



ANEXOS

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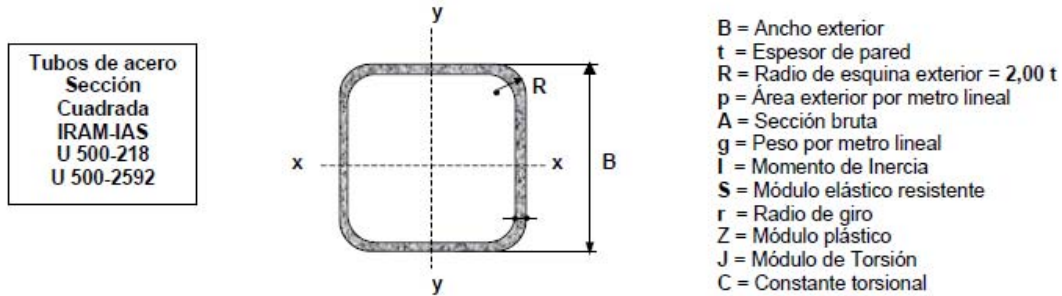
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TABLAS

A.1: Tablas de características de tuberías cuadradas de acero (Chasis)



B	t	p	Ag	g	lx=ly	Sx=Sy	rx=ry	Zx=Zy	J	C
[mm]	[mm]	[m ² /m]	[cm ²]	[Kg/m]	[cm ⁴]	[cm ³]	[cm]	[cm ³]	[cm ⁴]	[cm ³]
40	1.25	0.156	1.897	1.489	4.694	2.347	1.573	2.737	7.244	3.746
	1.60	0.155	2.392	1.877	5.791	2.895	1.556	3.412	8.999	4.703
	2.00	0.153	2.937	2.306	6.935	3.468	1.537	4.136	10.857	5.745
	2.50	0.151	3.589	2.817	8.209	4.104	1.512	4.971	12.958	6.971
50	1.60	0.195	3.032	2.380	11.698	4.679	1.964	5.462	18.064	7.480
	2.00	0.193	3.737	2.934	14.137	5.655	1.945	6.664	21.970	9.185
	2.50	0.191	4.589	3.602	16.931	6.773	1.921	8.078	26.507	11.221
	3.20	0.189	5.727	4.495	20.387	8.155	1.887	9.895	32.211	13.891
60	1.60	0.23	3.67	2.88	20.67	6.89	2.37	7.99	31.78	10.90
	2.00	0.23	4.54	3.56	25.13	8.38	2.35	9.79	38.84	13.43
	2.50	0.23	5.59	4.39	30.32	10.11	2.33	11.93	47.18	16.47
	3.20	0.23	7.01	5.50	36.91	12.30	2.30	14.74	57.92	20.52
	4.00	0.23	8.55	6.71	43.52	14.51	2.26	17.66	68.87	24.84
80	2.00	0.31	6.14	4.82	61.67	15.42	3.17	17.85	94.67	24.31
	2.50	0.31	7.59	5.96	75.10	18.78	3.15	21.90	115.90	29.97
	3.20	0.31	9.57	7.51	92.65	23.16	3.11	27.30	143.98	37.62
	4.00	0.31	11.75	9.22	110.96	27.74	3.07	33.09	173.72	45.96
	4.76	0.30	13.74	10.79	126.70	31.67	3.04	38.22	199.62	53.48
90	2.50	0.35	8.59	6.74	108.50	24.11	3.55	28.01	166.95	38.22
	3.20	0.35	10.85	8.51	134.42	29.87	3.52	35.02	208.17	48.09
	4.00	0.35	13.35	10.48	161.80	35.96	3.48	42.60	252.30	58.92
	4.76	0.34	15.65	12.28	185.67	41.26	3.44	49.39	291.27	68.75
	6.35	0.34	20.21	15.86	229.17	50.93	3.37	62.30	363.45	87.88
100	3.20	0.39	12.13	9.52	187.17	37.43	3.93	43.70	289.03	59.84
	4.00	0.39	14.95	11.73	226.20	45.24	3.89	53.31	351.52	73.48
	4.76	0.38	17.55	13.78	260.58	52.12	3.85	61.98	407.25	85.94

A.2: Catalogo y Tablas de Anillos Seeger (Eje Excéntrico)

Rulemanas de Mayo		ANILLOS SEEGER PARA EJES					DIN 471		
		Anillos de Retención							
Med.Nom.	ANILLO						RANURA		
d1	s h l1	d3	Tolerancia d3	a R	b R	d5 Min.	d2	Tolerancia d2	m Min.
3	0,4	2,7	+0,04 -0,15	1,9	0,8	1,0	2,8	-0,04	0,50
4		3,7		2,2	0,9		3,8		
5	0,6	4,7	+0,06 -0,18	2,5	1,1	1,2	4,8	-0,06	0,70
6	0,7	5,6		2,7	1,3		5,7		
7	0,8	6,5	+0,10 -0,36	3,1	1,4	1,7	6,7	-0,11	0,90
8		7,4		3,2	1,5		7,6		
9	1,0	8,4	+0,13 -0,42	3,3	1,8	2,0	8,6	-0,21	1,10
10		9,3		3,4	2,0		9,6		
11	1,2	10,2	+0,21 -0,42	3,5	2,1	2,5	10,5	-0,25	1,30
12		11,0		3,6	2,2		11,5		
13	1,5	11,9	+0,25 -0,50	3,7	2,2	2,5	12,4	-0,25	1,60
14		12,9		3,8	2,3		13,4		
15	1,75	13,8	+0,25 -0,50	3,9	2,4	2,5	14,3	-0,25	1,85
16		14,7		4,0	2,6		15,2		
17	1,75	15,7	+0,25 -0,50	4,1	2,7	2,5	16,2	-0,25	1,85
18		16,5		4,2	2,8		17,0		
19	1,75	17,5	+0,25 -0,50	4,3	2,9	2,5	18,0	-0,25	1,85
20		18,5		4,4	3,0		19,0		
21	1,75	19,5	+0,25 -0,50	4,5	3,1	2,5	20,0	-0,25	1,85
22		20,5		4,6	3,1		21,0		
23	1,75	21,5	+0,25 -0,50	4,7	3,2	2,5	22,0	-0,25	1,85
24		22,2		4,8	3,3		22,9		
25	1,75	23,2	+0,25 -0,50	5,0	3,4	2,5	23,9	-0,25	1,85
26		24,2		5,2	3,6		24,9		
27	1,75	24,9	+0,25 -0,50	5,4	3,8	2,5	25,6	-0,25	1,85
28		25,9		5,6	3,9		26,6		
29	1,75	26,9	+0,25 -0,50	5,7	4,1	2,5	27,6	-0,25	1,85
30		27,9		5,8	4,2		28,6		
31	1,75	28,6	+0,25 -0,50	5,7	4,1	2,5	29,3	-0,25	1,85
32		29,6		5,8	4,2		30,3		
33	1,75	30,5	+0,25 -0,50	5,7	4,1	2,5	31,3	-0,25	1,85
34		31,5		5,8	4,2		32,3		
35	1,75	32,2	+0,25 -0,50	5,7	4,1	2,5	33,0	-0,25	1,85
36		33,2		5,8	4,2		34,0		
37	1,75	34,2	+0,25 -0,50	5,7	4,1	2,5	35,0	-0,25	1,85
38		35,2		5,8	4,2		36,0		

A.3: Catalogo y Tablas de Chavetas para ejes



DIMENSIONES CHAVETEROS Y CHAVETAS

Según DIN – 6885/1 – 6886 – 6887



Chaveta paralela S/DIN-6885/1



Chaveta de cufia S/DIN-6886



Chaveta de cufia con cabeza S/DIN-6887

Ø Eje d (mm) desde-hasta	Medidas chaveta b x h mm	Medidas del chavetero en el oubo				Medidas del chavetero en el eje para chavetas paralelas y de cufia		Medidas de los ejes en el oubo de la rueda	
		Chaveta paralela S/DIN 6885/1		Chaveta de cufia S/DIN 6886 y 6887		t ₁ m/m	Tol. admisible (en altura) m/m	Ø m/m desde-hasta	Tol. H-7 m/m
		d + t ₁ m/m	Tol. Admisible (en altura) m/m	d + t ₁ m/m	Tol. admisible (en altura) m/m				
17-22	6x6	d+2,6	+0,1	d+2,1	-0,1	3,5	+0,2	10-18	+0,018 0
22-30	6x7	d+3,0	+0,2	d+2,4	+0,2	4,1		30-50	+0,025 0
30-38	10x8	d+3,4		d+2,8		4,7		50-80	+0,030 0
38-44	12x8	d+3,2		d+2,8		4,9		80-120	+0,035 0
44-50	14x9	d+3,6		d+2,9		5,5		120-180	+0,040 0
50-58	16x10	d+3,9		d+3,2		6,2		180-250	+0,046 0
58-65	18x11	d+4,3		d+3,5		6,8		250-315	+0,052 0
65-75	20x12	d+4,7		d+3,9		7,4		315-400	+0,057 0
75-85	22x14	d+5,6		d+4,8		8,5		400-500	+0,063 0
85-95	25x14	d+5,4		d+4,8		8,7			
95-110	28x16	d+6,2		d+5,4		9,9			
110-130	32x18	d+7,1	d+6,1	11,1					
130-150	36x20	d+7,9	d+6,9	12,3					
150-170	40x22	d+8,7	d+7,7	13,5					
170-200	45x25	d+9,9	d+8,9	15,3					
200-230	51x28	d+11,2	d+10,1	17					
230-260	56x32	d+12,9	d+11,8	19,3					
260-290	63x32	d+12,6	+0,3	d+11,5	+0,3	19,6			

Zonas de tolerancia en el ancho de los chaveteros

TIPO DE AJUSTE	Chavetero Eje	Chavetero Rueda
A Presión	P9	P9
Ligero	N9	J9
Deslizante	H8	D10

La chaveta deberá dimensionarse de manera que pueda transmitir el mismo par de torsión que el eje correspondiente. Por ello, la longitud de la chaveta deberá ser como mínimo igual a 1,5 veces el diámetro del eje.

A.4: Tablas de Selección de Cadenas Renold BS/ISO

**RELACION DE REDUCCION DE LA TRANSMISION
UTILIZANDO LOS PIÑONES SELECCIONADOS**

TABLA 1

	No de dientes del Piñón Conducido Z_2		No de dientes del Piñón Motriz Z_1			
	15	17	19	21	23	25
25	-	-	-	-	-	1.00
38	2.53	2.23	2.00	1.80	1.65	1.52
57	3.80	3.35	3.00	2.71	2.48	2.28
76	5.07	4.47	4.00	3.62	3.30	3.04
95	6.33	5.59	5.00	4.52	4.13	3.80
114	7.60	6.70	6.00	5.43	4.96	4.56

CHART 2

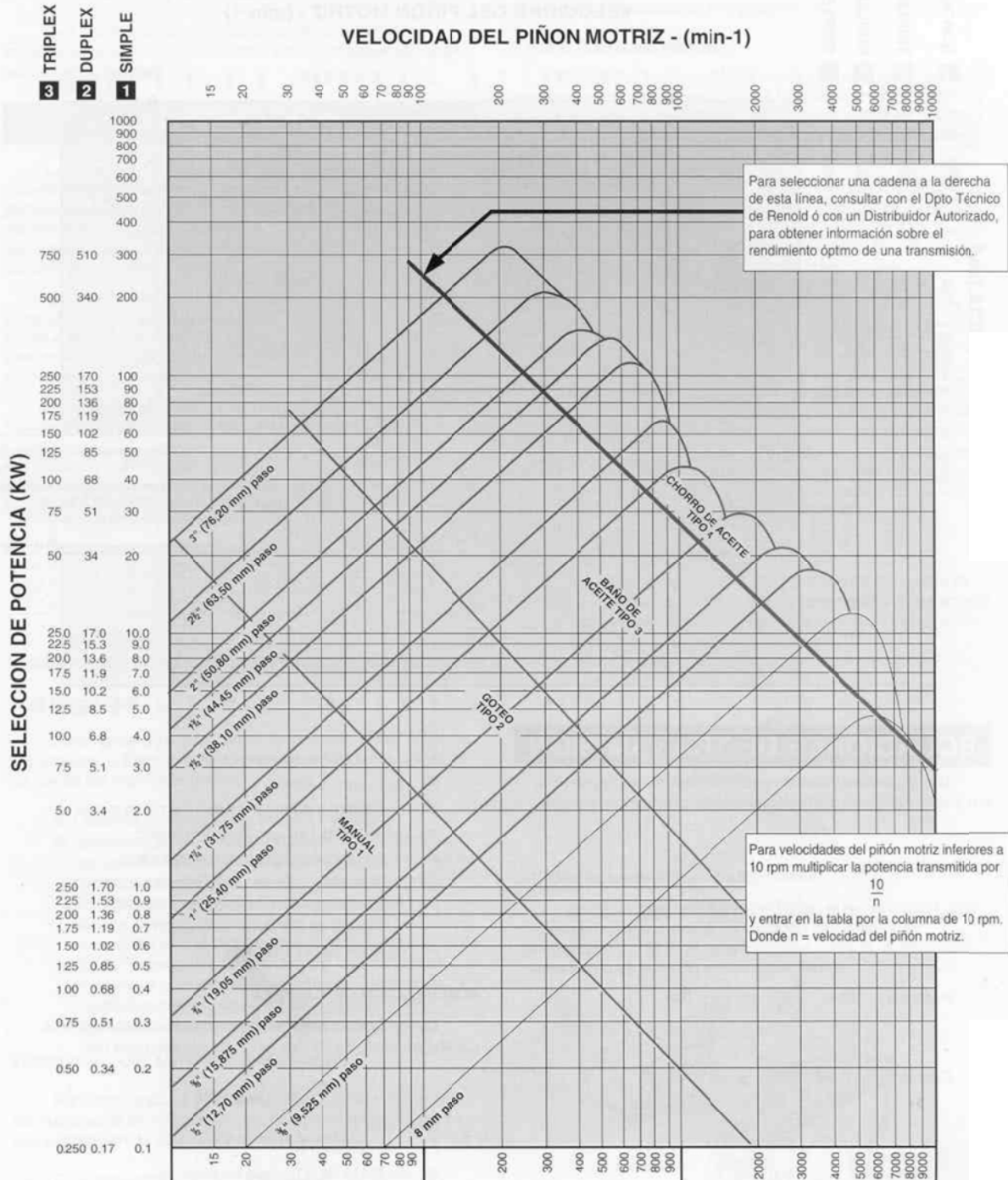
CARACTERISTICAS DE LA MAQUINA A MOVER		CARACTERISTICAS DEL PROPULSOR		
		FUNCIONAMIENTO SUAVE Motores eléctricos, Turbinas a vapor y gas, Motores de explosión con acoplamiento hidráulico	LIGERAMENTE IMPULSIVO Motores de explosión de 6 o más cilindros con acoplamiento mecánico, Motores eléctricos con arrancadas frecuentes	MEDIANAMENTE IMPULSIVO Motores de explosión de menos de 6 cilindros con acoplamiento mecánico
FUNCIONAMIENTO SUAVE	Bombas centrífugas y Compresores, Máquinas de Imprenta, Calandras de papel Cintas transportadoras con cargas uniformes, Escaleras, Agitadores de líquidos y Mezcladores, Secadores rotativos, Ventiladores.	1	1.1	1.3
MEDIANAMENTE IMPULSIVA	Bombas y compresores (3 cil+) Hormigoneras, Cintas transportadoras con cargas no uniformes, Agitadores y Mezcladores de sólidos.	1.4	1.5	1.7
ALTAMENTE IMPULSIVA	Aplanadoras, Excavadoras, Molinos de bolas, Molinos mezcladores de caucho, Prensas y Cizallas, Bombas y Compresores de 1 & 2 cil.	1.8	1.9	2.1

Factores f_2 para piñones de medidas standard

Z_1	f_2
15	1.27
17	1.12
19	1.00
21	0.91
23	0.83
25	0.76

TABLA DE SELECCION BS/ISO

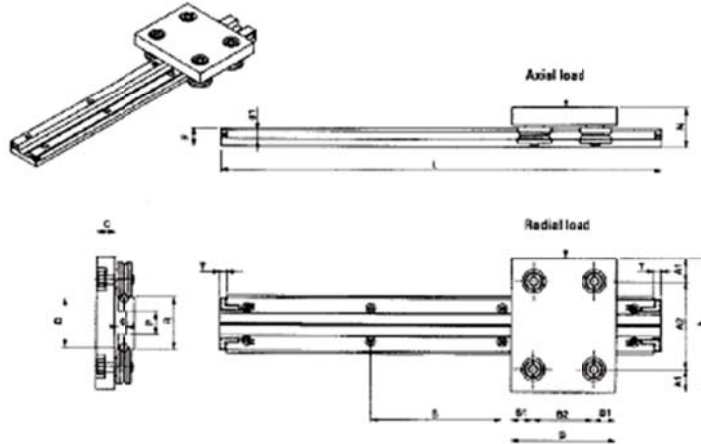
CADENAS DE TRANSMISION NORMAS EUROPEAS - Tabla de Selección utilizando piñón motriz de 19 dientes



1 Kilowatt = 1.34 hp.

A.5: Catalogo y Tablas del sistema de guía lineal (Sistema de Avance)

Linear Slide System - Type AD - with Steel or Aluminium Carriage Plate



Dimensions (in mm)

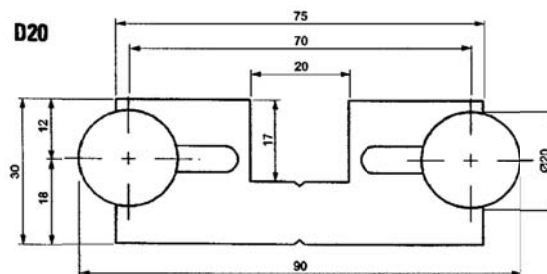
fig. 1

Type	A	A ₁	A ₂	B	B ₁	B ₂	C	D	F	L (max.)	d ₁	N	P	O	R	S	T
AD106	120	18.5	83	80	19.5	41	10	54	20	6000	10	30.5	25	11	58	150	7.5
AD208	140	25.0	90	120	25.0	70	15	54	20	6000	10	37.0	25	11	58	150	7.5
AD208R	140	25.0	90	120	25.0	70	20	54	20	6000	10	42.0	25	11	58	150	7.5
AD210	150	26.0	98	120	25.0	70	20	54	20	6000	10	44.0	25	11	58	150	7.5
AD312	180	27.0	126	150	30.0	90	20	70	30	6000	20	51.0	20	17	75	300	5.0
AD316	180	27.0	126	150	30.0	90	25	70	30	6000	20	61.5	20	17	75	300	5.0
AD416	200	30.0	140	180	40.0	100	25	70	30	6000	20	61.5	20	17	75	300	5.0
AD416R	200	30.0	140	180	40.0	100	25	70	30	6000	20	61.5	20	17	75	300	5.0
AD420	200	30.0	140	180	40.0	100	25	70	30	6000	20	61.5	20	17	75	300	5.0

Component Parts & System Load

Type	Part Numbers		Wheels	Load N	
	Guide + length	Carriage*		Axial	Radial
AD106	D10_	M106_	C106+ E106	800	400
AD208	D10_	M208_	C208 + E208	1600	2000
AD208R	D10_	M208R_	C208R + E208R	2400	2600
AD210	D10_	M210_	C210 + E210	2400	2600
AD312	D20_	M312_	C312 + E312	3200	3200
AD316	D20_	M316_	C316 + E316	6400	7000
AD416	D20_	M416_	C416 + E416	6400	7000
AD416R	D20_	M416R_	C416R + E416R	17200	8600
AD420	D20_	M420_	C416 + E416	20000	31400

* A = aluminium S = steel



A.6: Catalogo Servomotores Yaskawa Serie Sigma

Ratings and Specifications

Time Rating: Continuous
Vibration Class: V15
Insulation Resistance: 500 VDC, 10 MΩ min.
Ambient Temperature: 0 to 40°C
Excitation: Permanent magnet
Mounting: Flange-mounted
Thermal Class: B

Withstand Voltage: 1500 VAC for one minute
Enclosure: Totally enclosed, self-cooled, IP65
(except for shaft opening)
Ambient Humidity: 20% to 80% (no condensation)
Drive Method: Direct drive
Rotation Direction: Counterclockwise (CCW) with forward run
reference when viewed from the load side

Voltage		200 V						
Servomotor Model: SGMJV-□□□□		A5A	01A	C2A	02A	04A	06A	08A
Rated Output ¹	W	50	100	150	200	400	600	750
Rated Torque ^{1,2}	N·m	0.159	0.318	0.477	0.637	1.27	1.91	2.39
Instantaneous Peak Torque ¹	N·m	0.557	1.11	1.67	2.23	4.46	6.69	8.36
Rated Current ¹	A _{rms}	0.61	0.84	1.6	1.6	2.7	4.2	4.7
Instantaneous Max. Current ¹	A _{rms}	2.1	2.9	5.7	5.8	9.3	14.9	16.9
Rated Speed ¹	min ⁻¹	3000						
Max. Speed ¹	min ⁻¹	6000						
Torque Constant	N·m/A _{rms}	0.285	0.413	0.327	0.435	0.512	0.505	0.544
Rotor Moment of Inertia	×10 ⁻⁴ kg·m ²	0.0414 (0.0561)	0.0665 (0.0812)	0.0883 (0.103)	0.259 (0.323)	0.442 (0.506)	0.667 (0.744)	1.57 (1.74)
Rated Power Rate ¹	kW/s	6.11	15.2	25.8	15.7	36.5	54.7	36.3
Rated Angular Acceleration ¹	rad/s ²	38400	47800	54100	24600	28800	28600	15200
Applicable SERVOPACK	SGDV-□□□□	R70□	R90□	1R6A,2R1F	1R6A,2R1F	2R8□	5R5A	5R5A

*1: These items and torque-motor speed characteristics quoted in combination with an SGDV SERVOPACK are at an armature winding temperature of 100°C. Other values quoted are at 20°C.

*2: Rated torques are continuous allowable torque values at 40°C with an aluminum heat sink of the following dimensions attached.
SGMJV-A5A, -01A: 200 mm×200 mm×6 mm
SGMJV-02A, -04A, -08A: 250 mm×250 mm×6 mm
Note: The values in parentheses are for servomotors with holding brakes.

Ratings and Specifications

Time Rating: Continuous
Vibration Class: V15
Insulation Resistance: 500 VDC, 10 MΩ min.
Ambient Temperature: 0 to 40°C
Excitation: Permanent magnet
Mounting: Flange-mounted
Thermal Class: B

Withstand Voltage: 1500 VAC for one minute
Enclosure: Totally enclosed, self-cooled, IP65
(except for shaft opening)
Ambient Humidity: 20% to 80% (no condensation)
Drive Method: Direct drive
Rotation Direction: Counterclockwise (CCW) with forward run
reference when viewed from the load side

Voltage		200 V							
Servomotor Model: SGMJV-□□□□		A5A	01A	C2A	02A	04A	06A	08A	10A
Rated Output ¹	W	50	100	150	200	400	550	750	1000
Rated Torque ^{1,2}	N·m	0.159	0.318	0.477	0.637	1.27	1.75	2.39	3.18
Instantaneous Peak Torque ¹	N·m	0.477	0.955	1.43	1.91	3.82	5.25	7.16	9.55
Rated Current ¹	A _{rms}	0.66	0.91	1.3	1.5	2.6	3.8	5.3	7.4
Instantaneous Max. Current ¹	A _{rms}	2.1	2.8	4.2	5.3	8.5	12.2	16.6	23.9
Rated Speed ¹	min ⁻¹	3000							
Max. Speed ¹	min ⁻¹	6000							
Torque Constant	N·m/A _{rms}	0.265	0.375	0.381	0.450	0.539	0.496	0.487	0.467
Rotor Moment of Inertia	×10 ⁻⁴ kg·m ²	0.0242 (0.0389)	0.0380 (0.0527)	0.0531 (0.0678)	0.116 (0.180)	0.190 (0.254)	0.326 (0.403)	0.769 (0.940)	1.20 (1.41)
Rated Power Rate ¹	kW/s	10.4	26.6	42.8	35.0	84.9	93.9	74.1	84.3
Rated Angular Acceleration ¹	rad/s ²	65800	83800	89900	54900	67000	53700	31000	26500
Applicable SERVOPACK	SGDV-□□□□	R70□	R90□	1R6A,2R1F	2R8□	5R5A	5R5A	120A	

*1: These items and torque-motor speed characteristics quoted in combination with an SGDV SERVOPACK are at an armature winding temperature of 100°C. Other values quoted are at 20°C.

*2: Rated torques are continuous allowable torque values at 40°C with an aluminum heat sink of the following dimensions attached.
SGMAV-A5A, -01A: 200 mm×200 mm×6 mm
SGMAV-C2A, -02A, -04A, -06A, -08A: 250 mm×250 mm×6 mm
SGMAV-10A: 300 mm×300 mm×12 mm
Note: The values in parentheses are for servomotors with holding brakes.

A.7: Ficha Técnica de Ensamble de Tornillo de Bolas Rexroth



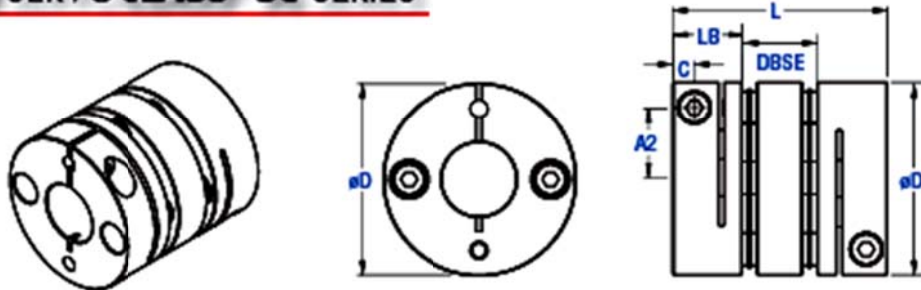
Ball Screw Assembly
FEM-E-S 25x5Rx3-4 1 0 T9 R 21Z170 21Z170 1161 0 1

Description		
Type		Ball Screw Assembly
Nut Type	FEM-E-S	Flange individual nut, standard series, Rexroth connection dimensions
Nut	R151221013	FEM-E-S 25 x 5R x 3-4 $C_{dyn.} = 15900 \text{ N}$
Nominal Diameter	25	$d_0 = 25 \text{ mm}$
Lead	5	$P = 5 \text{ mm}$
Direction of Lead	R	Screw Direction of Lead right (RH)
Ball diameter	3	$D_w = 3 \text{ mm}$
Number of circulations	4	$i = 4$
Seal	1	Standard Seal: Frictional torque T_{R0} ca. 0.12 Nm
Preload	0	Axial play standard max. 0.04 mm
Precision	T9	T9 (0,130mm/300mm)
Screw	R	rolled precision spindle
Left screw end	SEB-L	SEB-L: Floating bearing with deep-groove ball bearing per DIN 625, steel version
Form	21	
Version	170	Fitting bearing (not included in delivery) R159161720
Option	Z	centering per DIN 332-D
Right screw end	SEB-L	SEB-L: Floating bearing with deep-groove ball bearing per DIN 625, steel version
Form	21	
Version	170	Fitting bearing (not included in delivery) R159161720
Option	Z	centering per DIN 332-D
Overall length	1161.00 mm	
Threaded length	1137.00 mm	
Documentation	0	Standard report
Lubrication	1	preserved and basically greased



A.8: Catalogo de Acoples Flexibles para Servomotores

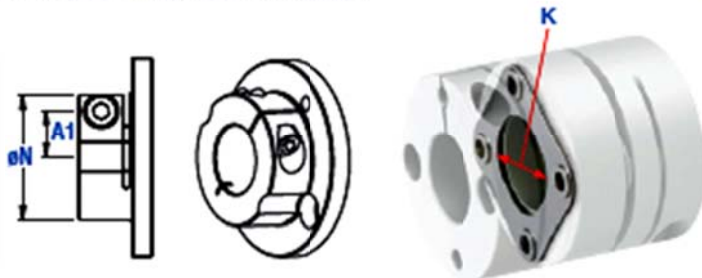
SERVOCLASS® SC SERIES



SC Series ServoClass Double Disc Dimensions														
Model	Bore		Outside Diameter	Overall Length	Hub Length	Reduced Hub Diameter	Distance Between Shaft Ends	Inside dia. of the flex disc	Clamp Screw to Bore (on reduced hub)	Clamp Screw	Clamp Screw to End of Hub	Clamp Screw Size	Tightening Torque	
	Min	Max	D	L	LB	N	DBSE	K	A1	A2	C	M	In. lb. (Nm)	
	Inch (mm)	Inch (mm)	Inch (mm)	Inch (mm)	Inch (mm)	Inch (mm)	Inch (mm)	Inch (mm)	Inch (mm)	Inch (mm)	Inch (mm)	Inch (mm)	In. lb. (Nm)	
SC005R	0.118 (3)	0.238 (6)	0.63 (16)	0.913 (23.2)	0.309 (7.8)	-	0.295 (7.5)	0.268 (6.8)	-	0.160 (4.1)	0.098 (2.5)	M2.0	3.5 (0.4)	
SC010R	0.118 (3)	0.310* (8)	0.748 (19)	1.02 (25.9)	0.26 (6.6)	-	0.290 (7.4)	0.335 (8.5)	-	0.228 (5.8)	0.124 (3.1)	M2.5*	9* (1)*	
SC020R	0.197 (5)	0.433 (11)	1.024 (26.0)	1.272 (32.3)	0.423 (10.7)	-	0.425 (10.8)	0.417 (10.6)	-	0.374 (9.5)	0.130 (3.3)	M2.5	9 (1)	
SC025R	0.197 (5)	0.551 (14)	1.142 (29.0)	1.291 (32.8)	0.423 (10.7)	-	0.445 (11.3)	0.571 (14.5)	-	0.433 (11.0)	0.130 (3.3)	M2.5	9 (1)	
SC030R	0.197** (5)	0.630 (16)	1.239 (31.4)	1.488 (37.8)	0.488 (12.4)	0.600 (21.6)	0.511 (13.0)	0.571 (14.5)	0.315 (8)	0.402 (10.2)	0.148 (3.7)	M3	13 (1.5)	
SC035R	0.238 (6)	0.700 (18)	1.235 (31.4)	1.890 (48)	0.610 (15.5)	-	0.689 (17.5)	0.689 (17)	-	0.501 (12.7)	0.177 (4.5)	M4	30 (3.4)	
SC040R	0.310** (8)	0.888 (22)	1.732 (44.0)	1.800 (45.7)	0.610 (15.5)	1.165 (29.8)	0.689 (17.5)	0.788 (20.0)	0.433 (11)	0.690 (17.5)	0.177 (4.5)	M4	30 (3.4)	
SC050R	0.310** (8)	1.181 (30)	2.205 (56.0)	2.354 (59.8)	0.607 (20.5)	1.468 (37)	0.740 (18.8)	1.024 (26)	0.571 (14.5)	0.688 (22)	0.238 (6)	M5	62 (7)	
SC060R	0.433** (11)	1.378 (35)	2.877 (73.0)	2.886 (73.3)	0.602 (20.2)	1.811 (46)	0.602 (22.9)	1.220 (31)	0.690 (17.5)	1.043 (26.5)	0.300 (7.7)	M6	124 (14)	
SC080R	0.709 (18)	1.57 (40)	3.228 (82.0)	3.838 (98)	1.181 (30)	-	1.468 (38.0)	1.468 (38)	-	1.102 (28)	0.354 (9)	M6	268 (30)	
SC090R	0.684 (20)	1.77 (45)	3.822 (97.0)	3.882 (98.6)	1.181 (30)	-	1.520 (38.8)	1.654 (42)	-	1.330 (34)	0.354 (9)	M6	268 (30)	
SC100R	1.280 (32)	1.77 (45)	4.095 (104.0)	4.000 (101.6)	1.181 (30)	-	1.638 (41.8)	1.860 (47)	-	1.335 (34)	0.354 (9)	M6	268 (30)	

*SC010 with a bore of 0.2125" will have a M2 clamp screw and a tightening torque of 3.5 in lbs. or 0.4Nm

** Reduced Hub Dimensions		
Model	Min	Max
	Inch (mm)	Inch (mm)
SC030R	0.1875 (5)	0.375 (9.5)
SC040R	0.315 (8)	0.5825 (14.8)
SC050R	0.315 (8)	0.750 (19)
SC060R	0.433 (11)	0.6075 (15.4)



A.9: Catalogo de Chumaceras Timken (Pillow Blocks)

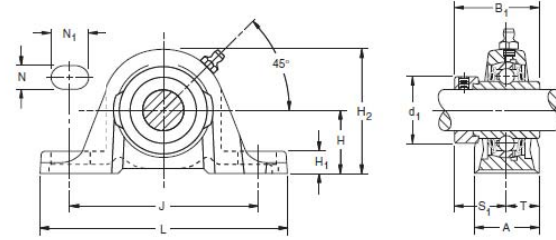


BALL BEARINGS

RAK, TAK, LAK INDUSTRIAL SERIES

Timken RAK, TAK and LAK pillow blocks are suggested for industrial applications where normal loads are encountered.

- A compact, one-piece housing that can be mounted in any position.
- Pillow blocks self-align at mounting with the spherical outside diameter of the bearing fitting into corresponding spherical housing seat.
- Units are prelubricated and ready for immediate installation.
- Grease fitting is provided for relubrication.
- Self-locking collars are supplied with all units.
- RAK pillow block is equipped with G-KRRB (R-Seal) wide inner ring bearings, the TAK with G-KPPB (Tri-Ply Seal) wide inner ring bearings and the LAK with the G-KLLB (Mechani-Seal) wide inner ring bearings.
- Contact a Timken representative to discuss highly corrosive applications (food processing, chemical exposure) where Timken thin dense chrome coated bearings can be utilized.



Suggested shaft tolerances: $\frac{1}{2}'' - 1\frac{15}{16}''$, nominal to $-.013$ mm, $-.0005''$;
 $2'' - 2\frac{15}{16}''$, nominal to $-.025$ mm, $-.0010''$.

BEARING DATA

Unit	Bearing Number	Dimensions and Load Ratings
RAK	G.KRRB	Page D54
TAK	G.KPPB	Page D65
LAK	G.KLLB	Page D62

TO ORDER, SPECIFY UNIT AND SHAFT DIAMETER. Example: RAK 1 7/16". POPULAR SIZES ARE IN BOLD.

Unit	Shaft Dia.	H	H2	B1	J	L	A	H1	N	N1	d1	S1	T	Bolt Size	Bearing Number ⁽¹⁾	Collar Number	Housing Number	Unit Wt.
mm	in.	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	RAK (TAK/LAK)	new	old	kg
RAK, LAK	1/2	26.99	53.2	37.3	92.1	123.8	30.2	8.7	11.1	22.2	28.6	23.4	15.1	10	G100KRRB (KLLB)	S100K	T-40238	0.454
RAK, LAK	3/8	1 1/8	2 1/2	1 7/8	3 1/2	4 7/8	1 3/8	1 7/8	1 7/8	3 7/8	4 7/8	3 1/4	1 3/8	3/8	G101KRRB (KLLB)	S101K	(T-30595)	1
RAK	1 1/8														G1011KRRB	S1011K		
RAK	1 1/4														GE17KRRB	SE17K		
RAK, LAK	3/4	31.75	62.7	43.7	96	127	31.8	11.9	11.1	19.8	33.3	26.6	15.9	10	G1012KRRB (KLLB)	S1012K	T-40239	0.635
RAK	20	1 1/4	2 1/2	1 7/8	3 3/4	5	1 1/4	1 7/8	1 7/8	3 1/2	4 1/4	3 1/4	1 3/4	3/8	GE20KRRB	SE20K	(T-30555)	1.4
RAK, TAK	7/8														G1014KRRB (KPPB3)	S1014K		
RAK, TAK, LAK	1 1/8	33.34	68.3	44.4	104.1	139.7	35.7	11.9	11.1	20.6	38.1	27	17.9	10	G1015KRRB (KPPB3/KLLB)	S1015K	T-30365	0.903
RAK, TAK, LAK	1	1 1/8	2 1 1/8	1 3/4	4 1/2	5 1/2	1 7/8	1 7/8	1 7/8	3 1/2	4 1/2	3 1/2	1 1/2	1 1/2	G1100KRRB (KPPB3/KLLB)	S1100K		1.77
RAK, TAK	25														GE25KRRB (KPPB3)	SE25K		
RAK, TAK	1 1/2														G1101KRRB (KPPB3)	S1101K		
RAK, TAK, LAK	1 3/8	29.89	60.2	48.4	117.5	157.2	29.7	12.5	14.3	23.8	44.1	30.2	19.9	12	G1102KRRB (KPPB3/KLLB)	S1102K	T-40241	1.297
RAK, TAK, LAK	1 3/4	1 3/4	2 3/4	1 7/8	4 1/2	6 3/4	1 3/4	1 3/4	1 3/4	3 1/2	4 1/2	3 1/2	1 3/4	1 1/2	G1103KRRB (KPPB3/KLLB)	S1103K	(T-30300)	2.86
RAK, TAK	30														GE30KRRB (KPPB3)	SE30K		
RAK, TAK, LAK	1 1/4														G1104KRRB (KPPB2/KLLB)	S1104K		
RAK, TAK	1 1/2	46.04	92.1	51.2	130.2	168.7	45.2	16.7	14.3	24.6	54	32.5	22.7	12	G1105KRRB (KPPB2)	S1105K	T-40242	1.674
RAK, TAK	1 3/8	1 13/16	2 3/8	2 1/4	5 1/2	6 9/16	1 7/8	1 7/8	1 7/8	3 1/2	4 1/2	3 1/2	1 1/2	1 1/2	G1106KRRB (KPPB2)	S1106K	(T-30410)	3.69
RAK, TAK, LAK	1 7/8														G1107KRRB (KPPB2/KLLB)	S1107K		
RAK, TAK	35														GE35KRRB (KPPB2)	SE35K		
RAK, TAK, LAK	1 1/2	49.21	100	56.4	136.5	179.4	47.6	19	14.3	26.2	60.3	34.9	23.8	12	G1108KRRB (KPPB3/KLLB)	S1108KT	T-40243	2.15
RAK, TAK	1 3/4	1 15/16	2 15/16	2 1/2	5 3/4	7 1/8	1 7/8	1 7/8	1 7/8	3 1/2	4 1/2	3 1/2	1 1/2	1 1/2	G1109KRRB (KPPB3)	S1109KT	(T-30484)	4.74
RAK, TAK	40														GE40KRRB (KPPB3)	SE40K		
RAK, TAK	1 3/8														G1110KRRB (KPPB4)	S1110K		
RAK, TAK, LAK	1 11/16	52.39	104.8	56.4	149.2	191.3	50.8	17.5	14.3	28.6	62.5	34.9	25.4	12	G1111KRRB (KPPB4/KLLB)	S1111K	T-40244	2.409
RAK, TAK, LAK	1 3/4	2 1/8	4 1/8	2 3/4	5 7/8	7 11/16	2	1 1/8	1 1/8	1 1/8	2 1/2	1 3/8	1	1 1/2	G1112KRRB (KPPB4/KLLB)	S1112K	(T-30682)	5.31
RAK, TAK	45														GE45KRRB (KPPB4)	SE45K		
RAK, TAK	1 1/2	55.56	112.7	62.7	158	200	55.6	17.5	17.5	23.8	68.8	38.1	27.8	16	G1114KRRB (KPPB3)	S1114K	T-40245	3.003
RAK, TAK, LAK	1 15/16	2 3/8	4 7/8	2 15/16	6 1/2	7 1/8	2 3/8	1 1/2	1 1/2	1 1/2	2 3/4	1 1/2	1 1/2	1 1/2	G1115KRRB (KPPB3/KLLB)	S1115K	(T-30706)	6.62
RAK, TAK	50														GE50KRRB (KPPB3)	SE50K		
RAK, TAK	2														G1200KRRB (KPPB4)	S1200K	T-40246	3.901
RAK, TAK	2 1/8	61.91	124.6	71.4	176.2	222.3	58.7	19	18.3	29.4	76.2	43.7	29.4	16	G1201KRRB (KPPB4)	S1201K	(T-30738)	8.6
RAK, TAK, LAK	2 3/8	2 7/8	4 3/8	2 13/16	6 11/16	8 1/4	2 3/8	1 3/4	1 3/4	1 3/4	3	1 3/4	1 3/4	1 3/4	G1202KRRB (KPPB4/KLLB)	S1202K		
RAK, TAK	55														GE55KRRB (KPPB4)	SE55K		
RAK	2 1/4														G1204KRRB	S1204K	T-40247	5.511
RAK	2 3/8	68.26	137.3	77.8	188.1	229.7	60.3	22.2	17.5	29.4	84.1	46.8	30.2	16	G1206KRRB	S1206K	(T-31244)	12.15
RAK, LAK	2 7/8	2 11/16	5 13/16	3 1/2	7 13/16	9 1/8	2 3/8	1 3/4	1 3/4	1 3/4	3 1/4	1 3/4	1 3/4	1 3/4	G1207KRRB (KLLB)	S1207K		
RAK	60														GE60KRRB	SE60K		
RAK	2 11/16	76.2	154	85.7	203.2	266.7	73	33.3	20.6	34.9	96.8	45.2	36.5	20	G1211KRRB	S1211KT	T-22503	7.52
RAK	70	3	6 1/8	3 3/8	1	10 1/2	2 7/8	1 3/4	1 3/4	1 3/4	3 13/16	1 3/4	1 3/4	1 3/4	GE70KRRB	SE70K		17.46
RAK	2 15/16	84.14	162.5	92.1	241.3	304.8	82.6	38.1	22.2	31.8	101.6	54.8	41.3	20	G1215KRRB	S1215K	T-20134	9.026
RAK	75	3 3/16	6 7/16	3 1/2	8 1/2	12	3 1/4	1 1/2	1 1/2	1 1/4	4	2 1/2	1 3/8	1 3/4	GE75KRRB	SE75K		19.9

⁽¹⁾ Bearing number for RAK is G-KRRB. TAK uses G-KPPB type. LAK uses G-KLLB. Note: All units have 1/2 pipe thread grease fitting except 1/2-11/16 and 3/4 units which have 1/4-28 fitting.

• **D82** TIMKEN PRODUCTS CATALOG

A.10: Catalogo de Sprockets ANSI SKF

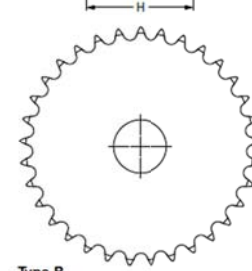
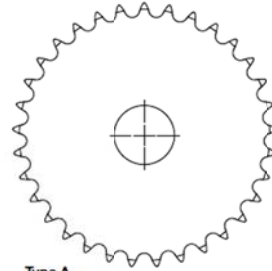
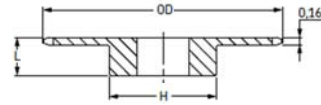
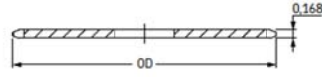


ANSI Sprockets

Simplex
Pilot Bore

- ▶ Belts
- ▶ Chains
- ▶ Couplings
- ▶ Bushings and Hubs
- ▶ Sprockets
- ▶ Pulleys
- ▶ Smart tools

ANSI 35-1 3/8" Pitch



Pilot Bore Type B

Type A

No. Teeth	Outside Diameter	Type	Bore		Hub		Weight lbs	Designation	No. Teeth	Outside Diameter	Type	Bore Stock	Weight lbs	Designation
			Min	Max	H	L								
8	1.13	B	3/8	3/8	3/4	3/4	0.07	PHS 35-1B8	8	1.13	-	-	-	-
9	1.26	B	3/8	3/8	27/32	3/4	0.09	PHS 35-1B9	9	1.26	-	-	-	-
10	1.38	B	3/8	9/16	21/32	3/4	0.14	PHS 35-1B10	10	1.38	-	-	-	-
11	1.50	B	3/8	9/16	1 1/16	3/4	0.17	PHS 35-1B11	11	1.50	-	-	-	-
12	1.63	B	1/2	9/16	1 7/32	3/4	0.20	PHS 35-1B12	12	1.63	-	-	-	-
13	1.75	B	1/2	11/16	1 1/4	3/4	0.23	PHS 35-1B13	13	1.75	-	-	-	-
14	1.87	B	1/2	7/8	1 1/4	3/4	0.25	PHS 35-1B14	14	1.87	-	-	-	-
15	1.99	B	1/2	7/8	1 11/32	3/4	0.29	PHS 35-1B15	15	1.99	A	1/2	0.10	PHS 35-1A15
16	2.11	B	1/2	15/16	1 15/32	3/4	0.35	PHS 35-1B16	16	2.11	A	1/2	0.12	PHS 35-1A16
17	2.23	B	1/2	1 1/16	1 19/32	3/4	0.42	PHS 35-1B17	17	2.23	A	1/2	0.12	PHS 35-1A17
18	2.35	B	1/2	1 1/8	1 23/32	3/4	0.48	PHS 35-1B18	18	2.35	A	1/2	0.14	PHS 35-1A18
19	2.47	B	1/2	1 1/4	1 27/32	3/4	0.54	PHS 35-1B19	19	2.47	A	1/2	0.16	PHS 35-1A19
20	2.59	B	1/2	1 1/2	1 25/16	3/4	0.59	PHS 35-1B20	20	2.59	A	1/2	0.20	PHS 35-1A20
21	2.71	B	1/2	1 3/8	2	7/8	0.80	PHS 35-1B21	21	2.71	A	1/2	0.20	PHS 35-1A21
22	2.83	B	1/2	1 3/8	2	7/8	0.80	PHS 35-1B22	22	2.83	A	1/2	0.22	PHS 35-1A22
23	2.95	B	1/2	1 3/8	2	7/8	0.82	PHS 35-1B23	23	2.95	A	1/2	0.24	PHS 35-1A23
24	3.07	B	1/2	1 3/8	2	7/8	0.88	PHS 35-1B24	24	3.07	A	1/2	0.26	PHS 35-1A24
25	3.19	B	1/2	1 3/8	2	7/8	0.88	PHS 35-1B25	25	3.19	A	1/2	0.28	PHS 35-1A25
26	3.31	B	1/2	1 3/8	2	7/8	0.90	PHS 35-1B26	26	3.31	A	1/2	0.28	PHS 35-1A26
27	3.43	B	1/2	1 3/8	2	7/8	0.94	PHS 35-1B27	27	3.43	A	1/2	0.34	PHS 35-1A27
28	3.55	B	1/2	1 3/8	2	7/8	0.94	PHS 35-1B28	28	3.55	A	1/2	0.34	PHS 35-1A28
30	3.79	B	1/2	1 3/8	2	7/8	1.02	PHS 35-1B30	30	3.79	A	1/2	0.46	PHS 35-1A30
32	4.03	B	1/2	1 3/8	2	7/8	1.24	PHS 35-1B32	32	4.03	A	5/8	0.46	PHS 35-1A32
35	4.39	B	5/8	1 1/2	2 3/4	7/8	1.50	PHS 35-1B35	35	4.39	A	5/8	0.60	PHS 35-1A35
36	4.51	B	5/8	1 1/2	2 3/4	7/8	1.56	PHS 35-1B36	36	4.51	A	5/8	0.62	PHS 35-1A36
40	4.99	B	5/8	1 1/2	2 3/4	1	1.62	PHS 35-1B40	40	4.99	A	19/32	0.70	PHS 35-1A40
42	5.23	B	5/8	1 1/2	2 3/4	1	1.68	PHS 35-1B42	42	5.23	A	19/32	0.78	PHS 35-1A42
45	5.59	B	5/8	1 1/2	2 3/4	1	1.78	PHS 35-1B45	45	5.59	A	19/32	0.88	PHS 35-1A45
48	5.95	B	5/8	1 1/2	2 3/4	1	1.88	PHS 35-1B48	48	5.95	A	19/32	1.21	PHS 35-1A48
54	6.66	B	5/8	1 1/2	2 3/4	1	2.20	PHS 35-1B54	54	6.66	A	19/32	1.32	PHS 35-1A54
60	7.38	B	3/4	1 1/2	2 3/4	1	2.48	PHS 35-1B60	60	7.38	A	23/32	1.66	PHS 35-1A60
70	8.58	B	3/4	1 1/2	2 3/4	1	3.12	PHS 35-1B70	70	8.58	A	23/32	2.30	PHS 35-1A70
72	8.81	B	3/4	1 1/2	2 3/4	1	3.42	PHS 35-1B72	72	8.81	A	23/32	2.56	PHS 35-1A72
80	9.77	B	3/4	1 1/2	2 3/4	1	3.82	PHS 35-1B80	80	9.77	A	23/32	3.16	PHS 35-1A80
84	10.25	B	3/4	1 1/2	2 3/4	1	4.24	PHS 35-1B84	84	10.25	A	23/32	3.26	PHS 35-1A84
96	11.68	B	3/4	1 1/2	2 3/4	1	5.16	PHS 35-1B96	96	11.68	A	23/32	4.64	PHS 35-1A96
112	13.59	B	3/4	1 1/2	2 3/4	1	6.70	PHS 35-1B112	112	13.59	A	23/32	5.05	PHS 35-1A112

Maximum bores can accommodate standard keyways. Larger bores are available where a shallow keyway is used or no keyway is required.