

Electric Drives
and Controls

Hydraulics

Linear Motion and
Assembly Technologies

Pneumatics

Service

Rexroth
Bosch Group

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									

Frequency converter

EFC 5610

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)				

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

EFC 5610

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 mod- ulation (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 resolu- tion	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 fre- quency	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)								

Frequency converter

EFC 5610

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)							

Frequency converter

EFC 5610

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

Frequency converter

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	241	233		
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	250	200	610	580	314	306	7	
EFC5610-30K0-3P4	265		750	717	342	334		
EFC5610-37K0-3P4	325		750	717	342	334	11	
EFC5610-45K0-3P4	265	750	717	342	334			
EFC5610-55K0-3P4	325	750	717	342	334			
EFC5610-75K0-3P4	325	750	717	342	334	334		
EFC5610-90K0-3P4	325	750	717	342	334	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

Frequency converter

EFC 5610

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

Frequency converter

EFC 5610

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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