles		3/4	Sensor rating (A)							
Rated insulation voltage (V)	Ui	1000	250 ⁽¹⁾	400	630	800	1000	1250	1600	
Impulse withstand voltage (kV)	Uimp	12	100	160	250	320	400	500	640	
Rated operational volt. (V AC 50/60 Hz)	Ue	690	to 250	to 400	to 630	to 800	to 1000	to 1250	to 1600	
Suitability for isolation	IEC 60947-2		(1) For NT02 rating, please consult us.							
Degree of pollution	IEC 60664-1	3								

Circuit breaker characteristics as per IEC 60947-2			NT06	NT08	NT10	NT12	NT16
Rated current (A)	In	40/50 °C ⁽¹⁾	630	800	1000	1250	1600
Rating of 4th pole (A)			630	800	1000	1250	1600
Sensor ratings (A)			400 to 630	400 to 800	400 to 1000	630 to 1250	800 to 1600
Type of circuit breaker			H1 H2 L1⁽²⁾			H1 H2	
Ultimate breaking capacity (kA rms)	Icu	220/415 V	42 50 150			42 50	
V AC 50/60 Hz		440 V	42 50 130			42 50	
		525 V	42 42 100			42 42	
		690 V	42 42 25			42 42	
Rated service breaking capacity (kA rms)	Ics	% Icu	100%			100%	
Utilisation category			B B A			B B	
Rated short-time withstand current (kA rms)	Icw	0.5 s	42 36 10			42 36	
V AC 50/60 Hz		1 s	42 36 -			42 36	
		3 s	24 20 -			24 20	
Integrated instantaneous protection (kA peak ±10 %)			- 90 10xIn ⁽³⁾			- 90	
Rated making capacity (kA peak)	Icm	220/415 V	88 105 330			88 105	
V AC 50/60 Hz		440 V	88 105 286			88 105	
		525 V	88 88 220			88 88	
		690 V	88 88 52			88 88	
Break time (ms) between tripping order and arc extinction			25 25 9			25 25	
Closing time (ms)			< 50			< 50	

Circuit breaker characteristics as per NEMA AB1		
Breaking capacity (kA)		42 50 150
V AC 50/60 Hz		480 V 42 50 100
		600 V 42 42 25

Switch-disconnector characteristics as per IEC 60947-3 and Annex A		
Type of switch-disconnector		HA
Rated making capacity (kA peak)	Icm	220 V 75
AC23A/AC3 category - V AC 50/60 Hz		440 V 75
		525/690 V 75
Rated short-time withstand current (kA rms)	Icw	0.5 s 36
AC23A/AC3 category - V AC 50/60 Hz		1 s 36
		3 s 20
Ultimate breaking capacity Icu (kA rms) with an external protection relay		690 V 36
Maximum time delay: 350 ms		

Mechanical and electrical durability as per IEC 60947-2/3 at In/Ie											
Service life	Mechanical	without maintenance	12.5								
C/O cycles x 1000											
Type of circuit breaker			H1 H2 L1	H1 H2 L1	H1 H2 L1	H1 H2 L1	H1 H2 L1	H1 H2 L1	H1 H2 L1	H1 H2 L1	H1 H2 L1
Rated current	In (A)		630	800	1000	1250	1600				
C/O cycles x 1000	Electrical	without maintenance	440 V ⁽⁶⁾	6 6 3	6 6 3	6 6 3	6 6 3	6 6 3	6 6 3	6 6 3	3 3
IEC 60947-2			690 V	3 3 2	3 3 2	3 3 2	3 3 2	3 3 2	3 3 2	3 3 2	1 1
Type of circuit breaker or switch-disconnector			H1/H2/HA								
Rated operational current	Ie (A)	AC23A	630	800	1000	1250	1600				
C/O cycles x 1000	Electrical	without maintenance	440 V ⁽⁶⁾	6	6	6	6	6	6	6	3
IEC 60947-3			690V	3	3	3	3	3	3	3	1
Type of circuit breaker or switch-disconnector			H1/H2/HA								
Rated operational current	Ie (A)	AC3⁽⁸⁾	500	630	800	1000	1250	1600			
Motor power (kW)			380/415 V	≤ 250	250 to 335	335 to 450	450 to 560	450 to 560			
			440 V	≤ 300	300 to 400	400 to 500	500 to 630	500 to 630			
C/O cycles x 1000	Electrical	without maintenance	440 V ⁽⁶⁾	6							
IEC 60947-3 Annex M/IEC 60947-4-1			690 V	-							

(1) 50 °C: rear vertical connected. Refer to temperature derating tables for other connection types.
 (2) See the current-limiting curves in the "additional characteristics" section.
 (3) SELLIM system.
 (4) Available for 480 V NEMA.
 (5) Suitable for motor control (direct-on-line starting).



Circuit breakers and switch-disconnectors

NW08 to NW63

Common characteristics			Sensor selection							
Number of poles		3/4	Sensor rating (A)							
Rated insulation voltage (V)	Ui	1000/1250	250 ⁽¹⁾	400	630	800	1000	1250	1600	
Impulse withstand voltage (kV)	Uimp	12	100	160	250	320	400	500	640	
Rated operational voltage (V AC 50/60 Hz)	Ue	690/1150	to 250	to 400	to 630	to 800	to 1000	to 1250	to 1600	
Suitability for isolation	IEC 60947-2		(1) For NW02 rating, please consult us.							
Degree of pollution	IEC 60664-1	4 (1000 V) / 3 (1250 V)								

Circuit breaker characteristics as per IEC 60947-2			NW08	NW10	NW12	NW16	NW20	NW25	NW32	NW40	NW40b	NW50	NW63
Rated current (A)		at 40 °C / 50 °C ⁽¹⁾	800	1000	1250	1600	2000	2500	3200	4000	4000	5000	6300
Rating of 4th pole (A)			800	1000	1250	1600	2000	2500	3200	4000	4000	5000	6300
Sensor ratings (A)			400 to 800	400 to 1000	630 to 1250	800 to 1600	1000 to 2000	1250 to 2500	1600 to 3200	2000 to 4000	2000 to 4000	2500 to 5000	3200 to 6300
Type of circuit breaker			N1 H1 H2 L1⁽²⁾ H10	H1 H2 H3 L1⁽²⁾ H10	H1 H2 H3 L1⁽²⁾ H10	H1 H2 H3 L1⁽²⁾ H10	H1 H2 H3 L1⁽²⁾ H10	H1 H2 H3 L1⁽²⁾ H10	H1 H2 H3 L1⁽²⁾ H10	H1 H2 H3 L1⁽²⁾ H10	H1 H2 H3 L1⁽²⁾ H10	H1 H2 H3 L1⁽²⁾ H10	H1 H2 H3 L1⁽²⁾ H10
Ultimate breaking capacity (kA rms)	Icu	220/415/440 V	42 65 100 150 -	65 100 150 150 -	65 100 150 150 -	65 100 150 150 -	65 100 150 150 -	65 100 150 150 -	65 100 150 150 -	65 100 150 150 -	65 100 150 150 -	65 100 150 150 -	65 100 150 150 -
V AC 50/60 Hz		525 V	42 65 85 130 -	65 85 130 130 -	65 85 130 130 -	65 85 130 130 -	65 85 130 130 -	65 85 130 130 -	65 85 130 130 -	65 85 130 130 -	65 85 130 130 -	65 85 130 130 -	65 85 130 130 -
		690 V	42 65 85 100 -	65 85 100 100 -	65 85 100 100 -	65 85 100 100 -	65 85 100 100 -	65 85 100 100 -	65 85 100 100 -	65 85 100 100 -	65 85 100 100 -	65 85 100 100 -	65 85 100 100 -
		1150 V	- - - - 50	- - - - 50	- - - - 50	- - - - 50	- - - - 50	- - - - 50	- - - - 50	- - - - 50	- - - - 50	- - - - 50	- - - - 50
Rated service breaking capacity (kA rms)	Ics	% Icu	100%				100%	100%				100%	100%
Utilisation category			B	B	A		B	B				B	B
Rated short-time withstand current (kA rms)	Icw	1 s	42 65 85 30 50	65 85 65 30 50	65 85 65 30 50	65 85 65 30 50	65 85 65 30 50	65 85 65 30 50	65 85 65 30 50	65 85 65 30 50	65 85 65 30 50	65 85 65 30 50	65 85 65 30 50
V AC 50/60 Hz		3 s	22 36 50 30 50	36 75 65 30 50	36 75 65 30 50	36 75 65 30 50	36 75 65 30 50	36 75 65 30 50	36 75 65 30 50	36 75 65 30 50	36 75 65 30 50	36 75 65 30 50	36 75 65 30 50
Integrated instantaneous protection (kA peak ±10 %)			- - 190 80 -	- 190 150 80 -	- 190 150 80 -	- 190 150 80 -	- 190 150 80 -	- 190 150 80 -	- 190 150 80 -	- 190 150 80 -	- 190 150 80 -	- 190 150 80 -	- 190 150 80 -
Rated making capacity (kA peak)	Icm	220/415/440 V	88 143 220 330 -	143 220 330 330 -	143 220 330 330 -	143 220 330 330 -	143 220 330 330 -	143 220 330 330 -	143 220 330 330 -	143 220 330 330 -	143 220 330 330 -	143 220 330 330 -	143 220 330 330 -
V AC 50/60 Hz		525 V	88 143 187 286 -	143 187 286 286 -	143 187 286 286 -	143 187 286 286 -	143 187 286 286 -	143 187 286 286 -	143 187 286 286 -	143 187 286 286 -	143 187 286 286 -	143 187 286 286 -	143 187 286 286 -
		690 V	88 143 187 220 -	143 187 220 220 -	143 187 220 220 -	143 187 220 220 -	143 187 220 220 -	143 187 220 220 -	143 187 220 220 -	143 187 220 220 -	143 187 220 220 -	143 187 220 220 -	143 187 220 220 -
		1150 V	- - - - 105	- - - - 105	- - - - 105	- - - - 105	- - - - 105	- - - - 105	- - - - 105	- - - - 105	- - - - 105	- - - - 105	- - - - 105
Break time (ms) between tripping order and arc extinction			25 25 25 10 25	25 25 25 10 25	25 25 25 10 25	25 25 25 10 25	25 25 25 10 25	25 25 25 10 25	25 25 25 10 25	25 25 25 10 25	25 25 25 10 25	25 25 25 10 25	25 25 25 10 25
Closing time (ms)			< 70			< 70		< 70			< 70		< 80

Circuit breaker characteristics as per NEMA AB1		
Breaking capacity (kA)		240/480 V
V AC 50/60 Hz		600 V 42 65 85 100 -
		600 V 42 65 85 100 -

Unprotected circuit breaker characteristics: Tripping by shunt trip as per IEC 60947-2											
Type of circuit breaker			HA HF⁽⁵⁾	HA HF⁽⁵⁾	HA HF⁽⁵⁾	HA HF⁽⁵⁾	HA HF⁽⁵⁾	HA HF⁽⁵⁾	HA HF⁽⁵⁾	HA HF⁽⁵⁾	HA HF⁽⁵⁾
Ultimate breaking capacity (kA rms) V AC 50/60 Hz	Icu	220...690 V	50 85	50 85	50 85	50 85	50 85	50 85	50 85	50 85	50 85
Rated service breaking capacity (kA rms)	Ics	% Icu	100%	100%	100%	100%	100%	100%	100%	100%	100%
Rated short-time withstand current (kA rms)	Icw	1 s	50 85	50 85	50 85	50 85	50 85	50 85	50 85	50 85	50 85
		3 s	36 50	36 75	36 75	36 75	36 75	36 75	36 75	36 75	36 75
Overload and short-circuit protection with external protection relay: short-circuit protection, maximum delay: 350 ms ⁽⁴⁾			- -	- -	- -	- -	- -	- -	- -	- -	- -
Rated making capacity (kA peak) V AC 50/60 Hz	Icm	220...690 V	105 187								

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Circuit breakers and switch-disconnectors

NT06 to NT16

Common characteristics

Number of poles		3/4
Rated insulation voltage (V)	Ui	1000
Impulse withstand voltage (kV)	Uimp	12
Rated operational volt. (V AC 50/60 Hz)	Ue	690
Suitability for isolation	IEC 60947-2	
Degree of pollution	IEC 60664-1	3

Sensor selection

Sensor rating (A)	250 ⁽¹⁾	400	630	800	1000	1250	1600
Ir threshold set. (A)	100 to 250	160 to 400	250 to 630	320 to 800	400 to 1000	500 to 1250	640 to 1600

(1) For NT02 rating, please consult us.

Circuit breaker characteristics as per IEC 60947-2

			NT06	NT08	NT10	NT12	NT16
Rated current (A)	In	40/50 °C ⁽¹⁾	630	800	1000	1250	1600
Rating of 4th pole (A)			630	800	1000	1250	1600
Sensor ratings (A)			400 to 630	400 to 800	400 to 1000	630 to 1250	800 to 1600
Type of circuit breaker			H1 H2 L1 ⁽²⁾			H1 H2	
Ultimate breaking capacity (kA rms)	Icu	220/415 V	42 50 150			42 50	
V AC 50/60 Hz		440 V	42 50 130			42 50	
		525 V	42 42 100			42 42	
		690 V	42 42 25			42 42	
Rated service breaking capacity (kA rms)	Ics	% Icu	100%			100%	
Utilisation category			B B A			B B	
Rated short-time withstand current (kA rms)	Icw	0.5 s	42 36 10			42 36	
V AC 50/60 Hz		1 s	42 36 -			42 36	
		3 s	24 20 -			24 20	
Integrated instantaneous protection (kA peak ±10 %)			- 90 10xIn ⁽³⁾			- 90	
Rated making capacity (kA peak)	Icm	220/415 V	88 105 330			88 105	
V AC 50/60 Hz		440 V	88 105 286			88 105	
		525 V	88 88 220			88 88	
		690 V	88 88 52			88 88	
Break time (ms) between tripping order and arc extinction			25 25 9			25 25	
Closing time (ms)			< 50			< 50	

Circuit breaker characteristics as per NEMA AB1

			42	50	150	42	50
Breaking capacity (kA)		240 V	42	50	150	42	50
V AC 50/60 Hz		480 V	42	50	100	42	50
		600 V	42	42	25	42	42

Switch-disconnector characteristics as per IEC 60947-3 and Annex A

Type of switch-disconnector			HA	HA
Rated making capacity (kA peak)	Icm	220 V	75	75
AC23A/AC3 category - V AC 50/60 Hz		440 V	75	75
		525/690 V	75	75
Rated short-time withstand current (kA rms)	Icw	0.5 s	36	36
AC23A/AC3 category - V AC 50/60 Hz		1 s	36	36
		3 s	20	20
Ultimate breaking capacity Icu (kA rms)		690 V	36	36
with an external protection relay				
Maximum time delay: 350 ms				

Mechanical and electrical durability as per IEC 60947-2/3 at In/Ie

Service life	Mechanical without maintenance		12.5												
C/O cycles x 1000															
Type of circuit breaker			H1	H2	L1	H1	H2	L1	H1	H2	L1	H1	H2	H1	H2
Rated current	In (A)		630			800			1000			1250			1600
C/O cycles x 1000	Electrical	without maintenance	6	6	3	6	6	3	6	6	3	6	6	3	3
IEC 60947-2			3	3	2	3	3	2	3	3	2	3	3	1	1
Type of circuit breaker or switch-disconnector			H1/H2/HA												
Rated operational current	Ie (A)		630			800			1000			1250			1600
C/O cycles x 1000	Electrical	without maintenance	6			6			6			6			3
IEC 60947-3			3			3			3			3			1
Type of circuit breaker or switch-disconnector			H1/H2/HA												
Rated operational current	Ie (A)		500			630			800			1000			1000
Motor power (kW)		380/415 V	≤ 250			250 to 335			335 to 450			450 to 560			450 to 560
		440 V	≤ 300			300 to 400			400 to 500			500 to 630			500 to 630
C/O cycles x 1000	Electrical	without maintenance	6												
IEC 60947-3 Annex M/IEC 60947-4-1		690 V	-												

(1) 50 °C: rear vertical connected. Refer to temperature derating tables for other connection types.

(2) See the current-limiting curves in the "additional characteristics" section.

(3) SELLIM system.

(4) Available for 480 V NEMA.

(5) Suitable for motor control (direct-on-line starting).



Circuit breakers and switch-disconnectors

NW08 to NW63

Common characteristics

Number of poles		3/4
Rated insulation voltage (V)	Ui	1000/1250
Impulse withstand voltage (kV)	Uimp	12
Rated operational voltage (V AC 50/60 Hz)	Ue	690/1150
Suitability for isolation	IEC 60947-2	—X1
Degree of pollution	IEC 60664-1	4 (1000 V) / 3 (1250 V)

Circuit breaker characteristics as per IEC 60947-2

Rated current (A)		at 40 °C / 50 °C ⁽¹⁾
Rating of 4th pole (A)		
Sensor ratings (A)		

Type of circuit breaker

Ultimate breaking capacity (kA rms) V AC 50/60 Hz	Icu	220/415/440 V 525 V 690 V 1150 V
Rated service breaking capacity (kA rms) Utilisation category	Ics	% Icu
Rated short-time withstand current (kA rms) V AC 50/60 Hz	Icw	1 s 3 s
Integrated instantaneous protection (kA peak ±10 %) Rated making capacity (kA peak) V AC 50/60 Hz	Icm	220/415/440 V 525 V 690 V 1150 V
Break time (ms) between tripping order and arc extinction		
Closing time (ms)		

Circuit breaker characteristics as per NEMA AB1

Breaking capacity (kA) V AC 50/60 Hz		240/480 V 600 V
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Unprotected circuit breaker characteristics:

Tripping by shunt trip as per IEC 60947-2

Type of circuit breaker

Ultimate breaking capacity (kA rms) V AC 50/60 Hz	Icu	220...690 V
Rated service breaking capacity (kA rms)	Ics	% Icu
Rated short-time withstand current (kA rms)	Icw	1 s 3 s
Overload and short-circuit protection with external protection relay: short-circuit protection, maximum delay: 350 ms ⁽⁴⁾		
Rated making capacity (kA peak) V AC 50/60 Hz	Icm	220...690 V

Switch-disconnector characteristics as per IEC 60947-3 and Annex A

Type of switch-disconnector

Rated making capacity (kA peak) AC23A/AC3 category - V AC 50/60 Hz	Icm	220...690 V 1150 V
Rated short-time withstand current (kA rms) AC23A/AC3 category - V AC 50/60 Hz	Icw	1 s 3 s

Earthing switch

Latching capacity (kA peak)		135
Rating short time withstand (kA rms)	Icw	1 s 3 s

Mechanical and electrical durability as per IEC 60947-2/3 at In/Ie

Service life	Mechanical	with maintenance	
C/O cycles x 1000		without maintenance	
Type of circuit breaker			In (A)
Rated current			
C/O cycles x 1000	Electrical	without maintenance	440 V ⁽⁵⁾
IEC 60947-2			690 V 1150 V
Type of circuit breaker or switch-disconnector			Ie (A)
Rated operational current			AC23A
C/O cycles x 1000	Electrical	without maintenance	440 V ⁽⁵⁾
IEC 60947-3			690 V
Type of circuit breaker or switch-disconnector			Ie (A)
Rated operational current			AC3⁽⁶⁾
Motor power			380/415 V (kW) 440 V ⁽⁵⁾ (kW) 690 V (kW)
C/O cycles x 1000	Electrical	without maintenance	440/690 V ⁽⁵⁾
IEC 60947-3 Annex M/IEC 60947-4-1			

(1) 50 °C: rear vertical connected. Refer to temperature derating tables for other connection types. (2) See the current-limiting curves in the "additional characteristics" section. (3) Equipped with a trip unit with a (5) Available for 480 V NEMA. (6) Suitable for motor control (direct-on-line starting).

Sensor selection

Sensor rating (A)	250 ⁽¹⁾	400	630	800	1000	1250	1600	2000	2500	3200	4000	5000	6300
Ir threshold setting (A)	100 to 250	160 to 400	250 to 630	320 to 800	400 to 1000	500 to 1250	630 to 1600	800 to 2000	1000 to 2500	1250 to 3200	1600 to 4000	2000 to 5000	2500 to 6300

(1) For NW02 rating, please consult us.

NW08	NW10	NW12	NW16	NW20					NW25	NW32	NW40	NW40b	NW50	NW63		
800	1000	1250	1600	2000					2500	3200	4000	4000	5000	6300		
800	1000	1250	1600	2000					2500	3200	4000	4000	5000	6300		
400 to 800	400 to 1000	630 to 1250	800 to 1600	1000 to 2000					1250 to 2500	1600 to 3200	2000 to 4000	2000 to 4000	2500 to 5000	3200 to 6300		
N1	H1	H2	L1⁽²⁾	H10	H1	H2	H3	L1⁽²⁾	H10	H1	H2	H3	H10	H1	H2	
42	65	100	150	-	65	100	150	150	-	65	100	150	-	100	150	
42	65	85	130	-	65	85	130	130	-	65	85	130	-	100	130	
42	65	85	100	-	65	85	100	100	-	65	85	100	-	100	100	
-	-	-	-	50	-	-	-	-	50	-	-	-	50	-	-	
100%				100%					100%				100%			
B				B					B				B			
42	65	85	30	50	65	85	65	30	50	65	85	65	50	100	100	
22	36	50	30	50	36	75	65	30	50	65	75	65	50	100	100	
-	-	190	80	-	-	190	150	80	-	-	190	150	-	-	270	
88	143	220	330	-	143	220	330	330	-	143	220	330	-	220	330	
88	143	187	286	-	143	187	286	286	-	143	187	286	-	220	286	
88	143	187	220	-	143	187	220	220	-	143	187	220	-	220	220	
-	-	-	-	105	-	-	-	-	105	-	-	-	105	-	-	
25	25	25	10	25	25	25	25	10	25	25	25	25	25	25	25	
< 70				< 70					< 70				< 80			

42	65	100	150	-	65	100	150	150	-	65	100	150	-	100	150
42	65	85	100	-	65	85	100	100	-	65	85	100	-	100	100

HA		HF ⁽³⁾		HA		HF ⁽³⁾		HA		HF ⁽³⁾		HA	
50	85	50	85	55	85	55	85	85	85	85	85	85	85
100%		100%		100%		100%		100%		100%		100%	
50	85	50	85	55	85	55	85	85	85	85	85	85	85
36	50	36	75	55	75	55	75	85	85	85	85	85	85
-	-	-	-	-	-	-	-	-	-	-	-	-	-
105	187	105	187	121	187	121	187	187	187	187	187	187	187

NW08/NW10/NW12/ NW16				NW20				NW25/NW32/NW40				NW40b/NW50/NW63	
NA	HA	HF	HA10	HA	HF	HA10	HA	HF	HA10	HA	HF	HA10	HA
88	105	187	-	105	187	-	121	187	-	187	187	-	187
-	-	-	105	-	-	105	-	-	105	-	-	105	-
42	50	85	50	50	85	50	55	85	50	85	50	50	85
-	36	50	50	36	50	50	55	75	50	75	50	50	85

60 Hz	
50 Hz	

800/1000/1250/1600				2000				2500/3200/4000				4000b/5000/6300	
N1/H1/H2	L1	H10		H1/H2	H3	L1	H10	H1/H2	H3	H10	H1	H2	
10	3	-	-	8	2	3	-	5	1.25	-	1.5	1.5	
10	3	-	-	6	2	3	-	2.5	1.25	-	1.5	1.5	
-	-	0.5	-	-	-	-	0.5	-	-	0.5	-	-	
H1/H2/HA/HF				H1/H2/H3/HA/HF				H1/H2/HA					
800/1000/1250/1600				2000				2500/3200/4000				4000b/5000/6300	
10				8				5				1.5	
10				6				2.5				1.5	
H1/H2/HA/HF				H1/H2/H3/HA/HF				H1/H2/HA					
800		1000		1250		1600		2000					
335 to 450		450 to 560		560 to 670		670 to 900		900 to 1150					
400 to 500		500 to 630		500 to 800		800 to 1000		1000 to 1300					
≤ 800		800 to 1000		1000 to 1250		1250 to 1600		1600 to 2000					

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