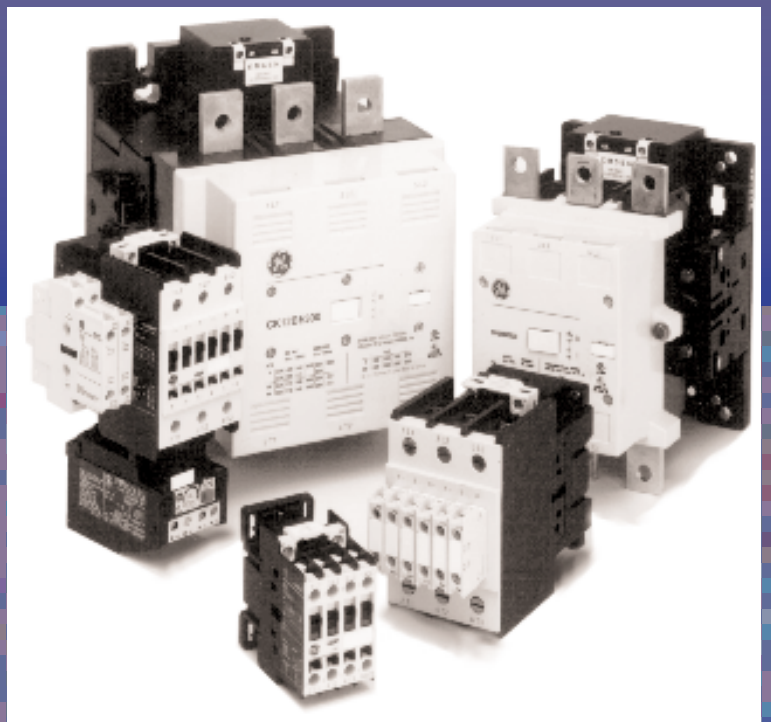




C-2000™ Contactors & Starters
Technical Information

***Broaden
Your Horizons***





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3-Pole Contactors

5-10 HP (460V)

10-17.5 FLA

Contactor catalog numbers are shown in the shaded area in the **Contactor Selection and Data** table. To complete the catalog number, replace the asterisk (*) with the appropriate digit from the shaded area in the **Coil Selection** table. Additional coil information is shown in the **Coil Data** table.

Contactor Selection and Data		Hp @ 460V AC-3 (kW @ 380/415V, 50 Hz)			
		5 hp (4 kW)	7.5 hp (5.5 kW)	10 hp (7.5 kW)	
AC Contactors	Full Voltage Non-Reversing	CL00A310T*	CL01A310T*	CL02A310T*	
	Reversing	LAR00A*	LAR01A*	LAR02A*	
DC Contactors	Full Voltage Non-Reversing	CL00D310T*	CL01D310T*	CL02D310T*	
	Reversing	LDR00A*	LDR01A*	LDR02A*	
Aux. Contacts	Maximum Aux. Contacts	4	4	4	
	Maximum Contact Block Configuration	4 Front-Mount or 1 Side-Mount on each side			
Aux. Contacts (A600, P600) (Built in)		1NO	1NO	1NO	
Continuous Amp Rating (UL)		25	25	32	
AC-1 Amperes (IEC)		25	25	32	
AC-2/AC-3	Max. FLA	10	13.8	17.5	
	Max. Hp (1-Phase)				
	115 Volts	.5	.75	1	
	230 Volts	1.5	2	3	
	Max. Hp (3-Phase)				
200 Volts	3	3	5		
230 Volts	3	3	5		
460 Volts	5	7.5	10		
575 Volts	7.5	10	15		
AC-4 Max. Hp	200 Volts	3	3	5	
	230 Volts	3	3	5	
	460 Volts	5	7.5	10	
	575 Volts	7.5	10	15	
Mechanical Life (millions of operations)		20	20	20	
Elec. Endurance (AC-3) At Rated Current (millions of operations)		2	2	1.8	
Maximum Operational Current 460V and below	AC-1 ≤ 1200 ops./hour	25	25	32	
		3000 ops./hour	12.5	12.5	16
	AC-3 ≤ 1200 ops./hour	10	13.8	17.5	
		3000 ops./hour	3.5	4.8	6.1
	AC-4 360 ops./hour max		10	13.8	17.5
	Net Weight	Contactor	10 oz.	10 oz.	10 oz.
Class 10 Overload Relay		7 oz.	7 oz.	7 oz.	
Wire Size - Power Terminals 75°C (Cu) AWG		14-10	14-10	14-10	
Torque (Main) in.-lb.		15	15	15	
Noise (dba)		25	25	25	

Coil Selection

AC Voltage		DC Voltage	Coil * Suffix
60 Hz	50 Hz		
24	24	—	1
—	—	12	B
—	—	24	D
48	42	—	F
—	—	48	G
120	110	—	J
—	—	125	K
208	—	—	L
277	220/230	—	N
240	—	—	S
—	—	250	T
480	380/400	—	U
—	415	—	W
600	500	—	Y

Coil Data

	AC Voltage	DC Voltage
Burden		
Inrush	45 VA	5.5 W
Holding	6 VA	5.5 W
Pick-up Voltage (% Of Coil Volts)	85-110	80-110
Drop-Out Voltage (% Of Coil Volts)	40-55	20-40
Switching Delay (ms)		
Switching Delay On		
Coil Voltage at +10% to -20%	6-25	35-65
Coil Voltage At Rated Value	8-20	40-50
Switching Delay Off		
Coil Voltage at +10% to -20%	6-13	30-60
Coil Voltage At Rated Value	6-13	30-60
Maximum Operations per Hour		
No Load	9000	3600
Rated Load — AC1, AC3	1200	1200
Rated Load — AC4	360	360

REFERENCES

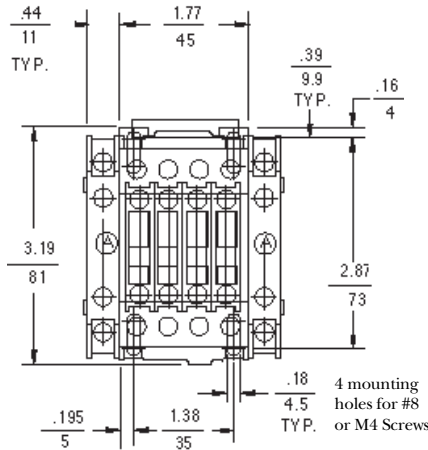
Standards and Listings	Page 41
Overload Relays	Pages 26-29
Accessories	Pages 30-37
Life Curves	Pages 42-44
Additional Coil Information	Page 37
Instruction Sheet	GEH-6223
UL File Number	E76233
CSA File Number	LR30821

3-Pole Contactors 5-10 HP (460V) 10-17.5 FLA

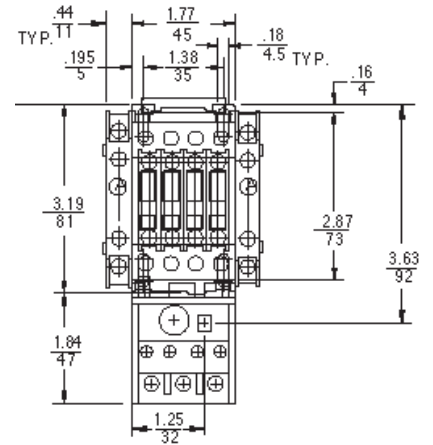
Legend and Notes for Illustration

- Ⓐ Extra Auxiliary Contacts, Side Mounted (if used)
- Ⓑ Extra Auxiliary Contacts, Front Mounted (if used)
- Ⓒ Pneumatic Timer (if used)
- Ⓓ Mechanical Latch (if used)
- Ⓔ Transient Voltage Suppressor

Add ½ inch for electrical clearance to enclosure.



Contactor - Front View



Starter - Front View

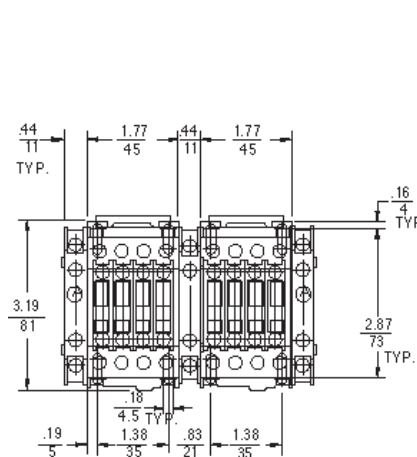
Engineering Outline Drawings

AC

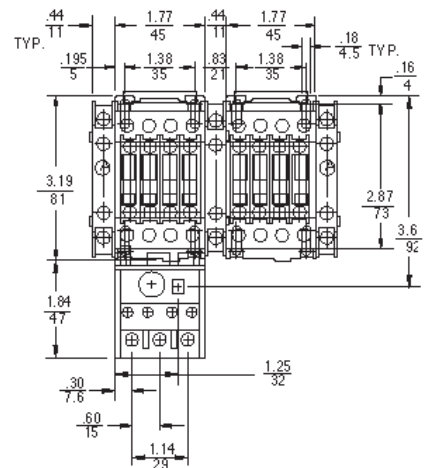
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- Starter55-215824
- Reversing Contactor55-215790
- Reversing Starter55-215791

DC

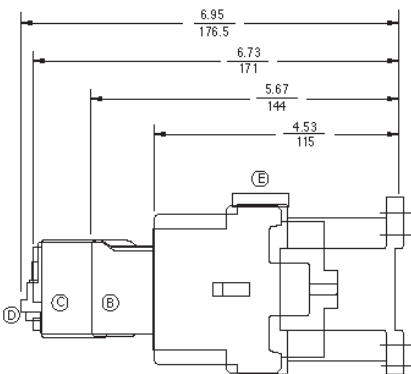
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- Starter55-215765
- Reversing Contactor55-215779
- Reversing Starter55-215803



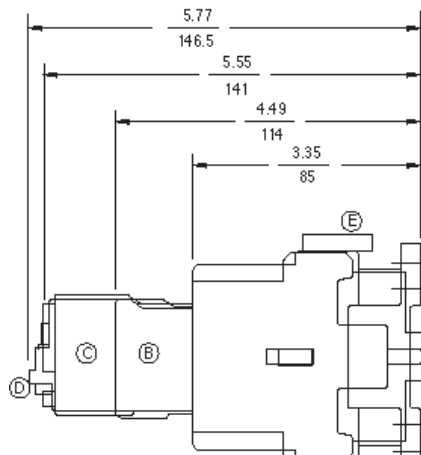
Reversing Contactor - Front View



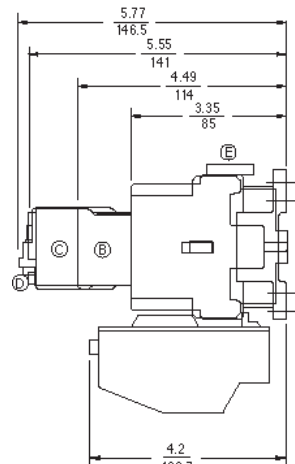
Reversing Starter - Front View



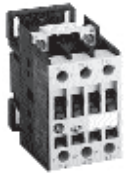
DC Contactor - Side View



AC Contactor - Side View



AC Starter - Side View



3-Pole Contactors

15 HP

22 FLA

Contactor catalog numbers are shown in the shaded area in the **Contactor Selection and Data** table. To complete the catalog number, replace the asterisk (*) with the appropriate digit from the shaded area in the **Coil Selection** table. Additional coil information is shown in the **Coil Data** table.

Contactor Selection and Data		15 hp @ 460V AC-3 (11 kW @ 380/415V, 50 Hz)
AC Contactors	Full Voltage Non-Reversing	CL25A310T*
	Reversing	LAR25A*
DC Contactors	Full Voltage Non-Reversing	CL25D310T*
	Reversing	LDR25A*
Aux. Contacts	Maximum Aux. Contacts	4
	Maximum Contact Block Configuration	4 Front-Mount or 1 Side-Mount on each side
Aux. Contacts (A600, Q600) ¹		1NO
Continuous Amp Rating (UL)		32
AC-1 Amperes (IEC)		45
AC-2/AC-3	Max. FLA	
	480 Volts	22
	600 Volts	17.5
	Max. Hp (1-Phase)	
	115 Volts	1.5
	230 Volts	3
	Max. Hp (3-Phase)	
	200 Volts	5
230 Volts	7.5	
460 Volts	15	
575 Volts	15	
AC-4 Max. Hp	200 Volts	5
	230 Volts	7.5
	460 Volts	15
	575 Volts	15
Mechanical Life (millions of operations)		20
Elec. Endurance (AC-3) At Rated Current (millions of operations)		2
Maximum Operational Current 460V and Below	AC-1 ≤ 1200 ops./hour	32
	3000 ops./hour	16
	AC-3 ≤ 1200 ops./hour	22
	3000 ops./hour	7.7
Net Weight	Contactor	10 oz.
	Class 10 Overload Relay	7 oz.
Wire Size - Power Terminals 75°C (Cu) AWG		14-8
Torque (Main) in.-lb.		20
Noise (dba)		25

¹ A Front-Mount auxiliary contact is supplied.
Add the suffix "S" to catalog number for Side-Mount auxiliary contact.

Coil Selection

AC Voltage		DC Voltage	Coil * Suffix
60 Hz	50 Hz		
24	24	—	1
—	—	12	B
—	—	24	D
48	42	—	F
—	—	48	G
120	110	—	J
—	—	125	K
208	—	—	L
277	220/230	—	N
240	—	—	S
—	—	250	T
480	380/400	—	U
—	415	—	W
600	500	—	Y

Coil Data

	AC Voltage	DC Voltage
Burden		
Inrush	45 VA	5.5 W
Holding	6 VA	5.5 W
Pick-up Voltage (% Of Coil Volts)	85-110	80-110
Drop-Out Voltage (% Of Coil Volts)	40-55	15-30
Switching Delay (ms)		
Switching Delay On		
Coil Voltage at +10% to -20%	6-25	35-65
Coil Voltage At Rated Value	8-20	40-50
Switching Delay Off		
Coil Voltage at +10% to -20%	6-13	30-60
Coil Voltage At Rated Value	6-13	30-60
Maximum Operations per Hour		
No Load	9000	3600
Rated Load — AC1, AC3	1200	1200
Rated Load — AC4	360	360

REFERENCES

Standards and Listings	Page 41
Overload Relays	Pages 26-29
Accessories	Pages 30-37
Life Curves	Pages 42-44
Additional Coil Information	Page 37
Instruction Sheet	GEH-6223
UL File Number	E76233
CSA File Number	LR30821

3-Pole Contactors

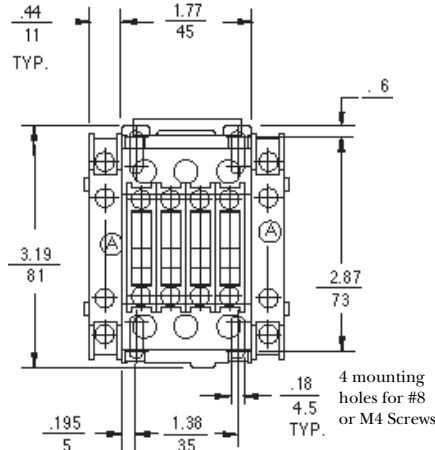
15 HP

22 FLA

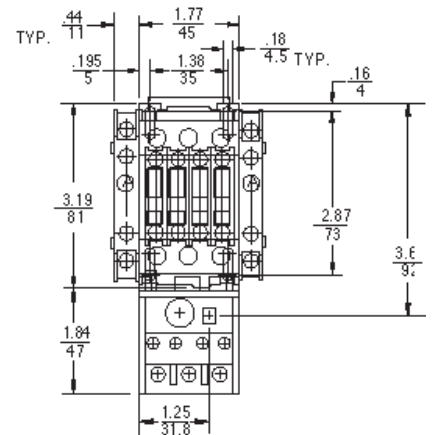
Legend and Notes for Illustration

- Ⓐ Extra Auxiliary Contacts, Side Mounted (if used)
- Ⓑ Extra Auxiliary Contacts, Front Mounted (if used)
- Ⓒ Pneumatic Timer (if used)
- Ⓓ Mechanical Latch (if used)
- Ⓔ Transient Voltage Suppressor

Add ½ inch for electrical clearance to enclosure.



Contactor - Front View



Starter - Front View

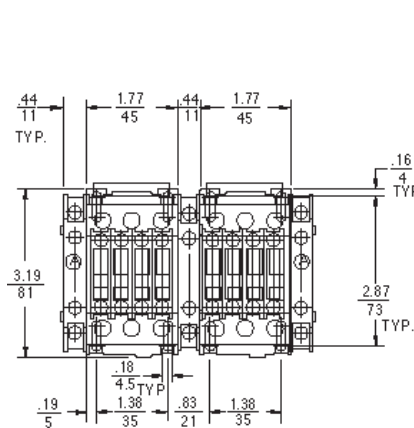
Engineering Outline Drawings

AC

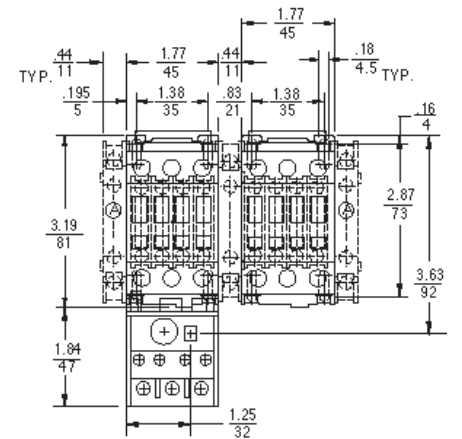
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- Reversing Contactor55-215798
- Reversing Starter55-215799

DC

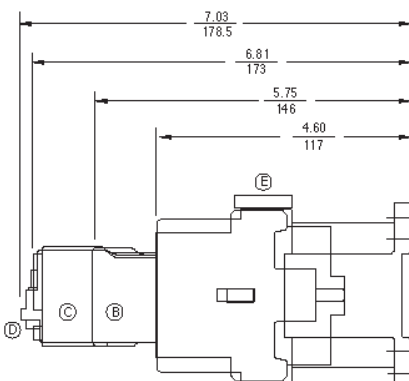
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- Starter55-215868
- Reversing Contactor55-215780
- Reversing Starter55-215804



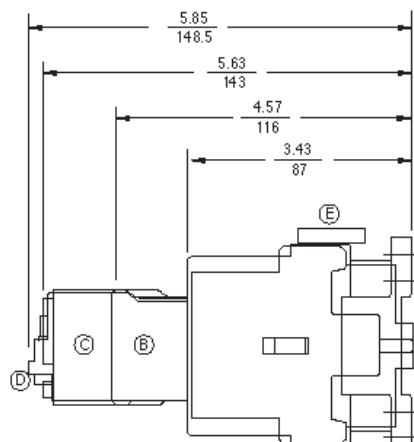
Reversing Contactor - Front View



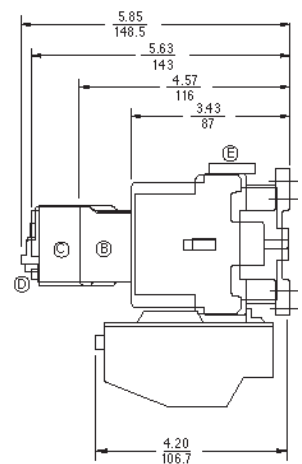
Reversing Starter - Front View



DC Contactor - Side View



AC Contactor - Side View



AC Starter - Side View



3-Pole Contactors

20 HP (460V)

32 FLA

Contactor catalog numbers are shown in the shaded area in the **Contactor Selection and Data** table. To complete the catalog number, replace the asterisk (*) with the appropriate digit from the shaded area in the **Coil Selection** table. Additional coil information is shown in the **Coil Data** table.

Contactor Selection and Data		20hp @ 460V AC-3 (16 kW @ 380/415V, 50 Hz)
AC Contactors	Full Voltage Non-Reversing	CL04A310M*
	Reversing	LAR04A*
DC Contactors	Full Voltage Non-Reversing	CL04D310M*
	Reversing	LDR04A*
Aux. Contacts	Maximum Aux. Contacts	6
	Maximum Contact Block Configuration	4 Front-Mount plus 1 Side-Mount, or 2 Front-Mount plus 1 Side-Mount on each side
Aux. Contacts (A600, P600) (Built in)		1NO
Continuous Amp Rating (UL)		54
AC-1 Amperes (IEC)		60
AC-2/AC-3	Max. FLA	32
	Max. Hp (1-Phase)	
	115 Volts	2
	230 Volts	5
	Max. Hp (3-Phase)	
	200 Volts	10
230 Volts	10	
460 Volts	20	
575 Volts	25	
AC-4 Max. Hp	200 Volts	10
	230 Volts	10
	460 Volts	20
	575 Volts	25
Mechanical Life (millions of operations)		20
Elec. Endurance (AC-3) At Rated Current (millions of operations)		2
Maximum Operational Current 460V and Below	AC-1 ≤ 1200 ops./hour	54
	3000 ops./hour	27
	AC-3 ≤ 1200 ops./hour	32
	3000 ops./hour	11.2
	AC-4 360 ops./hour max	32
Net Weight	Contactor	1 lb. 2 oz.
	Class 10 Overload Relay	7 oz.
Wire Size - Power Terminals 75°C (Cu) AWG		14-8
Torque (Main) in.-lb.		16
Noise (dba)		25

Coil Selection

AC Voltage		DC Voltage	Coil * Suffix
60 Hz	50 Hz		
24	24	—	1
—	—	12	B
—	—	24	D
48	42	—	F
—	—	48	G
120	110	—	J
—	—	125	K
208	—	—	L
277	220/230	—	M
240	—	—	S
—	—	250	T
480	380/400	—	U
—	415	—	W
600	500	—	Y

Coil Data

	AC Voltage	DC Voltage
Burden		
Inrush	88 VA	7.5 W
Holding	9 VA	7.5 W
Pick-up Voltage (% Of Coil Volts)	85-110	80-110
Drop-Out Voltage (% Of Coil Volts)	40-55	15-30
Switching Delay (ms)		
Switching Delay On		
Coil Voltage at +10% to -20%	7-25	35-70
Coil Voltage At Rated Value	10-19	40-65
Switching Delay Off		
Coil Voltage at +10% to -20%	5-25	40-65
Coil Voltage At Rated Value	5-25	40-65
Maximum Operations per Hour		
No Load	9000	3600
Rated Load — AC1, AC3	1200	1200
Rated Load — AC4	360	360

REFERENCES

Standards and Listings	Page 41
Overload Relays	Pages 26-29
Accessories	Pages 30-37
Life Curves	Pages 42-44
Additional Coil Information	Page 37
Instruction Sheet	GEH-6224
UL File Number	E76233
CSA File Number	LR30821

3-Pole Contactors

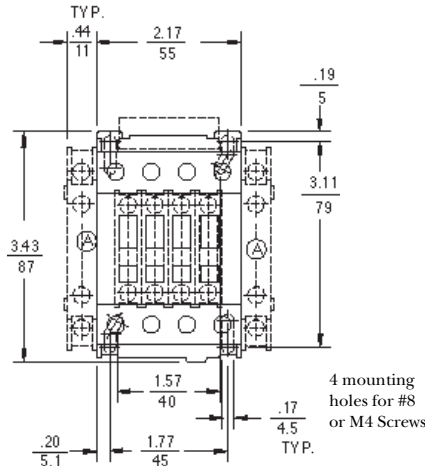
20 HP (460V)

32 FLA

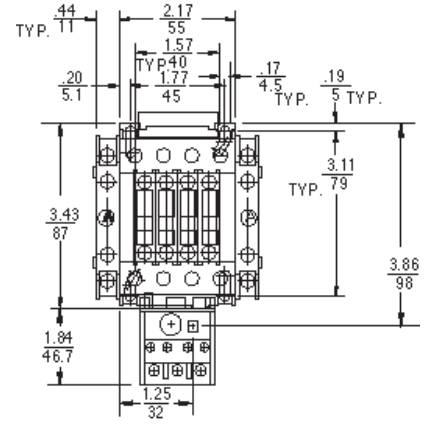
Legend and Notes for Illustration

- Ⓐ Extra Auxiliary Contacts, Side Mounted (if used)
- Ⓑ Extra Auxiliary Contacts, Front Mounted (if used)
- Ⓒ Pneumatic Timer (if used)
- Ⓓ Mechanical Latch (if used)
- Ⓔ Transient Voltage Suppressor

Add ½ inch for electrical clearance to enclosure.



Contactor - Front View



Starter - Front View

Engineering Outline Drawings

AC

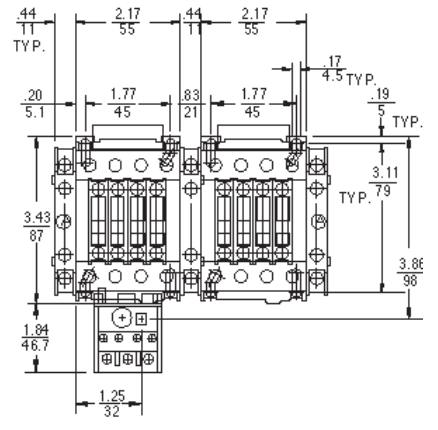
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- Starter55-215825
- Reversing Contactor55-215792
- Reversing Starter55-215793

DC

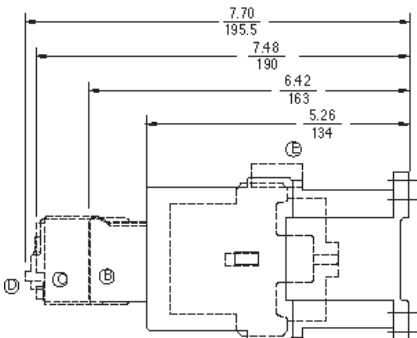
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- Reversing Starter55-215808



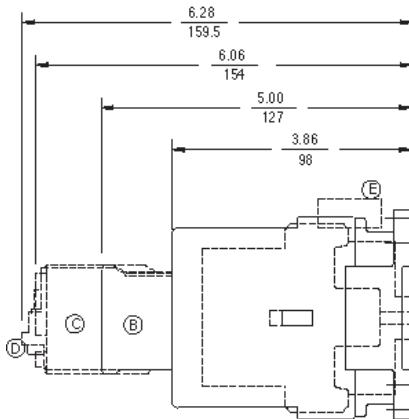
Reversing Contactor - Front View



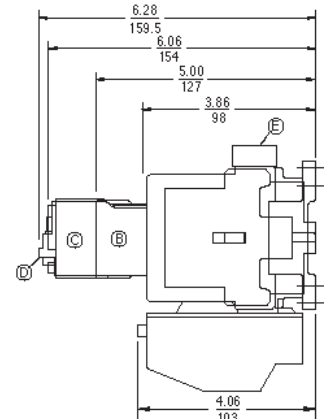
Reversing Starter - Front View



DC Contactor - Side View



AC Contactor - Side View



AC Starter - Side View



3-Pole Contactors

25 HP (460V)

34 FLA

Contactor catalog numbers are shown in the shaded area in the **Contactor Selection and Data** table. To complete the catalog number, replace the asterisk (*) with the appropriate digit from the shaded area in the **Coil Selection** table. Additional coil information is shown in the **Coil Data** table.

Contactor Selection and Data		25 hp @ 460V AC-3 (18.5 kW @ 380/415V, 50 Hz)
AC Contactors	Full Voltage Non-Reversing	CL45A310M*
	Reversing	LAR45A*
DC Contactors	Full Voltage Non-Reversing	CL45D310M*
	Reversing	LDR45A*
Aux. Contacts	Maximum Aux. Contacts	6
	Maximum Contact Block Configuration	4 Front-Mount plus 1 Side-Mount, or 2 Front-Mount plus 1 Side-Mount on each side
Aux. Contacts (A600, Q600) ¹		1NO
Continuous Amp Rating (UL)		55
AC-1 Amperes (IEC)		60
AC-2/AC-3	Max. FLA	
	480 Volts	34
	600 Volts	27
	Max. Hp (1-Phase)	
	115 Volts	3
	230 Volts	5
	Max. Hp (3-Phase)	
	200 Volts	10
230 Volts	10	
460 Volts	25	
575 Volts	25	
AC-4 Max. Hp	200 Volts	10
	230 Volts	10
	460 Volts	25
	575 Volts	25
Mechanical Life (millions of operations)		20
Elec. Endurance (AC-3) At Rated Current (millions of operations)		2
Maximum Operational Current 460V and Below	AC-1 ≤ 1200 ops./hour	55
	3000 ops./hour	27.5
	AC-3 ≤ 1200 ops./hour	34
	3000 ops./hour	11.9
Net Weight	Contactor	1 lb. 4 oz.
	Class 10 Overload Relay	7 oz.
Wire Size - Power Terminals 75°C (Cu) AWG		14-8
Torque (Main) in.-lb.		16
Noise (dba)		35

Coil Selection

AC Voltage		DC Voltage	Coil * Suffix
60 Hz	50 Hz		
24	24	—	1
—	—	12	B
—	—	24	D
48	42	—	F
—	—	48	G
120	110	—	J
—	—	125	K
208	—	—	L
277	220/230	—	M
240	—	—	S
—	—	250	T
480	380/400	—	U
—	415	—	W
600	500	—	Y

Coil Data

	AC Voltage	DC Voltage
Burden		
Inrush	88 VA	7.5 W
Holding	9 VA	7.5 W
Pick-up Voltage (% Of Coil Volts)	85-110	80-110
Drop-Out Voltage (% Of Coil Volts)	40-55	15-30
Switching Delay (ms)		
Switching Delay On		
Coil Voltage at +10% to -20%	7-25	35-70
Coil Voltage At Rated Value	10-19	40-55
Switching Delay Off		
Coil Voltage at +10% to -20%	5-25	40-65
Coil Voltage At Rated Value	5-25	40-65
Maximum Operations per Hour		
No Load	9000	3600
Rated Load — AC1, AC3	1200	1200
Rated Load — AC4	360	360

REFERENCES

Standards and Listings	Page 41
Overload Relays	Pages 26-29
Accessories	Pages 30-37
Life Curves	Pages 42-44
Additional Coil Information	Page 37
Instruction Sheet	GEH-6224
UL File Number	E76233
CSA File Number	LR30821

¹ A Front-Mount auxiliary contact is supplied.
Add the suffix "S" to catalog number for Side-Mount auxiliary contact.

3-Pole Contactors

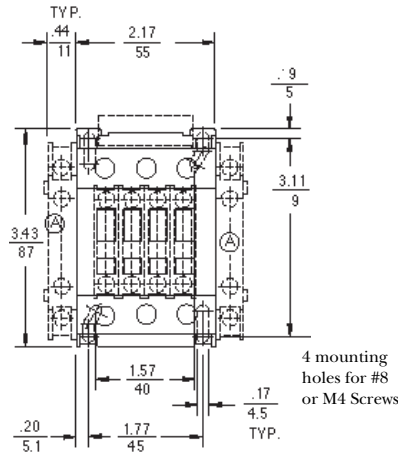
25 HP (460V)

34 FLA

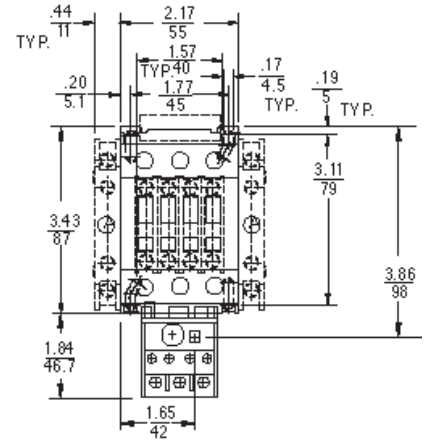
Legend and Notes for Illustration

- Ⓐ Extra Auxiliary Contacts, Side Mounted (if used)
- Ⓑ Extra Auxiliary Contacts, Front Mounted (if used)
- Ⓒ Pneumatic Timer (if used)
- Ⓓ Mechanical Latch (if used)
- Ⓔ Transient Voltage Suppressor

Add ½ inch for electrical clearance to enclosure.



Contactor - Front View



Starter - Front View

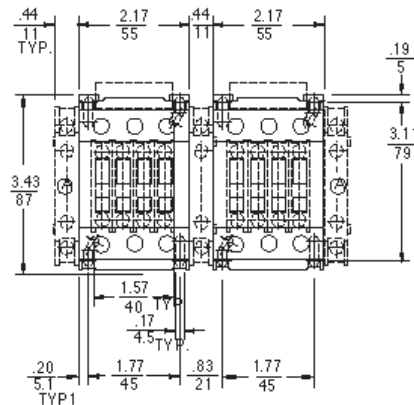
Engineering Outline Drawings

AC

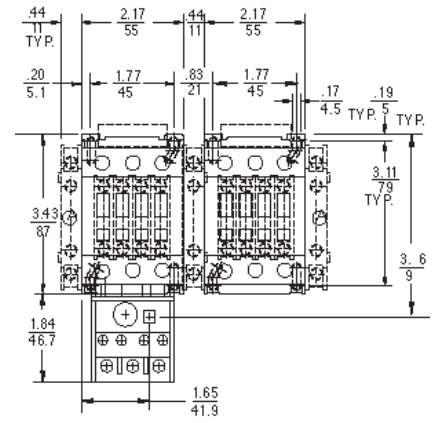
- Contactor55-215789
- Starter55-215827
- Reversing Contactor55-215800
- Reversing Starter55-215801

DC

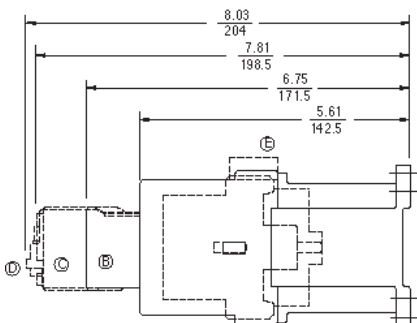
- Contactor55-215838
- Starter55-215870
- Reversing Contactor55-215778
- Reversing Starter55-215815



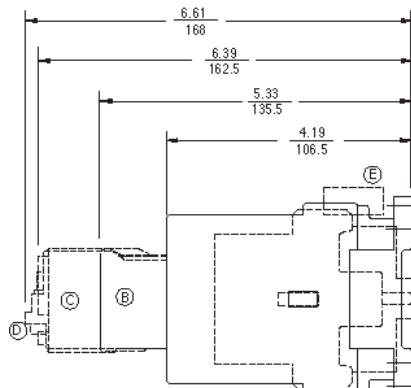
Reversing Contactor - Front View



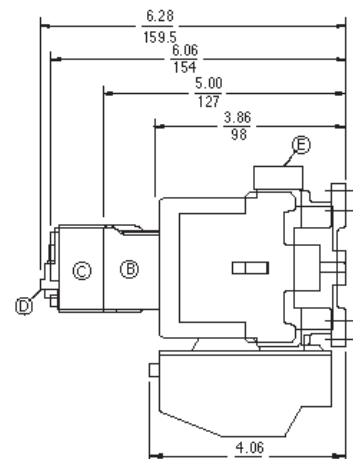
Reversing Starter - Front View



DC Contactor - Side View



AC Contactor - Side View



AC Starter - Side View



3-Pole Contactors

30-50 HP (460V)

48-68 FLA

Contactor catalog numbers are shown in the shaded area in the **Contactor Selection and Data** table. To complete the catalog number, replace the symbol (* or †) with the appropriate digit from the shaded area in the **Coil Selection** table. Additional coil information is shown in the **Coil Data** table.

Contactor Selection and Data		Hp @ 460V AC-3 (kW @ 380/415V, 50 Hz)		
		30 hp (22 kW)	40 hp (30 kW)	50 hp (37 kW)
AC Contactors	Full Voltage Non-Reversing	CL06A311M*	CL07A311M*	CL08A311M*
	Reversing	LAR06A*	LAR07A*	LAR08A*
AC/DC Electronic Contactors	Full Voltage Non-Reversing	CL06E311M†	CL07E311M†	CL08E311M†
	Reversing	LER06A†	LER07A†	LER08A†
Aux. Contacts	Maximum Aux. Contacts	8	8	8
	Maximum Contact Block Configuration	6 Front-Mount plus 1 Side-Mount, or 2 Side-Mount on each side		
Aux. Contacts (A600, Q600) ¹		1NO-1NC	1NO-1NC	1NO-1NC
Continuous Amp Rating (UL)		80	100	110(O), 102(E)
AC-1 Amperes (IEC)		80	100	110
AC-2/AC-3	Max. FLA	48	62	68
	Max. Hp (1-Phase)			
	115 Volts	3	5	5
	230 Volts	7.5	10	15
	Max. Hp (3-Phase)			
	200 Volts	15	20	20
	230 Volts	15	20	25
	460 Volts	30	40	50
	575 Volts	40	50	60
AC-4 Max. Hp	200 Volts	15	20	20
	230 Volts	15	20	25
	460 Volts	30	40	50
	575 Volts	40	50	60
Mechanical Life (millions of operations)		15	15	15
Elec. Endurance (AC-3) At Rated Current (millions of operations)		1.8	1.7	1.5
Maximum Operational Current 460V and Below	AC-1 ≤ 1200 ops./hour	80	100	110(O), 102(E)
	3000 ops./hour	40	50	55(O), 51(E)
	AC-3 ≤ 1200 ops./hour	48	62	68
	3000 ops./hour	16.8	21.7	23.8
Net Weight	Contactor	2 lb. 7 oz.	2 lb. 8 oz.	2 lb. 8 oz.
	Class 10 Overload Relay	13 oz.	13 oz.	13 oz.
Wire Size - Power Terminals 75°C (Cu) AWG		14-1/0	14-1/0	14-1/0
Torque (Main) in.-lb.		50	50	50
Noise (dba)		45	45	45

¹ Two Front-Mount auxiliary contacts are supplied. Add the suffix "S" to catalog number for Side-Mount auxiliary contact.

Note: (O) = Open, (E) = Enclosed

Coil Selection (AC)

AC Voltage		Coil * Suffix
60 Hz	50 Hz	
24	24	1
48	42	F
120	110	J
208	—	L
277	220/230	N
240	—	S
480	380/400	U
—	415	W
600	500	Y

Coil Selection (AC/DC Electronic)

AC (50/60 Hz) DC Voltage	Coil † Suffix
24-28	D
42-48	F
110-127	J
220-250	N
440-500	Y

Coil Data

	AC Voltage	AC/DC Voltage
Burden		
Inrush	191 VA	125 W
Holding	17 VA	2.5 W
Pick-up Voltage (% Of Coil Volts)	85-110	80-110
Drop-Out Voltage (% Of Coil Volts)	40-60	40-60
Switching Delay (ms)		
Switching Delay On		
Coil Voltage at +10% to -20%	9-35	60-80
Coil Voltage At Rated Value	15-30	50-60
Switching Delay Off		
Coil Voltage at +10% to -20%	9-15	40-50
Coil Voltage At Rated Value	9-15	55-60
Maximum Operations per Hour		
No Load	9000	2500
Rated Load — AC1, AC3	1200	1200
Rated Load — AC4	200	200

REFERENCES

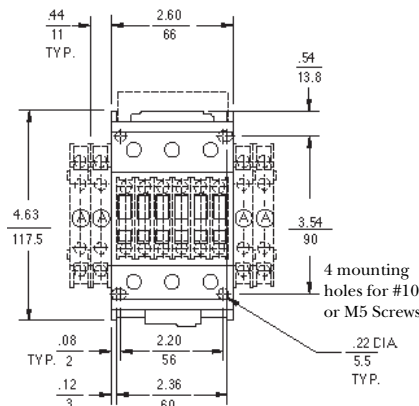
Standards and Listings	Page 41
Overload Relays	Pages 26-29
Accessories	Pages 30-37
Life Curves	Pages 42-44
Additional Coil Information	Page 37
Instruction Sheet	GEH-6225
UL File Number	E76233
CSA File Number	LR30821

3-Pole Contactors 30-50 HP (460V) 48-68 FLA

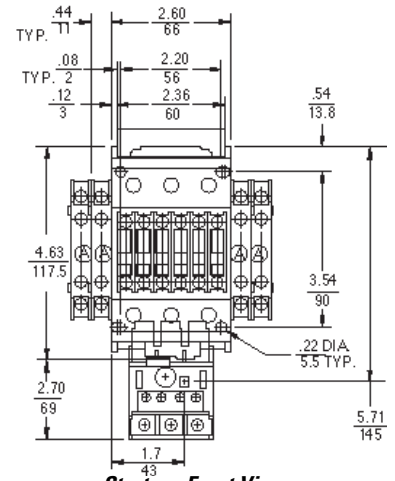
Legend and Notes for Illustration

- Ⓐ Extra Auxiliary Contacts, Side Mounted (if used)
- Ⓑ Extra Auxiliary Contacts, Front Mounted (if used)
- Ⓒ Pneumatic Timer (if used)
- Ⓓ Mechanical Latch (if used)
- Ⓔ Transient Voltage Suppressor

Add ½ inch for electrical clearance to enclosure.



Contactor - Front View



Starter - Front View

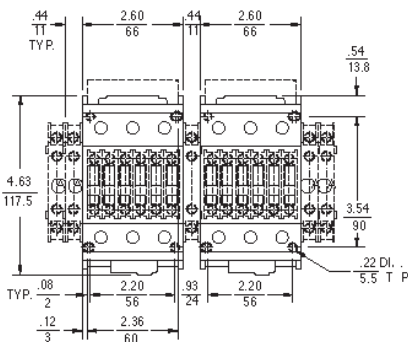
Engineering Outline Drawings

AC

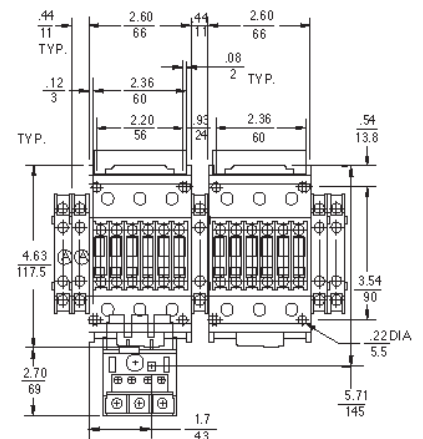
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Starter	55-215828
Reversing Contactor	55-215794
Reversing Starter	55-215795

AC/DC Electronic

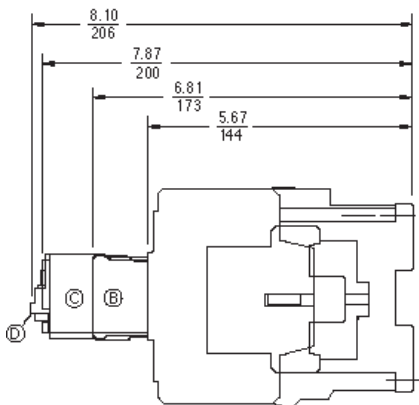
Contactor	55-216213
Starter	55-216209
Reversing Contactor	55-216212
Reversing Starter	55-216216



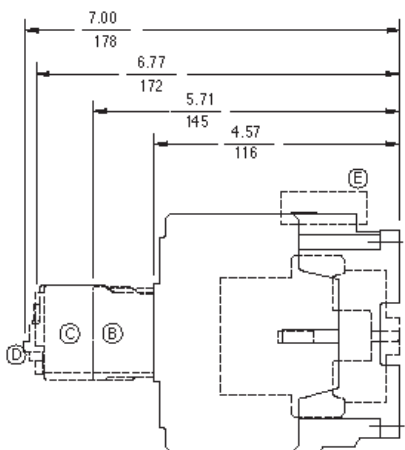
Reversing Contactor - Front View



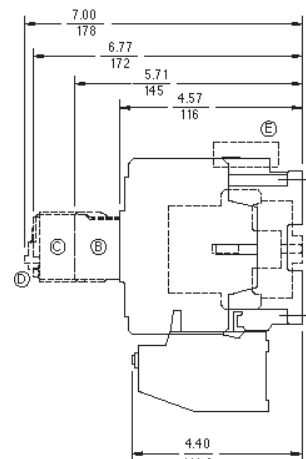
Reversing Starter - Front View



AC/DC Contactor - Side View



AC Contactor - Side View



AC Starter - Side View



3-Pole Contactors

60-75 HP (460V)

80-96 FLA

Contactor catalog numbers are shown in the shaded area in the **Contactor Selection and Data** table. To complete the catalog number, replace the symbol (* or †) with the appropriate digit from the shaded area in the **Coil Selection** table. Additional coil information is shown in the **Coil Data** table.

Contactor Selection and Data		Hp @ 460V AC-3 (kW @ 380/415V, 50 Hz)		
		60 hp (45 kW)	75 hp (55 kW)	
AC Contactors	Full Voltage Non-Reversing	CL09A311M*	CL10A311M*	
	Reversing	LAR09A*	LAR10A*	
AC/DC Electronic Contactors	Full Voltage Non-Reversing	CL09E311M†	CL10E311M†	
	Reversing	LER09A†	LER10A†	
Aux. Contacts	Maximum Aux. Contacts	8	8	
	Maximum Contact Block Configuration	6 Front-Mount plus 1 Side-Mount, or 2 Side-Mount on each side		
Aux. Contacts (A600, Q600) ¹		1NO-1NC	1NO-1NC	
Continuous Amp Rating (UL)		140 (O), 120 (E)	140(O), 120(E)	
AC-1 Amperes (IEC)		140	140	
AC-2/AC-3	Max. FLA			
	230 Volts	80	104	
	480 Volts	80	96	
	600 Volts	80	80	
	Max. Hp (1-Phase)			
	115 Volts	7.5	10	
	230 Volts	15	20	
	Max. Hp (3-Phase)			
	200 Volts	25	30	
230 Volts	30	40		
460 Volts	60	75		
575 Volts	75	75		
AC-4 Max. Hp	200 Volts	25	30	
	230 Volts	30	40	
	460 Volts	60	75	
	575 Volts	75	75	
Mechanical Life (millions of operations)		15	15	
Elec. Endurance (AC-3) At Rated Current (millions of operations)		1.7	1.5	
Maximum Operational Current 460V and Below	AC-1	≤ 600 ops./hour	120	140(O) 120(E)
		1200 ops./hour	96	112(O) 96(E)
		3000 ops./hour	48	56(O) 48(E)
	AC-3	≤ 600 ops./hour	80	96
		1200 ops./hour	60	72
		3000 ops./hour	20	24
	AC-4	200 ops./hour max	80	96
	Net Weight	Contactor	3 lb. 3 oz.	3 lb. 4 oz.
		Class 10 Overload Relay	13 oz.	13 oz.
	Wire Size - Power Terminals 75°C (Cu) AWG		10-1/0	10-1/0
	Torque (Main) in.-lb.		60	60
	Noise (dba)		45	45

¹ Two Front-Mount auxiliary contacts are supplied. Add the suffix "S" to catalog number for Side-Mount auxiliary contact.

Note: (O) = Open, (E) = Enclosed

Coil Selection (AC)

AC Voltage		Coil * Suffix
60 Hz	50 Hz	
24	24	1
48	42	F
120	110	J
208	—	L
277	220/230	N
240	—	S
480	380/400	U
—	415	W
600	500	Y

Coil Selection (AC/DC Electronic)

AC (50/60 Hz) DC Voltage	Coil † Suffix
24-28	D
42-48	F
110-127	J
220-250	N
440-500	Y

Coil Data

	AC Voltage	AC/DC Voltage
Burden		
Inrush	191 VA	125 W
Holding	17 VA	2.5 W
Pick-up Voltage (% Of Coil Volts)	85-110	80-110
Drop-Out Voltage (% Of Coil Volts)	40-60	40-60
Switching Delay (ms)		
Switching Delay On		
Coil Voltage at +10% to -20%	9-35	60-80
Coil Voltage At Rated Value	15-30	50-60
Switching Delay Off		
Coil Voltage at +10% to -20%	9-15	40-50
Coil Voltage At Rated Value	9-15	55-60
Maximum Operations per Hour		
No Load	5000	2500
Rated Load — AC1, AC3	1200	1200
Rated Load — AC4	200	200

REFERENCES

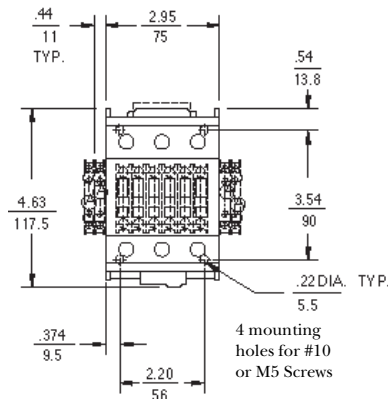
Standards and Listings	Page 41
Overload Relays	Pages 26-29
Accessories	Pages 30-37
Life Curves	Pages 42-44
Additional Coil Information	Page 37
Instruction Sheet	GEH-6226
UL File Number	E76233
CSA File Number	LR30821

3-Pole Contactors 60-75 HP (460V) 80-96 FLA

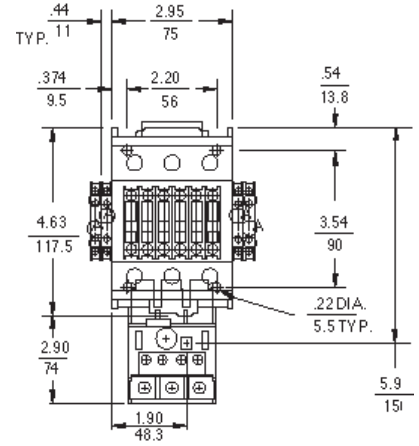
Legend and Notes for Illustration

- Ⓐ Extra Auxiliary Contacts, Side Mounted (if used)
- Ⓑ Extra Auxiliary Contacts, Front Mounted (if used)
- Ⓒ Pneumatic Timer (if used)
- Ⓓ Mechanical Latch (if used)
- Ⓔ Transient Voltage Suppressor

Add ½ inch for electrical clearance to enclosure.



Contactor - Front View



Starter - Front View

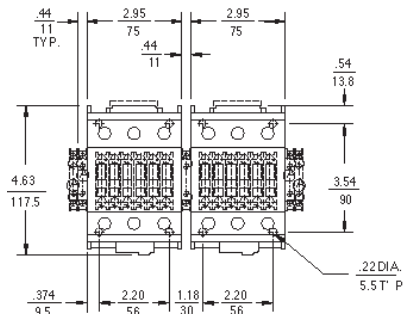
Engineering Outline Drawings

AC

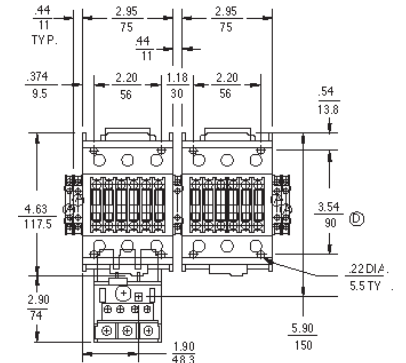
- Contactor55-215785
- Starter55-215829
- Reversing Contactor55-215796
- Reversing Starter55-215797

AC/DC Electronic

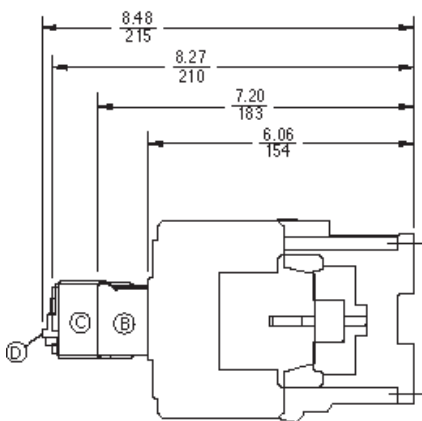
- Contactor55-216215
- Starter55-216211
- Reversing Contactor55-216214
- Reversing Starter55-216210



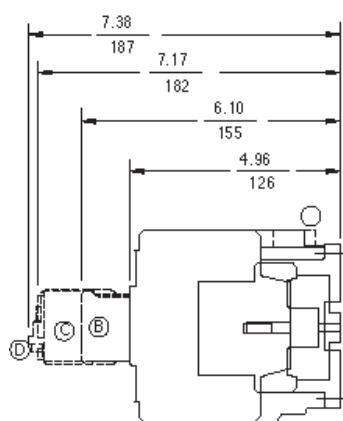
Reversing Contactor - Front View



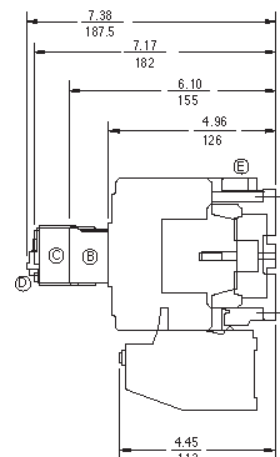
Reversing Starter - Front View



AC/DC Contactor - Side View



AC Contactor - Side View



AC Starter - Side View



3-Pole Contactors

100-125 HP (460V)

140-156 FLA

Contactor catalog numbers are shown in the shaded area in the **Contactor Selection and Data** table. To complete the catalog number, replace the asterisk (*) with the appropriate digit from the shaded area in the **Coil Selection** table. Additional coil information is shown in the **Coil Data** table.

Contactor Selection and Data		Hp @ 460V AC-3 (kW @ 380/415V, 50 Hz)		
		100 hp (75 kW)	125 hp (90 kW)	
AC Contactors	Full Voltage Non-Reversing	CK75CE311*	CK08CE311*	
	Reversing	KAR75C*	KAR08C*	
Aux. Contacts	Maximum Aux. Contacts	8	8	
	Maximum Contact Block Configuration	2 Side-Mount on each side		
Aux. Contacts (A600, Q600)		1NO-1NC	1NO-1NC	
Continuous Amp Rating (UL)		150	175	
AC-1 Amperes (IEC)		200	250	
AC-2/AC-3	Max. FLA	140	156	
	Max. Hp (1-Phase)	115 Volts	10	15
		230 Volts	25	30
	Max. Hp (3-Phase)	200 Volts	40	50
		230 Volts	50	60
		460 Volts	100	125
575 Volts		125	125	
AC-4 Max. Hp	200 Volts	40	50	
	230 Volts	50	60	
	460 Volts	100	125	
	575 Volts	125	125	
Mechanical Life (millions of operations)		10	10	
Elec. Endurance (AC-3) At Rated Current (millions of operations)		1.8	1.5	
Maximum Operational Current 460V and Below	AC-1	≤ 600 ops./hour	150	175
		1200 ops./hour	125	140
		3000 ops./hour	50	70
	AC-3	≤ 600 ops./hour	140	156
		1200 ops./hour	100	115
		3000 ops./hour	30	39
AC-4	200 ops./hour max	140	156	
Net Weight	Contactor	8 lb. 5 oz.	8 lb. 5 oz.	
	Class 10 Overload Relay	1 lb. 15 oz.	1 lb. 15 oz.	
Wire Size - Power Terminals 75°C (Cu) AWG		#6-250 MCM	#6-250 MCM	
Torque (Main) in.-lb. (applicable to lug kit CKX03)		275	275	
Noise (dba)		45	45	
Terminal Hole Dia.		.320	.320	
Screw Size		M-8	M-8	

Coil Selection

AC (50/60 Hz) DC	Coil * Suffix
24-28	D
42-48	F
110-127	J
220-250	N
380-415	U
440-500	Y

Coil Data

	AC Voltage
Burden	
Inrush	350 VA
Holding	20 VA
Pick-up Voltage (% Of Coil Volts)	80-110
Drop-Out Voltage (% Of Coil Volts)	40-60
Switching Delay (ms)	
Switching Delay On	
Coil Voltage At Rated Value	60-70
Switching Delay Off	
Coil Voltage At Rated Value	13-17
Maximum Operations per Hour	
No Load	1200
Rated Load — AC1, AC3	600
Rated Load — AC4	150

REFERENCES

Standards and Listings	Page 41
Overload Relays	Pages 26-29
Accessories	Pages 30-37
Life Curves	Pages 42-44
Additional Coil Information	Page 37
Instruction Sheet	GEH-6530
UL File Number	E76233
CSA File Number	LR30821

3-Pole Contactors 100-125 HP (460V) 140-156 FLA

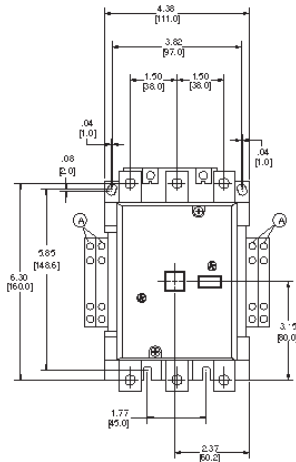
Legend and Notes for Illustration

- Ⓐ Extra Auxiliary Contacts, Side Mounted (if used) (1 Standard)
- Ⓑ Electronic Actuator Modulator

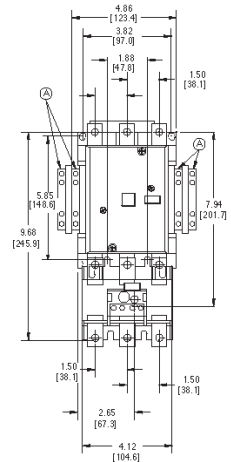
Engineering Outline Drawings

AC/DC

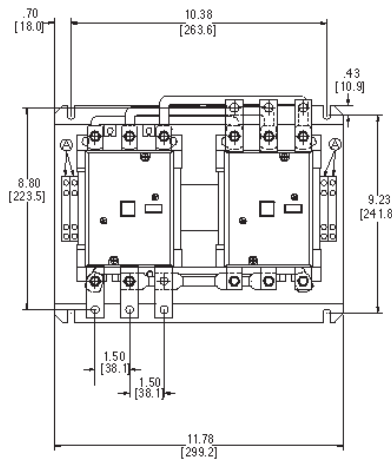
Contactors	55-216415
Starters	55-216412
Reversing Contactors	55-216410
Reversing Starters	55-216411



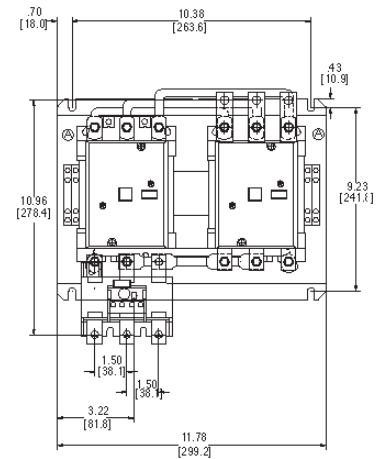
Contactor - Front View



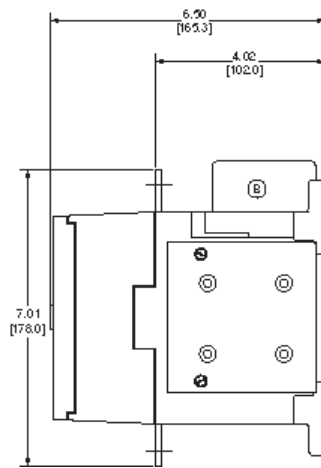
Starter - Front View



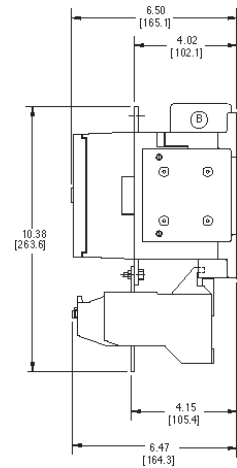
Reversing Contactor - Front View



Reversing Starter - Front View



AC Contactor - Side View



AC Starter - Side View



3-Pole Contactors

150-250 HP (460V)

192-302 FLA

Contactor catalog numbers are shown in the shaded area in the **Contactor Selection and Data** table. To complete the catalog number, replace the asterisk (*) with the appropriate digit from the shaded area in the **Coil Selection** table. Additional coil information is shown in the **Coil Data** table.

Contactor Selection and Data		Hp @ 460V AC-3 (kW @ 380/415V, 50 Hz)		
		150 hp (132 kW)	250 hp (160 kW)	
AC Contactors	Full Voltage Non-Reversing	CK09BE311*	CK95BE311*	
	Reversing	KAR09B*	KAR95B*	
Aux. Contacts	Maximum Aux. Contacts	8	8	
	Maximum Contact Block Configuration	2 Side-Mount on each side		
Aux. Contacts (A600, Q600)		1NO-1NC	1NO-1NC	
Continuous Amp Rating (UL)		200	310	
AC-1 Amperes (IEC)		315	500	
AC-2/AC-3	Max. FLA	192	302	
	Max. Hp (1-Phase)	—	—	
	115 Volts	—	—	
	230 Volts	—	—	
	Max. Hp (3-Phase)	—	—	
	200 Volts	60	100	
AC-4 Max. Hp	230 Volts	75	100	
	460 Volts	150	250	
	575 Volts	150	300	
	200 Volts	60	100	
Mechanical Life (millions of operations)		10	10	
	Elec. Endurance (AC-3) At Rated Current (millions of operations)	1.5	.9	
Maximum Operational Current 460V and Below	AC-1	≤ 600 ops./hour	200	310
		1200 ops./hour	160	250
		3000 ops./hour	80	120
	AC-3	≤ 600 ops./hour	192	302
		1200 ops./hour	144	227
		3000 ops./hour	48	76
AC-4	200 ops./hour max	192	302	
Net Weight	Contactor	13 lb. 12 oz.	13 lb. 12 oz.	
	Class 10 Overload Relay	5 lb. 5 oz.	5 lb. 5 oz.	
Wire Size - Power Terminals 75°C (Cu) AWG		#6-350 MCM	#6-350 MCM	
Torque (Main) in.-lb. (applicable to lug kit CKX02)		200	200	
Noise (dba)		45	45	
Terminal Hole Dia.		.430	.430	
Screw Size		M-10	M-10	

Coil Selection

AC (50/60 Hz) DC	Coil * Suffix
24-28	D
42-48	F
110-127	J
220-250	N
380-415	U
440-500	Y

Coil Data

	AC Voltage
Burden	
Inrush	425 VA
Holding	20 VA
Pick-up Voltage (% Of Coil Volts)	80-110
Drop-Out Voltage (% Of Coil Volts)	40-60
Switching Delay (ms)	
Switching Delay On	
Coil Voltage At Rated Value	60-70
Switching Delay Off	
Coil Voltage At Rated Value	13-17
Maximum Operations per Hour	
No Load	1200
Rated Load — AC1, AC3	600
Rated Load — AC4	150

REFERENCES

Standards and Listings	Page 41
Overload Relays	Pages 26-29
Accessories	Pages 30-37
Life Curves	Pages 42-44
Additional Coil Information	Page 37
Instruction Sheet	GEH-6227
UL File Number	E76233
CSA File Number	LR30821

3-Pole Contactors 150-250 HP (460V) 192-302 FLA

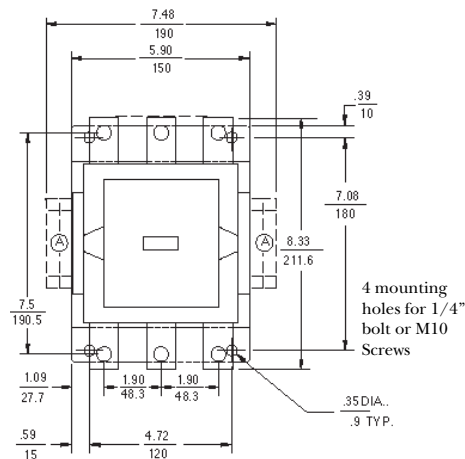
Legend and Notes for Illustration

- Ⓐ Extra Auxiliary Contacts, Side Mounted (if used) (1 Standard)
- Ⓑ Electronic Actuator Modulator

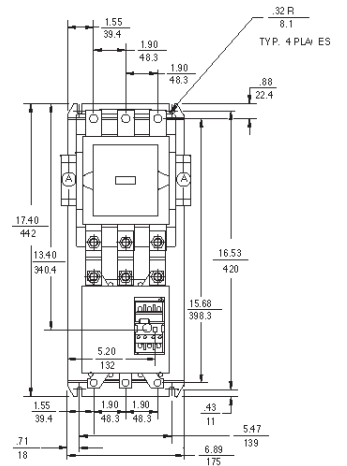
Engineering Outline Drawings

AC/DC

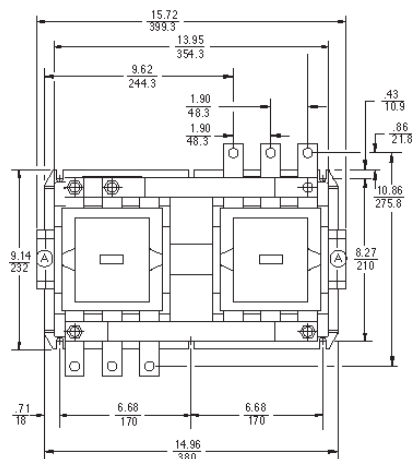
Contactor	55-215750
Starter	55-215753
Reversing Contactor	55-215757
Reversing Starter	55-215762



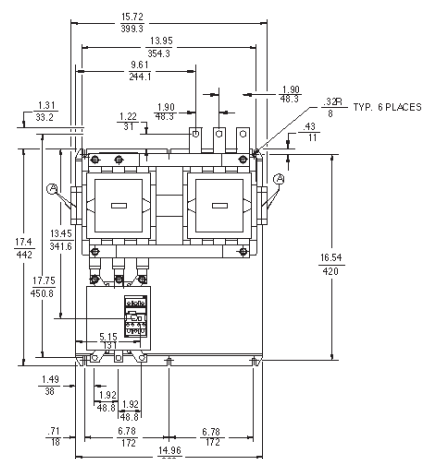
Contactor - Front View



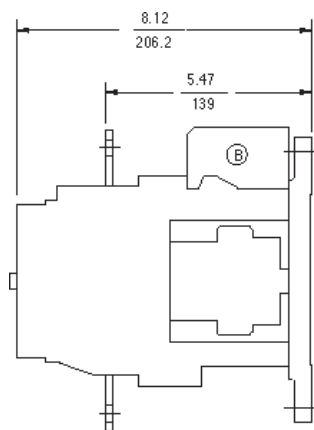
Starter - Front View



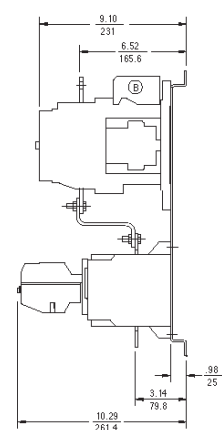
Reversing Contactor - Front View



Reversing Starter - Front View



AC Contactor - Side View



AC Starter - Side View



3-Pole Contactors

300-400 HP (460V)

398-480 FLA

Contactor catalog numbers are shown in the shaded area in the **Contactor Selection and Data** table. To complete the catalog number, replace the asterisk (*) with the appropriate digit from the shaded area in the **Coil Selection** table. Additional coil information is shown in the **Coil Data** table.

Contactor Selection and Data		Hp @ 460V AC-3 (kW @ 380/415V, 50 Hz)	
		300 hp (220 kW)	400 hp (280 kW)
AC Contactors	Full Voltage Non-Reversing	CK10CE311*	CK11CE311*
	Reversing	KAR10C*	KAR11C*
Aux. Contacts	Maximum Aux. Contacts	8	8
	Maximum Contact Block Configuration	2 Side-Mount on each side	
Aux. Contacts (A600, Q600)		1NO/1NC	1NO/1NC
Continuous Amp Rating (UL)		500	600
AC-1 Amperes (IEC)		600	700
AC-2/AC-3	Max. FLA	398	480
	Max. Hp (1-Phase)		
	115 Volts	—	—
	230 Volts	—	—
	Max. Hp (3-Phase)		
	200 Volts	125	150
230 Volts	150	200	
460 Volts	300	400	
575 Volts	400	500	
AC-4 Max. Hp	200 Volts	125	150
	230 Volts	150	200
	460 Volts	300	400
	575 Volts	400	500
Mechanical Life (millions of operations)		10	10
Elec. Endurance (AC-3) At Rated Current (millions of operations)		1.3	1.0
Maximum Operational Current 460V and Below	AC-1 300 ops./hour	500	600
	600 ops./hour	400	500
	AC-3 300 ops./hour	398	480
	600 ops./hour	299	360
AC-4 300 ops./hour max	398	480	
Net Weight	Contactor	37 lb. 4 oz.	39 lb. 8 oz.
	Class 10 Overload Relay	1 lb. 15 oz.	1 lb. 15 oz.
Wire Size - Power Terminals 75°C (Cu) AWG		#8-500 MCM, 2/0-600 MCM	
Torque (Main) in.-lb. (applicable to Lug Kit CKX01)		375	375
Noise (dba)		45	45
Terminal Hole Dia. Screw Size		.430 M-10	.430 M-10

Note: (O) = Open, (E) = Enclosed

Coil Selection

AC (50/60 Hz) DC	Coil * Suffix
24-28	D
42-48	F
110-127	J
220-250	N
380-415	U
440-500	Y

Coil Data

	AC Voltage
Burden	
Inrush	750 VA
Holding	25 VA
Pick-up Voltage (% Of Coil Volts)	80-110
Drop-Out Voltage (% Of Coil Volts)	40-60
Switching Delay (ms)	
Switching Delay On	
Coil Voltage At Rated Value	110-115
Switching Delay Off	
Coil Voltage At Rated Value	70-80
Maximum Operations per Hour	
No Load	900
Rated Load — AC1, AC3	300
Rated Load — AC4	120

REFERENCES

Standards and Listings	Page 41
Overload Relays	Pages 26-29
Accessories	Pages 30-37
Life Curves	Pages 42-44
Additional Coil Information	Page 37
Instruction Sheet	DEH-022
UL File Number	E76233
CSA File Number	LR30821

3-Pole Contactors

300-400 HP (460V)

398-480 FLA

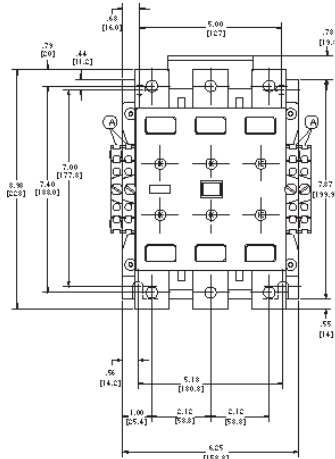
Legend and Notes for Illustration

- Ⓐ Extra Auxiliary Contacts, Side Mounted (if used) (1 Standard)
- Ⓑ Electronic Actuator Modulator

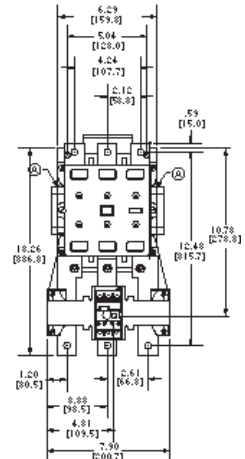
Engineering Outline Drawings

AC/DC

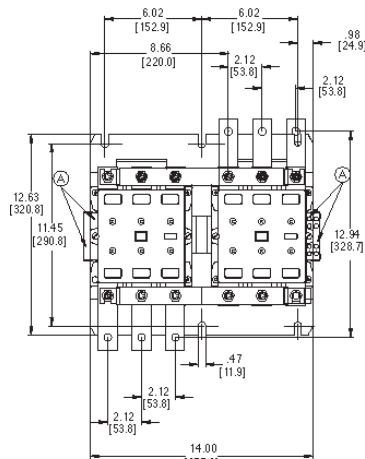
Contactors	55-216416
Starters	55-216402
Reversing Contactors	55-216400
Reversing Starters	55-216401



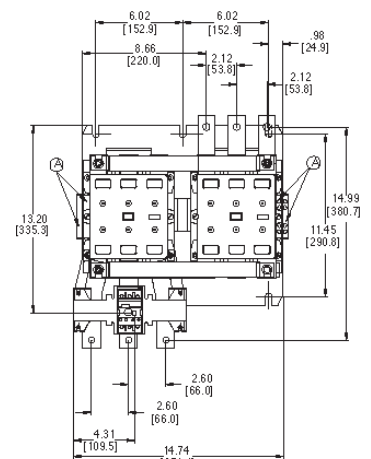
Contactors - Front View



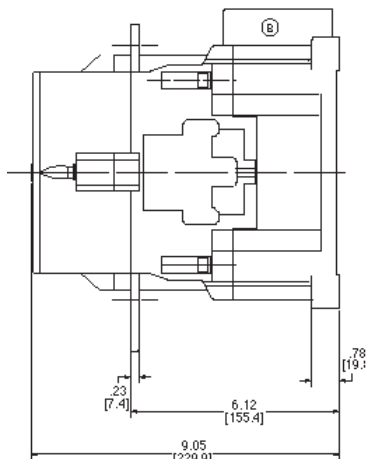
Starters - Front View



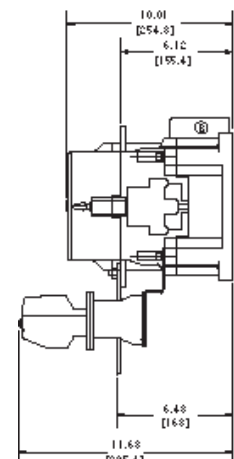
Reversing Contactors - Front View



Reversing Starters - Front View



AC Contactors - Side View



AC Starters - Side View



3-Pole Contactors

500 HP (460V)

602 FLA

Contactor catalog numbers are shown in the shaded area in the **Contactor Selection and Data** table. To complete the catalog number, replace the asterisk (*) with the appropriate digit from the shaded area in the **Coil Selection** table. Additional coil information is shown in the **Coil Data** table.

Contactor Selection and Data		Hp @ 460V AC-3 (kW @ 380/415V, 50 Hz)
		500 hp (375 kW)
AC Contactors	Full Voltage Non-Reversing	CK12BE311*
	Reversing	KAR12B*
Aux. Contacts	Maximum Aux. Contacts	8
	Maximum Contact Block Configuration	2 Side-Mount on each side
Aux. Contacts (A600, Q600)		1NO/1NC
Continuous Amp Rating (UL)		750(O), 650(E)
AC-1 Amperes (IEC)		1000
AC-2/AC-3	Max. FLA	602
	Max. Hp (1-Phase)	
	115 Volts	—
	230 Volts	—
	Max. Hp (3-Phase)	
	200 Volts	200
	230 Volts	250
460 Volts	500	
575 Volts	600	
AC-4 Max. Hp	200 Volts	200
	230 Volts	250
	460 Volts	500
	575 Volts	600
Mechanical Life (millions of operations)		10
Elec. Endurance (AC-3) At Rated Current (millions of operations)		0.7
Maximum Operational Current 460V and Below	AC-1 300 ops./hour	810
	600 ops./hour	648
	AC-3 300 ops./hour	602
	600 ops./hour	452
Net Weight	Contactor	39 lb. 13 oz.
	Class 10 Overload Relay	1 lb. 15 oz.
Wire Size - Power Terminals 75°C (Cu) AWG		#8-500 MCM, 2/0-600 MCM
Torque (Main) in.-lb. (applicable to Lug Kit CKX01)		375
Noise (dba)		45
Terminal Hole Dia. Screw Size		.430 M-10

Note: (O) = Open, (E) = Enclosed

Coil Selection

AC (50/60 Hz) DC	Coil * Suffix
24-28	D
42-48	F
110-127	J
220-250	N
380-415	U
440-500	Y

Coil Data

	AC Voltage
Burden	
Inrush	750 VA
Holding	25 VA
Pick-up Voltage (% Of Coil Volts)	80-110
Drop-Out Voltage (% Of Coil Volts)	40-60
Switching Delay (ms)	
Switching Delay On	
Coil Voltage At Rated Value	70-80
Switching Delay Off	
Coil Voltage At Rated Value	70-80
Maximum Operations per Hour	
No Load	900
Rated Load — AC1, AC3	300
Rated Load — AC4	120

REFERENCES

Standards and Listings	Page 41
Overload Relays	Pages 26-29
Accessories	Pages 30-37
Life Curves	Pages 42-44
Additional Coil Information	Page 37
Instruction Sheet	GEH-6228
UL File Number	E76233
CSA File Number	LR30821

3-Pole Contactors

500 HP (460V)

602 FLA

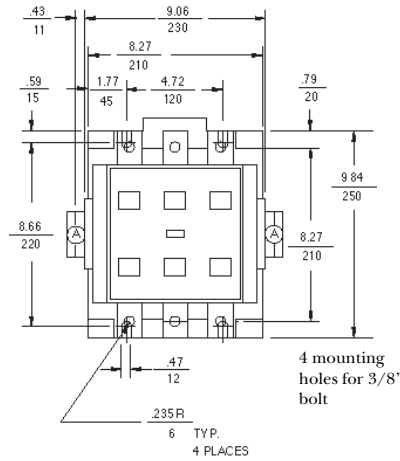
Legend and Notes for Illustration

- Ⓐ Extra Auxiliary Contacts, Side Mounted (if used) (1 Standard)
- Ⓑ Electronic Actuator Modulator

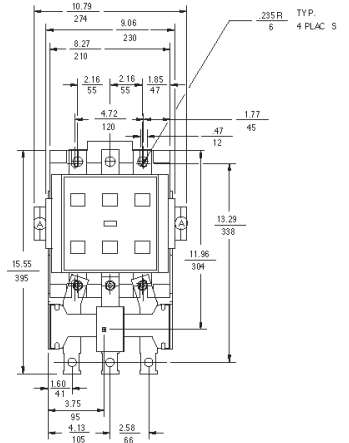
Engineering Outline Drawings

AC/DC

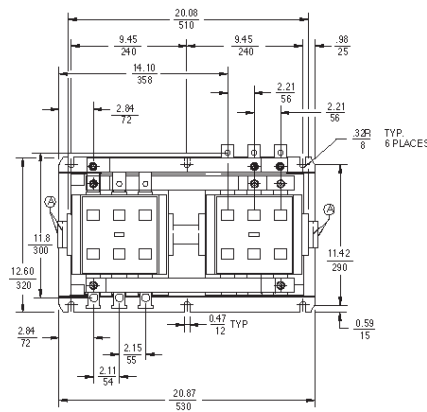
Contactor	55-215772
Starter	55-215771
Reversing Contactor	55-215775
Reversing Starter	55-215776



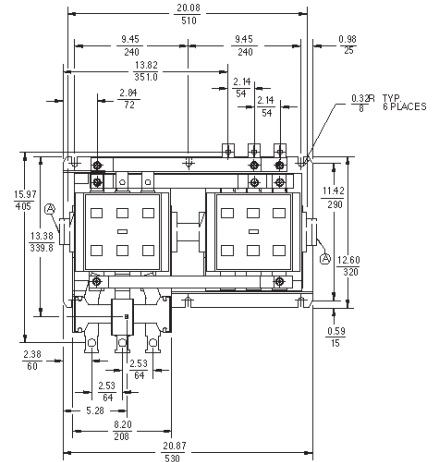
Contactor - Front View



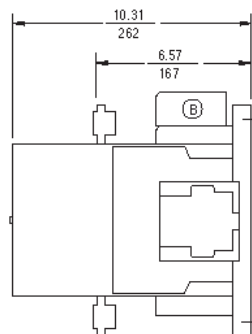
Starter - Front View



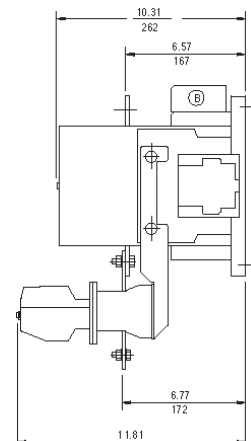
Reversing Contactor - Front View



Reversing Starter - Front View



AC Contactor - Side View



AC Starter - Side View



4-Pole Contactors

7.5-60 HP (460V)

13.8-80 FLA

Contactor catalog numbers are shown in the shaded area in the **Contactor Selection and Data** table. To complete the catalog number, replace the asterisk (*) with the appropriate digit from the shaded area in the **Coil Selection** table. Additional coil information is shown in the **Coil Data** table.

Contactor Selection and Data		Hp @ 460V AC-3 (kW @ 380/415V, 50 Hz)							
		7.5 hp (5.5 kW)	10 hp (7.5 kW)	15 hp (12 kW)	20 hp (16 kW)	30 hp (18.5 kW)	40 hp (30 kW)	50 hp (37 kW)	60 hp (45 kW)
AC Contactors	4NO	CL0A400T*	CL02A400T*	CL03A400M*	CL04AC400M*	CL05A400M*	CL07A400M*	—	CL09A400M*
	2NO-2NC	CL01AB00T*	CL02AB00T*	CL03AB00M*	CL04AB00M*	CL05AB00M*	CL07AB00M*	CL08AB00M*	—
Aux. Contacts	Maximum Aux. Contacts	4	4	6	6	8	8	8	8
	Maximum Contact Block Configuration	4 Front-Mount or 1 Side-Mount on each side		4 Front-Mount plus 1 Side-Mount or 2 Front-Mount plus one Side-Mount on each side		6 Front-Mount plus 1 Side-Mount or 2 Side-Mount on each side			
Aux. Contacts (A600, Q600)		None	None	None	None	None	None	None	None
Continuous Amp Rating (UL)		25	32	45	54	70	100	110 (O) 102 (E)	140 (O) 120 (E)
AC-1 Amperes (IEC)		25	32	45	60	80	110	110	140
AC-2/AC-3	Max. FLA	13.8	17.5	25	32	42	62	68	80
	Max. Hp (1-Phase)								
	115 Volts	0.75	1	2	2	3	5	5	7.5
	230 Volts	2	3	3	5	7.5	10	15	15
	Max. Hp (3-Phase)								
	200 Volts	3	5	7.5	10	10	20	20	25
230 Volts	3	5	7.5	10	15	20	25	30	
460 Volts	7.5	10	15	20	30	40	50	60	
575 Volts	10	15	20	25	30	50	60	75	
AC-4 Max. Hp	200 Volts	3	5	7.5	10	10	20	20	25
	230 Volts	3	5	7.5	10	15	20	25	30
	460 Volts	7.5	10	15	20	30	40	50	60
	575 Volts	10	15	20	25	30	50	60	75
Mechanical Life (millions of operations)		20	20	20	20	15	15	15	15
Elec. Endurance (AC-3) At Rated Current (millions of operations)		2	1.8	2	2	2	1.7	1.5	1.7
Maximum Operational Current 460V and Below	AC-3 600 Switchings/Hr.	13.8	17.5	25	32	42	62	68	80
	1200 Switchings/Hr.	13.8	17.5	25	32	42	62	68	64
	AC-1 ≤ 600 ops./hour	25	32	45	54	70	100	102	120
	601-1200 ops./hour	25	32	45	54	70	100	102	96
	> 1200 ops./hour	12.5	16	22	27	35	50	51	48
Net Weight	Contactor	10 oz.	10 oz.	1 lb. 2 oz.	1 lb. 2 oz.	2 lb. 13 oz.	2 lb. 13 oz.	2 lb. 13 oz.	3 lb. 6 oz.
	Class 10 Overload Relay	7 oz.	7 oz.	7 oz.	7 oz.	13 oz.	13 oz.	13 oz.	13 oz.
Wire Size - Power Terminals 75°C (Cu) AWG		14-10	14-10	14-8	14-8	14-1/0	14-1/0	14-1/0	10-1/0
Torque (Main) in.-lb.		15	15	16	16	50	50	50	60
Noise (dba)		25	25	25	25	45	45	45	45

Note: (O) = Open, (E) = Enclosed

4-Pole Contactors

7.5-60 HP (460V)

13.8-80 FLA

Coil Selection

AC Voltage		Coil * Suffix
60 Hz	50 Hz	
24	24	1
48	42	F
120	110	J
208	—	L
277	220/230	N
240	—	S
480	380/400	U
—	415	W
600	500	Y

Coil Data

	CL01 CL02	CL03 CL04	CL06 CL07 CL08	CL09
Burden				
Inrush	45 VA	88 VA	191 VA	191 VA
Holding	6 VA	9 VA	17 VA	17 VA
Pick-up Voltage (% Of Coil Volts)	80-110	80-110	80-110	80-110
Drop-Out Voltage (% Of Coil Volts)	40-55	40-55	40-60	40-60
Switching Delay (ms)				
Switching Delay On	6-25	7-25	9-35	9-35
Switching Delay Off	6-13	5-25	9-15	9-15
Maximum Operations per Hour No Load	9000	9000	9000	5000

Legend and Notes for Illustration

- (A) Extra Auxiliary Contacts, Side Mounted (if used)
 - (B) Extra Auxiliary Contacts, Front Mounted (if used)
 - (C) Pneumatic Timer (if used)
 - (D) Mechanical Latch (if used)
 - (E) Transient Voltage Suppressor
- * Add ½ inch for electrical clearance to enclosure.
- ** Add ½ inch for electrical clearance to enclosure when using C.

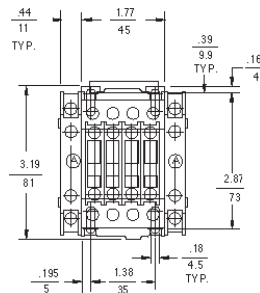
Engineering Outline Drawings

4-Pole Contactor

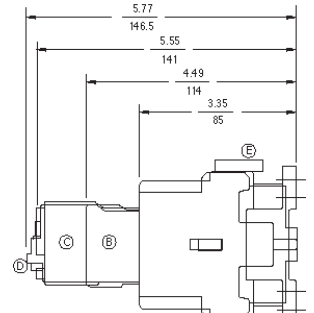
CL00, CL02.....	55-215782
CL03, CL04.....	55-215783
CL05, CL07, CL08.....	55-215786
CL09.....	55-215787

REFERENCES

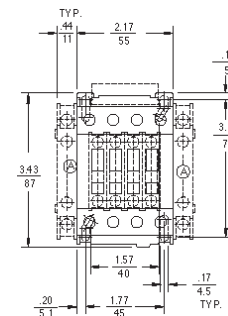
Standards and Listings ..	Page 41
Overload Relays	Pages 26-29
Accessories	Pages 30-37
Life Curves	Pages 42-44
Additional Coil Information	Page 37
Instruction Sheets:	
CL01, CL02.....	GEH-6223
CL03, CL04.....	GEH-6224
CL05, CL07, CL08	GEH-6225
CL09.....	GEH-6226
UL File Number.....	E76233
CSA File Number	LR30821



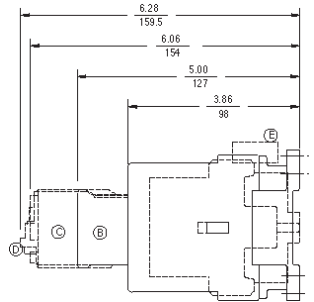
CL001, CL02 - Front View



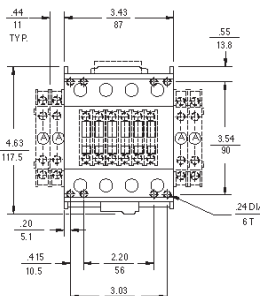
CL01, CL02 - Side View



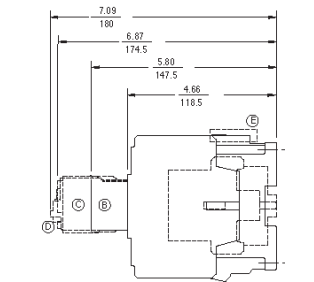
CL03, CL04 - Front View



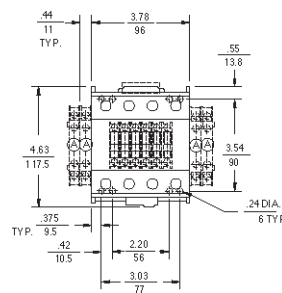
CL03, CL04 - Side View



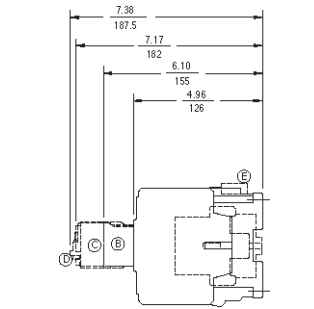
CL05, CL07, CL08 - Front View



CL05, CL07, CL08 - Side View



CL09 - Front View



CL09 - Side View



4-Pole Contactors

125-500 HP (460V)

156-602 FLA

Contactor catalog numbers are shown in the shaded area in the **Contactor Selection and Data** table. To complete the catalog number, replace the asterisk (*) with the appropriate digit from the shaded area in the **Coil Selection** table. Additional coil information is shown in the **Coil Data** table.

Contactor Selection and Data		Hp @ 460V AC-3 (kW @ 380/415V, 50 Hz)					
		125 hp (90 kW)	150 hp (132 kW)	250 hp (160 kW)	300 hp (220 kW)	400 hp (280 kW)	500 hp (375 kW)
AC Contactors	4NO	CK08BE411*	CK09BE411*	CK95BE411*	CK10CE411*	CK11CE411*	CK12BE411*
Aux. Contacts	Maximum Aux. Contacts	8	8	8	8	8	8
	Maximum Contact Block Configuration	2 Side-Mount on each side		2 Side-Mount on each side		2 Side-Mount on each side	
Aux. Contacts (A600, Q600)		1NO-1NC	1NO-1NC	1NO-1NC	1NO-1NC	1NO-1NC	1NO-1NC
Continuous Amp Rating (UL)		175	200	310	500	550	550
AC-1 Amperes (IEC)		250	315	500	600	650	700
AC-2/AC-3	Max. FLA	156	192	302	398	480	602
	Max. Hp (3-Phase)						
	200 Volts	50	60	100	125	150	200
	230 Volts	60	75	100	150	200	250
	460 Volts	125	150	250	300	400	500
AC-4 Max. Hp	575 Volts	125	150	300	400	500	600
	200 Volts	50	60	100	125	150	200
	230 Volts	60	75	100	150	200	250
	460 Volts	125	150	250	300	400	500
Mechanical Life (millions of operations)		10	10	10	10	10	10
	Elec. Endurance (AC-3) At Rated Current (millions of operations)	1.5	1.5	0.9	1.3	1.0	0.7
Maximum Operational Current 460V and Below	AC-3 300 Switchings/Hr.	156	192	302	398	480	602
	600 Switchings/Hr.	156	192	302	318	384	481
	AC-1 ≤ 300 ops./hour	100	100	100	100	100	100
	301-600 ops./hour	100	100	100	80	80	80
	> 600 ops./hour	80	80	80	—	—	—
Net Weight	Contactor	33 lb.	33 lb.	33 lb.	50 lb.	51 lb.	52 lb.
	Class 10 Overload Relay	2 lb.	5 lb. 5 oz.	5 lb. 5 oz.	2 lb.	2 lb.	2 lb.
Wire Size - Power Terminals 75°C (Cu) AWG		#6-350 MCM			#8-500 MCM, 2/0-600 MCM (2 wire lugs)		
Torque (Main) in.-lb.		200			375		
Applicable to lug kits		CKX02			CKX01		
Noise (dba)		45	45	45	45	45	45



Overload Relays

Class 10

Fixed Heater

Overload Relay catalog numbers are shown in the shaded area in the **Overload Relay Selection and Data** table. To complete the catalog number, replace the asterisk (*) with the appropriate digit from the shaded area in the **Rating Selection** table.

Overload Relay Selection and Data

Class 10 Overload Relays	Direct Mount	Man./Auto Reset	RT1*	RT2*	RT3*	RT4* (1)	RT5* (2)
	Separate Mount	Man./Auto Reset	RT1* (3)	RT2* (4)	RT3*	RT4*	RT5*
For use with			5-25 hp contactors (CL00, CL01 CL02, CL25 CL04, CL45)	30-75 hp contactors (CL06, CL07 CL08, CL09 CL10)	100-125 hp contactors (CK75, CK08)	150-250 hp contactors (CK09, CK95)	300-500 hp contactors (CK10, CK11, CK12)
Type		3-pole, differential (phase unbalanced protection)					
Ambient Temperature		-25° to +68°C		-25° to +60°C			
Auxiliary Contacts		Two independent double break contacts (B600, Q600)					
Standards		VDE 0106 T100, VBG4					
Net Weight		7 oz.	13 oz.	2 lb.	5 lb. 5 oz.	2 lb.	

(1) Used with Overload Jumpers: CKXJ02

(3) Used with Base Adapter: RTXP

(2) Used with Overload Jumpers: CKXJ11 or CKXJ10

(4) Used with Base Adapter: RT2XP

Selection and Dial Setting Guidelines

Motors with Service Factor of 1.15 or Greater

1. Select overload relay on the FLA as shown on the motor nameplate.
2. Adjust overload relay dial to the motor nameplate FLA.

Motors with Service Factor Less than 1.15

1. Select overload relay based on the following formula: FLA shown on the motor nameplate X 0.90. For example: if the Motor Service Factor is 1.0, then choose the overload based on the formula (FLA X 0.90).
2. Adjust overload relay dial to the result of the formula shown above.

REFERENCES

Trip Time Curves	Page 49-50
Overload Jumpers.....	Page 34
Instruction Sheet: RT1*	GEH-6237
RT2*	GEH-6238
RT3*	GEH-6239
RT4*	GEH-6240
RT5*	GEH-6241
UL File Number.....	E39584
CSA File Number	LR45167

Rating Selection (Amperes)

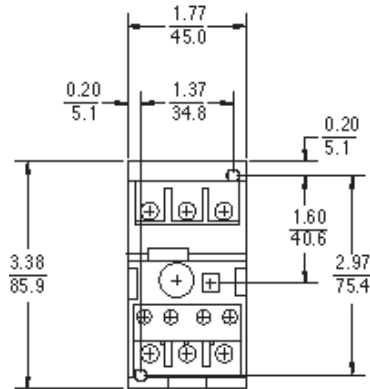
RT1*			RT2*			RT3*			RT4*			RT5*			Current Range Suffix
Current Rating	Maximum Fuse Rating (Amperes)	Maximum Circuit Breaker Rating (Amperes)	Current Rating	Maximum Fuse Rating (Amperes)	Maximum Circuit Breaker Rating (Amperes)	Current Rating	Maximum Fuse Rating (Amperes)	Maximum Circuit Breaker Rating (Amperes)	Current Rating	Maximum Fuse Rating (Amperes)	Maximum Circuit Breaker Rating (Amperes)	Current Rating	Maximum Fuse Rating (Amperes)	Maximum Circuit Breaker Rating (Amperes)	
—	—	—	11.5-15	35	25	—	—	—	—	—	—	120-190	800	500	A
0.16-0.26	1	15	14.5-19	50	45	55-80	225	200	—	—	—	175-280	1200	700	B
0.25-0.41	1	15	18.5-25	70	60	63-90	250	225	—	—	—	250-400	1200	1000	C
0.4-0.65	3	15	24-32	90	80	90-120	350	300	—	—	—	315-500	1200	1200	D
—	—	—	30-43	100	100	110-140	400	350	—	—	—	430-650	1200	1200	E
0.65-1.1	6	15	—	—	—	140-190	450	500	—	—	—	—	—	—	F
1-1.5	6	15	42-55	150	125	—	—	—	—	—	—	—	—	—	G
1.3-1.9	6	15	54-65	175	150	—	—	—	—	—	—	—	—	—	H
1.8-2.7	10	15	64-82	225	200	—	—	—	—	—	—	—	—	—	J
2.5-4.1	15	15	—	—	—	—	—	—	—	—	—	—	—	—	K
4-6.3	20	15	78-97	225	225	—	—	—	—	—	—	—	—	—	L
5.5-8.5	25	15	90-110	225	250	—	—	—	—	—	—	—	—	—	M
8-12	40	30	—	—	—	—	—	—	120-190	600	500	—	—	—	N
10-16	50	35	—	—	—	—	—	—	175-280	800	700	—	—	—	P
—	—	—	—	—	—	—	—	—	200-310	900	800	—	—	—	R
14.5-18	60	40	—	—	—	—	—	—	—	—	—	—	—	—	S
17.5-22	70	50	—	—	—	—	—	—	—	—	—	—	—	—	T
21-26	80	60	—	—	—	—	—	—	—	—	—	—	—	—	U
25-32	100	80	—	—	—	—	—	—	—	—	—	—	—	—	V
30-40	100	80	—	—	—	—	—	—	—	—	—	—	—	—	W

Overload Relays Class 10 Fixed Heater

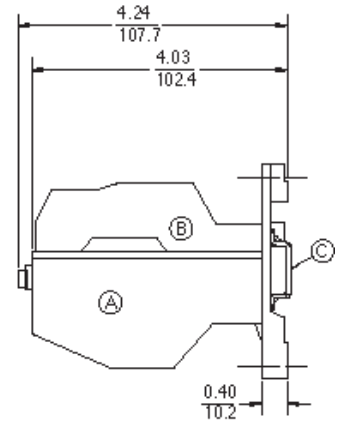
Engineering Outline Drawings

RT1+RTXP	55-215830
RT2+RT2XP	55-215831
RT3 OLR.....	55-215832
RT4 OLR.....	55-215833
RT5 OLR.....	55-215834

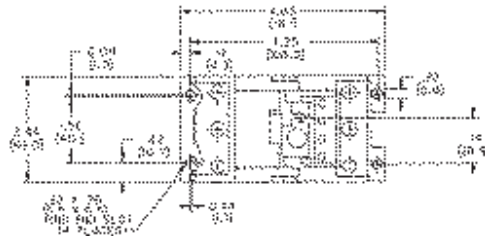
Dimensional Drawings for RT4
and RT5 are shown on page 29.



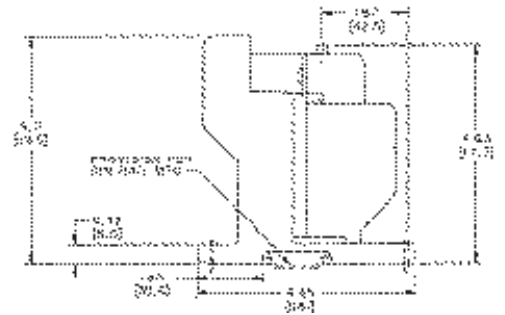
RT1 with RTXP Base Adapter - Front View



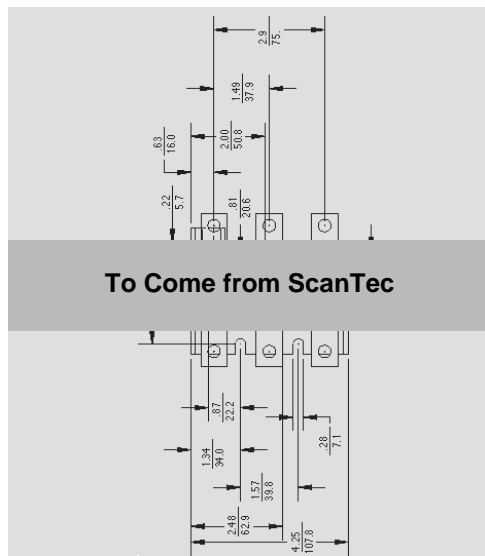
RT1 - Side View



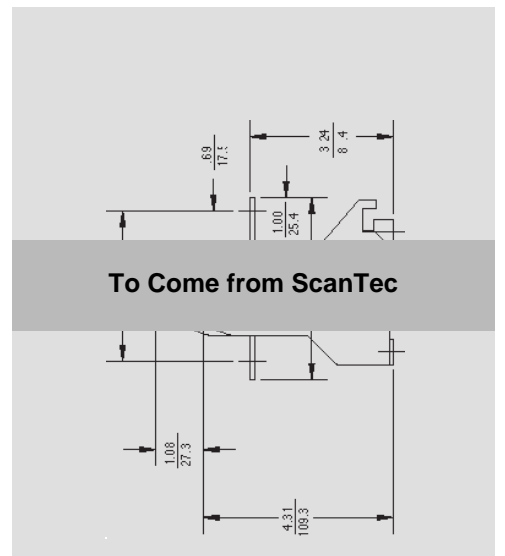
RT2 with RT2XP Base Adapter - Front View



RT2 - Side View



RT3 - Front View



RT3 - Side View

To Come from ScanTec

To Come from ScanTec



Overload Relays

Class 30

Fixed Heater

Overload Relay catalog numbers are shown in the shaded area in the **Overload Relay Selection and Data** table. To complete the catalog number, replace the asterisk (*) with the appropriate digit from the shaded area in the **Rating Selection** table.

Overload Relay Selection and Data

Class 30 Overload Relays	Man./Auto Reset	RT4L* (1)	RT5L* (2)
For use with		150-250 hp contactors (CK09, CK95)	300-500 hp contactors (CK10, CK11, CK12)
Type		3-pole, differential (phase unbalanced protection)	
Ambient Temperature		-25° +60°C	
Auxiliary Contacts		Two independent double break contacts (B600, Q600)	
Standards		VDE 0106 T100, VBG4	
Net Weight		4.5 lb.	2 lb.

- (1) For Direct Mount, use kit: CKXJ02
 (2) For Direct Mount, use kit: CXJ11

Selection and Dial Setting Guidelines

Motors with Service Factor of 1.15 or Greater

1. Select overload relay on the FLA as shown on the motor nameplate.
2. Adjust overload relay dial to the motor nameplate FLA.

Motors with Service Factor Less than 1.15

1. Select overload relay based on the following formula: FLA shown on the motor nameplate X 0.90. For example: if the Motor Service Factor is 1.0, then choose the overload based on the formula (FLA X 0.90).
2. Adjust overload relay dial to the result of the formula shown above.

REFERENCES

Trip Time Curves	Page 49-50
Overload Jumpers.....	Page 34
Instruction Sheet: RT4L*	GEH-6240
RT5L*	GEH-6241
UL File Number.....	E39584
CSA File Number	LR45167

Rating Selection (Amperes)

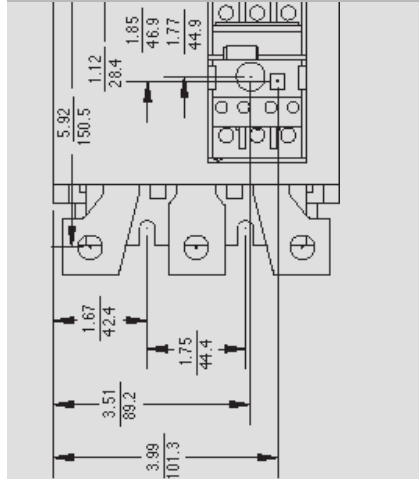
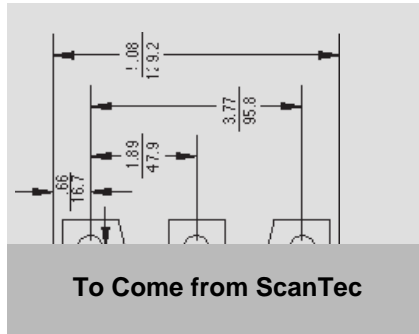
RT4L*			RT5L*			Current Range Suffix
Current Rating	Maximum Fuse Rating (Amperes)	Maximum Circuit Breaker Rating (Amperes)	Current Rating	Maximum Fuse Rating (Amperes)	Maximum Circuit Breaker Rating (Amperes)	
—	—	—	120-190	800	500	A
—	—	—	175-280	1200	700	B
—	—	—	250-400	1200	1000	C
—	—	—	315-500	1200	1200	D
—	—	—	430-650	1200	1200	E
45-70	225	175	—	—	—	K
60-90	300	225	—	—	—	L
80-150	400	350	—	—	—	M
120-190	600	500	—	—	—	N
175-280	800	700	—	—	—	P
200-310	900	800	—	—	—	R

Overload Relays Class 10 or 30 Fixed Heater

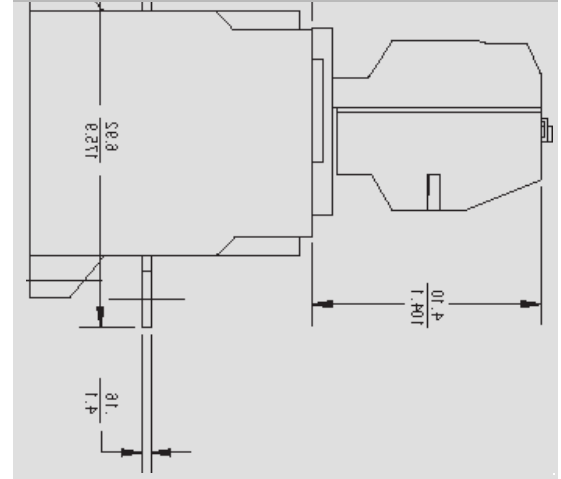
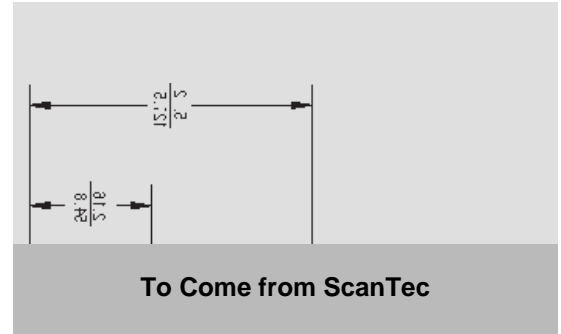
Engineering Outline Drawings

RT4, RT4L.....55-215833

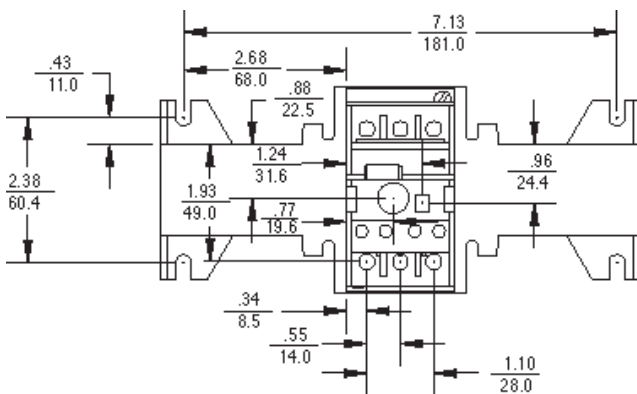
RT5, RT5L.....55-215834



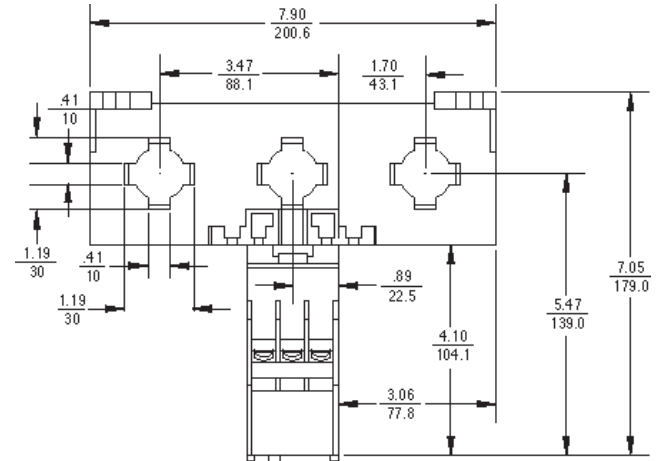
RT4, RT4L- Front View



RT4, RT4L- Side View



RT5, RT5L - Front View

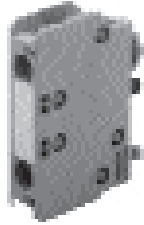


RT5, RT5L - Top View



Accessories

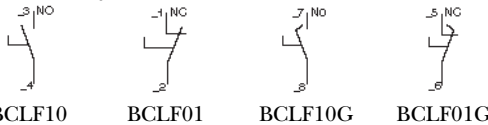
Front-Mount Auxiliary Contact Blocks (for CL contactors)



Front-mount auxiliary contact blocks clip onto front face of contactor. Contact Rating: A600 Q600.

Type	Contacts	Catalog No.	Weight
Standard	1NO	BCLF10	.5 oz.
	1NC	BCLF01	.5 oz.
Make Before Break (Overlapping Contacts)	1NO	BCLF10G	.5 oz.
	1NC	BCLF01G	.5 oz.

Instantaneous, Front-Mounted



Contact Ratings

	A600	Q600
Continuous Thermal Current	10 A	2.5 A
Max. VA/Amps Making	7200 VA / 60 A	69 VA
Max. VA/Amps Breaking	720 VA / 6 A	69 VA
Max. Operating Voltage	600 VAC	600 VDC

Note: For DC ratings at 600 Volts or less, the make and break ratings shall be obtained by dividing the voltampere rating by the application voltage but shall not exceed the continuous carrying current.

The DC rating shown in the above table shall not be exceeded when applied to control circuit devices.

Front-Mount Auxiliary Contact Block Specifications

- Rated thermal current (Ith) temperature below 55°C..... 10A
- Rated insulation voltage (Ui) in accordance with IEC 947 1000V
- Making capacity (r.m.s.) in accordance with IEC 947
AC 15/AC 11, Ue ≤ 400V, 50/60 Hz 90A
DC 13/DC 11, Ue ≤ 220V DC 90A
- Breaking capacity (r.m.s.) in accordance with IEC 947
AC 15/AC 11, Ue ≤ 400V, 50/60 Hz 60A
DC 13/DC 11, Ue ≤ 220V, DC 0.95A
- Electrical (AC-3) endurance at rated current (millions of operations) 1.0
- Short-circuit protection w/o welding 10A
- Insulation resistance
Between contacts > 10 MΩ
Between contacts and earth > 10 MΩ
Between input and output > 10 MΩ
- Standard (Instantaneous Contacts)
Guaranteed no overlap between NO and NC contacts
Space 1.3 mm
Time 1.5 ms

Side-Mount Auxiliary Contact Blocks (for CL and CK contactors)

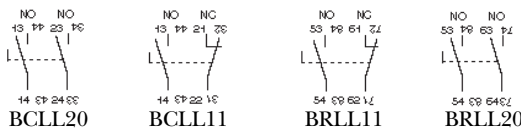


Side-mount auxiliary contact blocks can be mounted on either left or right sides of contactor. Positive displacement contacts are designed to prevent simultaneous closing of NO and NC contacts to avoid overlapping between opposing functions.

Contact Rating: A600 Q600.

For Use With	Contacts*	Base Block	Adder Block	Weight
5-500 hp contactors (all CL and CK contactors)	1NO-1NC	BCLL11	BRLL11	2 oz.
	2NO	BCLL20	BRLL20	2 oz.

* Maximum of two side-mount auxiliary contact blocks per side of contactor.



Contact Ratings

	A600	Q600
Continuous Thermal Current	10 A	2.5 A
Max. VA/Amps Making	7200 VA / 60 A	69 VA
Max. VA/Amps Breaking	720 VA / 6 A	69 VA
Max. Operating Voltage	600 VAC	600 VDC

Note: For DC ratings at 600 Volts or less, the make and break ratings shall be obtained by dividing the voltampere rating by the application voltage but shall not exceed the continuous carrying current.

The DC rating shown in the above table shall not be exceeded when applied to control circuit devices.

Side-Mount Auxiliary Contact Block Specifications

- Rated thermal current (Ith) temperature below 55°C 10A

- Rated insulation voltage (Ui) in accordance with IEC 947 1000V
- Making capacity (r.m.s.) in accordance with IEC 947
AC 15/AC 11, Ue ≤ 400V, 50/60 Hz 90A
DC 13/DC 11, Ue ≤ 220V DC 90A
- Breaking capacity (r.m.s.) in accordance with IEC 947
AC 15/AC 11, Ue ≤ 400V, 50/60 Hz 60A
DC 13/DC 11, Ue ≤ 220V DC 0.95A
- Electrical (AC-3) endurance at rated current (millions of operations) 1.0
- Short-circuit protection w/o welding 10A
- Insulation resistance
Between contacts > 10 MΩ
Between contacts and earth > 10 MΩ
Between input and output > 10 MΩ
- Standard (Instantaneous Contacts)
Guaranteed no overlap between NO and NC contacts
Space 1.3 mm
Time 1.5 ms

Accessories

Front-Mount and Side-Mount Auxiliary Contact Blocks (cont.)

Maximum Number Of Auxiliary Contact Blocks Per Each Contactor

For Use With	Maximum Number Of Aux. Contact Blocks	Arrangement Of Aux. Contact Blocks
5-15 hp contactors (CL00, CL01, CL02, CL25)	4	4 Front-Mount, or 1 Side-Mount on each side
20-25 hp contactors (CL03, CL04, CL45)	6	4 Front-Mount plus 1 Side-Mount, or 2 Front-Mount plus 1 Side-Mount on each side
30-75 hp contactors (CL05, CL06, CL07, CL08, CL09, CL10)	8	6 Front-Mount plus 1 Side-Mount, or 2 Side-Mount on each side
100-500 hp contactors (CK75, CK08, CK09, CK95, CK10, CK11, CK12)	8	2 Side-Mount on each side

Mechanical Interlocks (for CL and CK contactors)



Mechanical interlock, used for horizontal interlocking of two contactors, prevents the closing of one contactor (as long as the other remains closed). Contact Rating: A600 Q600.

For Use With Two Contactors Mounted Side-By-Side	Built in Aux.	Catalog No.	Weight
5-75 hp contactors (all CL contactors)	2NC	BEL02	2 oz.
100-500 hp contactors (all CK contactors)	0	BEKH	13 oz.



BEL02

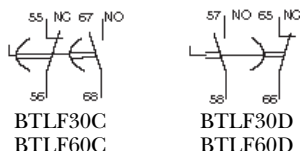
Pneumatic Timers (for CL contactors)



Pneumatic timers are adjustable time-delayed auxiliary contacts. They come equipped with two time-delayed contacts: 1NO and 1 NC, electrically separated. Setting is scaled over a 350° rotation by means of a knurled knob with timing guide marks. To mount a pneumatic timer, simply clip it on front face of contactor. Contact Rating: A600 Q600.

For Use With	Type	Time Range	Contacts	Catalog No.	Weight
5-75 hp contactors (all CL contactors)	Time Delay On	.1-30 sec	1NO-1NC	BTLF30C	3 oz.
		1-60 sec	1NO-1NC	BTLF60C	3 oz.
	Time Delay Off	.1-30 sec	1NO-1NC	BTLF30D	3 oz.
		1-60 sec	1NO-1NC	BTLF60D	3 oz.

Timer, Front-Mounted



BTLF30C
BTLF60C

BTLF30D
BTLF60D

Pneumatic Timer Specifications

- Rated thermal current (I_{th}) temperature below 55°C10A
- Rated insulation voltage (U_i) in accordance with IEC 9471000V
- Making capacity (r.m.s.) in accordance with IEC 947
 - AC 15/AC 11, U_e ≤ 400V, 50/60 Hz90A
 - DC 13/DC 11, U_e ≤ 220V DC90A
- Breaking capacity (r.m.s.) in accordance with IEC 947
 - AC 15/AC 11, U_e ≤ 400V, 50/60 Hz60A

DC 13/DC 11, U_e ≤ 220V DC0.95A

Electrical (AC-3) endurance at rated current (millions of operations)1.0

Short-circuit protection w/o welding10A

Insulation resistance

Between contacts> 10 MΩ

Between contacts and earth> 10 MΩ

Between input and output> 10 MΩ

Guaranteed no overlap between NO and NC contacts

Space1.3 mm

Time1.5 ms



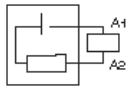
Accessories

Surge Suppressor (for CL contactors)

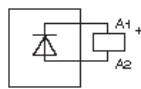


For suppression of disturbances in electronic circuits due to the coil transient voltage occurring on opening of the contactor. Limits high voltage transients that may be produced when coil is de-energized. Mounts directly on the top of the coil.

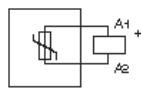
For Use With	Surge Suppressor Type	Catalog No.	Voltage	Weight
5-25 hp AC (CL00, CL01, CL02, CL25, CL04, CL45)	RC	BSLR2G	24-48 VAC	1 oz.
		BSLR2K	50-127 VAC	1 oz.
		BSLR2R	130-240 VAC	1 oz.
30-75 hp AC (CL06, CL07, CL08, CL09, CL10)	RC	BSLR3G	24-48 VAC	1 oz.
		BSLR3K	50-127 VAC	1 oz.
		BSLR3R	130-240 VAC	1 oz.
5-25 hp DC (All CL contactors)	Diode	BSLDZ	12-600 VDC	1 oz.
5-75 hp AC/DC (All CL contactors)	Varistor	BSLV3G	24-48 VAC,DC	1 oz.
		BSLV3K	50-127 VAC,DC	1 oz.
		BSLV3R	130-250 VAC,DC	1 oz.
		BSLV3U	380-500 VAC,DC	1 oz.



RC



Diode



Varistor

Amplifier (for CL and CK contactors)



Provides for 24VDC signals to operate contactor while control coils operate at the line voltage. Two forms are available: a panel-mount form (for CK contactors) and a side-mount form (for CL contactors).

For Use With	Catalog No.	Weight
CL contactors	CLXA01	5 oz.
CK contactors (Panel Mount)	CR305X112P	5 oz.

Input voltage19.2-26.4 Vdc
 Power consumption0.8 watts max.
 Contact ratingC600
 Pickup time35-40 ms
 Dropout time12-25 ms
 Average expected life3,000,000 operations

Mechanical Latch Block (for CL contactors)



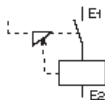
Mechanical latch block is used to convert a standard contactor into a latched contactor. Easy to mount, it clips onto front face of contactor. Includes INC contact for contactor coil cut-out. Contact rating: A600 Q600.

For Use With	Catalog No.	Voltage Applications	Weight
All CL contactors	RMLF*	50/60 Hz and DC	3 oz.

Replace asterisk in catalog number with appropriate coil letter designation:

	D	G	J	N	U	Y
Voltage	24-32V	42-48V	110-125V	208-277V	380-480V	500-600V

Coil is rated for pulse duty only. If a continuous unlatch signal is expected, use auxiliary contact on contactor to disconnect unlatch coil.



RMLF*

Mechanical Latch Block Specifications

Rated insulation voltage
 (Ui) in accordance with IEC 9471000 V
 Standard voltages, 50/60 Hz DC24-600 V
 Operating limitsnominal voltage
 Consumption for unlatching (auto cut-out)55 VA
 Unlatching control
 ElectricallyAuto cut-out by integral contact
 ManuallyBy local push button (O)
 Contactor control
 ElectricallyActuated to save on energy consumption in contactor coil
 ManuallyBy push button (I)
 Mechanical life:
 CL00-453 million @ 1200/hr max
 CL05-101 million @ 300/hr max
 Unlatching pulse time (min)40 ms

Accessories

Flexible Cable Reset Button



Allows manual reset of overload when overload is mounted in a special or inaccessible position.

For Use With	Cable Length	Catalog No.	Weight
All overloads	1.6 ft (.5 m)	RTXR	5 oz.
All overloads	3.2 ft (1 m)	RTXRL	6 oz.

Transparent Cover For Range Adjustment Dial



Deters tampering with dial.

For Use With	Catalog No.	Weight
All overload relays	RTX3	2 oz.

Catalog number represents a quantity of 10 pieces

Locking Plug for Manual/Auto Selector



Prevents changing reset mode after installation

For Use With	Catalog No.	Weight
All overload relays	RTXL	1 oz.

Catalog number represents a quantity of 10 pieces

Overload Base Adapter



Permits mounting of RT1 or RT2 overload on panel or DIN rail.

For Use With	Catalog No.	Weight
RT1 overload	RTXP	3 oz.
RT2 overload	RT2XP	5 oz.

Miscellaneous Kits (for CL and CK contactors)

	Type of Kit	For Use With	Catalog No.	Weight
	35mm DIN Rail (1 meter)	5-75 hp contactors (all CL contactors)	CLXR35	12 oz.
	Power Take-Off Terminals (wire size 12-18 AWG) (contains 2 terminals)	100-125 hp contactors (CK75, CK08)	CKXT03	2 oz.
		150-400 hp contactors (CK09, CK95, CK10, CK11)	CKXT01	2 oz.
		500 hp contactor (CK12)	CKXT02	2 oz.
	Terminal Screw Kit (contains 3 screws, 3 nuts, and 3 sets of washers) M-8 screws	100-125 hp contactors (CK75C, CK08C)	KVF75C	3 oz.
	Terminal Screw Kit (contains 3 screws, 3 nuts, and 3 sets of washers) M-10 screws	150-500 hp contactors (CK09, CK95, CK10, CK11, CK12)	KVF08C	5 oz.



Accessories

Starter Mounting Base (for CK contactors)



For use with overload requiring jumpers.

For Use With	Overload [†]	Catalog No.	Weight
150 and 250 hp Contactors (CK09, CK95)	RT4 RT4L	CKXB01	4.5 lb.

Overload Jumpers (for CK contactors)



Straps and Bracket for RT5

Overload jumpers allow an overload to be mounted to a contactor. Each catalog number represents a set of three overload jumpers (not required for CK75C, CK08C).

For Use With	Overload	Packing Quantity (No. Per Set)	Catalog No.	Weight
150-250 hp contactors (CK09, CK95) 2 jumpers required per phase above 192 amps.	RT4	3	CKXJ02	1 lb. 9 oz.
200-400 hp contactors (CK10, CK11)	RT5	3	CKXJ10	2 lb. 9 oz.
500 hp contactors (CK12)	RT5	3	CKXJ11	2 lb. 9 oz.

CKXJ02 consists of three insulated bus bar straps. Overloads and contactors are panel mounted.

CKXJ10 and CKXJ11 consist of three insulated bus bar straps, mounting brackets and mounting bracket hardware.

Contactors and overload relays supplied with terminal hardware.

Reversing Starter Wiring Kits (for CL contactors)



These kits provide interconnecting power wires for main power poles for assembly of reversing contactors.

For Use With	Reversing Wiring Kit Catalog No.
5-10 hp contactors (CL00, CL01, CL02)	CLXC01
15 hp contactor (CL25)	CLXC11
20 hp contactor (CL04)	CLXC21
25 hp contactor (CL45)	CLXC31
30-50 hp contactors (CL06, CL07, CL08)	CLXC41
60-75 hp contactors (CL09, CL10)	CLXC51

Reversing Contactor and Starter Selection Guide (for CK contactors)

Connection set for main poles of two (3-pole) contactors that are side-by-side mounted for wiring as reversing starting.

For Use With	Component Kits and Lugs	Reversing Contactor	Reversing Starter with RT3 Overload	Reversing Starter with RT4 Overload	Reversing Starter with RT5 Overload
CK75C CK08C	Bus Bar	CKXC04	CKXC04	—	—
	Overload Jumper Straps	—	—	—	—
	(3) Line Lugs (optional)	CKX03	CKX03	—	—
	(3) Load Lugs (optional)	CKX03	CKX03	—	—
	Mechanical Interlock	BEKH	BEKH	—	—
CK09B CK95B	Bus Bar	CKXC01	—	CKXC01	—
	Overload Jumper Straps	—	—	CKXJ02 (A)	—
	(3) Line Lugs (optional)	CKX02	—	CKX02 (A)	—
	(3) Load Lugs (optional)	CKX02	—	CKX02 (A)	—
	Mechanical Interlock	BEKH	—	BEKH	—
CK10C CK11C	Bus Bar	CKXC10	—	—	CKXC10
	Overload Jumper Straps	—	—	—	CKXJ10
	(3) Line Lugs (optional)	CKX01	—	—	CKX01
	(3) Load Lugs (optional)	CKX01	—	—	CKX01
	Mechanical Interlock	BEKH	—	—	BEKH
CK12B	Bus Bar	CKXC11	—	—	CKXC11
	Overload Jumper Straps	—	—	—	CKXJ11
	(3) Line Lugs (optional)	CKX01	—	—	CKX01
	(3) Load Lugs (optional)	CKX01	—	—	CKX01
	Mechanical Interlock	BEKH	—	—	BEKH

Requires two (2) contactors or two (2) contactors plus overload relay panel mounted to (field supplied) baseplate.

(A) Two (2) kits required for application above 192 amps.

Accessories

Reversing Contactor and Starter Selection Guide (for CK contactors)



Bus Bar Kit - Connection set for main power poles for assembly of reversing contactors

For Use With	Catalog No.	Weight
100-125 hp contactors (CK75C, CK08C)	CKXC04	3 lb.
150-250 hp contactors (CK09B, CK95B)	CKXC01	5 lb.
300-400 hp contactors (CK10C, CK11C)	CKXC10	6 lb.
500 hp contactors (CK12B)	CKXC11	10 lb.

The CKXC01, CKXC04, CKXC10 and CKXC11 are universal reversing contactor and starter bus bar kits consisting of line side and load side insulated bus bars plus six (6) power terminal extenders with bolts and hardware. When assembling reversing starters only three (3) power terminal extenders are required. Three (3) load side terminal extenders are replaced by overload connection straps purchased separately.

Wye-Delta Wiring Kits (for CL contactors)



Delta Contactor		Wye Contactor	Motor Horsepower - 60 Hz, Three Phase				Wire Kit
M1	M2	S1	200-208	230	460	575	
CL01	CL01	CL00	—	—	15	15	CLXC02
CL02	CL02	CL01	—	—	20	20	CLXC02
CL25	CL25	CL01	—	—	25	25	CLXC12
CL04	CL04	CL04	15	20	40	50	CLXC22
CL06	CL06	CL04	25	30	60	75	CLXC42
CL07	CL07	CL06	30	40	75	100	CLXC43
CL09	CL09	CL07	40	50	100	125	CLXC52
CL10	CL10	CL07	60	60	125	125	CLXC52

Wiring kit consists of incoming terminal block and power wires.

Wye-Delta Starter Selection Guide (for CK contactors)

For Use With	Compound Kits and Lugs*	With RT3 Overload	With RT4 Overload	With RT5 Overload
CK75C, CK08C	Bus Bar	CKXC05	—	—
	Load Lugs (optional)	CKX03 ⁽¹⁾	—	—
	Mechanical Interlock	BEKH	—	—
	Wye-Delta Timer	METV	—	—
CK09B, CK95B	Bus Bar w/OL Straps	—	CKXC03 ⁽²⁾	—
	Load Lugs (optional)	—	CKX02 ⁽³⁾	—
	Mechanical Interlock	—	BEKH	—
	Wye-Delta Timer	—	METV	—
CK10C, CK11C	Bus Bar w/OL Straps	—	—	CKXC13
	Load Lugs (optional)	—	—	CKX01 ⁽¹⁾
	Mechanical Interlock	—	—	BEKH
	Wye-Delta Timer	—	—	METV
CK12B	Bus Bar w/OL Straps	—	—	CKXC12
	Load Lugs (optional)	—	—	CKX01 ⁽¹⁾
	Mechanical Interlock	—	—	BEKH
	Wye-Delta Timer	—	—	METV

Requires three (3) contactors plus overload relay panel mounted to (field supplied) baseplate.

* Incoming power feed must be adaptable to bus bar connection.

⁽¹⁾Two (2) kits required.

⁽²⁾Additional CKXJ02 jumper straps required above 192 amps.

⁽³⁾Two (2) kits required, four (4) kits required for CK95 and above 218 amps.

CK Contactor Selection for wye-delta starters

Delta Contactor		Wye Contactor S1	Motor Horsepower - 60 Hz, Three Phase			
M1	M2		200 V	230 V	460 V	575 V
CK75	CK75	CK75	75	75	150	200
CK08	CK08	CK75	75	100	200	250
CK09	CK09	CK09	100	125	250	300
CK95	CK95	CK09	150	200	400	500
CK10	CK10	CK10	250	250	500	700
CK11	CK11	CK10	300	300	600	800
CK12	CK12	CK12	400	400	800	1000

Accessories

Coils

To complete coil catalog number, replace the circled number with the appropriate "Frequency/Voltage Designation Letter/Digit" (from the CL Frequency/Voltage Selection table) corresponding to the voltage and frequency of the control circuit.



For CL Contactors, Alternating Current (AC)

For Use With	Catalog No.	Weight
5-15 hp contactors (CL00A, CL01A, CL02A, CL25A)	LB1A ^①	2.2 oz.
20-25 hp contactors (CL04A, CL45A)	LB3A ^①	3.7 oz.
30-75 hp contactors (CL06A, CL07A, CL08A, CL09A, CL10A)	LB4A ^①	5.2 oz.

For CL Contactors, Direct Current (DC)

For Use With	Catalog No.	Weight
5-15 hp contactors (CL00D, CL01D, CL02D, CL25D)	LB1D ^②	6 oz.
20-25 hp contactors (CL04D, CL45D)	LB3D ^②	9 oz.

CL Frequency/Voltage Selection

Please Note: Frequency/voltage combinations in bold are available by special order only.

① AC Voltage			② DC Voltage	Frequency/Voltage Designation Letter/Digit	① AC Voltage			② DC Voltage	Frequency/Voltage Designation Letter/Digit
60 Hz	50 Hz	50/60 Hz			60 Hz	50 Hz	50/60 Hz		
			12	B	380			250	T
24				C	440				V
	24		24	D	480	380/400			U
	32		36	E		415			W
48	42		42	F		440			X
	48		48	G	600	500			Y
110			60	H		660/690			Z
			72	I			24		1
120	110		110	J			42		2
	127		120/125	K			110/115		3
208				L			120		4
220				M			220		5
277	220/230		220	N			230		6
	240			R			240		7
240				S			440		8

Special order coils (Bold):
 Minimum order, LB1A*: 20 units
 Minimum order, all others: 10 units

For CK Contactors, 50/60 Hz AC or DC Electronic Coils

For Use With	Item	Catalog Number	Weight
3-pole 100-125 hp CK75C, CK08C	Coils for use with electronic coil	KB4E ^③	4lb. 2 oz.
	Electronic module	KM4E ^③	7 oz.
3-pole 150-250 hp CK08B, CK09B, CK95B	Coils for use with electronic coil	KB5E ^③	4lb. 2 oz.
	Electronic module	KM5E ^③	7 oz.
3-pole 500 hp CK10B, CK11B, CK12B 4-pole 125-250 hp CK08B, CK09B, CK95B	Coils for use with electronic coil	KB6E ^③	4lb. 2 oz.
	Electronic module	KM6E ^③	7 oz.
3-pole 300-400 hp CK10C, CK11C 4-pole 300-400 hp CK10C, CK11C	Coils for use with electronic coil	KB7E ^③	4lb. 2 oz.
	Electronic module	KM7E ^③	7 oz.

For CL Contactors, 50/60 Hz AC or DC Electronic Coils

For Use With	Item	Catalog Number	Weight
3-pole 30-75 hp CL06E, CL07E, CL08E, CL09E, CL10E	Electronic coil and module combination	LM4E ^③	4lb. 2 oz.

Electronic Coil Voltage Selection for CL and CK Contactors

Voltage	Voltage Designation Letter ^③
24-28	D
42-48	F
110-127	J
220-250	N
380-415	U
440-500	Y



Enclosed Forms

To Come from ScanTec

NEMA Type 1

NEMA Type 1 Enclosures are the least expensive enclosure and most popular choice for indoor installation in a clean, dry environment. They provide mechanical protection from unintentional contact with live and moving parts inside the enclosure. They are **not** recommended for outdoor installations; they provide little or no protection from dripping water or fluids and are not oil-tight.

To Come from ScanTec

NEMA Type 4 Water Tight

NEMA Type 4 enclosures provide maximum protection. They are designed for outdoor locations where they may be subjected to windblown rain, sleet, dust. They are also widely used in indoor hosedown applications commonly found in the food and beverage industries. These enclosures resist rust and corrosion caused by a wide range of non-corrosive liquids.

To Come from ScanTec

NEMA Type 12/3R

Oil-, Dust-, and Rain-Tight

These enclosures are configured as Nema 12 devices when shipped from the factory and can be quickly converted to NEMA 3R by opening a weep hole and adding hubs as appropriate.

NEMA Type 12 enclosures are the second most popular enclosures and offer substantial protection for their cost. They are usually installed indoors, in typical “dirty” industrial environments where contamination by oil, dirt, dripping water, airborne dust and non-corrosive liquids is likely. These enclosures meet drip-, dust- and rust-resistance tests.

NEMA Type 3R enclosures are intended for protected outdoor installations. They are rust-resistant and protect against falling (but not wind-blown) rain or sleet and against external icing, although cover mounted controls may be inoperable while the enclosure is ice covered. They are not designed to be dust-tight. The best outdoor installations offer protection — through building walls or shelters — from the wind.

Dimension Legend



To order factory assembled enclosed contactors or starters, see (C-2000™ Contactors & Starters Purchasing Guide, DEP-070)

Enclosures For CL Contactors - Dimensions and Outlines

Note: Enclosures are designed for use with AC contactors without front-mounted accessories. Order CL25, CL45 and CL05-CL10 contactors with side-mounted auxiliary contacts for use in these enclosures.

Type	Catalog No.	For use with	Dimensions (in inches)			Outline
			H	W	D	
1	CLXE1A	CL00-45 Starter (without CPT)	10	6	4.6	55-215878
	CLXE1B	CL05-08 Starter (without CPT)	13.3	7.4	6.1	55-215895
	CLXE1C	CL09-10 Starter (without CPT)	20.3	8.8	7.3	55-215880
	CLXE1D	CL00-45 Starter (with CPT)	10	10	4.6	55-215879
	CLXE1E	CL05-08 Starter (with CPT)	13.3	12	6.1	55-215896
	CLXE1F	CL09-10 Starter (with CPT)	25	8.8	7.3	55-215898
	CLXE1G	CL00-45 Reverser (with CPT)	16.8	15	6.9	55-215894
	CLXE1G	CL00-45 Wye-Delta (without CPT)	16.8	15	6.9	55-215894
	CLXE1H	CL05-10 Reverser (with CPT)	20.3	16.8	6.6	55-215897
	CLXE1L	CL05-10 Wye-Delta (without CPT)	27	22	8.6	55-215893

Enclosed Forms

Enclosures For CL Contactors - Dimensions and Outlines

Note: Enclosures are designed for use with AC contactors without front-mounted accessories. Order CL25, CL45 and CL05-CL10 contactors with side-mounted auxiliary contacts for use in these enclosures.

Type	Catalog No.	For use with	Dimensions (in inches)			Outline
			H	W	D	
12/3R	CLXE2A	CL00-45 Starter (without CPT)	14.5	6.4	5.5	55-215875
	CLXE2B	CL05-10 Starter (without CPT)	16.5	7.8	6.25	55-215891
	CLXE2C	CL00-45 Starter (with CPT)	14.5	10.4	5.5	55-215888
	CLXE2C	CL00-45 Reverser (without CPT)	14.5	10.4	5.5	55-215888
	CLXE2D	CL05-10 Starter (with CPT)	16.5	12.5	6.25	55-215889
	CLXE2D	CL05-10 Reverser (without CPT)	16.5	12.5	6.25	55-215889
	CLXE2E	CL00-45 Reverser (with CPT)	14.5	14.4	5.5	55-215892
	CLXE2F	CL05-10 Reverser (with CPT)	17	16.5	6.25	55-215890
	CLXE2G	CL00-45 Wye-Delta (with or without CPT)	17	16.5	6.5	55-215887
CLXE2H	CL05-10 Wye-Delta (with or without CPT)	22	21.2	8	55-215886	
4	CLXE4A	CL00-45 Starter (without CPT)	17	7.75	6.5	55-215867
	CLXE4B	CL05-10 Starter (without CPT)	17	7.75	6.5	55-215866
	CLXE4C	CL00-45 Starter (with CPT)	14.5	10.5	5.5	55-215865
	CLXE4C	CL00-45 Reverser (without CPT)	14.5	10.5	5.5	55-215865
	CLXE4D	CL05-10 Starter (with CPT)	17	12.5	6.25	55-215864
	CLXE4D	CL05-10 Reverser (without CPT)	17	12.5	6.25	55-215864
	CLXE4E	CL00-45 Reverser (with CPT)	16.5	16.5	6.5	55-215863
	CLXE4F	CL05-10 Reverser (with CPT)	17	16.5	6.5	55-215862
	CLXE4E	CL00-45 Wye-Delta (with CPT)	17	16.5	6.5	55-215863
CLXE4H	CL05-10 Wye-Delta (with CPT)	26	18	8.0	55-215860	

Enclosures For CK Contactors - Dimensions and Outlines

Note: To order enclosed CK contactors and starters, see (C-2000™ Contactors & Starters Purchasing Guide, DEP 014) CK enclosures are only supplied with complete factory assembled contactors and starters.

Type	For use with	Dimensions (in inches)			Outline
		H	W	D	
1	CK75-08 Starter (with or without CPT)	28	14	9	55-216404
	CK09-95 Starter (with or without CPT)	36	17	12	55-215859
	CK10-12 Starter (with or without CPT)	46	20	15.5	55-215858
	CK75-08 Reverser (with or without CPT)	28	14	9	55-216404
	CK09-95 Reverser (with or without CPT)	36	17	12	55-215859
	CK10-12 Reverser (with or without CPT)	46	26	15.5	55-215857
	CK75-08 Wye-Delta (with or without CPT)	32	22	9	55-216405
	CK09-95 Wye-Delta (with or without CPT)	48	30	12	55-215856
	CK10-12 Wye-Delta (with or without CPT)	56	36	15.5	55-215855
12/3R	CK75-08 Starter (with or without CPT)	28	18	9	55-216406
	CK09-95 Starter (with or without CPT)	36	22	12	55-215854
	CK10-12 Starter (with or without CPT)	46	20	15.5	55-215858
	CK75-08 Reverser (with or without CPT)	28	18	9	55-216406
	CK09-95 Reverser (with or without CPT)	36	22	12	55-215854
	CK10-12 Reverser (with or without CPT)	46	26	15.5	55-215857
	CK75-08 Wye-Delta (with or without CPT)	32	22	9	55-216407
	CK09-95 Wye-Delta (with or without CPT)	48	30	12	55-215851
	CK10-12 Wye-Delta (with or without CPT)	56	36	15.5	55-215850
4	CK75-08 Starter (with or without CPT)	28	18	9	55-216408
	CK09-95 Starter (with or without CPT)	36	22	12	55-215849
	CK10-12 Starter (with or without CPT)	46	20	15.5	55-215848
	CK75-08 Reverser (with or without CPT)	28	18	9	55-216408
	CK09-95 Reverser (with or without CPT)	36	22	12	55-215849
	CK10-12 Reverser (with or without CPT)	46	27	15.5	55-215847
	CK75-08 Wye-Delta (with or without CPT)	32	22	9	55-216409
	CK09-95 Wye-Delta (with or without CPT)	48	30	12	55-215846
	CK10-12 Wye-Delta (with or without CPT)	56	36	15.5	55-215845



Enclosure Accessories

Pilot Devices For NEMA Type 1 CL Contactor and Starter Enclosures with Lift-Off Cover

Enclosure Catalog No.	Push Buttons		Selector Switch		
	Start/Stop Push Button	Start Stop with Red Light	HOA Switch	On/Off Switch	Red Light*
CLXE1A, CLXE1D	CLXP1B	CLXP1C ¹	CLXP1D	CLXP1E	CLXP1F
CLXE1B, CLXE1E	CLXP2B	CLXP2C ¹	CLXP2D	CLXP2E	CLXP2F
CLXE1C, CLXE1F	CLXP3B	CLXP3C ¹	CLXP3D	CLXP3E	CLXP3F

¹ Code	Voltage
1	115 Volts
2	230 Volts
4	460 Volts
5	575 Volts

* 120 Volts only

Recommended Pilot Devices For All Hinged Enclosures

Function	Operator	Contact Block	Power Supply	Nameplate	Nameplate Adapter
Start Button	P9SPNVG	P9B10VN	N/A	P9ACPBS202	P9ASTBS
Stop Button	P9SPNRG	P9B01VN	N/A	P9ACPBS201	P9ASTBS
Forward Button	P9SPNVG	P9B11VN	N/A	P9ACPBS214	P9ASTBS
Reverse Button	P9SPNVG	P9B11VN	N/A	P9ACPBS215	P9ASTBS
HOA Selector	P9SSMZ0N	P9B10VN	N/A	P9ACPBS261	P9ASTBS
On/Off Selector	P9SSMD0N	P9B10VN	N/A	P9ACPBS233	P9ASTBS
Forward/Reverse Selector	P9SSMD0N	P9B11VN	N/A	P9ACPBS231	P9ASTBS
Forward/Off/Reverse Selector	P9SSMZ0N	(2) P9B10VN	N/A	P9ACPBS239	P9ASTBS
Red "On" Light	P9SLRD	N/A	P9PDNVL	P9ACPBS212	P9ASTBS
Red "Forward" Light	P9SLRD	N/A	P9PDNVL	P9ACPBS214	P9ASTBS
White "Reverse" Light	P9SLBD	N/A	P9PDNVL	P9ACPBS215	P9ASTBS
Green "Off" Light	P9SLVD	N/A	P9PDNVL	P9ACPBS213	P9ASTBS
Yellow "Start" Light	P9SLGD	N/A	P9PDNVL	P9ACPBS202	P9ASTBS

Including CLXE1G, CLXE1H, CLXE1L, all CK NEMA 1 Enclosures, all NEMA 12/3R Enclosures and all NEMA 4 Enclosures. See GEP-1260 for additional options and selection.

¹ 120V Full Voltages Power Supply. For other voltages, refer to GEP-1260.

Overload Reset Buttons

For Use With	Catalog No.
CL00-45 Starters with and without CPT, Type 1 (CLXE1A, 1D)	CLXR11
CL05-10 Starters, CL00-10 Reverser and Wye-Delta Type 1 (CLXE1B-1C, CLXE1E-1L)	CLXR12
CL00-10 Starters, Reverser and Wye-Delta Type 12/3R and 4 (CLXE2A-2H, CLXE4A-4H)	CLXR21
CK75-12 Starters, Reverser and Wye-Delta Type 1	CKXR11
CK75-12 Starter, Reverser and Wye-Delta Type 12/3R and 4	CKXR12

Control Power Transformer

To complete catalog number, replace ¹ with the appropriate digit from the table on the right.

Description	Catalog No.
Standard capacity (50 VA)	CR308XT1 ¹ A
Extra capacity (150 VA)	CR308XT1 ¹ B

Digit	Voltage	Frequency
04	Dual Primary, reconnectable 220/230/240 Volt Primary, 440/460/480 Volt Primary, 110/115/120 Volt Secondary	60 Hz
05	550/575/600 Volt Primary, 110/115/120 Volt Secondary	60 Hz
23	200/208 Volt Primary, 115/120 Volt Secondary	60 Hz

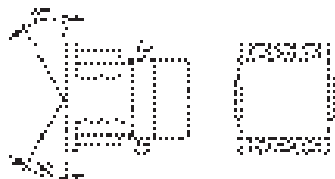
General Specifications

Standards And Listings	IEC 947-1 IEC 947-4 IEC 158-1 GENELEC HD419 NFC.63-110	BS 5424 BS 775 CEI 17-3/252 ASE 1025 UL 508	CSA C.22.2/14 EN 50005 UNE 20109 VDE 0660/102 CE Mark
Pending Standards And Listings	SEMKO, NEMKO, DEMKO, Lloyds Register		
Ambient Temperature			
Operating	-13° to +131°F/-25° to +55°C		
Storage	-58° to +176°F/-50° to +80°C		
Altitude Derating			
Up to 10,000 ft. (3,000 m)	Nominal Values		
10,000 to 13,200 ft. (3,000 to 4,000 m)	90% rated current		
13,200 to 16,000 ft. (4,000 to 5,000 m)	80% rated current		
Rated Insulation Voltage	600 VAC, $U_I = 1000V$ (IEC 947-1)		
Mounting Position			
3-Pole and 4-Pole CL Contactors (5-75 hp)	To maintain operating integrity, the contactor must be mounted in one of the positions shown below:		



3-Pole and 4-Pole
CK Contactors
(100-500 hp)

The contactor must be installed vertically or tilted a maximum of 30° from vertical, as shown below:





Applications Summary

Utilization Categories

Utilization categories are used to describe the type of motor load and duty cycle. Each category has a unique life/load curve which is used to estimate expected electrical life of a specific controller.

Following are descriptions of the most common AC utilization categories:

Utilization Category	Description
AC-1	Noninductive or slightly inductive loads, such as resistance furnaces.
AC-2	Starting of slip ring motors without plugging.
AC-3	Starting and stopping of squirrel cage motors. This utilization category is typical of the standard type of motor duty encountered in most industrial applications.
AC-4	Starting of squirrel cage motors in continuous inching, plugging, and reversing applications.

Life Curves . . . how to use

To determine estimated electrical life for a specific contactor, follow these guidelines:

1. Determine appropriate utilization category. The illustrations below show typical life curves for C-2000 contactors which will operate the AC-1 Utilization categories. AC-2, AC-3, AC-4 and AC-3/AC-4 (mixed duty) life curves are shown on page 43-44.
2. Once the appropriate utilization category has been determined, then using the appropriate curve, it is easy to determine the expected contactor's life by reading the figure (in millions of operations) to the left of the intersection of the rated operating current and the contactor curve.

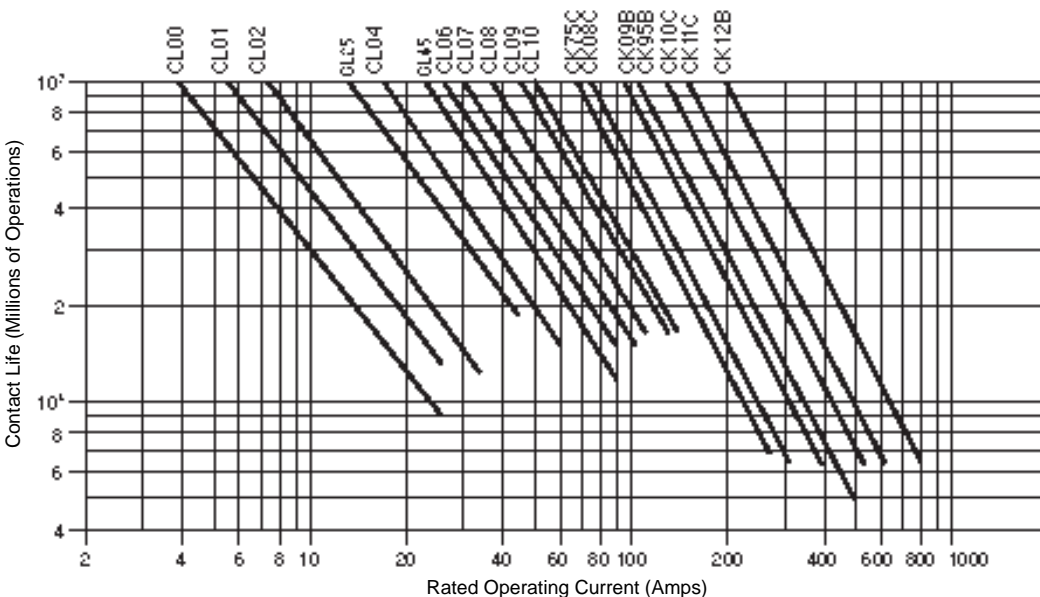
Example: Using a motor duty cycle of starting and stopping (standard) for a three-phase squirrel cage motor rated 15 horsepower at 460V with an operating current of 19.6 amperes, choose utilization category curve AC-3 and take the following action:

- A. Locate rated operating current on bottom (horizontal) scale and draw a vertical line to intersect the first heavy line which will indicate contactor size. In this example, the drawn vertical line for 19.6 amperes will intersect the C-2000 contactor line.
- B. Reading the vertical scale to the left of the intersection point denoted an expected life of approximately 3 million operations for the selected size of contactor (CL25).
- C. If greater contactor life is required, continue the drawn vertical line to intersect with a larger size contactor line.

Caution note: Do not apply a contactor for use on a motor which has greater horsepower rating than shown in the tables on pages 2-20.

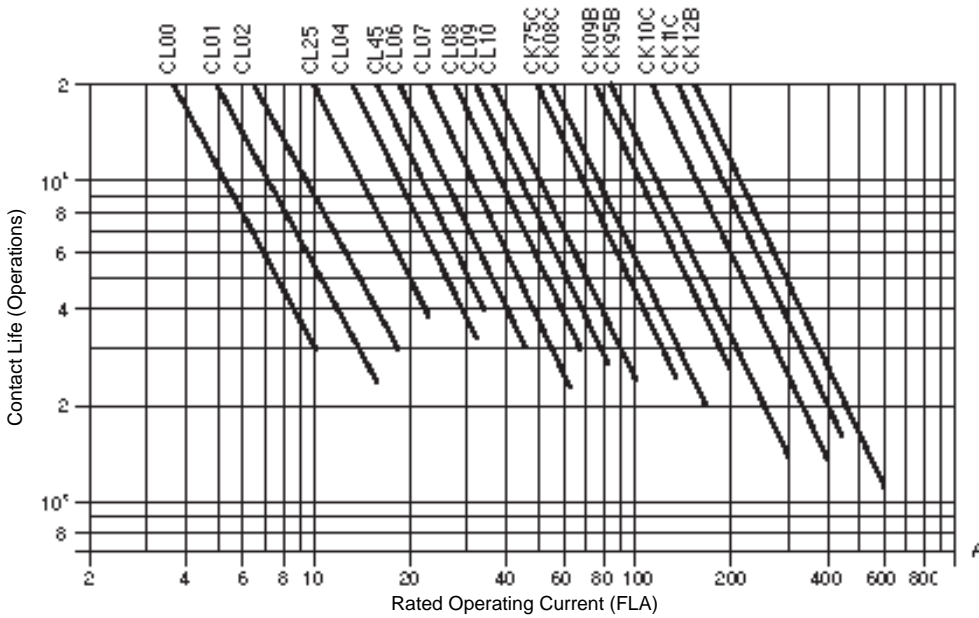
Life Curves

AC-1: Noninductive, or lightly inductive loads, e.g., resistance furnaces

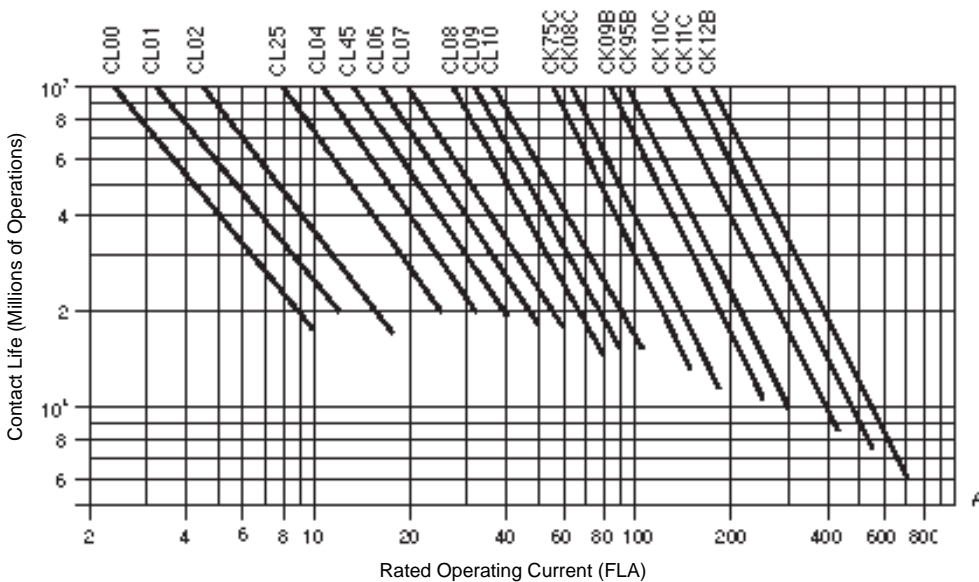


Applications Summary

AC-2: Starting of slip ring motors without plugging



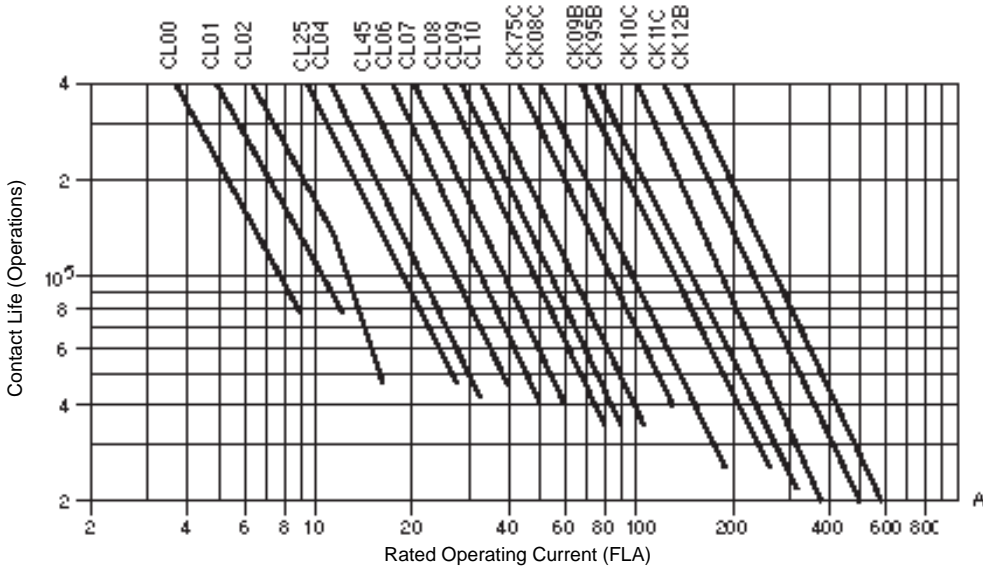
AC-3: Starting and stopping of squirrel cage motors





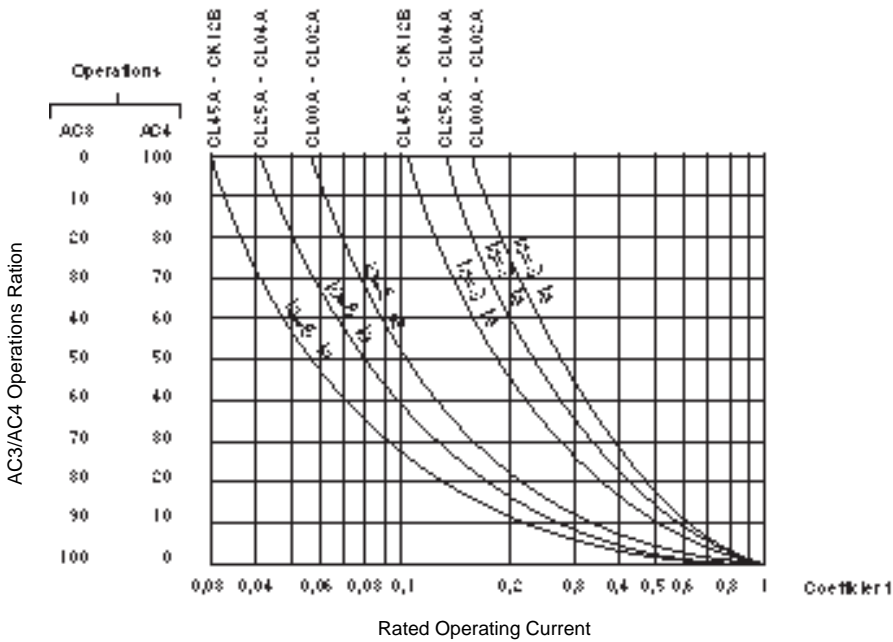
Applications Summary

AC-4: Inching (jogging) of squirrel cage motors



AC-3/AC-4: Mixed duty with squirrel cage motors

To calculate mixed AC-3/AC-4 life: Find the ratio of AC-3/AC-4 operations on the left side, read across to the appropriate curve for the contactor and breaking current expected (3 times FLA or 6 times FLA). Then read corresponding coefficient from the bottom of the curve. The product of this coefficient and the AC-3 life from the previous page is the expected life under mixed AC-3/AC-4 conditions.



Applications Summary

Specialized Applications

DC Utilization Categories

C-2000 Controls can be used as DC contactors in many industrial applications. These include: DC load banks, loop contactors and dynamic braking contactors in adjustable speed DC drives and other special motor control applications. Contact the motor manufacturer as to the starting requirements of a particular motor. Only small motors can be started at full voltage. Medium- and large-sized DC motors require resistance in series with armature during acceleration when connected to a constant potential DC system.

AC contactors are conditionally suitable for switching DC. The switching capacity for DC, using AC contactors, is decreased as the voltage increases, and also as inductance is added to the circuit.

Utilization Categories have been assigned to the more popular loads where contactors are required. They include:

DC-1

DC-1 applications involve switching noninductive loads such as resistive load banks.

DC-2

DC-2 applications involve starting and switching off shunt wound DC motors. Shunt wound DC motors are those most frequently used in adjustable voltage, adjustable speed DC drives. Even DC motors with permanent magnet fields are usually considered to be shunt wound.

DC-3

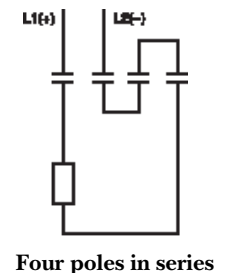
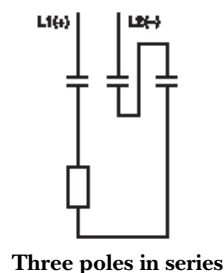
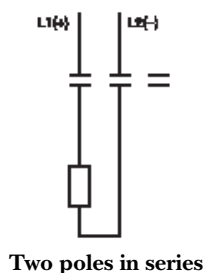
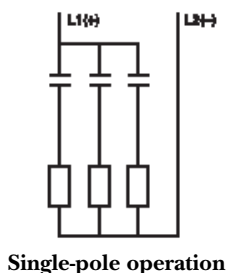
DC-3 applications involve starting, stopping, plugging and jogging shunt wound DC motors. Jogging is an inexpensive and frequently ordered DC drive modification. Care must be taken to determine when jogging is required, since it is more severe than duties covered by category DC-2.

DC-4 and DC-5

DC-4 and DC-5 applications cover use with series wound, traction-type DC motors. Traction motor requirements are application intensive and should involve factory review.

Ratings for DC Applications

Rated voltage Ue	DC-1 (LR ≤ 1 ms)												DC-3 (LR ≤ 2.5 ms)												DC-5 (LR ≤ 15 ms)														
	24V				125V				220V				440V				24V				125V				220V				440V										
Poles in Series	1	2	3	4	1	2	3	4	2	3	4	3	4	1	2	3	4	1	2	3	4	2	3	4	3	4	1	2	3	4	1	2	3	4	2	3	4	3	4
CL00	18	25	25	—	6	18	25	—	7.5	25	—	8	—	12	18	18	—	2	10	15	—	2	12	—	1.5	—	12	18	18	—	0.8	5	15	—	0.8	3	—	0.5	—
CL01	18	25	25	25	6	18	25	25	7.5	25	25	8	15	12	18	18	18	2	10	15	15	2	12	15	1.5	6	12	18	18	18	0.8	5	15	15	0.8	3	10	0.5	2
CL02	18	32	32	32	6	18	25	32	7.5	25	32	8	15	12	18	18	18	2	12	18	18	2	12	18	1.5	6	12	18	18	18	0.8	5	15	18	0.8	3	10	0.5	2
CL25	25	45	45	—	8	25	32	—	8	32	—	10	—	18	25	25	—	2	18	25	—	2	18	—	1.5	—	18	25	25	—	0.8	5	20	—	0.8	3	—	0.5	—
CL04	32	60	60	60	8	45	60	60	8	50	60	10	25	25	40	40	40	3	25	32	32	2	25	32	3	6	25	40	40	32	1.2	5	25	32	0.8	3	15	0.7	4
CL45	40	60	60	—	8	45	60	—	8	50	—	10	—	32	40	40	—	3	32	40	—	2	32	—	3	—	32	40	40	—	1.2	5	32	—	0.8	3	—	0.7	—
CL06	50	90	90	—	16	80	90	—	20	90	—	15	—	40	65	65	—	3	50	65	—	7	50	—	3	—	40	65	65	—	1.2	50	60	—	3	7	—	1	—
CL07	65	110	110	110	16	90	110	110	20	110	110	15	90	50	80	80	80	3	60	80	80	7	65	80	3	65	50	80	80	80	1.2	60	70	80	3	7	75	1	50
CL08	65	110	110	—	16	90	110	—	20	110	—	15	—	50	80	80	—	3	60	80	—	7	65	—	3	—	50	80	80	—	1.2	60	70	—	3	7	—	1	—
CL09	80	140	140	140	16	110	140	140	20	140	140	15	110	65	105	105	105	3	80	105	105	7	95	105	3	75	65	105	105	105	1.2	85	95	105	4	7	95	1	60
CL10	80	140	140	—	16	110	140	—	20	140	—	15	—	65	105	105	—	3	80	105	—	7	95	—	3	—	65	105	105	—	1.2	85	95	—	4	7	—	1	—
CK75	200	250	250	—	25	200	250	—	110	250	250	120	—	150	150	150	—	25	150	150	—	60	150	—	50	—	150	150	150	—	20	95	150	—	50	95	—	40	—
CK08	200	250	250	250	25	200	250	250	110	250	250	120	200	185	185	185	185	25	185	185	185	70	185	185	55	105	185	185	185	185	20	105	185	185	55	105	185	40	95
CK09	250	315	315	315	30	250	315	315	150	315	315	150	250	250	250	250	250	30	250	250	250	85	250	250	70	185	250	250	250	250	25	185	250	250	70	185	250	50	150
CK95	350	450	450	450	50	300	500	500	200	500	500	180	315	309	309	309	309	50	309	309	309	95	309	309	80	205	309	309	309	309	40	205	309	309	80	205	309	60	185
CK10	500	600	600	600	60	400	600	600	250	600	600	240	400	420	420	420	420	60	420	420	420	140	420	420	120	250	420	420	420	420	50	250	420	420	120	250	420	90	205
CK11	600	700	700	700	70	500	700	700	250	700	700	300	500	550	550	550	550	70	550	550	550	185	550	550	150	300	550	550	550	550	60	300	550	550	150	300	550	100	250
CK12	800	1000	1000	1000	100	600	1000	1000	300	1000	1000	400	700	700	700	700	700	100	700	700	700	225	700	700	180	400	700	700	700	700	80	400	700	180	400	700	700	100	300



Applications Summary

Maximum KVA of Transformer for Primary Switching (50/60 Hz)

Catalog Number	Max. Peak Closing Current	Phase	Inrush = 20 x Normal					Inrush = 40 x Normal				
			120V	208V	240V	480V	600V	120V	208V	240V	480V	600V
CL00	450 Amps	1	0.6	1	1.2	1.7	2.1	0.3	0.5	0.6	0.8	1
		3	1.1	1.9	2.2	3.1	3.8	0.5	0.9	1.1	1.5	1.9
CL01	450 Amps	1	0.8	1.4	1.7	2.4	3.0	0.4	0.7	0.8	1.2	1.5
		3	1.5	2.6	3.0	4.2	5.2	0.7	1.3	1.5	2.1	2.6
CL02	450 Amps	1	1.2	2.0	2.5	3.5	4.4	0.6	1.0	1.2	1.7	2.2
		3	2.2	3.8	4.5	6.3	7.7	1.1	1.9	2.2	3.1	3.8
CL25	550 Amps	1	1.8	3.1	3.7	5.2	6.4	0.9	1.5	1.8	2.6	3.2
		3	3.2	5.5	6.5	9.1	11.2	1.6	2.7	3.2	4.5	5.6
CL04	550 Amps	1	2.2	3.8	4.5	6.3	7.8	1.1	1.9	2.2	3.1	3.9
		3	4.0	7.0	8.0	11.2	13.7	2.0	3.5	4.0	5.6	6.8
CL45	550 Amps	1	2.8	4.8	5.7	8.0	9.7	1.4	2.4	2.8	4.0	4.8
		3	5	8.6	10	14.0	17	2.5	4.3	5	7.0	8.5
CL06	1000 Amps	1	3.4	5.9	6.8	9.5	12	1.7	2.9	3.4	4.7	6
		3	6	10.4	12	16.8	21	3	5.2	6	8.4	10.5
CL07	1000 Amps	1	4.2	7.2	8.5	12	14.2	2.1	3.6	4.2	6.0	7.1
		3	7.5	13	15	21	25	3.7	6.5	7.5	10.5	12.5
CL08	1000 Amps	1	5.7	10	11.4	16	20	2.8	5.0	5.7	8.0	10
		3	10	17.3	20	28	35	5	8.6	10	14	16
CL09	1280 Amps	1	7.1	12.3	14.2	20	22.8	3.5	6.1	7.1	10	11.4
		3	12.5	21.6	25	35	40	6.2	10.8	12.5	17.5	20
CL10	1280 Amps	1	8.5	14.7	17.1	24	28.5	4.2	7.3	8.5	12	14.2
		3	15	26	30	42	50	7.5	13	15	21	25
CK75	1850 Amps	1	10	17.2	20	28	31.3	5	8.6	10	14	15.6
		3	17.5	30.3	35	49	55	8.75	15.1	17.5	24.5	27.5
CK08	1850 Amps	1	11.4	19.7	22.8	32	34.2	5.7	9.8	11.4	16	17.1
		3	20	34.6	40	56	60	10	17.3	20	28	30
CK09	2500 Amps	1	14.2	24.6	28.5	40	48.5	7.1	12.3	14.2	20	24.2
		3	25	43.3	50	70	85	12.5	21.6	25	35	42.5
CK95	3700 Amps	1	18.5	32.0	37.1	52	62.8	9.2	16.0	18.5	26	31.4
		3	32	55.4	65	91	110	16	27.7	32	45	55
CK10	7000 Amps	1	22.8	39.5	45.7	64	85.7	11.4	19.7	22.8	32	42.8
		3	40	69.3	80	112	150	20	34.6	40	56	75
CK11	7000 Amps	1	28.5	49.4	57.1	80	97.1	14.2	24.7	28.5	40	48.5
		3	50	86.6	100	140	170	25	43.3	50	70	85
CK12	8400 Amps	1	45.7	79.2	91.4	128	160	22.8	39.6	45.7	64	80
		3	80	138.6	160	224	280	40	69.3	80	112	140



Overload Relays

Technical Characteristics

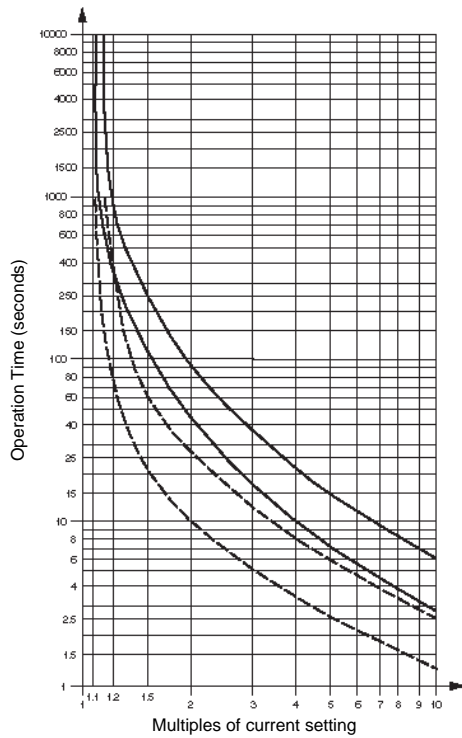
Catalog Number		RT1	RT2	RT3	RT4	RT5	RT4L	RT5L
Trip Class		10	10	10	10	10	30	30
Features		<ul style="list-style-type: none"> Thermal protection against balanced overloads. Differential protection against unbalanced overloads (phase failure). Protection against long starting times (RT4L, RT5L). Ambient temperature compensation. Front-mounted tripping current setting dial. Manual reset with stop or only automatic reset. Selected by means of a front selector lever. Tripping indicator. Independent and double-break auxiliary tripping contacts (1NO+1NC) with welding check lever. 						
For Use With		5-25 hp Contactors (CL00, CL01, CL02, CL25, CL04, CL45)	30-75 hp Contactors (CL06, CL07, CL08, CL09, CL10)	100-125 hp Contactors (CK75, CK08)	150-250 hp Contactors (CK09, CK95)	300-500 hp Contactors (CK10, CK11, CK12)	150-250 hp Contactors (CK09, CK95)	300-500 hp Contactors (CK10, CK11, CK12)
Standards, Approvals		IEC 947, VDE 660, UNE 115, NI C63-650, UL, CSA						
Terminals protected against accidental contact		In accordance with VDE 0106, T100, VBG 4						
Terminal Limits	Storage	-40° to +70° C						
	Operation (compensated)	-25° to +50° C						
Relative Humidity up to		98%						
Operating Altitude		10,000 feet without any change in characteristics						
Mounting Positions								
Plain Circuit Poles	Rated Insulation Voltage (UI) in Accordance with IEC	690 V	1000 V	1000 V	1000 V	1000 V	1000 V	1000V
	Frequency Limits	50-60 Hz	50-60 Hz	50-60 Hz	50-60 Hz	50-60 Hz	50-60 Hz	50-60 Hz
	Terminal Capacity			Lug Kit CKX03	Lug Kit CKX02	Lug Kit CKX01	Lug Kit CKX02	Lug Kit CKX01
			14-8 AWG	10-3 AWG RT2A - RT2J 10-1 AWG RT2K - RT2M	6-250 MCM	6-350 MCM	8-500 MCM, 2/0-600 MCM	6-350 MCM
Torque (in. - lb.)		20-14	50	275	200	375	200	375
Control Circuit	Rated Insulation Voltage (UI) in Accordance with IEC		690 V					
	Rated Thermal Current (Ith)		10 A					
	Operation Current	In AC-15 Ue-Ie	220-2 V-A, 380-1 V-A, 500-0.8 V-A					
		In DC-13 Ue-Ie	48-1.4 V-A, 110-0.6 V-A, 250-0.3 V.A					
	Utilization in Accordance with UL and CSA		B600, Q600					
Nr. and Arrangement of Contacts		1NO, 1NC 						

Warning: Overload Relays, when adjusted for automatic reset, should not be used with 2-wire maintained contact pilot device such as pressure, float and limit switched, as inadvertent restarting of the motor can occur.

Overload Relays

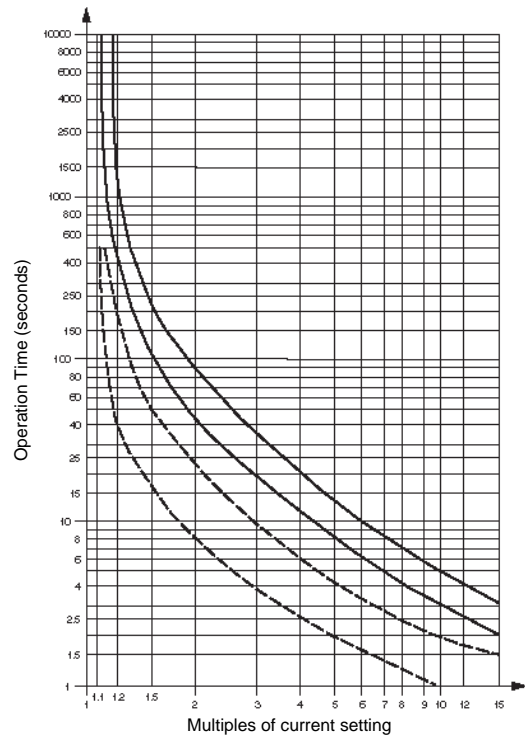
Technical Characteristics

Warning: Overload relays, when adjusted for automatic reset, should not be used with two-wire, and maintained contact pilot devices (e.g., pressure, float and limit switches) to prevent inadvertent restarting of the motor.

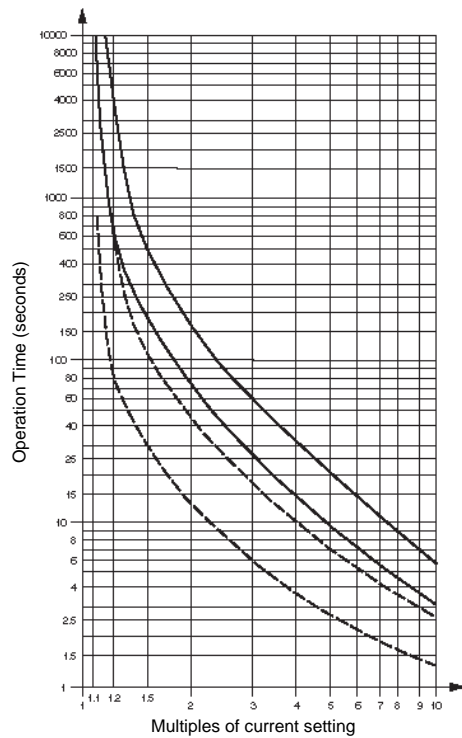


RT1

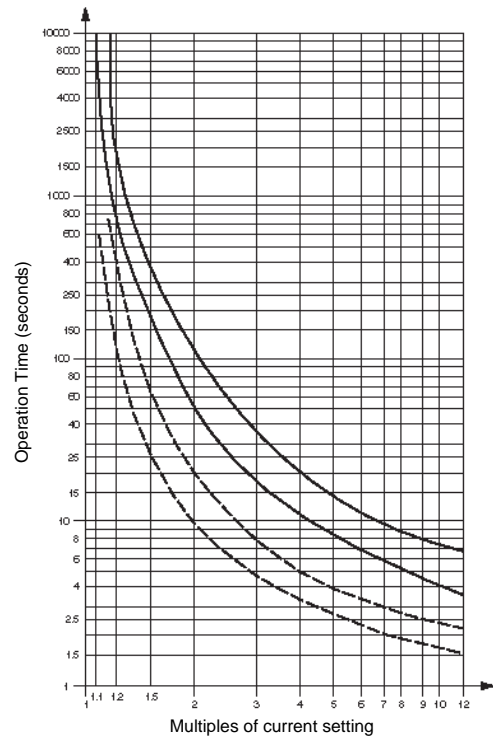
Tolerance Band
 — Cold State
 - - - Warm State



RT2



RT3



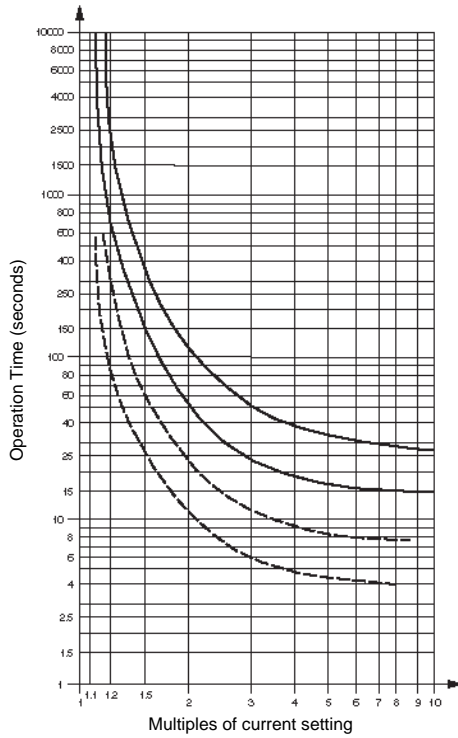
RT4



Overload Relays

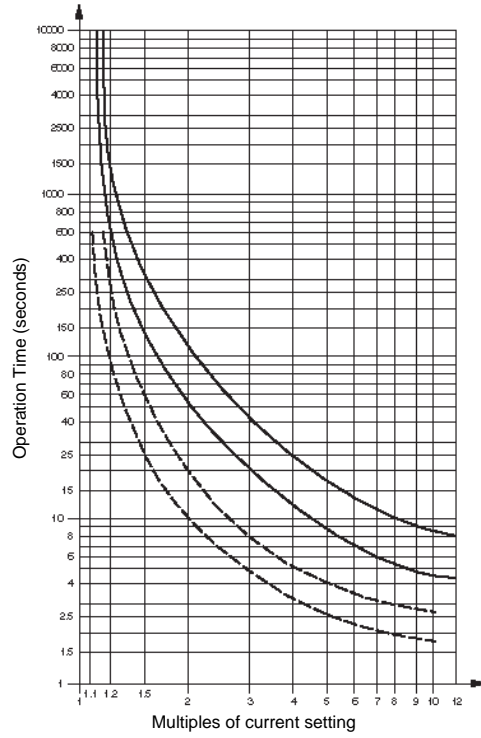
Technical Characteristics

Warning: Overload relays, when adjusted for automatic reset, should not be used with two-wire, and maintained contact pilot devices (e.g., pressure, float and limit switches) to prevent inadvertent restarting of the motor.

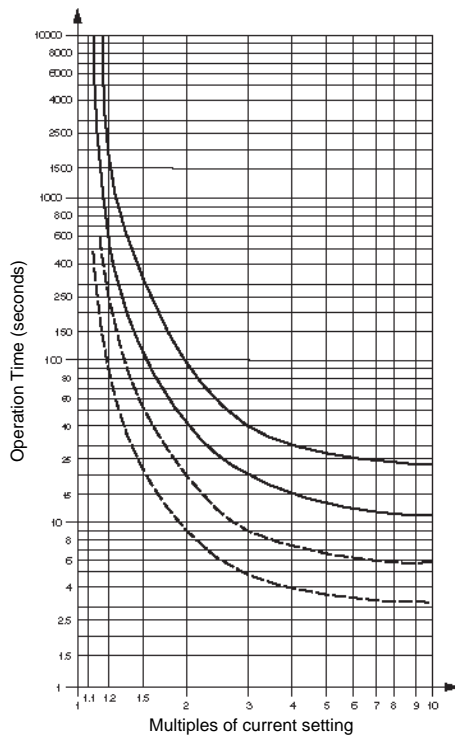


RT4L

Tolerance Band
— Cold State
- - - Warm State



RT5



RT5L

Type 2 Coordination

Type 2 Coordination

C-2000 contactors and starters have been tested and certified to meet IEC 947.4 Type 2 coordination when protected with the type “J” fuses shown below.

“Type 2 coordination requires that, under short-circuit conditions, the contactor or starter shall cause no danger to persons or installation and shall be suitable for further use. The risk of contact welding is recognized, in which case the manufacturer shall indicate the measures to be taken as regards the maintenance of the equipment.” (IEC 947.4)

Short Circuit Test Condition100,000 Amps (maximum)
 Fuse Type“J”
 Fuse Manufacturer Part Number or Type
 Bussmann“LPJ-SP”
 Gould Shawmut“AJT”

Note: Use of Short Circuit Protective Device not in compliance with the above manufacturer’s type may invalidate the coordination.

C-2000 Contactors

Catalog Type	Maximum Amps	Type LPJ-SP or AJT Maximum Fuse
CL00	10	25
CL01	13.8	35
CL02	17.5	40
CL25	22	45
CL03	25	60
CL04	32	60
CL45	34	70
CL05	42	90
CL06	48	100
CL07	62	125
CL08	68	125
CL09	80	150
CL10	104	200
CK08	156	300
CK09	192	400
CK95	302	450
CK10	398	800
CK11	480	900
CL12	602	1000

C-2000 Starters

Overload Type	Maximum Amps	Type LPJ-SP or AJT Maximum Fuse	Overload Type	Amp Range	Type LPJ-SP or AJT Maximum Fuse
RT1F	0.65-1.1	1.5	RT2M	90-110	200
RT1G	1-1.5	2	RT3PB	55-80	125
RT1H	1.3-1.9	4	RT3PC	63-90	150
RT1J	1.8-2.7	4	RT3PD	90-120	200
RT1K	2.5-4.1	8	RT3PE	110-140	250
RT1L	4-6.3	10	RT3PF	140-180	300
RT1M	5.5-8.5	12	RT4LN	120-190	350
RT1N	8-12	20	RT4N	120-190	350
RT1P	10-16	25	RT4LP	175-280	450
RT1S	14.5-18	35	RT4P	175-280	450
RT1T	17.5-22	45	RT4LR	200-310	450
RT1U	21-26	45	RT4R	200-310	450
RT1V	25-35	60	RT5A	120-190	400
RT1W	30-40	70	RT5LA	120-190	400
RT2A	11.5-15	30	RT5B	175-280	600
RT2B	14.5-19	35	RT5LB	175-280	600
RT2C	18.5-25	45	RT5C	250-400	800
RT2D	24-32	60	RT5LC	250-400	800
RT2E	30-43	70	RT5D	315-500	900
RT2G	42-45	100	RT5LD	315-500	900
RT2H	54-65	125	RT5E	430-650	1000
RT2J	64-82	150	RT5LE	430-650	1000
RT2L	78-97	200			

Type 2 Coordination, Group Installation, CR72 Manual Motor Controllers

Available Fault Current	Voltage	Motor Control Cat. No.	C-2000 Contactor Size	Fuse Class Max. Amps.		
				J	RRK-5	CC
42KA	480	CR72AMA-MP	CL00-04	100	30	30

Note: See GEP-1260 for more information on CR72 group installations.

Type 2 - Maintenance Procedure, C-2000 Products

Before Working on Contactor/Starter, make sure all electrical power is turned off, including the control voltage.

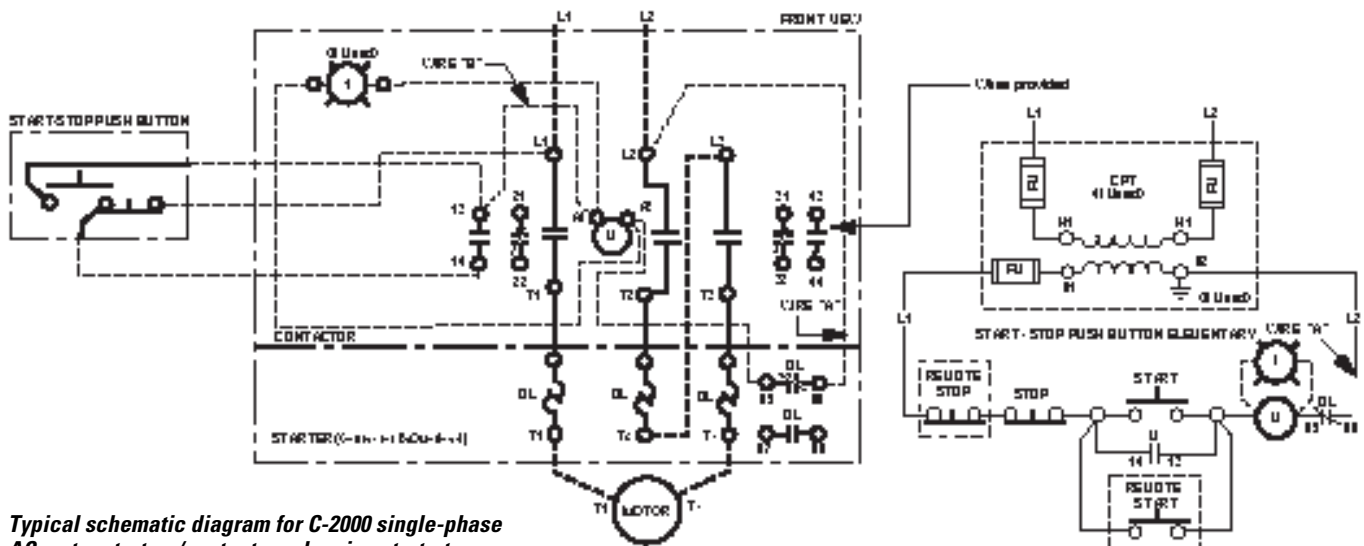
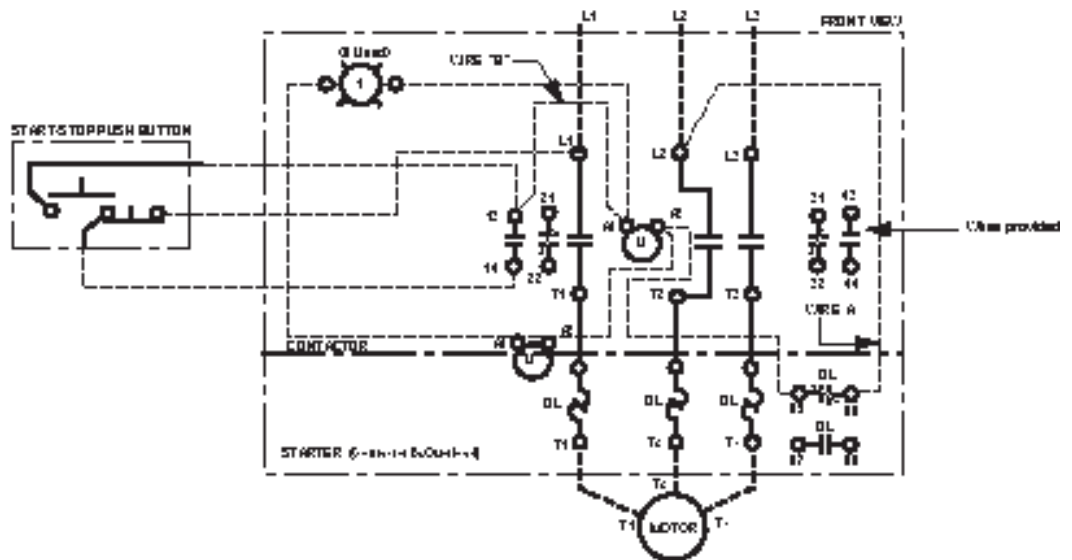
- Step 1. Tighten down all terminals, on the CL00 thru CL45, (including 4th pole auxiliary contacts), securing them in place.
- Step 2. Remove outer cover, with screwdriver:
CL Products: The cover has a snap fit design. Pry the ends of the cover loose from the contactor with screwdriver, releasing the snaps.
CK Products: The cover is held with two screws. Loosen the screws and remove.

- Step 3. Remove inner cover, CL03 thru CL10 only, which is held by 2 or 4 screws. Loosen screws and remove.
 - Step 4. Examine contacts for welding. If a contact is welded, gently pry the contacts apart using a screwdriver.
 - Step 5. Reassemble by reversing the above procedure (Steps 4, 3, 2).
- To ensure contactor is operating correctly, operate at least ten times with main power off. Confirm that all poles are correctly opening and closing with a continuity meter.



Wiring Diagrams

Typical schematic diagram for C-2000 three-phase AC motor starters/contactors showing start-stop push button connections



Typical schematic diagram for C-2000 single-phase AC motor starters/contactors showing start-stop push button connections

Start-stop push button/control transformer elementary

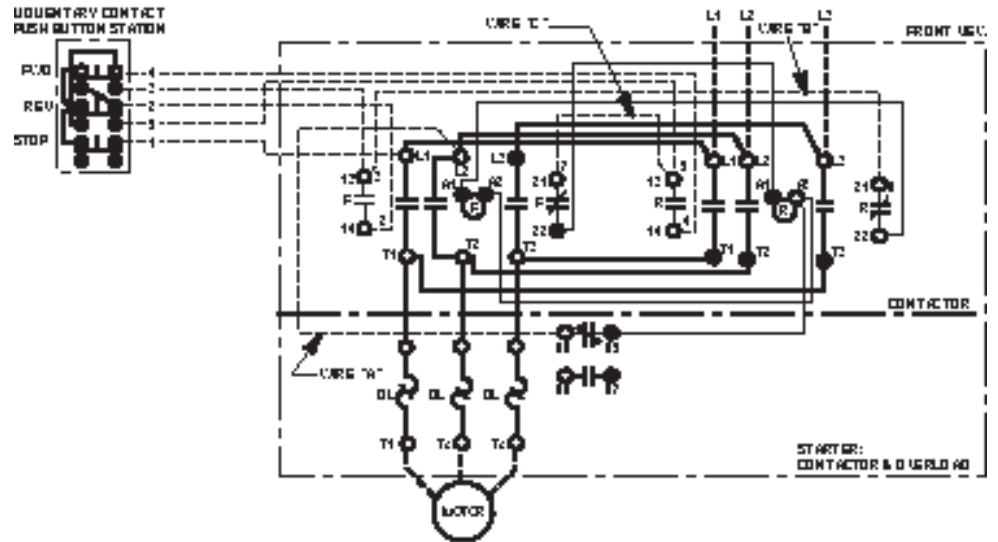
Notes:

Holding interlock is numbered 13 and 14 on some forms and the normally closed auxiliary contact is not standard on all forms.

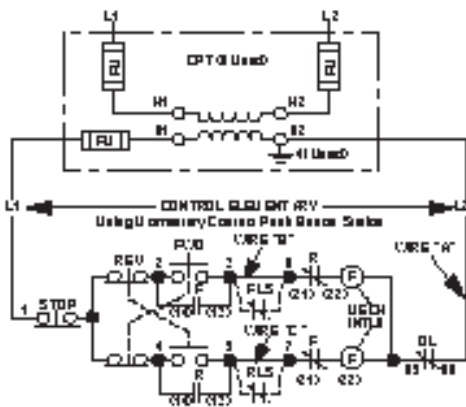
Wiring Diagrams

Legend

- F and R Forward and Reverse Line Contactors, Mechanically and Electronically Interlocked
- FLS Forward Limit Switch
- RLS Reverse Limit Switch
- OL Thermal Overload Relay



Typical Schematic drawing for C-2000 three-phase AC reversing motor starter/contactors showing monetary contact push button station connections



Momentary contact push button station/control transformer elementary

Notes:

Cross Electrical interlocks may be marked 01 and 02.

Wires "B" and "C" are omitted. These wires must be added if limit switches are not used.

● Factory wired terminals

○ Field wired terminals



Guideform Specifications

Description

All contactors shall follow European design conventions and shall conform to the standards of the International Electro-technical Commission (IEC), be listed by Underwriters Laboratories (UL) and be certified by the Canadian Standards Association (CSA). They shall include:

1. A full line of power contactors (3- and 4-pole)
2. A complete range of current overload relays
3. A full array of auxiliary devices to allow wide control functionality

The devices shall be easily assembled by either the supplier or the user. They shall be configurable into full-voltage non-reversing motor starters, full-voltage reversing motor starters, full-voltage two-speed two-winding motor starters, and wye-delta motor starters. The accessories shall be easily assembled and shall include:

1. Auxiliary contacts, both normally open and normally closed, mountable on the front or either side of the contactor
2. Timer, front mountable
3. Mechanical latch attachment, front mountable
4. Mechanical-electrical interlock with two built-in normally closed contacts for units through 75hp @ 460V
5. Surge suppressor: RC, varistor and diode types
6. Panel mounted overload relay capability

All components of the line shall be suitable for low voltage applications and shall therefore carry a 600V AC rating.

The power components (contactors and overload relays) shall be tested to UL and CSA standards and carry those listing marks. They also shall carry the appropriate listing marks showing compliance with European agency approvals based on IEC performance standards.

Auxiliary components, such as auxiliary contacts, also shall carry all of the above agency approvals and be capable of carrying 10 amperes of AC current at 600 volts in accordance with heavy pilot industrial duty (A600 rating) or clearly mark any and all exceptions.

Product

Contactors

Contactors shall function as electrically operated, three phase (or, in some cases, single phase) power switches that, when coupled with appropriate overload relays, function as full-voltage non-reversing motor starters. They shall have the capability of providing these functions for standard motors throughout the range of horsepower ratings from 5hp to 500hp @ 460Vac, three phase. The contactor line shall include 4-pole contactors in two versions: 4NO from 25A to 650A as a maximum current rating AC-1, and 2NO-2NC from 7.5hp to 50hp @ 460V.

The contactors shall provide a suitable method by which the user can connect power wires to both sides of the contactor. In the smaller sizes (5hp-75hp @ 460V), the wiring shall be fully inserted into a box lug (screw or terminal) and, in the larger sizes (100hp-500hp @ 460V), a bus bar shall be provided. It shall be possible to attach a separate lug as an accessory to the bus bar for ease of wiring if desired. The power terminals in the smaller frame sizes of contactor shall be recessed within the frame of the device, as shall the wire lugs, to provide finger and back-of-hand protection.

The power line and load lug connection of the power devices shall be labeled and identified with both U.S. terminology (i.e., L1, L2, L3, T1, T2, T3) and European terminology (i.e., 1,3,5,2,4,6). These markings shall be large and easy to read.

Electrical operation of the power contactor shall occur when a single phase control power voltage is applied across a wide horsepower/kilowatt range. Horsepower/ kilowatt ratings are shown below:

General Purpose Ratings	Max. FLA	1 Phase - Hp (A)		3 Phase - Hp (A)				Power In 380/400V kW (A)
		115V	230V	200V	230V	460V	575V	
25	10	.5 (9.8)	1.5 (10)	3 (11)	3 (9.6)	5 (7.6)	7.5 (9)	4 (9)
25	13.8	.75 (13.8)	2 (12)	3 (11)	3 (9.6)	7.5 (11)	10 (11)	5.5 (12)
32	17.5	1 (16)	3 (17)	5 (17.5)	5 (15.2)	10 (14)	15 (17)	7.5 (18)
32	22,22,17 ^A	1.5 (20)	3 (17)	5 (17.5)	7.5 (22)	15 (21)	15 (17)	11 (25)
54	32	2 (24)	5 (28)	10 (32)	10 (28)	20 (27)	25 (27)	16 (32)
55	34,34,27 ^A	3 (34)	5 (28)	10 (32)	10 (28)	25 (34)	25 (27)	18.5 (40)
80	48	3 (34)	7.5 (40)	15 (48)	15 (42)	30 (40)	40 (41)	22 (50)
100	62	5 (56)	10 (50)	20 (62)	20 (54)	40 (52)	50 (52)	30 (65)
110(O) 102(E)	68	5 (56)	15 (68)	20 (62)	25 (68)	50 (65)	60 (62)	37 (80)
140(O) 120(E)	80	7.5 (80)	15 (68)	25 (78)	30 (80)	60 (77)	75 (77)	45 (95)
140(O) 120(E)	104,96,80 ^A	10 (100)	20 (88)	30 (92)	40 (104)	75 (96)	75 (77)	55 (105)
150	140	10 (100)	25 (110)	40 (120)	50 (130)	100 (124)	125 (125)	75 (154)
175	156	15 (135)	30 (136)	50 (149.5)	60 (145)	125 (156)	125 (125)	90 (185)
200	192	—	—	60 (169.4)	75 (192)	150 (180)	150 (144)	132 (250)
310	302	—	—	100 (285)	100 (248)	250 (302)	300 (289)	160 (310)
500	398	—	—	125 (358)	150 (360)	300 (361)	400 (382)	220 (420)
600	480	—	—	150 (414)	200 (480)	400 (477)	500 (472)	280 (550)
650(E) 750(O)	602	—	—	200 (552)	250 (602)	500 (590)	600 (574)	375 (700)

^A Amps at 230V/460V/575V

Note: (O) = Open, (E) = Enclosed

Guideform Specifications

All power contactors above 125hp @ 460V shall incorporate an electronic module to control the voltage coil for lower power consumption, longer life and surge suppression

All models of the power contactor below 75hp @ 460V shall accept the full range of accessory devices and allow mounting of the accessories on the front or either side.

Contactors shall be provided with at least one normally open auxiliary contact for customer use.

A manufacturer's label affixed to each contactor shall clearly show the horsepower and kilowatt ratings of the device, and the UL, CSA and other appropriate listing marks. This label shall be permanent and the marking shall neither fade nor otherwise become illegible.

All power contactors up to 75hp @ 460V shall be provided with three coil terminals (A1-A2, A2). Coil terminal A2 shall be available on both upper and lower faces of the terminal for convenience of user wiring and ease of use.

Terminals on all contactors up to 75hp @ 460V shall simultaneously accept two wires of differing cross-section to simplify wiring and reduce wiring time. Power contactors from 5hp to 15hp @ 460V range shall accept two wires per terminal. Terminals on power contactors from 20hp to 75hp @ 460V shall be double clamp type, permitting the connection of two flexible or rigid power and control wires of differing sizes.

All power contactors up to 75hp @ 460V shall allow mounting both on a 35mm DIN rail, through a permanently installed clip on the device, and to a panel back plate with four-point screw attachment. Power contactors larger than 75hp @ 460V shall mount through a four-point screw attachment only.

The surge suppressor block shall fit directly in the upper A1-A2 coil terminals without reducing available wiring space.

Four different auxiliary contact combinations shall be available on relay devices: 4NO, 3NO-1NC, 2NO-2NC and 4NC.

The complete line of devices, in addition to carrying all UL, CSA and IEC listings, shall also be rated to:

1. CSA elevator-duty ratings
2. Capacitor switching duty values
3. Transformer switching duty values
4. Type 2 protection with approved fuse type
5. DC power current carrying capability values

Contactors shall have a professional appearance reflecting a quality design and industrial ruggedness. The manufacturer's logo shall be clearly visible.

Overload relays

Overload relays shall consist of models that satisfy applications in all motor current ranges from fractional horsepower ratings ($\frac{1}{4}$ hp, $\frac{1}{2}$ hp, $\frac{3}{4}$ hp) up to 500hp @ 460Vac, three phase power. In addition, they shall have the capability, when wired to the manufacturer's specifications, of being applied in single phase motor circuits of either 230V AC or 115V AC up to a 30hp rating.

The overload relays shall provide Class 10 overload protection to motors. Class 30 overload relays shall be available for contactors rated at 150 hp @ 460V and larger.

The overload relay shall have an auxiliary contact of a normally open form and a normally closed contact to be wired in series with the contactor coil. A method to test the overload relay by manually causing it to trip shall be provided and confirmation of that contact trip shall be visible. The manual trip mechanism shall be accessible without disassembling any components, but protected from accidental actuation.

The overload current setting adjustment shall be front-mounted and screwdriver operable. The calibrated legend and set points shall be easy to read. This adjustment shall change only when deliberately done so. A protective cover for this adjustment shall be an option.

All overload relays, up to 125hp @ 460V, shall be easily attached to the contactors for which they have been designed. Mounting stability shall be accomplished by both tightening the three load terminals into which the overload relay fits and by the use of a molded clip that rests on a receiving lip or edge of the contactor.

In accordance with IEC design standards, all electrical current carrying parts (terminals, screws, etc.) shall be recessed in the overload relay's housing to provide total finger and back-of-hand protection to reduce or eliminate the risk of accidental shock.

Overload relays shall be selectable with manual reset only, manual reset-push to stop, automatic reset only, and automatic reset-push to stop type. The desired method shall be selectable by setting a switch on the overload relay. When the overload relay is ordered, the manufacturer shall ship it set to the manual operation position.

The manufacturer's nameplate shall display the UL, CSA and appropriate IEC listings and shall clearly show the manufacturer's part number for easy identification. The nameplate shall be permanently affixed and the marking shall not fade, run, smudge or otherwise become illegible over time.

Coils

Contactors coils shall provide sufficient power to magnetically operate the mechanism within the tolerances of the design and shall be electrically isolated from the power circuit and its pieces.

The coils shall be clearly labeled or stamped by the manufacturer with their voltage and frequency ratings. This marking shall be permanently affixed.

The coils in the smaller devices shall have power applied directly to them, while the coils in sizes 100 hp @ 460V and above shall receive power through an electronic actuation module. The electronic actuation module shall provide positive pickup and positive dropout, thereby avoiding chatter under low voltage conditions. Audible noise during operation shall be minimized for use in offices and quiet environments. Coil inrush shall be 750VA or less. Holding burden shall be 25VA or less. Coils shall be provided with a wide range of power selections of both AC types and DC types. These selections shall be as shown on the following page:



Guideform Specifications

AC Voltage		DC Voltage
60 Hz	50 Hz	
24	24	—
—	—	12
—	—	24
48	42	—
—	—	48
120	110	—
—	—	125
208	—	—
277	220/230	—
240	—	—
—	—	250
480	380/400	—
—	415	—
600	500	—

Additional coil selections shall be available for specialized applications.

Accessories

Timer

The timer accessory shall be mountable on the front of every contactor up to 75hp @ 460V and shall include two contacts, one normally open and one normally closed. Timers shall be available in two styles, ON delay and OFF delay, and two ranges, 0.1-30 seconds and 10 to 60 seconds. The desired time shall be adjustable throughout the range by turning a calibrated knob to a set point. A mechanical stop will be provided to prevent adjustment beyond setting range. Contact operation shall occur upon time expiration and contact current load shall be consistent with a heavy pilot industry duty rating of A600 P300.

Mechanical latch

The mechanical latch accessory shall be a front-mountable device that fits every contactor up to 75hp @ 460V and shall incorporate an electrical release coil for contactor reset. The release coils available shall be as shown below.

- 24V-32V
- 48V-72V
- 110V-125V
- 208V-277V
- 380V-440V
- 480V-600V

Front-mount and side-mount auxiliary contacts

With just two front-mounted auxiliary contact blocks — 1NO and 1NC — it shall be possible to achieve any combination of auxiliaries while maintaining EN50012 numbering standards, thus reducing inventory requirements and increasing flexibility. Overlapping contact versions also shall be available on both front-mounted auxiliary contact blocks.

All contactors shall accommodate the same side-mounted auxiliary contact block. Such side-mounted auxiliary contact blocks shall be available in 2NO and 1NO-1NC versions.

Contactors shall accommodate maximum auxiliary contacts as shown in the following table.

Mechanical-electrical interlock

Horsepower @ 460V	Max. Aux. Contacts	Max. Contact Block Configuration
5-15	4	4 front-mount or 1 side-mount on each side
20-25	6	4 front-mount plus 1 side-mount or 2 front-mount plus 1 side-mount on each side
30-75	8	6 front-mount plus 1 side-mount or 2 side-mount on each side
100-500	8	2 side-mount on each side

Mechanical-electrical interlocks shall fit in all contactors from 5hp to 75hp @ 460V and shall provide two built-in NC contacts. A second mechanical interlock for all contactors 100 hp @ 460 V and larger shall be available.

Surge suppressor

Surge suppressors shall mount directly in the upper A1-A2 coil terminals in contactors from 5hp to 75hp @ 460V without reducing the available wiring space. The line shall provide R/C, diode and varistor surge suppressor accessories.



Control Relays

4 Contacts

AC and DC

Control Relay catalog numbers are shown in the shaded area in the **Control Relay Selection and Data** table. To complete the catalog number, replace the asterisk (*) with the appropriate digit from the shaded area in the **Coil Selection** table. Additional coil information is shown in the **Coil Data** table.

Control Relay Selection and Data

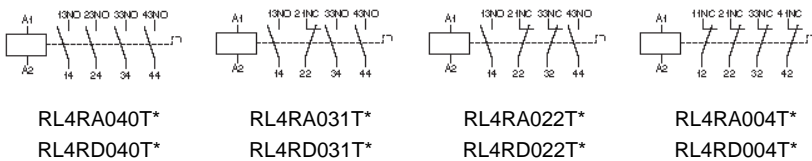
		Contact Arrangement			
		4NO-0NC	3NO-1NC	2NO-2NC	0NO-4NC
AC Control Relays		RL4RA040T*	RL4RA031T*	RL4RA022T*	RL4RA004T*
DC Control Relays		RL4RD040T*	RL4RD031T*	RL4RD022T*	RL4RD004T*
Aux. Contacts	Maximum Aux. Contacts	4	4	4	4
	Maximum Aux. Configuration	4 Front-Mount or 1 Side-Mount on each side			
Contact Rating		A600		P600	

Contact Rating	A600	P600
Continuous Thermal Current	10A	5A
Max. VA/Amps Making	7200VA/60A	138VA
Max VA/Amps Breaking	720VA/6A	138VA
Max. Operating Voltage	600 VAC	600 VDC

Note:

For DC ratings at 300 Volts or less, the make and break ratings shall be obtained by dividing the voltampere rating by the application voltage but shall not exceed the continuous carrying current.

The DC rating shown in the above table shall not be exceeded when applied to control circuit devices.



Coil Selection

AC Voltage		DC Voltage	Coil Suffix
60 Hz	50 Hz		
24	24	—	1
—	—	12	B
—	—	24	D
48	42	—	F
—	—	48	G
120	110	—	J
—	—	125	K
208	—	—	L
277	220/230	—	N
240	—	—	S
—	—	250	T
480	380/400	—	U
—	415	—	W
600	500	—	Y

Coil Data

	AC Voltage	DC Voltage
Burden		
Inrush	45 VA	5.5 W
Holding	6 VA	5.5 W
Pick-up Voltage (% Of Coil Volts)	85-110	80-110
Drop-Out Voltage (% Of Coil Volts)	40-55	20-40
Switching Delay (ms)		
Switching Delay On		
Coil Voltage at +10% to -20%	6-25	35-65
Coil Voltage At Rated Value	8-20	40-45
Switching Delay Off		
Coil Voltage at +10% to -20%	6-13	30-60
Coil Voltage At Rated Value	6-13	30-60
Maximum Operations per Hour		
No Load	9000	3600
Rated Load	1200	1200

REFERENCES

Standards and Listings	Page 41
Additional Coil Information	Page 37
Instruction Sheet	GEH-6428
UL File Number	E76233
CSA File Number	LR30821



Control Relays

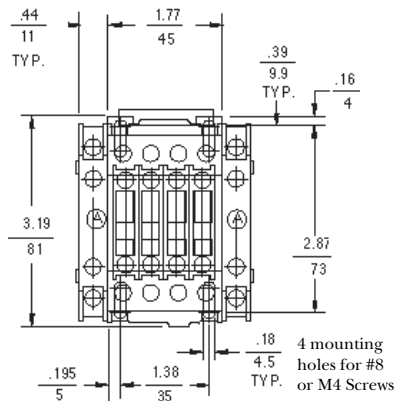
4 Contacts

AC and DC

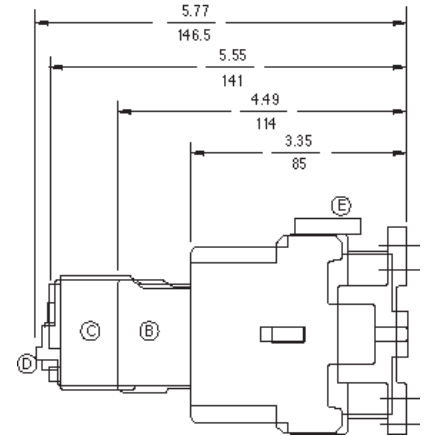
Legend and Notes for Illustration

- Ⓐ Extra Auxiliary Contacts, Side Mounted (if used)
- Ⓑ Extra Auxiliary Contacts, Front Mounted (if used)
- Ⓒ Pneumatic Timer (if used)
- Ⓓ Mechanical Latch (if used)
- Ⓔ Transient Voltage Suppressor

Add 1/2 inch for electrical clearance to enclosure.



AC Control Relay - Front View

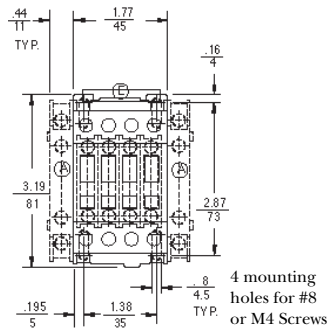


AC Control Relay - Side View

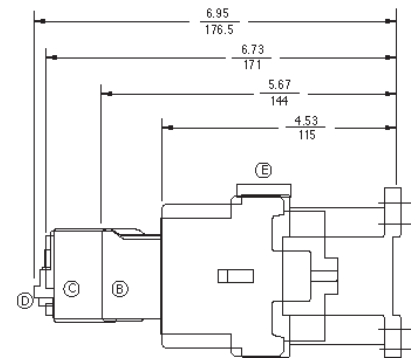
Engineering Outline Drawings

AC Control Relay.....55-215782

DC Control Relay55-215835



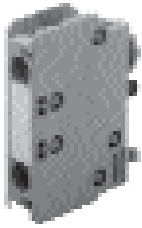
DC Control Relay - Front View



DC Control Relay - Side View

Control Relay Accessories

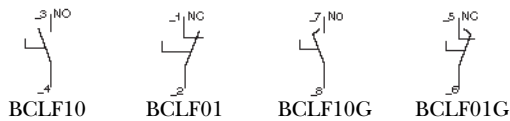
Front-Mount Auxiliary Contact Blocks



Front-mount auxiliary contact blocks clip onto front face of control relay. Contact rating: A600 Q600.

Type	Contacts	Catalog No.	Weight
Standard	1NO	BCLF10	.5 oz.
	1NC	BCLF01	.5 oz.
Make Before Break (Overlapping Contacts)	1NO	BCLF10G	.5 oz.
	1NC	BCLF01G	.5 oz.

Instantaneous, Front-Mounted



Contact Ratings

	A600	Q600
Continuous Thermal Current	10 A	2.5 A
Max. VA/Amps Making	7200 VA / 60 A	69 VA
Max. VA/Amps Breaking	720 VA / 6 A	69 VA
Max. Operating Voltage	600 VAC	600 VDC

Note: For DC ratings at 600 Volts or less, the make and break ratings shall be obtained by dividing the voltampere rating by the application voltage but shall not exceed the continuous carrying current.

The DC rating shown in the above table shall not be exceeded when applied to control circuit devices.

Front-Mount Auxiliary Contact Block Specifications

- Rated thermal current (I_{th}) temperature below 55°C 10A
- Rated insulation voltage (U_i) in accordance with IEC 947 1000V
- Making capacity (r.m.s.) in accordance with IEC 947 AC 15/AC 11, U_e ≤ 400V, 50/60 Hz 90A DC 13/DC 11, U_e ≤ 220V DC 90A
- Breaking capacity (r.m.s.) in accordance with IEC 947 AC 15/AC 11, U_e ≤ 400V, 50/60 Hz 60A DC 13/DC 11, U_e ≤ 220V DC 0.95A
- Electrical (AC-3) endurance at rated current (millions of operations) 1.0
- Insulation resistance
 - Between contacts > 10 MΩ
 - Between contacts and earth > 10 MΩ
 - Between input and output > 10 MΩ
- Standard Instantaneous Contacts
 - Guaranteed no overlap between NO and NC contacts Space 1.3 mm
 - Time 1.5 ms

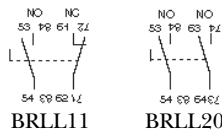
Side-Mount Auxiliary Contact Blocks



Side-mount auxiliary contact blocks can be mounted on either left or right sides of control relay. Positive displacement contacts are designed to prevent simultaneous closing of NO and NC contacts to avoid overlapping between opposing functions. Contact rating: A600 Q600.

Contacts*	Adder Block	Weight
1NO-1NC	BRLL11	2 oz.
2NO	BRLL20	2 oz.

* Maximum of two side-mount auxiliary contact blocks per side of control relay.



Contact Ratings

	A600	Q600
Continuous Thermal Current	10 A	2.5 A
Max. VA/Amps Making	7200 VA / 60 A	69 VA
Max. VA/Amps Breaking	720 VA / 6 A	69 VA
Max. Operating Voltage	600 VAC	600 VDC

Note: For DC ratings at 600 Volts or less, the make and break ratings shall be obtained by dividing the voltampere rating by the application voltage but shall not exceed the continuous carrying current.

The DC rating shown in the above table shall not be exceeded when applied to control circuit devices.

Side-Mount Auxiliary Contact Block Specifications

- Rated thermal current (I_{th}) temperature below 55°C 10A
- Rated insulation voltage (U_i) in accordance with IEC 947 1000V
- Making capacity (r.m.s.) in accordance with IEC 947 AC 15/AC 11, U_e ≤ 400V, 50/60 Hz 90A DC 13/DC 11, U_e ≤ 220V DC 90A
- Breaking capacity (r.m.s.) in accordance with IEC 947 AC 15/AC 11, U_e ≤ 400V, 50/60 Hz 60A DC 13/DC 11, U_e ≤ 220V DC 0.95A
- Electrical (AC-3) endurance at rated current (millions of operations) 1.0
- Insulation resistance
 - Between contacts > 10 MΩ
 - Between contacts and earth > 10 MΩ
 - Between input and output > 10 MΩ
- Standard Instantaneous Contacts
 - Guaranteed no overlap between NO and NC contacts Space 1.3 mm
 - Time 1.5 ms



Control Relay Accessories

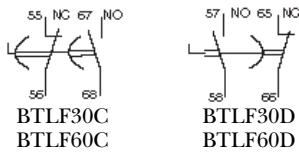
Pneumatic Timers



Pneumatic timers are adjustable time-delayed auxiliary contacts. They come equipped with two time-delayed contacts: 1NO and 1 NC, electrically separated. Setting is scaled over a 350° rotation by means of a knurled knob with timing guide marks. To mount a pneumatic timer, simply clip it on front face of control relay. Contact rating: A600 Q600.

Type	Range	Contacts	Time Catalog No.	Weight
Time Delay On	.1-30 sec 1-60 sec	1NO-1NC 1NO-1NC	BTLF30C BTLF60C	3 oz. 3 oz.
Time Delay Off	.1-30 sec 1-60 sec	1NO-1NC 1NO-1NC	BTLF30D BTLF60D	3 oz. 3 oz.

Timed, Front-Mounted



Pneumatic Timer Specifications

Rated thermal current
(I_{th}) temperature below 55°C10A

Rated insulation voltage
(U_i) in accordance with IEC 9471000V

Making capacity (r.m.s.) in accordance with IEC 947
AC 15/AC 11, U_e ≤ 400V, 50/60 Hz90A
DC 13/DC 11, U_e ≤ 220V DC90A

Breaking capacity (r.m.s.) in accordance with IEC 947
AC 15/AC 11, U_e ≤ 400V, 50/60 Hz60A
DC 13/DC 11, U_e ≤ 220V DC0.95A

Electrical (AC-3) endurance at
rated current (millions of operations)1.0

Mechanical life (millions of operations)5.0

Insulation resistance
Between contacts> 10 MΩ
Between contacts and earth> 10 MΩ
Between input and output> 10 MΩ

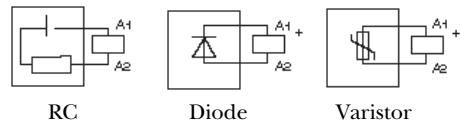
Guaranteed no overlap between NO and NC contacts
Space1.3 mm
Time1.5 ms

Surge Suppressor



For suppression of disturbances in electronic circuits due to the coil transient voltage occurring on opening of the contactor. Limits high voltage transients that may be produced when coil is de-energized. Mounts directly on the top of the coil.

Surge Suppressor Type	Catalog No.	Voltage	Weight
RC	BSLR2G	24-48 VAC	1 oz.
	BSLR2K	50-127 VAC	1 oz.
	BSLR2R	130-240 VAC	1 oz.
Diode	BSDLZ	12-600 VDC	1 oz.
Varistor	BSLV3G	24-48 VAC, DC	1 oz.
	BSLV3K	50-127 VAC, DC	1 oz.
	BSLV3R	130-250 VAC, DC	1 oz.
	BSLV3U	380-500 VAC, DC	1 oz.



Control Relay Accessories

Mechanical Latch Block



Mechanical latch block is used to convert a standard control relay into a latched control relay. Easy to mount, it clips onto front face of control relay. Includes 1NO contact for contactor cut-out. Contact Rating: A600 Q600.

Catalog No.	Voltage Applications	Weight
RMLF*	50/60 Hz	3 oz. and DC

Replace asterisk in catalog number with appropriate coil letter designation:

	D	G	J	N	U	Y
Voltage	24-32V	42-48V	110-125V	208-277V	380-480V	500-600V

Coil is rated for pulse duty only. If a continuous unlatch signal is expected, use auxiliary contact on contactor to disconnect unlatch coil.



Mechanical Latch Block Specifications

Rated insulation voltage (Ui) in accordance with IEC 947	1000 V
Standard voltages, 50/60 Hz DC	24-600 V
Operating limits	nominal voltage

Consumption for unlatching (auto cut-out)	55 VA
Unlatching control	
Electrically	Auto cut-out by integral contact
Manually	By local push button (O)
Contactor control	
Electrically	Can be activated to save on energy consumption in contactor coil
Manually	By push button (I)
Mechanical life (millions of operations)	3.0
Maximum operations per hour	1200
Unlatching pulse time (min.)	40 ms.



Notes

Notes



Notes



GE Electrical Distribution & Control

DET-034B 0996

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