

SIEMENS



FLENDER Gear Units

Fast Track – USA

Catalog MD 20.12 • 2011

Fast Availability, Utmost Reliability and Maximum Efficiency

usa.siemens.com/gearboxes

FLENDER Gear Units



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Answers for Industry.

Siemens Industry answers the challenges in the manufacturing and the process industry as well as in the building automation business. Our drive and automation solutions based on Totally Integrated Automation (TIA) and Totally Integrated Power (TIP) are employed in all kinds of industry. In the manufacturing and the process industry. In industrial as well as in functional buildings.

Siemens offers automation, drive, and low-voltage switching technology as well as industrial software from standard products up to entire industry solutions. The industry software enables our industry customers to optimize the entire value chain – from product design and development through manufacture and sales up to after-sales service. Our electrical and mechanical components offer integrated technologies for the entire drive train – from couplings to gear units, from motors to control and drive solutions for all engineering industries. Our technology platform TIP offers robust solutions for power distribution.

Check out the opportunities our automation and drive solutions provide. And discover how you can sustainably enhance your competitive edge with us.

General Information

The FLENDER gear unit series is a universal standard gear unit range developed for the use in nearly all fields of mechanical power transmission technology. Since the launching on the market, the gear units have proved their value in more than 80,000 drives where they are operating reliably.

With **Fast Track®**, Siemens now offers a **special selection** from its extensive gear unit range (for more types and sizes please refer to the main brochure MD 20.1; information about subranges on request). Ordering quantities of up to 3 **Fast Track®** gear units per type according to this brochure are available ex works, as a rule **within 21 working days** from the date of the order acknowledgement.

Details required in orders:

- Type and size; design
- Transmission ratio
- Seals
- Add-on pieces
- Language and quantity required of documentation (operating instructions, dimensioned drawings, spare parts lists and spare parts drawings) and language for the name plates.

The following items are absolutely to be observed!

- For other designs and dimensions please refer to the main brochure MD 20.1.
- For permissible radial forces, see main brochure MD 20.1.
- Gear units available with dip lubrication only.
- Gear units are protected against corrosion for 24 months.
- Inspection: test report 2.2.
- Illustrations are examples only and are not strictly binding. Dimensions are subject to change.
- The weights are mean values and not strictly binding.
- To prevent accidents, all rotating parts should be guarded according to local and national safety regulations.
- Prior to commissioning, the operating instructions must be observed. The gear units are delivered ready for operation but without oil filling.
- Oil quantities given are guide values only. The exact quantity of oil depends on the marks on the oil dipstick.
- The oil viscosity has to correspond to the data given on the name plate.
- Permitted lubricants may be used only. You will find current operating instructions and lubricant selection tables at: www.siemens.com/gearunits

Viscosity ISO-VG at 104°F in mm ² /s (cSt)	Permissible temperature limit in °F for dip lubrication	
	Mineral Oil	Synthetic Oil*
VG 220	5	-13
VG 320	10	-13
VG 460	16	-13

If the temperatures are below the values as listed in the table, the oil must be heated.

In case of dip lubrication, the oil temperature must not be below the pour point of the selected oil.

*Synthetic oils according to PG or PAO designation

Certified acc. to DIN EN ISO 9001

The General Terms and Conditions for the Supply of Products by Siemens AG are applicable.

Guidelines for the Selection

The calculation example below applies to:

- Constant power rating at $n_1 = 1500$ RPM
- Drive via electric motor with $n = 1500$ RPM
- Max. 5 starts per hour with uniform direction of load
- Continuous operation 24h/day
- Installation in large halls, workshops (wind velocity $w > 3.1$ mph)
- Altitude: up to 3,281 ft

For other operating conditions please refer to the main brochure MD 20.1.

Service Factors

Thermal Factor					
Ambient Temperature	Operating Cycle per hour (E_D) in %				
	100	80	60	40	20
50° F	1.11	1.31	1.60	2.14	3.64
68° F	1.00	1.18	1.44	1.93	3.28
86° F	0.88	1.04	1.27	1.70	2.89
104° F	0.75	0.89	1.08	1.45	2.46
122° F	0.63	0.74	0.91	1.22	2.07

Load Classification of Driven Machine		f_1
uniform	Belt conveyors ≤ 201 HP; centrifugal pumps; centrifuges	1.3
moderate shock	Belt conveyors > 201 HP; mixers; apron conveyors; agitators; water screw pumps	1.6
heavy shock	Roller drives (rolling mills); breakers	2

Example:

Known criteria:

PRIME MOVER
Electric motor: $P_1 = 100$ HP
Motor speed: $n_1 = 1500$ RPM

GEAR UNIT DESIGN
Bevel-helical gear unit
Mounting position: horizontal
Output shaft d_2 : on RH side, design C
Direction of rotation of output shaft d_2 : ccw

DRIVEN MACHINE
Belt conveyor: $P_2 = 89$ HP
Speed: $n_2 = 26$ RPM
Duty: 12h/day
Operating cycle per hour: $E_D = 100\%$
Ambient temperature: 86° F
Installation in a hall: ($w > 3.1$ mph)
Altitude: sea level

Required:

Type and size of gear unit

1. Selection of gear unit type and size

1.1 Calculation of transmission ratio i_N

$$i_s = \frac{n_1}{n_2} = \frac{1500}{26} = 57.7 \quad i_N = 56$$

1.2 Determination of the gear unit nominal power rating P_N

$$P_N \geq P_2 \times f_1 = 89 \times 1.3 = 115.7 \text{ HP}$$

Selected from power rating table: type B3, gear unit size 9, with $P_N = 134$ HP

2. Determination of thermal capacity P_G

2.1 Thermal capacity without auxiliary cooling P_{GA} acc. to table for type B3

$$P_G = P_{GA} \times f_4 = 86.8 \times 0.88 = 76 \text{ HP}$$

$$P_G = 76 \text{ HP} < P_2 = 89 \text{ HP}$$

A gear unit without auxiliary cooling is not sufficient!

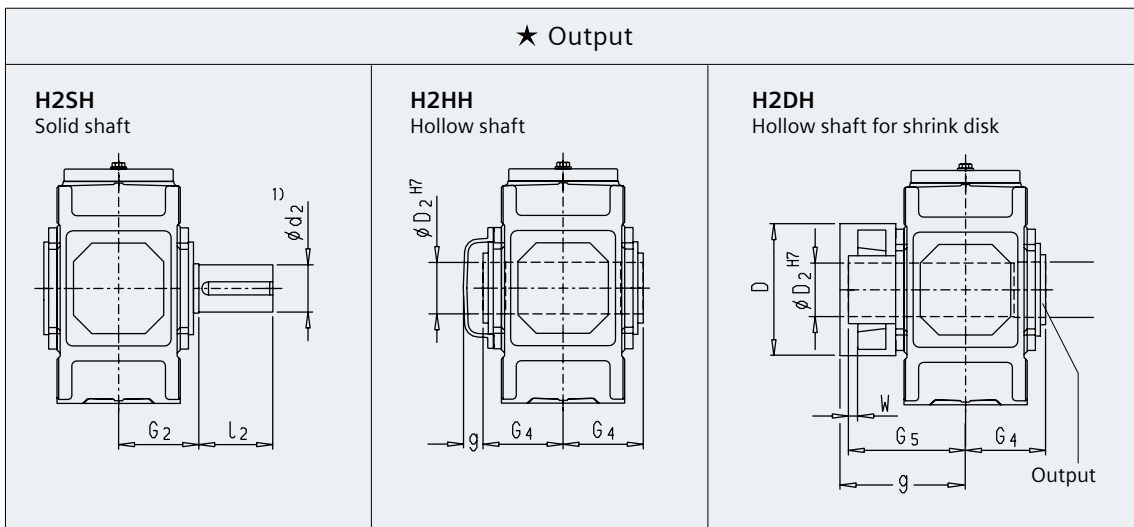
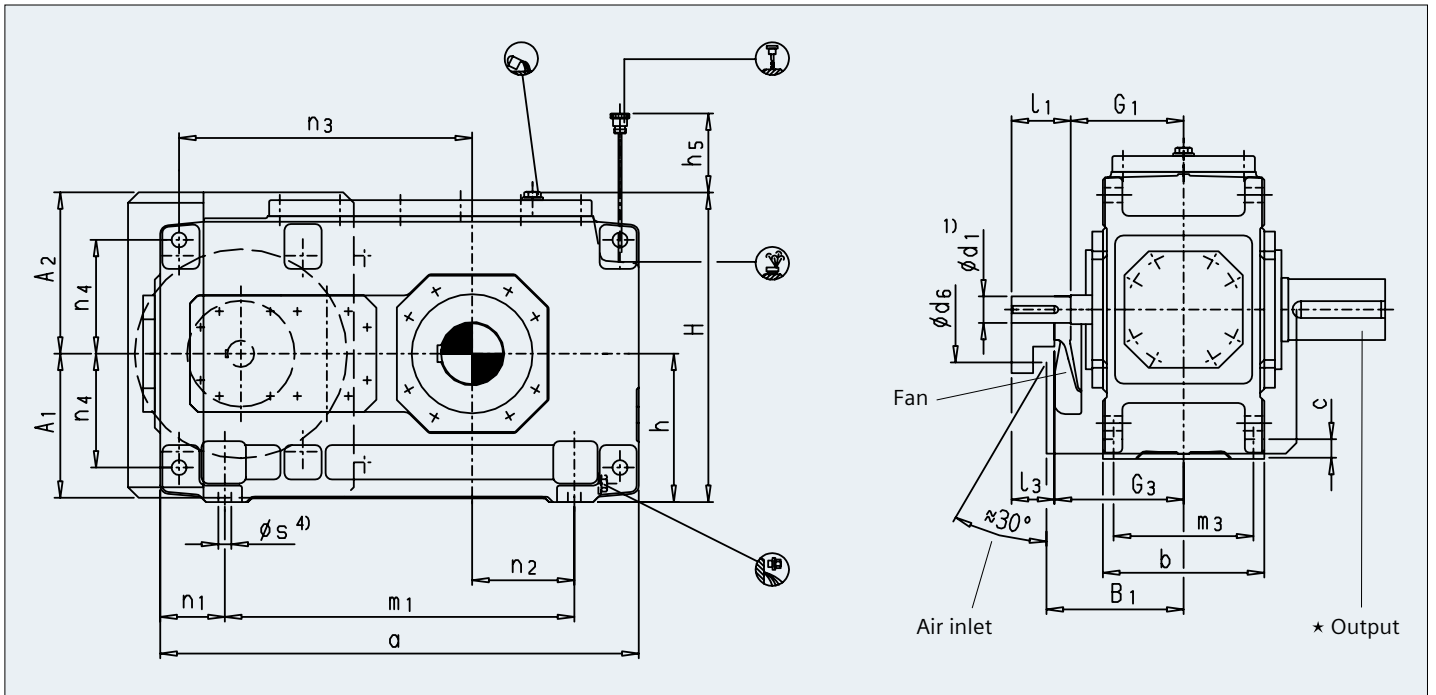
2.2 Thermal capacity with fan cooling P_{GB} acc. to table for type B3

$$P_G = P_{GB} \times f_4 = 188.0 \times 0.88 = 165 \text{ HP}$$

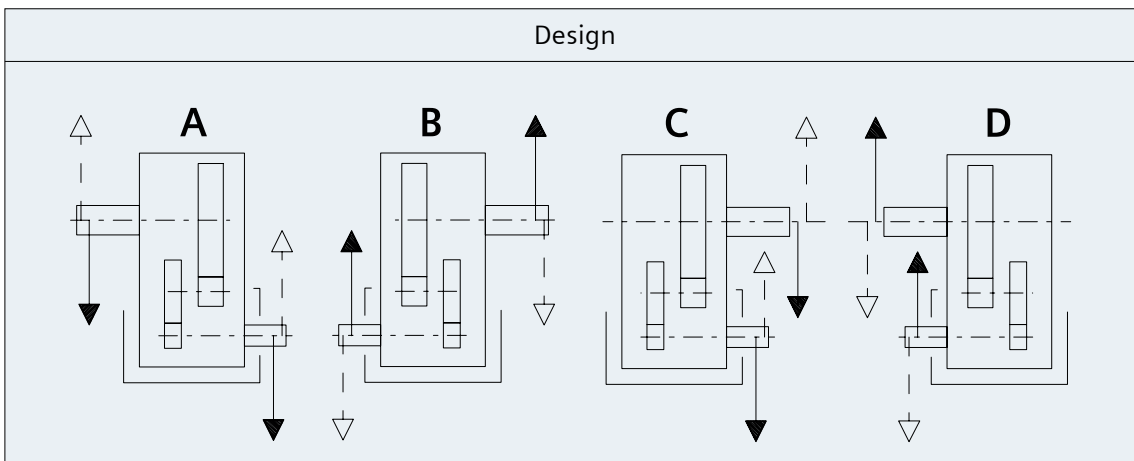
$$P_G = 165 \text{ HP} > P_2 = 89 \text{ HP}$$

A gear unit with fan is sufficient!

H2.H



Shafts:
 $k_6 < \emptyset 28$
 $m_6 \leq \emptyset 100$
 $n_6 > \emptyset 100$
 Parallel keyways acc. to
 DIN 6885/1
 The tolerance zone for the
 hub keyway width is JS9
 Parallel keys acc. to DIN
 6885/1 Form B



Nominal Ratios															
		6.3	7.1	8	9	10	11.2	12.5	14	16	18	20	22.4	25	28
Gear Unit Size	5	356.4 65.4 230.6	331.0 72.2 238.4	294.8 75.7 235.2	261.3 81.2 233.7	219.8 82.0 222.4	198.3 82.1 215.3	187.6 83.3 211.5	167.5 80.9 201.1	147.4 77.6 187.9	121.9 75.6 180.4	116.6 71.6 169.0	101.8 66.6 156.1	-	-
	6	-	-	355.1 79.3 256.1	336.3 90.9 265.5	302.8 95.1 263.0	270.7 96.9 256.9	226.5 94.5 243.7	202.3 93.1 234.0	188.9 93.7 227.7	167.5 90.7 217.2	151.4 85.9 201.8	126.0 82.3 193.5	119.3 77.3 180.6	104.5 72.5 167.6
	7	676.7 343.6	600.3 338.1	534.7 87.1 333.7	474.4 98.1 332.5	426.1 104.1 323.3	380.6 111.9 330.6	339.0 114.8 324.8	304.2 109.6 300.8	266.7 105.5 281.5	221.1 103.7 272.0	199.7 98.0 253.0	184.9 94.7 243.2	-	-
	8	-	-	674.0 - 370.5	599.0 103.4 369.6	538.7 112.8 366.9	481.1 118.1 358.9	430.1 118.5 346.5	383.2 125.0 352.8	335.0 127.3 344.5	297.5 120.5 318.0	269.3 115.6 297.6	225.1 110.4 286.0	201.0 103.6 264.2	188.9 101.2 255.5
	9	1124.3 432.7	997.0 432.8	888.4 - 432.0	789.3 115.8 435.2	708.9 128.8 429.1	632.5 133.9 414.3	566.8 139.6 409.5	505.2 143.2 400.0	443.5 139.8 377.1	391.3 136.5 357.6	353.8 134.7 345.7	310.9 124.2 320.3	-	-
	10	-	-	1112.2 - 440.3	987.6 - 447.4	887.1 127.8 449.4	793.3 138.2 444.2	710.2 143.1 431.6	632.5 145.4 415.5	556.1 148.3 407.4	490.4 149.8 396.8	443.5 144.3 373.5	396.6 136.3 350.3	355.1 132.5 339.0	314.9 125.3 315.2
	11	1979.2 573.9	1755.4 608.2	1563.8 - 628.9	1388.2 - 649.4	1247.5 - 655.9	1114.9 159.6 683.0	998.3 181.4 687.2	889.8 191.1 663.0	781.2 193.4 628.5	690.1 191.8 594.2	623.1 191.2 574.3	548.1 179.6 532.9	-	-
	12	-	-	1945.7 - 671.5	1728.6 - 742.0	1553.1 - 773.9	1386.9 - 766.7	1242.2 - 753.8	1106.8 206.2 781.2	972.8 226.6 782.4	858.9 235.0 750.9	775.9 228.7 703.8	692.8 213.6 655.9	620.4 208.9 630.9	548.1 201.9 589.2

Power Rating
 P_N in HP at $n_1 = 1500$ RPM

Thermal capacity P_G in HP for

- $n_1 = 1500$ RPM
- Installation in a large hall (wind velocity > 3.1 mph)
- Altitude up to 3,281 ft
- Thermal factor $f_4 = 1$ (see page 3)

Size	Oil Quantity (gal)*	Weight (lbs)**
5	4	660
6	4	780
7	7	1110
8	8	1300
9	11	1825
10	12	2110
11	18	2940
12	20	3550

Sealing:

- Input: shaft seal
- Output: shaft seal or Taconite seal (dustproof)

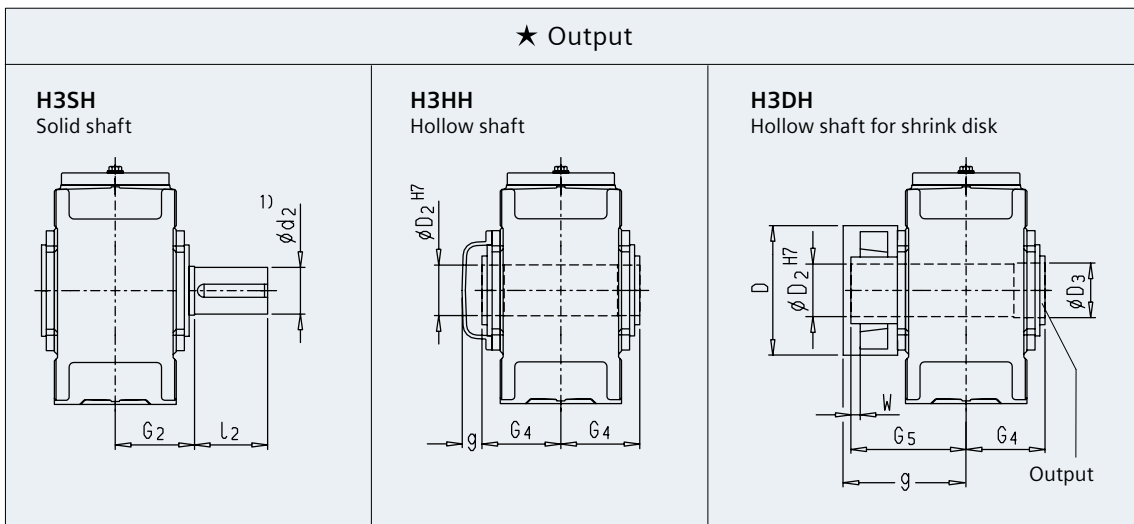
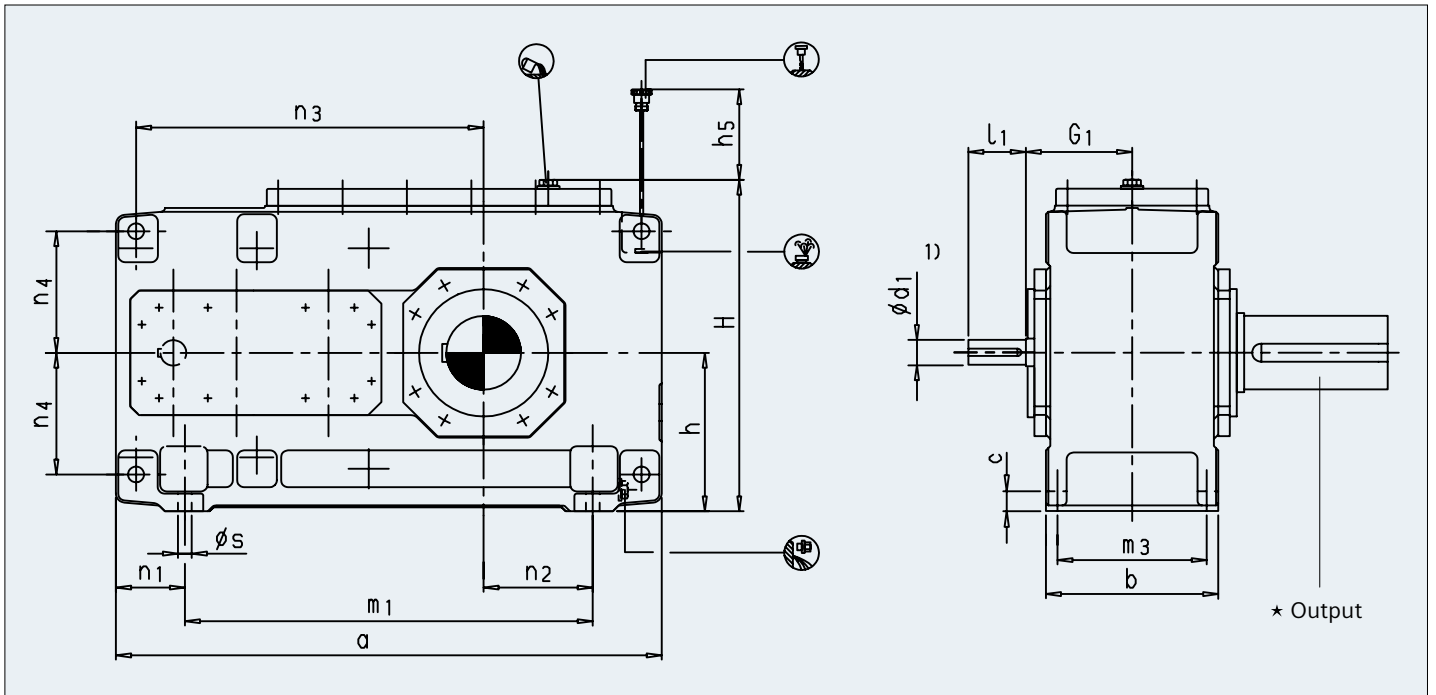
* Approximate values; exact data acc. to order-related documentation.

** Without oil filling

Size	Input									Gear Unit Dimensions (mm)										
	$i_N = 6.3 - 11.2$				$i_N = 12.5 - 22.4$															
	$i_N = 8 - 14$				$i_N = 16 - 28$															
	d_1	l_1	l_3	DS	d_1	l_1	l_3	DS	A_1	A_2	b	B_1	c	d_6	m_3	n_1	n_4	s	h_1	
5	+ 6	50	100	80	M16 x 36	38	80	60	M12 x 28	225	260	255	230	28	150	220	105	180	19	230
7	+ 8	60	135	105	M20 x 42	50	110	80	M16 x 36	272	305	300	255	35	200	260	120	215	24	280
9	+ 10	75	140	110	M20 x 42	60	140	110	M20 x 42	312	355	370	285	40	200	320	145	245	28	320
11	+ 12	90	165	130	M42 x 50	70	140	105	M20 x 42	372	420	430	325	50	210	370	165	300	35	380

Size	Gear Unit Dimensions (mm)									Output								
	G_1	G_3	a	h_5	H	m_1	n_2	n_3	G_2	G_4	d_2	l_2	DS	D_2	D_2	D_3	G_5	
5	195	215	640	150	482	430	100	405	165	165	100	210	M24 x 50	95	100	100	240	
6	195	215	720	150	482	510	145	440	165	165	110	210	M24 x 50	105	110	110	240	
7	210	240	785	190	572	545	130	500	195	195	120	210	M24 x 50	115	120	120	280	
8	210	240	890	190	582	650	190	545	195	195	130	250	M24 x 50	125	130	130	285	
9	240	270	925	205	662	635	155	585	235	235	140	250	M30 x 60	135	140	145	330	
10	240	270	1025	215	662	735	205	635	235	235	160	300	M30 x 60	150	150	155	350	
11	275	310	1105	250	782	775	180	710	270	270	170	300	M30 x 60	165	165	170	400	
12	275	310	1260	250	790	930	265	780	270	270	180	300	M30 x 60	180	180	185	405	

H3.H



Shafts:

$k_6 < \phi 28$

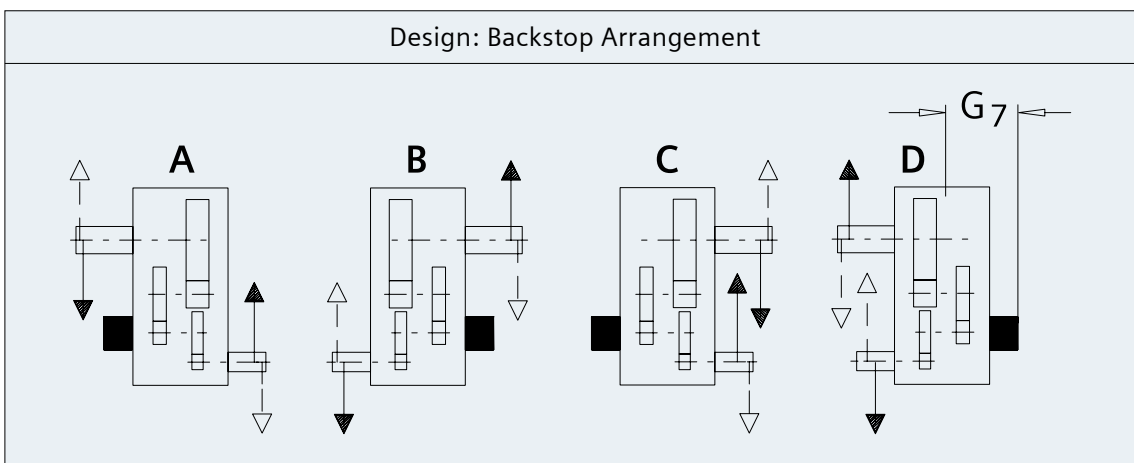
$m_6 \leq \phi 100$

$n_6 > \phi 100$

Parallel keyways acc. to DIN 6885/1

The tolerance zone for the hub keyway width is JS9

Parallel keys acc. to DIN 6885/1 Form B



Nominal Ratios															
		25	28	31.5	35.5	40	45	50	56	63	71	80	90	100	112
Gear Unit Size	5	96.5 70.5	87.1 68.3	77.7 67.0	68.3 65.3	61.6 61.8	53.6 59.2	48.2 57.9	42.9 55.3	38.9 52.4	33.5 52.0	29.5 49.3	26.8 48.8	- -	- -
	6	- -	- -	103.2 77.1	91.1 74.8	81.7 72.8	71.0 70.5	64.3 67.3	57.6 65.1	50.9 63.1	45.6 59.9	40.2 56.5	36.2 56.0	29.5 53.3	28.1 52.7
	7	182.2 102.0	163.5 104.0	146.1 101.0	127.3 99.0	115.2 94.6	99.2 91.4	91.1 87.5	81.7 84.2	72.4 79.2	63.0 76.9	56.3 75.2	45.6 71.2	- -	- -
	8	- -	- -	182.2 111.0	159.5 113.1	144.7 109.2	124.6 106.3	113.9 102.6	101.8 99.8	91.1 95.3	79.1 90.9	71.0 85.0	63.0 82.3	56.3 81.1	46.9 76.8
	9	300.2 134.7	269.3 135.9	239.9 134.8	210.4 132.3	190.3 126.0	164.8 121.8	150.1 121.4	134.0 117.1	119.3 112.0	104.5 109.7	93.8 104.0	80.4 98.9	- -	- -
	10	- -	- -	294.8 137.9	257.3 139.5	233.2 136.0	202.3 132.9	183.6 128.5	164.8 125.3	147.4 124.0	128.6 118.3	115.2 111.9	101.8 109.5	91.1 104.7	80.4 99.7
	11	533.3 185.2	481.1 184.7	427.5 183.6	373.9 182.1	337.7 177.7	293.5 177.8	266.7 180.5	239.9 170.3	213.1 164.7	186.3 161.3	167.5 152.8	148.7 147.9	- -	- -
	12	- -	- -	519.9 214.0	454.3 212.9	411.4 209.7	356.4 203.3	324.3 203.7	292.1 207.6	260.0 207.4	226.5 194.0	202.3 183.2	179.6 180.0	162.1 171.5	144.7 166.8

Power Rating
 P_N in HP at $n_1 = 1500$ RPM

96.5
70.5

Gear unit without auxiliary cooling
 P_{GA} in HP

Thermal capacity P_G in HP for

- $n_1 = 1500$ RPM
- Installation in a large hall (wind velocity > 3.1 mph)
- Altitude up to 3,281 ft
- Thermal factor $f_4 = 1$ (see page 3)

Size	Oil Quantity (gal)*	Weight (lbs)**
5	4	704
6	4	805
7	7	1190
8	8	1375
9	12	1925
10	12	2245
11	22	3080
12	23	3685

* Approximate values; exact data acc. to order-related documentation.
 ** Without oil filling

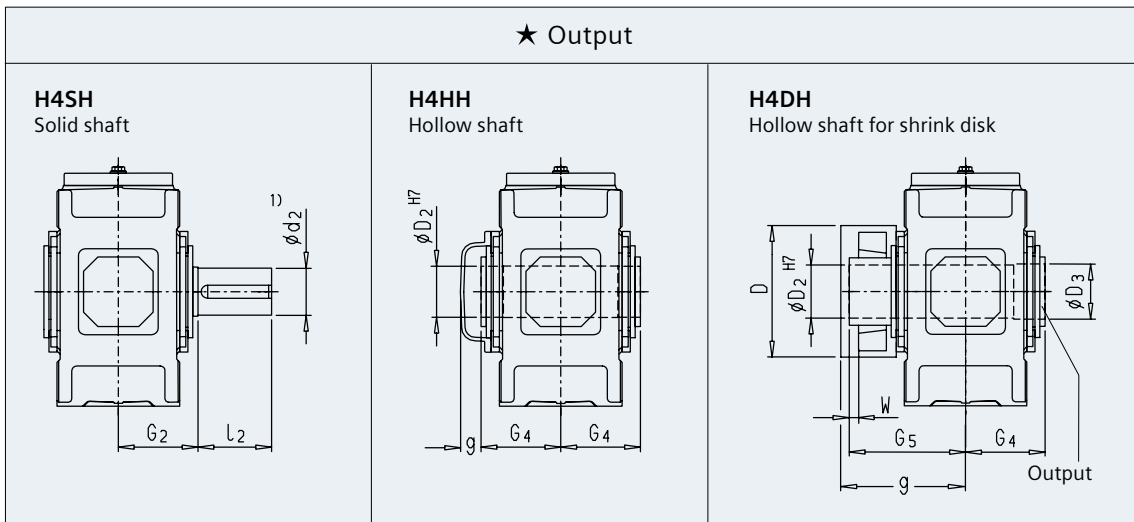
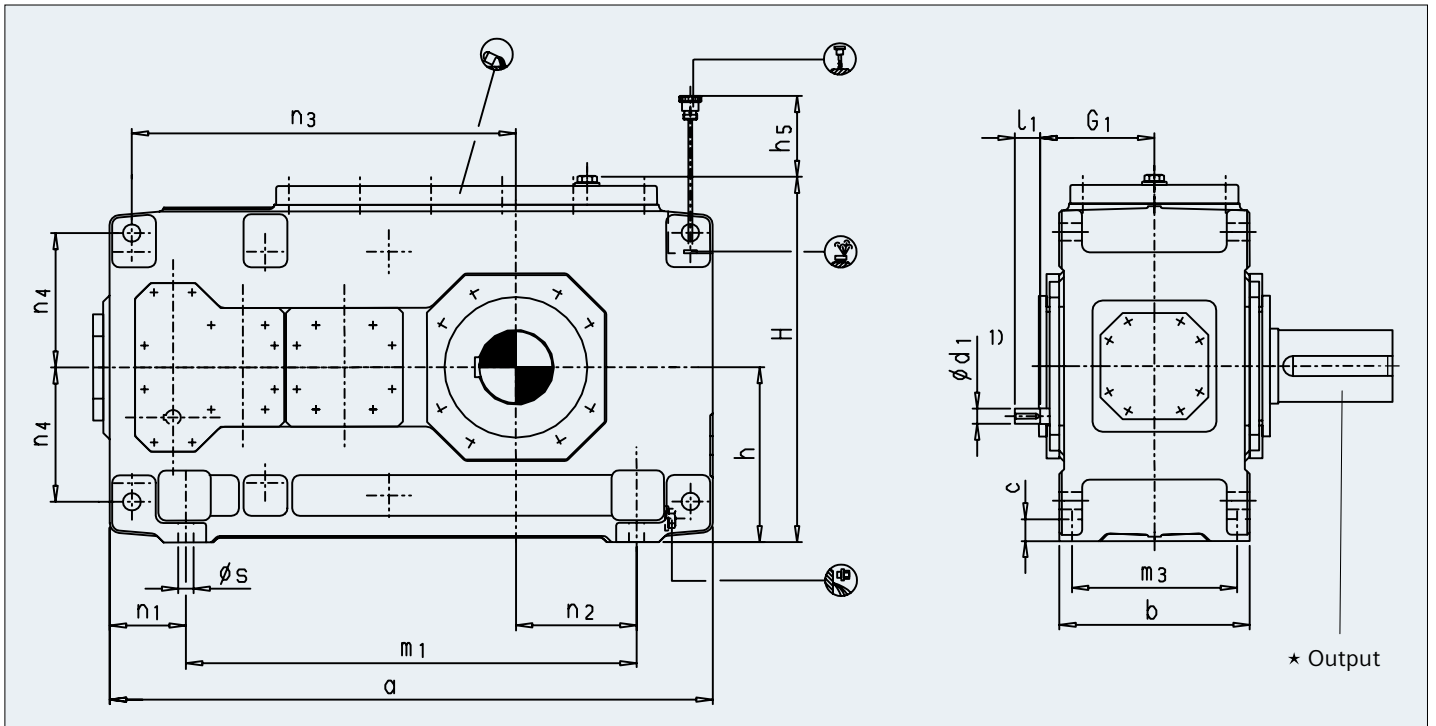
Sealing:

- Input: shaft seal
- Output: shaft seal or Taconite seal (dustproof)

Size		Input									Gear Unit Dimensions (mm)						
		$i_N = 25 - 45$			$i_N = 50 - 63$			$i_N = 71 - 90$									
		$i_N = 31.5 - 56$			$i_N = 63 - 80$			$i_N = 90 - 112$									
		d_1	l_1	DS	d_1	l_1	DS	d_1	l_1	DS	b	c	m_3	n_1	n_4	s	h_1
5	+ 6	40	70	M16 x 36	30	50	M10 x 22	24	40	M8 x 19	255	28	220	105	180	19	230
7	+ 8	45	80	M16 x 36	35	60	M12 x 28	28	50	M10 x 22	300	35	260	120	215	24	280
9	+ 10	60	125	M20 x 42	45	100	M16 x 36	32	80	M12 x 28	370	40	320	145	245	28	320
11	+ 12	70	120	M20 x 42	50	80	M16 x 36	42	70	M16 x 36	430	50	370	165	300	35	380

Size	Gear Unit Dimensions (mm)							Output									
								H3SH				H3HH	H3DH			Backstop	
	G_1	a	h_5	H	m_1	n_2	n_3	G_2	G_4	d_2	l_2	DS	D_2	D_2	D_3	G_5	G_7
5	160	690	130	482	480	100	455	165	165	100	210	M24 x 50	95	100	100	240	234
6	160	770	130	482	560	145	490	165	165	110	210	M24 x 50	105	110	110	240	234
7	185	845	170	572	605	130	560	195	195	120	210	M24 x 50	115	120	120	280	287
8	185	950	160	582	710	190	605	195	195	130	250	M24 x 50	125	130	130	285	287
9	230	1000	185	662	710	155	660	235	235	140	250	M30 x 60	135	140	145	330	317
10	230	1100	185	662	810	205	710	235	235	160	300	M30 x 60	150	150	155	350	317
11	255	1200	180	782	870	180	805	270	270	170	300	M30 x 60	165	165	170	400	369
12	255	1355	170	790	1025	265	875	270	270	180	300	M30 x 60	180	180	185	405	369

H4.H



Shafts:

$k_6 < \emptyset 28$

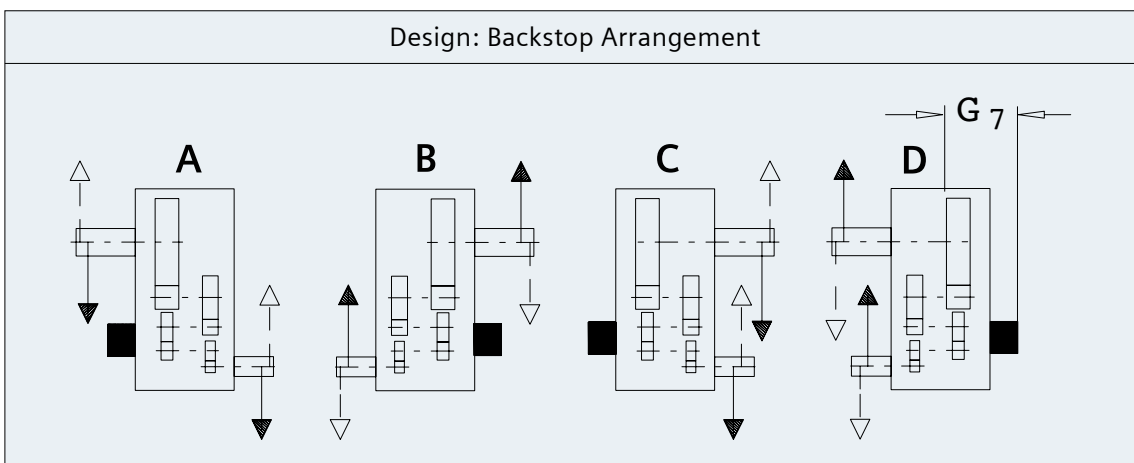
$m_6 \leq \emptyset 100$

$n_6 > \emptyset 100$

Parallel keyways acc. to DIN 6885/1

The tolerance zone for the hub keyway width is JS9

Parallel keys acc. to DIN 6885/1 Form B



Nominal Ratios															
		100	112	125	140	160	180	200	224	250	280	315	355	400	450
Gear Unit Size	7	45.6 65.4	40.2 63.1	36.2 61.4	32.2 58.4	28.1 56.3	24.1 54.3	22.8 52.3	20.1 49.3	17.4 47.0	16.1 45.7	13.4 44.8	11.5 42.6	- -	- -
	8	- -	- -	45.6 70.5	40.2 67.8	34.8 65.8	30.8 62.7	28.1 60.4	25.5 58.0	22.8 56.1	20.1 52.7	17.4 50.5	14.7 49.0	13.4 48.0	11.7 45.7
	9	75.0 90.7	67.0 87.2	59.0 84.7	52.3 82.1	46.9 77.9	41.5 74.8	37.5 72.5	33.5 69.7	29.5 66.5	26.8 64.6	22.8 61.5	20.1 60.4	- -	- -
	10	- -	- -	73.7 91.7	65.7 87.9	57.6 85.5	50.9 82.9	45.6 78.5	41.5 75.3	36.2 73.2	32.2 70.1	29.5 67.0	25.5 65.0	22.8 61.9	18.8 60.8
	11	128.6 132.8	115.2 132.9	103.2 128.0	92.5 124.5	80.4 118.7	71.0 115.1	64.3 108.9	57.6 104.8	50.9 99.6	45.6 95.8	40.2 93.4	36.2 88.8	- -	- -
	12	- -	- -	131.3 148.3	116.6 147.8	101.8 143.0	89.8 138.3	81.7 132.5	72.4 128.1	65.7 120.9	59.0 116.3	52.3 110.3	45.6 106.1	41.5 103.7	34.8 98.5

Power Rating
 P_N in HP at $n_1 = 1500$ RPM

45.6
65.4

Gear unit without auxiliary cooling
 P_{GA} in HP

Thermal capacity P_G in HP for

- $n_1 = 1500$ RPM
- Installation in a large hall (wind velocity > 3.1 mph)
- Altitude up to 3,281 ft
- Thermal factor $f_4 = 1$ (see page 3)

Size	Oil Quantity (gal)*	Weight (lbs)**
7	7	1210
8	7	1420
9	12	1925
10	13	2220
11	21	3210
12	23	3795

* Approximate values; exact data acc. to order-related documentation.

** Without oil filling

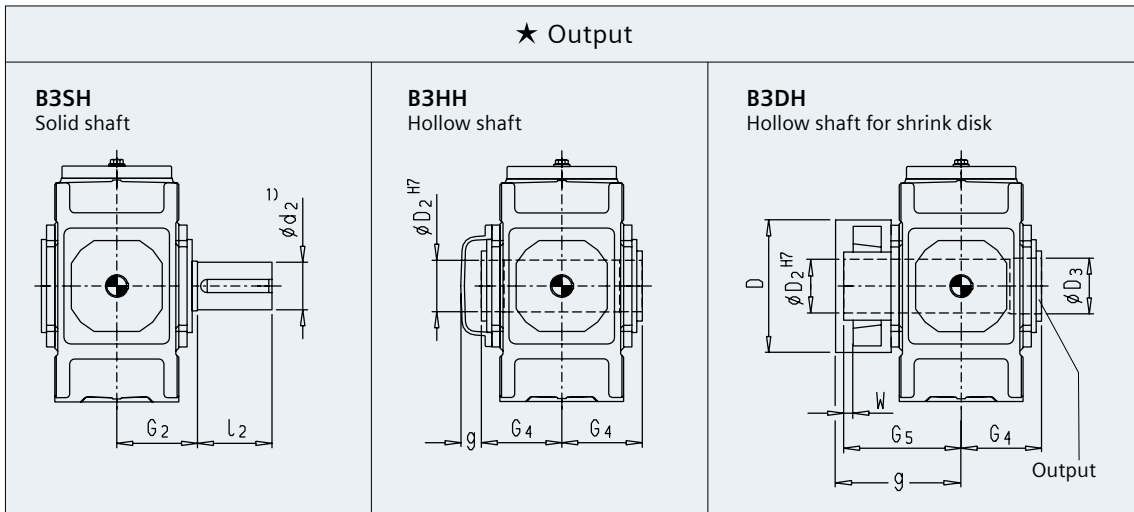
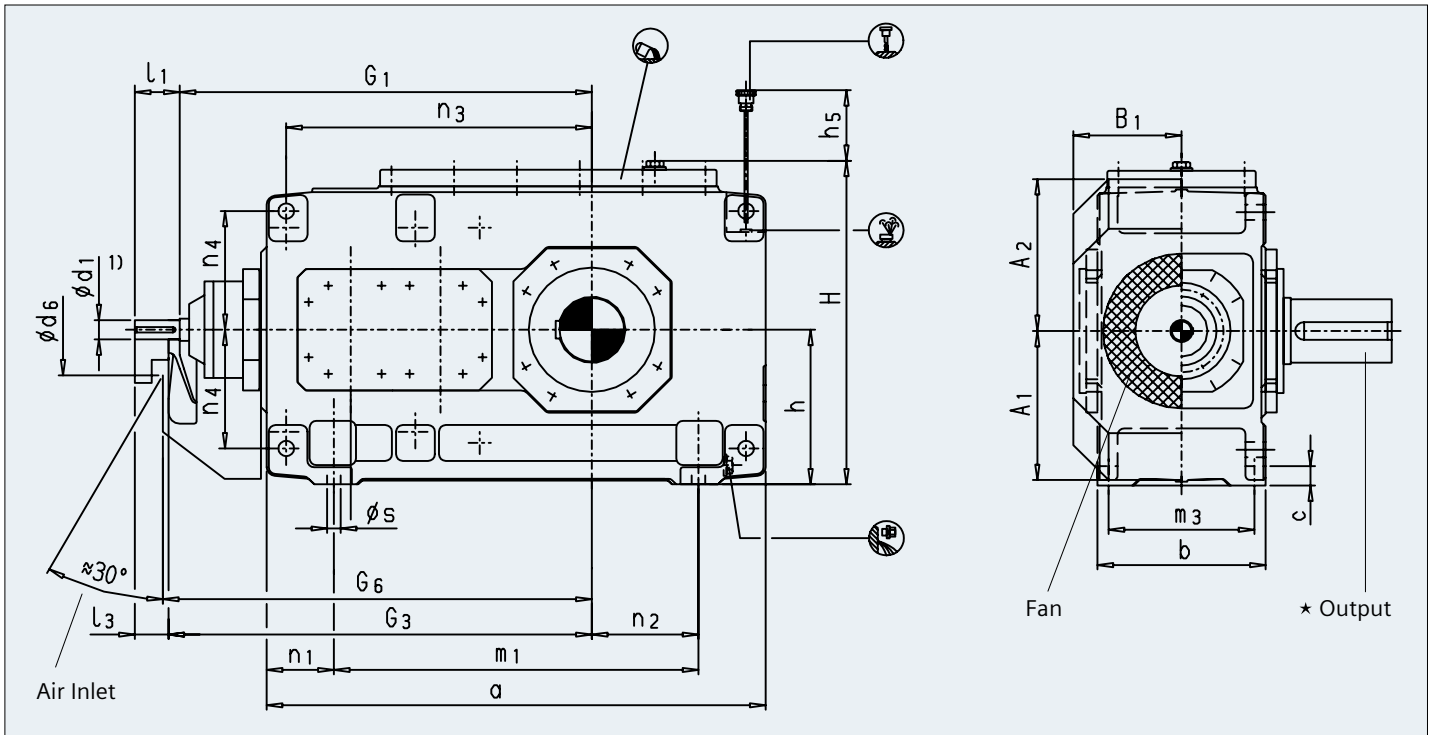
Sealing:

- Input: shaft seal
- Output: shaft seal or Taconite seal (dustproof)

Size		Input						Gear Unit Dimensions (mm)						
		$i_N = 100 - 180$			$i_N = 200 - 355$									
		$i_N = 125 - 224$			$i_N = 250 - 450$									
		d_1	l_1	DS	d_1	l_1	DS	b	c	m_3	n_1	n_4	s	h_1
7	+ 8	30	50	M10 x 22	24	40	M8 x 19	300	35	260	120	215	24	280
9	+ 10	35	60	M12 x 28	28	50	M10 x 22	370	40	320	145	245	28	320
11	+ 12	45	100	M16 x 36	32	80	M12 x 28	430	50	370	165	300	35	380

Size	Gear Unit Dimensions (mm)							Output									
								H4SH				H4HH	H4DH		Backstop		
	G_1	a	h_5	H	m_1	n_2	n_3	G_2	G_4	d_2	l_2	DS	D_2	D_2	D_3	G_5	G_7
7	180	845	140	572	605	130	560	195	195	120	210	M24 x 50	115	120	120	280	286
8	180	950	140	582	710	190	605	195	195	130	250	M24 x 50	125	130	130	285	286
9	215	1000	150	662	710	155	660	235	235	140	250	M30 x 60	135	140	145	330	317
10	215	1100	150	662	810	205	710	235	235	160	300	M30 x 60	150	150	155	350	317
11	250	1200	165	782	870	180	805	270	270	170	300	M30 x 60	165	165	170	400	333
12	250	1355	165	790	1025	265	875	270	270	180	300	M30 x 60	180	180	185	405	333

B3.H



Shafts:

$k_6 < \emptyset 28$

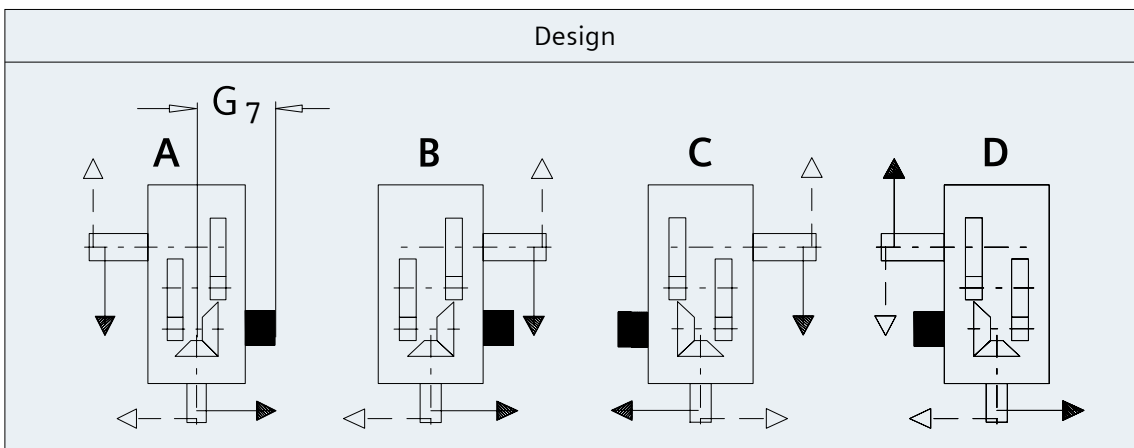
$m_6 \leq \emptyset 100$

$n_6 > \emptyset 100$

Parallel keyways acc. to
DIN 6885/1

The tolerance zone for the
hub keyway width is JS9

Parallel keys acc. to DIN
6885/1 Form B



Nominal Ratios																				
		12.5	14	16	18	20	22.4	25	28	31.5	35.5	40	45	50	56	63	71	80	90	
Gear Unit Size	5	158.1	146.1	138.0	131.3	121.9	108.5	96.5	87.1	77.7	68.3	61.6	53.6	48.2	42.9	37.5	32.2	-	-	
		67.7	66.6	64.9	63.2	61.1	60.6	58.2	57.0	54.5	51.7	45.2	44.1	44.4	41.1	39.7	37.8	-	-	
		158.4	154.0	148.5	144.3	138.7	136.7	129.6	125.0	118.6	111.2	96.1	93.7	92.7	85.9	82.5	78.4	-	-	
	6	-	-	158.1	146.1	138.0	132.7	130.0	116.6	103.2	91.1	81.7	71.0	64.3	57.6	50.9	45.6	36.2	32.2	-
		-	-	74.4	72.6	70.5	68.9	67.1	67.0	64.1	62.3	59.5	56.0	49.4	48.5	48.2	44.6	42.9	40.9	-
		-	-	169.6	164.7	158.9	154.5	148.6	146.9	139.0	133.9	126.8	118.7	103.2	100.6	99.6	91.7	88.3	84.0	-
	7	285.4	272.0	260.0	245.2	227.8	203.7	182.2	163.5	146.1	127.3	115.2	99.2	91.1	81.7	71.0	57.6	-	-	-
		102.8	101.4	97.7	95.3	92.3	90.0	88.7	85.9	82.7	79.3	69.8	68.1	68.1	63.7	61.8	59.0	-	-	-
		250.2	242.3	231.7	224.9	216.0	209.0	202.6	191.9	182.5	173.1	150.3	145.3	143.2	133.3	128.9	122.9	-	-	-
	8	-	-	282.7	268.0	262.6	247.9	227.8	205.0	182.2	159.5	144.7	124.6	113.9	101.8	91.1	79.1	69.7	59.0	-
		-	-	111.8	108.8	104.7	102.8	100.9	99.7	97.6	93.7	89.9	85.9	76.2	74.8	74.1	68.9	66.7	63.7	-
		-	-	263.7	257.1	244.8	238.1	228.3	222.3	215.7	204.8	194.3	183.7	160.3	155.7	153.2	142.2	137.5	130.8	-
9	470.3	442.2	408.7	394.0	375.2	335.0	300.2	269.3	239.9	210.4	190.3	164.8	150.1	134.0	119.3	99.2	-	-	-	
	128.0	127.7	126.4	124.0	120.5	118.9	116.6	114.0	111.0	106.7	100.5	93.0	93.0	86.8	84.2	79.1	-	-	-	
	335.8	327.5	321.5	311.6	299.8	293.5	280.6	267.6	255.5	242.9	226.1	207.0	202.3	188.0	181.6	170.0	-	-	-	
10	-	-	469.0	435.5	412.7	392.6	368.5	331.0	294.8	257.3	233.2	202.3	183.6	164.8	147.4	128.6	115.2	100.5	-	
	-	-	138.2	129.2	134.3	125.8	124.4	122.3	121.7	117.5	113.1	108.3	103.3	96.5	95.1	88.4	85.6	80.5	-	
	-	-	352.3	326.0	336.9	310.3	300.0	295.1	281.7	267.5	256.5	241.6	227.5	208.8	203.3	188.8	182.5	171.1	-	
11	881.7	850.9	789.3	720.9	667.3	596.3	533.3	481.1	427.5	373.9	337.7	293.5	266.7	239.9	213.1	175.5	-	-	-	
	151.2	157.2	153.3	154.6	151.0	147.9	147.1	146.5	143.4	140.8	134.7	124.9	128.5	119.1	115.8	107.6	-	-	-	
	505.7	502.4	480.8	473.3	454.8	434.2	412.3	397.2	378.1	363.4	341.8	314.4	311.4	283.9	273.0	253.7	-	-	-	
12	-	-	873.7	809.4	763.8	710.2	649.9	584.2	519.9	454.3	411.4	356.4	324.3	292.1	260.0	226.5	202.3	175.5	-	
	-	-	167.9	173.5	166.8	172.1	174.9	176.9	173.0	168.8	162.5	158.3	154.5	145.1	145.3	133.9	128.4	120.2	-	
	-	-	546.3	550.9	516.3	520.6	503.7	487.8	461.2	440.2	415.7	400.4	377.6	349.3	342.6	311.7	300.4	279.3	-	

Power Rating
 P_N in HP at $n_1 = 1500$ RPM

158.1
67.7
158.4

Gear unit without auxiliary cooling
 P_{GA} in HP
 Gear unit with fan
 P_{GB} in HP

Thermal capacity P_G in HP for

- $n_1 = 1500$ RPM
- Installation in a large hall (wind velocity > 3.1 mph)
- Altitude up to 3,281 ft
- Thermal factor $f_4 = 1$ (see page 3)

Size	Oil Quantity (gal)*	Weight (lbs)**
5	4	715
6	4	835
7	7	1210
8	7	1395
9	10	1960
10	11	2245
11	17	3200
12	19	3805

Sealing:

- Shaft seal or Taconite seal (dustproof)

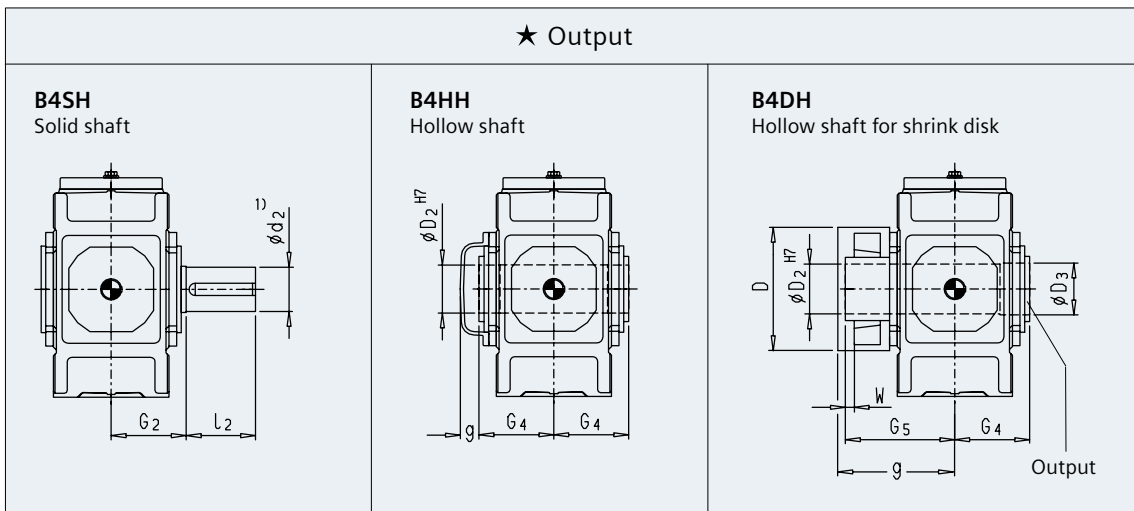
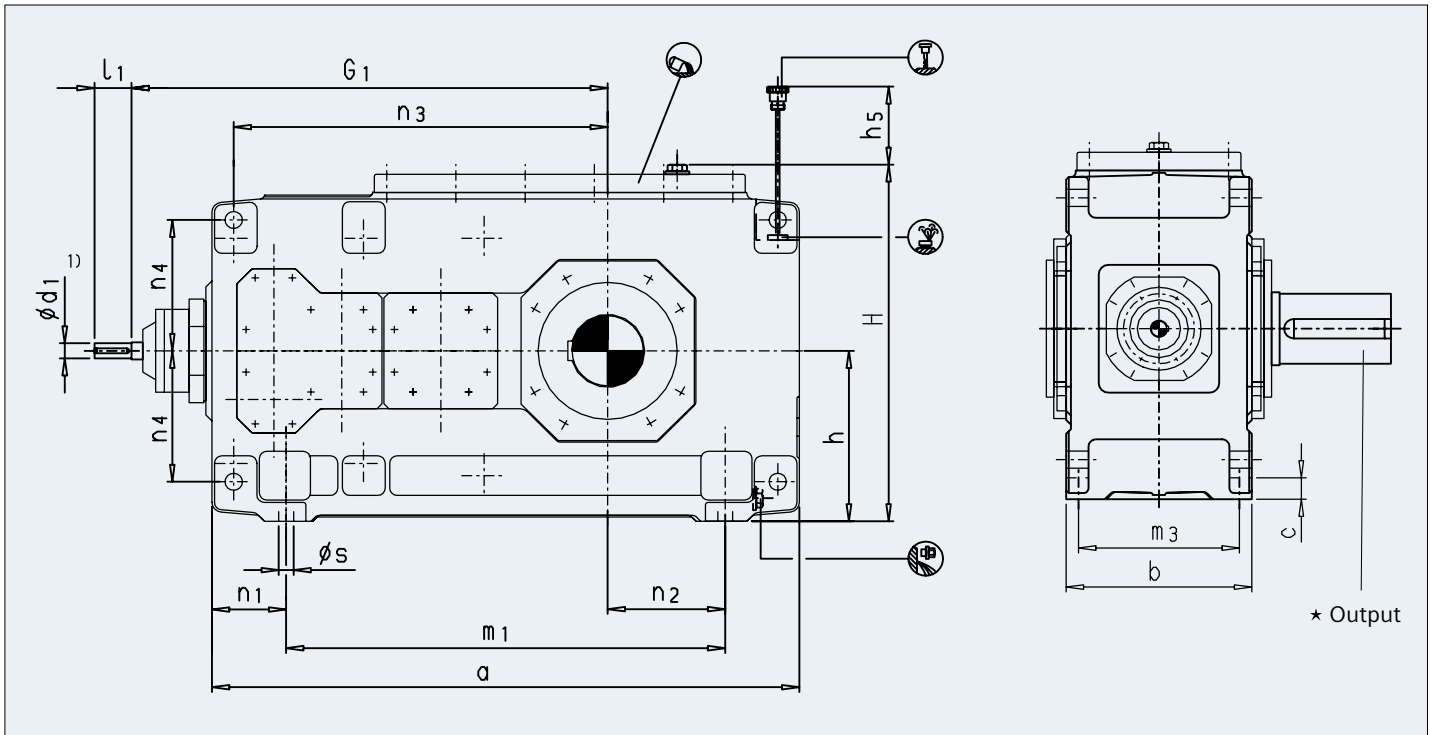
* Approximate values; exact data acc. to order-related documentation.

** Without oil filling

Size	Input									Gear Unit Dimensions (mm)										
	$i_N = 12.5 - 45$				$i_N = 50 - 71$															
	$i_N = 16 - 56$				$i_N = 63 - 90$															
	d_1	l_1	l_3	DS	d_1	l_1	l_3	DS	A_1	A_2	b	B_1	c	d_e	m_3	n_1	n_4	s	$h_{.1}$	
5	+ 6	35	80	60	M12 x 28	28	60	40	M10 x 22	220	235	255	168	28	130	220	105	180	19	230
7	+ 8	45	100	80	M16 x 36	35	80	60	M12 x 28	275	275	300	193	35	165	260	120	215	24	280
9	+ 10	55	110	80	M20 x 42	40	100	70	M16 x 36	315	325	370	231	40	175	320	145	245	28	320
11	+ 12	70	135	105	M20 x 42	50	110	80	M16 x 36	370	385	430	263	50	190	370	165	300	35	380

Size	Gear Unit Dimensions (mm)									Output									
	G_1	G_3	a	G_6	h_5	H	m_1	n_2	n_3	B3SH			B3HH		B3DH			Backstop	
	G_2	G_4	d_2	l_2	DS	D_2	D_2	D_3	G_5	G_7									
5	575	595	640	605	130	482	430	100	405	165	165	100	210	M24 x 50	95	100	100	240	223
6	610	630	720	640	130	482	510	145	440	165	165	110	210	M24 x 50	105	110	110	240	223
7	690	710	785	720	170	572	545	130	500	195	195	120	210	M24 x 50	115	120	120	280	281
8	735	755	890	765	160	582	650	190	545	195	195	130	250	M24 x 50	125	130	130	285	281
9	800	830	925	845	175	662	635	155	585	235	235	140	250	M30 x 60	135	140	145	330	317
10	850	880	1025	895	175	662	735	205	635	235	235	160	300	M30 x 60	150	150	155	350	317
11	960	990	1105	1010	220	782	775	180	710	270	270	170	300	M30 x 60	165	165	170	400	368
12	1030	1060	1260	1080	210	790	930	265	780	270	270	180	300	M30 x 60	180	180	185	405	368

B4.H



Shafts:

$k_6 < \phi 28$

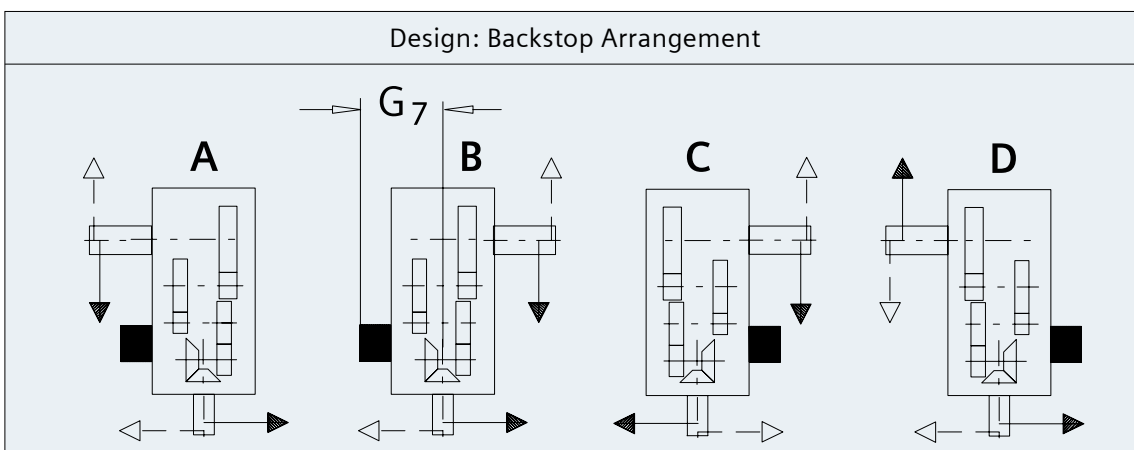
$m_6 \leq \phi 100$

$n_6 > \phi 100$

Parallel keyways acc. to
DIN 6885/1

The tolerance zone for the
hub keyway width is JS9

Parallel keys acc. to DIN
6885/1 Form B



Nominal Ratios																
		80	90	100	112	125	140	160	180	200	224	250	280	315	355	400
Gear Unit Size	5	29.5 42.6	26.8 41.7	24.1 39.8	21.4 38.5	18.8 36.7	16.1 35.1	14.7 32.3	13.4 31.8	12.2 30.7	10.9 28.5	9.6 28.0	8.7 26.7	7.5 24.9	- -	- -
	6	- -	- -	32.2 45.7	28.1 44.6	25.5 42.7	22.8 41.3	20.1 39.4	17.4 37.8	16.1 34.7	13.4 34.2	13.0 32.8	11.7 30.8	10.3 30.0	9.1 28.7	7.6 26.8
	7	56.3 63.0	49.6 61.1	45.6 57.9	40.2 55.7	36.2 53.3	32.2 50.8	28.1 46.4	24.1 45.3	22.8 44.9	20.1 41.9	17.4 40.6	16.1 38.1	13.4 35.6	- -	- -
	8	- -	- -	56.3 67.3	50.9 65.4	45.6 62.0	40.2 59.9	34.8 57.2	30.8 54.5	28.1 49.8	25.5 48.8	22.8 48.4	20.1 45.3	17.4 43.6	14.7 40.9	13.4 38.3
	9	93.8 88.6	83.1 86.8	75.0 82.4	67.0 79.5	59.0 76.0	52.3 71.7	46.9 65.7	41.5 64.2	37.5 63.1	33.5 59.1	29.5 57.1	25.5 54.5	22.8 51.2	- -	- -
	10	- -	- -	92.5 89.4	83.1 87.5	73.7 83.2	65.7 80.3	57.6 76.6	50.9 72.9	45.6 66.9	41.5 65.3	36.2 64.1	32.2 60.0	29.5 58.2	25.5 55.3	22.8 52.1
	11	162.1 132.1	143.4 128.5	128.6 124.0	115.2 118.3	103.2 113.6	92.5 107.9	80.4 98.6	71.0 96.3	64.3 94.5	57.6 89.1	50.9 86.6	45.6 82.9	40.2 77.5	- -	- -
	12	- -	- -	163.5 147.7	146.1 143.1	131.3 137.1	116.6 131.2	101.8 126.1	89.8 119.8	81.7 109.9	72.4 107.5	65.7 105.3	59.0 99.3	52.3 96.1	45.6 91.7	38.9 85.6

Power Rating
 P_N in HP at $n_1 = 1500$ RPM

Thermal capacity P_G in HP for

- $n_1 = 1500$ RPM
- Installation in a large hall (wind velocity > 3.1 mph)
- Altitude up to 3,281 ft
- Thermal factor $f_4 = 1$ (see page 3)

Size	Oil Quantity (gal)*	Weight (lbs)**
5	4	735
6	5	845
7	8	1220
8	9	1440
9	12	1960
10	13	2255
11	21	3265
12	23	3850

Sealing:

- Shaft seal or Taconite seal (dustproof)

* Approximate values; exact data acc. to order-related documentation.

** Without oil filling

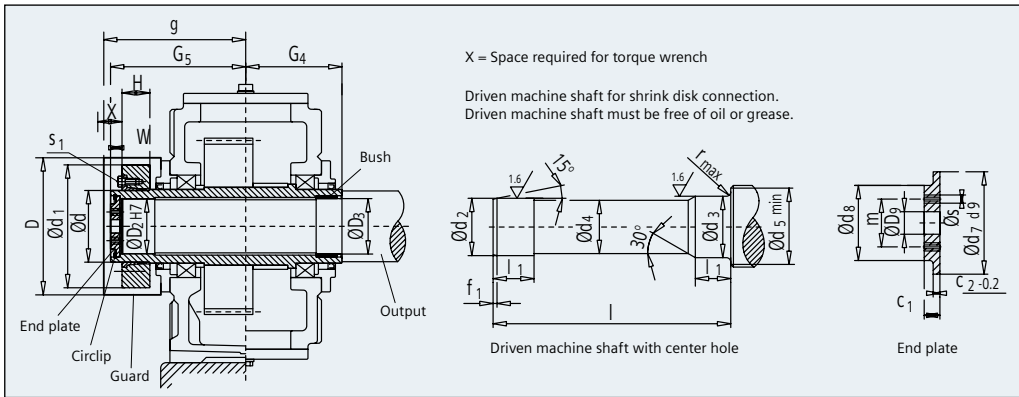
Size	Input							Gear Unit Dimensions (mm)						
	$i_N = 80 - 180$			$i_N = 200 - 315$										
	$i_N = 100 - 224$			$i_N = 250 - 400$										
	d_1	l_1	DS	d_1	l_1	DS	b	c	m_3	n_1	n_4	s	h_1	
5	+ 6	28	55	M10 x 22	20	50	M6 x 16	255	28	220	105	180	19	230
7	+ 8	30	70	M10 x 22	25	60	M10 x 22	300	35	260	120	215	24	280
9	+ 10	35	80	M12 x 28	28	60	M10 x 22	370	40	320	145	245	28	320
11	+ 12	45	100	M16 x 36	35	80	M12 x 28	430	50	370	165	300	35	380

Size	Gear Unit Dimensions (mm)							Output									
								B4SH			B4HH	B4DH			Backstop		
	G_1	a	h_5	H	m_1	n_2	n_3	G_2	G_4	d_2	l_2	DS	D_2	D_2	D_3	G_5	G_7
5	615	690	100	482	480	100	455	165	165	100	210	M24 x 50	95	100	100	240	236
6	650	770	100	482	560	145	490	165	165	110	210	M24 x 50	105	110	110	240	236
7	725	845	140	572	605	130	560	195	195	120	210	M24 x 50	115	120	120	280	286
8	770	950	130	582	710	190	605	195	195	130	250	M24 x 50	125	130	130	285	286
9	840	1000	135	662	710	155	660	235	235	140	250	M30 x 60	135	140	145	330	317
10	890	1100	135	662	810	205	710	235	235	160	300	M30 x 60	150	150	155	350	317
11	1010	1200	170	782	870	180	805	270	270	170	300	M30 x 60	165	165	170	400	333
12	1080	1355	160	790	1025	265	875	270	270	180	300	M30 x 60	180	180	185	405	333

Gear Units

Hollow Shafts for Shrink Disks

Types H2, H3, H4, B3, B4; Sizes 5–12



¹ Shrink disk does not belong to our scope of supply. Please order separately, if required. In case of order, shrink disk will be supplied as loose item.

² Material of driven machine shaft: C60N or higher strength.

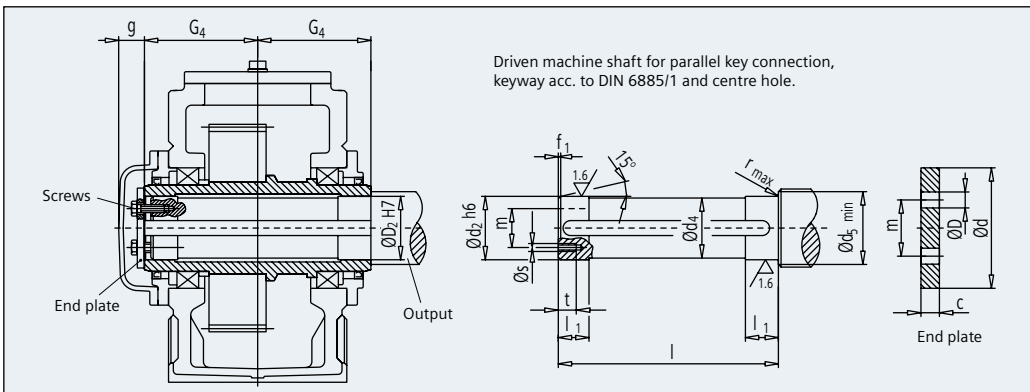
Shrink disk on machine side on request.

Types H2D., H3D., H4D., B3D., B4D.

Gear Unit Size	Driven Machine Shaft ²										End Plate						Circlip	Hollow Shaft				Shrink Disk ¹				Screw	Guard	
	d ₂	d ₃	d ₄	d ₅	f ₁	l	l ₁	r	c ₁	c ₂	d ₇	d ₈	D ₉	m	s	Qty.		DIN 472	D ₂	D ₃	G ₄	G ₅	d	d ₁	H		W	s ₁
5	100 g6	100 h6	99.5	114	5	383	53	2	20	8	105	80	26	55	M10	2	105 x 4	100	100	165	240	125	215	55	20	M12	275	260
6	110 g6	110 h6	109.5	124	5	383	58	3	20	8	115	85	26	60	M10	2	115 x 4	110	110	165	240	140	230	61	20	M14	285	255
7	120 g6	120 h6	119.5	134	5	453	68	3	20	8	125	90	26	65	M12	2	125 x 4	120	120	195	280	155	263	64	23	M14	330	305
8	130 g6	130 h6	129.5	145	6	458	73	3	20	8	135	100	26	70	M12	2	135 x 4	130	130	195	285	165	290	70	23	M16	340	305
9	140 g6	145 m6	139.5	160	6	539	82	4	23	10	150	110	33	80	M12	2	150 x 4	140	145	235	330	175	300	71	28	M16	360	355
10	150 g6	155 m6	149.5	170	6	559	92	4	23	10	160	120	33	90	M12	2	160 x 4	150	155	235	350	200	340	87	28	M16	395	365
11	165 f6	170 m6	164.5	185	7	644	112	4	23	10	175	130	33	90	M12	2	175 x 4	165	170	270	400	220	370	103	30	M20	435	420
12	180 f6	185 m6	179.5	200	7	649	122	4	23	10	190	140	33	100	M16	2	190 x 4	180	185	270	405	240	405	107	30	M20	450	420

Hollow Shafts for Parallel Key Connections

Types H2, H3, H4, B3, B4; Sizes 5–12



Types H2H., H3H., H4H., B3H., B4H.

Gear Unit Size	Driven Machine Shaft ¹										End Plate				Screw		Hollow Shaft		
	d ₂	d ₄	d ₅	f ₁	l	l ₁	r	s	t	c	D	D ₉	d	m	Size	Qty.	D ₂	G ₄	g
5	95	94.5	105	5	328	40	1.6	M 10	18	10	11	26	120	70	M 10 x 25	2	95	165	40
6	105	104.5	116	5	328	45	1.6	M 10	18	10	11	26	120	70	M 10 x 25	2	105	165	40
7	115	114.5	126	5	388	50	1.6	M 12	20	12	13.5	26	140	80	M 12 x 30	2	115	195	40
8	125	124.5	136	6	388	55	2.5	M 12	20	12	13.5	26	150	85	M 12 x 30	2	125	195	40
9	135	134.5	147	6	467	60	2.5	M 12	20	12	13.5	33	160	90	M 12 x 30	2	135	235	45
10	150	149.5	162	6	467	65	2.5	M 12	20	12	13.5	33	185	110	M 12 x 30	2	150	235	45
11	165	164.5	177	7	537	70	2.5	M 16	28	15	17.5	33	195	120	M 16 x 40	2	165	270	45
12	180	179.5	192	7	537	75	2.5	M 16	28	15	17.5	33	220	130	M 16 x 40	2	180	270	45

¹ Material of driven machine shaft: C60N or higher strength.

Parallel key does not belong to our scope of supply. Please order separately, if required.

Date _____
 Name _____
 City _____ State _____ Zip _____
 Phone _____
 Project Name or Reference _____

Quote Required by (Date): _____
 Company _____
 Email _____
 Dimensions in: Inches Metric

JOBSITE/USER CONTACT INFO

Company _____
 City _____ State _____ Zip _____
 Phone _____ Email _____

APPLICATION DATA

Application (e.g. Driven Machine): _____
 Service Factor: _____ Based on Demand Power Motor Power
 Requested Output RPM _____ Requested Ratio _____
 Duty Cycle (hrs. per day): ≤0.5 0.5-10 >10
 Direction of Output Rotation (view towards shaft end):
 CW CCW Both
 Peak Torque: _____
 Peak Loads per hr.: 1-5 6-30 31-100 >100
 Direction of Load: Steady Alternating
 Rated Power P2: _____ [HP / kW] or Torque = _____ [ft.-lb. / N•m]
 External Forces:
 Radial: _____ Axial: _____ on Shaft LSS HSS
 Minimum Bearing Life: _____ hrs. (L10)

SITE/INSTALLATION DATA

Altitude (ft.): <3,200 <6,400 <9,600 >9,600
 Ambient Temperature Range: _____ to _____ [°F / °C]
 Environment: High Dust Explosion Hazard
 Location: Indoors – Confined Space Outdoors
 Indoors – Large Hall
 Cooling Water Available: Y N Temp: _____ [°F / °C]

NOTE: If application data is unknown, default values will be used for calculations.

Sketch and/or description of application including external forces or erratic operation (starts/stops, braking, etc.) or other accessories:

PRIME MOVER (PM)/INPUT DRIVER DATA

Type: Electric Motor Other
 Power: _____ [HP / kW] Volts / ph / Hz: _____
 Speed: _____ RPM or Range (e.g. for VFD) _____
 Design Standard: NEMA IEC Other Frame: _____
 Controller: AAL / Y-D / VFD / Other _____
 Protection: ODP / TEFC / X-Proof _____
 Drive Method: Coupling Pulley Flange
 PM Source: I would like Siemens to also quote a motor

COUPLINGS

Please quote coupling for:
 High-Speed Shaft Preferred Type: _____
 Low-Speed Shaft Preferred Type: _____
 DBSE: _____ PM Shaft Size: _____

OTHER REQUIREMENTS AND ACCESSORIES

- | | |
|--|--|
| <input type="checkbox"/> Backstop | <input type="checkbox"/> Instrumentation |
| <input type="checkbox"/> Torque Arm | <input type="checkbox"/> Temperature Switch |
| <input type="checkbox"/> Brake | <input type="checkbox"/> Pressure Switch |
| <input type="checkbox"/> Clutch | <input type="checkbox"/> Heating Element |
| <input type="checkbox"/> Special Ratio | <input type="checkbox"/> Bearing RTDs or Vibration Monitors |
| <input type="checkbox"/> Motor Mounting Flange/Lantern | <input type="checkbox"/> Oil Level Indicator |
| <input type="checkbox"/> Swing Base | <input type="checkbox"/> Sight Gauge <input type="checkbox"/> Low-Level Switch |
| <input type="checkbox"/> Mounting Baseplate | <input type="checkbox"/> High-Dust Seals for |
| <input type="checkbox"/> Special Paint | <input type="checkbox"/> Input <input type="checkbox"/> Output |
| | <input type="checkbox"/> Drywell |

GEARBOX SELECTION

- Any, per Siemens recommendation or specify:
 Gear Type
 Parallel (Helical) Right-Angle (Bevel) Planetary
 Output Shaft Type
 Hollow Solid
 w/ Shrink disk Flanged
 w/ Keyway Other
 w/ Splines
 Output Mounting Style
 Horizontal Wall-Mount Vertical
 Up Down
 Equipment needed on-site:
 ASAP to 6 months
 6 months to 1 year
 >1 year or more
 Other

Quantity Needed: _____

For additional information regarding FLENDER gear units
visit us at: www.usa.siemens.com/gearboxes.

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Drive Technologies Division
100 Technology Drive
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1-800-241-4453
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