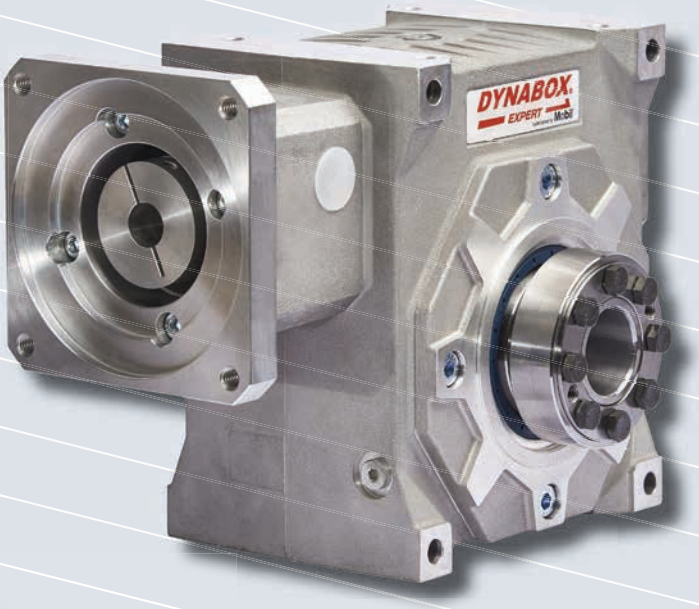
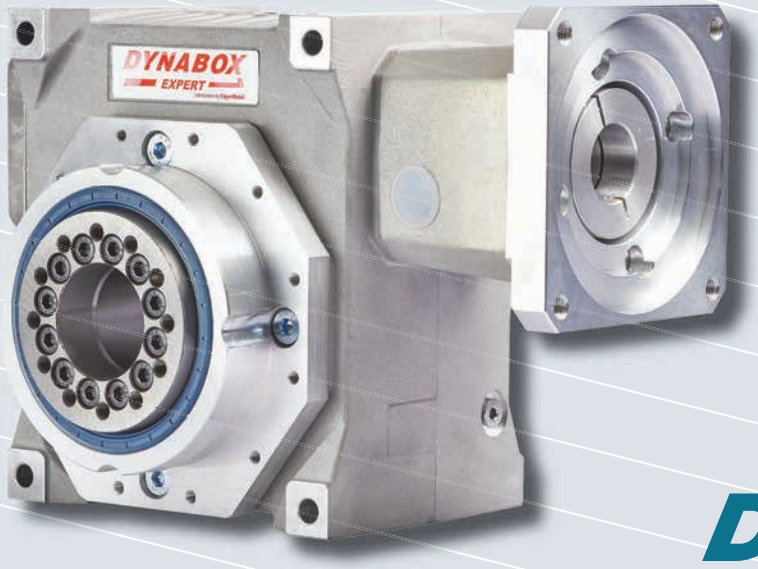
2017

Product Catalog





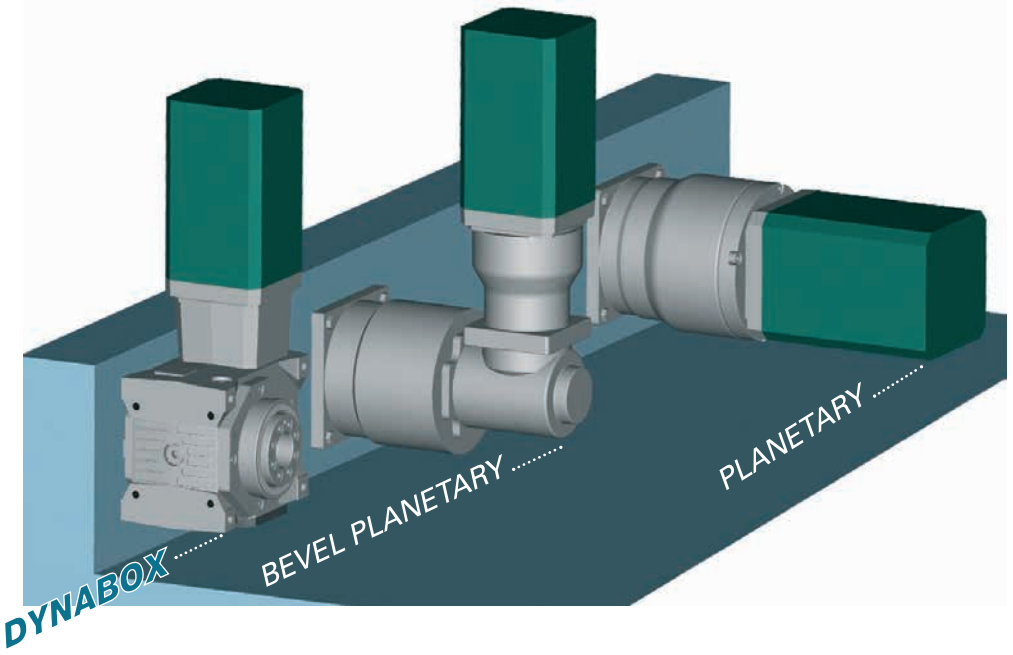
DYNABOX®

RIGHT ANGLE SERVO GEARHEADS

GIRARD TRANSMISSIONS
PRECISION GEARHEADS

DYNABOX® Provides :

- To machine designers a convenient option of turning servomotor drive systems through 90 degrees.



- To OEMs with the ideal solution to reduce costs in servomotor applications by replacing bevel planetary gearheads

- Hollow output with shrink disc *(designer's favorite)*, for easy integration

- Robot flange output, for tilting stiffness and compactness

- Solid output (single or dual), a classical solution

DYNABOX®

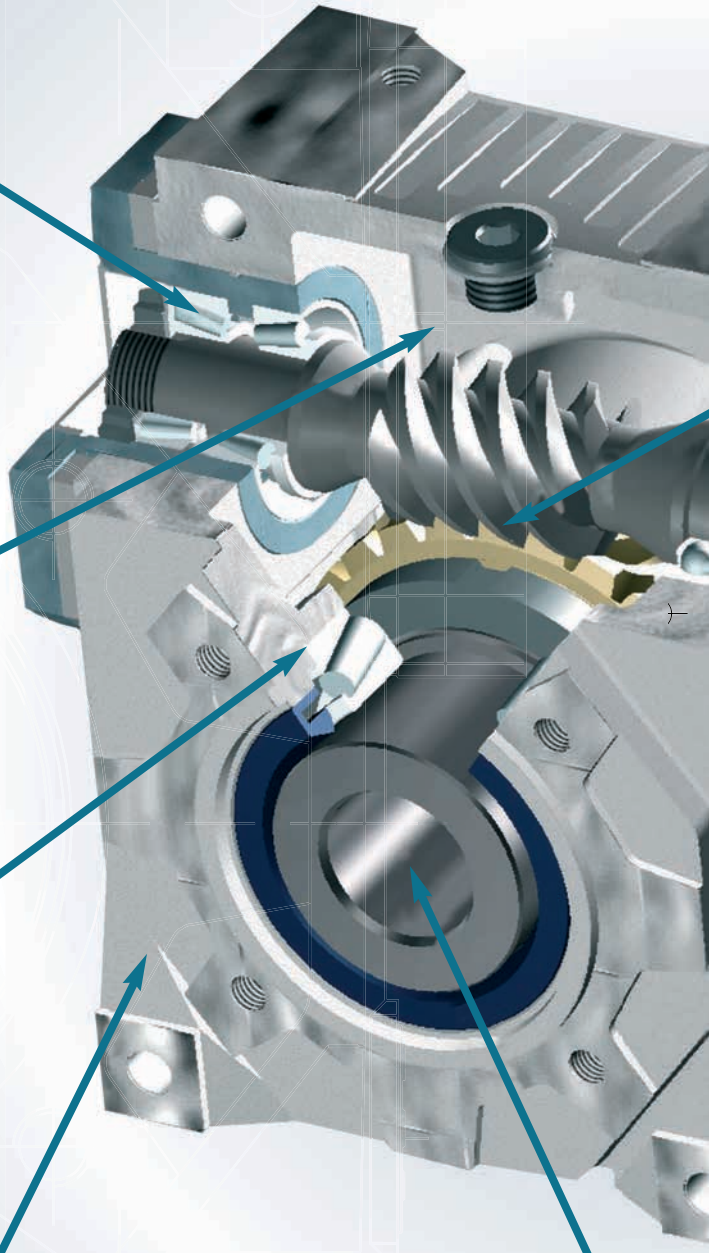
RIGHT ANGLE SERVO GEARHEADS :

DYNASET

HIGH PRECISION GEAR SET :

Preloaded input taper bearings :

provides higher stiffness.
2 bearings mounted on same side insure constant preload while temperature raises.
It maximizes bearing life.
On the opposite side, an axial-free ball bearing.
size 35 = angular contact ball bearing



Maintenance free :

life-lubricated unit
with high performance
synthetic lubricant

Oversized taper roller bearings,
providing unmatched radial loads
(size 25 = ball bearings)

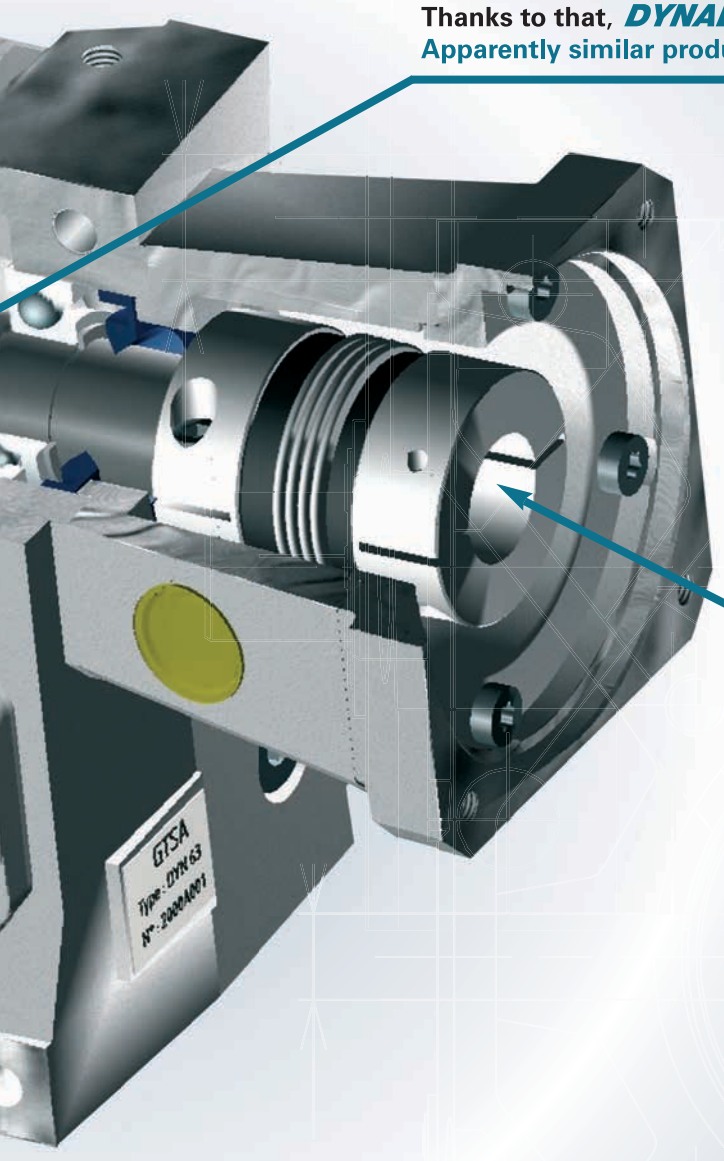
Single piece housing, made of cast and heat treated aluminium-magnesium alloy.
Offering superior rigidity and low weight

HIGHLIGHTS

Optimized contact pattern : a unique process to cut gears, combined to a state of the art assembly lead to a nearly 90% pattern surface, reducing drastically the contact pressure.

Special bronze alloy : developped by ourselves, it provides an unmatched wear resistance. Combined with 90% contact pattern, lowest backlash is maintained throughout the working life of the gearhead.

Thanks to that, *DYNABOX*® gearheads can run up to 6000RPM
Apparently similar products available on the market do not offer such performance



Servomotor mounted within 5 minutes :

a high stiffness below coupling eliminates shaft alignement problems.
A mating flange to ***your*** servomotor can always be supplied from our stock.

Output torsional backlash available in 3 ranges :

EXPERT : 1 arcminute for the most demanding applications
MEDIUM : 5 arcminutes, a good compromise price/quality
BASIC : 10 arcminutes, a budget gearhead to cut servo system costs

DYNABOX® SELECTION

START/STOP SERVICE S5

- Calculate acceleration torque on gearbox output :

C2acc = C1acc x i x η x F1 x 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 to 2000	2000 to 3000	3000 to 5000	5000 to 10000
F2	1 to 1,35	1,35 to 1,45	1,45 to 1,6	1,6 to 1,9

Intermediates values
To be interpolated

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

Torque S5 > C2acc

CONTINUOUS SERVICE S1

- Calculate nominal torque on gearbox output

C2nom = C1nom x i x η

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

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) : starting 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 stifness on output
ig (kg.m²) : 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)
Fa (N) : permissible axial load on output shaft

REVERSIBILITY CLASSES	
1	Total reversibility
2	Uncertain reversibility
3	Self-locking at N_1=0

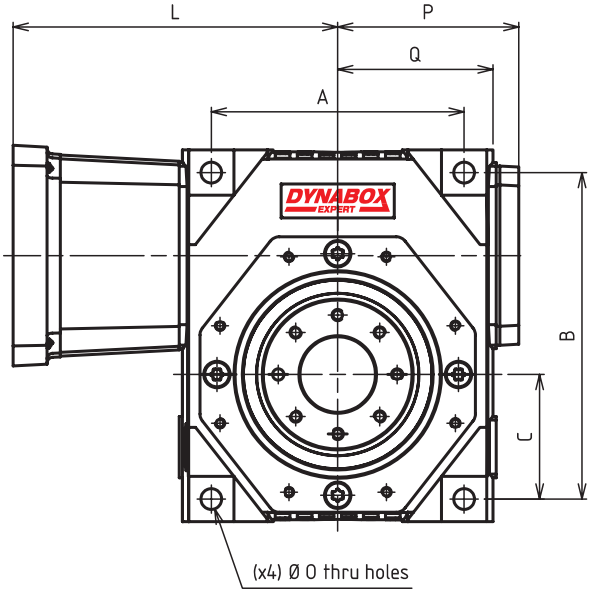
Note : Static self-locking only. Units can become reversible under vibrations..
For safety applications we advise to use a brake.
Efficiency values given for reference only and achieved after 24h hours full load operation.

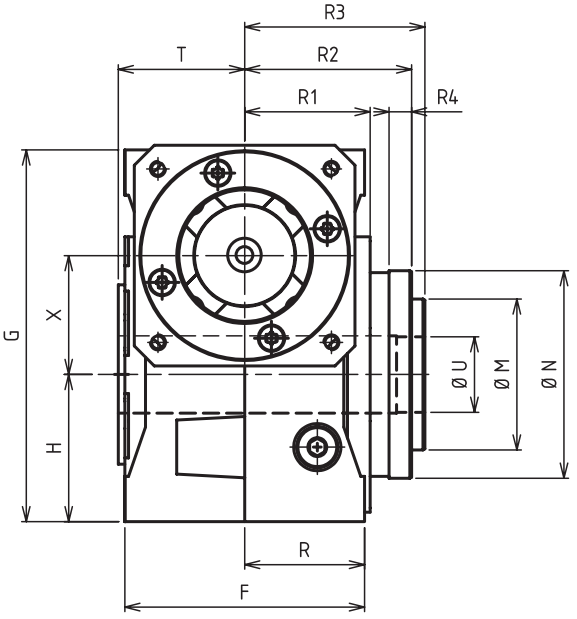
TECHNICAL SPECIFICATIONS

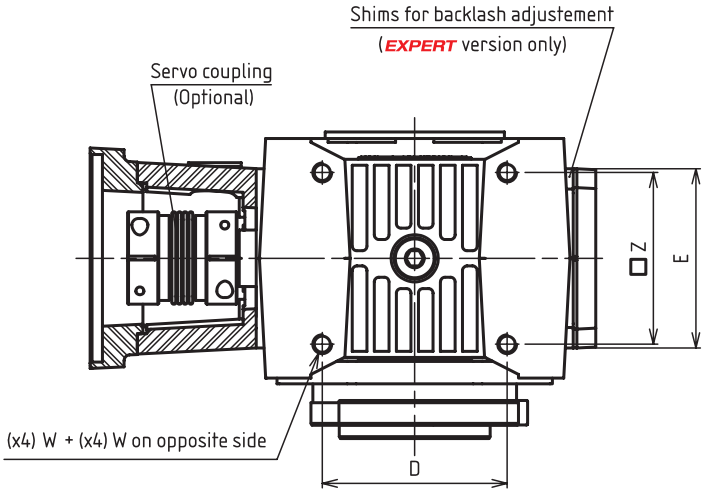
N1		6000		4000			3000			2000			1000									
	i	Torque S5	η	Torque S1	Torque S5	η	Torque S1	Torque S5	η	Torque S1	Torque S5	η	Torque S1	Torque S5	η	E-stop	C1f	ig	Et	Reversibility class	Fr	Fa
DYNABOX 25	5.2:1	11	89	8	13	88	9	15	87	11	18	86	14	23	84	46	0,03	2,2 X 10^{-6}	2	1	1500	500
	7.25:1	11	88	8	14	87	9	15	86	11	18	85	14	24	82	46	0,03	1,51 X 10^{-6}	2	1	1500	500
	10.25:1	11	87	8	13	86	8	14	85	11	18	84	14	23	81	46	0,03	1,15 X 10^{-6}	2	1	1500	500
	14.5:1	13	82	9	15	81	11	18	79	12	20	77	16	26	74	46	0,03	9,58 X 10^{-7}	2	2	1500	500
	19.5:1	13	80	9	15	78	11	18	76	12	20	74	16	26	70	46	0,03	8,67 X 10^{-7}	2	2	1500	500
	30:1	15	73	11	18	70	12	20	68	14	23	65	17	29	60	46	0,03	8 X 10^{-7}	2	3	1500	500
	45:1	15	67	11	18	64	11	19	62	14	23	59	17	28	53	42	0,03	7,77 X 10^{-7}	2	3	1500	500
	60:1	14	62	10	16	59	11	19	56	13	21	53	15	25	48	35	0,03	7,6 X 10^{-7}	2	3	1500	500
DYNABOX 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	26	41	81	33	52	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	30	77	23	37	74	25	40	72	29	46	69	36	58	63	96	0,2	4 X 10^{-6}	5	3	3800	2800
	45:1	30	71	23	36	68	25	40	65	28	45	61	35	56	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
DYNABOX 45	3.125:1	-	-	30	48	95	38	60	94	44	70	93	50	81	92	214	0,4	4,7 X 10^{-5}	9	1	5800	4000
	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
	10.25:1	68	93	46	80	92	53	88	91	62	98	90	80	128	88	214	0,4	1,5 X 10^{-5}	9	1	5800	4000
	14.5:1	69	90	52	83	88	59	94	87	68	109	86	88	141	82	214	0,4	1,4 X 10^{-5}	9	2	5800	4000
	19.5:1	66	89	50	80	87	55	88	86	64	102	84	81	129	80	214	0,3	1 X 10^{-5}	9	2	5800	4000
	30:1	74	83	55	88	80	61	98	78	70	112	76	88	141	71	214	0,3	1 X 10^{-5}	9	2	5800	4000
	45:1	74	77	54	86	75	59	94	72	68	109	69	83	133	64	185	0,3	8,2 X 10^{-6}	9	3	5800	4000
	60:1	69	73	50	78	70	55	86	68	62	97	64	75	116	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
DYNABOX 55	3.125:1	-	-	52	83	94	56	89	94	74	118	93	95	152	92	307	0,6	1,1 X 10^{-4}	20	1	7000	4800
	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	88	94	65	111	93	74	125	92	90	147	91	118	188	89	307	0,6	5,3 X 10^{-5}	20	1	7000	4800
	10.25:1	102	92	76	132	90	87	145	89	103	165	88	133	206	85	307	0,6	4,5 X 10^{-5}	20	1	7000	4800
	14.5:1	96	90	71	115	88	82	133	87	96	155	85	123	190	82	307	0,6	3,8 X 10^{-5}	20	2	7000	4800
	19.5:1	101	88	77	123	87	87	139	85	101	162	83	128	205	80	307	0,4	3,1 X 10^{-5}	20	2	7000	4800
	30:1	107	82	83	130	80	94	148	78	109	169	75	136	202	70	307	0,4	3,4 X 10^{-5}	20	2	7000	4800
	45:1	110	77	83	130	74	93	145	72	106	163	69	131	202	63	307	0,4	2,8 X 10^{-5}	20	3	7000	4800
	60:1	110	73	82	128	69	91	141	67	103	158	63	126	194	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
DYNABOX 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	146	91	110	179	90	128	207	89	149	240	87	191	293	84	497	0,8	6,9 X 10^{-5}	36	2	8800	8500
	19.5:1	155	90	119	190	88	135	215	87	156	250	85	199	318	82	497	0,5	5,5 X 10^{-5}	36	2	8800	8500
	30:1	179	84	138	218	82	155	245	80	179	281	78	223	335	73	497	0,5	5,9 X 10^{-5}	36	2	8800	8500
	45:1	163	80	123	193	77	137	214	75	156	239	72	193	287	67	403	0,5	5 X 10^{-5}	36	3	8800	8500
	60:1	162	76	121	189	73	134	205	71	151	233	67	186	288	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
DYNABOX 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	187	94	146	234	93	168	269	92	204	326	91	261	418	88	834	1	2,2 X 10^{-4}	50	1	10500	10500
	14.5:1	237	91	170	276	90	195	315	88	234	376	87	298	460	84	834	1	1,9 X 10^{-4}	50	2	10500	10500
	19.5:1	228	89	168	270	88	194	310	87	227	362	85	288	434	81	834	0,6	1,5 X 10^{-4}	50	2	10500	10500
	30:1	252	86	186	294	84	212	334	82	248	386	80	309	460	75	834	0,6	1,6 X 10^{-4}	50	2	10500	10500
	45:1	243	79	190	299	76	212	331	74	244	383	71	301	472	65	718	0,6	1,4 X 10^{-4}	50	3	10500	10500
	60:1	225	75	175	272	72	195	300	69	221	334	66	272	395	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
DYNABOX 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	379	92	272	444	91	314	504	90	380	612	88	486	748	85	1543	1,5	3,2 X 10^{-4}	75	2	15800	13000
	19.5:1	429	91	318	506	90	367	584	88	431	685	87	544	865	84	1543	0,8	2,5 X 10^{-4}	75	2	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	2	15800	13000
	45:1	454	83	343	538	80	385	599	79	441	674	76	546	811	71	1255	0,8	1,9 X 10^{-4}	75	3	15800	13000
	60:1	432	80	328	512	77	364	559	75	412	622	72	507	761	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
DYNABOX 110	5.2:1	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	630	93	450	720	92	519	830	91	630	1014	90	810	1247	87	2289	2	6,3 X 10^{-4}	120	2	21500	16000
	19.5:1	670	92	510	815	91	589	943	90	705	1121	88	893	1349	85	2289	1	4,6 X 10^{-4}	120	2	21500	16000
	30:1	790	88	597	955	87	688	1100	85	812	1299	83	1015	1512	79	2289	1	3,5 X 10^{-4}	120	2	21500	16000
	45:1	776	85	583	915	82	665	1037	80	765	1168	78	947	1411	73	2152	1	3,3 X 10^{-4}	120	3	21500	16000
	60:1	683	81	522	815	79	588	905	77	669	1030	73	826	1239	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

S1 service : over 2000 rpm, we recommend to use a cooling system.

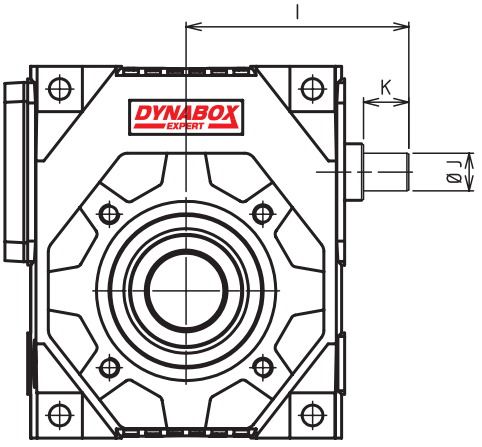
DYNABOX® ROBOT FLANGE



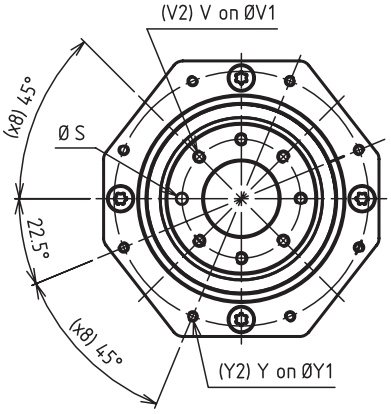




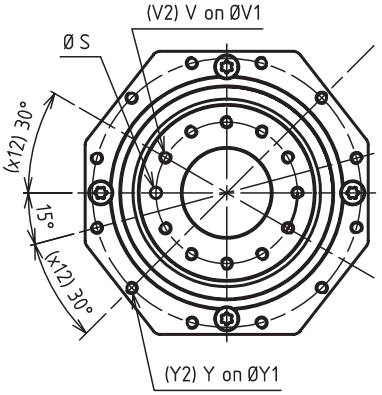
INPUT SHAFT VERSION



SIZES 45 - 55 and 63



SIZES 75 and 90



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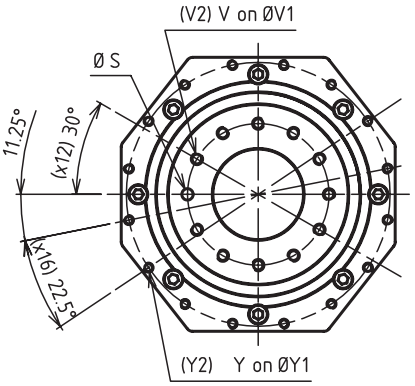
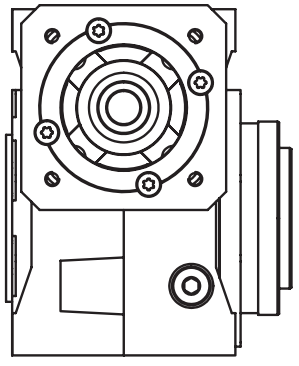


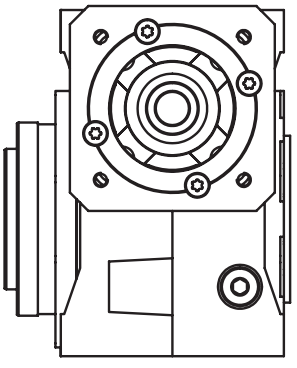
DYNABOX	45	55	63	75	90	110
A	108	120	134	172	186	220
B	135	155	173	208	234	276
C	53	61	66	82	91	108
D	81	90	98	136	141	175
E	68	78	91	110	130	140
F	100	112	127	148	170	182
G	153	175	197	232	264	306
H	62	71	78	94	106	123
I Maxi	105	116	126	151	165,5	189
I mini	97,5	108	116	140	153,5	177
J (j6)	15	18	20	24	28	32
K	20	22	24	28	28	36
L			see page 15			
M (h7)	50	63	80	100	125	160
N (h7)	80	90	110	140	165	200
O	9	9	11	11	13	13
P (Maxi)	83,5	91	101	124	136,5	152
Q	67,5	75	84	104	114,5	132
R	50	56	63,5	74	85	91
R1	54	59	66,5	79	93	100
R2	74	82	88,5	110	129	140
R3	80	89	95,5	117	138	150
R4	10	12	12	15	18	22
S (H7)	6	6	6	8	8	10
T	53	59,5	67	78	89	96
U (H7)	25	31,5	40	50	63	80
V - DEPTH	M6-11	M6-11	M6-11	M8-15	M8-15	M10-15
V1	40	50	63	80	100	125
V2	7	7	7	11	11	11
W	M8	M8	M10	M10	M12	M12
X	45	55	63	75	90	110
Y - DEPTH	M5-12	M5-12	M5-12	M6-15	M8-18	M8-19
Y1	100	109	135	168	190	233
Y2	8	8	8	12	12	16
Z	75	75	85	95	115	115
WEIGHT (kg)	7,6	10,5	15,2	22,5	36,15	51,7
Max. tilting torque (Nm)	250	450	780	1200	2150	3900
Tilting rigidity (Nm/arcmin)	330	520	580	800	1550	3050

MOUNTING POSITIONS

H1



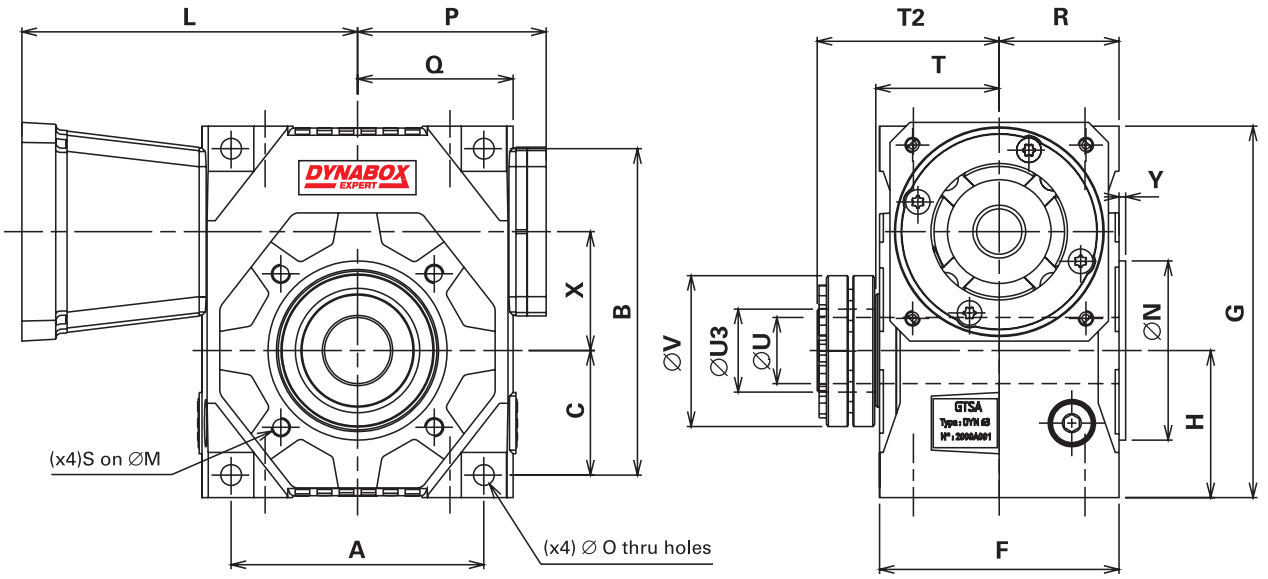
H2



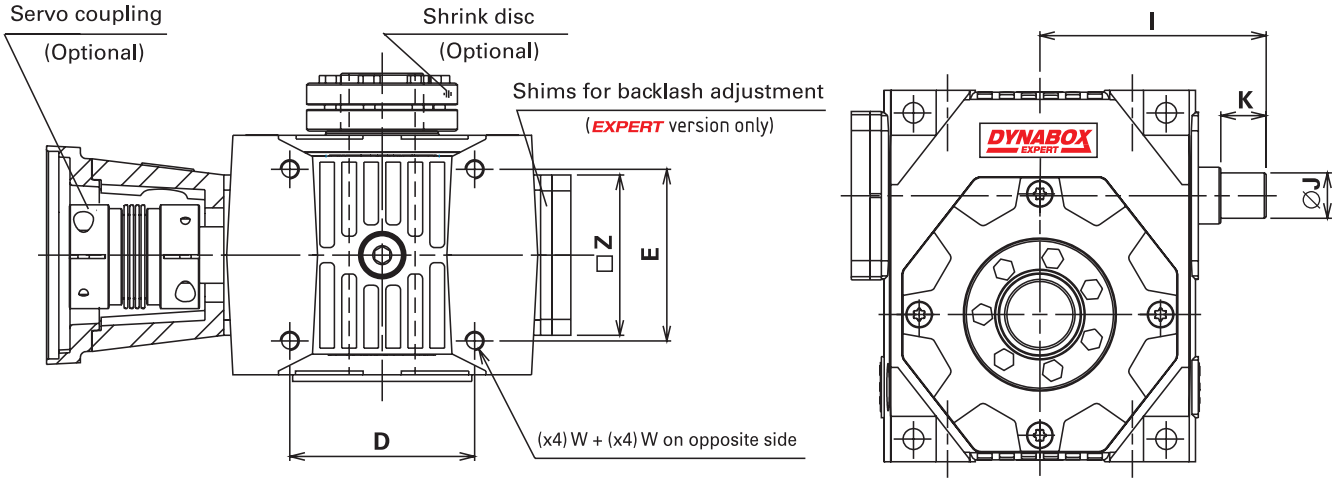
All mounting positions on the machine are accepted with the factory lubricated ***DYNABOX.***
However, applications which use less than 360° of the output require a higher oil level. It should be specified when ordering.

DYNABOX® HOLLOW SHAFT

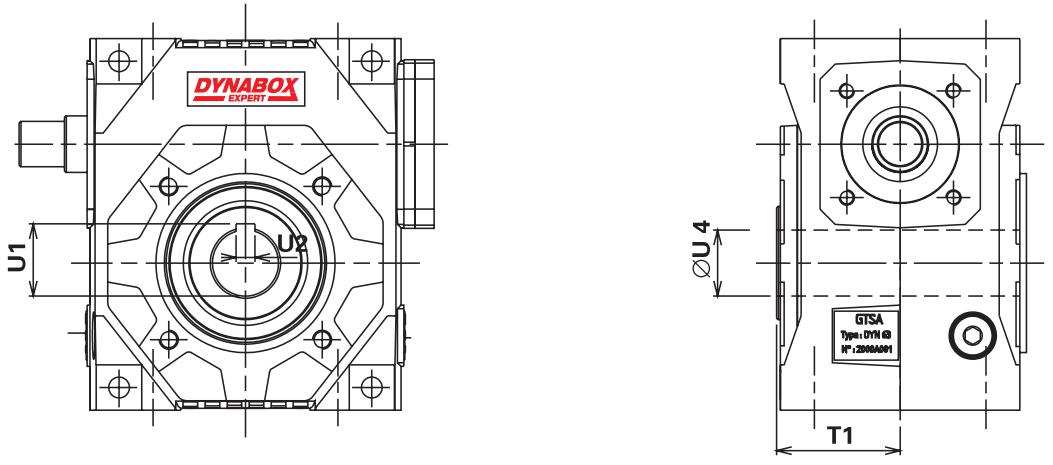
SMOOTH SHAFT FOR SHRINK DISC



INPUT SHAFT VERSION



KEYED HOLLOW SHAFT



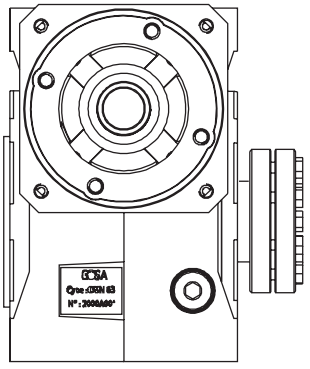
DYNABOX	25	35	45	55	63	75	90	110
A	66	86	108	120	134	172	186	220
B	84	110	135	155	173	208	234	276
C	33	44,5	53	61	66	82	91	108
D	49,5	62	81	90	98	136	141	175
E	44	56	68	78	91	110	130	140
F	64	86	100	112	127	148	170	182
G	96	126	153	175	197	232	264	306
H	39	52,5	62	71	78	94	106	123
I Maxi	53	84	105	116	126	151	165,5	189
I mini	—	77,5	97,5	108	116	140	153,5	177
J (j6)	9	12	15	18	20	24	28	32
K	10	17	20	22	24	28	28	36
L	SEE PAGE 15							
M *	65	65	85	100	115	130	165	200
N (j7) *	55	50	70	80	95	110	130	165
O	6,2	7	9	9	11	11	13	13
P (Maxi)	49	70	83,5	91	101	124	136,5	152
Q	42	55	67,5	75	84	104	114,5	132
R	32	43	50	56	63,5	74	85	91
S *	M5	M6	M8	M8	M10	M10	M12	M12 (x8)
T	—	45	52	58	65,5	76	87	93
T1	34,5	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
U1	16,3	18,3	28,3	33,3	38,3	43,3	53,8	64,4
U2	5	5	8	8	10	12	14	18
U3	—	24	30	36	44	50	68	80
U4	14	16	25	30	35	40	50	60
V	—	50	60	72	80	90	115	145
W	M5	M6	M8	M8	M10	M10	M12	M12
X	25	35	45	55	63	75	90	110
Y *	3	3	3	3,5	3,5	4	4	5
Z	50	58	75	75	85	95	115	115
WEIGHT (kg)	1,4	3,4	6,2	8,5	13,9	20,5	32,5	46,5

Note : size 25 only available with keyed hollow shaft

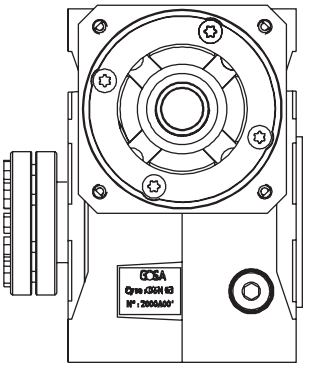
(*) Flange on both sides.

MOUNTING POSITIONS

H1



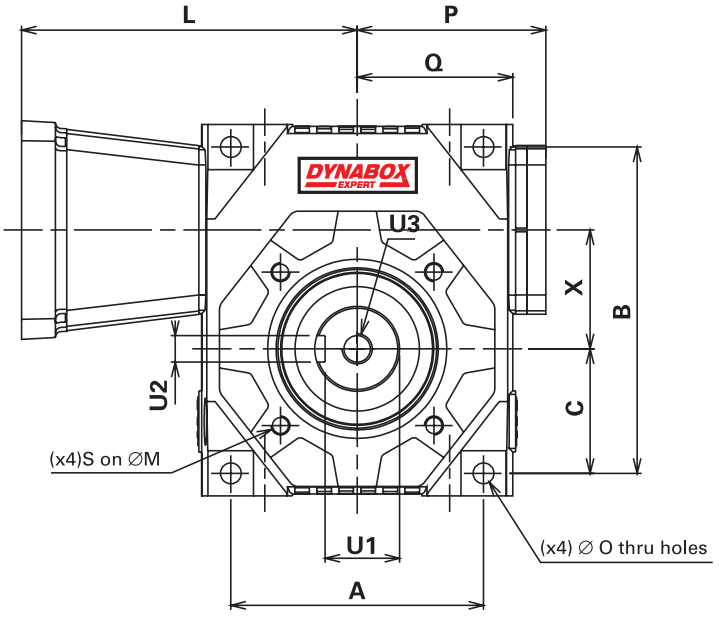
H2

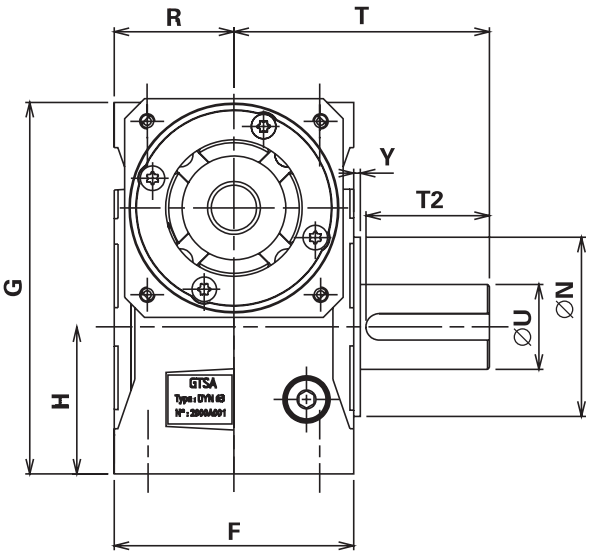


All mounting positions on the machine are accepted with the factory lubricated ***DYNABOX.***
However, applications which use less than 360° of the output require a higher oil level. It should be specified when ordering.

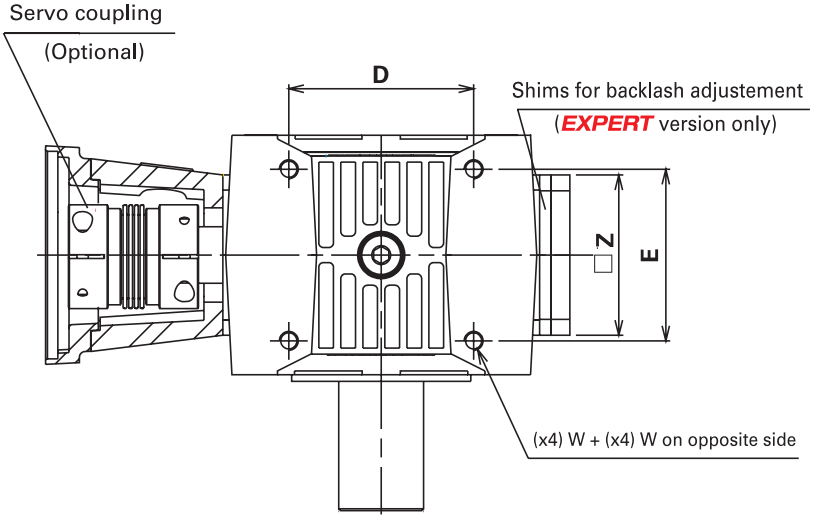
DYNABOX® OUTPUT SHAFT

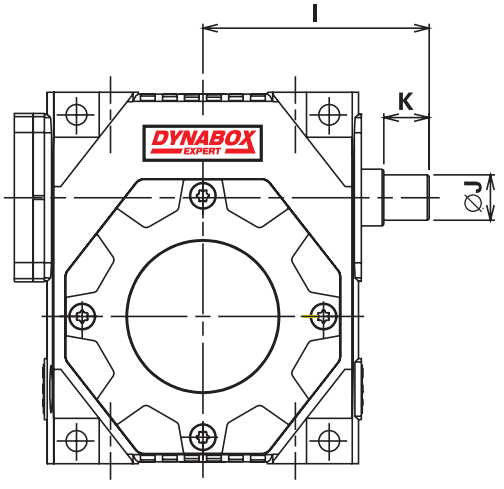
SINGLE OUTPUT SHAFT



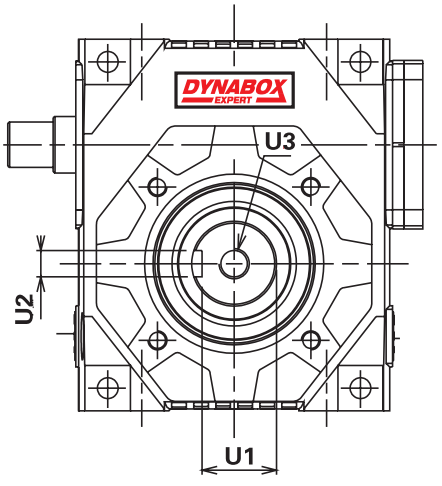


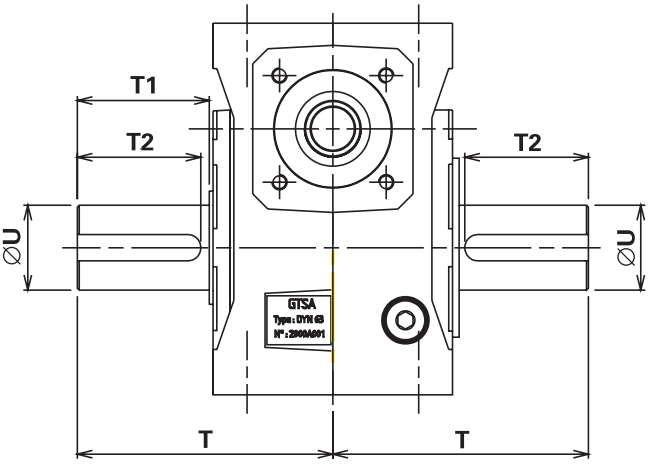
INPUT SHAFT VERSION





DUAL OUTPUT SHAFT



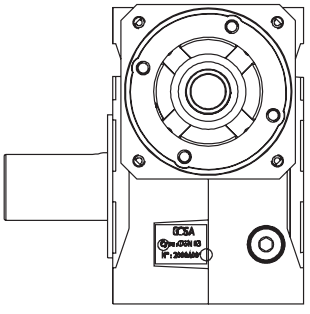


DYNABOX	35	45	55	63	75	90	110
A	86	108	120	134	172	186	220
B	110	135	155	173	208	234	276
C	44,5	53	61	66	82	91	108
D	62	81	90	98	136	141	175
E	56	68	78	91	110	130	140
F	86	100	112	127	148	170	182
G	126	153	175	197	232	264	306
H	52,5	62	71	78	94	106	123
I Maxi	84	105	116	126	151	168,5	189
I mini	77,5	97,5	108	116	140	153,5	177
J (j6)	12	15	18	20	24	28	32
K	17	20	22	24	28	28	36
L				see page 15			
M	65	85	100	115	130	165	200
N (j7)	50	70	80	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

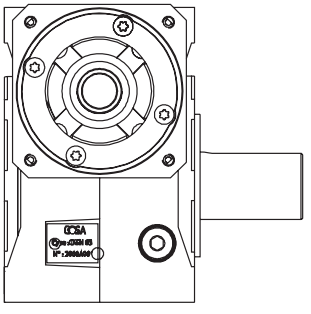
(*) : No shoulder on shaft

MOUNTING POSITIONS

H1



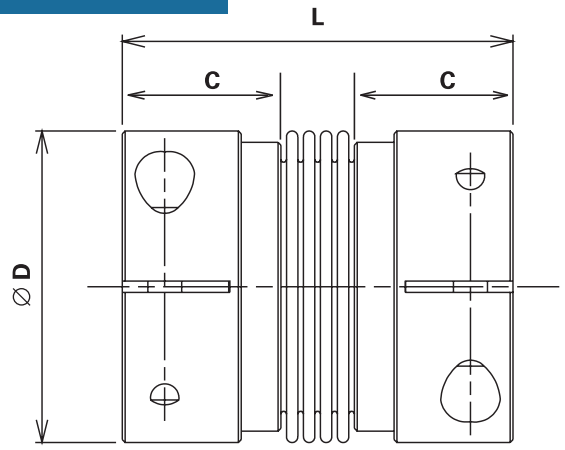
H2

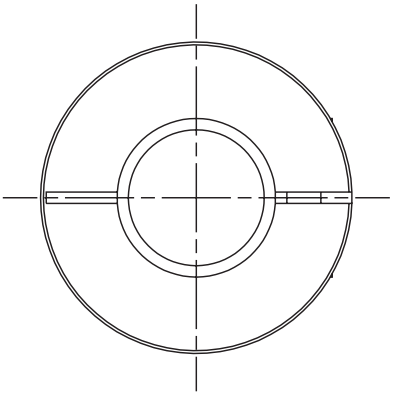


All mounting positions on the machine are accepted with the factory lubricated ***DYNABOX.***
However, applications which use less than 360° of the output require a higher oil level. It should be specified when ordering.

CONNECTING KIT DYNABOX® -SERVOMOTOR

TORSION STIFF COUPLINGS





Coupling reference		AM N° 5	AM N° 10	AM N° 15	AM N° 30	AM N° 60	AM N° 80
∅ servo shaft and **DYNABOX** shaft	mm	<∅16	<∅24	<∅28	<∅32	<∅35	<∅42
Servo nominal torque	Nm	5	10	15	30	60	80
Servo peak torque	Nm	7,5	15	22,5	45	90	120
∅ D	mm	32	40	49	55	66	82
L	mm	42	46	60	70	81	94
C Mounting length	mm	13	13	21,5	26	28	32,5
Polar moment of inertia	10^{-3}kgm²	0,01	0,02	0,05	0,09	0,18	0,54
Torsional stiffness	Nm/arcmin	2	2,6	6	11	22	37
Tightening torque of campling screws	Nm	4	4,5	9	14	35	70

Above table not valid for size 25 (contact us).

Specify the coupling reference and the servo shaft ∅ when ordering.

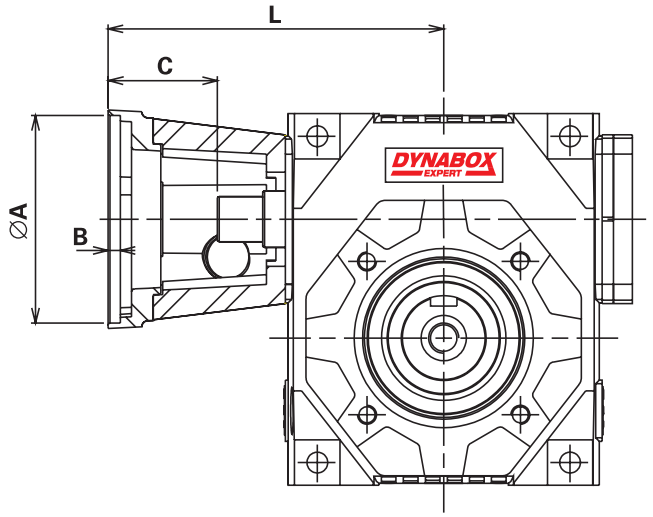
Exemple : AM n° 15 ∅ 14

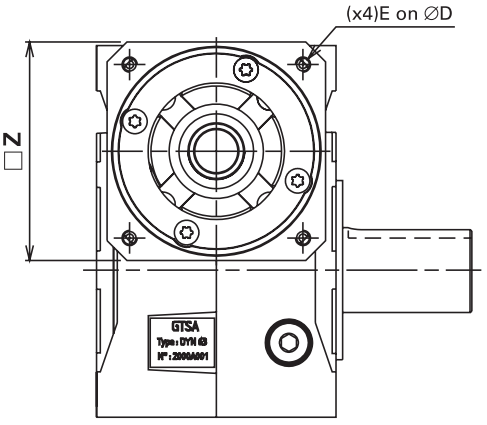
To calculate the input total inertia, add the coupling iner-

CONNECTING FLANGE

Select the required flange
on page 15.

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





DYNABOX	Reference	A	B	C*	D	E	L	Z
25	BM-F46/30	30	4	27	46	M3	80	58
	BM-F63/40	40	4	27	63	M4	80	65
	BM-F70/50	50	4	32	70	M4	85	65
	BM-F75/60	60	4	32	75	M5	85	65
	BM-F90/70	70	4	32	90	M5	85	90
	BM-F95/70	70	4	32	95	M6	85	90
	BM-F100/80	80	5	42	100	M6	95	90
	BM-F115/95	95	5	52	115	M8	105	105
35	BM-F63/40	40	4	32	63	M4	111	65
	BM-F70/50	50	4	35	70	M4	114	65
	BM-F75/60	60	4	35	75	M5	114	65
	BM-F90/70	70	4	45	90	M5	124	90
	BM-F95/50	50	4	35	95	M6	114	90
	BM-F100/80	80	5	45	100	M6	124	90
	BM-F115/95	95	5	45	115	M8	124	118
	BM-F130/95	95	5	55	130	M8	134	118
	BM-F130/110	110	5	55	130	M8	134	118
	BM-F145/110	110	6,5	65	145	M8	144	118
45	BM-F70/50	50	4	35	70	M4	135	81
	BM-F75/60	60	4	35	75	M5	135	81
	BM-F90/70	70	4	45	90	M5	145	91
	BM-F95/50	50	4	35	95	M6	135	91
	BM-F100/80	80	5	45	100	M6	145	91
	BM-F115/95	95	5	45	115	M8	145	115
	BM-F130/95	95	5	55	130	M8	155	115
	BM-F130/110	110	5	55	130	M8	155	115
	BM-F145/110	110	6,5	65	145	M8	165	140
	BM-F165/110	110	6,5	55	165	M10	155	140
	BM-F165/130	130	6,5	55	165	M10	155	140
55	BM-F70/50	50	4	35	70	M4	146	81
	BM-F75/60	60	4	35	75	M5	146	81
	BM-F90/70	70	4	45	90	M5	156	91
	BM-F95/50	50	4	35	95	M6	146	91
	BM-F100/80	80	5	45	100	M6	156	91
	BM-F115/95	95	5	45	115	M8	156	115
	BM-F130/95	95	5	55	130	M8	166	115
	BM-F130/110	110	5	55	130	M8	166	115
	BM-F145/110	110	6,5	65	145	M8	176	140
	BM-F165/110	110	6,5	55	165	M10	166	140
	BM-F165/130	130	6,5	55	165	M10	166	140
63	BM-F70/50	50	4	40	70	M4	160	102
	BM-F75/60	60	4	40	75	M5	160	102
	BM-F90/70	70	4	46	90	M5	166	102
	BM-F100/80	80	5	46	100	M6	166	102
	BM-F115/95	95	5	46	115	M8	166	115
	BM-F130/95	95	5	56	130	M8	176	115
	BM-F130/110	110	5	56	130	M8	176	115
	BM-F145/110	110	6,5	66	145	M8	186	140
	BM-F165/110	110	6,5	56	165	M10	176	140
	BM-F165/130	130	6,5	56	165	M10	176	140
	BM-F200/114,3	114,3	6,5	86	200	M10	206	185
	BM-F215/130	130	6,5	66	215	M12	186	185
	BM-F215/180	180	6,5	66	215	M12	186	185
75	BM-F70/50	50	4	40	70	M4	185	102
	BM-F75/60	60	4	40	75	M5	185	102
	BM-F90/70	70	4	46	90	M5	191	102
	BM-F100/80	80	5	46	100	M6	191	102
	BM-F115/95	95	5	46	115	M8	191	115
	BM-F130/95	95	5	56	130	M8	201	115
	BM-F130/110	110	5	56	130	M8	201	115
	BM-F145/110	110	6,5	66	145	M8	211	140
	BM-F165/110	110	6,5	56	165	M10	201	140
	BM-F165/130	130	6,5	56	165	M10	201	140
	BM-F200/114,3	114,3	6,5	86	200	M10	231	185
	BM-F215/130	130	6,5	66	215	M12	211	185
	BM-F215/180	180	6,5	66	215	M12	211	185
90	BM-F100/80	80	4	46	100	M6	205,5	123
	BM-F115/95	95	5	46	115	M8	205,5	123
	BM-F130/95	95	5	56	130	M8	215,5	123
	BM-F130/110	110	5	56	130	M8	215,5	123
	BM-F145/110	110	6,5	66	145	M8	225,5	140
	BM-F165/110	110	6,5	56	165	M10	215,5	140
	BM-F165/130	130	6,5	56	165	M10	215,5	140
	BM-F200/114,3	114,3	6,5	86	200	M10	245,5	185
	BM-F215/130	130	6,5	66	215	M12	225,5	185
	BM-F215/180	180	6,5	66	215	M12	225,5	185
	BM-F300/250	250	6,5	88	300	M14	247,5	260
110	BM-F100/80	80	4	46	100	M6	229	123
	BM-F115/95	95	5	46	115	M8	229	123
	BM-F130/95	95	5	56	130	M8	239	123
	BM-F130/110	110	5	56	130	M8	239	123
	BM-F145/110	110	6,5	66	145	M8	249	140
	BM-F165/110	110	6,5	56	165	M10	239	140
	BM-F165/130	130	6,5	56	165	M10	239	140
	BM-F200/114,3	114,3	6,5	86	200	M10	269	185
	BM-F215/130	130	6,5	66	215	M12	249	185
	BM-F215/180	180	6,5	66	215	M12	249	185
	BM-F300/250	250	6,5	88	300	M14	271	260

*** A spacer can be supplied if motor shaft length is longer than C dimension (specify it when ordering)**

HOW TO ORDER

Use following codification to order your ***DYNABOX.***

DYNABOX	63	EXPERT	5.2	C	H1	F	BM F 165/130	AM n° 30 ∅ 24	x motor shaft length

Options

AM	Servo coupling (page 14)
BM	Servo flange (pages 14 and 15)
F	Shrink disc for hollow shaft*
FI	Stainless steel shrink disc.

Mounting position H1 or H2

Output option

C	Hollow shaft for shrink disc (not included)*
CR	Hollow shaft with keyway
P	Single output shaft*
2P	Dual output shaft*
RF	Robot Flange*

*** not available for size 25**

Reduction ratio (see page 7)

Output torsional backlash

EXPERT	1 arcminute *
MEDIUM	5 arcminutes *
BASIC	10 arcminutes (15 arcminutes for size 25)

*** not available for size 25**

Size

25	35	45	55	63	75	90	110

SERVO GEARSETS ***DYNASET*** 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 are comparable to complete reducers, assuming following recommendations :

MOUNTING

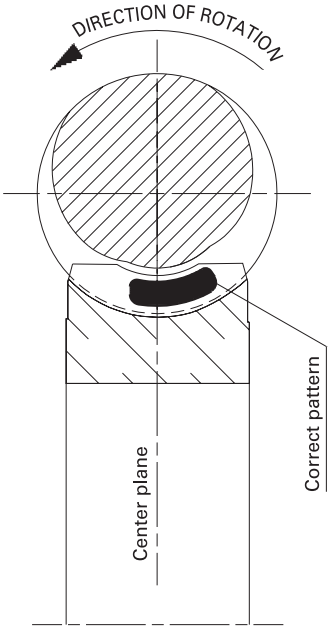
Wormshaft : housing and bearing design should allow an axial shifting, necessary for backlash adjustment. The total adjustment range is obtained with a permissible displacement equal to W, as per page 18.
It is recommended, whenever possible, to use our backlash adjustment device, which is delivered preset (see page 19).
The front ball bearing (see page 19) 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 18). As the bore ∅A 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°C.

After cooling, check that the wheel ring is no buckled, by applying a dial indicator on its face, while rotating the shaft.

Then, finish the pins bores ((xY) ∅S, see page 18) of the 2 assembled parts, as they are delivered pre-bored only. Otherwise, screws can be also used.

It is recommended to use tapper 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 below.



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 7 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

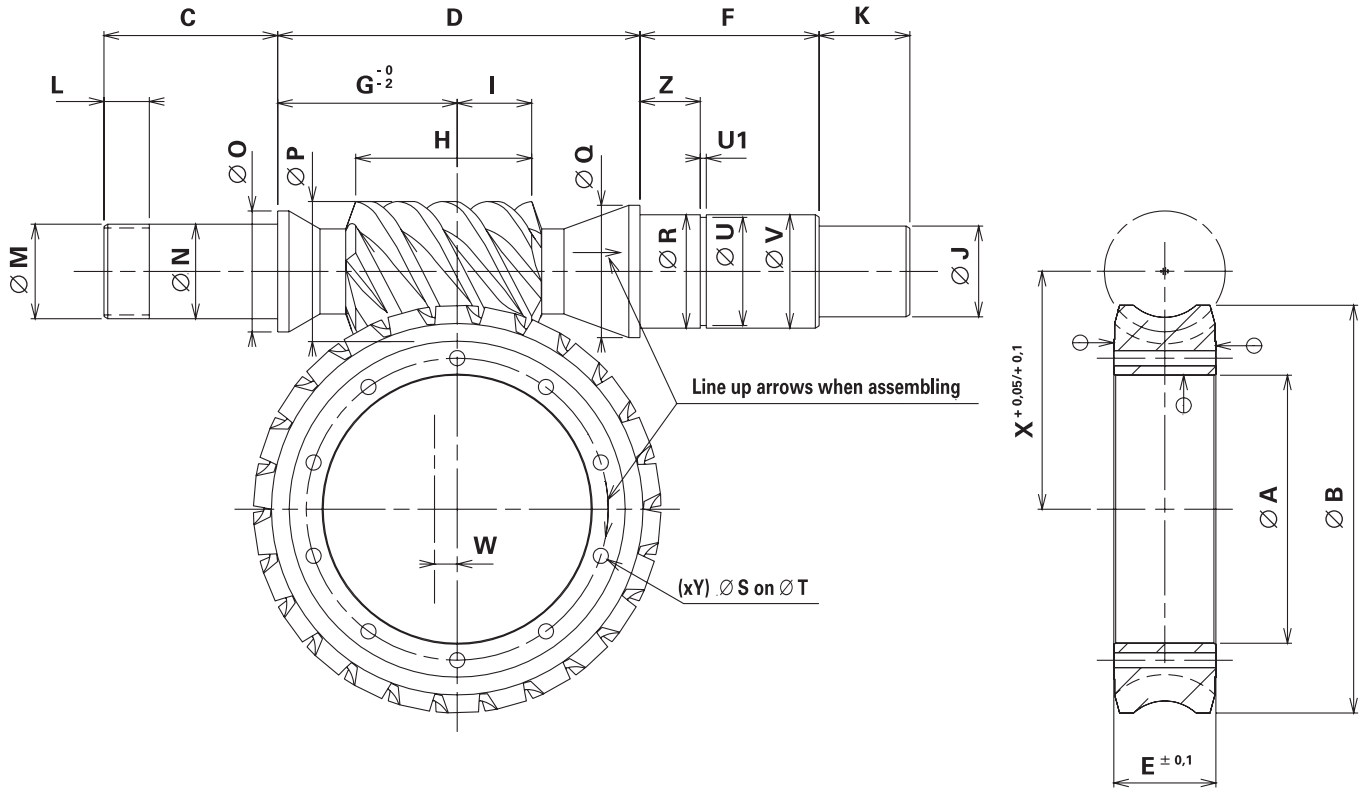
The accuracy of our servo gearsets ***DYNASET*** allows them to be set to less than 1 arcminute of backlash, without any efficiency or torque capacity losses (it is assumed than custom machined parts and mounting are correct).

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 arcminute is recommended.

For very intermittent applications (rotary tables or milling heads of CNC machines for ex.), 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.

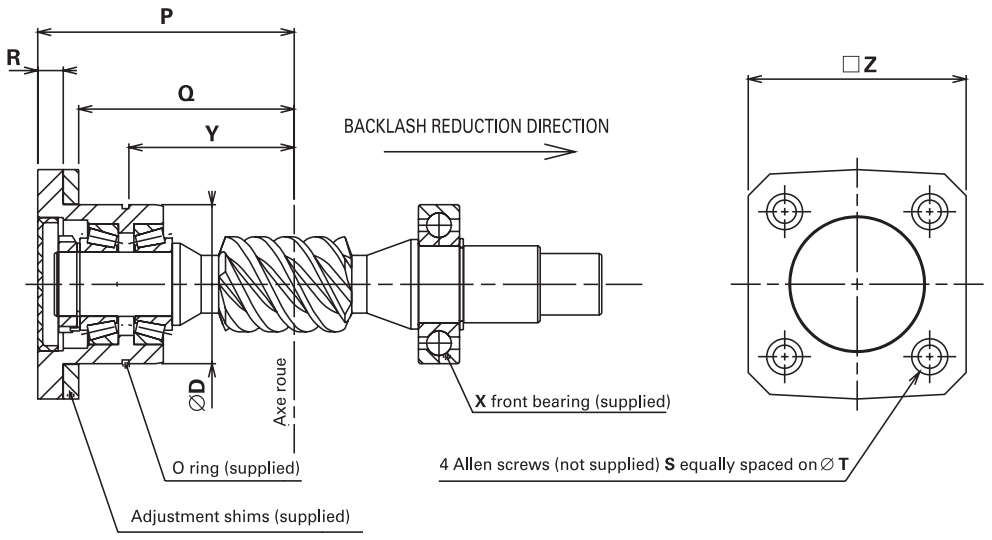
SERVO GEARSET DYNASET



Surfaces marked ⊖→ can be referred to for checking runnout

DYNASET	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	126,5	144	173
E	14	19	28	27	32	38	40
F	30,5	40	46	46,5	53,5	57,5	56
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 (j6)	12	15	18	20	24	28	32
K	17	20	22	24	28	28	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

BACKLASH ADJUSTMENT DEVICE FOR DYNASET



DYNASET	35	45	55	63	75	90	110
D	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.

HOW TO ORDER

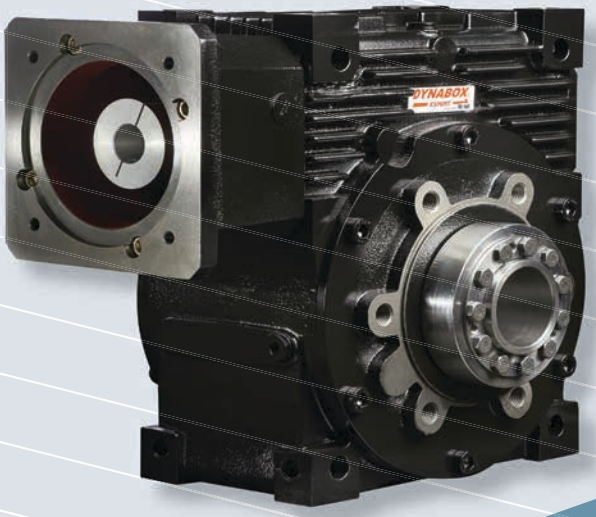
Use following codification to order your **DYNASET.**

DYNASET	63	90	ADJ

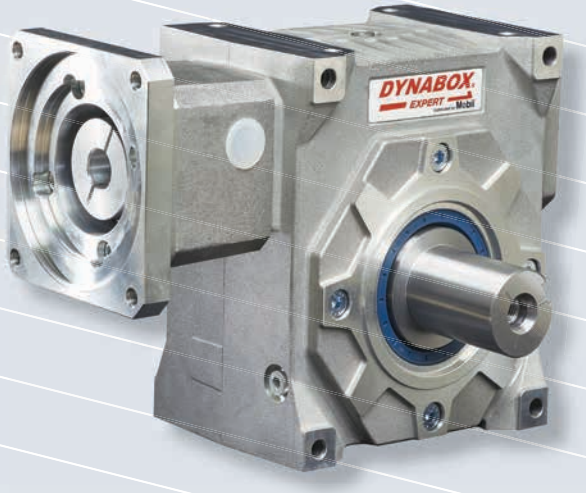
Option — **Backlash adj. device** (see page 19)

Reduction ratio (see page 7)

Size — 35 | 45 | 55 | 63 | 75 | 90 | 110



Visit our website to
Contact our international sales network
Download 2D and 3D drawings and discover our DYNABOX XL range (torque up to 8000Nm)



GIRARD TRANSMISSIONS
PRECISION GEARHEADS

Avenue Joseph-Marie Jacquard - BP 50208
64147 LONS INDUSPAL CEDEX FRANCE
Tél. : (33) 05 59 40 03 03 - Fax : (33) 05 59 32 11 45
Web : www.girard-transmissions.com