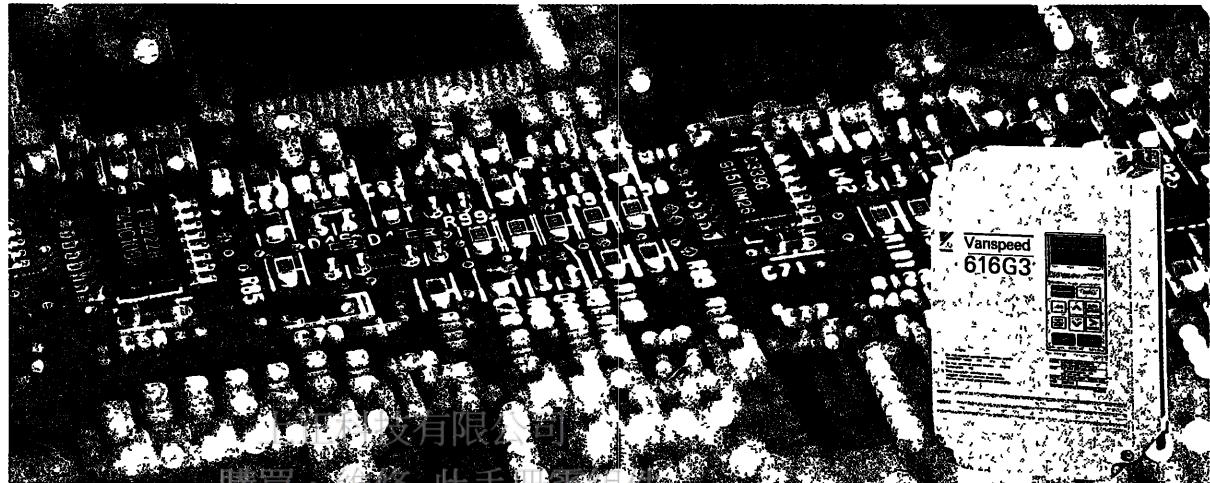


# Varispeed-616G3

HIGH PERFORMANCE ALL-DIGITAL SUPER LOW-NOISE  
GENERAL-PURPOSE INVERTER DRIVES

200 TO 230V 0.5 TO 100HP (0.4 TO 75kW) (1.4 TO 130kVA)  
380 TO 460V 0.5 TO 400HP (0.4 TO 300kW) (1.4 TO 510kVA)  
500 TO 575V 5 TO 200HP (3.7 TO 160kW) (5 TO 200kVA)



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YASKAWA

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# **YASKAWA'S SOFTWARE BASED INVERTER FOR OPTIMUM MACHINE PERFORMANCE**

A tough, effective, and adaptable inverter is a must for top performance of high-tech machines. Yaskawa's is a software based inverter which offers the flexibility to take full advantage of your machine's performance.

As a successor to the highly successful VS-616G2, the Varispeed-616G3 (VS-616G3) has been designed as a full software inverter. Its enhanced functions and performance guarantee that throughout the 90's the VS-616G3 will set the standard that other inverters will be judged by.

With its vast experience in motor drive manufacturing, YASKAWA developed the VS-616G3 as an inverter that adds value to your machine.

上正科技有限公司

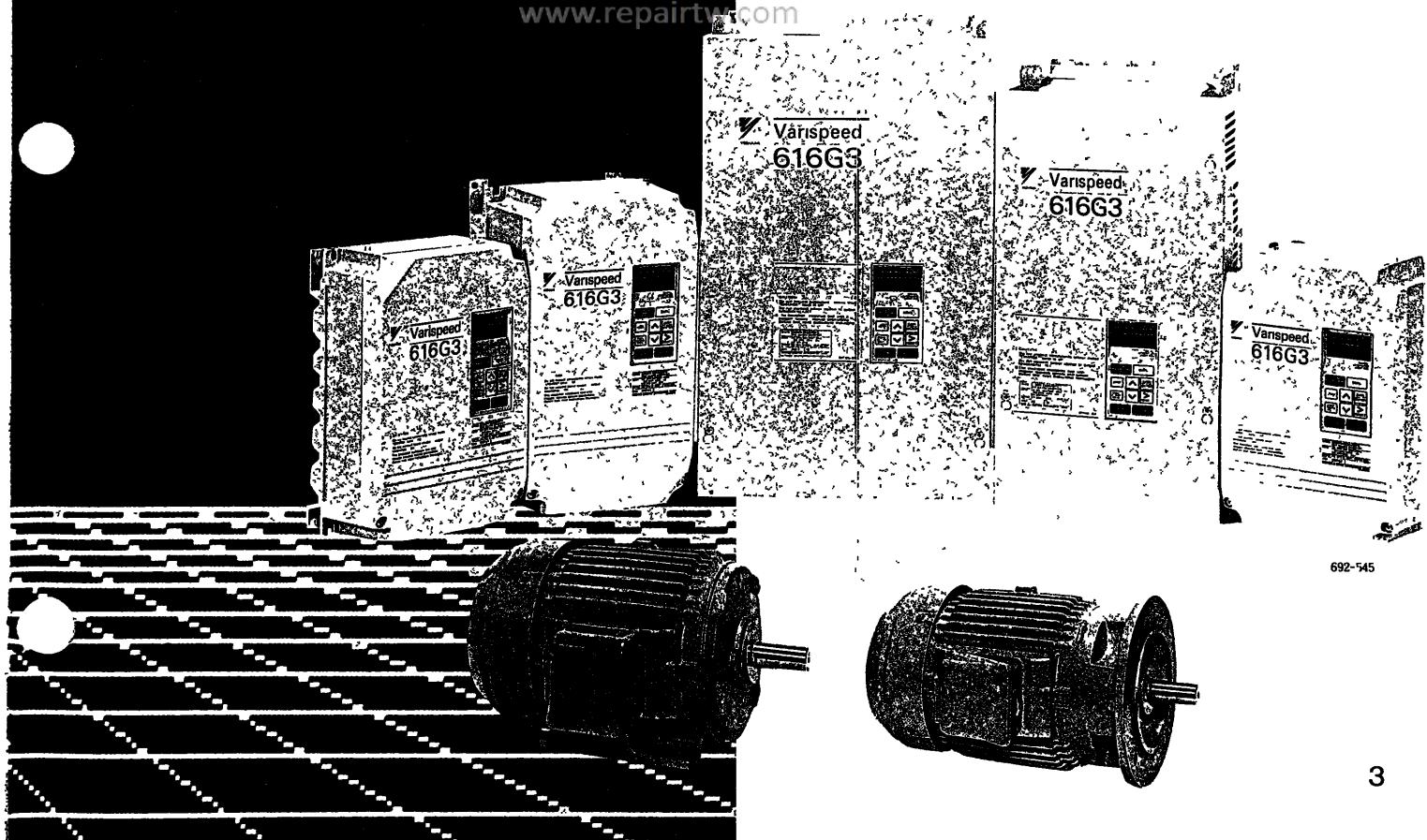
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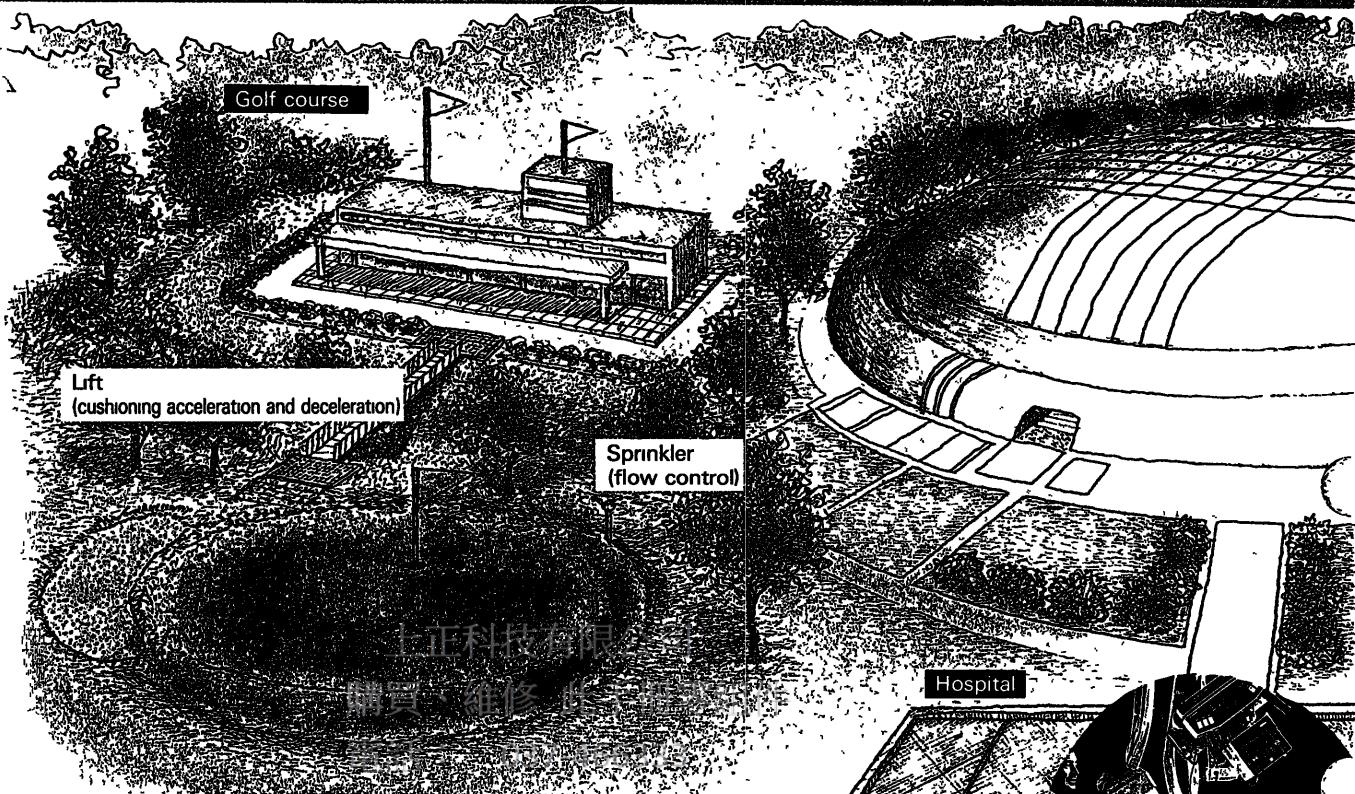
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692-545

# **YASKAWA inverters provide sign**

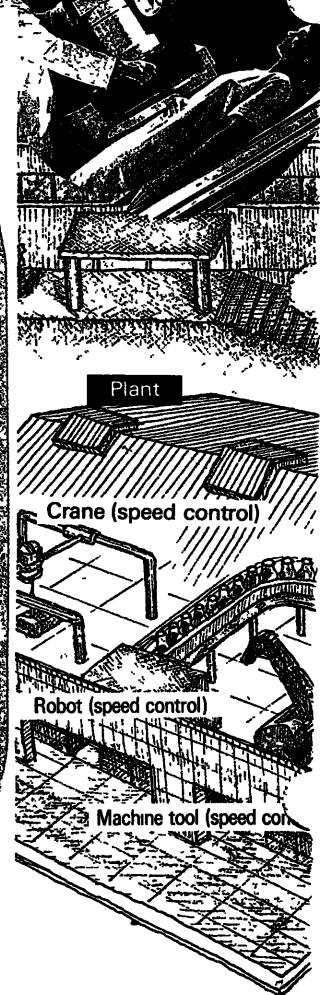
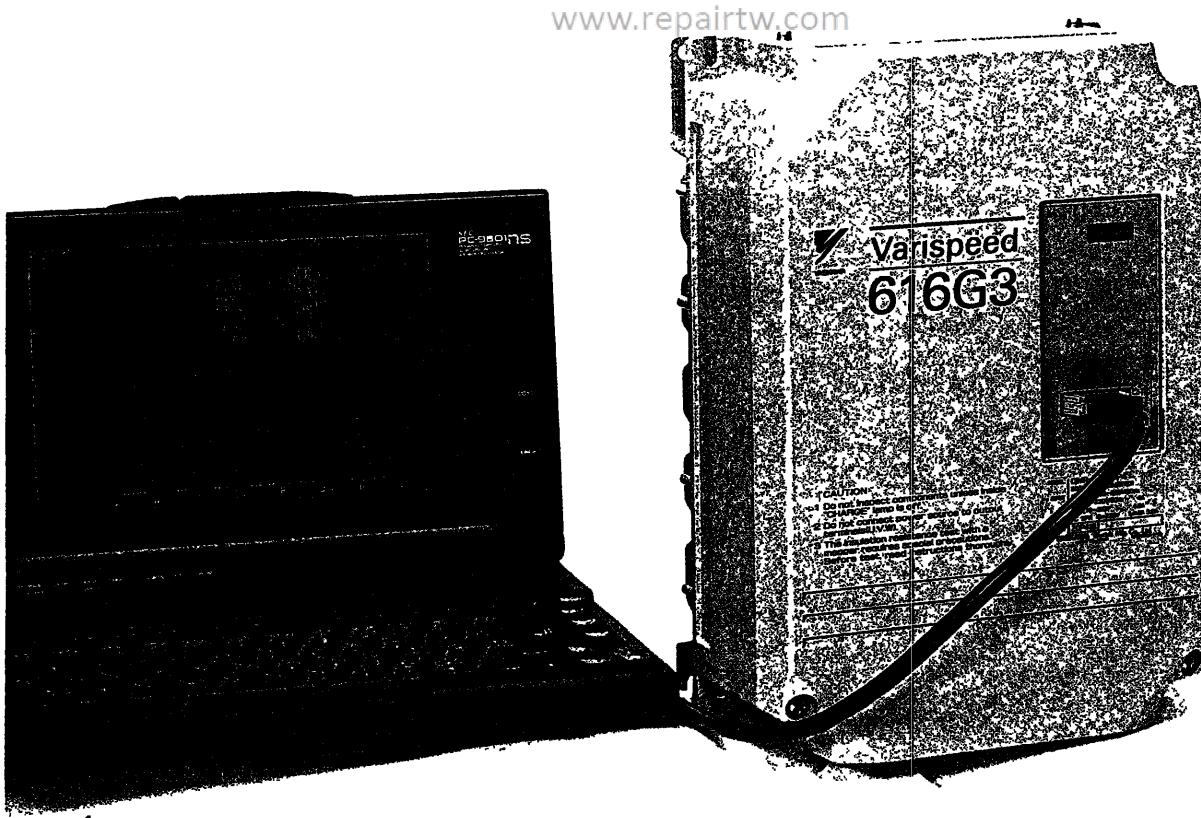
**In High-tech Machines, from Factories to Public Facilities**



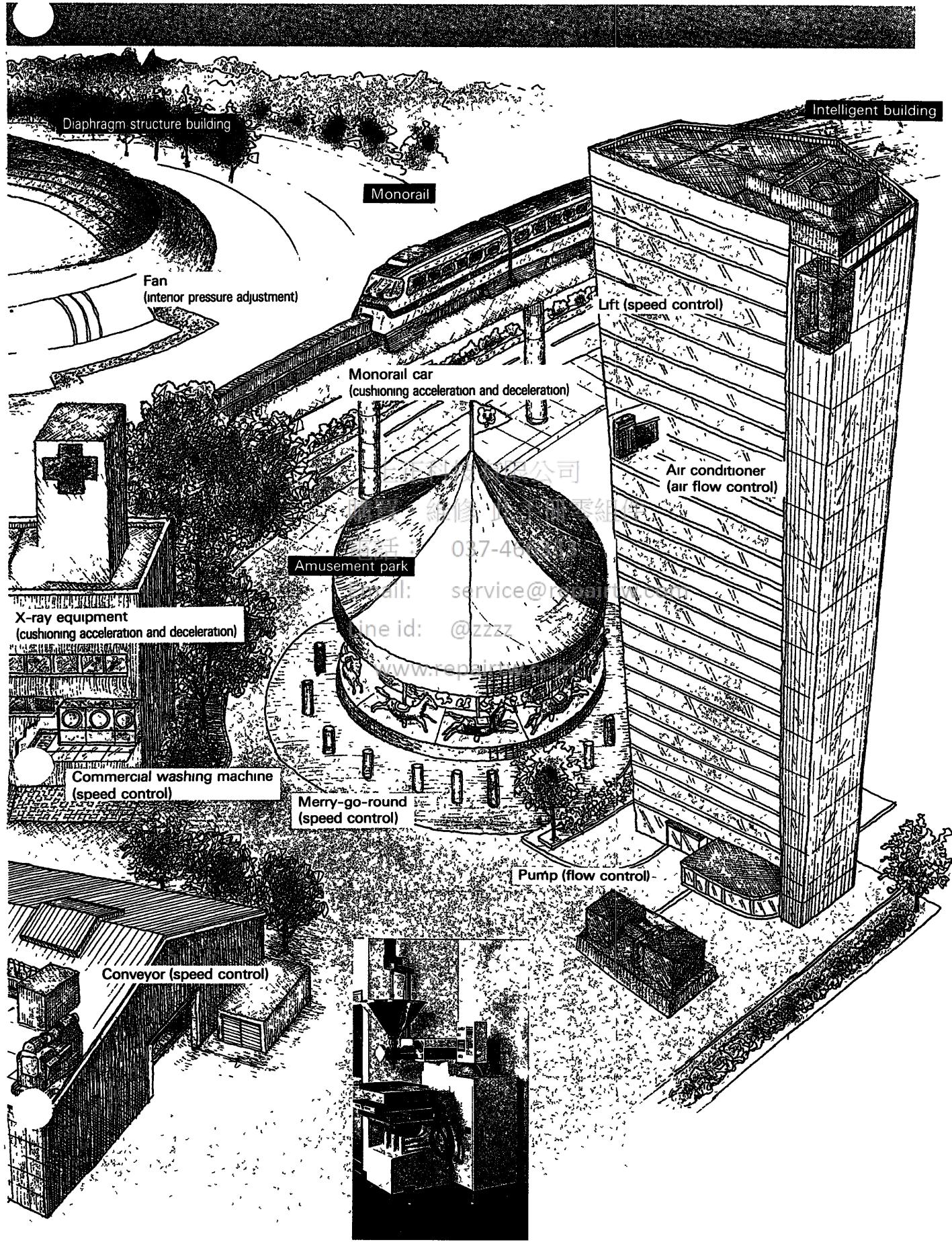
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# *fificant improvements*

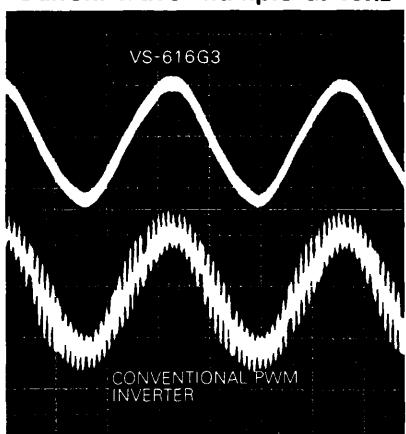


# **SUPER LOW-NOISE DRIVE ... IGBT**

## **General-purpose Inverter with Advanced Functions and Low Noise**

All VS-616G3 series models employ IGBT for switching. The high-speed switching of the IGBT has changed the very concept of inverter control. Precise waveform control coupled with the high performance of the IGBT provides numerous advantages such as quiet operation, high starting torque, smoother shaft rotation and improved reliability.

**Current Wave Example at 10Hz**



### **As quiet as running with commercial power**

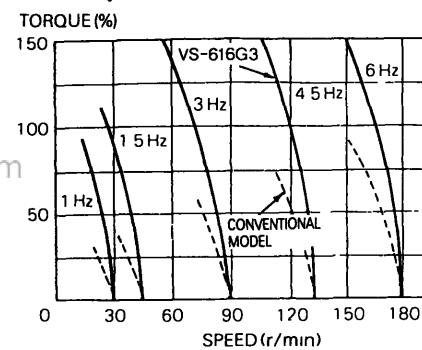
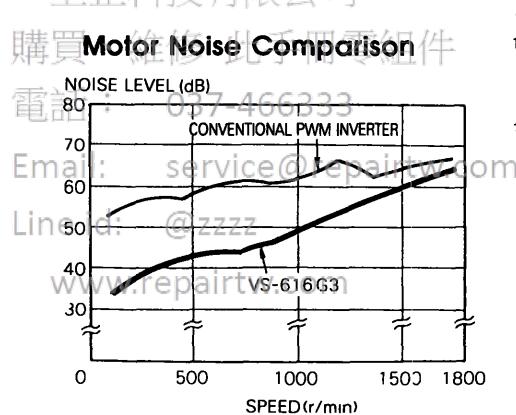
Employing our original asynchronous high-carrier technique for sine wave PWM control, we have succeeded in eliminating the motor noises that plagued conventional PWM inverters.

Running noise has been reduced by approximately 20 dB as compared to conventional PWM inverters. This quiet operation assures a more comfortable working environment.

### **High torque at low speeds ensures tripless operation**

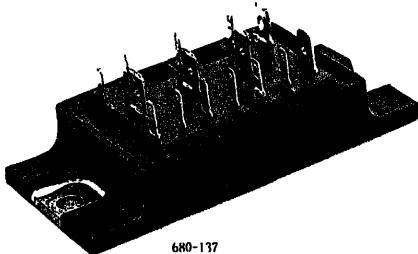
The full-automatic torque boost feature based on our unique vector control operation and exact sine wave drive achieves 150% or greater torque even at 1/20 speed. This ensures maximum performance whenever it is needed. This tough, no-stall inverter won't trip even if overloaded.

### **High torque assured even at low speeds**



### **IGBT**

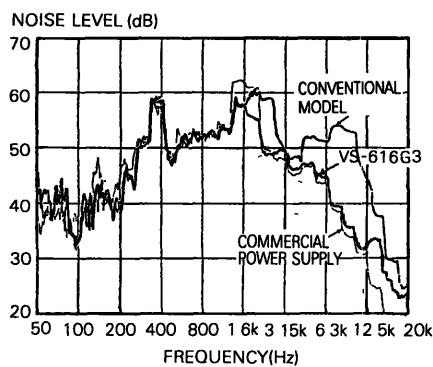
Insulated Gate Bi-polar Transistor



Features of IGBT ( Insulated Gate Bi-polar Transistor)

- Minimal-loss, high-speed switching up to larger ampere ratings
- Direct drive through logic circuitry because of voltage-driven element
- Can accommodate 575V power supply

### **Motor Noise Analysis when Controlled by Inverters (at 60Hz)**



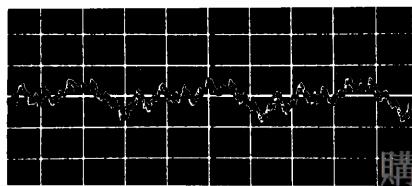
# **INVERTER**

**1.5Hz 100% Torque min., Rotational Stability ( more than double previous models )**

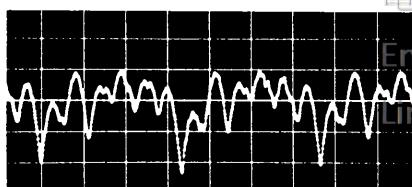
## **Smooth rotation at extra low speeds**

The Yaskawa sine wave control greatly reduces torque ripple and assures smooth operation at very low speeds. This allows maximum utilization of the driven machine's speed range.

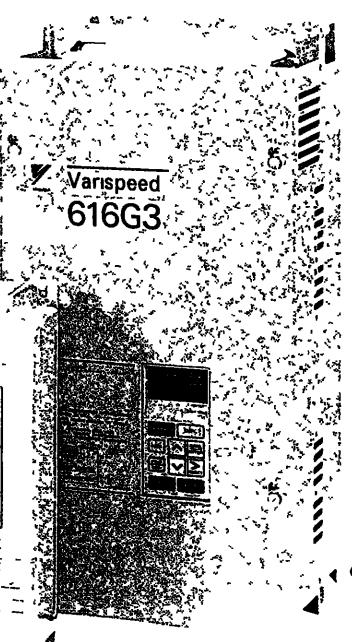
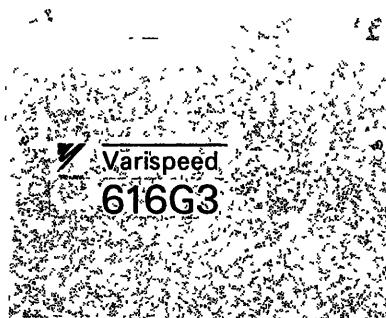
**Smooth rotation realized  
(4.5r/min DIV., 1.5Hz)**



VS-616G3



## Conventional Model

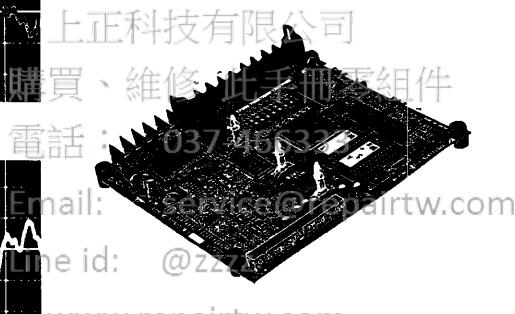


692-546

## Tough inverters with utmost reliability

Standardized control circuits, custom LSI with original high integration design, latest surface mounted technology (SMT), and our IGBT direct drive technique-all combine to provide a compact and highly reliable inverter.

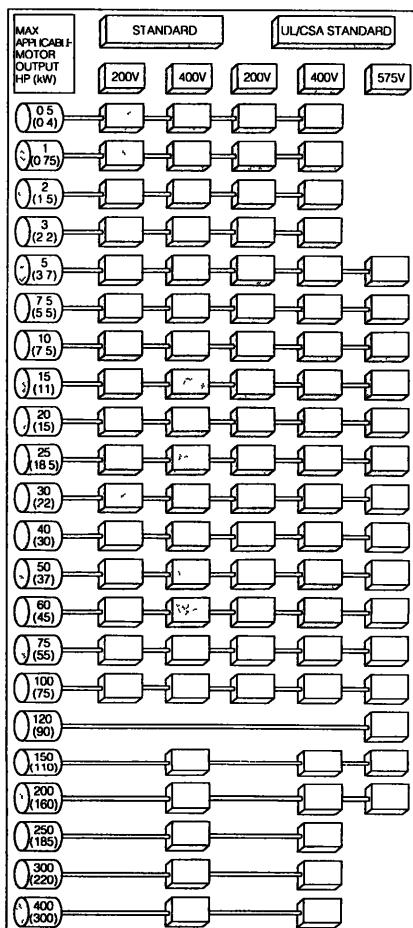
**Compact and highly reliable control board with SMT**



602-547

## A variety of models

The IGBT series consists of a variety of inverters from which you can select the optimum model for your machine.



**Note** Colored boxes indicate low noise types

## **Surface-Mounted Technology (SMT)**

The latest technology that allows soldering of discrete chips or leadless components directly to PC boards has the following features

- High density mounting, meaning more compact and lightweight chips can be made
  - Resistance to vibrations and shock enhances the reliability

# Your Machine becomes "one-of-a-kind."

The new intelligent inverter was designed based on accumulated know-how in motor drives. The versatility of the new fully-digital software inverter satisfies numerous needs and enables you to upgrade your machines. A broad function selection allows rapid and significant changes in your machine's performance. UL/CSA and non-COCOM certified products back up your global strategies.

## UL mark listed



## CSA mark listed



Note. The above mark listed are available for models

CIMR-G3U  
-G3V

## Global service network

Our quality assurance service network covers the USA, Europe, and Southeast Asia. UL, CSA, and non-COCOM certified products fit your global strategies.

## Many Functions for Dramatic Enhancement

### Consolidated monitoring functions for operating state

In addition to the conventional monitoring items, frequency input, output frequency, output current, output voltage, DC voltage, output power, and I/O terminal state are also indicated digitally to facilitate monitoring of machine operation. Alarm contents are retained in memory even at power off.

#### OUTPUT FREQUENCY INDICATION EXAMPLE



Digital indication of operating frequency makes checking of operating state easy

#### DC VOLTAGE INDICATION EXAMPLE



Input power can be checked by one-touch operation. The rectified value of input voltage can be read directly.

#### OUTPUT POWER DISPLAY EXAMPLE



Output power is read on digital display or output terminals so that load status is clear. Energy savings can be easily monitored with the output power.

#### MOTOR CURRENT INDICATION EXAMPLE



Direct indication of motor current allows easy verification of loads

#### ALARM MESSAGE INDICATION EXAMPLE



Should an error occur, the cause is indicated and kept in memory. Error history is retained for troubleshooting.

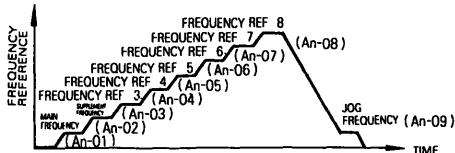
### INPUT TERMINAL STATUS DISPLAY EXAMPLE



Contact states "open" and "closed" are read directly from the display to simple system troubleshooting.

### Simple multi-step operation

Operation speed can be set by up to nine steps by switching four-contact input signals. Various sequence operations can also be easily set.

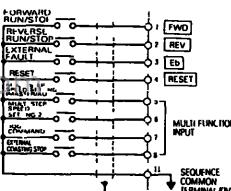


### High grade I/O functions

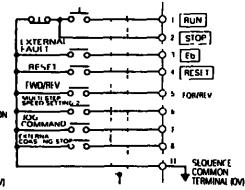
The advanced multi-function I/O terminals adapt the inverter to each machine. Just set system constants with the digital operator to customize the I/O terminals.

#### INPUT SIGNAL

##### STANDARD SETTING (2 WIRE SEQUENCE)



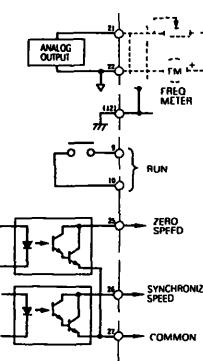
##### CUSTOMIZED SETTING EXAMPLE (3 WIRE EXAMPLE)



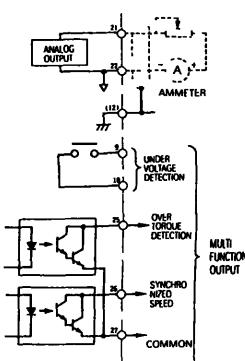
Note (Sn-15 = 00)

#### OUTPUT SIGNAL

##### STANDARD SETTING



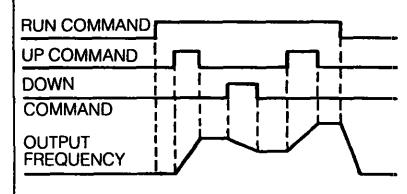
##### CUSTOMIZED SETTING EXAMPLE



Note [ Sn-05 = 1 x x x  
Sn-20 = 07  
Sn-21 = 0 B ]

For other options refer to page 12, 13

### ★ UP/DOWN function



★ Where requiring this function, contact your YASKAWA representative

# with the Highly Flexible Software Control

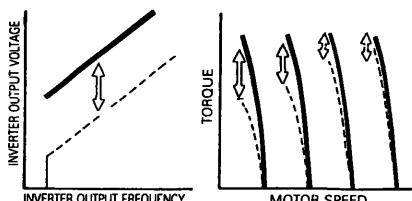
## Our Machines Capability

A well-stocked software library customizes the inverter for each machine

The software library of the highly regarded VS-616G2 has been further enhanced to optimize the inverter for any machine

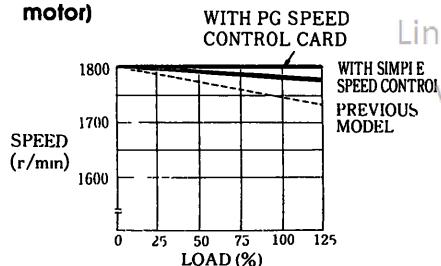
- Adjusts the motor voltage to the optimum level by exact calculation of torque required for the load. This assures continuous operation even under overload conditions.

**[Full-range, fully automatic torque boost] by vector control operation**



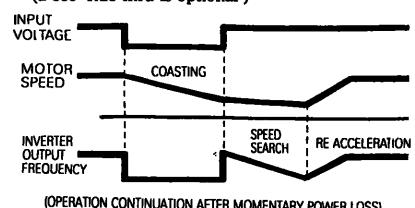
- Guarantees high-precision and constant operation regardless of load fluctuations. Slip compensation circuit reduces motor slip to less than 1%.
- ★ Use of PG speed control card (PG-C) improves up to approx 0.03%

**(Example of 200V, 10HP (7.5kW), 4-pole motor)**



**Quickly recovers from external problems and continues operation to assure final product quality.**

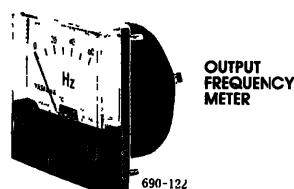
- Two seconds momentary power loss ride-thru  
0.5 to 1 sec for less than 3HP (2kW), 230V / 460V (2 sec ride-thru is optional)



- Automatic restart after fault  
After a fault occurs, the microcomputer performs self diagnosis and restarts automatically without stopping motor. (Up to 10 retries)
- Accel/decel  
The stall prevention at running function ensures tripless operation

## Various monitors

A scalable analog output for frequency or current measurement is provided as a standard. Changing the ammeter, voltmeter, and wattmeter\* outputs is also possible by setting system constants. For applications requiring more feedback, an optional AO-08 board allows three signals to be output. If two analog output signals are required, use option AO-08 or AO-12.



## Enhanced output interface

Two new open collector output signals (a total of three output signals including the contact output) together with the multifunction output selection make possible more enhanced control of machines

- At zero-speed, at set speed, at set speed with hysteresis on decel ramp or accel ramp (as standard)
- Frequency detection (detects a set frequency, below or above)
- Overtorque detected (machine overloaded)
- Low voltage detected (Input voltage insufficient)
- Others

## Load operation indication

The output frequency can be scaled such that many units such as motor speed, load axis speed (r/min), line speed (m/min), and flow (m<sup>3</sup>/min) may be indicated

MOTOR SPEED DISPLAY  
(1800 r/min)

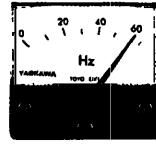


## Easy set-up

Accel/decel time, frequency reference, and frequency meter scale, among others, can be adjusted while the machine is running. This speeds start-up and reduces downtime for system tuning



690-126

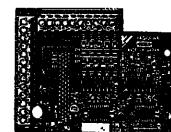


690-116

**Easy link with PLC by digital setting.**

## Easy to link with PLC

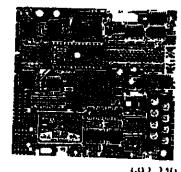
Motor speed can be precisely set with an external signal. Either 4 digits BCD (binary code decimal) or 16 binary bits can be used (on-board option)



692-551

## Computer link

Computer control with a personal computer or high-order sequencer can be accomplished through RS-232C, -422, -485 high-speed communication interface



692-210

## ★ High-accuracy operation by speed feedback control

Speed regulation caused by slip is minimized using speed feedback function of pulse generator (PG) mounted on a motor



692-551

PG SPEED CONTROL CARD PG-C

## Remote controlled operation

Operation can be controlled at the machine side or from a remote control panel (within 3m)



692-512

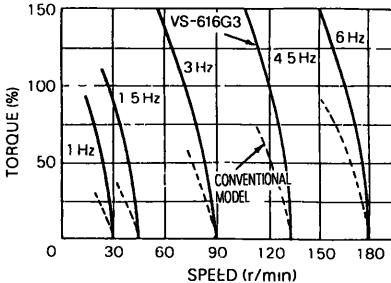
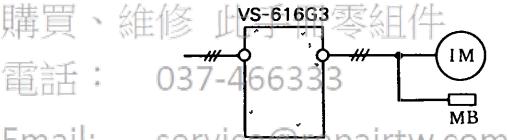
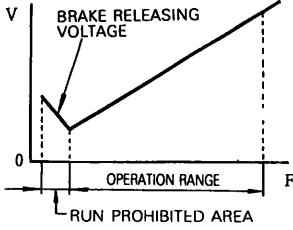
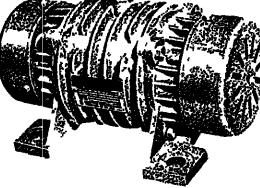
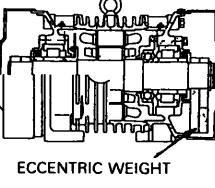
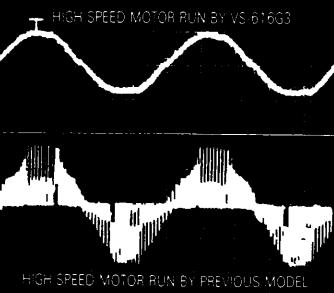
## A variety of options

The frequency input options and output monitoring options allow high-precision control and monitoring

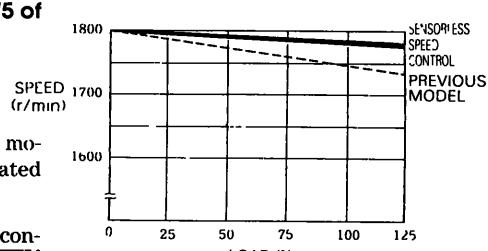
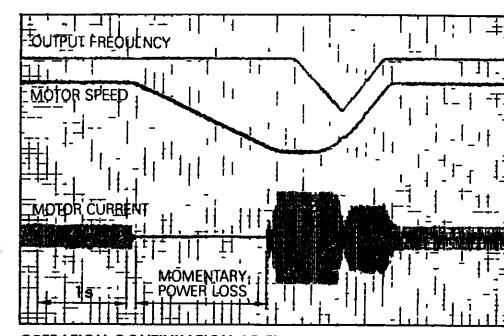
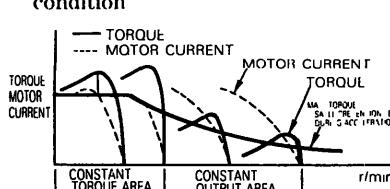
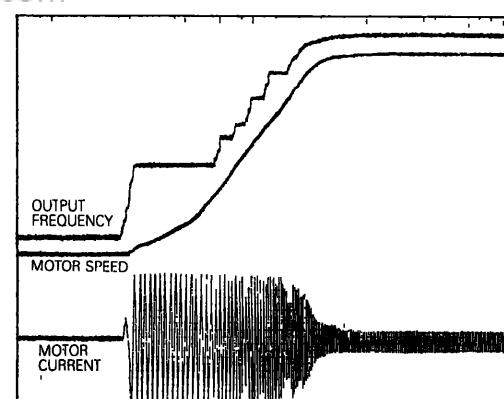
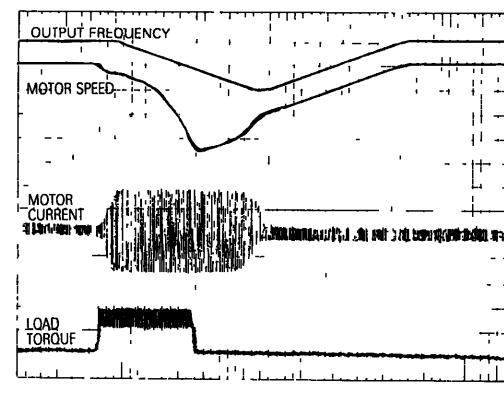
- Frequency reference option cards
  - High-precision analog input AI-14U (14 bits)
  - AI-14B (13 bits with direction)
- General-purpose digital input DI-08 (two BCD digits or eight binary bits)
- DI-16G (four BCD digits or sixteen binary bits)
- Monitoring option card
  - Analog monitor A0-08(0-10VDC, 8 bits, 2-point output)
  - A0-12 (0-10VDC, 12 bits, 2-point output)
  - Pulse monitor P0-36F (1F, 6F, 10F, 36F, +12V)
- Braking option, AC reactor, and noise filter are offered as options
- ★ Where requiring this function, contact your YASKAWA representative

# ADVANCED LEVEL MOTOR DRIVE

**Conventional Weak Points Have been Overcome to Achieve Top Motor Performance**

Conventional Inverter Shortcomings	VS-616G3 Solutions
<b>Low starting torque</b> Inverter of the next higher capacity must be employed for applications requiring high starting torque	<b>150% torque established at 1/20 of the rated speed.</b> Motor torque increases up to 150% over full-speed range due current waveform correction by asynchronous PWM method and automatic torque compensation by vector control operation
	 <p>Torque characteristics of 5HP (3.7kW) IM driven by model CIMR-G3A23P7</p>
<b>Typical Problem:</b> <b>Cannot vary speeds of the excitation release type motor with a brake.</b>	<b>VS-616G3 solution</b> <b>Easily starts motor with a brake. The brake can be securely tripped.</b>  <p>購買、維修 此乃零組件 電話 : 037-466333 Email: service@repairtw.com Line id: @zzzz <a href="http://www.repairtw.com">www.repairtw.com</a></p>  <p>The brake trip voltage can be controlled externally</p>
<b>Difficult to vary speeds of the vibrating type URAS motor.</b> Inverter of one or two classes greater capacity is applied for the eccentric-weight-incorporating type motor <b>YASKAWA "URAS" Motor</b>	<b>Automatic torque boost effectively solves the eccentric torque problem.</b> Inverter of the same capacity as the motor can be used for cost-savings
<b>Frequent overcurrent when starting a high frequency motor.</b> Because of very low inductance of a high frequency motor, ripple current tends to be high and overcurrent may frequently occur. To compensate for this, an inverter of one or two classes greater capacity and output AC reactor is normally used	  <p>Original, asynchronous, high-carrier frequency, PWM technique improves the motor characteristics.            This eliminates the need for an AC reactor to reduce ripple current</p> <p>Current waveform example</p> 

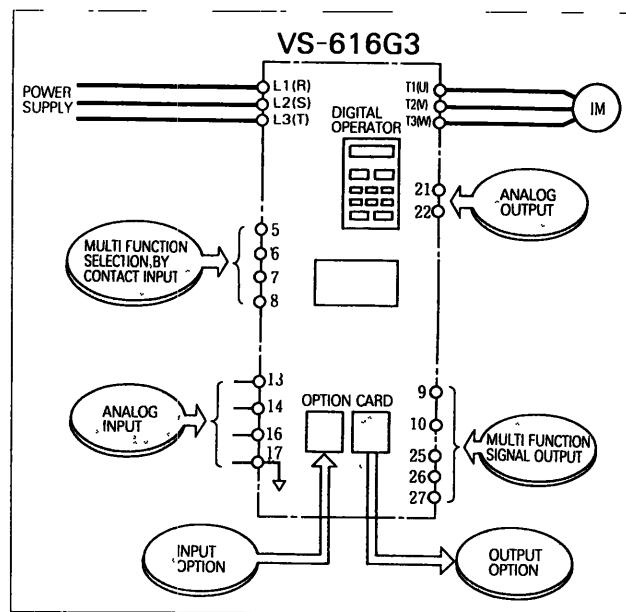
# Significantly Enhanced Speed Control Stability

Conventional Inverter Shortcomings	VS-616G3 Solutions
<p><b>Motor speed control cannot be improved beyond the VS-616G3's performance without using PG or TG feedback (closed-loop)</b></p>	<p><b>Built-in sensorless speed control function reduces speed fluctuations to 1/3 to 1/5 of rated speed</b></p> <p>Precisely calculates load from motor current and corrects slip</p> <p>For precise slip correction by this function, motor rated current, no load current, and rated slip are required</p> <p>★ For high-precision operation, use PG speed control card PG-C</p>  <p>The graph plots SPEED (r/min) from 1600 to 1800 against LOAD (%) from 0 to 125. A solid line represents the 'PREVIOUS MODEL' and shows significant speed drop at higher loads. A dashed line represents 'SENSORLESS SPEED CONTROL' which maintains a much more constant speed across the load range.</p>
<p><b>Operation cannot continue after momentary power loss</b></p>	<p><b>Continues operation during a momentary power loss of less than 2 seconds</b></p> <p>上正科技有限公司 購買、維修 此手冊零組件 電話 : 037-466333 Email: service@repairtw.com Line ID: @2zzz www.repairtw.com</p>  <p>The graph shows three stacked plots: OUTPUT FREQUENCY, MOTOR SPEED, and MOTOR CURRENT. A vertical bar indicates a 'MOMENTARY POWER LOSS'. After the loss, the motor speed and current quickly recover to their previous levels, demonstrating the ability to resume operation.</p> <p><b>OPERATION CONTINUATION AFTER MOMENTARY POWER LOSS</b></p>
<p><b>Hard to adjust starting time</b></p> <p>Setting a shorter time than that determined by motor torque and load <math>Wk^2(GD^2)</math> may cause acceleration failure resulting in OC or OL activation. Or it may cause acceleration failure and falling in rated output area</p>	<p><b>Stall prevention during acceleration</b></p> <p>Automatically adjusts the acceleration rate according to the current of the accelerating motor to prevent stalling or overcurrent condition</p>  <p>The graph shows TORQUE and MOTOR CURRENT over time. It highlights two regions: 'CONSTANT TORQUE AREA' and 'CONSTANT OUTPUT AREA'. Arrows indicate the transition between these areas, with a note 'MAX TORQUE STALL PREVENTION DURING ACCELERATION'.</p> <p><b>MOTOR accelerates at max torque value in constant output area.</b></p>  <p>The graph shows OUTPUT FREQUENCY, MOTOR SPEED, and MOTOR CURRENT. A step change in load torque causes a dip in speed. The motor current increases to prevent stall, demonstrating stall prevention during operation.</p> <p><b>STALL PREVENTION DURING ACCELERATION</b></p>
<p><b>Stall by overload in operation.</b></p> <p>Momentary overload condition during inverter operation causes pull-out condition, resulting in motor torque reduction operation failure due to overcurrent or overload protection activation</p>	<p><b>Stall prevention during operation</b></p> <p>If overloaded during operation, automatically reduces frequency. In this case, motor outputs the maximum torque. When the load returns to normal, frequency accelerates to the previous set value and operation continues</p>  <p>The graph shows OUTPUT FREQUENCY, MOTOR SPEED, and MOTOR CURRENT. A sharp step increase in load torque causes a significant dip in speed. The motor current increases to prevent stall. When the load is removed, the frequency and speed quickly return to their previous levels, demonstrating stall prevention during operation.</p> <p><b>STALL PREVENTION DURING OPERATION</b></p>

★ Where requiring this function, contact your YASKAWA representative

# Vast Application Experience is Inco

The VS-616G3 flexible inverter incorporates a variety of application know-how. Select special functions from a multitude of possibilities to perfectly match your machine.



Function name	Target market	Application	Operation, advantages	VS-616G3 setting			
				Contact setting	Analog I/O	Signal output	Control constant setting
Speed search operation	Inertia load drive such as blower, winder, etc	Synchronize with the coasting motor	Starts the inverter at the specified frequency, automatically detects the synchronization point, and leads the operation to the operation frequency. No speed detector is required. It is no longer necessary to stop the motor before starting, the operation efficiency for the customer is greatly improved	●			Sn-15 to 18
DC Injection braking before operation	Blower, pump, etc which have wind-mill effects	Starting the free running motor	When the direction of the free running motor is unfixed, the above speed search operation function is difficult to use. In these, the motor can be stopped by DC injection braking, and be restarted by the inverter. The operation is completely automatic	●			Sn 15 to 18 Cn 11 Cn 13
Commercial power source / inverter switchover operation	Blower, pump, mixer, extruder, etc	Automatic switching between commercial power source and inverter	Switching of commercial power source to inverter or inverter to commercial power source is done without stopping the motor. The operation efficiency for the customer is improved. When the inverter size is decided by the starting capacity (as in the extruder), this function can be used to reduce the inverter capacity	●			Sn 15 to 18
Energy saving operation	Precision machine tool	Energy saving, Low vibration	Full power is output during accel / decel. When it reaches a constant speed, the output voltage is automatically reduced to the preset value. Mainly applied to reduce the vibration in precision machine tools	●			Sn 15 to 18 bn 09
Multi-step speed operation	Transportation machine, etc	Schedule operation under fixed speed command and positioning stop	Multi-step operation can be set by setting the contact combinations, so the connection with PLC becomes very easy. When combined with jog speed can also allow simple positioning	●			Sn 15 to 18 An 01 to 09
Accel / decel time changeover operation	Machine tool, etc	The accel / decel time changeover with an external signal	The two kinds of accel / decel times are switched by an external contact signal. Necessary for switching operation of 2 machines with different functions by a single inverter. Also used in emergency stopping applications	●			Sn-15 to 18 bn 01, 02 bn 03, 04
Inverter overheating prediction	Air conditioner, etc	Preventive maintenance	When the ambient temperature of the inverter rises to within 10°C of the maximum allowable temperature, warning is given. Motor keeps running	●			Sn-15 to 18
3-wire sequence	General	Simple configuration of control circuit	Operation can be accomplished using a momentary push-button switch				
				●			Sn-15 to 18
Operating site selection	General	Easy operation	Operation and settings can be selected while the inverter is online (digital operator / external instruction, signal input / output)	●			Sn-04 Sn-15 to 18
Frequency hold * operation	General	Easy operation	Temporary stops change of frequencies during acceleration or deceleration	●			Sn-15 to 18
Fault trip retry operation	Air conditioner, etc	Improvement of operation reliability	When the inverter trips, it first begins to coast, and then it immediately is diagnosed by computer, resets automatically, and returns to the original operation speed by speed search operation. Up to 10 retry counts can be selected				Sn 04 Sn-15 to 18
Quick stop without braking resistor (DC injection braking stop)	High speed router, etc	DC injection braking of induction motor	DC injection braking is performed from top speed. The duty is 5% or less. Can generate 50% to 70% of the braking torque. Economic, because a braking resistor is not necessary. Has advantage of mounting in completely closed cabinets				Sn-04 Cn 11 Cn 12

\* Contact your Yaskawa representative for availability in North American markets

# porated in the Software Functions

Function name	Target market	Application	Operation, advantages	VS - 616G3 setting			
				Contact input	Analog I/O	Signal output	Control constant setting
Excess torque detect setting operation	Blower, cutter, extruder, etc	• Protection of machine • Improvement of continuous operation reliability • Torque limit	The inverter can be switched to coasting or motor speed reducing mode as soon as it reaches a certain preset torque level. Machine (especially cutter) protection can be done without using special peripheral devices. When used in a blower application the operation frequency can be automatically reduced to the load balancing point, according to the overload condition, and prevent overload tripping			●	Sn-07, 10 Cn 26, 27 Cn 30
Upper / lower frequency limit operation	Pump blower	Motor speed limit	The upper and lower limits of the motor speed can be set independently. No peripheral operation units. The command signal bias and gain can also be set independently				Cn-14, 15
Prohibit setting of specific frequency (frequency jump control)	General machines	Prevent mechanical vibration in the equipment	The motor simply passes through the preset speed, and continuous running cannot be done at this speed. This function is used to avoid the mechanical resonance point of the equipment. (Up to 3 points can be set.)				Cn-16 to 19
Carrier frequency setting	General machines	Lower noise, eliminates resonance	The carrier frequency can be set to reduce the acoustic noise from the motor and machine system				Cn 23 to 25
Automatic continuous operation when the speed command is lost	Air conditioner	Improving reliability of continuous operation	When the frequency command signal is lost, operation is automatically continued at the pre-programmed speed. (Countermeasures to the failure of host computer). This function is important for air conditioning systems in 'intelligent buildings.'				Sn 06
Load speed display	General	Monitor function enhancement	Can indicate motor speed (rpm), machine speed loaded (rpm), line speed (m/min), etc.				Cn 20
Run signal	General	Motor with mechanical brake operation	Closed during operation Open during coasting to a stop Can be used as interlock contact point during stop			●	Sn 20 to 22
Zero-speed signal	Machine tools	Zero frequency interlock	Can be used as tool exchange signal			●	Sn 20 to 22
Speed agreed signal	Machine tools	Command speed reach interlock	The contact closes when inverter output frequency reaches the set value. Can be used as an interlock for lathes, etc.			●	Sn 20 to 22
Excess torque signal	Blower, cutter, extruder, etc	Protection of machine, improvement of operation continuation reliability	Works when 'over torque setting operation' is accomplished. Can be used as a torque limiter.			●	Sn-07 Sn-20 to 22 Cn 26, 27
Low voltage signal	General	System protection for undervoltage	This contact is 'closed' only when tripped by low voltage. Can be used as power loss detection relay for the system power loss countermeasure			●	Sn-20 to 22
Free unintentionally speed agreed signal	General	Command speed agreed interlock	The contact closes when the speed agrees at arbitrary frequency command			●	Cn 21, 22
Output frequency detection 1	General	Gear change interlock etc	The contact closes at an arbitrary output frequency and above			●	Sn 20 to 22 Cn 21, 22
Output frequency detection 2	General	Gear change interlock etc	The contact closes at the arbitrary output frequency and below			●	Sn 20 to 22 Cn-21, 22
Base block signal	General	Operation interlock, etc	Always 'close' when the inverter output is off			●	Sn-20 to 22
Damping resistor protection	General	Preventive maintenance	'Close' when an overheat of a built-in braking resistor or a braking transistor error is detected			●	Sn-11
Frequency reference sudden change detection	General	Operation stability	'Close' when the frequency reference suddenly drops to 10% or below of the set value			●	Sn-20 to 22 Sn-06
Analog Input signal	General	Easy operation	Functions as supplementary frequency reference. Also used for fine control of input reference, output voltage adjustment, external control of accel / decel time, and fine adjustment of over torque detection level		●		Sn 19
Analog output signal	General	Monitor function enhancement	Either a frequency meter, ammeter, voltmeter, or wattmeter can be used	●			Sn-05
Analog input	General	Easy operation	Enables external operation with high resolution instructions. Also enables normal and reverse operation using positive or negative voltage signals				Sn-25
Digital input	General	Easy operation	Enables operation with 8-bit or 16 bit <sup>*</sup> digital signals. Easily connects to NC or PC (DI 08, DI 16G) <sup>*</sup>				Sn 26
Analog output	General	Monitor function enhancement	Monitors output frequency, motor current, output voltage, and DC voltage (AO-08 AO 12)				Sn-28
Digital output	General	Operation enhancement	Indicates output frequency using a pulse counter. Indicates errors through discrete output (PO-36F)				Sn-27

★Where requiring this function, contact your YASKAWA representative

With option card

# EXCELLENT SPECIFICATIONS FOR EASY OPERATION

## SPECIFICATIONS

Inverter Model CIMR - G3		200 to 230V															
		20P4	20P7	21P5	22P2	23P7	25P5	27P5	2014	2015	2018	2022	2030	2037	2045	2055	2075
Max Applicable Motor Output	Hp (kW)*	0.5 (0.4)	1 (0.75)	2 (1.5)	3 (2.2)	5 (3.7)	7.5 (5.5)	10 (7.5)	15 (11)	20 (15)	25 (18.5)	30 (22)	40 (30)	50 (37)	60 (45)	75 (55)	100 (75)
Output Characteristics	Inverter Capacity	kVA	14	21	27	41	69	103	137	200	274	34	41	54	68	78	95
	Rated Current	A	32	48	64	96	16	24	32	48	64	80	96	130	160	183	224
	Max Continuous Current†	A	36	54	72	108	18	27	36	54	72	90	108	146	180	205	237
	Max Voltage		3-Phase, 200/208/220/230V (Proportional to input voltage)														
Power Supply	Rated Frequency		50, 60, 72, 90, 120, 180 Hz (up to 400 Hz available)														
	Rated Input Voltage and Frequency		3-Phase 200/208/220V, 50 Hz 200/208/220/230V, 60 Hz														
	Allowable Voltage Fluctuation		± 10%														
	Allowable Frequency Fluctuation		± 5%														
Control Characteristics	Control Method		Sine wave PWM														
	Frequency Control Range		0 to 400 Hz														
	Frequency Accuracy		Digital command	0.01% (+14 to 104°F -10 to 40°C)	Analog command	0.1% (77 ± 18°F 25 ± 10°C)											
	Frequency Setting Resolution		Digital operator reference	0.01 Hz (when less than 100 Hz), 0.1 Hz (when 100 Hz or more)	Analog reference	0.06 Hz/60 Hz											
	Output Frequency Resolution		0.01 Hz (1/30000)														
	Overload Capacity		150% rated output current for one minute														
	Frequency Setting Signal		0 to 10 VDC (20 kΩ), 3.4-20 mA (250 Ω) 0 ± 10V (OPTIONAL)														
	Accel/Decel Time		0.1 to 6000 sec (Accel/Decel time setting independently)														
	Braking Torque		Email: <a href="mailto:service@repower.com">service@repower.com</a>														
	No. of V-f Patterns (Total of 16)		4 For general purpose 4 For fans and pumps	4 For high starting torque 3 For machine tools	1 For adjustable pattern												
Protective Functions	Motor Overload Protection		Line Id: <a href="http://www.repower.com">www.repower.com</a> Motor coasts to a stop at approx 200% rated output current														
	Instantaneous Overcurrent		Blown Fuse Protection														
	Overload		Overvoltage														
	Undervoltage		Undervoltage														
	Momentary Power Loss		Motor coasts to a stop if converter output voltage exceeds 400V														
	Fin Overheat		Motor coasts to a stop if converter output voltage drops to 210V or below														
	Cooling Fan Fault		Immediately stop by 15 ms and above longer power loss (Continuous system operation during power loss less than 2 sec is equipped as standard) ‡ Setting mode before shipment														
	Stall Prevention		Thermostat														
	Ground Fault		Fan sensor for inverter of more than 40HP (30kW)														
	Power Charge Indication		Stall prevention at acceleration/deceleration and constant speed operation														
Environmental Conditions	Location		Provided by electronic circuit														
	Ambient Temperature		Charge lamp stays ON until bus voltage drops below 50V														
	Storage Temperature #		Indoor (protected from corrosive gases and dust)														
	Humidity		+ 14 to 104°F (- 10 to + 40°C) (not frozen)														
	Vibration		- 4 to 140°F (- 20 to + 60°C)														

\* Our standard 4-pole motor is used for max applicable motor output

† Allowable values for the applications not requiring overload

‡ For Models of 41 kVA or less, continuous system operation during power loss less than 1 sec  
Two seconds ride-thru available as option

# Temperature during shipping (for short period)

## SPECIFICATIONS

Inverter Model CIMR - G3		380 to 460																																																	
		40P4	40P7	41P5	42P2	43P7	45P5	47P5	40I1	40I5	40I8	4022	4030	4037	4045 4L45	4055	4075	4110	4160	4185	4220	4300																													
Max Applicable Motor Output	Hp (kW)*	0.5 (0.4)	1 (0.75)	2 (1.5)	3 (2.2)	5 (3.7)	7.5 (5.5)	10 (7.5)	15 (11)	20 (18.5)	25 (22)	30 (30)	40 (37)	50 (45)	60** (55)	75 (75)	100 (110)	150 (160)	200 (185)	250 (220)	300 (300)	400																													
Output Characteristics	Inverter Capacity	kVA	1.4	2.2	3.4	4.1	6.9	10.3	13.7	20.6	27.4	34	41	54	68	82	110	140	200	250	290	380	510																												
	Rated Current	A	1.6	2.6	4.0	4.8	8	12	16	24	32	40	48	64	80	96	128	165	224	300	340	450	600																												
	Max Continuous Current†	A	1.8	2.9	4.5	5.4	9	13.5	18	27	36	45	54	72	90	108	144	180	252	337	380	506	675																												
Max Voltage		3-Phase, 380/400/415/440/460V (Proportional to input voltage)																																																	
Rated Frequency		50, 60, 72, 90, 120, 180 Hz (up to 400 Hz available)																																																	
Power Supply	Rated Input Voltage and Frequency	3-Phase 380/400/415/440/460V, 50/60Hz																																																	
	Allowable Voltage Fluctuation	± 10%																																																	
	Allowable Frequency Fluctuation	± 5%																																																	
Control Characteristics	Control Method	Sine wave PWM																																																	
	Frequency Control Range	0.1 to 400 Hz																																																	
	Frequency Accuracy	Digital command	0.01%	$+14 \text{ to } 104^{\circ}\text{F}$ $-10 \text{ to } 40^{\circ}\text{C}$				Analog command	0.1%	$77 \pm 18^{\circ}\text{F}$ $25 \pm 10^{\circ}\text{C}$																																									
	Frequency Setting Resolution	Digital operator reference	0.01 Hz (when less than 100 Hz), 0.1 Hz (when 100 Hz or more)	Analog reference 0.06 Hz/60 Hz																																															
	Output Frequency Resolution	0.01 Hz (1/30000)																																																	
	Overload Capacity	150% rated output current for one minute																																																	
	Frequency Setting Signal	0 to 10 VDC (20 kΩ), 4-20 mA (250 Ω) 0 ± 10V (OPTIONAL)																																																	
	Accel/Decel Time	0.1 to 6000 sec (Accel/Decel time setting independently)																																																	
	Braking Torque	Approx 20%																																																	
Protective Functions	No. of V-f Patterns (Total of 16)	4	For general purpose	4	For high starting torque	1	For adjustable pattern																																												
	Motor Overload Protection	Electronic thermal overload relay																																																	
	Instantaneous Overcurrent	Motor coasts to a stop at approx 200% rated output current																																																	
	Blown Fuse Protection	Motor coasts to a stop by blown-fuse																																																	
	Overload	Motor coasts to a stop after 1 minute at 150% rated output current																																																	
	Overvoltage	Motor coasts to a stop if converter output voltage exceeds 800V (700V) **																																																	
	Undervoltage	Motor coasts to a stop if converter output voltage drops to 420V or below																																																	
	Momentary Power Loss	Immediately stop by 15 ms and above longer power loss (Continuous system operation during power loss less than 2 sec is equipped as standard) † Setting mode before shipment																																																	
	Fin Overheat	Thermostat																																																	
	Cooling Fan Fault	Fan sensor for inverter of more than 75HP (55kW)																																																	
Environmental Conditions	Stall Prevention	Stall prevention at acceleration/deceleration and constant speed operation																																																	
	Ground Fault	Provided by electronic circuit																																																	
	Power Charge Indication	Charge lamp stays ON until bus voltage drops below 50V																																																	
	Location	Indoor (protected from corrosive gases and dust)																																																	
	Ambient Temperature	+ 14 to 104°F (- 10 to + 40°C) for enclosed wall-mounted type (not frozen) + 14 to 122°F (- 10 to + 50°C) for open chassis type																																																	
	Storage Temperature #	- 4 to 140°F (- 20 to + 60°C)																																																	
	Humidity	90% RH (non-condensing)																																																	
	Vibration	9.8m/s <sup>2</sup> (1G) less than 20Hz, up to 1.96m/s <sup>2</sup> (0.2G) at 20 to 50Hz																																																	

\* Our standard 4-pole motor is used for max applicable motor output

† Allowable values for the applications not requiring overload

‡ For Models of 4.1 kVA or less, continuous system operation during power loss less than 1 sec  
Two seconds ride-thru available as option

# Temperature during shipping (for short period)

## Both low noise type model-4L45 and low carrier frequency, compact type model-4045 are available

\*\* 800V for input voltage (Cn-01) more than 400V and 700V for less than 400V

# EXCELLENT SPECIFICATIONS FOR EASY OPERATION

## SPECIFICATIONS

Inverter Model CIMR - G3..			500 to 575V																																		
			53P7	55P5	57P5	5011	5045	5048	5022	5030	5037	5045	5055	5075	5090	5110	5160																				
Max Applicable Motor Output	Hp (kW)*		5 (3.7)	7.5 (5.5)	10 (7.5)	15 (11)	20 (15)	25 (18.5)	30 (22)	40 (30)	50 (37)	60 (45)	75 (55)	100 (75)	120 (90)	155 (110)	200 (160)																				
Output Characteristics	Inverter Capacity	kVA	5	7.5	10	15	20	25	30	40	50	60	75	100	125	150	200																				
	Rated Current	A	6.3	9.5	12.5	17	22	27	32	43	54	64	81	112	130	172	200																				
	Max Continuous Current†	A	7	10.5	14	19	25	30	36	48	60	72	90	125	145	192	224																				
	Max Voltage		3-Phase, 500/575V (Proportional to input voltage)																																		
Power Supply	Rated Frequency		50, 60, 72, 90, 120, 180 Hz (up to 400 Hz available)																																		
	Rated Input Voltage and Frequency		3-Phase 500/575V, 50/60 Hz																																		
	Allowable Voltage Fluctuation		$\pm 10\%$																																		
	Allowable Frequency Fluctuation		$\pm 5\%$																																		
Control Characteristics	Control Method		Sine wave PWM																																		
	Frequency Control Range		0.1 to 400 Hz																																		
	Frequency Accuracy		Digital command	0.01%	$+14 \text{ to } 104^\circ\text{F}$ $-10 \text{ to } 40^\circ\text{C}$			Analog command	0.1%	$77 \pm 18^\circ\text{F}$ $25 \pm 10^\circ\text{C}$																											
	Frequency Setting Resolution		Digital operator reference	0.01 Hz	(when less than 100 Hz), Analog reference 0.06 Hz/60 Hz			0.1 Hz (when 100 Hz or more)																													
Protective Functions	Output Frequency Resolution		0.01 Hz (1/30000)																																		
	Overload Capacity		150% rated output current for one minute																																		
	Frequency Setting Signal		0 to 10 VDC (20 kΩ), 4-20 mA (250 Ω) 0-±10V (OPTIONAL)																																		
	Accel/Decel Time		0.1 to 6000 sec (Accel/Decel time setting independently)																																		
Environmental Conditions	Braking Torque		Approx. 20%																																		
	No of V-f Patterns (Total of 16)		4	For general purpose			4	For high starting torque			1	For adjustable pattern																									
	Motor Overload Protection		4 For fans and pumps																																		
	Instantaneous Overcurrent		Electronic thermal overload relay																																		
Protective Functions	Blown Fuse Protection		Motor coasts to a stop at approx. 200% rated current																																		
	Overload		Motor coasts to a stop after 1 minute at 150% rated output current																																		
	Overspeed		Motor coasts to a stop if converter output voltage exceeds 1000V (875V) **																																		
	Undervoltage		Motor coasts to a stop if converter output voltage drops to 525V or below																																		
Environmental Conditions	Momentary Power Loss		Immediately stop by 15 ms and above longer power loss (Continuous system operation during power loss less than 2 sec is equipped as standard) † Setting mode before shipment																																		
	Fin Overheat		Thermostat																																		
	Cooling Fan Fault		Fan sensor for inverter of more than 30HP (22kW)																																		
	Stall Prevention		Stall prevention at acceleration/deceleration and constant speed operation																																		
Environmental Conditions	Ground Fault		Provided by electronic circuit																																		
	Power Charge Indication		Charge lamp stays ON until bus voltage drops below 50V																																		
	Location		Indoor (protected from corrosive gases and dust)																																		
	Ambient Temperature		+14 to 104°F (-10 to +40°C) for enclosed wall-mounted type (not frozen) +14 to 122°F (-10 to +50°C) for open chassis type																																		
Environmental Conditions	Storage Temperature #		-4 to 140°F (-20 to +60°C)																																		
	Humidity		90% RH (non-condensing)																																		
	Vibration		9.8m/s² (1G) less than 20Hz, up to 1.96m/s² (0.2G) at 20 to 50Hz																																		

\* Our standard 4-pole motor is used for max applicable motor output

† Allowable values for the applications not requiring overload

‡ For Models of 4.1 kVA or less, continuous system operation during power loss less than 1 sec  
Two seconds ride-thru available as option

# Temperature during shipping (for short period)

\*\* 1000V for input voltage (Cn-01) more than 500V and 875V for less than 500V

# RELIABLE PROTECTIVE ENCLOSURES

Voltage	Max Applicable Motor Output Hp(kW)	VS-616G3		Enclosures (Specify the enclosure type when ordering)	
		Inverter Capacity kVA	Model	Enclosed Type (NEMA 1)	Open Chassis Type (IEC IP00)
200 to 230V	0.5 (0.4)	1.4	CIMR-G3 20P4	2 0P41	Available by removing the upper and lower cover of enclosed type
	1 (0.75)	2.1	CIMR-G3 20P7	2 0P71	
	2 (1.5)	2.7	CIMR-G3 21P5	2 1P51	
	3 (2.2)	4.1	CIMR-G3 22P2	2 2P21	
	5 (3.7)	6.9	CIMR-G3 23P7	2 3P71	
	7.5 (5.5)	10.3	CIMR-G3 25P5	2 5P51	
	10 (7.5)	13.7	CIMR-G3 27P5	2 7P51	
	15 (11)	20.6	CIMR-G3 2011	2 0111	2011
	20 (15)	27.4	CIMR-G3 2015	2 0151	2015
	25 (18.5)	34	CIMR-G3 2018	2 0181	2018
	30 (22)	41	CIMR-G3 2022	2 0221	2022
	40 (30)	54	CIMR-G3 2030		2030
	50 (37)	68	CIMR-G3 2037		2037
	60 (45)	78	CIMR-G3 2045	--	2045
	75 (55)	95	CIMR-G3 2055		2055
	100 (75)	130	CIMR-G3 2075		2075
380 to 460V	0.5 (0.4)	1.4	CIMR-G3 40P4	4 0P41	Available by removing the upper and lower cover of enclosed type
	1 (0.75)	2.2	CIMR-G3 40P7	4 0P71	
	2 (1.5)	3.4	CIMR-G3 41P5	4 1P51	
	3 (2.2)	4.1	CIMR-G3 42P2	4 2P21	
	5 (3.7)	6.9	CIMR-G3 43P7	4 3P71	
	7.5 (5.5)	10.3	CIMR-G3 45P5	4 5P51	
	10 (7.5)	13.7	CIMR-G3 47P5	4 7P51	
	15 (11)	20.6	CIMR-G3 4011	4 0111	4011
	20 (15)	27.4	CIMR-G3 4015	4 0151	4015
	25 (18.5)	34	CIMR-G3 4018	4 0181	4018
	30 (22)	41	CIMR-G3 4022	4 0221	4022
	40 (30)	54	CIMR-G3 4030	4 0301	4030
	50 (37)	68	CIMR-G3 4037	4 0371	4037
	Note 60 (45)	82	CIMR-G3 4045	4 0451	4045
			CIMR-G3 4L45	4 L451	4L45
	75 (55)	110	CIMR-G3 4055		4055
	100 (75)	140	CIMR-G3 4075		4075
	150 (110)	200	CIMR-G3 4110		4110
	200 (160)	250	CIMR-G3 4160		4160
	250 (185)	290	CIMR-G3 4185		4185
	300 (220)	380	CIMR-G3 4220		4220
	400 (300)	510	CIMR-G3 4300		4300

Note The top of figure for the 400V class, 60HP (45 kW) model, indicates compact low-carrier frequency type  
The bottom figure indicates the low-noise type

## ENCLOSURES

### Open Chassis Type (IEC IP00)

Mounted in a customer's enclosure. Constructed so that openings do not permit direct or inadvertent access to live parts by personnel.

### Enclosed Type (NEMA 1)

Provides a clean, and ventilated environment within the enclosure. Front and rear panels are firmly secured (e.g. front, rear, right, left, top, bottom). Openings provided for ventilation, etc. are small enough to prevent inadvertent access by personnel.

## MODEL DESIGNATION

**CIMR - G3 □ 2 0P7 □**

Inverter

G3 Series

Specifications

A Non UL Listed Component\* (Japan use)

E Non UL Listed Component\* (Europe use)

U UL Listed and CSA Certified Component (U S A use)

V UL Listed and CSA Certified Component (Japan use)

Applicable maximum motor output  
OP4 0.5HP(0.4kW)  
to  
OP7 1HP(0.75kW)

Voltage  
2 200 to 230V  
4 380 to 460V  
5 500 to 575V

[“P” indicates a decimal point]

\*DC input available for non UL listed component

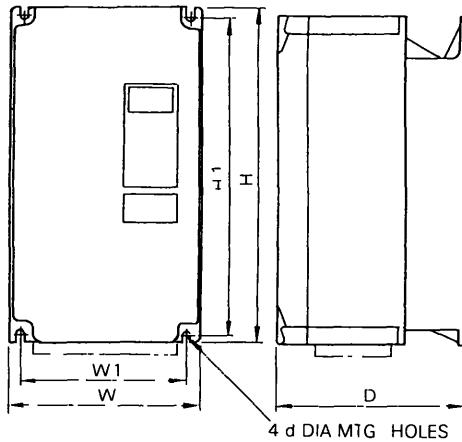
### SPEC. NP EXAMPLE

MODEL	CIMR-G3U23P7
INPUT	200V CLASS INVERTER AC 3PH 200 TO 220/50Hz 200 TO 230V/60Hz 20A
OUTPUT	DC 270 TO 310V 24A AC 3PH 0 TO 230V 6.9kVA 18A
SPEC	23P71E

**YASKAWA**

Voltage	□ □ T T T T	Revision	Enclosures and mountings
Applicable maximum motor output in kW	0 Open chassis type (IEC IP00) 1 Enclosed, wall mounted type (NEMA 1)		

# Dimensions in inch (mm)



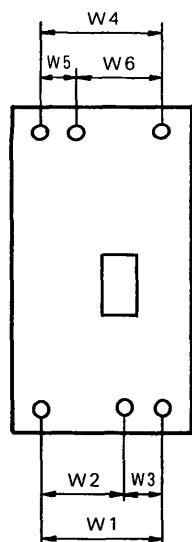
Notes 1 The above dimensions shows model CIMR-G3-27P51

2 Remove the upper and lower covers of the enclosed type units for [ ] area.

\* For more than 30HP (22kW), contact your YASKAWA representative.

† Mounting dimensions for 400V class, 250 (185) to 400HP (300kW) are as follows

## • Mounting Dimensions for 400V Class, 250 (185) to 400HP (300kW)



Model (CIMR-G3- )	Dimensions in inch (mm)					
	W1	W2	W3	W4	W5	W6
4220	29.53 (750)	17.32 (440)	12.20 (310)	33.46 (850)	11.22 (285)	22.24 (565)
4330	29.53 (750)	17.32 (440)	12.20 (310)	34.37 (873)	11.73 (298)	22.64 (575)

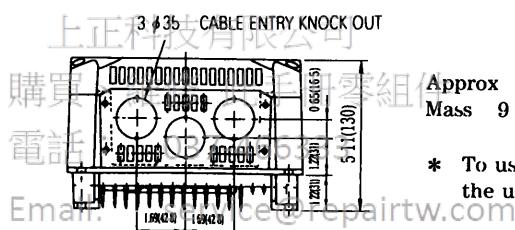
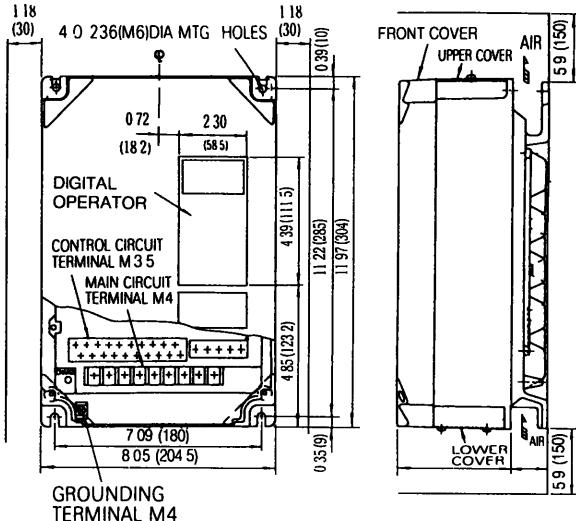
Voltage V	Enclosure	Model (CIMR-G3- )	Dimensions in inch (mm)						Mass lb (kg)
			W	H	D	W1	H1	d	
200 to 230	Open chassis type	20P4, 20P7, 21P5	8.05 (204.5)	11.97 (304)	5.12 (130)	7.09 (180)	11.22 (285)	M 6	9 (4)
		22P2, 23P7	8.05 (204.5)	11.97 (304)	6.50 (165)	7.09 (180)	11.22 (285)	M 6	15 (7)
		25P5, 27P5	8.05 (204.5)	13.94 (354)	7.87 (200)	7.09 (180)	13.19 (335)	M 6	22 (10)
		2011	9.84 (250)	19.69 (500)	9.45 (240)	7.87 (200)	19.09 (485)	M 6	42 (19)
		2015	12.79 (325)	21.65 (550)	9.65 (245)	10.83 (275)	21.06 (535)	M 6	53 (24)
		2018, 2022	12.79 (325)	21.65 (550)	10.04 (255)	10.83 (275)	21.06 (535)	M 6	70 (32)
		2030	16.73 (425)	26.57 (675)	11.02 (280)	12.40 (315)	25.79 (655)	M 8	112 (51)
		2037	18.70 (475)	31.50 (800)	11.02 (280)	14.76 (375)	30.71 (780)	M 10	130 (59)
		2043, 2055	18.70 (475)	31.50 (800)	11.02 (280)	14.76 (375)	30.71 (780)	M 10	143 (65)
		2075	23.62 (600)	50.39 (1280)	17.83 (453)	21.65 (550)	49.02 (1245)	M 12	337 (153)
380 to 460	Enclosed wall- mounted type (NEMA1)	20P41, 20P71, 21P51	8.05 (204.5)	11.97 (304)	5.12 (130)	7.09 (180)	11.22 (285)	M 6	9 (4)
		22P21, 23P71	8.05 (204.5)	11.97 (304)	6.50 (165)	7.09 (180)	11.22 (285)	M 6	15 (7)
		25P51, 27P51	8.05 (204.5)	11.97 (304)	7.87 (200)	7.09 (180)	13.19 (335)	M 6	22 (10)
		20111	11.81 (300)	23.62 (600)	9.84 (250)	11.02 (280)	19.69 (500)	M 6	57 (26)
		20151	14.76 (375)	25.59 (650)	9.65 (245)	13.98 (355)	21.65 (550)	M 6	71 (32)
		20181	18.50 (470)	27.56 (700)	10.24 (260)	17.52 (445)	23.62 (600)	M 8	95 (43)
		20221	18.50 (470)	29.11 (740)	10.24 (260)	17.52 (441)	23.62 (600)	M 8	95 (43)
		40P4, 40P7, 41P5, 42P2	8.07 (205)	14.00 (355)	6.50 (165)	7.09 (180)	13.19 (335)	M 6	15 (7)
		43P7, 45P5, 47P5	8.07 (205)	14.00 (355)	7.87 (200)	7.09 (180)	13.19 (335)	M 6	22 (10)
		4011, 4015	9.84 (250)	19.69 (500)	10.04 (255)	7.87 (200)	19.09 (485)	M 6	48 (22)
500 to 575*	Open chassis type	4018, 4022	12.79 (325)	21.65 (550)	10.04 (255)	10.43 (265)	21.06 (535)	M 6	70 (32)
		4030, 4037, 4045	13.78 (350)	28.54 (725)	11.02 (280)	9.84 (250)	27.76 (705)	M 8	99 (45)
		4L45	19.69 (500)	36.42 (925)	11.02 (280)	15.75 (400)	35.43 (900)	M 10	165 (75)
		4055	22.64 (575)	36.42 (925)	11.02 (280)	18.70 (475)	35.43 (900)	M 10	194 (88)
		1075	22.64 (575)	36.42 (925)	11.02 (280)	18.70 (475)	35.43 (900)	M 10	203 (92)
		4110	22.64 (575)	36.42 (925)	12.99 (330)	18.70 (475)	35.43 (900)	M 10	229 (104)
		4160	23.62 (600)	53.54 (1360)	17.83 (453)	21.65 (550)	52.17 (1325)	M 12	374 (170)
		4185, 4220	37.40 (950)	57.09 (1450)	17.13 (435)	↑	55.12 (1400)	M 12	793 (360)
		4300	37.97 (960)	62.99 (1600)	11.02 (455)	↑	61.02 (1550)	M 12	925 (420)
		40P41, 40P71, 41P51, 42P21	8.05 (204.5)	13.94 (354)	6.50 (165)	7.09 (180)	13.19 (335)	M 6	15 (7)
400V to 500V	Enclosed wall- mounted type (NEMA 1)	43P71, 45P51, 47P51	8.05 (204.5)	13.94 (354)	7.87 (200)	7.09 (180)	13.19 (335)	M 6	22 (10)
		40111, 40151	11.81 (300)	23.62 (600)	10.31 (262)	11.02 (280)	19.69 (500)	M 6	66 (28)
		40181, 40221	18.50 (470)	27.56 (700)	10.39 (264)	17.52 (445)	23.62 (600)	M 8	101 (39)
		40301, 40371	19.29 (490)	34.45 (875)	11.26 (286)	18.31 (465)	30.51 (775)	M 8	137 (62)
		40451	19.29 (490)	36.02 (915)	11.26 (286)	18.31 (465)	30.51 (775)	M 8	137 (62)
		4L451	25.98 (660)	44.29 (1125)	11.26 (286)	24.80 (630)	39.37 (1000)	M 10	227 (103)
		53P7, 55P5, 57P5	12.80 (325)	21.65 (550)	11.61 (295)	10.43 (265)	21.06 (535)	M 6	73 (33)
		5011, 5015, 5018	15.75 (400)	29.53 (750)	11.22 (285)	11.81 (300)	28.74 (730)	M 8	97 (44)
		53P71, 55P51, 57P51	20.67 (525)	27.56 (700)	11.91 (302.5)	19.69 (500)	23.62 (600)	M 8	106 (48)
		50111, 50151, 50181	20.67 (525)	35.43 (900)	11.46 (291)	19.69 (500)	31.50 (800)	M 8	132 (60)

# COMPACT DESIGN FOR SMALL SPACES

Dimensions in inch (mm): Enclosed Wall-mounted Type

200 TO 230V

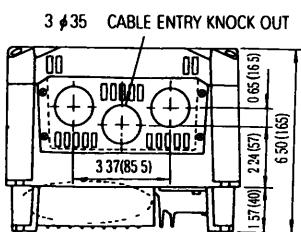
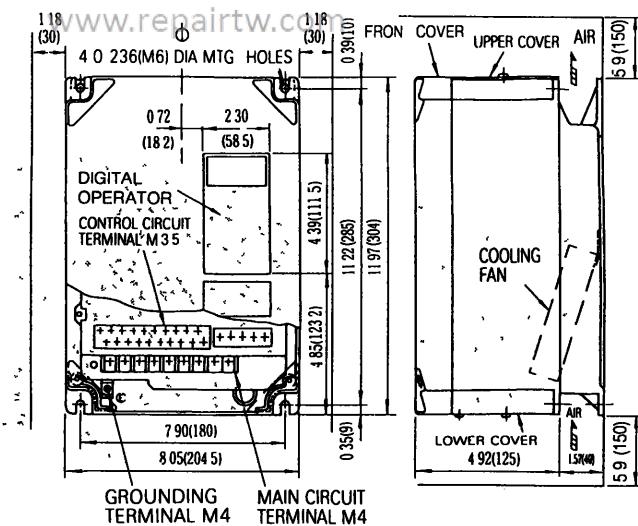
0.5 to 2HP (0.4 to 1.5kW) (Model CIMR-G3E20P4 to -G3E21P5) Enclosed Wall-mounted Type\*



Approx  
Mass 9 lb (4 kg)

\* To use the unit as an open chassis type, remove the upper and lower covers.

3 to 5HP (2.2 to 3.7kW) (Model CIMR-G3E22P2 to -G3E23P7) Enclosed Wall-mounted Type\*



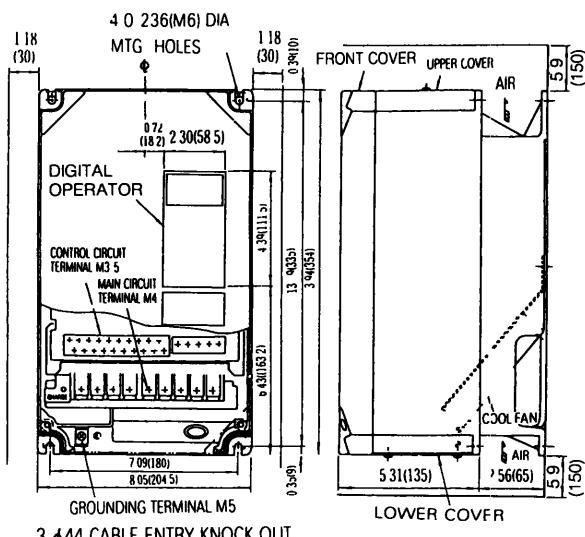
Approx  
Mass 15 lb (7 kg)

\* To use the unit as an open chassis type, remove the upper and lower covers.

# COMPACT DESIGN FOR SMALL SPACES

200 TO 230V

**7.5 to 10HP (5.5 to 7.5kW) (Model CIMR-G3-25P5 to -G3-27P5) Enclosed Wall-mounted Type\***

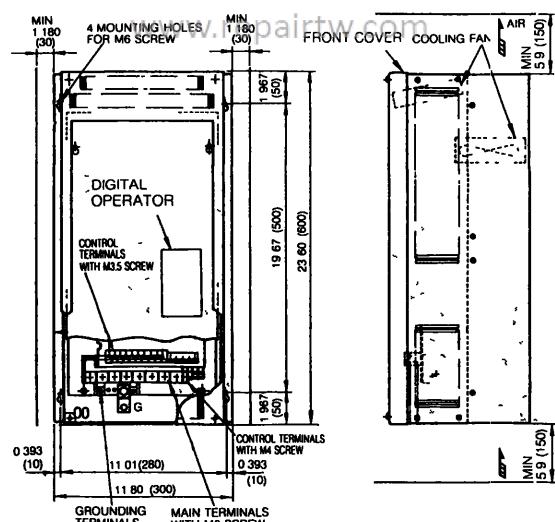


**ass** 22 lb (10 kg)

- \* To use the unit as an open chassis type, remove the upper and lower covers

Email: service@repairtw.com

**15HP (11kW) (Model CIMR-G3) Enclosed Wall-mounted Type**

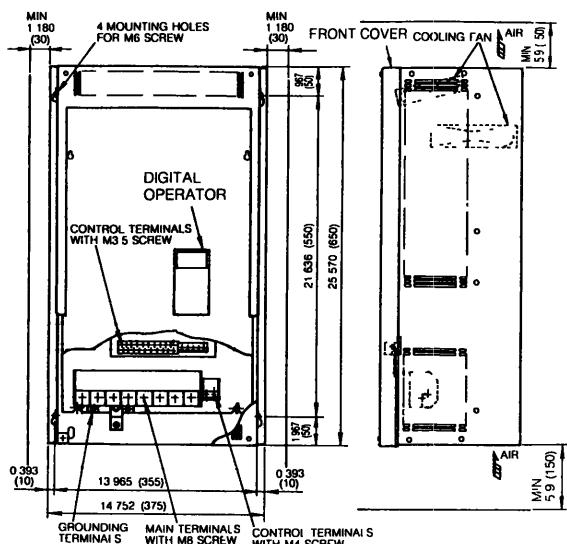


**Approx**  
**Mass 57 lb (26 kg)**

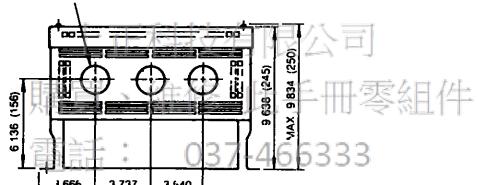
# Dimensions in inch (mm): Enclosed Wall-mounted Type

200 TO 230V

20HP (15kW) (Model CIMR-G3 2015) Enclosed Wall-mounted Type



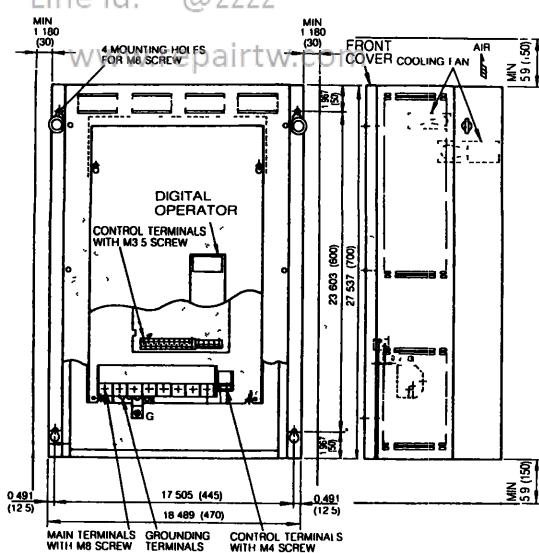
3 #50 CABLE ENTRY KNOCK OUT



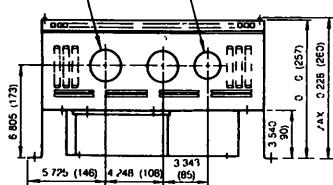
Approx  
Mass 70 lb (32 kg)

Email: [service@repairtw.com](mailto:service@repairtw.com)

25HP (18.5kW) (Model CIMR-G3 2018) Enclosed Wall-mounted Type



2 #62 CABLE ENTRY  
KNOCK OUT      #50 CABLE ENTRY  
KNOCK OUT

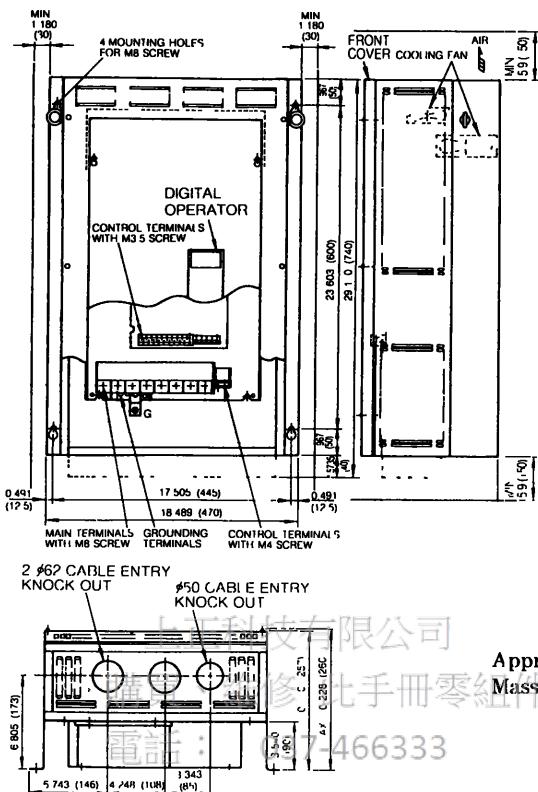


Approx  
Mass 95 lb (43 kg)

# COMPACT DESIGN FOR SMALL SPACES

200 TO 230V

30HP (22kW) (Model CIMR-G3□2022) Enclosed Wall-mounted Type



Approx  
Mass: 95 lb (43 kg)

Email: [service@repairtw.com](mailto:service@repairtw.com)

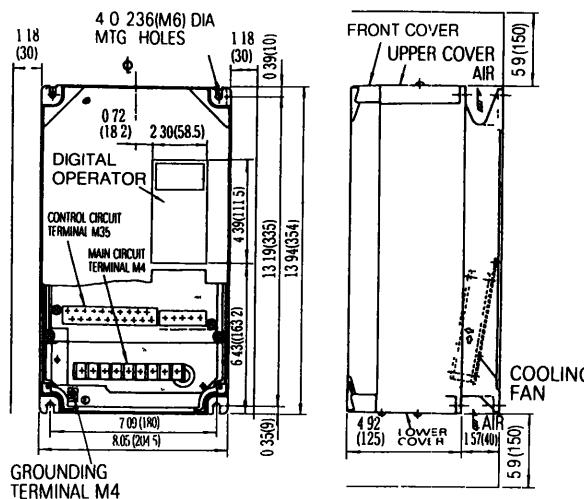
Line id: @zzzz

[www.repairtw.com](http://www.repairtw.com)

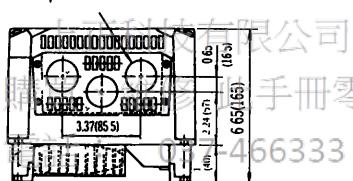
# Dimensions in inch (mm): Enclosed Wall-mounted Type

380 TO 460V

0.5 to 3HP (0.4 to 2.2kW) (Model CIMR-G3-40P4 to -G3-42P2) Enclosed Wall-mounted Type\*



3 #44 CABLE ENTRY KNOCK OUT

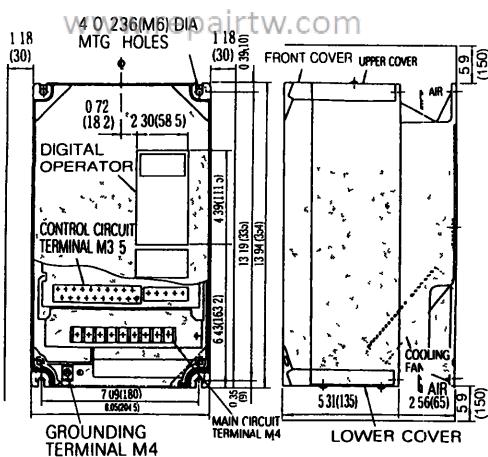


Approx  
Mass 15 lb (7 kg)

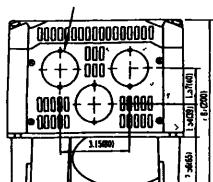
\* To use the unit as an open chassis type, remove the upper and lower covers

Email: [service@repairtw.com](mailto:service@repairtw.com)

5 to 10HP (3.7 to 7.5kW) (Model CIMR-G3-43P7 to -G3-47P5) Enclosed Wall-mounted Type\*



3 #44 CABLE ENTRY KNOCK OUT



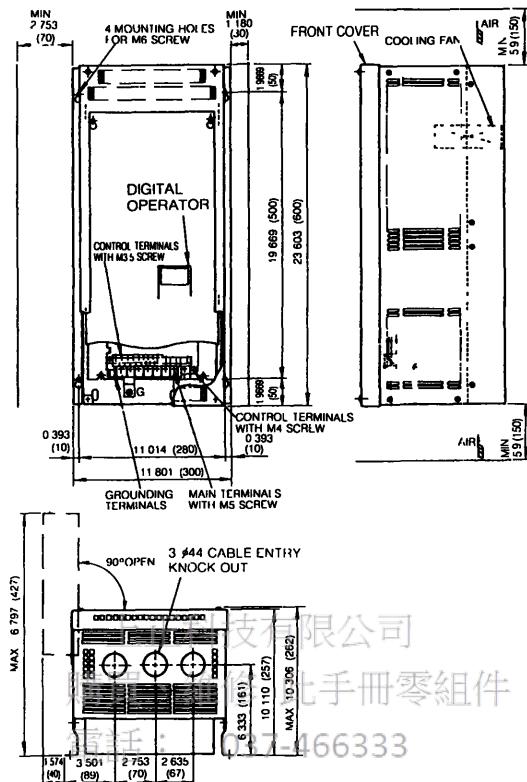
Approx  
Mass 22 lb (10 kg)

\* To use the unit as an open chassis type, remove the upper and lower covers

# COMPACT DESIGN FOR SMALL SPACES

380 TO 460V

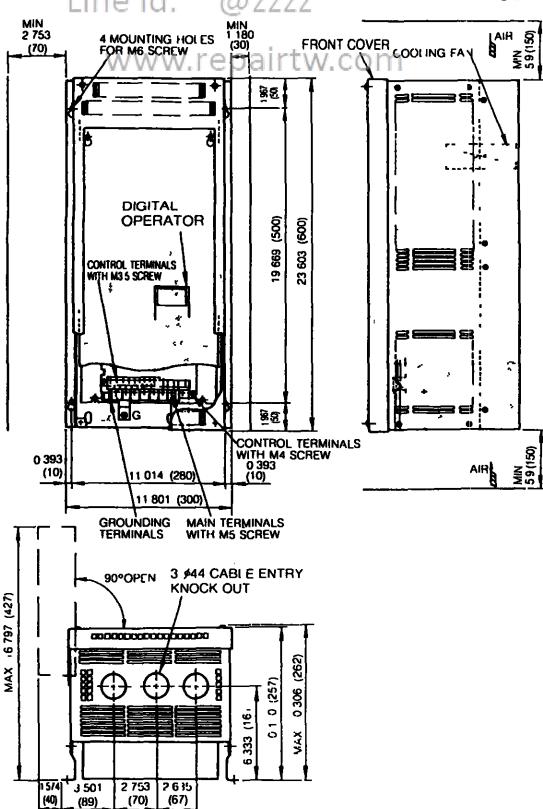
15HP (11kW) (Model CIMR-G3E4011) Enclosed Wall-mounted Type



Approx  
Mass 59 lb (27 kg)

Email: [service@reparttw.com](mailto:service@reparttw.com)

20HP (15kW) (Model CIMR-G3E4015) Enclosed Wall-mounted Type

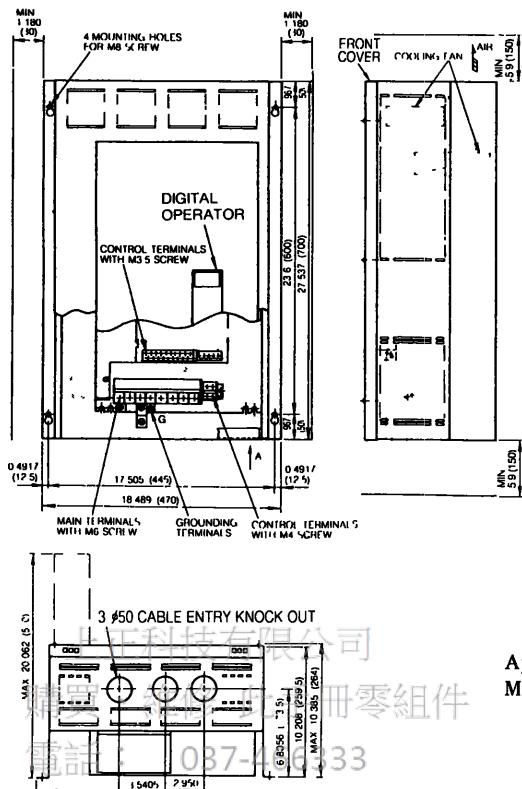


Approx  
Mass 62 lb (28 kg)

# Dimensions in inch (mm): Enclosed Wall-mounted Type

380 TO 460V

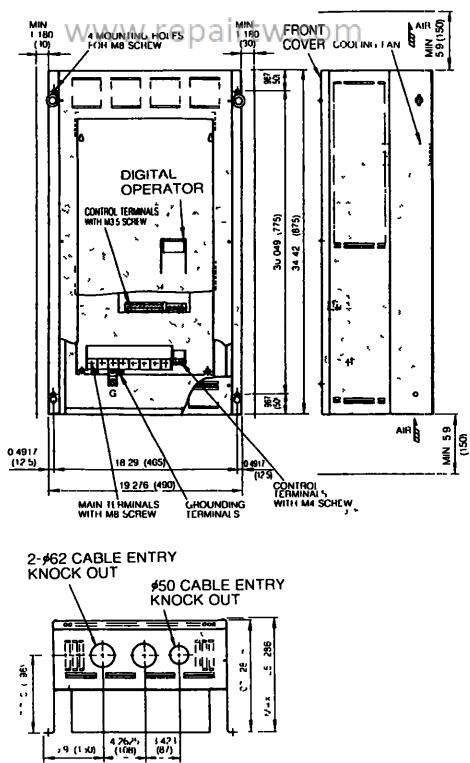
25 to 30HP (18.5 to 22kW) (Model CIMR-G3-4018 to -G3-4022) Enclosed Wall-mounted Type



Approx  
Mass 86 lb (39 kg)

Email: [service@repairtw.com](mailto:service@repairtw.com)

40 to 50HP (30 to 37kW) (Model CIMR-G3-4030 to -G3-4037) Enclosed Wall-mounted Type

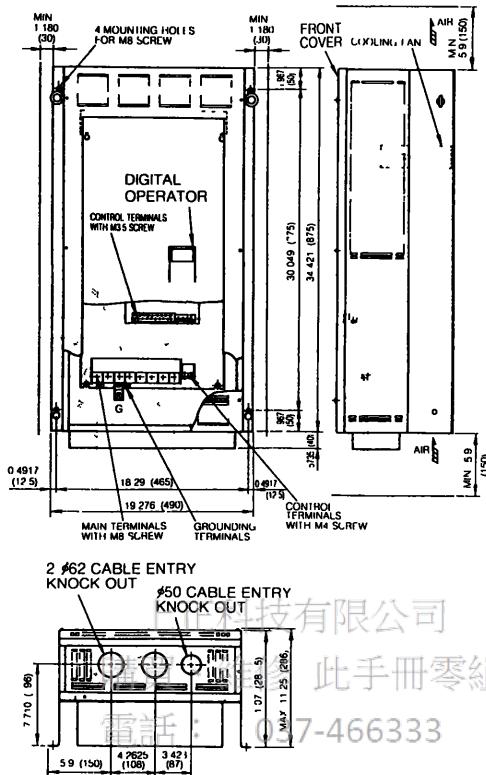


MODEL	APPROX MASS
CIMR-G3-4030	130 lb (59 kg)
CIMR-G3-4037	137 lb (62 kg)

# COMPACT DESIGN FOR SMALL SPACES

380 TO 460V

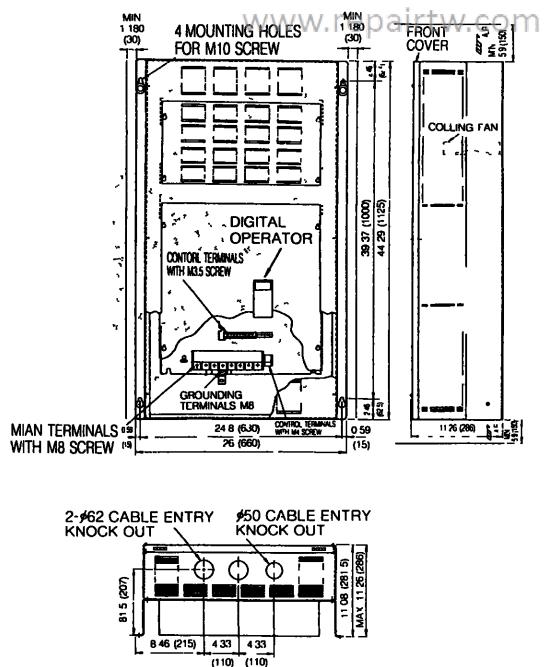
60HP (45kW) (Model CIMR-G3A4045) Enclosed Wall-mounted Type



Approx  
Mass 137 lb (62 kg)

Email: service@repairtw.com

60HP (45kW) (Model CIMR-G3A4L45) Enclosed Wall-mounted Type (Low-Noise Type)

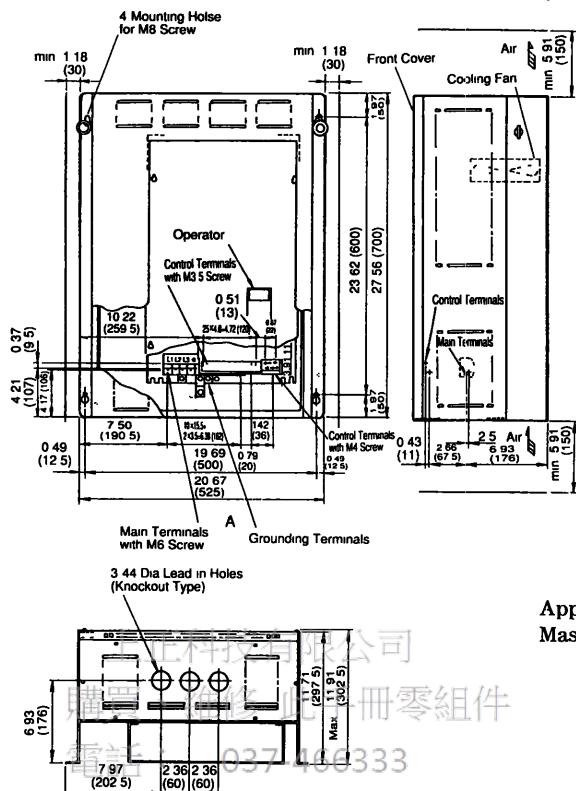


Approx  
Mass 137 lb (103 kg)

# Dimensions in inch (mm): Enclosed Wall-mounted Type

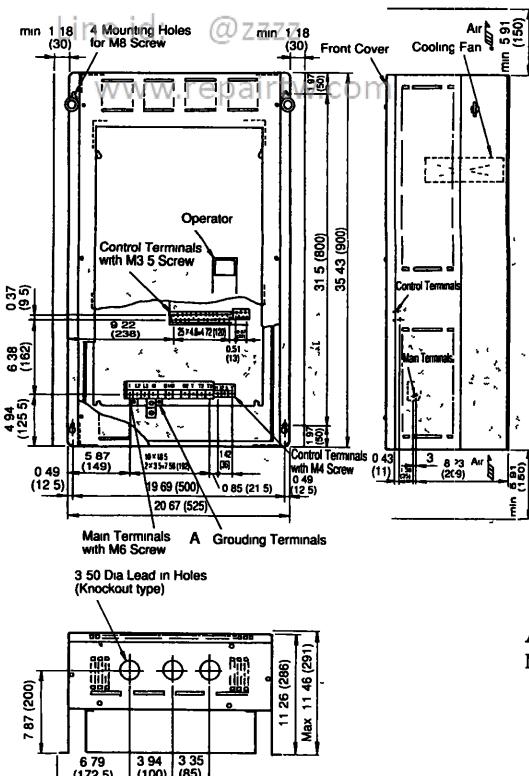
**500 TO 575V**

**5 to 10HP (3.7 to 7.5kW) (Model CIMR-G3□53P7 to -G3□57P5) Enclosed Wall-mounted Type**



Approx  
Mass 106 lb (48 kg)

**15 to 25HP (11 to 18.5kW) (Model CIMR-G3□5014 to -G3□5018) Enclosed Wall-mounted Type**



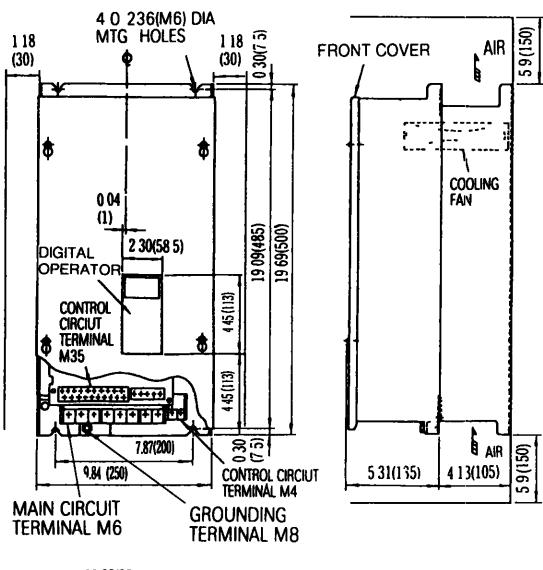
Approx  
Mass 132 lb (60 kg)

Note For 30 to 200HP (22 to 160kW), contact your YASKAWA representative

# COMPACT DESIGN FOR SMALL SPACES

200 TO 230V

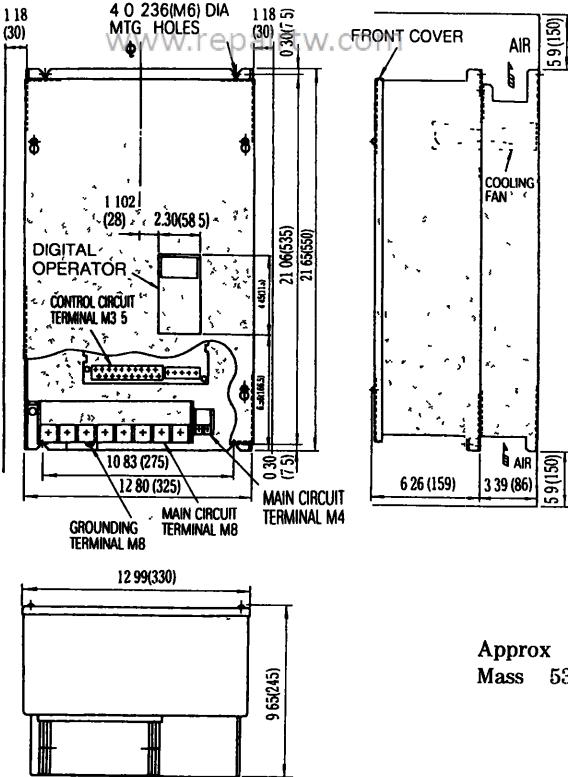
15HP (11kW) (Model CIMR-G3E2011) Open Chassis Type



上正科技有限公司  
購買、維修此手冊零組件  
電話：037-466333  
Email: service@repairtw.com

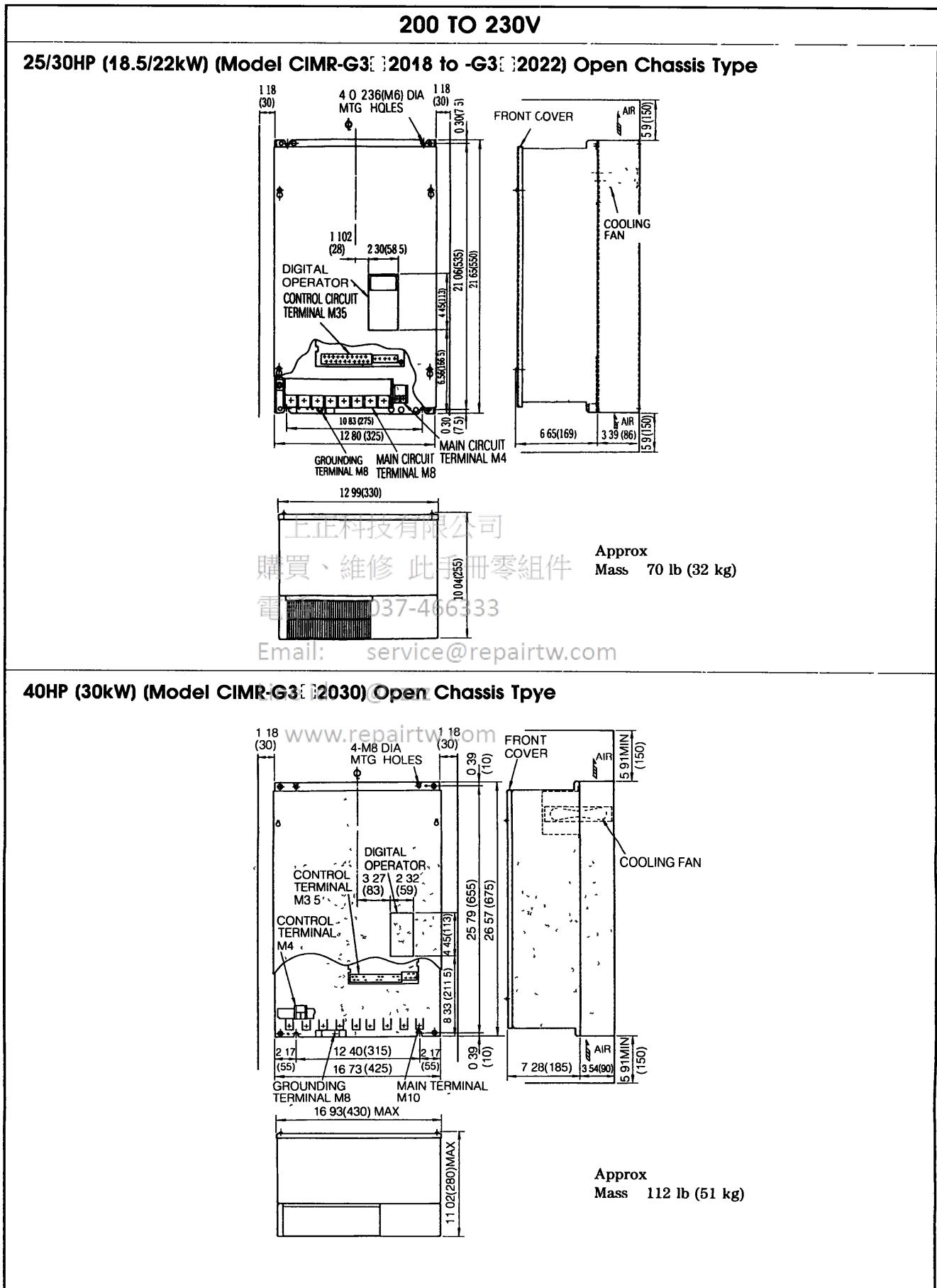
Approx  
Mass 42 lb (19 kg)

20HP (15kW) (Model CIMR-G3E2015) Open Chassis Type



Approx  
Mass 53 lb (24 kg)

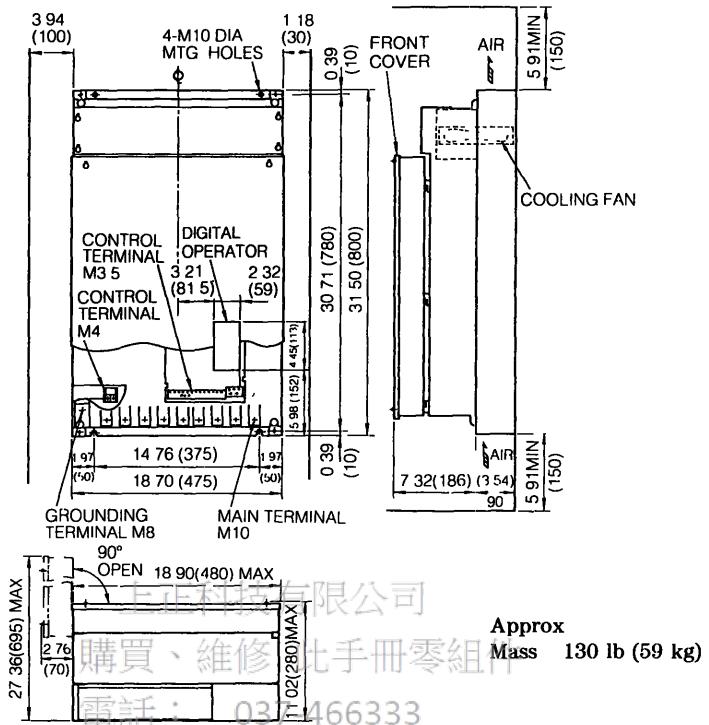
# Dimensions in inch (mm): Open Chassis Type



# COMPACT DESIGN FOR SMALL SPACES

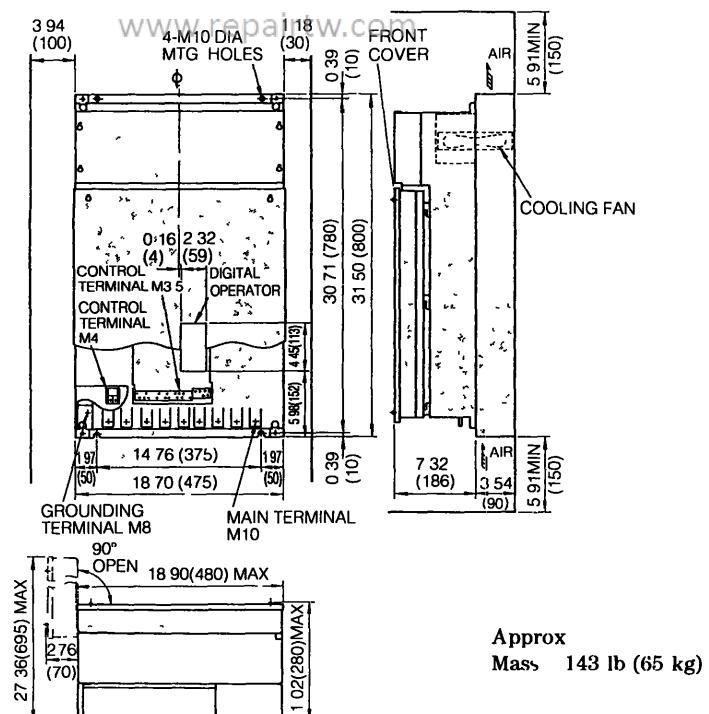
200 TO 230V

50HP (37kW) (Model CIMR-G3-2037) Open Chassis Type

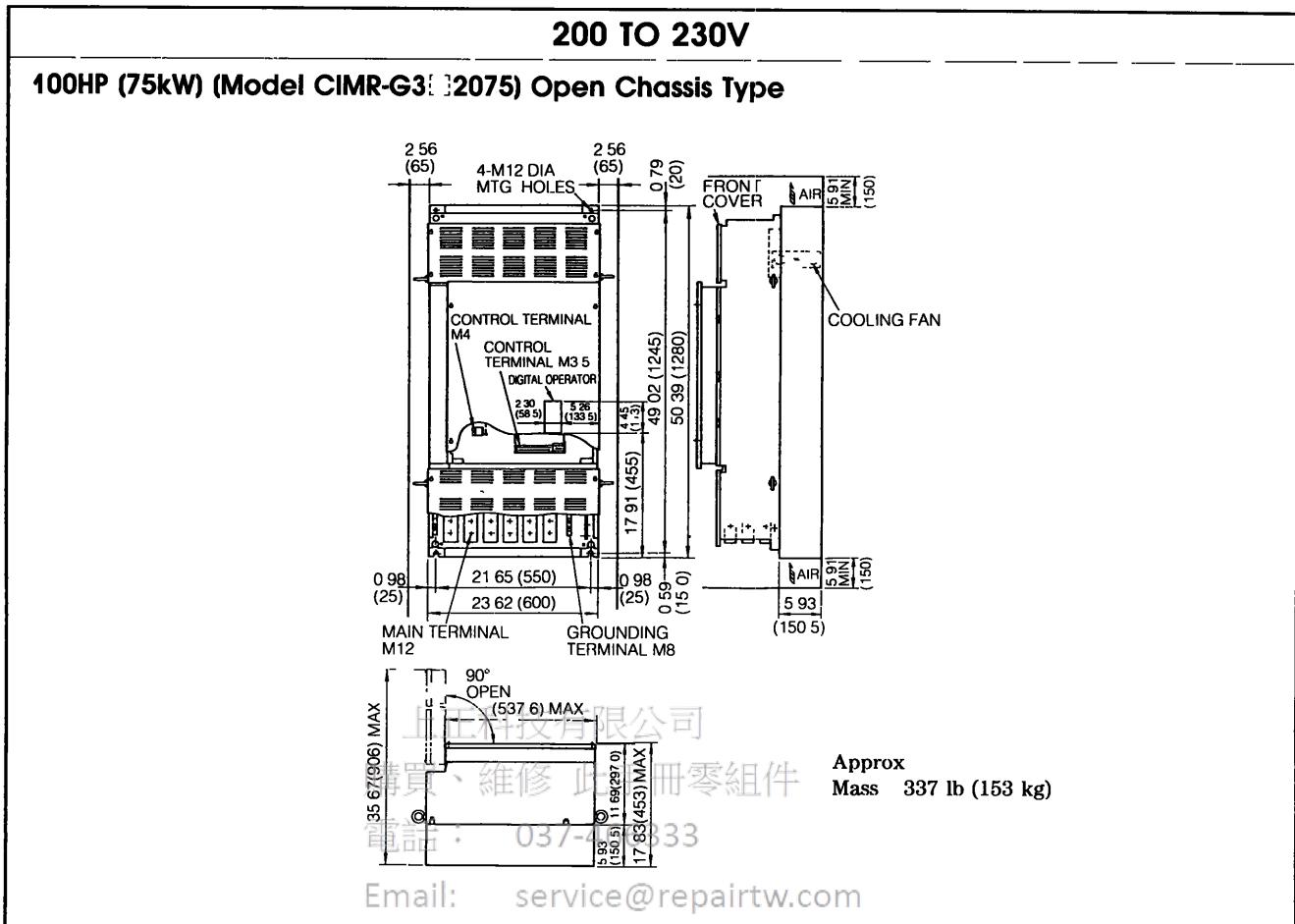


Email: [service@repairtw.com](mailto:service@repairtw.com)

60/75HP (45/55kW) (Model CIMR-G3-2045 to G3-2055) Open Chassis Type



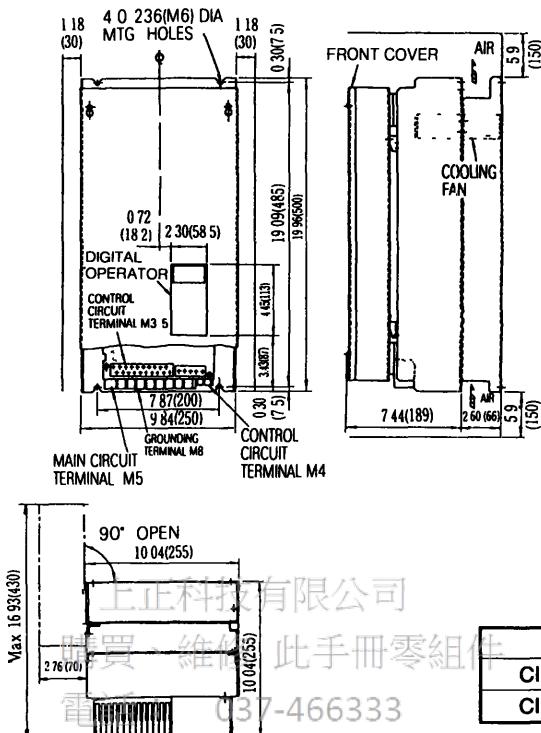
# Dimensions in inch (mm): Open Chassis Type



# COMPACT DESIGN FOR SMALL SPACES

380 TO 460V

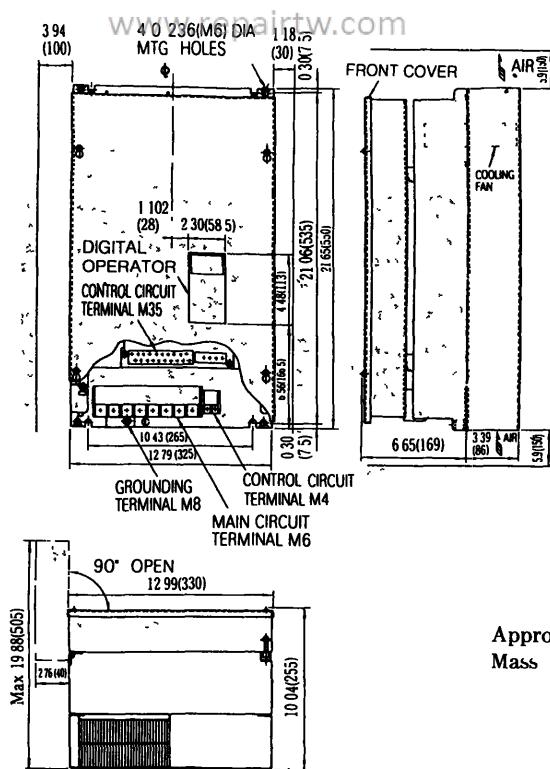
15 to 20HP (11 to 15kW) (Model CIMR-G3[-4011 to -G3-4015) Open Chassis Type



MODEL	APPROX MASS
CIMR-G3-4011	46 lb (21 kg)
CIMR-G3-4015	48 lb (22 kg)

Email: [service@repairtw.com](mailto:service@repairtw.com)

25 to 30HP (18.5 to 22kW) (Model CIMR-G3-4018 to -G3-4022) Open Chassis Type

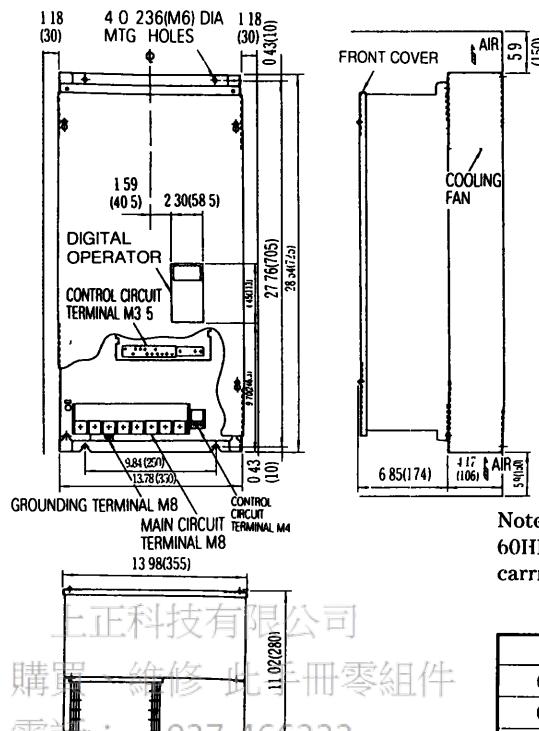


Approx  
Mass 70 lb (32 kg)

# Dimensions in inch (mm): Open Chassis Type

380 TO 460V

40 to 60HP (30 to 45kW) (Model CIMR-G314030 to -G314045) Open Chassis Type



Note

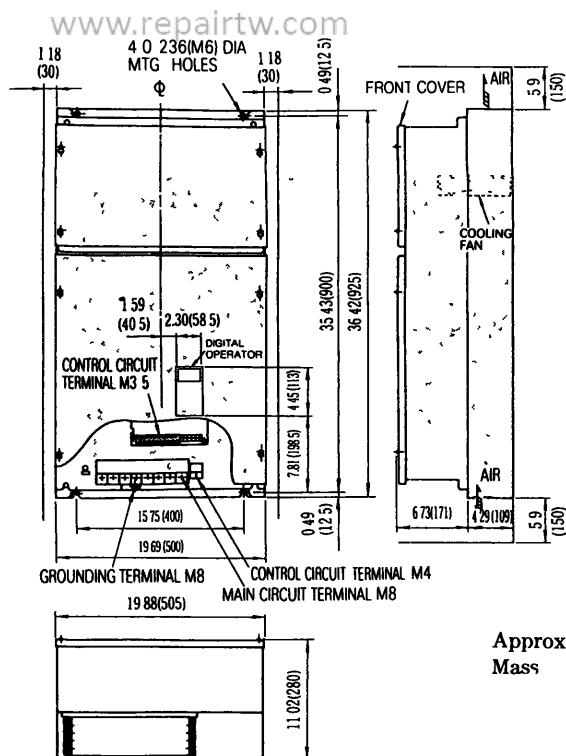
60HP (45kW) model is compact, low-carrier frequency type

上正科技有限公司  
購買、維修、此手冊零組件  
電話：037-466333

MODEL	APPROX MASS
CIMR-G314030	93 lb (42 kg)
CIMR-G314037	99 lb (45 kg)
CIMR-G314045	99 lb (45 kg)

Email: service@repairtw.com

60HP (45kW) (Model CIMR-G314145) Open Chassis Type (Low Noise Type)

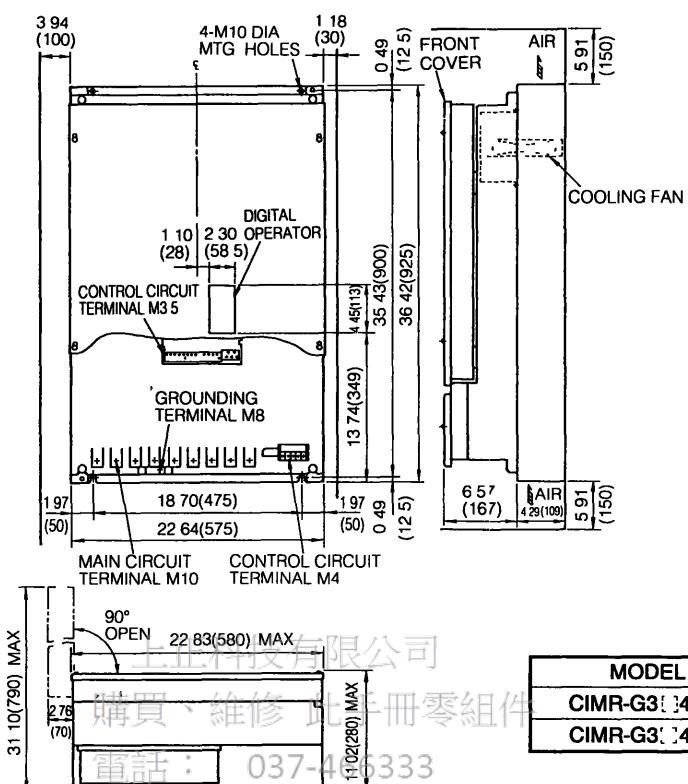


Approx  
Mass 165 lb (75 kg)

# COMPACT DESIGN FOR SMALL SPACES

380 TO 460V

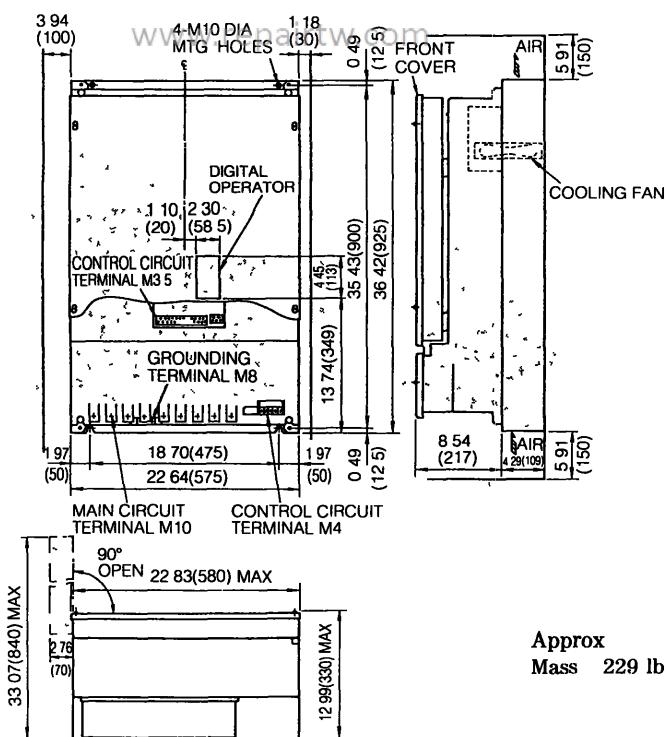
75 to 100HP (55 to 75kW) (Model CIMR-G3-4055 to -G3-4075) Open Chassis Type



Email: [service@repaiptw.com](mailto:service@repaiptw.com)

150HP (110kW) (Model CIMR-G3-4110) Open Chassis Type

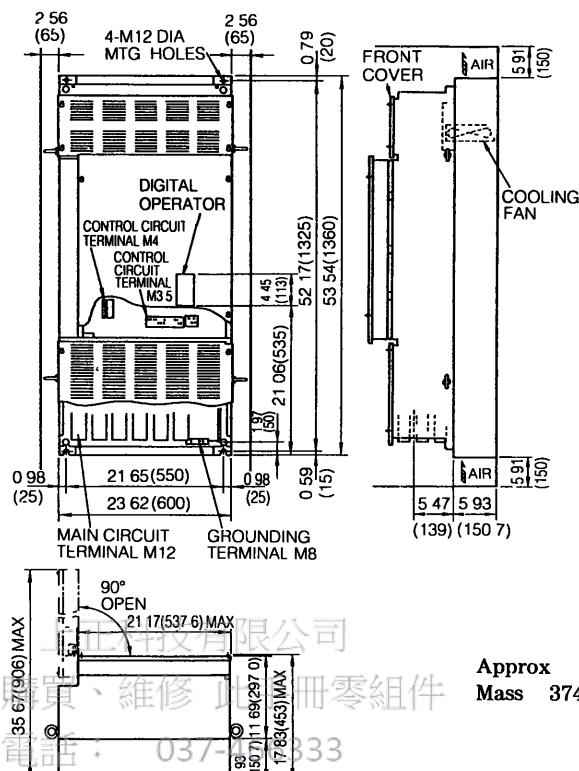
Line Id: @zzzz



# Dimensions in inch (mm): Open Chassis Type

**380 TO 460V**

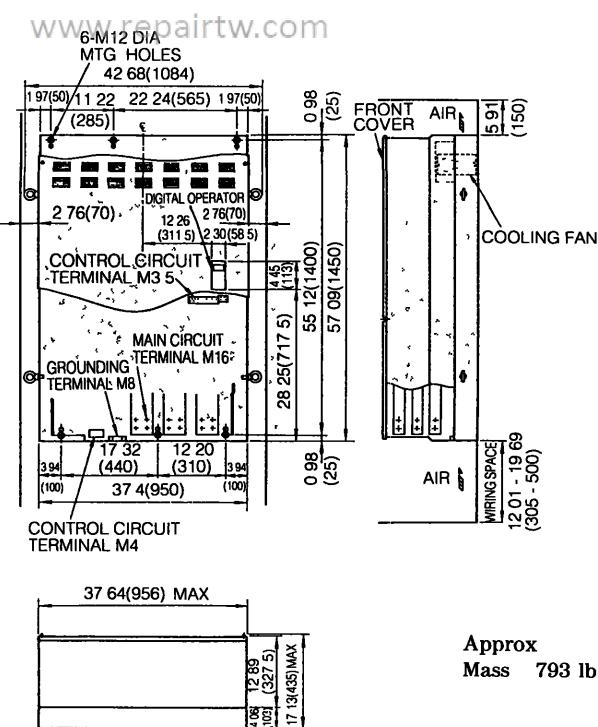
**200HP (160kW) (Model CIMR-G3E4160) Open Chassis Type**



Approx  
Mass 374 lb (170 kg)

Email: [service@repairtw.com](mailto:service@repairtw.com)

**250/300HP (185/220kW) (Model CIMR-G3E4185-G3E4220) Open Chassis Type**

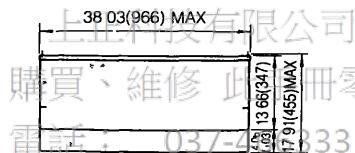
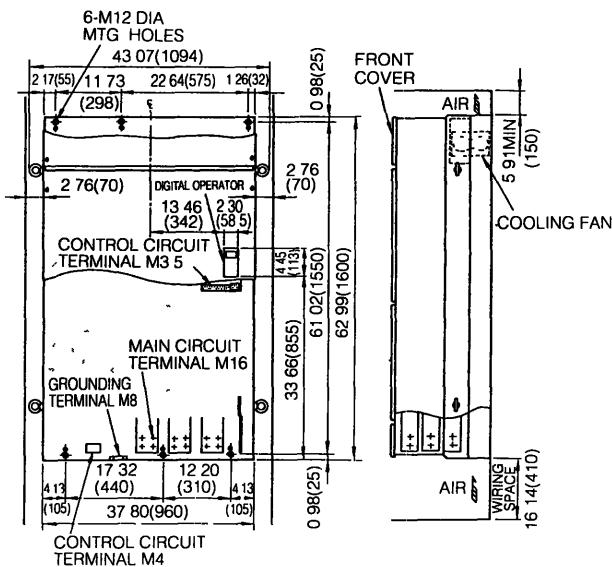


Approx  
Mass 793 lb (360 kg)

# COMPACT DESIGN FOR SMALL SPACES

380 TO 460V

400HP (300kW) (Model CIMR-G3-4300) Open Chassis Type



Approx  
Mass 925 lb (420 kg)

Email: [service@repairtw.com](mailto:service@repairtw.com)

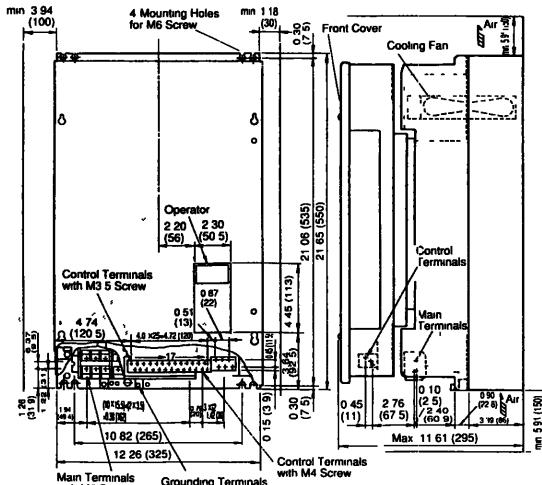
Line id: @zzzz

[www.repaitw.com](http://www.repaitw.com)

# Dimensions in inch (mm): Open Chassis Type

500 TO 575V

5 to 10HP (3.7 to 7.5kW) (Model CIMR-G3-53P7 to -G3-57P5) Open Chassis Type

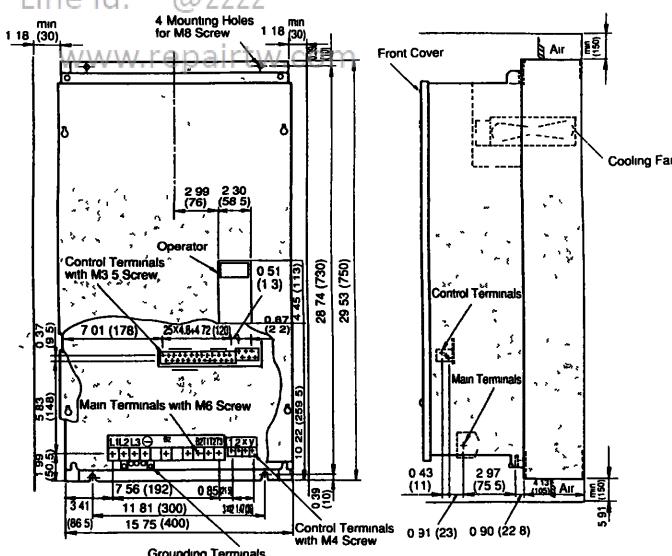


Approx  
Mass 73 lb (33 kg)

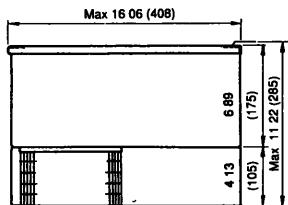


Email: service@repairtw.com

15 to 25HP (11 to 18.5kW) (Model CIMR-G3-5011 to -G3-5018) Open Chassis Type



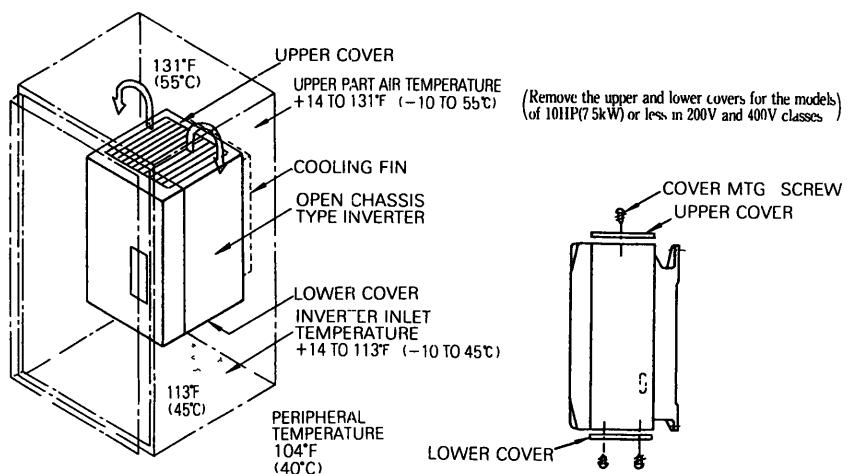
Approx  
Mass 97 lb (44 kg)



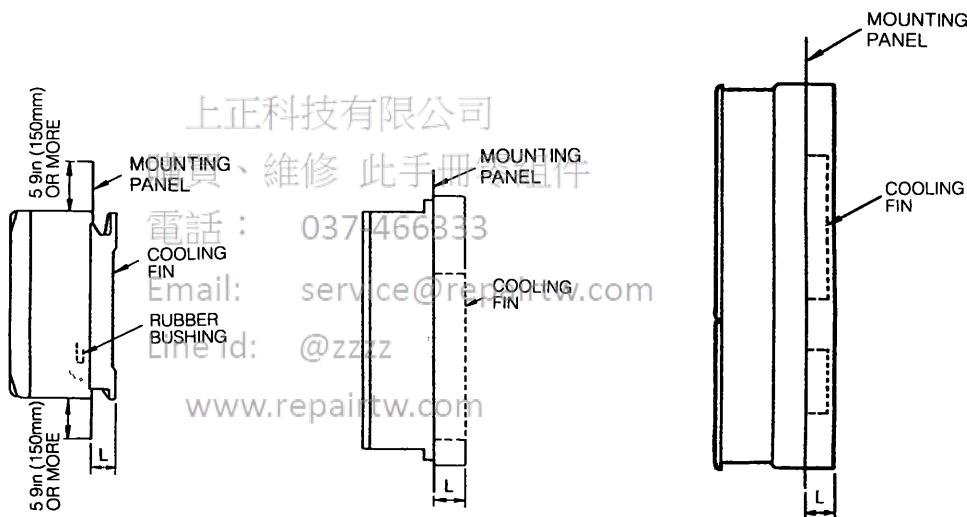
Note For 30 to 200HP (22 to 160kW), contact your YASKAWA representative

## Easy Modification to Gasketed Cabinet

Open chassis cabinet incorporating heat sink can be easily changed to gasketed enclosure by relocating the heat sink outside the casting and gasketing the mounting face.



## Inverter Unit Cooling Fin Dimensions



**200/400V Class**

**0.5 to 10HP  
(0.4 to 7.5kW)**

**15 to 200HP  
(11 to 160kW)**

**250 to 400HP  
(185 to 300kW)**

**575V Class**

**5 to 25HP  
(3.7 to 18.5kW)**

Voltage Class	200 to 230V								380 to 460V								500 to 575V*	
Model CIMR-G3	20P4 20P7	21P5	22P2 23P7	25P5 27P5	2011	2015 to 2022	2030 to 2055	2075	40P4 to 42P2	43P7 to 47P5	4011 4015	4018 4022	4030 to 4045	4L45 to 4110	4160	4185 to 4110	53P7 5011 to 57P5	5018
Cooling Fin Dimensions L max. inch(mm)	1.22 (31)	1.22 (31)	1.57 (40)	2.56 (65)	4.13 (105)	3.39 (86)	3.54 (90)	5.93 (150.7)	1.57 (40)	2.56 (65)	2.60 (66)	3.39 (86)	4.17 (106)	4.29 (109)	5.93 (150.7)	4.06 (103)	3.39 (86)	4.13 (105)
Number of Rubber Bushings	-	4	6	2	-	-	-	-	-	2	-	-	-	-	-	-	-	

Note For installation on a totally-enclosed type control panel, rubber bushing (Code No FL6402826-1) may be required depending on the model Procure necessary rubber bushings separately

\* For 30 to 200HP (22 to 160kW), contact your YASKAWA representative

## INVERTER HEAT LOSS

### 200 to 230V

Model CIMR - G 3	20P4	20P7	21P5	22P2	23P7	25P5	27P5	2011	2015	2018	2022	2030	2037	2045	2055	2075	
Inverter Capacity kVA	1 4	2 1	2 7	4 1	6 9	10 3	13 7	20 6	27 4	34	41	54	68	78	95	130	
Rated Current A	3 2	4 8	6 4	9 6	16	24	32	48	64	80	96	130	160	183	224	300	
Heat Loss W	Fin	25	30	45	100	170	235	310	465	575	785	940	1170	1580	1360	1800	1990
	Inside Unit	60	75	95	100	135	165	210	295	415	575	680	500	510	780	830	980
	Total Heat Loss	85	105	140	200	305	400	520	760	990	1360	1620	1670	2090	2140	2630	2970
	Fin Cooling	Self cooled															
		Fan cooled															

### 380 to 460V

Model CIMR - G 3	40P4	40P7	41P5	42P2	43P7	45P5	47P5	4011	4015	4018	4022	4030	4037	4L45	4045	4055	4075	4110	4160	4185	4220	4300	
Inverter Capacity kVA	1 4	2 2	3 4	4 1	6 9	10 3	13 7	20 6	27 4	34	41	54	68	82	82	110	140	200	250	290	380	510	
Rated Current A	1 6	2 6	4 0	4 8	8	12	16	24	32	40	48	64	80	96	96	128	165	224	300	340	450	600	
Heat Loss W	Fin	25	45	65	80	145	205	275	300	385	465	555	1175	1350	1570	975	1230	1670	2200	2850	3400	4740	6820
	Inside Unit	55	60	70	80	110	155	185	205	255	305	365	595	760	800	770	690	840	1060	1540	1510	2110	2910
	Total Heat Loss	80	105	135	160	255	360	460	505	640	770	920	1770	2110	2370	1745	1920	2510	3260	4390	4910	6850	9730
	Fin Cooling	Fan cooled																					

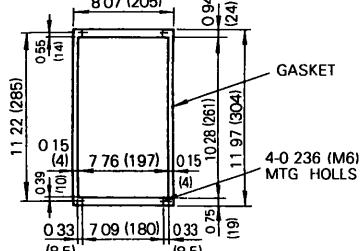
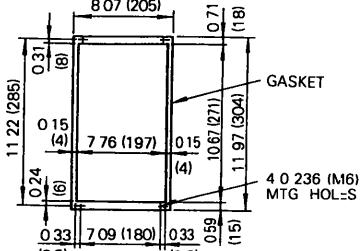
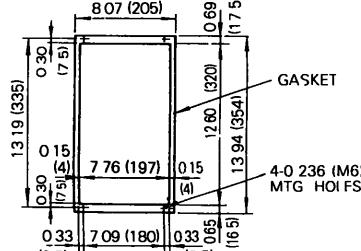
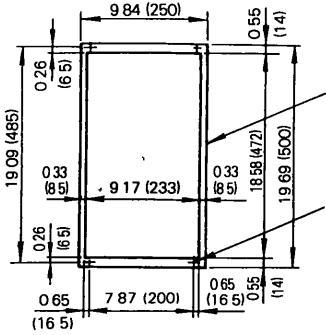
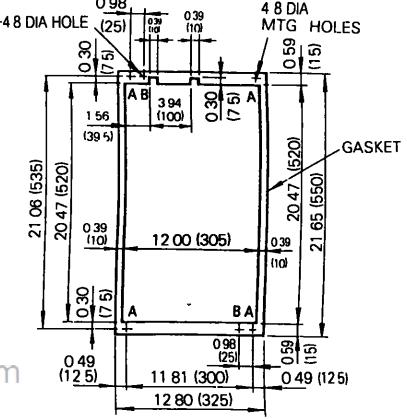
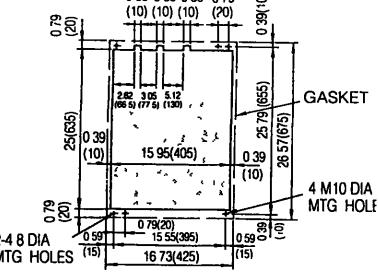
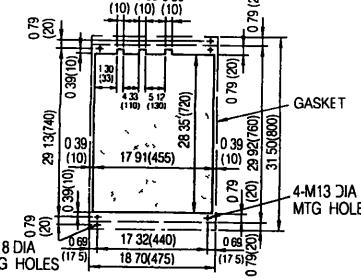
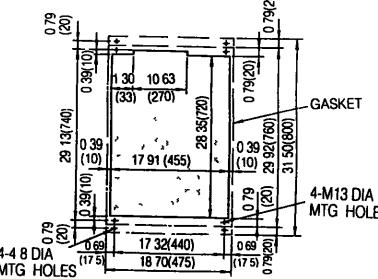
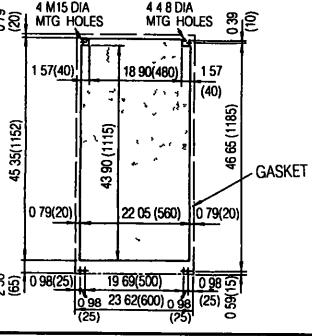
### 500 to 575V

Model CIMR - G 3	53P7	55P5	57P5	5011	5015	5018	5022	5030	5037	5045	5055	
Inverter Capacity kVA	5	7 5	10	15	20	25	30	40	50	60	75	
Rated Current A	6 3	9 5	12 5	17	22	27	32	43	54	64	81	
Heat Loss W	Fin	150	220	290	280	360	440	610	810	1010	1070	1320
	Inside Unit	150	170	200	220	270	320	410	550	690	710	970
	Total Heat Loss	300	390	490	500	630	760	1020	1360	1700	1780	2290
	Fin Cooling	Fan cooled										

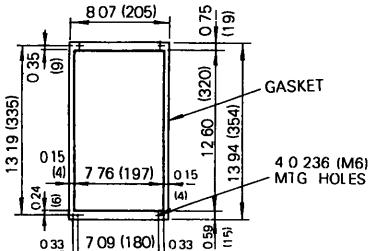
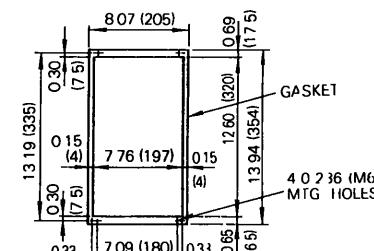
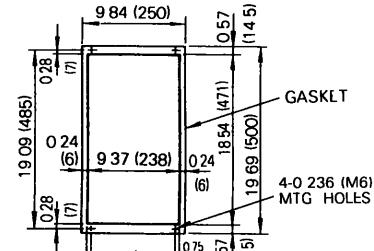
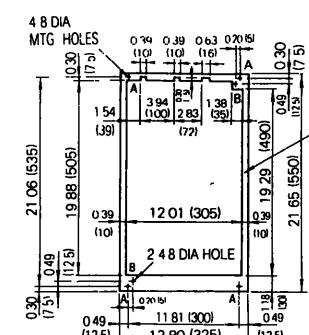
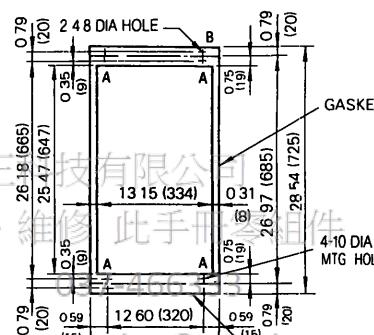
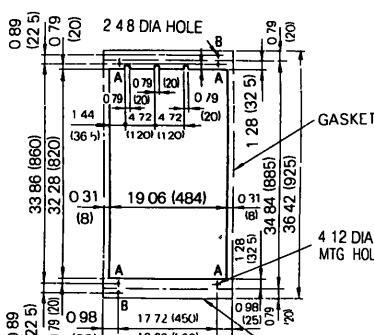
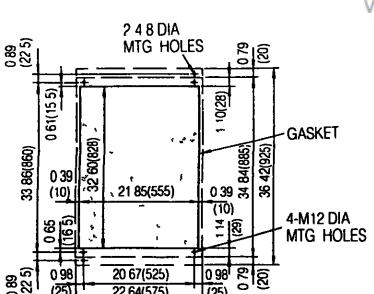
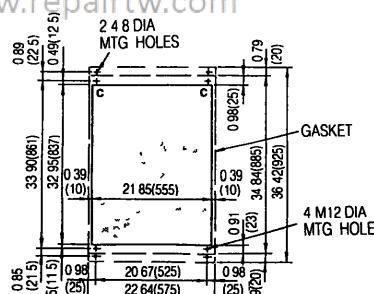
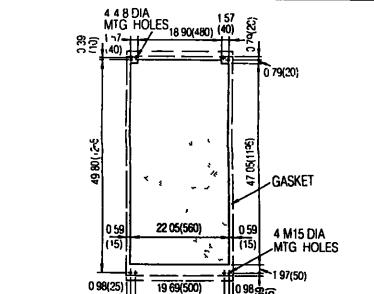
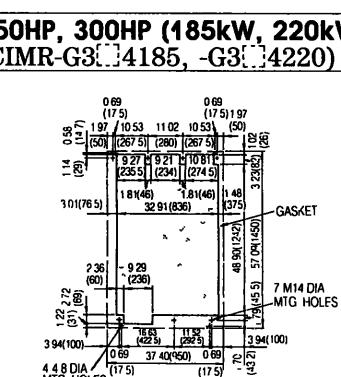
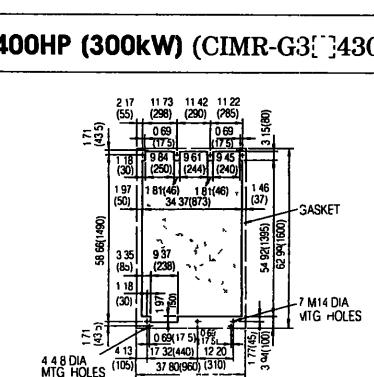
Note For 100 HP (75 kW) or more, contact your YASKAWA representative

# Panel Cut for External Installation of Cooling Fin

200 to 230V

<b>0.5 to 2HP (0.4 to 1.5kW)</b> (CIMR-G3[ ]20P4 to -G3[ ]21P5)	<b>3HP, 5HP (2.2kW, 3.7kW)</b> CIMR-G3[ ]22P2 to -G3[ ]23P7)	<b>7.5HP, 10HP (5.5kW, 7.5kW)</b> (CIMR-G3[ ]25P5 to -G3[ ]27P5)
		
<b>15HP (11kW) (CIMR-G3[ ]2011)</b>	<b>20HP (15kW) (CIMR-G3[ ]2015)</b>	<b>25HP, 30HP (18.5kW, 22kW)</b> (CIMR-G3[ ]2018 to -G3[ ]2022)
		
<b>40HP (30kW) (CIMR-G3[ ]2030)</b>	<b>50HP (37kW) (CIMR-G3[ ]2037)</b> <a href="http://www.reparttw.com">www.reparttw.com</a>	<b>60HP, 75HP (45kW, 55kW)</b> (CIMR-G3[ ]2045 to -G3[ ]2055)
		
<b>100HP (75kW) (CIMR-G3[ ]2075)</b>		
		

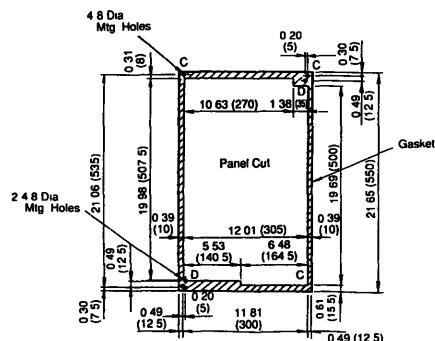
## 380 to 460V

<b>0.5 to 3HP (0.4 to 2.2kW)</b> (CIMR-G3[ ]40P4 to -G3[ ]42P2) 	<b>5 to 10HP (3.7kW to 5.7 kW)</b> (CIMR-G3[ ]43P7 to -G3[ ]47P5) 	<b>15HP, 20HP (11kW, 15kW)</b> (CIMR-G3[ ]4011 to -G3[ ]4015) 
<b>25HP, 30HP (18.5kW, 22kW)</b> (CIMR-G3[ ]4018 to -G3[ ]4022) 	<b>40 to 60HP (30 to 45kW)</b> (CIMR-G3[ ]4030 to -G3[ ]4045) 	<b>60HP (45kW) (CIMR-G3[ ]4L45)</b> 
<b>60HP, 100HP (55kW, 75kW)</b> (CIMR-G3[ ]4055 to -G3[ ]4075) 	<b>150HP (110kW) (CIMR-G3[ ]4110)</b> 	<b>200HP (160kW) (CIMR-G3[ ]4160)</b> 
<b>250HP, 300HP (185kW, 220kW)</b> (CIMR-G3[ ]4185, -G3[ ]4220) 	<b>400HP (300kW) (CIMR-G3[ ]4300)</b> 	

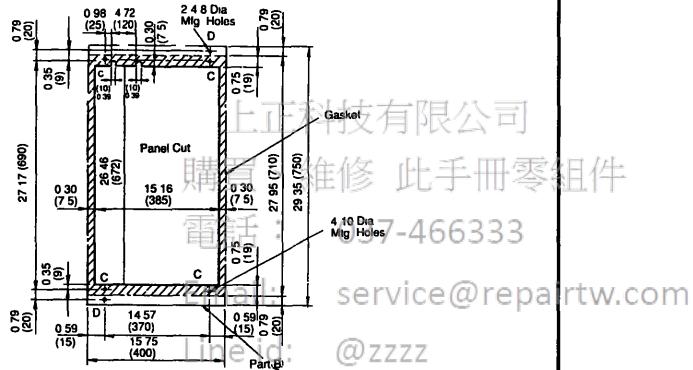
#### **Panel Cut for External Installation of Cooling Fin (Cont'd)**

**500 to 575V**

**0.5 to 10HP (3.7 to 7.5kW) (CIMR-G3 [ ]53P7 to -G3 [ ]57P5)**



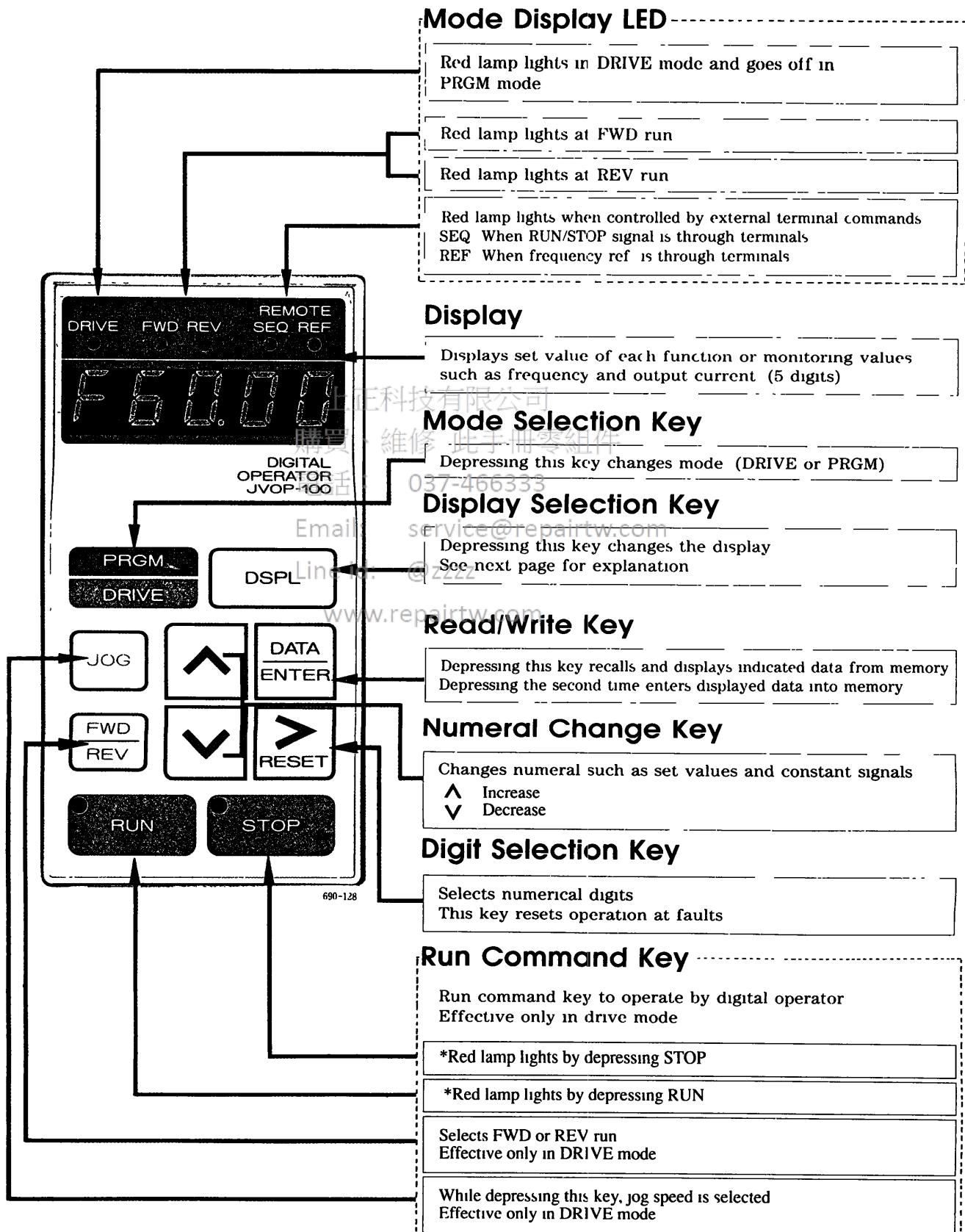
## **15 to 25HP (11 to 18.5kW) (CIMR-G3[ ]5011 to -G3[ ]5018)**



Note For 30 to 200HP (22 to 160kW), contact your YASKAWA representative

# Digital Operator for Easy Operation (Provided as Standard)

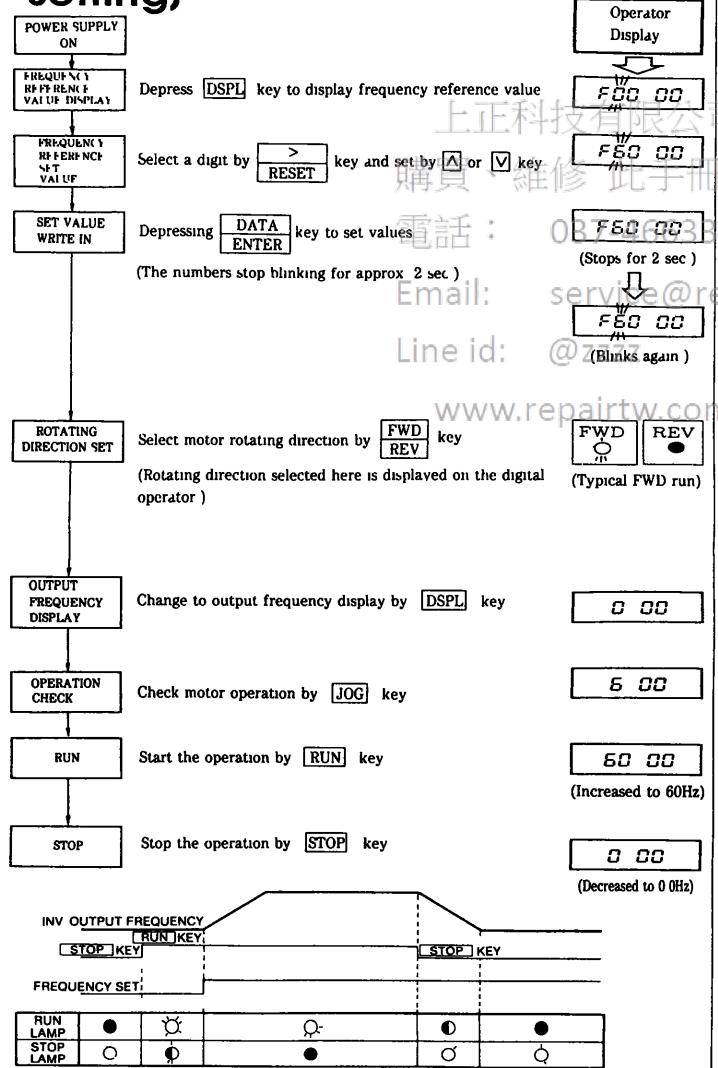
- Functions of the digital operator



## • Integrated monitoring facility guarantees safe operation

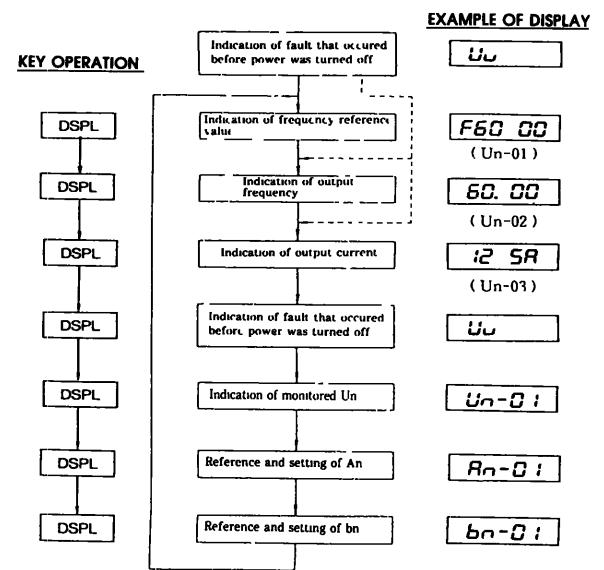
Un-□□	Monitor Item	LED Indication
01	Frequency Reference	F 60. 00
02	Output Frequency	60. 00
03	Output Current	12. 5A
04	Voltage Command	200V
05	D C Voltage (VPN)	Pn270
06	Output Power ( $\pm$ display)	- 2. 5
07	Status of Input Terminal	C 11111
08	Status of Output Terminal	O 111
09	Check of LED	88888
10	PROM No	10013

## • Example of operation with digital operator (with preset factory setting)

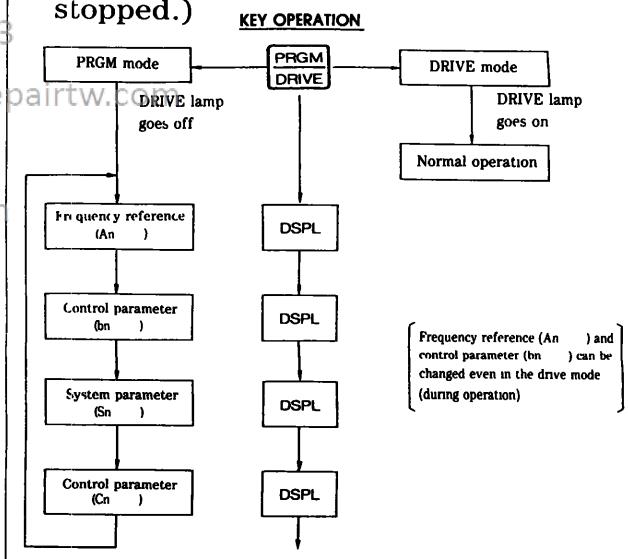


The RUN and STOP lamps goes on/off and blinks according to operation state.

## • Monitor Items Display Procedure

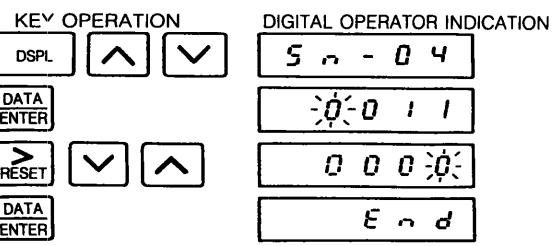


## • Switching between the DRIVE/PRGM (program) Mode (The mode can be switched only when the machine is stopped.)



## • Changing the Control Parameter

Example of change of system parameter Sn-04



# Versatile Software Menu Helps Hi-tech Implementation of Your Machine

## SYSTEM CONSTANT Sn-[]

Set before operation

Function	Sn- [ ]	Data Name	Function				Factory Setting
			4th digit	3rd digit	2nd digit	1st digit	4th digit 3rd digit 2nd digit 1st digit
Reference Constant	01	Inverter Capacity	Inverter capacity selected*				—
	02	V/f	V/f pattern selected				0 0
Operator Status	03	Display of Operator	0000 0101	Setting and reading of AN-100, bn-100, Sn-100, Cn-100 enabled Setting and reading of AN-100, reading of bn-100, Sn-100, Cn-100 enabled			
		Constants Initialization	1110 1111	NVRAM initialization (Multi-function terminals are set prior to shipping) NVRAM initialization (3 WIRE sequence)			0 0 0 0
Run Mode Selection 1	04	Operation Method Select	Master frequency reference by analog input of external terminals 13, 14				0
			Master frequency reference from keypad				1
			External terminal operation effective (start/stop, etc)				0 —
			Keypad operation effective				1 —
		Stopping Method Select	RAMP stop	0	0	—	—
			Coasting to stop	0	1	—	—
			Full-range DC injection braking stop	1	0	—	—
			Coasting stop (timer function provided) (Set time by bn-04 )	1	1	—	—
Run Mode Selection 2	05	Priority of Stopping	Keypad STOP key effective during operation	—	—	—	0
			Keypad STOP key not effective during operation	—	—	—	1
		Prohibition of REV run	REV run enabled	—	—	0	—
			REV run disabled	—	—	1	—
		Control Input Scan	Control input are scanned twice before being accepted by MPU	—	0	—	—
			Control input are scanned once before being accepted by MPU	—	1	—	—
		*Multi-function Analog Monitor Output*	Selection of analog output (terminals 21-22)	0	—	—	—
			Selection of analog output (terminals 21-22)	1	—	—	—
Run Mode Selection 3	06	S-curve at accel/decel time	0.2 sec S-curve	—	—	0	0
			No S-curve	—	—	0	1
			0.5 sec S-curve	—	—	1	0
			1.0 sec S-curve	—	—	1	1
		Input Reference	Response to master frequency reference 0 to 100% for 0 to 10V (4 to 20mA)	—	0	—	—
			Response to master frequency reference 0 to 100% for 10 to 0V (20 to 4mA)	—	1	—	—
			Stop by reference input loss	0	—	—	—
			Operation to continue with 80% of frequency reference	1	—	—	—
Run Mode Selection 4	07	Overtorque Detection	Overtorque detection not enabled	—	—	—	0
			Overtorque detection enabled	—	—	—	1
			Enabled only if at set speed	—	—	0	—
			Enabled during operation (except during DC injection)	—	—	1	—
			Operation continued after overtorque is detected	—	0	—	—
			Coasts to stop of overtorque is detected	—	1	—	—
			Not used	0	—	—	—
		★ Run Selection	Run by frequency reference input (option)	—	—	—	0
			Run by inverter operator or control circuit terminal input run command input	—	—	—	1
Run Mode Selection 5	08	★ Run Selection	Run by run command input (option)	—	—	0	—
			Run by inverter operator or control circuit terminal input run command input	—	—	1	—
		Stopping Method Selection of Communication Interface Card (SI-B) Communication Error	Ramp to a stop (decel time bn-02)	0	0	—	—
			Coasting to a stop	0	1	—	—
			Ramp to a stop (decel time bn-04)	1	0	—	—
			Operation to continue	1	1	—	—
		★ Multi-function Analog Monitor output*	Item to analog output (terminals 21-22) depends on Sn-05 4th digit and Sn-09 2nd digit setting	—	—	0	—
			Item to analog output (terminals 21-22) is set by communication interface card (SI-B)	—	—	1	—
			Selection of analog output (terminals 21-22)	—	—	0	—
			Selection of analog output (terminals 21-22)	—	—	1	—
Run Mode Selection 6	09	—				0	0
		—				—	—

\* When Sn-09 1st-digit is 0, analog output (terminals 21-22) is as follows \*

Sn-05 4th digit	Sn-09 2nd digit	Output
0	0	Output frequency
1	0	Output current
0	1	Voltage reference
1	1	Output power

★ Where requiring this function, contact your YASKAWA representative

# SYSTEM CONSTANT Sn- [ ] (Cont'd)

Set before operation

Function	Sn-	Data Name	Function					Factory Setting
				4th digit	3rd digit	2nd digit	1st digit	
Protection Section 1 (stall prevention)	10	Stall Prevention	Stall prevention during acceleration enabled	-	-	-	0	0 0 0 0
			Stall prevention during acceleration disabled	-	-	-	1	
			Stall prevention during deceleration enabled	-	-	0	-	
			Stall prevention during deceleration disabled	-	-	1	-	
			Stall prevention during running enabled	-	0	-	-	
			Stall prevention during running disabled	-	1	-	-	
			Decel time during stall prevention "DECEL TIME 1" (Fn-02 set value)	0	-	-	-	
			Decel time during stall prevention "DECEL TIME 2" (Fn-04 set value)	1	-	-	-	
Protection Section 2	11	DB resistor	No DB protection calculated or provided by inverter	-	-	-	0	0 0 0 0
			Protection provided for Yaskawa internal DB resistor only, if installed	-	-	-	1	
			Fault contact is not energized during auto reset/restart operation	-	-	0	-	
			Fault contact is energized during auto reset/restart operation	-	-	1	-	
			Momentary Power Loss Protection	-	0	-	-	
Protection Section 3	12	External Fault Signal Level	Operation stopped by momentary power loss detection	-	1	-	-	0 1 0 0
			Operation continues during momentary power loss	-	0	-	-	
			Not used	0	-	-	-	
			External fault input , Normal open-contact input	-	-	-	0	
			External fault input , Normal closed-contact input	-	-	-	1	
			External fault signal , always detected	-	-	0	-	
			External fault signal , detected while running only	-	-	1	-	
			Ramp stop (major fault)	0	0	-	-	
Protection Selection 4	13	Processing of External Fault Detection	Coasting to stop (major fault)	1	1	-	-	0 1 0 0
			Emergency stop (major fault)	1	0	-	-	
			decelerates to stop by emergency stop time(Fn-04 set value)	1	1	-	-	
			Operation to continue (minor fault)	1	1	-	-	
			Deceleration to stop (decel time Fn-02)	0	0	-	-	
			Coasting to stop	0	1	-	-	
			deceleration to stop (decel time Fn-04)	1	0	-	-	
			Operation to continue	1	1	-	-	
Protection Selection 5	14	Motor Protection (Electronic Thermal)	Electronic thermal motor Protection effective	-	-	-	0	0 0 0 0
			Electronic thermal motor Protection ineffective	-	-	-	1	
			Electronic thermal characteristics in accordance with standard motor	-	-	0	-	
			Electronic thermal characteristics in accordance with constant torque motor	-	-	1	-	
			Electronic thermal characteristics are standard	-	0	-	-	
			Electronic thermal characteristics are short-time rating	-	1	-	-	
			★Inverter Protection OL 103% continuous 150% for one minute	0	-	-	-	
			★Inverter Protection OL 113% continuous 123% for one minute	1	-	-	-	
Input Signal	15	Terminal 5 Function	00-FF	Selects terminal 5 function (factory set for multi-step speed reference 1)				0 3
	16	Terminal 6 Function	00-FF	Selects terminal 6 function (factory set for multi-step speed reference 2)				0 4
Analog Input	17	Terminal 7 Function	00-FF	Selects terminal 7 function (factory set for jog frequency reference)				0 6
	18	Terminal 8 Function	00-FF	Selects terminal 8 function (factory set for internal baseblock by NO contact input)				0 8
Output Signal	19	Multi-function Analog Input	00-FF	Selects multi-function analog input (terminal 16) function				0 0
	20	Multi-function Output 1	00-FF	Selects multi-function contact output (terminals 9, 10) function (factory set for during running)				0 0
	21	Multi-function Output 2	00-FF	Selects multi-function open collector (terminal 25) function (factory set for zero speed)				0 1
	22	Multi-function Output 3	00-FF	Selects multi-function open collector (terminal 26) function (factory set for speed agreed setting)				0 2
Option Card Function Section	25	Analog Reference Card (AI - 14B)	Positive / negative values of frequency reference determine FWD / REV operation	-	-	-	-	0 0 0 0
			Positive frequency reference value determine forward operation negative = 0 output	-	-	-	-	
			Not used	0	0	0	-	
	26	Digital Reference Card (DI - 08) (Frequency reference set mode)	BCD input 1% Resolution	0	0	0	0	0 0 0 0
			BCD input 0 1% Resolution	0	0	0	1	
			BCD input 0 01% Resolution	0	0	1	0	
			BCD input 1 Hz Resolution	0	0	1	1	
			BCD input 0 1 Hz Resolution	0	1	0	0	
			BCD input 0 01 Hz Resolution	0	1	0	1	
			BINARY input 255 / 100%	0	1	1	1	
	27	Pulse Monitor Card (PO - 36F) (No. of output pulses)	BINARY input (input value displayed in decimal on operator)	1	0	0	0	0 0 1 0
			1 F	0	0	0	0	
			6 F	0	0	1	0	
			10 F	0	1	0	0	
			12 F	0	1	1	0	
	28	Analog Monitor Card (AO - 08, AO - 12)	36 F	1	0	00	0	0 1 0 0
			Channel 1 output	Output frequency (max frequency /100%)	-	-	0	0
			Output current (rated current / 100%)	-	-	0	1	
			Output voltage ref (Input voltage / 100%)	-	-	1	0	
			DC voltage (400V / 100% for 200V class 800V / 100% for 400V class)	-	-	1	1	
			Output frequency (max frequency / 100%)	0	0	-	-	
			Output current (rated current / 100%)	0	1	-	-	
			Output voltage ref (Input voltage / 100%)	1	0	-	-	
			DC voltage (400V / 100% for 200V class 800V / 100% for 400V class)	1	1	-	-	

\* Effective only for inverter models of capacity 200V class 40HP (30kW) or more, 400V class 75HP (55kW) or more, or 575V class 30HP (22kW) or more  
★ Where requiring this function, contact your YASKAWA representative

## CONTROL CONSTANT Cn - [ ] [ ]

Set before operation

Function	Cn-	Data Name	Set Unit	Set Range	Factory Setting
V / f pattern Setting	01	Input voltage	0 1 V	0 0~255 0V (200V) 0 0~510 0V (400V)	230 0V (200V) 460 0V (400V)
	02	Max frequency	0 1 Hz	50 0~400 0 Hz	60 0 Hz
	03	Max voltage	0 1 V	0 0~255 0V (200V) 0 0~510 0V (400V)	200 0V *2
	04	Max voltage frequency	0 1 Hz	0 1~400 0 Hz	60 0 Hz
	05	Mid output frequency	0 1 Hz	0 1~400 0 Hz	3 0 Hz
	06	Mid output frequency voltage	0 1 V	0 0~255 0V (200V) 0 0~510 0V (400V)	15 0 V *2
	07	Min output frequency	0 1 Hz	0 1~400 0 Hz	1 5 Hz
	08	Min output frequency voltage	0 1 V	0 0~255 0V (200V) 0 0~510 0V (400V)	10 0 V *2
Electronic thermal Overload relay ref Current	09	Motor rated current	0 1 A	*4	*1
DC Injection Braking	10	DC injection braking start frequency	0 1 Hz	0 1~10 0 Hz	1 5 Hz
	11	DC injection braking current	1 %	0~100 % *6	50 %
	12	DC injection braking time at stopping	0 1 sec	0 0~25 5 sec	0 5 sec
	13	DC injection braking time at starting	0 1 sec	0 0~25 5 sec	0 0 sec
Freq Limit Control	14	Frequency (speed) reference upper limit	1 %	0~109 %	100 %
	15	Frequency (speed) reference lower limit	1 %	0~109 %	0 %
Freq Jump Control	16	Setting prohibit frequency 1	0 1 Hz	0 0~400 0 Hz	0 0 Hz
	17	Setting prohibit frequency 2	0 1 Hz	0 0~400 0 Hz	0 0 Hz
	18	Setting prohibit frequency 3	0 1 Hz	0 0~400 0 Hz	0 0 Hz
	19	Setting prohibit frequency range	0 1 Hz	0 0~25 5 Hz	1 0 Hz
Operator Display Change	20	Operator display mode	1	0~39999	0
Speed Agreed Detection	21	Up-to desired frequency setting	0 1 Hz	0 0~400 0 Hz	0 0 Hz
Carrier Freq Adjustment	22	Up-to frequency setting detection width / 2	0 1 Hz	0 0~25 5 Hz	2 0 Hz
	23	Carrier frequency upper limit	0 1 kHz	0 4~15 0 kHz	*3
	24	Carrier frequency lower limit	0 1 kHz	0 4~15 0 kHz	*3
Over torque Detection	25	Carrier frequency proportional gain	1	0~99	*3
	26	Over torque detection level	1 %	30~200 %	160 %
Stall Prevention	27	Over torque detection time	0 1 sec	0 0~25 5 sec	0 1 sec
	28	Stall prevention level during acceleration	1 %	30~200 %	170 %
	29	Constant HP area stall prevention limiter	1 %	30~200 %	50 %
Torque Boost Control	30	Stall prevention level during running	1 %	30~200 %	160 %
	31	Motor terminal resistance (Motor phase to phase resistance)	0 001 Ω	0 000~65 535 Ω	*1
	32	Motor iron loss	1 W	0~65535 W	*1
Simple Speed Control	33	Torque compensation limiter	1 V	0~50V (200V) 0~100V (400V)	*1
	34	Motor no-load current	1 %	0~99 % *5	30 %
Automatic reset & restart operation	35	Slip compensation primary delay time	0 1 sec	0 0~25 5 sec	2 0 sec
	36	No of auto restart attempt	1	0~10	0
Momentary Power Loss	37	Momentary power loss ride through time	0 1 sec	0 0~2 0 sec	*1
Speed Search Control	38	Speed search deactivation current level	1 %	0~200 %	150 %
	39	Speed search decel time *7	0 1 sec	0 0~25 5 sec	2 0 sec
	40	Min baseblock time	0 1 sec	0 0~2 0 sec	*1
	41	V / f during speed search	1 %	0~100 %	100 %
	42	Voltage recovery time	0 1 sec	0 1~2 0 S	0 3 sec

\*1 Factory setting differs depending on inverter capacity (Sn-01 set value)

\*2 Initial value differs depending on V / f (Sn-02 set value)

\*3 Factory setting differs depending on main circuit transistors

\*4 Set in a range of 10 to 200% of inverter rated current

\*5 Motor rated current (Cn-09) is set as 100% level

\*6 For set value ≤ 50% carrier frequency = 8 kHz

For set value > 50% carrier frequency = 1 kHz

\*7 If set to zero, speed search will be disabled

## FREQUENCY REFERENCE An - [ ]

These references are used during multi-speed operation. Set values of AN-[ ] can be changed or read during running in DRIVE mode.

### List of An - [ ]

An - [ ]	Data Name	Unit	Setting Range	Factory Setting
<b>01</b>	Frequency reference 1	0.01 Hz	0.00 Hz–400.00 Hz	0.00 Hz
<b>* 02</b>	Frequency reference 2	0.01 Hz	0.00 Hz–400.00 Hz	0.00 Hz
<b>03</b>	Frequency reference 3	0.01 Hz	0.00 Hz–400.00 Hz	0.00 Hz
<b>04</b>	Frequency reference 4	0.01 Hz	0.00 Hz–400.00 Hz	0.00 Hz
<b>05</b>	Frequency reference 5	0.01 Hz	0.00 Hz–400.00 Hz	0.00 Hz
<b>06</b>	Frequency reference 6	0.01 Hz	0.00 Hz–400.00 Hz	0.00 Hz
<b>07</b>	Frequency reference 7	0.01 Hz	0.00 Hz–400.00 Hz	0.00 Hz
<b>08</b>	Frequency reference 8	0.01 Hz	0.00 Hz–400.00 Hz	0.00 Hz
<b>09</b>	Jog Frequency reference	0.01 Hz	0.00 Hz–400.00 Hz	6.00 Hz

Note An - [ ] setting/reading units can be changed according to operator display mode (Cn-20) set values

The set unit at factory setting is 0.01 Hz

\*SN - 19 must be set to 1

## CONSTANT TO CHANGE DURING RUNNING Bn - [ ]

Set values of bn - [ ] can be changed or read during running in DRIVE mode.

### List of Bn - [ ]

Bn - [ ]	Data Name	Unit	Setting Range	Factory Setting
<b>01</b>	Acceleration time 1	0.1 Sec	0.0–6000.0 Sec	10.0 Sec
<b>02 #</b>	Deceleration time 1	0.1 Sec	0.0–6000.0 Sec	10.0 Sec
<b>03</b>	Acceleration time 2	0.1 Sec	0.0–6000.0 Sec	10.0 Sec
<b>04</b>	Deceleration time 2	0.1 Sec	0.0–6000.0 Sec	10.0 Sec
<b>05</b>	Frequency reference gain	0.1 %	0–1000.0 %	100.0 %
<b>06</b>	Frequency reference bias*	1 %	-100 to 100 %	0 %
<b>07</b>	Torque compensation gain*	0.1	0.0–2.0 **	1.0
<b>08</b>	Motor rated slip	0.1 %	0.0–9.9 % †	0.0 %
<b>09</b>	Energy-saving level gain	1 %	0–200 %	80 %
<b>10</b>	Monitor No. after turning on power supply	—	1–3	1
<b>11</b>	Gain of analog output (ter 21 and 22) and gain of channel 1 of option card if installed	0.01	0.00–2.55 ‡	1.00
<b>12</b>	Gain of channel 2 of option card if installed #	0.01	0.00–2.55 ‡	0.5

\* Setting method is different from VS-616GII (LN)

\*\* When EPROM No. is NSG610030 or more, gains can be set to max 2.0

Gains can be set to max 9.9 by setting "Sn-02=FF", however, excessive setting may damage inverter

† Cn-04 is regarded as 100% level

‡ When EPROM No. is NSG610010–NSG610012, the contents become as in the table below

# Contact our representative before setting less than 1 sec

## Effective for the installation of option cards A0–08 and A0–12

Set before operation

<b>11</b>	Analog monitor channel 1 gain	1 %	0–255 %	100 %
<b>12</b>	Analog monitor channel 2 gain	1 %	0–255 %	200 %

# Select Functions and Parameters for Optimal Operation

## Inverter capacity setting

Inverter capacity is preset at the factory. Refer to the table below and reset when using spare PC boards, etc. An incorrect data input may cause inverter fault

**200 to 230V**

Sn-01 Data	00	01	02	03	04	05	06	07
CIMR-G3	20P4	20P7	21P5	22P2	23P7	25P5	27P5	2011
	08	09	0A	0B	0C	0D	0E	0F
	2015	2018	2022	2030	2037	2045	2055	2075

**380 to 460V**

Sn-01 Data	20	21	22	23	24	25	26	27
CIMR-G3	40P4	40P7	41P5	42P2	43P7	45P5	47P5	4011
	28	29	2A	2B	2C	2D	2E	2F
	4015	4018	4022	4030	4037	4045	4055	4075
	30	31	32	33	34	35	36	3F
	4090	4110	4132	4160	4185	4220	4300	4L45

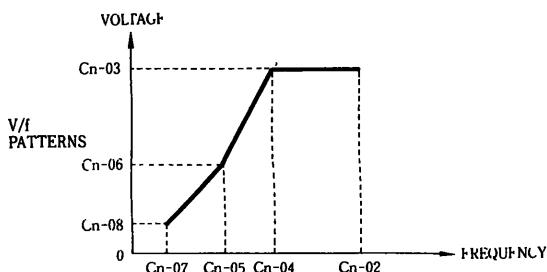
**500 to 575V**

Sn-01 Data	44	45	46	47	48	49	4A	4B
CIMR-G3	53P7	55P5	57P5	5011	5015	5018	5022	5030
	4C	4D	4E	4F	50	51	52	
	5037	5045	5055	5075	5090	5110	5160	

## V/f characteristics

Item name	Parameter to be set	Factory Preset
V/F selection	Sn-02	0 1
V/f parameter	Cn-02 to 08	See page 47

There are 15 patterns available. Optimum selection requires consideration of the load characteristics. Optional V/f pattern setting (F for Sn-02) allows programming of custom V/f patterns.



## Operation mode selection

Item name	Parameter to be set	Factory Preset
Operator status	Sn-03	0 0 0
Start/stop procedure	Sn-04	0 0 1
Operation mode selection	Sn-05	0 0 0

### • Constant write disable

Prevents operation error.

$$\boxed{\text{Sn-03}} = 0101$$

### • Constant initialization

Allows all constants to be set except Sn-01 and Sn-02 which are preset at the factory.

$$\boxed{\text{Sn-03}} = 1110$$

### • Analog output (Terminals 21 and 22) selection

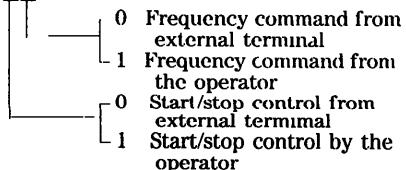
With the combination of 4th digit of Sn-05 and 2nd digit of Sn-09, the output will be as follows:

4th digit of Sn-05	2nd digit of Sn-09	Output
0	0	Output freq
1	0	Output Current
0	1	Voltage ref
1	1	Output power

### • Start/stop procedure

Control input can be selected from the digital operator or the terminal strip.

$$\boxed{\text{Sn-04}} = \times \times 00$$



### • Stop procedure

Stopping mode can be selected according to the application.

$$\boxed{\text{Sn-04}} = 00 \times \times$$

- |    |                                                                                                  |
|----|--------------------------------------------------------------------------------------------------|
| 00 | Ramp to a stop                                                                                   |
| 01 | Coasting to a stop                                                                               |
| 10 | Full-range DB stop                                                                               |
| 11 | Coasting to a stop with timer<br>(Restartable after the deceleration time set in bn-02 elapses ) |

### • Reverse rotation prevention

Prevents accidental selection of reverse rotation.

$$\boxed{\text{Sn-05}} = \times \times 1 \times$$

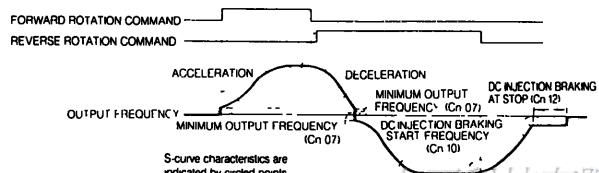
## Accel/decel time and patterns

Item name	Parameter to be set	Factory Preset
V/f Pattern choice	Sn-06	0 0 0 0
Acceleration time 1	bn-01	10 0s
Deceleration time 1	bn-02	10 0s
Acceleration time 2	bn-03	10 0s
Deceleration time 2	bn-04	10 0s

- S-curve non-linear accel/decel is possible.**  
Reduce shocks at accel/decel time

**Sn-06 = x x 00**

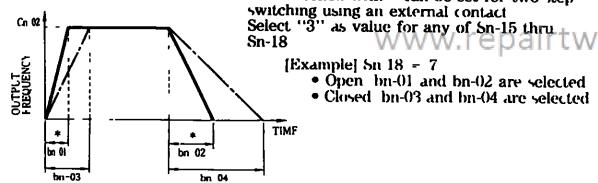
- 00 0.2 sec of non-linear accel/decel
- 01 0 sec of non-linear accel/decel
- 10 0.5 sec of non-linear accel/decel
- 11 1.0 sec of non-linear accel/decel



Note S-curve characteristics are not enabled at completion of deceleration when the first and second digits are 00

- Each item can be set from 0.0 sec to 6000.0 sec.**

The set time indicates the interval required before the maximum output frequency (Cn-02) is reached.



## Operation mode when frequency command is missing

Item name	Parameter to be set	Factory Preset
Operation signal selection 3	Sn-06	0 0 0 0

When analog frequency command is lost, operation will be continued at 80% of the speed specified by the preceding frequency command.  
Set as follows:

Simple backup is provided when an error occurs in the host computer.

**Sn-06 = 0 x x x**

- 0 Function not effective
- 1 Function effective

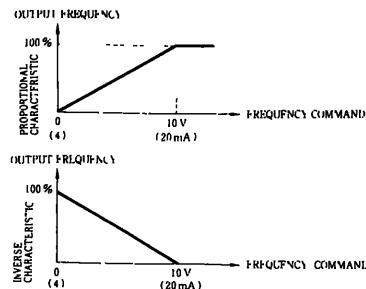
## Frequency command characteristics

Item name	Parameter to be set	Factory Preset
Operation signal selection 3	Sn-06	0 0 0 0

Frequency command input characteristics can be set as follows:

**Sn-06 = x 0 x x**

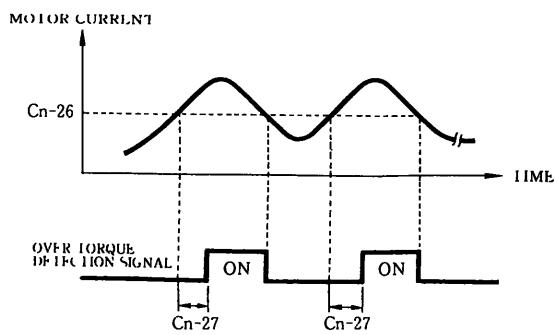
0 Direct response  
1 Indirect response



## Overtorque detection

Item name	Parameter to be set	Factory Preset
Overtorque detection selection	Sn-07	See page 45
Overtorque detection level	Cn-26	160%
Overtorque detection time	Cn-27	0 1s
Overtorque detection signal	Sn-20 to 22	See page 46

When excess load is placed on the machine, the increase in motor current is detected and an alarm signal may be output.



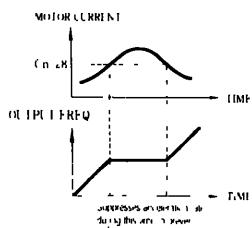
To use this function, set "B" for any constant from Sn-20 to Sn-22.

## Motor stall prevention

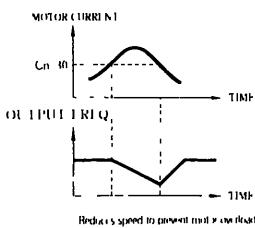
Item name	Parameter to be set	Factory Preset
Operation level for stall prevention during deceleration	Sn-10	0 0 0
Operation level for stall prevention during acceleration	Cn-28	170%
Operation level for stall prevention during operation	Cn-30	160%

Automatically adjusts output frequency according to the load so as to continue operation of the machine without stalling the motor

### • Stall prevention during acceleration



### • Stall prevention during operation



### • Stall prevention during deceleration

[Sn-10] =  $\times \times 0 \times$

- T - 0 Stall prevention during deceleration enabled
- 1 Stall prevention during deceleration disabled

Note Set to "1" when connecting braking resistor unit

## Built-in braking resistor protection

Item name	Parameter to be set	Factory Preset
Regenerative braking resistor protection	Sn-11	0 0 0

Built-in braking resistors are protected by thermal simulation. When a built-in braking resistor is used, select  $\times \times \times 1$  (protection effective).

When an external braking resistor unit is used, set  $\times \times \times 0$ , and protect the resistor unit with the built-in thermal relay. The thermal relay should be wired in series with the inverter run command or the external fault circuit

[Sn-11] =  $\times \times \times 0$       0 Not protected  
                                1 Protected

## Operation during momentary power loss

Item name	Parameter to be set	Factory Preset
Function enabled/disabled	Sn-11	0 0 0
Compensating time for momentary power loss	Cn-37	0.7s

Operation can be continued even when a momentary power loss occurs.

\* CIMR-G3A2 OP4

[Sn-11] =  $\times 0 \times \times$

- T — 0 Continuation function disabled
- 1 Continuation function enabled

Set compensation time (up to 2 sec) for Cn-37. For motors of 3HP (2.2 kW) capacity or below, the compensating time is 0.5 sec to 1 sec. If longer momentary power loss ride-thru is required, install back-up capacitor unit (optional for small unit)

## External error stop mode

Item name	Parameter to be set	Factory Preset
Protection characteristic selection 3	Sn-12	0 1 0 0

Stop method after external error (when external terminal 3 receives input) can be set as follows:

[Sn-12] =  $00 \times \times$

- T — 00 Frequency deceleration (bn-02)
- 01 Coasting to a stop
- 10 Frequency deceleration (bn-04)
- 11 Operation continued

## Electronic thermal overload

Item name	Parameter to be set	Factory Preset
Motor type	Sn-14	0 0 0
Motor rated current	Cn-09	1.9A*

The electronic thermal overload function prevents standard motors from overloading when the speed is reduced by the inverter. (No external thermal switch is necessary.) Set as follows:

[Sn-14] =  $0 0 0 \times$

- T — 0 Standard motors
- 1 Inverter controlled motors
- T — 0 Motor time constant 8min
- 1 Motor time constant 5min
- T — 0 Inverter protection constant torque mode
- 1 Inverter protection HVAC mode

Electronic thermal protection can be displayed by setting "[Sn-14] =  $\times \times \times 1$ "

\*The example represents YASKAWA 0.5HP (0.4kW), 200V, 4-pole motor. For motors of other manufacturers, set the nameplate value of the motor

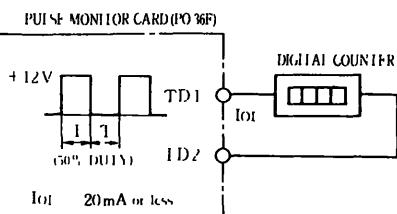
## Pulse monitor selection (option)

Item name	Parameter to be set	Factory Preset
Pulse frequency selection	Sn-27	0 0 0 0

With a digital counter connected, speed can be indicated as a pulsed output. The following output pulse frequencies can be selected.

[Sn-27] = 0000

- |        |                       |
|--------|-----------------------|
| -- 000 | Output frequency × 1  |
| 001    | Output frequency × 6  |
| 010    | Output frequency × 10 |
| 011    | Output frequency × 12 |
| - 100  | Output frequency × 36 |



## Analog monitor selection (option)

Item name	Parameter to be set	Factory Preset
Analog monitor selection	Sn-28	0100
Channel 1 gain	bn-11	1.00
Channel 2 gain	bn-12	0.50

Various monitors available with the connection of an analog meter. Also meter calibration is possible with internal constants [bn-11] and [bn-12].

[Sn-28] = 0100

- |                    |                       |
|--------------------|-----------------------|
| — Channel 1 output | 00 Output frequency   |
| 001 Output current | 10 Output voltage ref |
| 11 DC voltage      |                       |
| — Channel 2 output | 00 Output frequency   |
| 01 Output current  | 10 Output voltage ref |
| 11 DC voltage      |                       |

## Input voltage setting

Item name	Parameter to be set	Factory Preset
Input voltage set	Cn-01	200V

Input voltage set [Cn-01] provides optimum torque outputs.

## DC injection braking

Item name	Parameter to be set	Factory Preset
DC injection during stop	Cn-10, 12	See page 47
DC injection at start	Cn-07, 11, 13	See page 47
DC injection braking external control	Sn-15 to 18	See page 46

### • DC injection braking during stop

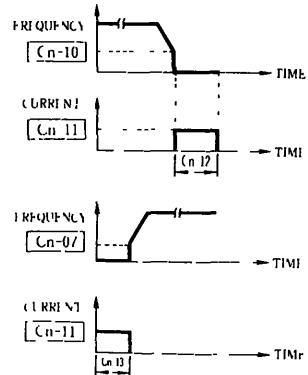
Prevents overrun at stop  
(Exact position stop)

### • Starting DC injection braking during start

Stops a coasting motor without tripping even when the direction of rotation is unknown

### • DC injection braking external control

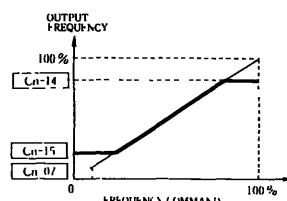
Controls DC injection braking during base block thru terminal while coasting to a stop) Set "60" for any of Sn-15 to Sn-18 When run command is removed, and motor is coasting, full range DC injection braking occurs



## Output frequency limit

Item name	Parameter to be set	Factory Preset
Frequency (speed) command upper limit	Cn-14	100%
Frequency (speed) command lower limit	Cn-15	0

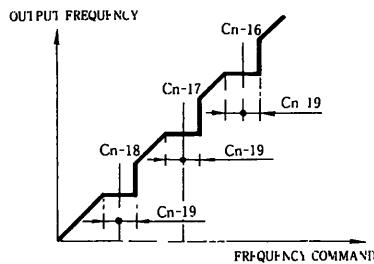
The upper and lower limits for the output frequency can be clamped. When the lower limit is not 0, acceleration to that lower limit setpoint begins immediately when the start command is input



## Resonant frequency jump control

Item name	Parameter to be set	Factory Preset
Prohibited frequency 1-3	Cn-16 to 18	0.0 Hz
Prohibited frequency range	Cn-19	1.0 Hz

Operation at the preset frequency will be eliminated. The inverter will accel/decel through the prohibited region. This function is used to avoid resonant frequencies in the mechanical systems.



## r/min indication (monitoring)

Item name	Parameter to be set	Factory Preset
Operator monitor indication	Cn-20	0

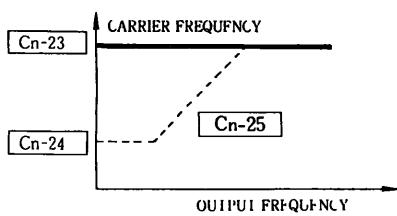
The unit of speed indicated on the operator can be switched from the following Hz, r/min, m/min, %, or any other directly proportional value.

[Example] Cn-20 = 0 Hz display  
1 % display  
Number of motor poles r/min display  
Other units with an arbitrary number of digits such as m/min and m<sup>3</sup>/min can be used

## Carrier frequency

Item name	Parameter to be set	Factory Preset
Carrier frequency upper limit	Cn-23	15.0 kHz
Carrier frequency lower limit	Cn-24	15.0 kHz
Carrier frequency proportional gain	Cn-25	0

Changing the carrier frequency reduces RFI noise and leakage current without increasing motor noise



## Automatic reset and restart

Item name	Parameter to be set	Factory Preset
Retry counts	Cn-36	0

If an inverter error occurs during operation, the inverter performs self diagnosis and automatically restarts.

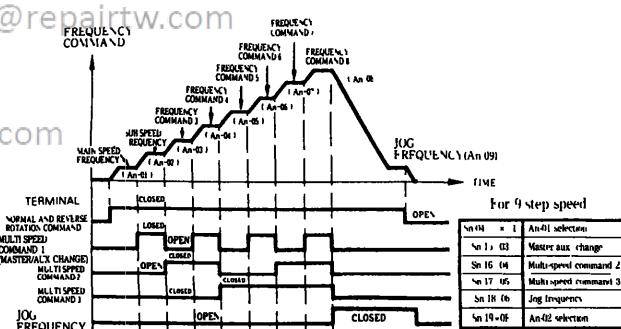
Up to 10 retry counts can be set for Cn-36.

## 9-step speed change

Item name	Parameter to be set	Factory Preset
Multi-speed frequency command	An-01 to 09	See page 48
Multi-function command	Sn-15 to 18	See page 46
Run selection	Sn-04	0 0 1 1
Multi-function analog input	Sn-19	0 0

Up to 9 steps of speeds can be set using signals from external terminals 5 to 8. This eliminates the need for an analog signal, thereby enabling simplified external control operation. See the following example.

- Set An-01 to -09 according to run specifications.
- Set Sn-04 = × × × 1, Sn-19 = OF

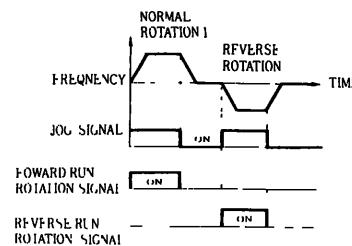


## Jog operation

Item name	Parameter to be set	Factory Preset
Jog frequency	An-09	6.00 Hz

Select the jog mode (connect terminals 11 and 7) and input the start signal. Inching starts.

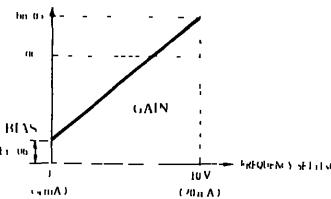
Depressing the JOG key on the digital operator performs the same operation.



## Output frequency control (gain/bias)

Item name	Parameter to be set	Factory Preset
Frequency command gain	bn-05	100%
Frequency command bias	bn-06	0%

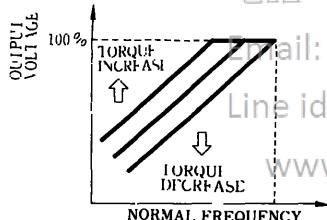
Output frequency (gain/bias) can be set freely according to frequency setting (0 to 10V or 4 to 20mA)



## Full-range automatic torque boost

Item name	Parameter to be set	Factory Preset
Torque compensation gain	bn-07	10

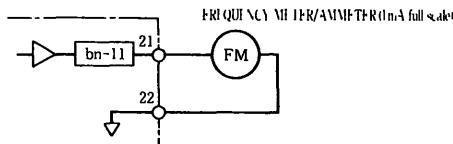
Automatic control of V/f ratio according to the load torque ensures tripless operation and optimum output current. Normally, no adjustment is necessary. Use this function when especially high starting torque is required



## Frequency meter/Ammeter calibration

Item name	Parameter to be set	Factory Preset
Analog output gain	bn-11	1.00

Frequency meter/ ammeter connected to the inverter can be calibrated without using a resistor for calibration



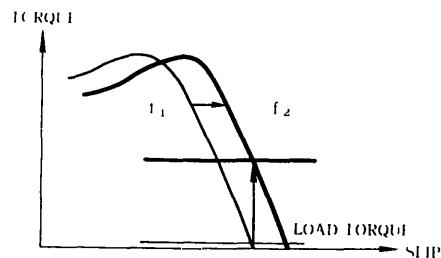
[Sn-05] = 0 × × ×

- 0 Output frequency meter
- 1 Output ammeter

## Slip compensation speed control

Item name	Parameter to be set	Factory Preset
Motor rated slip	bn-08	0.0%
Motor rated current	Cn-09	See page 47
Motor no-load current	Cn-34	30%
Slip compensation primary delay time	Cn-35	0.0s*

Simple speed control (slip compensation) is available without motor speed detection (PG or TG). Frequency command from  $f_1$  to  $f_2$  eliminates speed fluctuations caused by varying loads



## Multi-function input

Item name	Parameter to be set	Factory Preset
Multi-function input function	Sn-15 to 18	See page 46

Functions of external input terminals 5 to 8 can be switched. Set Sn-15 to Sn-18 in ascending order, or an OPE (parameter error) occurs (ie the lowest value programmed in must be set into the lowest number Sn constant)

Function of terminal 5 set into Sn-15

Function of terminal 6 set into Sn-16

Function of terminal 7 set into Sn-17

Function of terminal 8 set into Sn-18

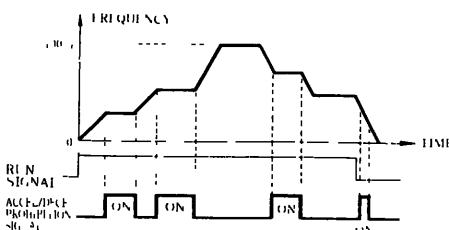
Set value	Function	Set value	Function
00	Normal and reverse rotation selection	0A	Accel/decel prohibition
01	Operation signal selection	0B	Inverter overheat warning
02	Option/inverter switch	0C	Multi function analog input enable
03	Multi-speed command 1 (in increments of 1)*	D-F	Not used
04	Multi-speed command 2*	★10	UP command
05	Multi-speed command 3	★11	DOWN command
06	Jog frequency selection*	★12	FJOG command
07	Accel/decel time setting	★13	RJOG command
08	Coasting stop command for NO contact*	14 to IF	Not used
09	Coasting stop command for NC contact	20 to 2F	External fault 1
		30 to 3F	External fault 2
		40 to 4F	External fault 3
		50 to 5F	External fault 4
		60	(*) Inching, common and operation and jog, like precedences)
		61	Search from max freq
		62	Search from set freq
		63	Energy saving operation

(\* Factory setting prior to shipment )

## Accel/decel prohibition

Item name	Parameter to be set	Factory Preset
Accel/decel stop function	Sn-15 to 18	See page 46

Frequency can be set externally using a push button instead of speed pot. Set "OA" for any constant from Sn-15 to Sn-18



Note Contact your YASKAWA representative for availability in North American markets

## Inverter overheating warning

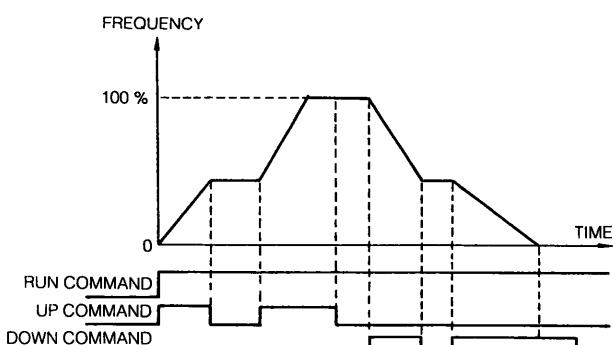
Item name	Parameter to be set	Factory Preset
Inverter overheating warning	Sn-15 to 18	See page 46

When terminal is closed, "OH2" blinks on the digital operator without stopping the inverter. (External thermal protection is required) Set "OB" for any of Sn-15 to Sn-18

## UP/DOWN

Item name	Parameter to be set	Factory Preset
UP/DOWN	Sn-15 to 18	See page 46

Allows remote speed setting with pushbutton. Set "10" or "11" in any constant from Sn-15 to 18.



Where requiring this function, contact your YASKAWA representative

## Speed search

Item name	Parameter to be set	Factory Preset
Speed search	Sn-15 to 18	See page 46

Allows switch operation from commercial power to inverter. Set "61" or "62" into any constant from Sn-15 to Sn-18

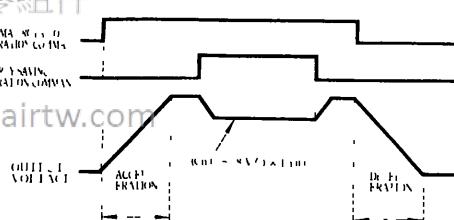
- 61 Search from max frequency
- 62 Search from set frequency

## Energy saving operation

Item name	Parameter to be set	Factory Preset
Energy saving level gain	Sn-09	80%

If reduced output voltage is required after acceleration, the energy-saving function can be used to reduce it.

This function helps to eliminate motor/system vibration. Set "63" for any constant from Sn-15 to Sn-18



## Multi-function output

Item name	Parameter to be set	Factory Preset
Multi-function output function	Sn-20 to 22	See page 46

Functions of external output terminals 9 to 1, 25 to 27, and 26 to 27 can be switched.

Function of terminals 9 and 10 Set into Sn-20

Function of terminals 25 and 27 Set into Sn-21

Function of terminals 26 and 27 Set into Sn-22

Set value	Function	Set value	Function
00	In operation*	07	Low voltage detected
01	Zero speed*	08	Brake blocked
02	Speed agreed*	09	Frequency command mode
03	Free speed agreed	0A	Operation command mode
04	Speed agreed detection (less than set value)	0B	Over torque detected
05	Speed agreed detection (more than set value)	0C	Frequency command missing
06	Inverter operation ready	0D	Braking resistor failure
96		0E	Fault

(\* Factory setting prior to shipment.)

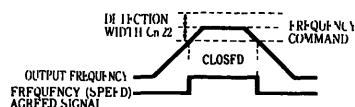
## Speed agreed signal output

Item name	Parameter to be set	Factory Preset
Desired frequency	Cn-21	0.0 Hz
Bandwidth	Cn-22	2.0 Hz
Multi-function contact output function	Sn-20 to 22	See page 46

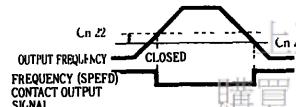
This function is used when operation at an arbitrary speed must be indicated. Set the multi-function contact output (Sn-20 to Sn-22) as follows:

[Example] Setting Sn-20=02 sets external output terminals 9 and 10 to indicate "speed agreed" (output frequency=input reference)

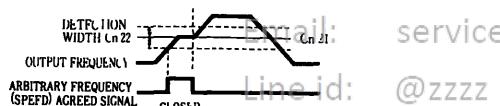
(1) Set value=2. "Speed agreed" detection



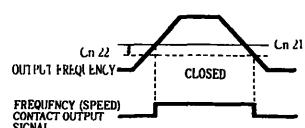
(2) Set value=3. "Medium speed" detection



(3) Set value=4. "Below set point" detection



(4) Set value=5. "Above set point" detection



## Multi-function analog input

Item name	Parameter to be set	Factory Preset
Multi-function analog input	Sn-19	0.0

An arbitrary function can be used with external input terminal 16

Set Value	Function	Set Value	Function
00	Aux frequency ref	06	Accel/Decel time reduction coefficient
01	Frequency ref gain	07	DC injection current
02	Frequency bias 1	08	Stall level during run
03	Frequency bias 2	09	Frequency ref lower limit
04	Over torque detection level	0A	Prohibited set frequency
05	Voltage bias		

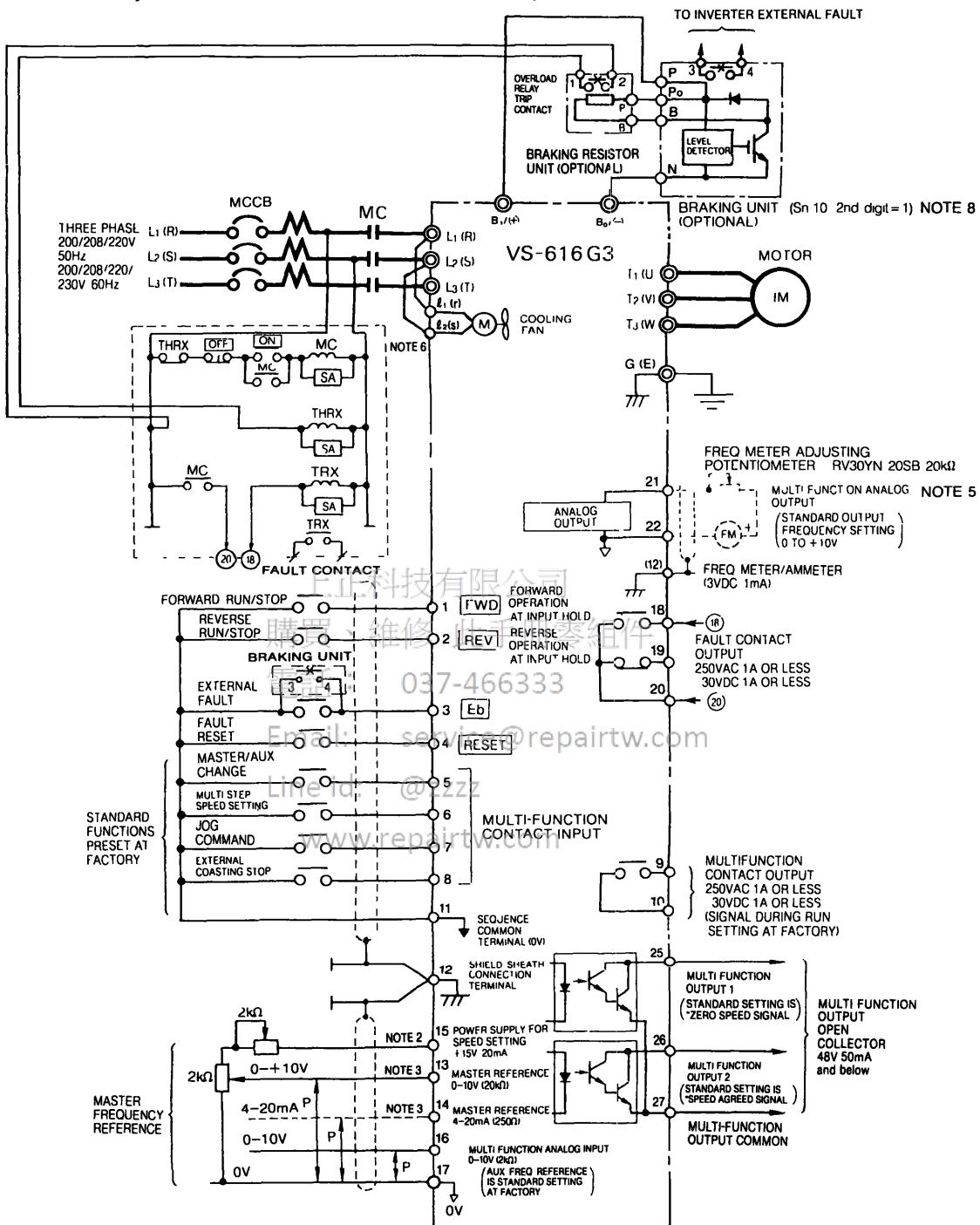
## Functions for reduction of "Machine vibration and shock"

Following constants are effective for the reduction of machine vibration and shock

Effective Method	Constant	Factory Preset
• For the decrease of generated torque • For the increase of generated torque	Sn-02 bn-07 Cn-02 to 08	01 1.0 Sec page 47
For the decrease of shock at accel	Sn-06 bn-01, 03 Cn-28 Cn-29	× × 00 10.0s 170% 50%
For the decrease of shock at decel	Sn-04 Sn-06 bn-02, 04 Cn-10 Cn-11	0011 0000 10.0s 1.5Hz 50%
For the decrease of carrier frequency	Cn-23, 24 Cn-25	15.0kHz 0
For the change of speed control characteristics	bn-08 Cn-34 Cn-35 bn-09	0.0% 30% 0.0s 80%

# TERMINALS AND STANDARD CONNECTION

**For models CIMR-G3U2011 to -G3U2022  
(200V class, 20.6kVA and above)**



Notes 1  indicates shielded leads and  twisted-pair shielded leads

- 2 External terminal 15 of +15V has maximum output current capacity of 20mA
  - 3 Either external terminal 13 or 14 can be used
  - 4 Terminal symbols shows main circuit, shows control circuit
  - ★ 5 Multi-function analog output is for use on meters (frequency, current, voltage, watt) only, and not available for the feedback control system. Use analog monitor cards (Model AO - 08 or AO - 12) For control system feedback
  - 6 Never remove the terminal leads r and s of control power supply
  - 7 Operating power voltage need not be set for motors of 200V class of 10HP (7.5kW) or below and 400V class 10HP (7.5kW) or below
  - 8 Stall prevention during deceleration should be disabled when using braking unit
  - ★ Where requiring this function, contact your YASKAWA representative

## **MAIN CIRCUIT**

Voltage	200 to 230V		
Model CIMR-G3	20P4 - 27P5	2011 - 2022	2030 - 2075
Terminal	Max applicable Motor Output	0.5 - 10HP (0.4 - 7.5kW)	15 - 30HP (11 - 22kW)
L1 (R)	Main circuit power unit		
L2 (S)			
L3 (T)			
T1 (U)			
T2 (V)			
T3 (W)			
B0 / (-)			
B1 / (+)	<ul style="list-style-type: none"> <li>Braking resistor unit connector (B1/+ - B0)</li> <li>DC bus (B1/+ - B0/-)</li> </ul>		
B2			
(-)			
+ 3 (P3)			
+ 1 (P1)			
I1 (r)			
I2 (s)			
I2 200 (> 200)	Cooling fan power input		
I2 400 (> 400)			
x			
y			
G (E)	Grounding (ground resistance should be 100 ohms or less)		

Note When using terminals  $\oplus$ 3 (P3) -  $\ominus$ , contact your YASKAWA representative

Voltage	380 to 460V				
Model CIMR-G3	40P4 - 47P5	4011, 4015	4018 - 4045	4055 - 4300	
Max applicable Motor Output	0.5 - 10HP (0.4 - 7.5kW)	15HP (11kW), 20HP (15kW)	25 - 60HP (18.5 - 45kW)	75 - 400 HP (55 - 300kW)	
Terminal	L1 (R)	Main circuit power input			
	L2 (S)	電話 : 037-466333			
	L3 (T)				
	T1 (U)				
	T2 (V)				
	T3 (W)	Email: service@repahtw.com			
	B0 / (-)	Inverter output			
	B1 / (+)	Braking resistor unit connector (B1/+ - B2)	Braking resistor unit connector (B1/+ - B2)	Braking unit connector (B1/+ - B0/-)	
	B2	DC bus (B1/+ - O)	DC bus (B1/+ - B0/-)	DC bus (B1/+ - B0/O)	
	(+) 3 (P3)				
	(+) 1 (P1)				
	I1 (r)				
	I2 (s)				
	l1 200 (< 200)	Cooling fan power input			
	l2 400 (< 400)				
	x				
	y				
	G (E)	Grounding (ground resistance should be 100 ohms or less)			

Note When using terminals  $\oplus$ 3 (P3) -  $\ominus$ , contact your YASKAWA representative.

	Voltage	500 to 575V	
Terminal	Model CIMR-G3	53P7 - 5018	5022 - 5160
	Max. applicable Motor Output	5 - 25HP (3.7 - 18.5kW)	30 - 200HP (22 - 160kW)
L <sub>1</sub> (R)			
L <sub>2</sub> (S)			Main circuit power unit
L <sub>3</sub> (T)			
T <sub>1</sub> (U)			
T <sub>2</sub> (V)			Inverter output
T <sub>3</sub> (W)			
B <sub>0</sub> / ⊕		—	• Braking unit connector (B1/⊕ - B0/⊖ )
B <sub>1</sub> / ⊕			• DC bus (B1/⊕ - B0/⊖ )
B <sub>2</sub>			—
⊖			
I <sub>1</sub> (r)			Cooling fan power input
I <sub>2</sub> (s)			
I <sub>2</sub> 200 (△ 200)			
I <sub>2</sub> 400 (△ 400)			
X			
Y			
G (E)			External power supply (220 VAC, 10VA)
			Grounding (ground resistance should be 100 ohms or less)

Note When using terminals  $\oplus$  (P3) -  $\ominus$ , contact your YASKAWA representative.

## CONTROL CIRCUIT (For 200V/400V/575V Class)

Classification	Terminal	Signal Function	Description		Signal Level
Sequence Output Signal	1	Forward operation-stop signal	Forward run at closed, stop at open	—	Photo-coupler insulation Input +24VDC 8mA
	2	Reverse operation-stop signal	Reverse run at closed, stop at open	—	
	3	External fault input	Fault at closed, normal state at open	—	
	4	Fault reset input	Reset at closed	—	
	5	Master/Aux change (Multi step speed ref 1)	Aux freq ref at "closed"	Multifunction contact input the following signals available to select: Forward/reverse select, run mode select, multistep select, jog frequency select, acc/decel time select, external fault, external base block stop, hold command, inverter overheat protection, DB command, aux input effective, speed search, energy saving operation	
	6	Multi-step speed ref 2	Effective at "closed"	—	
	7	Jog command	Jog run at "closed"	—	
	8	External coasting stop	Inv output stop at "closed"	—	
	11	Sequence control input common terminal	—	—	
	15	Power supply terminal for speed ref	Speed ref power supply	—	
Analog Input Signal	13	Master speed frequency ref	0 to +10V/100% freq	—	+15V (Allowable current 20mA max)
	14		4 to 20mA/100% freq	—	0 to +10V (20kΩ)
	16	Aux frequency ref	0 — 10V/100%	Multifunction contact input one of the following signals available to select, speed command, speed gain, speed bias, overtorque, overvoltage bias, rate of accel / decel DB current	4 to 20mA (250Ω) 0 to +10V (10kΩ)
	17	Common terminal for control circuit	—	0	—
	12	Connection to shield sheath of signal lead	—	—	—
Sequence Input Signal	9	—	—	Multifunction contact output one of the following signals available to output: Output during running, zero speed, synchronized speed, arbitrary speed agreed, frequency detection, overtorque, undervoltage, run mode, coasting stop, braking resistor overheat	Dry contact Contact capacity 250VAC 1A or less 30VDC 1A or less
	10	During running (NO)	Run at "closed"	—	Open collector output +48V 50mA or less
	25	Zero speed detection	Makes at min. freq (Cn-07) or less	—	
	26	Speed agreed detection	Makes when the freq reaches to $\pm 1\%$ of set freq	—	
	27	Open collector output common	—	—	—
	18	Fault contact output (NO, NC)	Fault at closed between terminals 18 and 20	—	Dry contact Contact capacity 250VAC 1A or less 30VDC 1A or less
	19		Fault at open between terminals 19 and 20	—	
Analog Output Signal	21	Frequency meter output	0 to 10V/100% freq	Ammeter/voltmeter/wattmeter*output selection available	0 to 11V max 2mA or less
	22	Common			—

★Where requiring this function, contact your YASKAWA representative

# YOU CAN RELY ON THESE PROTECTIVE,

## Protection Function

Protection function	Explanation		Monitor display	Fault contact output
Low voltage protection	Main circuit low voltage	When the inverter power voltage drops, torque becomes insufficient and motor is overeated Inverter output is stopped when the main circuit DC voltage becomes lower than the low voltage detection level for 15 ms or longer, or about 2 seconds or longer if the momentary power loss redo-thru function is used	UV 1 (UV1)	Operation
	Momentary power loss protection	Detection level Approximately 210V or less for 200V class and 420V or less for 400V class		
	Control circuit low voltage	The inverter output is shut-off when the control circuit voltage drops below the low voltage level	UV 2 (UV2)	Operation
	Main circuit soft start contactor defective	The inverter output is shut-off when no answer back is received from the main circuit soft-start contactor	UV 3 (UV3)	Operation
Overcurrent protection		The inverter output is shut-off when the inverter output current becomes approx 200% and above of inverter rated current	OC	Operation
Ground-fault protection		The inverter output is shut-off when a ground-fault occurs at the inverter output side and the ground-fault current exceeds approximately 50% of the inverter rated current	GF	Operation
Overvoltage protection		The inverter output is shut-off when the main circuit DC voltage becomes excessive because of regeneration energy caused by motor deceleration and negative load Detection level Approx 800V for input voltage set 400V and above Approx 700V for input voltage set 400V or less and approx 400V for 200V class	OV	Operation
Fuse blown		The inverter output is shut-off when the main circuit transistor fails The fuse clears to prevent wiring from being damaged by the short-circuit current	FU	Operation
Cooling fin overheat		The inverter output is shut-off when the ambient temperature rises and the heat sink fin reaches 90°C Please check for a defective cooling fan or clogged filter	OH	Operation
Overload protection	Motor	Inverter output is stopped when motor overload is detected by the electronic thermal overload in the inverter Either a inverter duty constant-torque specialized motor or general-purpose motor can be selected If more than one motor is driven, overload protection should be disabled Use a thermal relay or thermal protector for each motor	OL 1 (OL1)	Operation
	Inverter	The inverter output is shut-off when the electronic thermal overload reaches or exceeds the inverse time limit of 112% of the inverter's rated current occurs Maximum rated overload 150%, 1 min	OL 2 (OL2)	Operation
	Over torque detection	The motor operates according to a preset mode when the inverter output current exceeds the overtorque detection level This function is used to protect the machine or to monitor the output torque	OL 3 (OL3)	Operation
Braking transistor fault		Inverter output is shut off when an error occurs in the braking transistor	rr	Operation
Braking resistor overheated		For 5HP (3.7kW) or less (200V), 3HP (2.2kW) or less (400V), an optional dedicated resistor can be installed The resistor is monitored by the electronic thermal switch for overheating The inverter output is shut-off when a specified temperature is reached	rH	Operation
★ Cooling Fan Fault		When a cooling fan comes to fault, the inverter operates according to a preset stop method (coasting to a stop, ramp to stop, or continuous operation) For 40HP (30kW) or more (200V), 75HP (55kW) or more (400V)	FAn (FAN)	Operation
External fault signal input		When an external alarm signal is input, the inverter operates according to a preset stop method (coasting to a stop, continuous operation, or ramp to stop)	EF [ ] EF3 to EF8	Operation
Control circuit fault, communication option fault, option fault		The inverter output is shut-off when a transmission error occurs in the control circuit or a component fails The inverter output is also shut-off when a specialized option such as the digital operator is not properly connected	CPF00 CPF05 CPF06 CPF20 Err	Operation
★ Communication error		When any communication error between communication interface card (Si-B, option) and master controller occurs, the inverter operates according to a preset stop method (coasting to a stop, ramp to stop, or continuous operation)	bns (BUS)	Operation

\* Where requiring this function, contact your YASKAWA representative

# WARNING, AND SELF-DIAGNOSIS FUNCTIONS

	Error causes	Action to be taken
	<ul style="list-style-type: none"> <li>Inverter capacity is too small</li> <li>Voltage drop due to wiring</li> <li>Inverter power voltage selection is wrong</li> <li>A motor of large capacity (11 kW or greater) connected to the same power system has been started</li> <li>Rapid acceleration with generator power supply</li> <li>Operation sequence when power is off</li> <li>Defective electromagnetic contactor</li> </ul>	<ul style="list-style-type: none"> <li>Check the power capacity and power system</li> <li>UV display appears when the inverter power is turned off while operation signal is input Remove the power after stopping the inverter (Set the third and fourth bits of Sn-04 to 01 )</li> </ul>
	<ul style="list-style-type: none"> <li>Extremely rapid accel/decel</li> <li>Motor on/off switching at the inverter output side</li> <li>Short-circuit or ground-fault at the inverter output side</li> <li>Motor of a capacity greater than the inverter rating has been started</li> <li>High-speed motor or pulse motor has been started</li> </ul>	Transistor error may occur Investigate the error cause, correct it, then restart
	<ul style="list-style-type: none"> <li>Motor dielectric strength is insufficient</li> <li>Load wiring is not proper</li> </ul>	Check for ground-fault in motor or load wiring
	<ul style="list-style-type: none"> <li>Over voltage</li> <li>Insufficient deceleration time</li> <li>Regenerative load (Motor is turned by the load )</li> <li>High input voltage compared to motor rated voltage</li> </ul>	If braking torque is not proper, extend the decel time or use a braking resistor (If braking resistor is already installed, verify that Sn-10, 2nd digit to 1 )
	<ul style="list-style-type: none"> <li>Repeated overcurrent protection (OC)</li> <li>Repeated overload protection (OL2) power reset</li> <li>Rapid deceleration in excess excitation (improper V/f characteristic setting)</li> <li>External noise</li> </ul>	Correct the cause, check the main circuit transistor, replace the fuse, then restart
	<ul style="list-style-type: none"> <li>Defective cooling fan</li> <li>Ambient temperature rise</li> <li>Clogged filter</li> </ul>	Replace the cooling fan and clean the filter Ambient temperature 104°F (40°C) or less for enclosed type 122°F (50°C) or less for open chassis
	<p>Overload, low speed operation or extended acceleration time, improper V/f characteristic setting</p> <p>Line id: @zzzz</p> <p>www.repairtw.com</p>	Investigate the cause of overload and review the operation pattern, V/f characteristic, and motor/inverter capacities (If inverter is repeatedly reset after an overload occurs, the inverter may fault Investigate and correct the cause of overload )
	<p>Motor current exceeds the preset value because of machine error or overload</p> <ul style="list-style-type: none"> <li>Insufficient resistance of braking resistor</li> <li>Short-circuit or ground-fault in braking resistor</li> </ul>	<p>Check the use of the machine Correct the overload cause or set a higher detection level which is within the allowable range</p> <p>Review the resistance of the braking resistor and braking duty cycle Change the resistance or increase the inverter capacity</p>
	<ul style="list-style-type: none"> <li>Frequent operation stop</li> <li>Long-time continuous regeneration</li> <li>Rapid deceleration</li> </ul>	Shorten deceleration time or review the braking torque brake duty cycle (%ED) Use optional braking resistor or braking unit
	Defective cooling fan	Replace the cooling fan
	External fault condition occurred	Correct the cause of the fault input See Un-07 for the state of input signal
	<ul style="list-style-type: none"> <li>External noise</li> <li>Excess vibration or shock</li> </ul>	<ul style="list-style-type: none"> <li>Check data in Sn-01 and Sn-02 Record all data, then use Sn-03 for initializing</li> <li>Turn off power, then turn on again If error is persistent, contact your YASKAWA representative</li> </ul>
	<ul style="list-style-type: none"> <li>External noise</li> <li>Excessive vibration or shock</li> <li>Poor connection</li> </ul>	<ul style="list-style-type: none"> <li>Check data in Sn-01 and Sn-02 Record all data, then use Sn-03 for initializing</li> <li>Turn off power, then turn on again If error is persistent, contact your YASKAWA representative</li> <li>Check for communication cable between communication interface card (SI-B) and master controller</li> </ul>

## Warning and Self-Diagnosis Functions

Protection function	Explanation		Monitor display	Fault contact output
<b>Low-voltage protection [main circuit voltage insufficient]</b>	Monitor display appears if low voltage protection conditions such as a drop in main circuit voltage or momentary power loss occur while the inverter output is off		<b>UV</b> (Blink)	Non operation
<b>High voltage protection</b>	Monitor display appears when the main circuit DC voltage rises above the detection level while the inverter output is off		<b>OV</b> (Blink)	Non operation
<b>Cooling fan overheat warning</b>	Monitor display appears when a separate thermal protector contact is input to the external terminal		<b>OII2</b> (Blink)	Operation
<b>Overtorque detection</b>	This function is used to protect the machine and to monitor the inverter output torque. The inverter output reacts in a preset manner when the inverter output current exceeds the over torque detection level. The monitor display blinks when "operation continue" is preset		<b>OL3</b> (Blink)	Non operation
<b>Stall prevention</b> <small>(Accel/decel is accomplished with maximum capacity of the inverter without tripping on overcurrent or overvoltage &amp;</small>	<b>During acceleration</b>	Inverter acceleration is stopped when 170% of or more of the inverter rated current is required by the load. This prevents overload protection (OL2) or overcurrent (OC) from occurring. When current is reduced to less than 170%, acceleration is enabled	—	Non operation
	<b>During normal operation</b>	Output frequency is decreased when 160% of the inverter rated current or greater is required by the load. This prevents motor and inverter overload (OL1, OL2). When current is reduced below 160%, inverter acceleration is then enabled		
	<b>During deceleration</b>	Deceleration is stopped when the DC voltage is caused to rise by motor regenerative energy. This prevents overvoltage trips (OV). When DC voltage decreases, deceleration to the set value then resumes		
<b>★ Cooling Fan Fault</b>	At cooling fan fault, when setting a preset stop method of the inverter to "continuous operation," a monitor display blinks		<b>FAN</b> (Blink)	Non operation
<b>Simultaneous normal and reverse rotation commands</b>	When forward and reverse rotation commands are simultaneously detected for a period of time exceeding 500 ms, the inverter is stopped according to the preset stop method		<b>EF</b> (Blink)	Non operation
<b>External fault signal input (Minor failure)</b>	It is indicated on the monitor when the mode after external signal input is set to "Operation continue"		<b>EF</b> [ ] to EF8 (Blink)	Non operation
<b>External base block signal input [main circuit transistor Instantaneous shut-off]</b>	When an external base block signal is input, the motor coasts to a stop. When the external base block signal is removed, the inverter output is immediately turned on at the previously set frequency		<b>BB</b> (Blink)	Non operation
<b>Invalid parameter setting</b>	When an invalid parameter is set, it is indicated on the monitor at power up or when the inverter is changed from the PRG mode to the DRIVE mode		<b>OPERO</b> ; <b>OPER</b> //	Non operation
<b>★ Communication error</b>	When any communication error between communication interface card (SI-B, option) and master controller (PLC) occurs and a preset stop method of the inverter is set to "continuous operation," a monitor display blinks		<b>BUS</b> <b>b45</b> (Blink)	Non operation
<b>★ Communication ready</b>	When the inverter with communication interface card (SI-B, option) does not receive correct data from master controller (PLC), " <b>CALL</b> " is displayed		<b>CALL</b> (CALL)	Non operation

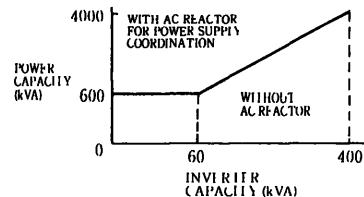
\*Where requiring this function, contact your YASKAWA representative

	Error causes	Action to be taken
	<ul style="list-style-type: none"> <li>• Input voltage drop</li> </ul>	Check the main circuit DC voltage in Un-xx If the voltage is low, adjust the input voltage
	<ul style="list-style-type: none"> <li>• Input voltage rise</li> </ul>	Check the main circuit DC voltage in Un-xx If the voltage is high, adjust the input voltage
	<ul style="list-style-type: none"> <li>• Overload</li> <li>• Cooling fan fault</li> <li>• Ambient temperature rise</li> <li>• Clogged filter</li> </ul>	Replace the cooling fan and clean the filter Ambient temperature 104°F (40°C) or less for enclosed type 122°F (50°C) or less for open chassis
	<ul style="list-style-type: none"> <li>• Motor current exceeded the set value because of machine fault or overload</li> </ul>	Check the driven machine and correct the cause of the fault or set to a higher value
	<ul style="list-style-type: none"> <li>• Insufficient power for accel/decel</li> <li>• Overload</li> <li>• Phase loss</li> </ul>	<ul style="list-style-type: none"> <li>• Set proper accel/decel time for smooth operation</li> <li>• For stall prevention during normal operation lighten the load or increase inverter capacity</li> </ul>
	<p style="text-align: center;">上正科技有限公司 購買、維修 此手冊零組件 電話 : 037-466333 Email: service@repairtw.com</p>	
	Defective cooling fan	Line id: @zzzz <a href="http://www.repairtw.com">www.repairtw.com</a>
	<ul style="list-style-type: none"> <li>• Operation sequence error</li> <li>• 3-wire/2-wire selection error</li> </ul>	<ul style="list-style-type: none"> <li>• Recheck the control sequence</li> <li>• Recheck system constant (Sn-15 to -18)</li> </ul>
	<ul style="list-style-type: none"> <li>• External fault conditions set-up</li> </ul>	Take appropriate measurement for the cause of external fault input
	<ul style="list-style-type: none"> <li>• Invalid parameter setting</li> </ul>	<ul style="list-style-type: none"> <li>• Review the parameter setting range and conditions</li> </ul>
	<ul style="list-style-type: none"> <li>• External noise</li> <li>• Excessive vibration or shock</li> <li>• Poor connection</li> </ul>	<ul style="list-style-type: none"> <li>• Check data in Sn-01 and Sn-02 Record all data, then use Sn-03 for initializing</li> <li>• Turn off power, then turn on again If error is persistent, contact your YASKAWA representative</li> <li>• Check for communication cable between communication interface card (SI-B) and master controller</li> </ul>
	<ul style="list-style-type: none"> <li>• Poor connection</li> <li>• Defective communication software (PLC)</li> </ul>	<ul style="list-style-type: none"> <li>• Check for communication cable between communication interface card (SI-B) and master controller (PLC)</li> <li>• Check for communication software</li> </ul>

# NOTES ON USE OF INVERTER

## Selection

- When the inverter is connected directly to a large-capacity power transformer (1000kVA or greater with 10 m or less cable length) or when a phase advance capacitor is switched, excess peak current may occur in the power feed circuit and the converter section may be damaged. To avoid this, use an AC reactor (option) on the inverter input side. An AC reactor is also required when a thyristor converter such as a DC drive is connected to the same power system.



- When a special motor is used or more than one motor is driven in parallel with a single inverter, select the inverter capacity so that 1.1 times of the total motor rated current does not exceed the inverter rated output current
- The motor starting and accelerating characteristics of the motor driven by an inverter are restricted by the overload current ratings of the inverter. Compared to running with commercial power supply, lower torque output should be expected. If high starting torque is required, use an inverter of higher capacity or increase the capacities of both the motor and the inverter.
- When an error occurs, a protective circuit is activated and the inverter output is turned off. However, the motor cannot be stopped immediately. Use a mechanical brake and hold the equipment for an emergency stop if necessary.
- Terminals B1/+, B0/-, B2, -, +1 and +3 are for Yaskawa options. Do not connect other equipment.

## Installation

電話：037-466333

Email: [service@reparttw.com](mailto:service@reparttw.com)

- Avoid oil mist or dust. Place the inverter in a clean area or house it in a totally enclosed case so that no contamination enters. To use the totally enclosed case, select the cooling method and panel dimensions so the inverter ambient temperature will be within the allowable range.
- Do not install the inverter on flammable material, such as wood.
- Install the inverter on a wall with the longer side in the vertical position.

## Setting

- The inverter can be driven at an output frequency of up to 400 Hz with the digital operator. Setting errors may create a dangerous situation. Set the upper limit with the upper limit frequency setting function. (Maximum output frequency in external input signal operation is preset to 60 Hz at the factory.)
- Large DC injection braking operating voltages and times may cause motor overheating.
- Motor accel/decel time is determined by the motor generating torque, load torque, and load inertia  $WK^2$  ( $GD^2$ ). If the stall prevention function is activated during accel/decel, set the accel/decel time longer. After the stall prevention function is activated, the accel/decel time is extended to a length that the inverter can handle. To shorten the accel/decel time, increase the capacity of the inverter and possibly the motor.

## Operation

- Applying power to inverter output terminals  $T_1$  (U),  $T_2$  (V), or  $T_3$  (W) will damage the inverter. Double check wiring and sequence before turning the power on.
- If magnetic contactor (MC) is used on the primary side of the inverter, do not use the MC for starting and stopping the inverter. Otherwise, the inverter life may be reduced.
- After turning power to the inverter off, electric charges in the internal capacitors are retained temporarily. Wait until the charge lamp goes off before touching the inside of the inverter.

# NOTES ON USE OF PERIPHERAL UNITS

## ■ Installation and selection of molded-case circuit breaker

On the input power side, a molded case circuit breaker (MCCB) to protect inverter primary wiring should be installed. The inverter power-factor (depending on power voltage, output frequency, and load) must be taken into account for selecting MCCB. For standard settings, see page 76. If a full electromagnetic MCCB is to be used, select a larger capacity because the operating characteristics are altered by harmonic current. A leakage current breaker of inverter use is recommended.

## ■ Use of input side magnetic contactor

The inverter can be used without an input side magnetic contactor (MC). An input MC can be used to prevent an automatic restart after recovery from an external power loss during remote control operation. However, do not use the MC frequently for start/stop operation, or it will lead to a reduced reliability. When the digital operator is used, automatic restart after power failure is disabled so that MC starting is impossible. Although primary the MC can stop the inverter, regeneration braking is disabled and the motor coasts to stop.

## ■ Use of secondary magnetic contactor

In general magnetic contactors on the output of the inverter, for motor control should not be used. Starting a motor with the inverter running will cause large surge currents and the inverter overcurrent protector to trigger. If an MC is used for switching to commercial power supply, switch MC after the inverter and the motor stop. To switch during motor rotation, use the speed search function. (See page 55.)

## ■ Use of overload relay

The inverter includes an electronics thermal protective function to protect the motor from overheating. If more than one motor is driven with a single inverter or when a multi-pole motor is used, place a overload relay between the inverter and the motor. Set 1 to the first position of Sn-14 (xxx1), and set the overload relay to the current nameplate value at 50 Hz, or 1.1 times of that at 60 Hz.

## ■ Power-factor improvement (elimination of phase advance capacitor)

To improve the power-factor, install an AC reactor on the inverter's primary side. Power-factor improvement capacitor or surge suppressors on the inverter output side will be damaged by the harmonic component in the inverter output. Also, the overcurrent caused in the inverter output will trigger the overcurrent protection. To avoid this, do not use capacitors or surge suppressors in the inverter's output. To improve the power-factor, install an AC reactor on the inverter primary side.

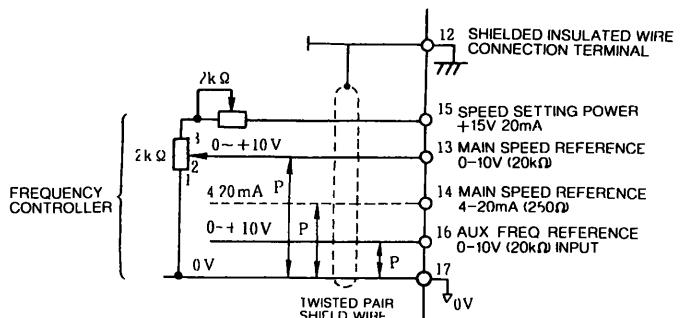
## ■ Radio frequency interference

Because the inverter I/O (main circuit) contains a higher harmonics component, it may emit RFI noise to communication equipment (AM radio, etc.) near the inverter. Use a noise filter to decrease the noise. Use of a metallic conduit between the inverter and motor and grounding the conduit is also effective. Proper routing of input and output leads is also recommended.

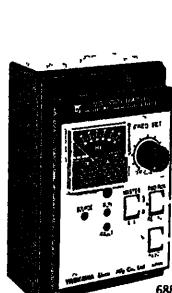
## ■ Wire thickness and cable length

If the inverter is connected to a distant motor, (especially when low frequency is output,) motor torque decreases because of voltage drop in the cable. Use sufficiently heavy wire.

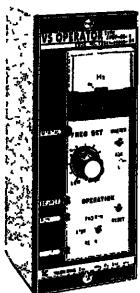
When a digital operator is to be installed separately from the inverter, use the Yaskawa connection cable (option). For remote control with analog signals, connect the operating pot or operating signal terminal and the inverter within 30 m of the inverter. The cable must be routed separately from power circuits (main circuit and relay sequence circuit) so that it is not subjected to inductive interference by other equipment. If frequencies are set not only from the digital operator but also with extenal frequency controller, use twisted pair shielded wire as shown in the following figure and connect the shielding to terminal 12, not to the ground.



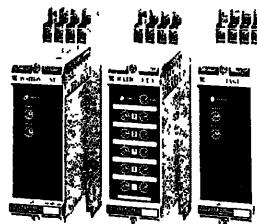
# A VARIETY OF OPTIONS TO MEET NUMEROUS DEMANDS



VS OPERATOR  
(SMALL PLASTIC MADE)



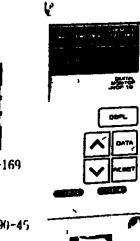
688-87



VS SYSTEM MODULE



688-169



DIGITAL MONITOR



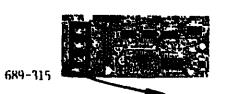
690-166



689-321  
CARD ANALOG  
MONITOR  
AO 08



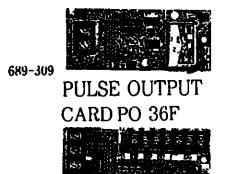
689-318  
ANALOG SPEED  
REFERENCE CARD  
AI 14U



689-315  
ANALOG MONITOR  
CARD AO 12



690-162  
ANALOG  
REFERENCE  
CARD AI 14B



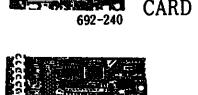
689-309  
PULSE OUTPUT  
CARD PO 36F



689-312  
DIGITAL  
REFERENCE  
CARD DI-08



691-123  
DIGITAL  
OUTPUT  
CARD DO-08



692-240  
COMMUNICATION  
INTERFACE  
CARD SI-B

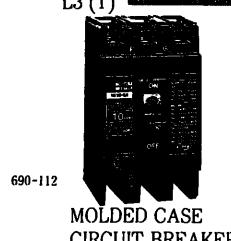


692-551  
★ DIGITAL  
REFERENCE  
CARD DI-16G

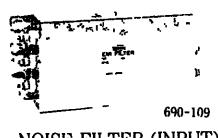


692-551  
★ PG SPEED  
CONTROL  
CARD PG-C

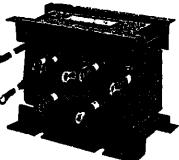
L1 (R)  
3-PHASE  
POWER L2 (S)  
SUPPLY  
L3 (T)



690-112  
MOLDED CASE  
CIRCUIT BREAKER  
(MCCB)

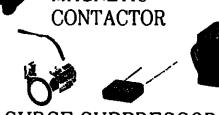


690-109  
NOISE FILTER (INPUT)



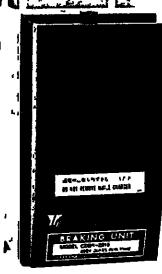
688-94  
AC REACTOR

690-115  
MAGNETIC  
CONTACTOR



692-111  
SURGE SUPPRESSOR

BACK UP UNIT



690-1



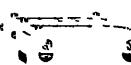
690-528  
LOW-COST TYPE  
NOISE FILTER



690-119  
NOISE FILTER (OUTPUT)



690-123  
BRAKING RESISTOR  
(BUILT IN TYPE)



690-97



690-94  
BRAKING RESISTOR  
UNIT

★ Where requiring this function, contact your  
YASKAWA representative

# OPTION UNITS

Type	Name	Model (Code No.)	Function	Installation	Page	Manual No
Speed (frequency) Reference Option Card	Analog reference card	AI-14U (73600-C001X)	Allows high precision, high resolution analog speed reference setting <ul style="list-style-type: none"> <li>• Input signal level 0 to +10VDC (20kΩ) 1 channel</li> <li>• Input resolution 4 to 20mA(DC (250Ω) 1 channel</li> <li>• Input resolution 14 bits (1/16384)</li> </ul>	Built-in	70	TOE-C736-30 13
	Analog reference card	AI-14B (73600-C002X)	Allows bipolar high precision, high resolution analog speed ref set <ul style="list-style-type: none"> <li>• Input signal level 0 to ±10VDC (20kΩ)</li> <li>• Input resolution 4 to 20mA(DC (250Ω) 3 channels</li> <li>• Input resolution 13 bits + code (1/8192)</li> </ul>		70	TOE-C736-30 14
	Digital reference card	DI-08 (73600-C003X)	Allows 8 bits digital speed ref set <ul style="list-style-type: none"> <li>• Input signal binary 8 bits/BCD 2 digits + code</li> <li>• Input voltage +24V (isolated)</li> <li>• Input current 8mA</li> </ul>		70	TOE-C736-30 15
	★Digital reference card DI-16G*	(73600-C011X)	Permits setting 16-bit digital speed reference <ul style="list-style-type: none"> <li>• Input signal Binary 16 bits/BCD 4 digits + code</li> <li>• Input voltage +24V (isolated)</li> <li>• Input current 8 mA</li> </ul> With 16-bit/12-bit select function		71	—
★Control power unit for DI-16G		AVR387 (72600-AVR387)	Used to supply power to digital reference card (DI-16G) <ul style="list-style-type: none"> <li>• Input 200 to 240VAC ±10% 50/60Hz</li> <li>• Output +24VDC 0.2A</li> </ul>	Separately installed	71	—
		AVR388 (72600-AVR388)	For momentary power loss, use AVR388 (holding time 2 sec available)		71	—
★Communication interface card SI-B*		(73600-C006X-□□)	Permits operation or constant setting by command from master controller <ul style="list-style-type: none"> <li>• Communication method Synchronous</li> <li>• Communication speed 19.2kBPS (up to 136.5kBPS possible)</li> <li>• Interface RS-232, RS-422, RS-485</li> </ul>	Built-in	71	—
Feedback Speed Control Card	★PG speed control card PG-C*	73600-A001X	Permits compensation of speed variation caused by slip, by speed feedback using a pulse generator (PG) provided to the motor <ul style="list-style-type: none"> <li>• Phase A (signal pulse) input</li> <li>• PG frequency range 50 to 32767 Hz</li> <li>• Pulse monitor output +12V, 20mA</li> <li>• Input voltage +12V</li> <li>• Input current 300mA</li> </ul> External supply		71	—
★Control power unit for PG-C		AVR385 (72600-AVR385)	Used to supply power to PG speed control card (PG-C) <ul style="list-style-type: none"> <li>• Input 200 to 240VAC ±10% 50/60Hz</li> <li>• Output +24VDC 0.3A</li> </ul>	Separately installed	71	—
		AVR386 (72600-AVR386)	For momentary power loss, use AVR386 (holding time 2 sec available)		71	—
Monitor Option Card	Analog monitor card	AO-08 (73600-D001X)	Outputs analog signal for monitoring inverter output state (output freq , output current etc ) after absolute value conversion <ul style="list-style-type: none"> <li>• Output resolution 8 bits (1/256)</li> <li>• Output voltage 0 to +10V (non isolated)</li> <li>• Output channel 2 channels</li> </ul>	Built-in	70	TOE-C736-30 21
	Analog monitor card	AO-12 (73600-D002X)	Outputs analog signal for monitoring inverter output state (output freq , output current etc ) <ul style="list-style-type: none"> <li>• Output resolution 11 bits (1/2048)</li> <li>• Output voltage -10 to +10V (non isolated)</li> <li>• Output channel 2 channels</li> </ul>		70	TOE-C736-30 22
	Pulse output card	PO-36F (73600-D003X)	Outputs pulse train signal corresponding to the inverter output frequency <ul style="list-style-type: none"> <li>• Output pulse 1F, 6I, 10F, 12F, 36F (F output freq )</li> <li>• Output voltage +12V ±10% (isolated)</li> <li>• Output current 20mA max</li> </ul>		70	TOE-C736-30 23
	Digital output card	DO-08 (73600-L004X)	Outputs isolated type digital signal for monitoring inverter run state (alarm signal, zero speed detection etc ) <ul style="list-style-type: none"> <li>• Output channel Photo coupler 6 channels (48V, 50mA or less)</li> <li>• Output channel Relay contact output 2 channels (250VAC, 1A or less)</li> <li>• Output channel 30VDC 1A or less</li> </ul>		71	TOE-C736-30 24
Option Unit	Digital monitor	JVOP-101 (73041-0911X)	Allows freq or current digital monitor displays and fault indications Run/stop operation and constant setting, are protected against tampering on site	Inverter-mounted	69	TOE-C730-50 4
	Adapter panel for digital operator/digital monitor	JVOP-109 (73041-09190)	Adapter panel is capable of mounting on the front of inverter unit with its special cable Use the adapter panel special cable		69	TOE-C736-50 11
	Adapter panel special cable	1m-cable (72616-W3001-01) 3m-cable (72616-W3003-01)	Used for the remote operation of digital operator or monitor with adapter panel (JVOP-109) Cable length , 1m, 3m		69	
	Special cable for digital operator/ digital monitor (with blank cover)	1m-cable (72616-W3001) 3m-cable (72616-W3003)	Used for the operation of digital operator or monitor when removed from the front of inverter unit Cable length , 1m, 3m		69	TOE-C730-50 10
	Remote Interface	JVOP-104 (73041-0914X)	Incorporated with inverter when RUN/STOP or monitoring from remote locations (max 100m) by using remote operator (type JVOP-102) and remote monitor (type JVOP-103) 20mA current loop/RS-232C (D-SUB connector and cover provided )		69	TOE-C736-20 4
	Remote operator	JVOP-102 (73041-0912X)	The operation panel incorporates digital operator (type JVOP-100) and digital monitor (type JVOP-101) Permits RUN/STOP operation or monitor from remote locations (max 100 m) through serial communication 20 mA current loop		69	
	Remote monitor	JVOP-103 (73041-0913X)	Power supply 85 to 264VAC 50 to 60Hz (D-SUB connector, cover and power supply connector provided )		69	

\*When using these cards, contact your YASKAWA representative

★Where requiring this function, contact your YASKAWA representative

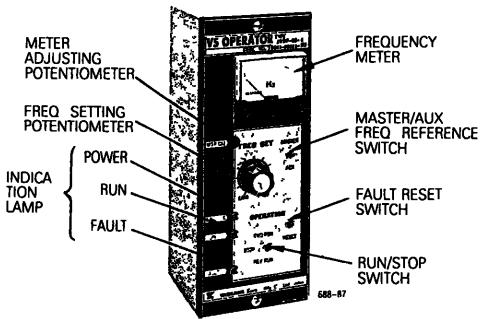
Type	Name	Model (Code No.)	Function	Installation	Page	Manual No
Option Unit	VS operator (small plastic type)	JVOP-95-□ (73041-0905X-L)	Allows frequency settings and RUN/STOP operations with analog ref from remote locations (max 50m) Frequency meter specifications 60/120Hz, 90/180Hz	Separately mounted	69	—
	VS operator (standard steel plate type)	JVOP-96-□ (73041-0906X-L)	Allows frequency settings and RUN/STOP operations with analog ref from remote locations (max 50m) Frequency meter specifications 75Hz, 150Hz, 220Hz		69	—
	Braking unit	CDBR-□ (72600-RLJ□□□0)	For motor decel time reduction, use this with braking resistor unit		72 to 74	TOD-C736 50 5
	Braking resistor unit	LKEB-□ (72600-K□□□□0)	Motor regenerative energy dissipation by the resistor reduces the decel time (duty cycle 10% ED)		72 to 74	—
	Braking resistor (built-in type)	ERF-150WJ□□ (R00□□□□□)	Motor regenerative energy dissipation by the resistor reduces the decel time (duty cycle 3% ED)	Inverter-mounted	72 to 74	—
	Backup capacitor for momentary power loss	P00□□0 (73600-P00□)	For power loss of less than 2 sec	Separately mounted	74	TOE-C736 50 6
	Mounting base	(SPAT32LJ-1)	This base is used to facilitate easy replacement of a VS-616GII with a VS-616G3	Inverter-mounted	72	—
	Rubber bushing	(FL6402826-1)	Used when installing inverter in totally-enclosed control panel		38	—

## PERIPHERAL UNITS

Name	Model (Code No.)	Function	Page
VS System Module	JGSM-□	Precise and complex drive system control Available in 15 types	80
Frequency Meter	DCF-6A		
Frequency Setting Frequency Meter Adjusting Potentiometer Frequency Setting Knob	—	Provided with VS operator as standard Available as separate components for remote control from several locations	80
Potentiometer	—	Install at control circuit terminal for the calibration of frequency meter or ammeter and frequency reference	75
AC Reactor	UZBA-□	• Motor noise reduction • Starting torque improvement • For motors exceeding the inverter capacity	77 to 79
Radio noise Protective Filter	LNFD, HIF, LF	Used the radio noise filter to eliminate radio wave interference It is provided at input terminals of the inverter main circuit	82 to 85
Molded-case Circuit Breaker (MCCB)	NF□	Installation of MCCB at power supply will protect the inverter connection	76
Magnetic Contactor (MC)	III-□E	MC is required on inverters using the dynamic braking function	76
Surge Suppressor	DCR2-□	Suppresses surge currents by opening and closing of magnetic contactors and control relays. Must be installed on magnetic contactors or control relays near the inverter	76
Output Voltmeter	SCF-12NH	Voltmeter for PWM inverter	80
Isolator	DGP□	Isolates the inverter's input and output signals to reduce noise	81

# **OPTION UNITS, OPTION CARDS**

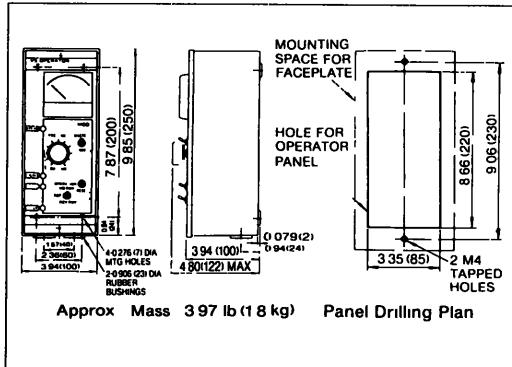
## **STANDARD STEEL PLATE TYPE** —————



- PRODUCT SERIES

Model JVOP	Code No. 73041-0906X-□	Frequency Meter Specifications	
-96 • 1	-01	Model	75Hz
-96 • 2	-02	DCF-6A,	150Hz
-96 • 3	-03	3V, 1mA	220Hz

- **DIMENSIONS** in inch (mm)



# **DIGITAL OPERATOR**

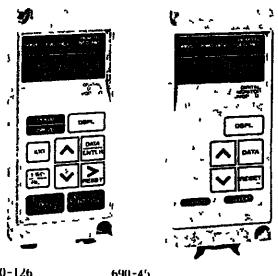
JVOP-100

# **DIGITAL MONITOR**

## **MODEL JVOP-101**

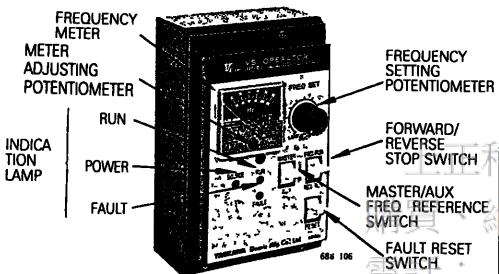
JVOP-100

JVOP-101



**Mass:** 0.22 lb(0.1 kg)

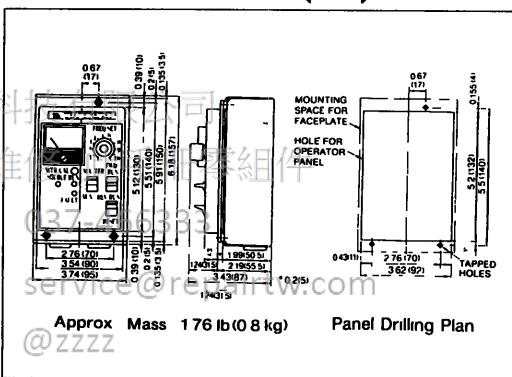
## **SMALL PLASTIC TYPE**



- PRODUCT SERIES

Model JVOP	Code No 73041-0905X-□	Frequency Meter Specifications	
-95 • 1	-01	Model TRM-45	60/120Hz
-95 • 2	-02	3V, 1mA	90/180Hz

- **DIMENSIONS** in inch (mm)



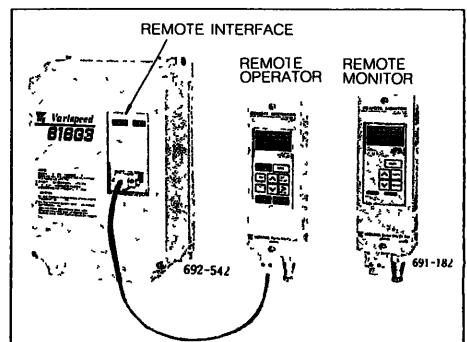
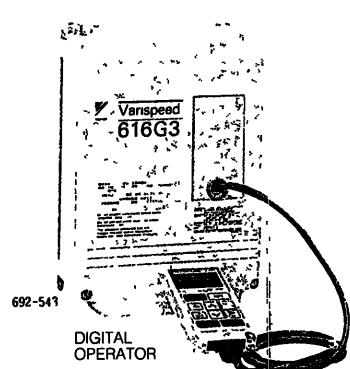
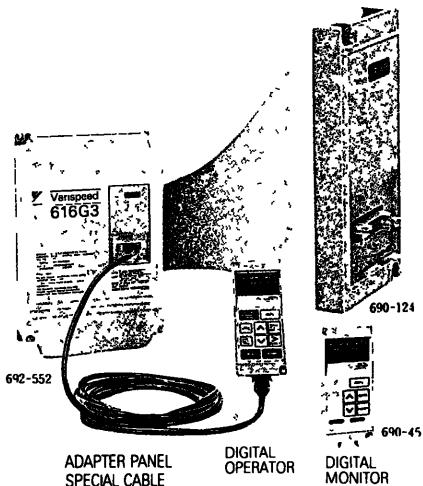
## PANEL DRILLING PLAN

# DIGITAL OPERATOR/ ADAPTER PANEL FOR DIGITAL MONITOR

# DIGITAL OPERATOR/ SPECIAL CABLE FOR DIGITAL MONITOR

# **REMOTE REMOTE REMOTE** OPERATOR MONITOR INTERFACE

**ADAPTER PANEL (TYPE JVOP 109)**



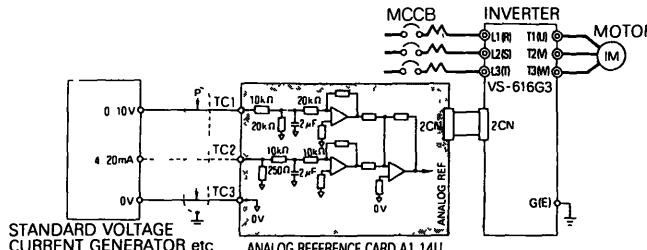
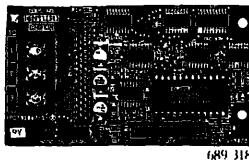
# BUILT-IN TYPE OPTION CARD

Weight: 0.22lb (0.1kg)

## ANALOG REFERENCE CARD

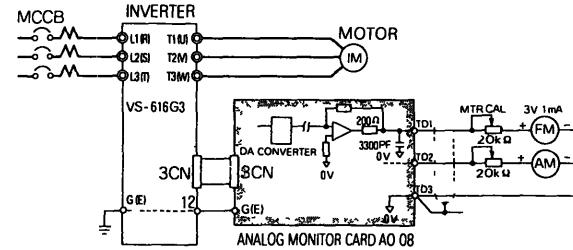
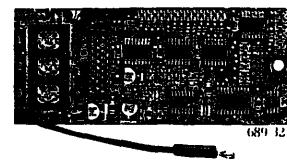
AI-14U

Unidirectional-type



## ANALOG MONITOR CARD

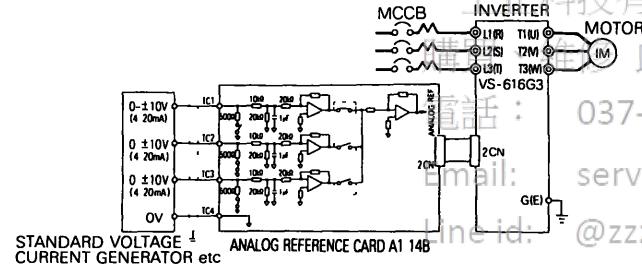
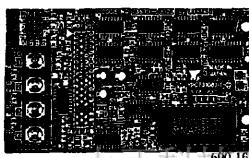
AO-08



## ANALOG REFERENCE CARD

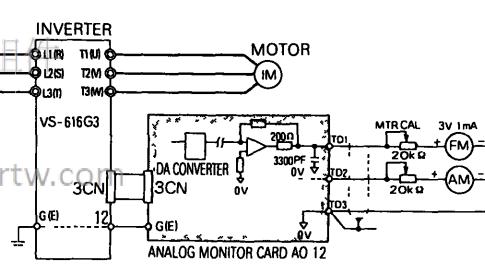
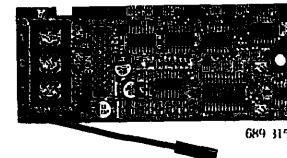
AI-14B

Bi-directional-type



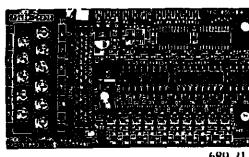
## ANALOG MONITOR CARD

AO-12

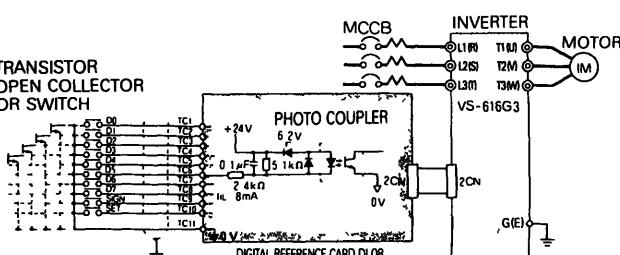


## DIGITAL REFERENCE CARD

DI-08

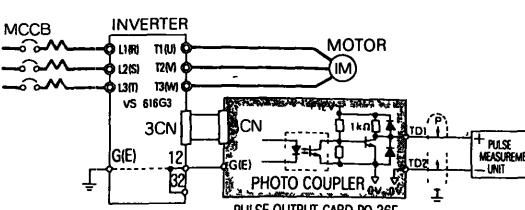
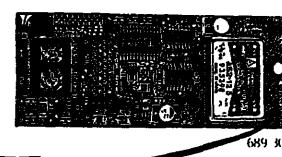


TRANSISTOR  
OPEN COLLECTOR  
OR SWITCH

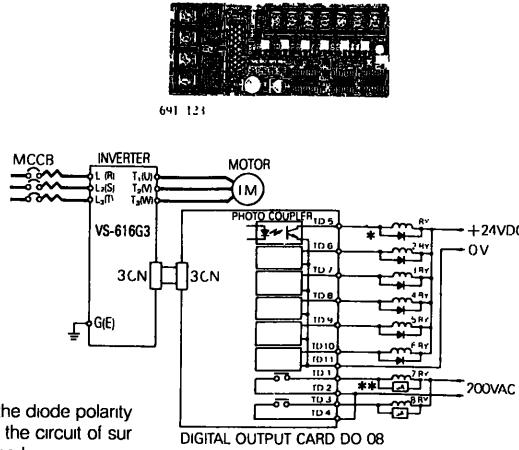


## PULSE MONITOR CARD

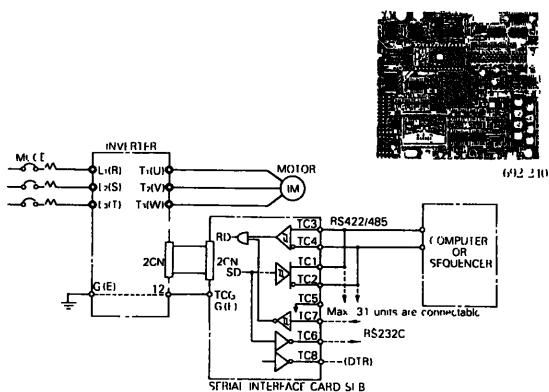
PO-36F



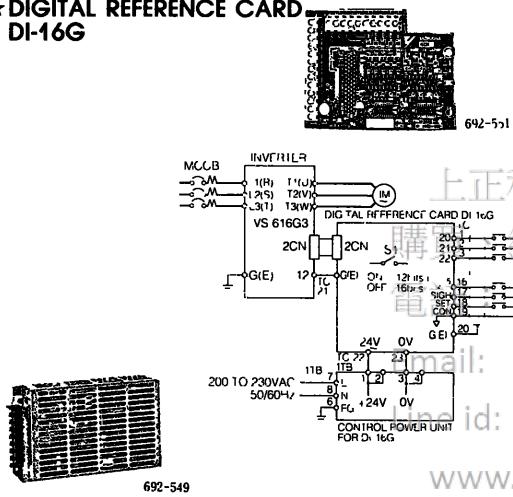
### DIGITAL OUTPUT CARD DO-08



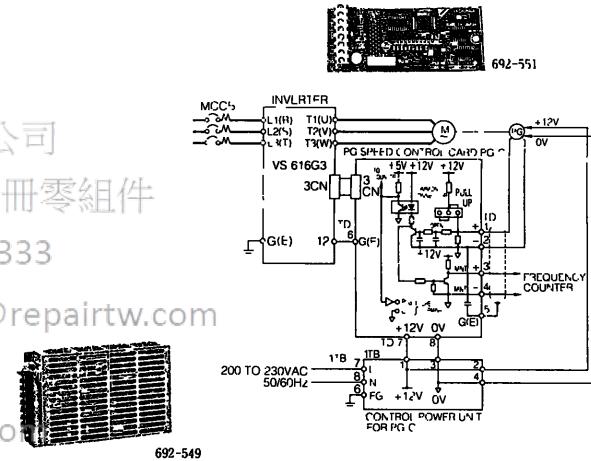
### COMMUNICATION INTERFACE CARD



### ★DIGITAL REFERENCE CARD DI-16G



### ★PG SPEED CONTROL CARD PG-C



# BRAKING RESISTOR, BRAKING UNIT,

Two kinds of unit mounting are available according to inverter capacity:

## Inverter-mounted Type

Braking unit: Standard  
Braking resistor. Available on request

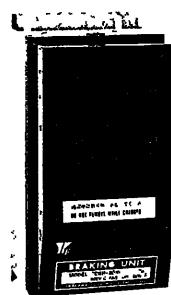
## Separately-installed Type

Braking unit:

200V class  
10HP (7.5kW) or less  
400V class  
20HP (15kW) or less  
200V class  
15HP (11kW) or more  
400V class  
25HP (18.5kW) or more

} Standard  
On request

Braking resistor unit. Available on request



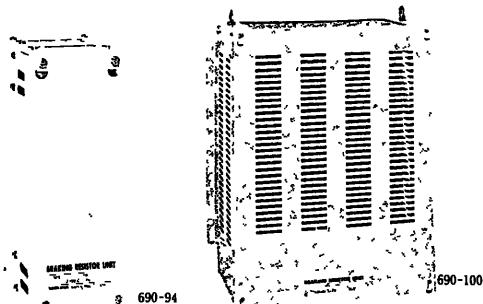
690-97



690-123

**BRAKING RESISTOR  
MODEL OF  
ERF-15WJ**

**BRAKING UNIT  
MODEL OF  
CDBR**



**BRAKING RESISTOR UNIT  
MODEL OF LKEB**

\* Braking unit as standard

† Resistance value per one braking unit

Note When connecting braking resistor unit, set system constant Sn-10 2nd-digit to 1

## INVERTER-MOUNTED TYPE (3%ED)

Voltage V	Inverter		Braking Resistor				Braking Torque (3% ED) %	Connectable Min Resistance Value* Ω
	Max Applicable Motor Unit HP (kW)	Model CIMR- G 3	Model ERF- 150WJ	Voltage of Resistance	Code No.	No. of Used		
200 to 230	0.5 (0.4)	20P4	201	200Ω	R007505	1	220	48
	1 (0.75)	20P7	201	200Ω	R007505	1	125	48
	2 (1.5)	21P5	101	100Ω	R007504	1	125	16
	3 (2.2)	22P2	700	70Ω	R007503	1	120	16
	5 (3.7)	23P7	620	62Ω	R007510	1	100	16
380 to 460	0.5 (0.4)	40P4	751	750Ω	R007508	1	230	96
	1 (0.75)	40P7	751	750Ω	R007508	1	130	96
	2 (1.5)	41P5	401	400Ω	R007507	1	125	64
	3 (2.2)	42P2	301	300Ω	R007506	1	115	64

\* Resistance value per one braking unit

Note For 500 to 575V class, contact your YASKAWA representative

## SEPARATELY-INSTALLED TYPE (10%ED)

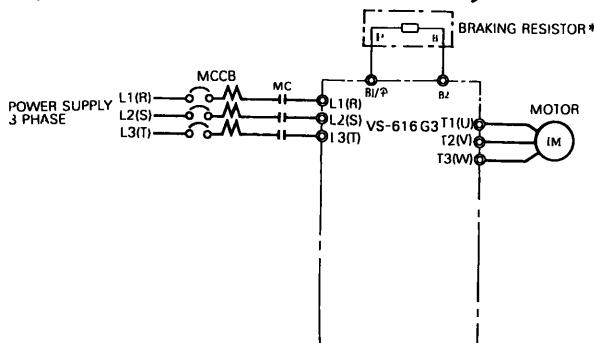
Voltage	Inverter		Braking Unit		Braking Resistor Unit			Braking Torque (10% ED) %	Connectable Min Resistance Value† Ω
	Max Applicable Motor Unit HP (kW)	Model CIMR- G 3	Model CDBR	No. of Used	Model LKEB	Specifications of Resistor	No. of Used Unit		
200 to 230V	0.5 (0.4)	20P4	*	20P7	70W 200Ω	1	220	48	
	1 (0.75)	20P7	*	20P7	70W 200Ω	1	125	48	
	2 (1.5)	21P5	*	21P5	260W 100Ω	1	125	16	
	3 (2.2)	22P2	*	22P2	260W 70Ω	1	120	16	
	5 (3.7)	23P7	*	23P7	390W 40Ω	1	125	16	
380 to 460V	7.5 (5.5)	25P5	*	25P5	520W 30Ω	1	115	96	
	10 (7.5)	27P5	*	27P5	780W 20Ω	1	125	96	
	15 (11)	2011	2015	1	2011	2400W 13.6Ω	1	125	96
	20 (15)	2015	2015	1	2015	3000W 10Ω	1	125	96
	25 (18.5)	2018	2022	1	2018	4800W 8Ω	1	125	64
	30 (22)	2022	2022	1	2022	4800W 6.8Ω	1	125	64
	40 (30)	2030	2015	2	2015	3000W 10Ω	2	125	96
	50 (37)	2037	2015	2	2015	3000W 10Ω	2	100	96
	60 (45)	2045	2022	2	2022	4800W 6.8Ω	2	120	64
	75 (55)	2055	2022	2	2022	4800W 6.8Ω	2	100	64
500 to 575V	100 (75)	2075	2022	3	2022	4800W 6.8Ω	3	110	64
	0.5 (0.4)	40P4	*	40P7	70W 750Ω	1	230	96	
	1 (0.75)	40P7	*	40P7	70W 750Ω	1	130	96	
	2 (1.5)	41P5	*	41P5	260W 400Ω	1	125	64	
	3 (2.2)	42P2	*	42P2	260W 250Ω	1	135	64	
	5 (3.7)	43P7	*	43P7	390W 150Ω	1	135	32	
	7.5 (5.5)	45P5	*	45P5	520W 100Ω	1	135	32	
	10 (7.5)	47P5	*	47P5	780W 75Ω	1	130	32	
	15 (11)	4011	*	4011	1040W 50Ω	1	135	20	
	20 (15)	4015	*	4015	1560W 40Ω	1	125	20	
	25 (18.5)	4018	4030	1	4018	4800W 32Ω	1	125	19.2
	30 (22)	4022	4030	1	4022	4800W 27.2Ω	1	125	19.2
	40 (30)	4030	4030	1	4030	6000W 20Ω	1	125	19.2
	50 (37)	4037	4045	1	4037	9600W 16Ω	1	125	12.8
	60 (45)	4045	4045	1	4045	9600W 13.6Ω	1	125	12.8
	75 (55)	4055	4030	2	4030	6000W 20Ω	2	135	19.2
	100 (75)	4075	4045	2	4045	9600W 13.6Ω	2	145	12.8
	150 (110)	4110	4030	3	4030	6000W 20Ω	3	100	19.2
	200 (160)	4160	4045	4	4045	9600W 13.6Ω	4	140	12.8
	250 (185)	4185	4045	4	4045	9600W 13.6Ω	4	120	12.8
	300 (220)	4220	4045	5	4045	9600W 13.6Ω	5	125	12.8
	400 (300)	4300	4045	6	4045	9600W 13.6Ω	6	110	12.8
500 to 575V	5 (3.7)	53P7	*	—	560W 150Ω	—	180	24	
	7.5 (5.5)	55P5	*	—	560W 150Ω	—	125	24	
	10 (7.5)	57P5	*	—	750W 100Ω	—	140	24	
	15 (11)	5011	*	—	1100W 75Ω	—	125	24	
	20 (15)	5015	*	—	1500W 50Ω	—	140	24	
	25 (13.5)	5018	*	—	2300W 40Ω	—	140	24	
	30 (22)	5022	5037	1	—	2800W 38Ω	—	125	24
	40 (30)	5030	5037	1	—	3900W 33Ω	—	110	24
	50 (37)	5037	5037	1	—	4900W 27Ω	—	110	24
	60 (45)	5045	5037	2	—	5900W 22Ω	—	110	24
	75 (55)	5055	5037	2	—	7200W 18Ω	—	110	24
	100 (75)	5075	5037	2	—	9800W 13.6Ω	—	105	24
	120 (90)	5090	5037	3	—	12000W 11Ω	—	110	24
	150 (110)	5110	5037	3	—	15000W 9Ω	—	110	24
	200 (160)	5160	5037	4	—	21000W 6.8Ω	—	100	24

# RAKING RESISTOR UNIT

## CONNECTIONS

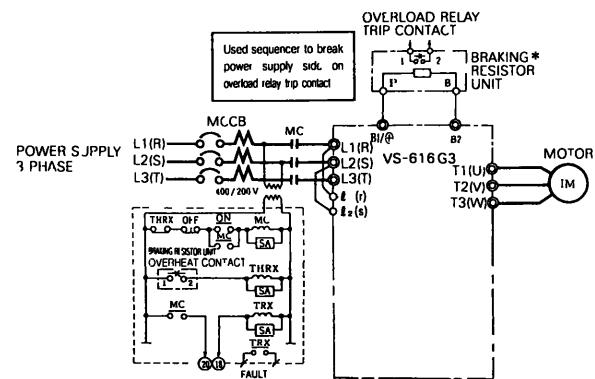
### • Inverter-mounted Type

200 to 230V 0.5 to 5HP (0.4 to 3.7kW)  
 380 to 460V 0.5 to 3HP (0.4 to 2.2kW)



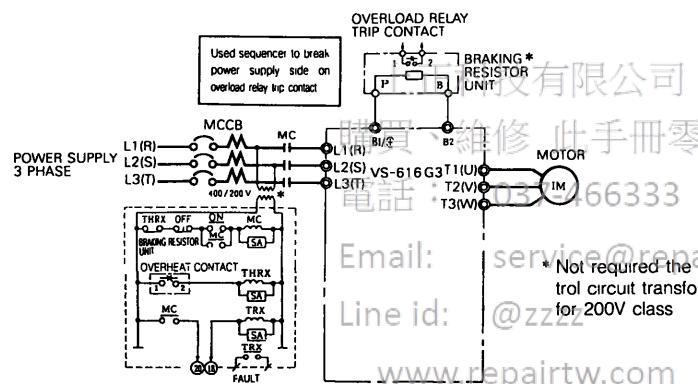
### • Separately-installed Type

(380 to 460V 15HP (11kW) 20HP (15kW))



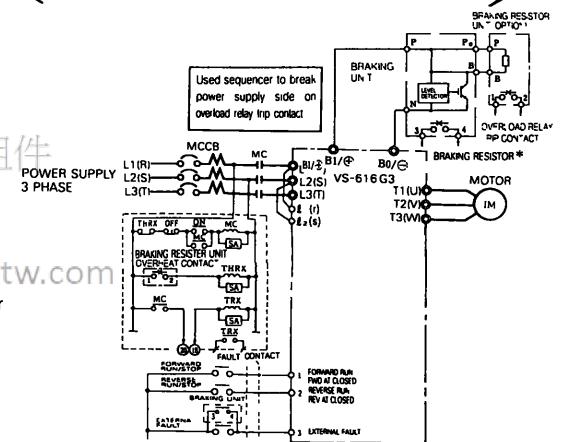
### • Separately-installed Type

200 to 230V 0.5 to 10HP (0.4 to 7.5kW)  
 380 to 460V 0.5 to 10HP (0.4 to 7.5kW)



### • Separately-installed Type

200 to 230V 15 to 100HP (11 to 75kW)  
 380 to 460V 25 to 400HP (18.5 to 300kW)



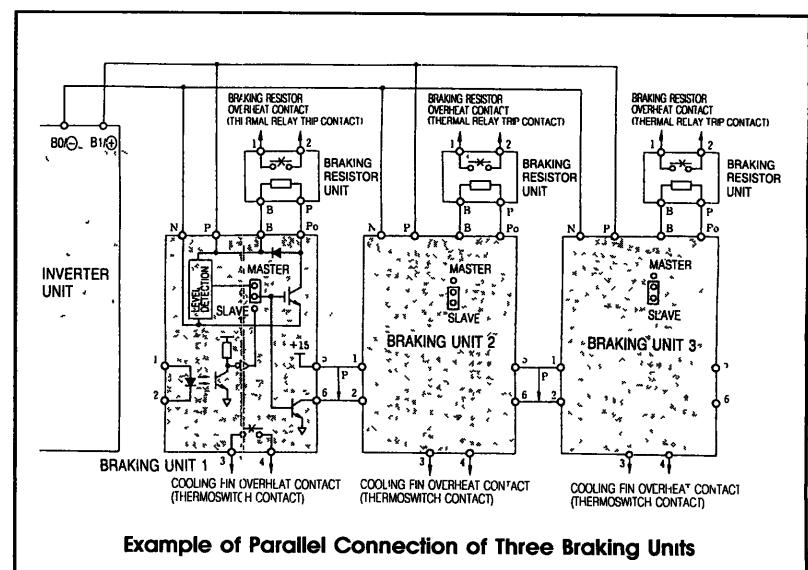
Note For installing braking resistor unit, set Sn-10, 2nd digit to 1

## PARALLEL CONNECTION OF BRAKING UNIT

For using more than one parallel-connected braking unit, connect and select the connectors as follows

- Braking units have a MASTER/SLAVE selection connector.

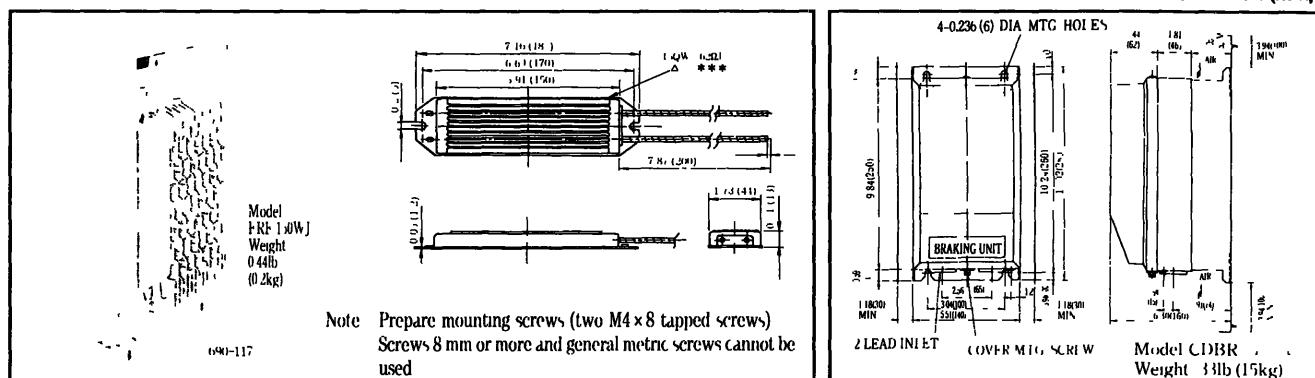
Select MASTER side only for braking unit 1 and select SLAVE side for braking units 2 and 3.



Example of Parallel Connection of Three Braking Units

## Mounting of Braking Resistor

## Braking Unit Dimensions in inch (mm)

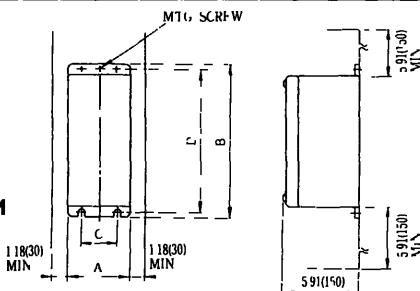


## Braking Resistor Unit Dimensions in inch (mm)

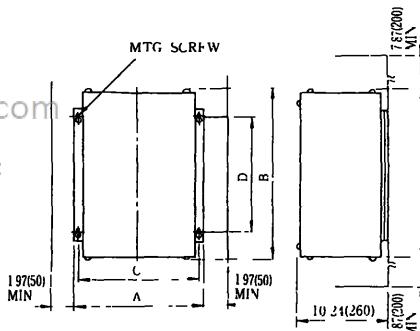
Voltage	Braking Resistor Unit Model (LKEB- <sup>1</sup> )	DWG	Dimensions in inch (mm)					
			A	B	C	D	MTG Screw	Approx Weight lb (kg)
200 to 230V	20P7	1	11.1(10)	10.81(273)	1.97(50)	10.24(240)	M5 x 3	6.02(3.0)
	21P5	1	5.12(130)	11.78(150)	2.95(75)	11.19(135)	M5 x 4	9.9(4.5)
	22P2	1	5.12(130)	11.78(150)	2.95(75)	11.19(135)	M5 x 4	9.9(4.5)
	23P7	1	5.12(130)	11.78(150)	2.95(75)	11.19(135)	M5 x 4	11.0(5.0)
	25P5	1	9.84(250)	11.78(150)	7.87(200)	11.19(135)	M6 x 4	16.6(7.5)
	27P5	1	9.84(250)	11.78(150)	7.87(200)	11.19(135)	M6 x 4	18.8(8.5)
	2011	2	10.47(260)	21.38(54)	9.69(240)	11.19(130)	M8 x 4	22.1(10)
	2015	2	14.02(356)	21.38(54)	11.21(336)	11.19(130)	M8 x 4	33.1(15)
	2018	2	17.46(446)	21.38(54)	16.77(426)	11.19(130)	M8 x 4	41.9(19)
	2022	2	17.76(446)	21.38(54)	16.77(426)	11.19(130)	M8 x 4	41.9(19)
380 to 460V	40P7	1	4.13(105)	10.82(273)	1.97(50)	10.24(240)	M5 x 3	6.02(3.0)
	41P5	1	5.12(130)	11.78(150)	2.95(75)	11.19(135)	M5 x 4	9.9(4.5)
	42P2	1	5.12(130)	11.78(150)	2.95(75)	11.19(135)	M5 x 4	9.9(4.5)
	43P7	1	5.12(130)	11.78(150)	2.95(75)	11.19(135)	M5 x 4	11.0(5.0)
	45P5	1	9.84(250)	11.78(150)	7.87(200)	11.19(135)	M6 x 4	16.6(7.5)
	47P5	1	9.84(250)	11.78(150)	7.87(200)	11.19(135)	M6 x 4	18.8(8.5)
	4011	2	11.78(350)	16.22(312)	12.99(330)	12.80(125)	M6 x 4	35.3(16)
	4015	2	11.78(350)	16.22(312)	12.99(330)	12.80(125)	M6 x 4	39.7(18)
	4018	2	17.56(446)	21.38(54)	16.77(426)	11.19(130)	M8 x 4	41.9(19)
	4022	2	17.76(446)	21.38(54)	16.77(426)	11.19(130)	M8 x 4	41.9(19)
	4030	2	14.02(356)	17.61(456)	11.23(336)	20.11(740)	M8 x 4	55.2(25)
	4037	2	17.56(446)	17.61(456)	16.77(426)	20.11(740)	M8 x 4	72.8(33)
	4045	2	17.76(446)	17.61(456)	16.77(426)	20.11(740)	M8 x 4	72.8(33)

**Note:** For 500 to 575V, contact your YASKAWA representative

**Drawing 1**



**Drawing 2**



## Backup Capacitor Unit for Momentary Power Loss

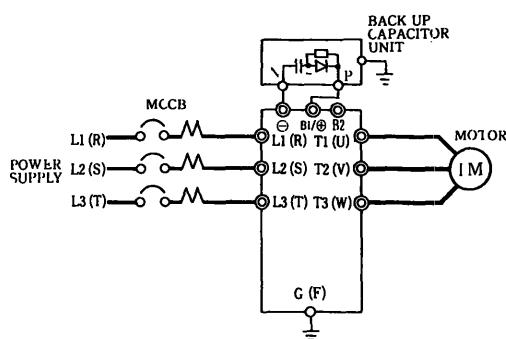
(Applicable to 0.5 to 3HP(0.4 to 2.2kW) of 200 to 230V or 380 to 460V)

Use this unit for 3HP (2.2kW) and below and to extend the inverters power loss ride-thru ability to 2 seconds (Not required above 3HP 2.2kW)

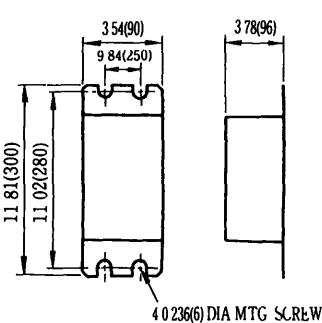
- Connection with Inverter
- Dimensions in inch (mm)

200 to 230V Model P0010

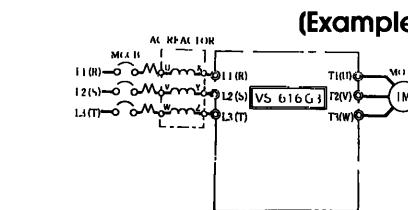
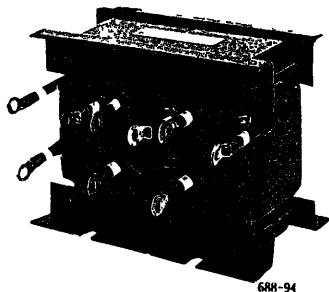
380 to 460V Model P0020



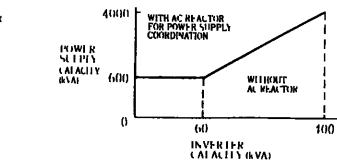
Weight  
4.4lb(2kg)



# AC REACTOR (Model UZBA-B, for input, 50/60Hz)



(Example of Connection)



Be sure to connect AC reactor to inverter input side [L<sub>1</sub> (R), L<sub>2</sub> (S), L<sub>3</sub> (T)]

When power capacity is significantly large compared to inverter capacity, or when the power-factor needs to be improved, connect the AC reactor. Select an AC reactor according to the motor capacity.

## 200 to 230V

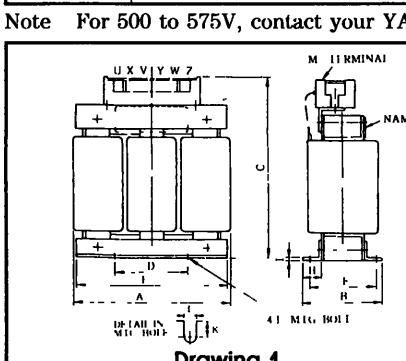
Max Applicable Motor Output HP (kW)	Current Value A	Inductance mH	Code No	Drawing	Dimensions in inch (mm)												Approx Weight lb (kg)	Loss Watt
					A	B	B1	C	D	E	F	H	J	K	L	M		
0.5 (0.4)	2.5	4.2	X002495		4.72 (120)	2.80 (71)	—	4.72 (120)	1.57 (40)	1.97 (40)	1.11 (28)	0.79 (20)	M6	0.41 (10.5)	0.28 (7)	M1	5.51 (2.5)	15
1 (0.75)	5	2.1	X002494		4.72 (120)	2.80 (71)	—	4.72 (120)	1.57 (40)	1.97 (40)	4.13 (105)	0.79 (20)	M6	0.11 (10.5)	0.28 (7)	M1	5.51 (2.5)	15
2 (1.5)	10	1.1	X002489		5.12 (230)	3.46 (88)	—	5.12 (130)	1.97 (50)	2.46 (61)	5.12 (130)	0.87 (22)	M6	0.45 (11.5)	0.28 (7)	M1	6.62 (1)	25
3 (2.2)	15	0.71	X002490		5.12 (230)	3.46 (88)	—	5.12 (130)	1.97 (50)	2.46 (61)	5.12 (130)	0.87 (22)	M6	0.45 (11.5)	0.28 (7)	M1	6.62 (1)	30
5 (3.7)	20	0.53	X002491		5.12 (230)	1.16 (30)	4.49 (98)	1.13 (31)	1.97 (40)	2.56 (61)	5.12 (130)	0.87 (22)	M6	0.15 (10.5)	0.28 (7)	M4	6.62 (1)	45
7.5 (5.5)	30	0.15	X002492		5.12 (230)	1.16 (30)	4.49 (98)	4.11 (105)	1.97 (40)	2.76 (70)	5.12 (130)	0.87 (22)	M6	0.05 (10)	0.28 (7)	M4	6.62 (1)	45
10 (7.5)	40	0.265	X002493		5.12 (230)	1.16 (30)	5.17 (130)	1.13 (30)	2.95 (61)	5.12 (130)	0.87 (22)	M6	0.15 (10.5)	0.28 (7)	M1	8.82 (1)	50	
15 (11)	60	0.18	X002495		6.81 (160)	4.11 (105)	7.01 (17.5)	5.12 (130)	2.95 (61)	4.15 (80)	0.96 (24)	M6	0.30 (10)	0.28 (7)	M1	11.24 (1)	65	
20 (15)	80	0.13	X002497		7.01 (180)	1.01 (100)	6.10 (13.5)	5.01 (130)	2.95 (61)	4.15 (80)	0.96 (24)	M6	0.10 (10)	0.28 (7)	M1	17.61 (8)	75	
25 (18.5)	90	0.12	X002498		7.01 (180)	1.01 (100)	5.91 (13.0)	5.01 (130)	2.95 (61)	4.15 (80)	0.96 (24)	M6	0.10 (10)	0.28 (7)	M1	17.61 (8)	90	
30 (22)	120	0.09	X002515		7.01 (180)	1.01 (110)	6.10 (13.0)	5.01 (130)	2.95 (61)	4.15 (80)	0.96 (24)	M6	0.08 (10)	0.28 (7)	M1	17.61 (8)	90	
40 (30)	160	0.07	X002516		8.27 (210)	1.01 (100)	6.69 (17.0)	6.89 (17.5)	2.95 (61)	4.15 (80)	0.96 (24)	M6	0.06 (10)	0.28 (7)	M10	26.46 (12)	100	
50 (17)	200	0.05	X002517		8.27 (210)	1.53 (11.7)	7.20 (18.2)	6.89 (17.5)	2.95 (61)	4.15 (80)	0.96 (24)	M6	0.05 (10)	0.28 (7)	M10	31.07 (15)	110	
60 (45)	240	0.044	X002518		9.15 (240)	4.96 (13.0)	8.58 (21.8)	8.72±0.2 (21.5±0.5)	5.91 (110)	4.41 (110)	0.45 (24)	M6	0.12 (8)	0.28 (7)	M10	50.71 (23)	125	
75 (55)	280	0.038	X002519		9.45 (240)	4.96 (13.0)	8.47±0.2 (21.5±0.5)	5.91 (110)	2.95 (61)	3.34 (70)	0.45 (24)	M8	0.12 (8)	0.39 (10)	M12	50.71 (23)	130	
100 (75)	360	0.026	X002560		10.61 (270)	6.38 (11.2)	8.89 (21.1)	8.69±0.2 (21.0±0.5)	5.91 (110)	5.12 (120)	10.24 (264)	1.58 (40)	M6	0.04 (10)	0.39 (10)	M12	70.56 (32)	145

電話 : 037-466333

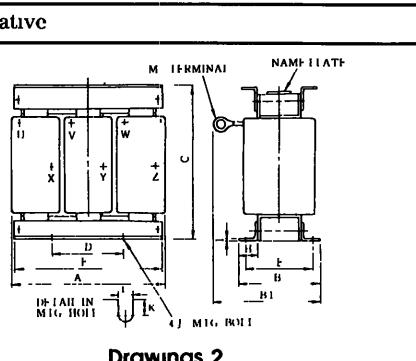
## 380 to 460V

Max Applicable Motor Output HP (kW)	Current Value A	Inductance mH	Code No	Drawing	Dimensions in inch (mm)												Approx Weight lb (kg)	Loss Watt
					A	B	B1	C	D	E	F	H	J	K	L	M		
0.5 (0.4)	1.3	18.0	X002561		4.72 (120)	2.80 (71)	—	4.72 (120)	1.57 (40)	1.97 (40)	1.11 (28)	0.79 (20)	M6	0.11 (10.5)	0.28 (7)	M1	5.52 (14.2)	15
1 (0.75)	2.5	8.4	X002562		4.72 (120)	2.80 (71)	—	4.72 (120)	1.57 (40)	1.97 (40)	1.11 (28)	0.79 (20)	M6	0.41 (10.5)	0.28 (7)	M1	5.52 (14.2)	15
2 (1.5)	5	4.2	X002563		5.12 (230)	3.46 (88)	—	5.12 (130)	1.97 (50)	2.76 (70)	5.12 (130)	0.87 (22)	M6	0.15 (10)	0.28 (7)	M1	6.62 (1)	25
3 (2.2)	7.5	3.6	X002564		5.12 (230)	3.46 (88)	—	5.12 (130)	1.97 (50)	2.76 (70)	5.12 (130)	0.87 (22)	M6	0.15 (10)	0.28 (7)	M1	6.62 (1)	35
5 (1.7)	10	2.2	X002560		5.12 (230)	3.46 (88)	—	5.12 (130)	1.97 (50)	2.76 (70)	5.12 (130)	0.87 (22)	M6	0.45 (11.5)	0.28 (7)	M1	6.62 (1)	41
7.5 (5.5)	15	14.2	X002561		5.12 (140)	1.16 (98)	—	5.12 (130)	1.97 (50)	2.76 (70)	5.12 (130)	0.87 (22)	M6	0.15 (11.5)	0.28 (7)	M4	6.62 (1)	50
10 (7.5)	20	1.06	X002562		6.81 (160)	1.41 (115)	4.54 (115)	5.12 (130)	2.95 (61)	2.76 (70)	6.30 (140)	0.98 (24)	M6	0.19 (10)	0.28 (7)	M5	8.82 (4)	50
15 (11)	30	0.7	X002563		8.30 (160)	1.41 (105)	5.22 (115)	5.12 (130)	2.95 (61)	3.15 (80)	6.30 (140)	0.98 (24)	M6	0.09 (10)	0.28 (7)	M5	11.08 (5)	65
20 (15)	40	0.53	X002564		7.01 (160)	1.41 (140)	5.01 (143)	5.01 (130)	2.95 (61)	3.00 (80)	6.30 (140)	0.98 (24)	M6	0.19 (10)	0.28 (7)	M5	11.08 (5)	65
25 (18.5)	50	0.42	X002565		7.01 (160)	1.41 (100)	5.71 (143)	5.01 (130)	2.95 (61)	3.00 (80)	6.30 (140)	0.98 (24)	M6	0.19 (10)	0.28 (7)	M5	17.64 (8)	90
30 (22)	60	0.36	X002566		7.01 (160)	1.41 (100)	5.91 (150)	5.01 (130)	2.95 (61)	3.00 (80)	6.30 (140)	0.98 (24)	M6	0.19 (10)	0.28 (7)	M5	17.64 (8)	90
40 (30)	80	0.26	X002568		8.27 (210)	1.94 (100)	5.91 (150)	6.89 (175)	2.95 (61)	3.15 (80)	8.07 (205)	0.98 (24)	M6	0.39 (10)	0.28 (7)	M8	18.74 (8.5)	85
50 (17)	90	0.24	X002569		8.27 (210)	4.53 (115)	6.89 (177.6)	6.89 (175)	2.95 (61)	3.15 (80)	8.07 (205)	0.98 (24)	M6	0.19 (10)	0.28 (7)	M8	26.46 (12)	110
60 (45)	120	0.18	X002566		9.45 (240)	4.96 (13.0)	7.06 (198)	8.07±0.2 (205±0.5)	5.91 (130)	4.41 (130)	0.45 (24)	M6	0.11 (8)	0.39 (10)	M10	31.07 (15)	130	
75 (55)	150	0.15	X002567		9.45 (240)	4.96 (120)	7.06 (211)	8.07±0.2 (205±0.5)	5.91 (130)	4.41 (130)	0.45 (24)	M6	0.12 (8)	0.39 (10)	M10	50.71 (23)	150	
100 (75)	200	0.11	X002568		10.61 (270)	6.38 (162)	9.10 (211)	9.06±0.2 (205±0.5)	5.91 (130)	5.12 (120)	10.24 (264)	1.58 (40)	M8	0.13 (10)	0.39 (10)	M10	70.56 (32)	155
150 (110)	250	0.09	X002568		10.61 (270)	6.38 (162)	9.10 (211)	9.06±0.2 (205±0.5)	5.91 (130)	5.12 (120)	10.24 (264)	1.58 (40)	M8	0.14 (10)	0.39 (10)	M10	70.56 (32)	155
200 (160)	330	0.06	X002570		12.60 (320)	6.50 (165)	9.16 (253)	9.06±0.2 (205±0.5)	5.91 (130)	5.12 (120)	12.60 (264)	1.58 (40)	M6	0.10 (17.5)	0.47 (12)	M12	121.27 (55)	200
250 (185)																		
300 (220)																		
400 (300)																		

Contact your YASKAWA representative



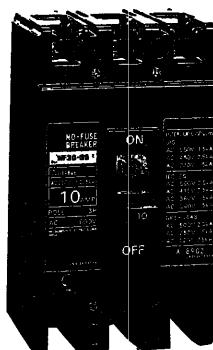
Drawing 1



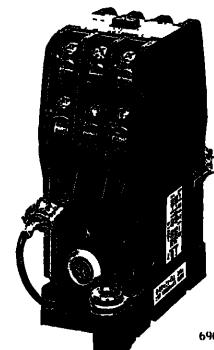
Drawings 2

# MOLDED-CASE CIRCUIT BREAKER (MCCB) AND POWER SUPPLY MAGNETIC CONTACTOR (MC)

Be sure to connect MCCBs between power supply and VS-616G3 input terminals L1 ( R ), L2 ( S ), L3 ( T ). Recommended MCCBs are listed as follows. Connect MC if required.



MOLDED-CASE CIRCUIT  
BREAKER (MCCB)



POWER SUPPLY MAGNETIC  
CONTACTOR (MC)

**200 to 230V**

VS - 616 G 3		Molded Case Circuit Breaker (MCCB)		YASKAWA Magnetic Contactor (Model MC)
Model CIMR-G3	Capacity kVA	Rated Output Current A	Model	Rated Current A
20P4	1.4	3.2	NF 30	5 HI - 7E
20P7	2.1	4.8	NF 30	10 HI - 7E
21P5	2.7	6.4	NF 30	20 HI - 10-2 E
22P2	4.1	9.6	NF 30	20 HI - 10-2 E
23P7	6.9	16	NF 30	30 HI - 20 E
25P5	10.3	24	NF 50	50 HI - 30 E
27P5	13.7	32	NF 100	60 HI - 50 E
2011	20.6	48	NF 100	100 HI - 50 E
2015	27.4	64	NF 100	100 HI - 80 E
2018	34	80	NF 225	150 HI - 100 E
2022	41	96	NF 225	150 HI - 100 E
2030	54	130	NF 225	225 HI - 100 E
2037	68	160	NF 225	225 HI - 100 E
2045	78	183	NF 400	300 HI - 200 E
2055	95	224	NF 400	400 HI - 300 E
2075	130	300	NF 600	600 HI - 500 E

**380 to 460V**

VS - 616 G 3		Molded Case Circuit Breaker (MCCB)		YASKAWA Magnetic Contactor (Model MC)
Model CIMR G3	Capacity kVA	Rated Output Current A	Model	Rated Current A
40P4	1.4	1.6	NF 30	5 HI - 7E
40P7	2.2	2.6	NF 30	5 HI - 7E
41P5	3.4	4.0	NF 30	10 HI - 10-2 E
42P2	4.1	4.8	NF 30	10 HI - 10-2 E
43P7	6.9	8	NF 30	20 H - 20 E
45P5	10.3	12	NF 30	20 H - 20 E
47P5	13.7	16	NF 30	30 H - 20 E
4011	20.6	24	NF 50	50 HI - 30 E
4015	27.4	32	NF 100	60 HI - 50 E
4018	34	40	NF 100	75 HI - 50 E
4022	41	48	NF 100	100 HI - 50 E
4030	54	64	NF 100	100 HI - 80 E
4037	68	80	NF 225	150 HI - 100 E
4045, 4L45	82	96	NF 225	150 HI - 100 E
4055	110	128	NF 225	225 HI - 125 E
4075	140	165	NF 400	300 HI - 200 E
4110	200	224	NF 400	400 HI - 300 E
4160	250	300	NF 600	600 HI - 500 E
4185	290	340	NF 600	600 HI - 500 E
4220	380	450	NF 800	800 HU - 4833E
4300	510	600	NF 1000	1000 HU - 593 E

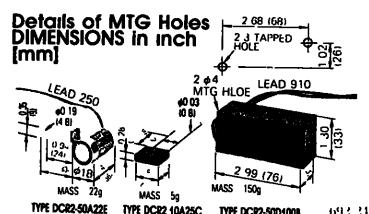
**500 to 575V**

VS - 616 G 3		Molded Case Circuit Breaker (MCCB)		YASKAWA Magnetic Contactor (Model MC)
Model CIMR G3	Capacity kVA	Rated Output Current A	Model	Rated Current A
U53P7	5	6.3	NF 30	20 HI - 10-2 E
U55P5	7.5	9.5	NF 30	20 HI - 10-2 E
U57P5	10	12.5	NF 30	20 HI - 20 E
U5011	15	17	NF 30	30 HI - 20 E
U5015	20	22	NF 50	50 HI - 30 E
U5018	25	27	NF 100	60 HI - 50 E
U5022	30	32	NF 100	60 HI - 50 E
U5030	40	43	NF 100	100 HI - 50 E
U5037	50	54	NF 100	100 HI - 80 E
U5045	60	64	NF 100	100 HI - 80 E
U5055	75	81	NF 225	150 HI - 100 E
U5075	100	112	NF 225	225 HI - 125 E
U5090	125	130	NF 225	225 HI - 125 E
U5110	150	172	NF 400	300 HI - 200 E
U5160	200	200	NF 400	400 HI - 300 E

## SURGE SUPPRESSOR

(Manufactured by Marcon Electronics)

Use surge suppressors for coils in electromagnetic contactors, control relays, electromagnetic valves, and electromagnetic brakes used as VS-616G3 peripheral units.



Coils of Magnetic Contactor and Control Relay	Surge Suppressor*		
	Model	Specifications	Code No.
200 to 230V	Large-size Magnetic Contactors	DCR2-50A22E	220VAC 0 5μF + 200Ω
	Control Relay LY-2, -3(OMRON) HH-22, -23(Fuji) MM-2, -4(OMRON)	DCR2-10A25C	250 VAC 0 1μF + 100Ω
380 to 460V Units		DCR2-50D100B	1000VDC + 0 5μF + 220Ω
			C002630

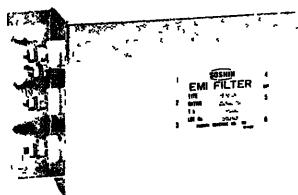
\* Made by MARCON Electronics

# NOISE FILTER

## INPUT NOISE FILTER



692-528



Manufactured  
by YASKAWA

Manufactured by  
Soshin Electric Co., Ltd

**200 TO 230V**

Inverter Model CIMR - G 3 -	Max Applicable Motor Output HP (kW)	Noise Filter by YASKAWA				Noise Filter by Soshin Electric Co., Ltd			
		Model	Code No	Q'ty	Rated Current A	Model	Code No	Q'ty	Rated Current A
20P4	0.5 (0.4)	LNFD - 2103 DY	72600-D2103DY	1	10	—	—	—	—
20P7	1 (0.75)	LNFD - 2103 DY	72600-D2103DY	1	10	—	—	—	—
21P5	2 (1.5)	LNFD - 2153 DY	72600-D2153DY	1	15	—	—	—	—
22P2	3 (2.2)	LNFD - 2203 DY	72600-D2203DY	1	20	—	—	—	—
23P7	5 (3.7)	LNFD - 2303 DY	72600-D2303DY	1	30	—	—	—	—
25P5	7.5 (5.5)	LNFD - 2203 DY	72600-D2203DY	2	40	HF3040A-Z	FIL000057	1	40
27P5	10 (7.5)	LNFD - 2303 DY	72600-D2303DY	2	60	HF3060A-Z	FIL000125	1	60
2011	15 (11)	LNFD - 2303 DY	72600-D2303DY	3	90	HF3100A-Z	FIL000060	1	100
2015	20 (15)	LNFD - 2303 DY	72600-D2303DY	4	120	HF3150A-Z	FIL000077	1	150
2018	25 (18.5)	LNFD - 2303 DY	72600-D2303DY	5	150	HF3150A-Z	FIL000077	1	150
2022	30 (22)	LNFD - 2303 DY	72600-D2303DY	6	180	HF3200A-Z	FIL000078	1	200
2030	40 (30)	—	—	—	—	HF3200A-Z	FIL000078	1	200
2037	50 (37)	—	—	—	—	HF3240A-Z	FIL001001	1	240
2045	60 (45)	—	—	—	—	HF3240A-Z	FIL001001	1	240
2055	75 (55)	—	—	—	—	HF3150A-Z	FIL000077	2	300
2075	100 (75)	—	—	—	—	HF3200A-Z	FIL000078	2	400

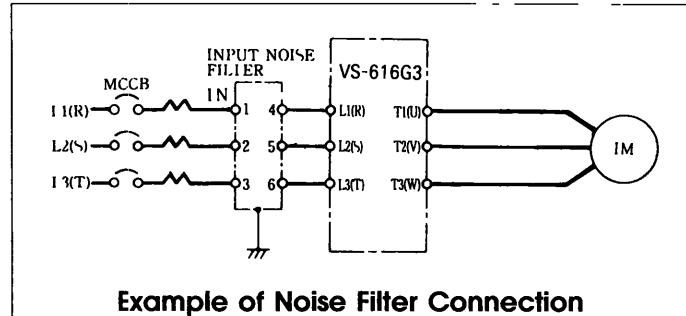
Line id: @zzzz

**380 TO 460V**

[www.repairtw.com](http://www.repairtw.com)

Inverter Model CIMR - G 3 -	Max Applicable Motor Output HP (kW)	Noise Filter by YASKAWA				Noise Filter by Soshin Electric Co., Ltd			
		Model	Code No	Q'ty	Rated Current A	Model	Code No	Q'ty	Rated Current A
40P4	0.5 (0.4)	LNFD - 4053 DY	72600-D4053DY	1	5	—	—	—	—
40P7	1 (0.75)	LNFD - 4053 DY	72600-D4053DY	1	5	—	—	—	—
41P5	2 (1.5)	LNFD - 4103 DY	72600-D4103DY	1	10	—	—	—	—
42P2	3 (2.2)	LNFD - 4103 DY	72600-D4103DY	1	10	—	—	—	—
43P7	5 (3.7)	LNFD - 4153 DY	72600-D4153DY	1	15	—	—	—	—
45P5	7.5 (5.5)	LNFD - 4203 DY	72600-D4203DY	1	20	—	—	—	—
47P5	10 (7.5)	LNFD - 4303 DY	72600-D4303DY	1	30	—	—	—	—
4011	15 (11)	LNFD - 4203 DY	72600-D4203DY	2	40	HF3040C-Z	FIL000066	1	40
4015	20 (15)	LNFD - 4303 DY	72600-D4303DY	2	60	HF3060C-Z	FIL000079	1	60
4018	25 (18.5)	LNFD - 4303 DY	72600-D4303DY	3	90	HF3080C-Z	FIL000080	1	80
4022	30 (22)	LNFD - 4303 DY	72600-D4303DY	3	90	HF3080C-Z	FIL000080	1	80
4030	40 (30)	LNFD - 4303 DY	72600-D4303DY	4	120	HF3150C-Z	FIL000082	1	150
4037	50 (37)	LNFD - 4303 DY	72600-D4303DY	5	150	HF3150C-Z	FIL000082	1	150
4045	60 (45)	LNFD - 4303 DY	72600-D4303DY	6	180	HF3200C-Z	FIL000083	1	200
4L45	60 (45)	LNFD - 4303 DY	72600-D4303DY	6	180	HF3200C-Z	FIL000083	1	200
4055	75 (55)	—	—	—	—	HF3200C-Z	FIL000083	1	200
4075	100 (75)	—	—	—	—	HF3150C-Z	FIL000082	2	300
4090	120 (90)	—	—	—	—	HF3150C-Z	FIL000082	2	300
4110	150 (110)	—	—	—	—	HF3150C-Z	FIL000082	2	300
4132	180 (132)	—	—	—	—	HF3200C-Z	FIL000083	2	400
4160	200 (160)	—	—	—	—	HF3200C-Z	FIL000083	2	400
4185	250 (185)	—	—	—	—	HF3200C-Z	FIL000083	3	600
4220	300 (220)	—	—	—	—	HF3200C-Z	FIL000083	3	600
4300	400 (300)	—	—	—	—	IIF3200C-Z	FIL000083	4	800

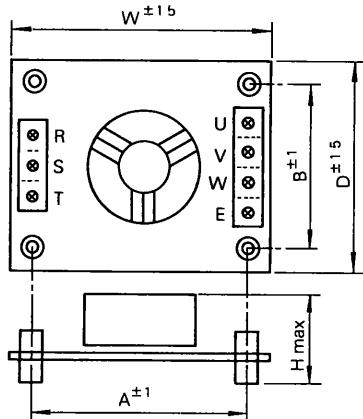
Note For 500 to 575V, contact your YASKAWA representative



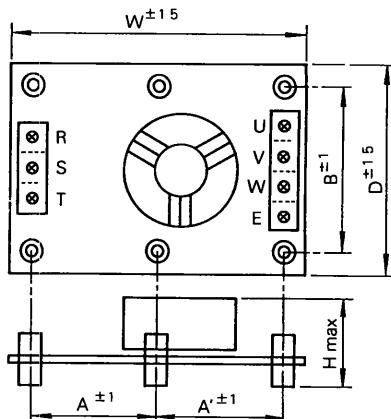
Example of Noise Filter Connection

Note Be sure to connect input noise filter on inverter input side [L<sub>1</sub> (R), L<sub>2</sub> (S), L<sub>3</sub> (T)]

## **NOISE FILTER DIMENSIONS** in inch (mm) (Manufactured by YASKAWA)



## Drawing 1

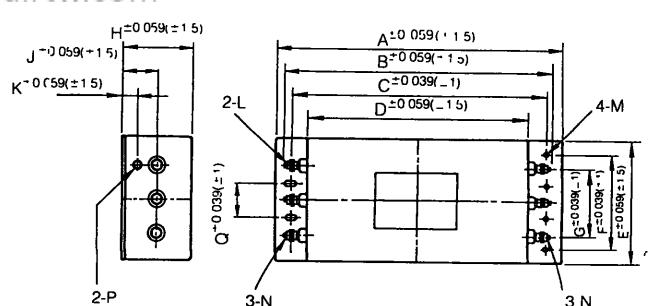
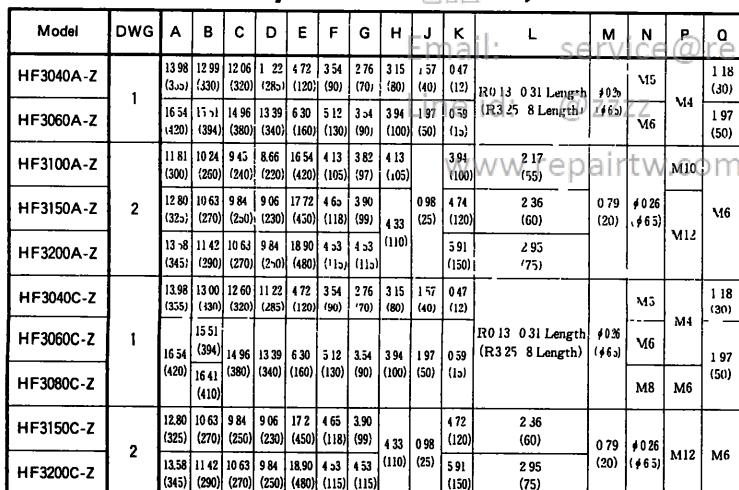


## **drawing 2**

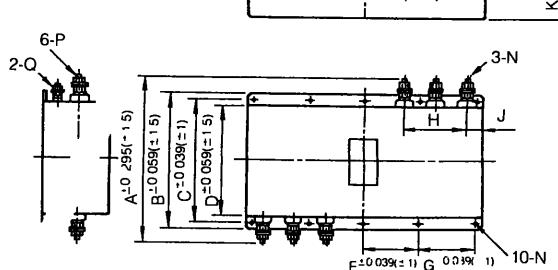
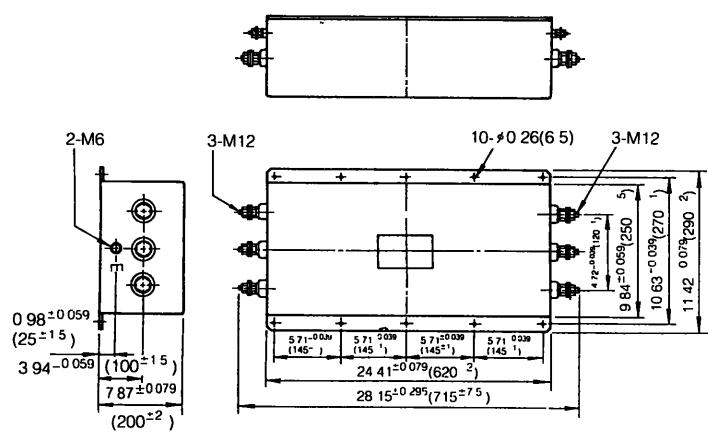
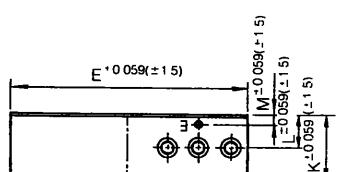
Model	Code No	Dwg No	W	D	H	A	A'	B	Mtg Screw
LNF-D - 2103 DY	72600 - D 2103 DY	1	4 72 (120)	3 15 (80)	2 17 (5 <sup>1</sup> / <sub>2</sub> )	4 25 (108)	—	2 68 (68)	M 4 X 20
LNF-D - 2153 DY	72600 - D 2153 DY	1	4 72 (120)	3 15 (80)	2 17 (5 <sup>1</sup> / <sub>2</sub> )	4 25 (108)	—	2 68 (68)	M 4 X 20
LNF-D - 2203 DY	72600 - D 2203 DY	1	6 69 (170)	3 54 (90)	2 76 (7 <sup>1</sup> / <sub>2</sub> )	6 22 (158)	—	3 07 (78)	M 4 X 20
LNF-D - 2303 DY	72600 - D 2303 DY	2	6 69 (170)	4 33 (110)	2 76 (7 <sup>1</sup> / <sub>2</sub> )	—	3 11 (79)	3 86 (98)	M 4 X 20
LNF-D - 4053 DY	72600 - D 4053 DY	2	6 69 (170)	5 12 (130)	2 95 (7 <sup>1</sup> / <sub>2</sub> )	—	3 11 (79)	4 65 (118)	M 4 X 30
LNF-D - 4103 DY	72600 - D 4103 DY	2	6 69 (170)	5 12 (130)	3 74 (9 <sup>1</sup> / <sub>2</sub> )	—	3 11 (79)	4 65 (118)	M 4 X 30
LNF-D - 4153 DY	72600 - D 4153 DY	2	6 69 (170)	5 12 (130)	3 74 (9 <sup>1</sup> / <sub>2</sub> )	—	3 11 (79)	4 65 (118)	M 4 X 30
LNF-D - 4203 DY	72600 - D 4203 DY	2	7 87 (200)	5 71 (145)	3 94 (100)	—	3 70 (94)	5 24 (133)	M 4 X 30
LNF-D - 4303 DY	72600 - D 4303 DY	2	7 87 (200)	5 71 (145)	3 94 (100)	—	3 70 (94)	5 24 (133)	M 4 X 30

# NOISE FILTER DIMENSIONS in inch (mm)

(Manufactured by Soshin Electric) 037-466333



Front Wing 1



## Drawing 2

# VDE STANDARD CONFORMING INPUT NOISE FILTER

(Manufactured by Soshin Electric)

200 TO 230V

Max Applicable Motor Output HP (kW)	Inverter Capacity kVA	Input Noise Filter												
		Model	Rated Current A			Code No								
0.5 (0.4)	1.4	HF3005A-DP	5			FIL 000084								
1 (0.75)	2.1	HF3010A-DP	10			FIL 000085								
2 (1.5)	2.7	HF3010A-DP	10			FIL 000085								
3 (2.2)	4.1	HF3015A-DP	15			FIL 000086								
5 (3.7)	6.9	HF3030A-DP	30			FIL 000088								
7.5 (5.5)	10.3	HF3040A-DP	40			FIL 000089								

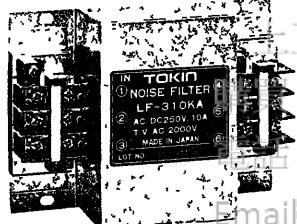
Note For 200V class with an output of 10HP (7.5kW) or greater, for 400V, 575V class motors, contact your YASKAWA representative

Model	DWG	Dimensions in inch (mm)														Mass kg
		A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q
HF3005A-DP	1	10.79 (274)	9.76 (248)	9.6 (24)	8.27 (21.0)	4.33 (11.0)	3.15 (8.0)	2.76 (7.0)	1.38 (3.5)	0.47 (1.2)	0.21 x 0.28 (5.5 x 7)	0.022 m5.5	M1	M1	5.29 (2.4)	
HF3010A-DP		14.74 (373)	12.40 (318)	11.22 (285)	10.74 (265)	5.60 (14.0)	2.70 (7.0)	1.15 (3.0)	1.07 (2.5)	0.47 (1.2)	0.26 x 0.31 (6.5 x 8)	0.026 m5.5	M1	M4	1.18 (0.5)	10/50
HF3015A-DP		14.96 (385)	11.39 (310)	10.30 (280)	9.54 (240)	5.12 (13.0)	3.04 (7.0)	1.07 (2.5)	0.47 (1.1)	0.46 x 0.31 (6.5 x 8)	0.026 m5.5	M5	M4	1.47 (0.6)	22/45	
HF3030A-DP	2	16.54 (41.0)	10.49 (26.0)	12.29 (32.0)	6.30 (16.0)	5.12 (13.0)	2.54 (6.0)	1.04 (2.5)	1.07 (2.5)	0.50 (1.5)	0.26 x 0.31 (6.5 x 8)	0.036 m5.5	M5	M4	1.97 (0.8)	-
HF3040A-DP		16.54 (41.0)	10.49 (26.0)	12.29 (32.0)	6.30 (16.0)	5.12 (13.0)	2.54 (6.0)	1.04 (2.5)	1.07 (2.5)	0.50 (1.5)	0.26 x 0.31 (6.5 x 8)	0.036 m5.5	M4	M4	-	

Figures are on page 78

## OUTPUT NOISE FILTER

(Tohoku Metal Industries Co., Ltd.)



正科技有限公司

、維修 此手冊零

網址： 037-466333

Email: 690-119 service@repairtw.com

200 TO 230V

Line id: @zzzz

[www.repairtw.com](http://www.repairtw.com)

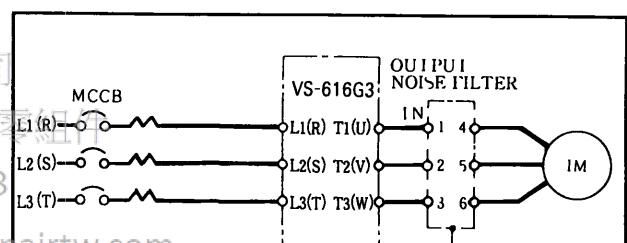
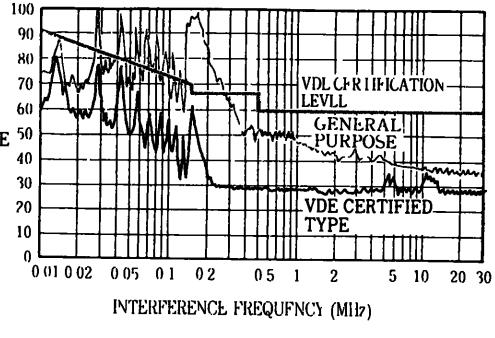
Max Applicable Motor Output HP (kW)	Inverter Capacity kVA	Output Noise Filter												
		Model	Rated Current A			Code No								
0.5 (0.4)	1.4	LF-310KA	10			FIL 000068								
1 (0.75)	2.1	LF-310KA	10			FIL 000068								
2 (1.5)	2.7	LF-310KA	10			FIL 000068								
3 (2.2)	4.1	LF-310KA	10			FIL 000068								
5 (3.7)	6.9	LF-320KA	20			FIL 000069								
7.5 (5.5)	11.3	LF-350KA	50			FIL 000070								
10 (7.5)	13.7	LF-350KA	50			FIL 000070								
15 (11)	20.6	LF-350KA x 2P	100			FIL 000070 (x 2)								
20 (15)	27.4	LF-350KA x 2P	100			FIL 000070 (x 2)								
25 (18.5)	34	LF-350KA x 2P	100			FIL 000070 (x 2)								
30 (22) to 100 (75)	41 to 130	Contact your YASKAWA representative												

380 TO 460V

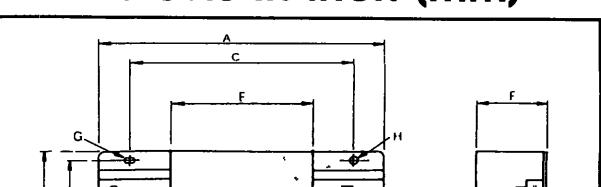
Max Applicable Motor Output HP (kW)	Inverter Capacity kVA	Output Noise Filter												
		Model	Rated Current A			Code No								
0.5 (0.4)	1.4	LF-310KB	10			FIL 000071								
1 (0.75)	2.1	LF-310KB	10			FIL 000071								
2 (1.5)	2.7	LF-310KB	10			FIL 000071								
3 (2.2)	4.1	LF-310KB	10			FIL 000071								
5 (3.7)	6.9	LF-320KB	20			FIL 000072								
7.5 (5.5)	10.3	LF-320KB	20			FIL 000072								
10 (7.5)	13.7	LF-320KB	20			FIL 000072								
10 (7.5)	20.6	LF-350KB	35			FIL 000073								
15 (11)	27.4	LF-350KB	35			FIL 000073								
25 (18.5)	34	LF-345KB	45			FIL 000074								
30 (22)	41	LF-375KB	75			FIL 000075								
40 (30)	54	LF-375KB	75			FIL 000075								
50 (37)	68	LF-3110KB	110			FIL 000076								
60 (45)	82	LF-3110KB	110			FIL 000076								
75 (55) to 400 (300)	110 to 510	Contact your YASKAWA representative												

Note For 500 to 575V, contact your YASKAWA representative

## Noise Attenuation Characteristics



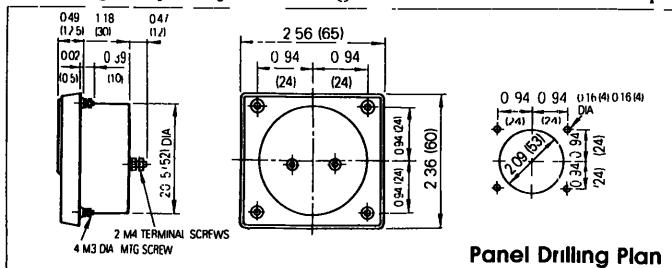
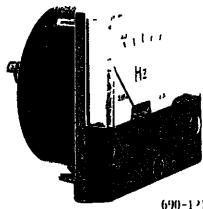
DIMENSIONS in inch (mm)



Model	Terminal Plate	A	B	C	D	E	F	G	H	Mass lb (kg)
LF-310KA	TE-K5 M M4	5.51 (13.0)	1.04 (10.0)	3.04 (30.0)	1.54 (16.0)	2.76 (27.0)	1.77 (14.5)	0.28 x 0.18 (7 x 4.5)	0.18 (0.4)	1.10 (0.5)
LF-320KA	TP-K5 M M4	5.51 (14.0)	1.04 (10.0)	3.04 (30.0)	1.54 (16.0)	2.76 (27.0)	1.77 (14.5)	0.28 x 0.18 (7 x 4.5)	0.18 (0.4)	1.32 (0.6)
LF-350KA	TE-K22 M6	10.24 (26.0)	7.09 (18.0)	7.09 (18.0)	6.80 (16.0)	4.72 (12.0)	2.56 (6.5)	0.28 x 0.18 (7 x 4.5)	0.18 (0.4)	4.41 (2.0)
LF-310KB	TF-K5 M M4	5.51 (14.0)	1.04 (10.0)	3.04 (30.0)	1.54 (16.0)	2.76 (27.0)	1.77 (14.5)	0.28 x 0.18 (7 x 4.5)	0.18 (0.4)	1.10 (0.5)
LF-320KB	TF-K5 M M4	5.51 (14.0)	1.04 (10.0)	3.04 (30.0)	1.54 (16.0)	2.76 (27.0)	1.77 (14.5)	0.28 x 0.18 (7 x 4.5)	0.18 (0.4)	1.32 (0.6)
LF-335KB	TF-K5 M M4	5.51 (14.0)	2.04 (10.0)	3.04 (30.0)	2.54 (25.0)	2.76 (27.0)	1.77 (14.5)	0.28 x 0.18 (7 x 4.5)	0.18 (0.4)	1.76 (0.8)
LF-345KB	TF-K22 M6	10.24 (26.0)	7.09 (18.0)	7.09 (18.0)	6.80 (16.0)	4.72 (12.0)	2.56 (6.5)	0.28 x 0.18 (7 x 4.5)	0.18 (0.4)	4.41 (2.0)
LF-375KB	TF-K22 M6	21.26 (54.0)	12.60 (32.0)	18.90 (48.0)	11.81 (29.0)	11.81 (29.0)	9.45 (24.0)	0.35 x 0.26 (8 x 6.5)	0.46 (0.65)	25.46 (12.0)
LF-310KB	TE-K6 M M8	21.26 (54.0)	13.36 (34.0)	18.00 (48.0)	11.81 (29.0)	15.98 (34.0)	9.45 (24.0)	0.35 x 0.26 (8 x 6.5)	0.46 (0.65)	42.93 (19.5)

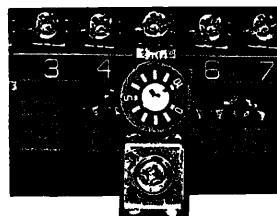
# FREQUENCY METER/AMMETER

MODEL DCF-6A, 1mA—Analog frequency indicating meter is available as an option



# POTENTIOMETER

(Attach to Inverter terminal)



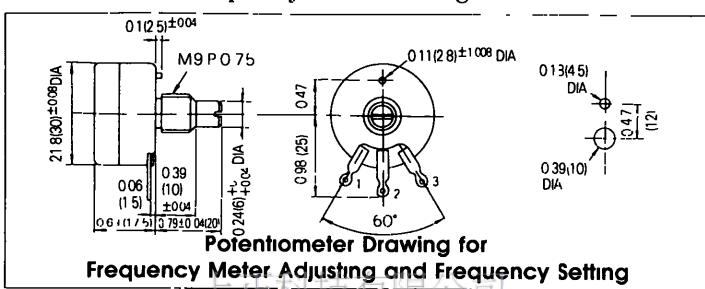
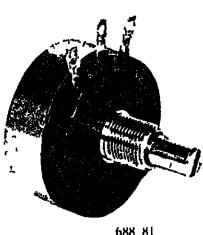
Resistance Value	Code No
2kΩ	LTX002780
20kΩ	LTX002910

# FREQUENCY SETTING POTENTIOMETER

MODEL RV30YN 20S, 2kΩ—Adjusts motor frequency by use of frequency setting knob covering the potentiometer

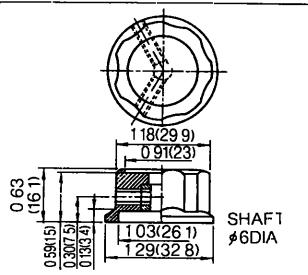
# FREQUENCY METER ADJUSTING POTENTIOMETER

MODEL RV30YN 20S, 20kΩ—Corrects frequency meter reading



# FREQUENCY SETTING KNOB (Type CM-3S)

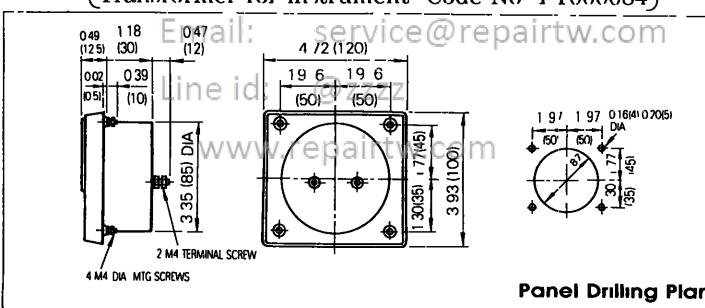
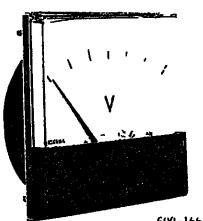
Used as a means of adjusting frequency setting potentiometer



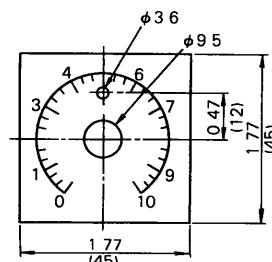
# OUTPUT VOLTMETER (Model SCF-12NH Rectification type class 2.5)

200 to 230V 300V Full-scale (Code No. VM000481)

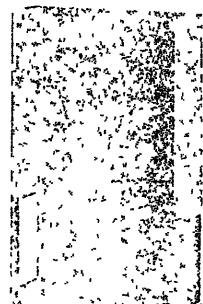
380 to 460V 600V Full-scale (Output Voltmeter Code No. VM000502,  
Transformer for instrument Code No. PT000084)



# SCALE PLATE (Code No. NPJT41561-1)



# MOUNTING BASE



## • Applied Models

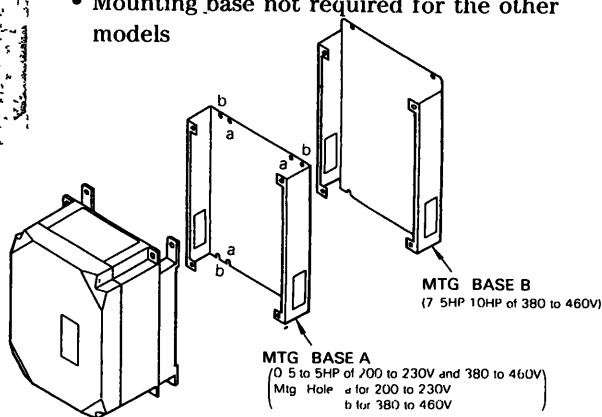
200 to 230V 7.5HP(5.5kW), 10HP(7.5kW)

(CIMR-G3U2 5P5, -G3U2 7P5)

380 to 460V 0.5 to 10HP(0.4 to 7.5kW)

(CIMR-G3U4 0P4 to -G3U4 7P5)

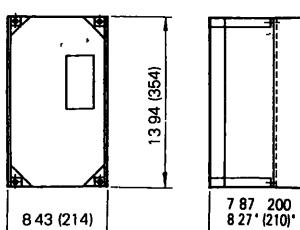
- Mounting base not required for the other models



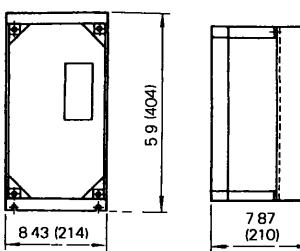
## Mounting Base Dimensions in inch (mm)

### Mtg. Base A

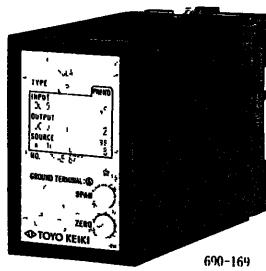
\*Indicates for  
200 to 230V



### Mtg. Base B



# ISOLATOR (Insulation Type DC Transmission Converter)

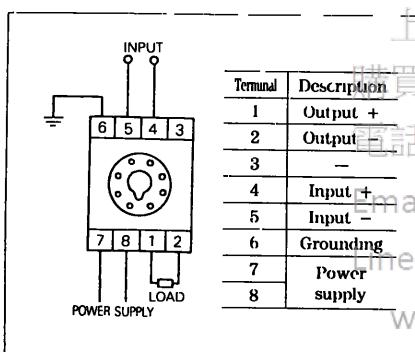


690-169

## Performance

(1) Allowance	$\pm 0.25\%$ of output span (Ambient temp $23^{\circ}\text{C}$ , $(73.4^{\circ}\text{F})$ )
(2) Temperature Influence	With $\pm 0.25\%$ of output span (The value at $\pm 10^{\circ}\text{C}$ ( $\pm 50^{\circ}\text{F}$ ) of ambient temp )
(3) Aux. Power Supply Influence	With $\pm 0.1\%$ of output span (The value at $\pm 10\%$ of aux power supply )
(4) Load Resistance Influence	With $\pm 0.05\%$ of output span (In the range of load resistance)
(5) Output Ripple	With $\pm 0.5\%$ P-P of output span
(6) Response Time	0.5 sec or less (Time to settle to $\pm 1\%$ of final steady value)
(7) Withstand Voltage	2000VAC for one min (between each terminal of input, output, power supply, and enclosure)
(8) Insulation Resistance	20M $\Omega$ and above (by 500VDC megger) (between each terminal of input, output, power supply and enclosure)

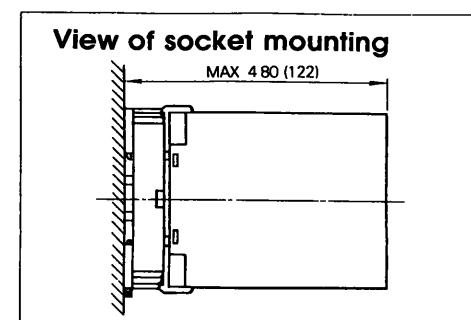
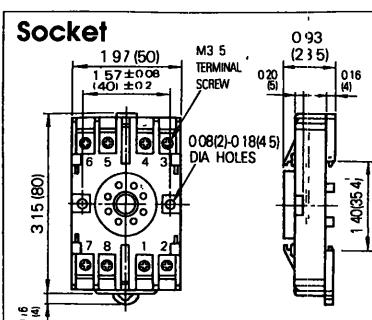
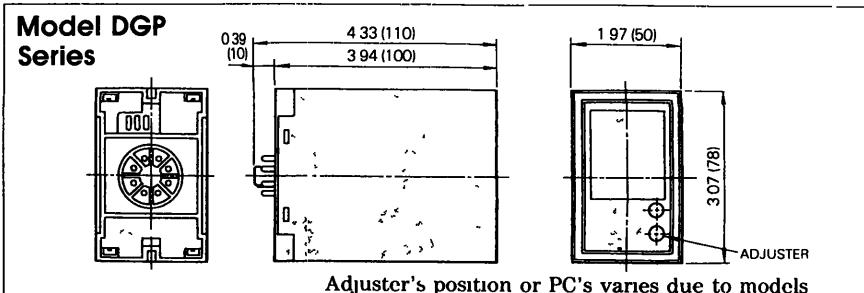
## Connecting Method



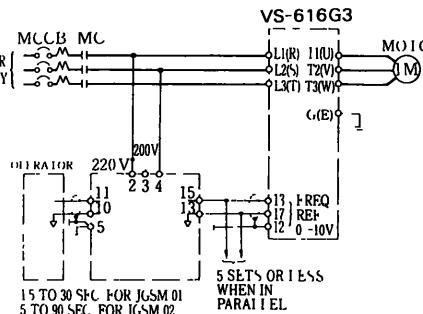
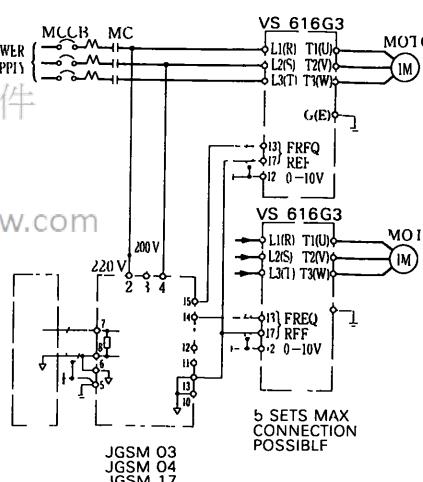
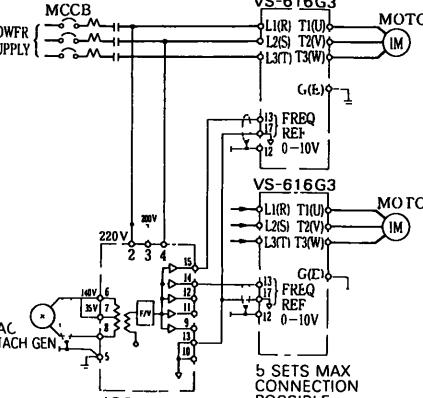
## Product Line

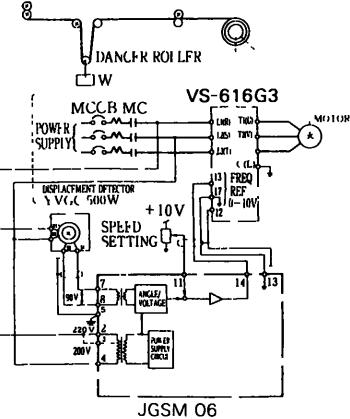
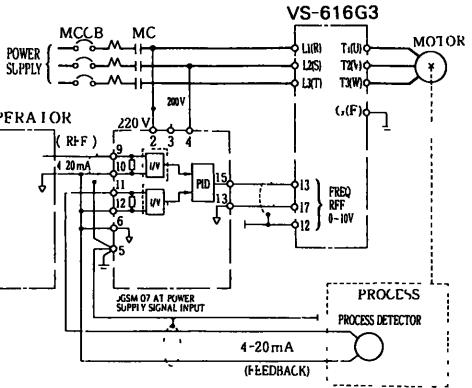
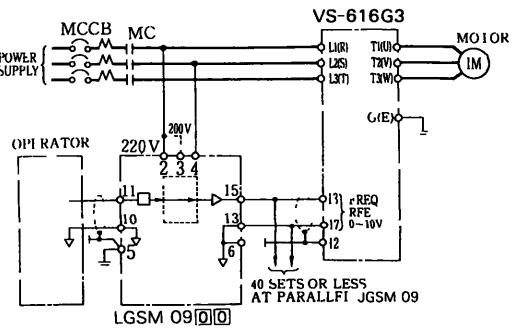
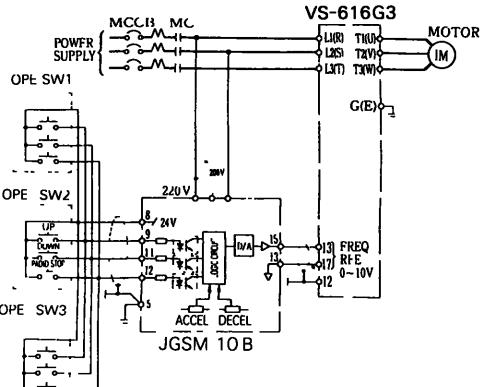
Model	Input Signal	Output Signal	Power Supply	Code No
DGP2-4-4	0 - 10V	0 - 10V	100VAC	CON 000019 25
DGP2-4-8	0 - 10V	4 - 20mA	100VAC	CON 000019 26
DGP2-8-4	4 - 20mA	0 - 10V	100VAC	CON 000019 35
DGP2-3-4	0 - 5V	0 - 10V	100VAC	CON 000019 15
DGP3-4-4	0 - 10V	0 - 10V	200VAC	CON 000020 25
DGP3-4-8	0 - 10V	4 - 20mA	200VAC	CON 000020 26
DGP3-8-4	4 - 20mA	0 - 10V	200VAC	CON 000020 35
DGP3-3-4	0 - 5V	0 - 10V	200VAC	CON 000020 15

## Dimensions in inch (mm)

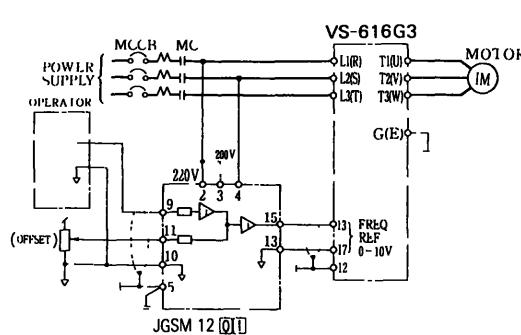
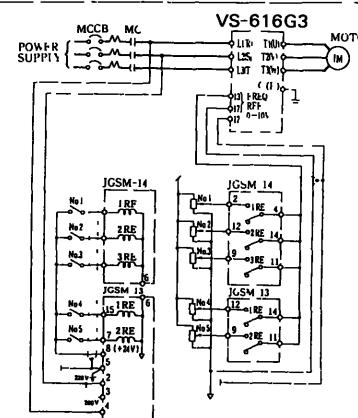
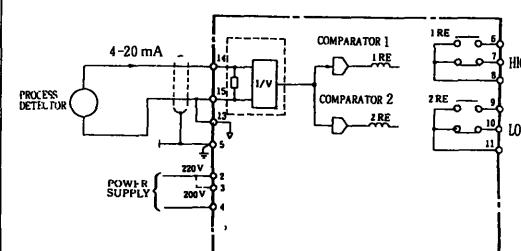
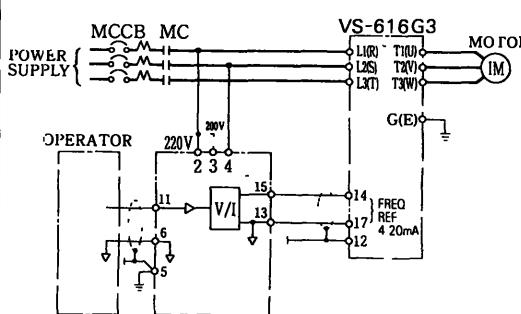


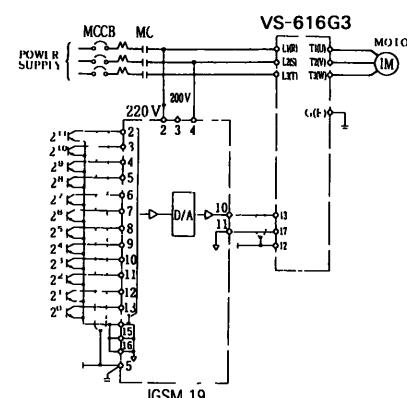
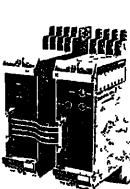
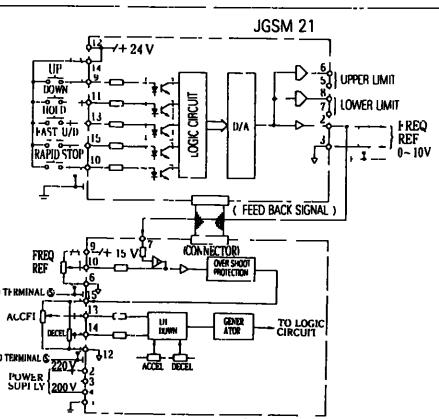
# VS SYSTEM MODULE (Power Supply Capacity: 6VA and below)

Name (Model)	Configuration	Function	Application
Soft Starter A (JGSM-01) Soft Starter B (JGSM-02)	 689-149	Linear acceleration/deceleration control provides smooth, uniform speed change during starting and stopping and during speed increase and decrease. Accel/decel time adjustable in 1 to 30 sec with "A" and 5 to 90 sec with "B".	
Ratio Setter A (JGSM-03)	 689-347	Converts the current signal 4 to 20mA of master setter JVOP-03* to voltage signal and sets five types of ratios and biases.	
Ratio Setter B (JGSM-04)	 689-145	Transforms the frequency signal 0 to 2kHz of master setter JVOP-04* to voltage signal and sets five types of ratios and biases.	
Ratio Setter C (JGSM-17)	 689-344	Transforms master speed signals such as AC voltage signal (200VAC), AC tach-gen signal (30VAC) or DC voltage signal (10VDC) to DC voltage. It can set five types of ratios and biases.	
Follower Ratio Setter (JGSM-05)	 689-143	Transforms frequency signal from AC tach-gen to voltage signal and sets five types of ratios and biases.	

Name (Model)	Configuration	Function	Application
<b>Position Controller (JGSM-06)</b>	 689-155	Synchronizes displacement detector YVGC-500W* in proportion to rotary angle to permit change to DC voltage signal Signal mixing function to take out deviation signal is available	 JGSM 06
<b>PID Controller (JGSM-07)</b>	 689-157	Independently sets ratio gain, integral and differential time for the simple process control Integral reset, stepless operation, and wind-up functions are available	 JGSM 07
<b>Preamplifier (JGSM-09+□□)</b>	 689-350	Amplifies both the power of DC input signal and output of snap-in function modules JZSP-11 to 16* when inserted	 LGSM 09 □□
<b>UP/DOWN Setter (JGSM-10B)</b>	 689-333	Executes "UP" or "DOWN" command from remote control type VS operator model JVOP-10* by lowering or raising reference voltage	 JGSM 10 B

# VS SYSTEM MODULE (Power Supply Capacity: 6VA and below) (Cont'd)

Name (Model)	Configuration	Function	Application
Operational Amplifier (JGSM-12 <sup>t-□□□</sup> )	 689-327	Required operational circuits are provided through a range of operational impedances	 VS-616G3 POWER SUPPLY OPERATOR MCCB MC L1(R) T1(U) L2(S) T2(V) L3(T) T3(W) MOTOR IM G(E) VS-616G3 POWER SUPPLY OPERATOR MCCB MC L1(R) T1(U) L2(S) T2(V) L3(T) T3(W) MOTOR IM G(E) JGSM 12 [0] (WHEN USING ADDER-SUBTRACTOR CIRCUIT)
Signal Selector A (JGSM-13)	 689-329	Consists of power supply circuit and two relay circuits Used as a selector circuit of control signals	 VS-616G3 POWER SUPPLY OPERATOR MCCB MC L1(R) T1(U) L2(S) T2(V) L3(T) T3(W) MOTOR IM G(E)
Signal Selector B (JGTM-14)	 689-341	Contains three relay circuits Used as a selector circuit of control signals Power supply from model JGSM-13 電話 : 037-466333 Email: service@repairtw.com	 VS-616G3 POWER SUPPLY OPERATOR MCCB MC L1(R) T1(U) L2(S) T2(V) L3(T) T3(W) MOTOR IM G(E)
Comparator (JGSM-15 <sup>t-□□</sup> )	 689-339	Line id: @zzzz <a href="http://www.repairtw.com">www.repairtw.com</a> Compares DC voltage, current, AC tach-gen, frequency, or reference signals with two preset levels It drives relays and output contact signal (1NO, NC contact )	 VS-616G3 POWER SUPPLY OPERATOR MCCB MC L1(R) T1(U) L2(S) T2(V) L3(T) T3(W) MOTOR IM G(E) JGSM 15 [1] (WHEN USING I/V CONVERTER)
V/I Converter (JGSM-16 <sup>t-□□</sup> )	 689-337	Converts DC voltage input signal to current signal of 4 to 20mA which can be connected to instrument Insertion of snap-in module can determine input signals such as frequency or tach-gen	 VS-616G3 POWER SUPPLY OPERATOR MCCB MC L1(R) T1(U) L2(S) T2(V) L3(T) T3(W) MOTOR IM G(E) JGSM 16 [0]

Name (Model)	Configuration	Function	Application
D/A Converter (JGSM-18) (JGSM-19)	 689-387	Converts BCD 3-digit or 12 bits binary digital signals to 0 to $\pm 10V$ analog signals with high accuracy  Model JGSM-18 BCD 3-digit input type Model JGSM-19 12 bits binary type	 VS-616G3 MOTOR IM POWER SUPPLY MCCB MC 220V 2 3 4 LNB TMR LSB TMR LTB TMR GND JGSM 19
Static Potentiometer (JGSM-24) (D/A Converter) (JGSM-22) (Controller)	 686-76	In addition to the functions of model JGSM-10B (remote setting device), wide application is offered through the command value maintenance function at power failure, the variable acceleration/deceleration function that allows external setting times, and the analog tracking function  The two system modules must always be used together to configure the static potentiometer	 JGSM 21 JGSM 22 UP +24V DOWN HOLD FAST RAPID STOP LOGIC CIRCUIT D/A FREQ REF 0-10V FEED BACK SIGNAL VCO OVER SHOOT PROTECTION ACCFI DECI LH DOWN GENERATOR TO LOGIC CIRCUIT TO TERMINAL 220V POWER SUPPLY 200V JGSM 22

\* Available as Yaskawa standard

† Shows model of VS snap-in function modules

‡ Indicates model of impedance

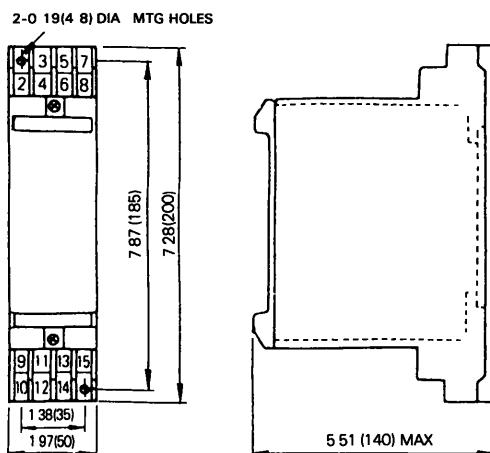
# Both 200/220V at 50Hz and at 60Hz are available as standard. Use a transformer for other power supplies

Email: service@repairv.com

## ■ VS Snap in Module List

Application	Name	Model
Short circuit of mounting connector of VS snap in module	Short-circuit PC board	JZSP-00
Buffer accel/decel operation	Soft starter	JZSP-12
Operation by signal of either process adjusting meter or VS operator JVOP-03	I/V converter	JZSP-13
Operation by signal of VS operator JVOP-04	F/V converter	JZSP-14
Sequence operation with main unit	Tach-gene follower	JZSP-15
Adding/subtracting operation of each signal	JZSP-16□□	JZSP-16-01
	JZSP-16-02	JZSP-16-03

## ■ VS System Module Dimensions in inch (mm)



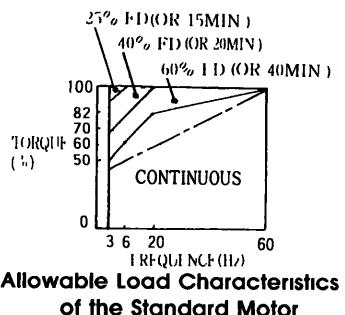
Approx Weight 1.8lb (0.8kg)

# NOTES ON APPLICATION OF MOTORS

## Application to Existing Standard Motors

A standard motor driven by the inverter generates slightly less power than it does when it is driven with commercial power supply

Also, the cooling effect deteriorates in low speed range so that the motor temperature rise increases. Reduce load torque in the low speed range. Allowable load characteristics of the standard motor are shown in the figure. If 100% continuous torque is required in the low speed range, use an inverter duty motor (See page 87)



### ■ High speed operation

When the motor is used above 60Hz, motor mechanical design should be verified. Contact your motor mfg

### ■ Torque characteristics

Motor torque characteristics vary when the motor is driven by an inverter instead of commercial power supply. Check the load torque characteristics of the machine to be connected (For torque characteristics for inverter operation, see page 87)

### ■ Vibrations

Because of the high carrier modulation technique for PWM control, the VS-616G3 series reduces motor vibration to a level equal to running with a commercial power supply. Larger vibrations may occur under the following conditions

- (1) Response at resonant frequency of the mechanical system

Special care is required if a machine which has previously been driven at a constant speed, is to be driven at varying speeds. Installation of anti-vibration rubber padding under the motor base and frequency jump control are recommended.

- (2) Rotator residual imbalance

Special care is required for operation at 60 Hz or higher frequencies.

### ■ Noise

Line id: @zzzz

Inverter operation is as quiet as operation with commercial power supply. At above rated speed (60 Hz), noise may increase by motor cooling fan

## Application to Special Purpose Motors

Motors with Brakes	Use brake-equipped motors with an independent power supply. Connect the brake power supply to the inverter primary side. When the brake operates (the motor stops) it turns the inverter output OFF. Some types of brakes may make abnormal sounds in low speed range
Pole Change Motors	Select the inverter with a capacity exceeding the rated current of each pole. Pole change should be made only after the motor stops. If a pole is changed while the motor is rotating, the regenerative overvoltage or overcurrent protection circuit is activated and the motor coasts to a stop
Submersible Motors	Since the rated current of underwater motors is large compared with general purpose motors, select an inverter with a larger capacity. If the wire length between the inverter and the motor is large, use cables with sufficiently large diameter
Explosion-proof Motors	Explosion-proof motors which are applied to an inverter must be currently approved as explosion-proof equipment. The inverter is not explosion-proof and should not be located where explosive gases exist
Geared Motors	Lubrication method and continuous rotation limit differ with manufacturers. When oil lubrication is employed, continuous operation only in low speed range may cause burnout. Before operating the motor at more than 60Hz you should consult the motor manufacturer
Single-phase Motors	Single-phase motors are not suitable for variable speed operation with an inverter. If the inverter is applied to a motor using a capacitor stack, a high harmonic current flows and the capacitor may be damaged. For split-phase start motors and repulsion start motors, the internal centrifugal switch will not be actuated and the starting coil may be burned out. Therefore, use only 3-phase motors

## Power Transmission Mechanism (Gear Reduction, Belt, Chain, etc.)

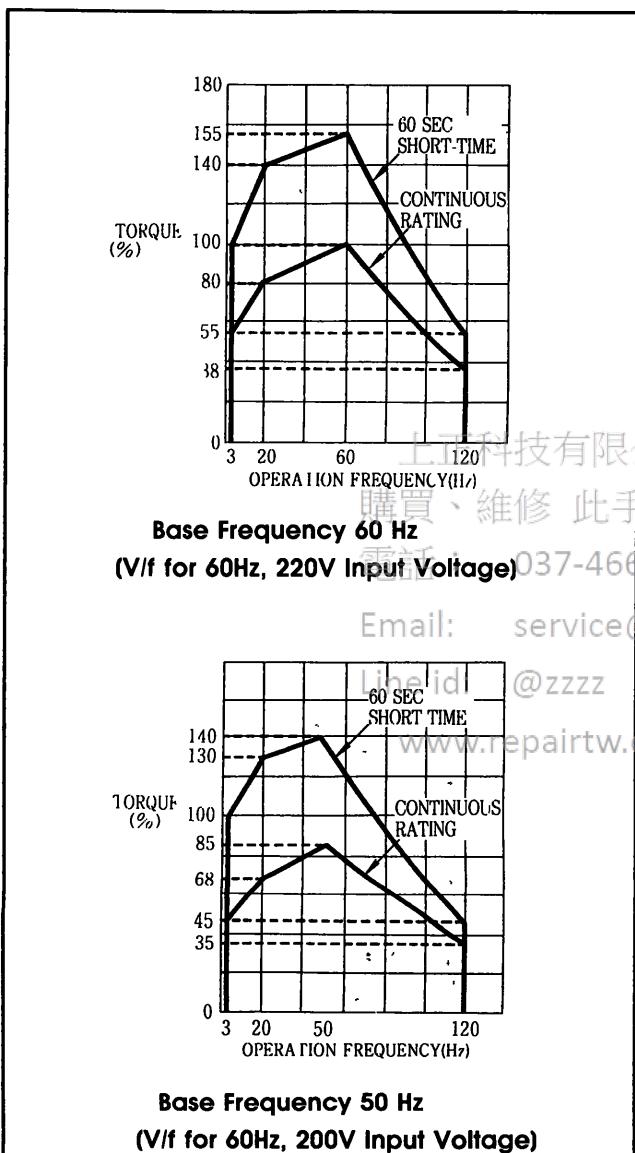
When gear boxes and change/reduction gears lubricated with oil are used in power transmission systems, continuous low speed operation decreases the oil lubrication function. Also, operation at more than 60Hz may result in noise, reduced life, etc

# MOTOR OUTPUT TORQUE CHARACTERISTICS

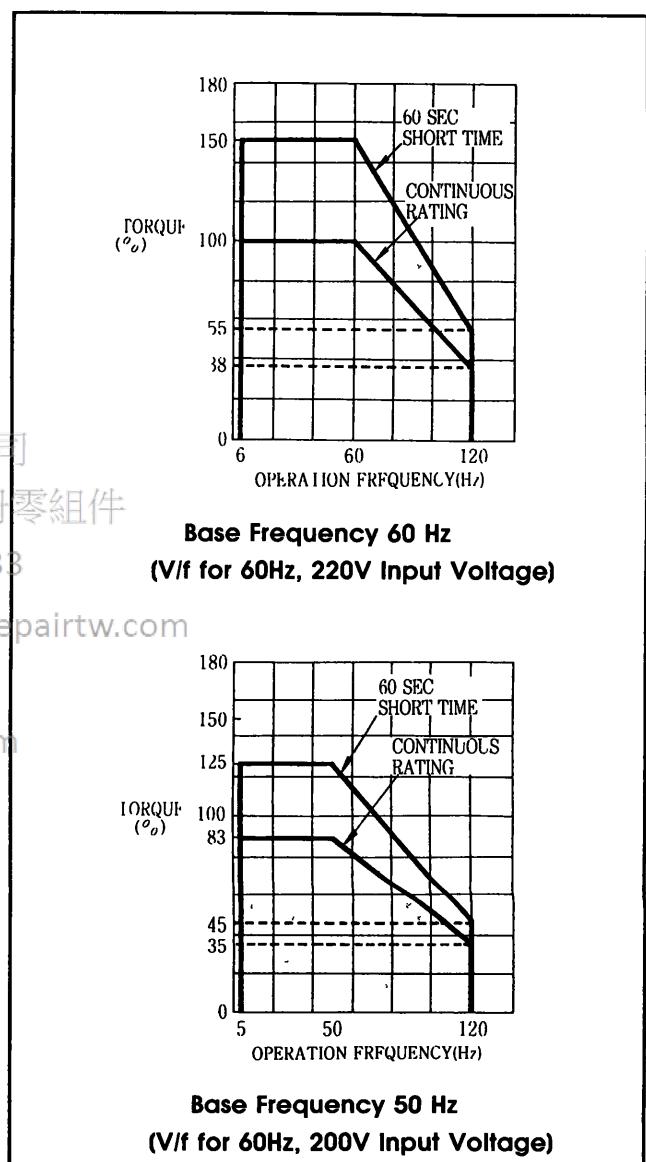
(Application example with 20HP (15 kW), 4-pole motor and CIMR-G3 2015 inverter)

The output torque of an induction motor driven by the inverter depends on the motor type. Select a motor according to the driven machine's load requirements.

## Examples of Standard Motor Combination Characteristics

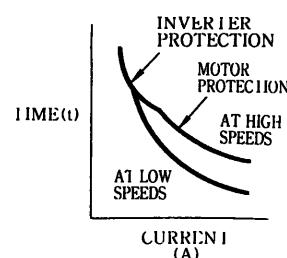


## Examples of Inverter Duty Motor Characteristics

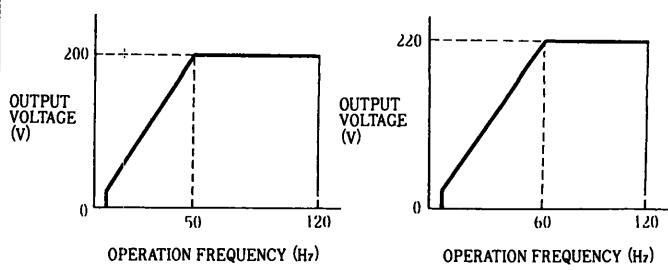


## Motor Protection with Electronics Thermal Overload

Motor thermal characteristics as a function of operating frequency are simulated to protect the motor at any speed.



## • Standard V/f Characteristics



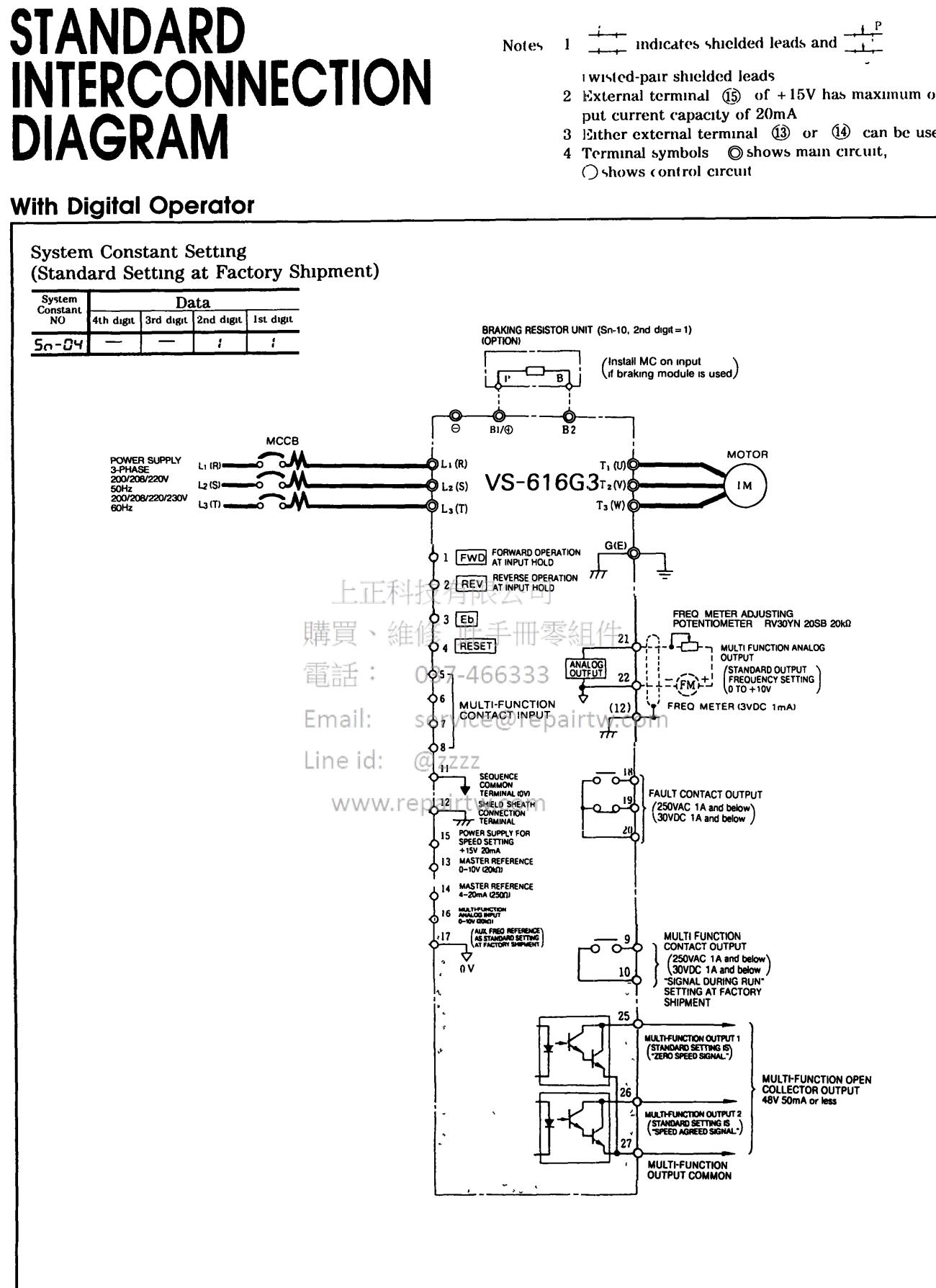
# STANDARD INTERCONNECTION DIAGRAM

## With Digital Operator

### System Constant Setting (Standard Setting at Factory Shipment)

System Constant NO	Data			
	4th digit	3rd digit	2nd digit	1st digit
Sn-04	—	—	/	/

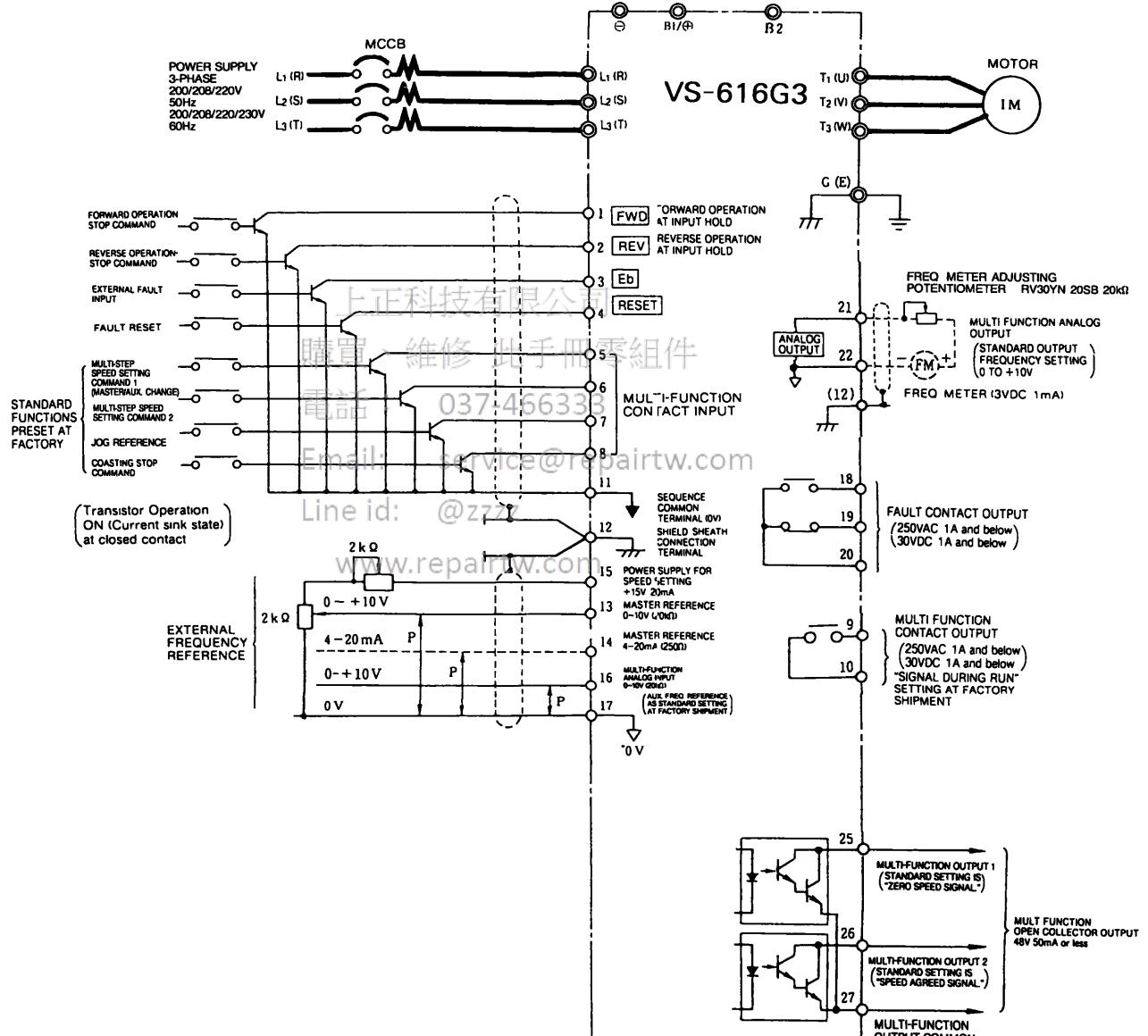
POWER SUPPLY  
3-PHASE  
200/208/220V  
50Hz  
200/208/220/230V  
60Hz



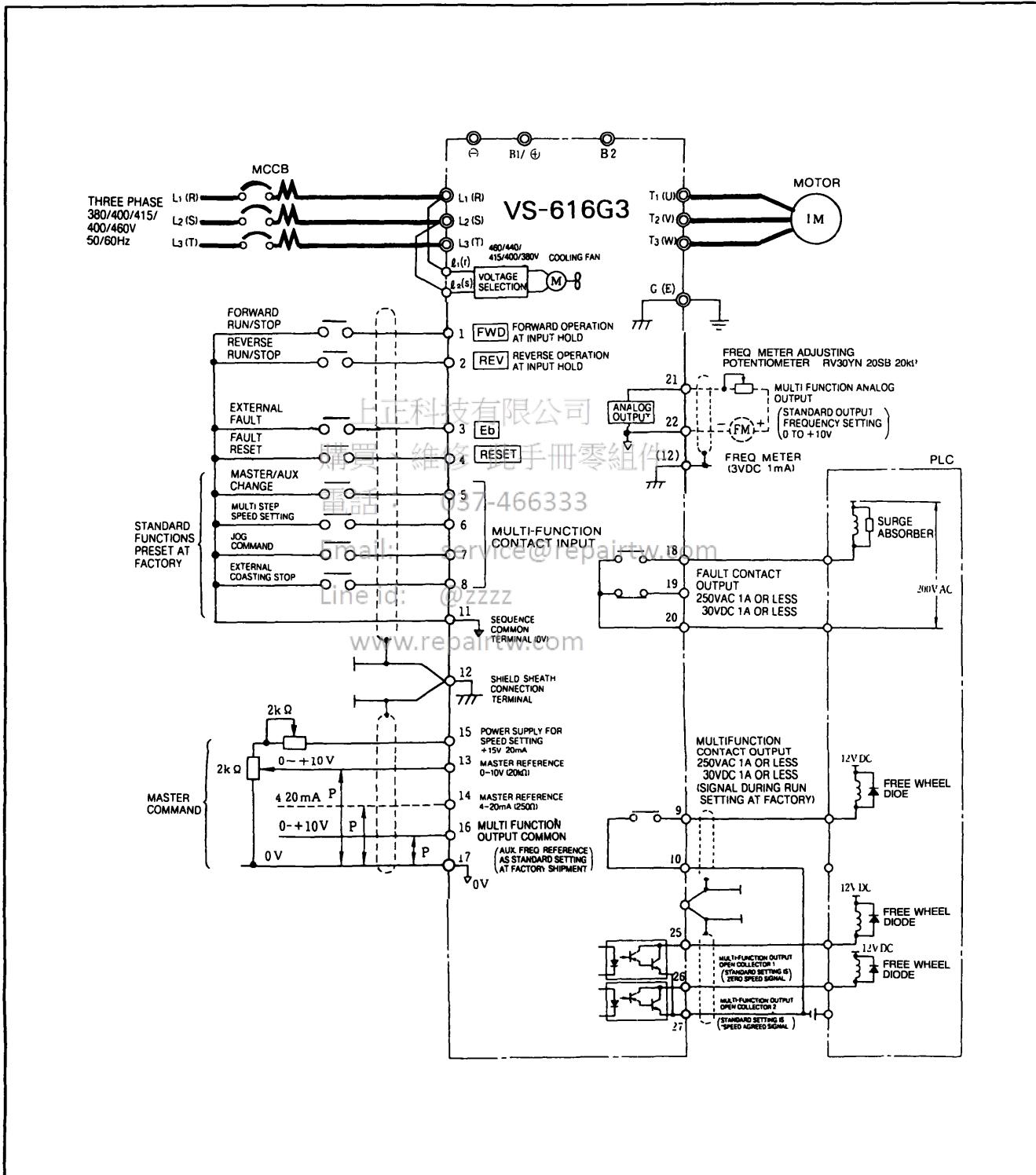
## With Transistor (Open Collector) Operation

### System Constant Setting

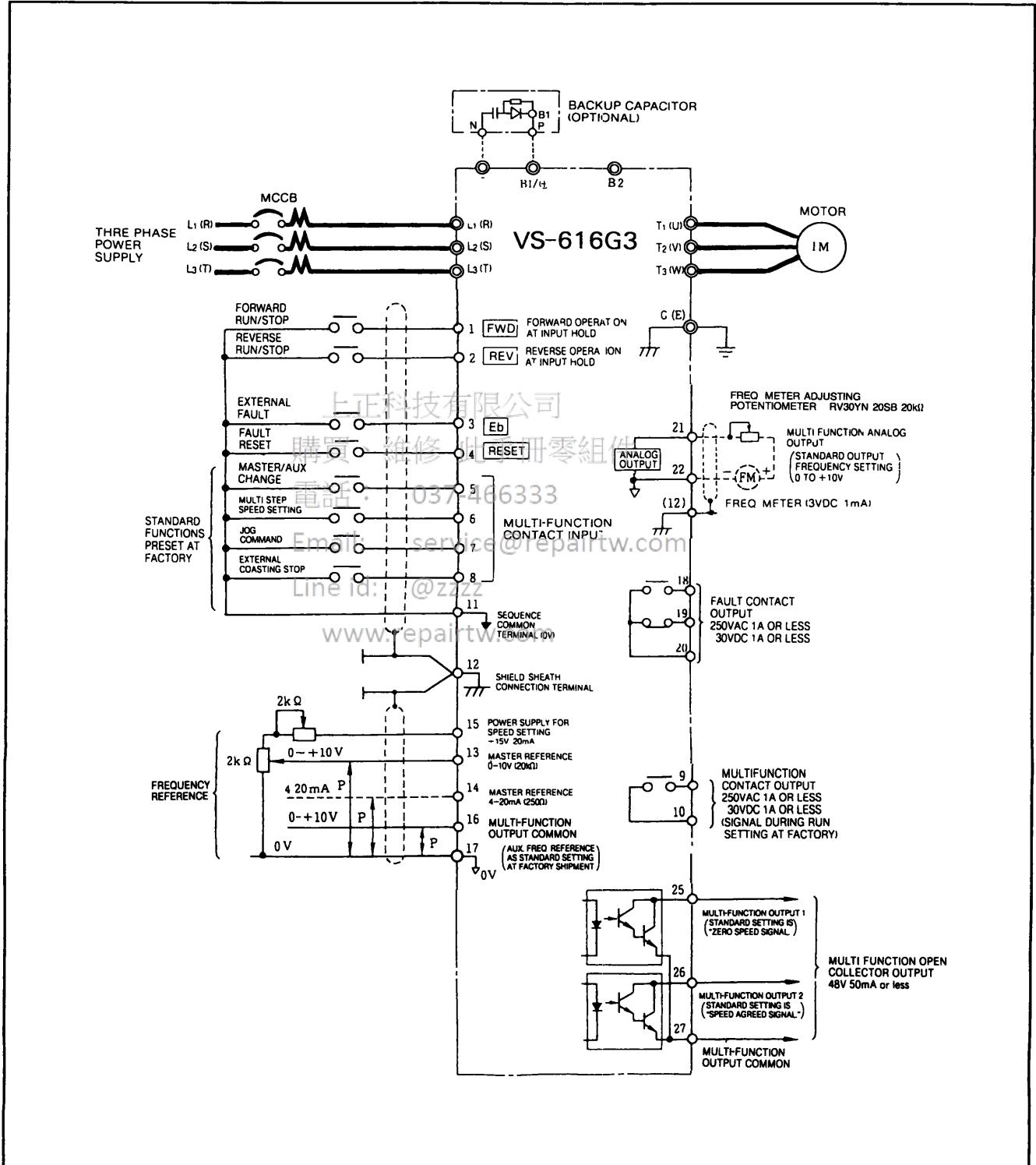
System Constant NO	Data			
	4th digit	3rd digit	2nd digit	1st digit
Sn-04	—	—	0	0



## With Contact Output, Open Collector Output



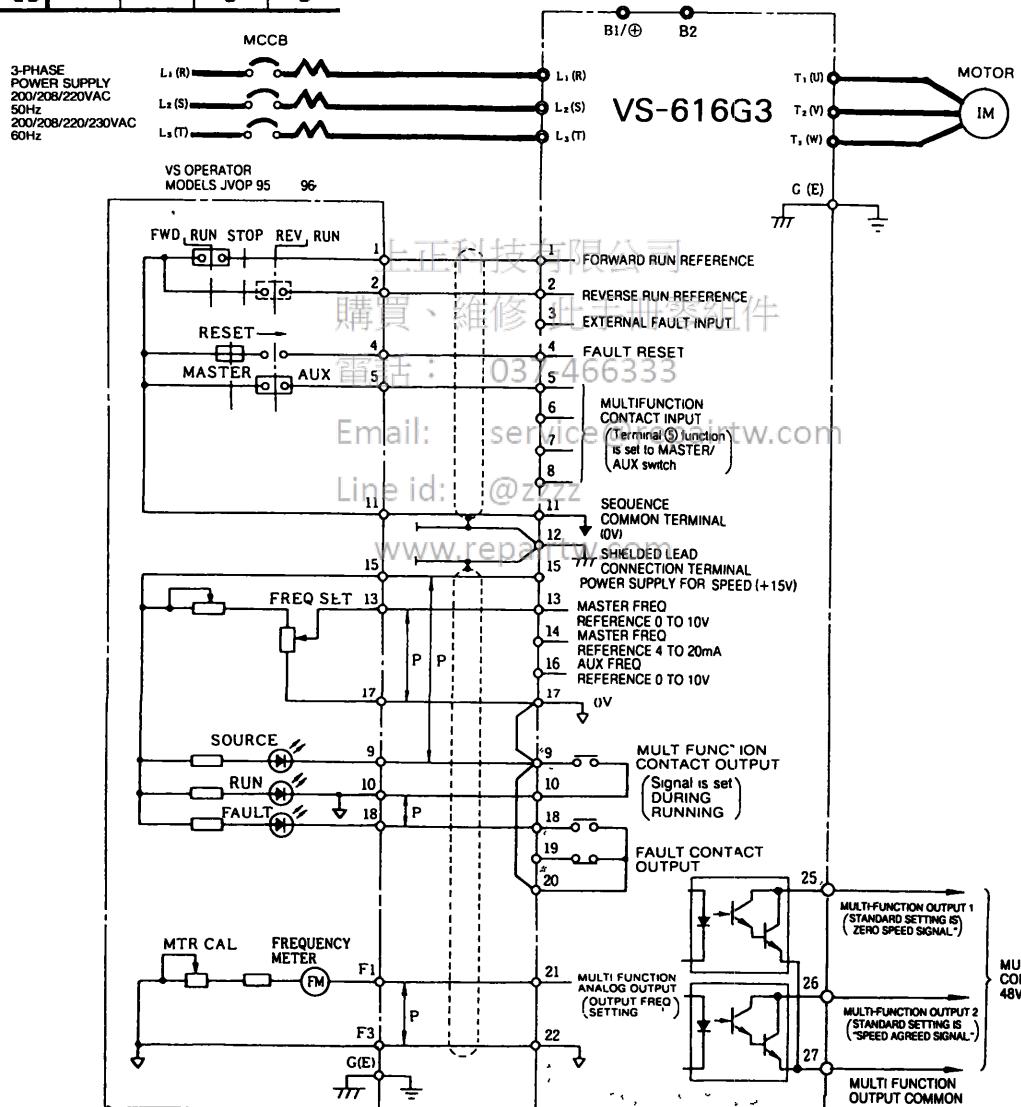
**Backup Capacitor for Momentary Power Loss** ( 200V class—4 1kVA and below )  
 ( 400V class—4 1kVA and below )



## With VS Operator Models JVOP - 95 □, - 96 □

### System Constant Setting

System Constant NO	Data			
	4th digit	3rd digit	2nd digit	1st digit
Sn-04	—	—	0	0
Sn-05	0	—	0	—
Sn-15	—	—	0	3
Sn-16	—	—	0	0
Sn-20	—	—	0	0

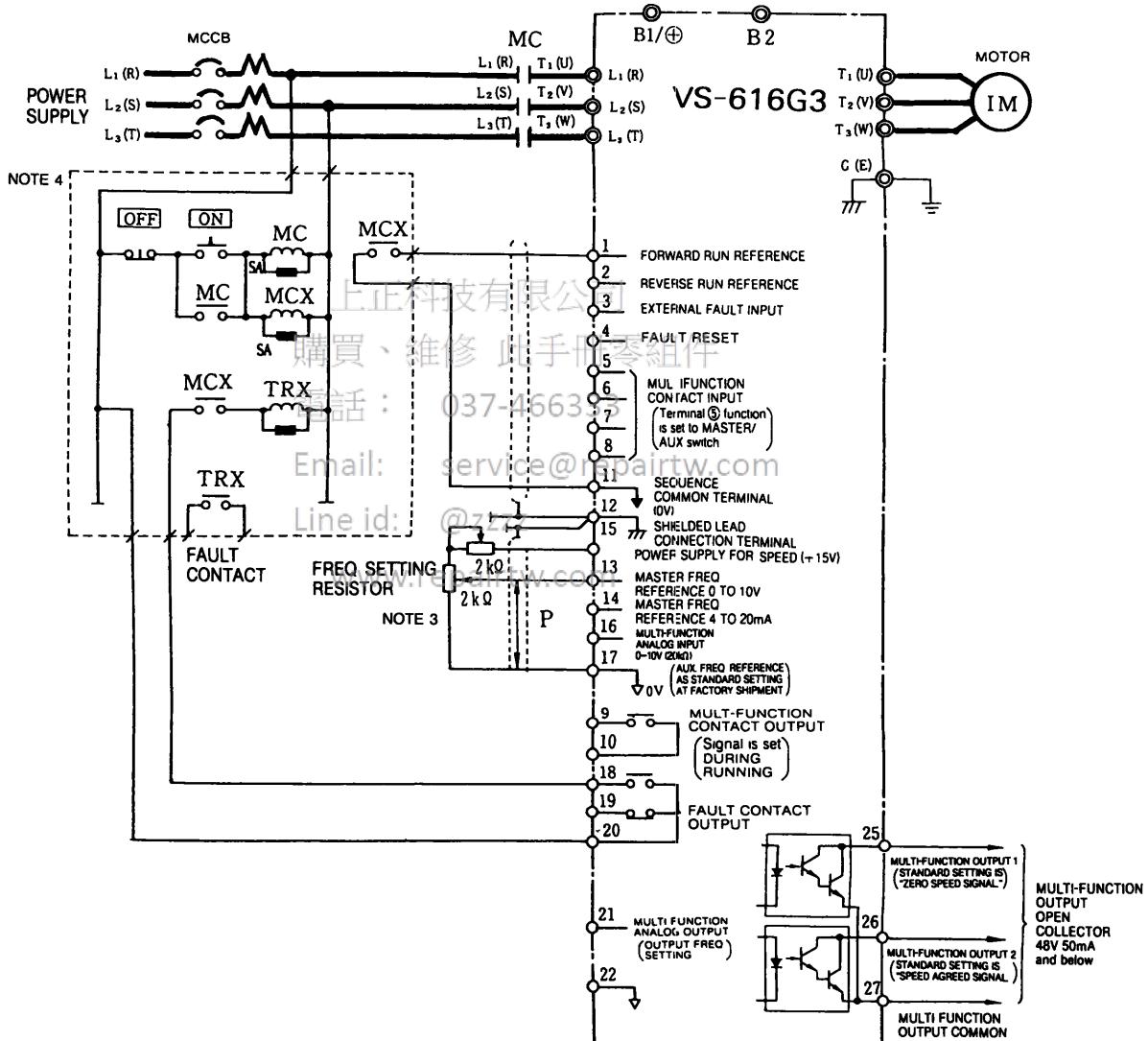


## With Power Supply Magnetic Contactor (MC)

### System Constant Setting

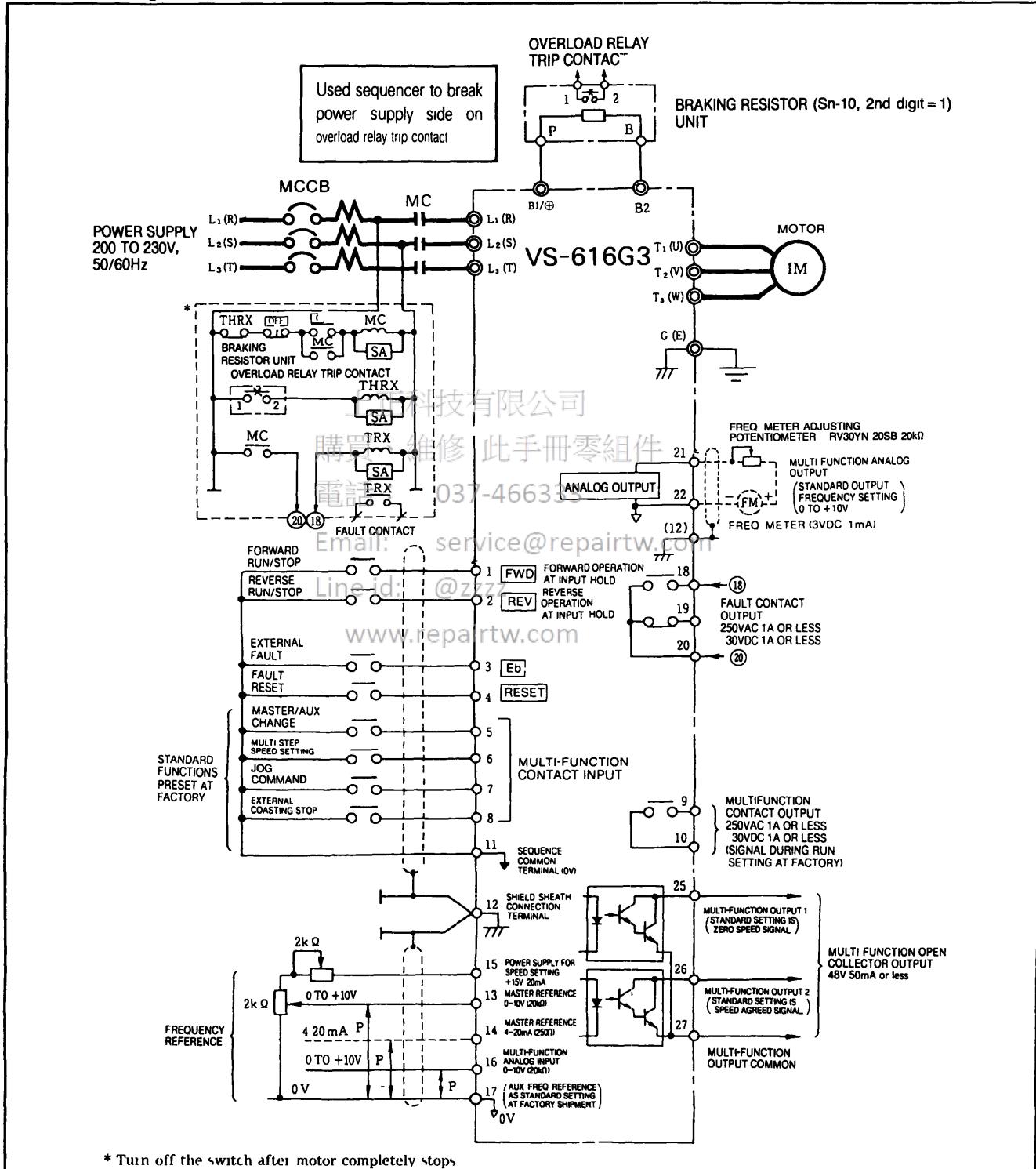
System Constant NO	Data			
	4th digit	3rd digit	2nd digit	1st digit
Sn-04	—	i	0	0*

- \* Frequency reference selection
- 0 Set by frequency setting resistor
- 1 Set value of digital operator (An-01)



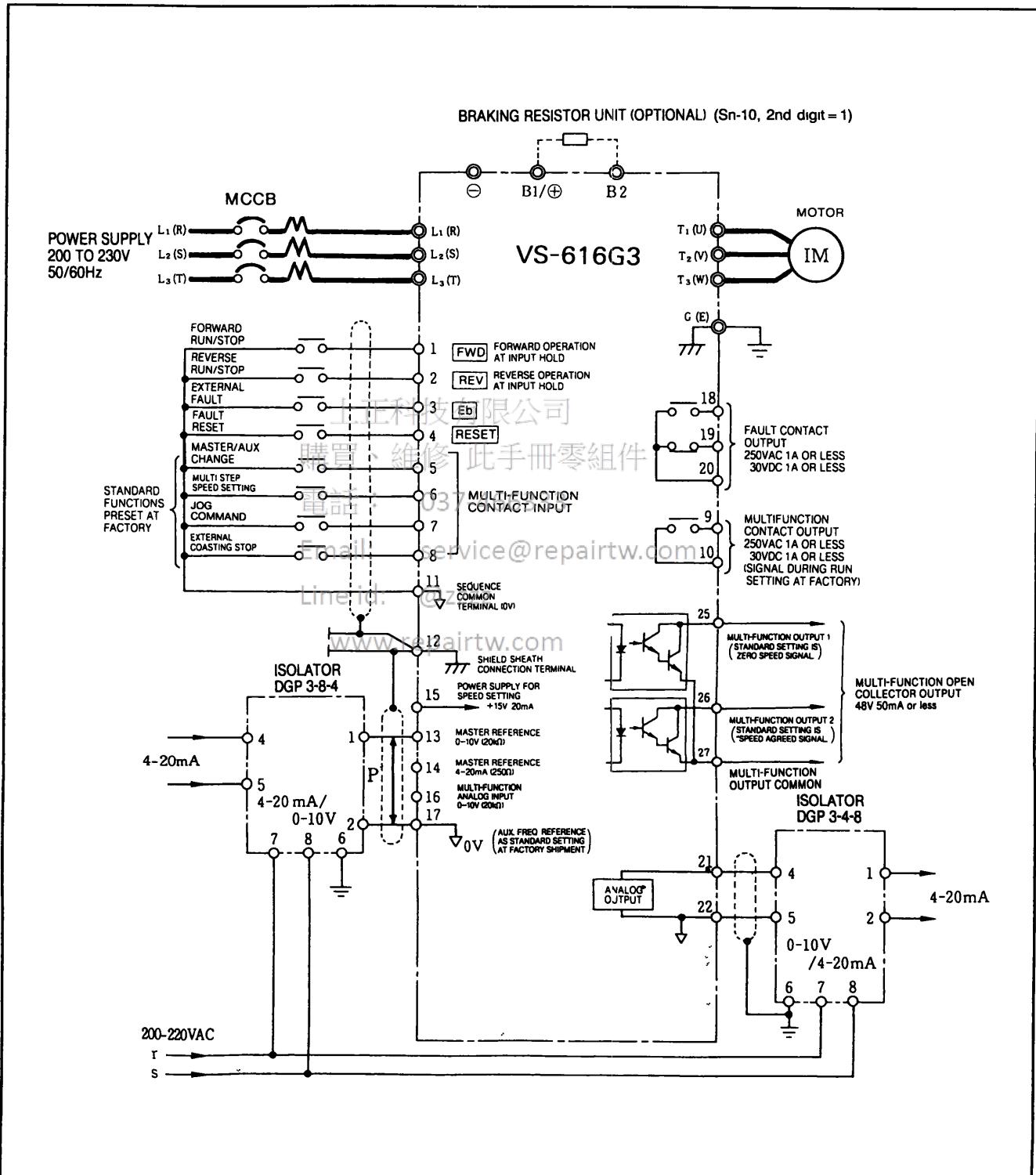
- Notes
- 1 Braking is not activated at deceleration stop. It coasts to a stop
  - 2 Use MC or MCX of delay release type for restart operation after momentary power loss
  - 3 Frequency setting resistor is not required for the use of digital operator's set value as frequency reference
  - 4 Turn off the switch after motor completely stops

## **With Braking Resistor Unit**



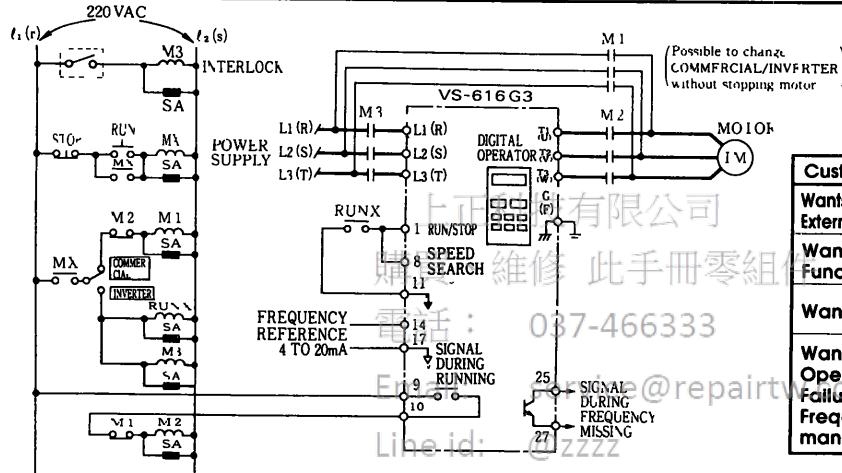
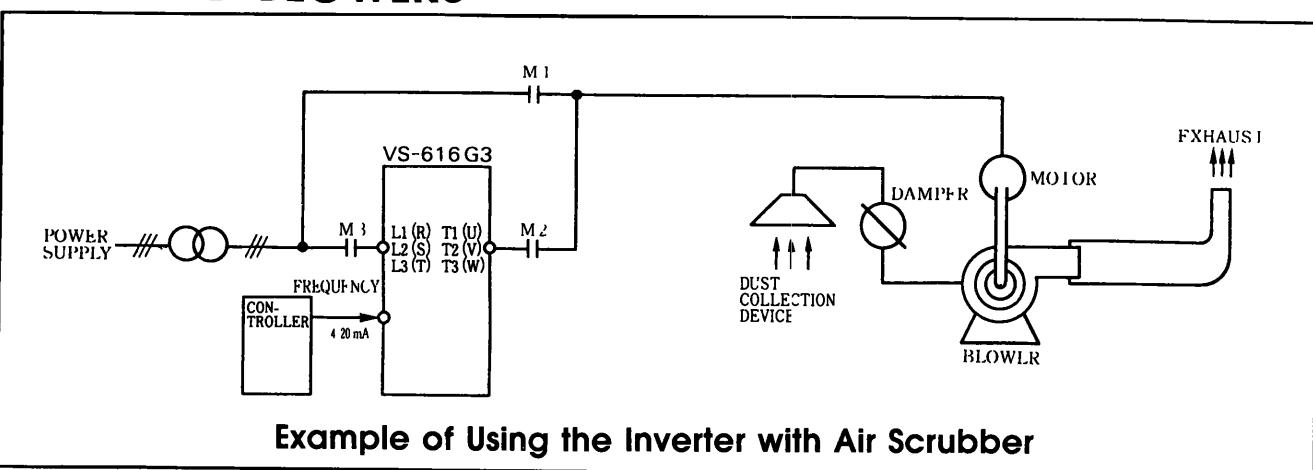
\* Turn off the switch after motor completely stops

## **With Isolator**



# CONTRIBUTES TO ENERGY-SAVING AND OPERATION

## FANS AND BLOWERS



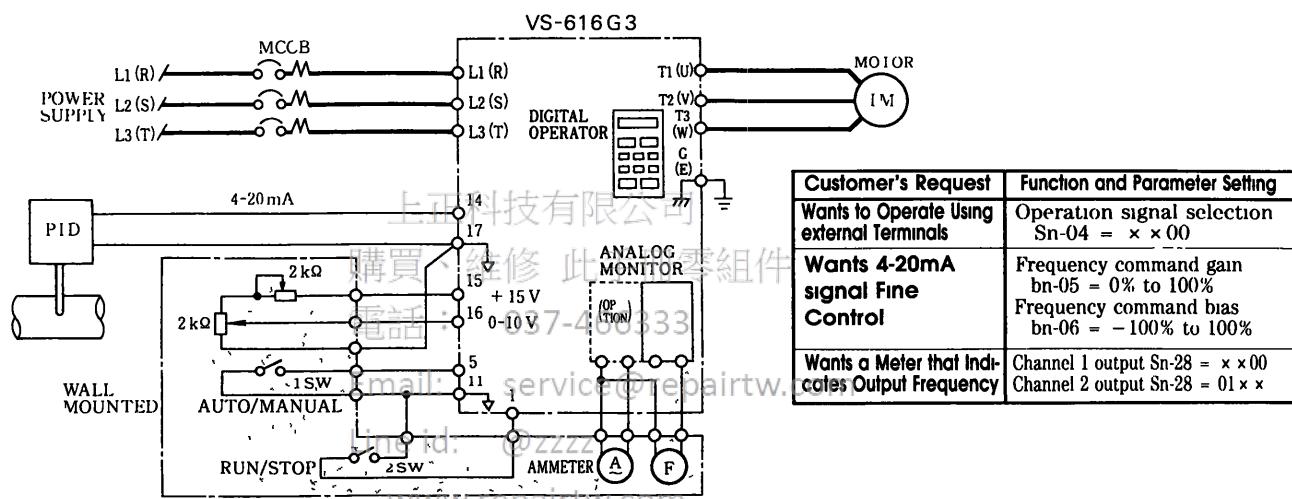
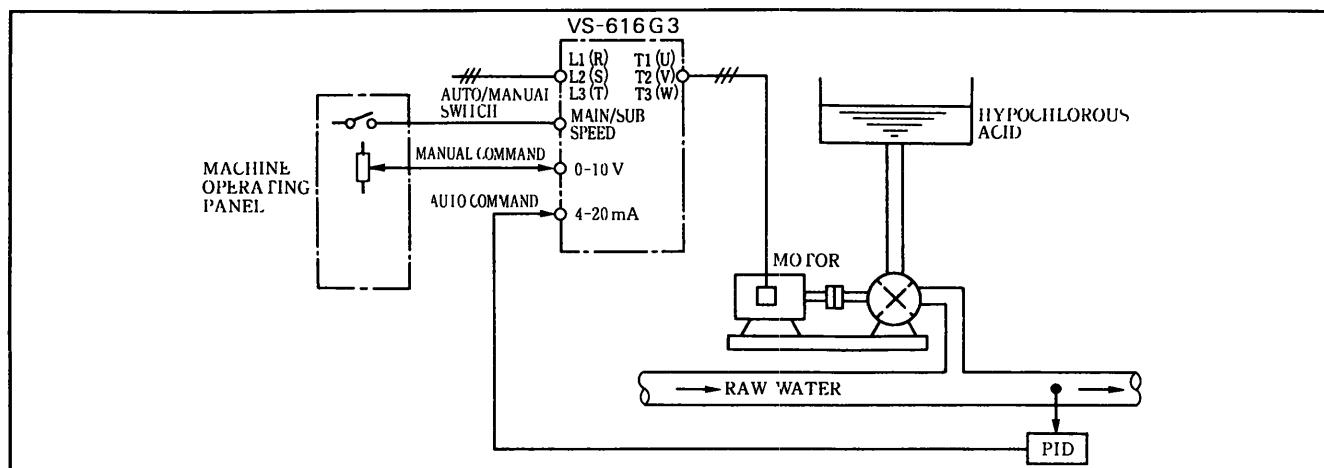
Customer's Request	Function and Parameter Setting
Wants to Operate Using External Terminals	Operation signal selection Sn-04 = x 00
Wants Speed Search Function	Multi-function input Sn-15 to Sn-18 = 61
Wants Coast to Stop	Stop procedure selection Sn-04 = 01 x x
Wants to Continue Operation even if Failure Occurs in Frequency Commanding Equipment	Automatic continuous operation mode when command is missing Sn-04 = 1 x x x Command missing signal Sn-20 to Sn-22 = 0C

### Details of the Commercial/Inverter Selector Circuit

Application example	Customer's Request	Applicable VS-616G3 Function	Function and Parameter Setting
Dust-collecting blower, fan for boilers	Wants to switch commercial power supply and inverter drive without stopping the motor	Use the speed search operation	Multi-function input Sn-15 to Sn-18 = 61 or 62
	Needs inverter start from coasting stop status Is it possible without stopping the motor?		
	Wants to save energy since the load is not heavy at low-speed operation	Apply the variable load V/f	V/f selection Sn-02 = 05
	Wants to avoid overload tripping	Apply the stall prevention function during-running	During-operation stall level change Cn-30 = 30 to 200%
	Wants to continue operation even when momentary power loss not longer than 2 seconds occurs	Select the instantaneous outage reset and restart mode	Momentary power loss protection Sn-11 = x 1 x x
Fan for cooling towers	Wants to continue operation even if a failure occurs in higher-order frequency commanding equipment	Select the automatic continuous operation mode when frequency command is missing	Operating signal selection when frequency command is missing Sn-06 = 1 x x x, Sn-20 to 22 = 0C
	Wants to monitor output power	Turn the monitor to the output power indication	Monitor display Un-06
	Needs r/min lower limit for lubricating the decelerator bearing	Use the frequency command lower limit	Frequency command lower limit Cn-15 = 0 to 109%
	Wants to avoid mechanical resonance (The resonance point will be passed, and continuous operation is eliminated at this point)	Use the preset frequency band prohibition function (frequency jump control) Up to 3 frequencies prohibited	Preset prohibited frequency Cn-16 to 18 = 0 to 400Hz  Preset prohibited frequency range Cn-19 = 0 to 25 5Hz
	Wants to prevent machine stop caused by inverter tripping	Use the retry function	Retry count Cn-36 = 0 to 10 times

# STABILITY MAKES AUTOMATIC CONTROL EASY

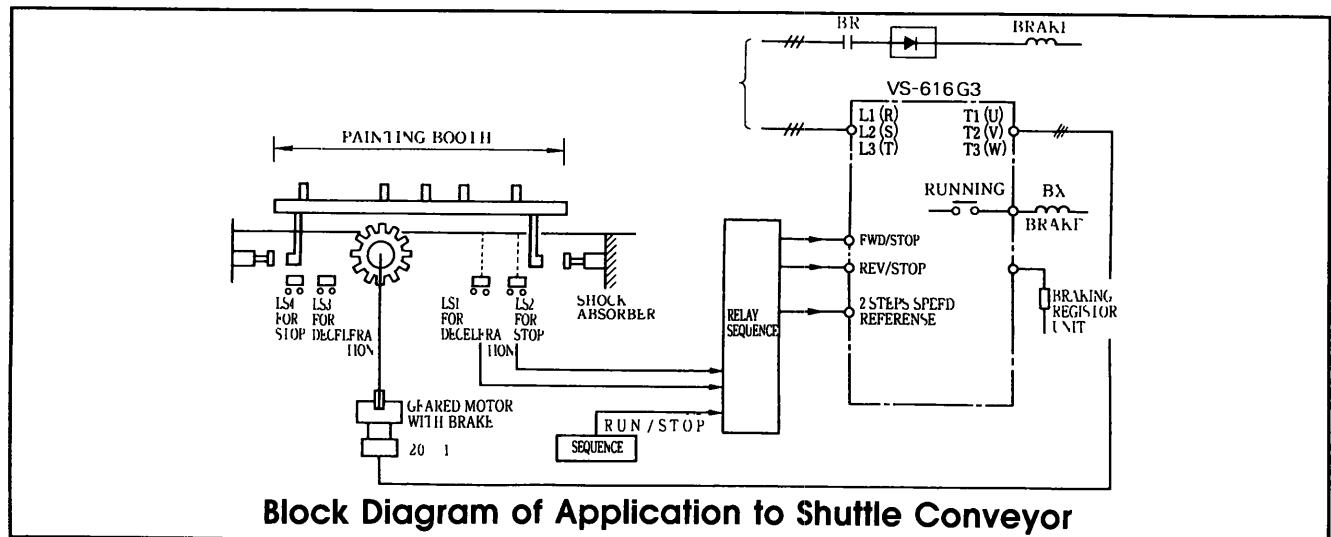
## PUMP



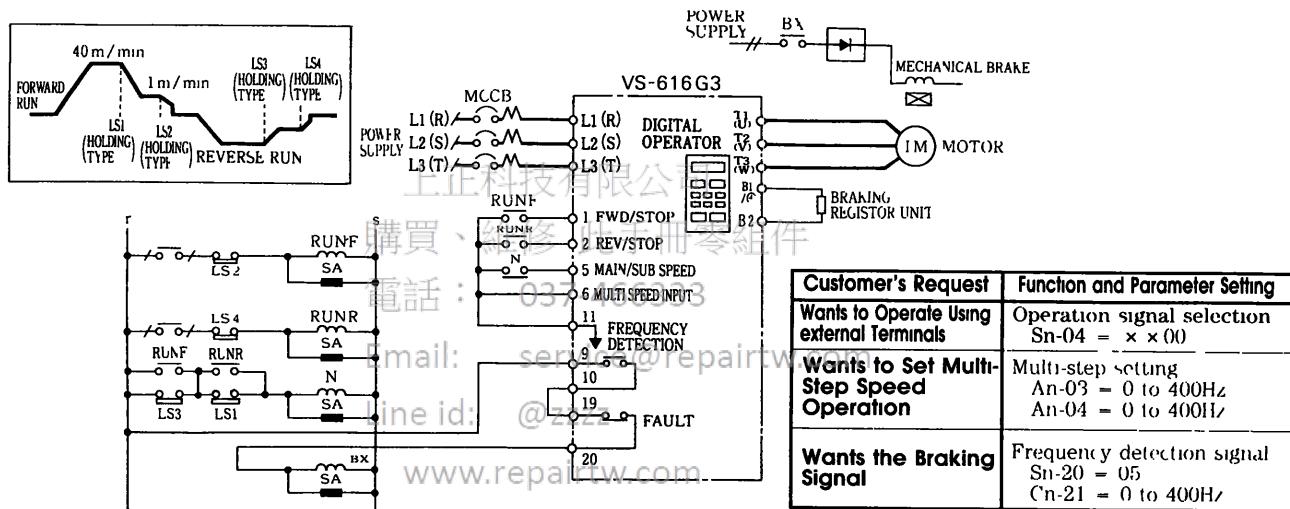
Man/Auto Switch Circuit

Application	Customer's Request	Applicable VS-616G3 Function	Function and Parameter Setting
Chemical-Feeding Pump	Wants to save energy since the load is not heavy at low-speed operation	Use torque compensation function Bn-07=1 0 Increment up/down in units of 0.1 and check current	Motor rated slip bn-08 = 0 to 9.9%, Motor rated current Cn-09 = 10 to 200A Motor no-load current Cn-34 = 0 to 99%, Slip correction primary lag time Cn-35 = 0 to 25.5s
	Wants to have Manual/Auto switching function	Use the Master/Aux switching function Two toggle switches do the job	Master/Aux switching Sn-15 to 18 = 03
	Needs an ammeter for monitoring load conditions	Use an F-I motor (option)	Output selection function Sn 28 = x x 00
Warm/Cold Water Circulation Pump	Wants to drive the pump directly using 4-20mA signal	Use external terminals (14) and (17)	Run signal selection Sn-04 = x x 00
	Wants a function which can maintain minimum speed	Use the lower-limit of the reference frequency	Frequency reference lower limit Cn 15 = 0 to 109%
	Wants to run the system using the commercial power supply when an emergency occurs, then return to inverter	Use a selector circuit together with the speed search function to restart turning motor	Speed search function selection Sn 15 to 18 = 61 or 62
	Wants a function which can keep the system working without resetting it even when a momentary power loss occurs	Use the continuous operation function which can compensate for a momentary power loss within two seconds. Use a toggle switch for selecting the start and stop of operations	Momentary power loss protection Sn 11 = x 1 x
Discharge Pump	Wants to keep a constant water level inside a tank using a water gauge	Read signals directly sent from the water-level adjusting unit (4 to 20 mA)	Run signal selection Sn 04 = x x 00
	Wants to keep the motor rpm above the minimum because if the rpm is too low, water flows in the reverse direction	Use the lower-limit of the frequency reference	Frequency ref lower limit Cn 15 = 0 to 109%

# Improves Safety and Enables Optimum Operation Setting



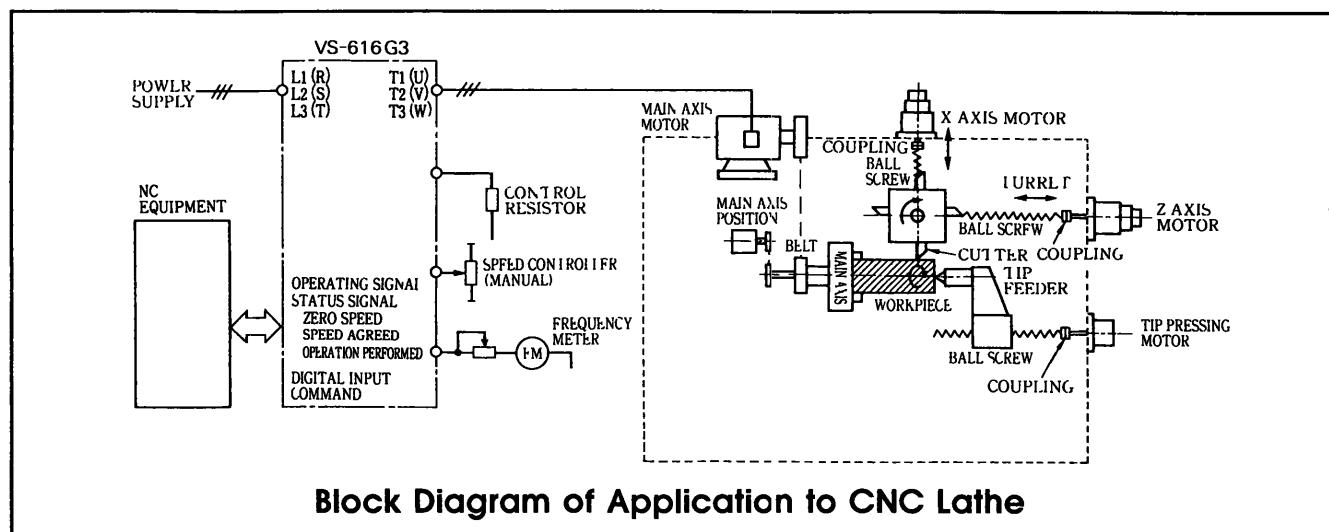
Block Diagram of Application to Shuttle Conveyor



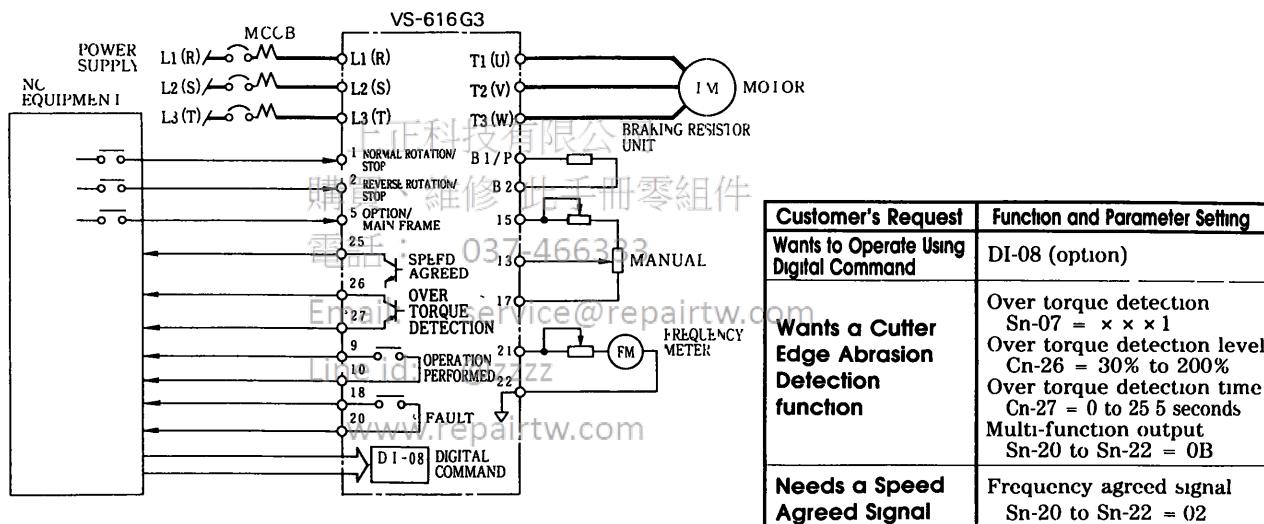
## For Application to Conveyor

Application	Customer's Request	Applicable VS-616G3 Function	Function and Parameter Setting
Shuttle Conveyor	Wants to increase precision of positioning stop	Control the braking motor using contact output from terminals 9 and 10	Operating signal selection Slip prevention Sn-04 = x x 0 x, Sn-20 = 05, Cn-21 = 0 to 400Hz
	Run at lower speeds	Torque compensation gain bn-07 = 0 to 9 9	
	Wants to perform two-step speed operation	Use the multi-step speed function	Multi-step operation An-01 to 04 = 0 to 400Hz
	Wants smooth accel/decel time	Apply non-linear accel/decel	Operating signal selection Sn 06 = x x □ selection
	Wants to vary accel/decel time	Use the accel/decel time setting function	Accel/decel time switching Sn-15 to 18 = 07
Raw Material Input Conveyor	Wants to select stop procedure according to degree of emergency	Select stop procedures	External fault Sn-15 to 18 = 20 to 5F
	Wants to increase starting torque (with a constant-torque motor)	Use the standard-equipped automatic torque boosting function	Torque compensation gain bn-07 = 0 to 9 9
Steel Pipe Conveyor	Wants to drive more than one motor with a single inverter	The function is provided	—
Lifter	Wants a simple slip compensation function	Check the motor generation torque by the excess torque detection function	Over torque detection Sn-07 = x x x 1 Over torque detection level Cn-26 = 30 to 200% Over torque detection time Cn-27 = 0 to 25 5S
	Wants to use the non-excitation operating type braking motor	Use the free V/f setting function to turn the motor without excess excitation	V/f selection Sn-02 = 0F Free V/f setting Cn-02 to 08 - Setting

# Improves Safety and Enables Optimum Operation Setting



Block Diagram of Application to CNC Lathe



## Interface Circuit to NC

Application	Customer's Request	Applicable VS-616G3 Function	Function and Parameter Setting
CNC Lathe	Needs a large constant-output range	Use the winding selection motor	Option
	Wants the cutting loss detection function	Apply the over torque detection function	Over torque detection Sn-07 = 0001 Over torque detection level Cn-26 = 30% to 200% Over torque detection time Cn-27 = 0 to 25 5 seconds Multi-function output Sn-20 to Sn-22 = 0B
	Wants to turn motor with digital input	Use the digital speed command equipment	Connect DI-08 Frequency command setting mode Sn-26 = select
		Apply the zero-speed function	Multi-function output Sn-20 to Sn-22 = 01
	Wants to interface to NC	Apply the speed agreed function	Multi-function output Sn-20 to Sn-22 = 02
Super High-precision Lathe		Apply the over torque detection function (Cutting loss)	Multi-function output Sn-20 to Sn-22 = 0B
	Wants to reduce vibration	Apply the energy-saving mode	Energy-saving operation Sn-15 to Sn-18 = 63 bn-9 = 0% to 200%

# YOU CAN RELY ON OUR REPLACEMENT

## Spare Parts for 200V Class (UL Listed)

VS-616G3 Model	Parts Name Specifications	Control PC Board	Power Board or Gate Driver†	Main Circuit Transistor	Main Circuit Diode	Fuse	Cooling Fan	Digital Operator
CIMR-G3U20P4□	Model	—	* —	6MBI10L-060	10L6P44	CR2LS-10/UL	—	JVOP-100
	Code ‡	ETC61313□-S514□ ETC61319□-S601□	ETP6U301□ ETP6U337□	STR000416	SID000429	FU000823	—	CDR000070
	Q'ty	1	1	1	1	1	—	1
CIMR-G3U20P7□	Model	—	—	6MBI15L-060	10L6P44	CR2LS-10/UL	—	JVOP-100
	Code ‡	ETC61313□-S514□ ETC61319□-S601□	ETP6U302□ ETP6U338□	STR000417	SID000429	FU000823	—	CDR000070
	Q'ty	1	1	1	1	1	—	1
CIMR-G3U21P5□	Model	—	—	6MBI20L-060	20L6P44	CR2LS-10/UL	—	JVOP-100
	Code ‡	ETC61313□-S514□ ETC61319□-S601□	ETP6U323□ ETP6U339□	STR000418	SID000433	FU000823	—	CDR000070
	Q'ty	1	1	1	1	1	—	1
CIMR-G3U22P2□	Model	—	—	6MBI30L-60	6RI30E-080	CR2LS-20/UL	4710NL-05W-B40	JVOP-100
	Code ‡	ETC61313□-S514□ ETC61319□-S601□	ETP6U324□ ETP6U340□	STR000419	SID000430	FU000799	FAN000137	CDR000070
	Q'ty	1	1	1	1	1	1	1
CIMR-G3U23P7□	Model	—	—	6MBI50L-60	6RI30E-080	CR2LS-30/UL	4710NL-05W-B40	JVOP-100
	Code ‡	ETC61313□-S514□ ETC61319□-S601□	ETP6U325□ ETP6U341□	STR000420	SID000430	FU000791	FAN000137	CDR000070
	Q'ty	1	1	1	1	1	1	1
CIMR-G3U25P5□	Model	—	—	MG75J2YS1	6RI50E-080	CR2LS-50/UL	4710NL-05W-B40	JVOP-100
	Code ‡	ETC61313□-S514□ ETC61318□-S601□	ETP61326□	STR000339	SID000431	FU000797	FAN000137	CDR000070
	Q'ty	1	1	3	1	1	1	1
CIMR-G3U27P5□	Model	—	—	MG100J2YS1	6RI75E-080	CR2LS-50/UL	4710NL-05W-B40	JVOP-100
	Code ‡	ETC61313□-S514□ ETC61318□-S601□	ETP61327□	STR000340	SID000432	FU000797	FAN000137	CDR000070
	Q'ty	1	1	3	1	1	1	1
CIMR-G3U2011□	Model	—	—	MG150J2YS1	100L6P41	CR2LS-75/UL	5915PC-22T-B30	JVOP-100
	Code ‡	ETC61313□-S514□ ETC61318□-S601□	ETC61302□	STR000364	SID000291	FU000792	FAN000131	CDR000070
	Q'ty	1	1	3	1	1	1	1
CIMR-G3U2015□	Model	—	—	MG200J2YS1	110L2G43	A50P100	5915PC-22T-B30	JVOP-100
	Code ‡	ETC61313□-S514□ ETC61318□-S601□	ETC61302□	STR000365	SID000412	FU000807	FAN000131	CDR000070
	Q'ty	1	1	3	3	1	1	1
CIMR-G3U2018□	Model	—	—	CM300HA-12	110L2G43	A50P150	5915PC-22T-B30	JVOP-100
	Code ‡	ETC61313□-S514□ ETC61318□-S601□	ETC61303□	STR000374	SID000412	FU000809	FAN000131	CDR000070
	Q'ty	1	1	6	3	1	1	1
CIMR-G3U2022□	Model	—	—	CM300HA-12	110L2G43	A50P150	5915PC-22T-B30	JVOP-100
	Code ‡	ETC61313□-S514□ ETC61318□-S601□	ETC61303□	STR000374	SID000412	FU000809	FAN000131	CDR000070
	Q'ty	1	1	6	3	1	1	1
CIMR-G3U2030□	Model	—	—	CM300HA-12E	160L2G43	A50P200	THA1V-U7556MX	JVOP-100
	Code	ETC61320□-S601□	ETC67046□	STR000478	SID000447	FU000810	FAN000191	CDR000070
	Q'ty	1	1	6	3	1	2	1
CIMR-G3U2037□	Model	—	—	CM400HA-12E	160L2G43	A50P275	THA1V-U7556MX	JVOP-100
	Code	ETC61320□-S601□	ETC67043□	STR000479	SID000447	FU000811	FAN000191	CDR000070
	Q'ty	1	1	6	6	1	2	1
CIMR-G3U2045□	Model	—	—	CM300HA-12E (2P)	160L2G43	A50P400	THA1V-U7556MX	JVOP-100
	Code	ETC61320□-S601□	ETC67016□	STR000456	SID000447	FU000938	FAN000191	CDR000070
	Q'ty	1	1	12	6	1	2	1
CIMR-G3U2055□	Model	—	—	CM300HA-12E (2P)	160L2G43	A50P400	THA1V-U7556MX	JVOP-100
	Code	ETC61320□-S601□	ETC67016□	STR000456	SID000447	FU000938	FAN000191	CDR000070
	Q'ty	1	1	12	6	1	2	1
CIMR-G3U2075□	Model	—	—	CM400HA-12E (2P)	160L2G43	AP50P600	THA1V-U7556MX	JVOP-100
	Code	ETC61320□-S601□	ETC67017□	STR000457	SID000447	FU000926	FAN000191	CDR000070
	Q'ty	1	1	12	9	1	2	1

\*It is recommended that the units be replaced for the part's faults in [ ] area.

†Gate drive PC board for CIMR-G3U2011 and above models.

‡For control PC boards and power boards, the upper code nos. are for models without revision mark and the lower for with revision mark "E" and beyond.

# EMENT PARTS STOCK

## Spare Parts for 200V Class (NON UL Listed)

VS-616G3 Model	Parts Name Specifications	Control PC Board	Power Board or Gate Driver†	Main Circuit Transistor	Main Circuit Diode	Fuse	Cooling Fan	Digital Operator
CIMR-G3A20P4□‡	Model	—	* —	6MBI10L-060	10L6P44	CR2LS-10/UL	—	JVOP-100
	Code ‡	ETC61313□-S004□ ETC61311□-S004□ ETC61319□-S101□	ETP61301□ ETP61332□ ETP61337□	STR000416	SID000429 SID000540 SID000540	FU000823	—	CDR000070
	Q'ty	1	1	1	1	1	—	1
CIMR-G3A20P7□‡	Model	—	—	6MBI15L-060	10L6P44	CR2LS-10/UL	—	JVOP-100
	Code ‡	ETC61313□-S004□ E1C61311□-S004□ ETC61319□-S101□	ETP61302□ ETP61333□ ETP61338□	STR000417	SID000429 SID000540 SID000540	FU000823	—	CDR000070
	Q'ty	1	1	1	1	1	—	1
CIMR-G3A21P5□‡	Model	—	—	6MBI20L-060	20L6P44	CR2LS-10/UL	—	JVOP-100
	Code ‡	ETC61313□-S004□ ETC61311□-S004□ ETC61319□-S101□	E1P61323□ ETP61334□ ETP61339□	STR000418	SID000433	FU000823	—	CDR000070
	Q'ty	1	1	1	1	1	—	1
CIMR-G3A22P2□‡	Model	—	—	6MBI30L-060	6RI30E-080	CR2LS-20/UL	4710NL-05W-B40	JVOP-100
	Code ‡	ETC61313□-S004□ ETC61311□-S004□ ETC61319□-S101□	ETP61324□ ETP61335□ ETP61340□	STR000419	SID000430	FU000799	FAN000137	CDR000070
	Q'ty	1	1	1	1	1	1	1
CIMR-G3A23P7□‡	Model	—	—	6MBI50L-060	6RI30E-080	CR2LS-30/UI	4710NL-05W-B40	JVOP-100
	Code ‡	E1C61313□-S004□ E1C61311□-S004□ ETC61319□-S101□	ETP61325□ ETP61336□ ETP61341□	STR000420	SID000430	FU000791	FAN000137	CDR000070
	Q'ty	1	1	1	1	1	1	1
CIMR-G3A25P5□	Model	—	—	MG75J2YS1	6RI50E-080	CR2LS-50/UL	4710NL-05W-B40	JVOP-100
	Code **	ETC61313□-S004□ ETC61318□-S101□	ETP61326□	STR000339	SID000431	FU000797	FAN000137	CDR000070
	Q'ty	1	3	1	1	1	1	1
CIMR-G3A27P5□	Model	—	—	MG100J2YS1	6RI75E-080	CR2LS-50/UL	4710NL-05W-B40	JVOP-100
	Code **	ETC61313□-S004□ ETC61318□-S101□	ETP61327□	STR000340	SID000432	FU000797	FAN000137	CDR000070
	Q'ty	1	3	3	1	1	1	1
CIMR-G3A2011□	Model	—	—	MG100J2YS1	10L6P41	CR2LS-75/UI	5915PC-22T-B30	JVOP-100
	Code **	ETC61313□-S004□ ETC61318□-S101□	ETP61302□	STR000364	SID000291	FU000792	FAN000131	CDR000070
	Q'ty	1	1	3	1	1	1	1
CIMR-G3A2015□	Model	—	—	MG200J2YS1	110L2G43	CR2LS-100	5915PC-22T-B30	JVOP-100
	Code **	ETC61313□-S004□ ETC61318□-S101□	ETC61302□	STR000365	SID000412	FU000794	FAN000131	CDR000070
	Q'ty	1	1	3	3	1	1	1
CIMR-G3A2018□	Model	—	—	CM300HA-12	110L2G43	CR2L-150	5915PC-22T-B30	JVOP-100
	Code **	ETC61313□-S004□ ETC61318□-S101□	ETC61303□	STR000374	SID000412	FU000750	FAN000131	CDR000070
	Q'ty	1	1	6	3	1	1	1
CIMR-G3A2022□	Model	—	—	CM300HA-12	110L2G43	CR2L-150	5915PC-22T-B30	JVOP-100
	Code **	ETC61313□-S004□ ETC61318□-S101□	ETC61303□	STR000374	SID000412	FU000750	FAN000131	CDR000070
	Q'ty	1	1	6	3	1	1	1
CIMR-G3A2030□	Model	—	—	CM300HA-12E	160L2G43	CR2L-200	THAIV-7556XV	JVOP-100
	Code	ETC61320□-S101□	ETC67046□	STR000478	SID000447	FU000751	FAN000176	CDR000070
	Q'ty	1	1	6	3	1	2	1
CIMR-G3A2037□	Model	—	—	CM400HA-12E	160L2G43	CR2L-260	THAIV-7556XV	JVOP-100
	Code	ETC61320□-S101□	ETC67043□	STR000479	SID000447	FU000752	FAN000176	CDR000070
	Q'ty	1	1	6	6	1	2	1
CIMR-G3A2045□	Model	—	—	CM300HA-12E (2P)	160L2G43	CR2L-450	THAIV-7556XV	JVOP-100
	Code	ETC61320□-S101□	ETC67016□	STR000456	SID000447	FU000825	FAN000176	CDR000070
	Q'ty	1	1	12	6	1	2	1
CIMR-G3A2055□	Model	—	—	CM300HA-12E (2P)	160L2G43	CR2L-450	THAIV-7556XV	JVOP-100
	Code	ETC61320□-S101□	ETC67016□	STR000456	SID000447	FU000825	FAN000176	CDR000070
	Q'ty	1	1	12	6	1	2	1
CIMR-G3A2075□	Model	—	—	CM400HA-12E (2P)	160L2G43	CR2L-600	THAIV-7556XV	JVOP-100
	Code	ETC61320□-S101□	ETC67017□	STR000457	SID000447	FU000923	FAN000176	CDR000070
	Q'ty	1	1	12	9	1	2	1

\* For faults in [ ] area, it is recommended that all affected units be replaced.

† Gate drive PC board for CIMR-G3A2011 and above models.

‡ For models CIMR-G3A20P4 to -G3A23P7, the upper code nos. are for the face plate specification without revision mark or with revision "A", and the middle codes for with revision "B", and the lower codes for with revision E and beyond.

\*\*For control PC boards, the upper code nos. are for models without revision mark and the lower for with revision mark "E" and beyond

# Spare Parts for 400V Class (UL Listed)

VS-616G3 Model	Parts Name Specifi- cations	Control PC Board	Power Board or Gate Driver†	Main Circuit Transistor	Main Circuit Diode	Fuse	Cooling Fan	Digital Operator	Chopper PC Board
CIMR-G3U40P4□	Model	—	* —	6MBI8-120	RM10TA-24	A70P15	4710NL-05W-B40	JVOP-100	—
	Code ‡	ETC61313□-S514□ ETC61318□-S601□	ETPGU308□ ETPGU342□	STR000344	SID000434	FU000840	FAN000137	CDR000070	ETC61304□
	Q'ty	1	1	1	1	1	1	1	1
CIMR-G3U40P7□	Model	—	—	6MBI8-120	RM10TA-24	A70P15	4710NL-05W-B40	JVOP-100	—
	Code ‡	ETC61313□-S514□ ETC61318□-S601□	ETPGU308□ ETPGU342□	STR000344	SID000434	FU000840	FAN000137	CDR000070	ETC61304□
	Q'ty	1	1	1	1	1	1	1	1
CIMR-G3U41P5□	Model	—	—	6MBI15-120	RM10TA-24	A70P15	4710NL-05W-B40	JVOP-100	—
	Code ‡	ETC61313□-S514□ ETC61318□-S601□	ETPGU329□ ETPGU343□	STR000345	SID000434	FU000840	FAN000137	CDR000070	ETC61304□
	Q'ty	1	1	1	1	1	1	1	1
CIMR-G3U42P2□	Model	—	—	6MBI15-120	RM10TA-24	A70P15	4710NL-05W-B40	JVOP-100	—
	Code ‡	ETC61313□-S514□ ETC61318□-S601□	ETPGU329□ ETPGU343□	STR000345	SID000434	FU000840	FAN000137	CDR000070	ETC61304□
	Q'ty	1	1	1	1	1	1	1	1
CIMR-G3U43P7□	Model	—	—	2MBI25-120	30Q6P42	A70P30	4710NL-05W-B40	JVOP-100	—
	Code ‡	ETC61313□-S514□ ETC61318□-S601□	ETPGU330□ ETPGU344□	STR000367	SID000435	FU000853	FAN000137	CDR000070	ETC61304□
	Q'ty	1	1	3	1	1	1	1	1
CIMR-G3U45P5□	Model	—	—	2MBI50-120	30Q6P42	A70P30	4710NL-05W-B40	JVOP-100	—
	Code ‡	ETC61313□-S514□ ETC61318□-S601□	ETPGU331□ ETPGU345□	STR000368	SID000435	FU000853	FAN000137	CDR000070	ETC61304□
	Q'ty	1	1	3	1	1	1	1	1
CIMR-G3U47P5□	Model	—	—	2MBI50-120	30Q6P42	A70P30	4710NL-05W-B40	JVOP-100	—
	Code ‡	ETC61313□-S514□ ETC61318□-S601□	ETPGU331□ ETPGU345□	STR000368	SID000435	FU000853	FAN000137	CDR000070	ETC61304□
	Q'ty	1	1	3	1	1	1	1	1
CIMR-G3U4011□	Model	—	—	MG75Q2YS1	50Q6P43	A70P50	HS4556MV	JVOP-100	—
	Code ‡	ETC61313□-S514□ ETC61318□-S601□	ETC61305□	STR000353	SID000407	FU000767	FAN000186	CDR000070	ETC61304□
	Q'ty	1	1	3	1	1	1	1	1
CIMR-G3U4015□	Model	—	—	MG100Q2YS1	75Q6P43	A70P50	UHS4556M	JVOP-100	—
	Code ‡	ETC61313□-S514□ ETC61318□-S601□	ETC61305□	STR000354	SID000443	FU000767	FAN000186	CDR000070	ETC61304□
	Q'ty	1	1	3	1	1	1	1	1
CIMR-G3U4018□	Model	—	—	MG150Q2YS1	100Q6P43	A70P100	5915PC-22T-B30	JVOP-100	—
	Code ‡	ETC61313□-S514□ ETC61318□-S601□	ETC61306□	STR000355	SID000408	FU000854	FAN000186	CDR000070	ETC61304□
	Q'ty	1	1	3	1	1	1	1	1
CIMR-G3U4022□	Model	—	—	MG150Q2YS1	100Q6P43	A70P100	5915PC-22T-B30	JVOP-100	—
	Code ‡	ETC61313□-S514□ ETC61318□-S601□	ETC61306□	STR000355	SID000408	FU000854	FAN000186	CDR000070	ETC61304□
	Q'ty	1	1	3	1	1	1	1	1
CIMR-G3U4030□	Model	—	—	CM300HA-24	110Q2G43	A70P125	5915PC-22T-B30	JVOP-100	—
	Code ‡	ETC61313□-S514□ ETC61318□-S601□	ETC61308□	STR000376	SID000409	FU000784	FAN000131	CDR000070	—
	Q'ty	1	1	6	3	1	1	1	1
CIMR-G3U4037□	Model	—	—	CM300HA-24	110Q2G43	A70P150	5915PC-22T-B30	JVOP-100	—
	Code ‡	ETC61313□-S514□ ETC61318□-S601□	ETC61308□	STR000376	SID000409	FU000770	FAN000131	CDR000070	—
	Q'ty	1	1	6	3	1	1	1	1
CIMR-G3U4045□	Model	—	—	CM300HA-24	110Q2G43	A70P150	5915PC-22T-B30	JVOP-100	—
	Code ‡	ETC61313□-S514□ ETC61318□-S601□	ETC61308□	STR000376	SID000409	FU000770	FAN000131	CDR000070	—
	Q'ty	1	1	6	3	1	1	1	1
CIMR-G3U4L45□	Model	—	—	CM400HA-24	110Q2G43	A70P130	4715S-2T-B30	5915PC-22T-B30	JVOP-100
	Code ‡	ETC61313□-S514□ ETC61318□-S601□	ETC61312□	STR000385	SID000409	FU000770	FAN000130	FAN000131	CDR000070
	Q'ty	1	1	6	3	1	1	1	1
CIMR-G3U4055□	Model	—	—	CM400HA-24	160Q2G43	CR6L-200/UL	THA1V-U7556MX	JVOP-100	—
	Code	ETC61320□-S601□	ETC67030□	STR000385	SID000410	FU000929	FAN000191	CDR000070	—
	Q'ty	1	1	6	6	1	2	1	—
CIMR-G3U4075□	Model	—	—	CM400HA-24	160Q2G43	CR6L-300/UL	THA1V-U7556MX	JVOP-100	—
	Code	ETC61320□-S601□	ETC67031□	STR000385	SID000410	FU000930	FAN000191	CDR000070	—
	Q'ty	1	1	6	6	1	2	1	—
CIMR-G3U4110□	Model	—	—	CM300HA 24E(2P)	160Q2G43	A70P350	THA1V-U7556MX	JVOP-100	—
	Code	ETC61320□-S601□	ETC67035□	STR000468	SID000410	FU000803	FAN000191	CDR000070	—
	Q'ty	1	1	12	9	1	2	1	—
CIMR-G3U4160□	Model	—	—	CM400HA 24E (2P)	RM250DZ-24	A70P600	THA1V-U7556MX	JVOP-100	—
	Code	ETC61320□-S601□	ETC67039□	STR000469	SID000411	FU000924	FAN000191	CDR000070	—
	Q'ty	1	1	12	6	1	2	1	—
CIMR-G3U4185□	Model	Contact your YASKAWA representative							
CIMR-G3U4220□	Code								
CIMR-G3U4300□	Code								
	Q'ty								

\*It is recommended the whole proper units be replaced for the part's faults in  area.

†Gate drive PC board for CIMR-G3U4011 and above models.

‡For control PC boards and power boards, the upper code nos are for models without revision mark and the lower for with revision mark "E" and beyond

# Spare Parts for 400V Class (NON UL Listed)

VS-616G3 Model	Parts Name Specifi- cations	Control PC Board	Power Board or Gate Driver†	Main Circuit Transistor	Main Circuit Diode	Fuse	Cooling Fan	Digital Operator	Chopper PC Board
CIMR-G3A40P4□	Model	—	* —	6MBI8-120	RM10TA-24	80LF15	4710NL-05W-B40	JVOP-100	—
	Code ‡	ETC61313□-S004□ ETC61318□-S101□	ETP61308□ ETP61342□	STR000344	SID000434	FU000760	FAN000137	CDR000070	ETC61304□
	Q'ty	1	1	1	1	1	1	1	1
CIMR-G3A40P7□	Model	—	—	6MBI8-120	RM10TA-24	80LF15	4710NL-05W-B40	JVOP-100	—
	Code ‡	ETC61313□-S004□ ETC61318□-S101□	ETP61308□ ETP61342□	STR000344	SID000434	FU000760	FAN000137	CDR000070	ETC61304□
	Q'ty	1	1	1	1	1	1	1	1
CIMR-G3A41P5□	Model	—	—	6MBI5-120	RM10TA-24	80LF15	4710NL-05W-B40	JVOP-100	—
	Code ‡	ETC61313□-S004□ ETC61318□-S101□	ETP61329□ ETP61343□	STR000345	SID000434	FU000760	FAN000137	CDR000070	ETC61304□
	Q'ty	1	1	1	1	1	1	1	1
CIMR-G3A42P2□	Model	—	—	6MBI5-120	RM10TA-24	80LF15	4710NL-05W-B40	JVOP-100	—
	Code ‡	ETC61313□-S004□ ETC61318□-S101□	ETP61329□ ETP61343□	STR000345	SID000434	FU000760	FAN000137	CDR000070	ETC61304□
	Q'ty	1	1	1	1	1	1	1	1
CIMR-G3A43P7□	Model	—	—	2MBI25-120	30Q6P42	80LF25	4710NL-05W-B40	JVOP-100	—
	Code ‡	ETC61313□-S004□ ETC61318□-S101□	ETP61330□ ETP61344□	STR000367	SID000435	FU000761	FAN000137	CDR000070	ETC61304□
	Q'ty	1	1	3	1	1	1	1	1
CIMR-G3A45P5□	Model	—	—	2MBI50-120	30Q6P42	80LF25	4710NL-05W-B40	JVOP-100	—
	Code ‡	ETC61313□-S004□ ETC61318□-S101□	ETP61331□ ETP61345□	STR000368	SID000435	FU000761	FAN000137	CDR000070	ETC61304□
	Q'ty	1	1	3	1	1	1	1	1
CIMR-G3A47P5□	Model	—	—	2MBI50-120	30Q6P42	80LF25	4710NL-05W-B40	JVOP-100	—
	Code ‡	ETC61313□-S004□ ETC61318□-S101□	ETP61331□ ETP61345□	STR000368	SID000435	FU000761	FAN000137	CDR000070	ETC61304□
	Q'ty	1	1	3	1	1	1	1	1
CIMR-G3A4011□	Model	—	—	MG75Q2YS1	50Q6P43	80LF50	HS4556MV	JVOP-100	—
	Code ‡	ETC61313□-S004□ ETC61318□-S101□	ETC61305□	STR000353	SID000407	FU000762	FAN000110	CDR000070	ETC61304□
	Q'ty	1	1	3	1	1	1	1	1
CIMR-G3A4015□	Model	—	—	MG100Q2YS1	75Q6P43	80LF50	HS4556MV	JVOP-100	—
	Code ‡	ETC61313□-S004□ ETC61318□-S101□	ETC61305□	STR000354	SID000443	FU000762	FAN000110	CDR000070	ETC61304□
	Q'ty	1	1	3	1	1	1	1	1
CIMR-G3A4018□	Model	—	—	MG150Q2YS1	100Q6P43	CR6L-100	5915PC-22T-B30	JVOP-100	—
	Code ‡	ETC61313□-S004□ ETC61318□-S101□	ETC61306□	STR000355	SID000408	FU000758	FAN000131	CDR000070	—
	Q'ty	1	1	3	1	1	1	1	—
CIMR-G3A4022□	Model	—	—	MG150Q2YS1	100Q6P43	CR6L-100	5915PC-22T-B30	JVOP-100	—
	Code ‡	ETC61313□-S004□ ETC61318□-S101□	ETC61306□	STR000355	SID000408	FU000758	FAN000131	CDR000070	—
	Q'ty	1	1	3	1	1	1	1	—
CIMR-G3A4030□	Model	—	—	CM300HA-24	110Q2G43	CR6L-100	5915PC-22T-B30	JVOP-100	—
	Code **	ETC61301□-S001□ ETC61313□-S004□ ETC61318□-S101□	ETC61308□	STR000376	SID000409	FU000758	FAN000131	CDR000070	—
	Q'ty	1	1	6	3	1	1	1	—
CIMR-G3A4037□	Model	—	—	CM300HA-24	110Q2G43	CR6L-150	5915PC-22T-B30	JVOP-100	—
	Code **	ETC61301□-S001□ ETC61313□-S004□ ETC61318□-S101□	ETC61308□	STR000376	SID000409	FU000756	FAN000131	CDR000070	—
	Q'ty	1	1	6	3	1	1	1	—
CIMR-G3A4045□	Model	—	—	CM300HA-24	110Q2G43	CR6L-150	5915PC-22T-B30	JVOP-100	—
	Code **	ETC61313□-S004□ ETC61318□-S101□	ETC61308□	STR000376	SID000409	FU000756	FAN000131	CDR000070	—
	Q'ty	1	1	6	3	1	1	1	—
CIMR-G3A4L45□	Model	—	—	CM400HA-24	110Q2G43	CR6L-150	4715PS-22T-B30	5915PC-22T-B30	JVOP-100
	Code **	ETC61313□-S004□ ETC61318□-S101□	ETC61312□	STR000385	SID000409	FU000756	FAN000130	FAN000131	CDR000070
	Q'ty	1	1	6	3	1	1	2	—
CIMR-G3A4055□	Model	—	—	CM400HA-24	160Q2G43	CR6L-200	THAIV-7556XV	JVOP-100	—
	Code	ETC61320□-S101□	ETC67030□	STR000385	SID000410	FU000755	FAN000176	CDR000070	—
	Q'ty	1	1	6	6	1	2	1	—
CIMR-G3A4075□	Model	—	—	CM400HA-24	160QG43	CR6L-300	THAIV-7556XV	JVOP-100	—
	Code	ETC61320□-S101□	ETC67031□	SRT000385	SID000410	FU000754	FAN000176	CDR000070	—
	Q'ty	1	1	6	6	1	2	1	—
CIMR-G3A4110□	Model	—	—	CM300HA 2E (2P)	160Q2G43	CR6L-350	THAIV7556XV	JVOP-100	—
	Code	ETC61320□-S101□	ETC67035□	STR000468	SID000410	FU000818	FAN000176	CDR000070	—
	Q'ty	1	1	12	9	1	2	1	—
CIMR-G3A4160□	Model	—	—	CM400HA 2E (2P)	RM250DZ-24	CR6L-600	THAIV-7556XV	JVOP-100	—
	Code	ETC61320□-S101□	ETC67039□	STR000469	SID000411	FU000916	FAN000176	CDR000070	—
	Q'ty	1	1	12	6	1	2	1	—
CIMR-G3A4185□	Model	Contact your YASKAWA representative							
CIMR-G3A4220□	Code								
CIMR-G3A4300□	Q'ty								

\* It is recommended the whole proper units be replaced for the part's faults in [ ] area.

† Gate drive PC board for CIMR-G3A4011 and above models.

‡ For control PC boards and power board, the upper code nos. are for models without revision mark and the lower for with revision mark "E" and beyond.

\*\*ETC61301□-S001□ for the face plate specification wthout "—C"

ETC61313□-S002□ for the face plate specification with "—C"

ETC61318□-S101□ for the face plate specification with the revision "E" and beyond.

## Spare Parts for 575V Class

VS-616G3 Model	Parts Name Specifications	Control PC Board	Gate Driver	Main Circuit Transistor	Main Circuit Diode	Fuse	Cooling Fan	Digital Operator
		Model	—	CM25DY-28	30U6P4?	A100P35	4715PS-22T-B30	JVOP-100
CIMR-G3U53P7□	Code *	ETC61313□-S515□	ETC61314□	STR000387	SID000503	IU000873	FAN000130	CDR000070
	Q'ty	1	1	3	1	1	1	1
	Model	—	—	CM50DY-28	30U6P4?	A100P35	5915PC-22T-B30	JVOP-100
CIMR-G3U55P5□	Code *	ETC61313□-S515□	ETC61315□	STR000388	SID000503	IU000873	FAN000131	CDR000070
	Q'ty	1	1	3	1	1	1	1
	Model	—	—	CM50DY-28	30U6P4?	A100P35	5915PC-22T-B30	JVOP-100
CIMR-G3U57P5□	Code *	ETC61313□-S515□	ETC61318□-S601□	STR000388	SID000503	FU000873	FAN000131	CDR000070
	Q'ty	1	1	3	1	1	1	1
	Model	—	—	CM100DY-28	75U6P4?	A100P50	5915PC-22T-B30	JVOP-100
CIMR-G3U5011□	Code *	ETC61313□-S515□	ETC61318□-S601□	STR000389	SID000504	FU000874	FAN000131	CDR000070
	Q'ty	1	1	3	1	1	1	1
	Model	—	—	CM100DY-28	75U6P4?	A100P50	5915PC-22T-B30	JVOP-100
CIMR-G3U5015□	Code *	ETC61313□-S515□	ETC61318□-S601□	STR000389	SID000504	FU000874	FAN000131	CDR000070
	Q'ty	1	1	3	1	1	1	1
	Model	—	—	CM100DY-28	75U6P4?	A100P50	5915PC-22T-B30	JVOP-100
CIMR-G3U5018□	Code *	ETC61313□-S515□	ETC61318□-S601□	STR000389	SID000504	IU000874	FAN000131	CDR000070
	Q'ty	1	1	3	1	1	1	1
	Model	—	—	CM200HA-28	110U2G43	A100P100	THAIV-U7556MX-TP	JVOP-100
CIMR-G3U5022□	Code	ETC61320□-S601□	ETC61603□	STR000390	SID000505	IU000875	FAN000191	CDR000070
	Q'ty	1	1	6	3	1	2	1
	Model	—	—	CM200HA-28	110U2G43	A100P100	THAIV-U7556MX-TP	JVOP-100
CIMR-G3U5030□	Code	ETC61320□-S601□	ETC61603□	STR000390	SID000505	IU000875	FAN000191	CDR000070
	Q'ty	1	1	6	3	1	2	1
	Model	—	—	CM200HA-28	110U2G43	A100P100	THAIV-U7556MX-TP	JVOP-100
CIMR-G3U5037□	Code	ETC61320□-S601□	ETC61603□	STR000390	SID000505	IU000875	FAN000191	CDR000070
	Q'ty	1	1	6	3	1	2	1
	Model	—	—	CM300HA-28	110U2G43	A100P150	THAIV-U7556MX-TP	JVOP-100
CIMR-G3U5045□	Code	ETC61320□-S601□	ETC61603□	STR000391	SID000505	IU000876	FAN000191	CDR000070
	Q'ty	1	1	6	3	1	2	1
	Model	—	—	CM300HA-28	110U2G43	A100P150	THAIV-U7556MX-TP	JVOP-100
CIMR-G3U5055□	Code	ETC61320□-S601□	ETC61603□	STR000391	SID000505	IU000876	FAN000191	CDR000070
	Q'ty	1	1	6	3	1	2	1
	Model	—	—	CM200HA-28 (2P)	110U2G43	A100P200	THAIV-U7556MX-TP	JVOP-100
CIMR-G3U5075□	Code	ETC61320□-S601□	LTC61607□	STR000460	SID000505	IU000877	FAN000191	CDR000070
	Q'ty	1	1	12	6	1	2	1
	Model	—	—	CM200HA-28 (2P)	110U2G43	A100P200	THAIV-U7556MX-TP	JVOP-100
CIMR-G3U5090□	Code	ETC61320□-S601□	FTC61607□	STR000460	SID000505	IU000877	FAN000191	CDR000070
	Q'ty	1	1	12	6	1	2	1
	Model	—	—	CM200HA-28 (2P)	110U2G43	A100P200	THAIV-U7556MX-TP	JVOP-100
CIMR-G3U5110□	Code							
	Q'ty							
	Model							
CIMR-G3U5160□	Code							
	Q'ty							

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\* For control PC boards, the upper code nos. are for models without revision mark and the lower for with revision mark "E" and beyond.

## Standard Parts Replacement

Item Name	Replacement Cycle	Remarks
Cooling fan	2 or 3 years	Replace with a new product
Smoothing capacitor	5 years	Replace with a new product (Determine after examination)
Circuit Breakers and relays	—	Determine after examination
Fuse	10 years	Replace with a new product
Aluminum capacitor on PC board	5 years	Replace with a new product (Determine after examination)

Note: operating as follows:

- Ambient temperature. Yearly average 30°C, 86°F
- Load factor. 80% or less
- Operating time 20 hours or less per day

# Inverter Capacity Selection

## Inverter Capacity Check Points

Classification	Item		Related specification			
			Speed and Torque Characteristics	Time ratings	Overload Capacity	Starting torque
Load characteristics	Load type	Friction load and weight load Liquid (viscous) load Inertia load Load with power transmission and accumulation	O			O
	Load speed and torque characteristics	Constant torque Constant output Decreasing torque	O		O	
	Load characteristics	Motoring Braking or overhauling load Constant load Shock load Repetitive load High-start torque Low-start torque	O	O	O	O
Operation	Continuous operation Long-time operation at medium or low speeds Short-time operation			O	O	
Rated output	Maximum required output (instantaneous) Constant output (continuous)		O		O	
Rated r/min	Maximum r/min Rated r/min		O			
Power supply	Power supply transformer capacity percentage impedance Voltage fluctuations Number of phases, single phase protection Frequency				O	O
Deterioration of load capacity due to age	Mechanical friction, losses in wiring Duty cycle modification	上正科技有限公司	O		O	O

## Inverter Capacity Required for Continuous Operation

Item	Calculation formula
Required output for the load within the allowable range ?	$\frac{k \times P_M}{\eta \times \cos \phi} \leq \text{Inverter capacity [kVA]}$
Motor capacity within the inverter ratings ?	$k \times \sqrt{3} \times V_M \times I_M \times 10^{-3} \leq \text{Inverter capacity [kVA]}$
Current within the inverter ratings ?	$k \times I_M \leq \text{Inverter capacity [A]}$

## Inverter Capacity Required for Group Drive

Item	Calculation formula with overload capacity of 150% for 1 minute	
	Motor acceleration of 1 minute or less	Motor acceleration of 1 minute or more
Starting requirements are within the inverter capacity ?	$\frac{k \times P_M}{\eta \times \cos \phi} \{ n_1 + n_s (k_s - 1) \}$ $= P_{CI} \{ 1 + \frac{n_s}{n_1} (k_s - 1) \}$ $\leq 1.5 \times \text{Inverter capacity [kVA]}$	$\frac{k \times P_M}{\eta \times \cos \phi} \{ m + n_s (k_s - 1) \}$ $= P_{CI} \{ 1 + \frac{n_s}{m} (k_s - 1) \}$ $\leq \text{Inverter capacity [kVA]}$
Current within the inverter capacity ?	$n_1 \times I_M \{ 1 + \frac{n_s}{n_1} (k_s - 1) \}$ $\leq 1.5 \times \text{Inverter capacity [A]}$	$n_1 \times I_M \{ 1 + \frac{n_s}{m} (k_s - 1) \}$ $\leq \text{Inverter capacity [kVA]}$

## Symbols

$P_M$	, Motor shaft output required for the load [kW]
$\eta$	, Motor efficiency (normally, approx 0.85)
$\cos \phi$	, Motor power factor (normally, approx 0.8)
$V_M$	, Motor voltage [V]
$I_M$	, Motor current [A] (current with commercial power supply)
$k$	, Correction factor calculated from current distortion factor (1.05 to 1.1, depending on the PWM method)
$P_{CI}$	, Continuous capacity [kVA]
$k_s$	, Motor starting current/motor rated current
$n_1$	, Number of motors in parallel
$n_s$	, Number of simultaneously started motors ( $GD^2$ )
$T_L$	, Total ( $GD^2$ ) reflected into motor shaft ( $\text{kg m}^2$ )
$t_A$	, Motor acceleration time
$J$	, Total ( $GD^2$ ) reflected into motor shaft ( $\text{kg m}^2$ )

## Inverter Capacity Required for Starting

Item	Calculation formula [ $t_A < 60s$ ]
Total starting capacity within the inverter capacity ?	$\frac{k \times N}{973 \times \eta \times \cos \phi} \left( \frac{T_L}{9.8} + \frac{4J}{375} \times \frac{N}{t_A} \right) \leq 1.5 \times \text{Inverter capacity [kVA]}$

# FORMULA for Calculating Motor Capacity

Rotary motion		Linear motion (Horizontal motion)
in HP lb•ft	<ul style="list-style-type: none"> <li><math>P_o = \frac{T\ell \cdot N\ell}{5250 \cdot \eta}</math> [HP]</li> <li><math>P_a = \frac{W K\ell^2 \cdot (N\ell)^2}{1620 \times 10^3 \cdot t_a}</math> [HP]</li> <li><math>T_L = \frac{N\ell}{N_M \cdot \eta} \cdot T\ell</math> [lb•ft]</li> <li><math>WKL^2 = \left(\frac{N\ell}{N_M}\right)^2 \cdot WK\ell^2</math> [lb•ft<sup>2</sup>]</li> <li><math>t_a = \frac{(WKM^2 + WKL^2) \cdot NM}{308 (\alpha \cdot TM - TL)}</math> [sec]</li> <li><math>t_d = \frac{(WKM^2 + WKL^2) \cdot NM}{308 (\beta \cdot TM + TL)}</math> [sec]</li> </ul>	<ul style="list-style-type: none"> <li><math>P_o = \frac{\mu \cdot W \cdot V\ell}{33000 \cdot \eta}</math> [HP]</li> <li><math>P_a = \frac{W \cdot (V\ell)^2}{64 \times 10^6 \cdot t_a}</math> [HP]</li> <li><math>T_L = \frac{\mu \cdot W \cdot V\ell}{2\pi \cdot NM \cdot \eta}</math> [lb•ft]</li> <li><math>WKL^2 = \frac{1}{4} W \left(\frac{V\ell}{\pi \cdot NM}\right)^2</math> [lb•ft<sup>2</sup>]</li> <li><math>t_a = \frac{(WKM^2 + WKL^2) \cdot NM}{308 (\alpha \cdot TM - TL)}</math> [sec]</li> <li><math>t_d = \frac{(WKM^2 + WKL^2) \cdot NM}{308 (\beta \cdot TM + TL)}</math> [sec]</li> </ul>
Legend		
<p> <b>Po</b> : Running power [HP]  <b>Pa</b> : Required power for accel [HP]  <b>N<sub>ℓ</sub></b> : Load speed [rpm]  <b>N<sub>M</sub></b> : Motor shaft speed [rpm]  <b>V<sub>ℓ</sub></b> : Load velocity of load [ft/min]  <b>η</b> : Machine efficiency  <b>μ</b> : Friction factor: 037-466333  <b>W</b> : Weight of load [lb]  <b>WKM<sup>2</sup></b> : Motor inertia [lb•ft<sup>2</sup>]  <b>WK<sup>2</sup></b> : Load inertia [lb•ft<sup>2</sup>]  <b>WKL<sup>2</sup></b> : Load inertia [lb•ft<sup>2</sup>]  (Reflected to shaft) </p>		
in kW kg•m	<ul style="list-style-type: none"> <li><math>P_o = \frac{T\ell \cdot N\ell}{973 \cdot \eta}</math> [kW]</li> <li><math>P_a = \frac{GD\ell^2 \cdot (N\ell)^2}{365 \times 10^3 \cdot t_a}</math> [kW]</li> <li><math>T_L = \frac{N\ell}{N_M \cdot \eta} \cdot T\ell</math> [kg•m]</li> <li><math>GD^2L = \left(\frac{N\ell}{N_M}\right)^2 \cdot GD^2\ell</math> [kg•m<sup>2</sup>]</li> <li><math>t_a = \frac{(GD^2M + GD^2L) \cdot NM}{375 (TM \cdot \alpha - TL)}</math> [sec]</li> <li><math>t_d = \frac{(GD^2M + GD^2L) \cdot NM}{375 (TM \cdot \beta + TL)}</math> [sec]</li> </ul>	<ul style="list-style-type: none"> <li><math>P_o = \frac{\mu \cdot W \cdot V\ell}{6120 \cdot \eta}</math> [kW]</li> <li><math>P_a = \frac{W \cdot (V\ell)^2}{3600 \times 10^3 \cdot t_a}</math> [kW]</li> <li><math>T_L = \frac{\mu \cdot W \cdot V\ell}{2\pi \cdot NM \cdot \eta}</math> [kg•m]</li> <li><math>GD^2L = W \left(\frac{V\ell}{\pi \cdot NM}\right)^2</math> [kg•m<sup>2</sup>]</li> <li><math>t_a = \frac{(GD^2M + GD^2L) \cdot NM}{375 (TM \cdot \alpha - TL)}</math> [sec]</li> <li><math>t_d = \frac{(GD^2M + GD^2L) \cdot NM}{375 (TM \cdot \beta + TL)}</math> [sec]</li> </ul>
(Conventional Unit)	Legend	
<p> <b>Po</b> : Running power [kW]  <b>Pa</b> : Required power for accel [kW]  <b>N<sub>ℓ</sub></b> : Load speed [rpm]  <b>N<sub>M</sub></b> : Motor shaft speed [rpm]  <b>V<sub>ℓ</sub></b> : Load velocity of load [m/min]  <b>η</b> : Machine efficiency  <b>μ</b> : Friction factor  <b>W</b> : Weight of load [lb]  <b>GD<sup>2</sup>M</b> : Motor inertia [kg•m<sup>2</sup>]  <b>GD<sup>2</sup>L</b> : Load inertia [kg•m<sup>2</sup>]  <b>GD<sup>2</sup>L</b> : Load inertia [kg•m<sup>2</sup>]  (Reflected to shaft) </p>		

in kW N•m	$\bullet P_o = \frac{2\pi \cdot T_\ell \cdot N_\ell}{60 \cdot \eta} \times 10^{-3}$ [kW]	$\bullet P_o = \frac{\mu \cdot W \cdot V_\ell}{6120 \cdot \eta}$ [kW]		
	$\bullet P_a = \frac{4J_\ell \cdot (N_\ell)^2}{365 \times 10^3 \cdot t_a}$ [kW]	$\bullet P_a = \frac{W \cdot (V_\ell)^2}{3600 \times 10^3 \cdot t_a}$ [kW]		
	$\bullet T_L = \frac{N_\ell}{N_M \cdot \eta} \cdot T_\ell$ [N•m]	$\bullet T_L = \frac{9.8\mu \cdot W \cdot V_\ell}{2\pi \cdot N_M \cdot \eta}$ [N•m]		
	$\bullet J_L = (\frac{N_\ell}{N_M})^2 \cdot J_\ell$ [kg•m <sup>2</sup> ]	$\bullet J_L = \frac{1}{4} W \cdot (\frac{V_\ell}{\pi \cdot N_M})^2$ [kg•m <sup>2</sup> ]		
	$\bullet t_a = \frac{2\pi (J_M + J_L) \cdot N_M}{60 \cdot (T_M \cdot \alpha - T_L)}$ [sec]	$\bullet t_a = \frac{2\pi (J_M + J_L) \cdot N_M}{60 \cdot (T_M \cdot \alpha - T_L)}$ [sec]		
	$\bullet t_d = \frac{2\pi (J_M + J_L) \cdot N_M}{60 \cdot (T_M \cdot \beta + T_L)}$ [sec]	$\bullet t_d = \frac{2\pi (J_M + J_L) \cdot N_M}{60 \cdot (T_M \cdot \beta + T_L)}$ [sec]		
	Legend			
Po : Running power [kW] Pa : Required power for accel [kW] N <sub>ℓ</sub> : Load speed [r/m] N <sub>M</sub> : Motor shaft speed [r/m] V <sub>ℓ</sub> : Load velocity of load [m/min] $\eta$ : Machine efficiency $\mu$ : Friction factor W : Weight of load [kg] J <sub>M</sub> : Motor inertia [kg•m <sup>2</sup> ] J <sub>ℓ</sub> : Load inertia [kg•m <sup>2</sup> ] J <sub>L</sub> : Load inertia [kg•m <sup>2</sup> ] (Reflected to motor shaft)				
T <sub>ℓ</sub> : Load torque [N•m] T <sub>L</sub> : Load torque [N•m] (Reflected to motor shaft) T <sub>M</sub> : Motor rated torque [N•m] t <sub>a</sub> : Acceleration time [sec] t <sub>d</sub> : Deceleration time [sec] $\alpha$ : 0.8 – 1.2 $\beta$ : 0.1 – 0.2 (200V class) 0.05 – 0.1 (400V class)				

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# Varispeed-616G3 Specification Check Sheet

## Customer

## Application

### User

Customer's Power Supply      Three-phase      VAC,      Hz

Item No.	Q'ty	Specifications	Remarks
1		<b>Inverter VS-616G3</b> <b>CIMR-G3□□□□□□*</b>  _____ V   _____ kVA   _____ A	
2		<b>Options</b> <ul style="list-style-type: none"> <li><input type="checkbox"/> Speed reference option cards      <input type="checkbox"/> Analog reference card      AI-14U</li> <li><input type="checkbox"/> Analog reference card      AI-14B</li> <li><input type="checkbox"/> Digital reference card      DI-08</li> <li><input checked="" type="checkbox"/> Digital reference card      DI-16G</li> <li><input type="checkbox"/> Monitor option cards      <input type="checkbox"/> Analog monitor card      AO-08</li> <li><input type="checkbox"/> Analog monitor card      AO-12</li> <li><input type="checkbox"/> Pulse monitor card      PO-36F</li> <li><input type="checkbox"/> Digital output card      DO-08</li> <li><input type="checkbox"/> Communication interface card      SI-B</li> <li><input checked="" type="checkbox"/> PG speed control card      PG-C</li> <li><input type="checkbox"/> Frequency meter DCF-6A 3V 1mA      Hz (Full-scale)</li> <li><input type="checkbox"/> Digital monitor JVOP-101</li> <li><input type="checkbox"/> Digital Operator/monitor adapter JVOP-109</li> <li><input type="checkbox"/> Adapter specialized extension cable 72616-W300<sup>†</sup></li> <li><input type="checkbox"/> VS operator      JVOP-9[XX]</li> <li><input type="checkbox"/> AC reactor      UZBA-B      A      mH (× 00[XXXX])</li> <li><input type="checkbox"/> Braking unit      CDBR-[XXXX]</li> <li><input type="checkbox"/> Braking resistor unit      LKEB-[XXXX] (10% ED)</li> <li><input type="checkbox"/> Braking resistor      ERF-15WJ[XXXX] (3% ED)      10HP (7.5kW) or below</li> <li><input type="checkbox"/> Noise filter (input side)      <input type="checkbox"/> LNFD-[XXXX]DY . Low-cost type           <ul style="list-style-type: none"> <li><input type="checkbox"/> HF3[XXXX]A-Z : Manufactured by Soshin Electric Co , Ltd.</li> <li><input type="checkbox"/> HF3[XXXX]A-DP : VDE certified</li> </ul>           (output side)      <input type="checkbox"/> LF-3[XXXX]KA         </li> <li><input type="checkbox"/> Backup capacitor unit for momentary power loss POO[XX]</li> <li><input type="checkbox"/> System module      JGSM-[XX], JGSM-[XX], JGSM-[XX]</li> <li><input type="checkbox"/> Surge suppressor      DCR2-[XXXX]</li> <li><input type="checkbox"/> Output voltmeter      SCF-12 NH      V</li> <li><input type="checkbox"/> Scale      NPJT41561-1</li> <li><input type="checkbox"/> Rubber bushing      FL6402826-1</li> <li><input type="checkbox"/> Mounting base      SPAT32[XX]-1</li> </ul>	* Specify the enclosures and mountings when ordering  <sup>†</sup> 1 · 1m Cable 3 · 3m Cable

★ Where requiring the function, contact your YASKAWA representative

**NOTES**

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# Varispeed-616G3

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GENERAL-PURPOSE INVERTER DRIVES

200 TO 230V 0.5 TO 100HP (0.4 TO 75kW) (1.4 TO 130kVA)  
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