RHYMEBUS

AC Motor Drive for HVAC

RM6F6 Series

Green Tech Green Life

The polar bear, like a white spirit, wanders through its pristine, snowy realm, yet stands on the brink of vanishing as the world warms.With advanced control modes and intelligent energy-saving technology, Rhymebus' HVAC Dedicated Inverter effectively reduces energy consumption, easing the burden on our environment.Let us join hands and harness the power of technology to safeguard the polar bear's fragile home.

Master the Air,
Master the Flow!

The RM6F6, powered by high-efficiency VFD technology, optimizes fluid system control, ensuring precise management of pressure, flow, and temperature. This significantly lowers energy consumption and enhances system performance, delivering outstanding energy savings.

Temperature Control
· Wet-bulb temperature control
· Differential temperature control

Smart Management
· Water-usage detection
· Multi-drive parallel control
· Backup unit auto takeover

Pressure Control
· Various pressure control modes
· Differential Pressure control

System Protection
· Dry run and cavitation protection
· Overpressure alarm/ protection
· Noise prevention

Features

◆ Integrated full pump control enables standalone multi-pump parallel systems without an external controller.

◆ Minimum operating units can be set to ensure stable water supply.

◆ Capable of obtaining system's constant pressure while pump disengages from operation for maintenance.

◆ Sensorless vector control supports induction and PMSM motors, offering high efficiency and stable performance at all speeds.

◆ Provides fire mode operation, suitable for ventilation system and fire safety equipment in emergency mode.

◆ Automatic restart upon power interruption or abnormal tripping, with adjustable restart intervals and retry limits.

◆ The keypad displays the setting value and practical value at the same time.

◆ Parameters of master drive can be easily copied to slave drive without setting each unit individually.

Advanced Control Modes

PID Constant Pressure Control

With built-in multi-mode PID pressure control, auto switchover to slave drive in an event of an abnorality and master/slave rotation functions. Supports up to 8 units in parallel with alternating operation to ensure uninterrupted performance, enhancing system reliability and service life.
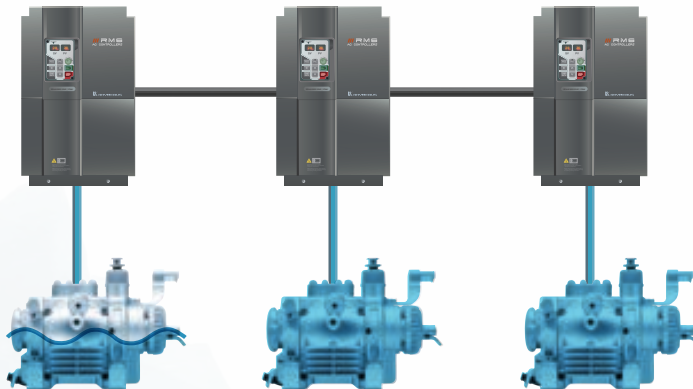

Internal Communication
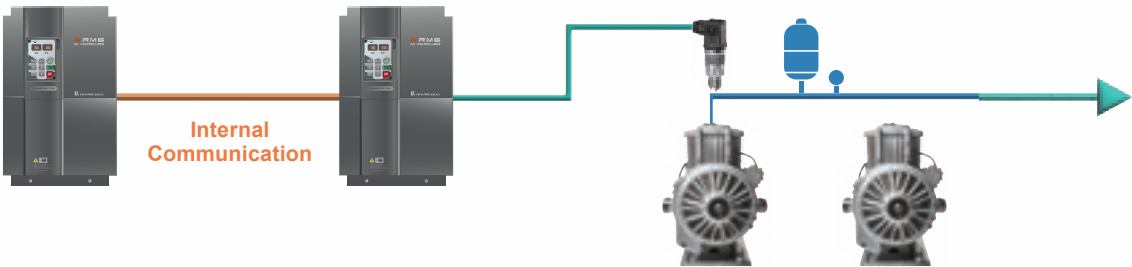
E-Mode

Multiple pumps run at the same speed. Flow rise rapidly. Steady pressure while drive separates. Suitable for processing cooling water.
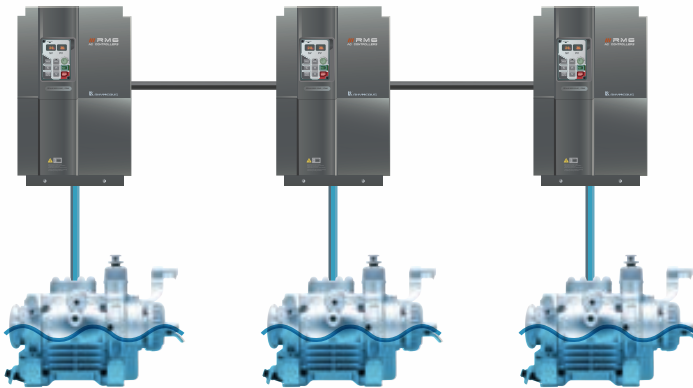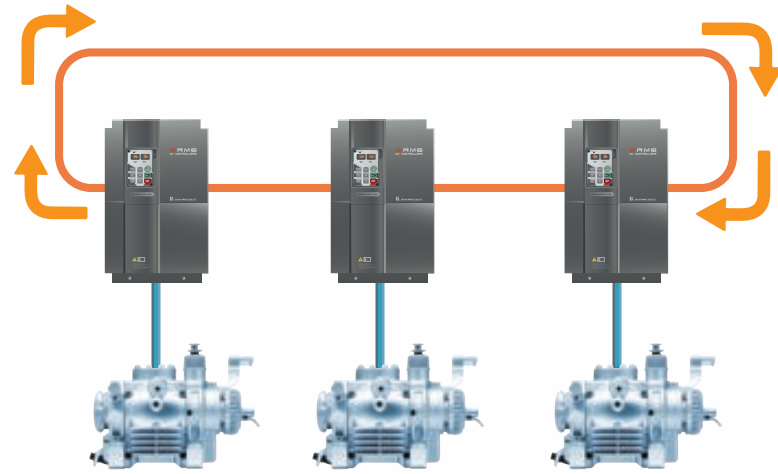

F-Mode

One operates to control speed, others at full speed or standby. Stabilizes pressure effectively. Suitable for general water supply systems.

Auto Shift

Master pump and slave pumps operate alternately, prevents slave pumps from idling for too long and cause abnormal situation.

On / Off Mode

When water pipe leakage is detected, the inverter automatically switches to on-off mode, preventing motor from starting repetitively, lowering noise and lowering power consumption.

Pipe leakage or low water flow

Temperature/Differential Temperature Control Mode

Temperature and wet-bulb temperature compensation control, suitable for energy-saving control of fans, cooling towers, and air handling units.

Wet-bulb temperature signal

Cooling Tower
Energy-Saving

Outlet temperature signal

Internal communication

Temperature signal

Air Handing Unit
Energy-Saving

Smart Hand On

The affected pump can be disconnected directly if one of the pump in parallel system fails. and others will automatically take over operation.

Pump A

Pump B

Manual Control Key
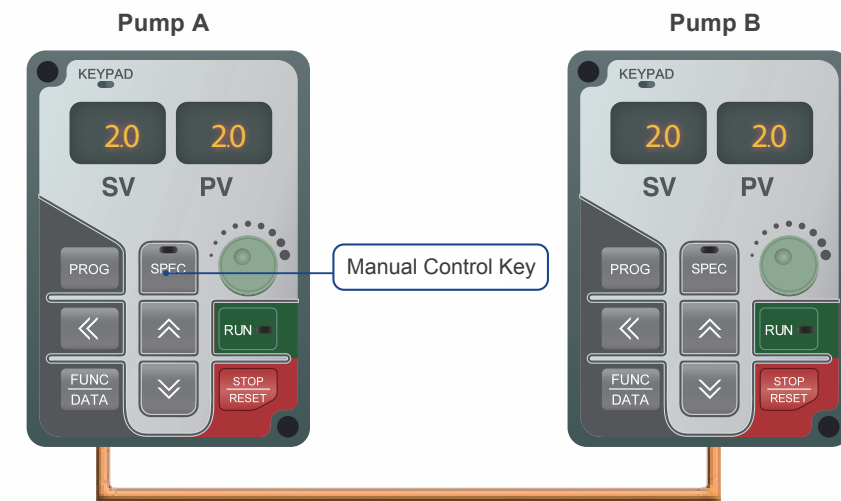
Standby Pump B automatically take over the operation when Pump A switches to manual mode, preventing pressure drop.

Fire Mode

The fire mode ensures maximum ventilation and water supply by overriding normal protections, keeping the system running at full capacity until failure to minimize damage.

FDCIE

Fire Hydrant Pump

Sensor

Sensor signal

Fire alarm
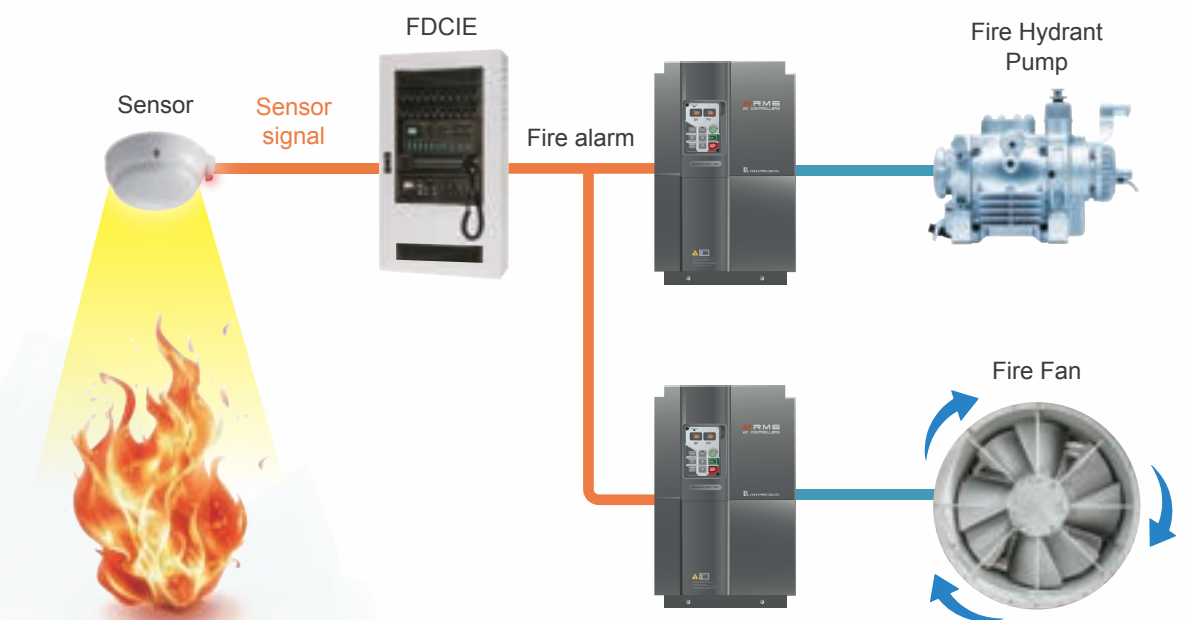
Fire Fan

Dry-run / Cavitation

Prevents dry running damage to the shaft and cavitation damage to the blades, ensuring a longer pump lifespan.

Over pressure
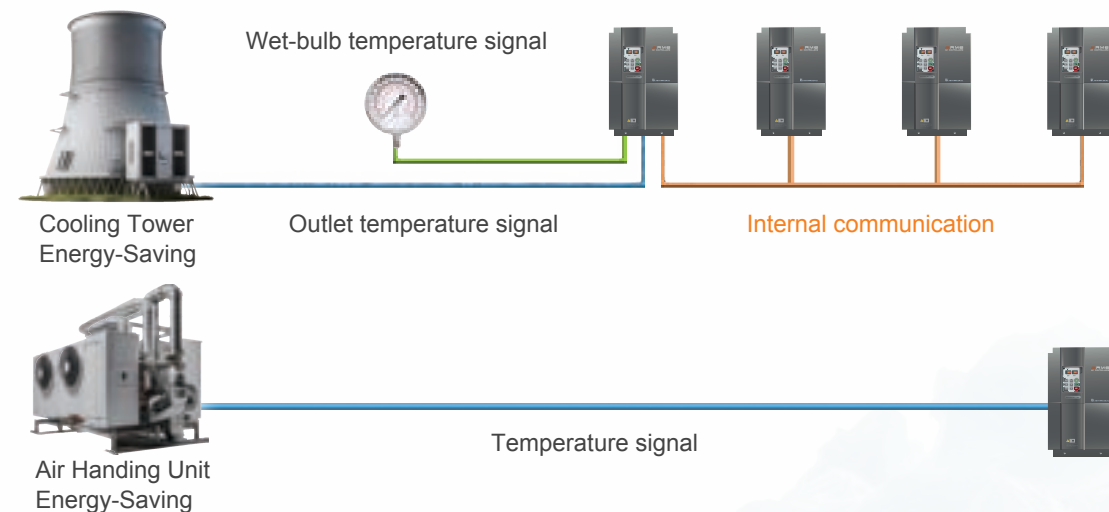
Automatically alarms and stops operation to prevent pipe bursts or equipment damage if pressure is too high.

Water hammer and noise prevention

Automatically enters buffer mode when there is no water demand to prevent water hammer, protect the piping system, and reduce noise.

Overheat

Automatically alarms and stops operation when motor temperature is too high. Supports PTC, NTC, PT100, RTD392, and KTY84 temperature sensors.

Auto Restart Function

Automatic restart upon power interruption or abnormal tripping.

Applications

Fans, Water pumps, Air conditioning systems, Factory process water systems, and public water supply systems.

Model Numbering Scheme

Products Series

for HVAC

RM6F6 — 2 A022 B 3

Input Voltage

2 : AC 200~240V
4 : AC 380~480V

Model Code

Input Power

1 : Single-phase
3 : Three-phase

Brake Type

B : Built-in brake transistor
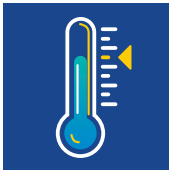E : Without brake transistor

Specification

200V Series

Model (RM6F6-□□□□□B3/E3) Note2	2A005	2A007	2A010	2A016	2A022	2A031	2A042	2A060	2A075	2A090	2A112	2A150	2A185	2A220	2A275	2A346	2A410	2A500	2A700	2A840
Maximum Applicable Motor (HP/kW)	1/0.75	2/1.5	3/3.2	5/3.7	7.5/5.5	10/7.5	15/11	20/15	25/18.5	30/22	40/30	50/37	60/45	75/55	100/75	125/90	150/110	175/132	250/200	300/220
Rated Output Capacity (kVA)	1.6	2.6	3.8	5.8	8.1	12	16	23	29	34	43	57	70	84	105	132	156	191	267	321
Rated Output Current (A)	4.2	6.8	10	15.2	21.3	31	42	60	75	90	112	150	185	220	275	346	410	500	700	840
Rated Output Voltage (V)	3Φ 200~240V																			
Rated output frequency (Hz)	0.1~599.0Hz																			
Power Source (Φ, V, Hz)	1Φ/3Φ 200~240V 50/60Hz Note1			3Φ 200~240V 50/60Hz																
Input Current (A)	9.7/6.1	18.1/8	23.8/12	18	25.2	41	56	68	86	103	128	183	211	240	280	330	385	470	660	792
Permissible AC Power Source Fluctuation	176~264V 50/60Hz / ±5%																			
Overload Protection	120% of rated output current for 1 minute																			
Cooling Method	Natural cooling		Fan cooling																	
Protection Structure	IP20											IP00 (IP20 OPTION)								
Weight (kg)	1.8	1.8	1.8	2.0	2.1	3.0	5.4	5.7	12.4	13.1	14.7	14.8	42.7	44.3	46.3	63.6	89	90	164	167
Case Code	case1					case2	case3			case4				case5		case6	case7		case8	

*Note1:2A005、2A007、2A010 support both single-phase and three-phase *Note2：Models below 2A060 are only available as B3 type. Models above 2A346 are only available as E3 type.
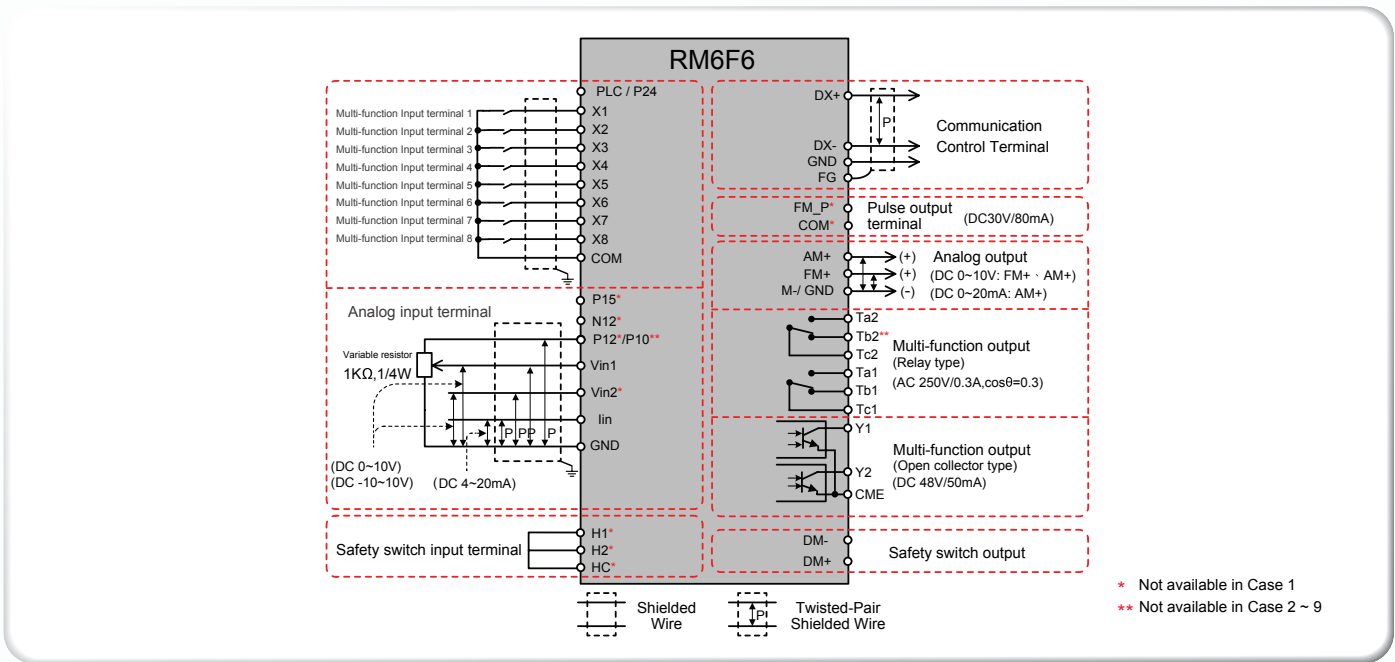
400V Series

Model (RM6F6-□□□□□B3/E3) Note3	4A004	4A005	4A009	4A012	4A018	4A023	4A031	4A039	4A045	4A058	4A075	4A091	4A110	4A144	4A180	4A216	4A253	4A304	4A377	4A415	4A480	4A585	4A700	4A860	4A960
Maximum Applicable Motor (HP/kW)	2/1.5	3/2.2	5/3.7	7.5/5.5	10/7.5	15/11	20/15	25/18.5	30/22	40/30	50/37	60/45	75/55	100/75	125/90	150/110	175/132	200/160	250/200	300/220	350/250	420/315	500/375	600/450	700/500
Rated Output Capacity (kVA)	2.7	3.8	6.9	8.6	14	18	24	30	34	44	57	69	84	110	137	165	193	232	287	316	366	446	533	655	732
Rated Output Current (A)	3.5	5	9	11.3	18	23	31	39	45	58	75	91	110	144	180	216	253	304	377	415	480	585	700	860	960
Rated Output Voltage (V)	3Φ 380~480V																								
Rated output frequency (Hz)	0.1~599.0Hz																								
Power Source (Φ, V, Hz)	3Φ 380~480V 50/60Hz																								
Input Current (A)	4.2	6	12	13.4	20	26	44	47	52	66	86	105	132	162	181	202	217	282	355	385	440	540	627	800	900
Permissible AC Power Source Fluctuation	332~528V 50/60Hz / ±5%																								
Overload Protection	120% of rated output current for 1 minute																								
Cooling Method	Natural cooling		Fan cooling																						
Protection Structure	IP20														IP00 (IP20 OPTION)										
Weight (kg)	1.8	1.8	1.9	2.0	3.0	3.1	5.6	5.7	5.8	12.8	12.9	15	15.3	44	45.5	46.4	64	64.5	95	97	159	163	164	217	272
Case Code	case1			case2			case3			case4				case5			case6		case7		case8			case9	

*Note3：Models below 4A045 are only available as B3 type. Models above 4A180 are only available as E3 type.

Control Terminals Wiring

RM6F6

PLC / P24
Multi-function Input terminal 1 — X1
Multi-function Input terminal 2 — X2
Multi-function Input terminal 3 — X3
Multi-function Input terminal 4 — X4
Multi-function Input terminal 5 — X5
Multi-function Input terminal 6 — X6
Multi-function Input terminal 7 — X7
Multi-function Input terminal 8 — X8
COM

DX+
DX-
GND
FG
Communication Control Terminal

FM_P*
COM*
Pulse output terminal (DC30V/80mA)

AM+
FM+
M-/ GND
Analog output
(+) (DC 0~10V: FM+、AM+)
(+)
(-) (DC 0~20mA: AM+)

P15*
N12*
P12*/P10**
Vin1
Vin2*
Iin
GND
Analog input terminal

Variable resistor 1KΩ,1/4W

(DC 0~10V)
(DC -10~10V)   (DC 4~20mA)

Ta2
Tb2**
Tc2
Ta1
Tb1
Tc1
Multi-function output (Relay type)
(AC 250V/0.3A,cosθ=0.3)

Y1
Y2
CME
Multi-function output (Open collector type)
(DC 48V/50mA)

H1*
H2*
HC*
Safety switch input terminal

DM-
DM+
Safety switch output

Shielded Wire
Twisted-Pair Shielded Wire

* Not available in Case 1
** Not available in Case 2 ~ 9

Control Terminal

Type		Symbol	Function	Description
Control Terminal	Control Power	PLC/P24	Control Power	Output DC+24V Max current: 100mA
		P12*/P10**		Output DC+12V (Case 1: DC+10V), Max current 20mA
		N12*		Output DC-12V, Maximum supplied current is 20mA
		GND	Common Terminal	Common terminal for power control (P12、N12、P15) and analog input (Vin1/ Vin2/ Iin)
	Multi-Function Input Terminals	X1	Multi-function Input Terminal 1	● Set the function at H1-00. Default setting: Forward
		X2	Multi-function Input Terminal 2	● Set the function at H1-01. Default setting: Reverse
		X3	Multi-function Input Terminal 3	● Set the function at H1-02. Default setting: Jog
		X4	Multi-function Input Terminal 4	● Set the function at H1-03. Default setting: External fault
		X5	Multi-function Input Terminal 5	● Set the function at H1-04. Default setting: Reset
		X6	Multi-function Input Terminal 6	● Set the function at H1-05. Default setting: Disable
		X7	Multi-function Input Terminal 7	● Set the function at H1-06. Default setting: Disable
		X8	Multi-function Input Terminal 8	● Set the function at H1-07. Default setting: Disable
		COM	Common Terminal	● Common of input control terminal (X1~X8) ● Control power (PLC), pulse input signal (FM_P)
		Vin1	Analog Input Terminal 1	● Analog input terminal 1
		Vin2*	Analog Input Terminal 2	● Input range DC 0~10V or DC -10~10V, input impedance 20kΩ
		Iin	Analog Input Terminal 3	● Selective function of DIP switch-SW1: Current signal or voltage signal
	Multi-Function Output Terminals	FM_P*	Pulse Output Signal Terminal	● NPN open collector isolated output: Maximum value: 30vDC/80mA.
		AM +	Analog Output Terminal 1	● Selective output signal-JP4: Current signal or voltage signal
		FM +	Analog Output Terminal 2	● Set the function at H4-00. Default setting: Output frequency
		M -*/ GND-	Common Terminal	● Common of analog output terminals
		Ta1	Digital Output (Relay Type)	● Set the function at H2-04. Default setting: Error detection
		Tb1		● Set the function at H2-04. Default setting: Error detection
		Tc1	Capacity: AC 250V、0.5AMax、cosθ=0.3	● Common of Ta1, Tb1 terminals
		Ta2		● Set the function at H2-05. Default setting: During operation
		Tb2**		● Set the function at H2-05. Default setting: During operation
		Tc2		● Common of Ta2 terminal
		Y1	Digital Output (Open Collector Type)	● Set the function at H2-00. Default setting: Zero speed
		Y2	Capacity: DC 48V、50mAMax	● Set the function at H2-01. Default setting: Constant speed
		CME		● Common of Y1, Y2 terminals

* Not available in Case 1   ** Not available in Case 2

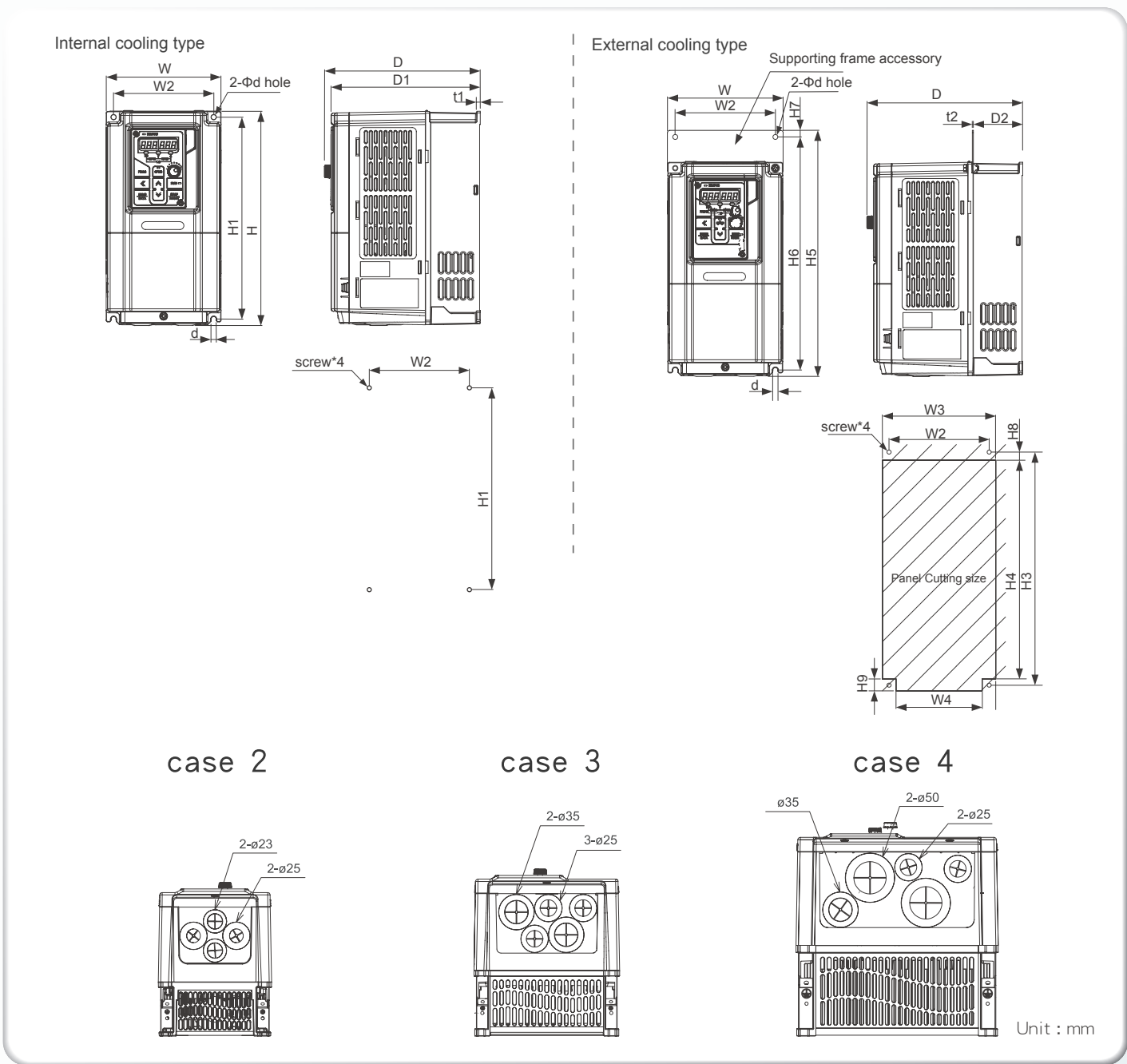# General Specifications

Control Characteristics	Control method		V/F control, PM Sensorless, IM Sensorless Carrier frequency：800Hz ~ 16kHz
	Range of frequency setting		0.1~599Hz
	Resolution of frequency setting		● Digital Keypad (KP-601A): 0.01Hz ● Analog Signal: 0.06Hz / 60Hz
	Resolution of output frequency		0.01Hz
	Frequency setting signal		DC 0~10V 、 -10~+10V 、 4~20mA
	Overload protection		120% of drive rated output current for 1 min. (Inverse time curve protection)
	DC braking		● Time of DC braking after stop/before start: 0~60.0sec ● DC braking frequency at stop: 0.1 ~ 60Hz ● DC braking level: 0~150% of rated current
	Braking torque		Approximately 20% (with built-in braking resistor connected, braking torque is above 100%)
	Acceleration / deceleration time		● 0.1~3200.0sec or 0.01~320.0sec ● The setting of acceleration/deceleration time can be adjusted from 0.01Hz to 599.00Hz.
	Stall prevention		● Stall prevention during acceleration/constant speed (Stall prevention current level 30~200%) ● Stall prevention during deceleration
	V/F pattern		● Linear, Square Curve, 1.7th power curve, 1.5th power curve ● V/F pattern (2 V/F points) ● V/F pattern can be adjusted by analog input (Voltage can be adjusted individually)
	Other functions		Slip compensation, auto-torque compensation, auto-adjustment for output voltage stability, auto-adjustment of carrier frequency, restart after instantaneous power failure, speed tracing, overload detection, acceleration/deceleration switch, parameters copy, counter function, timer function, Modbus communication, output frequency upper limit, output frequency lower limit, cooling fan control, password lock, predictive maintenance information, error record, multi-pumps parallel control, constant pressure control mode, ON/OFF mode, pump protection, noise prevention, Overpressure protection, Friction loss compensation
Operation Characteristics	Input	Digital Input	8 sets programmable input terminals: X1~X8
		Analog Input	● Vin1/Vin2*-GND： DC 0~10V or DC -10~+10V ● Iin-GND：DC 4~20mA/2~10V or DC 0~20mA/0~10V
		Communication	Operation controls and monitors via communication by external device.
	Output	Digital Output	4 sets programmable output detection： Ta2-Tc2、Ta1-Tb1-Tc1、Y1-CME、Y2-CME
		Analog Output	●"FM+" －"M-"：DC 0 ~ 10V ●"AM+" －"M-"：DC 4~20mA or DC 0 ~ 10V
Display	Digital Keypad (KP-601A)		Monitor the frequency of drive, voltage, current, terminal status ... etc.
Protection	Fault protection	Error trip of drive	EEPROM error (EEr), fuse open (SC), under voltage during operation (LE1), drive over current (OC), grounding fault (GF), over voltage (OE), drive overheat (OH), motor overload (OL), drive overload (OL1), system overload (OLO), external fault (EF), keypad interruption during copy (PAdF), input/output phase failure protection (IPLF/OPLF)
		Error trip of pressure control	PID feedback signal error(no Fb), Over pressure(OP), Water shortage(Fb Lo) cooling mathod: Fan-cooling (except RM6F6-2A004, 2A007, 4A004 models which are natural-cooling)
		Warning messages of drive	Power source under voltage(LE), Drive output interruption(bb), Coast to stop(Fr), Dynamic brake transistor over voltage (db), Keypad cable trip before connection(Err_00), Keypad cable trip during connecting(Err_01), FWD/REV command input simultaneously(dFt), Different software version inter-copy(wrF), Parameter copy failure.
	cooling method		Fan-cooling (except RM6F6-2A004, 2A007, 4A004 models which are natural-cooling)
Environment	Atmosphere		Non-corrosive or non-conductive, or non-explosive gas or liquid, and non-dusty
	Surrounding temperature		-10 ℃ (14 ℉) ~ +40 ℃ (104 ℉) (Non-freezing and non-condensing)
	Storage temperature		-20 ℃ (-4 ℉) ~ +70 ℃ (158 ℉)
	Relative humidity		90% RH or less (non-condensing atmosphere)
	Vibration		Less than 5.9m/sec² (0.6G)
	Altitude		Less than 1000m (3280 ft.)

Outline Dimensions

case1

Unit : mm

case 2~4

Internal cooling type

External cooling type

Supporting frame accessory

case 2

case 3

case 4

Unit : mm

case 5~9

Internal cooling type

External cooling type

Unit : mm
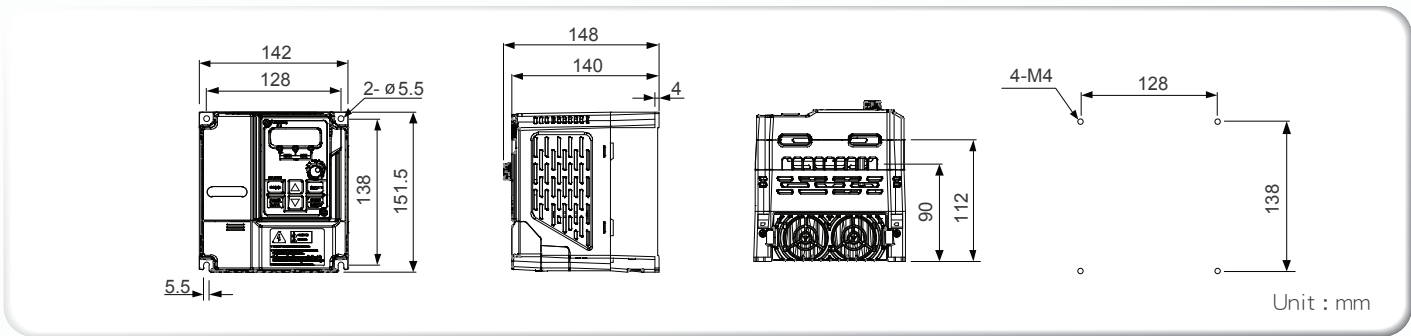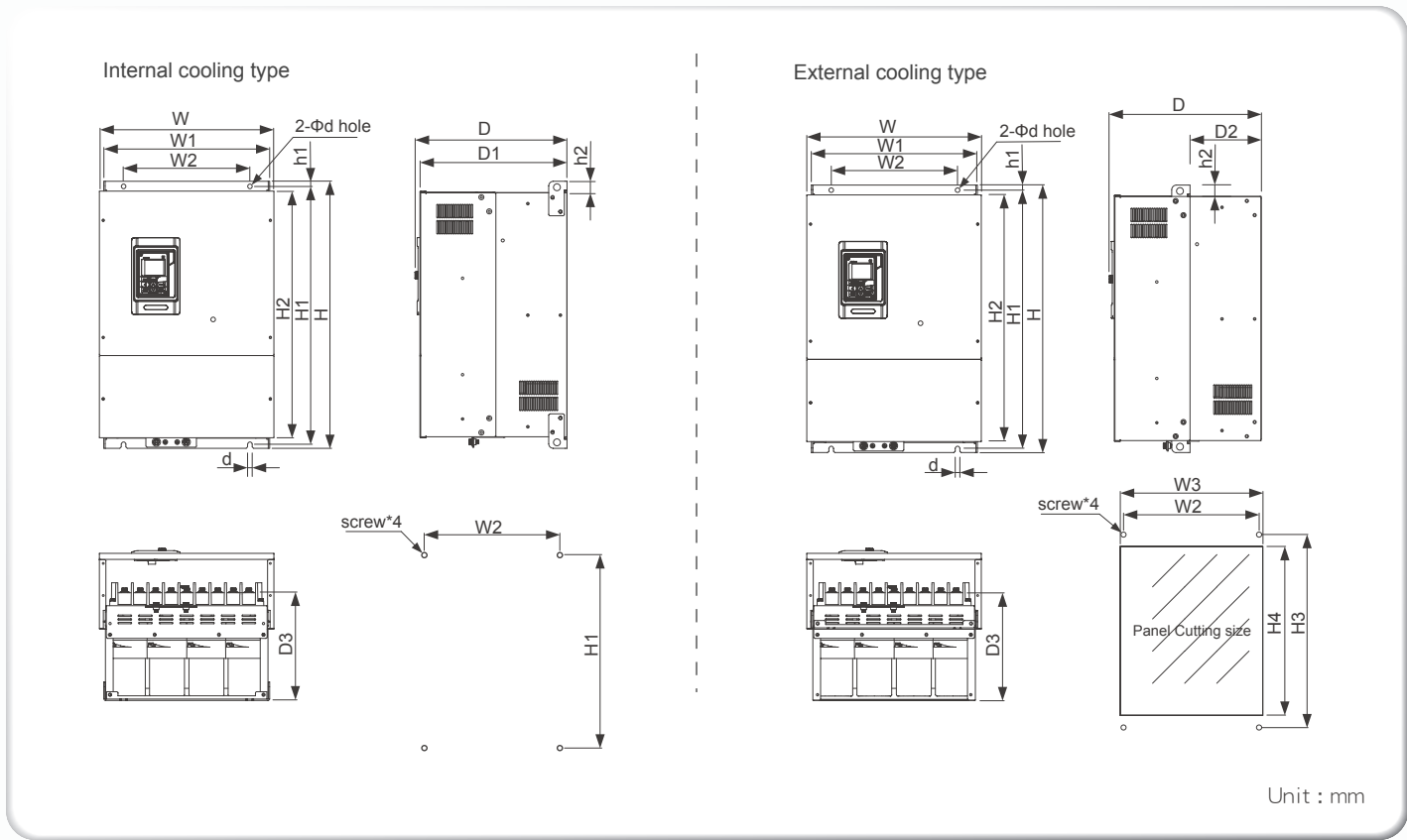
Dimensions

Case	Model Number		Size(mm)																										Screw
	200V	400V	W	W1	W2	W3	W4	H	H1	H2	H3	H4	H5	H6	H7	H8	H9	h1	h2	t1	t2	D	D1	D2	D3	d	(mm)
CASE2	005~031	004~023	140	-	122	138	105	260	246	-	284	267	300	284	8	9.5	14.5	-	-	4.7	1.2	190	182	60	-	6.5	M5
CASE3	042~060	031~045	180	-	162	177	148	290	277	-	313	290	329	313	8	11.5	20	-	-	9	1.6	207	199	74	-	7	M5
CASE4	075~150	058~110	250	-	230	247	211	400	380	-	427	396	448	427	10	11.5	29	-	-	9.5	2	258	250	103	-	9	M8
CASE5	185~275	144~216	386	361	275	365	-	584	562	539	564	545	-	-	-	-	-	11	25	-	-	332	325	155	242	10	M8
CASE6	346	253~304	446	418	275	427	-	685	660	630	662	634	-	-	-	-	-	14	30	-	-	342	334	162	246	12	M10
CASE7	410~500	377~415	508	479	275	487	-	818	785	751	788	758	-	-	-	-	-	19	35	-	-	375	366	183	257	15	M12
CASE8	700~840	480~700	696	654	580	657	-	1000	974	929	978	936	-	-	-	-	-	15	39	-	-	411	405	181	294	15	M12
CASE9	-	860~960	992	954	710	958	-	1030	1003	963	1007	968	-	-	-	-	-	15	39	-	-	427	419	184	308	15	M12