

YASKAWA

R1000

REGENERATIVE BRAKING UNIT

IT'S PERSONAL



R1000 REGENERATIVE BRAKING UNIT

A Smart and Efficient Alternative to Dynamic Braking

COMPATIBILITY

Compatible with all conventional drives having full power access to the DC bus.

Unlike dynamic braking, which dissipates all braking energy in the form of heat, the R1000 avoids wasted energy by delivering it back to your power source for use by other loads. Since the R1000 transfers power during regeneration (not motoring), it is very economical for regenerative applications. Also, return on investment is often less than one year. Not only does this save energy and money, it also eliminates the need to safely locate and maintain braking resistors.

HIGHLIGHTS

- Compatible with all conventional drives having full power access to DC bus
- Dual power rated
- Overload capability of 150% for 30 seconds
- 0.9 power factor at full load
- Overcurrent and overheat protection

TYPICAL APPLICATIONS

Continuous

Loads operating in a continuous regenerative state.

- Decanter Centrifuges (Scroll Motor)
- Unwinders
- Downhill Conveyors
- Transmission Test Stands
- Escalators
- Moving Walkways
- Test Dynamometers (e.g. Engine Test Stands, Wind Tunnel Balancing Equipment, Tire Load Testers)

Cyclic Loading

Loads that go in and out of regeneration.

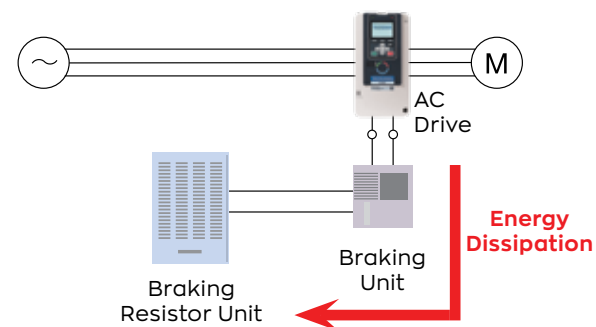
- Pumpjacks
- Punch/Stamping Presses
- Ram Presses
- Mixers
- Industrial Washers
- Steel Grinders
- Vibratory Conveyors
- Elevators

Stopping

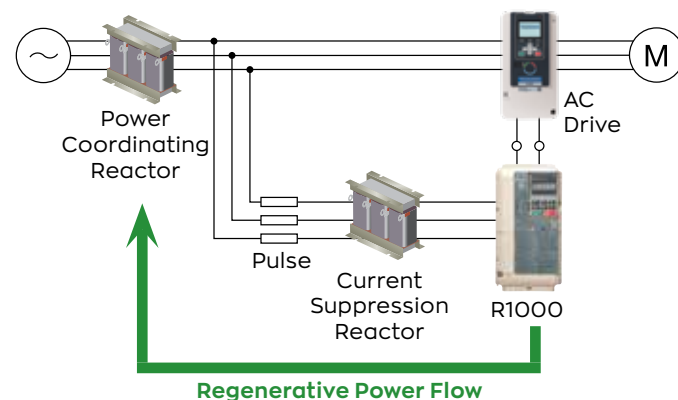
Loads that regenerate due to forced deceleration (specifically loads that decelerate for long periods of time).

- Solid Bowl Centrifuges
- Decanter Centrifuge (Bowl Motor)
- Large Inertia Fans/Saws

DYNAMIC BRAKING SYSTEM (WASTED ENERGY)



REGENERATIVE BRAKING SYSTEM (RECOVERED ENERGY)



Each package requires the following:

R1000

The R1000 regenerative unit is used to divert energy generated by the motor back onto the line for use by other loads. The energy is directed back onto the line by taking DC voltage from the drive and converting it into a three-phase AC voltage waveform.

POWER COORDINATION REACTOR

The power coordination reactor provides impedance to limit peak current. The reactor represents minimum impedance required to limit current to levels acceptable to the R1000.

CURRENT SUPPRESSION REACTOR

The current suppression reactor provides impedance to protect the connected drive's input section from peak current that may result from the R1000 IGBT switching section.

FUSES AND FUSE HOLDER

Recommended fusing and their corresponding holder(s) is provided for device protection and UL certification.

Power Range

- 240V: 5 - 150 HP
- 480V: 5 - 500 HP

Ambient Operating Temperature

- -10°C to 50°C (Open Type/IP00)
- -10°C to 40°C (UL Type 1/IP20)

Certifications

- UL, CE, RoHs, CSA B44.1

Standard I/O

- (8) Digital Inputs
- (3) Analog Inputs
- (4) Relay Outputs
- (2) Analog Outputs

Network Communications

- EtherNet/IP (Single/Dual Port)
- Modbus TCP/IP (Single/Dual Port)
- PROFINET
- EtherCAT
- DeviceNet
- MECHATROLINK-II
- Modbus RTU (Built-In)

Mechanical Options

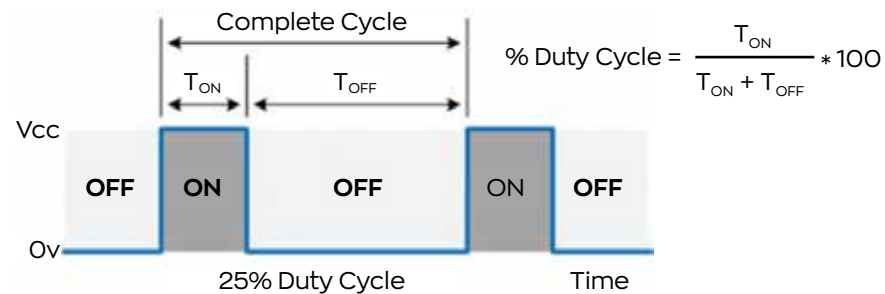
- External Heatsink Kit

SELECTION PROCESS

STEP 1 / DETERMINE APPLICATION'S REGENERATIVE DUTY CYCLE

Regenerative duty cycle is based on the time the motor is in regeneration compared to the total cycle time. The "on time" is only when the motor is in regeneration. The "off time" can be when the motor is moving the load (motoring at steady state or accelerating) or in an idle state (powered off or stopped). This selection process assumes a one-to-one configuration.

When a detailed application study shows that the regenerative energy is lower than the drive power rating in a 1:1 configuration, a smaller R1000 kit can be selected. The R1000 rated output power must be higher than the expected maximum regenerative energy. Note that the Power Coordination Reactor must be sized to withstand the total input motoring current of the system, which in these cases would be higher than the expected regenerative current. Contact Yaskawa for more information or when more than one drive is to be connected to an R1000.



STEP 2A / OPTION 1: SELECT BASED ON DUTY CYCLE

The R1000 has two output current ratings. If the regenerative duty cycle is continuous, use the Continuous Rating selection tables. For all other regenerative duty cycles use the Standard Use rating tables.

- Standard Rating (100% Power for 60 seconds, 25% duty cycle)
- Continuous Rating (80% Power)

STEP 2B / OPTION 2: SELECT BASED ON KNOWN APPLICATIONS

CONTINUOUS RATING

Loads operating in a continuous regenerative state.

- Decanter Centrifuge (Scroll Motor)
- Downhill Conveyors
- Escalators
- Moving Walkways
- Test Dynamometers
- Unwinders

STANDARD RATING

Cyclic Loading

Loads that go in and out of regeneration.

- Industrial Washers
- Mixers
- Punch/Stamping Presses
- Ram Presses
- Steel Grinders
- Vibratory Equipment
- Elevators

Stopping

Loads that only regenerate during deceleration for a long period of time.

- Decanter Centrifuge (Bowl Motor)
- Large Inertia Fans/Saws
- Solid Bowl Centrifuges

SIZING EXAMPLE

The following 40 HP centrifuge application has a very long deceleration time. The R1000 enables users to shorten deceleration time to increase production, while also saving the extra energy generated from stopping the large inertial load quickly.

SIZING CRITERIA

- Motor Power: 40 HP
- Regeneration Type: Forced Deceleration
 - Duty Cycle: 3 minutes every 12 minutes = 25%
- Peak regenerative power: 36 kW or 48.26 HP
- Operation Time:
 - 1 shift/day = 8 hours/shift
 - 5 days/week = 40 hours/week
 - 50 weeks/year = 2,000 hours/year

R1000 SELECTION

- 40 HP, 480V, Standard Rating R1000

ENERGY SAVINGS

- Minimum 5 year drive life:
 - 2,000 hrs/year × 5 years = 10,000 hours
 - Energy (U) = 1/2 × Peak Power × On-Time
 $U = 1/2 \times 36 \text{ kW} \times 25\% \times 10,000 \text{ hours} = 45,000 \text{ kWh}$
 - 1 shift/day: \$0.08*/kWh × 45,000 kWh = \$3,600

* Note: Power Rates May Vary

\$3,600

1 shift/day savings

\$7,200

2 shifts/day savings

Centrifuge

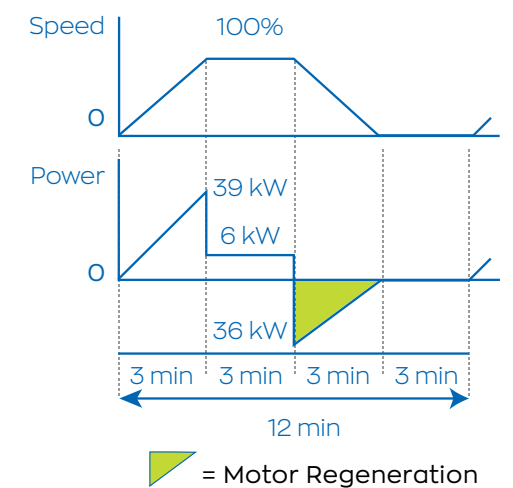
40 HP (30kW) 460 V Motor

Bowl
+
Material
=
High Inertia

Operation:

- 8 Hrs/Shift
- 50 Weeks/Year
- 5 Days/Week
- \$0.08/kWh

Operation Profile



SELECTION TABLES

STANDARD RATING

Standard ratings are provided in two tables based on input voltage (208-240V and 480V).

208 - 240V, 3-Phase, Standard Rating Selection Table

Motor Power	R1000 Model	Current Suppression Reactor		Power Coordination Reactor		Fusing		Fuse Holder(s)	
	CIMR-RU	Part Number	QTY	Part Number	QTY	Part Number	QTY	Part Number	QTY
5 HP	2A03P5FAA ^{*1}	05P00620-0134	1	05P00620-0136	1	FU-002031	3	FU-002055	1
7.5 HP	2A0005FAA ^{*1}	URX000083	1	05P00620-0138	1	FU-002031	3	FU-002055	1
10 HP	2A0007FAA ^{*1}	URX000083	1	05P00620-0044	1	FU-002032	3	FU-002055	1
15 HP	2A0010FAA ^{*1}	05P00620-0044	1	05P00620-0140	1	UFU000153	3	FU-002082	3
20 HP	2A0014FAA ^{*1}	05P00620-0141	1	05P00620-0141	1	UFU000479	3	FU-002082	3
25 HP	2A0017FAA ^{*1}	05P00620-0143	1	05P00620-0143	1	UFU000154	3	FU-002083	3
30 HP	2A0020FAA ^{*1}	URX000085	1	05P00620-0143	1	UFU000155	3	FU-002083	3
40 HP	2A0028FAA ^{*1}	URX000085	1	05P00620-0013	1	UFU000156	3	FU-002083	3
50 HP	2A0035AAA ^{*2}	05P00620-0064	1	05P00620-0070	1	UFU000156	3	FU-002083	3
75 HP	2A0053AAA ^{*2}	URX000086	1	05P00620-0146	1	UFU000494	3	FU-002083	3
100 HP	2A0073AAA ^{*2}	URX000175	1	URX000175	1	UFU000375	3	UFU000378	3
150 HP	2A0105AAA ^{*2}	URX000178	1	URX000181	1	UFU000376	3	UFU000122	3

*1. UL Type 1 / IP20 Enclosure *2. Open-Type / IP00 Enclosure

480V, 3-Phase, Standard Rating Selection Table

Motor Power	R1000 Model	Current Suppression Reactor		Power Coordination Reactor		Fusing		Fuse Holder(s)	
	CIMR-RU	Part Number	QTY	Part Number	QTY	Part Number	QTY	Part Number	QTY
5 HP	4A03P5FAA ^{*1}	05P00620-0025	1	05P00620-0133	1	FU-002030	3	FU-002055	1
7.5 HP	4A0005FAA ^{*1}	05P00620-0133	1	05P00620-0135	1	FU-002030	3	FU-002055	1
10 HP	4A0007FAA ^{*1}	05P00620-0135	1	05P00620-0137	1	FU-002030	3	FU-002055	1
15 HP	4A0010FAA ^{*1}	05P00620-0137	1	05P00620-0138	1	FU-002032	3	FU-002055	1
20 HP	4A0014FAA ^{*1}	URX000083	1	05P00620-0139	1	FU-002032	3	FU-002055	1
25 HP	4A0017FAA ^{*1}	05P00620-0044	1	05P00620-0139	1	FU-000783	3	FU-002082	3
30 HP	4A0020FAA ^{*1}	05P00620-0049	1	05P00620-0049	1	FU-000783	3	FU-002082	3
40 HP	4A0028FAA ^{*1}	05P00620-0142	1	05P00620-0142	1	UFU000480	3	FU-002082	3
50 HP	4A0035AAA ^{*2}	05P00620-0144	1	05P00620-0144	1	FU-000806	3	FU-002084	3
60 HP	4A0043AAA ^{*2}	05P00620-0143	1	05P00620-0144	1	FU-000807	3	FU-002084	3
75 HP	4A0053AAA ^{*2}	URX000085	1	05P00620-0145	1	FU-000809	3	FU-002084	3
100 HP	4A0073AAA ^{*2}	05P00620-0064	1	05P00620-0070	1	FU-000809	3	FU-002084	3
150 HP	4A0105AAA ^{*2}	05P00620-0075	1	05P00620-0146	1	UFU000374	3	UFU000378	3
250 HP	4A0150AAA ^{*2}	URX000175	1	URX000176	1	UFU000375	3	UFU000378	3
350 HP	4A0210AAA ^{*2}	URX000181	1	URX000182	1	UFU000376	3	UFU000122	3
500 HP	4A0300AAA ^{*2}	URX000088	1	05P00620-0094	1	UFU000377	3	UFU000122	3

*1. UL Type 1 / IP20 Enclosure *2. Open-Type / IP00 Enclosure

CONTINUOUS RATING

Current ratings are provided in three tables based on voltage (208, 240V and 480V).

208V, 3-Phase, Continuous Rating Selection Table

Continuous Regen Power	R1000 Model	Current Suppression Reactor		Power Coordination Reactor		Fusing		Fuse Holder(s)	
	CIMR-RU	Part Number	QTY	Part Number	QTY	Part Number	QTY	Part Number	QTY
3.2 HP	2A03P5FAA ^{*1}	05P00620-0134	1	05P00620-0136	1	FU-002031	3	FU-002055	1
4.5 HP	2A0005FAA ^{*1}	URX000083	1	05P00620-0138	1	FU-002031	3	FU-002055	1
6.1 HP	2A0007FAA ^{*1}	URX000083	1	05P00620-0044	1	FU-002032	3	FU-002055	1
9.2 HP	2A0010FAA ^{*1}	05P00620-0044	1	05P00620-0140	1	UFU000153	3	FU-002082	3
12.4 HP	2A0014FAA ^{*1}	05P00620-0141	1	05P00620-0141	1	UFU000479	3	FU-002082	3
15.3 HP	2A0017FAA ^{*1}	05P00620-0143	1	05P00620-0143	1	UFU000154	3	FU-002083	3
18.2 HP	2A0020FAA ^{*1}	URX000085	1	05P00620-0143	1	UFU000155	3	FU-002083	3
25.2 HP	2A0028FAA ^{*1}	URX000085	1	05P00620-0013	1	UFU000156	3	FU-002083	3
31.0 HP	2A0035AAA ^{*2}	05P00620-0064	1	05P00620-0070	1	UFU000156	3	FU-002083	3
46.5 HP	2A0053AAA ^{*2}	URX000086	1	05P00620-0146	1	UFU000494	3	FU-002083	3
63.4 HP	2A0073AAA ^{*2}	URX000175	1	URX000175	1	UFU000375	3	UFU000378	3
92.8 HP	2A0105AAA ^{*2}	URX000178	1	URX000181	1	UFU000376	3	UFU000122	3

*1. UL Type 1 / IP20 Enclosure *2. Open-Type / IP00 Enclosure

240V, 3-Phase, Continuous Rating Selection Table

Continuous Regen Power	R1000 Model	Current Suppression Reactor		Power Coordination Reactor		Fusing		Fuse Holder(s)	
	CIMR-RU	Part Number	QTY	Part Number	QTY	Part Number	QTY	Part Number	QTY
4.9 HP	2A03P5FAA ^{*1}	05P00620-0134	1	05P00620-0136	1	FU-002031	3	FU-002055	1
7.0 HP	2A0005FAA ^{*1}	URX000083	1	05P00620-0138	1	FU-002031	3	FU-002055	1
9.4 HP	2A0007FAA ^{*1}	URX000083	1	05P00620-0044	1	FU-002032	3	FU-002055	1
14.2 HP	2A0010FAA ^{*1}	05P00620-0044	1	05P00620-0140	1	UFU000153	3	FU-002082	3
19.1 HP	2A0014FAA ^{*1}	05P00620-0141	1	05P00620-0141	1	UFU000479	3	FU-002082	3
23.6 HP	2A0017FAA ^{*1}	05P00620-0143	1	05P00620-0143	1	UFU000154	3	FU-002083	3
28.2 HP	2A0020FAA ^{*1}	URX000085	1	05P00620-0143	1	UFU000155	3	FU-002083	3
38.9 HP	2A0028FAA ^{*1}	URX000085	1	05P00620-0013	1	UFU000156	3	FU-002083	3
48.0 HP	2A0035AAA ^{*2}	05P00620-0064	1	05P00620-0070	1	UFU000156	3	FU-002083	3
71.9 HP	2A0053AAA ^{*2}	URX000086	1	05P00620-0146	1	UFU000494	3	FU-002083	3
98.0 HP	2A0073AAA ^{*2}	URX000175	1	URX000175	1	UFU000375	3	UFU000378	3
143.6 HP	2A0105AAA ^{*2}	URX000178	1	URX000181	1	UFU000376	3	UFU000122	3

*1. UL Type 1 / IP20 Enclosure *2. Open-Type / IP00 Enclosure

SELECTION TABLES

EXTERNAL HEATSINK KITS

The optional, UL Type 1, heatsink kit allows the R1000 to be mounted with its heatsink external to the panel.

CONTINUOUS RATING (CONT.)

480V, 3-Phase, Continuous Rating Selection Table

Continuous Regen Power	R1000 Model	Current Suppression Reactor		Power Coordination Reactor		Fusing		Fuse Holder(s)	
	CIMR-RU	Part Number	QTY	Part Number	QTY	Part Number	QTY	Part Number	QTY
4.9 HP	4A03P5FAA ^{*1}	05P00620-0025	1	05P00620-0133	1	FU-002030	3	FU-002055	1
7.6 HP	4A0005FAA ^{*1}	05P00620-0133	1	05P00620-0135	1	FU-002030	3	FU-002055	1
10.4 HP	4A0007FAA ^{*1}	05P00620-0135	1	05P00620-0137	1	FU-002030	3	FU-002055	1
15.3 HP	4A0010FAA ^{*1}	05P00620-0137	1	05P00620-0138	1	FU-002032	3	FU-002055	1
20.9 HP	4A0014FAA ^{*1}	URX000083	1	05P00620-0139	1	FU-002032	3	FU-002055	1
25.0 HP	4A0017FAA ^{*1}	05P00620-0044	1	05P00620-0139	1	FU-000783	3	FU-002082	3
29.9 HP	4A0020FAA ^{*1}	05P00620-0049	1	05P00620-0049	1	FU-000783	3	FU-002082	3
40.3 HP	4A0028FAA ^{*1}	05P00620-0142	1	05P00620-0142	1	UFU000480	3	FU-002082	3
50.8 HP	4A0035AAA ^{*2}	05P00620-0144	1	05P00620-0144	1	FU-000806	3	FU-002084	3
61.9 HP	4A0043AAA ^{*2}	05P00620-0143	1	05P00620-0144	1	FU-000807	3	FU-002084	3
75.8 HP	4A0053AAA ^{*2}	URX000085	1	05P00620-0145	1	FU-000809	3	FU-002084	3
103.6 HP	4A0073AAA ^{*2}	05P00620-0064	1	05P00620-0070	1	FU-000809	3	FU-002084	3
150.8 HP	4A0105AAA ^{*2}	05P00620-0075	1	05P00620-0146	1	UFU000374	3	UFU000378	3
222.5 HP	4A0150AAA ^{*2}	URX000175	1	URX000176	1	UFU000375	3	UFU000378	3
305.9 HP	4A0210AAA ^{*2}	URX000181	1	URX000182	1	UFU000376	3	UFU000122	3
437.3 HP	4A0300AAA ^{*2}	URX000088	1	05P00620-0094	1	UFU000377	3	UFU000122	3

*1. UL Type 1 / IP20 Enclosure *2. Open-Type / IP00 Enclosure

R1000 EXTERNAL HEATSINK KIT FOR UL TYPE 1 200 VOLT CLASS

Rated Input Voltage	Drive Model Number	Kit Part Number
	CIMR-RU2Axxxxxxx	
200-240 VAC Three-Phase	03P5	EZZ020800B
	0005	
	0007	
	0010	EZZ020800C
	0014	
	0017	
	0020	EZZ020800D
	0028	
	0035	
	0053	
	0073	
	0105	

Required brackets are included with the drive.

R1000 EXTERNAL HEATSINK KIT FOR UL TYPE 1 400 VOLT CLASS

Rated Input Voltage	Drive Model Number	Kit Part Number
	CIMR-RU4Axxxxxxx	
480 VAC Three-Phase	03P5	EZZ020800B
	0005	
	0007	
	0010	EZZ020800C
	0014	
	0017	
	0020	EZZ020800D
	0028	
	0035	
	0053	
	0073	
	0105	
	0150	Required brackets are included with the drive.
	0210	
	0300	

R1000 DIMENSIONS

FRAME REFERENCE

200 - 240V, 3-PHASE, DIMENSIONS AND WEIGHTS

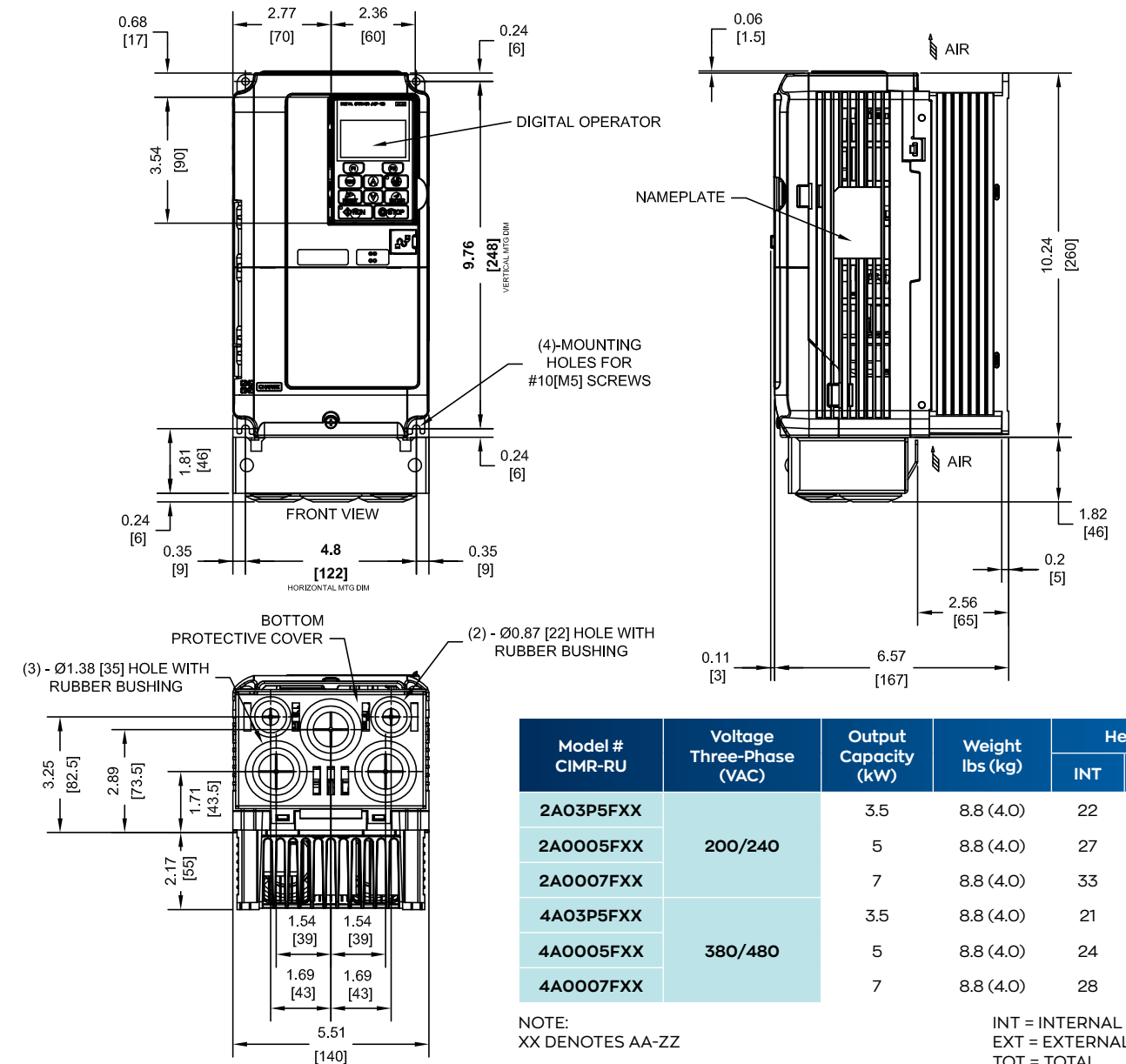
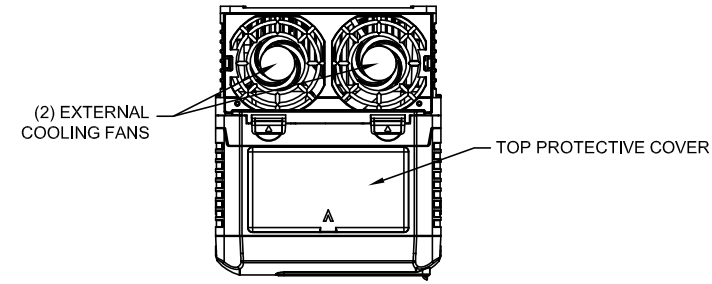
Drive Model ¹	Physical Dimensions (in)			Weight (lbs) ³	Standard Enclosure ²	Reference Drawing
	H	W	D			
CIMR-RU2A03P5FAA	11.8	5.5	6.6	9	UL Type 1	FR1.N1
CIMR-RU2A0005FAA	11.8	5.5	6.6	9	UL Type 1	FR1.N1
CIMR-RU2A0007FAA	11.8	5.5	6.6	9	UL Type 1	FR1.N1
CIMR-RU2A0010FAA	13.4	7.1	7.4	13	UL Type 1	FR2.N1
CIMR-RU2A0014FAA	13.4	7.1	7.4	13	UL Type 1	FR2.N1
CIMR-RU2A0017FAA	15.8	8.7	7.8	20	UL Type 1	FR3.N1
CIMR-RU2A0020FAA	15.8	8.7	7.8	20	UL Type 1	FR3.N1
CIMR-RU2A0028FAA	15.8	8.7	7.8	20	UL Type 1	FR3.N1
CIMR-RU2A0035AAA	17.7	10.8	10.2	46	Open	FR4.IPOO
CIMR-RU2A0053AAA	21.7	12.8	11.1	73	Open	FR5.IPOO
CIMR-RU2A0073AAA	27.8	17.7	13.0	137	Open	FR6.IPOO
CIMR-RU2A0105AAA	31.5	19.7	13.8	179	Open	FR7.IPOO

1 For dimensions and weights on reactors, please see models and ratings for more information.
 2 Add-on kit is necessary to convert open style to UL Type 1 style enclosure.
 3 This data represents the drive weight only, not the shipping weight.

480V, 3-PHASE, DIMENSIONS AND WEIGHTS

Drive Model ¹	Physical Dimensions (in)			Weight (lbs) ³	Standard Enclosure ²	Reference Drawing
	H	W	D			
CIMR-RU4A03P5FAA	11.8	5.5	6.6	9	UL Type 1	FR1.N1
CIMR-RU4A0005FAA	11.8	5.5	6.6	9	UL Type 1	FR1.N1
CIMR-RU4A0007FAA	11.8	5.5	6.6	9	UL Type 1	FR1.N1
CIMR-RU4A0010FAA	13.4	7.1	7.4	11	UL Type 1	FR2.N1
CIMR-RU4A0014FAA	13.4	7.1	7.4	11	UL Type 1	FR2.N1
CIMR-RU4A0017FAA	15.8	8.7	7.8	18	UL Type 1	FR3.N1
CIMR-RU4A0020FAA	15.8	8.7	7.8	18	UL Type 1	FR3.N1
CIMR-RU4A0028FAA	15.8	8.7	7.8	20	UL Type 1	FR3.N1
CIMR-RU4A0035AAA	17.7	10.8	10.2	44	Open	FR4.IPOO
CIMR-RU4A0043AAA	17.7	10.8	10.2	44	Open	FR4.IPOO
CIMR-RU4A0053AAA	21.7	12.8	11.1	73	Open	FR5.IPOO
CIMR-RU4A0073AAA	21.7	12.8	11.1	73	Open	FR5.IPOO
CIMR-RU4A0105AAA	27.8	17.7	13.0	137	Open	FR6.IPOO
CIMR-RU4A0150AAA	27.8	17.7	13.0	137	Open	FR6.IPOO
CIMR-RU4A0210AAA	31.5	19.7	13.8	190	Open	FR7.IPOO
CIMR-RU4A0300AAA	31.5	19.7	13.8	192	Open	FR7.IPOO

1 For dimensions and weights on reactors, please see models and ratings for more information.
 2 Add-on kit is necessary to convert open style to UL Type 1 style enclosure.
 3 This data represents the drive weight only, not the shipping weight.



FR1.N1

NOTE: PROTECTIVE COVERS ARE FACTORY INSTALLED TO THE TOP AND BOTTOM OF THE DRIVE TO MEET IP20 & UL TYPE 1 REQUIREMENTS, RESULTING IN AN AMBIENT TEMPERATURE RATING OF 104°F (40°C). REMOVE THESE COVERS WHEN OPERATING THE DRIVE WITHIN A PANEL TO OBTAIN THE MAXIMUM SURROUNDING AIR TEMPERATURE RATING OF 122°F (50°C). REMOVING THESE COVERS RESULTS IN AN ENCLOSURE RATING OF IP00.

Model # CIMR-RU	Voltage Three-Phase (VAC)	Output Capacity (kW)	Weight lbs (kg)	Heat Loss (W)		
				INT	EXT	TOT
2A03P5FXX	200/240	3.5	8.8 (4.0)	22	31	53
2A0005FXX		5	8.8 (4.0)	27	51	78
2A0007FXX		7	8.8 (4.0)	33	76	109
4A03P5FXX	380/480	3.5	8.8 (4.0)	21	16	37
4A0005FXX		5	8.8 (4.0)	24	27	51
4A0007FXX		7	8.8 (4.0)	28	41	69

NOTE: XX DENOTES AA-ZZ

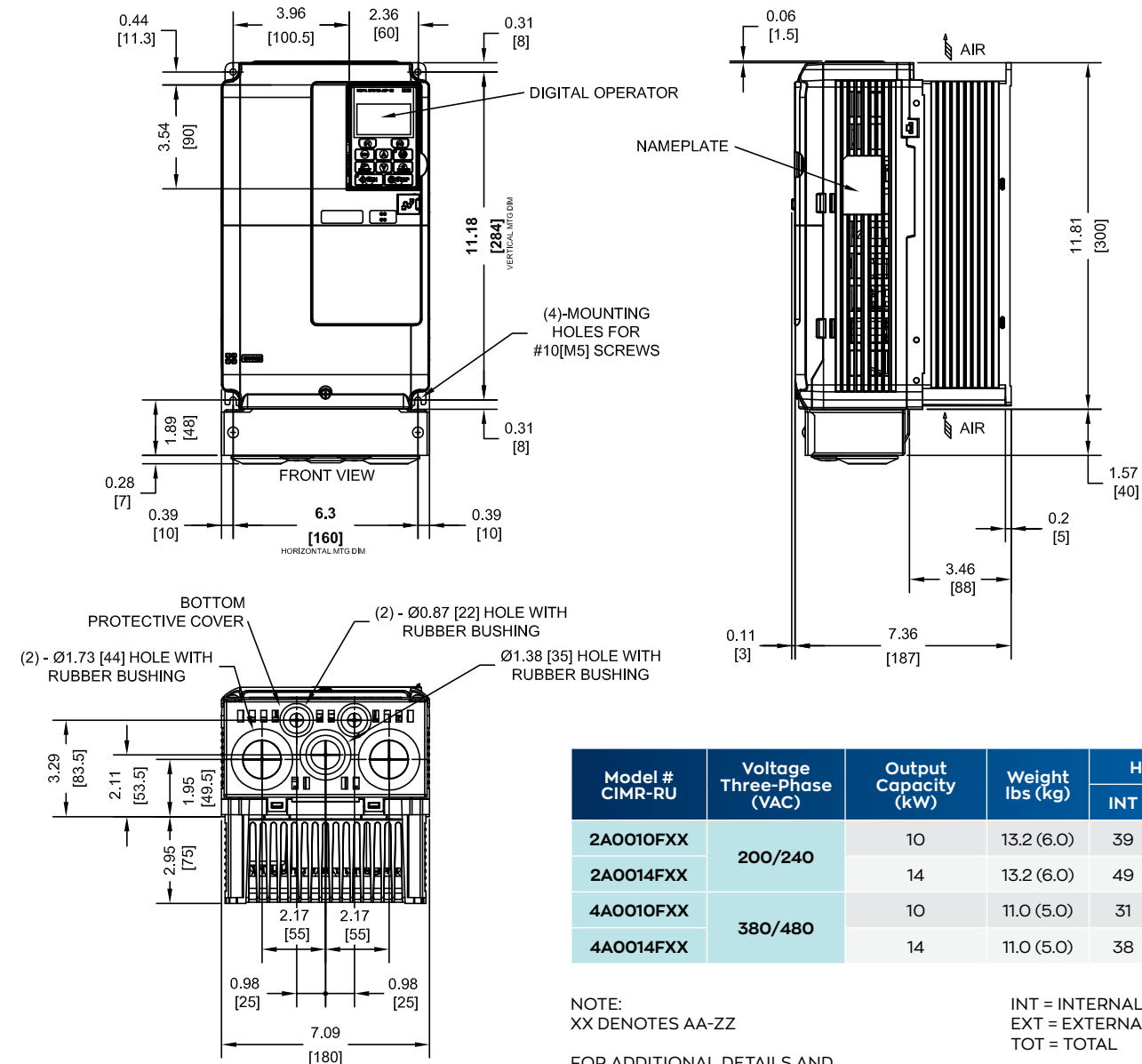
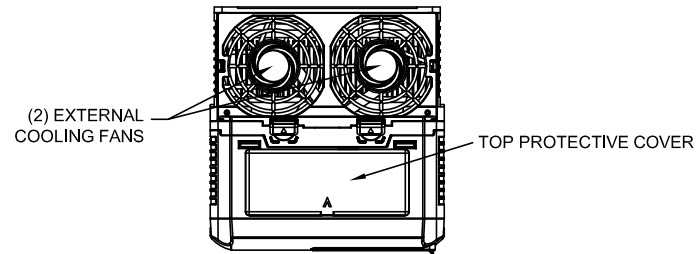
INT = INTERNAL COMPONENTS
 EXT = EXTERNAL HEATSINK
 TOT = TOTAL

FOR ADDITIONAL DETAILS AND SPECIFICATIONS, CONSULT MANUAL.

FRAME REFERENCE

FR2.N1

NOTE:
PROTECTIVE COVERS ARE FACTORY INSTALLED TO THE TOP AND BOTTOM OF THE DRIVE TO MEET IP20 & UL TYPE 1 REQUIREMENTS, RESULTING IN AN AMBIENT TEMPERATURE RATING OF 104°F (40°C). REMOVE THESE COVERS WHEN OPERATING THE DRIVE WITHIN A PANEL TO OBTAIN THE MAXIMUM SURROUNDING AIR TEMPERATURE RATING OF 122°F (50°C). REMOVING THESE COVERS RESULTS IN AN ENCLOSURE RATING OF IP00.



Model # CIMR-RU	Voltage Three-Phase (VAC)	Output Capacity (kW)	Weight lbs (kg)	Heat Loss (W)		
				INT	EXT	TOT
2A0010FXX	200/240	10	13.2 (6.0)	39	99	138
2A0014FXX		14	13.2 (6.0)	49	149	198
4A0010FXX	380/480	10	11.0 (5.0)	31	53	84
4A0014FXX		14	11.0 (5.0)	38	80	118

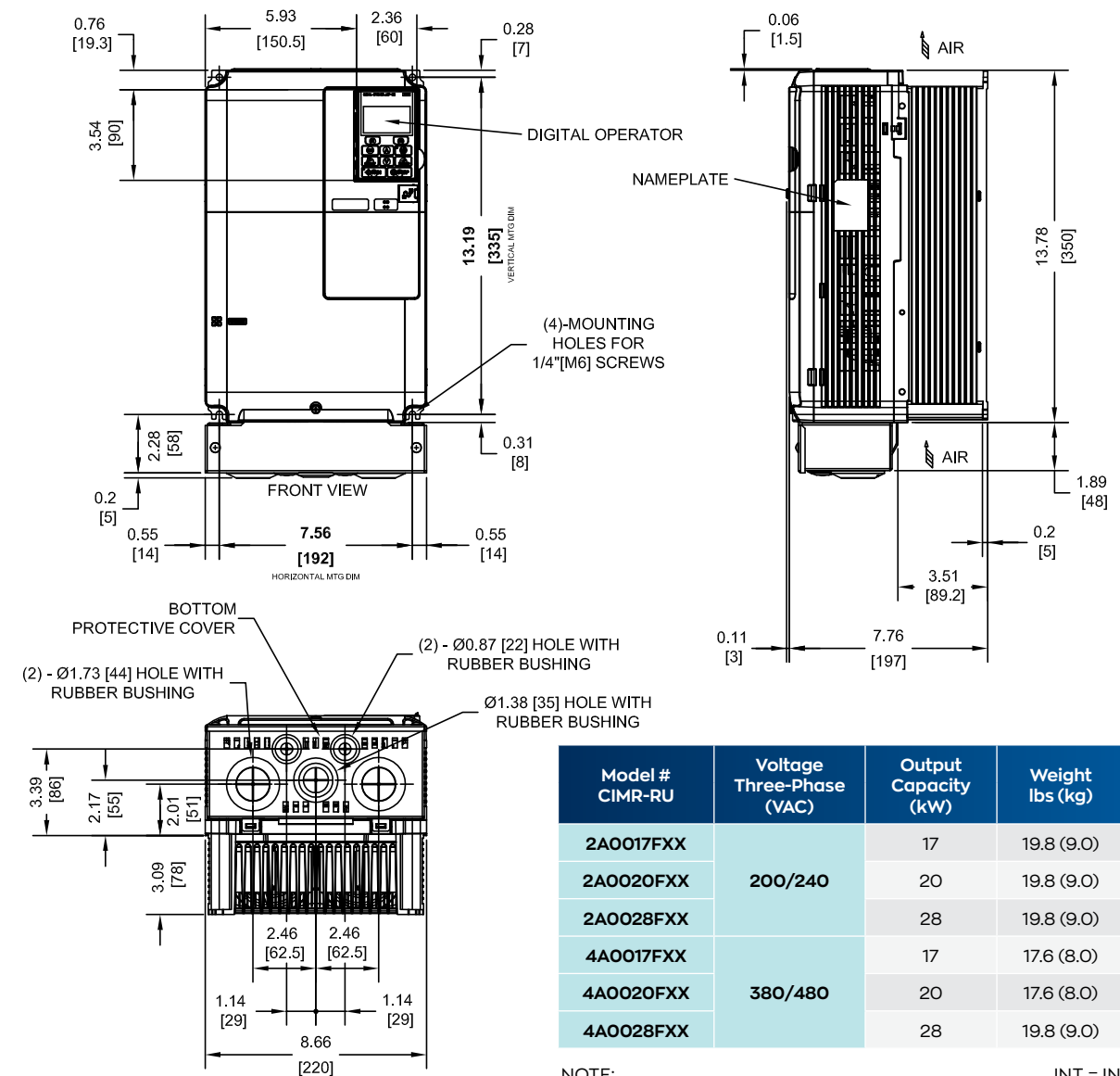
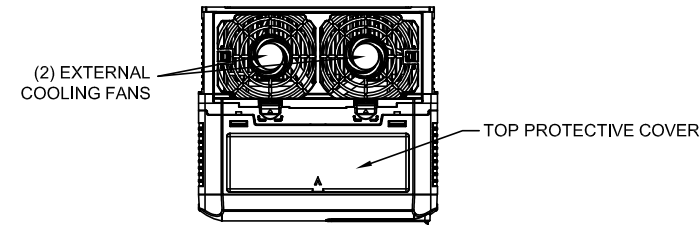
NOTE:
XX DENOTES AA-ZZ

FOR ADDITIONAL DETAILS AND SPECIFICATIONS, CONSULT MANUAL.

INT = INTERNAL COMPONENTS
EXT = EXTERNAL HEATSINK
TOT = TOTAL

FR3.N1

NOTE:
PROTECTIVE COVERS ARE FACTORY INSTALLED TO THE TOP AND BOTTOM OF THE DRIVE TO MEET IP20 & UL TYPE 1 REQUIREMENTS, RESULTING IN AN AMBIENT TEMPERATURE RATING OF 104°F (40°C). REMOVE THESE COVERS WHEN OPERATING THE DRIVE WITHIN A PANEL TO OBTAIN THE MAXIMUM SURROUNDING AIR TEMPERATURE RATING OF 122°F (50°C). REMOVING THESE COVERS RESULTS IN AN ENCLOSURE RATING OF IP00.



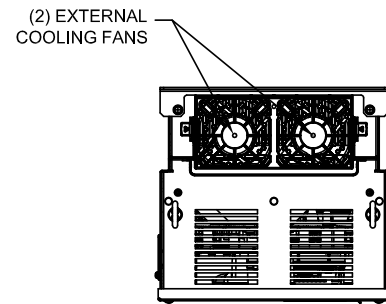
Model # CIMR-RU	Voltage Three-Phase (VAC)	Output Capacity (kW)	Weight lbs (kg)	Heat Loss (W)		
				INT	EXT	TOT
2A0017FXX	200/240	17	19.8 (9.0)	53	155	208
2A0020FXX		20	19.8 (9.0)	67	201	268
2A0028FXX		28	19.8 (9.0)	98	270	368
4A0017FXX	380/480	17	17.6 (8.0)	44	91	135
4A0020FXX		20	17.6 (8.0)	50	114	164
4A0028FXX		28	19.8 (9.0)	66	174	240

NOTE:
XX DENOTES AA-ZZ

FOR ADDITIONAL DETAILS AND SPECIFICATIONS, CONSULT MANUAL.

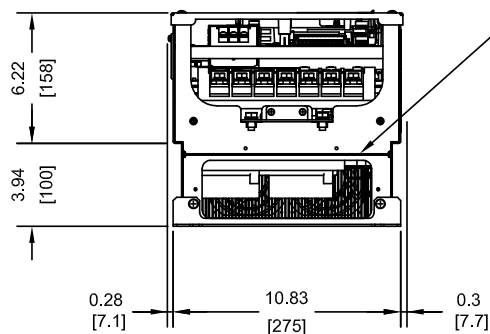
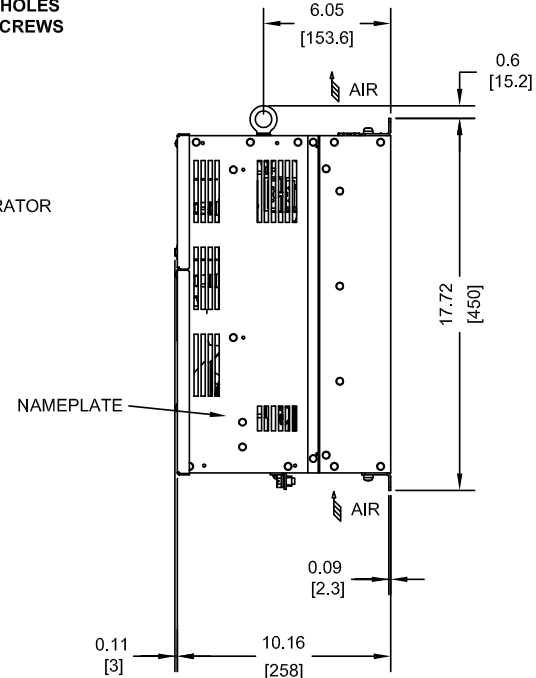
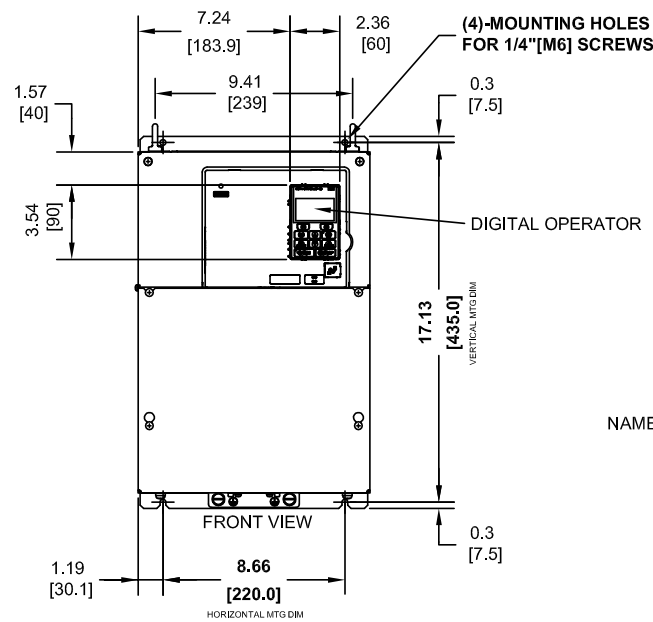
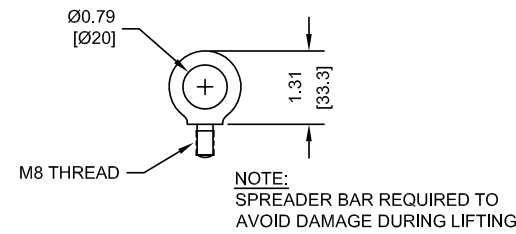
INT = INTERNAL COMPONENTS
EXT = EXTERNAL HEATSINK
TOT = TOTAL

FRAME REFERENCE



FR4.IP00

LIFTING AND EYEBOLT DETAILS



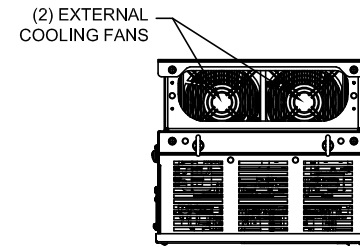
OPTIONAL CAPACITOR COVER
WHEN USING AN EXTERNAL MOUNT HEATSINK, UL COMPLIANCE REQUIRES COVERING EXPOSED CAPACITORS IN THE MAIN CIRCUIT TO PREVENT INJURY. CONSULT MANUAL FOR DETAILS.

Model # CIMR-RU	Voltage Three-Phase (VAC)	Output Capacity (kW)	Weight lbs (kg)	Heat Loss (W)		
				INT	EXT	TOT
2A0035AXX	200/240	35	46.2 (21.0)	127	295	422
4A0035AXX	380/480	35	44.0 (20.0)	74	169	243
4A0043AXX		43	44.0 (20.0)	91	221	312

NOTE:
XX DENOTES AA-ZZ

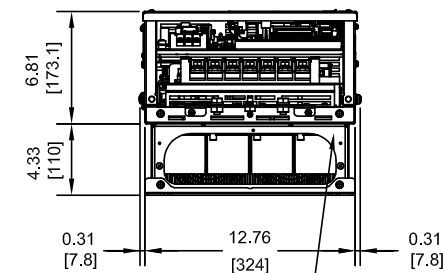
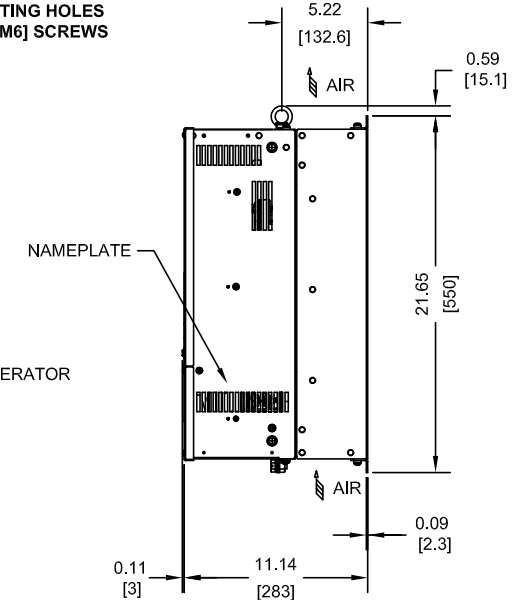
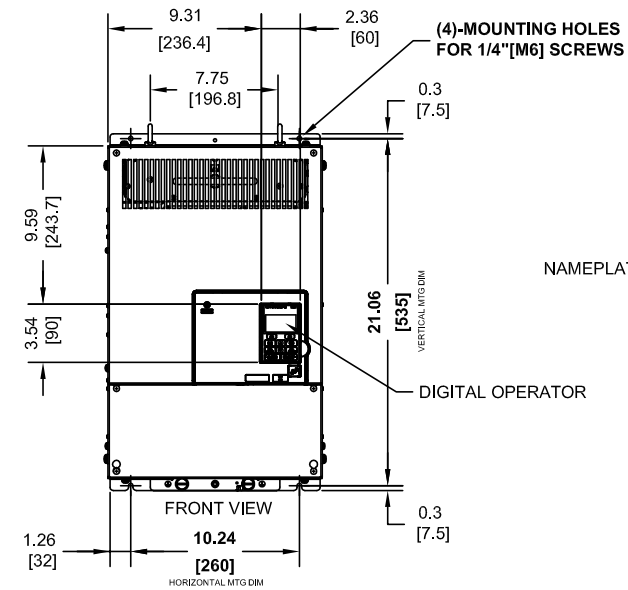
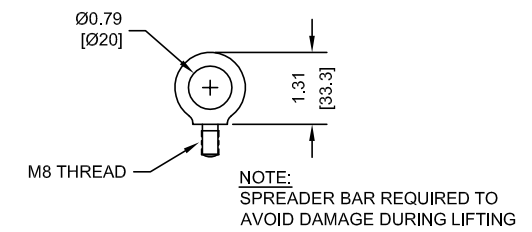
FOR ADDITIONAL DETAILS AND SPECIFICATIONS, CONSULT MANUAL.

INT = INTERNAL COMPONENTS
EXT = EXTERNAL HEATSINK
TOT = TOTAL



FR5.IP00

LIFTING AND EYEBOLT DETAILS



OPTIONAL CAPACITOR COVER
WHEN USING AN EXTERNAL MOUNT HEATSINK, UL COMPLIANCE REQUIRES COVERING EXPOSED CAPACITORS IN THE MAIN CIRCUIT TO PREVENT INJURY. CONSULT MANUAL FOR DETAILS.

Model # CIMR-RU	Voltage Three-Phase (VAC)	Output Capacity (kW)	Weight lbs (kg)	Heat Loss (W)		
				INT	EXT	TOT
2A0053AXX	200/240	53	72.6 (33.0)	164	494	658
4A0053AXX	380/480	53	72.6 (33.0)	109	266	375
4A0073AXX		73	72.6 (33.0)	164	397	561

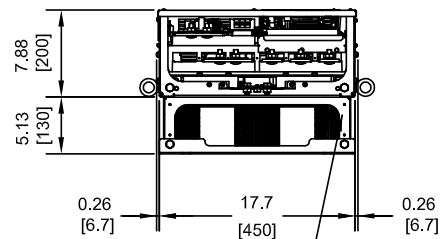
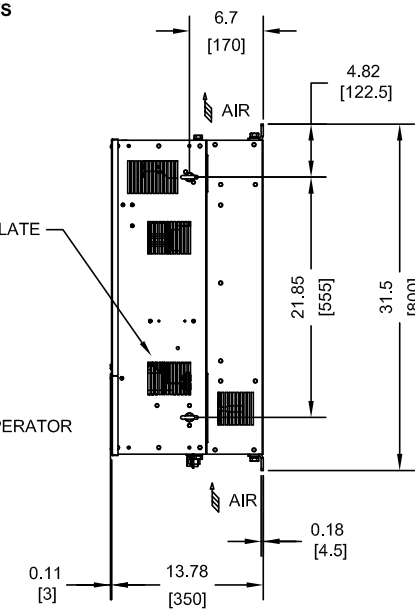
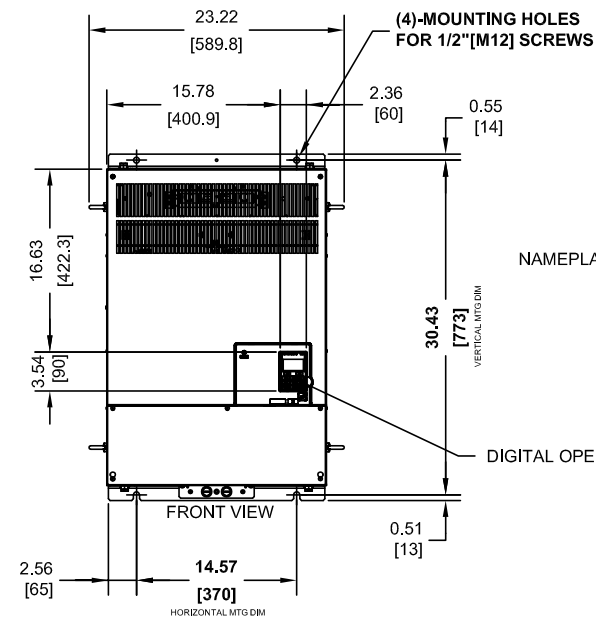
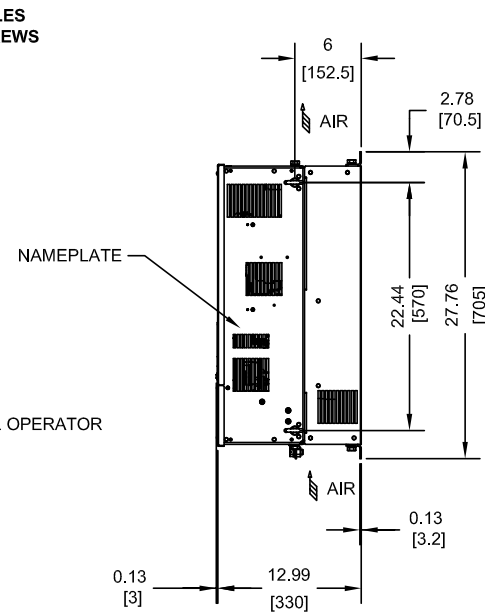
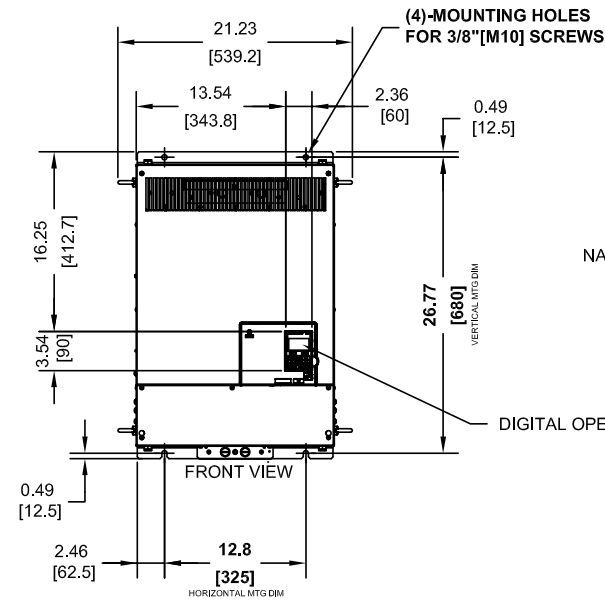
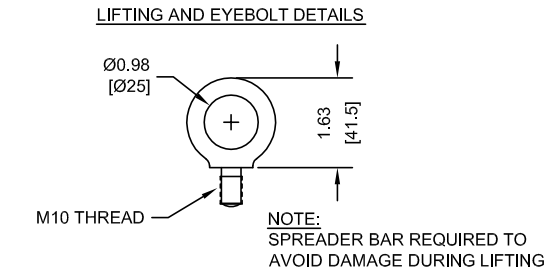
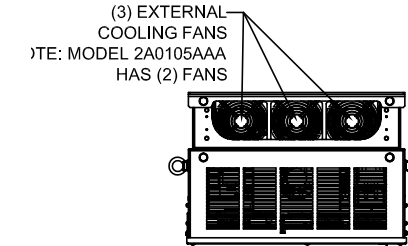
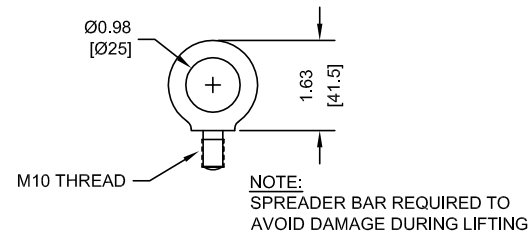
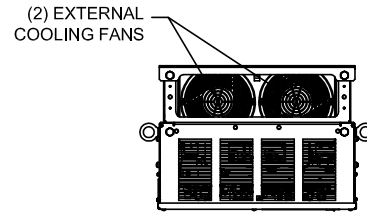
NOTE:
XX DENOTES AA-ZZ

FOR ADDITIONAL DETAILS AND SPECIFICATIONS, CONSULT MANUAL.

INT = INTERNAL COMPONENTS
EXT = EXTERNAL HEATSINK
TOT = TOTAL

FRAME REFERENCE

FR6.IPO0



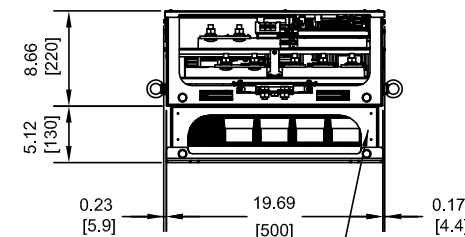
OPTIONAL CAPACITOR COVER
WHEN USING AN EXTERNAL MOUNT HEATSINK, UL COMPLIANCE REQUIRES COVERING EXPOSED CAPACITORS IN THE MAIN CIRCUIT TO PREVENT INJURY. CONSULT MANUAL FOR DETAILS.

Model # CIMR-RU	Voltage Three-Phase (VAC)	Output Capacity (kW)	Weight lbs (kg)	Heat Loss (W)		
				INT	EXT	TOT
2A0073AXX	200/240	73	136.0 (62.0)	236	609	845
4A0105AXX	380/480	105	136.0 (62.0)	255	572	827
4A0150AXX		150	136.0 (62.0)	336	869	1205

NOTE:
XX DENOTES AA-ZZ

FOR ADDITIONAL DETAILS AND SPECIFICATIONS, CONSULT MANUAL.

INT = INTERNAL COMPONENTS
EXT = EXTERNAL HEATSINK
TOT = TOTAL



OPTIONAL CAPACITOR COVER
WHEN USING AN EXTERNAL MOUNT HEATSINK, UL COMPLIANCE REQUIRES COVERING EXPOSED CAPACITORS IN THE MAIN CIRCUIT TO PREVENT INJURY. CONSULT MANUAL FOR DETAILS.

Model # CIMR-RU	Voltage Three-Phase (VAC)	Output Capacity (kW)	Weight lbs (kg)	Heat Loss (W)		
				INT	EXT	TOT
2A0105AXX	200/240	105	178.0 (81.0)	365	910	1275
4A0210AXX	380/480	210	189.0 (86.0)	532	1193	1725
4A0300AXX		300	191.0 (87.0)	630	1534	2164

NOTE:
XX DENOTES AA-ZZ

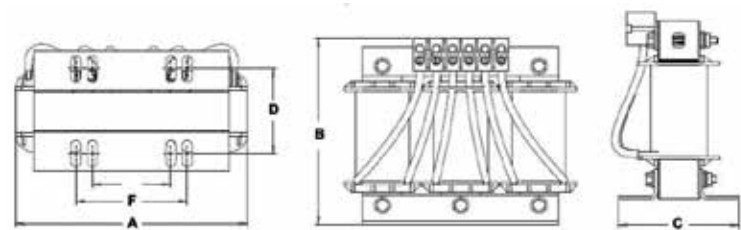
FOR ADDITIONAL DETAILS AND SPECIFICATIONS, CONSULT MANUAL.

INT = INTERNAL COMPONENTS
EXT = EXTERNAL HEATSINK
TOT = TOTAL

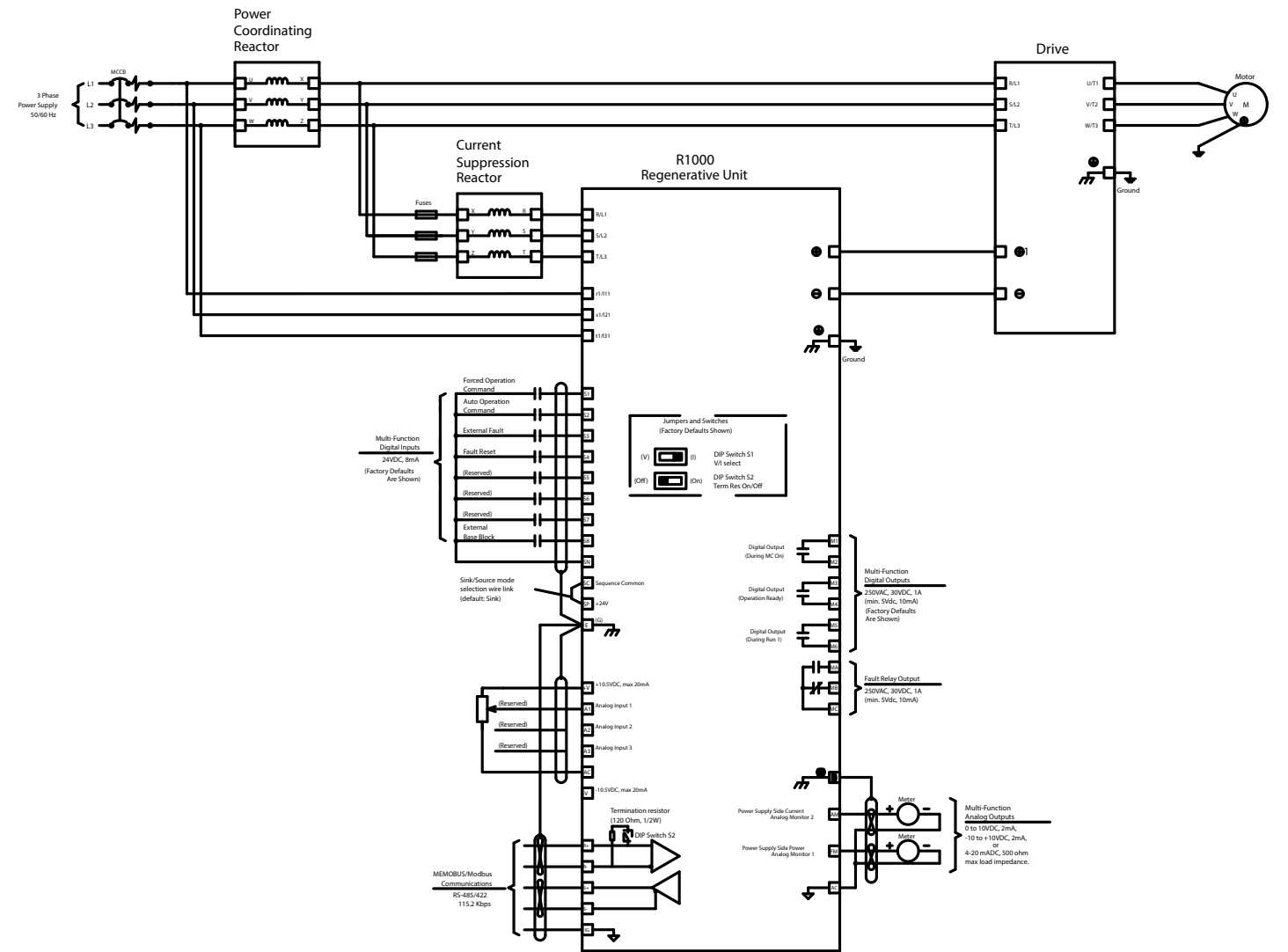
PERIPHERAL DEVICES

AC REACTORS DIMENSIONS AND SPECIFICATIONS

Reactor Part Number	Current Rating (A)	Inductance	Watt Loss	Dimensions					Weight kg/lbs
				A mm/in	B mm/in	C mm/in	D mm/in	E mm/in	
05P00620-0013	130	0.20mh	180	229/9.0	183/7.2	172/6.8	93/3.66	92/3.63	28.0/62
05P00620-0025	8	5.0mh	25.3	152/6.0	122/4.8	86/3.4	67/2.62	51/2.00	5.0/11
05P00620-0044	35	0.4mh	49	183/7.2	147/5.8	102/4.0	66/2.60	76/3.00	6.4/14
05P00620-0049	45	0.7mh	62	229/9.0	188/7.4	119/4.7	80/3.16	76/3.00	13.0/28
05P00620-0064	130	0.10mh	108	229/9.0	179/7.1	118/4.7	80/3.16	76/3.00	13.0/29
05P00620-0070	160	0.150mh	149	274/10.8	277/8.3	152/6.0	88/3.47	92/3.63	23.0/51
05P00620-0075	200	0.055mh	124	229/9.0	191/7.5	185/7.3	106/4.16	92/3.63	22.0/49
05P00620-0094	500	0.050mh	340	366/14.4	292/11.5	292/11.5	172/6.76	117/4.60	82.0/180
05P00620-0133	8	3.0mh	29	152/6.0	122/4.8	76/3.0	53/2.10	51/2.00	3.6/8
05P00620-0134	12	1.25mh	26	152/6.0	127/5.0	84/3.3	53/2.10	51/2.00	4.1/9
05P00620-0135	12	2.5mh	31	152/6.0	127/5.0	84/3.3	53/2.10	51/2.00	4.5/10
05P00620-0136	18	0.8mh	36	152/6.0	135/5.3	81/3.2	54/2.10	51/2.00	4.1/9
05P00620-0137	18	1.5mh	43	152/6.0	135/5.3	89/3.5	63/2.48	51/2.00	5.5/12
05P00620-0138	25	1.2mh	52	183/7.2	147/5.8	89/3.5	60/2.35	76/3.00	6.4/14
05P00620-0139	35	0.8mh	54	183/7.2	147/5.8	102/4.0	70/2.75	76/3.00	7.3/16
05P00620-0140	45	0.3mh	54	229/9.0	188/7.4	119/4.7	80/3.16	76/3.00	10.0/23
05P00620-0141	55	0.25mh	64	229/9.0	185/7.3	135/5.3	80/3.16	76/3.00	11.0/24
05P00620-0142	55	0.50mh	67	229/9.0	178/7.0	135/5.3	80/3.16	76/3.00	12.0/27
05P00620-0143	80	0.20mh	82	229/9.0	183/7.2	160/6.3	88/3.47	92/3.63	20.0/43
05P00620-0144	80	0.40mh	86	229/9.0	183/7.2	165/6.5	88/3.47	92/3.63	23.0/51
05P00620-0145	100	0.30mh	84	229/9.0	185/7.3	173/6.8	93/3.66	92/3.63	23.0/51
05P00620-0146	200	0.110mh	168	229/9.0	191/7.5	211/8.3	112/4.41	92/3.63	31.0/67
URX000083	25	0.5mh	48	183/7.2	147/5.8	89/3.5	60/2.35	76/3.00	5.0/11
URX000085	100	0.15mh	94	229/9.0	185/7.3	165/6.5	88/3.46	92/3.62	21.0/47
URX000086	160	0.230mh	138	292/11.5	216/8.5	229/9.0	118/4.66	92/3.63	33.0/72
URX000088	500	0.025mh	266	274/10.8	229/9.0	267/10.5	140/5.50	117/4.60	55.0/120
URX000175	250	0.045mh	154	229/9.0	191/7.5	229/9.0	106/4.16	92/3.63	31.0/68
URX000176	250	0.090mh	231	274/10.8	216/8.5	229/9.0	131/5.16	117/4.60	48.0/106
URX000178	320	0.040mh	224	274/10.8	229/9.0	277/8.3	131/5.16	117/4.60	50.0/110
URX000181	400	0.030mh	231	274/10.8	254/10.0	254/10.0	131/5.16	117/4.60	46.0/100
URX000182	400	0.060mh	333	381/15.0	286/11.3	292/11.5	172/6.76	117/4.60	71.0/155



ELECTRICAL SCHEMATIC



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