Couplings
Overview

How to Select a Coupling

Operating Temperature (°C)	Temperature Correction Factor
-20~30	1.00
30~40	0.80
40~60	0.70
60~100	0.55

· Couplings are machine components designed to connect two separate rotating bodies and transmit a torque between them. They allow various misalignments (Lateral/Angular/Axial) of the rotating bodies to be absorbed, and alleviate installation and adjustment work loads. Furthermore, they protect expensive inter-connected machine components from sudden and unexpected excess loads by breaking and disconnecting. Please select appropriate coupling type from the provided chart based on your application specific needs.

· For applications with frequent direction reversals, choose a coupling with max. torque capacity 2 ~ 5 times of the motor's peak torque.
· For servo motor applications, choose a servo motor and calculate the compensation torque according to the formula below. Choose a coupling with max. torque capacity of the calculated compensation torque.
(Formula) Compensation Torque = Motor's Peak Torque x Compensation Factor * For Compensation Factor, please see products page.
· Compensation factor is for reference when using couplings with servo motors in general. Please use the values as reference.
· Ensure that the specification parameters such as Allowable Torque, Max. Rotational Speed and Dimensions listed in this catalog are properly applicable to your application.
· Resin spacer couplings such as Oldham and Jaw Types have allowable torque values that vary depending on operation temperatures.
Select couplings by multiplying couplings Allowable Torque, Max. Rotational Speed, etc by Temperature Compensation Factor in the right hand table.

Precautions for Use

· Make sure to keep misalignment within the allowable range and avoid excessive torque. Otherwise the coupling's service life will be shortened considerably due to plastic deformation.
· For your safety, enclose the revolving parts of equipment with a protective cover.
· If the coupling item generates abnormal metallic noises, immediately turn off the equipment and identify the cause, because such noises may be an indication of improper alignment, shaft interference or a loose screw.
· For applications with a large load fluctuation, apply an adhesive agent on the coupling's screws to prevent them from loosening, alternatively select 1 size larger couplings.

Disc Couplings Zero Backlash, and Best Suited for High Torque Servo Motor Applications

· **Feature** · Designed to absorb misalignments by disc flexures.
· Zero backlash nature provides high angular accuracy, suitable for applications requiring high positioning accuracies.
· High Rigidity Type have largely improved torsional rigidity over the Standard Types due to screw-coupled discs instead of the swage-coupled discs of the Standard Type.
* Products in red frame are servo motor compatible couplings.

Page	P.943	P.946	P.946, 948	P.947~950	P.944	P.945	P.945	P.951, 952	P.953, 954
Type	SCXW SCXWK SCPW SCPS	CPSWS_ CPSW_ CPSHS_ CPSH_	CPAWS CPAWN CPAHS CPAHN	CPSW_CPSW_ CPSH_CPSH_	MCSLC_ _ MCSSC_ _	CPDW CPDT	CPDD CPDS	MCGL_ MCGS_ MCGLC_ MCGSC_	MCKL_ MCKS_ MCKLC_ MCKSC_
Shaft Bore Dia. (mm)	3~25	10~16	10~35	15~45	4~24	4~25	6~25	2~25	2~25
Torque (N · m)	1~25	8	6~40	60~250	0.9~16	0.7~9.0	2~10	0.15~7.0	0.25~11.0
External Appearance	High Rigidity For Servo Motors	High Rigidity For Servo Motors	High Rigidity For Servo Motors	High Rigidity For Servo Motors	For Servo Motors	For Servo Motors			
Zero Backlash	○	○	○	○	○	○	○	○	○
High Torsional Rigidity	◎	◎	◎	◎	○	△	△	×	○
High Torque	◎	○	○	◎	○	△	△	△	○
Allowable Angular Misalignment Double	○	△	△	△	◎	○	◎	◎	◎
Allowable Angular Misalignment Single	○	△	△	△	△	△	△	◎	△
Allowable Lateral Misalignment Double	○	△	△	△	△	△	△	○	○
Allowable Lateral Misalignment Single	×	×	×	×	×	×	×	△	△
Moment of Inertia	○	△	○	△	○	○	◎	○	○
Electrical Insulation	×	×	×	×	×	×	×	○	×

Oldham Couplings Easy to Install with Large Angular/Lateral Misalignment Allowances

· **Feature** · The spacers are designed to flex and slide to allow misalignments.
· Larger misalignment allowance ranges compared to the other types, making for easy to adjust for installing.
· The High Rigidity Type has bronze spacer material instead of resin, and has torque capacity 2x of the conventional type.
· The Space Saving Type are up to 17% shorter in length, contributing to space saving machine deigns.

Page	P.955, 957	P.956, 958	P.959	P.960	P.961	P.962	P.962
Type	MCO_ _ MCOC_ _	MCOG_ _ MCOCG_ _	MFJ_ _ MFJC_ _	MFJG_ _ MFJCG_ _	SCOC	CPO CPOC	CPOCG
Shaft Bore Dia. (mm)	1~20	4~20	14~38	15~35	3~10	3~16	3~14
Torque (N · m)	0.3~28	3~50	26~80	50~160	0.3~1.6	0.7~9	0.2~2.8
External Appearance		High Rigidity		High Rigidity	Space Saving Design		
Zero Backlash	*△	×	×	×	*△	×	×
High Torsional Rigidity	△	◎	△	◎	×	×	×
High Torque	◎	◎	○	◎	△	△	△
Allowable Angular Misalignment	◎	◎	◎	△	◎	◎	◎
Allowable Lateral Misalignment	◎	◎	◎	○	◎	◎	◎
Moment of Inertia	○	○	○	△	◎	◎	◎
Electrical Insulation	×	×	○	×	○	○	○

* If used with the lateral misalignment less than 0.1mm, the backlash amount will practically be zero.

Slit Couplings Integrated Structure with No Backlash

· **Feature** · Slits are designed to allow misalignments.
· Because backlash is 0, it is suitable for applications where rotation accuracy is required.
· Please consider the Disc Types if higher torque transmission capability is needed.
* Products in red frame are servo motor compatible couplings.

Page	P.968	P.969, 970	P.969, 970	P.969, 970	P.969, 970
Type	CPSX CPCX	CPL CPLCN	CPLS CPLSC	CPS CPSCN	CPSS CPSSC
Shaft Bore Dia. (mm)	5~16	2~18	2~18	2~14	2~14
Torque (N · m)	0.5~3	0.1~8	0.2~8	0.1~4	0.2~3.5
External Appearance	For Servo Motors				
Zero Backlash	○	○	○	○	○
High Torsional Rigidity	△	×	×	△	△
High Torque	△	△	△	△	△
Allowable Angular Misalignment	×	◎	◎	△	△
Allowable Lateral Misalignment	△	△	△	×	×
Moment of Inertia	◎	◎	◎	◎	○
Electrical Insulation	×	×	×	×	×

Couplings (Others)

Series	Jaw			Sleeved	N Coupling	Chain Coupling	Rigid		Bellows	Resin
Page	P.964	P.965, 966	P.967	P.967	P.964	P.964	P.971	P.972	P.973	P.974
Type	MMJ_ _	CPJ CPJ_ _	CPJL	CPF	CPN	CPC	CPR CPRC CPRS CPRSC	CPSR CPND CPSRS CPNDS	CPB CPBC CPBS CPBSC	MCJN MCJSN
Shaft Bore Dia. (mm)	15~40	3~16	5~28	3~14	6~35	14~55	3~24	5~14	3~14	1.5~12
Torque (N · m)	20~180	0.7~17	0.3~13.1	0.5~3	7.8~206	-	0.3~6	0.3~2	0.3~3	0.05~0.8
External Appearance										
Zero Backlash	△	×	×	×	○	×	○		○	○
High Torsional Rigidity	△	×	×	×	◎	△	◎		×	×
High Torque	○	○	×	△	◎	○	×		△	×
Allowable Angular Misalignment	◎	△	△	◎	×	△	×		◎	◎
Allowable Lateral Misalignment	○	△	○	△	×	△	×		△	△
Moment of Inertia	○	◎	△	○	◎	×	◎		○	◎
Electrical Insulation	○	○	○	○	×	×	×		×	○

Alignment Adjustment

Couplings are designed to transmit angular motion and torque while being able to absorb some misalignments. However, if the allowable maximum values are exceeded, the coupling's service life may dramatically be reduced, or result in vibrations. Coupling alignment procedures must always be performed.

· Misalignments are: Angular Misalignment (Fig. 1); Lateral Misalignment (Fig. 2); and Axial Misalignment (Fig. 3). Be sure to adjust the shaft alignment using tools such as dial indicators etc. to meet the tolerances shown in the dimensions and performance table.
· The allowable misalignment values shown in the specification chart assume that only one of: Lateral; Angular; or Axial Misalignment is occurring at a given time.
When multiple misalignments are occurring simultaneously, the allowable maximum value of each will be reduced to 1/2.
· It is recommended that each misalignment is to be kept below 1/3 of the allowed maximum value in order to prolong the service life of couplings.

Fig. 1 Declination (Angular Misalignment)
(Angle Error between Two Shaft Centers)

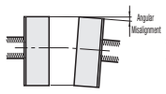


Fig. 2 Eccentricity (Lateral Misalignment)
(Parallelism Error between Two Shaft Centers)

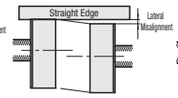
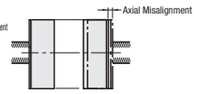


Fig. 3 End Play (Axial Misalignment)
(Shaft's Shift in the Axial Direction)



Simple Method to Confirm the Alignment of Disc Type Coupling

[Before Installing]
· Confirm that the clamping screws are loosened, and wipe clean the inner bore and shaft surfaces off dust and oils.
· Insert the shaft into the coupling while taking care not to apply excessive compressive/tensile forces on the disc section.
[Quick Lateral Misalignment Check]
· With all the locking screws loose, slide the coupling axially over both shafts (Fig. 4) to ensure smooth sliding movements.
If not smooth, perform the lateral alignment procedure again.
[Quick Angular Misalignment Check]
· Rotate the coupling/shaft (Fig. 5) and visually check for smooth and even movement.
If not smooth, perform the lateral alignment procedure again.
[Final Assembly]
· With a torque wrench, tighten the screws on both the motor and driven shafts to the recommended torques.
[Validation]
· Check for tightening torques after approximately 30min. of continuous operation to account for any initial self-loosening of the screws.

Fig. 4 Quick Lateral Misalignment Check

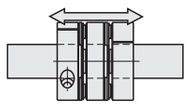


Fig. 5 Quick Angular Misalignment Check