

INVERTER SERIES HIGH PERFORMANCE VECTOR CONTROL A1000



A1000

YASKAWA A1000 HIGH PERFORMANCE DRIVE

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Experience & Innovation

For more than 90 years YASKAWA has been manufacturing and supplying mechatronic products for machine building and industrial automation. Its standard products as well as tailor-made solutions are famous and have a high reputation for outstanding quality and durability.

A leader in Inverter Drives technology

Extensive research and development has allowed YASKAWA to remain at the forefront of motion control and automation technology. This technological leadership has helped to modernise industries such as mining, steel, pulp and paper, chemical, automotive, pakkaging, machine tool and semiconductor. In 2007 YASKAWA produced its 10 millionth inverter in the new inverter plant in Yukuhashi, Japan. By this YASKAWA is probably the biggest inverter manufacturer in the world.

With the new A1000, YASKAWA continues its tradition of developing innovative solutions in drive technology. The A1000 provides remarkable advantages through excellent motor drive performance, environmental benefits and energy savings as well as many user orientated operational features. Moreover, the A1000 offers advanced characteristics that are included as standard.

In response to the needs of users, we have introduced next-generation product features to A1000 vector control technology:

Main Features:

- For Induction Motor and Permanent Magnet Motor Control: The A1000 is a premium inverter drive for a wide field of applications including great advantages in more than one way
- Providing newest Safety Features: Safety features of the A1000 comply with today's market safety requirements and standards
- For Easy Start-up and Reliable Operation: YASKAWA A1000 provides significant costs reduction potentials during installation and operation

- Improved Drive Design & Functions: Small size and application oriented design improve performance, reliability and performance life
- Enhanced Efficiency & Environment: Using the A1000 saves energy and reduces audible noise







- Open loop position control (No Motor Feedback)
- 200% rated torque at 0 rpm
- New Auto-Tuning Features
- Tuning of the Speed Loop according to Load
- Power Loss Recovery

Safety Features & Communication

- Safety Torque Off (STO) according to EN954-1 safety category 3, stop category 0; EN ISO 13849-1 PLd; IEC EN 61508 SiL2
- External Device Monitor (EDM) to Observe the Safety Status

Easy Start-up & Reliable Operation

- Application Parameter Presets
- Screwless Removable Control Terminal with Parameter Backup
- Online Auto-Tuning for Motor Parameter
- Tuning of the Speed Loop according to Load
- Parameter Copy and Backup Function
- Engineering Tool DriveWizard Plus for Parameter Management
- Application SW Library
- Performance Life Diagnostics for all major inverter components

Drive Design & Functions

- Even more compact
- Side-by-Side Mounting
- Dual Rating for Cost & Space Saving
- Long Performance Life
- Overexcitation Braking to reduce Deceleration Time

Efficiency & Environment

- Advanced Energy Saving Functionality
- Unique PWM function reduces audible noise.
- Minimum Power Loss in Normal Duty Rating

Customize Your Drive

DriveWorksEZ visual programming tool. Simply drag and drop icons to customize your drive. Create special sequences and detection functions, then load them onto the drive.

Program a customized sequence

Example:

Sensorless positioning control function (Available soon)

Create customized detection features

 Example: Machine weakening analysis using torque pulse detection

USB port lets the drive connect to a PC

Example:

Sensorless positioning control function (Available soon)









Drives are also equipped with an RJ-45 comm. port that takes the existing W103 cable used in Yaskawa's previous models. Simply remove the operator keypad for to the RJ-45 connector.



Advanced Drive Technology



Positioning Capability without External Devices

- Use an IPM motor to perform position control without motor feedback. Electrical saliency in IPM motors makes it possible to detect speed, direction and rotor position without the use of external feedback devices.
- Positioning functionality without a PLC. Visual programming in DriveWorksEZ eliminates the need for external controllers by giving the user the power to create customized functions such as position control.







New Auto-Tuning Features

- > Auto-Tuning features optimize drive parameters for operation with induction motors as well as synchronous motors to achieve the highest performance levels possible.
- > Optimizing not only the drive and motor performance, but also automatically adjusts settings relative to the connected machinery.
- New Auto-Tuning methods.

A1000 continuously analyzes changes in motor characteristics during operation for highly precise speed control.

-	Tuning the Motor	AB	Tuning the Load
Rotational Auto-Tuning	Applications requiring high starting torque, high speed, and high accuracy.	ASR*Tuning	Perfects responsiveness relative to the machine. Until now, this tuning procedure was fairly time
Stationary Auto-Tuning	Applications where the motor must remain connected to		consuming to set.
outional y nato running	the load during the tuning process.		Optimizes the drive's ability to decelerate the load.
Line-to-Line Resistance	For tuning after the cable length between the motor and drive has changed, or when motor and drive capacity	Inertia Tuning	Useful for applications using Kinetic Energy Buffering Function and Feed Forward functions.
Auto-Turning	ratings differ.	* Automatic Speed Regulator	
Energy-Saving Auto-Tuning	For running the motor at top efficiency all the time.	Automatic opecu negulator	
3, 3, 3, 3, 3, 3, 3, 3, 3, 3, 3, 3, 3, 3			

Powerful Torque Characteristics

Powerful torque at 0 Hz, without sensors or feedback devices. Until recently, sensorless control has been out of reach for synchronous motors. Now A1000 provides powerful starting torque algorithm without relying on pole sensors or motor feedback.



► High-performance current vector control achieves powerful starting torque with an induction motor.

-	Synchronous Motor
dvanced Open Loop ector for PM motors	200% rated torque at 0 r/min*, speed range of 1:100*
losed Loop Vector Control or PM motors	200% rated torque at 0 r/min, speed range of 1:1500

	Induction Motor
Open Loop Vector Control	200% rated torque at 0.3 Hz*, speed range of 1:200
Closed Loop Vector Control	200% rated torque at 0 r/min*, speed range of 1:1500

Proper output torque depends on matching drive and motor capacity.

* only IPM motor

f



synchronous motors.

2 seconds.*

* Option available for certain models.

Safety Features & Communication

Power Loss & Recovery



Protective Design

A variety of protective designs are available to reinforce the drive against moisture, dust, oil mist, vibration, corrosive sulfur gas, conductive particles, and other harsh environments. IP54, dust proof and splash-waterproof options are also available

A1000 offers two ways to handle momentary power loss

with sensorless control for induction motors as well as for

A1000 is capable of handling momentary power loss

A1000 lets you ride through a power loss for up to

► RoHS Compliance





Safety Features as a Standard

- A1000 provides Safe Torque Off (STO) functional safety in compliance with EN954-1 safety category 3 stop category 0, EN ISO 13849-1, PLd, IEC/EN61508 SIL2.
- An External Device Monitor (EDM) function has also been added to monitor the safety status of the drive.



All Major Serial Communication Protocols

- RS-422/485 (MEMOBUS/Modbus at 115.2 kbps) standard on all models.
- Option cards available for all major fieldbuses used across the globe:



Easy start-up and reliable operation

Application Parameter Presets

A1000 automatically sets parameters needed for major applications. Selecting the appropriate application optimizes the drive for top performance, while saving time for set up.





Setting	Settin	g									
00	General-purpo	se	Parameters are programmed								
01	Water Supply	Pump									
02	Conveyor		A1-02	Control mode selection							
03	Exhaust Fan		C1-01	Accel Time 1							
04	HVAC Fan		C1-02	Decel Time							
05	Air Compresso	or	C6-01	ND/HD Selection							
06	Crane (Hoist)										
07	Crane (Travers	se)									

Example using Application Presets

Selecting "Conveyor" optimizes parameter settings so the drive is ready to start your conveyor application immediately

Multifunction Terminal Block

The first terminal board with a Parameter Backup Function The terminal block's ability to save parameter setting data makes it easy to get the application back online in the event of a failure requiring drive replacement.

A1000 Terminal Block



Parameter												
Name	Number	Setting										
ND/HD	C6-01	1										
Control Mode	A1-02	0										
Frequency Reference Selection	b1-01	1										
Run Command Selection	b1-02	1										



Parameter Copy Function

- All standard models are equipped with a Parameter Copy Function that allows parameter settings to be easily copied from the drive or uploaded for quick setup using the operator.
- A USB Copy Unit is also available as an even faster, more convenient way to back up settings and instantly program the drive.



Engineering Tool DriveWizard Plus



Note: To obtain a copy of DriveWitard Plus, contact a Yaskawa representative.

- Engineering Tool DriveWizard Plus
- Manage the unique settings for all your drives right on your PC.
- An indispensable tool for drive setup and maintenance. Edit parameters, access all monitors, create customized operation sequences, and observe drive performance with the oscilloscope function.
- The Drive Replacement feature in DriveWizard Plus saves valuable time during equipment replacement and application upgrades by converting previous Yaskawa product parameter values to the new A1000 parameters automatically.



Drive Design & Features

Even More Compact

- Yaskawa continues to make applications even smaller by combining the compact designed drive with the light, efficient design of a synchronous motor.
- Use Side-by-Side installation for an even more compact setup.
- Finless models available*.
 * Coming soon



Dual Rating for Cost & Space Saving

Each drive lets the user choose between Normal Duty or Heavy Duty operation. Depending on the application, A1000 can run a motor an entire frame size larger than our previous model.



Note: Always select a drive with a current rating greater than the motor rated current.



Long Performance Life

Designed for 10 years of maintenance-free operation. Cooling fan, capacitors, relays, and IGBTs have been carefully selected and designed for a life expectancy up to ten years.*

* Assumes the drive is running continuously for 24 hours a day at 80% load with an

ambient temperature of 40°C

10 YEARS of maintenance-free operation

Performance Life Monitors

Yaskawa's latest drive series is equipped with performance life monitors that notify the user of part wear and maintenance periods to prevent problems before they occur.



Operator Display	Corresponding Component
LT-1	Cooling fan
LT-2	Capacitors
LT-3	Inrush prevention relay
LT-4	IGBTs

Drive outputs a signal to the control device indicating components may need to be replaced

Variety of Braking Functions

- Overexcitation deceleration capabilities bring the motor to a quick stop without the use of a braking resistor.
- All models up to 30 kW (HD) are equipped with a braking transistor for even more powerful braking options by just adding a braking resistor.





Efficiency & Environment

Energy Saving

Conditions:

- Loaded with advanced energy-saving control technology. Energy-Saving control makes highly efficient operation possible with an induction motor.
- Amazing energy saving with a synchronous motor Combining the high efficiency of a synchronous motor along with A1000's Energy-Saving control capabilities allows for unparalleled energy saving.



Efficiency with energy saving function Example shows a 200 V 4.0 kW drive in a fan or pump application

Annual energy savings for an HVAC fan application running 100 3.7 kW motors. Electric costs of 8 cents/kWh*. Average industrial electric costs in Europe Examples of energy saving with A1000 and PM Motor Power consumption Electrical c Induction motor + A1000 1,903,100 kWh € 152,300 Α IPM motor + A1000 В 1,754,600 kWh € 140,400 Annual savings on energy costs: 148,500 kWh € 11.900 [A] vs. [B] 148,500 kWh x 0.555 ÷ 82.4 tons! 1,000 = Annual reduction in CO. €152,300 €140,400 Assumes 1 kW of power consumed creates 0.555 kg/kWh of CO2 В Δ

Noise Reduction



A1000 uses YASKAWA Swing PWM function to suppress electromagnetic and audible motor noise, creating a more peaceful environment.

Calculated by comparing peak values during noise generation



Standard Specifications

	Item	Specifications									
	Control Method	V/f Control, V/f Control with PG, Open Loop Vector Control, Closed Loop Vector Control, Open Loop Vector for PM, Closed Loop Vector for PM, Advanced Open Loop Vector for PM									
	Frequency Control Range	0.01 to 400 Hz									
	Frequency Accuracy (Temperature Fluctuation)	Digital reference: within $\pm 0.01\%$ of the max. output frequency (-10 to $+40^{\circ}$ C) Analog reference: within $\pm 0.1\%$ of the max. output frequency (25° C $\pm 10^{\circ}$ C)									
	Frequency Setting Resolution	Digital referece: 0.01 Hz Analog referece: 0.03 Hz / 60 Hz (11 bit)									
	Output Frequency Resolution	0.001 Hz									
	Frequency Setting Signal	-10 to +10 V, 0 to +10 V, 4 to 20 mA, Pulse Train									
	Starting Torque	150%/3 Hz (V/f Control and V/f Control with PG), 200%/0.3 Hz ⁺¹ (Open Loop Vector Control), 200%/0 r/min ⁻¹ (Closed Loop Vector Control, Closed Loop Vector Control for PM, and Advanced Open Loop Vector Control for PM), 100%/5% speed (Open Loop Vector Control for PM)									
teristics	Speed Control Range	1:1500 (Closed Loop Vector Control and Closed Loop Vector for PM) 1:200 (Open Loop Vector Control) 1:40 (V/f Control and V/f Control with PG) 1:20 (Open Loop Vector for PM) 1:100 (Advanced Open Loop Vector for PM)									
harac	Speed Control Accuracy	$\pm 0.2\%$ in Open Loop Vector Control (25°C ± 10 °C) ⁻² , 0.02% in Closed Loop Vector Control (25°C ± 10 °C)									
rol Cl	Speed Response	10 Hz in Open Loop Vector (25°C ±10°C), 50 Hz in Closed Loop Vector Control (25°C±10°C) (excludes temperature fluctuation when performing Rotational Auto-Tuning)									
B Torque Limit All Vector Control allows separate settings in four quadrants											
	Accel/Decel Time	0.00 to 6000.0 s (4 selectable combinations of independent acceleration and deceleration settings)									
	Braking Torque	Drives of 200/400 V 30 kW or less have a built-in braking transistor. 1. Short-time decel torque ⁻³ : over 100% for 0.4/ 0.75 kW motors, over 50% for 1.5 kW motors, and over 20% for 2.2 kW and above motors (over excitation braking/High-Slip Braking: approx. 40%) 2. Continuous regen. torque: approx. 20% (approx. 125% with dynamic braking resistor option ⁻⁴ : 10% ED,10s, internal braking transistor)									
	V/f Characteristics	User-selected programs and V/f preset patterns possible									
	Main Control Functions	Torque control, Droop control, Speed/torque control switching, Feedforward control, Zero-servo control, Momentary power loss ride-thru, Speed search, Overtorque detection, Torque 17-step speed (max), Accel/decel time switch, S-curve accel/decel, 3-wire sequence, Auto-tuning (rotational, stationary), Online tuning, Dwell, Cooling fan on/off switch, Slip compe Torque compensation, Frequency jump, Upper/lower limits for frequency reference, DC injection braking at start and stop, Overexcitation braking, High slip braking, PID control (with function), Energy saving control, MEMOBUS comm. (RS-485/422 max, 115.2 kbps), Fault restart, Application presets, DriveWorksEZ (customized function), Removable terminal bloc parameter backup function									
	Motor Protection	Motor overheat protection based on output current									
	Momentary Overcurrent Protection	Drive stops when output current exceeds 200% of Heavy Duty Rating									
	Overload Protection	Drive stops after 60 s at 150% of rated output current (Heavy Duty Rating)'s									
5	Overvoltage Protection	200 V class: Stops when DC bus exceeds approx. 410 V, 400 V class: Stops when DC bus exceeds approx. 820 V									
uncti	Undervoltage Protection	200 V class: Stops when DC bus exceeds approx. 190 V, 400 V class: Stops when DC bus exceeds approx. 380 V									
ion F	Momentary Power Loss Ride-Thru	Immediately stop after 15 ms or longer power loss. Continuous operation during power loss of less than 2 s (standard) ⁶									
otect	Heatsink Overheat Protection	Thermistor									
ž	Braking Resistance Overheat Protection	Overheat sensor for braking resistor (optional ERF-type, 3% ED)									
	Stall Prevention	Stall prevention during acceleration/deceleration and constant speed operation									
	Ground Protection	Protection by electronic circuit 7									
	Charge LED	Charge LED remains lit until DC bus has fallen below approx. 50 V									
Ħ	Area of Use	Indoors									
Inmel	Ambient Temperature	-10 to +50°C (open chassis), -10 to +40°C (NEMA Type 1)									
inviro	Humidity	95% RH or less (no condensation)									
ting E	Storage Temperature	-20 to +60°C (short-term temperature during transportation)									
peral	Altitude	Up to 1000 meters (output derating of 1% per 100 m above 1000 m, max. 3000 m)									
9	Shock	10 to 20 Hz: 9.8m/s ² ; 20 to 55 Hz: 5.9 m/s ² for 200 V up to 45 kW and 400 V up to 75 kW, 2.0 m/s ² for 200 V, 55 to 110 kW and 400 V, 90 to 315 kW									
	Safety Standard	EN954-1 safe category 3 stop category 0; EN ISO 13849-1; IEC EN 61508 SiL2									
	Protection Design	IP00 open-chassis, IP20, NEMA Type 1 enclosure									

*1: Requires a drive with recommended capacity.
*2: Speed control accuracy may vary slightly depending on installation conditions or motor used. Contact Yaskawa for details.
*3: Instantaneous average deceleration torque refers to the torque required to decelerate the motor (uncoupled from the load) from the rated motor speed down to zero in the shortest time.
*4: If L3-04 is enabled when using a braking resistor or braking resistor unit, the motor may not stop within the specified deceleration time.

4. If 2004 is productive which using tests of thanking resistor thanking re



Connection Diagram



③ Remove the jumper when installing a DC reactor. Models CIMR-A□2A0110 through 0415 and 4A0058 through 0675 come with a built-in DC reactor.

- ② Never short terminals SP and SN as doing so will damage the drive.
- ③ Disconnect the wire jumper between H1-HC and H2-HC when utilizing the Safe Disable input.



Terminal Functions

Main Circuit Terminals

A1000

Voltage		200 V			400 V					
Model CIMR-AA2A	2A0004 to 2A0081	2A0110, 2A0138	2A0169, 2A0211	4A0002 to 4A0044	4A0058, 4A0072	4A0088 to 4A0165				
Max. Applicable Motor Capacity*1 kW	0.4 to 18.5	22, 30	37, 45	0.4, 18.5	22, 30	37 to 75				
R/L1										
S/L2		Main circuit input power supply		Main circuit input power supply						
T/L3										
U/T1										
V/T2		Drive output			Drive output					
W/T3										
B1	Braking re	eistor unit		Broking register unit						
B2	Diaking it			Diaking resistor unit –						
()	DC reactor (@1_@2)			DC reactor (@1_@2)						
(+) 1	DC nower supply $(\oplus 1 - \oplus 2)$	DC power sup	oply (⊕1–⊕)*2	DC newer supply $(\oplus 1 - \oplus 2)$	DC power su	pply (⊕1–⊖)*2				
(+) 2	Do power supply (@1 C)	Braking ur	nit (⊕3–⊖)	Do power supply (@1 O)	Braking u	nit (⊕3–⊖)				
(+) 3	-			-						
Ð		Ground terminal (100 Ω or less)		Ground terminal (10 Ω or less)						

*1: Max. Applicable Motor Capacity indicates Heavy Duty *2: DC power supply input terminals (+1, –) are not UL/cUL and CE certifi ed. Note: A dash, (–), indicates no applicable terminals.

Control Circuit Terminals Terminals (200 V/400 V Class)

H1 Safe Disable input 1 Of Works PA Set Disable input 2 One or both open: Dire original set II, I2, and IC to use the Safe Disable inputs. Set the S3 µmper to select between airking, social monits of the original set II, I2, and IC to use the Safe Disable inputs. Set the S3 µmper to select between airking, social monits of the original set II, I2, and IC to use the Safe Disable inputs. Set the S3 µmper to select between airking, social monits of the original set II, I2, and IC to use the Safe Disable inputs. Set the S3 µmper to select between airking, social monits of the original set II, I2, and IC to use the Safe Disable inputs. Set the S3 µmper to select between airking, social monits of the OS 2442: Signal Dub Cycle: 30 to 70%; High level: 3.5 to 13.2 Vide, tow level: 0.0 to 0.8 Vide: 100 to 100 Vice (100 to 100 Vic	Туре	Terminal	Terminal Name (Function)	Function (Signal Level) Default Setting								
Safe Disable hpds Infl. Safe Disable input 2 One or both open: three update disable chances. Hormal operatore, internal imperatore. 33 AC; Off time of at least 1 ms; between sinking, sourcing mode, and the power supply. IFC Safe Disable function common Safe disable function common Safe disable function common IFR Multi-function pulse train input (Frequency reference) Imput frequency range: 0 is 28 Hz; Signal Duty Cycle: 30 to 70%; High level: 3.5 to 13.2 Vc6, two level: 0.0 to 0.8 Vcf; Imput modence: 3.4 CX IFR Multi-function analog input 10.5 Vcf (max allowable current 20 mA) IFR Multi-function analog input 10.5 Vcf (max allowable current 20 mA) IFR Multi-function analog input (Frequency reference bias) 10.0 Vcf, (but (input impedance: 20 AC) IfR Multi-function analog input (Frequency reference bias) 10.0 Vcf (input impedance: 20 AC) IfR Multi-function analog input (Frequency reference bias) 10.0 Vcf (input impedance: 20 AC) IfR Multi-function analog input (Frequency reference bias) 10.0 Vcf (input impedance: 20 AC) IfR Multi-function input 2 (Frequency reference bias) 10.0 Vcf (input impedance: 20 AC) IfR Multi-function input 3 (Multi-function input 3 (Multi-function input 4 (Frequency Impedance) SifR		H1	Safe Disable input 1	24 Vdc, 8 mA								
He Safe Disable function common Safe disable function common Safe disable function common Analo Input: P Multi-function puble train input (Frequency reference) Input impedance: 3 k2 Analo Input: V Power supply for analog inputs -10.5 Vbc (max allowable current 20 mÅ) -V Power supply for analog inputs -10.5 Vbc (max allowable current 20 mÅ) -V Power supply for analog inputs -10.5 Vbc (max allowable current 20 mÅ) -V Power supply for analog inputs -10.5 Vbc (max allowable current 20 mÅ) Input impedance: 20 k3 -10.5 Vbc (max allowable current 20 mÅ) Input impedance: 20 k3 -10.5 Vbc (max allowable current 20 mÅ) Input impedance: 20 k3 -10.5 Vbc (max allowable current 20 mÅ) Input impedance: 20 k3 -10.5 Vbc (max allowable current 20 mÅ) Input impedance: 20 k3 Vbs (max impedance: 20 k3) Volte: Oncol Tor input i Checune analog input 3 / PTC input -10.5 Vbc (max impedance: 20 k3) Volte: Input impedance: 20 k3 Multi-function analog input 3 / PTC input -10.5 Vbc (max impedance: 20 k3) Volte: Input impedance: 20 k3 Multi-function input 1 (breant set pedance forward 8 m.) Opem Suppl - St	Safe Disable Inputs	H2	Safe Disable input 2	One or both open: Drive output disabled; Both closed: Normal operation; Internal impedance: $3.3 \text{ k}\Omega$; Off time of at least 1 ms; Disconnect the wire jumpers shorting terminals H1, H2, and HC to use the Safe Disable inputs. Set the S3 jumper to select between sinking, sourcing mode, and the power supply.								
RP Multi-function pulse train input (Frequency reference) Input frequency range 0.05 2 Met Sympl 0 for analog inputs Input frequency range 0.05 2 Met Sympl 0 for analog inputs Analog Inputs / Pues range AI Wulti-function analog inputs 10.5 V(c (max allowable current 20 mA) Analog Inputs / Pues range AI Wulti-function analog input 1 (Frequency reference bias) -10 to 10 V(c, (to to 10 V(c) (to to to 10 V(c) (to to to 10 V(c) (to to 10 V(c) (to to to 10 V(c) (to		HC	Safe Disable function common	Safe disable function common								
Image: Process papely for analog inputs 10.5 Vdc (max allowable current 20 mA) Analog Inputs / Paile Train All Multi-function analog inputs -10.5 Vdc (max allowable current 20 mA) Analog Inputs / Paile Train All Multi-function analog input 2 (Frequency reference bias) -10.5 Vdc (max allowable current 20 mA) Analog Inputs / Paile Train All Multi-function analog input 3 / PTC Input -10.1 to 10 vdc, 0 to 10 Vdc (input impedance: 20 kC). Analog Inputs / Input Multi-function analog input 3 / PTC Input -10 to 10 vdc, 0 to 10 Vdc (input impedance: 20 kC). Vdta or analog input 3 / PTC Input All Multi-function analog input 3 / PTC Input -10 to 10 vdc, 0 to 10 Vdc (input impedance: 20 kC). Vdta or analog input 3 / PTC Input All Multi-function input 1 (State Traver Mn, Open: Stop) - - State Multi-function input 1 (State Traver Mn, Open: Stop) - - State Multi-function input 1 (State Traver Mn, Open: Stop) - - State Multi-function input 1 (State Traver Mn, Open: Stop) - - State Multi-function input 1 (State Traver Mn, Open: Stop) - - State Multi-function input 1 (State Traver Mn, Open: Stop) - - <t< td=""><td></td><td>RP</td><td>Multi-function pulse train input (Frequency reference)</td><td>Input frequency range: 0 to 32 kHz; Signal Duty Cycle: 30 to 70%; High level: 3.5 to 13.2 Vdc, low level: 0.0 to 0.8 Vdc; Input impedance: 3 kΩ</td></t<>		RP	Multi-function pulse train input (Frequency reference)	Input frequency range: 0 to 32 kHz; Signal Duty Cycle: 30 to 70%; High level: 3.5 to 13.2 Vdc, low level: 0.0 to 0.8 Vdc; Input impedance: 3 kΩ								
Image inputs / Participation Image inputs / Participation Image input / (Frequency reference bias) Image input / (Frequency reference bias) Analog input / Participation All Multi-function analog input 1 (Frequency reference bias) Image input 1 (Frequency reference bias) Image input 1 (Frequency reference bias) Image input 2 (Frequency reference common Image		+V	Power supply for analog inputs	10.5 Vdc (max allowable current 20 mA)								
Analog Inputs/ Plasm Trained Input A1 Multi-function analog input 1 (Frequency reference bias) -10 to 10 Vdc, 0 to 10 Vdc (input impedance: 20 kC) Plasm Trained A2 Multi-function analog input 2 (Frequency reference bias) -10 to 10 Vdc (input impedance: 20 kC) Plasm Trained A3 (Auxiii function analog input 3 / PC loput -10 to 10 Vdc (input impedance: 20 kC); Use switch S1 and H3-09 A3 (Auxiii function analog input 3 / PC loput -10 to 10 Vdc, 0 to 10 Vdc (input impedance: 20 kC); Use switch S1 and H3-09 A4 (Auxiii function input 3 / PC loput -10 to 10 Vdc, 0 to 10 Vdc (input impedance: 20 kC); Use switch S1 and H3-09 Field Field Bis Cond for bidded lines and option carries - S1 Multi-function input 1 (Dobed: Forward Run, Open: Stop) S2 Multi-function input 2 (Closed: Forward Run, Open: Stop) S3 Multi-function input 2 (Closed: Forward Run, Open: Stop) S3 Multi-function input 2 (Glosed: ference 2) S5 Multi-function input 2 (Multi-stop speed reference 2) S6 Multi-function input 2 (Multi-stop speed reference 2) S6 Multi-function input 2 (Multi-stop speed reference 2) S7 Multi-function input 2 (Multi-stop speed reference 2) S6 Multi-functininput 2 (Multi-stop speed reference 2)		-V	Power supply for analog inputs	-10.5 Vdc (max allowable current 20 mA)								
Hadd pulse Paster Train Input Paster Train Paster Train Input Paster Train Paster Train Input Paster Train Paster Train (Auditary Requency reference) Paster Train Paster Train (Auditary Requency reference) Paster Train Paster Train (Auditary Requency reference) Paster Train Paster Train Paster Train Paster Train Paster Train Paster Train Paster Train	Analog Inpute /	A1	Multi-function analog input 1 (Frequency reference bias)	-10 to 10 Vdc, 0 to 10 Vdc (input impedance: 20 kΩ)								
As Multi-function analog input 3 / PCE (input) -10 to 10 Vic. (input impedance: 20 KQ): Use switch S4 on the control terminal board to select between analog input or PTC input. IF PTC input. Ac Frequency reference common 0V E(0) Ground for shielded lines and option cards - S3 Multi-function input 1 (Closed: Forward Bun, Open: Stop) - S3 Multi-function input 2 (Closed: Forward Bun, Open: Stop) - S4 Multi-function input 4 (Fault Reset) Photocoupler S3 Multi-function input 5 (Closed: Forward Bun, Open: Stop) - S5 Multi-function input 6 (Multi step speed reference 1) 24 Vic. 8 mA: Set the wire jumper between SC and SN or SC and SP for selection of sinking/sourcing mode and power supply. S6 Multi-function input 7 (Glog reference) - S8 Multi-function input 7 (Glog reference) - S8 Multi-function input 7 (Molt step speed reference 1) 24 Vic. 8 mA: Set the wire jumper between SC and SN or SC and SN or SC and SN as doing so will damage the drive. S9 Digital input power supply 0 V - 24 Vic. 8 mA: Set the wire jumper between SC and SN or SC and SN as doing so will damage the drive. SN Digital input power supply 0 V 24 Vic. 9 o	Pulse Train Input	A2	Multi-function analog input 2 (Frequency reference bias)	-10 to 10 Vdc, 0 to 10 Vdc (input impedance: 20 k Ω) 4 to 20 mA, 0 to 20 mA (input impedance: 250 Ω) Voltage or current input must be selected by DIP switch S1 and H3-09								
AC Frequency reference common OV E(G) Ground for shielded lines and option cards - S1 Multi-function input 1 (Closed: Forward Run, Open: Stop) - S3 Multi-function input 1 (Closed: Reverse Run, Open: Stop) - S4 Multi-function input 1 (Closed: Reverse Run, Open: Stop) - S4 Multi-function input 3 (Autil: Stetmar latur, NO.) Photocoupler S4 Multi-function input 4 (Fault Reset) Photocoupler S6 Multi-function input 3 (Multi Step speed reference 2) - S7 Multi-function input 1 (Closed: Reverse Run, Open: Stop) 24 Vdc, 8 mA; Set the wire jumper between SC and SN or SC and SP for selection of sinking/sourcing mode and power supply. S6 Multi-function input 4 (Fault Reset) Photocoupler S8 Multi-function input 2 (Closed: Reverse) 24 Vdc, 8 mA; Set the wire jumper between SC and SN or SC and SP for selection of sinking/sourcing mode and power supply. S9 Digital input power supply 0 V 24 Vdc power supply for digital inputs, 150 mA max. Never short terminals SP and SN as doing so will damage the drive. S9 Digital input power supply -24Vdc Dry contact, contact capacity Multi-function digital output (Quing run) <td>A3</td> <td>Multi-function analog input 3 / PTC Input (Auxiliary frequency reference)</td> <td>-10 to 10 Vdc, 0 to 10 Vdc (input impedance: 20 kΩ); Use switch S4 on the control terminal board to select between analog input or PTC input. If PTC is selected, set H3-06 = E.</td>		A3	Multi-function analog input 3 / PTC Input (Auxiliary frequency reference)	-10 to 10 Vdc, 0 to 10 Vdc (input impedance: 20 k Ω); Use switch S4 on the control terminal board to select between analog input or PTC input. If PTC is selected, set H3-06 = E.								
Field Found for shielded lines and option cards - S1 Multi-function input 1 (Closed: Forward Run, Open: Stop) - S2 Multi-function input 3 (Closed: Forward Run, Open: Stop) - S3 Multi-function input 3 (Closed: Reverse Run, Open: Stop) - S4 Multi-function input 3 (Closed: Reverse Run, Open: Stop) - S4 Multi-function input 5 (Multi-step speed reference 1) 24 Vdc, 8 mA; Set the wire jumper between SC and SN or SC and SP for selection of sinking/sourcing mode and power supply. S6 Multi-function input 7 (Jog reference 2) - S7 Multi-function input 7 (Jog reference 2) - S0 Digital input power supply 0 V - 24 Vdc, 8 wer supply for digital inputs, 150 mA max. Never short terminals SP and SN as doing so will damage the drive. S7 Multi-function digital output power supply - 24Vdc 24 Vdc power supply for digital inputs, 150 mA max. Never short terminals SP and SN as doing so will damage the drive. S9 Digital input power supply - 24Vdc 30 Vdc, 10 mA to 1 A 250 Vac, 10 mA to 1 A Multi-function digital output (During run) - - Multi-function digital output (Speed agree 1) 30 Vdc, 10 mA to 1 A 250 Vac, 10 mA to 1 A <t< td=""><td></td><td>AC</td><td>Frequency reference common</td><td>0V</td></t<>		AC	Frequency reference common	0V								
Site Multi-function input 1 (Closed: Forward Run, Open: Stop) Site Multi-function input 2 (Closed: Reverse Run, Open: Stop) Site Multi-function input 3 (External fault, N.O.) Site Multi-function input 4 (Fault Reset) Digital Inputs Site Site Multi-function input 3 (Multi-step speed reference 2) Site Multi-function input 6 (Multi-step speed reference 2) Site Multi-function input common Site Multi-function input common Site Multi-function input common Multi-function Ory contact, contact capacity Multi-function digital output common Multi-function digital output (Zero speed) Multi-function		E(G)	Ground for shielded lines and option cards	-								
S2 Multi-function input 2 (Cosed: Reverse Run, Open: Stop) S3 Multi-function input 3 (External fault, N.O.) S4 Multi-function input 5 (Multi-step speed reference 1) Digital Inputs S5 S8 Multi-function input 7 (Jog reference 2) S7 Multi-function input 7 (Jog reference 2) S8 Multi-function input common Multi-function input common Multi-function input common S8 Digital input power supply 0 V S9 Digital input power supply +24Vdc Dry contact, contact capacity S0 Vdc, 10 mA to 1 A; 250 Vac, 10 mA Multi-function digital output (During run) Multi-function digital output (Zero speed) Multi-function digital output (Zero speed) Multi-function digital output (Speed agree 1) Dry contact, contact capacity Multi-function digital output (Spe		S1	Multi-function input 1 (Closed: Forward Run, Open: Stop)									
S3 Multi-function input 3 (External fault, N.O.) Photocoupler Multi-function S4 Multi-function input 5 (Multi-step speed reference 1) 24 Vdc, 8 mA; Set the wire jumper between SC and SN or SC and SP for selection of sinking/sourcing mode and power supply. S6 Multi-function input 6 (Atlant Besp Speed reference 2) 24 Vdc, 8 mA; Set the wire jumper between SC and SN or SC and SP for selection of sinking/sourcing mode and power supply. S6 Multi-function input 6 (External baseblock) Multi-function input 4 (fexternal baseblock) S6 Multi-function input 8 (External baseblock) Multi-function input 4 (fexternal baseblock) S7 Multi-function input 4 (fexternal baseblock) Very ordigital input power supply 0 V S8 Multi-function input 4 (fexternal baseblock) Very ordigital inputs, 150 mA max. Never short terminals SP and SN as doing so will damage the drive. S7 Digital input power supply 0 V 24 Vdc power supply for digital inputs, 150 mA max. Never short terminals SP and SN as doing so will damage the drive. Fault Relay MA N.O. Dry contact, contact capacity MUlti-function digital output (Ouring run) Protocoupler Protocoupler Multi-function digital output (Speed agree 1) Mainimum load: 5 Vdc, 10 mA Mainimum load: 5 Vdc, 10 mA		S2	Multi-function input 2 (Closed: Reverse Run, Open: Stop)									
S4 Multi-function input 4 (Fault Reset) Photocoupler Multi-function S6 Multi-function input 5 (Multi-step speed reference 1) 24 Vdc, 8 mA; Set the wire jumper between SC and SN or SC and SP for selection of sinking/sourcing mode and power supply. Digital Inputs S6 Multi-function input 6 (Multi-step speed reference 2) 24 Vdc, 8 mA; Set the wire jumper between SC and SN or SC and SP for selection of sinking/sourcing mode and power supply. S8 Multi-function input 6 (Multi-step speed reference 2) 24 Vdc, 8 mA; Set the wire jumper between SC and SN or SC and SP for selection of sinking/sourcing mode and power supply. S8 Multi-function input 6 (Multi-step speed reference 2) 24 Vdc power supply for digital inputs, 150 mA max. Never short terminals SP and SN as doing so will damage the drive. SN Digital input power supply + 24Vdc 24 Vdc power supply for digital inputs, 150 mA max. Never short terminals SP and SN as doing so will damage the drive. Fault Relay MA N.0. Dry contact, contact capacity MUlti-function digital output (During run) Multi-function digital output (During run) Dry contact, contact capacity Multi-function digital output (Zero speed) Multi-function digital output (Cero speed) Dry contact, contact capacity Multi-function digital output (During run) Mati-function digital output (Cero speed)		S3	Multi-function input 3 (External fault, N.O.)									
Multi-Function Digital inputs S5 Multi-function input 5 (Multi-step speed reference 1) S6 24 Vdc, 8 mA; Set the wire jumper between SC and SN or SC and SP for selection of sinking/sourcing mode and power supply. Digital inputs S6 Multi-function input 7 (Jog reference) S6 S8 Multi-function input 7 (Jog reference) S6 Multi-function input 7 (Jog reference) S8 Multi-function input 7 (Jog reference) Multi-function input 7 (Jog reference) Multi-function input 7 (Jog reference) S8 Multi-function input 6 (External baseblock) Multi-function input 7 (Jog reference) Multi-function input 7 (Jog reference) S9 Digital input power supply 0 V 24 Vdc power supply for digital inputs, 150 mA max. Never short terminals SP and SN as doing so will damage the drive. Fault Relay MA N.0. Dry contact, contact capacity MC Fault output common Minimum load: 5 Vdc, 10 mA Multi-function digital output (Zero speed) 30 Vdc, 10 mA to 1 A; 250 Vac, 10 mA to 1 A Multi-function digital output (Speed agree 1) Minimum load: 5 Vdc, 10 mA Main Analog monitor output 1 (Output frequency) 32 kHz (max) Monitor Output Analog monitor output 1 (Output frequency) 32 kHz (max)		S4	Multi-function input 4 (Fault Reset)	Photocoupler								
Multi-function Digital inputs S6 S6 S8 S8 Multi-function input 6 (Multi-step speed reference 2) S7 Multi-function input 7 (Jog reference) S8 S0 Multi-function input 6 (Multi-step speed reference 2) S8 Multi-function input 7 (Jog reference) S8 Multi-function input 6 (Multi-step speed reference 2) S8 Multi-function input 7 (Jog reference) S8 Multi-function input 7 (Jog reference) S8 Multi-function input 6 (Multi-step speed reference 2) S8 Multi-function input 7 (Jog reference) S8 Multi-function input 7 (Jog reference) S9 Multi-function input 8 (Multi-step speed reference 2) S8 Multi-function input 7 (Jog reference) S9 Multi-function input 7 (Jog reference) S9 Multi-function input 8 (Multi-step speed reference 2) S9 Multi-function input 7 (Jog reference) S9 Multi-function input 7 (Jog reference) Multi-function digital output / 24 Vdc power supply for digital inputs, 150 mA max. Never short terminals SP and SN as doing so will damage the drive. Fault Relay MA N.0. N.0. Dry contact, contact capacity 30 Vdc, 10 mA to 1 A; 250 Vac, 10 mA to 1 A Multi-function digital output (Zero speed) Dry contact, contact capacity 30 Vdc, 10 mA to 1 A; 250 Vac, 10 mA to 1 A Multi-function digital output (Speed agree 1) Multi-function digital output (Speed agree 1) Dry contact, contact capacity 30 Vdc, 10 mA to 1 A; 250 Vac, 10 mA No.1 Monitor Output Multi-function digital output (Interquency) 32 kHz (max) -10 to +10 Vdc, or 4 to 20 mA -10 to +10 Vdc, or 4 to 20 mA Monitor Output Analog monitor output 2 (Output current) 32 kHz (max) -10 to +10 Vdc, or 4 to 20 mA -10 t		S5	Multi-function input 5 (Multi-step speed reference 1)	24 Vdc, 8 mA; Set the wire jumper between SC and SN or SC and SP for selection of sinking/sourcing mode and power supply.								
Digital inputs \$7 Multi-function input 7 (Jog reference) S8 Multi-function input 8 (External baseblock) S0 Multi-function input 7 (Jog reference) S8 Multi-function input 8 (External baseblock) S0 Multi-function input 7 (Jog reference) S8 Multi-function input 7 (Jog reference) S8 Multi-function input 7 Digital input power supply 0 V 24 Vdc power supply for digital inputs, 150 mA max. Never short terminals SP and SN as doing so will damage the drive. Fault Relay MA N.C. Dry contact, contact capacity MM N.C. output 30 Vdc, 10 mA to 1 A; 250 Vac, 10 mA Multi-function digital output (During run) Multi-function digital output (Zero speed) 30 Vdc, 10 mA to 1 A; 250 Vac, 10 mA to 1 A Multi-function digital output (Zero speed) Multi-function digital output (Quptur frequency) 32 kHz (max) Minimum load: 5 Vdc, 10 mA Minimum load: 5 Vdc, 10 mA Monitor Output Analog monitor output 1 (Output frequency) 32 kHz (max) -10 to +10 Vdc, 0 to +10 Vdc, or 4 to 20 mA Use jumper S5 on the control terminal board to select between voltage or current output at terminals AM and FM. Set parameters Monitor Output Monitor output Monitor output 2 (Output current) -10 to +10 Vdc, 0	Multi-Function	S6	Multi-function input 6 (Multi-step speed reference 2)									
S8 Multi-function input 8 (External baseblock) Multi-function input common SC Multi-function input common Multi-function input common SN Digital input power supply 0V 24 Vdc power supply for digital inputs, 150 mA max. Never short terminals SP and SN as doing so will damage the drive. Pault Relay MA N.0. Dry contact, contact capacity MA N.0. Dry contact, contact capacity MULTi-Function Multi-function digital output (During run) Multi-function digital output (During run) M2 Multi-function digital output (Zero speed) 30 Vdc, 10 mA to 1A; 250 Vac, 10 mA to 1 A; 250 Vac, 10 mA Multi-function Multi-function digital output (Speed agree 1) Multi-function digital output (Speed agree 1) Monitor Output FM Analog monitor output 1 (Output frequency) 32 kHz (max) Analog monitor output 1 (Output frequency) -10 to +10 Vdc, or 4 to 20 mA -10 to +10 Vdc, or 4 to 20 mA Monitor Common GK Monitor common -10 to +10 Vdc, or 4 to 20 mA Safety monitor DM+ Safety monitor output 4 common Outputs status of Safe Disable function. Closed when both Safe Disable channels are closed. Up to +48 Vdc 50 mA	Digital Inputs	S7	Multi-function input 7 (Jog reference)									
SC Multi-function input common Multi-function input common SN Digital input power supply 0 V 24 Vdc power supply or digital inputs, 150 mA max. Never short terminals SP and SN as doing so will damage the drive. Fault Relay MA N.O. Dry contact, contact capacity MLI SC Fault output common Dry contact, contact capacity MLI MUI-function digital output common 30 Vdc, 10 mA to 1 A; 250 Vac, 10 mA to 1 A MLI Multi-function digital output (During run) Minimum load: 5 Vdc, 10 mA MLI Multi-function digital output (Zero speed) 30 Vdc, 10 mA to 1 A; 250 Vac, 10 mA to 1 A Multi-function digital output (Zero speed) 30 Vdc, 10 mA to 1 A; 250 Vac, 10 mA to 1 A Multi-function digital output (Speed agree 1) 30 Vdc, 10 mA to 1 A; 250 Vac, 10 mA to 1 A Monitor Output MP Pulse train output (Output frequency) 32 kHz (max) FM Analog monitor output 1 (Output frequency) 32 kHz (max) Monitor Common -10 to +10 Vdc, ot +10 Vdc, or 4 to 20 mA Multi-function digital output 2 (Output current) Use jumper S5 on the control terminal board to select between voltage or current output at terminals AM and FM. Set parameters Monitor Common		S8	Multi-function input 8 (External baseblock)									
SN Digital input power supply 0 V 24 Vdc power supply for digital inputs, 150 mA max. Never short terminals SP and SN as doing so will damage the drive. SP Digital input power supply + 24Vdc Dry contact, contact capacity Dry contact, contact capacity Fault Relay MB N.C. output Fault output common Minimum load: 5 Vdc, 10 mA Dry contact, contact capacity Multi-Function Multi-function digital output (During run) Multi-function digital output (Zero speed) Dry contact, contact capacity Dry contact, contact capacity Multi-function digital output (Speed agree 1) Multi-function digital output (Speed agree 1) Dry contact, contract capacity Or worth terminal SP and SN as doing so will damage the drive. Monitor Output MP Pulse train output (Output frequency) S2 kHz (max) Or worth terminal SP and SN as doing so will damage the drive. Monitor Output Analog monitor output 2 (Output trequency) S2 kHz (max) Or worth terminal SP and SN as doing so will damage the drive. Safety monitor DM+ Safety monitor output common Safety monitor output common Output status of Safe Disable function. Closed when both Safe Disable channels are closed. Up to +48 Vdc 50 mA		SC	Multi-function input common	Multi-function input common								
SP Digital input power supply +24Vdc 24 Vdc power supply for ugital inputs, 150 HA HAX. Never short terminals SP and SN as doing S0 Will dahage the drive. Fault Relay MA N.O. Dry contact, contact capacity MB N.C. output 30 Vdc, 10 mA to 1 A; 250 Vac, 10 mA to 1 A MUIti-Function Multi-function digital output (During run) Minimum load: 5 Vdc, 10 mA Tot 1 A; 250 Vac, 10 mA Multi-Function Multi-function digital output (Zero speed) Multi-function digital output (Zero speed) Dry contact, contact capacity Multi-function digital output (Speed agree 1) Multi-function digital output (Speed agree 1) Dry contact, contact capacity S0 Vdc, 10 mA Monitor Output MP Pulse train output (Output frequency) 32 kHz (max) Analog monitor output 1 (Output frequency) 32 kHz (max) -10 to +10 Vdc, 0 to +10 Vdc, or 4 to 20 mA Safety monitor output DM+ Safety monitor output common Output status of Safe Disable function. Closed when both Safe Disable channels are closed. Up to +48 Vdc 50 mA		SN	Digital input power supply 0 V	041/de annuel (fragilitation de 150 et Annuel Neurophent Annuels (De and ON as deine and the statistication of								
MA N.O. Dry contact, contact capacity Fault Relay MB N.C. output Dry contact, contact capacity MU N.C. output		SP	Digital input power supply +24Vdc	24 vuc power supply for digital inputs, 150 mA max. Never short terminals SP and SN as doing so will damage the drive.								
Fault Relay MB N.C. output 30 Vdc, 10 mA to 1 A; 250 Vac, 10 mA to 1 A MC Fault output common Minimum load: 5 Vdc, 10 mA Multi-function digital output (During run) Multi-function digital output (Zero speed) Dry contact, contact capacity Multi Multi-function digital output (Zero speed) Multi-function digital output (Speed agree 1) Dry contact, contact capacity Monitor Output MP Pulse train output (Output frequency) 32 kHz (max) Monitor Output Analog monitor output 2 (Output frequency) 32 kHz (max) Analog monitor output 2 (Output current) 32 kHz (max) Analog monitor output 2 (Output current) 32 kHz (max) Analog monitor output 2 (Output current) 32 kHz (max) Analog monitor output 2 (Output current) 32 kHz (max) Analog monitor output 2 (Output current) 32 kHz (max) Analog monitor output 2 (Output current) 32 kHz (max) Ac Monitor common 34 conding when changing the jumper setting. Analog monitor output 2 (Output current) Output status of Safe Disable function. Closed when both Safe Disable channels are closed. Up to +48 Vdc 50 mA		MA	N.O.	Dry contact, contact capacity								
MC Fault output common Minimum load: 5 Vdc, 10 mA Multi-Function Multi-function digital output (During run) Dry contact, contact capacity Multi-Function Multi-function digital output (Zero speed) Dry contact, contact capacity Multi-function digital output (Speed agree 1) Multi-function digital output (Output frequency) 32 kHz (max) Monitor Output FM Analog monitor output 1 (Output frequency) 32 kHz (max) Monitor Output Analog monitor output 2 (Output current) 32 kHz (max) Monitor Courtput Analog monitor output 2 (Output current) -10 to +10 Vdc, 0 to +10 Vdc, or 4 to 20 mA Safety monitor output DM+ Safety monitor output common Outputs status of Safe Disable function. Closed when both Safe Disable channels are closed. Up to +48 Vdc 50 mA	Fault Relay	MB	N.C. output	30 Vdc, 10 mA to 1 A; 250 Vac, 10 mA to 1 A								
Multi Multi Multi Multi Multi Multi-function digital output (During run) Dry contact, contact capacity 30 Vdc, 10 mA to 1 A, 250 Vac, 10 mA to 1 A Minimum load: 5 Vdc, 10 mA to 1 A Multi-function digital output (Zero speed) Multi-function digital output (Speed agree 1) Multi-function digital output (Speed agree 1) Monitor Output MP Pulse train output (Output frequency) 32 kHz (max) Monitor Output FM Analog monitor output 1 (Output frequency) 32 kHz (max) Analog monitor output 2 (Output current) Safety monitor On tor common -10 to +10 Vdc, 0 to +10 Vdc, or 4 to 20 mA Safety monitor output Safety monitor output 2 monitor output common Outputs status of Safe Disable function. Closed when both Safe Disable channels are closed. Up to +48 Vdc 50 mA		MC	Fault output common	Minimum load: 5 Vdc, 10 mA								
Multi-Function Digital Output M3 M4 M5 M6 Multi-function digital output (Zero speed) Digital Output 30 Vdc, 10 mA to 1, 250 Vac, 10 mA to 1 A Monitor Output M6 Multi-function digital output (Speed agree 1) Minimum load: 5 Vdc, 10 mA Monitor Output MP Pulse train output (Output frequency) 32 kHz (max) FM Analog monitor output 1 (Output frequency) 32 kHz (max) Amage monitor output 2 (Output current) 10 to +10 Vdc, 0 to +10 Vdc, or 4 to 20 mA Vise jumper S5 on the control terminal board to select between voltage or current output a terminals AM and FM. Set parameters H4-07 and H4-08 accodingly when changing the jumper setting. Safety monitor output DM+ Safety monitor output common Outputs status of Safe Disable function. Closed when both Safe Disable channels are closed. Up to +48 Vdc 50 mA		M1 M2	Multi-function digital output (During run)	Dev contrat contrat consoity								
M5 M6 Multi-function digital output (Speed agree 1) Minimum road. 5 voc, 10 m/A MP Pulse train output (Output frequency) 32 kHz (max) Analog monitor output 1 (Output frequency) 10 to +10 Vdc, 0 to +10 Vdc, or 4 to 20 mA Monitor Output Analog monitor output 2 (Output current) -10 to +10 Vdc, 0 to +10 Vdc, or 4 to 20 mA Safety monitor output MA+ Safety monitor output 2 (Output common -10 to +10 Vdc, 0 to +10 Vdc, or 4 to 20 mA Safety monitor output DM+ Safety monitor output common Outputs status of Safe Disable function. Closed when both Safe Disable channels are closed. Up to +48 Vdc 50 mA	Multi-Function Digital Output	M3 M4	Multi-function digital output (Zero speed)	30 Vdc, 10 mA to 1 A; 250 Vac, 10 mA to 1 A								
MP Pulse train output (Output frequency) 32 kHz (max) Monitor Output FM Analog monitor output 1 (Output frequency) -10 to +10 Vdc, 0 to +10 Vdc, or 4 to 20 mA Monitor Output Am Analog monitor output 2 (Output current) -10 to +10 Vdc, 0 to +10 Vdc, or 4 to 20 mA Am Analog monitor output 2 (Output current) -10 to +10 Vdc, 0 to +10 Vdc, or 4 to 20 mA Am Analog monitor output 2 (Output current) -10 to +10 Vdc, 0 to		M5 M6	Multi-function digital output (Speed agree 1)									
FM Analog monitor output 1 (Output frequency) -10 to +10 Vdc, 0 to +10 Vdc, or 4 to 20 mA Monitor Output Analog monitor output 2 (Output current) Use jumper SS on the control terminal board to select between voltage or current output at terminals AM and FM. Set parameters H4-07 and H4-08 accodingly when changing the jumper setting. Safety monitor output DM+ Safety monitor output common Outputs status of Safe Disable function. Closed when both Safe Disable channels are closed. Up to +48 Vdc 50 mA		MP	Pulse train output (Output frequency)	32 kHz (max)								
Monitor Output AM Analog monitor output 2 (Output current) -10 to +10 Vdc, 0 to +10 Vdc, or 4 to 20 mA Very provide the providet the provide the provide the provide the pro		FM	Analog monitor output 1 (Output frequency)									
AC Monitor common Safety monitor DM+ Safety monitor output Outputs status of Safe Disable function. Closed when both Safe Disable channels are closed. Up to +48 Vdc 50 mA Outputs DM- Safety monitor output common Outputs status of Safe Disable function. Closed when both Safe Disable channels are closed. Up to +48 Vdc 50 mA	Monitor Output	AM	Analog monitor output 2 (Output current)	-10 to +10 Voc, 0 to +10 Voc, or 4 to 20 mA Use jumper S5 on the control terminal board to select between voltage or current output at terminals AM and FM. Set parameters H4-07 and H4-08 accodingly when changing the jumper setting.								
Safety monitor output DM+ Safety monitor output Output DM- Safety monitor output common Outputs status of Safe Disable function. Closed when both Safe Disable channels are closed. Up to +48 Vdc 50 mA		AC	Monitor common									
output DM- Safety monitor output common	Safety monitor	DM+	Safety monitor output	Outputs status of Safe Disable function. Closed when both Safe Disable channels are closed. Up to +48 Vdc 50 mA								
	output	DM-	Safety monitor output common									

Serial Communication Terminals (200 V/400 V Class)

Classification Terminal Signal Function Signal Level Description R+ Differential input MEMOBUS communications Read R-When using RS-422 two wires communication, short-circuit PHC isolation RS-485/422 S+ between R+ and S+, R- and S-. Differential output Transmission MEMOBUS communications send PHC isolation S-IG Communications output



Dimensions

Enclosures

Enclosures of standard products vary depending on the model. Refer to the table below.

								200 \	/ Class																
Model CIMR-AC2A		0004	0006	0008	0010	0012	0018	0021	0030	0040	0056	0069	0081	0110	0138	0169	0211	0250	0312	0360	041	5			
Max. Applicable	Normal Duty	0.75	1.1	1.5	2.2	3	4.0	5.5	7.5	11	15	18.5	22	30	37	45	55	75	90	110	110	J			
Motor Capacity [kW]	Heavy Duty	0.4	0.75	1.1	1.5	2.2	3	4.0	5.5	7.5	11	15	18.5	22	30	37	45	55	75	90	110	J			
Enclosure Panel [NEMA Type1]							Star	ndard									on requ	est			-				
Open-Chassis (IP00)						Withou	ıt top an	d bottor	n covers								Sta	andard							
400 V Class																									
Model CIMR-AC4A		0002	0004	0005	0007	0009	0011	0018	0023	0031	0038	0044	0058	0072	8800	0103	0139	0165	0208	0250	0296	0362	0414	0515	067
Max. Applicable	Normal Duty	0.75	1.5	2.2	3	4.0	5.5	7.5	11	15	18.5	22	30	37	45	55	75	90	110	132	160	185	220	250	355
Motor Capacity [kW]	Heavy Duty	0.4	0.75	1.5	2.2	3	4.0	5.5	7.5	11	15	18.5	22	30	37	45	55	75	90	110	132	160	185	220	315
Enclosure Panel [NEMA Type1] Standard													on red	quest						-					
Open-Chassis (POO) Without top and bottom covers							Standard																		

Open-Chassis [IP00]

Fig. 2







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200 V Class

Model	Max. applicable m	Max. applicable motor capacity [kW]				Weight (kg)	Cooling																												
CIMR-AC2A	Normal Duty	Heavy Duty	riguie	w	Н	D	W1	H1	H2	D1	t1	t2	d	weigin (kg)	Cooling																				
0004	0.75	0.4												2.1																					
0006	1.1	0.75				147				20				3.1	Colf cooling																				
0010	2.2	1.5				147				30				2.0	Sell cooling																				
0012	3	2.2		140	260		122	248	6				4 ME	3.2																					
0021	5.5	4.0	Fig. 1			164	1			55	_		4-M5	3.5																					
0030	7.5	5.5				107	1				5	-		4.0																					
0040	11	7.5				107								4.0																					
0056	15	11		180	300	187	160	284		75				5.6																					
0069	18.5	15			350	107	100	005	8	70				8.7																					
0081	22	18.5	Fig. 2	220	365	197	192	335		78				9.7	Fan cooled																				
0110	30	22		250	400	050	195	385					4.440	21																					
0138	37	30		275	450	258	220	435	7.5	100			4-100	25																					
0169	45	37		005	550	000	000	505	1.5	110	2.3	2.3		37																					
0211	55	45	Fig. 3	325	550	283	260	535		110				38																					
0250	75	55		450	705	220	205	600	10.5			0.0	4 1410	76																					
0312	90	75		450	705	330	325	000	12.5	100	3.2	3.2	4-11110	80	-																				
0360	110	90		-	1		1	1			1 -		1 -	-	1	-	1 -				1	1 -			500	0.00	250	970	770	10	130	4.5	4.5	4 1410	98
0415	110	110		500	000	350	3/0	1/3	13		4.5	4.5	4-1/112	99																					

400 V Class

Model	Max. applicable m	otor capacity [kW]	Figuro	Dimensions in mm											Cooling
CIMR-AC4A	Normal Duty	Heavy Duty	liguie	W	н	D	W1	H1	H2	D1	t1	t2	d	weigin (kg)	Cooling
0002	0.75	0.4													
0004	1.5	0.75				147				38				3.2	Self cooling
0005	2.2	1.5													
0007	3	2.2		140	260		100	240	6					3.4	
0009	4.0	3		140	200	164	122	240	0				4-M5	2.5	
0011	5.5	4.0	Fig. 1							55	5	-	4-1413	5.5	
0018	7.5	5.5								55				2.0	
0023	11	7.5				167								5.5	
0031	15	11		190	200		160	284						5.4	
0038	18.5	15		100	300	187	100	204	8	75				5.7	
0044	22	18.5		220	350	197	192	335		78				8.3	
0058	30	22		250	50 400		195	385		100		22		21	
0072	37	30		275	450	258	220	435		100		2.5		25	
0088	45	37			510	200		495	7.5	105	22	2.2	4-M6	26	Fan cooled
0103	55	45		325			260		1.5		2.5	3.2			
0139	75	55	Fig. 2	525	510	202	200	525				22		41	
0165	90	75	rig. 5			205		333		110		2.3		42	
0208	110	90		450	705	330	325	680	12.5		3.2	3.2	4-M10	79	
0250	132	110								120				96	
0296	160	132	500	500	800	350	270	773	12	130				102	
0362	185	160		500			370		15		4.5	4.5	4-M12	107	
0414	220	185	Fig. 4	Fig. 4				923		135	т .Ј	ч.Ј	- 10/12	125	-
0515	250	220	Fig. F	670	1140	370	440	1110	15	150				221	
0675	355	315	гıў. э	0/0	1140		440	1110	10	100				221	





Dimensions

Enclosure Panel [NEMA Type1]



200 V Class

Model	Max. applicable motor capacity [kW]		Figure	Dimensions in mm											Moinht (kn)	Cooling															
CIMR-AC2A	Normal Duty	Heavy Duty	Figure	w	Н	D	W1	HO	H1	H2	H3	D1	t1	t2	d	weigilt (kg)	Cooling														
0004	0.75	0.4	Fig. 1													2.1															
0006	1.1	0.75				147	122			6	00	20	5	-		3.1	Self cooling														
0010	2.2	1.5										38			4 ME	2.0															
0012	3	2.2		140	260				248							3.2															
0021	5.5	4.0				164		-			-	55			4-1010	3.5															
0030	7.5	5.5				167										4.0															
0040	11	7.5					107										4.0														
0056	15	11																180	300	187	160		284		1	75	1			5.6	
0069	18.5	15			220	350	107	102		225	8		70				8.7														
0081	22	18.5	Fig. 2	220	365	197	192	350	330		15	15 /0				9.7															
0110	30	22	254 534 258 195 400 385 279 614 258 220 450 435 329 730 283 260 550 535 456 960 330 325 705 608 504 1168 350 370 800 773		134	100		4 140	23	Fan cooled																					
0138	37	30		279	614	200	220	450	435	7.5	7 64	100	0 00	.3 2.3	4-110	28	-														
0169	45	37		000 70	700	000	000	550	505	7.5	100	110	2.3			41															
0211	55	45		329	730	203	200	550	535		100	110				42															
0250	75	55		450	000	220	205	705	c00	10.5	055		2.0	2.0	4 1410	83															
0312	90	75		450	900	330	325	705	800	12.5	255	130	3.2	3.2	4-IVI10	88															
0360	110	90		504	1168	350	370	800	773	13	368]	4.5	4.5	4-M12	108															

400 V Class

Model	Max. applicable motor capacity [kW]		Figuro	Dimensions in mm										Weight (kg)	Cooling													
CIMR-AC4A	Normal Duty	Heavy Duty	riguie	w	Н	D	W1	HO	H1	H2	H3	D1	t1	t2	d	weigint (kg)	Cooling											
0002	0.75	0.4	Fig. 1																									
0004	1.5	0.75				147						38				3.2	Self cooling											
0005	2.2	1.5							248	6							-											
0007	3	2.2		140 26	260	164	164 ¹²² -	-			55				3.4													
0009	4.0	3											5	-	4 M6	2.5												
0011	5.5	4.0									-				4-1010	3.0												
0018	7.5	5.5				167					(E					2.0												
0023	11	7.5														3.9												
0031	15	11		190	200		160		284							5.4												
0038	18.5	15				100 500	187	100		204	8		75				5.7											
0044	22	18.5			220	350	197	192		335			78				8.3											
0058	30	22	254 279	254 465 279 515	19	195	400	385		65	65 100		22		23	Fan cooled												
0072	37	30			279	515	250	258 220	450	435		03 100	100		2.5		27	i ali cooleu										
0088	45	37		220	200											620	200		510	405	7.5	120	105	22	2.2	4-M6	20	
0103	55	45	Fig. 3			030	030		260	510	490	1.5	120	105	2.3	3.2		39										
0139	75	55		Fig. 3	329	720	202	200	550	626		100	110		2.2		45											
0165	90	75				730	203		550	000		100	110		2.3		46											
0208	110	90		456	960	330	325	705	680	12,5	255		3.2	3.2	4-M10	87												
0250	132	110													120				106									
0296	160	132		504	1168	350	370	880	773	13	368	130	4.5	4.5	4-M12	112												
0362	185	160														117												



Options

Name	Purpose	Model		
		4A0002 🗆 AA 4A0004 🗋 AA 4A0005 🗋 AA 4A0007 🗋 AA 4A0009 🗋 AA 4A0011 🗋 AA 4A0011 🗋 AA 4A0018 BA		
Input Noise Filter	Reduces noise from the line that enters into the drive input power system. Should be installed as close as possible to the drive. 400V class: Filter of the manufacturer Block are used. Class C1 and footmounting up to 15 kW (HD), Class C2 and side mounting up to 110 kW (HD)	4A0023 □ AA FB-40025A 4A0031 □ AA FB-40044A 4A0038 □ AA FB-40044A 4A0044 □ AA FB-40060A 4A0058 □ AA FB-40060A		
		4A0072 ⊟ AA 4A0088 ⊟ AA 4A0103 ⊟ AA 4A0139 ⊟ AA 4A0139 ⊟ AA 4A0165 ⊟ AA 4A0165 ⊟ AA FB-40170A FB-40170A FB-40250A		
AC Chokes	Paducing Harmonics	4AU250 LI AA B06040 Series		
Analog input	Enables high-precision and high-resolution analog speed reference setting. • Input signal level: -10 to +10 Vdc (20 k Ω) 4 to 20 mA (500 Ω) • Input channels: 3 channels, DIP switch for input voltage/input current selection • Input resolution: Input voltage 13 bit signed (1/8192) Input current 1/6554	Al-A3		
Digital Input	Enables 16-bit digital speed reference setting. • Input signal: 16 bit binary, 2 digit BCD + sign signal + set signal • Input voltage: +24 V (isolated) • Input current: 8 mA Selectable Parameter: 8 bit, 12 bit, 16 bit	DI-A3		
DeviceNet communications interface	Used for running or stopping the drive, setting or referencing parameters and monitoring output frequency, output current, or similar items through DeviceNet communication with the host controller	SI-N3		
CC-Link communications interface	Used for running or stopping the drive, setting or referencing parameters and monitoring output frequency, output current, or similar items through CC-Link communication with the host controller.	SI-C3		
CANopen communications interface	Used for running or stopping the drive, setting or referencing parameters and monitoring output frequency, output current, or similar items through CANopen communication with the host controller.	SI-S3		
MECHATROLINK communications interface	Used for running or stopping the drive, setting or referencing parameters and monitoring output frequency, output current, or similar items through MECHATROLINK communication with the host controller.	SI-T3		
PROFIBUS-DP communications interface	Used for running or stopping the drive, setting or referencing parameters and monitoring output frequency, output current, or similar items through CANopen communication with the host controller.	SI-P3		
Analog monitor	Outputs analog signal for monitoring drive output state (output freq., output current etc.) • Output resolution: 11 bit signed (1/2048) • Output voltage: -10 to +10 Vdc (non-isolated) • Output channels: 2 channels	A0-A3		
Digital output	Outputs isolated type digital signal for monitoring drive run state (alarm signal, zero speed detection, etc.). Output channel: Photo coupler 6 channels (48 V, 50 mA or less) Relay contact output 2 channels 250 Vac, 1 A or less 30 Vdc, 1 A or less	D0-A3		
Open collector PG interface	For control modes requiring a PG encoder for motor feedback. • Phase A, B, and Z pulse inputs (complementary type) • PG frequency range: Approx. 50 kHz max. • Pulse monitor output: Open collector, max. voltage: 24 V, max. current 30 mA • Power supply output for PG: +12 V, max. current 200 mA	PG-B3		
Line Driver PG interface	For control modes requiring a PG encoder for motor feedback. • Phase A, B, and Z pulse (differential pulse) inputs (RS-422) • PG frequency range: up to 300 kHz (approx.) • Pulse monitor output: RS-422 • Power supply output for PG: +5 V or +12 V, max. current 200 mA	PG-X3		
LED Operator	Easy long distance reading	JVOP-182		
Braking Resistor	Used to shorten the deceleration time by dissipating regenerative energy through a resistor. (3% ED) (all models up to 3,7 kW)	ERF-150WJ series		
Braking Chopper Unit	Shortened deceleration time results when used with a Braking Transistor Unit.	CDBR series		
24 V Power Supply	Provides power supply for the control circuit and option boards. Note: Parameter settings cannot be changed when the drive is operating solely from this power supply.	PS-A10H PS-A10L		
USB Copy Unit (RJ-45/USB compatible plug)	 Adapter for connecting the drive to the USB port of a PC Can copy parameter settings easily and quickly to be later transferred to another drive. 	JV0P-181		
LCD operator extension cable	Cable for connecting the LCD operator.	WV001: 1 m WV003: 3 m		

Note: contact the manufacturer in question for availability and specifications of non-YASKAWA products.



Ratings & Type Descriptions

Model Number Key



Note: Contact Yaskawa for more information on environmental tolerance specifications.

		200 V					
	Norm	al duty*1	Heavy duty				
	Rated output current [A]	Max. applicable motor*2 [kW]	Rated output current [A]	Max. applicable motor*2 [kW]			
0004	3.5	0.75	3.2*3	0.4			
0006	6	1.1	5* ³	0.75			
0010	9.6	2.2	8*3	1.5			
0012	12	3	11* ³	2.2			
0021	21	5.5	17.5*3	4.0			
0030	30	7.5	25*3	5.5			
0040	40	11	33* ³	7.5			
0056	56	15	47* ³	11			
0069	69	18.5	60* ³	15			
0081	81	22	75*3	18.5			
0110	110	30	85*3	22			
0138	138	37	115*3	30			
0169	169	45	145*4	37			
0211	211	55	180*4	45			
0250	250	75	215*4	55			
0312	312	90	283*4	75			
0360	360	110	346*4	90			
0415	415	110	415 ^{*1}	110			

400 V								
	Norm	al duty*1	Heav	y duty				
	Rated output current [A]	Max. applicable motor*2 [kW]	Rated output current [A]	Max. applicable motor*2 [kW]				
0002	2.1	0.75	1.8*3	0.4				
0004	4.1	1.5	3.4*3	0.75				
0005	5.4	2.2	4.8*3	1.5				
0007	6,9	3	5.5*3	2.2				
0009	8.8	4.0	7.2*3	3				
0011	11.1	5.5	9.2*3	4.0				
0018	17.5	7.5	14.8*3	5.5				
0023	23	11	18*3	7.5				
0031	31	15	24*3	11				
0038	38	18.5	31*3	15				
0044	44	22	39*3	18.5				
0058	58	30	45*3	22				
0072	72	37	60* ³	30				
0088	88	45	75*5	37				
0103	103	55	91*3	45				
0139	139	75	112*4	55				
0165	165	90	150*4	75				
0208	208	110	180*4	90				
0250	250	132	216*4	110				
0296	296	160	260*4	132				
0362	362	185	304*4	160				
0414	414	220	370*4	185				
0515	515	250	450*1	220				
0675	675	355	605*1	315				

*1: This value assumes a carrier frequency of 2 kHz. Increasing the carrier frequency requires a reduction in current.
*2: The motor capacity (kW) refers to a Yaskawa 4-pole, 60 Hz, 200 V motor or 400 V motor. The rated output current of the drive output amps should be equal to or greater than the motor rated current.
*3: This value assumes a maximum carrier frequency of 8 kHz. Increasing the carrier frequency requires a reduction in current.
*4: This value assumes a maximum carrier frequency of 5 kHz. Increasing the carrier frequency requires a reduction in current.



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NaHS Directive Stands for the EU directive on the Restriction of the Use of Centain Hiszandous Substances in Electrical and Electricite Equations

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