



**Contents**

Introduction .....2

    Features .....2

    Applications .....3

Specifications .....3

    230V\_ Single-Phase .....3

    230V\_ Three-Phase .....4

    430V\_ Three-Phase .....5

    General Specifications .....6

    IP Rating .....8

Dimensions .....9

    Dimensions and Models for Plastic Cable Glands ..... 12

Ordering Information ..... 13

    Model Name ..... 13

    Option Cards ..... 13

    Optional Accessories ..... 13

## Introduction

### MS300 IP66/NEMA 4X



## Features

- Supports Open-loop control of IM and PM motors
- Supports FOC sensorless and TQC sensorless control for IM motors, PMSVC for PM motors.
- Max. output frequency: 599.00 Hz
- Over load capability:
  - Factory default , Heavy Duty (HD), 150% of rated output current for 60 s
  - Normal Duty (ND), 120% of rated output current for 60 s
- Integrated PLC program with 2K steps capacity
- Built-in brake choppers for the entire series
- Built-in EMC filter (optional)
- Built-in 5-digit LED keypad
- Safety standard compliance: Safe Torque Off (SIL2/PL d)
- Supports 4 independent induction motor switching control
- Built-in high speed (33 KHz) pulse input terminals (MI7) and output terminals (DFM)
- Built-in one slot do communication card installation : CANopen, PROFIBUS DP, DeviceNet, MODBUS TCP, EtherNet/IP, EtherCAT
- Optional disconnect switch accessory (as below Fig.), when there is a need to isolate the drive and enable a safe working environment for maintenance as and servicing.

## Applications

Food and Beverage, pumps manufacturing and other humid and dusty operating environments

• Beverage Manufacturing



• Food Manufacturing



• Pumps Manufacturing



## Specifications

### 230V\_Single-Phase

Frame			A1		A2		B		
Model VFD_____ SAA			2A8MS21 <input type="checkbox"/>		4A8MS21 <input type="checkbox"/>		11AMS21 <input type="checkbox"/>		
			<input type="checkbox"/> MN	<input type="checkbox"/> MF	<input type="checkbox"/> MN	<input type="checkbox"/> MF	<input type="checkbox"/> MN	<input type="checkbox"/> MF	
Applicable Motor Output (kW)			0.4		0.75		2.2		
Applicable Motor Output (HP)			0.5		1		3		
Output	HD	Rated Output	1.1		1.8		4.2		
		Capacity (kVA)	1.1		1.8		4.2		
	ND	Rated Output	2.8		4.8		11		
		Current (A)	2.8		4.8		11		
ND	Rated Output	1.2		1.9		4.8			
	Capacity (kVA)	1.2		1.9		4.8			
ND	Rated Output	3.2		5		12.5			
	Current (A)	3.2		5		12.5			
Input	Rated Input Current (A)	HD	7.3		10.8		24.2		
		ND	8.3		11.3		27.5		
	Rated Voltage /Frequency		Single-Phase 200 – 240 V <sub>AC</sub> (-15 % ~ +10 %), 50/60 Hz						
	Mains Input Voltage Range (V <sub>AC</sub> )		170 – 264 V <sub>AC</sub>						
Mains Frequency Range (Hz)		47~63							
Cooling Method			Convective cooling				Fan cooling		
EMC Filter			Optional	Built-in	Optional	Built-in	Optional	Built-in	



230V\_ Three-Phase

Frame			A1	A2	B	C		
Model VFD_----- _SAA			2A8MS23MN	4A8MS23MN	7A5MS23MN	11AMS23MN	17AMS23MN	25AMS23MN
Applicable Motor Output (kW)			0.4	0.75	1.5	2.2	3.7	5.5
Applicable Motor Output (HP)			0.5	1	2	3	5	7.5
Output	HD	Rated Output Capacity (kVA)	1.1	1.8	2.9	4.2	6.5	9.5
		Rated Output Current (A)	2.8	4.8	7.5	11	17	25
		Rated Output Capacity (kVA)	1.2	1.9	3.0	4.8	7.4	10.3
	ND	Rated Output Current (A)	3.2	5	8	12.5	19.5	27
		Rated Input Current (A)	3.4	5.8	9.0	13.2	20.4	30
	Input	Rated Input Current (A)	ND	3.8	6.0	9.6	15	23.4
Rated Voltage/ Frequency		Three-Phase 200 – 240 V <sub>AC</sub> (-15 % ~ +10 %), 50/60 Hz						
Mains Input Voltage Range (V <sub>AC</sub> )		170 – 264 V <sub>AC</sub>						
Mains Frequency Range (Hz)		47~63						
Cooling Method			Convective cooling			Fan cooling		
EMC Filter			Optional					



# New Product Release

# Newsletter

## 430V\_ Three-Phase

Frame			A1				A2		A3
Model VFD_----- SAA			1A5MS43		2A7MS43		4A2MS43		5A5MS43MN
			MN	MF	MN	MF	MN	MF	
Applicable Motor Output (kW)			0.4		0.75		1.5		2.2
Applicable Motor Output (HP)			0.5		1		2		3
Output	HD	Rated Output Capacity (kVA)	1.1		2.1		3.2		4.2
		Rated Output Current (A)	1.5		2.7		4.2		5.5
	ND	Rated Output Capacity (kVA)	1.4		2.3		3.5		5.0
		Rated Output Current (A)	1.8		3		4.6		6.5
Input	Rated Input Current (A)	HD	2.1		3.7		5.8		6.1
		ND	2.5		4.2		6.4		7.2
	Rated Voltage / Frequency		Three-Phase 380 – 480 V <sub>AC</sub> (-15 % ~ +10 %), 50/60 Hz						
	Mains Input Voltage Range (V <sub>AC</sub> )		323 - 528 V <sub>AC</sub>						
Mains Frequency Range (Hz)		47~63							
Cooling Method			Convective cooling						
EMC Filter			Optional	Built-in	Optional	Built-in	Optional	Built-in	Optional

Frame			B				C			
Model VFD_----- SAA			5A5MS43MF		9A0MS43		13AMS43		17AMS43	
					MN	MF	MN	MF	MN	MF
Applicable Motor Output (kW)			2.2		3.7		5.5		7.5	
Applicable Motor Output (HP)			3		5		7.5		10	
Output	HD	Rated Output Capacity (kVA)	4.2		6.9		9.9		13	
		Rated Output Current (A)	5.5		9		13		17	
	ND	Rated Output Capacity (kVA)	5.0		8.0		12		15.6	
		Rated Output Current (A)	6.5		10.5		15.7		20.5	
Input	Rated Input Current (A)	HD	6.1		9.9		14.3		18.7	
		ND	7.2		11.6		17.3		22.6	
Rated Voltage / Frequency		Three-Phase 380 – 480 V <sub>AC</sub> (-15 % ~ +10 %), 50/60 Hz								

Mains Input Voltage Range (V <sub>AC</sub> )	323 - 528 V <sub>AC</sub>						
Mains Frequency Range (Hz)	47~63						
Cooling Method	Fan cooling						
EMC Filter	Built-in	Optional	Built-in	Optional	Built-in	Optional	Built-in

## General Specifications

<b>Control Characteristics</b>	Control Method	V/F, SVC, FOC Sensorless	
	Applied Motor	IM, PM (IPM, SPM)	
	Max. output frequency (HZ)	599.00	
	Starting Torque	150%/3 Hz	V/F, SVC control for IM, Heavy duty
		200%/0.5 Hz	FOC control for IM, Heavy duty
	[Note 1]	100%/(1/20 of motor rated frequency)	SVC control for PM, Heavy duty
	Speed Control	1 : 50	V/F, SVC control for IM, Heavy duty
		1 : 100	FOC control for IM, Heavy duty
	Range [Note 1]	1 : 20	SVC control for PM, Heavy duty
	Overload Capability	Heavy Duty (HD): 150% 60 sec., 200% 3 sec. (Factory default) Normal Duty (ND): 120% 60 sec., 150% 3 sec.	
Frequency Setting Signal	0-10 V / -10-10 V		
	4-20 mA / 0-10 V		
Main Function	1 channel pulse input (33 kHz), 1 channel pulse output (33 kHz)		
	Multiple motor switching (maximum four independent motor parameter settings), Fast start-up, Deceleration Energy Back (DEB) function, Wobble frequency function, Fast deceleration function, Master and Auxiliary frequency source selectable, Momentary power loss ride thru, Speed search, Over-torque detection, 16-step speed (including master speed), Accel./Decel. time switch, S-curve Accel./Decel., three-wire sequence, JOG frequency, Frequency upper/lower limit settings, DC injection braking at start and stop, PID control, Integrated PLC (2000 steps), Simple positioning function.		
Application Macro	Built-in application parameter groups (selected by industry) and user-defined application parameter groups.		
<b>Protection Characteristics</b>	Motor Protection	Over-current, Over-voltage, Over-temperature, Phase loss.	
	Stall Prevention	Stall prevention during acceleration, deceleration and running (independent settings).	
<b>Accessory</b>	Communication Cards	DeviceNet, EtherNet/IP, PROFIBUS DP, Modbus TCP, CANopen, EtherCAT	
	External DC Power Supply	EMM-BPS01 (24 V power supply card)	



# New Product Release

# Newsletter

<b>Certifications</b>		UL, CE, C-Tick, TÜV (SIL 2), RoHS, REACH		
<b>Environment</b>	Installation Location	PCB design is compliant with IEC 60364-1 / IEC 60664-1 Pollution Degree 2. The outer case meets IP66 standard for indoor use. If the drive is for outdoor application, avoid direct sunlight.		
	Surrounding Temperature	Operation	IP66 / NEMA 4X / UL Type 4X	-20 ~ 40 °C -20 ~ 50 °C (with derating)
	Altitude	< 1000 m (> 1000 m with derating)		

\*\*Please do not Do not place the drive in a critical environment, such as direct contact with chemical substance and solvent, and exposure to direct sunlight.

## IP Rating

First Digit : Solids Protection			Second Digit : Liquids Protection		
Level	Object size protected against	Effective against	Level	Object size protected against	Effective against
0	Not protected	No protection against contact and ingress of objects	0	Not protected	-
1	>50mm	Any large surface of the body, such as the back of the hand, but no protection against deliberate contact with a body part.	1	Dripping water	Dripping water (vertically falling drops) shall have no harmful effect.
2	>12.5mm	Fingers or similar objects.	2	Dripping water when tilted up to 15°	Vertically dripping water shall have no harmful effect when the enclosure is tilted at an angle up to 15° from its normal position.
3	>2.5mm	Tools, thick wires, etc.	3	Spraying water	Water falling as a spray at any angle up to 60° from the vertical shall have no harmful effect.
4	>1mm	Most wires, screws, etc.	4	Splashing water	Water splashing against the enclosure from any direction shall have no harmful effect.
5	Dust Protected	Ingress of dust is not entirely prevented, but it must not enter in sufficient quantity to interfere with the satisfactory operation of the equipment; complete protection against contact.	5	Water jets	Water projected by a nozzle (6.3mm) against enclosure from any direction shall have no harmful effects.
6	<b>Dust Tight</b>	<b>No ingress of dust; complete protection against contact.</b>	6	<b>Powerful water jets</b>	<b>Water projected in powerful jets (12.5mm nozzle) against the enclosure from any direction shall have no harmful effects.</b>
			7	Immersion up to 1m	Ingress of water in harmful quantity shall not be possible when the enclosure is immersed in water under defined conditions of pressure and time (up to 1 m of submersion).
			8	Immersion beyond 1m	The equipment is suitable for continuous immersion in water under conditions which shall be specified by the manufacturer. Normally, this will mean that the equipment is hermetically sealed. However, with certain types of equipment, it can mean that water can enter but only in such a manner that it produces no harmful effects.

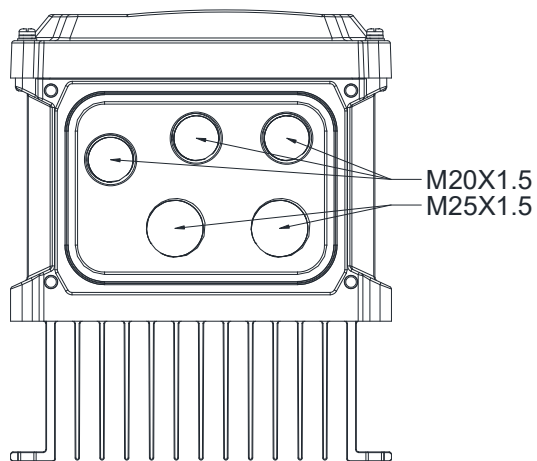
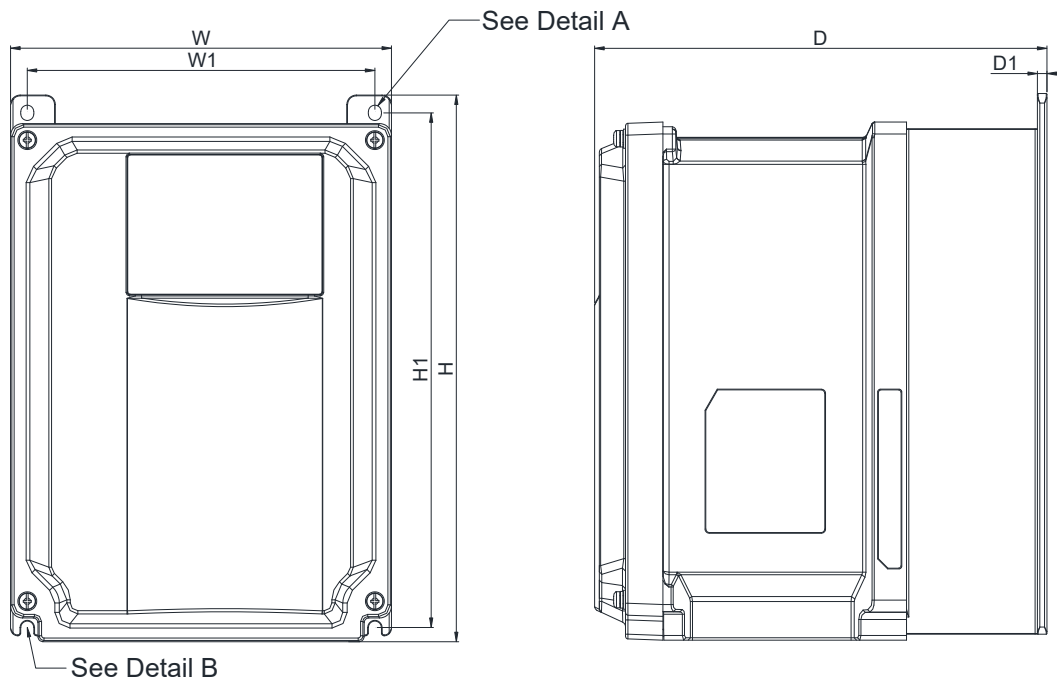


## Dimensions

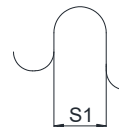
### Frame A

Frame	W	H	D	W1	H1	D1	S1
A1	160.0 [6.30]	230.0 [9.06]	151.0 [5.94]	146.0 [5.75]	216.5 [8.52]	4.0 [0.16]	5.5 [0.22]
A2	160.0 [6.30]	230.0 [9.06]	167.0 [6.57]	146.0 [5.75]	216.5 [8.52]	4.0 [0.16]	5.5 [0.22]
A3	160.0 [6.30]	230.0 [9.06]	190.0 [7.48]	146.0 [5.75]	216.5 [8.52]	4.0 [0.16]	5.5 [0.22]

Unit: mm (inch)



Detail A (Mounting Hole)

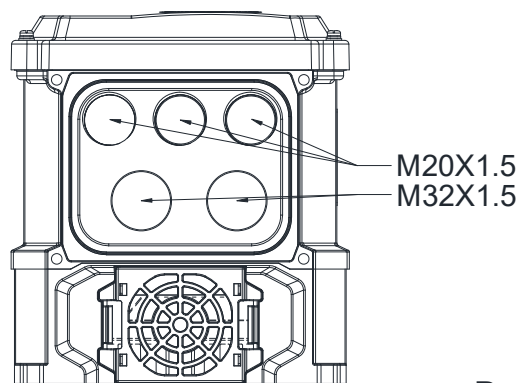
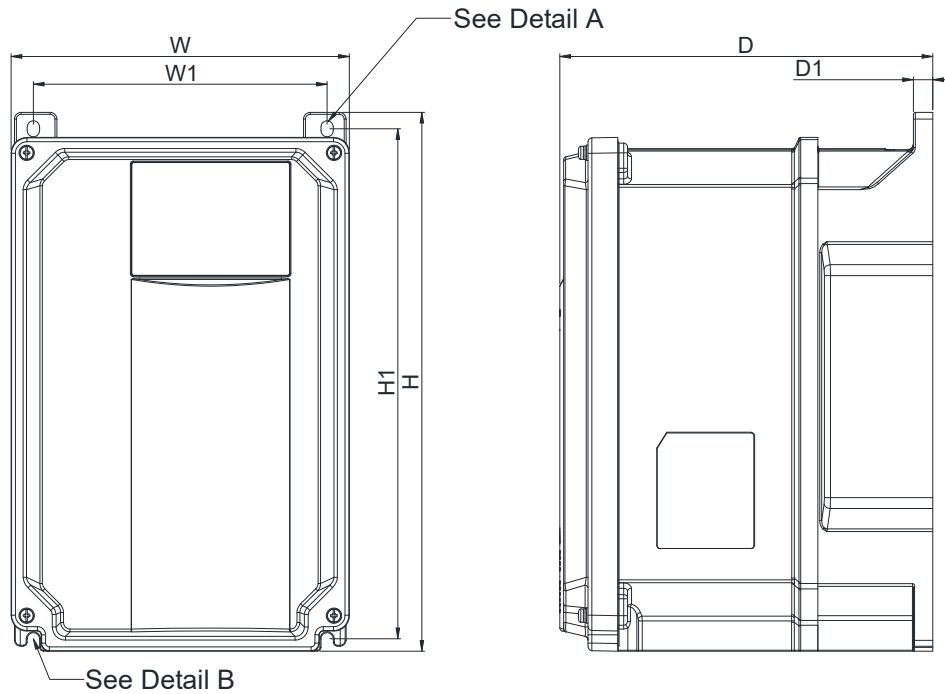


Detail B (Mounting Hole)

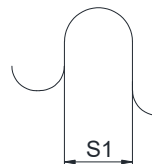
**Frame B**

Frame	W	H	D	W1	H1	D1	S1
<b>B</b>	175.0 [6.89]	280.0 [11.02]	193.0 [7.60]	152.0 [5.98]	266.0 [10.43]	10 [0.39]	6.4 [0.25]

Unit: mm (inch)



Detail A (Mounting Hole)

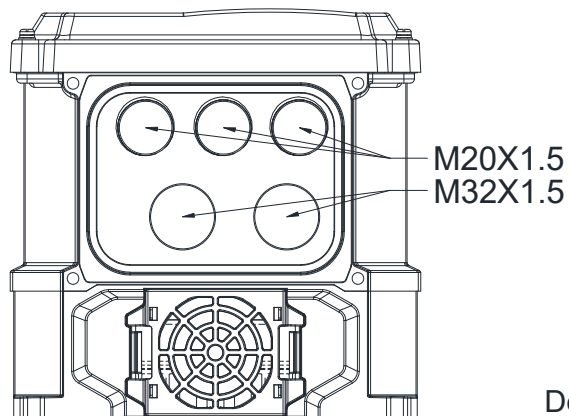
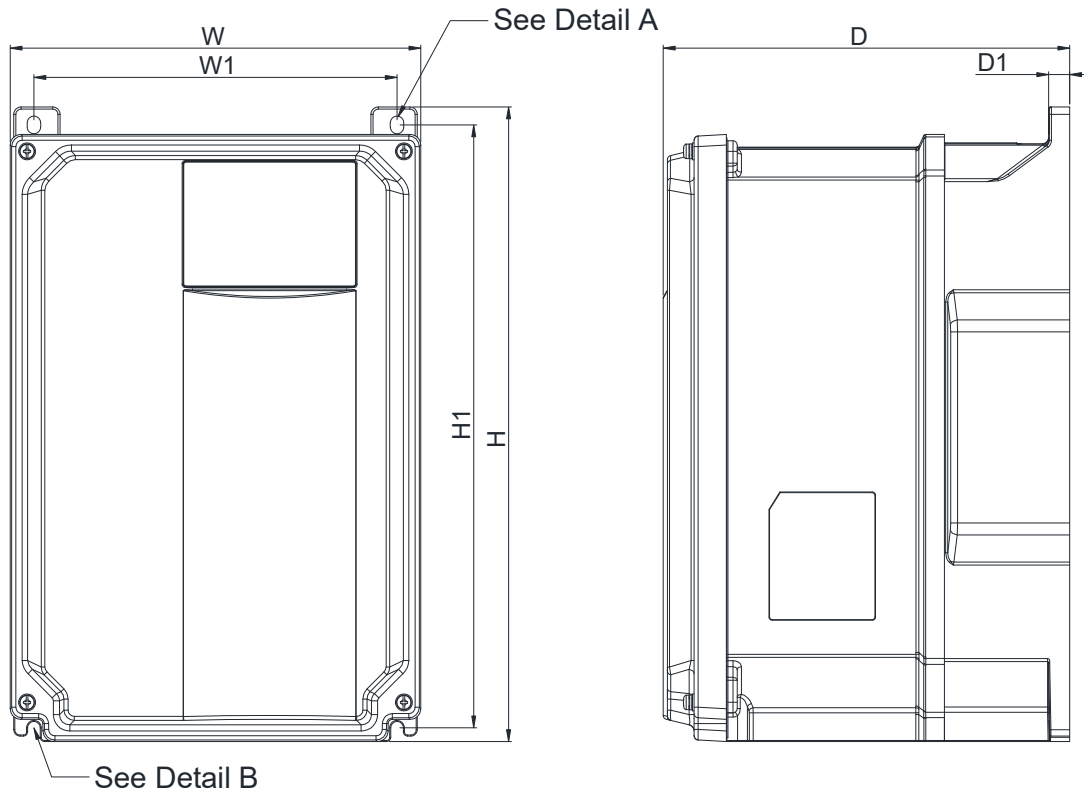


Detail B (Mounting Hole)

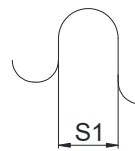
**Frame C**

Frame	W	H	D	W1	H1	D1	S1
C	195.0 [7.68]	300.0 [11.81]	193.0 [7.606]	172.4 [6.79]	285.0 [11.22]	10 [0.39]	6.4 [0.25]

Unit: mm (inch)



Detail A (Mounting Hole)

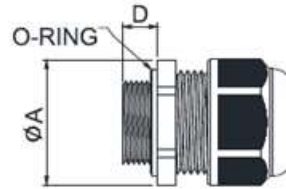
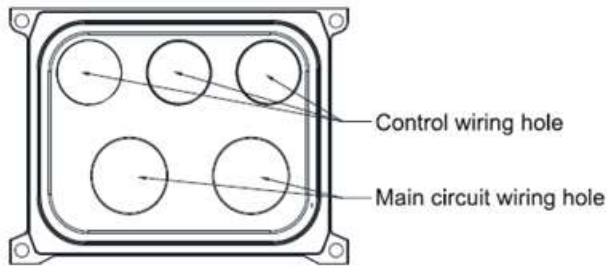


Detail B (Mounting Hole)

**Dimensions and Models for Plastic Cable Glands**

Frame	Function	Screw	D Max.	ØA MAX.	Suggested AVC Category No.* or Equivalent
<b>A</b>	Control Wiring Hole	M20 P1.5	11 [0.43]	31 [1.22]	MG20A-XX
	Main Circuit Wiring Hole	M25 P1.5	11 [0.43]	37 [1.46]	MG25A-XX
<b>B</b>	Control Wiring Hole	M20 P1.5	11 [0.43]	31 [1.22]	MG20A-XX
	Main Circuit Wiring Hole	M32 P1.5	11 [0.43]	47 [1.85]	MG32A-XX
<b>C</b>	Control Wiring Hole	M20 P1.5	11 [0.43]	31 [1.22]	MG20A-XX
	Main Circuit Wiring Hole	M32 P1.5	11 [0.43]	47 [1.85]	MG32A-XX

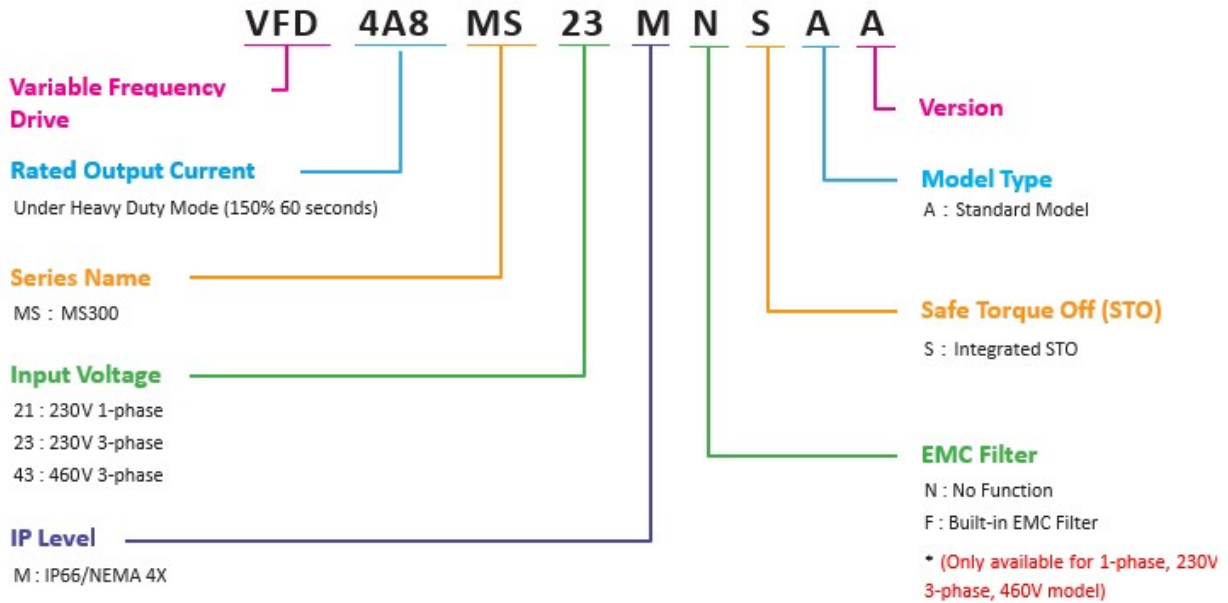
\* -XX means that you select the appropriate AVC Category No. according to the cable outside diameter you use.



\*Plastic cable gland only

## Ordering Information

### Model Name



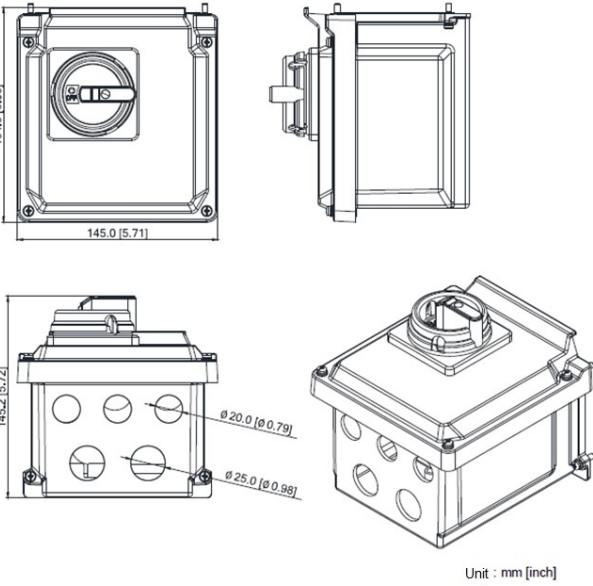
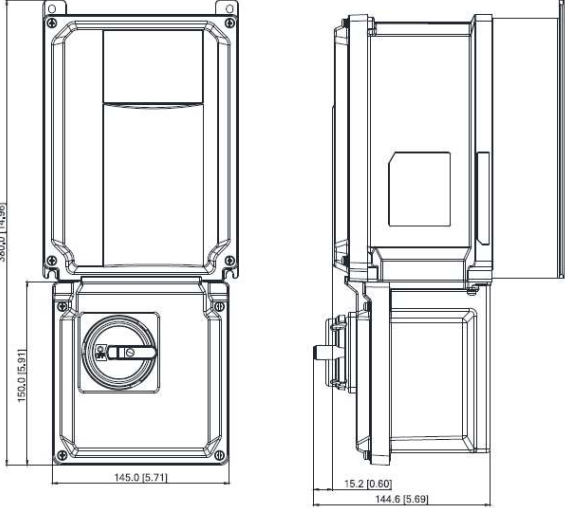
### Option Cards

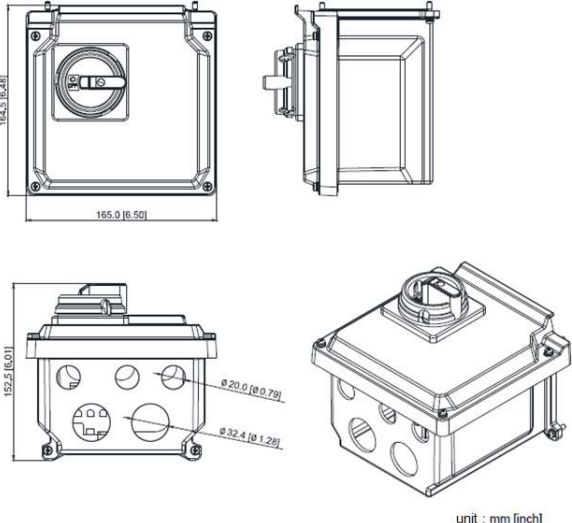
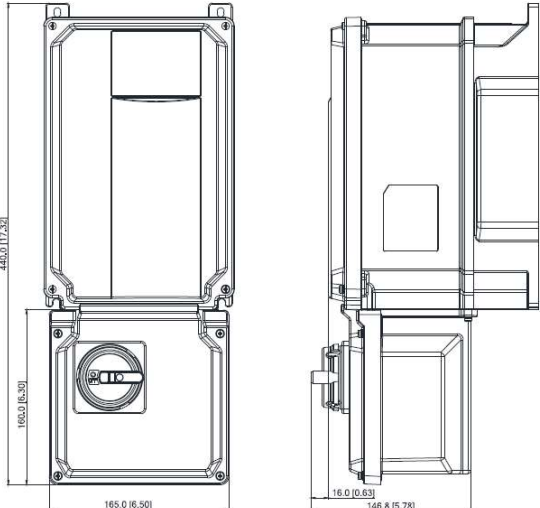
Model	Function
EMM-BPS02	24 V <sub>DC</sub> external power supply
CMM-DN02	DeviceNet communication
CMM-EIP02	EtherNet/IP, Modbus TCP communication
CMM-PD02	Profibus DP communication
CMM-COP02	CANopen communication
CMM-EC02	EtherCAT communication

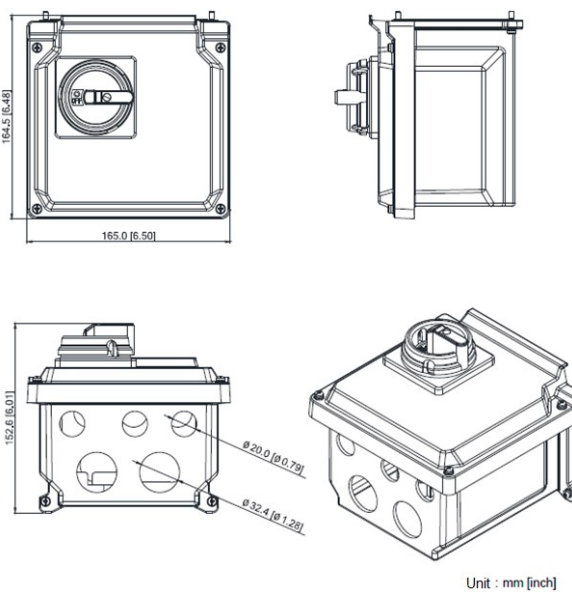
### Optional Accessories

- Brake Resistors
- AC/DC Reactor (IP00)
- Zero Phase Reactors (IP00)
- EMC Filter (IP20)
- EMC Shield Plate
- Capacitive Filter (IP20)
- Fan Kit (IP66)

- Main Switch (IP66)

Main Switch model name: MKMX-SWA Size (mm)	Applicable model: Frame A The drive with MKMX-SWA (mm)
 <p>Unit : mm [inch]</p>	

Main Switch model name: MKMX-SWB Size (mm)	Applicable model: Frame B The drive with MKMX-SWB (mm)
 <p>unit : mm [inch]</p>	

Main Switch model name: MKMX-SWC Size (mm)	Applicable model: Frame C The drive with MKMX-SWC (mm)
 <p>Unit : mm [inch]</p>	