SIEMENS Mechanical Drives

SIEMENS

AEMT Visit 23rd April

Siemens Mechanical Drives, Leeds

- The Mechanical Drives business has been in the UK since 1969
- 1969 Flender established in UK in Morley, Leeds
- 1971 Flender moved to Thornbury, Bradford
- 2005 Siemens acquired Flender
- 2010 Siemens Mechanical Drives moves to Navigation Park,
- 2014 Re-structure to meet market needs – LD GM formed

Geared Motors HQ - Tübingen

Founded 1879 (Himmelwerk)

Former Flender Tübingen was renamed to
Siemens Geared Motors in Nov. 2007

Employees 530
+ 52 apprentices

Certification DIN EN ISO 9001

Assembly centers worldwide available

Factory Tübingen:
Area size utilized 70.771 m^2
(buildings 31.165 m^2)

Production volume about 150.000 geared motors per year

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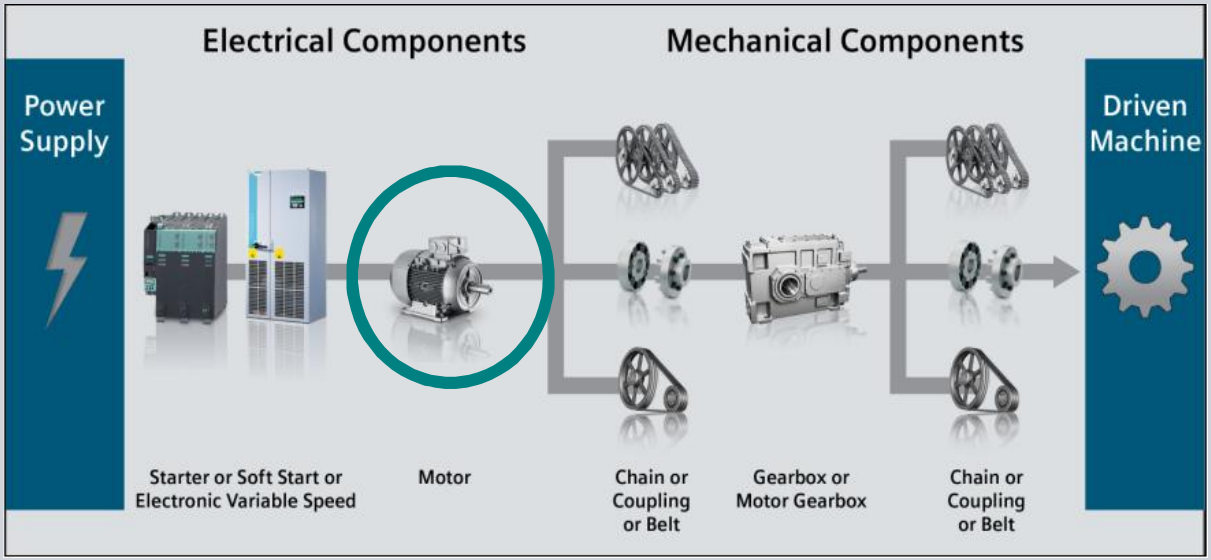

Siemens Low Voltage Motors

Mechanical Drives

Industry Sector

Siemens IEC Standard Motors

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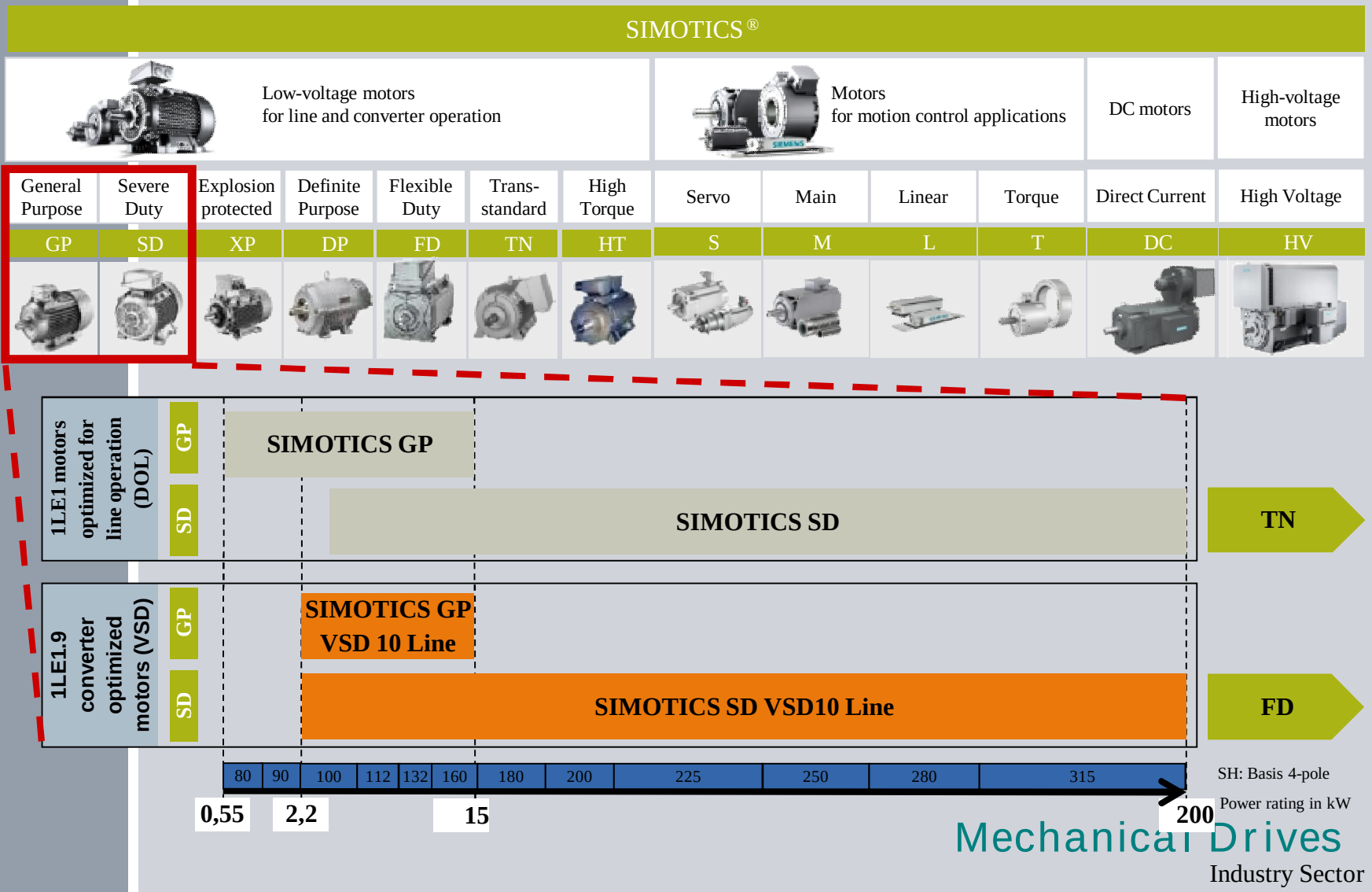

Mechanical Drives

Industry Sector

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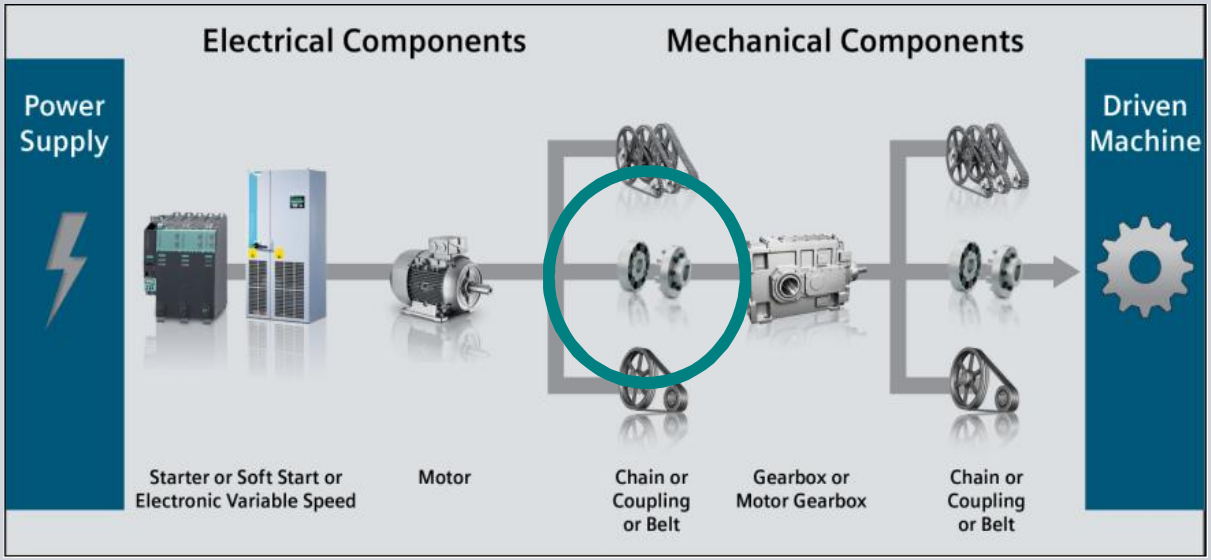

Siemens Couplings

Mechanical Drives

Industry Sector

Flender Standard Couplings

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Overall torque range: 10 … 10.000.000 Nm

Standard size range: 48 … 2800 mm

Hydrodynamic couplings

FLUDEX
Fluid coupling

Torsionally rigid couplings

ARPEX
All steel disc coupling

ZAPEX
Gear Coupling

Elastomeric couplings

Flexible coupling

N-EUPEX
Claw coupling

BIPEX
Jaw coupling

RUPEX
Pin & bush coupling

High flexible coupling

ELPEX
Rubber coupling

ELPEX-B
Rubber tire coupling

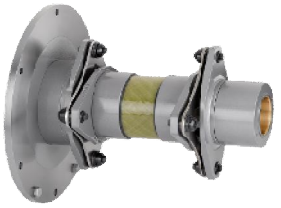
ELPEX-S
Rubber disc coupling

couplings for special applications

Couplings for railway vehicle

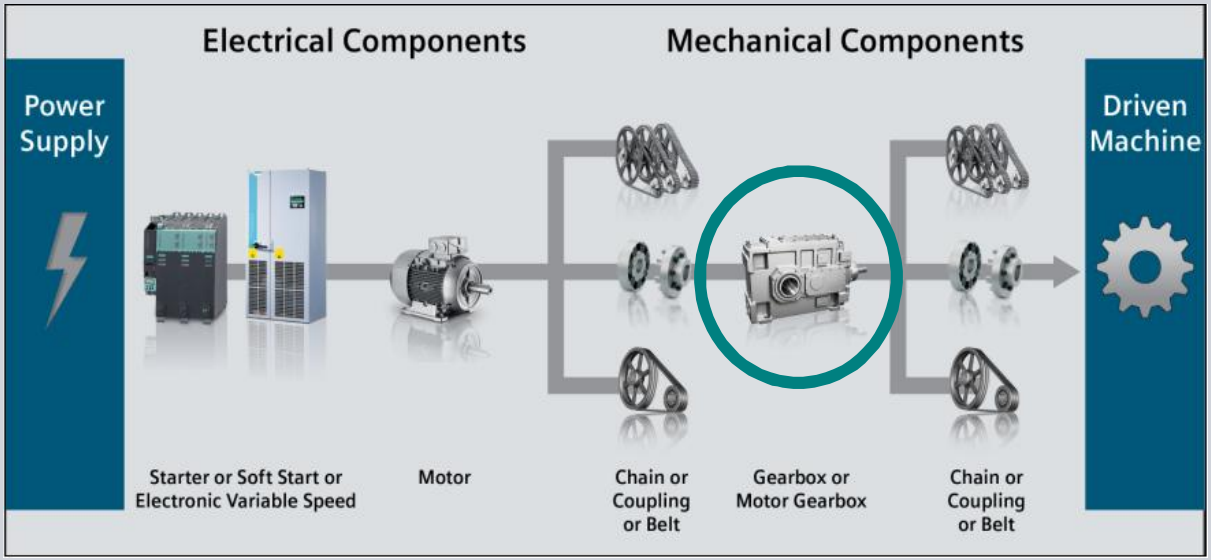
High performance couplings

Couplings for wind turbines



Mechanical Drives
Industry Sector

SIEMENS



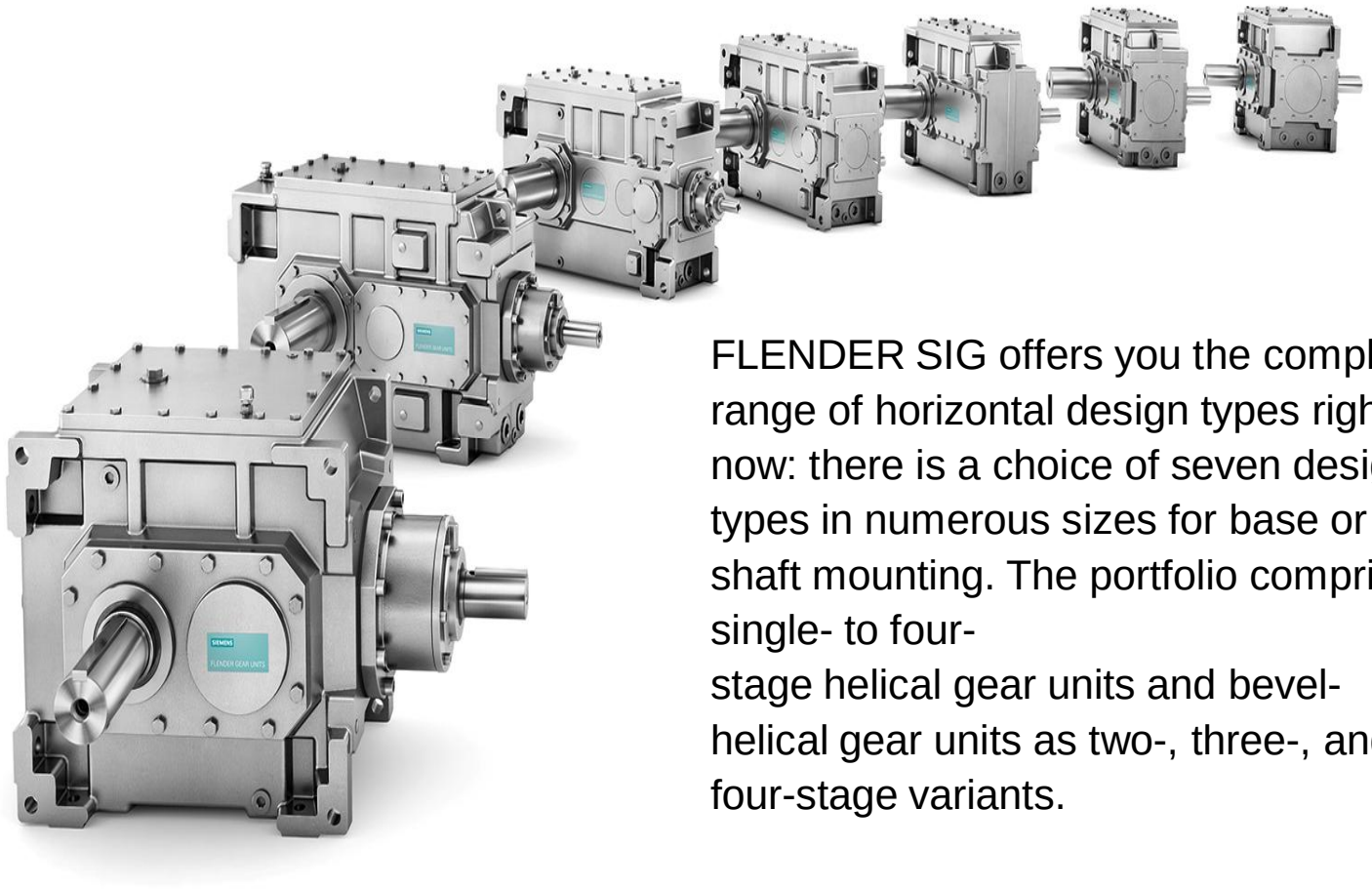
S.I.G - Siemens Industrial Gear

Mechanical Drives

Industry Sector

S.I.G – Siemens Industrial Gearbox

SIEMENS



FLENDER SIG offers you the complete range of horizontal design types right now: there is a choice of seven design types in numerous sizes for base or shaft mounting. The portfolio comprises single- to four-
stage helical gear units and bevel-helical gear units as two-, three-, and four-stage variants.

Typical applications

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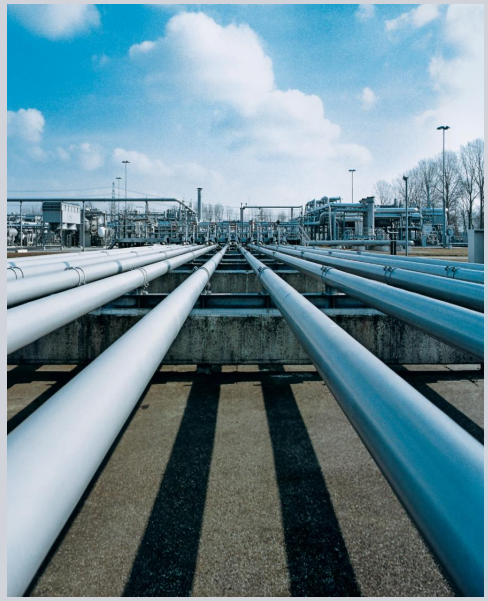
- Conveyor drives
- Hoisting gear drives for cranes
- Water screw drives
- Bucket elevator drives
- Paper machine drives
- Fan drives
- Pump drives
- Compressor drives



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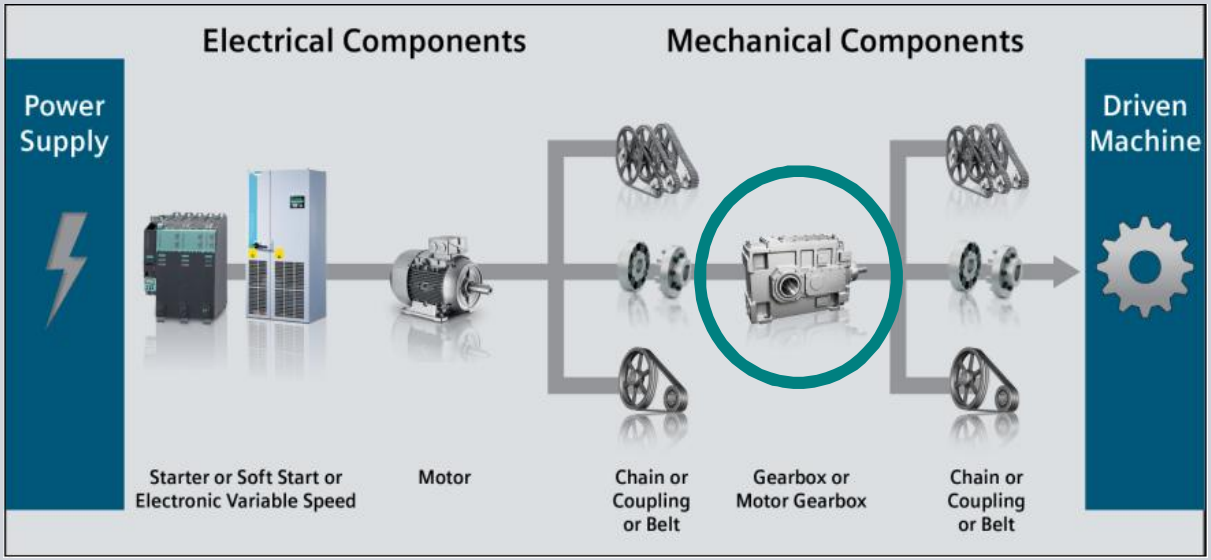

SIP - Siemens Industrial Planetary

Mechanical Drives

Industry Sector

S.I.P

SIEMENS

FLENDER SIP

- 10,000 to 80,000 Nm,
- Solid Shaft
- Hollow shaft with a shrink disk
- Hollow shaft multi-spline profile.
- Flanged shaft,
- Taconite seals

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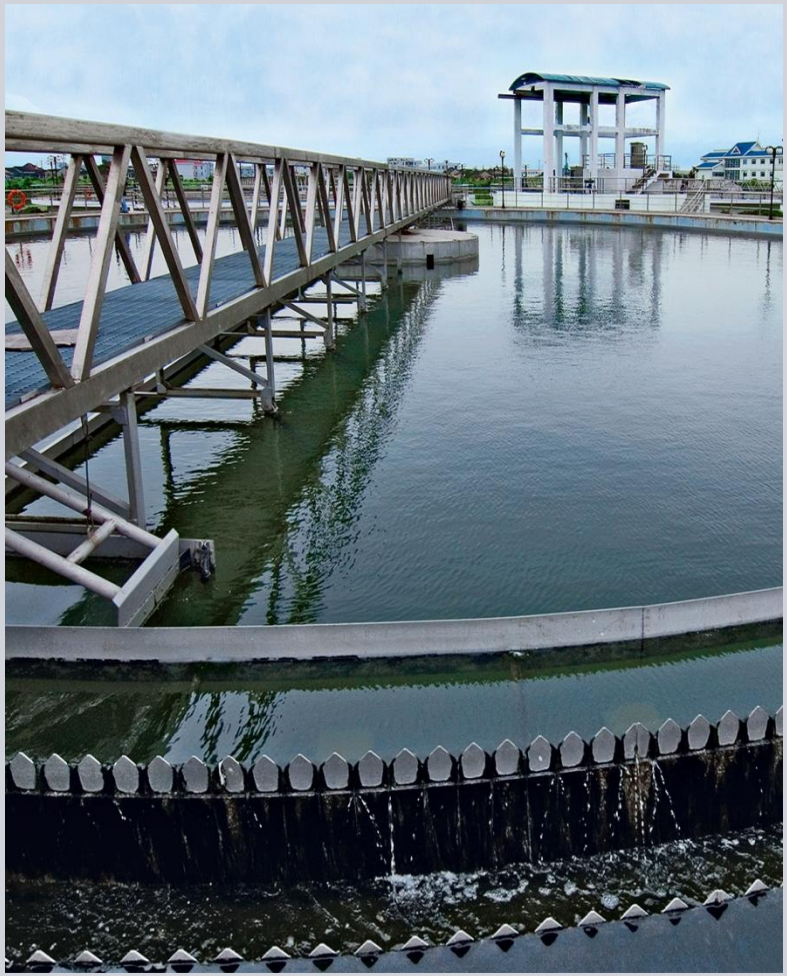
Examples of typical applications

- Apron feeders
- Shredders
- Mixers
- Filtration technology
- Reactors
- Traveling gears
- Water treatment



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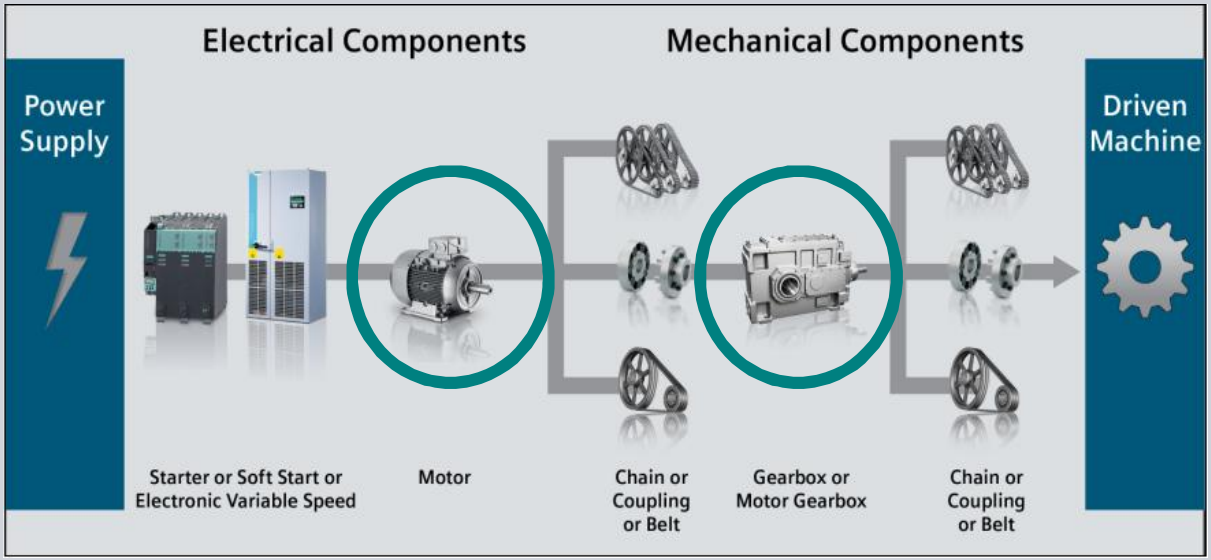


SIMOGEAR Geared motors

Mechanical Drives

Industry Sector

SIEMENS

New Geared Motor Range SIMOGEAR

Torque class T_{2N}	25 Nm	50 Nm	100 Nm	200 Nm	300 Nm	500 Nm	750 Nm	1000 Nm	2000 Nm	3000 Nm	5000 Nm	8000 Nm	13000 Nm	20000 Nm	35000 Nm	50000 Nm
Helical gearbox 2-/3-stage		D/Z19 90 Nm	D/Z29 140 Nm	D/Z39 200 Nm	D/Z49 320 Nm	D/Z59 450 Nm	D/Z69 600 Nm	D/Z79 840 Nm	D/Z89 1680 Nm	D/Z109 3100 Nm	D/Z129 5000 Nm	D/Z149 8000 Nm	D/Z169 13600 Nm	D/Z189 19000 Nm		
Parallel shaft gearbox 2-/3-stage			F29 150 Nm	F39 290 Nm	F49 480 Nm		F69 600 Nm	F79 1000 Nm	F89 1850 Nm	F109 3100 Nm	F129 4500 Nm	F149 8100 Nm	F169 13000 Nm	F189 18500 Nm		
Bevel helical gearbox 2-stage		B19 50 Nm	B29 110 Nm	B39 250 Nm	B49 450 Nm											
Bevel helical gearbox 3-stage				K39 220 Nm	K49 420 Nm		K69 600 Nm	K79 820 Nm	K89 1600 Nm	K109 2900 Nm	K129 4700 Nm	K149 8000 Nm	K169 13500 Nm	K189 19500 Nm		
Helical worm gearbox 2-stage			C29 100 Nm	C39 225 Nm	C49 400 Nm		C69 700 Nm	C89 1600 Nm								
Worm gearbox 1-stage	S09	S19	S29													

Range 20.000Nm … 50.000Nm postponed until further notice

Prioritization on Drive Train topics

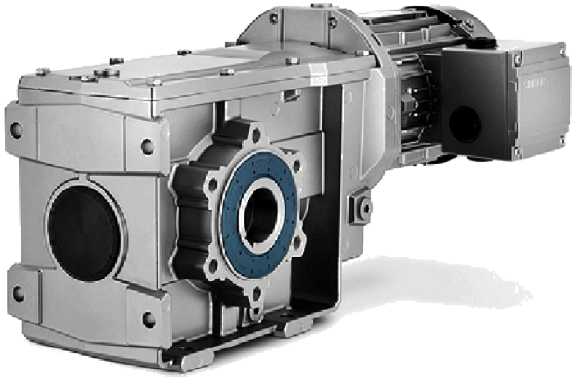
Phase 1 HMI 2014	Phase 2a SPS 2014	Phase 2b HMI 2015	Phase 2c SPS 2015

Siemens Geared Motors – Portfolio Overview

SIEMENS

	Inline Geared Motor	Flange Mounted Geared Motor	Helical Bevel *2-stage*	Helical Bevel *3-stage*	Worm Geared Motor *2-stage*	Worm Geared Motor *1-stage*
						
Gear Unit Size	E39…E149 (1-stage) Z19…Z189 (2-stage) D19…D189 (3-stage)	FZ29…FZ229 (2-stage) FD29…FD229 (3-stage)	B19…B49 (2-stage)	K39…K229 (3-stage)	C29…C89 (2-stage)	S09…S29 (1 – stage)
Number of contruction sizes	7 (1-stage) 13 (2-/3-stage	13	4	12	5	3
Torque range [Nm]	90…20.000	150…50.000	50… 450	220… 50.000	100…1600	18.. 80
Ratio Range	1.1… 10 (1-stage) 3,4…60,97 (2-stage) 39,34..330 (3-stage) 250..50.000 (multi--stage)	3.57...60,21 (2-stage) 46,36...357 (3-stage) 250..50.000 (multi--stage)	3.47..59,28 (2-stage)	5,17...244 (3-stage) 250..50.000 (multi-stage)	10..290 (2-stage) 250..25.000 (multi-stage)	5…100 (1-stage)
max. Motor Power [kW]	200	200	7.5	200	15	0,75

2-stage Bevel Helical Geared Motors (B series)



- ✓ Aluminum Housing
- ✓ Less weight
- ✓ Corrosion resistant
- ✓ Higher efficiency
- ✓ Less noise
- ✓ Cost effective

Expansion of torque range enables 95% coverage of applications.

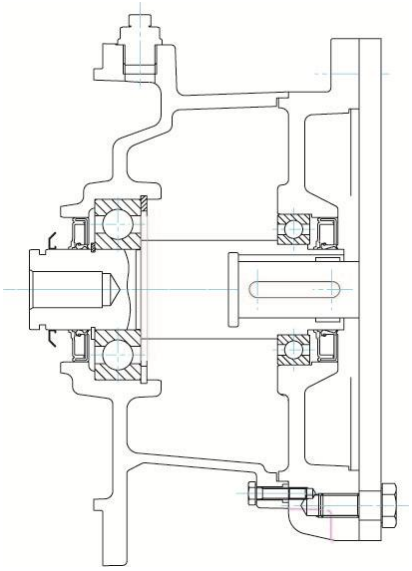
	B29	B39	B49
Rated Torque T_2 [Nm]	73 – 110	200 – 250	290 - 450
Ø Hollow Shaft **Shrink Disc** / Feather Key	**20**/25 mm	**30**/35/40 mm	**35/40** mm
Ratio	3,65 – 46,85	3,50 – 56,36	3,47 – 59,28

Motor adapters – K4 – Shortadapter

Technical features

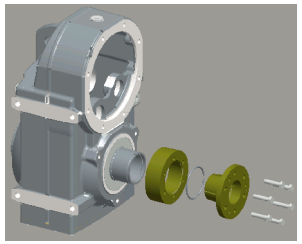
SIEMENS

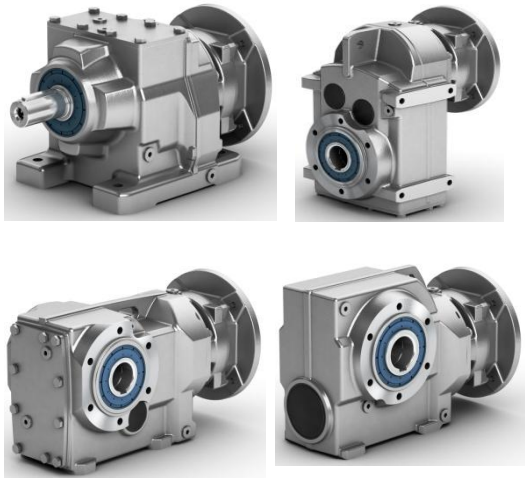
Adapter sizes	▪ 8 sizes with IEC 63, 71, 80, 90, 100, 112, 132 and 160
Purpose	▪ Universal and easy-to-mount standard solution for mounting IEC standard motors (flange IEC B5)
Characteristics	▪ Short, less expensive
Technical features	▪ **Coupled With other features such as the Eco Fast connector and Simoloc system availabilty, reduced downtime and site standardisation are the key advantages**



Harting Plug Connector

Simoloc Fast Shaft Mount





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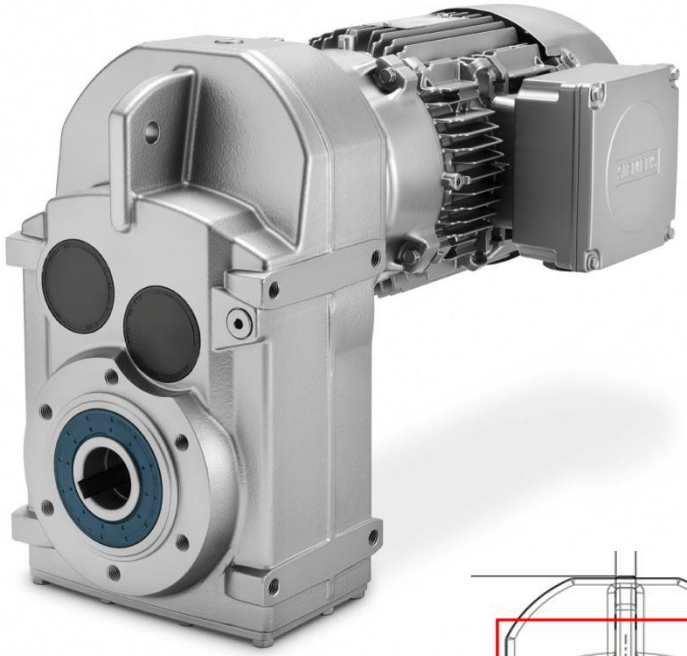
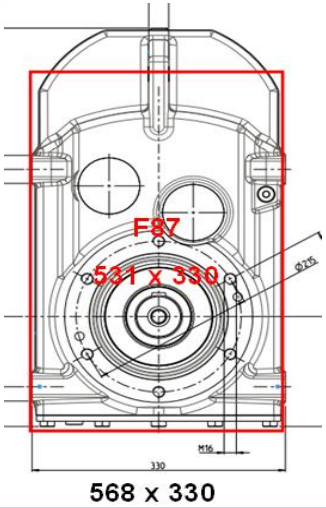
Interchangeable Mechanical Interface





The Mechanical interface is a direct fit to SEW

	SIMOGEAR FDZ109	MOTOX FDZ108	SEW F87
Design			
Shaft mounting	✓	✓	✓
Flange	✓	✓	✓
Feet	✓	✓	✓
Centering	✓	✓	✓
Material GG25	✓	✓	✓
Shaft distance	252,5	280	246,7
Two-stage unit			
Nominal torque	3100	3400	3000
Ratio i min	4,77	5,68	4,12
Ratio i max	70,74	64,21	33,92
Three-stage unit			
Nominal torque	3100	3400	3000
Ratio i min	55,31	48,24	29,20
Ratio i max	410,0	424,5	270,7
Dimensions			
Feet bores	310 x 165	310 x 165	310 x 165
Flange diameter	350	350	350
Housing flange	C245	C245	C215
Solid shaft metric	V60	V60/V80	V60
Hollow shaft metric	H60	H60/H70	H60
Hollow shaft shrink	HS65	HS65/HS70	HS65
Hollow shaft splined	N65	N70	N65
Housing heigth	568	573	531
Distance to D	346	346	346

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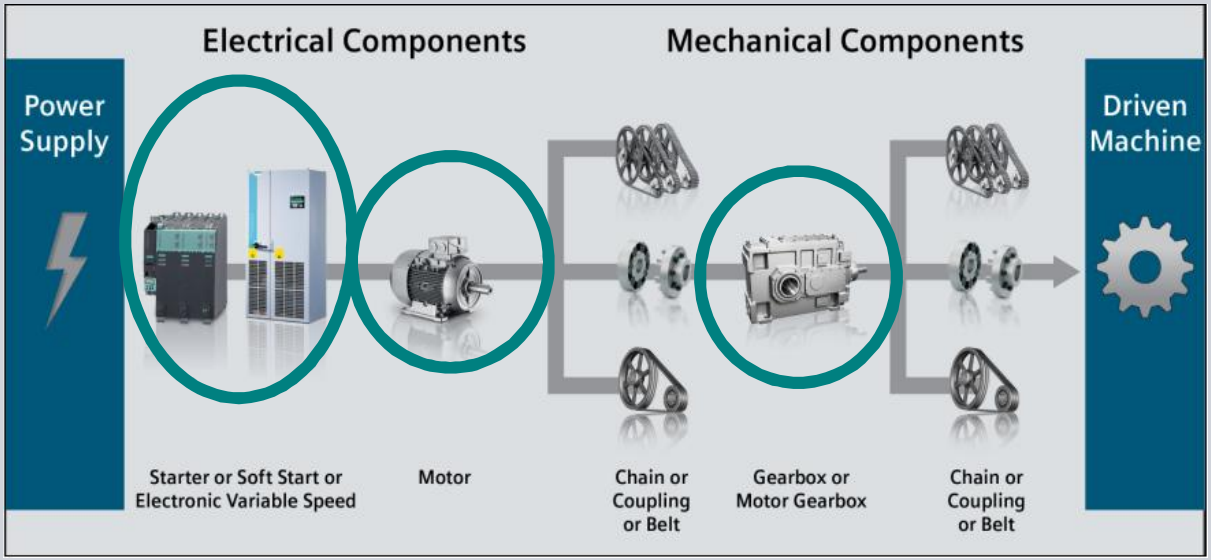

SIMOGEAR Geared motors

G110M

SIEMENS

Overview Power Module

- **2 Frame Sizes**
  Frame Size A = 0,37kW; 0,55kW; 0,75kW; 1,1kW; 1,5kW
  Frame Size B = 2,2kW; 3,0kW; 4,0kW
- **Mains**
  (3AC 380 $_{-10\%}$ … 500 $_{-10\%}$)
- **High Overload Capability**
  (200% for 3s or 150% for 57s at a 300s cyclus)
- **„Easy to use“**
  integrated potentiometer (max. speed)
  USB interface (Commissioning via Starter/Start Drive)
  optical interface (Connection of IOP)
- **Easy Diagnosis**
  (local LEDs for „ready“, „bus fault“, „system fault“)
- **Cooling**
  (by motor fan / Derating at reduced motor speeds)

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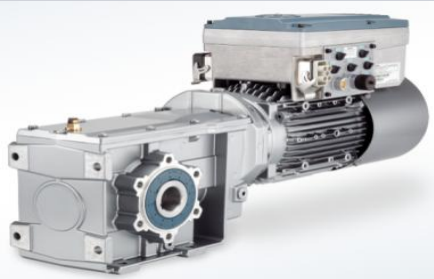
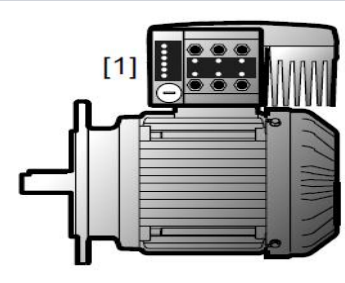
SINAMICS G110M vs SEW MOVIMOT D





- **Compact** (integrated communication-same height)
- **Safety integrated** (STO) without additional costs or additional external components
- **I/O‘s** by M12 connectors without additional costs
- **PROFINET** and Profibus DP at identical price level
- **basic PLC functionality** without additional costs (logical function blocks, BiCo technology, etc.)
- **USB interface** on top of inverter (for commissioning tool Starter/Start Drive)
- **fast exchange** of defective Power Modules (drive data stored within control unit)

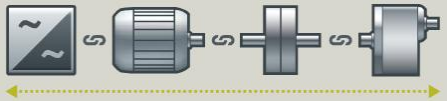
- **Big** (communication by external modules)
- **SafeTorqOff** at extra costs (approx. 50 EUR list price) + additional external, fail safe 24VDC supply (e.g. Pnoz) required
- **I/O‘s** by M12 connectors at extra costs (approx. 70 EUR list price)
- **PROFINET** more expensive than Profibus DP
- **no intelligence** of basic unit (programmable „IPOS“ at extra costs – approx. 100 EUR list price)
- **additional Hardware** (e.g. USB 11A) needed for interconnection of Engineering PC/PG and inverter
- **Replacement** of defective power modules time intensive (drive data stored within power module, DIP switches need to be adjusted according to defective power module)

There’s more to it

Siemens INTEGRATED DRIVE SYSTEMS

What is I.D.S

Horizontal



Functional, mechanical and energy-efficient integration of the drive train – motor, gear unit, coupling, and converter – along the power flow

You can boost the availability of your application or plant to up to **99%***

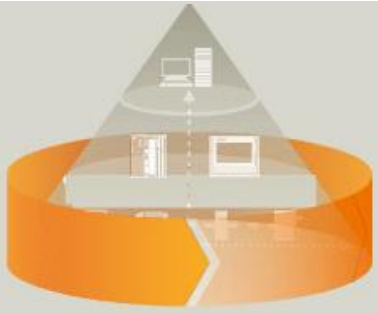
*e.g., Conveyor application

Vertical

Integration of the drive train and controller up to MES IT, along the information flow, engineering based on Totally Integrated Automation (TIA)

With TIA Portal you can cut your engineering time by up to **30%**

Lifecycle



Supplementing the drive system with service and software that support the entire lifecycle, especially design and operation

With Integrated Drive Technologies you can reduce your maintenance costs by up to **15%**

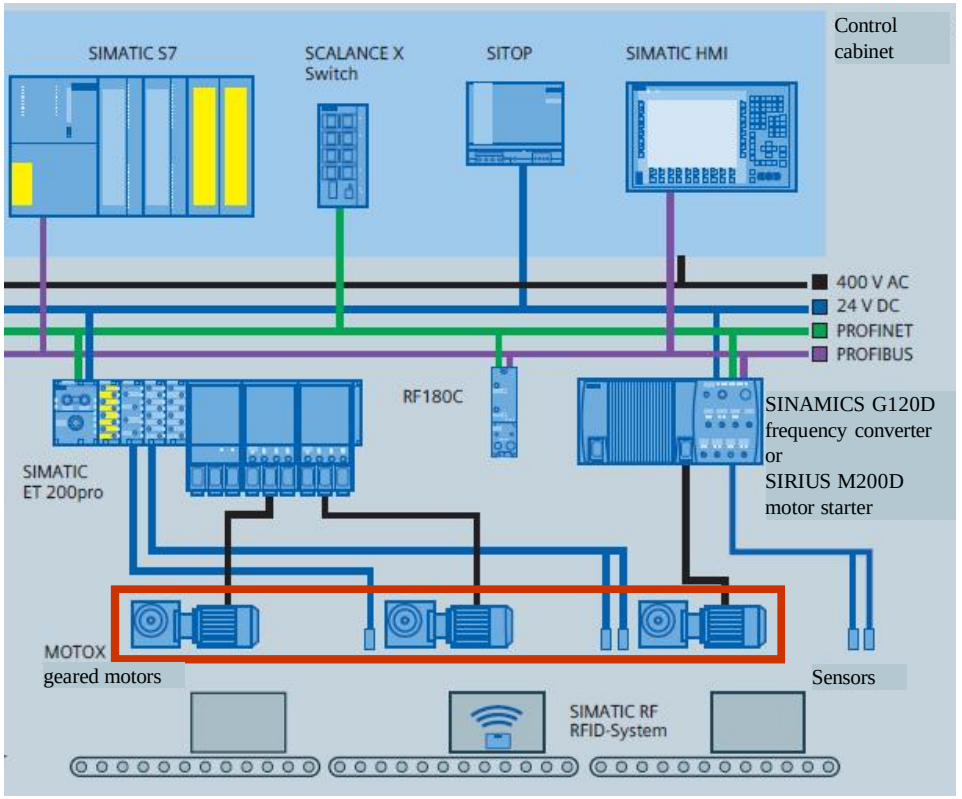
With SIMOGEAR we are continuing with the TIA pyramid in conveyor technology

SIEMENS

Most comprehensive portfolio
from the geared motor through motor starter and converter, identification systems and switchgear up to the automation

Standard, tailored and modular
components, systems and services

→ **Lower assembly and commissioning costs**
→ **Increased flexibility and system availability**



TIA: Totally Integrated Automation

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Thank you for your attention!

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