

Spiral Bevel Right Angle Gearbox - Type DZ & ZP

DZ and ZP right angle drives are designed for industrial applications where rotary power must be transferred between two shafts at right angles to each other.

Features:

Housing - single piece aluminium alloy casting with mounting points and centering conditions.

Gears - spiral bevel gears cut on GLEASON hobbing machines to ensure maximum load capacity. Nickel chrome steel gears with surface case hardened gear teeth; this ensures maximum service life while leaving the tooth core tough and flexible to resist mechanical shocks. Units are manufactured with backlash tolerances to ensure perfect gear engagement and silent operation.

Shafts - manufactured in steel with 80kg/mm² surface treatment for corrosion protection. Shaft coupling on the power take-off has ISO standard keyways (except for size 1).

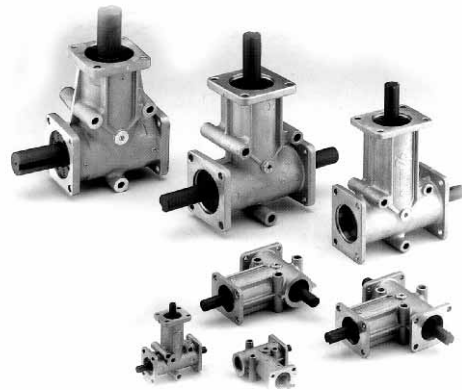
Bearings - large bearings in deep races.

Oil Seals - oil seal rings are fitted to all models. Special seal rings for high and low temperatures are available on request.

Lubrication - units are supplied already filled with lubricant. Size 1 units are filled with long-life grease, all other sizes are oil filled - use Shell Omala 100 or similar mineral oil.

Table 1a shows the following information for each model: the shaft diameter, the transmission ratio, the input shaft A, the output shaft B or C, and the direction of the rotation. In accordance with accepted usage, shaft A is the input shaft, on models with a 2:1 ratio, shaft A is the fast shaft.

Table 1a - Type DZ 1:1, 2:1



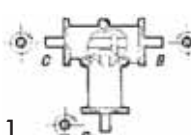
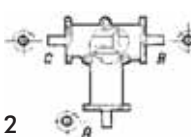
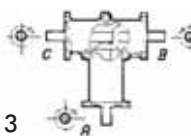
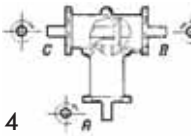
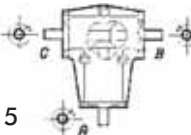
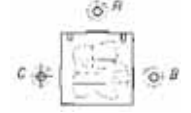
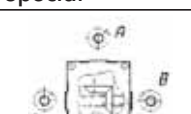
Size	Shaft Ø mm	Ratio	Input	Output	Part Number	Approx. Weight Kg.
 1	8	1:1	A	B	DZ 10S 3FAB	0.28
	8	2:1	A	B	DZ 12S 3FAB	0.28
	8	1:1	A	B-C	DZ 11 3FABC	0.30
	8	2:1	A	B-C	DZ 13 3FABC	0.30
 2	15	1:1	A	B	DZ 20S 3FAB	1.1
	15	2:1	A	B	DZ 22S 3FAB	1.1
	15	1:1	A	B-C	DZ 21 3FABC	1.2
	15	2:1	A	B-C	DZ 23 3FABC	1.2
 3	20	1:1	A	B	DZ 30S 3FAB	3.4
	20	2:1	A	B	DZ 32S 3FAB	3.4
	20	1:1	A	B-C	DZ 31 3FABC	3.5
	20	2:1	A	B-C	DZ 33 3FABC	3.5
 4	25	1:1	A	B	DZ 40S 3FAB	5.5
	25	2:1	A	B	DZ 42S 3FAB	5.5
	25	1:1	A	B-C	DZ 41 3FABC	5.8
	25	2:1	A	B-C	DZ 43 3FABC	5.8
 5	35	1:1	A	B	DZ 50S 3FAB	8.1
	35	2:1	A	B	DZ 52S 3FAB	8.1
	35	1:1	A	B-C	DZ 51 3FABC	8.8
	35	2:1	A	B-C	DZ 53 3FABC	8.8
 Special	14mm hollow input & output +5mm keyway	1:1	A	B-C	DZ50S-60	0.7
 Special	25mm hollow input 25.35 splined output 6 keys	1:1	A	B-C	DZ 512-31	4.1

Table 1b shows the following information for each model: the shaft diameter, the transmission ratio, the input shaft A, the output shaft B or C, and the direction of the rotation. In accordance with accepted usage, shaft A is the input shaft, on models with a 2:1 and 3:1 ratio, shaft A is the fast shaft.



Table 1b - Type ZP 1:1, 2:1, 3:1

Size	Shaft Ø mm	Ratio	Input	Output	Part Number	Approx. Weight Kg.
2	14	3:1	A	B	ZP 24S 4PAB	2.0
	14	3:1	A	B-C	ZP 25 4PABC	2.0
2	14 input & keyed hollow output	1:1	A	B-C	ZP 211-4P3V	1.9
		2:1	A	B-C	ZP 213-4P3V	1.9
		3:1	A	B-C	ZP 215-4P3V	1.9
3	19	3:1	A	B	ZP 34S 4PAB	4.5
	19	3:1	A	B-C	ZP 35 4PABC	4.5
3	19 input & keyed hollow output	1:1	A	B-C	ZP 311-4P3V	4.4
		2:1	A	B-C	ZP 313-4P3V	4.4
		3:1	A	B-C	ZP 315-4P3V	4.4
4	24	3:1	A	B	ZP 44S 4PAB	4.6
	24	3:1	A	B-C	ZP 45 4PABC	4.6

How to select the correct right angle spiral bevel gearbox for your application:

Selecting the correct type of right angle spiral bevel gears is not simply a question of defining the power required in relation to rpm and the torque to be transmitted. It also involves defining the conditions under which the gear box will be used. Defining operating conditions involves taking into consideration a number of factors such as the type of operating cycles (intermittent/continuous), radial and axial loads on the shaft ends, maximum and minimum temperatures, ambient conditions (eg. dust/dirt levels), and the type of lubricant used.

To select the correct sized right angle spiral bevel gear box proceed as follows:

1. Use Table 2 to define the Service Factor for your application (Fs).
2. Calculate the Rated Power (Pn); $P_n = P_e \text{ (kW)} \times F_s$.
3. On Table 3 (required ratio) use the output speed and the rated power (Pn) to select the right angle gear size and transmission ratio required for your application.
4. Check that the radial and axial load at the midpoint of the exposed shaft end does not exceed the values shown in Table 4.
5. Check that the operating temperature does not exceed -20°C to + 80°C.
6. If you require a 2:1 or 3:1 ratio do not use a speed multiplier with an input more than 750rpm and 500rpm respectively.
7. If the unit is to be used in very dusty conditions, protect the oil seal against direct exposure to dust to prevent abrasive damage which might shorten the working life of the unit.

Table 2 Service Factor Fs

	Hours of operation per day			
	3	8	12	24
Uniform Load	0.7	0.9	1	1.3
Load with moderate shock	0.9	1	1.3	1.8
Load with shock	1.3	1.6	1.8	2.3

Table 4 Max Axial and Radial Loads

Size	Max. axial load Kg.	Max. radial load Kg.
DZ1	21	11
DZ2	41	20
DZ3	76	43
DZ4	88	49
DZ5	97	55
ZP2	53	30
ZP3	65	45
ZP4	80	60

Table 3a Torque & Power Rating for DZ & ZP 1:1

Ratio 1:1															
Size	1		2				3				4		5		
Model	DZ 10	DZ 11	DZ 20	DZ 21	ZP 211		DZ 30	DZ 31	ZP 311		DZ 40	DZ 41	DZ 50	DZ 51	
Output Torque	Nm		Nm		Nm		Nm		Nm		Nm		Nm		
Input Power (Pn)	kW		kW		kW		kW		kW		kW		kW		
output in rpm	50	4.7	0.026	16.5	0.093	33.0	0.166	50.5	0.28	79.5	0.408	89.0	0.50	132.0	0.74
	100	4.2	0.047	14.5	0.162	25.4	0.255	44.0	0.49	62.2	0.639	79.0	0.89	118.0	1.32
	200	3.7	0.082	12.6	0.280	19.4	0.391	38.0	0.85	47.6	0.978	69.0	1.54	102.0	2.27
	300	3.4	0.113	11.6	0.386	16.4	0.496	34.7	1.15	41.0	1.262	62.9	2.09	93.2	3.10
	400	3.2	0.142	10.6	0.470	14.6	0.590	32.5	1.44	36.6	1.502	58.7	2.60	86.9	3.85
	600	2.9	0.195	10.0	0.665	12.4	0.746	29.7	1.98	31.0	1.912	53.1	3.53	78.4	5.21
	800	2.7	0.242	9.6	0.847	10.9	0.875	28.4	2.50	27.5	2.258	49.2	4.34	72.6	6.40
	1000	2.6	0.287	9.2	1.014	9.8	0.983	27.1	3.00	25.1	2.576	46.3	5.10	68.3	7.58
	1200	2.5	0.331	8.9	1.177	9.0	1.085	26.2	3.47	23.2	2.864	44.0	5.82	64.8	8.57
	1400	2.4	0.368	8.6	1.320	8.4	1.182	25.2	3.87	21.7	3.117	42.1	6.46	61.9	9.50
	1600	2.3	0.407	8.3	1.455	7.8	1.263	24.3	4.26	20.5	3.375	40.5	7.10	59.5	10.44
	1800	2.3	0.442	8.0	1.571	7.4	1.340	23.5	4.61	19.4	3.588	39.1	7.68	57.3	11.25
	2000	2.2	0.476	7.9	1.723	7.0	1.409	22.8	4.98	18.6	3.812	37.9	8.27	55.5	12.11
2500	2.1	0.556	7.8	2.105	6.3	1.574	21.3	5.75	16.7	4.293	35.3	9.53	51.6	13.93	
3000	2.0	0.632	7.7	2.494	5.7	1.709	20.2	6.54	15.3	4.714	33.3	10.78	48.5	15.71	

Table 3b Torque & Power Rating for DZ & ZP 2:1

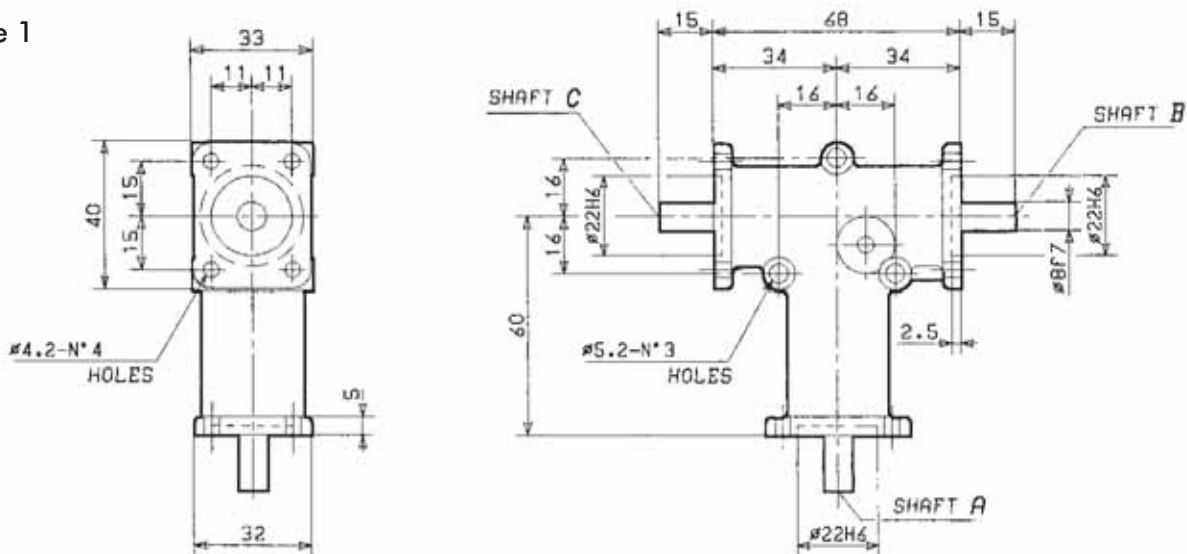
Ratio 2:1															
Size	1		2				3				4		5		
Model	DZ 12	DZ 13	DZ 22	DZ 23	ZP213		DZ 32	DZ 33	ZP 313		DZ 42	DZ 43	DZ 52	DZ 53	
Output Torque	Nm		Nm		Nm		Nm		Nm		Nm		Nm		
Input Power (Pn)	kW		kW		kW		kW		kW		kW		kW		
output in rpm	50	1.7	0.010	6.7	0.038	25.7	0.129	27.0	0.15	43.6	0.223	46.0	0.26	72.2	0.41
	100	1.5	0.017	6.2	0.069	22.0	0.221	26.0	0.29	37.8	0.388	44.0	0.49	67.7	0.76
	200	1.3	0.030	5.9	0.131	16.6	0.335	24.5	0.55	32.6	0.669	42.5	0.95	63.3	1.41
	300	1.3	0.042	5.6	0.186	13.9	0.421	23.0	0.77	29.6	0.912	41.0	1.36	61.0	2.03
	400	1.2	0.053	5.3	0.235	12.4	0.498	22.0	0.98	27.4	1.128	39.0	1.73	56.6	2.51
	600	1.1	0.074	5.0	0.332	10.2	0.617	21.0	1.40	24.7	1.519	37.0	2.46	53.6	3.56
	800	1.0	0.092	4.8	0.423	8.9	0.713	20.0	1.76	22.8	1.873	35.0	3.09	49.3	4.35
	1000	1.0	0.106	4.5	0.496	8.0	0.801	19.0	2.09	21.3	2.189	33.0	3.64	47.5	5.25
	1200	0.9	0.122	4.3	0.569	7.3	0.879	18.0	2.38	20.2	2.489	31.0	4.10	44.6	5.90
	1400	0.9	0.135	4.2	0.645	6.7	0.937	17.9	2.79	19.2	2.760	29.5	4.53	42.5	6.52
1600	0.8	0.147	4.1	0.719	6.2	1.0	17.8	3.12	18.4	3.022	29.0	5.09	41.8	7.33	

Table 3c Torque & Power Rating for ZP 3:1

Ratio 3:1					
Size	2		3 & 4		
Model	ZP 24, ZP 25, ZP 215		ZP 34, ZP 35, ZP 315, ZP44, ZP45		
Output Torque	Nm		Nm		
Input Power (Pn)	kW		kW		
output in rpm	50	15.9	0.083	34.2	0.179
	100	14.0	0.147	30.1	0.315
	200	12.2	0.257	25.9	0.543
	300	11.1	0.352	24.0	0.755
	400	10.5	0.441	22.5	0.945
	600	9.7	0.609	20.0	1.260
	800	9.0	0.756	18.4	1.540
	1000	8.5	0.893	17.5	1.838
	1200	8.1	1.019	16.7	2.100

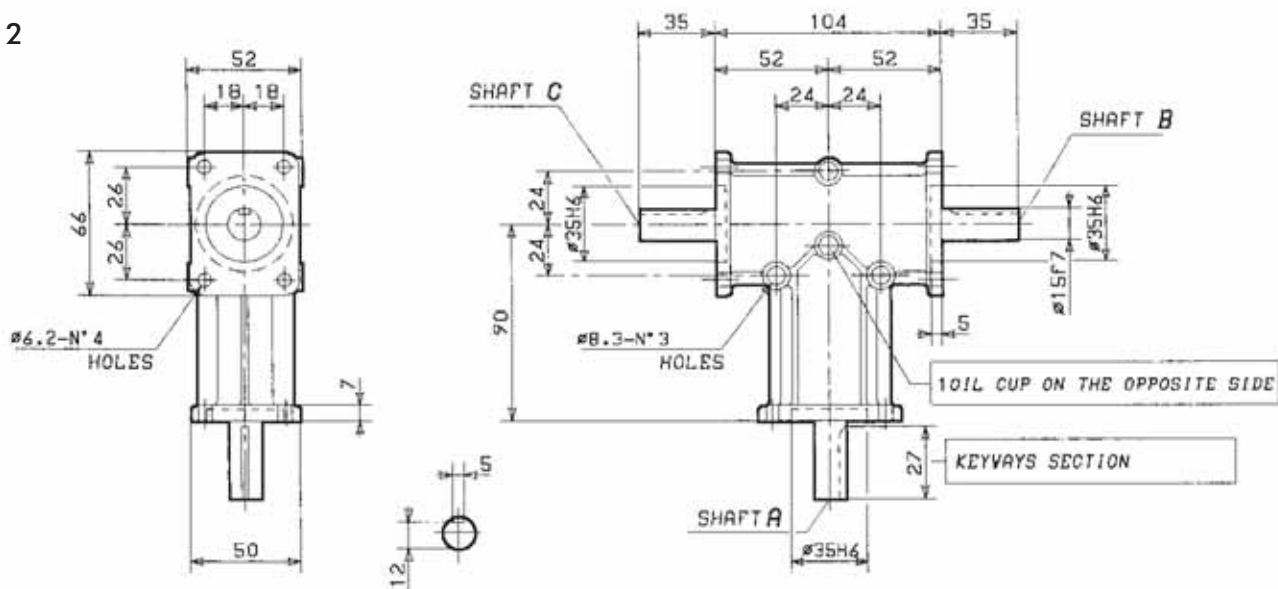
Dimensions for Type DZ

Size 1



Size 1	Ratio	Input	Output	Part Number
	1:1	A	B	DZ10S 3FAB
	2:1		B	DZ12S 3FAB
	1:1		B & C	DZ11 3FABC
	2:1		B & C	DZ13 3FABC

Size 2

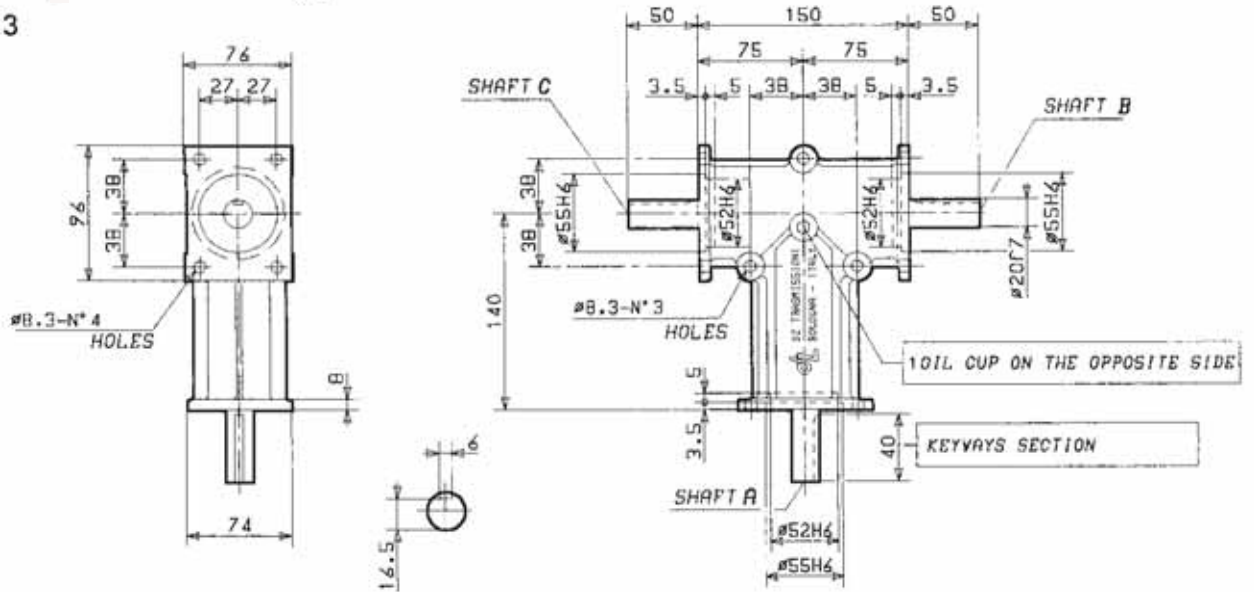


Size 2	Ratio	Input	Output	Part Number
	1:1	A	B	DZ20S 3FAB
	2:1		B	DZ22S 3FAB
	1:1		B & C	DZ21 3FABC
	2:1		B & C	DZ23 3FABC

All dimensions in mm.
All dimensions are subject to change without notice.

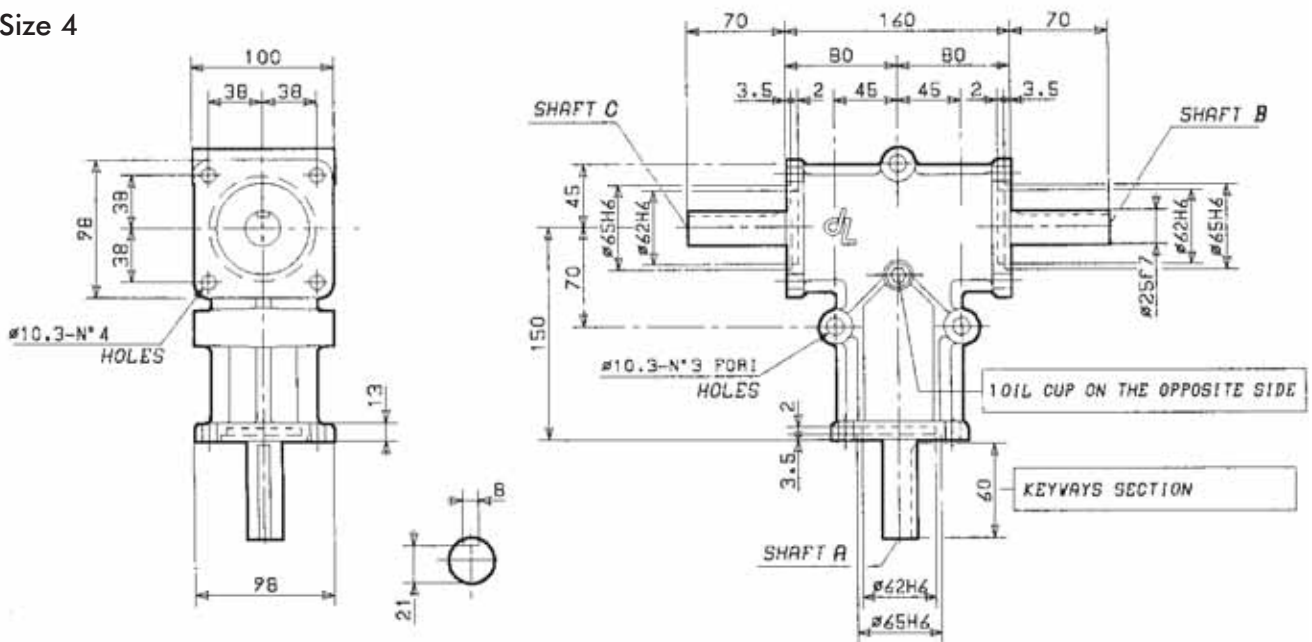
Dimensions for Type DZ

Size 3



Size 3	Ratio	Input	Output	Part Number
	1:1	A	B	DZ30S 3FAB
	2:1		B	DZ32S 3FAB
	1:1		B & C	DZ31 3FABC
	2:1		B & C	DZ33 3FABC

Size 4

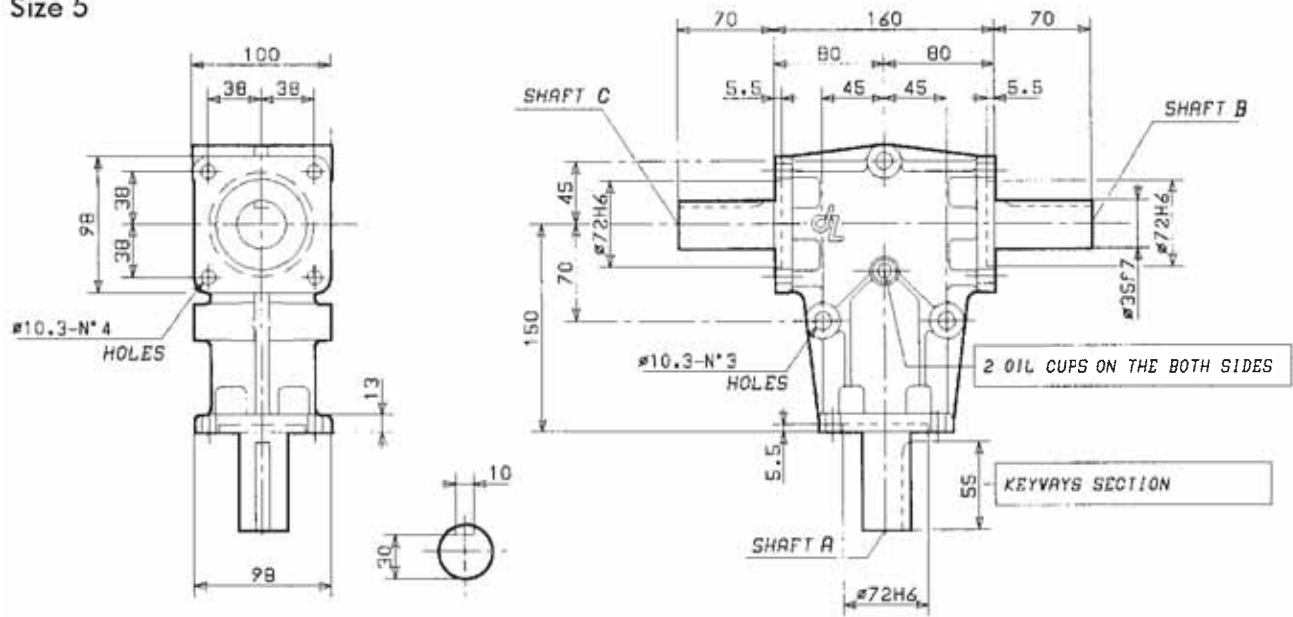


Size 4	Ratio	Input	Output	Part Number
	1:1	A	B	DZ40S 3FAB
	2:1		B	DZ42S 3FAB
	1:1		B & C	DZ41 3FABC
	2:1		B & C	DZ43 3FABC

All dimensions in mm.
All dimensions are subject to change without notice.

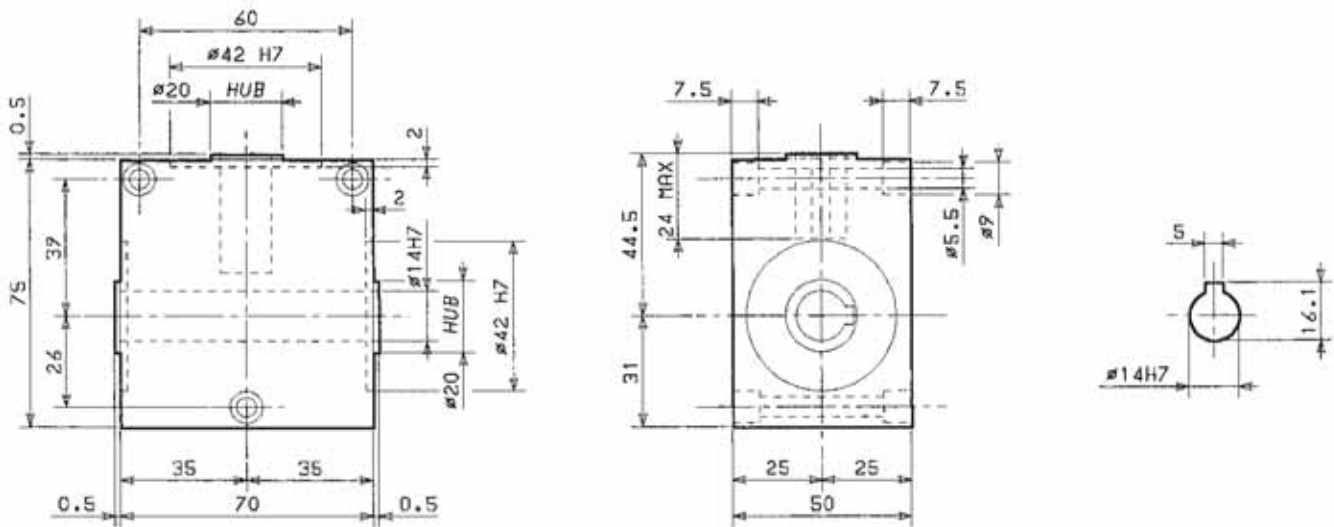
Dimensions for Type DZ & DZ Specials

Size 5



Size 5	Ratio	Input	Output	Part Number
	1:1	A	B	DZ50S 3FAB
	2:1		B	DZ52S 3FAB
	1:1		B & C	DZ51 3FABC
	2:1		B & C	DZ53 3FABC

DZ Special

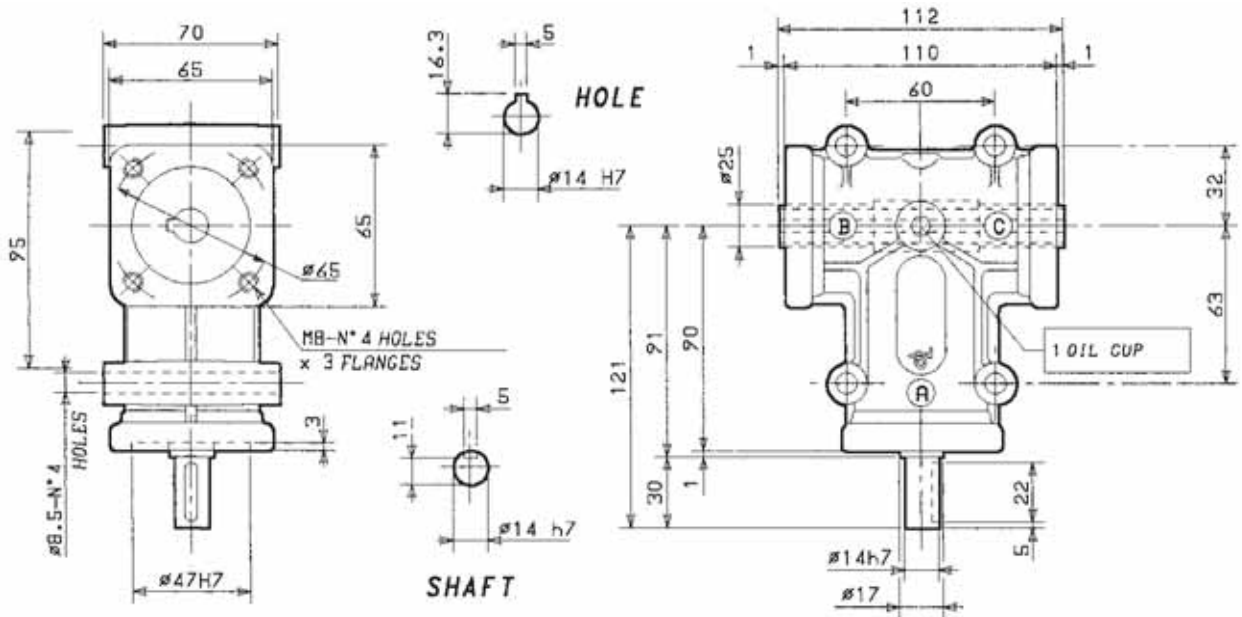


Special	Ratio	Input	Output	Part Number
	1:1	A	B & C	DZ505-60

All dimensions in mm.
All dimensions are subject to change without notice.

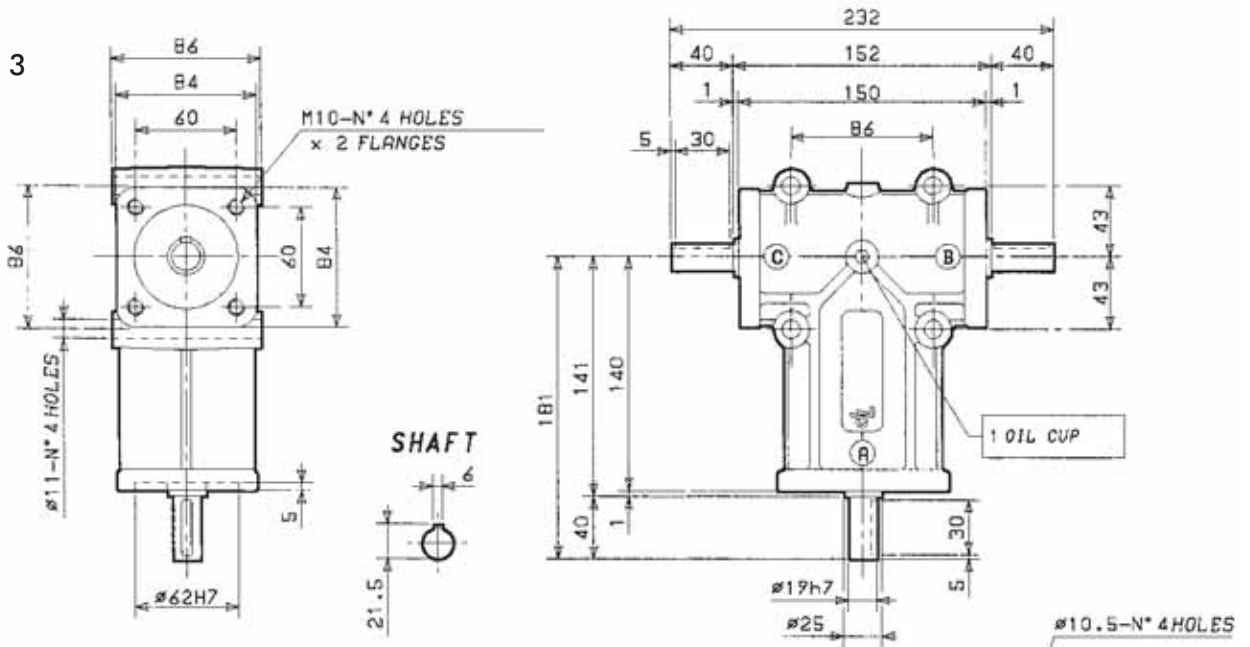
Dimensions for Type ZP

Size 2 Hollow Output

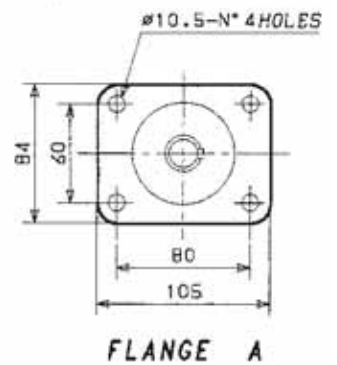


Size 2	Ratio	Input	Output	Part Number
	1:1	A	B & C	ZP 211 4P3V
	2:1			ZP 213 4P3V
	3:1			ZP 215 4P3V

Size 3



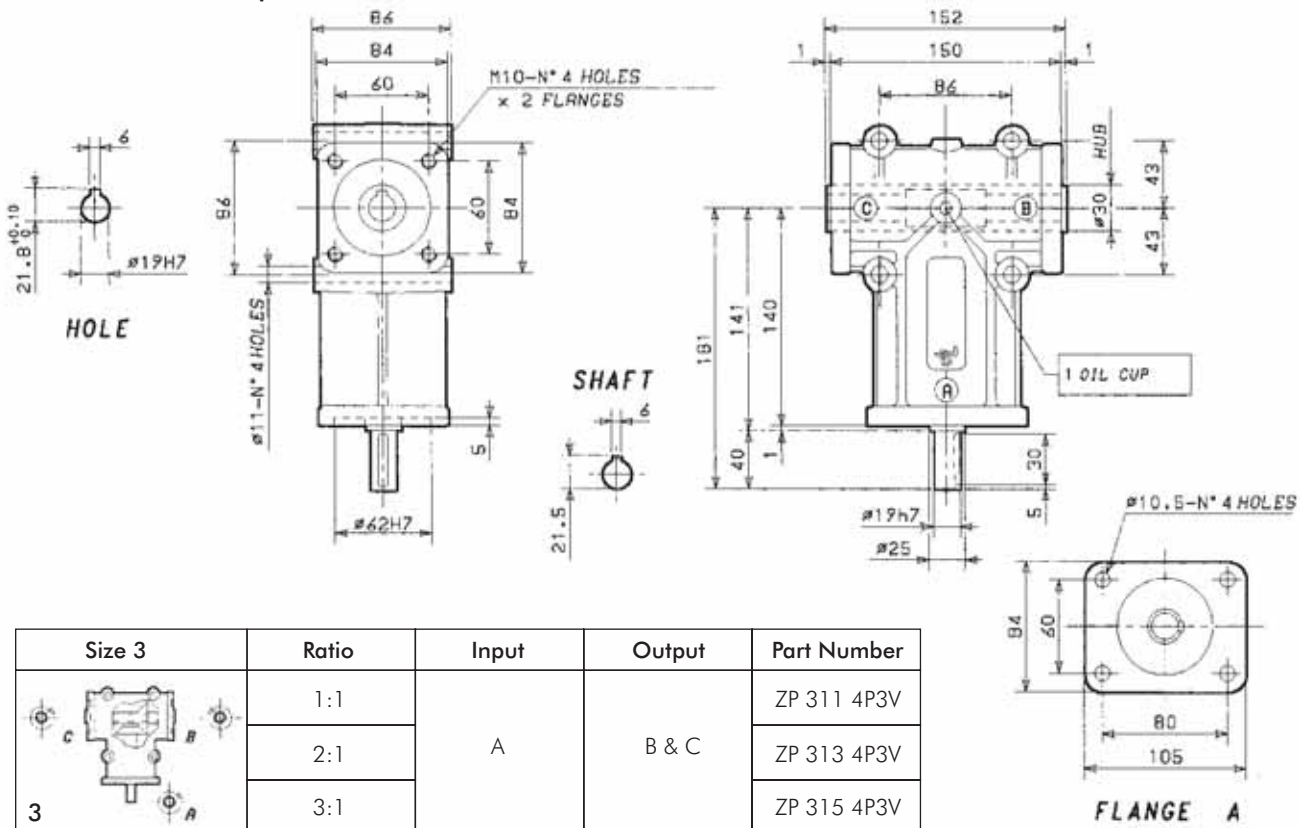
Size 3	Ratio	Input	Output	Part Number
	3:1	A	B	ZP 34S 4PAB
			B & C	ZP 35 4PABC



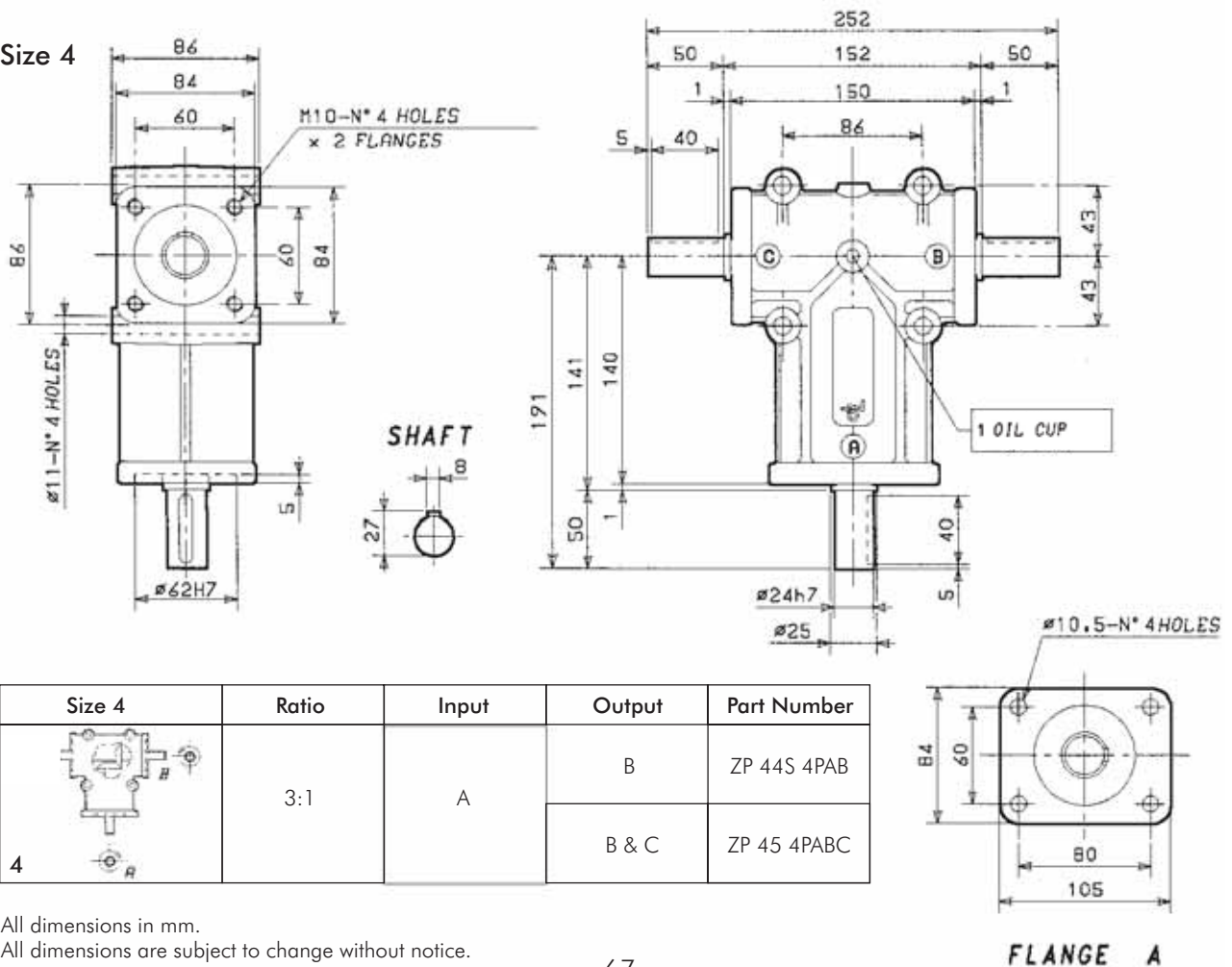
All dimensions in mm.
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Dimensions for Type ZP

Size 3 Hollow Output



Size 4



All dimensions in mm.
All dimensions are subject to change without notice.



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