



**Wölfer technology
is moving your
business**

1 Who are we today?

3 Business figures /
development

2 Effizient Cranes by
Customized Motors!

Applications

Products

Efficiency

4 References!

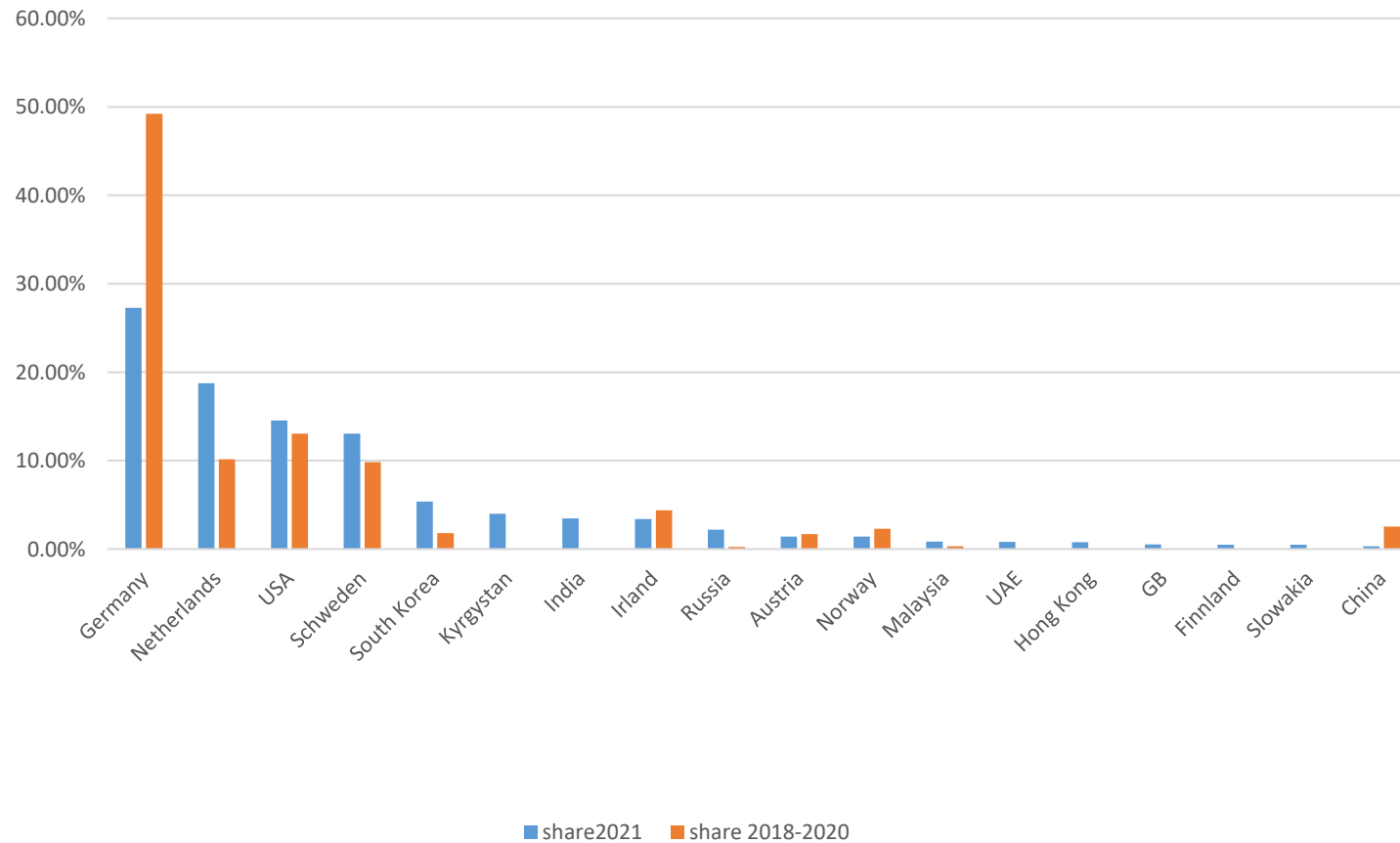
1 Who we are today, 2023-01-25?

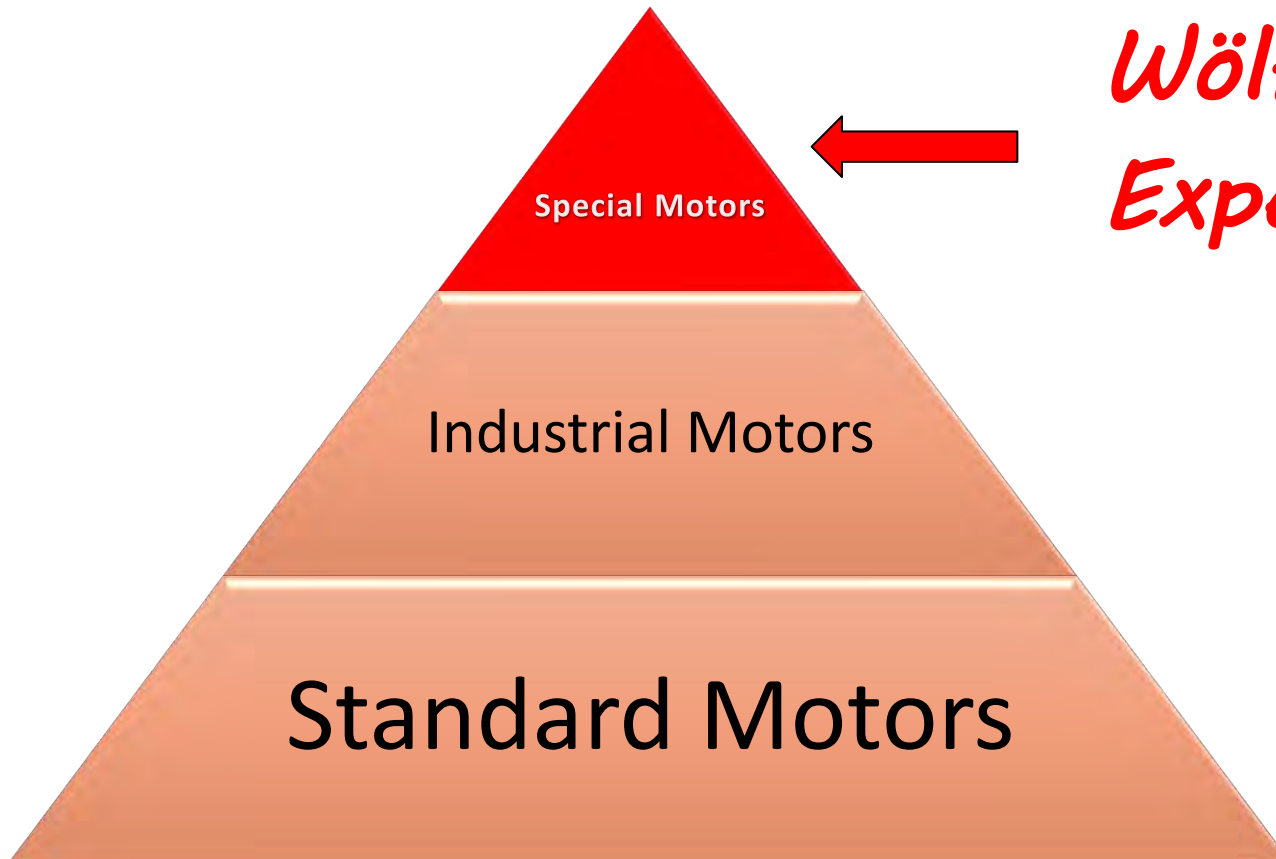


- **1945:** Founded by engineer Franz Wölfer
- **1955:** First Slipring Motors for lifting applications
- **1960:** First Squirrel-cage Motors
- **1985:** First Squirrel-cage Motors for inverter operation
- **2008:** New test field up to 2.100 kW
- **2019:** Wölfer becomes part of Menzel in Berlin
- **2022:** Wölfer becomes part of Kairos Industries AG in Berlin



Turnover with markets in 2022 and from 2018-2021





*Wölfer's
Expertise!*



2 | **Efficient Application by Customized Motors**

Special Applications are our core business - since more than 77 years!

Business Areas

Lifting Applications

Marine Applications

General Machinery

Container Cranes

Goliath Cranes

Tower Cranes

STS Cranes

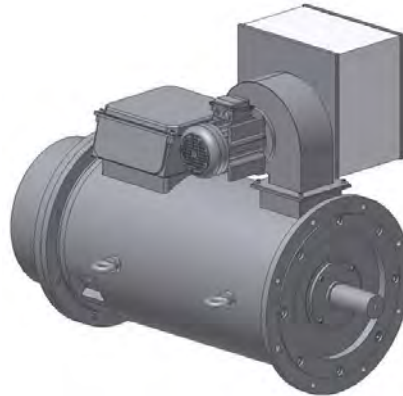
RTG Cranes

RMG Cranes

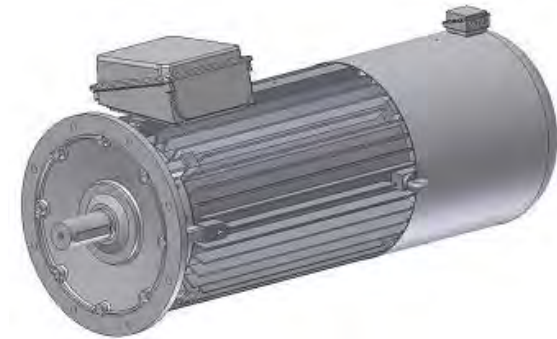
Straddle Carrier

Construction Types – IEC Classification and Frame Size Covered!

IP 23
Inner Cooled
Steel Welded Housing



IP 66
Outer Cooled
Grey Cast Iron Housing



IP 66/67
Water Cooled
Steel welded Housing



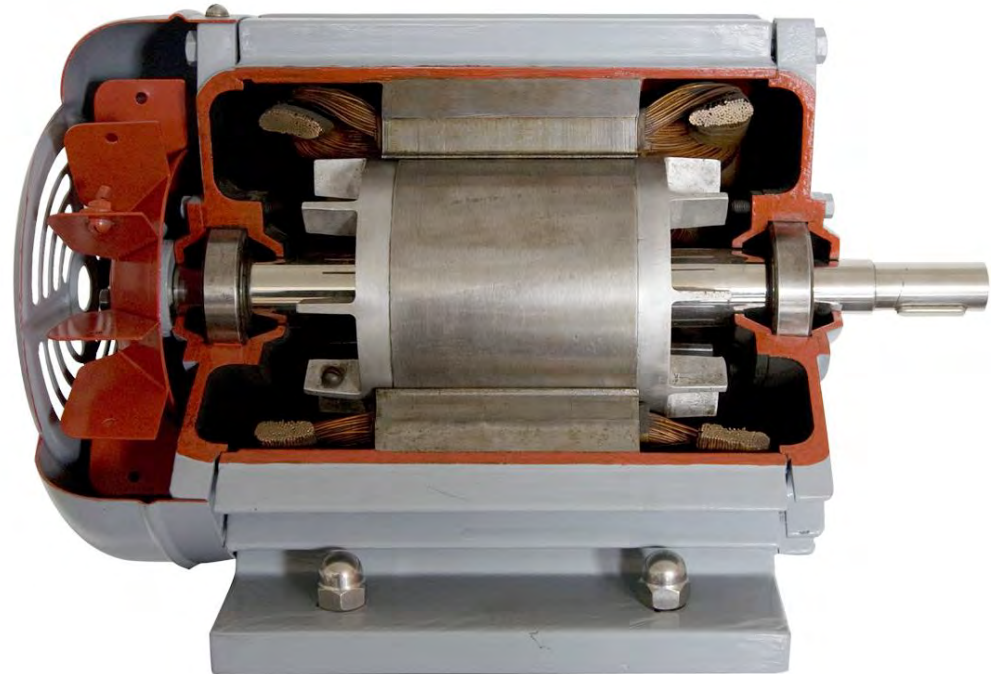
Construction Types – Cooling Principles!



- Self ventilation (IC411 and IC01)
- Forced ventilation (IC416 and IC06)
- Without ventilation (IC410)
- Air-air-cooler (IC616)
- Air-water-heat-exchanger (IC86W)
- Water cooled

Construction Types – Technical Design Specs...

- Rated voltage up to 690 Volt
- Rated speed limited by mechanical carrying capacity, not by electrical parameter
- Insulation class F or H
- Available numbers of poles: 2, 4, 6, 8, 10, 12
- Duty cycles according to FEM
- Types of mounting according to IEC



Important Constructive Elements – Windings, most special from Wölfer!

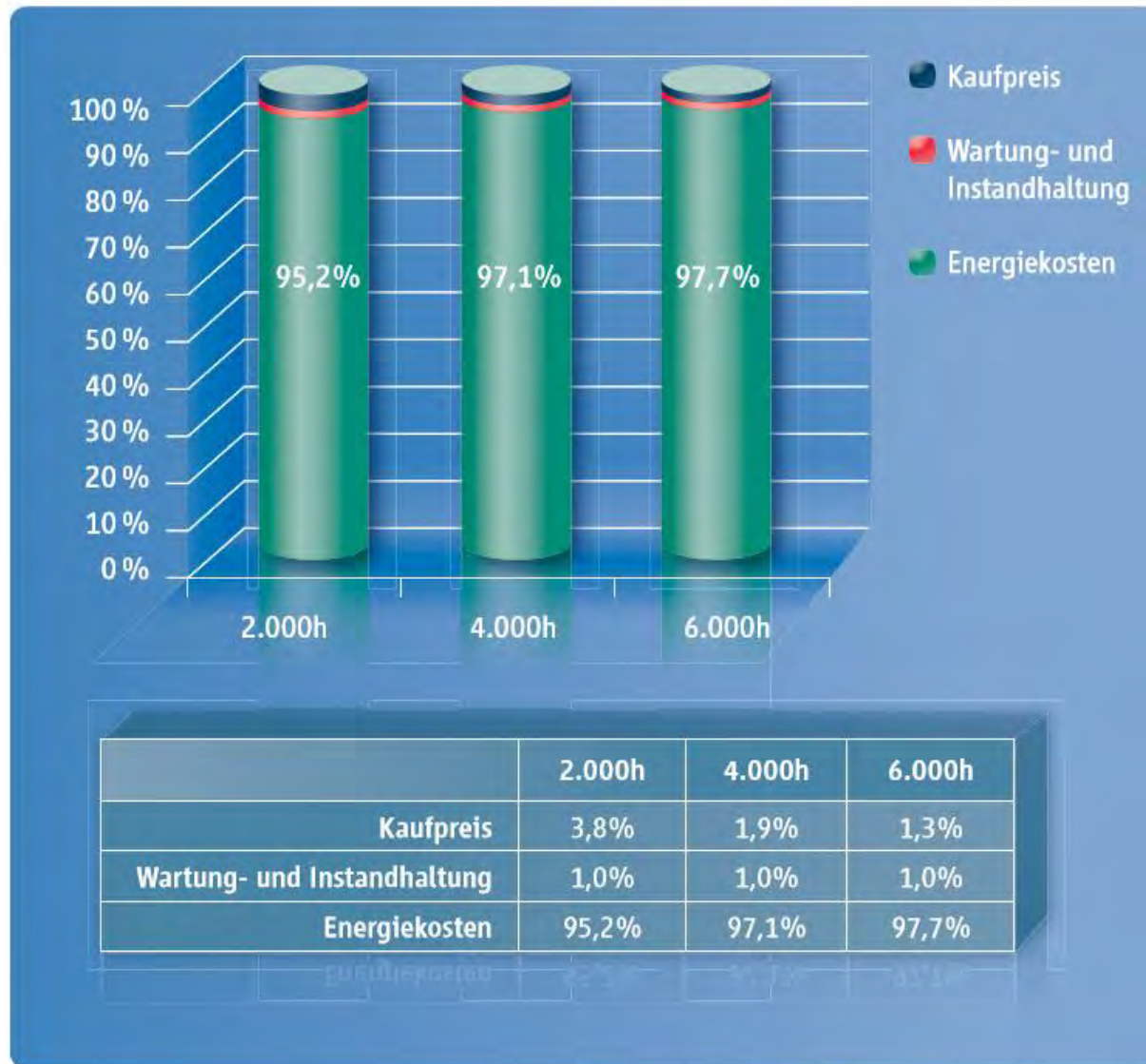
- Special insulation system for inverter operation
- Special wires developed for frequency converter operation
- Resistance against partial discharges



Important Constructive Elements – Rotors, most special from Wölfer!



- Lowest moments of inertia
- High pull-out torques
- Excellent control qualities, in whole range of speed
- Shorter acceleration times
- Low current consumption



According ZVEI :

Investment app. 2%

Maintenance app.
1%

**Energy cost app. 97
%**

2 Efficiency



- Lower moment of inertia
- Shorter acceleration time
- Excellent control characteristics, in whole range of speed



- Lower starting and operating currents
- Due to lower currents possibility to use:
 - smaller cables
 - smaller inverters
- more moves of containers per hour!

Important Constructive Elements – wide variety of Additional Equipment!



- Brake
- Encoder (specified by customer)
- Forced ventilation
- Two shaft ends
- Anti-condensation heater
- All kind of winding protection
- Bearing monitoring
- Vibration monitoring
- Insulated bearings,
standard $\geq$ frame size 315
- Special grounding system

technical data from Wölfer and from other german manufacturer



Comparison of 6 pole type, protection IP23, cooling IC06					
Competitor					
motor size	power (kW)	voltage (V)	current (A)	pull-out torque (%)	moment of inertia
355M	255	460	400	315	6
355L	290	460	450	319	6,7
355L	375	460	580	329	8,6
Wölfer					
280L	250	460	385	440	3,51
280X	300	460	465	405	4,6
315L	385	460	610	420	6,23
Competitor					
400M	450	460	706	352	8,2
400M	530	460	822	352	12,1
400L	560	460	880	370	14
Wölfer					
355L	480	460	815	440	8,2
355L	530	460	815	360	9,02
355L	580	460	910	400	9,84
Competitor					
450M	610	460	950	340	16,6
450L	700	460	1085	315	18,5
450L	760	460	1170	320	20,6
Wölfer					
355L	650	460	985	365	10,99
400L	700	460	1015	335	16,18
400L	750	460	1090	335	17,24

4 | **References /Projects**

Special motors for project Chile 2022





DP World, two Super Post Panamax ship-to-shore (STS) cranes at its Lirquén Chile terminal.



3 References



2 x 10.000 t crane Huismann/Netherlands





App. 150 motors installed

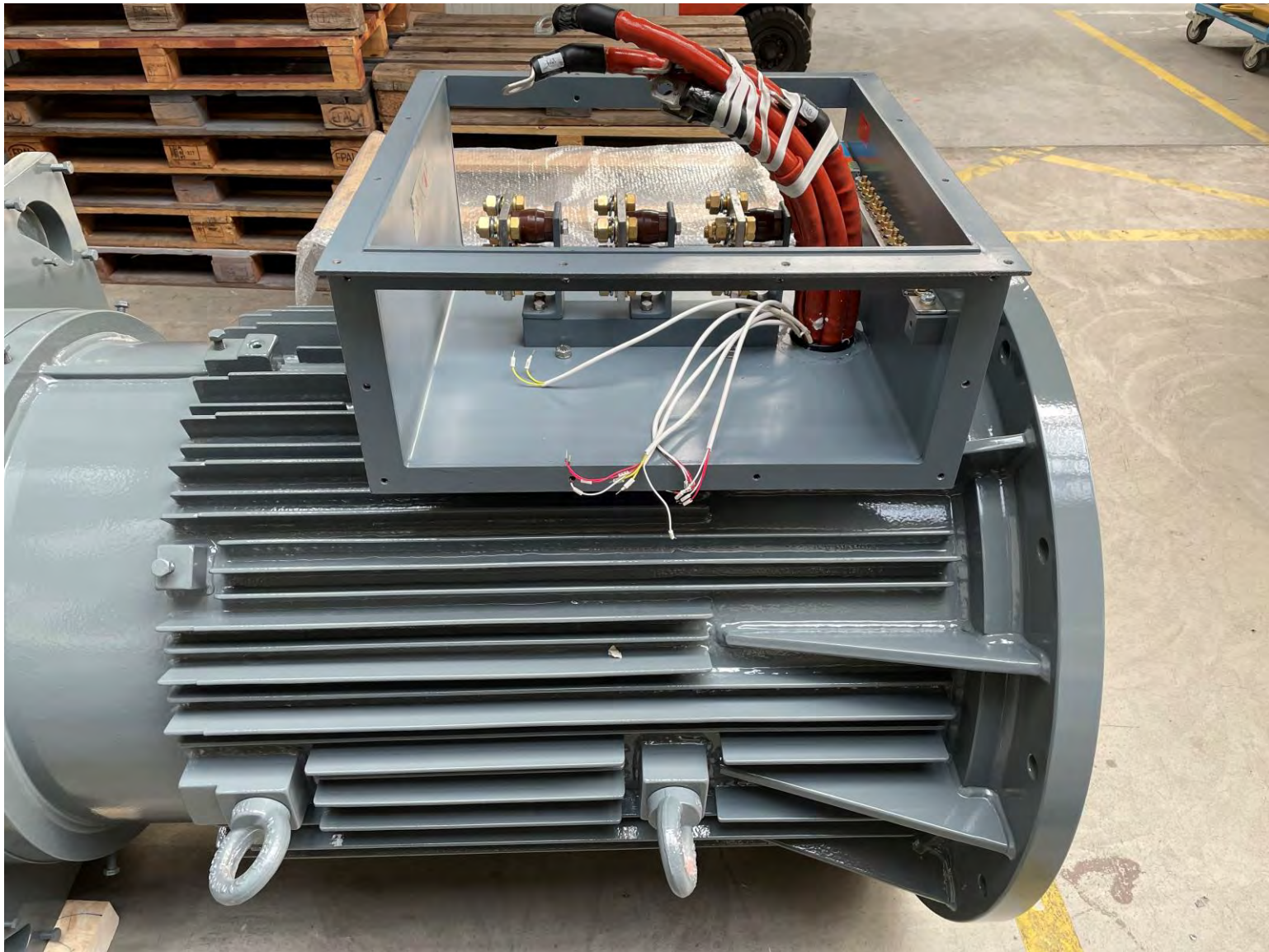
motors for cranes and winches on ships

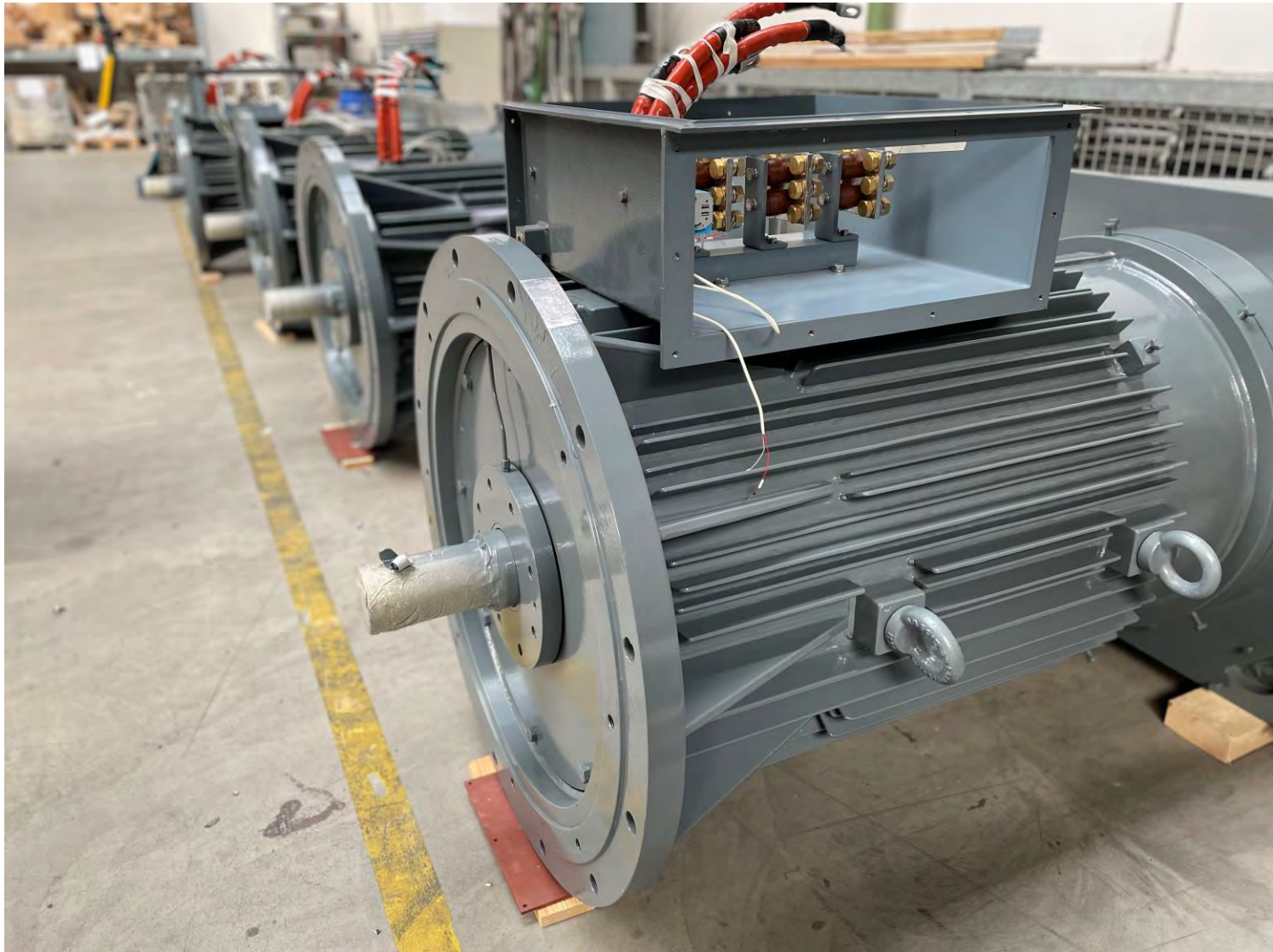


SC-14000XL for Japan



25.01.2023 30.01.2023







W WÖLFER EN 60034-1 Class NK **CE**
 Industriestraße 14 / D-49082 Osnabrück 2020

MDRKF 355X-6/SHD5A-5M2T No:207295 // Tag-No. 02M01

TH.CL-F -20°C to +45°C IP56 IM B5 3030 kg

V	Hz	kW	cosphi	duty	η	rpm	A
690Y	50	500	0,90	S2-30min	95,4	985	490
690Y	50,7	500	0,90	S2-30min	95,4	1000	485
690Y	101	500	0,91	S2-30min	94,9	2000	485
690Y	50,9	580	0,90	S2-10sec	95,0	1000	565
690Y	101,7	580	0,88	S2-10sec	94,2	2000	580

(6+2)xPT100 // heater:230V / 260W
 3xSHD5 on 550P30 / 440VAC
 HOG 10 DN 1024 I 17K KLK-AX (No. 700005669955)



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(6+2)xPT100 // heater:230V / 260W
 3xSHD5 on 550P30 / 440VAC
 HOG 10 DN 1024 I 17K KLK-AX
 (No. 700005669955)



new brake design for this application



Offshore application, C5 painting



3 References



SSA Long Beach – USA; Electrical OEM - TMEIC



3 References



SSA Long Beach – USA Electrical OEM - TMEIC





Newport Terminal Busan – Korea
Electrical OEM - ABB

Hoist:

Motor type: ODRKF 355 L-6bbT

Power: 4 x 550 kW

Type of cooling: IC 06

Type of construction: IM B3

Newport Terminal Busan – Korea ODRKF355L-6bbT – 4x550kW



new cranes für Hamburg Port HHLA from ZPMC



Ningbo – China RTG-Crane Kone (former Noell)



Hoist:

Motor type: DRKF 315 L-6bbbT

Power: 1 x 210 kW

Type of cooling: IC 416

Type of construction: IM B5

Trolley:

Motor type: DRKO 180 M-4bSFB10HT

Power: 2 x 15 kW

Type of cooling: IC 410

Type of construction: IM V1

Gantry:

Motor type: DRKO 200 L-4bSFB25HT

Power: 4 x 30 kW

Type of cooling: IC 410

Type of construction: IM V1







3 References



AGV – Kone (former Gottwald)– CTA – Hamburg, Germany





3 References

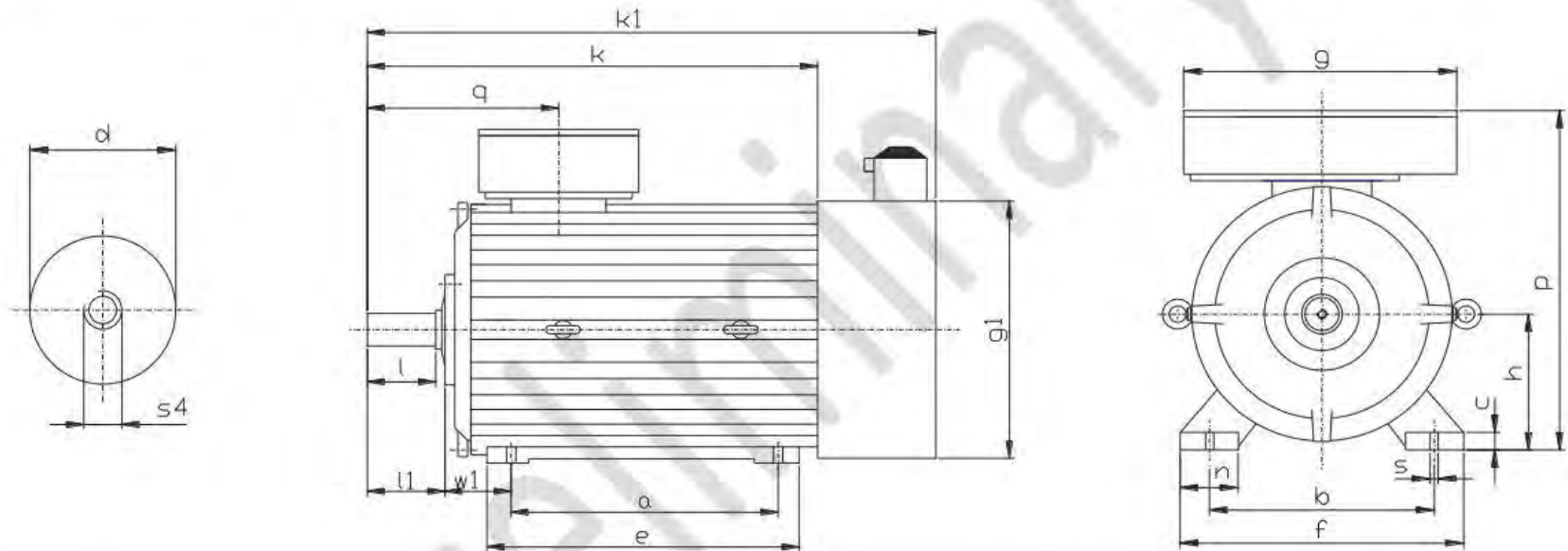


3 References



Special motor with imperial dimensions /US market

 Franz Wölfer Elektromaschinenfabrik Osnabrück GmbH Tel 0049 (0)541/ 99022 – 0 Fax 0049 (0)541/ 99022 – 22 Email: info@woelfer-motoren.com	Drehstrom-Käfigläufermotoren für Frequenzumrichter <i>three phases low voltage squirrel cage motors for frequency converter</i>	Enclosure IP 55 <i>Schutzart</i> Mounting IM B3 <i>Bauform</i>
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Alle Maße in Millimeter (Zoll) / All dimensions are in mm (inch)

female thread DIN 332D
tolerance range shaft end DIN 748 page3
up to Ø55mm"K6", over Ø55mm"m6"
fitting key to DIN 6885 page1

Innengewinde S4 nach DIN332D
Passungen für Wellenenden DIN 748 Bl.3
bis Ø55mm"K6, über Ø55mm"m6"
Paßfeder nach DIN 6885 Bl.1

Type	a	b	c	e	f	g	ll	k	k1	p	q	h	w1	n	s	l	d	s4
DDRKf 200Z – 4	717,5	317,5	25	790	398	415	140	1070	1600	615	410	200	146	80	Ø20	127	60	M20
	28.25	12.5	0.98	31.1	15.67	16.33	5.5	42.1	63	24.2	16.14	7.87	5.75	3.15	Ø0.69	5	2.36	

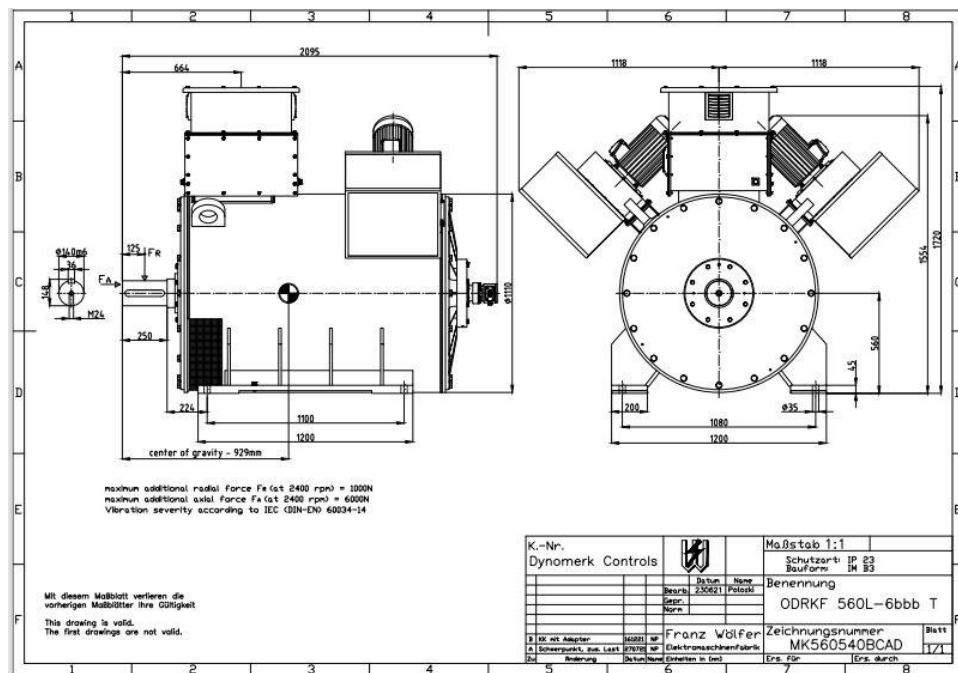
Datum: 10.03.2022
Zg.Nr.: MK2001155

Special motor for US industry

 Three phase low voltage squirrel cage motor <i>Drehstrom-Käfigläufer-Motor</i> for frequency converter <i>für Umrichterbetrieb</i>				
Drive / Antrieb				
Product type / Motortype				
Rated power / Bemessungsleistung	(kW)	DRKF 200Z-4		
Type of operation		135	135	
Rated voltage / Bemessungsspannung	(V)	S3-60%	S3-60%	
Rated current / Bemessungsstrom	(Amp)	460Y	460Y	
Range of frequency / Frequenzbereich	(Hz)	195	195	
Speed / Drehzahl	(rpm)	60	120	
Rated torque / Bemessungsmoment	(Nm)	1750	3495	
Pull out torque / Kippmoment	(%)	735	365	
Power factor / Leistungsfaktor		375	190	
Efficiency / Wirkungsgrad	(%)	0,94	0,94	
Height of installation / Aufstellhöhe		92,6	92,0	
Insulation class / Isolationsklasse		< 1000 m above sea level		
Ambient temperature / Umgebungstemp.		F		
Type of cooling / Kühlart		-15°C to +40°C		
Separate fan / Fremdlüfter		IC416		
Mounting of position / Bauform		400V / 50Hz		
Enclosure / Schutzart		IM B3		
Heater / Heizung		IP 55		
Winding protection / Wicklungsschutz		—		
Brake / Bremse		3xNC180°C		
Encoder / Tacho		—		
remarks / Bemerkungen		—		
Weight / Gesamtgewicht	(kg)	Approx.		
Moment of inertia / Trägheitsmoment	(kgm²)	Approx. 0,6		
Information No / Datenblatt Nr.		DK2001038		
Drawing No. / Maßblatt Nr.		MK200		
Instruction / Vorschrift		IEC (DIN-EN) 60034-		
Date: 07.03.2022				
Franz W ö l f e r Elektromaschinenfabrik Osnabrück GmbH Industriestraße 14 * 49082 Osnabrück Tel. 0049 (0) 541 / 99022-0 * Fax 0049 (0) 541 / 9902222 Email: info@woelfer-motoren.com * www.woelfer-motoren.com				

Technical data are issued to change / Technische Änderungen vorbehalten

special motors for test fields for India December 2021



Three phase low voltage squirrel cage motor Drehstrom-Käfigläufer-Motor for frequency converter für Umrichterbetrieb

Drive / Antrieb

Product type / Motortype

Rated power / Bemessungsleistung

Type of operation

Rated voltage / Bemessungsspannung

Rated current / Bemessungsstrom

Range of frequency / Frequenzbereich

Speed / Drehzahl

Rated torque / Bemessungsmoment

Pull out torque / Kippmoment

Power factor / Leistungsfaktor

Efficiency / Wirkungsgrad

Ambient temperature / Umgebungstemp.

Type of cooling / Kühlart

Separate fan / Fremdlüfter

Mounting of position / Bauform

Insulation class / Isolationsklasse

Enclosure / Schutzart

Heater / Heizung

Winding protection / Wicklungsschutz

Brake / Bremse

Encoder / Tacho

remarks / Bemerkungen

ODRKF 560L-6bbb T

	0-2250	2250			
SI	SI				
0-300D	415D				
4800	3515				
0-45	120				
0-894	2391				
24005	9020				
265	185				
0,92	0,92				
97,3	96,7				

+40°C

IC 06

2x 415V / 50Hz // noise level approx. 96dB(A)

IM B3

H / H

IP 23

6xPT100 (winding) + 2xPT100 (bearing)

POG 10 DN 1024 I

Weight / Gesamtgewicht (kg) Approx. 7500

Moment of inertia / Trägheitsmoment (kgm²) 110

Informations No / Datenblatt Nr. DK560078C

Drawing No. / Maßblatt Nr. MK560540A

Instruction / Vorschrift EN 60034-1

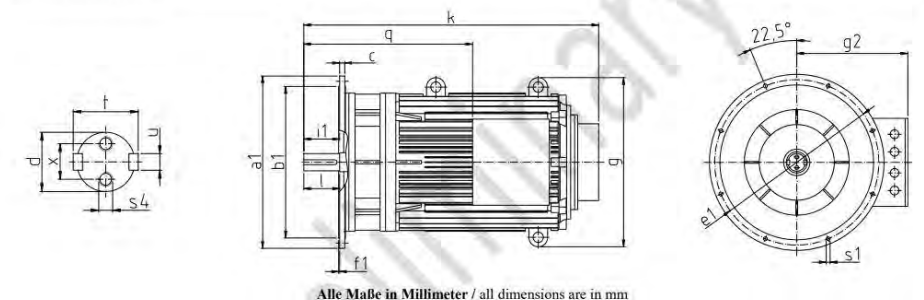
Date: 23.06.2021

Franz Woelfer
 Elektromaschinenfabrik Osnabrück GmbH
 Industriestraße 14 * 49082 Osnabrück
 Tel. 0049 (0) 541 / 99022-0 * Fax 0049 (0) 541 / 9902222
 Email: info@woelfer-motoren.com * www.woelfer-motoren.com

Motors in IP67/68 to be used in project delivered August 2022



 Franz Wölfer Elektromaschinenfabrik Osnabrück GmbH Tel 0049(0)541/ 99022-0 Fax 0049(0)541/ 99022-22 Email: info@woelfer-motoren.com	Three phase low voltage squirrel cage motor <i>Drehstrom-Käfigläufer-Motor</i>	Enclosure: IP 68 Schutzart Mounting: IM V1 Bauform
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Alle Maße in Millimeter / all dimensions are in mm

female thread DIN 332D
 tolerance range shaft end DIN 748 page3
 up to 1255mm/k6", over 1255mm/m6"
 fitting key to DIN 6885 page1
 n1=number of flange holes
 flanges to DIN 42948

innengewinde S4 nach DIN 332D
 Passungen für Wellenenden DIN 748 Bl.3
 bis 1255mm/k6, über 1255mm/m6"
 Paßfedern nach DIN 6885 Bl.1
 n1=Anzahl der Flanschlöcher
 Befestigungsflansche nach DIN 42948

Type	a1	b1	c	e1	f1	g	g2	i1	k	n	q	s1	d	l	u	t	s4
DRKO 400L - 12	1000	880	30	940	6	985	640	210	1730	8	1020	22	100	210	28	112	M24
													60				

Datum: 17.11.2021
 Zg.Nr.: MK4001078

Three phase low voltage squirrel cage motor *Drehstrom-Käfigläufer-Motor* for frequency converter *für Umrichterbetrieb*

Drive / Antrieb	TPKR500			
Product type / Motortype	DRKO 400L-12			
Rated power / Bemessungsleistung (kW)	75			
Type of operation	S1			
Rated voltage / Bemessungsspannung (V)	400D			
Rated current / Bemessungsstrom (Amp)	140			
Range of frequency / Frequenzbereich (Hz)	50			
Speed / Drehzahl (rpm)	492			
Rated torque / Bemessungsmoment (Nm)	1450			
Pull out torque / Kippmoment (M _k /M _n)	2,3			
Starting torque / Anlaufmoment (M _A /M _n)	1,3			
Pullup torque / Sattelmoment (M _s /M _n)	1,0			
Starting current / Anlaufstrom (I _A /I _N)	5,3			
	100%	125%	75%	50%
Power factor / Leistungsfaktor	0,84	0,85	0,80	0,71
Efficiency / Wirkungsgrad (%)	94,1	93,4	94,2	93,7
Ambient temperature / Umgebungstemp.	-15°C to +40°C			
Installation altitude / Aufstellhöhe	< 1000m above sea level			
Type of cooling / Kühlung	IC410 / noise level max. 80dB(A)			
Separate fan / Fremdlüfter	---			
Mounting of position / Bauform	IM V1			
Insulation class / Isolationsklasse	F / B			
Enclosure / Schutzart	IP 68			
Heater / Heizung	---			
Winding protection / Wicklungsschutz	3xPTC 155°C			
Starting time / Hochlaufzeit	2,8 s			
Encoder / Tacho	---			
remarks / Bemerkungen	Zulässige Anläufe / h: aus betriebswarmen Zustand: 12 aus kaltem Zustand: 14			
Weight / Gesamtgewicht (kg)	Approx. 2900			
Moment of inertia / Trägheitsmoment (kgm ²)	33,89			
Informations No / Datenblatt Nr.	DK400893A			
Drawing No. / Maßblatt Nr.	MK4001078			
Instruction / Vorschrift	IEC (DIN-EN) 60034-1			

Date: 27.01.2022

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 Email: info@woelfer-motoren.com * www.woelfer-motoren.com

Technical data are issued to change / Technische Änderungen vorbehalten

Thank you very much!