Technical Data

Allen-Bradley

Manual Motor Starter Specifcations

Bulletin 140A

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Additional Resources

These documents contain additional information concerning related products from Rockwell Automation.

Resource	Description
Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1	Provides general guidelines for installing a Rockwell Automation industrial system.
Product Certifications website, http://www.rockwellautomation.com/global/certification/overview.page	Provides declarations of conformity, certificates, and other certification details.

You can view or download publications at http://www.rockwellautomation.com/global/literature-library/overview.page. To order paper copies of technical documentation, contact your local Allen-Bradley distributor or Rockwell Automation sales representative.

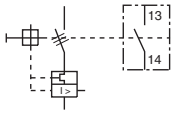
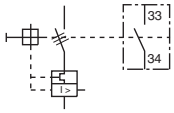
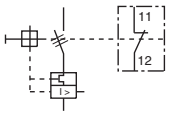
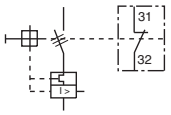
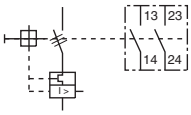
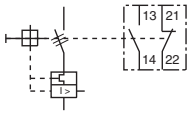
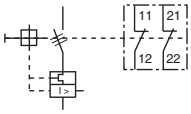
Product Selection

3-pole Manual Motor Starter

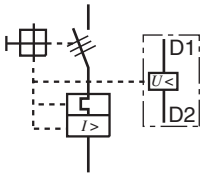
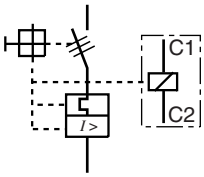
Rated Operational Current I_e [A]	Motor Current Adjustment Range [A]	Magnetic Release Operating Current [A]	Switching of Standard 3-phase AC Motors, AC-2, AC-3						$I_{cu} = I_{cs}$ [kA]	Cat. No.
			3-phase [kW] (50 Hz)(1)			3-phase [Hp] (60 Hz)				
			230V	400V	690V	230V	460V	575V	400/415V	
0.16	0.1…0.16	1.8	—	0.02	—	—	—	—	65	140A-C2A-A16
0.25	0.16…0.25	2.8	—	0.06	—	—	—	—	65	140A-C2A-A25
0.4	0.25…0.4	4.4	—	0.09	—	—	—	—	65	140A-C2A-A40
0.63	0.4…0.63	6.9	0.06/0.09	0.12/0.18	0.25	—	—	—	65	140A-C2A-A63
1	0.63…1.0	11	0.12	0.25	0.37/0.55	—	1/2	3/4	65	140A-C2A-B10
1.6	1.0…1.6	18	0.18/0.25	0.37/0.55	0.75/1.1	—	1	1	65	140A-C2A-B16
2.5	1.6…2.5	28	0.37	0.75	1.8	3/4	1-1/2	2	50	140A-C2A-B25
4	2.5…4.0	44	0.55/0.75	1.1/1.5	2.2/3.0	1	3	3	10	140A-C2A-B40
6.3	4.0…6.3	69	1.1/1.5	2.2	—	2	5	5	10	140A-C2A-B63
10	6.3…10	110	2.2	3.0/4.0	—	3	7-1/2	10	8	140A-C2A-C10
16	10…16	176	3.0/4.0	5.5/7.5	—	5	10	15	6	140A-C2A-C16

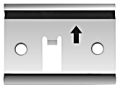
(1) Power ratings: Preferred values according to IEC 60072-1

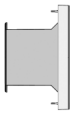
Auxiliary Contacts

	Description	Connection Diagram	For Use With	Pkg. Qty.	Cat. No.
	Auxiliary Contact for Flush Mounting • 1-pole • No additional space required		140A	1	140A-C-AEA10
					140A-C-AEA210
					140A-C-AEA01
					140A-C-AEA201
	Auxiliary Contact for Left-side Mounting • 2-pole • Adds 9 mm to the width of the Manual Motor Starter • Use compact bus bars with 54 mm spacing		140A	1	140A-C-ASA20
					140A-C-ASA11
					140A-C-ASA02

Accessories

	Description	Trip Rating	Connection Diagram	For Use With	Pkg. Qty.	Cat. No.
	Undervoltage Trip Release • For right-side mounting • Adds 18 mm to the width of the Manual Motor Starter	24V, 60 Hz		140A	1	140A-C-UXJ
		24V, 50 Hz				140A-C-UXK
		48V, 60 Hz				140A-C-UXX
		220…230V, 50 Hz				140A-C-UXF
		240V, 50 Hz/277V, 60 Hz				140A-C-UXT
		400V, 50 Hz/460V, 60 Hz				140A-C-UXN
		415V, 50 Hz/480V, 60 Hz				140A-C-UXB
		500V, 50 Hz/575V, 60 Hz				140A-C-UXM
		110V, 50 Hz/120V, 60 Hz				140A-C-UXD
		240…260V, 60 Hz				140A-C-UXA
		110V, 50/60 Hz				140A-C-UXKD
		525V, 50 Hz/600V, 60 Hz				140A-C-UXVC
	Shunt Trip Release • For right-side mounting • Adds 18 mm to the width of the Manual Motor Starter	24V, 60 Hz		140A	1	140A-C-SXJ
		24V, 50 Hz				140A-C-SXK
		48V, 60 Hz				140A-C-SXX
		220…230V, 50 Hz				140A-C-SXF
		240V, 50 Hz/277V, 60 Hz				140A-C-SXT
		400V, 50 Hz/460V, 60 Hz				140A-C-SXN
		415V, 50 Hz/480V, 60 Hz				140A-C-SXB
		500V, 50 Hz/575V, 60 Hz				140A-C-SXM
		110V, 50 Hz/120V, 60 Hz				140A-C-SXD
		240…260V, 60 Hz				140A-C-SXA
		525V, 50 Hz/600V, 60 Hz				140A-C-SXVC

	Description	Terminal links	For Use With	Pkg. Qty.	Cat. No.
	Compact Bus Bars • 45 mm spacing for manual motor starters with flush-mounted auxiliary contact blocks	2 x 3	140A	1	140A-C-W452
		3 x 3			140A-C-W453
		4 x 3			140A-C-W454
		5 x 3			140A-C-W455
	Compact Bus Bars • 54 mm spacing for manual motor starters with side-mounted auxiliary contact blocks	2 x 3	140A	1	140A-C-W542
		3 x 3			140A-C-W543
		4 x 3			140A-C-W544
		5 x 3			140A-C-W545
	Bus Bar Feeder Terminal • Supply of compact busbars Increases wiring capacity		140A-C-W	1	140A-C-WT
	Blank Space Cover • For covering unused terminal links • Must be ordered in multiples of 10 (10 pcs/pkg)		140A-C-W	1	140A-C-WS
	Screw Adapter • Hat (DIN) Rail 35 x 7.5 mm, length 44 mm		140A	1	140A-C-N12

	Description		For Use With	Pkg. Qty.	Cat. No.
	Enclosures for Surface Mounting • With center marks for two indicator lights • Includes protective earth and neutral wire terminals	Protection Class: IP41	140A	1	140A-C-EA41
		Protection Class: IP55 (with seal and protective membrane)	140A		140A-C-EA55
	Enclosures for Flush Mounting • Includes protective earth and neutral wire terminals	Protection Class: IP41	140A		140A-C-EE41
		Protection Class: IP55 (with seal and protective membrane)	140A		140A-C-EE55
	Button Membrane • For IP55 enclosures • Replacement part with four screws (mounting frame included)		140A-C-EA55 140A-C-EE55	1	140A-C-N55
	Locking Arrangement • For locking ON-button of the Manual Motor Starter • For 1…3 padlocks with ø 4…6 mm		140A	1	140A-C-M3
	Locking Arrangement • Suitable for 140A-C-E… enclosures • For 1…3 padlocks with ø 4…8 mm		140A-C-E…	1	140A-C-M3E
	Emergency Stop Push Button Set • For use with enclosures • Twist to release		140A-C-E…	1	140A-C-MT
	Emergency-Stop Push Button Set • For use with enclosures • Key release		140A-C-E…	1	140A-C-MK

	Description	Color	Voltage	For Use With	Pkg. Qty.	Cat. No.
	Pilot Lights • Length of connection leads: 180 mm • includes lamp • protection class IP54	Green	120V	198E-A… 198E-C… 140A-C-E…	1	140-LG120
			240V			140-LG240
			400V			140-LG400
			415V			140-LG415
			480V			140-LG480
		Red	120V			140-LR120
			240V			140-LR240
			400V			140-LR400
			415V			140-LR415
			480V			140-LR480
		White	120V			140-LW120
			240V			140-LW240
			400V			140-LW400
			415V			140-LW415
			480V			140-LW480
		Yellow	120V			140-LY120
			240V			140-LY240
			400V			140-LY400
			415V			140-LY415
			480V			140-LY480

Specifications

IEC Performance Data

		Cat. No. 140A-C2A-…										
		A16	A25	A40	A63	B10	B16	B25	B40	B63	C10	C16
Rated Operational Current I_e	[A]	0.16	0.25	0.4	0.63	1.0	1.6	2.5	4.0	6.3	10	16
Magnetic Release Current	[A]	1.8	2.8	4.4	6.9	11	18	28	44	69	110	176
Switching of Standard Three-Phase Motors (1)												
AC-2, AC-3												
230/240V	[kW]	—	—	—	0.06/0.09	0.12	0.18/0.25	0.37	0.55/0.75	1.1/1.5	2.2	3.0/4.0
400/415V	[kW]	0.02	0.06	0.09	0.18/0.25	0.25	0.37/0.55	0.75	1.1/1.5	2.2	3.0/4.0	5.5/7.5
500V	[kW]	—	—	—	0.18	0.25/0.37	0.55/0.75	1.1	1.5/2.2	2.5/3.0	4.0/6.3	7.5/10
690V	[kW]	—	—	—	0.25	0.37/0.55	0.75/1.1	1.8	2.2/3.0	—	—	—
Back-Up Fuses												
gG, aM, only if $I_{cc} \geq I_{cu}$												
230/240V	[A]	No fuses required										50
400/415V	[A]	No fuses required									63	50
500V	[A]	No fuses required								63	50	50
690V	[A]	No fuses required						25	35	—	—	—
Ultimate- (I_{cu}) and Rated Service (I_{cs}) Short Circuit Breaking Capacity, $I_{cu} = I_{cs}$												
230/240V	[kA]	65	65	65	65	65	65	50	50	50	50	3
400/415V	[kA]	65	65	65	65	65	65	50	10	10	8	6
500V	[kA]	50	50	50	50	50	50	50	3	10	4.5	4.5
690V	[kA]	50	50	50	50	50	50	4.5	2	—	—	—

(1) Power ratings: Preferred values according to IEC 60072-1.

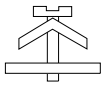
UL / CSA Performance Data

Manual Motor Controller (UL 508, CSA C22.2 No.14, for group installation, in combination with a short-circuit protection device)

		Cat. No. 140A-C2A-…										
		A16	A25	A40	A63	B10	B16	B25	B40	B63	C10	C16
Max. short-circuit current												
480V	[kA]	42	42	42	42	42	42	42	18	18	10	5
600V	[kA]	42	42	42	42	42	42	10	5	5	5	5
Motor load												
1-phase												
115V	[Hp]	—	—	—	—	—	—	1/10	1/8	1/4	1/2	1
230V	[Hp]	—	—	—	—	—	1/10	1/6	1/3	3/4	1-1/2	3
3-phase												
200V	[Hp]	—	—	—	—	—	—	1/2	3/4	1-1/2	2	3
230V	[Hp]	—	—	—	—	—	—	3/4	1	2	3	5
460V	[Hp]	—	—	—	—	1/2	1	1-1/2	3	5	7-1/2	10
575V	[Hp]	—	—	—	—	3/4	1	2	3	5	10	15
Maximum rated current of protection device	[A]	175										

General Data

		Cat. No. 140A-C2A-…
Rated Insulation Voltage U_i		
EN/IEC	[V]	690
UL, CSA	[V]	600
Overvoltage Category / Pollution degree		III / 3
Rated Impulse Withstand Voltage U_{imp}		
Main circuits		6 kV
Auxiliary circuits		6 kV
Rated Frequency	[Hz]	40…60
Life Span		
Mechanical	[operations]	100000
Electrical (I_e max.)	[operations]	50000
Switching Frequency	[operations/h]	max. 30
Ambient Temperature		
Storage	[°C]	- 25…+ 80
Operation	[°C]	- 25…+ 60
Resistance to Climatic Stress		C IV (according to IEC 68)
Moisture/heat resistance		40 °C, 92 %, 56 days
Moisture/change resistance		23 °C, 83 %/40 °C, 93 %, 56 cycles
Site Altitude	[m]	≤ 2000
Protection Class		IP20, when wired
Resistance to Shock, transport	[g]	30 g, 20 ms
Resistance to Vibration		
Frequency range	[Hz]	10…150
in all directions	[g]	7.5
Rated Thermal Current I_{th}		
IEC		
up to 40°C ambient temperature	[A]	0.1…16
up to 60°C ambient temperature	[A]	0.1…16
Rated Supply Current I_e	[A]	0.1…16
Number of setting ranges		11
Dependence on Temperature		
40 °C	[A]	no reduction
50 °C	[A]	
60 °C	[A]	
70 °C	[A]	15 % current reduction of the upper rated current I_e
Overload Protection		
Characteristics		EN/IEC 60947-4-1 Motor protection
Ambient Temperature Compensation	[°C]	-20…+60
Trip Class		10
Magnetic Release		fixed setting
Release current		11 x I_e max. I_e max. = maximum values of setting ranges
Total Power dissipation		
Manual motor starter at rated load	[W]	7
Main Supply Application		Usable as main supply switch according to EN/IEC 60-204 with corresponding accessories

			Cat. No. 140A-C2A-…
Conformity to Standards			IEC 60947-1/ -2/ -4/ -5-1 UL 508 CSA 22.2, Part 1
Approvals/Markings			CE, cULus Listed
Terminal Parts			
Type of terminals			
Screwdriver			Pozidriv No. 2/Blade No. 3
	1 conductor	[mm^2]/[AWG]	1…4/No. 16…12
	2 conductor	[mm^2]/[AWG]	1…4/No. 16…12
	1 conductor	[mm^2]/[AWG]	1…6/No. 16…12
	2 conductor	[mm^2]/[AWG]	1…6/No. 16…12
	1 conductor	[mm^2]/[AWG]	1.5…6/No. 16…12
	2 conductor	[mm^2]/[AWG]	1.5…6/No. 16…12
Tightening torque		[N•m]/[lb•in]	2…2.5/18…22

Weights

Description	Cat. No.	Weight
Manual Motor Starter	140A-C2A-…	290 g
Auxiliary Contact Blocks for Flush Mounting	140A-C-AEA…	12 g
Auxiliary Contact Blocks for Left-side Mounting	140A-C-ASA…	35 g
Undervoltage Release	140A-C-UX…	104 g
Shunt Release	140A-C-SX…	100 g
Bus Bar Feeder Terminal	140A-C-WT	36 g
Compact Bus Bar	140A-C-W452	42 g
	140A-C-W453	69 g
	140A-C-W454	94 g
	140A-C-W455	119 g
	140A-C-W542	45 g
	140A-C-W543	76 g
	140A-C-W544	104 g
	140A-C-W545	135 g

Description	Cat. No.	Weight
Blank Space Cover	140A-C-WS	3.3 g
Enclosure for Surface Mounting	140A-C-EA41	250 g
	140A-C-EA55	258 g
Enclosure for Flush Mounting	140A-C-EE41	126 g
	140A-C-EE55	134 g
Button Membrane	140A-C-N55	8 g
Indicator Light	140-L…	10 g
Hat (DIN) rail Adapter	140A-C-N12	16 g
Locking Arrangement	140A-C-M3E	19 g
	140A-C-M3	11 g

		Cat. No. 140A-C-EA41 / -EE41 Enclosure	Cat. No. 140A-C-EA55 / -EE55 Enclosure	Cat. No. 140-L... Indicator light
IP Protection		IP41	IP55 (with seal and protective membrane)	IP54
Ambient Temperature	[°C]	-25…+40	-25…+40	—
Rated Operating Voltage	[V]	—	—	120, 240, 415, 480

		Cat. No. 140A-C-W45... Compact Bus Bar	Cat. No. 140A-C-W54... Compact Bus Bar
Rated Insulation Voltage U_i	[V]	690	690
Rated Thermal Current I_{th}	[A]	63	63

Accessory Specifications

			Cat. No. 140A-C-AEA... Auxiliary Contact Block for Flush Mounting				Cat. No. 140A-C-ASA... Auxiliary Contact Block for Left-side Mounting			
Rated Thermal Current I_{th}										
at 40°C ambient temperature		[A]	6				10			
at 60°C ambient temperature		[A]	4				6			
Contact Class Coordination According to NEMA (UL/CSA Standards)		AC	B 600 Standard Pilot Duty				B 600 Standard Pilot Duty			
		DC	R 300 Light Pilot Duty				R 300 Light Pilot Duty			
Back-Up Fuses gG, gL		[A]	16				16			
Rated Supply Current		[V]	230/240	400/415	500	690	230/240	400/415	500	690
AC-15		[A]	2	1	0.8	0.5	2	1	0.8	0.5
DC-13		[V]	24	48	110	220	24	48	110	220
		[A]	2	0.6	0.2	0.1	2	0.6	0.2	0.1
Terminal Parts										
Type of terminals										
Screwdriver			Pozidriv No. 2/Blade No. 3				Pozidriv No. 2/Blade No. 3			
	1 conductor	[mm²]/[AWG]	0.75…2.5/No. 18…14				0.75…2.5/No. 18…14			
	2 conductor	[mm²]/[AWG]	0.75…2.5/No. 18…14				0.75…2.5/No. 18…14			
	1 conductor	[mm²]/[AWG]	0.75…4/No. 18…14				0.75…4/No. 18…14			
	2 conductor	[mm²]/[AWG]	0.75…4/No. 18…14				0.75…4/No. 18…14			
	1 conductor	[mm²]/[AWG]	0.75…4/No. 18…14				0.75…4/No. 18…14			
	2 conductor	[mm²]/[AWG]	0.75…4/No. 18…14				0.75…4/No. 18…14			
Tightening torque		[N•m]/[lb•in]	1…1.5/9…13				1…1.5/9…13			

			Cat. No. 140A-C-UX... Undervoltage Release Unit for Right-side Mounting	Cat. No. 140A-C-SX... Shunt Release for Right-side Mounting	Cat. No. 140A-C-WT Supply Block
Actuating Voltage		Pull-in	0.8…1.1 x U_s	0.7…1.1 x U_s	—
		Drop-out	0.7…0.35 x U_s	—	—
Rated Control Voltage		min.	12V, 50 Hz; 14V, 60 Hz	12V, 50 Hz; 14V, 60 Hz	—
		max.	600V, 50 Hz	600V, 50 Hz	—
On-Time			100 %	100 %	—
Coil Rating		Pull-in	8.5 VA, 6 W	8.5 VA, 6 W	—
		Hold	3 VA, 1.2 W	3 VA, 1.2 W	—
Terminal Parts					
Type of terminals					
Screwdriver			Pozidriv No. 2/Blade No. 3	Pozidriv No. 2/Blade No. 3	Pozidriv No. 2/Blade No. 3
	1 conductor	[mm²]/[AWG]	0.75…2.5/No. 18…14	0.75…2.5/No. 18…14	4…16/No. 14…6
	2 conductor	[mm²]/[AWG]	0.75…2.5/No. 18…14	0.75…2.5/No. 18…14	4…16/No. 14…6
	1 conductor	[mm²]/[AWG]	0.75…4/No. 18…14	0.75…4/No. 18…14	4…16/No. 14…6
	2 conductor	[mm²]/[AWG]	0.75…4/No. 18…14	0.75…4/No. 18…14	4…16/No. 14…6
	1 conductor	[mm²]/[AWG]	0.75…4/No. 18…14	0.75…4/No. 18…14	4…16/No. 14…6
	2 conductor	[mm²]/[AWG]	0.75…4/No. 18…14	0.75…4/No. 18…14	4…16/No. 14…6
Tightening torque		[N•m]/[lb•in]	1…1.5/9…13	1…1.5/9…13	4/36

Cut-off Current

The Bulletin 140A-C2A manual motor starter limits short-circuit current I_{cc} (prospective short-circuit current). I_D is the maximum cut-off current (highest instantaneous value of the limited short-circuit current). This value is indicated in Figure 1 as a function of the system short-circuit current.

Figure 1 - Short-circuit Current Function

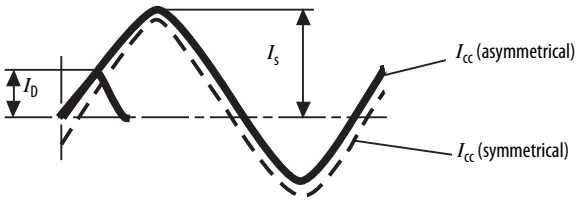


Figure 2 - 140A-C2A Max. Let-Through (cut-off) Current, U_e = 400...415V

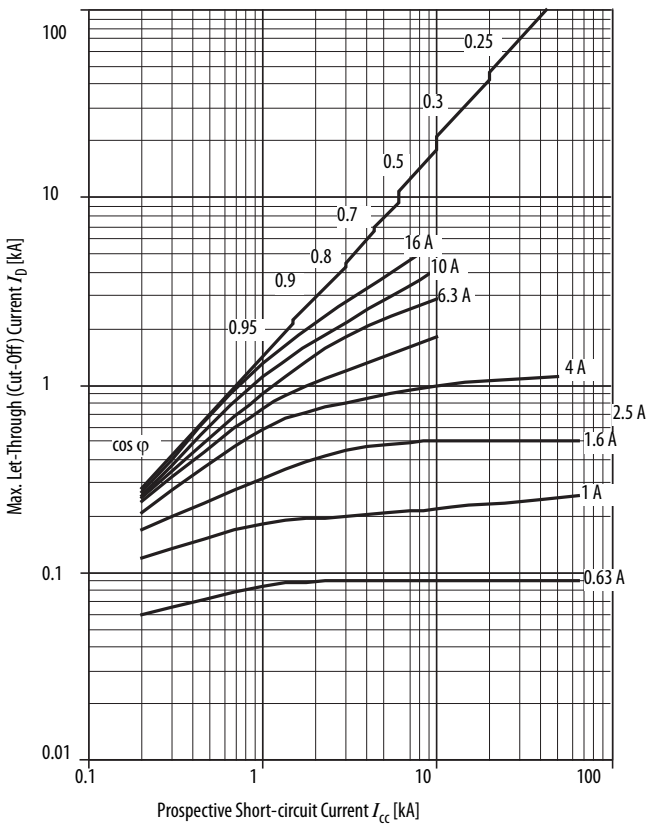
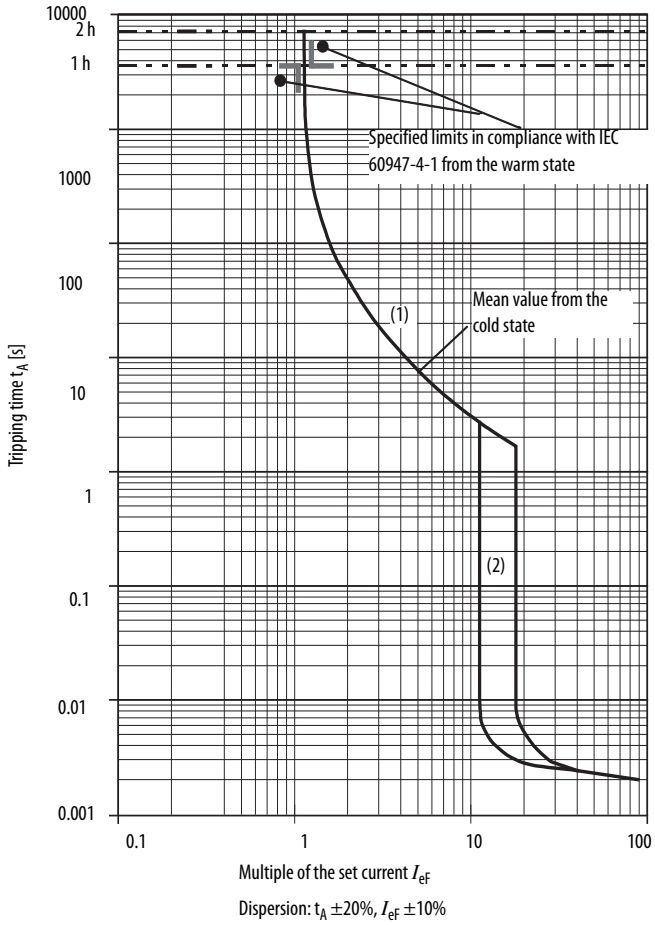


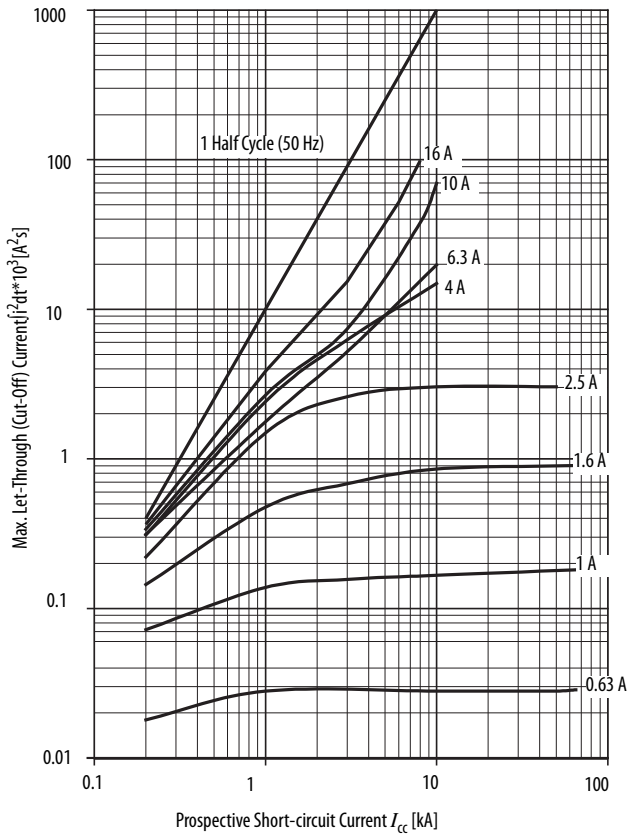
Figure 3 - 140A-C2A Time/Current characteristics



(1) Operating Current of Thermal Releases:
The adjustable inverse bimetal trip reliability protects motors against overloads. The curve shows the mean operating current at an ambient temperature of 20 °C starting from cold.
In equipment at operating temperature, release time is less than or equal to release time from the cold state.
(2) Operating Current of Magnetic Releases:
Electromagnetic instantaneous releases react at a fixed tripping current.
At the upper thermal release setting, this tripping current is 11 times the set current.

Correspondingly, the maximum forward i^2 dt energy is limited. This value is indicated in Figure 4 as a function of the system short-circuit current.

Figure 4 - 140A-C2A Max. Let-through Energy, U_e = 400...415V



Current To Be Set:

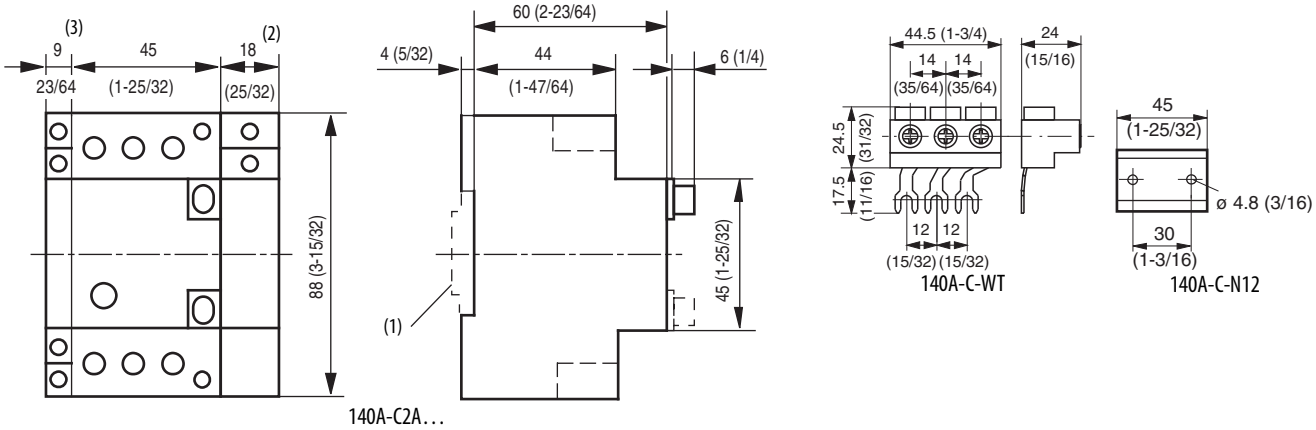
Thermal releases meet the requirements for a thermal release of a starter in accordance with IEC 60947-4-1 f. If a different value is specified (such as reduced I_e in motors with an ambient temperature higher than 40 °C or a site altitude >2000 m above sea level), the rated operating current I_e must be adjusted.

Performance categories per IEC 60947-2

Current	Description	
I_{cu}	Rated short-circuit breaking capacity Operational after completing O-t-CO test sequence	O = off CO = restart and off t = set delay, 3 min
I_{cs}	Ultimate short-circuit breaking capacity Suitable for normal operation after completing O-t-CO-t-CO test sequence	

Approximate Dimensions

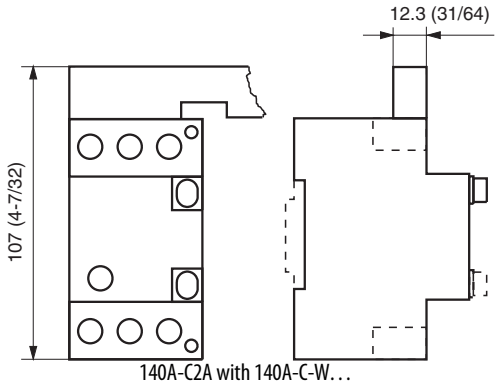
Dimensions are shown in millimeters (inches). Dimensions are not intended to be used for manufacturing purposes.



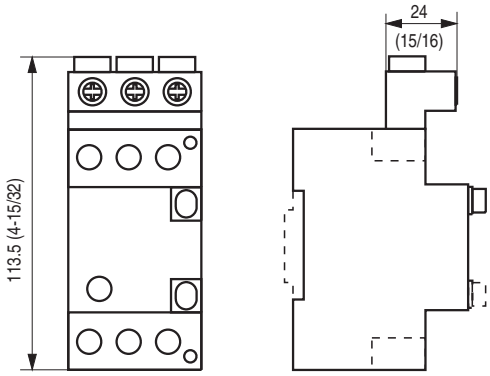
(1) Can be mounted on DIN Rail EN 50 022-35

(2) Auxiliary contact block for side-mounting of 140A-C-ASA…

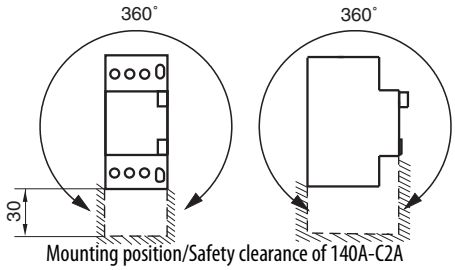
(3) 140A-C-SX… shunt release or 140A-C-UX… undervoltage release



140A-C2A with 140A-C-W…

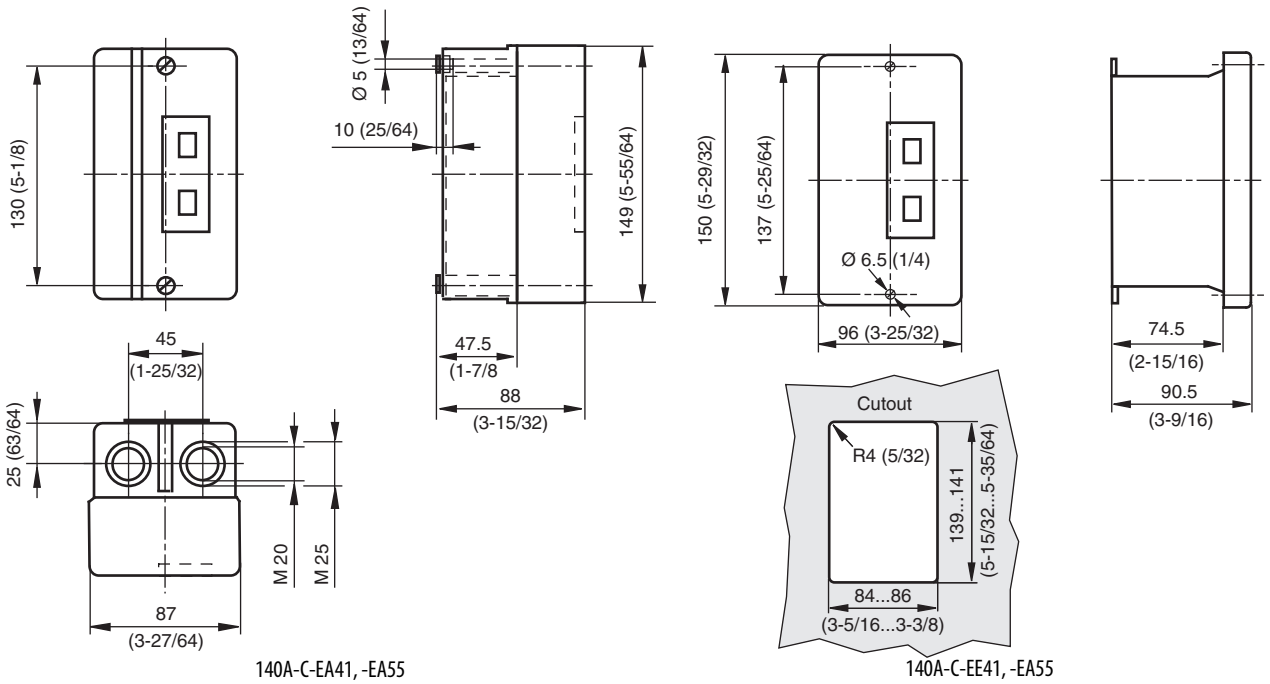


140A-C2A with 140A-C-WT



Mounting position/Safety clearance of 140A-C2A

Dimensions are shown in millimeters (inches). Dimensions are not intended to be used for manufacturing purposes.



140A-C-EA41, -EA55

140A-C-EE41, -EA55

Notes:

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Product Compatibility and Download Center (PCDC)	Get help determining how products interact, check features and capabilities, and find associated firmware.	www.rockwellautomation.com/global/support/pcdc.page

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