



Bonfiglioli

Vectron

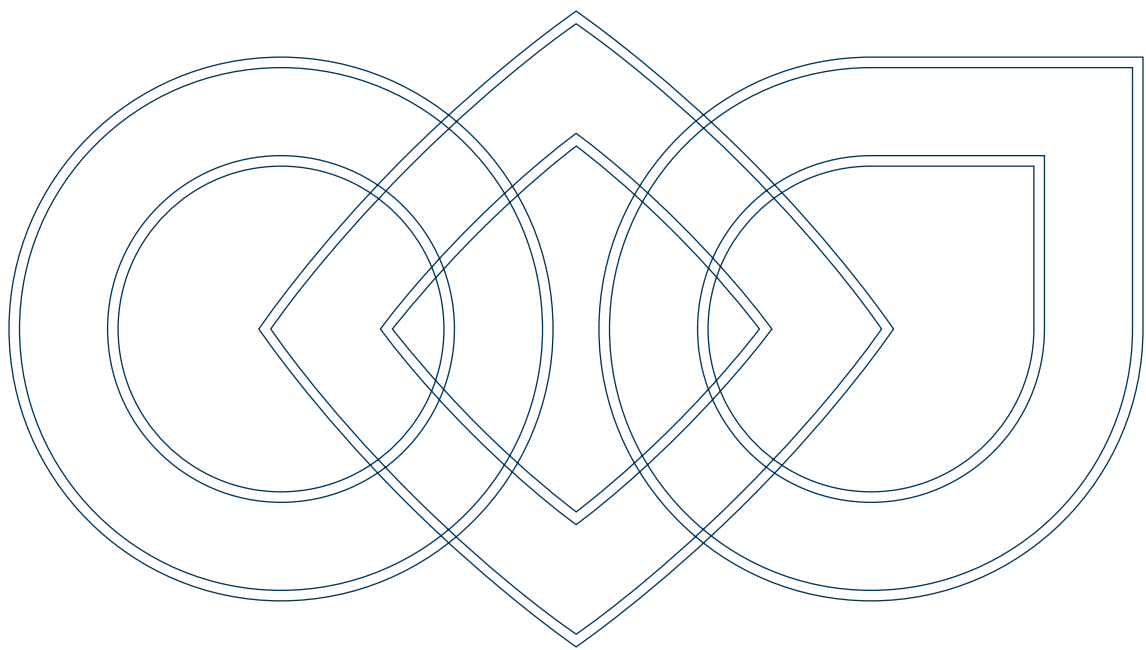
Active Next Generation

Servo Drive Solutions



PRODUCT

 **Bonfiglioli**
Forever Forward



Active Next Generation

With the new servo inverter series ANG Active Next Generation, Bonfiglioli expands its drive portfolio. Our new servo inverter is designed for providing machine builders high performance.

Thanks to a new micro controller, new enhanced functionalities are embedded such as cyclic synchronous positioning mode with cubic interpolation, brake control, and evaluation of feedback contact.

A new positioning configuration is dedicated for travelling drives in crane applications.

Our new single axis for the control of servo motors, induction motors, delivering high dynamic response, high performance and application versatility.

Bonfiglioli develops Active Next Generation to meet the specific requirements of special machinery in a large range of Industries.

Moreover, ANG series support many ethernet fieldbuses like, EtherCAT, EtherNet/IP, and PROFINET. With this new servo inverter series, Bonfiglioli offers the broadest connectivity with the most advanced control technology and the highest power density.

Key Features

- Power ratings: 0.25 kW to 400 kW
- Voltage ratings: 230 V, 400 V, 525 V, 690 V
- Safety: STO (safe torque off, SIL2)
- Communication protocols: CANopen, RS232, EtherCAT, EtherNet/IP, PROFINET.
- Feedback sensors: resolver, absolute encoder
- PLC functions
- Motion tasks
- Fast control loops
- Brake control
- Evaluation of feedback contact.

Customer Benefits

- PLC functions with graphical software tool
- Cubic interpolation for high dynamic interpolated axis
- 525V and 690V supply voltages for heavy and steel industry.
- High precision closed loop configuration.

Bonfiglioli always contributes to save energy and offering the most efficient solution.

Bonfiglioli power range



General technical data

Environment

Operating temperature

- 0°C - 40°C (40°C - 55°C with derating)

Environment class

- Operation 3K3 (EN60721-3-3)
- Relative humidity 15% ... 85%, no moisture condensation

Altitude of installation

- Up to 1000m (up to 4000 with derating)

Storage conditions

- According to EN50178
- Protection degree
- IP20

Electrical

Rated mains voltage

- ANG 210 in the range 184 ... 264 V
- ANG 410 in the range 320 ... 528 V

Rated mains frequency

- 45 ... 66 Hz

Overload current

- 150% of rated current (200% for 0.25 and 0.37 kW)

Peak current

- 200% of rated current for most ratings

Electric protection

- Short circuit / Earth fault proof

Braking transistor

- Built-in on standard devices

Standards

CE conformity:

- Low voltage directive 73/23/EEC and EN50178 / DIN VDE 0160 and EN61800

Interference immunity

- According to EN 61800-3 for use in industrial environments

UL approval

- UL marked, according to UL508c

Technical data

ANG210- (from 0.25 to 9.2 kW)			01	03	05	07	09	11	13	15	18	19	21	22
			Size 1 (F, A)					Size 2 (F, A)			Size 3 (- or F, A)	Size 4 (-, A)		
Output, motor side														
Rated motor current output	I_n	A	1.6	2.5	3.0	4.0	5.4	7.0	9.5	12.5	18.0	22.0	32.0	35.0
Rated motor voltage output	U_n	V	3 x (from 0 to mains voltage)											
Overload current	I_{pk}	A	3.2	5.0	4.5	6.0	7.3	10.5	14.3	16.2	26.3	30.3	44.5	51.5
Recommended rated motor power	P_n	kW	0.25	0.37	0.55	0.75	1.1	1.5	2.2	3.0	4.0	5.5	7.5	9.2
Switching frequency	f_s	kHz	From 2 to 6											
Rated motor frequency	f_n	Hz	From 0 to 1000											
Input, mains side														
Rated mains voltage	U	V	184 ... 264											
Rated mains frequency	F	Hz	45 ... 66											
Rated current 3 ph/PE	I	A	1.6	2.5	3.0	4.0	5.5	7.0	9.5	10.5	18	20	28.2	35.6
Rated current 1 ph/N/PE; 2 ph/PE	I	A	2.9	4.5	5.4	7.2	9.5	13.2	16.5	16.5	28	-	-	-
General														
Short circuit / ground fault protection	-	-	Yes, unlimited											
Mounting position	-	-	Vertical											
Protection class	-	-	IP 20 (EN60529)						IP 20 (EN60529) ⁽⁰⁾			IP 20 (EN60529) ⁽⁰⁾		
Dimensions Std. A	HxWxD	mm	190 x 60 x 175					250 x 60 x 175			250 x 100 x 200		250 x 125 x 200	
Weight (approx.)	m	kg	1.2					1.6			3.0		3.7	
Brake unit	-	-	Internal brake transistor											
Environment														
Cooling temperature	T_n	°C	From 0 to 40 (3K3 DIN IEC 721-3-3)											
Relative air humidity	-	%	From 15 to 85, non-condensing											
Options & accessories														
Input line choke	-	-	External (depending on mains supply)											
EMI filter	-	-	Internal Class A (EN 61800-3); external Class B											
Digital control unit	-	-	yes											

Note: (0) = for protection classes higher than IP20 consult your local Bonfiglioli Drives Service Center

ANG410- (from 0.25 to 9.2 kW)			01	03	05	07	09	11	12	13	15	18	19	21	22	
			Size 1 (F, A)					Size 2 (F, A)			Size 3 (- or F, A)					
Output, motor side																
Rated motor current output	I_n	A	1.0	1.6	1.8	2.4	3.2	3.8	4.2	5.8	7.8	9.0	14.0	18.0	22.0	
Rated motor voltage output	U_n	V	3 x (from 0 to mains voltage)													
Overload current	I_{pk}	A	2.0	3.2	2.7	3.6	4.8	5.7	6.3	8.7	11.7	13.5	21.0	26.3	30.3	
Recommended rated motor power	P_n	kW	0.25	0.37	0.55	0.75	1.1	1.5	1.85	2.2	3.0	4.0	5.5	7.5	9.2	
Switching frequency	f_s	kHz	From 2 to 16													
Rated motor frequency	f_n	Hz	From 0 to 1000													
Input, mains side																
Rated mains voltage	U	V	320 ... 528													
Rated mains frequency	f	Hz	45 ... 66													
Rated current 3 ph/PE	I	A	1.0	1.6	1.8	2.4	2.8	3.3	4.2	5.8	6.8	7.8	14.2	15.8	20.0	
Mains fuses 3 ph/PE	I	A	6					10			10.0		16.0		25.0	
General																
Short circuit / ground fault protection	-	-	Yes, unlimited													
Mounting position	-	-	Vertical													
Protection class	-	-	IP 20 (EN60529) ⁽⁰⁾													
Dimensions Std. A	HxWxD	mm	190 x 60 x 175					250 x 60 x 175			250 x 100 x 200					
Weight (approx.)	m	kg	1.2					1.6			3.0					
Brake unit	-	-	Internal brake transistor													
Environment																
Cooling temperature	T_n	°C	From 0 to 40 (3K3 DIN IEC 721-3-3)													
Relative air humidity	-	%	From 15 to 85, non-condensing													
Options & accessories																
Input line choke	-	-	External (depending on mains supply)													
EMI filter	-	-	Internal Class A (EN 61800-3); External Class B													
Digital control unit	-	-	Yes													

Note: (0) = for protection classes higher than IP20 consult your local Bonfiglioli Drives Service Center

ANG410- (from 11 to 132 kW)			23	25	27	29	31	33	35	37	39	43	45	47	49								
			Size 4 (-, A)		Size 5 (-, A)			Size 6 (-, A)				Size 7 (-, A)											
Output, motor side																							
Rated motor current output	I_n	A	25.0	32.0	40.0	45.0	60.0	75.0	90.0	110.0	125.0	150.0	180.0	210.0	250.0								
Rated motor voltage output	U_n	V	3 x (from 0 to mains voltage)																				
Overload current	I_{pk}	A	37.5	44.5	60.0	67.5	90.0	112.5	135.0	165.0	187.5	225.0	270.0	315.0	332.0								
Recommended rated motor power	P_n	kW	11.0	15.0	18.5	22.0	30.0	37.0	45.0	55.0	65.0	75.0	90.0	110.0	132.0								
Switching frequency	f_s	kHz	From 2 to 16						From 2 to 8														
Rated motor frequency	f_n	Hz	From 0 to 1000																				
Input, mains side																							
Rated mains voltage	U	V	320 ... 528																				
Rated mains frequency	f	Hz	45 ... 66																				
Rated current 3 ph/PE	I	A	26.0	28.2	42	50	58.0	87	104	105	120	143	172	208	249								
Mains fuses 3 ph/PE	I	A	35.0		50.0			60		100		125		125		160		200		250		315	
General																							
Short circuit / ground fault protection	-	-	Yes, unlimited																				
Mounting position	-	-	Vertical																				
Protection class	-	-	IP 20 (EN60529) ⁽⁰⁾																				
Dimensions Std. A	HxWxD	mm	250 x 125 x 200			250 x 200 x 260			400 x 275 x 260				510 x 412 x 351										
Weight (approx.)	m	kg	3.7			8.0			20				45		48								
Brake unit	-	-	Internal brake transistor																				

ANG410- (from 160 to 400 kW) **51 53 55 57 59 61 51 53 55 57 59 61 51 53 55 57 59 61**
 401 / 400 V | 501 / 525 V | 601 / 690 V

Output, motor side			401 / 400 V												501 / 525 V				601 / 690 V			
Recommended motor shaft power	P	kW	160	200	250	315	355	400	160	200	250	315	355	400	160	200	250	315	355	400		
Output current	I	A _{eff}	305	380	475	595	645	735	230	290	360	450	490	560	180	230	280	350	400	450		
Long-term overload current (60 s) ¹⁾	I	A _{eff}	460	570	715	895	970	1100	345	435	540	675	735	840	270	350	420	530	600	675		
Short-term overload current (1 s) ²⁾	I	A _{eff}	550	685	855	1070	1160	1330	420	520	650	810	880	1000	330	420	510	630	720	810		
Output voltage	U	V _{eff}	Maximum input voltage, three-phase																			
Protection	-	-	Short circuit / earth fault proof ³⁾																			
Rotary field frequency	f	Hz	±500 Hz ³⁾																			
Switching Frequency	f	kHz	2, 4, 8 ⁴⁾																			

Output, braking resistor (extern) ⁴⁾																				
Min. Brake resistance	R	Ω	1.20	1.20	1.20	0.80	0.80	0.80	1.20	1.20	1.20	0.80	0.80	0.80	3.00	3.00	3.00	1.80	1.80	1.80
Recommended Brake resistance (U _{ref} = 770V)	R	Ω	1.50	1.50	1.50	1.00	1.00	1.00	2.70	2.70	2.70	1.50	1.50	1.50	5.00	5.00	5.00	3.00	3.00	3.00

Input, mains side																				
Mains current ⁵⁾	I	A	280	350	440	550	620	690	215	270	335	420	470	525	160	200	250	320	360	410
Mains voltage	U	V	400						400						690 (reduced for UL: 600)					
Mains frequency	f	Hz	50 (60)						50 (60)						50 (60)					
Fuses ⁶⁾	I	A	400	500	630	700	800	900	315	350	450	550	630	700	250	315	350	450	500	550
Fuses as per UL ⁶⁾	Type	-																		

Mechanical																				
Dimensions	HxWxD	mm	1067 x 439 x 375																	
Weight approx.	m	kg	120	120	140	140	140	140	120	120	140	140	140	140	120	120	140	140	140	140
Ingress protection rating	-	-	IP20 (EN60529)																	
Connection terminal	A	mm ²	up to 2 x 240																	
Form of assembly	-	-	Vertical																	

Ambient conditions																				
Energy dissipation (2 kHz Switching Freq.)	P	W	3800	4500	5600	6300	6850	7900	3800	4500	5600	6300	6850	7900	3200	3950	4500	5500	6250	6900
Coolant temperature	T _n	°C	-25 ... 45 (3K3 DIN IEC 60721-3-3)																	
Storage temperature	T _s	°C	-25 ... 50																	
Transport temperature	T _t	°C	-25 ... 70																	
Relative humidity	-	%	15 ... 85, not condensing																	

If required by the customer, the switching frequency may be increased if the output current is reduced at the same time. Comply with the applicable standards and regulations for this operating point.

Frequency inverter nominal power	Switching Frequency			Switching Frequency			Switching Frequency		
	2 kHz	4 kHz	8 kHz	2 kHz	4 kHz	8 kHz	2 kHz	4 kHz	8 kHz
160 kW	305	305	305	230	230	230	180	180	180
200 kW	380	380	380	290	290	290	230	230	230
250 kW	475	475	475	360	360	360	280	280	280
315 kW	595	595	595	450	450	450	350	350	350
355 kW	645	645	645	490	490	490	400	400	400
400 kW	735	735	735	560	560	560	450	450	450

¹⁾ Power reduction with torsional frequencies below 10 Hz
²⁾ Only with torsional frequencies above 10 Hz
³⁾ Depending on switching frequency
⁴⁾ Reduction of switching frequency possible on certain conditions
⁵⁾ Related value with recommended motor power, 400V mains voltage and mains inductance U_i=4%
⁶⁾ For UL-compliant fusing, the specified fuses must be used (in preparation)
⁷⁾ Maximum current in continuous operation
⁸⁾ Semiconductor fuses recommended (in example Bussmann Type 170M)

Automation modules

Active Next Generation is designed to give the highest flexibility in drive hardware to suit every control requirement. Machine designers can select up to four different possible automation modules

that are fitted into Active Next Generation unit. Build the best hardware configuration of Active Next Generation for your application!

Hardware modularity

Interface module.
 Connection of optional control unit KP500, serial interface adapter KP232, or the control unit reprograming cable for accessory KPCMK.



EM communication module.



	EM-AUT-01	EM-AUT-04	EM-AUT-11	EM-AUT-21
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Protocol				
Ethernet Protocol	EtherCAT	EtherCAT	PROFINET	EtherNet/IP
Isolated CANopen	Yes	Yes	Yes	Yes

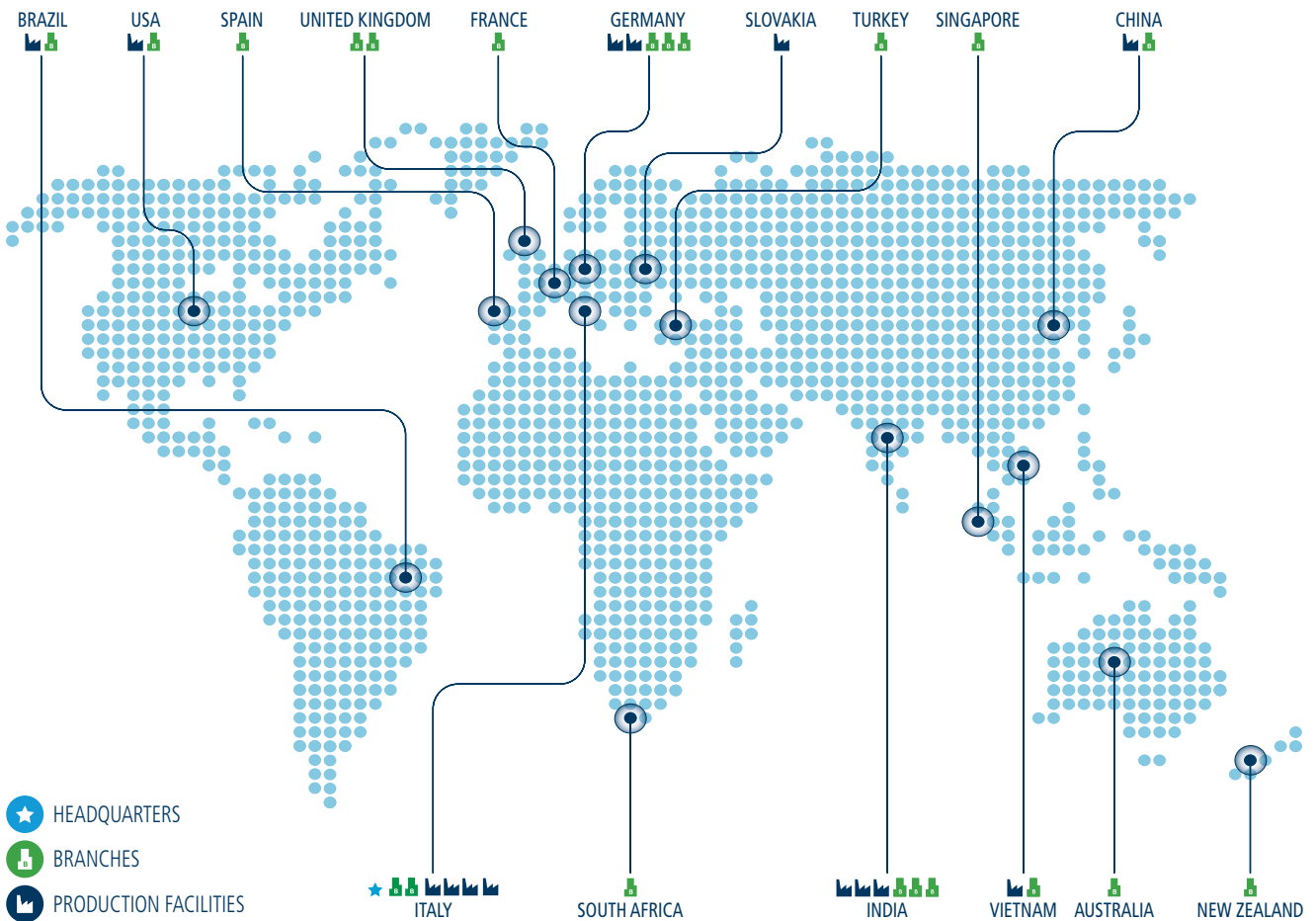
Encoder Interface				
Hiperface	Yes	No	Yes	Yes
SSI	Yes	No	Yes	Yes
EnDAT2.1	Yes	No	Yes	Yes

Resolver/Encoder				
Resolverinterface	Yes	Yes	Yes	Yes
Encoderinterface	Yes	Yes	Yes	Yes

Analog, Multifunctions IO				
0...+10V Input	Yes	No	Yes	Yes
-10...+10V Input	Yes	No	Yes	Yes
0...20mA Input	Yes	No	Yes	Yes
PTC Input (KTY, PT1000, PT100)	Yes	No	Yes	Yes
0...10V Output	Yes	Yes	Yes	Yes

Bonfiglioli worldwide presence

Bonfiglioli is located in regions and countries around the world that enable us to provide faster sales and service to customers.
We are around the world, and around the corner.



LOCAL SUPPORT
 Sales, Customer Service,
 Warranty, Tech support,
 Spare parts



**21 BRANCH OFFICES
 IN 15 COUNTRIES**



**WORLDWIDE
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We have a relentless commitment to excellence, innovation and sustainability. Our team creates, distributes and services world-class power transmission and drive solutions to keep the world in motion.



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