

Achieving Type 2 “No Damage” Motor Start Protection

Square D TeSys D Line (Telemecanique) IEC Class 10 Overload Relay & Mersen Fuses

Type 2 “No Damage” Protection - What Is It and Which Fuses Are Best?

Type 2 protection, also referred to as “no damage” protection, simply means that if a short circuit occurs, the short circuit protective device will operate fast enough to prevent fault current damage to healthy equipment in the system. Tests show that current-limiting fuses are the best choice for the protection of the motor controllers if damage-free performance is required. To ensure that correct fuse choices are made, short circuit tests must be made on every possible combination of motor control and fuse. This sheet summarizes a major manufacturer’s motor starter and the Mersen time-delay fuses which give Type 2 “no damage” protection. All combinations are UL witnessed and certified.

200 Volt, Three-Phase Motors

HP	Contactor	OLR	Class J	Class CC	SCCR (kA)
1/2	LC1D09	LRD07	AJT5	ATDR8	100
3/4	LC1D09	LRD08	AJT5	ATDR12	100
1	LC1D09	LRD10	AJT20	ATDR30	100
1 1/2	LC1D09	LRD12	AJT20	ATDR30	100
2	LC1D09	LRD12	AJT20	ATDR30	100
3	LC1D12	LRD16	AJT20	ATDR30	100
10	LC1D40	LRD3355	AJT60	-	100
15	LC1D50	LRD3357	AJT70	-	100
20	LC1D65	LRD3359	AJT100	-	100
25	LC1D80	LRD3363	AJT110	-	100
30	LC1D115	LR9D5569	AJT150	-	100
40	LC1D150	LR9D5569	AJT200	-	100

230 Volt, Three-Phase Motors

HP	Contactor	OLR	Class J	Class CC	SCCR (kA)
1/2	LC1D09	LRD07	AJT5	ATDR8	100
3/4	LC1D09	LRD08	AJT5	ATDR12	100
1	LC1D09	LRD10	AJT20	ATDR30	100
1 1/2	LC1D09	LRD12	AJT20	ATDR30	100
2	LC1D09	LRD12	AJT20	ATDR30	100
3	LC1D12	LRD16	AJT20	ATDR30	100
10	LC1D40	LRD3355	AJT60	-	100
15	LC1D50	LRD3357	AJT70	-	100
20	LC1D65	LRD3359	AJT100	-	100
25	LC1D80	LRD3363	AJT110	-	100
30	LC1D80	LRD3363	AJT110	-	100
40	LC1D115	LR9D5569	AJT150	-	100

460 Volt, Three-Phase Motors

HP	Contactor	OLR	Class J	Class CC	SCCR (kA)
1/2	LC1D09	LRD06	AJT2	ATDR5	100
3/4	LC1D09	LRD06	AJT2	ATDR5	100
1	LC1D09	LRD07	AJT5	ATDR8	100
1 1/2	LC1D09	LRD08	AJT5	ATDR12	100
2	LC1D09	LRD08	AJT5	ATDR12	100
3	LC1D09	LRD10	AJT20	ATDR30	100
5	LC1D09	LRD14	AJT20	ATDR30	100
7 1/2	LC1D12	LRD16	AJT20	ATDR30	100
10	LC1D18	LRD21	AJT25	-	100
15	LC1D25	LRD22	AJT35	-	100
15	LC1D32	LRD22	AJT40	-	100
25	LC1D40	LRD3355	AJT60	-	100
30	LC1D40	LRD3355	AJT60	-	100
30	LC1D40	LRD3357	AJT60	-	100
40	LC1D50	LRD3359	AJT70	-	100
50	LC1D65	LRD3359	AJT100	-	100
60	LC1D80	LRD5363	AJT110	-	100
75	LC1D115	LR9D5569	AJT150	-	100
100	LC1D150	LR9D5569	AJT200	-	100

575 Volt, Three-Phase Motors

HP	Contactor	OLR	Class J	Class CC	SCCR (kA)
1/2	LC1D09	LRD05	AJT1-1/2	ATDR2-8/10	100
3/4	LC1D09	LRD06	AJT2	ATDR5	100
1	LC1D09	LRD07	AJT5	ATDR8	100
1 1/2	LC1D09	LRD07	AJT5	ATDR8	100
2	LC1D09	LRD08	AJT5	ATDR12	100
3	LC1D09	LRD08	AJT5	ATDR12	100
5	LC1D09	LRD12	AJT20	ATDR30	100
7 1/2	LC1D12	LRD16	AJT20	ATDR30	100
10	LC1D18	LRD16	AJT20	ATDR30	100
15	LC1D25	LRD21	AJT25	-	100
20	LC1D32	LRD22	AJT40	-	100
30	LC1D40	LRD3355	AJT60	-	100
40	LC1D50	LRD3357	AJT70	-	100
50	LC1D65	LRD3359	AJT100	-	100
75	LC1D115	LR9D5367	AJT125	-	100
100	LC1D115	LR9D5569	AJT150	-	100
125	LC1D150	LR9D5569	AJT200	-	100

[www.squared.com/.../iec_contactors_starters.nsf/unid/B7D67A0C9FB16F8285256F6900567C4E/\\$file/Shawmutt10.htm](http://www.squared.com/.../iec_contactors_starters.nsf/unid/B7D67A0C9FB16F8285256F6900567C4E/$file/Shawmutt10.htm) - 22k

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Square D TeSys D Line (Telemecanique) IEC Class 10 Overload Relay & Mersen Fuses

200 Volt, Three-Phase Motors

HP	Contactor	OLR	Class J	Class CC	SCCR (kA)
1/2	LC1D09	LRD07	AJT5	ATDR8	100
3/4	LC1D09	LRD08	AJT5	ATDR12	100
1	LC1D09	LRD10	AJT20	ATDR30	100
1 1/2	LC1D09	LRD12	AJT20	ATDR30	100
2	LC1D09	LRD12	AJT20	ATDR30	100
3	LC1D12	LRD16	AJT20	ATDR30	100
10	LC1D40	LRD3355	AJT60	-	100
15	LC1D50	LRD3357	AJT70	-	100
20	LC1D65	LRD3359	AJT100	-	100
25	LC1D80	LRD3363	AJT110	-	100
30	LC1D115	LR9D5569	AJT150	-	100
40	LC1D150	LR9D5569	AJT200	-	100

230 Volt, Three-Phase Motors

HP	Contactor	OLR	Class J	Class CC	SCCR (kA)
1/2	LC1D09	LRD07	AJT5	ATDR8	100
3/4	LC1D09	LRD08	AJT5	ATDR12	100
1	LC1D09	LRD10	AJT20	ATDR30	100
1 1/2	LC1D09	LRD12	AJT20	ATDR30	100
2	LC1D09	LRD12	AJT20	ATDR30	100
3	LC1D12	LRD16	AJT20	ATDR30	100
10	LC1D40	LRD3355	AJT60	-	100
15	LC1D50	LRD3357	AJT70	-	100
20	LC1D65	LRD3359	AJT100	-	100
25	LC1D80	LRD3363	AJT110	-	100
30	LC1D80	LRD3363	AJT110	-	100
40	LC1D115	LR9D5569	AJT150	-	100

460 Volt, Three-Phase Motors

HP	Contactor	OLR	Class J	Class CC	SCCR (kA)
1/2	LC1D09	LRD06	AJT2	ATDR5	100
3/4	LC1D09	LRD06	AJT2	ATDR5	100
1	LC1D09	LRD07	AJT5	ATDR8	100
1 1/2	LC1D09	LRD08	AJT5	ATDR12	100
2	LC1D09	LRD08	AJT5	ATDR12	100
3	LC1D09	LRD10	AJT20	ATDR30	100
5	LC1D09	LRD14	AJT20	ATDR30	100
7 1/2	LC1D12	LRD16	AJT20	ATDR30	100
10	LC1D18	LRD21	AJT25	-	100
15	LC1D25	LRD22	AJT35	-	100
15	LC1D32	LRD22	AJT40	-	100
25	LC1D40	LRD3355	AJT60	-	100
30	LC1D40	LRD3355	AJT60	-	100
30	LC1D40	LRD3357	AJT60	-	100
40	LC1D50	LRD3359	AJT70	-	100
50	LC1D65	LRD3359	AJT100	-	100
60	LC1D80	LRD5363	AJT110	-	100
75	LC1D115	LR9D5569	AJT150	-	100
100	LC1D150	LR9D5569	AJT200	-	100

575 Volt, Three-Phase Motors

HP	Contactor	OLR	Class J	Class CC	SCCR (kA)
1/2	LC1D09	LRD05	AJT1-1/2	ATDR2-8/10	100
3/4	LC1D09	LRD06	AJT2	ATDR5	100
1	LC1D09	LRD07	AJT5	ATDR8	100
1 1/2	LC1D09	LRD07	AJT5	ATDR8	100
2	LC1D09	LRD08	AJT5	ATDR12	100
3	LC1D09	LRD08	AJT5	ATDR12	100
5	LC1D09	LRD12	AJT20	ATDR30	100
7 1/2	LC1D12	LRD16	AJT20	ATDR30	100
10	LC1D18	LRD16	AJT20	ATDR30	100
15	LC1D25	LRD21	AJT25	-	100
20	LC1D32	LRD22	AJT40	-	100
30	LC1D40	LRD3355	AJT60	-	100
40	LC1D50	LRD3357	AJT70	-	100
50	LC1D65	LRD3359	AJT100	-	100
75	LC1D115	LR9D5367	AJT125	-	100
100	LC1D115	LR9D5569	AJT150	-	100
125	LC1D150	LR9D5569	AJT200	-	100

[www.squared.com/.../iec_contactors_starters.nsf/unid/B7D67A0C9FB16F8285256F6900567C4E/\\$file/Shawmutt10.htm](http://www.squared.com/.../iec_contactors_starters.nsf/unid/B7D67A0C9FB16F8285256F6900567C4E/$file/Shawmutt10.htm) - 22k

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Achieving Type 2 “No Damage” Motor Start Protection

Square D NEMA Motor Starters and Mersen Fuses

Type 2 “No Damage” Protection - What Is It and Which Fuses Are Best?

Type 2 protection, also referred to as “no damage” protection, simply means that if a short circuit occurs, the short circuit protective device will operate fast enough to prevent fault current damage to healthy equipment in the system. Tests show that current-limiting fuses are the best choice for the protection of the motor controllers if damage-free performance is required. To ensure that correct fuse choices are made, short circuit tests must be made on every possible combination of motor control and fuse. This sheet summarizes a major manufacturer’s motor starter and the Mersen time-delay fuses which give Type 2 “no damage” protection. All combinations are UL witnessed and certified.

200 Volt, Three-Phase Motors

HP	Starter	Cat. No.	Heater Size	Class RK1	Class J	SCCR (kA)
1 1/2	0	SB02V02S	B10.2	A6D12R	AJT10	100
2	0	SB02V02S	B12.8	A6D15R	AJT12	100
3	0	SB02V02S	B19.5	A6D20R	AJT17-1/2	100
5	1	SC03V02S	B32	A6D30R	AJT30	100
7 1/2	1	SC03V02S	B50	A6D50R	AJT45	100
10	2	SD01V02S	B62	A6D60R	AJT60	100
15	3	SE01V02S	CC81.5	A6D90R	AJT80	100
20	3	SE01V02S	CC112	A6D110R	AJT110	100
25	3	SE01V02S	CC180	A6D150R	AJT125	100
30	4	SF01V02S	CC156	A6D175R	AJT150	100
40	4	SF01V02S	CC208	A6D200R	AJT200	100
50	5	SG01V02SY500	B3.70	A6D250R	AJT250	100
60	5	SG01V02SY500	B4.15	A6D350R	AJT300	100
75	5	SG01V02SY500	B5.50	A6D400R	AJT400	100

230 Volt, Three-Phase Motors

HP	Starter	Cat. No.	Heater Size	Class RK1	Class J	SCCR (kA)
1 1/2	0	SB02V02S	B8.20	A6D10R	AJT8	100
2	0	SB02V02S	B11.5	A6D15R	AJT12	100
3	0	SB02V02S	B15.5	A6D17-1/2R	AJT15	100
5	1	SC03V02S	B28.0	A6D30R	AJT25	100
7 1/2	1	SC03V02S	B45	A6D40R	AJT40	100
10	2	SD01V02S	B50	A6D50R	AJT50	100
15	3	SE01V02S	CC68.5	A6D70R	AJT70	100
20	3	SE01V02S	CC94.0	A6D100R	AJT90	100
25	3	SE01V02S	CC132	A6D125R	AJT110	100
30	3	SE01V02S	CC196	A6D150R	AJT150	100
40	4	SF01V02S	CC180	A6D175R	AJT175	100
50	5	SG01V02SY500	B3.30	A6D225R	AJT225	100
60	5	SG01V02SY500	B3.70	A6D250R	AJT250	100
75	5	SG01V02SY500	B4.15	A6D350R	AJT300	100
100	5	SG01V02SY500	B6.25	A6D400R	AJT400	100

460 Volt, Three-Phase Motors

HP	Starter	Cat. No.	Heater Size	Class RK1	Class J	SCCR (kA)
3	0	SB02V02S	B7.70	A6D9R	AJT8	100
5	0	SB02V02S	B12.8	A6D15R	AJT12	100
7 1/2	1	SC03V02S	B19.5	A6D20R	AJT17-1/2	100
10	1	SC03V02S	B25	A6D25R	AJT25	100
15	2	SD01V02S	B36	A6D35R	AJT35	100
20	2	SD01V02S	B45	A6D50R	AJT45	100
25	2	SD01V02S	B70	A6D60R	AJT60	100
30	3	SE01V02S	CC64.3	A6D70R	AJT70	100
40	3	SE01V02S	CC87.7	A6D90R	AJT90	100
50	3	SE01V02S	CC121	A6D125R	AJT110	100
60	4	SF01V02S	CC121	A6D150R	AJT125	100
75	4	SF01V02S	CC167	A6D175R	AJT175	100
100	5	SG01V02SY500	B3.00	A6D225R	AJT225	100
125	5	SG01V02SY500	B3.70	A6D250R	AJT250	100
150	5	SG01V02SY500	B4.15	A6D350R	AJT300	100
200	5	SG01V02SY500	B6.25	A6D400R	AJT400	100

575 Volt, Three-Phase Motors

HP	Starter	Cat. No.	Heater Size	Class RK1	Class J	SCCR (kA)
3	0	SB02V02S	B6.25	A6D7R	AJT6	100
5	0	SB02V02S	B10.2	A6D12R	AJT10	100
7 1/2	1	SC03V02S	B15.5	A6D17-1/2R	AJT15	100
10	1	SC03V02S	B19.5	A6D20R	AJT17-1/2	100
15	2	SD01V02S	B28.0	A6D30R	AJT25	100
20	2	SD01V02S	B40	A6D40R	AJT40	100
25	2	SD01V02S	B45	A6D50R	AJT45	100
30	3	SE01V02S	CC50.1	A6D60R	AJT50	100
40	3	SE01V02S	CC68.5	A6D70R	AJT70	100
50	3	SE01V02S	CC87.7	A6D90R	AJT90	100
60	4	SF01V02S	CC103	A6D110R	AJT110	100
75	4	SF01V02S	CC121	A6D150R	AJT125	100
100	4	SF01V02S	CC167	A6D175R	AJT175	100
125	5	SG01V02SY500	B3.00	A6D225R	AJT225	100
150	5	SG01V02SY500	B3.70	A6D250R	AJT250	100
200	5	SG01V02SY500	B4.15	A6D350R	AJT300	100

* These overloads were not tested. Maximum fuse sizes are for the lower value of over-load which was tested.

** Y500 † Sized larger than code max for single motor.

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