

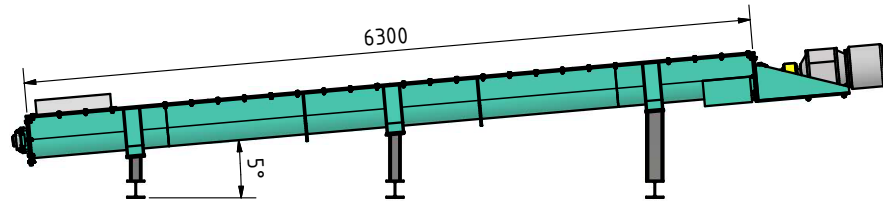
LAMPIRAN

Pembuatan Screw Conveyor

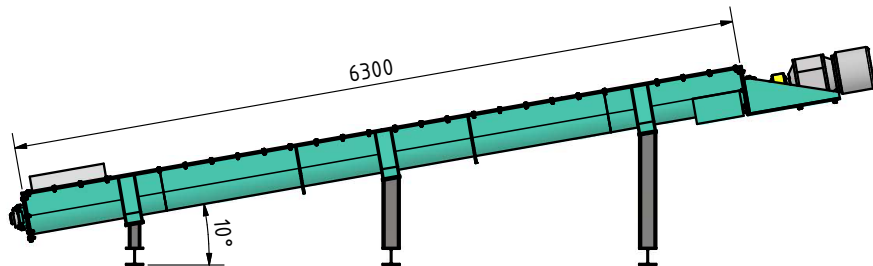


Jenis bentalan	Beban putar pd cincin dalam	Beban putar pada cincin luar	Beban putar		Beban putar		ϵ	Beban putar		Beban putar pada cincin dalam	
			Baris tunggal	Baris ganda	Baris tunggal	Baris ganda		Baris tunggal	Baris ganda		
Bentalan bola dalam	1	1,2	$F_0/VE > \epsilon$	$F_0/VE \leq \epsilon$	$F_0/VE > \epsilon$	$F_0/VE \leq \epsilon$		X_0	Y_0	X_0	Y_0
			X	Y	X	Y					
			2,30	1,90	2,30	1,90	0,19				
			1,71	1,71	1,71	1,71	0,26				
			1,55	1,45	1,55	1,45	0,28				
Bentalan bola dalam	1	1,2	0,56	1	0,56	1		0,6	0,5	0,6	0,5
			1,55	1,45	1,55	1,45	0,30				
			1,31	1,31	1,31	1,31	0,34				
			1,15	1,15	1,15	1,15	0,38				
			1,04	1,04	1,04	1,04	0,42				
Bentalan bola sudut	1	1,2	1,00		1,00		0,44				
			0,43	1,00	0,70	1,63	0,57		0,42		0,84
			0,41	0,87	0,67	1,41	0,68		0,38		0,76
			0,39	0,76	0,63	1,24	0,80		0,5	1	0,66
			0,37	0,66	0,60	1,07	0,95		0,29		0,58
Bentalan bola sudut	1	1,2	0,35	0,57	0,57	0,93	1,14		0,26		0,52
			1,09	0,70	1,09	0,70	0,57		0,42		0,84
			0,92	0,67	0,92	0,67	0,68		0,38		0,76
			0,78	0,63	0,78	0,63	0,80		0,5	1	0,66
			0,66	0,60	0,66	0,60	0,95		0,29		0,58

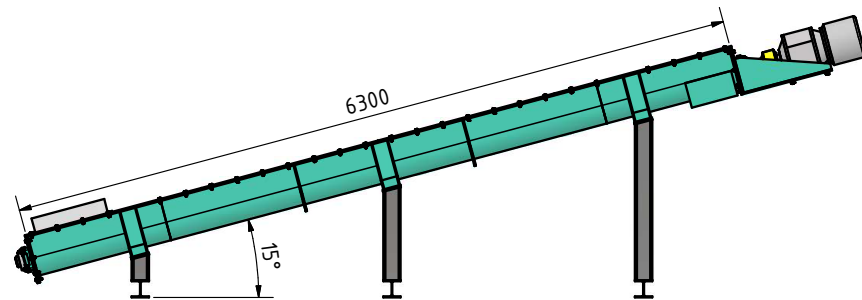
Untuk bentalan baris tunggal, bila $F_0/VE \leq \epsilon$, $X = 1$, $Y = 0$



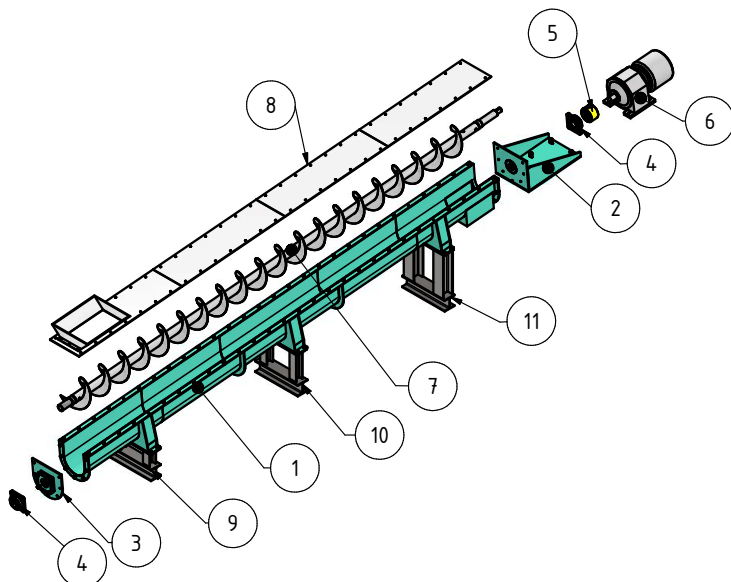
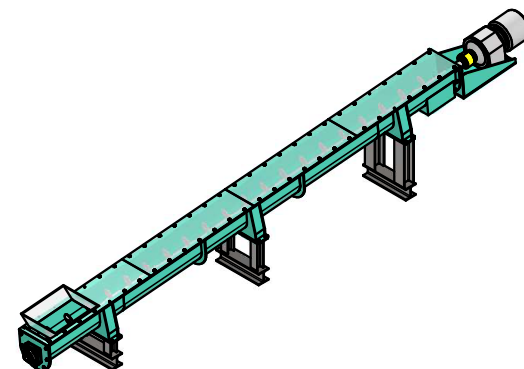
Screw Conveyor untuk Variasi I (5°)



Screw Conveyor untuk Variasi II (10°)

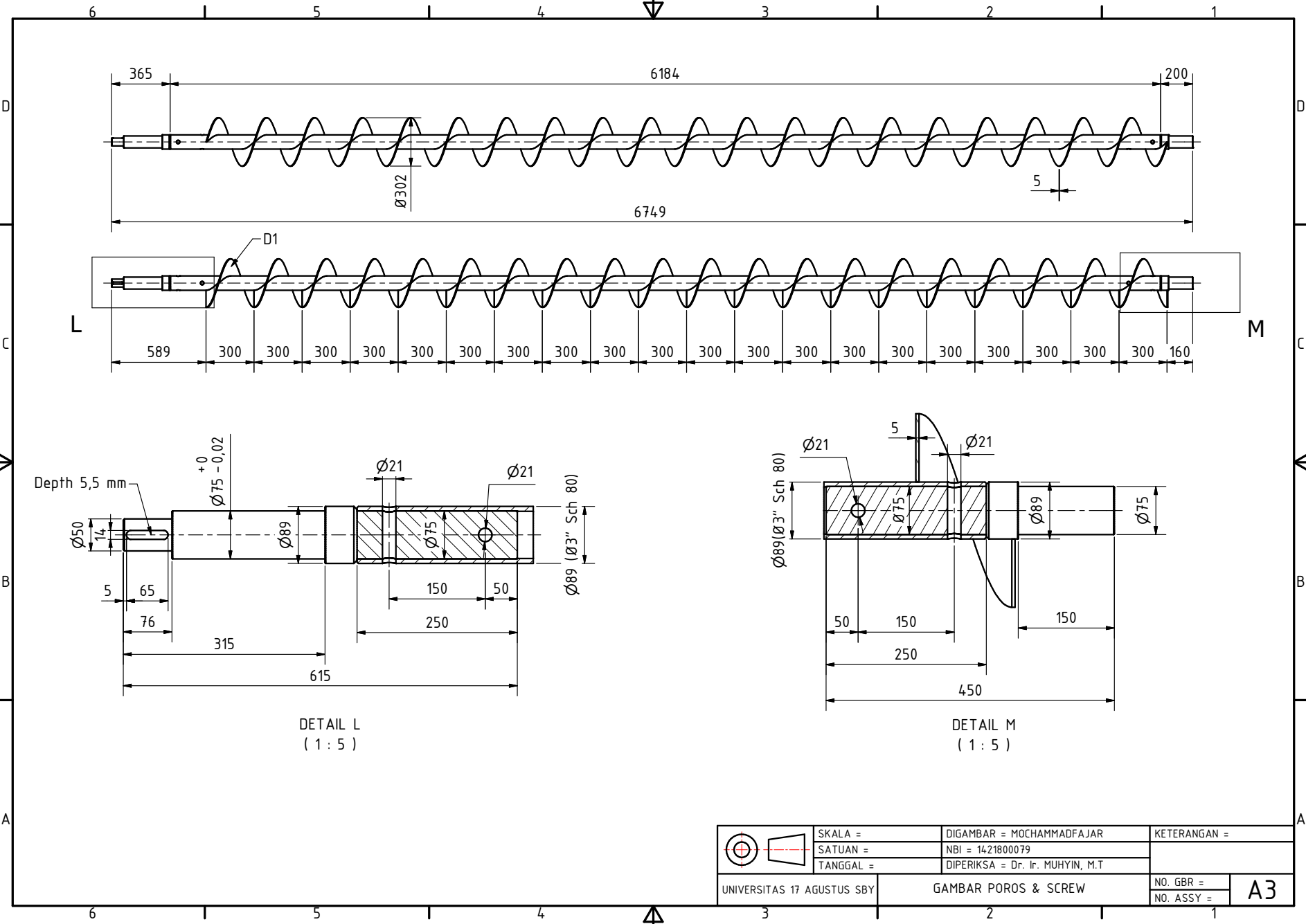


Screw Conveyor untuk Variasi III (15°)



11	Penyangga Depan		1	
10	Penyangga Tengah		1	
9	Penyangga Belakang		1	
8	Tutup Atas		1	
7	Screw dan Poros		1	
6	Motor dan Gearbox		1	
5	Kopling		1	
4	Bantalan		2	
3	Tutup Samping		1	
2	Penyangga Motor		1	
1	Bodi Screw Conveyor		1	
ITEM	PART NAME	MATERIAL	QTY	NO. GAMBAR

	SKALA =	DIGAMBAR = MOHAMMADFAJAR	KETERANGAN =
	SATUAN =	NBI = 1421800079	
	TANGGAL =	DIPERIKSA = Dr. Ir. MUHYIN, M.T	
UNIVERSITAS 17 AGUSTUS SBY	GAMBAR ASSEMBLY SCREW CONVEYOR		NO. GBR = NO. ASSY =
			A3



DETAIL L
(1 : 5)

DETAIL M
(1 : 5)

	SKALA =	DIGAMBAR = MOCHAMMADFAJAR	KETERANGAN =
	SATUAN =	NBI = 1421800079	
	TANGGAL =	DIPERIKSA = Dr. Ir. MUHYIN, M.T	
UNIVERSITAS 17 AGUSTUS SBY	GAMBAR POROS & SCREW		NO. GBR =
			NO. ASSY =
			A3

Attached Table 2. Dimensions and Mass of Carbon Steel Pipes for High Temperature Service

Nominal dia.		Outside dia. mm	Nominal wall thickness																					
			Schedule 10		Schedule 20		Schedule 30		Schedule 40		Schedule 60		Schedule 80		Schedule 100		Schedule 120		Schedule 140		Schedule 160			
A	B		Wall thick mm	Unit mass kg/m	Wall thick mm	Unit mass kg/m	Wall thick mm	Unit mass kg/m	Wall thick mm	Unit mass kg/m	Wall thick mm	Unit mass kg/m	Wall thick mm	Unit mass kg/m	Wall thick mm	Unit mass kg/m	Wall thick mm	Unit mass kg/m	Wall thick mm	Unit mass kg/m	Wall thick mm	Unit mass kg/m	Wall thick mm	Unit mass kg/m
6	1/8	10.5	-	-	-	-	-	-	-	1.7	0.369	-	-	2.4	0.479	-	-	-	-	-	-	-	-	-
8	1/4	13.8	-	-	-	-	-	-	-	2.2	0.629	-	-	3.0	0.799	-	-	-	-	-	-	-	-	-
10	3/8	17.3	-	-	-	-	-	-	-	2.3	0.851	-	-	3.2	1.11	-	-	-	-	-	-	-	-	-
15	1/2	21.7	-	-	-	-	-	-	-	2.8	1.31	-	-	3.7	1.64	-	-	-	-	-	-	-	4.7	1.97
20	3/4	27.2	-	-	-	-	-	-	-	2.9	1.74	-	-	3.9	2.24	-	-	-	-	-	-	-	5.5	2.94
25	1	34.0	-	-	-	-	-	-	-	3.4	2.57	-	-	4.5	3.27	-	-	-	-	-	-	-	6.4	4.36
32	1 1/4	42.7	-	-	-	-	-	-	-	3.6	3.47	-	-	4.9	4.57	-	-	-	-	-	-	-	6.4	5.73
40	1 1/2	48.6	-	-	-	-	-	-	-	3.7	4.10	-	-	5.1	5.47	-	-	-	-	-	-	-	7.1	7.27
50	2	60.5	-	-	-	-	-	-	-	3.9	5.44	-	-	5.5	7.46	-	-	-	-	-	-	-	8.7	11.1
65	2 1/2	76.3	-	-	-	-	-	-	-	5.2	9.12	-	-	7.0	12.0	-	-	-	-	-	-	-	9.5	15.6
80	3	89.1	-	-	-	-	-	-	-	5.5	11.3	-	-	7.6	15.3	-	-	-	-	-	-	-	11.1	21.4
90	3 1/2	101.6	-	-	-	-	-	-	-	5.7	13.5	-	-	8.1	18.7	-	-	-	-	-	-	-	12.7	27.8
100	4	114.3	-	-	-	-	-	-	-	6.0	16.0	-	-	8.6	22.4	-	-	11.1	28.2	-	-	-	13.5	33.6
125	5	139.8	-	-	-	-	-	-	-	6.6	21.7	-	-	9.5	30.5	-	-	12.7	39.8	-	-	-	15.9	48.6
150	6	165.2	-	-	-	-	-	-	-	7.1	27.7	-	-	11.0	41.8	-	-	14.3	53.2	-	-	-	18.2	66.0
200	8	216.3	-	-	6.4	33.1	7.0	36.1	8.2	42.1	10.3	52.3	12.7	63.8	15.1	74.9	18.2	88.9	20.6	99.4	23.0	110		
250	10	267.4	-	-	6.4	41.2	7.8	49.9	9.3	59.2	12.7	79.8	15.1	93.9	18.2	112	21.4	130	25.4	152	28.6	168		

Kilowatt Ratings Table

Note: Be sure to follow the procedure on page 6 for the selection of couplings.

Unit: kW

Model no.	Max. bore dia. (mm)	Max. allowable transmission torque at below 50 r/min. (N·m)	Speed of rotation (r/min.)												
			1	5	10	25	50	100	200	300	400	500	600	800	
CR 3812	16	99.9	0.01	0.05	0.11	0.26	0.52	0.79	1.21	1.58	1.89	2.26	2.58	3.19	
CR 4012	22	217	0.02	0.11	0.22	0.58	1.15	1.73	2.63	3.46	4.15	4.96	5.67	7.01	
CR 4014	28	295	0.03	0.16	0.32	0.79	1.58	2.36	3.59	4.72	5.66	6.77	7.72	9.56	
CR 4016	32	386	0.04	0.21	0.41	1.03	2.06	3.09	4.69	6.17	7.41	8.85	10.1	12.5	
CR 5014	35	562	0.06	0.30	0.60	1.50	3.00	4.48	6.80	8.95	10.7	12.8	14.7	18.1	
CR 5016	40	735	0.08	0.39	0.78	1.95	3.91	5.86	8.92	11.7	14.1	16.8	19.2	23.8	
CR 5018	45	931	0.10	0.50	0.99	2.48	4.95	7.43	11.3	14.9	17.8	21.3	24.4	30.1	
CR 6018	56	1750	0.18	0.93	1.87	4.67	9.33	14.0	21.3	28.0	33.6	40.1	45.9	56.8	
CR 6022	71	2370	0.25	1.25	2.51	6.31	12.5	18.8	28.6	37.7	45.3	54.1	61.9	76.5	
CR 8018	80	3880	0.41	2.07	4.14	10.3	20.7	31.0	47.2	62.1	74.5	89.0	101	126	
CR 8022	100	5580	0.59	2.96	5.93	14.8	29.6	44.5	67.2	89.0	106	127	146	180	
CR10020	110	8780	0.93	4.66	9.33	23.3	46.6	70.0	106	140	168	200	229	283	
CR12018	125	13200	1.40	7.02	14.0	35.1	70.2	105	160	210	252	302	345	426	
CR12022	140	17100	1.81	9.07	18.1	45.3	90.7	136	206	272	326	390	446	551	
CR16018	160	28600	3.03	15.1	30.3	75.8	151	227	345	455	546	652	746	922	
CR16022	200	41700	4.43	22.1	44.3	110	221	333	506	665	799	954	1090	1350	
CR20018	205	57000	6.06	30.3	60.6	151	303	454	691	909	1090	1300	1490	1840	
CR20022	260	71900	7.63	38.2	76.3	191	382	572	871	1140	1370	1640	1880		
CR24022	310	129000	13.7	68.8	137	344	688	1030	1570	2060	2470	2960	3380		
CR24026	380	157000	16.7	83.7	167	418	837	1250	1900	2510	3010	3600			
CR32022	430	255000	27.2	136	272	680	1360	2040	2850	4080	4900				
CR40020	470	494000	52.6	263	526	1310	2630	3940	5990	7890	9470				
CR40024	590	602000	64.0	320	640	1600	3200	4800	7300	9600					
CR40028	700	717000	76.2	380	762	1900	3800	5700	8690	11400					
Lubrication type			I	II		III									

Unit: kW

Model no.	Max. bore dia. (mm)	Max. allowable transmission torque at below 50 r/min. (N·m)	Speed of rotation (r/min.)											
			1000	1200	1500	1800	2000	2500	3000	3600	4000	4800	5200	6000
CR 3812	16	99.9	3.88	4.41	5.35	6.25	6.73	8.12	9.44	11.0	12.0	14.0	14.8	16.7
CR 4012	22	217	8.53	9.68	11.6	13.7	14.8	17.9	20.7	24.1	26.3	30.8		
CR 4014	28	295	11.64	13.21	15.8	18.7	20.2	24.4	28.3	32.9	35.9	42.1		
CR 4016	32	386	15.3	17.3	21.0	24.4	26.3	31.9	37.0	43.0	46.9	54.9		
CR 5014	35	562	22.1	25.1	30.0	35.4	38.3	46.2	53.6	62.4				
CR 5016	40	735	28.9	32.9	39.9	46.4	50.0	60.6	70.4	81.6				
CR 5018	45	931	36.6	41.6	50.5	58.8	63.4	76.8	89.2					
CR 6018	56	1750	69.1	78.4	95.2	111	120	145						
CR 6022	71	2370	93.1	105	128	149	161	195						
CR 8018	80	3880	153	174	211	246	265							
CR 8022	100	5580	219	249	302	352	379							
CR10020	110	8780	345	392	476	554								
CR12018	125	13200	519	590	716									
CR12022	140	17100	671	762										
CR16018	160	28600	1122											
CR16022	200	41700	1640											
CR20018	205	57000												
CR20022	260	71900												
CR24022	310	129000												
CR24026	380	157000												
CR32022	430	255000												
CR40020	470	494000												
CR40024	590	602000												
CR40028	700	717000												
Lubrication type			Lubrication System I : Apply grease regularly on a monthly basis. Lubrication System II : Apply grease regularly on a weekly basis, or mount the casing filled with grease. Lubrication System III : Mount the casing filled with grease. Refer to page 8 for lubrication method.											

Selection

1. Operating Conditions Required for Selection

- (1) Daily operating hours
- (2) Load characteristics and type of motor
- (3) Transmission power (kW) and rotation speed (r/min) or torque (N·m)
- (4) Outer diameters of both shafts

2. Selection Method

- (1) Obtain the service factor from the table of service factors on the right-hand side according to the operating conditions.
- (2) Multiply the transmission power (or torque) by the service factor and obtain the correction transmission power (or correction transmission torque).
- (3) Select from the kilowatt ratings table a coupling that satisfy the corrected transmission power (or correction transmission torque) at the operating rotation speed.
- (4) If the required shaft diameter exceeds the maximum shaft diameter of the coupling selected, adopt a coupling a size larger.
- (5) The contact surface pressure may become excessive if a standard key is used. Calculate the contact surface pressure of the key and consider the necessity of using a special key or spline.
- (6) If the coupling is directly connected to the motor, select the coupling from the following table of recommended models for direct motor connection.

Table of Service Factors (SF)

Load Characteristics	Source of Power		
	Motor Turbine	Steam engine Gasoline engine (4 cylinders)	Diesel engine Gas engine
Low fluctuation, low impact, low starting torque, and no reverse rotation	1.0	1.5	2.0
Middle fluctuation, middle impact, and no reverse rotation (standard load)	1.5	2.0	2.5
High fluctuation, high impact, reverse rotation, and loaded starting	2.0	2.5	3.0

Note1. An increase according to the operating hour of the chain coupling (provided that the rotation speed is 50 r/min. or more).

8 to 16 hours/day: 0.5
16 hours or more/day: 1.0

2. The above table shows rough service factor standards. Decide on the service factor according to the operating conditions.

Reference: Relationship between torque, transmission, and rotation speed

$$T = \frac{60000 \times P}{2\pi \times n} \quad \left\{ T = \frac{974 \times P}{n} \right\}$$

T : Torque N · m
P : Transmission power kW
n : Rotation speed r/min

3. Recommended Coupling Models for Direct Motor Connection

Motor Output kW	Motor shaft dia. mm	Model no.
0.1 0.2	11	CR3812
0.4	14	CR3812
0.75	19	CR4012
1.5	24	CR4014
2.2 3.7	28	CR4014

Note: The above motor is of 4-pole type with a totally enclosed external fan.

Motor capacity kW	Motor shaft dia. mm	Model no.
5.5 7.5	38	CR5016
11 15	42	CR5018
22	48	CR6018
30	55	CR6018
37 45	60	CR6022

4. Backlash

Model no.	CR3812	CR4012	CR4014	CR4016	CR5014	CR5016	CR5018	CR6018	CR6022
Backlash (Angle°)	±1.02	±1.06	±0.90	±0.79	±0.86	±0.75	±0.66	±0.62	±0.51

Model no.	CR8018	CR8022	CR10020	CR12018	CR12022	CR16018	CR16022	CR20018	CR20022
Backlash (Angle°)	±0.58	±0.47	±0.50	±0.42	±0.34	±0.31	±0.26	±0.33	±0.27

Note: The above figures are calculated value and not guaranteed. Consult your TSUBAKI representative for the backlash angles of other models.

5. Operating Ambient Temperature

− 10°C ~ 60°C

If the operating ambient temperature range is other than the above, refer to page 190 for information on special applications.

UCF 215



Square flanged ball bearing unit with set screw locking, cast iron housing, JIS

These square flanged ball bearing units are compliant with Japanese Industrial Standards (JIS). They consist of an insert bearing, with an extended inner ring and set screw locking, and are suitable for applications where the direction of rotation is constant or alternating. The bearing is mounted in a cast iron housing, which can be bolted to a machine wall or frame. Ball bearing units can accommodate moderate initial misalignment, but normally do not permit axial displacement.

- Resist high levels of contamination
- Designed for high temperatures and speeds
- Accommodate relatively heavy loads
- Cost-effective

Overview

Dimensions

Bearing width, total	77.8 mm
Centre distance between bolt holes	159 mm
Housing overall width	56.5 mm
Shaft diameter	75 mm

Performance

Basic dynamic load rating	66.3 kN
Basic static load rating	49 kN
Limiting speed	2 100 r/min

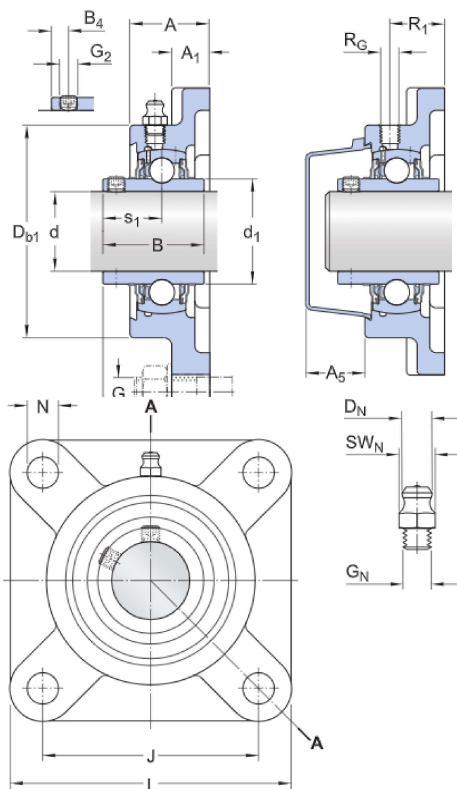
Properties

Bore type	Cylindrical
Coating	Without
Fastening bolt hole type	Plain
Flanged housing type	Square
Housing type	Flanged
Lubricant	Grease
Material, bearing	Bearing steel
Material, housing	Cast iron
Number of bolt holes for fasteners	4
Relubrication hole	With
Relubrication nipple	With
Retaining feature, inner ring	Set screws
Rubber seating ring	Without

Technical Specification

Compliance with standard	JIS
Purpose specific	For material handling applications
Material, housing	Cast iron
Sealing, bearing	Seal and flinger on both sides
Sealing type, bearing	Contact, standard
Sealing, unit	Optional end cover
Coating	Without

Dimensions



d	75 mm	Bore diameter
d ₁	≈ 91.5 mm	Outer diameter inner ring
A	56.5 mm	Overall width
A ₁	22 mm	Flange width
A ₅	41.5 mm	Standout of end cover
B	77.8 mm	Width of inner ring
B ₄	11 mm	Distance from locking device side face to thread centre
D _{b1}	165 mm	Top external diameter
J	159 mm	Distance between attachment bolts
L	200 mm	Overall length
N	19 mm	Diameter of attachment bolt hole
s ₁	44.5 mm	Distance from locking device side face to raceway centre
T	78.3 mm	Overall unit width

Grease fitting

D_f 6.589 mm	Diameter of head sphere of grease fitting
S_V 11.11 mm	Hexagonal key size for the grease fitting
G_f 1/8-27 NPT	Thread of grease fitting

Threaded hole

R_C 1/8-27 NPT	Housing thread for grease fitting
R_1 39 mm	Axial position of the housing thread

Calculation data

Basic dynamic load rating	C	66.3 kN
Basic static load rating	C_0	49 kN
Fatigue load limit	P_u	2.04 kN
Limiting speed		2 100 r/min
with shaft tolerance h6		

Mass

Mass bearing unit	6.2 kg
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Mounting information

Set screw	G_2	M12x1.5
Hexagonal key size for set screw		6.08 mm
Recommended tightening torque for set screw		28.5 Nm
Recommended diameter for attachment bolts, mm	G	16 mm
Recommended diameter for attachment bolts, inch	G	0.625 in

Included products

Housing	F 215/Y
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