



HELICAL AND BEVEL-HELICAL UNITS



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GENERAL INFORMATION

Alliance Transmission gear units are suitable for most applications in both horizontal and vertical drives. New design, outstanding innovations offer :

- increased power capacity
- more sizes
- more competitiveness with the same high reliability

The high power to weight ratio of all units, combined with low volume, enable installation in the most critical situations.

New concepts have been used to improve the **noise level** in a consistent way, by grinding all gears sets, both the helical and the Gleason spiral bevel type gears.

Because of **higher capacity**, particular consideration has been given to efficiency and housing surface area to guarantee a convenient heat dissipation in most cases. When necessary, units can be supplied with:

- fans fitted to high speed shafts
- cooling water coil
- fan and cooling coil
- separate oil cooler incorporated in forced lubrication system.

GEAR CASES

Gear cases are of rigid close grained grey cast iron construction up to size 110. Fabricated steel cases are available as standard from size 120 up and as optional for smaller sizes. Computer designed and CNC machined.

GEARS

High quality alloy case hardening materials provide long life, wear resistance and fatigue strength. Helical and spiral bevel gears(usually) are ground to high standards and quiet running characteristics. Life and wear calculations (**25.000 hrs** with **$f_m=1$**) based on ISO 6336, DIN 3990 and AGMA 2001 recommendations.

DESIGNATION

P	B	30	UB	16	B	S	2
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Mounting position

High speed shaft

S solid

PAM hollow+motor flange

B solid+motor flange

Shaft arrangement

Ratio i_N

Output shaft

S solid

C hollow

UB hollow with shrink disc

Size

No. of stages

A single reduction

B double reduction

C triple reduction

D quadruple reduction

Type

P helical unit

RH horizontal bevel-helical unit

RV vertical bevel-helical unit

KEY TO SYMBOLS

f_m	mechanical service factor	
i	transmission ratio	
i_N	nominal transmission ratio	
η	efficiency	
f_a	ambient correction factor	
n_1	high speed	min ⁻¹ or rpm
n_2	low speed	min ⁻¹ or rpm
P_t	thermal capacity	kW
P_{tN}	nominal thermal capacity	kW
P_N	nominal power	kW
P	absorbed motor power	kW
t	temperature	°C celsius
T	torque	Nm
T_N	nominal torque	Nm
Fr_1	high speed shaft overhung load	N
Fr_2	low speed shaft overhung load	N
J_1	high speed shaft mass moment of inertia	Kgm ²

EFFICIENCY (η)

99% Single reduction helical unit

98% Double reduction helical unit

98% Triple reduction helical unit

96% Quadruple reduction helical unit

97.5% Double reduction bevel-helical unit

96.5% Triple reduction bevel-helical unit

95.5% Quadruple reduction bevel-helical unit

MECHANICAL SERVICE FACTOR f_m

For stop-starts per hour exceeding 5, please refer to us.

Prime Mover	Duration of service (hrs/day)	Load classification		
		Uniform load	Moderate shock	Heavy shock
El. motor, steam turbine, hydraulic motor.	< 3	0.8	1.0	1.5
	3 - 10	1.0	1.25	1.75
	>10	1.25	1.5	2.0
Multi-cylinder internal combustion engine.	< 3	1.0	1.25	1.75
	3 - 10	1.25	1.5	2.0
Single-cylinder internal combustion engine.	>10	1.5	1.75	2.25
	< 3	1.25	1.5	2.0
	3 - 10	1.5	1.75	2.25
	>10	1.75	2.0	2.5

LOAD CLASSIFICATION

- U** Uniform load
- M** Moderate shock
- H** Heavy shock
- * refer to us

Driven machine	Type of load
Agitators	
pure liquids	U
liquids and solids	M
liquids-variable density	M
Blowers	
centrifugal	U
lobe	M
vane	U
Car pullers	M
Clarifiers	U
Clay working machinery	
brick press	H
briquette machine	H
clay working machinery	M
Compressors	
centrifugal	U
lobe	M
reciprocating	
multi-cylinder	M
single-cylinder	H
Conveyors-uniformly fed	
apron	U
assembly	U
belt	U
bucket	U
chain	U
screw	U
Conveyors-heavy duty	
apron	M
assembly	M
belt	M
bucket	M
chain	M
reciprocating	H
screw	M
shaker	H

Driven machine	Type of load
Cranes	
main hoist	*
bridge travel	*
trolley travel	*
Crushers	
ore	H
stone	H
sugar	H
Dredges	
conveyors	M
cutter head drives	H
pumps	M
screen drive	H
stackers	M
Elevators	
bucket-uniform load	U
bucket-heavy load	M
centrifugal discharge	U
gravity discharge	U
Fans	
centrifugal	U
cooling towers	
induced draft	M
forced draft	*
large, mining	M
large, industrial	M
light, small diameter	U
Feeders	
apron	M
belt	M
disc	U
reciprocating	H
screw	M

Driven machine	Type of load
Food industry	
slicers	M
cereal cooker	U
dough mixer	M
meat grinders	M
Generators	U
Hoists	
heavy duty	H
medium duty	M
Laundry tumblers	M
Lumber industry	
de-barkers	M
burner conveyor	M
chain saw, drag saw	H
chain transfer	H
craneway transfer conveyor	H
slab conveyor	M
conveyor-belt	H
conveyor-chain	U
tipple hoist conveyor	M
tipple hoist drive	M
waste conveyor	M
Machine tools	
bending roll	M
punch press-gear driven	H
plate planers	H
tapping machine	H
other machine tools	
main drives	M
auxiliary drives	U
Metal mills	
slitters	M
table conveyors	
non-reversing	M
reversing	*
wire winding machine	M
Mixers	
concrete mixer	M
constant density	U
variable density	M
Oil well pumping	*
Paper mills	
agitators	M
de-barkers-hydraulic	M
de-barkers-mechanical	H
barking drum	H
bleacher	U
calenders	U
conveyors	M
cutters-plates	U

Driven machine	Type of load
cylinders	M
dryers	M
felt stretcher	M
felt wipper	H
jordans	M
Printing press	U
Pumps	
centrifugal	U
proportioning	M
reciprocating	
single acting >2 cylinders	M
single acting <3 cylinders	*
double acting >1 cylinder	M
double acting 1 cylinder	*
rotary,gear, lobe type	U
Rubber and plastics	
crackers	H
refiners	M
rubber calenders	M
films extruders	U
sheets extruders	U
extruders	U
Sand muller	M
Sewage disposal equip.	
bar screeners	U
chemical feeders	U
dewatering screws	M
scum breakers	M
mixers	M
thickeners	M
vacuum filter	M
Screens	
air washing	M
rotary-stone or gravel	U
travelling water intake	M
Sugar industry	
cane and beet knives	M
crushers	M
pulp conveyors	M
Textile industry	
calenders	M
cards	M
driers	M
dyeing machinery	M
knitting machines	*
looms	M
mangles	M
soapers	M
spinners	M
washers	M

THERMAL CAPACITY

Nominal thermal capacities P_{tN}

The tables below show the values of the thermal capacities under different cooling conditions, viz : natural cooling, fan cooling and coil cooling. Values apply to an ambient temperature of 20 degree C. For different ambient temperatures, the nominal thermal capacity P_{tN} can be obtained by multiplying the thermal capacity P_t for the selected type of cooling, by the ambient thermal factor f_a . Whenever a high heat dissipation level is required together with high operational reliability, it is recommended to consider the application of a separate oil-cooler, incorporated in a forced lubrication system.

$$P_{tN} = P_t \times f_a$$

f_a ambient correction factor

Ambient temperature	w/o auxiliary cooling	Auxiliary cooling
10 °C	1,14	1,04
20 °C	1	1
30 °C	0,86	0,94
40 °C	0,72	0,89
50 °C	0,56	0,83

Thermal capacity (kW)

A - No auxiliary cooling

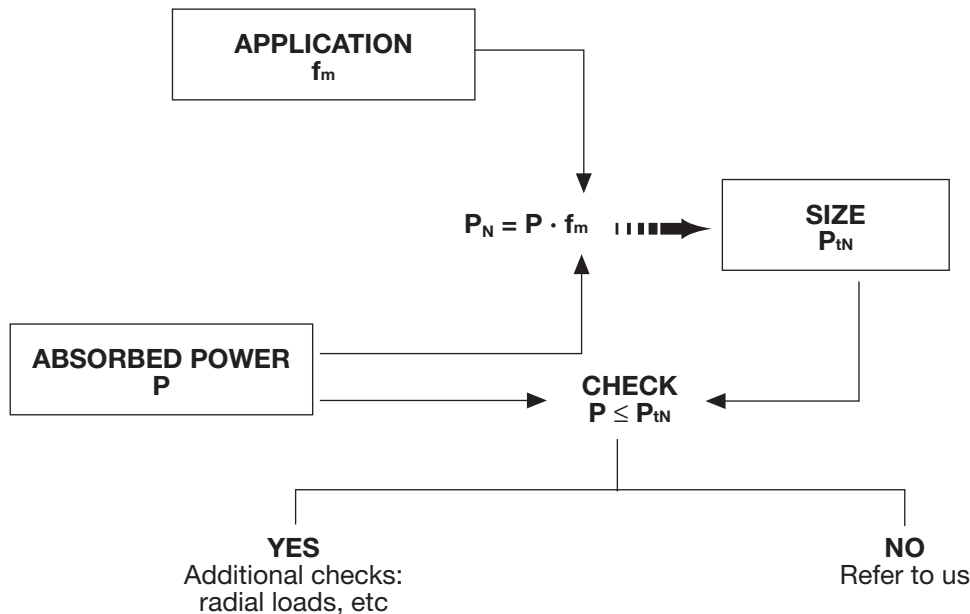
	n_1	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	
PA	1750	60	77	100	122	155	190	226	289	359	437	547						
	1500	55	72	93	115	148	180	212	271	338	408	505						
	1000	52	68	88	109	140	170	200	256	320	386	477						
	750	51	67	86	107	137	167	195	251	313	377	467						
PB	1750	33	44	57	72	94	116	136	175	223	275	345	429	549	683	835	1045	
	1500	30	40	52	66	86	106	125	163	206	252	316	395	502	630	768	960	
	1000	28	38	49	63	82	100	119	156	197	240	301	378	481	603	732	914	
	750	27	36	47	59	77	95	112	147	185	227	284	356	452	567	691	864	
PC	1750	25	34	44	56	72	89	107	138	177	217	275	349	441	538	678	848	
	1500	23	31	40	51	66	82	98	127	162	199	252	320	405	494	622	778	
	1000	21	29	37	47	61	76	91	118	151	185	234	298	377	459	578	724	
	750	21	28	36	46	59	74	88	114	146	179	227	288	365	445	560	700	
PD	1750	20	26	35	44	57	71	85	111	142	175	223	279	354	457	558	698	
	1500	18	24	32	40	52	65	78	102	130	161	205	256	325	419	512	640	
	1000	17	22	29	37	48	60	72	94	120	148	189	236	299	385	471	589	
	750	16	22	29	36	47	59	70	92	117	145	185	230	293	377	461	576	

	n_1	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160
RB	1750	33	44	57	72	94	116	136	175	223	275	345	429	549	683	835	1045
	1500	30	40	52	66	86	106	125	163	206	252	316	395	502	630	768	960
	1000	28	38	49	63	82	100	119	156	197	240	301	378	481	603	732	914
	750	27	36	47	59	77	95	112	147	185	227	284	356	452	567	691	864
RC	1750	25	34	44	56	72	89	107	138	177	217	275	349	441	538	678	848
	1500	23	31	40	51	66	82	98	127	162	199	252	320	405	494	622	778
	1000	21	29	37	47	61	76	91	118	151	185	234	298	377	459	578	724
	750	21	28	36	46	59	74	88	114	146	179	227	288	365	445	560	700
RD	1750	20	26	35	44	57	71	85	111	142	175	223	279	354	457	558	698
	1500	18	24	32	40	52	65	78	102	130	161	205	256	325	419	512	640
	1000	17	22	29	37	48	60	72	94	120	148	189	236	299	385	471	589
	750	16	22	29	36	47	59	70	92	117	145	185	230	293	377	461	576

SELECTION PROCEDURES

Data required :

- Absorbed motor power P (kW)
- Input speed n_1 (min^{-1})
- Gearbox ratio i_N
- Application: to state f_m



Example:

Helical unit

- $i_N = 5,6$
- $P = 220$ kW at 1500 min^{-1}
- $f_m = 1,75$
- Ambient temperature = 30°C

$$P_N = P \cdot f_m = 220 \times 1,75 = 385 \text{ kW}$$

The unit PA 80 gives 441 kW at 1500 rpm, hence it should be mechanically in order. The nominal thermal capacity without auxiliary cooling (see table page 7) is :

$$P_{tN} = 180 \times 0,86 = 155 \text{ kW}$$

Since this value is lower than the power P , the extra heat generated must be dissipated by an auxiliary system with a fan, for instance.

The nominal thermal capacity becomes :

$$P_{tN} = 261 \times 0,94 = 245 \text{ kW}$$

Since $P=220$ kW is lower than $P_{tN} = 245$ kW, the unit with one fan is convenient.

In addition to the auxiliary cooling (fan/s, coil and fan+coil), we recommend to consider that a definitive solution to the thermal problem can be achieved by a cooler (oil/water or oil/air if water is not available). For medium to large unit sizes, such a cooler is also more cost economical.

**HELICAL
UNITS**

**BEVEL-HELICAL
UNITS**

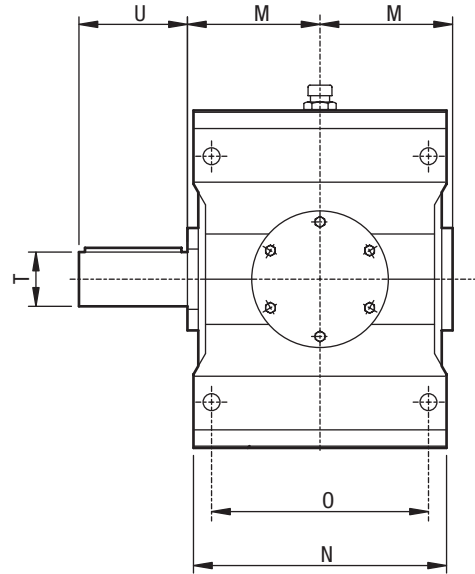
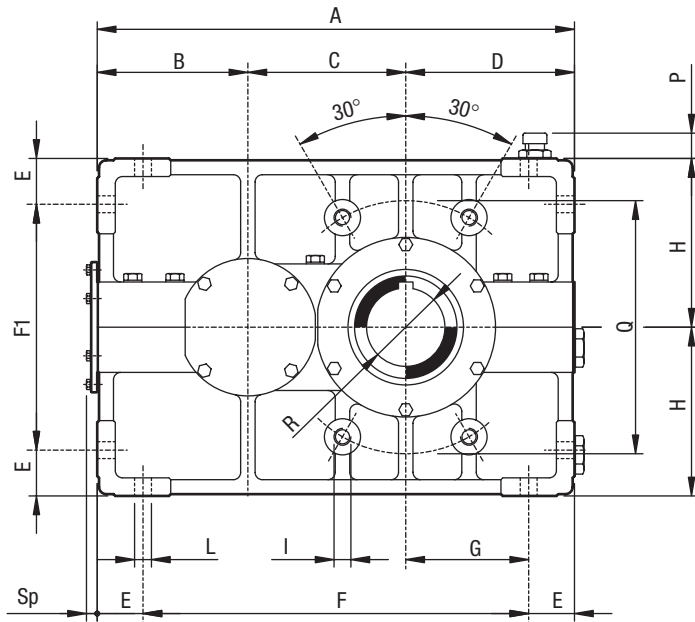
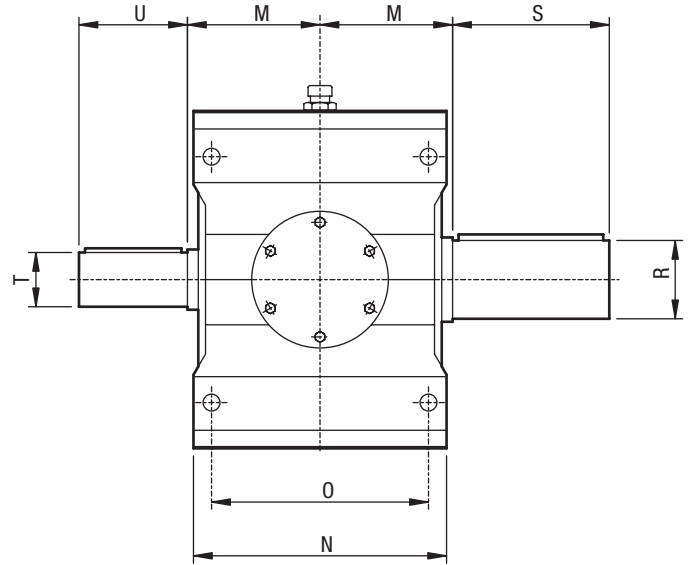
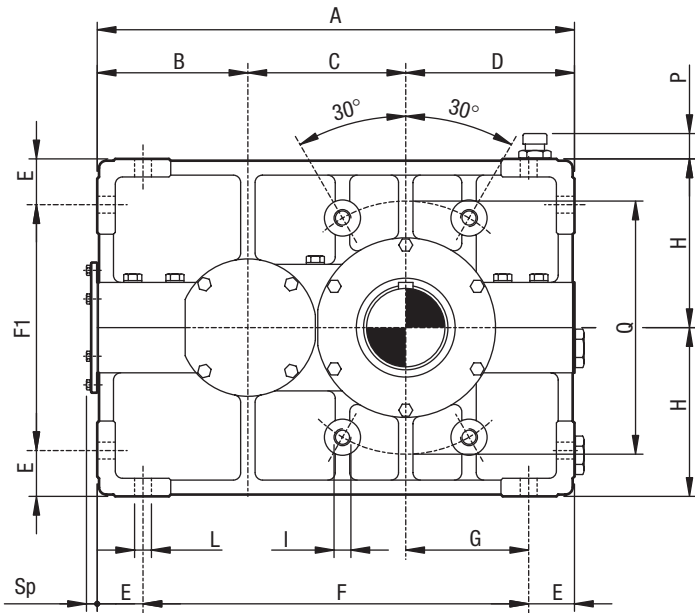
RH • RV Series - Bevel-helical units - Nominal power rating (kW)

i _n	Size		Size																
	n ₁	n ₂	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	
80	1500	18.8	7.9		16										339	506			
	1000	12.5	5.4		11										230	344			
	750	9.4	4.2		8.1										175	261			
90	1500	16.7	7.2	9.7	14	19	28	39	56	78	111	155	228	319	447	635	895	1236	
	1000	11	4.8	6.6	9.4	13	19	27	38	53	75	106	155	217	304	432	608	840	
	750	8.3	3.7	5.1	7.1	10	15	20	29	41	57	80	118	165	231	328	463	639	
100	1500	15	6.2	8.4	12	17	25	35	49	69	98	136	200	281	391	556	787	1083	
	1000	10	4.3	5.7	8.3	11	17	24	33	47	66	92	136	191	265	378	534	736	
	750	7.5	3.2	4.4	6.3	8.7	13	18	25	35	50	70	103	145	202	287	407	560	
112	1500	13.4	5.8	8	11	16	22	30	46	64	91	127	187	246	365	518	736	1010	
	1000	8.9	4	5.3	7.7	11	15	21	31	44	62	86	127	167	248	352	500	686	
	750	6.7	3	4.1	5.9	8.1	11	16	23	33	47	65	96	126	188	267	379	520	
125	1500	12	5	6.9	9.9	15	20	28	40	55	79	118	162	230	316	449	640	874	
	1000	8	3.4	4.7	6.8	9.9	14	19	27	38	54	80	110	156	215	305	435	594	
	750	6	2.6	3.5	5.1	7.4	10	15	20	28	41	61	83	117	161	229	327	447	
140	1500	10.7	4.6	6.3	9.3	13	19	24	37	51	74	102	150	198	293	415	595	811	
	1000	7.1	3.1	4.3	6.3	8.5	13	17	25	35	50	69	102	134	199	282	404	550	
	750	5.4	2.4	3.2	4.7	6.4	10	12	19	26	38	52	76	100	149	211	303	412	
160	1500	9.4	4	5.4	7.9	12	16	23	31	44	63	94	127	183	249	353	509	689	
	1000	6.3	2.6	3.6	5.3	7.9	11	15	21	29	42	63	86	123	167	237	342	463	
	750	4.7	2	2.7	4	5.9	8	11	16	22	32	48	64	92	125	178	257	347	
180	1500	8.3	3.6	5	7.3	10	15	21	28	40	58	79	117	168	228	322	468	631	
	1000	5.6	2.4	3.3	4.9	6.6	9.8	14	19	27	39	53	78	113	152	216	313	422	
	750	4.2	1.8	2.5	3.7	4.9	7.3	10	14	20	29	40	59	85	114	162	235	317	
200	1500	7.5	3.3	4.5	6.7	8.9	13	17	26	36	53	72	106	140	207	294	428	574	
	1000	5	2.2	3	4.4	5.9	8.8	12	17	24	35	48	71	94	138	196	285	383	
	750	3.8	1.6	2.2	3.3	4.5	6.6	8.7	13	18	27	36	53	70	104	147	214	287	
225	1500	6.7	2.8	3.9	5.7	7.7	11	16	22	33	47	62	92	131	179	254	363	491	
	1000	4.5	1.9	2.6	3.8	5.1	7.6	11	15	22	31	42	61	88	119	169	242	327	
	750	3.3	1.4	1.9	2.8	3.8	5.7	8.1	11	16	23	31	46	66	89	127	181	246	
250	1500	6	2.6	3.6	5.2	7	10	15	20	29	40	57	84	121	164	232	334	450	
	1000	4	1.7	2.4	3.5	4.7	7	10	14	19	26	38	56	81	109	155	222	300	
	750	3	1.3	1.8	2.6	3.5	5.2	7.5	10	14	20	29	42	60	82	116	167	225	
280	1500	5.4	2.4	3.2	4.8	6.4	10	12	19	26	36	52	77	101	149	212	306	410	
	1000	3.6	1.6	2.2	3.2	4.3	6.4	8.3	12	17	24	35	51	67	100	141	204	273	
	750	2.7	1.2	1.6	2.4	3.2	4.8	6.2	9.3	13	18	26	38	51	75	106	153	205	
315	1500	4.8	2.1	2.9	3.9	5.8	8.7	11	17	24	33	47	62	92	135	192	252	372	
	1000	3.2	1.4	2	2.6	3.9	5.8	7.6	11	16	22	31	42	61	90	128	168	248	
	750	2.4	1.1	1.5	2	2.9	4.3	5.7	8.5	12	16	24	31	46	68	96	126	186	
355	1500	4.2	1.9	2.6	3.6	5.2	7.7	10	15	19	29	42	56			173			
	1000	2.8	1.3	1.8	2.4	3.5	5.1	6.8	10	13	20	28	37			115			
	750	2.1	1	1.3	1.8	2.6	3.8	5.1	7.5	9.5	15	21	28			86			
400	1500	3.8							13		26	37							
	1000	2.5							8.9		18	25							
	750	1.9							6.7		13	19							

RHD
RVD

HELICAL UNITS

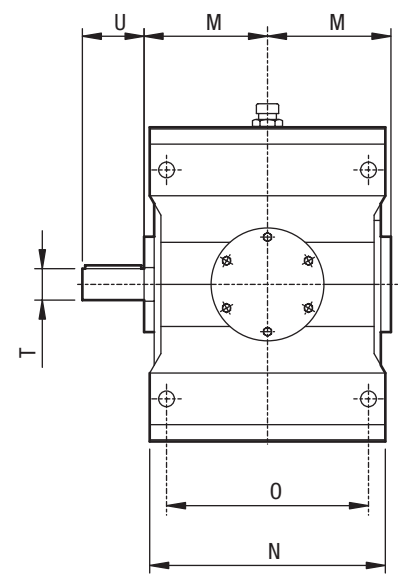
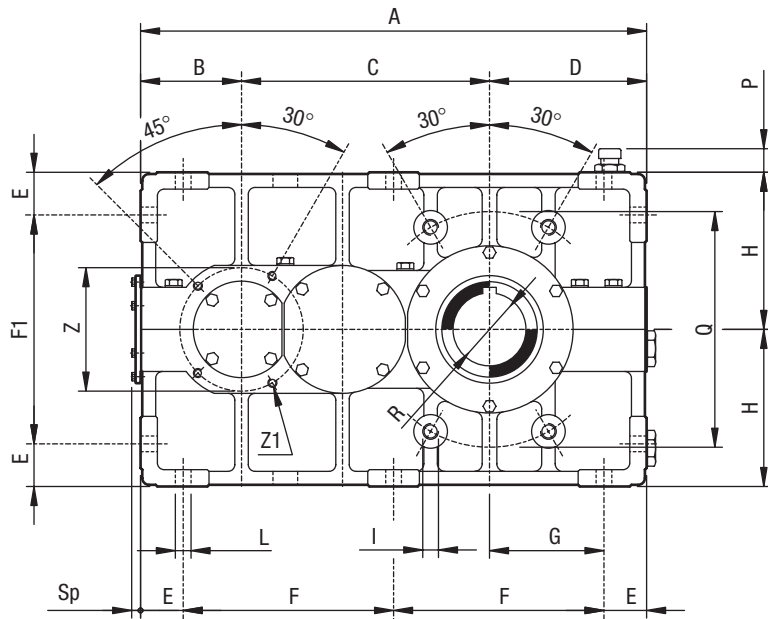
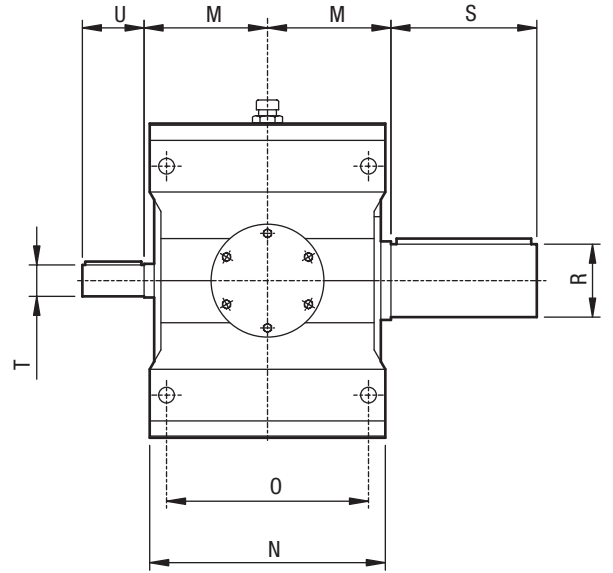
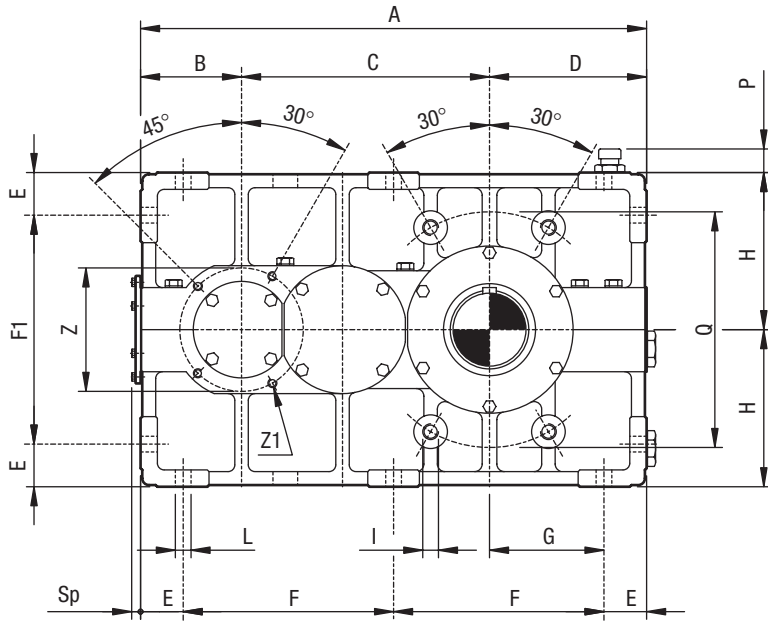
PA series single reduction



Size	iN 1.12-2.5																			iN 2.8-5.6			
	A	B	C	D	E	F	F1	G	H	I	L	M	N	O	P	Q	R	S	T	U	T	U	Sp
10	396	125	131	140	38	320	204	102	140	M16	14	115	210	180	20	210	65	110	45	90	35	70	13
20	450	140	150	160	42	366	236	118	160	M18	16	135	235	200	22	240	80	140	50	100	40	80	16
30	510	160	170	180	46	418	268	134	180	M20	18	145	260	220	22	270	90	160	55	110	45	90	17
40	570	180	190	200	52	466	296	148	200	M22	20	160	295	250	22	300	100	180	70	140	55	110	18
50	641	200	216	225	57	527	336	168	225	M24	22	170	325	275	22	340	110	200	75	150	60	120	22
60	715	225	240	250	62	591	376	188	250	M27	25	190	360	300	22	380	120	210	85	170	70	140	23
70	792	250	262	280	72	648	416	208	280	M30	27	225	415	350	25	430	140	250	90	180	80	160	25
80	895	280	300	315	80	735	470	235	315	M33	30	250	455	385	25	490	160	280	100	200	85	170	26
90	1010	315	340	355	87	836	536	268	355	M36	33	280	535	460	25	560	170	300	130	260	100	200	29
100	1135	355	380	400	93	949	614	307	400	M39	36	310	600	520	25	640	200	350	150	300	110	220	30
110	1282	400	432	450	100	1082	700	350	450	M42	39	375	710	620	25	730	220	390	160	320	130	260	32

HELICAL UNITS

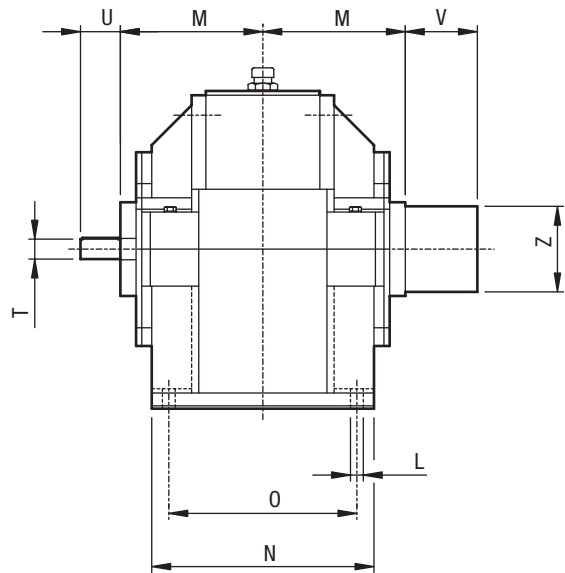
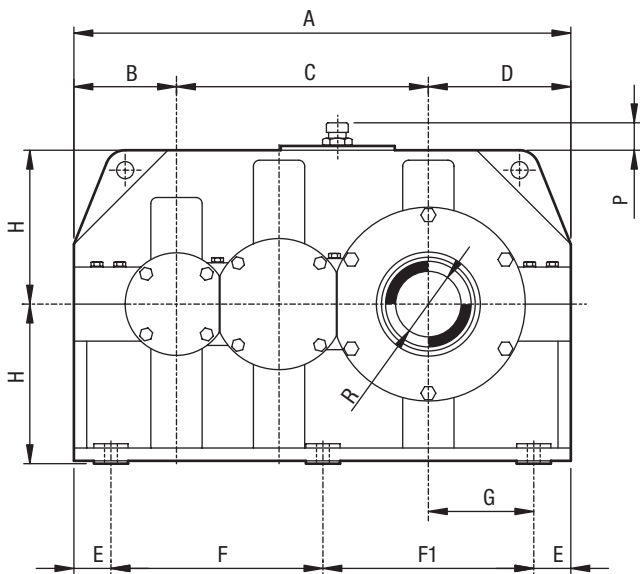
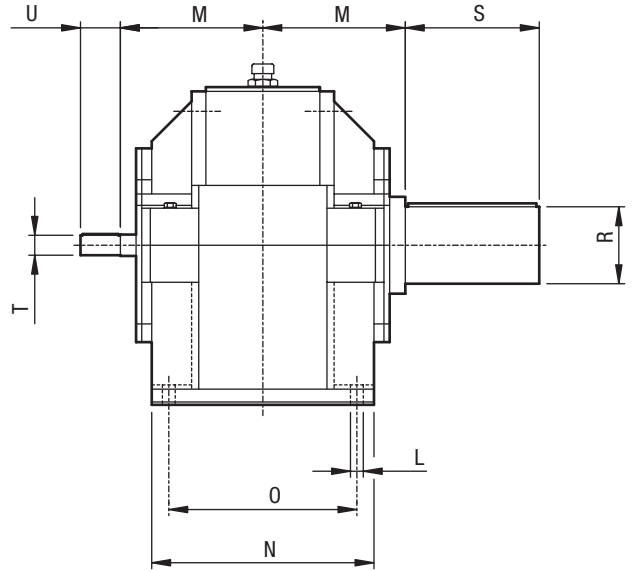
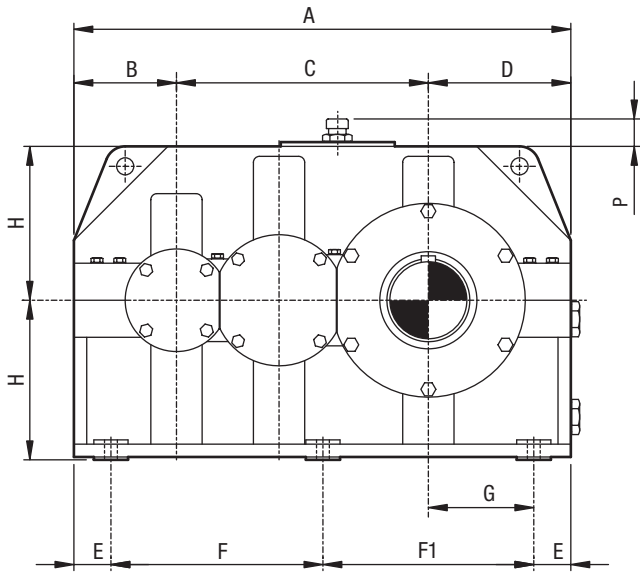
PB series double reduction



Size	iN 6.3-11.2																			iN 12.5-20					
	A	B	C	D	E	F	F1	G	H	I	L	M	N	O	P	Q	R	S	T	U	T	U	Z	Z1	Sp
10	451	90	221	140	38	187,5	204	102	140	M16	14	115	210	180	20	210	65	110	28	55	24	50	110	M8	11
20	510	100	250	160	42	213	236	118	160	M18	16	135	235	200	22	240	80	140	32	65	28	55	125	M10	11
30	574	112	282	180	46	241	268	134	180	M20	18	145	260	220	22	270	90	160	35	70	32	65	140	M12	12
40	640	125	315	200	52	268	296	148	200	M22	20	160	295	250	22	300	100	180	45	90	35	70	160	M14	13
50	721	140	356	225	57	303,5	336	168	225	M24	22	170	325	275	22	340	110	200	50	100	40	80	175	M16	16
60	810	160	400	250	62	343	376	188	250	M27	25	190	360	300	22	380	120	210	55	110	45	90	200	M16	17
70	902	180	442	280	72	379	416	208	280	M30	27	225	415	350	25	430	140	250	70	140	55	110	220	M18	18
80	1015	200	500	315	80	427,5	470	235	315	M33	30	250	455	385	25	490	160	280	75	150	60	120	250	M20	20
90	1145	225	565	355	87	485,5	536	268	355	M36	33	280	535	460	25	560	170	300	85	170	70	140	275	M22	22
100	1280	250	630	400	93	547	614	307	400	M39	36	310	600	520	25	640	200	350	90	180	80	160	310	M24	25
110	1442	280	712	450	100	621	700	350	450	M42	39	375	710	620	25	730	220	390	100	200	85	170	350	M27	26

HELICAL UNITS

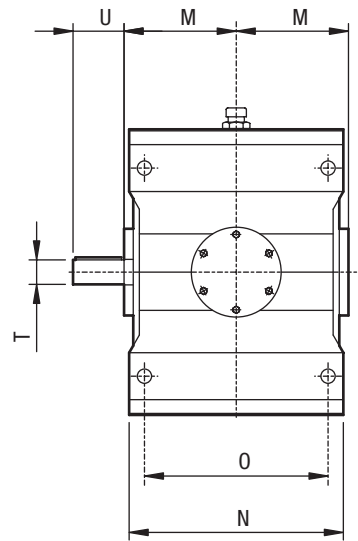
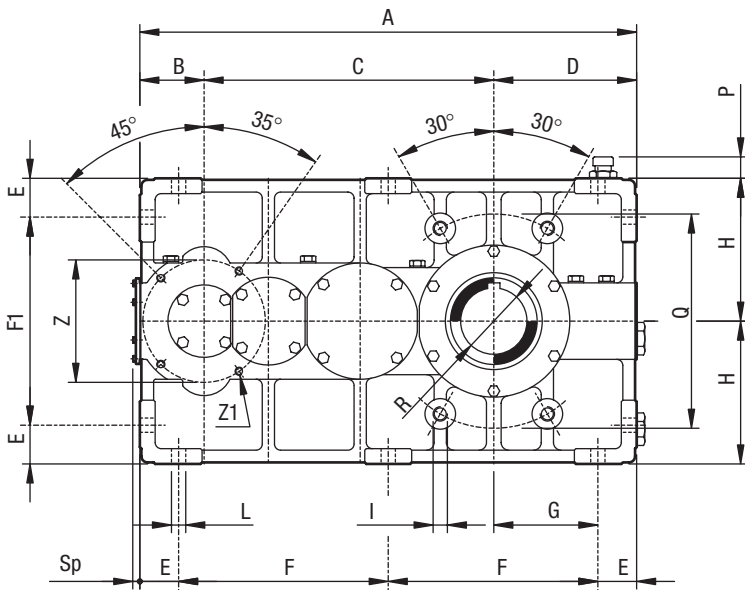
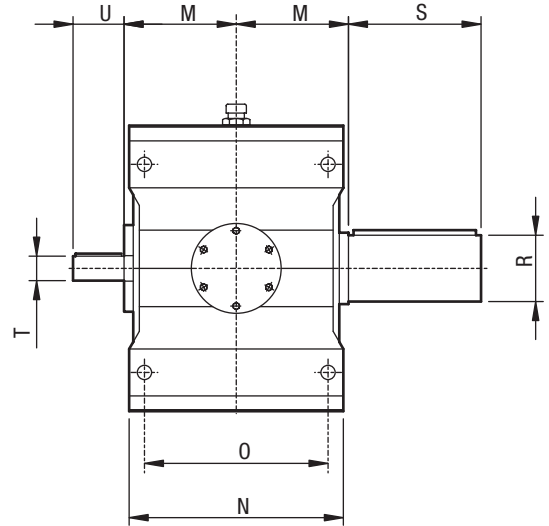
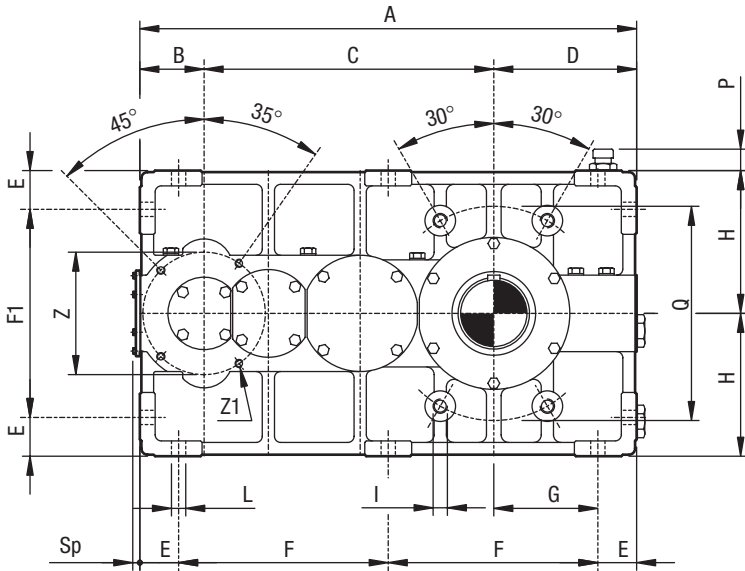
PB series double reduction



Size	A	B	C	D	E	F	F1	G	H	L	M	N	O	P	R	S	iN 1.12-2.5		iN 2.8-5.6		V	Z
																	T	U	T	U		
120	1565	315	800	450	110	665	680	340	500	42	420	700	590	33	240	410	130	260	100	200	175	300
130	1739	355	884	500	125	739	750	375	560	45	480	780	660	35	270	470	150	300	110	220	190	340
140	1960	400	1000	560	150	840	820	410	630	48	505	850	720	37	300	500	160	320	130	260	205	380
150	2210	450	1130	630	170	950	920	460	710	52	565	930	790	40	340	550	180	360	140	280	235	420
160	2470	500	1260	710	200	1050	1020	510	800	56	630	1020	870	43	380	630	190	380	160	320	260	460

HELICAL UNITS

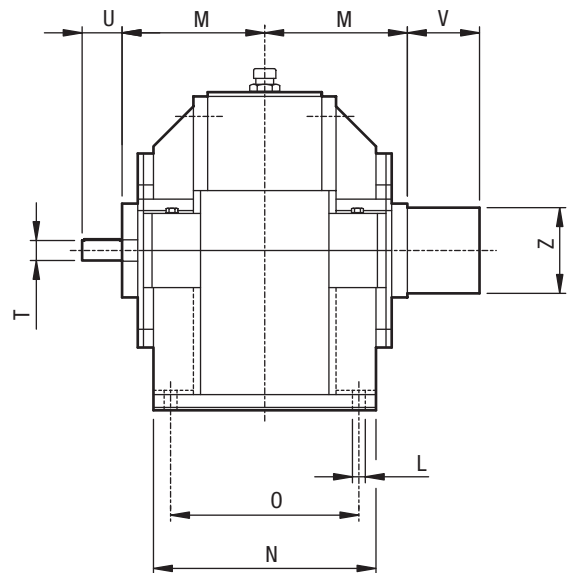
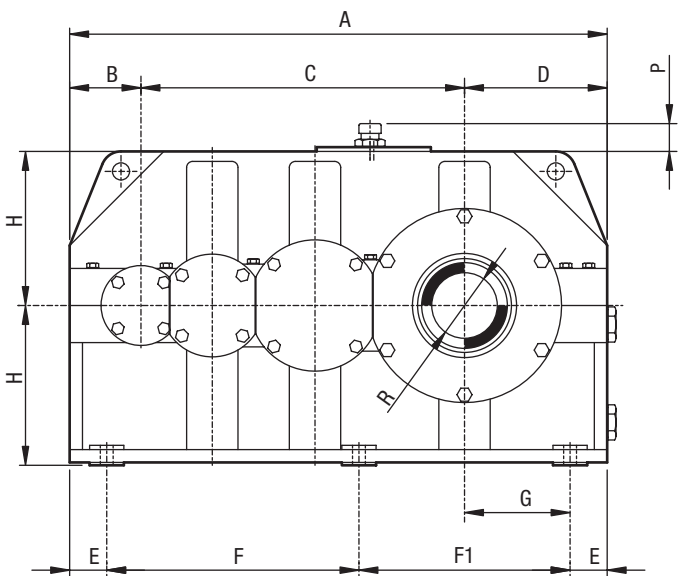
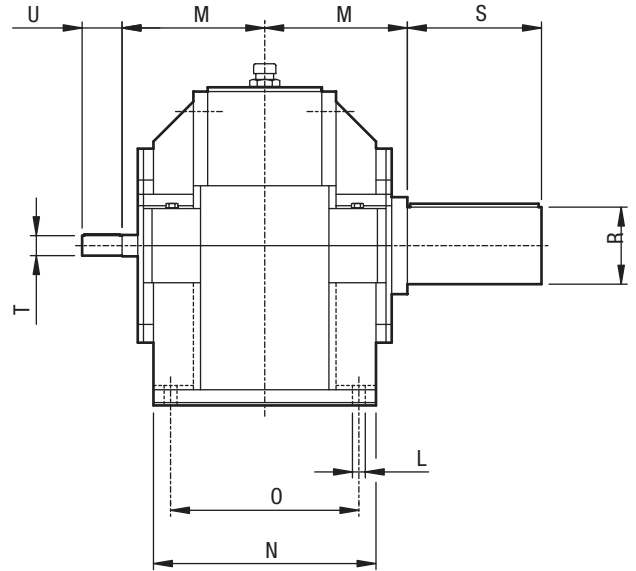
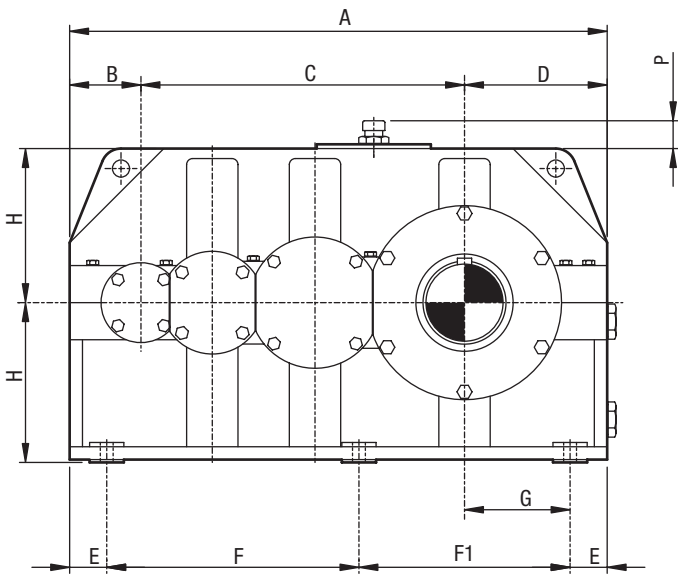
PC series triple reduction



Size	A	B	C	D	E	F	F1	G	H	I	L	M	N	O	P	Q	R	S	T	U	Z	Z1	Sp
10	487	63	284	140	38	205,5	204	102	140	M16	14	115	210	180	20	210	65	110	24	50	120	M8	10
20	550	70	320	160	42	233	236	118	160	M18	16	135	235	200	22	240	80	140	24	50	130	M10	10
30	622	80	362	180	46	265	268	134	180	M20	18	145	260	220	22	270	90	160	28	55	150	M12	11
40	695	90	405	200	52	295,5	296	148	200	M22	20	160	295	250	22	300	100	180	28	55	170	M12	11
50	781	100	456	225	57	333,5	336	168	225	M24	22	170	325	275	22	340	110	200	32	65	185	M12	11
60	874	112	512	250	62	375	376	188	250	M27	25	190	360	300	22	380	120	210	85	70	210	M14	12
70	972	125	567	280	72	414	416	208	280	M30	27	225	415	350	25	430	140	250	45	90	235	M14	13
80	1095	140	640	315	80	467,5	470	235	315	M33	30	250	455	385	25	490	160	280	50	100	260	M16	16
90	1240	160	725	355	87	533	536	268	355	M36	33	280	535	460	25	560	170	300	55	110	290	M16	17
100	1390	180	810	400	93	602	614	307	400	M39	36	310	600	520	25	640	200	350	70	140	320	M18	18
110	1562	200	912	450	100	681	700	350	450	M42	39	375	710	620	25	730	220	390	75	150	350	M18	22

HELICAL UNITS

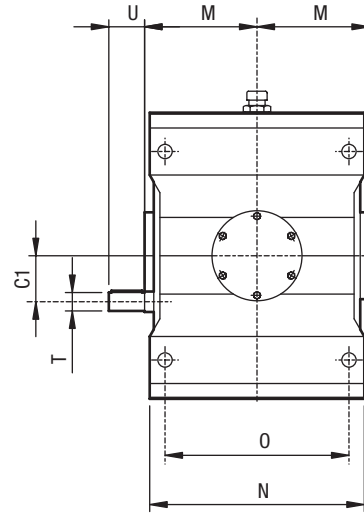
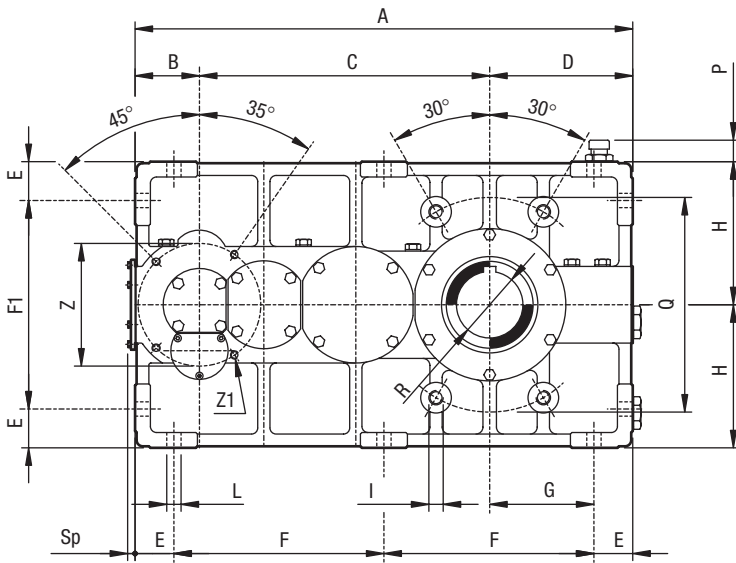
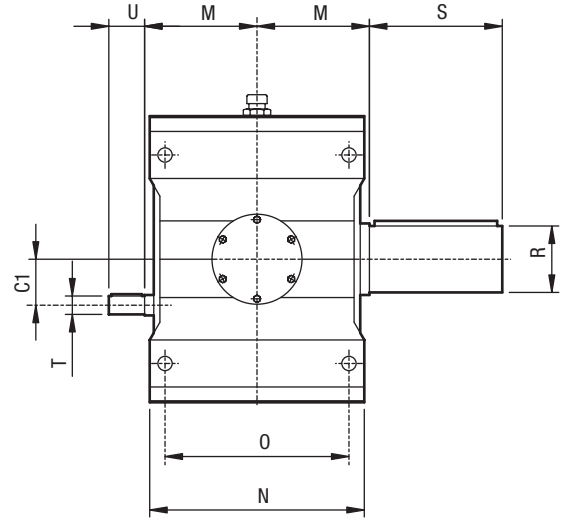
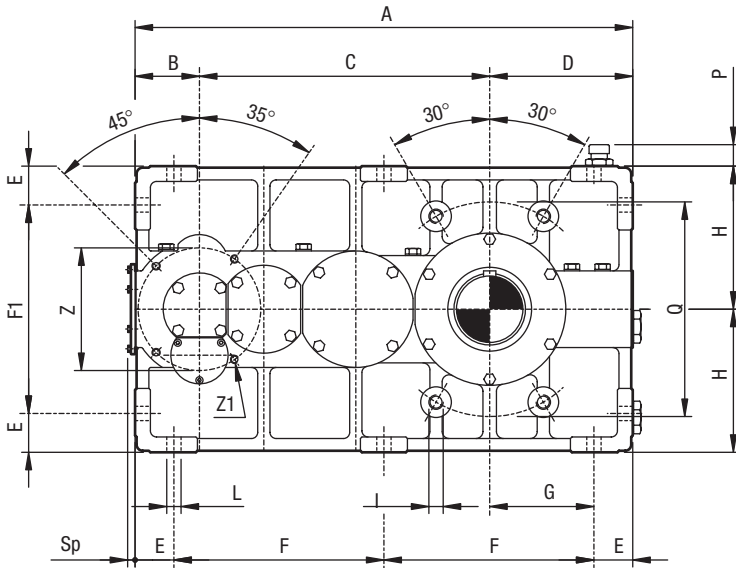
PC series triple reduction



Size	A	B	C	D	E	F	F1	G	H	L	M	N	O	P	R	S	T	U	V	Z
120	1700	225	1025	450	110	800	680	340	500	42	420	700	590	33	240	410	85	170	175	300
130	1884	250	1134	500	125	884	750	375	560	45	480	780	660	35	270	470	90	180	190	340
140	2120	280	1280	560	150	1000	820	410	630	48	505	850	720	37	300	500	100	200	205	380
150	2395	315	1450	630	170	1135	920	460	710	52	565	930	790	40	340	550	130	260	235	420
160	2685	355	1620	710	200	1265	1020	510	800	56	630	1020	870	43	380	630	150	300	260	460

HELICAL UNITS

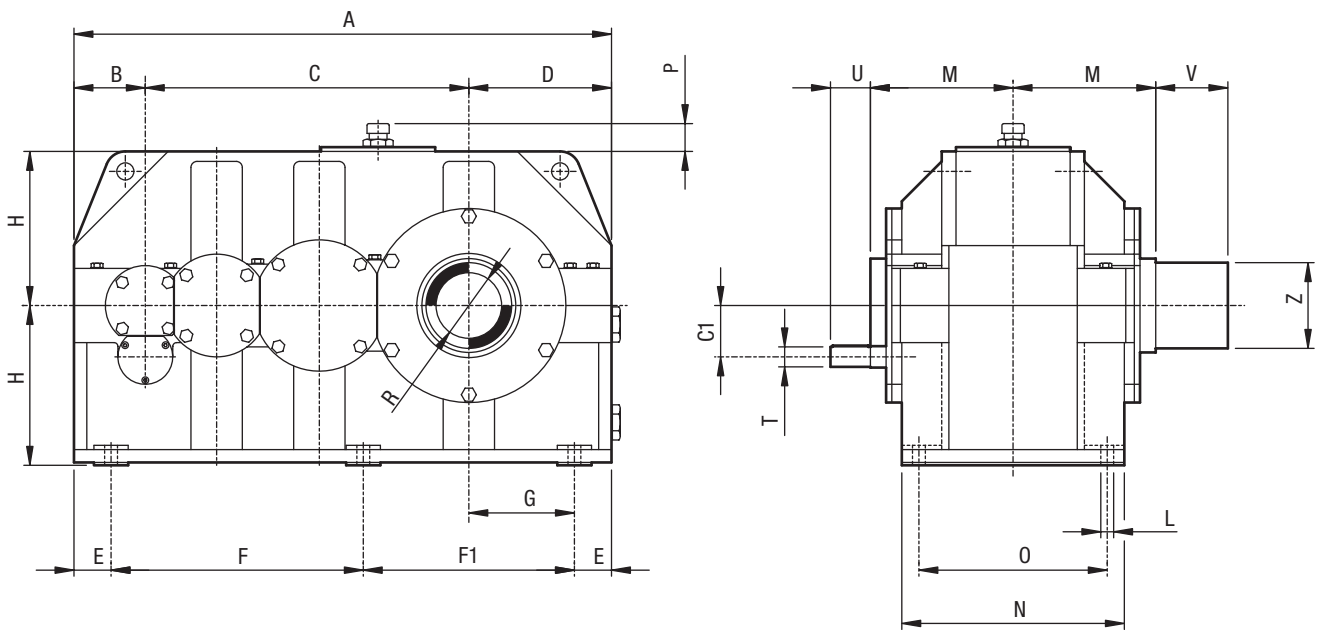
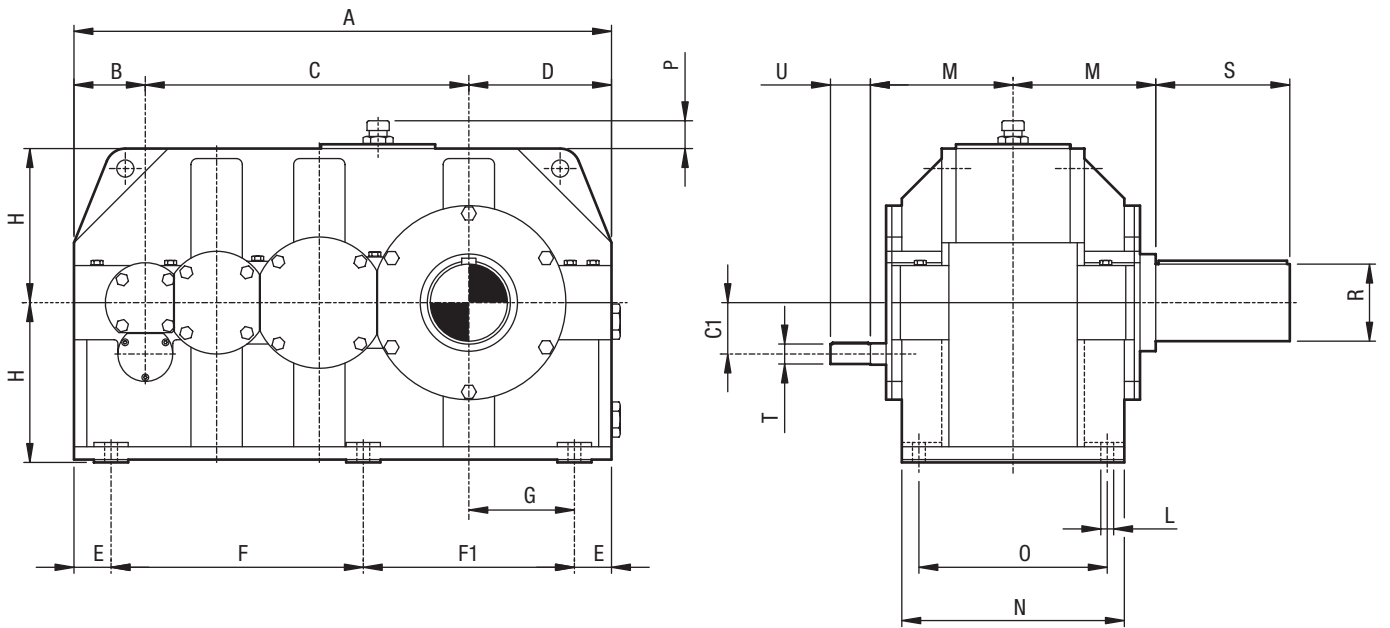
PD series quadruple reduction



Size	A	B	C	C1	D	E	F	F1	G	H	I	L	M	N	O	P	Q	R	S	T	U	Z	Z1	Sp
10	487	63	284	45	140	38	205,5	204	102	140	M16	14	115	210	180	20	210	65	110	18	35	120	M8	10
20	550	70	320	50	160	42	233	236	118	160	M18	16	135	235	200	22	240	80	140	18	35	130	M10	10
30	622	80	362	56	180	46	265	268	134	180	M20	18	145	260	220	22	270	90	160	24	50	150	M12	11
40	695	90	405	63	200	52	295,5	296	148	200	M22	20	160	295	250	22	300	100	180	24	50	170	M12	11
50	781	100	456	70	225	57	333,5	336	168	225	M24	22	170	325	275	22	340	110	200	24	50	185	M12	11
60	874	112	512	80	250	62	375	376	188	250	M27	25	190	360	300	22	380	120	210	28	55	210	M14	12
70	972	125	567	90	280	72	414	416	208	280	M30	27	225	415	350	25	430	140	250	28	55	235	M14	13
80	1095	140	640	100	315	80	467,5	470	235	315	M33	30	250	455	385	25	490	160	280	32	65	260	M16	16
90	1240	160	725	112	355	87	533	536	268	355	M36	33	280	535	460	25	560	170	300	35	70	290	M16	17
100	1390	180	810	125	400	93	602	614	307	400	M39	36	310	600	520	25	640	200	350	45	90	320	M18	18
110	1562	200	912	140	450	100	681	700	350	450	M42	39	375	710	620	25	730	220	390	50	100	350	M18	22

HELICAL UNITS

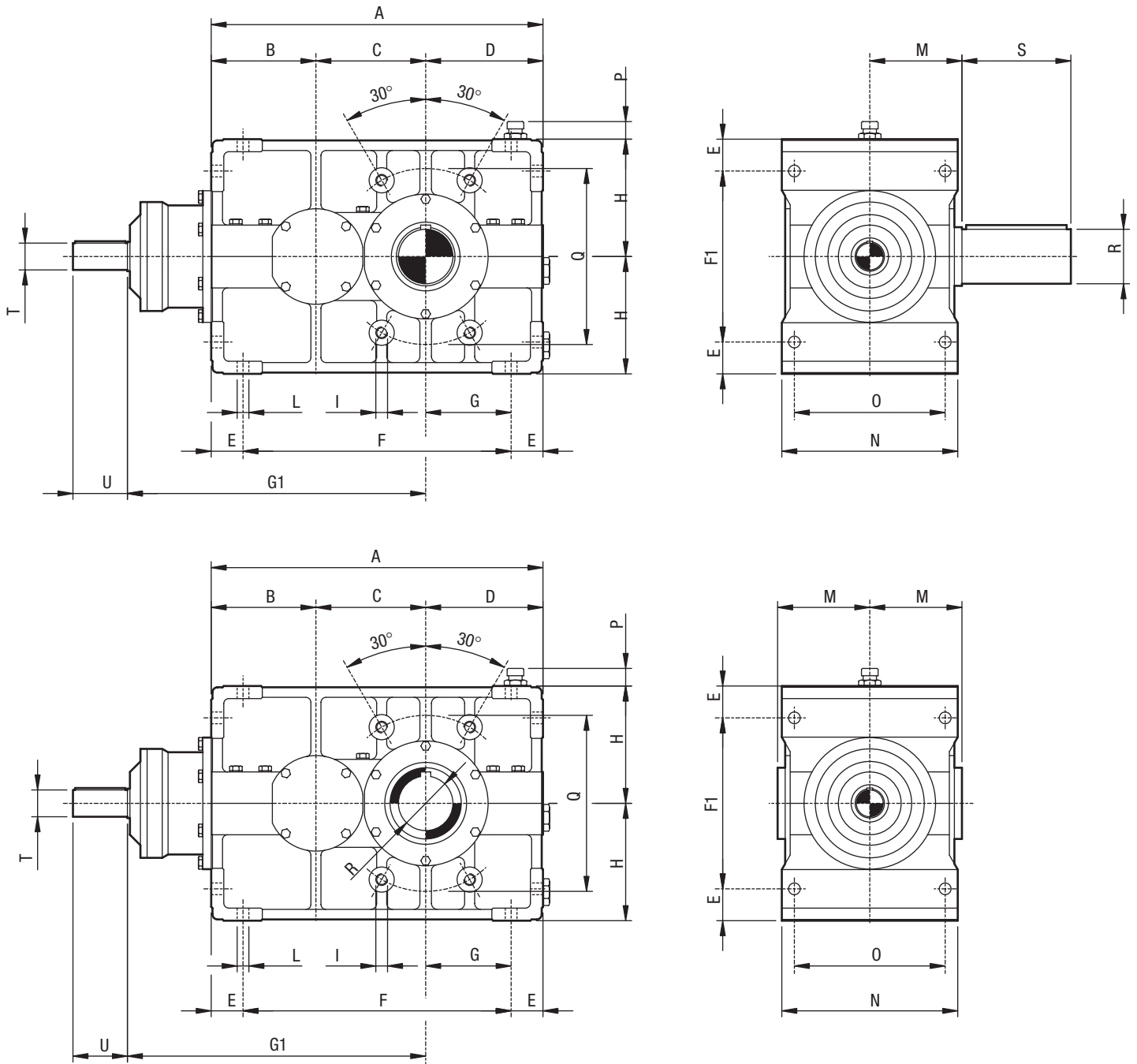
PD series quadruple reduction



Size	A	B	C	C1	D	E	F	F1	G	H	L	M	N	O	P	R	S	T	U	V	Z
120	1700	225	1025	160	450	110	800	680	340	500	42	420	700	590	33	240	410	55	110	175	300
130	1884	250	1134	180	500	125	884	750	375	560	45	480	780	660	35	270	470	70	140	190	340
140	2120	280	1280	200	560	150	1000	820	410	630	48	505	850	720	37	300	500	75	150	205	380
150	2395	315	1450	225	630	170	1135	920	460	710	52	565	930	790	40	340	550	85	170	235	420
160	2685	355	1620	250	710	200	1265	1020	510	800	56	630	1020	870	43	380	630	90	180	260	460

BEVEL-HELICAL UNITS

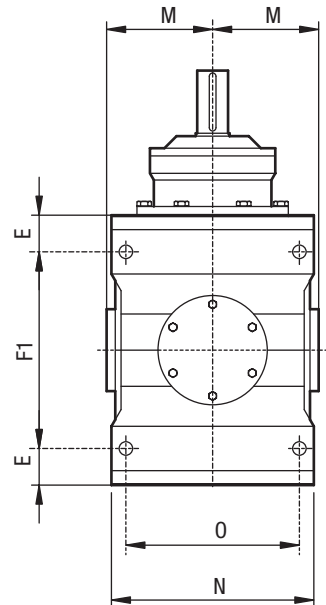
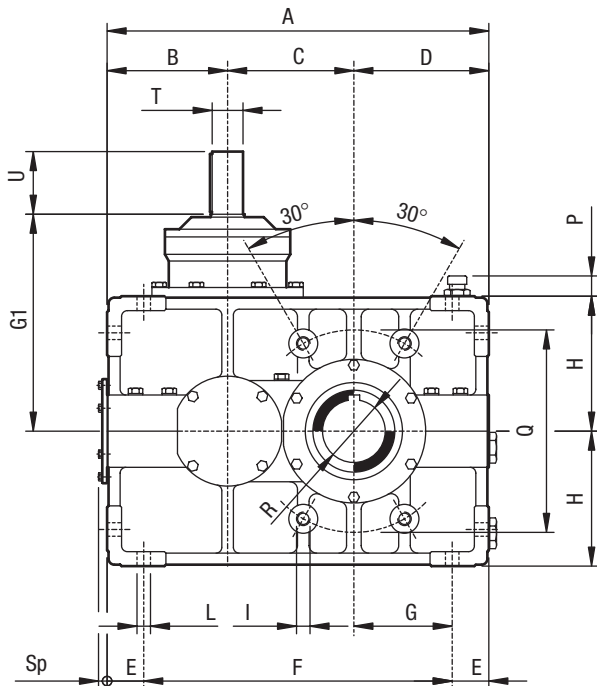
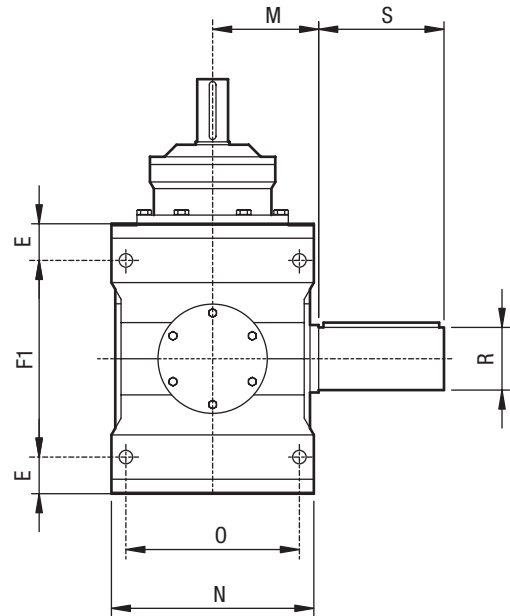
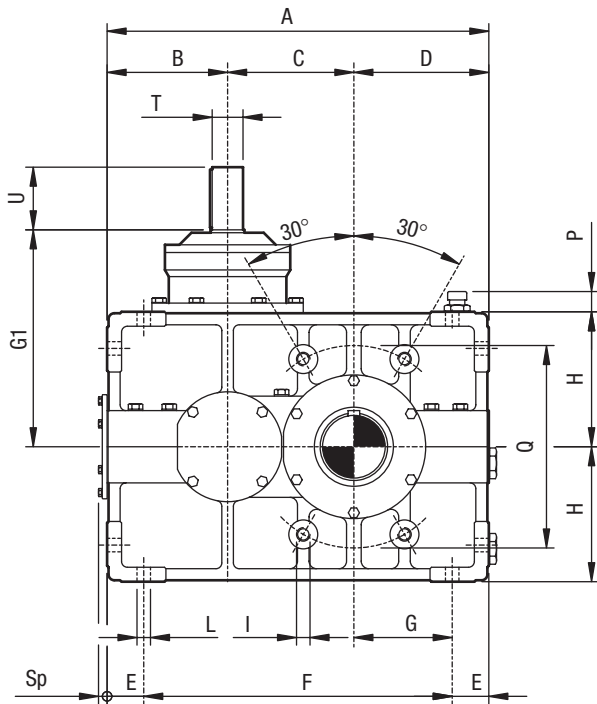
RHB series double reduction



Size																				iN 5-11.2		iN 12.5-18	
	A	B	C	D	E	F	F1	G	G1	H	I	L	M	N	O	P	Q	R	S	T	U	T	U
10	396	125	131	140	38	320	204	102	356	140	M16	14	115	210	180	20	210	65	110	35	70	32	65
20	450	140	150	160	42	366	236	118	400	160	M18	16	135	235	200	22	240	80	140	40	80	35	70
30	510	160	170	180	46	418	268	134	450	180	M20	18	145	260	220	22	270	90	160	45	90	40	80
40	570	180	190	200	52	466	296	148	505	200	M22	20	160	295	250	22	300	100	180	50	100	45	90
50	641	200	216	225	57	527	336	168	571	225	M24	22	170	325	275	22	340	110	200	55	110	50	100
60	715	225	240	250	62	591	376	188	640	250	M27	25	190	360	300	22	380	120	210	60	120	55	110
70	792	250	262	280	72	648	416	208	712	280	M30	27	225	415	350	25	430	140	250	70	140	60	120
80	895	280	300	315	80	735	470	235	800	315	M33	30	250	455	385	25	490	160	280	80	160	70	140
90	1010	315	340	355	87	836	536	268	900	355	M36	33	280	535	460	25	560	170	300	90	180	80	160
100	1135	355	380	400	93	949	614	307	1010	400	M39	36	310	600	520	25	640	200	350	100	200	90	180
110	1282	400	432	450	100	1082	700	350	1142	450	M42	39	375	710	620	25	730	220	390	110	220	100	200

BEVEL-HELICAL UNITS

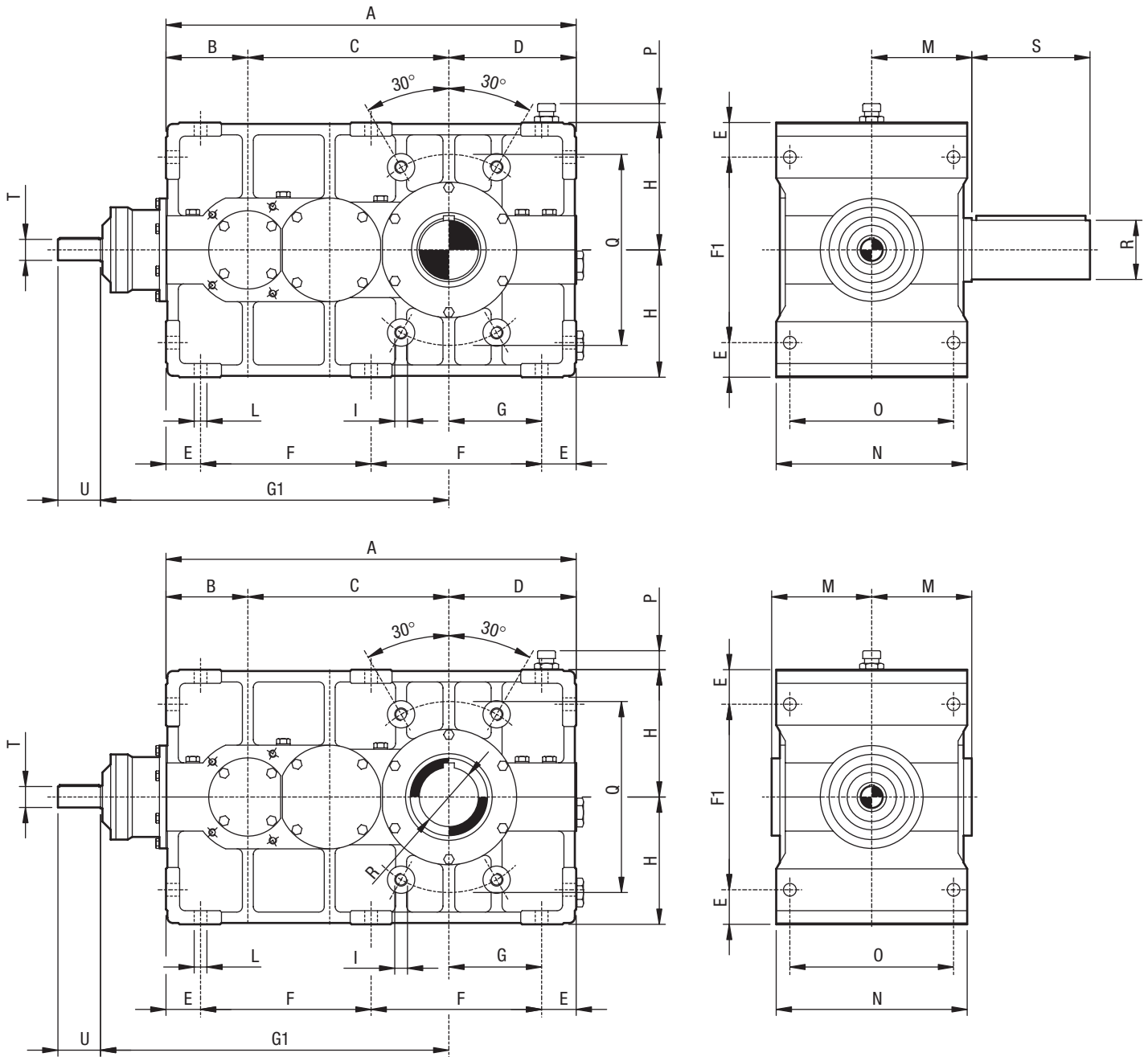
RVB series double reduction



Size																					iN 5-11.2		iN 12.5-18		Sp
	A	B	C	D	E	F	F1	G	G1	H	I	L	M	N	O	P	Q	R	S	T	U	T	U		
10	396	125	131	140	38	320	204	102	225	140	M16	14	115	210	180	20	210	65	110	35	70	32	65	13	
20	450	140	150	160	42	366	236	1118	250	160	M18	16	135	235	200	22	240	80	140	40	80	35	70	16	
30	510	160	170	180	46	418	268	134	280	180	M20	18	145	260	220	22	270	90	160	45	90	40	80	17	
40	570	180	190	200	52	466	296	148	315	200	M22	20	160	295	250	22	300	100	180	50	100	45	90	18	
50	641	200	216	225	57	527	336	168	355	225	M24	22	170	325	275	22	340	110	200	55	110	50	100	22	
60	715	225	240	250	62	591	376	188	400	250	M27	25	190	360	300	22	380	120	210	60	120	55	110	23	
70	792	250	262	280	72	648	416	208	450	280	M30	27	225	415	350	25	430	140	250	70	140	60	120	25	
80	895	280	300	315	80	735	470	235	500	315	M33	30	250	455	385	25	490	160	280	80	160	70	140	26	
90	1010	315	340	355	87	836	536	268	560	355	M36	33	280	535	460	25	560	170	300	90	180	80	160	29	
100	1135	355	380	400	93	949	614	307	630	400	M39	36	310	600	520	25	640	200	350	100	200	90	180	30	
110	1282	400	432	450	100	1082	700	350	710	450	M42	39	375	710	620	25	730	220	390	110	220	100	200	32	

BEVEL-HELICAL UNITS

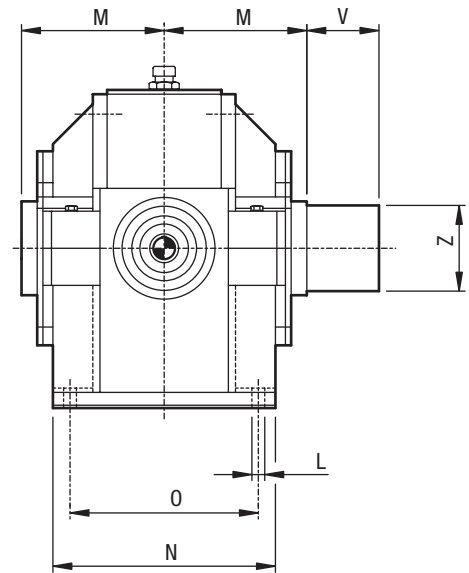
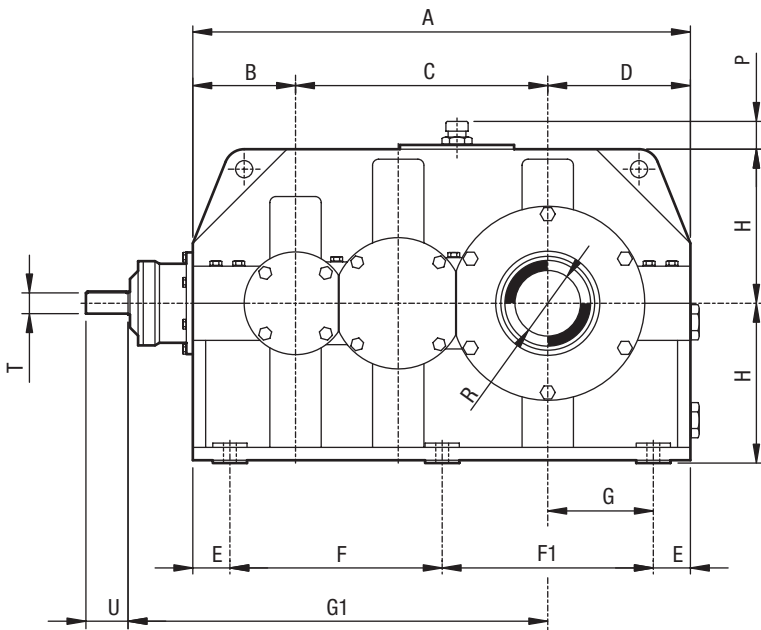
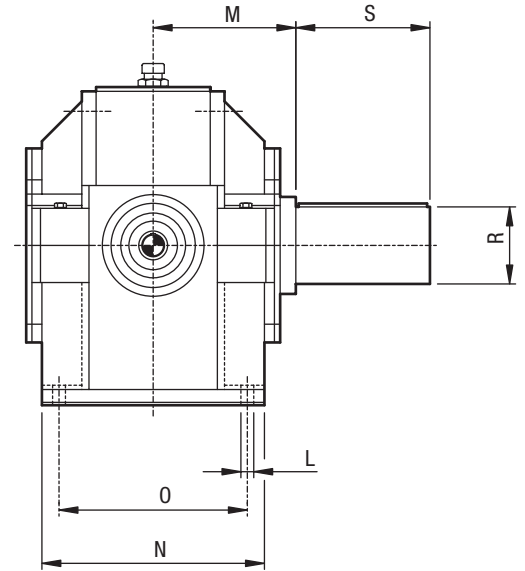
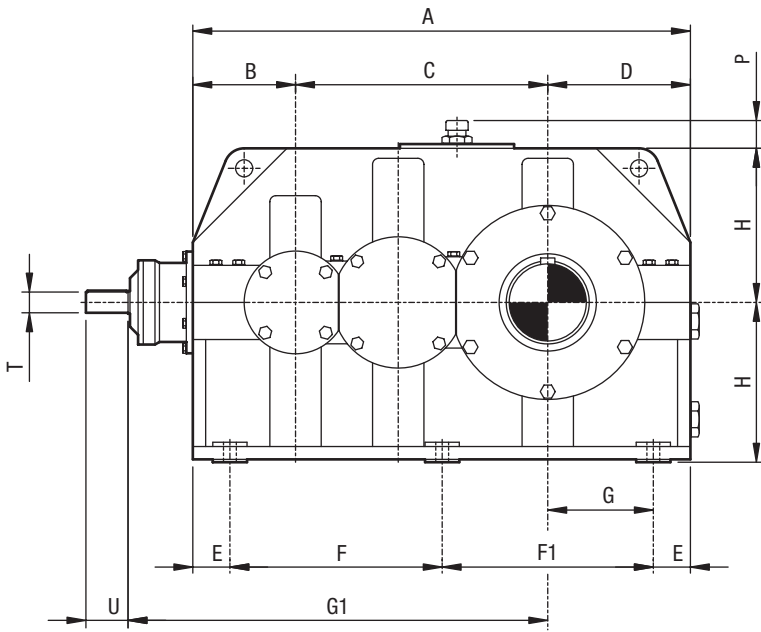
RHC series triple reduction



Size	iN 1.12-2.5																			iN 2.8-5.6			
	A	B	C	D	E	F	F1	G	G1	H	I	L	M	N	O	P	Q	R	S	T	U	T	U
10	451	90	221	140	38	187,5	204	102	381	140	M16	14	115	210	180	20	210	65	110	24	50	22	45
20	510	100	250	160	42	213	236	118	430	160	M18	16	135	235	200	22	240	80	140	28	55	24	50
30	574	112	282	180	46	241	268	134	482	180	M20	18	145	260	220	22	270	90	160	32	65	28	55
40	640	125	315	200	52	268	296	148	540	200	M22	20	160	295	250	22	300	100	180	35	70	32	65
50	721	140	356	225	57	303,5	336	168	606	225	M24	22	170	325	275	22	340	110	200	40	80	35	70
60	810	160	400	250	62	343	376	188	680	250	M27	25	190	360	300	22	380	120	210	45	90	40	80
70	902	180	442	280	72	379	416	208	757	280	M30	27	225	415	350	25	430	140	250	50	100	45	90
80	1015	200	500	315	80	427,5	470	235	855	315	M33	30	250	455	385	25	490	160	280	55	110	50	100
90	1145	225	565	355	87	485,5	536	268	965	355	M36	33	280	535	460	25	560	170	300	60	120	55	110
100	1280	250	630	400	93	547	614	307	1080	400	M39	36	310	600	520	25	640	200	350	70	140	60	120
110	1442	280	712	450	100	621	700	350	1212	450	M42	39	375	710	620	25	730	220	390	80	160	70	140

BEVEL-HELICAL UNITS

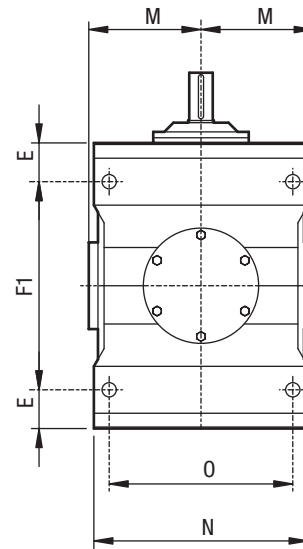
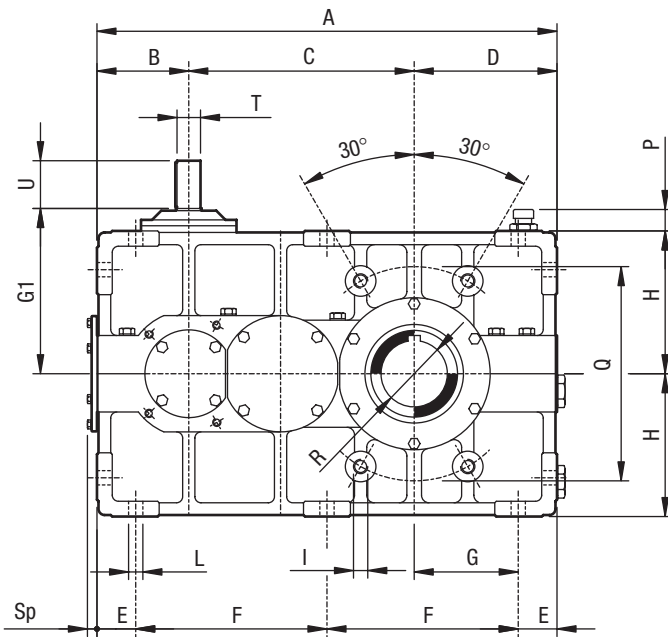
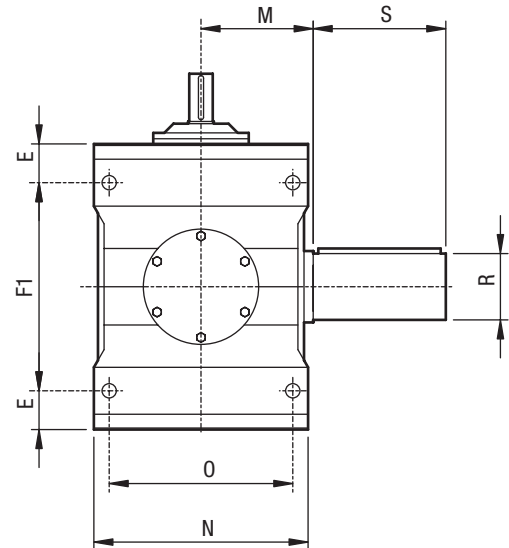
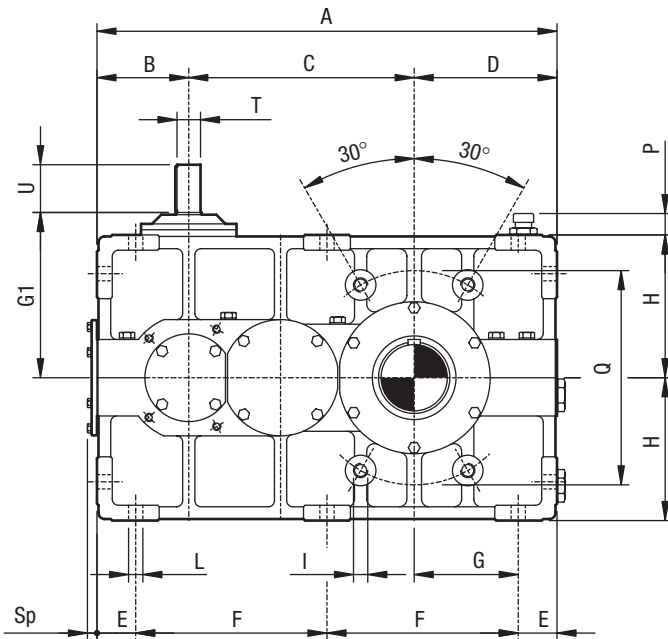
RHC series triple reduction



Size	iN 1.12-2.5																			iN 2.8-5.6			
	A	B	C	D	E	F	F1	G	G1	H	L	M	N	O	P	R	S	T	U	T	U	V	Z
120	1565	315	800	450	110	665	680	340	1360	500	42	420	700	590	33	240	410	90	180	80	160	175	300
130	1739	355	884	500	125	739	750	375	1514	560	45	480	780	660	35	270	470	100	200	90	180	190	340
140	1960	400	1000	560	150	840	820	410	1710	630	48	505	850	720	37	300	500	110	220	100	200	205	380

BEVEL-HELICAL UNITS

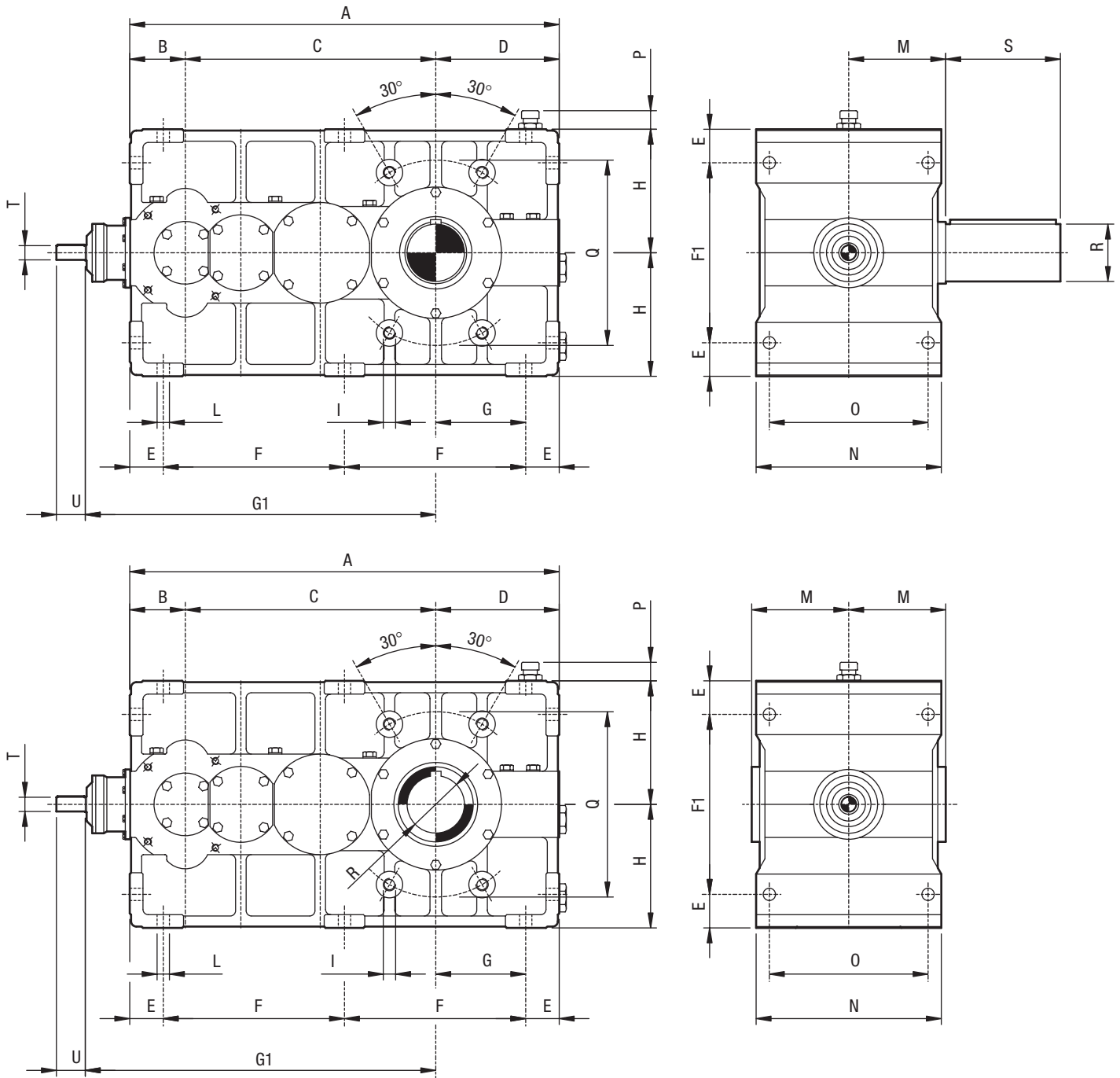
RVC series triple reduction



Size	iN 20-45																			iN 50-71				Sp
	A	B	C	D	E	F	F1	G	G1	H	I	L	M	N	O	P	Q	R	S	T	U	T	U	
10	451	90	221	140	38	187,5	204	102	160	140	M16	14	115	210	180	20	210	65	110	24	50	22	45	11
20	510	100	250	160	42	213	236	118	180	160	M18	16	135	235	200	22	240	80	140	28	55	24	50	11
30	574	112	282	180	46	241	268	134	200	180	M20	18	145	260	220	22	270	90	160	32	65	28	55	12
40	640	125	315	200	52	268	296	148	225	200	M22	20	160	295	250	22	300	100	180	35	70	32	65	13
50	721	140	356	225	57	303,5	336	168	250	225	M24	22	170	325	275	22	340	110	200	40	80	35	70	16
60	810	160	400	250	62	343	376	188	280	250	M27	25	190	360	300	22	380	120	210	45	90	40	80	17
70	902	180	442	280	72	379	416	208	315	280	M30	27	225	415	350	25	430	140	250	50	100	45	90	18
80	1015	200	500	315	80	427,5	470	235	355	315	M33	30	250	455	385	25	490	160	280	55	110	50	100	22
90	1145	225	565	355	87	485,5	536	268	400	355	M36	33	280	535	460	25	560	170	300	60	120	55	110	23
100	1280	250	630	400	93	547	614	307	450	400	M39	36	310	600	520	25	640	200	350	70	140	60	120	25
110	1442	280	712	450	100	621	700	350	500	450	M42	39	375	710	620	25	730	220	390	80	160	70	140	26

BEVEL-HELICAL UNITS

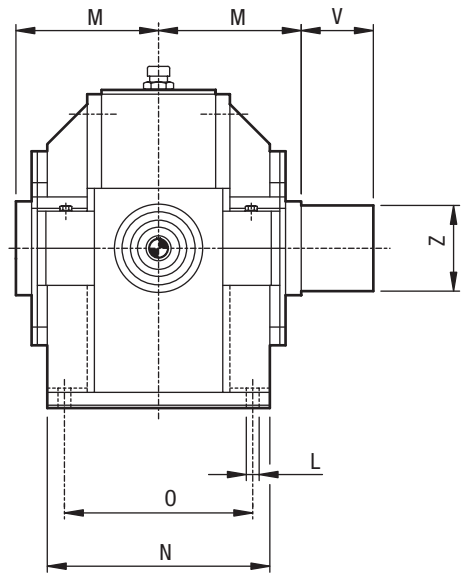
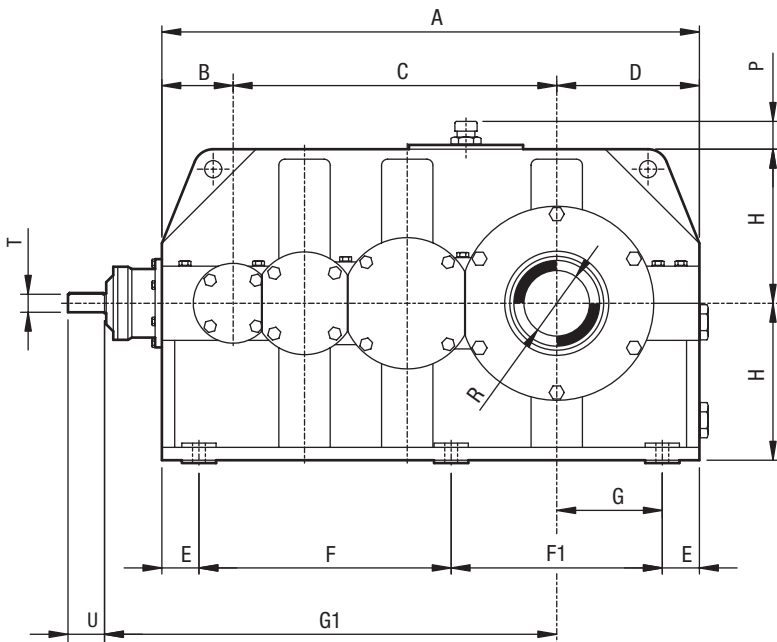
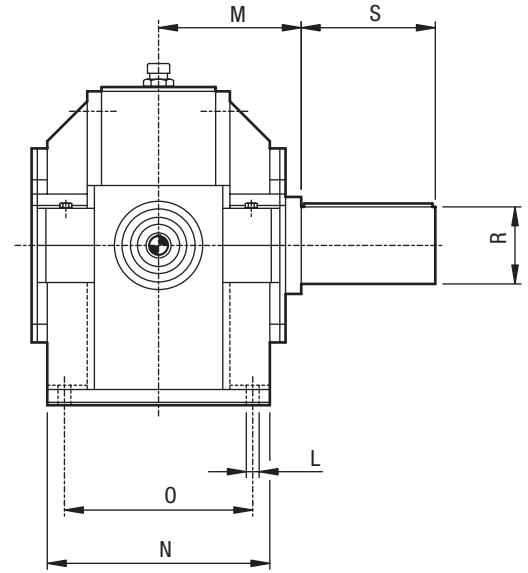
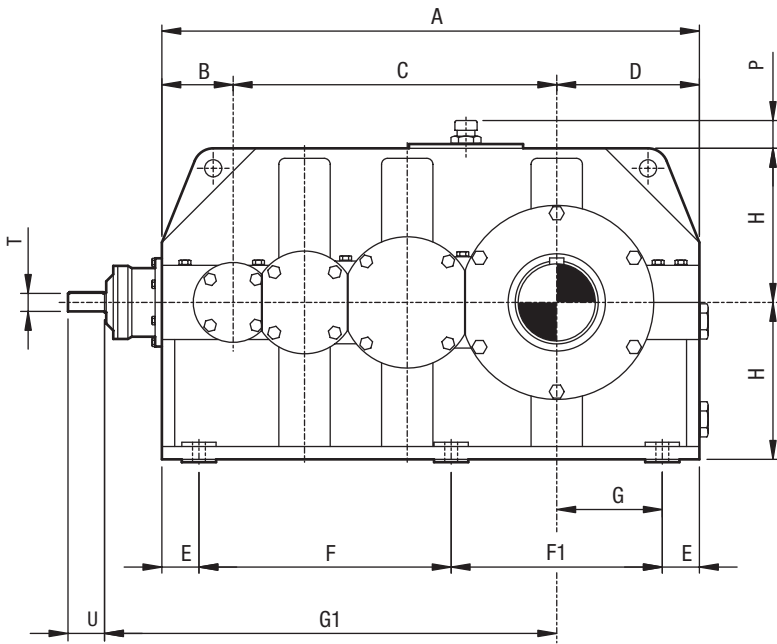
RHD series quadruple reduction



Size	iN 80-225																			iN 250-355			
	A	B	C	D	E	F	F1	G	G1	H	I	L	M	N	O	P	Q	R	S	T	U	T	U
10	487	63	284	140	38	205,5	204	102	396	140	M16	14	115	210	180	20	210	65	110	20	40	20	40
20	550	70	320	160	42	233	236	118	445	160	M18	16	135	235	200	22	240	80	140	20	40	20	40
30	622	80	362	180	46	265	268	134	502	180	M20	18	145	260	220	22	270	90	160	22	45	20	40
40	695	90	405	200	52	295,5	296	148	565	200	M22	20	160	295	250	22	300	100	180	24	50	22	45
50	781	100	456	225	57	333,5	336	168	636	225	M24	22	170	325	275	22	340	110	200	28	55	24	50
60	874	112	512	250	62	375	376	188	712	250	M27	25	190	360	300	22	380	120	210	32	65	28	55
70	972	125	567	280	72	414	416	208	792	280	M30	27	225	415	350	25	430	140	250	35	70	32	65
80	1095	140	640	315	80	467,5	470	235	890	315	M33	30	250	455	385	25	490	160	280	40	80	35	70
90	1240	160	725	355	87	533	536	268	1005	355	M36	33	280	535	460	25	560	170	300	45	90	40	80
100	1390	180	810	400	93	602	614	307	1125	400	M39	36	310	600	520	25	640	200	350	50	100	45	90
110	1562	200	912	450	100	681	700	350	1247	450	M42	39	375	710	620	25	730	220	390	55	110	50	100

BEVEL-HELICAL UNITS

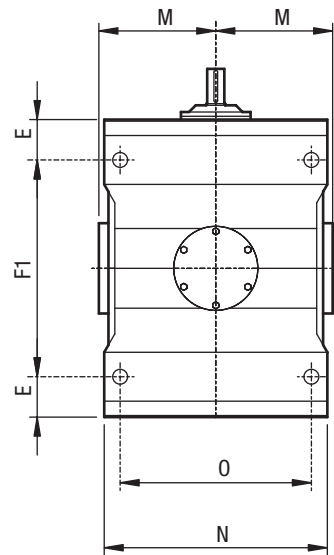
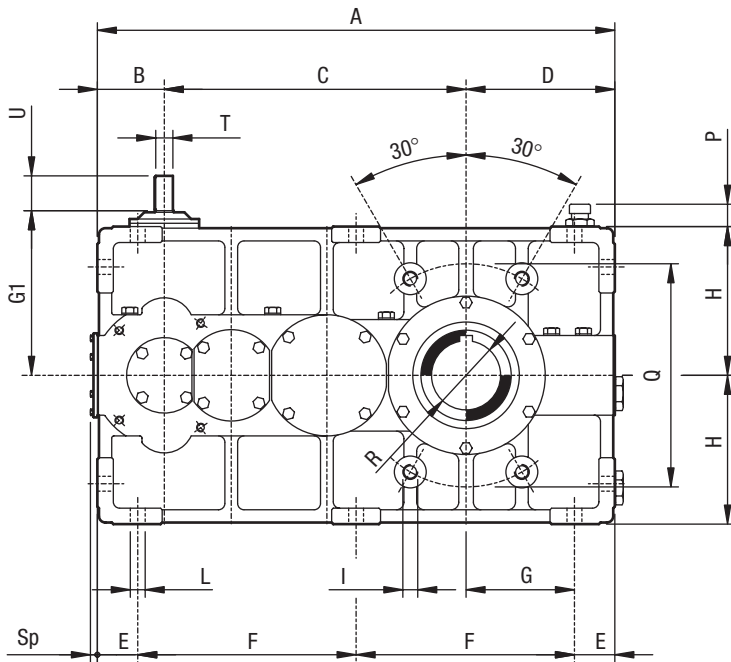
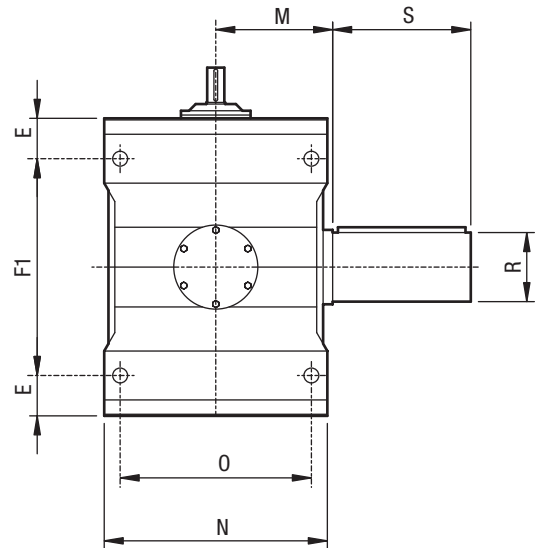
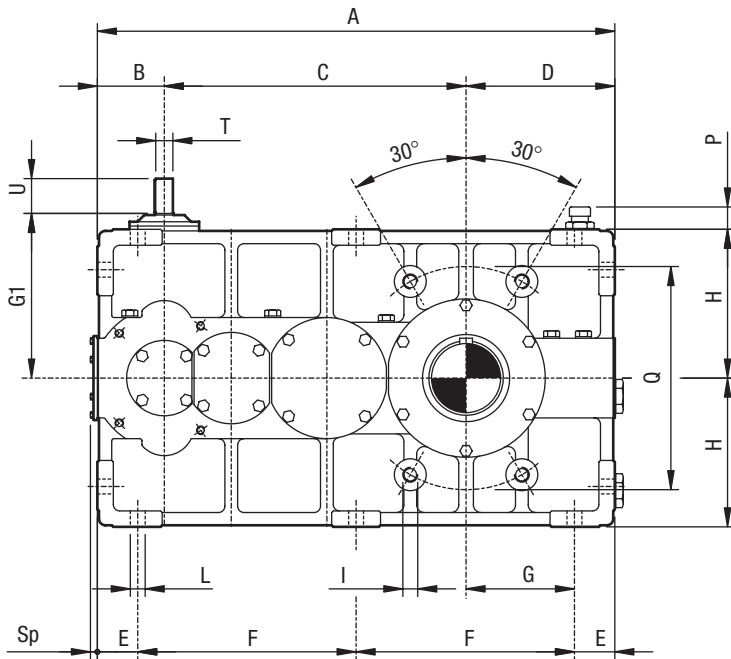
RHD series quadruple reduction



Size	iN 80-225																iN 250-355						
	A	B	C	D	E	F	F1	G	G1	H	L	M	N	O	P	R	S	T	U	T	U	V	Z
120	1700	225	1025	450	110	800	680	340	1425	500	42	420	700	590	33	240	410	60	120	55	110	175	300
130	1884	250	1134	500	125	884	750	375	1584	560	45	480	780	660	35	270	470	70	140	60	120	190	340
140	2120	280	1280	560	150	1000	820	410	1780	630	48	505	850	720	37	300	500	80	160	70	140	205	380
150	2395	315	1450	630	170	1135	920	460	2010	710	52	565	930	790	40	340	550	90	180	80	160	235	420
160	2685	355	1620	710	200	1265	1020	510	2250	800	56	630	1020	870	43	380	630	100	200	90	180	260	460

BEVEL-HELICAL UNITS

RVD series quadruple reduction



Size																					iN 80-225		iN 250-355		Sp
	A	B	C	D	E	F	F1	G	G1	H	I	L	M	N	O	P	Q	R	S	T	U	T	U		
10	487	63	284	140	38	205,5	204	102	160	140	M16	14	115	210	180	20	210	65	110	20	40	20	40	10	
20	550	70	320	160	42	233	236	118	180	160	M18	16	135	235	200	22	240	80	140	20	40	20	40	10	
30	622	80	362	180	46	265	268	134	200	180	M20	18	145	260	220	22	270	90	160	22	45	20	40	11	
40	695	90	405	200	52	295,5	296	148	225	200	M22	20	160	295	250	22	300	100	180	24	50	22	45	11	
50	781	100	456	225	57	333,5	336	168	250	225	M24	22	170	325	275	22	340	110	200	28	55	24	50	11	
60	874	112	512	250	62	375	376	188	280	250	M27	25	190	360	300	22	380	120	210	32	65	28	55	12	
70	972	125	567	280	72	414	416	208	315	280	M30	27	225	415	350	25	430	140	250	35	70	32	65	13	
80	1095	140	640	315	80	467,5	470	235	355	315	M33	30	250	455	385	25	490	160	280	40	80	35	70	16	
90	1240	160	725	355	87	533	536	268	400	355	M36	33	280	535	460	25	560	170	300	45	90	40	80	17	
100	1390	180	810	400	93	602	614	307	450	400	M39	36	310	600	520	25	640	200	350	50	100	45	90	18	
110	1562	200	912	450	100	681	700	350	500	450	M42	39	375	710	620	25	730	220	390	55	110	50	100	22	

SHAFT ARRANGEMENT

<p>PA - PC</p>	
<p>PB - PD</p>	
<p>RH - RV</p>	

MOUNTING POSITION

<p>P</p>	
<p>RH</p>	
<p>RV</p>	

▼ Breather plug

● Level plug

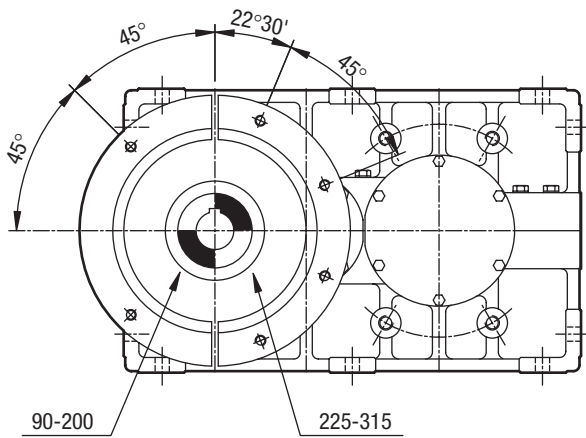
▲ Drain plug

MOTORIZED GEAR UNITS

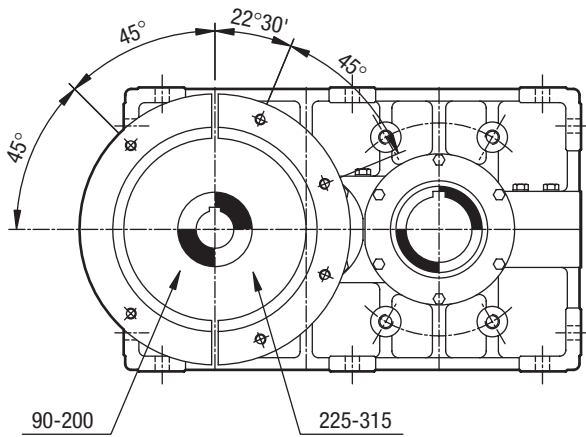
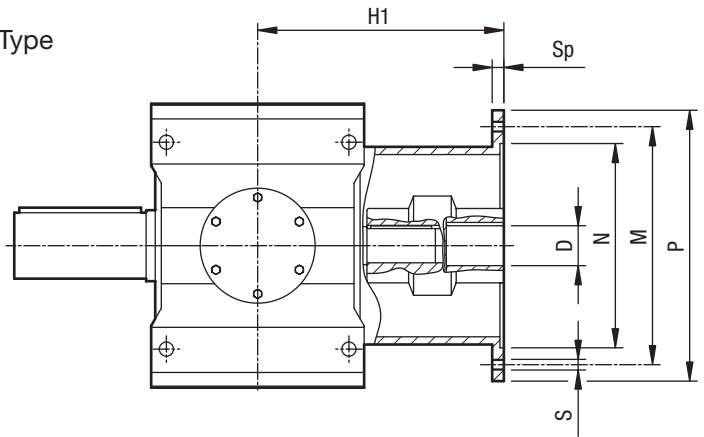
Gear units are available as standard assemblies with IEC metric B5 flanged motors as well as NEMA C-face motors. Normally gearbox and motor shaft are connected by flexible couplings, but other more compact and special solutions can be supplied.

MOTORIZED GEAR UNITS

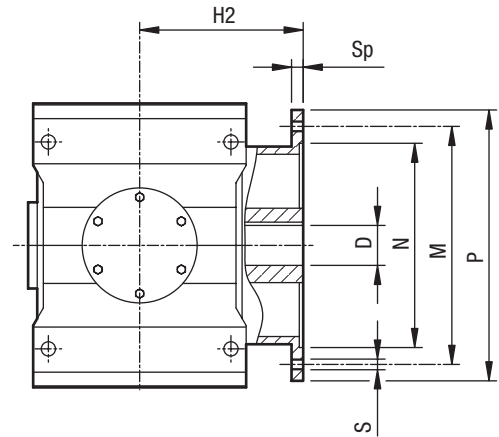
Helical unit PB series



BC Type



PAM Type



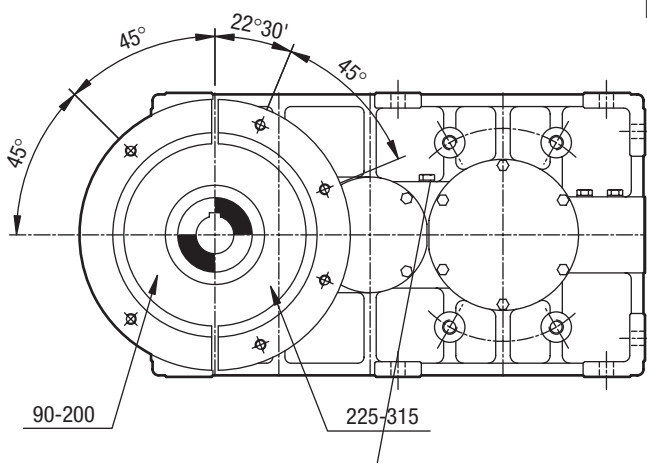
Unit Size	Motor IEC	D H7	M	N	P	S	Sp	H1	H2
10	90	24	165	130	200	M10	12	224	130
	100-112	28	215	180	250	M12	14	234	140
	132	38	265	230	300	M12	16	254	160
	160	42	300	250	350	M16	18	284	190
	180	48	300	250	350	M16	18	284	
20	100-112	28	215	180	250	M12	14	264	145
	132	38	265	230	300	M12	16	284	165
	160	42	300	250	350	M16	18	314	195
	180	48	300	250	350	M16	18	314	195
	200	55	350	300	400	M16	20	314	
30	100-112	28	215	180	250	M12	14	279	160
	132	38	265	230	300	M12	16	299	180
	160	42	300	250	350	M16	18	329	210
	180	48	300	250	350	M16	18	329	210
	200	55	350	300	400	M16	20	329	210
40	225	60	400	350	450	M16	20	359	
	132	38	265	230	300	M12	16	334	180
	160	42	300	250	350	M16	18	364	210
	180	48	300	250	350	M16	18	364	210
	200	55	350	300	400	M16	20	364	210
50	225	60	400	350	450	M16	20	394	240
	250	65	500	450	550	M16	20	394	
	132	38	265	230	300	M12	16	354	200
	160	42	300	250	350	M16	18	384	230
	180	48	300	250	350	M16	18	384	230
50	200	55	350	300	400	M16	20	384	230
	225	60	400	350	450	M16	20	414	260
	250	65	500	450	550	M16	20	414	260
	280	75	500	450	550	M16	20	414	

Unit Size	Motor IEC	D H7	M	N	P	S	Sp	H1	H2
60	160	42	300	250	350	M16	18	414	220
	180	48	300	250	350	M16	18	414	220
	200	55	350	300	400	M16	20	414	220
	225	60	400	350	450	M16	20	444	250
	250	65	500	450	550	M16	20	444	250
70	280	75	500	450	550	M16	20	444	250
	160	42	300	250	350	M16	18	479	245
	180	48	300	250	350	M16	18	479	245
	200	55	350	300	400	M16	20	479	245
	225	60	400	350	450	M16	20	509	275
80	250	65	500	450	550	M16	20	509	275
	280	75	500	450	550	M16	20	509	275
	200	55	350	300	400	M16	20	514	275
	225	60	400	350	450	M16	20	544	305
	250	65	500	450	550	M16	20	544	305
90	280	75	500	450	550	M16	20	544	305
	315	80	600	550	660	M20	24	574	335
	200	55	350	300	400	M16	20	564	320
	225	60	400	350	450	M16	20	594	350
	250	65	500	450	550	M16	20	594	350
90	280	75	500	450	550	M16	20	594	350
	315	80	600	550	660	M20	24	624	380

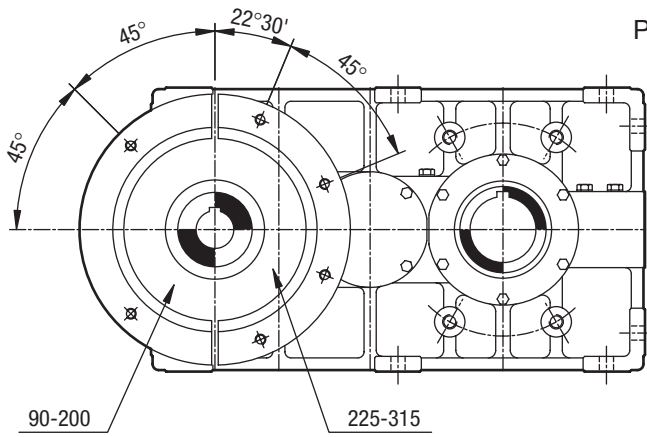
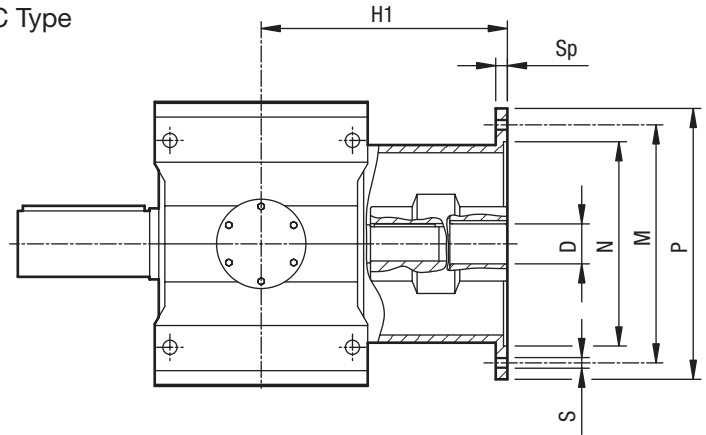
All dimensions refer to IEC frame size motors

MOTORIZED GEAR UNITS

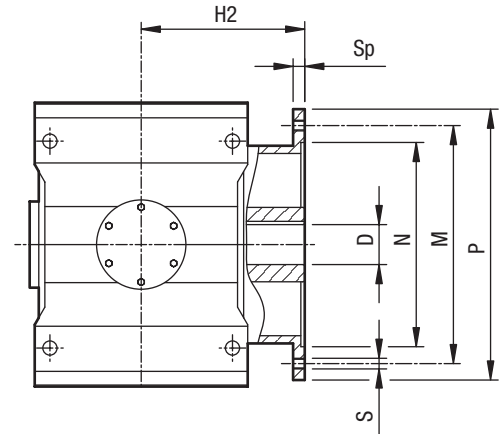
Helical unit PC series



BC Type



PAM Type



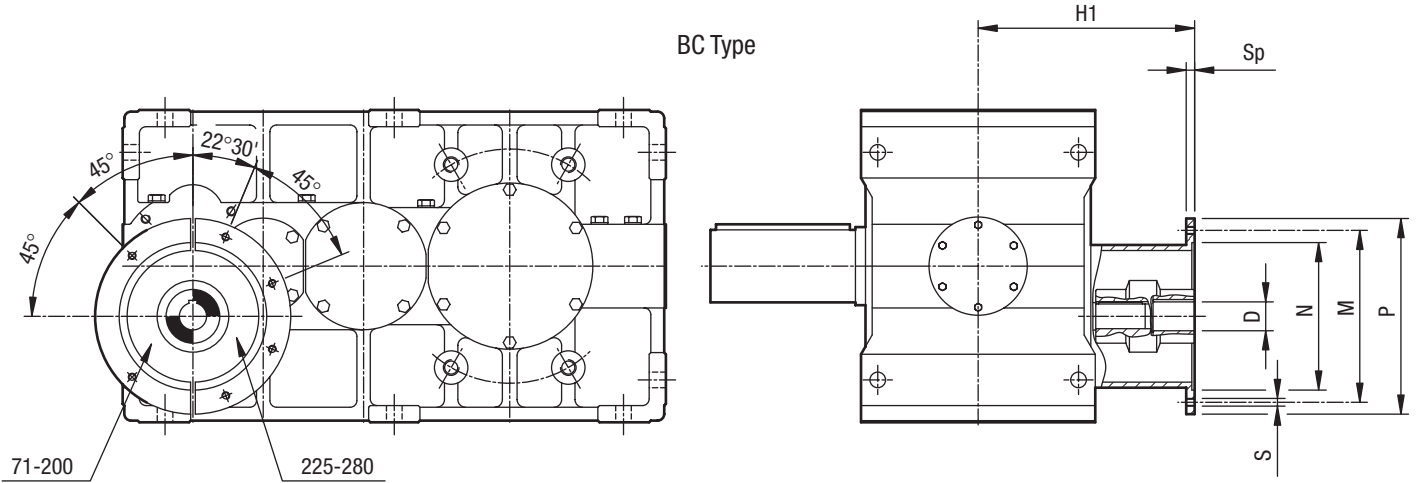
Unit Size	Motor IEC	D H7	M	N	P	S	Sp	H1	H2
10	90	24	165	130	200	M10	12	219	125
	100-112	28	215	180	250	M12	14	229	135
	132	38	265	230	300	M12	16	249	
	160	42	300	250	350	M16	18	279	
	180	48	300	250	350	M16	18	279	
20	100-112	28	215	180	250	M12	14	249	140
	132	38	265	230	300	M12	16	269	
	160	42	300	250	350	M16	18	299	
	180	48	300	250	350	M16	18	299	
	200	55	350	300	400	M16	20	299	
30	100-112	28	215	180	250	M12	14	264	155
	132	38	265	230	300	M12	16	284	175
	160	42	300	250	350	M16	18	314	
	180	48	300	250	350	M16	18	314	
	200	55	350	300	400	M16	20	314	
40	225	60	400	350	450	M16	20	344	
	132	38	265	230	300	M12	16	229	175
	160	42	300	250	350	M16	18	329	205
	180	48	300	250	350	M16	18	329	
	200	55	350	300	400	M16	20	329	
50	225	60	400	350	450	M16	20	359	
	250	65	500	450	550	M16	20	359	
	132	38	265	230	300	M12	16	319	195
	160	42	300	250	350	M16	18	349	225
	180	48	300	250	350	M16	18	349	225
	200	55	350	300	400	M16	20	349	
50	225	60	400	350	450	M16	20	379	
	250	65	500	450	550	M16	20	379	
	280	75	500	450	550	M16	20	379	

Unit Size	Motor IEC	D H7	M	N	P	S	Sp	H1	H2
60	132	38	265	230	300	M12	16	344	215
	160	42	300	250	350	M16	18	374	245
	180	48	300	250	350	M16	18	374	245
	200	55	350	300	400	M16	20	374	245
	225	60	400	350	450	M16	20	404	
	250	65	500	450	550	M16	20	404	
70	280	75	500	450	550	M16	20	404	
	160	42	300	250	350	M16	18	429	245
	180	48	300	250	350	M16	18	429	245
	200	55	350	300	400	M16	20	429	245
	225	60	400	350	450	M16	20	459	275
80	250	65	500	450	550	M16	20	459	
	280	75	500	450	550	M16	20	459	
	180	48	300	250	350	M16	18	464	270
	200	55	350	300	400	M16	20	464	270
	225	60	400	350	450	M16	20	494	300
90	250	65	500	450	550	M16	20	494	300
	280	75	500	450	550	M16	20	494	
	200	55	350	300	400	M16	20	504	315
	225	60	400	350	450	M16	20	534	345
	250	65	500	450	550	M16	20	534	345
	280	75	500	450	550	M16	20	534	345
90	315	80	600	550	660	M20	24	564	

All dimensions refer to IEC frame size motors

MOTORIZED GEAR UNITS

Helical unit PD series



Unit Size	Motor IEC	D H7	M	N	P	S	Sp	H1
10	71	14	130	110	160	M8	12	184
	80	19	165	130	200	M10	12	194
	90	24	165	130	200	M10	12	204
	100-112	28	215	180	250	M12	14	214
	132	38	265	230	300	M12	16	234
20	80	19	165	130	200	M10	12	214
	90	24	165	130	200	M10	12	224
	100-112	28	215	180	250	M12	14	234
	132	38	265	230	300	M12	16	254
30	80	19	165	130	200	M10	12	239
	90	24	165	130	200	M10	12	249
	100-112	28	215	180	250	M12	14	259
	132	38	265	230	300	M12	16	279
40	160	42	300	250	350	M16	18	309
	90	24	165	130	200	M10	12	264
	100-112	28	215	180	250	M12	14	274
50	132	38	265	230	300	M12	16	294
	160	42	300	250	350	M16	18	324
	100-112	28	215	180	250	M12	14	284
50	132	38	265	230	300	M12	16	304
	160	42	300	250	350	M16	18	334
	180	48	300	250	350	M16	18	334
	180	48	300	250	350	M16	18	334

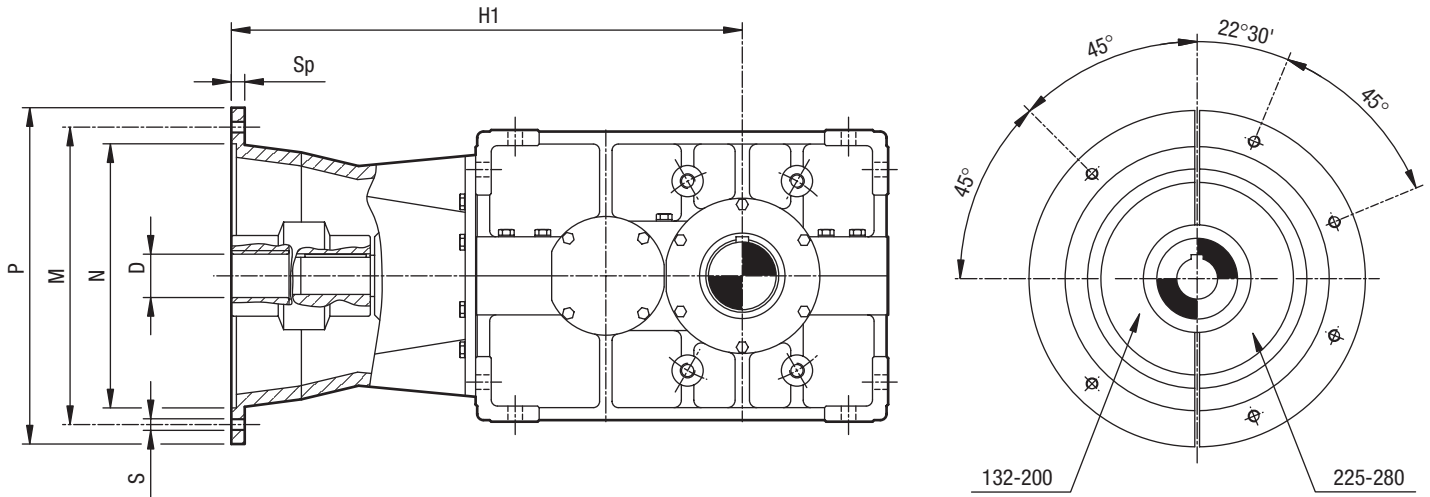
All dimensions refer to IEC frame size motors

Unit Size	Motor IEC	D H7	M	N	P	S	Sp	H1
60	100-112	28	215	180	250	M12	14	309
	132	38	265	230	300	M12	16	329
	160	42	300	250	350	M16	18	359
	180	48	300	250	350	M16	18	359
	200	55	350	300	400	M16	20	359
70	100-112	28	215	180	250	M12	14	344
	132	38	265	230	300	M12	16	364
	160	42	300	250	350	M16	18	394
	180	48	300	250	350	M16	18	394
	200	55	350	300	400	M16	20	394
	225	60	400	350	450	M16	20	424
80	132	38	265	230	300	M12	16	399
	160	42	300	250	350	M16	18	429
	180	48	300	250	350	M16	18	429
	200	55	350	300	400	M16	20	429
	225	60	400	350	450	M16	20	459
90	250	65	500	450	550	M16	20	459
	132	38	265	230	300	M12	16	434
	160	42	300	250	350	M16	18	464
	180	48	300	250	350	M16	18	464
	200	55	350	300	400	M16	20	464
	225	60	400	350	450	M16	20	494
	250	65	500	450	550	M16	20	494
280	75	500	450	550	M16	20	494	

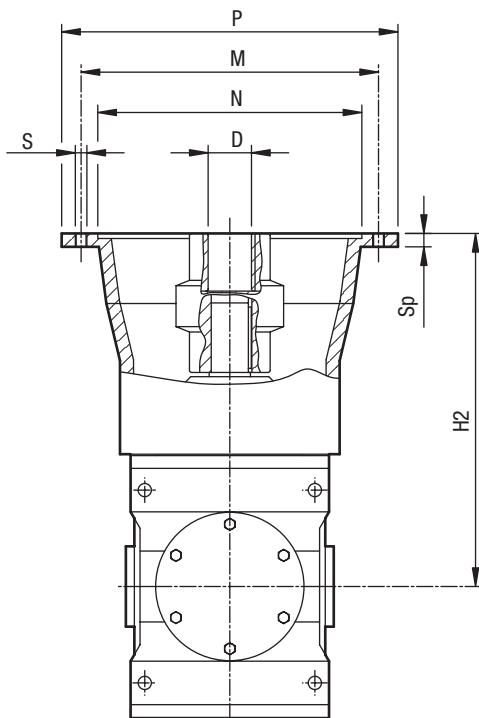
MOTORIZED GEAR UNITS

Bevel-helical units RHB/RVB series

RHB



RVB

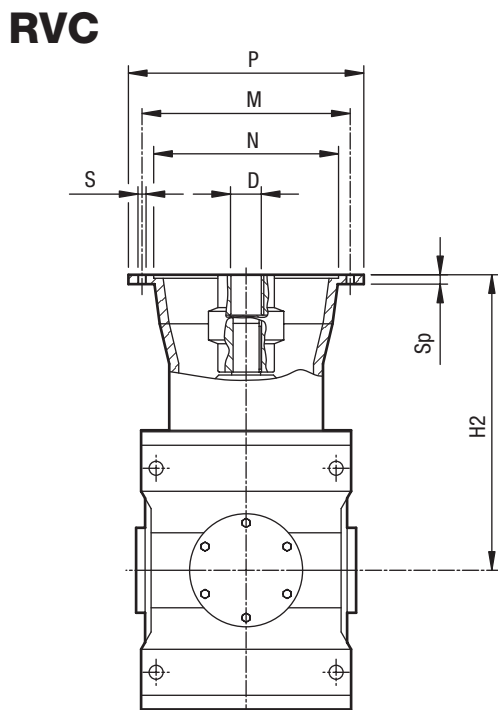
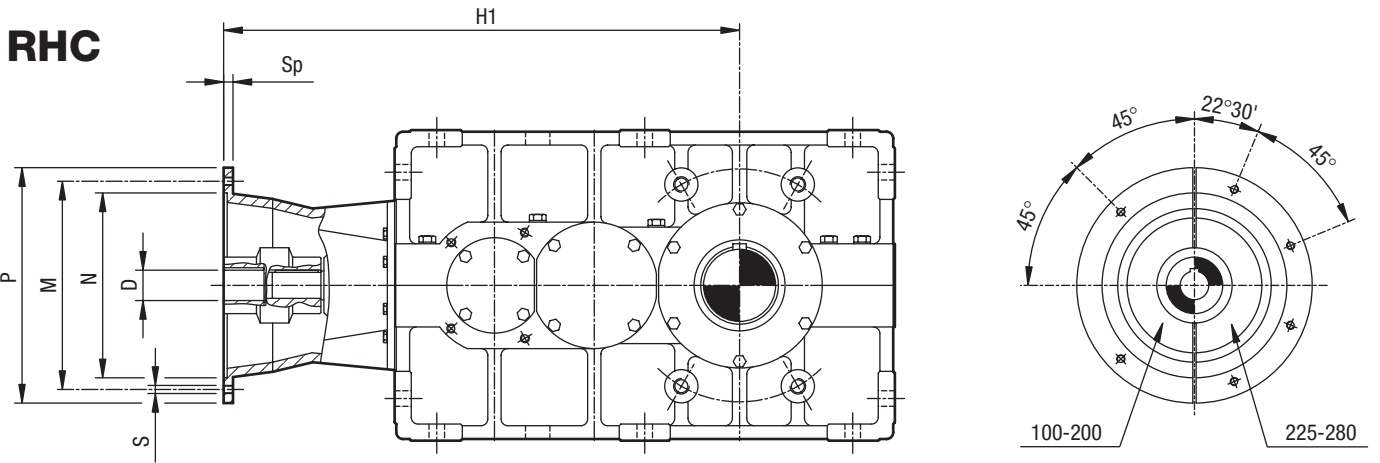


Unit Size	Motor IEC	D H7	M	N	P	S	Sp	H1	H2
10	132	38	265	230	300	M12	16	510	379
	160	42	300	250	350	M16	18	540	409
	180	48	300	250	350	M16	18	540	409
	200	55	350	300	400	M16	20	540	409
20	132	38	265	230	300	M12	16	564	414
	160	42	300	250	350	M16	18	594	444
	180	48	300	250	350	M16	18	594	444
	200	55	350	300	400	M16	20	594	444
30	225	60	400	350	450	M16	20	624	474
	160	42	300	250	350	M16	18	654	484
	180	48	300	250	350	M16	18	654	484
	200	55	350	300	400	M16	20	654	484
40	225	60	400	350	450	M16	20	684	514
	250	65	500	450	550	M16	20	684	514
	160	42	300	250	350	M16	18	719	529
	180	48	300	250	350	M16	18	719	529
50	200	55	350	300	400	M16	20	719	529
	225	60	400	350	450	M16	20	749	559
	250	65	500	450	550	M16	20	749	559
	160	42	300	250	350	M16	18	795	579
60	180	48	300	250	350	M16	18	795	579
	200	55	350	300	400	M16	20	795	579
	225	60	400	350	450	M16	20	825	609
	250	65	500	450	550	M16	20	825	609
70	280	75	500	450	550	M16	20	825	609
	200	55	350	300	400	M16	20	874	634
	225	60	400	350	450	M16	20	904	664
	250	65	500	450	550	M16	20	904	664
80	280	75	500	450	550	M16	20	904	664
	200	55	350	300	400	M16	20	966	704
	225	60	400	350	450	M16	20	996	734
	250	65	500	450	550	M16	20	996	734
90	280	75	500	450	550	M16	20	996	734
	200	55	350	300	400	M16	20	1074	774
	225	60	400	350	450	M16	20	1104	804
	250	65	500	450	550	M16	20	1104	804
	280	75	500	450	550	M16	20	1104	804
	200	55	350	300	400	M16	20	1194	854
	225	60	400	350	450	M16	20	1224	884
	250	65	500	450	550	M16	20	1224	884
	280	75	500	450	550	M16	20	1224	884

All dimensions refer to IEC frame size motors

MOTORIZED GEAR UNITS

Bevel-helical units RHC/RVC series

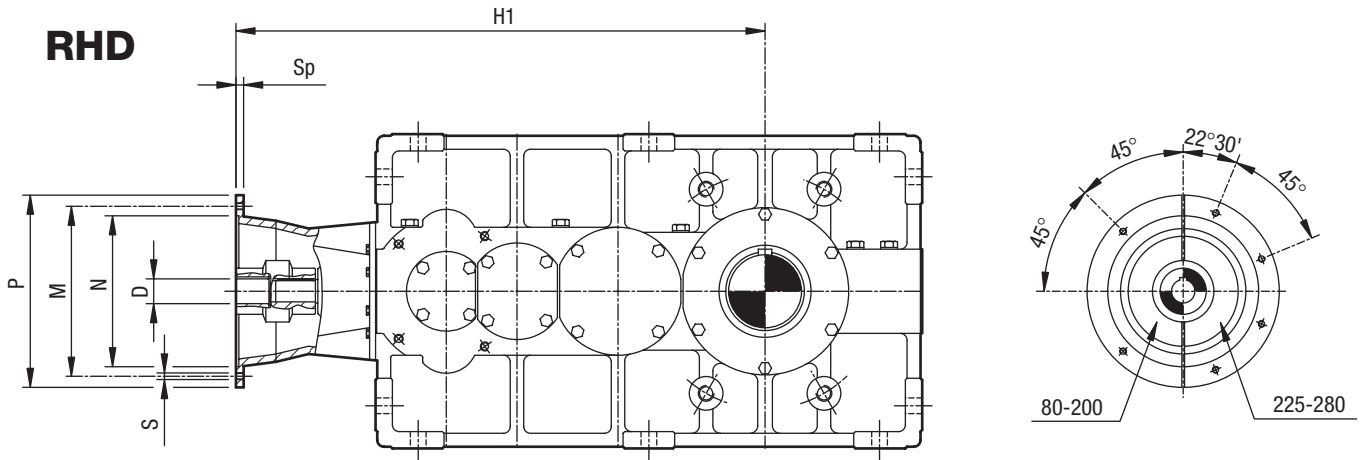


Unit Size	Motor IEC	D H7	M	N	P	S	Sp	H1	H2
10	100-112	28	215	180	250	M12	14	495	274
	132	38	265	230	300	M12	16	515	294
	160	42	300	250	350	M16	18	545	324
	180	48	300	250	350	M16	18	545	324
20	100-112	28	215	180	250	M12	14	549	299
	132	38	265	230	300	M12	16	569	319
	160	42	300	250	350	M16	18	599	349
	180	48	300	250	350	M16	18	599	349
30	200	55	350	300	400	M16	20	599	349
	132	38	265	230	300	M12	16	631	349
	160	42	300	250	350	M16	18	661	379
	180	48	300	250	350	M16	18	661	379
40	200	55	350	300	400	M16	20	661	379
	225	60	400	350	450	M16	20	691	409
	132	38	265	230	300	M12	16	694	379
	160	42	300	250	350	M16	18	724	409
50	180	48	300	250	350	M16	18	724	409
	200	55	350	300	400	M16	20	724	409
	225	60	400	350	450	M16	20	754	439
	250	65	500	450	550	M16	20	754	439
60	160	42	300	250	350	M16	18	800	444
	180	48	300	250	350	M16	18	800	444
	200	55	350	300	400	M16	20	800	444
	225	60	400	350	450	M16	20	830	474
70	250	65	500	450	550	M16	20	830	474
	280	75	500	450	550	M16	20	830	474
	180	48	300	250	350	M16	18	884	484
	200	55	350	300	400	M16	20	884	484
80	225	60	400	350	450	M16	20	914	514
	250	65	500	450	550	M16	20	914	514
	280	75	500	450	550	M16	20	914	514
	200	55	350	300	400	M16	20	971	529
90	225	60	400	350	450	M16	20	1001	559
	250	65	500	450	550	M16	20	1001	559
	280	75	500	450	550	M16	20	1001	559
	225	60	400	350	450	M16	20	1109	609
90	250	65	500	450	550	M16	20	1109	609
	280	75	500	450	550	M16	20	1109	609
90	250	65	500	450	550	M16	20	1229	664
	280	75	500	450	550	M16	20	1229	664

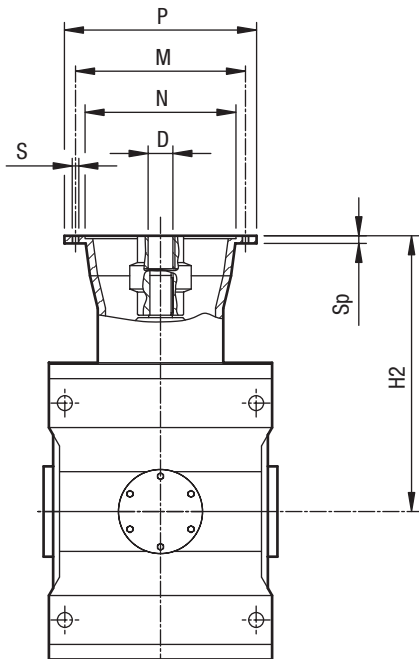
All dimensions refer to IEC frame size motors

MOTORIZED GEAR UNITS

Bevel-helical units RHD/RVD series



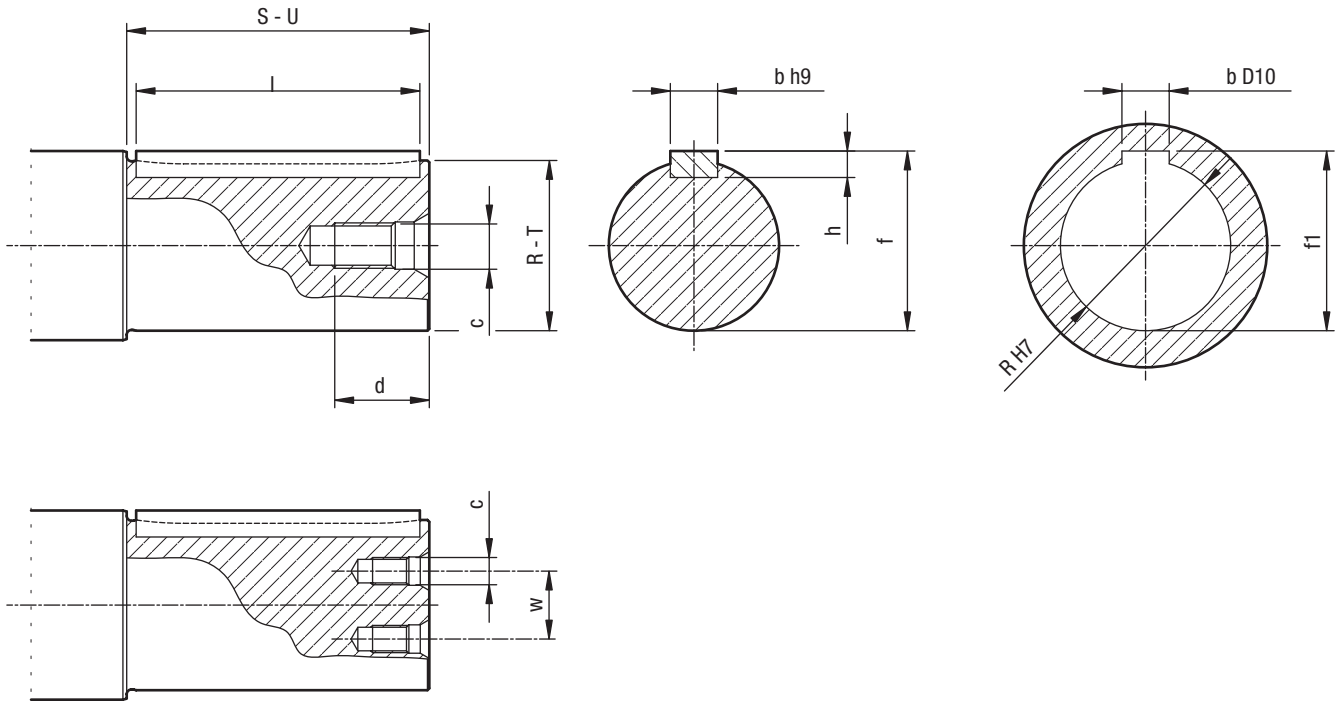
RVD



Unit Size	Motor IEC	D H7	M	N	P	S	Sp	H1	H2
10	80	19	165	130	200	M10	12	475	239
	90	24	165	130	200	M10	12	485	249
	100-112	28	215	180	250	M12	14	495	259
20	90	24	165	130	200	M10	12	539	274
	100-112	28	215	180	250	M12	14	549	284
	132	38	265	230	300	M12	16	569	304
30	90	24	165	130	200	M10	12	601	299
	100-112	28	215	180	250	M12	14	611	309
	132	38	265	230	300	M12	16	631	329
	160	42	300	250	350	M16	18	661	359
40	100-112	28	215	180	250	M12	14	679	339
	132	38	265	230	300	M12	16	699	359
	160	42	300	250	350	M16	18	729	389
50	100-112	28	215	180	250	M12	14	755	369
	132	38	265	230	300	M12	16	775	389
	160	42	300	250	350	M16	18	805	419
	180	48	300	250	350	M16	18	805	419
60	100-112	28	215	180	250	M12	14	841	409
	132	38	265	230	300	M12	16	861	429
	160	42	300	250	350	M16	18	891	459
	180	48	300	250	350	M16	18	891	459
	200	55	350	300	400	M16	20	891	459
70	132	38	265	230	300	M12	16	946	469
	160	42	300	250	350	M16	18	976	499
	180	48	300	250	350	M16	18	976	499
	200	55	350	300	400	M16	20	976	499
	225	60	400	350	450	M16	20	1006	529
	250	65	500	450	550	M16	20	1114	579
80	132	38	265	230	300	M12	16	1054	519
	160	42	300	250	350	M16	18	1084	549
	180	48	300	250	350	M16	18	1084	549
	200	55	350	300	400	M16	20	1084	549
	225	60	400	350	450	M16	20	1114	579
90	250	65	500	450	550	M16	20	1114	579
	160	42	300	250	350	M16	18	1209	604
	180	48	300	250	350	M16	18	1209	604
	200	55	350	300	400	M16	20	1209	604
	225	60	400	350	450	M16	20	1239	634
	250	65	500	450	550	M16	20	1239	634
	280	75	500	450	550	M16	20	1239	634

All dimensions refer to IEC frame size motors

SHAFT ENDING

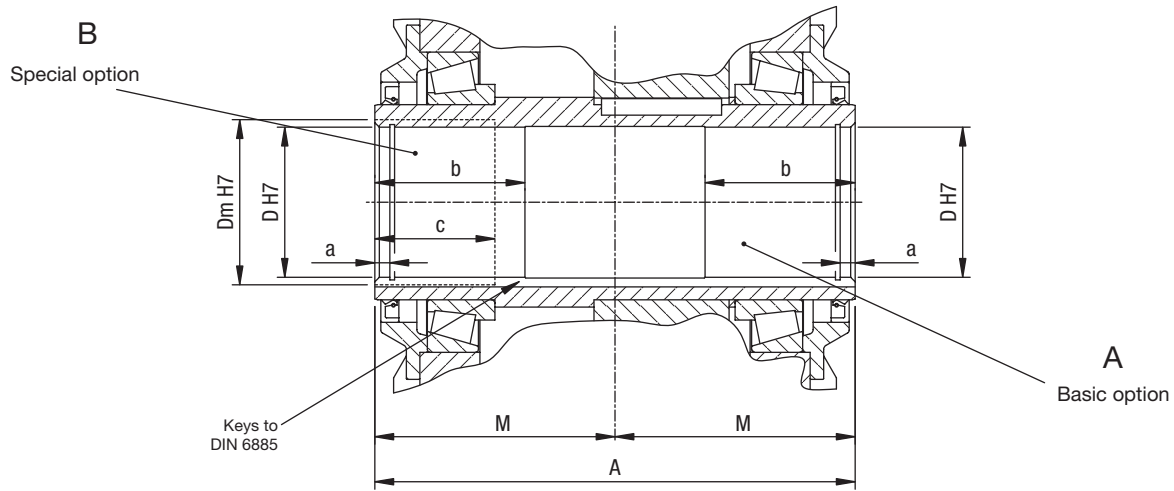


Tapped holes on top according to DIN 332
Key to DIN 6885

R-T	S-U a11	c	d	w	Key			f	f1
					b	h	l		
15 j6	30	M6	16		6	6	25	17,5	
18 j6	35	M6	16		6	6	30	20,5	
20 j6	40	M6	16		6	6	35	22,5	
22 j6	45	M6	16		6	6	40	24,5	
24 j6	50	M8	19		8	7	45	27	
28 j6	55	M8	19		8	7	50	31	
32 k6	65	M10	22		10	8	60	35	
35 k6	70	M10	22		10	8	60	38	
40 k6	80	M10	22		12	8	70	43	
45 k6	90	M10	22		14	9	80	48,5	
50 k6	100	M12	28		14	9	90	53,5	
55 m6	110	M12	28		16	10	100	59	
60 m6	120	M12	28		18	11	110	64	
65 m6	110	M16	36		18	11	100	69	69,4
70 m6	140	M16	36		20	12	125	74,5	
75 m6	150	M16	36		20	12	125	79,5	
80 m6	140	M16	36		22	14	125	85	
80 m6	160	M16	36		22	14	140	85	85,4
85 m6	170	M16	36		22	14	140	90	
90 m6	160	M16	36		25	14	140	95	95,4
90 m6	180	M16	36		25	14	160	95	
100 m6	180	M20	42		28	16	160	106	106,4
100 m6	200	M20	42		28	16	180	106	
110 m6	200	M20	42		28	16	180	116	116,4
110 m6	22	M20	42		28	16	200	116	
120 m6	210	M20	42		32	18	180	127	127,4
130 m6	260	M20	42		32	18	220	137	
140 m6	250	M24	50		36	20	220	148	148,4
140 m6	280	M24	50		36	20	250	148	
150 m6	300	M24	50		36	20	280	158	
160 m6	280	M24	50		40	22	250	169	169,4
160 m6	320	M24	50		40	22	280	169	
170 m6	300	M24	50		40	22	280	179	179,4
180 m6	360	M24	50		45	25	320	190	
190 m6	380	M30	64		45	25	360	200	
200 m6	350	M30	64		45	25	320	210	210,4
220 m6	390	M30	64		50	28	360	231	231,4
240 m6	410	2 off M30	64	150	56	32	360	252	
270 m6	470	2 off M30	64	150	63	32	400	282	
300 m6	500	2 off M30	64	180	70	36	450	314	
340 m6	550	2 off M30	64	180	80	40	500	355	
380 m6	630	2 off M30	64	210	90	45	550	397	

SHAFT ENDING

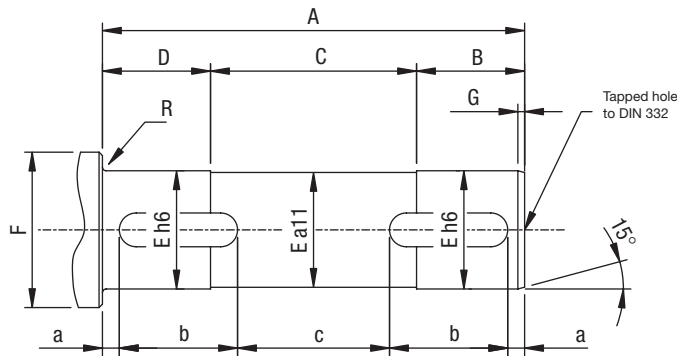
Hollow shaft with keyway



Size	10	20	30	40	50	60	70	80	90	100	110
A	230	270	290	320	340	380	450	500	560	620	750
D	65	80	90	100	110	120	140	160	170	200	220
Dm	70	90	100	110	120	130	155	175	185	215	235
M	115	135	145	160	170	190	225	250	280	310	375
a	7	8	9	10	11	12	14	16	18	20	22
b	65	80	90	100	110	120	140	160	170	200	220
c	56	70	80	90	100	110	125	140	160	180	200

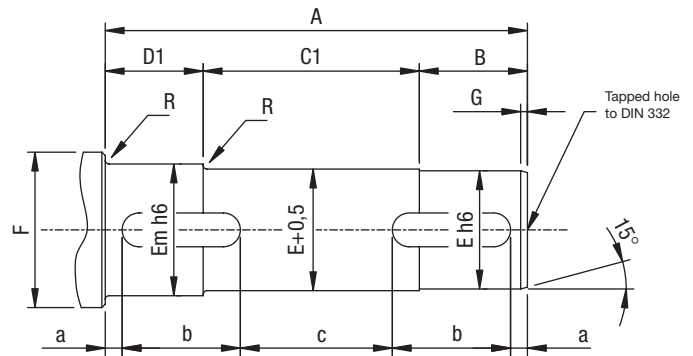
Driven machine shaft end

Option A



Keys of dimensions E to DIN 6885

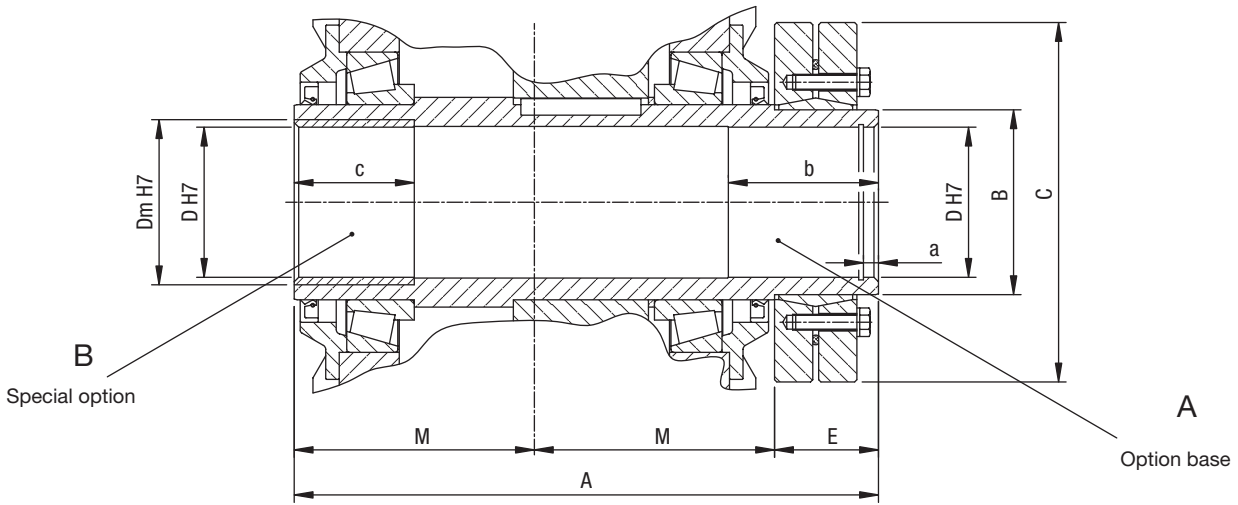
Option B



Size	10	20	30	40	50	60	70	80	90	100	110
A	212	250	265	295	310	350	415	460	515	570	695
B	50	65	70	80	85	95	110	125	130	155	170
C	97	105	105	115	115	135	165	175	215	215	305
C1	108	117	117	127	127	147	182	197	227	237	327
D	65	80	90	100	110	120	140	160	170	200	220
D1	54	68	78	88	98	108	123	138	158	178	198
E	65	80	90	100	110	120	140	160	170	200	220
Em	70	90	100	110	120	130	155	175	185	215	235
F	83	97	107	122	135	145	175	195	205	235	255
G	3	3,5	4	4,5	5	5,5	6	7	8	9	10
R	2	2,2	2,5	2,8	3	3,5	4	4,5	5	5,5	6
a	5	5	5	5	8	8	8	8	10	10	10
b	60	80	90	100	110	110	125	150	160	180	200
c	82	80	75	85	74	114	149	144	175	190	275

SHAFT ENDING

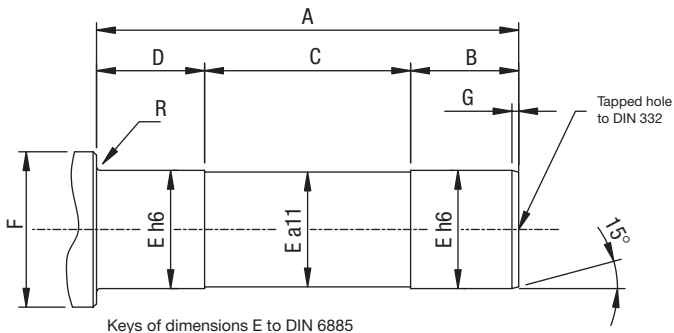
Hollow shaft with shrink disc



Size	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160
A	278	333	366	396	429	476	564	614	694	770	914	1015	1150	1215	1365	1520
B	80	100	120	130	155	165	185	200	220	260	280	300	340	380	420	460
C	145	170	215	215	265	290	330	350	370	430	460	485	570	645	690	770
D	65	80	90	100	110	120	140	160	170	200	220	240	270	300	340	380
Dm	70	90	100	110	120	130	155	175	185	215	235	260	290	320	360	400
E	48	63	76	76	89	96	114	114	134	150	164	175	190	205	235	260
M	115	135	145	160	170	190	225	250	280	310	375	420	480	505	565	630
a	7	8	9	10	11	12	14	16	18	20	22	25	28	31	35	40
b	65	80	90	100	110	120	140	160	170	200	220	240	270	300	340	380
c	56	70	80	90	100	110	125	140	160	180	200	225	250	280	310	350

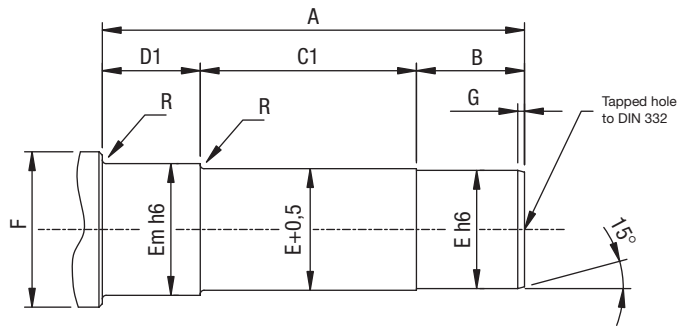
Driven machine shaft end

Option A



Keys of dimensions E to DIN 6885

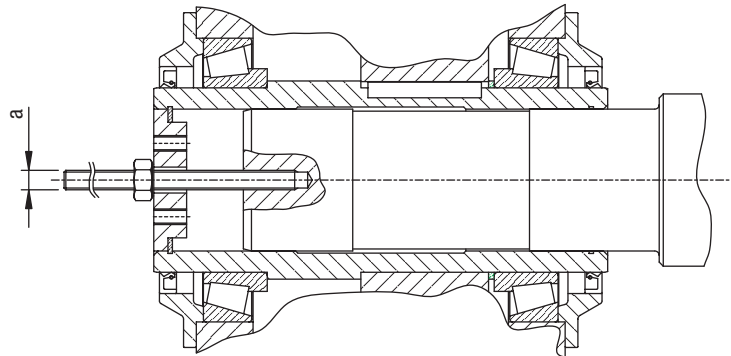
Option B



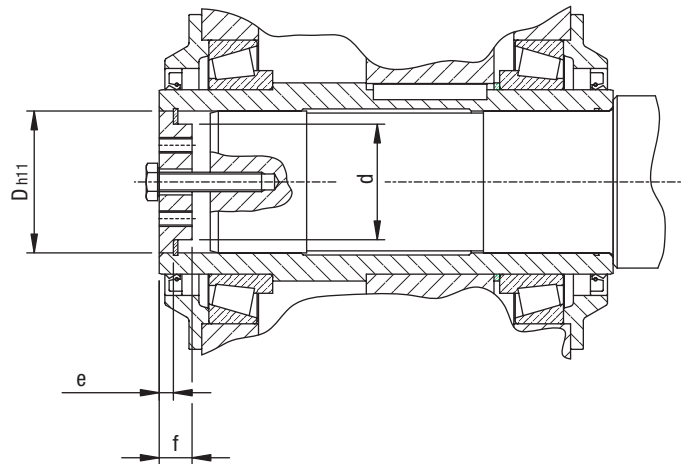
Size	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160
A	260	313	341	371	399	446	529	574	649	720	859	955	1085	1140	1280	1425
B	50	65	70	80	85	95	110	125	130	155	170	185	210	230	260	290
C	145	168	181	191	204	231	279	289	349	365	469	530	605	610	680	755
C1	156	180	193	203	216	243	296	311	361	387	491	548	628	633	713	788
D	65	80	90	100	110	120	140	160	170	200	220	240	270	300	340	380
D1	54	68	78	88	98	108	123	138	158	178	198	222	247	277	307	347
E	65	80	90	100	110	120	140	160	170	200	220	240	270	300	340	380
Em	70	90	100	110	120	130	155	175	185	215	235	260	290	320	360	400
F	83	97	107	122	135	145	175	195	205	235	255	290	320	350	390	430
G	3	3,5	4	4,5	5	5,5	6	7	8	9	10	11	12	14	16	18
R	2	2,2	2,5	2,8	3	3,5	4	4,5	5	5,5	6	6,5	7	8	9	10

INSTALLATION

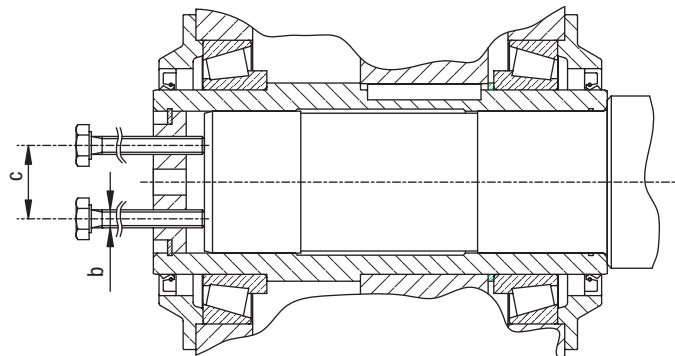
Mounting



Fixing



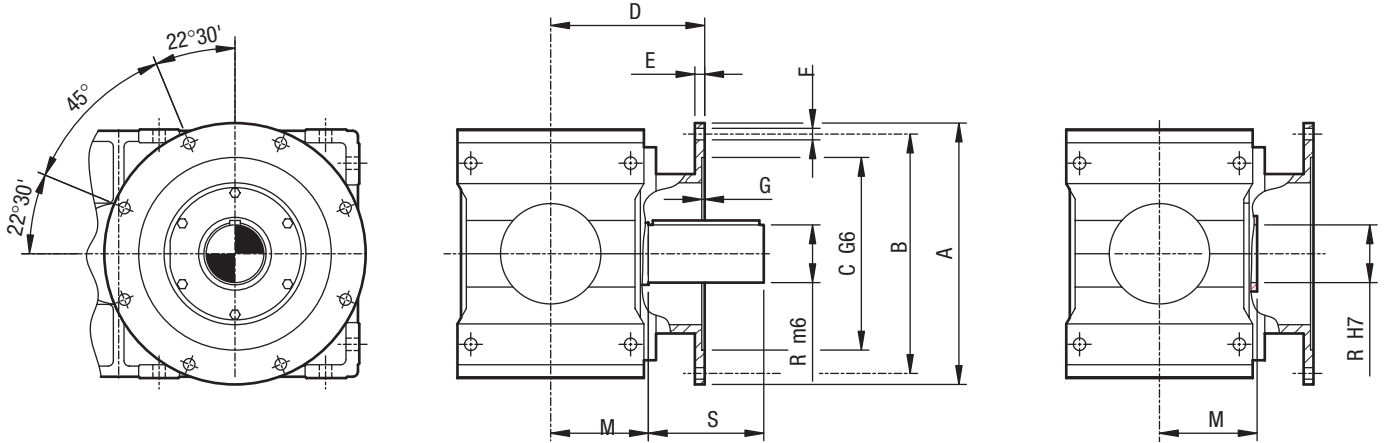
Removing



Size	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160
a	M16	M16	M16	M20	M20	M20	M24	M24	M24	M30	M30	M30	M30	M36	M36	M36
b	M10	M12	M14	M14	M16	M16	M18	M18	M20	M20	M24	M24	M24	M24	M30	M30
c	37	48	55	60	65	75	95	105	115	140	155	165	190	210	235	260
Ø D	65	80	90	100	110	120	140	160	170	200	220	240	270	300	340	380
Ø d	52	66	74	82	90	100	120	136	148	172	190	205	230	255	290	320
e	7	8	9	10	11	12	14	16	18	20	22	25	28	32	35	40
f	16	18	20	22	25	28	32	36	40	45	50	55	60	70	80	90
Circlip	165	180	190	1100	1110	1120	1140	1160	1170	1200	1220	1240	1270	1300	1340	1380

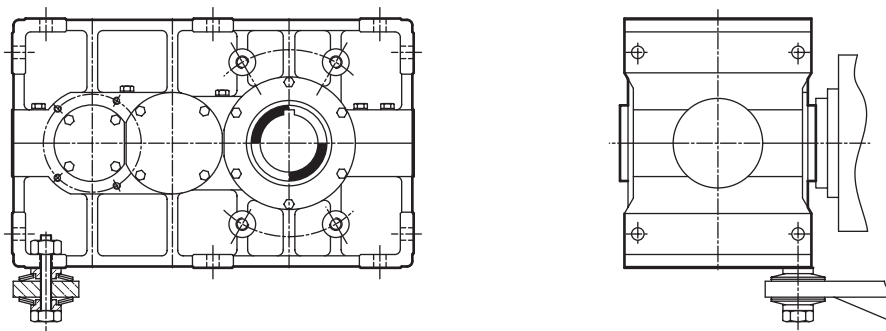
OUTPUT FLANGE

Flanged gearbox output casing normally allow direct assembly to the driven machine. Special designs, as well as B5 standard patterns (see dimensional data sheet), are available.



Size	Ø A	Ø B	Ø C	D	E	Ø F	G	M	Ø R	S
10	300	265	230	170	14	18	5	115	65	110
20	300	265	230	185	14	20	5	135	80	140
30	350	300	250	210	16	22	6	145	90	160
40	400	350	300	225	16	22	6	160	100	180
50	450	400	350	245	16	24	6	170	110	200
60	550	500	450	270	18	27	7	190	120	210
70	550	500	450	300	20	30	7	225	140	250
80	660	600	550	350	22	33	7	250	16	280
90	660	600	550	390	22	36	7	280	170	300
100	ON REQUEST									
110	ON REQUEST									

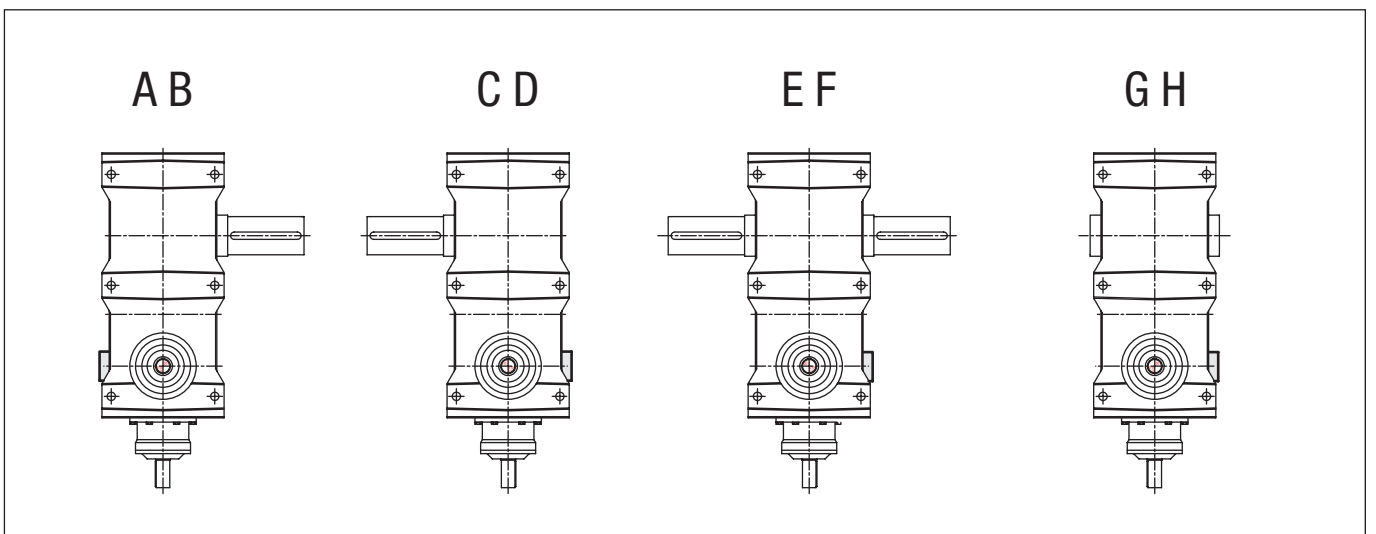
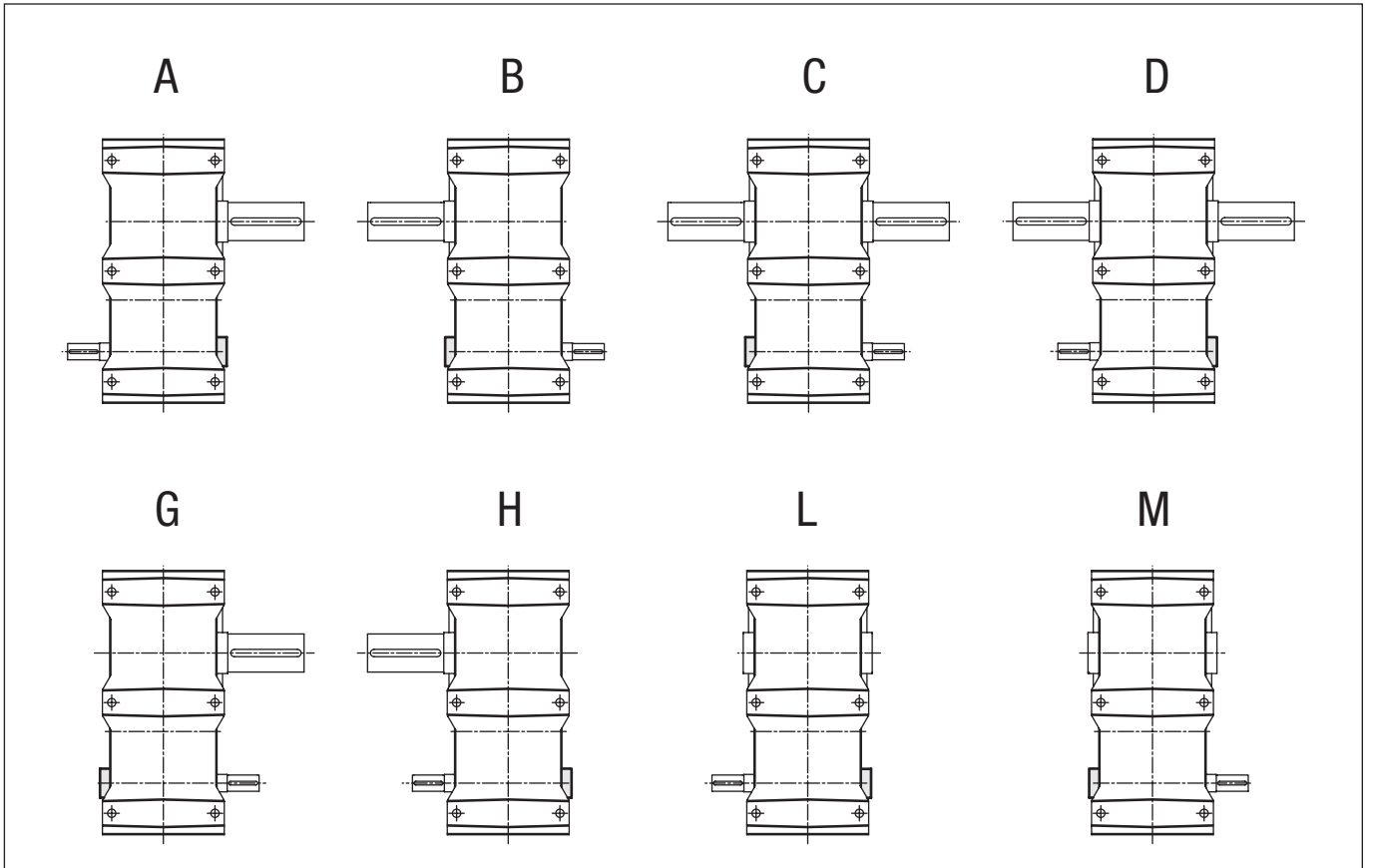
SHAFT-MOUNTED APPLICATIONS



All units can be supplied with elastic constraint, semi-flexible and rigid reaction arrangement.

BACKSTOP DEVICES

Holdbacks can be fitted to all gear units. They are located externally on helical pinion shaft as shown in the diagrams below.



OVERHUNG LOADS

Whenever transmission components, generating radial loads, are fitted on input and output shafts, it is necessary to check that the values of such loads are compatible with the gearbox capacity.

In the table below, maximum admissible overhung loads on high speed shaft Fr_1 and on the low speed shaft Fr_2 are shown, having as reference the load operating at the middle of the shaft ends (dimensions U and S of relevant dimensional tables).

- a) if acting at 0.25 U or S from the gearbox side, multiply such values by 2.
- b) if acting at 0.75 U or S from the gearbox side, multiply such values by 0.67.

When overhung load is less than 20% of admissible load shown in the table, no check is required.

Along with overhung load, a **thrust load** of 20% of overhung load is acceptable. For higher value, please refer to us.

Roughly overhung loads can be obtained by using the following formula :

$$Fr = k \cdot \frac{T}{D}$$

T (Nm) : torque

D (mm) : pitch circle diameter of the driving or driven component

Where k :

1. 2000 for chain drive
2. 2100 for gear drive
3. 3000 for cog belt drive
4. 5000 for V-belt drive

MASS MOMENTS OF INERTIA

The mass moments of inertia J_1 refer to the high speed shaft of a standard gearbox without fan.

The mass moments of inertia J_2 refer to the low speed shaft and are given by the following formula :

$$J_2 = J_1 \cdot i_r^2$$

i_r : actual ratio

BEVEL-HELICAL UNITS

Overhung loads Fr_1, Fr_2 - Mass Moment of Inertia J_1

RHD	RVD	i_N	Size																
			10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	
80	Fr_1	N	1900																
		N	4100																
		J_1 kgm^2	0,0001																
90	Fr_1	N	1900	2400	3200	3900	5300	6400	11900	14900	17700	19300	23100	27700	30200	33600	34400	40500	
		N	4100	5200	9600	14400	20000	25700	31900	37600	46100	50400	60700	68800	76500	81800	93000	100000	
		J_1 kgm^2	0,0001	0,0005	0,0007	0,0009	0,0018	0,0029	0,0051	0,0096	0,0177	0,0311	0,0501	0,0988	0,1703	0,3111	0,5629	1,0018	
100	Fr_2	N	1900																
		N	4100																
		J_1 kgm^2	0,0001																
112	Fr_1	N	1900	2400	3200	3900	5300	6400	11900	14900	17700	19300	23100	27700	30200	33600	34400	40500	
		N	4100	5200	9600	14400	20000	25700	31900	37600	46100	50400	60700	68800	76500	81800	93000	100000	
		J_1 kgm^2	0,0001	0,0005	0,0007	0,0009	0,0018	0,0029	0,0051	0,0096	0,0177	0,0311	0,0501	0,0988	0,1703	0,3111	0,5629	1,0018	
125	Fr_1	N	1900																
		N	4100																
		J_1 kgm^2	0,0001																
140	Fr_1	N	1900	2400	3200	3900	5300	6400	11900	14900	17700	19300	23100	27700	30200	33600	34400	40500	
		N	4100	5200	9600	14400	20000	25700	31900	37600	46100	50400	60700	68800	76500	81800	93000	100000	
		J_1 kgm^2	0,0001	0,0005	0,0007	0,0009	0,0018	0,0029	0,0051	0,0096	0,0177	0,0311	0,0501	0,0988	0,1703	0,3111	0,5629	1,0018	
160	Fr_1	N	1900																
		N	4100																
		J_1 kgm^2	0,0001																
180	Fr_1	N	1900	2400	3200	3900	5300	6400	11900	14900	17700	19300	23100	27700	30200	33600	34400	40500	
		N	4100	5200	9600	14400	20000	25700	31900	37600	46100	50400	60700	68800	76500	81800	93000	100000	
		J_1 kgm^2	0,0001	0,0005	0,0007	0,0009	0,0018	0,0029	0,0051	0,0096	0,0177	0,0311	0,0501	0,0988	0,1703	0,3111	0,5629	1,0018	
200	Fr_1	N	1900																
		N	4100																
		J_1 kgm^2	0,0001																
225	Fr_1	N	1900	2400	3200	3900	5300	6400	11900	14900	17700	19300	23100	27700	30200	33600	34400	40500	
		N	4100	5200	9600	14400	20000	25700	31900	37600	46100	50400	60700	68800	76500	81800	93000	100000	
		J_1 kgm^2	0,0001	0,0005	0,0007	0,0009	0,0018	0,0029	0,0051	0,0096	0,0177	0,0311	0,0501	0,0988	0,1703	0,3111	0,5629	1,0018	
250	Fr_1	N	1600	2200	2900	3600	4500	5600	10900	13400	16100	17700	19800	24200	27200	30500	31500	34700	
		N	4100	5200	9600	14400	20000	25700	31900	37600	46100	50400	60700	68800	76500	81800	93000	100000	
		J_1 kgm^2	0,0001	0,0005	0,0007	0,0009	0,0018	0,0029	0,0051	0,0096	0,0177	0,0311	0,0501	0,0988	0,1703	0,3111	0,5629	1,0018	
280	Fr_1	N	1600	2200	2900	3600	4500	5600	10900	13400	16100	17700	19800	24200	27200	30500	31500	34700	
		N	4100	5200	9600	14400	20000	25700	31900	37600	46100	50400	60700	68800	76500	81800	93000	100000	
		J_1 kgm^2	0,0001	0,0005	0,0007	0,0009	0,0018	0,0029	0,0051	0,0096	0,0177	0,0311	0,0501	0,0988	0,1703	0,3111	0,5629	1,0018	
315	Fr_1	N	1600	2200	2900	3600	4500	5600	10900	13400	16100	17700	19800	24200	27200	30500	31500	34700	
		N	4100	5200	9600	14400	20000	25700	31900	37600	46100	50400	60700	68800	76500	81800	93000	100000	
		J_1 kgm^2	0,0001	0,0005	0,0007	0,0009	0,0018	0,0029	0,0051	0,0096	0,0177	0,0311	0,0501	0,0988	0,1703	0,3111	0,5629	1,0018	
355	Fr_1	N	1600	2200	2900	3600	4500	5600	10900	13400	16100	17700	19800	24200	27200	30500	31500	34700	
		N	4100	5200	9600	14400	20000	25700	31900	37600	46100	50400	60700	68800	76500	81800	93000	100000	
		J_1 kgm^2	0,0001	0,0005	0,0007	0,0009	0,0018	0,0029	0,0051	0,0096	0,0177	0,0311	0,0501	0,0988	0,1703	0,3111	0,5629	1,0018	
400	Fr_1	N	1600																
		N	4100																
		J_1 kgm^2	0,0001																

WEIGHTS (kg)

Helical units

	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160
PA	72	120	164	237	324	450	616	915	1250	1490						
PB	81	138	166	250	390	540	753	955	1465	2040	2810	3750				
PC	96	165	228	309	438	591	814	1190	1520	1810	3280	4450	6100	8900		
PD	116	177	241	327	461	636	865	1298	1620	2400	3410	4690	6550	9650		

Bevel-helical units

	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160
RB	91	126	176	248	362	494	688	910	1320	1870						
RC	106	126	206	294	360	569	785	1110	1510	2180	3080	4210				
RD	110	159	225	312	436	618	873	1205	1626	2315	3350	4490	6350	8900		

LUBRICANT QUANTITIES (liters)

Otherwise stated, all units are despatched without oil (a warning label is attached). The approximate quantity of oil required for horizontal mounting is given in the Table below. For mounting positions different from pos.1 (page 32) unit should be filled to the level marked on the level plug or on the dipstick. Do not overfill the unit as this can cause leakage and overheating.

Helical units

	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160
PA	2,8	3,9	5,4	7,3	9,8	13,8	19	26	37	52	72					
PB	3,6	5	6,5	10	13	18	28	35	49	69	96	135	189	235	289	343
PC	4,5	6,3	8,1	13	17	26	36	52	73	102	145	208	297	407	537	692
PD	4,5	6,3	8,1	13	17	26	36	52	73	102	145	208	297	407	537	692

Bevel-helical units

	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160
RB	3,4	4,7	6,5	8,8	12	16,5	22,8	31	44,4	62	86,5					
RC	4,7	6,5	9	13	18	25	35	49	69	96	135	189	243	303		
RD	5,5	7,7	10,1	16,2	21	32,5	45	65	91	127	178	255	365	500	660	851

LUBRIFICATION

ISO & AGMA Viscosity grade

Speed n ₂ (min ⁻¹)	Standard	Ambient temperature range (°C)		
		da -10 a -15	da 0 a +30	da +10 a +50
Under 100	ISO - AGMA	VG 68 2 EP	VG 150 4 EP	VG 220 5 EP
Over 100	ISO - AGMA	VG 100 3 EP	VG 220 5 EP	VG 320 6 EP

Recommended Mineral Lubricants

ISO viscosity at 40°Celsius (cSt)	BP Energol	ESSO Spartan	MOBIL Mobilgear	SHELL Omala	TEXACO Meropa	TOTAL Carter	AGIP Blasia
VG 320	GR-XP 320	EP 320	632	320	320	EP 320	320
VG 220	GR-XP 220	EP 220	630	220	220	EP 220	220
VG 150	GR-XP 150	EP 150	629	150	150	EP 150	150
VG 100	GR-XP 100	EP 100	627	100	100	EP 100	100
VG 68	GR-XP 68	EP 68	626	68	68	EP 68	68

Recommended Synthetic Lubricants

ISO viscosity at 40°Celsius (cSt)	BP Energol	CASTROL Tribol	MOBIL SHC	KLUEBER EG4
VG 320	EPX 320	1510/320	632	320
VG 220	EPX 220	1510/220	630	220
VG 150	HTX 150	1510/150	629	150
VG 68			626	

Mineral oil : max running temperature 90°Celsius

Synthetic oil: max running temperature 100°Celsius (110°Celsius for short running).

Do not mix up different brands.

Oil change interval (h)

TYPE	Oil temperature		
	65°C	80°C	90°C
Mineral	8000	4000	2000
Synthetic	20000	15000	10000

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