

HBC-2Z & HBC-3Z Series Three-Phase DIN Mount Solid-State Contactors



- 54mm & 70mm DIN mount three-phase solid-state contactors
- Two-pole and three-pole output configurations
- Zero-crossing output ratings up-to 75 amps @ 42-600Vac in a 40°C ambient environment
- 4-32Vdc or 20-275Vac / 24-190Vdc control voltage with LED status indicator
- Integrated fan with over temperature protection (HBC-2Z..75..F & HBC-3Z..65..F models)
- I²T ratings up to 15,000 A²S
- Integrated output over voltage transient protection
- IP20 touch-safe housing
- Design according to EN/IEC60947-4-2, EN/IEC60947-4-3, EN/IEC62314, UL508, CSA 22-2 No. 14-13
- 100 kA short circuit current rating according to UL508
- cULus Listed, CE Compliant

Selection Guide

Output Configuration	Load Current (Product Width)	Input Voltage	Part Number	Ext. Power Supply	Fan	Over Temp. Protection
Two-Pole (one direct pole)	25A @ 42-600Vac (54mm)	4-32Vdc	HBC-2Z60D25	-	-	-
		20-275Vac / 24-190Vdc	HBC-2Z60A25	-	-	-
	40A @ 42-600Vac (70mm)	4-32Vdc	HBC-2Z60D40	-	-	-
		20-275Vac / 24-190Vdc	HBC-2Z60A40	-	-	-
	75A @ 42-600Vac (70mm + Fan)	5-32Vdc	HBC-2Z60D75F	24Vdc	Yes	Yes
		20-275Vac	HBC-2Z60A75F	90-250Vac	Yes	Yes
Three-Pole	20A @ 42-600Vac (54mm)	4-32Vdc	HBC-3Z60D20	-	-	-
		20-275Vac / 24-190Vdc	HBC-3Z60A20	-	-	-
	30A @ 42-600Vac (70mm)	4-32Vdc	HBC-3Z60D30	-	-	-
		20-275Vac / 24-190Vdc	HBC-3Z60A30	-	-	-
	65A @ 42-600Vac (70mm + Fan)	5-32Vdc	HBC-3Z60D65F	24Vdc	Yes	Yes
		20-275Vac	HBC-3Z60A65F	90-250Vac	Yes	Yes

HBC-2Z Output Specifications

Two-Pole Switching (One Direct Pole)	HBC..2Z..25..	HBC..2Z..40..	HBC..2Z..75..
Operational Voltage (45-65Hz)	42-660	42-660	42-660
Blocking Voltage (Vpk)	1,200		
Load Current Range (AC-51 rating, Arms @ 40°C)	0.25 - 27	0.4 - 40	0.5 - 75
Load Current Range (AC-53a rating, Arms @ 40°C)	0.25 - 11.5	0.4 - 16.5	0.5 - 28
Max. Motor Starts per Hour (50% duty-cycle @ 40°C)	30		
Maximum Surge Current (Apk, t=10ms)	600	1,150	1,750
I ² T for Fusing (A ² S, t=10ms)	1,800	6,600	15,000
Critical dv/dt (V/μs, Tj @ 40°C)	1,000	1,000	1,000
Max. Off-State Leakage Current (Arms @ 600Vac)	.005		
Power Factor @ Rated Voltage	>0.5		

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HBC-3Z Output Specifications

Three-Pole Switching	HBC..3Z..20..	HBC..3Z..30..	HBC..3Z..65..
Operational Voltage (45-65Hz)	42-660	42-660	42-660
Blocking Voltage (Vpk)	1,200		
Load Current Range (AC-51 rating, Arms @ 40°C)	0.25 - 20	0.4 - 30	0.5 - 66
Load Current Range (AC-53a rating, Arms @ 40°C)	0.25 - 10	0.4 - 14	0.5 - 25
Max. Motor Starts per Hour (50% duty-cycle @ 40°C)	30		
Maximum Surge Current (Apk, t=10ms)	600	1,150	1,750
I ² T for Fusing (A ² S, t=10ms)	1,800	6,600	15,000
Critical dv/dt (V/μs, Tj @ 40°C)	1,000	1,000	1,000
Max. Off-State Leakage Current (Arms @ 600Vac)	.005		
Power Factor @ Rated Voltage	>0.5		

Input Specifications

Two-Pole & Three-Pole Models	HBC..D..	HBC..A..
Control Voltage Range	HBC..60..	5-32Vdc
	HBC..60..F	5-32Vdc
Maximum Reverse Voltage	32Vdc	-
Turn-On Response Time	1 cycle + 500μs @ 24VDC	5 cycles @ 230VAC/110VDC
Input Current Range (mA)	HBC..60..	23-32mA
	HBC..60..F	2.5-12.5mA

Power Supply & Over Temperature Alarm Specifications for HBC..60..F

Two-Pole & Three-Pole Models	HBC..D..F	HBC..A..F
Power Supply Voltage Range (Us)	24 VDC, -15% / +20%	90-250 VAC
Reverse Polarity Protection	Yes	-
Maximum Power Supply Current	150mA	80mA
Fan Voltage Rating	N/A (internally supplied)	
Alarm Output Type (terminal label)	EMR, form C / SPDT: Normally Closed (12-11) & Normally Open (14-11)	
Alarm Output Maximum Current Rating	2A @ 250 VAC / 30 VDC	

General Specifications

Dielectric Strength - Input to Output	4,000Vrms	
Dielectric Strength - Input / Output to Heat Sink	4,000Vrms	
Ambient Operating Temperature Range	-40 +80°C (-30 +70°C for HBC..60D..F) (-30 +60°C for HBC..60A..F)	
Weight	HBC..2Z..25.. / HBC..3Z..20	Approximately 1.33 lbs (600 g)
	HBC..2Z..40.. / HBC..3Z..30	Approximately 1.87 lbs (850 g)
	HBC..2Z..75.. / HBC..3Z..65	Approximately 2.14 lbs (980 g)
UL Flammability Rating (Housing)	UL94 V-0 (conforms to EN 60335-1 requirements)	
Impact Resistance (EN 50155 / EN 61373)	15/11 g/ms	
Vibration Resistance (2-100Hz, IEC 60068-2-6, EN 50155, EN 61373)	2g / axis	
Relative Humidity	95% non-condensing @ 40°C	
EU RoHS Compliant	Yes	
China RoHS Compliant	Power assembly contains lead (Pb) above the limit requirement of GB/T 26572 in one of the homogeneous materials used for this part.	

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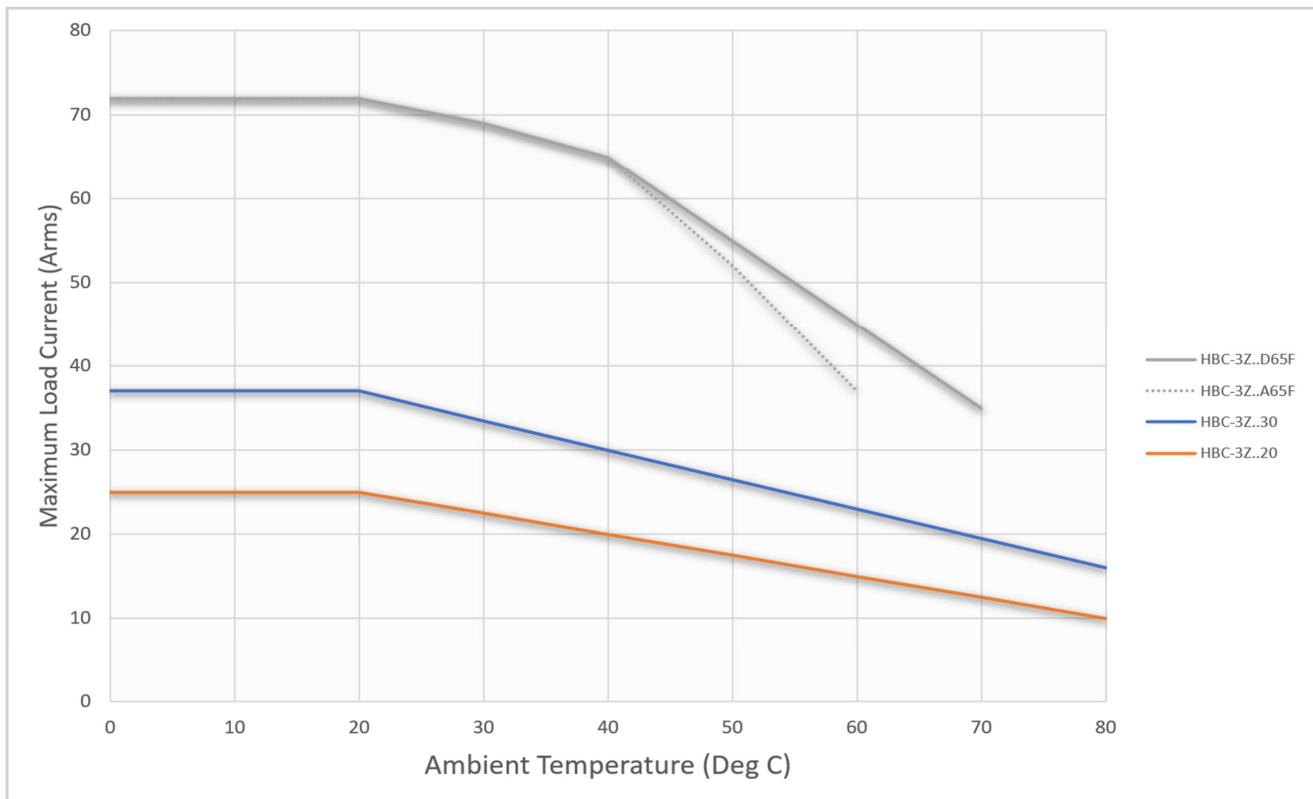
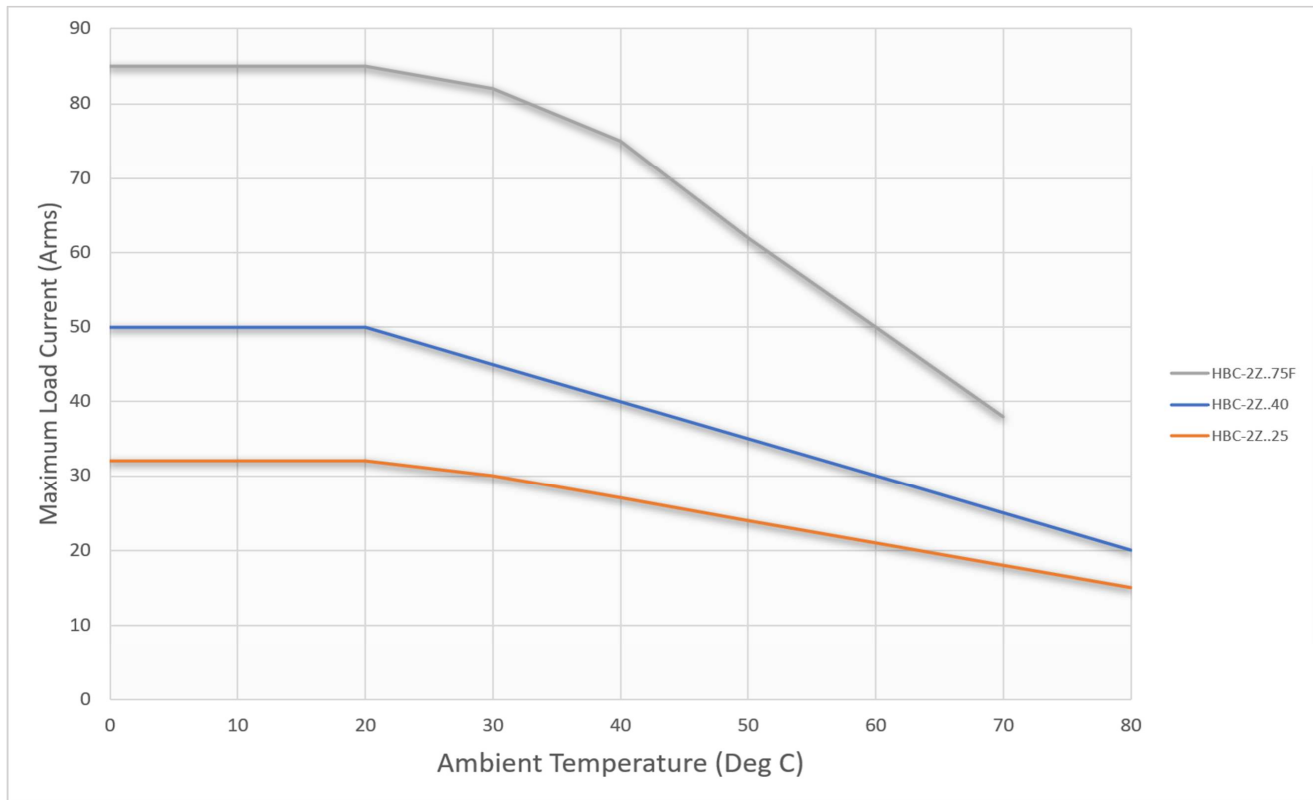
Agency Approvals and Electromagnetic Compatibility

Agency Approvals	UL508 Listed (E224932) cULus Listed (E224932)
Conformance	IEC/EN 60947-4-2 IEC/EN 60947-4-3
UL Short Circuit Current Rating	100kA (UL508)
Electrostatic Discharge (ESD) Immunity	IEC/EN 61000-4-2
- Air discharge, 8kV	Performance Criteria 1
- Contact, 4kV	Performance Criteria 2
Electrical Fast Transient (Burst) Immunity	IEC/EN 61000-4-4
- Output: 2kV, 5kHz	Performance Criteria 1
- Input: 1kV, 5kHz	Performance Criteria 1
Electrical Surge Immunity (All Models)	IEC/EN 61000-4-5
- Output, line to line, 1kV	Performance Criteria 2
- Output, line to earth, 2kV	Performance Criteria 2
- Input, line to line, 500V	Performance Criteria 2
- Input, line to earth, 500V	Performance Criteria 2
Electrical Surge Immunity (HBC..60..F)	IEC/EN 61000-4-5
- Signal, line to line, 500V (Us, 21, 22, 24)	Performance Criteria 1
- Signal, line to earth, 500 V (Us, 21, 22, 24)	Performance Criteria 1
- 11, 12, 14, line to line, 1 kV	Performance Criteria 1
- 11, 12, 14, line to earth, 2 kV	Performance Criteria 1
Radio Interference Voltage Emission (Conducted) 0.15 - 30MHz	IEC/EN 55011 Class A (industrial) with filters
Radiated Radio Frequency Immunity	IEC/EN 61000-4-3
- 10V/m, 80 - 1000 MHz	Performance Criteria 1
- 10V/m, 1.4 - 2 GHz	Performance Criteria 1
- 3V/m, 2 - 2.7 GHz	Performance Criteria 1
Conducted Radio Frequency Immunity	IEC/EN 61000-4-6
- 10V/m, 0.15 - 80 MHz	Performance Criteria 1
Voltage Dips Immunity	IEC/EN 61000-4-11
- 0% for 0.5, 1 cycle	Performance Criteria 2
- 40% for 10 cycles	Performance Criteria 2
- 70% for 25 cycles	Performance Criteria 2
- 80% for 250 cycles	Performance Criteria 2
Voltage Interruptions Immunity	IEC/EN 61000-4-11
- 0% for 5000ms	Performance Criteria 2
Radio Interference Field Emission (Radiated) 30 - 1000MHz	IEC/EN 55011 Class A (industrial)

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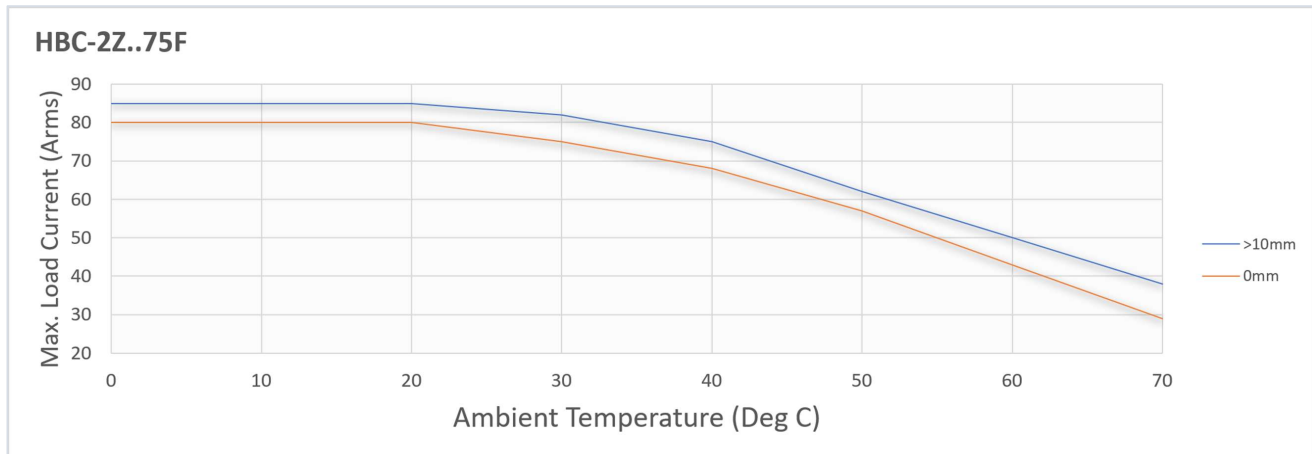
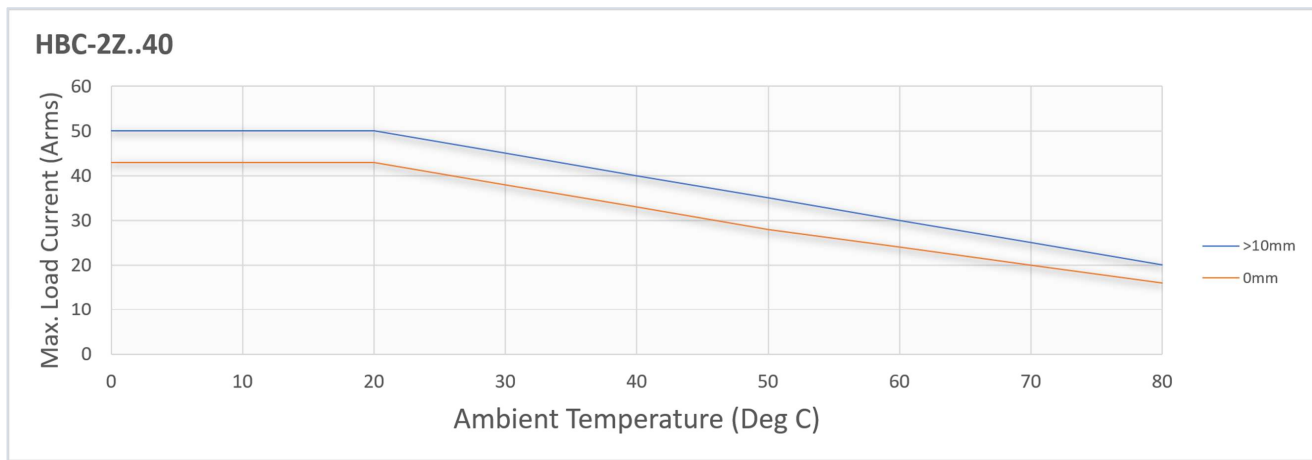
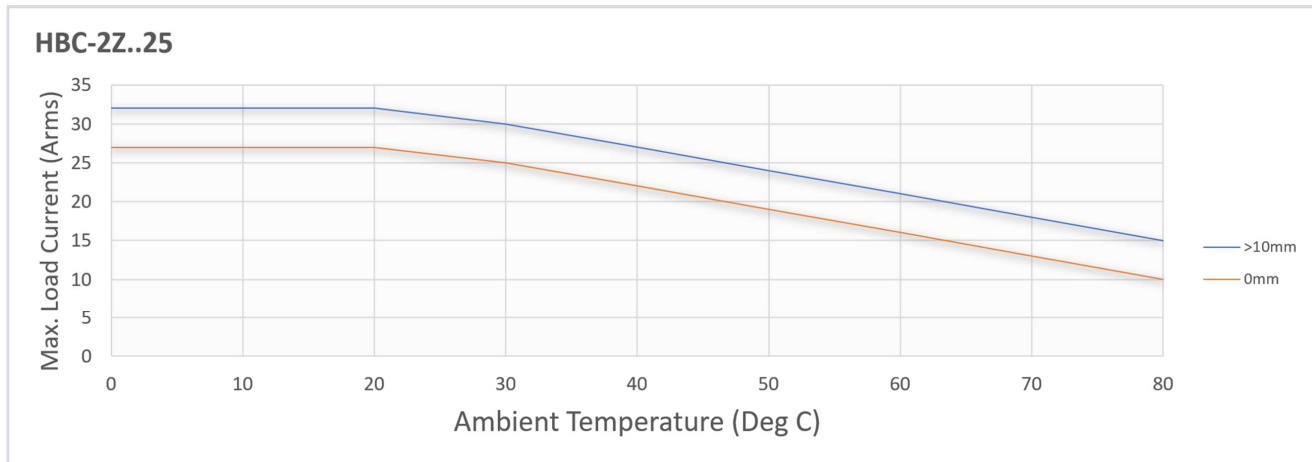
Derate Curves (UL508)



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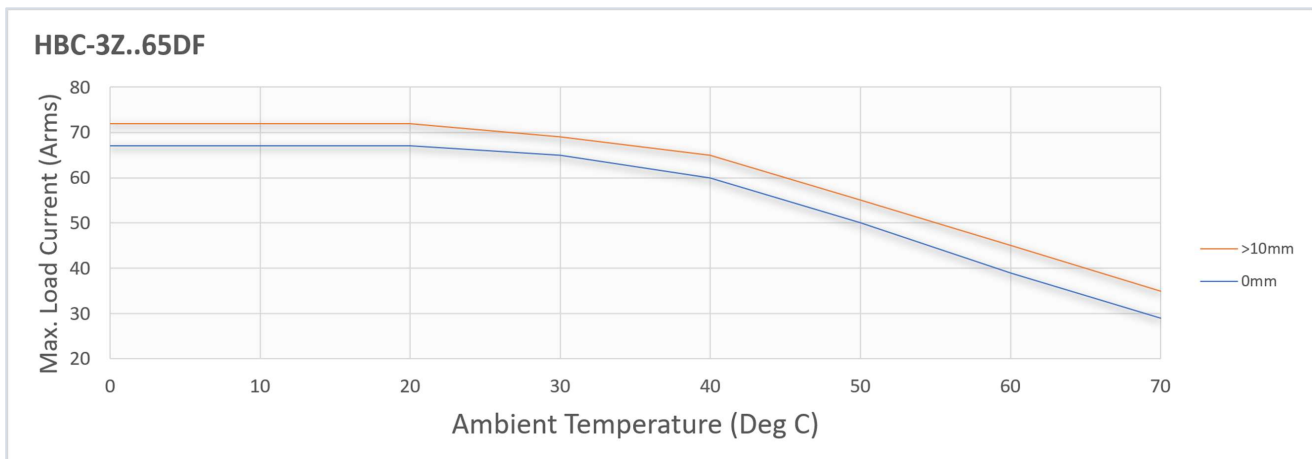
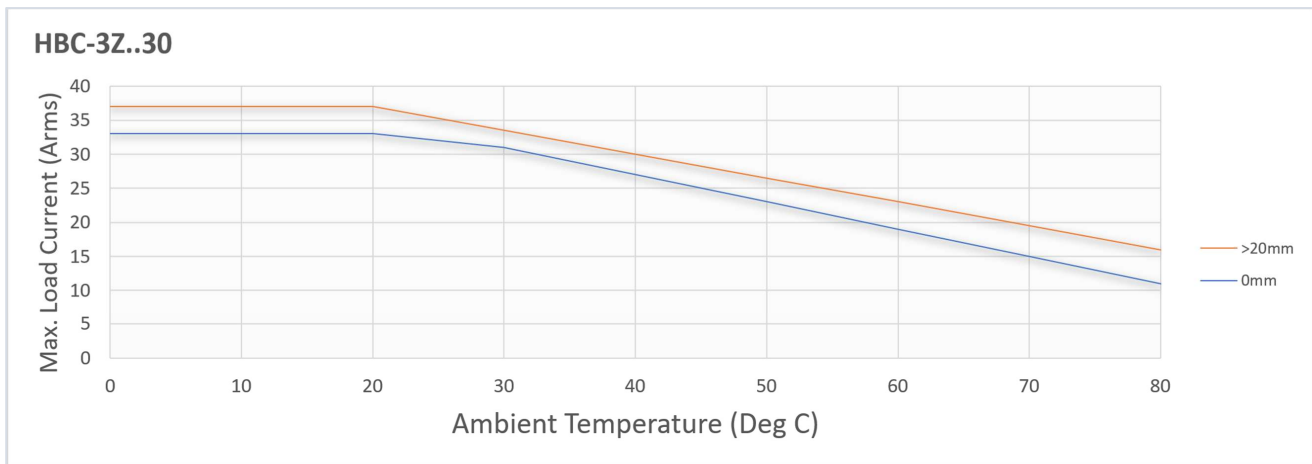
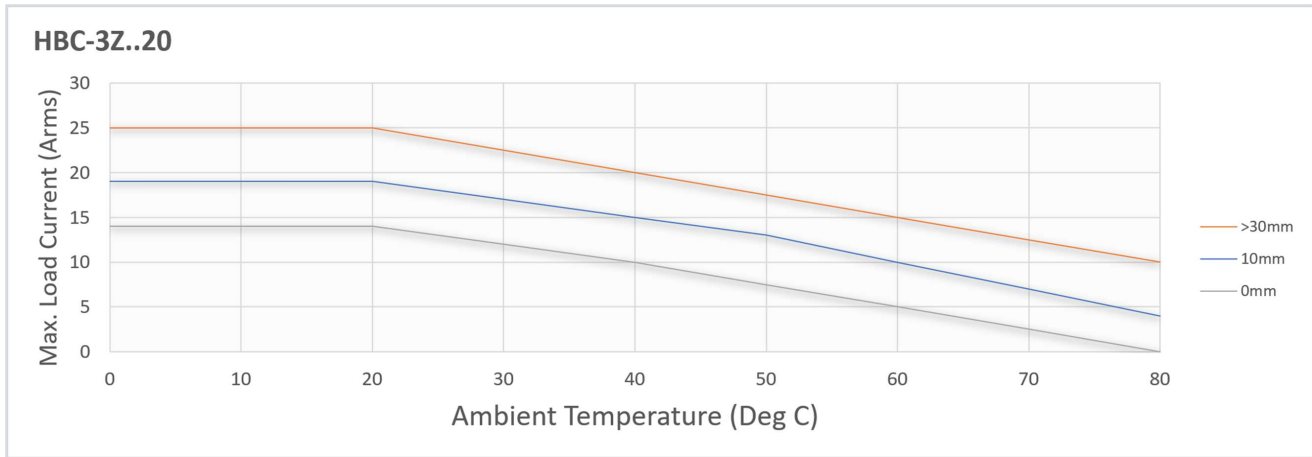
Derating vs. Spacing



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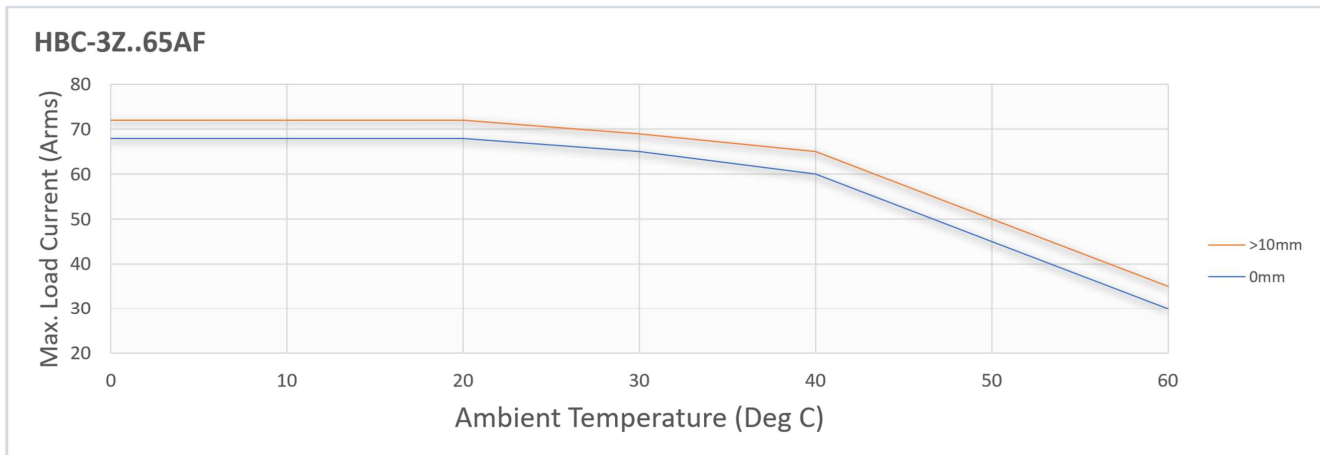
Derating vs. Spacing



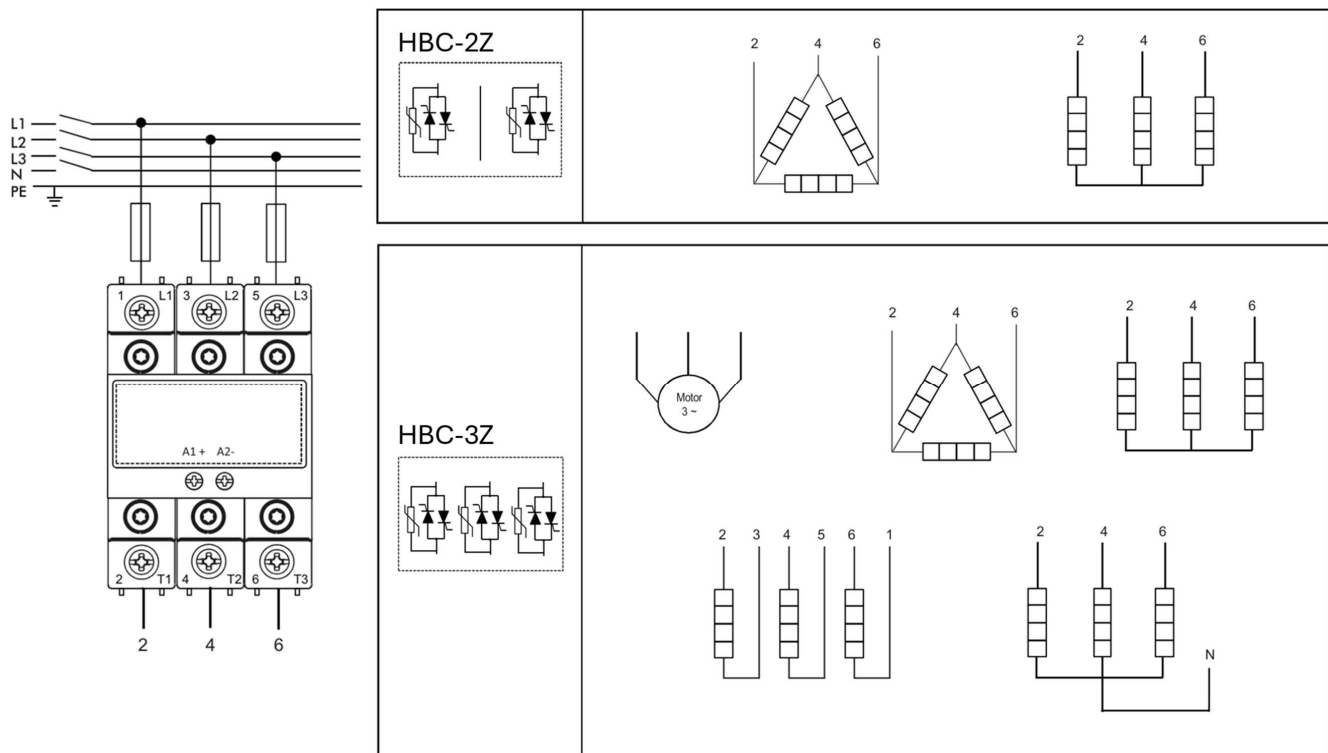
HBC-2Z & HBC-3Z Series Three-Phase DIN Mount Solid-State Contactors



Derating vs. Spacing



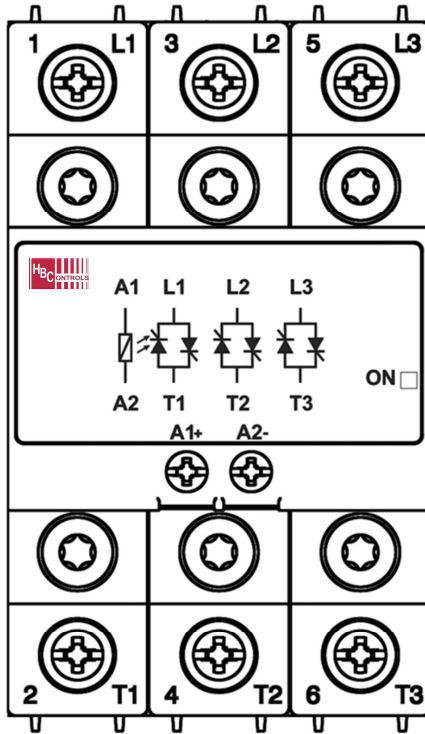
Connection Diagram



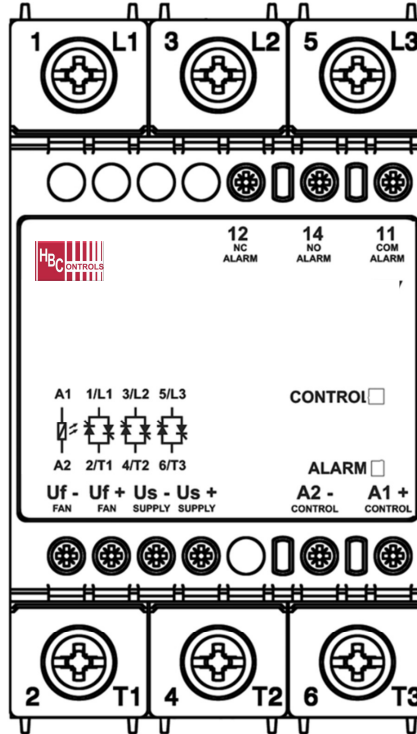
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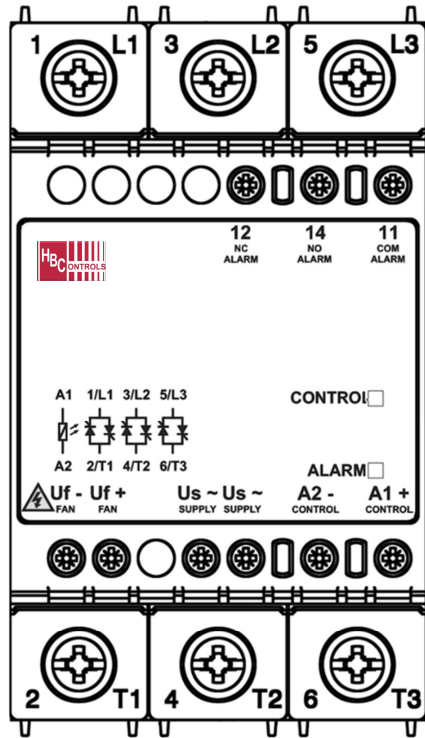
Terminal Layout



HBC-2Z..25, HBC-2Z..40
HBC-3Z..20, HBC-3Z..40



HBC-2Z..D75F
HBC-3Z..D65F



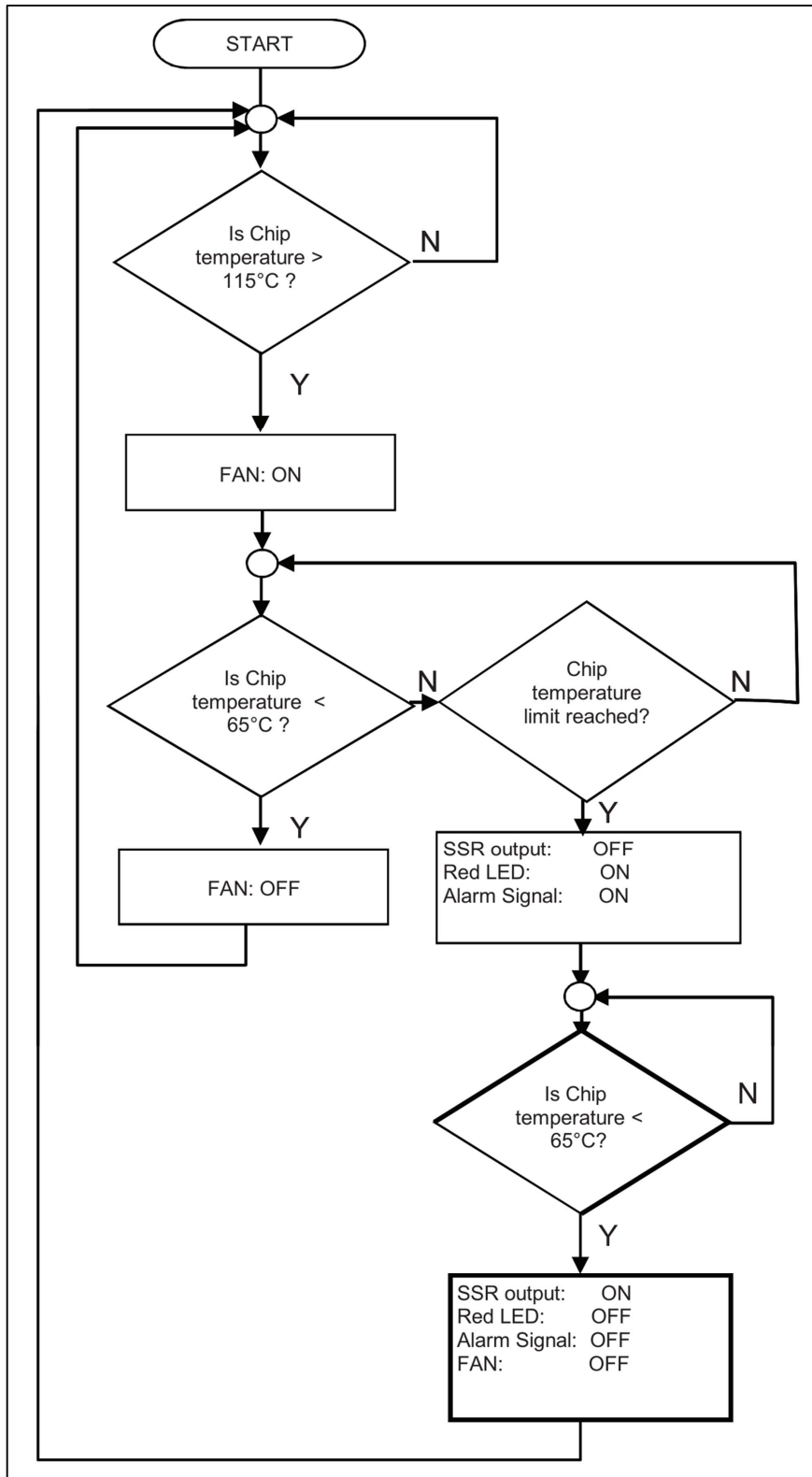
HBC-2Z..A75F
HBC-3Z..A65F

- 1/L1, 3/L2, 5/L3: Mains connections
- 2/T1, 4/T2, 6/T3: Load connections
- A1+: Positive control signal
- A2-: Control signal ground
- Us+/Us-: External DC supply
- Us~: AC external supply
- Uf+/Uf-: Fan supply (internally supplied – no connection required)
- 12: Alarm normally closed terminal
- 14: Alarm normally open terminal
- 11: Alarm common terminal

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Fan & Alarm Operation for HBC-2Z..F & HBC-3Z..F



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Short Circuit Protection

Type 1 protection indicates that, following a short circuit, the device under test will no longer function. Conversely, Type 2 coordination ensures the device remains functional after the short circuit. In both scenarios, the short circuit must be interrupted. The fuse between the enclosure and the supply must not open. Additionally, the enclosure door or cover must not be blown open. There must be no damage to conductors or terminals, and conductors must remain connected to their terminals. The insulating bases must not break or crack to the extent that the integrity of live part mounting is compromised. There should be no discharge of parts or any risk of fire.

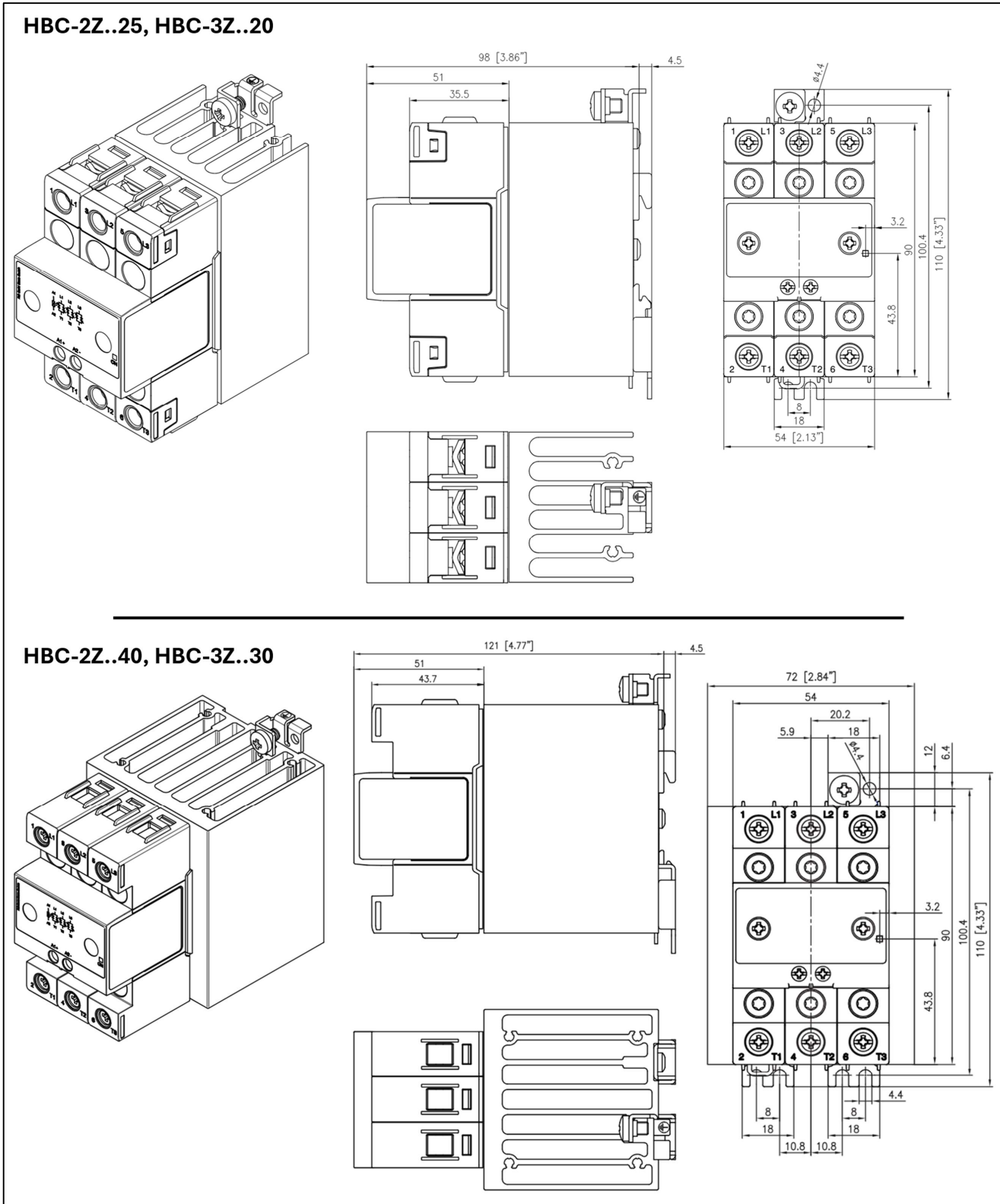
The product variants listed in the table below are suitable for use in circuits capable of delivering up to 100,000 Arms Symmetrical Amperes at a maximum of 600 Volts when protected by fuses. Tests at 100,000 amps were conducted with Class J fast-acting fuses. Refer to the table for the maximum allowed ampere rating of the fuse. Only use fuses. Tests with Class J fuses are representative of Class CC fuses.

Protection Coordination Type 1 per UL508					
Part Number	Prospective Short Circuit Current	Max Fuse Size	Class	Maximum Voltage (Vac)	
HBC-2Z..25 HBC-3Z..20	100kArms	30A	J or CC	600	
HBC-2Z..40 HBC-3Z..30		40A	J		
HBC-2Z..75.. HBC-3Z..65..		60A	J		
Protection Coordination Type 2 for Heater Load Applications @ 600Vrms Max.					
Part#	Prospective Short Circuit Current	Ferraz Shawmut (Mersen)		Siba	
		Max Fuse Size	Part#	Max Fuse Size	Part#
HBC-2Z..25	10kArms	40A	660 URC 14x51/40	32A	50 142 06 32
		40A	6.9xx gRC URD 22x58/40		
	100kArms	40A	660 URD 22x58/40		
		40A	A70QS40-4		
HBC-2Z..40	10kArms	63A	6.9xx gRC URC 14x51/63	63A	50 194 20 63
	100kArms	63A	6.9xx gRC URD 22x58/63		
		60A	A70QS60-4		
HBC-2Z..75..	10kArms	100A	6.9xx gRC URD 22x58/100	125A	50 196 20 125
	100kArms	100A	660 URQ 27x60/100		
		100A	A70QS100-4		
HBC-3Z..20	10kArms	32A	6.9xx gRC URC 14x51/32	32A	50 142 06 32
	100kArms	32A	6.9xx gRC URC 14x51/32		
		40A	A70QS40-4		
HBC-3Z..40	10kArms	63A	6.9xx gRC URC 14x51/63	50A	50 194 20 50
	100kArms	63A	6.9xx gRC URC 22x58/63		
		50A	A70QS50-4		
HBC-3A..65..	10kArms	100A	6.9xx gRC URC 22x58/100	125A	50 196 20 125
	100kArms	90A	660 URD 22x58/90		
		100A	A70QS100-4		

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Dimensions



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Dimensions

