

1. Preface

Why Common DC bus?

In the current of electrical transmission, variable-frequency drive applications are very common. Because of the way technology, types of loads and driving device, and so on for various reasons, regenerative energy phenomena occur frequently. In General inverter, regeneration of energy most commonly used treatment method, there are two : (1) Transformation of mechanical energy into electrical energy and eventually into the braking resistor in a DC loop, and then spilled out after converted to thermal energy, called power braking. (2)bring it back to the mains. DC common bus is based on the principle of universal converter uses the AC-DC-AC frequency conversion, while when the motor is brake, the braking energy back into the DC side, in order to better deal with feedback of braking energy, people used to connect the inverter at DC side. For example, when a drive is at braking state and another drive in a motor to accelerate State, so that energy can complement each other.

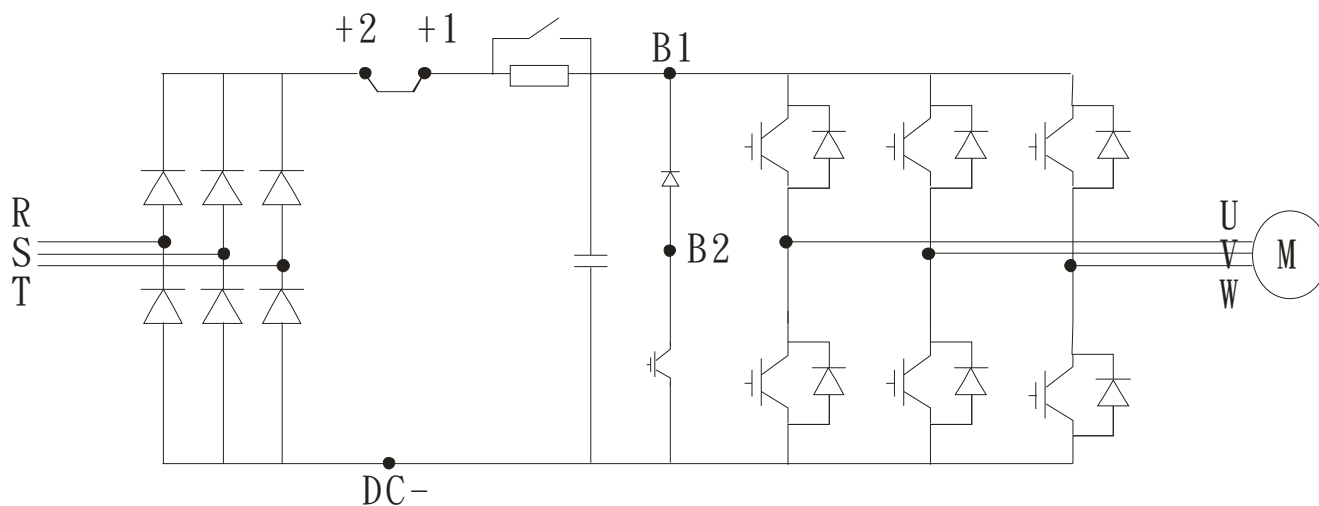
In addition, the energy savings in the current era is a serious and most commonly discussed topics. Drive expected to complete the work, must also take into account the overall system to reduce electricity consumption. At this point, common DC bus of the manner in which they are beginning to be widely used to discuss and research. Delta VFD-C family motor drives are therefore apply a common DC bus as a responsibility that must be completed.

Chapter_1 VFD-C family circuit diagram

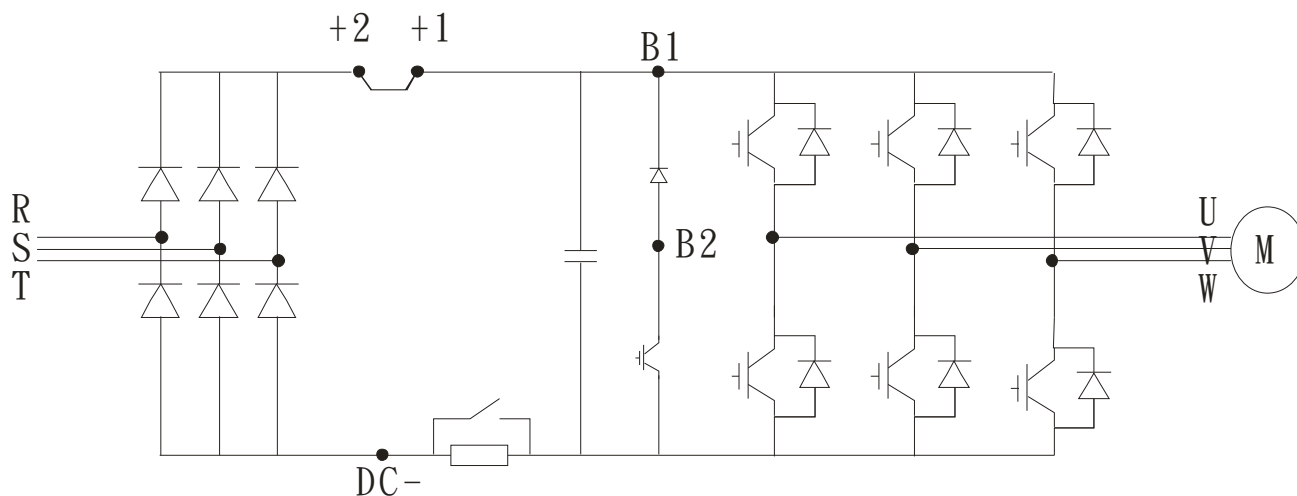
The frame A0 to frame H of VFD- C family drive, the DC+ and DC- terminals are designed in front of the soft start circuit. Therefore, Delta VFD-C family on the application of common DC bus, there are several ways of wiring can be used.

The VFD-C2000, VFD-CH2000, VFD-CP2000 circuit diagrams are as below:

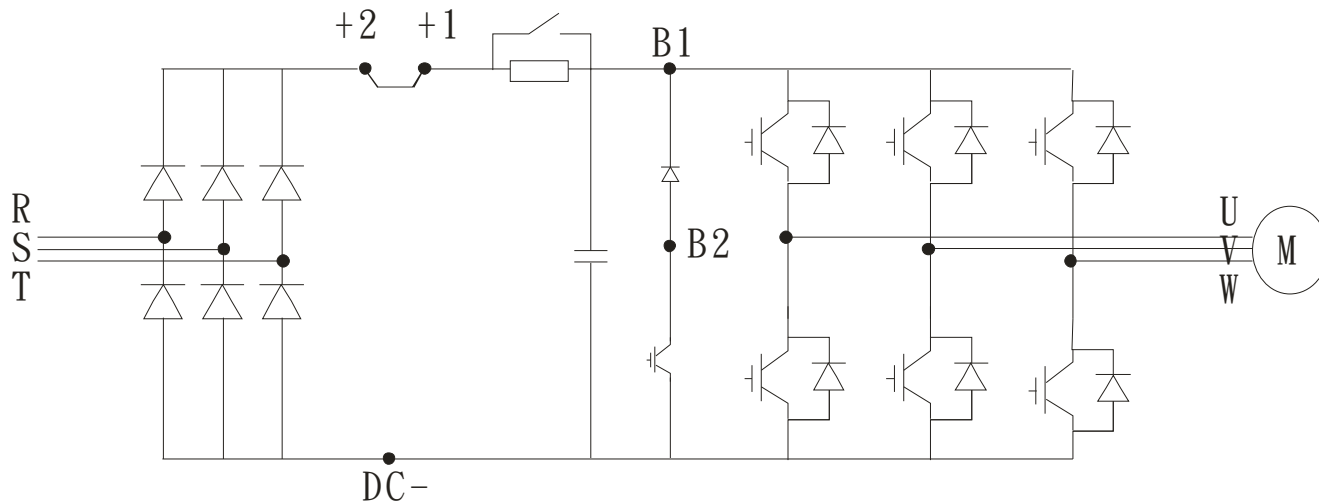
Frame A



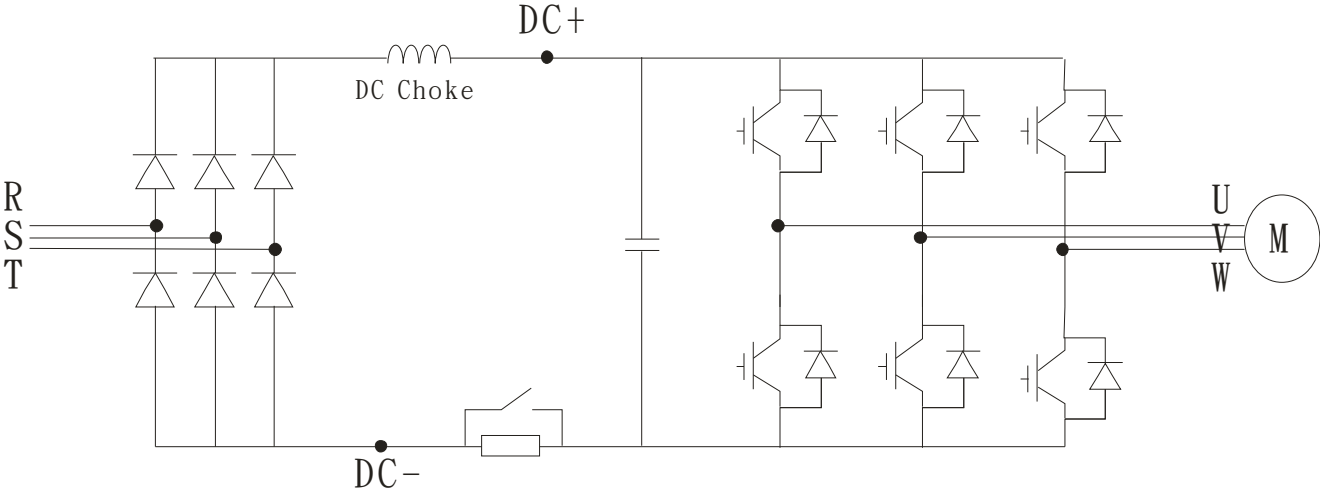
Frame B



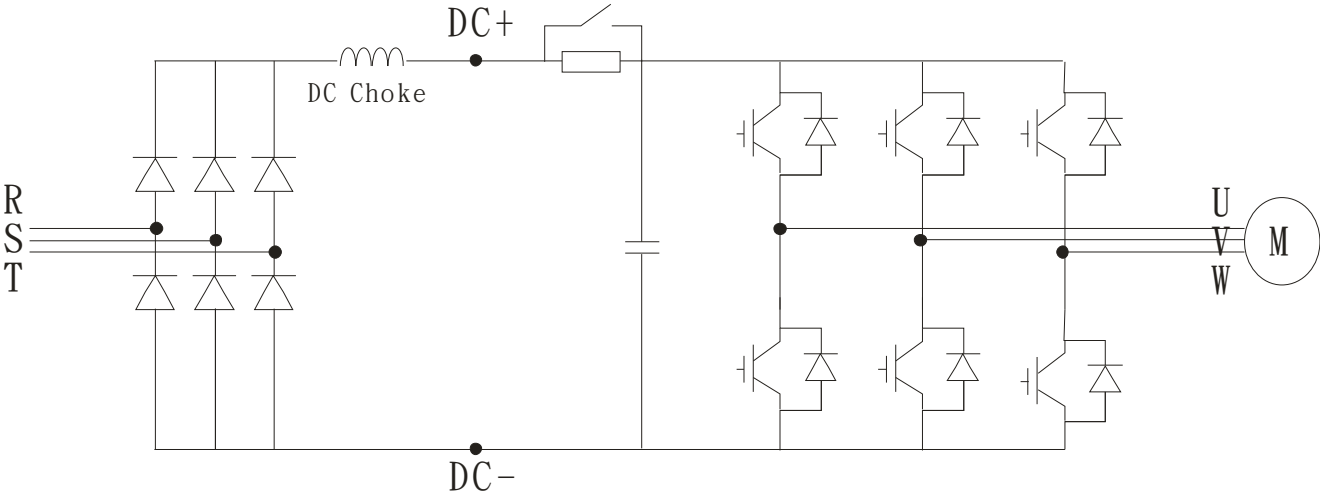
Frame C



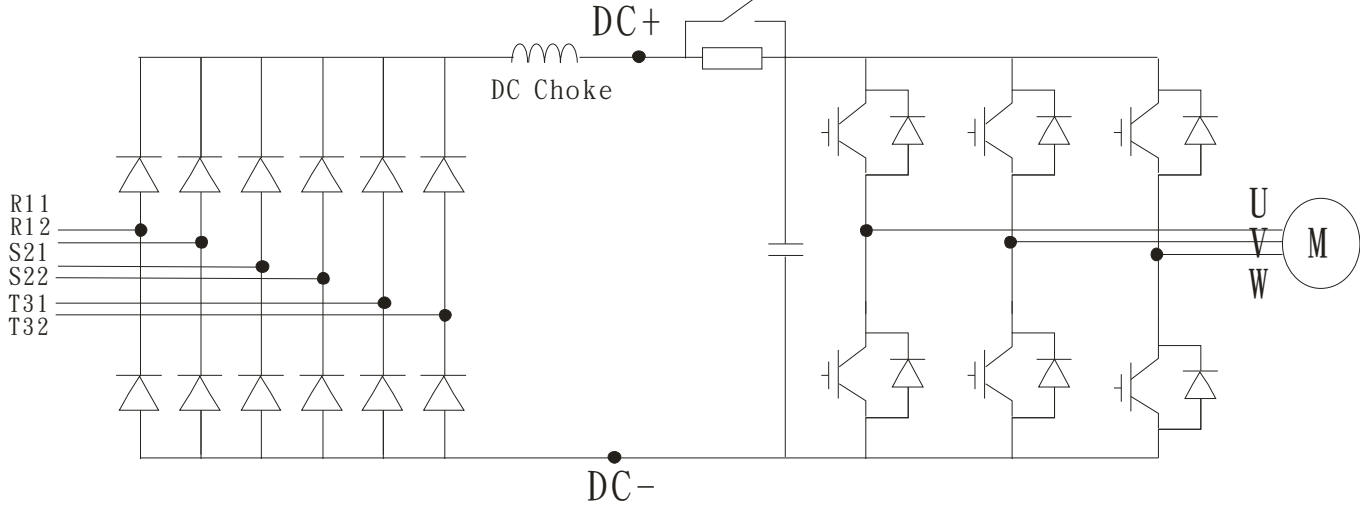
Frame D~E



Frame F

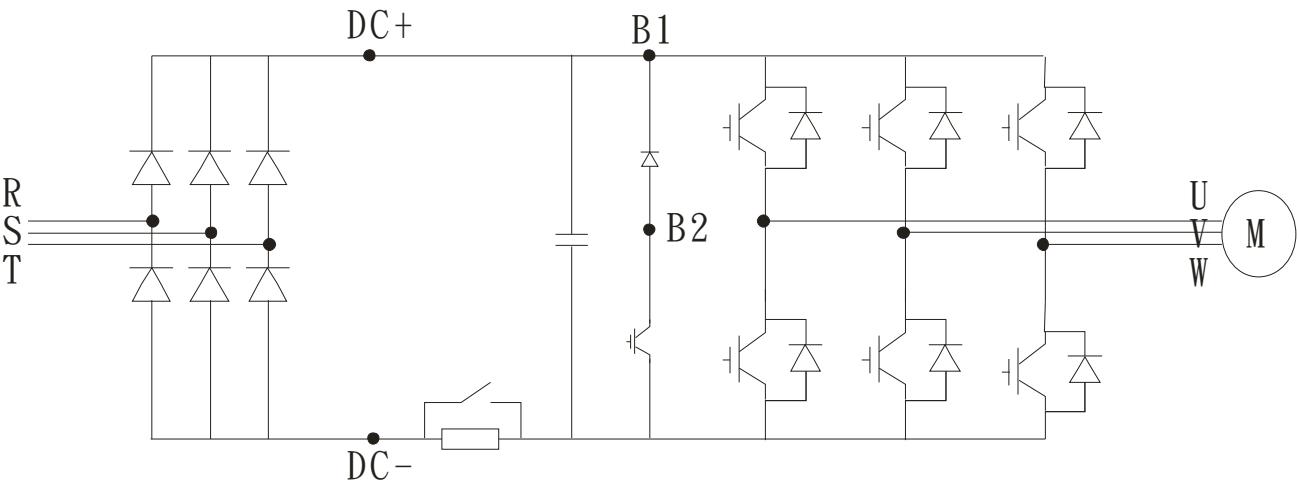


Frame G 及 H

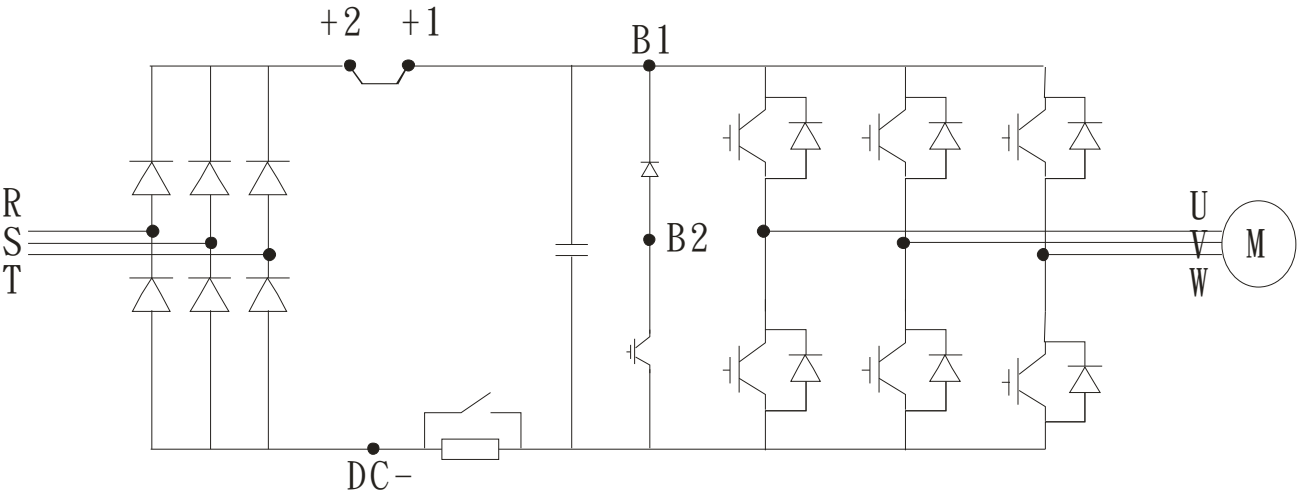


The VFD-C200 circuit diagrams are as below:

Frame A0



Frame A



VFD-C family power range and frame size table

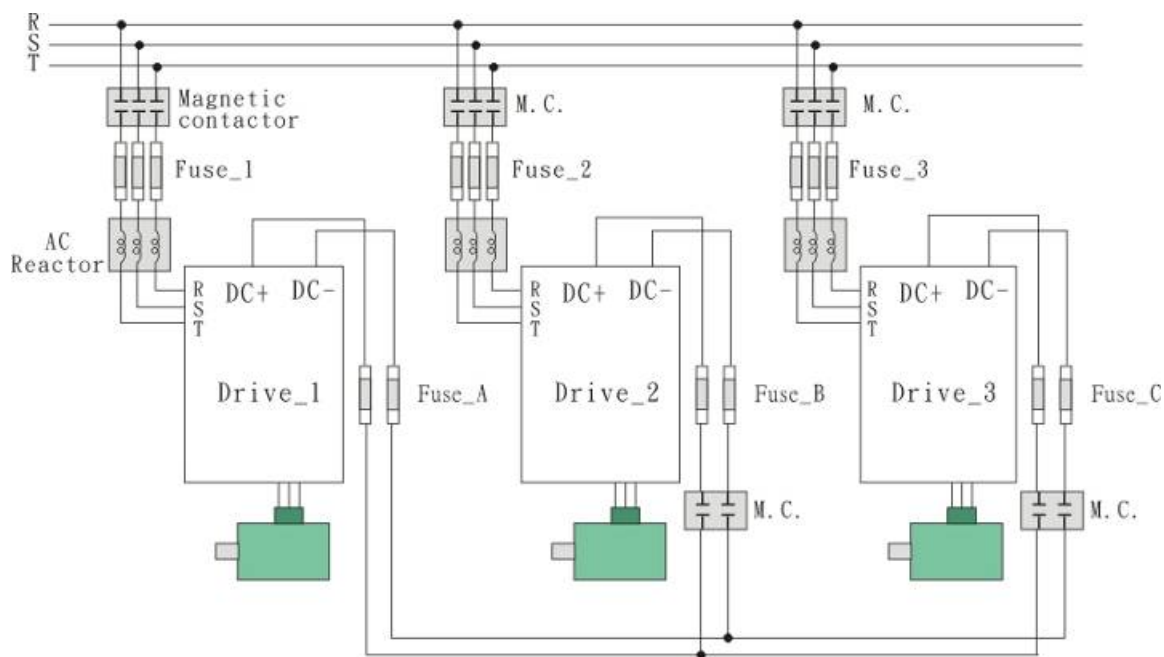
		Frame A0	Frame A	Frame B	Frame C	Frame D
C200	230V 1Φ	0.5~3HP				
	230V 3Φ	0.5~5HP				
	460V	1HP~5HP(3.7kW)	5HP(4kW)~10HP			
C2000	230V		1~5HP	7.5~15HP	20~30HP	40~50HP
	460V		1~7.5HP	10~20HP	25~40HP	50~100HP
CH2000	230V		1~5HP	7.5~15HP	20~25HP	30~50HP
	460V		1~7.5HP	10~20HP	25~40HP	50~100HP
CP2000	230V		1~7.5HP	10~20HP	25~40HP	50~60HP
	460V		1~10HP	15~25HP	30~50HP	60~125HP

		Frame E	Frame F	Frame G	Frame H
C2000	230V	60~100HP	125HP		
	460V	125~150HP	175~215HP	250~300HP	375~465HP
CH2000	230V	60~75HP	100HP		
	460V	125~150HP	175HP	215~300HP	375HP

		Frame E	Frame F	Frame G	Frame H
CP2000	230V	75~125HP			
	460V	150~175HP	215~250HP	300~375HP	425~536HP

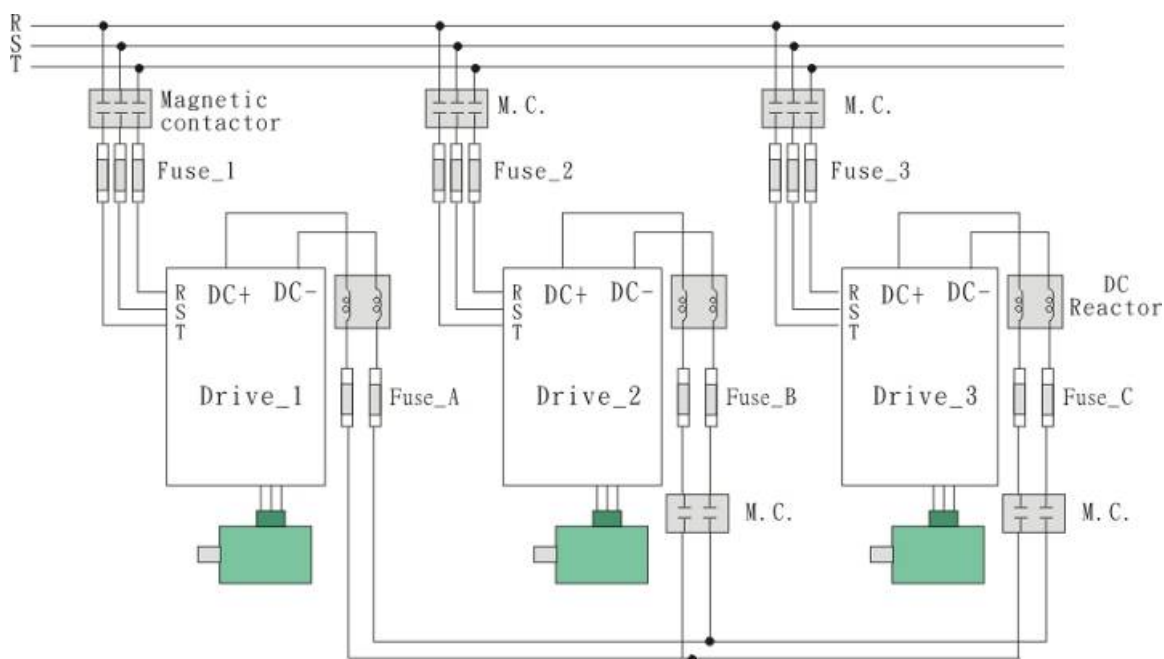
Chapter_2: Share AC power and Common DC Bus

Wiring method 2.1: Drive 1 to drive 3 the power level is the same



Note: Adding 3-phase Line reactor for proportional current sharing

Wiring method 2.2: Drive 1 to drive 3 in the power level is not the same.

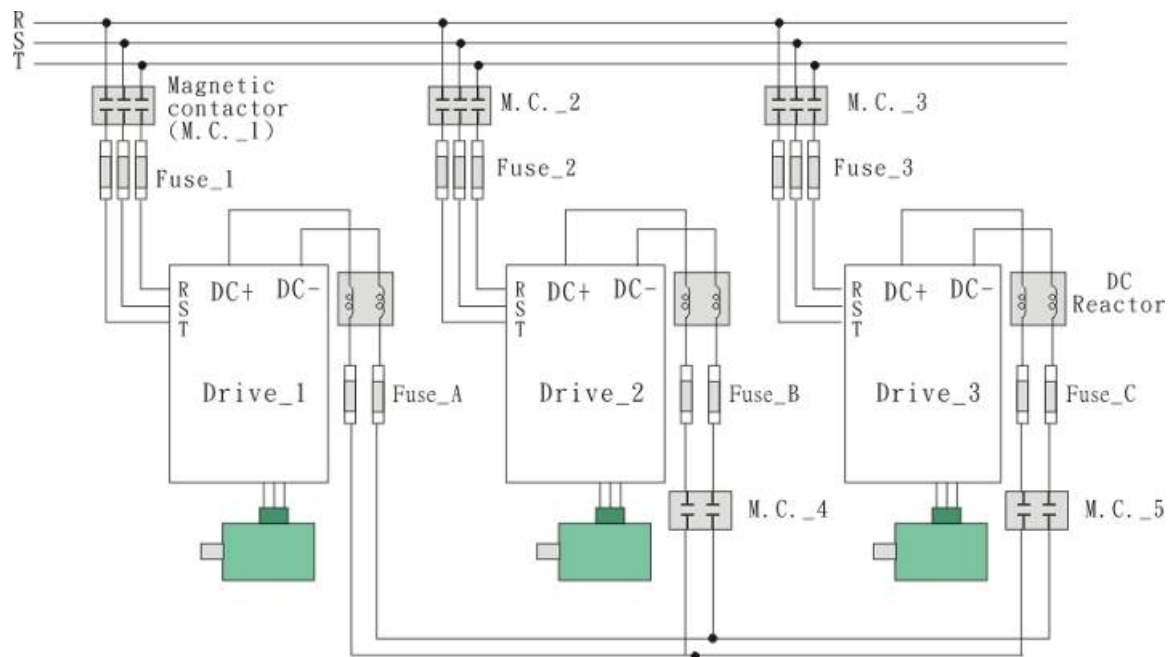


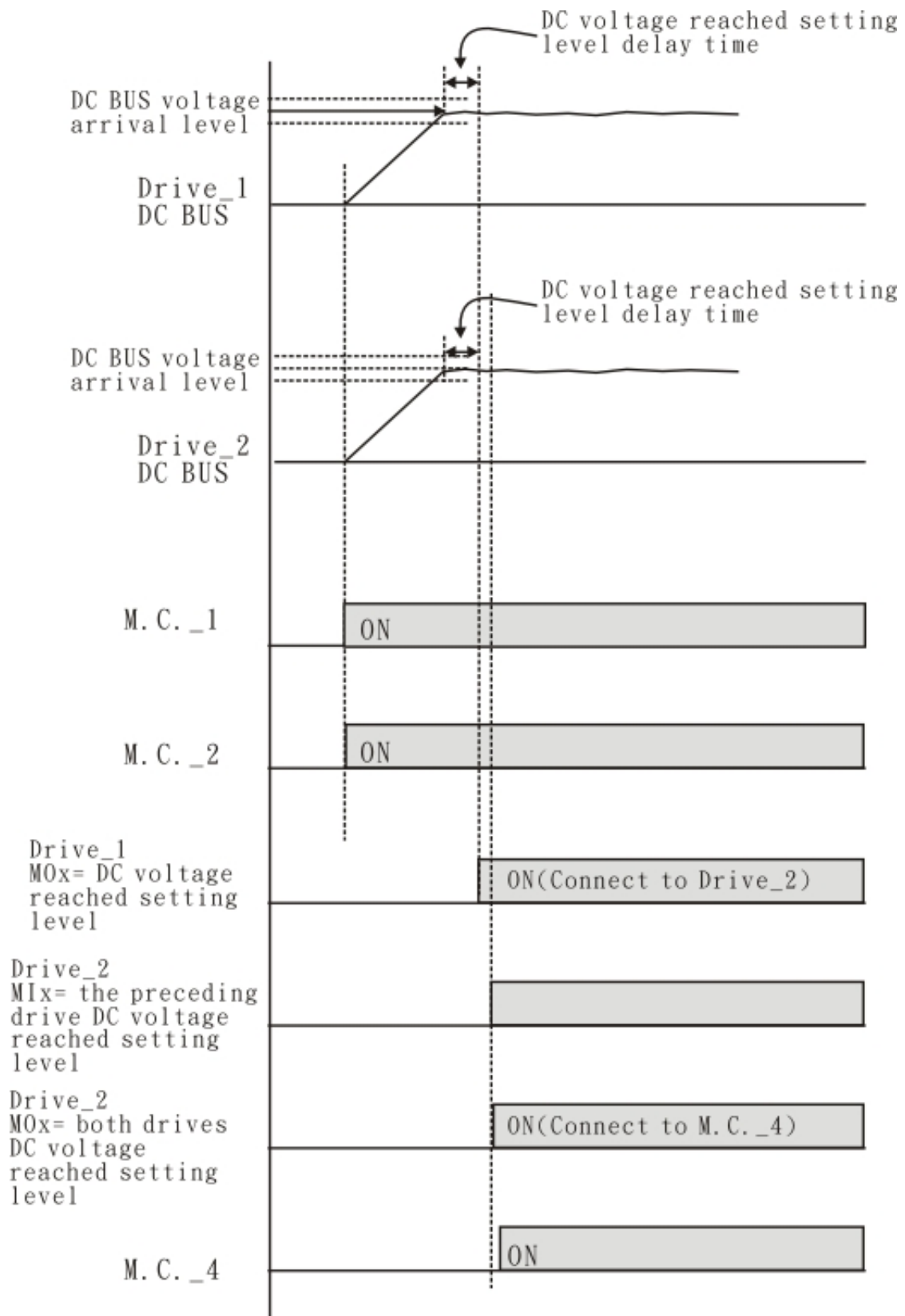
Note: Installing DC reactor for DC-side achieve the proper current sharing.

- On the charged issue, each drive both side of the AC power input and the DC side required the installation of electromagnetic contactor
- When the larger power frame drive is loaded, the current through the small power drive may exceed its current rating. To prevent this, please install DC reactor for DC-side achieve the proper current sharing.
- When using a common DC bus, make DC circuit inductance as small as possible is imperative. To installs

each AC motor drive as close to each other as possible.

📖 When share AC power and Common DC Bus, the turn ON sequence of each electromagnetic contactor:

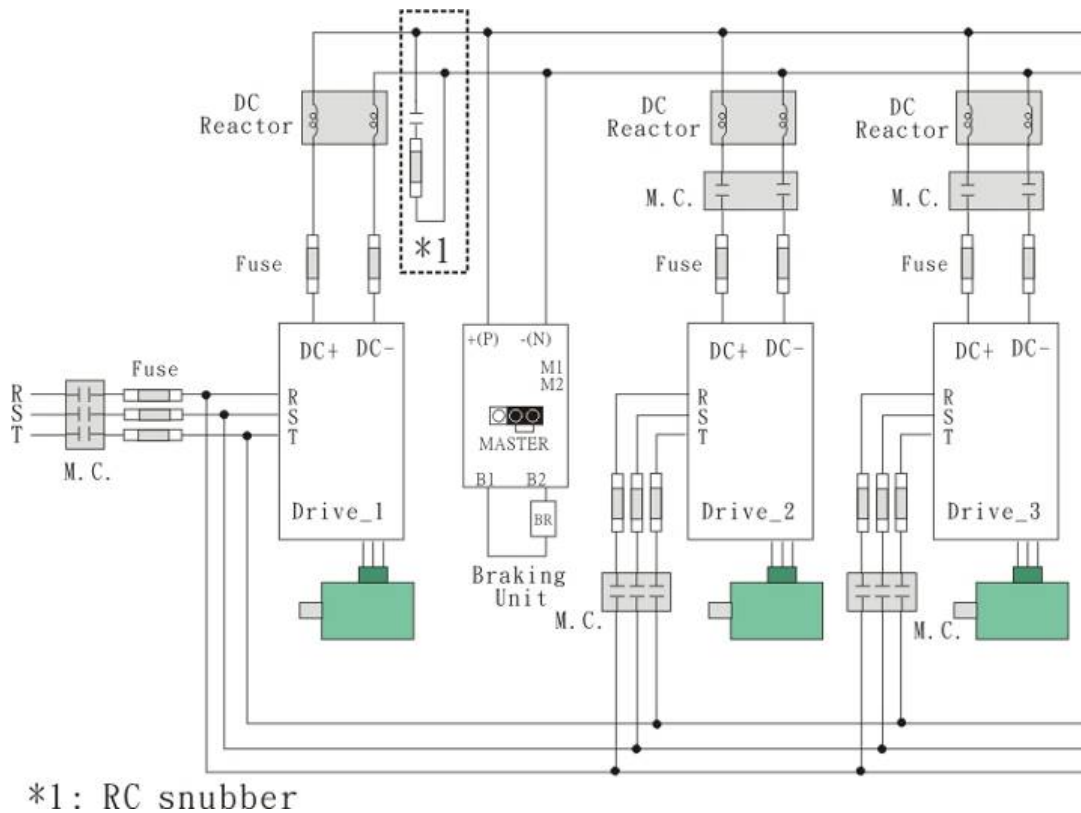




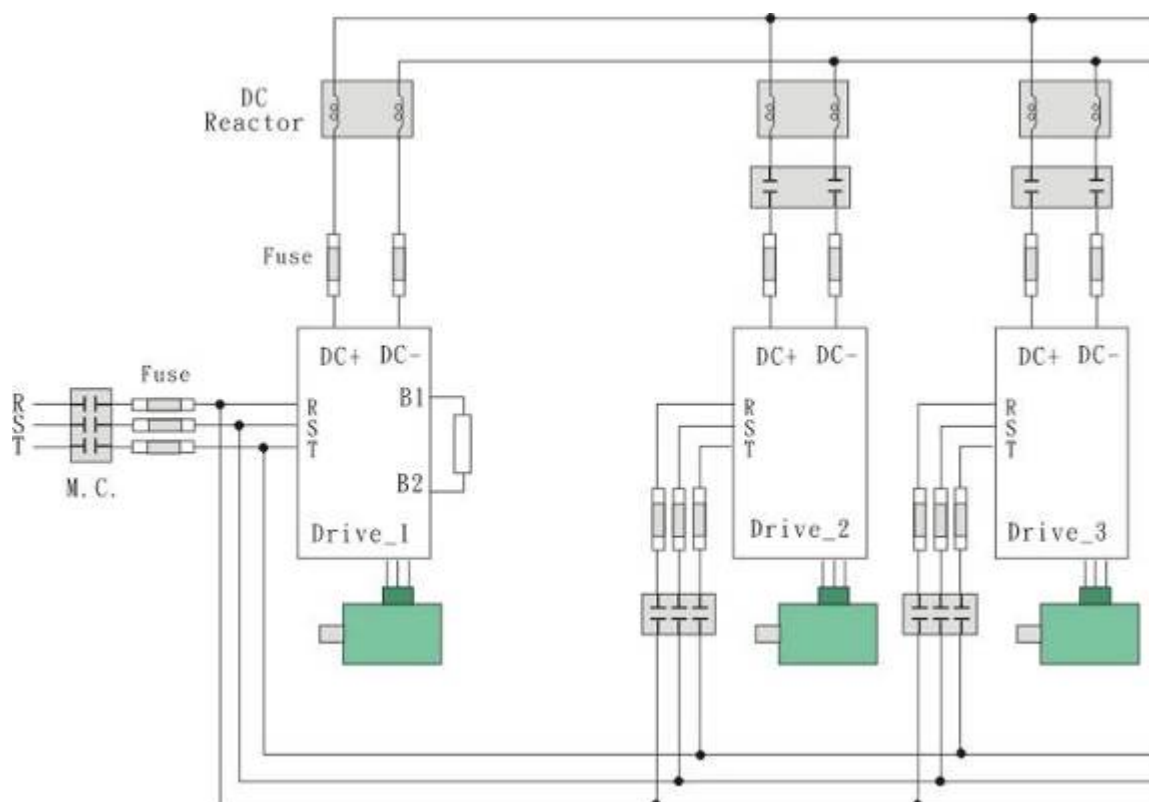
Note: The electromagnetic contactor's On and Off can only control via controller such as PLC.

Chapter_3: Share AC power and Common DC Bus: collocated with DC side regenerated voltage adjustment device

Wiring method 3.1 : Use optional braking unit



Wiring method 3.2 : Use built in braking transistor

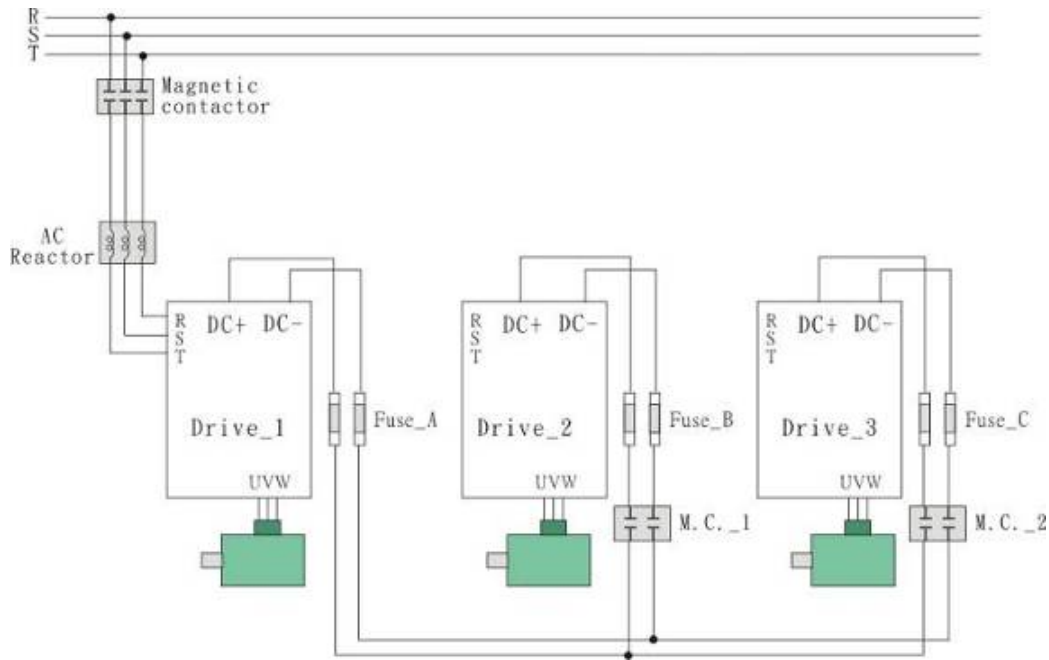


- 📖 The braking unit must be connected closest to the supply drive(biggest power level drive). If the drives are at the same power level, to install braking unit close to the drive which have the most regenerated power.
- 📖 When a vibration is happened in the system, an RC Snubber circuit is required.
- 📖 About the pre-charging issue, the electromagnetic contactor are required in both AC and DC side of each drive.
- 📖 About the loading, when the larger power frame drive is loaded, the current through the small power drive may exceed its current rating. To prevent this, please install DC reactor for DC-side achieve the proper current sharing.
- 📖 When using a common DC bus, make DC circuit inductance as small as possible is imperative. To installs each AC motor drive as close to each other as possible.
- 📖 If AC power is removed from one drive in shared AC /DC bus, this drive can still be charging through the DC bus of another drive. Thus, AC power to all of the drive should be provided through a common disconnected switch or circuit breaker.

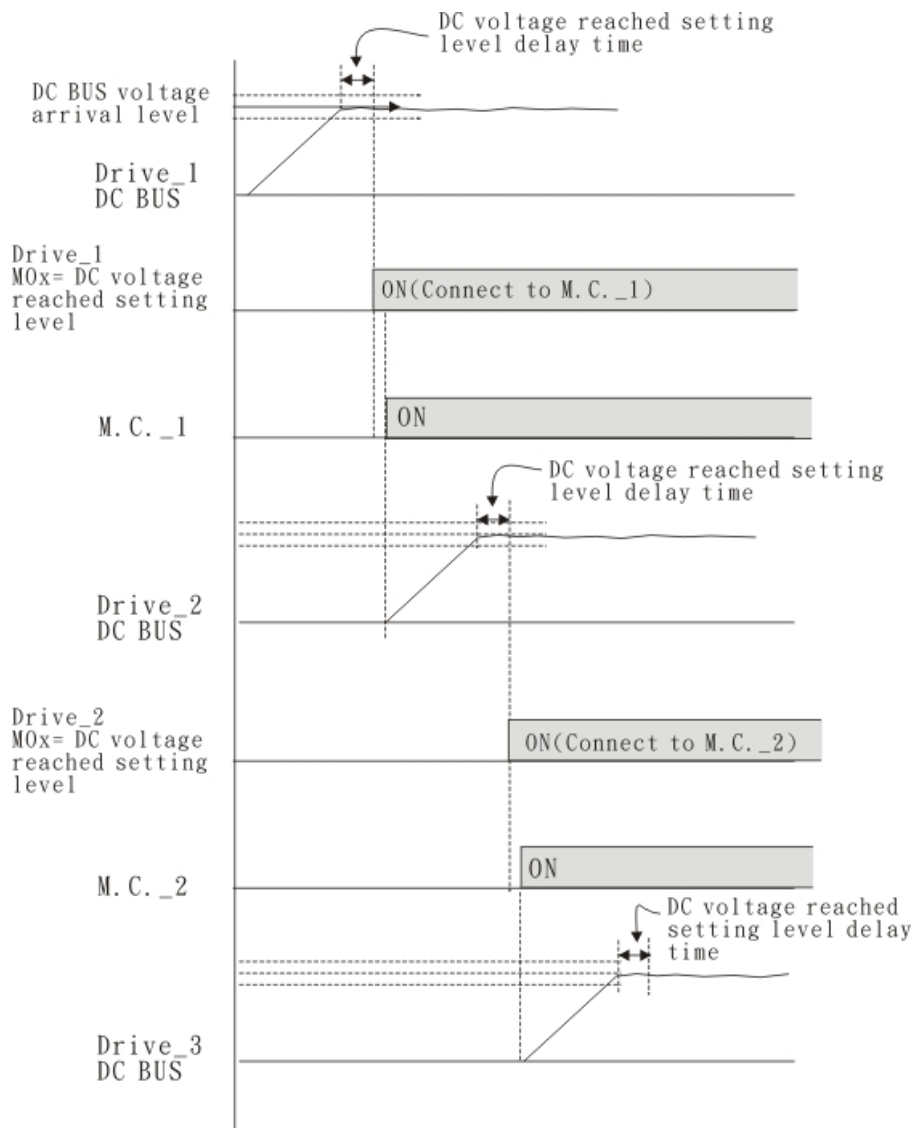
Drive	Voltage	Braking chopper
C2000	230V	Built-in: frame A~C(1HP~30HP) Optional: frame D~H(40HP~125HP)
	460V	Built-in: frame A~C(1HP~40HP) Optional: frame D~H(50HP~475HP)
CH2000	230V	Built-in: frame A~C(1HP~25HP) Optional: frame D~H(30HP~100HP)
	460V	Built-in: frame A~C(1HP~40HP) Optional: frame D~H(50HP~375HP)
CP2000	230V	Built-in: frame A~C(1HP~30HP) Optional: frame D~H(40HP~125HP)
	460V	Built-in: frame A~C(1HP~50HP) Optional: frame D~H(60HP~536HP)
C200	230V	All series built-in: frame A0~A(0.5HP~5HP)
	460V	All series built-in: frame A0~A(1HP~10HP)

Chapter_4: Common DC Bus

Wiring method 4.1 :



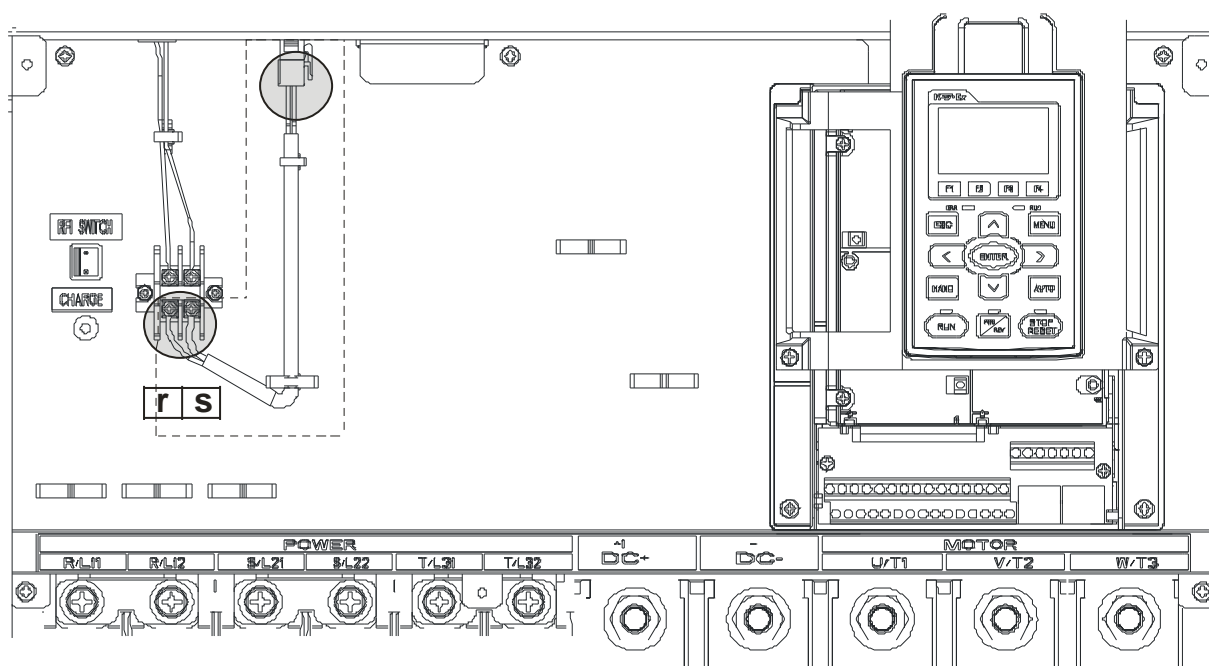
When share AC power and Common DC Bus, the turn ON sequence of every M.C. as below:



- 📖 Main power is always connecting to biggest drive and its charging circuit must capable of charging the whole DC Bus.
- 📖 As the rectifier circuit with charge circuit design is a mix of. So, if you wish to use this wiring method, to avoid the first drive of the rectifier's life is shortened due to overheating, the sum of all drives current output cannot be greater than the rated current of the first drive. For example, the 3 drives' power range are 90kW(normal duty rated current is 180A); 37kW(normal duty rated current is 73A) and 1.5kW(normal duty rated current is 5.9A).
 $(73A+5.9A)*1.3=102.57A$. →take 103A
 The first drive output current shouldn't bigger than $180A-103A=77A$
 If more output current is need, please connect the mains to 37kW drive.
- 📖 When using a common DC bus, make DC circuit inductance as small as possible is imperative. To installs each AC motor drive as close to each other as possible.
- 📖 The electromagnetic contactor's On and Off can only control via controller such as PLC.
- 📖 Before give Run command, please make sure that all the drive are completed on power on and have send a "Drive ready" signal to controller.
- 📖 Applicable to Frame E~H
 1. When RST power is off, please disconnect terminal r and terminal s. (As circled in dotted line, uninstall the gray section and properly store cable r and cable s. Cable r and cable s are not available in optional accessories, do not dispose them.)

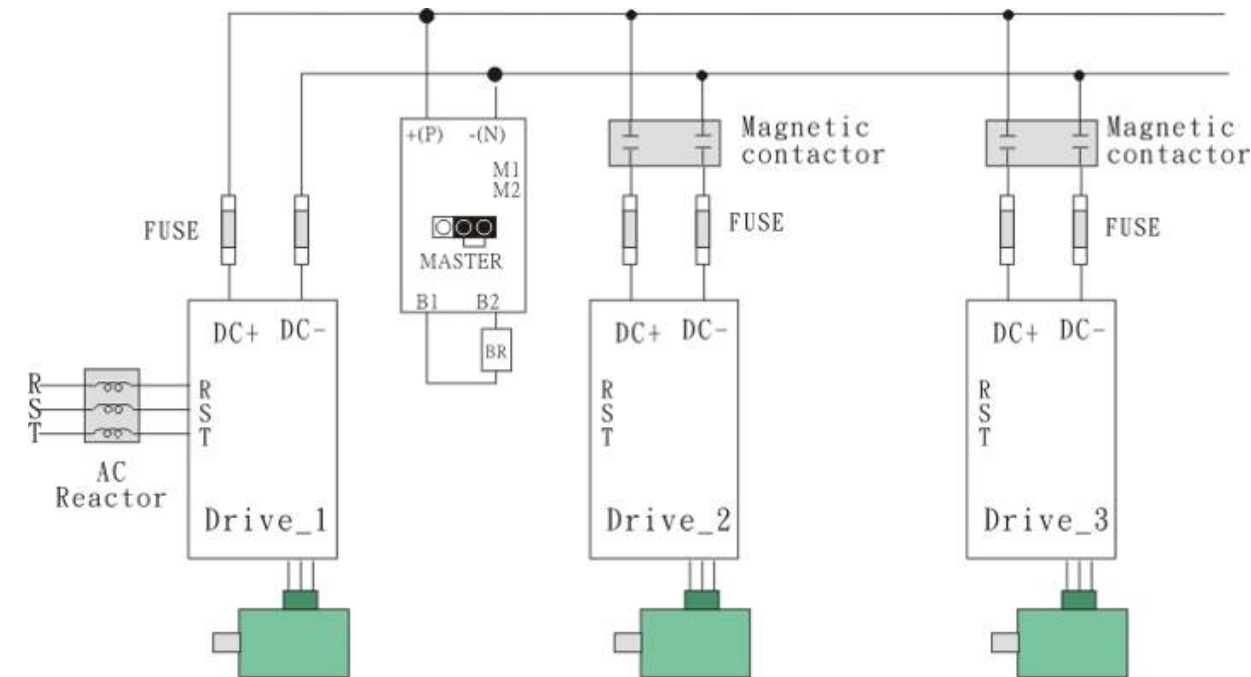
 After terminal r and terminal s are cleared, user may now connect new power source to terminal r and terminal s. Please connect 220Vac for 220V model and 440 Vac for 440V model.

 When the drive power is on, if terminal r and terminal s are not connected to new power source (220 Vac for 220V model and 440Vac for 440 V model), the digital keypad will display an error message "ryF".
 2. When DC Link is used as a DC Bus connection (RST power is applied), it is not required to remove terminal r and terminal s.

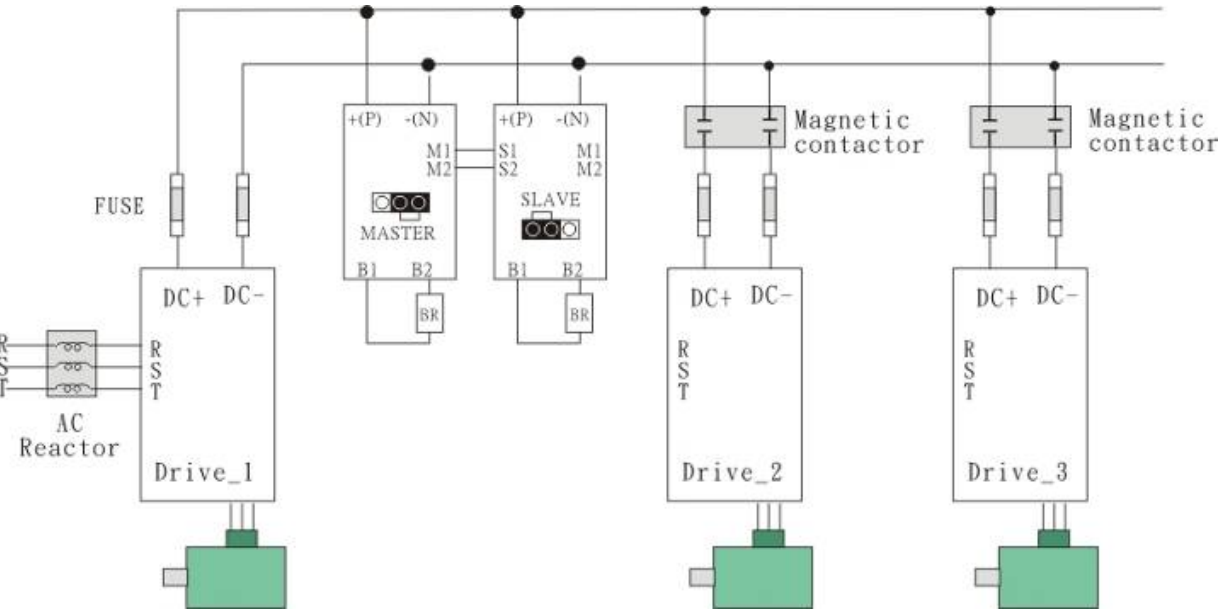


Chapter_5: Common DC Bus: collocated with DC side regenerated voltage adjustment device

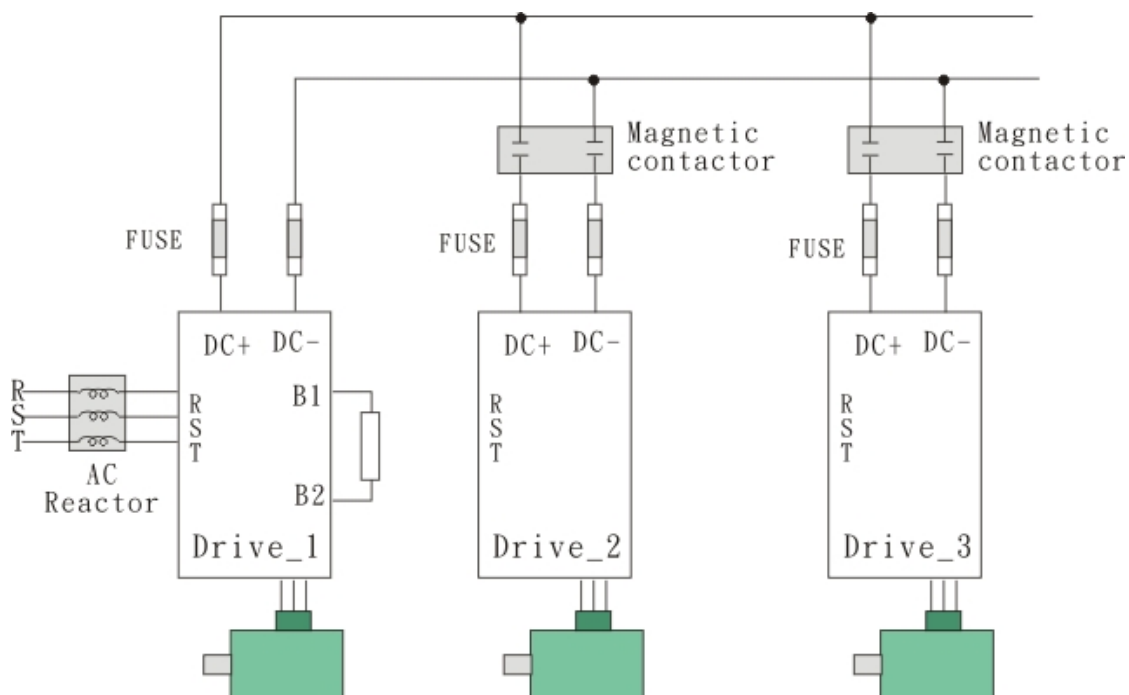
Wiring method 5.1 : use optional braking unit_1 unit




Wiring method 5.1 : use optional braking unit_2 unit



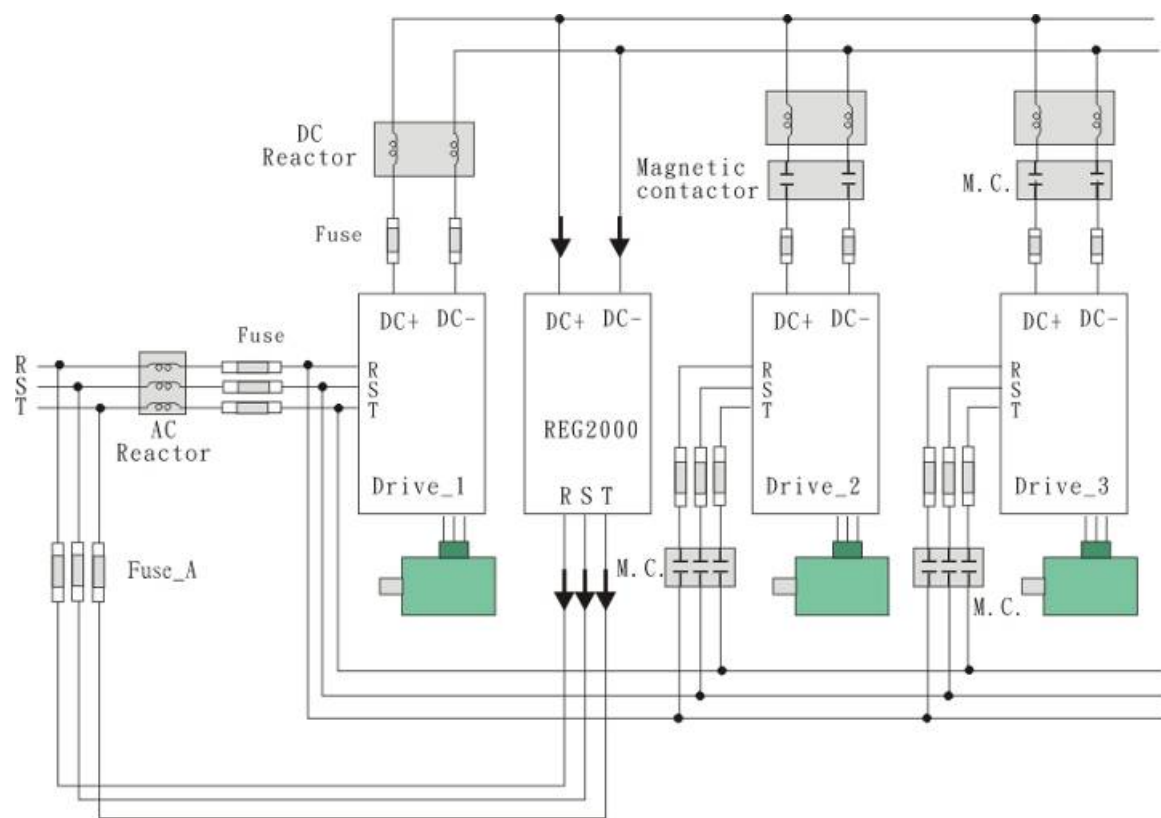
Wiring method 5.3 : Use built in braking transistor



 The braking unit must be connected closest to the supply drive (biggest power level drive). If the drives are at the same power level, to install braking unit close to the drive which have the most regenerated power.

Drive	Voltage	Braking chopper
C2000	230V	Built-in: frame A~C(1HP~30HP) Optional: frame D~H(40HP~125HP)
	460V	Built-in: frame A~C(1HP~40HP) Optional: frame D~H(50HP~475HP)
CH2000	230V	Built-in: frame A~C(1HP~25HP) Optional: frame D~H(30HP~100HP)
	460V	Built-in: frame A~C(1HP~40HP) Optional: frame D~H(50HP~375HP)
CP2000	230V	Built-in: frame A~C(1HP~30HP) Optional: frame D~H(40HP~125HP)
	460V	Built-in: frame A~C(1HP~50HP) Optional: frame D~H(60HP~536HP)
C200	230V	All series built-in: frame A0~A(0.5HP~5HP)
	460V	All series built-in: frame A0~A(1HP~10HP)

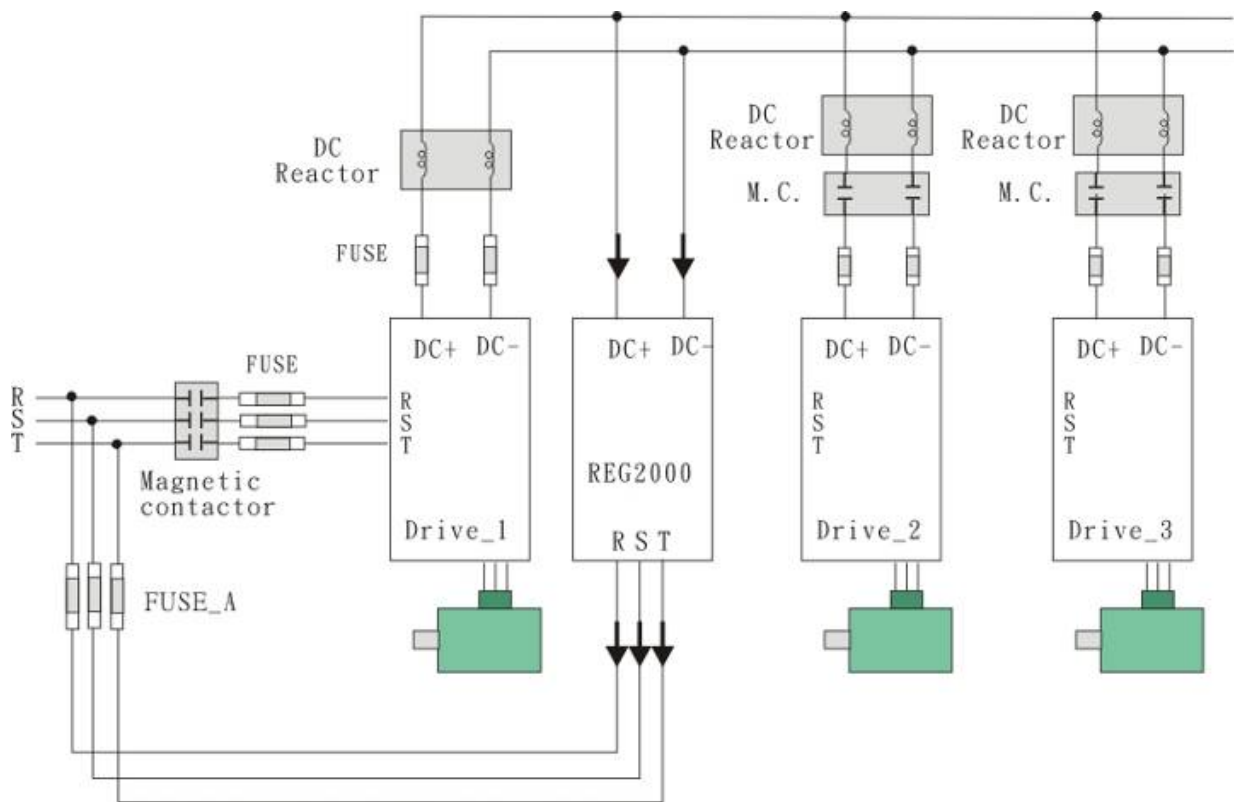
Chapter_6: Share AC power and Common DC Bus: collocated with power regenerated device_REG2000



- When using generator, emergency power supply or transformer(same power capacity to AC motor drive) as power input, the REG2000 is not allow to run with this system. Please use braking resistor to dissipate regenerative energy.
- The cable length of DC+ and DC- to REG2000 should shorter than 5m.
- The Fuse_A spec. for REG2000 as below table:

Frame A		Frame B		Frame C	
Model No.	Amp	Model No.	Amp	Model No.	Amp
REG075A23A-21	50	REG0150A23A-21	100	REG300A23A-21	200
REG110A23A-21	80	REG185A23A-21	125	REG370A23A-21	250
REG075A43A-21	25	REG220A23A-21	150	REG370A43A-21	125
REG110A43A-21	45	REG185A43A-21	60	REG450A43A-21	150
REG150A43A-21	50	REG220A43A-21	80	REG550A43A-21	200
		REG300A43A-21	100		

Chapter_7: Common DC Bus: collocated with power regenerated device_REG2000

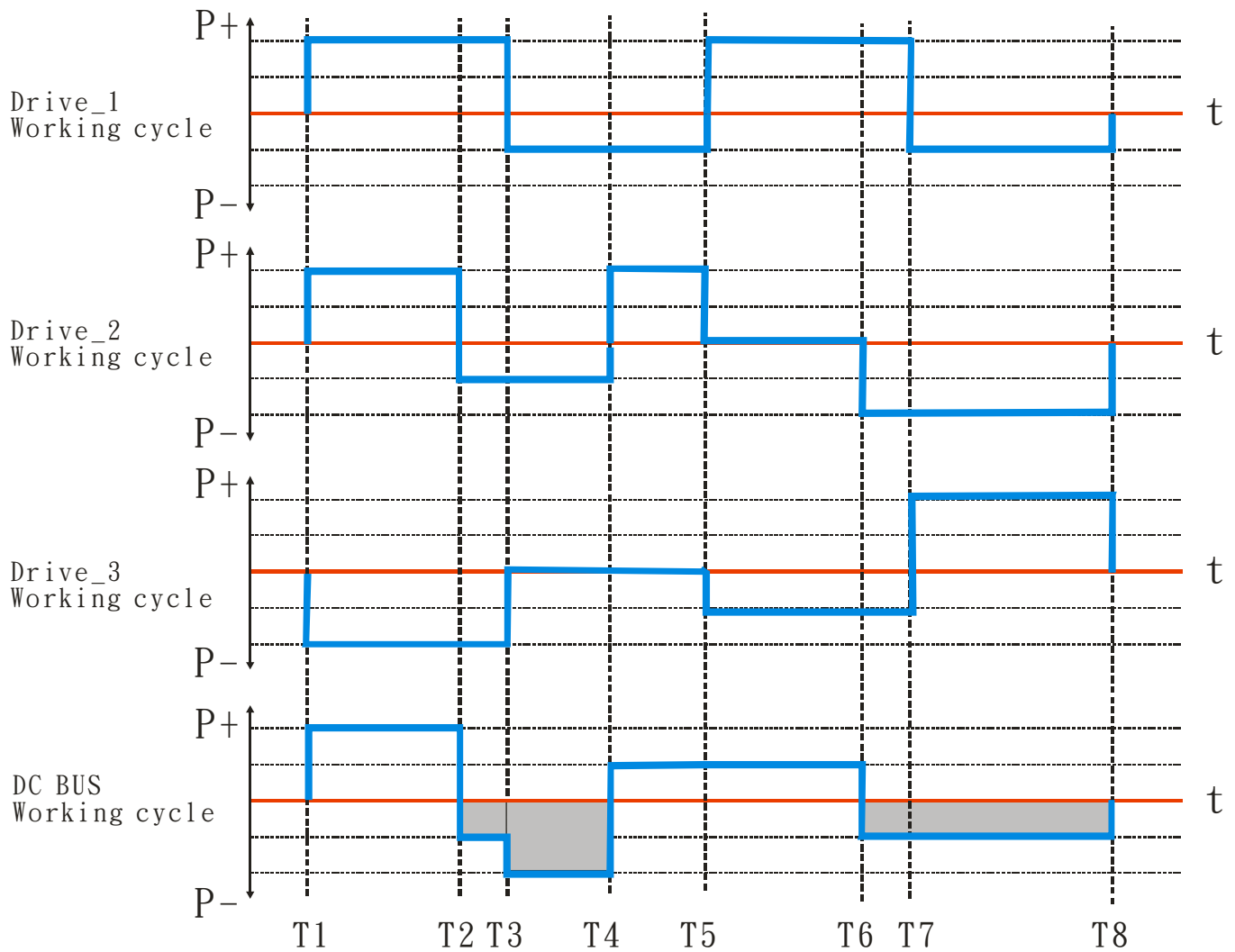


- When using generator, emergency power supply or transformer(same power capacity to AC motor drive) as power input, the REG2000 is not allow to run with this system. Please use braking resistor to dissipate regenerative energy.
- The cable length of DC+ and DC- to REG2000 should shorter than 5m.
- The Fuse_A spec. for REG2000 as below table:

Frame A		Frame B		Frame C	
Model No.	Amp	Model No.	Amp	Model No.	Amp
REG075A23A-21	50	REG0150A23A-21	100	REG300A23A-21	200
REG110A23A-21	80	REG185A23A-21	125	REG370A23A-21	250
REG075A43A-21	25	REG220A23A-21	150	REG370A43A-21	125
REG110A43A-21	45	REG185A43A-21	60	REG450A43A-21	150
REG150A43A-21	50	REG220A43A-21	80	REG550A43A-21	200
		REG300A43A-21	100		

Chapter_8: The selection of braking unit and braking resistor

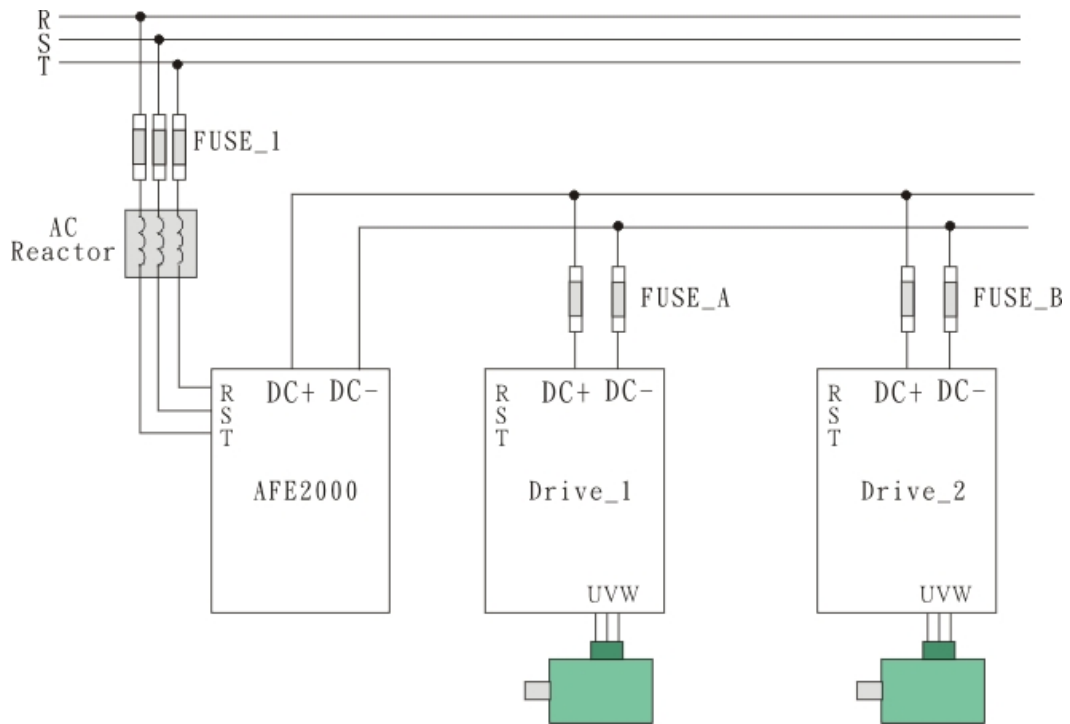
For the common DC Bus system, to check whether it needs to be equipped with an additional brake unit or brake resistor, it will according to the total power of the common DC system is negative at any point of the duty cycle.



From upon diagram, the total power of the common DC system is negative during T2 to T4 and T6 to T8, therefore, a brake unit and brake resistor or REG2000 are needed.

To choose power size of the REG2000, brake unit and brake resistor, please refer to the selection software.

Chapter_9: Common DC Bus: collocated with AFE2000



- For one-to-many installation, the capacity of AFE2000 should be bigger or equal to the total drive power capacity.
- For one-to-many installation, installing a fuse on the AC motor drive's input side is recommended.
- DC side fuse specification = $\text{AC rated input current} / 0.78 \times 1.5$

Chapter_10: Common DC Bus, recommend DC side fuse spec. as below table

C2000

230V class (Fuse voltage spec. is 690VAC)

Model :VFD_ _ _ _C_ _	7	15	22	37	55	75	110	150	185
Applicable Motor Output(kW)	0.75	1.5	2.2	3.7	5.5	7.5	11	15	18.5
Applicable Motor Output(HP)	1	2	3	5	7.5	10	15	20	25
Rated Output Current (ND)(A)	5	8	11	17	25	33	49	65	75
Rated Output Current (HD)(A)	4.8	7.1	10	16	24	31	47	62	71
DC Fuse spec.	10	16	20	32	50	63	100	125	160

Model :VFD_ _ _ _C_ _	220	300	370	450	550	750	900
Applicable Motor Output(kW)	22	30	37	45	55	75	90
Applicable Motor Output(HP)	30	40	50	60	75	100	125
Rated Output Current (ND)(A)	90	120	146	180	215	255	346
Rated Output Current (HD)(A)	86	114	139	171	204	242	329
DC Fuse spec.	200	250	315	400	400	500	700

460V class (Fuse voltage spec. is 1250VAC)

Model :VFD_ _ _ _C_ _	7	15	22	37	40	55	75	110	150
Applicable Motor Output(kW)	0.75	1.5	2.2	3.7	4	5.5	7.5	11	15
Applicable Motor Output(HP)	1	2	3	5	5	7.5	10	15	20
Rated Output Current (ND)(A)	3	4	6	9	10.5	12	18	24	32
Rated Output Current (HD)(A)	2.9	3.8	5.7	8.1	9.5	11	17	23	30
DC Fuse spec.	10	10	16	20	20	25	40	50	63

Model :VFD_ _ _ _C_ _	185	220	300	370	450	550	750	900	1100
Applicable Motor Output(kW)	18.5	22	30	37	45	55	75	90	110
Applicable Motor Output(HP)	25	30	40	50	60	75	100	125	150
Rated Output Current (ND)(A)	38	45	60	73	91	110	150	180	220
Rated Output Current (HD)(A)	36	43	57	69	86	105	143	171	209
DC Fuse spec.	80	100	125	160	200	250	315	350	400

Model :VFD_ _ _ _C_ _	1320	1600	1850	2200	2800	3150	3550
Applicable Motor Output(kW)	132	160	185	220	280	315	355
Applicable Motor Output(HP)	175	215	250	300	375	425	475
Rated Output Current (ND)(A)	260	310	370	460	550	616	683
Rated Output Current (HD)(A)	247	295	352	437	523	585	649
DC Fuse spec.	500	630	800	1000	1250	1250	1600

CH2000

230V class (Fuse voltage spec. is 690VAC)

Model :VFD____CH__	7	15	22	37	55	75	110	150	185
Applicable Motor Output(kW)	0.75	1.5	2.2	3.7	5.5	7.5	11	15	18.5
Applicable Motor Output(HP)	1	2	3	5	7.5	10	15	20	25
Rated Output Current (SHD)(A)	5	8	11	17	25	33	49	65	75
DC Fuse spec.	10	16	25	40	50	80	100	160	160

Model :VFD____CH__	220	300	370	450	550	750
Applicable Motor Output(kW)	22	30	37	45	55	75
Applicable Motor Output(HP)	30	40	50	60	75	100
Rated Output Current (SHD)(A)	90	105	146	180	215	276
DC Fuse spec.	200	250	315	400	450	550

460V class (Fuse voltage spec. is 1250VAC)

Model :VFD____CH__	7	15	22	37	55	75	110	150	185
Applicable Motor Output(kW)	0.75	1.5	2.2	3.7	5.5	7.5	11	15	18.5
Applicable Motor Output(HP)	1	2	3	5	7.5	10	15	20	25
Rated Output Current (SHD)(A)	3	4	6	9	12	18	24	32	38
DC Fuse spec.	10	10	16	20	25	40	50	63	80

Model :VFD____CH__	220	300	370	450	550	750	900	1100	1320
Applicable Motor Output(kW)	22	30	37	45	55	75	90	110	132
Applicable Motor Output(HP)	30	40	50	60	75	100	125	150	175
Rated Output Current (SHD)(A)	45	60	73	91	110	150	180	220	250
DC Fuse spec.	100	125	160	200	250	315	350	450	500

Model :VFD____CH__	1600	1850	2200	2800
Applicable Motor Output(kW)	160	185	220	280
Applicable Motor Output(HP)	215	250	300	375
Rated Output Current (SHD)(A)	310	370	450	550
DC Fuse spec.	630	800	900	1100

CP2000

230V class (Fuse voltage spec. is 690VAC)

Model :VFD____CP__	7	15	22	37	55	75	110	150
Applicable Motor Output(kW)	0.75	1.5	2.2	3.7	5.5	7.5	11	15
Applicable Motor Output(HP)	1	2	3	5	7.5	10	15	20
Rated Output Current (LD)(A)	5	7.5	10	15	21	31	46	61
Rated Output Current (ND)(A)	4.6	5	8	11	17	25	33	49
DC Fuse spec.	10	10	16	25	40	50	80	100

Model :VFD____CP__	185	220	300	370	450	550	750	900
Applicable Motor Output(kW)	18.5	22	30	37	45	55	75	90
Applicable Motor Output(HP)	25	30	40	50	60	75	100	125
Rated Output Current (LD)(A)	75	90	105	146	180	215	276	322
Rated Output Current (ND)(A)	65	75	90	120	146	180	215	255
DC Fuse spec.	160	160	200	250	315	400	450	500

460V class (Fuse voltage spec. is 1250VAC)

Model :VFD____CP__	7	15	22	37	40	55	75	110	150
Applicable Motor Output(kW)	0.75	1.5	2.2	3.7	4	5.5	7.5	11	15
Applicable Motor Output(HP)	1	2	3	5	5	7.5	10	15	20
Rated Output Current (LD)(A)	3	3.7	5	7.5	10.5	12	14	22.5	30
Rated Output Current (ND)(A)	2.8	3	4	6	9	10.5	12	18	24
DC Fuse spec.	10	10	10	16	20	25	25	40	50

Model :VFD____CP__	185	220	300	370	450	550	750	900	1100
Applicable Motor Output(kW)	18.5	22	30	37	45	55	75	90	110
Applicable Motor Output(HP)	25	30	40	50	60	75	100	125	150
Rated Output Current (LD)(A)	36	45	56	72	91	110	144	180	220
Rated Output Current (ND)(A)	32	38	45	60	73	91	110	150	180
DC Fuse spec.	63	80	100	125	160	200	250	315	400

Model :VFD____CP__	1320	1600	1850	2200	2800	3150	3550	4000
Applicable Motor Output(kW)	132	160	185	220	280	315	355	400
Applicable Motor Output(HP)	175	215	250	300	375	425	475	536
Rated Output Current (LD)(A)	246	310	343	460	530	616	683	770
Rated Output Current (ND)(A)	220	260	310	370	460	550	616	683
DC Fuse spec.	450	550	630	800	900	1100	1250	1400

C200

230V class (Fuse voltage spec. is 690VAC)

Model :VFD___CB__	4	7	15	22	37
Applicable Motor Output(kW)	0.4	0.75	1.5	2.2	3.7
Applicable Motor Output(HP)	0.5	1	2	3	5
Rated Output Current (ND)(A)	3	5	8	11	17
Rated Output Current (HD)(A)	2.8	4.8	7.1	10	16
DC Fuse spec.	10	10	16	20	32

460V class (Fuse voltage spec. is 1250VAC)

Model :VFD___CB__	7	15	22	37	40	55	75
Applicable Motor Output(kW)	0.75	1.5	2.2	3.7	4	5.5	7.5
Applicable Motor Output(HP)	1	2	3	5	5	7.5	10
Rated Output Current (ND)(A)	3	4	6	9	10.5	12	18
Rated Output Current (HD)(A)	2.9	3.8	5.7	8.1	9.5	11	17
DC Fuse spec.	10	10	16	20	20	25	40

Chapter_11: Common DC Bus, recommend AC side fuses spec. as below table

C2000

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230V class

230V Model	Input Current I(A)		Line Fuse	
	Heavy Duty	Normal Duty	I (A)	Bussmann P/N
VFD007C23A	6.1	6.4	15	JJN-15
VFD015C23A	11	12	20	JJN-20
VFD022C23A	15	16	30	JJN-30
VFD037C23A	18.5	20	80	JJN-80
VFD055C23A	26	28	50	JJN-50
VFD075C23A	34	36	60	JJN-60
VFD110C23A	50	52	175	JJN-175
VFD150C23A	68	72	125	JJN-125
VFD185C23A	78	83	150	JJN-150
VFD220C23A	95	99	350	JJN-350
VFD300C23A/E	118	124	225	JJN-225
VFD370C23A/E	136	143	500	DLS-R-500
VFD450C23A/E	162	171	300	JJN-300
VFD550C23A/E	196	206	400	JJN-400
VFD750C23A/E	233	245	1000	JJN-1000

460V class

460V Model	Input Current I(A)		Line Fuse	
	Heavy Duty	Normal Duty	I (A)	Bussmann P/N
VFD007C43A/E	4.1	4.3	10	JJS-10
VFD015C43A/E	5.6	5.9	10	JJS-10
VFD022C43A/E	8.3	8.7	15	JJS-15
VFD037C43A/E	13	14	20	JJS-20
VFD040C43A/E	14.5	15.5	20	JJS-20
VFD055C43A/E	16	17	45	JJS-45
VFD075C43A/E	19	20	40	JJS-40
VFD110C43A/E	25	26	50	JJS-50
VFD150C43A/E	33	35	125	JJS-125
VFD185C43A/E	38	40	75	JJS-75
VFD220C43A/E	45	47	100	JJS-100
VFD300C43A/E	60	63	200	JJS-200
VFD370C43A/E	70	74	150	JJS-150
VFD450C43A/E	96	101	175	JJS-175
VFD550C43A/E	108	114	250	JJS-250
VFD750C43A/E	149	157	600	DLS-R-600
VFD900C43A/E	159	167	300	JJS-300
VFD1100C43A/E	197	207	800	JJS-800
VFD1320C43A/E	228	240	500	JJS-500
VFD1600C43A/E	285	300	600	JJS-600
VFD1850C43A/E	361	380	600	JJS-600
VFD2200C43A/E	380	400	800	JJS-800
VFD2800C43A/E	469	494	1000	KTU-1000
VFD3150C43A/E	527	555	1200	KTU-1200
VFD3550C43A/E	594	625	1350	KTU-1350

CH2000

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230V class

230V Model	Input Current I(A)	Line Fuse	
	Super Heavy Duty	I (A)	Bussmann P/N
VFD007CH23A-21	6.4	15	JJN-15
VFD015CH23A-21	12	20	JJN-20
VFD022CH23A-21	16	30	JJN-30
VFD037CH23A-21	20	80	JJN-80
VFD055CH23A-21	28	50	JJN-50
VFD075CH23A-21	36	60	JJN-60
VFD110CH23A-21	52	175	JJN-175
VFD150CH23A-21	72	125	JJN-125
VFD185CH23A-21	83	150	JJN-150
VFD220CH23A-00/21	99	350	JJN-350
VFD300CH23A-00/21	124	225	JJN-225
VFD370CH23A-00/21	143	500	DLS-R-500
VFD450CH23A-00/21	171	300	JJN-300
VFD550CH23A-00/21	206	400	JJN-400
VFD750CH23A-00/21	245	1000	JJN-1000

460V class

460V Model	Input Current I(A)	Line Fuse	
	Super Heavy Duty	I (A)	Bussmann P/N
VFD007CH43A/4EA-21	4.3	10	JJS-10
VFD015CH43A/4EA-21	5.9	10	JJS-10
VFD022CH43A/4EA-21	8.7	15	JJS-15
VFD037CH43A/4EA-21	14	20	JJS-20
VFD055CH43A/4EA-21	17	45	JJS-45
VFD075CH43A/4EA-21	20	40	JJS-40
VFD110CH43A/4EA-21	26	50	JJS-50
VFD150CH43A/4EA-21	35	125	JJS-125
VFD185CH43A/4EA-21	40	75	JJS-75
VFD220CH43A/4EA-21	47	100	JJS-100
VFD300CH43A/4EA-21	63	200	JJS-200
VFD370CH43A-00/21	74	150	JJS-150
VFD450CH43A-00/21	101	175	JJS-175
VFD550CH43A-00/21	114	250	JJS-250
VFD750CH43A-00/21	157	600	DLS-R-600
VFD900CH43A-00/21	167	300	JJS-300
VFD1100CH43A-00/21	207	800	JJS-800
VFD1320CH43A-00/21	240	500	JJS-500
VFD1600CH43A-00/21	300	600	JJS-600
VFD1850CH43A-00/21	380	600	JJS-600
VFD2200CH43A-00/21	400	800	JJS-800
VFD2800CH43A-00	494	1000	KTU-1000
VFD2800CH43C-00/21			

CP2000

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230V class

Model 230V	Input current (A)		Line Fuse	
	Light duty	Normal duty	I (A)	Bussmann P/N
VFD007CP23A-21	6.4	3.9	15	JJN-15
VFD015CP23A-21	9.6	6.4	20	JJN-20
VFD022CP23A-21	15	12	30	JJN-30
VFD037CP23A-21	22	16	40	JJN-40
VFD055CP23A-21	25	20	50	JJN-50
VFD075CP23A-21	35	28	60	JJN-60
VFD110CP23A-21	50	36	100	JJN-100
VFD150CP23A-21	65	52	125	JJN-125
VFD185CP23A-21	83	72	150	JJN-150
VFD220CP23A-21	100	83	200	JJN-200
VFD300CP23A-21	116	99	225	JJN-225
VFD370CP23A-00/23A-21	146	124	250	JJN-250
VFD450CP23A-00/23A-21	180	143	300	JJN-300
VFD550CP23A-00/23A-21	215	171	400	JJN-400
VFD750CP23A-00/23A-21	276	206	450	JJN-450
VFD900CP23A-00/23A-21	322	245	600	JJN-600

460V class

Model 460V	Input current (A)		Line Fuse	
	Light duty	Normal duty	I (A)	Bussmann P/N
VFD007CP43A-21/4EA-21	4.3	3.5	10	JJS-10
VFD015CP43A-21/4EA-21	5.4	4.3	10	JJS-10
VFD022CP43A-21/4EA-21	7.4	5.9	15	JJS-15
VFD037CP43A-21/4EA-21	11	8.7	20	JJS-20
VFD040CP43A-21/4EA-21	16	14	30	JJS-20
VFD055CP43A-21/4EA-21	18	15.5	30	JJS-30
VFD075CP43A-21/4EA-21	20	17	40	JJS-40
VFD110CP43A-21/4EA-21	25	20	50	JJS-50
VFD150CP43A-21/4EA-21	33	26	60	JJS-60
VFD185CP43A-21/4EA-21	39	35	75	JJS-75
VFD220CP43A-21/4EA-21	47	40	100	JJS-100
VFD300CP43A-21/4EA-21	58	47	125	JJS-125
VFD370CP43A-21/4EA-21	76	63	150	JJS-150
VFD450CP43S-00/43S-21	91	74	175	JJS-175
VFD450CP43A-00/43A-21				
VFD550CP43S-00/43S-21	110	101	250	JJS-250
VFD550CP43A-00/43A-21				
VFD750CP43A-00/43A-21	144	114	300	JJS-300
VFD900CP43A-00/43A-21	180	157	300	JJS-300
VFD1100CP43A-00/43A-21	220	167	400	JJS-400
VFD1320CP43A-00/43A-21	246	207	500	JJS-500
VFD1600CP43A-00/43A-21	310	240	600	JJS-600
VFD1850CP43A-00/43A-21	343	300	600	JJS-600
VFD2200CP43A-00/43A-21	460	380	800	JJS-800
VFD2800CP43A-00/43A-21	530	400	1000	KTU-1000
VFD3150CP43A-00/43C-00/43C-21	616	494	1200	KTU-1200
VFD3550CP43A-00/43C-00/43C-21	683	555	1350	KTU-1350
VFD4000CP43A-00/43C-00/43C-21	770	625	1500	KTU-1500

C200

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- “For installation in Canada, branch circuit protection must be provided in accordance with Canadian Electrical Code and any applicable provincial codes. To fulfill this requirement, use the UL classified fuses”

230V class

Model 230V	Input Current I(A)		Line Fuse	
	Normal duty	Heavy Duty	I (A)	Busmann P/N
VFD004CB21A-20/-21/-21M	3	2.8	15A	JJN-15
VFD007CB21A-20/-21/-21M	5	4.8	20A	JJN-20
VFD015CB21A-20/-21/-21M	8	7.1	30A	JJN-30
VFD022CB21A-20/-21/-21M	11	10	50A	JJN-50
VFD004CB23A-20/-21/-21M	3	2.8	10A	JJN-10
VFD007CB23A-20/-21/-21M	5	4.8	15A	JJN-15
VFD015CB23A-20/-21/-21M	8	7.1	20A	JJN-20
VFD022CB23A-20/-21/-21M	11	10	30A	JJN-30
VFD037CB23A-20/-21/-21M	17	16	40A	JJN-40

460V class

Model 460V	Input Current I(A)		Line Fuse	
	Normal duty	Heavy Duty	I (A)	Busmann P/N
VFD007CB43A-20/-21/-21M	3	2.9	10A	JJS-10
VFD015CB43A-20/-21/-21M	4	3.8	10A	JJS-10
VFD022CB43A-20/-21/-21M	6	5.7	15A	JJS-15
VFD037CB43A-20/-21/-21M	9	8.1	20A	JJS-20
VFD040CB43A-20/-21/-21M	10.5	9.5	20A	JJS-20
VFD055CB43A-20/-21/-21M	12	11	30A	JJS-30
VFD075CB43A-20/-21/-21M	18	17	40A	JJS-40

Chapter_12: Common DC Bus, recommend AC reactor spec. as below table

C2000

230V, 50/60Hz, 3-phase

kW	HP	Rated Amps of AC Reactor	Max. continuous Amps	Inductance (mh)	
				3% impedance	5% impedance
0.75	1	4	6	3	6.5
1.5	2	8	12	1.5	3
2.2	3	12	18	1.25	2.5
3.7	5	18	27	0.8	1.5
5.5	7.5	25	37.5	0.5	1.2
7.5	10	35	52.5	0.4	0.8
11	15	45	67.5	0.3	0.7
15	20	55	82.5	0.25	0.5
18.5	25	80	120	0.2	0.4
22	30	100	150	0.15	0.3
30	40	130	195	0.1	0.2
37	50	160	240	0.075	0.15
45	60	200	300	0.055	0.110
55	75	250	375	0.090	0.150
75	100	320	480	0.040	0.075
90	125	400	600	0.03	0.006

460V, 50/60Hz, 3-phase

kW	HP	Rated Amps of AC Reactor	Max. continuous Amps	Inductance (mh)	
				3% impedance	5% impedance
0.75	1	4	6	9	12
1.5	2	4	6	6.5	9
2.2	3	8	12	5	7.5
3.7	5	12	18	2.5	4.2
4	5	12	18	2.5	4.2
5.5	7.5	18	27	1.5	2.5
7.5	10	18	27	1.5	2.5
11	15	25	37.5	1.2	2
15	20	35	52.5	0.8	1.2
18.5	25	45	67.5	0.7	1.2
22	30	45	67.5	0.7	1.2
30	40	80	120	0.4	0.7
37	50	80	120	0.4	0.7
45	60	100	150	0.3	0.45
55	75	130	195	0.2	0.3
75	100	160	240	0.15	0.23
90	125	200	300	0.110	0.185
110	150	250	375	0.090	0.150
132	175	320	480	0.075	0.125
160	215	400	600	0.03	0.06
185	250	400	600	0.03	0.06
220	300	500	750	0.025	0.05
280	375	600	900	0.02	0.04
315	425	750	1125	0.029	0.048
355	475	750	1125	0.029	0.048

CH2000

230V, 50/60Hz, 3-phase

kW	HP	Rated Amps of AC Reactor	Max. continuous Amps	Inductance (mh)	
				3% impedance	5% impedance
0.75	1	4	6	3	6.5
1.5	2	8	12	1.5	3
2.2	3	12	18	1.25	2.5
3.7	5	18	27	0.8	1.5
5.5	7.5	25	37.5	0.5	1.2
7.5	10	35	52.5	0.4	0.8
11	15	45	67.5	0.3	0.7
15	20	55	82.5	0.25	0.5
18.5	25	80	120	0.2	0.4
22	30	100	150	0.15	0.3
30	40	130	195	0.1	0.2
37	50	160	240	0.075	0.15
45	60	200	300	0.055	0.110
55	75	250	375	0.090	0.150
75	100	320	480	0.040	0.075

460V, 50/60Hz, 3-phase

kW	HP	Rated Amps of AC Reactor	Max. continuous Amps	Inductance (mh)	
				3% impedance	5% impedance
0.75	1	4	6	9	12
1.5	2	4	6	6.5	9
2.2	3	8	12	5	7.5
3.7	5	12	18	2.5	4.2
5.5	7.5	18	27	1.5	2.5
7.5	10	18	27	1.5	2.5
11	15	25	37.5	1.2	2
15	20	35	52.5	0.8	1.2
18.5	25	45	67.5	0.7	1.2
22	30	45	67.5	0.7	1.2
30	40	80	120	0.4	0.7
37	50	80	120	0.4	0.7
45	60	100	150	0.3	0.45
55	75	130	195	0.2	0.3
75	100	160	240	0.15	0.23
90	125	200	300	0.110	0.185
110	150	250	375	0.090	0.150
132	175	320	480	0.075	0.125
160	215	400	600	0.03	0.06
185	250	400	600	0.03	0.06
220	300	500	750	0.025	0.05
280	375	600	900	0.02	0.04

CP2000

230V, 50/60Hz, 3-phase

kW	HP	Rated Amps of AC Reactor	Max. continuous Amps	Inductance (mh)	
				3% impedance	5% impedance
0.75	1	5	10	2.113	3.522
1.5	2	7.5	15	1.409	2.348
2.2	3	10	20	1.057	1.761
3.7	5	15	30	0.704	1.174
5.5	7.5	21	42	0.503	0.839
7.5	10	31	62	0.341	0.568
11	15	46	92	0.230	0.383
15	20	61	122	0.173	0.289
18.5	25	75	150	0.141	0.235
22	30	90	180	0.117	0.196
30	40	105	210	0.101	0.168
37	50	146	292	0.072	0.121
45	60	180	360	0.059	0.098
55	75	215	430	0.049	0.082
75	100	276	552	0.038	0.064
90	125	322	644	0.033	0.055

460V, 50/60Hz, 3-phase

kW	HP	Rated Amps of AC Reactor	Max. continuous Amps	Inductance (mh)	
				3% impedance	5% impedance
0.75	1	3	6	7.045	11.741
1.5	2	3.7	7.4	5.712	9.520
2.2	3	5	10	4.227	7.045
3.7	5	7.5	15	2.818	4.697
4	5	10.5	21	2.013	3.355
5.5	7.5	12	24	1.761	2.935
7.5	10	14	28	1.510	2.516
11	15	22.5	45	0.939	1.566
15	20	30	60	0.704	1.174
18.5	25	36	72	0.587	0.978
22	30	45	90	0.470	0.783
30	40	56	112	0.377	0.629
37	50	72	144	0.294	0.489
45	60	91	182	0.232	0.387
55	75	110	220	0.192	0.320
75	100	144	288	0.147	0.245
90	125	180	360	0.117	0.196
110	150	220	440	0.096	0.160
132	175	246	492	0.086	0.143
160	215	310	620	0.068	0.114
185	250	343	686	0.062	0.103
220	300	460	920	0.046	0.077
280	375	530	1060	0.040	0.066
315	425	616	1232	0.034	0.057
355	475	683	1366	0.031	0.052
400	536	770	1540	0.027	0.046

C200

230V, 50/60Hz, 1-phase

kW	HP	Rated Amps of AC Reactor	Max. continuous Amps	Inductance (mh) 3~5% impedance
0.37	0.5	5	7.5	3
0.75	1	8	12	1.5
1.5	2	12	18	1.25
2.2	3	18	27	0.8

230V, 50/60Hz, 3-phase

kW	HP	Rated Amps of AC Reactor	Max. continuous Amps	Inductance (mh)	
				3% impedance	5% impedance
0.37	0.5	4	6	6.5	9
0.75	1	8	12	3	5
1.5	2	8	12	1.5	3
2.2	3	12	18	1.25	2.5
3.7	5	18	27	0.8	1.5

460V, 50/60Hz, 3-phase

kW	HP	Rated Amps of AC Reactor	Max. continuous Amps	Inductance (mh)	
				3% impedance	5% impedance
0.75	1	4	6	9	12
1.5	2	4	6	6.5	9
2.2	3	8	12	5	7.5
3.7	5	12	18	2.5	4.2
4	5	12	18	2.5	4.2
5.5	7.5	18	27	1.5	2.5
7.5	10	18	27	1.5	2.5

Chapter_13: Common DC Bus, recommend DC reactor spec. as below table

C2000

230V DC Choke

Input Voltage	kW	HP	DC Amps	Inductance (mh)
230Vac 50/60Hz 3-Phase	0.75	1	9.4	3.43
	1.5	2	18	1.83
	2.2	3	24	1.37
	3.7	5	30	1.1
	5.5	7.5	42	0.78
	7.5	10	53	0.61
	11	15	76	0.42
	15	20	106	0.31
	18.5	25	122	0.26
	22	30	145	0.22

460V DC Choke

Input Voltage	kW	HP	DC Amps	Inductance (mh)
460Vac 50/60Hz 3-Phase	0.75	1	6	9.77
	1.5	2	9	7.12
	2.2	3	13	4.83
	3.7	5	23	2.7
	5.5	7.5	25	2.47
	7.5	10	30	2.1
	11	15	38	1.62
	15	20	52	1.2
	18.5	25	60	1.05
	22	30	70	0.89
	30	40	93	0.67

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230V DC Choke

Input Voltage	kW	HP	DC Amps	Inductance (mh)
230Vac 50/60Hz 3-Phase	0.75	1	9.4	3.43
	1.5	2	18	1.83
	2.2	3	24	1.37
	3.7	5	30	1.1
	5.5	7.5	42	0.78
	7.5	10	53	0.61
	11	15	76	0.42
	15	20	106	0.31
	18.5	25	122	0.26
	22	30	145	0.22

460V DC Choke

Input Voltage	kW	HP	DC Amps	Inductance (mh)
460Vac 50/60Hz 3-Phase	0.75	1	6	9.77
	1.5	2	9	7.12
	2.2	3	13	4.83
	3.7	5	23	2.7
	5.5	7.5	25	2.47
	7.5	10	30	2.1
	11	15	38	1.62
	15	20	52	1.2
	18.5	25	60	1.05
	22	30	70	0.89
	30	40	93	0.67

CP2000

230V DC Reactor (Choke)

Input Voltage	kW	HP	Nominal Amperes (rms)	Max. continuous amperes (rms)	Inductance (mh)
230Vac 50/60Hz 3-Phase	0.75	1	5.65	11.3	3.660
	1.5	2	8.475	16.95	2.440
	2.2	3	11.3	22.6	1.830
	3.7	5	16.95	33.9	1.220
	5.5	7.5	23.73	47.46	0.872
	7.5	10	35.03	70.06	0.590
	11	15	51.98	103.96	0.398
	15	20	68.93	137.86	0.300
	18.5	25	84.75	169.5	0.244
	22	30	101.7	203.4	0.203
	30	40	118.65	237.3	0.174

460V DC Choke

Input Voltage	kW	HP	Nominal Amperes (rms)	Max. continuous amperes (rms)	Inductance (mh)
460Vac 50/60Hz 3-Phase	0.75	1	3.39	6.78	12.202
	1.5	2	4.181	8.362	9.893
	2.2	3	5.65	11.3	7.321
	3.7	5	8.475	16.95	4.881
	4	5	11.865	23.73	3.486
	5.5	7.5	13.56	27.12	3.050
	7.5	10	15.82	31.64	2.615
	11	15	25.425	50.85	1.627
	15	20	33.9	67.8	1.220
	18.5	25	40.68	81.36	1.017
	22	30	50.85	101.7	0.813

C200

460V DC Choke

Input Voltage	kW	HP	DC Amps	Inductance (mh)
460Vac 50/60Hz 3-Phase	4	5.5	23	2.7
	5.5	7.5	25	2.47
	7.5	10	30	2.1

Chapter_14: VFD-C family capacitor, charge and discharge time**C2000****230V class**

Frame	Model name	Drive DC BUS capacitance (uF)	Max. Rectifier current	Max. charge current	Charge time (DC)ms	Charge time (AC)ms	Discharge time
Frame A	VFD007C23A	540	30	5.67	200	320	20s
	VFD015C23A	810	30	5.67	300	480	20s
	VFD022C23A	1680	30	5.67	605	920	20s
	VFD037C23A	2240	60	11.33	405	660	20s
Frame B	VFD055C23A	2240	50	8.5	268.8	415	21s
	VFD075C23A	3360	75	8.5	403.2	620	21s
	VFD110C23A	4920	100	8.5	590.4	905	21s
Frame C	VFD150C23A	5440	150	11.33	489.6	1270	26.7s
	VFD185C23A	6560	150	11.33	590.4	1270	26.7s
	VFD220C23A	8000	200	11.33	720	1270	26.7s
Frame D	VFD300C23A	10800	155	15.45	712.8	1007.9	21s
	VFD370C23A	13200	156	15.45	871.2	1231.88	21s
Frame E	VFD450C23A	15600	235	20.61	772.2	1091.89	46s
	VFD550C23A	18800	235	20.61	930.6	1315.87	46s
	VFD750C23A	21200	314	20.61	1049.4	1483.85	46s
Frame F	VFD900C23A	27200	470	34	816	1153.82	39s

460V class

Frame	Model name	Drive DC BUS capacitance (uF)	Max. Rectifier current	Max. charge current	Charge time (DC)ms	Charge time (AC)ms	Discharge time
Frame A	VFD007C43A/E	135	30	5.67	50	72	20s
	VFD015C43A/E	220	30	5.67	80	120	20s
	VFD022C43A/E	330	30	5.67	120	175	20s
	VFD037C43A/E	705	30	7.23	200	300	20s
	VFD040C43A/E	840	60	7.23	240	350	23s
	VFD055C43A/E	840	60	7.23	240	350	23s
Frame B	VFD075C43A/E	840	35	17	100.8	150	18s
	VFD110C43A/E	1020	50	17	122.4	180	18s
	VFD150C43A/E	1380	75	17	165.6	245	18s
Frame C	VFD185C43A/E	1680	75	15.11	226.8	524	37.4S
	VFD220C43A/E	2040	100	15.11	275.4	524	37.4S
	VFD300C43A/E	2760	150	15.11	372.6	524	37.4S
Frame D	VFD370C43A	2700	150/3	12.14	453.6	641.37	46s
	VFD450C43A	3300	200/3	12.14	554.4	783.92	46s
	VFD550C43A	3900	155	12.14	655.2	926.45	46s
	VFD750C43A	5300	156	18.23	593.07	838.6	46s
Frame E	VFD900C43A	6800	235	24.29	571.2	807.68	33s
	VFD1100C43A	8200	235	24.29	688.8	973.96	33s
Frame F	VFD1320C43A	8400	314	23.45	730.8	1033.35	36s
	VFD1600C43A	10200	360	28.33	734.4	1038.44	36s
Frame G	VFD1850C43A	13600	470	30.91	897.6	1269.21	55s
	VFD2200C43A	16400	628	37.78	885.6	1252.24	55s
Frame H	VFD2800C43A	16800	780	40	856.8	1211.52	
	VFD3150C43A	20400	780	48.57	856.8	1211.52	
	VFD3550C43A	24600	1260	56.67	885.6	1252.24	

CP2000**230V class**

Frame	Model name	Drive DC BUS capacitance (uF)	Max. Rectifier current	Max. charge current	Charge time (DC)ms	Charge time (AC)ms	Discharge time
Frame A	VFD007CP23A-21	540	30	5.67	200ms	320ms	20s
	VFD015CP23A-21	810	30	5.67	300ms	480ms	20s
	VFD022CP23A-21	810	30	5.67	300ms	480ms	20s
	VFD037CP23A-21	1680	30	5.67	605ms	920ms	20s
	VFD055CP23A-21	2240	60	11.33	405ms	660ms	20s
Frame B	VFD075CP23A-21	2240	50	8.5	268.8	415ms	21s
	VFD110CP23A-21	3360	75	8.5	403.2	620ms	21s
	VFD150CP23A-21	4920	100	8.5	590.4	905ms	21s
Frame C	VFD185CP23A-21	5440	150	11.33	489.60	692ms	26.7S
	VFD220CP23A-21	6560	150	11.33	590.40	835ms	26.7S
	VFD300CP23A-21	8000	200	11.33	720.00	1100ms	26.7S
Frame D	VFD370CP23A-00/21	10800	155	15.45	712.80	1007.90	21s
	VFD450PC23A-00/21	13200	156	15.45	871.20	1231.88	21s
Frame E	VFD550CP23A-00/21	15600	235	20.61	772.20	1091.89	46S
	VFD750CP23A-00/21	18800	235	20.61	930.60	1315.87	46S
	VFD900CP23A-00/21	21200	314	20.61	1049.40	1483.85	46S

460V class

Frame	Model name	Drive DC BUS capacitance (uF)	Max. Rectifier current	Max. charge current	Charge time (DC)ms	Charge time (AC)ms	Discharge time
Frame A	VFD007CP43A/4EA-21	135	30	5.67	50ms	72ms	20s
	VFD015CP43A/4EA-21	135	30	5.67	50ms	72ms	20s
	VFD022CP43A/4EA-21	220	30	5.67	80ms	120ms	20s
	VFD037CP43A/4EA-21	330	30	5.67	120ms	175ms	20s
	VFD040CP43A/4EA-21	705	30	7.23	200ms	300ms	20s
	VFD055CP43A/4EA-21	840	60	7.23	240ms	350ms	23s
	VFD075CP43A/4EA-21	705	60	7.23	200ms	300ms	20s
Frame B	VFD110CP43A/E-21	840	35	17	100.8	150ms	18s
	VFD150CP43A/E-21	1020	50	17	122.4	180ms	18s
	VFD185CP43A/E-21	1230	75	17	147.6	245ms	18s
Frame C	VFD220CP43A/E-21	1680	75	15.11	226.80	321ms	37.4S
	VFD300CP43A/E-21	2040	100	15.11	275.40	390ms	37.4S
	VFD370CP43A/E-21	2460	150	15.11	332.10	470ms	37.4S
Frame D	VFD450CP43A-00/21	2700	150	12.14	453.60	641.39	46s
	VFD550CP43A-00/21	3300	200	12.14	554.40	783.92	46s
	VFD750CP43A-00/21	3900	156	12.14	655.20	926.45	46s
	VFD900CP43A-00/21)	5300	156	18.23	593.07	838.60	46s
Frame E	VFD1100CP43A-00/21	6800	235	24.29	571.20	807.68	33S
	VFD1320CP43A-00/21	8200	235	24.29	688.80	973.96	33S
Frame F	VFD1600CP43A-00/21	8400	314	23.45	730.80	1033.35	36S
	VFD1850CP43A-00/21	10200	360	28.33	734.40	1038.44	36S
Frame G	VFD2200CP43A-00/21	13600	470	30.91	897.60	1269.21	55s
	VFD2800CP43A-00/21	16400	628	37.78	885.60	1252.24	55s
Frame H	VFD3150CP43A/C-00/21	16800	780	40.00	856.80	1211.52	
	VFD3550CP43A/C-00/21	20400	780	48.57	856.80	1211.52	
	VFD4000CP43A/C-00/21	24600	1260	56.67	885.60	1252.24	
Frame D0	VFD450CP43S - 00 / 21	2200	150	12.14	369.60	522.61	
	VFD550CP43S- 00 / 21	2700	200	12.14	453.60	641.39	

CH2000**230V class**

Frame	Model name	Drive DC BUS capacitance (uF)	Max. Rectifier current	Max. charge current	Charge time (DC)ms	Charge time (AC)ms	Discharge time
Frame A	VFD007CH23A-21	540	30	5.67	200ms	320ms	20s
	VFD015CH23A-21	810	30	5.67	300ms	480ms	20s
	VFD022CH23A-21	1680	30	5.67	605ms	920ms	20s
	VFD037CH23A-21	2240	60	11.33	405ms	660ms	20s
Frame B	VFD055CH23A-21	2240	75	8.5	268.8	415ms	21s
	VFD075CH23A-21	3360	100	8.5	403.2	620ms	21s
	VFD110CH23A-21	4920	150	8.5	590.4	905ms	21s
Frame C	VFD150CH23A-21	5440	200	11.33	489.60	692ms	26.7S
	VFD185CH23A-21	6560	200	11.33	590.40	835ms	26.7S
Frame D	VFD220CH23A-00/21	10800	155	15.45	712.80	1007.90	21s
	VFD300CH23A-00/21	10800	155	15.45	712.80	1007.90	21s
	VFD370CH23A-00/21	13200	156	15.45	871.20	1231.88	21s
Frame E	VFD450CH23A-00/21	15600	235	20.61	772.20	1091.89	46S
	VFD550CH23A-00/21	18800	235	20.61	930.60	1315.87	46S
Frame F	VFD750CH23A-00/21	27200	470	34.00	816.00	1153.82	39S

460V class

Frame	Model name	Drive DC BUS capacitance (uF)	Max. Rectifier current	Max. charge current	Charge time (DC)ms	Charge time (AC)ms	Discharge time
Frame A	VFD007CH43A/4EA-21	135	30	5.67	50ms	72ms	20s
	VFD015CH43A/4EA-21	220	30	5.67	80ms	120ms	20s
	VFD022CH43A/4EA-21	330	30	5.67	120ms	175ms	20s
	VFD037CH43A/4EA-21	705	30	7.23	200ms	300ms	20s
	VFD055CH43A/4EA-21	840	60	7.23	240ms	350ms	23s
Frame B	VFD075CH43A/E-21	840	50	17	100.8	150ms	18s
	VFD110CH43A/E-21	1020	75	17	122.4	180ms	18s
	VFD150CH43A/E-21	1380	100	17	165.6	245ms	18s
Frame C	VFD185CH43A/E-21	1680	150	15.11	226.80	321ms	37.4S
	VFD220CH43A/E-21	2040	150	15.11	275.40	390ms	37.4S
	VFD300CH43A/E-21	2760	150	15.11	372.60	527ms	37.4S
Frame D	VFD370CH43A-00/21	2700	150	12.14	453.60	641.39	46s
	VFD450CH43A-00/21	3300	200	12.14	554.40	783.92	46s
	VFD550CH43A-00/21	3900	156	12.14	655.20	926.45	46s
	VFD750CH43A-00/21	5300	156	18.23	593.07	838.60	46s
Frame E	VFD900CH43A-00/21	6800	235	24.29	571.20	807.68	33S
	VFD1100CH43A-00/21	8200	235	24.29	688.80	973.96	33S
Frame F	VFD1320CH43A-00/21	8400	314	23.45	730.80	1033.35	36S
Frame G	VFD1600CH43A-00/21	11200	470	30.91	739.20	1045.23	55s
	VFD1850CH43A-00/21	13600	470	30.91	897.60	1269.21	55s
	VFD2200CH43A-00/21	16400	628	37.78	885.60	1252.24	55s
Frame H	VFD2800CH43A-00/21	16800	780	40.00	856.80	1211.52	
Frame D0	VFD370CH43S - 00 / 21	2200	150	12.14	369.60	522.61	

C200**230V class**

Frame	Model name	Drive DC BUS capacitance (uF)	Max. Rectifier current	Max. charge current	Charge time (DC)ms	Charge time (AC)ms	Discharge time
Frame A0 1~ phase	VFD004CB21A-20	660	30	7.23	200ms	416ms	25s
	VFD007CB21A-20	1080	30	7.23	300ms	690ms	25s
	VFD015CB21A-20	1880	30	5.66	605ms	1500ms	25s
	VFD022CB21A-20	2240	50	5.66	405ms	1800ms	25s
Frame A0 3~ phase	VFD004CB23A-20	300	30	2.83	50ms	170ms	25s
	VFD007CB23A-00/-21/-21M	440	30	2.83	80ms	250ms	25s
	VFD015CB23A-00/-21/-21M	720	30	2.83	120ms	410ms	25s
	VFD022CB23A-00/-21/-21M	1080	30	5.66	200ms	300ms	25s
	VFD037CB23A-00/-21/-21M	1880	60	5.66	240ms	525ms	25s

460V class

Frame	Model name	Drive DC BUS capacitance (uF)	Max. Rectifier current	Max. charge current	Charge time (DC)ms	Charge time (AC)ms	Discharge time
Frame A0	VFD007CB43A-00/-21/-21M	135	30	5.67	240ms	72ms	25s
	VFD015CB43A-00/-21/-21M	180	30	5.67	64.8	96ms	25s
	VFD022CB43A-00/-21/-21M	270	30	7.23	76.14	113ms	25s
	VFD037CB43A-00/-21/-21M	470	30	7.23	132.54	195ms	25s
Frame A	VFD040CB43A-00/-21/-21M	495	60	7.23	139.59	205ms	25s
	VFD055CB43A-00/-21/-21M	585	60	7.23	164.97	243ms	25s
	VFD075CB43A-00/-21/-21M	1020	60	7.23	287.64	425ms	25s