



STT TORQMAX

INDUSTRIAL GEARBOXES

Engineering and service catalogue 2026

Double and triple reduction | helical | bevel helical | planetary | worm

DRIVING INDUSTRY FORWARD

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Gearbox range and catalogue guide

STT TORQMAX is the industrial gearbox range of STT Engineering Solutions, covering new drive enquiries, engineered replacements and gearbox repair. This catalogue organizes the information needed to select, quote, manufacture and service a unit.

Family	Arrangement	Typical enquiry
IG-HL	Inline helical	Conveyors, pumps and mixers
IG-PL	Parallel shaft helical	Bulk handling and offset shaft layouts
IG-BH	Bevel helical	Right angle drives; double or triple reduction
IG-PG	Planetary	Compact coaxial high torque drives
IG-WM	Worm	Legacy and special applications
IG-CU	Custom or retrofit	Replacement interfaces and rebuilds

How to use this catalogue

Choose the shaft arrangement, calculate the required ratio and operating torque, then provide duty, loads and interface dimensions. STT confirms the design route, supply scope and delivery basis in a written quotation.

TORQMAX family codes identify enquiry arrangements. They do not define a stocked model, frame size, maximum bore, mechanical rating or thermal rating. The calculation schedules are application examples, with all assumptions stated.

The following sections cover arrangements, double and triple reduction, ratio and torque calculations, selection, interfaces, manufacturing controls, lubrication, repairs, spares, testing and ordering. Final unit data is issued on a serial-specific data sheet and approved drawing.

Helical and parallel shaft gearboxes

Helical gearing provides a practical basis for many industrial reduction drives. Select the shaft layout and reduction stages around the machine envelope, ratio and service duty.

Feature	IG-HL inline	IG-PL parallel shaft
Shaft layout	Coaxial input and output arrangement	Parallel input and output axes with offset
Reduction	Double or triple reduction by design	Double or triple reduction by design
Mounting	Foot or flange by application	Foot, flange or shaft mounting by application
Output	Solid shaft, hollow shaft or specified interface	Solid shaft, hollow shaft or specified interface
Enquiry focus	Motor connection, center height and access	Shaft offset, torque reaction and mounting clearance

Application details

Record conveyor starts, loaded restart torque, reversing duty, mixer load cycle or pump transients. A steady running load alone may understate the required tooth, shaft and bearing capacity.

Shaft mounted arrangements

The design must define the hollow shaft connection, torque arm, reaction point, machine shaft fit and removal method. Machine shaft bending and the supporting structure require review with the drive loads.

Motor and coupling integration

Specify the actual motor flange, shaft and adapter dimensions or free input shaft arrangement. Include coupling torque, speed, alignment and guard clearances in the complete drive review.

Double reduction gearboxes

Double reduction uses two reduction stages in series. The total ratio is the product of the two stage ratios. TORQMAX enquiries include inline helical, parallel shaft and bevel helical arrangements, with the exact construction confirmed by design.

Stage 1 ratio	Stage 2 ratio	Total ratio	Output RPM at 1500 input	Output torque N.m
3	4	12	125.00	2,157
4	5	20	75.00	3,594
5	5	25	60.00	4,493
5	6	30	50.00	5,391
6	8	48	31.25	8,626

Calculated torque basis: 30 kW input at 1500 RPM; overall efficiency assumed 0.9409. Values are operating duty examples, not rated or maximum gearbox capacities. $T_{out} = 9550 \times P_{in} \times i \times \text{efficiency} / n_{in}$.

These are illustrative ratio combinations, not released model ratios. Actual stage ratios follow the selected tooth counts. Stage division must consider gear size, tooth strength, shaft loading, bearing arrangement, lubrication and housing layout.

Calculated two stage example

For 30 kW input at 1500 RPM, stage ratios 4:1 and 5:1 give 20:1 overall and 75 RPM output. Assuming 0.97 efficiency for each stage, overall efficiency is 0.9409 and calculated output torque is approximately 3594 N.m. The efficiencies are illustrative assumptions, not TORQMAX ratings.

Identification and supply

Proposed enquiry example: TORQMAX IG-PL-DR | double reduction | target ratio 20:1 | input power and speed stated | output interface and duty supplied. DR identifies the requested two stage arrangement; it is not a frame size or torque rating.

Confirm mounting, input and output shaft positions, radial and axial loads, cooling requirement, actual ratio and spare parts list on the unit data sheet and general arrangement.

Triple reduction gearboxes

Triple reduction uses three reduction stages in series. TORQMAX enquiries include suitable helical, bevel helical and planetary stage arrangements. Three stages can distribute a larger total reduction across the gear train; capacity remains specific to the complete design.

Stage 1	Stage 2	Stage 3	Total ratio	Output RPM at 1500 input	Output torque N.m
3	4	5	60	25.00	10,459
4	4	5	80	18.75	13,946
4	5	5	100	15.00	17,432
5	5	6	150	10.00	26,148
5	6	6	180	8.33	31,378

Calculated torque basis: 30 kW input at 1500 RPM; overall efficiency assumed 0.912673. Values are operating duty examples, not rated or maximum gearbox capacities. $T_{out} = 9550 \times P_{in} \times i \times \text{efficiency} / n_{in}$.

The table is an illustrative planning schedule. It does not establish a minimum or maximum ratio, tooth count, housing size or operating speed for a TORQMAX model.

Calculated three stage example

For 30 kW input at 1500 RPM, stage ratios 4:1, 5:1 and 5:1 give 100:1 overall and 15 RPM output. Assuming 0.97 efficiency for each stage, overall efficiency is 0.912673 and calculated output torque is approximately 17432 N.m. This is a calculated duty example, not a gearbox load capacity.

Selection and service

Check the final stage gears, output shaft and bearings against operating and peak torque. Include all stage losses in the thermal and lubrication review. Low output speed does not remove the need to check high-speed input components, intermediate stages and transient loads.

Proposed enquiry example: TORQMAX IG-BH-TR | triple reduction | target ratio 100:1 | input power and speed stated | shafts, mounting and duty supplied. TR identifies the requested three stage arrangement. List stage-specific gear sets, shafts and bearings on the serial-specific BOM.

For simple serial reduction stages: $i_{total} = i_1 \times i_2 \times i_3$; $\eta_{total} = \eta_1 \times \eta_2 \times \eta_3$. Planetary stage ratios require the actual fixed, driven and output member definitions before applying the overall reduction calculation.

Bevel helical planetary and worm gearboxes

Different gear arrangements solve different layout and duty requirements. Select the architecture before assigning ratio, envelope or load capacity.

Family	Design purpose	Confirm on enquiry
IG-BH	Right angle power path	Shaft hand, rotation, bevel stage and mounting orientation
IG-PG	Coaxial reduction with load-sharing gear stages	Input and output interfaces, carrier or ring reaction and stage arrangement
IG-WM	Cross-axis worm reduction	Ratio, efficiency, heat rejection, wheel material and permitted backdriving
IG-CU	Custom or retrofit unit	Existing interfaces, duty and replacement constraints

Bevel helical replacements

Record mating gear geometry, contact pattern, mounting distance, backlash and bearing setting. An apparent external fit does not establish that a replacement bevel gear matches its retained mating gear.

Planetary design

Carrier, planet bearings, ring gear support and load sharing form part of the rating. Specify whether the housing or ring carries the reaction torque and whether the drive must tolerate reversing or shock loads.

Worm drives

Do not assume self-locking or use the gearbox as a holding brake. Confirm backdriving behavior and provide the required brake or anti-runback design. Efficiency and temperature are specific to geometry, speed, load and lubricant.

Ratio and output speed schedule

The table calculates output speed for a nominal input speed of 1500 RPM. It is a ratio planning schedule, not a list of released STT gear ratios or maximum speeds.

Target ratio i	Input RPM	Calculated output RPM	Output torque N.m
5	1500	300.00	907
7.5	1500	200.00	1,361
10	1500	150.00	1,814
12.5	1500	120.00	2,268
15	1500	100.00	2,722
20	1500	75.00	3,629
25	1500	60.00	4,536
30	1500	50.00	5,444
40	1500	37.50	7,258
50	1500	30.00	9,072
60	1500	25.00	10,887
100	1500	15.00	18,145

Calculated torque basis: 30 kW input at 1500 RPM; overall efficiency assumed 0.95. Values are operating duty examples, not rated or maximum gearbox capacities. $T_{out} = 9550 \times P_{in} \times i \times \text{efficiency} / n_{in}$.

Ratio i = input RPM / output RPM. Actual gear ratios follow integer tooth counts and may differ from a round target ratio. Confirm the actual ratio on the unit data sheet.

Example: a required 50 RPM output from 1500 RPM input gives a target ratio of 30:1. If the selected motor runs at 1480 RPM and the actual ratio is 30.00, output speed is 49.33 RPM.

With a variable speed drive, assess the complete input speed range. Low-speed lubrication and cooling, high-speed limits, transient torque and motor cooling may govern selection.

Calculated operating torque schedule

Illustrative output torque at 1500 RPM input and an assumed overall efficiency of 0.95. The values are calculated load examples and are not STT gearbox capacities. The assumption is not a rating for any gear family, especially worm drives.

Input power kW	Ratio	Output RPM	Calculated output torque N.m
15	10	150.0	907
15	20	75.0	1,814
15	30	50.0	2,722
15	50	30.0	4,536
30	10	150.0	1,814
30	20	75.0	3,629
30	30	50.0	5,444
30	50	30.0	9,072
55	10	150.0	3,327
55	20	75.0	6,653
55	30	50.0	9,980
55	50	30.0	16,633

Input torque $T_{in} = 9550 \times P_{in} / n_{in}$. Output speed $n_{out} = n_{in} / i$. Output torque $T_{out} = T_{in} \times i \times \eta = 9550 \times P_{in} \times \eta / n_{out}$. Here η is the verified overall efficiency expressed as a decimal.

Example: 30 kW at 1500 RPM with ratio 30 and assumed η 0.95 produces about 5444 N.m at 50 RPM. If an illustrative mechanical duty factor of 1.5 is used, the mechanical selection target is about 8166 N.m. Check peak torque separately; the factor does not multiply the continuous operating power used for a thermal check.

Use actual absorbed power when known. An oversized motor, drive current limit or startup method can change the highest torque the gearbox experiences.

Custom ratios and product output torque

TORQMAX custom ratios are available for enquiry across inline helical, parallel shaft, bevel helical, planetary and worm arrangements. State the required input and output speeds. The target ratio is input RPM divided by output RPM; actual tooth counts, stage arrangement and achievable ratio are confirmed during design.

Calculated duty examples by product family

All rows below use 30 kW input at 1500 RPM. Efficiencies are illustrative calculation assumptions for these examples only. They are not validated family efficiencies or released product ratings. A family code alone does not define torque capacity.

Family	Target ratio	Output RPM	Assumed efficiency	Output torque N.m
IG-HL	20:1	75.00	0.95	3,629
IG-PL	30:1	50.00	0.95	5,444
IG-BH	40:1	37.50	0.95	7,258
IG-PG	100:1	15.00	0.95	18,145
IG-WM	30:1	50.00	0.75	4,298
IG-CU	37.5:1	40.00	0.95	6,804

Custom ratio calculation example

A 30 kW drive at 1500 RPM with a required 40 RPM output needs a target ratio of 37.5:1. With assumed overall efficiency 0.95, calculated output torque is 6804 N.m. For a two stage arrangement, illustrative stage ratios 5:1 and 7.5:1 give 37.5:1 overall; the actual tooth counts and efficiencies require design confirmation.

Output RPM = input RPM / total ratio. Output torque N.m = 9550 x input power kW x overall efficiency / output RPM. Use the actual operating input power and exact speed for the final calculation. For serial stages, multiply their efficiencies to obtain overall efficiency.

Custom ratio enquiry

TORQMAX IG-CU | target ratio 37.5:1 | 30 kW at 1500 RPM | 40 RPM output | calculated duty torque 6804 N.m at assumed efficiency 0.95 | mounting, shaft interfaces, operating hours and peak loads supplied. Specify the acceptable output speed tolerance. Confirm rated torque, thermal duty and permissible peak torque on the released unit data sheet.

Mechanical and thermal selection

A gearbox must satisfy mechanical duty and heat rejection for the actual application. A mechanical torque comparison alone does not establish continuous suitability.

Check	Required application information
Duty spectrum	Running torque, starts, reversals, shock, stall and overload duration
Gear capacity	Tooth bending and contact loading for the released gear geometry
Shafts and bearings	Torque, deflection, bearing life, radial and axial loads
Thermal duty	Continuous absorbed power, losses, ambient temperature and cooling
Lubrication	Mounting position, speed range, oil delivery and cold startup
Mounting reactions	Torque reaction, housing stiffness, foundation and alignment
Complete drive	Motor, couplings, brakes, backstop and driven machine

Thermal basis

Compare continuous operating duty with the gearbox thermal rating under the stated ambient conditions, mounting position and cooling arrangement. Temperature, altitude, airflow and contamination can change heat rejection. Select a fan or oil system where required by the thermal design.

External shaft loads

A pulley, sprocket or pinion applies more than torsional load. Provide the force direction and distance from the defined shaft datum. Combined radial and axial loads must be checked together against shafts and bearings.

Selection reference

SEW-EURODRIVE industrial gear unit guidance identifies both mechanical and thermal design as selection criteria. Manufacturer guidance informs the selection method; it does not establish an STT rating or affiliation.

Shaft mounting and drawing requirements

The approved general arrangement fixes the gearbox interfaces and installation envelope. Measure replacement units from defined datums rather than scaling photographs.

Interface	Drawing information required
Input	Diameter, engagement, key or spline, fit and shoulder position
Output	Solid or hollow interface, key or spline, fit and retention
Feet	Hole pattern, hole size, center height and support faces
Flange	Pilot diameter and depth, PCD, bolt count, clocking and face datum
Envelope	Length, width, height, shaft offsets and removal clearances
Torque arm	Attachment, reaction point, loads and permitted articulation
Orientation	Input and output hand, rotation, mounting and oil positions
Ancillaries	Motor, couplings, guard, cooling pipes, sensors and access

Replacement survey

Supply the maker, model and serial, nameplate photograph, ratio, shaft-end details, mounting pattern and installed orientation. Record the machine-side interfaces and any inaccessible removal constraints.

Change control

Changing the mounting position may change lubrication, oil quantity, breather location, seals and thermal duty. Obtain the approved unit configuration before rotating a housing or moving a port.

A nominal motor frame or shaft diameter does not establish interchangeability. Confirm the actual adapter, flange, register, engagement and coupling dimensions.

Materials manufacturing and inspection

Each unit requires a released specification for geometry, material condition, heat treatment, fits and inspection. Catalogue dimensions alone do not provide manufacturing authority.

Part group	Specification and inspection fields
Gears and pinions	Module or pitch, tooth count, helix or bevel geometry, accuracy, material, heat treatment, hardness and contact inspection
Shafts	Material, journals, fits, keys or splines, runout, shoulder geometry and fatigue load cases
Bearings	Exact designation, arrangement, fits, clearance or preload and assembly method
Housing	Material, stiffness, bearing alignment, mounting faces, sealing faces and inspection datums
Seals and fasteners	Material compatibility, temperature range, size, grade, preload and retention
Assembly	Backlash, contact pattern, end float, runout, cleanliness and serial identification

Heat treatment and repair

Choose hardening and case requirements from the gear design. Record the process, effective case depth or hardness requirements where applicable, distortion allowance and inspection method. A heat-treatment route is not assigned solely from gearbox power.

Housing repair, bearing-seat restoration, welded components and shaft reclamation require their own approved repair method. Inspect the restored geometry and material condition before assembly.

Traceability

Maintain material and process records for the agreed critical parts. Record drawing revisions and inspection results so future spare parts match the released unit.

Lubrication cooling and monitoring

Lubrication is specified for the gear geometry, bearings, operating temperatures, speed and mounting position. The unit lubrication sheet controls oil type, quantity and service requirements.

System	Define for the exact unit
Oil bath or splash	Oil level, mounting position, speed range and delivery to components
Forced circulation	Pump, flow, filtration, pressure, return and startup sequence
Cooling	Fan, cooler duty, airflow or cooling-water conditions
Sealing	Shaft seals, labyrinths, breather and contamination exclusion
Monitoring	Oil level, oil temperature, vibration and sample points
Interlocks	Required flow, pressure or temperature permissives

Oil selection

State viscosity grade, base oil, additive requirements and material compatibility. Do not assign one oil grade to the entire range or mix oils without checking compatibility. Confirm the approved oil level after installation in the specified orientation.

Commissioning and service

Check breather and drain positions, oil level, rotation and auxiliary system operation before running. Establish oil sampling and inspection intervals from duty and environment. Review particles, water ingress, overheating and recurring oil loss.

Bearing inspection reference

SKF describes bearing remanufacturing as a specialist process involving condition assessment and dimensional inspection. Reuse or remanufacture decisions require component qualification; cleaning alone does not restore bearing capacity.

Industrial gearbox repair and rebuild programme

Repairs begin with condition assessment and an agreed scope. The strip report records defects, measurements and proposed replacement or repair actions before manufacture.

Stage	Work and deliverable
01 Intake	Asset identification, operating history, symptoms and photographs
02 Strip	Clean and dismantle; record damage and match marks
03 Measure	Gear geometry, bearing seats, shafts, housing alignment and runout
04 Diagnose	Review loading, lubrication, alignment, fits and failure evidence
05 Quote	Agreed scope, parts, repair methods, delivery basis and exclusions
06 Manufacture	Approved replacement gears, shafts, interfaces and repair work
07 Assemble	Set bearings, contact, backlash, seals and lubrication
08 Test	Agreed test procedure and recorded acceptance results

Noise and contact investigation

Bearing condition and measured backlash do not by themselves rule out a gear-mesh problem. Check contact position, tooth geometry, mounting distance, runout, housing movement, lubrication and loading before assigning the cause of noise.

Repair documentation

Provide condition photographs, dimensional findings, parts replaced, drawing revisions, assembly measurements and test records as agreed. No fixed turnaround is promised before inspection and parts availability are confirmed.

Spare parts and service kits

All parts are identified by the gearbox serial number, drawing revision and BOM item. Kits below are enquiry structures; final content and quantities follow the actual unit.

Enquiry suffix	Kit or component	Identification required
BRG	Bearing set	Exact bearing designations and arrangement
SEA	Seal and gasket set	Seal dimensions, material and orientation
GPR	Gear or pinion set	Mating gear geometry, handedness and heat treatment
SHA	Shaft assembly	Shaft drawing, bearing fits and interface
HSG	Housing or cover	Machining datums, alignment and mounting
LUB	Lubrication service parts	Pump, filter, breather or level-device details
CLG	Cooling parts	Fan or cooler design and duty
FST	Fastener set	BOM sizes, grades and assembly requirements
ASM	Complete gearbox	Approved unit data and interfaces

Matched components

Gear pairs, bevel sets and other matched components must preserve geometry and assembly settings. Replacing one member requires compatibility and retained-part condition review. Do not assume tooth count and outside diameter identify a suitable gear.

Ordering a spare

Example: TORQMAX IG-BH | STT serial and drawing revision | BOM item 12 | SEA kit | quantity 1. Include photographs and the original part markings. Final part numbers are assigned on the approved BOM.

For third-party gearbox repairs, keep the original manufacturer identity in the asset record. STT repair or replacement work does not imply an authorized OEM relationship.

Assembly testing and delivery records

Agree the acceptance criteria before manufacture or rebuild. A no-load running test checks assembly behavior under its test conditions; it does not establish a full-load rating or service life.

Record	Required content
Preambly inspection	Critical dimensions, fits, gear and bearing condition
Assembly settings	Backlash, contact pattern, preload or end float and runout
Lubrication check	Oil grade, level, ports and auxiliary system operation
Running test	Speed, direction, duration, temperature trend, vibration and leakage
Loaded test if agreed	Load points, duration, instrumentation and acceptance limits
Final data sheet	Ratio, permitted speeds, rated duty, interfaces and oil requirements
Delivery pack	Serial, drawings, parts list, installation and maintenance instructions

Acceptance limits

Temperature, vibration, noise, backlash and gear contact criteria are set for the unit and test method. Do not substitute a generic limit where the design or original manufacturer requires a specific procedure.

Packing and installation

Protect shaft and flange faces, preserve machined surfaces and specify oil-filled or drained delivery condition. Identify lifting points and mass on the released general arrangement. Commission with alignment and guards checked.

Rated performance is issued only after the supporting design, inspection and agreed verification have been completed for the exact gearbox.

Enquiry sheet references and issue control

Use this checklist to request a new gearbox, engineered replacement or repair quotation. Complete the duty and interface information before final model selection.

New unit enquiry	Repair or replacement enquiry
Driver power and input speed	Maker, model, serial and nameplate
Required output speed and torque	Existing ratio and input or output speeds
Hours, starts, shocks and reversals	Failure symptoms and operating history
Radial and axial loads with load point	Shaft, flange, base and envelope dimensions
Mounting position and shaft interfaces	Installed orientation and ancillary systems
Ambient conditions and cooling supply	Photographs, samples and original drawings
Quantity, inspection and delivery needs	Required scope, turnaround and test needs

Enquiry example: TORQMAX IG-BH | foot mounted | target ratio 30:1 | motor 30 kW at 1500 RPM | required output 50 RPM | shafts, loads and site conditions supplied. The family code and target ratio do not define a released size or capacity.

Technical references

SEW-EURODRIVE, Industrial gear units and complete drive systems:
<https://www.sew-eurodrive.co.za/products/industrial-gear-units/industrial-gear-units.html>. Selection concepts only; no SEW performance table is presented as an STT rating.

SKF, Remanufacturing bearings: <https://evolution.skf.com/us/remanufacturing-bearings/>. Component assessment reference only; no SKF service or certification is implied.

Contact and issue

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TORQMAX expanded issue 5 | 2 October 2026. Maintain the Word document as the editable master and the PDF as the matching customer issue. Model-specific capacities, dimensions, mass and supply availability require an approved unit data sheet and written quotation.