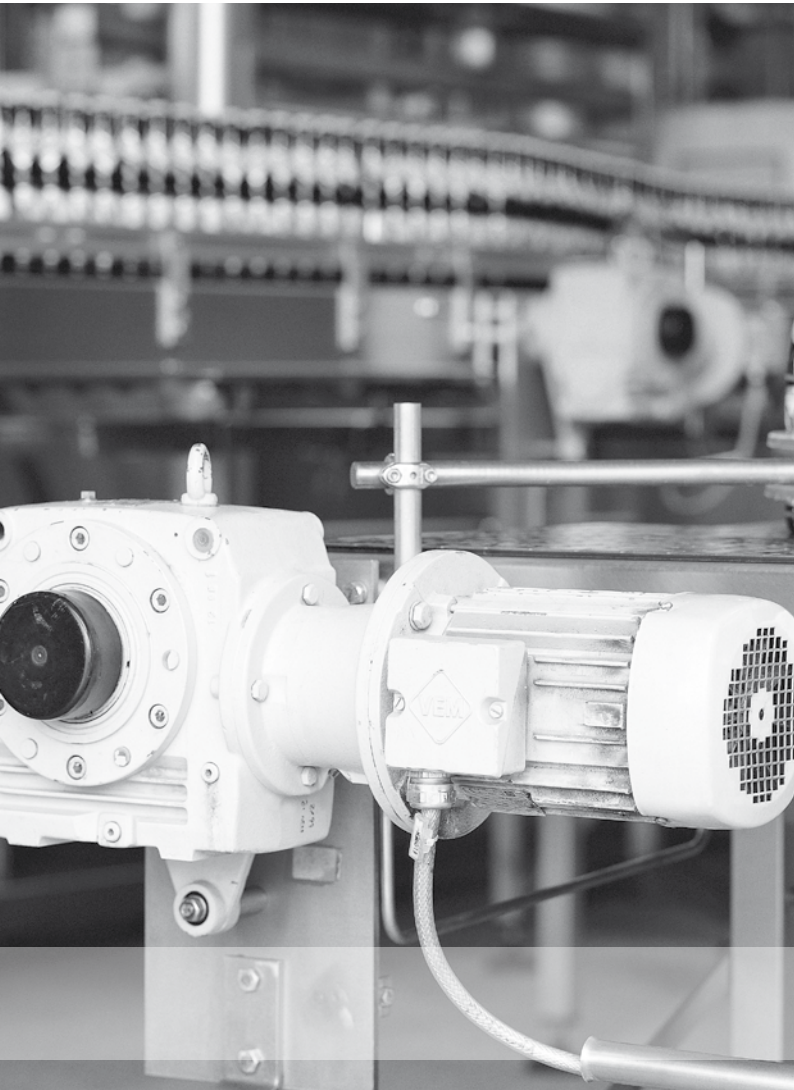




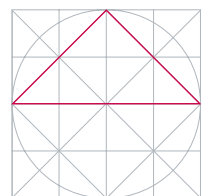
ELECTRIC DRIVES
FOR EVERY DEMAND



Energy saving motors

Permanent magnet synchronous motors
Design version
Super-Premium Efficiency IE4*

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Energy-saving permanent-magnet synchronous motors

Design version for Super Premium Efficiency IE4*

High-efficiency drives for pumps and fans

Economy and ecology

High-efficiency energy-saving motors from VEM

- › reduce power consumption
- › help cut energy costs
- › comply with the statutory regulations of the European Union
- › spare natural resources thanks to their high energy efficiency.

EC regulation 640/2009 currently requires three-phase motors in 2-, 4- and 6-pole designs for the output range 0.75 to 375 kW to attain the efficiency of asynchronous motors of efficiency class IE2 “High Efficiency”. From 2015, the requirements stipulated in EU law will be tightened to IE3 “Premium Efficiency” for the output range 7.5 to 375 kW.

IE3 will not be prescribed as the minimum efficiency for the whole output range until 01.01.2017.

Efficiency class IE4 “Super Premium Efficiency” is presently still at the draft stage. The limit values specified in IEC2/1741/CD-IEC 60034-30-2 TS, Ed.1 and the regulations on efficiency measurement (IEC 2/1696/DTS (IEC/TS 60034-2-3:2013-01)) are thus subject to change in the course of the standardisation process.

The series IE4-PE.R applies the requirements of this future efficiency class to permanent-magnet synchronous motors.

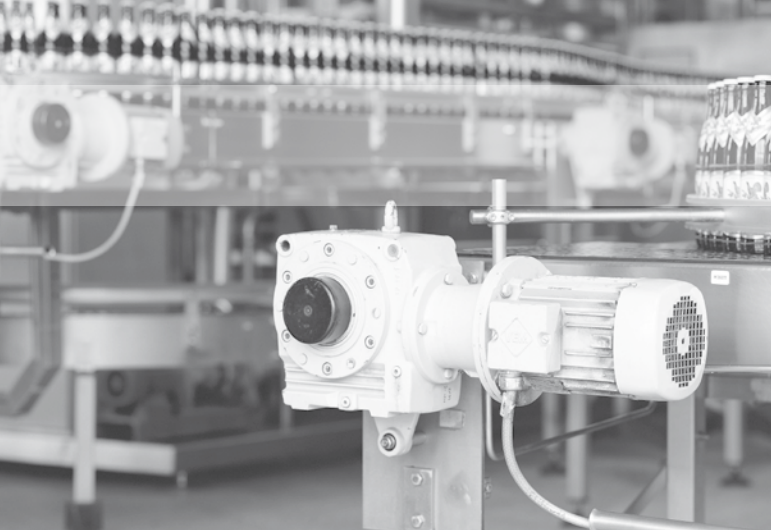
Design concept

The new series IE4-PE.R establishes a drive system based on permanent-magnet synchronous motors, taking up the mechanical design of the proven series IE2-WE.R. In contrast to the previous low-voltage asynchronous machine, the rotor excitation is realised not by the current flowing through the rotor windings, but instead with permanent magnets attached to the surface of the rotor. This design achieves a significantly higher motor efficiency, as rotor losses are eliminated. The use of high-quality permanent magnets renders rotor windings and brush systems superfluous. The result is a robust, low-maintenance design. Different cooling systems from the modular VEM product range permit tailoring to the particular field of application.

Speed and torque ranges

The motors are designed exclusively for converter-fed operation and for variable speeds up to 3000 rpm. The possible overload is defined by the fundamental terminal voltage inherent to the motor design, and by the maximum possible voltage rise of the frequency converter; it lies between 1.3 and 1.6.

* Motors of the VEM series PE.R meet the requirements of efficiency class IE4* in accordance with draft regulation IEC2/1741/CD-IEC 60034-30-2 TS, Ed. 1.



In all branches in which high-efficiency pumps and fans are used, energy-saving permanent-magnet synchronous motors of the class Super Premium Efficiency IE4 are the ideal choice as drives. They are designed exclusively for operation with a frequency converter.

Series	IE4-PE.R and IE4-PE.F (mounting dimensions acc. to DIN EN 50347)
Sizes	63 to 315
Efficiency class	IE4*
	acc. to IEC2/1741/CD-IEC 60034-30-2 TS, Ed. 1 and IEC 2/1696/DTS (IEC/TS 60034-2-3:2013-01)
Degree of protection	IP 55 acc. to IEC/EN 60034-5, optionally IP 56 and IP 65
Type of construction	IM B3, IM B35, IM B5 and derived types acc. to IEC/EN 60034-7
Torque range	0.4 to 1592 Nm
Type of cooling	IC 411, version IE4-PE.R IC 416, version IE4-PE.F
Synchronous speeds	3000, 1500, 1000 and 750 rpm, 4-pole 50 Hz and 100 Hz, 6-pole and 8-pole

Please refer to our catalogues for technical details. The catalogues are available in printed or in digital version on DVD. They are also available in the internet.





Energy-saving permanent-magnet synchronous motors for converter-fed operation

efficiency class IE4* acc. to IEC2/1741/CD-IEC 60034-30-2 TS, Ed.1 and IEC 2/1696/DTS (IEC/TS 60034-2-3:2013-01), with surface cooling, type IC 411, thermal class 155[F/B], degree of protection IP 55

Motor selection data

Converter input voltage 400 V, 50 Hz

	Rated output	Torque	Max. torque (2 min)	Voltage	Limit value IE4*	Efficiency	Power factor	Rated current	Phase resistance at 20 °C		No-load voltage at speed 1000 rpm	Main inductance	Leakage inductance	Main reactance	Leakage reactance	Motor inertia	Motor mass
									R ₁₂₀	U _{P020}							
	[kW]	[Nm]		[V]	[%]	[%]	[-]	[A]	[Ω]	[V/1000 rpm]	[mH]	[mH]	[Ω]	[Ω]	[Ω]	[kgm ²]	[kg]
Speed 1000 rpm – Rated frequency 50 Hz																	
IE4-PE2R 63	G6	0.12	1.3	4.8	285	64.9	81.9	0.99	0.30	63	260	90	90	28.3	28.27	0.00027	5.7
IE4-PE2R 71	K6	0.18	1.7	7	285	70.1	81.9	0.99	0.45	36	250	70	60	22.0	18.85	0.00045	7.4
IE4-PE2R 71	G6	0.25	2.4	10	285	74.1	85.3	0.99	0.60	25	270	55	45	17.3	14.14	0.00060	8.3
IE4-PE2R 80	K6	0.37	3.5	14	310	78.0	92.8	0.99	0.75	19	280	37	23	11.6	7.23	0.00130	11.0
IE4-PE2R 80	G6	0.55	5.3	21	310	80.9	90.0	0.99	1.15	10.7	295	25	15	7.9	4.71	0.00175	12.5
IE4-PE2R 90	S6	0.75	7.2	28	315	82.7	88.7	1.00	1.55	7.5	300	25	13	7.9	4.08	0.00325	16
IE4-PE2R 90	L6	1.1	10.5	42	305	84.5	90.5	1.00	2.3	4.7	295	19	9	6.0	2.83	0.00425	19
IE4-PE2R 100	L6	1.5	14.3	60	310	85.9	90.1	1.00	3.10	2.7	300	14	6	4.4	1.88	0.00625	24
IE4-PE2R 112	M6	2.2	21	75	305	87.4	94.7	1.00	4.4	1.6	300	10	3	3.1	0.94	0.01225	33.5
IE4-PE2R 132	S6T	3.0	29	100	310	88.6	93.1	1.00	6.0	1.3	305	9	3	2.8	0.94	0.0139	39
IE4-PE1R 132	M6	4.0	38	48	350	89.5	90.9	0.99	7.4	0.991	343	7.74	4.02	2.43	1.26	0.021	53
IE4-PE1R 132	MX6	5.5	53	66	362	90.5	91.5	0.99	9.8	0.5350	348	6.624	3.072	2.080	0.965	0.040	70
IE4-PE1R 160	M6	7.5	72	90	364	91.3	91.7	0.99	13.2	0.3580	351	5.160	2.300	1.620	0.722	0.052	86
IE4-PE1R 160	L6	11.0	105	131	361	92.3	92.5	0.98	19.4	0.2390	345	4.549	1.729	1.428	0.543	0.104	114
IE4-PE1R 180	L6	15.0	143	179	360	92.9	93.1	0.98	26.4	0.1590	345	3.385	1.217	1.063	0.382	0.135	136
IE4-PE1R 180	L6	18.5	177	221	358	93.4	93.6	0.99	32.3	0.1545	347	3.403	1.217	1.069	0.382	0.135	136
IE4-PE1R 200	L6	22.0	210	263	359	93.7	93.9	0.99	38.1	0.1140	355	3.332	1.136	1.046	0.357	0.219	175
IE4-PE1R 200	LX6	30.0	287	358	359	94.2	94.3	0.98	52.3	0.0790	343	2.538	0.835	0.797	0.262	0.270	200
IE4-PE1R 225	M6	37.0	353	442	362	94.5	94.6	0.981	63.7	0.0495	350	1.899	0.610	0.596	0.192	0.437	265
IE4-PE1R 250	M6	45.0	430	537	360	94.8	94.9	0.98	77.7	0.0375	349	1.604	0.529	0.504	0.166	0.711	360
IE4-PE1R 280	S6	55.0	525	657	360	95.1	95.3	0.95	97.6	0.0335	334	1.656	0.538	0.520	0.169	1.142	465
IE4-PE1R 280	M6	75.0	716	895	367	95.4	95.5	0.97	127.5	0.0260	348	1.414	0.436	0.444	0.137	1.423	520
IE4-PE1R 315	S6	90.0	860	1074	358	95.6	95.8	0.95	159.8	0.0163	334	1.123	0.348	0.353	0.109	2.275	690
IE4-PE1R 315	M6	110.0	1051	1313	360	95.8	96	0.96	191.8	0.0120	341	0.908	0.266	0.285	0.084	2.875	800
IE4-PE1R 315	MX6	132.0	1261	1576	371	96.0	96.2	0.97	220.6	0.0116	356	0.910	0.262	0.286	0.082	3.110	890
IE4-PE1R 315	MY6	160.0	1528	1910	368	96.2	96.3	0.97	269.0	0.0076	353	0.717	0.181	0.225	0.057	5.285	1050
IE4-PE1R 315	L6	200.0	1273	1592	365	96.3	96.4	0.96	342.2	0.0063	347	0.612	0.151	0.192	0.047	5.940	1250
IE4-PE1R 315	LX6	250.0	1592	1990	362	96.5	96.5	0.95	434.9	0.0043	340	0.451	0.106	0.142	0.033	7.644	1460
Upon request		>250				96.5											

Speed 750 rpm – Rated frequency 50 Hz

IE4-PE2R 71	G8	0.12	1.5	7	290	60.0	80.4	0.99	0.30	51.0	365	60	75	18.8	23.56	0.0006	8.1
IE4-PE2R 80	K8	0.18	2.3	9	300	66.0	87.5	0.99	0.40	40.0	365	65	55	20.4	17.28	0.0013	10.5
IE4-PE2R 80	G8	0.25	3.2	14	310	70.2	85.5	0.99	0.55	26.0	390	50	40	15.7	12.57	0.00175	12
IE4-PE2R 90	S8	0.37	4.7	20	300	74.5	89.9	0.99	0.80	12.0	400	22	21	6.9	6.60	0.003	15
IE4-PE2R 90	L8	0.55	7.0	28	310	77.9	94.1	0.99	1.10	7.3	410	18	16	5.7	5.03	0.003775	18
IE4-PE2R 100	L8	0.75	9.6	38	275	80.0	93.6	0.99	1.70	4.8	370	14	11	4.4	3.46	0.00625	23
IE4-PE2R 100	LX8	1.1	14.0	55	310	82.1	90.0	0.99	2.30	3.6	410	14	9	4.4	2.83	0.009	28
IE4-PE2R 112	M8	1.5	19.1	75	320	83.7	94.3	0.99	2.90	2.4	430	11	7	3.5	2.20	0.01225	33.5
IE4-PE2R 132	S8T	2.2	28.0	100	300	85.5	93.0	0.99	4.60	1.5	400	8	4	2.5	1.26	0.0139	39

The maximum speed is dependent on the converter link voltage, load and converter type.
 Parameters with index 1: Phase values
 Subject to change in the course of technical further development

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