

MECHTRIC



Motor Control & Drives

Motor Control and Drives: Powered by Mechtrix's Expertise and Global Partnerships

With over 60 years of industry experience, Mechtrix proudly partners with world-class manufacturers to deliver innovative solutions.

Mechtrix offers a comprehensive range of **Motor Control and Drive** solutions, from contactors, overload relays, and motor protection devices to advanced VFDs for general, high-performance, and application-specific needs. These products provide safe, efficient, and reliable motor management. Designed for durability, energy savings, and enhanced system performance, the range ensures long service life and complete solutions for optimising motor-driven systems.








Through these partnerships, Mechtrix delivers high-quality products, competitive pricing, and unparalleled technical support, empowering your business to perform at its best.









Motor Control & Drives

Motor Control Gear

Mini contactors		Lovato	A-1
Contactors		Lovato	A-2...7
Thermal overload relays		Lovato	A-1/8
Motor protection circuit breakers		Lovato	A-9...10
Direct-on-line starters		Lovato	A-11
Soft starters		Lovato	A-13...14
Electronic motor starter		Lovato	A-15

Variable Frequency Drives (VFDs)

General-purpose VFDs		Delta	A-19...20
High-performance VFDs		Delta	A-21...22
Fan & Pump VFDs		Delta	A-23
Drive accessories & braking units		Delta	A-24...25



Mini contactors AC & DC control



BG0901A



BG09T4D



BGX1020



BGX1040



G324



BGX5000



RF9...

type	rated current		kW rating (AC3) 400V	control	description	auxiliary contacts
	(AC1)	(AC3)				

BG series - Three-pole mini contactors AC & DC control

Three-pole mini contactors (Ui 690V)

BG0610A...	16A	6A	2.2 kW	AC	three-pole mini contactor	1NO
BG0910A...	20A	9A	4.0 kW	AC	three-pole mini contactor	1NO
BG0901A...	20A	9A	4.0 kW	AC	three-pole mini contactor	1NC
BG1210A...	20A	12A	5.7 kW	AC	three-pole mini contactor	1NO
BG1201A...	20A	12A	5.7 kW	AC	three-pole mini contactor	1NC
BG0910D...	20A	9A	4.0 kW	DC	three-pole mini contactor	1NO
BG0901D...	20A	9A	4.0 kW	DC	three-pole mini contactor	1NC

BG series - Four-pole mini contactors AC & DC control

type	rated current		kW (AC1)		control	description	main contacts
	(AC1)	(AC3)	230V	400V			

Four-pole mini contactors (Ui 690V)

BG09T4A...	20A	9A	8	14	AC	four-pole mini contactor	4NO
BG09T2A...	20A	9A	8	14	AC	four-pole mini contactor	2NO + 2NC
BGP09T4A...	20A	9A	8	14	AC	PCB mount contactor	4NO
BG09T4D...	20A	9A	8	14	DC	four-pole mini contactor	4NO
BG09T2D...	20A	9A	8	14	DC	four-pole mini contactor	2NO + 2NC

Standard coil voltages (add to part number):

AC - 024/048/110/230/400

DC - 012/024/048/060/110/220

Mini control relays

Control relays are used where additional contacts are required to switch low-level current loads such as pilot lights, motor starters, or other relays.

AC control circuit

BG0040A...	10A	—	—	—	AC	mini control relay	4NO
BG0031A...	10A	—	—	—	AC	mini control relay	3NO + 1NC
BG0022A...	10A	—	—	—	AC	mini control relay	2NO + 2NC

Standard coil voltages (add to part number):

AC - 024/048/110/230/400

Auxiliary contact blocks for above mini contactors 10A lth / Ui 690V

BGX1020	10A	clip-on auxiliary contact	—	for BG contactors	2NO
BGX1011	10A	clip-on auxiliary contact	—	for BG contactors	1NO + 1NC
BGX1002	10A	clip-on auxiliary contact	—	for BG contactors	2NC
BGX1040	10A	clip-on auxiliary contact	—	for BG contactors	4NO
BGX1022	10A	clip-on auxiliary contact	—	for BG contactors	2NO + 2NC
BGX1004	10A	clip-on auxiliary contact	—	for BG contactors	4NC

Accessories for above mini contactors

BGX8000	modular shroud to raise the front degree of protection to IP40			
BGX5000	mechanical interlock	for BG contactors	—	
G324	paralleling links (2-pole)	for BG contactors	—	
G326	paralleling links (4-pole)	for BG contactors	—	

Thermal overload relays for above mini BG contactors

- Manual reset
- NO + NC auxiliary contacts
- Phase failure sensitive

type	motor rating AC3 (400V)	description	adjustable range	for contactors
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RF9 series - Mini thermal overload relays - Adjustable range: 0.09 - 15A

RF9015	—	thermal overload relay	0.09 - 0.15A	BG6/9/12
RF9023	0.06 kW	thermal overload relay	0.14 - 0.23A	BG6/9/12
RF9033	0.09 kW	thermal overload relay	0.2 - 0.33A	BG6/9/12
RF905	0.12 kW	thermal overload relay	0.3 - 0.5A	BG6/9/12
RF9075	0.18 kW	thermal overload relay	0.45 - 0.75A	BG6/9/12
RF91	0.25 kW	thermal overload relay	0.6 - 1A	BG6/9/12
RF91V5	0.37 kW	thermal overload relay	0.9 - 1.5A	BG6/9/12
RF92V3	0.55-0.75 kW	thermal overload relay	1.4 - 2.3A	BG6/9/12
RF933	1.1 kW	thermal overload relay	2.0 - 3.3A	BG6/9/12
RF95	1.1 kW	thermal overload relay	3.0 - 5A	BG6/9/12
RF975	2.2-3 kW	thermal overload relay	4.5 - 7.5A	BG6/9/12
RF910	4 kW	thermal overload relay	6.0 - 10A	BG6/9/12
RF915	5.5 kW	thermal overload relay	9.0 - 15A	BG6/9/12



BF0910A



BF5000A



BF23000E...



BF26500E



BF265T4E



BF series - Contactors

- Mechanical interlock without overall dimensions increasing
- 4 terminals coil, 3 connections possibility: top-top, bottom-bottom, top-bottom
- Rigid connection kits for fast wiring without mistakes (see *contactors accessories*)

type	rated current		kW rating	control	description	auxiliary contacts
	(AC1)	(AC3)	(AC3) 400V			

BF series - Three-pole contactors AC control

Three-pole contactors (Ui 690V) / AC control circuit

BF0910A...	25A	9A	4.2 kW	AC	three-pole contactor	1NO
BF0901A...	25A	9A	4.2 kW	AC	three-pole contactor	1NC
BF1210A...	28A	12A	5.7 kW	AC	three-pole contactor	1NO
BF1201A...	28A	12A	5.7 kW	AC	three-pole contactor	1NC
BF1810A...	32A	18A	7.5 kW	AC	three-pole contactor	1NO
BF1801A...	32A	18A	7.5 kW	AC	three-pole contactor	1NC
BF2510A...	32A	25A	12.5 kW	AC	three-pole contactor	1NO
BF2501A...	32A	25A	12.5 kW	AC	three-pole contactor	1NC
BF2600A...	45A	26A	13.0 kW	AC	three-pole contactor	—
BF3200A...	56A	32A	16.0 kW	AC	three-pole contactor	—
BF3800A...	56A	38A	18.5 kW	AC	three-pole contactor	—

Three-pole contactors (Ui 1000V) / AC and AC/DC control circuit

BF4000A...	70A	40A	18.5 kW	AC	three-pole contactor	—
BF5000A...	90A	50A	22 kW	AC	three-pole contactor	—
BF6500A...	100A	65A	30 kW	AC	three-pole contactor	—
BF8000A...	115A	80A	45 kW	AC	three-pole contactor	—
BF9400A...	115A	95A	55 kW	AC	three-pole contactor	—
BF9500A...	140A	95A	55 kW	AC	three-pole contactor	—
BF11500A...	160A	115A	55 kW	AC	three-pole contactor	—
BF15000A...	165A	150A	75 kW	AC	three-pole contactor	—
BF16000E...	250A	160A	75 kW	AC/DC	three-pole contactor	—
BF19500E...	275A	195A	90 kW	AC/DC	three-pole contactor	—
BF23000E...	350A	230A	110 kW	AC/DC	three-pole contactor	—
BF26500E...	450A	265A	132 kW	AC/DC	three-pole contactor	—
BF33000E...	500A	330A	160 kW	AC/DC	three-pole contactor	—
BF40000E...	600A	400A	200 kW	AC/DC	three-pole contactor	—
BF50000E...	700A	520A	250 kW	AC/DC	three-pole contactor	—
BF63000E...	800A	630A	355 kW	AC/DC	three-pole contactor	—
B125024...	1250A	—	(AC1) 830 kW	AC/DC	three-pole contactor	—
B160024...	1600A	—	(AC1) 950 kW	AC/DC	three-pole contactor	—

BF series - Four-pole contactors AC control

type	rated current		kW (AC1)		control	description	
	(AC1)	(AC3)	230V	400V			

Four-pole contactors AC control circuit

BF09T4A...	25A	9A	9.5	16	AC	four-pole contactor	—
BF12T4A...	28A	12A	10	18	AC	four-pole contactor	—
BF18T4A...	32A	18A	12	21	AC	four-pole contactor	—
BF26T4A...	45A	26A	17	30	AC	four-pole contactor	—
BF38T4A...	56A	38A	21	36	AC	four-pole contactor	—

Attachable 4th pole - for above 3-pole contactors BF26...150

BFX42	56A	—	attachable 4th pole for three-pole contactor			BF26...38A
BFX43	115A	—	attachable 4th pole for three-pole contactor			BF40...94A/E
BFX44	165A	—	attachable 4th pole for three-pole contactor			BF95...150A/E

Four-pole contactors (Ui 1000V) / AC/DC control circuit

BF160T4E...	250A	160A	95	165	AC/DC	four-pole contactor	—
BF195T4E...	275A	175A	104	181	AC/DC	four-pole contactor	—
BF230T4E...	350A	230A	132	230	AC/DC	four-pole contactor	—
BF265T4E...	450A	265A	170	296	AC/DC	four-pole contactor	—
BF330T4E...	500A	330A	189	329	AC/DC	four-pole contactor	—
BF400T4E...	600A	400A	227	395	AC/DC	four-pole contactor	—
BF500T4E...	700A	500A	265	461	AC/DC	four-pole contactor	—
BF630T4E...	800A	630A	303	527	AC/DC	four-pole contactor	—

"A" standard coil voltages: AC - 024/048/110/230/400 (others available on request)

"E" standard voltage coils: BF160...400E AC/DC - 024 (24-60V)/110 (60-130V)/230 (100-250V)/400 (250-500V)

BF500...630 AC/DC - 110/220/400

B125024...160024 AC/DC - 110/220



BF0910D



BF1810L...



BF9400E



BF23000E...



BF15000E + BFX44

type	rated current (AC1) (AC3)		kW rating (AC3) 400V	control	description	auxiliary contacts
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Three-pole contactors (Ui 690V) - DC control circuit

Permanent magnet types (Ui 690V) - DC control circuit (low consumption coil 5.4 watts)

BF0910D...	25A	9A	4.2 kW	DC	three-pole contactor	1NO
BF1210D...	28A	12A	5.7 kW	DC	three-pole contactor	1NO
BF1810D...	32A	18A	7.5 kW	DC	three-pole contactor	1NO
BF2510D...	32A	25A	12.5 kW	DC	three-pole contactor	1NO
BF2600D...	45A	26A	13.0 kW	DC	three-pole contactor	—
BF3200D...	56A	32A	16.0 kW	DC	three-pole contactor	—
BF3800D...	56A	38A	18.5 kW	DC	three-pole contactor	—

Extra-low consumption coil 2.4 watt (ideal for direct PLC interfacing)

BF0910L...	25A	9A	4.2 kW	DC	three-pole contactor	1NO
BF1210L...	28A	12A	5.7 kW	DC	three-pole contactor	1NO
BF1810L...	32A	18A	7.5 kW	DC	three-pole contactor	1NO
BF2510L...	32A	25A	12.5 kW	DC	three-pole contactor	1NO
BF3200L...	56A	32A	16.0 kW	DC	three-pole contactor	—
BF3800L...	56A	38A	18.5 kW	DC	three-pole contactor	—

BF series - Three-pole AC/DC contactors

Contactor coil is controlled electronically and can therefore be used as AC or DC supply. These contactors have an electronically controlled AC/DC coil for greatly reduced consumption and a wide nominal voltage range (e.g. just one coil for 100...250V AC/DC).

- No chattering in the event of irregular voltage
- Low consumption during in-rush and in service
- Ui 1000 VAC rating - idea for mining applications
- Built-in surge suppression

Three-pole contactors - AC/DC electronically controlled coil

BF4000E...	70A	40A	18.5 kW	AC/DC	three-pole contactor	—
BF5000E...	90A	50A	22 kW	AC/DC	three-pole contactor	—
BF6500E...	100A	65A	30 kW	AC/DC	three-pole contactor	—
BF8000E...	115A	80A	45 kW	AC/DC	three-pole contactor	—
BF9400E...	115A	95A	55 kW	AC/DC	three-pole contactor	—
BF9500E...	140A	95A	55 kW	AC/DC	three-pole contactor	—
BF11500E...	160A	115A	55 kW	AC/DC	three-pole contactor	—
BF15000E...	165A	150A	75 kW	AC/DC	three-pole contactor	—
BF16000E...	250A	160A	75 kW	AC/DC	three-pole contactor	—
BF19500E...	275A	195A	90 kW	AC/DC	three-pole contactor	—
BF23000E...	350A	230A	110 kW	AC/DC	three-pole contactor	—
BF26500E...	450A	265A	132 kW	AC/DC	three-pole contactor	—
BF33000E...	500A	330A	160 kW	AC/DC	three-pole contactor	—
BF40000E...	600A	400A	200 kW	AC/DC	three-pole contactor	—

Larger sizes available - see page A-2 AC/DC contactors

Attachable 4th pole - for above 3-pole contactors BF26...150

BFXD42	56A	attachable 4th pole	for three-pole contactor	BF26...38D/L
BFX43	115A	attachable 4th pole	for three-pole contactor	BF40...94A/E
BFX44	165A	attachable 4th pole	for three-pole contactor	BF95...150A/E

Four-pole contactors (Ui 690V) - DC control circuit

type	rated current (AC1) (AC3)		kW (AC1) 230V 400V	control	description
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Permanent magnet types (Ui 690V) - DC control circuit

BF09T4D...	25A	9A	9.5 16	DC	four-pole contactor	—
BF18T4D...	32A	18A	12 21	DC	four-pole contactor	—

Four-pole contactors (Ui 1000V) / AC/DC control circuit

BF265T4E...	450A	265A	170 296	AC/DC	four-pole contactor	—
BF330T4E...	500A	330A	189 329	AC/DC	four-pole contactor	—
BF400T4E...	600A	400A	227 395	AC/DC	four-pole contactor	—

Larger sizes available - see page A-2 AC/DC contactors

"D" standard coil voltages: DC - 012/024/048/060/110/220

"L" standard coil voltages: DC - 024/048

"E" standard voltage coils: BF40...150E AC/DC - 024 (24-60V)/110 (60-130V)/230 (100-250V)
BF160...400E AC/DC - 024 (24-60V)/110 (60-130V)/230 (100-250V)/400 (250-500V)



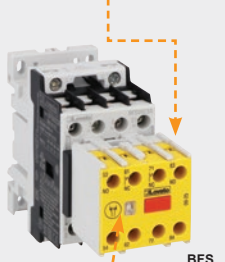
BF09T2A...



BF00...



Tamper-proof contact block



BFS...



Contactor status

type	rated current		kW rating		control	description	main contacts
	(AC1)	(AC3)	230V	400V			

Special configuration contactors AC & DC control

Four-pole contactor AC control circuit

BF09T2A...	25A	9A	9.5	16	AC	four-pole contactor	2NO+2NC
BF18T2A...	32A	18A	12	21	AC	four-pole contactor	2NO+2NC
BF26T2A...	45A	26A	17	30	AC	four-pole contactor	2NO+2NC
BF38T2A...	56A	38A	21	36	AC	four-pole contactor	2NO+2NC
BF18T0A...	32A	18A	12	21	AC	four-pole contactor	4NC

Four-pole contactor DC control circuit

BF18T2D...	32A	18A	12	21	DC	four-pole contactor	2NO+2NC
BF26T2D...	45A	26A	17	30	DC	four-pole contactor	2NO+2NC
BF38T2D...	56A	38A	21	36	DC	four-pole contactor	2NO+2NC
BF80T2E...	115A	80A	43	76	AC/DC	four-pole contactor	2NO+2NC
BF18T0D...	32A	18A	12	21	DC	four-pole contactor	4NC
BF26T0D...	45A	26A	17	30	DC	four-pole contactor	4NC

Control relays AC & DC control

AC control circuit

BF0040A...	10A	—	—	—	AC	control relay	4NO
BF0031A...	10A	—	—	—	AC	control relay	3NO+1NC
BF0022A...	10A	—	—	—	AC	control relay	2NO+2NC
BF0004A...	10 A	—	—	—	AC	control relay	4NC

DC control circuit (extra-low consumption coil 2.4 watt)

BF0040L...	10A	—	—	—	DC	control relay	4NO
BF0031L...	10A	—	—	—	DC	control relay	3NO+1NC
BF0022L...	10A	—	—	—	DC	control relay	2NO+2NC
BF0004L...	10A	—	—	—	DC	control relay	4NC

Standard coil voltages (add to part number): **AC**- 024/048/110/230/400V

Contactors for safety applications

Designed for operator and equipment protection, BFS contactors provide reliable redundant disconnection while ensuring compliance with essential safety protocols. Their fail-safe design and redundancy features add an extra layer of security, making them indispensable in safety-critical environments.

General features:

- Auxiliary contact blocks with yellow covers to highlight their role in the safety circuit
- Non-removable auxiliary contact blocks to prevent tampering
- Clear contactor status indication (*open/closed*), visible from the front
- Manual operation or operation using tools is made impossible in order to tampering during operation

Certifications:

- **ISO 13849-1**: Safety of machinery - Safety-related parts of control systems
- **IEC/EN 62061**: Safety of machinery - Functional safety of safety-related control systems

Mirror contact function:

- The NC auxiliary contact cannot close while the NO main contact is closed, even in a fault condition (e.g., *main contact welding*).

Mechanically linked contacts function:

- The NO and NC auxiliary contacts cannot close simultaneously, even in a fault condition (e.g., *welding of NO or NC contacts*).

type	rated current		kW rating	control	description	main contacts
	(AC1)	(AC3)	(AC3) 400V			

BFS series - Safety contactors AC control

BFS0923A...	25A	9A	4.2 kW	AC	safety contactor	2NO+3NC
BFS2523A...	32A	25A	12.5 kW	AC	safety contactor	2NO+3NC
BFS3822A...	56A	38A	18.5 kW	AC	safety contactor	2NO+2NC

Standard coil voltages (add to part number): **AC** - 024/048/110/230V

BFS series - Safety contactors DC control

BFS0923D024	25A	9A	4.2 kW	024 VDC	safety contactor	2NO+3NC
BFS2523D024	32A	25A	12.5 kW	024 VDC	safety contactor	2NO+3NC
BFS3822D024	56A	38A	18.5 kW	024 VDC	safety contactor	2NO+2NC



Contactor accessories



Lovato Electric offers a comprehensive range of contactor accessories designed to enhance functionality, improve safety and simplify maintenance, providing a flexible and cost-effective way to customise your control systems.

General accessories for contactors

- Snap-on installation: Quick and easy installation to fit and remove an auxiliary contact without a tool
- Rigid connection kits: Available in reversing, changeover or line-star-delta connecting kits
- Mechanical interlock: Side, top, horizontal and vertical options are available, see contactor accessories
- Attachable 4th pole: Side mount attachable 4th pole can be snapped on a 3-pole contactor
- Pneumatic delay blocks: On-delay, delay-on de-energisation
- Spare voltage coils: Spare coils compatible with all contactors, see contactor accessories

type	mounting	description	terminal	contacts
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Clip-on auxiliary contact blocks

For contactors BF09...150 - 10A lth / Ui 690V

BFX1020	top (centre)	auxiliary contact block	screw	2NO
BFX1011	top (centre)	auxiliary contact block	screw	1NO + 1NC
BFX1002	top (centre)	auxiliary contact block	screw	2NC
BFX1040	top (centre)	auxiliary contact block	screw	4NO
BFX1031	top (centre)	auxiliary contact block	screw	3NO + 1NC
BFX1022	top (centre)	auxiliary contact block	screw	2NO + 2NC
BFX1004	top (centre)	auxiliary contact block	screw	4NC
BFX1220	side	auxiliary contact block	screw	2NO
BFX1211	side	auxiliary contact block	screw	1NO + 1NC
BFX1202	side	auxiliary contact block	screw	2NC
G48430	top (centre)	auxiliary contact block	screw	3NO
G48421	top (centre)	auxiliary contact block	screw	2NO + 1NC
G48412	top (centre)	auxiliary contact block	screw	1NO + 2NC
G48403	top (centre)	auxiliary contact block	screw	3NC
G41810	top (side)	auxiliary contact block	screw	1NO
G41810A	top (side)	auxiliary (early make)	screw	1NO
G41801	top (side)	auxiliary contact block	screw	1NC
G41801D	top (side)	auxiliary (late break)	screw	1NC
G48120	top (side)	auxiliary contact block	push-on	2NO
G48111	top (side)	auxiliary contact block	push-on	1NO + 1NC
G48102	top (side)	auxiliary contact block	push-on	2NO
G218	top (side)	auxiliary contact block	push-on	1NO (or) 1NC

For contactors BF160...630 - 10A lth / Ui 690V

BFX10C10	top	auxiliary contact block	screw	1NO
BFX10C01	top	auxiliary contact block	screw	1NC
BFX12C02	side	auxiliary contact block	screw	2NC
BFX12C11	side	auxiliary contact block	screw	1NO + 1NC
BFX12C20	side	auxiliary contact block	screw	2NO
G370	adaptor	adaptor for push-on to screw terminal for		G350/354

Accessories for above auxiliary contact blocks

G280	side	side mount adaptor for auxiliary	G218
G419	side	side mount adaptor for auxiliary	G418
G483	side	side mount adaptor for auxiliary	G481
G358	adaptor	to fit BFX10/G484...7 auxiliaries to	B500...B630

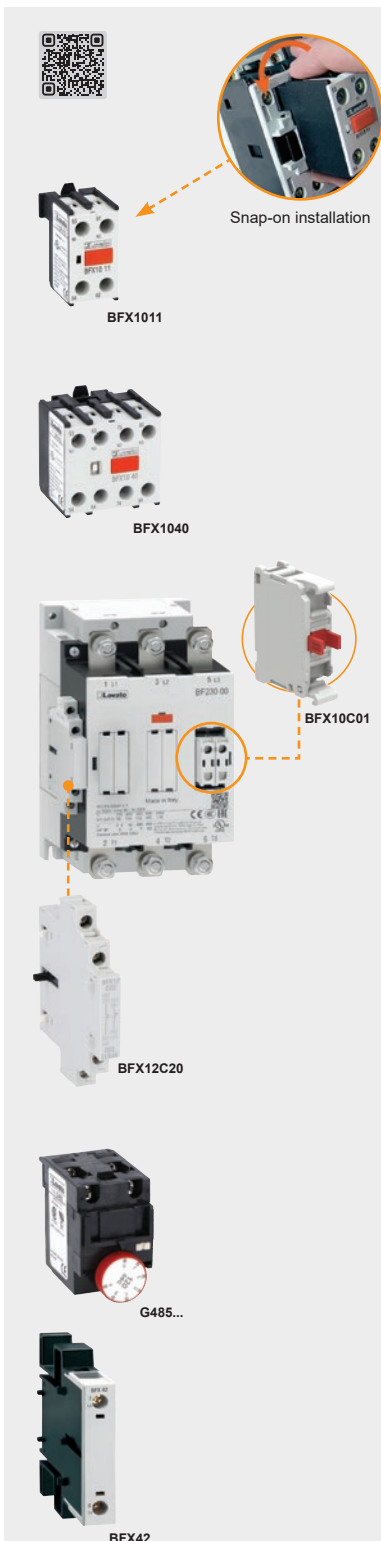
Pneumatic time delay blocks BF09...150

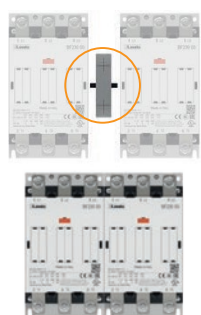
G4856	on-delay pneumatic timer contact block	6sec	1NO + 1NC
G48560	on-delay pneumatic timer contact block	60sec	1NO + 1NC
G485120	on-delay pneumatic timer contact block	120sec	1NO + 1NC
G4866	delay-on de-energisation timer contact block	6sec	1NO + 1NC
G48660	delay-on de-energisation timer contact block	60sec	1NO + 1NC
G486120	delay-on de-energisation timer contact block	120sec	1NO + 1NC
G487	delay-on de-energisation timer contact block	70msec	1NO + 1NC

Attachable 4th pole for contactors BF26...150A/E (fully rated)

- Add following attachable 4th pole to above 3-pole contactors to make up a 4-pole contactor

BFX42	56A	attachable 4th pole for contactors	BF26...38A
BFXD42	56A	attachable 4th pole for contactors	BF26...38D/L
BFX43	115A	attachable 4th pole for contactors	BF40...94A/E
BFX44	165A	attachable 4th pole for contactors	BF95...150A/E





Horizontal interlock



Vertical interlock

General accessories for contactors

- Mechanical interlock: Side, top, horizontal and vertical options are available, see contactor accessories
- Snap-on installation: Quick and easy installation to fit and remove an auxiliary contact without a tool
- Rigid connection kits: Available in reversing, changeover or line-star-delta connecting kits
- Attachable 4th pole: Side mount attachable 4th pole can be snapped on a 3-pole contactor
- Spare voltage coils: Spare coils compatible with all contactors, see contactor accessories
- Pneumatic delay blocks: On-delay, delay-on de-energisation

type	mounting	description	for contactor
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Accessories for BF contactors

Prevents two contactors from being energized at the same time. Typically used in applications such as forward/reverse motor control or other setups where simultaneous operation could cause damage or unsafe conditions.

Mechanical interlocks between two contactors

BFX5000	side	side mount mechanical interlock	BF09...38
BFX5001	side	mechanical interlock with 2NC contacts	BF09...38
BFX5002	top (side)	economy (low profile) mech. interlock	BF09...38
BFX5003	top (side)	top mount mechanical interlock	BF09...38
BFX5300	side	side mount mechanical interlock	BF40...94A/E
BFX5301	side	mechanical interlock with 2NC contacts	BF40...94A/E
BFX5303	top (side)	top mount mechanical interlock	BF40...94A/E
BFX5400	side	side mount mechanical interlock	BF95...150A/E
BFX5401	side	mechanical interlock with 2NC contacts	BF95...150A/E
BFX5403	top (side)	top mount mechanical interlock	BF95...150A/E
BFX5500	horizontal	side mount mechanical interlock	BF160...400
BFX5503	vertical	vertical mech. interlock (interaxis 305 - 345 mm)	BF160...400

Mechanical latch blocks (electric or hand reset)

G222...	mechanical latch mechanism (electrical/hand reset)	BF09...38
G272...	mechanical latch mechanism (electrical/hand reset)	BF40...94
BFX641...	mechanical latch mechanism (electrical/hand reset)	BF95...150

Standard coil voltages (add to part number): **AC** - 024/048/110/220/380

DC - 012/024/048/110/220

Connection accessories for large frame contactors BF160...400

BFX805	phase barrier	for large frame contactors (4-piece set)	BF160...230
BFX806	phase barrier	for large frame contactors (4-piece set)	BF265...400

Captive nut support - to support the connection nut (for ease of installation)

BFX8508	captive nut support	for large frame contactors (8-piece set)	BF160...230
BFX8608	captive nut support	for large frame contactors (8-piece set)	BF265...400
BFX3592	2-pole paralleling link	for large frame contactors	BF160...230
BFX3692	2-pole paralleling link	for large frame contactors	BF265...400
BFX3593	3-pole paralleling link	for large frame contactors	BF160...230
BFX3693	3-pole paralleling link	for large frame contactors	BF265...400

Accessories for contactors BF09...150

(with interlock)

type	description	mech. interlock	for contactor
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Reversing connecting kit

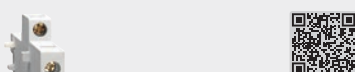
BFX3101	reversing contactor rigid connecting kit	BFX5002/5003	BF09...25
BFX3102	reversing contactor rigid connecting kit	BFX5000/5001	BF09...25
BFX3201	reversing contactor rigid connecting kit	BFX50	BF26...38
BFX3301	reversing contactor rigid connecting kit	BFX5303	BF40...94
BFX3401	reversing contactor rigid connecting kit	BFX5403	BF95...150

Changeover connecting kit

BFX3361	changeover rigid connecting kit (3-pole)	BFX5300/5301	BF40...94
BFX3461	changeover rigid connecting kit (3-pole)	BFX5400/5401	BF95...150
BFX3371	changeover rigid connecting kit (4-pole)	BFX5300/5301	BF40...94
BFX3471	changeover rigid connecting kit (4-pole)	BFX5400/5401	BF95...150

Line-star-delta connecting kit

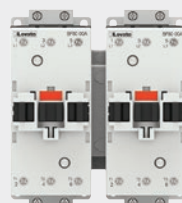
BFX3131	line-star-delta rigid connecting kit	—	BF09...25
BFX3231	line-star-delta rigid connecting kit	—	BF26...38
BFX3232	line-star-delta rigid connecting kit	(L / Δ) BF26...38	(Y) BF09...25
BFX3331	line-star-delta rigid connecting kit	—	BF40...94
BFX3432	line-star-delta rigid connecting kit	(L / Δ) BF95...150	(Y) BF40...94
BFX3431	line-star-delta rigid connecting kit	—	BF95...150



BFX5001



G454



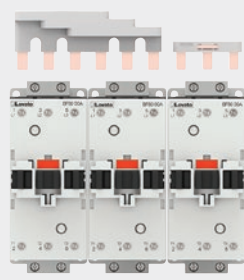
BFX3401

Reversing contactor rigid connecting kit



BFX3461

Changeover rigid connecting kit



BFX3431

Line-star-delta rigid connecting kit



BFX80



BFX8901



BA135



BA435



BFX77...



BFX91...



G...

General accessories for contactors

type	description		for contactor
Accessories for contactors BF09...400 / BF09...630			
BFX80	sealing cover		for contactors BF09...38
BFX8901	universal screw mounting base		for contactors BF09...38
BFX8902	screw fixing brackets (2 pcs)		for contactors BF09...38
BFX835	3-pole	terminal cover	for contactors BF160...230
BFX836	3-pole	terminal cover	for contactors BF265...400
BFX845	4-pole	terminal cover	for contactors BF160...230
BFX846	4-pole	terminal cover	for contactors BF265...400
BA135	2-pole	paralleling links	for contactors BF09...25
BA235	2-pole	paralleling links	for contactors BF26...38
BFX3592	2-pole	paralleling links	for contactors BF160...230
BFX3692	2-pole	paralleling links	for contactors BF265...400
BA435	3-pole	paralleling links	for contactors BF95...150
BFX3593	3-pole	paralleling links	for contactors BF160...230
BFX3693	3-pole	paralleling links	for contactors BF265...400
BFX3583	3-pole	spreader links	for contactors BF160...230
BFX3683	3-pole	spreader links	for contactors BF265...400
BFX3584	4-pole	spreader links	for contactors BF160...230
BFX3684	4-pole	spreader links	for contactors BF265...400
G231	1-pole enlarged terminal (1 x 6 mm²)		for contactors BF09...25
G232	1-pole enlarged terminal (1 x 16 mm²)		for contactors BF26...38
BFX30	blank label for self-labelling (orange)		for contactors BF09...150

Surge suppressors for contactors BF09...150 (quick connect)

BFX77048	≤ 48 VAC/DC	varistor	for contactors	BF09...150A
BFX77125	48-125 VAC/DC	varistor	for contactors	BF09...150A
BFX77240	125-240 VAC/DC	varistor	for contactors	BF09...150A
BFX79415	240-415 VAC	resistor-capacitor	for contactors	BF09...150A

Spare coils for all contactors

BFX91A...	AC	spare coil only	for contactors	BF09...25A
BFX92A...	AC	spare coil only	for contactors	BF26...38A
BFX93A...	AC	spare coil only	for contactors	BF40...94A
BFX94A...	AC	spare coil only	for contactors	BF95...150A

Standard coil voltages: **AC** - 024/048/110/230/400

BFX93E...	AC/DC	spare coil only	for contactors	BF40...94E
BFX94E...	AC/DC	spare coil only	for contactors	BF95...150E
BFX95E...	AC/DC	spare coil only	for contactors	BF160...230E
BFX96E...	AC/DC	spare coil only	for contactors	BF265...400E

Standard coil voltages: AC/DC - **024** (24-60V), **110** (60-130V), **230** (100-250V), **400** (250-500V)

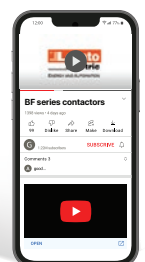
Spare contact sets (fixed and moving) per three-pole set

BFX99040T	3-pole	main contact set (fixed and moving)	BF40
BFX99050T	3-pole	main contact set (fixed and moving)	BF50
BFX99065T	3-pole	main contact set (fixed and moving)	BF65
BFX99080T	3-pole	main contact set (fixed and moving)	BF80
BFX99095T	3-pole	main contact set (fixed and moving)	BF95
BFX99115T	3-pole	main contact set (fixed and moving)	BF115
BFX99150T	3-pole	main contact set (fixed and moving)	BF150
BFX99195T	3-pole	main contact set (fixed and moving)	BF195
BFX99230T	3-pole	main contact set (fixed and moving)	BF230

Contactor range - Tutorials



◀ **Scan the QR Code**
for easy access to tutorials on
the Lovato Contactor range





RF38...



RF82...



RF200...



RFE45...



RFX3804



RFX3802

type	motor rating AC3 (400V)	description	adjustment range	for contactor
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RF series - Thermal overload relays (bimetal based)

Motor protection relay, phase failure/single-phase sensitive. Three-pole (three-phase), manual or automatic resetting.

RF38 series (phase failure sensitive)

• Selectable manual or automatic reset		• Direct mounting on BF09...38 contactors	
RF380016	—	thermal overload	0.10 - 0.16A BF09...38
RF380025	0.06 kW	thermal overload	0.16 - 0.25A BF09...38
RF380040	0.09 kW	thermal overload	0.25 - 0.40A BF09...38
RF380063	0.12 - 0.18 kW	thermal overload	0.40 - 0.63A BF09...38
RF380100	0.25 kW	thermal overload	0.63 - 1.00A BF09...38
RF380160	0.37 - 0.55 kW	thermal overload	1.00 - 1.60A BF09...38
RF380250	0.75 kW	thermal overload	1.60 - 2.50A BF09...38
RF380400	1.1 - 1.5 kW	thermal overload	2.50 - 4.00A BF09...38
RF380650	2.2 kW	thermal overload	4.00 - 6.50A BF09...38
RF381000	3.0 - 4.0 kW	thermal overload	6.30 - 10.0A BF09...38
RF381400	5.5 kW	thermal overload	9.00 - 14.0A BF09...38
RF381800	7.5 kW	thermal overload	13.0 - 18.0A BF09...38
RF382300	11 kW	thermal overload	17.0 - 23.0A BF09...38
RF382500	11 kW	thermal overload	20.0 - 25.0A BF09...38
RF383200	15 kW	thermal overload	24.0 - 32.0A BF09...38
RF383800	18.5 kW	thermal overload	32.0 - 38.0A BF09...38

RF82 series (phase failure sensitive)

• Manual resetting - direct mounting on BF40...94 contactors				
RF824200	15 - 18.5 kW	thermal overload	28 - 42A	BF40...94
RF825000	22 kW	thermal overload	35 - 50A	BF40...94
RF826500	22 - 30 kW	thermal overload	46 - 65A	BF40...94
RF828200	37 - 45 kW	thermal overload	60 - 82A	BF40...94
RF829500	45 kW	thermal overload	70 - 95A	BF40...94

RF110 series (phase failure sensitive)

• Manual resetting - direct mounting on BF95...150 contactors				
RF110095	45 kW	thermal overload	70 - 95A	BF95...150
RF110110	55 kW	thermal overload	90 - 110A	BF95...150

RF200 series (phase failure sensitive) req. links **RFX20035/RFX20036** to attach to contactors

• Manual or automatic resetting - direct mounting of BF160...400 contactors				
RF200150	51 - 80 kW	thermal overload	90 - 150A	BF160...400
RF200200	75 - 100 kW	thermal overload	120 - 200A	BF160...400

RF420 series (phase failure sensitive) req. links **RFX42035/*RFX42036** to attach to contactors

RF420250	92 - 132 kW	thermal overload	150 - 250A	BF160...400
RF420300*	100 - 162 kW	thermal overload	180 - 300A	BF160...400
RF420420*	129 - 198 kW	thermal overload	250 - 420A	BF160...400

Electronic thermal overload relays for BF series

The RFE... electronic thermal overload relays for BF series contactors are characterised by a wide current adjustment range and high reliability and accuracy of tripping.

A single front push button is used to select the reset function, manual or automatic, and to activate or deactivate the STOP function.

RFE series - Electronic overload relays (self-powered by main circuit)

RFE450200	0.12 - 0.75 kW	electronic overload	0.4 - 2A	BF09...38
RFE450800	0.75 - 3.0 kW	electronic overload	1.6 - 8A	BF09...38
RFE453200	3 - 15 kW	electronic overload	6.4 - 32A	BF09...38
RFE454500	4 - 22 kW	electronic overload	9 - 45A	BF09...38

Accessories for RF series overloads

RFX20035	set of links for mounting RF200 overload relays onto contactor	BF160...230
RFX20036	set of links for mounting RF200 overload relays onto contactor	BF265...400
RFX42035	set of links for mounting RF420 overload relays onto contactor	BF160...230
RFX42036	set of links for mounting RF420 overload relays onto contactor	BF265...400
RFX3804	separate mounting adaptor (surface / DIN-rail mount)	RF38/RFE45
G270	separate mounting adaptor (surface / DIN-rail mount)	RF82/110
G228220	electrical reset mechanism for overloads (220 VAC)	RF82/110
RFX3801	lead sealing device for overloads	RF38/200/420
G233	lead sealing device for overloads	RF82/110
RFX3802	protection cover for RF38 on contactor assembly	BF09...25
RFX3803	protection cover for RF38 on contactor assembly	BF26...38



Motor protection circuit breakers



SM1P...



SM1R...



SM2R5000



SM3R...

SM series - Motor protection circuit breakers

The SM series motor protection circuit breakers have been completely updated across all ranges of rated current, from 0.1 to 100A. The series includes three sizes: SM1, with a range-extended up to 40A (*available versions: with buttons or with rotary knob for motor protection*) SM2 from 34 to 63A and SM3 from 55 to 100A, both with rotary knobs.

General features:

- Temperature compensation
- Rated insulation voltage U_i 690V
- For safety lockout hasps (*contact us*)
- Thermal and magnetic protection ($13 \times I_e$)
- High fault level (*type 2 co-ordination with contactors*)
- Differential single-phase protection (*phase failure sensitive*)
- Snap-on auxiliary contacts, shunt trip and undervolt release
- 3 sizes, from 0.1 to 100A, with pushbutton and rotary versions
- Trip-test facility/indication of trip condition overload (*or*) short circuit (*SM1R series*)
- Magnetic protection for transformer ($20 \times I_e$) and for fuses monitoring (*on request*)

type	motor rating		thermal trip adj.range	description	short circuit capacity
	230V	400V			Icu 400V

SM series - Motor protection circuit breakers

SM1P series **Icu 100 to 10kA** (H) 90 x (W) 45 x (D) 75 mm (inc. buttons)

- Pushbutton control - padlockable in OFF position

SM1P0016	—	—	0.1 - 0.16A	manual motor starter	100 kA
SM1P0025	—	—	0.16 - 0.25A	manual motor starter	100 kA
SM1P0040	—	—	0.25 - 0.4A	manual motor starter	100 kA
SM1P0063	—	0.18 kW	0.40 - 0.63A	manual motor starter	100 kA
SM1P0100	0.12 kW	0.25 kW	0.63 - 1A	manual motor starter	100 kA
SM1P0160	0.25 kW	0.37 - 0.55 kW	1 - 1.6A	manual motor starter	100 kA
SM1P0250	0.37 kW	0.75 kW	1.6 - 2.5A	manual motor starter	100 kA
SM1P0400	0.55 - 0.75 kW	1.1 - 1.5 kW	2.5 - 4A	manual motor starter	100 kA
SM1P0650	1.1 - 1.5 kW	2.2 kW	4 - 6.5A	manual motor starter	100 kA
SM1P1000	1.5 - 2.2 kW	4.0 kW	6.3 - 10A	manual motor starter	100 kA
SM1P1400	3.0 kW	5.5 kW	9 - 14A	manual motor starter	25 kA
SM1P1800	4.0 kW	7.5 kW	13 - 18A	manual motor starter	25 kA
SM1P2500	5.5 kW	11.0 kW	20 - 25A	manual motor starter	15 kA
SM1P3200	7.5 kW	15.0 kW	24 - 32A	manual motor starter	10 kA
SM1P4000	11 kW	18.5 kW	30 - 40A	manual motor starter	10 kA

SM1R series **Icu 100 to 20kA** (H) 90 x (W) 45 x (D) 91 mm (inc. knob)

- Rotary selector control - padlockable in OFF position
- Magnetic trip indicator, for differentiation with overload tripping

SM1R0016	—	—	0.1 - 0.16A	manual motor starter	100 kA
SM1R0025	—	—	0.16 - 0.25A	manual motor starter	100 kA
SM1R0040	—	—	0.25 - 0.4A	manual motor starter	100 kA
SM1R0063	—	0.18 kW	0.40 - 0.63A	manual motor starter	100 kA
SM1R0100	0.12 kW	0.25 kW	0.63 - 1A	manual motor starter	100 kA
SM1R0160	0.25 kW	0.37 - 0.55 kW	1 - 1.6A	manual motor starter	100 kA
SM1R0250	0.37 kW	0.75 kW	1.6 - 2.5A	manual motor starter	100 kA
SM1R0400	0.55 - 0.75 kW	1.1 - 1.5 kW	2.5 - 4A	manual motor starter	100 kA
SM1R0650	1.1 - 1.5 kW	2.2 kW	4 - 6.5A	manual motor starter	100 kA
SM1R1000	1.5/2.2 kW	4.0 kW	6.3 - 10A	manual motor starter	100 kA
SM1R1400	3.0 kW	5.5 kW	9 - 14A	manual motor starter	100 kA
SM1R1800	4.0 kW	7.5 kW	13 - 18A	manual motor starter	100 kA
SM1R2500	5.5 kW	11.0 kW	20 - 25A	manual motor starter	50 kA
SM1R3200	7.5 kW	15.0 kW	24 - 32A	manual motor starter	50 kA
SM1R4000	11 kW	18.5 kW	30 - 40A	manual motor starter	20 kA

SM2R series **Icu 50kA** (H) 140 x (W) 55 x (D) 145 mm (inc. knob)

- Rotary selector control - padlockable in OFF position

SM2R5000	15.0 kW	22.0 kW	34 - 50A	manual motor starter	50 kA
SM2R6300	18.5 kW	30.0 kW	45 - 63A	manual motor starter	50 kA

SM3R series **Icu 50kA** (H) 165 x (W) 70 x (D) 170 mm (inc. knob)

- Rotary selector control - padlockable in OFF position

SM3R7500	22.0 kW	37.5 kW	55 - 75A	manual motor starter	50 kA
SM3R9000	25.0 kW	45.0 kW	70 - 90A	manual motor starter	50 kA
SM3R9900	30.0 kW	55.0 kW	80 - 100A	manual motor starter	50 kA

Accessories include left, right, and front auxiliary blocks, shunt trips, undervoltage releases, mounting accessories, and special enclosures, providing versatility and convenience for various applications.

type	config.	mount position	description	for starter
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General accessories for motor protection circuit breakers

Auxiliary contacts

SM1X1211	1NO + 1NC	left side	add-on auxiliary contact block	SM1P/R
SM1X1220	2NO	left side	add-on auxiliary contact block	SM1P/R
SM1X1311	1NO + 1NC	left side	trip indication auxiliary contact block	SM1P/R
SM1X1111	1NO + 1NC	front	add-on auxiliary contact block	SM1P/R
SM1X1120	2NO	front	add-on auxiliary contact block	SM1P/R
SM2X1211	1NO + 1NC	left side	add-on auxiliary contact block	SM2/3R
SM2X1220	2NO	left side	add-on auxiliary contact block	SM2/3R
SM2X1311	1NO + 1NC	left side	trip indication auxiliary contact block	SM2/3R
SM2X1111	1NO + 1NC	front	add-on auxiliary contact block	SM2/3R
SM2X1120	2NO	front	add-on auxiliary contact block	SM2/3R

Shunt trip release (permits remote tripping of the motor protection circuit breakers)

SM1X16024	24 VAC	right side	add-on shunt trip release unit	SM1P/R
SM1X16110	110 VAC	right side	add-on shunt trip release unit	SM1P/R
SM1X16230	230 VAC	right side	add-on shunt trip release unit	SM1P/R
SM1X16400	400 VAC	right side	add-on shunt trip release unit	SM1P/R
SM2X16024	24 VAC	right side	add-on shunt trip release unit	SM2/3R
SM2X16110	110 VAC	right side	add-on shunt trip release unit	SM2/3R
SM2X16230	230 VAC	right side	add-on shunt trip release unit	SM2/3R
SM2X16400	400 VAC	right side	add-on shunt trip release unit	SM2/3R

Undervoltage release

- Opens the MPCB when mains voltage fails and prevents unexpected starting when power is restored
- Equipped with integrated normally open early make contacts

SM1X14230	230 VAC	right side	add-on undervoltage release	SM1P/R
SM1X14400	400 VAC	right side	add-on undervoltage release	SM1P/R
SM2X14230	230 VAC	right side	add-on undervoltage release	SM2/3R
SM2X14400	400 VAC	right side	add-on undervoltage release	SM2/3R

Door interlocking handle (for SM1/2/3R rotary type starters)

SM1X18200R	red/yellow	door interlock handle (IP65) and 200 mm shaft	SM1R
SM2X18200R	red/yellow	door interlock handle (IP65) and 200 mm shaft	SM2/3R
SM1X18S	support	optional shaft support for	SM1R

Mounting accessories

BFX8901	universal	base for screw fixing motor protection	SM1P/R
SM1X3040P	3Ph rigid	rigid connection between SM1P and contactor	BG mini
SM1X3141P	3Ph rigid	rigid connection between SM1P and contactor	BF09...25A
SM1X3241P	3Ph rigid	rigid connection between SM1P and contactor	BF26...38A
SM1X3040R	3Ph rigid	rigid connection between SM1R and contactor	BG mini
SM1X3141R	3Ph rigid	rigid connection between SM1R and contactor	BF09...25A
SM1X3241R	3Ph rigid	rigid connection between SM1R and contactor	BF26...38A

Bridge bars for SM1P/R motor protection circuit breakers

SMX9032	insulated	3-phase bridge bar to connect	2 units	(45 mm)
SMX9033	insulated	3-phase bridge bar to connect	3 units	(45 mm)
SMX9034	insulated	3-phase bridge bar to connect	4 units	(45 mm)
SMX9035	insulated	3-phase bridge bar to connect	5 units	(45 mm)

With spacing to accommodate side-mounted auxiliaries or releases

SMX9042	insulated	3-phase bridge bar to connect	2 units	(54 mm)
SMX9043	insulated	3-phase bridge bar to connect	3 units	(54 mm)
SMX9044	insulated	3-phase bridge bar to connect	4 units	(54 mm)
SMX9045	insulated	3-phase bridge bar to connect	5 units	(54 mm)
SMX9030	25 mm ²	3-phase busbar supply block		(enlarged terminal)

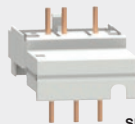
Enclosures for motor protection circuit breakers - IP65

Robust plastic enclosures for rotary and button-controlled motor protection circuit breakers up to 40A.

SM1Z1701P	surface	mount enclosure for starters	135 x 80 x 101	SM1P
SM1Z1715R	surface	mount enclosure for starters	154 x 100 x 138	SM1R

Flush mount enclosure - (IP65) panel cutout (H) 115.5 x (W) 70.5 mm

SM1Z1705P	flush	mount enclosure for starters	133 x 87 x 86	SM1P
SM1X1745P	IP65	button membrane protection cover for enclosure		SM1P
SM1X1740P		emergency stop (twist release) pushbutton assembly for enc.		SM1P





M2P...



M1N



M3N



M3PA

Enclosed direct-on-line starters

The **M series** Direct-On-Line (DOL) starters, provide a robust, reliable, and cost-effective motor control solution for industrial applications. Designed for full-voltage motor starting, these starters ensure efficient operation while protecting motors against overload and phase failure.

M Series safeguards motors from overcurrent, overheating, and phase loss, enhancing motor longevity and minimizing downtime. Housed in an IP65-rated non-metallic enclosure, these starters are dustproof, water-resistant, and UV-protected, making them ideal for harsh industrial environments.

Applications: Pumps, compressors, HVAC systems, ventilation fans, industrial machinery, automation, and agricultural irrigation systems.

Key Features:

- **Compact Design:** Space-saving enclosure with robust construction for industrial use
- **Direct-On-Line Motor Starting:** Simple full-voltage startup for efficient and straightforward motor control
- **IP65-Rated Enclosure:** Dustproof, water-resistant, and UV-protected for harsh environments
- **Start/Stop/Reset Pushbuttons:** Easy operation and quick reset after overload trips
- **Certifications:** IEC 60947-1, IEC 60947-4-1, UL 60947-4-1, CSA C22.2 No. 60947-4-1, **Supplied without an integrated thermal overload relay.** If overload protection is required, a separate relay must be purchased and installed.

type	motor rating AC3 (400V)	max current AC3 (400V)	description	thermal relay
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M-Series - Enclosed direct-on-line starters *start and stop pushbuttons* **IP65**

Standard DOL starters with BF/BG contactors

- Supplied complete enclosure, contactor and start and stop/reset pushbuttons
- Insulated IP65 polycarbonate enclosure

M1P (H)202 x (W) 88 x (D)156 mm
M2P (H)234 x (W)110 x (D)170 mm

M1P00910...	4 kW	13 A	direct-on-line starter	RF38
M1P01810...	7 kW	18 A	direct-on-line starter	RF38
M2P02510...	11 kW	25 A	direct-on-line starter	RF38
M2P03210...	15 kW	32 A	direct-on-line starter	RF38

Specify others voltages (add to part number): 230, 400V
Larger sizes available on request

RF38 series - Thermal overload relays (for above DOL starters)

			adjustment range	
RF380016	—	thermal overload	0.10 - 0.16A	BF09...38
RF380025	0.06 kW	thermal overload	0.16 - 0.25A	BF09...38
RF380040	0.09 kW	thermal overload	0.25 - 0.40A	BF09...38
RF380063	0.12 - 0.18 kW	thermal overload	0.40 - 0.63A	BF09...38
RF380100	0.25 kW	thermal overload	0.63 - 1.00A	BF09...38
RF380160	0.37 - 0.55 kW	thermal overload	1.00 - 1.60A	BF09...38
RF380250	0.75 kW	thermal overload	1.60 - 2.50A	BF09...38
RF380400	1.1 - 1.5 kW	thermal overload	2.50 - 4.00A	BF09...38
RF380650	2.2 kW	thermal overload	4.00 - 6.50A	BF09...38
RF381000	3.0 - 4.0 kW	thermal overload	6.30 - 10.0A	BF09...38
RF381400	5.5 kW	thermal overload	9.00 - 14.0A	BF09...38
RF381800	7.5 kW	thermal overload	13.0 - 18.0A	BF09...38
RF382300	11 kW	thermal overload	17.0 - 23.0A	BF09...38
RF382500	11 kW	thermal overload	20.0 - 25.0A	BF09...38
RF383200	15 kW	thermal overload	24.0 - 32.0A	BF09...38

Accessories

M0PA	empty housing with start-stop/reset pushbuttons (IP65)	BG06...12
M1PA	empty housing with start-stop/reset pushbuttons (IP65)	BF09...18
M2PA	empty housing with start-stop/reset pushbuttons (IP65)	BF09...32
M25PA	empty housing with start-stop/reset pushbuttons (IP65)	BF26...38
M3PA	empty housing with start-stop/reset pushbuttons (IP65)	BFA70
M3PA70	empty housing with start-stop/reset pushbuttons (IP65)	BFA70
M3RA	empty housing with reset pushbuttons (IP65)	202 x 88 x 135 mm
M1N	empty housing without external pushbuttons (IP65)	202 x 88 x 135 mm
M2N	empty housing without external pushbuttons (IP65)	234 x 110 x 149 mm
M3N	empty housing without external pushbuttons (IP65)	280 x 233 x 170 mm
M25N	housing no external pushbuttons (IP65) with chassis plate	210 x 175 x 149 mm
MX31	metal chassis/mounting plate	(for M25N enclosures)
MX30	metal chassis/mounting plate	(for M3N enclosures)
MX21P	fixing adaptor for pushbutton contact blocks	(for M1/2/25 enclosures)
MX11P	stop/reset button extension rod	(for M1 enclosures)
MX12P	stop/reset button extension rod	(for M2/25 enclosures)

PUSHBUTTONS AND SELECTORS



Refer to Category D





Soft starters

Soft starters application guide

	2 Ph control	3 Ph control
Heavy loads 		ADXT 34...554A
Standard loads 	ADXL 18...320A 	
Light/standard loads 	ADXN 6...45A 	



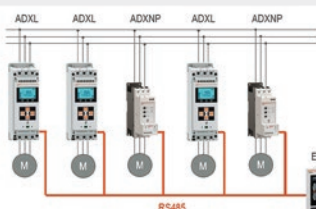
ADXNB...



ADXNP...



EXCRDU2



ADXN series - Compact soft starters (two-phase control)

ADXN soft starters are a simple, compact (*only 45 mm width*) and fast-to-configure products for the gradual control of the starting and stopping of motors. The versatility makes it suitable for several applications for the control of pumps, fans, conveyor belts, compressors. Available with rated currents from 6 to 45A.

- Economical soft starters for motors up to 22 kW (400 VAC)
- Rated operational voltage: 208...600 VAC
- Integrated bypass relay disabling the thyristors once the starting ramp has concluded
- Ready to use - factory set configurations for quick and simple commissioning
- Suitable for IE3 premium efficiency motors

Integrated protection functions include: Soft starter thermal protection with integrated temperature sensor, line frequency/voltage out of tolerance, line voltage not present, phase loss, incorrect phase sequence.

type	rated current Ie	rated power (400V)	description	dimensions (mm)		
				(H)	(W)	(D)

ADXNB series - Basic version (requires external overload protection)

Ideal solution for a soft starter with basic functions that are extremely simple to configure for gradually starting and stopping motors. Their versatility makes them adaptable to various applications, including pump, fan, conveyor and compressor control.

Just three parameters, configurable with the front panel potentiometers:

- Initial voltage step: 30-80%U
- Deceleration ramp: 0-20sec
- Acceleration ramp: 1-20sec

Auxiliary supply Us 100...240 VAC

ADXNB006	6A	2.2 kW	basic industrial soft starter	139	45	113
ADXNB012	12A	5.5 kW	basic industrial soft starter	139	45	113
ADXNB018	18A	7.5 kW	basic industrial soft starter	139	45	113
ADXNB025	25A	11.0 kW	basic industrial soft starter	159	45	128
ADXNB030	30A	15.0 kW	basic industrial soft starter	159	45	128
ADXNB038	38A	18.5 kW	basic industrial soft starter	159	45	128
ADXNB045	45A	22.0 kW	basic industrial soft starter	159	45	128

Auxiliary supply Us 24 VAC/DC

ADXNB00624	6A	2.2 kW	basic industrial soft starter	139	45	113
ADXNB01224	12A	5.5 kW	basic industrial soft starter	139	45	113
ADXNB01824	18A	7.5 kW	basic industrial soft starter	139	45	113
ADXNB02524	25A	11.0 kW	basic industrial soft starter	159	45	128
ADXNB03024	30A	15.0 kW	basic industrial soft starter	159	45	128
ADXNB03824	38A	18.5 kW	basic industrial soft starter	159	45	128
ADXNB04524	45A	22.0 kW	basic industrial soft starter	159	45	128

ADXNP series - Advanced version (includes overload protection)

Parameter configuration via front potentiometers or NFC connectivity via smart devices with the LOVATO NFC App (*available for Android and iOS*).

Provides electronic thermal overload protection of the motor via integrated current transformers, permitting management of starting ramps with current limiting, automatically adapted to follow load variations with configurable separate thermal classes for starting and stopping. Offering protection against locked rotor, current asymmetry, low load, starter timeout.

- Optional RS-485 (*Modbus-RTU*) module for integration into a control and supervision network - **CX04**
- Factory set thresholds, reconfigurable via NFC

Auxiliary supply Us 100...240 VAC

ADXNP012	12A	5.5 kW	advanced industrial soft starter	139	45	113
ADXNP018	18A	7.5 kW	advanced industrial soft starter	139	45	113
ADXNP025	25A	11.0 kW	advanced industrial soft starter	159	45	128
ADXNP030	30A	15.0 kW	advanced industrial soft starter	159	45	128
ADXNP038	38A	18.5 kW	advanced industrial soft starter	159	45	128
ADXNP045	45A	22.0 kW	advanced industrial soft starter	159	45	128

Auxiliary supply Us 24 VAC/DC

ADXNP01224	12A	5.5 kW	advanced industrial soft starter	139	45	113
ADXNP01824	18A	7.5 kW	advanced industrial soft starter	139	45	113
ADXNP02524	25A	11.0 kW	advanced industrial soft starter	159	45	128
ADXNP03024	30A	15.0 kW	advanced industrial soft starter	159	45	128
ADXNP03824	38A	18.5 kW	advanced industrial soft starter	159	45	128
ADXNP04524	45A	22.0 kW	advanced industrial soft starter	159	45	128

Accessories for ADXN and ADXL soft starters

SM1X3150R	rigid con. kit for direct mnt ADXN 6-38A to SM1R motor protection circuit breakers
CX01	USB connects PC to ADXNP for programming, download and diagnostics
CX02	Wi-Fi connect PC/smartphone to ADX/NP/XL for programming and monitoring
CX04	RS-485 comm. module for ADXNP, Modbus-RTU, 24 VAC/DC aux supply
EXC1042	RS-485 communication plug-in board for ADXL...
EXCRDU2	remote monitoring/control for ADXNP/ADXL soft-starters (<i>conn. up to 32 devices</i>)



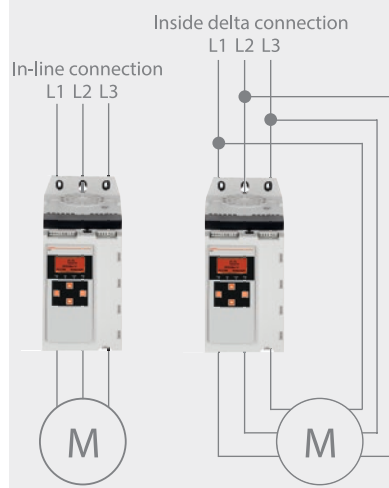
ADXL series



ADXL...



ADXT...



ADXL series - Soft starters (two-phase control)

ADXL series soft starters feature a backlit LCD icon display and NFC connectivity for convenient configuration, accessible even from smartphones and tablets. Ideal for both straightforward "plug and play" setups and demanding applications requiring precise control and protection during motor startup and operation. Incorporating two-phase control during motor starting and stopping torque control during operation.

General features:

- Auxiliary supply: 100...240 VAC
- Rated operational voltage: 208...600 VAC
- Programming, data download and diagnostics via incorporated optical port with **CX01/02**
- Voltage ramp startup, torque ramp, kick start, with or without current limit
- Selectable default application: Centrifugal pump, fire pump, conveyor belt, fan, mixer and general purpose
- Optional RS-485 communication with **EXC1042**
- Indicating:
 - Voltage - current L1/L2/L3 - torque - active power - PF - motor thermal status
 - Soft starter temperature - active energy - motor hour counter - startup counter

type	rated current Ie	rated power 400V	description	dimensions (mm)		
				(H)	(W)	(D)
ADXL series (two phase control, integrated bypass facility)						
ADXL0018600	18A	7.5 kW	industrial soft starter	218	75	172
ADXL0030600	30A	15.0 kW	industrial soft starter	218	75	172
ADXL0045600	45A	22.0 kW	industrial soft starter	218	75	172
ADXL0060600	60A	30.0 kW	industrial soft starter	218	75	172
ADXL0075600	75A	37.0 kW	industrial soft starter	226	95	182
ADXL0085600	85A	45.0 kW	industrial soft starter	226	95	182
ADXL0115600	115A	55.0 kW	industrial soft starter	226	95	182
ADXL0135600	135A	75.0 kW	industrial soft starter	301	212	216
ADXL0162600	162A	90.0 kW	industrial soft starter	301	212	216
ADXL0195600	195A	110.0 kW	industrial soft starter	486	212	216
ADXL0250600	250A	132.0 kW	industrial soft starter	486	212	216
ADXL0320600	320A	160.0 kW	industrial soft starter	486	212	216

ADXT... series - Advanced heavy-duty soft starters (three-phase control)

ADXT... soft starters for applications requiring high performance, reliability and robustness. Mainly used for control of heavy loads due to high torque availability during starting, overcoming the inertia of applications such as crushers, fans, vertical/inclined conveyors, screw compressors, etc.

The integrated or internal bypass contactor disabling the thyristors once motor starting is completed, reducing energy consumption, generated heating and power dissipation.

- Auxiliary supply voltage 110...120 / 220...240 VAC
- Rated operational voltage 380...690 VAC

Advanced features:

- Various motor starting modes / Emergency mode: Running of the motor ignoring alarms
- Power Through function: allow starting with a damaged thyristor (2-phase control)
- Scheduled start: timer & clock modes, based on ADXT RTC
- Control of breaking/reversing contactors

ADXT soft starters can be installed with traditional in-line connection or inside delta connection (six-wire connection) with thyristors connected in series to each motor winding. In this configuration, requiring six-wire motors, the soft starter is only crossed by the phase current, which is significantly lower than the line current. This permits the use of a smaller starter, resulting in cost savings, and simplifies the replacement of star-delta starters since the existing wiring is retained.

type	rated current Ie	in-line (400V)	inside Δ	description	dimensions (mm)		
					(H)	(W)	(D)
Soft starter - Three-phase control							
ADXT0034	34A	18.5 kW	22 kW	heavy-duty soft starter	336	152	233
ADXT0060	60A	30 kW	45 kW	heavy-duty soft starter	336	152	233
ADXT0084	84A	45 kW	55 kW	heavy-duty soft starter	336	152	233
ADXT0104	104A	55 kW	75 kW	heavy-duty soft starter	336	152	233
ADXT0126	126A	55 kW	90 kW	heavy-duty soft starter	336	152	233
ADXT0139	139A	75 kW	110 kW	heavy-duty soft starter	482	216	244
ADXT0165	165A	90 kW	132 kW	heavy-duty soft starter	482	216	244
ADXT0187	187A	90 kW	160 kW	heavy-duty soft starter	482	216	244
ADXT0230	230A	132 kW	160 kW	heavy-duty soft starter	482	216	244
ADXT0311	311A	160 kW	250 kW	heavy-duty soft starter	482	216	243
ADXT0410	410A	220 kW	355 kW	heavy-duty soft starter	482	216	243
ADXT0506	506A	280 kW	400 kW	heavy-duty soft starter	482	216	243
ADXT0554	554A	315 kW	450 kW	heavy-duty soft starter	482	216	243

Accessories (for ADXT soft starters)

- ADXTTRTU RS485 communication card for ADXT, Modbus-RTU protocol
- ADXTTCPP Ethernet communication card for ADXT, Modbus-TCP protocol
- ADXTC01KIT remote keypad kit for ADXT (IP65)

Several functions in one device



ME070RD024



ME024RS024



Electronic motor starters

ME... series electronic motor starters are extremely compact (22.5 mm width) ideal for applications requiring a very high number of starts with electronic thermal protection incorporated.

Employing hybrid technology, combining advantages of extremely long working life of a wear-free semiconductor device with the robustness of a mechanical relay and low consumption.

Direct-on-line and Reversing starters for motors up to 3 kW with rated voltage up to 500VAC.

Electronic motor thermal protection incorporated in all models and are also available with built-in STO (Safe Torque Off) emergency stop function.

Typical applications:

- Conveyors, packaging machines, automatic doors, escalators, sorting equipment and access control systems

Functionality:

- Direct-on-line and Reversing starters
- Rated motor current 2.4 or 7A (AC3, AC53)
- Operational voltage $U_e \leq 500$ VAC
- Auxiliary and control supply voltage 24 VDC
- Potentiometer for the adjustment of the rated motor current I_e
- Integrated electronic motor thermal protection with tripping class 10A
- Versions with STO (Safe Torque Off) emergency stop with Safety Integrity Level SIL3 (IEC/EN 61508) and Performance Level "PL e" (ISO 13489)

General benefits

- 4 digital inputs / 3 integrated digital outputs
- 4 status LEDs on front for diagnostics
- Motor thermal protection against overload / phase loss / phase imbalance

Advanced features:

- Various motor starting modes
- Emergency mode: Running of the motor ignoring alarms
- Power Through function: allow starting with a damaged thyristor (2-phase control)
- Scheduled start: timer & clock modes, based on ADXT RTC
- Event log / Jog function / - Pump clean cycles
- Control of breaking/reversing contactors

type	rated power (400VAC)	rated current I_e AC-53a	adjustment range	STO (safe torque off)	description
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ME...series Electronic motor starters

Direct-on-line starters with integrated motor thermal protection

Offer reliable motor control while ensuring the safety and longevity of the connected motors, making them suitable for a wide range of applications across different industries.

Particularly beneficial in applications where motors are subjected to varying loads or operating conditions which may lead to overheating if not adequately monitored and protected.

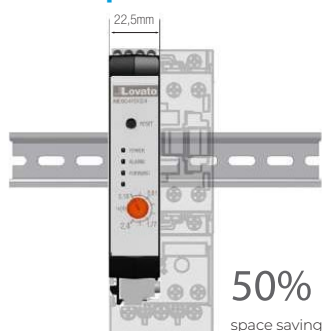
ME024FD024	0.75 kW	2.4 A	0.18 - 2.4 A	—	direct-on-line starter
ME070FD024	3.0 kW	7.0 A	1.5 - 7.0 A	—	direct-on-line starter
ME024FSD024	0.75 kW	2.4 A	0.18 - 2.4 A	•	direct-on-line starter
ME070FSD024	3.0 kW	7.0 A	1.5 - 7.0 A	•	direct-on-line starter

Reversing starters with integrated motor thermal protection

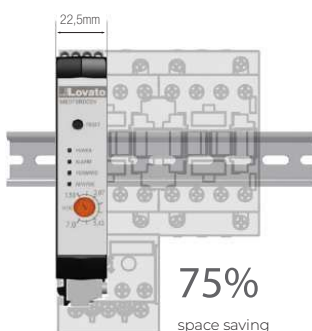
Provides a comprehensive solution for starting, stopping, and reversing induction motors while safeguarding them against overheating in various industrial and commercial applications.

ME024RD024	0.75 kW	2.4 A	0.18 - 2.4 A	—	reversing starter
ME070RD024	3.0 kW	7.0 A	1.5 - 7.0 A	—	reversing starter
ME024RS024	0.75 kW	2.4 A	0.18 - 2.4 A	•	reversing starter
ME070RS024	3.0 kW	7.0 A	1.5 - 7.0 A	•	reversing starter

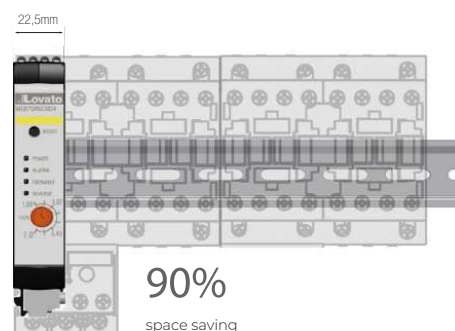
Compact dimensions



DOL starter with motor thermal protection



Reversing starter with motor thermal protection



Reversing starter with motor thermal protection and emergency stop

Superior Efficiency

VP3000 Series



Introducing the **Delta VP3000 Series** – a cutting-edge solution designed to address the critical challenges of energy conservation and carbon emission reduction in the fluid industry. With advanced drive capabilities, predictive maintenance features, and options for low harmonic improvement, the VP3000 enhances operational efficiency across a wide range of applications, from water treatment to HVAC systems.

Features & Benefits:

- Harmonic Suppression: THDi Min. 35%, better than EN 61000-3-12.
- Predictive Maintenance: Monitors key component life.
- 23% smaller design for efficient space use
- Multi-Pump Function: Supports alternate operation and redundancy.



Scan to watch

Applications



HVAC, air compressors



Tunnel Ventilation





Water Supply



Water Treatment

Variable frequency drives - Selection chart

Series			ME300 Series												MS300 Series									
																								
			single-phase					three-phase							single-phase					three-phase				
Model number VFD-__ME/MS/E			1A6	2A8	4A8	7A5	11A	1A5	2A7	4A2	5A5	9A0	13A	17A	1A6	2A8	4A8	7A5	11A	13A	2A7	4A2		
Frame size			A	A	B	C	C	A	A	B	C	C	D	D	A	A	B	C	C	D	A	B		
Max. applicable motor output			kW		0.2	0.4	0.75	1.5	2.2	0.4	0.75	1.5	2.2	3.7	5.5	7.5	0.2	0.4	0.75	1.5	2.2	5.5	0.75	1.5
Output rating																								
Rated output capacity		NORMAL DUTY heavy duty	kVA	0.7	1.2	1.9	3.2	4.8	1.4	2.3	3.5	5	8	12	15.6	0.7	1.2	1.9	3.2	4.8	9.9	2.3	3.5	
Rated output current			A	1.8	3.2	5	8.5	12.5	1.8	3	4.6	6.5	10.5	15.7	20.5	1.8	3.2	5	8.5	12.5	15.7	3	4.6	
Output frequency		HEAVY DUTY super heavy duty	Hz	0.0 - 599Hz												0.0 - 599Hz								
Carrier frequency			kHz	2 - 15kHz												2 - 15 kHz (default 4)								
Rated output capacity			kVA	0.6	1.1	1.8	2.9	4.2	1.1	2.1	3.2	4.2	6.9	9.9	13	0.6	1.1	1.8	2.9	4.2	9.9	2.1	3.2	
Rated output current			A	1.6	2.8	4.8	7.5	11	1.5	2.7	4.2	5.5	9	13	17	1.6	2.8	4.8	7.5	11	13	2.7	4.2	
Carrier frequency			kHz	2 - 15kHz												2 - 15kHz (default 4)								
Input rating																								
Input current (heavy duty)		A	3.4	5.9	10.1	15.8	23.1	1.7	3	4.6	6.1	9.9	14.3	18.7	3.4	5.9	10.1	15.8	23.1	14.3	3.7	5.8		
Input current (normal duty)		A	3.8	6.7	10.5	17.9	26.3	2	3.3	5.1	7.2	11.6	17.3	22.6	3.8	6.7	10.5	17.9	26.35	17.3	4.2	6.4		
Rated voltage		V	1-phase 200-240V (-15 to +10%)					3-phase AC 380V - 480V (-15 to +10%)							1-phase 200-240V (-15 to +10%)					3-phase AC 380V - 480V 50/60Hz				
Operating voltage range		V	170 - 265V					323 - 528V							170 - 264V									
Frequency range		Hz	47 - 63Hz ± 5%												47 - 63Hz ± 5%									
Cooling method			convection		fan		convection		fan cooling			conv.		fan cooling			fan cooling							
Braking chopper			built-in												built-in									
DC reactor			optional												optional									
Control method			V/F, SVC												V/F, SVC,									
Starting torque		%	up to 150% at 3 Hz including auto-torque/slip												up to 150% at 3.0Hz including auto-torque/slip compensation									
Max. output frequency		Hz	0.00-599.00 Hz												0.00-599.00 Hz									
Frequency output accuracy			-												-									
Frequency setting resolution		Hz	0.01Hz												0.01Hz									
Overload tolerance (normal duty, heavy duty)			120% of rated output current for 60 seconds; 150% for 3 seconds												120% of rated output current for 60 seconds; 150% for 3 seconds									
Overload tolerance (heavy duty, super heavy duty)			150% of rated output current for 60 seconds; 200% for 3 seconds												150% of rated output current for 60 seconds; 200% for 3 seconds									
Frequency setting signal			0 - 10V / 4(0)-20mA, PWM pulse width input (1kHz), pulse input (10kHz)												0 - +10 V / -10 V - +10 V, 4 - 20 mA / 0 - +10 V, 1 pulse input (33 kHz), 1 pulse output (33 kHz)									
Accel./decel. Time			0.1 - 600 sec. (2 settings accel/decel time)												0.1 - 600 sec. (2 independent settings accel/decel time)									
Main control functions			2 independent motor parameter settings, fast run, deceleration energy back (DEB) function, fast deceleration function, selectable master and auxiliary frequency source, momentary power loss ride through, speed search, over-torque detection, 16-step speed accel/decel timer, S-curve accel/decel, JOG frequency, upper/lower limits frequency ref, DC injection braking at start and stop, PID control, simple positioning function, Modbus integrated as standard												Multiple motor switches (max. 4 independent motor parameter settings), fast run, deceleration energy back (DEB) function, wobble frequency function, fast deceleration function, master and auxiliary frequency source selectable, momentary power loss ride thru, speed search, over-torque detection, 16-step speed (max.), accel/decel time switch, S-curve accel/decel, 3-wire sequence, JOG frequency, upper/lower limits for frequency reference, DC injection braking at start and stop, PID control, built-in PLC (2k steps), simple positioning function, Modbus is integrated as standard									
Fan control			fan control												fan control									
Motor protection			electronic thermal relay and phase failure protection												over/under-volt/current, external fault, overload, IGBT short circuit, PTC									
Over-current protection			yes												yes									
Over-voltage protection			yes												yes									
Over-temperature protection			yes												yes									
Stall prevention			Stall prevention during acceleration, deceleration and running independently												Stall prevention during acceleration, deceleration and running independently									
Re-start after momentary power off			yes												yes									
Ground current protection			yes												yes									
EMI filter			no												no									
Dimensions (H) x (W) x (D)		H	mm	128	128	142	157	128	128	142	157	207	128	128	142	157	128	128	142	157	128	128	142	
		W	mm	68	68	72	87	68	68	72	87	109	68	68	72	87	68	68	72	87	68	68	72	
		D	mm	78	107	127	136	113	127	127	136	138	96	143	143	179	129	129	143	143	143	143	143	
Weight		kg	0.4	0.5	0.8	1	0.55	0.7	0.8	1	2	0.65	0.95	0.95	1.24	0.76	0.81	1	1	1	1	1		
Optional accessories			DIN-rail mount adaptor												DeviceNet, Ethernet/IP, Profibus DP, Modbus TCP, CANopen, Ethercat communication cards, external 24 VDC power supply card, DIN-rail mount adaptor, cable for remote mounting of digital keypad									

A-18



Variable frequency drives - Compact



Conveyor



Fan



Machine Tool



Motors



VFD1A6ME21ANN



VFD4A8ME21ANN



VFD4A8MS21ANS



VFD32AMS43ANS



ME300 / MS300 series - Vector control compact drive

ME300 / MS300 range of compact vector controlled drives offer standard essential built-in functionality including multi-pump control, built-in brake chopper, RS-485 (Modbus). For both IM and PM motors.

Common features include:

- Built-in PID feedback control
- **Built-in EMI filter reduces electrical noise**
- Easy to navigate keypad with LED display and potentiometer
- Pre-configured parameters for most commonly used applications
- High-efficiency cooling and compact design (*for side-by-side installation*)
- Multiple digital outputs MS300 (*1x relay, 2x transistor*) ME300 (*1x relay, 1x transistor*)
- Dual rating chart for ME / MS300 drives - normal and heavy duty applications
- Overload capabilities: 150% of rated output current for 60 sec, 200% for 3 seconds (*heavy duty*)
- Overcurrent, overvoltage, overload, over-temperature and phase failure protection incorporated
- Enhanced PCB coatings (**IEC 60721-3-3 class 3C2 standard**) ensures drive operation in harsh environments
- Default drive rating: Heavy duty

type	motor rating	rated current	description	frame size	dimensions (mm)		
					(H)	(W)	(D)

ME300 series - Basic ultra-compact AC motor drives - (VF/SVC open-loop control)

- High starting torque (*up to 150% rated starting torque at 3 Hz*)
- Supports side-by-side installation, with operating temp -20 to +40°C
- Supports high speed pulse and PWM (10kHz) frequency input signals
- Ultra compact frame sizes, up to 60% reduction compared to previous VFD-EL
- Front fascia 4 digit LED display, frequency adjustment knob and direction - run/stop function keys

Single-phase input 200-240V 50/60Hz (three-phase output voltage 230 VAC)

VFD1A6ME21AFNAA	200 W	1.6A	single-phase AC motor drive	B3	142	72	143
VFD2A8ME21AFNAA	400 W	2.8A	single-phase AC motor drive	B3	142	72	143
VFD4A8ME21AFNAA	750 W	4.8A	single-phase AC motor drive	B3	142	72	143
VFD7A5ME21AFNAA	1.5 kW	7.5A	single-phase AC motor drive	C2	157	87	163
VFD11AME21AFNAA	2.2 kW	11A	single-phase AC motor drive	C2	157	87	163

Three-phase input 380-480V 50/60Hz

VFD1A5ME43AFNAA	400 W	1.5A	three-phase AC motor drive	B3	142	72	143
VFD2A7ME43AFNAA	750 W	2.7A	three-phase AC motor drive	B3	142	72	143
VFD4A2ME43AFNAA	1.5 kW	4.2A	three-phase AC motor drive	B3	142	72	143
VFD5A5ME43AFNAA	2.2 kW	5.5A	three-phase AC motor drive	C2	157	87	163
VFD9A0ME43AFNAA	3.7 kW	9.0A	three-phase AC motor drive	C2	157	87	163
VFD13AME43AFNAA	5.5 kW	13A	three-phase AC motor drive	D2	207	109	171
VFD17AME43AFNAA	7.5 kW	17A	three-phase AC motor drive	D2	207	109	171

MS300 series - Standard compact AC motor drives (VF/SVC open-loop control)

Essential functions built-in as standard includes: PLC for simple programming needs, communication slots for various communication cards, support for both IM and PM motor controls, STO function ensuring worry-free operation and protection.

- Built-in PLC functionality (*2K steps*)
- Supports high speed pulse (33kHz) frequency input signal
- High starting torque (*up to 200% rated starting torque at 0.5 Hz*)
- Built-in slot for optional communication modules (*see accessories for ME/MS drives*)
- Integrated Safe Torque Off (STO) SIL2/PLD compliance, offers high safety machine stop
- USB port for simplicity of data uploads and downloads (*supports PC program via USB*)
- Removable 5 digit LED keypad with function keys and frequency adjustment knob

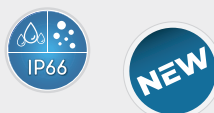
Single-phase input 200-240V 50/60Hz (three-phase output voltage 230 VAC)

VFD1A6MS21AFSAA	200 W	1.6A	single-phase AC motor drive	B3	142	72	159
VFD2A8MS21AFSAA	400 W	2.8A	single-phase AC motor drive	B3	142	72	159
VFD4A8MS21AFSAA	750 W	4.8A	single-phase AC motor drive	B3	142	72	159
VFD7A5MS21AFSAA	1.5 kW	7.5A	single-phase AC motor drive	C2	157	87	179
VFD11AMS21AFSAA	2.2 kW	11A	single-phase AC motor drive	C2	157	87	179

Three-phase input 380-480V 50/60Hz

VFD1A5MS43AFSAA	400 W	1.5A	three-phase AC motor drive	B3	142	72	159
VFD2A7MS43AFSAA	750 W	2.7A	three-phase AC motor drive	B3	142	72	159
VFD4A2MS43AFSAA	1.5 kW	4.2A	three-phase AC motor drive	B3	142	72	159
VFD5A5MS43AFSAA	2.2 kW	5.5A	three-phase AC motor drive	C2	157	87	179
VFD9A0MS43AFSAA	3.7 kW	9.0A	three-phase AC motor drive	C2	157	87	179
VFD13AMS43AFSAA	5.5 kW	13A	three-phase AC motor drive	D2	207	109	187
VFD17AMS43AFSAA	7.5 kW	17A	three-phase AC motor drive	D2	207	109	187
VFD25AMS43AFSAA	11 kW	25A	three-phase AC motor drive	E2	250	130	219
VFD32AMS43AFSAA	15 kW	32A	three-phase AC motor drive	E2	250	130	219
VFD38AMS43AFSAA	18.5 kW	38A	three-phase AC motor drive	F2	300	175	244
VFD45AMS43AFSAA	22 kW	45A	three-phase AC motor drive	F2	300	175	244

See accessories for ME/MS drives



VFD2A8MS21MNS


MS300 + isolator
available on request

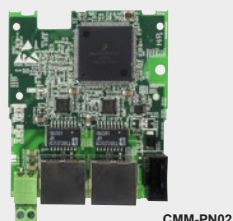

MKM-DRB



MKM-HUB01



IFD6530



CMM-PN02

MS300 series - Vector control compact drive

MS300 series provides essential built-in features, including multi-pump control, a brake chopper, and RS-485 (Modbus) communication for use with both induction and permanent magnet motors.

With an STO (SIL2) safety function, integrated PLC functionality, and dependable operation, it is suitable for food and beverage production and pumping applications.

- High starting torque (*up to 200% rated starting torque at 0.5 Hz*)
- Overload capabilities: 150% of rated output current for 60 seconds, 200% for 3 seconds
- Protection against humidity and dust in industrial environments
- Default drive rating: Heavy duty (*break resistor chart, see page A-25*)

type	motor rating	rated current	description	frame size	dimensions (mm)		
					(H)	(W)	(D)

MS300 series IP66 - AC motor drives

(VF/SVC open-loop control)

IP66 / NEMA4X water-proof and dust-proof design enables stable operation under harsh environments.

Single-phase input 200-240V 50/60Hz (three-phase output voltage 230 VAC)

VFD2A8MS21MFSAA	400 W	2.8A	single-phase AC motor drive	A1	230	160	151
VFD4A8MS21MFSAA	750 W	4.8A	single-phase AC motor drive	A1	230	160	151
VFD7A5MS21MFSAA	1.5 kW	7.5A	single-phase AC motor drive	B	280	175	193
VFD11AMS21MFSAA	2.2 kW	11A	single-phase AC motor drive	B	280	175	193

Three-phase input 380-480V 50/60Hz

VFD2A7MS43MFSAA	750 W	2.7A	three-phase AC motor drive	A1	230	160	151
VFD4A2MS43MFSAA	1.5 kW	4.2A	three-phase AC motor drive	A2	230	160	167
VFD5A5MS43MFSAA	2.2 kW	5.5A	three-phase AC motor drive	B	280	175	193
VFD9A0MS43MFSAA	3.7 kW	9.0A	three-phase AC motor drive	B	280	175	193
VFD13AMS43MFSAA	5.5 kW	13A	three-phase AC motor drive	C	300	195	193
VFD17AMS43MFSAA	7.5 kW	17A	three-phase AC motor drive	C	300	195	193

EL series multi-function micro AC motor drives (open-loop control mode)

- High-efficiency cooling and flexible space (*side-by-side installation*)
- Built-in PID feedback control and EMI filter (*Optional fieldbus models on request*)

Single-phase input 180-264V 50/60Hz (three-phase output voltage)

VFD002EL21A	200 W	1.6A	single-phase AC motor drive	A	142	72	136
VFD004EL21A	400 W	2.5A	single-phase AC motor drive	A	142	72	136
VFD007EL21A	750 W	4.2A	single-phase AC motor drive	A	142	72	136
VFD015EL21A	1.5 kW	7.5A	single-phase AC motor drive	B	174	100	136
VFD022EL21A	2.2 kW	11A	single-phase AC motor drive	B	174	100	136

Three-phase 380-480V 50/60Hz

VFD004EL43A	400 W	1.5A	three-phase AC motor drive	A	174	72	136
VFD007EL43A	750 W	2.5A	three-phase AC motor drive	A	174	72	136
VFD015EL43A	1.5 kW	4.2A	three-phase AC motor drive	A	174	72	136
VFD022EL43A	2.2 kW	5.5A	three-phase AC motor drive	B	174	100	136
VFD037EL43A	3.7 kW	8.2A	three-phase AC motor drive	B	174	100	136

Accessories for ME/MS300 series drives

MKM-DRB	DIN-rail	mounting kit for frame A and B			ME/MS300 drives
MKM-DRC	DIN-rail	mounting kit for frame C			ME/MS300 drives
KPC-CC01	keypad	(MS300 IP66) panel mount LCD			for MS300 drives
KPMS-LE01	keypad	removable LED keypad			for MS300 drives
MKM-HUB01	adaptor	daisy chain - RJ-45 to screw connector			ME/MS300 drives
EG1010A	cable	to remotely mount keypad	1 met		for MS300 drives
EG3010A	cable	to remotely mount keypad	3 met		for MS300 drives
UC-PRG030-02A	USB (B to A)	programming cable PC-VFD	3 met		for MS300 drives
IFD6530	RS-485 to USB	converter (<i>no ext. power supply required</i>)			

Fieldbus modules for MS series drives

CMM-EIP03	Ethernet/IP	Modbus TCP plug-in com. card	2 port		for MS300 drives
CMM-EC02	EtherCAT	plug-in communication card	2 port		for MS300 drives
CMM-PN02	Profinet	plug-in communication card	2 port		for MS300 drives
CMM-COP02	CANopen	plug-in communication card	2 port		for MS300 drives

Note: CBM-CCxxA required when using above communication card

Cables for above communication cards

				frame	Pos.
CBM-CL01A	cable for	CMM-DN/EIP/PD/COP	145 mm	A,B	1
		CMM-EC02		A	2
CBM-CL02A	cable for	CMM-DN/EIP/PD/COP	250 mm	C,D,E,F	1
		CMM-EC02		B,C,D	2
CBM-CC01A	cable for	CMM-DN/EIP/PD/COP	145 mm	A	2
CBM-CC02A	cable for	CMM-DN/EIP/PD/COP	250 mm	B,C,D	2



Milling Machine



Cranes



Compressor



Motors



VFD150C4EA-21



VFD220C4EA-21



VFD370C63B-21

C2000+ series - High performance vector control drive

C2000+ series features precise speed, torque and position control, suitable for both sensor and sensorless types of synchronous and asynchronous motors. With a higher overload capacity the C2000+ provides the best performance and stability for a variety of heavy duty and constant torque applications in refrigeration, mining, crains/hoists, crushers, compressors etc.

- Accepts various PG (encoder), I/O extension, relay extension and communication cards
- Integrated Safe Torque Off (STO) SIL2/PLd compliance, offers high safety machine stop
- Dual rating design - heavy duty / super heavy duty. Built-in PLC function (10k steps capacity)
- Overload capabilities: C2000+ 150% of rated output current for 1min, 180% for 3sec (heavy duty)
- Enhanced PCB coatings (IEC 60721-3-3 class 3C3 standard) ensures drive operation in harsh environments
- Built-in Modbus and CANopen (up to 30kW) high-speed communication interface (optional cards for others)
- For drives exceeding 30 kW, an external EMI filter, see page A-24

type	motor rating 400V	rated current	description	frame size	dimensions (mm)		
					(H)	(W)	(D)

C2000+ series - High performance vector control drive

Three-phase input 380-480V 50/60Hz

VFD007C4EA-21	0.75 kW	3.0A	three-phase AC motor drive	A	250	130	170
VFD015C4EA-21	1.5 kW	4.0A	three-phase AC motor drive	A	250	130	170
VFD022C4EA-21	2.2 kW	6.0A	three-phase AC motor drive	A	250	130	170
VFD040C4EA-21	4.0 kW	10.5A	three-phase AC motor drive	A	250	130	170
VFD055C4EA-21	5.5 kW	12A	three-phase AC motor drive	A	250	130	170
VFD075C4EA-21	7.5 kW	18A	three-phase AC motor drive	B	320	190	190
VFD110C4EA-21	11 kW	24A	three-phase AC motor drive	B	320	190	190
VFD150C4EA-21	15 kW	32A	three-phase AC motor drive	B	320	190	190
VFD185C4EA-21	18.5 kW	38A	three-phase AC motor drive	C	400	250	210
VFD220C4EA-21	22 kW	45A	three-phase AC motor drive	C	400	250	210
VFD300C4EA-21	30 kW	60A	three-phase AC motor drive	C	400	250	210
VFD370C43S-00	37 kW	73A	three-phase AC motor drive	D0-1	500	280	255
VFD450C43S-00	45 kW	91A	three-phase AC motor drive	D0-1	500	280	255
VFD550C43A-00	55 kW	110A	three-phase AC motor drive	D1	550	330	275
VFD750C43A-00	75 kW	150A	three-phase AC motor drive	D1	550	330	275
VFD900C43A-00	90 kW	180A	three-phase AC motor drive	E1	589	370	300
VFD1100C43A-00	110 kW	220A	three-phase AC motor drive	E1	589	370	300
VFD1320C43A-00	132 kW	260A	three-phase AC motor drive	F1	800	420	300
VFD1600C43A-00	160 kW	310A	three-phase AC motor drive	F1	800	420	300
VFD1850C43A-00	185 kW	370A	three-phase AC motor drive	G1	1000	500	397
VFD2000C43A-00	200 kW	395A	three-phase AC motor drive	G1	1000	500	397
VFD2500C43A-00	250 kW	481A	three-phase AC motor drive	G1	1000	500	397
VFD2800C43A-00	280 kW	550A	three-phase AC motor drive	H1	1435	700	398
VFD3150C43A-00	315 kW	616A	three-phase AC motor drive	H1	1435	700	398
VFD3550C43A-00	355 kW	683A	three-phase AC motor drive	H1	1435	700	398
VFD4000C43A-00	400 kW	770A	three-phase AC motor drive	H1	1435	700	398
VFD4500C43A-00	450 kW	866A	three-phase AC motor drive	H1	1435	700	398
VFD5000C43A-00	500 kW	930A	three-phase AC motor drive	H1	1435	700	398
VFD5600C43A-00	560 kW	1094A	three-phase AC motor drive	H1	1435	700	398

Frames A, B, C - built-in braking chopper, EMI filter and CANopen communication

Frames D,E,F,G,H - DC reactor built-in

C2000+ series - Features

Plus Overload capability



- Heavy Duty 150% 60 / 180% 3 sec.
- Super Heavy Duty 150% 60 / 200% 3 sec.



Power rating



Excellent Environment Adaptability





VP3000 series - Open-loop variable-torque standard drive

The Delta **VP3000** series provides new advanced features for a seamless and robust customer experience with predictive maintenance for key components, lower harmonics, reduced dimensions and a lower carbon footprint

VP3000 is ideal for variable-torque applications such as blowers, pumps, HVAC, water treatment and supply systems. With built-in support for **BACnet**, the drives are easily integrated with Building Management Systems.

- Custom development platform: Built-in PLC with 20k steps
- Functional safety: Built-in Safe Torque Off (STO) SIL3
- Built-in EMC filter: In compliance with **(EN61800-3 C2, C3)**
- High-speed network: Supports various industrial comm. protocols
- Enhanced PCB coating: In compliance with **(IEC 60721-3-3 class 3C3)**
- Energy efficiency: IM, PM, and high-efficiency SynRM motor control modes
- Lower harmonics: EN 61000-3-12 standard harmonics reach min. 35% (from 22 kW)
- PdM: Monitors key component's service life for stable equipment operation
- Built-in USB-C port: Facilitates drive setting, updating, real-time monitoring and system tuning

type	motor rating	rated current	description	frame size	dimensions (mm)		
					(H)	(W)	(D)

VP3000 series - Open-loop variable-torque standard drive

Three-phase input 380-480V 50/60Hz

VFD4A2VP43BFTAA	1.5 kW	4.2A	three-phase AC motor drive	A2	300	110	147
VFD5A6VP43BFTAA	2.2 kW	5.6A	three-phase AC motor drive	A2	300	110	147
VFD011VP43BFTAA	4.0 kW	11A	three-phase AC motor drive	A2	300	110	147
VFD013VP43BFTAA	5.5 kW	13A	three-phase AC motor drive	B2	300	110	167
VFD018VP43BFTAA	7.5 kW	18A	three-phase AC motor drive	B2	300	110	167
VFD025VP43BFTAA	11.0 kW	25A	three-phase AC motor drive	C2	380	142	213
VFD032VP43BFTAA	15.0 kW	32A	three-phase AC motor drive	C2	380	142	213
VFD038VP43BFTAA	18.5 kW	38A	three-phase AC motor drive	C2	380	142	213
VFD045VP43BFTCA	22 kW	45A	three-phase AC motor drive	D2	460	175	221
VFD062VP43BFTCA	30 kW	62A	three-phase AC motor drive	D2	460	175	221
VFD073VP43BFTCA	37 kW	73A	three-phase AC motor drive	E2	489	190	226
VFD090VP43BFTCA	45 kW	90A	three-phase AC motor drive	E2	489	190	226
VFD110VP43BFTCA	55 kW	110A	three-phase AC motor drive	F2	595	190	255
VFD150VP43BFTCA	75 kW	150A	three-phase AC motor drive	G2	660	199	310
VFD180VP43BFTCA	90 kW	180A	three-phase AC motor drive	H2	710	262	310
VFD220VP43BFTCA	110 kW	220A	three-phase AC motor drive	H2	710	262	310
VFD260VP43BFTCA	132 kW	260A	three-phase AC motor drive	I2	783	260	341
VFD310VP43BFTCA	160 kW	310A	three-phase AC motor drive	I2	783	260	341
VFD370VP43BFTCA	185 kW	370A	three-phase AC motor drive	J2	937	346	410
VFD460VP43BFTCA	220 kW	460A	three-phase AC motor drive	K2	955	380	410
VFD530VP43SHTCA	280 kW	530A	three-phase AC motor drive	L2	1279	345	529
VFD616VP43SHTCA	315 kW	616A	three-phase AC motor drive	L2	1279	345	529
VFD683VP43SHTCA	355 kW	683A	three-phase AC motor drive	L2	1279	345	529
VFD770VP43SHTCA	400 kW	770A	three-phase AC motor drive	L2	1279	345	529
VFD866VP43SHTCA	450 kW	866A	three-phase AC motor drive	M2	1434	345	529
VFD930VP43SHTCA	500 kW	930A	three-phase AC motor drive	M2	1434	345	529
VFD1K1VP43SHTCA	560 kW	1100A	three-phase AC motor drive	M2	1434	345	529

Accessories for VP3000 drives

EMV-R6AA	relay	plug-in extension card for multi-function output selection
EMV-A22A	analog	plug-in I/O extension card 0 - 10 V, 0 - 20mA/4 - 20mA
EMV-D42A	I/O	plug-in I/O extension card
EMC-COP01	CANopen	plug-in CANopen communication card
CMC-EIP02	EtherNet	plug-in EtherNet/IP, Modbus TCP communication card
CMC-PN01	PROFINET	plug-in PROFINET communication card
UC-CMC010-01A	1 m	CANopen CANopen cable (RJ45 connector)
UC-CMC020-01A	2 m	CANopen CANopen cable (RJ45 connector)
UC-CMC030-01A	3 m	CANopen CANopen cable (RJ45 connector)
UC-EMC010-02B	1 m	EtherNet EtherNet cable (shielded)
UC-EMC020-02B	2 m	EtherNet EtherNet cable (shielded)
UC-EMC050-02B	5 m	EtherNet EtherNet cable (shielded)

VP3000 series - Key features

Reduce Carbon Emissions



High-efficiency motor and system

Lower Harmonics


Harmonics standard
IEC61000-3-12 (THDi<48%)

User Friendly



Easy installation and maintenance



VFD866VP43SHTCA



Variable frequency drives - Variable-torque



HVAC



Fan



Pump



Motors



VFD150CP4EB-21



VFD450CP43S-21



VFD450FP4EA-52

CP2000 series - Fan and Pump purpose drives

CP2000 series AC motor drive for energy-saving HVAC systems and for pump and fan applications. Equipped with special HVAC parameters and PID control functions for efficient operation, multi-segment V/F control curve and soft start functions to assist frequent torque change and constant output applications with energy-saving performance.

General features:

- Built-in PLC (10K steps) programming capacity with real-time-clock and calendar
- Built-in RS-485 (Modbus) and BACnet MS/TP (expandable with optional extension cards)
- Multi-pump control of up to 8 motors provide fixed amount and fixed time circulation control
- Flying start and auto restart after momentary power loss functions, suitable for fan application
- Enhanced PCB coatings (IEC 60721-3-3 class 3C2 standard) ensures drive operation in harsh environments
- Default rated current: Light duty (break resistor chart, see page A-25)
- Dual rating chart for CP/CFP2000 drives - normal and heavy-duty applications (see page A-25)
- For drives exceeding 37 kW, an external EMI filter, see page A-24

type	motor rating	rated current	description	frame size	dimensions (mm)		
					(H)	(W)	(D)

CP2000 series - Fan/Pump vector control drives

Three-phase input 380-480V 50/60 Hz

VFD015CP4EB-21	1.5 kW	4.2A	three-phase AC motor drive	A	250	130	170
VFD022CP4EB-21	2.2 kW	5.5A	three-phase AC motor drive	A	250	130	170
VFD040CP4EA-21	4.0 kW	10.5A	three-phase AC motor drive	A	250	130	170
VFD055CP4EB-21	5.5 kW	13A	three-phase AC motor drive	A	250	130	170
VFD075CP4EB-21	7.5 kW	18A	three-phase AC motor drive	A	250	130	170
VFD110CP4EB-21	11 kW	24A	three-phase AC motor drive	B	320	190	190
VFD150CP4EB-21	15 kW	32A	three-phase AC motor drive	B	320	190	190
VFD185CP4EB-21	18.5 kW	38A	three-phase AC motor drive	B	320	190	190
VFD220CP4EA-21	22 kW	45A	three-phase AC motor drive	C	400	250	210
VFD300CP4EB-21	30 kW	60A	three-phase AC motor drive	C	400	250	210
VFD370CP4EB-21	37 kW	73A	three-phase AC motor drive	C	400	250	210
VFD450CP43S-21	45 kW	91A	three-phase AC motor drive	D0	500	280	255
VFD550CP43S-21	55 kW	110A	three-phase AC motor drive	D0	500	280	255
VFD750CP43B-21	75 kW	150A	three-phase AC motor drive	D	550	330	275
VFD900CP43A-21	90 kW	180A	three-phase AC motor drive	D	550	330	275
VFD1100CP43A-21	110 kW	220A	three-phase AC motor drive	E	589	370	300
VFD1320CP43B-21	132 kW	260A	three-phase AC motor drive	E	589	370	300
VFD1600CP43A-21	160 kW	310A	three-phase AC motor drive	F	800	420	300
VFD1850CP43B-21	185 kW	370A	three-phase AC motor drive	F	800	420	300
VFD2200CP43A-21	220 kW	460A	three-phase AC motor drive	G1	1000	500	397
VFD2800CP43A-21	280 kW	530A	three-phase AC motor drive	G1	1000	500	397
VFD3150CP43A-00	315 kW	616A	three-phase AC motor drive	H1	1435	700	398
VFD3550CP43A-00	355 kW	683A	three-phase AC motor drive	H1	1435	700	398
VFD4000CP43A-00	400 kW	770A	three-phase AC motor drive	H1	1435	700	398
VFD5000CP43A-00	500 kW	930A	three-phase AC motor drive	H1	1435	700	398

Frames A, B, C - built-in braking chopper, EMI filter. Frames D,E,F,G,H - DC reactor built-in
Flange mount kits for rear projecting heat sinks for improved ventilation (see accessories page)
Larger sizes up to 630kW available on request

CFP2000 series - Drives for Fans and Pumps

IP55

CFP2000 series designed with an industry leading IP55 enclosure providing protection from dust and water. It includes many outstanding features and built-in functionality, reducing setup and tuning time while providing higher efficiency.

- Built-in EMI filter (meets EN61800-3)
- Built-in DC choke (meets EN6100-3-12)
- Built-in Safe Torque Off (STO) SIL2 function and 2 sets of PID controller functions
- Enhanced PCB coating to (IEC 60721-3-3 class 3C3) ensures reliability in harsh environments

Three-phase input 380-480V 50/60 Hz

VFD015FP4EA-52	1.5 kW	4.2A	three-phase AC motor drive	A-1	366	161	199
VFD022FP4EA-52	2.2 kW	5.5A	three-phase AC motor drive	A-1	366	161	199
VFD040FP4EA-52	4.0 kW	10.5A	three-phase AC motor drive	A-1	366	161	199
VFD055FP4EA-52	5.5 kW	13A	three-phase AC motor drive	A-1	366	161	199
VFD075FP4EA-52	7.5 kW	18A	three-phase AC motor drive	A-1	366	161	199
VFD110FP4EA-52	11 kW	24A	three-phase AC motor drive	B-1	491	216	229
VFD150FP4EA-52	15 kW	32A	three-phase AC motor drive	B-1	491	216	229
VFD185FP4EA-52	18.5 kW	38A	three-phase AC motor drive	B-1	491	216	229
VFD220FP4EA-52	22 kW	45A	three-phase AC motor drive	B-1	491	216	229
VFD300FP4EA-52	30 kW	60A	three-phase AC motor drive	C-1	630	282	265
VFD370FP4EA-52	37 kW	73A	three-phase AC motor drive	C-1	630	282	265
VFD450FP4EA-52	45 kW	91A	three-phase AC motor drive	D0-1	680	308	307
VFD550FP4EA-52	55 kW	110A	three-phase AC motor drive	D0-1	680	308	307
VFD750FP4EA-52	75 kW	150A	three-phase AC motor drive	D-1	770	370	335
VFD900FP4EA-52	90 kW	180A	three-phase AC motor drive	D-1	770	370	335

Frames A-1, B-1, C-1 - built-in braking chopper



IFD6500



MKC-DN1CB



CMC-EIP02



FIN538S1.075.M

Accessories for C2000+, CP/CFP2000 series drives

Delta's AC Motor Drive product line provides a full range of motor control technologies and accessories that can be used throughout a wide range of industries to enhance and improve machine automation.

type	device	description	
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Hardware accessories

KPC-CC01	keypad	with LCD, parameters backup function	C series drives
MKC-KPPK	bracket	remote panel adapter for KPC-CC01 (IP66)	C series drives
EMC-D42A	DC 24V	digital I/O extension card, selectable NPN/PNP	4DI / 2DO
EMC-A22A	analog	I/O extension card, selectable 0-10V/4-20mA	2AI / 2AO
EMC-R6AA	card	multi-function relay output extension card	6 relay
IFD6530	converter/program	USB to RS-485 - KPC-CC01 and C series drives	

Mounting accessories

Flange mount kits to permit the chassis mounting of drives with the heat-sink section protruding from the rear of the enclosure for improved cooling/heat dissipation of drives.

MKC-AFM	flange	mount kit for rear exposure of heat sink	for drive frame A
MKC-BFM	flange	mount kit for rear exposure of heat sink	for drive frame B
MKC-CFM	flange	mount kit for rear exposure of heat sink	for drive frame C

Base mounting flange can be moved to central position to expose heat sinks for frames D, E, F.

Conduit boxes

• Application:	Wall mount IP00 - IP21		
MKC-DN1CB	frame D	Conduit box kit for frame D1 (<i>not</i> D01)	
MKC-EN1CB	frame E	Conduit box kit for frame E1	
MKC-FN1CB	frame F	Conduit box kit for frame F1	

PG cards for C2000 drives

type	output voltage	PG 1-300kHz motor encoder	PG 2-300kHz optional pulse command	PG out re-transmission 1-255 ratio
EMC-PG01L	5 or 12 VDC	Line drive / Open collector	Line drive / Open collector	Line driver
EMC-PG01O	5 or 12 VDC	Line drive / Open collector	Line drive / Open collector	Open collector
EMC-PG01U	5 or 12 VDC	Line drive with commutation	Line drive / Open collector	Line driver

Fieldbus modules for drives (*plugs into drive*)

type	comms	description		rate
CMC-EIP02	EtherNet/IP	supports, Modbus TCP protocols	2 port	10/100 Mbps
CMC-PD01	Profibus-DP	plug-in communication card		9.6kbps - 12Mbps
EMC-COP01	CANopen	plug-in communication card		50kbps - 1Mbps
CMC-EC01	EtherCAT	plug-in 2 port comm. card		100 Mbps
CMC-PN01	Profinet	plug-in 2 port comm. card		10/100 Mbps Auto-Detect

Cables for above communication cards

UC-CMC010-01A	CANopen	standard fieldbus cable, RJ45 connector	1 meter
UC-CMC030-01A	CANopen	standard fieldbus cable, RJ45 connector	3 meter
UC-EMC010-02B	Ethernet	shielded Ethernet cable	1 meter
UC-EMC050-02B	Ethernet	shielded Ethernet cable	5 meter

EMI Filtering for Delta Drives –

FIN538S1 series EMC filters are specifically designed to reduce EMI in compliance with IEC 61800-3, making them ideal for Delta CP2000, CFP2000, and C2000+ series drives.

- Compliance with Australian EMC regulations (AS/NZS CISPR 11 & 22)

type	rated amps	max output cable CE	emissions conducted	emissions radiated	carrier freq	dimensions (mm)		
						(H)	(W)	(D)

- Connection: **M**: Terminal block (*up to 180A*) - **V**: Screw connection - **BC**: Busbar connection
- Overload: 4 x Rated current (*Switch ON*) / 2 x In 10 seconds / 1.5 In for 10 minutes
- Approvals: UL 1283; CSA C22.2 No.8 - complies with IEC 60939

Category C2/C3 - 400V three-phase (600VAC)

FIN538S1.075.M	75A	150m	C3	C3	<6kHz	135	85	270
FIN538S1.100.M	100A	150m	C3	C3	<4kHz	155	90	270
FIN538S1.130.M	130A	150m	C3	C3	<4kHz	155	90	270
FIN538S1.180.M	180A	150m	C3	C3	<4kHz	170	125	380
FIN538S1.250.V	250A	150m	C3	C3	<4kHz	90	220	356
FIN538S1.280.V	280A	100m	C3	C3	<4kHz	90	220	356
FIN538S1.500.BC	500A	100m	C3	C3	<4kHz	150	230	420
FIN538S1.750.BC	750A	100m	C3	C3	<4kHz	150	230	420

Larger sizes on request

Brake resistors chart for drives

Drive FRAME	Resistor connection per brake unit	Resistor	ME 300	MS 300	C2000+	Breaking Unit(s)	Total qty resistors
230V 1ph drives - 125% Braking torque/ 10 % ED							
200 W	Single	BR080W750	Yes	Yes		Built in	1
400 W	Single	BR080W200	Yes	Yes		Built in	1
750 W	Single	BR080W200	Yes	Yes		Built in	1
1.5 kW	Single		Yes	Yes		Built in	1
2.2 kW	Single	BR300W070	Yes	Yes		Built in	1
3.7 kW	2 in parallel	BR300W070				Built in	2
400V 3ph drives - 125% Braking torque/ 10 % ED							
400 W	Single	BR080W750	Yes	Yes		Built in	1
750 W	Single	BR080W750	Yes	Yes	Yes	Built in	1
1.5 kW	Single	BR200W360	Yes	Yes	Yes	Built in	1
2.2 kW	Single	BR300W250	Yes	Yes	Yes	Built in	1
4 kW	2 in parallel	BR300W250	Yes	Yes	Yes	Built in	1
5.5 kW	Single	BR1K0W075	Yes	Yes	Yes	Built in	1
7.5 kW	Single	BR1K0W075	Yes	Yes	Yes	Built in	1
11 kW	Single	BR1K5W043		Yes	Yes	Built in	1
15 kW	Single	BR1K0W016 * 2		Yes	Yes	Built in	1
18.5 kW	Single	BR1K0W016 * 2		Yes	Yes	Built in	1
22 kW	Single	BR1K5W013 * 2		Yes	Yes	Built in	1
30 kW	Single	BR1K2W015 * 4			Yes	Built in	
37 kW	Single	BR1K2W015 * 4			Yes		1
45 kW	Single	BR1K5W013 * 4			Yes		1
55 kW	Single				Yes		2
75 kW	Single	BR1K2W015 * 4			Yes		2
90 kW	Single	BR1K5W013 * 2			Yes		2
110 kW	2 in parallel				Yes		2
132 kW	4 in parallel				Yes		4
160 kW	4 in parallel				Yes		4
185 kW	4 in parallel				Yes		4
200 kW	2 in parallel				Yes		4
220 kW	2 in parallel				Yes		4
250 kW	4 in parallel				Yes		8
280 kW	4 in parallel				Yes		8
315 kW	4 in parallel				Yes		8
355 kW	4 in parallel				Yes		8
400 kW	3 in parallel				Yes		9
450 kW	3 in parallel				Yes		9
500 kW	4 in parallel				Yes		12
560 kW	3 in parallel				Yes		12

Braking resistor - selection criteria

Selection of braking resistor must respect 3 criteria:

1. Resistance of braking resistor must be equal or greater then minimal allowed resistance R_{min} . This value is available in the above table and in the Delta user manual
2. Power of the braking resistor must be adequate to load and load cycle. Having more wattage allows for a larger ED(%). Delta recommends 3 x the recommended wattage for continuous braking.
3. Resistance of braking resistor must be equal or less then maximal resistance R_{max} : use the following calculation to determine maximum resistance (Ohms = (DC bus volts)² / (Peak power of VFD)

Parallel connection



Series connection



Drive rating chart C2000+

Drive series	(Default) Heavy Duty		Super Heavy Duty	
	150% (60sec) / 180% (3 sec)		150% (60sec) / 200% (3 sec)	
	kW	Rated Amps	kW	Rated Amps
VFD007C4EA-21*	0.75	3	0.4	1.7
VFD015C4EA-21*	1.5	4	0.75	3
VFD022C4EA-21*	2.2	6	1.5	4
VFD040C4EA-21*	4	10.5	3.7	9
VFD055C4EA-21*	5.5	12	4	10.5
VFD075C4EA-21*	7.5	18	5.5	12
VFD110C4EA-21*	11	24	7.5	18
VFD150C4EA-21*	15	32	11	24
VFD185C4EA-21*	18.5	38	15	32
VFD220C4EA-21*	22	45	18.5	38
VFD300C4EA-21*	30	60	22	45
VFD370C43S-00	37	73	30	60
VFD450C43S-00	45	91	37	73
VFD550C43A-00	55	110	45	91
VFD750C43A-00	75	150	55	110
VFD900C43A-00	90	180	75	150
VFD1100C43A-00	110	220	90	180
VFD1320C43A-00	132	260	110	220
VFD1600C43A-00	160	310	132	260
VFD1850C43A-00	185	370	160	310
VFD2000C43A-00	200	395	160	310
VFD2200C43A-00	220	460	185	370
VFD2500C43A-00	250	481	200	395
VFD2800C43A-00	280	550	220	460
VFD3150C43A-00	315	616	280	550
VFD3550C43A-00	355	683	315	616
VFD4000C43A-00	400	770	355	683
VFD4500C43A-00	450	866	355	683
VFD5000C43A-00	500	930	450	866
VFD5600C43A-00	560	1094	500	930

Drive rating chart CP2000 / CFP2000

Drive series	(Default) Light Duty		Normal Duty	
	120% (1min)		120% (1min) / 160% (3 sec)	
	kW	Rated Amps	kW	Rated Amps
VFD015CP/FP	1.5	4.2	0.75	3
VFD022CP/FP	2.2	5.5	1.5	4
VFD040CP/FP	4	10.5	3.7	9
VFD055CP/FP	5.5	13	4	10.5
VFD075CP/FP	7.5	18	5.5	12
VFD110CP/FP	11	24	7.5	18
VFD150CP/FP	15	32	11	24
VFD185CP/FP	18.5	38	15	32
VFD220CP/FP	22	45	18.5	38
VFD300CP/FP	30	60	22	45
VFD370CP/FP	37	73	30	60
VFD450CP/FP	45	91	37	73
VFD550CP/FP	55	110	45	91
VFD750CP/FP	75	150	55	110
VFD900CP/FP	90	180	75	150
VFD1100CP/FP	110	220	90	180
VFD1320CP/FP	132	260	110	220
VFD1600CP/FP	160	310	132	260
VFD1850CP/FP	185	370	160	310
VFD2200CP/FP	220	460	185	370
VFD2800CP/FP	280	530	220	460
VFD3150CP/FP	315	616	280	550
VFD3550CP/FP	355	683	315	616
VFD4000CP/FP	400	770	355	683

Drive dual rating chart ME300 / MS300

Dual rating allows drives to be used across a range of applications according to overload capacity required, for example:

Light Duty / Normal Duty - Fan and pump application
Heavy Duty - Compressor, crusher, spindle and conveyor

Drive series	(Default) Heavy Duty		Normal Duty	
	150% (60sec) / 200% (3sec)		120% (60sec) / 150% (3sec)	
	kW	Rated Amps	kW	Rated Amps
VFD1A6ME/MS21	0.2	1.6	0.3	1.8
VFD2A8ME/MS21	0.4	2.8	0.55	3.2
VFD4A8ME/MS21	0.75	4.8	0.9	5
VFD7A5ME/MS21	1.5	7.5	1.8	8.5
VFD11A1ME/MS21	2.2	11	3	12.5
VFD1A5ME/MS43	0.4	1.5	0.55	1.8
VFD2A7ME/MS43	0.75	2.7	1.1	3
VFD4A2ME/MS43	1.5	4.2	1.6	4.6
VFD5A5ME/MS43	2.2	5.5	2.8	6.5
VFD9A0ME/MS43	4	9	4.5	10.5
VFD13A1ME/MS43	5.5	13	6	15.7
VFD17A1ME/MS43	7.5	17	8.5	20.5
VFD25AMS43AFS	11	25	12	28
VFD32AMS43AFS	15	32	17	36
VFD38AMS43AFS	18.5	38	20	41.5
VFD45AMS43AFS	22	45	24	49

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