

STT ENGINEERING SOLUTIONS | TORQMAX



TORQMAX Fluid Couplings

Industrial selection and spare parts catalogue 2026

Hydrodynamic drive solutions for conveyors, crushers, mixers and other industrial machinery.

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Catalogue status

Draft B • 4 October 2026. This catalogue defines the proposed STT fluid coupling offering and enquiry process. It includes calculated drive torque references, configuration options and service components. STT model ratings, dimensions and availability require confirmation on an approved quotation and drawing.

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Product range and applications

A fluid coupling transfers energy between a driving impeller and a driven runner through circulating fluid. The wheels operate at different speeds under load. The coupling can moderate starting shocks and damp torsional vibration. It does not provide gearbox reduction or torque multiplication.

Proposed code	Configuration	Application focus
FC-CF	Constant fill shaft drive	General industrial starts
FC-DC	Constant fill with delay chamber	Conveyors and higher inertia starts
FC-PD	Pulley drive arrangement	Belt driven machinery
FC-CU	Custom engineered arrangement	Replacement and unusual interfaces

Codes are STT catalogue proposals, not released size designations. Delay chamber performance and pulley loads must be verified for each application. Variable fill speed control and diesel SAE arrangements require a separate engineering scope.

Where to use fluid couplings

Conveyors and bucket elevators need controlled acceleration and a review of loaded restart conditions. Crushers and mills need checks for breakaway torque, shock loading and jam protection. Mixers, fans and pumps need matching to the machine torque curve and operating speed.

What the selection must establish

The selected coupling must transmit running torque, accelerate the load within the permitted time, and dissipate heat through repeated starts. Starting performance depends on input speed, fluid fill, geometry and driven inertia. A motor power value alone cannot establish suitability.

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Coupling sizes and bore limits

Voith Type T dimensional benchmark for TORQMAX range development. All dimensions are in mm. These reference sizes are not released STT products and do not imply interchangeability.

Reference size	Outside D	Length L	Max bore d1	Max bore d2
154 T	190	143	32	28
206 T	248	183	42	42
274 T	328	202	70	55
366 T	427	276	90	65
422 T	470	320	100	80
487 T	556	352	120	90
562 T	634	385	130	110
650 T	740	469	140	120
750 T	846	529	150	135
866 T	978	610	160	150
1000 T	1118	651	180	160
1150 T	1295	715	180	180

Minimum bores

Minimum bores for d1 and d2 are not published in the cited dimensional table. Both remain subject to manufacturer confirmation or an STT hub design review for every size. Maximum bore values are separate limits for the two interfaces, not a minimum to maximum range.

Keep the manufacturer interface labels d1 and d2: their motor and driven side assignments depend on the assembly arrangement and must be checked on the order drawing. D and L are reference envelope dimensions; verify the complete assembly and guard space.

Source: Voith hydrodynamic couplings product overview, Type T dimension table, reviewed 4 October 2026. See technical references at the back of this catalogue.

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Delay chamber coupling sizes

Voith Type TV dimensional benchmark. All dimensions are in mm. These sizes provide a separate reference for the proposed FC-DC configuration; use the actual assembly drawing for selection.

Reference size	Outside D	Length L	Max bore d1	Max bore d2
274 TV	328	239	70	55
366 TV	424	303	90	65
422 TV	470	359	100	80
487 TV	556	403	120	90
562 TV	634	449	130	110
650 TV	740	536	140	120
750 TV	846	603	150	135
866 TV	978	682	160	150
1000 TV	1118	757	180	180
1150 TV	1295	880	180	180

Minimum bores for both interfaces require confirmation for every size. Do not infer them from a smaller coupling or from standard motor shaft dimensions.

How to use the size tables

First check both shaft interfaces and the available envelope. Then select against the manufacturer power and starting performance charts at the actual speed, fill and load duty. A dimensional match alone does not establish torque capacity, maximum RPM or thermal suitability.

The following motor torque table remains a calculation aid and has no one to one size mapping to these reference tables.

Type TV dimensions can differ from Type T at the same nominal size. Pulley drives, twin circuits and other configurations require their own dimensional tables.

Source: Voith hydrodynamic couplings product overview, Type TV dimension table, reviewed 4 October 2026.

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Motor power and calculated torque

The table gives motor shaft torque at two example speeds. These are calculated input torque values, not fluid coupling capacities or guaranteed output ratings.

Torque in Nm = $9550 \times \text{shaft power in kW} \div \text{shaft speed in rpm}$. Use actual motor nameplate speed and mechanical shaft power.

Motor kW	Torque at 1450 rpm Nm	Torque at 2900 rpm Nm
5.5	36.2	18.1
7.5	49.4	24.7
11	72.4	36.2
15	98.8	49.4
18.5	121.8	60.9
22	144.9	72.4
30	197.6	98.8
37	243.7	121.8
45	296.4	148.2
55	362.2	181.1
75	494.0	247.0
90	592.8	296.4
110	724.5	362.2
132	869.4	434.7
160	1053.8	526.9
200	1317.2	658.6
250	1646.6	823.3
315	2074.7	1037.3

Example: a 55 kW motor at 1450 rpm develops approximately 362.2 Nm at rated output. A proposed coupling must be checked against its torque versus slip curve and thermal duty; this value does not select a size.

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Slip output speed and thermal duty

Slip fraction $s = (\text{input rpm} - \text{output rpm}) \div \text{input rpm}$. Therefore $\text{output rpm} = \text{input rpm} \times (1 - s)$. Slip is required for hydrodynamic torque transmission.

Assumed slip	Output at 1450 rpm	Slip heat at 55 kW input
2%	1421 rpm	1.10 kW
3%	1406.5 rpm	1.65 kW
5%	1377.5 rpm	2.75 kW

These examples assume equal input and output torque and neglect bearing and windage losses. Approximate slip heat = input mechanical power $\times$ slip fraction. At 3% slip, output power is approximately 53.35 kW and torque remains approximately 362.2 Nm. These assumptions do not predict the slip of a TORQMAX product.

Starting and stall conditions

During a start, slip is much greater than during normal running. At stalled output, transmitted input energy becomes heat rather than useful output work. A fluid coupling must not be treated as an indefinitely slipping clutch.

Check absorbed start energy, permitted acceleration time, starts per hour, restart intervals, ambient temperature and ventilation. Determine transient heat from the torque and speed histories. Use a thermal model and test data to confirm the allowable duty.

Protection concept

Specify compatible thermal sensing and a motor trip strategy. Where the design uses fusible plugs, their temperature, position and fluid compatibility must be released for the actual assembly. Never substitute solid plugs for fusible protection. Provide a guard that accounts for rotating parts and possible hot fluid discharge.

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Internal components and spare parts

The following component schedule describes a conceptual constant fill assembly. It is a service identification guide; it is not a manufacturing bill of materials. Counts and part geometry depend on the released design.

Item	Component	Function or ordering detail
01	Driving impeller	Transfers motor energy to fluid
02	Driven runner	Receives fluid energy and drives load
03	Outer shell and cover	Contains fluid and closes working circuit
04	Input connection	Bore, key and retention per drawing
05	Output shaft or hub	Driven interface per drawing
06	Bearing set	Supports relative rotation; exact type required
07	Seal set	Shaft seals and static joint seals
08	Assembly fasteners	Specified grade, length and preload
09	Fill and drain fittings	Thread and sealing arrangement
10	Fusible protection plugs	Released temperature and configuration
11	Thermal sensing equipment	Optional sensor and trip interface
12	Delay chamber	FC-DC only; controlled fluid transfer
13	Flexible connection	If required for external shaft alignment
14	Pulley and retention	FC-PD only; radial load review

Proposed service kits

SK-SEAL: seal kit. SK-BRG: bearing kit. SK-PLUG: approved plug kit. SK-FAST: specified fastener kit. Each enquiry must include the model, serial number, drawing revision and photographs. Kit codes do not establish interchangeability with other brands.

Rotor or shell replacement requires inspection of the mating components, leak checks and balance verification. Internal clearance, fluid passages and rotor orientation must be retained as designed.

Dimensions engineering and release

Manufacturer benchmark dimensions are included on pages 3 and 4. No STT dimensional or maximum speed series has been verified for this catalogue. Record the following values on the approved size sheet before manufacture, supply or website publication as rated products.

Parameter	Required release information
Power and torque	Duty curve at stated speed and fill
Maximum rpm	Structural and overspeed validation
Input and output bores	Maximum bore, fit, keyway and retention
Envelope	Outside diameter, total length and shaft separation
Installation	Orientation, supports and guard clearances
Mass and inertia	Dry mass, fluid mass and rotor inertia
Operating fluid	Approved type, quantity and fill method
Temperature and starts	Limits, trip settings and duty cycle
Pulley arrangement	Diameter, belt forces and bearing life

Manufacturing development

Release rotor blade geometry and clearances using hydrodynamic analysis and prototype testing. Validate shell stresses, joints, centrifugal pressure and fatigue at operating and overspeed conditions. Specify materials, casting integrity, machining datums, inspection, bearing fits, seal finishes and corrosion protection on controlled drawings.

Qualify leak testing, balancing and assembled run tests. Develop measured torque versus slip curves at each operating fill and speed. Validate thermal performance during starts, repeated starts and protection events before publishing a rated product series.

Material choices

Rotor and shell materials must follow validated stress, temperature and casting requirements. Hub and shaft grades follow torsional and fatigue calculations. Seal materials depend on the approved fluid and temperature. General workshop material substitutions are not a release specification.

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Ordering service and technical references

Quotation enquiry

Send motor power and actual speed; driven equipment type; load torque and inertia; loaded or unloaded start; required acceleration time; starts per hour; shaft diameters, keys and lengths; distance between shaft ends; mounting orientation; ambient temperature; and available envelope.

For replacements, add maker, model, serial number, nameplate photographs, overall dimensions and the existing fluid and fill details. Matching outside dimensions does not confirm hydraulic performance or interchangeability.

Order code example

TORQMAX FC-DC | 55 kW | 1450 rpm | shaft drive | bores 60/65 mm | conveyor. This is an enquiry example only; final size, bore capability, fluid fill and protection remain subject to approved selection.

Installation and maintenance

Isolate the drive before work and allow hot parts to cool. Install to the approved drawing, verify alignment and shaft retention, fill only with the specified fluid and quantity, and fit the required guard. Commission with temperature, speed, leak and vibration checks.

Inspect for leaks, overheating, abnormal noise and loose connections. Investigate thermal trips before restarting. Maintenance intervals, tightening torques and oil changes must come from the released unit manual, rather than generic values.

Technical reference basis

Voith hydrodynamic couplings product overview: configuration concepts, delay chambers and thermal monitoring. <https://www.voith.com/corp-en/products-services/connection-components-couplings/hydrodynamic-couplings.html>

Voith installation and operating manual 3626 011000 Revision 11: fluid handling and thermal protection principles. https://www.voith.com/corp-en/3626-011000_en_Rev.11.pdf

References reviewed 4 October 2026. Voith product data are not STT product ratings. STT torque tables and slip examples are independently calculated from the stated equations; all TORQMAX codes are proposed.

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