PETER electronic

VersiDrive i
MS3 Series

COMPACT AND INTELLIGENT

The new standard for micro drives

The automation industry today continues to face challenges such as increasing competition and rising costs. In addition to improving productivity and reducing labor, the driving force for automation is the shift to higher efficiency, optimal quality, and most importantly, flexibility and compatibility for a wide range of applications.

Our MS3 series are the new generation high performance and standard compact vector control drives that inherit PETER electronic superior drive technology – all in a compact drive that has been reduced 40% in size.

A variety of essential functions are built-in as standard, including: PLC capacity for simple programming needs, a communication slots for various communication cards, and a USB port to make data uploads and downloads fast and easy. This saves the need for additional hardware, while providing more installation space for the power cabinet.
Other key features include: Support for both IM and PM motor control for application flexibility, an STO function to ensure worry-free operation while protecting facilities from damage, and a simplified wiring process with a new screwless wiring design of terminal blocks for quick installation.

Saving space, reducing setup and wiring time, and providing high efficiency and a highly stable system, the MS3 are your key to improving market competitiveness and ensuring success.

PETER electronic

Overview

Hardware Design

Compact design and user-friendly interface

Removable Keypad

Press to remove; supports remote operation away from drive

5 digits 7 segments LED display, frequency knob, Up and Left/ Down function keys

Removable RFI Jumper

Applicable for different application needs

Built-in USB Port

Easy and fast programming setting, update and real-time monitoring and tuning

Screwless Top Cover Design

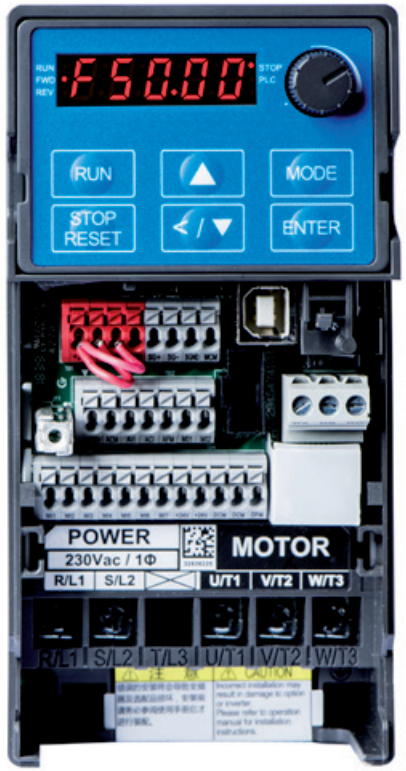
Press on both side tabs to remove the cover

Removable Fan

Easy to replace and maintain for a longer lifetime

Option Cards

A wide selection of option cards for highly flexible applications



External Power Supply Card (DC 24V)

VersiCardM-24VDC

Communication Cards

VersiCardM-PFDB
PROFIBUS DP

VersiCardM-DN
DeviceNet

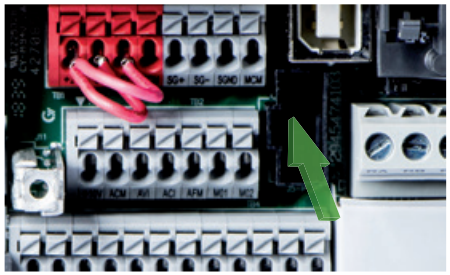
VersiCardM-MbTCP
Modbus TCP

VersiCardM-ENIP
EtherNet/IP

VersiCardM-CAN
CANopen

VersiCardM-ECAT
EtherCAT

Built-in 1 Option Slot



Optimized Space Utilization

Compact Design

Provides more powerful features in smaller sizes with reduction up to 40% that effectively optimizes the installation space

Side-by-Side Installation

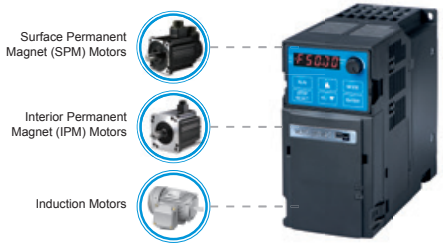
Supports side-by-side installation with operating temperatures of -20˚C ~ 40˚C; enables highly flexible and highly efficient installation

Substantial savings in space!

Outstanding Drive Performance

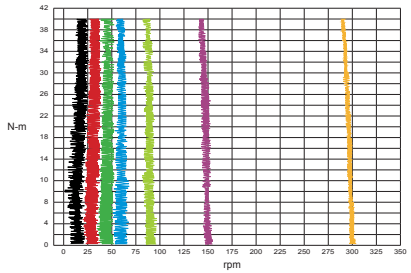
Supports IM and PM Motors

Supports 4 independent induction motor control parameter sets



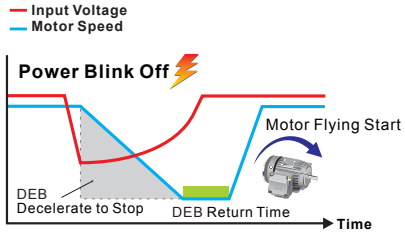
High Starting Torque

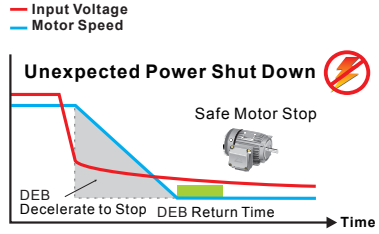
Delivers 200% high starting torque with a low speed control of 0.5 Hz and provides outstanding machine stability; suitable for dynamic loading applications



Deceleration Energy Backup (DEB)

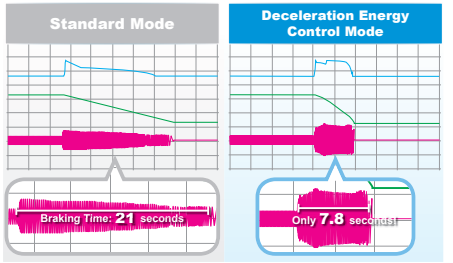
Controls the motor deceleration to a stop when an unexpected power shut-down occurs to prevent mechanical damage. When power resumes, the motor will accelerate to its previous speed





Enhanced Braking Capability

Provides Deceleration Energy Control Mode to shorten braking time by adjusting the motor speed and current, replacing break resistors

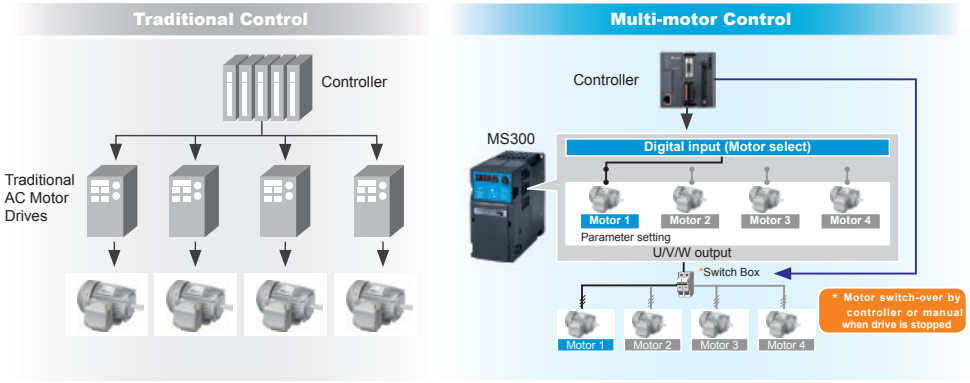


* Actual deceleration performance varies upon different system loads

Strong System Support

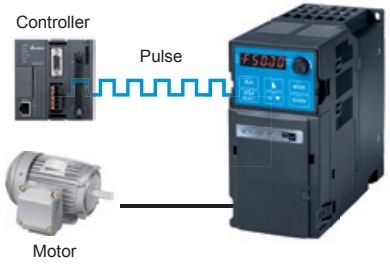
Multi-motor Control

Supports 4 induction motors switching control



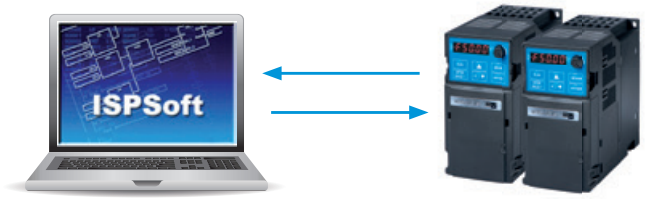
Pulse Input

Supports single pulse input signal from controller as frequency command



Built-in PLC

Built-in PLC capacity (2k steps) to provide distributed control and independent operation via network connection



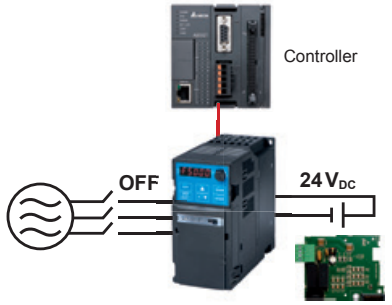
High-Speed Applications

High-speed models are available to support high-speed processing

– upon request

DC 24V External Power

External power supply card is available for external power connection to protect the system and ensure uninterrupted communication when mains power failure occurs



High Overload Capability

- Normal duty: rated current 120% for 60 seconds; 150% for 3 seconds
- Heavy duty: rated current 150% for 60 seconds; 200% for 3 seconds

Built-in Braking Chopper

Larger braking torque capability is provided by using an additional braking resistor

Versatile Communication Interfaces

Built-in RS-485 (Modbus) and various communication card options

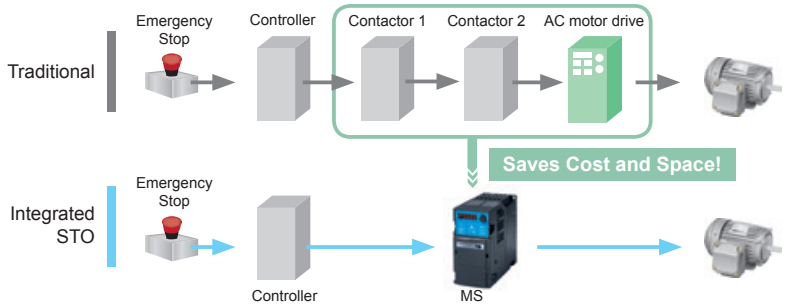
Communication	MS3
Modbus	Built-in
PROFIBUS DP	Optional
DeviceNet	Optional
Modbus TCP	Optional
EtherNet/IP	Optional
CANopen	Optional
EtherCAT	Optional

Stable, Safe and Reliable

Safety Standard

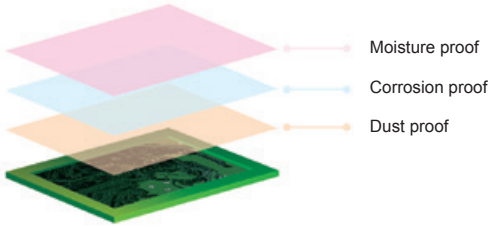
Integrated Safe Torque Off (STO), compliance with:

- ► ISO 13849-1:2015 Category 3 PL d
- ► EN 61508 SIL2
- ► EN 60204-1 Category 0
- ► EN 62061 SIL CL 2



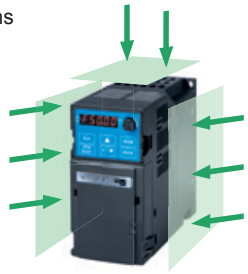
PCB Coating

100% PCB coating (IEC 60721-3-3 class 3C2 standard) ensures drive operation stability and safety in critical environments



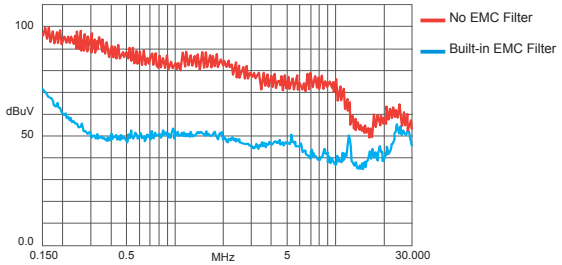
IP40 Models

Strengthened fan coating and concealed air vent prevent dust and other particles from entering the drive, suitable for critical environment applications



Built-in EMC Filter

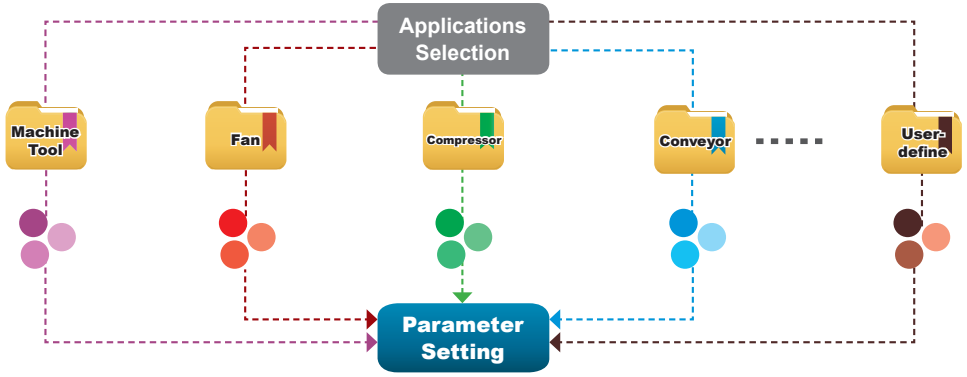
Built-in Class A (C2) standard EMC filter; saves on additional procurement cost and wiring time, and provides more cabinet space for other devices to use



Easy to Install

Application Groups (Macro)

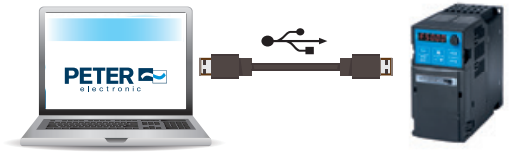
Simplifies the parameter setting process by grouping the parameters for different applications to use



Built-in USB Port

Built-in USB port facilitates the drive setting, updating, real-time monitoring and system tuning process

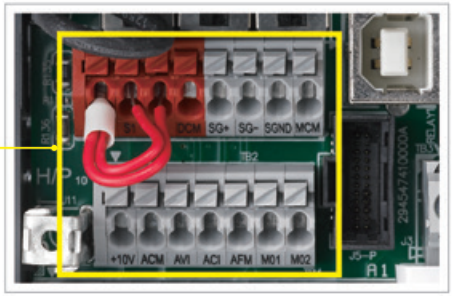
- No need of USB or RS-485 connectors
- Supports offline (drive power off) parameter setting/copying and system update



Screwless Wiring of Control Terminal

Spring clamp terminal blocks provide fast and easy wiring

No need for special tools, and saves wiring time

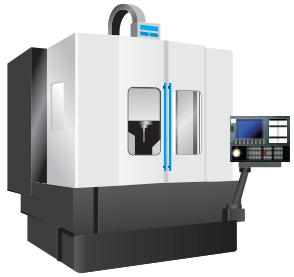


Wide Range of Applications

Machine Tools

Features and Benefits

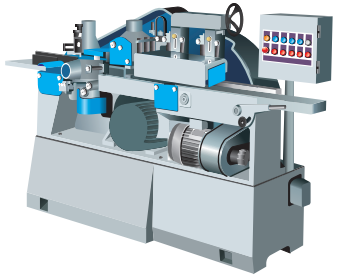
- High-speed models support main spindle 1500Hz frequency output; suitable for complex and high precision processing applications
- Timely acceleration/deceleration control to improve machinery operation efficiency
- Built-in brake chopper to save on purchasing cost
- Built-in PLC capacity for flexible application needs
- Built-in STO function ensures operator safety and effectively reduces accident risk
- Provides deceleration-to-stop function to protect tools from damage and ensure operator safety



Woodworking Machines

Features and Benefits

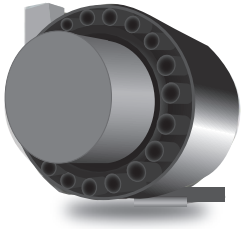
- Timely acceleration/deceleration control improves machinery operation efficiency
- Built-in STO function ensures operator safety and effectively reduces accident risk
- Built-in PLC capacity saves on purchasing cost
- Built-in EMC filter effectively reduces electromagnetic interference
- Compact in size and weight, easy to install and maintain



Automatic Tool Changers (ATC)

Features and Benefits

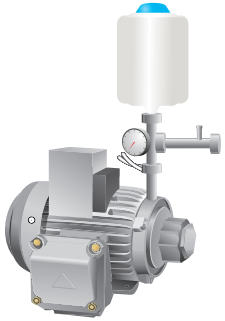
- Compact design of drive provides more cabinet space for other devices to use
- Quick start and timely acceleration/deceleration control function effectively shortens tool changing time and improves system efficiency and productivity
- Simple structure is easy to install and maintain
- Built-in STO function ensures operator safety and effectively reduces accident risk
- Built-in brake chopper saves on purchasing cost



Pump Applications

Features and Benefits

- Built-in PID feedback control
- Built-in PLC capacity saves on purchasing cost of PLC and simpler wiring
- Supports a wide range of input voltages, suitable for various types of pumps application and use in different countries
- Deceleration energy control mode shortens deceleration time and reduces cost and installation space for braking resister



Packaging Machines

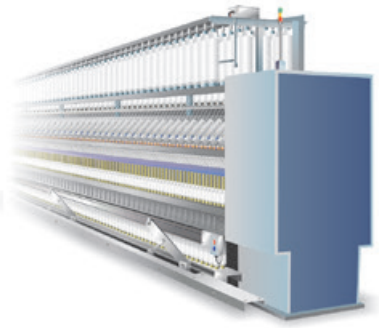
Features and Benefits

- Compact design to save installation space
- Built-in STO function ensures operator safety and effectively reduces accident rate
- Built-in brake chopper saves on system construction cost
- Built-in RS-485 (Modbus) and various communication cards upon selection (optional)
- High-speed pulse input
- Supports frequency command by pulse input to improve control precision

Textile Machines

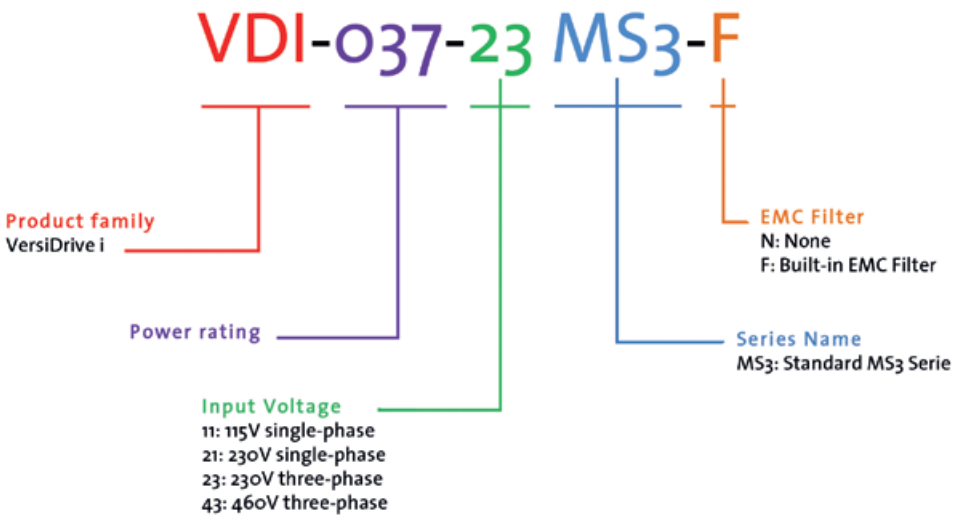
Features and Benefits

- IP40 models provide excellent protection from a high dust, fiber or moisture environment
- Improved heatsink design prevents fiber clogging the air way; modular design of fan is easy to clean and provides longer lifetime
- Improved braking capability shortens the deceleration-to-stop time and is suitable for sudden stop requirements
- Built-in STO function ensures operator safety and effectively reduces accident rate
- Supports both induction motors and PM motors
- Provides deceleration-to-stop function to protect the equipment from damage when sudden power failure occurs



Specifications

Model Name Explanation



Product Specifications

115 V series

115 V series one-phase (without built-in filter)

Model VD i □-11MS3-N			020	037	075
Order number: 2D001.11...			**020**	**037**	**075**
Applicable motor output (kW)			0.2	0.4	0.75
Applicable motor output (HP)			0.25	0.5	1
Output	Heavy duty	Rated output capacity (kVA)	0.6	1.0	1.8
		Rated output current (A)	1.6	2.5	4.8
		Carrier frequency (kHz)	2–15 (Default: 4)		
	Normal duty	Rated output capacity (kVA)	0.7	1.0	2.1
		Rated output current (A)	1.8	2.7	5.5
		Carrier frequency (kHz)	2–15 (Default: 4)		
Input	Rated input current (A)	Heavy duty	6.0	9.4	18
		Normal duty	6.8	10.1	20.6
	Rated voltage/frequency		One-phase 100–120 V AC (-15–10%), 50/60 Hz		
	Mains input voltage range (V AC)		85–132 V AC		
	Mains frequency range (Hz)		47–63 Hz		
Frame size			A1	A3	C1
Weight (kg)			0.65	0.74	1.24
Cooling method			Convective cooling		Fan cooling
EMC filter			Optional		
IP rating			IP20		

230 V series

230 V series one-phase (without built-in filter)

Model VD i □-21MS3-N			020	037	075	150	220
Order number: 2D001.21...			**020**	**037**	**075**	**150**	**220**
Applicable motor output (kW)			0.2	0.4	0.75	1.5	2.2
Applicable motor output (HP)			0.25	0.5	1	2	3
Output	Heavy duty	Rated output capacity (kVA)	0.6	1.1	1.8	2.9	4.2
		Rated output current (A)	1.6	2.8	4.8	7.5	11
		Carrier frequency (kHz)	2–15 (Default: 4)				
	Normal duty	Rated output capacity (kVA)	0.7	1.2	1.9	3.2	4.8
		Rated output current (A)	1.8	3.2	5	8.5	12.5
		Carrier frequency (kHz)	2–15 (Default: 4)				
Input	Rated input current (A)	Heavy duty	3.4	5.9	10.1	15.8	23.1
		Normal duty	3.8	6.7	10.5	17.9	26.35
	Rated voltage/frequency		One-phase 200–240 V AC (-15–10 %), 50/60 Hz				
	Mains input voltage range (V AC)		170–264 VAC				
	Mains frequency range (Hz)		47–63 Hz				
Frame			A1	A3	B2	C1	
AC drive weight (kg)			0.65	0.76	0.95	1.24	
Cooling method			Convective cooling			Fan cooling	
EMC filter			Optional				
IP rating			IP20				

230 V series one-phase (with built-in filter)

Model VD i □-21MS3-F			020	037	075	150	220
Order number: 2D000.21...			**020**	**037**	**075**	**150**	**220**
Applicable motor output (kW)			0.2	0.4	0.75	1.5	2.2
Applicable motor output (HP)			0.25	0.5	1	2	3
Output	Heavy duty	Rated output capacity (kVA)	0.6	1.1	1.8	2.9	4.2
		Rated output current (A)	1.6	2.8	4.8	7.5	11
		Carrier frequency (kHz)	2–15 (Default: 4)				
	Normal duty	Rated output capacity (kVA)	0.7	1.2	1.9	3.2	4.8
		Rated output current (A)	1.8	3.2	5	8.5	12.5
		Carrier frequency (kHz)	2–15 (Default: 4)				
Input	Rated input current (A)	Heavy duty	3.4	5.9	10.1	15.8	23.1
		Normal duty	3.8	6.7	10.5	17.9	26.35
	Rated voltage/frequency		One-phase 200–240 V AC (-15–10 %), 50/60 Hz				
	Mains input voltage range (V AC)		170–264 VAC				
	Mains frequency range (Hz)		47–63 Hz				
Frame				B3		C2	
AC drive weight (kg)				1.32		1.8	
Cooling method			Convec-tive cooling	Fan cooling			
EMC filter			Built-in				
IP rating			IP20				

230 V series three-phase (without built-in filter)

Model VD i □-23MS3-N			020	037	075	150	220
Order number: 2D001.23...			**020**	**037**	**075**	**150**	**002**
Applicable motor output (kW)			0.2	0.4	0.75	1.5	2.2
Applicable motor output (HP)			0.25	0.5	1	2	3
Output	Heavy duty	Rated output capacity (kVA)	0.6	1.1	1.8	2.9	4.2
		Rated output current (A)	1.6	2.8	4.8	7.5	11
		Carrier frequency (kHz)	2–15 (Default: 4)				
	Normal duty	Rated output capacity (kVA)	0.7	1.2	1.9	3.2	4.8
		Rated output current (A)	1.8	3.2	5	8.5	12.5
		Carrier frequency (kHz)	2–15 (Default: 4)				
Input	Rated input current (A)	Heavy duty	1.9	3.4	5.8	9	13.2
		Normal duty	2	3.8	6	9.6	15
	Rated voltage/frequency		Three-phase 200–240 V AC (-15–10 %), 50/60 Hz				
	Mains input voltage range (V AC)		170–264 VAC				
	Mains frequency range (Hz)		47–63 Hz				
Frame			A1	A2	A5	B1	C1
AC drive weight (kg)			0.65	0.68	0.81	1.05	1.24
Cooling method			Convective cooling			Fan cooling	
EMC filter			Optional				
IP rating			IP20				

Model VD i □-23MS3-N			400	550	750	1100	1500
Order number: 2D001.23...			**004**	**005**	**007**	**011**	**015**
Applicable motor output (kW)			3.7	5.5	7.5	11	15
Applicable motor output (HP)			5	7.5	10	15.2	20
Output	Heavy duty	Rated output capacity (kVA)	6.5	9.5	12.6	18.7	24.8
		Rated output current (A)	17	25	33	49	65
		Carrier frequency (kHz)	2–15 (Default: 4)				
	Normal duty	Rated output capacity (kVA)	7.4	10.3	13.7	19.4	26.3
		Rated output current (A)	19.5	27	36	51	69
		Carrier frequency (kHz)	2–15 (Default: 4)				
Input	Rated input current (A)	Heavy duty	20.4	30	39.6	58.8	78
		Normal duty	23.4	32.4	43.2	61.2	82.8
	Rated voltage/frequency		Three-phase 200–240 V AC (-15–10 %), 50/60 Hz				
	Mains input voltage range (V AC)		170–264 VAC				
	Mains frequency range (Hz)		47–63 Hz				
Frame			C1	D1	E1		F1
AC drive weight (kg)			1.24	2.07	3.97		6.25
Cooling method			Fan cooling				
EMC filter			Optional				
IP rating			IP20				

460 V series

460 V series three-phase (without built-in filter)

Model VD i □-43MS3-N			037	075	150	220	400
Order number: 2D001.43...			**037**	**075**	**150**	**220**	**004**
Applicable motor output (kW)			0.4	0.75	1.5	2.2	3.7
Applicable motor output (HP)			0.5	1	2	3	5
Output	Heavy duty	Rated output capacity (kVA)	1.1	2.1	3.2	4.2	6.9
		Rated output current (A)	1.5	2.7	4.2	5.5	9
		Carrier frequency (kHz)	2–15 (Default: 4)				
	Normal duty	Rated output capacity (kVA)	1.4	2.3	3.5	5	8
		Rated output current (A)	1.8	3	4.6	6.5	10.5
		Carrier frequency (kHz)	2–15 (Default: 4)				
Input	Rated input current (A)	Heavy duty	2.1	3.7	5.8	6.1	9.9
		Normal duty	2.5	4.2	6.4	7.2	11.6
	Rated voltage/frequency		Three-phase 380–480 V AC (-15–10 %), 50/60 Hz				
	Mains input voltage range (V AC)		342–528 V AC				
	Mains frequency range (Hz)		47–63 Hz				
Frame			A4	A5	B1	C1	
AC drive weight (kg)			0.76	0.81	1.05	1.24	
Cooling method			Convective cooling		Fan cooling		
EMC filter			Optional				
IP rating			IP20				

Model VD i □-43MS3-N			550	750	1100	1500	1850	2200
Order number: 2D001.43...			**005**	**007**	**011**	**015**	**018**	**022**
Applicable motor output (kW)			5.5	7.5	11	15	18.5	22
Applicable motor output (HP)			7.5	10	15	20	25	30
Output	Heavy duty	Rated output capacity (kVA)	9.9	13	19.1	24.4	29	34.3
		Rated output current (A)	13	17	25	32	38	45
		Carrier frequency (kHz)	2–15 (Default: 4)					
	Normal duty	Rated output capacity (kVA)	12	15.6	21.3	27.4	31.6	37.3
		Rated output current (A)	15.7	20.5	28	36	41.5	49
		Carrier frequency (kHz)	2–15 (Default: 4)					
Input	Rated input current (A)	Heavy duty	14.3	18.7	27.5	35.2	41.8	49.5
		Normal duty	17.3	22.6	30.8	39.6	45.7	53.9
	Rated voltage/frequency		Three-phase 380–480 V AC (-15–10 %), 50/60 Hz					
	Mains input voltage range (V AC)		342–528 V AC					
	Mains frequency range (Hz)		47–63 Hz					
Frame			D1		E1		F1	
AC drive weight (kg)			2.07		3.97		6.25	
Cooling method			Fan cooling					
EMC filter			Optional					
IP rating			IP20					

460 V series three-phase (with built-in filter)

Model VD i □-43MS3-F			037	075	150	220	400
Order number: 2D000.43...			**037**	**075**	**150**	**220**	**004**
Applicable motor output (kW)			0.4	0.75	1.5	2.2	3.7
Applicable motor output (HP)			0.5	1	2	3	5
Output	Heavy duty	Rated output capacity (kVA)	1.1	2.1	3.2	4.2	6.9
		Rated output current (A)	1.5	2.7	4.2	5.5	9
		Carrier frequency (kHz)	2–15 (Default: 4)				
	Normal duty	Rated output capacity (kVA)	1.4	2.3	3.5	5	8
		Rated output current (A)	1.8	3	4.6	6.5	10.5
		Carrier frequency (kHz)	2–15 (Default: 4)				
Input	Rated input current (A)	Heavy duty	2.1	3.7	5.8	6.1	9.9
		Normal duty	2.5	4.2	6.4	7.2	11.6
	Rated voltage/frequency		Three-phase 380–480 V AC (-15–10 %), 50/60 Hz				
	Mains input voltage range (V AC)		342–528 V AC				
	Mains frequency range (Hz)		47–63 Hz				
Frame			B3			C2	
AC drive weight (kg)			1.32			1.80	
Cooling method			Fan cooling				
EMC filter			Built-in				
IP rating			IP20				

Model VD i □-43MS3-F			550	750	1100	1500	1850	2200
Order number: 2D000.43...			**005**	**007**	**011**	**015**	**018**	**022**
Applicable motor output (kW)			5.5	7.5	11	15	18.5	22
Applicable motor output (HP)			7.5	10	15	20	25	30
Output	Heavy duty	Rated output capacity (kVA)	9.9	13	19.1	24.4	29	34.3
		Rated output current (A)	13	17	25	32	38	45
		Carrier frequency (kHz)	2–15 (Default: 4)					
	Normal duty	Rated output capacity (kVA)	12	15.6	21.3	27.4	31.6	37.3
		Rated output current (A)	15.7	20.5	28	36	41.5	49
		Carrier frequency (kHz)	2–15 (Default: 4)					
Input	Rated input current (A)	Heavy duty	14.3	18.7	27.5	35.2	41.8	49.5
		Normal duty	17.3	22.6	30.8	39.6	45.7	53.9
	Rated voltage/frequency		Three-phase 380–480 V AC (-15–10 %), 50/60 Hz					
	Mains input voltage range (V AC)		342–528 V AC					
	Mains frequency range (Hz)		47–63 Hz					
Frame			D2		E2		F2	
AC drive weight (kg)			2.91		5.15		8.50	
Cooling method			Fan cooling					
EMC filter			Built-in					
IP rating			IP20					

General Specifications and Accessories

Control Functions	Control Methods	V/F, SVC, FOC Sensorless
	Applicant Motors	Induction motors (IM), interior permanent magnet (IPM) motors, and surface permanent magnet (SPM) motors
	Max. Output Frequency	Standard model: 599.00 Hz / High speed model: 1500.0 Hz (with derating, V/F control only)
	Starting Torque*	150% / 3 Hz (V/f, SVC control for IM, heavy duty) 100% / (1/20 of motor rated frequency) (SVC control for PM, heavy duty) 200% / 0.5 Hz (FOC Sensorless control for IM, heavy duty)
	Speed Control Range*	1:50 (V/f, SVC control for IM, heavy duty) 1:20 (SVC control for PM, heavy duty) 1:100 (FOC Sensorless control for IM, heavy duty)
	Overload Tolerance	Normal Duty (ND): 120% of rated output current for 60 seconds; 150% of rated output current for 3 seconds Heavy Duty (HD): 150% of rated output current for 60 seconds; 200% of rated output current for 3 seconds
	Frequency Setting Signal	0 ~ +10 V / -10 V ~ +10 V, 4 ~ 20 mA / 0 ~ +10 V, 1 pulse input (33 kHz), 1 pulse output (33 kHz)
	Main Control Functions	Multiple motor switches (max. 4 independent motor parameter settings), fast run, 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 (max.), accel/decel time switch, S-curve accel/decel, 3-wire sequence, JOG frequency, upper/lower limits for frequency reference, DC injection braking at start and stop, PID control, built-in PLC (2k steps), simple positioning function, Modbus integrated as standard
Protection Functions	Motor Protection	Overcurrent protection, overvoltage protection, over-temperature protection, phase failure protection
	Stall Prevention	Stall prevention during acceleration, deceleration and running independently
Accessories	Communication Cards	PROFIBUS DP, DeviceNet, Modbus TCP, EtherNet/IP, CANopen, EtherCAT
	External DC power supply	EMM-BPS01 (DC 24V power supply card)
Digital Controller		A removable keypad as standard
Certifications		UL, CE, RoHS, RCM, TUV, REACH

***Control accuracy may vary depending on the environment, application conditions, different motors or encoder. For details, please contact our company or your local distributor.**

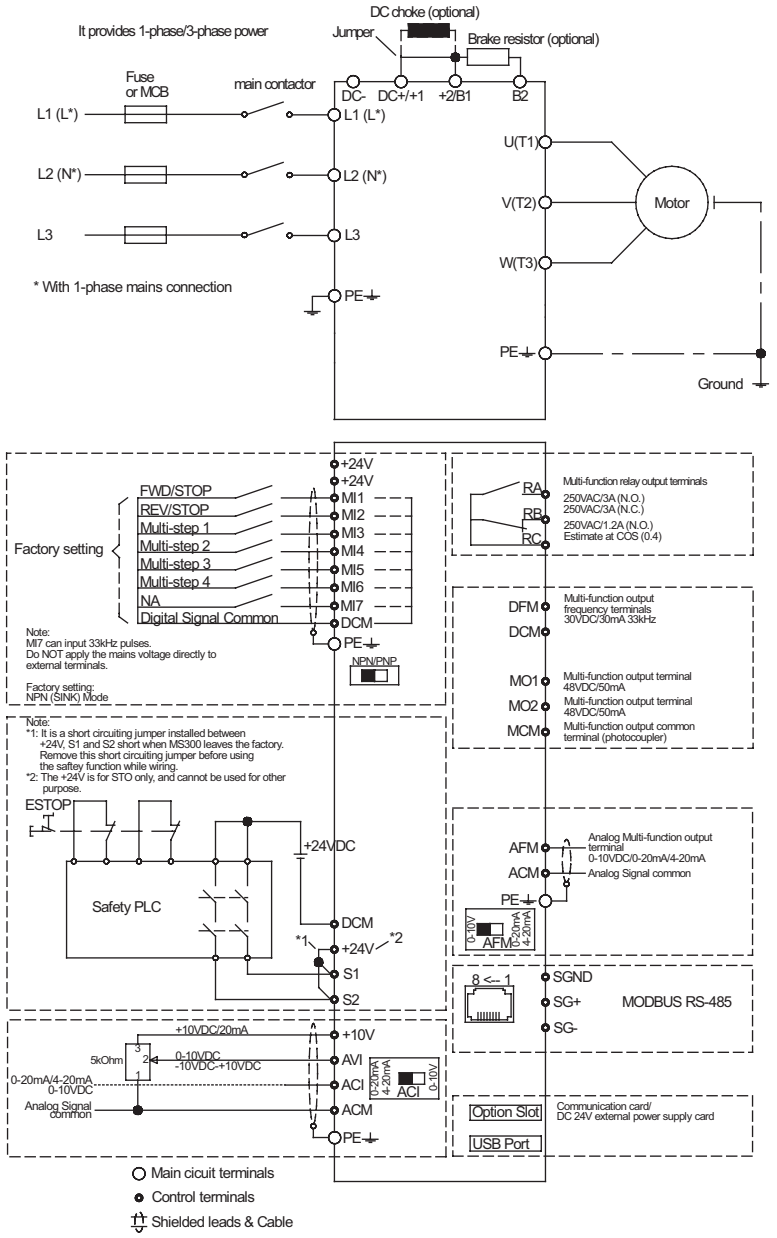
MS3 Operating Environment

Operating Environment	Installation Location		IEC60364-1 / IEC60664-1 Pollution degree 2, Indoor use only	
	Ambient Temperature (˚C)	Operation	IP20 / UL Open Type	-20 to 50 -20 to 60 (needs derating)
			IP40 / NEMA 1 / UL Type 1	-20 to 40 -20 to 50 (needs derating)
			Zero stacking Installation	
		Storage		-40 to 85
		Transportation		-20 to 70
	Rated Humidity	Operation		Max. 90%
		Storage / Transportation		Max. 95%
	Air Pressure (kPa)	Operation		86 ~ 106
		Storage / Transportation		70 ~ 106
	Pollution Level	Compliance to IEC60721-3-3, 3C2		
	Altitude	An altitude of 0 ~ 1000 m for normal operation (derating is required for installation at an altitude above 1000 m)		
Vibration		Compliance to IEC 60068-2-6		
Shock		Compliance to IEC/EN 60068-2-27		

Please refer to MS3 user manual for more details.

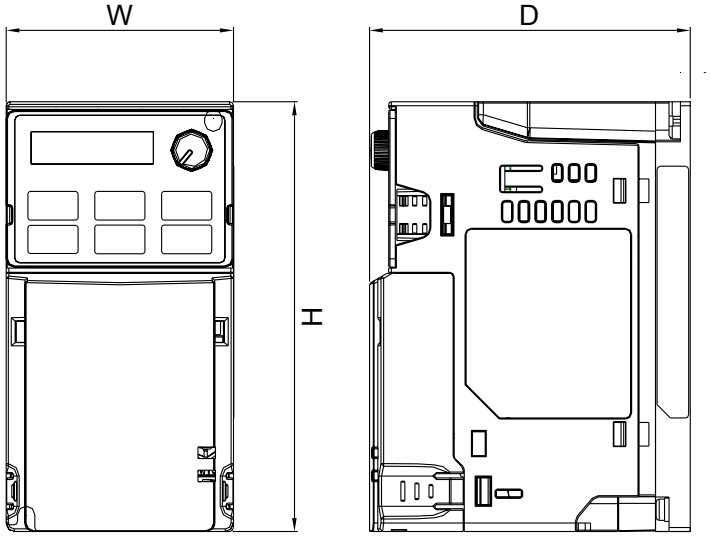
Wiring

Input: Single-phase / 3-phase power



Dimensions

MS 3 Series



Dimensions	W (mm)	H (mm)	D (mm)
A1	68	128	96
A2			110
A3			125
A4			129
A5			143
B1	72	142	143
B2			143
B3			159
C1	87	157	152
C2			179
D1	109	207	154
D2			187
E1	130	250	185
E2			219
F1	175	300	192
F2			244

PETER electronic

Notes:

PETER electronic

VersiDrive i
MS3 Series

PETER electronic GmbH & Co. KG

Bruckäcker 9
92348 Berg

www.peter-electronic.com

Kontakt:

Fon +49 (0) 91 89 / 41 47 0
Fax +49 (0) 91 89 / 41 47 47

mail@peter-electronic.com