

## FL-SP

Torsionally Stiff Flange Couplings



SIMPLY **POWERFUL.**





## D2C – Designed to Customer

The guiding principle of Designed to Customer is the recipe for success behind REICH. In addition to the catalogue products, we supply our customers with couplings developed to their specific requirements. The designs are mainly based on modular components to provide effective and efficient customer solutions. The special nature of our close cooperation with our partners ranges from; consulting, development, design, manufacture and integration to existing environments, to customer-specific production, logistics concepts and after-sales service - worldwide.

This customer-oriented concept applies to both standard products and production in small batch sizes.

The company policy at REICH embraces, first and foremost, principles such as customer satisfaction, flexibility, quality, prompt delivery and adaptability to the requirements of our customers.

REICH supplies not only a coupling, but a solution:

Designed to Customer – SIMPLY **POWERFUL**.





# FL-SP

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# FL-SP

## General Technical Description

### FL-SP

## Torsionally Stiff Flange Couplings

The flange coupling FL-SP has been developed especially for hydrostatic pump drives for the connection of internal combustion engines to hydraulic pumps.

Due to the torsionally stiff design critical resonances can be shifted into the range above the operating speed. This enables a sub critical operation of the drive without passing through detrimental torsional vibration amplitudes.

The hydrostatic drive applications often demand compact coupling design and axial pluggability. The FL-SP coupling is designed to meet these requirements.

The FL-SP coupling consists of a clamping hub and a plastic-steel composite flange, which are connected to each other as a plug-in connection. The hub ensures a backlash-free clamping connection on the pump shaft. The coupling flange is available in various SAE sizes.

As a supplementary service, REICH also offers numerous pump mounting plates through which the hydraulic pumps can be connected to the engine housings.

REICH can also develop optimized solutions for non-standard designs following the principle 'D2C-Designed to Customer'.



## FL-SP

Nominal torques up to 1200 Nm

## FL-SP

### Advantages and Uses

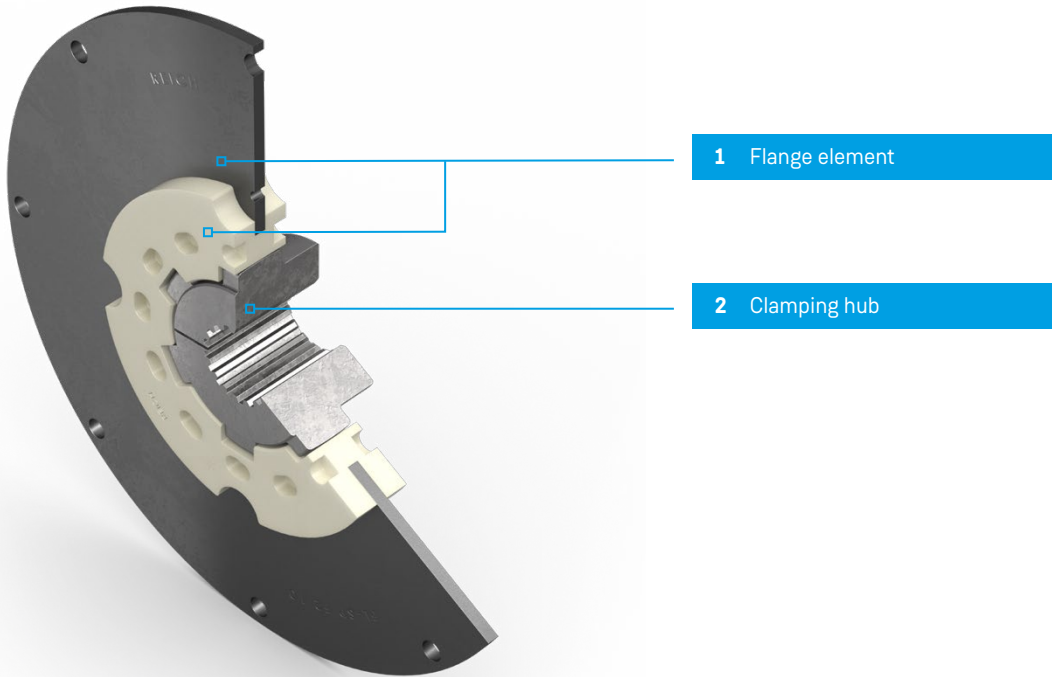
#### Key features and benefits of the FL-SP coupling

→ Sub critical operation through high torsional stiffness	→ Avoiding resonances and vibrations
→ High torque transmission capacity	→ Suitable for wide range of applications
→ Compact, robust and maintenance-free	→ Suitable for applications with limited installation space and long life time
→ Compensation of axial, radial and angular displacements	→ Little assembly effort, high operation reliability
→ Backlash-free shaft-hub connection	→ Prevents wearing of the pump shaft, ensures smoother operation, longer service life of components
→ Axial plug-in design	→ Fast installation and repair times resulting in high economic efficiency
→ Multiple spline options for the connection to the pump shaft / bore and keyway possible	→ Compatible with various pump connections
→ Ambient temperatures from -20°C to 100°C	→ Global use possible under toughest conditions
→ Pump mounting flanges for almost any installation situation	→ High variety of use

# FL-SP

## Technical Layout

### FL-SP layout and materials



### Material Overview

Part No.	Designation	Materials
1	Flange element	Steel / PA + GF
2	Clamping hub	Cast iron

### Technical Note

The technical data applies only to the complete coupling or the corresponding coupling elements. It is the customer's/user's responsibility to ensure there are no inadmissible loads acting on any of the components. In particular, existing connections, e.g. bolted connections, must be checked with regard to the torques to be transmitted. If necessary, further measures, such as additional reinforcement with pins, may be necessary.

It is the customer's/user's responsibility to make sure the dimensioning of the shaft and keyed or other connection, e.g. shrinking or clamping connection, is correct.

# FL-SP

## General Technical Data



### Standard Type

Coupling size	Nominal torque $T_{KN}$ [Nm]	Maximum torque $T_{K max}$ [Nm]	Flange size <sup>1)</sup> SAE J 620	Maximum speed $n_{max}$ [min <sup>-1</sup> ]	Max. shaft displacement		
					axial $\Delta K_a$ [mm]	radial $\Delta K_r$ [mm]	angular $\Delta K_w$ [°]
FL-SP 120	1 200	2 400	6.5	4 000	±2	±0.8	±1
			7.5				
			8				
			10	3 800			
			11.5				
			14				

<sup>1)</sup> Other flange dimensions on request

### Coupling and pump mounting plate

Coupling size	Flange version	SAE flywheel connection	Total length of coupling	with pump mounting plate	SAE engine housing connection	SAE pump housing connection	Length of pump mounting plate	2-hole or 4-hole flange
FL-SP 120	F2.	11.5.	38.	PTF	3 -	C.	15.	4

Designation: FL-SP 120 F2. 11.5. 38. PTF 3-C. 15. 4

### Bore

Tooth profile according to ANSI B92.1 or DIN 5480	Toothing size	Toothing number	Toothing length
ANSI B92.1	- 16/32 -	21	L=50
DIN 5480	N45x2x30x	21	L=50

<sup>i</sup> Other tooth profiles and finish bore with keyway on request


Designation: ANSI B92.1 - 16/32 - 21T or DIN 5480 N45x2x30x21

# FL-SP


## Selection of the Coupling Size

The selection of FL-SP coupling is based on drive torque. A general safety factor of  $S = 1.5$  to  $1.7$  should be applied.

**In selecting the coupling size the following should be satisfied:**

 The **nominal torque capacity of the coupling**  $T_{KN}$  shall be at least equal to the drive torque while taking the layout factors into account.

$$T_{KN} \geq T_{AN} \cdot S$$

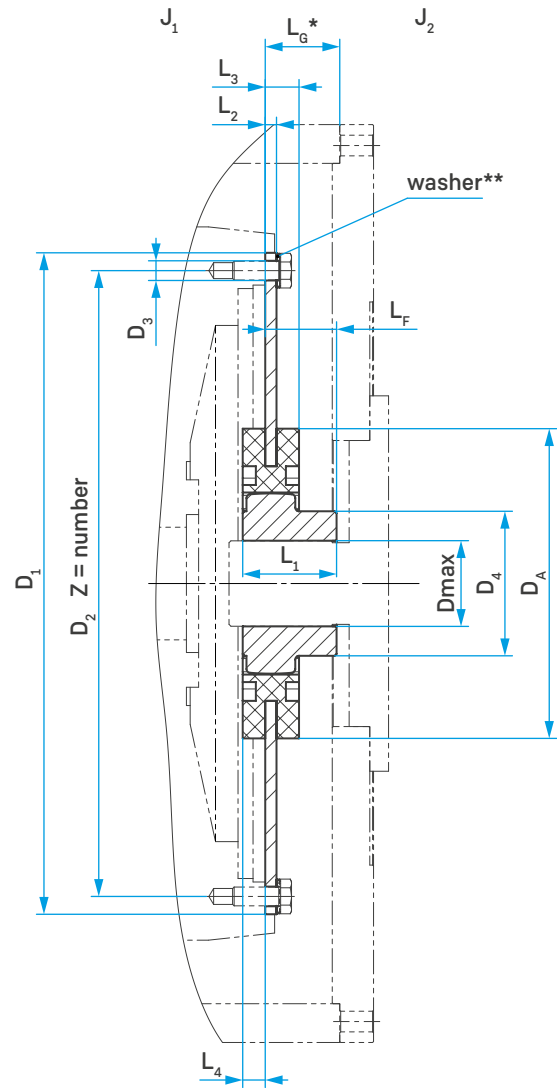
 Calculate the **driving torque**  $T_{AN}$

Given a driving power  $P_{AN}$  and a coupling speed  $n_{AN}$ , the driving torque is calculated as follows:

$$T_{AN} [\text{Nm}] = 9550 \frac{P_{AN} [\text{kW}]}{n_{AN} [\text{min}^{-1}]}$$

# FL-SP

Type FL-SP...F2.



**i** \* Acc. to customer specification

\*\* Flanges must be mounted with appropriate washers

## Coupling details

Coupling size	Flange connections <sup>1)</sup>					D max. [mm]	$D_A$ [mm]	$D_4$ [mm]	$L_1$ [mm]	$L_2$ [mm]	$L_3$ [mm]	$L_4$ [mm]	$L_F$ [mm]	$J_1$ outside [kgm <sup>2</sup> ]	$J_2$ inside [kgm <sup>2</sup> ]	Total mass [kg]
	SAE	$D_1$	$D_2$	$D_3$	Z											
	J 620	[mm]	[mm]	[mm]												
FL-SP 120	6.5	215.9	200.0	8.5	6	50.0	165.0	77.0	50.0	6.0	18.0	12.0	38.0	0.011	0.002	3.3
	7.5	241.3	222.3	8.5	8									0.016		3.7
	8	263.5	244.5	10.5	6									0.022		4.0
	10	314.3	295.3	10.5	8									0.045		4.2
	11.5	352.4	333.4	10.5	8									0.035		4.4
	14	466.7	438.2	13.0	8									0.085		7.0

**i** 1) Other flange dimensions on request

# FL-SP

## Pump Mounting Plate PTF

As a supplementary product to its FL-SP couplings, REICH offers matching pump mounting plates: By means of the pump mounting plates the pump housing is mounted to the engine flywheel housing. The power is transmitted from the engine flywheel via the FL-SP coupling to the pump shaft.

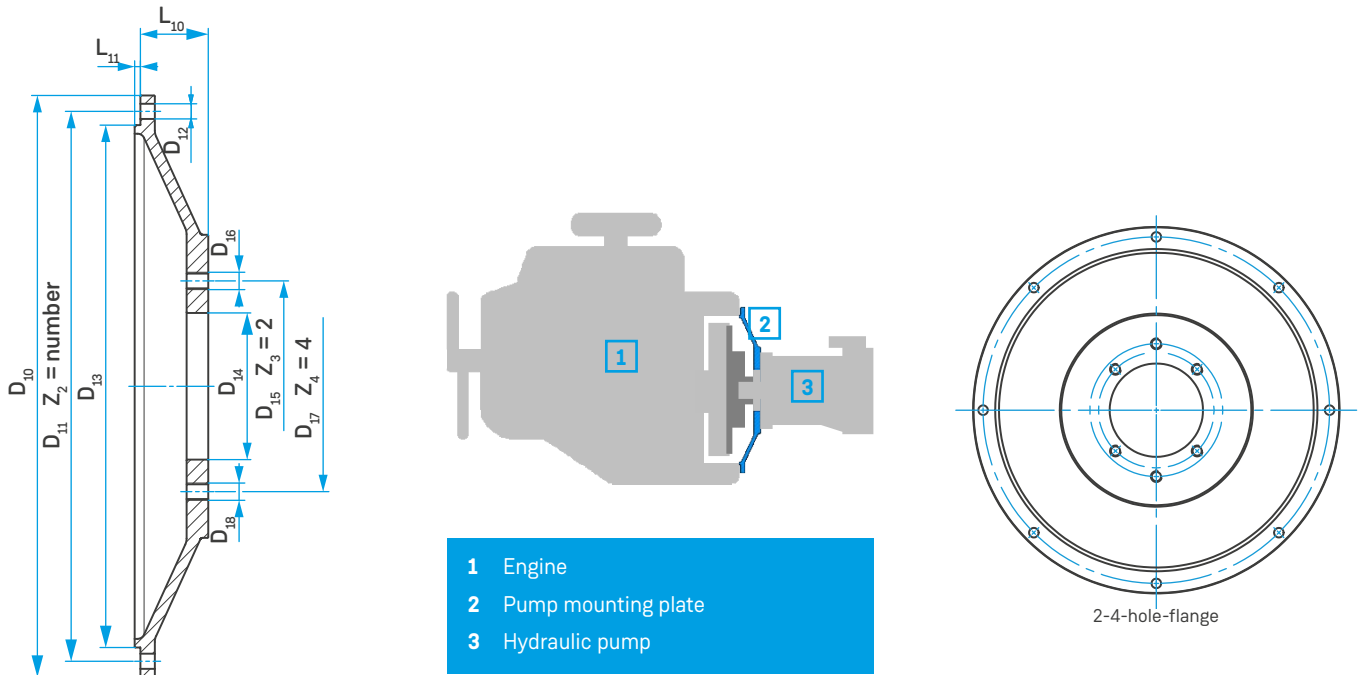


Fig. 1\*

\* Pump mounting plate/contour may differ

### Pump mounting plate details

Engine housing SAE J 617	Pump housing SAE J 744 2-4-hole	Engine side								Pump side				L <sub>10</sub> [mm]	L <sub>11</sub> [mm]
		D <sub>10</sub> [mm]	D <sub>11</sub> [mm]	Z <sub>2</sub>	D <sub>12</sub> [mm]	D <sub>13</sub> [mm]	D <sub>14</sub> [mm]	D <sub>15</sub> [mm]	Z <sub>3</sub>	D <sub>16</sub> [mm]	D <sub>17</sub> [mm]	Z <sub>4</sub>	D <sub>18</sub> [mm]		
5	A <sup>1)</sup>	356.0	333.4	8	11.0	314.3	82.55	106.4	2	Thread acc. to customer specs	-	-	Thread acc. to customer specs	Length acc. To application	4.0
	B						101.6	146.0	2		127.0	4			
4	A <sup>1)</sup>	404.0	381.0	12	11.0	362.0	82.55	106.4	2	Thread acc. to customer specs	-	-	Thread acc. to customer specs	Length acc. To application	4.0
	B						101.6	146.0	2		127.0	4			
	C						127.0	181.0	2		161.9	4			
3	B	451.0	428.6	12	11.0	409.6	101.6	146.0	2	Thread acc. to customer specs	127.0	4	Thread acc. to customer specs	Length acc. To application	4.0
	C						127.0	181.0	2		161.9	4			
	D						152.4	228.6	2		228.6	4			
	E						165.1	317.5	2		317.5	4			
	C						127.0	181.0	2		161.9	4			
2	D	489.0	466.7	12	11.0	447.7	152.4	228.6	2	Thread acc. to customer specs	228.6	4	Thread acc. to customer specs	Length acc. To application	5.0
	E						165.1	317.5	2		317.5	4			
	C						127.0	181.0	2		161.9	4			
1	D	552.0	530.2	12	12.0	511.2	152.4	228.6	2	Thread acc. to customer specs	228.6	4	Thread acc. to customer specs	Length acc. To application	5.0
	E						165.1	317.5	2		317.5	4			
	C						127.0	181.0	2		161.9	4			

1) Only 2-hole flange

The selection of both the pump mounting plate and the FL-SP coupling is subject to verification by REICH with regard to the existing mounting situation of the pump drive.

# FL-SP

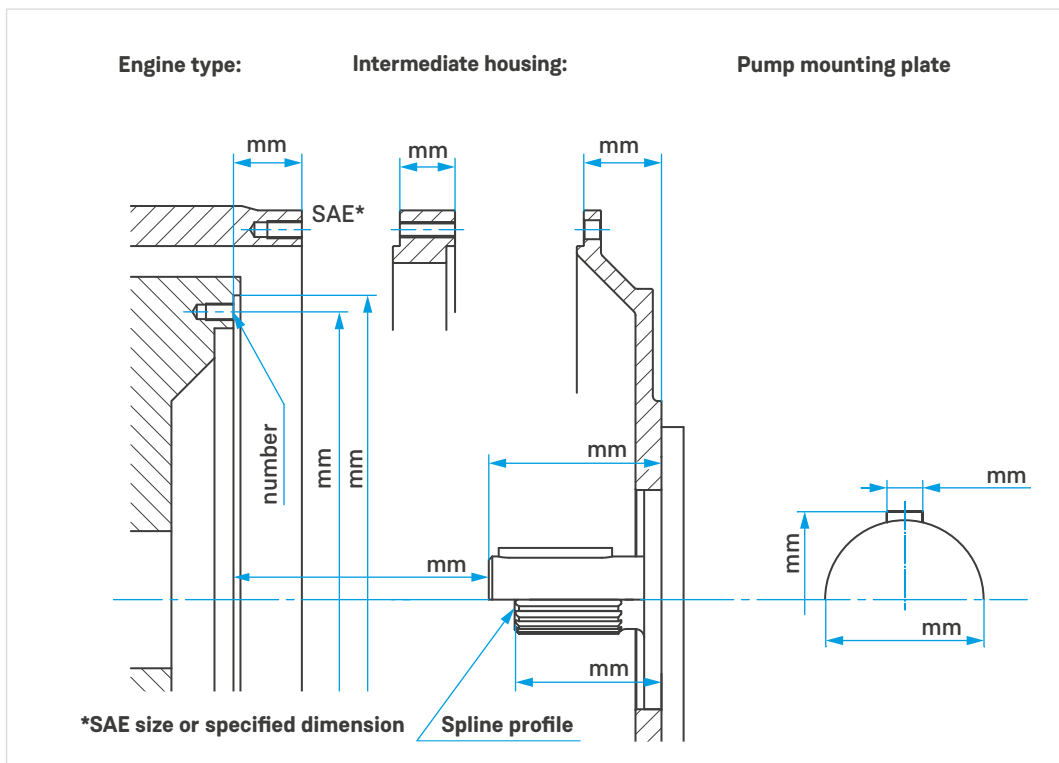
## Data Required for Coupling Size Selection

### Engine side:

1. Engine type: \_\_\_\_\_
2. Engine power: P \_\_\_\_\_ [kW]
3. Engine speed: n \_\_\_\_\_ [min<sup>-1</sup>]
4. In-line/V-engine: R/V \_\_\_\_\_ (angle)
5. Number of cylinders: \_\_\_\_\_
6. Total stroke volume:  $V_H$  \_\_\_\_\_ [ccm]
7. Moments of inertia (engine + flywheel): J \_\_\_\_\_ [kgm<sup>2</sup>]
8. Gas pressure diagram: \_\_\_\_\_
9. Vital information/rules for selecting the coupling size: \_\_\_\_\_
10. Drawing of engine flywheel and engine housing with position markings: \_\_\_\_\_

### Output side:

1. Application (generator, pump, compressor etc.): \_\_\_\_\_
2. Type: \_\_\_\_\_
3. Moments of inertia: J \_\_\_\_\_ [kgm<sup>2</sup>]
4. Shaft diameter: d \_\_\_\_\_ [mm]
5. Shaft length: l \_\_\_\_\_ [mm]
6. Drawing of the prime mover: \_\_\_\_\_














## FL-SP

SIMPLY **POWERFUL.** 

### Industrial solutions:

-  Power generation
-  Mobile applications
-  Test benches
-  Pumps & compressors
-  Industry
-  Ship & port engineering

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