

YASKAWA

Much More Than an AC Drive!

Next-generation motor drives accomplish "Low harmonics" and "Power regeneration to save energy"



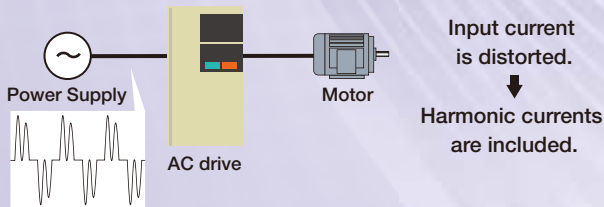
Low Harmonics Regenerative Matrix Converter

U1000

Feature 1: Low Harmonics

Low Harmonics

- Using AC drive



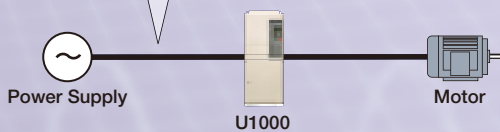
Influences of Harmonic Currents



Results from Using the U1000

- Low harmonics

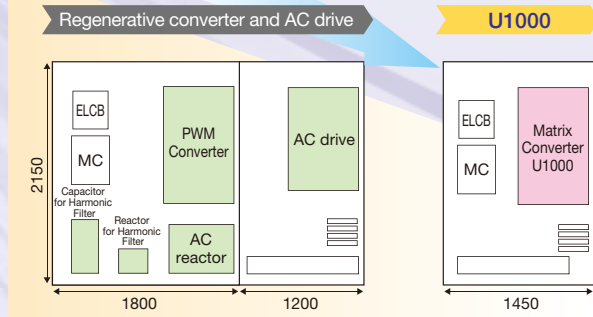
Power Current Waveform Samples	Input Current Spectrums	Current Distortion	Power factor
		5%	0.98



Results from Using the U1000

- Downsize of control panels

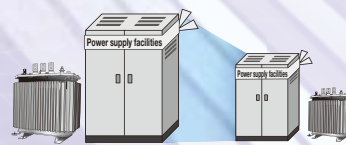
[Control Panel Configuration Example] (400 V 185 kW) Unit : mm



Reduced by approx. **50%**

- Reduce power supply and generator capacity

By suppressing harmonic currents and improving power factors, you can reduce power supply and generator capacity.



Power supply capacity

Reduced by approx. **20%**



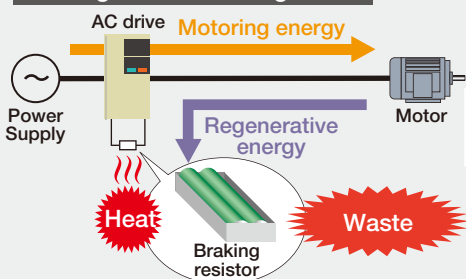
Generator capacity

Reduced by approx. **50%**

Feature 2: Power Regeneration to Save Energy

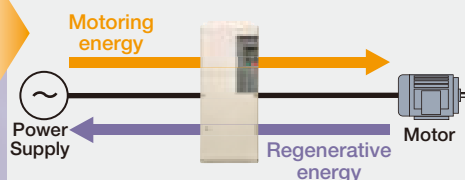
Braking resistor results in regenerative energy abandoned as heat, but you can return this regenerative energy to the power supply for saving energy.

Braking Resistor Configuration



Matrix Converter U1000

Just this one unit can adjust power regeneration.



Results from Using the U1000

Cranes (Motor Capacity: 45 kW)*

Annual power consumption
Previous configuration : 10,150 kWh
U1000 : 4,700 kWh

Reduction:

5,450 kWh

* : Rated load: 10 t, with rated hoisting speed of 20 m/min
Operating time: 25 operations/hour for 365 days

Standard Specifications

200 V Class

ND: Normal Duty, HD: Heavy Duty

Model CIMR-U ₂ A		0028	0042	0054	0068	0081	0104	0130	0154	0192	0248		
Rated Input/Output	Rated Input	ND	25	38	49	62	74	95	118	140	175	226	
	Current*1	A	HD	20	25	38	49	62	74	95	118	140	175
	Rated Input	ND	12	17	22	28	34	43	54	64	80	103	
	Capacity*2	kVA	HD	9	12	17	22	28	34	43	54	64	80
	Rated Output	ND	28	42	54	68	81	104	130	154	192	248	
	Current**4*5	A	HD	22	28	42	54	68	81	104	130	154	192
Overload Tolerance		HD Rating: 150% of rated output current for 60 s, ND Rating: 120% of rated output current for 60 s (Derating may be required for repetitive loads)											
Carrier Frequency		4 kHz (User adjustable up to 10 kHz. Derating may be required.)											
Max. Output Voltage		Depends on input voltage											
Max. Output Frequency		400 Hz											
Power	Rated Voltage/Rated Frequency	Three-phase AC power supply: 200 to 240 Vac 50/60 Hz											
	Allowable Voltage Fluctuation	-15% to +10%											
	Allowable Frequency Fluctuation	±3% (Frequency fluctuation rate: 1 Hz/100 ms or less)											
	Allowable Power Voltage Imbalance between Phases	less than 2%											
	Harmonic Current Distortion Rate*6	5% or less (IEEE 519)											
Input Power Factor		0.98 or more (for rated load)											

400 V Class

Model CIMR-U ₄ A		0011	0014	0021	0027	0034	0040	0052	0065	0077	0096	0124	0156	0180	0216	0240	0302	0361	0414	0477	0590	0720*7	0900*7	0930*7		
Rated Input/Output	Rated Input	ND	10	13	19	25	31	36	47	59	70	87	113	142	164	197	218	275	329	377	434	537	655	819	846	
	Current*1	A	HD	8.7	10	13	19	25	31	36	47	59	70	87	113	142	164	197	218	275	329	377	434	537	655	819
	Rated Input	ND	9	12	17	22	28	33	43	54	64	80	103	130	150	180	200	251	300	344	396	490	598	748	773	
	Capacity*3	kVA	HD	8	9	12	17	22	28	33	43	54	64	80	103	130	150	180	200	251	300	344	396	490	598	748
	Rated Output	ND	11	14	21	27	34	40	52	65	77	96	124	156	180	216	240	302	361	414	477	590	720	900	930	
	Current**4*5	A	HD	9.6	11	14	21	27	34	40	52	65	77	96	124	156	180	216	240	302	361	414	477	590	720	900
Overload Tolerance		HD Rating: 150% of rated output current for 60 s, ND Rating: 120% of rated output current for 60 s (Derating may be required for repetitive loads)																								
Carrier Frequency		4 kHz (User adjustable up to 10 kHz. Derating may be required.)																			3 kHz					
Max. Output Voltage		Depends on input voltage																								
Max. Output Frequency		400 Hz																								
Power	Rated Voltage/Rated Frequency	Three-phase AC power supply (CIMR-U ₄ A/4P): 380 to 500 Vac*8 50/60 Hz Three-phase AC power supply (CIMR-U ₄ E/4W): 380 to 480 Vac 50/60 Hz																								
	Allowable Voltage Fluctuation	-15% to +10%																								
	Allowable Frequency Fluctuation	±3% (Frequency fluctuation rate: 1 Hz/100 ms or less)																								
	Allowable Power Voltage Imbalance between Phases	less than 2%																								
	Harmonic Current Distortion Rate*6	5% or less (IEEE 519)																								
Input Power Factor		0.98 or more (for rated load)																								

* 1 : Assumes operation at the rated output current. This value may fluctuate based on the power supply side impedance, as well as the input current, power supply transformer, and wiring conditions.

* 2 : The rated input capacity is calculated by multiplying the power line voltage (240 V) by 1.1.

* 3 : The rated input capacity is calculated by multiplying the power line voltage (480 V) by 1.1.

* 4 : The rated output current of the drive should be equal to or greater than the motor rated current.

* 5 : This value assumes a carrier frequency of 4 kHz for models CIMR-U₂A0028 to 200248, 400011 to 400414 and a carrier frequency of 3 kHz for models CIMR-U₄A0477 to 400930. Increasing the carrier frequency requires a reduction in current.

* 6 : When the harmonic current distortion rate is 5% or less, the maximum output voltage is calculated by multiplying input power voltage by 0.87. You must also change the parameter from the default setting.

* 7 : Models CIMR-U₄A0720 to 400930 need installation of standard configuration device (harmonic filter module).

* 8 : Use a stand-alone EMC filter with a voltage of 380 to 480 V for models CIMR-U₄A0477 to 400930.

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Note: Faxes are accepted 24 hours a day.

Contact Information

Specifications are subject to change without notice for ongoing product modifications and improvements.
For inquiries on the contents of this document, contact a Yaskawa representative or the Yaskawa sales department listed above.

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