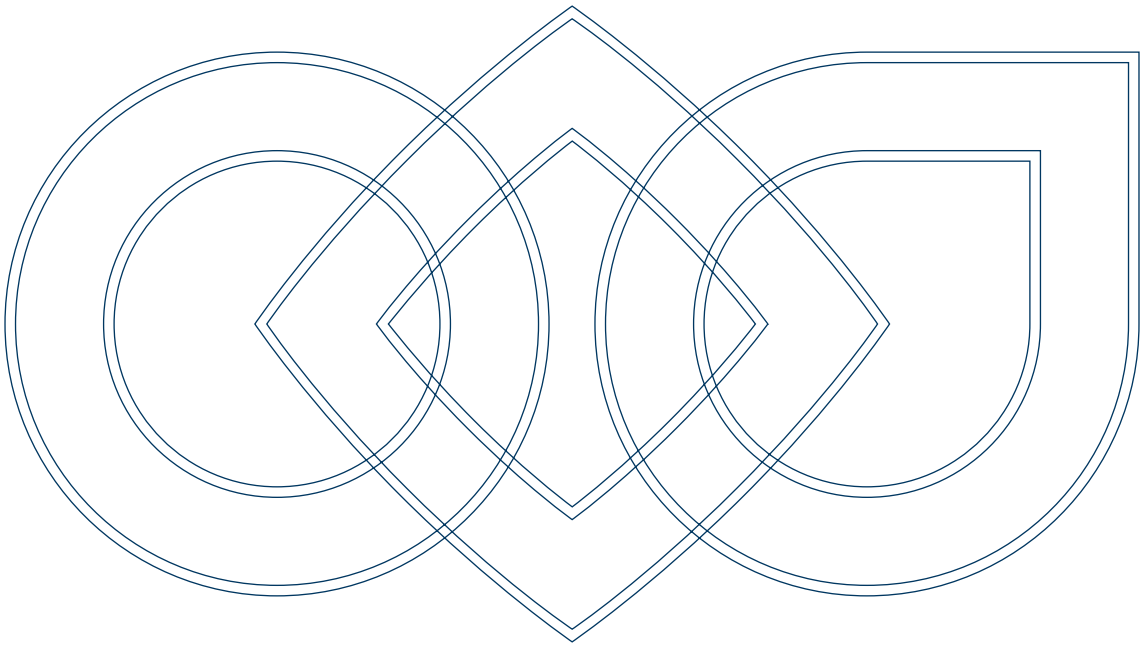
Bonfiglioli
Vectron

VCB400

Power Drive

PRODUCT

Bonfiglioli
Forever Forward



Bonfiglioli, one name for a large international group

It was back in 1956 that Clementino Bonfiglioli established in Bologna, Italy, the company that still bears his name. Now, some fifty years later, the same enthusiasm and dedication is driving Bonfiglioli to become the world's top name in power transmission and control solutions. Through directly controlled subsidiaries and production plant around the world, Bonfiglioli designs, manufactures and distributes a complete range of gearmotors, drive systems and planetary gearboxes, and boasts the most integrated offering on the market today.

Now, to emphasise its commitment to health, safety and environmental sustainability, Bonfiglioli is adding the term "green" to the description of its offering.

This commitment can be seen too in the Group's new trademark, made up of three shapes and colours identifying Bonfiglioli's three main business areas - Power, Control & Green Solutions and symbolising a set of values that includes openness and respect for other cultures.

In a market in which excellent product quality alone is no longer sufficient, Bonfiglioli also provides experience, know-how, an extensive sales network, excellent pre-sales and after-sales service and modern communication tools and systems to create high level solutions for industry, mobile machinery and renewable energy.

Power and performance

Advanced technologies for all industrial fields.

Bonfiglioli VCB inverters are designed for applications calling for speed, torquue, position control of three phase aynchronous motors 132kW rating and larger.
The robust and flexible VCB series spans over a 132 to 800kW range, covering a broad spectrum of applications, and is the ideal drive for large industrial plans and manufacturing lines.
VCB inverters can optionally feature either the 150% overload capability which is typical of constant torque applications or 120% overload capability addressing the demands of quadratic load applications, which are common in the HVAC industry.

The installation and wiring solutions adopted (internal signal terminals, power bus bars with input and output protection) ensure high levels of protection and safety when service time comes and make it easy to mount and wire the inverter into standard automation cabinets.
In applications with significant regenerative loads, the common DC bus connection allows the energy generated by braking loads to be recovered, shared and used by other drives, optimising the system overall energy efficiency.
Power ratings from 355kW to 800kW are catered for by connecting two VCB units in parallel.

General characteristics

Common DC bus
VCB inverters can be used in system architectures with a common DC bus to share energy between different drives in the same line

Disconnectable terminal blocks
All VCB series inverters are equipped with disconnectable signal terminal blocks

VPlus programming software
Inverter parameter programming is greatly facilitated by the user-friendly VPlus programming software, common to Bonfiglioli's other inverter series

KP100 programming unit
This practical and lightweight programming unit features a 4-key keypad with 140 segments. The KP100 can be used for manual speed control and to enter programming and functioning parameters

Disconnectable terminal blocks
All VCB series inverters are equipped with disconnectable signal terminal blocks

Liquid cooling
In addition to the standard air cooled versions, water cooled versions are also available

Brake unit
On request, a brake unit is available for installation on board the inverter to dissipate load energy through resistors, limiting the voltage of the DC bus during energy regeneration by the motor

EN 60204 safety relay
Prevents undesired starts during system maintenance and inspection

Digital communications
- RS 232 and RS 485 ports
- and CAN open and Profibus-DP LON standard field buses

Hardware flexibility
Analog output and feedback acquisition expansion modules are available

Inputs/Outputs
VCB series inverters permit the connection sets listed below for all models. Electrical safety is granted by insulation and conformity to EN standards. All outputs are individually insulated. Terminals are easily accessible

1	+ 10 V reference power
2	0 V analog (GND)
3	analog input 1
4	analog input 1 (with speed inversion)
5	analog input 2
6	analog inputs 2, 3 (with speed inversion)
7	analog input 3
8	analog output

1	NO relay (voltage free)
2	common
3	NC relay (voltage free)

1	+24 V outputs power
2	0 V digital (GND)
3	digital input 1
4	digital input 2
5	digital input 3
6	digital input 4
7	digital input 5
8	digital input 6
9	digital input 7
10	digital input 8
11	external 30 V power
12	digital output 1
13	digital output 2
14	external 0 V power (GND)
15	external +8 V power

Functional characteristics

Four different parameter sets
Users can create 4 different drive functioning configurations that can be switched even with the motor running

Synchronisation to catch a spinning motor
This function restores quickly and efficiently the control of a motor rotating without load

Motor potentiometer function (UP/DOWN)
Increases and decreases the speed reference via digital inputs

Controlled braking
VCB inverters permit rapid deceleration even without a braking module, thanks to a sophisticated voltage control and a motor chopper function

Application functions
Software functions and dedicated algorithms are available for the control of processes like lifting, winding, pressure control, etc.

Analog I/O configuration
The possibility of adapting the range and gain of signals exchanged with other control systems allows VCB inverters to adapt to most common control and display devices

Programmable automatic start and stop
The behaviour of VCB inverters during starting and stopping can be configured by parameters. The inverter can be started and stopped safely and controlled at speed suit the needs of the application

S-curve acceleration and deceleration ramp profiles
Smooth acceleration and deceleration ramps can be configured to soften quick speed changes

Power failure control
The inverter can use the kinetic energy of the load to keep the control system active during brief periods of power failure avoiding undesired machine faults

Intelligent current limits
The control system can adapt to dynamic load changes to avoid undesired over current faults

Efficient control of motor holding brake
Precise and quick activation of the motor holding brake means reduced brake wear

Memorisation of last 16 alarms
This function provides useful information on inverter malfunctions and operating errors. A complete list of values is provided for the last four alarms occured

Electronic protection relay (thermal relay)
VCB inverters use the motor's thermal image to protect it against overheating and short circuits

Operating value display
Inverter values can be monitored on the display as

I/O logic state display required
This is an extremely useful function during start-up, as it lets you simulate and display the functioning of the control logic

Technical data

VCB 400 / 132-355 kW			250 OL 1.5	300 OL 1.5	370 OL 1.5	460 OL 1.5	300 OL 1.2	370 OL 1.2	460 OL 1.2	570 OL 1.2	610 OL 1.2
			Overload 1.5				Overload 1.2				
Output, motor side											
Rated motor output rec.	P	kW	132	160	200	250	160	200	250	315	355
Nominal power	S	kVA	173.2	207.8	256.3	318.7	207.8	256.3	318.7	395	422.6
Nominal current	I	A	250	300	370	460	300	370	60	570	610
Voltage	U	V	3 x 0 ... mains voltage input								
Overload capacity	-	-	1.5 for 60 s				1.2 for 60 s				
Frequency	f	Hz	From 0 to 400, according to switching frequency								
Input, mains side											
Voltage	U	V	From 3 x 400 (-20%) to 460 (+10%)								
Frequency	f	Hz	From 50 (-10%) to 60 (+10%)								
Power factor	Cosφ	-	~1 (Power factor of the fundamental)								
General											
Short circuit / earth fault	-	-	Yes, unlimited								
Efficiency (approx.)	η	%	98, at 2 kHz switching frequency								
Switching frequency	f	kHZ	From 1 to 4								
Protection	-	-	IP20, VBG4								
Dimensions	LxHxP	mm	518 x 820 x 406							518 x 1095 x 406	
Weight (approx.)	m	kg	110							120	
Environment											
Coolant temperature	T_n	°C	From 0 to 40, forced ventilation								
Rel. Humidity	-	%	From 15 to 85, no condensation								
Power reduction	ΔP	%	2.5%/K aboveT_n; Tmax = 50°C; 5%/1000m above 1000m above sea level; hmax= 4000m								
Options & accessories											
Line choke (uk=4%)	-	-	External								
EMC filter	-	-	External								
Brake unit	-	-	Internal brake transistor, external							External	

High power ratings can be achieved by connecting two VCB units in parallel. Consult the product manual for further details.

Accessories

Add-on modules
A wide selection of add-on control and communication modules are available for VCB series inverters to boost functionality in specific applications.

Reference standards
All models in the VCB series are designed and made in conformity to the requirements of the 'low voltage' directive 73/23/EEC (CEconformity). Conformity to the EMC directive 89/336/EEC is subject to the correct installation procedures being followed. The manufacturer's declaration of conformity and the installation instructions are included in the documentation accompanying the product.

Expansions

KP 100	Control unit (keypad)
ADA-VCB-2	KP100 serial conversion interface/ RS232 control panel
VCM-PTC	Monitoring of motor temperature via PTC sensor
ENC-1	Speed feedback and motor temperature control via PTC sensor
EAL-1	Expansion for additional analog outputs, frequency regulation and motor temperature control via PTC sensor
VCI-232	RS232 connection
VCI-485	RS485 connection
VCI-CAN	CANopen connection
VCI-PROF	Profibus-DP connection
VCI-LON	LON connection

Designation rules
- The BU option is only available with overload OL1.5
- Sizes 570 and 610 are only available with overload OL1.2
- Communication modules (Field 6) are alternatives
- Expansion modules (Field 7) are alternatives

Field 1	Field 2	Field 3	FIeld 4	Field 5	Field 6	Field 7
Inverter series	Size	Overload OL	Braking unit	KP keyboard	Communication modules	Expansion modules
VCB 400	250	**OL1.5** OL1.2	**_no BU** BU	**KP100** _no KP	**VCI 232** _no comunic. VCI485 VCICAN VCIPROF VCILON	**_no exp** EAL1 ENC1 VCMPTC
	300					
	370					
	460					
	570					
	610					

Standard values are shown in bold

Field 1:	VCB400	= inverter VCB 3ph 400VAC
Field 2:	250	= 132 kW
	300	= 160 kW
	370	= 200 kW
	460	= 250 kW
	570	= 315 kW
	610	= 355 kW
Field 3:	OL1.2	= overload 120%
	OL1.5	= overload 150%
Field 4:	_ (blank)	= no braking unit
	BU	= internal braking unit

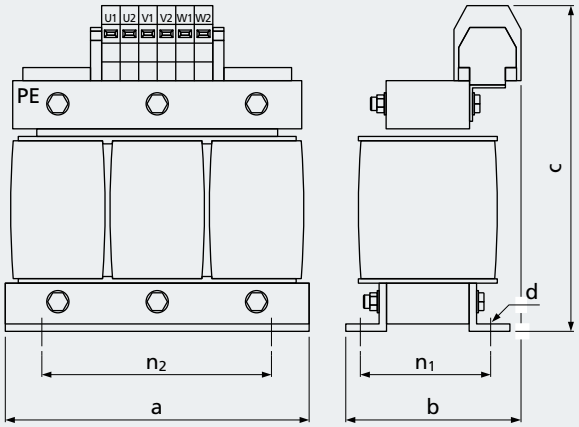
Field 5:	_ (blank)	= no keypad
	KP100	= keypad
Field 6:	_ (blank)	= no communication module
	VCI232	= RS232 serial interface
	VCI485	= RS485 serial interface
	VCICAN	= CAN BUS interface
	VCIPROF	= PROFIBUS interface
	VCILON	= LON interface
Field 7:	_ (blank)	= no expansion module
	EAL1	= analog expansion module
	ENC1	= encoder module
	VCMPTC	= temperature control module with PTC thermistor

Example of designation: VCB400 370 OL1.5 BU KP100 VCI232

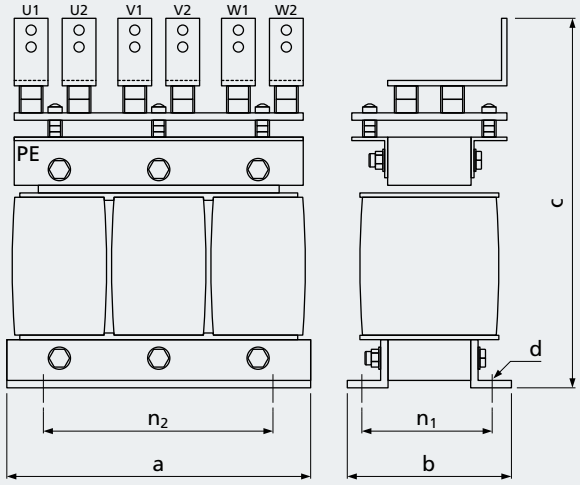
3x400V line inductor for VCB 400 inverters

Dimensions

LCVT250 ... LCVT370



LCVT460 ... LCVT600



Technical data

Always fit the inductor on the input

Size	Description of inductor	Rated current	Inductance	Dissipated power
		[A]	[mH]	[W]
250	LCVT250	250	0.12	210
300	LCVT300	300	0.098	290
370	LCVT370	370	0.077	350
460	LCVT460	460	0.064	410
570	LCVT600	610	0.049	480
610	Verify the application with Bonfiglioli's technical service			

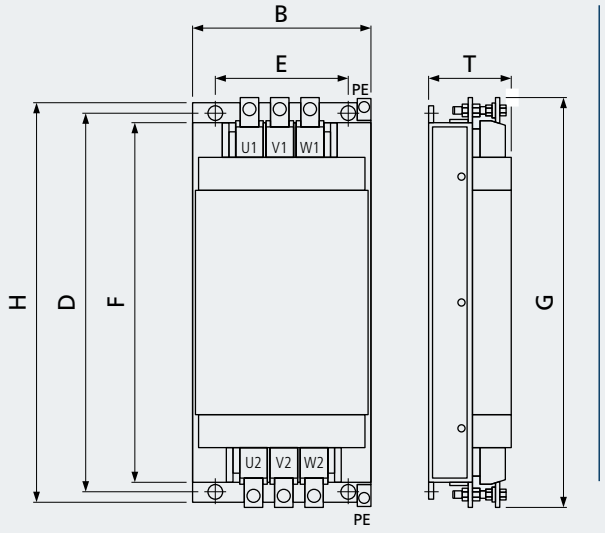
Technical assembly data

Size	Dimensions				Installation		Weight
	a [mm]	b [mm]	c [mm]	n_2 [mm]	n_1 [mm]	d [mm]	[kg]
250	240	210	350	190	126	11	28
300	320	210	410	240	121	11	38
370	320	230	410	240	134	11	46
460	360	270	460	240	146	11	55
570	360	290	510	310	126	11	65
610	Verify the application with Bonfiglioli's technical service						

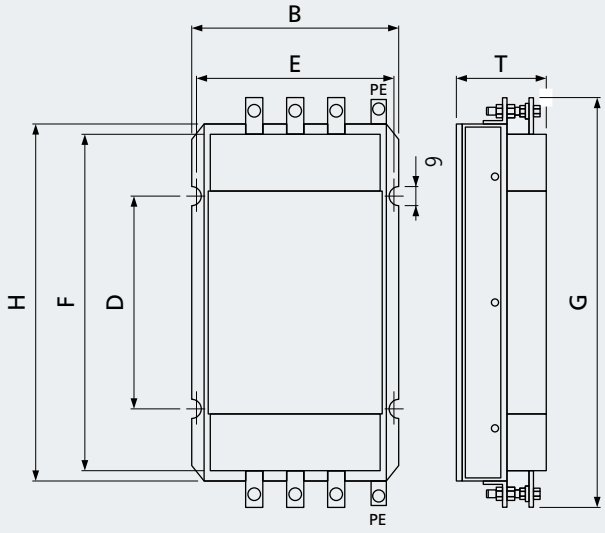
EMC filters for VCB 400 inverters

Dimensions

FTV250 ... FTV400



FTV500 ... FTV600



Technical data

Size	Description of filter	Rated current	Inductance	Dissipated power
		[A]	[mH]	[W]
250	250	50	375	180
300	FTV300	300	400	200
370	FTV400	400	600	230
460	FTV500	500	750	270
570	FTV600	600	900	290
610	Verify the application with Bonfiglioli's technical service			

Technical assembly data

Size	Dimensions			Installation	
	H [mm]	B [mm]	T [mm]	D [mm]	E [mm]
250	490	230	158	470	170
300	490	230	158	470	170
370	580	230	158	560	170
460	630	345	158	530	325
570	660	375	187	450	355
610	Verify the application with Bonfiglioli's technical service				

Added value

We want to share the value of our work with you.

The development of effective, tailored solutions for a wide range of applications is a fundamental aspect of our work.
We succeed so well because we co-operate closely with our customers, listen to their requests and work with them to improve our own performance.

Bonfiglioli is determined to deliver the best service possible - before, during and after the sale of any of our products - by applying all our know-how, experience, technology and advanced communication tools. Bonfiglioli works to the strictest standards of quality and safety, as certified by seven different internationally recognised institutes.

We believe in innovation, and back up this belief by dedicating 100 of our people and 5 activity centres to research and development and by working hand in hand with some of the world's most prestigious universities.

Our work also brings us into contact with other nations and cultures, for which we have the greatest respect and with whom we share a vision of sustainable development based on renewable energy.
This binding commitment allows us to be an authoritative and reliable global partner for the present and the future.

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.

HEADQUARTERS BRANCHES PRODUCTION FACILITIES

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22 BRANCH OFFICES IN **16** COUNTRIES

WORLDWIDE DISTRIBUTION NETWORK

Bonfiglioli Worldwide Locations

Bonfiglioli Australia
www.bonfiglioli.com.au
2, Cox Place Glendenning NSW 2761
Locked Bag 1000 Plumpton NSW 2761
Tel. (+ 61) 2 8811 8000 - Fax (+ 61) 2 9675 6605

Bonfiglioli Brasil
www.bonfigliolidobrasil.com.br
Travessa Cláudio Armando 171
Bloco 3 - CEP 09861-730 - Bairro Assunção
São Bernardo do Campo - São Paulo
Tel. (+55) 11 4344 2323 - Fax (+55) 11 4344 2322

Bonfiglioli Canada
www.bonfigliolicanada.com
2-7941 Jane Street - Concord, Ontario L4K 4L6
Tel. (+1) 905 7384466 - Fax (+1) 905 7389833

Bonfiglioli China
www.bonfiglioli.cn
Bonfiglioli Drives (Shanghai) Co., Ltd.
#68, Hui-Lian Road, QingPu District,
201707 Shanghai
Ph. (+86) 21 6700 2000 - Fax (+86) 21 6700 2100

Bonfiglioli Deutschland
www.bonfiglioli.de
Industrial, Mobile, Wind
Sperberweg 12 - 41468 Neuss
Tel. +49 (0) 2131 2988 0 - Fax +49 (0) 2131 2988 100
Industrial
Europark Fichtenhain B6 - 47807 Krefeld
Tel. +49 (0) 2151 8396 0 - Fax +49 (0) 2151 8396 999
O&K Antriebstechnik
Ruhrallee 8-12 - 45525 Hattingen
Tel. +49 (0) 2324 2050 1 - Fax +49 (0) 2324 2054 29

Bonfiglioli España
www.tecnotrans.bonfiglioli.com/es-es/
Industrial, Mobile, Wind
Tecnotrans Bonfiglioli S.A.
Pol. Ind. Zona Franca sector C, calle F, n°6
08040 Barcelona
Tel. (+34) 93 4478400 - Fax (+34) 93 3360402

Bonfiglioli France
www.bonfiglioli.fr
14 Rue Eugène Pottier
Zone Industrielle de Moimont II - 95670 Marly la Ville
Tel. (+33) 1 34474510 - Fax (+33) 1 34688800

Bonfiglioli India
www.bonfiglioli.in
Bonfiglioli Transmissions Pvt. Ltd.
Plot No. AC7-AC11, SIDCO Industrial Estate,
Thirumudivakkam - 600 044 Chennai
Tel.: +91 44 2478 1035

Bonfiglioli Italia
www.bonfiglioli.it
Headquarters
Bonfiglioli Riduttori S.p.A.
Via Giovanni XXIII, 7/A
Lippo di Calderara di Reno - 40012 Bologna
Tel. +39 051 647 3111 - Fax +39 051 647 3126
Mobile, Wind
Via Enrico Mattei, 12 Z.I. Villa Selva - 47100 Forlì
Tel. +39 0543 789111 - Fax +39 0543789242
Industrial
Via Bazzane, 33/A - 40012 Calderara di Reno (BO)
Tel. +39 051 6473111 - Fax +39 051 6473330
Industrial
Via Trinità, 1 - 41058 Vignola (MO)
Tel. +39 059 768511 - Fax +39 059 768522
Industrial
Via Sandro Pertini lotto 7b - 20080 Carpiano (Milano)
Tel. (+39) 02 985081 - Fax (+39) 02 985085817
Bonfiglioli Mechatronic Research
Via F. Zeni 8 - 38068 Rovereto (Trento)
Tel. (+39) 0464 443435/36 - Fax (+39) 0464 443439

Bonfiglioli New Zealand
www.bonfiglioli.co.nz
88 Hastie Avenue, Mangere Bridge, 2022 Auckland
PO Box 11795, Ellerslie
Tel. (+64) 09 634 6441 - Fax (+64) 09 634 6445

Bonfiglioli South East Asia
www.bonfiglioli.com
24 Pioneer Crescent #02-08
West Park Bizcentral - Singapore, 628557
Tel. (+65) 6268 9869 - Fax. (+65) 6268 9179

Bonfiglioli South Africa
www.bonfiglioli.co.za
55 Galaxy Avenue, Linbro Business Park - Sandton
Tel. (+27) 11 608 2030 OR - Fax (+27) 11 608 2631

Bonfiglioli Türkiye
www.bonfiglioli.com.tr
Atatürk Organize Sanayi Bölgesi, 10007 Sk. No. 30
Atatürk Organize Sanayi Bölgesi, 35620 Çiğli - Izmir
Tel. +90 (0) 232 328 22 77 (pbx) - Fax +90 (0) 232 328 04 14

Bonfiglioli United Kingdom
www.bonfiglioli.co.uk
Industrial
Unit 7, Colemeadow Road
North Moons Moat - Redditch, Worcestershire B98 9PB
Tel. (+44) 1527 65022 - Fax (+44) 1527 61995
Mobile, Wind
3 - 7 Grosvenor Grange, Woolston
Warrington - Cheshire WA1 4SF
Tel. (+44) 1925 852667 - Fax (+44) 1925 852668

Bonfiglioli USA
www.bonfiglioliusa.com
3541 Hargrave Drive Hebron, Kentucky 41048
Tel. (+1) 859 334 3333 - Fax (+1) 859 334 8888

Bonfiglioli Vietnam
www.bonfiglioli.vn
Lot C-9D-CN My Phuoc Industrial Park 3
Ben Cat - Binh Duong Province
Tel. (+84) 650 3577411 - Fax (+84) 650 3577422

Bonfiglioli
Forever Forward

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.

HEADQUARTERS
Bonfiglioli Riduttori S.p.A.
Via Giovanni XXIII, 7/A
40012 Lippo di Calderara di Reno
Bologna (Italy)
tel: +39 051 647 3111
fax: +39 051 647 3126
bonfiglioli@bonfiglioli.com
www.bonfiglioli.com

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