

Frequency converter
EFC 5610

Frequency converter

EFC 5610

Documentation

- Power range 1 x AC 230 V 0.4 kW to 3 x AC 400 V 90.0 kW
- Use with permanent magnet motors
- Integrated brake chopper and mains filter
- Integrated operating panel for simple, fast commissioning
- Expandability through I/O and fieldbus modules

EFC 5610 is a universal, low-cost frequency converter for reliable speed control and demand-oriented energy supply. V/f and vector control, easy installation and commissioning as well as a power range of 0.4 to 18.5 kW enable a wide range of applications. In a power range up to 18.5 kW the powerful SVC vector control provides an optimum torque curve and high starting torque for specific special requirements.

Technical data

		EFC5610-0K40-1P2	EFC5610-0K75-1P2	EFC5610-1K50-1P2	EFC5610-2K20-1P2	EFC5610-0K40-3P4	EFC5610-0K75-3P4	EFC5610-1K50-3P4	EFC5610-2K20-3P4
Performance data									
Rated output HD operation	[kW]	0.4	0.75	1.5	2.2	0.4	0.75	1.5	2.2
Continuous rated current HD operation	[A]	2.4	4.1	7.3	10.1	1.3	2.3	4	5.6
Motor rated voltage	Three phase, 0 V ... mains voltage								
Output voltage	0 V to mains voltage								
Output frequency	0 ... 400 Hz								
Mains voltage	1 AC	1 AC 200 ... 240 V (-10 % / +10 %)							
	3 AC					3 AC 380 ... 480 V (-15 % / +10 %)			
Frequency	50 ... 60 Hz (±5 %)								
Overload capacity HD operation	150 % for 60 s, 200 % for 1 s								
Brake chopper / resistor									
Braking resistance	External								
Brake chopper	Internal up to 22 kW								
Ambient conditions									
Permissible temperature (operation)	-10 ... +45 °C (Derating 1.5 % of the output power per 1 °C from 45 ... 55 °C)								
Permissible relative humidity (operation)	< 90 % (no condensation)								
Max. installation height	1000 m (> 1000 m Derating 1 % of the output power pro 100 m)								
Protection category	IP20								
Functions									

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Control technology		V/f or SVC (sensorless vector control)				
Pulse width modulation (PWM), adjustable in 1 kHz steps	[kHz]	1 ... 15				
Type of modulation		Magnetic flux PWM modulation: SVPWM				
Speed control range	Without pulse generator	1 : 200				
Start-up torque	V/f	100% at 1.5 Hz; 150% at 3 Hz				
	SVC	200 % at 0.5 Hz				
Frequency resolution	Digital	0.01 Hz				
	Analog	1/1000 of the output frequency				
V/f curve		linear, quadratic, freely definable				
Ramps		linear, S-curve				
DC disc brake	Start frequency	0 ... 50 Hz				
	Braking time	0 ... 10 s				
Automatic PWM frequency adjustment		load-dependent adaptation of PWM frequency				
Frequency setting tolerance	Analog	0.4 %				
	Digital	0.04 %				
Controller		PID				
Bus systems		Modbus RTU (with Multi-Ethernet Modbus TCP)				
		PROFIBUS, CANopen, Multi-Ethernet (ext. options)				
Status messages via digital outputs		Operation, target value achieved, etc.				
Number of digital inputs 24 VDC		5 (of which 1x pulse train 50 kHz)				
Number of digital outputs 24 VDC / 50 mA		1 (pulse train 32 kHz)				
Number of relay outputs 230 VAC / 30 VDC / 3 A		1				
Number of analog inputs 0 ... 10 V or 0 ... 20 mA		2				
Number of analog outputs 0 ... 10 V or 0 ... 20 mA		1				
Display		Dust cover with 4 diagnostic LED				
		LED 5 digit (optional)				
		LCD (optional)				
Status LED		Rotation direction and operating status				
Weight						
Weight	[kg]	1.5	1.9	2.6	1.5	1.9
Norms and Standards						
Certification		CE cUL UL EAC C-Tick (RCM)				

EFC5610-
3K00-3P4EFC5610-
4K00-3P4EFC5610-
5K50-3P4EFC5610-
7K50-3P4EFC5610-
11K0-3P4EFC5610-
15K0-3P4EFC5610-
18K5-3P4EFC5610-
22K0-3P4

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Performance data									
Rated output HD operation	[kW]	3	4	5.5	7.5	11	15	18.5	22
Continuous rated current HD operation	[A]	7.4	9.7	12.7	16.8	24.3	32.4	39.2	45
Motor rated voltage	Three phase, 0 V ... mains voltage								
Output voltage	0 V to mains voltage								
Output frequency	0 ... 400 Hz								
Mains voltage	3 AC	3 AC 380 ... 480 V (-15 % / +10 %)							
Frequency	50 ... 60 Hz (± 5 %)								
Overload capacity HD operation	150 % for 60 s, 200 % for 1 s								
Brake chopper / resistor									
Braking resistance	External								
Brake chopper	Internal up to 22 kW								
Ambient conditions									
Permissible temperature (operation)	-10 ... +45 °C (Derating 1.5 % of the output power per 1 °C from 45 ... 55 °C)								
Permissible relative humidity (operation)	< 90 % (no condensation)								
Max. installation height	1000 m (> 1000 m Derating 1 % of the output power pro 100 m)								
Protection category	IP20								
Functions									
Control technology	V/f or SVC (sensorless vector control)								
Pulse width modulation (PWM), adjustable in 1 kHz steps	[kHz]	1 ... 15							
Type of modulation	Magnetic flux PWM modulation: SVPWM								
Speed control range	Without pulse generator	1 : 200							
Start-up torque	V/f	100% at 1.5 Hz; 150% at 3 Hz							
	SVC	200 % at 0.5 Hz							
Frequency resolution	Digital	0.01 Hz							
	Analog	1/1000 of the output frequency							
V/f curve	linear, quadratic, freely definable								
Ramps	linear, S-curve								
DC disc brake	Start frequency	0 ... 50 Hz							
	Braking time	0 ... 10 s							
Automatic PWM frequency adjustment	load-dependent adaptation of PWM frequency								
Frequency setting tolerance	Analog	0.4 %							
	Digital	0.04 %							
Controller	PID								
Bus systems	Modbus RTU (with Multi-Ethernet Modbus TCP)								
	PROFIBUS, CANopen, Multi-Ethernet (ext. options)								

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Status messages via digital outputs	Operation, target value achieved, etc.							
Number of digital inputs 24 VDC	5 (of which 1x pulse train 50 kHz)							
Number of digital outputs 24 VDC / 50 mA	1 (pulse train 32 kHz)							
Number of relay outputs 230 VAC / 30 VDC / 3 A	1							
Number of analog inputs 0 ... 10 V or 0 ... 20 mA	2							
Number of analog outputs 0 ... 10 V or 0 ... 20 mA	1							
Display	Dust cover with 4 diagnostic LED							
	LED 5 digit (optional)							
	LCD (optional)							
Status LED	Rotation direction and operating status							
Weight								
Weight	[kg]	2.6	3.9	4.3	5.7	6.4	8	8.5
Norms and Standards								
Certification	CE cUL UL EAC C-Tick (RCM)							

		EFC5610-30K0-3P4	EFC5610-37K0-3P4	EFC5610-45K0-3P4	EFC5610-55K0-3P4	EFC5610-75K0-3P4	EFC5610-90K0-3P4	
Performance data								
Rated output HD operation	[kW]	30	37	45	55	75	90	
Continuous rated current HD operation	[A]	60.8	73.7	89	108	147	176	
Motor rated voltage	Three phase, 0 V ... mains voltage							
Output voltage	0 V to mains voltage							
Output frequency	0 ... 400 Hz							
Mains voltage	3 AC	3 AC 380 ... 480 V (-15 % / +10 %)						
Frequency	50 ... 60 Hz (±5 %)							
Overload capacity HD operation	150 % for 60 s, 200 % for 1 s							
Brake chopper / resistor								
Braking resistance	External							
Brake chopper	Internal up to 22 kW							
Ambient conditions								
Permissible temperature (operation)	-10 ... +45 °C (Derating 1.5 % of the output power per 1 °C from 45 ... 55 °C)							
Permissible relative humidity (operation)	< 90 % (no condensation)							
Max. installation height	1000 m (> 1000 m Derating 1 % of the output power pro 100 m)							
Protection category	IP20							
Functions								
Control technology	V/f or SVC (sensorless vector control)							

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Pulse width modulation (PWM), adjustable in 1 kHz steps	[kHz]	1 ... 15					
Type of modulation		Magnetic flux PWM modulation: SVPWM					
Speed control range	Without pulse generator	1 : 200					
Start-up torque	V/f	100% at 1.5 Hz; 150% at 3 Hz					
	SVC	200 % at 0.5 Hz					
Frequency resolution	Digital	0.01 Hz					
	Analog	1/1000 of the output frequency					
V/f curve		linear, quadratic, freely definable					
Ramps		linear, S-curve					
DC disc brake	Start frequency	0 ... 50 Hz					
	Braking time	0 ... 10 s					
Automatic PWM frequency adjustment		load-dependent adaptation of PWM frequency					
Frequency setting tolerance	Analog	0.4 %					
	Digital	0.04 %					
Controller		PID					
Bus systems		Modbus RTU (with Multi-Ethernet Modbus TCP)					
		PROFIBUS, CANopen, Multi-Ethernet (ext. options)					
Status messages via digital outputs		Operation, target value achieved, etc.					
Number of digital inputs 24 VDC		5 (of which 1x pulse train 50 kHz)					
Number of digital outputs 24 VDC / 50 mA		1 (pulse train 32 kHz)					
Number of relay outputs 230 VAC / 30 VDC / 3 A		1					
Number of analog inputs 0 ... 10 V or 0 ... 20 mA		2					
Number of analog outputs 0 ... 10 V or 0 ... 20 mA		1					
Display		Dust cover with 4 diagnostic LED					
		LED 5 digit (optional)					
		LCD (optional)					
Status LED		Rotation direction and operating status					
Weight							
Weight	[kg]	27.5	29.5	39	42	54	61
Norms and Standards							
Certification		CE cUL UL EAC C-Tick (RCM)					

Dimensions

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EFC 5610**Dimensions**

Type	A	B	C	D	F	G	ØH	
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	
EFC5610-0K40-1P2	95	66	166	156	167	159	4.5	
EFC5610-0K75-1P2			206	196	170	162		
EFC5610-1K50-1P2			231	221	175	167		
EFC5610-2K20-1P2	120	80	231	221	175	167		
EFC5610-0K40-3P4	95	66	166	156	167	159		
EFC5610-0K75-3P4			206	196	170	162		
EFC5610-1K50-3P4			231	221	175	167		
EFC5610-2K20-3P4	120	80	231	221	175	167		
EFC5610-3K00-3P4	130	106	243	228	233	225		6.5
EFC5610-5K50-3P4			283	265				
EFC5610-7K50-3P4			313	295				
EFC5610-11K0-3P4	150	125	283	265	241	233		
EFC5610-15K0-3P4	165	140	313	295	241	233		
EFC5610-18K5-3P4			510	492	272	264		
EFC5610-22K0-3P4			610	580	314	306		
EFC5610-30K0-3P4	250	200	510	492	272	264	7	
EFC5610-37K0-3P4	265		610	580	314	306		
EFC5610-45K0-3P4	325		750	717	342	334		
EFC5610-55K0-3P4	325	200	610	580	314	306	11	
EFC5610-75K0-3P4			750	717	342	334		
EFC5610-90K0-3P4			750	717	342	334		

Order details

Type code	Description	Material number:
EFC5610-0K40-1P2-MDA-7P-NNNNN-NNNN	0.4 kW, 1 AC 200 ... 240 V, 50/60 Hz, 2.4 A, LED Display	R912005739
EFC5610-0K40-1P2-MDA-NN-NNNNN-NNNN	0.4 kW, 1 AC 200 ... 240 V, 50/60 Hz, 2.4 A, Dust cover	R912005724
EFC5610-0K75-1P2-MDA-7P-NNNNN-NNNN	0.75 kW, 1 AC 200 ... 240 V, 50/60 Hz, 4.1 A, LED Display	R912005740
EFC5610-0K75-1P2-MDA-NN-NNNNN-NNNN	0.75 kW, 1 AC 200 ... 240 V, 50/60 Hz, 4.1 A, Dust cover	R912005725
EFC5610-1K50-1P2-MDA-7P-NNNNN-NNNN	1.5 kW, 1 AC 200 ... 240 V, 50/60 Hz, 7.3 A, LED Display	R912005741
EFC5610-1K50-1P2-MDA-NN-NNNNN-NNNN	1.5 kW, 1 AC 200 ... 240 V, 50/60 Hz, 7.3 A, Dust cover	R912005726
EFC5610-2K20-1P2-MDA-7P-NNNNN-NNNN	2.2 kW, 1 AC 200 ... 240 V, 50/60 Hz, 10.1 A, LED Display	R912005742
EFC5610-2K20-1P2-MDA-NN-NNNNN-NNNN	2.2 kW, 1 AC 200 ... 240 V, 50/60 Hz, 10.1 A, Dust cover	R912005727

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Type code	Description	Material number:
EFC5610-0K40-3P4-MDA-7P-NNNNN-NNNN	0.4 kW, 3 AC 380 ... 480 V, 50/60 Hz, 1.3 A, LED Display	R912005743
EFC5610-0K40-3P4-MDA-NN-NNNNN-NNNN	0.4 kW, 3 AC 380 ... 480 V, 50/60 Hz, 1.3 A, Dust cover	R912005728
EFC5610-0K75-3P4-MDA-7P-NNNNN-NNNN	0.75 kW, 3 AC 380 ... 480 V, 50/60 Hz, 2.3 A, LED Display	R912005744
EFC5610-0K75-3P4-MDA-NN-NNNNN-NNNN	0.75 kW, 3 AC 380 ... 480 V, 50/60 Hz, 2.3 A, Dust cover	R912005729
EFC5610-1K50-3P4-MDA-7P-NNNNN-NNNN	1.5 kW, 3 AC 380 ... 480 V, 50/60 Hz, 4.0 A, LED Display	R912005745
EFC5610-1K50-3P4-MDA-NN-NNNNN-NNNN	1.5 kW, 3 AC 380 ... 480 V, 50/60 Hz, 4.0 A, Dust cover	R912005730
EFC5610-2K20-3P4-MDA-7P-NNNNN-NNNN	2.2 kW, 3 AC 380 ... 480 V, 50/60 Hz, 5.6 A, LED Display	R912005746
EFC5610-2K20-3P4-MDA-NN-NNNNN-NNNN	2.2 kW, 3 AC 380 ... 480 V, 50/60 Hz, 5.6 A, Dust cover	R912005731
EFC5610-3K00-3P4-MDA-7P-NNNNN-NNNN	3,0 kW, 3 AC 380 ... 480 V, 50/60 Hz, 7,4 A, LED Display	R912005747
EFC5610-3K00-3P4-MDA-NN-NNNNN-NNNN	3,0 kW, 3 AC 380 ... 480 V, 50/60 Hz, 7,4 A, Staubschutzkappe	R912005732
EFC5610-4K00-3P4-MDA-7P-NNNNN-NNNN	4.0 kW, 3 AC 380 ... 480 V, 50/60 Hz, 9.7 A, LED Display	R912005748
EFC5610-4K00-3P4-MDA-NN-NNNNN-NNNN	4.0 kW, 3 AC 380 ... 480 V, 50/60 Hz, 9.7 A, Dust cover	R912005733
EFC5610-5K50-3P4-MDA-7P-NNNNN-NNNN	5.5 kW, 3 AC 380 ... 480 V, 50/60 Hz, 12.7 A, LED Display	R912005099
EFC5610-5K50-3P4-MDA-NN-NNNNN-NNNN	5.5 kW, 3 AC 380 ... 480 V, 50/60 Hz, 12.7 A, Dust cover	R912005734
EFC5610-7K50-3P4-MDA-7P-NNNNN-NNNN	7.5 kW, 3 AC 380 ... 480 V, 50/60 Hz, 16.8 A, LED Display	R912005100
EFC5610-7K50-3P4-MDA-NN-NNNNN-NNNN	7.5 kW, 3 AC 380 ... 480 V, 50/60 Hz, 16.8 A, Dust cover	R912005735
EFC5610-11K0-3P4-MDA-7P-NNNNN-NNNN	11 kW, 3 AC 380 ... 480 V, 50/60 Hz, 24,3 A, LED Display	R912005101
EFC5610-11K0-3P4-MDA-NN-NNNNN-NNNN	11 kW, 3 AC 380 ... 480 V, 50/60 Hz, 24,3 A, Staubschutzkappe	R912005736
EFC5610-15K0-3P4-MDA-7P-NNNNN-NNNN	15 kW, 3 AC 380 ... 480 V, 50/60 Hz, 32,4 A, LED Display	R912005102
EFC5610-15K0-3P4-MDA-NN-NNNNN-NNNN	15 kW, 3 AC 380 ... 480 V, 50/60 Hz, 32,4 A, Staubschutzkappe	R912005737
EFC5610-18K5-3P4-MDA-7P-NNNNN-NNNN	18.5 kW, 3 AC 380 ... 480 V, 50/60 Hz, 39.2 A, LED Display	R912005749
EFC5610-18K5-3P4-MDA-NN-NNNNN-NNNN	18.5 kW, 3 AC 380 ... 480 V, 50/60 Hz, 39.2 A, Dust cover	R912005738
EFC5610-22K0-3P4-MDA-7P-NNNNN-NNNN	22 kW, 3 AC 380 ... 480 V, 50/60 Hz, 45,2 A, LED Display	R912005980
EFC5610-22K0-3P4-MDA-NN-NNNNN-NNNN	22 kW, 3 AC 380 ... 480 V, 50/60 Hz, 45.2 A, Dust cover	R912005987
EFC5610-30K0-3P4-MDA-7P-NNNNN-L1NN	30 kW, 3 AC 380 ... 480 V, 50/60 Hz, 60,8 A, LED Display	R912005981
EFC5610-30K0-3P4-MDA-NN-NNNNN-L1NN	30 kW, 3 AC 380 ... 480 V, 50/60 Hz, 60.8 A, Dust cover	R912005988
EFC5610-37K0-3P4-MDA-7P-NNNNN-L1NN	37 kW, 3 AC 380 ... 480 V, 50/60 Hz, 73,7 A, LED Display	R912005982
EFC5610-37K0-3P4-MDA-NN-NNNNN-L1NN	37 kW, 3 AC 380 ... 480 V, 50/60 Hz, 73.7 A, Dust cover	R912005989
EFC5610-45K0-3P4-MDA-7P-NNNNN-L1NN	45 kW, 3 AC 380 ... 480 V, 50/60 Hz, 89 A, LED Display	R912005983

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Type code	Description	Material number:
EFC5610-45K0-3P4-MDA-NN-NNNNN-L1NN	45 kW, 3 AC 380 ... 480 V, 50/60 Hz, 89 A, Dust cover	R912005990
EFC5610-55K0-3P4-MDA-7P-NNNNN-L1NN	55 kW, 3 AC 380 ... 480 V, 50/60 Hz, 108 A, LED Display	R912005984
EFC5610-55K0-3P4-MDA-NN-NNNNN-L1NN	55 kW, 3 AC 380 ... 480 V, 50/60 Hz, 108 A, Dust cover	R912005991
EFC5610-75K0-3P4-MDA-7P-NNNNN-L1NN	75 kW, 3 AC 380 ... 480 V, 50/60 Hz, 147 A, LED Display	R912005985
EFC5610-75K0-3P4-MDA-NN-NNNNN-L1NN	75 kW, 3 AC 380 ... 480 V, 50/60 Hz, 147 A, Dust cover	R912005992
EFC5610-90K0-3P4-MDA-7P-NNNNN-L1NN	90 kW, 3 AC 380 ... 480 V, 50/60 Hz, 176 A, LED Display	R912005986
EFC5610-90K0-3P4-MDA-NN-NNNNN-L1NN	90 kW, 3 AC 380 ... 480 V, 50/60 Hz, 176 A, Dust cover	R912005993

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The data specified above only serve to describe the product. As our products are constantly being further developed, no statements concerning a certain condition or suitability for a certain application can be derived from our information. The information given does not release the user from the obligation of own judgment and verification.

It must be remembered that our products are subject to a natural process of wear and aging.