

INTEGRAL™ Self-Protected Combination Motor Controllers

Class 8539



Merlin Gerin
Modicon
Square D
Telemecanique
Schneider Electric Brands

CONTENTS

Description	Page
Product Descriptions	3-5
Selection	6-20
Application and General Information	21-27
Specifications	28-41
Wiring Diagrams	42-46
Dimensions	47-51



SQUARE D
Schneider Electric

INTEGRAL™ Self-Protected Combination Motor Controllers



INTEGRAL™ Self-Protected Combination Motor Controllers

Product Description

COMBINATION MOTOR CONTROL IN ONE COMPACT PACKAGE!



Integral 18



Integral 32



Integral 63

The INTEGRAL™ Self-Protected Combination Motor Controller (CMC) combines all the functions of a disconnect, circuit breaker, contactor, and overload relay in a coordinated motor controller. A wide variety of easy-to-install auxiliary blocks and interface modules provides powerful communication and control capabilities.

As much as 60% less panel space is required by the INTEGRAL CMC as compared to traditional combination motor control circuit installations. In addition, installation and wiring time is dramatically reduced — simply snap the INTEGRAL onto a 35 mm DIN rail and connect load and line side wires.

The entire family of INTEGRAL CMCs have proven their reliability and effectiveness in thousands of applications worldwide. By installing the INTEGRAL Self-Protected CMC, you are implementing the latest in motor control and protection technology, and assuring the lowest installed cost of any motor control scheme.




Features

- Non-reversing and reversing combination motor controllers available in 18, 32, or 63 ampere ratings.
- NEMA Type 1 and 12 enclosed combination motor controllers and open style combination motor controllers both available.
- Current-limiting short-circuit protection provides 42 kA interrupt rating.
- UL listed as a Type E combination motor controller.
- UL verified to meet “Type 2” coordination protection per IEC 947-4.
- Meets “Total Coordination” requirements of IEC 947-6 — no damage to contactor or overload relay, and no welding of contacts after interruption of short-circuit faults.
- Padlockable isolation knob.
- Minimum 1.5 million operation life expectancy.
- Proven reliability — even after exposure to multiple short-circuit faults!
- Control direct from PLC or PC with optional interface modules.



INTEGRAL™ Self-Protected Combination Motor Controllers

Product Description

	INTEGRAL 18	INTEGRAL 32
		
	LD1LB030* + LB1LB03P**	LD5LB030* + LB1LB03P**
	LD4LC030* + LB1LC03M**	LD5LC130* + LB1LC03M**
Rated Operational Current for AC-3 Duty	18 A	32 A
Rated Breaking Capacity	42 KA at 480 Vac	42 KA at 480 Vac
Approvals	ASTA, BS, CSA, DEMKO, IEC, NEMKO, SEMKO, UL, VDE	ASTA, BS, CSA, DEMKO, IEC, NEMKO, SEMKO, UL, VDE
Number of Poles	3	3
Protection Module	LB1LB03P**	LB1LC03M**
Magnetic Protection	Fixed, 15 times maximum thermal current	Adjustable, 6 to 12 times maximum thermal current
Overload Protection	0.1 to 0.16 A: P01	
	0.16 to 0.25 A P02	
	0.25 to 0.4 A P03	0.25 to 0.4 A M03
	0.4 to 0.63 A P04	0.4 to 0.63 A M04
	0.63 to 1.0 A P05	0.63 to 1.0 A M05
	1.0 to 1.6 A P06	1.0 to 1.6 A M06
	1.6 to 2.5 A P07	1.6 to 2.5 A M07
	2.5 to 4.0 A P08	2.5 to 4.0 A M08
	4.0 to 6.0 A P10	4.0 to 6.3 A M10
	6.0 to 10.0 A P13	6.3 to 10.0 A M13
	10.0 to 16.0 A P17	10.0 to 16.0 A P17
	12.0 to 18.0 A P21	–
	–	16.0 to 25.0 A M22
	–	23.0 to 32.0 A M23

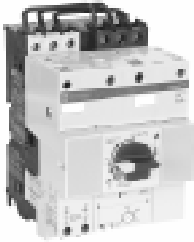
INTEGRAL™ Self-Protected Combination Motor Controllers Selection

To order an INTEGRAL CMC, complete these four steps:

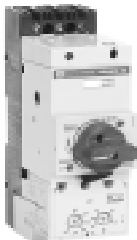
1. Select the correct combination motor controller from Table 1A (open) or Table 1B (enclosed).
2. Complete the catalog number by adding the coil voltage code from Table 2.
3. Choose the appropriate protection module from Table 3.
4. For enclosed combination motor controllers only, select any desired INSTA-KITS™ or factory modifications from Table on page 20. For factory modification, add the “form” number to the end of the catalog number.



LD1LB030•



LD5LB130•



LD4LC030•



LD5LC030•



LD4LD030•

Table 1A: Open Style INTEGRAL CMC Base Unit Selection Table

Continuous Current Rating Amperes	Maximum 3-Phase HP Rating			With Isolator	Without Isolator
	230 V	460 V	575 V	Catalog Number	Catalog Number
Non-Reversing					
18	5	10	15	LD1LB030*	N/A
32	10	20	30	LD4LC030*	LD1LC030 ●
63	20	40	60	LD4LD030*	LD1LD030 ●
Reversing					
18	5	10	15	LD5LB130*	N/A
32	10	20	30	LD5LC030*	N/A
63	20	40	60	LD5LD030*	N/A

Table 1B: Enclosed INTEGRAL CMC Selection Table

Continuous Current Rating Amperes	Maximum 3-Phase HP Rating			Type 1 Enclosure	Type 12 Enclosure
	230 V	460 V	575 V	Catalog Number	Catalog Number
Non-Reversing					
18	5	10	15	LE1UI1846 ●	LE1UI1847 ●
32	10	20	20	LE1UI3246 ●	LE1UI3247 ●
63	20	40	60	LE1UI6346 ●	LE1UI6347 ●
Reversing					
18	5	10	15	LE2UI1846 ●	LE2UI1847 ●
32	10	20	20	LE2UI3246 ●	LE2UI3247 ●
63	20	40	60	LE2UI6346 ●	LE2UI6347 ●

● Complete the catalog number by adding the voltage code from Table 2

Table 2: Coil Voltage Codes

INTEGRAL	Frequency Hz	Control Voltage									
		24	48	110	120	220	240	380	415	480	600
I18	50	B	E	F	-	M	U	Q	N	-	-
	60	BC	D	K	FC	LC	MC	-	-	N	S
	DC ■	BD	-	-	-	-	-	-	-	-	-
I32	50	B	E	F	-	M	U	Q	N	-	-
	60	BC	D	FC	FC	MC	MC	-	-	Q	S
	DC ■	BD	ED	FD	-	-	-	-	-	-	-
I63	50	B	E	F	-	M	U	Q	N	-	-
	60	BC	CE	K	FC	LC	MC	-	-	Q	S
	DC ■	BD	ED	FD	-	-	-	-	-	-	-

■ INTEGRAL Base Units ordered with DC voltage code (BD, ED or FD) are shipped with LA1L*080*D Voltage Converter Module already installed.

Open INTEGRAL CMC Dimensions page 48
 Enclosed INTEGRAL CMC Dimensions page 51

Open Product



File E164871
CCN NKJH
NKJH7



File LR 43364
Class 3211 08

Enclosed Product



File E163364
CCN NKJH
NKJH7



File LR 105062
Class 3211 08



INTEGRAL™ Self-Protected Combination Motor Controllers Selection

**Table 3: Overload Protection Modules
(Class 10, Ambient Compensated)**



LB1LB03P05



LB1LC03M22



LB1LD03M57

Thermal Setting Range, Amperes ■	Magnetic Setting Range, Amperes	Standard Module with Thermal & Magnetic Trip Catalog No.	Magnetic only Module
For 18 Ampere models			
0.1 - 0.16	–	LB1LB03P01	N/A
0.16 - 0.25	–	LB1LB03P02	N/A
0.25 - 0.4	–	LB1LB03P03	N/A
0.4 - 0.63	–	LB1LB03P04	N/A
0.63 - 1	–	LB1LB03P05	N/A
1 - 1.6	–	LB1LB03P06	N/A
1.6 - 2.5	–	LB1LB03P07	N/A
2.5 - 4	–	LB1LB03P08	N/A
4 - 6	–	LB1LB03P10	N/A
6 - 10	–	LB1LB03P13	N/A
10 - 16	–	LB1LB03P17	N/A
12 - 18	–	LB1LB03P21	N/A
For 32 Ampere models			
0.25 - 0.40	2.4 - 4.8	LB1LC03M03	LB6LC03M03
0.40 - 0.63	3.8 - 7.6	LB1LC03M04	LB6LC03M04
0.63 - 1.0	6.0 - 12	LB1LC03M05	LB6LC03M05
1.0 - 1.6	9.5 - 19	LB1LC03M06	LB6LC03M06
1.6 - 2.5	15 - 30	LB1LC03M07	LB6LC03M07
2.5 - 4.0	24 - 48	LB1LC03M08	LB6LC03M08
4.0 - 6.3	38 - 76	LB1LC03M10	LB6LC03M10
6.3 - 10	60 - 120	LB1LC03M13	LB6LC03M13
10 - 16	95 - 190	LB1LC03M17	LB6LC03M17
16 - 25	150 - 300	LB1LC03M22	LB6LC03M22
23 - 32	190 - 380	LB1LC03M53	LB6LC03M53
For 63 Ampere models			
18 - 25	150 - 300	LB1LD03M22	LB6LD03M22
23 - 32	190 - 380	LB1LD03M53	LB6LD03M53
28 - 40	240 - 480	LB1LD03M55	LB6LD03M55
35 - 50	300 - 600	LB1LD03M57	LB6LD03M57
45 - 63	380 - 760	LB1LD03M61	LB6LD03M61

■ Thermal settings are based on motors with a service factor (S.F.) of 1.0.

Specifications

Operating Positions: 	UL Listed and CSA certified	CE
	Conforms to IEC standards	
	Shock resistance - 8 g (Duration of impulse: 11 ms)	
	Vibration resistance - 3 g (5 to 150 Hz)	
	AC control circuit temperature limits:	
	Storage -40 to +176 °F/-40 to +80 °C	
	Operation -13 to +104 °F/-25 to +70 °C	
Rated voltage - 600 Vac		
Rated thermal current - 18 A (INTEGRAL 18), 32 A (INTEGRAL 32), 63 A (INTEGRAL 63)		
Interrupting current at 480 Vac: 42 kA ms		Fixed magnetic trip is set at approximately 15 times full load current (FLC)
INTEGRAL 18 INTEGRAL 32 INTEGRAL 63	Mechanical life: 20 million operations 10 million operations 5 million operations	Operating current of magnetic trip is approximately 15 times maximum thermal trip (non-adjustable setting)



File E164871
CCN NKJH
NKJH7

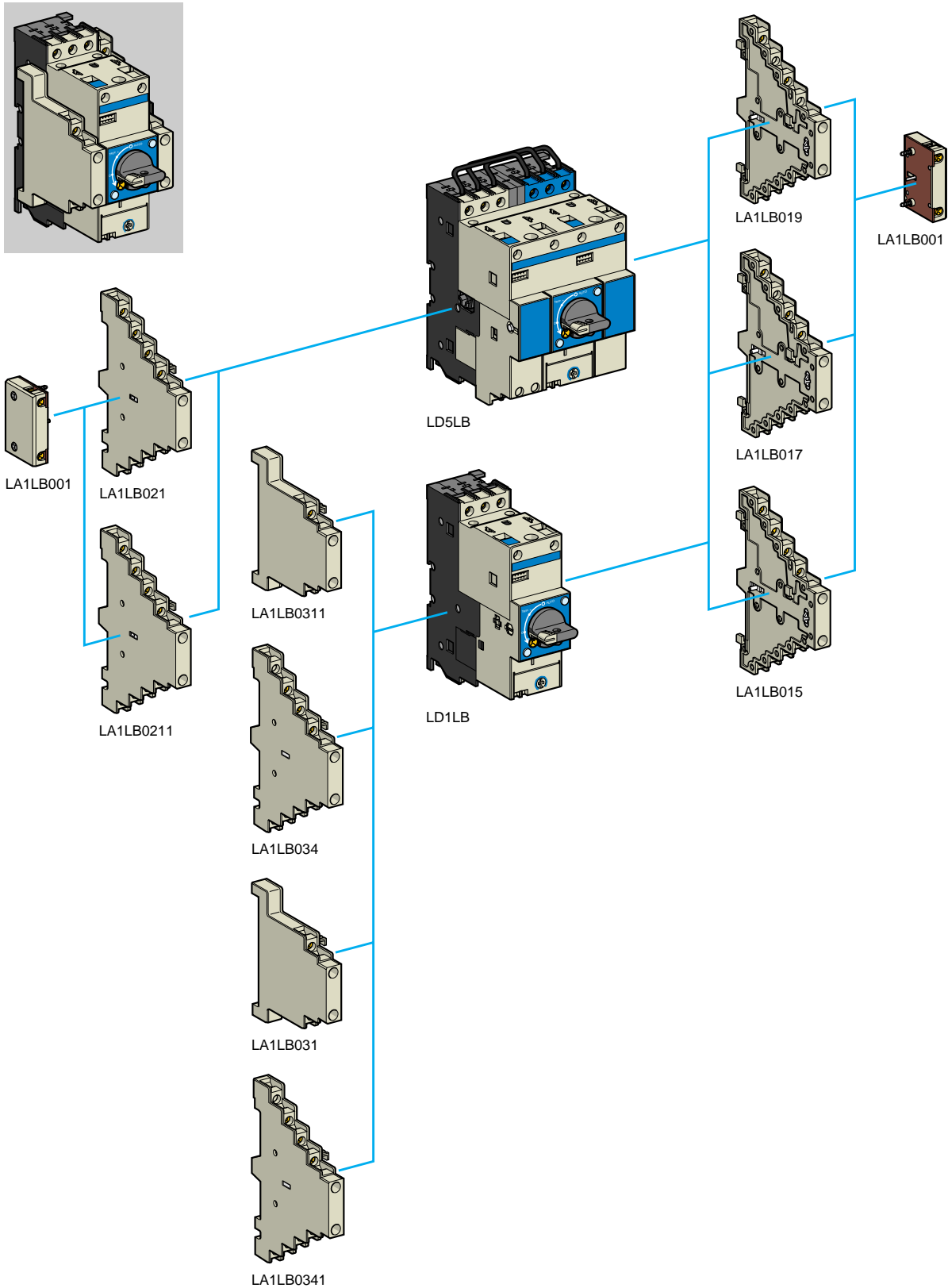


File LR 43364
Class 3211 08



INTEGRAL™ Self-Protected Combination Motor Controllers

INTEGRAL 18 Accessories



INTEGRAL™ Self-Protected Combination Motor Controllers INTEGRAL 18 Accessories

Auxiliary Contact Blocks for the INTEGRAL 18 CMC



LD1LB03FC + LB1LB03P01

For Use On	Mounting Location	Type and Number of Contacts per Block	Contact Type	Catalog Number
LD1 or LD5	Right Side	Block of 5 instantaneous contacts 3 signal "contactor state" 2 signal "tripped" status	2 N/O + 1 N/C 1 N/O + 1 N/C	LA1LB015
	Right Side	Block of 3 instantaneous contacts 2 signal "contactor state" 1 signal "tripped" status	1 N/O + 1 N/C 1 N/O	LA1LB017
	Right Side	Block of 3 instantaneous contacts 2 signal "contactor state" 1 signal "tripped" status	1 N/O + 1 N/C 1 N/C	LA1LB019
	Left or Right Side	Complementary auxiliary block 1 signal "contactor state"	1 N/C	LA1LB001★
LD1	Left Side	2 signal operating handle not in "Auto" position	2 N/O	LA1LB031
	Left Side	2 signal operating handle not in "Auto" position	1 N/O + 1 N/C	LA1LB0311
	Left Side	Block of 3 instantaneous contacts 2 signal operating handle not in "Auto" position 2 signals "tripped on short circuit" status	2 N/O 1 N/O + 1 N/C	LA1LB034
	Left Side	Block of 3 instantaneous contacts 2 signal operating handle not in "Auto" position 2 signals "tripped on short circuit" status	1 N/O + 1 N/C 1 N/O + 1 N/C	LA1LB0341
LD5	Left Side	Block of 5 instantaneous contacts 3 signal "contactor state" 2 signal operating handle not in "Auto" position	2 N/O + 1 N/C 2 N/O	LA1LB021
	Left Side	Block of 5 instantaneous contacts 3 signal "contactor state" 2 signal operating handle not in "Auto" position	2 N/O + 1 N/C 1 N/O + 1 N/C	LA1LB0211

★ Use of auxiliary contact LA1LB001 requires combination with contact block LA1LB015, LA1LB021, LA1LB017, or LA1LB019.



File E164871
CCN NKJH
NKJH7

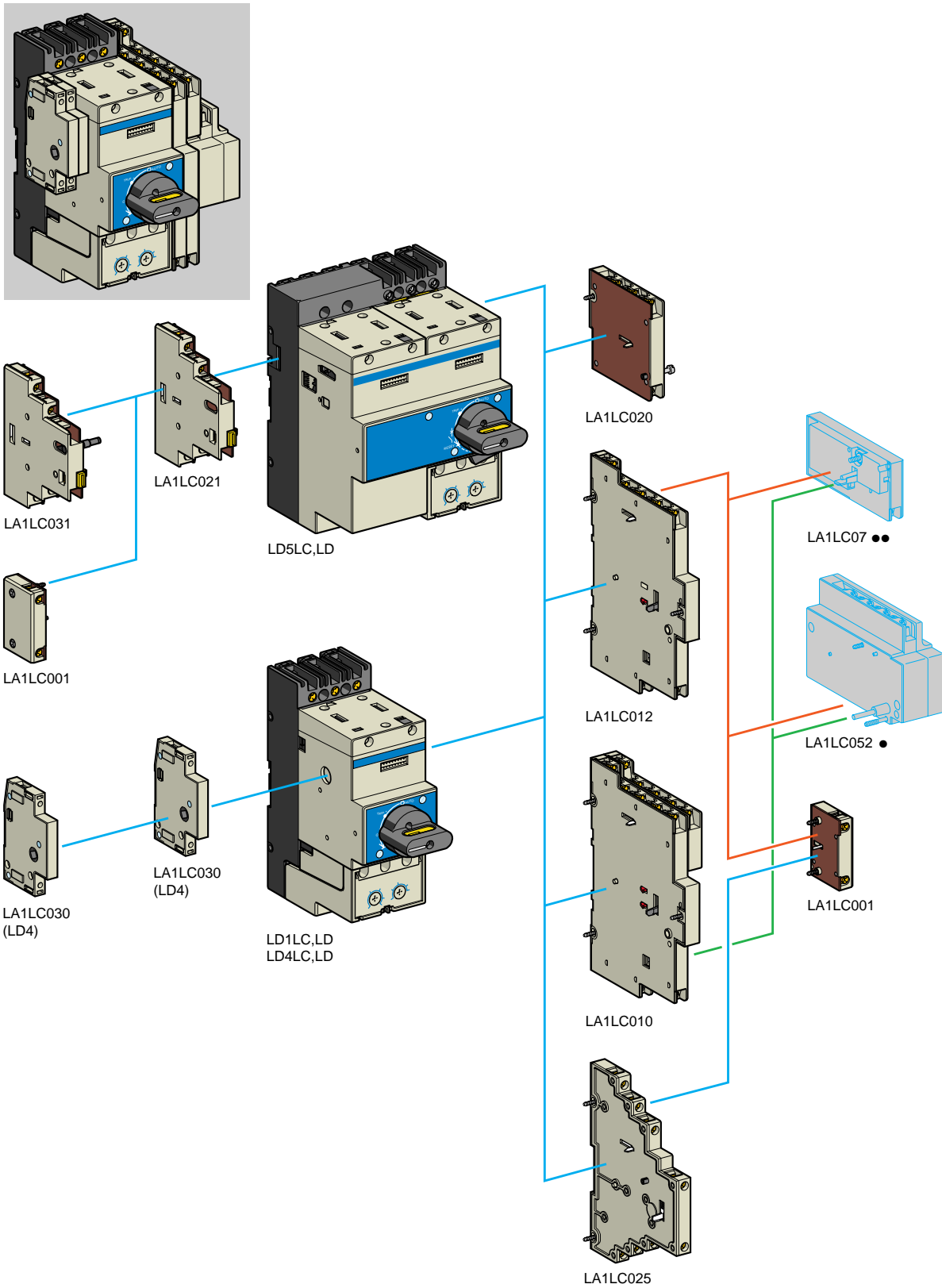


File LR 43364
Class 3211 08



INTEGRAL™ Self-Protected Combination Motor Controllers

INTEGRAL 32/63 Accessories



INTEGRAL™ Self-Protected Combination Motor Controllers INTEGRAL 32/63 Accessories

Auxiliary Contact Blocks for the INTEGRAL 32/63 CMC



LA1LC030



LA1LC012



**LC4LC030+
LB1LC03M22+
LA1LC030+
LA1LC010+
LA1LC070F**

For Use On	Mounting Location	Type and Number of Contacts per Block	Contact Type	Catalog Number
LD1, LD4 or LD5	Right Side	Block of 6 instantaneous contacts 3 signal "contactor state" 1 signal "tripped on short circuit" 1 signal "tripped" 1 signal "not in Auto position"	2 N/O + 1 N/C 1 N/O-N/C (form C contact) 1 N/O-N/C (form C contact) 1 N/O-N/C (form C contact)	LA1LC010
	Right Side	Block of 5 instantaneous contacts 3 signal "contactor state" 1 signal "tripped on short circuit" 1 signal "tripped"	2 N/O + 1 N/C 1 N/O 1 N/O	LA1LC012
	Right Side	Block of 4 instantaneous contacts 3 signal "contactor state" 1 signal "tripped"	2 N/O + 1 N/C 1 N/O or 1 N/C, User Selectable	LA1LC025
	Right Side	Block of 3 instantaneous contacts 3 signal "contactor state"	2 N/O + 1 N/C	LA1LC020
	Left or Right Side	Complementary auxiliary block 1 signal "contactor state"	1 N/C	LA1LC001▲
LD4	Left Side	Block of 1 "control circuit isolation" contact	1 N/O	LA1LC030
LD5	Left Side	Block of 3 instantaneous contacts 3 signal "contactor state"	2 N/O + 1 N/C	LA1LC021
	Left Side	Block of 2 "control circuit isolation" contact	2 N/O	LA1LC031▲

▲ See table below.

Complementary blocks LA1LC001 and LA1LC031, as well as LA1LC052** reset modules and LA1LC07** trip modules on page 12 must be used with an additional auxiliary block. This following table shows all allowable combinations.

Possible Combinations of Auxiliary Contact Blocks for the INTEGRAL 32/63 CMC

			LA1LC001	LA1LC07**	LA1LC052*	LA1LC031
LA1LC010	Block of 6 auxiliary contacts	Right Side		√	√	
LA1LC012	Block of 5 auxiliary contacts	Right Side	√♦	√	√♦	
LA1LC025	Block of 4 auxiliary contacts	Right Side	√			
LA1LC021	Block of 3 auxiliary contacts	Left Side	√*			√*

♦ Only one attachment may be added -- either LA1LC001 or LA1LC052

* Only one attachment may be added -- either LA1LC001 or LA1LC031



File E164871
CCN NKJH
NKJH7

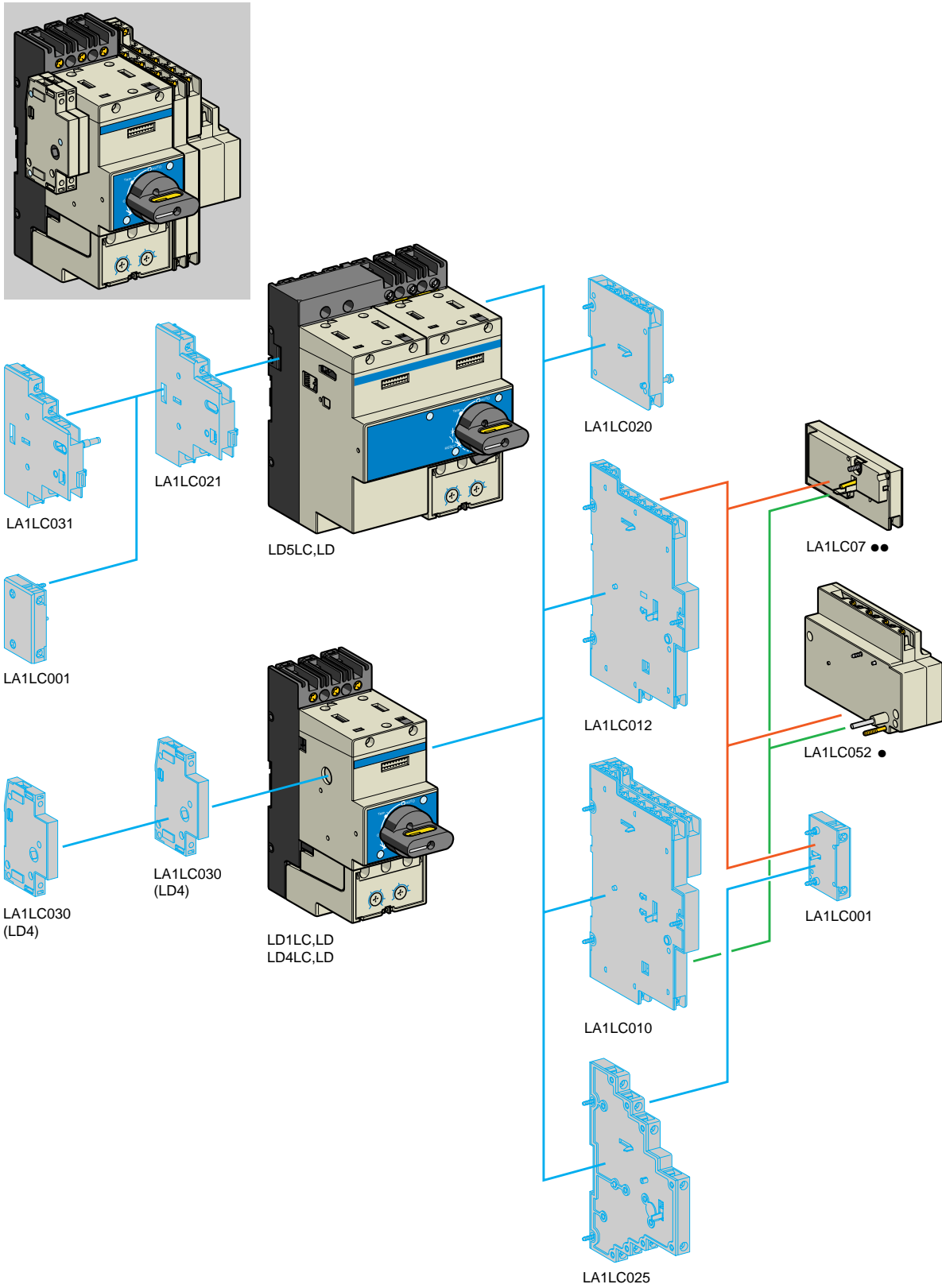


File LR 43364
Class 3211 08
3211 04



INTEGRAL™ Self-Protected Combination Motor Controllers

INTEGRAL 32/63 Accessories



INTEGRAL™ Self-Protected Combination Motor Controllers INTEGRAL 32/63 Accessories

The shunt and undervoltage trip modules are for use with any 32 A or 63 A INTEGRAL CMC fitted with either an LA1LC010 or LA1LC012 add-on block.



LA1LC070F

Shunt and Undervoltage Trip Modules

Description	Trip Specifications	Catalog Number
Undervoltage Trip Module	Time Delay (0.2 seconds)	LA1LC070●
	Instantaneous	LA1LC072●
Shunt Trip Module	Instantaneous	LA1LC071●

● Complete the catalog number with the letter shown below for the required coil voltage

Volts	24	48	110	120	220	240	380	415	440
50 Hz	B	E	F	-	M	U	Q	N	N
60 Hz	B	E	F	F	M	M	Q	-	N



LA1LC052F

The remote reset modules are for use with any 32 A or 63 A INTEGRAL CMC fitted with either an LA1LC010 or LA1LC012 add-on block.

Remote Reset Modules

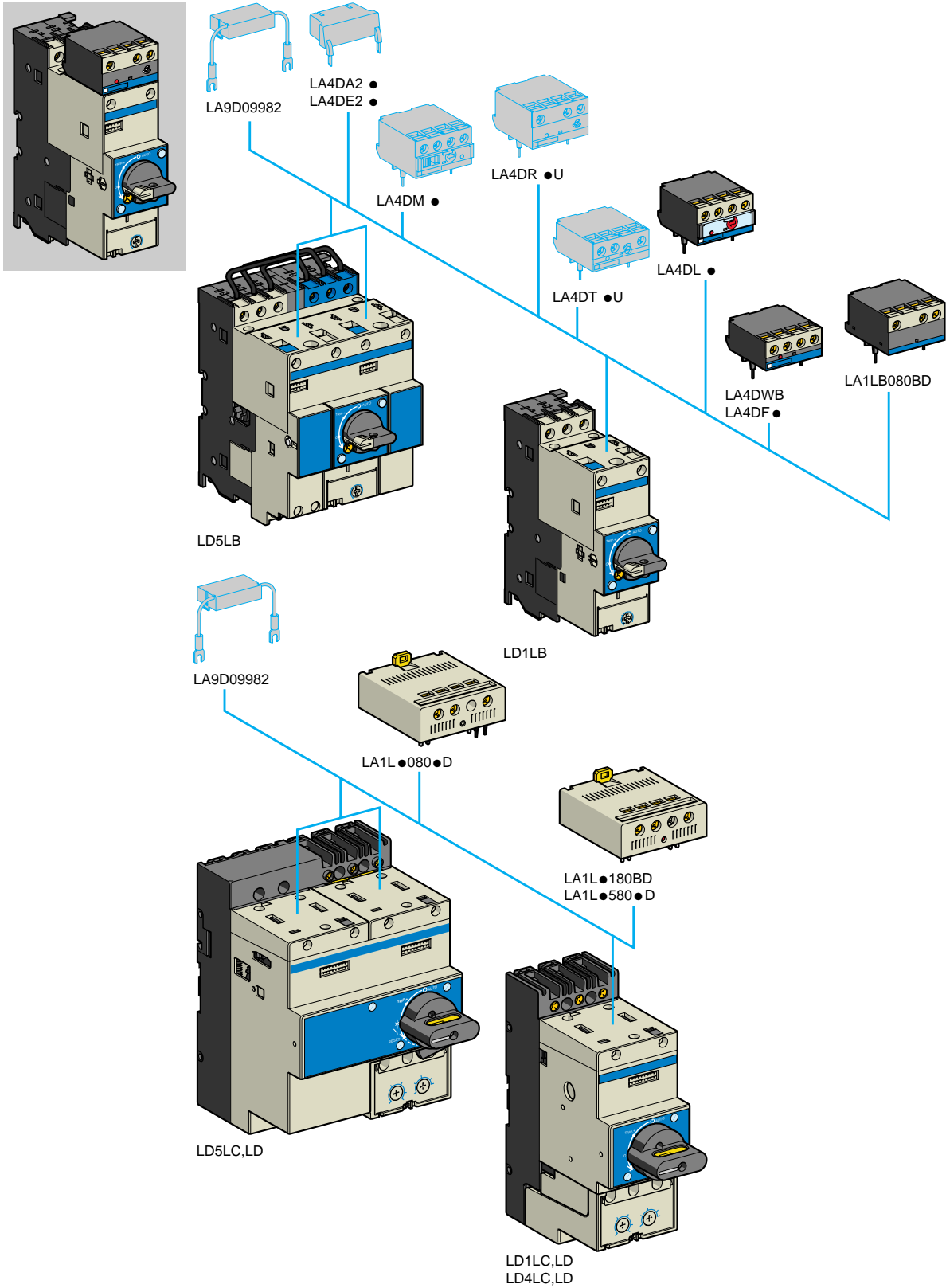
Description	Control Voltage	Catalog Number
Remote Reset Module ■	24 V 50/60 Hz	LA1LC052B
	42 V 50 Hz 48 V 50/60 Hz	LA1LC052E
	100/127 V 50/60 Hz	LA1LC052F
	200/240 V 50/60 Hz	LA1LC052M

■ When adding a remote reset module to a LE•UI••• enclosed device (page 6), an oversized enclosure is required.



INTEGRAL™ Self-Protected Combination Motor Controllers

INTEGRAL 18/32/63 Accessories



INTEGRAL™ Self-Protected Combination Motor Controllers INTEGRAL 18/32/63 Accessories

The top-mounted, add-on voltage converter modules are required to allow operation of an INTEGRAL CMC with DC control voltage. The converters may only be used with the coils shown in the table below.

NOTE: When INTEGRAL CMCs are factory ordered with a DC coil code (from Table 1A / 1B and Table 2, Page 6), these converter modules need not be ordered separately.

Voltage Converter Modules ■ ★





LA1LC180BD

Description	Nominal Voltage	For Use With Coils	Catalog Number
INTEGRAL 18 Converter Module	24 Vdc	LX1LB024	LA1LB080BD
INTEGRAL 32 Converter Module	24 Vdc	LX1LC0249	LA1LC080BD
	48 Vdc	LX1LC0489	LA1LC080ED
	110 Vdc	LX1LC1109	LA1LC080FD
INTEGRAL 63 Converter Module	24 Vdc	LX1LD0249	LA1LD080BD
	48 Vdc	LX1LD0489	LA1LD080ED
	110 Vdc	LX1LD1109	LA1LD080FD

- When using a rectified AC supply, ripple must not exceed 14%.
- ★ Reversing INTEGRAL CMCs require use of two converter modules.

The interface modules allow INTEGRAL CMCs to be energized from low voltage and low current signals. Solid state and mechanical relay versions are both available. The “relay plus manual override” version includes a slide switch for manually energizing the contactor.

Interface Modules

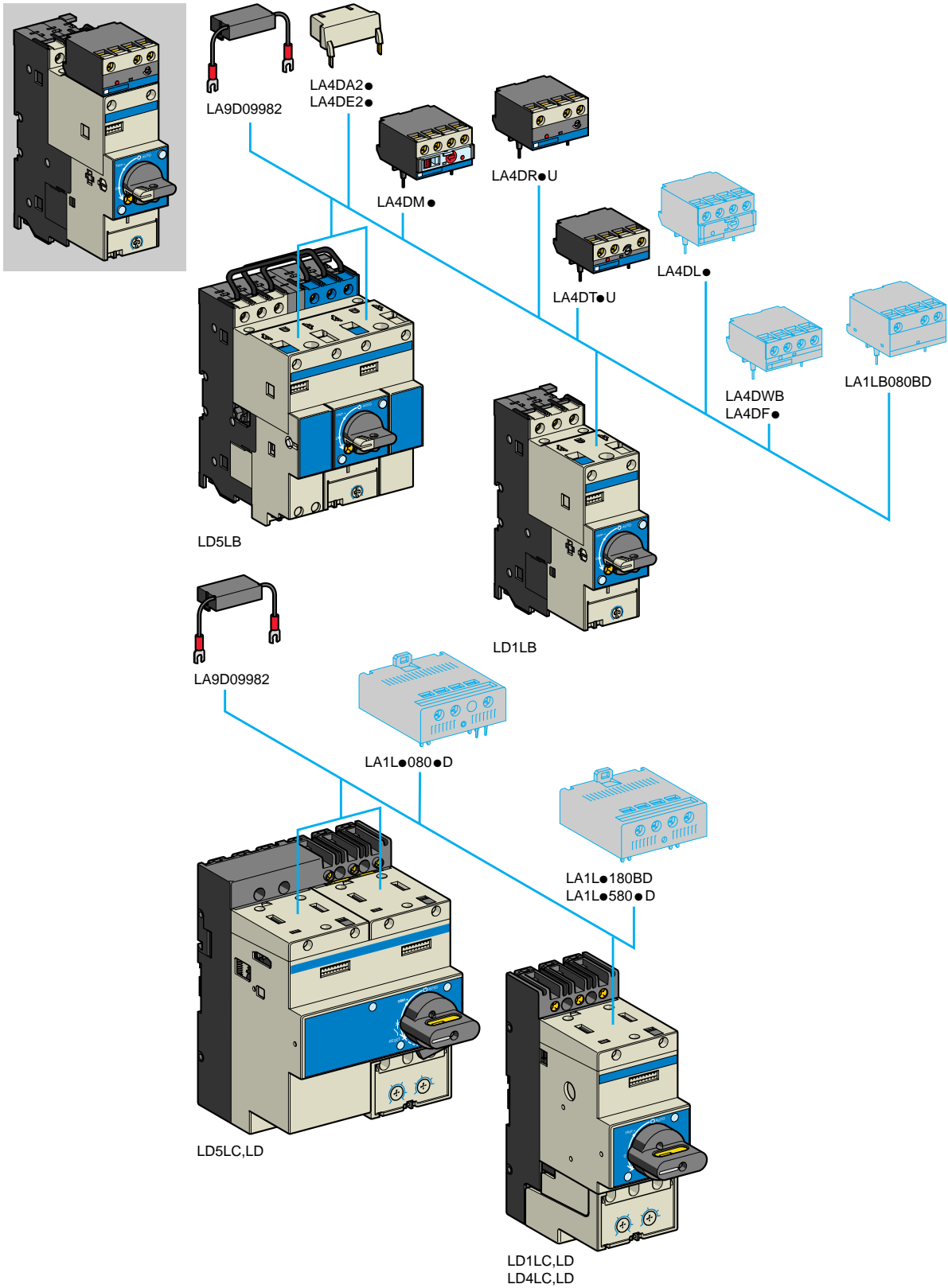
Description ▲	Type	Input Voltage	Operational Voltage	Catalog Number	
 File E164871 CCN NKJH NKJH7  File LR 43364 Class 3211 08	INTEGRAL 18 Interface Module	Solid State Relay	5 to 24 Vdc	24 to 250 Vac	LA4DWB
	Mechanical Relay	24 Vdc	24 to 250 Vac	LA4DFB	
		48 Vdc	24 to 250 Vac	LA4DFE	
		24 Vdc	24 to 250 Vac	LA4DLB	
	Mechanical Relay plus manual override	48 Vdc	24 to 250 Vac	LA4DLE	
INTEGRAL 32 Interface Module	Solid State Relay	5 to 24 Vdc	24 to 240 Vac	LA1LC180BD	
	Mechanical Relay	24 Vdc	24 to 240 Vac	LA1LC580BD	
		48 Vdc	24 to 240 Vac	LA1LC580ED	
INTEGRAL 63 Interface Module	Solid State Relay	5 to 24 Vdc	24 to 240 Vac	LA1LD180BD	
	Mechanical Relay	24 Vdc	24 to 240 Vac	LA1LD580BD	
		48 Vdc	24 to 240 Vac	LA1LD580ED	

- ▲ Reversing INTEGRAL CMCs require use of two interface modules.



INTEGRAL™ Self-Protected Combination Motor Controllers

INTEGRAL 18/32/63 Accessories



INTEGRAL™ Self-Protected Combination Motor Controllers Accessories

The control modules allow local or remote operation of the 18 A INTEGRAL CMC. The module includes a slide switch to change from automatic (remote) operation to manual (local) operation. When in manual mode, a separate dial allows the user to locally energize and de-energize the combination motor controller.



LA4DMU

“Automatic - Manual - Stop” Control Module (for INTEGRAL 18 only)

Description	Control Voltage	Catalog Number
Auto- Manual-Stop Module	24 - 100 Vac	LA4DMK
	100 - 250 Vac	LA4DMU

These electronic timer modules delay the energization or de-energization of the 18 ampere INTEGRAL CMC.



LA4DROU

Electronic Timer Module (for INTEGRAL 18 only)

Description	Time Delay	Operational Voltage ■ 50/60 Hz AC	Catalog Number
On-Delay Timer Module	0.1 to 2 sec.	24 to 240 Vac	LA4DT0U
	1.5 to 30 sec.	24 to 240 Vac	LA4DT2U
	25 to 500 sec.	24 to 240 Vac	LA4DT4U
Off-Delay Timer Module	0.1 to 2 sec.	24 to 240 Vac	LA4DR0U
	1.5 to 30 sec.	24 to 240 Vac	LA4DR2U
	25 to 500 sec.	24 to 240 Vac	LA4DR4U

■ For 24 Vac operation, INTEGRAL CMCs requires a 21 volt coil, see coil table page 19.

The coil suppressor modules reduce electrical noise generated by operation of the INTEGRAL CMC.



LA4DA2U

Coil Suppressor Modules

Description	For Use With	Operational Voltage 50/60 Hz AC	Catalog Number
RC Circuit	18A INTEGRAL	24 to 48 Vac	LA4DA2E
		50 to 127 Vac	LA4DA2G
		110 to 250 Vac	LA4DA2U
Varistor	18A INTEGRAL	24 to 48 Vac	LA4DE2E
		50 to 127 Vac	LA4DE2G
		110 to 250 Vac	LA4DE2E
RC Circuit	18A, 32A, 63A INTEGRAL	24 to 250 Vac	LA9D09982



File E164353
CCN NKJH



File LR 43364
Class 3211 03



INTEGRAL™ Self-Protected Combination Motor Controllers

INTEGRAL 18/32/63 Accessories



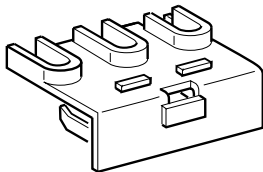
LA9LB390



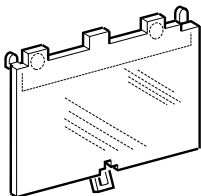
GV1G09



LA9LB960



LA9LC701



LA9L090

Other Accessories

Description	Usage	Catalog Number
Control Knob Padlocking Kit	Attaches to front face of INTEGRAL 18 to allow attachment of up to 3 padlocks	LA9LB390
Control Circuit Test Device	Used on INTEGRAL 18 only	LA9LB398
Mounting Plate	To mount I18 or I32 on two 32 mm Omega rails	LA9LC010
	To mount I32 on one 75mm or two 32mm Omega rails	LA9LC012
	To mount I63 on one 75mm Omega rail	LA9LD010
DIN Rail, 35 mm		AM1DE200
DIN Rail, 75 mm		AM1DL201

Connection Accessories (INTEGRAL 18 Units Only)

Description	Catalog Number
Set of 63 A 3-pole busbars to supply an additional INTEGRAL	LA9LB930 (2)
Terminal to supply one or more LA9LB930 busbar sets; cables connected to top	GV1G09 (1)
Terminal to supply one or more LA9LB930 busbar sets; cables connected to bottom	LA9LB960 (2)

Through the Door Operators (IP54)

Description	For Use With	Knob Color	Catalog Number
Adjustable Depth Operator * (from 0 to 185mm depth)	I18 (LD1 or LD5)	Red	LA9LB330
		Black	LA9LB331
	I32, I63 (LD1)	Red	LA9LC330
		Black	LA9LC331
	I32, I63 (LD4 or LD5)	Red	LA9LC530
		Black	LA9LC531
Fixed Depth Operator *	I18 (LD1 or LD5)	Red	LA9LB320
		Black	LA9LB321
	I32, I63 (LD1)	Red	LA9LC320
		Black	LA9LC321
	I32, I63 (LD4 or LD5)	Red	LA9LC520
		Black	LA9LC521

* See page 49 for mounting dimensions.

Protection Accessories

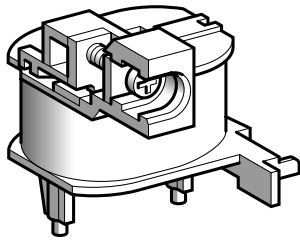
Description	For use with	Sold in Lots of	Catalog Number
Finger Protection Cover for power terminals (L1, L2, L3)	INTEGRAL 32	5	LA9LC701
	INTEGRAL 63	5	LA9LD701
Anti-tamper cover for:	INTEGRAL 18	1	LA1LB090
protection module LB ■			
protection module LC or LD	INTEGRAL 32 or 63	1	LA1LC090

■ For use with trip modules manufactured after January 1, 1998.

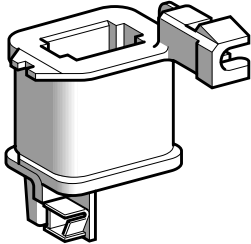


INTEGRAL™ Self-Protected Combination Motor Controllers

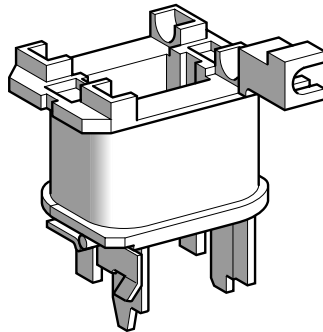
INTEGRAL 18/32/63 Accessories



LX1LB●●●



LX1LC●●●



LX1LD●●●

AC Coils

Nominal Voltage	60 Hz Coil Cat. No.	50 Hz Coil Cat. No.
18 A Models		
21	LX1LB019	LX1LB021
24	LX1LB021	LX1LB024
36	LX1LB032	-
42	-	LX1LB042
48	LX1LB042	LX1LB048
110	LX1LB100	LX1LB110
115/120	LX1LB105	-
127	-	LX1LB127
220	LX1LB200	LX1LB220
230/240	LX1LB210	-
240	-	LX1LB240
380	-	LX1LB380
415	-	LX1LB415
440	LX1LB380	LX1LB440
460/480	LX1LB415	-
500	-	LX1LB500
575/600	LX1 LB500	-
660	-	LX1LB660
32 A models		
24	LX1LC020	LX1LC024
110	-	LX1LC110
120	LX1LC100	-
220	LX1LC190	LX1LC220
240	LX1LC190	LX1LC240
480	LX1LC380	-
63 A models		
24	LX1LD020	LX1LD024
110	LX1LD090	LX1LD110
120	LX1LD100	-
220	LX1LD180	LX1LD220
240	LX1LD190	LX1LD240
480	LX1LD380	-

DC Coils ■

Nominal Voltage	Converter Cat. No.	DC Coil Cat. No.
18 A model		
24	LA1LB080BD	LX1LB024
32 A models		
24	LA1LC080BD	LX1LC0249
48	LA1LC080ED	LX1LC0489
110	LA1LC080FD	LX1LC1109
63 A models		
24	LA1LD080BD	LX1LD0249
48	LA1LD080ED	LX1LD0489
110	LA1LD080FD	LX1LD1109

■ INTEGRAL CMCs can operate on D.C. control voltage when fitted with a coil and converter from the table above.



INTEGRAL™ Self-Protected Combination Motor Controllers

Accessories



LA9C6P12

Pilot devices and control transformers for enclosed INTEGRAL CMCs can be ordered in one of two convenient ways. Telemecanique INSTA-KITS™ may be installed at our factory by attaching the form number suffix from the table below to the end of the catalog number selected in Table 1B on page 6. Alternatively, the INSTA-KIT may be ordered separately by choosing the appropriate catalog number from the right-most column below. INSTA-KITS are easily installed in the field by removing the existing cover plate on the enclosure, installing the INSTA-KIT plate, and plugging the pre-terminated wires into its mating connector.

Table 4: INSTA-KITS™ Selection.

Description	Factory-Installed Form Number★	INSTA-KIT Catalog Number
On/Off Selector Switch	C6	LA9C6
Hand-Off-Auto Selector Switch	C	LA9C
Green Pilot Light	P2 ▲	LA9P12 ▲
Red Pilot Light	P1 ▲	LA9P12 ▲
Green Transformer Pilot Light	P52 ▲	LA9P5152* ■ ▲
Red Transformer Pilot Light	P51 ▲	LA9P5152* ■ ▲
Start/Stop Pushbutton	A	LA9A
Start/Stop (Mushroom Head) Pushbuttons	A22	LA9A2
I/O (Start/Stop) Pushbutton	A6	—
On/Off Selector Switch with Green Pilot Light	C6P2	LA9C6P12
On/Off Selector Switch with Red Pilot Light	C6P1	LA9C6P12
Hand-Off-Auto Selector Switch with Green Pilot Light	CP2	LA9CP12
Hand-Off-Auto Selector Switch with Red Pilot Light	CP1	LA9CP12
H-O-A Selector Switch with Green Transformer Pilot Light	CP52	LA9CP5152* ■
H-O-A Selector Switch with Red Transformer Pilot Light	CP51	LA9CP5152* ■
Forward-Reverse-Stop Pushbuttons	A1	LA9A1
Start/Stop Pushbutton with Green Pilot Light	AP2	LA9AP12
Start/Stop Pushbutton with Red Pilot Light	AP1	LA9AP12
Start/Stop Pushbutton with Green Transformer Pilot Light	AP52	LA9AP5152* ■
Start/Stop Pushbutton with Red Transformer Pilot Light	AP51	LA9AP5152* ■
Standard Control Transformer with Top Mounted Fuse Block:		
50 VA Transformer (Standard size for INTEGRAL 18 and 32)	FF4TKF50♦	LA9FF4TKF50♦
100 VA Transformer (Extra capacity for I18 or I32; Std. capacity for I63)	FF4TKF100♦	LA9FF4TKF100♦
150 VA Transformer (Extra capacity for INTEGRAL 63)	FF4TKF150♦	LA9FF4TKF150♦
Local/Remote Adapter - Three Wire ▲	—	LA93W
Local/Remote Adapter - Four Wire ▲	—	LA94W
Local/Remote Adapter - Five Wire ▲	—	LA95W
Local/Remote Adapter - Seven Wire ▲	—	LA97W
Fuse Kit for Remote ▣	—	LA9FK

All except Transformers



File E14839
CCN NKCR
NKCR7



File LR 105062
Class 3211 02

Transformers



File E 61239
CCN XPTQ
XPTQ7

♦ Complete the form number or catalog number with one of the following voltage codes:

Voltage	D1	D2	D3	D14	D33
Primary	480/240	480/240	208	208	380/400/415
Secondary	120	24	120	24	115/230

■ Replace * with the suffix letter corresponding to the pilot light voltage.

Voltage	24 V	120 V	208/240 V	480 V
Suffix Letter	B	K	P	W

★ For factory modification, add form number to the end of the catalog number.

▲ ●LA93W required when START/STOP pushbutton remote station is used in conjunction with START/STOP local control OR if local pilot light only is used.

●LA94W required when FOR/REV/STOP is required for both local and remote control.

●LA95W required when START/STOP pushbutton with pilot light remote station OR pilot light only remote is used with START/STOP pushbutton local control.

●LA97W required for remote control only applications.

▣ Required when local/remote adapters are used.



INTEGRAL™ Self-Protected Combination Motor Controllers

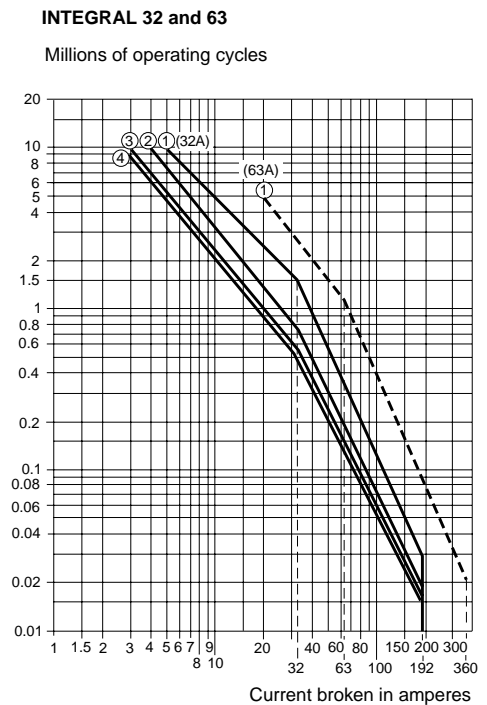
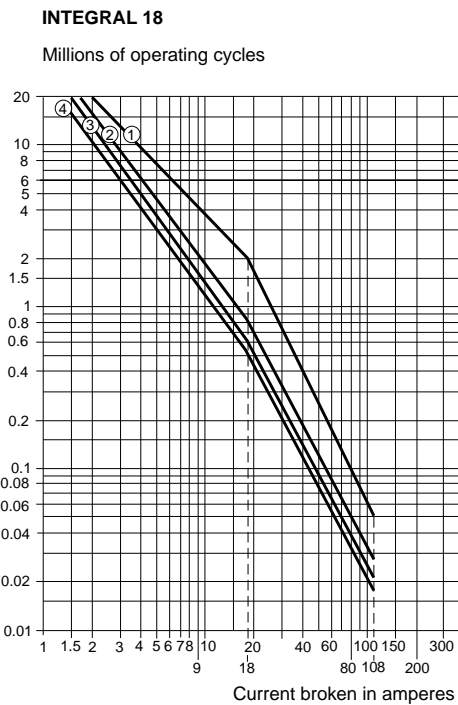
INTEGRAL 18/32/63 Technical Data

**Mechanical and Electrical Life Curves Based
on Utilization Category and Number of Switching Cycles**

Alternating Current Utilization Category AC-3

Operating voltage	200 V	230 V	460 V	575 V
Operating current at $q \leq 104^\circ\text{F}$ (40°C)				
INTEGRAL 18	18 A	18 A	18 A	18 A
INTEGRAL 32	32 A	32 A	32 A	32 A
INTEGRAL 63	63 A	63 A	63 A	63 A
Rated horsepower at $q \leq 104^\circ\text{F}$ (40°C)				
INTEGRAL 18	5 hp	5 hp	10 hp	15 hp
INTEGRAL 32	10 hp	10 hp	20 hp	30 hp
INTEGRAL 63	20 hp	20 hp	40 hp	60 hp
Electrical life				
Motor control and protection in utilization categories AC-2, AC-3, AC-4, at $U_e \leq 400$ volts				

Current Breaking Limit



- ① Not having previously broken a short circuit current
- ② Having broken a short circuit current 10 times at $30 I_n$ ★
- ③ Having broken a short circuit current 20 times at $30 I_n$ ★
- ④ Having broken a short circuit current 10 times at $100 I_n$
- ★ Most common value of short circuit current



INTEGRAL™ Self-Protected Combination Motor Controllers

INTEGRAL 18/32/63 Technical Data

Mechanical and Electrical Life Curves Based on Utilization Category and Number of Switching Cycles

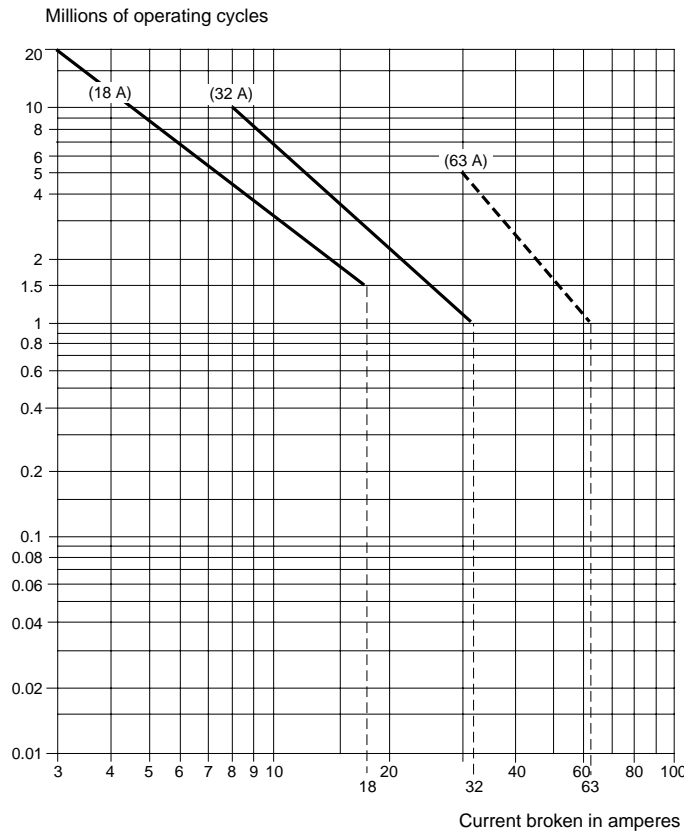
Electrical life curves			
CMC size	18	32	63
Wire size (AWG)	12-10	12-8	8-3

Maximum rate of operating cycles per hour			
Operating duty 85% - operation at maximum current - operation at 50% of maximum current	600	1200	1200
	1200	2400	2400
Operating duty 25% - operation at maximum current	900	1800	1800

Operating current (according to ambient temperature)			
$q \leq 104 \text{ }^\circ\text{F}$ (40 °C)	18 A	32 A	63 A
$q \leq 131 \text{ }^\circ\text{F}$ (55 °C)	16 A	28 A	55 A
$q \leq 158 \text{ }^\circ\text{F}$ (70 °C)	14 A	25 A	50 A

Electrical Life

Utilization category AC-1, $U_e \leq 400$ Volts



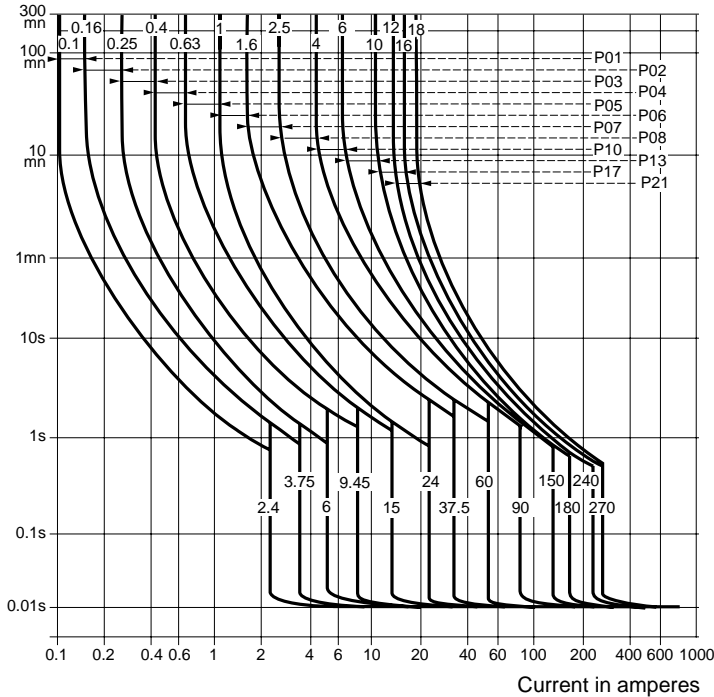
INTEGRAL™ Self-Protected Combination Motor Controllers

INTEGRAL 18 Technical Data

PROTECTON MODULE TRIPPING SPECIFICATIONS

Motor Protection

By thermal magnetic modules **LB1LB03P**



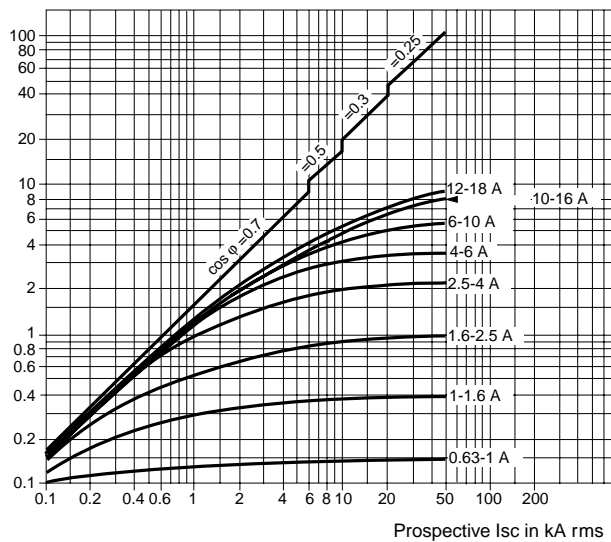
The average operating times shown are for ambient temperature of 68 °F (20 °C), without prior current flow (cold state). The average operating time after prolonged current flow (hot state) can be calculated by applying a coefficient of 0.5.

CURRENT LIMITATION AND THERMAL LIMIT ON SHORT CIRCUIT

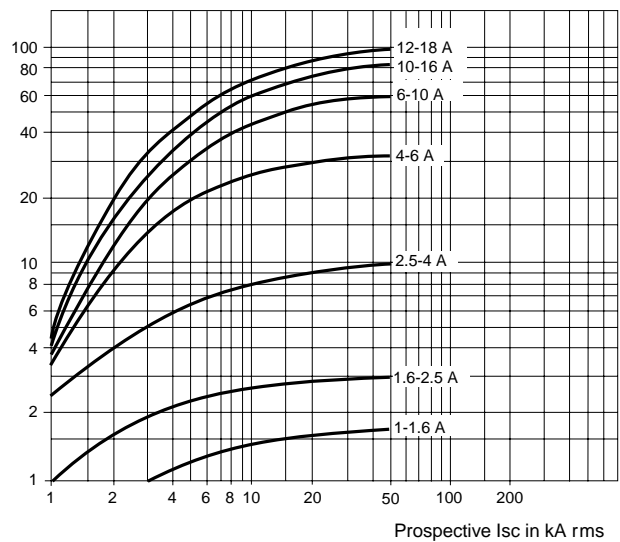
3-Phase 380/415 V, 50 Hz

Current limit on short circuit

Max. I peak in kA



Thermal limit I²t in kA²s in short circuit protection zone

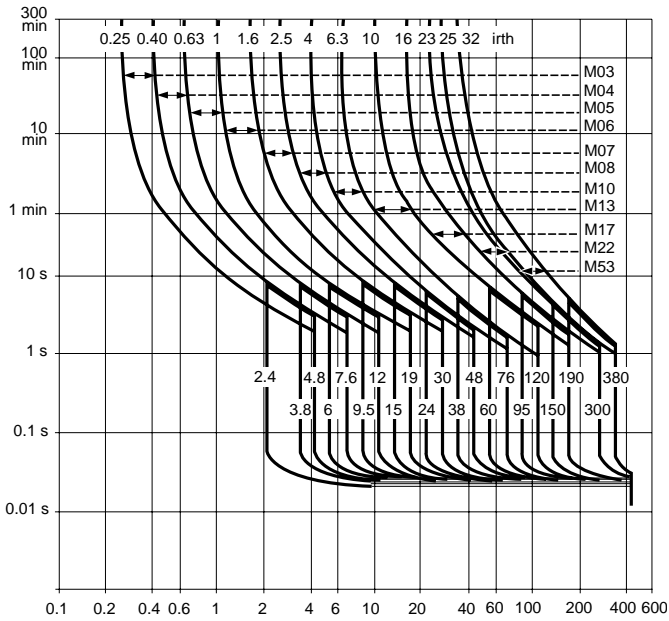


INTEGRAL™ Self-Protected Combination Motor Controllers

INTEGRAL 32 Technical Data

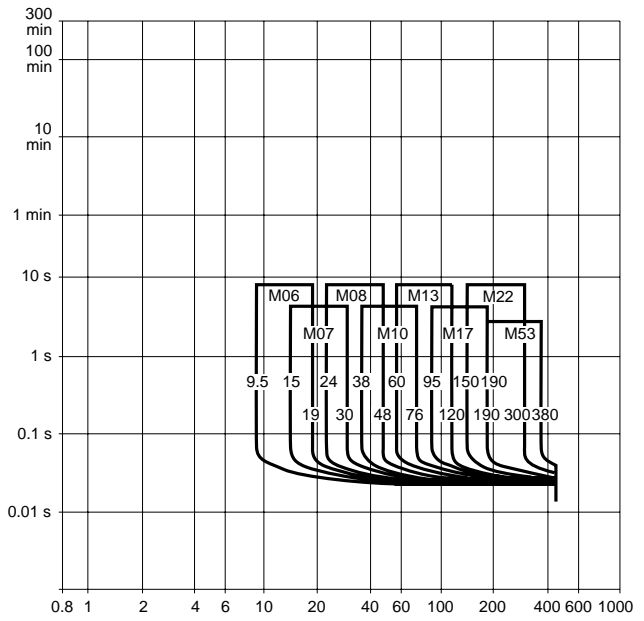
Motor Protection

By thermal magnetic modules **LB1LC03M**



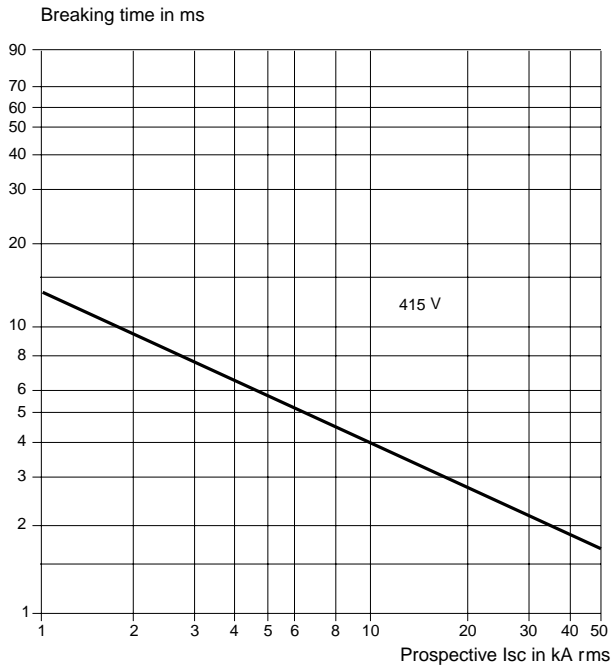
Motor Protection (frequent starting)

By magnetic modules **LB6LC03M**



The average operating times shown are for ambient temperature of 68 °F (20 °C), without prior current flow (cold state).
The average operating time after prolonged current flow (hot state) can be calculated by applying a coefficient of 0.5.

Tripping Curve on Short Circuit



INTEGRAL™ Self-Protected Combination Motor Controllers

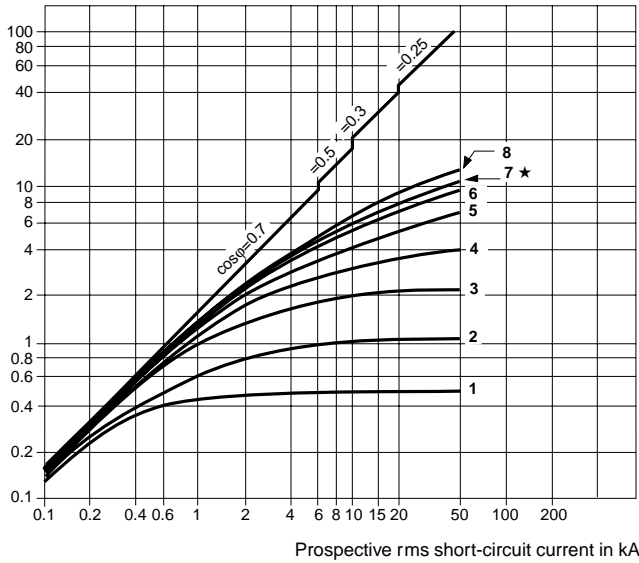
INTEGRAL 32 Technical Data

CURRENT LIMITATION AND THERMAL LIMIT ON SHORT-CIRCUIT

3-Phase 400/415 V, 50 Hz

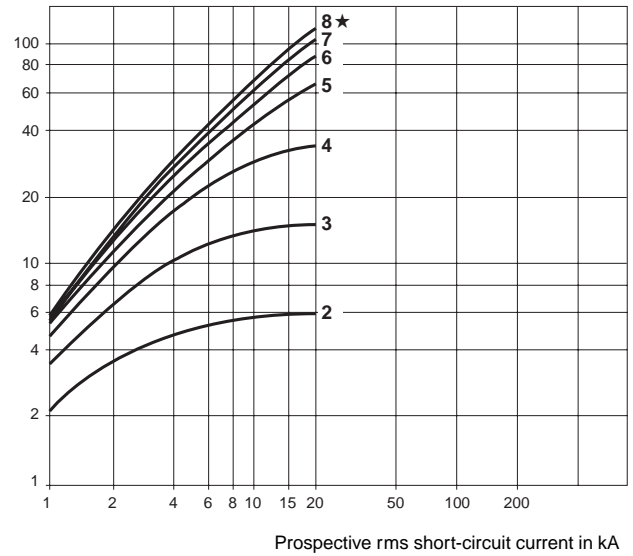
Current limitation on short-circuit

Max. I peak in kA



Maximum thermal limit on short-circuit

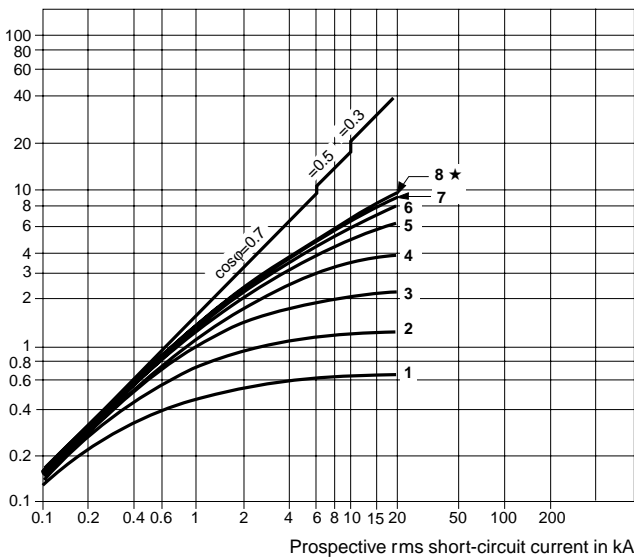
Thermal limit I^2t in kA^2s in short circuit protection zone



3-Phase 400/415 V, 50 Hz

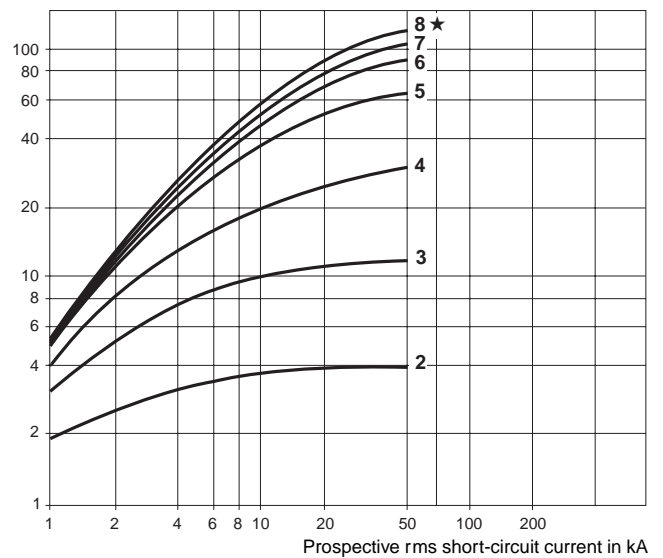
Current limitation on short-circuit

Max. I peak in kA



Maximum thermal limit on short-circuit

Thermal limit I^2t in kA^2s in short circuit protection zone



★ Associated thermal protection rating.

1	1-1.6 A	5	6.3-10 A
2	1.6-2.5 A	6	10-16 A
3	2.5-4 A	7	16-25 A
4	4-6.3 A	8	23-32 A

For 1-1.6 A ratings, the thermal limit is less than $1 \times 10^3 A^2s$

The breaking capacity is unlimited on contactor breakers fitted with modules:

- up to a rating of 10-16 A at 220/380/415 V.
- up to a rating of 6.3-10 A at 440/500 V.



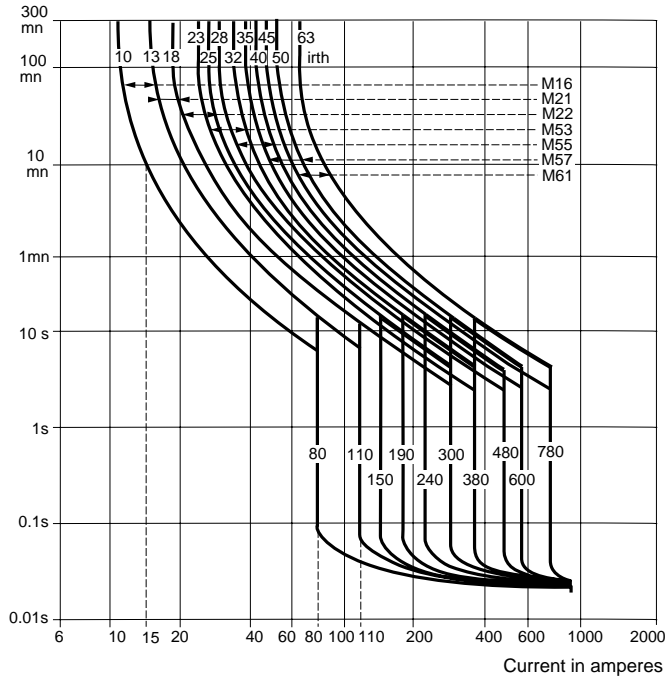
INTEGRAL™ Self-Protected Combination Motor Controllers

INTEGRAL 63 Technical Data

PROTECTION MODULE TRIPPING SPECIFICATIONS

Motor Protection (normal starting duty)

By thermal magnetic modules LB1LD03M



The average operating times shown are for ambient temperature of 68 °F (20 °C), without prior current flow (cold state). The average operating time after prolonged current flow (hot state) can be calculated by applying a coefficient of 0.5.

Tripping Curve on Short Circuit

