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KSB SuPremE® in IE5: the world's most efficient magnet-less pump motor

INTERVIEW
WITH EXPERTS



Energy diet

KSB SuPremE® in IE5*: The energy diet for your pump system – interview with experts

Energy efficiency is at the top of the priority list at KSB. This is why the highly efficient KSB SuPremE® motor also meets IE5* requirements, thereby ensuring the highest possible savings during operation. To further optimise the efficiency of hydraulic systems, KSB employs its comprehensive FluidFuture® energy-saving concept.



Left: Daniel Gontermann,
Head of Product Management -
Drives and Mechatronic Solutions

Right: Dr. Jochen Schaab,
Head of Model-Based
Product Development

KSB SuPremE® motors now correspond with efficiency class IE5 in line with the new IEC/TS 60034-30-2 standard.

How much better are the motors now?

Daniel Gontermann: IE5 class motors have 20 % less losses compared with IE4 class motors.

Why is this?

Dr. Jochen Schaab: As regards KSB SuPremE® motors, we previously based the efficiency class on a now outdated draft standard – IEC/CD 60034-30 Ed.2. This standard defined more stringent requirements on the efficiency of KSB SuPremE® motors. This is why the majority of KSB SuPremE® motors have already been 20 % better than IE4 motors as per IEC/TS 60034-30-2.

Does this mean that KSB SuPremE® motors were always IE5-compliant?

Dr. Jochen Schaab: I guess if you put it that way – yes!

One more question: How much energy do customers save in pump applications as a result of the IE5 motor technology?

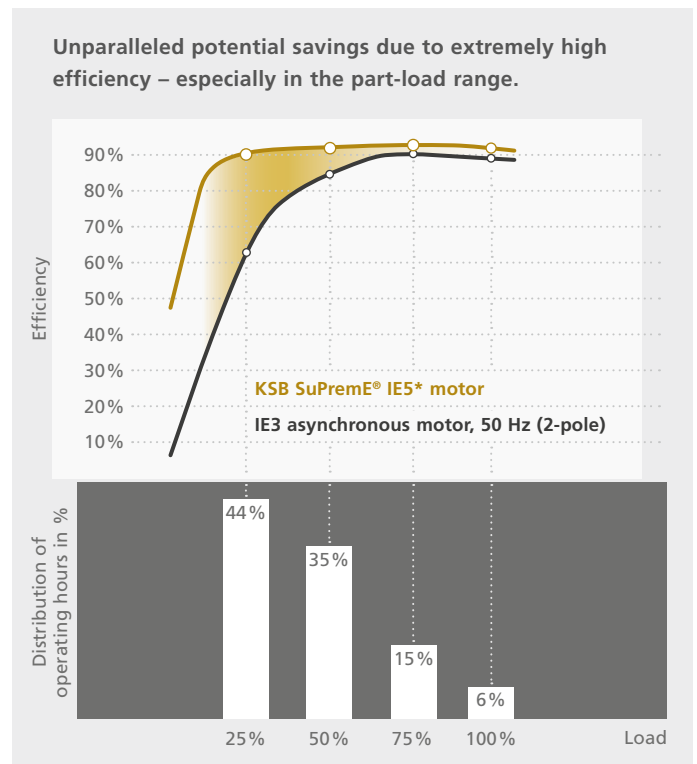
Daniel Gontermann: The savings can be as high as 15 percentage points, depending on the operating speed and load. The efficiency of a 7.5 kW KSB SuPremE® motor operated at full speed and full load already exceeds that of an equivalent IE3 motor by up to 3 percentage points. At a quarter of the speed, and consequentially 25 % of the flow rate, this advantage can be as high as 15 percentage points. You can therefore find a convenient comparison calculator on our web site.

Can it therefore be said that it is important to remember that the benefits of the drives heavily depend on the respective application?

Dr. Jochen Schaab: That's exactly right. This is why KSB consultants continually point out how critical it is to know the load profile, i.e. the number of operating hours in the required flow rate range. This load profile is key to choosing not only the best motor but also the best pump system for the application in order to achieve maximum efficiency.

Understood! But where do I get this information?

Dr. Jochen Schaab: KSB has several different solutions: Starting with the KSB Sonolyzer app, which interprets the noise of a



Source: Dipl.-Ing. M. Wiele, Prof. Prof. h. c. mult. Dr.-Ing. Peter F. Brosch, University of Applied Sciences and Arts of Hanover, Faculty I, Drives and Automation Technology

Motor losses [W]

Rated power (kW)	Rated speed [rpm]	IE class	Point of reference						
			1	2	3	4	5	6	7
0.55	1500	IE4 ^{*)}	110	96	58	57	51	33	15
0.75	1500	IE4 ^{*)}	138	128	114	82	72	59	50
1.1	1500	IE5	144	126	120	68	57	29	26
1.5	1500	IE5	179	164	161	84	73	36	34
2.2	1500	IE4 ^{*)}	255	224	203	137	112	62	49
3	1500	IE4 ^{*)}	321	285	273	150	130	66	57
4	1500	IE4 ^{*)}	380	327	307	160	136	63	59
5.5	1500	IE5	447	430	354	189	196	83	68
7.5	1500	IE5	538	464	417	226	197	83	80
11	1500	IE5	684	565	387	311	173	92	47
15	1500	IE5	801	589	524	320	241	63	10
18.5	1500	IE4 ^{*)}	1069	834	712	513	374	225	187
22	1500	IE4 ^{*)}	1175	899	735	599	453	265	178
30	1500	IE4 ^{*)}	1594	1296	1086	837	642	364	268
37	1500	IE4 ^{*)}				On request			
45	1500	IE4 ^{*)}				On request			
0.55	3000	IE5	90	66	54	52	37	24	16
0.75	3000	IE5	112	81	72	78	54	45	32
1.1	3000	IE5	158	120	100	96	69	45	32
1.5	3000	IE5	163	124	107	96	70	48	29
2.2	3000	IE5	190	142	119	101	72	40	30
3	3000	IE5	216	149	130	110	73	37	29
4	3000	IE5	396	280	205	257	166	137	90
5.5	3000	IE5	391	261	196	227	136	82	14
7.5	3000	IE5	557	346	270	305	179	108	64
11	3000	IE5	582	284	204	281	153	56	20
15	3000	IE5	899	477	302	534	273	213	51
18.5	3000	IE5	783	456	312	543	276	186	99
22	3000	IE4 ^{*)}	1218	771	598	735	480	330	191
30	3000	IE4 ^{*)}	1631	1036	803	946	577	425	230
37	3000	IE4 ^{*)}	1701	1144	820	1130	654	448	299
45	3000	IE4 ^{*)}				On request			

*) IE5 in preparation

pump with an old asynchronous motor, our PumpMeter pump monitoring unit with flow rate estimation and memory for the load profile, and a host of services such as our Pump Operation Check and SES System Efficiency Service.

The motors are then apparently just one aspect to consider when optimising efficiency.

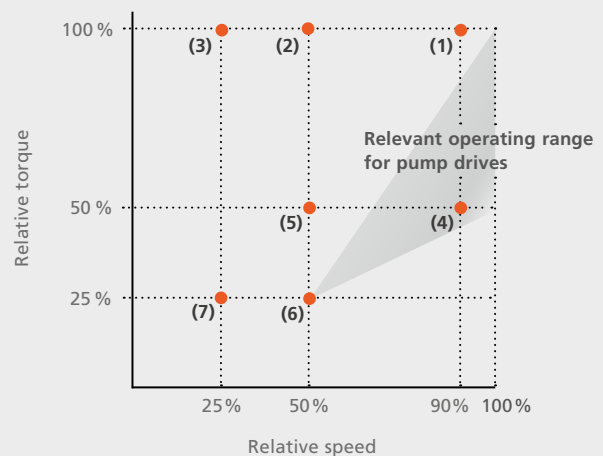
Daniel Gontermann: Despite all the euphoria surrounding maximum motor efficiency, it must not be forgotten that maximum efficiency is only possible when one is prepared to optimise the entire hydraulic system and operate it in line with demand. To assist with this complex task, almost ten years ago, KSB developed a corresponding action guideline known as the FluidFuture concept.

A system is only as good as its weakest component.

Is that what you mean?

Daniel Gontermann: Maximum system efficiency requires systems expertise. And that's exactly what we offer at KSB. ■

Classification and loss values for the reference points (1) – (7) defined in IEC 60034-2-3:2016



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Your local KSB representative:



KSB Aktiengesellschaft
Johann-Klein-Straße 9
67227 Frankenthal (Germany)
www.ksb.com

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