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DIRECT-ON-LINE STARTERS WITH THERMAL RELAY

- Motor ratings, up to 95A 440V in AC3 duty
- Versions with Reset button or with Start-Stop/Reset buttons.



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DIRECT-ON-LINE STARTER WITHOUT THERMAL RELAY

- Motor ratings, up to 95A 440V in AC3 duty
- Versions with Reset button or with Start-Stop/Reset buttons



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REVERSING CONTACTOR ASSEMBLIES

- For three-phase motor control 9-25A 440V / 4-12.5kW 400V, in AC3 duty
- Versions with built-in or external mechanical interlock
- PCB versions 9A 440V / 4kW 400V in AC3 duty
- Complete with rigid connections.



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CHANGEOVER CONTACTOR ASSEMBLIES

- For 20A loads at $\leq 40^{\circ}\text{C}$ in AC1 duty
- With built-in mechanical interlock.



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STAR-DELTA STARTERS OPEN FRAME

- Suitable for three-phase motor control, 16A-690A 440V / 7.5kW-375kW 400V ratings in AC3 duty.



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STAR-DELTA STARTERS IN INSULATED ENCLOSURE

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



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EMPTY INSULATED ENCLOSURES

- Versions without push buttons, with Reset button only or with Start-Stop/Reset buttons
- Suitable to contain BG mini-contactor or BF09A to BF110 contactors, up to 110A 440V rating, in AC3 duty.

- ◆ *Direct-on-line starters in insulated enclosure complete with or without thermal relay*
- ◆ *Versions with RESET or START/STOP push buttons*
- ◆ *Insulated enclosures for customer-assembled starters*
- ◆ *Reversing and changeover contactor assemblies*
- ◆ *Star-delta starters, open frame and in insulated enclosure versions.*



PLANET - SWITCH

Direct-on-line starters

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Changeover contactor assemblies

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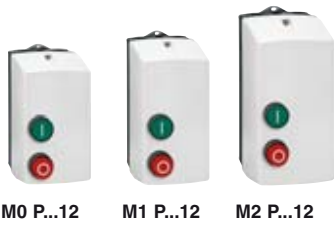
Star-delta starters

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Empty insulated enclosures

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With thermal relay in insulated enclosure



M0 P...12 M1 P...12 M2 P...12



M3 P...12



M0 R...12 M1 R...12 M2 R...12



M3 R...12



① 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: M0 R009 12 024 1 for direct-on-line starter in M0 type enclosure with Start and Stop/Reset buttons, 9A/AC3 contactor with 24VAC 50/60Hz coil and 0.6-1A thermal overload relay.
 M0 P009 12 024 60 1 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.

② I_e max (≤440V).
 ③ Protection fuses are to be mounted externally by the user.

Order code	Relay adj range [A]	Technical characteristics I _e ② [A]	Technical characteristics I _e ② kW 400V [kW]	Qty per pkg n°	Wt [kg]
Starters with Start and Stop/Reset push buttons ③.					
M0 P009 1201	0.6-1	1	0.18-0.25	1	0.760
M0 P009 1201V5	0.9-1.5	1.5	0.37	1	0.760
M0 P009 1202V3	1.4-2.3	2.3	0.55-0.75	1	0.760
M0 P009 12033	2-3.3	3.3	1.1	1	0.760
M0 P009 1205	3-5	5	1.5-2.2	1	0.760
M0 P009 12075	4.5-7.5	7.5	2.2-3	1	0.760
M0 P009 12010	6-10	10	3-4	1	0.760
M0 P012 12015	9-15	12	5.5	1	0.760
M1 P009 120A4	0.63-1	1	0.25	1	1.040
M1 P009 120A5	1-1.6	1.6	0.37-0.55	1	1.040
M1 P009 120A6	1.6-2.5	2.5	0.75	1	1.040
M1 P009 120A7	2.5-4	4	1.1-1.5	1	1.040
M1 P009 120A8	4-6.5	6.5	2.2-3	1	1.040
M1 P009 120A9	6.3-10	10	3-4	1	1.040
M1 P009 120B0	9-14	13	5.5	1	1.040
M1 P018 120B1	13-18	18	7.5	1	1.040
M2 P025 120B2	17-23	23	11	1	1.210
M2 P025 120B3	20-25	25	11	1	1.210
M2 P032 120B4	24-32	32	15	1	1.285
M3 P038 120B5	32-38	38	18.5	1	2.500
M3 P050 120B6	35-50	50	18.5-22	1	3.450
M3 P065 120B7	45-65	65	30	1	3.450
M3 P080 120B8	60-82	80	37-45	1	3.450
M3 P095 120B9	70-95	95	45	1	3.450

Order code	Relay adj range [A]	Technical characteristics I _e ② [A]	Technical characteristics I _e ② kW 400V [kW]	Qty per pkg n°	Wt [kg]
Starters with Reset push button ③.					
M0 R009 1201	0.6-1	1	0.18-0.25	1	0.720
M0 R009 1201V5	0.9-1.5	1.5	0.37	1	0.720
M0 R009 1202V3	1.4-2.3	2.3	0.55-0.75	1	0.720
M0 R009 12033	2-3.3	3.3	1.1	1	0.720
M0 R009 1205	3-5	5	1.5-2.2	1	0.720
M0 R009 12075	4.5-7.5	7.5	2.2-3	1	0.720
M0 R009 12010	6-10	10	3-4	1	0.720
M0 R012 12015	9-15	12	5.5	1	0.720
M1 R009 120A4	0.63-1	1	0.25	1	0.995
M1 R009 120A5	1-1.6	1.6	0.37-0.55	1	0.995
M1 R009 120A6	1.6-2.5	2.5	0.75	1	0.995
M1 R009 120A7	2.5-4	4	1.1-1.5	1	0.995
M1 R009 120A8	4-6.5	6.5	2.2-3	1	0.995
M1 R009 120A9	6.3-10	10	3-4	1	0.995
M1 R009 120B0	9-14	13	5.5	1	0.995
M1 R018 120B1	13-18	18	7.5	1	0.995
M2 R025 120B2	17-23	23	11	1	1.165
M2 R025 120B3	20-25	25	11	1	1.165
M2 R032 120B4	24-32	32	15	1	1.240
M3 R038 120B5	32-38	38	18.5	1	2.460
M3 R050 120B6	35-50	50	18.5-22	1	3.410
M3 R065 120B7	45-65	65	30	1	3.410
M3 R080 120B8	60-82	80	37-45	1	3.410
M3 R095 120B9	70-95	95	45	1	3.410

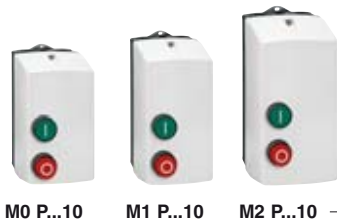
Special M3... versions
 In addition to standard-indicated versions, cULus certified starters are available.
 Add suffix **UL** to the order code, e.g. M3 P050 12 024 B6**UL**.

Components Starter enclosure	Contactor	Thermal relay	Auxiliary contact block
M0 PA	BG09 10A	RF9 1	—
M0 PA	BG09 10A	RF9 1V5	—
M0 PA	BG09 10A	RF9 2V3	—
M0 PA	BG09 10A	RF9 33	—
M0 PA	BG09 10A	RF9 5	—
M0 PA	BG09 10A	RF9 75	—
M0 PA	BG09 10A	RF9 10	—
M0 PA	BG12 10A	RF9 15	—
M1 PA	BF09 10A	RF38 0100	—
M1 PA	BF09 10A	RF38 0160	—
M1 PA	BF09 10A	RF38 0250	—
M1 PA	BF09 10A	RF38 0400	—
M1 PA	BF09 10A	RF38 0650	—
M1 PA	BF09 10A	RF38 1000	—
M1 PA	BF09 10A	RF38 1400	—
M1 PA	BF18 10A	RF38 1800	—
M2 PA	BF25 10A	RF38 2300	—
M2 PA	BF25 10A	RF38 2500	—
M2 PA	BF32 00A	RF38 3200	G418 10
M3 PA	BF38 00A	RF38 3800	G418 10
M3 PA	BF50 00	RF95 3 50	G418 10
M3 PA	BF65 00	RF95 3 65	G418 10
M3 PA	BF80 00	RF95 3 82	G418 10
M3 PA	BF95 00	RF95 3 95	G418 10
M0 RA	BG09 10A	RF9 1	—
M0 RA	BG09 10A	RF9 1V5	—
M0 RA	BG09 10A	RF9 2V3	—
M0 RA	BG09 10A	RF9 33	—
M0 RA	BG09 10A	RF9 5	—
M0 RA	BG09 10A	RF9 75	—
M0 RA	BG09 10A	RF9 10	—
M0 RA	BG12 10A	RF9 15	—
M1 RA	BF09 10A	RF38 0100	—
M1 RA	BF09 10A	RF38 0160	—
M1 RA	BF09 10A	RF38 0250	—
M1 RA	BF09 10A	RF38 0400	—
M1 RA	BF09 10A	RF38 0650	—
M1 RA	BF09 10A	RF38 1000	—
M1 RA	BF09 10A	RF38 1400	—
M1 RA	BF18 10A	RF38 1800	—
M2 RA	BF25 10A	RF38 2300	—
M2 RA	BF25 10A	RF38 2500	—
M2 RA	BF32 00A	RF38 3200	G418 10
M3 RA	BF38 00A	RF38 3800	G418 10
M3 RA	BF50 00	RF95 3 50	G418 10
M3 RA	BF65 00	RF95 3 65	G418 10
M3 RA	BF80 00	RF95 3 82	G418 10
M3 RA	BF95 00	RF95 3 95	G418 10

Operational characteristics:
 - Ambient conditions:
 • Operating temperature: -25...+60°C
 • Storage temperature: -40...+70°C
 - Degree of protection: IP65.
Certifications and compliance
 Certifications obtained: cULus and cCSAus for M0, M1 and M2 types only; cULus pending for M3 types.
 Compliant with standards: IEC/EN 60947-1, IEC/EN 60947-4-1.



Without thermal relay in insulated enclosure



M0 P...10 M1 P...10 M2 P...10



M3 P...10



M0 R...10 M1 R...10 M2 R...10



M3 R...10

Order code	Maximum operating current ($\leq 440V$)	Qty per pkg	Wt
	[A]	n°	[kg]

Starters with Start and Stop/Reset push buttons ②.

M0 P009 10①	10	1	0.677
M0 P012 10①	12	1	0.677
M1 P009 10①	13	1	0.917
M1 P018 10①	18	1	0.917
M2 P025 10①	25	1	1.060
M2 P032 10①	32	1	1.162
M3 P038 10①	38	1	2.360
M3 P050 10①	50	1	3.110
M3 P065 10①	65	1	3.110
M3 P080 10①	80	1	3.110
M3 P095 10①	95	1	3.110

Starters with Reset push button ②.

M0 R009 10①	9	1	0.627
M0 R012 10①	12	1	0.627
M1 R009 10①	13	1	0.867
M1 R018 10①	18	1	0.867
M2 R025 10①	25	1	1.020
M2 R032 10①	32	1	1.110
M3 R038 10①	38	1	2.320
M3 R050 10①	50	1	3.070
M3 R065 10①	65	1	3.070
M3 R080 10①	80	1	3.070
M3 R095 10①	95	1	3.070

① 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: M0 R009 10 024 1 for direct-on-line starter in M0 type enclosure with Reset button, 9A /AC3 contactor with 24VAC 50/60Hz coil.

M0 P009 10 024 60 1 for direct-on-line starter in M0 type enclosure with Start and Stop/Reset buttons, 9A /AC3 contactor with 24VAC 60Hz coil.

② Protection fuses are to be mounted externally by the user.

Components	Starter enclosure	Contactor	Thermal relay to purchase separately	Auxiliary contact block
M0 PA	BG09 10A	RF9⑥	—	—
M0 PA	BG12 10A	RF9⑥	—	—
M1 PA	BF09 10A	RF38④	—	—
M1 PA	BF18 10A	RF38④	—	—
M2 PA	BF25 10A	RF38④	—	—
M2 PA	BF32 00A	RF38④	—	G418 10
M3 PA	BF38 00A	RF38④	—	G418 10
M3 PA	BF50 00	RF95 3⑤	—	G418 10
M3 PA	BF65 00	RF95 3⑤	—	G418 10
M3 PA	BF80 00	RF95 3⑤	—	G418 10
M3 PA	BF95 00	RF95 3⑤	—	G418 10

M0 RA	BG09 10A	RF9⑥	—	—
M0 RA	BG12 10A	RF9⑥	—	—
M1 RA	BF09 10A	RF38④	—	—
M1 RA	BF18 10A	RF38④	—	—
M2 RA	BF25 10A	RF38④	—	—
M2 RA	BF32 00A	RF38④	—	G418 10
M3 RA	BF38 00A	RF38④	—	G418 10
M3 RA	BF50 00	RF95 3⑤	—	G418 10
M3 RA	BF65 00	RF95 3⑤	—	G418 10
M3 RA	BF80 00	RF95 3⑤	—	G418 10
M3 RA	BF95 00	RF95 3⑤	—	G418 10

③ For thermal overload relay selection, refer to pages 4-2 or 4-3.

④ For thermal overload relay selection, refer to pages 4-4.

⑤ For thermal overload relay selection, refer to pages 4-4 or 4-5.

Operational characteristics:

- Ambient conditions:
 - Operating temperature: -25...+60°C
 - Storage temperature: -40...+70°C
- Degree of protection: IP65.

Special M3... versions

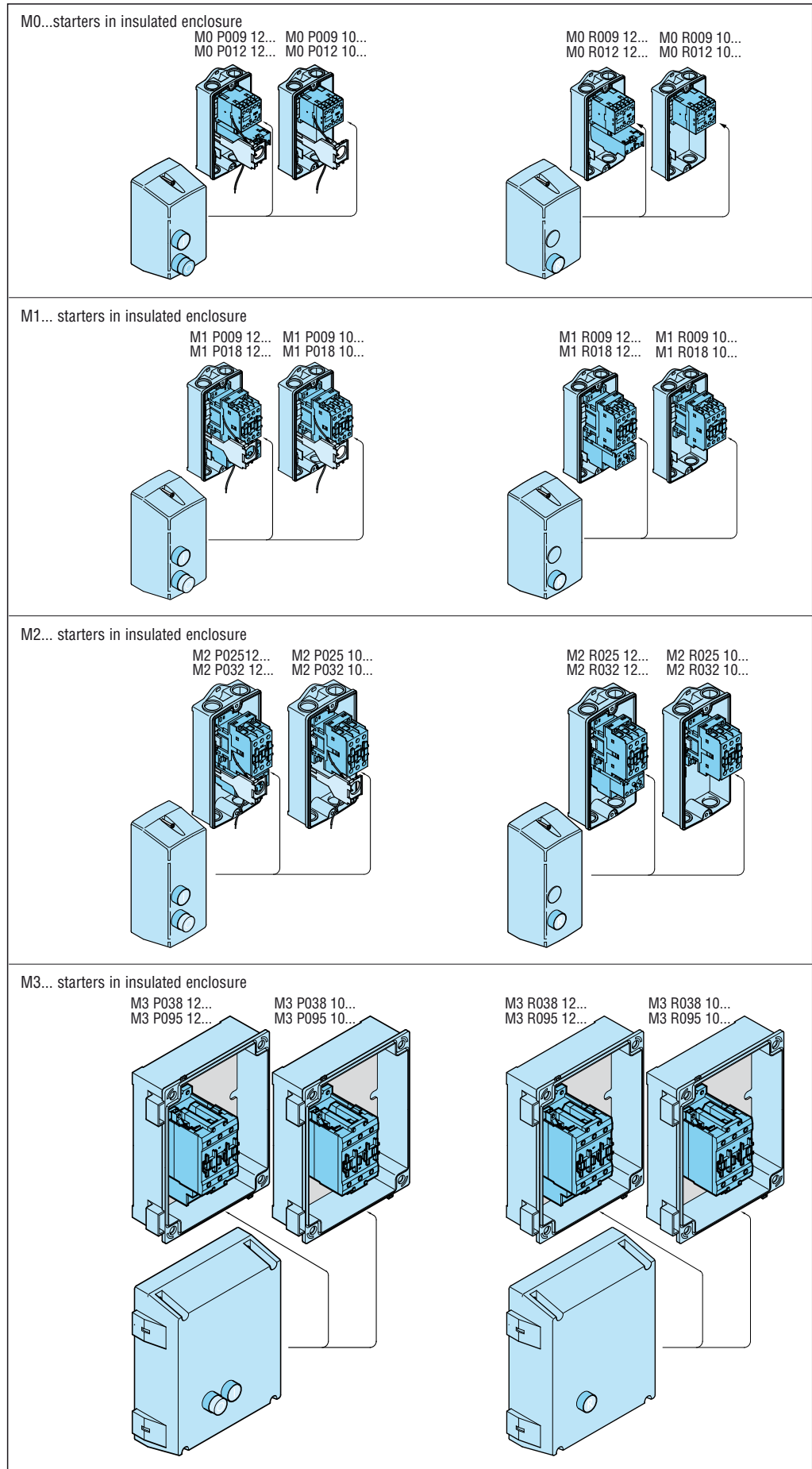
In addition to standard-indicated versions, cULus certified starters are available. Add suffix **UL** to the order code, e.g. M3 P050 10 024 B6**UL**.

Certifications and compliance

Certifications obtained: cULus and cCSAus M0, M1 and M2 types only; cULus pending for M3 types. Compliant with standards: IEC/EN 60947-1, IEC/EN 60947-4-1.

5





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

For the fitting of add-on blocks and electronic relays in the starters, contact our Customer Service (Tel. +39 035 4282422; email: service@LovatoElectric.com).

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 8 LM2T IL10... or 8 LP2T IL... pilot light can be fitted.

To fit the 8 LM2T IL10... (not type 8 LP2T IL...) pilot light head, the MX 00 fixing adapter and the mounting base, type MX 20 for M0 enclosure, or type MX 21 for M1 enclosure, must also be purchased.

The lamp holder is snapped on to this mounting base.

2) Middle position 2

Based on the enclosure type, in this position, the user finds either the Start button or a plug in the 22.5mm hole. Various actuators can be fitted in this position, such as flush or extended push buttons, selectors or pilot lights, as illustrated below.

To fit the actuators, the MX 00 fixing adapter, not required for 8 LP2T IL... pilot lights, and the mounting base, type MX 20 for M0 enclosure, or type MX 21 for M1 enclosure, must also be purchased.

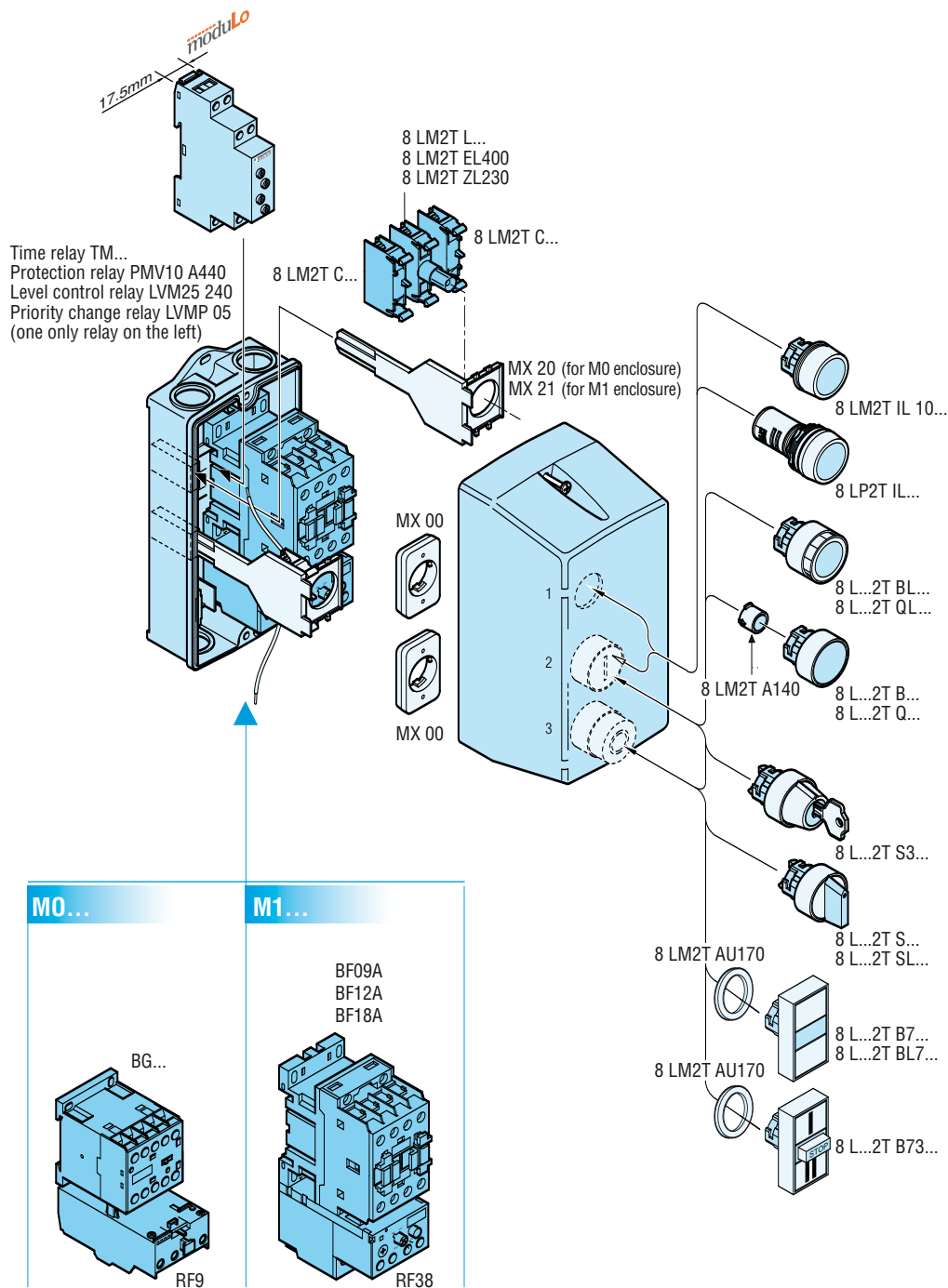
The contact or lamp holder elements are snapped on to this mounting base.

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 stopped up by the threaded plug 8 LM2 T A129.



Maximum combinations for M2... starters in enclosure

For the fitting of add-on blocks and electronic relays in the starters, contact our Customer Service (Tel. +39 035 4282422; email: service@LovatoElectric.com).

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; 8 LM2T IL10... or 8 LP2T IL... pilot light can be fitted.

To fit the 8 LM2T IL10... (not type 8 LP2T IL...) pilot light, the MX 00 fixing adapter and the mounting base type MX 21, must also be purchased.

The lamp holder is snapped on to this mounting base.

2) Middle position 2

Based on the enclosure type, in this position, the user finds either the Start button or a plug in the 22.5mm hole.

Various actuators can be fitted in this position, such as flush or extended push buttons, selectors or pilot lights, as illustrated in the side figure.

To fit the actuators, the MX 00 fixing adapter, not required for 8 LP2T IL... pilot light, and the mounting base type MX 21, must also be purchased. The contact or lamp holder elements are snapped on to this mounting base.

3) Lower position 3

The STOP/RESET button is mounted in this position, except for the enclosure without buttons.

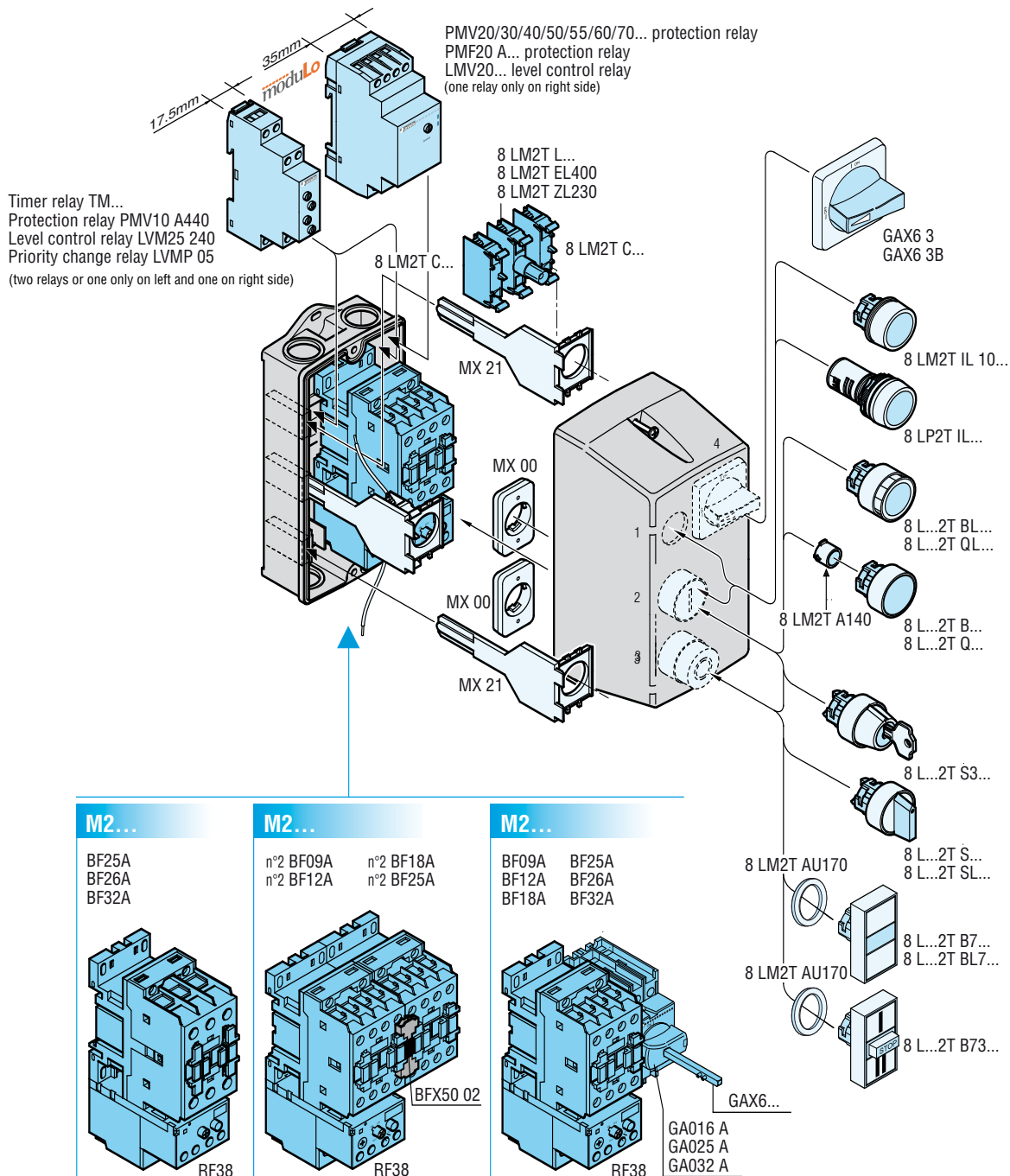
This button activates the thermal overload relay via a

mechanical actuator. In eventual applications without thermal overload relay, this button can be removed and the hole stopped up by the threaded plug 8 LM2T A129.

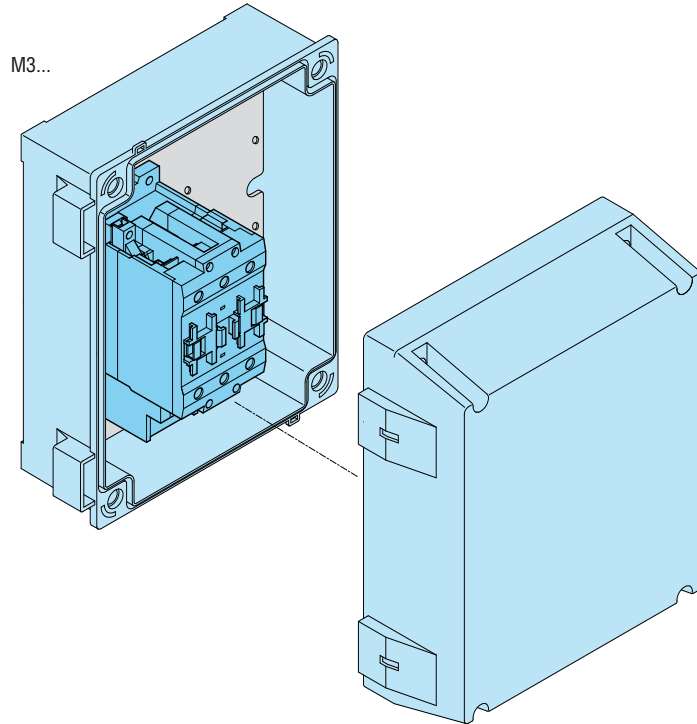
Various actuators can be fitted in this position, such as flush or extended push buttons, selectors or pilot lights, as illustrated in the drawing below. To fit the actuators, the MX 00 fixing adapter, not required for 8 LP2T IL... pilot light, and the mounting base type MX 21, must also be purchased. The contact or lamp holder elements are snapped on to this mounting base.

4) Upper position 4

The cover must be drilled in this position, with a 22.5mm hole, by the user whenever a switch disconnecter is fitted in the enclosure.

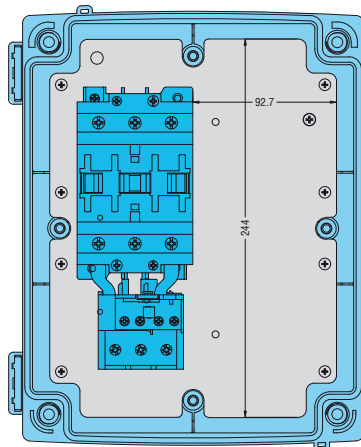


Maximum combinations for M3... starters in enclosure

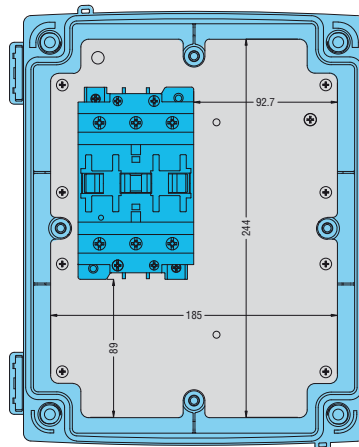


Available space for fitting other electrical or electronic devices

M3P... 12... - M3R... 12...

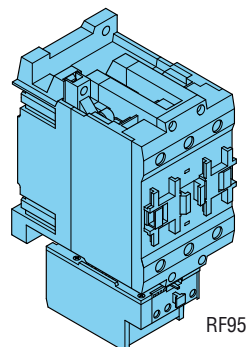


M3P... 10... - M3R... 10...



M3...

- BF38 BF65 BF95
- BF50 BF80 BF110



Reversing contactor assemblies



11 BGR...



BFA...



11 BGT...



11 BGTP...

Order code	Ie (AC3) ≤440V ≤55°C	Max. 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.

11 BGR09 01 A①	9	4	0 1②	1	0.374
11 BGR12 01 A①	12	5.7	0 1②	1	0.374
BFA009 42③	9	4.2	0 1②	1	0.700
BFA012 42③	12	5.7	0 1②	1	0.700
BFA018 42③	18	7.5	0 1②	1	0.700
BFA025 42③	25	12.5	0 1②	1	0.700

Built-in interlock with power wiring only.

11 BGT09 10 A①	9	4	1② 0	1	0.366
11 BGT12 10 A①	12	5.7	1② 0	1	0.366

Rear terminals: PCB solder pins.

Built-in interlock only.

11 BGTP09 01 A①	9	4④	0 1②	1	0.340
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DC COIL.

Terminals: clamp screw.

External interlock with power and auxiliary wiring.

11 BGR09 01 D②	9	4	0 1②	1	0.384
11 BGR12 01 D②	12	5.7	0 1②	1	0.384

Built-in interlock with power wiring only.

11 BGT09 10 D②	9	4	1② 0	1	0.376
11 BGT12 10 D②	12	5.7	1② 0	1	0.376

Rear terminals: PCB solder pins.

Built-in interlock only.

11 BGTP09 01 D②	9	4④	0 1②	1	0.350
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① 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: 11 BGR09 01 A024 for reversing contactor assembly with 2 mini-contactors BG09 having 1 NC auxiliary contact each and 24VAC 50/60Hz coil.

11 BGR09 01 A024 60 for reversing contactor assembly with 2 mini-contactors BG09 having 1 NC auxiliary contact each and 24VAC 60Hz coil.

② Complete order code with coil voltage digit.

Standard voltages are:

– DC 012 / 024 / 048 / 060 / 110 / 125 / 220V.

Example: 11BGR09 01 D012 is a reversing contactor assembly with 2 mini-contactors BG09 having 1 NC auxiliary contact each and 12VDC coil.

③ One auxiliary contact for each contactor.

④ Maximum voltage is limited 300V for UL. For certified type up to 600V, contact our Customer Service (Tel. +39 035 4282422; email: service@LovatoElectric.com).

General characteristics

The reversing contactor assemblies are supplied complete, ready for quick mounting. The various versions are composed as follows:

BGR... Screw termination, external mechanical interlock BGX50 00, 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.

BFA... Screw termination, mechanical interlock BFX50 02 and power wiring.

No thermal overload relay can be directly mounted to BG... reversing contactor assemblies.

The thermal overload relay RF38... can be directly mounted to BFA... reversing contactor assemblies; for selection, refer to section 4.

Operational characteristics

Type	Maximum operational power at ≤55°C (AC3)					
	230V	400V	415V	440V	500V	690V
	[kW]	[kW]	[kW]	[kW]	[kW]	[kW]
BGR09	2.2	4	4.3	4.5	5	5
BGT09	2.2	4	4.3	4.5	5	5
BGTP09④	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

NOTE: No coil change or replacement is possible for BG... types.

Add-on blocks

Refer to section 3, pages 3-16 and 3-18.

Special add-on auxiliary contacts, 11 BGX11 11 or 11 BGX11 12 type, must be used the left-side contactor of the BGT reversing assemblies.

For the right-side contactor, normal 11 BGX10... types of auxiliary contacts can be used instead.

Refer to page 3-16 for details.

Certifications and compliance

Certifications obtained: cULus for BGR, BGT, and BFA and cULus for BGTP④.

Compliant with standards IEC/EN 60947-1, IEC/EN 60947-4-1.

Ⓜ "Recognized". Product having this type of marking are intended for use as components of complete workshop-assembled equipment.

Changeover contactor assemblies



11 BGC09 ...

Order code	Operating current (AC1)			Qty per pkg	Wt
	≤40°C	≤55°C	≤60°C		
	[A]	[A]	[A]	n°	[kg]

AC COIL.

Terminals: clamp screw. Built-in interlock only.

11 BGC09 T4 A	20	18	15	1	0.340
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DC COIL.

Terminals: clamp screw. Built-in interlock only.

11 BGC09 T4 D	20	18	15	1	0.350
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- ① 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: 11 BGC09 T4 A024 for changeover contactor assembly with 2 mini-contactors BG09 having 4 main poles each and 24VAC 50/60Hz coil.

11 BGC09 T4 A024 60 for changeover contactor assembly with 2 mini-contactors BG09 having 4 main poles each and 24VAC 60Hz coil.

- ② Complete order code with coil voltage digit.

Standard voltages are:

- DC 012 / 024 / 048 / 060 / 110 / 125 / 220V.

Example: 11BGC09 T4 D012 is a changeover contactor assembly with 2 mini-contactors BG09 having 4 main poles each and 12VDC coil.

General characteristics

The changeover contactor assemblies are supplied complete, ready for quick mounting.
BGC09 T4 contactors of four-pole type with built-in mechanical interlock. No power or auxiliary wiring included.

Operational characteristics

Type	Maximum operational power at ≤40°C (AC3)					
	230V	400V	415V	440V	500V	690V
	[kW]	[kW]	[kW]	[kW]	[kW]	[kW]
BGC09 T4	8	14	14	15	16	22

NOTE: No coil change or replacement is possible for BGC09 T4... types.

Add-on blocks

Refer to section 3, page 3-16.

Special add-on auxiliary contacts, 11 BGX11 11 or 11 BGX11 12 type, must be used the left-side contactor of the BGC changeover assemblies.

For the right-side contactor, normal 11 BGX10... types of auxiliary contacts can be used instead.

Refer to page 3-16 for details.

Certifications and compliance

Certifications obtained: cULus.

Compliant with standards IEC/EN 60947-1, IEC/EN 60947-4-1.

With TM ST electronic time relay



BFA...

5

Order code	Three-phase motor control. Max operating current ($\leq 440V$)	Qty per pkg	Wt
	[A]	n°	[kg]

Complete star-delta starters, open frame, for starting time up to 12 seconds and a maximum of 30 operations/hour.

BFA009 70 024	16	1	1,424
BFA012 70 024	22	1	1,424
BFA018 70 024	28	1	1,424
BFA025 70 024	35	1	1,524
BFA026 70 024	43	1	1,524
BFA032 70 024	50	1	2,108
BFA038 70 024	60	1	2,108
21 DYF50 E 001	85	1	4.200
21 DYF65 E 001	110	1	4.200
21 DYF80 E 001	140	1	5.000
21 DYF95 E 001	145	1	5.000
21 NYF115 001	220	1	17.700
21 NYF145 001	260	1	17.700
21 NYF180 001	310	1	17.700
21 NYF250 001	480	1	38.000
21 NYF310 001	530	1	38.000
21 NYF400 001	690	1	43.000

Operational characteristics

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	59	63	75
40	75	80	100
40	75	80	100
63	110	129	147
80	132	162	185
92	160	185	210
145	250	280	315
160	295	335	368
220	375	425	450

Thermal relay adjustment range

Choose the thermal relay adjustment range considering a value equal to 58% of rated motor current (e.g.: $I_e=100A$; 58% $I_e=58A$ - The suitable relay range is 46-65A and the digit to complete the starter order code is 65. During the setup, the relay is to be regulated at 58A).

Digit defining thermal relay range	Relay adj range	aM fuses 00	DYF starters			
			50	65	80	95
23	14-23	40				
33	20-33	63				
42	28-42	80				
50	35-50	80				
65	46-65	125				
82	60-82	160				
95	70-95	200				

Digit defining thermal relay range	Relay adj range	aM fuses 00	NYF starters						
			115	145	180	250	310	400	
100	60-100	200							
125	75-125	250							
150	90-150	315							
200	120-200	400							
250	150-250	500							
300	180-300	630							
420	250-420	800							

- 1 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: BFA009 70 024 for BFA009 star-delta starter with 24VAC 50/60Hz power supply.

BFA009 70 024 60 for BFA009 star-delta starter with 24VAC 60Hz power supply.

- 2 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 4-4 for the order code.
- 3 Replace with digit of thermal relay; see tables under thermal relay adjustment range.
- 4 Complete order code with coil digit followed by 50 60, if 50/60Hz frequency, or with voltage digit followed by 60, if 60Hz. Standard voltages are:
 - AC 50/60Hz 024 / 048 / 110 / 230 / 400V
 - AC 60Hz 024 60 / 048 60 / 120 60 / 220 60 / 230 60 (V).
- 5 TM ST with auxiliary supply 24...240VAC.
 TM ST A440 with auxiliary supply 380...440VAC.

NOTE: For higher powers and voltages, or suitable for heavy-duty starting (centrifugal fans, mills, crushers) that is with starting time exceeding 12s, contact our Customer Service (Tel. +39 035 4282422; email: service@LovatoElectric.com).

Components

Starter	Contactors			Thermal overload relay	Time relay	Auxiliary contacts fitted on contactor:			Rigid connections
	Line	Delta	Star			Line	Delta	Star	
BFA009 70	BF09 10A	BF09 01A	BF09 10A	RF38	TM ST	BFX10 20	—	BFX10 11	BFX31 31
BFA012 70	BF12 10A	BF12 01A	BF09 10A	RF38	TM ST	BFX10 20	—	BFX10 11	BFX31 31
BFA018 70	BF18 10A	BF18 01A	BF12 10A	RF38	TM ST	BFX10 20	—	BFX10 11	BFX31 31
BFA025 70	BF25 10A	BF25 01A	BF18 10A	RF38	TM ST	BFX10 20	—	BFX10 11	BFX31 31
BFA026 70	BF26 00A	BF26 00A	BF18 10A	RF38	TM ST	BFX10 20	BFX10 11	BFX10 11	BFX32 32
BFA032 70	BF32 00A	BF32 00A	BF25 10A	RF38	TM ST	BFX10 20	BFX10 11	BFX10 11	BFX32 32
BFA038 70	BF38 00A	BF38 00A	BF25 10A	RF38	TM ST	BFX10 20	BFX10 11	BFX10 11	BFX32 32
DYF50 E	BF50 00	BF50 00	BF32 00	RF95 3	TM ST	BFX10 20	BFX10 11	BFX10 11	—
DYF65 E	BF65 00	BF65 00	BF32 00	RF95 3	TM ST	BFX10 20	BFX10 11	BFX10 11	—
DYF80 E	BF80 00	BF80 00	BF50 00	RF95 3	TM ST	BFX10 20	BFX10 11	BFX10 11	—
DYF95 E	BF95 00	BF95 00	BF50 00	RF95 3	TM ST	BFX10 20	BFX10 11	BFX10 11	—
NYF115	B115 00	B115 00	BF65 00	RF200	TM ST	G350	G354	BFX10 11	—
NYF145	B145 00	B145 00	BF80 00	RF200	TM ST	G350	G354	BFX10 11	—
NYF180	B180 00	B180 00	B115 00	RF200	TM ST	G350	G354	G354	—
NYF250	B250 00	B250 00	B145 00	RF420	TM ST	G350	G354	G354	—
NYF310	B310 00	B310 00	B180 00	RF420	TM ST	G350	G354	G354	—
NYF400	B400 00	B400 00	B250 00	RF420	TM ST	G350	G354	G354	—

Reference standards

Compliant with standards: IEC/EN 60947-1, IEC/EN 60947-4-9.

Starters in insulated enclosure



M3P...



Order	Three-phase motor control. Max operating current ($\leq 440V$)	Qty per pkg	Wt
	[A]	n°	[kg]
M3P009 70	16	1	2.420
M3P012 70	22	1	2.420
M3P018 70	28	1	2.420
M3P025 70	35	1	2.520
M3P026 70	43	1	2.520
M3P032 70	50	1	4.110
M3P038 70	60	1	4.110

Star-delta starters in enclosure with Start and Stop/Reset buttons. Starting time up to 12 seconds and a maximum of 30 operations /hour.

- ① 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: M3P009 70 024 for M3P009 star-delta starter with 24VAC 50/60Hz power supply.
M3P009 70 02460 024 for M3P009 star-delta starter with 24VAC 60Hz power supply.
- ② 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 (e.g.: $I_e=10A$; 58% $I_e = 5.8A$. The suitable relay range is 4-6.5A, set at 5.8A, so the order code to select is RF380650). Refer to page 4-4 for the order codes available.
- ③ TM ST with auxiliary supply 24...240VAC.

NOTE: For higher powers and voltage ratings or suitable for heavy-duty starting (centrifugal fans, mills, crushers) that is with starting time exceeding 12s, contact our Customer Service (Tel. +39 035 4282422; email: service@LovatoElectric.com).

Operational characteristics

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

- Ambient conditions:
 - Operating temperature: $-25...+60^{\circ}C$
 - Storage temperature: $-40...+70^{\circ}C$
- Degree of protection: IP6.

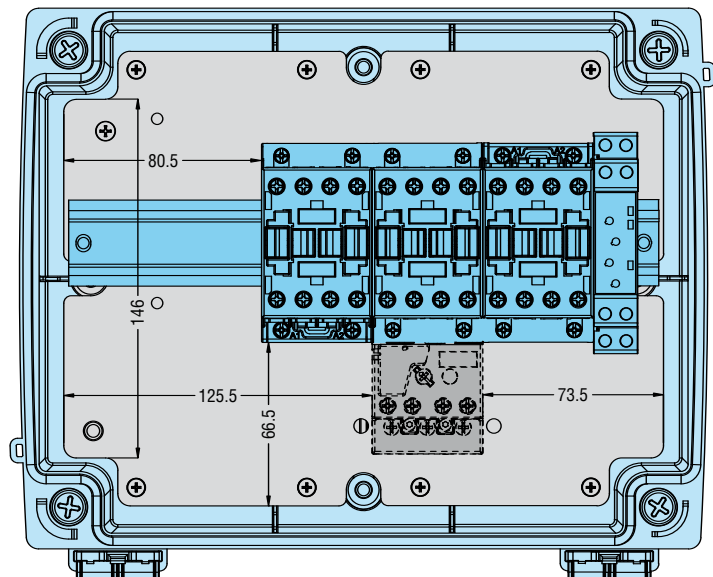
Certifications and compliance

Certifications obtained: cULus pending.
Compliant with standards: IEC/EN 60947-1, IEC/EN 60947-4-1.

Components

Type	Enclosure	Plate	Contactors			T/o relay ②	Time relay ③	Auxiliary contacts fitted on contactor:			Rigid connections
			Line	Delta	Star			Line	Delta	Star	
M3P009 70	M3N	MX30	BF09 10A	BF09 01A	BF09 10A	RF38	TM ST	BFX10 20	—	BFX10 11	BFX31 31
M3P012 70	M3N	MX30	BF12 10A	BF12 01A	BF09 10A	RF38	TM ST	BFX10 20	—	BFX10 11	BFX31 31
M3P018 70	M3N	MX30	BF18 10A	BF18 01A	BF12 10A	RF38	TM ST	BFX10 20	—	BFX10 11	BFX31 31
M3P025 70	M3N	MX30	BF25 10A	BF25 01A	BF18 10A	RF38	TM ST	BFX10 20	—	BFX10 11	BFX31 31
M3P026 70	M3N	MX30	BF26 00A	BF26 00A	BF18 10A	RF38	TM ST	BFX10 20	BFX10 11	BFX10 11	BFX32 32
M3P032 70	M3N	MX30	BF32 00A	BF32 00A	BF25 10A	RF38	TM ST	BFX10 20	BFX10 11	BFX10 11	BFX32 32
M3P038 70	M3N	MX30	BF38 00A	BF38 00A	BF25 10A	RF38	TM ST	BFX10 20	BFX10 11	BFX10 11	BFX32 32

Maximum available space inside M3P... star-delta starters in enclosure



Empty insulated enclosures



M...PA

Order code	Contacteur type ①	Thermal relay ②	Degree of protect.	Qty per pkg n°	Wt [kg]
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Enclosures with Start-Stop/Reset buttons.

M0PA	BG06, BG09, BG12	RF9	IP65	1	0.490
M1PA	BF09A, BF12A, BF18A	RF38	IP65	1	0.545
M2PA	BF25A, BF26A, BF32A③	RF38	IP65	1	0.715
M3PA④	BF38A, BF50, BF65, BF80, BF95, BF110	RF95 3 ⑤	IP65	1	1.900

Enclosures with Reset button.

M0RA	BG06, BG09, BG12	RF9	IP65	1	0.445
M1RA	BF09A, BF12A, BF18A	RF38	IP65	1	0.500
M2RA	BF25A, BF26A, BF32A③	RF38	IP65	1	0.670
M3RA④	BF38A, BF50, BF65, BF80, BF95, BF110	RF95 3 ⑤	IP65	1	1.850

Enclosures without external push-buttons.

M0N	BG06, BG09, BG12	RFA9	IP65	1	0.405
M1N	BF09A, BF12A, BF18A	RF38	IP65	1	0.460
M2N	BF25A, BF26A, BF32A③	RF38	IP65	1	0.640
M3N	BF38A, BF50, BF65, BF80, BF95, BF110	RF95 3 ⑤	IP65	1	1.800

① To be purchased separately; refer to page 3-4 for contactor choice.

② To be purchased separately; refer to pages 4-2 to 4-6 for thermal overload relay choice.

③ Reversing contactor assemblies can be fitted as well. Refer to drawing on page 5-7.

④ MX 30 metal mounting plate included.

⑤ For the thermal overload relay to use with BF38A contactor, contact our Customer Service (Tel. +39 035 4282422; email: service@LovatoElectric.com)

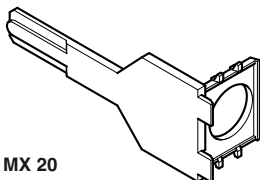


M...RA

Accessories and spare parts



MX 00

MX 20
MX 21

Order code	Description	Qty per pkg n°	Wt [kg]
MX 00	Button actuator fixing adapter for M0, M1 and M2 enclosures	10	0.010
MX 10	Stop/Reset button extension rod for M0 enclosure	5	0.007
MX 11	Stop/Reset button extension rod for M1 enclosure	5	0.010
MX 12	Stop/Reset button extension rod for M2 enclosure	5	0.010
MX 20	Mounting base for 8LM2T C... contact on M0 enclosure	5	0.010
MX 21	Mounting base for 8LM2T C... contact on M1 or M2 enclosure	5	0.010
MX 30	Metal mounting plate for M3N	1	0.500

Enclosure type	Maximum operating current (≤440V) A
M0...	12
M1...	18
M2...	32
M3...	110

General characteristics

Enclosures are supplied with the following accessories:

Enclosure	M0 PA	M1 PA	M2 PA	M0 RA	M1 RA	M2 RA
Mounting base MX 20	1					
MX 21		1	1			
Stop/Reset button 8 LP2T B1176				1	1	1
8 LP2T B2104	1	1	1			
Start button 8 LP2T B1113	1	1	1			
Contact element for Start button 8 LM2T C10	1	1	1			
Operator mounting adapter MX 00	2	2	2	1	1	1
Start/Reset button extension rod MX 10	1			1		
MX 11		1			1	
MX 12			1			1
Threaded plug for unused holes 8 LM2T A129				1	1	1

M3 P... type enclosures are equipped with the following accessories:

- For M3 PA enclosure with 2 push buttons Start and Stop/Reset: 1 earth terminal and 2 G285 auxiliary terminals and 1 MX30 mounting plate
- For M3 RA enclosure with 1 push button Reset: 1 earth terminal and 2 G285 auxiliary terminals and 1 MX30 mounting plate
- For M3N enclosure: Supplied without accessories to be purchased separately including MX 30 mounting plate.

NOTE: Enclosures can house the following contactors with the relative thermal relay:

M0 = BG...

M1 = BF09A-BF12A-BF18A

M2 = BF25A-BF26A-BF32A③

M3 = BF38A-BF50-BF65-BF80-BF95-BF110

Operational characteristics:

- Ambient conditions:
 - Operating temperature: -25...+60°C
 - Storage temperature: -40...+70°C
- Degree of protection: IP65.

Special M3... versions

In addition to standard-indicated versions, cULus certified starters are available. Add suffix **UL** to the order code, e.g. M3N **UL**.

Certifications and compliance

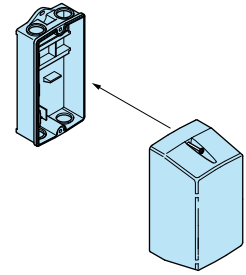
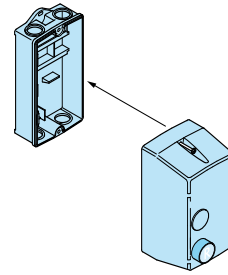
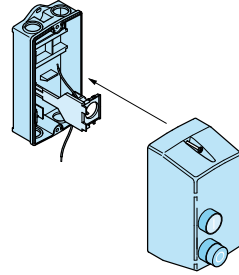
Certifications obtained: cULus and cCSAus M0, M1 and M2 types enclosures only; cULus pending for M3 types. Compliant with standards: IEC/EN 60947-1, IEC/EN 60947-4-1.

M0... empty enclosures

M0PA

M0RA

M0N

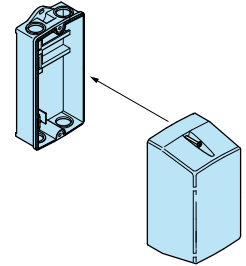
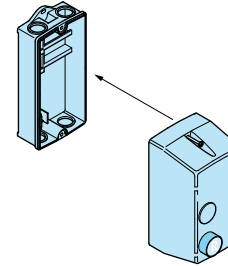
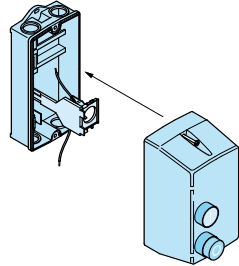


M1... empty enclosures

M1PA

M1RA

M1N

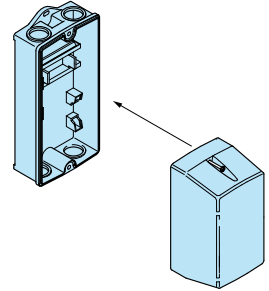
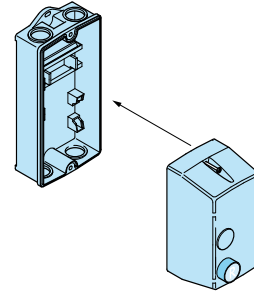
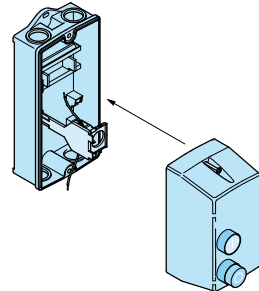


M2... empty enclosures

M2PA

M2RA

M2N



M3... empty enclosures

M3PA

M3RA

M3N

