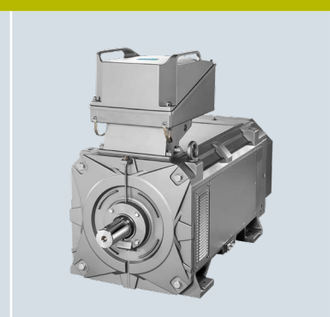
Motors	Low-voltage motors for line and inverter operation						
The right motor for every application	**General Purpose SIMOTICS GP**	**Severe Duty SIMOTICS SD**	**Explosion Proof SIMOTICS XP**	**Definite Purpose SIMOTICS DP**	**Transnorm SIMOTICS TN**	**Flexible Duty SIMOTICS FD**	**High Torque SIMOTICS HT**
							
Summary description	Asynchronous/synchronous-reluctance motors with aluminum frame: light, reliable, compact and optimized for converter operation: VSD10 asynchronous motors, VSD4000 synchronous reluctance motors; NEMA and APAC motors for applications in the USA and ASEAN markets	Asynchronous/synchronous-reluctance motors with gray cast-iron frame: robust, reliable, compact and optimized for converter operation: VSD10 asynchronous motors, VSD4000 synchronous-reluctance motors; NEMA and APAC motors for applications in the USA and ASEAN markets; pole-changing motors	Explosion-proof asynchronous motors for reliable operation in Ex-Zones 1, 2, 21 and 22 or Division 1 (Class 1 and 2) and Division 2 (Class 1 and 2)	Marine motors, roller table and steel plant motors, smoke extraction motors, crane motors, and customized motors in asynchronous technology	Asynchronous motors with gray cast-iron frame for standard and harsh ambient conditions	Asynchronous motors with gray cast-iron frame optimized for converter operation, including explosion-proof motors and industry solutions for marine motors, crane motors and energy storage motors	Multi-pole torque motor for gearless use in applications requiring high torques
Efficiency/ Motor efficiency class	IE4, IE3, IE2, IE1, NPE	IE4, IE3, IE2, IE1, NPE	IE3, IE2, IE1 NEE, NPE	IE4, IE3, IE2, IE1 NEE, NPE	IE2, IE3, NPE	Water-cooled motors for line operation: IE2, IE3	
System efficiency class with SINAMICS G (EN 50598-2)	IES1/IES2	IES1/IES2	IES1/IES2	IES1/IES2		IES2	
IEC – shaft height/ NEMA – frame size	IEC: 63 to 200 Reluctance: 80, 112 to 200 NEMA: 140 to 250	IEC: 71 to 450 Reluctance: 80, 112 to 200 NEMA: 140 to 500	IEC: 63 to 450 NEMA: 140 to 440	IEC: 63 to 450 NEMA: 140 to 440	315 to 560	315 to 450	400 to 500
Rated power	IEC: 0.09 to 45 kW Reluctance: 0.55 to 48 kW NEMA: 1 to 20 HP	IEC: 0.09 to 1,000 kW Reluctance: 0.55 to 48 kW NEMA: 1 to 700 HP	IEC: 0.09 to 1,000 kW NEMA: 1 to 300 HP	IEC: 0.09 to 1,000 kW NEMA: 1 to 250 HP	200 to 4,000 kW	200 to 1,800 kW	150 to 2,100 kW
Rated voltage	IEC: 230 to 690 V Reluctance: 400/460 V at inverter input NEMA: 208 to 575 V	IEC: 230 to 690 V Reluctance: 400/460 V at inverter input NEMA: 208 to 575 V	IEC: 230 to 690 V NEMA: 208 to 575 V	IEC: 230 to 690 V Reluctance: 400/460 V at inverter input NEMA: 208 to 575 V	400 to 690 V	400 to 690 V	400 to 690 V
Rated torque M_N Feed force F_N	IEC: 0.61 to 293.8 Nm Reluctance: 3.5 to 191 Nm NEMA: 1.5 to 60 lb-ft	IEC: 1.3 to 8,100 Nm Reluctance: 3.5 to 191 Nm NEMA: 1.5 to 5,865 lb-ft	IEC: 0.61 to 8,090 Nm NEMA: 1.5 to 1,187 lb-ft	IEC: 2.5 to 3,142 Nm Reluctance: 3.5 to 191 Nm NEMA: 1.5 to 5,865 lb-ft	800 to 22,500 Nm	610 to 14,600 Nm	6,000 to 42,000 Nm
Max. torque M_{max} Max. force F_{max}							42,000 Nm
Rated speed n_N Speed at rated force	IEC: 750 to 3,000 min^{-1} (at 50 Hz) Reluctance:1,500/1,800/ 2,610 min^{-1} NEMA: 900 to 3,600 min^{-1} (at 60 Hz)	IEC: 750 to 3,000 min^{-1} (at 50 Hz) Reluctance: 1,500/1,800/2,610/ 3,000/3,600 min^{-1} NEMA: 900 to 3,600 min^{-1} (at 60 Hz)	IEC: 750 to 3,000 min^{-1} (at 50 Hz) NEMA: 900 to 3,600 min^{-1} (at 60 Hz)	IEC: 750 to 3,000 min^{-1} (at 50 Hz) NEMA: 900 to 3,600 min^{-1} (at 60 Hz)	IEC: 750 to 3,600 min^{-1} (at 50 Hz)	IEC: 750 to 3,000 min^{-1} (at 50 Hz)	IEC: 200 to 800 min^{-1} (at 50 Hz)
Maximum speed n_{Max} Max. speed	Asynchronous: up to 6,000 min^{-1} Reluctance: up to 4,500 min^{-1}	Asynchronous: up to 6,000 min^{-1} Reluctance: up to 4,500 min^{-1}	up to 6,000 min^{-1}	up to 10,000 min^{-1}	up to 5,000 min^{-1}	up to 3,600 min^{-1}	up to 1,000 min^{-1}
Overload capability	up to 2 * M_N	up to 2 * M_N	up to 2 * M_N	up to 2 * M_N	up to 2 * M_N	up to 3 * M_N	up to 1.5 * M_0
Type of protection (rating)	IEC: IP55, IP56, IP65 NEMA: IP54, IP56, IP65	IEC: IP55, IP56, IP65 NEMA: IP55, IP56, IP65	IEC: IP55, IP56, IP65 NEMA: IP65	IP55, IP56, IP65 NEMA: IP55	IP23, IP55, IP56, IP65	IP23, IP55, IP56, IP65	IP55
Explosion protection	–	NEMA: Division 2, Groups F&G, Class I	IEC: Ex eb IIC, Ex db eb IIC, Ex db IIC, Ex ec, Ex tb, Ex tc and double protection Ex ec / Ex tc NEMA: Division 1, Groups C&D, Class I, Division 1, Groups F&G, Class II, Division 1, Group D, Class I IEC Ex – Ex db IIB T3	–	Ex ec, Ex tc, Ex p, Division 2, Class I	Ex ec IIC (Zone 2), Ex tc IIIB (Zone 22)	–
Cooling method	IEC: self-cooling, forced-air cooled NEMA: totally enclosed fan cooled (TEFC)	IEC: self-cooling, forced-air cooled NEMA: totally enclosed fan cooled (TEFC)	IEC: self-cooling, forced-air cooled NEMA: totally enclosed fan cooled (TEFC)	Self-cooling, forced-air cooled NEMA: totally enclosed fan cooled (TEFC), totally enclosed blower cooled (TEBC)	Self-cooling, forced-air cooled, through ventilation, water-jacket cooled, air-to-air heat exchanger, air-to-water heat exchanger	Self-cooling, forced-air cooled, through ventilation, water-jacket cooled, air-to-water heat exchanger	Rib-cooled with forced-air cooling, water-jacket cooled
Encoders	Optional: HTL pulse encoder TTL pulse encoder	Optional: HTL pulse encoder, TTL pulse encoder NEMA: 1024PPR Stub shaft & C face mount	Optional: HTL pulse encoder	Optional: HTL or TTL pulse encoder (type-dependent) NEMA: 1024PPR stub shaft encoder	Optional: HTL pulse encoder, TTL pulse encoder, EnDat absolute encoder	Optional: HTL pulse encoder TTL pulse encoder	Optional: HTL pulse encoder, TTL pulse encoder, EnDat absolute encoder
Option – Moter brake	Yes	Yes	On request	Type-dependent	Yes	Yes	–
Option – DRIVE-CLiQ interface	–	–	–	–	–	–	–
Option – Forced-air fan	Yes	Yes	Type-dependent	Yes	Yes	Yes	
Option – 2nd shaft end	Yes	FS 250T – 440T	Yes	Type-dependent	Yes	Yes	–
Typical applications	Pumps, fans, compressors with specific requirements relating to low weight	Pumps, ventilators, compressors, materials handling, mixers, mills, extruders, rollers, winders, shredders, shears, and cranes/ lifting equipment with special requirements for sturdiness, especially in the chemical and petrochemical industry	General industrial applications with special requirements relating to explosion protection in zone 1, 2, 21 and 22, e.g. in the process industry, chemical and petrochemical industry, and in oil and gas applications	Marine applications, transport and working roller tables, ventilating tunnels, parking garages, shopping malls, port cranes, container terminals as well as customized motors, adapted for special applications	Pumps, fans, compressors, conveyor belts, mixers, extruders in the chemical and petrochemical industries, paper machines, mining, cement, steel industry and marine applications, including propulsion	Pumps, fans, compressors, conveyor belts, centrifuges, extruders, winches, lifting hoist and cranes, presses, paper machines, rolling mills and marine applications, including propulsion	Gearless motors with high torque for papermaking machinery, slow-running pumps, mills, industrial steel shears, bow thrusters, winches or main drives in ships
Catalog	IEC: D81.1 NEMA: D81.2	IEC: D81.1 NEMA: D81.2	IEC: D81.1, D83.1 NEMA: D81.2	D81.1, SIMOTICS DP - Cranes: CR81, SIMOTICS DP - roller table motors / steel plant motors: D81.1 AO - roller table motors / steel plant motors NEMA: D81.2	D81.1, D84.1, D84.3	D81.8, CR81: SIMOTICS FD for lifting hoists	D86.2

NPE: NEMA Premium Efficient