

## KONGSBERG PROPULSION SYSTEMS

### KEY FEATURES

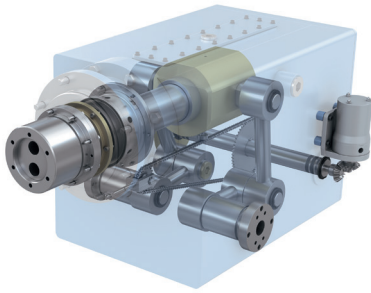
- Two main hub types are available; standard for speeds below 30 knots and H for speeds above 30 knots
- The range of hub sizes will cover powers from approx. 0,5 to 75 MW
- The CP-A hub offers normal pitch control and can also be supplied with full blade feathering
- Bronze or stainless steel blades and hub can be specified, and a version is available in which the blades and blade seals can be exchanged under water
- Open water, nozzle, and ice-class options
- Full US Mil-Spec shock versions are available

## Controllable pitch propellers and reduction gear

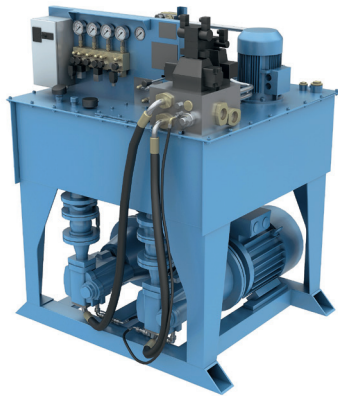
### Controllable pitch propellers

The Kamewa CP-A controllable pitch hub is an evolution of the XF5 system, renowned for its high efficiency and its blade bearing arrangement designed to avoid peak pressures and cavitation. Compared with its predecessor, the CP-A offers improved power to weight ratio by 20%, a significant increase in efficiency and a blade foot with decreased exposure to cavitation, thanks to the latest mechanical design and hydrodynamic techniques. At the same time, the blade foot bearing surfaces have been increased to provide even greater strength and wear-resistance.

The system can be supplied with four or five blades of high skew or moderate skew type, conventional or nozzle design.



The new FA oil distribution box provides reduced oil volume, easier seal replacement and improved pitch feedback accuracy.

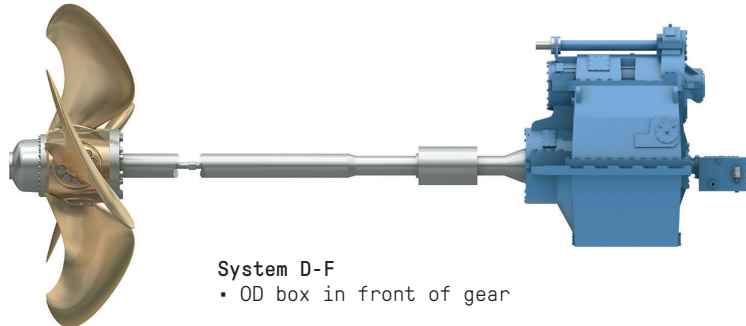


The new compact hydraulic system offers greatly reduced weight and oil volume and about 50% less energy consumption at constant pitch

The CP-A is available with three types of oil distribution systems;

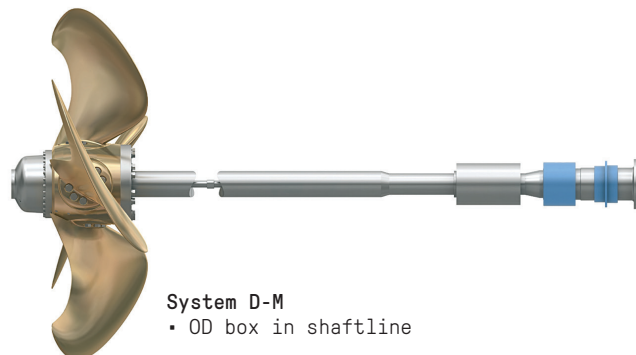
#### Type D-F:

The oil distribution box is mounted on the forward end of the reduction gearbox. Additional intermediate shafts can be arranged between the propeller shaft and the gearbox.



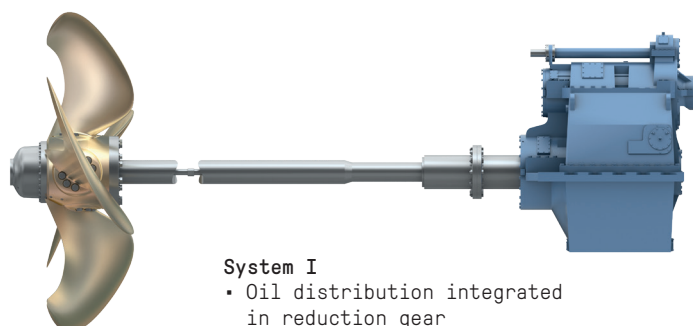
#### Type D-M:

A separate shaft carries the oil distribution box, and additional intermediate shafts can be arranged between the propeller shaft and the OD box shaft.



#### Type I:

Oil distribution integrated in reduction gearbox. The reduction gearbox is a free-standing gearbox intended for integrated propulsion systems.

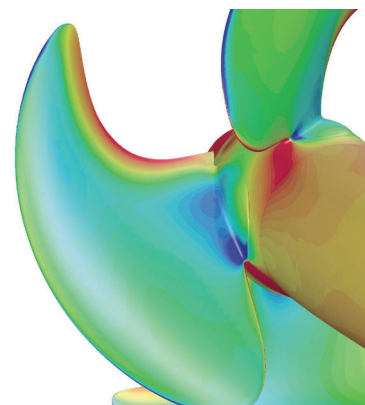


## Main dimensions

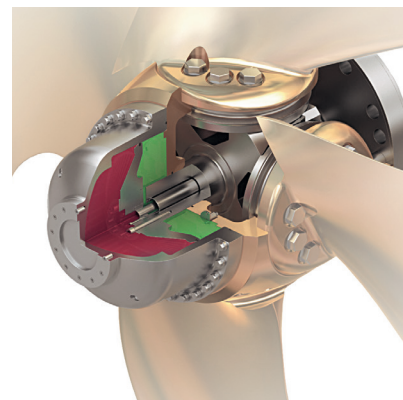
### 4-bladed propellers

NAV/ HUB	A	B	C	D	E	F	Gmin	G	H	** ) Weight	*** ) Weight
46	585	190	48	460	280	415	140	270	65	280	270
50	640	210	53	500	300	463	150	280	65	370	350
55	700	220	58	550	330	500	170	290	65	490	470
60	765	240	63	600	365	547	185	300	65	635	610
66	840	275	70	660	400	612	205	325	80	850	810
72	917	300	76	720	435	650	215	350	80	1110	1050
79	1005	320	83	790	480	700	235	375	80	1455	1390
86	1095	345	90	860	520	772	255	400	95	1875	1790
94	1170	375	97	940	600	840	280	425	95	2450	2340
102	1265	405	107	1020	650	920	305	650	110	3040	2985
111	1380	440	117	1110	705	1000	330	675	110	3920	3850
121	1502	482	127	1210	770	1090	355	750	125	5075	4984
132	1640	525	138	1320	840	1180	395	775	125	6590	6470
144	1780	575	150	1440	915	1285	420	835	150	8555	8400
150	1880	595	160	1500	960	1340	440	850	150	9670	9495
157	1969	625	165	1570	1007	1400	460	875	150	11090	10890
164	2055	655	172	1640	1050	1450	480	900	150	12580	12410
171	2145	685	180	1710	1095	1500	500	925	175	14260	14070
179	2245	715	188	1790	1150	1570	520	950	175	16360	16135
186	2330	730	195	1860	1195	1640	540	975	175	18350	18105
194	2435	772	204	1940	1245	1710	570	1050	175	20820	20540
202	2535	805	212	2020	1295	1820	585	1075	175	23510	23190
211	2645	840	222	2110	1355	1900	610	1125	200	26790	26430
220	2760	875	230	2200	1410	1980	640	1150	200	30370	29955

Weight = Hub without blade flange  
Dimensions in the table are not binding. Right of alterations reserved.



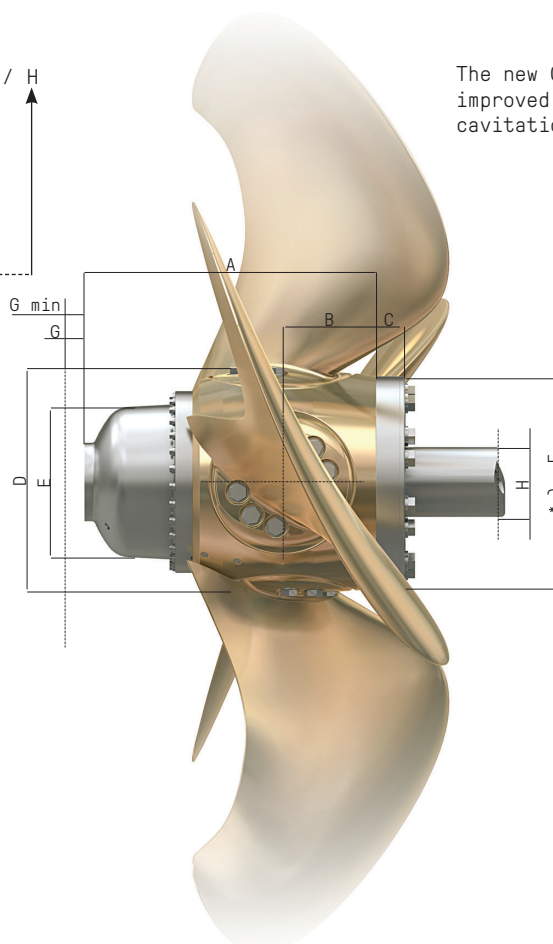
Computational fluid dynamics (CFD) and cavitation tank testing were used to refine the contours of the propeller hub and blade roots. Improved hydrodynamic performance results in lower fuel consumption and reduced emissions.



### Hub designations

Kamewa 157 A / 4 - D / S / H

Hub size .....  
Hub type .....  
Number of blades .....  
Type of actuator system .....  
Hub material .....  
Different options .....

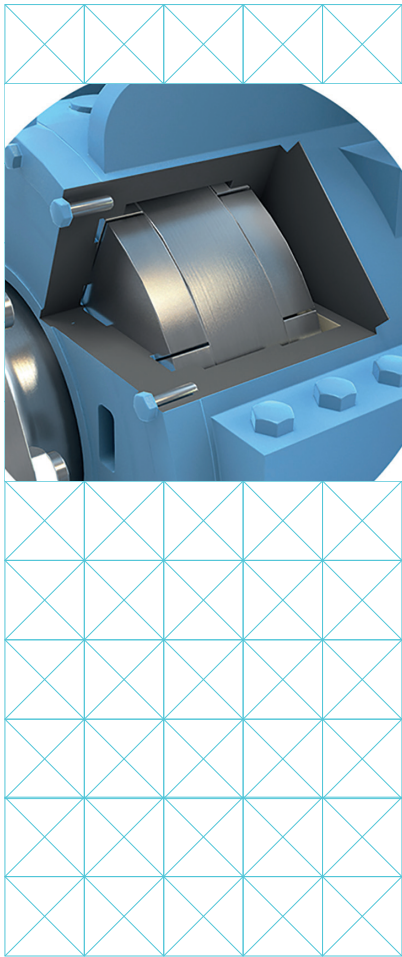


The new CP-A hub is designed for improved efficiency, strength and cavitation properties.

### Twin tube system

Gmin and G = Dismounting space  
(see drwg. 154069)

\* ) Incl. flange cover  
\*\* ) Standard and ice hub  
\*\*\* ) Nozzle hub



### Kongsberg Maritime reduction gear

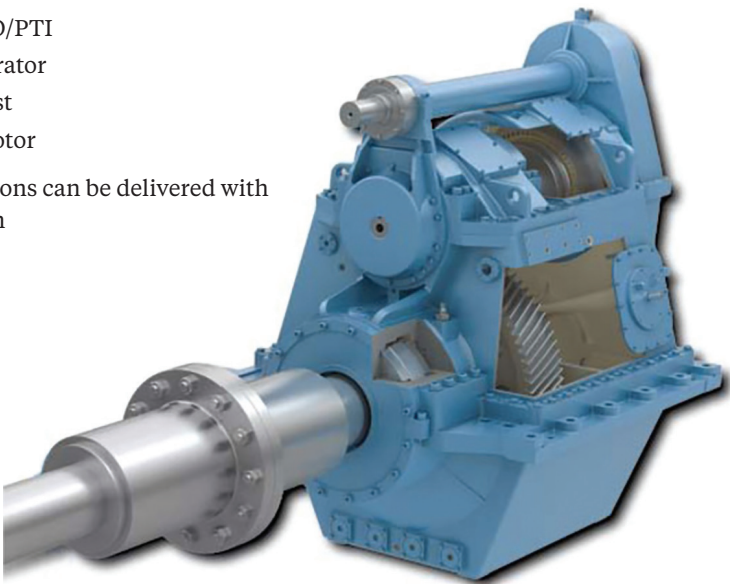
The reduction gearbox is a freestanding gearbox intended for integrated propulsion systems. It is designed as a combined speed reduction unit with common hydraulic system for gear and propeller. The gear has a built-in hydraulically operated clutch and is provided with seating brackets for bolting to the ship's foundation. The input shaft is provided for mounting of the flexible coupling, and the output shaft with a flange. The hollow bored propeller shaft carries the oil tube. The reduction gearboxes are normally equipped with one-step reductions from 1,5:1 to 6,3. The thrust bearing is of the tilting pad type, absorbing the propeller thrust in both ahead and astern direction.

### Available with both vertical and horizontal offset

Option for both primary and secondary PTO/PTI enables for selection of operation on electric motor.

- Primary PTO
  - Shaft generator
  - Power boost
- Secondary PTO/PTI
  - Shaft generator
  - Power boost
  - Electric motor

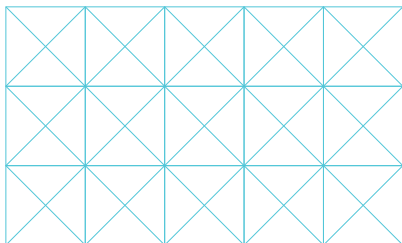
All PTO/PTI options can be delivered with or without clutch



### Technical data reduction gearboxes

GEAR SIZE	480	480E	550	600 *	650	750	1500 *	850	3000-2T	950	1080	6000
Offset	480mm	480mm	550mm	580mm	650mm	750mm	750mm	850mm	900mm	950mm	1080mm	1200mm
Offset direction	V/S/B	V	V/S/B	V/S/B	V/S/B	V/S/B	V/S/B	V/S/B	V	V/S/B	V/S/B	V
Max. Torque in	23 KNm	9.55 KNm	36 KNm	45 KNm	45 KNm	57 KNm	70 KNm	90 KNm		130 KNm	235 KNm	300 KNm
Max. Torque out	90 KNm	90 KNm	125 KNm	145 KNm	180 KNm	230 KNm	300 KNm	380 KNm	430 KNm	530 KNm	950 KNm	1200 KNm
Min. ratio	1.8:1	i>6	2:1	1.5:1	2:1	2:1	2:1		i>6		2.0:1	2.3:1
Max. Ratio	6:1	12:1	6:1	5.5:1	6.2:1	6.25:1	6:1	6.25:1	12:1	6.3:1	6.3:1	5.5:1
Input rpm max.	1600	1800	1600	1600	1500	1400	1200	1200	1200	1000	750	600

\* Gearbox sizes to be replaced as a part of ongoing gearbox range development  
All data subject to change without prior notice



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