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Supplemental Information - Applicable Documents

The contents of this supplement apply to the product instructions in [Table 1.1](#).

Table 1.1 Affected Documents

Drive Series	Document
GA500	Installation & Primary Operation (TOEPC71061752)
	Technical Reference (SIEPC71061752)
	Quick Setup Procedure (TOEPC71061769)

Short Circuit Protection Requirements for UL Listing

Install one of these types of short circuit protection to comply with UL 61800-5-1. Semiconductor protective type fuses are recommended, but the tables also show alternative short circuit protection devices. Maximum Time Delay fuse is 175% of drive full load output amps (FLA). This includes all Class CC, J, T, or RK class fuses.

⚠ WARNING

Electrical Shock Hazard

After the input protective device trips, do not immediately energize the drive or operate peripheral devices. Wait for the time specified on the warning label at a minimum and make sure that all indicators are OFF. Then check the wiring and peripheral device ratings to find the cause of the problem. If you do not know the cause of the problem, contact Yaskawa before you energize the drive or peripheral devices.

If you do not fix the problem before you operate the drive or peripheral devices, it can cause serious injury or death.

- 240 V models

Use the protection specified in this document to prepare the drive for use on a circuit that supplies not more than 31,000 RMS and not more than 240 Vac when there is a short circuit in the power supply.

- 480 V models

Use the protection specified in this document to prepare the drive for use on a circuit that supplies not more than 31,000 RMS and not more than 480 Vac when there is a short circuit in the power supply.

The user must provide short circuit protection to protect input branch circuits as specified by the National Electric Code (NEC), the Canadian Electric Code, Part I (CEC), and local codes.

2.1	240 V Models	6
2.2	480 V Models	7
2.3	UL Compliance	8

2.1 240 V Models

Table 2.1 Required Short Circuit Protection for 240 V Models ³

Drive	Semiconductor Fuse Manufacturer: EATON/ Bussman		Class CC, J or T Fuse ^{*1}		Class RK Fuse ^{*5} or MCCB (Molded Case Circuit Breaker) ^{*6}				
	Part Number	Maximum SCCR (Fuse-Drive Combination)	Maximum Fuse Size (Amps) ^{*2}	Maximum SCCR (Fuse-Drive Combination)	Maximum RK Fuse Size (Amps) ²	Maximum MCCB Size (Amps) ²	Maximum SCCR (MCCB-Drive or Fuse-Drive Combination)	Mfr Catalog No. (Schneider Electric)	Minimum Enclosure Volume (in ³) ^{*4}
B001XXX	FWH-25A14F	31 kA	3.5	31 kA	3.5	15	31 kA	HLL36015	600
B002XXX	FWH-25A14F	31 kA	6	31 kA	6	15	31 kA	HLL36015	600
B004XXX	FWH-60B	31 kA	12	31 kA	12	15	31 kA	HLL36015	600
B006XXX	FWH-80B	31 kA	20	31 kA	20	25	31 kA	HLL36025	600
B010XXX	FWH-100B	31 kA	35	31 kA	35	40	31 kA	HLL36040	960
B012XXX	FWH-125B	31 kA	40	31 kA	40	45	31 kA	HLL36045	960
B018XXX	FWH-150B	31 kA	60	31 kA	60	70	31 kA	HLL36070	960
2001XXX	FWH-25A14F	31 kA	2	31 kA	2	15	31 kA	HLL36015	600
2002XXX	FWH-25A14F	31 kA	3.2	31 kA	3.2	15	31 kA	HLL36015	600
2004XXX	FWH-25A14F	31 kA	6	31 kA	6	15	31 kA	HLL36015	600
2006XXX	FWH-25A14F	31 kA	10	31 kA	10	15	31 kA	HLL36015	600
2008XXX	FWH-70B	31 kA	12	31 kA	12	15	31 kA	HLL36015	600
2010XXX	FWH-70B	31 kA	15	31 kA	15	15	31 kA	HLL36015	600
2012XXX	FWH-70B	31 kA	20	31 kA	20	20	31 kA	HLL36020	600
2018XXX	FWH-90B	31 kA	30	31 kA	30	35	31 kA	HLL36035	960
2021XXX	FWH-90B	31 kA	35	31 kA	35	40	31 kA	HLL36040	960
2030XXX	FWH-100B	31 kA	50	31 kA	50	60	31 kA	HLL36060	960
2042XXX	FWH-150B	31 kA	70	31 kA	n/a	80	31 kA	HLL36080	960
2056XXX	FWH-200B	31 kA	90	31 kA	n/a	110	31 kA	HLL36110	2560
2070XXX	FWH-200B	31 kA	110	31 kA	n/a	125	31 kA	HLL36125	2560
2082XXX	FWH-225B	31 kA	125	31 kA	n/a	150	31 kA	HLL36150	2560

*1 Class T fuses are fast acting (non-time delay) only.

*2 Maximum Fuse or MCCB ratings are based on ND ratings and 175 and 200% respectively.

*3 Alternate BCP fuse selection evaluation based on UL61800-5-1.

*4 Ventilated enclosure type.

*5 Protected enclosure required for RK fuses (same as MCCB).

*6 The specified MCCB is current limiting. An equivalent listed current limiting type MCCB is able to be used where the peak let-through current and I²t of the equivalent MCCB is not greater than the specified MCCB.

2.2 480 V Models

Table 2.2 Required Short Circuit Protection for 480 V Models ³

Drive	Semiconductor Fuse Manufacturer: EASTON/ Bussman		Class CC, J or T Fuse ^{*1}		Class RK Fuse ^{*5} or MCCB (Molded Case Circuit Breaker) ^{*6}					
	Part Number	Maximum SCCR (Fuse-Drive Combina tion)	Maximum Size (Amps) ^{*2}	Maximum SCCR (Fuse-Drive Combina tion)	Maximum RK Fuse Size (Amps)	Maximum SCCR (Fuse-Drive Combina tion)	Maximum MCCB Size (Amps) ²	Maximum SCCR (MCCB- Drive Combina tion)	Mfr Catalog No. (Schneider Electric)	Minimum Enclosure Volume (in ³) ^{*4}
4001XXX	FWH-40B	31kA	2	31kA	2	31kA	15	31kA	HLL36015	960
4002XXX	FWH-40B	31kA	3.5	31kA	3.5	31kA	15	31kA	HLL36015	960
4004XXX	FWH-50B	31kA	7	31kA	7	31kA	15	31kA	HLL36015	960
4005XXX	FWH-70B	31kA	9	31kA	9	31kA	15	31kA	HLL36015	960
4007XXX	FWH-70B	31kA	12	31kA	12	31kA	15	31kA	HLL36015	960
4009XXX	FWH-90B	31kA	15	31kA	15	31kA	15	31kA	HLL36015	960
4012XXX	FWH-90B	31kA	20	31kA	20	31kA	20	31kA	HLL36020	960
4018XXX	FWH-80B	31kA	30	31kA	30	31kA	35	31kA	HLL36035	960
4023XXX	FWH-100B	31kA	40	31kA	40	31kA	40	31kA	HLL36040	960
4031XXX	FWH-125B	31kA	50	31kA	50	31kA	60	31kA	HLL36060	2560
4038XXX	FWH-175B	31kA	60	31kA	n/a	n/a	75	31kA	HLL36075	2560
4044XXX	FWH-200B	31kA	75	31kA	n/a	n/a	80	31kA	HLL36080	2560
4060XXX	FWH-200B	31kA	100	31kA	n/a	n/a	110	31kA	HLL36110	2560

*1 Class T fuses are fast acting (non-time delay) only.

*2 Maximum Fuse or MCCB ratings are based on ND ratings and 175 and 200% respectively.

*3 Alternate BCP fuse selection evaluation based on UL61800-5-1.

*4 Ventilated enclosure type.

*5 Protected enclosure required for RK fuses (same as MCCB).

*6 The specified MCCB is current limiting. An equivalent listed current limiting type MCCB is able to be used where the peak let-through current and I²t of the equivalent MCCB is not greater than the specified MCCB.

2.3 UL Compliance

Install one of these types of short circuit protection devices in [Table 2.3](#) to comply with UL 61800-5-1. Semiconductor protective type fuses are recommended, but the table also shows alternative short circuit protection devices.

When you use MCCBs, RK1 or RK5 fuses, you must mount the drive in a ventilated enclosure according to the minimum enclosure volume specified in this document.

◆ Molded Case Circuit Breaker (MCCB) Ratings

- Maximum MCCB rating is 200% of the Normal-Duty drive full load output amp (FLA) rating.
- When you use MCCBs you must mount the drive in a ventilated enclosure according to the minimum enclosure volume specified in this document.

Note:

When you use MCCBs, current limiting type are recommended, but not required.

◆ Non-Semiconductor Fuse Ratings

- Maximum CC, J, T, RK1 or RK5 fuse rating is 175% of the Normal-Duty drive full load output amp (FLA) rating.

◆ Short Circuit Current Rating (SCCR)

The maximum SCCR provided by drive and fuse, or drive and MCCB combinations in this document, is 31,000 RMS symmetrical amps.

- **240 V models:** Use the protection specified in this document to prepare the drive for use on a circuit capable of delivering not more than 31,000 RMS symmetrical amps and not more than 240 Vac.
- **480 V models:** Use the protection specified in this document to prepare the drive for use on a circuit capable of delivering not more than 31,000 RMS symmetrical amps and not more than 480 Vac.

◆ Electric Code Compliance

The user must provide short circuit protection to protect input branch circuits as specified by the National Electric Code (NEC), the Canadian Electric Code, Part 1 (CEC), and local codes.

◆ Required Short Circuit Protection

Table 2.3 Required Short Circuit Protection for HV305 AC Drives

Drive Catalog Code HV35U	Ventilated Protected Enclosure Not Required		Ventilated Protected Enclosure Required		
	Semiconductor Fuse Part Number <i>Manufacturer: Eaton/ Bussman</i>	Class CC, J or T Fuse Maximum Amps	MCCB Maximum Amps	Class RK1 or RK5 Fuse Maximum Amps	Enclosure Volume Minimum (in ³)
Single-phase 240 V Class					
B001	FWH-25A14F	3.5	15	3.5	600
B002	FWH-25A14F	6	15	6	600
B004	FWH-60B	12	15	12	600
B006	FWH-80B	20	25	20	600
B010	FWH-100B	35	40	35	960
B012	FWH-125B	40	45	40	960
B018	FWH-150B	60	70	60	960
Three-phase 240 V Class					
2001	FWH-25A14F	2	15	2	600

Drive Catalog Code HV35U	Ventilated Protected Enclosure Not Required		Ventilated Protected Enclosure Required		
	Semiconductor Fuse Part Number <i>Manufacturer: Eaton/ Bussman</i>	Class CC, J or T Fuse Maximum Amps	MCCB Maximum Amps	Class RK1 or RK5 Fuse Maximum Amps	Enclosure Volume Minimum (in ³)
Single-phase 240 V Class					
2002	FWH-25A14F	3.2	15	3.2	600
2004	FWH-25A14F	6	15	6	600
2006	FWH-25A14F	10	15	10	600
2008	FWH-70B	12	15	12	600
2010	FWH-70B	15	15	15	600
2012	FWH-70B	20	20	20	600
2018	FWH-90B	30	35	30	960
2021	FWH-90B	35	40	35	960
2030	FWH-100B	50	60	50	960
2042	FWH-150B	70	80	n/a	960
2056	FWH-200B	90	110	n/a	2560
2070	FWH-200B	110	125	n/a	2560
2082	FWH-225B	125	150	n/a	2560
Three-phase 480 V Class					
4001	FWH-40B	2	15	2	960
4002	FWH-40B	3.5	15	3.5	960
4004	FWH-50B	7	15	7	960
4005	FWH-70B	9	15	9	960
4007	FWH-70B	12	15	12	960
4009	FWH-90B	15	15	15	960
4012	FWH-90B	20	20	20	960
4018	FWH-80B	30	35	30	960
4023	FWH-100B	40	40	40	960
4031	FWH-125B	50	60	50	2560
4038	FWH-175B	60	75	n/a	2560
4044	FWH-200B	75	80	n/a	2560
4060	FWH-200B	100	110	n/a	2560

Revision History

Date of Publication	Revision Number	Section	Revised Content
April 2021	<2>	All	Modification of protected enclosure requirements.
March 2020	<1>	All	Format and layout and wording. Normalized the Fuse and MCCB table.

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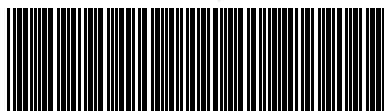
In the event that the end user of this product is to be the military and said product is to be employed in any weapons systems or the manufacture thereof, the export will fall under the relevant regulations as stipulated in the Foreign Exchange and Foreign Trade Regulations. Therefore, be sure to follow all procedures and submit all relevant documentation according to any and all rules, regulations and laws that may apply.

Specifications are subject to change without notice for ongoing product modifications and improvements.

Original Instructions

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