



Smart
connections.

Data sheet

INVEOR MP Modular

INVEOR – "Smart connections." on five levels

1 The INVEOR

IP65 protection class

Design without a fan up to 11 kW

Cover level and internal space for e.g. the customer to mount a switch

100% of connections can be plugged in (Harting plug HAN Q4/2, Quickon)

Optional slots

Brake module

Robust and vibration-resistant housing concept

Internal PTC brake resistor

Functional safety

3 Operation and observation

Potentiometer

M12 RS485 service interface

Main switch

MMI handheld controller

MMI cover option

Touch operating terminal

PC software: KOSTAL INVERTERpc
www.kostal-industrie-elektrik.com/KOSTAL_INVERTERpc

App: KOSTAL INVERTERapp



4 Motor adaptations

Robust and vibration-resistant adapter concept

Motor adapter concept compatible with all commercially available motors

Mechanics of motor adapter compatible with INVEOR M product group

5 Control process

Supports all synchronous reluctance, synchronous and asynchronous motors with maximum energy efficiency

2 Communication

CANopen

PROFINET

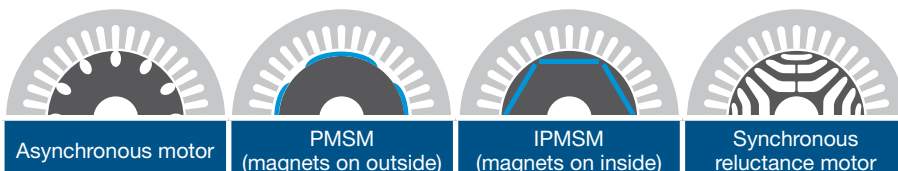
MODBUS RTU

SERCOS
the automation bus

EtherCAT

EtherNet/IP

Bluetooth

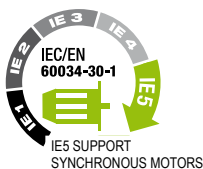
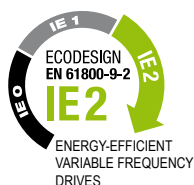


Asynchronous motor




PMSM
(magnets on outside)

IPMSM
(magnets on inside)

Synchronous
reluctance motor



400 V devices, technical data for INVEOR MP Modular

Size	A					B				C			D				
Recommended motor rating ¹⁾ [kW]	0.55	0.75	1.1	1.5	2.2 LD ⁵⁾	2.2	3	4	5.5 LD ⁵⁾	5.5	7.5	11 LD ⁵⁾	11	15	18.5	22	30 LD ⁵⁾
Supply voltage	3 x 200 V AC -10 %...480 V AC +10 % 280 V DC -10 %...680 V DC +10 % ²⁾																
Grid frequency	50/60 Hz ± 6%																
Network configurations	TN / TT																
Line current [A]	1.4	1.9	2.6	3.3	3.9	4.6	6.2	7.9	9.3	10.8	13.8	18.3	23.2	28.2	33.2	38.2	49.8
Rated current output eff. [IN at 4 kHz]	1.7	2.3	3.1	4	4.8	5.6	7.5	9.5	11	13	16.5	22	28	34	40	46	60
Min. brake resistance [Ω]	100					50						30					
Overload for 60 sec. [%]	150				110	150			110	150		110	150			110	
Overload for 3 sec. [%]	200				150	200			150	200		150	200			150	
Switching frequency	Auto regardless of temperature, 2 kHz, 4 kHz, 6 kHz, 8 kHz, 12 kHz, 16 kHz (factory setting 4 kHz)																
Output frequency	0 Hz – 599 Hz																
Nominal output apparent power [kVA]	1.06	1.43	1.93	2.49	2.99	3.49	4.68	5.92	6.86	8.11	10.29	13.72	17.46	21.2	24.94	28.6	37.41
Mains cycles of operation / restart	Unlimited ³⁾												> 2 min.				
DIN EN 61800-5 touch current	< 3.5 mA ⁴⁾																
Protective function	Overvoltage and undervoltage, I ² t restriction, short-circuit, ground leak, motor and variable frequency drive temperature, stall prevention, blocking detection																
Software functions	Torque control ⁶⁾ , fixed frequencies, data record changeover, flying restart, motor current limit																
Housing	Two-part aluminium die-cast casing																
Dimensions [L x W x H] mm	233 x 153 x 120					270 x 189 x 140				307 x 223 x 181			414 x 294 x 232				
Weight including adapter plate [kg]	3.9					5.0				8.7			21.0				
Protection class [IPxy]	IP 65									IP 55							
Cooling	Passive Cooling												Active Cooling				
Climate class (DIN EN 60721-3-3)	3K3 (50°C)				3K3 (40°C)	3K3 (50°C)			3K3 (40°C)	3K3 (50°C)		3K3 (40°C)	3K3 (50°C)			3K3 (40°C)	
Ambient temperature	-40 °C (non condensing) to +50 °C (without derating)				up to +40°C	-40 °C (non condensing) to +50 °C (without derating)			up to +40°C	-40 °C to +50 °C >50 °C (with derating)		to +40°C	-40 °C to +50 °C >50 °C (with derating)			to +40°C	
Storage temperature	-40 °C...+85 °C																
Altitude of the installation location	Up to 1000m above sea level / over 1000m with reduced performance (1 % per 100 m) / above 2000 m see operating manual																
Relative air humidity	≤ 96 %, condensation not permitted.																
Vibration class (DIN EN 60721-3-3) ⁷⁾	3M7 (3g)																
EMC (DIN-EN-61800-3)	C2																
Energy efficiency class (EN 61800-9-2)	IE2																
Certificates and conformity	  																

Technical data for 400 V devices INVEOR MP Modular (subject to technical changes)

¹⁾ Recommended motor rating (4-pole asynch. motor) is given based on the 400 V AC supply voltage.

²⁾ In compliance with the overvoltage category.

³⁾ < 3 s may result in power failure/intermediate circuit undervoltage faults.

⁴⁾ With 1LA7 asynchronous motor, motor-mounted.

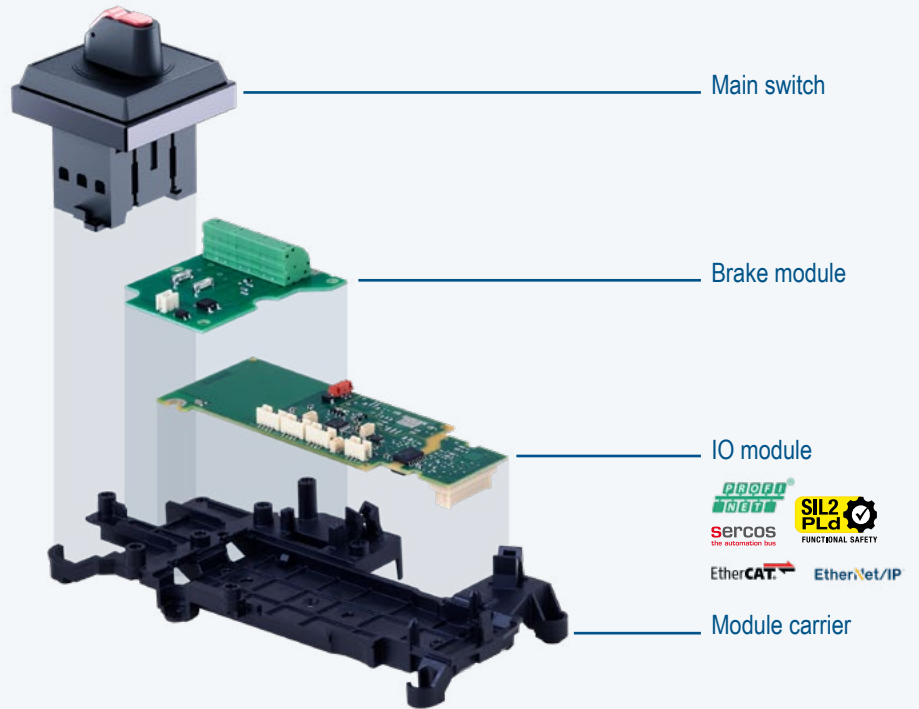
⁵⁾ Low-duty devices with reduced output currents.

⁶⁾ Only for synchronous and reluctance motors.

⁷⁾ Installation- and application-related resonant frequencies can damage the devices.

INVEOR MP Modular – Individually smart.

MODULES



POWER STACK

Power stack, self-contained

Works without extra controller cards.

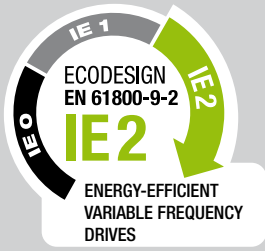


Model	Without IO module	With IO module 1
I/O interfaces ¹⁾	-	3 DI / 1 DO
STO input Sil 2 PLd	-	Option ²⁾
Potentiometer on device	-	Option
MMI/MMI option	-	Option
Bluetooth	-	Option
Internal power supply	-	24 V DC, 100 mA short-circuit proof
External feed-in 24 V DC	-	only with STO or fieldbus option
Fieldbus integrated ¹⁾	Modbus RTU or CANopen	Modbus RTU and CANopen
Fieldbus option	-	Profinet, Sercos III optional, EtherCAT, EtherNet/IP
Brake module	-	Option
Main switch	-	Option

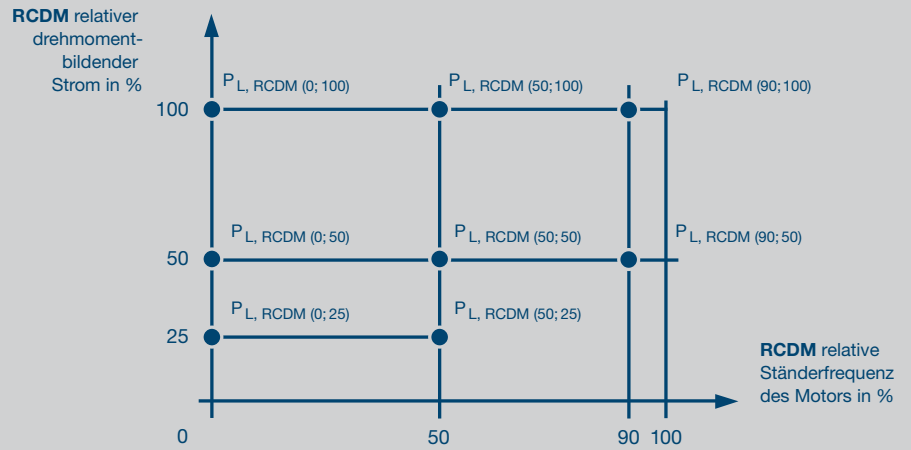
Technical data for INVEOR MP Modular 400 V devices (subject to technical changes)

¹⁾ Via M12 plug connector (optional)

Variable frequency drive losses in accordance with EN 61800-9-2



INVEOR variable frequency drives meet the most stringent of energy efficiency requirements.



Device	Supply voltage [V]	Nominal current [A]	Measurement (90; 100)	Measurement (50; 100)	Measurement (10; 100)	Measurement (90; 50)	Measurement (50; 50)	Measurement (10; 50)	Measurement (50; 25)	Measurement (10; 25)	Standby losses [W]	IE class	
			Absolute power loss [W] ^{1) 2)}										
			Relative losses [%] ^{1) 2) 3)}										
Size A 0.55 kW	400	1.7	24	24	27	22	20	25	24	25	5	IE2	
			2.3	2.2	2.5	2	1.9	2.4	2.2	2.3			
Size A 0.75 kW	400	2.3	29	28	32	23	21	28	25	27	5	IE2	
			2	1.9	2.2	1.6	1.5	2	1.7	1.9			
Size A 1.1 kW	400	3.1	35	30	38	27	26	31	26	28	5	IE2	
			1.8	1.6	2	1.4	1.3	1.6	1.4	1.4			
Size A 1.5 kW	400	4.0	45	39	46	31	27	36	25	31	5	IE2	
			1.8	1.6	1.8	1.3	1.1	1.4	1	1.2			
Size B 2.2 kW LD	400	4.8	56	51	54	39	36	40	35	33	5	IE2	
			1.9	1.7	1.8	1.3	1.2	1.3	1.2	1.1			
Size B 2,2 kW	400	5.6	61	60	65	46	38	48	37	42	7	IE2	
			1.7	1.7	1.9	1.3	1.1	1.4	1	1.2			
Size B 3.0 kW	400	7.5	83	62	80	54	38	58	28	51	7	IE2	
			1.8	1.3	1.7	1.2	0.8	1.3	0.6	1.1			
Size B 4.0 kW	400	9.5	107	80	98	66	51	70	31	58	7	IE2	
			1.8	1.4	1.7	1.1	0.9	1.2	0.5	1			
Size C 5.5 kW LD	400	11.0	137	117	122	71	67	70	50	56	7	IE2	
			2	1.7	1.8	1	1	1	0.7	0.8			
Size C 5.5 kW	400	13.0	149	114	125	69	52	76	44	70	7	IE2	
			1.8	1.4	1.5	0.9	0.6	0.9	0.5	0.9			
Size C 7.5 kW	400	16.5	203	157	166	98	75	95	58	78	7	IE2	
			2	1.5	1.6	0.9	0.7	0.9	0.6	0.8			
Size D 11.0 kW LD	400	22.0	323	226	244	151	123	133	80	99	7	IE2	
			2.4	1.6	1.8	1.1	0.9	1	0.6	0.7			
Size D 11,0 kW	400	28.0	249	222	245	148	133	140	101	109	18	IE2	
			1.4	1.3	1.4	0.8	0.8	0.8	0.6	0.6			
Size D 15.0 kW	400	34.0	314	279	298	181	163	173	122	134	18	IE2	
			1.5	1.3	1.4	0.9	0.8	0.8	0.6	0.6			
Size D 18.5 kW	400	40.0	381	333	347	211	189	202	140	152	18	IE2	
			1.5	1.3	1.4	0.8	0.8	0.8	0.6	0.6			
Size D 22.0 kW	400	46.0	485	398	392	247	189	276	197	194	18	IE2	
			1.7	1.4	1.4	0.9	0.7	1	0.7	0.7			
Size D 30.0 kW LD	400	60.0	710	579	581	360	284	317	125	243	18	IE2	
			1.9	1.5	1.6	1	0.8	0.8	0.3	0.6			

¹⁾ Loss values were determined at 4 kHz switching frequency
²⁾ Loss values include 10% supplement in accordance with standard
³⁾ Relative losses in relation to the device's rated apparent power

KOSTAL

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