INOVANCE

MD290 AC Drive

Open loop general purpose drive

Wide operating voltage
Three-phase 380 to 480 Vac
0.4 to 450 kW
Three phase 200 to 240 Vac

Operation in high ambient temperature 50°C
Please note: If operating above 40°C derating is required

Built-in DC reactor
(400V: 18.5 kW and above;
200V: 11 kW and above)

CE

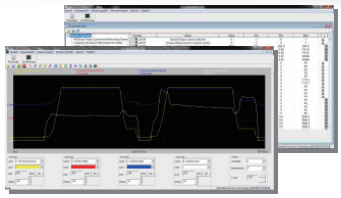
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E467465
IND. CONT. EQ.*1

Enhanced reliability

Dual rated
(G type and P type)

Conformally coated PCBs suitable for 3S2 and 3C3 environments
(acc. to IEC 60721-3-3)





PC-based software: simplified start up & backup*2



Through-hole mounting options (0.4 to 160 kW)

Features & functions

- Open loop control
- Communication options:
  - Modbus-RTU
  - PROFIBUS-DP
  - CANopen
  - CANlink
  - PROFINET
  - EtherCAT
- Automatic torque boost
- Slip compensation
- Simplified parameters for easy start up
- 4 independent S-ramps
- Flexible programmable I/Os
- User programmable functions
- Variable DC-injection braking
- Comprehensive trip diagnostics
- Output frequency: 500 Hz
- Built-in dynamic braking unit

*1 cUL is available for 380-480 Vac models. For other voltages, please consult with your local Inovance representative.
*2 PC comms kit is required (optional accessory)

General specifications

Voltage class CE UL	Three-phase 380 to 480 Vac										
MD290TxxxG/yyyPB-INT	0.4G/0.7PB	0.7G/1.1PB	1.1G/1.5PB	1.5G/2.2PB	2.2G/3.0PB	3.0G/3.7PB	3.7G/5.5PB	5.5G/7.5PB	7.5G/11PB	11G/15PB	15G/18.5PB
Frame size	T1*1						T2		T3		T4
Drive input: Rated input voltage	Three-phase 380 to 480 Vac -15% to +10%										
Drive input: Rated input current [A]	1.8/2.5	2.4/3.7	3.7/4.6	4.6/6.4	6.3/9.1	9.0/11.3	11.4/15.9	16.7/22.4	21.9/32.9	32.2/39.7	41.3/44
Drive input: 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
Drive input: Rated input frequency	50/60 Hz ±5%										
Drive output: Applicable motor [kW]	0.4/0.7	0.7/1.1	1.1/1.5	1.5/2.2	2.2/3.0	3.0/3.7	3.7/5.5	5.5/7.5	7.5/11	11/15	15/18.5
Drive output: Output current [A]*2	1.5/2.1	2.1/3.1	3.1/3.8	3.8/5.1	5.1/7.2	7.2/9.0	9.0/13	13/17	17/25	25/32	32/37
Drive output: Default carrier frequency [kHz]	6	6	6	6	6	6	6	6	6	6	6
Drive output: Overload capacity	150% for G type and 110% for P type for 60 s										
Drive output: Max. output voltage	Three-phase 380 to 480 Vac (proportional to input voltage)										
Drive output: Max. output frequency	500 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
Braking resistor: Minimum resistance [Ω]	96	96	96	96	64	64	32	32	32	24	24
Braking unit	Built-in										
Enclosure	IP 20										

Voltage class CE UL	Three-phase 380 to 480 Vac										
MD290TxxxG/xxxP-INT	18.5G/22P	22G/30P	30G/37P	37G/45P	45G/55P	55G/75P	75G/90P	90G/110P	110G/132P	132G/160P	160G/200P
Frame size	T5		T6		T7		T8			T9	
Drive input: Rated input voltage	Three-phase 380 to 480 Vac -15% to +10%										
Drive input: Rated input current [A]	43.4/51.3	51.3/65.8	57/71	69/86	89/111	106/143	139/167	164/198	196/239	240/295	287/359
Drive input: Power capacity [kVA]	54	60	65	79	102	131	153	181	219	270	328
Drive input: Rated input frequency	50/60 Hz ±5%										
Drive output: Applicable motor [kW]	18.5/22	22/30	30/37	37/45	45/55	55/75	75/90	90/110	110/132	132/160	160/200
Drive output: Output current [A]*2	37/45	45/60	60/75	75/91	91/112	112/150	150/176	176/210	210/253	253/304	304/377
Drive output: Default carrier frequency [kHz]	6	6	6	5	5	4	3	3	3	3	3
Drive output: Overload capacity	150% for G type and 110% for P type for 60 s										
Drive output: Max. output voltage	Three-phase 380 to 480 Vac (proportional to input voltage)										
Drive output: Max. output frequency	500 Hz										
Braking resistor: Recommended power [kW]	4	4.5	6	7	9	11	15	18	22	26	32
Braking resistor: Minimum resistance [Ω]	24	24	19.2	14.8	12.8	9.6	6.8	11.4x2*3	7.7x2*3	7.7x2*3	7.7x2*3
Braking unit	Built-in as option (for models MD290TxxxG/yyyPB-INT)							MDBUN-60-5T x2	MDBUN-90-5T x2		
Enclosure	IP 20										

*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.

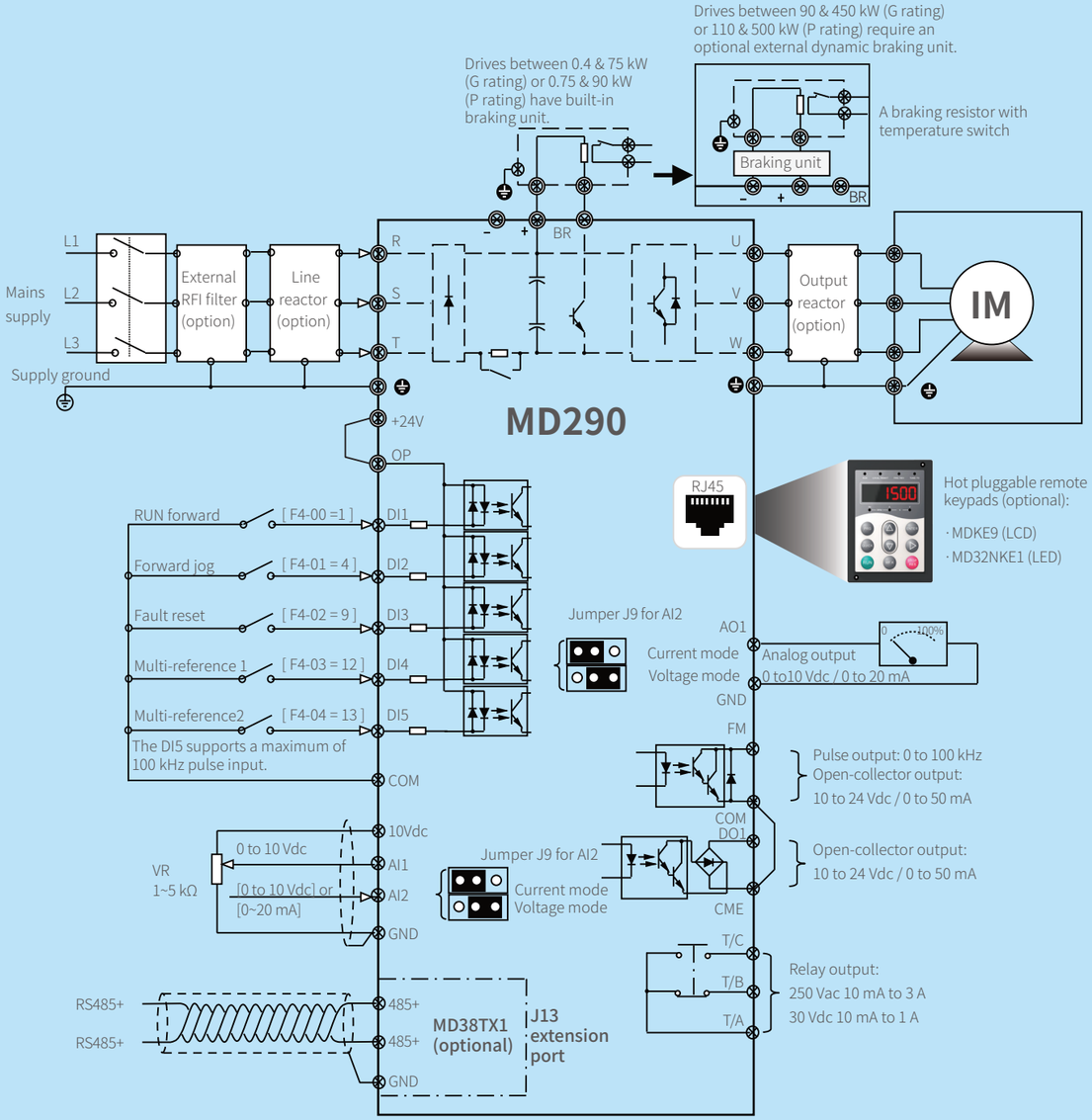
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Voltage class CE UL	Three-phase 380 to 480 Vac															
MD290Txxxx-INT*4	200G	220P	220G	250P	280P	250G	280G	315P	355P	315G	355G	400P	400G	450P	450G	500P
Frame size	T10					T11				T12						
Drive input: Rated input voltage	Three-phase 380 to 480 Vac -15% to +10%															
Drive input: Rated input current [A]	365	410	410	456	507	441	495	559	624	565	617	708	687	782	782	840
Drive input: Power capacity [kVA]	334	375	375	417	464	404	453	511	571	517	565	647	629	715	716	768
Drive input: Rated input frequency	50/60 Hz ±5%															
Drive output: Applicable motor [kW]	200	220	220	250	280	250	280	315	355	315	355	400	400	450	450	500
Drive output: Output current [A]*2	377	426	426	465	520	465	520	585	650	585	650	725	725	820	820	880
Drive output: Default carrier frequency [kHz]	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Drive output: Overload capacity	150% for G type and 110% for P type for 60 s (130% for MD290T450G (-L))															
Drive output: Max. output voltage	Three-phase 380 to 480 Vac (proportional to input voltage)															
Drive output: Max. output frequency	500 Hz															
Braking resistor: Recommended power [kW]	38	38	42	42	48	48	54	54	60	60	69	69	78	78	87	87
Braking resistor: Minimum resistance [Ω]	2.8 x2 *3	2.8 x2 *3	2.8 x2 *3	2.8 x2 *3	2.8 x2 *3	2.8 x2 *3	2.8 x3 *3	2.8 x3 *3	2.8 x3 *3	2.8 x3 *3	2.8 x3 *3	2.8 x3 *3	2.8 x3 *3	2.8 x3 *3	2.8 x3 *3	2.8 x3 *3
Braking unit	MDBUN-200-5T x2					MDBUN-200-5T x3										
Enclosure	IP 00															

Voltage class CE	Three-phase 200 to 240 Vac															
MD290-2TxxxG/yyyP(B)-INT	0.4G/0.7PB	0.7G/1.1PB	1.1G/1.5PB	1.5G/2.2PB	2.2G/3.7PB	3.7G/5.5PB	5.5G/7.5PB	7.5G/11PB	11G/15P	15G/18.5P	18.5G/22P	22G/30P	30G/37P	37G/45P	45G/55P	55G/75P
Frame size	T1*1				T2		T3	T4	T5	T6		T7		T8		
Drive input: Rated input voltage	Three-phase 200 to 240 Vac -15% to +10%															
Drive input: Rated input current [A]	2.4/3.7	4.6/6.4	6.3/9.1	9/11.3	11.4/15.9	16.7/22.4	32.2/39.7	41.3/44	51.3/65.8	57/71	69/86	89/111	106/143	139/167	164/198	196/239
Drive input: Rated input frequency	50/60 Hz ±5%															
Drive output: Applicable motor [kW]	0.4/0.75	0.75/1.1	1.1/1.5	1.5/2.2	2.2/3.7	3.7/5.5	5.5/7.5	7.5/11	11/15	15/18.5	18.5/22	22/30	30/37	37/45	45/55	55/75
Drive output: Output current [A]*2	2.1/3.1	3.8/5.1	5.1/7.2	7.2/9	9/13	13/17	25/32	32/37	45/60	60/75	75/91	91/112	112/150	150/176	176/210	210/253
Drive output: Default carrier frequency [kHz]	6	6	6	6	6	6	6	6	6	6	5	5	5	4	3	3
Drive output: Overload capacity	150% for G type & 110% for P type for 60 s															
Drive output: Max. output voltage	Three phase 200 to 240 Vac (proportional to input voltage)															
Drive output: Max. output frequency	500 Hz															
Braking resistor: Recommended power [kW]	90	160	250	340	500	800	1300	1700	2300	3000	3900	4600	5500	6800	5000x2	6000x2
Braking resistor: 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
Braking unit	Built-in								Built-in as option (for models MD290-2TxxxG/yyyPB-INT)						MDBUN-60-2T x2	MDBUN-90-2T x2
Enclosure	IP20															

*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.
*4 For the standard AC drive, motor cable length should be <100m. Where it is >100m, we recommend the "L" option with 1% voltage drop output reactors to overcome the effects of voltage reflections on the motor windings (e.g. drive model M290T200G-L-INT). To discuss your application, consult your local Inovance representative.

General wiring diagram

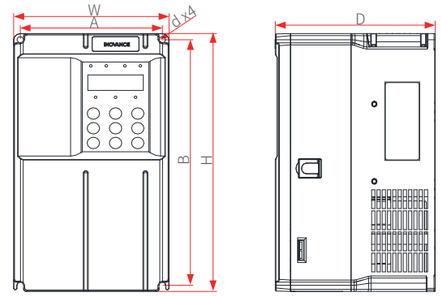


Note: This wiring diagram shows the digital inputs used in NPN (SINK) configuration. They can be used also as PNP (SOURCE) configuration.

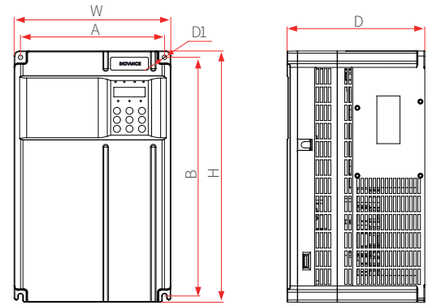
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Dimensions

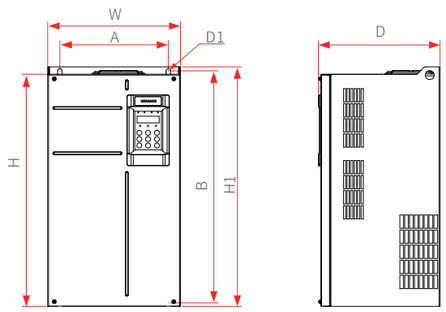
MD290T0.4G/0.7PB-INT to MD290T15G/18.5PB-INT
MD290-2T0.4G/0.7PB-INT to MD290-2T7.5G/11PB-INT



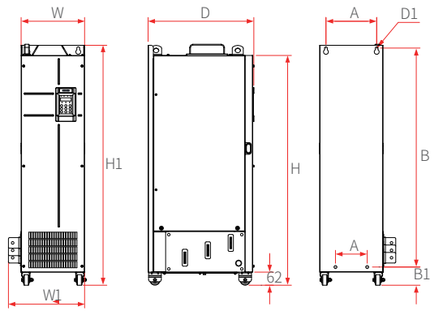
MD290T18.5G/22P(B)-INT to MD290T37G/45P(B)-INT
MD290-2T11G/15P(B)-INT to MD290-2T18.5G/22P(B)-INT



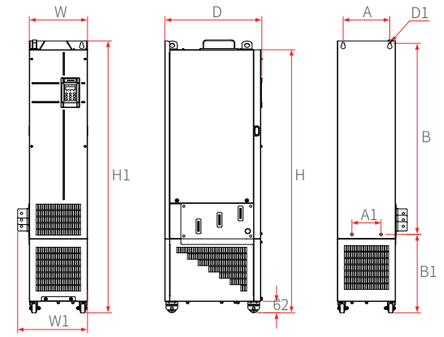
MD290T45G/55P(B)-INT to MD290T160G/200P-INT
MD290-2T22G/30P(B)-INT to MD290-2T55G/75P-INT



MD290T200G-INT to MD290T450G-INT
MD290T220P-INT to MD290T500P-INT

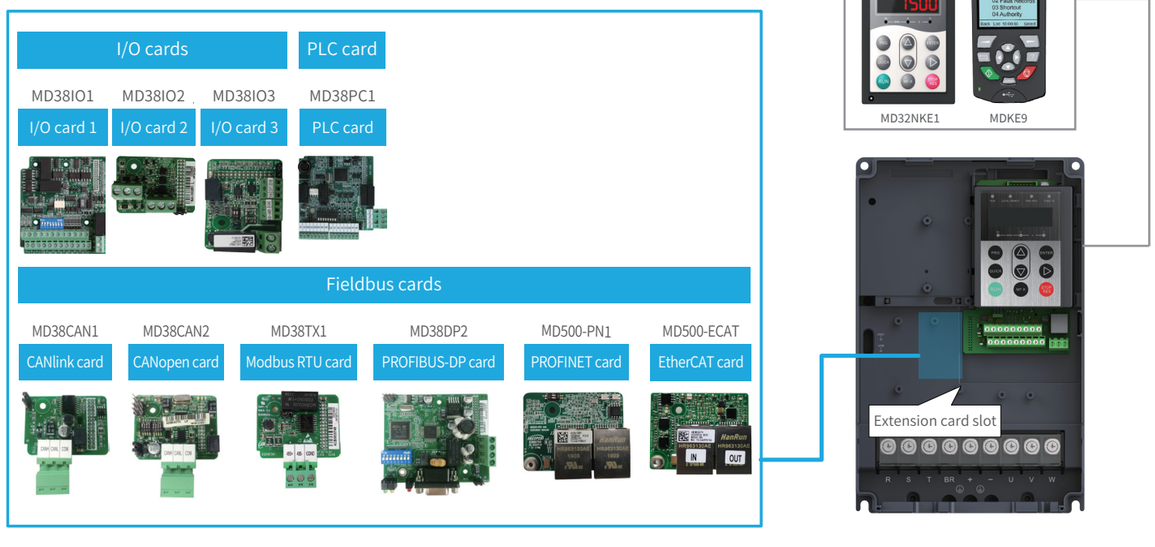


MD290T200G-L-INT to MD290T450G-L-INT
MD290T220P-L-INT to MD290T500P-L-INT



MD290 model	Frame size	Dimensions (mm)										Mass (kg)
		A	A1	B	B1	H	H1	W	W1	D	D1	
MD290T0.4G/0.7PB-INT, MD290T0.7G/1.1PB-INT, MD290T1.1G/1.5PB-INT MD290T1.5G/2.2PB-INT, MD290T2.2G/3.0PB-INT, MD290T3.0G/3.7PB-INT MD290-2T0.4G/0.7PB-INT, MD290-2T0.7G/1.1PB-INT, MD290-2T1.1G/1.5PB-INT, MD290-2T1.5G/2.2PB-INT	T1	119	/	189	/	**200**	/	**130**	/	**152**	Ø5	1.6
MD290T3.7G/5.5PB-INT, MD290T5.5G/7.5PB-INT MD290-2T2.2G/3.7PB-INT, MD290-2T3.7G/5.5PB-INT	T2	119	/	189	/	**200**	/	**130**	/	**162**	Ø5	2.0
MD290T7.5G/11PB-INT, MD290T11G/15PB-INT, MD290-2T5.5G/7.5PB-INT	T3	128	/	238	/	**250**	/	**140**	/	**170**	Ø6	3.3
MD290T15G/18.5PB-INT, MD290-2T7.5G/11PB-INT	T4	166	/	266	/	**280**	/	**180**	/	**170**	Ø6	4.3
MD290T18.5G/22P(B)-INT, MD290T22G/30P(B)-INT, MD290-2T11G/15P(B)-INT	T5	195	/	335	/	**350**	/	**210**	/	**192**	Ø6	10
MD290T30G/37P(B)-INT, MD290T37G/45P(B)-INT MD290-2T15G/18.5P(B)-INT, MD290-2T18.5G/22P(B)-INT	T6	230	/	380	/	**400**	/	**250**	/	**220**	Ø7	17.5
MD290T45G/55P(B)-INT, MD290T55G/75P(B)-INT MD290-2T22G/30P(B)-INT, MD290-2T30G/37P(B)-INT	T7	245	/	523	/	525	**542**	**300**	/	**275**	Ø10	35
MD290T75G/90P(B)-INT, MD290T90G/110P-INT, MD290T110G/132P-INT MD290-2T37G/45P(B)-INT, MD290-2T45G/55P-INT, MD290-2T55G/75P-INT	T8	270	/	560	/	554	**580**	**338**	/	**315**	Ø10	51.5
MD290T132G/160P-INT, MD290T160G/200P-INT	T9	320	/	890	/	874	**915**	**400**	/	**320**	Ø10	85
MD290T200G-INT, MD290T220P-INT, MD290T220G-INT, MD290T250P-INT MD290T280P-INT	T10	240	150	1,035	86	1,086	**1,134**	300	**360**	**500**	Ø13	110
MD290T200G-L-INT, MD290T220P-L-INT, MD290T220G-L-INT, MD290T250P-L-INT, MD290T280P-L-INT		240	150	1,035	424	1,424	**1,472**	300	**360**	500	Ø13	160
MD290T250G-INT, MD290T280G-INT, MD290T315P-INT, MD290T355P-INT	T11	225	185	1,175	97	1,248	**1,284**	330	**390**	**545**	Ø13	155
MD290T250G-L-INT, MD290T280G-L-INT, MD290T315P-L-INT, MD290T355P-L-INT		225	185	1,175	435	1,586	**1,622**	330	**390**	**545**	Ø13	215
MD290T315G-INT, MD290T355G-INT, MD290T400P-INT, MD290T400G-INT, MD290T450P-INT, MD290T450G-INT, MD290T500P-INT	T12	240	200	1,280	101	1,355	**1,405**	340	**400**	**545**	Ø16	185
MD290T315G-L-INT, MD290T355G-L-INT, MD290T400P-L-INT, MD290T400G-L-INT, MD290T450P-L-INT, MD290T450G-L-INT, MD290T500P-L-INT		240	200	1,280	432	1,683	**1,733**	340	**400**	**545**	Ø16	245

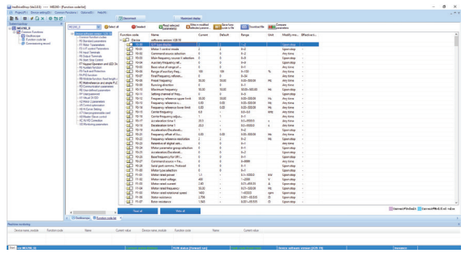
Extension cards and mounting position



PC software tools

InoDriveShop

InoDriveShop is Inovance's PC-based software offering. It is based on a familiar Windows interface. InoDriveShop can upload and download drive parameters, and features a variety of other functions, such as a real-time oscilloscope



Parameter uploading/downloading



Multi-drive, multi-channel oscilloscope

Accessories list

Category	Model	Function description	Suitable for
External braking units	MDBUN-60-2T	External braking unit, rated current 60 A, for supply input voltage 200 to 240 Vac AC drives.	2T models: 45G - 55G
	MDBUN-200-5T	External braking unit, rated current 200 A, for supply input voltage 380 to 480 Vac AC drives.	T models: 200G - 450G
	MDBUN-60-5T	External braking unit, rated current 60 A, for supply input voltage 380 to 480 Vac AC drives.	T models: 90G - 110G
	MDBUN-90-5T	External braking unit, rated current 90 A, for supply input voltage 380 to 480 Vac AC drives.	T models: 132G - 160G
Keypads	MD32NKE1	Remote LED keypad. Includes MDCAB cable.	All
	MDKE9	Remote LCD keypad. For parameter programming and monitoring, data copy (for various MD series). 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
I/O cards	MD38IO1	I/O extension card 1, provides: 5x DI, 1x AI, 1x relay output, 1x DO, 1x AO, Modbus-RTU and CANlink.	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
PLC card	MD38PC1	PLC card, compatible with Inovance PLC.	Frame sizes T4-T12
Fieldbus cards	MD500-ECAT	EtherCAT communication card.	All
	MD38CAN1	CANlink communication card, supports only CANlink.	All
	MD38CAN2	CANopen communication card, supports only CANopen.	All
	MD38TX1	Modbus-RTU communication card.	All
	MD38DP2	PROFIBUS-DP communication card.	Frame sizes T4-T12
	MD500-PN1	PROFINET communication card.	All
PC comms kit	MDPCKIT02	Kit for connection with a personal computer, to be used with PC software tools.	All
Mounting brackets	MD500-AZJ-A1T1	Through hole mounting bracket - MD290/MD500 for frame T1.	Frame size T1
	MD500-AZJ-A1T2	Through hole mounting bracket - MD290/MD500 for frame T2.	Frame size T2
	MD500-AZJ-A1T3	Through hole mounting bracket - MD290/MD500 for frame T3.	Frame size T3
	MD500-AZJ-A1T4	Through hole mounting bracket - MD290/MD500 for frame T4.	Frame size T4
	MD500-AZJ-A1T5	Through hole mounting bracket - MD290/MD500 for frame T5.	Frame size T5
	MD500-AZJ-A1T6	Through hole mounting bracket - MD290/MD500 for frame T6.	Frame size T6
	MD500-AZJ-A1T7	Through hole mounting bracket - MD290/MD500 for frame T7.	Frame size T7
	MD500-AZJ-A1T8	Through hole mounting bracket - MD290/MD500 for frame T8.	Frame size T8
	MD500-AZJ-A1T9	Through hole mounting bracket - MD290/MD500 for frame T9.	Frame size T9
Guide Rails	MD500-AZJ-A3T10	Guide rails for inserting in/ extracting from the cabinet - frame sizes T10 to T12.	Frame sizes T10-T12

Driven by Technology

AC Drives



AC MultiDrives



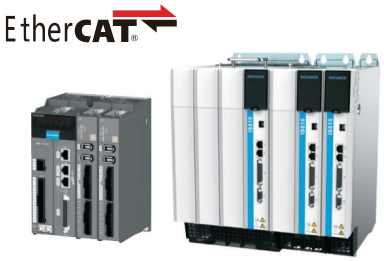
MV Drives



Single-Axis Servos



Multi-Axis Servos



Robotics & Motion Controllers



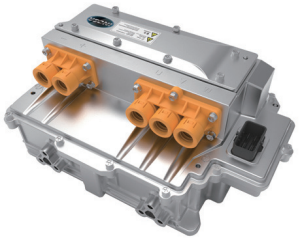
PLCs & HMIs



CNC Machine Tool Solutions



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