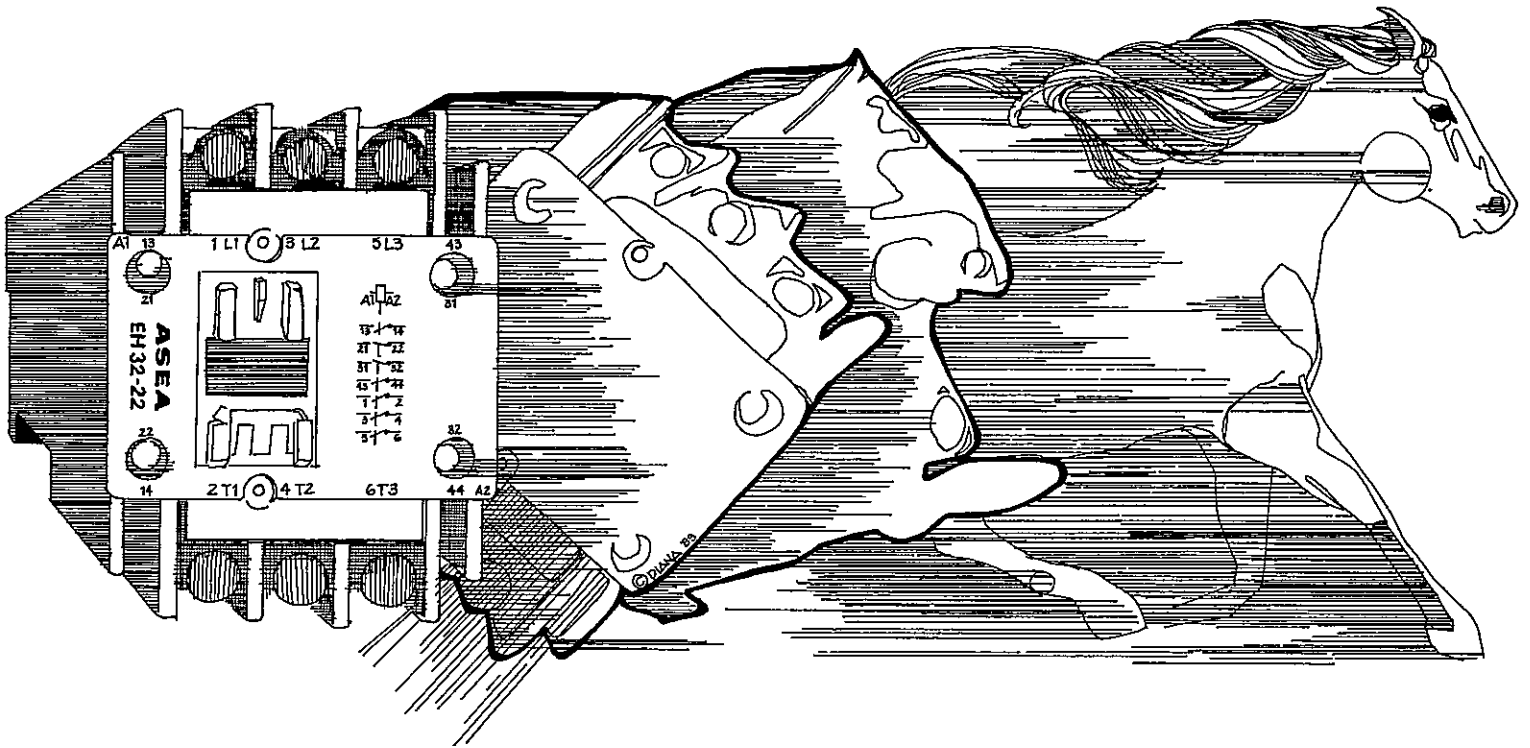


ASEA

control
equipment

Quic Pic Catalog TS 1200



HORSEPOWER RATED
CONTACTORS AND STARTERS

ASEA | control
equipment

Changing technology for changing times.

General:

ASEA's line of components and controls are all designed, engineered and manufactured for long, dependable service. ASEA's motor control production facility is located in Yonkers, New York and has several regional offices and warehouses throughout the country and Canada, in addition to manufacturing and sales offices throughout the world.

About the Catalog:

Catalog S1200 is sectionalized by main product groups, EH contactors, Relays, and Motor Control. Individual products within the main categories are identified by a series number shown at the top of each page. Supplementary engineering information can be found at the end of each product section and at the rear of the catalog.

How to Order

To simplify ordering and to assure speedy delivery, order by catalog number and include a description for each item.

Stock Items:

Most of the catalog listed items are available from stock at your nearest ASEA Control Equipment authorized distributor or at one of ASEA's regional warehouses. Check your nearest ASEA distributor or representative for specific stock availability.

Prices and Discounts:

All prices shown are list. The discount schedule is shown at the bottom center of each page. Consult your nearest representative or authorized ASEA Control Equipment distributor for discount information.

Engineering Assistance:

ASEA maintains a competent experienced group of design, application and sales engineers who will assist you in the selection and application of cataloged items, as well as non-standard or specialized controls to meet your specific requirements.

Standard Sales Policy:

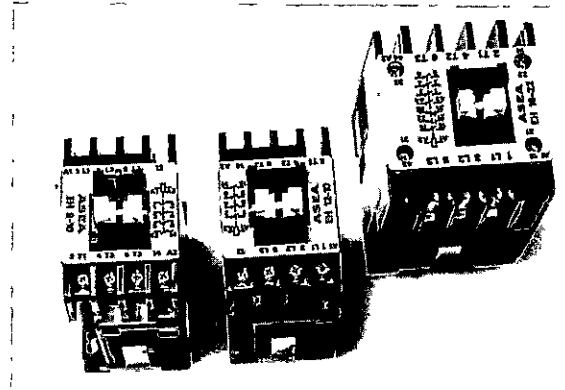
The ASEA Conditions of Sale for Control Equipment Products apply to all products of this catalog. For copies of Conditions of Sale, contact your nearest authorized ASEA Control Equipment Distributor or Representative.

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The Horsepower rated EH line of AC contactors offers a new approach to the traditional Nema designs while providing an economical and efficient means of power disconnection and motor control. The EH Series 100 contactors offers a saving in panel space and weight requirements without sacrificing performance. These contactors are designed to operate on the same motor applications as the Nema rated contactors.



The EH Horsepower rated contactors are available in six sizes falling between Nema size 00 and size 2 to provide greater flexibility in meeting actual rating requirements, permitting selective of a device closely suited to the motor being used. The Horsepower rated concept plus the addition of two more sizes allows a more efficient and compact design. Coil burdens have been reduced up to 50% of the standard Nema designs of the same Horsepower rating, while the mechanical life has been doubled to 20 million operations.

The EH 9 and EH 12 size contactors have 1-NO auxiliary contact as standard. The EH 16 through EH 40 sizes have 2-NO and 2-NC auxiliary contacts as standard. Four additional auxiliary contacts can be added to meet even the most stringent control needs on all sizes.

The series 100 contactors have a full range of snap on accessories including a top mounted two or four pole auxiliary contact block, a pneumatic timing relay and a mechanical latch attachment. Other accessories include a mechanical interlock, base plates and plug in connectors to provide a complete line of low voltage control devices for customer panel designs.

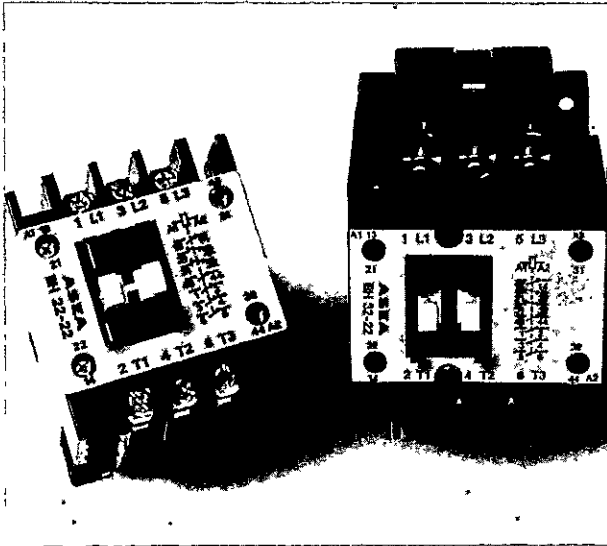
Other features of design include up front power wiring with easy accessible line and load terminals a ridge type double break contact design to insure positive contact and a built in accessory bracket designed to accept a full range of accessories.

In addition, the EH contactors can be either horizontally or vertically mounted as well as suspended from ceiling. The contactors have a flush side design with a built in rail mounting feature to accommodate critical panel space mounting.

The coils are clearly marked with the voltages and frequency stamped on the base for easy inspection. The coil terminals are located on the base for easy access.

Contactor H.P. Rating Information

ASEA Type	Ampere Rating		220V - 240V		440V - 480V	Outline Dimensions			Wgt. Lbs.	Terminal Wire Max.
	Enclosed	Open	1 Phase HP	3 Phase HP	3 Phase HP	Wide	High	Deep		
EH 9	12	13	2	2	5	1-3/4	3	3-5/8	.9	(2)AWG.#12
EH 12	16	18	2	3	7-1/2	1-3/4	3	3-5/8	.9	(2)AWG.#12
EH 16	18	20	3	5	10	2-1/16	3-3/16	4-3/8	1.3	(2)AWG.#10
EH 22	25	28	3	7-1/2	15	2-1/16	3-3/16	4-3/8	1.4	(2)AWG.#10
EH 32	35	39	5	10	20	3	3-3/4	4-7/16	1.9	(2)AWG.# 4
EH 40	45	50	7-1/2	15	30	3	3-3/4	4-7/16	1.9	(2)AWG.# 4



The new Horsepower rated EH line of AC contactors offers a new approach to the traditional NEMA designs providing specific means of motor control and protection with significant cost savings. The EH Series 100 contactors offers a savings in panel space and weight requirements without sacrificing performance. These contactors are designed to operate on the same motor applications as the NEMA rated contactors.

The EH Horsepower rated contactors are available in six sizes between size 00 and size 2 to provide greater flexibility in meeting actual rating requirements. The Horsepower rating concept plus the addition of two more sizes allows a more efficient and compact design; coil burdens have been reduced up to 50% of the standard NEMA designs of the same horsepower rating while the mechanical life has been doubled to 20 million operations.

3 Pole A.C. Contactors

Line Volts	Max. H.P.	Max. Ampere Rating		Type	Coil Voltage	Catalog Number	List Price						
		Enclosed	Open										
200 230 460 575	2 2 5 5	12	13	EH.9	120 208 240 480 600	100A3000-A -B -C -D -E	\$ 62.						
200 230 460 575	3 3 7-1/2 7-1/2	16	18		EH 12	120 208 240 480 600		100B3000-A -B -C -D -E	82.				
200 230 460 575	5 5 10 10	18	20			EH 16		120 208 240 480 600		100C3000-A -B -C -D -E	98.		
200 230 460 575	5 7-1/2 15 15	25	28					EH 22		120 208 240 480 600		100D3000-A -B -C -D -E	110.
200 230 460 575	7-1/2 10 20 25	35	39							EH 32		120 208 240 480 600	
200 230 460 575	10 15 30 40	45	50	EH 40			120 208 240 480 600					100F3000-A -B -C -D -E	

Other Information

See opposite page for coil voltage chart.

For additional information refer to:

- Accessories.....Page 11, 12
- Renewal Parts.....Page 13
- Maintenance Information....Page 14
- Technical Data.....Page 15, 16
- Outline Dimensions.....Page 17, 18, 19

Single Phase 2 Pole A.C. Contactors

Line Volts	Max. H.P.	Max. Ampere Rating		Type	Coil Voltage	Catalog Number	List Price
		Enclosed	Open				
115 230	1/2 2	12	13	EH 9	120 208 240 480 600	100A2000-A -B -C -D -E	\$ 62.
115 230	3/4 2	16	18	EH 12	120 208 240 480 600	100B2000-A -B -C -D -E	82.
115 230	1 3	18	20	EH 16	120 208 240 480 600	100C2000-A -B -C -D -E	94.
115 230	1-1/2 3	25	28	EH 22	120 208 240 480 600	100D2000-A -B -C -D -E	106.
115 230	2 5	35	39	EH 32	120 208 240 480 600	100E2000-A -B -C -D -E	154.
115 230	3 7-1/2	45	50	EH 40	120 208 240 480 600	100F2000-A -B -C -D -E	200.

R.V.H. Overload Protection

For overload protection information see page 7 for technical and ordering information.

Other Available Coil Voltages

For contactors with control voltages other than shown in catalog, substitute the corresponding letter from the coil selection chart for the last digit of the catalog number.

Example: 100A2000-H is an A.C. contactor with a 110/50 Hz. A.C. coil.

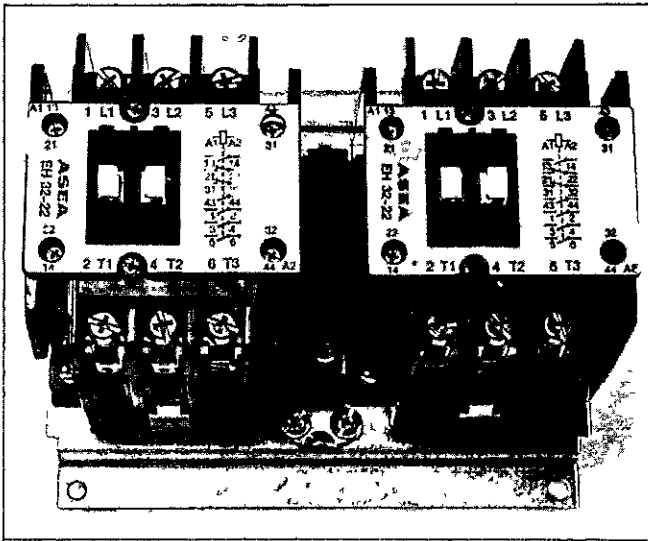
If coils other than shown are required substitute S-special (specify) for the last digit and specify operating voltage and hertz.

Coil Selection Chart

60 Hz A.C.	50 Hz A.C.
A-110/120V	H-110V
B-208V	J-220V
C-220/240V	K-380V
D-440/480V	L-440V
E-550/600V	M-550V
F-24V	
G-48V	
S-Special (Specify)	

- (1) For motor ratings of 2-pole contactors at higher voltages, consult ASEA.
- (2) EH 9-22 are UL listed.
- (3) EH 32-40 pending UL listing.

Series 140
Mechanically Interlocked A.C. Contactors



Series 140 contactors are designed for custom made reversing or 2 speed starters or for applications which require transfer switching from normal to emergency power supplies.

Two contactors are mounted on a baseplate with mechanical interlock only, complete with terminals. Control or power wiring is not included.

Coil Voltages

Series 140 mechanically interlocked contactors are available with other AC coil voltages. Refer to previous page for other available coil voltages and ordering information.

RVH Overload Protection

For overload protection information see page 7 for technical and ordering information.

3 Pole Mechanically Interlocked Contactors.

Motor Rating		Contactor			Open Type		
Line Volts	Max. H.P.	Max. Amp.	Type	Coil Volts	Catalog No.	List Price	
200	5	20	EH 16	120	140C3000-A	216.	
230	5			208			-B
460	10			240			-C
575	10			480			-D
				600			-E
200	5	28	EH 22	120	140D3000-A	270.	
230	7-1/2			208			-B
460	15			240			-C
575	19			480			-D
				600			-E
200	7-1/2	39	EH 32	120	140E3000-A	338.	
230	10			208			-B
460	20			240			-C
575	25			480			-D
				600			-E
200	10	50	EH 40	120	140F3000-A	470.	
230	15			208			-B
460	30			240			-C
575	40			480			-D
				600			-E

Other Information

- Contactor Accessories...Page 11, 12
- Renewal Parts.....Page 13
- Outline Dimensions.....Page 19

(1) Size EH 16-40 mechanically interlocked contactors UL listing pending.

The new RVH 3-pole adjustable thermal overload relay is available in two sizes; the RVH 22 and RVH 40. The RVH 22 adjustable overload relay has a current range from 0.1 to 23 amps in 13 steps. The RVH 40 adjustable overload relay has a current range from 12 to 45 amps in 4 steps.

The RVH overload relays are ambient compensated and have single phase protection. When single phase motors are connected to the overload relay all three circuits must be connected in series. The relays have separate alarm and trip contacts, a manual or automatic reset lever and a dial type adjustable current setting. The stop/reset button has a trip free feature which allows the trip contact to open when the reset button is depressed. Thus the reset button can be used as a stop button. The RVP 40 overload relay has the same features except that it has a separate stop button.

The RVH overload relays are designed for mounting directly to the contactor to save valuable panel space. A separate mounting base is available for panel mounting the RVH 22 relay. The separate mounting base has a built in feature for rail mounting.

Overload Relay Selection

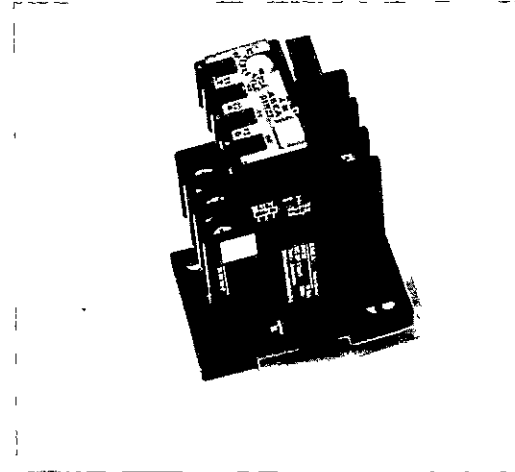
For proper selection of overload relay, determine the motor full load current (FLC or FLA) either from the motor nameplate or the manufacturer. Select the overload relay whose current range suits the full load amperes of the motor, from the chart below.

Type	Current Range (Motor FLA)	Catalog Number	List Price
RVH 22	0.1 -0.15	RVH 22A	\$ 42.
	0.15-0.25	RVH 22B	
	0.25-0.4	RVH 22C	
	0.4 -0.6	RVH 22D	
	0.6 -1.0	RVH 22E	
	1.0 -1.6	RVH 22F	
	1.6 -2.5	RVH 22G	
	2.5 -4.0	RVH 22H	
	4-6	RVH 22J	
	6-9	RVH 22K	
	9-13	RVH 22L	
	13-18	RVH 22M	
	18-23	RVH 22N	
RVH40B	12-16	RVH 40BP	\$ 68.
	16-22	RVH 40BR	
	22-32	RVH 40BS	
	32-45	RVH 40BT	

Additional Information:

- Outline Dimensions.....page 20
- General Engineering.....page 27

- (1) RVH 22 UL listed
- (2) RVH 40B Pending UL listing.



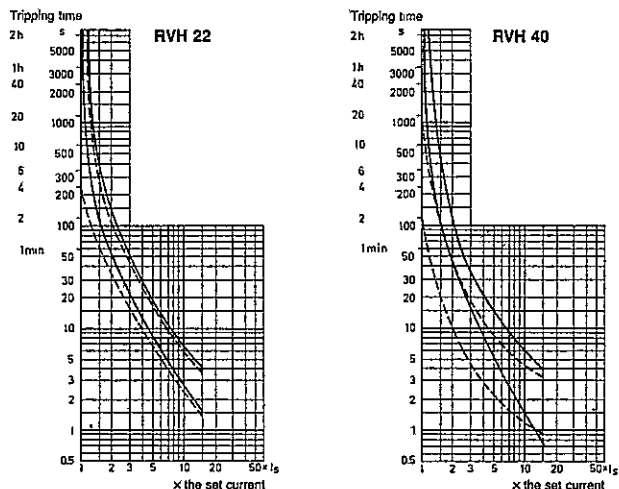
Panel Mounting Bracket

The RVH 22 can be mounted on a bracket for separate panel mounting. The separate mounting bracket has a built in feature for rail mounting. The base can only be used with RVH 22.

Catalog No. RVHB List Price \$6.00

Time-current Curves

Normal triple-phase tripping is received on or between the solid curves. Single-phase tripping is received between the dotted curves. The tripping times apply from the cold condition. The tripping time for an operationally warm relay is decreased to approximately 1/3. The tolerance range of the time-current curve includes all the current ranges' tolerances and deviations from each other.



Series 200
A.C. Motor Starter, Full Voltage

3 Phase Motor Starters

Line Volts	Max. H.P.	Max. Ampere Rating		Type	Coil Volts	Operi Type Catalog No.	List Price
		Enclosed	Open				
200 230 460 575	2 2 5 5	12	13	EH 9	120 208 240 480 600	200A3000-Ax -Bx -Cx -Dx -Ex	\$ 108.
200 230 460 575	3 3 7-1/2 7-1/2	16	18	EH 12	120 208 240 480 600	200B3000-Ax -Bx -Cx -Dx -Ex	128.
200 230 460 575	5 5 10 15	18	20	EH 16	120 208 240 480 600	200C3000-Ax -Bx -Cx -Dx -Ex	144.
200 230 460 575	5 7-1/2 15 15	25	28	EH 22	120 208 240 480 600	200D3000-Ax -Bx -Cx -Dx -Ex	156.
200 230 460 575	7-1/2 10 20 25	35	39	EH 32	120 208 240 480 600	200E3000-Ax -Bx -Cx -Dx -Ex	232.
200 230 460 575	10 15 30 40	45	50	EH 40	120 208 240 480 600	200F3000-Ax -Bx -Cx -Dx -Ex	298.

RVH Overload Protection

For proper selection of overload relay, determine the motor full load current (FLC or FLA) either from the motor nameplate or the manufacturer. Select the overload relay, whose current range suits the full load amperes of the motor from the chart below.

After selecting the correct rating, take the suffix code and substitute the letter for the last digit of the catalog number (x).

Example: 200F3000-AX insert the letter "m" for the "x" at the end of the catalog number. The catalog number becomes 200F3000-AM which is an AC starter 110/120V/60Hz. Coil with an overload relay, 3 phase protection ranging 13-18 amperes protection.

Other Available Coil Voltages

See opposite page for other available coil voltages.

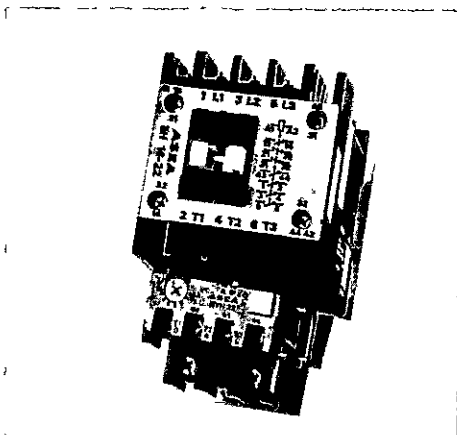
Additional Information:

- Renewal Parts.....Page 13
- General Engineering.....Page 16
- Outline Dimensions.....Page 22
- Wiring Diagrams.....Page 23

Overload Relay Selection Chart

A-0.1-0.15 amp.	G-1.6-2.5 amp.	N-18-23
B-0.15-0.25	H-2.5-4.0	P-12-16
C-0.25-0.4	J-4-6	R-16-22
D-0.4-0.6	K-6-9	S-22-32
E-0.6-1.0	L-9-13	T-32-45
F-1.0-1.6	M-13-18	

- (1) Sizes EH 9-22 are UL listed.
- (2) Sizes EH 32-40 pending UL listing.



The new Horsepower rated EH line of AC starters offers a new approach to the traditional Nema designs at a price well below the Nema rated starters. The EH series 200 starters offers a savings in panel space and weight requirements without sacrificing performance. These starters are designed to operate on the same motor applications as the Nema contactors.

Other Available Coil Voltages

For contactors with control voltages other than shown in the catalog, substitute the corresponding letter from the coil selection chart below for the last digit of the catalog number.

Example: 200A2000-H is an AC starter with 110/50 Hz. AC coil.

If coils other than shown are required substitute S-Special (specify) for the last digit and specify operating voltage and hertz.

R.V.H. Overload Protection

See opposite page.

Coil Selection Chart

<u>60Hz. AC</u>	<u>50Hz. AC</u>
A-110/120V	H-110V
B-208V	J-220V
C-220/240V	K-380V
D-440/480V	L-440V
E-550/600V	M-500V
F-24V	
G-48V	
S-Special (specify)	

Single Phase Motor Starters 2 Pole

Line Volts	Max. H.P.	Max. Amperes		Type	Coil Voltage	Catalog No.	List Price
		Encl.	Open				
115 230	1/2 2	12	13	EP 9	120 208 240 480 600	200A2000-Ax -Bx -Cx -Dx -Ex	\$ 108.
115 230	3/4 2	16	18	EH 12	120 208 240 480 600	200B2000-Ax -Bx -Cx -Dx -Ex	122.
115 230	1 3	18	20	EH 16	120 208 240 480 600	200C2000-Ax -Bx -Cx -Dx -Ex	126.
115 230	1-1/2 3	25	28	EH 22	120 208 240 480 600	200D2000-Ax -Bx -Cx -Dx -Ex	136.
115 230	2 5	35	39	EH 32	120 208 240 480 600	200E2000-Ax -Bx -Cx -Dx -Ex	182.
115 230	3 7-1/2	45	50	EH 40	120 208 240 480 600	200F2000-Ax -Bx -Cx -Dx -Ex	255.

Additional Information:

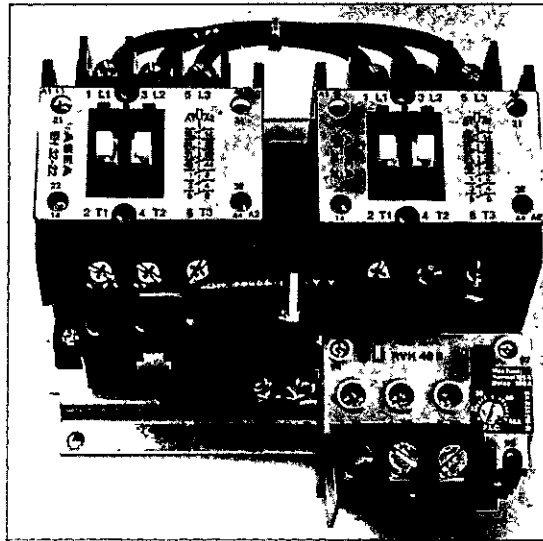
- Renewal Parts.....Page 13
- General Engineering.....Page 16
- Outline Dimensions.....Page 22
- Wiring Diagrams.....Page 23

- (1) For motor ratings of 2-pole motor starters at higher voltages, consult ASEA.
- (2) EH 9-22 are UL listed.
- (3) EH 32-40 pending UL listing.

Series 210 Reversing A.C. Motor Starter

Series 210 Starters are used for reversing motor applications. Two standard contactors are mounted on a common base complete with mechanical and electrical interlocks to prevent both contactors from being operated simultaneously.

These starters are supplied complete with reversing power wiring and terminals on the line and load sides and include an overload relay for motor protection.



3 Phase Reversing Motor Starter

Line Volts	Max. H.P.	Max. Ampere Rating		Type	Coil Volts	Open Type Catalog No.	List Price
		Enclosed	Open				
200	5	18	20	EH 16	120	210C3000-AX	286.
230	5				208	-BX	
460	10				240	-CX	
575	10				480	-DX	
					600	-EX	
200	5	25	28	EH 22	120	210D3000-AX	346.
230	7-1/2				208	-BX	
460	15				240	-CX	
575	15				480	-DX	
					600	-EX	
200	7-1/2	35	39	EH 32	120	210E3000-AX	428.
230	10				208	-BX	
460	20				240	-CX	
575	25				480	-DX	
					600	-EX	
200	10	45	50	EH 40	120	210F3000-AX	550.
230	15				208	-BX	
460	30				240	-CX	
575	40				480	-DX	
					600	-EX	

Additional Information Refer to:

- Renewal Parts.....Page 13
- General Engineering.....Page 16
- Outline Dimensions.....Page 22
- Wiring Diagrams.....Page 23

RVH Overload Protection

For proper selection of overload relay, determine the motor full current (FLC or FLA) either from the motor nameplate or the manufacturer. Select the overload relay, whose current range suits the load amperes of the motor, from the chart below.

After selecting the correct rating, take the suffix code and substitute the letter for the last digit of the catalog number (X).

Example: 210F3000-AX insert the letter "M" for the "X" at the end of the catalog number. The catalog number then becomes 210F3000-AM which is an reversing A.C. starter 110/120v/60Hz. coil with an overload relay, 3 phase protection ranging 13-18 amperes protection.

Overload Selection Chart

A-0.1-0.15 amp.	G-1.6-2.5 amp.	N-18-23 amp.
B-0.15-0.25	H-2.5-4.0	P-12-16
C-0.25-0.4	J-4-6	R-16-22
D-0.4-0.6	K-6-9	S-22-32
E-0.6-1.0	L-9-13	T-32-45
F-1.0-1.6	M-13-18	

Other Available Coil Voltages

For starters with control voltages other than shown in the catalog, substitute the corresponding letter from the Coil selection Chart for the ninth digit of the catalog number.

Coil Selection Chart

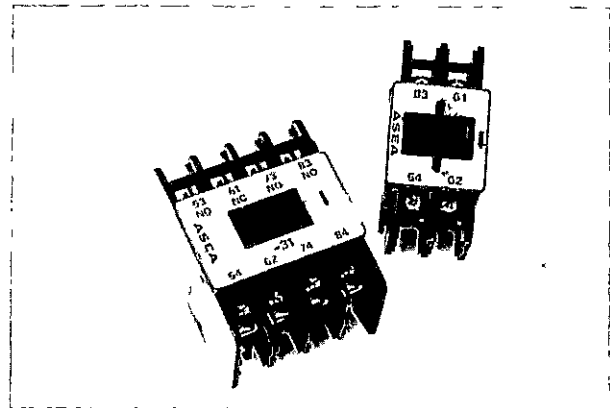
60 Hz. A.C.	50 Hz.
A-110-120/60	H-110/50
B-208/60	J-220/50
C-220-240/60	K-380/50
D-440-480/60	L-440/50
E-550-600/60	M-500/50
F-24/60	
G-48/60	

(1) Sizes EH 16-22 UL listed.
(2) Sizes EH 32-40 pending UL listing.

Extra Interlock Adder Decks

Adder decks are designed to be snapped on to the top of the contactor. Contacts are rated 10A/600V Pilot duty, and are available with various contact combinations.

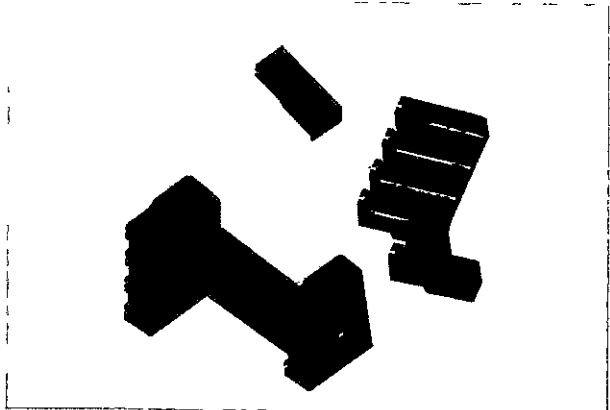
<u>No. of Contacts</u>	<u>Catalog No.</u>	<u>List Price</u>
2-NO	ECRAD-20	\$ 12.
1-NO - 1-NC	ECRAD-11	12.
2-NC	ECRAD-02	12.
4-NO	ECRAD-40	24.
3-NO-1-NC	ECRAD-31	24.
2-NO-2-NC	ECRAD-22	24.
1-NO-3-NC	ECRAD-13	24.
4-NC	ECRAD-04	24.



Plug in Wiring Attachments

Plug in devices are used to provide quick connection of control and power wiring to contactors, starters and auxiliary adder decks for types EH 9 or EH 12. Flat pin connections are mounted on devices. Wires are connected to insulated female plugs, which are designated with the letter "c" as the last digit of the catalog number.

<u>Catalog No.</u>	<u>Wire Size</u>	<u>List Price</u>
EHPC-12A	22-16 AWG.	\$ 14.
EHPC-12B	14-12 AWG.	16.
EHPC-12C	16-14 AWG.	26.
RVHPC-22A	22-16 AWG.	14.
RVHPC-22B	14-12 AWG.	16.
RVHPC-22C	16-14 AWG.	26.



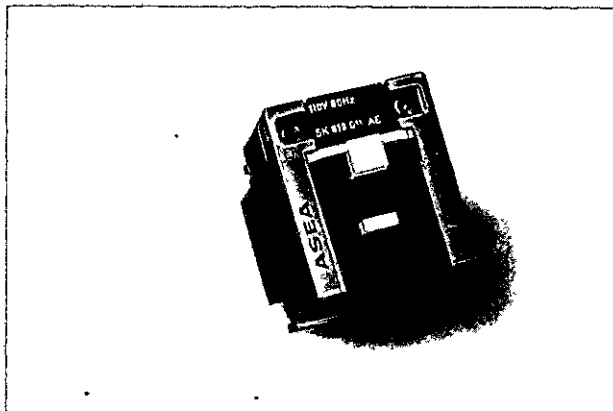
Aux. Interlock Adder Deck Connection Device

<u>Catalog No.</u>	<u>Wire Size</u>	<u>List Price</u>
ECRAD-2PCA	22-16 AWG.	\$ 12.
ECRAD-2PCB	14-12 AWG.	14.
ECRAD-2PCC	16-14 AWG.	24.
ECRAD-4PCA	22-16 AWG.	24.
ECRAD-4PCB	14-12 AWG.	26.
ECRAD-4PCC	16-14 AWG.	30.

Male Flat Pin Connection Device

<u>Catalog No.</u>	<u>List Price</u>
EHFP-12	\$ 30. Set of 50
RVH-22FP	40. Set of 50

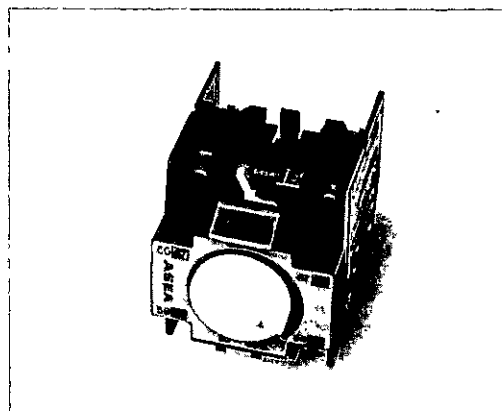
Mechanical Latch



The latch is a separate snap on attachment designed to mechanically hold the contactor in the picked up position, once the contactor has been momentarily energized. The latch contains a trip coil for releasing the contactor electrically and a pushbutton for releasing the contactor or relay mechanically.

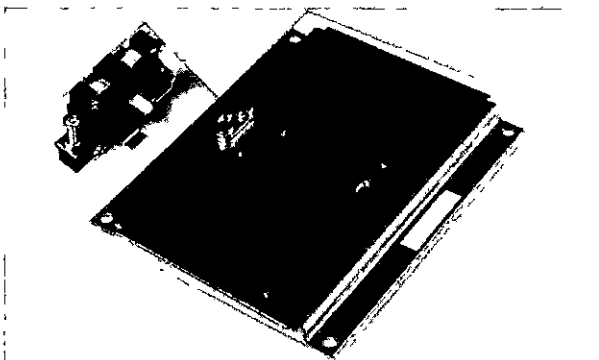
Catalog Number	List Price
ECRML	\$ 56.

Pneumatic Timer



A relay pneumatic timer attachment is designed to snap on to the top of the contactor. The timer is field convertible from on-delay to off delay and is equipped with one N.O. and one N.C. timed contacts operating after the main contactor base is energized (on delay) or de-energized (off delay). Timing is adjustable from 0.1 - 30 seconds to 10-180 seconds.

Catalog No.	Description	List Price
ECRPT-30	0.1-30 sec.	\$ 72.
ECRPT-180	10-180 sec.	72.



Mechanical Interlock

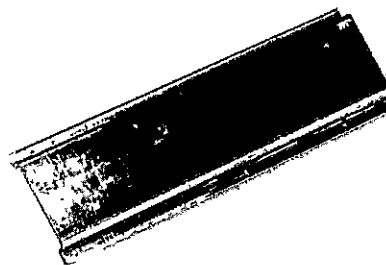
A mechanical interlock is available to provide interlocking of 2 contactors type EH 16 and larger. The mechanical interlock is mounted between 2 contactors mounted 5/8" apart. A rocker arm interlocks the armatures preventing simultaneous operation.

Catalog No.	List Price
EHMI	\$ 14.

Mechanical Interlock Mounting Base

A mounting base is available for mounting two contactors and mechanical interlock. Bases are predrilled to fit two contactors as noted below. Kit includes base, hardware and instructions.

Catalog No.	Description	List Price
EH 22MB	22MB-(2) EH 16 or 22 or (1) 16 and (1) 22	\$10.
EH 24MB	32MB-(1) EH 16 or 22 and (1) 32 or 40	10.
EH 40MB	40MB-(2) EH 32 or 40 or (1) 32 and (1) 40	10.



Rail Mounting

Universal mounting rails DIN type are available in 39 inch strips (1 meter) and can be cut to length required and attached to panels. Contactors have built in clips which allow for snap on mounting.

Catalog No.	List Price
ECRMC	\$ 6.

End Supports

End supports close rail ends eliminating sharp edges and preventing contactors from moving along rail.

Catalog No.	List Price
ECRMR-S	\$ 2. Set of 2

Contact Kits

Contact Kits for type EH 9-12 contactors are not available. For larger size contactors select kit from chart below.

ASEA Type	2-Pole Contact Kit Catalog Number	List Price	3-Pole Contact Kit Catalog No.	List Price
EH 16	EH 16-2PCK	\$ 40.	EH 16-3PCK	\$ 48.
EH 22	EH 22-2PCK	40.	EH 22-3PCK	48.
EH 32	EH 32-2PCK	40.	EH 32-3PCK	48.
EH 40	EH 40-2PCK	40.	EH 40-3PCK	48.

Operating Coils

For selection of proper voltage coil, add code letter as suffix from the coil selection chart below.

100 Series H.P. Line	A.C. Coil Catalog No.	List Price
EH 9		
EH 12	EH 12RC-*	\$30.
EH 16		
EH 22	EH 22RC-*	30.
EH 32		
EH 40	EH 40RC-*	36.

Coil Selection Chart

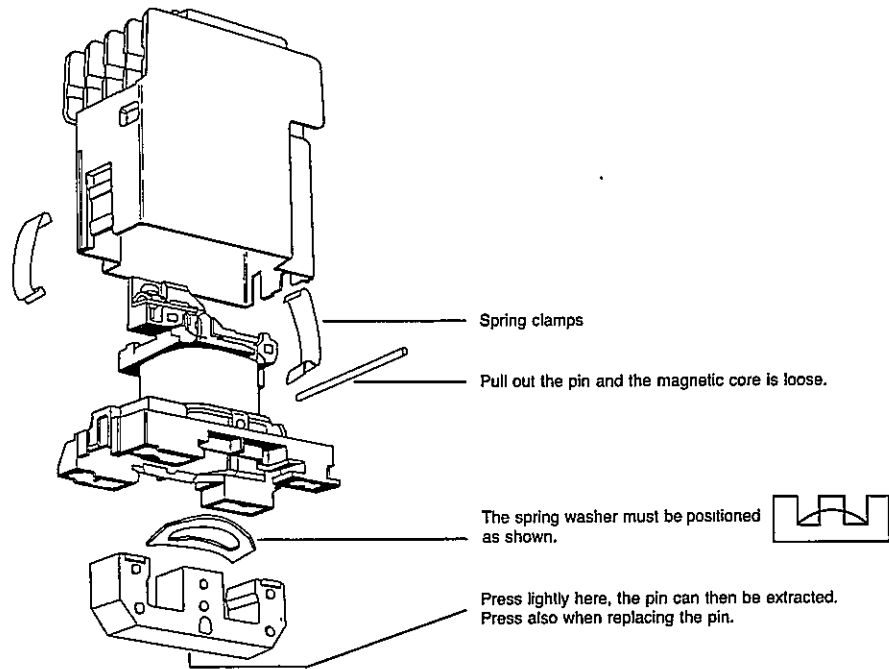
60HZ A.C.	50HZ A.C.
A-110-120V	H-110V
B-208V	J-220V
C-220-240V	K-380V
D-440-480V	L-440V
E-550-600V	M-500V
F-24V	
G-48V	
S-Special (Specify)	

(1) Sizes EH 9-22 coils UL listed.
 (2) Sizes EH 32-40 coils pending UL listing.

Replacment of A.C. and D.C coils

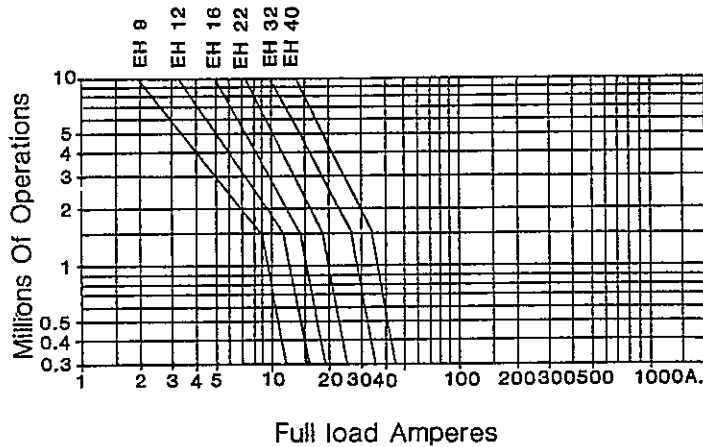
Replacement of A.C. and D.C. coils.
To replace the operating coil, loosen the two
spring clamps and take out the coil. Remove
the magnetic core from the coil and put it back
on the new coil. Then push the coil into the
contactor (cannot be reversed since it is keyed)
and snap the spring clamps into position.

Coil replacement



Operating Factors

Contact Life



Contact Life

Average contact life can be determined from the chart at the left. Based on laboratory tests the chart illustrates the average electrical life of a set of contacts when used for starting or stopping of A.C. motors, which are inductive loads. Other loads such as lighting or heating have considerably longer contact life, while motor loads requiring frequent inching or plugging may have shorter life. The chart is used to provide an estimate of operations before contacts should be checked and replaced. To determine contact life, determine full load amperes of motor then match with the type of contactor used.

Frequency

The frequency of A.C. circuits causes magnetic fields to be set up in electrical devices. As frequency increases, eddy currents increase, creating heat. Devices must be derated to compensate for increased heat. No derating is necessary on type EH contactor sizes up to 1000 Hz. on applications over 1000 Hz. derate contactor by 8% for each additional 1000 Hz.

Altitude

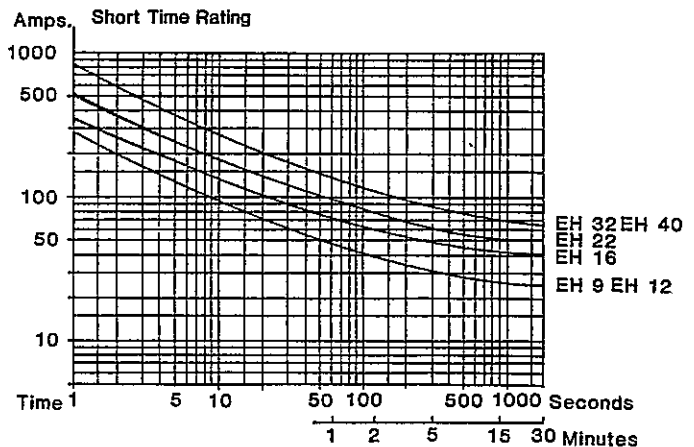
As air pressure decreases, cooling capability also decreases. Therefore, when electrical apparatus is installed at higher altitudes consideration must be given to derating equipment. For type EH contactors used at high altitudes derate continuous ampere rating by 8% for each mile (5280 ft.) above sea level.

Ambient Temperature

Continuous current ratings of contactors are based on 40°C (104°F) in accordance with UL 508 and Nema Standards. If contactors are applied in ambients above 40° derating of the contactor continuous current capacity is necessary. For each 10°C (18°F) derate contactor ampere rating by 8% conversely for each 10°C (18°F) below a 40°C ambient contactors can be uprated by 8%. Maximum operating ambient recommended 60°C.

Short Time Rating

The short time rating is the rating which defines the load which can be carried for a short and definitely specified period of time.



Application Characteristics

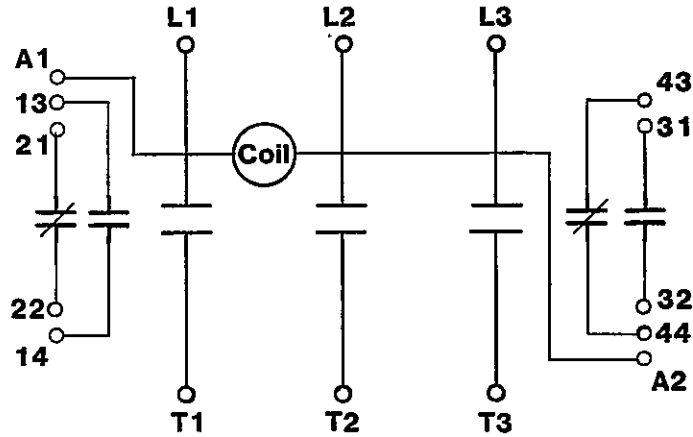
ASEA Type	Amp Rating Encl. Open		Horsepower Rating								Making Current Amp. @600V	Breaking Current Amp. @600V.	Tung- sten Load Amperes	Capacitor Switching	
			110V - 120V		200V 3 PH	220V - 240V		440V- 480V 3 PH	550V - 600V 3 PH	KVAR 240V				KVAR 480V	
			1 PH	3 PH		1 PH	3 PH								
EH 9	12	13	1/2	1-1/2	2	2	2	5	5	200	90	6	3	7	
EH 12	16	18	3/4	1-1/2	3	2	3	7-1/2	7-1/2	200	90	8	5	10	
EH 16	18	20	1	2	5	3	5	10	10	264	135	10	5	11	
EH 22	25	28	1-1/2	3	5	3	7-1/2	15	15	500	190	13	8	16	
EH 32	35	39	2	3	7-1/2	5	10	20	25	600	320	21	11	22	
EH 40	45	50	3	5	10	7-1/2	15	30	40	600	320	30	14	28	

General Performance Characteristics

ASEA Type	Coil Data A.C.			Coil Data DC		Operating time in Milliseconds				Mech. Life (Millions) Operations	Frequency of oper. Per/Hr. under Full Load
	Inrush Va.	Sealed Va.	Sealed Watts	Inrush Watts	Sealed Watts	A.C. Contactors		D.C. Contactors			
						Pick-up	Drop out	Pick-up	Drop Out		
EH-9	85	9.5	2.8	8.5	8.5	10-20	10-20	40	20	20	1200
EH-12	85	9.5	2.8	8.5	8.5	10-20	10-20	40	20	20	1200
EH-16	100	11.5	3	9	9	10-20	10-20	45	20	20	1200
EH-22	100	11.5	3	9	9	10-20	10-20	45	20	20	1200
EH-32	150	15	4.5	10	10	10-30	10-30	50	30	10	1200
EH-40	150	15	4.5	10	10	10-30	10-30	50	30	10	1200

Wiring Diagrams

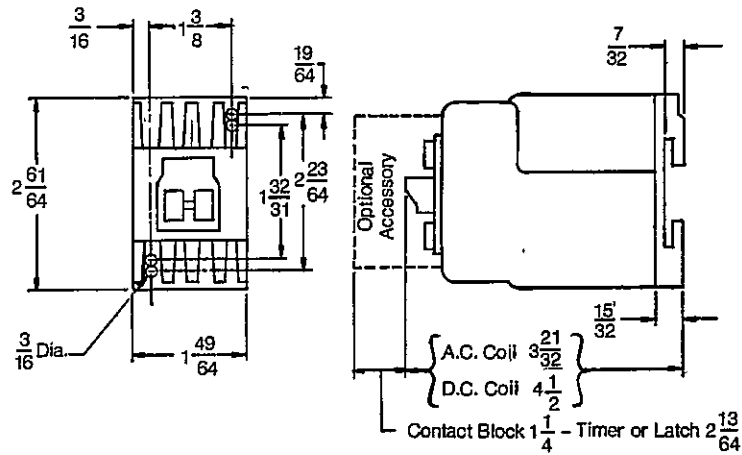
EH 16 - 40



Note: EH 9-12 are the same diagram as EH 16-40, except they do not include aux. contacts, terminals no. 13,14, located to the left of the wiring diag.

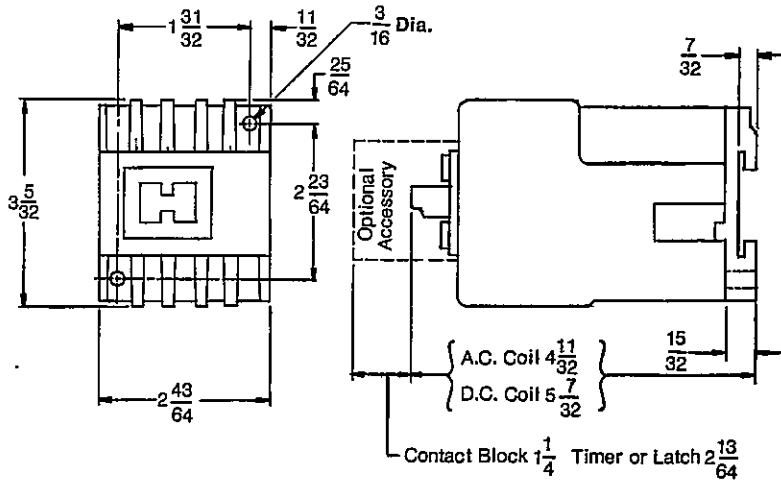
Dimensions 2 or 3 Pole Contactors

EH 9 and EH 12

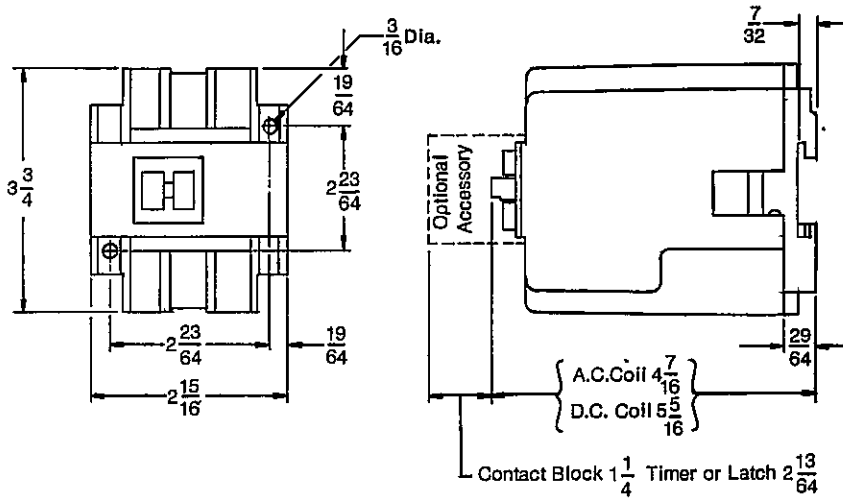


Dimensions subject to change without notice.

Dimensions, 2 or 3 Pole Contactors
Types EH 16 and EH 22

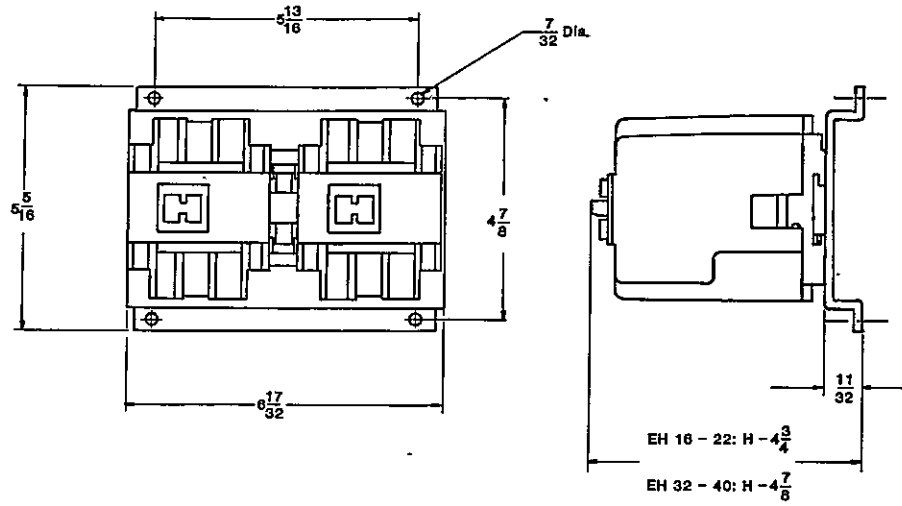


Types EH 32 and EH 40



Dimensions subject to change without notice

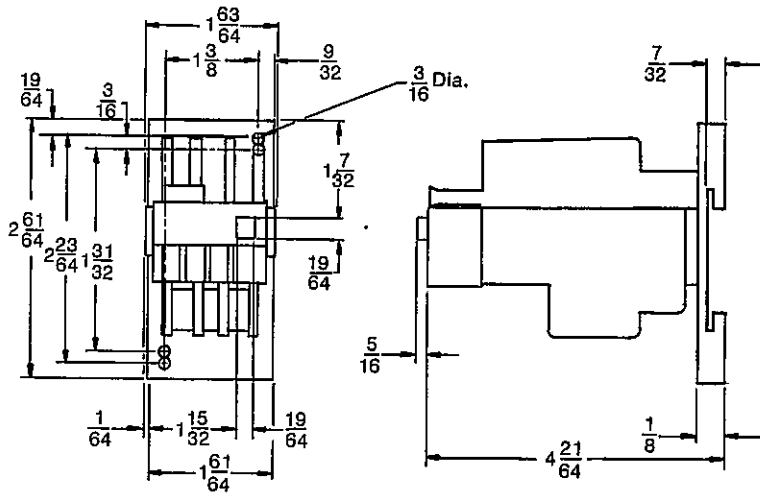
Dimensions
Mechanically Interlocked Contactors
Type EH 16 - 40



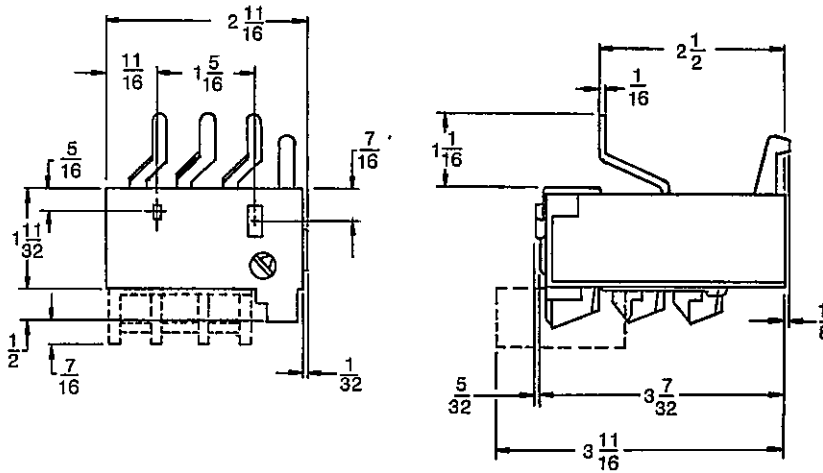
Dimensions Subject To Change Without Notice.

**Series 200
Thermal Overload Relay**

**Outline Dimensions
Type RVH 22**

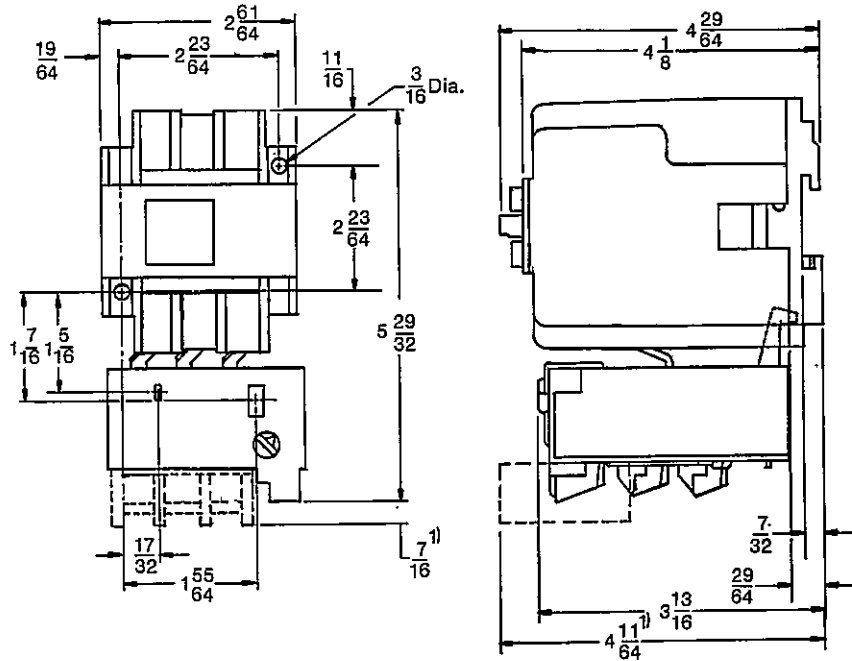


Type RVH 40B

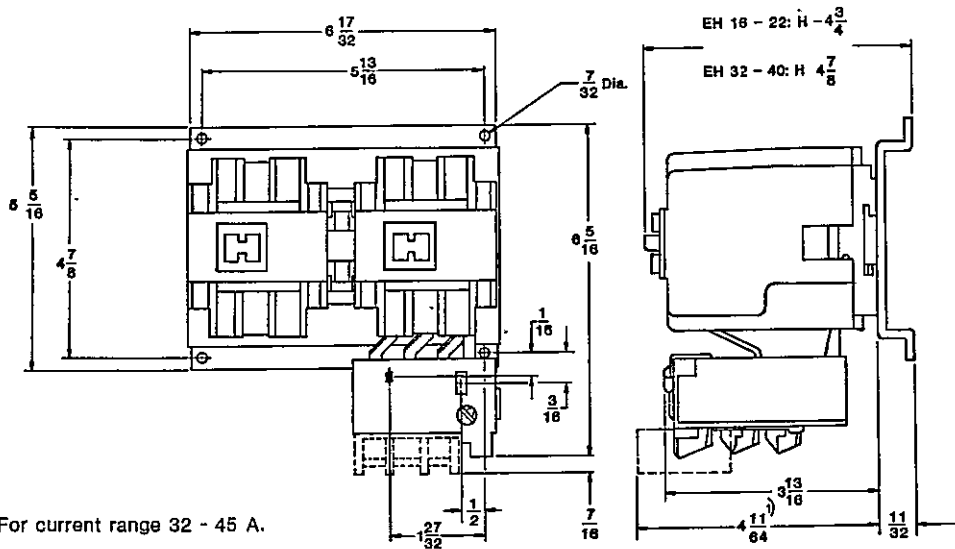


Dimensions subject to change without notice.

Outline Dimensions, Open Type Motor Starters
Type EH 32 and 40



Outline Dimensions, Open Type Reversing Motor Starters
Type EH 16 - 40

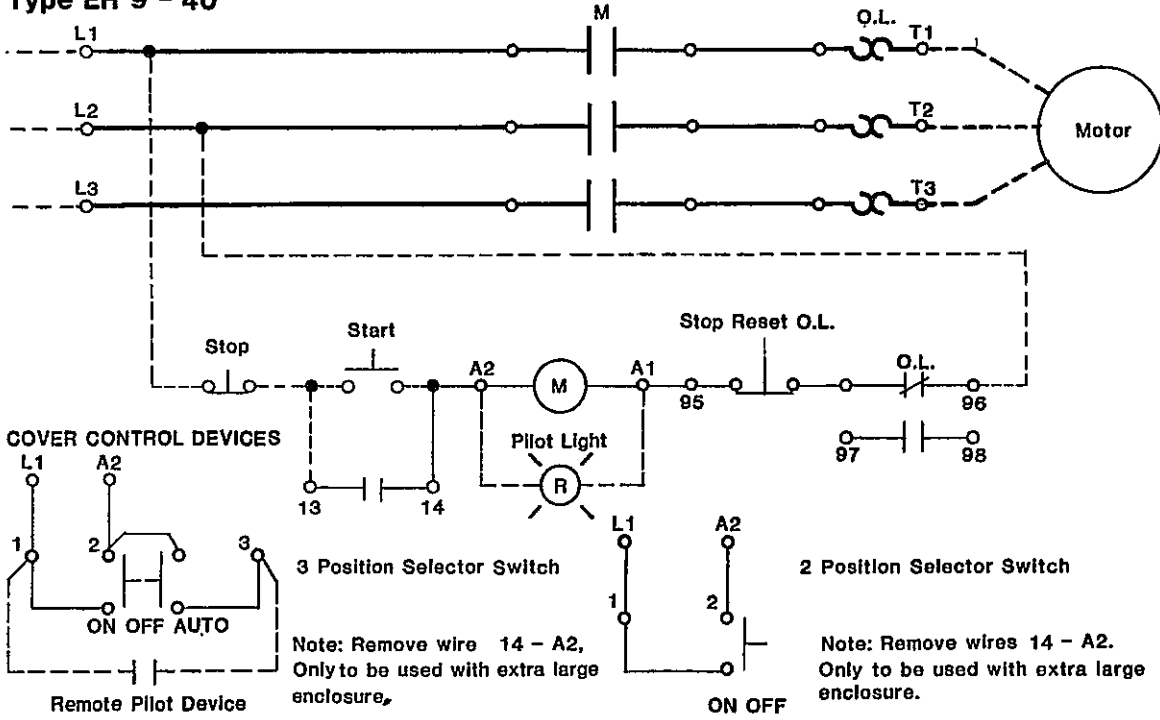


1) For current range 32 - 45 A.

Dimensions subject to change without notice.

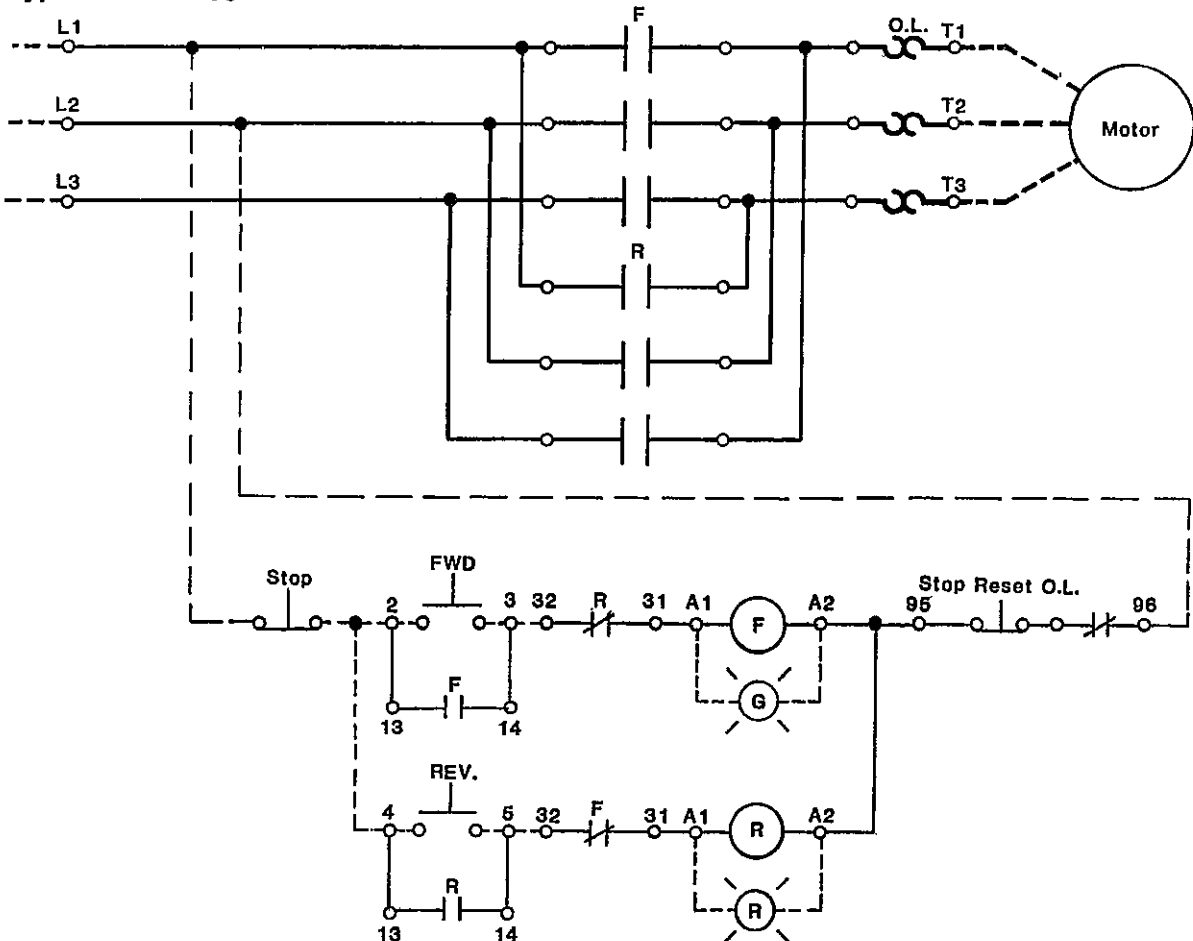
Schematic Diagram

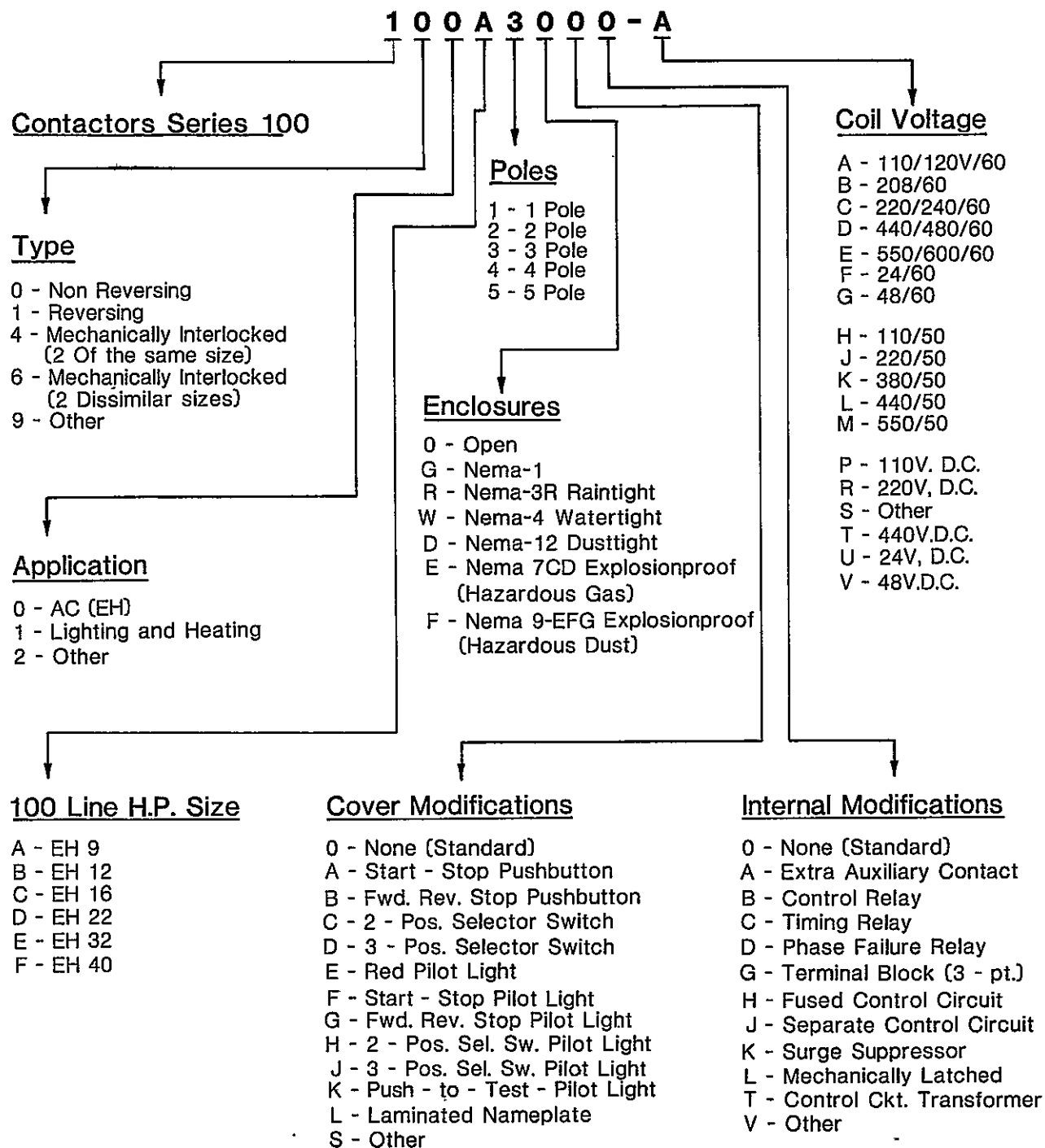
Type EH 9 - 40

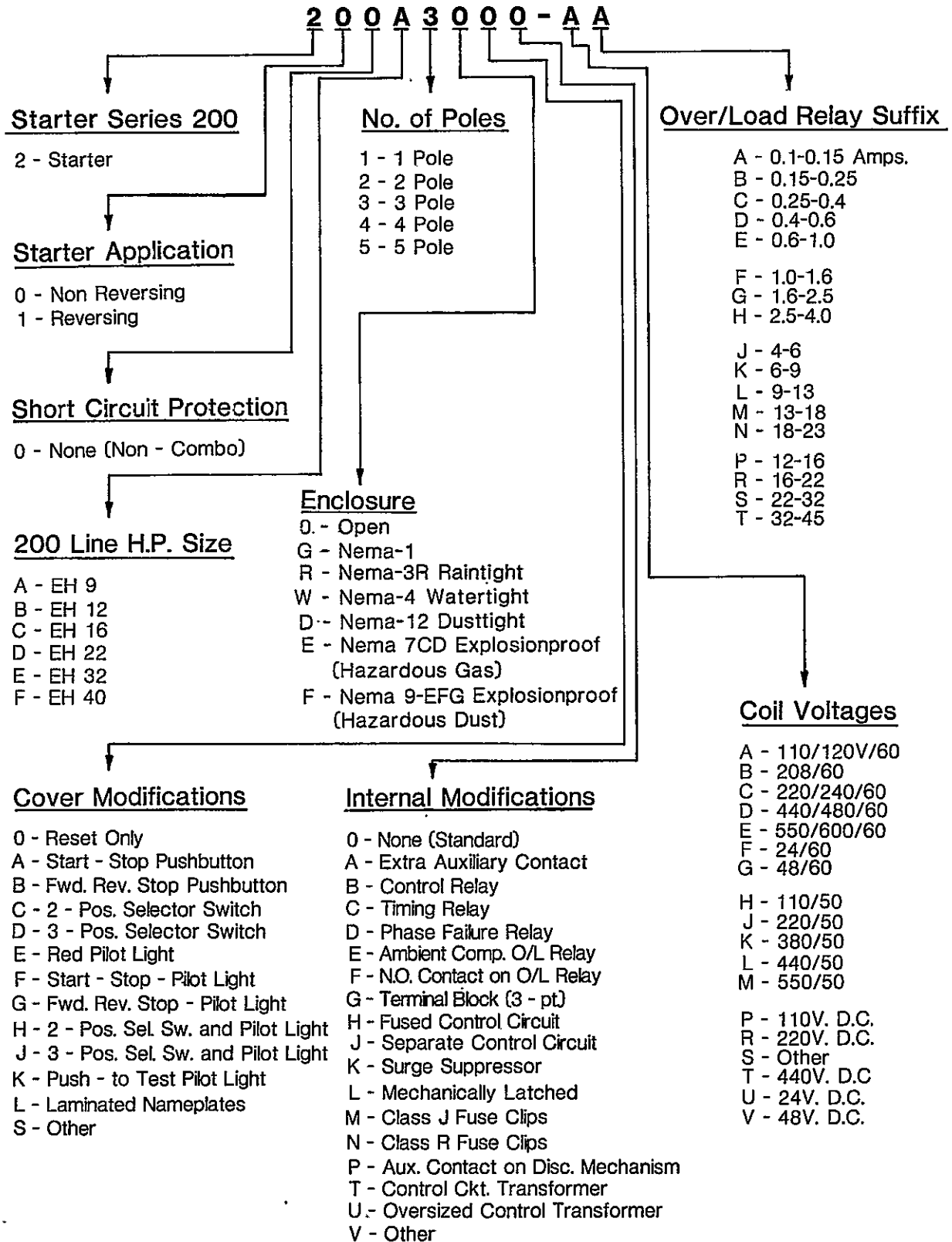


Reversing A.C. Starter

Type EH 16 - 40







Cross Reference Style Number To Catalog Number

Contactors (EH)

Style Number	Equivalent Catalog No.
SK 812 001-AE	100A3000-A
SK 812 001-AS	100A3000-D
SK 813 001-AE	100B3000-A
SK 813 001-AS	100B3000-D
SK 814 001-AE	100C3000-A
SK 814 001-AS	100C3000-D
SK 815 001-AE	100D3000-A
SK 815 001-AS	100D3000-D
SK 816 001-AE	100E3000-A
SK 816 001-AS	100E3000-D

Style Number	Equivalent Catalog No.
SK 819 011-AE	ECR-ML
SK 819 013-A	ECRPT-30
SK 819 001-A	ECRAD-11
SK 819 001-B	ECRAD-20
SK 819 001-C	ECRAD-02
SK 819 003-A	ECRAD-22
SK 819 003-B	ECRAD-31
SK 819 003-C	ECRAD-13
SK 819 003-D	ECRAD-40
SK 819 003-E	ECRAD-04

Overload Relays

SK 831 101-A	RVH 22-A
SK 831 101-B	RVH 22-B
SK 831 101-C	RVH 22-C
SK 831 101-D	RVH 22-D
SK 831 101-E	RVH 22-E
SK 831 101-F	RVH 22-F
SK 831 101-G	RVH 22-G
SK 831 101-H	RVH 22-H
SK 831 101-K	RVH 22-J
SK 831 101-L	RVH 22-K
SK 831 101-M	RVH 22-L
SK 831 101-N	RVH 22-M
SK 831 101-P	RVH 22-N
SK 832 113-M	RVH 40BP
SK 832 113-N	RVH 40BR
SK 832 113-P	RVH 40BS
SK 832 113-R	RVH 40BT

Coils

SK 811 100-208	EH 12RC-B
SK 811 100-AK	EH 12RC-C
SK 811 100-AS	EH 12RC-D
SK 811 100-AP	EH 12RC-K
SK 814 100-208	EH 22RC-B
SK 814 100-AK	EH 22RC-C
SK 814 100-AS	EH 22RC-D
SK 814 100-AP	EH 22RC-K
SK 816 100-208	EH 40RC-B
SK 816 100-AK	EH 40RC-C
SK 816 100-AS	EH 40RC-D
SK 816 100-AP	EH 40RC-K

Accessories

SK 819 038-A	EHPC-12A
SK 819 038-B	EHPC-12B
SK 819 038-C	EHPC-12C
SK 819 035-A	RVHPC-22A
SK 819 035-B	RVHPC-22B
SK 819 035-C	RVHPC-22C
SK 819 037-A	ECRAD -2PCA
SK 819 037-B	ECRAD -2PCB
SK 819 037-C	ECRAD -2PCC
SK 819 036-A	ECRAD -4PCA
SK 819 036-B	ECRAD -4PCB
SK 819 036-C	ECRAD -4PCC
SK 819 023-A	EH 12 FP
SK 819 024-A	RVH 22 FP
1376 1910-1	ECRMR
2166 0582-2	ECRMRS
5254 226-A	EHMI
2175 0261-1	EH 22MB
2175 0261-2	EH 24MB
2175 0261-3	EH 40MB
SK 831 105-A	RVH-B
SK 819 013-B	ECRPT-180

Approximate Ampere Ratings Of Three Phase, A.C. Induction Motors

Hp	Speed (RPM)	Amperes @				
		200 Volts	230 Volts	380 Volts	460 Volts	575 Volts
¼	1800	1.09	.95	.55	.48	.38
	1200	1.61	1.40	.81	.70	.56
	900	1.84	1.60	.93	.80	.64
½	1800	1.37	1.19	.69	.60	.48
	1200	1.83	1.59	.92	.80	.64
	900	2.07	1.80	1.04	.90	.72
¾	1800	1.98	1.72	.99	.86	.69
	1200	2.47	2.15	1.24	1.08	.86
	900	2.74	2.38	1.38	1.19	.95
1	1800	2.83	2.46	1.42	1.23	.98
	1200	3.36	2.92	1.69	1.46	1.17
	900	3.75	3.26	1.88	1.63	1.30
1 ½	3600	3.22	2.80	1.70	1.40	1.12
	1800	4.09	3.56	2.06	1.78	1.42
	1200	4.32	3.76	2.28	1.88	1.50
2	3600	4.95	4.30	2.60	2.15	1.72
	1800	5.01	4.36	2.64	2.18	1.74
	1200	5.59	4.86	2.94	2.43	1.94
3	3600	6.07	5.28	3.20	2.64	2.11
	1800	6.44	5.60	3.39	2.80	2.24
	1200	6.44	5.60	3.39	2.80	2.24
5	3600	6.44	5.60	3.39	2.80	2.24
	1800	7.36	6.40	3.87	3.20	2.56
	1200	7.87	6.84	4.14	3.42	2.74
7 ½	3600	9.09	7.90	4.77	3.95	3.16
	1800	9.59	8.34	5.02	4.17	3.34
	1200	10.8	9.40	5.70	4.70	3.76
10	3600	11.7	10.2	6.20	5.12	4.10
	1800	13.1	11.4	6.90	5.70	4.55
	1200	15.5	13.5	8.20	6.76	5.41
15	3600	16.6	14.4	8.74	7.21	5.78
	1800	18.2	15.8	9.59	7.91	6.32
	1200	18.3	15.9	9.60	7.92	6.33
20	3600	22.4	19.5	11.8	9.79	7.81
	1800	24.7	21.5	13.0	10.7	8.55
	1200	25.1	21.8	13.2	10.9	8.70
25	3600	26.5	23.0	13.9	11.5	9.19
	1800	29.2	25.4	15.4	12.7	10.1
	1200	30.8	26.8	16.3	13.4	10.7
30	3600	32.2	28.0	16.9	14.0	11.2
	1800	35.1	30.5	18.5	15.2	12.2
	1200	41.9	36.4	22.0	18.2	14.5
40	3600	45.1	39.2	23.7	19.6	15.7
	1800	47.6	41.4	25.0	20.7	16.5
	1200	51.2	44.5	26.9	22.2	17.8
50	3600	58.0	50.4	30.5	25.2	20.1
	1800	58.9	51.2	31.0	25.6	20.5
	1200	60.7	52.8	31.9	26.4	21.1
60	3600	63.1	54.9	33.2	27.4	21.9
	1800					
	1200					

Hp	Speed (RPM)	Amperes @				
		200 Volts	230 Volts	380 Volts	460 Volts	575 Volts
25	3600	69.9	60.8	36.8	30.4	24.3
	1800	74.5	64.8	39.2	32.4	25.9
	1200	75.4	65.6	39.6	32.8	26.2
30	3600	77.4	67.3	40.7	33.7	27.0
	1800	84.8	73.7	44.4	36.8	29.4
	1200	86.9	75.6	45.7	37.8	30.2
40	3600	90.6	78.8	47.6	39.4	31.5
	1800	94.1	81.8	49.5	40.9	32.7
	1200	111.	96.4	58.2	48.2	38.5
50	3600	116.	101.	61.0	50.4	40.3
	1800	117.	102.	61.2	50.6	40.4
	1200	121.	105.	63.2	52.2	41.7
60	3600	138.	120.	72.9	60.1	48.2
	1800	143.	124.	75.2	62.2	49.7
	1200	145.	126.	76.2	63.0	50.4
75	3600	150.	130.	78.5	65.0	52.0
	1800	164.	143.	86.8	71.7	57.3
	1200	171.	149.	90.0	74.5	59.4
100	3600	173.	150.	91.0	75.0	60.0
	1800	177.	154.	93.1	77.0	61.5
	1200	206.	179.	108.	89.6	71.7
125	3600	210.	183.	111.	91.6	73.2
	1800	212.	184.	112.	92.0	73.5
	1200	222.	193.	117.	96.5	77.5
150	3600	266.	231.	140.	115.	92.2
	1800	271.	236.	144.	118.	94.8
	1200	275.	239.	145.	120.	95.6
200	3600	290.	252.	153.	126.	101.
	1800	292.	176.	148.	116.	116.
	1200	293.	177.	147.	117.	117.
250	3600	298.	180.	149.	119.	119.
	1800	305.	186.	153.	122.	122.
	1200	343.	208.	171.	137.	137.
300	3600	348.	210.	174.	139.	139.
	1800	350.	210.	174.	139.	139.
	1200	365.	211.	183.	146.	146.
400	3600	458.	277.	229.	184.	184.
	1800	452.	274.	226.	181.	181.
	1200	460.	266.	230.	184.	184.
500	3600	482.	279.	241.	193.	193.
	1800	559.	338.	279.	223.	223.
	1200	568.	343.	284.	227.	227.
600	3600	573.	345.	287.	229.	229.
	1800	600.	347.	300.	240.	240.
	1200	678.	392.	339.	271.	271.
800	3600	684.	395.	342.	274.	274.
	1800	696.	518.	446.	358.	358.
	1200	1110.	642.	555.	444.	444.

Changing technology for changing times

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