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MARINE
GEARBOX SELECTION GUIDE

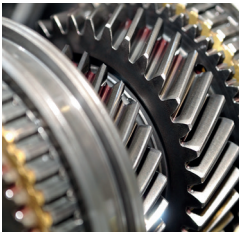

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Table of contents

Introduction 4
Design features 5
Model designations 6
Gearbox configurations 7
Power Take Off (PTO) 7
Power Take In (PTI) 7
Transmission ratings 8
Survey society classification 8
Flexible couplings and TVC 8
Safe operation 9
Warranty 9
CPP gearboxes for workboats 10
CPP gearboxes for high speed vessels 24
CPP gearboxes for sailing yachts 26
Twin-in single-out CPP gearboxes 28
Step-up front PTO gearboxes 30
Inquiry data requirement 32

Introduction

Mekanord has designed, manufactured and sold CPP (Controllable Pitch Propulsion) marine gearboxes since 1980. They are compatible with all types of engines and CP propulsion systems. Mekanord can offer complete CP propulsion systems including the gearbox, propeller and control system.

Mekanord marine gearboxes are designed for use in continuous duty applications requiring CPP systems and are suitable for engines in the power range 200-7000 kW. Mekanord also offers step-up front PTO gearboxes with a power output range 200-1650 kW suitable for 2-stroke engines.

This pocket selection guide is designed to provide a quick reference to our standard range of marine gearboxes for CPP systems and help the reader select a suitable Mekanord gearbox.

For the dimensional data of our products please see the corresponding product data sheet, which can be found on our website.

Ratios and configurations not shown in this selection guide are available on request. Contact Mekanord for an offer.

Design features

Mekanord gearboxes are as standard equipped with an internal hydraulic servo system for actuating the propeller blades in a CPP system via a push-pull rod. The Mekanord range also includes gearboxes prepared for actuation of the propeller via an externally mounted oil distribution box.

Mekanord gearboxes have as standard a direct driven oil pump mounted on the input shaft opposite the engine i.e. on the output (propeller) side of the gearbox. Solutions with an electric oil pump mounted on the gearbox are also available.

Other standard features include:

- compact cast iron housing
- common oil distribution system for lubrication and cooling
- internally mounted thrust bearings
- option of 1-3 PTOs

Mekanord gearboxes are designed according to major survey society classification requirements as standard.

Mekanord's design, manufacture and quality control standards comply with ISO 9001.

Model designations

HS = Hydraulic Servo (gearbox with internal hydraulic servo system for actuation of the CP propeller blades)

OD = Oil Distribution (gearbox prepared for externally mounted oil distribution box for actuation of the CP propeller blades)

HSC = Hydraulic Servo Compact (our compact, lightweight gearbox series designed for high speed vessels)

LS = Long Stroke (our gearbox series with extra long stroke designed to make propeller feathering on sailing yachts possible)

IS = Intermediate Shaft (additional internal gearing for same propeller rotation direction as engine rotation direction)

R = Reverse (externally mounted gearing for same propeller rotation direction as engine rotation direction)

Gearbox configurations

VO = Vertical Offset (most Mekanord models)
HO = Horizontal Offset (for low clearance engine rooms)
Twin = Twin-in single-out (for 2 engines and 1 propeller)
U = U-drive (e.g. for engine rooms of limited length)

Power Take Off (PTO)

All Mekanord gearboxes are available with 1-3 PTOs. The maximum number available is dependent upon the model.

Most Mekanord gearboxes are available with independent PTO clutches.

Other SAE and ISO flanges and splines as well as free shaft ends are also available.

Power Take In (PTI)

Some Mekanord gearboxes are available with PTI. Contact Mekanord for details.

Transmission ratings

The ratings are based on continuous operation (heavy duty) for all applications.

Ratings are shown in kW (1 kW = 1,36 metric HP).

The given data is subject to modifications and/or corrections without prior notice.

Survey society classification

All Mekanord gearboxes are dimensioned to continuous duty ratings in full accordance with the rules of the major classification societies.

When classification is required, please indicate the specific class required and whether or not an ice classification notation is also required and Mekanord will select a suitable gearbox.

Flexible couplings and TVC

Mekanord can as an option offer the flexible coupling including TVC (torsional vibration calculation).

Safe operation

Mekanord advises users of its products that their safe operation depends on their use in compliance with the technical information provided in the corresponding product manuals. Proper installation, operation, monitoring, periodical inspection and maintenance are a prerequisite for the safe operation of Mekanord's products.

It is the responsibility of the assembler of the propulsion system to provide and install safety devices, which may be required in accordance with recognized safety standards.

Warranty

All Mekanord gearboxes are subject to the standard Mekanord warranty conditions. Modifications of the products are permissible only after consultation with Mekanord.

Damage to a Mekanord gearbox caused by repeated or continuous emergency maneuvers or abnormal operation is not covered under warranty.

CPP Gearboxes for Workboats

Model	Power factor kW/rpm	Standard gearbox ratio
270HS	0.220	1,61:1
	0.220	1,97:1
	0.220	2,47:1
	0.220	2,96:1
	0.220	3,52:1
	0.163	3,95:1
	0.163	4,47:1
	0.163	5,12:1
	0.163	5,51:1
	0.145	5,93:1
	0.128	6,53:1
Model	**Power factor kW/rpm**	**Standard gearbox ratio**
337HS	0.278	2,48:1
	0.278	3,00:1
	0.278	3,54:1
	0.278	4,14:1
	0.220	4,55:1
	0.220	5,11:1
	0.220	5,47:1
	0.220	5,94:1

* Other engine speeds and power capacities are possible.

Sample power capacities*			Offset/Options
kW	kW	kW	
1600 rpm	1800 rpm	2100 rpm	
352	396	462	VO=270 mm 1 or 2 PTOs SAE flange
352	396	462	
352	396	462	
352	396	462	
352	396	462	
261	293	342	
261	293	342	
261	293	342	
261	293	342	
232	261	305	
205	230	269	
Sample power capacities*			Offset/Options
kW	kW	kW	
1200 rpm	1600 rpm	1800 rpm	
334	445	500	VO=337 mm 1 or 2 PTOs SAE flange Intermediate shaft (IS)
334	445	500	
334	445	500	
334	445	500	
264	352	396	
264	352	396	
264	352	396	
264	352	396	

CPP Gearboxes for Workboats

Model	Power factor kW/rpm	Standard gearbox ratio
350HS	0.302	1,96:1
	0.302	2,53:1
	0.302	3,04:1
	0.302	3,52:1
	0.302	4,14:1
	0.302	4,65:1
	0.302	5,12:1
	0.302	5,53:1
	0.278	5,94:1
	0.236	6,35:1
	0.208	6,94:1
Model	kW/rpm	Ratio
400HS	0.540	3,04:1
	0.540	3,57:1
	0.540	4,11:1
	0.540	4,65:1
	0.540	5,17:1
	0.518	5,53:1
	0.453	5,94:1
	0.367	6,59:1
	0.344	6,89:1

* Other engine speeds and power capacities are possible.

Sample power capacities*			Offset/Options
kW	kW	kW	
1200 rpm	1600 rpm	1800 rpm	
362	483	544	VO=350 mm 1, 2 or 3 PTOs SAE flange Reverse gear (R)
362	483	544	
362	483	544	
362	483	544	
362	483	544	
362	483	544	
362	483	544	
362	483	544	
334	445	500	
283	378	425	
250	333	374	
1200 rpm	1600 rpm	1800 rpm	Offset/Options
648	864	972	VO=400 mm 1, 2 or 3 PTOs SAE flange Reverse gear (R)
648	864	972	
648	864	972	
648	864	972	
648	864	972	
622	829	932	
544	725	815	
440	587	661	
413	550	619	

CPP Gearboxes for Workboats

Model	Power factor kW/rpm	Standard gearbox ratio
430HS	0.690	1,56:1
	0.690	2,04:1
	0.690	2,48:1
	0.690	3,12:1
	0.690	3,48:1
	0.690	4,15:1
	0.690	4,45:1
	0.690	5,12:1
	0.613	5,44:1
	0.575	6,11:1
Model	kW/rpm	Ratio
430-2HS	0.540	7,08:1
	0.508	7,31:1
	0.495	8,00:1
	0.436	9,14:1
Model	kW/rpm	Ratio
450HS 450OD	1.500	3,11:1
	1.500	3,58:1
	1.120	4,18:1
	1.120	4,44:1
	0.972	5,11:1
	0.889	5,47:1
	0.773	5,94:1
	0.670	6,47:1

* Other engine speeds and power capacities are possible.

Sample power capacities*			Offset/Options
kW	kW	kW	
1200 rpm	1600 rpm	1800 rpm	
828	1104	1242	VO=430 mm 1, 2 or 3 PTOs
828	1104	1242	
828	1104	1242	
828	1104	1242	
828	1104	1242	
828	1104	1242	
828	1104	1242	
828	1104	1242	
736	981	1103	
690	920	1035	
1200 rpm	1600 rpm	1800 rpm	Offset/Options
648	864	972	VO=430 mm 1, 2 or 3 PTOs
610	813	914	
594	792	891	
523	698	785	
1200 rpm	1600 rpm	1800 rpm	Offset/Options
1800	2400	2700	VO=450 mm 1, 2 or 3 PTOs
1800	2400	2700	
1344	1792	2016	
1344	1792	2016	
1166	1555	1750	
1067	1422	1600	
928	1237	1391	
804	1072	1206	

CPP Gearboxes for Workboats

Model	Power factor kW/rpm	Standard gearbox ratio
500HS 500OD	2.400	2,03:1
	2.400	2,56:1
	2.400	3,04:1
	2.400	3,32:1
	2.315	3,63:1
	1.803	4,24:1
	1.752	4,39:1
	1.433	4,56:1
	1.345	4,94:1
	1.026	5,67:1
	0.951	6,06:1
	0.810	6,56:1
Model	kW/rpm	Ratio
500-2HS 500-2OD	1.050	6,58:1
	1.050	7,05:1
	1.050	7,61:1
	0.910	7,93:1
	0.910	8,49:1
	0.894	9,16:1
	0.861	9,91:1
	0.842	10,68:1

* Other engine speeds and power capacities are possible.

Sample power capacities*			Offset/Options
kW	kW	kW	
1200 rpm	1600 rpm	1800 rpm	
2880	3840	4320	VO=500 mm 1, 2 or 3 PTOs PTI
2880	3840	4320	
2880	3840	4320	
2880	3840	4320	
2778	3704	4167	
2164	2885	3245	
2102	2803	3154	
1720	2293	2579	
1614	2152	2421	
1231	1642	1847	
1141	1522	1712	
972	1296	1458	
1200 rpm	1600 rpm	1800 rpm	Offset/Options
1260	1680	1890	VO=500 mm 1, 2 or 3 PTOs
1260	1680	1890	
1260	1680	1890	
1092	1456	1638	
1092	1456	1638	
1073	1430	1609	
1033	1378	1550	
1010	1347	1516	

CPP Gearboxes for Workboats

Model	Power factor kW/rpm	Standard gearbox ratio
580HS 580OD	3.680	2,03:1
	3.680	2,55:1
	3.680	3,12:1
	3.680	3,48:1
	3.280	4,15:1
	2.730	4,53:1
	2.330	5,06:1
	1.960	5,65:1
	1.800	6,06:1
	1.160	6,94:1
Model	kW/rpm	Ratio
580HS-H 580OD-H	3.680	2,03:1
	3.680	2,55:1
	3.680	3,12:1
	3.680	3,48:1
	3.280	4,15:1
	2.730	4,53:1
	2.330	5,06:1
	1.960	5,65:1
	1.800	6,06:1
	1.250	6,53:1
	1.160	6,94:1

* Other engine speeds and power capacities are possible.

Sample power capacities*			Offset/Options
kW	kW	kW	
1200 rpm	1600 rpm	1800 rpm	
4416	5888	6624	VO=580 mm 1, 2 or 3 PTOs PTI
4416	5888	6624	
4416	5888	6624	
4416	5888	6624	
3936	5248	5904	
3276	4368	4914	
2796	3728	4194	
2352	3136	3528	
2160	2880	3240	
1392	1856	2088	
1200 rpm	1600 rpm	1800 rpm	Offset/Options
4416	5888	6624	VO=0 mm HO=580 mm 1, 2 or 3 PTOs PTI
4416	5888	6624	
4416	5888	6624	
4416	5888	6624	
3936	5248	5904	
3276	4368	4914	
2796	3728	4194	
2352	3136	3528	
2160	2880	3240	
1500	2000	2250	
1392	1856	2088	

CPP Gearboxes for Workboats

Model	Power factor kW/rpm	Standard gearbox ratio
650HS 650OD	4.580	2,03:1
	4.580	2,58:1
	4.580	3,04:1
	4.580	3,55:1
	4.185	4,05:1
	3.631	4,53:1
	3.067	5,05:1
	2.836	5,44:1
	2.303	6,06:1
	1.990	6,47:1
Model	**Power factor kW/rpm**	**Standard gearbox ratio**
60HS 60OD	3.700	2,84:1
	3.700	3,67:1
	3.700	4,06:1
	3.600	4,44:1
	3.000	4,94:1
	2.600	5,61:1
	2.300	5,94:1
	1.970	6,76:1
	1.500	8,18:1

* Other engine speeds and power capacities are possible.

Sample power capacities*			Offset/Options
kW	kW	kW	
1200 rpm	1600 rpm	1800 rpm	
5496	7328	8244	VO=650 mm 1, 2 or 3 PTOs
5496	7328	8244	
5496	7328	8244	
5496	7328	8244	
5022	6696	7533	
4357	5810	6536	
3680	4907	5521	
3403	4538	5105	
2764	3685	4145	
2388	3184	3582	
Sample power capacities*			Offset/Options
kW	kW	kW	
750 rpm	1000 rpm	1200 rpm	
2775	3700	4440	VO=600 mm (approx.) 1 PTO/PTI
2775	3700	4440	
2775	3700	4440	
2700	3600	4320	
2250	3000	3600	
1950	2600	3120	
1725	2300	2760	
1478	1970	2364	
1125	1500	1800	

CPP Gearboxes for Workboats

Model	Power factor	Standard gearbox ratio
	kW/rpm	
70HS 70OD	7.000	3,05:1
	6.800	3,53:1
	5.900	4,16:1
	5.300	4,44:1
	4.500	5,05:1
	3.800	5,58:1
	3.500	5,94:1
	2.690	7,12:1
	1.500	8,12:1
Model	kW/rpm	Ratio
80OD	9.900	2,95:1
	9.900	3,58:1
	8.800	4,16:1
	7.600	4,33:1
	7.000	4,95:1
	5.800	5,59:1
	4.500	6,15:1

* Other engine speeds and power capacities are possible.

Sample power capacities*			Offset/Options
kW	kW	kW	
750 rpm	1000 rpm	1200 rpm	
5250	7000	8400	VO=700 mm (approx.) 1 PTO/PTI
5100	6800	8160	
4425	5900	7080	
3975	5300	6360	
3375	4500	5400	
2850	3800	4560	
2625	3500	4200	
2018	2690	3228	
1125	1500	1800	
750 rpm	1000 rpm	1200 rpm	Offset/Options
7425	9900	11880	VO=800 mm (approx.) 1 PTO/PTI
7425	9900	11880	
6600	8800	10560	
5700	7600	9120	
5250	7000	8400	
4350	5800	6960	
3375	4500	5400	

CPP Gearboxes for High Speed Vessels

Model	Power factor	Standard gearbox ratio
	kW/rpm	
200HSC	0.260	2,13:1
	0.226	2,55:1
	0.224	2,94:1
Model	kW/rpm	Ratio
235HSC	0.350	1,96:1
	0.350	2,45:1
	0.310	2,94:1
	0.226	3,43:1
Model	kW/rpm	Ratio
280HSC	0.610	1,75:1
	0.610	2,06:1
	0.610	2,55:1
	0.570	3,06:1
	0.474	3,47:1

* Other engine speeds and power capacities are possible.

Sample power capacities*			Offset/Options
kW	kW	kW	
1600 rpm	1800 rpm	2100 rpm	
416	468	546	VO=200 mm 1 PTO; SAE flange Intermediate shaft (IS)
362	407	475	
358	403	470	
1600 rpm	1800 rpm	2100 rpm	Offset/Options
560	630	735	VO=235 mm 1 PTO Intermediate shaft (IS) SAE flange; U-drive (U)
560	630	735	
496	558	651	
362	407	475	
1600 rpm	1800 rpm	2100 rpm	Offset/Options
976	1098	1281	VO=280 mm 1 PTO Intermediate shaft (IS) SAE flange U-drive (U)
976	1098	1281	
976	1098	1281	
912	1026	1197	
758	853	995	

CPP Gearboxes for Sailing Yachts

Model	Power factor kW/rpm	Standard gearbox ratio
270HS/LS	0.220	1,61:1
	0.220	1,97:1
	0.220	2,47:1
	0.220	2,96:1
	0.220	3,52:1
	0.163	3,95:1
	0.163	4,47:1
	0.163	5,12:1
Model	Power factor kW/rpm	Standard gearbox ratio
350HS/LS	0.302	1,96:1
	0.302	2,53:1
	0.302	3,04:1
	0.302	3,52:1
	0.302	4,14:1
	0.302	4,65:1
	0.302	5,12:1
Model	kW/rpm	Ratio
400HS/LS	0.540	3,04:1
	0.540	3,57:1
	0.540	4,11:1
	0.540	4,65:1
	0.540	5,17:1

* Other engine speeds and power capacities are possible.

Sample power capacities*			Offset/Options
kW	kW	kW	
1600 rpm	1800 rpm	2100 rpm	
352	396	462	VO=270 mm 1 or 2 PTOs
352	396	462	
352	396	462	
352	396	462	
352	396	462	
261	293	342	
261	293	342	
261	293	342	
Sample power capacities*			Offset/Options
kW	kW	kW	
1200 rpm	1600 rpm	1800 rpm	
362	483	544	VO=350 mm 1, 2 or 3 PTOs Reverse gear (R)
362	483	544	
362	483	544	
362	483	544	
362	483	544	
362	483	544	
362	483	544	
1200 rpm	1600 rpm	1800 rpm	Offset/Options
648	864	972	VO=400 mm 1, 2 or 3 PTOs
648	864	972	
648	864	972	
648	864	972	
648	864	972	

Twin-in Single-out CPP Gearboxes

Model	Power factor kW/rpm	Standard gearbox ratio
Twin 1400/450HS Twin 1400/450OD	0.302	2,03:1
	0.302	4,03:1
	0.302	5,04:1
	0.339	6,11:1
	0.229	7,18:1
Model	kW/rpm	Ratio
Twin 1800/0HS Twin 1800/0OD	0.540	2,34:1
	0.540	4,05:1
	0.540	4,55:1
	0.540	5,05:1
	0.540	6,05:1
	0.540	7,12:1
	0.540	7,59:1

* Other engine speeds and power capacities are possible.

Sample power capacities*			Offset/Options
kW	kW	kW	
1200 rpm	1600 rpm	1800 rpm	
362	483	544	VO=450 mm HO=2x700 mm 1, 2 or 3 PTOs x 2
362	483	544	
362	483	544	
407	542	610	
275	366	412	
1200 rpm	1600 rpm	1800 rpm	Offset/Options
648	864	972	VO=0 mm HO=2x900 mm 1, 2 or 3 PTOs x 2
648	864	972	
648	864	972	
648	864	972	
648	864	972	
648	864	972	
648	864	972	

Step-up Front PTO Gearboxes

Model	Input speed	Output speed
	rpm	rpm
PTO900	113	1789
	127	1820
	146	1816
	173	1805
	173	1506
	210	1502
Model	rpm	rpm
PTO1500	110	1801
	127	1803
	167	1802
	173	1805

* Other step-up ratios are possible.

Step-up ratio*	Generator power (max.)	Offset/Options
	kW	
1:15,83	900	HO dependent on step-up ratio
1:14,30	900	
1:12,44	900	
1:10,44	900	
1:8,71	700	
1:7,15	900	
Ratio	kW	Offset/Options
1:16,37	1250	HO dependent on step-up ratio
1:14,20	1350	
1:10,79	1650	
1:10,44	1650	

Inquiry data requirement

To prepare a quotation as precisely and competitively as possible, the following data is required:

For gearbox supply:

1. Type of vessel
2. Number of vessels
3. Number of propulsion lines per vessel
4. Engine type, brand and model
5. Engine power, rpm, and rotation
6. Engine flexibly or rigidly mounted
7. Requested reduction ratio on gearbox or propeller diameter (mm)
8. Requested vessel speed (knots)
9. No. of PTOs for hydraulic pumps or generator
10. Classification and Ice Class

For CP propeller supply:

11. **Open propeller or in nozzle**
12. **Maximum propeller diameter (mm)**
13. **Propeller shaft length (meters)**
14. **Stern tube length (meters)**
15. **Stem tube lubrication type (water or oil)**
16. **Classification and Ice Class**
17. **Shaft brake requirement**

For remote control supply:

18. **Electronic or mechanical**
19. **Number and type of control stations**
20. **Emergency control requirement**

PROPULSION EXCELLENCE

MADE IN DENMARK

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