



COMBIVERT F5

MODULAR DRIVE 0.37 ... 900 kW

EN

OPEN-LOOP SYSTEMS

BASIC 0.37 ... 15 kW
COMPACT 0.37 ... 90 kW

Compact units with 230 V and 400 V connection in functional and economical orientation and universal features create the ideal platform for the design of high-quality machines and systems.



CLOSED-LOOP SYSTEMS

MULTI 0.75 ... 900 kW

Closed-loop drives of voltage classes 230 V, 400 V and 690 V for asynchronous and synchronous servo motors with feedback devices.



APPLICATION

Customized equipment solutions tailored to operating conditions and requirements.

Examples are the software versions

- **ASCL**, encoder-less field orientation for asynchronous motors
- **SCL** for closed-loop performance without a feedback device for synchronous motors
- Versions with special adapted hardware and software



F5 COMPACT

MORE THAN JUST AN INVERTER... HIGH TECHNOLOGY FOR OPEN-LOOP DRIVE SYSTEMS



- Wide power range for 230 V and 400 V connection
- Either AC or DC connection
- Optimal characteristics at the motor shaft in different application areas with KEB-SMM (sensorless motor management)
- 29 plug-in control terminals, PNP- / NPN logic switchable
- 2 analogue inputs 0 ... ± 10 V, 0 ... ± 20 mA, 4 ... 20 mA
- 2 programmable analogue outputs 0 ... ± 10 V
- 8 programmable digital inputs
- Programmable outputs: 2 x relay, 2 x transistor
- 4 programmable software inputs/outputs
- 8 free-to-program parameter sets including S-curves, ramp stop, power-off-function, DC-braking, PID controller, electronic motor protection, brake control, internal timer, counter input and energy saving function
- Output frequencies up to 800 Hz – optional up to 1600 Hz, output voltage control, adjustable switching frequencies up to 16 kHz
- Controlled positioning to end position/counter pulse
- High-dynamic scanning of the control terminals and the serial interface in 2 ms
- + / - DC-link connection, internal braking chopper GTR7, motor-PTC-evaluation
- Integrated filter to EN 55011/C1 (option: B-, D-, E-housing)

	P_N [kW]	Housing	I_N [A]	I_{max} [A]	$f_{sN/max}$ [kHz]	EMC	Part no.
3-PH. 230 V (180 ... 260 V)	0.37	B*	2.3	5	16	C1 ♦	05F5C1B-2B0A
	0.75	B*	4	8.6	16	C1 ♦	07F5C1B-2B0A
	1.5	B*	7	15.1	16	C1 ♦	09F5C1B-2B0A
	2.2	B*	10	21.6	8/16	C1 ♦	10F5C1B-2A0A
	4	D	16.5	35.6	8/16	C1 ♦	12F5C1D-1A0A
	5.5	E	24	43	8/16	C1 ♦	13F5C1E-160A
	7.5	E	33	59	4/16	C1 ♦	14F5C1E-150A
	11	G	48	103	4/16	C1 ♦	15F5C1G-190F
	15	H	66	142	16	C1 ♦	16F5C0H-1B0F
	18.5	H	84	181	4/16	C1 ♦	17F5C0H-190F
	22	R	100	180	8	C1 ●	18F5C0R-760A
	30	R	115	206	8	C1 ●	19F5C0R-760A
	37	R	145	261	8	C1 ▲	20F5C0R-760A
	45	R	180	324	8	C1 ▲	21F5C0R-760A

GENERALLY:

Product standard EN 61800-2, -5 – 1
 Emitted interference EN 61800-3
 EN 61000-6-1 ... 4
 Enclosure IP 20 / VBG 4
 Storage temperature -25 ... 70 °C
 Operation temperature -10 ... 45 °C
 Short-circuit and earth fault monitoring

	P_N [kW]	Housing	I_N [A]	I_{max} [A]	$f_{sN/max}$ [kHz]	EMC	Part no.
3-PH. 400 V (305 ... 528 V)	0.37	B	1.3	2.8	16	C1 ♦	05F5C1B-3B0A
	0.75	B	2.6	5.6	16	C1 ♦	07F5C1B-3B0A
	1.5	B	4.1	8.9	8/16	C1 ♦	09F5C1B-3A0A
	2.2	B	5.8	12.5	8/16	C1 ♦	10F5C1B-3A0A
	4	B	9.5	21	4	C1 ♦	12F5C1B-350A
	5.5	D	12	25.9	4/16	C1 ♦	13F5C1D-390A
	7.5	D	16.5	35.6	2/16	C1 ♦	14F5C1D-380A
	11	E	24	43	4/16	C1 ♦	15F5C1E-350A
	15	E	33	59	2/16	C1 ♦	16F5C1E-340A
	18.5	G	42	75	4/16	C1 ♦	17F5C1G-350A
	22	G	50	90	2/8	C1 ♦	18F5C1G-340F
	30	H	60	108	4/16	C1 ♦	19F5C0H-350F
	37	H	75	135	2/8	C1 ♦	20F5C0H-340F
	45	R	90	162	4/16	C1 ●	21F5C0R-950A
	55	R	115	207	4/16	C1 ●	22F5C0R-950A
	75 ★	R	150	270	2/8	C1 ●	23F5C0R-940A
	90 ★	R	180	324	2/8	C1 ▲	24F5C0R-940A

- internal (option) * 1-/3-phase 230 V AC
- ♦ footprint (option) ▲ book-style (option)
- ★ mains choke generally required (page 26)



Frequency inverters F5 COMBIVERT are in a modular system and available in the following versions

- Chassis unit of protection class IP 20 – universal mounting in the control cabinet
- Chassis unit with factory mounted interference filter – unit-internal interference suppression
- Chassis unit with factory mounted braking resistor – absorb pulse energy without additional required space, also available in combination with Interference filter
- Customer version **FLAT-REAR - (FR)** – direct thermal connection with cooling surfaces
- Customer version **LIQUID COOLED - (LC)** liquid cooling
- Customer version **EXTERNAL HEAT - (EH)** – through-mounted heat sink for the thermal separation of the power unit

For customer-specific series-applications KEB provides complete solutions in the control cabinet installation in protection class IP 54.



Applied mounting points in a grid allow the use of prepared mounting plates.

**COMPACT...
NEW DEFINED!**



HOUSING	INSTALLATION VERSION IP20 W X H X D (MM)			AVAILABLE CUSTOMER VERSIONS		
	Unit	With EMC filter	With resistor	FR	LC	EH
A	76 x 191 x 144	76 x 191 x 144 76 x 216 x 184		-	-	-
B	90 x 220 x 160	90 x 249 x 200	90 x 220 x 190	•	-	•
D	90 x 250 x 181	90 x 285 x 221	90 x 250 x 211	•	-	•
E	130 x 290 x 208	132 x 352 x 258	130 x 290 x 238	•	•	•
G	170 x 340 x 255	181 x 415 x 311	170 x 340 x 280	•	•	•
H	297 x 340 x 255	300 x 445 x 321		•	•	•
R	340 x 520 x 355	340 x 520 x 355* 110 x 478 x 115		•	•	•
U	340 x 800 x 355	110 x 598 x 240		-	•	•
P	340 x 960 x 454	260 x 386 x 115		-	•	•
W	670 x 940 x 368	260 x 386 x 115 260 x 386 x 135		-	•	-

* up to size 23.F5

■ external unit

• customer version upon request



		BASIC	COMPACT	MULTI		SCL		ASCL	
CONTROLBOARD INVERTER HOUSING		B ABDE	C BDEGHR	A A	A / K DEGHRUWP	A A	E / P DEGHRUWP	H / L DEGHRUWP	
Operating mode	open-loop	•	•	•	•	-	-	•	
	closed-loop	-	-	•	•	•	•	•	
	encoder-less closed-loop	-	-	-	-	•	•	•	
	AC servo mode	-	-	•	•	•	•	•	
	flux vector mode	-	-	•	•	•	•	•	
	encoder-less vector mode (KEB SMM - sensor less motor management)	•	•	•	•	-	-	•	
	standard v/f mode	•	•	•	•	-	-	•	
	Controlboard	voltage supply	intern	intern	extern	intern	extern	intern	intern
	internal voltage supply	24 V DC	24 V DC	-	24 V DC	-	24 V DC	24 V DC	
	24 V DC supply external	no	yes	yes	yes	yes	yes	yes	
	I/O scan time	2 ms	2 ms	1 ms	1 ms	1 ms	1 ms	1 ms	
	number of terminals	17	29	17	29	17	29	29	
	pluggable control terminals	yes	yes	yes	yes	yes	yes	yes	
digital	number	5	8	5	8	5	8	8	
	specification	PNP	PNP/NPN	PNP	PNP/NPN *	PNP	PNP/NPN *	PNP/NPN *	
	adjustable	-	•	-	•	-	•	•	
					13...30 V DC				
INPUT	analogue	number	1	2	1	2	1	2	2
		specification	0 ... ± 10 V	•	•	•	•	•	•
		0 ... ± 20 mA / 4 ... 20 mA	-	•	-	•	-	•	•
		potential-free	(single-ended)	•	•	•	•	•	•
		resolution	11 bit	12 bit	11 bit	12 bit	11 bit	12 bit	12 bit
		fast scan time	no	250 ms	250 ms	250 ms	250 ms	250 ms	250 ms
		sample and hold mode	yes	yes	yes	yes	yes	yes	yes
digital	number	0	2	2	2	2	2	2	
	specification	-	•	•	•	•	•	•	
	specification open-collector (50 mA total)	-	•	•	•	•	•	•	
relay	number	2	2	1	2	1	2	2	
	specification	•	•	•	•	•	•	•	
analogue	number	1	2	1	2	1	2	2	
	specification	0 ... 10 V; ± 10 V	•	•	•	•	•	•	
	resolution	(5 mA)	2x (5 mA)	(5 mA)	2x (5 mA)	(5 mA)	2x (5 mA)	2x (5 mA)	
	resolution	11 bit	11 bit	11 bit	11 bit	11 bit	11 bit	11 bit	
ENCODER FEEDBACK		-	-	standard	option card	standard	option card	option card	
	2 encoder inputs	-	-	•	•	•	•	•	
	positioning to second encoder	-	-	•	•	•	•	•	
	encoder emulation TTL output	-	-	•	•	•	•	•	
	analogue encoder	-	-	resolver	resolver	resolver	resolver	resolver	
					Sin/Cos		Sin/Cos	Sin/Cos	
					UVW encoder		UVW encoder	UVW encoder	
					tacho generator		tacho generator	tacho generator	
	digital encoder	-	-	TTL	TTL	TTL	TTL	TTL	
					HTL		HTL	HTL	
					initiator		initiator	initiator	
	serial encoder	-	-	-	BiSS	-	BiSS	BiSS	
	(single- und multi-turn)				EnDat		EnDat	EnDat	
					Hiperface		Hiperface	Hiperface	
					SSI		SSI	SSI	
				SSI-Sin/Cos		SSI-Sin/Cos	SSI-Sin/Cos		

• included

* not for K / L / P

	BASIC	COMPACT	MULTI		SCL		ASCL
	B ABDE	C BDEGHR	A A	A / K DEGHRUWP	E / P A	DEGHRUWP	H / L DEGHRUWP
CONTROL BOARD							
INVERTER HOUSING							
SPEED MODE	Hz	Hz	Hz, rpm	Hz, rpm	rpm	rpm	Hz, rpm
separate S-curve ACC/DEC	•	•	•	•	•	•	•
separate lower/upper S-curve times	-	-	•	•	•	•	•
sep. acceleration time for counter clockwise-/clockwise rotation	•	•	•	•	•	•	•
sep. deceleration time for counter clockwise-/clockwise rotation	•	•	•	•	•	•	•
ogive function	-	-	•	•	•	•	•
speed search (aligning the motor)	•	•	•	•	•	•	•
fast analogue input	•	•	•	•	•	•	•
2 analogue inputs with prog. function	-	•	-	•	-	•	•
fixed speed / fixed frequency	4	4	4	4	4	4	4
fixed speed / fixed frequency with set-programming	16	32	16	32	16	32	32
POSITIONING MODE							
simple repeatable positioning without encoder	•	•	-	-	-	-	-
positioning via motor encoder	-	-	•	•	-	-	-
positioning via external encoder	-	-	•	•	-	-	-
position value resolution	-	-	32 bit	32 bit	-	-	-
internally storable positions	-	-	32	32	-	-	-
analogue setpoint setting for target position	-	-	•	•	-	-	-
different reference routines	-	-	•	•	-	-	-
limit switch protection	-	-	•	•	-	-	-
relative-/absolute positioning	-	-	•	•	-	-	-
interruption in the positioning	-	-	•	•	-	-	-
rotary table positioning	-	-	•	•	-	-	-
rotary table positioning with shortest path	-	-	•	•	-	-	-
contouring with bus	-	-	•	•	-	-	-
synchronisation mode	-	-	•	•	-	-	-
positional synchronisation	-	-	•	•	-	-	-
speed synchronisation	-	-	•	•	-	-	-
programmable gearshifts	-	-	8	8	-	-	-
gearshift via analog input	-	-	•	•	-	-	-
angle adjustment	-	-	•	•	-	-	-
synchronisation with constant distance or ramp	-	-	•	•	-	-	-
torque mode	-	-	•	•	•	•	•
adjustable torque for all operating conditions	-	-	•	•	•	•	•
adjustable torque for ACC/DEC	-	-	•	•	•	•	•
adjustable torque for motor/regen operation	-	-	•	•	•	•	•
analogue torque setting	-	-	•	•	•	•	•
fast analog torque setting	-	-	250 µs	250 µs	250 µs	250 µs	250 µs
acceleration at torque limit	-	-	•	•	•	•	•
FUNCTIONS							
PID process control	•	•	•	•	•	•	•
automatic motor identification	-	-	•	•	•	•	•
automatic rotor position detection in standstill	-	-	•	•	•	•	-
torque precontrol	-	-	•	•	•	•	•
brake control / handling	•	•	•	•	•	•	•
power off / braking without mains voltage	•	•	•	•	•	•	•
programmable restart-starting conditions	-	-	•	•	•	•	•
programmable timer/counter (sec/h/inc)	2	2	2	2	2	2	2
max. input frequency of the counter	250 Hz	250 Hz	500 Hz	500 Hz	500 Hz	500 Hz	500 Hz

• included