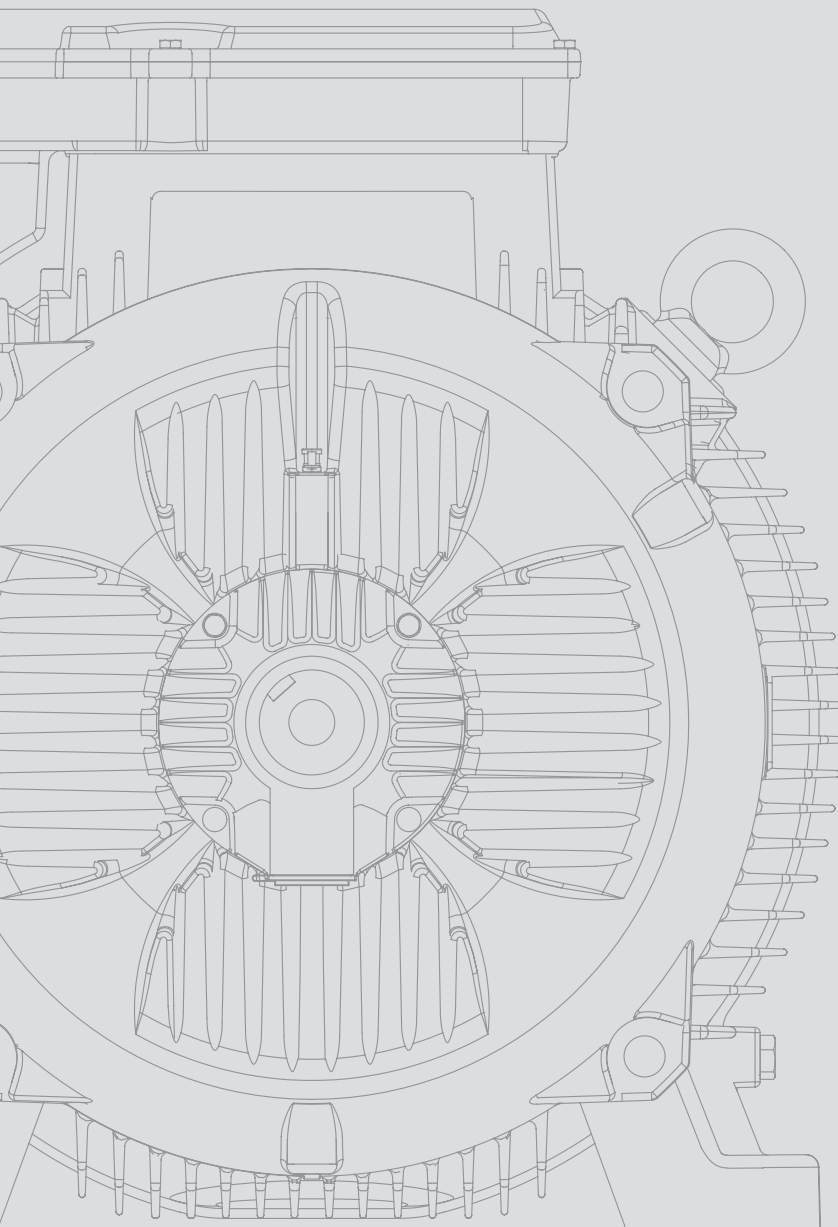
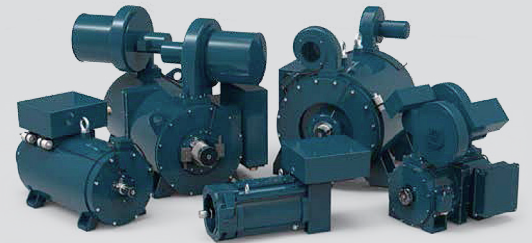


Three-Phase Dynamometers

3상 다이나모 미터

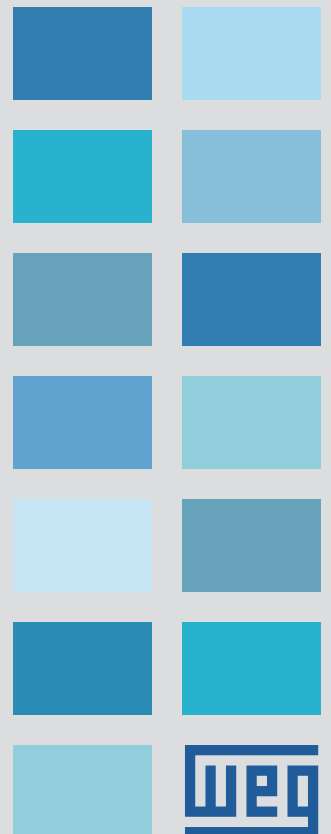
Custom made in Germany
Precise, Individual, Durable

정밀성 / 독창성 / 내구성



Antriebstechnik **KATT** Hessen

AKH
WEG Group





WEG Group

WEG is a leading global solutions provider for drive technology, energy generation and distribution, as well as for automation technology and panel building. Founded in 1961 in Brazil by three entrepreneurs of German ancestry, WEG has evolved into one of the most important manufacturers of electric motors worldwide. WEG has more than 30,000 employees, of which 360 are based in Germany. An annual revenue of approx. 3 billion Euros demonstrates WEG's growing success. WEG global presence is supported through its branches established in 29 countries, manufacturing plants and a network of distributors and agents in five continents.



At AKH, diversity says it all

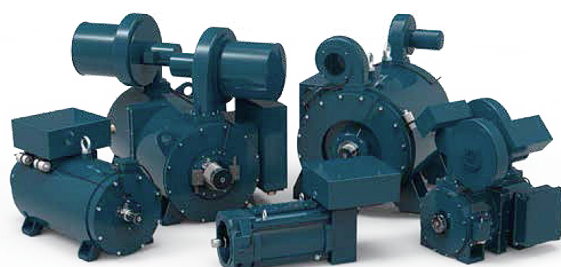
We have been developing innovative electric motors since 1924 and for the most diverse industry branches and applications. And this is why we can offer you today an extremely broad spectrum of products that is as diverse as our customers themselves. This also includes the development of new motors on short call that are specially tailored to your requirements.

Due to our extraordinary degree of vertical integration and highly experienced development team, from an engineering point of view, the sky is the limit. Whether you require motors for the toughest operating conditions such as underwater, vibrating, or sawmill motors or machines of the highest performance for sophisticated tasks such as development test benches in the automotive industry: It is your choice and we have matching motor. We guarantee it.

What we can do for you:

- Determining the exact requirements and professional advice for selecting your drive
- Design and construction of special motors in close corporation with your responsible engineers
- Production and comprehensive testing, including documentation
- Construction of prototypes
- Production of cost-optimizing special motors for medium quantities
- On-site service or at our factory provided by an highly experienced service team (including 24-hour Service Hotline)

As part of the Brazilian WEG Group, we extend the latter's product range with high-class special motors since 2014.



우리의 모터를 통해 동력을 전달 Power connects us with our motors



테스트 벤치용 모터 Test bench drives

AKH는 양산라인 및 연구목적으로 사용되는 다이내모미터의 제작 및 개발에 20년 이상의 경험을 갖고 있습니다. 폐사의 모터 기술은 자동차 산업의 발전 과 함께 지속적으로 진화해 왔습니다. 최대출력 1MW, 최대속도 25,000rpm의 제품을 공급할 수 있습니다.

업계 선두주자로서, 특허, 다양한 냉각방식 그리고 지속적인 연구 개발을 통해 관성 모멘트가 낮은 유도전동기를 공급하고 있습니다.

For more than 20 years we develop and manufacture dynamometers that are utilized in production as well as development test benches. The technology of our electrical motors has evolved permanently with the testing tasks in the automotive industry. Today we are able to deliver dynamometers for the most sophisticated testing applications in the power range up to 1 MW and speed up to 25,000 rpm.

Diverse cooling systems, patented and permanently further developed, ensure us the leading role as provider of low inertia asynchronous machines.

고객은 아래 분야에 초점을 두고 Test Bench를 개발 공급하고 있습니다.

변속기 및 엔진의 양산 및 연구개발용 Test Bench

- 하이브리드 및 전기자동차
- 내연기관 (엔진)
- 변속기
- 전체 구동계통
- 차량
- 기타 차량의 부품

Our customers develop and supply test bed technology, focussing on the following:

End of Line test of gearboxes and engines development test benches for

- hybrid applications and electric motors
- combustion engines
- gearboxes
- complete drive trains
- vehicles
- other vehicle components

AKH의 3상 다이내모미터는 Test Bench 전용으로 개발된 것으로 다음과 같은 특징을 갖고 있습니다.

- 고객의 요구사항을 정확히 충족시킨 성능 유지보수가 거의 없어 Test Bench의 이용률 증대
- 높은 과부하 용량
- 광폭의 정출력 구간
- 저소음, 저진동
- 공냉식, 수냉식, 열교환식 냉각방식 가능
- 인버터 전류에 최적화
- 전압의 가변화(최대 700V)

AKH-three-phase current dynamometers are specially developed for using in test benches. Features:

- Motor performance exactly acc. to customer requirements
- Very low maintenance – ensures high availability of the test beds
- High overload capacity
- Wide range of constant power
- Low vibration and low noise level
- Available with air cooling, water cooling and cooling by heat exchanger
- Optimized for a given inverter current
- Variable voltage (up to 700V)

차별화

Nearly Unrivaled

다양한 냉각방식을 통해 Test Bed에서 요구하는 다양한 조건을 유연하게 충족시키고 있습니다. 자체 개발한 산출프로그램을 이용해 고속 회전 시에도 모터의 손실을 정확하게 산출할 수 있습니다. 폐사 시험실에서 S1 부하 상태에서의 기술 데이터를 검증하고 있습니다.

고객이 사용하는 인버터를 사용하여 측정하는 것도 가능합니다. 특히 Test Bed의 요구조건에 맞게 모터 베어링을 선정하고 있습니다. 즉, 유지보수가 거의 필요하지 않은 다이내모미터는 동적특성이 우수하고 고속운전에도 충분히 견딜 수 있는 내구성을 갖고 있습니다. 또한 부품의 수직 계열화가 높고 강력한 개발팀을 보유하고 있어 고객의 요구사항을 정확하게 충족시킬 수 있습니다.

Due to the different cooling systems, we offer the most flexibility for the different conditions in test beds. In-house developed calculation programs, permanently further developed, enables us to exactly calculate the losses even at motors with high speed. The technical values are verified by S1 load measurement in our test lab.

Measurements with using the customer inverter are possible. The bearings of the drives are especially dimensioned for the requirements in test beds, that's saying low maintenance dynamometers with high durability even of high speed motors and high dynamic operated motors. Due to the high degree of vertical integration and the strong development team the motor performance and the design can exactly be realized according customer wishes.

모터형식 Type	UHMF	UHTD / UHMD	UHTZ	UHTW / UHMW	UHTY / UHMY	UTTW / USTW(Y)
정격출력 Power[kW]	15 - 500	5 - 1,000	40 - 1,500	3 - 1,000	100 - 1,000	60 - 600
정격토크 Torque[Nm]	40 - 4,000	20 - 10,000	80 - 10,000	10 - 10,000	200 - 10,000	50 - 5,000
최대속도 Maximum speed [rpm]	< 12,000	< 10,000	< 20,000	< 15,000	< 16,000	< 25,000
보호등급 Degree of protection	IP54	IP23(IP54)	IP23(IP54)	IP54	IP23(IP54)	IP54(IP23)
냉각방식 Cooling	강제냉각 Forced ventilation	개회로 냉각 (열교환 방식) Open-circuit cooling (heat exchanger)	개회로 냉각 (열교환 방식) Open-circuit cooling (heat exchanger)	Water jacket 냉각 Water jacket cooling	복합냉각 (열교환 방식) Combined cooling (heat exchanger)	수냉각 (복합냉각 방식) Water cooling (combined cooling)
축높이 Axis height[mm]	160 - 400	132 - 500	200 - 500	100 - 500	200 - 500	112 - 250
원리 Principle	비동기 Asynchronous	비동기 Asynchronous	비동기 Asynchronous	비동기 Asynchronous	비동기 Asynchronous	비동기/영구자석 Asynchronous Permanent Magnet
상세정보 Details	프레임 없는 디자인 고풍력 컴팩트 디자인 Frameless design, high power with compact design	고속 고 토크 부드러운 주행 High torque and high speed, smooth running	고속 저관성 높은 과부하 용량 High speed, very low inertia, high overload capacity	수냉각 방식 저소음 부드러운 주행 낮은 열손실 Water jacket cooling, low noise, smooth running, low waste heat in the test lab	수냉 및 공냉식 고 토크, 높은 최대속도, 컴팩트 디자인 Water jacket and air cooling, high torque, high maximum speed, compact design	특허받은 수냉각 방식, 극히 작은 사이즈 고속 및 고 토크 저관성 모멘트 Patented water cooling, highest speed, high torque at very small size, extremely low inertia

변속장치 및 파워 트레인용 다이내모미터(저속)

Dynamometers for transmission and powertrain testing(low speed)

특징

- 광역대의 동적 범위에서도 매우 낮은 관성
- 고객의 요구에 따라 회전자의 관성 조정
- 진동이 낮음

Special features

- Very low inertia for high dynamic simulation
- Rotor inertia according customer requirements
- Low vibration level

모터의 주요 사양* Extract of the motor range*

형식 Type	출력 Power [kW]	토크 Torque [Nm]	정격속도 Rated speed [rpm]	최대속도 Max. Speed [rpm]	연속출력 속도 Const. Power Speed [rpm]	인버터전압 Inverter Voltage [V]	정격전류 Rated Current [A]	극수 No. of poles	관성모멘트 Inertia [kgm ²]	냉각방식 Cooling
UHTZ 282.4Z-4	250	1,900	1,255	3,000	3,000	440	480	4	1.0	
UHTW 322.2Z-4	250	1,989	1,200	3,000	2,300	460	410	4	3.9	
UHTZ 318.3Z-4	300	2,500	1,146	3,000	2,500	400	650	4	1.8	
USTU 250.4Z-4 ⁽¹⁾	250	3,000	795	3,000	3,000	440	850	4	0.62	
UHTZ 321.3X-4	220	3,000	700	3,000	3,000	460	740	4	2.55	
UHTD 355.2Y-4	367	3,500	1,000	3,000	3,000	440	770	4	5.6	
UHTZ 318.5X-4	277	3,500	756	2,500	1,900	440	560	4	2.4	
UHTW 325.4-4	220	4,000	525	3,000	3,000	460	650	4	4.3	
UHTZ 321.6-4	300	4,000	716	3,000	2,742	440	750	4	3.6	
USTU 252.5-4 ⁽¹⁾	250	4,000	597	3,000	3,000	440	1,080	4	0.8	
UHTD 355.4X-4	360	5,000	688	3,600	2,900	460	865	4	8.0	

⁽¹⁾동기전동기 *요청시 칫수 변경 가능 ⁽¹⁾synchronous *other dimensioning on request.

전기자동차용 모터 및 부품시험용 다이내모미터

Dynamometers for E-Motor and EV-component testing

특징

- 고속도, 높은 과부하 용량
- 전체 속도구간에서 진동이 낮음
- 컴팩트한 설계 가능, 예) 외함

Special features

- High speed motors, High overload capacity
- Low vibration level over the whole speed range
- Available with very compact design, e.g. for enclosures

모터의 주요 사양* Extract of the motor range*

형식 Type	출력 Power [kW]	토크 Torque [Nm]	정격속도 Rated speed [rpm]	최대속도 Max. Speed [rpm]	연속출력 속도 Const. Power Speed [rpm]	인버터전압 Inverter Voltage [V]	정격전류 Rated Current [A]	극수 No. of poles	관성모멘트 Inertia [kgm ²]	냉각방식 Cooling
UHMW 181.0Y-2	60	47.5	12,060	13,560	13,560	660	75	2	0.065	
UHTZ 203.2-2	75	100	7,000	20,000	20,000	440	176	2	0.06	
UHMY 200.1-2	80	153	5,000	15,600	15,600	420	160	2	0.13	 
UHTW 255.2-2(B)	100	190	5,000	15,000	15,000	400	185	2	0.36	
UHTZ 226.2-2(C)	200	420	4,545	16,000	16,000	690	270	2	0.37	
UHTW 255.2-2(A)	173	430	3,840	15,000	13,300	460	345	2	0.38	
UHTZ 226.2-2(B)	150	430	3,300	15,000	15,000	400	388	2	0.37	
USTY 226.2Z-4 ⁽¹⁾	250	500	4,775	20,000	20,000	440	1,110	4	0.10	 
UHTK 228.1-4	220	525	4,000	16,000	15,000	380	870	4	0.36	
UHTZ 226.2-2(E)	250	525	4,500	16,000	12,000	460	574	2	6.37	
UHTW 253.2-4	80	618	1,235	11,000	8,550	400	250	4	0.83	
UHTZ 282.3-2	250	703	3,394	12,000	12,000	400	625	2	0.71	
UHMY 251.3-2	271	780	3,320	10,000	7,000	415	435	2	1.25	 

⁽¹⁾동기전동기 *요청시 칫수 변경 가능 ⁽¹⁾synchronous *other dimensioning on request.

엔진 및 변속기 시험용 다이내모미터

Dynamometers for engine and transmission testing

특징

- 높은 내구성
- 광폭의 정출력 구간, 필요시 최대속도까지 연장 가능
- 낮은 관성모멘트, 고객사양에 맞게 설계 가능
- 전체 속도 구간에 걸쳐 낮은 진동

Special features

- Highest durability
- Wide constant power range, if needed up to maximum speed
- Very low inertia, if required exactly acc. to customer specification
- Low vibration level over the whole speed range

모터의 주요 사양* Extract of the motor range*

형식 Type	출력 Power [kW]	토크 Torque [Nm]	정격속도 Rated speed [rpm]	최대속도 Max. Speed [rpm]	정출력 속도 Const. Power Speed[rpm]	인버터전압 Inverter Voltage[V]	정격전류 Rated Current[A]	극수 No. of poles	관성모멘트 Inertia [kgm ²]	냉각방식 Cooling
UHTD 162.2Y-2	36	170	2,000	9,000	9,000	400	85	2	0.16	
UTTY 161.2-4	135	215	6,000	8,000	8,000	460	249	4	0.12	
UHMF 226.2-2	80	300	2,547	7,500	7,500	460	120	2	0.85	
UTTY 180.4-4	240	573	4,000	8,500	8,500	440	470	4	0.65	
UHTW 280.2Y-2	300	716	4,000	8,000	8,000	400	500	2	1.44	
UTTW 230.4Y-2	450	900	4,775	9,000	9,000	420	790	2	1.40	
UHTZ 357.3-2	593	970	5,830	10,000	10,000	420	915	2	2.40	
UHTD 281.1Y-2	500	1,000	4,775	10,000	8,500	460	840	2	1.30	
UHTY-K 317.2-2	600	1,200	4,775	9,500	7,400	480	860	2	1.70	
UHTZ 291.3Z-4	355	1,205	2,815	6,000	4,000	460	550	4	0.85	
UHMU 356.4Z-2	600	1,302	4,400	5,600	5,600	660	605	2	6.00	
UHTW 324.3Z-4	210	2,005	1,000	9,000	6,500	440	695	4	2.90	
UHTZ 329.3-4	550	2,500	2,100	8,500	6,800	420	1,410	4	2.90	
UHTD 320.3X-4	250	2,600	918	6,000	6,000	460	675	4	5.40	
UHTY 356.2Z-4	367	3,500	1,000	7,000	5,200	690	700	4	6.20	
UHTD 355.3X-4	450	3,500	1,227	6,000	3,330	460	817	4	6.60	
UHTD 407.3X-4	750	4,000	1,790	5,500	5,500	690	1,135	4	7.80	
UHTY 356.4-4	800	4,500	1,698	4,000	4,000	460	1,415	4	9.75	
UHTY 451.2-4	800	5,093	1,500	3,500	3,500	460	1,270	4	19.00	
UHTD 400.3X-4	1,300	5,500	2,560	3,000	3,000	690	1,320	4	12.80	
UHMW 500.4Z-4	691	6,600	1,000	2,600	2,600	460	1,210	4	34.00	
UHTY 451.2-4	754	7,200	1,000	4,500	4,000	690	1,090	4	19.00	

*요청시 치수 변경 가능. *other dimensioning on request.

범례 Legend

- 공냉식 Air cooling
- 열교환방식 Heat exchanger
- 수냉식 Water cooling
- 수냉 - 공냉 혼합방식 Water-Air-cooling



제품의 범위

Our product range

- 3상 농형 유도전동기 및 슬립링 타입 3상 유도전동기
- 3상 동기전동기
- 와류 브레이크
- 1에서 1,500kW의 출력
- 최대속도 25,000rpm
- 모터의 축 높이 90에서 500mm
- Three-phase asynchronous motors with squirrel-cage and slip ring rotor
- Three-phase synchronous motors
- Eddy-current brakes
- Power 1 to 1,500kW
- Speed up to 25,000rpm
- Motors with 90 to 500mm axis height

자동차 시장 납품 실적

References Automotive Testing

MAN SE, Renault, Robert Bosch GmbH, Renk AG, Schaeffler AG, Scania AB, Shandong Gold Phoenix Group Co. Ltd., Shanghai Volkswagen Automotive Co., Shanghai W-Ibeda High Tech. Group, Shell, Siemens AG, teamtechnik GmbH, Skoda, Technoerma Systems GmbH, ThyssenKrupp System Engineering, Voith GmbH, Volkswagen AG, Volvo Trucks, ZF Friedrichshafen AG



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