Electromechanical starters and enclosures

- Direct-on-line starters in non-metallic enclosure complete with or without thermal relay
- Versions with RESET or START/STOP pushbuttons
- Non-metallic enclosures for customer-assembled starters
- Reversing and changeover contactor assemblies
- Star-delta starters, open frame and in non-metallic enclosure versions.

Page 4-2

DIRECT-ON-LINE STARTERS

- Motor ratings up to 80A 440V in IEC AC3 duty
- Motor rating up to 52A 600V per UL/CSA
- Versions with Start-Stop/Reset buttons or Reset button
- Versions with and without thermal relay
- Versions with motor protection circuit breaker.

Page 4-5

REVERSING CONTACTOR ASSEMBLIES

- For three-phase motor control 9...25A 440V / 4...12.5kW 400V, in IEC AC3 duty and up to 15HP 600V per UL/CSA
- Versions with built-in or external mechanical interlock
- Complete with rigid connections
- PCB version 9A 440V / 4kW 400V in IEC AC3 duty; 5HP 300V per UL/CSA.

Page 4-5

CHANGEOVER CONTACTOR ASSEMBLIES

- From 20A to 165A loads at ≤40°C in IEC AC1 duty
- For 20A general use per UL/CSA
- With built-in mechanical interlock.

Page 4-6

STAR-DELTA STARTERS OPEN FRAME

- Suitable for three-phase motor control, 16A...225A 440V / 7.5kW...132kW 400V ratings in IEC AC3 duty.

Page 4-7

STAR-DELTA STARTERS IN NON-METALLIC ENCLOSURE

- Suitable for three-phase motor control, 16...60A 440V / 7.5kW...30kW 400V ratings in IEC AC3 duty.

Page 4-8

EMPTY NON-METALLIC ENCLOSURES

- Versions without pushbuttons, with Reset button only or Start-Stop/Reset buttons
- For starters, with pushbuttons and metal plate
- Suitable to contain BG mini-contactor or BF09A to BF80 contactors, up to 110A 440V rating in IEC AC3 duty; up to 52A at 600V for UL/CSA.

Lovato electric

Enclosed with thermal overload relay


M0P...12


M0R...12


M1P...12


M1R...12


M2P...12


M2R...12


M25P03812


M25R03812


M3P...12


M3R...12

Order code	Relay adj range	IEC technical characteristics (≤440V) Ie	kW	Qty per pkg	Wt
	[A]	[A]	[kW]	n°	[kg]
Starters with Start and Stop/Reset pushbuttons ❷.					
M0P00912❶01	0.6-1	1	0.18-0.25	1	0.760
M0P00912❶1V5	0.9-1.5	1.5	0.37	1	0.760
M0P00912❶2V3	1.4-2.3	2.3	0.55-0.75	1	0.760
M0P00912❶33	2-3.3	3.3	1.1	1	0.760
M0P00912❶5	3-5	5	1.5-2.2	1	0.760
M0P00912❶75	4.5-7.5	7.5	2.2-3	1	0.760
M0P00912❶10	6-10	10	3-4	1	0.760
M0P01212❶15	9-15	12	5.5	1	0.760
M1P00912❶A4	0.63-1	1	0.25	1	1.040
M1P00912❶A5	1-1.6	1.6	0.37-0.55	1	1.040
M1P00912❶A6	1.6-2.5	2.5	0.75	1	1.040
M1P00912❶A7	2.5-4	4	1.1-1.5	1	1.040
M1P00912❶A8	4-6.5	6.5	2.2-3	1	1.040
M1P00912❶A9	6.3-10	10	3-4	1	1.040
M1P00912❶B0	9-14	13	5.5	1	1.040
M1P01812❶B1	13-18	18	7.5	1	1.040
M2P02512❶B2	17-23	23	11	1	1.220
M2P02512❶B3	20-25	25	11	1	1.220
M2P03212❶B4	24-32	32	15	1	1.300
M25P03812❶B5	32-38	38	18.5	1	2.880
M3P05012❶B6	35-50	50	18.5-22	1	3.760
M3P06512❶B7	46-65	65	30	1	3.760
M3P08012❶B8	60-82	80	37-45	1	3.760
Starters with Reset pushbuttons ❷.					
M0R00912❶01	0.6-1	1	0.18-0.25	1	0.720
M0R00912❶1V5	0.9-1.5	1.5	0.37	1	0.720
M0R00912❶2V3	1.4-2.3	2.3	0.55-0.75	1	0.720
M0R00912❶33	2-3.3	3.3	1.1	1	0.720
M0R00912❶5	3-5	5	1.5-2.2	1	0.720
M0R00912❶75	4.5-7.5	7.5	2.2-3	1	0.720
M0R00912❶10	6-10	10	3-4	1	0.720
M0R01212❶15	9-15	12	5.5	1	0.720
M1R00912❶A4	0.63-1	1	0.25	1	0.995
M1R00912❶A5	1-1.6	1.6	0.37-0.55	1	0.995
M1R00912❶A6	1.6-2.5	2.5	0.75	1	0.995
M1R00912❶A7	2.5-4	4	1.1-1.5	1	0.995
M1R00912❶A8	4-6.5	6.5	2.2-3	1	0.995
M1R00912❶A9	6.3-10	10	3-4	1	0.995
M1R00912❶B0	9-14	13	5.5	1	0.995
M1R01812❶B1	13-18	18	7.5	1	0.995
M2R02512❶B2	17-23	23	11	1	1.165
M2R02512❶B3	20-25	25	11	1	1.165
M2R03212❶B4	24-32	32	15	1	1.260
M25R03812❶B5	32-38	38	18.5	1	2.600
M3R05012❶B6	35-50	50	18.5-22	1	3.410
M3R06512❶B7	46-65	65	30	1	3.410
M3R08012❶B8	60-82	80	37-45	1	3.410

❶ Complete order code with coil voltage digit (if 50/60Hz) or with voltage digit followed by 60 (if 60Hz).
Standard voltages are as follows:
– AC 50/60Hz 024 / 048 / 110 / 230 / 400V
– AC 60Hz 024 60 / 048 60 / 120 60 / 220 60 / 230 60 / 460 60 / 575 60 (V).
Example: M0R009120241 for direct-on-line starter in M0 type enclosure with Reset button, 9A/AC3 contactor with 24VAC 50/60Hz coil and 0.6-1A thermal overload relay.
M0P00912024601 for direct-on-line starter in M0 type enclosure with Start and Stop/Reset buttons , 9A /AC3 contactor with 24VAC 60Hz coil and 0.6-1A thermal overload relay.

❷ Protection fuses are to be mounted externally by the user.

Components

Starter enclosure	Contactor	Thermal relay	Auxiliary contact block
M0PA	BG0910A	RF91	—
M0PA	BG0910A	RF91V5	—
M0PA	BG0910A	RF92V3	—
M0PA	BG0910A	RF933	—
M0PA	BG0910A	RF95	—
M0PA	BG0910A	RF975	—
M0PA	BG0910A	RF910	—
M0PA	BG1210A	RF915	—
M1PA	BF0910A	RF380100	—
M1PA	BF0910A	RF380160	—
M1PA	BF0910A	RF380250	—
M1PA	BF0910A	RF380400	—
M1PA	BF0910A	RF380650	—
M1PA	BF0910A	RF381000	—
M1PA	BF0910A	RF381400	—
M1PA	BF1810A	RF381800	—
M2PA	BF2510A	RF382300	—
M2PA	BF2510A	RF382500	—
M2PA	BF3200A	RF383200	G41810
M25PA	BF3800A	RF383800	G41810
M3PA	BF5000A	RF825000	G41810
M3PA	BF6500A	RF826500	G41810
M3PA	BF8000A	RF828200	G41810
M0RA	BG0910A	RF91	—
M0RA	BG0910A	RF91V5	—
M0RA	BG0910A	RF92V3	—
M0RA	BG0910A	RF933	—
M0RA	BG0910A	RF95	—
M0RA	BG0910A	RF975	—
M0RA	BG0910A	RF910	—
M0RA	BG1210A	RF915	—
M1RA	BF0910A	RF380100	—
M1RA	BF0910A	RF380160	—
M1RA	BF0910A	RF380250	—
M1RA	BF0910A	RF380400	—
M1RA	BF0910A	RF380650	—
M1RA	BF0910A	RF381000	—
M1RA	BF0910A	RF381400	—
M1RA	BF1810A	RF381800	—
M2RA	BF2510A	RF382300	—
M2RA	BF2510A	RF382500	—
M2RA	BF3200A	RF383200	G41810
M25RA	BF3800A	RF383800	G41810
M3RA	BF5000A	RF825000	G41810
M3RA	BF6500A	RF826500	G41810
M3RA	BF8000A	RF828200	G41810

Certifications and compliance
Refer to page 4-3 for details.

Special M3... versions
Refer to page 4-3 for details.

UL/CSA HP ratings
See page 4-24.

Enclosed without thermal overload relay


M0P...10


M0R...10


M1P...10


M1R...10


M2P...10


M2R...10


M25P03810


M25R03810


M3P...10


M3R...10

Order code	Maximum operating current (≤440V)	Qty per pkg	Wt
	[A]	n°	[kg]
Starters with Start and Stop/Reset pushbuttons ❷.			
M0P00910❶	10	1	0.667
M0P01210❶	12	1	0.667
M1P00910❶	13	1	0.910
M1P01810❶	18	1	0.910
M2P02510❶	25	1	1.060
M2P03210❶	32	1	1.162
M25P03810❶	38	1	2.360
M3P05010❶	50	1	3.110
M3P06510❶	65	1	3.110
M3P08010❶	80	1	3.110
Starters with Reset pushbutton ❷.			
M0R00910❶	10	1	0.627
M0R01210❶	12	1	0.627
M1R00910❶	13	1	0.867
M1R01810❶	18	1	0.867
M2R02510❶	25	1	1.020
M2R03210❶	32	1	1.110
M25R03810❶	38	1	2.320
M3R05010❶	50	1	3.070
M3R06510❶	65	1	3.070
M3R08010❶	80	1	3.070

Components

Starter enclosure standard supplied	Contactor standard supplied	Thermal relay to purchase separately	Auxiliary contact standard supplied
M0PA	BG0910A	RF9❸	—
M0PA	BG1210A	RF9❸	—
M1PA	BF0910A	RF38❹	—
M1PA	BF1810A	RF38❹	—
M2PA	BF2510A	RF38❹	—
M2PA	BF3200A	RF38❹	G41810
M25PA	BF3800A	RF38❹	G41810
M3PA	BF5000A	RF82❺	G41810
M3PA	BF6500A	RF82❺	G41810
M3PA	BF8000A	RF82❺	G41810
M0RA	BG0910A	RF9❸	—
M0RA	BG1210A	RF9❸	—
M1RA	BF0910A	RF38❹	—
M1RA	BF1810A	RF38❹	—
M2RA	BF2510A	RF38❹	—
M2RA	BF3200A	RF38❹	G41810
M25RA	BF3800A	RF38❹	G41810
M3RA	BF5000A	RF82❺	G41810
M3RA	BF6500A	RF82❺	G41810
M3RA	BF8000A	RF82❺	G41810

❶ Complete order code with coil voltage digit if 50/60Hz or with voltage digit followed by 60 if 60Hz.
Standard voltages are as follows:
– AC 50/60Hz 024 / 048 / 110 / 230 / 400V
– AC 60Hz 024 60 / 048 60 / 120 60 / 220 60 / 230 60 / 460 60 / 575 60 (V).
Example: M0R009100241 for direct-on-line starter in M0 type enclosure with Reset button, 9A /AC3 contactor with 24VAC 50/60Hz coil.
M0P00910024601 for direct-on-line starter in M0 type enclosure with Start and Stop/Reset buttons , 9A /AC3 contactor with 24VAC 60Hz coil.

❷ Protection fuses are to be mounted externally by the user.

❸ For thermal overload relay selection, refer to pages 3-2 or 3-3.
❹ For thermal overload relay selection, refer to pages 3-4.
❺ For thermal overload relay selection, refer to pages 3-4 or 3-5.

General characteristics
The M0..., M1..., M2..., M25... and M3...UL enclosures are made in UV protected polycarbonate. They are ideal to assemble starters for stand alone motors; robust and easily customizable adding pushbuttons, selector switches, pilot lights, modular time relays, modular level controls, etc.
M3 enclosures are made in ABS plastic material: a version in polycarbonate is available by adding the UL suffix at the end of the code.

Operational characteristics
– Cable entry:
  • M0/M1... - 2 knockouts PG13.5/M20 on enclosure top and bottom
  • M2... - 2 knockouts PG13.5/M20 or PG16/M25 on enclosure top and bottom
  • M25... - 2 knockouts PG16/M25-PG29/M32 on enclosure top and bottom
  • M3... - Smooth surfaces; can be drilled by customer
– Ambient conditions:
  • Operating temperature: -25...+60°C
  • Storage temperature: -40...+70°C
– Degree of protection: IEC IP65 for all; Type 4/4X industrial control environment for M1/M2/M25... and M3... UL versions.

Special M3... versions
In addition to standard-indicated versions, cULus certified starters are available up to 52A motor control or 65A general use rating max.
Add suffix **UL** to the order code, e.g. M3P05010024**UL**.

UL/CSA HP ratings
See page 4-24.

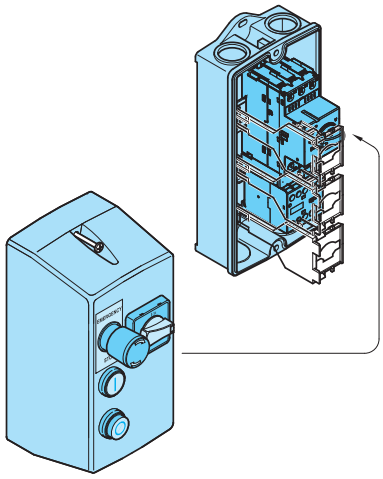
Certifications and compliance
Certifications obtained: UL Listed for USA and Canada cULus - File E93602) and CSA certified for Canada and USA (cCSAus - File 94157) as Magnetic Motor Controllers, enclosed type, for all M0-M1-M2-M25P/R... starters and M3P/R50-65...UL types as indicated in "Special M3" above; EAC for all.
Compliant with standards: IEC/EN/BS 60947-1, IEC/EN/BS 60947-4-1, UL 60947-1, UL 60947-4-1, CSA C22.2 n° 60947-1, CSA C22.2 n° 60947-4-1.

Enclosed with motor protection circuit breaker

M2P00911....

Order code	Thermal trip adjustment range	IEC technical characteristics (≤440V) Ie	kW	Qty per pkg	Wt
	[A]	[A]	[kW]	n°	[kg]
M2P00911❶A4	0.63-1	1	0.25	1	1.450
M2P00911❶A5	1-1.6	1.6	0.37-0.55	1	1.450
M2P00911❶A6	1.6-2.5	2.5	0.75	1	1.515
M2P00911❶A7	2.5-4	4	1.1-1.5	1	1.515
M2P00911❶A8	4-6.5	6.5	2.2-3	1	1.515
M2P00911❶A9	6.3-10	10	3-5	1	1.515
M2P00911❶B0	9-14	13	5.5	1	1.515

❶ Complete order code with coil voltage digit (if 50/60Hz) or with voltage digit followed by 60 (if 60Hz).
Standard voltages are as follows:
– AC 50/60Hz 024 / 048 / 110 / 230 / 400V
– AC 60Hz 024 60 / 048 60 / 120 60 / 220 60 / 230 60 / 460 60 / 575 60 (V).
Example: M2P00911400A8 for direct-on-line starter in M2 type with reset and reset/emergency button, 9A/AC3 contactor with 400VAC 50/60Hz coil and motor protection circuit breaker 4...6.5A.



General characteristics
M2P00911... is ideal for starting applications on small machines. It is robust and fully functional for machine control: start, stop, emergency stop, overload protection, short circuit protection and disconnection (insulation function), padlockable in OFF position.

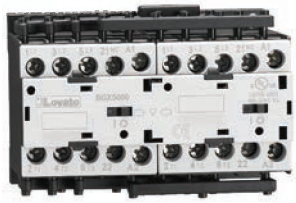
General characteristics
The M2P00911... starters are composed of an IP65 plastic enclosure where the following devices are mounted:
– a motor protection circuit breaker type SM1R... with the short circuit and overload protection function
– a contactor with start / stop function of the motor
– 2 push-buttons for the start and stop
– a mushroom push-button for the emergency stop
– a padlockable rotary actuator, that operates the circuit breaker, for the isolation, with door coupling function.

These starters are easily and quickly installed. They are especially suitable to operate the motor of smaller machines where there is no electrical panel.
Inside the enclosure, other components can be added like timers, level relays, protection relays, etc.

Operational characteristics
– M2... - 2 knockouts PG13.5/M20 or PG16/M25 on enclosure top and bottom
– Ambient conditions:
  • Operating temperature: -25...+60°C
  • Storage temperature: -40...+70°C
– Degree of protection: IEC IP65.

Certifications and compliance
Certifications obtained: EAC.
Compliant with standards: IEC/EN/BS 60947-1, IEC/EN/BS 60947-4-1.

Reversing contactor



11BGR...

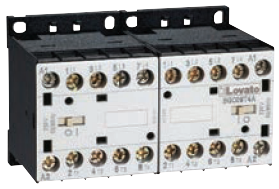
BFA...

11BGT...

11BGTP...

Order code	IEC Ie (AC3) ≤440V ≤55°C	Max. IEC power AC3 400V at ≤55°C	Built-in auxiliary contacts		Qty per pkg	Wt
	[A]	[kW]	NO	NC	n°	[kg]
AC COIL. Terminals: clamp screw. External interlock with power and auxiliary wiring.						
11BGR0901A❶	9	4	0	1❸	1	0.394
11BGR1201A❶	12	5.7	0	1❸	1	0.394
BFA00942❶	9	4.2	0	1❸	1	0.760
BFA01242❶	12	5.7	0	1❸	1	0.760
BFA01842❶	18	7.5	0	1❸	1	0.760
BFA02542❶	25	12.5	0	1❸	1	0.760
Built-in interlock with power wiring only.						
11BGT0910A❶	9	4	1❸	0	1	0.380
11BGT1210A❶	12	5.7	1❸	0	1	0.380
Rear terminals: PCB solder pins. Built-in interlock only.						
11BGTP0901A❶	9	4❹	0	1❸	1	0.400
DC COIL. Terminals: clamp screw. External interlock with power and auxiliary wiring.						
11BGR0901D❷	9	4	0	1❸	1	0.460
11BGR1201D❷	12	5.7	0	1❸	1	0.460
Built-in interlock with power wiring only.						
11BGT0910D❷	9	4	1❸	0	1	0.445
11BGT1210D❷	12	5.7	1❸	0	1	0.445
Rear terminals: PCB solder pins. Built-in interlock only.						
11BGTP0901D❷	9	4❹	0	1❸	1	0.460

Changeover contactor assemblies 4 poles



11BGC09 ...

new

BFC150T4A230

Order code	IEC Operating current (AC1) ≤40°C	≤55°C	≤60°C	UL/CSA General Use	Qty per pkg	Wt
	[A]	[A]	[A]	[A]	n°	[kg]
AC COIL. Terminals: clamp screw. Built-in interlock only.						
11BGC09T4A❶	20	18	15	20	1	0.365
AC COIL 230V 50/60HZ. Terminals: screw. Side mount mechanical interlock with 2NC contacts.						
BFC18T4A230	32	26	23		1	0.786
BFC38T4A230	56	45	40		1	1.068
BFC80T4A230	115	95	80		1	2.532
BFC95T4A230	140	115	100		1	4.892
BFC150T4A230	165	135	118		1	4.892
DC COIL. Terminals: clamp screw. Built-in interlock only.						
11BGC09T4D❷	20	18	15	20	1	0.450

❶ Complete order code with coil voltage digit or with voltage digit followed by 60 if 60Hz. Standard voltages are as follows:
– AC 50/60Hz 024 / 048 / 110 / 230 / 400V
– AC 60Hz 024 60 / 048 60 / 120 60 / 220 60 / 230 60 / 460 60 / 575 60 (V).
Example: 11BGR0901A024 for reversing contactor assembly with 2 mini-contactors BG09 having 1 NC auxiliary contact each and 24VAC 50/60Hz coil.
11BGR0901A02460 for reversing contactor assembly with 2 mini-contactors BG09 having 1 NC auxiliary contact each and 24VAC 60Hz coil.

❷ Complete order code with coil voltage digit.
Standard voltages are:
– DC 012 / 024 / 048 / 060 / 110 / 125 / 220V.
Example: 11BGC09T4D012 is a changeover contactor assembly with 2 mini-contactors BG09 having 4 main poles each and 12VDC coil.

❸ One auxiliary contact for each contactor.

❹ Maximum voltage is limited at 300V for UL. For certified type up to 600V, consult Technical support; see contact details inside front cover.

General characteristics

REVERSING CONTACTOR ASSEMBLIES
Supplied complete, ready for quick mounting.
The various versions are composed as follows:
BGR... Screw termination, external mechanical interlock BGX5000, power and auxiliary wiring.
BGT... Screw termination, built-in mechanical interlock and power wiring only.
BGTP... Rear PCB solder pin termination, built-in mechanical interlock only.
No thermal overload relay can be directly mounted to BG... reversing contactor assemblies.
BFA... Screw termination, external mechanical interlock BFX5002 and power wiring.
The thermal overload relay RF38... can be directly mounted to BFA... reversing contactor assemblies; for selection, refer to section 3.

CHANGEOVER CONTACTOR ASSEMBLIES 4 POLES
Supplied complete, ready for quick mounting as follows: 11BGC... with built-in mechanical interlock, BFC... with side mounting mechanical interlock including NC contacts for electrical interlock. The changeover contactor assemblies are made with four-pole contactors.
No power or auxiliary wiring included.

Operational characteristics

Type	Maximum IEC operational power at ≤55°C (AC3) 230V [kW]	400V [kW]	415V [kW]	440V [kW]	500V [kW]	690V [kW]
BGR09	2.2	4	4.3	4.5	5	5
BGT09	2.2	4	4.3	4.5	5	5
BGTP09❹	2.2	4	4.3	4.5	5	–
BGR12	3.2	5.7	6.2	5.5	5	5
BGT12	3.2	5.7	6.2	5.5	5	5
BFA009	2.2	4.2	4.5	4.8	5.5	7.2
BFA012	3.2	5.7	6.2	6.2	7.5	10
BFA018	4	7.5	9	9	10	10
BFA025	7	12.5	13.4	13.4	15	11
	at ≤40°C (AC1)					
BGC09 T4	8	14	14	15	16	22

Type	Maximum UL/CSA horsepower rating Single phase 120V [HP]	240V [HP]	Three phase 208V [HP]	240V [HP]	480V [HP]	600V [HP]
BGR09	½	1½	2	3	5	5
BGT09	½	1½	2	3	5	5
BGTP09	½	1½	2	3	5❹	-❹
BGR12	½	1½	3	3	7½	10
BGT12	½	1½	3	3	7½	10
BFA009	¾	2	3	3	5	7½
BFA012	1	2	5	5	7½	10
BFA018	1	3	5	5	10	15
BFA025	2	3	7½	7½	15	15

NOTE: BGR09, BGT09, BGR12, BGT12... types are UL Listed for USA and Canada as "Magnetic Motor Controller – Reversing Contactors". All these are rated 20A general purpose use and suitable for use on a circuit capable of delivering more than 5kA symmetrical amps at 600V max when protected by fuses class K5 rated no more than 30A.
BGTP09 type is UL Recognized for USA and Canada as "Magnetic Motor Controller – Component – reversing contactors". Max HP rating up to 300VAC only; rated 20A general purpose use.
BGC... types are UL Listed for USA and Canada as "Magnetic Motor Controller – Changeover contactor".
No coil change or replacement is possible for any BG... types.

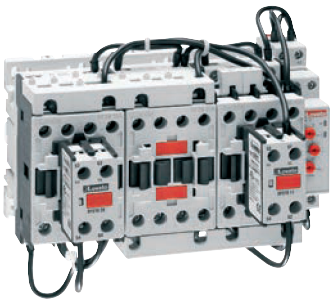
Add-on blocks

Refer to section 2, page 2-18 and page 2-20.
Special add-on auxiliary contacts 11BGX1111 or 11BGX1112 must be used on the left-side contactor of the BGT reversing assemblies. For the right-side contactor, normal 11BGX10... types of auxiliary contacts can be used instead. Refer to page 2-16 for details.

Certifications and compliance

Certifications obtained: UL Listed for USA and Canada (File E93602) for BGR09, BGT09, BGR12, BGT12, BFA... and BGC... (see NOTE above), EAC.
UL Recognized, for USA and Canada (cULus - File E93602 Component), for BGTP09; products having this type of marking are intended for use as components of complete workshop-assembled equipment.
Compliant with standards UL 60947-1, UL 60947-4-1, IEC/EN/BS 60947-1, IEC/EN/BS 60947-4-1, CSA C22.2 n° 60947-1, CSA C22.2 n° 60947-4-1.

Open frame



BFA009…BFA025

Order code	Three-phase motor control. Max IEC operating current (≤440V)	Thermal overload relay	Qty per pkg	Wt
	[A]		n°	[kg]
Complete star-delta starters, open frame, for starting time up to 12s and a maximum of 30 operations/hour.				
BFA00970❶❷	16	No	1	1.700
BFA01270❶❷	22	No	1	1.700
BFA01870❶❷	28	No	1	1.700
BFA02570❶❷	35	No	1	1.800
BFA02670❶❷	43	No	1	1.800
BFA03270❶❷	50	No	1	1.900
BFA03870❶❷	60	No	1	1.900
BFA05070❶❷	85	No	1	5.200
BFA06570❶❷	110	No	1	5.200
BFA08070❶❷❹	140	No	1	6.265
BFA09570❶❷	160	No	1	6.900
BFA11570❶❷❺	195	No	1	7.500
BFA15070❶❷❺	225	No	1	7.500

Operational characteristics
IEC standard motor powers

230V [kW]	400V [kW]	440V [kW]	500V [kW]
4	7.5	7.5	7.5
5.5	11	11	11
7.5	15	11	11
11	18.5	18.5	22
11	22	22	25
15	25	25	25
15	30	30	30
25	45	45	59
30	55	55	75
45	75	75	90
45	90	90	110
55	110	110	132
75	132	132	160

Thermal relay adjustment range
Choose the thermal relay adjustment range considering a value equal to 58% of rated motor current (Ie).
Example: Ie=100A; 58% Ie=58A.
The suitable relay range is 46-65A.
During the setup, the relay is to be regulated at 58A.

❶ Complete order code with the coil voltage digit or the coil voltage digit followed by 60 if 60Hz. Standard voltage are as follows:
– AC 50/60Hz 024 / 048 / 110 / 230 / 400V
– AC 60Hz 024 60 / 048 60 / 120 60 / 220 60 / 230 60 (V).
Example: BFA00970024 for BFA009 star-delta starter with 24VAC 50/60Hz power supply.
BFA0097002460 for BFA009 star-delta starter with 24VAC 60Hz power supply.
❷ The thermal overload relay is not included and must be purchased separately.
Refer to the example given under Thermal relay adjustment range, for a correct choice and then to page 3-4 for the order code.
❸ TMST with auxiliary supply 24...240VAC.
TMSTA440 with auxiliary supply 380...440VAC.
❹ For motors with rated current >115A connect the line side with 50mm² wires crimped with pin terminals or with 2x25mm² wires connected in parallel.
❺ For motors with rated current >175A connect the line side with insulated flexible copper bars or with 2x35mm² wires in parallel.

NOTE: for higher powers and voltages, or suitable for heavy-duty starting (centrifugal fans, mills, crushers) that is with starting time exceeding 12s, consult Technical support; see contact details inside front cover.

Components

Starter	Contactors			Thermal overload relay	Time relay	Auxiliary contacts fitted on contactor:			Rigid connections
	Line	Delta	Star			Line	Delta	Star	
BFA00970	BF0910A	BF0901A	BF0910A	❷ RF38	TMST❸	BFX1020	—	BFX1011	BFX3131
BFA01270	BF1210A	BF1201A	BF0910A	❷ RF38	TMST❸	BFX1020	—	BFX1011	BFX3131
BFA01870	BF1810A	BF1801A	BF1210A	❷ RF38	TMST❸	BFX1020	—	BFX1011	BFX3131
BFA02570	BF2510A	BF2501A	BF1810A	❷ RF38	TMST❸	BFX1020	—	BFX1011	BFX3131
BFA02670	BF2600A	BF2600A	BF1810A	❷ RF38	TMST❸	BFX1020	BFX1011	BFX1011	BFX3232
BFA03270	BF3200A	BF3200A	BF2510A	❷ RF38	TMST❸	BFX1020	BFX1011	BFX1011	BFX3232
BFA03870	BF3800A	BF3800A	BF2510A	❷ RF38	TMST❸	BFX1020	BFX1011	BFX1011	BFX3232
BFA05070	BF5000A	BF5000A	BF32 00A	❷ RF82	TMST❸	BFX1020	BFX1011	BFX1011	BFX3332
BFA06570	BF6500A	BF6500A	BF3200A	❷ RF82	TMST❸	BFX1020	BFX1011	BFX1011	BFX3332
BFA08070	BF8000A	BF8000A	BF5000A	❷ RF82	TMST❸	BFX1020	BFX1011	BFX1011	BFX3331
BFA09570	BF9500A	BF9500A	BF6500A	❷ RF110	TMST❸	BFX1020	BFX1011	BFX1011	BFX3432
BFA11570	BF11500A	BF11500A	BF8000A	❷ RF200	TMST❸	BFX1020	BFX1011	BFX1011	BFX3432
BFA15070	BF15000A	BF15000A	BF8000A	❷ RF200	TMST❸	BFX1020	BFX1011	BFX1011	BFX3432

Certifications and compliance
Certifications obtained: EAC.
Compliant with stardards: IEC/EN/BS 60947-1, IEC/EN/BS 60947-4-1.

Enclosed starters

M3P...70... - M3PA70

M3P...73...

Order	Three-phase motor control. Max IEC operating current (≤440V)	Qty per pkg	Wt
	[A]	n°	[kg]
Star-delta starters in enclosure with Start and Stop/Reset buttons. Starting time up to 12s and a maximum of 30 operations/hour.			
M3P00970❶❷	16	1	3.540
M3P01270❶❷	22	1	3.540
M3P01870❶❷	28	1	3.540
M3P02570❶❷	35	1	3.650
M3P02670❶❷	43	1	3.650
M3P03270❶❷	50	1	3.800
M3P03870❶❷	60	1	3.800
With switch disconnector, rotary door coupling handle GAX61 and Start and Stop/Reset buttons.			
M3P00973❶❷	16	1	3.700
M3P01273❶❷	22	1	3.700
M3P01873❶❷	28	1	3.700
M3P02573❶❷	35	1	3.800
M3P02673❶❷	43	1	3.800
M3P03273❶❷	50	1	4.300
M3P03873❶❷	60	1	4.300
Enclosure for star-delta starter, complete with Start and Stop/Reset buttons, metal plate fixed with piece of 35mm DIN (IEC/EN 60715) rail.			
M3PA70 ❸	—	1	2.240

❶ Complete order code with the coil voltage digit or the coil voltage digit followed by 60 if 60Hz. Standard voltage are as follows:
– AC 50/60Hz 024 / 048 / 110 / 230 / 400V
– AC 60Hz 024 60 / 048 60 / 120 60 / 220 60 / 230 60 (V).
Example: M3P00970024 for M3P009 star-delta starter with 24VAC 50/60Hz power supply.
M3P0097002460 for M3P009 star-delta starter with 24VAC 60Hz power supply.

❷ The thermal overload relay is not included and must be purchased separately.
Choose the thermal relay adjustment range considering a value equal to 58% of rated motor current (Ie).
Example: Ie=10A; 58% Ie = 5.8A. The suitable relay range is 4-6.5A, set at 5.8A, so the order code to select is RF380650).
Refer to page 3-4 for the order codes available.

❸ Suitable for BFA...70 starters.

❹ TMST with auxiliary supply 24...240VAC; TMSTA440 with auxiliary supply 380...400VAC.

NOTE: for higher powers and voltage ratings or suitable for heavy-duty starting (centrifugal fans, mills, crushers) that is with starting time exceeding 12s, consult Technical support; see contact details inside front cover.

Operational characteristics
IEC standard motor powers

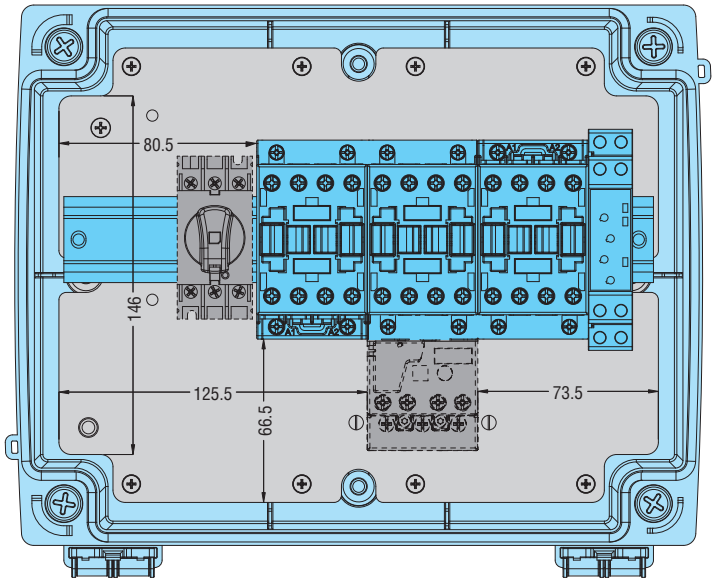
230V	400V	440V	500V
[kW]	[kW]	[kW]	[kW]
4	7.5	7.5	7.5
5.5	11	11	11
7.5	15	11	11
11	18.5	18.5	22
11	22	22	25
15	25	25	25
15	30	30	30

– Enclosure is made in ABS plastic material
– Cable entry: smooth surface; can be drilled by customer
– Ambient conditions:
  • Operating temperature: -25...+60°C
  • Storage temperature: -40...+70°C
– Degree of protection: IEC IP65 for M3P...; UL Type 1, 12, 4/4X for M3...UL versions.

Special M3... versions
In addition to standard-indicated versions, cULus certified starters are available up to 52A motor control rating max. This is also valid for the enclosure with general use rating of 65A.
Add suffix **UL** to the order code, e.g. M3PA70**UL**.

Certifications and compliance
Certifications obtained: UL Listed, for USA and Canada (File E93602), as Magnetic Motor Controllers - Enclosed (starters) and - Enclosures for M3...PUL types.
Compliant with standards: IEC/EN/BS 60947-1, IEC/EN/BS 60947-4-1, UL 60947-1, UL 60947-4-1, CSA C22.2 n° 60947-1, CSA C22.2 n° 60947-4-1.

Maximum available space inside M3P...70/73 with star-delta starters BFA...70...



Components

Type	Enclosure	Contactors			T/o relay ❷	Time relay	Auxiliary contacts fitted on contactor:			Rigid connec-tions	Switch disconnector ❺	Handle ❺	Shaft ❺
		Line	Delta	Star			Line	Delta	Star				
M3P00970/73	M3PA70	BF0910A	BF0901A	BF0910A	RF38	TMST❹	BFX1020	—	BFX1011	BFX3131	GA016A	GAX61	GAX7150
M3P01270/73	M3PA70	BF1210A	BF1201A	BF0910A	RF38	TMST❹	BFX1020	—	BFX1011	BFX3131	GA025A	GAX61	GAX7150
M3P01870/73	M3PA70	BF1810A	BF1801A	BF1210A	RF38	TMST❹	BFX1020	—	BFX1011	BFX3131	GA032A	GAX61	GAX7150
M3P02570/73	M3PA70	BF2510A	BF2501A	BF1810A	RF38	TMST❹	BFX1020	—	BFX1011	BFX3131	GA040A	GAX61	GAX7150
M3P02670/73	M3PA70	BF2600A	BF2600A	BF1810A	RF38	TMST❹	BFX1020	BFX1011	BFX1011	BFX3232	GA063SA	GAX61	GAX7150
M3P03270/73	M3PA70	BF3200A	BF3200A	BF2510A	RF38	TMST❹	BFX1020	BFX1011	BFX1011	BFX3232	GA063SA	GAX61	GAX7150
M3P03870/73	M3PA70	BF3800A	BF3800A	BF2510A	RF38	TMST❹	BFX1020	BFX1011	BFX1011	BFX3232	GA063SA	GAX61	GAX7150

❺ For M3P...73 types

Empty enclosures


M…PA

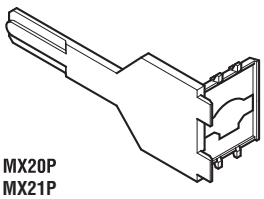

M…RA


M…N

Order code	Contactor type ❶	Thermal relay ❷	Degree of protect.	Qty per pkg	Wt
				n°	[kg]
Enclosures with Start-Stop/Reset pushbuttons.					
M0PA	BG06, BG09, BG12	RF9	IP65	1	0.490
M1PA	BF09A, BF12A, BF18A	RF38	IP65	1	0.545
M2PA	BF09A, BF12A, BF18A	RF38	IP65	1	0.715
M25PA❸	BF26A, BF32A	RF38	IP65	1	0.990
M3PA❹	BF40A, BF50A, BF65A, BF80A, BF94A	RF82 RF82	IP65	1	1.900
Enclosures with Reset pushbutton.					
M0RA	BG06, BG09, BG12	RF9	IP65	1	0.445
M1RA	BF09A, BF12A, BF18A	RF38	IP65	1	0.500
M2RA	BF09A, BF12A, BF18A	RF38	IP65	1	0.670
M25RA❸	BF26A, BF32A	RF38	IP65	1	0.970
M3RA❹	BF40A, BF50A, BF65A, BF80A, BF94A	RF82 RF82	IP65	1	1.850
Enclosures without external pushbuttons.					
M0N	BG06, BG09, BG12	RFA9	IP65	1	0.405
M1N	BF09A, BF12A, BF18A	RF38	IP65	1	0.460
M2N	BF09A, BF12A, BF18A	RF38	IP65	1	0.640
M24N❸❺	BG06...BG12 BF09A...BF25A	❷	IP65	1	0.625
M25N❸	BF09A, BF12A, BF18A, BF26A, BF32A	RF38	IP65	1	0.940
M3N	BF40A, BF50A, BF65A, BF80A, BF94A	RF82 RF82	IP65	1	1.800

❶ To be purchased separately; refer to page 2-6 for contactor choice.
❷ To be purchased separately.
Refer to pages 3-2 to 9 for thermal overload relay choice.
For use of the overload relay in the M24N, consult Technical support; see contact details on inside front cover.
❸ MX31 metal mounting plate included.
❹ MX30 metal mounting plate included.
❺ To install eventual pushbuttons, selectors and/or other control accessories, use the PLatinum series and mount the relay contact elements on the cover using the LPXAU120 mounting adapter.
See section 7.

Accessories and spare parts


MX20P
MX21P

Order code	Description	Qty per pkg	Wt
		n°	[kg]
MX01	Threaded plug for unused holes, grey RAL7035	10	0.007
MX10P	Stop/Reset button extension rod for M0 enclosure	5	0.010
MX11P	Stop/Reset button extension rod for M1 enclosure	5	0.010
MX12P	Stop/Reset button extension rod for M2, M25 enclosures	5	0.010
MX20P	Mounting base for LPX C... contact on M0 enclosure	5	0.014
MX21P	Mounting base for LPX C... contact on M1, M2, M25 enclosures	5	0.014
MX30	Metal mounting plate for M3N	1	0.500
MX31	Metal mounting plate for M24N and M25 enclosures	1	0.400

General characteristics
The M0..., M1..., M2..., M25... and M3...UL enclosures are made in UV protected polycarbonate.
M3 enclosure is made in ABS plastic material.

Operational characteristics

Enclosure type	Maximum operating current (≤440V) [A]
M0...	12
M1...	18
M2...	32
M24N	38
M25...	38
M3...	80

General characteristics
Enclosures are supplied with the following accessories:

Accessory		Type of enclosure							
Description	Type	M0PA	M1PA	M2PA	M25PA	M0RA	M1RA	M2RA	M25RA
Contact holder	MX20P	1							
	MX21P		1	1	1				
Buttons: - Stop/Reset - Start	LPCB1176					1	1	1	1
	LPCB2104	1	1	1	1				
	LPCB1113	1	1	1	1				
Contact for Start button	LPXC10	1	1	1	1				
Stop/Reset button extension	MX10P	1				1			
	MX11P		1				1		
	MX12P			1	1			1	1
Unused hole threaded plug	MX01					1	1	1	1

– M3PA enclosure: 2 Start and Stop/Reset pushbuttons and 1 MX30 mounting plate
– M3RA enclosure: 1 Reset pushbutton and 1 MX30 mounting plate
– M3N enclosure: supplied without accessories to be purchased separately including MX 30 mounting plate.

Enclosures can house the following devices:
M0 = BG... with/without RF9
M1 = BF09A-BF12A-BF18A with/without RF38
M2 = BF25A-BF26A-BF32A, assemblies BFA...42 with/without RF38
M24N = BG..., BF09A...BF25A, assemblies BGR/BGT/BGC and BFA...42 without overload
M25 = BF26...BF38A, assemblies BGR/BGT/BGC and BFA...42 with/without overload
M3 = BF40...BF94 and all assemblies with/without overload.

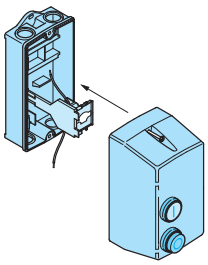
Operational characteristics:
– Cable entry:
  • M0/M1//M2... - 2 knockouts PG13.5/M20 on enclosure top and bottom
  • M24N/M25... - 2 knockouts PG16/M25-PG29/M32 on enclosure top and bottom
  • M3... - Smooth surfaces; can be drilled by customer
– Ambient conditions:
  • Operating temperature: -25...+60°C
  • Storage temperature: -40...+70°C
– Degree of protection: IEC IP65 for all; UL Type 1, 12, 4/4X for M0/M1/M2/M24N/M25... types and M3...UL versions.

Special M3… versions
In addition to standard-indicated versions, cULus certified starters and enclosures are available up to 52A - motor control and 65A general use rating max (MX30 plate, earth/ground and neutral terminal plates are always included in this case). Add suffix **UL** to the order code of enclosures e.g. M3N **UL**.

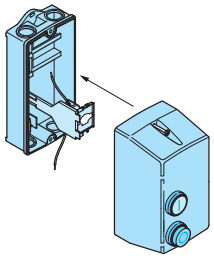
Certifications and compliance
Certifications obtained: EAC for all; for M3NUL type, UL Listed for USA and Canada (cULus – File E300050) as Industrial control panels; for M0/M1/M2PA/RA/N and other M3...UL types, UL Listed for USA and Canada (cULus – File E93602) under magnetic motor controllers as Polymeric enclosures - and CSA certified for Canada and USA (cCSAus – File 94157) as Non-metallic enclosures.
Compliant with standards: IEC/EN/BS 60947-1, IEC/EN/BS 60947-4-1, UL 60947-1, UL 60947-4-1, CSA C22.2 n° 60947-1, CSA C22.2 n° 60947-4-1.

M...PA EMPTY ENCLOSURES

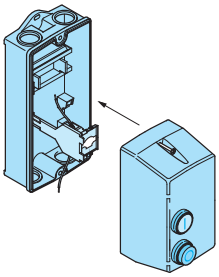
M0PA



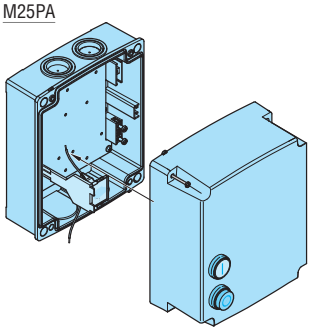
M1PA



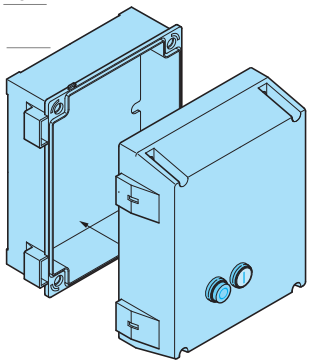
M2PA



M25PA

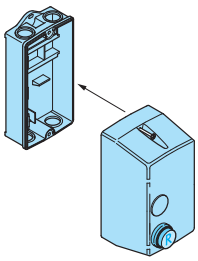


M3PA

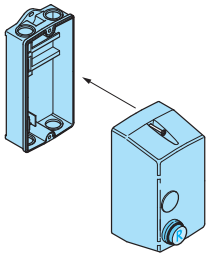


M...RA EMPTY ENCLOSURES

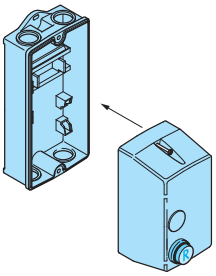
M0RA



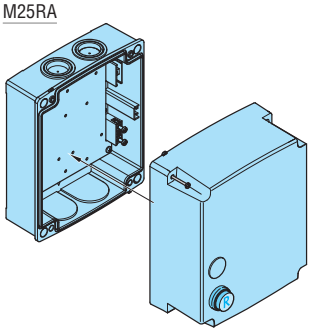
M1RA



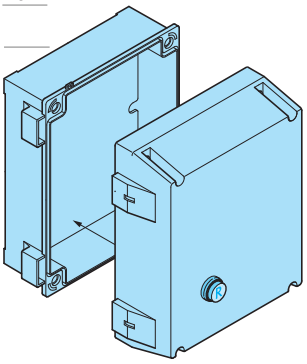
M2RA



M25RA

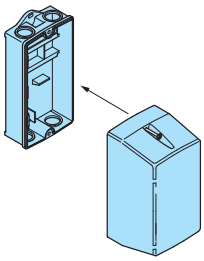


M3RA

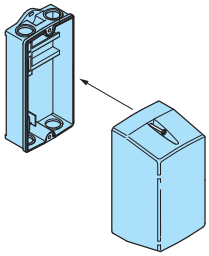


M...N EMPTY ENCLOSURES

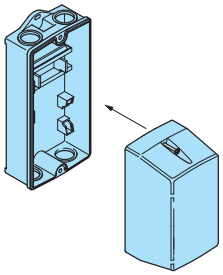
M0N



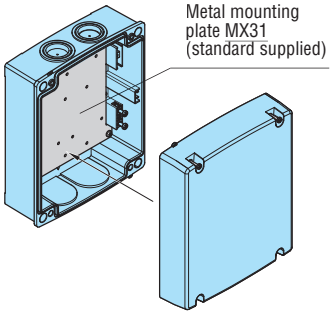
M1N



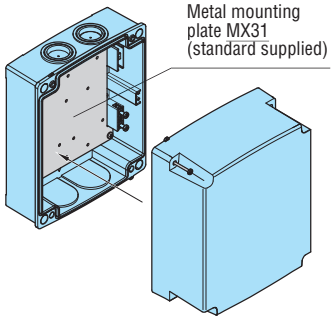
M2N



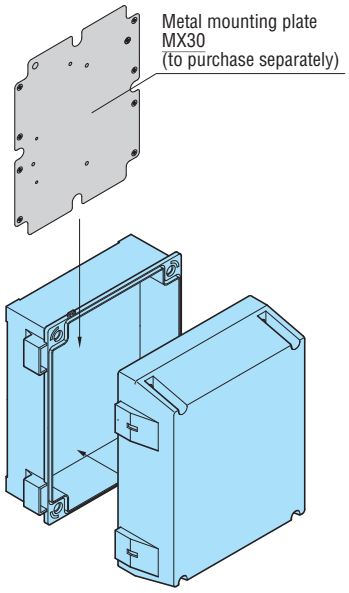
M24N



M25N

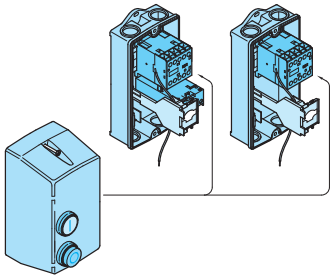


M3N

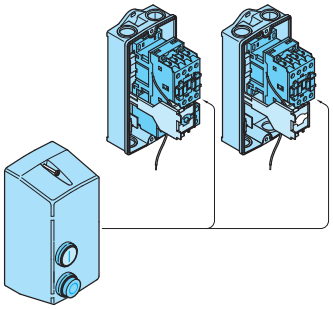


M...P... STARTERS, ENCLOSED

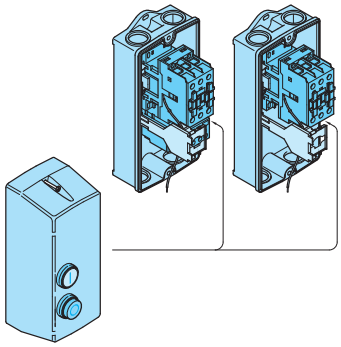
M0P00912... M0P01212... M0P00910... M0P01210...



M1P00912... M1P01812... M1P00910... M1P01810...

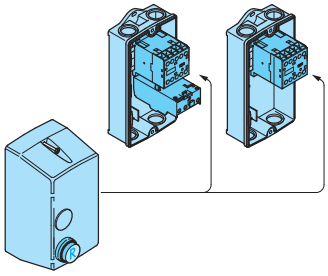


M2P02512... M2P03212... M2P02510... M2P03210...

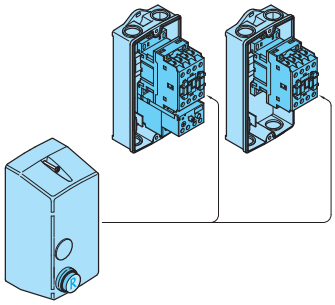


M...R... STARTERS, ENCLOSED

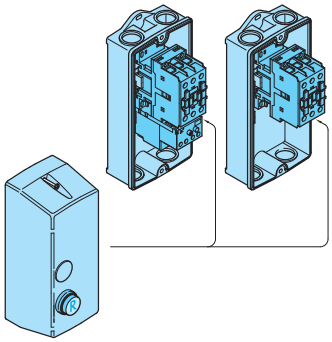
M0R00912... M0R01212... M0R00910... M0R01210...



M1R00912... M1R01812... M1R00910... M1R01810...

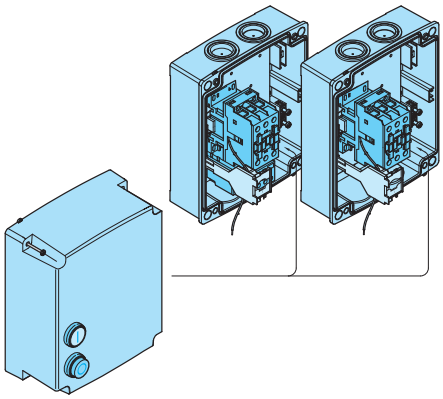


M2R02512... M2R03212... M2R02510... M2R03210...

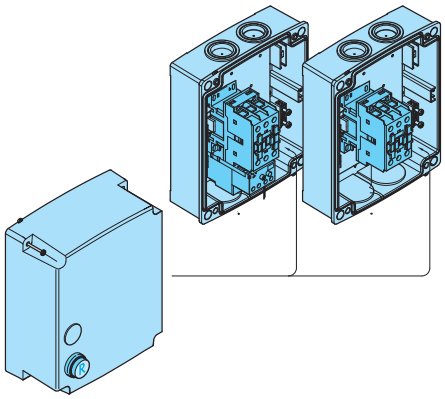


M25... STARTERS, ENCLOSED

M25P03812... M25P03810...

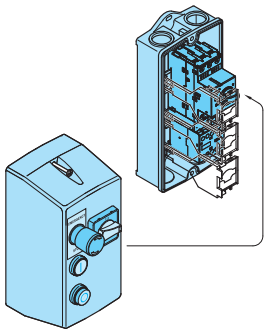


M25R03812... M25R03810...



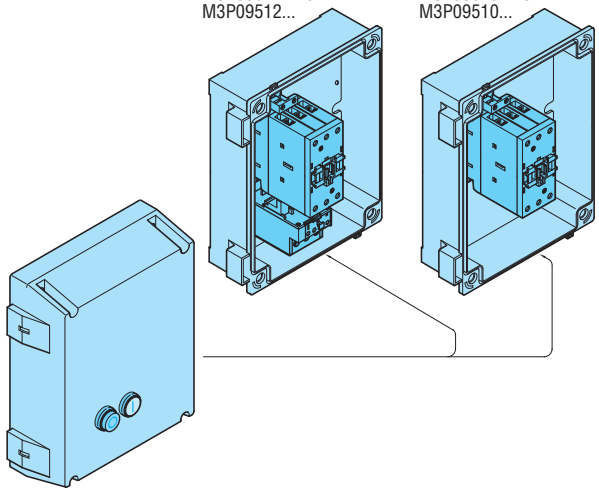
M2... STARTERS, ENCLOSED

M2P00911

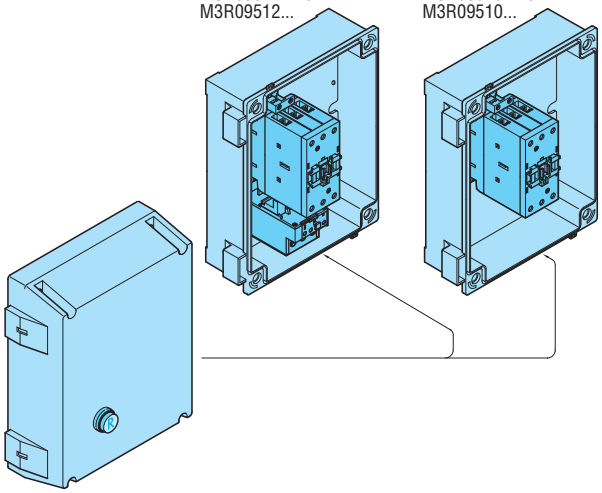


M3... STARTERS, ENCLOSED

M3P05012... to M3P09512... M3P05010... to M3P09510...



M3R05012... to M3R09512... M3R05010... to M3R09510...



Dimensions
pages 4-16 and 17

Wiring diagrams
page 4-21

Maximum combinations for M0... and M1... starters in enclosure

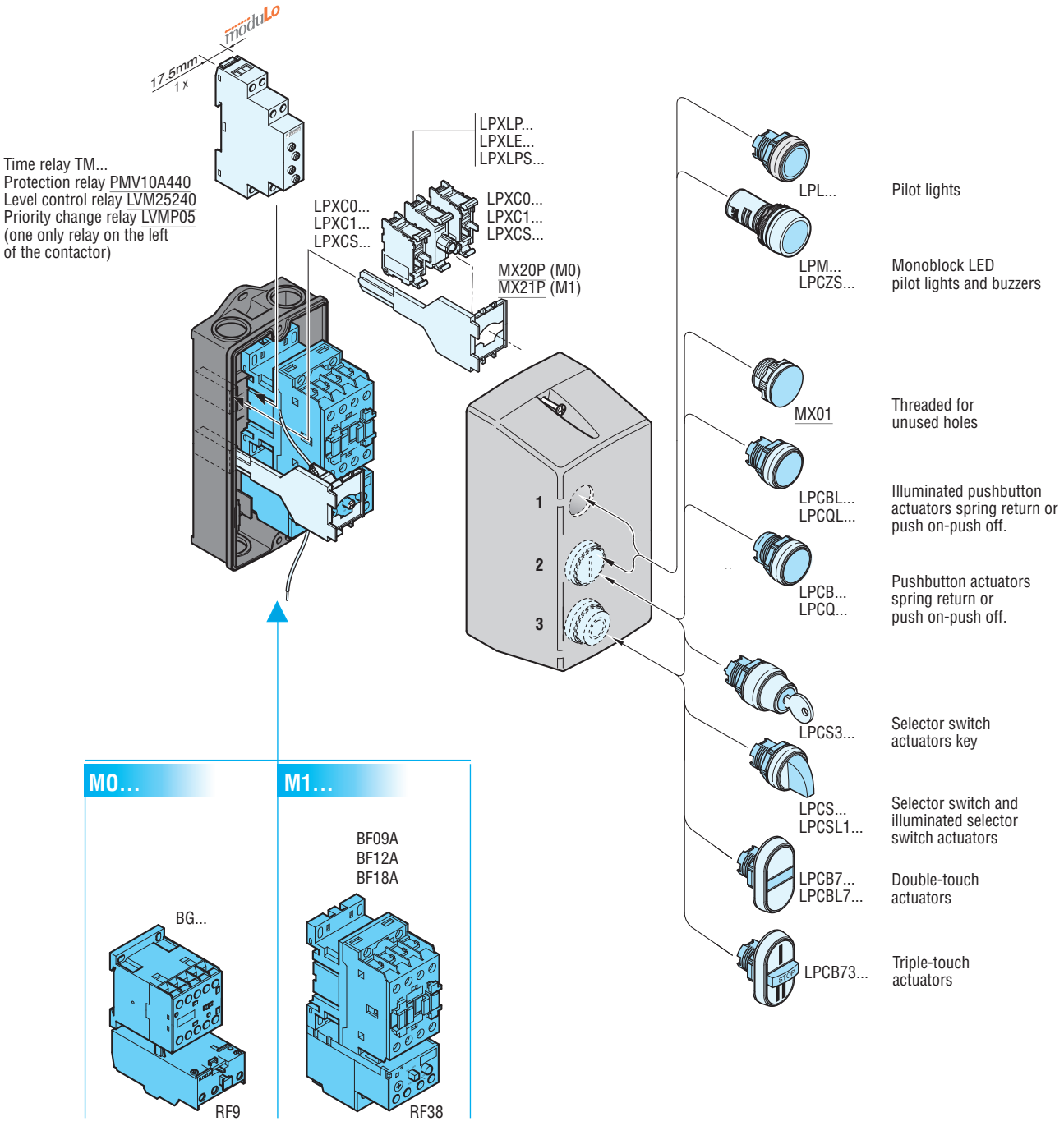
For the fitting of add-on blocks and electronic relays in the starters, consult our Technical support; see contact details on inside front cover.

The enclosure cover can be equipped with various types of actuators and pilot lights, per following details:

1) Upper position 1
   The cover must be drilled in this position, with a 22.5mm hole, by the user and LPL..., LPM... and LPCZS... pilot light can be fitted.
   To fit the LPL... pilot light head, the mounting base, type MX20P for M0 enclosure or type MX21P for M1 enclosure, must also be purchased. The LED element is snapped onto this mounting base.
   No adapter or base is needed for LPL..., LPM... and LPCZS...

2) Middle position 2
   Based on the enclosure type, in this position, the user finds either the Start button or threaded plug.
   Various PLatinum (plastic series) actuators can be fitted in this position, such as flush or extended buttons, selectors or pilot lights, as illustrated below.
   To fit the actuators, the mounting base, type MX20 for M0 enclosure, or type MX21P for M1 enclosure, must also be purchased. The contact or LED elements are snapped onto this mounting base.
   No adapter or base is needed for LPL..., LPM... and LPCZS...

3) Lower position 3
   The STOP/RESET button is mounted in this position, except for the enclosure without buttons.
   This button activates the thermal overload relay via a mechanical actuator.
   In eventual applications without thermal overload relay, this button can be removed and the hole closed up by the threaded plug MX01.



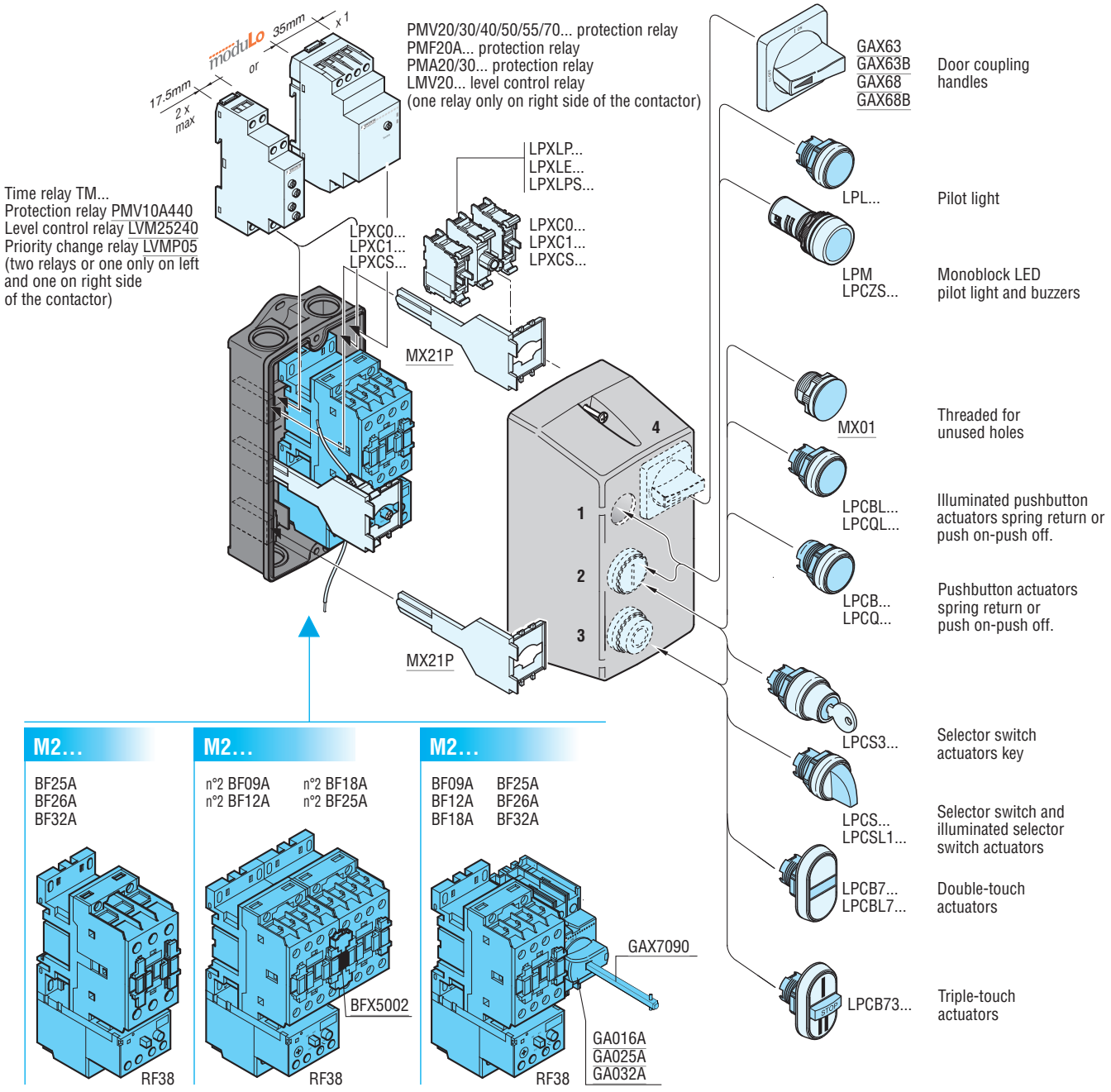
Maximum combinations for M2… starters in enclosure
For the fitting of add-on blocks and electronic relays in the starters, consult our Technical support; see contact details on inside front cover.
The enclosure covers can be equipped with various types of actuators and pilot lights, per following details:

1) Upper position 1
The cover must be drilled in this position with a 22.5mm hole by the user; LPL..., LPM... or LPCZS... pilot light can be fitted.
To fit the LPL... pilot light, the mounting base type MX21P must also be purchased. The LED element is snapped onto this mounting base.
No adapter or base is needed for LPL..., LPM... and LPCZS...

2) Middle position 2
Based on the enclosure type, in this position, the user finds either the Start button or threaded plug.
Various PLatinum (plastic series) actuators can be fitted in this position, such as flush or extended buttons, selectors or pilot lights, as illustrated in the side figure.
To fit the actuators, the mounting base type MX 21P must also be purchased.
The contact or LED elements are snapped onto this mounting base.
No adapter or base is needed for LPL..., LPM... and LPCZS...

3) Lower position 3
The STOP/RESET button is mounted in this position, except for the enclosure without buttons.
This button activates the thermal overload relay via a mechanical actuator. In eventual applications without thermal overload relay, this button can be removed and the hole closed up by the threaded plug MX01.
Various PLatinum (plastic series) actuators can be fitted in this position, such as flush or extended buttons, selectors or pilot lights, as illustrated in the drawing below. To fit the actuators, the mounting base type
MX21P must also be purchased. The contact or LED elements are snapped onto this mounting base.
No adapter or base is needed for LPL..., LPM... and LPCZS...

4) Upper position 4
The cover must be drilled in this position with a 22.5mm hole by the user whenever an external handle is needed for a switch disconnector fitted in the enclosure.



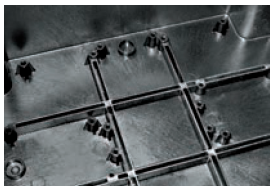
Maximum combinations for starters in M24N enclosure
In addition to a direct-on-line, full voltage across the line, starter or reversing contactor assembly, various other electromechanical devices can be fitted. The cover of the M24N enclosure can be used across the entire surface to mount pushbuttons, measuring instruments, switch disconnectors GA016A...GA040A and GA063SA type.
No contact blocks or other additional accessories can be mounted on the contactor face of AC BF series; they can only be fitted on the contactor side since the cover is shallow.
Eventually pushbuttons, selector switches and/or other control accessories of the PLatinum (plastic series) can be used and contact or LED elements can be mounted directly inside on the cover with the LPXAU120 mounting adapter; refer to section 7.
MX31 internal metal mounting plate is standard-supplied.

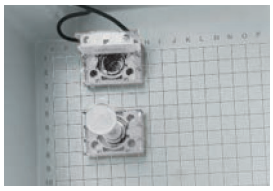
The wall fixing holes and the cover closing captive **screws** are positioned **outwards** with respect to the sealing gasket. This guarantees the protection degree of the enclosure against infiltrations liquid (IEC IPX5 / UL Type 4X).

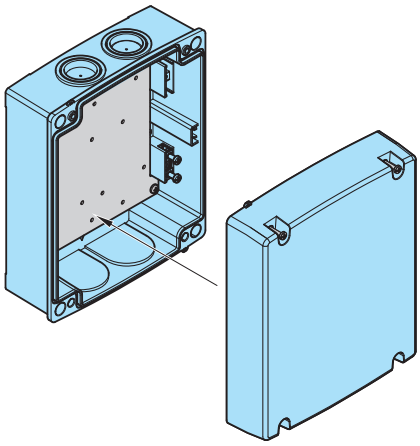
The base has **ribbing** which facilitates the fixing of DIN rails, metal mounting plates and electronic printed boards.

Grid references, marked by letters and numbers, are engraved on the interior surface of the cover. This grid allows to quickly identify the exact drilling points where pushbuttons, handles or pilot lights will be mounted.

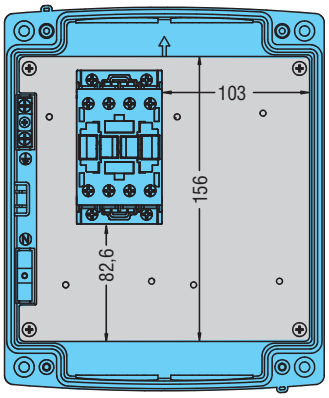
A **safety sealing** system keeps the cover and base together to avoid inopportune opening and tampering.

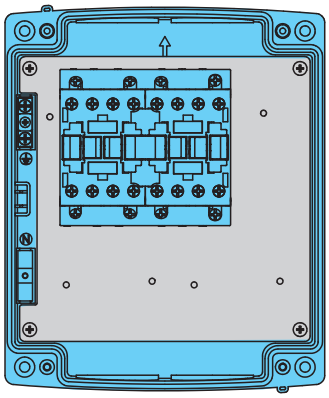


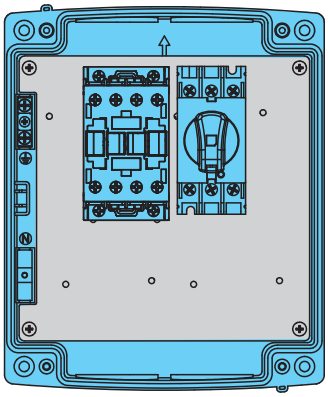




Available space for fitting other electrical or electronic devices

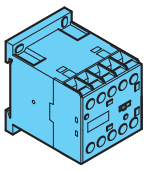






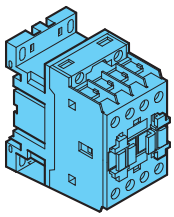
M24N

BG06
BG09
BG12
without overload



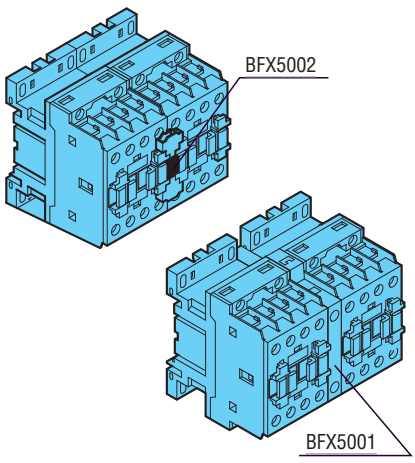
M24N

BF09A...BF25A
without overload



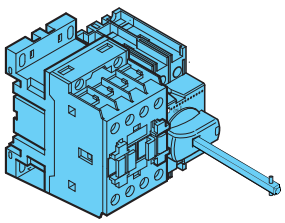
M24N

BGR... - BGT... - BGC... without overload
n° 2 BF09A n° 2 BF12A
n° 2 BF18A n° 2 BF25A
All without overload
BFA...42 without overload



M24N

BF09A BF12A
BF18A BF25A
with GA016A...GA040A and GA063SA



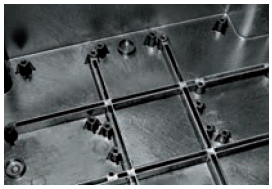
Maximum combinations for starters in M25… enclosure
In addition to a direct-on-line, full voltage across the line, starter or reversing contactor assembly, various other electromechanical devices can be fitted. The cover of the M25 enclosure can be used across the entire surface to mount pushbuttons, measuring instruments, switch disconnectors GA016A...GA040A and GA063SA type. Possible contact blocks or other additional accessories can be mounted on the contactor face of AC or DC BF series or on the contactor side since the cover is deep.
Eventually pushbuttons, selector switches and/or other control accessories of the PLatinum (plastic series) can be used and contact or LED elements can be mounted directly inside on the cover with the LPXAU120 mounting adapter; refer to section 7.
MX31 internal metal mounting plate is standard-supplied.

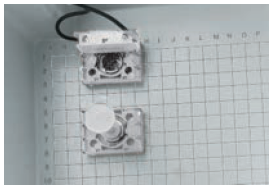
The wall fixing holes and the cover closing captive **screws** are positioned **outwards** with respect to the sealing gasket. This guarantees the protection degree of the enclosure against liquid infiltrations (IEC IPX5 / UL Type 4X).

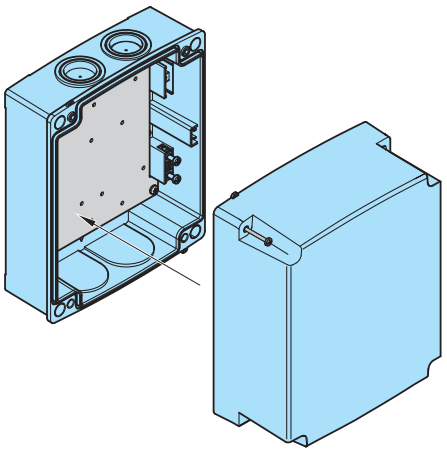
The base has **ribbing** which facilitates the fixing of DIN rails, metal mounting plates and electronic printed boards.

Grid references, marked by letters and numbers, are engraved on the interior surface of the cover. This grid allows to quickly identify the exact drilling points where pushbuttons, handles or pilot lights will be mounted.

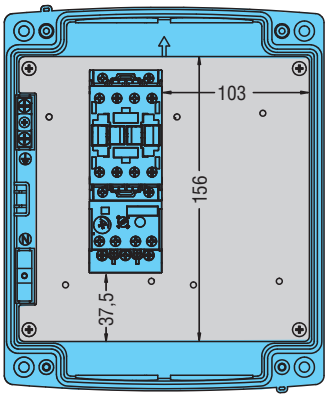
A **safety sealing** system keeps the cover and base together to avoid inopportune opening and tampering.

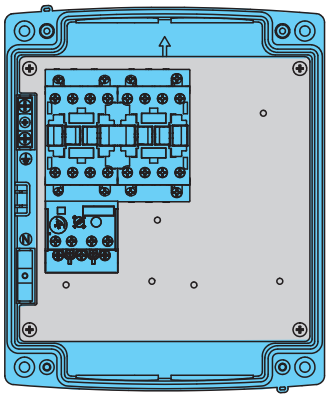


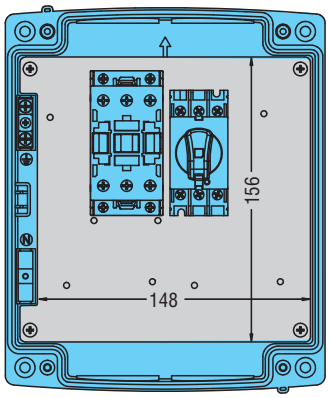




Available space for fitting other electrical or electronic devices

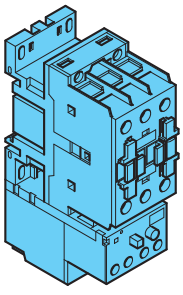






M25…038…

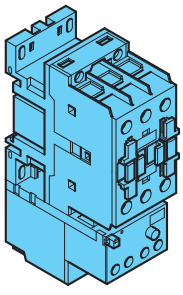
BF38
with or without overload



RF38...

M25…

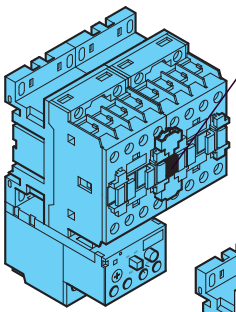
BF26 - BF32
with or without overload



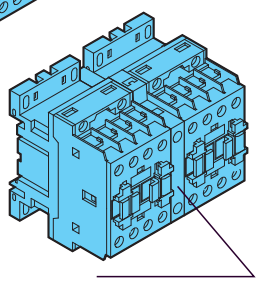
RF38...

M25…

BGR... - BGT... - BGC with or without overload RF9
n° 2 BF26 - n° 2 BF32 - n° 2 BF38 with or without overload RF38
BFA...42 with or without overload RF38



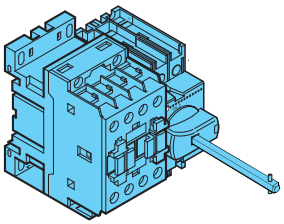
RF38...



BF09A...BF38A with BFX5001

M25…

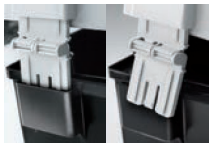
BF09 BF12 BF18
BF26 BF32 BF38
with GA016A...GA040A and GA063SA



Dimensions page 4-17
Wiring diagrams page 4-21

Maximum combinations for starters in M3… enclosure
In addition to a direct-on-line, full voltage across the line, starter or reversing contactor assembly, star-delta starters can be installed as illustrated at the lower right as well as various other electromechanical devices. The cover of the M3 enclosure can be used across the entire surface to mount pushbuttons, measuring instruments or switch disconnectors GA016A...GA125A, etc.
MX30 internal metal mounting plate is standard supplied with M3P… and M3R… types; not included with the M3N, it can be purchased separately.

With the specifically designed **hinges**, the cover remains attached to the base, fully open, while the wiring work is being carried out. By applying **slight pressure** on the hinges, the cover can be released from the base.

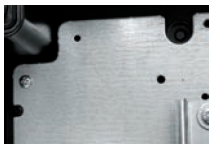


The cover closing captive **screws** and the wall fixing holes are positioned **outwards** with respect to the sealing gasket. This guarantees the protection degree of the enclosure against liquids infiltrations (IEC IPX5 / UL Type 4X).

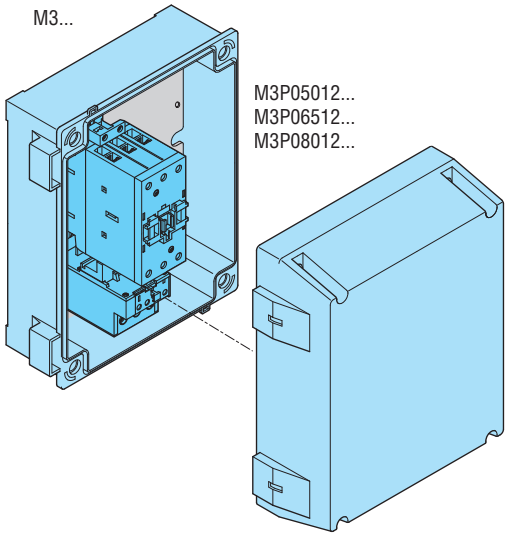
A **safety sealing** system keeps the cover and base together to avoid inopportune opening and tampering.

Grid references, marked by letters and numbers, are engraved on the interior surface of the cover. This grid allows to quickly identify the exact drilling points where pushbuttons, handle or pilot lights will be mounted.

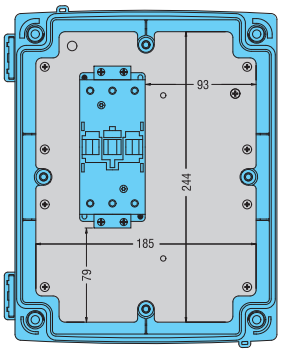
A properly predrilled metal mounting plate (MX30 standard supplied except for M3N) permits to quickly and precisely fix equipment in place.



The base has **ribbing** which facilitates the fixing of DIN rails, metal mounting plates and electronic printed boards.

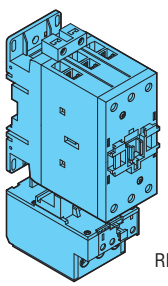


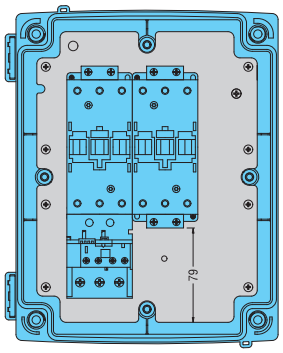
Available space for fitting other electrical or electronic devices



M3…

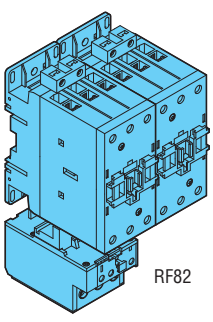
n° 1 BF40 n° 1 BF80
n° 1 BF50 n° 1 BF94
n° 1 BF65

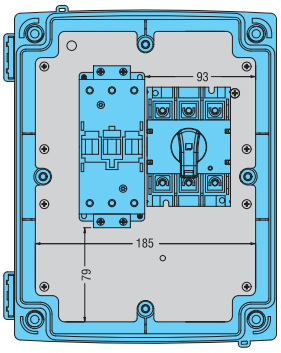




M3…

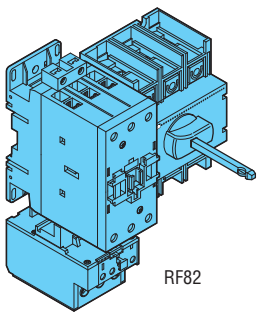
n° 2 BF40 n° 2 BF65 n° 2 BF94
n° 2 BF50 n° 2 BF80

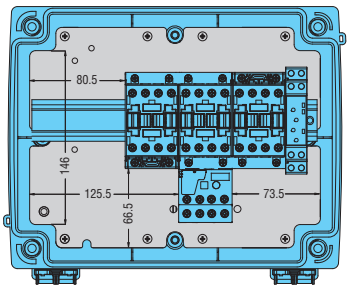




M3…

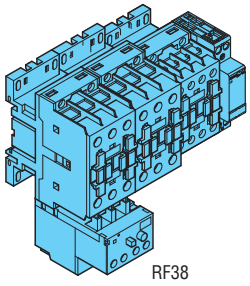
n° 1 BF40 n° 1 BF65 n° 1 BF94 + n° 1 GA...
n° 1 BF50 n° 1 BF80





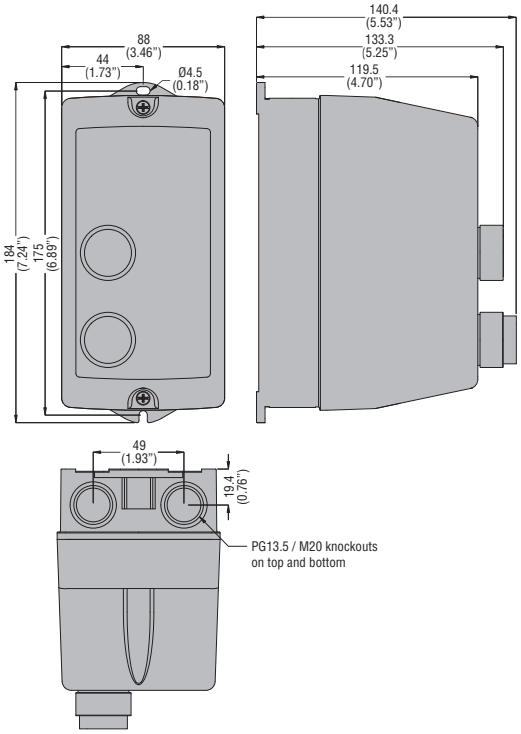
M3P…70

Star-delta configuration with RF38 relay, TM ST time relays and contactors:
BF09A BF12A BF18A
BF25A BF26A BF38A

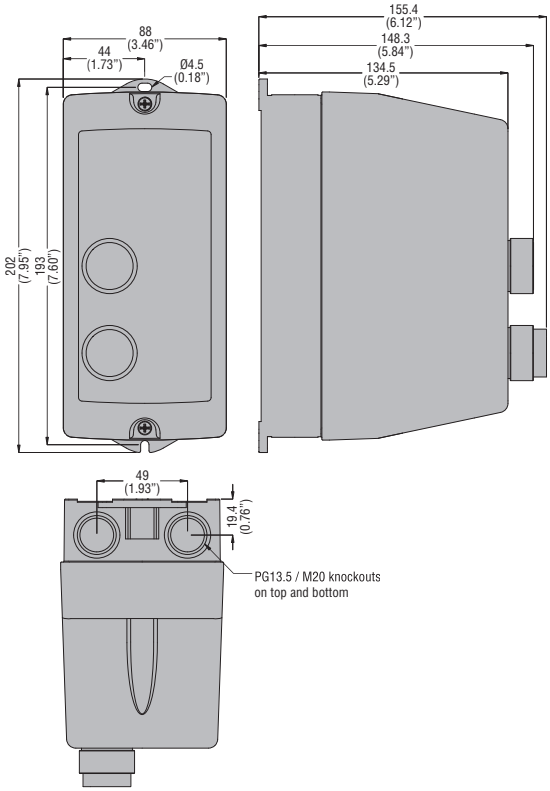


DIRECT-ON-LINE STARTERS - EMPTY ENCLOSURES

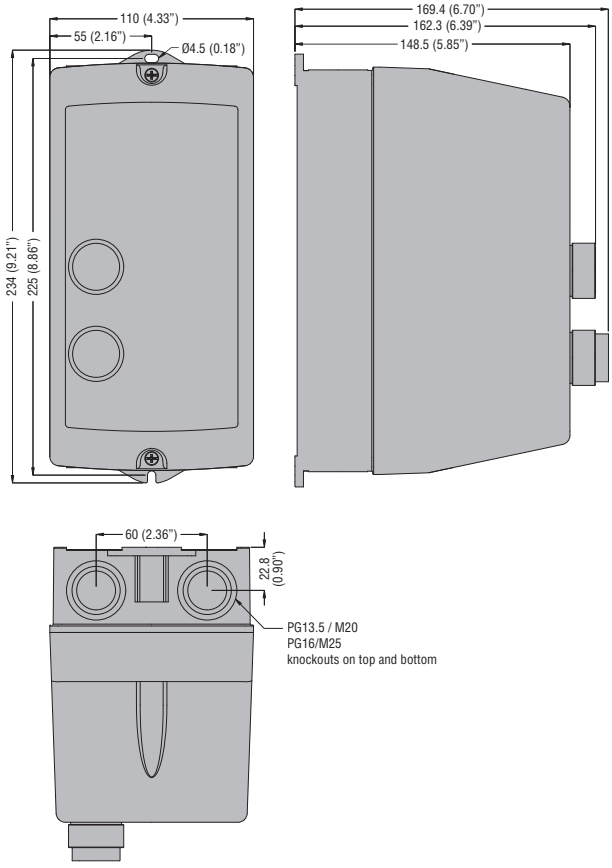
M0

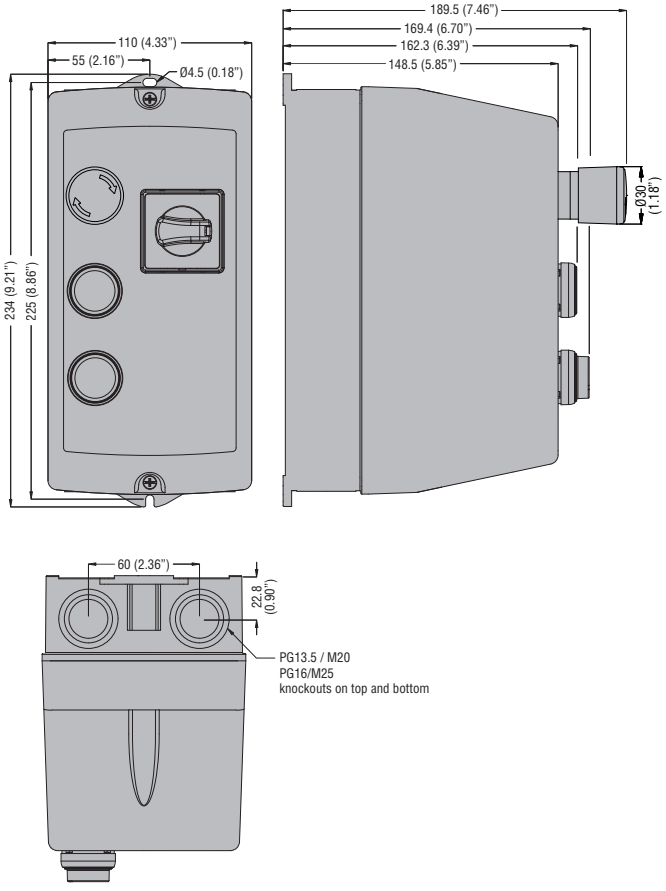


M1

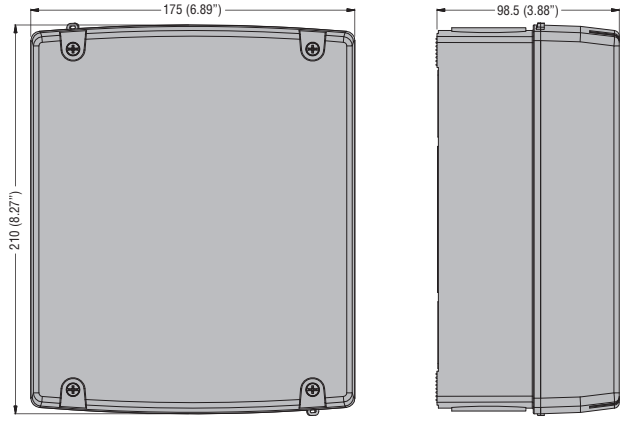


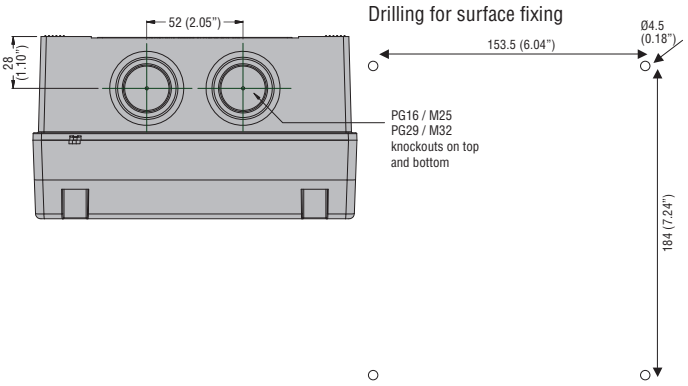
M2





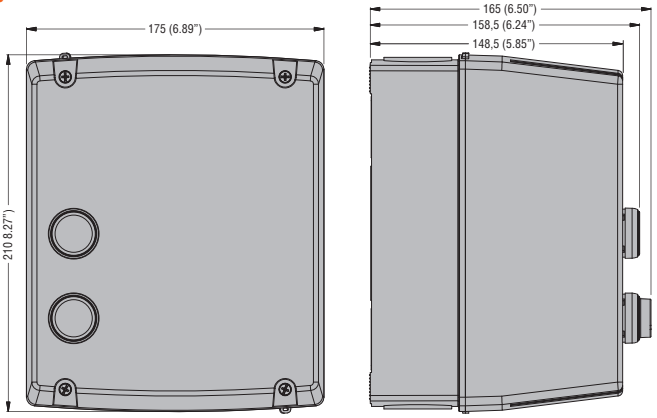
M24N

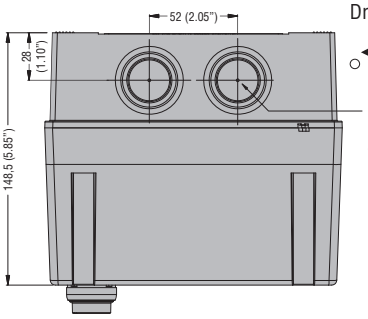




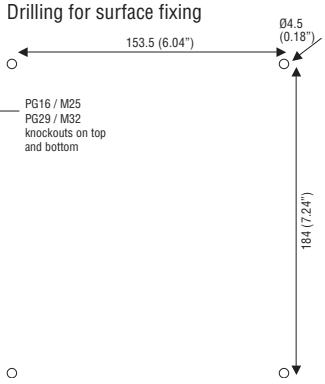
Drilling for surface fixing

M25

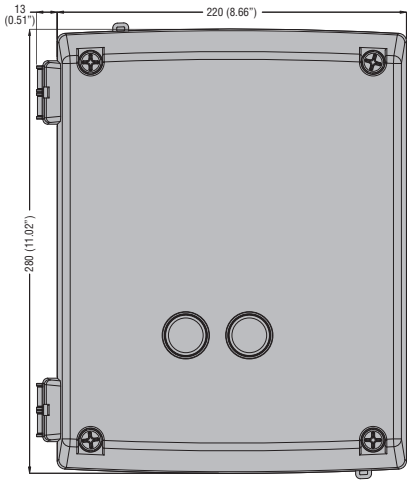


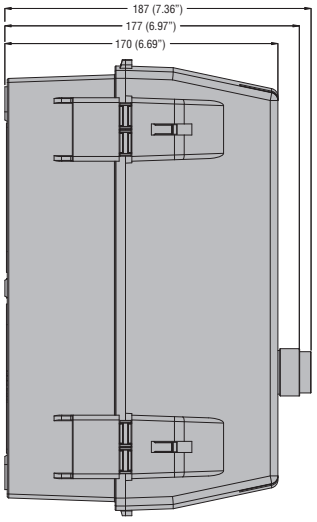


Drilling for surface fixing

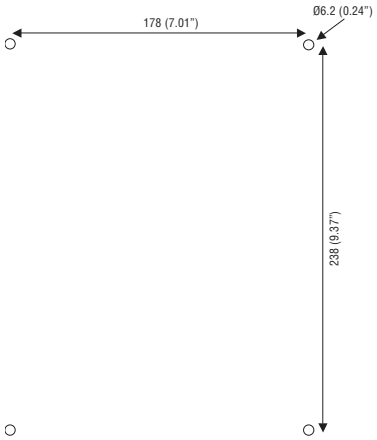


M3



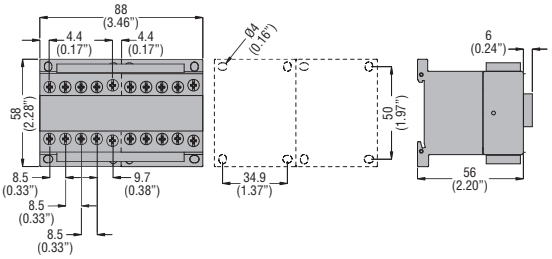


Drilling for surface fixing

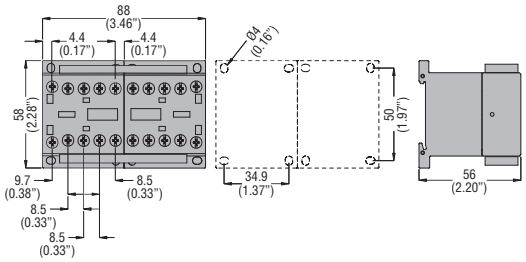


REVERSING CONTACTOR ASSEMBLIES

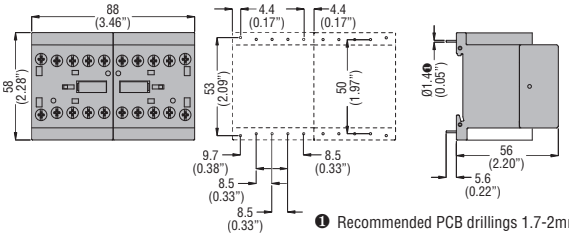
BGR...



BGT...

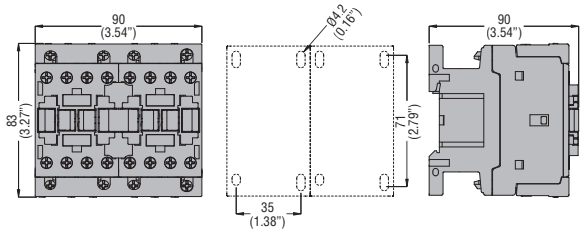


BGTP...



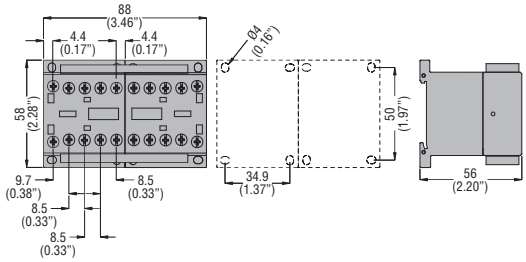
❶ Recommended PCB drillings 1.7-2mm (0.07-0.08").

BFA...42

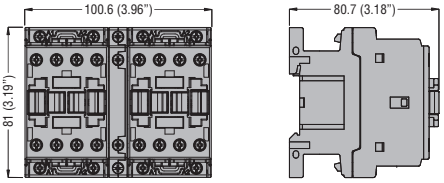


CHANGEOVER CONTACTOR 4 POLES ASSEMBLIES

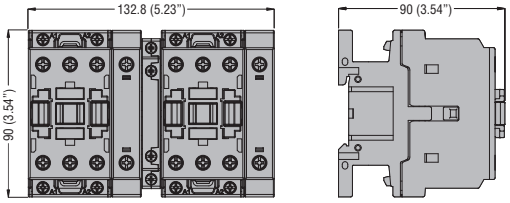
BGC09T4...



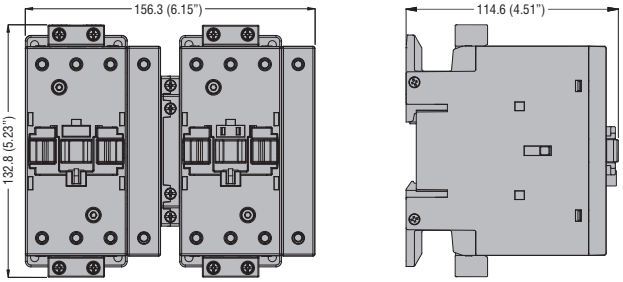
BFC18T4A230



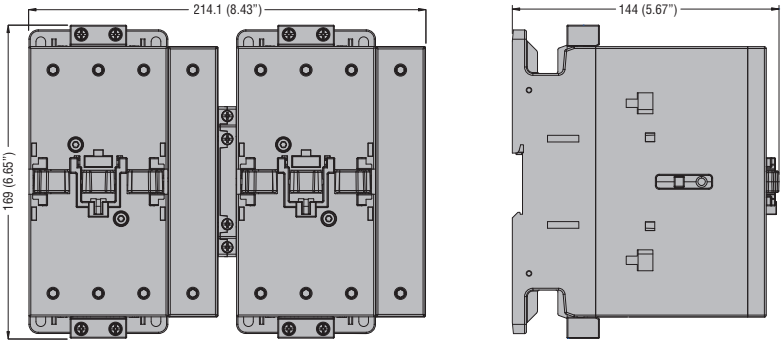
BFC38T4A230



BFC80T4A230

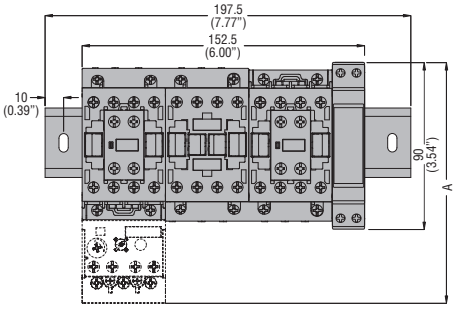


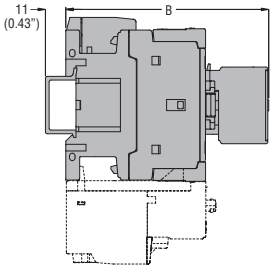
BFC95T4A230 - BFC150T4A230



STAR-DELTA STARTERS OPEN FRAME

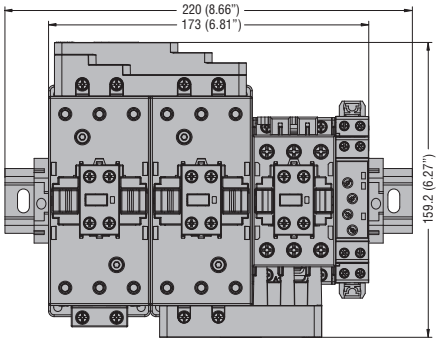
BFA00970...BFA03870

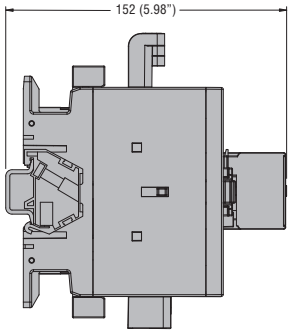




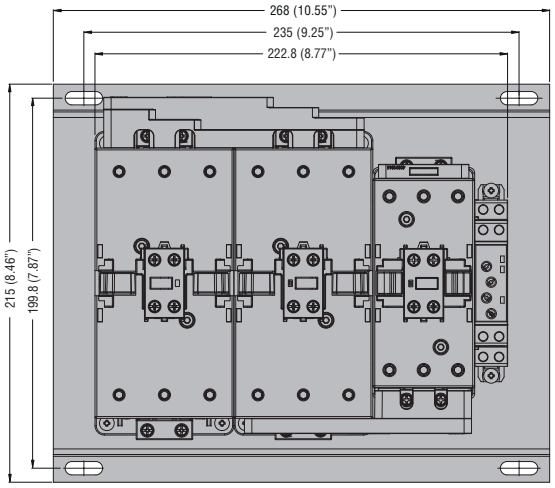
STARTER TYPE	A	B
BFA00970	130.5 (5.14")	109.5 (4.31")
BFA01270	130.5 (5.14")	109.5 (4.31")
BFA01870	130.5 (5.14")	109.5 (4.31")
BFA02570	130.5 (5.14")	109.5 (4.31")
BFA02670	135 (5.14")	119 (4.68")
BFA03270	135 (5.14")	119 (4.68")
BFA03870	135 (5.14")	119 (4.68")

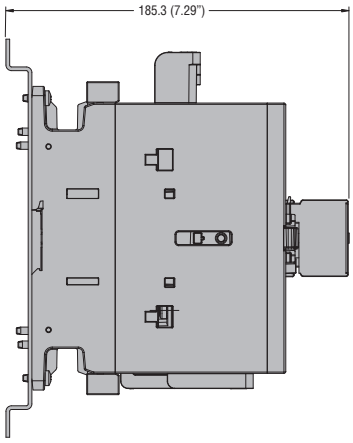
BFA05070...BFA08070





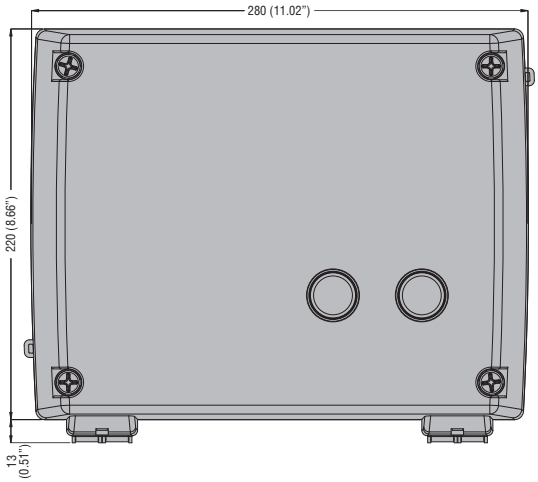
BFA09570...BFA15070

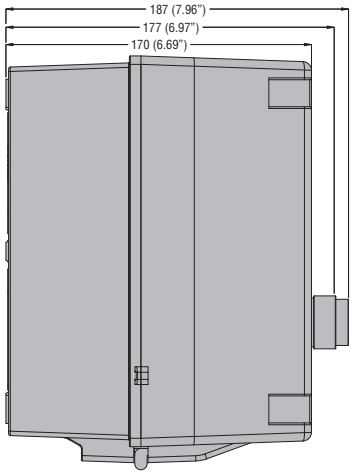




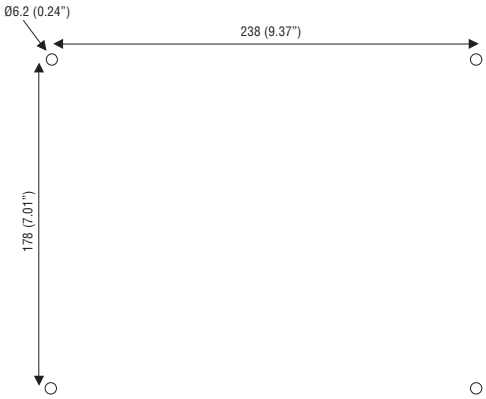
STAR-DELTA STARTERS IN ENCLOSURE - EMPTY ENCLOSURE FOR STAR-DELTA STARTERS

M3P...70 - M3PA70

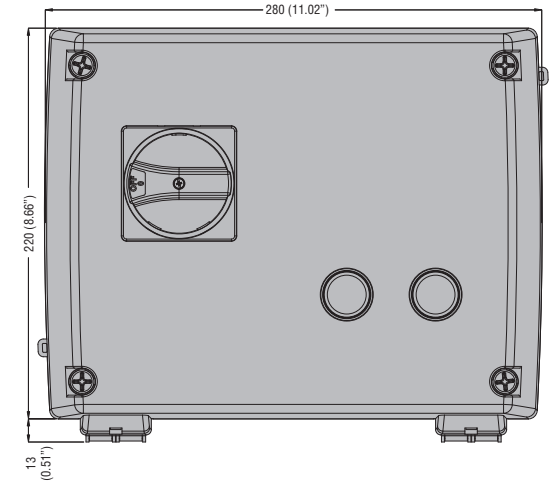


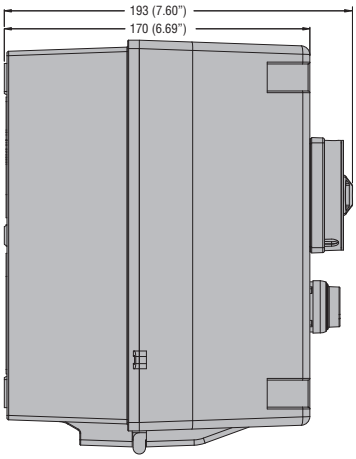


Drilling for surface fixing

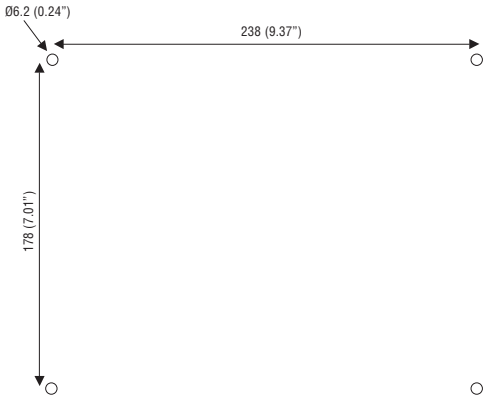


M3P...73





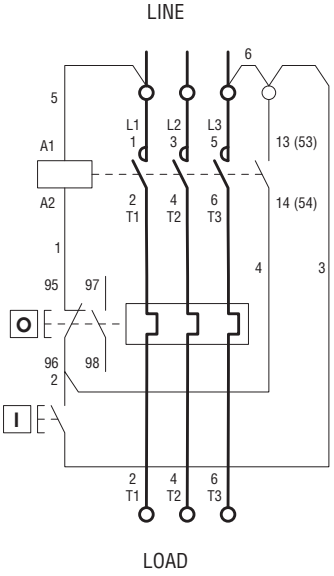
Drilling for surface fixing



DIRECT-ON-LINE STARTERS IN ENCLOSURE

M...P

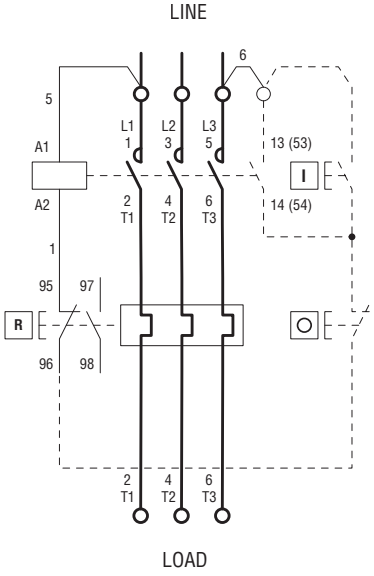
Diagram 1 - Incorporated button control for 3-phase motors



I = Start; O = Stop/Reset

M...R

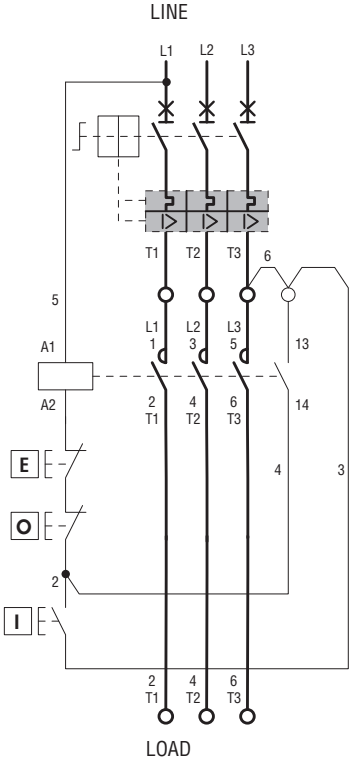
Diagram 2 - External button control for 3-phase motors



R = Reset; I = Start; O = Stop

M2P00911...

Diagram 3 - Incorporated button control and rotary actuator for 3-phase motors



I = Start; O = Stop; E = Emergency Stop

Diagram 4 - Power connection for 1-phase motors

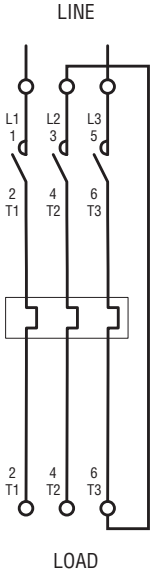
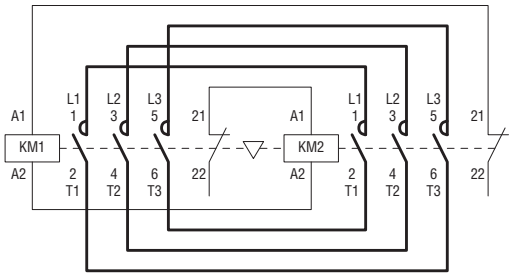


DIAGRAM 2
Connect the eventual two-wire control (e.g. automatism) between terminal 3 of the contactor and terminal 96 of the thermal overload relay.

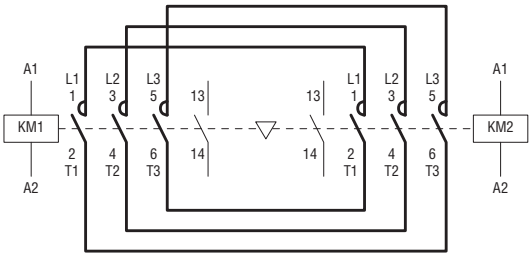
IMPORTANT
- Remove jumpers 5 and 6 and connect the auxiliary line to terminals A1 and 3 for a control circuit with a voltage value different than the supply.
- Remove jumper 5 and connect the neutral to terminal A1 for a control circuit between phase and neutral.
- SINGLE-PHASE SUPPLY
  The main circuit must be configured according to Diagram 4 in the case of a single-phase line or motor.
- FUSES
  A set of three fuses must be connected upstream of the starter in the event no appropriate protection is included in the system.

REVERSING CONTACTOR ASSEMBLY

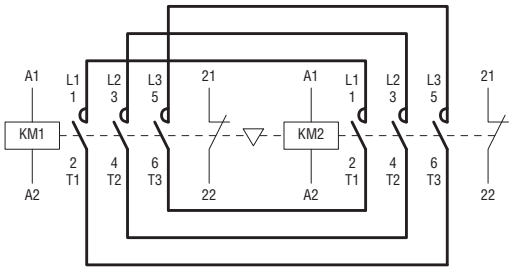
BGR...



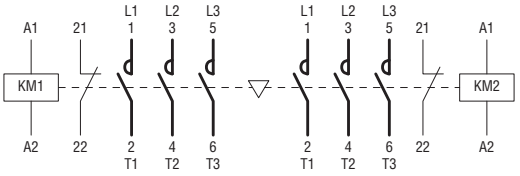
BGT...



BFA...42

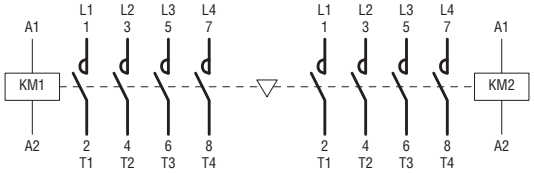


BGTP09...

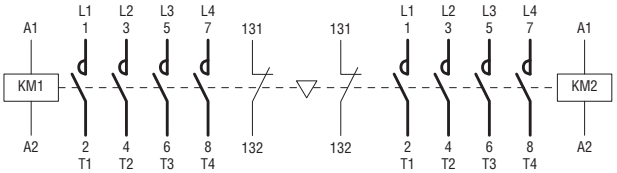


CHANGEOVER CONTACTOR ASSEMBLY

BGC09...

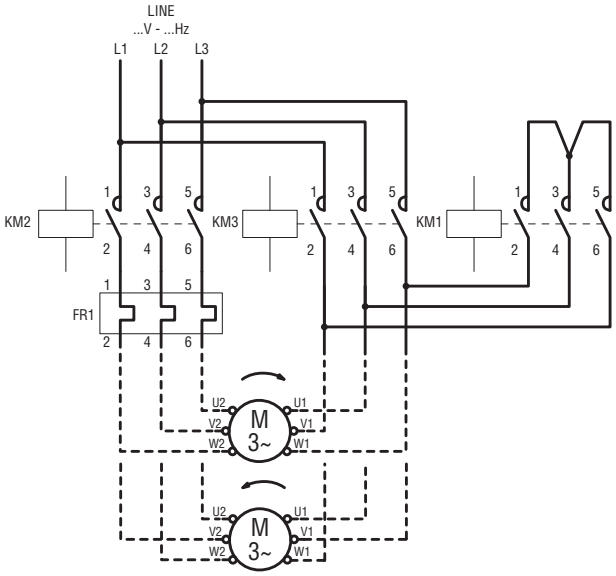


BFC...

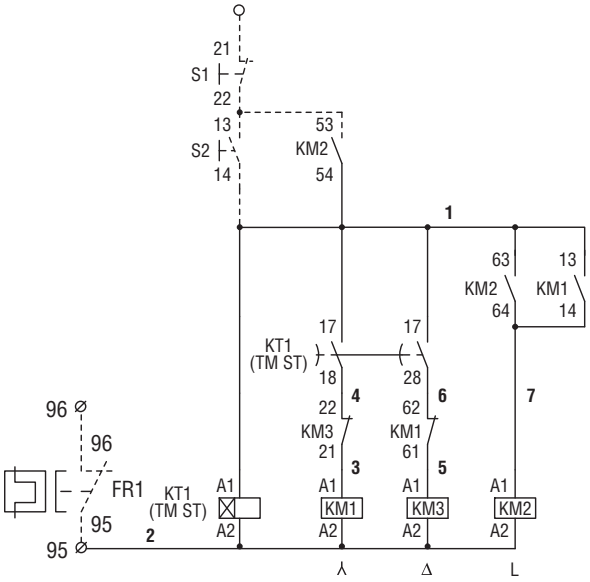


STAR-DELTA STARTERS, OPEN FRAME

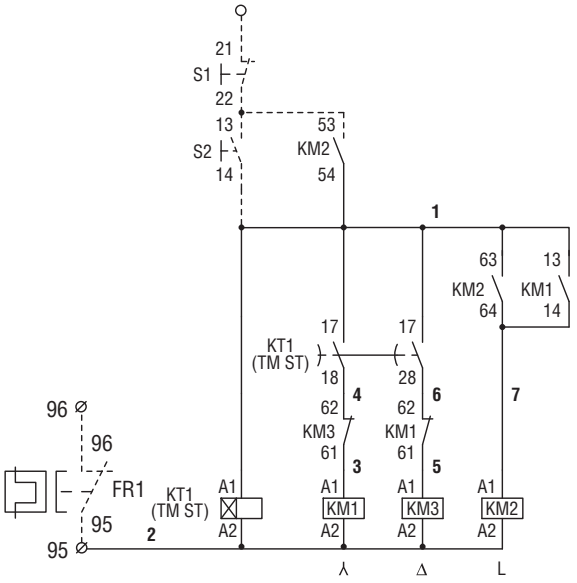
BFA009…03870 - M3P009…03870



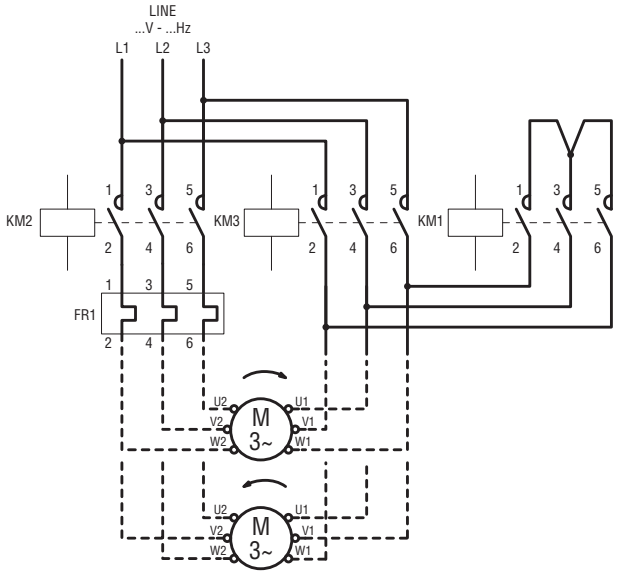
BFA00970… BFA02570
M3P00970…M3P02570

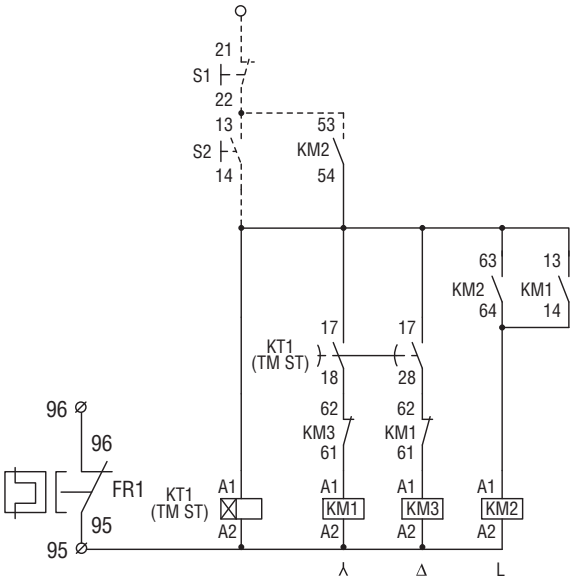


BFA2670…BFA03870
M3P02670…M3P03870



BFA050…BFA150





RATINGS FOR USA AND CANADA.

Order code for magnetic motor starters in non-metallic enclosure with 2 push buttons	T/O RELAY ADJ RANGE	MAX UL/CSA HP RATINGS INDICATED ON STARTER (based on t/o relay adj range)					
		Single phase		Three phase			
	[A]	120V	240V	200V	240V	480V	600V
M0P009❶❷1	0.6 - 1	-	-	-	-	½	½
M0P009❶❷1V5	0.9 - 1.5	-	-	-	-	¾	¾
M0P009❶❷2V3	1.4 - 2.3	-	-	-	½	1	1
M0P009❶❷33	2 - 3.3	-	¼	¾	1½	1½	2
M0P009❶❷5	3 - 5	-	½	1	1	3	3
M0P009❶❷75	4.5 - 7.5	-	¾	1½	2	5	5
M0P009❶❷10	6 - 10	½	1½	2	3	5	5
M0P012❶❷15	9 - 15	½	1½	3	3	7½	10
M1P009❶❷A4	0.63 - 1	-	-	-	-	-	½
M1P009❶❷A5	1 - 1.6	-	-	-	-	½	¾
M1P009❶❷A6	1.6 - 2.5	-	-	½	½	1	1½
M1P009❶❷A7	2.5 - 4	-	-	¾	¾	2	3
M1P009❶❷A8	4 - 6.5	¼	½	1	1½	3	5
M1P009❶❷A9	6.3 - 10	½	1½	2	3	5	7½
M1P009❶❷B0	9 - 14	¾	2	3	3	5	7½
M1P012❶❷B0	9 - 14	1	2	5	5	7½	10
M1P018❶❷B1	13 - 18	1	3	5	5	10	15
M2P025❶❷B2	17 - 23	1½	3	5	7½	15	15
M2P025❶❷B3	20 - 25	2	3	7½	7½	15	15
M2P026❶❷B2	17 - 23	1½	3	5	7½	15	20
M2P026❶❷B3	20 - 25	2	5	7½	7½	15	20
M2P026❶❷B4	24 - 32	2	5	7½	7½	15	20
M2P032❶❷B4	24 - 32	3	7½	10	10	20	25
M25P038❶❷B5	32 - 38	3	7½	10	15	30	30
M3P050❶❷B6UL	35 - 50	5	10	15	20	40	40
M3P065❶❷B7UL❸	46 - 65	-	-	20	25	50	60
M3P080❶❷B8❹	60 - 82	-	-	25❹	30❹	60❹	75❹

NOTE: the HP / FLA values vary from one motor to another; if possible, always verify the HP and FLA (or rated current) on the motor nameplate.
Enclosure UL Type 1, 12, 4 and 4X industrial control environment for M1, M2, M25 and M3...UL versions; designation of control units can be:
N – without push buttons
R – with reset button only
P – per table, with start-stop push buttons.
Consult Technical support for any other combination required (e.g. with other type of contactors, contactor assemblies or definite-purpose version, different overload version or range, additional pilot lights, extra electrical or electronic elements); see contact details on inside front cover. Refer to ❶ below for specified standard configurations.

❶ Complete the order code by indicating:
– 10 if required without thermal overload relay
– 12 if required with three-phase overload relay
– 17 if required with disconnect switch for M2 and M3 types.

❷ Complete order code with coil voltage digit (if 50/60Hz) or with voltage digit followed by 60 (if 60Hz).
Standard voltages are as follows:
– AC 50/60Hz 024 / 048 / 110 / 230 / 400V
– AC 60Hz 024 60 / 048 60 / 120 60 / 220 60 / 230 60 / 460 60 / 575 60 (V).

❸ Maximum UL ratings is 52A for motor control and 65A for general use.

❹ No CSA or UL certification. Indicated values correspond to UL/CSA magnetic contactor ratings and for indication and reference purposes only.

Certifications obtained:
– CSA certified for Canada and USA (cCSAus - File 94157) as Magnetic Motor Controllers at max 600VAC, max 15HP per single phase, max 60HP three phase, max 125A with general purpose enclosure.
– UL Listed for USA and Canada (cULus - File E93602) as Magnetic Motor Controllers – Enclosed.

THREE-PHASE POWER RATINGS		Rated motor current								
		200V	230V	**220-240V**	**380-415V**	400V	**440-480V**	500V	**550-600V**	690V
[HP]	[kW]	**[A]**	[A]	**[A]**	**[A]**	[A]	**[A]**	[A]	**[A]**	[A]
-	0.37	**-**	1.9	**-**	**-**	1.1	**-**	0.88	**-**	0.64
1/2	-	**2.5**	-	**2.2**	**1.3**	-	**1.1**	-	**0.9**	-
-	0.55	**-**	2.6	**-**	**-**	1.5	**-**	1.2	**-**	0.87
3/4	-	**3.7**	-	**3.2**	**1.8**	-	**1.6**	-	**1.3**	-
1	-	**4.8**	-	**4.2**	**2.3**	-	**2.1**	2	**1.7**	-
-	0.75	**-**	3.3	**-**	**-**	1.9	**-**	1.5	**-**	1.1
-	1.1	**-**	4.7	**-**	**-**	2.7	**-**	2.2	**-**	1.6
1-1/2	-	**6.9**	-	**6**	**3.3**	-	**3**	-	**2.4**	-
2	-	**7.8**	-	**6.8**	**4.3**	-	**3.4**	-	**2.7**	-
-	1.5	**-**	6.3	**-**	**-**	3.6	**-**	2.9	**-**	2.1
-	2.2	**-**	5.5	**-**	**-**	4.9	**-**	3.9	**-**	2.8
3	-	**-**	11.3	**-**	**-**	6.5	**-**	5.2	**-**	3.8
-	4	**-**	15	**-**	**-**	8.5	**-**	6.8	**-**	4.9
5	-	**17.5**	-	**15.2**	**9.7**	-	**7.6**	-	**6.1**	-
-	5.5	**-**	20	**-**	**-**	11.5	**-**	9.2	**-**	6.7
7-1/2	-	**25.3**	-	**22**	**14**	-	**11**	-	**9**	-
10	-	**32.2**	-	**28**	**18**	-	**14**	-	**11**	-
-	7.5	**-**	27	**-**	**-**	15.5	**-**	12.4	**-**	8.9
-	11	**-**	38	**-**	**-**	22	**-**	17.6	**-**	12.8
15	-	**48**	-	**42**	**27**	-	**21**	-	**17**	-
20	-	**62.1**	-	**54**	**34**	-	**27**	-	**22**	-
-	15	**-**	51	**-**	**-**	29	**-**	23	**-**	17
-	18.5	**-**	61	**-**	**-**	35	**-**	28	**-**	21
25	-	**78.2**	-	**68**	**44**	-	**34**	-	**27**	-
-	22	**-**	72	**-**	**-**	41	**-**	33	**-**	24
30	-	**92**	-	**80**	**51**	-	**40**	-	**32**	-
40	-	**120**	-	**104**	**66**	-	**52**	-	**41**	-
-	30	**-**	96	**-**	**-**	55	**-**	44	**-**	32
-	37	**-**	115	**-**	**-**	66	**-**	53	**-**	39
50	-	**150**	-	**130**	**83**	-	**65**	-	**52**	-
60	-	**177**	-	**154**	**103**	-	**77**	-	**62**	-
-	45	**-**	140	**-**	**-**	80	**-**	64	**-**	47
-	55	**-**	169	**-**	**-**	97	**-**	78	**-**	57
75	-	**221**	-	**192**	**128**	-	**96**	-	**77**	-
100	-	**285**	-	**248**	**165**	-	**124**	-	**99**	-
-	75	**-**	230	**-**	**-**	132	**-**	106	**-**	77
-	90	**-**	278	**-**	**-**	160	**-**	128	**-**	93
125	-	**359**	-	**312**	**208**	-	**156**	-	**125**	-
-	110	**-**	340	**-**	**-**	195	**-**	156	**-**	113
150	-	**414**	-	**360**	**240**	-	**180**	-	**144**	-
-	132	**-**	400	**-**	**-**	230	**-**	184	**-**	134
200	-	**552**	-	**480**	**320**	-	**240**	-	**192**	-
-	160	**-**	487	**-**	**-**	280	**-**	224	**-**	162
250	-	**-**	-	**604**	**403**	-	**302**	-	**242**	-
-	200	**-**	609	**-**	**-**	350	**-**	280	**-**	203
300	-	**-**	-	**722**	**482**	-	**361**	-	**289**	-
-	250	**-**	748	**-**	**-**	430	**-**	344	**-**	250
350	-	**-**	-	**828**	**560**	-	**414**	-	**336**	-
400	-	**-**	-	**954**	**636**	-	**477**	-	**382**	-
-	315	**-**	940	**-**	**-**	540	**-**	432	**-**	313
450	-	**-**	-	**1030**	**-**	-	**515**	-	**412**	-
-	355	**-**	1061	**-**	**-**	610	**-**	488	**-**	354
500	-	**-**	-	**1180**	**786**	-	**590**	-	**472**	-

SINGLE-PHASE POWER RATINGS	Rated motor current	
[HP]	**[A] at 120V**	**[A] at 240V**
1/10	3	1.5
1/8	3.8	1.9
1/6	4.4	2.2
1/4	5.8	2.9
1/3	7.2	3.6
1/2	9.8	4.9
3/4	12.8	6.9
1	16	8
1-1/2	20	10
2	24	12
3	34	17
5	56	28
7-1/2	80	40
10	100	50
15	135	68

The information in the chart has been obtained from the IEC/EN/BS 60947-4-1 standards. The kW ratings are preferred rated values according to IEC 60072-1 (primary series) at 50/60Hz while Horsepower and corresponding current values are according to UL 508 Industrial Control Standard at 60Hz.

The full load current values listed are for motors running at standard speeds with normal torque characteristics. Motors which are non-standard, such as low speed, high torque or other special applications may have higher full load currents.

Caution: for accurate and reliable motor protection, motor nameplate current should be used to obtain actual motor full load amps for all motors. The information given is for indication and reference purposes only.