

Q2V

Driving Quality

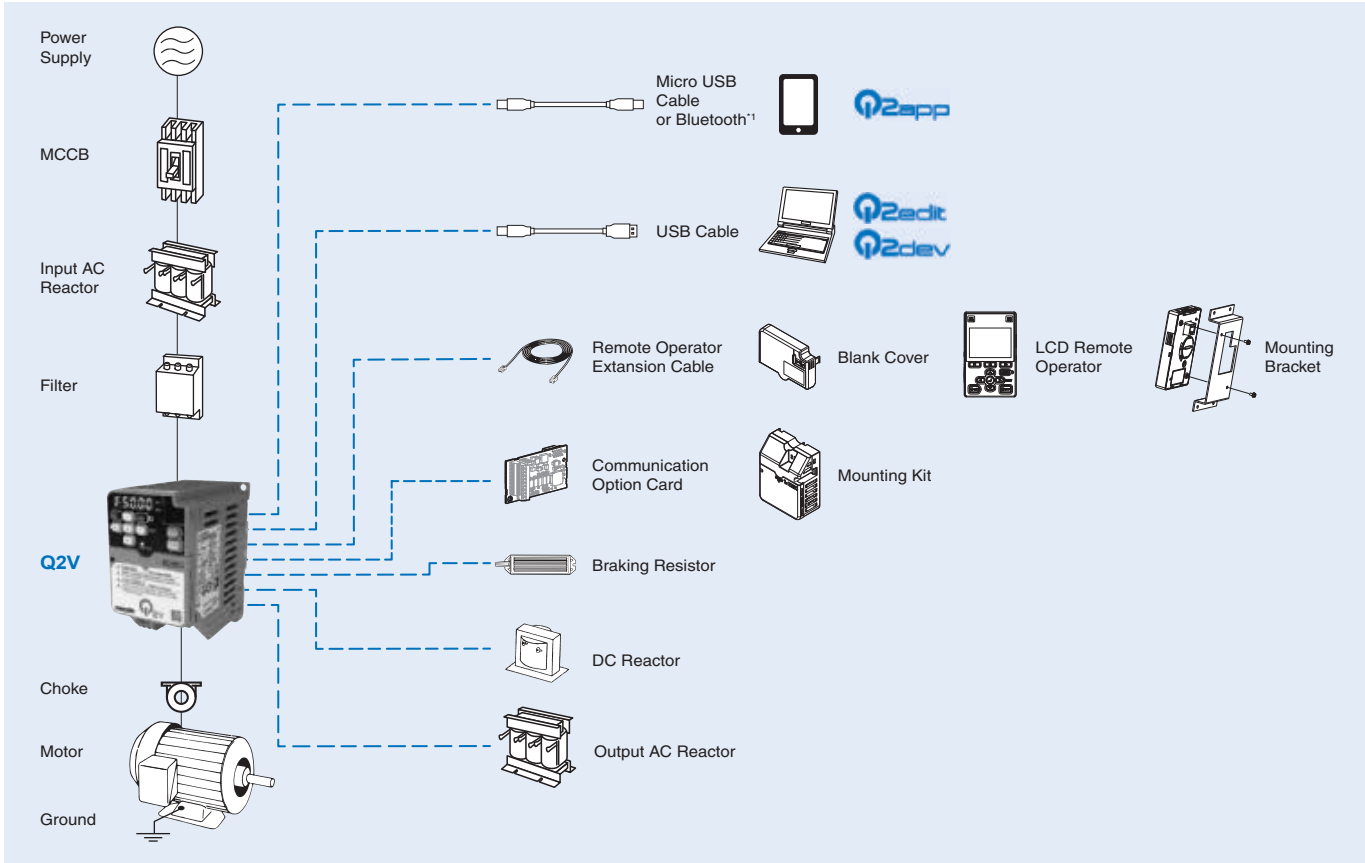
- Flexible motor control: IM, PM, SynRM
- V/f and Sensorless vector motor control
- Speed and torque control in open loop
- Embedded STO (Safe Torque Off) safety function, SIL3/PLe
- Built-in C1/C2/C3 class EMC filter
- Built-in braking transistor
- Quick and easy setup with optional remote LCD keypad with Micro SD card for data storage
- 24 VDC power supply input for control board
- Communication options: EtherCAT, EtherNet/IP, PROFINET, POWERLINK
- Up to 5 Q2V with a single communication option card
- Q2dev: Intuitive drag and drop programming
- Q2app: Mobile app for setup and monitoring
- CE, UL, cUL, EAC, REACH, RoHS

Ratings

- 200 V class single-phase: 0.1 to 4 kW
- 200 V class three-phase: 0.1 to 22 kW
- 400 V class three-phase: 0.37 to 30 kW



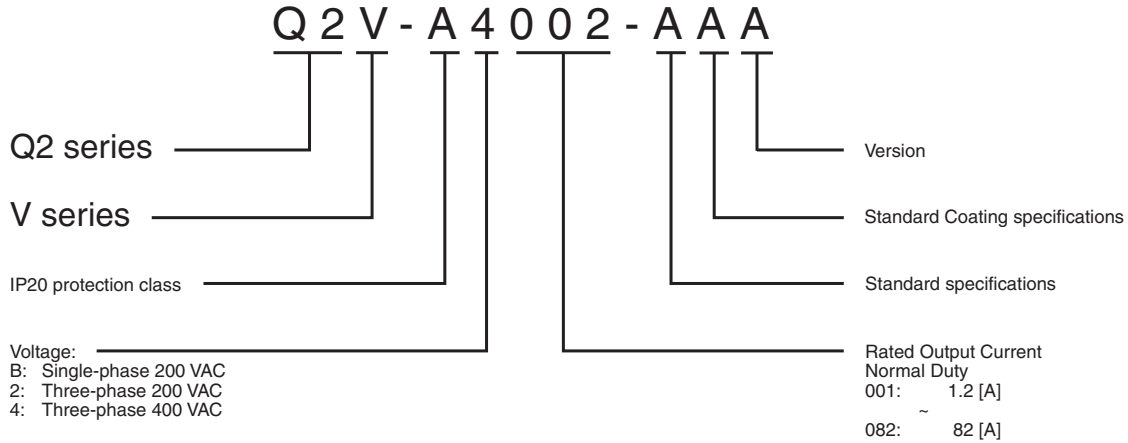
System configuration



*1 With optional LCD remote operator model with Bluetooth.

Specifications

Type designation



200 V class

Single-phase: Q2V-A□		Duty rating	B001	B002	B004	B006	B010	B012	B018	—	—	—	—	—									
Three-phase: Q2V-A□			2001	2002	2004	2006	2010	2012	—	2021	2030	2042	2056	2070	2082								
Max. applicable motor output (kW)	HD ^{*1}	0.1	0.25	0.55	1.1	1.5	2.2	3.0	4.0	4.0	5.5	7.5	11	15	18.5								
	ND ^{*2}	0.18	0.37	0.75	1.1	2.2	3.0	—	—	5.5	7.5	11	15	18.5	22								
Inverter capacity (kVA) ^{*3}	HD	0.3	0.6	1.1	1.9	3.0	4.2	6.7	6.7	9.5	12.6	17.9	22.9	28.6									
	ND	0.5	0.7	1.3	2.3	3.7	4.6	—	—	8.0	11.4	16	21.3	26.7	31.2								
Rated output current (A)	HD	0.8	1.6	3.0	5.0	8.0	11	17.6	17.6	25	33	47	60	75									
	ND	1.2	1.9	3.5	6.0	9.6	12.2	—	—	21	30	42	56	70	82								
Overload tolerance ^{*4}		<ul style="list-style-type: none"> • HD: 150% of the rated output current for 60 seconds • ND: 110% of the rated output current for 60 seconds 																					
Carrier frequency ^{*5} (without derating the drive capacity)		<ul style="list-style-type: none"> • HD: 10 kHz • ND: 2 kHz 						<ul style="list-style-type: none"> • HD: 8 kHz • ND: 2 kHz 															
Max. output voltage		• Proportional to input voltage: 200-240 V																					
Max. output frequency		<ul style="list-style-type: none"> • EZOLV: 120 Hz • AOLV/PM: 270 Hz • V/f, OLV, OLV/PM: 590 Hz 																					
Rated voltage and frequency		<ul style="list-style-type: none"> • 3-phase AC power supply 200-240 V at 50/60 Hz • DC power supply 270-340 VDC 																					
Allowable voltage fluctuation		-15% to +10%																					
Allowable frequency fluctuation		±5%																					
Input Power (kVA)	HD	0.3	0.7	1.3	2.7	3.4	5.0	9.2	8.7	11.0	17.0	24.0	31.0	44.0									
	ND	0.5	1.2	1.8	3.3	4.9	6.4	—	—	11.0	17.0	24.0	31.0	37.0	52.0								
Weight (kg)		0.5		0.8		0.9		1.5		2.9		2.0		3.4		3.6		5.5		7.5		8.0	

*1. The maximum applicable motor output complies with 208 V motor ratings as specified in NEC Table 430.250. The rated output current of the drive output amps must be equal to or more than the motor rated current.
 *2. The maximum applicable motor output is based on 4-pole, general-purpose 220 V motor ratings. The rated output current of the drive output amps must be equal to or more than the motor rated current.
 *3. The rated output capacity is calculated with a rated output voltage of 220 V.
 *4. Derating may be necessary for applications that start and stop frequently.
 *5. Derate the drive capacity to use values to 15 kHz maximum.

400 V class

Three-phase: Q2V-A□		Duty rating	4001	4002	4004	4005	4007	4009	4012	4018	4023	4031	4038	4044	4060
Max. applicable motor output (kW) ^{*1}	HD	0.37	0.55	1.1	1.5	2.2	3.0	4.0	5.5	7.5	11	15	18.5	22	
	ND	0.37	0.75	1.5	2.2	3.0	4.0	5.5	7.5	11	15	18.5	22	30	
Inverter capacity (kVA) ^{*2}	HD	0.9	1.4	2.6	3.7	4.3	5.6	7.0	11.3	13.7	18.3	23.6	29.7	34.3	
	ND	0.9	1.6	3.1	4.1	5.4	6.8	9.1	13.3	17.8	23.6	29	33.5	45.7	
Rated output current (A)	HD	1.2	1.8	3.4	4.8	5.6	7.3	9.2	14.8	18	24	31	39	45	
	ND	1.2	2.1	4.1	5.4	7.1	8.9	11.9	17.5	23.4	31	38	44	60	
Overload tolerance ^{*3}		<ul style="list-style-type: none"> • HD: 150% of the rated output current for 60 seconds • ND: 110% of the rated output current for 60 seconds 													
Carrier frequency ^{*4} (without derating the drive capacity)		<ul style="list-style-type: none"> • HD: 8 kHz • ND: 2 kHz 													
Max. output voltage		• Proportional to input voltage: 380-480 V													
Max. output frequency		<ul style="list-style-type: none"> • V/f, OLV, OLV/PM: 590 Hz • AOLV/PM: 270 Hz • EZOLV: 120 Hz 													

Three-phase: Q2V-A□		Duty rating	4001	4002	4004	4005	4007	4009	4012	4018	4023	4031	4038	4044	4060
Power supply	Rated voltage and frequency	• 3-phase AC power supply 380-480 V at 50/60 Hz													
	Allowable voltage fluctuation	-15% to +10%													
	Allowable frequency fluctuation	±5%													
Input Power (kVA)	HD	1.1	1.6	2.9	4.0	5.5	7.5	9.5	14	18	27	36	47	55	
	ND	1.1	1.9	3.9	5.4	7.4	8.6	13	18	22	35	40	55	74	
Weight (kg)		0.8	0.9	1.5				2.0	3.0	3.2	4.6	4.8	6.5		

- *1. The maximum applicable motor output complies with 380 V motor ratings as specified in Annex G of IEC 60947-4-1. The rated output current of the drive output amps must be equal to or more than the motor rated current.
- *2. The rated output capacity is calculated with a rated output voltage of 440 V.
- *3. Derating may be necessary for applications that start and stop frequently.
- *4. Derate the drive capacity to use values to 15 kHz maximum.

Common specifications

Model number Q2V-A□	Specifications	
Control functions	Control methods	V/f Control (V/f), Open Loop Vector Control (OLV), Open Loop Vector Control for PM (OLV/PM), Advanced Open Loop Vector Control for PM (AOLV/PM), EZ Open Loop Vector Control (EZOLV)
	Frequency control range	<ul style="list-style-type: none"> • V/f, OLV and OLV/PM: 0.01 Hz to 590 Hz • AOLV/PM: 0.01 Hz to 270 Hz • EZOLV: 0.01 Hz to 120 Hz
	Frequency tolerance	<ul style="list-style-type: none"> • Digital inputs: ±0.01% of the max. output frequency (-10 to +40 °C) • Analog inputs: ±0.1% of the max. output frequency (25 ±10 °C)
	Frequency setting resolution	<ul style="list-style-type: none"> • Digital inputs: 0.01 Hz • Analog inputs: 1/2048 of the max. output frequency (11-bit signed)
	Output frequency resolution	0.001 Hz
	Frequency setting signal	<ul style="list-style-type: none"> • Main speed freq reference: 0 to 10 VDC (20 kΩ), 4 to 20 mA (250 Ω), 0 to 20 mA (250 Ω) • Main speed reference: Pulse train input (max. 32 kHz)
	Starting torque*1	<ul style="list-style-type: none"> • V/f: 150%/3 Hz • OLV: 150%/1 Hz • OLV/PM: 100%/5% speed • AOLV/PM: 100%/0 min⁻¹ (when high frequency injection is enabled) • EZOLV: 100%/10% speed
	Speed control range	<ul style="list-style-type: none"> • V/f: 1:40 • OLV: 1:100 • OLV/PM: 1:10 • AOLV/PM: 1:100 (when high frequency injection is enabled) • EZOLV: 1:10
	Zero speed control	Possible in AOLV/PM control method
	Torque limits	Parameter settings allow different limits in four quadrants in these control methods: OLV, AOLV/PM, EZOLV
Accel/Decel Time	0.0 to 6000.0 s (the drive can set four pairs of different acceleration and deceleration times)	
Control functions	Braking torque	<p>Approximately 20% Approximately 125% with a dynamic braking option</p> <p>Short-time average deceleration torque:</p> <ul style="list-style-type: none"> • Motor output 0.1/0.2 kW: over 150% • Motor output 0.4/0.75 kW: over 100% • Motor output 1.5 kW: over 50% • Motor output 2.2 kW and larger: over 20%, • Overexcitation Braking/High Slip Braking allow for approximately 40% <p>Short-time average deceleration torque refers to the torque needed to decelerate the motor (uncoupled from the load) from the rated speed to zero. Motor characteristics can change the actual specifications. Motor characteristics change the continuous regenerative torque and short-time average deceleration torque for motors of 2.2 kW or higher.*2</p>
	V/f characteristics	Select from 15 pre-defined V/f patterns or a user-set V/f pattern
Functionality	Main control functions	Feed Forward Control, Restart After Momentary Power Loss, Speed Search, Overtorque Detection, Torque Limit, 17 Step Speed (max.), Accel/Decel Switch, S-curve Acceleration/Deceleration, 3-wire Sequence, Auto-Tuning (Rotational and Stationary), Dwell Function, Cooling Fan ON/OFF Switch, Slip Compensation, 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 Sleep Function), Energy Saving Control, MEMOBUS/Modbus Communications (RS-485 max, 115.2 kbps), Auto Restart, Application Presets, DriveWorksEZ (customized functions), Parameter Backup Function, Online Tuning, KEB, Overexcitation Deceleration, Overvoltage Suppression, High Frequency Injection.
Protection functions	Motor	Electronic thermal overload protection
	Momentary overcurrent	Drive stops when the output current exceeds 200% of the HD output current
	Overload	Drive stops when the output current exceeds 150% of the HD output current or 110% of the ND output current for 60 seconds*3
	Overvoltage	200 V class: Stops when the DC bus voltage is more than approximately 410 V 400 V class: Stops when the DC bus voltage is more than approximately 820 V
	Undervoltage	Single-phase 200 V class: Stops when the DC bus voltage decreases to less than approximately 160 V Three-phase 200 V class: Stops when the DC bus voltage decreases to less than approximately 190 V Three-phase 400 V class: Stops when the DC bus voltage decreases to less than approximately 380 V
	Momentary power loss ride-thru	Stops when power loss is longer than 15 ms. Continues operation if power loss is shorter than 2 s (depending on parameter settings). Stop time may be shortened depending on the load and motor speed. Drive capacity will change the continuous operation time. A momentary power loss recovery unit is necessary to continue operation through a 2 s power loss on models 2001 to 2042 and 4001 to 4023.
	Heatsink overheat	Protected by thermistor
	Stall prevention	Stall prevention is available during acceleration, deceleration and during run
	Ground fault	Electronic circuit protection This protection detects ground faults during run. The drive will not provide protection when there is a low-resistance ground fault for the motor cable or terminal block or energizing the drive when there is a ground fault.
	DC Bus charge LED	Charge LED illuminates when DC bus voltage is more than 50 V.

Environment	Area of use	Indoor (no corrosive gas, dust, etc...)
	Power supply	Overvoltage Category III
	Ambient temperature	-10°C to +50°C
	Humidity	95% RH or less (without condensation)
	Storage temperature	-20°C to +70°C (short-term temperature during transportation)
	Surrounding area	Pollution degree 2 or less Install the drive in an area without: <ul style="list-style-type: none"> • Oil mist, corrosive or flammable gas or dust • Metal powder, oil, water or other unwanted materials • Radioactive materials or flammable materials, including wood • Harmful gas or fluids • Salt • Direct sunlight
	Altitude	Up to 1000 meters max. (output derating of 1% per 100 m above 1000 m, max. 3000 m)
	Vibration	<ul style="list-style-type: none"> • 10 Hz to 20 Hz: 1G (9.8 m/s²) • 20 Hz to 55 Hz: 0.6G (5.9 m/s²)
Installation orientation	Install the drive vertically for sufficient airflow to cool the drive.	
Safety standard	<ul style="list-style-type: none"> • UL61800-5-1 • EN61800-3 • EN61800-5-1 • Two Safe Disable inputs and one EDM output according to ISO/EN13849-1 Cat.III PLe, IEC/EN61508 SIL3 	
Protection design⁴	Open chassis type: IP20	

*1. Correctly select drive capacity for this starting torque in these control methods: OLV, AOLV/PM.

*2. Set L3-04 to 0 (Stall Prevention during Decel = Disabled) when operating the drive with a regenerative converter, regenerative unit, braking unit, braking resistor or braking resistor unit. Failure to obey could prevent the drive from stopping in the specified deceleration time and cause serious injury or death.

*3. The drive can trigger the overload protection function within the overload tolerance if the output frequency is less than 6 Hz. Do not allow the overload more than once every ten minutes.

*4. Install an UL Type 1 kit on an Open-chassis type (IP20) to convert the drive to a Enclosed wall-mounted type (UL Type 1).

Dimensions

Q2V inverter

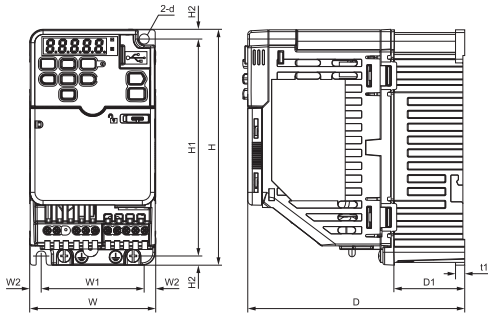


Figure 1

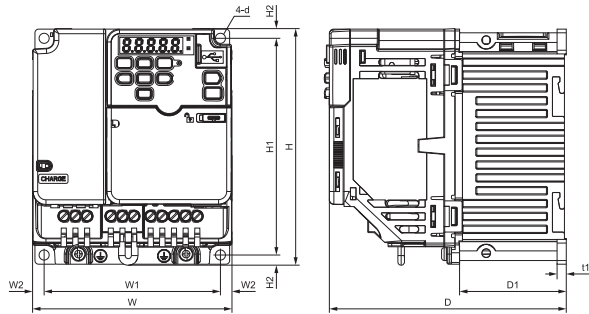


Figure 2

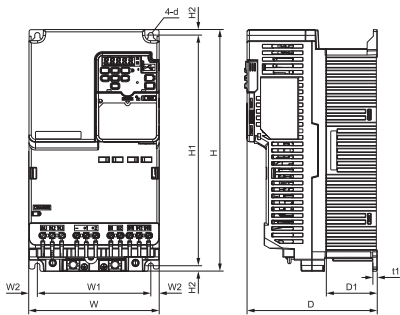


Figure 3

Voltage	Inverter model	Fig.	Dimensions (mm)										
			W	W1	W2	H	H1	H2	D	D1	t1	d	
Single-phase 200 V	B001, B002	1	68	56	6	128	118	5	116	6.5	3	M5	
	B004								158	38.5			
	B006	2	108	96	6	128	118	5	182.5	56.5			
	B010								199				
	B012								203	65			
B018	170	158	180										
Three-phase 200 V	2001, 2002	1	68	56	6	128	118	5	116	6.5	3	M5	
	2004								148	38.5			
	2006								168	58.5			
	2010	2	108	96	6	128	118	5	174	56.5	5		
	2012								182.5				
	2021	3	140	128	9	260	248	6	193	65			
	2030, 2042								196	55			
	2056								180	160	10		300
2070, 2082	220	192	14	350	336	7	216	78	M6				
Three-phase 400 V	4001	2	108	96	6	128	118	5	126	8.5	5	M5	
	4002								144	26.5			
	4004								182.5	56.5			
	4005, 4007, 4009								199				
	4012	140	128	9	260	248	6	193	65				
	4018, 4023	3	140	122	9	260	248	6	196	55			
	4031, 4038								180	160	10		300
4044, 4060	190								15	350	336	7	251

Line filters

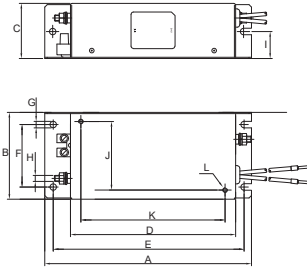


Figure 1

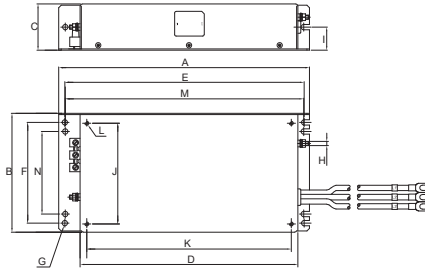


Figure 2

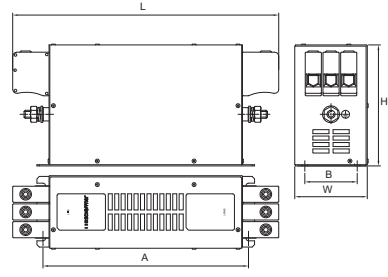


Figure 3

Standard line filter		Fig	Dimensions (mm)														Weight (kg)						
			A	B	C	D	E	F	G	H	I	J	K	L	M	N		W					
Single-phase 200 V	A1000-FIV1010-SE	1	169	71	45	135	156	51	5.3	M5	22	56	118	M4	-	-	-	0.44					
	A1000-FIV1020-SE-Q		111	50	91		25	96			0.8												
	A1000-FIV1030-SE-Q		174	144	128		158	1.2															
	A1000-FIV1040-SE		174	150	1.6																		
Three-phase 200 V	A1000-FIV2010-SE-V1	166	70	40		130	156		51	6.5		M5	20	56	248	M5	289	100	90	4.0			
	A1000-FIV2020-SE	169	111	45		135	300		91		22		96	0.58									
	A1000-FIV2030-SE	174	144	50		161	120	25	128		0.9												
	A1000-FIV2060-SE-V1	305	144	56	264	290	122	28	122				248				289	100			2.0		
	A1000-FIV2080-SE-V1	345	182	65	300	330	160	M6	32.5				160				285	325				130	2.6
	A1000-FIV2100-SE-V1	394	214	353	380	192	M8	192	336				M6				378	167				3.1	
	Q2-FIA4100-SE	3	255	65	-	-	-	-	150				-				-	-					
Three-phase 400 V	A1000-FIV3005-SE	1	169	111	45	135	156	91	5.3	M5		22	96		118	M4	-	-	-	0.5			
	A1000-FIV3010-SE-Q		111	50	91		25	128				0.7											
	A1000-FIV3020-SE-Q		174	144	50		161	120			0.9												
	A1000-FIV3030-SE-V1	2	305	144	56	264	290	122	6.5	M6			28	122	248	M5	289	100	1.8				
	A1000-FIV3050-SE-V2		345	182	65	300	330	160				M6	32.5	160	285		325	130		2.7			
	Q2-FIA4080-SE		3	270	-	-	-	-			-	205	-	-	-		250	M6			-	80	4.3

Low leakage line filter		Fig	Dimensions (mm)														Weight (kg)		
			A	B	C	D	E	F	G	H	I	J	K	L	M	N		W	
Single-phase 200 V	A1000-FIV1010-SE-LL	1	166	70	40	130	156	51	5.3	M5	20	56	118	M4	-	-	-	0.33	
	A1000-FIV1020-SE-LL-Q		110	50	91		25	96			0.72								
	A1000-FIV1030-SE-LL-Q		171	142	128		158	0.92											
	A1000-FIV1040-SE-LL		174	176	150		1.4												
Three-phase 200 V	A1000-FIV2010-SE-LL	191	80	40	130	181			62	6.5		M6	20	56	248	M5	289	100	90
	A1000-FIV2020-SE-LL	166	110	50	156	91			25		96		0.65						
	A1000-FIV2030-SE-LL	172	142	161	120	25		128	0.92										
Three-phase 400 V	A1000-FIV3005-SE-LL	1	166	110	45	130	156	91		5.3	M5	22.5		96	248	M5	289	100	90
	A1000-FIV3010-SE-LL-Q		110	50	91		25	96				0.66							
	A1000-FIV3020-SE-LL-Q		171	142	128		158	0.85											
	A1000-FIV3030-SE-LL		304	140	55		263		290				122	27.5			122	248	
A1000-FIV3050-SE-LL	344	180	300	330	160	M6	160		285	325	130		2.65						

Input AC Reactor

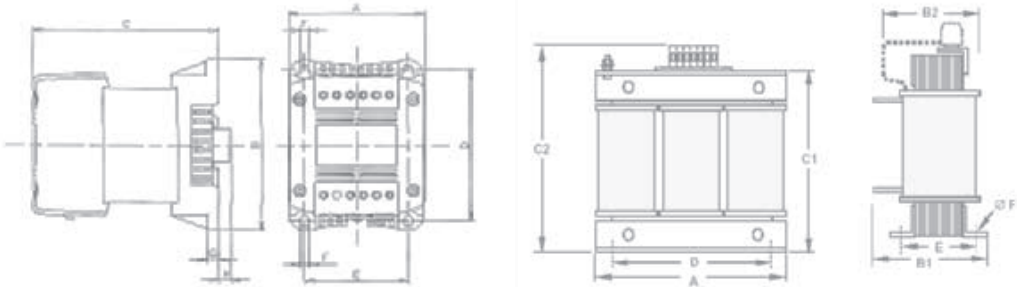


Figure 1

Figure 2

Voltage	Reference	Fig	Dimensions (mm)										Weight (kg)	
			A	B	B2	C	C2	D	E	F	G	H		
Single-phase 200 V	AX-RAI02000070-DE	1	84	113	-	96	-	101	66	5	7.5	2	1.22	
	AX-RAI01700140-DE				116	1.95								
	AX-RAI01200200-DE				131	2.55								
	AX-RAI00630240-DE				116	1.95								
Three-phase 200 V	AX-RAI02800100-DE	2	120	-	70	-	120	80	52	5.5	-	-	1.78	
	AX-RAI00880200-DE				80	62			2.35					
	AX-RAI00350335-DE		180	85	190	140	55	6	5.5					
	AX-RAI00180670-DE			205	6	6.5								
	AX-RAI00091000-DE			70	120	80	52	5.5	1.78					
Three-phase 400 V	AX-RAI07700042-DE	2	120	-	80	120	80	52	5.5	-	-	1.78		
	AX-RAI07700050-DE				80			62				2.35		
	AX-RAI03500090-DE				75			195				140	55	6
	AX-RAI03500100-DE		180	85	190	140	55	6	75	-	-	-	-	
	AX-RAI01300170-DE			205	6									6.5
	AX-RAI00740335-DE			105	75									11.2
	AX-RAI00360500-DE			105	75									11.2

DC Reactor

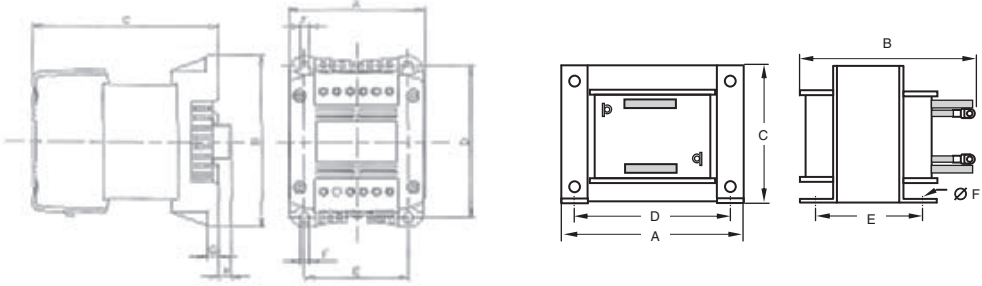


Figure 1

Figure 2

Voltage	Reference	Fig	Dimensions (mm)								Weight (kg)
			A	B	C	D	E	F	G	H	
200 V	AX-RC10700032-DE	1	84	113	96	101	66	5	7.5	2	1.22
	AX-RC06750061-DE				105						1.60
	AX-RC03510093-DE				116						1.95
	AX-RC02510138-DE		108	135	124	120	82	6.5	9.5	9.5	3.20
	AX-RC01600223-DE				136						5.20
	AX-RC01110309-DE				146						6.00
	AX-RC00840437-DE		150	177	160	160	115	7	2	-	11.4
	AX-RC00590614-DE				183						14.3
	AX-RC00440859-DE				163						17.0
AX-RC00301275-DE	2	195	161	163	185	88	10	-	-	17.0	
400 V	AX-RC43000020-DE	1	84	113	96	101	66	5	7.5	2	1.22
	AX-RC10100069-DE				116						1.95
	AX-RC06400116-DE		108	135	133	120	82	6.5	9.5	9.5	3.70
	AX-RC04410167-DE				136						5.20
	AX-RC03350219-DE				146						6.00
	AX-RC02330307-DE		150	177	160	160	115	7	2	-	11.4
	AX-RC01750430-DE				183						14.3

Chokes

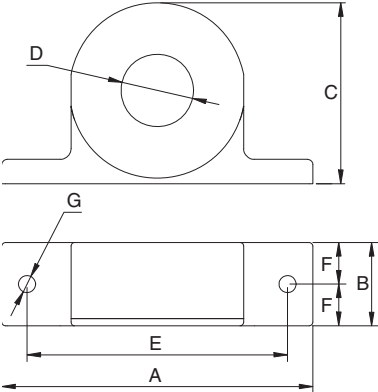


Figure 1

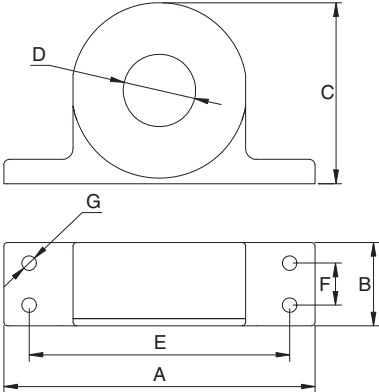
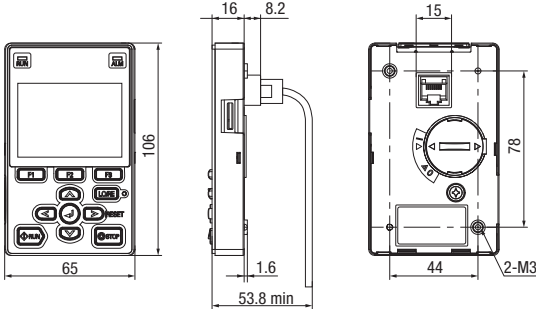


Figure 2

Reference	Fig	D (diameter)	Motor (kW)	Dimensions (mm)									Weight (kg)
				A	B	C	D	E	F	G (diameter)	H	I	
AX-FER2102-PE	1	21	< 2.2	86	24	50	21	70	12	4	-	-	0.09
AX-FER2815-PE		28	< 15	106	25	65	28	90	12.5				0.22
AX-FER5045-PE	2	50	< 45	150	51	112	50	125	30	5			0.53

LCD keypad



Braking resistor

AX-REM00K1200-IE

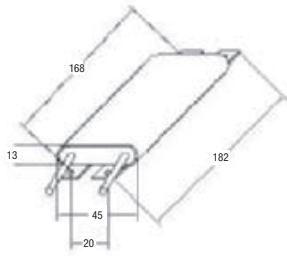


Fig 3

Fig 1

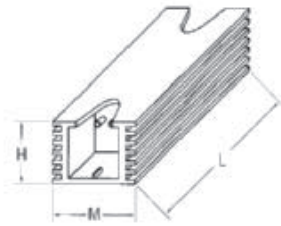


Fig 2

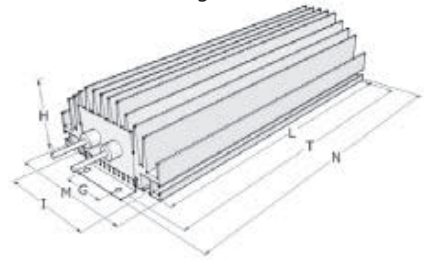


Fig 5

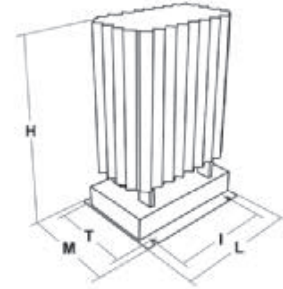
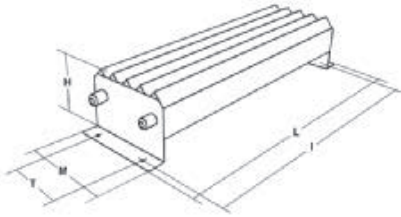
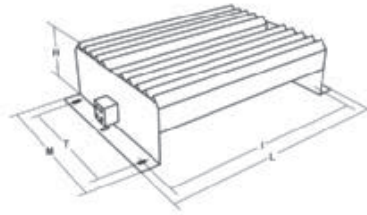


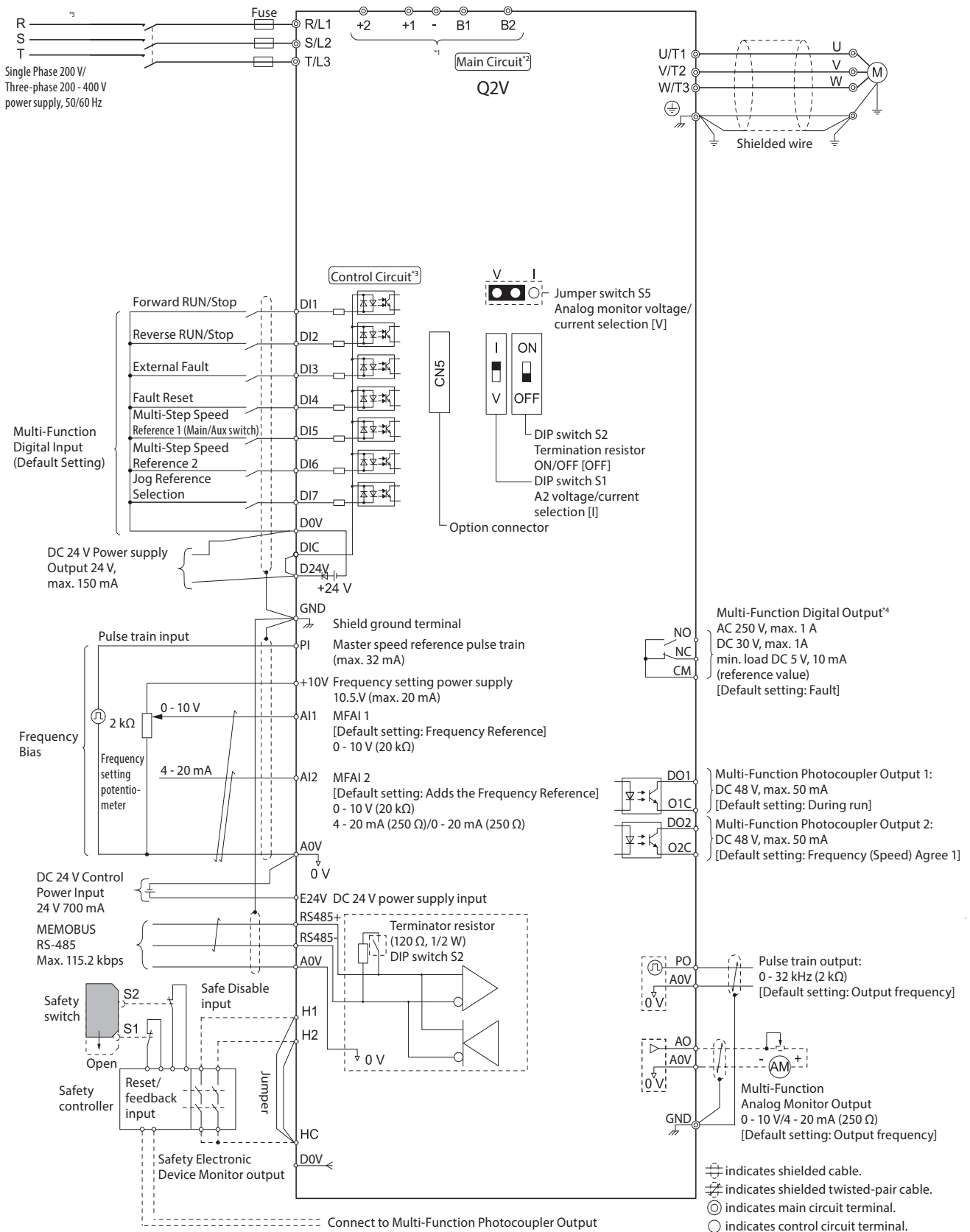
Fig 4



Type	Fig	Dimensions (mm)							Weight (kg)
		L	H	M	I	T	G	N	
AX-REM00K1400-IE	1	105	27	36	94	-	-	-	0.2
AX-REM00K2070-IE									
AX-REM00K2120-IE									
AX-REM00K2200-IE		200			189				0.425
AX-REM00K4035-IE									
AX-REM00K4075-IE									
AX-REM00K5120-IE		260			249				0.58
AX-REM00K6035-IE									
AX-REM00K6100-IE									
AX-REM00K9020-IE	2	200	61	100	74.5	216	40	230	1.41
AX-REM00K9070-IE									
AX-REM01K9017-IE	3	365	73	105	350	70	-	-	4
AX-REM01K9070-IE									
AX-REM02K1017-IE	4	310	100	240	295	210	-	-	7
AX-REM02K1070-IE									
AX-REM03K5010-IE		365			350				8
AX-REM03K5035-IE									
AX-REM19K0020-IE	5	206	350	140	190	50	-	-	8.1

Installation

Standard connections



*1. For three-phase 200 V class and 400 V class drives, use terminals -, +1, +2, B1 and B2 to connect options to the drive. For single-phase 200 V class drives, use terminals -, +1, B1 and B2 to connect options to the drive.

WARNING! Fire Hazard. Only connect factory-recommended devices or circuits to drive terminals B1, B2, -, +1, +2 and +3 terminals. Do not connect AC power to these terminals. Incorrect wiring can cause damage to the drive and serious injury or death from fire.

*2. For circuit protection, the main circuit is separated from the surface case that can touch the main circuit.


*3. The control circuit is a Safety Extra-Low Voltage circuit. Separate this circuit from other circuits with reinforced insulation. Make sure that the Safety Extra-Low Volt-

age circuit is connected as specified.

*4. Reinforced insulation separates the output terminals from other circuits. Users can also connect circuits that are not Safety Extra-Low Voltage circuits if the drive output is 250 VAC 1 A max. or 30 VDC 1 A maximum.

*5. Set $L8-05 = 1$ [In PhaseLoss Selection = Enabled] or set the wiring sequence to prevent input phase loss.

Main circuit

Terminal	Name	Function
R/L1, S/L2, T/L3	Main circuit power supply input (2001 to 2082 and 4001 to 4060)	Used to connect a power supply
L/L1, N/L2	Main circuit power supply input (B001 to B018)	Used to connect a power supply
U/T1, V/T2, W/T3	Inverter output	Used to connect a motor
B1, B2	Braking resistor connection	To connect a braking resistor or braking resistor unit
+2	DC reactor connection (2001 to 2082 and 4001 to 4060 models)	+1 and +2: To connect a DC reactor ^{*1}
+1		
-		
	<ul style="list-style-type: none"> 200 V class: D class grounding (ground to 100 Ω or less) 400 V class: C class grounding (ground to 10 Ω or less) 	To ground the inverter

*1. Remove the jumper between terminals +1 and +2 to connect a DC reactor.

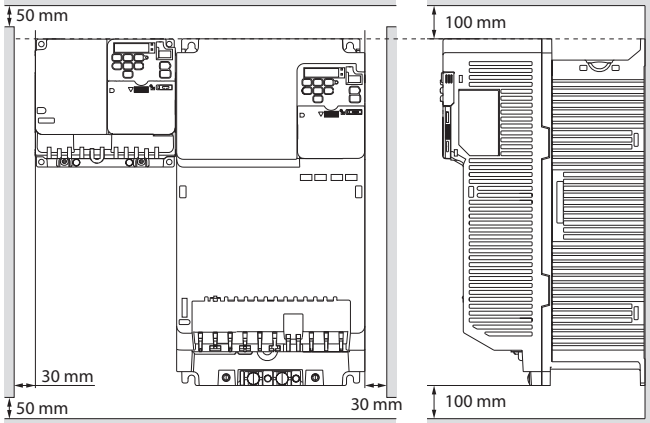
Control circuit

Type	Terminal	Name	Function (Signal level)	
Digital input signals	DI1	Multi-Function Digital Input 1 (ON: Forward run, OFF: Stop)	Photocoupler 24 V, 6 mA Install the wire jumpers between DIC-D24V and DIC-D0V terminals to set the Multi-Function Digital Input power supply. <ul style="list-style-type: none"> SINK mode: Install a jumper between SC and SP terminals. SOURCE mode: Install a jumper between SC and SN terminals. External power supply: No jumper necessary. 	
	DI2	Multi-Function Digital Input 2 (ON: Reverse run, OFF: Stop)		
	DI3	Multi-Function Digital Input 3 (External fault (N.O.))		
	DI4	Multi-Function Digital Input 4 (Fault reset)		
	DI5	Multi-Function Digital Input 5 (Multi-step speed reference 1)		
	DI6	Multi-Function Digital Input 6 (Multi-step speed reference 2)		
	DI7	Multi-Function Digital Input 7 (Jog reference selection)		
	D0V ^{*1}	MFDI power supply 0 V		24 V, 150 mA max. (for external fuse)
	DIC	MFDI common		
D24V	MFDI power supply +24 VDC			
Safe Disable input	H1	Safe Disable input 1	Remove the jumper between H1-HC and H2-HC terminals to use the Safe Disable input. 24 V, 6 mA ON: Normal operation, OFF: Coasting motor Internal impedance: 4.7 kΩ Minimum OFF time of 3 ms	
	H2	Safe Disable input 2		
	HC ^{*2}	Safe Disable function common		
Master frequency reference	PI	Master speed reference pulse train	Response frequency: 0 to 32 kHz H level duty and voltage: 30 to 70%, 3.5 to 13.2 V L level voltage: 0 to 0.8 V Input impedance: 3 kΩ	
	+10V	Frequency setting power supply	+10.5 V (allowable current max. 20 mA)	
	A11	Multi-Function Analog Input 1 (Frequency reference)	<ul style="list-style-type: none"> Voltage input or current input: 0 to 10 V/100 % (input impedance: 20 kΩ) 4 to 20 mA/100 %, 0 to 20 mA/100 % (input impedance: 250 Ω) 	
	A12	Multi-Function Analog Input 2 (Frequency reference bias)		
	A0V	Frequency reference common	0 V	
GND	Connecting shielded cable			
Fault relay output	NO	Multi-Function Digital Output, N.O. output	Relay output 30 VDC, 10 mA to 1 A 250 VAC, 10 mA to 1 A Min. load: 5 V, 10 mA (Reference value)	
	NC	Multi-Function Digital Output, N.C. output		
	CM	MFDO common		

Type	Terminal	Name	Function (Signal level)
Multi-function photocoupler output	DO1	Multi-Function Photocoupler Output 1 (During Run)	Photocoupler output*3 48 V, 2 mA to 50 mA
	O1C		
	DO2	Multi-Function Photocoupler Output 2 (Speed agree 1)	
	O2C		
Monitor output	PO	Pulse train output (Output frequency)	32 kHz max.
	AO	Analog monitor output (Output frequency)	Select voltage or current output: 0 to 10 V / 0 to 100 % 4 to 20 mA
	A0V	Monitor common	0 V
External power supply input	E24V	External 24 V power supply input	Supplies backup power to the drive control circuit, keypad and option board. 21.6 to 26.4 VDC, 700 mA
	A0V	External 24 V power supply ground	0 V
MEMOBUS/Modbus ⁴	RS485+	Communication input/output (+)	MEMOBUS/Modbus communication protocol Use an RS-485 cable to connect the inverter Maximum 115.2 kbps
	RS485-	Communication output (-)	
	A0V	Shield ground	0 V

*1. Do not close the circuit between D24V and D0V terminals. Failure to obey will cause damage to the drive.
 *2. Do not close the circuit between HC and D0V terminals. Failure to obey will cause damage to the drive.
 *3. Connect a flywheel diode as shown in when you drive a reactive load such as a relay coil. Make sure that the diode rating is larger than the circuit voltage.
 *4. Select DIP switch S2 to ON to enable the termination resistor in the last drive in a MEMOBUS/Modbus network.

Side by side mounting



Inverter watt loss

Single-phase 200 V class

Inverter model Q2V-A□	Heavy Duty (HD)					Normal Duty (ND)				
	Rated output current (A)	Carrier frequency (kHz)	Interior unit loss (W)	Cooling fin loss (W)	Total loss (W)	Rated output current (A)	Carrier frequency (kHz)	Interior unit loss (W)	Cooling fin loss (W)	Total loss (W)
B001	0.8	10	8	5	13	1.2	2	8	6	14
B002	1.6		10	9	19	1.9		14	11	25
B004	3		14	16	30	3.5		17	17	31
B006	5		18	28	46	6		17	26	43
B010	8	8	31	42	73	9.6		36	50	86
B012	11		41	55	96	12.2		48	60	108
B018	17.6		53	98	151	N/A		49	92	141

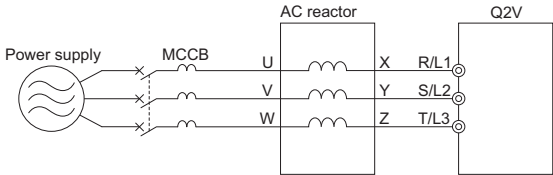
Three-phase 200 V class

Inverter model Q2V-A□	Heavy Duty (HD)					Normal Duty (ND)				
	Rated output current (A)	Carrier frequency (kHz)	Interior unit loss (W)	Cooling fin loss (W)	Total loss (W)	Rated output current (A)	Carrier frequency (kHz)	Interior unit loss (W)	Cooling fin loss (W)	Total loss (W)
2001	0.8	10	6	5	11	1.2	2	7	5	12
2002	1.6		7	8	15	1.9		9	9	18
2004	3		10	16	26	3.5		11	16	27
2006	5		14	27	41	6		14	25	39
2010	8	8	18	43	61	9.6		25	51	76
2012	11		24	56	80	12.2		30	61	91
2021	17.6		40	108	148	21		52	111	163
2030	25		49	187	236	30		63	240	303
2042	33		60	232	292	42		84	307	391
2056	47		85	318	403	56		109	367	476
2070	60		119	473	592	70		142	534	676
2082	75		148	525	673	82		160	531	691

Three-phase 400 V class

Inverter model Q2V-A□	Heavy Duty (HD)					Normal Duty (ND)				
	Rated output current (A)	Carrier frequency (kHz)	Interior unit loss (W)	Cooling fin loss (W)	Total loss (W)	Rated output current (A)	Carrier frequency (kHz)	Interior unit loss (W)	Cooling fin loss (W)	Total loss (W)
4001	1.2	8	9	11	20	1.2	2	8	7	15
4002	1.8		11	16	27	2.1		13	12	25
4004	3.4		15	31	46	4.1		14	24	38
4005	4.8		18	42	60	5.4		16	32	48
4007	5.6		18	49	67	7.1		20	44	64
4009	7.3		25	65	90	8.9		28	58	86
4012	9.2		32	85	117	11.9		39	83	122
4018	14.8		55	166	221	17.5		52	155	207
4023	18		61	200	261	23.4		86	236	322
4031	24		79	255	334	31		101	284	385
4038	31		95	338	433	38		108	341	449
4044	39		127	442	569	44		137	417	554
4060	45		135	446	581	60		176	490	666

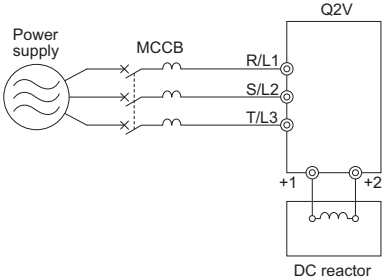
Input AC reactor



Single-phase 200 V				Three-phase 200 V				Three-phase 400 V			
Max. applicable motor output (kW) ^{*1}	Reference	Current value (A)	Inductance (mH)	Max. applicable motor output (kW) ^{*1}	Reference	Current value (A)	Inductance (mH)	Max. applicable motor output (kW) ^{*1}	Reference	Current value (A)	Inductance (mH)
0.75	AX-RAI0200070-DE	7.0	2.0	1.1	AX-RAI02800100-DE	8.0	2.8	0.75	AX-RAI07700042-DE	4.2	7.7
1.1	AX-RAI01700140-DE	14.0	1.7	3.0	AX-RAI00880200-DE	20.0	0.88	1.5	AX-RAI07700050-DE	5.0	7.7
2.2	AX-RAI01200200-DE	20.0	1.2	7.5	AX-RAI00350335-DE	33.5	0.35	2.2	AX-RAI03500090-DE	9.0	3.5
3.0	AX-RAI00630240-DE	24.0	0.63	15.0	AX-RAI00180670-DE	67.0	0.18	3.0	AX-RAI03500100-DE	10.0	3.5
-				22.0	AX-RAI00091000-DE	100.0	0.09	5.5	AX-RAI01300170-DE	17.0	1.3
				-				11.0	AX-RAI00740335-DE	33.5	0.74
								18.5	AX-RAI00360500-DE	50.0	0.36
								30.0	AX-RAI00290780-DE	78.0	0.29

*1. The motor sizes are for heavy duty applications.

DC reactor



200 V class				400 V class			
Max. applicable motor output (kW) ^{*1}	Reference	Current value (A)	Inductance (mH)	Max. applicable motor output (kW) ^{*1}	Reference	Current value (A)	Inductance (mH)
0.37	AX-RC10700032-DE	3.2	10.7	1.5	AX-RC43000020-DE	2.0	43.0
0.75	AX-RC06750061-DE	6.1	6.75	2.2	AX-RC10100069-DE	6.9	10.1
2.2	AX-RC03510093-DE	9.3	3.51	4.0	AX-RC06400116-DE	11.6	6.4
3.0	AX-RC02510138-DE	13.8	2.51	5.5	AX-RC04410167-DE	16.7	4.41
	AX-RC01600223-DE	22.3	1.60	7.5	AX-RC03350219-DE	21.9	3.35
7.5	AX-RC01110309-DE	30.9	1.11	11.0	AX-RC02330307-DE	30.7	2.33
11.0	AX-RC00840437-DE	43.7	0.84	18.5	AX-RC01750430-DE	43.0	1.75
15.0	AX-RC00590614-DE	61.4	0.59	22.0	AX-RC01200644-DE	64.4	1.20
18.5	AX-RC00440859-DE	85.9	0.44	-			
22.0	AX-RC00301275-DE	127.5	0.30				

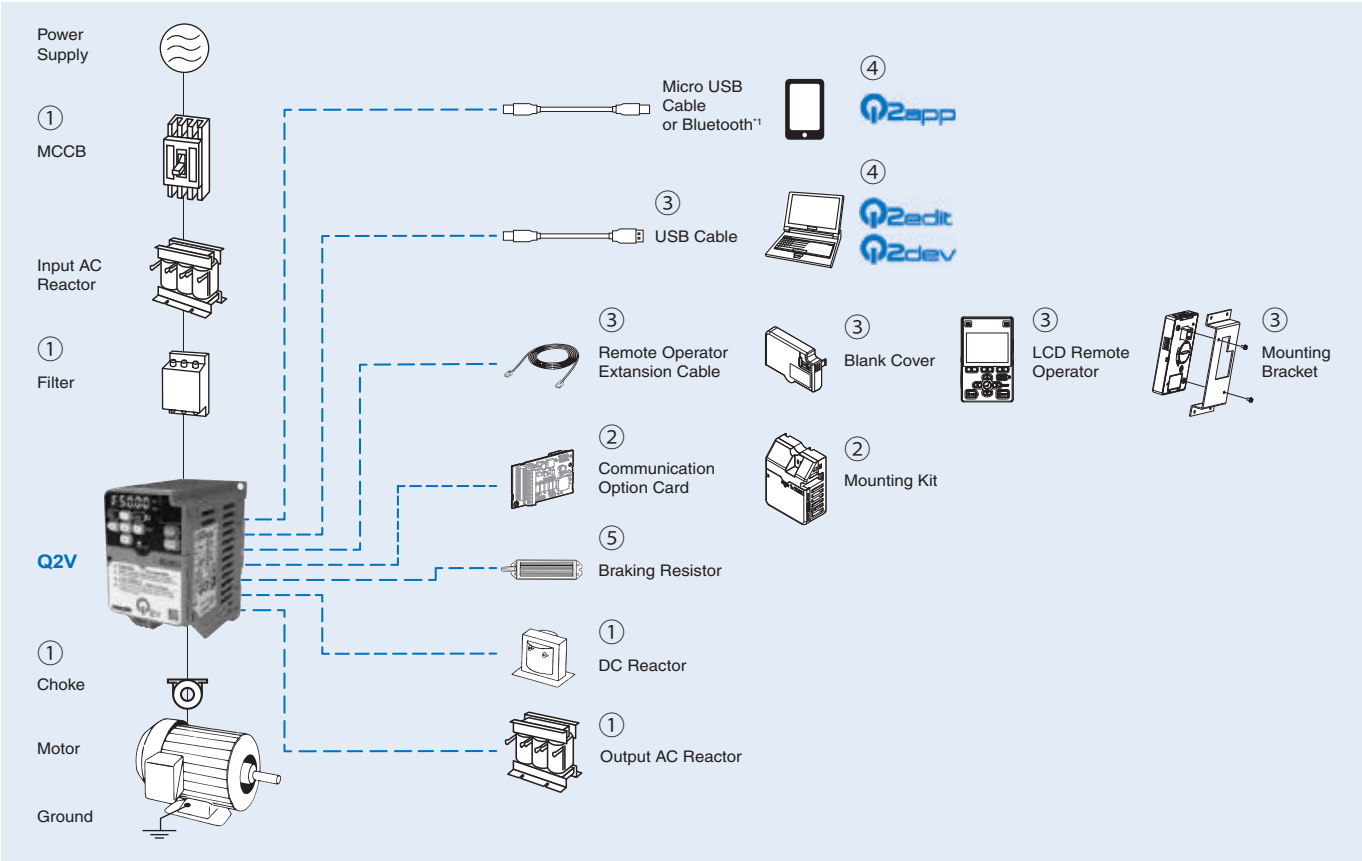
*1. The motor sizes are for heavy duty applications.

Output AC reactor

200 V class				400 V class			
Max. applicable motor output (kW) ^{*1}	Reference	Current value (A)	Inductance (mH)	Max. applicable motor output (kW) ^{*1}	Reference	Current value (A)	Inductance (mH)
0.37	AX-RAO11500026-DE	2.6	11.5	0.75	AX-RAO16300038-DE	3.8	16.3
0.75	AX-RAO07600042-DE	4.2	7.60	1.5	AX-RAO11800053-DE	5.3	11.8
1.1	AX-RAO04100075-DE	7.5	4.10	2.2	AX-RAO07300080-DE	8.0	7.3
2.2	AX-RAO03000105-DE	10.5	3.00	4.0	AX-RAO04600110-DE	11.0	4.6
3.0	AX-RAO01830160-DE	16.0	1.83	5.5	AX-RAO03600160-DE	16.0	3.6
5.5	AX-RAO01150220-DE	22.0	1.15	7.5	AX-RAO02500220-DE	22.0	2.5
7.5	AX-RAO00950320-DE	32.0	0.95	11.0	AX-RAO02000320-DE	32.0	2.0
11.0	AX-RAO00630430-DE	43.0	0.63	15.0	AX-RAO01650400-DE	40.0	1.65
15.0	AX-RAO00490640-DE	64.0	0.49	22.0	AX-RAO01300480-DE	48.0	1.3
18.5	AX-RAO00390800-DE	80.0	0.39	30.0	AX-RAO00800750-DE	75.0	0.8
22.0	AX-RAO00330950-DE	95.0	0.33		-		

*1. The motor sizes are for heavy duty applications.

Ordering information



*1 With optional LCD remote operator model with Bluetooth.

Q2V inverter

Voltage	Specifications				Model
	Heavy Duty (HD)		Normal Duty (ND)		
	Max motor (kW)	Rated current (A)	Max motor (kW)	Rated current (A)	
Single-phase 200 V	0.1	0.8	0.18	1.2	Q2V-AB001-AAA
	0.25	1.6	0.37	1.9	Q2V-AB002-AAA
	0.55	3.0	0.75	3.5	Q2V-AB004-AAA
	1.1	5.0	1.1	6.0	Q2V-AB006-AAA
	1.5	8.0	2.2	9.6	Q2V-AB010-AAA
	2.2	11.0	3.0	12.2	Q2V-AB012-AAA
	4.0	17.6	-	-	Q2V-AB018-AAA
Three-phase 200 V	0.1	0.8	0.18	1.2	Q2V-A2001-AAA
	0.25	1.6	0.37	1.9	Q2V-A2002-AAA
	0.55	3.0	0.75	3.5	Q2V-A2004-AAA
	1.1	5.0	1.1	6.0	Q2V-A2006-AAA
	1.5	8.0	2.2	9.6	Q2V-A2010-AAA
	2.2	11	3.0	12.2	Q2V-A2012-AAA
	4.0	17.6	5.5	21	Q2V-A2021-AAA
	5.5	25	7.5	30	Q2V-A2030-AAA
	7.5	33	11	42	Q2V-A2042-AAA
	11	47	15	56	Q2V-A2056-AAA
	15	60	18.5	70	Q2V-A2070-AAA
18.5	75	22	82	Q2V-A2082-AAA	

Specifications					Model
Voltage	Heavy Duty (HD)		Normal Duty (ND)		
	Max motor (kW)	Rated current (A)	Max motor (kW)	Rated current (A)	
Three-phase 400 V	0.37	1.2	0.37	1.2	Q2V-A4001-AAA
	0.55	1.8	0.75	2.1	Q2V-A4002-AAA
	1.1	3.4	1.5	4.1	Q2V-A4004-AAA
	1.5	4.8	2.2	5.4	Q2V-A4005-AAA
	2.2	5.6	3.0	7.1	Q2V-A4007-AAA
	3.0	7.3	4.0	8.9	Q2V-A4009-AAA
	4.0	9.2	5.5	11.9	Q2V-A4012-AAA
	5.5	14.8	7.5	17.5	Q2V-A4018-AAA
	7.5	18	11	23.4	Q2V-A4023-AAA
	11	24	15	31	Q2V-A4031-AAA
	15	31	18.5	38	Q2V-A4038-AAA
	18.5	39	22	44	Q2V-A4044-AAA
22	45	30	60	Q2V-A4060-AAA	

① Line filters

Inverter		Standard line filter		Low leakage line filter	
Voltage	Model Q2V-A□	Reference	Current (A)	Reference	Current (A)
Single-phase 200 V	B001/B002/B004	A1000-FIV1010-SE	10	A1000-FIV1010-SE-LL	10
	B006/B010	A1000-FIV1020-SE-Q	20	A1000-FIV1020-SE-LL-Q	20
	B012	A1000-FIV1030-SE-Q	30	A1000-FIV1030-SE-LL-Q	24
	B018	A1000-FIV1040-SE	40	A1000-FIV1040-SE-LL	40
Three-phase 200 V	2001/2002/2004/2006	A1000-FIV2010-SE-V1	10	A1000-FIV2010-SE-LL	10
	2010/2012	A1000-FIV2020-SE	14	A1000-FIV2020-SE-LL	20
	2021	A1000-FIV2030-SE	24	A1000-FIV2030-SE-LL	30
	2030/2042	A1000-FIV2060-SE-V1	52	-	
	2056	A1000-FIV2080-SE-V1	68		
	2070	A1000-FIV2100-SE-V1	80		
2082	Q2-FIA4100-SE	100			
Three-phase 400 V	4001/4002	A1000-FIV3005-SE	5	A1000-FIV3005-SE-LL	5
	4004/4005/4007/4009	A1000-FIV3010-SE-Q	10	A1000-FIV3010-SE-LL-Q	10
	4012	A1000-FIV3020-SE-Q	15	A1000-FIV3020-SE-LL-Q	15
	4018/4023	A1000-FIV3030-SE-V1	30	A1000-FIV3030-SE-LL	30
	4031/4038	A1000-FIV3050-SE-V2	50	A1000-FIV3050-SE-LL	50
	4044/4060	Q2-FIA4080-SE	80	-	-

① Input AC reactors

Single-phase 200 V		Three-phase 200 V		Three-phase 400 V	
Model Q2V-A□	Input AC reactor	Model Q2V-A□	Input AC reactor	Model Q2V-A□	Input AC reactor
B001/B002/B004	AX-RAI02000070-DE	2001/2002/2004/2006	AX-RAI02800100-DE	4001/4002	AX-RAI07700042-DE
B006	AX-RAI01700140-DE	2010/2012	AX-RAI00880200-DE	4004	AX-RAI07700050-DE
B010	AX-RAI01200200-DE	2021/2030	AX-RAI00350335-DE	4005	AX-RAI03500090-DE
B012	AX-RAI00630240-DE	2042/2056	AX-RAI00180670-DE	4007	AX-RAI03500100-DE
B018	-	2070/2082	AX-RAI00091000-DE	4009/4012	AX-RAI01300170-DE
				4018/4023	AX-RAI00740335-DE
				4031/4038	AX-RAI00360500-DE
				4044/4060	AX-RAI00290780-DE

① DC reactors

Single-phase 200 V		Three-phase 200 V		Three-phase 400 V	
Model Q2V-A□	DC reactor	Model Q2V-A□	DC reactor	Model Q2V-A□	DC reactor
B001/B002	AX-RC10700032-DE	2001/2002/2004/2006	AX-RC06750061-DE	4001/4002/4004	AX-RC43000020-DE
B004	AX-RC06750061-DE	2010	AX-RC03510093-DE	4005	AX-RC10100069-DE
B006	AX-RC03510093-DE	2012	AX-RC02510138-DE	4007/4009	AX-RC06400116-DE
B010	AX-RC02510138-DE	2021/2030	AX-RC01110309-DE	4012	AX-RC04410167-DE
B012	AX-RC01600223-DE	2042	AX-RC00840437-DE	4018	AX-RC03350219-DE
B018	-	2056	AX-RC00590614-DE	4023	AX-RC02330307-DE
		2070	AX-RC00440859-DE	4031/4038	AX-RC01750430-DE
		2082	AX-RC00301275-DE	4044	AX-RC01200644-DE

① Output AC reactors

Single-phase 200 V		Three-phase 200 V		Three-phase 400 V	
Model Q2V-A□	Output AC reactor	Model Q2V-A□	Output AC reactor	Model Q2V-A□	Output AC reactor
B001/B002	AX-RAO11500026-DE	2001/2002/2004	AX-RAO07600042-DE	4001/4002	AX-RAO16300038-DE
B004	AX-RAO07600042-DE	2006	AX-RAO04100075-DE	4004	AX-RAO11800053-DE
B006	AX-RAO04100075-DE	2010	AX-RAO03000105-DE	4005	AX-RAO07300080-DE
B010	AX-RAO03000105-DE	2012/2021	AX-RAO01150220-DE	4007/4009	AX-RAO04600110-DE
B012	AX-RAO01830160-DE	2030	AX-RAO00950320-DE	4012	AX-RAO03600160-DE
B018	AX-RAO01150220-DE	2042	AX-RAO00630430-DE	4018	AX-RAO02500220-DE
		2056	AX-RAO00490640-DE	4023	AX-RAO02000320-DE
		2070	AX-RAO00390800-DE	4031	AX-RAO01650400-DE
		2082	AX-RAO00330950-DE	4038/4044	AX-RAO01300480-DE
				4060	AX-RAO00800750-DE

Note: This table corresponds with HD rating. When ND is used, please choose the reactor for the next size inverter.

① Chokes

Model	Diameter	Description
AX-FER2102-PE	21	For 2.2 KW motors or below
AX-FER2815-PE	28	For 15 KW motors or below
AX-FER5045-PE	50	For 45 KW motors or below

② Option cards

Type	Model	Description	Function
Mounting kit	JOHB-Q2V	Option card enclosure	• Enclosure to install a communication option card on a Q2V.
Communication option cards	SI-ES3	EtherCAT	• Used for running or stopping the inverter, setting or referencing parameters, and monitoring output frequency, output current, or similar items through EtherCAT communication with the host controller.
	SI-EP3	PROFINET	• Used for running or stopping the inverter, setting or referencing parameters, and monitoring output frequency, output current, or similar items through PROFINET communication with the host controller.
	SI-EN3	EtherNet/IP	• Used for running or stopping the inverter, setting or referencing parameters, and monitoring output frequency, output current, or similar items through EtherNet/IP communication with the host controller.
	SI-EN3/D	EtherNet/IP Dual-Port	
	SI-EL3	POWERLINK	• Used for running or stopping the inverter, setting or referencing parameters, and monitoring output frequency, output current, or similar items through POWERLINK communication with the host controller.

③ Accessories

Description	Functions	Model	
LCD remote operator	Standard model	JVOP-KPLCA04AEZ	
	Model with Bluetooth	JVOP-KPLCC04ABZ	
Blank cover	This cover is required when using a LCD remote operator	JVOP-KPBCH04AAZ	
USB cable	Mini USB to USB cable	AX-CUSBM002-E	
Remote operator cable	3 meters cable to connect the keypad and drive	3G3AX-CAJOP300-EE	
Keypad mounting bracket	This bracket is required to mount the LCD Remote Operator outside an enclosure panel	Screw type	900-192-933-001
		Nut type	900-192-933-002

④ Software tools

Description	Functions	Model
Software tools	Software tool to configure drives and manage parameters	Q2edit
	Software tool to do advanced drive programming	Q2dev
	Software tool to configure drives and manage parameters for mobile devices (Android & iOS)	Q2app

⑤ Braking resistor

Inverter model Q2V-A□					Braking resistor (3 % ED, 10 sec max)				Braking resistor (10 % ED, 10 sec max)						
Voltage	Max. applicable motor kW	Single-phase	Three-phase	Connectable min. resistance	Model	Specifications		Qty	Model	Specifications		Qty			
200 V	0.1	B001	2001	300 Ω	AX-REM00K1400-IE	100 W	400 Ω	1	AX-REM00K1400-IE	100 W	400 Ω	1			
	0.25	B002	2002												
	0.55	B004	2004	200 Ω	AX-REM00K1200-IE		200 Ω		AX-REM00K1200-IE		200 Ω				
	1.1	B006	2006	120 Ω					AX-REM00K2200-IE	200 W					
	1.5	B010	2010	60 Ω	AX-REM00K2070-IE	200 W	70 Ω		AX-REM00K4075-IE	400 W	75 Ω				
	2.2	B012	2012												
	4.0	B018	2021	32 Ω	AX-REM00K4035-IE	400 W	35 Ω		AX-REM00K6035-IE	600 W	35 Ω				
	5.5	-	2030	9.6 Ω					AX-REM00K9020-IE	900 W	20 Ω		AX-REM00K9020-IE	900 W	20 Ω
	7.5		2042						AX-REM01K9017-IE	1900 W	17 Ω		AX-REM01K9017-IE	1900 W	17 Ω
	11		2056						AX-REM00K6035-IE	600 W			AX-REM02K1017-IE	2100 W	
	15		2070						AX-REM00K9020-IE	900 W	20 Ω		AX-REM03K5010-IE	3500 W	10 Ω
	18.5		2082												
400 V	0.37	-	4001	750 Ω	AX-REM00K1400-IE	100 W	400 Ω	2	AX-REM00K1400-IE	100 W	400 Ω	2			
	0.55		4002												
	1.1		4004	510 Ω											
	1.5		4005	240 Ω											
	2.2		4007	200 Ω	AX-REM00K2200-IE	200 W	200 Ω		AX-REM00K2200-IE	200 W	200 Ω				
	3.0		4009	100 Ω	AX-REM00K2120-IE		120 Ω		AX-REM00K5120-IE	500 W	120 Ω		1		
	4.0		4012				AX-REM00K6100-IE		600 W	100 Ω					
	5.5		4018	32 Ω	AX-REM00K4035-IE	400 W	35 Ω		AX-REM00K9070-IE	900 W	70 Ω				
	7.5		4023				AX-REM01K9070-IE		1900 W						
	11		4031	20 Ω	AX-REM00K6035-IE	600 W	35 Ω		AX-REM02K1070-IE	2100 W					
	15		4038		AX-REM00K9020-IE	900 W	20 Ω		AX-REM03K5035-IE	3500 W	35 Ω				
	18.5		4044	19.2 Ω											
	22		4060						AX-REM19K0020-IE	19000 W	20 Ω				

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
 To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.