

MD520 - AC Drive

High Performance Universal AC Drive



- Unified AC asynchronous, PM synchronous and synchronous reluctance motors control
- Wide operating voltage and product range:
 - 3 ph 380-480 Vac: 0.4 to 500 kW
 - 3 ph 200-240 Vac: 0.4 to 75 kW
 - 1 ph 200-240 Vac: 0.4 to 2.2 kW
- STO SIL 3 PL e
- Built-in DC reactor (400 V: 18.5 kW and above; 200 V: 11 kW and above) complying to IEC 61000-3-12
- Enhanced reliability: conformal coated PCBs compliant to 3S2 and 3C3 environments
- Complies to efficiency level IE2 as defined in IEC 61800-9-2
- Through-hole mounting options (0.4 to 160 kW)

Features & functions

- AC asynchronous, PM synchronous and synchronous reluctance motors control:
 - Open loop V/F (induction motors only) and SVC
 - Closed loop FVC
 - Dual rated: heavy duty (overload: 150%/ 1 min) and normal duty (overload: 110%/ 1 min)
 - Starting torque
 - 150% at 0.25 Hz for SVC
 - 180% at 0 Hz for FVC
 - Communication options:
 - Modbus-RTU
 - Modbus-TCP
 - PROFIBUS-DP
 - CANopen
 - CANlink
 - PROFINET
 - EtherCAT
 - EtherNet/IP
- Category C2 compliance with external RFI filter. Ratings with built-in filter comply with Category C3*¹
 - Built-in dynamic braking unit, up to/including 75 kW (400 V) or 37 kW (200 V)
 - Operation in ambient temperature of up to 50°C (with de-rating above 40°C)*²
 - Bipolar analog input as standard (-10 to +10 V)
 - PTC input as standard
 - Simplified parameters for easy start up
 - 4 independent S-ramps
 - Flexible programmable I/Os
 - User programmable logic
 - Variable DC-injection braking
 - Comprehensive trip diagnostics
 - Output frequency: 599 Hz
 - Application dedicated functions:
 - Master-slave function (torque, speed)
 - Textile wobble control
 - Brake control logic
 - 4 motor parameter sets
 - Automatic torque boost
 - PC-based software: simplified start up & backup*³

*¹ For detailed EMC compliance information, consult your local Inovance representative

*² For operation in higher ambient temperatures, consult your local Inovance representative

*³ USB to RS485 adapter required. MDKE-10 or SOP-20 keypads can be used for this purpose



NEW: built-in colour LED keypad

- The clearest possible information display
- Displays multiple pieces of information simultaneously (e.g. drive status and operating information)
- User friendly with additional keys

Product ordering code

MD520

-

4T

220

B

S

-

L

-

INT

1

2

3

4

5

6

7

- ① **Drive series:**
MD520 series

② **Voltage level:**
4T: three phase 380 V - 480 V
2T: three phase 200 V - 240 V
2S: single phase 200 V - 240 V

③ **Power rating for heavy duty (kW):**
0.4: 0.4
400: 400

④ **Braking unit:**
None: without braking unit
B: with braking unit

⑤ **STO:**
None: STO not supported
S: STO supported

⑥ **Reactor:**
None: without reactor
-T: with DC reactor; applicable to T5 models
-L: with AC output reactor; applicable to T10 to T12 models

⑦ **Version:**
INT: International variant

Voltage class		1 Phase 200 - 240Vac			
Drive model: MD520-2SxxxB(S)-INT		0.4	0.7	1.5	2.2
Frame size		T2			
Drive Input	Rated input voltage	1 Phase 200 to 240Vac, -15% to +10%			
	Rated input current (A)	5.4	8.2	14	20
	Power capacity (kVA)	1.4	2.2	3.7	6
	Rated input frequency	50/60 Hz, ±5%			
Drive Output	Applicable motor (kW)	0.4	0.7	1.5	2.2
	Output current (A) ^{*2}	2.3	4.0	7.0	9.6
	Default carrier frequency (kHz)	6	6	6	6
	Overload capacity	150% for 60 s			
	Max. output voltage	Three Phase 200Vac to 240Vac (Proportional to input voltage)			
Braking Resistor	Max. output frequency	599 Hz			
	Recommended power (W)	80	80	100	100
	Minimum resistance (Ω)	64	64	32	32
Braking unit		Built-in			
Enclosure		IP 20			

*2 Rated output current at default carrier frequency.

Heavy duty ratings, 150% overload

Voltage class		Three Phase 380 - 480Vac																												
Drive model: MD520-4Txxx(B)(S)(-T)(-L)-INT ^{*3*5}		0.4B(S)	0.7B(S)	1.1B(S)	1.5B(S)	2.2B(S)	3.0B(S)	3.7B(S)	5.5B(S)	7.5B(S)	11B(S)	15B(S)	18.5(B)(S)(-T)	22(B)(S)(-T)	30(B)(S)	37(B)(S)	45(B)(S)	55(B)(S)	75(B)(S)	90(S)	110(S)	132(S)	160(S)	200(S)(-L)	220(S)(-L)	250(S)(-L)	280(S)(-L)	315(S)(-L)	355(S)(-L)	400(S)(-L)
Frame size		T1 ^{*1}						T2		T3		T4	T5		T6		T7		T8			T9		T10		T11		T12		
Drive Input	Rated input voltage	Three Phase 380 to 480Vac, -15% to +10%																												
	Rated input current (A)	1.8	2.4	3.7	4.6	6.3	9.0	11.4	16.7	21.9	32.2	41.3	41	48.5	57	69	89	106	139	164	196	240	287	365	410	441	495	565	617	687
	Power capacity (kVA)	2	2.8	4.1	5.0	6.7	9.5	12	17.5	22.8	33.4	42.8	45	54	52	63	81	97	127	150	179	220	263	334	375	404	453	517	565	629
	Rated input frequency	50/60 Hz, ±5%																												
Drive Output	Applicable motor (kW)	0.4	0.7	1.1	1.5	2.2	3.0	3.7	5.5	7.5	11	15	18.5	22	30	37	45	55	75	90	110	132	160	200	220	250	280	315	355	400
	Output current (A) ^{*2}	1.5	2.1	3.1	3.8	5.1	7.2	9.0	13.0	17.0	25.0	32.0	37	45	60	75	91	112	150	176	210	253	304	377	426	465	520	585	650	725
	Default carrier frequency (kHz)	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	5	4	3	3	3	3	3	3	3	3	3	3	3	3
	Overload capacity	150% for 60 s																												
	Max. output voltage	Three Phase 380Vac to 480Vac (Proportional to input voltage)																												
	Max. output frequency	599 Hz																												
Braking Resistor	Recommended power (kW)	0.08	0.14	0.22	0.3	0.44	0.6	0.74	1.1	1.5	2.2	3	4	4.5	6	7	9	11	15	18	22	26	32	38	42	48	54	60	69	78
	Minimum resistance (Ω)	96	96	96	96	64	64	32	32	32	24	24	24	24	19.2	14.8	12.8	9.6	6.8	11.4 x2 ^{*4}	7.7 x2 ^{*4}	7.7 x2 ^{*4}	7.7 x2 ^{*4}	2.8 x2 ^{*4}	2.8 x2 ^{*4}	2.8 x3 ^{*4}	2.8 x3 ^{*4}	2.8 x3 ^{*4}	2.8 x3 ^{*4}	2.8 x3 ^{*4}
Braking unit		Built-in																		MDBUN-60-5T x2	MDBUN-90-5T x2			MDBUN-200-5T x2	MDBUN-200-5T x3					
Enclosure		IP20																						IP00						

Normal duty ratings, 110% overload

Voltage class		Three Phase 380 - 480Vac																												
Drive model: MD520-4Txxx(B)(S)(-T)(-L)-INT ^{*3*5}		0.4B(S)	0.7B(S)	1.1B(S)	1.5B(S)	2.2B(S)	3.0B(S)	3.7B(S)	5.5B(S)	7.5B(S)	11B(S)	15B(S)	18.5(B)(S)(-T)	22(B)(S)(-T)	30(B)(S)	37(B)(S)	45(B)(S)	55(B)(S)	75(B)(S)	90(S)	110(S)	132(S)	160(S)	200(S)(-L)	220(S)(-L)	250(S)(-L)	280(S)(-L)	315(S)(-L)	355(S)(-L)	400(S)(-L)
Frame size		T1 ^{*1}						T2		T3		T4	T5		T6		T7		T8			T9		T10		T11		T12		
Drive Input	Rated input voltage	Three Phase 380 to 480Vac, -15% to +10%																												
	Rated input current (A)	2.5	3.7	4.6	6.4	9.1	11.3	15.9	22.4	32.9	39.7	44.0	48.5	62.5	71	86	111	143	167	198	239	295	359	456	507	559	624	708	782	840
	Power capacity (kVA)	2.3	3.4	4.2	5.9	8.3	10.4	15.5	20.5	30.2	38.2	44.4	54	60	65	79	102	131	153	181	219	270	328	417	464	511	571	647	715	768
	Rated input frequency	50/60 Hz, ±5%																												
Drive Output	Applicable motor (kW)	0.75	1.1	1.5	2.2	3.7	3.7	5.5	7.5	11	15	18.5	22	30	37	45	55	75	90	110	132	160	200	250	280	315	355	400	450	500
	Output current (A) ^{*2}	2.1	3.1	3.8	5.1	7.2	9.0	13.0	17.0	25.0	32.0	37.0	45	60	75	91	112	150	176	210	253	304	377	465	520	585	650	725	820	880
	Default carrier frequency (kHz)	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	5	4	3	3	3	3	3	3	3	3	3	3	3	3
	Overload capacity	110% for 60 s																												
	Max. output voltage	Three Phase 380Vac to 480Vac (Proportional to input voltage)																												
	Max. output frequency	599 Hz																												
Braking Resistor	Recommended power (kW)	0.08	0.14	0.22	0.3	0.44	0.6	0.74	1.1	1.5	2.2	3	4	4.5	6	7	9	11	15	18	22	26	32	38	42	48	54	60	69	78
	Minimum resistance (Ω)	96	96	96	96	64	64	32	32	32	24	24	24	24	19.2	14.8	12.8	9.6	6.8	11.4 x2 ^{*4}	7.7 x2 ^{*4}	7.7 x2 ^{*4}	2.8 x2 ^{*4}	2.8 x2 ^{*4}	2.8 x2 ^{*4}	2.8 x3 ^{*4}	2.8 x3 ^{*4}	2.8 x3 ^{*4}	2.8 x3 ^{*4}	2.8 x3 ^{*4}
Braking unit		Built-in																		MDBUN-60-5T x2	MDBUN-90-5T x2	MDBUN-200-5T x2	MDBUN-200-5T x2	MDBUN-200-5T x3						
Enclosure		IP20																						IP00						

^{*1} 0.75/1.5/2.2 kW are the preferred stocking ratings. To learn more, please get in touch with your local Inovance representative.

^{*2} Rated output current at default carrier frequency.

^{*3} -T in the type code of 18.5B and 22B models indicates built-in DC reactor.

^{*4} Minimum value of the resistance for each braking unit.

^{*5} For the standard AC drive, we recommend motor cable lengths to be <100 m. Where your installation exceeds 100 m, the “ L ” version is an option with a built-in AC output reactor (1% voltage drop) which can help to overcome the effects of long cable installations. To discuss your application, contact your local Inovance representative.

^{*6} If bigger ratings than 400 kW (HD)/500 kW (ND) are required, please get in touch with your local Inovance representative.

Heavy duty ratings , 150% overload

Voltage class		Three Phase 200 - 240Vac																					
Drive model: MD520-2Txxx(B)(S)-INT		0.4B(S)	0.7B(S)	1.1B(S)	1.5B(S)	2.2B(S)	3.7B(S)	5.5B(S)	7.5B(S)	11(B)(S)	15(B)(S)	18.5(B)(S)	22(B)(S)	30(B)(S)	37(B)(S)	45(S)	55(S)	75(S)	90(S)	110(S)	132(S)	160(S)	200(S)
Frame size		T1 ¹				T2		T3	T4	T5	T6		T7		T8			T9	T10		T11	T12	
Drive Input	Rated input voltage	Three Phase 200 to 240Vac, -15% to +10%																					
	Rated input current (A)	2.4	4.6	6.3	9.0	11.4	16.7	32.2	41.3	51.3	57	69/86	89	106	139	164	196	287	365	410	441	565	687
	Power capacity (kVA)	1.1	2.1	2.9	4.1	5.2	7.6	14.7	18.9	27	26.1	31.6	40.7	48.5	63.6	75	89.6	1.1	2.1	2.9	4.1	5.2	7.6
	Rated input frequency	50/60 Hz, ±5%																					
Drive Output	Applicable motor (kW)	0.4	0.75	1.1	1.5	2.2	3.7	5.5	7.5	11	15	18.5	22	30	37	45	55	75	90	110	132	160	200
	Output current (A) ²	2.1	3.8	5.1	7.2	9.0	13	25	32	45	60	75	91	112	150	176	210	304	377	426	465	585	725
	Default carrier frequency (kHz)	6	6	6	6	6	6	6	6	6	6	5	5	4	3	3	3	3	3	3	3	3	3
	Overload capacity	150% for 60 s																					
	Max. output voltage	Three Phase 200Vac to 240Vac (Proportional to input voltage)																					
	Max. output frequency	599 Hz																					
Braking Resistor	Recommended power (kW)	0.09	0.16	0.25	0.34	0.5	0.8	1.3	1.7	2.3	3.0	3.9	4.6	5.5	6.8	5.0 x2	6.0 x2	7.5 x2	6 x3	7.5 x3	7.0 x4	6.5 x5	7.0 x6
	Minimum resistance (Ω)	48	48	0.26	32	16	16	12	12	12	9	7	6	5	4	5.5 x2 ³	3.7 x2 ³	3.7 x2 ³	3.7 x3 ³	3.7 x3 ³	3.7 x4 ³	3.7 x5 ³	3.7 x6 ³
Braking unit		Built-in														MDBUN-60-2T x2	MDBUN-90-2T x2	MDBUN-90-2T x2	MDBUN-90-2T x3	MDBUN-90-2T x3	MDBUN-90-2T x4	MDBUN-90-2T x5	MDBUN-90-2T x6
Enclosure		IP20																	IP00				

Normal duty ratings, 110% overload

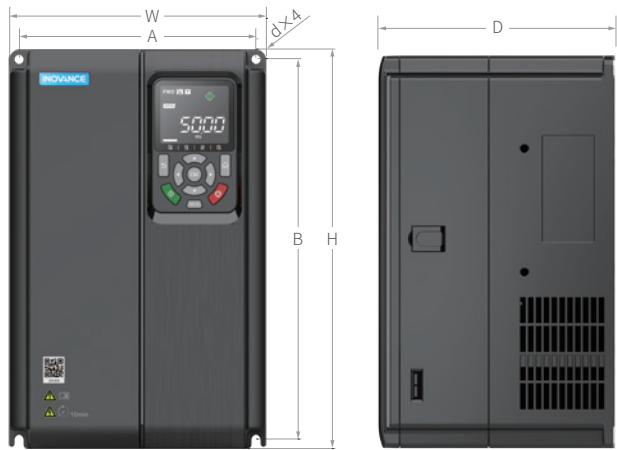
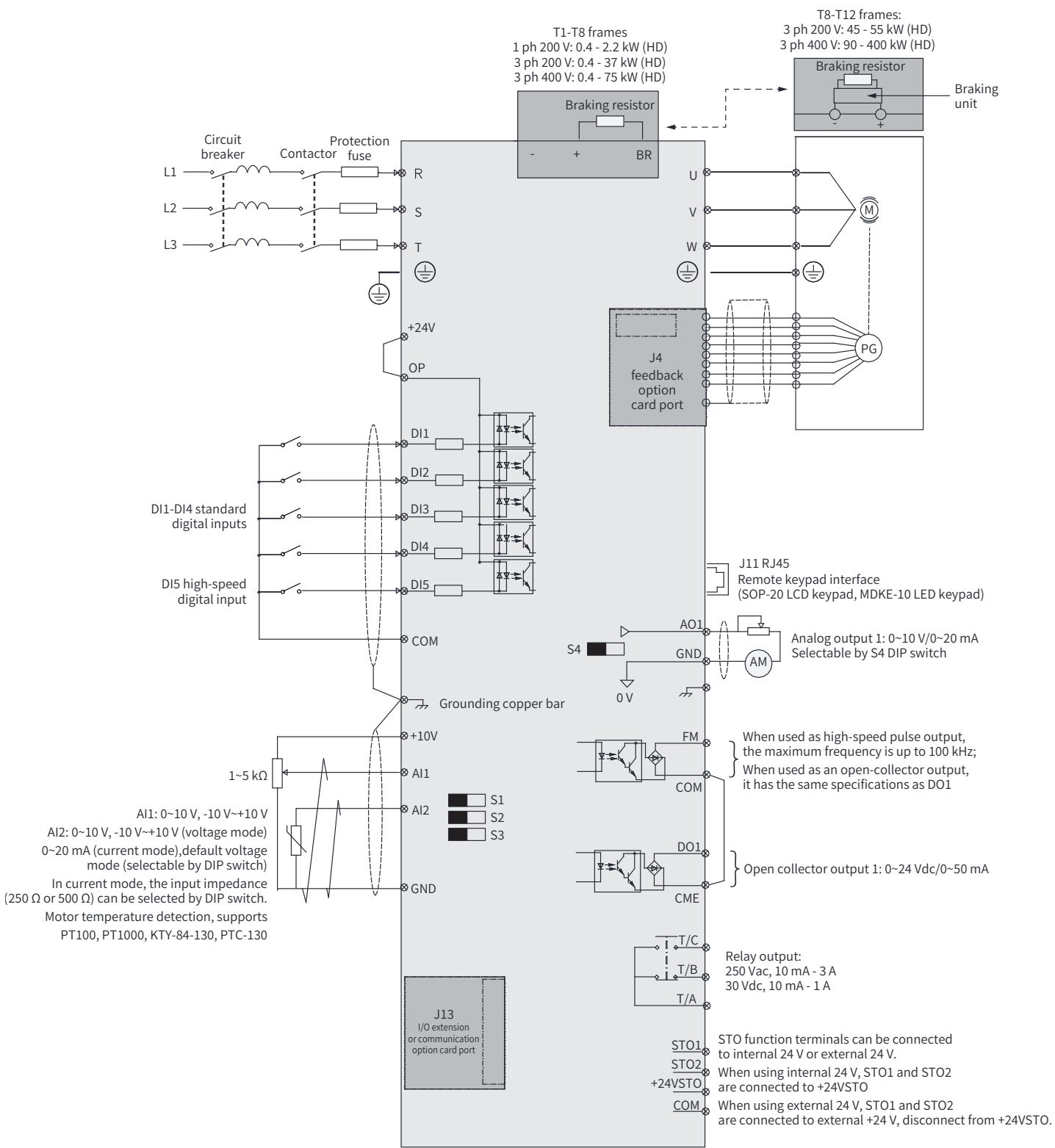
Voltage class		Three Phase 200 - 240Vac																					
Drive model: MD520-2Txxx(B)(S)-INT		0.4B(S)	0.7B(S)	1.1B(S)	1.5B(S)	2.2B(S)	3.7B(S)	5.5B(S)	7.5B(S)	11(B)(S)	15(B)(S)	18.5(B)(S)	22(B)(S)	30(B)(S)	37(B)(S)	45(S)	55(S)	75(S)	90(S)	110(S)	132(S)	160(S)	200(S)
Frame size		T1 ¹				T2		T3	T4	T5	T6		T7		T8			T9	T10		T11	T12	
Drive Input	Rated input voltage	Three Phase 200 to 240Vac, -15% to +10%																					
	Rated input current (A)	3.7	6.4	9.1	11.3	15.9	22.4	39.7	44	65.8	71	86	111	143	167	198	239	359	456	507	559	708	840
	Power capacity (kVA)	1.7	2.9	4.2	5.2	7.3	10.2	18.2	20.1	30.1	32.5	39.3	50.8	65.4	76.4	90.5	109.3	1.7	2.9	4.2	5.2	7.3	10.2
	Rated input frequency	50/60 Hz, ±5%																					
Drive Output	Applicable motor (kW)	0.75	1.1	1.5	2.2	3.7	5.5	7.5	11	15	18.5	22	30	37	45	55	75	90	110	132	160	200	220
	Output current (A) ²	3.1	5.1	7.2	9.0	13	17	32	37	60	75	91	112	150	176	210	253	377	465	520	585	725	880
	Default carrier frequency (kHz)	6	6	6	6	6	6	6	6	6	6	5	5	4	3	3	3	3	3	3	3	3	3
	Overload capacity	110% for 60 s																					
	Max. output voltage	Three Phase 200Vac to 240Vac (Proportional to input voltage)																					
	Max. output frequency	599 Hz																					
Braking Resistor	Recommended power (kW)	0.09	0.16	0.25	0.34	0.5	0.8	1.3	1.7	2.3	3.0	3.9	4.6	5.5	6.8	5.0 x2	6.0 x2	6 x3	7.5 x3	7.0 x4	6.5 x5	7.0 x6	7.0 x7
	Minimum resistance (Ω)	48	48	32	32	16	16	12	12	12	9	7	6	5	4	5.5 x2 ³	3.7 x2 ³	3.7 x3 ³	3.7 x3 ³	3.7 x4 ³	3.7 x5 ³	3.7 x6 ³	3.7 x7 ³
Braking unit		Built-in														MDBUN-60-2T x2	MDBUN-90-2T x2	MDBUN-90-2T x3	MDBUN-90-2T x3	MDBUN-90-2T x4	MDBUN-90-2T x5	MDBUN-90-2T x6	MDBUN-90-2T x7
Enclosure		IP20																	IP00				

*1 0.75/1.5/2.2 kW are the preferred stocking ratings. To learn more, please get in touch with your local Inovance representative.

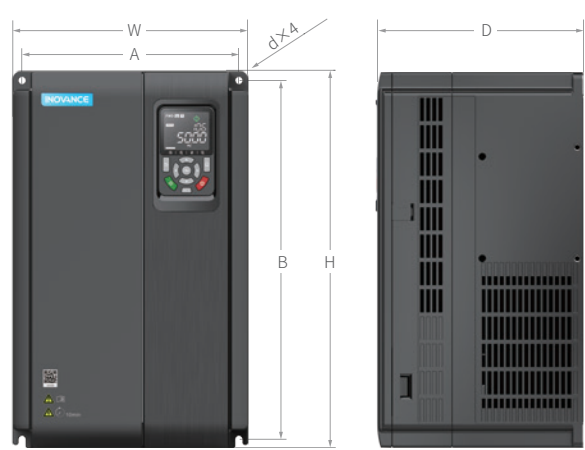
*2 Rated output current at default carrier frequency.

*3 Minimum value of the resistance for each braking unit.

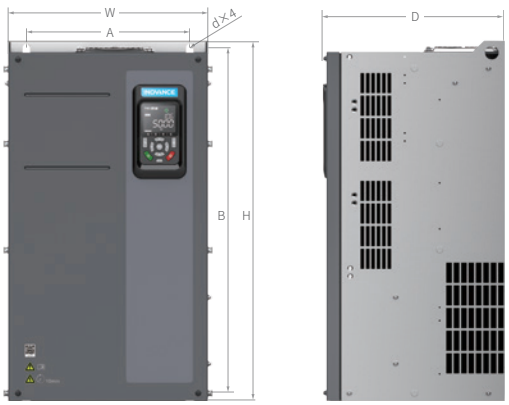
General wiring diagram



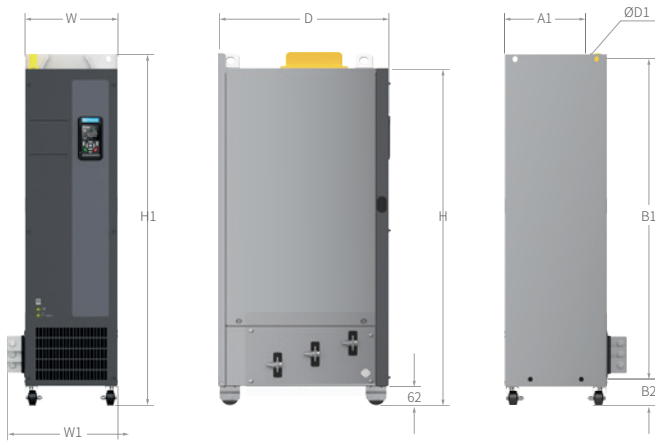
MD520-4T0.4B(S)-INT to MD520-4T15B(S)-INT
MD520-2T0.4B(S)-INT to MD520-2T7.5B(S)-INT
MD520-2S0.4B(S)-INT to MD520-2S2.2B(S)-INT



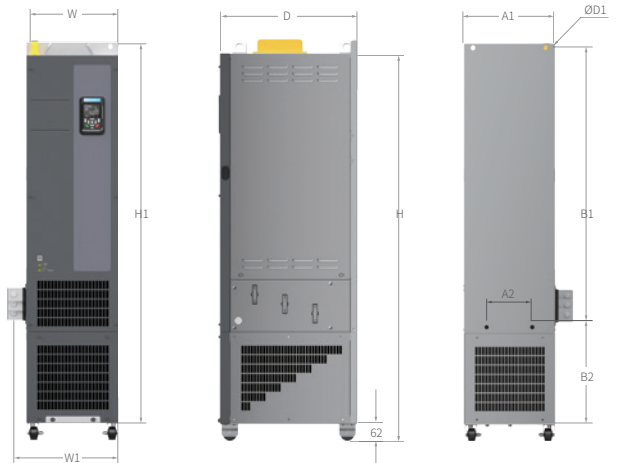
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MD520-2T11B(S)-INT to MD520-2T18.5B(S)-INT



MD520-4T45B(S)-INT to MD520-4T160(S)-INT
MD520-2T22B(S)-INT to MD520-2T55(S)-INT



MD520-4T200(S)-INT to MD520-4T400(S)-INT



MD520-4T200(S)-L-INT to MD520-4T400(S)-L-INT

MD520 Model	Frame Size	Dimensions										Mass (kg)
		A	A1	B	B2	H	H1	W	W1	D	D1	
MD520-4T0.4B(S)-INT, MD520-4T0.7B(S)-INT, MD520-4T1.1B(S)-INT	T1	119	/	189	/	200	/	130	/	150	Ø5	1.6
MD520-4T1.5B(S)-INT, MD520-4T2.2B(S)-INT, MD520-4T3.0B(S)-INT												
MD520-2T0.4B(S)-INT, MD520-2T0.7B(S)-INT												
MD520-2T1.1B(S)-INT, MD520-2T1.5B(S)-INT												
MD520-4T3.7B(S)-INT, MD520-4T5.5B(S)-INT	T2	119	/	189	/	200	/	130	/	160	Ø5	2.0
MD520-2S0.4B(S)-INT to MD520-2S2.2B(S)-INT												
MD520-2T2.2B(S)-INT, MD520-2T3.7B(S)-INT												
MD520-4T7.5B(S)-INT, MD520-4T11B(S)-INT, MD520-2T5.5B(S)-INT	T3	128	/	238	/	250	/	140	/	168.3	Ø6	3.3
MD520-4T15B(S)-INT, MD520-2T7.5B(S)-INT	T4	166	/	266	/	280	/	180	/	169	Ø6	4.3
MD520-4T18.5B(S)-INT, MD520-4T22B(S)-INT, MD520-2T11B(S)-INT	T5	195	/	335	/	350	/	210	/	193.4	Ø6	10
MD520-4T30B(S)-INT, MD520-4T37B(S)-INT	T6	230	/	380	/	400	/	250	/	220.8	Ø7	17.5
MD520-2T15B(S)-INT, MD520-2T18.5B(S)-INT												
MD520-4T45B(S)-INT, MD520-4T55B(S)-INT												
MD520-2T22B(S)-INT, MD520-2T30B(S)-INT	T7	245	/	523	/	542	/	300	/	275	Ø10	35
MD520-4T75B(S)-INT, MD520-4T90(S)-INT, MD520-4T110(S)-INT												
MD520-2T37B(S)-INT, MD520-2T45(S)-INT, MD520-2T55(S)-INT												
MD520-4T132(S)-INT, MD520-4T160(S)-INT	T9	320	/	890	/	915	/	400	/	320	Ø10	85
MD520-4T200(S)-INT	T10	240	150	1035	86	1086	1134	300	360	500	Ø13	110
MD520-4T220(S)-INT												
MD520-4T200(S)-L-INT												
MD520-4T220(S)-L-INT												
MD520-4T250(S)-INT, MD520-4T280(S)-INT	T11	225	185	1175	97	1248	1284	330	390	545	Ø13	155
MD520-4T250(S)-L-INT												
MD520-4T280(S)-L-INT												
MD520-4T315(S)-INT, MD520-4T355(S)-INT, MD520-4T400(S)-INT	T12	240	200	1280	101	1355	1405	340	400	545	Ø16	185
MD520-4T315(S)-L-INT, MD520-4T355(S)-L-INT												
MD520-4T400(S)-L-INT												

Option cards and mounting position

Feedback Card Slot – Feedback option cards

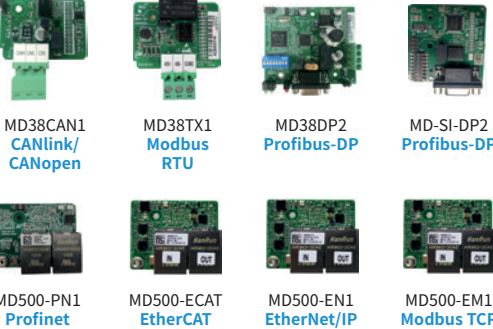


Extension or comms card slot

I/O extension option cards



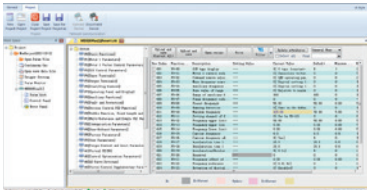
Communication option cards



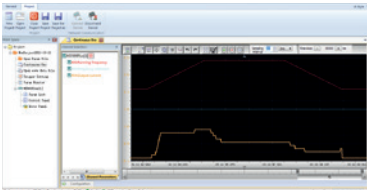
PC software tools

InoDriverShop

InoDriverShop is Inovance’s free of charge PC-based software offering. It is based on a familiar Windows interface. InoDriverShop can upload and download drive parameters, and features a variety of other functions, such as a real-time oscilloscope. For the connection with the PC a standard USB to RS485 adapter can be used. MDKE-10 or SOP-20 keypads can also be used for this purpose.



Parameter uploading/downloading



Multi channel oscilloscope

Accessories list

Category	Model	Function description	Suitable for
External braking units	MDBUN-60-5T	External braking unit, rated current 60 A, for supply input voltage 380 to 480 Vac AC drives.	4T models: 90G
	MDBUN-90-5T	External braking unit, rated current 90 A, for supply input voltage 380 to 480 Vac AC drives.	4T models: 110G - 132G
	MDBUN-200-5T	External braking unit, rated current 200 A, for supply input voltage 380 to 480 Vac AC drives.	4T models: 160G -450G
	MDBUN-60-2T	External braking unit, rated current 60 A, for supply input voltage 200 to 240 Vac AC drives.	2T models: 45G
	MDBUN-90-2T	External braking unit, rated current 90 A, for supply input voltage 200 to 240 VAC AC drives.	2T models: 55G
Keypads	MDKE-10	Remote LED keypad. Can be used as USB to RS485 adapter for the connection to the PC. Includes MDCAB cable.	All
	SOP-20	Remote multi-language LCD keypad. For parameter programming and monitoring, data copy. Keypad can be used as USB to RS485 adapter for the connection to the PC. Includes MDCAB cable.	All
	MDCAB	3 meter connection cable for remote keypad.	All
	MDCAB-1.5	1.5 meter connection cable for remote keypad.	All
	CP600-BASE1	Panel mounting base (only) for SOP-20 keypad. IP20 rating.	All
	SOP20-MP-IP20	Panel mounting base for SOP-20 keypad, including adapting metal plate and PCB protection plate. IP20 rating.	All
	SOP20-MP-IP54	Panel mounting base for SOP-20 keypad, including PCB protection plate and rubber seals. IP54 rating.	All
I/O extension cards	MD580-AZJ1	Panel mounting base for MDKE-10. IP20 rating.	All
	MD38IO1	I/O extension card 1, provides: 5x DI, 1x AI, 1x relay output, 1x DO, 1x AO, RS485 (Modbus-RTU) and CAN (CANlink) ports.	Frame sizes T4-T12
	MD38IO2	I/O extension card 2, provides 3x extra DI terminals.	All
	MD38IO3	I/O extension card 3, provides 3x DI, 1x relay output, Modbus-RTU interface.	All
	MD38DW1	I/O extension card 4, provides 5x DI, 1x AI, 1x AO, 1x DO, 1x relay output , RS485 (Modbus-RTU) and CAN (CANlink) ports, TTL differential encoder input.	Frame sizes T4-T12
	MD38DW2	I/O extension card 5, provides RS485 (Modbus-RTU) port and TTL differential encoder input.	All
	MD520IO1	I/O extension card 6, provides 3x DI, 1x relay output, 1x AO, Modbus-RTU interface.	All
Fieldbus cards	MD38CAN1	CANlink/CANopen option card.	All
	MD38TX1	Modbus RTU option card.	All
	MD38DP2	PROFIBUS DP option card.	Frame sizes T4-T12
	MD-SI-DP2	PROFIBUS DP option card (designed to cover small frames).	All
	MD500-PN1	PROFINET option card.	All
	MD500-ECAT	EtherCAT option card.	All
	MD500-EN1	EtherNet/IP option card.	All
PG cards	MD500-EM1	Modbus TCP option card.	All
	MD38PGMD	Multifunctional encoder option card, compatible with differential, open-collector and push-pull encoder types. Supports differential output and open-collector output.	All
	MD38PG4D	Option card for resolver (10 kHz excitation) with selectable ratio simulated encoder output (TTL differential).	Frame sizes T4, T7-T12
	MD38PG4	Option card for resolver (10 kHz excitation).	All
	ES510-PG-CT1	23-bit serial encoder card.	All
	MD520-PG-S1	Sin/Cos encoder option card with selectable ratio simulated encoder output (TTL differential and HTL).	All
	MD500-AZJ-A1T1	Through hole mounting bracket for frame T1.	Frame size T1
Mounting brackets	MD500-AZJ-A1T2	Through hole mounting bracket for frame T2.	Frame size T2
	MD500-AZJ-A1T3	Through hole mounting bracket for frame T3.	Frame size T3
	MD500-AZJ-A1T4	Through hole mounting bracket for frame T4.	Frame size T4
	MD500-AZJ-A1T5	Through hole mounting bracket for frame T5.	Frame size T5
	MD500-AZJ-A1T6	Through hole mounting bracket for frame T6.	Frame size T6
	MD500-AZJ-A1T7	Through hole mounting bracket for frame T7.	Frame size T7
	MD500-AZJ-A1T8	Through hole mounting bracket for frame T8.	Frame size T8
Cable brackets	MD500-AZJ-A1T9	Through hole mounting bracket for frame T9.	Frame size T9
	MD500-AZJ-A2T1	Cable shield grounding bracket for frame T1.	Frame size T1
	MD500-AZJ-A2T2	Cable shield grounding bracket for frame T2.	Frame size T2
	MD500-AZJ-A2T3	Cable shield grounding bracket for frame T3.	Frame size T3
	MD500-AZJ-A2T4	Cable shield grounding bracket for frame T4.	Frame size T4
	MD500-AZJ-A2T5	Cable shield grounding bracket for frame T5.	Frame size T5
	MD500-AZJ-A2T6	Cable shield grounding bracket for frame T6.	Frame size T6
Guide rails	MD500-AZJ-A2T7	Cable shield grounding bracket for frame T7.	Frame size T7
	MD500-AZJ-A2T8	Cable shield grounding bracket for frame T8.	Frame size T8
	MD500-AZJ-A2T9	Cable shield grounding bracket for frame T9.	Frame size T9
	MD500-AZJ-A3T10	Guide rails for inserting in/extracting from the cabinet for frame sizes T10 to T12.	Frame sizes T10-T12

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