

# MOTOR STARTING SOLUTIONS



 **Lovato**  
**electric**

ENERGY AND AUTOMATION

# MOTOR STARTING SOLUTIONS



LOVATO Electric products are suitable for new motors with high IE3 efficiency values.



MOTOR PROTECTION CIRCUIT BREAKER WITH CONTACTOR

CONTACTOR WITH THERMAL RELAY

ASSEMBLED STAR-DELTA STARTER (OPEN FRAME)

STAR-DELTA STARTER COMPONENTS (TO BE CUSTOMER ASSEMBLED)

SOFT STARTER

VARIABLE SPEED DRIVE

Motor power

# 400V

kW HP A (AC3)	0.37	0.75
	0.5	1
	1.1	1.9

<b>Motor protection circuit breaker ■</b>	SM1P 0160	SM1P 0250
Thermal trip adjustment range ▲	[A] 1...1.6	1.6...2.5
Icu 400V	[kA] 100	100
<b>Rigid circuit breaker - contactor connection</b>	SM1X30 40P	SM1X30 40P
<b>AC contactor</b>	11 BG06 1A 2	11 BG06 1A 2

<b>Fuse holder</b>	FB01 F 3P	FB01 F 3P
Backup fuse aM	[A] 2 (10X38)	4 (10X38)
<b>AC contactor ●</b>	11 BG06 1A 2	11 BG06 1A 2
<b>Thermal overload relay</b>	11 RF9 1V5	11 RF9 2V3
Thermal trip adjustment range ▲	[A] 0.9...1.5	1.4...2.3
<b>Set of links for direct thermal overload relay mounting on contactor</b>	---	---

<b>Fuse holder</b>	---	---
Backup fuse aM	[A] ---	---
<b>Star-delta starter</b>	---	---
<b>Thermal overload relay</b>	---	---
Thermal trip adjustment range ▲	[A] ---	---

<b>Fuse holder</b>	---	---
Backup fuse aM	[A] ---	---
<b>AC line contactor ●</b>	---	---
<b>AC delta contactor ●</b>	---	---
<b>AC star contactor ●</b>	---	---
<b>Thermal overload relay ◆★</b>	---	---
Thermal trip adjustment range ▲	[A] ---	---
<b>Time relay</b>	---	---
<b>Add-on auxiliary contact blocks (line contactor)</b>	---	---
<b>Add-on auxiliary contact blocks (delta contactor)</b>	---	---
<b>Add-on auxiliary contact blocks (star contactor)</b>	---	---
<b>Rigid connections</b>	---	---

<b>Fuse holder</b>	---	---
High speed fuse	[A] ---	---
<b>AC line contactor ●</b>	---	---
<b>Soft starter</b>	---	---

<b>Fuse holder</b>	FB01 F 3P	FB01 F 3P
Backup fuse aM	[A] 2 (10X38)	2 (10X38)
<b>Variable speed drive</b>	VLB3 0004 A480	VLB3 0007 A480

① Replace with 10 to obtain contactor with 1 normally open auxiliary contact NO or 01 to obtain contactor with 1 normally closed auxiliary contact NC.  
E.g.: 11 BG06 10 A 2, contactor with 1 NO auxiliary contact.



<b>1.5</b>	<b>2.2</b>	<b>3</b>	<b>4</b>	<b>5.5</b>	<b>7.5</b>	<b>11</b>	<b>15</b>
<b>2</b>	<b>3</b>	<b>4</b>	<b>5.5</b>	<b>7.5</b>	<b>10</b>	<b>15</b>	<b>20</b>
<b>3.6</b>	<b>4.9</b>	<b>6.5</b>	<b>8.5</b>	<b>11.5</b>	<b>15.5</b>	<b>22</b>	<b>29</b>

SM1P 0400	SM1P 0650	SM1P 1000	SM1P 1000	SM1P 1400	SM1P 1800	SM1P 2300	SM1P 3200
2.5...4	4...6.5	6.3...10	6.3...10	9...14	13...18	17...23	24...32
100	100	100	100	25	25	15	10
SM1X30 40P	SM1X30 40P	SM1X31 41P	SM1X31 41P	SM1X31 41P	SM1X31 41P	SM1X31 41P	SM1X32 41P
11 BG06 1A 2	11 BG06 1A 2	BF09 1A 2	BF09 1A 2	BF12 1A 2	BF18 1A 2	BF25 1A 2	BF32 00A 2
FB01 F 3P	FB01 F 3P	FB01 F 3P	FB01 F 3P	FB01 F 3P	FB01 F 3P	FB01 F 3P	FB02 A 3P
6 (10X38)	8 (10X38)	8 (10X38)	10 (10X38)	16 (10X38)	20 (10X38)	25 (10X38)	32 (14X51)
11 BG06 1A 2	11 BG06 1A 2	BF09 1A 2	BF09 1A 2	BF12 1A 2	BF18 1A 2	BF25 1A 2	BF32 00A 2
11 RF9 5	11 RF9 75	RF38 1000	RF38 1000	RF38 1400	RF38 1800	RF38 2300	RF38 3200
3...5	4.5...7.5	6.3...10	6.3...10	9...14	13...18	17...23	24...32
--	--	--	--	--	--	--	--
--	--	FB01 F 3P	FB01 F 3P	FB01 F 3P	FB01 F 3P	FB01 F 3P	FB02 A 3P
--	--	8 (10X38)	10 (10X38)	16 (10X38)	20 (10X38)	25 (10X38)	32 (14X51)
--	--	BFA009 70 2	BFA009 70 2	BFA009 70 2	BFA009 70 2	BFA012 70 2	BFA018 70 2
--	--	RF38 0400	RF38 0650	RF38 1000	RF38 1000	RF38 1400	RF38 1800
--	--	2.5...4	4...6.5	6.3...10	6.3...10	9...14	13...18
--	--	FB01 F 3P	FB01 F 3P	FB01 F 3P	FB01 F 3P	FB01 F 3P	FB02 A 3P
--	--	8 (10X38)	10 (10X38)	16 (10X38)	20 (10X38)	25 (10X38)	32 (14X51)
--	--	BF09 10A 2	BF09 10A 2	BF09 10A 2	BF09 10A 2	BF12 10A 2	BF18 10A 2
--	--	BF09 01A 2	BF09 01A 2	BF09 01A 2	BF09 01A 2	BF12 01A 2	BF18 01A 2
--	--	BF09 10A 2	BF09 10A 2	BF09 10A 2	BF09 10A 2	BF09 10A 2	BF12 10A 2
--	--	RF38 0400	RF38 0650	RF38 1000	RF38 1000	RF38 1400	RF38 1800
--	--	2.5...4	4...6.5	6.3...10	6.3...10	9...14	13...18
--	--	TM ST 4	TM ST 4	TM ST 4	TM ST 4	TM ST 4	TM ST 4
--	--	BFX10 20	BFX10 20	BFX10 20	BFX10 20	BFX10 20	BFX10 20
--	--	--	--	--	--	--	--
--	--	BFX10 11	BFX10 11	BFX10 11	BFX10 11	BFX10 11	BFX10 11
--	--	BFX31 31	BFX31 31	BFX31 31	BFX31 31	BFX31 31	BFX31 31
--	--	FB02 A 3P	FB02 A 3P	FB02 A 3P	FB03 A 3P	FB03 A 3P	FB03 A 3P
--	--	35 (14X51)	35 (14X51)	35 (14X51)	90 (22X58)	90 (22X58)	90
--	--	BF09 1A 2	BF09 1A 2	BF12 1A 2	BF18 1A 2	BF18 1A 2	BF32 00A 2
--	--	ADXC 012 400	ADXC 012 400	ADXL 0018 600	ADXL 0018 600	ADXL 0030 600	ADXL 0030 600
FB01 F 3P	FB01 F 3P	FB01 F 3P	FB01 F 3P	FB01 F 3P	FB01 F 3P	FB01 F 3P	FB02 A 3P
4 (10X38)	6 (10X38)	8 (10X38)	10 (10X38)	16 (10X38)	20 (10X38)	25 (10X38)	32 (14X51)
VLB3 0015 A480	VLB3 0022 A480	VLB3 0040 A480	VLB3 0040 A480	VLB3 0055 A480	VLB3 0075 A480	VLB3 0110 A480	VLB3 0150 A480

2 Complete order code with the coil voltage digit if 50/60Hz or the coil voltage digit followed by 60 if 60Hz.  
 Standard voltages are as follow:  
 - 50/60Hz 024 - 048 - 110 - 230 - 400VAC  
 - 60Hz 024 60 - 048 60 - 120 60 - 220 60 - 230 60 - 460 60 - 575 60VAC  
 E.g.: 11 BG06 10 A230 or 11 BG06 10 A460 60.

3 The coil of the contactor can be powered indifferently in AC or DC.  
 Complete the order code with the digit of the coil voltage.  
 Standard voltages are as follow: 24 - 48 - 60 - 110 - 125 - 220 - 240 - 380 - 415.  
 For coils: 110...125V indicate 110, 220...240V indicate 220, 380...415V indicate 380, 440...480V indicate 440.  
 E.g.: 11 B180 00 220 for contactor with 20...240VAC/DC coil.



<b>18.5</b>	<b>22</b>	<b>30</b>	<b>37</b>	<b>45</b>	<b>55</b>	<b>75</b>	<b>90</b>
<b>25</b>	<b>30</b>	<b>40</b>	<b>50</b>	<b>60</b>	<b>75</b>	<b>100</b>	<b>125</b>
<b>35</b>	<b>41</b>	<b>55</b>	<b>66</b>	<b>80</b>	<b>97</b>	<b>132</b>	<b>160</b>

SM1P 4000	SM2R 5000	SM2R 6300	SM3R 7500	SM3R 9000	SM3R 9900	---	---
30...40	34...50	45...63	55...75	70...90	80...100	---	---
10	50	50	50	50	50	---	---
SM1X32 41P	---	---	---	---	---	---	---
BF38 00A <sup>②</sup>	BF50 00A <sup>②</sup>	BF65 00A <sup>②</sup>	BF80 00A <sup>②</sup>	BF80 00A <sup>②</sup>	BF115 00A <sup>②</sup>	BF150 00A <sup>②</sup>	11 B180 00 <sup>③</sup>
FB02 A 3P	FB02 A 3P	FB03 A 3P	FB03 A 3P	FB03 A 3P	FB03 A 3P	GE0161 N <sup>⑤</sup>	GE0161 N <sup>⑤</sup>
40 (14X51)	50 (14X51)	63 (22X58)	80 (22X58)	80 (22X58)	100 (22X58)	160 (NH)	160 (NH)
BF38 00A <sup>②</sup>	BF50 00A <sup>②</sup>	BF65 00A <sup>②</sup>	BF80 00A <sup>②</sup>	BF80 00A <sup>②</sup>	BF115 00A <sup>②</sup>	BF150 00A <sup>②</sup>	11 B180 00 <sup>③</sup>
RF38 3800	RF82 5000	RF82 6500	RF82 8200	RF82 8200	RF110 110	RF200 150	RF200 200
32...38	35...50	46...65	60...82	60...82	90...110	90...150	120...200
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FB02 A 3P	FB02 A 3P	FB03 A 3P	FB03 A 3P	FB03 A 3P	FB03 A 3P	GE0161 N <sup>⑤</sup>	GE0161 N <sup>⑤</sup>
40 (14X51)	50 (14X51)	63 (22X58)	80 (22X58)	80 (22X58)	100 (22X58)	160 (NH)	160 (NH)
BFA025 70 <sup>②</sup>	BFA026 70 <sup>②</sup>	BFA038 70 <sup>②</sup>	BFA050 70 <sup>②</sup>	BFA050 70 <sup>②</sup>	BFA065 70 <sup>②</sup>	BFA080 70 <sup>②</sup>	BFA095 70 <sup>②</sup>
RF38 2300	RF38 3200	RF38 3800	RF82 5000	RF82 5000	RF82 6500	RF82 8200	RF110 110
17...23	24...32	32...38	35...50	35...50	46...65	60...82	---

FB02 A 3P	FB02 A 3P	FB03 A 3P	FB03 A 3P	FB03 A 3P	FB03 A 3P	GE0161 N <sup>⑤</sup>	GE0161 N <sup>⑤</sup>
40 (14X51)	50 (14X51)	63 (22X58)	80 (22X58)	100 (22X58)	100 (22X58)	160 (NH)	160 (NH)
BF25 10A <sup>②</sup>	BF26 00A <sup>②</sup>	BF38 00A <sup>②</sup>	BF50 00A <sup>②</sup>	BF50 00A <sup>②</sup>	BF65 00A <sup>②</sup>	BF80 00A <sup>②</sup>	BF95 00A <sup>②</sup>
BF25 01A <sup>②</sup>	BF26 00A <sup>②</sup>	BF38 00A <sup>②</sup>	BF50 00A <sup>②</sup>	BF50 00A <sup>②</sup>	BF65 00A <sup>②</sup>	BF80 00A <sup>②</sup>	BF95 00A <sup>②</sup>
BF18 10A <sup>②</sup>	BF18 10A <sup>②</sup>	BF25 10A <sup>②</sup>	BF32 00A <sup>②</sup>	BF32 00A <sup>②</sup>	BF32 00A <sup>②</sup>	BF50 00A <sup>②</sup>	BF65 00A <sup>②</sup>
RF38 2300	RF38 3200	RF38 3800	RF82 5000	RF82 5000	RF82 6500	RF82 8200	RF110 110
17...23	24...32	32...38	35...50	35...50	46...65	60...82	---
TM ST <sup>④</sup>	TM ST <sup>④</sup>	TM ST <sup>④</sup>	TM ST <sup>④</sup>	TM ST <sup>④</sup>	TM ST <sup>④</sup>	TM ST <sup>④</sup>	TM ST <sup>④</sup>
BFX10 20	BFX10 20	BFX10 20	BFX10 20	BFX10 20	BFX10 20	BFX10 20	BFX10 20
---	BFX10 11	BFX10 11	BFX10 11	BFX10 11	BFX10 11	BFX10 11	BFX10 11
BFX10 11	BFX10 11	BFX10 11	BFX10 11	BFX10 11	BFX10 11	BFX10 11	BFX10 11
BFX31 31	BFX31 31	BFX32 32	---	---	---	---	---

GE0161 N <sup>⑤</sup>	GE0161 N <sup>⑤</sup>	GE0161 N <sup>⑤</sup>	GE0250 N <sup>⑥</sup>	GE0250 N <sup>⑥</sup>	GE0250 N <sup>⑥</sup>	GE0400 N <sup>⑥</sup>	GE0630 N <sup>⑦</sup>
120 (NH)	120 (NH)	160 (NH)	180 (NH)	200 (NH)	250 (NH)	315 (NH)	500 (NH)
BF38 00A <sup>②</sup>	BF50 00A <sup>②</sup>	BF65 00A <sup>②</sup>	BF80 00A <sup>②</sup>	BF80 00A <sup>②</sup>	BF115 00A <sup>②</sup>	BF150 00 <sup>②</sup>	11 B180 00 <sup>③</sup>
ADXL 0045 600	ADXL 0045 600	ADXL 0060 600	ADXL 0075 600	ADXL 0085 600	ADXL 0115 600	ADXL 0135 600	ADXL 0162 600

FB02 A 3P	FB02 A 3P	FB03 A 3P	FB03 A 3P	FB03 A 3P	FB03 A 3P	GE0161 N <sup>⑤</sup>	GE0161 N <sup>⑤</sup>
40 (14X51)	50 (14X51)	63 (22X58)	80 (22X58)	80 (22X58)	100 (22X58)	160 (NH)	160 (NH)
VLB3 0185 A480	VLB3 0220 A480	VLB3 0300 A480	VLB3 0370 A480 XX <sup>⑧</sup>	VLB3 0450 A480 XX <sup>⑧</sup>	VLB3 0550 A480 XX <sup>⑧</sup>	VLB3 0750 A480 XX <sup>⑧</sup>	VLB3 0900 A480 XX <sup>⑧</sup>

④ TM ST for auxiliary supply 24...240VAC; TM ST A440 for auxiliary supply 380...440VAC.  
 ⑤ Order to complete: GEX66N door coupling handle; GEX7536N shaft extension.  
 ⑥ Order to complete: GEX67N door coupling handle; GEX7535N shaft extension.  
 ⑦ Order to complete: GEX68N door coupling handle; GEX7535N shaft extension.  
 ⑧ The code refers only at power unit.  
 Complete with code VLBX L06 logic unit (Modbus RTU) and keypad code VLBX C01.

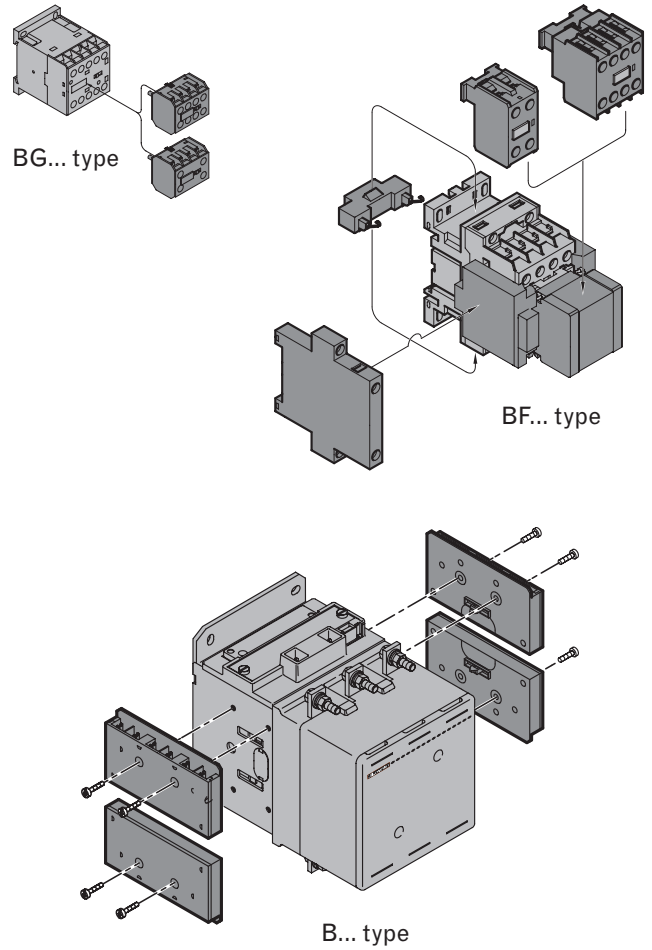
⑨ Consult Technical Support for information (tel. +39 035 4282422; e-mail: service@LovatoElectric.com).  
 ▲ Recommended range. For other ranges, see the general catalogue.  
 ◆ RF9, RF82 and RF110 are with manual resetting. RF38, RF200 and RF420 are with manual and automatic resetting.  
 ● For contactor with DC coil see general catalogue.



# CONTACTORS



Order code	Characteristics
<b>For BG... contactors. Auxiliary contacts with front mounting. Screw terminals.</b>	
11 BGX10 02	2NC
11 BGX10 11	1NO + 1NC
11 BGX10 20	2NO
11 BGX10 04	4NC
11 BGX10 13	1NO + 3NC
11 BGX10 22	2NO + 2NC
11 BGX10 31	3NO + 1NC
11 BGX10 40	4NO
<b>For BF... contactors. Auxiliary contacts with front mounting. Screw terminals.</b>	
BFX10 02	2NC
BFX10 11	1NO + 1NC
BFX10 20	2NO
BFX10 04	4NC
BFX10 13	1NO + 3NC
BFX10 22	2NO + 2NC
BFX10 31	3NO + 1NC
BFX10 40	4NO
BFX10 11 11	1NO+1NC and 1EM+1LB
<b>For BF... contactors. Auxiliary contacts with side mounting. Screw terminals.</b>	
BFX12 02	2NC
BFX12 11	1NO+1NC
BFX12 20	2NO
<b>For B... contactors. Auxiliary contacts with side mounting. Faston terminals.</b>	
11 G350	2NO+1NC or 1NO+2NC reversible
11 G354	1NO+1NC



# VARIABLE SPEED DRIVES



Order code	Characteristics
<b>Modules.</b>	
VLBX C00	Blanking cover
VLBX C01	Display and keypad
VLBX C02	USB communication module
VLBX C03	Wi-Fi communication module
VLBX SM	Safe Torque Off (STO) module
<b>Logic units.</b>	
VLBX L01	Logic unit with CANopen
VLBX L02	Logic unit with ProfIBUS
VLBX L03	Logic unit with ProfiNET
VLBX L04	Logic unit with Ethercat
VLBX L06	Logic unit with Modbus RTU

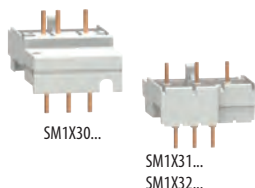


Order code	Characteristics
<b>Remote units.</b>	
EXC RDU1	Remote keypad, LCD graphic touchscreen display, for monitoring and control of max 32 drives, IP65 and 4X protection rating, built-in RS485 port, 3m long cable included
VLBX P01	Door-mount installation kit for VLBX C01 keypad, IP65, 3m long Ethernet cable included
Order code	Driver output power [kW]
<b>Braking resistors.</b>	
VLBX R390	0.4...0.75kW
VLBX R180	1.5...2.2kW
VLBX R047	4...5.5kW
VLBX R027	7.5...11kW
VLBX R018	15kW
VLBX R015	18.5...22kW
VLBX R007	30...75kW
<b>Three-phase inductances.</b>	
VLBX L590	22...30kW
VLBX L370	37kW
VLBX L330	45kW
VLBX L300	55kW
VLBX L190	75kW

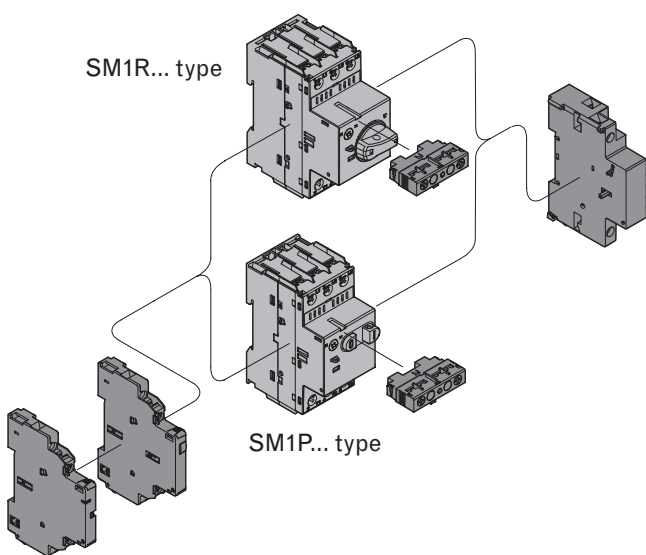
# MOTOR PROTECTION CIRCUIT BREAKERS

## SM1...

Order code	Characteristics
<b>Add-on auxiliary contacts.</b>	
SM1X11 20	Front mount 2NO
SM1X11 11	Front mount 1NO+1NC
SM1X12 20	Side mount 2NO
SM1X12 11	Side mount 1NO+1NC
SM1X12 02	Side mount 2NC
SM1X13 11	Side mount. Contacts for thermal and magnetic tripping indication 1NO+1NC
SM1X13 11M	Side mount. Contacts for magnetic tripping indication 1NO+1NC
<b>Undervoltage trip releases.</b>	
SM1X14 110	110VAC 50Hz / 120VAC 60Hz
SM1X14 230	230VAC 50Hz
SM1X14 400	400VAC 50Hz / 440VAC 60Hz
SM1X15 110R	With early-make contacts 110VAC 50Hz / 120VAC 60Hz
SM1X15 230R	With early-make contacts 230VAC 50Hz
SM1X15 400R	With early-make contacts 400VAC 50Hz
<b>Shunt trip releases.</b>	
SM1X16 024	24VAC 50/60Hz
SM1X16 110	110VAC 50/60Hz
SM1X16 230	230VAC 50/60Hz
SM1X16 400	400VAC 50/60Hz
<b>Rigid SM1 breaker - contactor connections.</b>	
SM1X30 40P	For motor protection circuit breaker SM1P... with BG... mini-contactors
SM1X31 41P	For motor protection circuit breaker SM1P... with BF09...25A contactors
SM1X32 41P	For motor protection circuit breaker SM1P... with BF26...38A contactors



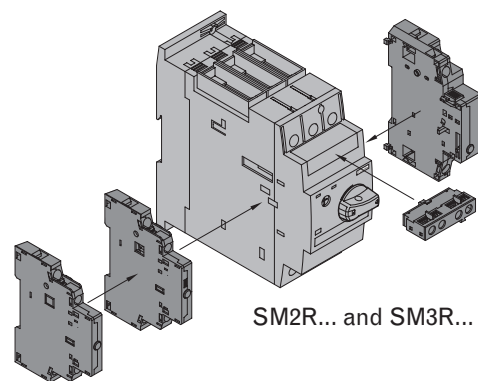
SM1R... type



SM1P... type

## SM2... and SM3...

Order code	Characteristics
<b>Add-on auxiliary contacts.</b>	
SM2X11 20	Front mount 2NO
SM2X11 11	Front mount 1NO+1NC
SM2X11 02	Front mount 2NC
SM2X12 20	Side mount 2NO
SM2X12 11	Side mount 2NC
SM2X12 02	Side mount 1NO+1NC
SM2X13 11	Side mount. Contacts for thermal and magnetic tripping indication 1NO+1NC
<b>Undervoltage trip releases.</b>	
SM2X14 230	230VAC 50/60Hz
SM2X14 400	400VAC 50/60Hz
SM2X14 400	440VAC 50/60Hz
<b>Shunt trip releases.</b>	
SM2X16 024	24VAC 50/60Hz
SM2X16 110	110VAC 50/60Hz
SM2X16 230	230VAC 50/60Hz
SM2X16 400	400VAC 50/60Hz
SM2X16 440	440VAC 50/60Hz



SM2R... and SM3R... type

# SOFT STARTER

Order code	Characteristics
CX 01	USB connection dongle PC÷ADXL for programming, data download, diagnostics and firmware update
CX 02	Wi-Fi connection dongle PC÷ADXL for programming, data download, diagnostics and configuration cloning
EXC RDU1	Remote keypad, LCD graphic touchscreen display, for monitoring and control of max 32 drives, IP65 and 4X protection rating, built-in RS485 port, 3m long cable included
EXC 1042	RS485 communication card
EXP80 03	DIN rail mount kit for ADXL0018...ADXL0115
EXP80 04	Fan for ADXL0018 600...ADXL0115 600 (codes ADXL0075 600...ADXL0115 600 max. of two EXP80 04 fans)



EXC RDU1



EXC 1042



EXP80 03

# MOTOR STARTING SOLUTIONS



ENERGY AND AUTOMATION

[www.LovatoElectric.com](http://www.LovatoElectric.com)

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