Use of BLDCPn series in the context of individual motor development

PulnikovEC
Electromechanics

Use of BLDCPn series in the context of individual motor development

Content

- Individual motor development
- Replacement for BLDC40S40A-22.1.053D
- Summary
- Conclusion

PulnikovEC Electromechanics

Individual motor development

Individual motor development is development of a motor for a client specification (voltage, speed, power)

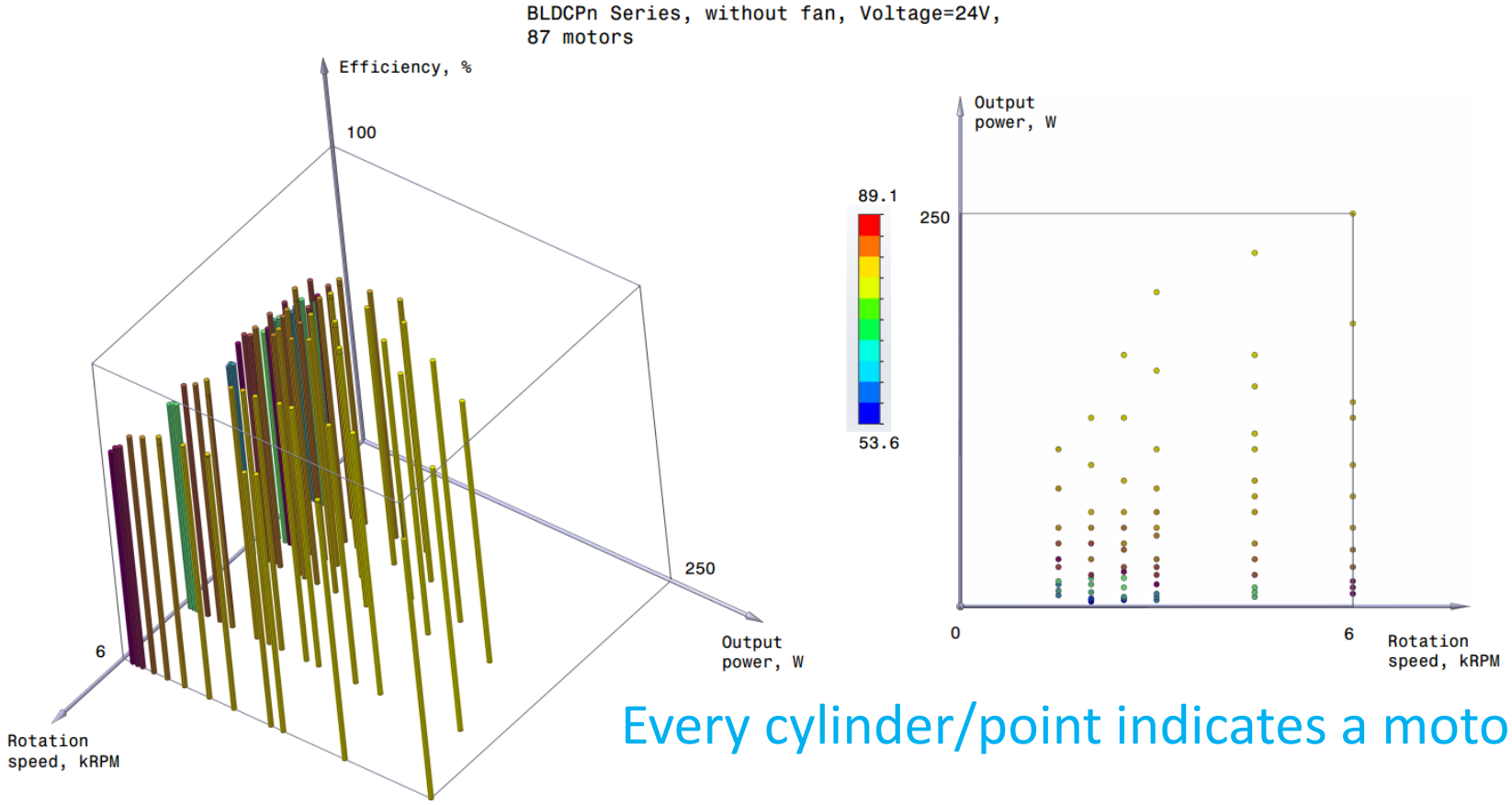
This requires at least a year for development and testing of first prototypes and another year for preparation for production

With our series we provide an immediate response to any specification

In this presentation we will use our motor selection software, which is specially developed as a supplement to the series.

PulnikovEC
Electromechanics

Replacement for BLDC40S40A-22.1.053D

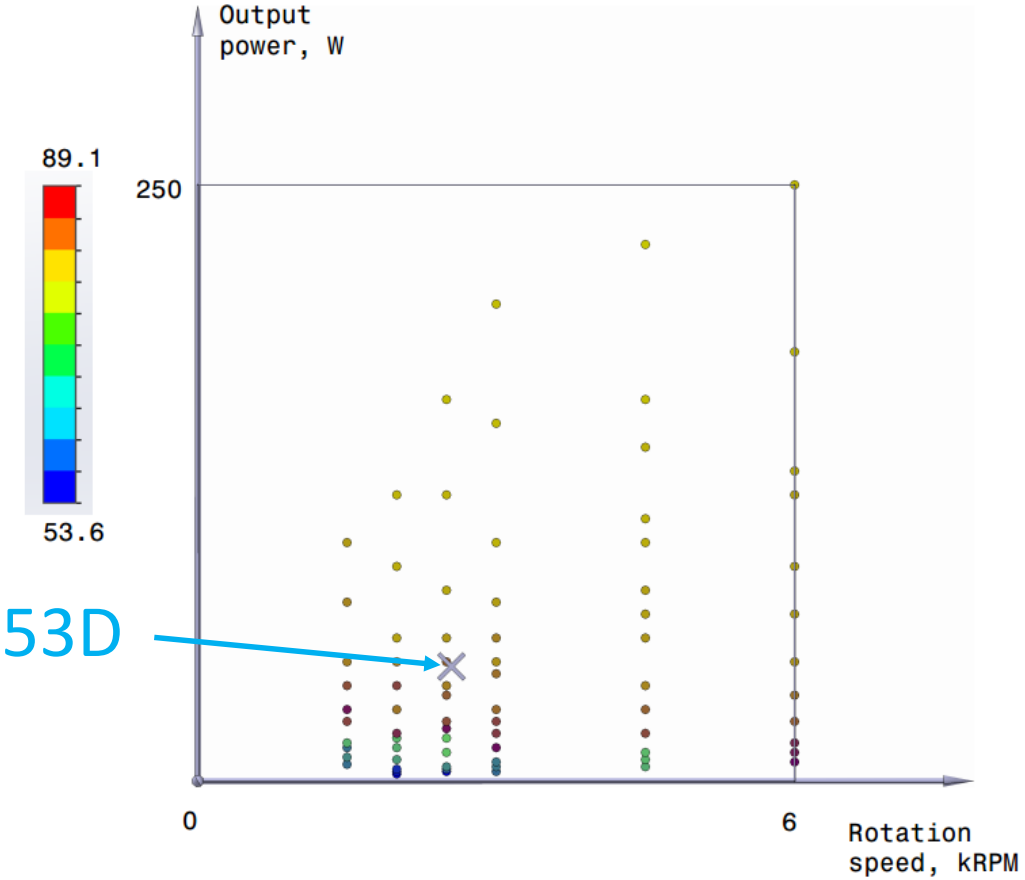


Every cylinder/point indicates a motor of the series

Efficiency chart for BLDCPn series without fan, 24V

PulnikovEC
Electromechanics

Replacement for BLDC40S40A-22.1.053D



BLDC40S40A-22.1.053D

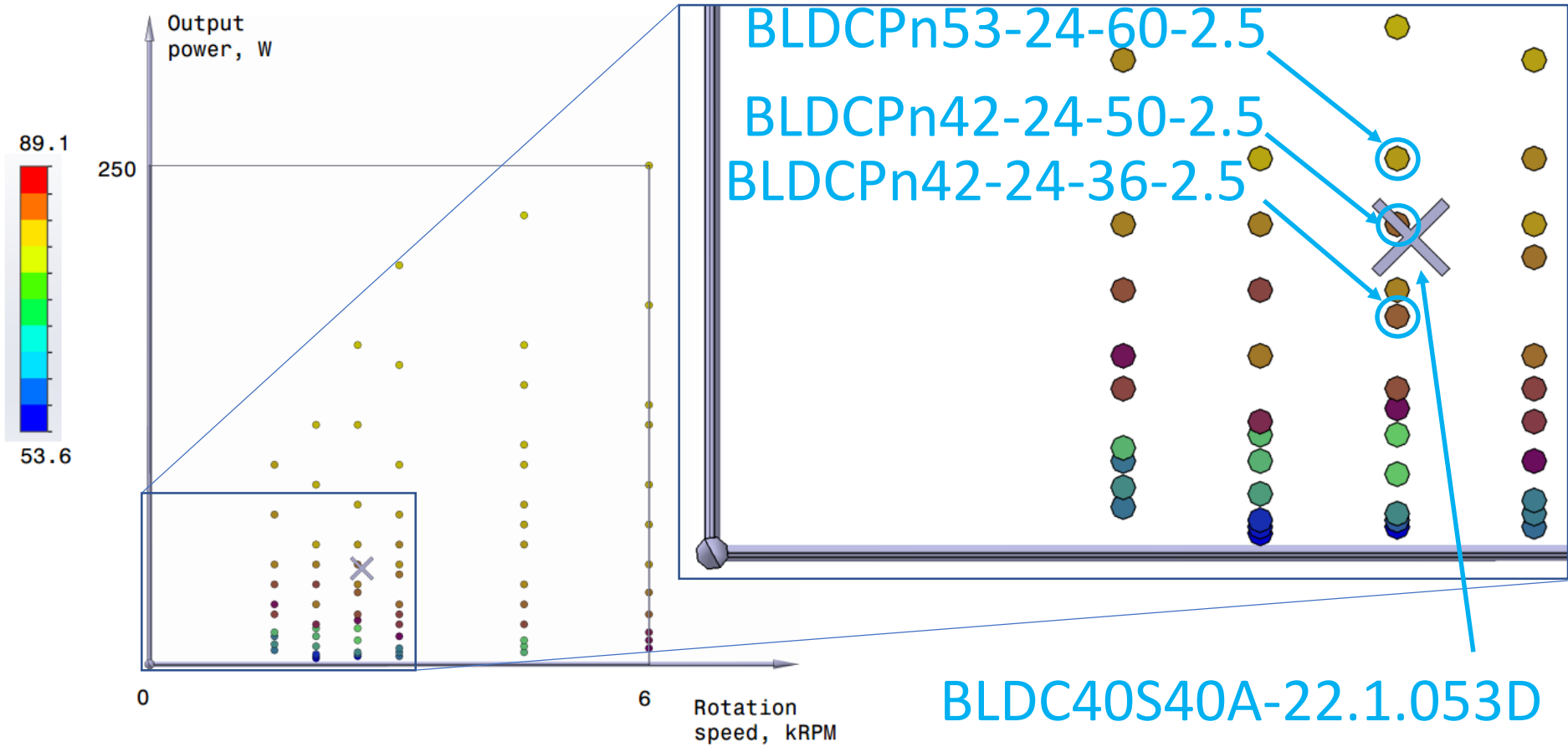
A cross indicates a motor of another producer we are supposed to replace with motors of the series

Efficiency chart for BLDCPn series without fan, 24V

PulnikovEC
Electromechanics

Replacement for BLDC40S40A-22.1.053D

Candidate motors are selected from the series in the vicinity of the cross.

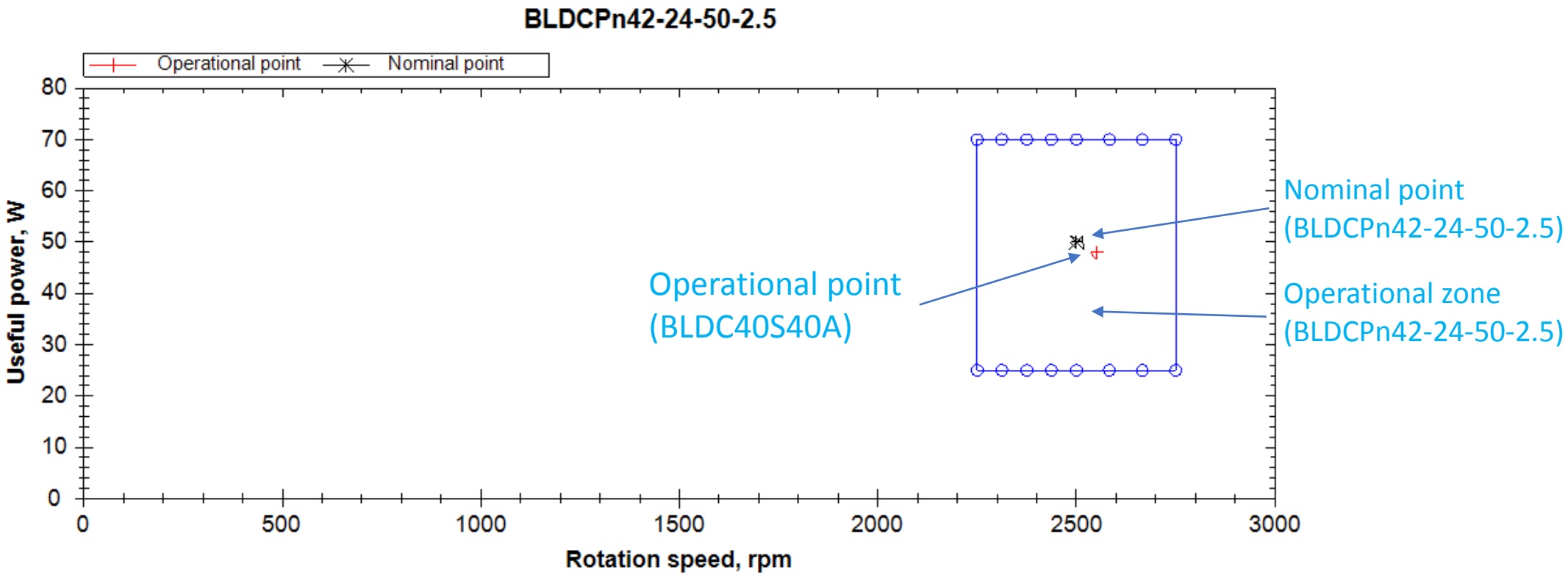


Efficiency chart for BLDCPn series without fan, 24V

PulnikovEC Electromechanics

Replacement for BLDC40S40A-22.1.053D

Operational zone of BLDCPn42-24-50-2.5 with efficiency above 66.9%

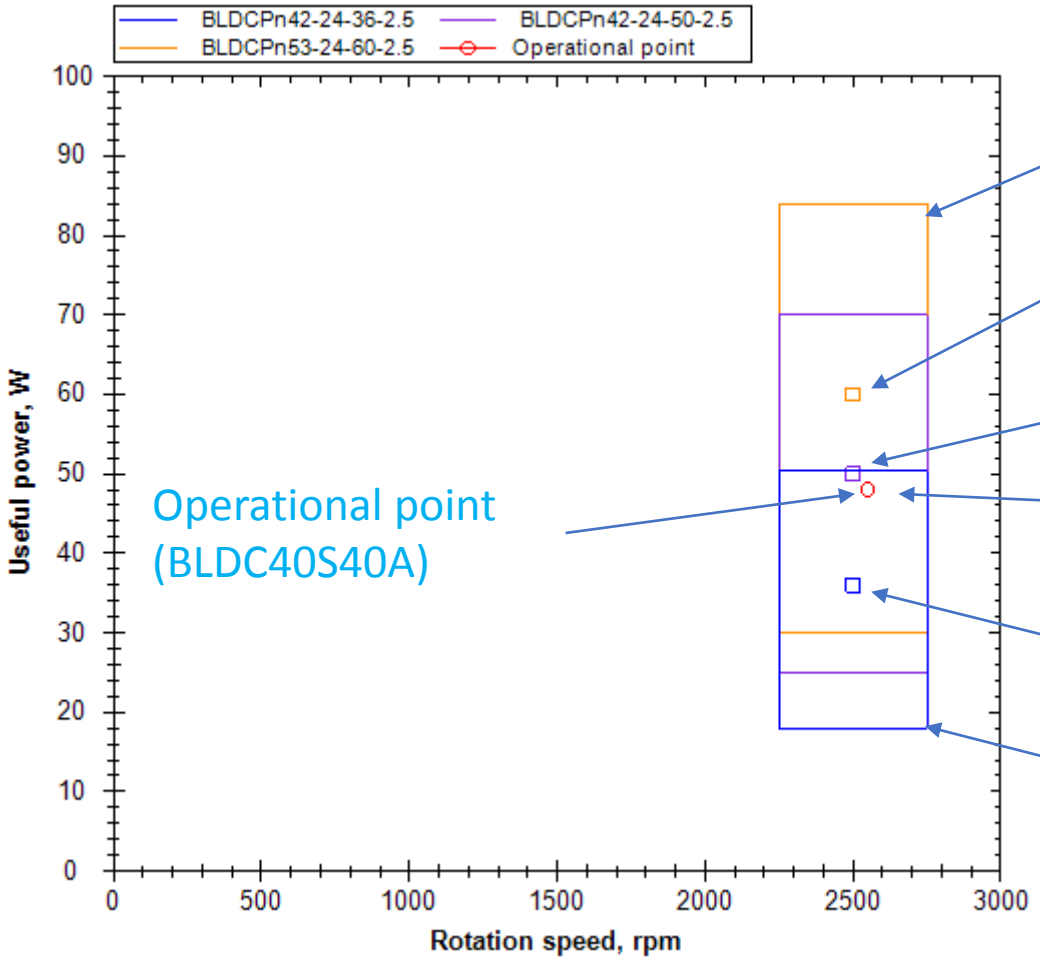


For every motor we identify an operational zone around the nominal point where acceptable efficiency and operating temperature are maintained

PulnikovEC Electromechanics

Replacement for BLDC40S40A-22.1.053D

Operational point is enclosed by the operational zones of all 3 candidate motors



Operational point (BLDC40S40A)

Operational zone (BLDCPn53-24-60-2.5)

Nominal point (BLDCPn53-24-60-2.5)

Nominal point (BLDCP42-24-50-2.5)

Operational zone (BLDCP42-24-50-2.5)

Nominal point zone (BLDCP42-24-36-2.5)

Operational zone (BLDCP42-24-36-2.5)

PulnikovEC Electromechanics

Replacement for BLDC40S40A-22.1.053D

Candidate motors for replacement

No.	Value	BLDCPn42-24-36-2.5		BLDCP42-24-50-2.5		BLDCP53-24-60-2.5	
		nominal operational point	new operational point	nominal operational point	new operational point	nominal operational point	new operational point
1	Torque of motor, mNm	138	179,8	191,0	179,8	229	179,8
2	Rotation speed of motor, rpm	2500	2550	2500	2550	2500	2550
3	Voltage of power supply, V	24	24	24	24	24	24
4	Current in DC link, A	2,36	3,19	3,29	3,07	3,61	3,15
5	Useful power, W	36	48,00	50,00	48,00	60,00	48,00
6	Primary power, W	45,11	64	60,90	58,97	70,59	56
7	Efficiency, %	79,8	75	80,1	81,4	85	85,7
8	Overheating of winding, °C	54,1	84,7	62,2	56,9	40	30,2
9	Motor mass, kg	0,353	0,353	0,436	0,436	0,714	0,714

Nominal parameters of the candidate motors

PulnikovEC Electromechanics

Replacement for BLDC40S40A-22.1.053D

Candidate motors for replacement

No.	Value	BLDCPn42-24-36-2.5		BLDCP42-24-50-2.5		BLDCP53-24-60-2.5	
		nominal operational point	new operational point	nominal operational point	new operational point	nominal operational point	new operational point
1	Torque of motor, mNm	138	179,8	191,0	179,8	229	179,8
2	Rotation speed of motor, rpm	2500	2550	2500	2550	2500	2550
3	Voltage of power supply, V	24	24	24	24	24	24
4	Current in DC link, A	2,36	3,19	3,29	3,07	3,61	3,15
5	Useful power, W	36	48,00	50,00	48,00	60,00	48,00
6	Primary power, W	45,11	64	60,90	58,97	70,59	56
7	Efficiency, %	79,8	75	80,1	81,4	85	85,7
8	Overheating of winding, °C	54,1	84,7	62,2	56,9	40	30,2
9	Motor mass, kg	0,353	0,353	0,436	0,436	0,714	0,714

New operating parameters of the candidate motors when used as a replacement

PulnikovEC Electromechanics

Replacement for BLDC40S40A-22.1.053D

Candidate motors for replacement

No.	Value	BLDCPn42-24-36-2.5		BLDCP42-24-50-2.5		BLDCP53-24-60-2.5	
		nominal operational point	new operational point	nominal operational point	new operational point	nominal operational point	new operational point
1	Torque of motor, mNm	138	179,8	191,0	179,8	229	179,8
2	Rotation speed of motor, rpm	2500	2550	2500	2550	2500	2550
3	Voltage of power supply, V	24	24	24	24	24	24
4	Current in DC link, A	2,36	3,19	3,29	3,07	3,61	3,15
5	Useful power, W	36	48,00	50,00	48,00	60,00	48,00
6	Primary power, W	45,11	64	60,90	58,97	70,59	56
7	Efficiency, %	79,8	75	80,1	81,4	85	85,7
8	Overheating of winding, °C	54,1	84,7	62,2	56,9	40	30,2
9	Motor mass, kg	0,353	0,353	0,436	0,436	0,714	0,714

Light cheap motor with moderate efficiency suitable for operation in normal environment (up to 30°C)

Balanced motor with high efficiency suitable for operation in hot environment (up to 60°C)

Large expensive motor with very high efficiency suitable for operation in very hot environment (up to 90°C)

PulnikovEC Electromechanics

Use of BLDCPn series in the context of individual motor development

Content

PulnikovEC Electromechanics

Summary

- The use of our motors is not restricted to nominal operation points
- Our motors have large operation zones
- For any given operation point the series usually offers a few motor candidates. Each motor candidate is automatically evaluated in the operation point.
- The customer is offered with a motor satisfying his preferred operation point and, possibly, some additional conditions

PulnikovEC Electromechanics

Use of BLDCPn series in the context of individual motor development

Content

PulnikovEC Electromechanics

Conclusion

- The series offers immediate candidate for specification of the customer
- The series could satisfy additional conditions, such as preferred efficiency, preferred mass or operational temperature
- The series makes individual motor development unnecessary
- The owner of the series would have a clear advantage over competitors offering individual motor development due to their inflexibility and long time to market

PulnikovEC
Electromechanics