

Innovation
+ Advance

NEVER STOP IMPROVING

Contact Information of Agency

Shenzhen Inovance Technology Co., Ltd.
Add.: Building E, Hongwei Industry Park, Liuxian Road,
Baoheng No. 70 Zone, Bao'an District, Shenzhen
Tel: +86 755 2979 9595
Fax: +86 755 2961 9897
Technical Support: 400-777-1260
<http://www.inovance.cn>

Copyright © Shenzhen Inovance Co., Ltd. All Rights Reserved.

Inoflex

MD601 Modularized Engineering-type
Drive System



ABOUT INOVANCE



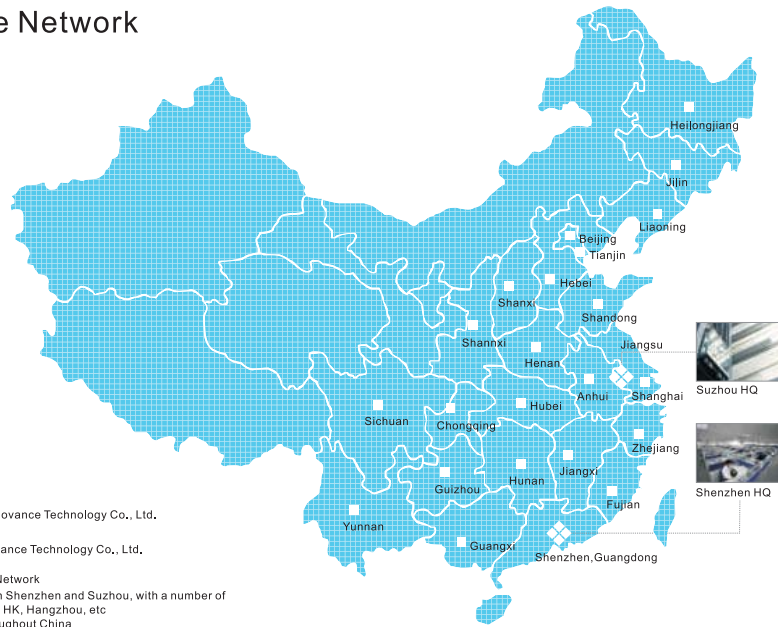
Suzhou Factory

Shenzhen Inovance Technology Co., Ltd. (Stock code: 300124) is a leading industrial automation product and solution provider, dedicated to R&D, manufacturing and sales of automation control products. Targeting at high-end equipment manufacturers, we are committed to achieving a win-win situation with customers based on our solid automation control technologies with IPRs. We have maintained a mature business model through which customized solutions have been constantly and rapidly delivered to customers.

Our offering provides low/mid-voltage AC drives, PLCs, HMIs, servo drives, motors, photoelectric encoders, integrated and special drives, and renewable energy products, etc. We are now taking up the largest market share in domestic low-voltage section and have obtained a leading position in various segmentation markets with our all-round integrated and special drives.

As a national high-tech enterprise, we have obtained 57 authorized patents till the end of year 2011, including 9 invention patents, 31 utility model patents, and 17 design patents. Besides, we have mastered various core platform technologies covering the fields of high-performance vector control inverter, PLC, servo, and PMSM. Attracting and cultivating talents is our constant pursuit. Till now, Inovance has already owned a large group of professional R&D experts dedicated to development of core platform technologies, application technologies and new products.

Service Network



Suzhou HQ

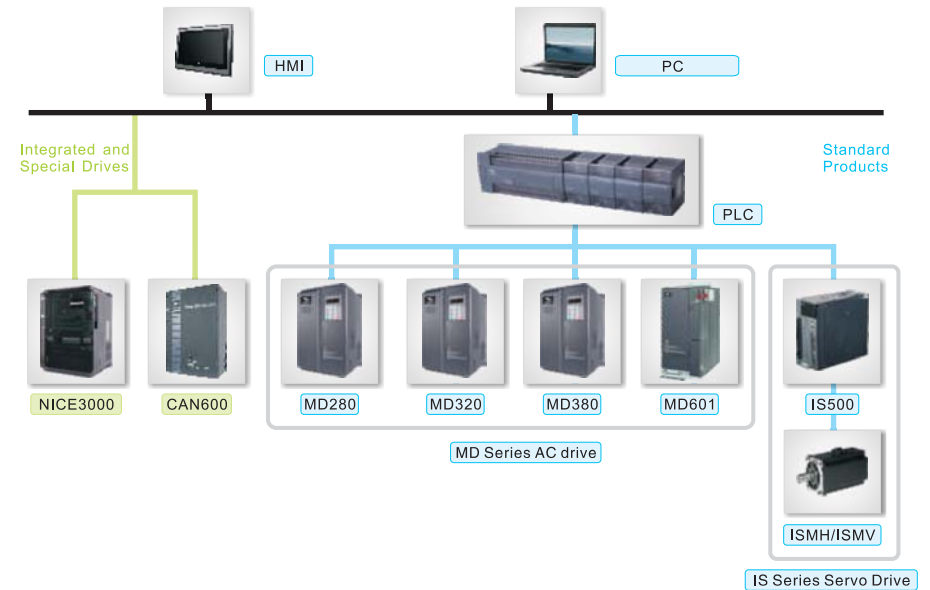
Shenzhen HQ

- ◆ Shenzhen: Shenzhen Inovance Technology Co., Ltd.
- ◆ Suzhou: Suzhou Inovance Technology Co., Ltd.

- HQ & Branch Network
- Headquarter in Shenzhen and Suzhou, with a number of subsidiaries in HK, Hangzhou, etc
- 41 offices throughout China
- Over 400 sales and service engineers
- 200 authenticated distributors
- 50 nationwide warranty centers
- 8 spare parts centers

Quickly respond to customer needs.

General Products and Solutions



MD Series Vector AC Drive

Performance	Series	Target Market	Appearance
<ol style="list-style-type: none"> Supporting 2-quadrant/4-quadrant operation modes 380V, 480V and 690V voltage levels Supporting paralleling of maximum 8 drawer-type modules through optical fiber Simultaneous use of industrial Ethernet, PROFIBUS-DP, CAN and Modbus-RTU Realizing load distribution among various drives through point to point communication Complete background monitoring functions: rapid oscilloscope function, real time update of function parameters, parameters recording 10s before error occurs, etc 	MD601 Max:2MW	Oil drilling rig Lifting equipment Paper making Metallurgy	
<ol style="list-style-type: none"> Powerful control of current vector; Rich options of expansion card options Powerful function with different kinds of field buses; Supporting asynchronous motor and synchronous motor simultaneously; Expanded PLC card: completely compatible with Hi series PLC 	Max:400kW MD380	CNC manufacturing center Printing and packaging Lifting equipment Textile	
Dedicated drive for tension control	Max:132kW MD330	Winding/unwinding tension control	
Dedicated drive for elevator control	 ME320L	Elevator control	
<ol style="list-style-type: none"> High performance Multiple control modes Rich functions Flexible expansion capability 	Max:900kW MD320 MD300	Cable EPS Metal Plastics machinery Steel cord Textile dyeing and printing Air compressor	

Inoflex MD601

Powerful Functions

- ⊕ Modularized rectifier, inverter and braking units;
- ⊕ Supporting a maximum of 8 power units connected in parallel; 380V, 480V, 690V voltage levels;
- ⊕ Supporting 2-quadrant/4-quadrant operation of the motor;
- ⊕ Supporting V/F, SVC and FVC control modes;
- ⊕ Supporting parallel connection of multiple drive systems, realizing the single-master multi-slave paralleling mode through point-to-point communication;
- ⊕ Supporting common DC bus application where a rectifier unit works with multiple inverter units;
- ⊕ Supporting thermal drop-out of faulty unit;
- ⊕ Supporting synchronous use of 4 communication functions:
- ⊕ Ethernet, PROFIBUS-DP, CAN and Modbus-RTU;
- ⊕ Supporting switchover among four motors;
- ⊕ Rich user resources (AIx4, AOx4, DIx15, DOx11, PGx2, PTCx3, motor temperature inspection);
- ⊕ Various functions designed especially for hoisting applications, including power-on logic control, braking control, pre-excitation, starting pre-torque compensation, overspeed protection, encoder disconnect protection, etc.



Perfect Performance

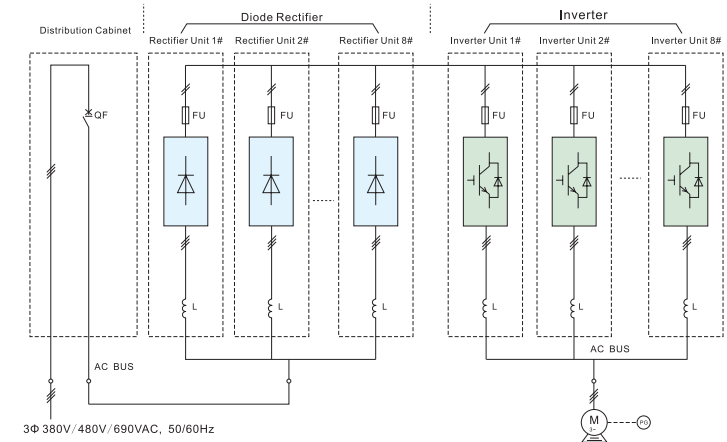
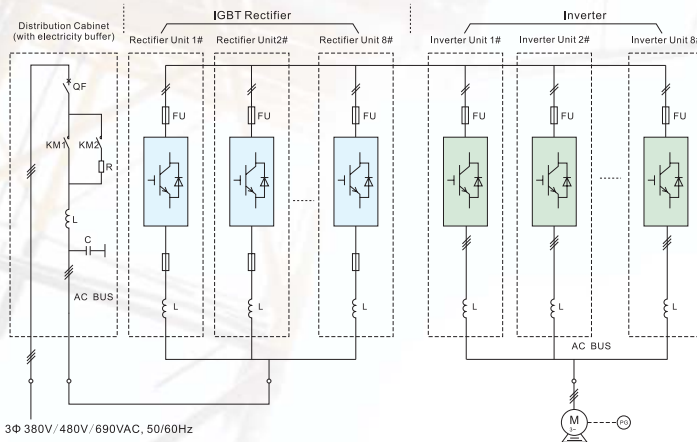
- ⊕ System's power factor in 4-quadrant operation: ± 0.99 ; grid-side current harmonics: $< 5\%$; IGBT rectifying bus voltage vibration: $< 2\%$
- ⊕ Supporting VC control modes, with a capacity of 200% torque output at zero velocity;
- ⊕ Excellent control of motor's weak magnetic, meeting field demand of wide speed range;
- ⊕ Supporting two torques balanced control mode: master speed control, slave torque control and master and slave speed control;
- ⊕ Uneven fluidity of power unit is less than 5%;
- ⊕ Uneven fluidity of paralleling system is less than 5%;
- ⊕ The noise in operation is below 80DB.

4-quadrant VF Drive System (IGBT Rectifier/Energy Feedback + Inverter)

4-quadrant VF Drive System

2-quadrant VF Drive System

2-quadrant VF System (Diode Rectifier+Inverter)



Inoflex MD601

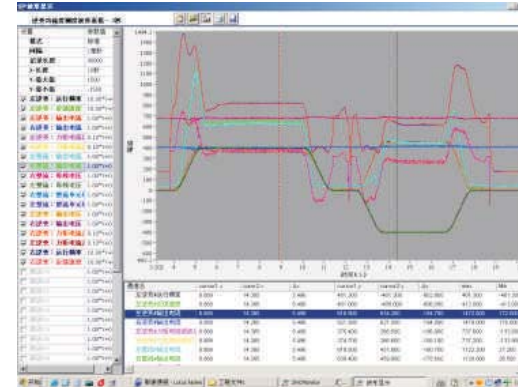
The MD601 modularized high power drive system offers a perfect solution for system engineering through flexible combination of modules. Power distribution, rectifier, inverter and energy feedback units can be combined flexibly to realize different applications, such as multi-pulse rectification, 4-quadrant operation, common DC bus, etc.

High Safety and Reliability

- ⊕ Improved anti-electromagnetic interference capability and system reliability through fiber-driven control;
- ⊕ All-round self-inspection and alarming mechanisms provides double protection for the security of the drive system;
- ⊕ Perfect fault protection function: The system is embedded with more than 50 error codes, which facilitates fast fault diagnosis and troubleshooting;
- ⊕ Complete background monitoring functions via industrial Ethernet: rapid oscilloscope function, parameters recording 10s before error occurs, real time update of function parameters, real time display of modular status, etc

Ease of Use and Maintenance

- ⊕ The system has the function of inquiring the record of multi-fault parameters;
- ⊕ The system has the function of changing and inquiring function code;
- ⊕ The system has the function of using background software to easily copy parameters;
- ⊕ Modularized power units with the design of drawer-like structure, easy for installation and dismantling;
- ⊕ The same structure appearance, mounting dimensions and hardware of IGBT rectification unit, inverter unit and braking unit facilitate maintenance and management.



▲Monitor software

名称	单位	范围	备注	地址	数据类型	读写
变频器频率	Hz	0.0000~150.0000		0x0000	浮点	读写
变频器速度	r/min	0.0000~1500.0000		0x0001	浮点	读写
变频器转矩	Nm	0.0000~1000.0000		0x0002	浮点	读写
变频器电流	A	0.0000~100.0000		0x0003	浮点	读写
变频器电压	V	0.0000~1000.0000		0x0004	浮点	读写
变频器功率	W	0.0000~100000.0000		0x0005	浮点	读写
变频器效率	%	0.0000~100.0000		0x0006	浮点	读写
变频器温度	°C	0.0000~100.0000		0x0007	浮点	读写
变频器故障	bit	0/1		0x0008	布尔	只读
变频器报警	bit	0/1		0x0009	布尔	只读
变频器运行	bit	0/1		0x000A	布尔	只读
变频器停止	bit	0/1		0x000B	布尔	只读
变频器故障清除	bit	0/1		0x000C	布尔	只写
变频器报警清除	bit	0/1		0x000D	布尔	只写
变频器运行清除	bit	0/1		0x000E	布尔	只写
变频器停止清除	bit	0/1		0x000F	布尔	只写

▲Monitor software

Complete Background Monitoring Function

- ⊕ Complete background monitoring functions shall be implemented via industrial Ethernet: high-speed data communication with the rectifier unit or inverter unit, rapid oscilloscope function, parameters recording 10s before error occurs, real-time update of function parameters, real time display of modular status, etc.

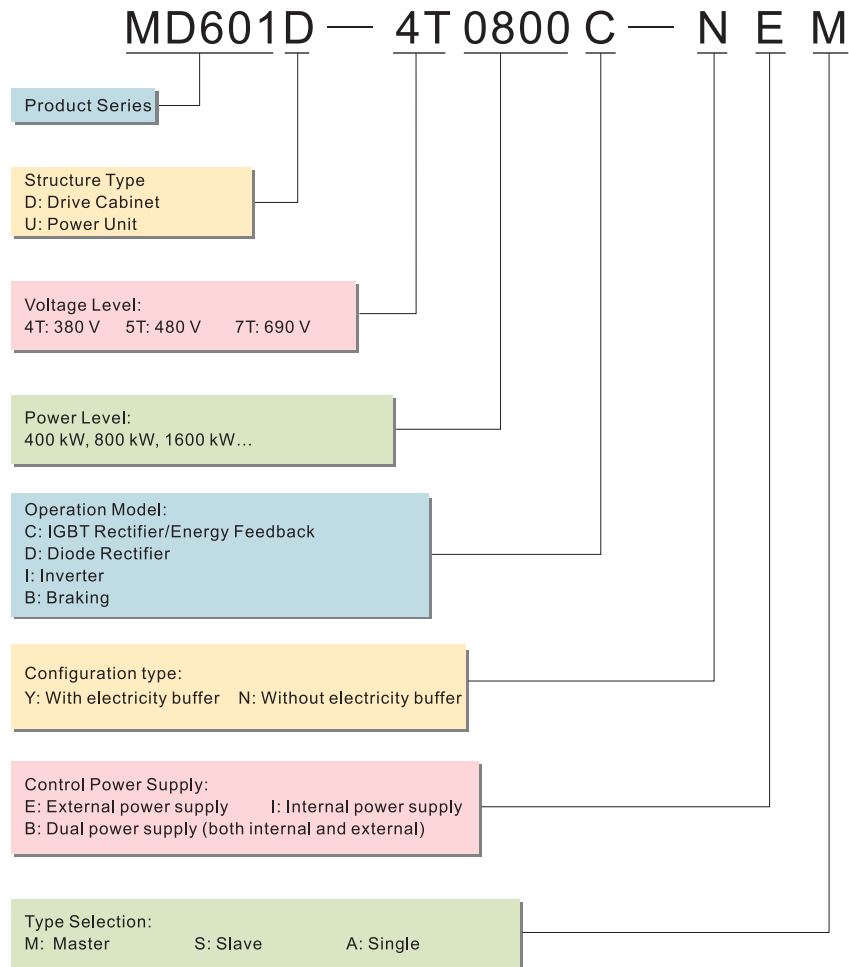
Not only the data (voltage, current, frequency, AI, AO, DI, DO, PID, motor operation, communication) wave of multiple systems in one network, but also the parameter information like current and temperature of each module shall be monitored at the same time. With the black box function, the parameter information can be stored 10 seconds before the fault occurrence through high-speed Ethernet's ceaseless wave tracking and recording.

Field Application

- ⊕ Quayside container crane, gantry crane, ship loader, ship unloader, dumper and other kinds of port machinery;
- ⊕ Large tonnage (40 tons and more) bridge crane, door crane and other kinds of hoisting machinery;
- ⊕ High power mine hoist;
- ⊕ High power multi-motor transmission rolling mill (steel industry);
- ⊕ Centrifugal casting machine, large punch and other metal processing machinery;
- ⊕ High power motor testing platform;
- ⊕ High power EPS offshore emergency power.



Naming Rules



Technical Specifications

Item		Specifications	
Diode Rectifier	Basic Function	Input Voltage	4T: 3-phase, 380-415 V, ±10% 5T: 3-phase, 380-500 V, ±10% 7T: 3-phase, 525-690 V, ±10%
		Input Frequency	48-63 Hz
		Capacity	4T: 400-1600 kW 5T: 500-2000 kW 7T: 600-2400 kW (extensible if required)
		Uneven Fluidity of Paralleling System	< 5%
		Overload Capacity	Normal load: 105% 1 hour, 120% 1 min Heavy load: 120% 1 hour, 150% 1 min
		Work Efficiency	> 99%
		Input Harmonic Current	6-pulse: < 30% 12-pulse: < 12%
		Overheat Protection	Supporting thermal dropout of faulty unit: normally closed contacts of thermal relay output at 80°C
		Short Protection	Fuse for short-circuit protection at DC-side
		IGBT Rectifier/Feedback	Basic Function
Input Frequency	48-63 Hz		
Output Voltage	4T: 600 V (550-710 VDC settable) 5T: 740 V (680-800 VDC settable) 7T: 1100 V (980-1200 VDC settable) When the output exceeds rated voltage, the drive needs to derate 1% every 10 V.		
Carrier Frequency	4T: 3.5K (default) 5T: 3.5K (default) 7T: 2.5K (default)		
Rate Factor	> ± 0.99		
Input Harmonic Current	< 5%		
Bus Voltage Control Precision	< ± 1%, suddenly applied/removed load < ± 5%		
Work Efficiency	> 97%		
Overload Capacity	Normal load: 105% 30 min, 120% 1 min, 130% 10 sec Heavy load: 120% 30 min, 150% 1 min, 180% 1 sec		
Paralleling Module Number	1-8		
Capacity	4T: 200-1600 kW 5T: 250-2000 kW 7T: 250-2000 kW (extensible if required)		
Uneven Fluidity of Paralleling System	< 5%		
IGBT Rectifier/Feedback	Personalized Function	Master-slave control function	Supporting parallel connection of multiple drive systems, realizing single-master multi-slave paralleling mode requiring no extension card
		Uncontrolled rectifier	Uncontrolled rectifier
		Optional Working Mode	Controlled rectifier, energy feedback to grid allowable Controlled rectifier, energy feedback to grid unallowable Energy feedback unit mode System paralleling slave mode
		Module Fault System	1. The module will exit automatically and the system will derate. 2. The system will stop.
		Optional Working Way	
		Analog Input	AIx4: 0-10 V/0-20 mA (selected via jumper), 12-bit resolution, calibration accuracy 0.5%
		Analog Output	A0x4: 0-10 V/0-20 mA (selected via jumper), 12-bit resolution, calibration accuracy 1%
		Digital Input	Normal DIx10: 930 V input, PNP/NPN mode decided by the user AC DIx4: 120-240 VAC input 1 high-speed input: PNP/NPN mode, input frequency < 100 kHz
		Digital Output	10 relay output: programmable normally open /normally closed contacts 1 high-speed output: output frequency < 100 kHz
		Keyboard Display	Standard configuration is with an external operation panel, which has 5 nixie tubes for LED display and 9 keys. HMI (H0U) is optional.
Inverter	Basic Performance	Communication/Bus	The standard configuration is with RS485 and CAN communication function. Ethernet adapter card: supporting Ethernet Protocol DP adapter card: supporting Profibus-DP
		Protection Function	Short to ground at power-on, drive overcurrent, drive overload, drive overvoltage, drive undervoltage, drive overheat, abnormal input voltage, communication fault, current detection fault, EEPROM read-write fault, input voltage too low, voltage deviation too large, power-on buffer fault, external fuse fault, external inductor overheat, module fan fault, parallel logic fault and fault during the process of power-on, When the input exceeds rated voltage, the inverter needs to derate 1% every 20 V.
		Input Voltage	4T: 550 V (550-710 VDC) 5T: 680 V (680-800 VDC) 7T: 980 V (980-1200 VDC)
		Output Voltage	4T: 0-380 VAC 5T: 0-480 VAC 7T: 0-690 VAC
		Output Frequency	V/F control: 0-300 Hz Vector control: 0-300 Hz
		Carrier Frequency	Default carrier frequency, 2 kHz, 1-6 kHz settable. Carrier frequency can be adjusted according to heatsink temperature. The inverter needs to derate when default value is exceeded.
		Input Frequency Resolution Ratio	Digital setting: 0,01 Hz Analog setting: max. frequency>0,025%
		Paralleling Module Number	1-8
		Capacity	4T: 200-1600 kW 5T: 250-2000 kW 7T: 250-2000 kW Extensible if required
		Uneven Fluidity of Paralleling System	< 5%
Work Efficiency	> 98%		
Motor Type and Control Way	3-phase asynchronous motor: V/F, SVC, FVC		
Speed Range	V/F: 1: 50 SVC: 1:200 FVC: 1:1000		
Speed Control Precision	V/F: ±1.0% SVC: ±0.5% FVC: ±0.05%		

Selection Guide of Drive System MD601

■ **4-Quadrant Operation System Type** 【Electric Cabinet (with electric buffer), IGBT Rectification/Energy Feedback, Inverter Cabinet】

Item		Specifications	
Inverter	Speed Fluctuation	SVC: ±0.5% FVC: ±0.2%	
	Torque Response	SVC: < 20 ms FVC: < 5 ms	
	Torque Control Mode	SVC, FVC	
	Starting Torque	0.5 Hz/150% (SVC), 0 Hz/200% (VC)	
	Overload Capacity	Normal load: 105% 30 min, 120% 1 min, 130% 10 sec Heavy load: 120% 30 min, 150% 1 min, 180% 1 sec	
	Torque Boost(V/F)	Automatic torque boost, manual torque boost 0.1%~30.0%	
	V/F Curve	6 types of curves: linear V/F, multipoint V/F, square V/F A, square V/F B, complete V/F separation, incomplete V/F separation	
	Acceleration-Deceleration Curve	Linear, S curve mode 1, S curve mode 2	
	Master-Slave Control Function	Supporting parallel connection of multiple drive systems, realizing single-master multi-slave paralleling mode requiring no extension card	
	Operation Command Channel	3 channels: operation panel, control terminal and serial communication port, which can be switched over in different modes	
	Source Frequency	10 frequency sources: digital setting, analog voltage/current setting, pulse setting, communication setting, PID, multi-speed, built-in PLC, which can be switched over or operated in different modes.	
	Optional Encoder	2 types of encoders: differential, OC (selected via DIP switch)	
	Motor Temperature Inspection	3 motor temperature detection modes: PT100, PT1000 (selected via DIP switch)	
	Analog Correction	Analog accuracy greatly improved via analog correction	
	Module Fault System Optional Working Way	1, The module will exit automatically and the system will derate. 2, The system stops.	
	Status Surveillance Function	Querying parameters and monitoring inverter running statuses, like voltage, current, frequency, existing status of AI, AO, DI, DO and PID, as well as motor running status, communication status and running parameters if each module in the paralleling system. The system directly communicates with PC via Ethernet. All parameters are monitored and waveforms are drawn via background software.	
	Recording and Inquiring of Multiple Faults Parameters	Recording parameter information at occurrence of 4 faults, like frequency reference, motor speed, output current, bus voltage, torque reference, heatsink temperature, DI/DO status and accumulative running time, etc	
	Changing and Modifying of Function Code	Querying the modified parameters (different from default value)	
4 Group of Motors for Change	4 groups of motor parameters, which can be switched over according to field application		
Special Application	Applied to port crane machinery		
HMI	Analog Input	AIx4: 0-10 V/0-20 mA (selected via jumper), 12-bit resolution, calibration accuracy 0.5%	
	Analog Output	AOx4: 0-10 V/0-20 mA (selected via jumper), 12-bit resolution, calibration accuracy 1%	
	Digital Input	10 normal input: 9-30 V input voltage, PNP/NPN input way for choice. User can define either way. 4 AC digital input: 120-240 VAC input 1 high speed input: PNP/NPN input way for choice, input frequency <100 kHz	
	Digital Output	10 relay output: programmable normally open / normally closed 1 high speed output: output frequency <100 kHz	
	Keyboard Display	Standard configuration is with an external operation panel, which has 5 nixie tubes for LED display and 9 keys. HMI (H0U) is optional.	
	Communications/Bus	The standard configuration is with RS485 and CAN communication function, Ethernet adapter card: supporting Ethernet Protocol DP adapter card: supporting Profibus-DP	
Protection Function	Protection Function	Short to ground at power-on, motor overheating (PTC), drive overcurrent, drive overload, drive overvoltage, drive undervoltage, drive overheat, output phase loss, communication fault, current detection fault, motor tuning fault, encoder wire-breaking protection, EEPROM read-write fault, buffer resistance overload fault, DC contactor suction fault, modularized fan fault, external inductor overheat fault, external fuse fault, black box function fault, parallel logic fault and DP/Ethernet communication fault.	
	Basic Parameters	Input Voltage	4T: 550-800 VDC 5T: 680-900 VDC 7T: 980-1350 VDC
		Braking Voltage	4T: 700 VDC 5T: 800 VDC 7T: 1100 VDC (The user can set the braking voltage.)
Braking Use Rate		0-100%	
Environment	Using Field	Indoors, free from direct sunlight, dust, corrosive gas, combustible gas, oil mist, vapor, drip and salt	
	Altitude	0-1000 m, no derating 1000-4000 m, derate 1% every 100 m	
Environment	Environment Temperature	-10°C to +40°C (derate 1% every 1°C in the range of 40-50°C)	
	Humidity	< 95%RH, no condensation	
	Vibration	< 5.9 m/s ² (0.6g)	
	Storage Temperature	-20°C to +60°C	
	Protection Level	IP 21	
	Cooling Way	Forced air cooling	

Rated Output Current AC (A)	Rated Power (kW)	Order Model	Cabinet Dimensions (Width×Depth×Height) mm
UN: 380 VAC (Voltage Range 380-415 V)			
377	200	MD601P-4T0200Y	800×600×2350
754	400	MD601P-4T0400Y	
1131	600	MD601P-4T0600Y	
1508	800	MD601P-4T0800Y	
1885	1000	MD601P-4T1000Y	1000×600×2350
2262	1200	MD601P-4T1200Y	
2639	1400	MD601P-4T1400Y	
3016	1600	MD601P-4T1600Y	1200×600×2350
UN: 480 VAC (Voltage Range 380-500 V)			
377	250	MD601P-5T0250Y	800×600×2350
754	500	MD601P-5T0500Y	
1131	750	MD601P-5T0750Y	
1508	1000	MD601P-5T1000Y	
1885	1250	MD601P-5T1250Y	1000×600×2350
2262	1500	MD601P-5T1500Y	
2639	1750	MD601P-5T1750Y	
3016	2000	MD601P-5T2000Y	1200×600×2350
UN: 690 VAC (Voltage Range 525-690 V)			
260	250	MD601P-7T0250Y	800×600×2350
520	500	MD601P-7T0500Y	
780	750	MD601P-7T0750Y	
1040	1000	MD601P-7T1000Y	
1300	1250	MD601P-7T1250Y	1000×600×2350
1560	1500	MD601P-7T1500Y	
1820	1750	MD601P-7T1750Y	
2080	2000	MD601P-7T2000Y	1200×600×2350

Note: 1. The standard configuration of the cabinet is with breaker, electricity buffer and LC filter. 2. The electric cabinet can make up the IGBT rectifier system with IGBT rectifier cabinet of the same power and level.

IGBT Rectifier/Energy Feedback

Normal Load		Heavy Load		Heat Dissipation (kW)	Power Modular Number	Normal Load	Dimensions (Width×Depth×Height) mm
Icont (A)	Pcont (kW)	Ihd (A)	Phd (kW)				
UN: 380 VAC (Power Range 380-415 V)							
334	220	304	200	6	1	MD601D-4T0200C-N*A	700×600×2350
669	440	608	400	12	2	MD601D-4T0400C-N*A	
1003	660	912	600	18	3	MD601D-4T0600C-N*A	
1337	880	1216	800	24	4	MD601D-4T0800C-N*A	
1671	1100	1519	1000	30	5	MD601D-4T1000C-N*A	(700+1000)×600×2350
2006	1320	1823	1200	36	6	MD601D-4T1200C-N*A	(2×1000)×600×2350
2340	1540	2127	1400	42	7	MD601D-4T1400C-N*A	(2×700+1000)×600×2350
2674	1760	2431	1600	48	8	MD601D-4T1600C-N*A	(4×700)×600×2350
UN: 480 VAC (Power Range 380-500 V)							
337	280	301	250	8	1	MD601D-5T0250C-N*A	700×600×2350
674	560	601	500	15	2	MD601D-5T0500C-N*A	
1010	840	902	750	23	3	MD601D-5T0750C-N*A	1000×600×2350
1347	1120	1203	1000	30	4	MD601D-5T1000C-N*A	(2×700)×600×2350
1684	1400	1504	1250	38	5	MD601D-5T1250C-N*A	(700+1000)×600×2350
2021	1680	1804	1500	45	6	MD601D-5T1500C-N*A	(2×1000)×600×2350
2358	1960	2105	1750	53	7	MD601D-5T1750C-N*A	(2×700+1000)×600×2350
2694	2240	2406	2000	60	8	MD601D-5T2000C-N*A	(4×700)×600×2350
UN: 690 VAC (Power Range 525-690 V)							
234	280	209	250	8	1	MD601D-7T0250C-NEA	700×600×2350
469	560	418	500	15	2	MD601D-7T0500C-NEA	
703	840	628	750	23	3	MD601D-7T0750C-NEA	1000×600×2350
937	1120	837	1000	30	4	MD601D-7T1000C-NEA	(2×700)×600×2350
1171	1400	1046	1250	38	5	MD601D-7T1250C-NEA	(700+1000)×600×2350
1406	1680	1255	1500	45	6	MD601D-7T1500C-NEA	(2×1000)×600×2350
1640	1960	1464	1750	53	7	MD601D-7T1750C-NEA	(2×700+1000)×600×2350
1874	2240	1674	2000	60	8	MD601D-7T2000C-NEA	(4×700)×600×2350

Note: 1. The standard configuration of the cabinet is with PFC inductor, used as boost inductor at rectification and used for current filter at energy feedback. 2. IGBT rectifier must equip with distribution cabinet of the same power and level with electric buffer. 3. "*" indicates selection of control power: E: External power (220 VAC) for general applications; B: Bi-power supply (both external power (220 VAC) and internal DC bus power provide power supply simultaneously) in special applications (cost added). 4. Overload capacity: normal load applies to most applications and overload rate is 120%/60s; heavy load applies to applications with high requirements and overload rate is 150%/60s.

Inverter Cabinet

Normal Load		Heavy Load		Heat Dissipation (kW)	Power Modular Number	Order Model	Cabinet Dimensions (Width×Depth×Height) mm
Icont (A)	Pcont (kW)	Ihd (A)	Phd (kW)				
UN: 380 VAC (Voltage Range 380-415V)							
426	220	377	200	4	1	MD601D-4T0200L-N*A	700×600×2350
852	440	754	400	8	2	MD601D-4T0400L-N*A	
1278	660	1131	600	12	3	MD601D-4T0600L-N*A	1000×600×2350
1704	880	1508	800	16	4	MD601D-4T0800L-N*A	(2×700)×600×2350
2130	1100	1885	1000	20	5	MD601D-4T1000L-N*A	(700+1000)×600×2350
2556	1320	2262	1200	24	6	MD601D-4T1200L-N*A	(2×1000)×600×2350
2982	1540	2639	1400	28	7	MD601D-4T1400L-N*A	(2×700+1000)×600×2350
3408	1760	3016	1600	32	8	MD601D-4T1600L-N*A	(4×700)×600×2350
UN: 480 VAC (Voltage Range 380-500V)							
426	280	377	250	5	1	MD601D-5T0250L-N*A	700×600×2350
852	560	754	500	10	2	MD601D-5T0500L-N*A	
1278	840	1131	750	15	3	MD601D-5T0750L-N*A	1000×600×2350
1704	1120	1508	1000	20	4	MD601D-5T1000L-N*A	(2×700)×600×2350
2130	1400	1885	1250	25	5	MD601D-5T1250L-N*A	(700+1000)×600×2350
2556	1680	2262	1500	30	6	MD601D-5T1500L-N*A	(2×1000)×600×2350
2982	1960	2639	1750	35	7	MD601D-5T1750L-N*A	(2×700+1000)×600×2350
3408	2240	3016	2000	40	8	MD601D-5T2000L-N*A	(4×700)×600×2350
UN: 690 VAC (Voltage Range 525-690V)							
299	280	260	250	5	1	MD601D-7T0250L-NEA	700×600×2350
598	560	520	500	10	2	MD601D-7T0500L-NEA	
897	840	780	750	15	3	MD601D-7T0750L-NEA	1000×600×2350
1196	1120	1040	1000	20	4	MD601D-7T1000L-NEA	(2×700)×600×2350
1495	1400	1300	1250	25	5	MD601D-7T1250L-NEA	(700+1000)×600×2350
1794	1680	1560	1500	30	6	MD601D-7T1500L-NEA	(2×1000)×600×2350
2093	1960	1820	1750	35	7	MD601D-7T1750L-NEA	(2×700+1000)×600×2350
2392	2240	2080	2000	40	8	MD601D-7T2000L-NEA	(4×700)×600×2350

Note: 1. The standard configuration of the cabinet is with current-equalizing reactor. 2. The inverter drive has no built-in electric buffer because the distribution cabinet is configured with it. 3. "*" indicates selection of control power: E: External power (220 VAC) for general applications; B: Bi-power supply (both external power (220 VAC) and internal DC bus power provide power supply simultaneously) in special applications (cost added). 4. Overload capacity: normal load applies to most applications and overload rate is 120%/60s; heavy load applies to applications with high requirements and overload rate is 150%/60s.

2-Quadrant System Model Selection [Electric Cabinet, Diode Rectifier, Inverter Cabinet with Electric Buffer, Braking Cabinet]

Distribution Cabinet

Rated Output Current AC(A)	Rated Power(kW)	Order Model	Cabinet Dimensions (Width×Depth×Height) mm
UN:380VAC			
789	400	MD601P-4T0400N	800×600×2350
1579	800	MD601P-4T0800N	
2368	1200	MD601P-4T1200N	
3157	1600	MD601P-4T1600N	
UN:80VAC			
781	500	MD601P-5T0500N	800×600×2350
1562	1000	MD601P-5T1000N	
2343	1500	MD601P-5T1500N	
3124	2000	MD601P-5T2000N	
UN:690VAC			
652	600	MD601P-7T0600N	800×600×2350
1304	1200	MD601P-7T1200N	
1956	1800	MD601P-7T1800N	
2608	2400	MD601P-7T2400N	

Note: This cabinet equipped with a built-in breaker only is optional.

Diode Rectifier

Normal Load		Heavy Load		Heat Dissipation (kW)	Power Modular Number	Order Model	Cabinet Dimensions (Width×Depth×Height) mm
Icont (A)	Pcont (kW)	Ihd (A)	Phd (kW)				
UN: 380 VAC (Power Range 380-415 V)							
888	440	789	400	4	1	MD601D-4T0400D-NEA	700×600×2350
1776	880	1579	800	8	2	MD601D-4T0800D-NEA	
2664	1320	2368	1200	12	3	MD601D-4T1200D-NEA	1000×600×2350
3552	1760	3157	1600	16	4	MD601D-4T1600D-NEA	(2×700)×600×2350
UN: 480 VAC (Power Range 380-500V)							
888	560	781	500	5	1	MD601D-4T0400D-NEA	700×600×2350
1776	1120	1562	1000	10	2	MD601D-4T0800D-NEA	
2664	1680	2343	1500	15	3	MD601D-4T1200D-NEA	1000×600×2350
3552	2240	3124	2000	20	4	MD601D-4T1600D-NEA	(2×700)×600×2350
UN: 690 VAC (Power Range 525-690V)							
739	680	652	600	6	1	MD601D-7T0600D-NEA	700×600×2350
1478	1360	1304	1200	12	2	MD601D-7T1200D-NEA	
2217	2040	1956	1800	18	3	MD601D-7T1800D-NEA	1000×600×2350
2956	2720	2608	2400	24	4	MD601D-7T2400D-NEA	(2×700)×600×2350

Note: 1. The standard configuration of the cabinet is with input reactor. 2. The diode rectifier and the inverter make up the 2-quadrant inverter drive system. 3. Overload capacity: normal load applies to most applications and overload rate is 120%/60s; heavy load applies to applications with high requirements and overload rate is 150%/60s.

Inverter Cabinet

Normal Load		Heavy Load		Heat Dissipation (kW)	Power Modular Number	Order Model	Cabinet Dimensions (Width×Depth×Height) mm
Icont (A)	Pcont (kW)	Ihd (A)	Phd (kW)				
UN: 380 VAC (Voltage Range 380-415V)							
426	220	377	200	4	1	MD601D-4T0200L-Y*A	700×600×2350
852	440	754	400	8	2	MD601D-4T0400L-Y*A	
1278	660	1131	600	12	3	MD601D-4T0600L-Y*A	1000×600×2350
1704	880	1508	800	16	4	MD601D-4T0800L-Y*A	(2×700)×600×2350
2130	1100	1885	1000	20	5	MD601D-4T1000L-Y*A	(700+1000)×600×2350
2556	1320	2262	1200	24	6	MD601D-4T1200L-Y*A	(2×1000)×600×2350
2982	1540	2639	1400	28	7	MD601D-4T1400L-Y*A	(2×700+1000)×600×2350
3408	1760	3016	1600	32	8	MD601D-4T1600L-Y*A	(4×700)×600×2350
UN: 480 VAC (Voltage Range 380-500V)							
426	280	377	250	5	1	MD601D-5T0250L-Y*A	700×600×2350
852	560	754	500	10	2	MD601D-5T0500L-Y*A	
1278	840	1131	750	15	3	MD601D-5T0750L-Y*A	1000×600×2350
1704	1120	1508	1000	20	4	MD601D-5T1000L-Y*A	(2×700)×600×2350
2130	1400	1885	1250	25	5	MD601D-5T1250L-Y*A	(700+1000)×600×2350
2556	1680	2262	1500	30	6	MD601D-5T1500L-Y*A	(2×1000)×600×2350
2982	1960	2639	1750	35	7	MD601D-5T1750L-Y*A	(2×700+1000)×600×2350
3408	2240	3016	2000	40	8	MD601D-5T2000L-Y*A	(4×700)×600×2350
UN: 690 VAC (Voltage Range 525-690V)							
299	280	260	250	5	1	MD601D-7T0250L-YEA	700×600×2350
598	560	520	500	10	2	MD601D-7T0500L-YEA	
897	840	780	750	15	3	MD601D-7T0750L-YEA	1000×600×2350
1196	1120	1040	1000	20	4	MD601D-7T1000L-YEA	(2×700)×600×2350
1495	1400	1300	1250	25	5	MD601D-7T1250L-YEA	(700+1000)×600×2350
1794	1680	1560	1500	30	6	MD601D-7T1500L-YEA	(2×1000)×600×2350
2093	1960	1820	1750	35	7	MD601D-7T1750L-YEA	(2×700+1000)×600×2350
2392	2240	2080	2000	40	8	MD601D-7T2000L-YEA	(4×700)×600×2350

Note: 1. The standard configuration of the cabinet is with output current-equalizing reactor. 2. The inverter is with electric buffer and the rectifier has no need to add the electric buffer circuit. "*" indicates selection of control power: E: External power (220 VAC) for general applications; B: Bi-power supply (both external power (220 VAC) and internal DC bus power provide power supply simultaneously) in special applications (cost added). 4. Overload capacity: normal load applies to most applications and overload rate is 120%/60s; heavy load applies to applications with high requirements and overload rate is 150%/60s.

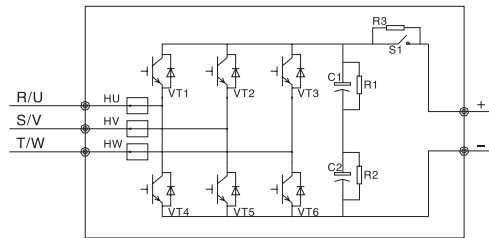
Braking Cabinet

Normal Load		Heavy Load		Heat Dissipation (kW)	Power Modular Number	Order Model	Cabinet Dimensions (Width×Depth×Height) mm
Icont (A)	Pcont (kW)	Phd (kW)					
UN: 380 VAC (Power Range 380-415 V)							
566	396	700V (set by software)	8	1	MD601D-4T0400B-YIA	700×600×2350	
1131	792		16	1	MD601D-4T0800B-YIA		
1697	1188		24	2	MD601D-4T1200B-YIA		
2262	1583		32	2	MD601D-4T1600B-YIA		
2828	1979		40	3	MD601D-4T2000B-YIA		
3393	2375		48	3	MD601D-4T2400B-YIA		
UN: 480 VAC (Power Range 380-500V)							
566	452	800V (set by software)	9	1	MD601D-5T0450B-YIA	700×600×2350	
1131	905		18	1	MD601D-5T0900B-YIA		
1697	1357		27	2	MD601D-5T1350B-YIA		
2262	1810		36	2	MD601D-5T1800B-YIA		
2828	2262		45	3	MD601D-5T2250B-YIA		
3393	2714		54	3	MD601D-5T2700B-YIA		
UN: 690 VAC (Power Range 525-690V)							
390	449	1150V (set by software)	9	1	MD601D-7T0450B-YIA	700×600×2350	
780	897		18	1	MD601D-7T0900B-YIA		
1170	1346		27	2	MD601D-7T1350B-YIA		
1560	1794		36	2	MD601D-7T1800B-YIA		
1950	2243		45	3	MD601D-7T2250B-YIA		
2340	2691		54	3	MD601D-7T2700B-YIA		

Note: The braking cabinet without braking resistor is optional.

Drive Module of MD601U Modularized High Power Drive System

Model Selection of MD601U Drive Module



Features of Power Unit

1. Diode rectifier and IGBT rectifier are available;
2. IGBT rectifier unit, inverter unit and braking unit are combined into one, which can work in multiple modes: controlled rectifier mode, energy feedback unit mode, inverter mode and braking unit mode;
3. Diode rectifier supports 12-pulse rectification to reduce the influence in harmonics of power grid;
4. It supports three voltage classes: 380 V, 480 V and 690 V;
5. It can be used as a drive or other unit independently, or be connected with multiple modules in parallel;
6. It supports synchronous use of 4 communication functions: Ethernet, Profibus-DP, CAN and Modbus-RTU;
7. It has complete fault detection and protection function;
8. The 4 units have exactly the same physical dimensions;
9. The technique makes the equipment able to work in tough environment reliably for long time;
10. It is easy to install and uninstall the unit. The unit adopts the drawer-like design, Above it is the DC bus copper bar and below it is the AC copper bar. The modular structure enables the control unit and cooling fan to be removed and maintained independently.

Model and Technical Parameters of MD601U Power Unit

Operation Mode	Voltage Level (VAC)	Normal Load		Heavy Load		Order Model	Physical Dimensions (Length*Width*Height) mm		
		Icont (A)	Pcont (kW)	Ihd (A)	Phd (kW)				
IGBT Rectifier/ Energy Feedback	380	334	220	304	200	MD601U-4T200C-XXX	460 x 282 x 711		
	480	337	280	301	250	MD601U-5T250C-XXX			
	690	234	280	209	250	MD601U-7T250C-XXX			
Inverter	380	426	220	377	200	MD601U-4T200I-XXX			
	480	426	280	377	250	MD601U-5T250I-XXX			
	690	299	280	260	250	MD601U-7T250I-XXX			
6/12Pulse Diode Rectifier	380	888	450	789	400	MD601U-4T400D-XXX			
	480	875	560	781	500	MD601U-5T500D-XXX			
	690	739	680	652	600	MD601U-7T600D-XXX			
Braking	380	Braking Current (ADC)	Braking Voltage (ADC)	Braking (kW)	Order Model	1131		792	MD601U-4T800B-XXX
						566		396	MD601U-4T400B-XXX
						1131		905	MD601U-5T900B-XXX
	480	566	800	452	MD601U-5T450B-XXX				
				780	897	MD601U-7T900B-XXX			
				390	449	MD601U-7T450B-XXX			

MD601X Optional Parts



MD601X-Card-IE Ethernet Card

The card is installed on the MCB and makes up the Ethernet hub with PC via Ethernet concentrator. It can realize drive system debugging, background monitoring, fault data storage and other functions through background software which is intended for MD601.

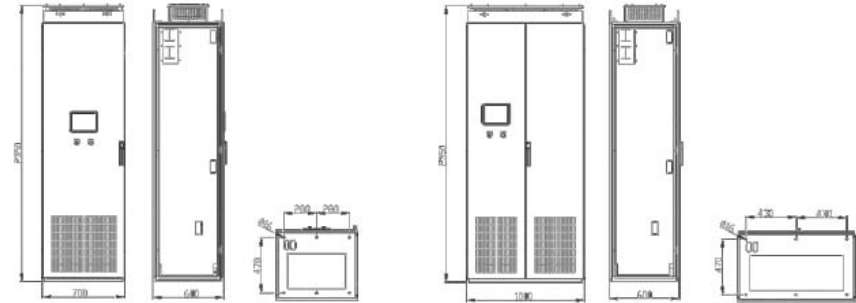


MD601X-Card-DP (Profibus-DP card)

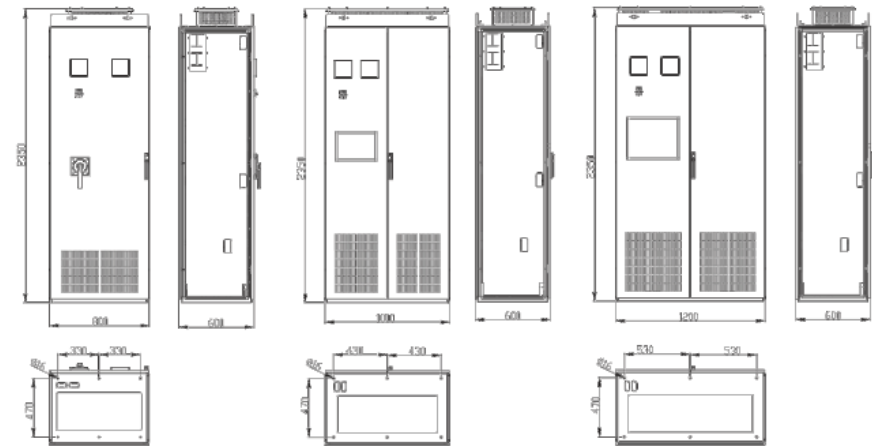
The card is installed on the MCB and makes up the Profibus field bus control system with host computer (PLC). It is used for communication control of the host computer and background monitoring.

Installation Dimensions of All Series Products

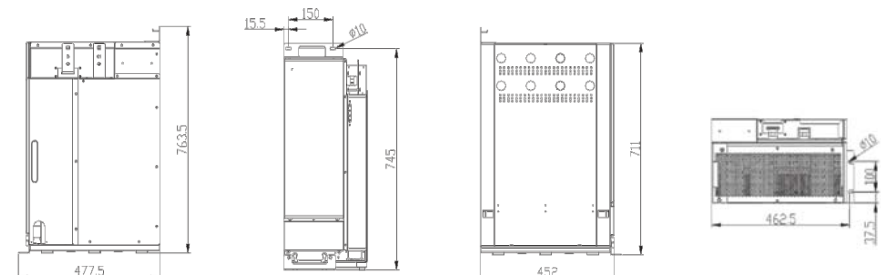
Drive Cabinet (IGBT Rectifier/Energy Feedback/Inverter/Braking Unit/Diode Rectifier)



Distribution Cabinet

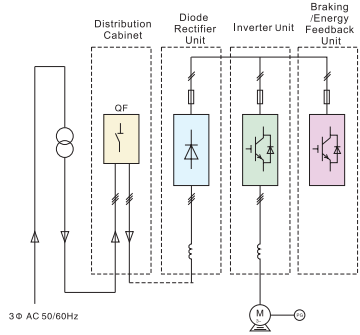


Installation Dimensions of MD601 Drive Module



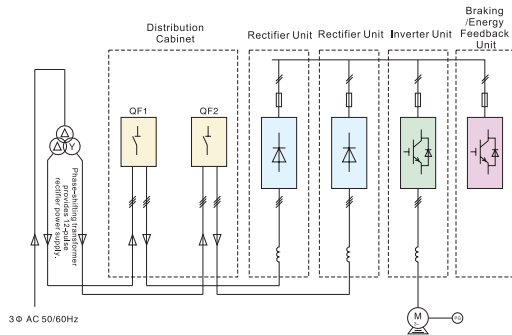
Basic Configuration of System MD601

Configuration Diagram of MD601 2-quadrant Drive System (2-quadrant Single-module Drive)



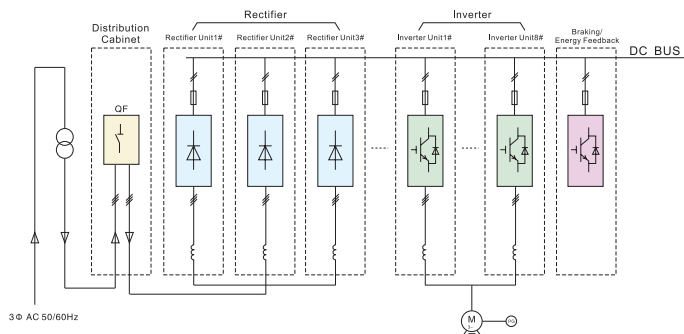
▶ The single diode rectifier unit and the inverter unit make up the general 2-quadrant drive system. When bus voltage increases, the bus voltage can be stabilized via the braking unit or the energy feedback unit. It is commonly applied in the applications which do not have high requirements on the power class of AC drive and the harmonics control.

Configuration Diagram of MD601 2-quadrant VF Drive System (12-pulse Rectifier Drive)



▶ The system mainly aims to reduce the influence of current harmonics on power grid. After phase shifting is performed by the transformer, the power is rectified by the diode rectifier unit, then flows to the inverter, and then is connected to the braking or energy feedback unit through DC bus. In this case, the drive requires the even number of diode rectifier units to ensure 12-pulse rectification and current-equalizing of the rectifier unit. It is commonly applied in the applications which do not have high requirements on the power class of AC drive but have high requirements on harmonics control.

Configuration Diagram of MD601 2-quadrant VF Drive System (2-quadrant Paralleling-module Drive)

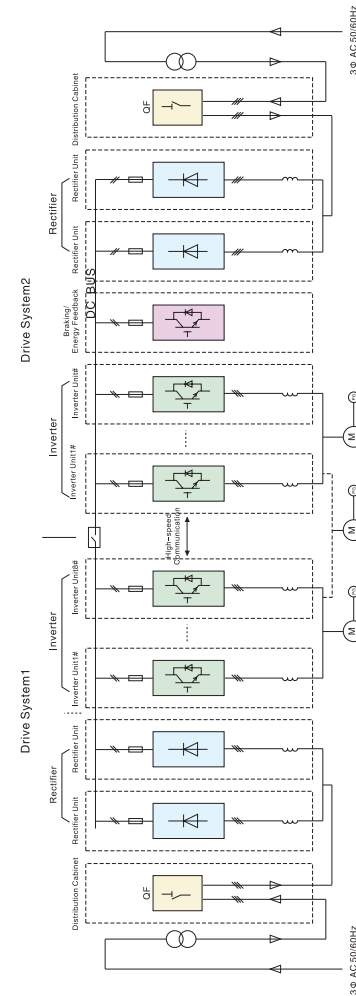


▶ The paralleling diode rectifier units, paralleling inverter units and braking unit or energy feedback unit make up the high-power 2-quadrant AC drive system. The system power expansion can be realized through paralleling of units. There is no limit on the number of paralleling diode rectifier units. Up to 8 inverter units in parallel are allowed (For the power of each unit, refer to the related table). It is mainly applied in the high-power synchronous and asynchronous motors with low requirements on harmonics control and high-power EPS power drive system.

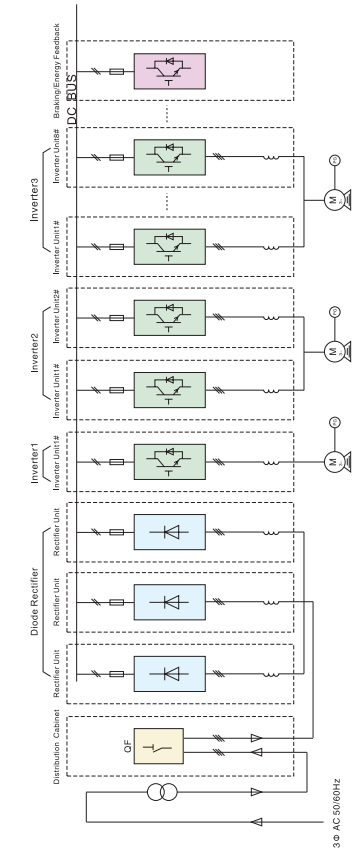
▶ System 1 and system 2 can operate with their motors respectively. When the load is too large and the drive capacity of system 1 is not enough, system 1 and system 2 can have one load after paralleling. This can be realized only by adding one high-speed communication between the inverter of system 1 and that of system 2 and changing relative software parameter settings. It can support simultaneously paralleling of multiple systems. This system is commonly applied in EPS power supply, motor testing platform (do motor locked-rotor experiment after system paralleling) and system whose single motor capacity is over 2 MW and some special application locations.

▶ The rectifier end makes up the high-power rectifier through the paralleling of diode rectifier units. The inverter end can hang multiple inverters through the common DC bus. The power of different inverters can be expanded through the paralleling of inverter units and the voltage of bus can be stabilized through paralleling of inverter units and the braking and energy feedback unit. This system is commonly applied in the common DC bus field with one rectifier and multiple inverters, such as papermaking field, steel-rolling field and so on.

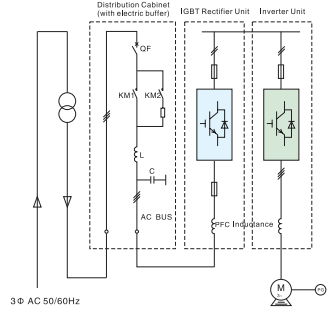
Configuration Diagram of MD601 2-quadrant VF Drive System (2-quadrant Multi-drive Paralleling System)



Configuration Diagram of MD601 2-quadrant VF Drive System (2-quadrant Common DC Bus Drive)

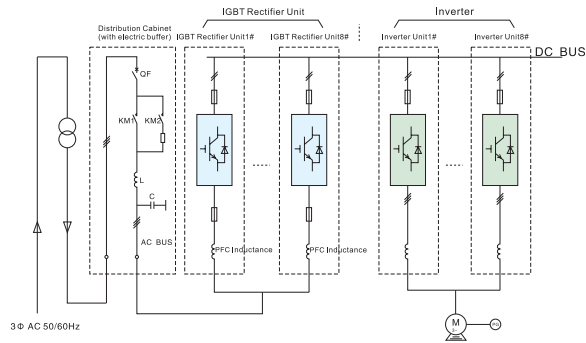


Configuration Diagram of MD601 4-quadrant VF Drive System (4-quadrant Single-module Drive)



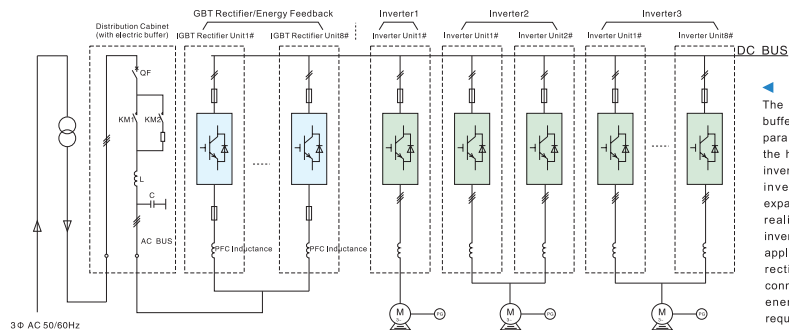
The single IGBT rectifier module and the inverter module make up the general 4-quadrant AC drive system. The distribution cabinet has the electric buffer and LC filter circuits. It is applied in the applications where the drive power class is not high, the requirements of harmonics control are high and the energy feedback is large.

Configuration Diagram of MD601 4-quadrant VF Drive System (4-quadrant Paralleling-module Drive)



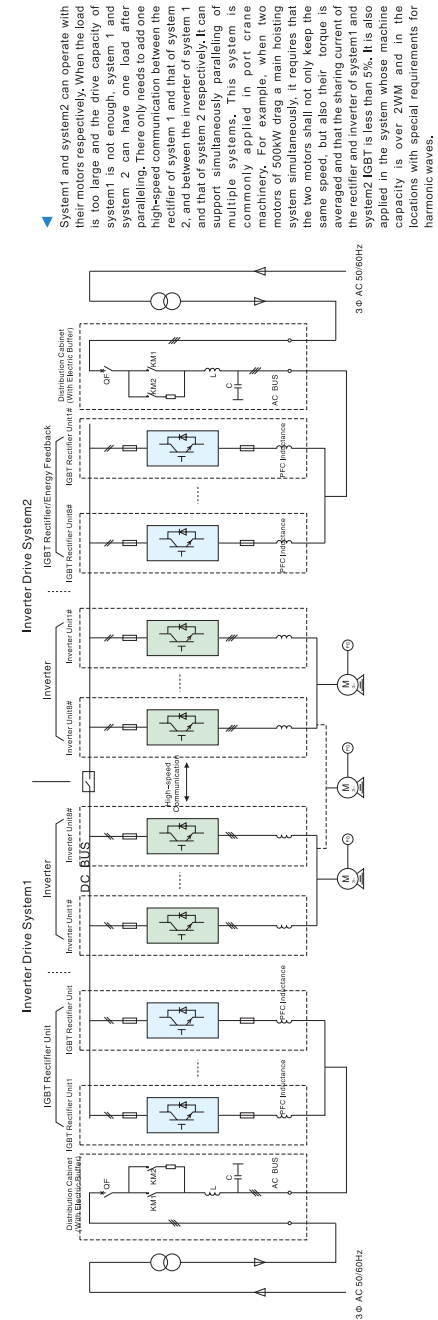
The paralleling IGBT rectifier units and paralleling inverter units make up the 4-quadrant AC drive system. The system power expansion can be realized through paralleling of units. Up to 8 GBT rectifier units or inverter units in parallel are allowed (For the power of each unit, refer to the related table). It is mainly applied in the high-power synchronous and asynchronous motor drive system of potential energy load which has high requirements on harmonics control, such as high-power mine hoisting machinery, port hoisting machinery, etc.

Configuration Diagram of MD601 4-quadrant VF Drive System (4-quadrant Common DC Bus Drive)



The distribution cabinet with electric buffer and LC filter circuit and the paralleling IGBT rectifier units make up the high-power IGBT rectifier part. The inverter part is made up of multiple inverters via DC bus. The power expansion of the inverter part can be realized through paralleling of the inverter units. This system is commonly applied in the applications where one rectifier and multiple inverters are connected by the common DC bus, the energy feedback is large, and the requirements on harmonics control are high.

Configuration Diagram for 4-quadrant Inverter System MD601 (4-quadrant Multi-inverter Drive System Paralleling)



System1 and system2 can operate with their motors respectively. When the load is too large and the drive capacity of system1 is not enough, system1 and system2 can have one load after paralleling. There only needs to add one high-speed communication between the rectifier of system1 and that of system2, and between the inverter of system1 and that of system2 respectively. It can support simultaneously paralleling of multiple systems. This system is commonly applied in port crane machinery, for example, when two motors of LGV drag a main hoisting machinery, the two motors shall not only keep the same speed, but also their torque is averaged and that the sharing current of the rectifier and inverter of system1 and system2 IGBT is less than 5%. It is also applied in the system whose machine capacity is over 2MW and in the locations with special requirements for harmonic waves.