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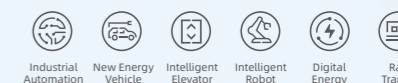
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**INOVANCE**

# MD520-IP55-INT Series

## High Protection AC Drive



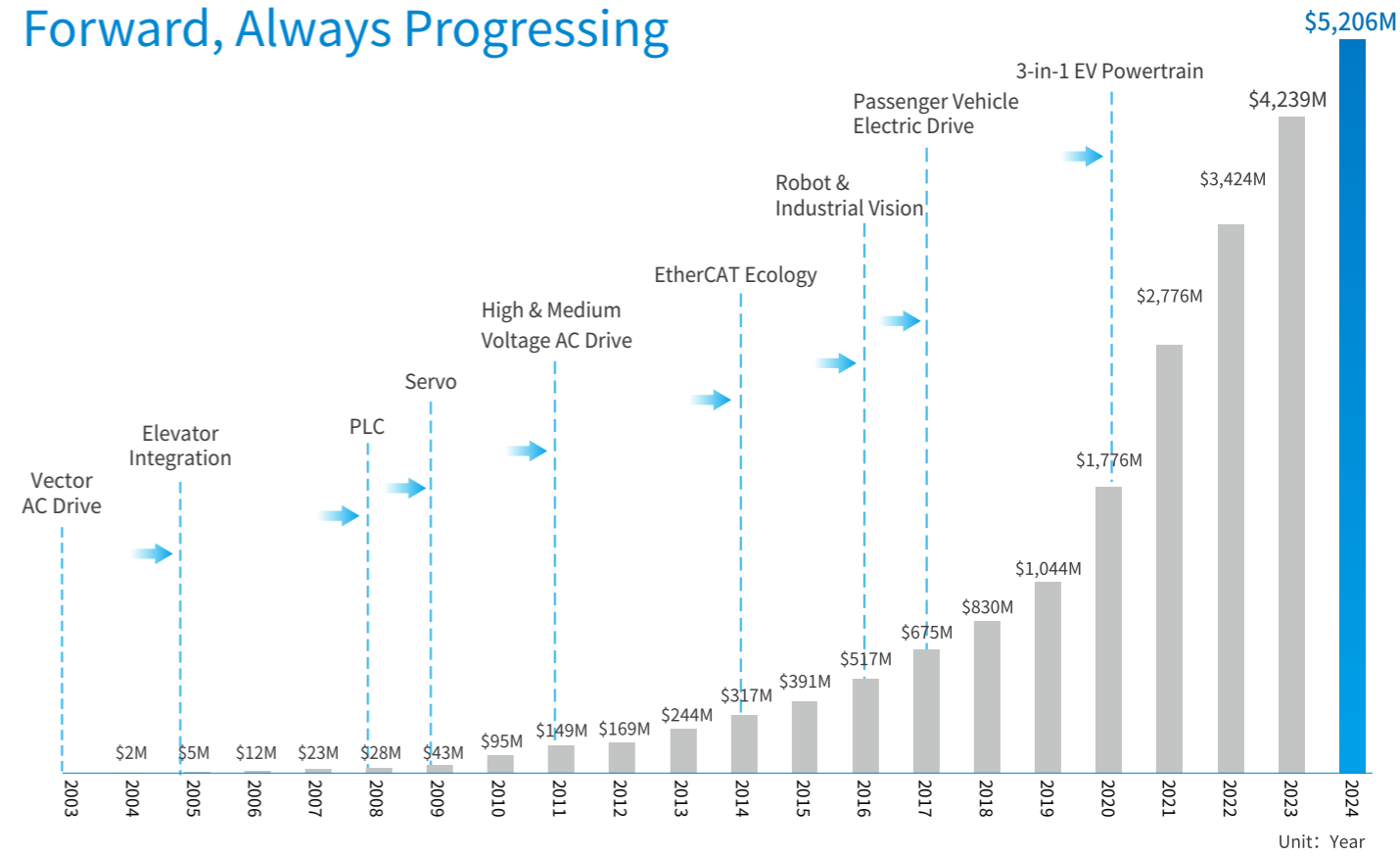
Advancing industrial technology,  
for a better world



# About Inovance

The Inovance Group, founded in 2003, is a global industrial automation company with revenues of 5.2bn for 2024. The company is headquartered in Shenzhen, China, and has built a global operation with offices and facilities in Germany, France, Italy, Spain, Turkey, Hungary, India, South Korea, Thailand, and Vietnam. Additionally, the company has a strong network of distribution partners around the world. The company's flexible production techniques and expert understanding of all industry sectors - from plastics to printing to packaging to iron & steel production - have allowed it to establish globally leading industry-specific business units. Over the years, Inovance has built an engineering team with specialist expertise in industrial automation. This knowledge allows it to form strong partnerships with OEMs and end users, providing ongoing advice about how to get the most out of their automation solutions today, and how to stay prepared for the market and technology changes that are coming in future.

## Forward, Always Progressing



**2003**  
founded

**IPO:2010**  
Shenzhen, China

**30,000**  
employees

**Global**  
network of offices and distributors

**\$5.2+bn**  
revenues in 2024

**5538** R&D Employees  
Account for 23% of total employees

**5** R&D Centers  
Shenzhen, Suzhou, Xi'an, Nanjing, Stuttgart (Germany)

**2886** Patents and software copyrights  
Invention 450 / Utility model 1443 / Industrial design 511 / Software copyright 482

**USD 442+ Million**  
Account for 8.5% of revenue 2024

# MD520-IP55-INT Series

## High Protection AC Drive



High Safety



High Stability



High Performance



The MD520-IP55-INT series high protection AC drive is developed based on the MD520 high-performance product platform, achieving an IP55 rating.

It meets the requirements for stable operation in harsh environments.

It can be driven by three-phase asynchronous motors, permanent magnet synchronous motors (PMSMs), and various special motors, with performance reaching industry-leading levels, enabling it to drive various types of loads.

It is primarily applied for textile printing and dyeing, carbon fiber production, and metal processing.

## Rich Application Scenarios

The product meets the requirements of high-dust, high-oil contamination scenarios such as textiles, metallurgy, wastewater treatment, and stone processing.



## IP Rating: IP55

The product features enhanced protection performance, suitable for working conditions with severe dust and moisture, achieving comprehensive protection.



## Cabinet-Free Installation

The product offers ultra-high protection, allowing direct installation on walls without a separate electrical cabinet.



## Superb Protection

- The product has an all-metal enclosure, achieving complete isolation between the internal cavity and air ducts
- Components like capacitors and reactors are enhanced for water resistance, achieving all-round protection.
- The wiring and keyboard display areas are specially reinforced to ensure ease of use while maintaining protection.



## Drive Expert

The product provides high-performance drive for various motors:

- Three-phase asynchronous motor
- PMSM
- Synchronous reluctance motor

※ Note: For other special motors, consult Inovance engineers.



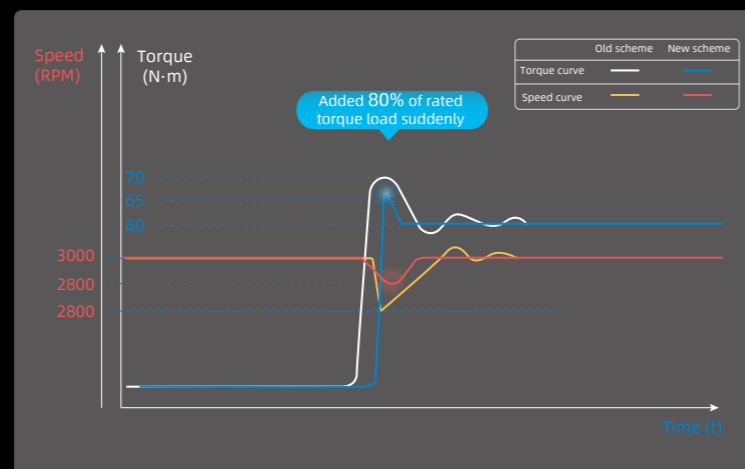
## Configuration Upgrade

- The entire product series comes with a built-in DC reactor by default to reduce harmonic pollution to the power grid.
- The series has a built-in EMC filter of C3 class, reducing external interference.



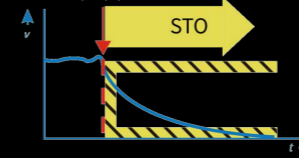
## Performance Upgrade

- The product control performance inherits the new leading platform's SVC function, with a speed regulation range of 1:500 and torque accuracy of  $\pm 3\%$ .
- Under equivalent load impact, the speed drop is reduced by 80% and torque overshoot is reduced by 30%, ensuring more stable operation.



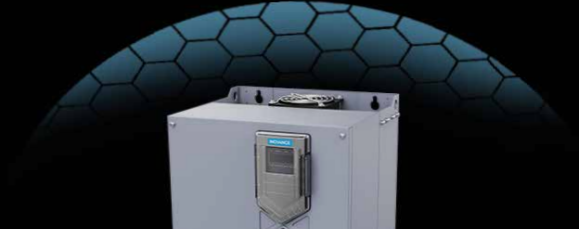
## Safe and Stable

- Versatile fault detection functions are added, including IGBT self-check, encoder self-check, and load harmonic analysis, are integrated to fully protect the drive and system.
- The drive supports self-check upon power-on to identify system risks in advance.
- You can customize shutdown modes and limp modes when a fault occurs.
- The product is equipped with the STO function.



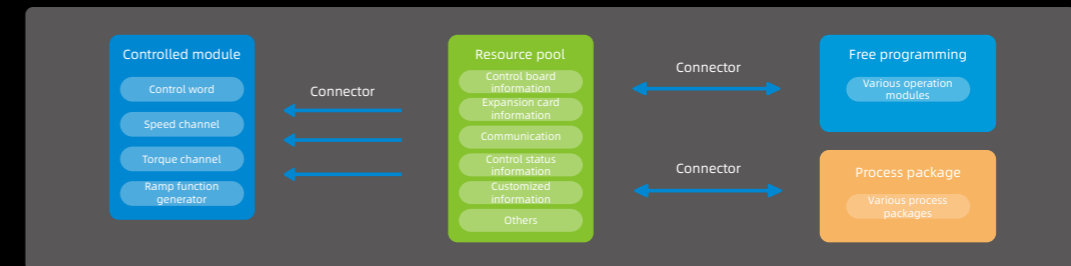
## Enhanced Conformal Coating

- The product utilizes multi-layer high-quality conformal coating spraying to enhance product environmental adaptability and identify system risks in advance.
- The conformal coating employs an automatic spraying process, ensuring uniform coating thickness on circuit boards and consistency for mass-produced products.



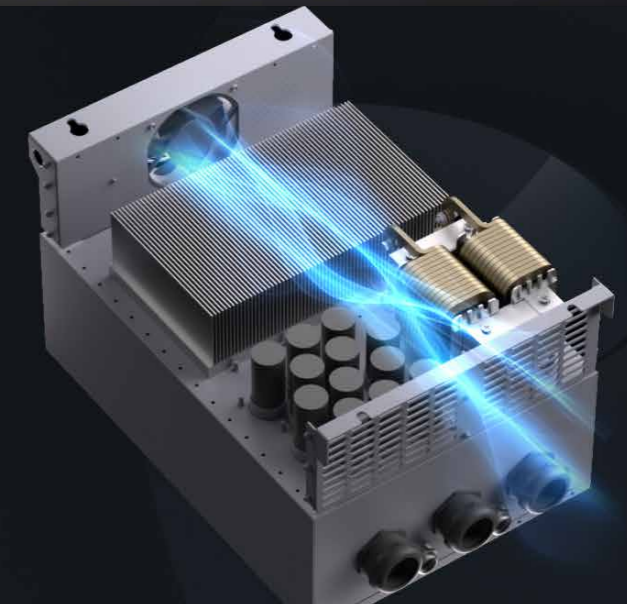
## Other Features

- Secondary development is supported, quickly meeting the field process requirements.
- The built-in connector supports parameter input and output and supports association and operation of the internal core parameters.
- The drive provides common built-in modules such the logic operation module, mathematical operation module, and word and bit conversion module for common function development.



## Independent Air Duct

- The independent air duct design effectively prevents dust from entering the interior of the AC drive, avoiding faults like short circuits and improving reliability.
- High-airflow, long-life cooling fans are used, effectively reducing internal temperature rise and ensuring reliable and stable operation of the inverter.



## Naming Rules

**MD520 - 4T 37 B S - T - IP55 - INT**

① ② ③ ④ ⑤ ⑥ ⑦ ⑧

① Product name	④ Braking unit	⑥ Reactor
MD520: AC drive series	Null: None B: with the braking unit	T: with the DC reactor
② Voltage class (V)		⑦ Ingress Protection
4T: three-phase 380 V to 480 V		IP55: IP55 Model
③ Power rating (kW)	⑤ Functional safety	⑧ Version
7.5: 7.5 ... 90: 90	Null: without the STO function S: with the STO function	INT: International version

Relationship Between Product Models and Structures

Structure	Power (kW)	Model (Three-Phase 380 V to 480 V)	Product Code
T1	7.5	MD520-4T7.5BS-T-IP55-INT	0101E445
	11	MD520-4T11BS-T-IP55-INT	0101E443
T2	15	MD520-4T15BS-T-IP55-INT	0101E442
	18.5	MD520-4T18.5BS-T-IP55-INT	0101E446
	22	MD520-4T22BS-T-IP55-INT	0101E449
T3	30	MD520-4T30BS-T-IP55-INT	0101E448
	37	MD520-4T37BS-T-IP55-INT	0101E451
	45	MD520-4T45BS-T-IP55-INT	0101E444
T4	55	MD520-4T55BS-T-IP55-INT	0101E441
	75	MD520-4T75BS-T-IP55-INT	0101E447
	90	MD520-4T90S-T-IP55-INT	0101E450

Note:

B: with the braking unit

S: with the STO function

-T: with the DC reactor

## Electrical Specifications

Note: For three-phase 380 V to 480 V models, the rated power of the AC drive is measured at the input voltage of 440 VAC.

Electrical Parameters of T1 to T4 Models (Three-Phase 380 V to 480 V)												
Item	Specifications											
Model: MD520-4Txxxx-IP55-INT	7.5BS-T	11BS-T	15BS-T	18.5BS-T	22BS-T	30BS-T	37BS-T	45BS-T	55BS-T	75BS-T	90S-T	
Structure	T1		T2				T3			T4		
Output	Power (kW) (heavy load)	7.5	11	15	18.5	22	30	37	45	55	75	90
	Rated output current (A) (heavy load)	17	25	32	37	45	60	75	91	112	150	176
	Output voltage	Three-phase 0 V to input voltage										
	Maximum output frequency	599 Hz										
	Carrier frequency	3 kHz to 12.0 kHz (automatically adjusted based on load characteristics)										3 kHz to 6 kHz
	Overload capacity	Heavy load: 60s at 150% of the rated current continuously										
Input	Rated input current (A) (heavy load)	21.9	32.2	41.3	37.2	43.4	52	63	89	106	139	164
	Rated voltage/frequency	Three-phase 380 VAC to 480 VAC, 50 Hz/60 Hz										
	Voltage range	-15% to +10%; allowed voltage range: 323 VAC to 528 VAC										
	Frequency range	±5%, or 47.5 Hz to 63.0 Hz										
Heat dissipation design	Power capacity (kVA) (heavy load)	22.8	33.4	42.8	33	39	52	63	81	97	127	150
	Thermal design power (kW) (heavy load)	0.24	0.355	0.454	0.478	0.551	0.694	0.815	1.01	1.21	1.57	1.81
	Air flow (CFM)	30	40	42	51.9	57.4	118.5	118.5	122.2	122.2	218.6	287.2
Efficiency class (IEC 61800-9-2)	IE2											
Overvoltage level	OVC III											
Pollution degree	PD2											
IP rating	IP55 (open type, for IEC products) Type 1 (enclosed type, applicable to UL-certified products)											
Protection class	Class I											

## General Specifications

Item		Specifications	
Control performance	Motor type	Asynchronous induction motors (IM), permanent magnet synchronous motors (PMSM), and synchronous reluctance motors (SynRM)	
	Control mode	Sensorless vector control (SVC), and voltage/frequency (V/f) control	
	Asynchronous motor (V/f)	Supported function	Energy saving control, overvoltage suppression, overcurrent suppression, voltage dip suppression, oscillation suppression, torque boost, slip compensation, different V/f curve selection, V/f separation, DC braking, random PWM, overexcitation fast deceleration, and droop control
		Supported function	Energy saving control, inertia auto-tuning and acceleration feedforward, droop control, master-slave control, free programming adaptive speed loop parameters, load observer, overvoltage suppression, voltage dip suppression, overexcitation fast deceleration, automatic voltage regulation (AVR generator bus voltage control), speed tracing, and DC braking
	Asynchronous motor SVC	Speed range	1:500
		Start torque	200%
		Torque step response	Within 2 ms
		Torque control accuracy	±3% at the frequency above 5 Hz
		Speed stability accuracy	Within 10% of the rated slip value
		Flux weakening magnification	5
		Synchronous motor SVC	Supported function
	Speed range		1:200
	Start torque		200%
	Torque step response		Within 2 ms
	Speed stability accuracy		0.05% when the motor is free from faults
	Torque control accuracy		±3% at the frequency above 5 Hz
	Basic functions		Command source
		Reference channel	Input frequency resolution
Speed/Torque reference			Acceleration and deceleration curve, dynamic switchover among multiple acceleration and deceleration time sets, acceleration and deceleration S curve, external PID reference, AI (2 channels, supporting ±10 V or 0-20 mA), speed and torque set through communication, pulse reference (DI5), multi-reference, speed/torque set through programming
Communication method		Seven communication methods are supported: PROFIBUS DP, CANlink, CANopen, PROFINET, EtherCAT, EtherNet/IP, Modbus (Modbus-RTU, Modbus ASCII, and Modbus TCP).	
Output limit		Torque limit, power limit, current limit, maximum/minimum torque limit, speed limit, and jump frequency	
Process control		PID	Hibernation, configurable reference and feedback sources, 2-segment PID parameter switchover, feedback loss detection, configuration of output limit, and configuration initialization
		Brake	Brake with or without feedback, start speed, start torque, and brake judgment condition settings
Protection		AC drive and motor protection, including protection against overvoltage, overcurrent, overload, motor overheating (PT100, PT1000, KTY-84-130, PTC-130, and PTC-150), and load loss, as well as automatic fault reset, automatic restart, and limp mode upon fault	

## Accessory Specifications

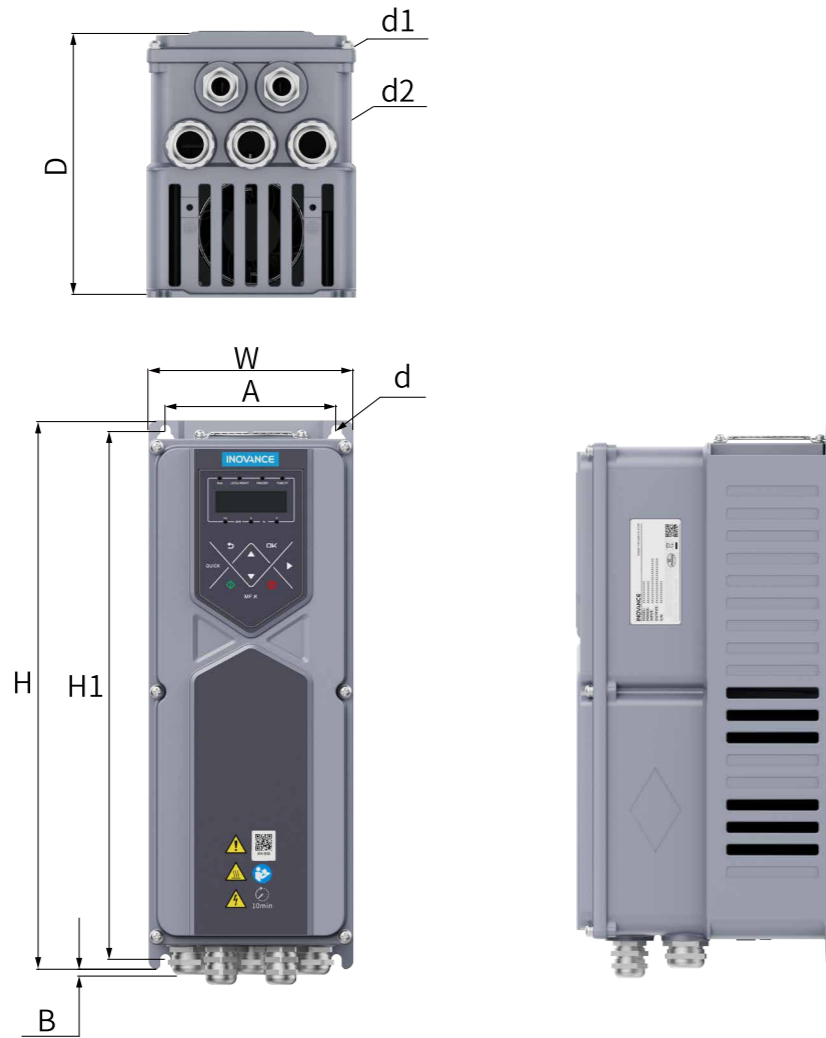
List of Accessories					
Name	Model	Order Number	Model	Remarks	
Braking components	External braking unit <sup>[1]</sup>	MDBUN-60-T	01013133	MD520-4T90S-T-IP55-INT	60 A, 380 VAC series
		MDBUN-60-5T	0101AR57	MD520-4T90S-T-IP55-INT	60 A, 480 VAC series
	Built-in braking unit	Models with the name containing letter "B"	-	T1 to T4 (7.5 kW to 75 kW)	For T1 to T4 models (three phase 380 V to 480 V), the built-in braking unit is standard.
Expansion card	I/O expansion card 2	MD38IO2	01013103	T1 to T4 (7.5 kW to 90 kW)	Three Dis
	I/O expansion card 3	MD38IO3	01040051	T1 to T4 (7.5 kW to 90 kW)	Three Dis, one RO, and one RS485 communication input terminal with isolation input
	RS485 communication card	MD38TX1	01013112	T1 to T4 (7.5 kW to 90 kW)	Modbus communication card with the isolation feature
	CANopen/CANlink communication card	MD38CAN1	01013100	T1 to T4 (7.5 kW to 90 kW)	CANopen/CANlink communication card
	CANopen/CANlink communication card	MD38CAN2	01013102	T1 to T4 (7.5 kW to 90 kW)	CANopen/CANlink communication card
	PROFINET communication card	MD500-PN1	01040098	T1 to T4 (7.5 kW to 90 kW)	PROFINET communication card
	EtherCAT communication card	MD500-ECAT	01040113	T1 to T4 (7.5 kW to 90 kW)	EtherCAT communication card
	EtherNet/IP communication card	MD500-EN1	01040167	T1 to T4 (7.5 kW to 90 kW)	Ethernet/IP communication card
MODBUS TCP communication card	MD500-EM1	01040201	T1 to T4 (7.5 kW to 90 kW)	MODBUS TCP communication card	

Note:

The default initial braking voltage of the external braking unit MDBUN-60-T is 670 V. This braking unit applies to grids with the input voltage lower than or equal to 440 VAC. The default initial braking voltage of the external braking unit MDBUN-60-5T is 760 V. This braking unit applies to grids with the input voltage greater than 440 VAC. You can adjust the initial braking voltage based on the grid voltage. Higher initial braking voltage requires higher braking resistance.

## Dimensions of MD520-T1 to T2 Models

### Outline and Mounting Dimensions

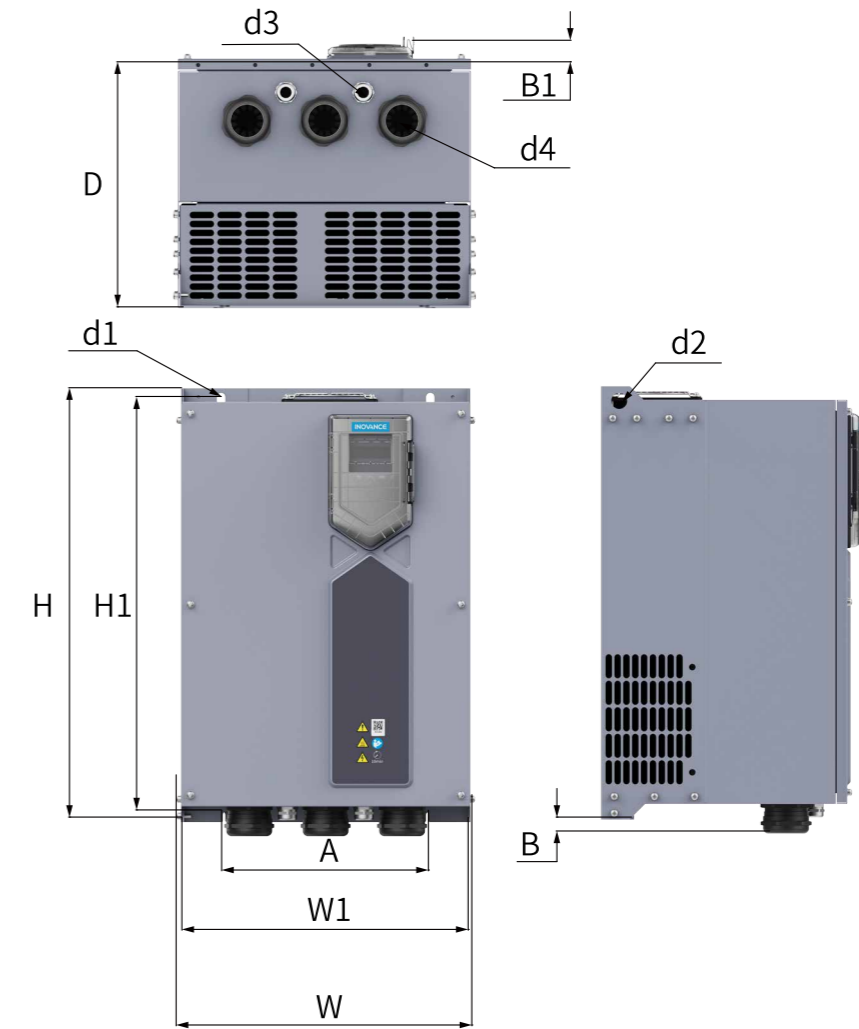


### Outline and Mounting Dimensions

Dimensions of T1 to T2 Models (7.5 kW to 30 kW)											
Structure	Model	Outline Dimensions (mm)									Net Weight (kg)
		W	A	H	H1	B	D	d	d1	d2	
T1	MD520-4T7.5BS-T-IP55-INT	144	120	385	371	7.8	183.4	4-Φ7.0	13 to 18	9	
	MD520-4T11BS-T-IP55-INT										
T2	MD520-4T15BS-T-IP55-INT	195	150	460	446	16	218.9	4-Φ7.0	13 to 18	20 to 25	14.5
	MD520-4T18.5BS-T-IP55-INT										
	MD520-4T22BS-T-IP55-INT										
	MD520-4T30BS-T-IP55-INT										

## Dimensions of MD520-T3 to T4 Models

### Outline and Mounting Dimensions



### Outline and Mounting Dimensions

Dimensions of T3 to T4 Models (37 kW to 90 kW)														
Structure	Model	Outline Dimensions (mm)											Net Weight (kg)	
		W	W1	A	H	H1	B	B1	D	d1	d2	d3		d4
T3	MD520-4T37BS-T-IP55-INT	371.8	360	260	540	520	28	27.1	308.2	4-Φ10.0	Φ20.0	13 to 18	30 to 38	38
	MD520-4T45BS-T-IP55-INT													
	MD520-4T55BS-T-IP55-INT													
T4	MD520-4T75BS-T-IP55-INT	411.8	400	302	580	560	28.5	27.1	315.7	Φ10.0	Φ20.0	13 to 18	37 to 44	47.4
	MD520-4T90S-T-IP55-INT													47.2

