

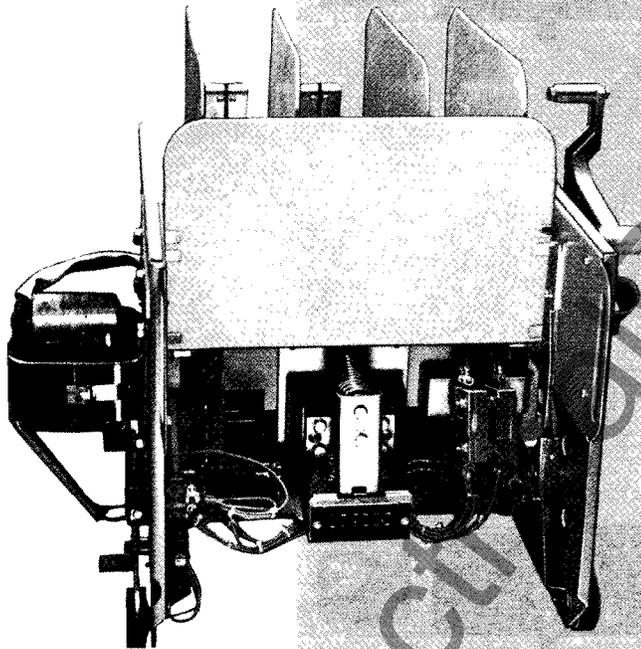


AMPGARD® Renewal And Replacement Parts Vacuum Break 400, 800 Amp

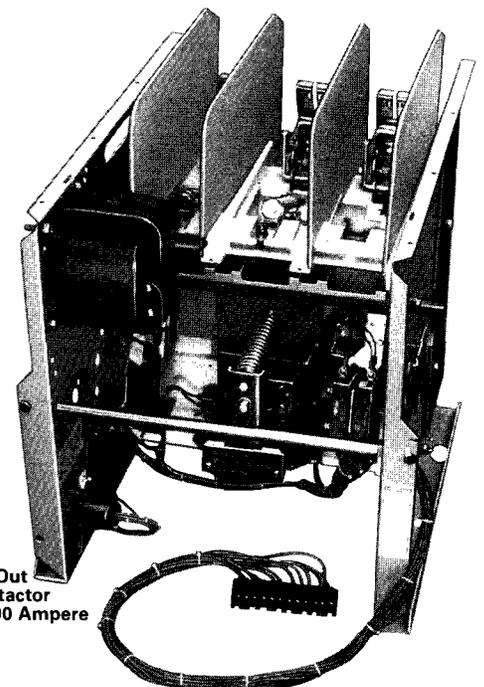
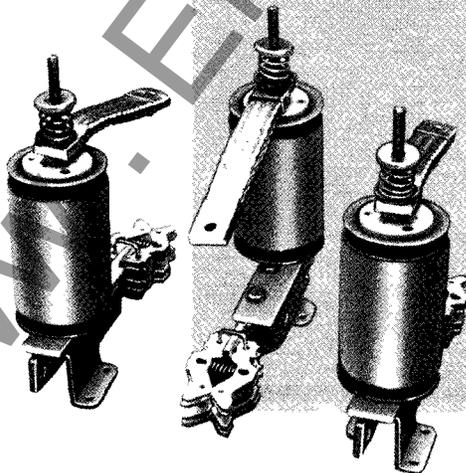
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See Renewal Parts Data 8855A for air break design.

See Renewal Parts Data 8855C for retrofits, OEM contactors, miscellaneous components.



Roll-Out Contactor
400 Ampere



Slide-Out
Contactor
400 Ampere

General Information

Renewal and Replacement Parts

The present design of Ampgard medium voltage starters was introduced in 1962. Additional ratings and features have been continuously introduced over the years.

This renewal parts data will provide the proper identification of standard parts which may be required for the maintenance of Westinghouse Ampgard starters. All of the complete contactors, isolating switches and sub assemblies that are available are shown photographically in kit form.

Some of the detail parts shown in the renewal parts data are recommended only as part of a sub assembly to facilitate their replacement or installation in the field.

Style numbers identified in this brochure will not be the same as style numbers on the original equipment. The renewal part styles in this brochure are in a kit form and may include sub assembly, carton, installation instructions, etc.

It is the intent of this renewal parts data brochure to make it possible for you to quickly identify the parts needed rather than have to search through twenty years of records to determine the specific style of the original part. All of the parts shown in the kits are compatible with the design from 1962 to the present (or noted otherwise).

Special attention should be given to forecasting your particular renewal parts requirements to ensure on-site availability of necessary parts and materials when needed, as well as guaranteeing efficiency and continued operation of your equipment.

The amount of investment to be made in renewal parts is best determined by you, taking into consideration such things as the impact of probable shutdown time, equipment duty cycle, etc.

To maintain maximum operating efficiency and dependability of your equipment, genuine Westinghouse renewal parts are recommended.

This publication identifies those replacement parts which are available and should be ordered by style number.

Procedure for Identifying Renewal Parts

- (1) Determine the ampere rating of your starter by measuring the width of the structure.
- (2) Determine if it is non-reversing or reversing by measuring the height of the high voltage portion of your starter. (see page 3)

Examples:

36 in. width is 400 ampere rated.

Roll-out design is contactor with wheels.

Slide-out design is contactor without wheels.

45 in. height is non-reversing starter.

75 in. height is reversing starter.

Refer to pages 4, 5, 8, 15 for **Roll-out** design.

Refer to pages 6, 7, 9, 14 for **Slide-out** design.

40 in. width is 800 ampere rated.

60 in. height is non-reversing starter.

90 in. height is reversing starter.

Refer to pages 10, 11, 12, 13, 16.

- (3) Determine the volt amp rating of the control transformer by measuring the height of the control transformer.
- (4) Determine primary voltage; 2300, 4160, etc. This information is on the starter nameplate in the low voltage area.
- (5) Now that you have identified the design of your complete contactor determine from the photographs which parts are required and identify them by style number.

Ampgard Starters

Since many starters are supplied to meet specific customer electrical control and distribution requirements, other parts not listed in this publication might occasionally be needed. Refer to factory for specific requests.

For equipment other than 60 Hz, refer to factory for information.

Price and availability of parts not listed may be obtained by contacting your local Westinghouse representative. Provide a complete description of the part, along with the complete data on the starter nameplate which is found in the low voltage area. Be sure to include: ratings, shop order and diagram reference.

Ordering Instructions

- (1) Specify by **style number**.
- (2) Refer to Price List/Style Number Index 8855 for pricing information.

Additional Service

Should you experience difficulty in determining needed parts for repair or determining existing starter condition, contact your local Westinghouse representative. Westinghouse can provide qualified technical personnel on site to:

- Identify and recommend replacement parts for damage caused by short circuit or fault.
- Remove damaged parts and install replacements.
- Retrofit vintage motor starting equipment with new components.
- Evaluate condition of existing equipment.
- Test components.
- Provide a recommended spare parts list.
- Upgrade existing unit from one Hp to another or change operating voltage of existing equipment.
- Convert the starter from air break to vacuum break contactor.

Obsolete Ampgard Designs

Obsolete Ampgard design starters manufactured prior to 1966 were designated **AMI** starters and were built in various cities in the USA. These starters were "1 High" design, 30 in., 34 in., or 38 in. wide, 100 in. high, and either 30 in. or 60 in. deep. Retrofitting an **AMI** starter is possible with up to date Ampgard components. Refer to Renewal Parts Data 8855C or refer to factory for information.

Contactors designated type H130, H230, H430 (air) and contactors designated type K430 (oil) were utilized in the **AMI** starters. These contactors are obsolete. Refer to factory for information.

The isolating switch utilized in the **AMI** starters were manufactured by G&W Electric and is no longer available. For replacement of G&W Electric switch, contact:

Phoenix Electric
P.O. Box 53
Readville Station
Boston, MA 02137
Phone: 617-821-0200
FAX: 617-828-5719

—or—

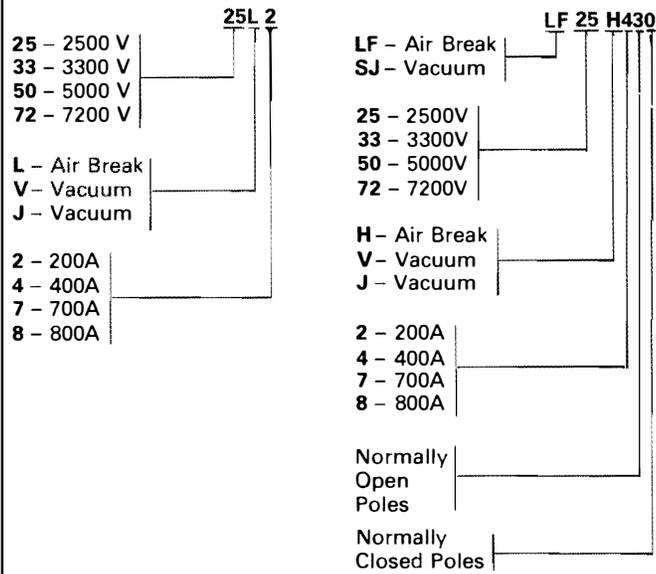
Refer to Renewal Parts Data 8855C for retrofit of the entire starter with current design Ampgard. This will consist of welded cell assembly, drawout isolating switch, vacuum contactor, power fuses, current transformers, overload protection. Above will all mount in existing customer **AMI** enclosure.

Type LF66V430 vacuum contactors shipped prior to 1982 are obsolete and no longer available. For replacement order up to date design vacuum contactor from page 4, which is mechanically and electrically interchangeable with obsolete Type LF66V430 contactor.

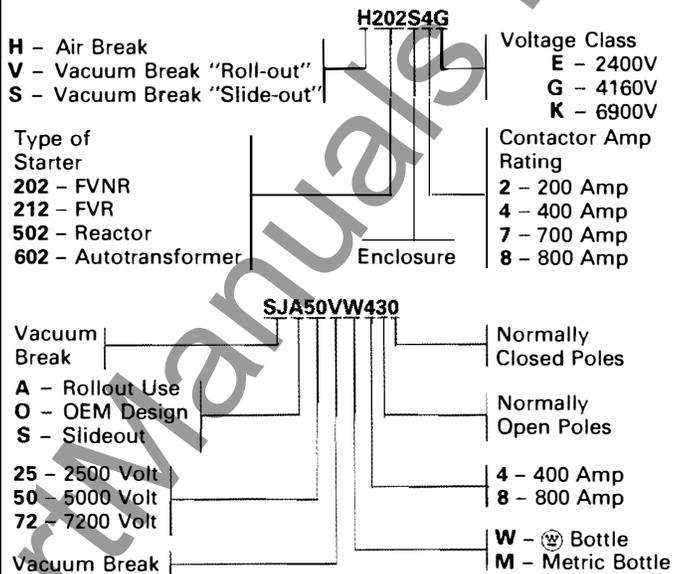


www.ElectricalParts.com

Older Catalog Number Systems

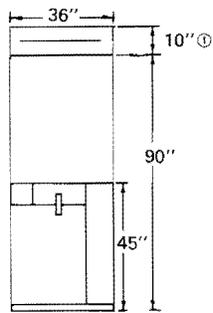


Current Catalog System*

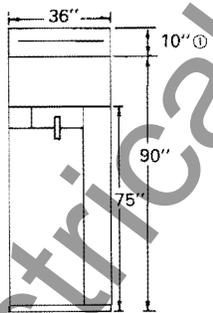


*Refer to Price List 8810 for complete catalog system breakdown.

Dimensions



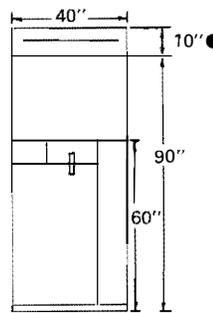
400 Amp Vacuum Contactor
7200 volt max. non-reversing
Pages 4 & 5 **Rollout** design
Pages 6 & 7 **Slideout** design



400 Amp Vacuum Contactor
7200 volt max. reversing
Pages 4, 5, 8 **Rollout** design
Pages 6, 7, 9 **Slideout** design

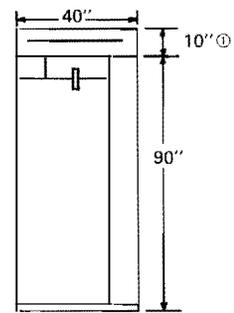
400 Amp
7200 volt max. Isolating Switch
Page 15 **Rollout** design
Page 14 **Slideout** design

400 Amp
7200 volt max. Isolating Switch
Page 15 **Rollout** design
Page 14 **Slideout** design



800 Amp Vacuum Contactor
7200 volt max.
Pages 10, 11, 12

800 Amp
7200 volt max. Isolating Switch
Page 16



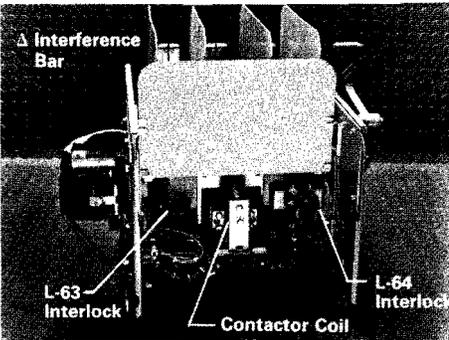
800 Amp Vacuum Break Contactor,
Reversing
7200 volt max.
Pages 10, 11, 12

800 Amp Isolating Switch
Page 16

① Main bus enclosure.



400 Amp Vacuum Break Contactor 7200 Volt Max. "Roll-out" Design



Front View

400 amp vacuum contactor 120 volt control, with control transformer and two normally open and two normally closed interlocks. To determine proper complete contactor style number, refer to the photograph showing both sizes of control transformers. The smaller control transformer with a height dimension of 5 inches is rated 600 volt amp at 4160 volts and 750 volt amp at 2300 volts. The larger control transformer with a height of 7 inches is rated 2 kVA at either 2300 or 4160 volts.

Approximate shipping weight 150 lbs.

Complete contactor 2300/120 volt, 750 volt amp transformer, 60 Hz
Style No. 2147A45G01Δ

Complete contactor 2300/120 volt, 2 kVA transformer, 60 Hz
Style No. 2147A45G02Δ

Complete contactor 4160/120 volt, 600 volt amp transformer, 60 Hz
Style No. 2147A45G03Δ

Complete contactor 4160/120 volt, 2 kVA transformer, 60 Hz
Style No. 2147A45G04Δ

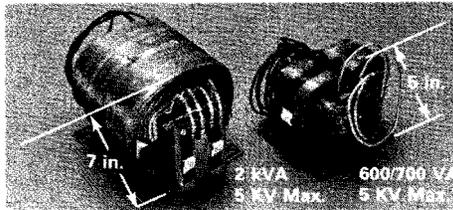
For contactor with 240 volt AC control, order similar to style number 2147A45G0_ , except 240 volt AC control.

For SJA contactors supplied after October 1988 with pull-a-part terminal blocks, order SJS pre-cable Style No. 2147A15G_ from page 7 for field mounting.

If main contactor is used in reversing, auto-transformer, multi-speed starter, or has potential transformer connection refer to page 5 and order line fingers Style No. 2147A49G01.

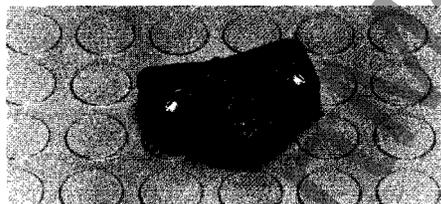
If main contactor must be mechanically interlocked with other contactor, order mechanical interlock arm Style No. 2147A43G14 from page 8 for field mounting.

Δ Remove interference bar if used with old narrow flange doors supplied prior to July 1983.
Ⓛ Recommended for "Start-up" spares.

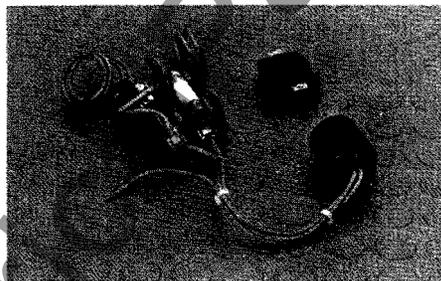


Control transformers*

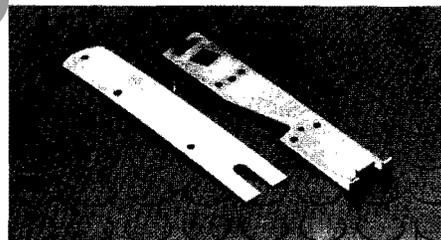
Control transformers shown above are 5000 volt max. Transformers for higher primary voltages are available but may be a larger physical size and mounted remote from contactor. Specify system voltage, Hz, V.A. size and refer to factory.



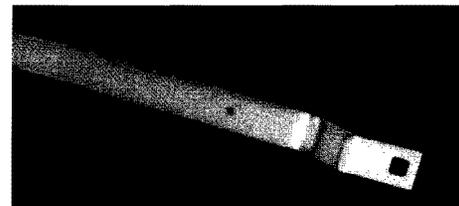
L-63 Interlock (Coil Circuit)
Style No. 578D461G03* Ⓛ



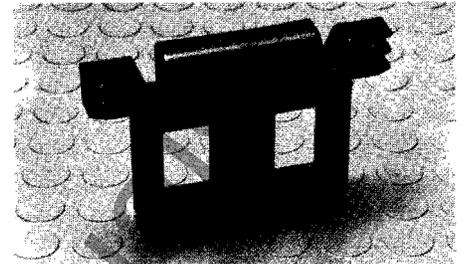
Contactor mounted Run-Test circuit, 15 amp plug (Use standard NEC fuse.)
Style No. 2147A15G09



Tools, feeler gauge and bottle wrench
Style No. 2147A47G15*

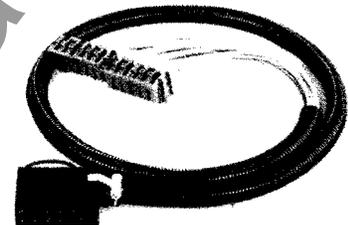


Tool, heavy duty contactor closing tool, for 400/800 amp vacuum contactor
Style No. 2147A47G17

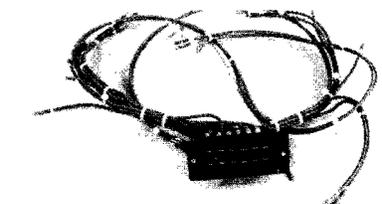


Contactor coil 120 volts
Style No. 2147A48G11* Ⓛ

Contactor coil 240 volt
Style No. 2147A48G21*



12 prong receptacle with wires (part of structure)
Style No. 2147A15G03



12 prong plug with wire (part of contactor)
Style No. 2147A15G04

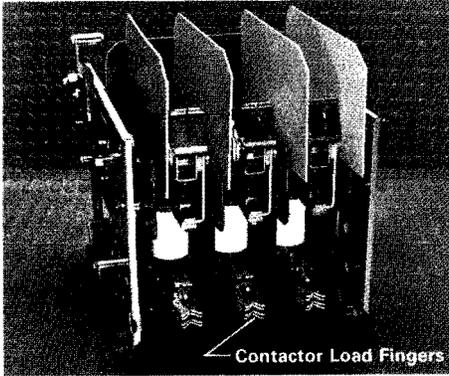


Contactor fuse clips, Qty 3
Style No. 2147A49G11*

*Common to Roll-out and Slide-out design.

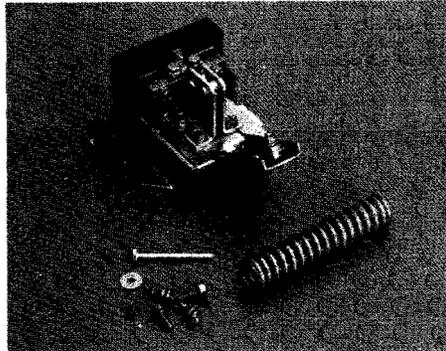


400 Amp Vacuum Break Contactor 7200 Volt Max. "Roll-out" Design



Rear View

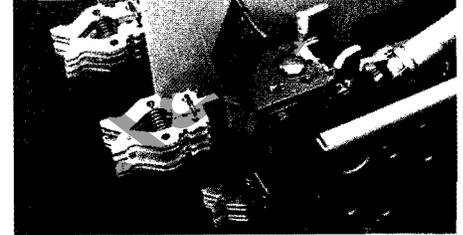
Contactor Load Fingers



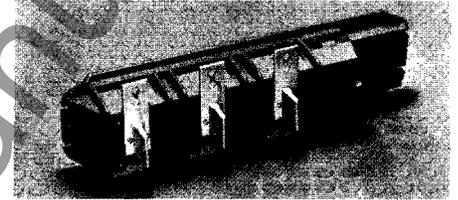
Magnet assembly complete with 120V. coil
Style No. 2147A48G12*

Magnet assembly complete with 240V. coil
Style No. 2147A48G13*

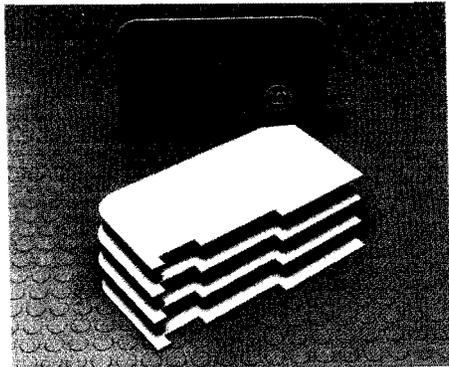
Magnet assembly complete except without coil
Style No. 2147A48G14*



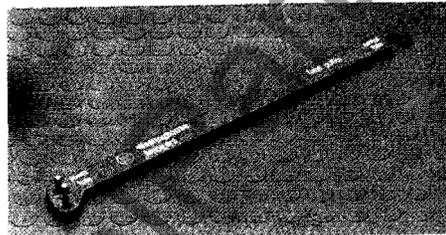
Line fingers mounted on contactor.



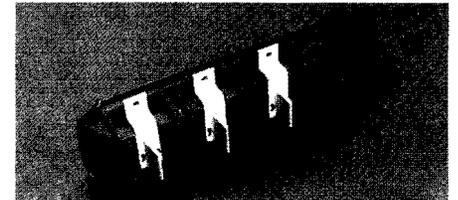
Contactor Line stab assembly, 3 copper stabs plus insulator (part of structure)
Style No. 2147A49G14



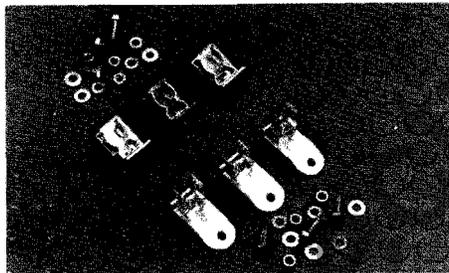
Phase barriers main and reversing contactor, Qty 5
Style No. 2147A47G11



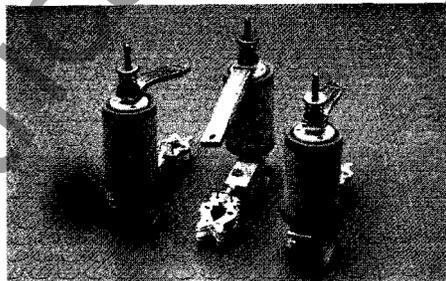
Fuse puller
Style No. 2147A93G04*



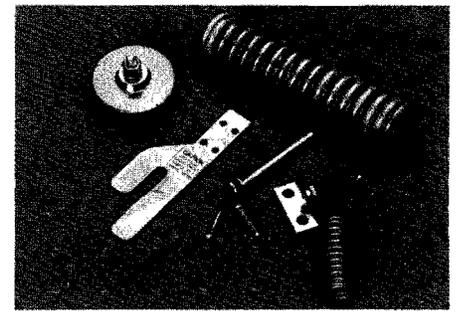
Contactor Load stab assembly, 3 copper stabs plus insulator (part of structure)
Style No. 2147A49G05 ●



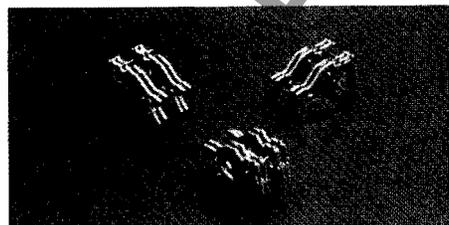
Fuse clips and mounting for primary fuses of control transformer or potential transformer, Qty 3
Style No. 2147A47G16*



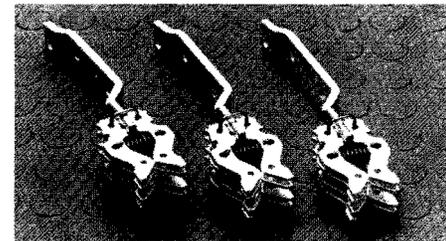
Vacuum bottle subassemblies with shunt and load support and load fingers, Qty 3
Style No. 2147A47G03 ●



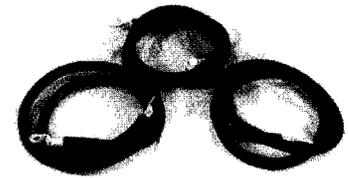
Misc. parts kit —
Kickout spring and adjusting bolt, coil clip, set screw, electrical interlock operating arm with mounting hardware, mechanical interlock spring and contactor wheel.
Style No. 2147A48G15*



Contactor Line or load fingers, without support Qty. 3
Style No. 2147A47G23



Line fingers with copper support, Qty 3
Style No. 2147A49G01
Required as a field modification to a main contactor to supply power to potential transformers and to reversing contactors.

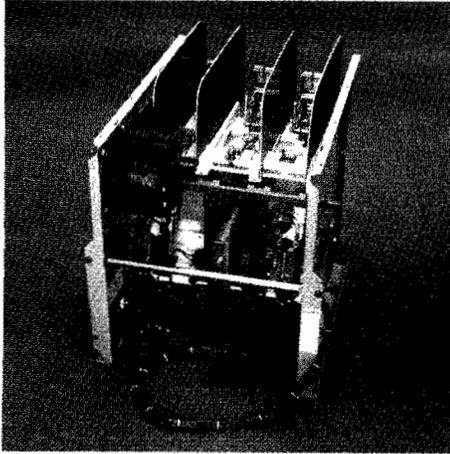


Contactor main load cables
Style No. 2147A15G18
1/0 Cable if C.T. ratio is below 250/5

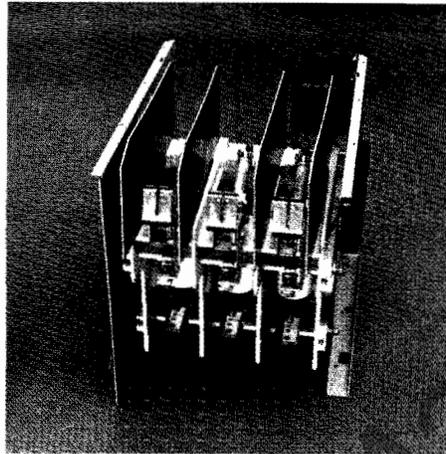
Contactor main load cables
Style No. 2147A15G19
4/0 Cable if C.T. ratio is 250/5 or above



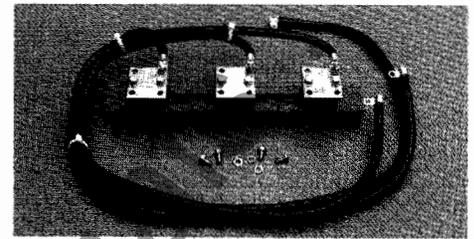
400 Amp Vacuum Break Contactor, 7200 Volt Max. "Slide-out" Design



Front View



Rear View



Contactor main load cables with load adapter

Style No. 2147A15G13 1/0 cable if C.T. ratio is below 250/5.

Style No. 2147A15G14 4/0 cable if C.T. ratio is 250/5 or above.

400 amp vacuum contactor 120 volt control, with control transformer and two normally open and two normally closed interlocks. To determine proper complete contactor style number, refer to the photograph showing both sizes of control transformers. The smaller control transformer with a height dimension of 5 inches is rated 600 volt amp at 4160 volts and 750 volt amp at 2300 volts. The larger control transformer with a height of 7 inches, is rated 2 kVA at either 2300 or 4160 volts.

Approximate shipping weight 150 lbs.

Complete contactor 2300/120 volt, 750 volt amp transformer, 60 Hz
Style No. 2147A45G21

Complete contactor 2300/120 volt, 2 kVA transformer, 60 Hz
Style No. 2147A45G22

Complete contactor 4160/120 volt, 600 volt amp transformer, 60 Hz
Style No. 2147A45G23

Complete contactor 4160/120 volt, 2 kVA transformer, 60 Hz
Style No. 2147A45G24

For contactor with 240 volt AC control, order similar to Style No. 2147A45G21, except 240 volt AC control.

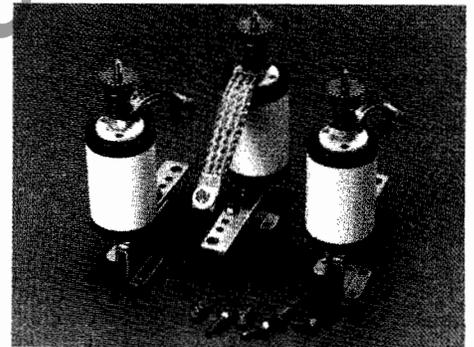
If main contactor must be interlocked with other contactors, order contactor interlock arms Style No. 2147A43G12 from page 7 for field mounting.

The main contactor may mount line current transformers, ground fault current transformer, control transformer and 3 phase potential transformer. See Renewal Parts Data 8855C pages 3, 4, 5 for various Style Numbers.

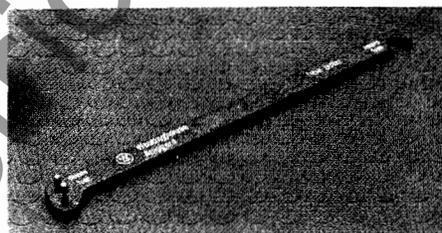


Control transformers*

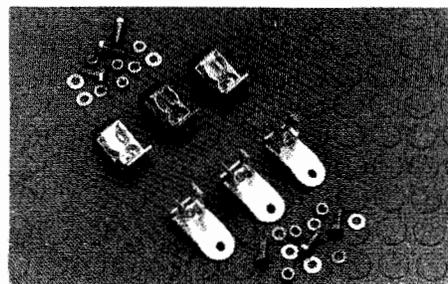
Control transformers shown above are 5000 volt max. Transformers for higher voltages are available but may be a larger physical size and mounted remote from contactor. Specify system voltage, Hz, V.A. size and refer to factory.



Vacuum bottle sub-assemblies with shunt and load support, Qty 3
Style No. 2147A47G13 ②



Fuse puller
Style No. 2147A93G04*



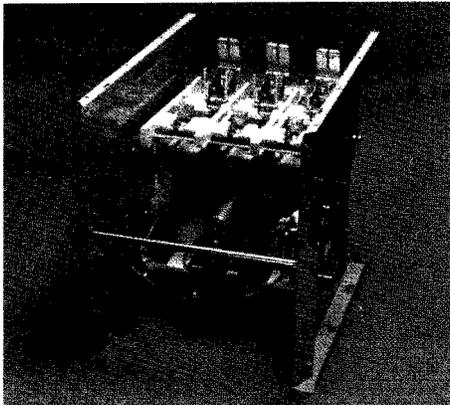
Fuse clips and mounting for primary fuses of control transformer or potential transformer, Qty 3
Style No. 2147A47G16*

*Common to Roll-out and Slide-out design.

② Recommended for "Running" spares.



400 Amp *Vacuum* Break Contactor, 7200 Volt Max. "Slide-out" Design



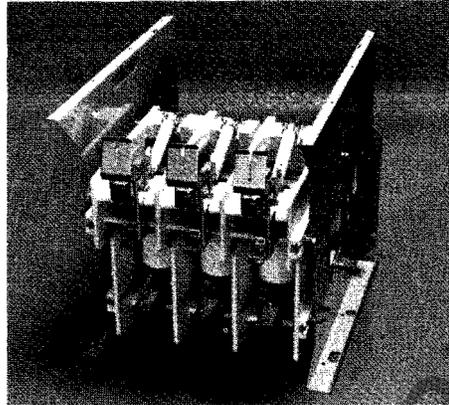
Front View

400 amp vacuum contactor (basic quick ship) similar to Style No. 2147A45G21, G22, G23, G24, page 6, except without control transformer, without precable, without (4) barriers, without mechanical interlock arm, 120 volt control.

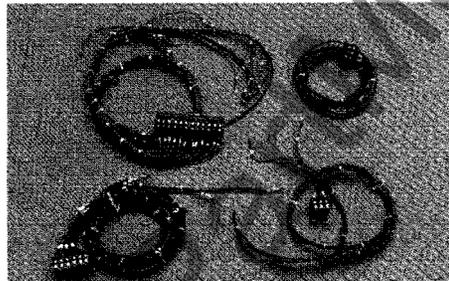
Approximate shipping weight 125 lbs

Style No. 2147A45G25

For contactor with 240 volt AC control order similar to 2147A45G25, except 240 volt AC control.



Rear View

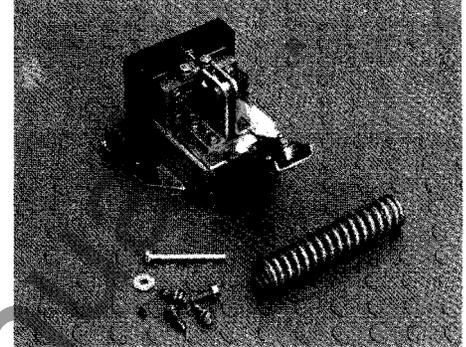


Contactor control pre-cables with pull-apart terminal blocks

Style No. 2147A15G10

Contactor control pre-cables, 12 point (part of 2147A15G10) for coil and electrical interlock circuitry only.

Style No. 2147A15G17.



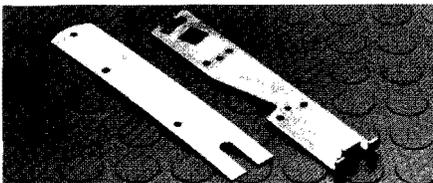
Magnet assembly complete with 120 V. coil
Style No. 2147A48G12*

Magnet assembly complete with 240 V. coil
Style No. 2147A48G13*

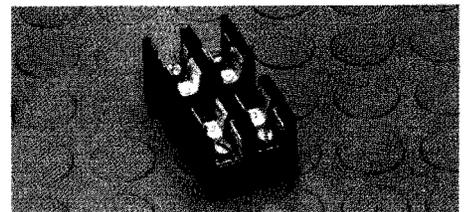
Magnet assembly complete except without coil
Style No. 2147A48G14*



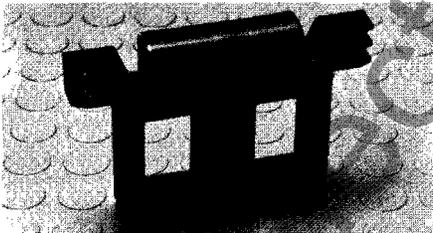
L-63 interlock
Style No. 578D461G03*^①



Tools, feeler gauge and bottle wrench
Style No. 2147A47G15*



P.T. sec. fuse block, 2 pole
Style No. 2147A15G16



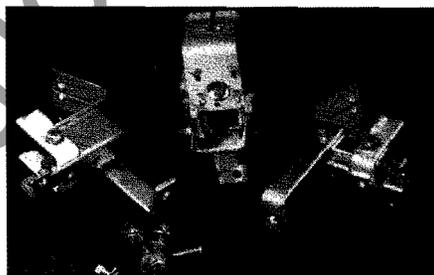
Contactor coil 120 volts
Style No. 2147A48G11*^①

CPT sec. fuse block, 1 pole
Style No. 2147A15G15
Above fuse blocks mounted on contactor side sheet, and use miniature dual element fuses 1 1/2 in. long, 1/32 in. dia.

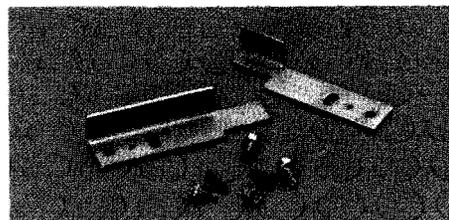
Contactor coil 240 volts
Style No. 2147A48G21*



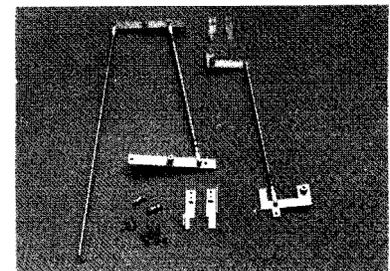
Phase barriers, main contactor, Qty 4
Style No. 2147A47G14



Contactor fuse clips, Qty 3
Style No. 2147A49G11*



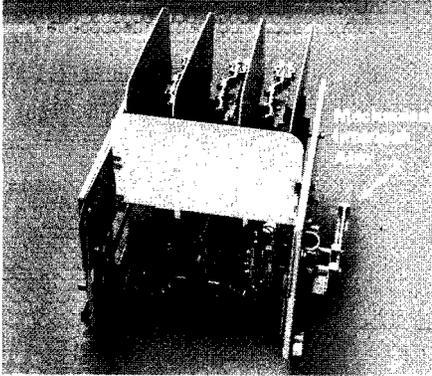
Contactor mechanical interlock arms.
For interlock between isolating switch or any reversing or reduced voltage or multi-speed contactor
Style No. 2147A43G12



Mechanical interlock kit.
Between isolating switch and main contactor.
Between (2) contactors (auto-transformer, reversing, multi-speed application.)
Style No. 2147A43G13



400 Amp *Vacuum* Break Contactor, 7200 Volt Max. Reversing, 2 Pole and Latched "Roll-out" Design



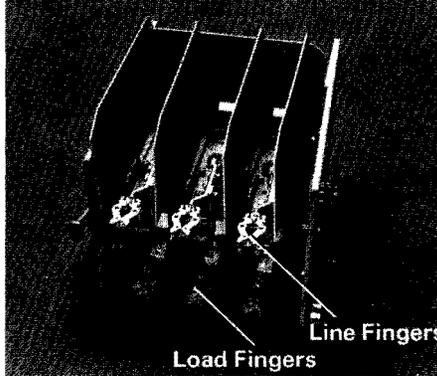
Front View

Three pole reversing contactor with line and load fingers, includes mechanical interlock arm, for mechanical interlock, 120 volt coil (used as reversing contactor or reactor shorting contactor of a reactor reduced voltage starter).

Approximate shipping weight 150 lbs.

Style No. 2147A46G05

For contactor with 240 volt coil order similar to Style No. 2147A46G05 except 240 volt coil.



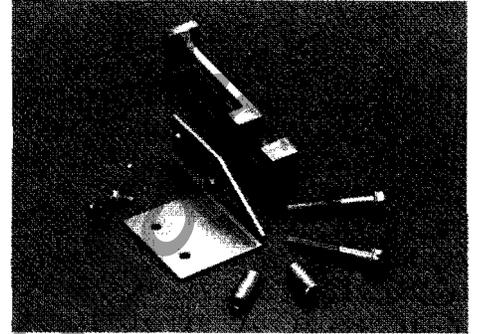
Rear View

Two pole contactor with line and load fingers, 120 volt coil, (used as the shorting and run contactor for an autotransformer reduced voltage starter).

Approximate shipping weight 125 lbs.

Style No. 2147A46G06

For contactor with 240 volt coil order similar to Style Number 2147A46G06 except 240 volt coil.

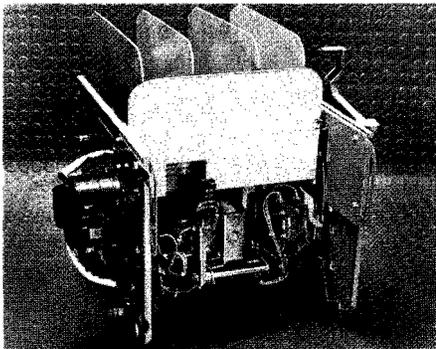


Mechanical interlock arm for field mounting on contactor
Style No. 2147A43G14



Control transformers*

Control transformers shown above are 5000 volt max. Transformers for higher voltages are available but may be a larger physical size and mounted remote from contactor. Specify system voltage, Hz, V.A. size and refer to factory.



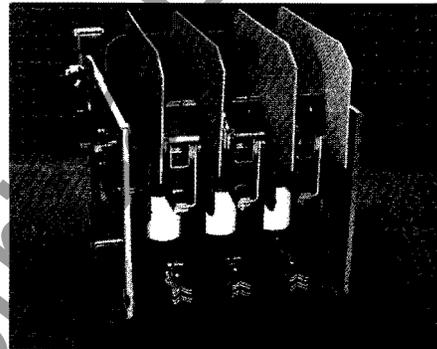
Front View

400 amp vacuum latched contactor single trip solenoid. 120 volt control, with control transformer and two normally open and two normally closed interlocks. To determine proper complete contactor style number, refer to the photograph showing both sizes of control transformers. The smaller control transformer with a height dimension of 5 inches is rated 600 volt amp at 4160 volts and 750 volt amp at 2300 volts. The larger control transformer with a height of 7 inches, is rated 2 kVA at either 2300 or 4160 volts.

Approximate shipping weight 150 lbs.

Complete latched contactor 2300/120 volt, 750 volt amp transformer, 60 Hz
Style No. 2147A45G11

Complete latched contactor 2300/120 volt, 2 kVA transformer, 60 Hz
Style No. 2147A45G12



Rear View

Complete latched contactor 4160/120 volt, 600 volt amp transformer, 60 Hz
Style No. 2147A45G13

Complete latched contactor 4160/120 volt, 2 kVA transformer, 60 Hz
Style No. 2147A45G14

For contactor with 240 volt AC control, order similar to Style No. 2147A45G1_ except 240 volt AC control.

For contactor with 2 trip solenoids order similar to Style No. 2147A45G1_ except specify trip voltage 120 or 240 volt AC, or intermittent 48, 125, 250 volt DC (any combination of 2 voltages)



Mechanical latch kit with 1 trip solenoid. Complete with L-63 and L-64 electrical interlock and contactor mounted 12 point receptacle, 115 volt AC coil.
Style No. 2147A48G29

For mechanical latch kit with dual trip solenoid order similar to Style No. 2147A48G29 except dual solenoid for operation at _____ volts. Specify trip voltage, 120 or 240 volt AC, or intermittent 48, 125, 250 volt DC

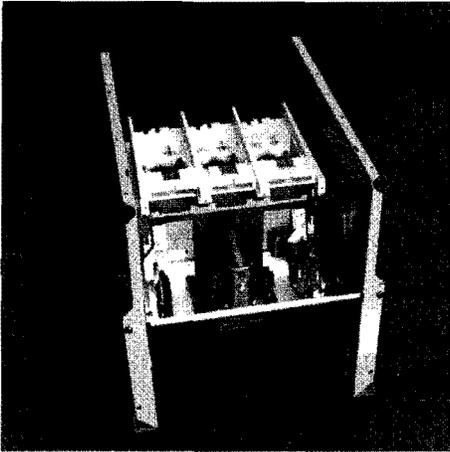
Single solenoid assembly **only** without magnet assembly, L-63 and L-64 interlocks, 12 point receptacle, wiring.

	AC	DC (Int.)
Style No. 5259C73H01	115 V.	48 V.
Style No. 5259C73H02	230 V.	96-125 V.
Style No. 5259C73H03	460 V.	230 V.
Style No. 5259C73H04	575 V.	—
Style No. 5259C73H05	—	24 V.

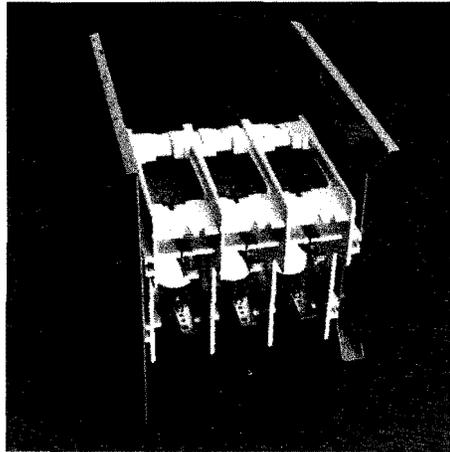
*Common to Roll-out and Slide-out design.



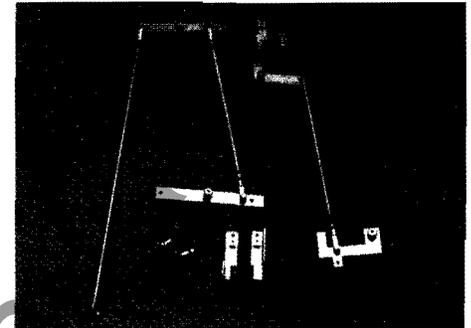
400 Amp *Vacuum* Break Contactor, 7200 Volt Max. Reversing, 2 Pole and Latched "Slide-out" Design



Front View



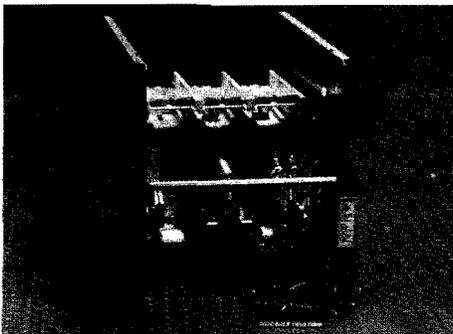
Rear View



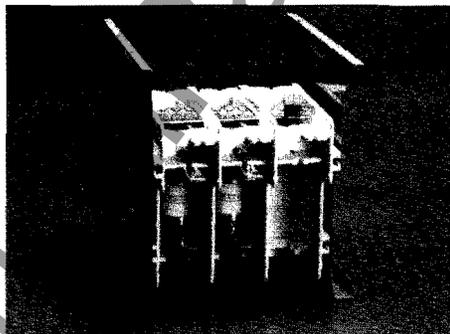
Mechanical interlock kit.
Between isolating switch and main contactor:
Between (2) contactors (*auto-transformer, reversing, multi-speed application*)
Style No. 2147A43G13

Three pole reversing contactor, includes mechanical interlock arm for mechanical interlock, 120 volt coil. (*Used as reversing contactor or reactor shorting contactor of a reactor reduced voltage starter.*)
Style No. 2147A46G15

For contactor with 240 volt coil, order similar to Style No. 2147A46G15 except with 240 volt coil.



Front View



Rear View

Two pole contactor, 120 volt coil. (*Used as starting and run contactor for an auto-transformer reduced voltage, starter includes mechanical interlock arm for mechanical interlock.*)
Style No. 2147A46G16

For contactor with 240 volt coil, order similar to Style No. 2147A46G16 except with 240 volt coil.

400 amp vacuum **latched** contactor single trip solenoid. 120 volt control, with control transformer and two normally open and two normally closed interlocks. To determine proper complete contactor style number, refer to the photograph (Page 8) showing both sizes of control transformers. The smaller control transformer with a height dimension of 5 inches is rated 600 volt amp at 4160 volts and 750 volt amp at 2300 volts. The larger control transformer with a height of 7 inches is rated 2 kVA at either 2300 or 4160 volts.

Complete latched contactor 2300/120 volt, 750 volt amp transformer
Style No. 2147A45G31

Complete latched contactor 2300/120 volt, 2 kVA transformer
Style No. 2147A45G32

Complete latched contactor 4160/120 volt, 600 volt amp transformer
Style No. 2147A45G33

Complete latched contactor 4160/120 volt, 2 kVA transformer
Style No. 2147A45G34

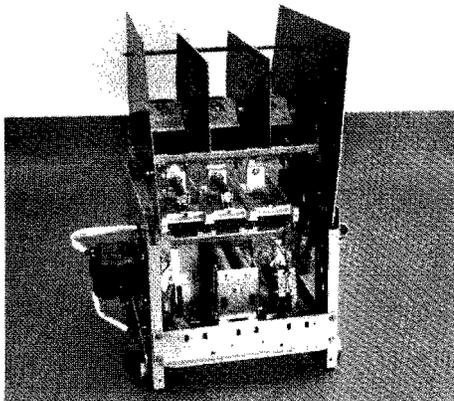
For contactor with 240 volt AC control order similar to Style No. 2147A45G3... except 240 volt AC control.

For contactor with 2 trip solenoids order similar to Style No. 2147A45G3... except specify trip voltage 120 or 240 volt AC, or intermittent 48, 125, 250 volt DC (*any combination of 2 voltages*).

For field mounting of mechanical latch kit on slideout contactor order Style No. 2147A48G16 (Page 8) and discard 12 point receptacle and pre-cable.



800 Amp Vacuum Break Contactor, 7200 Volt Max – Type SJA



Front View

800 amp vacuum break contactor 120 volt control, with control transformer and two normally open and two normally closed interlocks, 2kVA control transformer.

Approximate shipping weight 175 lbs.

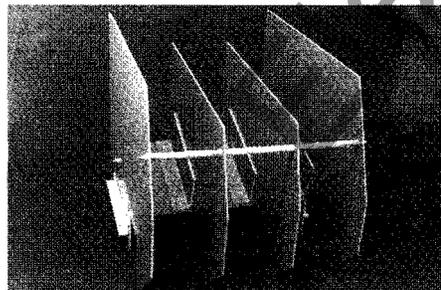
Complete contactor, 2300/120 volt, 2 kVA transformer, 60 Hz
Style No. 2147A85G01

Complete contactor, 4160/120 volt, 2 kVA transformer, 60 Hz
Style No. 2147A85G02

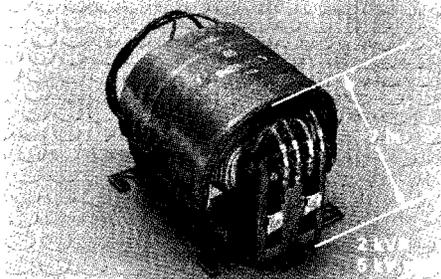
For contactor with 240 volt AC control, order similar to Style No. 2147A85G0_ except 240 volt AC control.

For SJA contactors supplied after October 1988 with pull-a-part terminal blocks, order SJS pre-cable Style No. 2147A15G_ from page 7 for field mounting.

If main contactor is used in reversing, auto-transformer, multi-speed starter, or has potential transformer connection refer to page 11 and order line fingers Style No. 2147A89G01.

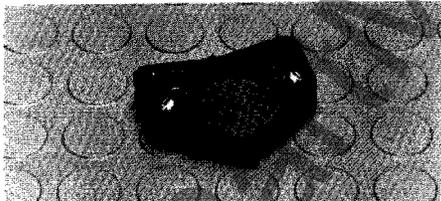


Barrier Assembly
Style No. 2147A89G07

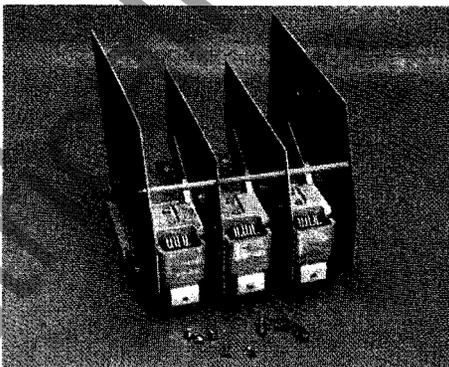


Control transformer

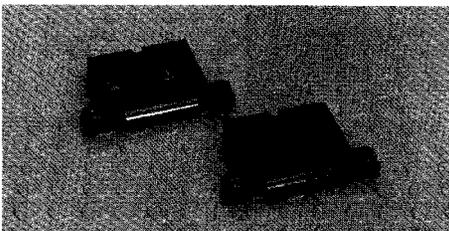
Control transformer shown above is 5000 volt max. Transformers for higher voltages are available but maybe a larger physical size and mounted remote from contactor. Specify system voltage, Hz, V.A. size and refer to factory.



L-63 interlock
Style No. 578D461G03①

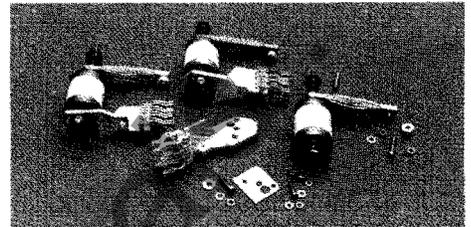


Fuse support and barrier assembly
Style No. 2147A89G06

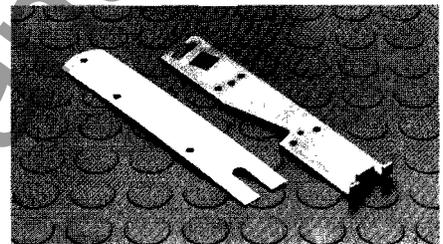


Contactor coil, 120 volts
Style No. 2147A88G11①

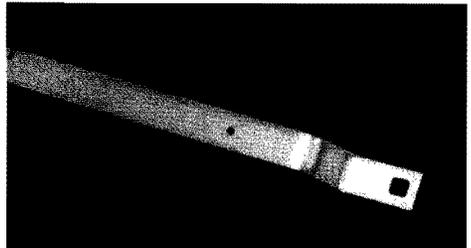
Contactor coil, 240 volts
Style No. 2147A88G12



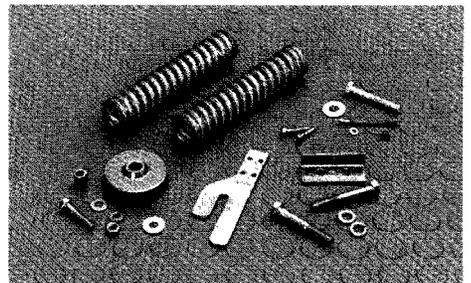
Vacuum bottle sub-assemblies with shunt, load support, load fingers Qty 3
Style No. 2147A87G03②



Tools, feeler gauge and bottle wrench
Style No. 2147A47G15



Tool, heavy duty contactor closing tool, for 400/800 ampere vacuum contactor
Style No. 2147A47G17

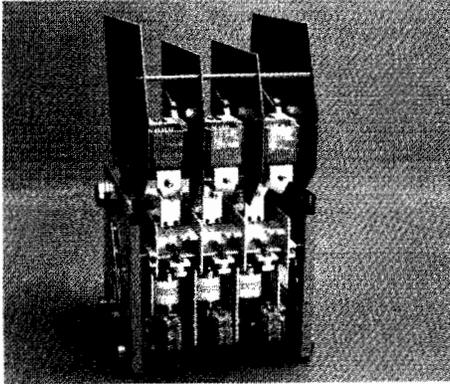


Misc. Parts Kit – Kickout springs and adjusting bolt, coil clip, electrical interlock operating arm with mounting hardware, mechanical interlock spring and contactor wheel
Style No. 2147A88G15

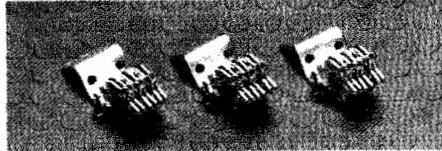
① Recommended for "Start-up" spares.
 ② Recommended for "Running" spares.



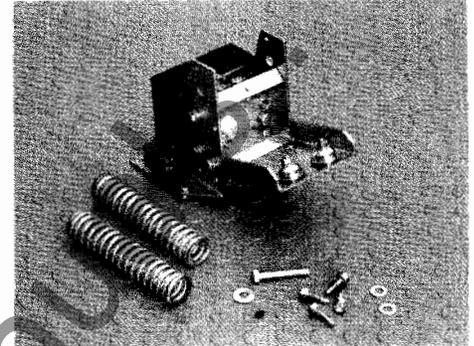
800 Amp Vacuum Break Contactor, 7200 Volt Max. – Type SJA



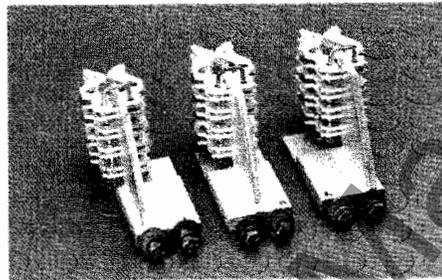
Rear View



Fuse load fingers (connection between contactor, and fuse) Qty 3
Style No. 2147A71G15

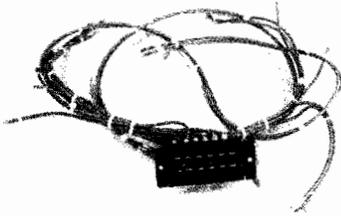


Magnet assembly complete with 120 volt coil.
Style No. 2147A88G02



Contactor line fingers with copper support Qty 3
Style No. 2147A89G01

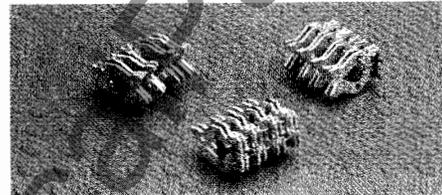
Magnet assembly complete with 240 volt coil.
Style No. 2147A88G03



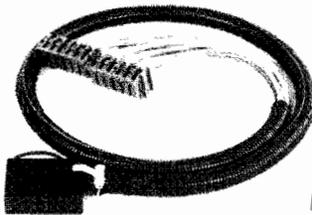
12 prong plug with wire, (part of contactor)
Style No. 2147A15G04

Magnet assembly complete except without coil.
Style No. 2147A88G04

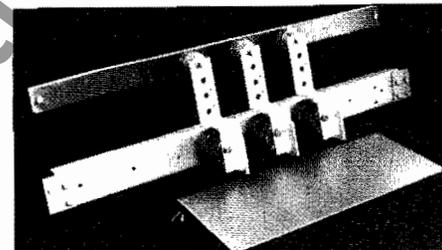
Required as a field modification to a main contactor to supply power to potential transformers and to reversing contactors.



Contactor line or load fingers without support. Qty 3
Style No. 2147A89G02



12 prong receptacle with wire, (part of structure)
Style No. 2147A15G12



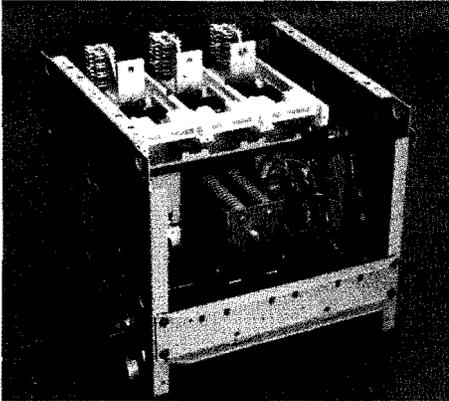
Contactor load or line stab assembly, complete with mounting.
Style No. 2147A89G03



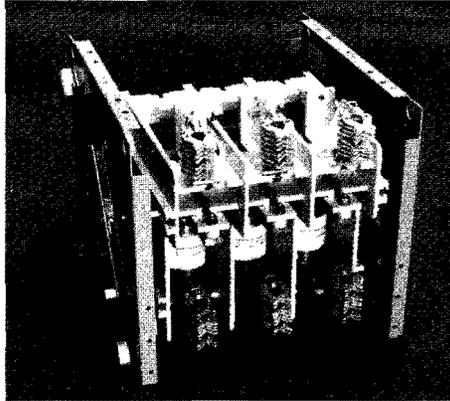
Fuse puller for 800 amp starter
Style No. 2147A93G07



800 Amp Vacuum Break Contactor, 7200 Volt Max. – Type SJA Reversing and Latched



Front View

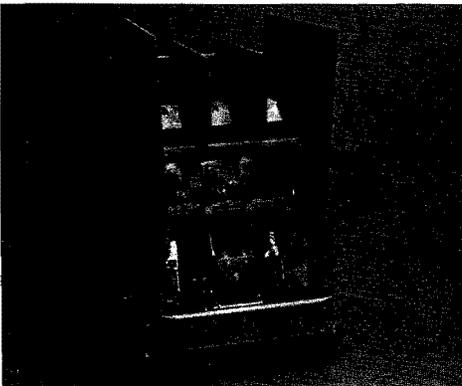


Rear View

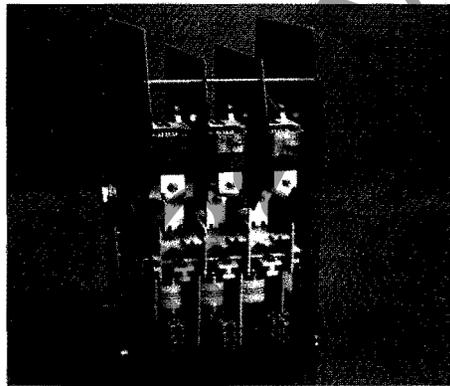
Three pole reversing contactor with line and load fingers, includes mechanical interlock arm for mechanical interlock, 120 volt coil (used as reversing contactor or reactor shorting contactor of a reactor reduced voltage starter)

Style No. 2147A86G12

For contactor with 240 volt coil order similar to Style No. 2147A86G12 except with 240 volt coil.



Front View



Rear View



Mechanical Latch Kit with (1) trip solenoid 120 volt AC continuous/48 VDC intermittent.
Style No. 2147A88G22

Above photograph shown without control transformer mounted on connector.

800 amp vacuum **latched** contactor, single trip solenoid 120 volt control, with control transformer and two normally open and two normally closed interlocks, 2 kVA control transformer.

Complete latched contactor 2300/120 volt, 2 kVA transformer, 60 Hz
Style No. 2147A85G11

Complete latched contactor 4160/120 volt, 2 kVA transformer, 60 Hz
Style No. 2147A85G12

For contactor with 240 volt AC control, order similar to Style No. 2147A85G1_ , except 240 volt AC control.

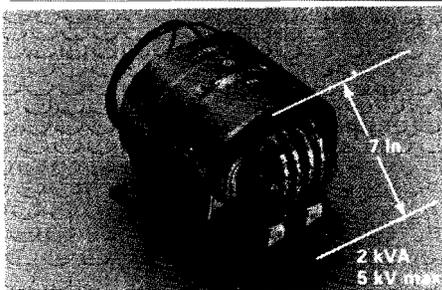
For contactor with 2 trip solenoids order similar to Style No. 2147A85G1_ except specify trip voltage 120 or 240 volt AC, or intermittent 48, 125, 250 volt DC (any combination of 2 voltages)

230 volt AC continuous/125 VDC intermittent.

Style No. 2147A88G23

Single solenoid assembly **only** without L-63 and L-64 interlocks, precable, or magnet parts.

	AC	DC (Int.)
Style No. 5259C73H01	115 V.	48 V.
Style No. 5259C73H02	230 V.	96-125 V.
Style No. 5259C73H03	460 V.	230 V.
Style No. 5259C73H04	575 V.	—
Style No. 5259C73H05	—	24 V.

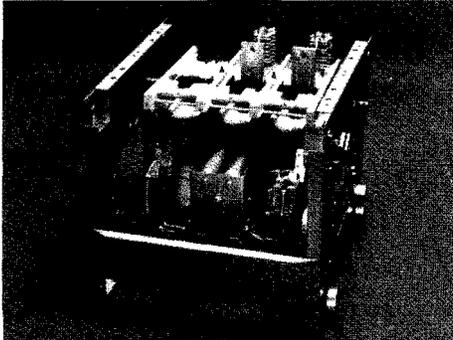


Control transformer

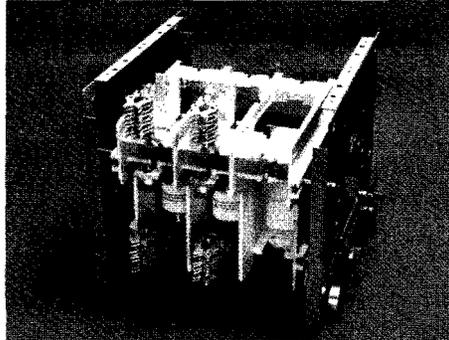
Control transformer
 Control transformer shown above is 5000 volt max. Transformers for higher voltages are available but may be a larger physical size and mounted remote from contactor. Specify system voltage, Hz, V.A. size and refer to factory.



800 Amp *Vacuum* Break Contactor, 7200 Volt Max. – Type SJA, 2 Pole



Front View



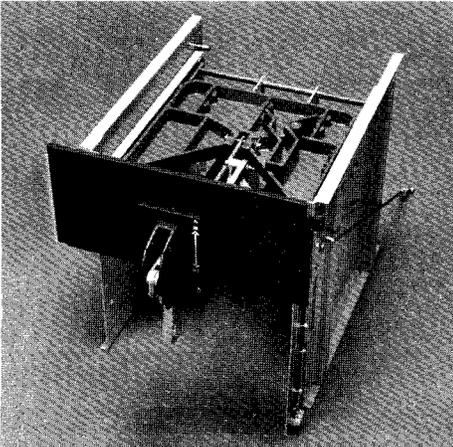
Rear View

Two pole contactor with line and load fingers, 120 volt coil (*used as starting and run contactor for an auto-transformer reduced voltage starter*) includes mechanical interlock arm for mechanical interlock.
Style No. 2147A86G06

For contactor with 240 volt coil, order similar to Style No. 2147A86G06 except with 240 volt coil.



Isolating Switch 400 Amp "Slide-out" Design 7200 Volt Max. Type 72LFS-4

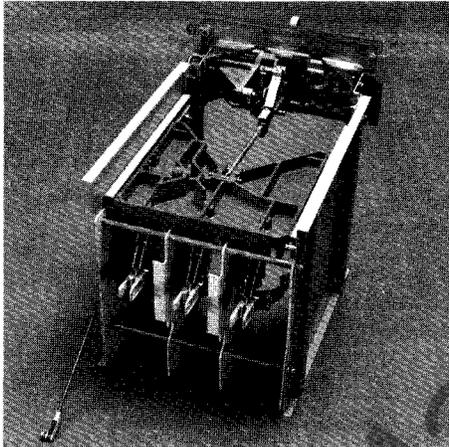


Front View

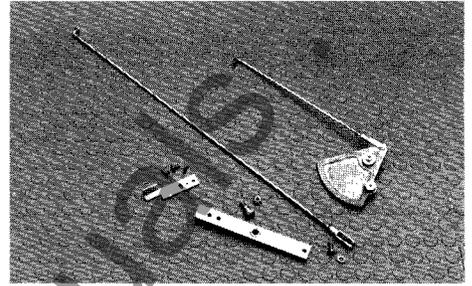
400 amp, 7200 V max. complete isolating switch with microswitch

Approximate shipping weight 75 lbs.

Style No. 2147A41G21

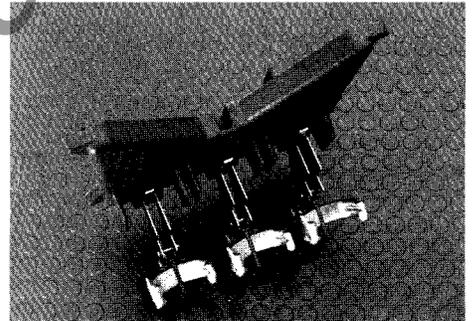


Rear View



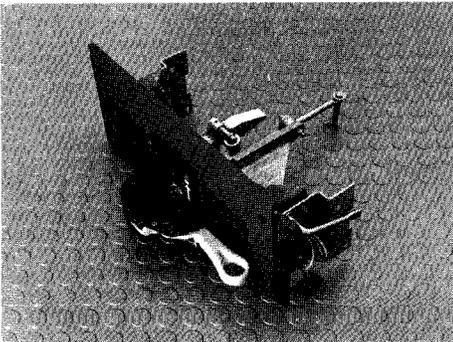
Mechanical interlock parts kit for either drawout or slideout design isolating switch, or for converting from one design to the other.

Style No. 2147A41G23



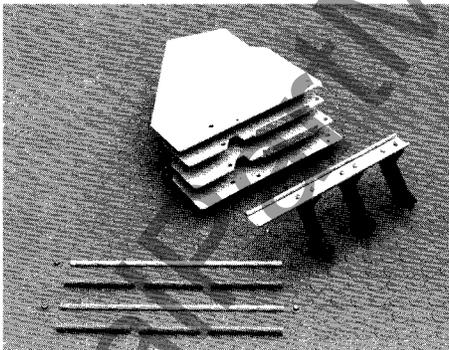
Tray assembly with fuse clamps and grounding fingers

Style No. 2147A41G22*



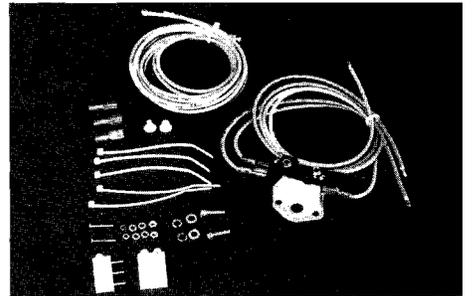
Handle and front plate assembly with microswitch

Style No. 2147A41G18*



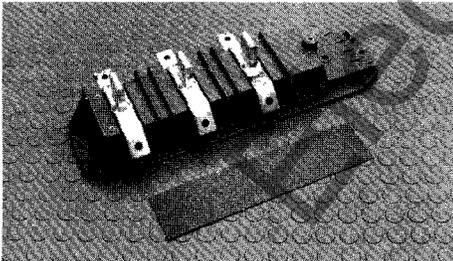
Grounding bar and barriers

Style No. 2147A41G20*



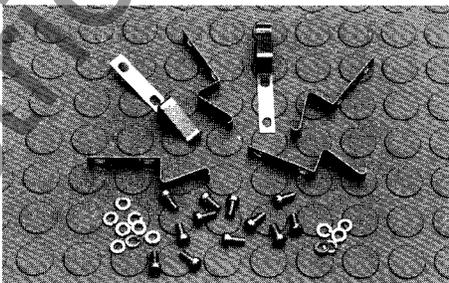
Microswitch assembly (common to all isolating switches)

Style No. 2147A01G01*[Ⓛ]



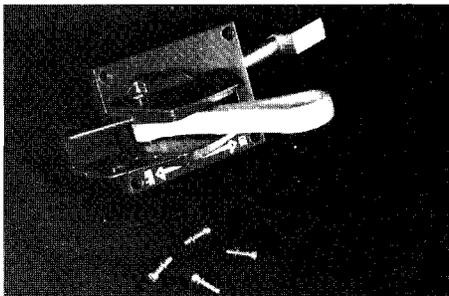
Incoming line stab assembly (part of structure)

Style No. 2147A21G19*



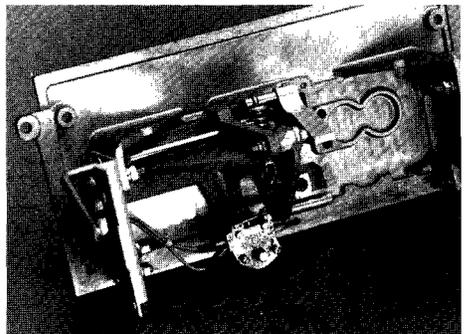
Grounding fingers Qty 6

Style No. 2147A21G21*



Handle, housing, clevis

Style No. 2147A41G08*

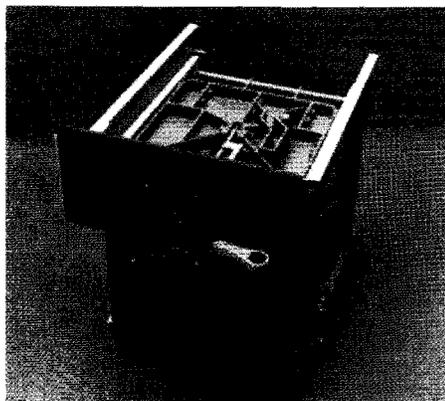


Mounting of microswitch*

*Common to Roll-out and Slide-out Design.

[Ⓛ] Recommended for "Start-up" spares.

Isolating Switch 400 Amp "Roll-out" Design 7200 Volt Max. – Type 72LFR-4

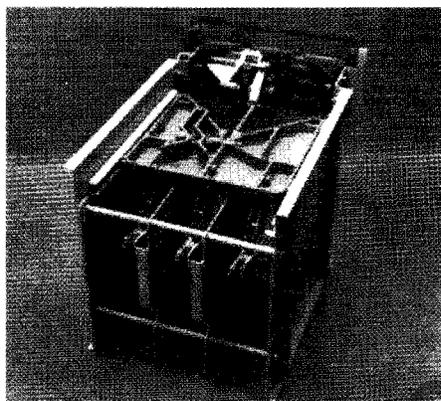


Front View

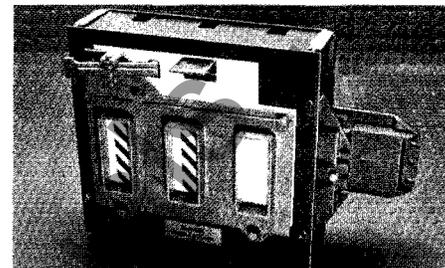
400 amp, 7200 V max. complete isolating switch with microswitch.

Approximate shipping weight 75 lbs.

Style No. 2147A41G01

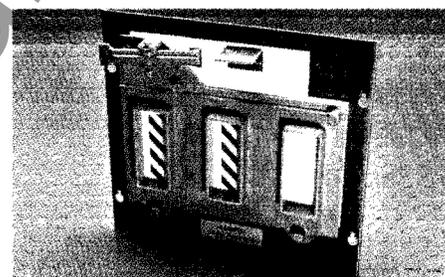


Rear View



400 amp incoming line stab assembly with shutter mechanism and finger barrier (part of structure)

Style No. 2147A41G11*●



Shutter mechanism only for 400 amp
Style No. 2147A41G12*

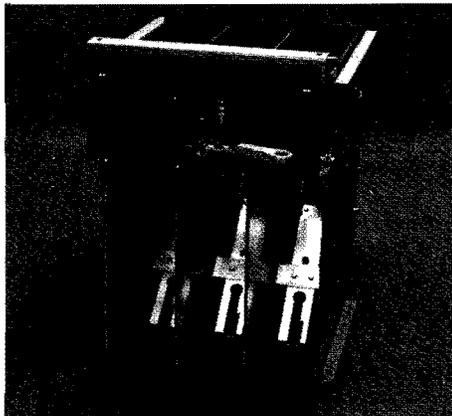
NOTE – See Page 14 for additional common parts.

① Recommended for "Start-up" spares.

*Common to Roll-out and Slide-out design.



800 Amp Isolating Switch, 7200 Volt Max. – Type LFM-8

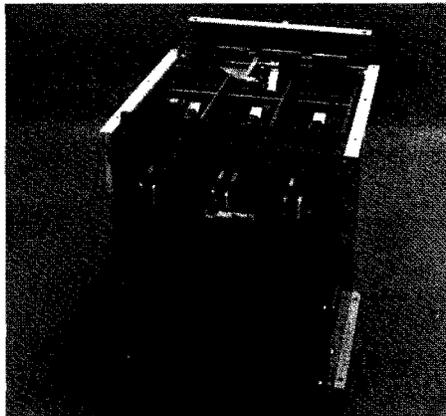


Front View

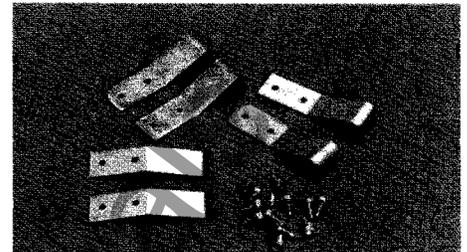
800 amp, 7200 volt max. complete isolating switch with microswitch

Approximate shipping weight 100 lbs.

Style No. 2147A81G01



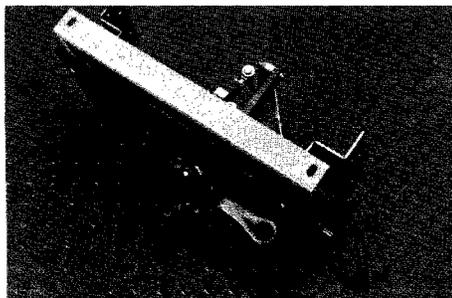
Rear View



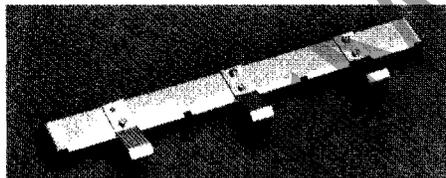
Grounding fingers Qty 6
Style No. 2147A71G23



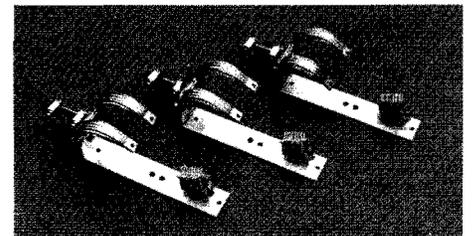
Tray assembly with line fingers
Style No. 2147A81G22



Handle and front plate with microswitch
Style No. 2147A71G18

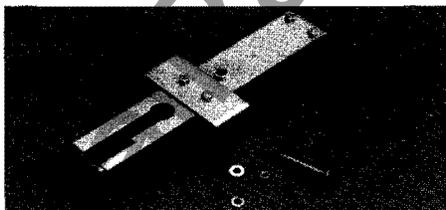


Grounding bar assembly with fingers
Style No. 2147A71G20

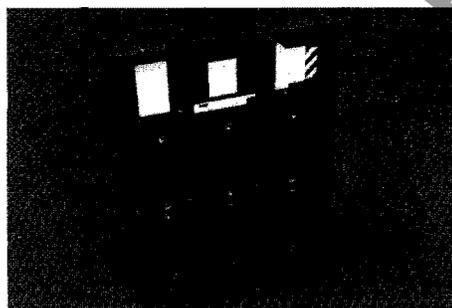


Line fuse cluster finger support assembly
Style No. 2147A81G20

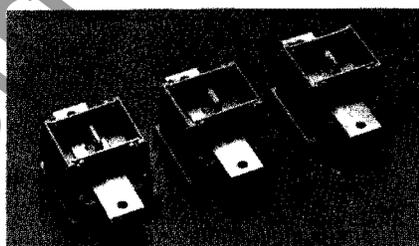
Handle, housing, clevis only
Style No. 2147A71G08



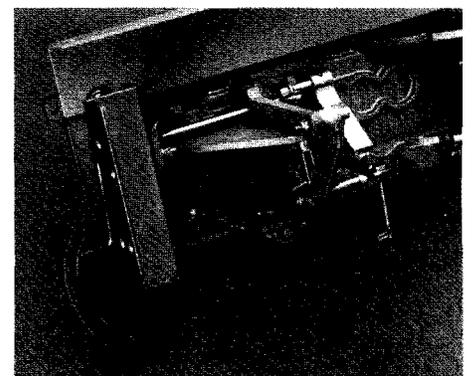
Upper fuse retainer
Style No. 2147A81G17



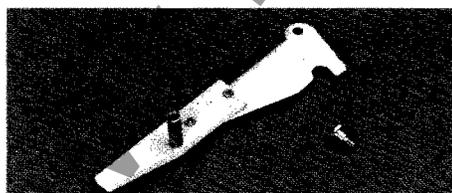
Shutter assembly
Style No. 2147A81G19



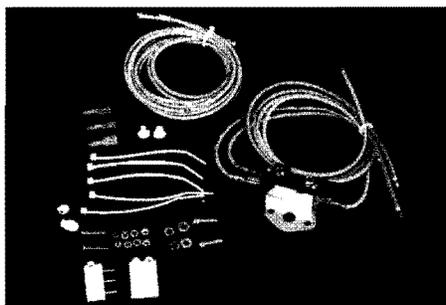
800 amp line stab assembly and barriers,
(part of structure), Qty 3
Style No. 2147A71G11●



Mounting of microswitch



Shutter operator (for use with upper fuse
retainer. Required in phase "B" only.)
Style No. 2147A71G21



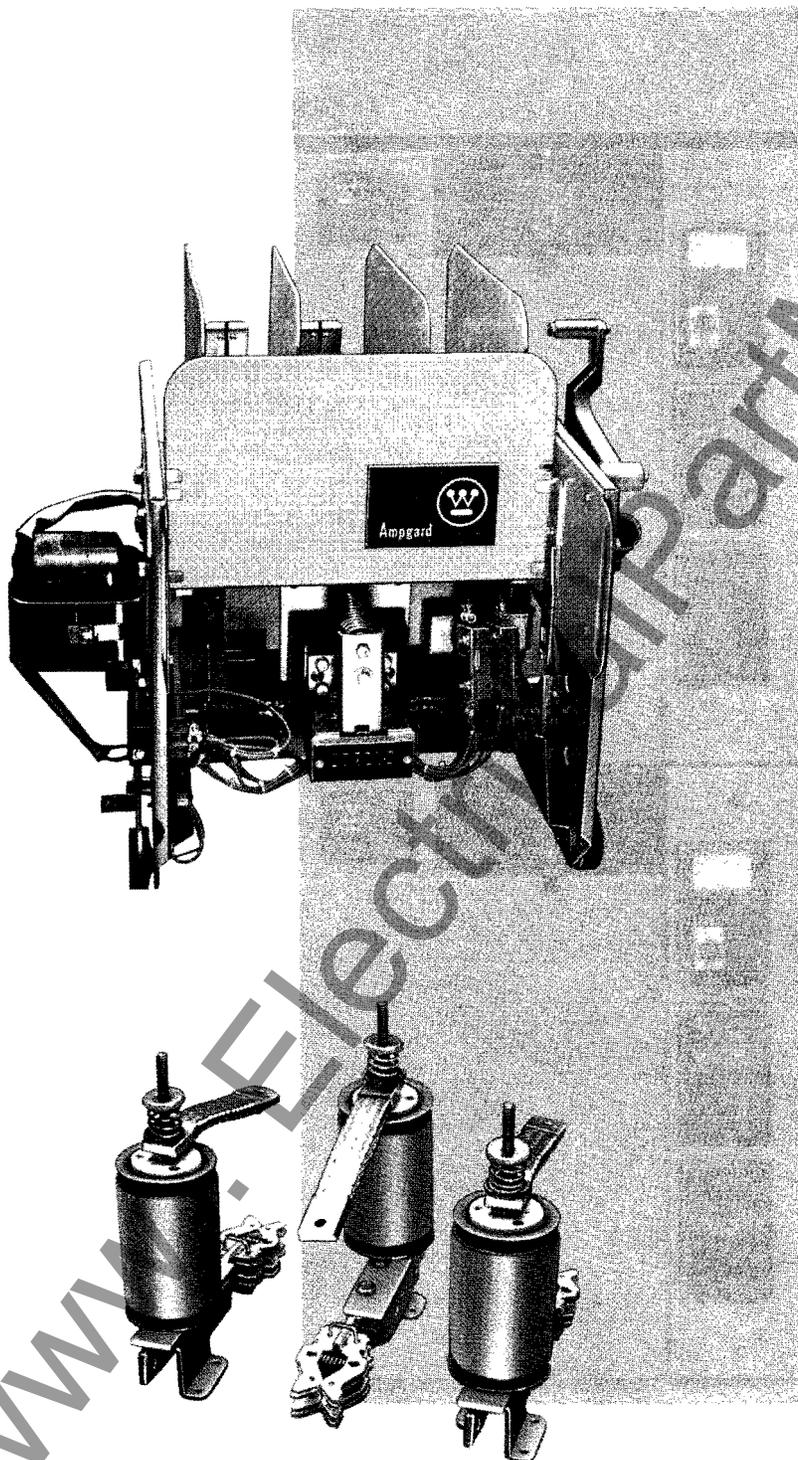
Microswitch assembly (common to all iso-
lating switches)
Style No. 2147A01G01●

- ① Recommended for "Start-up" spares.
- ② Recommended for "Running" spares.

Westinghouse Electric Corporation
Distribution and Control Business Unit
Asheville, North Carolina, U.S.A. 28813

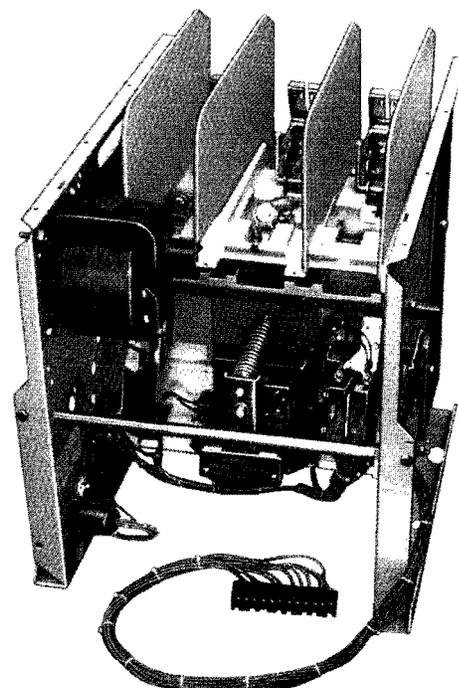


AMPGARD® Renewal And Replacement Parts Vacuum Break 400, 800 Amp



Contents	Pages
General Information	2, 3
Ampgard Dimensions	3
400 Amp Contactor "Draw-Out" Design	4, 5
400 Amp Contactor "Slide-Out" Design	6, 7
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400 Amp Contactor Reversing, Latched, 2 Pole "Slide-Out" Design	9
800 Amp Contactor	10, 11
800 Amp Contactor Reversing, Latched	12
800 Amp Contactor 2 Pole	13
400 Amp Isolating Switch "Draw-Out" Design	15
400 Amp Isolating Switch "Slide-Out" Design	14
800 Amp Isolating Switch	16

See Renewal Parts Data 8855A for air break design.
See Renewal Parts Data 8855C for retrofits, OEM contactors, miscellaneous components.





General Information

Renewal and Replacement Parts

The present design of Ampgard medium voltage starters was introduced in 1962. Additional ratings and features have been continuously introduced over the years.

This renewal parts data will provide the proper identification of standard parts which may be required for the maintenance of Westinghouse Ampgard starters. All of the complete contactors, isolating switches and sub assemblies that are available are shown photographically in kit form.

Some of the detail parts shown in the renewal parts data are recommended only as part of a sub assembly to facilitate their replacement or installation in the field.

Style numbers identified in this brochure will not be the same as style numbers on the original equipment. The renewal part styles in this brochure are in a kit form and may include sub assembly, carton, installation instructions, etc.

It is the intent of this renewal parts data brochure to make it possible for you to quickly identify the parts needed rather than have to search through twenty years of records to determine the specific style of the original part. All of the parts shown in the kits are compatible with the design from 1962 to the present (or noted otherwise).

Special attention should be given to forecasting your particular renewal parts requirements to ensure on-site availability of necessary parts and materials when needed, as well as guaranteeing efficiency and continued operation of your equipment.

The amount of investment to be made in renewal parts is best determined by you, taking into consideration such things as the impact of probable shutdown time, equipment duty cycle, etc.

To maintain maximum operating efficiency and dependability of your equipment, genuine Westinghouse renewal parts are recommended.

This publication identifies those replacement parts which are available and should be ordered by style number.

Note: All products were photographed against the same background to provide a size reference. The larger the background pattern the smaller the product.

Procedure for Identifying Renewal Parts

- (1) Determine the ampere rating of your starter by measuring the width of the structure.
- (2) Determine if it is non-reversing or reversing by measuring the height of the high voltage portion of your starter. (see page 3)

Examples:

36 in. width is 400 ampere rated.

Drawout design is contactor with wheels.

Slideout design is contactor without wheels.

45 in. height is non-reversing starter.
75 in. height is reversing starter.

Refer to pages 4, 5, 8, 15 for **Drawout** design.

Refer to pages 6, 7, 9, 14 for **Slideout** design.

40 in. width is 800 ampere rated.

60 in. height is non-reversing starter.
90 in. height is reversing starter.

Refer to pages 10, 11, 12, 13, 16.

- (3) Determine the volt amp rating of the control transformer by measuring the height of the control transformer.
- (4) Determine primary voltage; 2300, 4160, etc. This information is on the starter nameplate in the low voltage area.
- (5) Now that you have identified the design of your complete contactor determine from the photographs which parts are required and identify them by style number.

Ampgard Starters

Since many starters are supplied to meet specific customer electrical control and distribution requirements, other parts not listed in this publication might occasionally be needed. Refer to factory for specific requests.

For equipment other than 60 Hz, refer to factory for information.

Price and availability of parts not listed may be obtained by contacting your local Westinghouse representative. Provide a complete description of the part, along with the complete data on the starter nameplate which is found in the low voltage area. Be sure to include: ratings, shop order and diagram reference.

Ordering Instructions

- (1) Specify by **style number**.
- (2) Refer to Price List 8855V for pricing information.

Additional Service

Should you experience difficulty in determining needed parts for repair or determining existing starter condition, contact your local Westinghouse representative. Westinghouse can provide qualified technical personnel on site to:

- Identify and recommend replacement parts for damage caused by short circuit or fault.
- Remove damaged parts and install replacements.
- Retrofit vintage motor starting equipment with new components.
- Evaluate condition of existing equipment.
- Test components.
- Provide a recommended spare parts list.
- Upgrade existing unit from one Hp to another or change operating voltage of existing equipment.
- Convert the starter from air break to vacuum break contactor.

Obsolete Ampgard Designs

Obsolete Ampgard design starters manufactured prior to 1966 were designated **AMI** starters and were built in various cities in the USA. These starters were "1 High" design, 30 in., 34 in., or 38 in. wide, 100 in. high, and either 30 in. or 60 in. deep. Retrofitting an **AMI** starter is possible with up to date Ampgard components. Refer to Renewal Parts Data 8855C or refer to factory for information.

Contactors designated type H130, H230, H430 (air) and contactors designated type K430 (oil) were utilized in the **AMI** starters. These contactors are obsolete. Refer to factory for information.

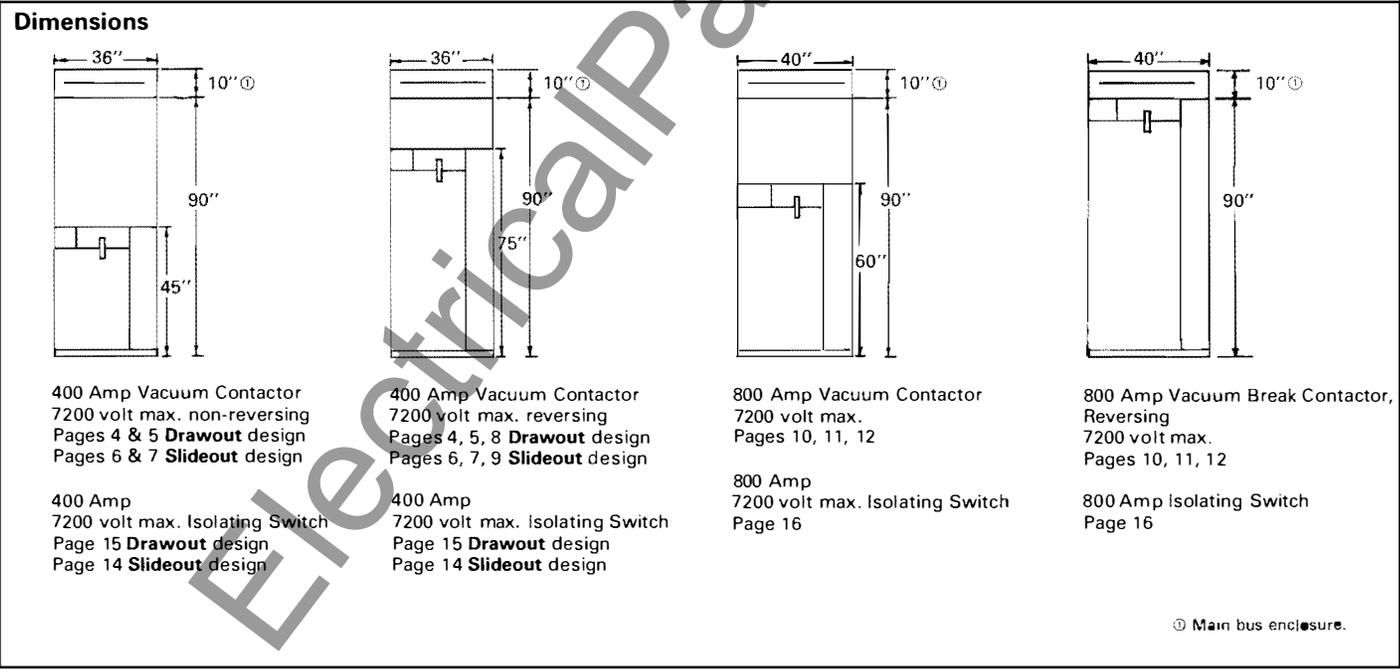
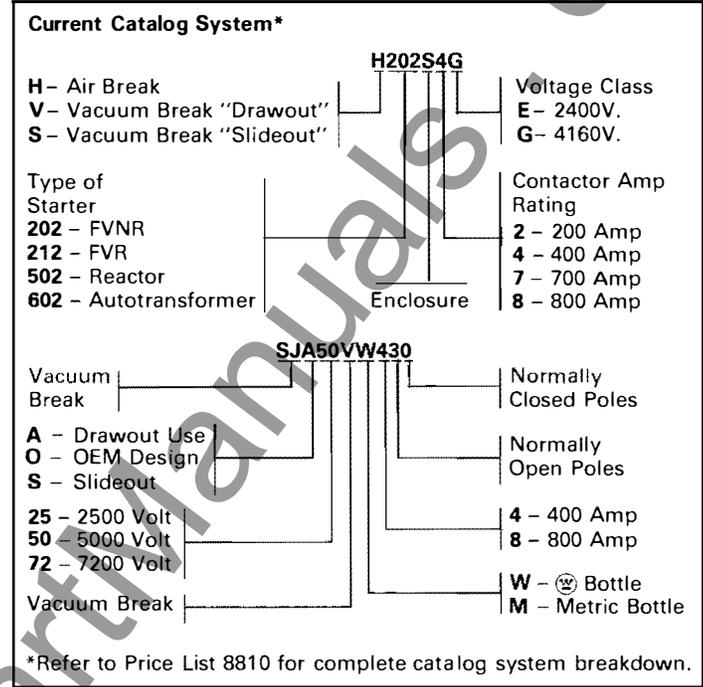
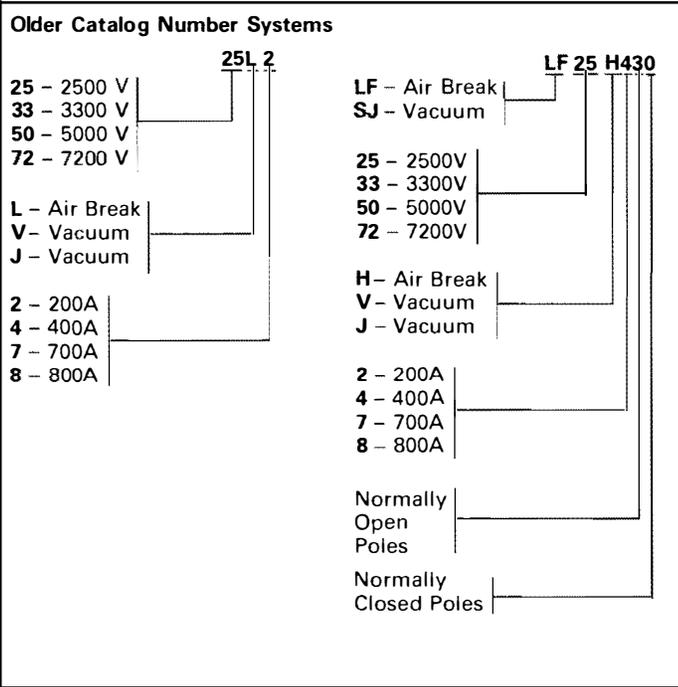
The isolating switch utilized in the **AMI** starters were manufactured by G&W Electric and is no longer available. For replacement of G&W Electric switch, contact:

Phoenix Electric
P.O. Box 53
Readville Station
Boston, MA 02137
Phone: 617-821-0200
FAX: 617-828-5719

—or—

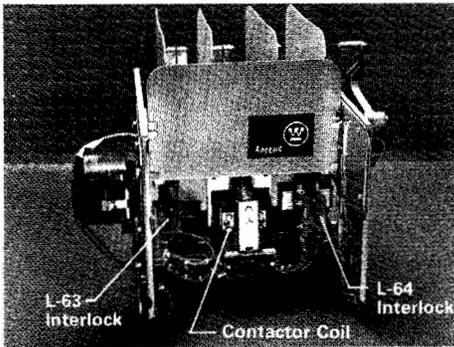
Refer to Renewal Parts Data 8855C for retrofit of the entire starter with current design Ampgard. This will consist of welded cell assembly, drawout isolating switch, vacuum contactor, power fuses, current transformers, overload protection. Above will all mount in existing customer **AMI** enclosure.

Type LF66V430 vacuum contactors shipped prior to 1982 are obsolete and no longer available. For replacement order up to date design vacuum contactor from page 4, which is mechanically and electrically interchangeable with obsolete Type LF66V430 contactor.





400 Amp Vacuum Break Contactor 7200 Volt Max. "Drawout" Design



Front View

400 amp vacuum contactor 120 volt control, with control transformer and two normally open and two normally closed interlocks. To determine proper complete contactor style number, refer to the photograph showing both sizes of control transformers. The smaller control transformer with a height dimension of 5 inches is rated 600 volt amp at 4160 volts and 750 volt amp at 2300 volts. The larger control transformer with a height of 7 inches is rated 2 kVA at either 2300 or 4160 volts.

Complete contactor 2300/120 volt, 750 volt amp transformer, 60 Hz
Style No. 2147A45G01

Complete contactor 2300/120 volt, 2 kVA transformer, 60 Hz
Style No. 2147A45G02

Complete contactor 4160/120 volt, 600 volt amp transformer, 60 Hz
Style No. 2147A45G03

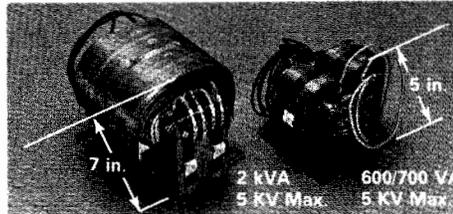
Complete contactor 4160/120 volt, 2 kVA transformer, 60 Hz
Style No. 2147A45G04

For contactor with 240 volt AC control, order similar to style number 2147A45G01 except 240 volt AC control.

For SJA contactors supplied after October 1988 with pull-a-part terminal blocks, order SJS pre-cable Style No. 2147A15G from page 7 for field mounting.

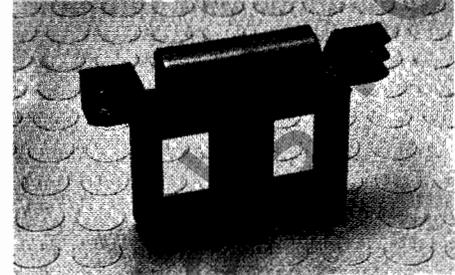
If main contactor is used in reversing, auto-transformer, multi-speed starter, or has potential transformer connection refer to page 5 and order line fingers Style No. 2147A49G01.

If main contactor must be mechanically interlocked with other contactor, order mechanical interlock arm Style No. 2147A43G14 from page 8 for field mounting.

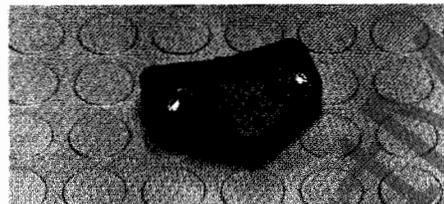


Control transformers*

Control transformers shown above are 5000 volt max. Transformers for higher primary voltages are available but may be a larger physical size and mounted remote from contactor. Specify system voltage, Hz, V.A. size and refer to factory.



Contactor coil 120 volts
Style No. 2147A48G11*
Contactor coil 240 volt
Style No. 2147A48G21*



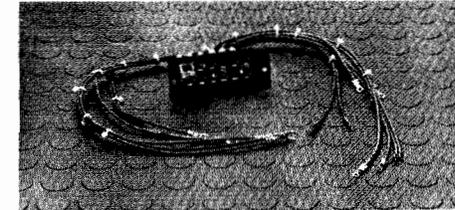
L-63 Interlock (Coil Circuit)
Style No. 578D461G03*



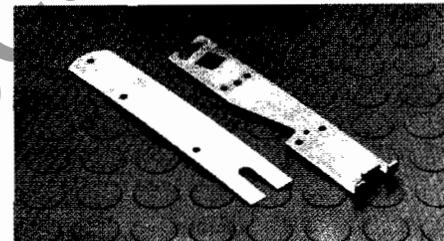
12 prong plug with wires (part of structure)
Style No. 2147A15G03



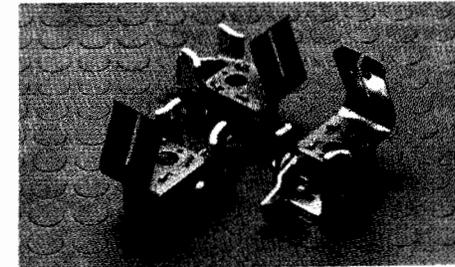
Contactor mounted Run-Test circuit, 15 amp plug (Use standard NEC fuse.)
Style No. 2147A15G09



12 prong receptacle with wire (part of contactor)
Style No. 2147A15G04



Tools, feeler gauge and bottle wrench
Style No. 2147A47G15*

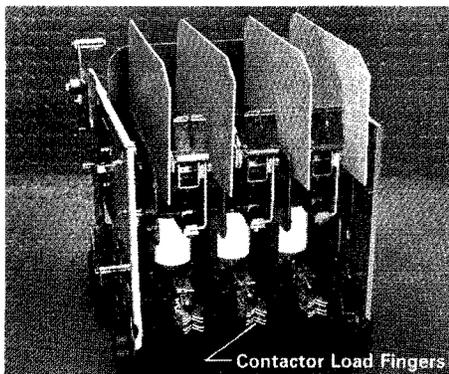


Contactor fuse clips, Qty 3
Style No. 2147A49G11*

*Common to Drawout and Slideout design.

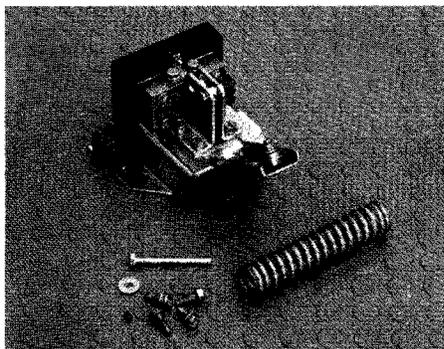


400 Amp Vacuum Break Contactor 7200 Volt Max. "Drawout" Design



Contactor Load Fingers

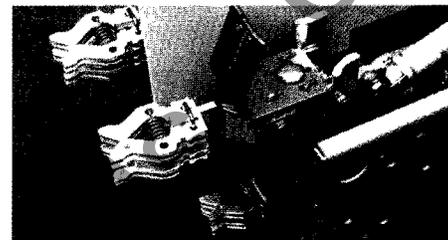
Rear View



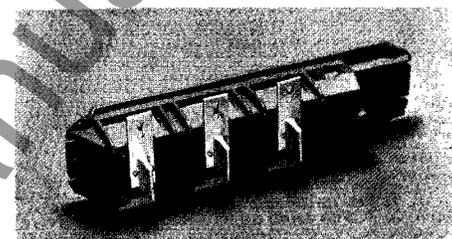
Magnet assembly complete with 120V. coil
Style No. 2147A48G12*

Magnet assembly complete with 240V. coil
Style No. 2147A48G13*

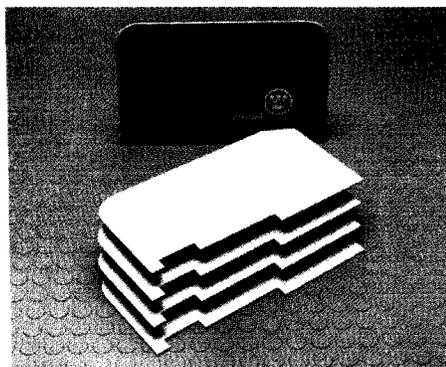
Magnet assembly complete except without coil
Style No. 2147A48G14*



Line fingers mounted on contactor.



Contactor Line stab assembly, 3 copper stabs plus insulator (part of structure)
Style No. 2147A49G14



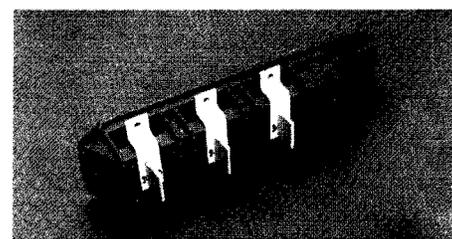
Phase barriers main and reversing contactor, Qty 5

Style No. 2147A47G11

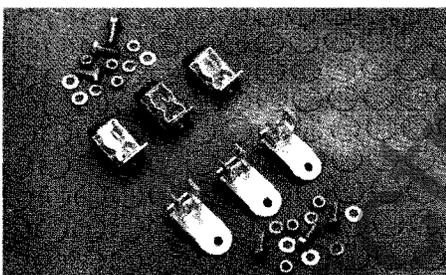


Fuse puller

Style No. 2147A93G04*

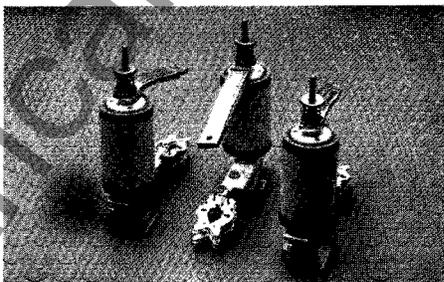


Contactor Load stab assembly, 3 copper stabs plus insulator (part of structure)
Style No. 2147A49G05



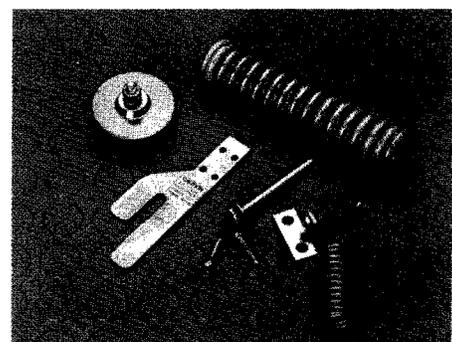
Fuse clips and mounting for primary fuses of control transformer or potential transformer, Qty 3

Style No. 2147A47G16*



Vacuum bottle subassemblies with shunt and load support and load fingers, Qty 3

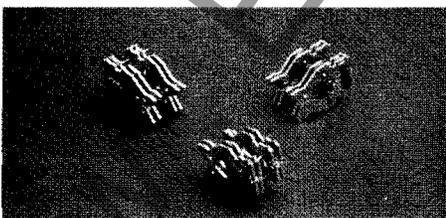
Style No. 2147A47G03



Misc. parts kit —

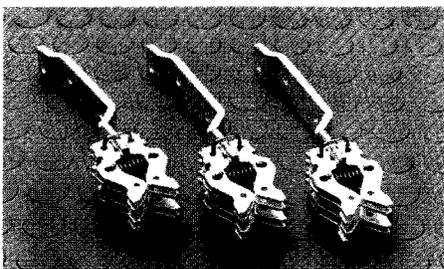
Kickout spring and adjusting bolt, electrical interlock operating arm with mounting hardware, mechanical interlock spring and contactor wheel.

Style No. 2147A48G15*



Contactor Line or load fingers, without support Qty. 3

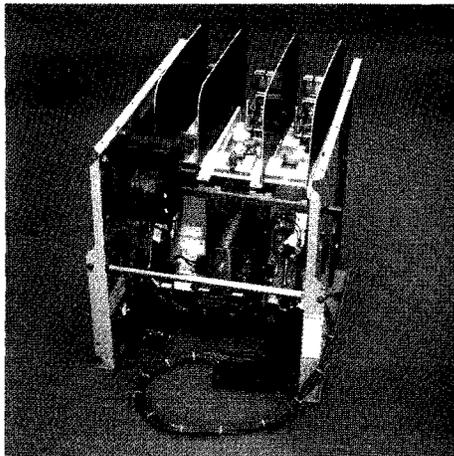
Style No. 2147A47G23



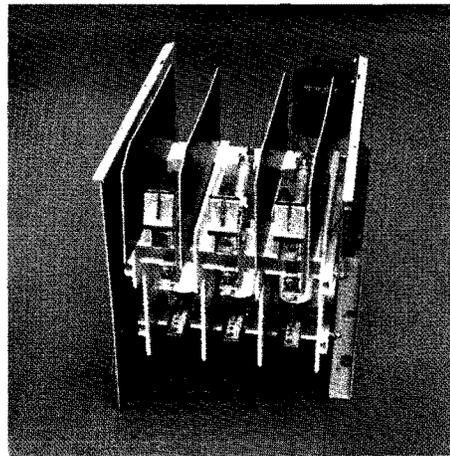
Line fingers with copper support, Qty 3
Style No. 2147A49G01

Required as a field modification to a main contactor to supply power to potential transformers and to reversing contactors.

400 Amp Vacuum Break Contactor, 7200 Volt Max. "Slideout" Design



Front View



Rear View

400 amp vacuum contactor 120 volt control, with control transformer and two normally open and two normally closed interlocks. To determine proper complete contactor style number, refer to the photograph showing both sizes of control transformers. The smaller control transformer with a height dimension of 5 inches is rated 600 volt amp at 4160 volts and 750 volt amp at 2300 volts. The larger control transformer with a height of 7 inches, is rated 2 kVA at either 2300 or 4160 volts.

Complete contactor 2300/120 volt, 750 volt amp transformer, 60 Hz
Style No. 2147A45G21

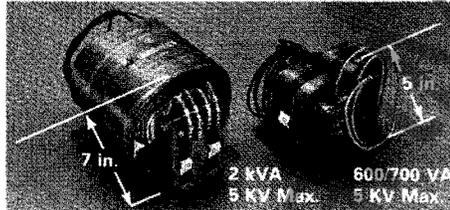
Complete contactor 2300/120 volt, 2 kVA transformer, 60 Hz
Style No. 2147A45G22

Complete contactor 4160/120 volt, 600 volt amp transformer, 60 Hz
Style No. 2147A45G23

Complete contactor 4160/120 volt, 2 kVA transformer, 60 Hz
Style No. 2147A45G24

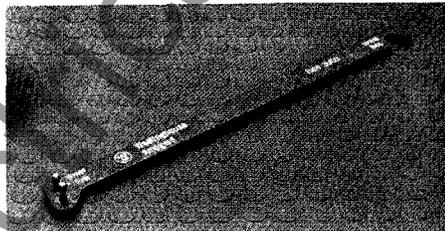
For contactor with 240 volt AC control, order similar to Style No. 2147A45G21, except 240 volt AC control.

If main contactor must be interlocked with other contactors, order contactor interlock arms Style No. 2147A43G12 from page 7 for field mounting.

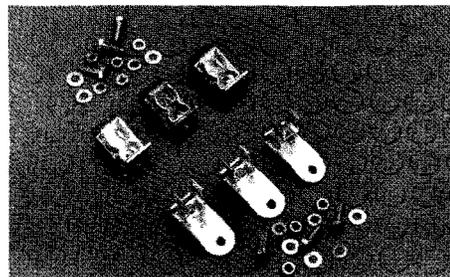


Control transformers*

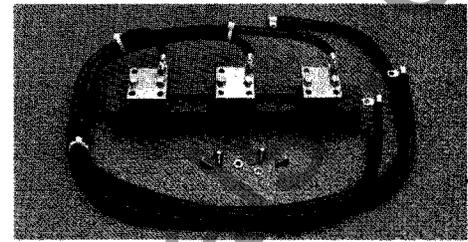
Control transformers shown above are 5000 volt max. Transformers for higher voltages are available but may be a larger physical size and mounted remote from contactor. Specify system voltage, Hz, V.A. size and refer to factory.



Fuse puller
Style No. 2147A93G04*

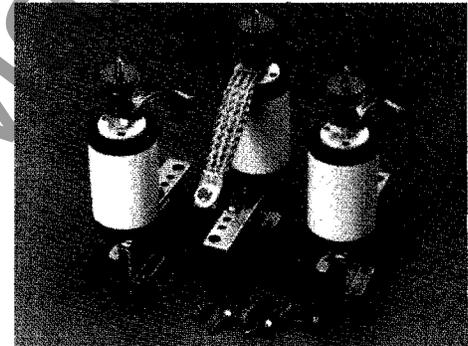


Fuse clips and mounting for primary fuses of control transformer or potential transformer, Qty 3
Style No. 2147A47G16*



Contactor main load cables with load adapter
Style No. 2147A15G13 I/O cable if C.T. ratio is below 250/5.

Style No. 2147A15G14 4/0 cable if C.T. ratio is 250/5 or above.



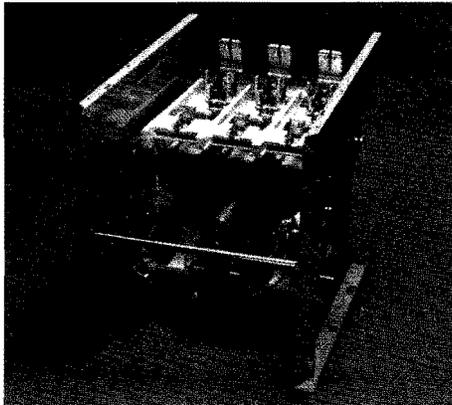
Vacuum bottle sub-assemblies with shunt and load support, Qty 3
Style No. 2147A47G13

The main contactor may mount line current transformers, ground fault current transformer, control transformer and 3 phase potential transformer. See Renewal Parts Data 8855C pages 3, 4, 5 for various Style Numbers.

*Common to Drawout and Slideout design.



400 Amp Vacuum Break Contactor, 7200 Volt Max. "Slideout" Design

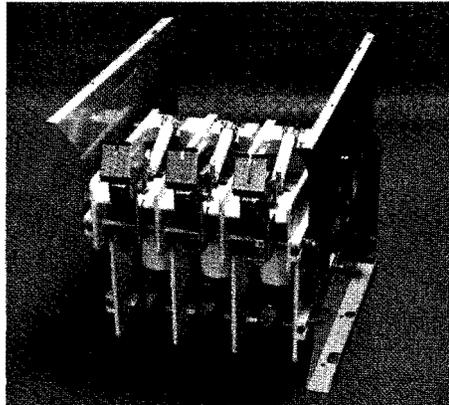


Front View

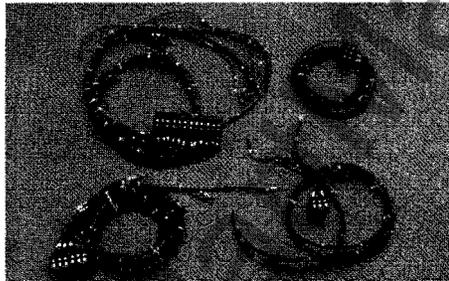
400 amp vacuum contactor (basic quick ship) similar to Style No. 2147A45G21, G22, G23, G24, page 6, except without control transformer, without precable, without (4) barriers, without mechanical interlock arm, 120 volt control.

Style No. 2147A45G25

For contactor with 240 volt AC control order similar to 2147A45G25, except 240 volt AC control.



Rear View

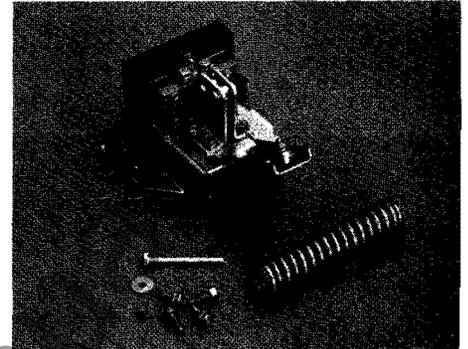


Contactor control pre-cables with pull-apart terminal blocks

Style No. 2147A15G10

Contactor control pre-cables, 12 point (part of 2147A15G10) for coil and electrical interlock circuitry only.

Style No. 2147A15G17.

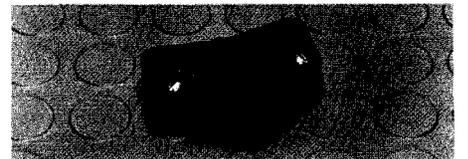


Magnet assembly complete with 120 V. coil
Style No. 2147A48G12*

Magnet assembly complete with 240 V. coil
Style No. 2147A48G13*

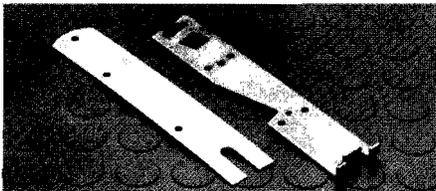
Magnet assembly complete except without coil

Style No. 2147A48G14*



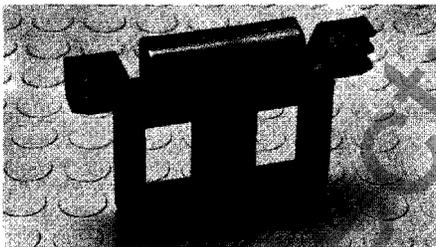
L-63 interlock

Style No. 578D461G03*



Tools, feeler gauge and bottle wrench

Style No. 2147A47G15*



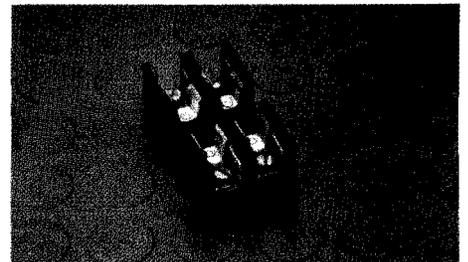
Contactor coil 120 volts
Style No. 2147A48G11*

Contactor coil 240 volts
Style No. 2147A48G12*



Contactor fuse clips, Qty 3

Style No. 2147A49G11*



P.T. sec. fuse block, 2 pole

Style No. 2147A15G16

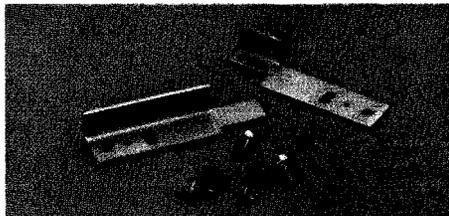
CPT sec. fuse block, 1 pole

Style No. 2147A15G15

Above fuse blocks mounted on contactor side sheet, and use miniature dual element fuses 1 1/2 in. long, 1/32 in. dia.

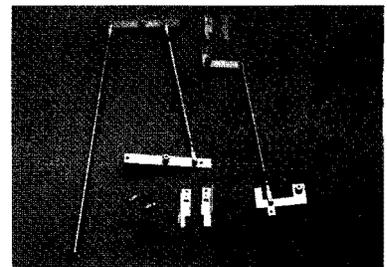


Phase barriers, main contactor, Qty 4
Style No. 2147A47G14



Contactor mechanical interlock arms. For interlock between isolating switch or any reversing or reduced voltage or multi-speed contactor

Style No. 2147A43G12



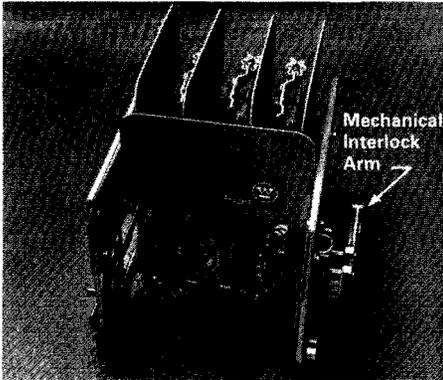
Mechanical interlock kit. Between isolating switch and main contactor.

Between (2) contactors (auto-transformer, reversing, multi-speed application.)

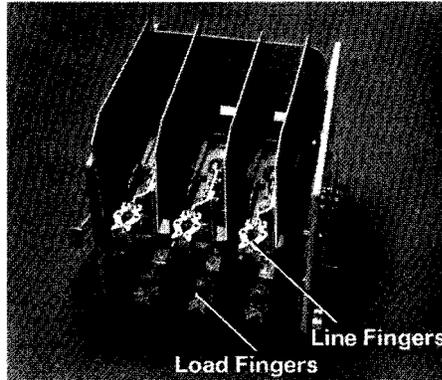
Style No. 2147A43G13



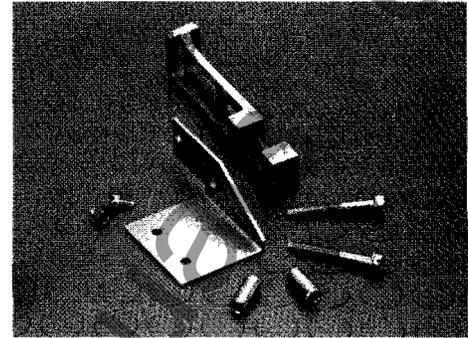
400 Amp Vacuum Break Contactor, 7200 Volt Max. Reversing, 2 Pole and Latched "Drawout" Design



Front View



Rear View



Mechanical interlock arm for field mounting on contactor.
Style No. 2147A43G14

Three pole reversing contactor with line and load fingers, includes mechanical interlock arm, for mechanical interlock, 120 volt coil (used as reversing contactor or reactor shorting contactor of a reactor reduced voltage starter).

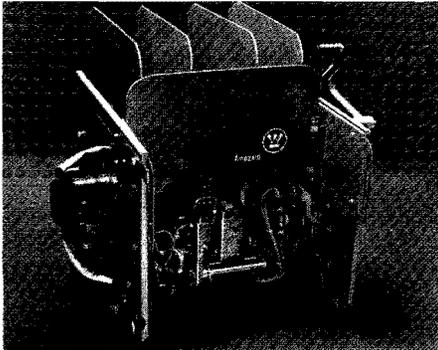
Style No. 2147A46G05

For contactor with 240 volt coil order similar to Style No. 2147A46G05 except 240 volt coil.

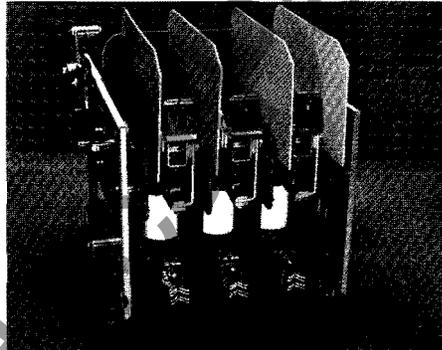
Two pole contactor with line and load fingers, 120 volt coil, (used as the shorting and run contactor for an autotransformer reduced voltage starter).

Style No. 2147A46G06

For contactor with 240 volt coil order similar to Style Number 2147A46G06 except 240 volt coil.



Front View



Rear View

400 amp vacuum **latched** contactor single trip solenoid. 120 volt control, with control transformer and two normally open and two normally closed interlocks. To determine proper complete contactor style number, refer to the photograph showing both sizes of control transformers. The smaller control transformer with a height dimension of 5 inches is rated 600 volt amp at 4160 volts and 750 volt amp at 2300 volts. The larger control transformer with a height of 7 inches, is rated 2 kVA at either 2300 or 4160 volts.

Complete latched contactor 2300/120 volt, 750 volt amp transformer, 60 Hz
Style No. 2147A45G11

Complete latched contactor 2300/120 volt, 2 kVA transformer, 60 Hz
Style No. 2147A45G12

*Common to Drawout and Slideout design

Complete latched contactor 4160/120 volt, 600 volt amp transformer, 60 Hz
Style No. 2147A45G13

Complete latched contactor 4160/120 volt, 2 kVA transformer, 60 Hz
Style No. 2147A45G14

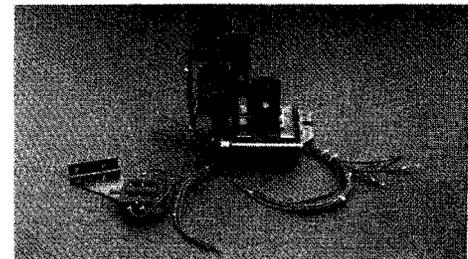
For contactor with 240 volt AC control, order similar to Style No. 2147A45G1_ except 240 volt AC control.

For contactor with 2 trip solenoids order similar to Style No. 2147A45G1_ except specify trip voltage 120 or 240 volt AC, or intermittent 48, 125, 250 volt DC (any combination of 2 voltages)



Control transformers*

Control transformers shown above are 5000 volt max. Transformers for higher voltages are available but may be a larger physical size and mounted remote from contactor. Specify system voltage, Hz, V.A. size and refer to factory.

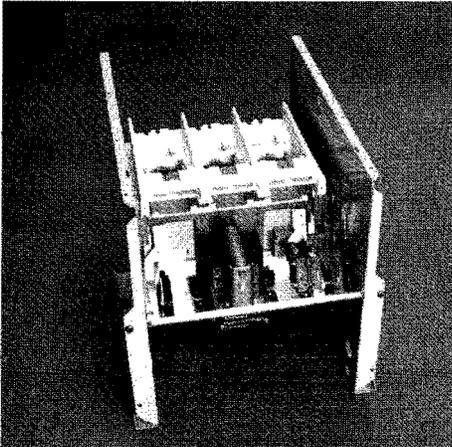


Mechanical latch kit with 2 trip solenoids. Complete with L-64 electrical interlock and contactor mounted 12 point receptacle, 120 volt AC coils
Style No. 2147A48G16

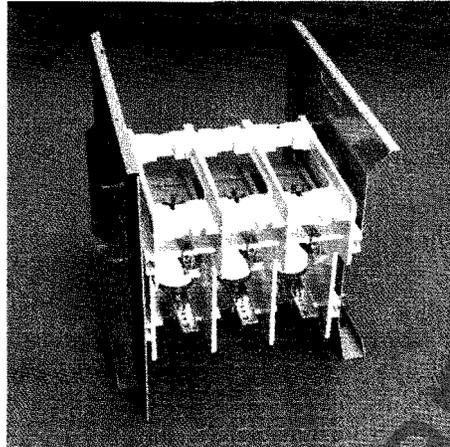
For single trip solenoid order similar to Style No. 2147A46G16 except single solenoid for operation at ____volts. Specify trip voltage 120 or 240 volt AC, or intermittent 48, 125, 250 volt DC



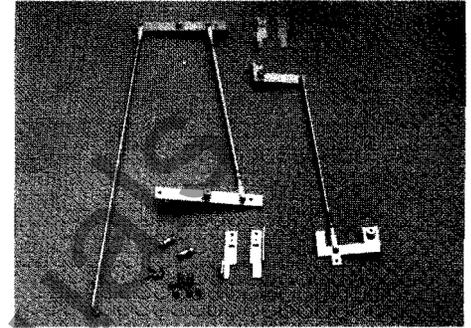
400 Amp Vacuum Break Contactor, 7200 Volt Max. Reversing, 2 Pole and Latched "Slideout" Design



Front View



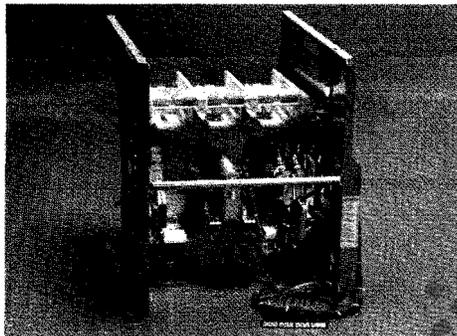
Rear View



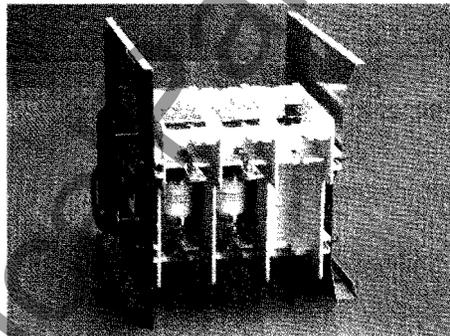
Mechanical interlock kit.
Between isolating switch and main contactor:
Between (2) contactors (auto-transformer, reversing, multi-speed application)
Style No. 2147A43G13

Three pole reversing contactor, includes mechanical interlock arm for mechanical interlock, 120 volt coil. (Used as reversing contactor or reactor shorting contactor of a reactor reduced voltage starter.)
Style No. 2147A46G15

For contactor with 240 volt coil, order similar to Style No. 2147A46G15 except with 240 volt coil.



Front View



Rear View

Two pole contactor, 120 volt coil. (Used as starting and run contactor for an auto-transformer reduced voltage, starter includes mechanical interlock arm for mechanical interlock.)
Style No. 2147A46G16

For contactor with 240 volt coil, order similar to Style No. 2147A46G16 except with 240 volt coil.

400 amp vacuum **latched** contactor single trip solenoid. 120 volt control, with control transformer and two normally open and two normally closed interlocks. To determine proper complete contactor style number, refer to the photograph (Page 8) showing both sizes of control transformers. The smaller control transformer with a height dimension of 5 inches is rated 600 volt amp at 4160 volts and 750 volt amp at 2300 volts. The larger control transformer with a height of 7 inches is rated 2 kVA at either 2300 or 4160 volts.

Complete latched contactor 2300/120 volt, 750 volt amp transformer
Style No. 2147A45G31

Complete latched contactor 2300/120 volt, 2 kVA transformer
Style No. 2147A45G32

Complete latched contactor 4160/120 volt, 600 volt amp transformer
Style No. 2147A45G33

Complete latched contactor 4160/120 volt, 2 kVA transformer
Style No. 2147A45G34

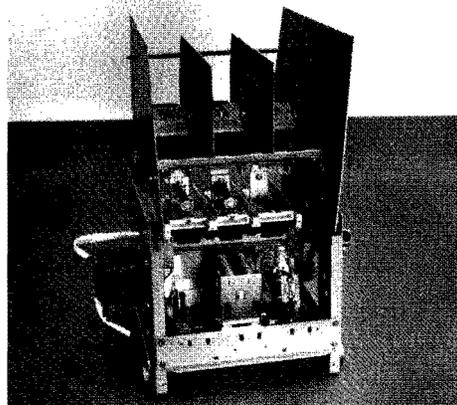
For contactor with 240 volt AC control order similar to Style No. 2147A45G3 except 240 volt AC control.

For contactor with 2 trip solenoids order similar to Style No. 2147A45G3 except specify trip voltage 120 or 240 volt AC, or intermittent 48, 125, 250 volt DC (any combination of 2 voltages).

For field mounting of mechanical latch kit on slideout contactor order Style No. 2147A48G16 (Page 8) and discard 12 point receptacle and pre-cable.



800 Amp Vacuum Break Contactor, 7200 Volt Max – Type SJA



Front View

800 amp vacuum break contactor 120 volt control, with control transformer and two normally open and two normally closed interlocks, 2kVA control transformer.

Complete contactor, 2300/120 volt, 2 kVA transformer, 60 Hz
Style No. 2147A85G01

Complete contactor, 4160/120 volt, 2 kVA transformer, 60 Hz
Style No. 2147A85G02

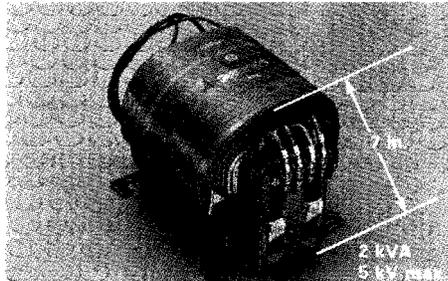
For contactor with 240 volt AC control, order similar to Style No. 2147A85G01 except 240 volt AC control.

For SJA contactors supplied after October 1988 with pull-a-part terminal blocks, order SJS pre-cable Style No. 2147A15G from page 7 for field mounting.

If main contactor is used in reversing, auto-transformer, multi-speed starter, or has potential transformer connection refer to page 11 and order line fingers Style No. 2147A89G01.

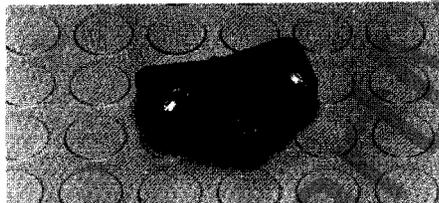
— IMPORTANT —

For proper operation of mechanical interlock, customer must remove interlock arm from old contactor and replace it on new contactor. (Discard interlock arm from new contactor.)

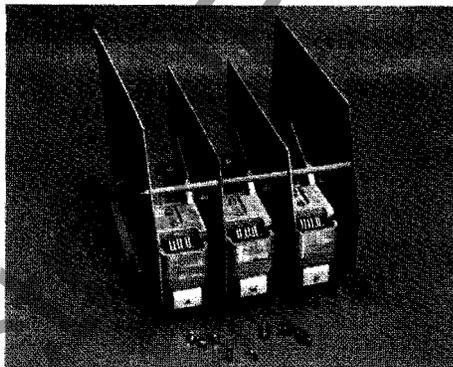


Control transformer

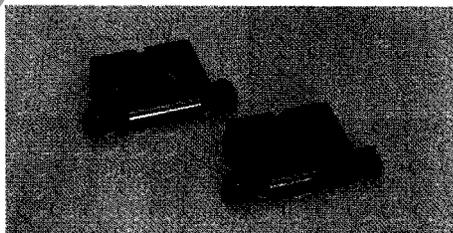
Control transformer shown above is 5000 volt max. Transformers for higher voltages are available but maybe a larger physical size and mounted remote from contactor. Specify system voltage, Hz, V.A. size and refer to factory.



L-63 interlock
Style No. 578D461G03

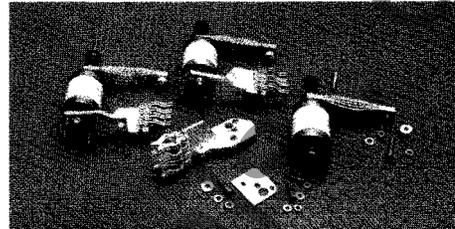


Fuse support and barrier assembly
Style No. 2147A89G06

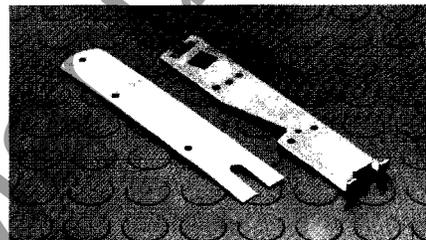


Contactor coil, 120 volts
Style No. 2147A88G11

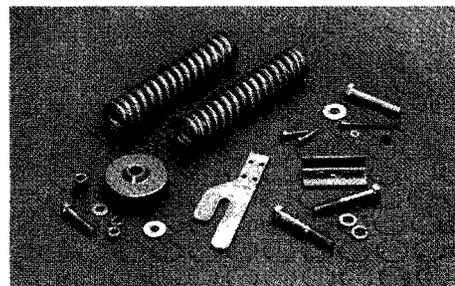
Contactor coil, 240 volts
Style No. 2147A88G12



Vacuum bottle sub-assemblies with shunt, load support, load fingers Qty 3
Style No. 2147A87G03



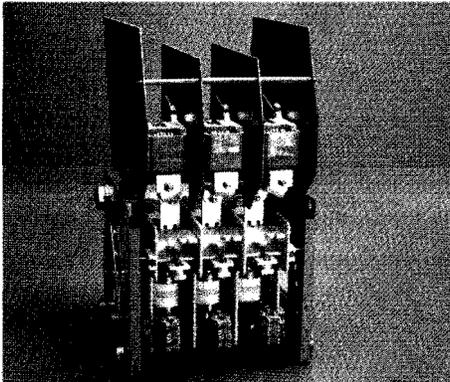
Tools, feeler gauge and bottle wrench
Style No. 2147A47G15



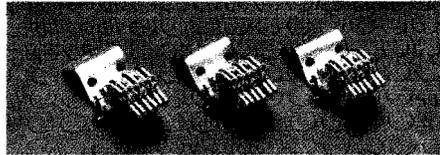
Misc. Parts Kit –
Kickout springs and adjusting bolt, coil clip, electrical interlock operating arm with mounting hardware, mechanical interlock spring and contactor wheel
Style No. 2147A88G15



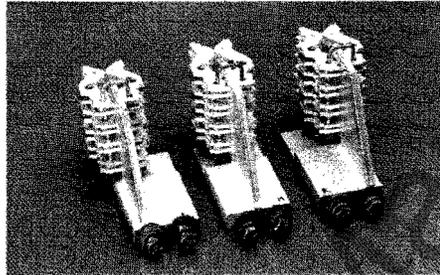
800 Amp Vacuum Break Contactor, 7200 Volt Max. - Type SJA



Rear View

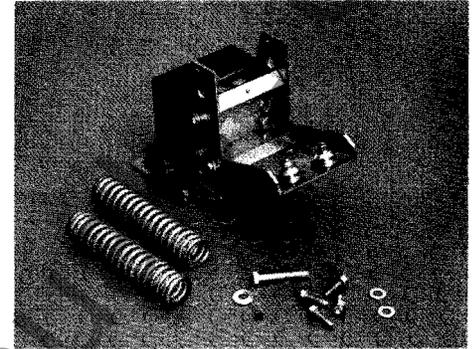


Fuse load fingers (connection between contactor, and fuse) Qty 3
Style No. 2147A71G15



Contactor line fingers with copper support Qty 3
Style No. 2147A89G01

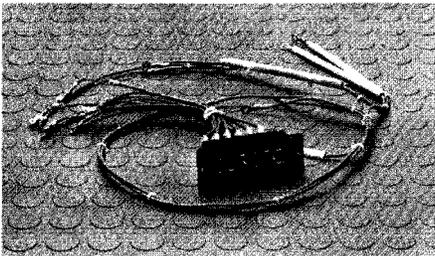
Required as a field modification to a main contactor to supply power to potential transformers and to reversing contactors.



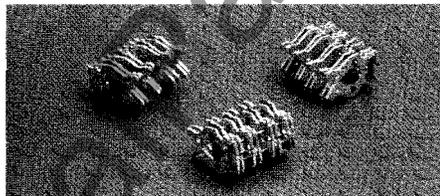
Magnet assembly complete with 120 volt coil.
Style No. 2147A88G02

Magnet assembly complete with 240 volt coil.
Style No. 2147A88G03

Magnet assembly complete except without coil.
Style No. 2147A88G04



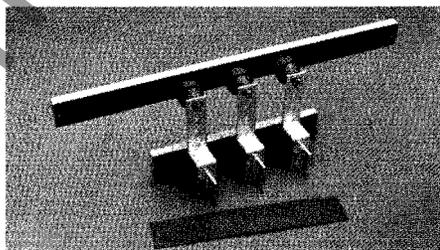
12 prong receptacle with wire, (part of contactor)
Style No. 2147A15G11



Contactor line or load fingers without support. Qty 3
Style No. 2147A89G02



12 prong plug with wire, (part of structure)
Style No. 2147A15G12



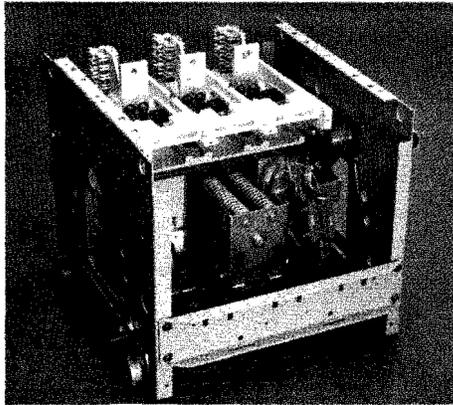
Contactor load or line stab assembly, complete with mounting.
Style No. 2147A89G03



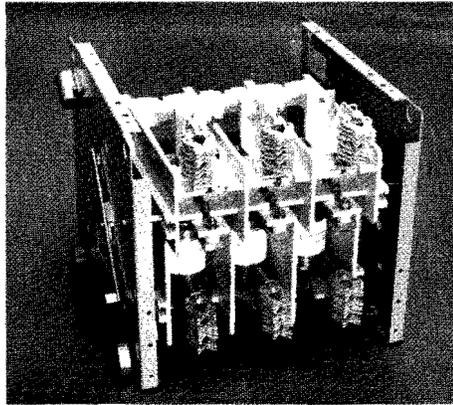
Fuse puller for 800 amp starter
Style No. 2147A93G07



800 Amp *Vacuum* Break Contactor, 7200 Volt Max. – Type SJA Reversing and Latched



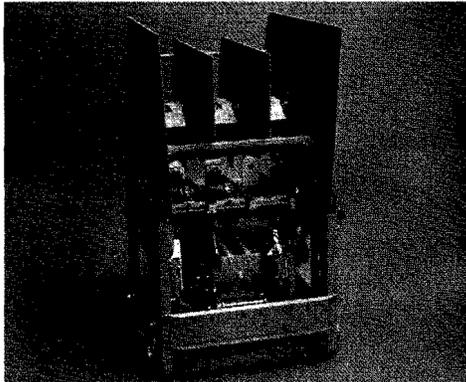
Front View



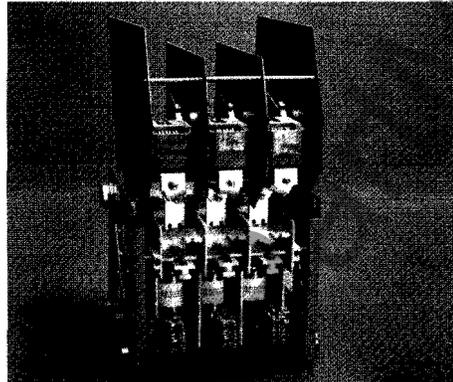
Rear View

Three pole reversing contactor with line and load fingers, includes mechanical interlock arm for mechanical interlock, 120 volt coil (used as reversing contactor or reactor shorting contactor of a reactor reduced voltage starter)
Style No. 2147A86G12

For contactor with 240 volt coil order similar to Style No. 2147A86G12 except with 240 volt coil.



Front View



Rear View

Above photograph shown without control transformer mounted on connector.

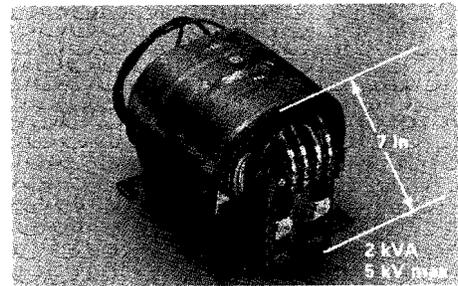
800 amp vacuum **latched** contactor, single trip solenoid 120 volt control, with control transformer and two normally open and two normally closed interlocks, 2 kVA control transformer.

Complete latched contactor 2300/120 volt, 2 kVA transformer, 60 Hz
Style No. 2147A85G11

Complete latched contactor 4160/120 volt, 2 kVA transformer, 60 Hz
Style No. 2147A85G12

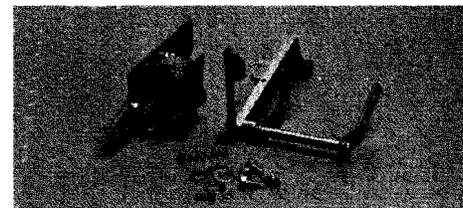
For contactor with 240 volt AC control, order similar to Style No. 2147A85G1_, except 240 volt AC control.

For contactor with 2 trip solenoids order similar to Style No. 2147A85G1_ except specify trip voltage 120 or 240 volt AC, or intermittent 48, 125, 250 volt DC (any combination of 2 voltages)



Control transformer

Control transformer shown above is 5000 volt max. Transformers for higher voltages are available but may be a larger physical size and mounted remote from contactor. Specify system voltage, Hz, V.A. size and refer to factory.

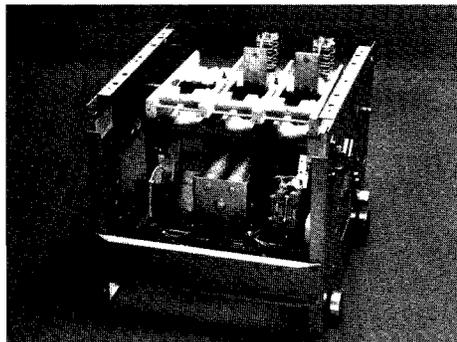


Mechanical Latch Kit with (1) trip solenoid 120 volt AC continuous/48 VDC intermittent.
Style No. 2147A88G22

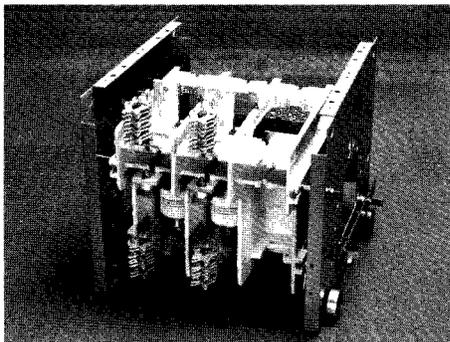
230 volt AC continuous/125 VDC intermittent.
Style No. 2147A88G23



800 Amp *Vacuum* Break Contactor, 7200 Volt Max. – Type SJA, 2 Pole



Front View



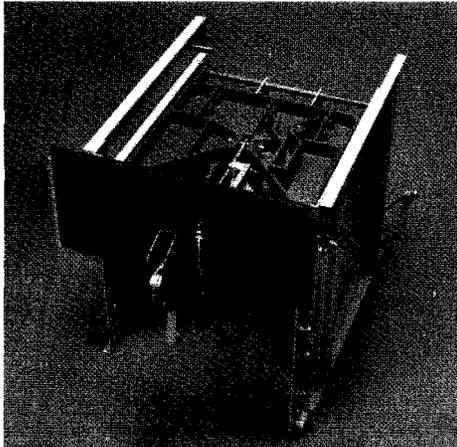
Rear View

Two pole contactor with line and load fingers, 120 volt coil (*used as starting and run voltage starter*) includes mechanical interlock arm for mechanical interlock.

Style No. 2147A86G06

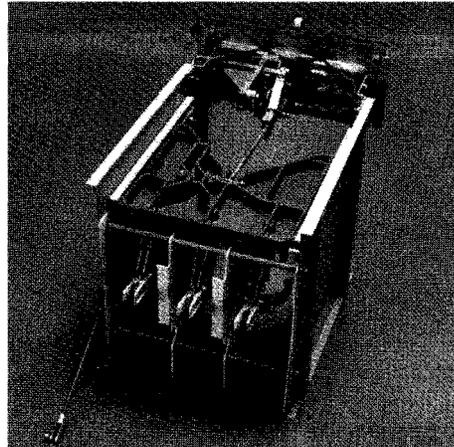
For contactor with 240 volt coil, order similar to Style No. 2147A86G06 except with 240 volt coil.

Isolating Switch 400 Amp "Slideout" Design 7200 Volt Max. Type 72LFS-4

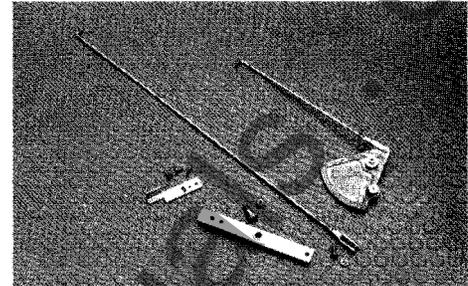


Front View

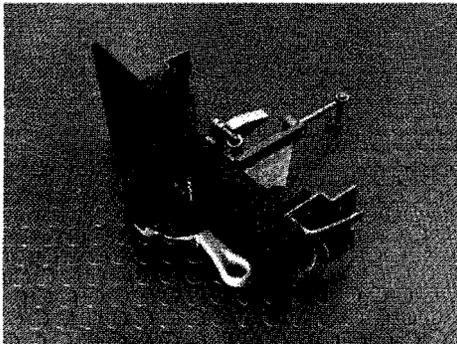
400 amp, 7200 V max. complete isolating switch with microswitch
Style No. 2147A41G21



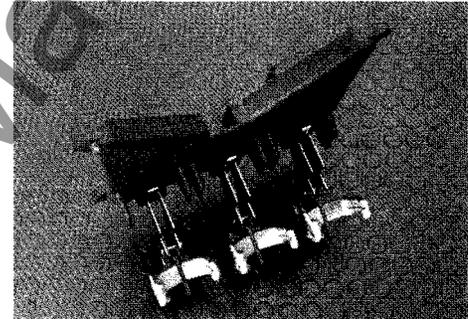
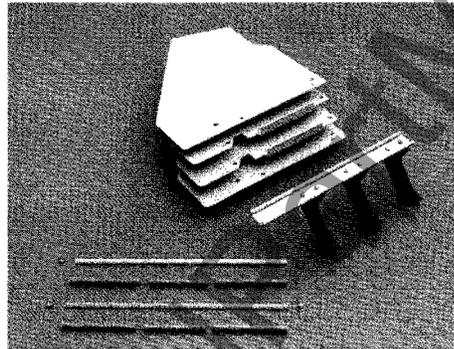
Rear View



Mechanical interlock parts kit for either drawout or slideout design isolating switch, or for converting from one design to the other.
Style No. 2147A41G23

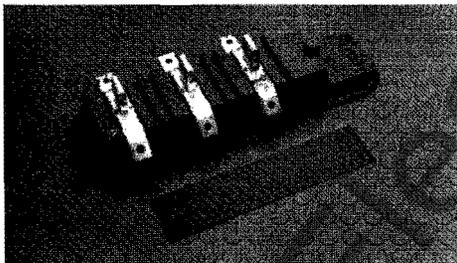


Handle and front plate assembly with microswitch
Style No. 2147A41G18*

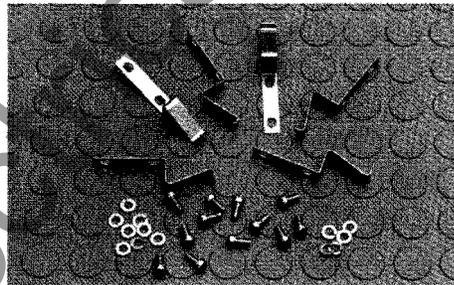


Tray assembly with fuse clamps and grounding fingers
Style No. 2147A41G22*

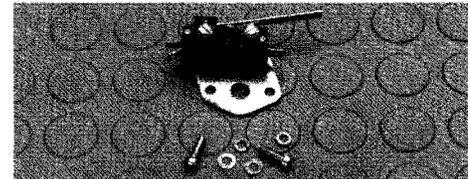
Grounding bar and barriers
Style No. 2147A41G20*



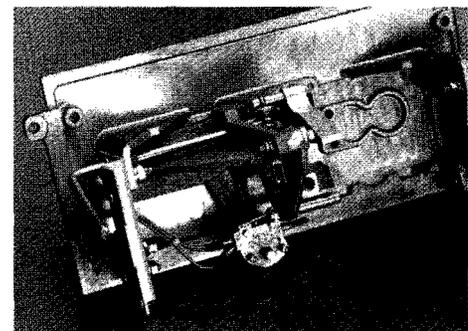
Incoming line stab assembly (part of structure)
Style No. 2147A21G19*



Grounding fingers Qty 6
Style No. 2147A21G21*



Microswitch assembly (common to all isolating switches)
Style No. 2147A01G01*

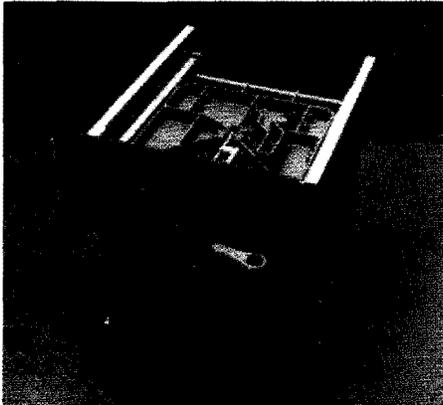


Mounting of microswitch*

*Common to Drawout and Slideout Design

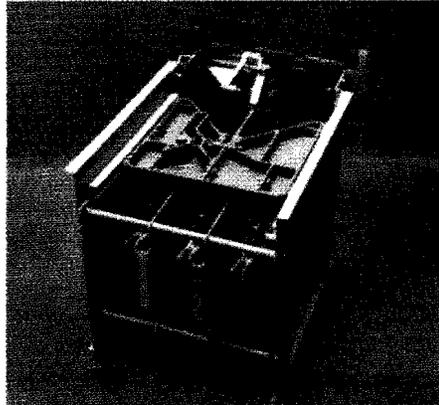


Isolating Switch 400 Amp "Drawout" Design 7200 Volt Max. – Type 72LFR-4

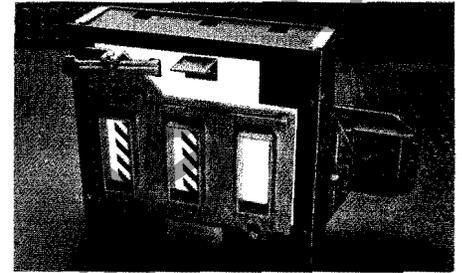


Front View

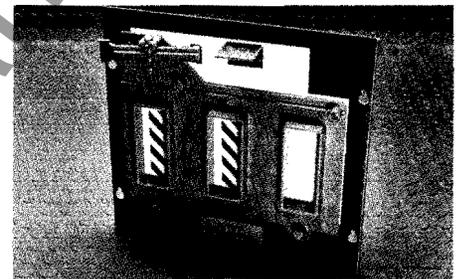
400 amp, 7200 V max. complete isolating switch with microswitch.
Style No. 2147A41G01



Rear View



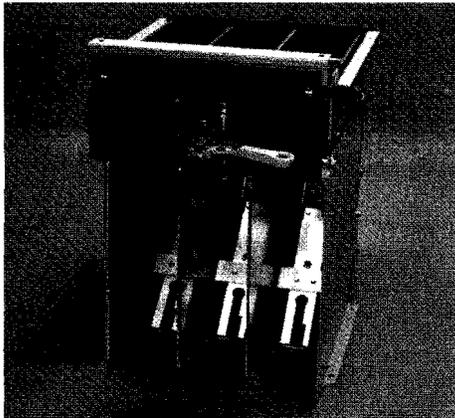
400 amp incoming line stab assembly with shutter mechanism and finger barrier (part of structure)
Style No. 2147A41G11*



Shutter mechanism only for 400 amp
Style No. 2147A41G12*

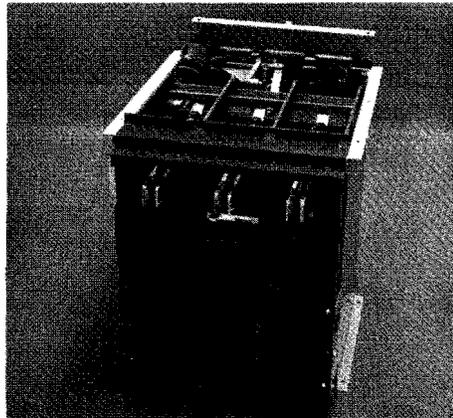


800 Amp Isolating Switch, 7200 Volt Max. – Type LFM-8

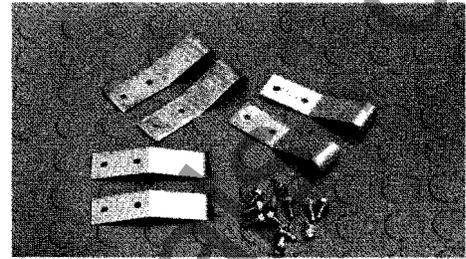


Front View

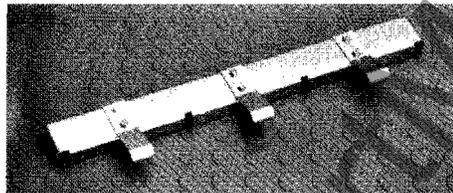
800 amp, 7200 volt max. complete isolating switch with microswitch
Style No. 2147A81G01



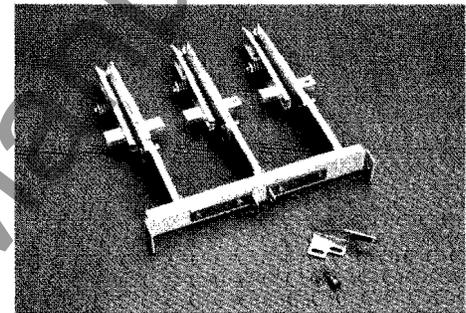
Rear View



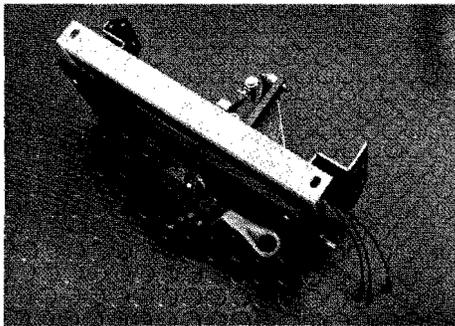
Grounding fingers Qty 6
Style No. 2147A71G23



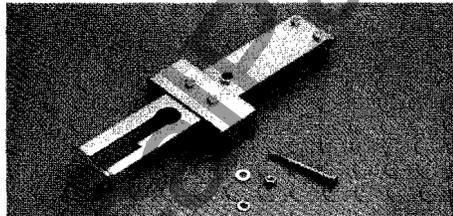
Grounding bar assembly with fingers
Style No. 2147A71G20



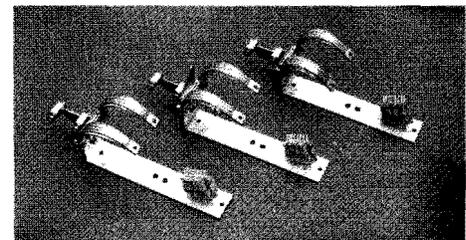
Tray assembly with line fingers
Style No. 2147A81G22



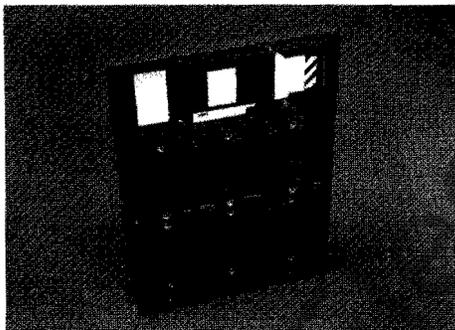
Handle and front plate with microswitch
Style No. 2147A71G18



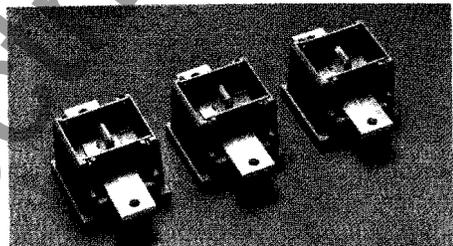
Upper fuse retainer
Style No. 2147A81G17



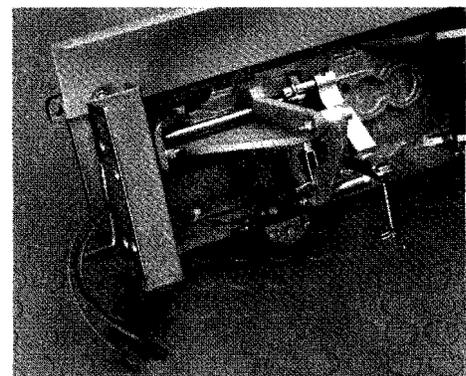
Line fuse cluster finger support assembly
Style No. 2147A81G20



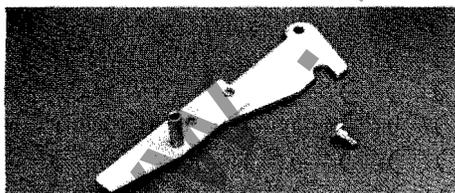
Shutter assembly
Style No. 2147A81G19



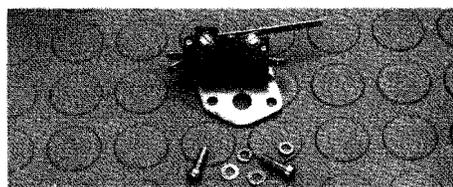
800 amp line stab assembly and barriers,
(part of structure), Qty 3
Style No. 2147A81G11



Mounting of microswitch



Shutter operator (for use with upper fuse
retainer. Required in phase "B" only.)
Style No. 2147A71G21



Microswitch assembly (common to all iso-
lating switches)
Style No. 2147A01G01

Westinghouse Electric Corporation
Distribution and Control Business Unit
Asheville, North Carolina, U.S.A. 28813



AMPGARD®

Electrical Components
OEM Vacuum Contactors
Structural Parts
ADM Switch
Retrofits

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General Information

Renewal and Replacement Parts

The present design of Ampgard medium voltage starters was introduced in 1962. Additional ratings and features have been continuously introduced over the years.

This renewal parts data will provide the proper identification of standard parts which may be required for the maintenance of Westinghouse Ampgard starters. All of the complete contactors, isolating switches and sub assemblies that are available are shown photographically in kit form.

Some of the detail parts shown in the renewal parts data are recommended only as part of a sub assembly to facilitate their replacement or installation in the field.

Style numbers identified in this brochure will not be the same as style numbers on the original equipment. The renewal part styles in this brochure are in a kit form and may include sub assembly, carton, installation instructions, etc.

It is the intent of this renewal parts data brochure to make it possible for you to quickly identify the parts needed rather than have to search through twenty years of records to determine the specific style of the original part. All of the parts shown in the kits are compatible with the design from 1962 to the present (or noted otherwise).

Special attention should be given to forecasting your particular renewal parts requirements to ensure on-site availability of necessary parts and materials when needed, as well as guaranteeing efficiency and continued operation of your equipment.

The amount of investment to be made in renewal parts is best determined by you, taking into consideration such things as the impact of probable shutdown time, equipment duty cycle, etc.

To maintain maximum operating efficiency and dependability of your equipment genuine Westinghouse renewal parts are recommended.

This publication identifies those replacement parts which are available and should be ordered by style number.

Note: All products were photographed against the same background to provide a size reference. The larger the background pattern the smaller the product.

Ampgard Starters

Since many starters are supplied to meet specific customer electrical control and distribution requirements, other parts not listed in this publication might occasionally be needed. Refer to factory for specific requests.

For equipment other than 60 Hz, refer to factory for information.

Price and availability of parts not listed may be obtained by contacting your local Westinghouse representative. Provide a complete description of the part, along with the complete data on the starter nameplate which is found in the low voltage area. Be sure to include: ratings, shop order and diagram reference.

Obsolete Ampgard Designs

Obsolete Ampgard design starters manufactured prior to 1966 were designated **AMI** starters and were built in various cities in the USA. These starters were "1 High" design, 30 in., 34 in., or 38 in. wide, 100 in. high, and either 30 in. or 60 in. deep. Retrofitting an **AMI** starter is possible with up to date Ampgard components. Refer to page 16 or refer to factory for information.

Contactors designated type H130, H230, H430 (air) and contactors designated type K430 (oil) were utilized in the **AMI** starters. These contactors are obsolete. Refer to factory for information.

The isolating switch utilized in the **AMI** starters were manufactured by G&W Electric and is no longer available. For replacement of G&W Electric switch, contact:

Phoenix Electric
P.O. Box 53
Readville Station
Boston, MA 02137
Phone: 617-821-0200
FAX: 617-828-5719

—or—

Refer to pages 15, 16 for retrofit of the entire starter with current design Ampgard. This will consist of welded cell assembly, drawout isolating switch, vacuum contactor, power fuses, current transformers, overload protection. Above will all mount in existing customer **AMI** enclosure.

Type LF66V430 vacuum contactors shipped prior to 1982 are obsolete and no longer available. For replacement order up to date design vacuum contactor from Renewal Parts Data 8855V page 4, which is mechanically and electrically interchangeable with obsolete Type LF66V430 contactor.

Additional Service

Should you experience difficulty in determining needed parts for repair or determining existing starter condition, contact your local Westinghouse representative. Westinghouse can provide qualified technical personnel on site to:

- Identify and recommend replacement parts for damage caused by short circuit or fault.
- Remove damaged parts and install replacements.
- Retrofit vintage motor starting equipment with new components.
- Evaluate condition of existing equipment.
- Test components.
- Provide a recommended spare parts list.
- Upgrade existing unit from one Hp to another or change operating voltage of existing equipment.
- Convert the starter from air break to vacuum break contactor.

See Renewal Parts Data 8855A for air break design.

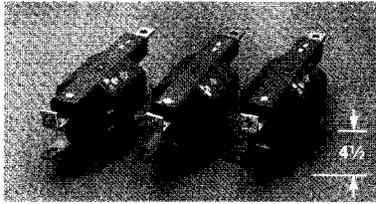
See Renewal Parts Data 8855V for vacuum break design.

Ordering Instructions

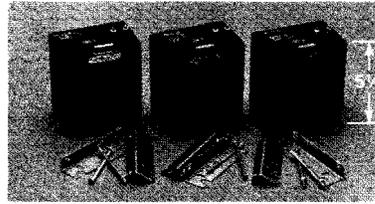
- (1) Specify by **style number**.
- (2) Refer to Price List 8855C for pricing information.



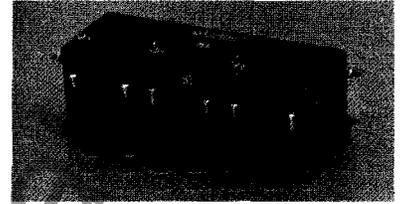
AMPGARD Electrical Components



Single phase bar type, Qty 3



Single phase donut type, Qty 3



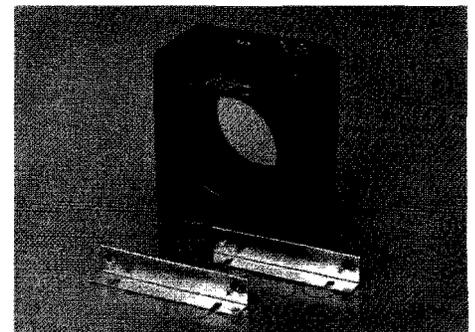
3 Phase donut type, Qty 1
Also includes ground fault transformer 50/5 ratio. Used on "drawout" AMPGARD design prior to 1988. For use with IQ1000*, IQ2000* and IQ data plus.*

Ratio 25/5	Style No. 2147A12G01		
Ratio 50/5	Style No. 2147A12G02	Note 1	Style No. 2147A14G02
Ratio 75/5	Style No. 2147A12G03	Note 2	Style No. 2147A14G03
Ratio 100/5	Style No. 2147A12G04	Style No. 2147A13G04	Style No. 2147A14G04
Ratio 150/5	Style No. 2147A12G05	Style No. 2147A13G05	Style No. 2147A14G05
Ratio 200/5	Style No. 2147A12G06	Style No. 2147A13G06	Style No. 2147A14G06
Ratio 250/5	Style No. 2147A12G07	Style No. 2147A13G07	Style No. 2147A14G07
Ratio 300/5	Style No. 2147A12G08	Style No. 2147A13G08	Style No. 2147A14G08
Ratio 400/5	Style No. 2147A12G09	Style No. 2147A13G09	Style No. 2147A14G09
Ratio 500/5	—	Style No. 2147A13G10	Style No. 2147A14G10
Ratio 600/5	—	Style No. 2147A13G11	Style No. 2147A14G11
Ratio 750/5	—	Style No. 2147A13G12	Style No. 2147A14G12
Ratio 800/5	—	Style No. 2147A13G13	Style No. 2147A14G13
Ratio 1000/5	—	Style No. 2147A13G14	Style No. 2147A14G14
Ratio 1200/5	—	Style No. 2147A13G15	—



3 phase donut type Qty 1 without 50/5 ground fault C.T. used on most AMPGARD designs after 1987.

Ratio 50/5	Style No. 2147A16G04 (Loop (2) primary leads)
Ratio 100/5	Style No. 2147A16G04
Ratio 150/5	Style No. 2147A16G05
Ratio 200/5	Style No. 2147A16G06
Ratio 300/5	Style No. 2147A16G08
Ratio 400/5	Style No. 2147A16G09
Ratio 500/5	Style No. 2147A16G10
Ratio 600/5	Style No. 2147A16G11
Ratio 800/5	Style No. 2147A16G13
Ratio 1000/5	Style No. 2147A16G14
Ratio 1200/5	Style No. 2147A16G15



Ground fault current transformer, 50/5 ratio. For use with IQ1000, IQ2000
Style No. 5264C10H11

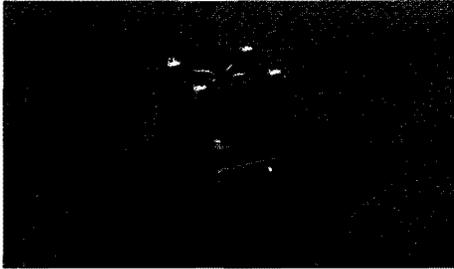
For standard **ground gard** ground fault C.T. Refer to Cat 25-000.

Ground fault current transformer, 9/0.5 ratio 7½ in. high, 3⅜ in. dia. hole. High Burden C.T. used with SC Relay, CO Relay etc.
Style No. 654C777H01

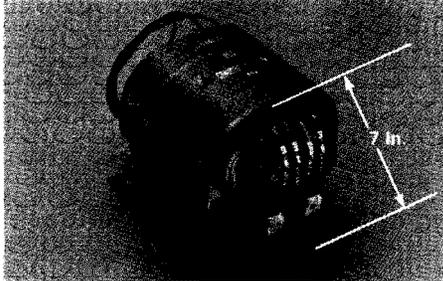
Note 1 - Use Style No. 2147A13G04 and loop (2) primary leads.
Note 2 - Use Style No. 2147A13G05 and loop (2) primary leads.



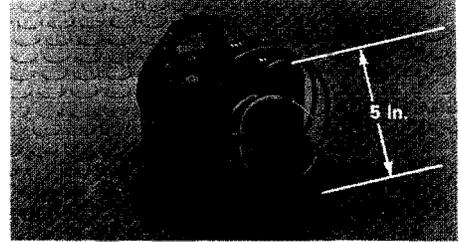
AMPGARD Electrical Components



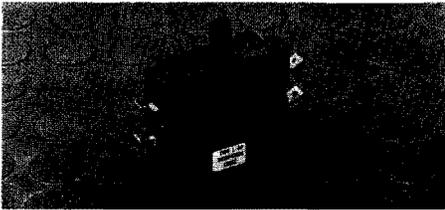
Rectifier
120 volt control
Style No. 2018A40G01
240 volt control
Style No. 2018A40G02



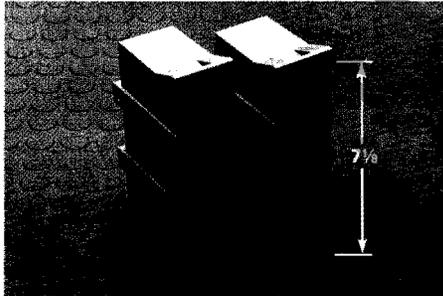
2 KVA control transformer
2300/240/120 volt, 60 Hz
Style No. 2147A11G02
4160/240/120 volt, 60 Hz
Style No. 2147A11G06



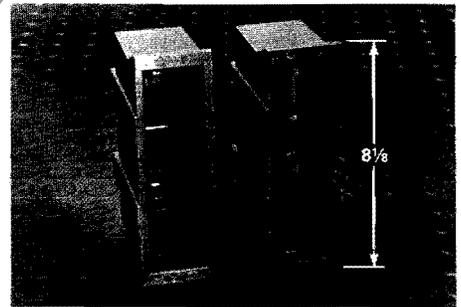
Standard control transformer
2300/120 volt, 750 volt amp, 60 Hz
Style No. 2147A11G01
2300/240 volt, 750 volt amp, 60 Hz
Style No. 2147A11G03
4160/120 volt, 600 volt amp, 60 Hz
Style No. 2147A11G05
4160/240 volt, 600 volt amp, 60 Hz
Style No. 2147A11G07



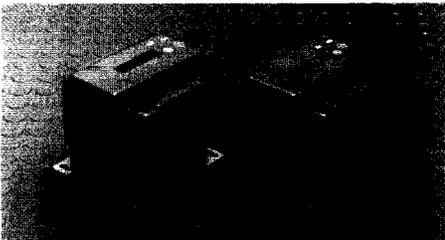
L-64 interlock one normally open & one normally closed contact (standard)
Style No. 843D943G21
L-64 interlock – 2 N.O. contacts
Style No. 843D943G22
L-64 interlock – 2 N.C. contacts
Style No. 843D943G23



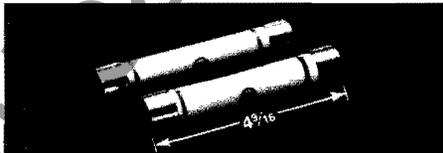
Fuse blocks with fuse clips for primary fuses for control transformers, 2500 volt primary, max
Qty 2 **Style No. 2147A11G21**
Qty 3 **Style No. 2147A11G44**



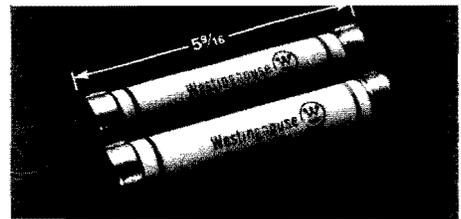
Fuse blocks with fuse clips for primary fuses for control transformers, 5000 volt max primary,
Qty 2 **Style No. 2147A11G22**
Qty 3 **Style No. 2147A11G45**



Potential transformers, 450 volt amp, single phase, Qty 2
2400/120 volt, 60 Hz
Style No. 2147A11G11
4200/120 volt, 60 Hz
Style No. 2147A11G12



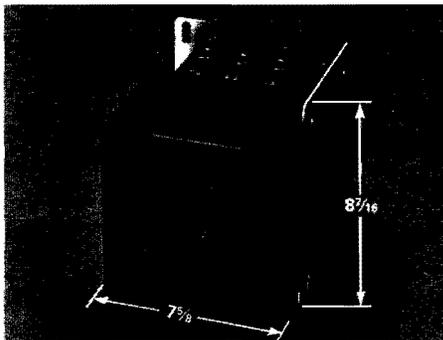
Control transformer primary fuse, 2500 volt, max 2 amp,
Qty 2 **Style No. 2147A11G24**
Qty 3 **Style No. 2147A11G43**



Control transformer primary fuse, 5000 volt max 3 amp,
Qty 2 **Style No. 2147A11G25**
Qty 3 **Style No. 2147A11G46**



Primary Fuse Bands, Qty 3
Style No. 2147A11G31



Potential transformer, 100 volt amp, 3 phase open delta. With prim. fuse provision, Qty 1
2400/120 volt, 60 Hz
Style No. 2147A11G14
4200/120 volt, 60 hz
Style No. 2147A11G15



2 pole fuse block with fuse clips for secondary fuses for control circuit, 30 amp max, 250 volt max, uses standard NEC fuses, 2 in. long, 1 7/32 in. dia, Qty 2
Style No. 2147A11G35

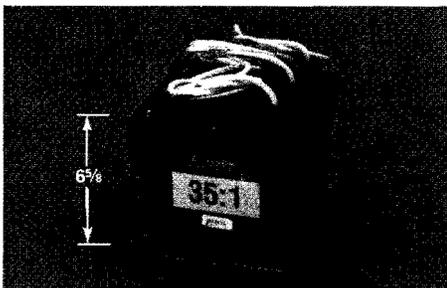


AMPGARD Electrical Components, Overload Heaters, Power Fuses



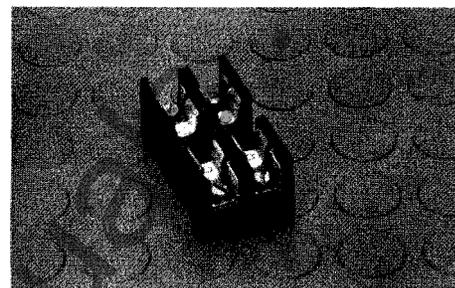
Fuses, dual element miniature type, 1½ in. long, 1³⁄₃₂ in. dia. for use with Style No. 2147A15G15 or G16

1 amp Qty 5
10 amp Qty 5
15 amp Qty 5
Style No. 2147A11G42



Potential transformer, 100 volt amp, 3 phase open delta. Without prim. fuse provision, Qty 1

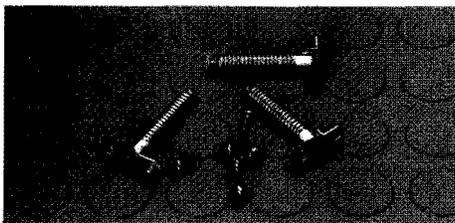
Used primarily on slide out vacuum design
2400: 120 volt, 60 Hz
Style No. 2147A11G36
3300: 120 volt, 60 Hz
Style No. 2147A11G37
4200: 120 volt, 60 Hz
Style No. 2147A11G38
4800: 120 volt, 60 Hz
Style No. 2147A11G39



2 pole fuse block with fuse clips for secondary fuses for control circuit, 30 amp, 600 volt max, uses dual element fuses (miniature) 1½ in. long, 1³⁄₃₂ in. dia, Qty 2

Style No. 2147A15G16
Same as above except 1 pole, Qty 4
Style No. 2147A15G15

Type G Overload Heaters



Qty. 3	Secondary Current Transformer Range - 3 Pole Rating -	Heater Rating
Style No. 506C578G22	1.63-1.78	2.03
Style No. 506C578G23	1.79-1.95	2.23
Style No. 506C578G24	1.96-2.15	2.44
Style No. 506C578G25	2.16-2.35	2.69
Style No. 506C578G26	2.36-2.58	2.95
Style No. 506C578G27	2.59-2.83	3.23
Style No. 506C578G28	2.84-3.11	3.55
Style No. 506C578G29	3.12-3.42	3.90
Style No. 506C578G30	3.43-3.73	4.28
Style No. 506C578G31	3.74-4.07	4.67
Style No. 506C578G32	4.08-4.39	5.1
Style No. 506C578G33*	4.40-4.87	5.5
Style No. 506C578G34*	4.88-5.30	6.1

The Type G overload heaters for the Type A overload relay are for use on AMPGARD starters only. These heaters are coordinated with power fuses and current transformers for each order. Do not change heater, power fuse, or current transformer before consulting factory.

Note that prior to 5/66 the standard overload for the AMPGARD was the Type MG overload, which is no longer available. Also note that the Type A 2 pole overload was standard from 6/66 to 7/73. For conversion to up to date overload with 3 phase protection consult factory.

*Not stocked - used on older AMPGARDs only.

Power Fuses

General Information

The AMPGARD design over the years has used many different types of power fuses. i.e., with and without hook-eye, different lengths (50L2 prior to 6/71 used 14 in. clip center, after 6/71 used 12 in. clip center), Type CLS for motor application, Type CLE

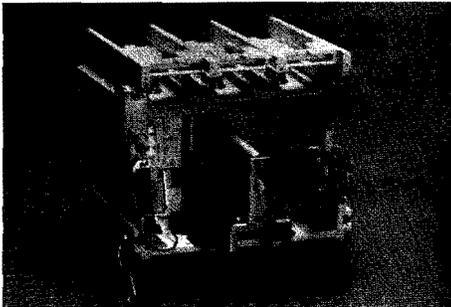
for transformer applications etc. The renewal part name plate on the inside of the high voltage door will identify the power fuses by rating and style number. Since the power fuses are coordinated with the overload relay and current transformers for each order we do not recommend substituting fuses of a different rating or style number without consulting factory.

Westinghouse encourages its customers to stock power fuses to ensure on-site availability, as well as guaranteeing efficiency and continued operation of their equipment. Most fuses are available from Cat Index 36-685, otherwise refer to factory for availability/substitution.

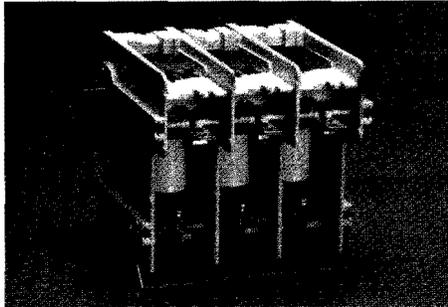


OEM Contactors

400 Amp Vacuum Break Contactor, 7200 Volt Max – SJO Type



Front View



Rear View

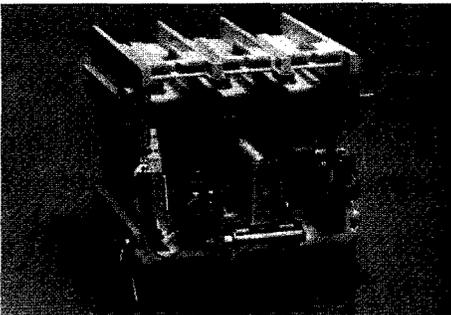
SJO 430 contactor 120 volt A.C./125V D.C. coil

Style No. 2197A01G21

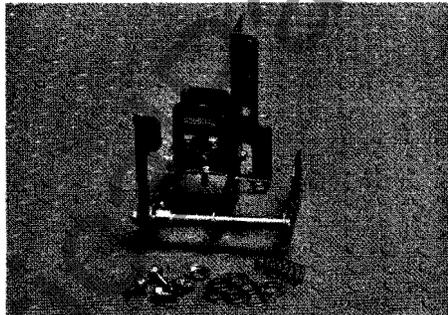
SJO 430 contactor 240 volt A.C./250V D.C. coil

Style No. 2197A01G23

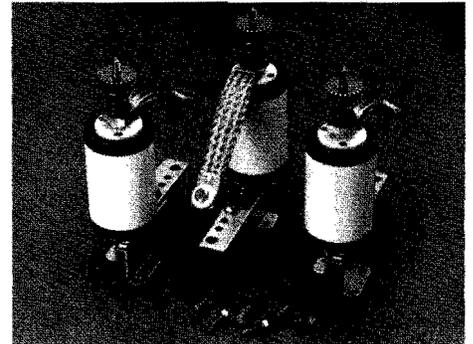
400 Amp Vacuum Break Contactor, 7200 Volt Max. – SJO Type with Mechanical Latch



Front View



Solenoid latch (single solenoid) for field mounting



Vacuum bottles with shunt, load connection
 Qty 3

Style No. 2147A47G13

Note – Cannot be used on Type SJA "Drawout Contactor."

SJO 430 contactor – single solenoid
 120 volt A.C./125V D.C. – main coil
 120 volt A.C. continuous/48V D.C.
 intermittent-trip coil

Style No. 2147A45G41

SJO 430 contactor – single solenoid
 120 volt A.C./125V D.C. – main coil
 230 volt A.C./96-125V D.C. intermittent-trip
 coil

Style No. 2147A45G42

120 Volt A.C. continuous/48V D.C.
 intermittent

Style No. 2147A48G22

230 Volt A.C. continuous/96-125V D.C.
 intermittent

Style No. 2147A48G23

Note 2 –
 Double solenoid latch attachments are also available. Specify sim. to Style No. 2147A48G___ above except with double solenoid latch. Also specify operating voltage from Note 1 for each trip coil.

Note 3 –

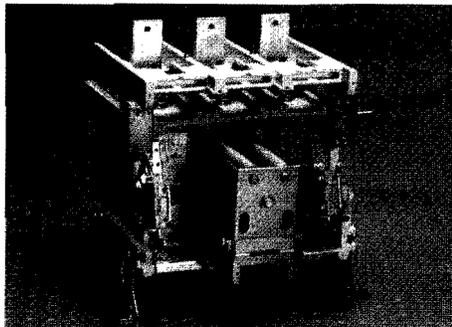
For contactor with 2 trip solenoids, order similar to Style No. 2147A45G___ except with double solenoid latch. Also specify operating voltage from Note 1 for each trip coil.

Standard Solenoid	Operating Voltages
Continuous Duty	Intermittent
120V. A.C.	48V D.C.
230V. A.C.	96-125V D.C.
None	24V D.C.

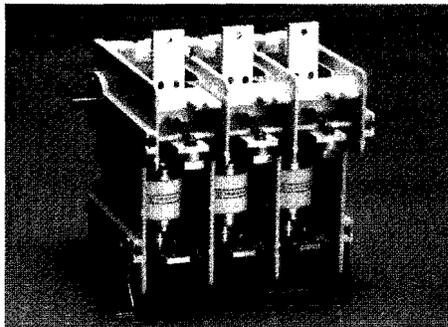


OEM Contactors

800 Amp Vacuum Break Contactor, 7200 Volt Max – SJO Type



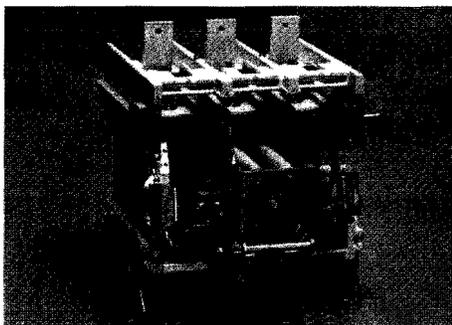
Front View



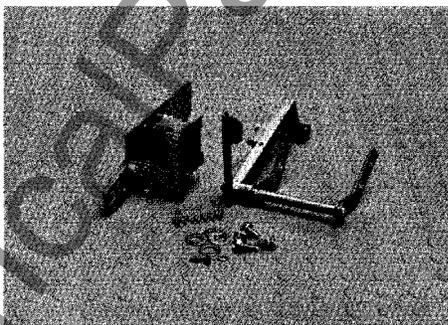
Rear View

SJO 830 contactor 120 volt A.C./125V D.C. coil
Style No. 7860A46G11
 SJO 830 contactor 240 volt A.C./250V D.C. coil
Style No. 7860A46G13

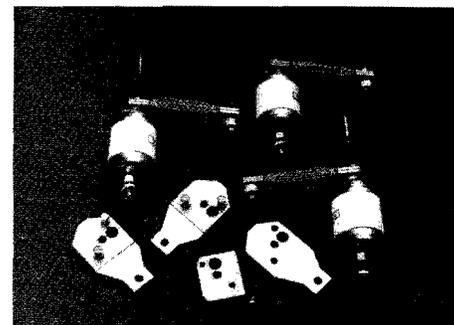
800 Amp Vacuum Break Contactor, 7200 Volt Max. – SJO Type with Mechanical Latch



Front View



Solenoid latch (single solenoid) for field mounting



Vacuum bottles with shunt, load connection
Qty 3
Style No. 2147A87G13

SJO 830 contactor – single solenoid
 120 volt A.C./125V D.C. – main coil
 120 volt A.C. continuous/48V D.C. intermittent-trip coil
Style No. 2147A85G21
 SJO 830 contactor – single solenoid
 120 volt A.C./125V D.C. – main coil
 230 volt A.C./96-125V D.C. intermittent-trip coil
Style No. 2147A85G22

120 Volt A.C. continuous/48V D.C. intermittent
Style No. 2147A88G22

230 Volt A.C. continuous/96-125V D.C. intermittent
Style No. 2147A88G23

Note – Cannot be used on Type SJA "Drawout" Contactor.

Note 3 –
 For contactor with 2 trip solenoids, order similar to Style No. 2147A85G___ except with double solenoid latch. Also specify operating voltage from Note 1 for each trip coil.

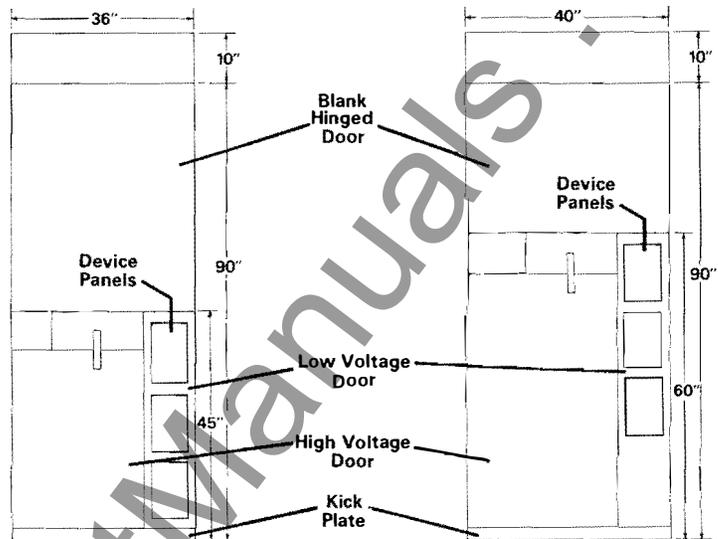
Note 1 –

Standard Solenoid	Operating Voltages
Continuous Duty	Intermittent
120V. A.C.	48V D.C.
230V. A.C.	96-125V D.C.
None	24V D.C.

Note 2 –
 Double solenoid latch attachments are also available. Specify sim. to Style No. 2147A88G___ above except with double solenoid latch. Also specify operating voltage from Note 1 for each trip coil.

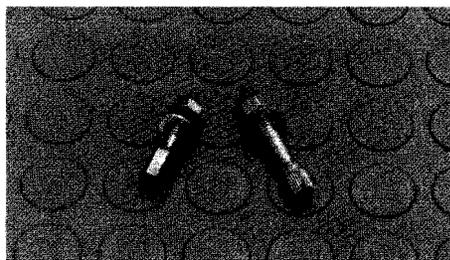


AMPGARD Structural Parts

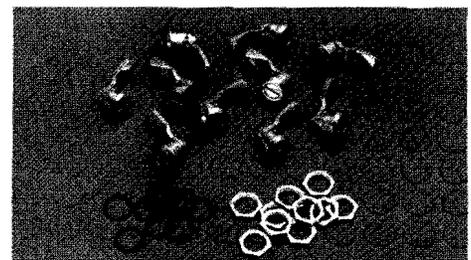


		400 Amp	700/800 Amp
High Voltage Door NEMA 1 Ⓢ	Non Reversing	45" High Style No. 2147A94G01	60" High Style No. 2147A97G01
	Reversing	75" High Style No. 2147A94G02	
Low Voltage Door with 3 Device Panels NEMA 1 Ⓢ	Non Reversing	45" High Style No. 2147A94G03	60" High Style No. 2147A97G03
	Reversing	75" High Style No. 2147A94G04	
Blank Ⓢ Hinged Door NEMA 1		15" High Style No. 2147A94G05	15" High Style No. 2147A97G05
		30" High Style No. 2147A94G06	30" High Style No. 2147A97G06
		45" High Style No. 2147A94G07	60" High Style No. 2147A97G07
		90" High Style No. 2147A97G08	90" High Style No. 2147A97G08
Back Sheet			
Bus Enclosure Empty		Style No. 2147A94G11	Style No. 2147A97G11
Bus Enclosure With Insulators, 1200 Amp Copper Bus, 1/4" x 4" Non Insulated, Non Plated		Style No. 2147A94G12	Style No. 2147A97G12
Kick Plate Front		Style No. 2147A94G21	Style No. 2147A97G21

Ⓢ If replacing narrow flange doors with above, remove vertical trim strip and drill holes for hinge mounting. Narrow flange supplied prior to July 1983.



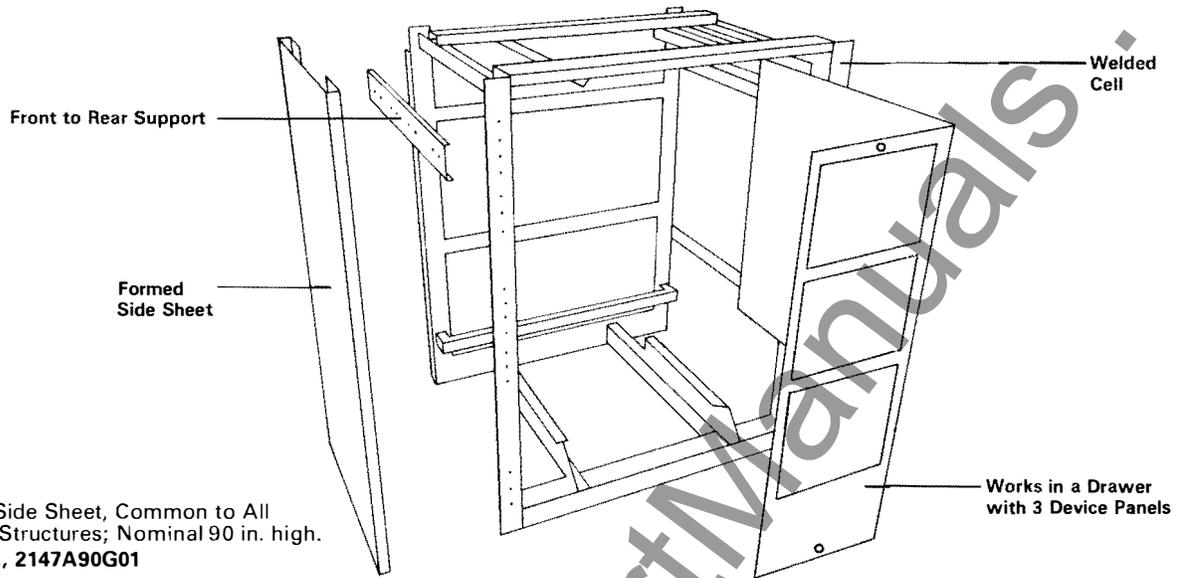
Obsolete door fastener.
No longer available, customer to use standard hardware 3/8" dia., 2 in. long (approx.)



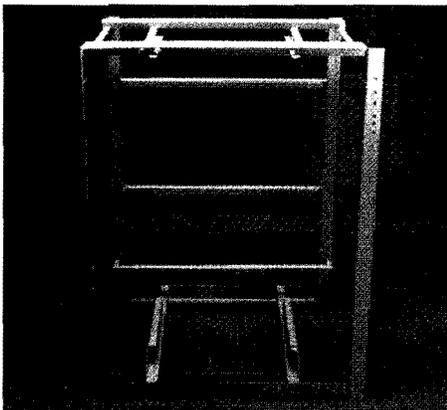
Door fastener kit Qty 10
Style No. 2147A91G15



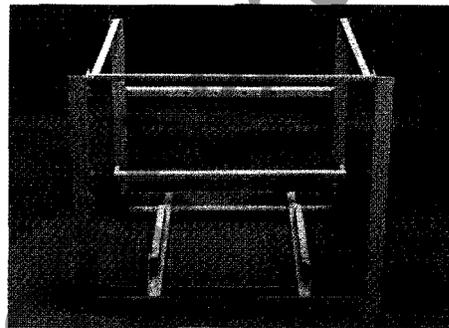
AMPGARD Structural Parts



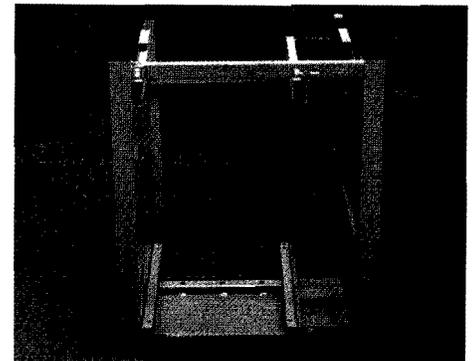
Formed Side Sheet, Common to All NEMA 1 Structures; Nominal 90 in. high.
Style No., 2147A90G01



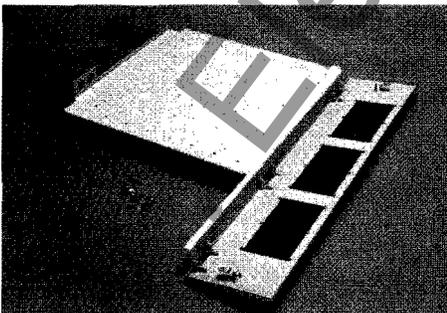
400 Amp welded cell, nominal 45 in. high. Standard, for use with isolating switch and power fuses. Complete with H.V. door and L.V. door with "Works in a Drawer" (not shown in photo)
Style No. 2147A91G04



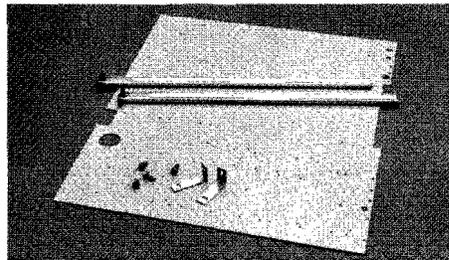
400 amp welded cell, nominal 30 in. high, complete with H.V. door (not shown in photo) Reversing.
(Reversing cells are used in starters for reversing contactors, shorting and run contactors of reactor and autotransformer and multispeed starters.)
Style No. 2147A91G05



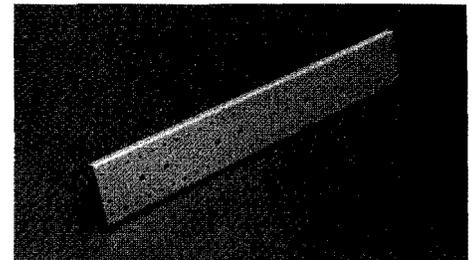
200 Amp welded cell, nominal 30 in. high. For use with all 200 amp, 2500 volt starters (25L2). Complete with H.V. & L.V. door (not shown in photo)
Style No. 2147A91G02



Works in a drawer with slide rails. Mounts in 400 amp cell. Nominal 45 in. high
Style No. 2147A91G13
Same as above except for use in 700/800 cell (60 in. high.)
Style No. 2147A91G14
Note - above includes 3 device panels.



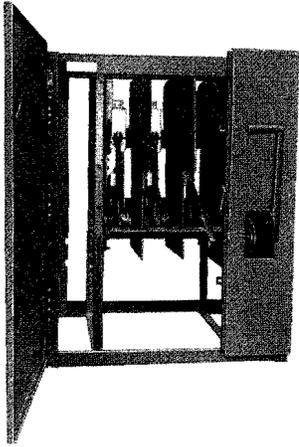
Slide out control panel, slide rails. Mounts in 400, 700, 800 amp cell
Style No. 2147A91G12



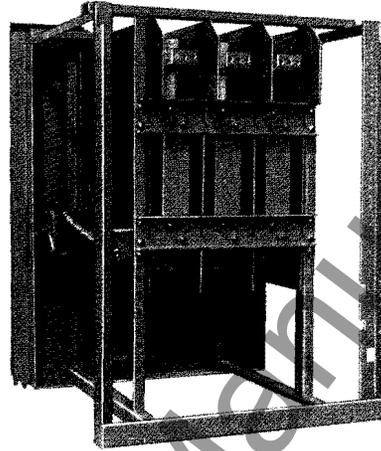
Front to rear support, Qty 2
Style No. 2147A91G11



ADM Switch, 1200 Amp, 5500 Volt Max.

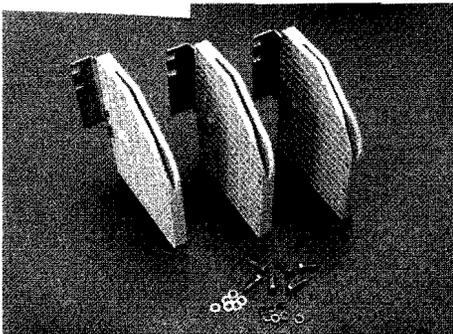


Front View



Rear View

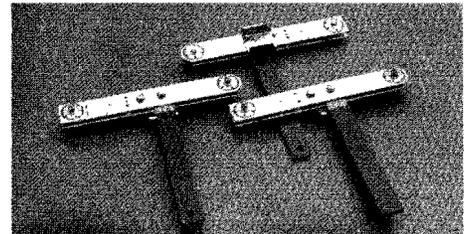
ADM Switch, in welded frame assembly,
with front door. Nominal 45" high.
Style No. 2147A02G01



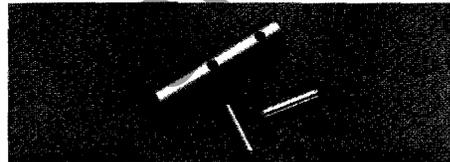
Arc chute Qty 3
Style No. 2147A02G02



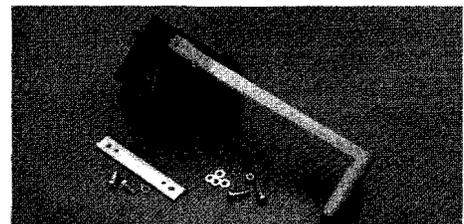
Rod ends Qty 3
Style No. 2147A02G08



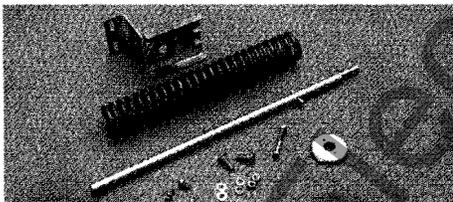
Main switch blades Qty 3
Style No. 2147A02G04



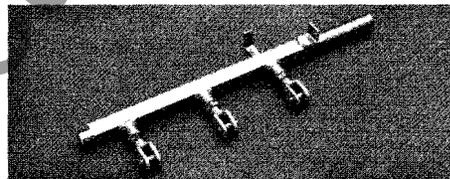
Shaft (for handle) with roll pins
Style No. 2147A02G10



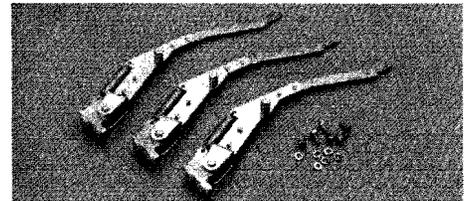
Operating mechanism assembly, with
handle
Style No. 2147A02G07



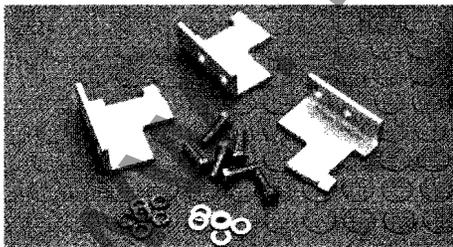
Main spring, rod, mounting
Style No. 2147A02G05



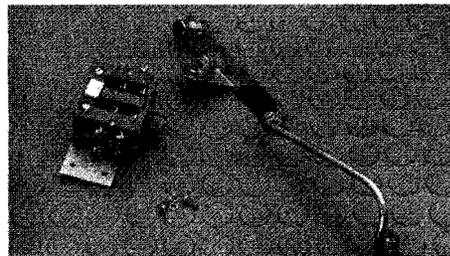
Shaft with rod ends
Style No. 2147A02G09



Flicker blade assembly Qty 3
Style No. 2147A02G06



Main stationary contacts Qty 3
Style No. 2147A02G03



Electrical interlock operating mechanism,
with 2 N.O., 2 N.C. electrical interlocks
Style No. 2147A02G11



Retrofit Kits

General Information

This section is designed to supplement the renewal part kits listed in other sections of RPD 8855C. Retrofit kits are created for customers who want to:

- Modify and upgrade existing equipment. Kits exist for adding potential transformers, conversion from 700 ampere air break to vacuum and adding new starters in existing spaces.
- Replace out-of-production starter equipment without having to remove existing structures or replace cable and conduit. Kits of this type include the 50L2 retrofit, the AMI retrofit and the 700 ampere starter conversion to 800 ampere vacuum.
- Convert existing motor protection to microprocessor based IQ protection. Kits are available to add IQ1000 or Data Plus in surface mounted enclosures or in 10 inch wide 90 inch high auxiliary sections. These kits can be combined with IQ communications devices from the IQ family price lists.

Note: Retrofit kits contain many specialized parts and pieces. They can be combined with other renewal part kits to expand the kit application. **The kits do not contain standard hardware or wire.** The kits may require additional material to meet your specific customer needs. All kits will require substantial field labor to install. The installation is not included.

Retrofit Kit Index

Vacuum Starter Kits Page 12

These kits contain a complete full voltage vacuum starter with cell and doors. (36" wide x 45" high x 30" deep). This retrofit applies to all 400 ampere spaces manufactured after 1966 to present.

Disconnecting Potential Transformer Kits Page 13

These kits can be installed in any 36 inch wide structure with minimum 15 inches of panel height.

Fixed Potential Transformer Kits Page 13

These kits will provide the ability to add 3 phase potential transformers to any starter or incoming line/auxiliary enclosure.

IQ Retrofit Kits Page 14

There are 4 basic kits offered. One kit provides the ability to surface mount the IQ product, one kit contains a 10 inch auxiliary section, one kit is for converting from IQ2000 Model A to IQ2000 Model B, the fourth kit includes material to add an IQ1000 and Data Plus to an existing starter.

700 Amp Contactor Retrofit Kit Page 15

This kit includes the material to modify the out-of-production 700 ampere air break starter from air break to 800A vacuum.

Limited to 450 amperes full load maximum.

700 Amp Controller Retrofit Kit Page 15

This kit includes the material to upgrade the out-of-production 700 ampere air break starter to a fully rated 800 ampere vacuum starter. Also used to upgrade 700 ampere reversing, reactor and multispeed starters to vacuum.

50L2 Retrofit Kit Page 15

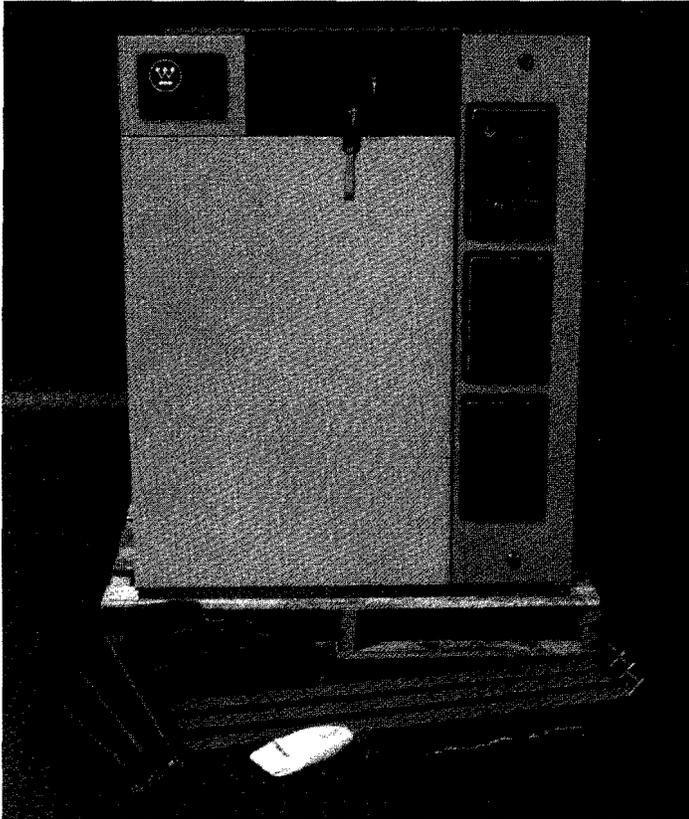
This kit contains the material to convert the out-of-production 50L2 (5000 volt, 200 ampere air break) to SJ vacuum, it utilizes the existing structure and isolation switch and can be used on 50L2 starters manufactured from 1963 to 1982.

AMI Retrofit Kits Page 16

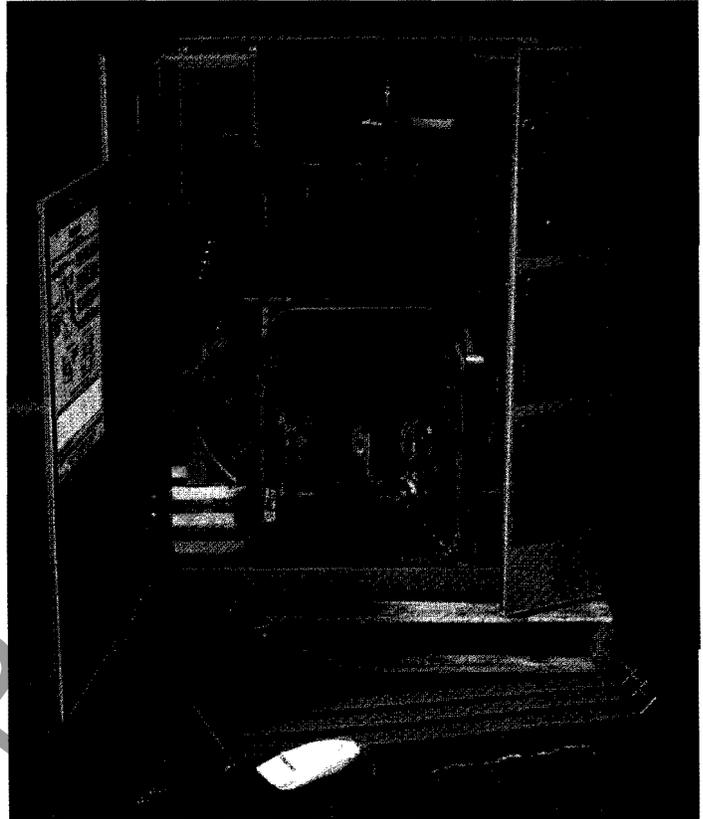
These kits are similar to the vacuum starter kits except for retrofit of the earlier AMPGARD design which utilized Type "H" air break Type "K" oilbreak, and Type "DN-OH" oilbreak. The AMI design was used from 1960-1967. The AMI retrofit can be used on earlier "AMPGARD" designs if the existing structure is wider than 30 inches and at least 30" deep.

AMPGARD Starter Retrofit Kits

AMPGARD Complete in 45 in. High Cell, for Mounting in Existing 36 in. Wide (AMPGARD Type) Customer Enclosure



Front View (Doors Closed)



Front View (Doors Open)

Draw-out Design Shown

Complete full voltage, non reversing, induction, Vacuum break AMPGARD motor starter, 400 amp, 7200 volt max. for mounting in existing 36 in. wide enclosure. Includes main contactor, isolating switch, (3) power fuses, IQ1000 motor command without RTD module, (3) current transformers, vertical bus, high voltage and low voltage doors, welded cell assembly for mounting in existing 36 in. wide customer enclosure.
Style No. 2147A95G01 Slideout design
Style No. 2147A95G02 Drawout design

When ordering specify the following –
Style number from left hand column
Quantity
HP, FLA, service factor
Voltage, Hertz, phase
Load cable entry (top or bottom)

Note –

For functional up to date duplicate of existing motor starter, to be mounted in existing AMPGARD enclosure, with same modifications as previously supplied refer to factory with all ordering information from middle column and also advise size of cable, number of cables per phase, existing  outline dwg. no. and schematic & wiring diagram.

WWW.ELECTRICAL.COM



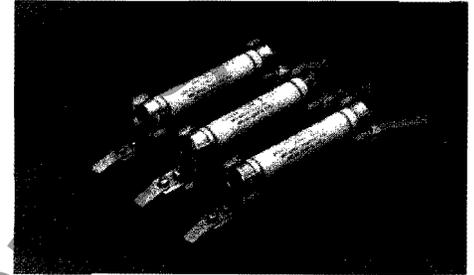
Potential Transformers, Disconnect and Fixed Mounted

Potential Transformer Disconnect



Potential transformer disconnect complete with (2) potential transformers, (3) primary and (2) secondary fuses.

Style No. 2147A95G06 2400/120V.
Style No. 2147A95G07 4200/120V.



Potential transformer disconnect without transformers, with (3) primary and (2) secondary fuses. 5KV max.

Style No. 2147A95G08

Main fingers, ground fingers, primary fuses, fuse mountings, 5KV max. Qty 3
Style No. 2147A95G09

Fixed Mounted

Potential Transformer Kits, 3 Phase – For Incoming Line or Auxiliary Enclosure Application

A – 100V.A. Capacity 2400/120 Volt, 60 Hz

Consisting of – (1) potential transformer, 3 phase, open delta, (3) primary fuses, (1) secondary fuse block with (2) fuses, mounting panel, danger high voltage NP's, schematic dwg. showing P.T.'s connected to main bus.
Style No. 2147A95G24

B – 450V.A. Capacity 2400/120 Volt, 60 Hz

Consisting of – (2) potential transformers, single phase, (3) primary fuse blocks with fuses, (1) secondary fuse block with (2) fuses, mounting panel, danger high voltage NP's, schematic dwg. showing P.T.'s connected to main bus.
Style No. 2147A95G25

C – 100V.A. Capacity 4200/120 Volt, 60 Hz

Similar to kit "A" except transformer primary voltage.
Style No. 2147A95G26

D – 450V.A. Capacity 4200/120 Volt, 60 Hz

Similar to kit "B" except transformer primary voltage.
Style No. 2147A95G27

Fixed Mounted or Contactor Mounted

Potential Transformer Retrofit Kits, 3 Phase – For AMPGARD Starter Application

A – 400 Amp Air Break or Vacuum Break "Drawout" Design

1 – 100V.A. Capacity 2400/120 Volt, 60 Hz.
Consisting of – (3) contactor line fingers, (1) line stab assembly, (1) potential transformer, 3 phase, open delta, (3) primary fuses, (1) secondary fuse block with (2) fuses.
Style No. 2147A95G10

2 – 450V.A. Capacity 2400/120 Volt, 60 Hz.
Consisting of – (3) contactor line fingers, (1) line stab assembly, (2) potential transformers, single phase, (3) primary fuse blocks & fuses, (1) secondary fuse block with (2) fuses.
Style No. 2147A95G11

3 – 100V.A. Capacity 4200/120 Volt, 60 Hz.
Similar to kit A-1 above except transformer primary voltage.
Style No. 2147A95G12

4 – 450V.A. Capacity 4200/120 Volt 60 Hz.
Similar to kit A-2 above except transformer primary voltage.
Style No. 2147A95G13

B – 400 Amp Vacuum Break "Slideout" Design

1 – 100V.A. Capacity 2400/120 Volt, 60 Hz.
Consisting of – (1) potential transformer, 3 phase, open delta (mounted on contactor), (1) secondary fuse block with (2) fuses.
Style No. 2147A95G14

2 – 100V.A. Capacity 4200/120 Volt, 60 Hz.
Similar to kit B-1 above, except transformer primary voltage.
Style No. 2147A95G15

C – 700 Amp Air Break

1 – 100V.A. Capacity 2400/120 Volt, 60 Hz.
Consisting of – (3) contactor line fingers, (1) stab assembly complete with mounting, (1) potential transformer, 3 phase, open delta, (3) primary fuses, (1) secondary fuse block with (2) fuses.
Style No. 2147A95G16

2 – 450V.A. Capacity 2400/120 Volt, 60 Hz.
Consisting of – (3) contactor line fingers, (1) stab assembly complete with mounting, (2) potential transformers, single phase, (3) primary fuse blocks & fuses, (1) secondary fuse block with (2) fuses.
Style No. 2147A95G17

3 – 100V.A. Capacity 4200/120 Volt, 60 Hz.
Similar to kit C-1 above, except transformer primary voltage.
Style No. 2147A95G18

4 – 450V.A. Capacity 4200/120 Volt, 60 Hz.
Similar to kit C-2 above, except transformer primary voltage.
Style No. 2147A95G19

D – 800 Amp Vacuum Break
1 – 100V.A. Capacity 2400/120 Volt, 60 Hz.
Consisting of – (3) contactor line fingers, (1) stab assembly complete with mounting, (1) potential transformer, 3 phase, open delta, (3) primary fuses, (1) secondary fuse block with (2) fuses.
Style No. 2147A95G20

2 – 450V.A. Capacity 2400/120 Volt, 60 Hz.
Consisting of – (3) contactor line fingers, (1) stab assembly complete with mounting, (2) potential transformers, single phase, (3) primary fuse blocks & fuses, (1) secondary fuse block with (2) fuses.
Style No. 2147A95G21

3 – 100V.A. Capacity 4200/120 Volt, 60 Hz.
Similar to kit D-1 above, except transformer primary voltage.
Style No. 2147A95G22

4 – 450V.A. Capacity 4200/120 Volt, 60 Hz.
Similar to kit D-2 above, except transformer primary voltage.
Style No. 2147A95G23

IQ Retrofit Kits

IQ Surface Mount Enclosure – NEMA 1

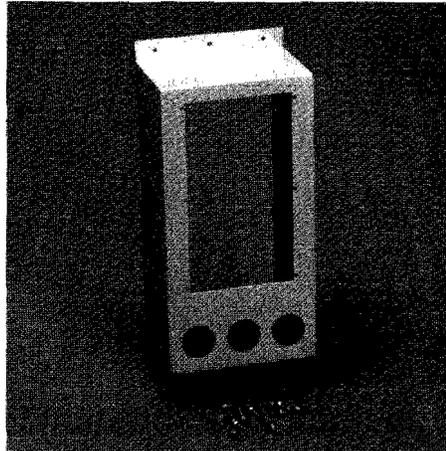
Heavy gauge #14, painted ASA-61. Enclosure for mounting IQ family products on walls, panels or doors without making large cutouts. Six mounting holes and mounting hardware included. Basic footprint is 7.375 in. wide by 16.25 in. high. Depth will vary based on type of IQ product used. Includes drilling for (3) PB-1 or PB-2 devices. **The IQ product or PB product are not included.**

4.19 in. deep, for use with IQ 1000, with or without communications.

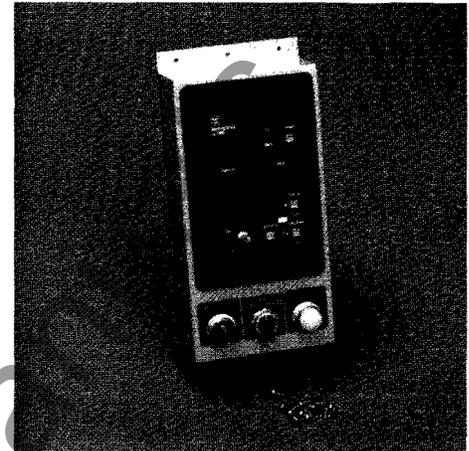
Style No. 2147A95G33

6.13 in. deep for use with IQ Data Plus, with or without communications.

Style No. 2147A95G34

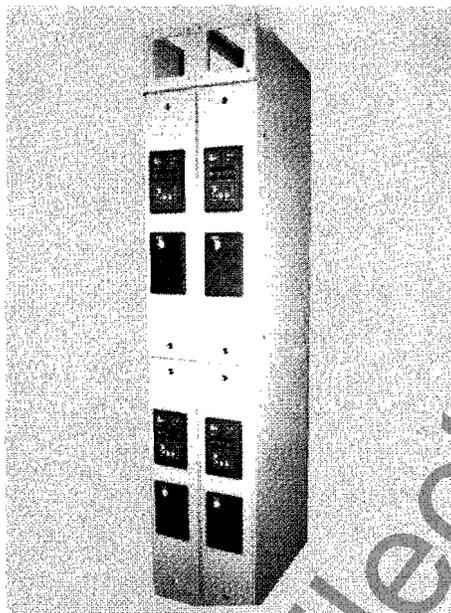


Surface Mount Enclosure



Shown with IQ 1000, PB-1 Devices Mounted

IQ Floor Mounted Enclosure – NEMA 1



Two 10 in. wide enclosures
(Shown with optional 10 in. high bus compartment.)

Standard AMPGARD structure construction, painted ASA-61. To be used as a line-up extension for mounting IQ products. Each 10 in. wide section comes with (2) doors with "works-in-a drawer" drawout panel. Each door has (3) standard IQ cutouts with device panels. This kit can be used to minimize field wiring during IQ retrofit or for adding IQ protection where there isn't enough panel space.

The IQ product is not included.

10 in. wide, 30 in. deep, 90 in. high auxiliary section (bus compartment optional).

Style No. 2147A95G35

IQ 2000 Model "A" to Model "B" Conversion kit

This kit includes a collection of parts to make conversion from the out-of-production Model A to Model B IQ 2000 in an AMPGARD Starter as easy as possible. Two face-plate installation options are provided – surface mount enclosure or new low voltage door. **The IQ 2000 is not included.**

Included in the kit are:
IQ A to B conversion labels
Instruction drawing 9966D97
TD 11-720-B User Manual
Typical schematics 5291C64, 5291C23, 5291C25
Deep flanged low voltage door with 3 device panels
IQ surface mount enclosure
Style No. 2147A95G36

IQ 1000 and Data Plus Retrofit Kit

This kit includes a collection of parts to make a retrofit of these IQ products and AMPGARD easier. If current transformers or potential transformers are required refer to the appropriate page in this RPD. The IQ 1000 and Data Plus are pre-wired to terminal blocks on the drawout panel.

This kit includes:
Typical starter schematics
Deep-flanged low voltage door with 3 device panels
Works-in-a-drawer panel with terminal blocks
IQ 1000 (without RTD)
IQ Data Plus (with MWH counter)
Style No. 2147A95G37

Note: For modifications to any IQ kit please contact Westinghouse for specific quotation.



700 Ampere Retrofit Kits, 50L2 Retrofit Kit

700 Ampere Retrofit Kit

700 Ampere Airbreak to Vacuum Conversion Kit

This kit will convert an existing full voltage non-reversing 700 ampere air break starter to vacuum. The modified 800 ampere SJA contactor with 120 volt control is mechanically interchangeable with the 700 ampere air break contactor. If line stabs are required, order separately from RPD 8855V page 11. The SJA contactor is supplied with 2 KVA CPT, 2 N.O., 2 N.C. auxiliary contacts. **Maximum full load amperes is limited to 450.** Modification kit is also supplied for necessary cell barriers etc.
Style No. 2147A95G31.

For higher FLA or for multi-speed, reversing or reduced voltage application utilizing the "upside-down" isolation switch refer to Westinghouse for quotation.

700 Ampere Controller Upgrade

This kit will upgrade an existing 700 ampere air break starter to 800 ampere vacuum, the existing structure is reused. The load stab assembly, isolation switch, contactor and line stab barriers are replaced. The basic kit will convert a standard full voltage non-reversing starter. For multi-speed, reversing or reduced voltage applications utilizing the "upside-down" isolation switch, with power fuses located above the switch mechanism, refer to Westinghouse for quotation.

This kit includes:

SJA vacuum contactor with 2KVA CPT,
2 N.O., 2 N.C. auxiliary contacts. –
Type SJA 50V830
Isolation switch – Type 72-LFM-8
Contactor load stab assembly, mounting
and barriers

Mechanical interlock kit
Isolation switch line barrier kit
Assembly drawing 9917D86
Style No. 2147A95G32

Note: The above kits can be combined with other material such as ground fault protection, IQ product retrofits, horsepower changes. Contact Westinghouse for specific quotation.

50L2 Retrofit Kits

50L2 Retrofit Kit

Replaces the out-of-production 5000 volt 200 ampere air break contactor with a SJO vacuum contactor. The customer keeps the existing starter cell and isolation switch and modifies the cell to accept the SJO contactor which is mechanically interlocked with the isolation switch. **The rating will remain at 200 amperes.**

The basic kit includes:

- Type SJO 50V430 with mechanical interlock, line and load stabs
- SJO mounting brackets
- Line and load stab assemblies with mounting brackets
- 3 current transformers with mounting bracket

Style No. 2147A95G30

This retrofit can be used on all the 26 inch wide 50L2 design manufactured from 1963 to 1982. However, if your 50L2 was manufactured prior to 1974 you may want to also purchase a new LFR type isolation switch with fixed mounted shutter. If your 50L2 was manufactured prior to 1971 and utilized power fuses with 14 inch clip centers, you will need to include 3 new 12 inch clip center CLS type fuses with the retrofit kit.

For other options, such as, ground fault, horsepower changes, IQ microprocessor protection and starters that are reversing, multi-speed, reduced voltage, or synchronous please contact Westinghouse for a specific quotation. Include all nameplate information with the request for quotation.



26 in. wide 50L2 air break design, with SJO Vacuum Contactor Retrofit installed. (Power fuses not installed).



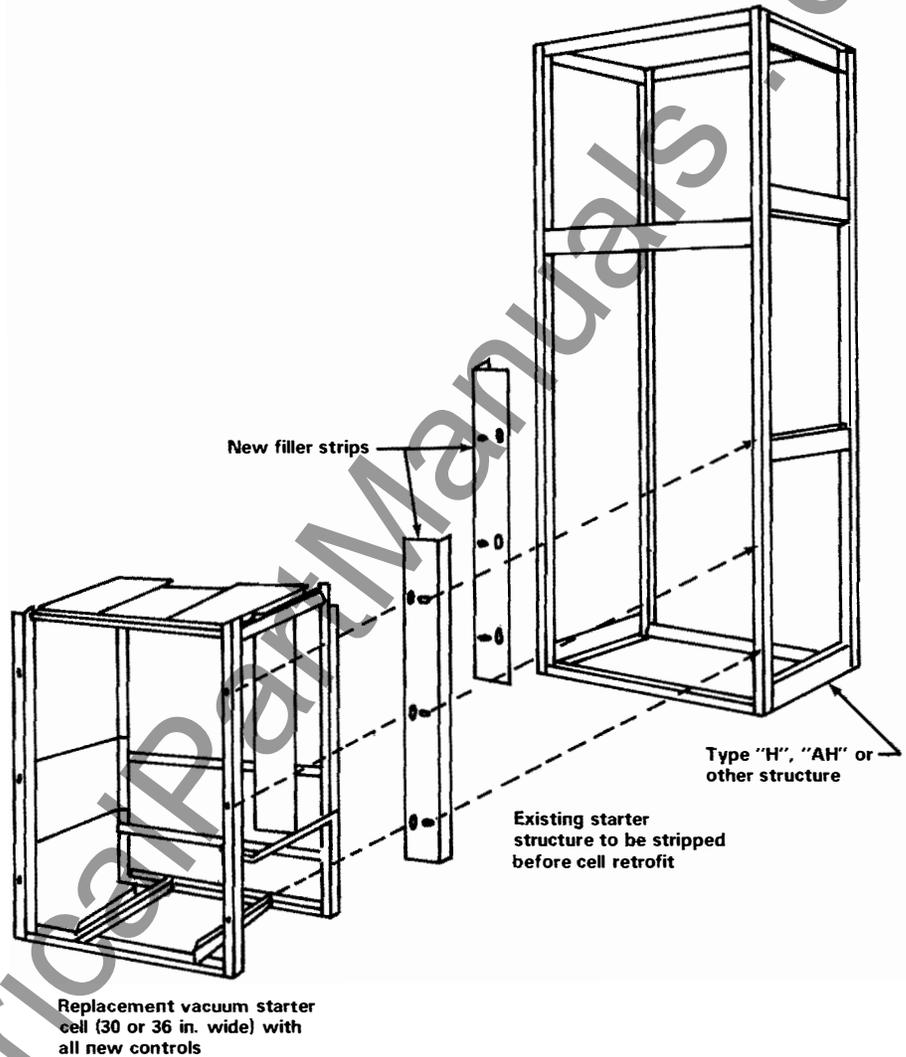
AMI Retrofit Kits

AMI History

Westinghouse medium voltage starters, utilizing a contactor, have been built since the late 1920's. Oilbreak contactors, supplied until 1967, were gradually replaced with the AH and H air break contactors with asbestos arc chutes. The Westinghouse "M&R shops" developed regional designs in the mid to late 1950's utilizing Type H air break, DN-OH oilbreak, and Type K oilbreak. Late 1950's M&R designs replaced hookstick operated fuses with a non-loadbreak isolation switch, the G&W switch. The M&R organization began to standardize and consolidate the regional designs into the AMI design which was transferred to general control in 1960. The AMI design, discontinued in 1969, was gradually phased out by the AMPGARD LF air break designs.

All of the devices used in these designs are out-of-production, many are still in service. We have developed two kits similar to the vacuum starter retrofit kits to convert these designs to current technology. Competitor structures can also be converted utilizing the basic AMI retrofit. These kits can be supplied with additional features such as IQ products, ground fault protection synchronous, reduced voltage and multi-speed options. Contact Westinghouse for specific quotation.

Before installing an AMI retrofit kit the existing structure must be "stripped". Existing contactors, switches, CT's, controls and mounting plates removed. Existing doors will be taken off and replaced by the standard AMPGARD doors, adjustable trim strips and filler panels or doors.



Standard AMI Retrofit

This kit includes a standard full voltage non-reversing vacuum starter in a welded cell assembly with horizontal top barriers and deep flanged doors. The nominal 36 inch wide cell is 32.50" wide at the rear, 35.25" wide across the front vertical channels. Depth is 29.50" from the front frame to the back frame. Height is 44" not including cell mounting channels. This kit will retrofit the AMI "3-door designs" that are 36 inches or wider with minimum depth of 30 inches.

The basic kit consists of:

Standard welded cell with doors
Type SJA 50V430 standard drawout contactor
Type 50LFR-4 isolation switch
power fuses
current transformers
Type A overload with heaters
Control panel with interposing relay
Standard CPT with 120 volt secondary
2 N.O., 2 N.C. auxiliary contacts
Cell mounting rails
Filler panel
Two vertical "trim angles"
General instruction for AMI retrofit
Style No. 2147A95G41

} Size based on horse-power, full load amperes, service factor and voltage

Narrow AMI retrofit

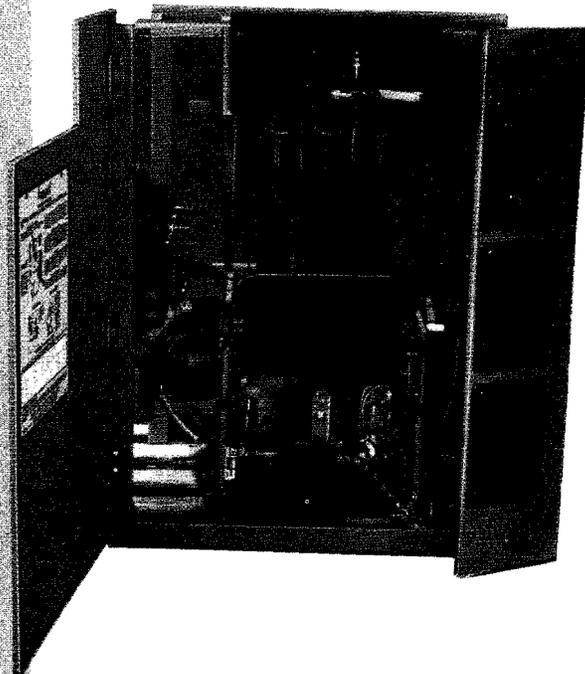
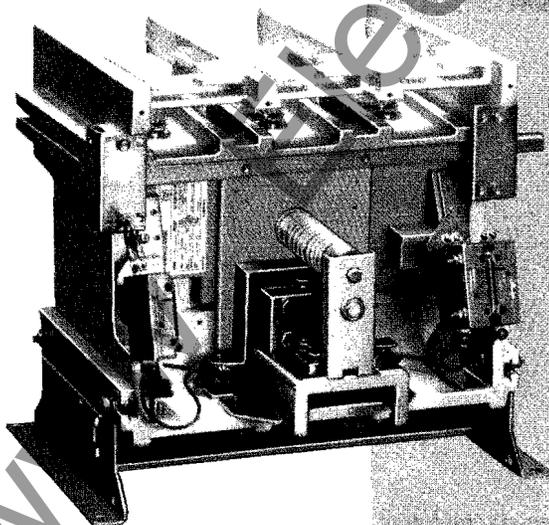
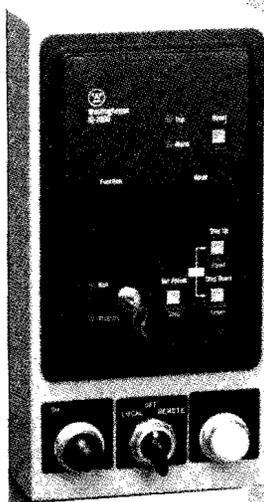
This kit is similar to the standard AMI retrofit kit except the nominal cell is 30 inches wide. The cell is 26.63 inches wide at the rear and 29.38 inches wide across the front vertical channels. The height of the cell is 64 inches with the low voltage controls located in the upper 15 inches. The assembly utilizes a standard isolation switch and vacuum contactor.

Style No. 2147A95G40



AMPGARD®
Retrofits
Electrical Components
OEM Vacuum Contactors
Structural Parts
ADM Switch

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FVNR Vacuum Starter	12
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IQ Family	14
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General Information

Renewal and Replacement Parts

The present design of Ampgard medium voltage starters was introduced in 1962. Additional ratings and features have been continuously introduced over the years.

This renewal parts data will provide the proper identification of standard parts which may be required for the maintenance of Westinghouse Ampgard starters. All of the complete contactors, isolating switches and sub assemblies that are available are shown photographically in kit form.

Some of the detail parts shown in the renewal parts data are recommended only as part of a sub assembly to facilitate their replacement or installation in the field.

Style numbers identified in this brochure will not be the same as style numbers on the original equipment. The renewal part styles in this brochure are in a kit form and may include sub assembly, carton, installation instructions, etc.

It is the intent of this renewal parts data brochure to make it possible for you to quickly identify the parts needed rather than have to search through twenty years of records to determine the specific style of the original part. All of the parts shown in the kits are compatible with the design from 1962 to the present (or noted otherwise).

Special attention should be given to forecasting your particular renewal parts requirements to ensure on-site availability of necessary parts and materials when needed, as well as guaranteeing efficiency and continued operation of your equipment.

The amount of investment to be made in renewal parts is best determined by you, taking into consideration such things as the impact of probable shutdown time, equipment duty cycle, etc.

To maintain maximum operating efficiency and dependability of your equipment genuine Westinghouse renewal parts are recommended.

This publication identifies those replacement parts which are available and should be ordered by style number.

Ampgard Starters

Since many starters are supplied to meet specific customer electrical control and distribution requirements, other parts not listed in this publication might occasionally be needed. Refer to factory for specific requests.

For equipment other than 60 Hz, refer to factory for information.

Price and availability of parts not listed may be obtained by contacting your local Westinghouse representative. Provide a complete description of the part, along with the complete data on the starter nameplate which is found in the low voltage area. Be sure to include: ratings, shop order and diagram reference.

Obsolete Ampgard Designs

Obsolete Ampgard design starters manufactured prior to 1966 were designated **AMI** starters and were built in various cities in the USA. These starters were "1 High" design, 30 in., 34 in., or 38 in. wide, 100 in. high, and either 30 in. or 60 in. deep. Retrofitting an **AMI** starter is possible with up to date Ampgard components. Refer to page 16 or refer to factory for information.

Contactors designated type H130, H230, H430 (air) and contactors designated type K430 (oil) were utilized in the **AMI** starters. These contactors are obsolete. Refer to factory for information.

The isolating switch utilized in the **AMI** starters were manufactured by G&W Electric and is no longer available. For replacement of G&W Electric switch, contact:

Phoenix Electric
P. O. Box 53
Readville Station
Boston, MA 02137
Phone: 617-821-0200
FAX: 617-828-5719

—or—

Refer to pages 15, 16 for retrofit of the entire starter with current design Ampgard. This will consist of welded cell assembly, drawout isolating switch, vacuum contactor, power fuses, current transformers, overload protection. Above will all mount in existing customer **AMI** enclosure.

Type LF66V430 vacuum contactors shipped prior to 1982 are obsolete and no longer available. For replacement order up to date design vacuum contactor from Renewal Parts Data 8855V page 4, which is mechanically and electrically interchangeable with obsolete Type LF66V430 contactor.

Additional Service

Should you experience difficulty in determining needed parts for repair or determining existing starter condition, contact your local Westinghouse representative. Westinghouse can provide qualified technical personnel on site to:

- Identify and recommend replacement parts for damage caused by short circuit or fault.
- Remove damaged parts and install replacements.
- Retrofit vintage motor starting equipment with new components.
- Evaluate condition of existing equipment.
- Test components.
- Provide a recommended spare parts list.
- Upgrade existing unit from one Hp to another or change operating voltage of existing equipment.
- Convert the starter from air break to vacuum break contactor.

See Renewal Parts Data 8855A for air break design.

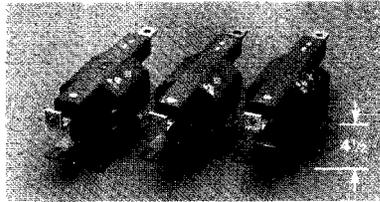
See Renewal Parts Data 8855V for vacuum break design.

Ordering Instructions

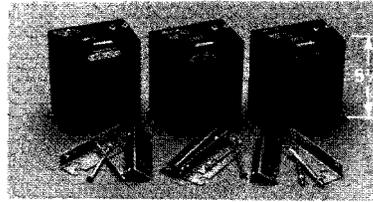
- (1) Specify by **style number**.
- (2) Refer to Price List/Style Number Index 8855 for pricing information.



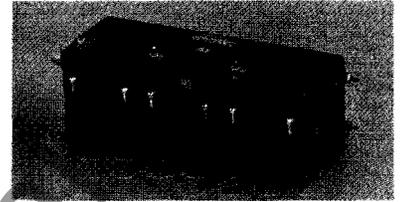
AMPGARD Electrical Components



Single phase bar type, Qty 3

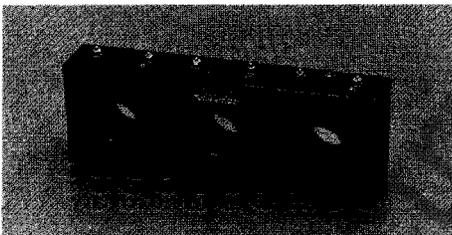


Single phase donut type, Qty 3

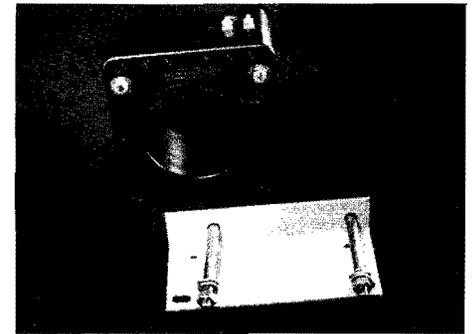


3 Phase donut type, Qty 1
Also includes ground fault transformer 50:5 ratio.
Used on "drawout" AMPGARD design prior to 1988.
For use with IQ1000*, IQ2000* and IQ data plus.*

Ratio 25/5	Style No. 2147A12G01		
Ratio 50/5	Style No. 2147A12G02	Note 1	Style No. 2147A14G02
Ratio 75/5	Style No. 2147A12G03	Note 2	Style No. 2147A14G03
Ratio 100/5	Style No. 2147A12G04	Style No. 2147A13G04	Style No. 2147A14G04
Ratio 150/5	Style No. 2147A12G05	Style No. 2147A13G05	Style No. 2147A14G05
Ratio 200/5	Style No. 2147A12G06	Style No. 2147A13G06	Style No. 2147A14G06
Ratio 250/5	Style No. 2147A12G07	Style No. 2147A13G07	Style No. 2147A14G07
Ratio 300/5	Style No. 2147A12G08	Style No. 2147A13G08	Style No. 2147A14G08
Ratio 400/5	Style No. 2147A12G09	Style No. 2147A13G09	Style No. 2147A14G09
Ratio 500/5	---	Style No. 2147A13G10	Style No. 2147A14G10
Ratio 600/5	---	Style No. 2147A13G11	Style No. 2147A14G11
Ratio 750/5	---	Style No. 2147A13G12	Style No. 2147A14G12
Ratio 800/5	---	Style No. 2147A13G13	Style No. 2147A14G13
Ratio 1000/5	---	Style No. 2147A13G14	Style No. 2147A14G14
Ratio 1200/5	---	Style No. 2147A13G15	---



3 phase donut type Qty 1 without 50:5 ground fault C.T. used on most AMPGARD designs after 1987.



Ground fault current transformer, 50:5 ratio. For use with IQ1000, IQ2000

Style No. 2147A11G47

For standard ground guard ground fault C.T. Refer to Cat 25-000.

Ground fault current transformer, 9/0.5 ratio 7 1/2 in. high, 3 1/8 in. dia. hole. High Burden C.T. used with SC Relay, CO Relay etc.

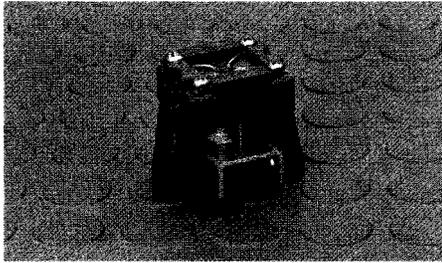
Style No. 654C777H01

Ratio 50/5	Style No. 2147A16G04 (Loop (2) primary leads)
Ratio 100/5	Style No. 2147A16G04
Ratio 150/5	Style No. 2147A16G05
Ratio 200/5	Style No. 2147A16G06
Ratio 300/5	Style No. 2147A16G08
Ratio 400/5	Style No. 2147A16G09
Ratio 500/5	Style No. 2147A16G10
Ratio 600/5	Style No. 2147A16G11
Ratio 800/5	Style No. 2147A16G13
Ratio 1000/5	Style No. 2147A16G14
Ratio 1200/5	Style No. 2147A16G15

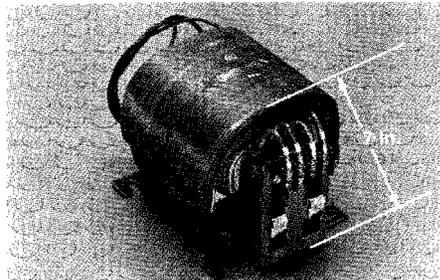
Note 1 - Use Style No. 2147A13G04 and loop (2) primary leads.
Note 2 - Use Style No. 2147A13G05 and loop (2) primary leads.



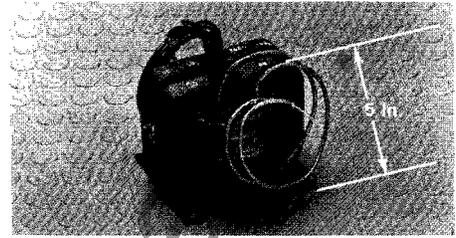
AMPGARD Electrical Components



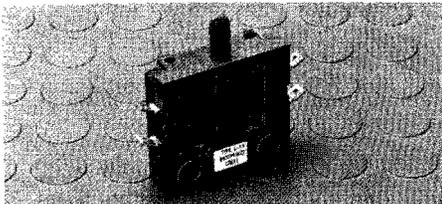
Rectifier
120 volt control
Style No. 2018A40G01
240 volt control
Style No. 2018A40G02



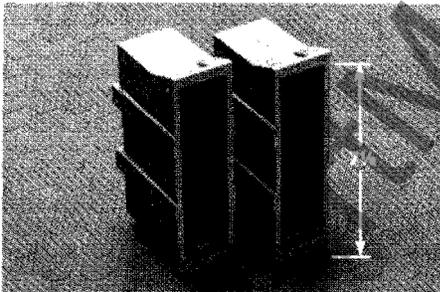
2 KVA control transformer
2300/240/120 volt, 60 Hz
Style No. 2147A11G02
4160/240/120 volt, 60 Hz
Style No. 2147A11G06



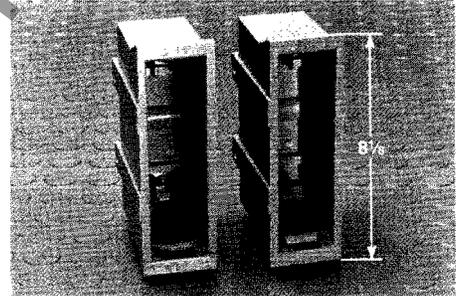
Standard control transformer
2300/120 volt, 750 volt amp, 60 Hz
Style No. 2147A11G01
2300/240 volt, 750 volt amp, 60 Hz
Style No. 2147A11G03
4160/120 volt, 600 volt amp, 60 Hz
Style No. 2147A11G05
4160/240 volt, 600 volt amp, 60 Hz
Style No. 2147A11G07



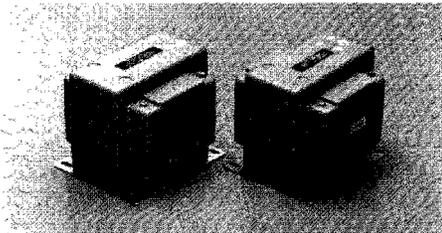
L-64 interlock one normally open & one normally closed contact (standard)
Style No. 843D943G21 ⓘ
L-64 interlock – 2 N.O. contacts
Style No. 843D943G22
L-64 interlock – 2 N.C. contacts
Style No. 843D943G23



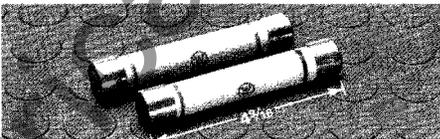
Fuse blocks with fuse clips for primary fuses for control transformers, 2500 volt primary, max
Style No. 2147A11G21 (Kit of 2)
Style No. 2147A11G44 (Kit of 3)



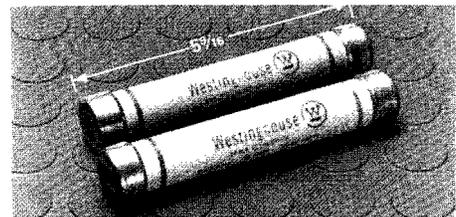
Fuse blocks with fuse clips for primary fuses for control transformers, 5000 volt primary, max
Style No. 2147A11G22 (Kit of 2)
Style No. 2147A11G45 (Kit of 3)



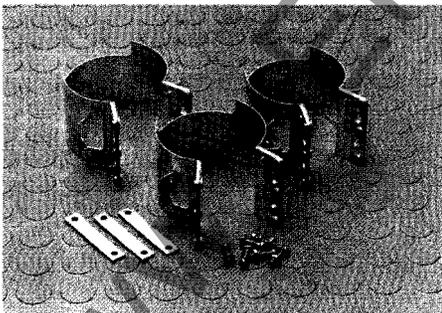
Potential transformers, 450 volt amp. single phase, Qty 2
2400/120 volt, 60 Hz
Style No. 2147A11G11
4200/120 volt, 60 Hz
Style No. 2147A11G12



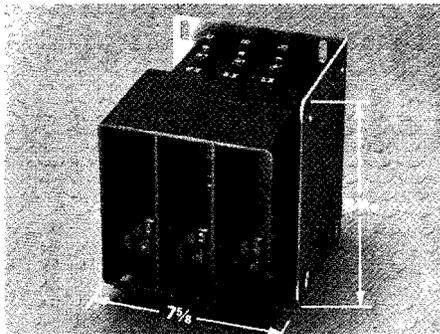
Control transformer primary fuse, 2500 volt, max 2 amp, for use w/ above fuse blocks
Style No. 2147A11G24 ⓘ (Kit of 2)
Style No. 2147A11G43 ⓘ (Kit of 3)



Control transformer primary fuse, 5000 volt max 3 amp, for use w/ above fuse blocks
Style No. 2147A11G25 ⓘ (Kit of 2)
Style No. 2147A11G46 ⓘ (Kit of 3)



Primary Fuse Bands, Qty 3
Style No. 2147A11G31



Potential transformer, 100 volt amp, 3 phase open delta. With prim. fuse provision, Qty 1
2400/120 volt, 60 Hz
Style No. 2147A11G14
4200/120 volt, 60 Hz
Style No. 2147A11G15

ⓘ Recommended for "Start-Up" spares.

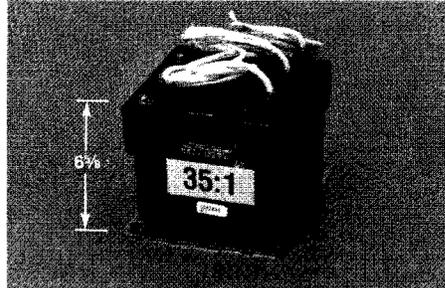


AMPGARD Electrical Components, Overload Heaters, Power Fuses



Fuses, dual element miniature type, 500 volt, 1 1/2 in. long, 1 3/32 in. dia. for use with Style No. 2147A15G15 or G16

- 1 amp Qty 5
 - 10 amp Qty 5
 - 15 amp Qty 5
- Style No. 2147A11G42**



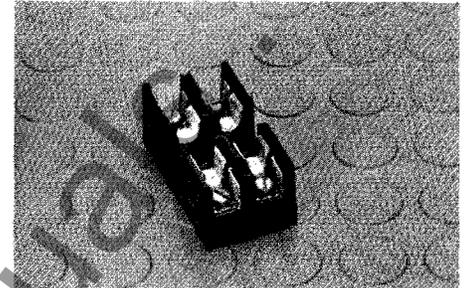
Potential transformer, 100 volt amp, 3 phase open delta. Without prim. fuse provision, Qty 1 Used primarily on slide out vacuum design

Style No. 2147A11G36

3300/120 volt, 60 Hz
Style No. 2147A11G37

4200/120 volt, 60 Hz
Style No. 2147A11G38

4800/120 volt, 60 Hz
Style No. 2147A11G39

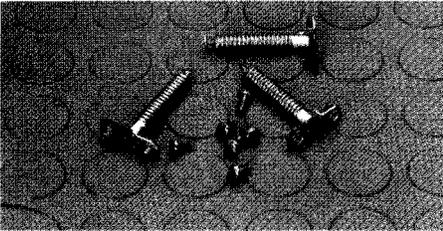


2 pole fuse block with fuse clips for secondary fuses for control circuit, 30 amp, 600 volt max, uses dual element fuses (miniature) 1 1/2 in. long, 1 3/32 in. dia, Qty 2

Style No. 2147A15G16

Same as above except 1 pole, Qty 4
Style No. 2147A15G15

Type G Overload Heaters



Each carton includes 3 heaters plus 3 sets mounting hardware per photograph above.

Order entry note: Heaters are priced as each heater. Heaters must be ordered in multiples of 3.

Qty. 1	Secondary Current Transformer Range - 3 Pole Rating -	Heater Rating
Style No. 506C578G24	1.96-2.15	2.44
Style No. 506C578G25	2.16-2.35	2.69
Style No. 506C578G26	2.36-2.58	2.95
Style No. 506C578G27	2.59-2.83	3.23
Style No. 506C578G28	2.84-3.11	3.55
Style No. 506C578G29	3.12-3.42	3.90
Style No. 506C578G30	3.43-3.73	4.28
Style No. 506C578G31	3.74-4.07	4.67
Style No. 506C578G32	4.08-4.39	5.1

The Type G overload heaters for the Type A overload relay are for use on AMPGARD starters only. These heaters are coordinated with power fuses and current transformers for each order. Do not change heater, power fuse, or current transformer before consulting factory.

Note that prior to 5/66 the standard overload for the AMPGARD was the Type MG overload, which is no longer available. Also note that the Type A 2 pole overload was standard from 6/66 to 7/73. For conversion to up to date overload with 3 phase protection consult factory.

Power Fuses

General Information

The AMPGARD design over the years has used many different types of power fuses. i.e., with and without hook-eye, different lengths (50L2 prior to 6/71 used 14 in. clip center, after 6/71 used 12 in. clip center), Type CLS for motor application, Type CLE

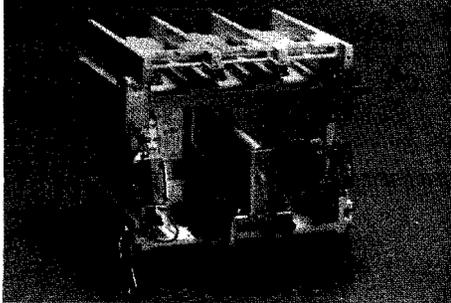
for transformer applications etc. The renewal part name plate on the inside of the high voltage door will identify the power fuses by rating and style number. Since the power fuses are coordinated with the overload relay and current transformers for each order we do not recommend substituting fuses of a different rating or style number without consulting factory.

Westinghouse encourages its customers to stock power fuses to ensure on-site availability, as well as guaranteeing efficiency and continued operation of their equipment. Most fuses are available from Cat Index 36-685, otherwise refer to factory for availability/substitution.



OEM Contactors

400 Amp Vacuum Break Contactor, 7200 Volt Max – SJO Type



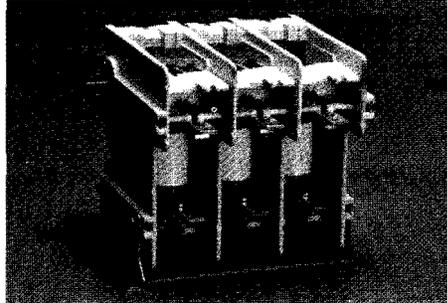
Front View

SJO 430 contactor 120 volt A.C./125V D.C. coil

Style No. 2197A01G21

SJO 430 contactor 240 volt A.C./250V D.C. coil

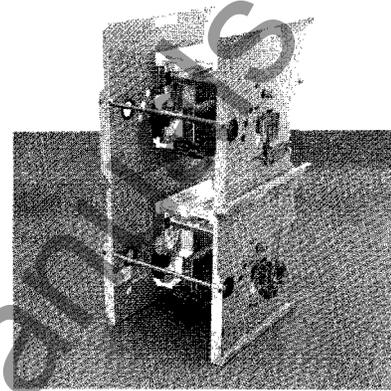
Style No. 2197A01G23



Rear View

SJO 430 – Approximate shipping weight 75 lbs.

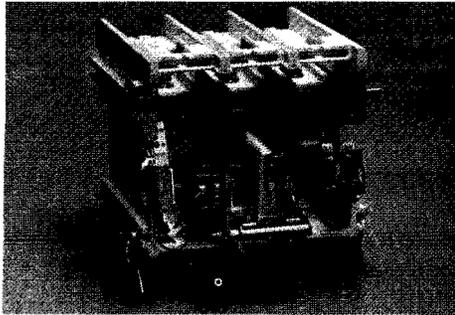
SJO 430 Reversing Assembly



Front View

SJO 430 Reversing assembly, 120 Volt A.C./125V D.C. coil, complete with (2) contactors, mechanical interlock
 Approximate shipping weight 150 lbs.
Style No. 2147A46G17

400 Amp Vacuum Break Contactor, 7200 Volt Max. – SJO Type with Mechanical Latch



Front View

SJO 430 contactor – single solenoid
 120 volt A.C./125V D.C. – main coil
 115 volt A.C./48V D.C.

intermittent-trip coil
 Approximate shipping weight 75 lbs.

Style No. 2147A45G41

SJO 430 contactor – single solenoid
 120 volt A.C./125V D.C. – main coil
 230 volt A.C./96-125V D.C. intermittent-trip coil

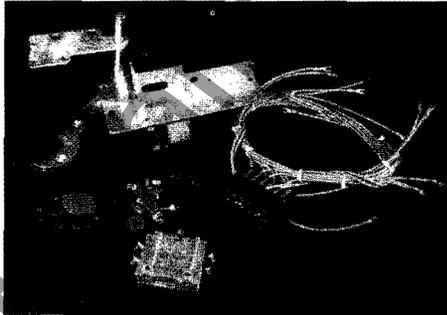
Approximate shipping weight 75 lbs.
Style No. 2147A45G42

Note 1

For contactor with 2 trip solenoids, order similar to Style No. 2147A45G... except with double solenoid latch. Also specify operating voltage from Note 2 for each trip coil.

Note 2 – Standard Solenoid Operating Voltages

A.C.	D.C.
115 V.	48 V.
230 V.	96-125 V.
460 V.	250 V.
575 V.	24 V.



Solenoid latch (single solenoid) for field mounting

120 Volt A.C. continuous/48V D.C. intermittent

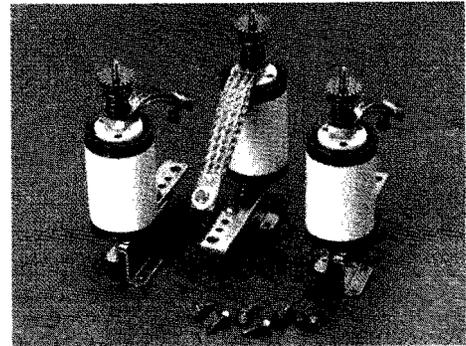
Style No. 2147A48G22

230 Volt A.C. continuous/96-125V D.C. intermittent

Style No. 2147A48G23

Note 3

Double solenoid latch attachments are also available. Specify sim. to Style No. 2147A48G... above except with double solenoid latch. Also specify operating voltage from Note 2 for each trip coil.



Vacuum bottles with shunt, load connection
 Qty 3

Style No. 2147A47G13²

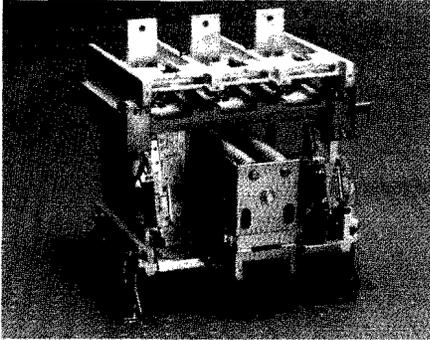
Note – Cannot be used on Type SJA "Roll-out Contactor."

² Recommended for "Running" spares.



OEM Contactors

800 Amp Vacuum Break Contactor, 7200 Volt Max – SJO Type

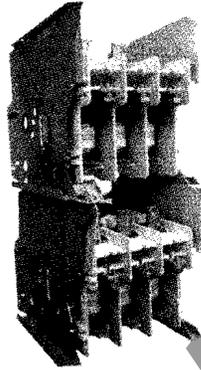


Front View

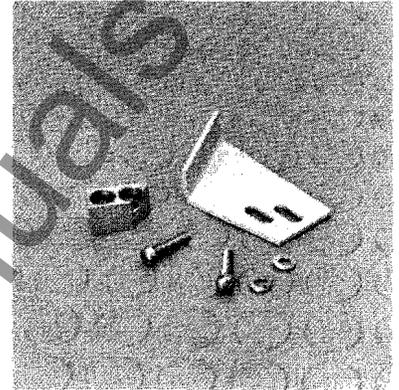
SJO 830 contactor 120 volt A.C./125V D.C. coil
Approximate shipping weight 100 lbs.
Style No. 7860A46G11

SJO 830 contactor 240 volt A.C./250V D.C. coil
Approximate shipping weight 100 lbs.
Style No. 7860A46G13

SJO 830 Reversing Assembly

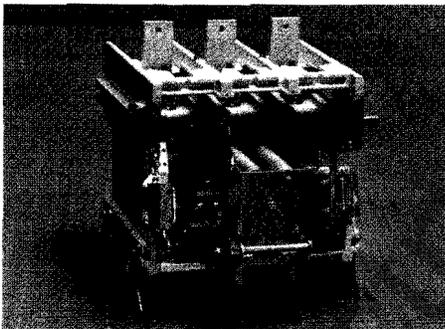


SJO 830 Reversing assembly, 120 Volt A.C./125V D.C. coil complete with (2) contactors, mechanical interlock
Approximate shipping weight 200 lbs.
Style No. 2147A86G17



Mechanical interlock kit for field mounting on contactor (reversing, multi-speed, auto-transformer) 800 Amp only
Style No. 2147A86G13

800 Amp Vacuum Break Contactor, 7200 Volt Max. – SJO Type with Mechanical Latch



SJO 830 contactor – single solenoid
120 volt A.C./125V D.C. – main coil
120 volt A.C./48V D.C. intermittent-trip coil
Approximate shipping weight 100 lbs.
Style No. 2147A85G21

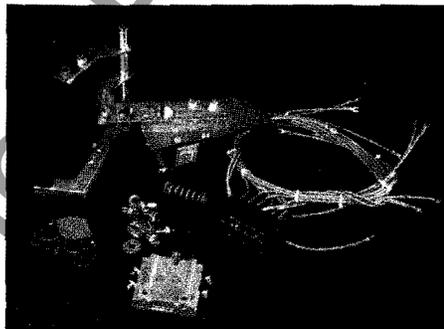
SJO 830 contactor – single solenoid
120 volt A.C./125V D.C. – main coil
230 volt A.C./96-125V D.C. intermittent-trip coil
Approximate shipping weight 100 lbs.
Style No. 2147A85G22

Note 1

For contactor with 2 trip solenoids, order similar to Style No. 2147A85G_____ except with double solenoid latch. Also specify operating voltage from Note 2 for each trip coil.

Note 2 – Standard Solenoid Operating Voltages

A.C.	D.C.
115 V.	48 V.
230 V.	96-125 V.
460 V.	250 V.
575 V.	—
—	24 V.



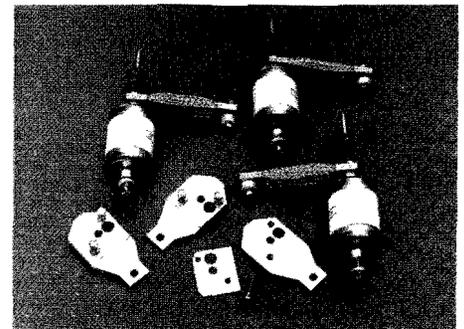
120 Volt A.C. continuous/48V D.C. intermittent
Style No. 2147A88G22

230 Volt A.C. continuous/96-125V D.C. intermittent
Style No. 2147A88G23

Note 3

Double solenoid latch attachments are also available. Specify sim. to Style No. 2147A88G_____ above except with double solenoid latch. Also specify operating voltage from Note 2 for each trip coil.

Solenoid latch (single solenoid) for field mounting



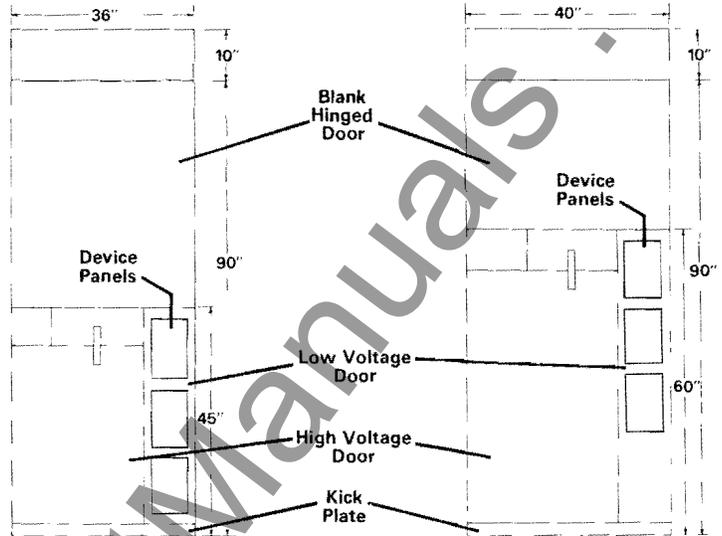
Vacuum bottles with shunt, load connection
Qty 3
Style No. 2147A87G13 ②

Note – Cannot be used on Type SJA "Roll-out" Contactor.

② Recommended for "Running" spares.



AMPGARD Structural Parts

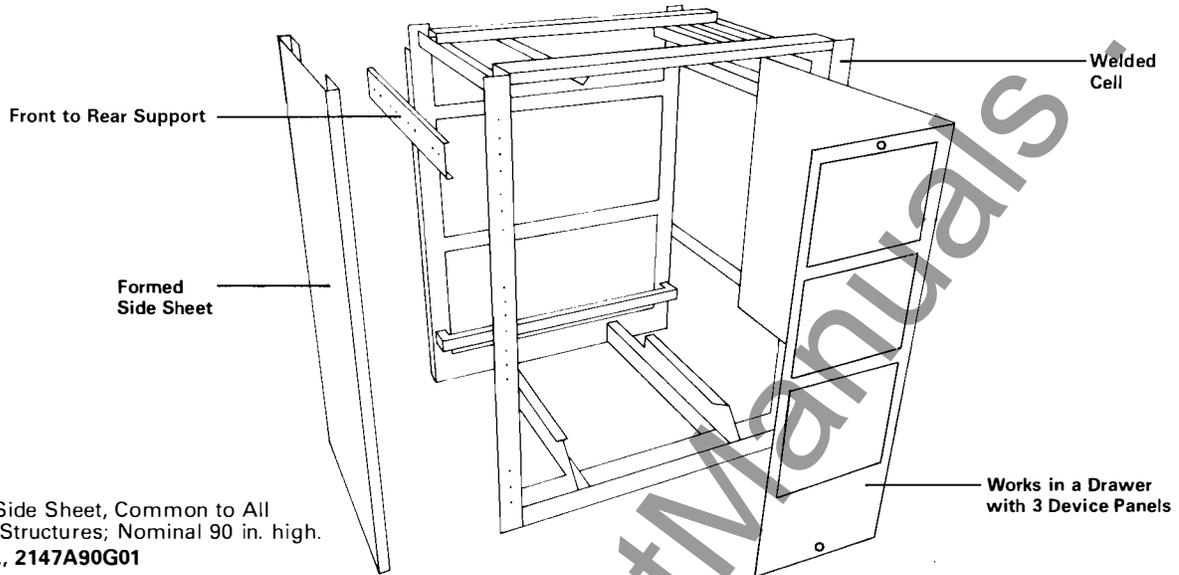


		400 Amp	700/800 Amp
High Voltage Door NEMA 1 ①	Non Reversing	45" High Style No. 2147A94G01	60" High Style No. 2147A97G01
	Reversing	75" High Style No. 2147A94G02	
Low Voltage Door with 3 Device Panels NEMA 1 ①	Non Reversing	45" High Style No. 2147A94G03	60" High Style No. 2147A97G03
	Reversing	75" High Style No. 2147A94G04	
Blank ① Hinged Door NEMA 1		15" High Style No. 2147A94G05	15" High Style No. 2147A97G05
		30" High Style No. 2147A94G06	30" High Style No. 2147A97G06
		45" High Style No. 2147A94G07	60" High Style No. 2147A97G07
		90" High Style No. 2147A94G08	90" High Style No. 2147A97G08
Back Sheet			
Bus Enclosure Empty		Style No. 2147A94G11	Style No. 2147A97G11
Bus Enclosure With Insulators, 1200 Amp Copper Bus, 1/4" x 4" Non Insulated, Non Plated		Style No. 2147A94G12	Style No. 2147A97G12
Kick Plate Front		Style No. 2147A94G21	Style No. 2147A97G21
Vertical Bus – One High Starter (Lower Position)		Style No. 2147A94G22	Style No. 2147A97G22
Vertical Bus – Two High Starter Between Upper and Lower Isolating Switch		Style No. 2147A94G23	—
Vertical Bus – Between Upper Isolating Switch and Main Bus		Style No. 2147A94G24	—

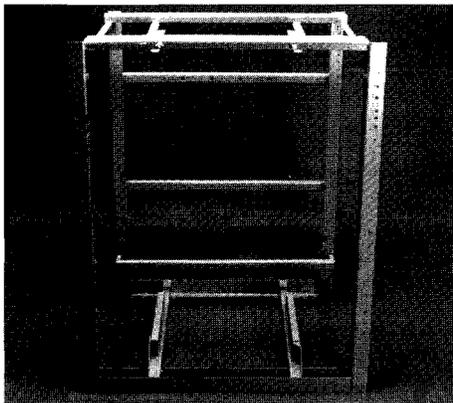
① If replacing narrow flange doors with above, remove vertical trim strip and drill holes for hinge mounting. Narrow flange supplied prior to July 1983.



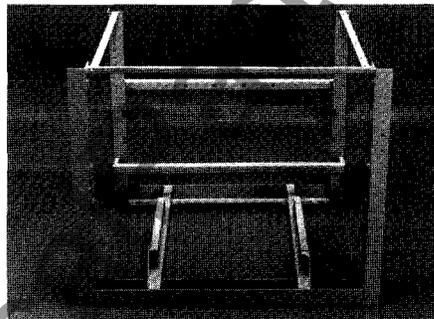
AMPGARD Structural Parts



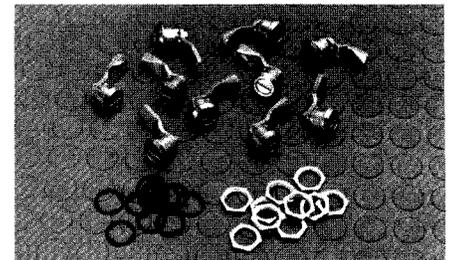
Formed Side Sheet, Common to All NEMA 1 Structures; Nominal 90 in. high.
Style No., 2147A90G01



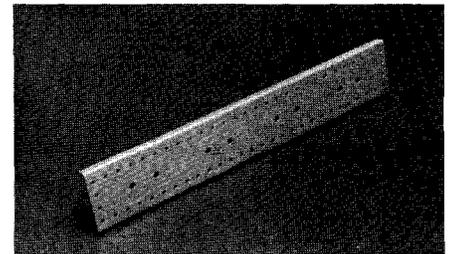
400 Amp welded cell, nominal 45 in. high. Standard, for use with isolating switch and power fuses. Complete with H.V. door and L.V. door with "Works in a Drawer" (not shown in photo)
Style No. 2147A91G04



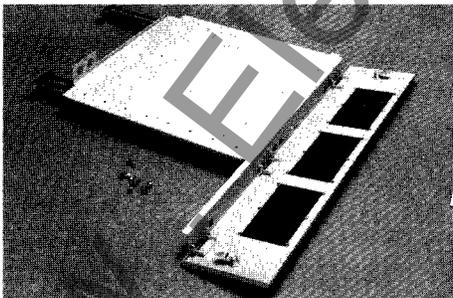
400 amp welded cell, nominal 30 in. high, complete with H.V. door (not shown in photo) Reversing. (Reversing cells are used in starters for reversing contactors, shorting and run contactors of reactor and autotransformer and multispeed starters.)
Style No. 2147A91G05



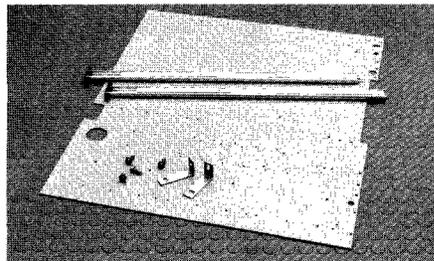
Door fastener kit Qty 10
Style No. 2147A91G15



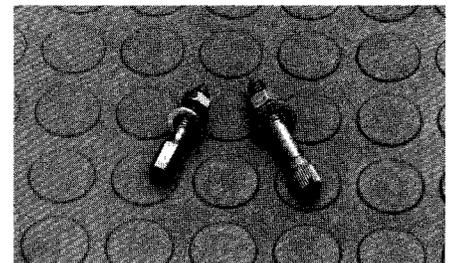
Front to rear support, Qty 2
Style No. 2147A91G11



Works in a drawer with slide rails. Mounts in 400 amp cell. Nominal 45 in. high
Style No. 2147A91G13



Slide out control panel, slide rails. Mounts in 400, 700, 800 amp cell
Style No. 2147A91G12



Obsolete door fastener. No longer available, customer to use standard hardware 5/16 dia., 2 in. long (approx.)

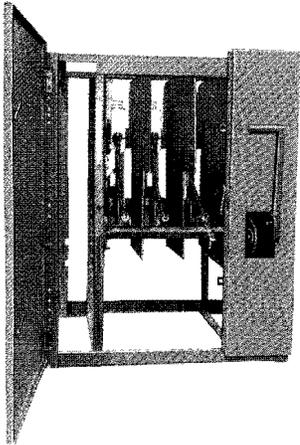
Same as above except for use in 700/800 cell (60 in. high.)

Style No. 2147A91G14

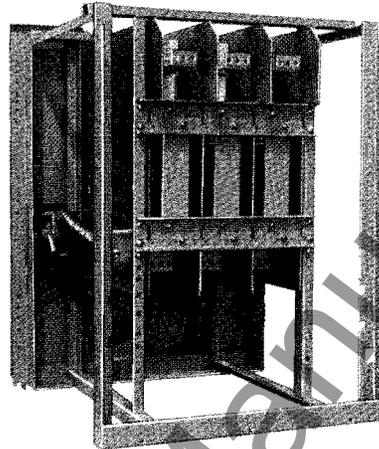
Note - above includes 3 device panels.



ADM Switch, 1200 Amp, 5500 Volt Max.

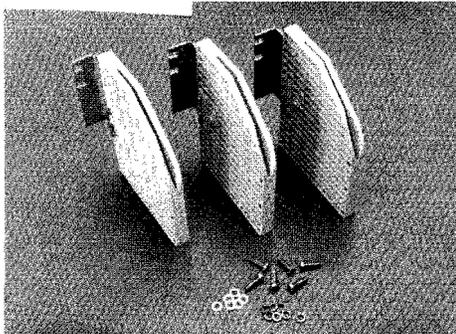


Front View



Rear View

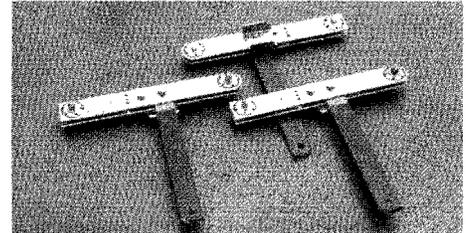
ADM Switch, in welded frame assembly, with front door. Nominal 45" high.
Style No. 2147A02G01



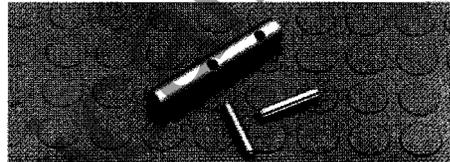
Arc chute Qty 3
Style No. 2147A02G02



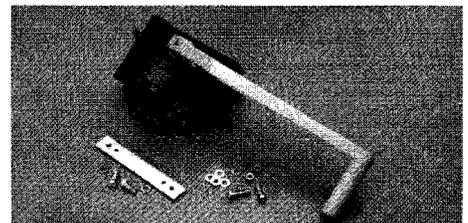
Rod ends Qty 3
Style No. 2147A02G08



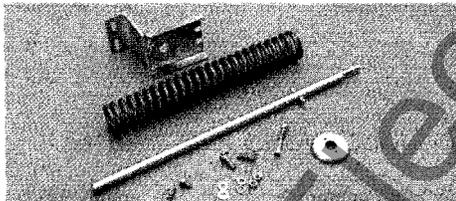
Main switch blades Qty 3
Style No. 2147A02G04



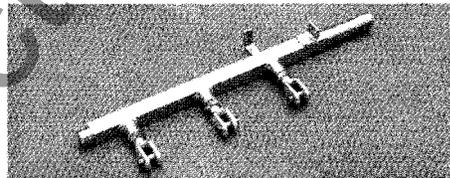
Shaft (for handle) with roll pins
Style No. 2147A02G10



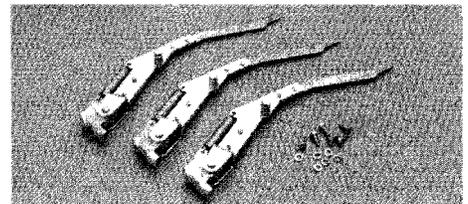
Operating mechanism assembly, with handle
Style No. 2147A02G07



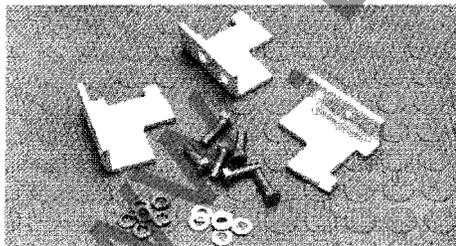
Main spring, rod, mounting
Style No. 2147A02G05



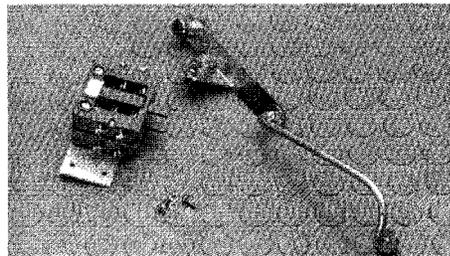
Shaft with rod ends
Style No. 2147A02G09



Flicker blade assembly Qty 3
Style No. 2147A02G06



Main stationary contacts Qty 3
Style No. 2147A02G03



Electrical interlock operating mechanism, with 2 N.O., 2 N.C. electrical interlocks
Style No. 2147A02G11



General Information

This section is designed to supplement the renewal part kits listed in other sections of RPD 8855C. Retrofit kits are created for customers who want to:

- Modify and upgrade existing equipment. Kits exist for adding potential transformers, conversion from 700 ampere air break to vacuum and adding new starters in existing spaces.
- Replace out-of-production starter equipment without having to remove existing structures or replace cable and conduit. Kits of this type include the 50L2 retrofit, the AMI retrofit and the 700 ampere starter conversion to 800 ampere vacuum.
- Convert existing motor protection to microprocessor based IQ protection. Kits are available to add IQ1000 II or Data Plus II in surface mounted enclosures or in 10 inch wide 90 inch high auxiliary sections. These kits can be combined with IQ communications devices from the IQ family price lists.

Note: Retrofit kits contain many specialized parts and pieces. They can be combined with other renewal part kits to expand the kit application. **The kits do not contain standard hardware or wire.** The kits may require additional material to meet your specific customer needs. All kits will require substantial field labor to install. The installation is not included.

Retrofit Kit Index

Vacuum Starter Kits Page 12

These kits contain a complete full voltage vacuum starter with cell and doors. (36" wide x 45" high x 30" deep). This retrofit applies to all 400 ampere spaces manufactured after 1966 to present.

Disconnecting Potential Transformer Kits Page 13

These kits can be installed in any 36 inch wide structure with minimum 15 inches of panel height.

Fixed Potential Transformer Kits Page 13

These kits will provide the ability to add 3 phase potential transformers to any starter or incoming line/auxiliary enclosure.

IQ Retrofit Kits Page 14

There are 3 basic kits offered. One kit provides the ability to surface mount the IQ product, one kit contains a 10 inch auxiliary section, the third kit includes material to add an IQ1000 II and Data Plus II to an existing starter.

700 Amp Contactor Retrofit Kits Page 15

These kits include the material to modify the out-of-production 700 ampere air break starter from air break to 800A vacuum.

700 Amp Controller Retrofit Kit Page 15

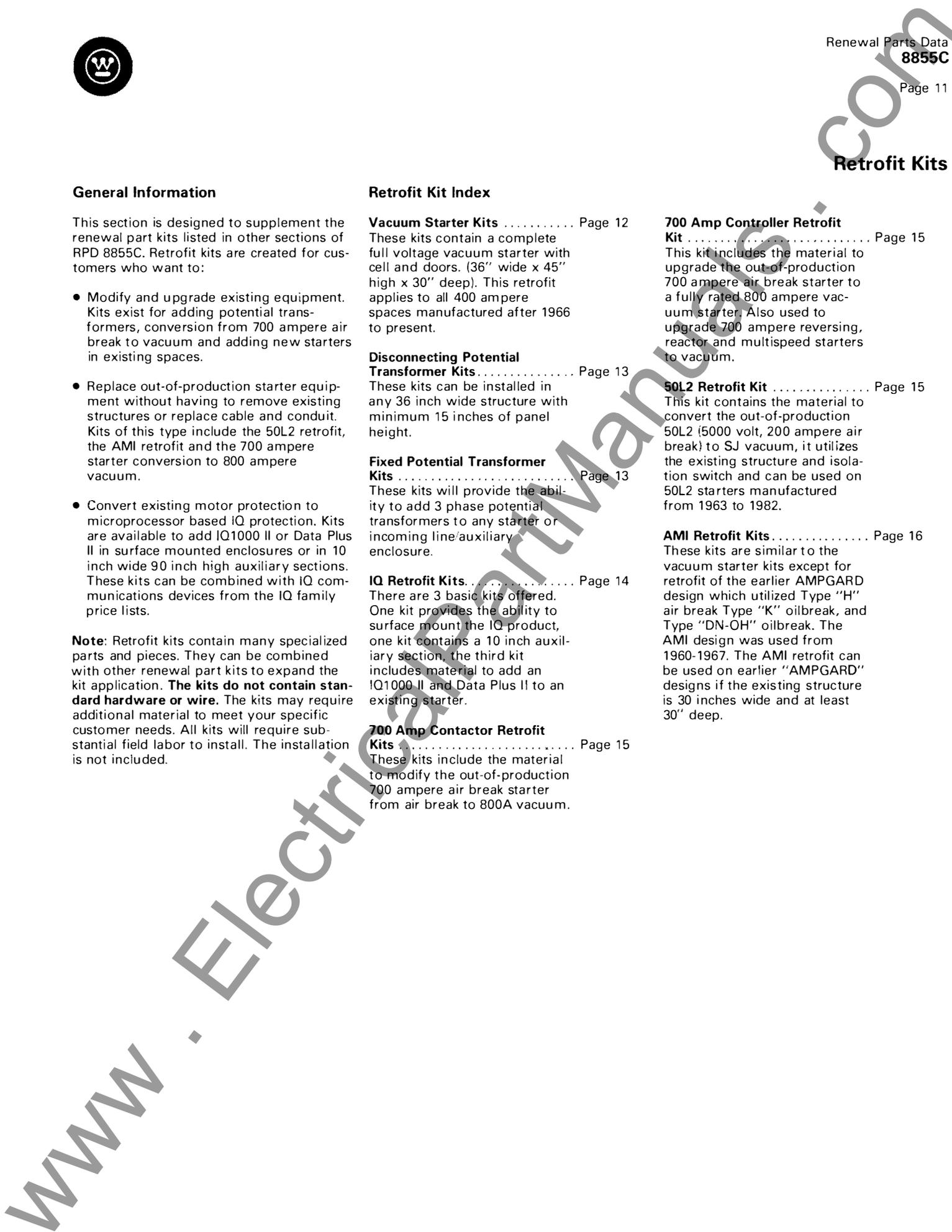
This kit includes the material to upgrade the out-of-production 700 ampere air break starter to a fully rated 800 ampere vacuum starter. Also used to upgrade 700 ampere reversing, reactor and multispeed starters to vacuum.

50L2 Retrofit Kit Page 15

This kit contains the material to convert the out-of-production 50L2 (5000 volt, 200 ampere air break) to SJ vacuum, it utilizes the existing structure and isolation switch and can be used on 50L2 starters manufactured from 1963 to 1982.

AMI Retrofit Kits Page 16

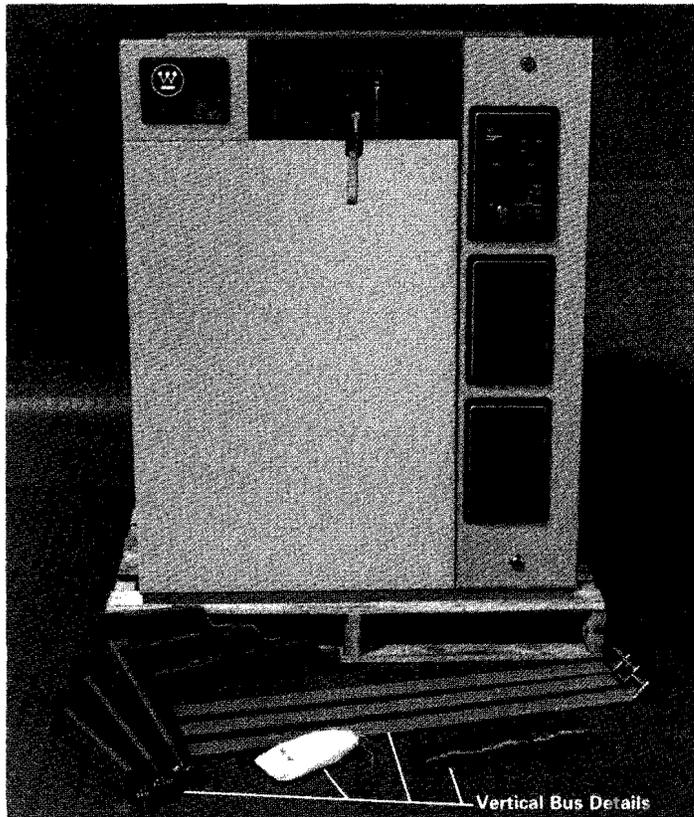
These kits are similar to the vacuum starter kits except for retrofit of the earlier AMPGARD design which utilized Type "H" air break Type "K" oilbreak, and Type "DN-OH" oilbreak. The AMI design was used from 1960-1967. The AMI retrofit can be used on earlier "AMPGARD" designs if the existing structure is 30 inches wide and at least 30" deep.





AMPGARD Starter Retrofit Kits

AMPGARD Complete in 45 in. High Cell, for Mounting in Existing 36 in. Wide (AMPGARD Type) Customer Enclosure



Vertical Bus Details

Front View (Doors Closed)



Front View (Doors Open)

Roll-out Design Shown

Complete full voltage, non reversing, induction, Vacuum break AMPGARD motor starter, 400 amp, 7200 volt max. for mounting in existing 36 in. wide enclosure. Includes main contactor, isolating switch, (3) power fuses, IQ1000 II motor command without RTD module, (3) current transformers, vertical bus, high voltage and low voltage doors, welded cell assembly for mounting in existing 36 in. wide customer enclosure.

Approximate shipping weight 1000 lbs.

Style No. 2147A95G01 Slideout design

Style No. 2147A95G02 Roll-out design

When ordering specify the following –
Style number from left hand column
Quantity
HP, FLA, service factor
Voltage, Hertz, phase
Load cable entry (top or bottom)

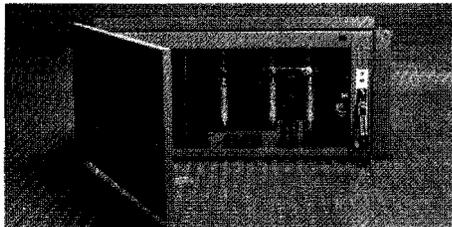
Note –

For functional up to date duplicate of existing motor starter, to be mounted in existing AMPGARD enclosure, with same modifications as previously supplied refer to factory with all ordering information from middle column and also advise size of cable, number of cables per phase, existing ☺ outline dwg. no. and schematic & wiring diagram.



Potential Transformers, Disconnect and Fixed Mounted

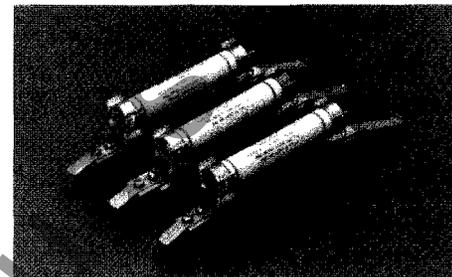
Potential Transformer Disconnect



Potential transformer disconnect complete with (2) potential transformers, (3) primary and (2) secondary fuses.

Style No. 2147A95G06 2400/120V.

Style No. 2147A95G07 4200/120V.



Potential transformer disconnect without transformers, with (3) primary and (2) secondary fuses. 5KV max.

Style No. 2147A95G08

Main fingers, ground fingers, primary fuses, fuse mountings, 5KV max. Qty 3

Style No. 2147A95G09

Fixed Mounted

Potential Transformer Kits, 3 Phase – For Incoming Line or Auxiliary Enclosure Application

A – 100V.A. Capacity 2400/120 Volt, 60 Hz

Consisting of – (1) potential transformer, 3 phase, open delta, (3) primary fuses, (1) secondary fuse block with (2) fuses, mounting panel, danger high voltage NP's, schematic dwg. showing P.T.'s connected to main bus.

Style No. 2147A95G24

B – 450V.A. Capacity 2400/120 Volt, 60 Hz

Consisting of – (2) potential transformers, single phase, (3) primary fuse blocks with fuses, (1) secondary fuse block with (2) fuses, mounting panel, danger high voltage NP's, schematic dwg. showing P.T.'s connected to main bus.

Style No. 2147A95G25

C – 100V.A. Capacity 4200/120 Volt, 60 Hz

Similar to kit "A" except transformer primary voltage.

Style No. 2147A95G26

D – 450V.A. Capacity 4200/120 Volt, 60 Hz

Similar to kit "B" except transformer primary voltage.

Style No. 2147A95G27

Fixed Mounted or Contactor Mounted

Potential Transformer Retrofit Kits, 3 Phase – For AMPGARD Starter Application

A – 400 Amp Air Break or Vacuum Break "Roll-out" Design

1 – 100V.A. Capacity 2400/120 Volt, 60 Hz.

Consisting of – (3) contactor line fingers, (1) line stab assembly, (1) potential transformer, 3 phase, open delta, (3) primary fuses, (1) secondary fuse block with (2) fuses.

Style No. 2147A95G10

2 – 450V.A. Capacity 2400/120 Volt, 60 Hz.

Consisting of – (3) contactor line fingers, (1) line stab assembly, (2) potential transformers, single phase, (3) primary fuse blocks & fuses, (1) secondary fuse block with (2) fuses.

Style No. 2147A95G11

3 – 100V.A. Capacity 4200/120 Volt, 60 Hz.

Similar to kit A-1 above except transformer primary voltage.

Style No. 2147A95G12

4 – 450V.A. Capacity 4200/120 Volt, 60 Hz.

Similar to kit A-2 above except transformer primary voltage.

Style No. 2147A95G13

B – 400 Amp Vacuum Break "Slideout" Design

1 – 100V.A. Capacity 2400/120 Volt, 60 Hz.

Consisting of – (1) potential transformer, 3 phase, open delta (mounted on contactor), (1) secondary fuse block with (2) fuses.

Style No. 2147A95G14

2 – 100V.A. Capacity 4200/120 Volt, 60 Hz.

Similar to kit B-1 above, except transformer primary voltage.

Style No. 2147A95G15

C – 700 Amp Air Break

1 – 100V.A. Capacity 2400/120 Volt, 60 Hz.

Consisting of – (3) contactor line fingers, (1) stab assembly complete with mounting, (1) potential transformer, 3 phase, open delta, (3) primary fuses, (1) secondary fuse block with (2) fuses.

Style No. 2147A95G16

2 – 450V.A. Capacity 2400/120 Volt, 60 Hz.

Consisting of – (3) contactor line fingers, (1) stab assembly complete with mounting, (2) potential transformers, single phase, (3) primary fuse blocks & fuses, (1) secondary fuse block with (2) fuses.

Style No. 2147A95G17

3 – 100V.A. Capacity 4200/120 Volt, 60 Hz.

Similar to kit C-1 above, except transformer primary voltage.

Style No. 2147A95G18

4 – 450V.A. Capacity 4200/120 Volt, 60 Hz.

Similar to kit C-2 above, except transformer primary voltage.

Style No. 2147A95G19

D – 800 Amp Vacuum Break

1 – 100V.A. Capacity 2400/120 Volt, 60 Hz.

Consisting of – (3) contactor line fingers, (1) stab assembly complete with mounting, (1) potential transformer, 3 phase, open delta, (3) primary fuses, (1) secondary fuse block with (2) fuses.

Style No. 2147A95G20

2 – 450V.A. Capacity 2400/120 Volt, 60 Hz.

Consisting of – (3) contactor line fingers, (1) stab assembly complete with mounting, (2) potential transformers, single phase, (3) primary fuse blocks & fuses, (1) secondary fuse block with (2) fuses.

Style No. 2147A95G21

3 – 100V.A. Capacity 4200/120 Volt, 60 Hz.

Similar to kit D-1 above, except transformer primary voltage.

Style No. 2147A95G22

4 – 450V.A. Capacity 4200/120 Volt, 60 Hz.

Similar to kit D-2 above, except transformer primary voltage.

Style No. 2147A95G23



IQ Retrofit Kits

IQ Surface Mount Enclosure – NEMA 1

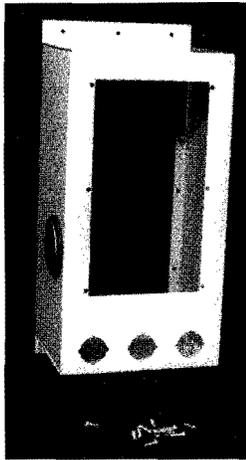
Heavy gauge #14, painted ASA-61. Enclosure for mounting IQ family products on walls, panels or doors without making large cutouts. Six mounting holes and mounting hardware included. Basic footprint is 7.375 in. wide by 16.25 in. high. For use with IQ1000 II or IQ Data Plus II, with or without communications. Includes drilling for (3) PB-1 or PB-2 devices. **The IQ product or PB product are not included.**

Surface mount enclosure only, with "Flat" Face, 6.13 in. deep. Recommended for mounting 45 in. or less from floor.

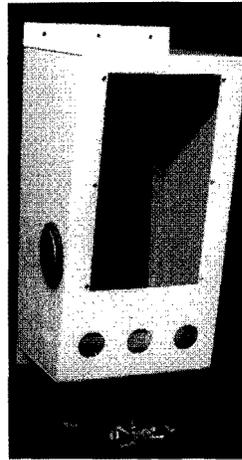
Style No. 2147A95G34

Surface mount enclosure only, with "Slanted" Face, 8.13 in. top, 6.13 in. bottom. Recommended for mounting above 45 in. from floor.

Style No. 2147A95G51



Surface Mount Enclosure
"Flat" Face

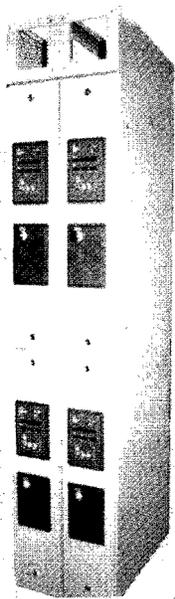


Surface Mount Enclosure
"Slanted" Face



Shown with IQ 1000, PB-1 Devices Mounted

IQ Floor Mounted Enclosure – NEMA 1



Two 10 in. wide enclosures

(Shown with optional 10 in. high bus compartment and (2) IQ cutouts with optional devices per door)

Standard AMPGARD structure construction, painted ASA-61. To be used as a line-up extension for mounting IQ products. Each 10 in. wide section comes with (2) doors with "works-in-a drawer" drawout panel. Each door has (3) standard IQ cutouts with device panels. This kit can be used to minimize field wiring during IQ retrofit or for adding IQ protection where there isn't enough panel space.

The IQ product is not included.

10 in. wide, 30 in. deep, 90 in. high auxiliary section (bus compartment optional).

Style No. 2147A95G35

IQ Retrofit Kits for Ampgard 400A Motor Starters

These kits include a collection of parts to make a retrofit of these IQ products to an AMPGARD easier. If current transformers or potential transformers are required refer to the appropriate page in this RPD. The IQ products are pre-wired to terminal blocks on the drawout panel.

These kits include:

Typical starter schematic
Deep-flanged low voltage door with (3) cutouts for IQ products. Device panel will cover unused cutouts. Works-in-a-drawer panel with terminal blocks
IQ 1000 II (without RTD)
IQ Data Plus II

Style No. 2147A95G37

Similar to above except IQ1000 II only
Style No. 2147A95G39

Note: For modifications to any IQ kit please contact Westinghouse for specific quotation.



700 Ampere Retrofit Kits, 50L2 Retrofit Kit

700 Ampere Retrofit Kit

700 Ampere Airbreak to Vacuum Conversion Kit – Maximum FLA 450

This kit will convert an existing full voltage non-reversing 700 ampere air break starter to vacuum. The modified 800 ampere SJA contactor with 120 volt control is mechanically interchangeable with the 700 ampere air break contactor. If line stabs are required, order separately from RPD 8855V page 11. The SJA contactor is supplied with 2 KVA CPT, 2 N.O., 2 N.C. auxiliary contacts. **Maximum full load amperes is limited to 450.** Modification kit is also supplied with necessary cell barriers etc. Approximate shipping weight 175 lbs. **Style No. 2147A95G31.**

700 Ampere Airbreak to Vacuum Conversion Kit – Maximum FLA 630

This kit will convert an existing full voltage non-reversing 700 ampere air break starter to vacuum. The modified 800 ampere SJA contactor with 120 volt control is mechanically interchangeable with the 700 ampere air break contactor. If line stabs are required, order separately from RPD 8855V page 11. The SJA contactor is supplied with

2 KVA CPT, 2 N.O., 2 N.C. auxiliary contacts. **Maximum full load amperes is limited to 630.** Modification kit is also supplied with necessary cell barriers, line stabs, fuse line fingers, tray assembly. Approximate shipping weight 200 lbs. **Style No. 2147A95G36**

700 Ampere Controller Upgrade – Maximum FLA 720, 4200 Volt

This kit will upgrade an existing 700 ampere air break starter to 800 ampere vacuum, the existing structure is reused. The load stab assembly, isolation switch, contactor and line stab barriers are replaced. The basic kit will convert a standard full voltage non-reversing starter.

This kit includes:
SJA vacuum contactor with 2KVA CPT, 2 N.O., 2 N.C. auxiliary contacts. – Type SJA 50V830
Isolation switch – Type 72-LFM-8
Contactor load stab assembly, mounting and barriers
Mechanical interlock kit
Isolation switch line barrier kit

Assembly drawing 9917D86
Approximate shipping weight 300 lbs.
Style No. 2147A95G32

700 Ampere Controller Upgrade – Maximum FLA 720, 2400 Volt
(Same as 2147A95G32 except 2400 Volt
Approximate shipping weight 300 lbs.
Style No. 2147A95G38

Note: These kits can be combined with other material such as ground fault protection, IQ product retrofits, horsepower changes. For multi-speed, reversing or reduced voltage application utilizing "Upside-down" isolation switch, with the power fuses located above the switch mechanism, refer to Westinghouse for quotation.

50L2 Retrofit Kits

50L2 Retrofit Kit

Replaces the out-of-production 5000 volt 200 ampere air break contactor with a SJO vacuum contactor. The customer keeps the existing starter cell and isolation switch and modifies the cell to accept the SJO contactor which is mechanically interlocked with the isolation switch. **The rating will remain at 200 amperes.**

The basic kit includes:

- Type SJO 50V430 with mechanical interlock, line and load stabs
- SJO mounting brackets
- Line and load stab assemblies with mounting brackets
- 3 current transformers with mounting bracket

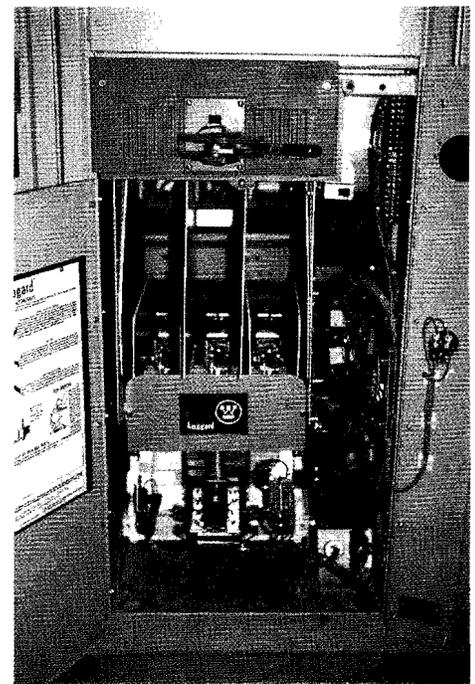
Approximate shipping weight 125 lbs.
Style No. 2147A95G30

This retrofit can be used on all the 26 inch wide 50L2 design manufactured from 1963 to 1982. However, if your 50L2 was manufactured prior to 1974 you may want to also purchase a new LFR type isolation switch with fixed mounted shutter. If your 50L2 was manufactured prior to 1971 and utilized power fuses with 14 inch clip centers, you will need to include 3 new 12 inch clip center CLS type fuses with the retrofit kit.

For other options, such as, ground fault, horsepower changes, IQ microprocessor protection and starters that are reversing, multi-speed, reduced voltage, or synchronous please contact Westinghouse for a specific quotation. Include all nameplate information with the request for quotation.

Include the following ordering information with order:

- Existing current transformer ratio.
- Existing starter location, upper or lower position.
- Advise if motor leads enter enclosure top or bottom.



26 in. wide 50L2 air-break design, with SJO Vacuum Contactor Retrofit installed. (Power fuses not installed).



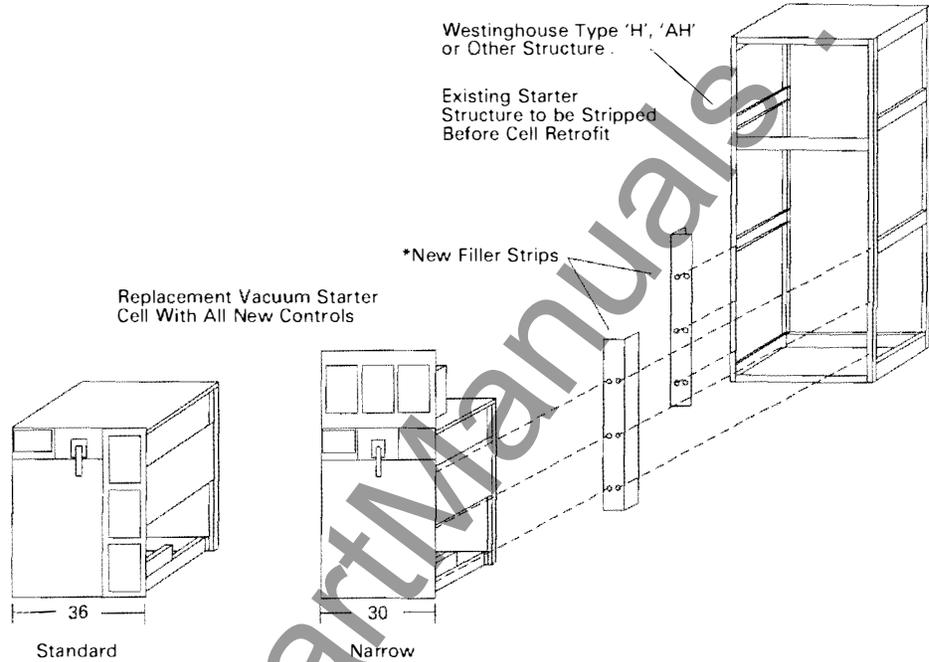
AMI Retrofit Kits

AMI History

Westinghouse medium voltage starters, utilizing a contactor, have been built since the late 1920's. Oilbreak contactors, supplied until 1967, were gradually replaced with the AH and H air break contactors with asbestos arc chutes. The Westinghouse "M&R shops" developed regional designs in the mid to late 1950's utilizing Type H air break, DN-OH oilbreak, and Type K oilbreak. Late 1950's M&R designs replaced hookstick operated fuses with a non-loadbreak isolation switch, the G&W switch. The M&R organization began to standardize and consolidate the regional designs into the AMI design which was transferred to general control in 1960. The AMI design, discontinued in 1969, was gradually phased out by the AMPGARD LF air break designs.

All of the devices used in these designs are out-of-production, many are still in service. We have developed two kits similar to the vacuum starter retrofit kits to convert these designs to current technology. Competitor structures can also be converted utilizing the basic AMI retrofit. These kits can be supplied with additional features such as IQ products, ground fault protection synchronous, reduced voltage and multi-speed options. Contact Westinghouse for specific quotation.

Before installing an AMI retrofit kit the existing structure must be "stripped". Existing contactors, switches, CT's, controls and mounting plates removed. Existing doors will be taken off and replaced by the standard AMPGARD doors, adjustable trim strips and filler panels or doors.



Style #2147A95G41 - Standard AMI Retrofit (36" wide, 29.5" deep, 44" high)
 Style #2147A95G42 - Narrow AMI Retrofit (30" wide, 29.5" deep, 58" high)

*Upper Filler Cover May Require Field Modification

Standard AMI Retrofit (FVNR) Nominal 36 W x 44 H

This kit includes a standard full voltage non-reversing vacuum starter in a welded cell assembly with horizontal top barriers and deep flanged doors. The nominal 36 inch wide cell is 32.50" wide at the rear, 35.25" wide across the front vertical channels. Depth is 29.50" from the front frame to the back frame. Height is 44" not including cell mounting channels. This kit will retrofit the AMI "3-door designs" that are 36 inches or wider with minimum depth of 30 inches.

See page 12 of this brochure for typical assembly, except vertical bus will not be supplied and Type A overload will be used in place of IQ1000 II.

The basic kit consists of:
 Standard welded cell with doors
 Type SJA 50V430 standard roll-out contactor
 Type 50LFR-4 isolation switch
 power fuses
 current transformers
 Type A overload with heaters
 Control panel with interposing relay
 Standard CPT with 120 volt secondary
 2 N.O., 2 N.C. auxiliary contacts
 Cell mounting rails
 Filler panel
 Two vertical "trim angles"
 General instruction for AMI retrofit
 Approximate shipping weight 1000 lbs.
Style No. 2147A95G41

Size based on horsepower, full load amperes, service factor and voltage

Narrow AMI retrofit (FVNR) Nominal 30 W x 58 H.

This kit is similar to the standard AMI retrofit kit except the nominal cell is 30 inches wide. The cell is 27.62 inches wide at the rear and 29.37 inches wide across the front vertical channels. The height of the cell is 58 inches with the low voltage controls located in the upper 15 inches. The assembly utilizes a standard isolation switch and vacuum contactor.

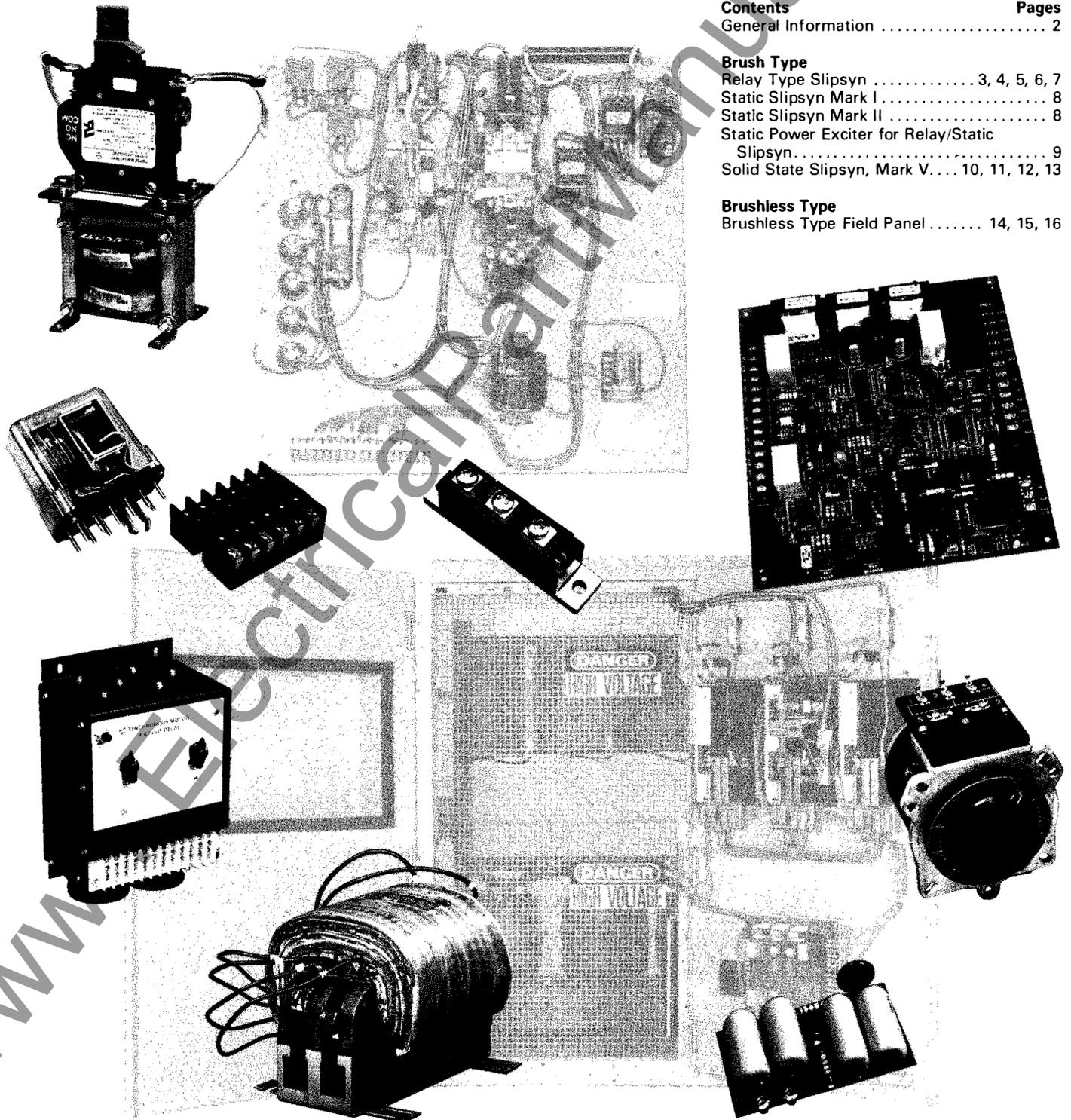
Approximate shipping weight 1000 lbs.
Style No. 2147A95G42

Synchronous motor field application panels are also available for retrofit to old AMI motor starters. Refer to Cat 26-000 for details.



Slipsyn® Motor Field Control for Synchronous Motors

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Brush Type	
Relay Type Slipsyn	3, 4, 5, 6, 7
Static Slipsyn Mark I	8
Static Slipsyn Mark II	8
Static Power Exciter for Relay/Static Slipsyn	9
Solid State Slipsyn, Mark V	10, 11, 12, 13
Brushless Type	
Brushless Type Field Panel	14, 15, 16



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General Information

The information contained in this publication is to be used as a general guide only. Industrial control of this type is supplied to meet specific customer electrical control and distribution requirements. Design changes based on technological improvements are made for the purpose of updating the individual components; therefore, information contained in this publication may or may not be totally applicable to as built equipment.

Synchronous motor field controls fall into two general categories:

Brush Type

All of the following brush type synchronous field application panels provide Slipsyn® automatic field application, damper winding protection and pull-out protection.

Relay Type Slipsyn – see pages 3, 4, 5, 6, 7, this publication.

Static Slipsyn Mark I – see page 8, this publication.

Static Slipsyn Mark II – see page 8, this publication.

Solid State Slipsyn Mark V – see pages 10, 11, 12, 13, this publication.

Brushless Type

The following brushless type synchronous field application panel provides damper winding protection and pull-out protection.

See pages 14, 15, 16, this publication.

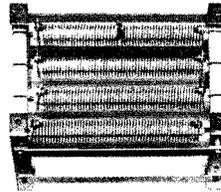


For Brush Type Motors

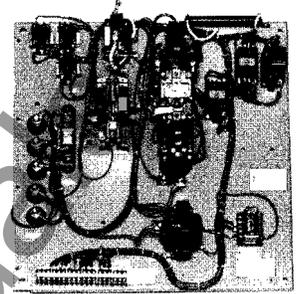
Relay Type Slipsyn

Instructions I.L.17097 (original I.L. 14-000-1)
For complete field panel refer to Cat. 25-000
Designed in 1947

Utilizes Electro-mechanical Devices to
Automatically Apply D.C. Power to Motor Field.



Starting and Discharge Resistor



Field Application Panel (A.C. Control Circuit)

Common Parts for D.C. or A.C. Control Circuits Below. See Pages 4, 5, This Publication, for Typical Schematic

Device Type	Normal Device Designation	Application	Note
ASR Relay	FR	Synchronizing Relay	①
PO Relay	PO	Pull-Out Relay	②
PO Transformer	PO1	Pull-Out Transformer	②
DP Relay	SC	Damper Winding Protection Relay	⑥
D.C. Shunt	SH	Shunt for D.C. Ammeter	②
D.C. Ammeter	DC AMM	D.C. Ammeter	②
Starting and Discharge Resistor	RES	Starting and Discharge Resistor (Required to Obtain Maximum Pull-in Torque)	③
Type M Contactor	FC	Field Contactor	①
Selenium Rectifier	1 REC	Half-Wave Rectifier for Synchronizing Relay (ASR) Coil (Hold-in Winding)	⑤
Silicon Rectifier			

Following Devices were used on D.C. Control Circuit Design from 1947 to 1982. See Page 4, This Publication, for Typical Schematic

Device Type	Normal Device Designation	Application	Static Exciter	Note
AZ Relay	2TR	Auxiliary Sequence Relay		①
Resistor	2RES	Resistor for Field Contactor Coil/125V.D.C. Field	Yes	②
Resistor	2RES	100 Watt, 300 Ohms (0-45 Field Amps), S#443A325H14	Yes	②
Resistor	2RES	100 Watt, 75 Ohms (46-135 Field Amps), S#443A325H05	No	②
Resistor	2RES	100 Watt, 150 Ohms (0-45 Field Amps), S#443A325H09	No	②
Resistor	2RES	160 Watt, 50 Ohms (46-135 Field Amps), S#443A326H01		
Resistor	2RES	Resistor for Field Contactor Coil/250V.D.C. Field	Yes	②
Resistor	2RES	100 Watt, 1.0K Ohms (0-45 Field Amps), S#443A325H24	Yes	②
Resistor	2RES	100 Watt, 300 Ohms (46-135 Field Amps), S#443A325H14	No	②
Resistor	2RES	100 Watt, 500 Ohms (0-45 Field Amps), S#443A325H18	No	②
Resistor	2RES	100 Watt, 75 Ohms (46-135 Field Amps), S#443A325H05 (Quantity 2)	No	②

Following Devices were used on A.C. Control Circuit Design Beginning in 1982. See Page 5, This Publication, for Typical Schematic

Device Type	Normal Device Designation	Application	Note
DSL9-22 Relay	2TR, MX, 2TRX, 2MX	Auxiliary Relays	⑥
ZAI-30 Rectifier	2TR	Timing Head for Auxiliary Relay 2TR (DSL9-22)	⑥
Rectifier	3REC	Rectifier for Type M Field Contactor Coil	⑦
Rectifier	2REC	Rectifier for Synchronizing Relay (ASR) Coil (Main Winding)	⑦
Resistor	2RES	120 Volt A.C. Control Circuit – Field Contactor Coil	②
Resistor	2RES	100 Watt, 200 Ohms (0-45 Field Amps), S#443A325H11	②
Resistor	2RES	100 Watt, 100 Ohms (46-135 Field Amps), S#443A325H07	

Optional Devices for Field Panel. See Pages 4-5, This Publication, for Typical Schematic

Device Type	Normal Device Designation	Application	Note
AV Relay	FLA	Field Loss Relay – Current and/or Voltage	①
Tapped Field Resistor	RES	Field Resistor – For Adjusting Voltage to D.C. Field Circuit	③
Exciter Field Rheostat	RHEO	Field Rheostat for Rotating Generator, Type LK or LR	④
DSL9-22 Relay	IS	Auxiliary Relay	⑥
ZEI-30 or ZAI-30	IS	Timing Head for Auxiliary Relay IS (DSL9-22)	⑥

① Refer to Catalog Section 16-220.

② Refer to page 6 this publication.

③ Refer to Price List 8322.

④ Refer to Price List 8330.

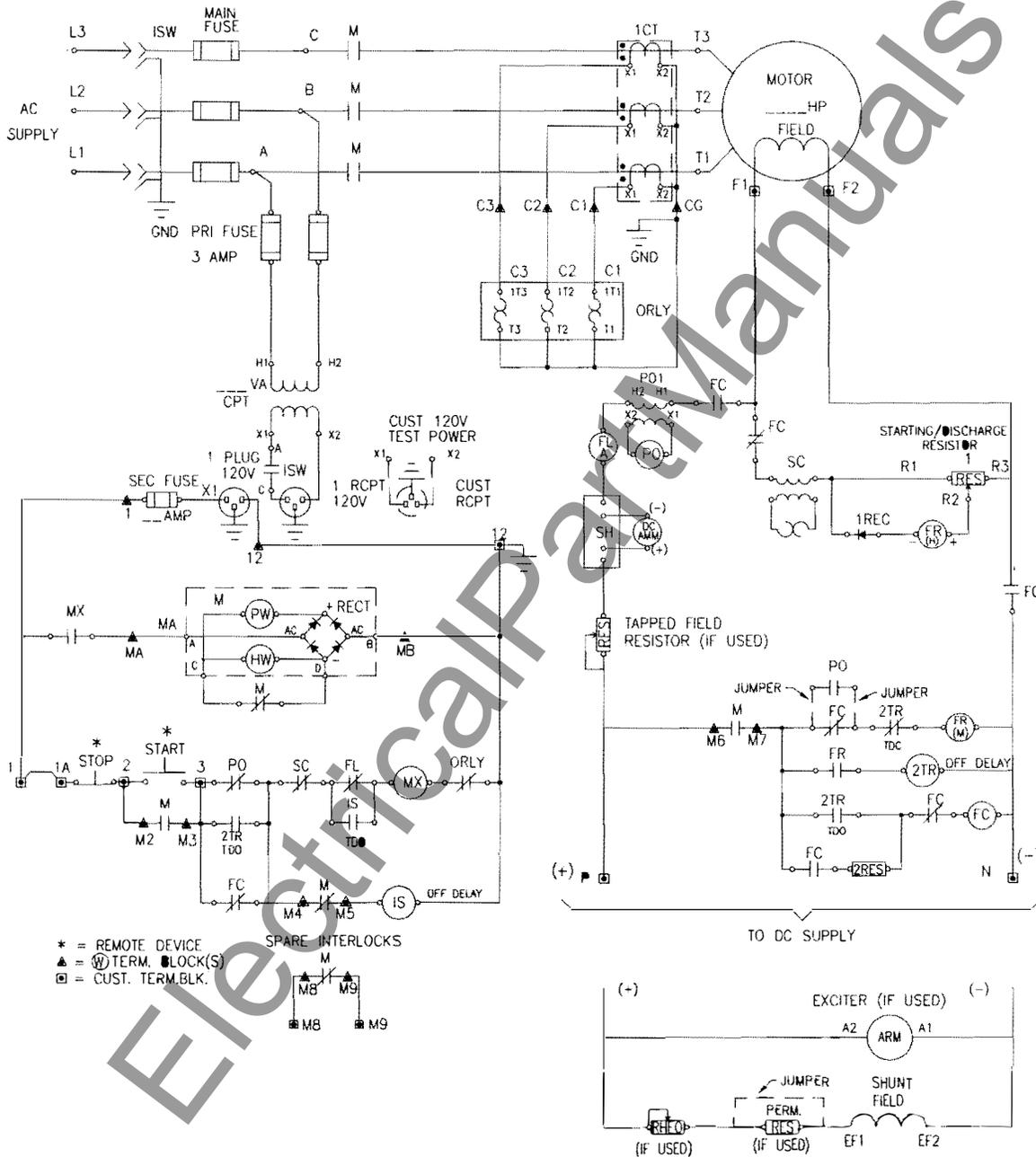
⑤ Selenium rectifier S#44A3770G09 obsolete, replaced by silicon rectifier S#2018A40G02. Refer to RPD 8855C.

⑥ Refer to Catalog 25-000.

⑦ Style No. 2018A40G02. Refer to RPD 8855C.

⑧ Refer to page 7 this publication.

For Brush Type Motors

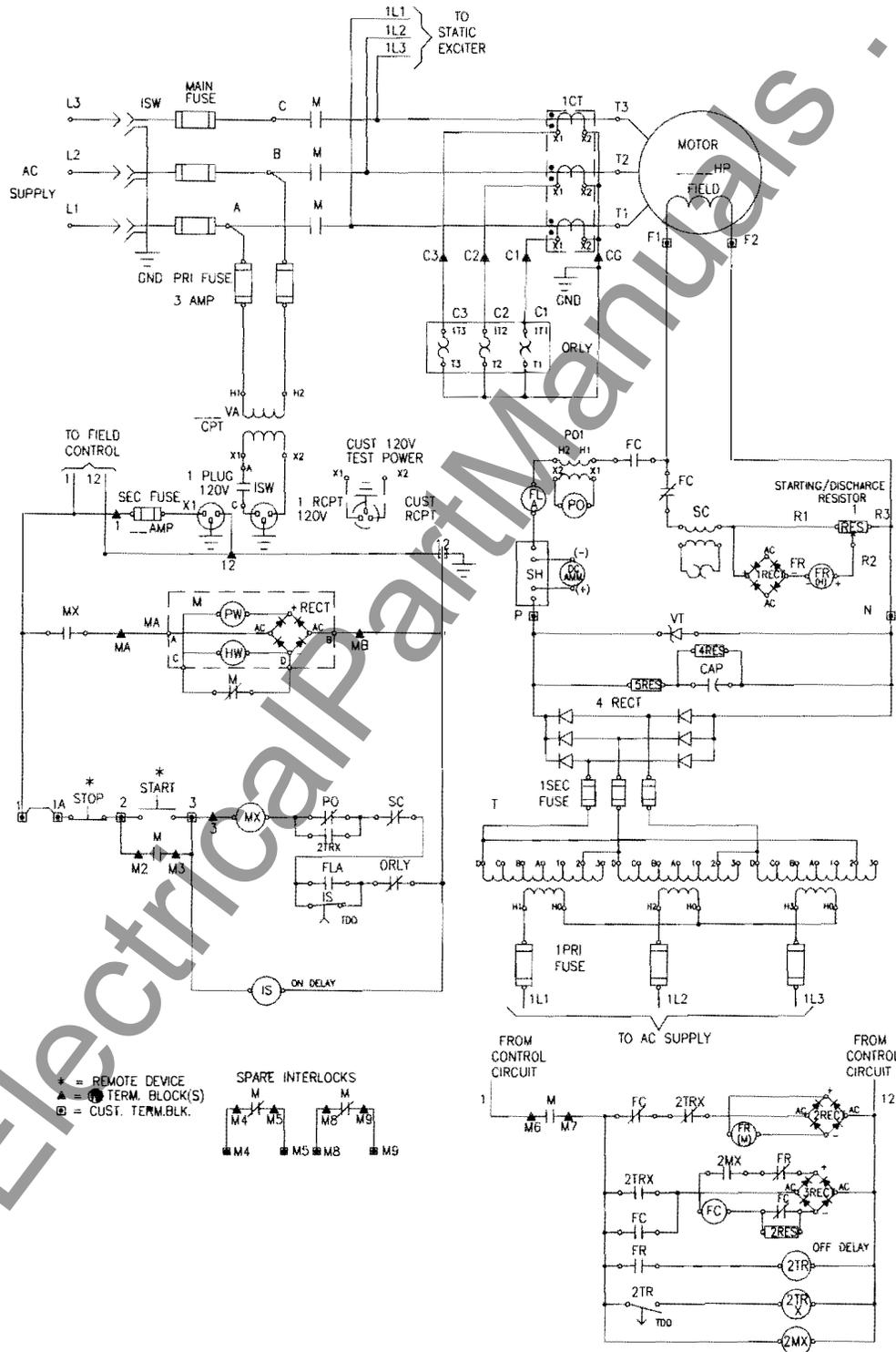


TYPICAL SCHEMATIC

Ampgard full voltage, non-reversing, synchronous motor starter.
 Complete with relay type Slipsyn®, D.C. control circuit.
 Shown with rotating generator, for D.C. power



For Brush Type Motors



TYPICAL SCHEMATIC

Ampgard full voltage, non-reversing, synchronous motor starter.
Complete with relay type Slipsyn®, A.C. control circuit.
Shown with static exciter, for D.C. power



For Brush Type Motors

Synchronous Starter Components

PO Relay — The Pull-Out Relay (PO) operates on pull-out of the synchronous motor to trip the line and field contactors, thus stopping the motor; or to energize the synchronizing relay, thereby initiating a re-synchronizing sequence, depending upon connections used. The pull-out transformer is not affected by D.C., but pulses of A.C. in the field are transformed to the secondary to operate the relay.

Style Number Relay

Current Style	Old Obsolete Styles	List Price
2162A13G01	1419344, 17D3022G01, 202A648H01	\$1072

Transformer Only for PO Relay

Current Style	Obsolete Style	D.C. Field Current	Hertz	List Price
07C5710G01	1419345	4-8	60	\$1170
07C5710G02	1419346	9-16	60	1170
07C5710G03	1419347	17-33	60	1170
07C5710G04	1419348	34-66	60	1820
07C5710G05	1419349	67-132	60	1820
07C5710G06	1419350	134-200	60	1820
07C5710G07	1419351	201-400	60	1820
07C5710G08	1419352	4-8	25	1170
07C5710G09	1419353	9-16	25	1170
07C5710G10	1419354	17-33	25	1170
07C5710G11	1419355	34-66	25	1820
07C5710G12	1419356	67-132	25	1820
07C5710G13	1419357	134-200	25	1820
07C5710G14	1419358	201-400	25	1820

D.C. Ammeter Shunts — 50 MV

Style	Amp	List Price
1788A88H13	25	\$350
1788A88H15	50	350
1788A88H18	100	350
1788A88H20	200	350

D.C. Ammeter (Panel Type) List Price

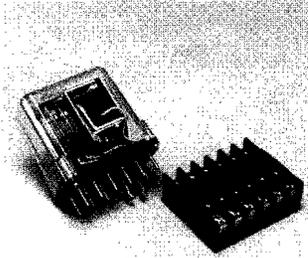
7857A73H40	0-25	\$715
7857A73H41	0-50	715
7857A73H42	0-100	715
7857A73H43	0-200	715

D.C. Ammeter (Switchboard Type) List Price

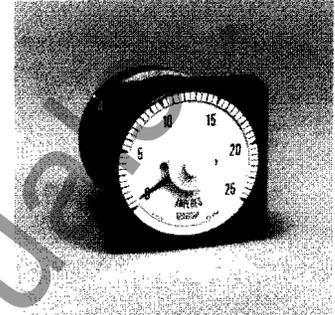
7857A83H40	0-25	\$1025
7857A83H41	0-50	1025
7857A83H42	0-100	1025
7857A83H43	0-200	1025

Resistor (For Field Contactor Coil)

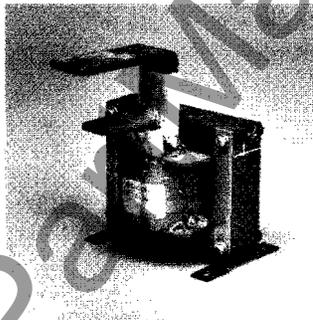
Style	Rating		List Price Each
	Watts	Ohms	
443A325H05	100	75	\$200
443A325H07	100	100	200
443A325H09	100	150	200
443A325H11	100	200	200
443A325H14	100	300	200
443A325H18	100	500	200
443A325H24	100	1000	200
443A326H01	160	50	200



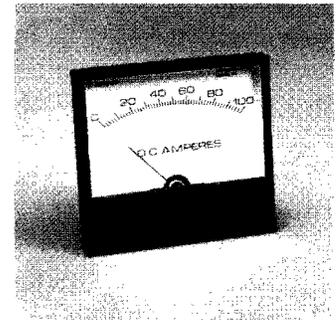
PO Relay
Style Number 2162A13G01



D.C. Ammeter -
Switchboard Type
Style Number 7857A83H40



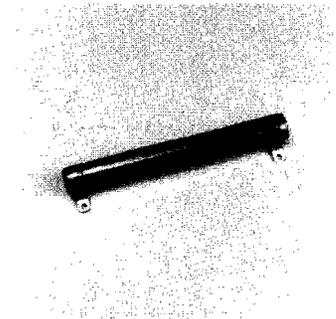
Transformer - For PO Relay
Style Number 07C5710G06



D.C. Ammeter - Panel Type
Style Number 7857A73H42



D.C. Ammeter Shunt
Style Number 1788A88H13



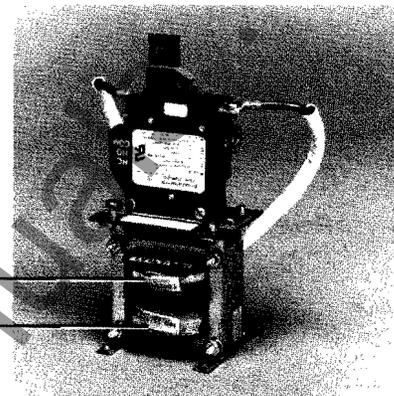
Resistor -
For Field Contactor Coil
Style Number 443A325H05



For Brush Type Motors

Synchronous Starter Components

Type DP Relay — Damper Protective Relay — The Type DP damper winding protection relay is used to protect the damper windings of synchronous motors against stalled conditions. It is designed for connection in the field circuit of the motor, in series with the discharge resistor, during starting. The frequency of the current induced in the damper windings of the motor and in the motor field circuit is proportional to the difference between motor speed and rated synchronous speed. The greater the difference in speed, the higher the frequency of the current induced. At rated synchronous speed there is no current induced in the field circuit because there is no longer an alternating magnetic field. At zero speed the induced current is at line frequency. Because the inductance of the motor field circuit changes with frequency the induced current is fairly constant during motor accelerating. The relay, responsive to the changing frequency, trips quickly if the motor fails to start, but does not trip if the motor accelerates.



DP Relay
Style Number 6712C53G01
Complete with Primary and Secondary Coil

Model "B" Relay Instructions I.L. 17152

DP Relay with Secondary Coil Style Number	Secondary Coil (Part of Relay Style) Style Number	List Price Complete with Primary and Secondary Coil	List Price with Secondary Coil Only
6712C53G01	L426713G01 (6 Turn)	\$1350	\$950
6712C53G02	L427547G01 (10 Turn)	1350	950

Model "B"

Primary Coil Model "B" Relay

Style Number List Price \$396	Primary Coil Turns	Locked Rotor Induced Field Current (Amperes at 60 Hertz)	
		With 6 Turn Secondary	With 10 Turn Secondary
L427592G01	215	2.94 to 4.33	5.58 to 8.36
L427534G01	145	4.34 to 6.54	8.37 to 12.4
L426712G01	96	6.55 to 8.74	12.5 to 16.6
L426721G01	72	8.75 to 10.4	16.7 to 19.9
L427548G01	60	10.5 to 13.0	20.0 to 24.9
L426711G01	48	13.1 to 19.6	25.0 to 37.4
L425018G01	32	19.7 to 26.1	37.5 to 49.9
L426710G01	24	26.2 to 39.3	50.0 to 74.9
L425019G01	16	39.4 to 57.1	75.0 to 108
L443994G01	11	57.2 to 89.4	109 to 170
L443993G01	7	89.5 to 125	171 to 239
L443995G01	5	126 to 190	240 to 290
Trip Time:		4 to 10 Seconds	2.5 to 5 Seconds

Replacement Parts — Model "B"

Secondary Coil Style Number	Turns	List Price
L426713G01	6	\$380
L427547G01	10	380
Overload Relay Style Number		
376D379G15		\$200

Model "A" Relay

(Obsolete. No longer available.) Information for reference only.
Instructions I.L. 15-827-DP-1.

DP Relay Complete with Secondary Coil Style Number		Secondary Coil (Part of Relay Style) Style Number
Superseding Style	Original Style	
15A9312G01	1320764	1344022 (6 Turn)
15A9312G06	1399220	1367886 (10 Turn)

Primary Coil Model "A" Relay

(Obsolete. No longer available.) Information for reference only.

Style Number	Primary Coil Turns	Locked Rotor Induced Field Current (Amperes at 60 Hertz)	
		With 6 Turn Secondary	With 10 Turn Secondary
1399 306	215	2.94 to 4.33	4.75 to 6.89
1367 873	145	4.34 to 6.54	6.90 to 10.3
1344 021	96	6.55 to 8.74	10.4 to 13.9
1344 030	72	8.75 to 10.4	14.0 to 16.6
1367 887	60	10.5 to 13.0	16.7 to 20.9
1344 020	48	13.1 to 19.6	21.0 to 31.1
1320 623	32	19.7 to 26.1	31.2 to 41.4
1344 019	24	26.2 to 39.3	41.5 to 62.4
1320 624	16	39.4 to 57.1	62.5 to 89.9
1399 005	11	57.2 to 89	90.0 to 139
1399 004	7	90 to 125	140 to 199
1399 006	5	126 to 190	200 to 260
Trip Time:		4 to 10 Seconds	2.5 to 5 Seconds

For Brush Type Motors

Static Slipsyn® — Mark I

Instructions I.L. 14-000-2
Designed in 1959 — Now obsolete
Replaced by Mark II in 1971

This device employs static components and supplies intelligence for applying field excitation power at proper speed and pole position of motor. It serves the same purpose as the ASR relay, timing relay, PO relay, PO transformer, and DP relay in the relay Slipsyn panel pages 3, 4, 5, 6, 7, this publication.

Note that the starting and discharge resistors are required with this device.



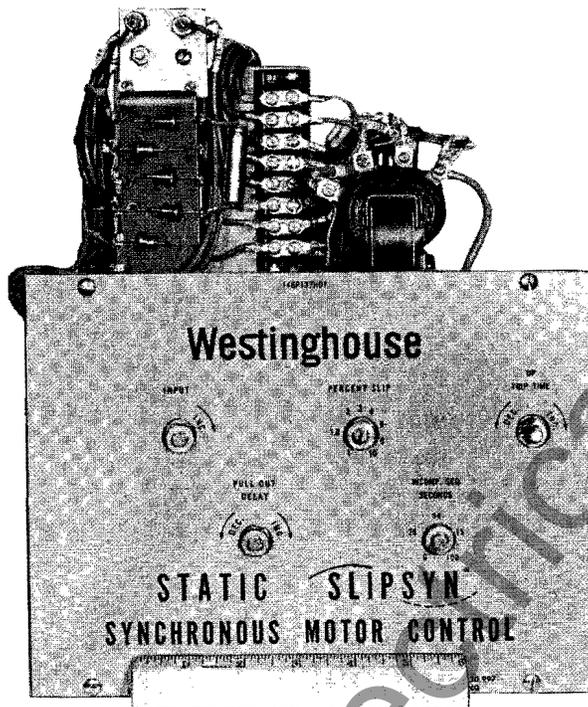
Static Slipsyn® — Mark II

Instructions I.L. 14-000-3
Designed in 1971 — Now obsolete

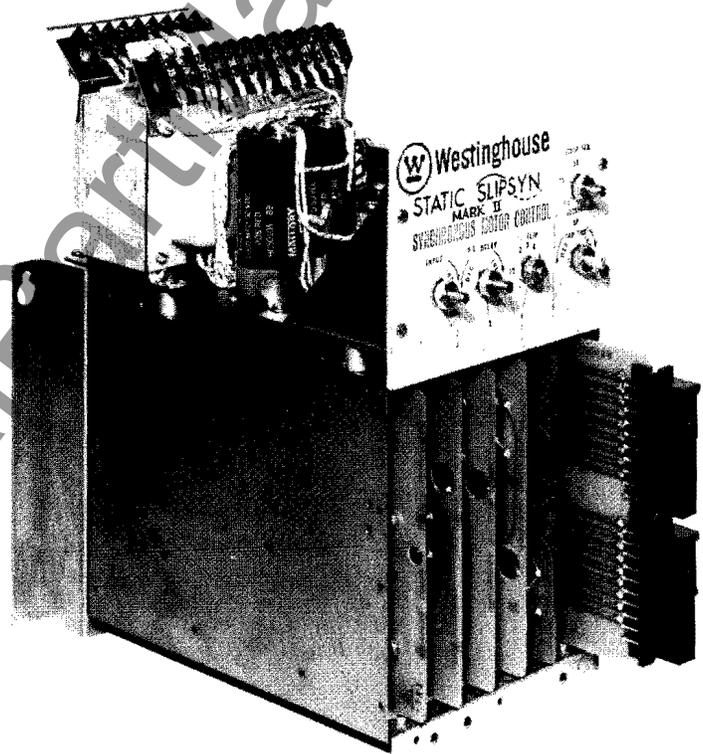
For service and repair parts contact:

Garand Research
2207 Union Road
West Seneca, N.Y. 14224
Telephone 716-668-0024

This device is similar to Mark I, except it utilizes up-dated components, mounted on plug-in printed circuit boards.



Static Slipsyn — Mark I



Static Slipsyn — Mark II

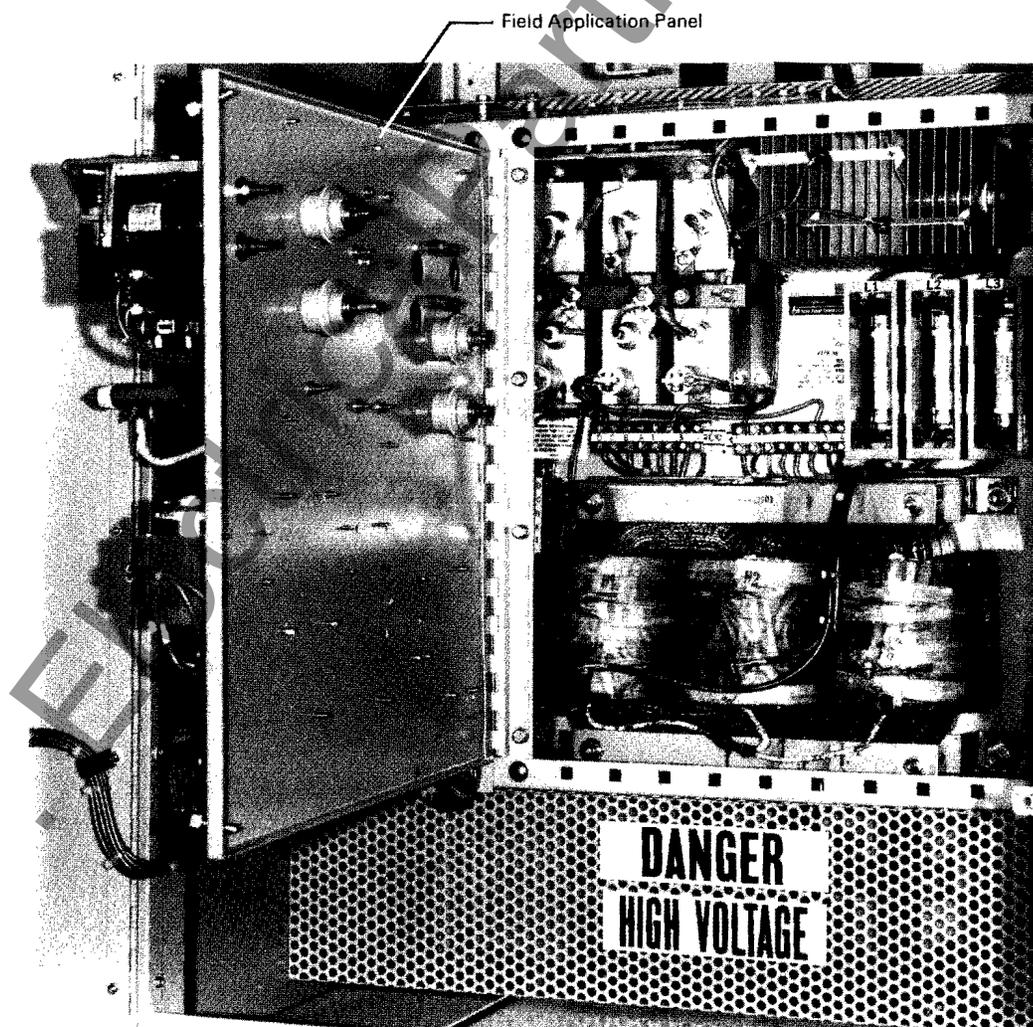
**For Brush Type Motors****Static Power Exciter for
Synchronous Motor Field Excitation
Relay/Static Slipsyn Only**

Instructions I.L. 14-900-1 Fixed Voltage
Instructions I.L. 14-900-2 Adjustable Voltage

Since D.C. excitation voltage is required for relay Slipsyn and static Slipsyn (pages. 3, 4, 5, 6, 7, 8, this publication), a static exciter may have been supplied with the synchronous control package.

Repair parts for static power exciters are available but not listed in this publication, due to the many varieties and ratings.

Price and availability of parts may be obtained by contacting your local Westinghouse representative. Complete description of the part, along with complete data on the controller's nameplate should include: ratings, shop order, diagram and year of manufacture.



**Typical Static Power Exciter – Fixed Voltage Type
Mounted Behind “Swing-Out” Relay Field Application Panel**



For Brush Type Motors

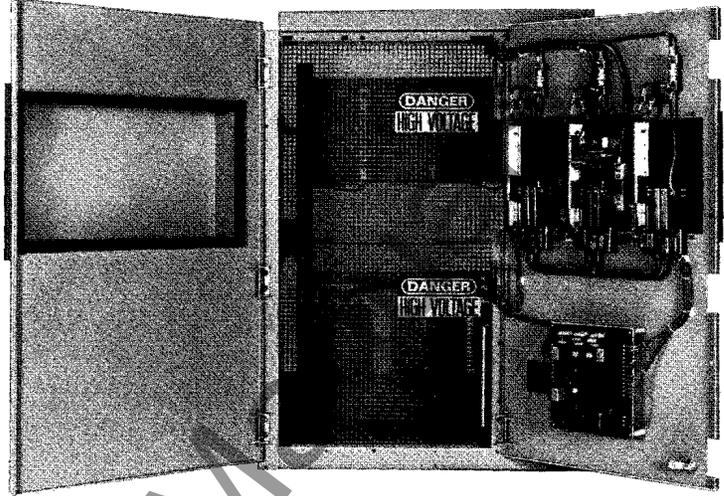
Solid State Slipsyn® — Mark V

Instructions I.L. 17224

For complete assembly refer to Cat. 25-000

Designed in 1989

Mark V solid state technology enables all required functions for correct synchronization to be accomplished without the use of contacts or mechanical closing devices, 100% solid state. The static power exciter is part of this package as standard.



See Page 11, This Publication, For Typical Schematic

Device Type	Normal Device Designation	Application	Note
Thyristor	QA1, QA2	Solid State Panel — Power Module	①
Thyristor	QB1, QB2		
Thyristor	QC1, QC2	Surge Protection	①
Metal Oxide Varistor	MOV		
Printed Circuit Board	CB	Main Synchronizing Control/Protection Board	④
Ammeter, Shunt	DC AMM, SH	D.C. Ammeter and Shunt	③
Transformer	TX	Step Down Exciter Power Transformer — 3-Phase	④
Medium Voltage Fuse	3 PRI	Primary Fuses for Step Down Transformer	④
Low Voltage Fuse	1 SEC	Secondary Fuses for Step Down Transformer	④
Resistor	1 RES	Starting and Discharge Resistor	②
Resistor	RES	Resistor Style No. 04D7908G18, 250 OHM, 1.7 Amp.	⑤
Potentiometer	P2	Potentiometer/Manual Adjust Voltage	④
Printed Circuit Board	SB	Snubber/Thyristor Stack (Not shown on Page 11)	⑥
Printed Circuit Board	SB4	Snubber/Starting and Discharge Resistor (Not shown on Page 11)	⑥

① Refer to pages 11, 12, this publication.

② Refer to Price List 8322.

③ Refer to pages 6, 11, this publication.

④ Refer to pages 11, 13, this publication.

⑤ Refer to AMS, page 11, this publication.

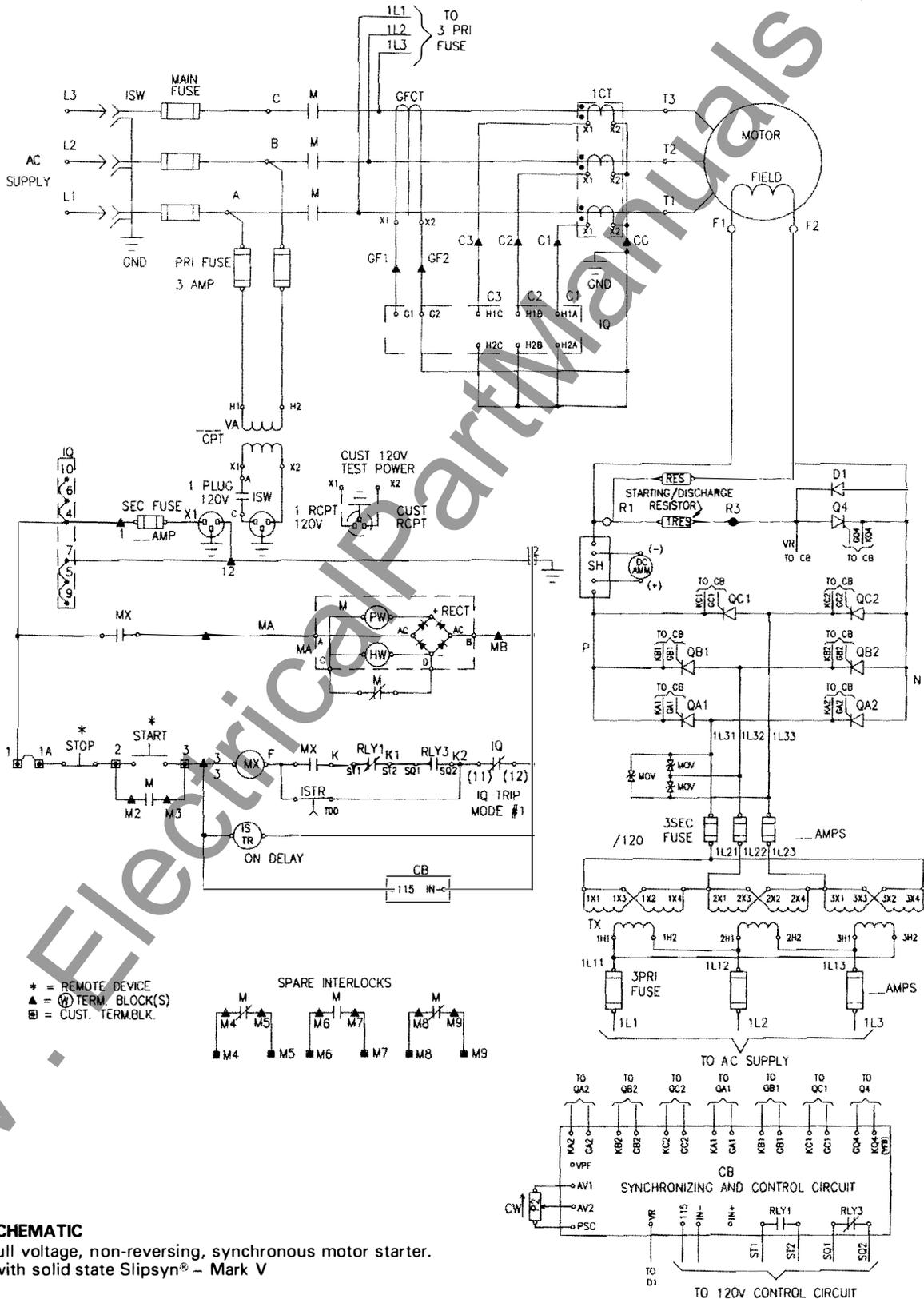
● Refer to page 12, this publication.

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For Brush Type Motors

Solid State Slipsyn® — Mark V



TYPICAL SCHEMATIC

Ampgard full voltage, non-reversing, synchronous motor starter.
Complete with solid state Slipsyn® - Mark V

For Brush Type Motors

Synchronous Starter Components

Solid State Slipsyn® — Mark V

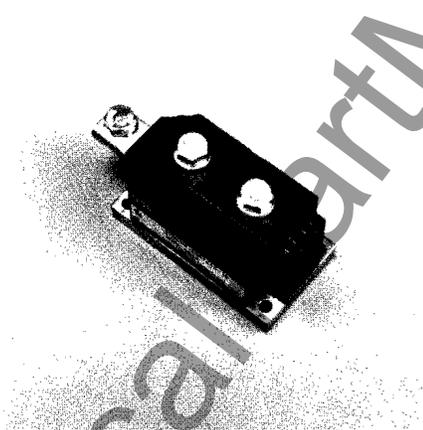
Solid State Panel with Surge Protection

Rating Amps	Power Module	Quantity	Heat Sink	Quantity	Shunt	Quantity	Snubber for Thyristor Stack	Quantity	Snubber for Starting and Discharge Resistor	Quantity	MOV	Quantity
50	2D78510H04	3	2D78510H01	1	1788A88H15	1	3925B02G02	3	3925B02G03	1	2089A87H02	3
	2D78510H02	1										
100	2D78510H04	3	2D78510H01	3	1788A88H18	1	3925B02G02	3	3925B02G03	1	2089A87H02	3
	2D78510H05	1										
200	2D78510H05	1	2D78510H01	3	1788A88H20	1	3925B02G02	3	3925B02G03	1	2089A87H02	3
	2D78510H06	3										

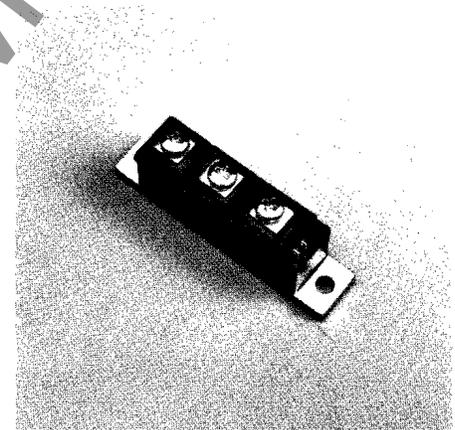
Prices

Style	List Price Each
2089A87H02	\$ 150
3925B02G02	775
3925B02G03	500
2D78510H01	950
2D78510H02	525
2D78510H04	1050
2D78510H05	1450
2D78510H06	1975

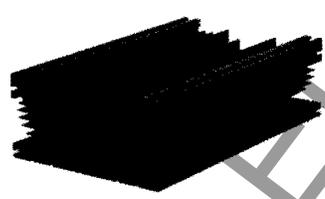
For D.C. Ammeter and Shunt see page 6, this publication.



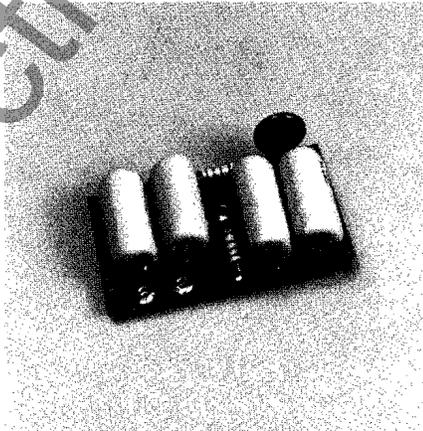
Power Module
Style Number 2D78510H06



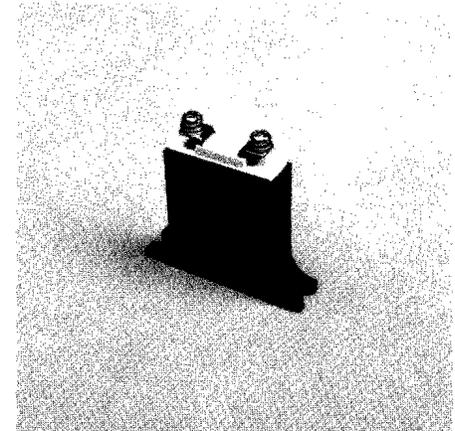
Power Module
Style Number 2D78510H02



Heat Sink
Style Number 2D78510H01



Snubber for Thyristor Stack
Style Number 3925B02G02



MOV
Style Number 2089A87H02



For Brush Type Motors

Synchronous Starter Components

Solid State Slipsyn® — Mark V

3-Phase Power Transformer and Primary/Secondary Fuses

2400/4160 Volt 60 Hz Transformer				Primary Fuses			Secondary Fuses					
KVA	Phase	Style #	Quantity	Amp Rating	Style #	Quantity	120 Volt			240 Volt		
							Amp Rating	Style #	Quantity	Amp Rating	Style #	Quantity
6	1	2147A11G02	3	3	2147A11G46	1 (Set 3)	50	1A96200H17	3	30	1A96200H15	3
9	1	2114A96G01	3	3	2147A11G46	1 (Set 3)	100	1A96200H21	3	50	1A96200H17	3
15	1	435A550G01	3	5	677C453G01	3	100	1A96200H21	3	50	1A96200H17	3
20	3	2089A91H01	1	10	677C453G04	3	150	1A96200H23	3	100	1A96200H21	3
25	3	2089A91H02	1	10	677C453G04	3	150	1A96200H23	3	100	1A96200H21	3
30	3	2089A91H03	1	15	678C240G04	3	150	1A96200H23	3	100	1A96200H21	3
35	3	2089A91H04	1	15	678C240G04	3	200	1A96200H24	3	100	1A96200H21	3
40	3	2089A91H05	1	15	678C240G04	3				100	1A96200H21	3
50	3	2089A91H06	1	20	678C240G05	3				150	1A96200H23	3
68	3	2089A91H19	1	25	678C240G06	3				200	1A96200H24	3

Note – Transformers and fuses are available at other ratings. Price and availability may be obtained by contacting your local Westinghouse representative. Complete description of the part, along with complete data on the controller's nameplate should include: ratings, shop order, diagram and year of manufacture.

Prices

Transformer Style	List Price Each	Primary Fuses	List Price Each	Secondary Fuses	List Price Each
2147A11G02	\$ 1930	2147A11G46	\$450	1A96200H15	\$200
2114A96G01	2975	677C453G01	①	1A96200H17	200
435A550G01	3500	677C453G04	①	1A96200H21	200
2089A91H01	9275	678C240G04	①	1A96200H23	200
2089A91H02	11400	678C240G05	①	1A96200H24	200
2089A91H03	13000	678C240G06	①		
2089A91H04	15000				
2089A91H05	16000				
2089A91H06	18600				
2089A91H19	19500				

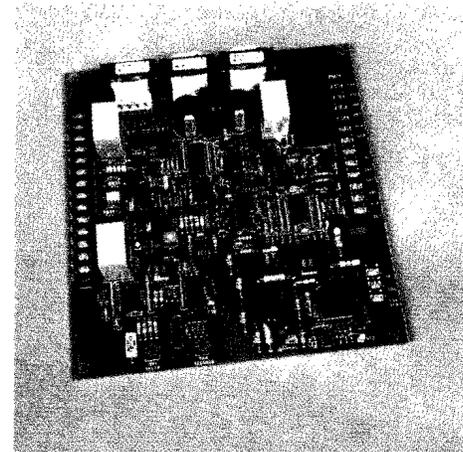
① = Refer to AMS.

Main Synchronizing Control/Protection Board (Common to all units)

Style No.	List Price
7064C03G01	\$5200

Potentiometer (Common to all units)

Style No.	List Price
1A48769H06	\$100



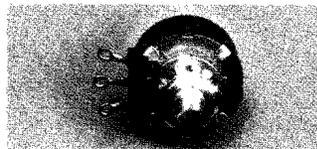
**Main Synchronizing Control/Protection Board
Style Number 7064C03G01**



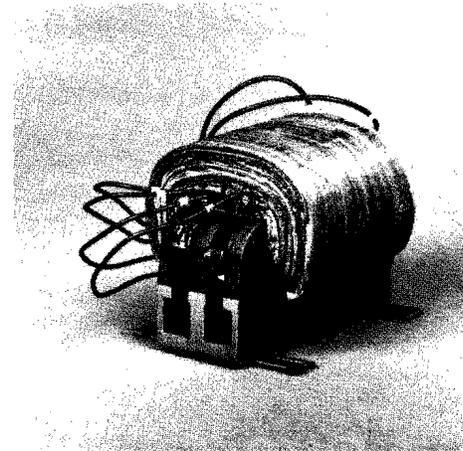
**Primary Fuses
Style Number 2147A11G46**



**Secondary Fuse
Style Number 1A96200H21**



**Potentiometer
Style Number 1A48769H06**



**Transformer
Style Number 2147A11G02**



For Brushless Type Motors

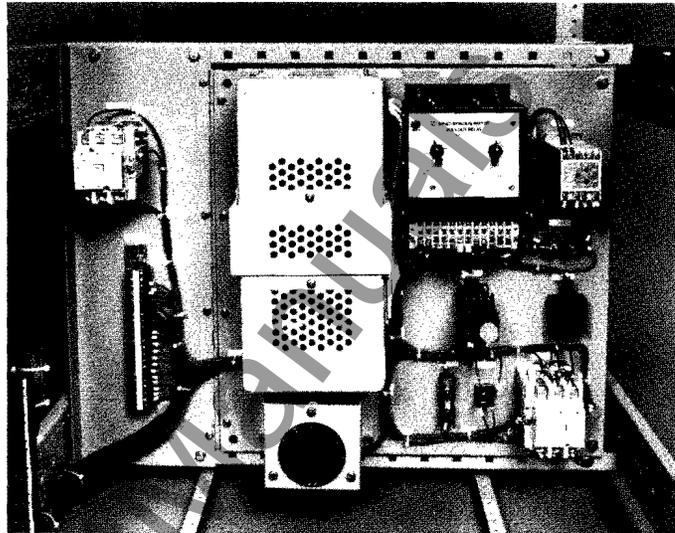
Synchronous Starter Components

Instructions I.L. 17097

For complete field panel refer to Cat. 25-000

Designed in 1965

Utilizes electro-mechanical devices to apply D.C. power to the motor exciter field circuit. Note that the power rectifiers for motor field circuit and automatic synchronizer are mounted on the synchronous motor's rotor.



See Page 15, This Publication, For Typical Schematic

Device Type	Normal Device Designation	Application	Note
Voltage Transformer	ICPT	Constant Voltage Potential Transformer	①
PRP	PO	Pull-Out/Power Factor Relay	①
Powerstat	AT	Adjusts Voltage to Motor Exciter Field	①
CO Relay	DP	Damper Winding Protection Relay	①
A200 Contactor	FC	Field Contactor - A.C. Contactor, Size 1	②
Selenium Rectifier	VT	Volt-Trap, Protects Rectifier from Transient Voltage Spikes	①
Silicon Rectifier	1RECT	D.C. Rectifier for Motor Exciter Field Circuit	①
DSL9-22 Relay	TR, 86, MX	Auxiliary Sequence Relays	②
ZE1-30	TR	Timing Relay Head for Auxiliary Relay	②
Resistor	1RES	Loading Resistor for 86 Device (Not Illustrated) S#443A322H25	③
Ammeter	D.C. AMM	D.C. Ammeter	①

● Refer to pages 15, 16, this publication.

② Refer to Catalog 25-000 and page 15, this publication.

③ Refer to page 15, this publication, Price List/Style Number Index 8855.

www.ElectricalParts.com



For Brushless Type Motors

Synchronous Starter Components

Pull-Out/Power Factor Relay

Instructions 486A357

Type PRP Style	Hertz	List Price
658C688H02	60	\$4360
658C688H03	50	4360

Damper Winding Protection Relay

Instructions I.L. 41-100

Style	Type	List Price
Advise Style Number	CO	\$3350

Volt-Trap

Style	List Price
637C026G05	\$495

Rectifier

Style	List Price
508C013H06	\$220

Power Stat

Style	List Price
214A458H01	\$1150

Constant Voltage Potential Transformer

Style	List Price
1 KVA	\$3190

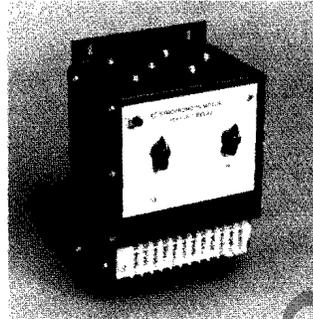
D.C. Ammeter (Panel Type)①

Style	Range	List Price
7857A73H50	0-5	\$715
7857A73H51	0-10	715
7857A73H52	0-15	715
7857A73H53	0-20	715

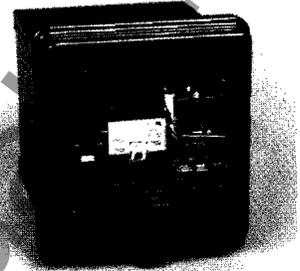
D.C. Ammeter (Switchboard Type)①

Style	Range	List Price
7857A83H50	0-5	\$1025
7857A83H51	0-10	1025
7857A83H52	0-15	1025
7857A83H53	0-20	1025

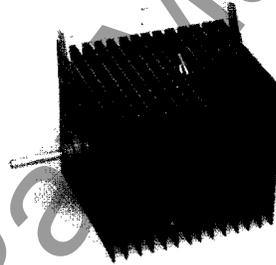
① = D.C. Ammeter shunt not required.



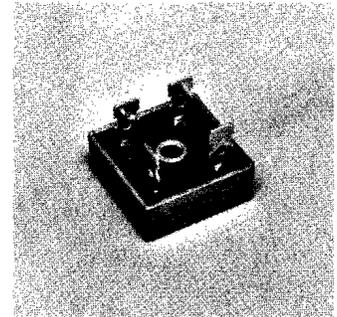
Pull-Out/Power Factor Relay
 Style Number 658C688H02



Damper Winding Protection Relay
 Type CO



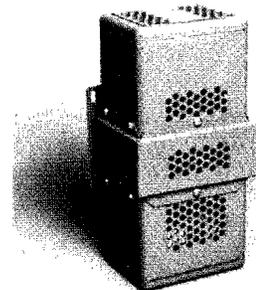
Volt-Trap
 Style Number 637C026G05



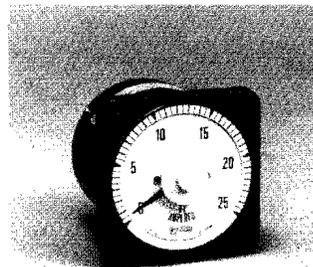
Rectifier
 Style Number 508C013H06



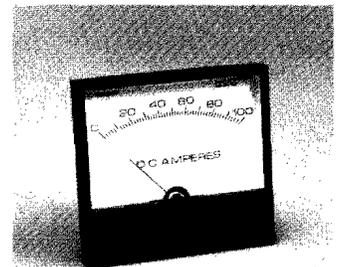
Power Stat
 Style Number 214A458H01



Constant Voltage Potential Transformer



D.C. Ammeter -
 Switchboard Type



D.C. Ammeter - Panel Type