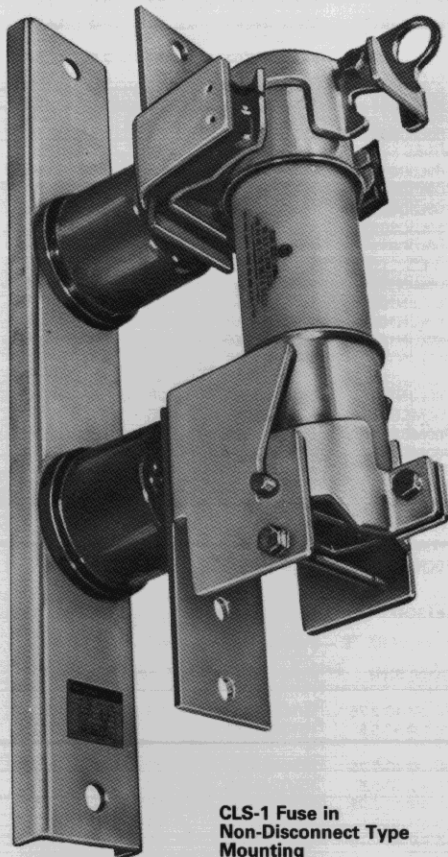




July, 1986
Supersedes Technical Data 36-691
dated November, 1984
Mailed to: E, D, C/36-600A

Indoor-Current Limiting Motor Starter Type
2400 to 7200 Volts, 30 to 700 Amps,
And Special Types

Types CLS-1 and CLS-2 Power Fuses



CLS-1 Fuse in
Non-Disconnect Type
Mounting



CLS-22

"R" Designation—NEMA SG.2-46-10

The numerical and "R" signifies that the fuse will melt in a range of 15 to 35 seconds at a current value equal to 100 x "R" number.

Note: CLS Fuses now have new ampere ratings and an "R" designation. The table below shows the necessary cross references: "Present rating" indicates those fuses manufactured prior to January, 1975 and not stamped with an "R" rating.

Present Ampere Rating	New Ampere Rating	Fuse "R" Designation
25	25	NONE
30	30	NONE
50	70	2R
70	100	3R
90	130	4R
110	150	5R
130	170	6R
200	200	9R
225	230	12R
300	390	18R
400	450	24R
480	480	26R
650	600	32R
700	650	36R
...	720	44R

UL Recognized Label

Underwriters' Laboratories has tested and now recognizes certain styles of the CLS-12, CLS-22, CLS-14, and CLS-24 fuses. Each fuse that has been recognized carries the "UL recognized" stamp.

Application

Type CLS-1 and CLS-2 current limiting fuses are used in conjunction with high voltage motor starters to provide short circuit protection for individual motors. Contactors in motor starting equipment protect the motor against overcurrents due to starting, stalling and plugging while current limiting fuses furnish short circuit protection only.

The duty of fuses in motor starter is characterized by the frequent application of high overloads such as motor starting currents. Motor starter fuses, therefore must be designed to withstand these frequent severe heating and cooling cycles without fatigue failures. Type CLS fuses are of such construction. They contain no elements sensitive to low currents. The CLS fuses are designed with a "fatigue proof" feature to provide highly uniform flexing of elements during heating cycles.

Advantages

Quiet Safe Operation

Designed for silent operation and elimination of flame discharges when fuse blows.

Easy Identification of Blown Fuse

Indicator will protrude from the bottom end of indicating type fuse providing a visual aid when the fuse has blown.

Space Economy

The fuse being designed for elimination of flame or gas discharges when operated, requires no discharge filters, fire boxes, special vents or reinforcing.

Complete Protection Provided

Current limiting fuses insure positive interruption. The fuse limits the magnitude of electro-mechanical stresses in the apparatus to be protected. They also control the surge voltage that is produced when the short circuit is limited to less than three times that of the nominal voltage rating.

Fatigue Proof

Bending or crimping of the silver elements prior to assembly permits the current limiting fuse to stand up under the most severe duty cycling without failure.



Types CLS-1 and CLS-2 Power Fuses

Construction

The CLS fuse is basically of inorganic construction, the only organic material used is glass resin outer casing and the plastic indicator. The fuse elements are pure silver and are crimped or bent at regular intervals to make the element structurally stronger and distribute expansion uniformly preventing failure due to severe duty cycling.

The design of the element combines maximum load carrying ability with the most favorable short circuit interruption characteristics. CLS fuses are filled with a high purity silica sand of controlled grain size.

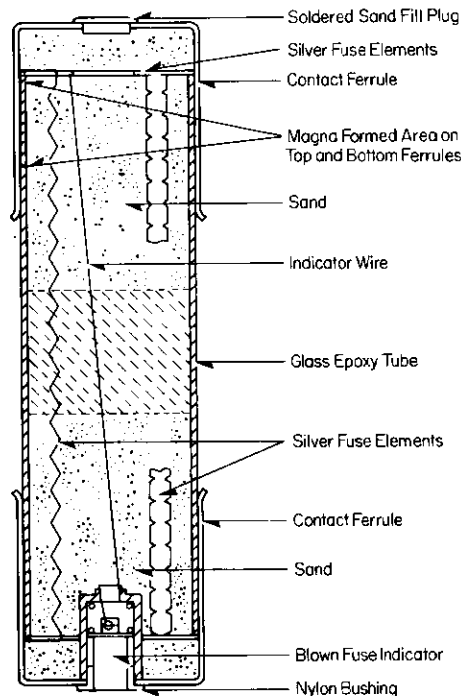


Figure 1: Cross-section drawing showing component parts of a type CLS-1 fuse unit

CLS Interchangeability Chart

The following information lists other manufacturer's fuse styles for which we have an interchangeable fuse unit or mounting. These fuses are mechanically interchangeable and carry the same current rating. For close coordination the time-current curves should be checked to assure desired selectivity. Included in the list are the manufacturer's style listed alpha-numerically, the Westinghouse style, current rating, voltage rating and type of fuse.

Allis Chalmers

A/C Style	Style	Amps	KV	Fuse
24-FM2X-4	591C812G02	2R	2.8	CLS
24-FM3X-4	591C812G03	3R	2.8	CLS
24-FM4X-4	591C812G04	4R	2.8	CLS
24-FM6X-4	591C812G06	6R	2.8	CLS
24-FM9X-4	591C812G07	9R	2.8	CLS
24-FM12X-4	591C812G08	12R	2.8	CLS
24-FM18X-5	591C813G01	18R	2.8	CLS
24-FM24X-5	591C813G02	24R	2.8	CLS
48-FM2X-4	151D241G02	2R	5.5	CLS
48-FM3X-4	151D241G03	3R	5.5	CLS
48-FM4X-4	151D241G04	4R	5.5	CLS
48-FM6X-4	151D241G06	6R	5.5	CLS
48-FM9X-4	151D961G01	9R	5.5	CLS
48-FM12X-4	151D961G02	12R	5.5	CLS
48-FM18X-5	151D961G03	18R	5.5	CLS
48-FM24X-5	151D961G04	24R	5.5	CLS

Bussman

Buss Style	Style	Amps	KV	Fuse
JCL 2R	151D241G02	2R	5.5	CLS
JCL 3R	151D241G03	3R	5.5	CLS
JCL 4R	151D241G04	4R	5.5	CLS
JCL 6R	151D241G06	6R	5.5	CLS
JCL 9R	151D961G01	9R	5.5	CLS
JCL 12R	151D961G02	12R	5.5	CLS
JCL 18R	151D961G03	18R	5.5	CLS
JCL 24R	151D961G04	24R	5.5	CLS
JCK 2R	591C812G02	2R	2.8	CLS
JCK 3R	591C812G03	3R	2.8	CLS
JCK 4R	591C812G04	4R	2.8	CLS
JCK 6R	591C812G06	6R	2.8	CLS
JCK 9R	591C812G07	9R	2.8	CLS
JCK 12R	591C812G08	12R	2.8	CLS
JCK 18R	591C813G01	18R	2.8	CLS
JCK 24R	591C813G02	24R	2.8	CLS

General Electric

G.E. Style	Style	Amps	KV	Fuse
9F60LCB802	591C812G02	2R	2.8	CLS
9F60LCB803	591C812G03	3R	2.8	CLS
9F60LCB804	591C812G04	4R	2.8	CLS
9F60LCB806	591C812G06	6R	2.8	CLS
9F60LCB809	591C812G07	9R	2.8	CLS
9F60LCB812	591C812G08	12R	2.8	CLS
9F60LCL102	591C154G02	2R	2.8	CLS
9F60LCL103	591C154G03	3R	2.8	CLS
9F60LCL104	592C154G04	4R	2.8	CLS
9F60LCL106	591C154G06	6R	2.8	CLS
9F60LCL109	591C154G07	9R	2.8	CLS
9F60LCL112	591C154G08	12R	2.8	CLS
9F60LJD802	151D241G02	2R	5.5	CLS
9F60LJD803	151D241G03	3R	5.5	CLS
9F60LJD804	151D241G04	4R	5.5	CLS
9F60LJD806	151D241G06	6R	5.5	CLS
9F60LJD809	151D961G01	9R	5.5	CLS
9F60LJD812	151D961G02	12R	5.5	CLS
9F60LJN102	151D240G02	2R	5.5	HCLS
9F60LJN103	151D240G03	3R	5.5	HCLS
9F60LJN104	151D240G04	4R	5.5	HCLS
9F60LJN106	151D240G06	6R	5.5	HCLS
9F60LJN109	151D962G01	9R	5.5	HCLS
9F60LJN112	151D962G02	12R	5.5	HCLS
9F60MCB818	591C813G01	18R	2.8	CLS
9F60MCB824	591C813G02	24R	2.8	CLS
9F60MCL118	591C156G01	18R	2.8	CLS
9F60MCL124	591C156G02	24R	2.8	CLS
9F60MJD818	151D961G03	18R	5.5	CLS
9F60MJD824	151D961G04	24R	5.5	CLS
9F60MJN118	151D962G03	18R	5.5	HCLS
9F60MJN124	151D962G04	24R	5.5	HCLS

Nelson

Nelson Style	Style	Amps	KV	Fuse
70-2M-IC-2.75	591C812G01	2R	2.8	CLS
70-2M-IC-5.5	151D241G01	2R	5.5	CLS
100-3M-IC-2.75	591C812G03	3R	2.8	CLS
100-3M-IC-5.5	151D241G03	3R	5.5	CLS
130-4M-IC-2.75	591C812G04	4R	2.8	CLS
130-4M-IC-5.5	151D241G04	4R	5.5	CLS
150-5M-IC-2.75	591C812G05	5R	2.8	CLS
150-5M-IC-5.5	151D241G05	5R	5.5	CLS
170-6M-IC-2.75	591C812G06	6R	2.8	CLS
170-6M-IC-5.5	151D241G06	6R	5.5	CLS
200-9M-IC-2.75	591C812G07	9R	2.8	CLS
200-9M-IC-5.5	151D961G01	9R	5.5	CLS
230-12M-IC-2.75	591C812G08	12R	2.8	CLS
230-12M-IC-5.5	151D961G02	12R	5.5	CLS
390-18M-2C-2.75	591C813G01	18R	2.8	CLS
390-18M-2C-5.5	151D961G03	18R	5.5	CLS
450-24M-2C-2.75	591C813G02	24R	2.8	CLS
450-24M-2C-5.5	151D961G04	24R	5.5	CLS

Further Information

Dimensions: TCS 36-712

Prices: PL 36-609

Technical Data: TD 36-710



Types CLS-1 and CLS-2 Power Fuses

Fuse Units

Type	Amps	"R" Des.	Max. Voltage Design	Interrupting Rating RMS Amps (SYM.)	Interrupting Rating Amps (ASYM.)	Style Number ③	Curve No.	Approx. Ship. Wt.	Fuse Mtg. Size
2400 Volt – Indoor – 3" Diameter Ferrule – 7" Clip Center For Use on All Makes of High Voltage Starters Without Hookeye (Min. Order Quan. (3)) (No Returns)									
CLS-1 50/60 Hertz	25	NONE	2540Ⓢ	50,000	80,000	591C812G01	3, 4, 9,	7	D
	70	2R	2540Ⓢ	50,000	80,000	591C812G02	3, 4, 9	7	
	100	3R	2540Ⓢ	50,000	80,000	591C812G03	3, 4, 9	7	
	130	4R	2540Ⓢ	50,000	80,000	591C812G04	3, 4, 9	7	
	150	5R	2540Ⓢ	50,000	80,000	591C812G05	3, 4, 9	7	
	170	6R	2540Ⓢ	50,000	80,000	591C812G06	3, 4, 9	7	
	200	...	2540Ⓢ	50,000	80,000	591C812G07	3, 4, 9	7	
	230	...	2540Ⓢ	50,000	80,000	591C812G08	3, 4, 9	7	
CLS-2 50/60 Hertz	390	...	2750	50,000	80,000	591C813G01	3, 4, 9	16	E
	450	24R	2750	50,000	80,000	591C813G02	3, 4, 9	16	
2400 Volt – Indoor – 3" Diameter Ferrule – 7" Clip Center With Hookeye For Use on Ampgard® Starters (Min. Order Quan. (3)) (No Returns)									
CLS-15 50/60 Hertz	25Ⓢ	None	2540Ⓢ	50,000	80,000	591C142G01	3, 4, 9	8	None
	70	2R	2540Ⓢ	50,000	80,000	591C142G02	3, 4, 9	8	
	100	3R	2540Ⓢ	50,000	80,000	591C142G03	3, 4, 9	8	
	130	4R	2540Ⓢ	50,000	80,000	591C142G04	3, 4, 9	8	
	150	5R	2540Ⓢ	50,000	80,000	591C142G05	3, 4, 9	8	
	170	6R	2540Ⓢ	50,000	80,000	591C142G06	3, 4, 9	8	
	200	9R	2540Ⓢ	50,000	80,000	591C142G07	3, 4, 9	8	
	230	12R	2540Ⓢ	50,000	80,000	591C142G08	3, 4, 9	8	
CLS-25 50/60 Hertz	390	18R	2540Ⓢ	50,000	80,000	591C143G01	3, 4, 9	17	None
	450	24R	2540Ⓢ	50,000	80,000	591C143G02	3, 4, 9	17	
2.4/4.8 kV Indoor Fuse For Use With All Makes of High Voltage Starters – 3" Diameter Ferrule – 12" Clip Center Without Hookeye (Min. Order Quan. (3)) (No Returns)									
CLS-14 50/60 Hertz	30	NONE	5.08Ⓢ kV	50,000	80,000	⑤151D241G01	5, 6, 9	9	None
	70	2R	5.08Ⓢ kV	50,000	80,000	⑤151D241G02	5, 6, 9	9	
	100	3R	5.08Ⓢ kV	50,000	80,000	⑤151D241G03	5, 6, 9	9	
	130	4R	5.08Ⓢ kV	50,000	80,000	⑤151D241G04	5, 6, 9	9	
	150	5R	5.08Ⓢ kV	50,000	80,000	⑤151D241G05	5, 6, 9	9	
	170	6R	5.08Ⓢ kV	50,000	80,000	⑤151D241G06	5, 6, 9	9	
	200	9R	5.08Ⓢ kV	50,000	80,000	⑤151D961G01	5, 6, 9	9	
	230	12R	5.08Ⓢ kV	50,000	80,000	⑤151D961G02	5, 6, 9	9	
CLS-24 50/60 Hertz	390	18R	2.75/5.5 kV	50,000	80,000	⑤151D961G03	5, 6, 9	17	None
	450	24R	2.75/5.5 kV	50,000	80,000	151D961G04	5, 6, 9	17	
2.4/4.8 kV – Indoor Fuse For Use With Ampgard® Starters – 3" Diameter Ferrule – 12" Clip Center, With Hookeye (Min. Order Quan. (3)) (No Returns)									
CLS-12 50/60 Hertz	30	NONE	5.08Ⓢ kV	50,000	80,000	⑤449D597G01	5, 6, 9	9	None
	70	2R	5.08Ⓢ kV	50,000	80,000	⑤449D597G02	5, 6, 9	9	
	100	3R	5.08Ⓢ kV	50,000	80,000	⑤449D597G03	5, 6, 9	9	
	130	4R	5.08Ⓢ kV	50,000	80,000	⑤449D597G04	5, 6, 9	9	
	150	5R	5.08Ⓢ kV	50,000	80,000	⑤449D597G05	5, 6, 9	9	
	170	6R	5.08Ⓢ kV	50,000	80,000	⑤449D597G06	5, 6, 9	9	
	200	9R	5.08Ⓢ kV	50,000	80,000	⑤151D933G01	5, 6, 9	9	
	230	12R	5.08Ⓢ kV	50,000	80,000	⑤151D933G02	5, 6, 9	9	
CLS-22 50/60 Hertz	390	18R	5.08Ⓢ kV	50,000	80,000	⑤151D933G03	5, 6, 9	17	None
	450	24R	5.08Ⓢ kV	50,000	80,000	⑤151D933G04	5, 6, 9	17	
	480	26R	2.8/4.3 kV	50,000	80,000	151D207G01	1, 2, 9	17	
Special – 2.4/4.8 kV – Indoor Fuse for Use on Ampgard® Starters – 4" Diameter Ferrule (Min. Order Quan. (3)) (No Returns)									
CLS-700 50/60 Hertz	600	32R	5.08Ⓢ kV	50,000	80,000	140D045G01	5, 6, 9	40	None
	650	36R	5.08Ⓢ kV	50,000	80,000	140D045G02	5, 6, 9	40	
	450	24R	5.08Ⓢ kV	50,000	80,000	140D045G03	5, 6, 9	40	
	450	24R	5.08Ⓢ kV	50,000	80,000	①151D257G05	5, 6, 9	40	
	650	36R	5.08Ⓢ kV	50,000	80,000	①151D257G01	5, 6, 9	40	
	600	32R	5.08Ⓢ kV	50,000	80,000	①151D257G02	5, 6, 9	40	
	600E	None	2.75/5.5 kV	40,000Ⓢ	64,000Ⓢ	②151D979G01	④	40	
	750E	None	2.75/5.5 kV	40,000Ⓢ	64,000Ⓢ	②151D979G02	④	40	

① This fuse has the melting characteristics of the CLS-700 but the external dimensions of the CLE-750.

② This fuse has the melting characteristics of the CLE-750, but the external dimensions of the 140D045 series.

③ Heavy Duty mounting recommended where full load exceeds 200 Amps.

④ See Application Data 36-715.

⑤ UL component recognition.

Ⓢ Changed since previous issue.



Types CLS-1 and CLS-2 Power Fuses

Fuse Units, Continued

Type	Amps	"R" Des.	Max. Voltage Design	Interrupting Rating RMS Amps (SYM.)	Interrupting Rating Amps (ASYM.)	Style Number ②	Curve No.	Approx. Ship. Wt.	Fuse Mtg. Size
4800 Volt - Indoor - 3" Diameter Ferrule - 14" Clip Center Without Hookeys (Min. Order Quan. (3)) (No Returns)									
CLS-1	70	2R	5080Ⓢ	50,000	80,000	676C546G15	1, 2, 9	10¾	D
50/60 Hertz	100	3R	5080Ⓢ	50,000	80,000	676C546G16	1, 2, 9	10¾	
	130	4R	5080Ⓢ	50,000	80,000	676C546G17	1, 2, 9	10¾	
	150	5R	5080Ⓢ	50,000	80,000	676C546G18	1, 2, 9	10¾	
	170	6R	5080Ⓢ	50,000	80,000	676C546G19	1, 2, 9	10¾	
	200	9R	5080Ⓢ	50,000	80,000	676C546G22	1, 2, 9	10¾	
	230	12R	5080Ⓢ	50,000	80,000	676C546G25	1, 2, 9	10¾	
21CLS-2	390	18R	5080Ⓢ	50,000	80,000	304C463G03	1, 2, 9	21	E
50/60 Hertz	450	24R	5080Ⓢ	50,000	80,000	304C463G04	1, 2, 9	21	
7200 Volt - Indoor - 3" Diameter Ferrule - 12" Clip Center With Hookeys (Minimum Order Quan. (3)) (No Returns)									
CLSS-18	70	2R	8300	50,000	80,000	151D963G01	13, 14	9	None
50/60 Hertz	100	3R	8300	50,000	80,000	151D963G02	13, 14	9	
	130	4R	8300	50,000	80,000	151D963G03	13, 14	9	
	150	5R	8300	50,000	80,000	151D963G04	13, 14	9	
	170	6R	8300	50,000	80,000	151D963G05	13, 14	9	
	200	9R	7200	50,000	80,000	151D963G06	13, 14	9	
	230	12R	7200	50,000	80,000	151D963G07	13, 14	7	
CLSS-28	390	18R	7200	50,000	80,000	151D963G10	13, 14	17	None
50/60 Hertz									
7200 Volt - Indoor - 3" Diameter Ferrule - 14" Clip Center With Hookeys (Min. Order Quan. (3)) (No Returns)									
CLS-18	15	None	8300	50,000	80,000	151D256G01	7, 8, 10	10½	None
50/60 Hertz	30	None	8300	50,000	80,000	151D256G02	7, 8, 10	10½	
	60	None	8300	50,000	80,000	151D256G03	7, 8, 10	10½	
	70	None	8300	50,000	80,000	151D256G04	7, 8, 10	10½	
	90	None	8300	50,000	80,000	151D256G05	7, 8, 10	10½	
	110	None	8300	50,000	80,000	151D256G06	7, 8, 10	10½	
	125	None	8300	50,000	80,000	151D256G07	7, 8, 10	10½	
CLS-28	150	None	8300	50,000	80,000	151D256G11	7, 8, 10	17	None
50/60 Hertz	200	None	8300	50,000	80,000	151D256G12	7, 8, 10	17	
	225	None	8300	50,000	80,000	151D256G13	7, 8, 10	17	
2400 Volt Indoor Fuse, Hermetically Sealed Class #1, Group D, Division 2, Hazardous Locations. For Use with Ampgard® Starter 3" Diameter Ferrule - 7" Clip Center With Hookeys (Min. Order Quan. (3)) (No Returns)									
HCLS-15	25Ⓢ	None	2540Ⓢ	50,000	80,000	591C155G01	3, 4, 9	7	None
50/60 Hertz	70	2R	2540Ⓢ	50,000	80,000	591C155G02	3, 4, 9	7	
	100	3R	2540Ⓢ	50,000	80,000	591C155G03	3, 4, 9	7	
	130	4R	2540Ⓢ	50,000	80,000	591C155G04	3, 4, 9	7	
	150	5R	2540Ⓢ	50,000	80,000	591C155G05	3, 4, 9	7	
	170	6R	2540Ⓢ	50,000	80,000	591C155G06	3, 4, 9	7	
	200	...	2540Ⓢ	50,000	80,000	591C155G07	3, 4, 9	7	
	230	...	2540Ⓢ	50,000	80,000	591C155G08	3, 4, 9	7	
HCLS-25	390	...	2540Ⓢ	50,000	80,000	591C157G01	3, 4, 9	16	None
50/60 Hertz	450	24R	2540Ⓢ	50,000	80,000	591C157G02	3, 4, 9	16	
2.4/4.8 kV - Indoor Fuse, Hermetically Sealed, Class #1, Group D Hazardous Locations For Use With Ampgard® Starters - 3" Diameter Ferrule - 12" Clip Center, With Hookeys① (Min. Order Quan. (3)) (No Returns)									
HCLS-12	30	None	5.08Ⓢ kV	50,000	80,000	151D240G01	5, 6, 9	9	None
50/60 Hertz	70	2R	5.08Ⓢ kV	50,000	80,000	151D240G02	5, 6, 9	9	
	100	3R	5.08Ⓢ kV	50,000	80,000	151D240G03	5, 6, 9	9	
	130	4R	5.08Ⓢ kV	50,000	80,000	151D240G04	5, 6, 9	9	
	150	5R	5.08Ⓢ kV	50,000	80,000	151D240G05	5, 6, 9	9	
	170	6R	5.08Ⓢ kV	50,000	80,000	151D240G06	5, 6, 9	9	
	200	9R	5.08Ⓢ kV	50,000	80,000	151D962G01	5, 6, 9	9	
	230	12R	5.08Ⓢ kV	50,000	80,000	151D962G02	5, 6, 9	9	
HCLS-22	390	18R	5.08Ⓢ kV	50,000	80,000	151D962G03	5, 6, 9	17	None
50/60 Hertz	450	24R	5.08Ⓢ kV	50,000	80,000	151D962G04	5, 6, 9	17	

① When hermetically sealed fuse without hookeys is required order this style and remove hookeys.

② Heavy Duty Mounting recommended where full load exceeds 230 amps.

Ⓢ Changed since previous issue.

Westinghouse Electric Corporation
Distribution and Control Business Unit
Commercial Division
Greentree, PA 15220