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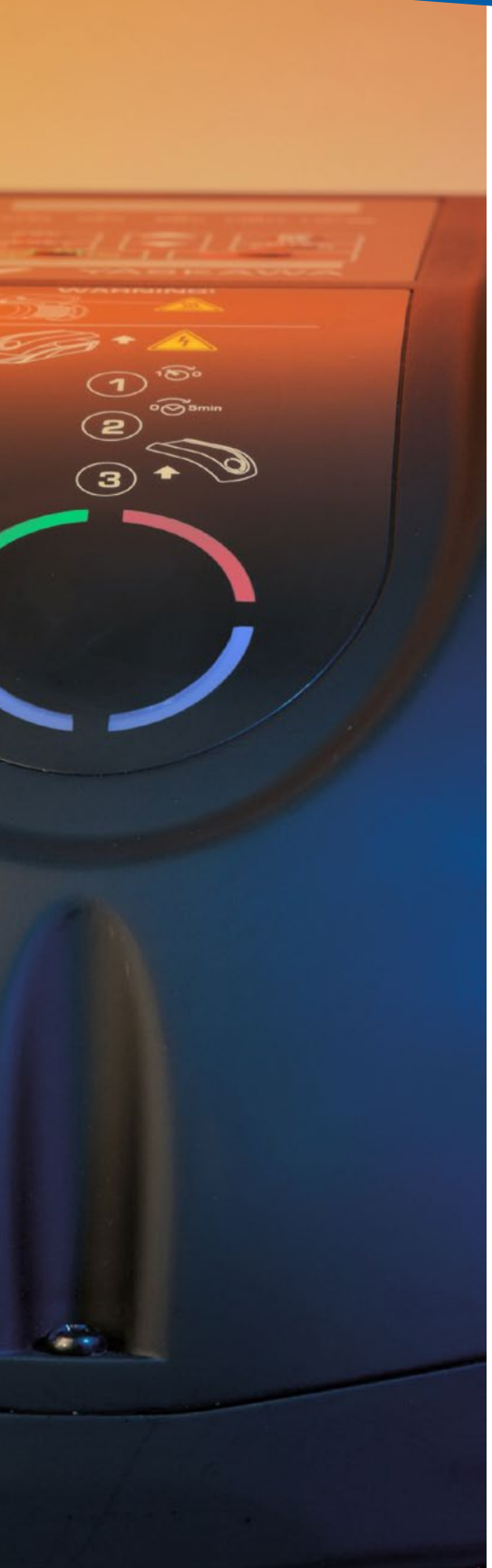
МаксАЭРО

Частотный преобразователь Yaskawa V1000 MMD

МаксАЭРО

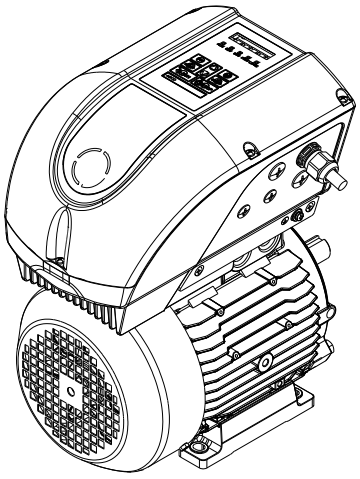
More freedom - lower cost

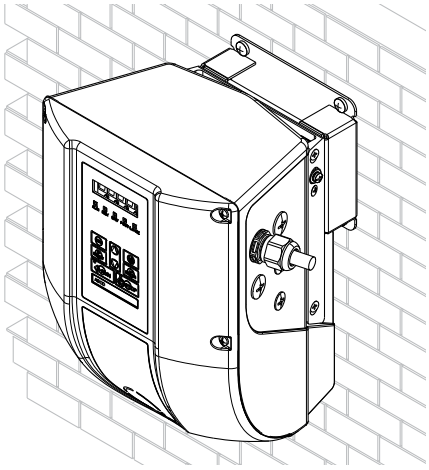


V1000 MMD - Flexible to operate

The V1000 MMD is a frequency converter for decentralized use. It can be mounted directly on the motor, or installed directly next to the motor on the wall. Decentralized drive solutions are always in demand when a classic design in the control cabinet reaches its limits. Costs for wiring and cooling are minimized thanks to its decentralized mounting outside the control cabinet. And no additional space is needed in the control cabinet. This solution also offers flexibility for energy-efficient retrofits on existing installations.

The V1000 MMD is the perfect solution for a variety of applications in combination with an asynchronous motor or a high-efficiency permanent magnet motor. The proven YASKAWA technology works on the inside, and the Motor Mounted Drive offers all functions of the V1000.





The V1000 MMD is a versatile frequency inverter for different motor types and operating modes. It offers a variety of functions, is reliable and especially easy to use. This is the first choice for many applications, such as pumps, transport systems, fans and blowers.

More time

Installation is quickly accomplished thanks to the presets for common applications, such as pumps and fans, so you can spend your time on more important things.

More space

You can find space everywhere for the V1000 MMD. You can extend existing installations without the need for an additional control cabinet.
The V1000 MMD also provides reliable operation in rough environments. The IP65 housing ensures that dirt stays away from all working parts.

More energy efficiency

Conventional motors can be easily converted to speed control with the V1000 MMD. This enables great energy saving potentials in applications like pumps and fans. Efficiency can be improved even more when combined with a perfectly coordinated high-efficiency permanent magnet motor.
The integrated cooling system reduces heat radiation and makes external ventilation unnecessary.

Less components to handle

No shielded cables required. The EMC filter is already integrated in the unit. Thus the V1000 MMD saves money.

A highly-efficient system, right where it's needed

The V1000 MMD offers the flexibility of a decentralized installation combined with outstanding efficiency. The V1000 MMD can also be combined with a highly-efficient permanent magnet motor in order to reach energy efficiency class IE4+ for maximum energy savings.

Proven V1000 functionalities

- Highly-efficient vector controls for asynchronous and permanent magnet motors
- SIL2 STO built-in
- Motor speed search functions
- Integrated PID controller
- Speed Search
- PLC functionality
- Supports all common field busses

DeviceNet EtherNet/IP EtherCAT

ETHERNET POWERLINK MECHATROLINK II/III Modbus /TCP

PROFIBUS PROFINET CC-Link CANopen

Compact and versatile

- Decentralized mounting directly on the motor or on a wall outside of the control cabinet
- 400 V, 1.5 to 5.5 kW (Dual Rating HD/ND)
- IP65 protection class
- Installed C1 EMC filter
- Large control panel with push buttons
- Easy-to-read LED display and status lights

V1000 MMD
+ SPRiPM Motor
= 100% Efficiency

Decentralized V1000 frequency converter

By mounting it directly on the motor, or next to the motor, you save the costs of long, shielded cables, reduce space needs in the control cabinet and minimize cooling needs. Thus the V1000 MMD package is a simple solution if you want to save space and energy and reduce costs.

- Great space-savings and flexible installation opportunities.
  No control cabinet needed
- Expensive shielded cables are not needed
- A low-cost alternative for new machines and systems.
  Ideal for conversions, retrofits or extension of existing machines and systems
- Integrated functional safety (STO) replaces motor protection for emergency stops
- Integrated speed search function gently starts the spinning drives and protects the mechanics, ideal for fans, pumps, transport systems and blowers, among others
- High torque, even at low speeds

Simple installation - reliable operation

The V1000 MMD reduces installation time and costs. It can be installed in the smallest spaces, needs very little installation time, and offers all the benefits of a modern, state of the art frequency converter. The V1000 MMD decentralized solution is based on the reliable and user-friendly V1000 technology.

- Pre-set application parameters shorten set-up times
- Simple handling and parameter structure
- Short reaction time to load and RPM changes improve machine performance
- DriveWorksEZ visual programming tool
- Can be combined with many motors
- Also offered as a highly-efficient drive package together with a SPRiPM motor

The highly-efficient drive package

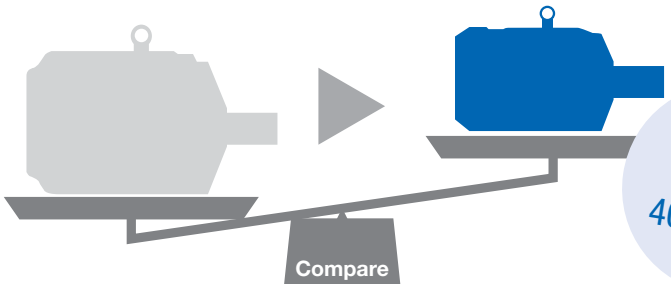
An investment in a SPRiPM drive package is amortized quickly thanks to its significantly lower energy costs. The perfect solution to fulfil future ErP requirements today, as well as a simple option to save costs and be good to the environment. YASKAWA offers its customers a highly-efficient, decentralized drive solution when combined with the V1000 MMD.

Lighter, space-saving motor

YASKAWA's SPRiPM motors are highly-efficient permanent magnet motors which exceed strict IE4 standards. They operate at very high efficiency even in moderate speed ranges. In addition, SPRiPM motors are smaller and lighter than conventional motors, up to 50% in comparison to conventional IE2 models.
The V1000 MMD frequency converter and SPRiPM motors' strengths are maximized when combined. They form a compact, flexible, reliable and extraordinarily efficient solution for a variety of demanding applications.

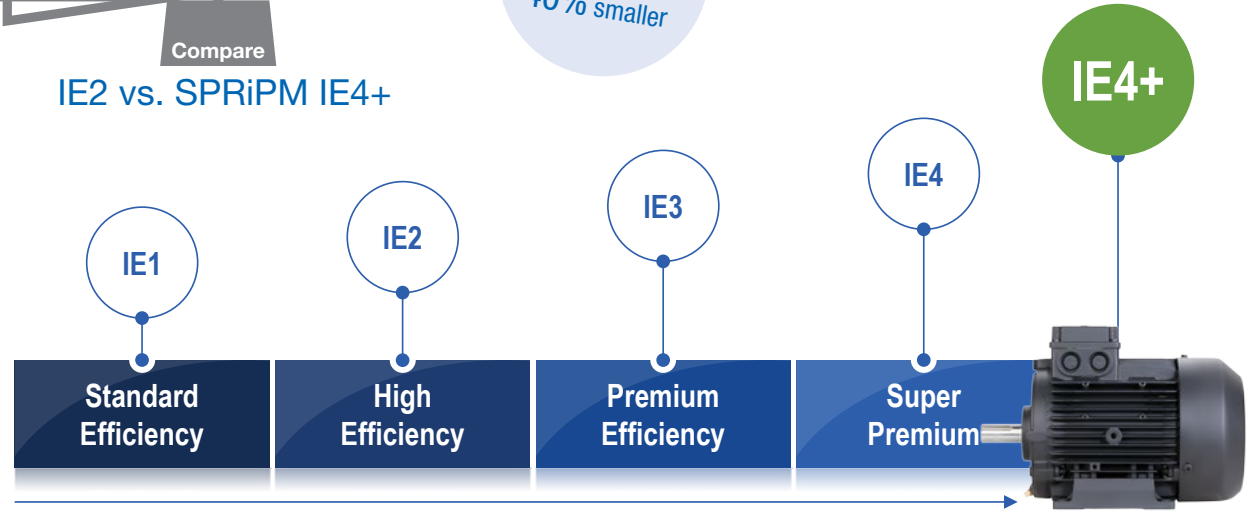
- Minimal space needs for installation, up to two sizes smaller than IE2 asynchronous motors
- For smaller and lighter machines
- Less inertia, greater dynamics
- Improved performance without changing mechanicals
- Lower current, smaller drivers, lower installed power

Super Premium Efficiency
even better than specified by IE4



IE2 vs. SPRiPM IE4+

Up to 50% lighter and 40% smaller



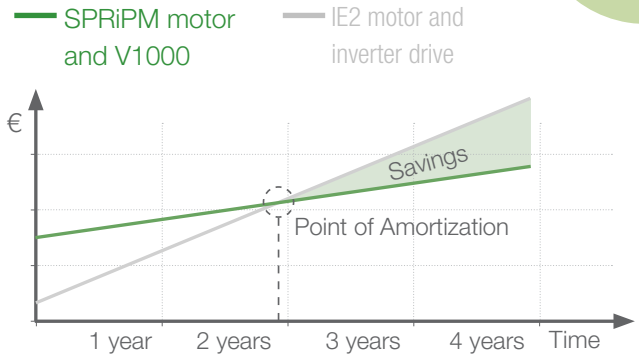
The advantage of the SPRiPM package

The SPRiPM motor and V1000 MMD inverter drive package requires higher initial investment than a solution with IE2 motor and inverter drive, but the SPRiPM drive package pays for itself within a stunningly short time in a broad range of applications - very often in less than 2 years. From the point of amortization onwards, the SPRiPM drive package saves a significant amount of money.

Pays for itself in less than 2 years

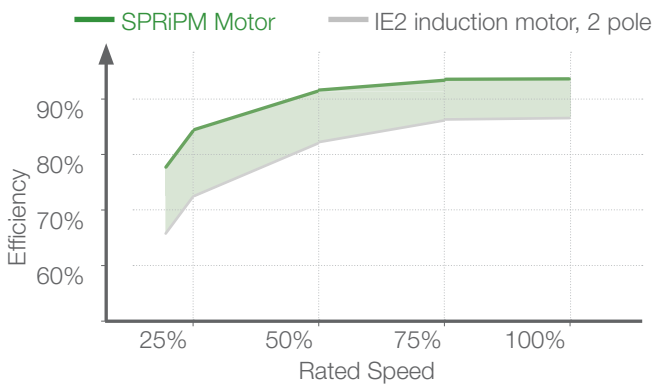
Example

Motor power	4.0 kW
Rated Speed	3000 min^{-1}
Average load	85 %
Operating Hours	16 hours a day, 5 days a week, 45 weeks a year = 3600 h
Energy cost	0.13 €/kWh
IE2 energy consumption	14,266 kWh
SPRiPM energy consumption	13,540 kWh

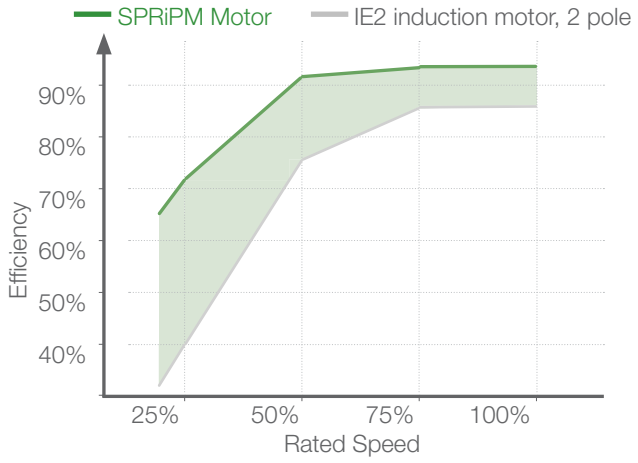


Best efficiency at any speed and load

Most motor applications operate at moderate RPM's and loads. Thus efficiency at partial loads is an important factor for energy-savings, moreso than efficiency at nominal RPM. In contrast to many other motor solutions, SPRiPM motors offer premium efficiency over the entire range of RPM and loads.



Constant torque applications e.g. compressors, conveyors ...

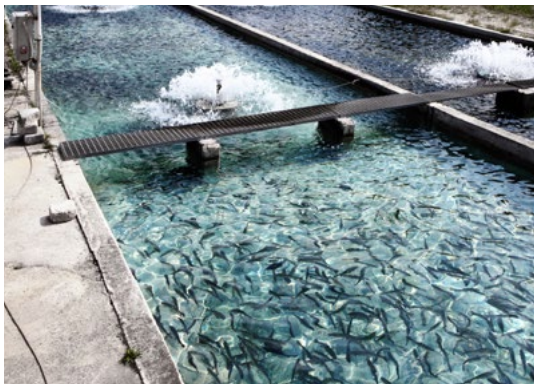


Variable torque applications e.g. pumps and fans ...

Source: University of Coimbra, Portugal

For a wide range of applications

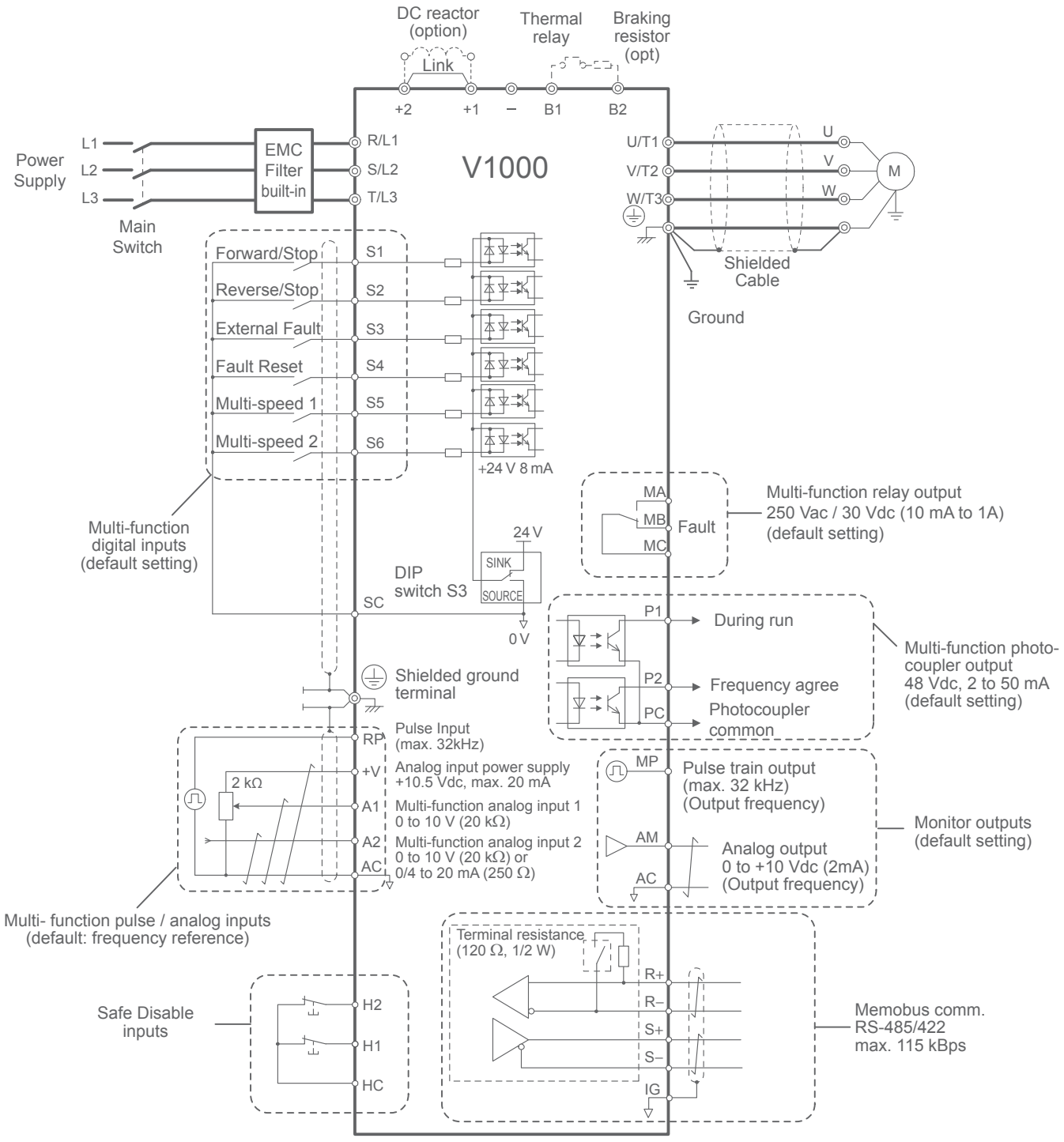
The V1000 MMD can be deployed in a variety of areas, saving energy and costs. It offers a great degree of functionality and reliability as well as being easier to use, and is thus ideally suited for a broad area of applications.



- Pumps
- Fans and blowers
- Compressors

- Conveyor belts
- Transport systems
- and many other applications

Connection diagram

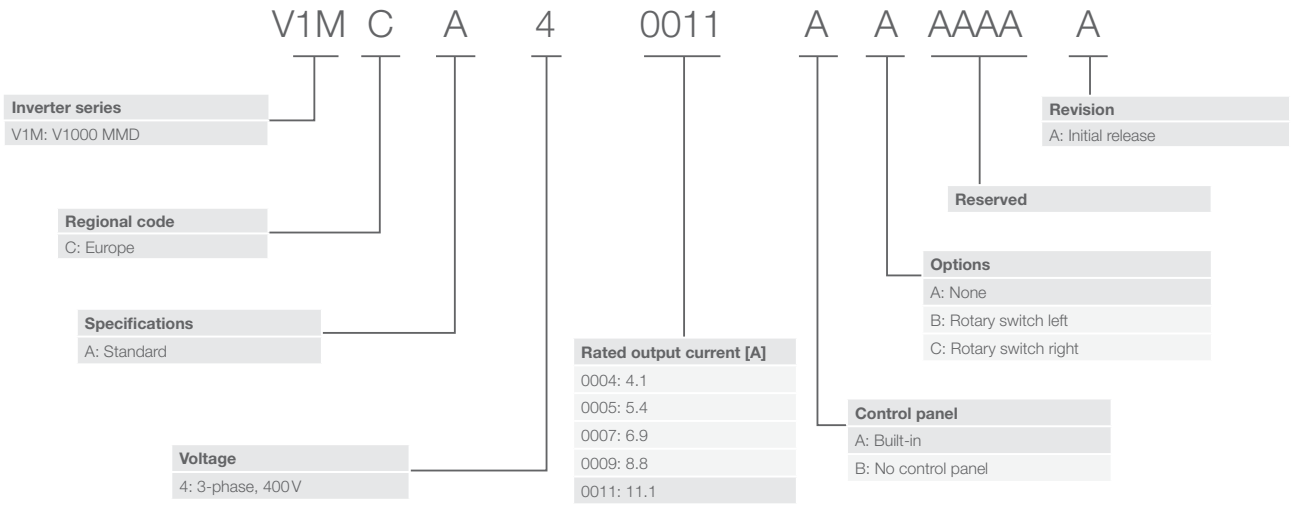


Symbols:

- Use twisted pair cables.
- Use shielded twisted pair cables.
- Indicates a main circuit terminal.
- Indicates a control circuit terminal.

Specifications

Model code



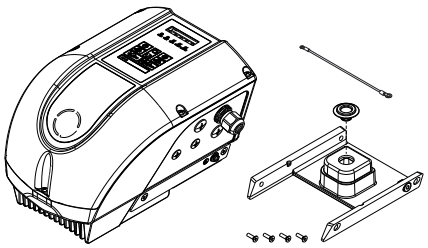
Drive specifications

Operating environment	
Ambient temperature	-10 to +40 °C (+60 °C with performance reduction)
Humidity	95 % RH or less (non-condensing)
Storage temperature	-20 to +60 °C (short-term temperature during transportation)
Installation height above sea level	Up to 1,000 meters (output derating required above 1,000 m, max. 3,000 m)
Shock	10 to 20 Hz: 9.8 m/s²; 20 to 55 Hz: 5.9 m/s²
Degree of protection	IP65
Standards	UL508C, IEC/EN 61800-3, IEC/EN 61800-5-1, ISO/EN 13849-1 Cat.3 PLd, IEC/EN 61508 SIL2
Power ratings	
Input voltage	380 to 480 VAC 50/60 Hz (-15 % to +10 %)
Rated input frequency	50/60 Hz ± 5 %
Output frequency	0 to 400 Hz
Overload capability	Heavy Duty: 150 % for 1 min Normal Duty: 120 % for 1 min
Carrier frequency	2 - 15 kHz (with performance reduction)

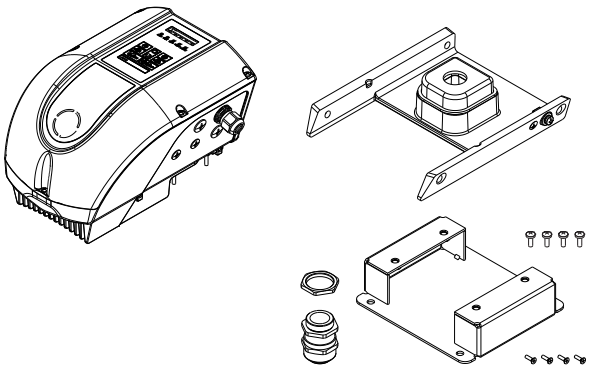
Mounting adapter

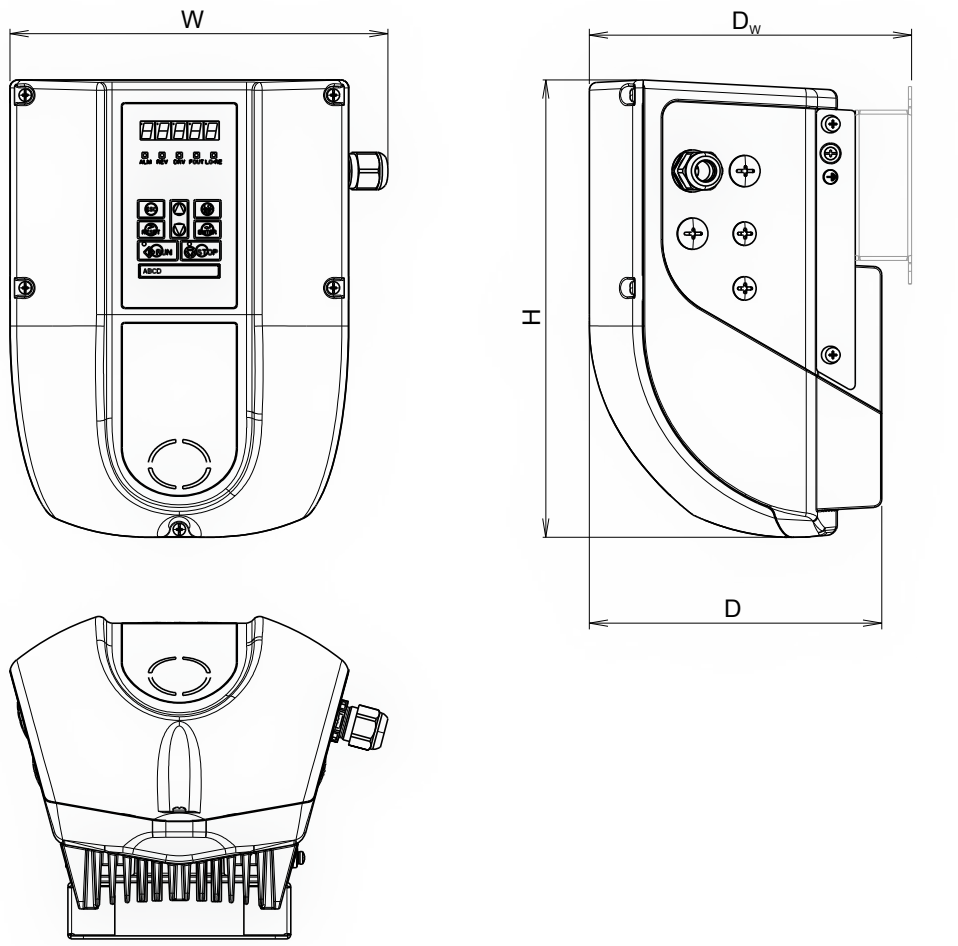
Model code	Description
EUOP-V11015	Mounting kit for SPRiPM motors
EUOP-V11016	MMD wall mounting kit
EUOP-V11017	Mounting kit for motors (Needs work to adapt to the motor terminal board)

Mounting kit for motors



Wall mounting kit





Dimensions

Model V1MCA	Rated Output Current	Dimensions				Weight
		W	H	D	D_W	
40004A	4.1A	241.6mm	293.3mm	186.6mm	170mm (Motor mount)	5.3kg
40005A	5.4A					
40007A	6.9A					5.7kg
40009A	8.8A				206mm (Wall mount)	
40011A	11.1A					6.0kg

Compatible SPRiPM motors

Compatible SPRiPM motors

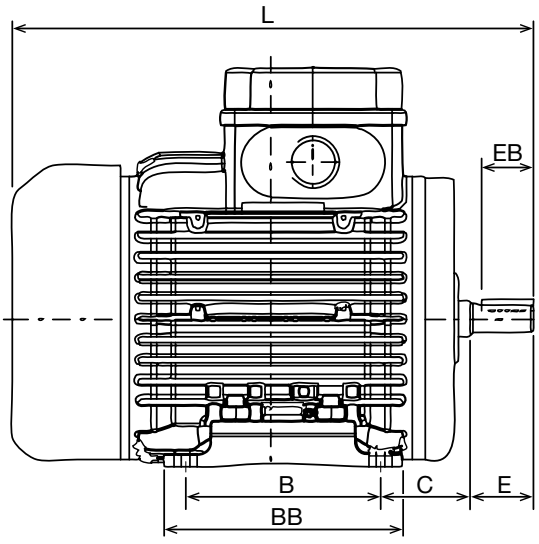
	Inverter model	Rated power	Motor mounting type	Compatible SPRiPM motor
3,000 min^{-1}	V1MCA40005	1.5 kW	B3 - Foot mount	M071M015BMA00000A0000C
			B5 - Flange mount	M071M015BMC00000A0000C
	V1MCA40007	2.2 kW	B3 - Foot mount	M071M022BMA00000A0000C
			B5 - Flange mount	M071M022BMC00000A0000C
	V1MCA40011	4.0 kW	B3 - Foot mount	M071M040BMA00000A0000C
			B5 - Flange mount	M071M040BMC00000A0000C
1,500 min^{-1}	V1MCA40005	1.5 kW	B3 - Foot mount	M071M015BJA00000A0000C
			B5 - Flange mount	M071M015BJC00000A0000C
	V1MCA40007	2.2 kW	B3 - Foot mount	M080M022BJA00000A0000C
			B5 - Flange mount	M080M022BJC00000A0000C
	V1MCA40011	4.0 kW	B3 - Foot mount	M090L040BJA00000A0000C
			B5 - Flange mount	M090L040BJC00000A0000C

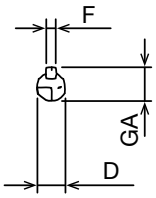
SPRiPM motor data

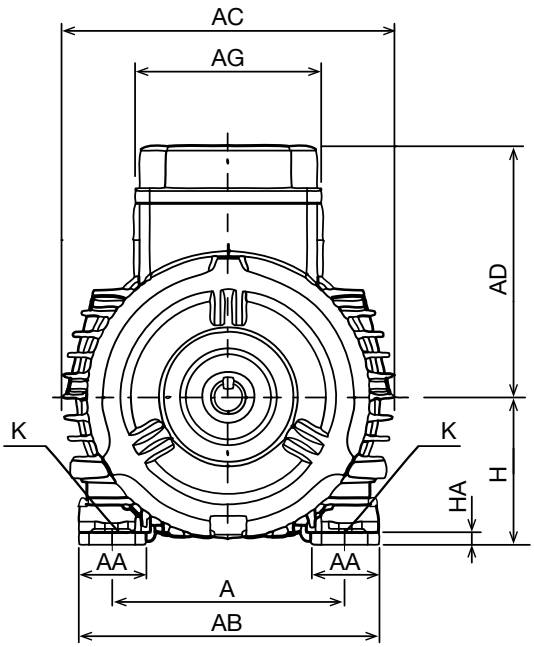
	Motor model	Rated power	IEC installation size	Rated voltage	Rated current	Rated torque	Min. efficiency
3,000 min^{-1}	M071M015BM□00000C0000C	1.5 kW	71	310 V	3.3 A	4.8 Nm	86.5%
	M071M022BM□00000C0000C	2.2 kW	71	280 V	5.3 A	7.0 Nm	88.0%
	M071M040BM□00000C0000C	4.0 kW	71	310 V	8.7 A	12.7 Nm	90.0%
1,500 min^{-1}	M071M015BJ□00000C0000C	1.5 kW	71	310 V	3.3 A	9.6 Nm	88.2%
	M080M022BJ□00000C0000C	2.2 kW	80	310 V	4.7 A	14.0 Nm	89.5%
	M090L040BJ□00000C0000C	4.0 kW	90	310 V	8.4 A	25.5 Nm	91.1%

SPRiPM motors - foot mounting (B3, aluminum housing)

	Power	Model	Dimensions [mm]																	Weight
			L	A	AA	AB	AC	AD	AG	B	BB	C	D	E	EB	F	GA	H	HA	K	
3000 min-1	1.5kW	M071M015BM	250	112	32	144	160	121	90	90	115	45	14	30	25	5	16	71	6	Ø7 x 13	11kg
	2.2kW	M071M022BM	250	112	32	144	160	121	90	90	115	45	14	30	25	5	16	71	6	Ø7 x 13	11kg
	4.0kW	M071M040BM	250	112	32	144	160	121	90	90	115	45	14	30	25	5	16	71	6	Ø7 x 13	11kg
1500 min-1	1.5kW	M071M015BJ	250	112	32	144	160	121	90	90	115	45	14	30	25	5	16	71	6	Ø7 x 13	11kg
	2.2kW	M080M022BJ	269	125	32	160	176	129	90	100	125	50	19	40	25	6	21.5	80	8	Ø10 x 12	13kg
	4.0kW	M090L040BJ	328	140	35	176	192	136	90	125	150	56	24	50	36	8	27	90	10	Ø10 x 12	19kg



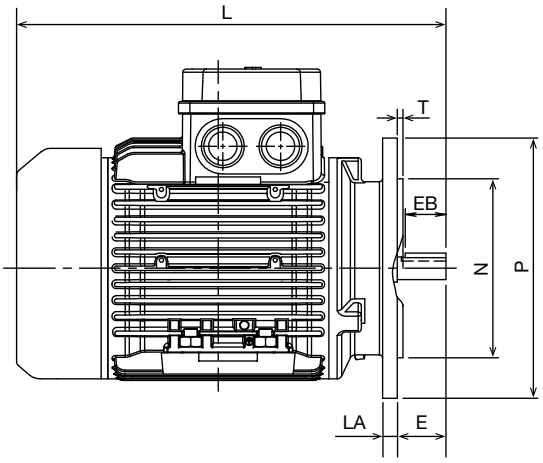


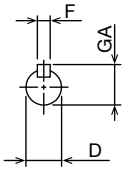


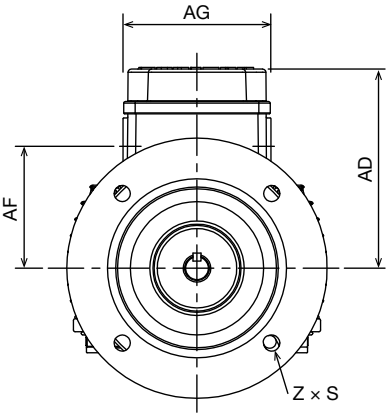
SPRiPM motors - flange mounting (B5, aluminum housing)

	Power	Model	Dimensions [mm]													Weight
			L	AD	AF	AG	D	E	EB	F	GA	LA	N	P	T	Z × S (P.C.D.*)	
3000 min-1	1.5kW	M071M015BM	264	121	75	90	14	30	25	5	16	9	110	160	3.5	4× Ø10 (130)	13kg
	2.2kW	M071M022BM	264	121	75	90	14	30	25	5	16	9	110	160	3.5	4× Ø10 (130)	13kg
	4.0kW	M071M040BM	264	121	75	90	14	30	25	5	16	9	110	160	3.5	4× Ø10 (130)	13kg
1500 min-1	1.5kW	M071M015BJ	264	121	75	90	14	30	25	5	16	9	110	160	3.5	4× Ø10 (130)	13kg
	2.2kW	M080M022BJ	274	129	83	90	19	40	25	6	21.5	10	130	200	3.5	4× Ø12 (165)	16kg
	4.0kW	M090L040BJ	361	136	90	90	24	50	36	8	27	12	130	200	3.5	4× Ø12 (165)	23kg

* Pitch circle diameter







Z: Number of mounting holes