

Precision Worm Gearboxes

Variable Pitch Design



 **TECHNOGEAR®**
Precision Gearing

**SIPCO**
Mechanical Linkage Solutions



Visit our Web site at
www.sipco.cc

Our Company

SIPCO is your source for mechanical linkage solutions. Our experience in bringing together knowledge, resources, manufacturing and assembly gives you complete solutions that fit between your load and drive systems. These solutions are a result of: our inventory of precision and standard components; ability to design and manufacture custom components; and fabrication of full working assemblies for specific applications.

SIPCO has been satisfying customers since 1984. In that time we have established a reputation for efficient service to industries using motion control, power transmission, and hydraulic systems. Today, our products are working in many applications, including robotic, packaging, automotive, pharmaceutical, printing, steel, energy and material handling. Through this experience, we are continually evolving, offering new innovative solutions for high-tech applications.

One Source—One Order

SIPCO offers a complete product line of standard and precision components. When you have one source, you only have to place one order to fill your mechanical linkage needs.

SIPCO product lines are:

- **TechnoGear®** –precision gearing
- **TechnoDrive®** –standard gearing
- **TechnoMotion®** –linear movement
- **TechnoLock®** –couplings and clutches
- **TechnoTeam®** –components to complete systems

Engineering, Custom Manufacturing and Assembly

At **SIPCO** we know that customers often require special components or assemblies. We have invested in engineers, technicians and manufacturing equipment to offer the flexibility and quality you demand at a competitive price.

SIPCO can:

- Engineer components or work from your plans
- Manufacture single prototypes
- Make full production runs
- Fabricate complete assemblies

Service

SIPCO can get you the parts when you need them. We keep an extensive inventory in our warehouse that is constantly tracked and monitored. Our in-house capabilities allow us to custom-manufacture components and assemblies on demand.

*Our flexibility has been paramount in our success...
 Because of our knowledge and resources our
 customers get what they want, when they need it.*

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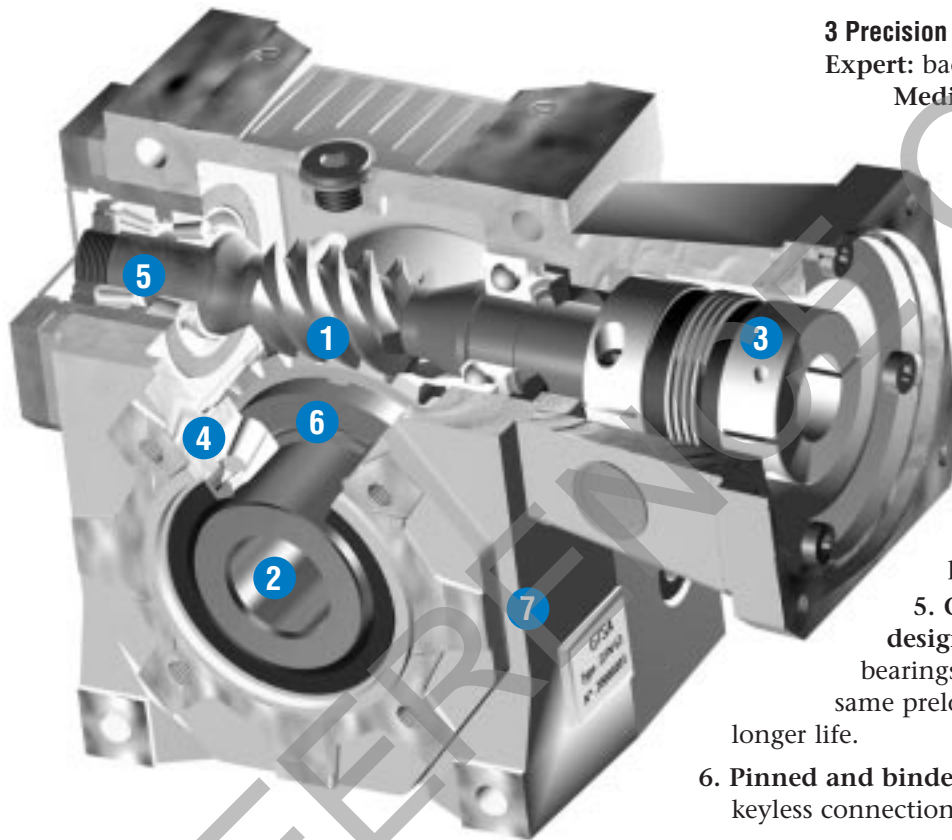


Precision Worm Gearboxes

BENEFITS

- **Low backlash**
- **Space saving configuration:** the right-angle design, more compact, is favorable in most cases.
- **Wormgear:** very silent (<55 dB), more important permissible overloads, higher torsional stiffness.
- **Maintenance free:** life-lubricated unit with high performances polyglycol lubricant.
- **Unbeatable ratio price/performances - quality**

PRODUCT FEATURES



3 Precision Levels

Expert: backlash < 1 arc minute (adjustable)

Medium: backlash < 5 arc minutes (fixed)

Basic: backlash < 10 arc minutes (fixed)

1. **Computer optimized gear contact pattern:** less stress, longer life.
2. **Keyless connection:** reliable and backlash free connection with shrink disc.
3. **Universal servo-kit:** including high torsional stiffness coupling + flange available for all existing servomotors.
4. **Oversized taper roller bearings:** provide very high permissible loads.
5. **Constant input bearings preload design:** 2 taper roller bearings + 1 floating ball bearings allowing temperature variations with same preload: higher input permissible speeds, longer life.
6. **Pinned and binded wheel ring:** 100% stiff and reliable keyless connection.
7. **Compact design, hardened aluminum-magnesium alloy:** lower weight, higher

MOUNTING OPTIONS



Hollow shaft + servo kit



Dual output shaft + servo kit



Single output shaft + servo kit

Precision Worm Gearboxes

SELECTION GUIDE

START/STOP SERVICE S5

- Calculate acceleration torque on gearbox output :

$$C2acc = C1acc \times i \times \eta \times F1 \times F2$$



F1 and F2 : correction factors as per following chart.

GEARBOX RUNNING TIME DURING 1 FULL CYCLE					
	10 %	30 %	50 %	70 %	90 %
F1	0,7	0,85	1	1,11	1,2

NUMBER OF STARTS PER HOUR				
	1000 à 2000	2000 à 3000	3000 à 5000	5000 à 10000
F2	1 à 1,35	1,35 à 1,45	1,45 à 1,6	1,6 à 1,9

Intermediates values
To be interpolated



- Select the gearbox size in the column **Torque S5** :



$$\text{Torque S5} > C2acc$$

CONTINUOUS SERVICE S1

- Calculate nominal torque on gearbox output

$$C2nom = C1nom \times i \times \eta$$



- Select the gearbox size in the column **Torque S1** :



$$\text{Torque S1} > C2nom$$

LEGEND	
C1acc (N.m)	motor acceleration torque
C1nom (N.m)	nominal motor torque
C2acc (N.m)	gearbox output acceleration torque
C2nom (N.m)	Gearbox output nominal torque
E-stop (N.m)	gearbox output emergency torque (2 seconds duration maximum, applied a maximum of 25000 times over the gearbox life)
C1f (N.m)	input friction torque (without any load on output)
N1	maximum input RPM to be achieved during a full cycle (S5 service) or input nominal RPM (S1 service)
i	exact gear ratio
Et (N.m/minute)	Torsional stiffness on output
ig (kg.m ²)	polar moment of inertia on input (to be added to coupling inertia, see page 10)
η (%)	gearbox efficiency at considered input RPM
Fr (N)	permissible radial load on output shaft (applied at the middle of the shaft)

REVERSIBILITY CLASSES	
1	Total reversibility
2	Uncertain reversibility
3	Irreversible

Note : indicated efficiency values are achieved after a 24 hours full load operation

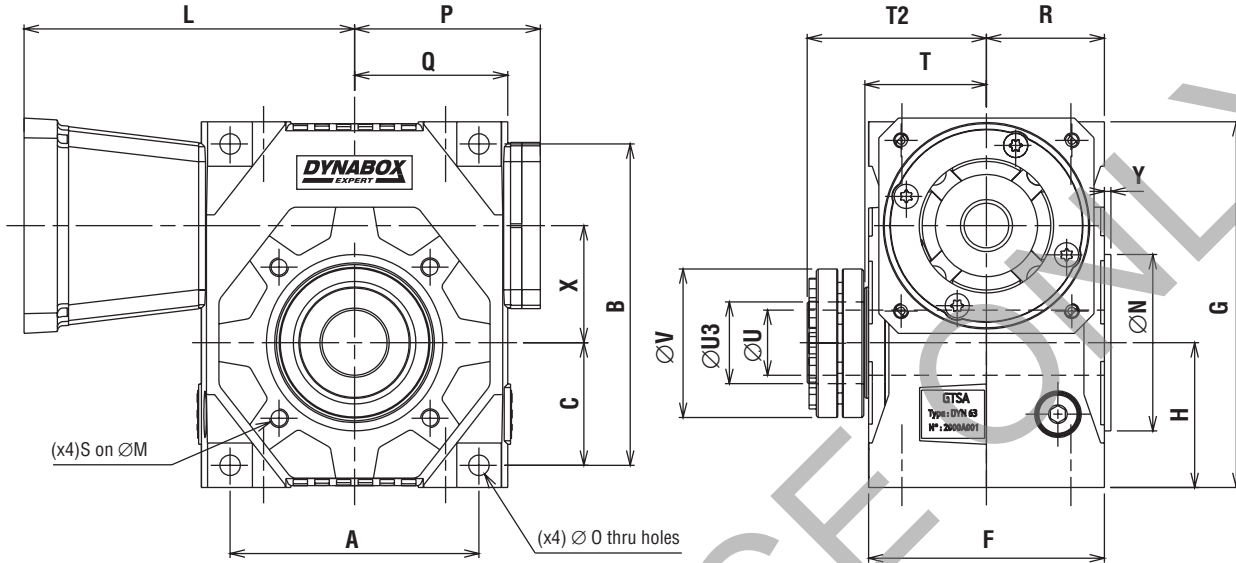
Precision Worm Gearboxes

TECHNICAL SPECIFICATIONS																						
N1	6000			4000			3000			2000			1000			E-Stop	C1f	ig	Et	Reversibility Class	Fr	Fa
	i	Torque S5	η	Torque S1	Torque S5	η	Torque S1	Couple S5	η	Torque S1	Torque S5	η	Torque S1	Torque S5	η							
35	5.2:1	23	94	16	27	93	18	31	92	22	36	91	29	48	89	96	0,3	7,4 X 10 ⁻⁶	5	1	3800	2800
	7.25:1	23	92	17	28	91	19	32	90	23	37	89	30	48	86	96	0,3	5,6 X 10 ⁻⁶	5	1	3800	2800
	10.25:1	24	90	17	29	89	20	34	88	23	39	87	30	51	81	96	0,3	5 X 10 ⁻⁶	5	1	3800	2800
	14.5:1	27	87	19	31	85	22	35	83	25	40	81	32	50	77	96	0,3	4,4 X 10 ⁻⁶	5	2	3800	2800
	19.5:1	28	84	20	32	82	22	35	80	26	42	78	33	50	73	96	0,2	4,2 X 10 ⁻⁶	5	2	3800	2800
	30:1	29	77	21	33	74	23	37	72	26	41	69	33	49	63	96	0,2	4 X 10 ⁻⁶	5	3	3800	2800
	45:1	28	71	21	33	68	23	36	65	26	40	61	32	48	56	87	0,2	3,9 X 10 ⁻⁶	5	3	3800	2800
	60:1	30	65	22	34	62	24	37	59	27	41	55	34	50	50	73	0,1	3,1 X 10 ⁻⁶	5	3	3800	2800
	90:1	28	57	21	32	53	23	35	50	26	39	46	32	46	41	72	0,1	2,31 X 10 ⁻⁶	5	3	3800	2800
45	5.2:1	54	95	36	62	94	41	70	93	50	83	92	67	109	91	214	0,4	2,9 X 10 ⁻⁵	9	1	5800	4000
	7.25:1	59	94	42	71	93	48	80	92	57	93	91	76	121	89	214	0,4	2,2 X 10 ⁻⁵	9	1	5800	4000
	11.5:1	68	92	46	80	90	53	88	89	62	98	88	80	128	85	214	0,4	1,5 X 10 ⁻⁵	9	1	5800	4000
	14.5:1	68	90	48	78	88	55	88	87	63	101	86	82	126	82	214	0,4	1,4 X 10 ⁻⁵	9	1	5800	4000
	19.5:1	58	89	42	67	87	47	74	86	54	86	84	69	104	80	214	0,3	1 X 10 ⁻⁵	9	1	5800	4000
	30:1	67	83	49	77	80	54	85	78	62	96	76	77	115	71	214	0,3	1 X 10 ⁻⁵	9	3	5800	4000
	45:1	65	77	48	75	75	53	83	72	61	93	69	74	111	64	185	0,3	8,2 X 10 ⁻⁶	9	3	5800	4000
	60:1	63	73	47	73	70	51	79	68	58	87	64	71	106	59	170	0,2	7,3 X 10 ⁻⁶	9	3	5800	4000
	90:1	63	66	46	71	62	50	76	59	57	86	56	68	99	50	154	0,2	4,6 X 10 ⁻⁶	9	3	5800	4000
55	5.2:1	85	95	60	103	94	68	116	94	82	137	93	111	181	91	307	0,6	7,5 X 10 ⁻⁵	20	1	7000	4800
	7.25:1	79	94	57	97	93	65	110	92	79	129	91	104	166	89	307	0,6	5,3 X 10 ⁻⁵	20	1	7000	4800
	11.5:1	85	92	58	101	90	67	112	89	79	125	88	102	162	85	307	0,6	4,5 X 10 ⁻⁵	20	1	7000	4800
	14.5:1	90	90	65	105	88	74	120	87	86	139	85	110	170	82	307	0,6	3,8 X 10 ⁻⁵	20	1	7000	4800
	19.5:1	81	88	60	96	87	68	109	85	78	124	83	100	151	80	307	0,4	3,1 X 10 ⁻⁵	20	2	7000	4800
	30:1	96	82	71	111	80	80	126	78	92	143	75	115	171	70	307	0,4	3,4 X 10 ⁻⁵	20	3	7000	4800
	45:1	94	77	70	110	74	78	122	72	89	137	69	110	164	63	307	0,4	2,8 X 10 ⁻⁵	20	3	7000	4800
	60:1	95	73	71	111	69	79	121	67	90	136	63	109	163	58	286	0,3	2,6 X 10 ⁻⁵	20	3	7000	4800
	90:1	102	65	76	117	62	82	125	59	94	142	55	113	164	49	263	0,3	1,2 X 10 ⁻⁵	20	3	7000	4800
63	5.2:1	128	95	90	153	95	105	179	94	126	210	93	169	275	91	497	0,8	1,6 X 10 ⁻⁴	36	1	8800	8500
	7.25:1	123	95	91	155	94	103	174	93	125	206	92	165	264	90	497	0,8	9 X 10 ⁻⁵	36	1	8800	8500
	10.25:1	134	94	103	169	93	118	194	92	141	231	91	181	290	89	497	0,8	8 X 10 ⁻⁵	36	1	8800	8500
	14.5:1	133	91	95	155	90	110	178	89	129	208	87	166	255	84	497	0,8	6,9 X 10 ⁻⁵	36	1	8800	8500
	19.5:1	134	90	99	158	88	113	180	87	130	206	85	165	249	82	497	0,5	5,5 X 10 ⁻⁵	36	1	8800	8500
	30:1	148	84	109	172	82	123	194	80	142	221	78	178	265	73	497	0,5	5,9 X 10 ⁻⁵	36	3	8800	8500
	45:1	149	80	110	173	77	123	192	75	141	216	72	174	259	67	403	0,5	5 X 10 ⁻⁵	36	3	8800	8500
	60:1	143	76	107	167	73	119	182	71	135	204	67	165	248	62	404	0,4	4,7 X 10 ⁻⁵	36	3	8800	8500
	90:1	149	68	110	169	65	121	184	63	137	207	59	166	241	53	368	0,4	3,2 X 10 ⁻⁵	36	3	8800	8500
75	5.2:1	213	96	147	252	95	174	296	94	209	349	94	282	459	92	834	1	3,7 X 10 ⁻⁴	50	1	10500	10500
	7.25:1	190	95	139	236	94	161	270	93	196	321	92	256	409	90	834	1	2,5 X 10 ⁻⁴	50	1	10500	10500
	10.25:1	180	94	140	224	93	161	258	92	196	314	91	250	400	88	834	1	2,2 X 10 ⁻⁴	50	1	10500	10500
	14.5:1	195	91	140	227	90	161	260	88	194	312	87	245	378	84	834	1	1,9 X 10 ⁻⁴	50	1	10500	10500
	19.5:1	189	89	139	223	88	160	256	87	187	298	85	238	359	81	834	0,6	1,5 X 10 ⁻⁴	50	2	10500	10500
	30:1	215	86	159	251	84	180	284	82	209	325	80	261	389	75	834	0,6	1,6 X 10 ⁻⁴	50	3	10500	10500
	45:1	218	79	164	258	76	185	289	74	213	326	71	264	393	65	718	0,6	1,4 X 10 ⁻⁴	50	3	10500	10500
	60:1	208	75	162	252	72	179	275	69	204	308	66	253	379	60	657	0,5	1,3 X 10 ⁻⁴	50	3	10500	10500
	90:1	218	68	167	257	64	184	280	62	209	316	57	255	370	52	625	0,5	8 X 10 ⁻⁵	50	3	10500	10500
90	5.2:1	332	96	227	387	95	271	460	95	327	546	94	445	725	92	1543	1,5	8,5 X 10 ⁻⁴	75	1	15800	13000
	7.25:1	376	95	263	460	95	306	490	95	373	597	94	490	784	92	1543	1,5	6 X 10 ⁻⁴	75	1	15800	13000
	10.25:1	391	95	273	478	94	314	528	93	383	627	92	488	781	90	1543	1,5	3,8 X 10 ⁻⁴	75	1	15800	13000
	14.5:1	346	92	248	405	91	287	461	90	347	559	88	444	684	85	1543	1,5	3,2 X 10 ⁻⁴	75	1	15800	13000
	20.5:1	403	91	297	475	90	340	544	88	399	634	87	503	759	84	1543	0,8	2,5 X 10 ⁻⁴	75	1	15800	13000
	30:1	433	86	316	500	84	362	572	82	424	661	80	531	792	75	1543	0,8	2,6 X 10 ⁻⁴	75	3	15800	13000
	45:1	388	83	293	460	80	329	512	79	379	579	76	469	698	71	1255	0,8	1,9 X 10 ⁻⁴	75	3	15800	13000
	60:1	403	80	306	478	77	341	524	75	389	587	72	474	711	67	1230	0,5	1,7 X 10 ⁻⁴	75	3	15800	13000
	90:1	394	74	298	459	70	332	505	68	372	562	64	460	667	59	1114	0,5	1 X 10 ⁻⁴	75	3	15800	13000
110	6.2:1	567	96	390	666	95	458	779	95	561	937	94	760	1239	92	2289	2	1,85 X 10 ⁻³	120	1	21500	16000
	7.25:1	579	95	417	680	95	488	795	95	599	976	94	802	1307	92	2289	2	1,3 X 10 ⁻³	120	1	21500	16000
	10.25:1	650	95	449	786	94	522	878	93	638	1047	92	827	1323	90	2289	2	8,5 X 10 ⁻⁴	120	1	21500	16000
	14.5:1	544	93	389	634	92	450	725	91	546	879	90	703	1082	87	2289	2	6,3 X 10 ⁻⁴	120	1	21500	16000
	19.5:1	600	92	439	702	91	506	810	90	606	964	88	767	1159	85	2289	1	4,6 X 10 ⁻⁴	120	1	21500	16000
	29.5:1	614	89	449	709	88	513	811	86	601	937	84	749	1116	81	2051	1	3,5 X 10 ⁻⁴	120	2	21500	16000
	45:1	631	85	474	744	82	538	839	80	623	952	78	771	1149	73	2152	1	3,3 X 10 ⁻⁴	120	3	21500	16000
	60:1	636	81	486	759	79	546	840	77	626	945	73	765	1147	68	2094	0,8	3 X 10 ⁻⁴	120	3	21500	16000
	90:1	645	75	497	765	72	557	847	70	625	944	66	778	1128	60	1941	0,8	1,7 X 10 ⁻⁴	120	3	21500	16000

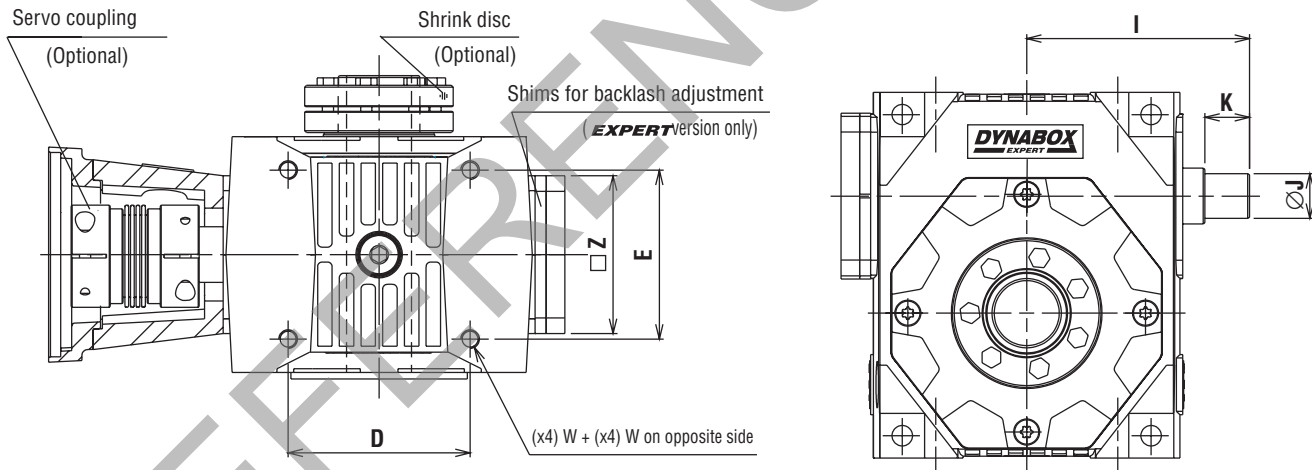
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HOLLOW SHAFT

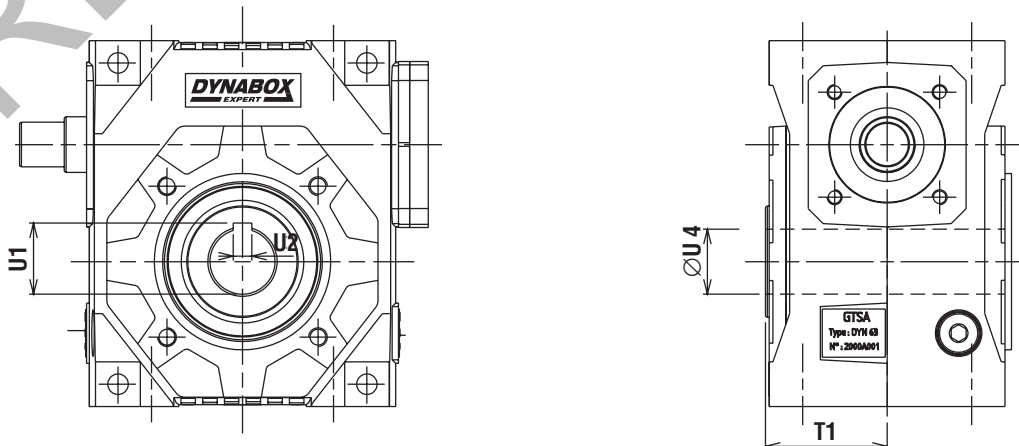
SMOOTH SHAFT FOR SHRINK DISC (AVAILABLE FROM STOCK)



INPUT SHAFT VERSION



KEYWAYED HOLLOW SHAFT (NOT STOCKED)



Precision Worm Gearboxes

HOLLOW SHAFT

DIMENSIONS							
	35	45	55	63	75	90	110
A	86	108	120	134	172	186	220
B	110	135	155	173	208	234	276
C	44.5	53	61	66	82	91	108
D	62	81	90	98	136	141	175
E	56	68	78	91	110	130	140
F	86	100	112	127	148	170	182
G	126	153	175	197	232	264	306
H	52,5	62	71	78	94	106	123
I Maxi	80	97	107	120	145	159	182
I mini	73,5	89,5	99	110	134	147	170
J (h6)	12	15	18	20	24	28	32
K	17	20	22	24	28	30	36
L				see page 11			
M	65	85	85	115	130	165	200
N (j7)	50	70	70	95	110	130	165
O	7	9	9	11	11	13	13
P (Maxi)	70	83,5	91	101	124	136,5	152
Q	55	67,5	75	84	104	114,5	132
R	43	50	56	63,5	74	85	91
S	M6	M8	M8	M10	M10	M12	M12 (x8)
T	45	52	58	65,5	76	87	93
T1	45	52	58	65,5	76	87	93
T2	69	78	87	96,5	110	124	133
U (H7)	20	25	30	35	40	50	60
U4	16	25	30	35	40	50	60
U1	18,3	28,3	33,3	38,3	43,3	53,8	64,4
U2	5	8	8	10	12	14	18
U3	24	30	36	44	50	68	80
V	50	60	72	80	90	115	138
W	M6	M8	M8	M10	M10	M12	M12
X	35	45	55	63	75	90	110
Y	3	3	3,5	3,5	4	4	5
Z	58	75	75	85	95	115	115
WEIGHT (kg)	3,4	6,2	8,5	13,9	20,5	32,5	46,5

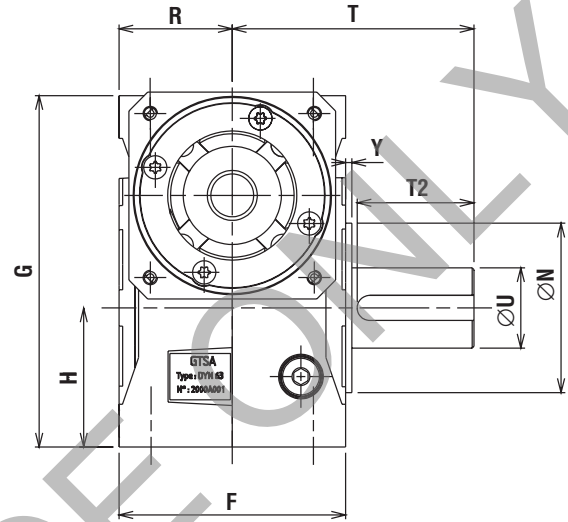
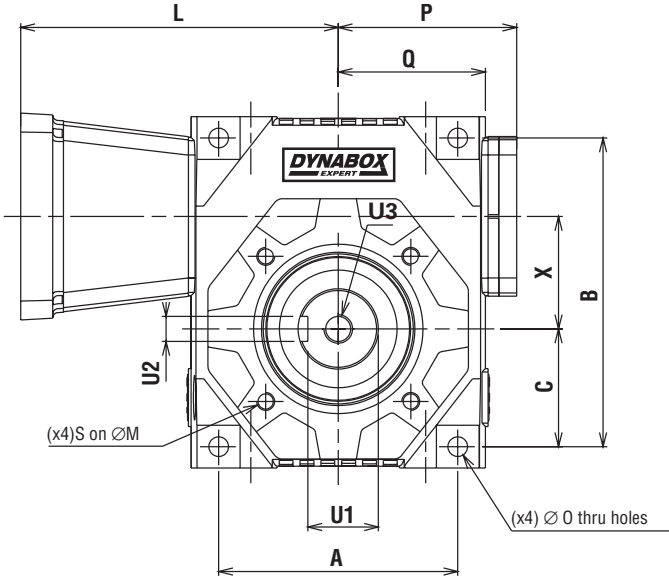
MOUNTING POSITIONS

	1	2	3	4
H				
V				
F				

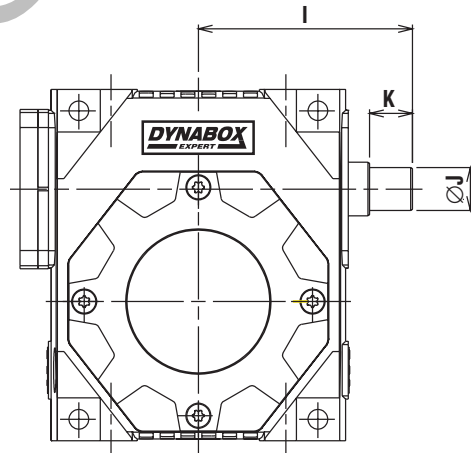
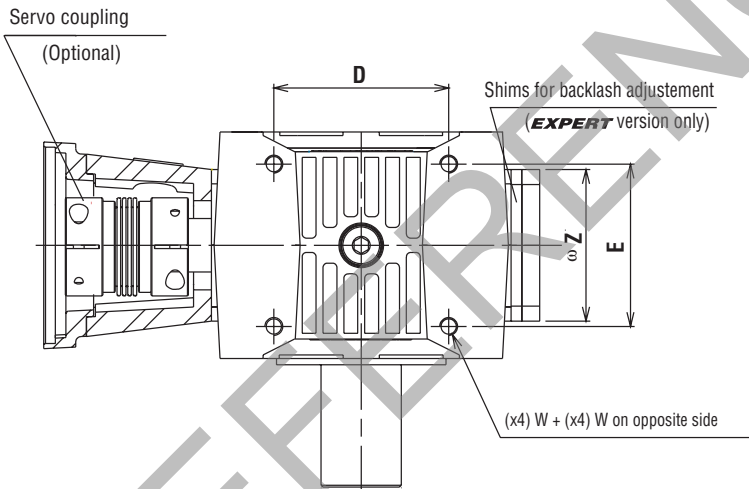
Precision Worm Gearboxes

OUTPUT SHAFT

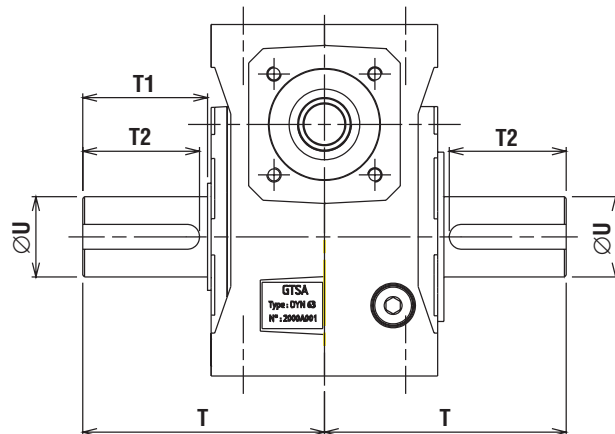
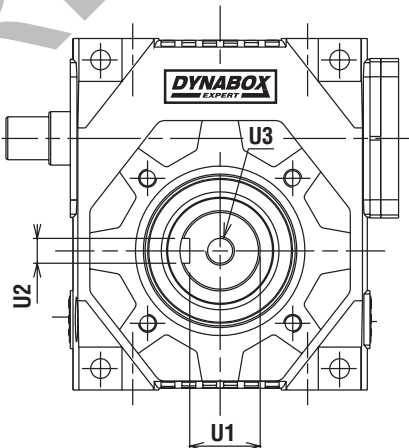
SINGLE OUTPUT SHAFT



INPUT SHAFT VERSION



DUAL OUTPUT SHAFT



Precision Worm Gearboxes

OUTPUT SHAFT

DIMENSIONS							
	35	45	55	63	75	90	110
A	86	108	120	134	172	186	220
B	110	135	155	173	208	234	276
C	44.5	53	61	66	82	91	108
D	62	81	90	98	136	141	175
E	56	68	78	91	110	130	140
F	86	100	112	127	148	170	182
G	126	153	175	197	232	264	306
H	52,5	62	71	78	94	106	123
I Maxi	80	97	107	120	145	159	182
I mini	73,5	89,5	99	110	134	147	170
J (h6)	12	15	18	20	24	28	32
K	17	20	22	24	28	30	36
L				see page 11			
M	65	85	85	115	130	165	200
N(j7)	50	70	70	95	110	130	165
O	7	9	9	11	11	13	13
P (Maxi)	70	83,5	91	101	124	136,5	152
Q	55	67,5	75	84	104	114,5	132
R	43	50	56	63,5	74	85	91
S	M6	M8	M8	M10	M10	M12	M12 (x8)
T	83	107	118	135,5	151	187	208
T1	38	55	60	70	75	100	115
T2	35	50	55	65	70	95,5	110
U (h6)	25	35	40	45	50	65	75
U1	21	30	35	39,5	44,5	58	67,5
U2	8	10	12	14	14	18	20
U3	M10	M12	M16	M16	M16	M20	M20
W	M6	M8	M8	M10	M10	M12	M12
X	35	45	55	63	75	90	110
Y	3	3	3,5	3,5	4	4	5
Z	58	75	75	85	95	115	115
WEIGHT (kg)	3,6	6,8	9,2	15,2	22,2	35,1	50,3

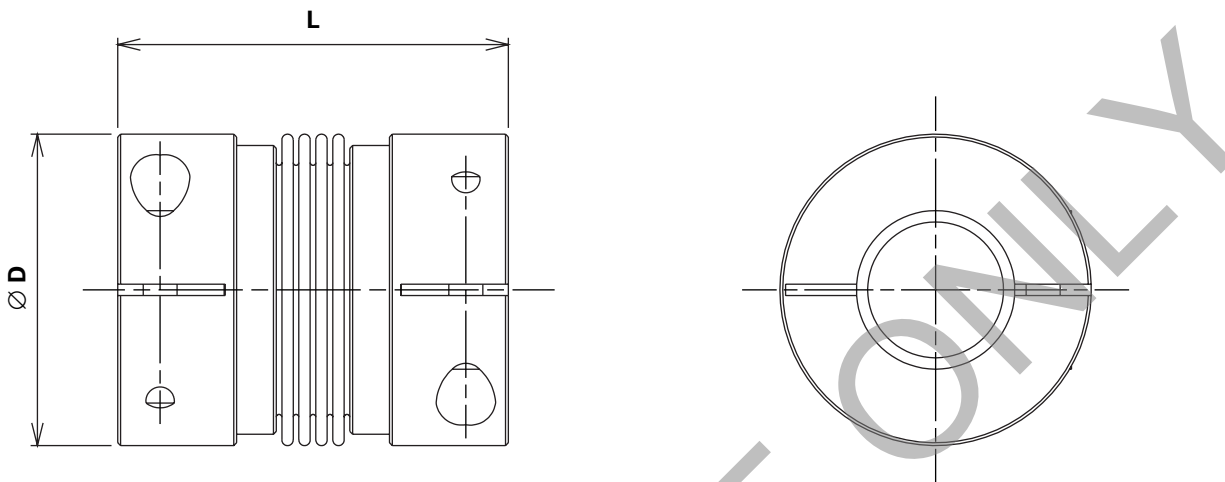
MOUNTING POSITIONS

	1	2	3	4
H				
V				
F				

Precision Worm Gearboxes

CONNECTING KIT

TORSION STIFF COUPLINGS



Coupling reference		AM N° 2	AM N° 5	AM N° 10	AM N° 15	AM N° 30	AM N° 60	AM N° 80
x servo shaft and DYNABOX shaft	mm	<x13	<x16	<x24	<x28	<x32	<x32	<x42
Servo nominal torque	Nm	2	5	10	15	30	60	80
Servo peak torque	Nm	5	12,5	25	37,5	75	150	200
x D	mm	25	32	40	49	55	66	82
L	mm	32	42	46	60	70	81	94
Polar moment of inertia	10-3kgm ²	0,002	0,01	0,02	0,05	0,09	0,18	0,54
Torsional stiffness	Nm/mn	0,4	2	2,6	6	11	22	37
Tightening torque of campling screws	Nm	1,5	3	4	8	15	40	50

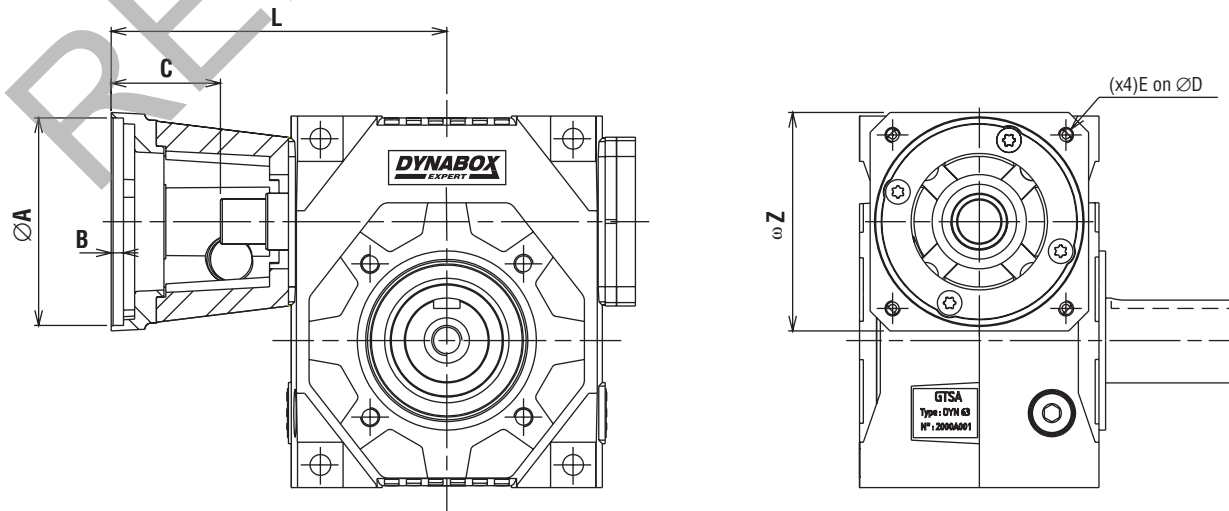
Specify the coupling reference and the servo shaft x when ordering.
Exemple : AM n° 15 x 14.

To calculate the input total inertia, add the coupling inertia to the gearbox inertia (page 5).

CONNECTING FLANGE

Select the required flange on page 11.

If no flange can be found in the list, supply the dimensions from A to Z, or supply the servo reference when ordering.



Precision Worm Gearboxes

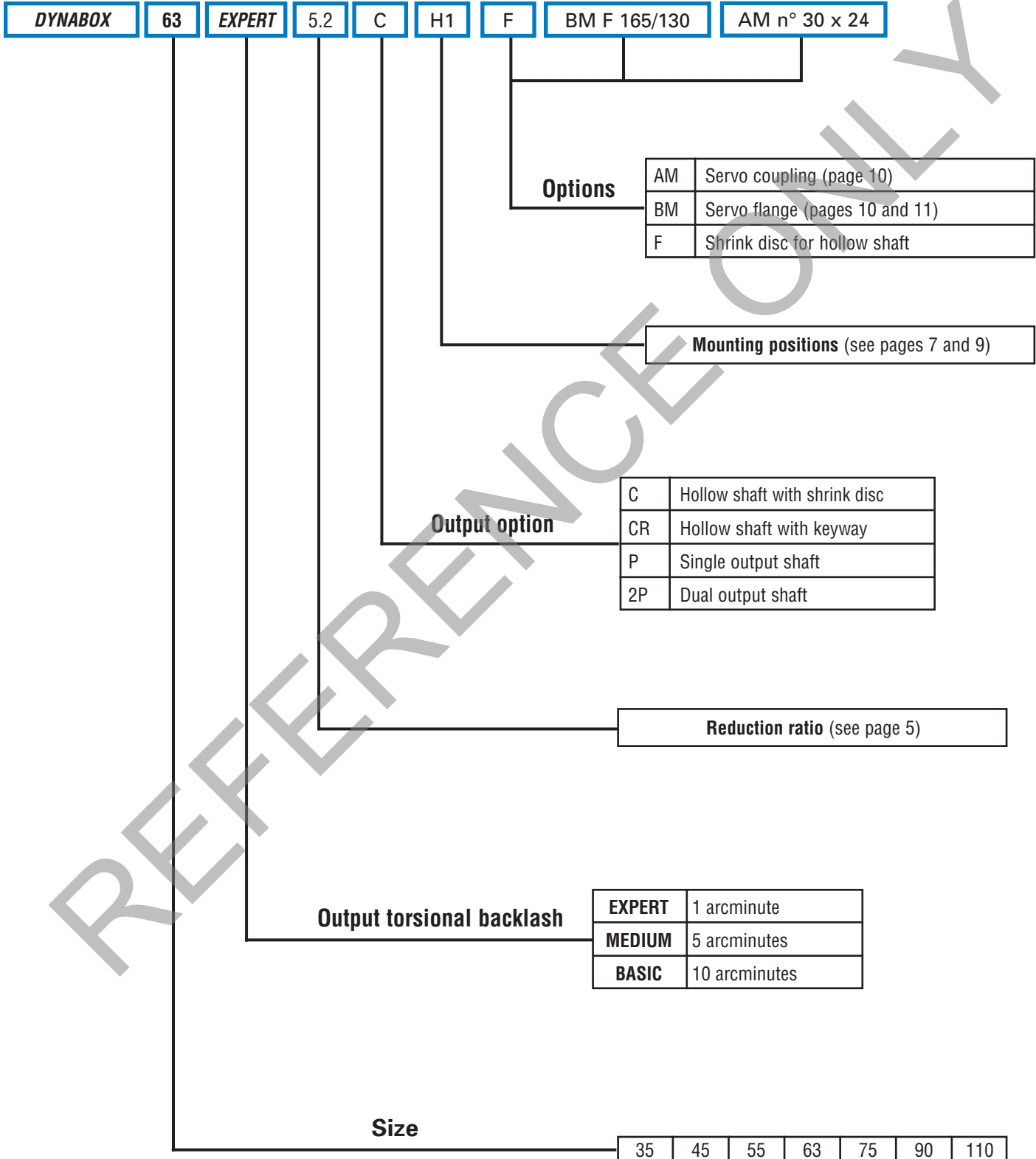
CONNECTING KIT

DIMENSIONS									
	Reference	A	B	C Maxi	C mini	D	E	L	Z
35	BM-F70/50	50	6,5	37	32	70	M4	114	65
	BM-F75/60	60	6,5	37	32	75	M5	114	65
	BM-F90/70	70	6,5	47	42	90	M5	124	90
	BM-F95/50	50	6,5	37	32	95	M6	114	90
	BM-F100/80	80	6,5	47	42	100	M6	124	90
	BM-F115/95	95	6,5	47	42	115	M8	124	115
	BM-F130/110	110	6,5	57	52	130	M8	134	115
	BM-F145/110	110	6,5	67	62	145	M8	144	140
45	BM-F70/50	50	6,5	37	32	70	M4	131,5	81
	BM-F75/60	60	6,5	37	32	75	M5	131,5	81
	BM-F90/70	70	6,5	47	42	90	M5	141,5	90
	BM-F95/50	50	6,5	37	32	95	M6	131,5	90
	BM-F100/80	80	6,5	47	42	100	M6	141,5	90
	BM-F115/95	95	6,5	47	42	115	M8	141,5	115
	BM-F130/110	110	6,5	57	52	130	M8	151,5	115
	BM-F145/110	110	6,5	67	62	145	M8	161,5	140
55	BM-F70/50	50	6,5	37	32	70	M4	142	81
	BM-F75/60	60	6,5	37	32	75	M5	142	81
	BM-F90/70	70	6,5	47	42	90	M5	152	90
	BM-F95/50	50	6,5	37	32	95	M6	142	90
	BM-F100/80	80	6,5	47	42	100	M6	152	90
	BM-F115/95	95	6,5	47	42	115	M8	152	115
	BM-F130/110	110	6,5	57	52	130	M8	162	115
	BM-F145/110	110	6,5	67	62	145	M8	172	140
	BM-F165/130	130	6,5	57	52	165	M10	162	140
63	BM-F70/50	50	6,5	38	32	70	M4	156	102
	BM-F75/60	60	6,5	38	32	75	M5	156	102
	BM-F90/70	70	6,5	48	42	90	M5	162	102
	BM-F100/80	80	6,5	48	42	100	M6	162	102
	BM-F115/95	95	6,5	48	42	115	M8	162	115
	BM-F130/110	110	6,5	58	52	130	M8	172	115
	BM-F145/110	110	6,5	68	62	145	M8	182	140
	BM-F165/130	130	6,5	58	52	165	M10	172	140
	BM-F200/114,3	114,3	6,5	88	82	200	M10	202	180
BM-F215/180	180	6,5	68	62	215	M12	182	180	
75	BM-F100/80	80	6,5	48	42	100	M6	191	102
	BM-F115/95	95	6,5	48	42	115	M8	191	115
	BM-F130/110	110	6,5	58	52	130	M8	201	115
	BM-F145/110	110	6,5	68	62	145	M8	211	140
	BM-F165/130	130	6,5	58	52	165	M10	201	140
	BM-F200/114,3	114,3	6,5	88	82	200	M10	231	180
	BM-F215/180	180	6,5	68	62	215	M12	211	180
90	BM-F100/80	80	6,5	48	42	100	M6	205,5	124
	BM-F115/95	95	6,5	48	42	115	M8	205,5	124
	BM-F 130/110	110	6,5	58	52	130	M8	215,5	124
	BM-F145/110	110	6,5	68	62	145	M8	225,5	140
	BM-F165/130	130	6,5	58	52	165	M10	215,5	140
	BM-F200/114,3	114,3	6,5	88	82	200	M10	245,5	180
	BM-F215/180	180	6,5	68	62	215	M12	225,5	180
	BM-F300/250	250	6,5	90	84	300	M16	248,5	260
110	BM-F100/80	80	6,5	48	42	100	M6	229	124
	BM-F115/95	95	6,5	48	42	115	M8	229	124
	BM-F130/110	110	6,5	58	52	130	M8	239	124
	BM-F145/110	110	6,5	68	62	145	M8	249	140
	BM-F165/130	130	6,5	58	52	165	M10	239	140
	BM-F200-114,3	114,3	6,5	88	82	200	M10	269	180
	BM-F215/180	180	6,5	68	62	215	M12	249	180
BM-F300/250	250	6,5	90	84	300	M16	271	260	

Precision Worm Gearboxes

ORDER GUIDE

Use following codification to order your *DYNABOX*.



Precision Worm Gearboxes

SERVO GEARSETS—FOR GEARBOXES WITH ADJUSTABLE BACKLASH

When DYNABOX servo gearheads cannot be used, the DYNASET servo gearsets, to be mounted in customed housing, are an interesting alternative. Their performance is comparable to complete reducers, assuming following recommendations:

MOUNTING

Wormshaft: housing and bearing design should allow an axial shifting, necessary for backlash adjustment. The total adjustment range is obtained with a permissible displacement equal to W, as per page 14.

It is recommended, whenever possible, to use our backlash adjustment device, which is delivered preset (see page 15).

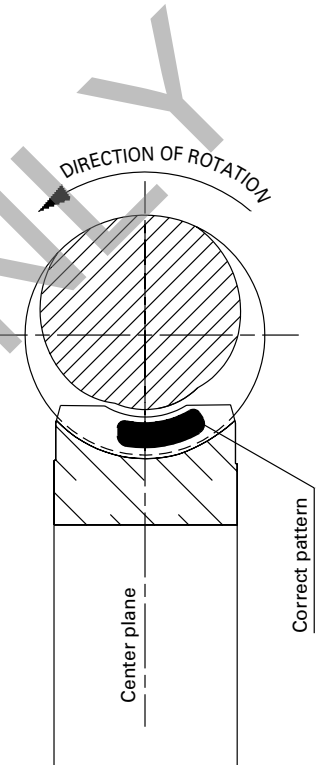
The front ball bearing (see page 15) must be engaged on the shaft after the complete gear assembly, and before the backlash adjustment operation.

Wheel ring: Arrows shown on wormshaft and wheel ring must be lined up during assembly (see page 14). As the bore ΔA tolerance is H6, it is recommended to grind the shaft with a tolerance k5. This will eliminate any runnout between the wheel ring and the shaft. In order to facilitate the connection between the 2 parts, heat the wheel ring up to $50 \pm C$.

After cooling, check that the wheel ring is not buckled, by applying a dial indicator on its face, while rotating the shaft.

Then, finish the pins bores ((xY) ΔS , see page 14) of the 2 assembled parts, as they are delivered pre-bored only. Otherwise, screws can be also used.

It is recommended to use taper roller bearings on output shaft, in order to allow an axial displacement of the wheel, during the mounting operations, to center the gear correctly. The contact pattern can be checked with Prussian blue or any similar product. A good pattern should be located slightly on the right side of the wheel tooth flanks (on both sides). It is normal to have no contact on the left side of the flanks. This gap is necessary for a good oil film forming. See sketch on the right.



LUBRICATION

The best gear performances in terms of efficiency, life, temperature, will be achieved with a polyglycol lubricant such as MOBIL GLYGOYLE 30 or equivalent. The ratings shown on page 5 can be considered only if this kind of lubricant is used.

Before use, check that the inner paint of the housing is compatible (Epoxy paints can be used).

Otherwise, use MOBIL SHC 634 or equivalent.

BACKLASH ADJUSTMENT

The accuracy of our servo gearsets DYNASET allows them to be set to less than 1 arc minute of backlash, without any efficiency or torque capacity losses (it is assumed than custom machined parts and mounting are correct).

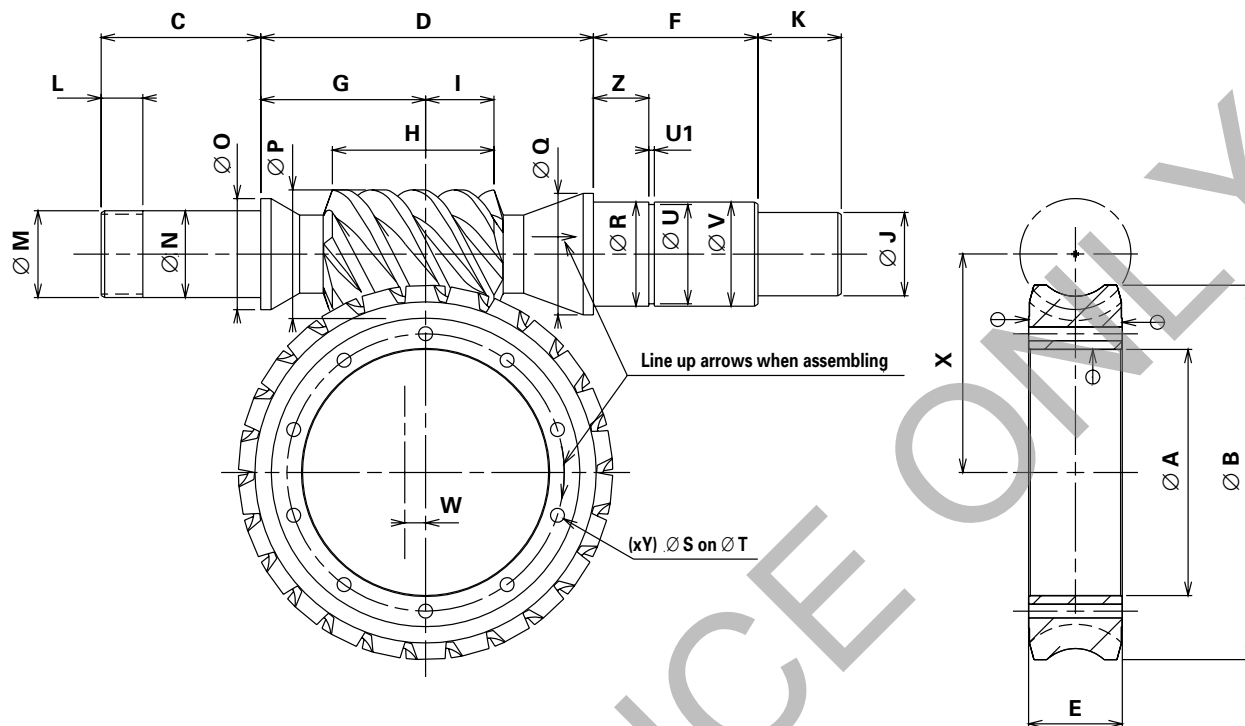
If our backlash adjustment device is used, simply remove some shims (delivered) between the bearing bush and the housing, until the desired backlash value is obtained.

For high speed applications, a backlash between 0.5 to 1 arc minute is recommended.

For very intermittent applications (rotary tables or milling heads of CNC machines for example), a backlash down to zero is tolerated, as soon as the no load input torque does not vary more than + 30% around the average value.

Precision Worm Gearboxes

SERVO GEARSET

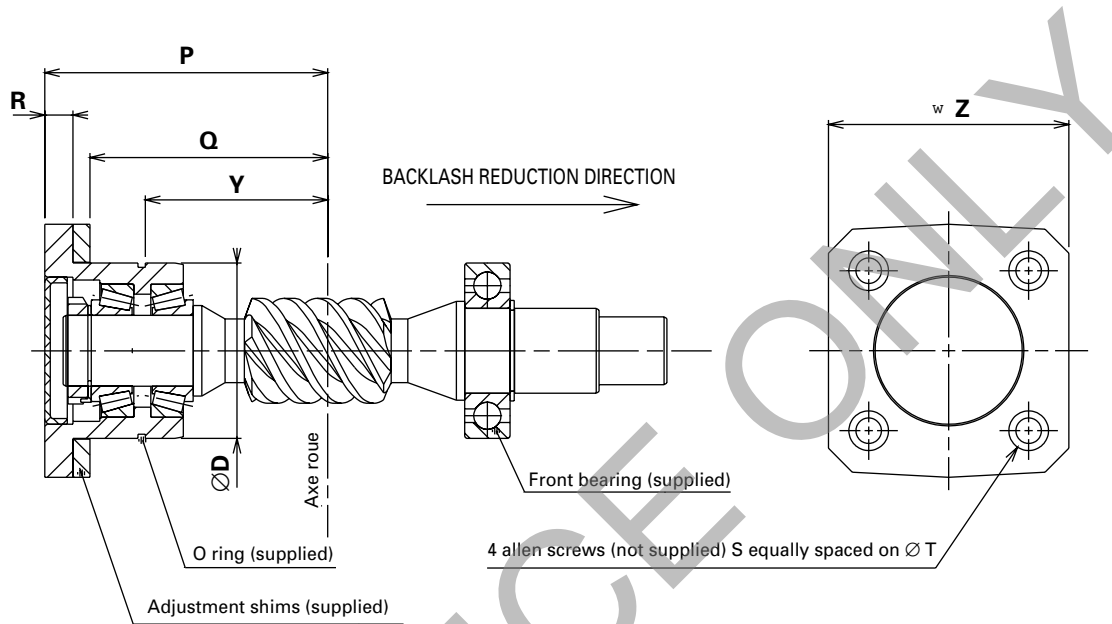


Surfaces marked \ominus can be referred to for checking runout

DIMENSIONS							
	35	45	55	63	75	90	110
A (H6)	32	47	52	71	82	103	136
B Maxi	55	78	92	108	124,5	157,4	191,4
C	33	38	43	46	52	57	60
D	63,5	80	85	97	116,5	144	173
E	14	19	28	27	32	38	40
F	26,5	32	37	40,5	47,5	49	49
G	32	40	42	47,5	63	70	82
H Maxi	31	37,6	43,7	49,7	54,7	67,5	75,5
I Maxi	13,5	17,3	20,5	23,4	26,3	33,2	36,1
J (h6)	12	15	18	20	24	28	32
K	17	20	22	24	28	30	36
L	8	9	10	11	13	14	15
M	M15 x 1,00	M17 x 1,00	M20 x 1,00	M25 x 1,50	M 30 x 1,50	M35 x 1,50	M40 x 1,50
N (k6)	15	17	20	25	30	35	40
O	20	24	26	32	37	42	47
P Maxi	24,7	26,5	32,5	37,1	44,2	50,8	56,5
Q	24	30	30	35	42	42	47
R (k6)	20	25	25	30	35	35	40
S	3,5	4	4	4	5	6	8
T	38	54,5	60	79	91	113	148
U	19	23,9	23,9	28,6	33	33	37,5
U1	1,3	1,3	1,3	1,6	1,6	1,6	1,85
V (h11)	20	25	25	30	35	35	40
W	5	5	5	6	6	6	6
X	35	45	55	63	75	90	110
Y	4	6	8	10	10	10	10
Z	8	12	15	16	17	17	18

Precision Worm Gearboxes

DIMENSIONS – RS



DIMENSIONS							
	35	45	55	63	75	90	110
D (h6)	42	47	52	62	72	72	80
Y Maxi	43,5	54	58	65	84	94	110
Y Mini	38,5	49	53	59	78	88	104
P Maxi	69	83	91	100	121	131,5	150
P Mini	64	78	86	94	115	125,5	144
Q	55	67,5	75	84	104	114,5	132
R	9	10,5	10	10	11	11	12
S	M6	M6	M8	M8	M10	M10	M10
T	55	65	66	80	90	100	100
Z	58	75	75	95	95	115	115
X	16004	6005	6205	6206	6207	6207	6208

The backlash adjustment device is delivered mounted and preset.

Bearings are factory preloaded.

Backlash adjustment is operated with shims located between the housing and the bearing bush.



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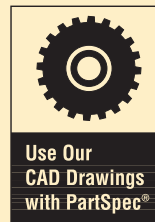
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