CHYN RONG
MACHINERY

Servo Power Saving System

Precise Hydraulic Power System

MANUAL

ENERGY SAVING • POWER SAVING • NEW REVOLUTION

▶ 勤謹慎求 榮耀所成

CHYN RONG Interduction

Energy Saving | Power Saving | New Revolution

■本公司創立於1988年，致力於省力化、自動化機械、液壓迴路及零件之開發、油壓裝置、油路板、邏輯零件邏輯系統及特殊弁門之設計製造，多年來對客戶秉持著『產業要升級、迴路要改造』的信念，對產品品質的要求及客戶服務的精神從不懈怠，也因此在業界贏得良好的口碑，現為符合客戶需求與因應節能的趨勢增加伺服節能系統業務，提供給客戶更全面更完整的服務。

CHYN RONG was located in 1988, concentrates on energy-saving automatic machine, hydraulic circuit & parts development, oil hydraulic equipment, manifold, logic parts and special design and manufacture. These years, it has been bearing the idea---business upgrade and circuit product improvement, never slacks off in product quality and customer service. Thus, it has well established reputation among the industries.

■為了使客戶得到妥善的服務及優良產品，在1996年在大陸中山成立了「中勤機械有限公司」，提供業界在大陸的需求，同時也經由大陸的行銷，將本公司的經營方向朝多元化、國際化進行，以提昇本身的競爭力，提高油壓產品的品質。

To offer well-arranged service and excellent products, the company established Chung Chyn Machine in chung shan, China to serve the Taiwan industries there. Meanwhile, it is diversification-oriented for better competitive capability and oil hydraulic production by taking china as first stride to global market.

Flow Intergration•High Efficiency Produce

The company runs consistent operation from order acceptance, production to lead time under ISO 9001 standard process for the assurance that all products conform to requirements for quality during every step of production.

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◎upgrade Power Saving System

■ As energy cost is increasing everywhere in the world, energy-saving products are drawing more attention of people than ever. No matter in sectors of high-technological or manufacturing industries, many products are representing this trend to display relationship with the concept of energy-saving, which reflects the importance of energy-saving industry and the impact on enterprises that could not follow this trend. In view of this, our company is offering not only hydraulic profession but integrating servo-driven energy-saving system, in order to provide customers with more comprehensive and extensive service and so promote competitiveness of their products.

◎Eight major reasons for using servo-driven energy-saving system

■ Following the market trend to promote order rate of your company.

■ Reducing energy consumption under various conditions by 30% to 70%.

■ Reducing temperature rise of hydraulic oil and extending its usage life.

■ Reducing noise and improving quality of working environment.

■ Performing stable efficacy and ensuring required rate of accepted products.

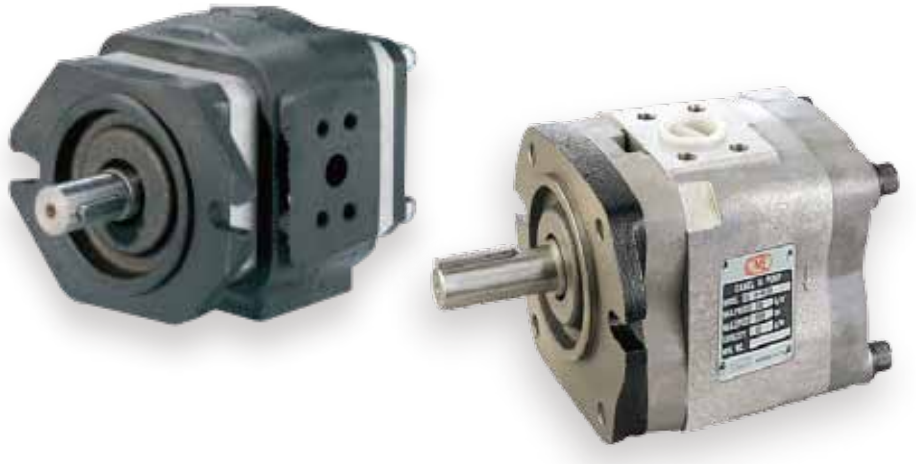
■ Providing rapid responsiveness and ensuring required rate of operational efficiency.

■ Promoting competitiveness of products.

■ Requiring slight change in design and presenting easiness in system induction.

Product introduction

◎High Pressure Inside Gearing Gear Pump



- High pressure up to 300 kgf/cm2.
- Very quiet, meeting requirement of low-voice working environment.
- Low pulse, running smoothly.
- Compensating radial and axial direction pressure, ultra-high efficiency.
- Excellent absorbing ability, having wide range in viscosity of actuating oil.
- Having wide range of flow, from 3.5cc to 125cc in a single pump.
- Could be used as a multi-connecting pump, applying to a multiple loop.
- Applicable when a Eckerle's high-pressure internal gear pump from Germany is chosen as an accessory.

◎High Efficiency Servo Motor

Characteristics：

- Frame body–precise and compact structural design promotes motor's precision and extends its life.
- Dynamic balance–all production processes and workpieces are subject to dynamic balance analysis and calibration.
- Precise bearing–all bearing used belongs to precise level, with which the motor has long life even in high-speed operation.
- Cooling system–with this independent cooling system, the motor has excellent cooling performance in high- or low-speed operation.
- High-liability encoder–clad with protective casing to prevent signal from being interfered, so to enhance reliability of closed-loop control.

Characteristics:

- In a setting above base frequency, it maintains fixed horsepower output in high-speed operation and has characteristic of wide-area specific power output.
- In a setting under base frequency, it maintains very stable linear magnetic field in low-speed operation to keep fixed cogging torque output.
- With special winding design and insolating level, the drive does not damage the coil insulation during serving control of carrier wave.
- With advanced silicon steel blade, the motor maintains excellent serving characteristics of linear control within its operational range.
- With special magnetic path design and magnetic field analysis, the motor does not occur a phenomenon of magnetic field saturation within its operation range, through which serving characteristics of the motor is largely promoted and damage to the motor and the drive caused by surge current is reduced.
- By using advanced precision technology as design norm, the servo-motor is equipped with very high power-volume ratio.
- With excellent design in inertia moment of rotation, the motor displays characteristic of high responsiveness when it is running rigid taping.
- With precise design of slot-formed rotor, the motor moves fast and smoothly during locating control, no throbbing occurs due to occurrence of surge magnetic field.

◎Variable frequency drive of current vector

High-efficacy universal variable frequency drive of current vector applies technology of current vector and advanced modern control theory to generate even larger cogging torque for electric machine when it is running in low speed, in order to realize high-efficacy dynamic control. As four control modes are available, it can also start with 1% of low speed to realize high cogging torque and failure-free operation when it operates without using PG for vector control. When PG control is used, it easily realizes high cogging torque operation at zero speed. It is truly ideal for you to improve quality and promote production efficiency.

Characteristics:

- Perfect control on current vector–by simultaneously controlling current and phase of the electric machine to respectively control current of the magnetic field and the torque, smooth operation at very low-speed operation, control of speed and torque with high torque and high precision are realized.
- Profuse control functions–such as slip compensation, speed search, detection of over/low cogging torque, energy-saving control.
- Outstanding characteristics of cogging torque–even under condition of no PG, it can present characteristic of cogging torque as high as 150%/0.5Hx.
- Powerful brake function–machines with 220V 30KW or over 380V 55KW can use externally mounted brake unit to perform powerful brake function.
- High-efficacy energy-saving control–incredible operational function in energy-saving to almost maximum of theoretical energy-saving efficacy.
- Low-noise operation–with modulation mode of high carrier frequency, noise is largely suppressed, which is especially suitable for location where noise restriction regulated.
- Comprehensive restriction policy for high sub-harmonics from the electric power–DC reactor for improvement of power factor is embedded in full series over 55KW, while models under 55KW have connecting terminals for DC reactor. By using DC reactor, interference of high sub-harmonics from the electric power is reduced.

STANDARD

Specification and dimensions of products

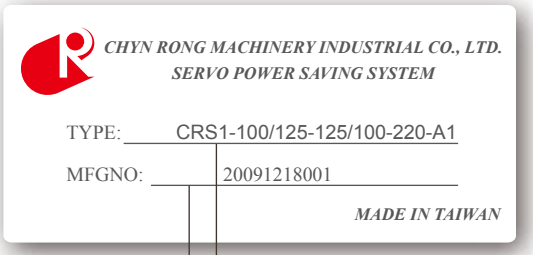
◎Specification and description of energy-saving system

Specification code ▼

CRS1-100/125-125/100-220-A1

- Vision number
- Voltage
- Displacement of the 2nd pump (cc/rev)
- Displacement of the 1st pump (cc/rev)
- Capacity of frequency converter (HP)
- Motor power (HP)
- System number

Product nameplate ▼



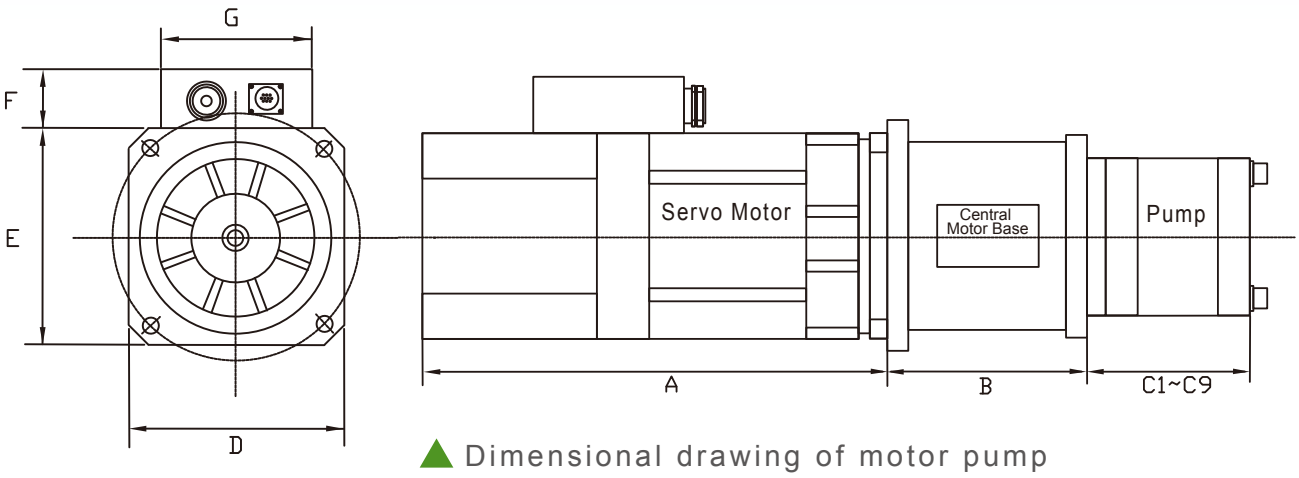
- Model number
- Manufacture date

Reference for selecting model parameters ▼

Model	L/min	kg/cm²
CRS1-15/20-32/XX-220-A1	73	140
CRS1-20/25-40/XX-220-A1	90	
CRS1-25/30-50/XX-220-A1	110	
CRS1-30/40-64/XX-220-A1	130	
CRS1-40/50-80/XX-220-A1	160	
CRS1-40/50-64/32-220-A1	180	
CRS1-50/60-100/XX-220-A1	200	
CRS1-50/60-64/50-220-A1	220	
CRS1-60/75-125/32-220-A1	282	
CRS1-75/100-125/64-220-A1	340	
CRS1-100/125-125/100-220-A1	405	

※ Selection of model is based on actual usage condition. For more details and operational instruction, please contact our Sales Department where you will receive our most sincere service.

◎Dimension of Motor Pump



▲ Dimensional drawing of motor pump

Motor specification	10 HP	15 HP	20 HP	25 HP	30 HP	40 HP	50 HP	60 HP	75 HP	100 HP
Motor length A	512	580	526	566	636	706	738	798	984.8	1074.8
Length of middle base B	180	180	230	230	230	230	230	230	240	240
(IG-4) C1	164	164	164	164	164	164	164	164	164	164
(IG-5) C2	208	208	208	208	208	208	208	208	208	208
(IG-6) C3	263.5	263.5	263.5	263.5	263.5	263.5	263.5	263.5	263.5	263.5
(IG-4/IG-4) C4	365	364	364	364	364	364	364	364	364	364
(IG-5/IG-4) C5	461	461	461	461	461	461	461	461	461	461
(IG-5/IG-5) C6	461	461	461	461	461	461	461	461	461	461
(IG-6/IG-4) C7	440	440	440	440	440	440	440	440	440	440
(IG-6/IG-5) C8	466	466	466	466	466	466	466	466	466	466
(IG-6/IG-6) C9	514	514	514	514	514	514	514	514	514	514
D	198	262	262	262	262	262	310	310	310	359
E	198	263	263	263	263	263	315	315	359	315
F	61	85	85	85	85	85	110	110	110	110
G	120	167	167	167	167	167	200	200	200	200

Unit：mm

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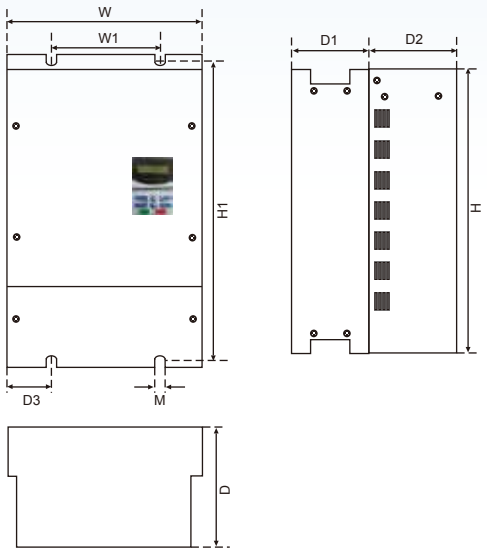
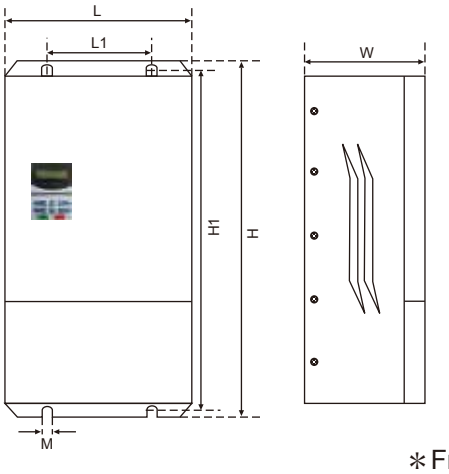
◎Dimensional drawing of frequency converter:

<Steel housing TK for 40HP and below> ▼



Voltage	Model	Horse power	H	H1	W	W1	D	D1	D2	D3	M
AC220V	0522	7.5HP	320	304	230	170	195	85	110	30	Ø7
	0722	10HP									
	1122	15HP									
AC440V	0544	7.5HP									
	0744	10HP									
	1144	15HP									
	1544	20HP									
AC220V	1522	20HP	470	454	260	200	246	116	130	30	Ø7
	1822	25HP									
	2222	30HP									
AC440V	1844	25HP									
	2244	30HP									
	3044	40HP									
AC220V	3022	40HP	500	484	330	230	300	100	200	50	Ø7

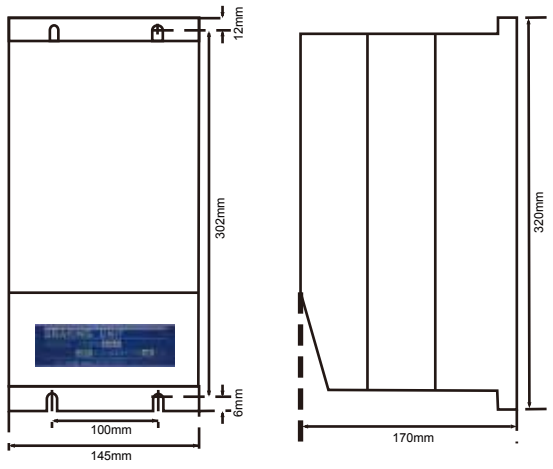
<Steel housing TK for 50HP and up> ▼



Voltage	Model	Horse power	H	H1	W	L	L1	M
AC220V	3722	50HP	705	683	320	407	240	Ø10
	4522	60HP						
	5522	75HP						
AC440V	5544	75HP						
	7544	100HP						
AC440V	3744	50HP	605	583	280	352	240	Ø8
	4544	60HP						
AC220V	7522	100HP	1002	975	325	525	350	Ø10
AC440V	9044	125HP						
	1104	150HP						

＊Frequency converter with 220V 40HP and above and 380V 75HV and above require externally mounted brake unit.

◎Dimensions of externally mounted brake unit:



Horse power	Voltage	Model
40HP	220V	CDBR-2030
50HP		CDBR-2037
60HP		CDBR-2045
75HP		CDBR-2055
100HP		CDBR-2075
120HP		CDBR-2090
75HP	440V	CDBR-4055
100HP		CDBR-4075
120HP		CDBR-4090

◎Specification and dimensions of reactor

External dimensions ▼

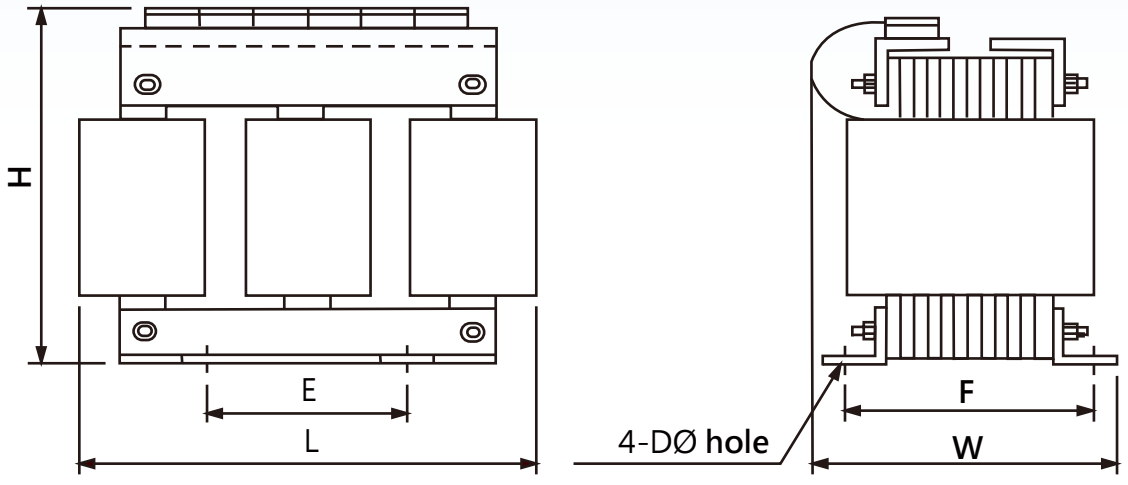


Table of dimensions of corresponding reactor in serial connection▼

House power	Voltage (V)	Dimensions						Approximate weight kg
		L	W	H	D	E	F	
10HP (7.5KW)	220	155	100	175	5	80	62	5.2
	440	155	100	140	5	80	62	5.2
15HP (11KW)	220	155	120	175	5	80	68	7.0
	440	155	120	140	5	80	68	7.0
20HP (15KW)	220	185	150	150	6	90	65	9.0
	440	185	120	210	6	90	65	9.0
25HP (18.5KW)	220	185	150	150	6	90	75	9.5
	440	185	120	210	6	90	75	9.5
30HP (22KW)	220	185	170	150	6	90	75	11
	440	185	130	210	6	90	75	11
40HP (30KW)	220	220	170	150	10	160	81	15
	440	220	160	210	10	160	81	15
50HP (37KW)	220	220	180	190	10	160	96	16
	440	220	165	190	10	160	96	16
60HP (45KW)	220	230	210	190	10	160	106	21
	440	230	185	190	10	160	106	21
75HP (55KW)	220	230	220	190	10	160	116	23
	440	230	195	190	10	135	115	29
100HP (75KW)	220	270	240	195	10	135	115	29
	440	270	220	195	10	135	115	29

◎Specification and dimensions of brake resistor

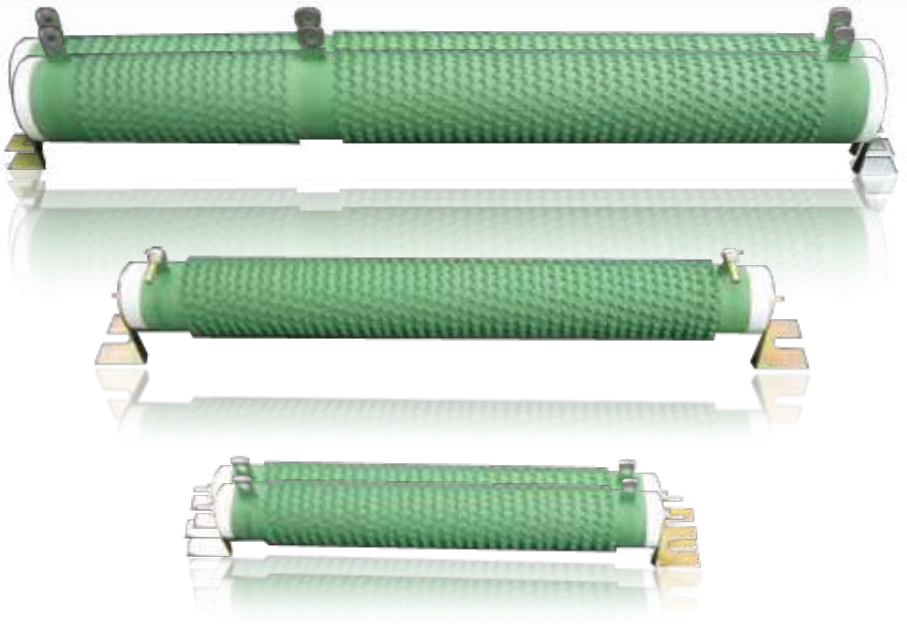


Table of corresponding specification of brake resistor ▼

Motor specification			Resistor specification	Quantity	Externally mounted brake unit
10HP	220V	(7.5KW)	1000W	1	No
15HP	220V	(11KW)	1200W	2	No
20HP	220V	(15KW)	1500W	2	No
25HP	220V	(18.5KW)	2400W	2	No
30HP	220V	(22KW)	2400W	2	No
40HP	220V	(30KW)	2000W	3	Standard
50HP	220V	(37KW)	2400W	4	Standard
60HP	220V	(45KW)	2400W	5	Standard
75HP	220V	(55KW)	2400W	6	Standard
100HP	220V	(75KW)	2400W	8	Standard
10HP	440V	(7.5KW)	1000W	1	No
15HP	440V	(11KW)	2000W	1	No
20HP	440V	(15KW)	2000W	1	No
25HP	440V	(18.5KW)	2400W	2	No
30HP	440V	(22KW)	2400W	2	No
40HP	440V	(30KW)	2000W	3	No
50HP	440V	(37KW)	2400W	4	No
60HP	440V	(45KW)	2400W	4	No
75HP	440V	(55KW)	2400W	5	Standard
100HP	440V	(75KW)	2400W	8	Standard

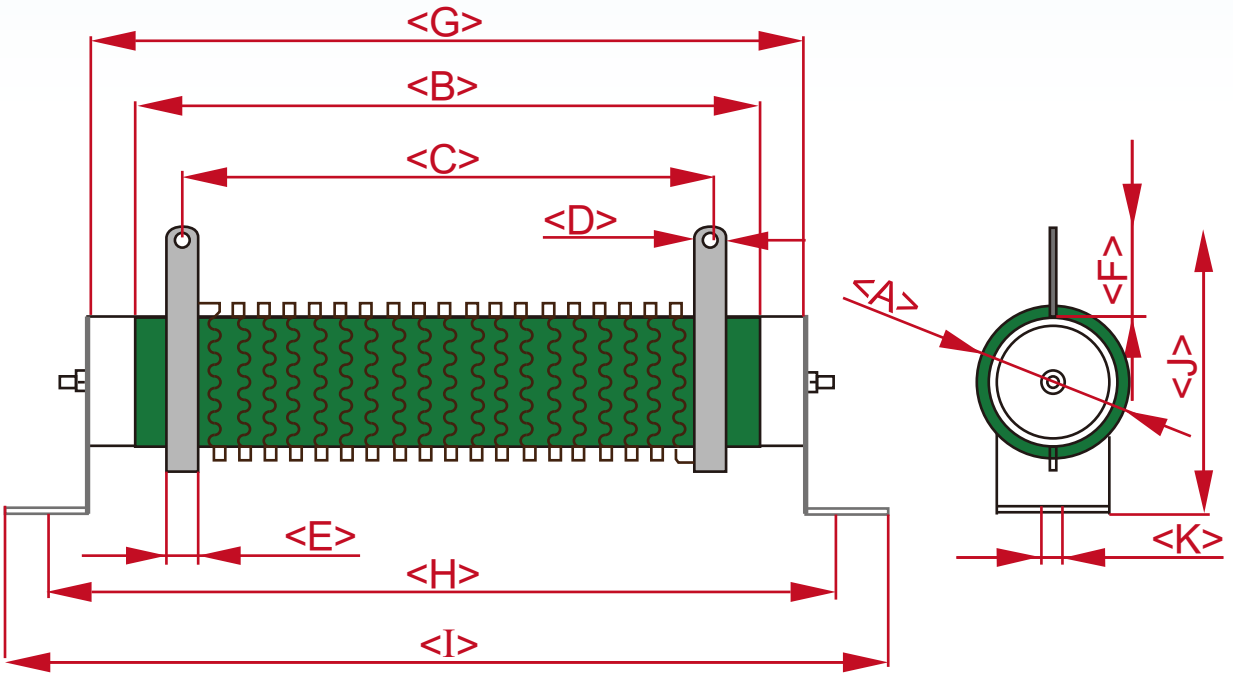


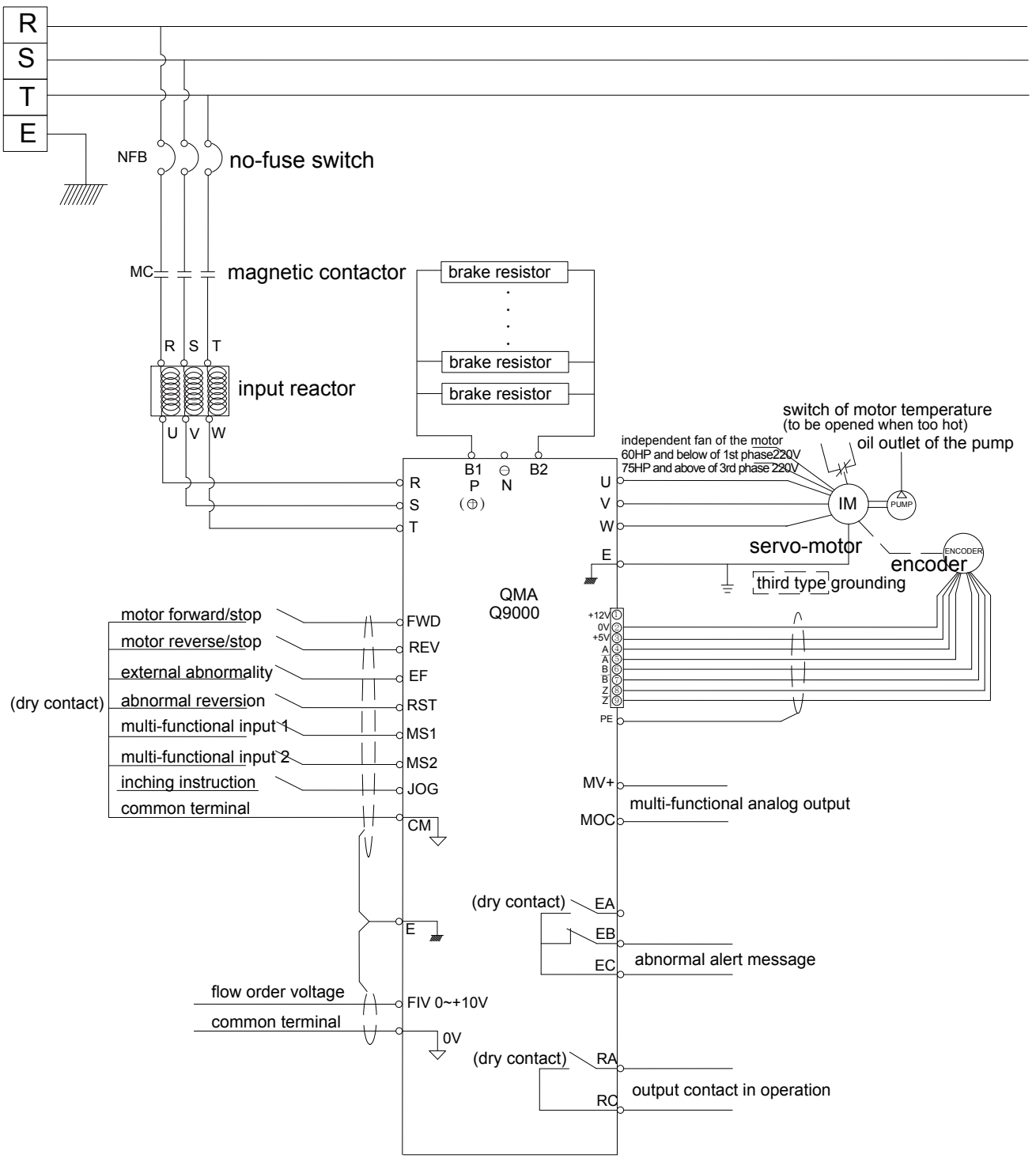
Table of dimensions of brake resistor

Model	A±1	B±2	C±2	D±0.1	E±0.2	F±1	G±2	H±2	I±2	J±2	K±0.1
QR-800W	50	330	298	6.4	12	25.5	346	367	400	99	10
QR-1000W	50	460	428	6.4	12	25.5	475	497	528	99	10
QR-1200W	60	460	420	6.4	15	28	480	502	533	112	10
QR-1500W	60	540	500	6.4	15	28	560	582	613	110	10
QR-2000W	60	650	615	6.4	15	31	672	696	725	125	10
QR-2400W											

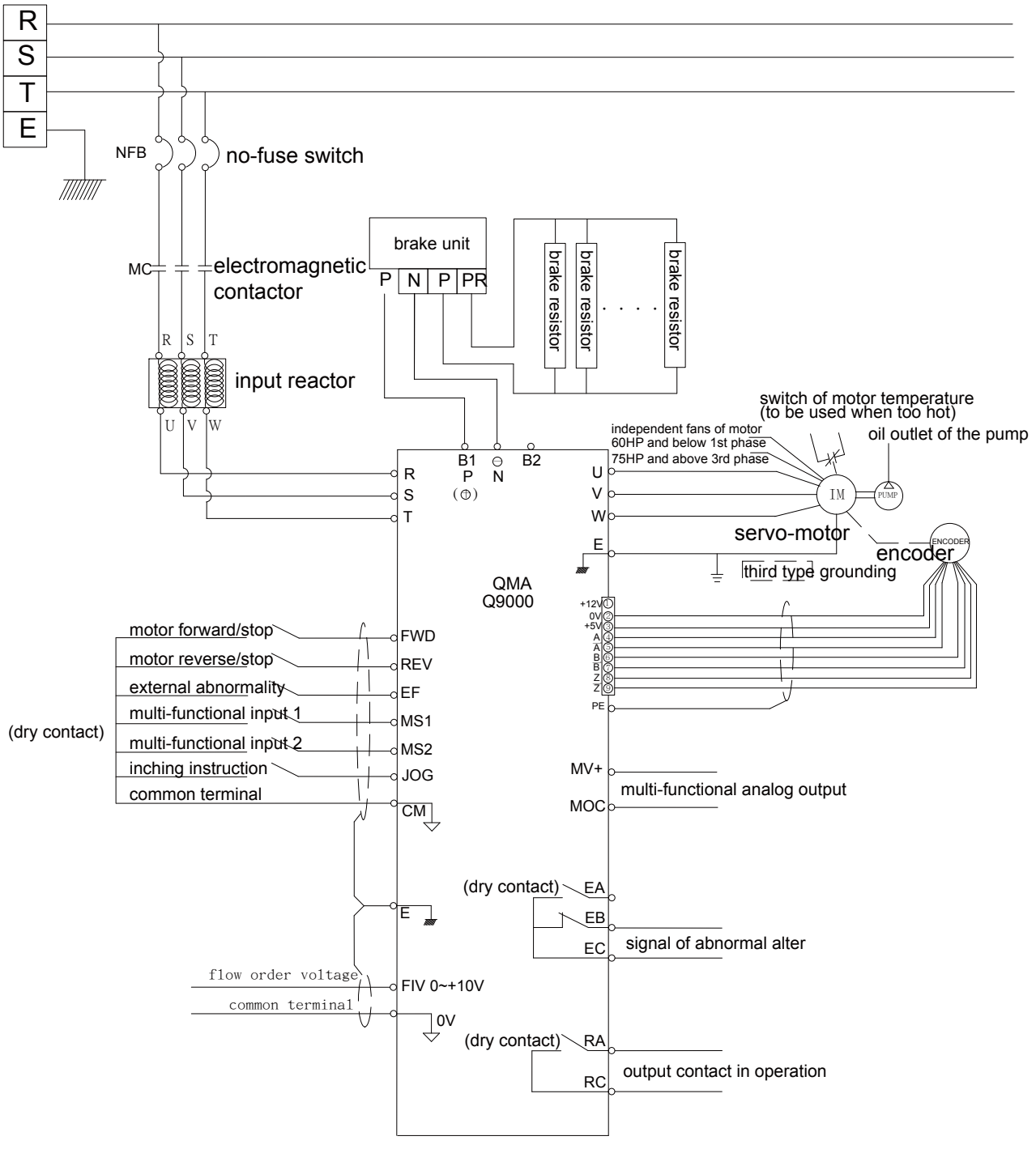
Wiring description

◎Wiring diagram of energy-saving system

Wiring diagram under QS9000 for brake unit not externally mounted



Wiring diagram under Q9000 for brake unit externally mounted



Notice for wiring:

1. Starting signal and abnormal output alert are dry contacts.
2. Motor fans are uni-directional 220V independent power.
3. Connecting mode is different between motors with and without externally mounted brake units, of which the one with externally mounted brake unit should be mounted by distinguishing polarity according to wiring diagram, or the frequency converter might be damaged.

Reference for wire diameter in wiring

Horse power (HP或KW)	Voltage (V)	Variable frequency driver Nominal current (A)	Motor capacity Nominal current (A)	Wire diameter of primary loop (mm2) Ambient temperature below 35℃ Wire resistant to temperature of 60℃.	Wire diameter for grounding (mm2)	Wire diameter of brake resistance (mm2) heat-resistant wire
5HP (3.75KW)	200	17.5	16.1	3.5	2	3.5
	440	8	9.2	3.5	2	2
7HP (5.5KW)	220	25	20.3	5.5	3.5	5.5
	440	14	11.72	5.5	2	2
10HP (7.5KW)	220	33	27.7	8	5.5	8or3.5*2
	440	18	15.9	3.5	3.5	3.5
15HP (11KW)	220	49	40.6	14	8	14or5.5*2
	440	27	23.4	5.5	5.5	5.5
20HP (15KW)	220	64	50.08	22	8	14or5.5*2
	440	34	28.9	8	8	5.5
25HP (18.5KW)	220	80	62.2	30	14	14or5.5*2
	440	41	35.9	14	8	8or3.5*2
30HP (22KW)	220	96	74	38	14	14or5.5*2
	440	48	42.7	14	8	8or3.5*2
40HP (30KW)	220	130	101	60	14	22or8*2
	440	65	58.3	30	14	14or5.5*2
50HP (37.5KW)	220	160	129.45	80	22	22or8*2
	440	80	74.7	38	14	14or5.5*2
60HP (45KW)	220	183	155.4	100	22	30or14*2
	440	96	89.7	50	14	14or5.5*2
75HP (55KW)	220	224	191.1	150	22	60or22*2
	440	128	110.3	80	22	22or8*2
100HP (75KW)	220	300	260.6	250	30	60or22*2
	440	165	150.4	100	22	230or14*2
120HP (90KW)	220	375	314	325	30	60or22*2
	440	183	181.3	150	22	30or14.*2

PS. (1) Data of wire diameters in this table is defined according to relative regulation for ambient temperature below 35℃; suitable wires should be properly chosen according to actual condition or requirement when ambient temperature is above 35℃.
(2) Standard for selecting a wire diameter is defined as 1.3 times of motor's nominal current, which can also be conducted by using frequency converter capacity*safety coefficient as a standard. Wire diameter is to be selected at your discretion.
(3) When using wires with large current flux, wire diameters can be variable according to current magnitude.
(4) For wiring of brake resistance, heat-resistant wires should be selected because brake resistance release heat, normal wire tends to be affected by high temperature, and the conducting wire extending from the brake resistance to the frequency converter or brake unit requires metal wave tube.
(5) The conducting wire from frequency U, V, and W to the terminal box of the motor requires metal wave tube.
(6) Wiring of primary loop includes wires between no-fuse switch, electromagnetic contactor, reactor, frequency converter, and motor.
(7) If the motor has a brake unit, the wire diameter between the frequency converter and the brake unit should be chosen based on the above table when wiring; when it is 14mm2 and above, the wire diameter must be at least one grade lower and must be heat-resistant wire; when 30mm2 and above of non-heat-resistant wire is used, it should be PVC wire.
(8) If the motor has not a brake unit, the wire diameter of 14mm2 and above must be at least one grade lower and must be heat-resistant; when 30mm2 and above of non-heat resistant wire is used, then it should be PVC wire.
(9) If the frequency converter is one grade higher, wire diameter of the primary loop should also be one grade higher; if the brake resistance is also higher grade, one higher grade of wire diameter should be used.

Processing of ground wire

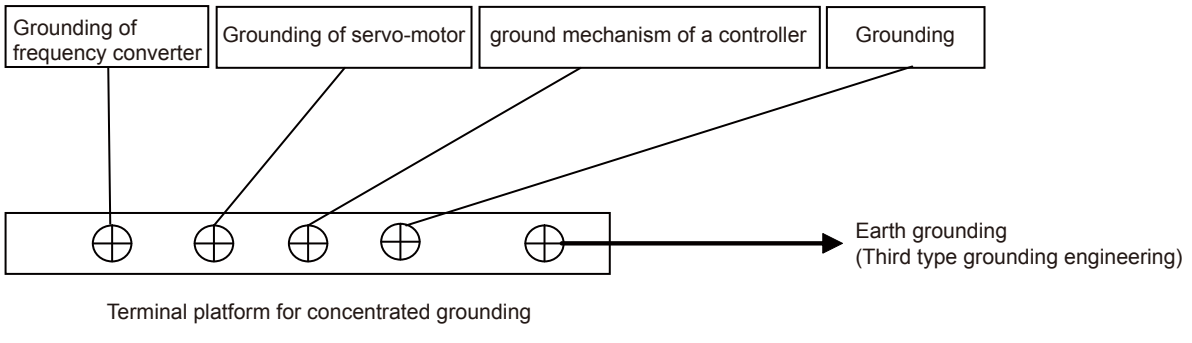
Notice for the third type grounding engineering

Type	applicable condition	Resistant value
.third type grounding	1.Grounding of electric equipment with low voltage. 2.Grounding of internal wire system. 3.Secondary grounding of the current-voltage ratio converter 4.Supports grounding of metal body of electric equipments using low voltage.	1.Voltage to ground below 150V~below 100Ω. 2.Voltage to ground below 151V to 300V~ below 50Ω. 3.Voltage to ground above 301V~below 10Ω.

Selecting standard for wire diameter in grounding

Nominal or setting of over-current protector	Size of grounding lead (mm2) (copper)
below 20A	2
below 30A	3.2
below 60A	5.5
below 100A	8
below 200A	14
below 400A	22
below 600A	38
below 800A	50
below 1000A	60

Illustration of standard grounding method



Resolution and notice for interference of variable frequency driver

- Proper earth ground is required, or interference between machines tends to occur.
- Engineering should be conducted according to standard grounding method, only through which good grounding effect can be yielded. Adverse effect tends to occur if grounding is not properly treated.
- Wire diameter should be selected according to the data required by the above table, poor conduction tends to occur if the grounding wire is too thin, and noise and leakage current can not be perfectly conducted to the ground.
- Prior to trial run in the plant, grounding should be well done to prevent abnormality caused by interference.

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