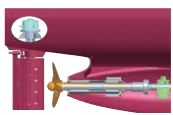
STONE MARINE

STONE MARINE PROPULSION NGC LTD

CONTROLLABLE PITCH PROPELLER SYSTEMS

AZIMUTH THRUSTERS

TUNNEL THRUSTERS



CUSTOM PROPELLERS, SHAFTS AND RUDDERS

GEARBOXES

Josiah Stone little knew how successful the company that bears his name would become in the nearly 200 hundred years since he started his business. A pioneer in the development of marine propellers, Stone's business is now Stone Marine Propulsion, a world leader in the design and manufacture of fixed pitch marine propellers and complete stern gear packages.

That pioneering expertise has now been expanded with the formation of Stone Marine Propulsion NGC using NGC Marine's state of the art manufacturing facility in Nanjing China to offer a full range of turnkey propulsion equipment including controllable pitch propeller systems, fixed pitch propellers, azimuth thrusters, tunnel thrusters, various types of marine main/auxiliary gearboxes, port jack-up/transfer gearboxes, high-speed gearboxes, marine shaft rudder system components and deck machinery.

SMPNGC supplies technologically advanced propulsion solutions of the highest quality at competitive prices for vessels of all types and sizes, merchant and naval, with maintenance and repair back up provided by Stone Marine Group companies and agents worldwide.

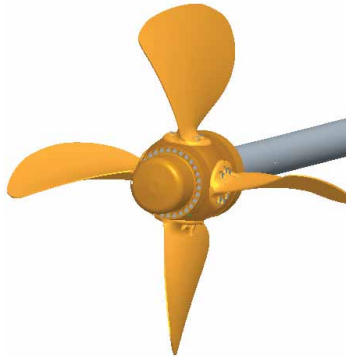
Contents

CONTROLLABLE PITCH PROPELLER SYSTEMS

Controllable pitch propeller systems

The SMPNGC range of CPP systems are well proven and supplied with modern high performance control systems which optimise pitch settings for economy and speed. Fully feathering versions are also available to reduce drag for sailing or multi screw applications. Hydraulic control units can be supplied incorporated into our own gearboxes or installed in the shaftline.

Each system has a hydrodynamically optimised blade design to suit the specific application and customer operational requirements whilst maintaining the important environmental protection requirement of high efficiency and low fuel consumption.



Hub diameter	Blade diameter	Max. transmission power	Blade Number	OD Box Fitting Position
390-1800mm	1120-8000mm	34000 KW	4, 5	Gearbox or Shafting

Hub Type	Hub Dia. (mm)	Max. Dia (mm)	Speed (rpm)	Thrust (t)	Rating factor (kw/rpm)
NCP39	390	1650	500	12.2	2
NCP43	430	1800	500	15.5	2.6
NCP48	480	1900	450	20.5	3.6
NCP52	520	2000	480	24.5	4.3
NCP56	560	2150	400	28.5	5.5
NCP60	600	2600	400	34	6.8
NCP68	680	2900	300	43	9.7
NCP76	760	3300	240	52	13.8
NCP85	850	3700	240	63	20
NCP96	960	4000	240	77	28
NCP102	1020	4200	240	86	34
NCP107	1070	4500	240	95	39
NCP120	1200	5300	240	110	55
NCP136	1360	6000	220	125	81
NCP145	1450	6300	220	141	98
NCP154	1540	6800	220	157	118
NCP163	1630	7200	200	176	140
NCP172	1720	7700	200	196	165

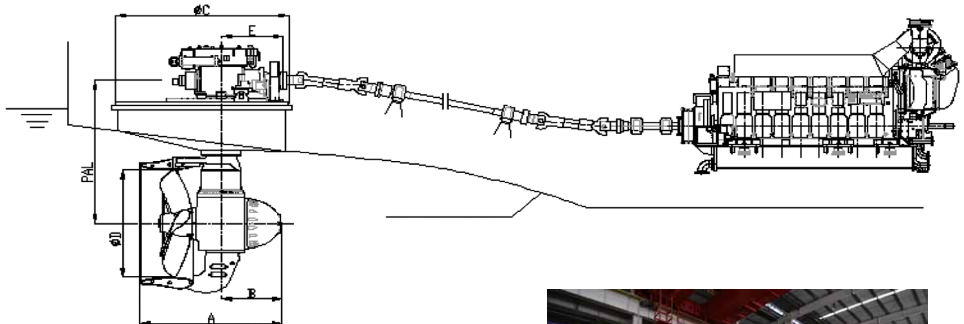
AZIMUTH THRUSTERS

NRP series of azimuth thrusters FP / CP

SMPNGC's azimuth thrusters are supplied with either fixed pitch or controllable pitch propellers according to customer needs. Arranged in Z or L drive configurations our thrusters reliably transmit the power of diesel, electric and hydraulic motors ensuring the highest possible propulsion efficiency and manoeuvrability. They are successfully in service on a wide range of vessels including offshore platforms, wind power installation vessels, semi-submerged vessels, scientific & research vessels, exploration vessels, crane & pipe-laying ships and harbour tugs. Control systems are supplied which can be incorporated into DP systems when required.

Input power	Input speed	Propeller dia.
90-6000KW	400-2100 rpm	600-5000mm

NRP series azimuth thrusters



Assembled azimuth thrusters at our factory

NRP series azimuth thrusters

Model	Max input power	Input speed	Propeller dia.	PAL
NRP15	100	1000-2100	600-700	1500
NRP20	150	1000-2100	700-900	1600
NRP30	220	1000-2100	900-1100	1800
NRP50	360	1000-2100	1100-1200	2000
NRP60	441	1000-1800	1100-1350	2000
NRP80	588	1000-1800	1350-1500	2250
NRP100	736	1000-1800	1400-1600	2300
NRP140	1030	750-1500	1600-1800	2700
NRP160	1200	750-1500	1700-2000	2800
NRP180	1324	750-1500	1800-2100	2800
NRP200	1471	750-1500	2100-2300	2900
NRP220	1618	750-1500	2100-2300	2900
NRP250	1839	750-1500	2400-2600	3000

Model	Max input power	Input speed	Propeller dia.	PAL
NRP280	2059	750-1500	2400-2600	3600
NRP300	2207	750-1500	2600-2800	3700
NRP350	2574	600-1000	2600-2800	3700
NRP370	2721	600-1000	2800-3000	3800
NRP400	2942	600-1000	3000-3200	4000
NRP450	3310	600-1000	3200-3500	4200
NRP500	3678	600-1000	3500-3800	4300
NRP550	4100	600-900	3800-4200	4400
NRP600	4500	600-900	4200-4500	4500
NRP650	4800	600-900	4400-4600	
NRP700	5200	600-900	4500-4700	
NRP750	5600	400-600	4600-4800	
NRP800	6000	400-600	4800-5000	

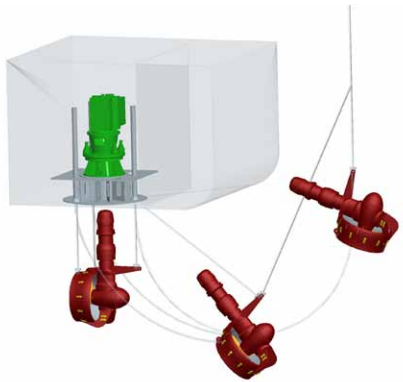
Other configurations

NURP underwater installed azimuth thruster

The NURP azimuth thruster can be installed underwater and thrusters are available with power outputs up to 6000kw.

NCRP compact azimuth thruster

The NCRP azimuth thruster can be specifically designed and manufactured for a variety of specialist craft including wind power installation vessels, lift boats and lifting platforms. These thrusters are extremely compact and light weight and have excellent reliability. The prime mover can be either a diesel or electric motor.



NRRP retractable azimuth thruster

NTA twin screw azimuth thruster

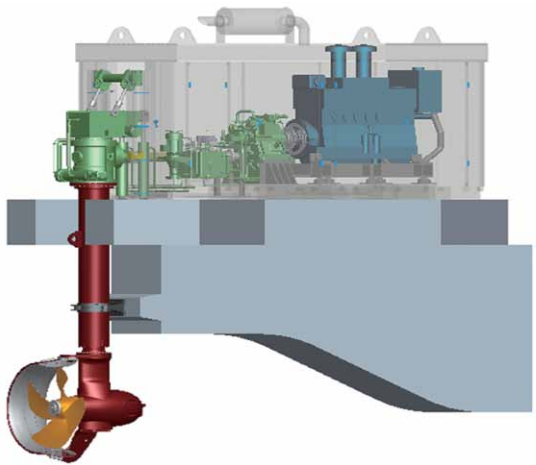
Very low vibration and noise with excellent thrust. Propellers can rotate in same or opposing directions.

NHRP hydraulic azimuth thruster

Widely used on platforms, barges, and deep water work boats the NHRP thruster rotates using the hydraulic motor which also drives the propeller. Normally mounted on the outside of the vessel it is propelling the units can also tilt.

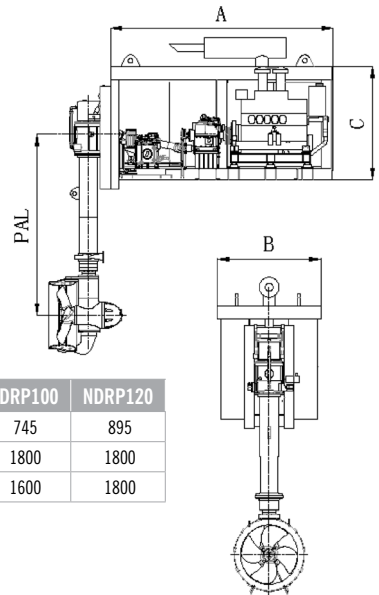
NDRP series deck mounted azimuth thrusters

The NDRP deck mounted thrusters components are fully protected but also easily accessible for maintenance. Suitable for virtually any type of vessel the diesel engines considerable torque provides excellent performance and 360 degree manoeuvrability with control made simple by the electronic control system. Lifting and tilting of the equipment is efficiently carried out hydraulically.



NDRP series deck mounted azimuth thrusters

Model	Dimension A*B*C(mm)	Max PAL (mm)	Weight (kg)
NDRP20	3250 x 1400 x 1700	3300	2500
NDRP40	4100 x 1800 x 2000	4800	5000
NDRP60	4500 x 1800 x 2300	4800	8000
NDRP80	5500 x 2000 x 2700	5400	11500
NDRP100	6400 x 2500 x 3300	7000	14500
NDRP120	6600 x 2600 x 3400	7000	16000



Model	NDRP20	NDRP40	NDRP60	NDRP80	NDRP100	NDRP120
Max input power (kW)	150	320	450	600	745	895
Nominal input speed (r/min)	2500	2100	1800	1800	1800	1800
Blade dia. (mm)	800	1000	1100	1400	1600	1800

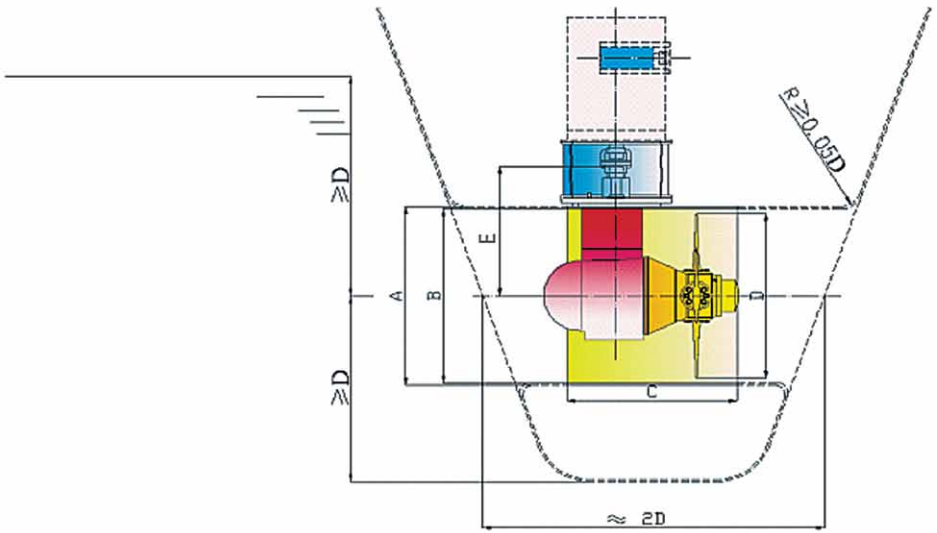
TUNNEL THRUSTERS

NFT / NCT series tunnel thrusters

SMPNGC tunnel thrusters are available with controllable pitch propellers (NCT), or fixed pitch propellers (NFT), and are normally supplied in four units, the prime mover, the hydraulic system, the remote control system and the mechanical section. The prime mover is usually an electric motor, but diesel or hydraulic motors can also be supplied. The mechanical section of the thruster can be connected to the hydraulic cylinder to enable retraction.

NFT power	NFT Propeller dia.	NCT power	NCT Propeller dia.
60-3050KW	500-3000mm	280-3050KW	1100-3000mm

Tunnel thruster recommended arrangement



CPP tunnel thrusters

Type	Motor Power kW	Frequency Hz	Input Rotation	A	B	C	D	E	F
NCT100	280	50	1450	1054	1022	1200	1000	575	792
	330	60	1760						
NCT110	345	50	1450	1158	1126	1200	1100	650	862
	400	60	1760						
NCT130	450	50	1450	1360	1328	1265	1300	780	932
	500	60	1760						
NCT150	560	50	1450	1570	1534	1400	1500	880	1040
	630	60	1760						
NCT165	680	50	1450	1732	1692	1611	1650	950	1146
	780	60	1770						
NCT180	800	50	1450	1882	1842	1690	1800	1040	1220
	930	60	1770						
NCT200	1150	50	1450	2082	2038	1890	2000	1160	1327
	1000	60	1180						
NCT250	1800	50	975	2620	2560	2280	2500	1460	1780
	1700	60	880						
NCT275	2300	50	975	2890	2810	2335	2750	1635	1911
	2000	60	880						
NCT300	2800	50	735	3150	3060	2500	3000	1810	2180
	3050	60	880						

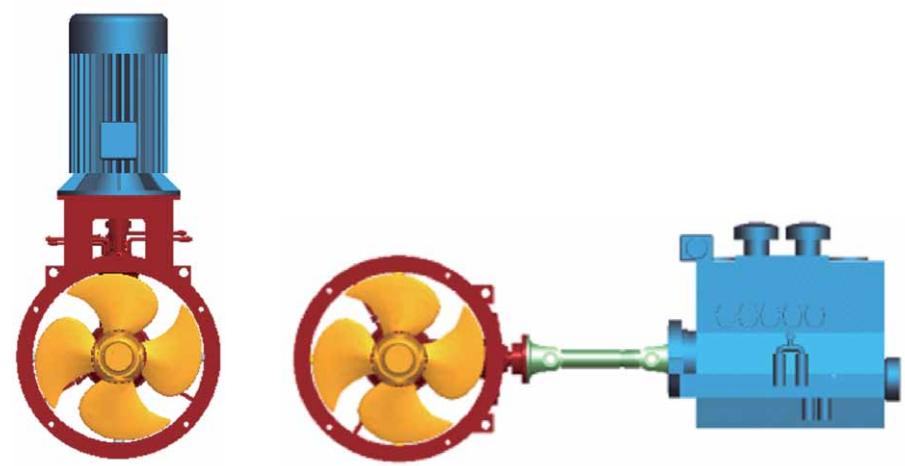
Fixed pitch tunnel thrusters

Type	Motor Power kW	Frequency Hz	Input Rotation	A	B	C	D	E
NFT050	60	50	1450	545	525	600	500	551
	75	60	1755					
NFT060	90	50	1450	651	621	800	600	623
	120	60	1755					
NFT070	132	50	1450	751	721	800	700	650
	170	60	1755					
NFT080	200	50	1450	862	822	920	800	710
	260	60	1755					
NFT090	220	50	1450	962	922	920	900	800
	260	60	1755					
NFT100	280	50	1450	1054	1022	1200	1000	792
	330	60	1755					
NFT110	345	50	1450	1158	1126	1200	1100	862
	400	60	1760					
NFT130	450	50	1450	1360	1328	1265	1300	932
	500	60	1760					
NFT150	560	50	1450	1570	1534	1400	1500	1040
	630	60	1760					

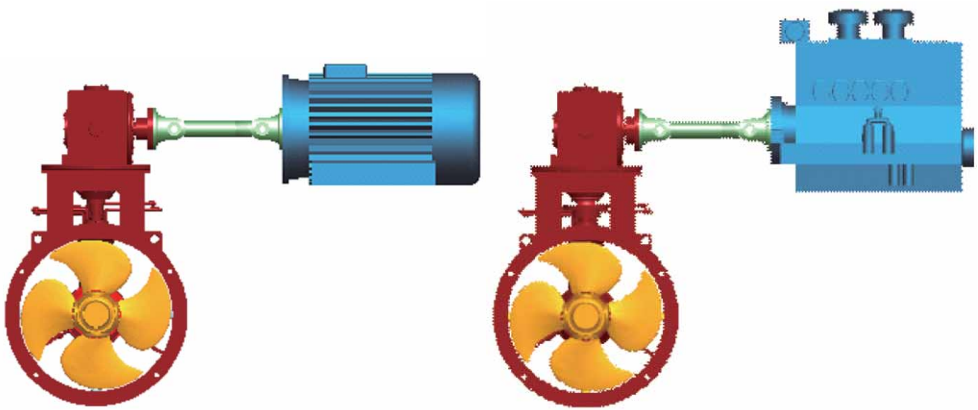
Type	Motor Power kW	Frequency Hz	Input Rotation	A	B	C	D	E
NFT165	680	50	1450	1732	1692	1611	1650	1146
	780	60	1770					
NFT180	800	50	1450	1882	1842	1690	1800	1220
	930	60	1770					
NFT200	1150	50	1450	2082	2038	1890	2000	1327
	1000	60	1180					
NFT250	1800	50	975	2620	2560	2280	2500	1780
	1700	60	880					
NFT275	2300	50	975	2890	2810	2335	2750	1911
	2000	60	880					
NFT300	2800	50	735	3150	3060	2500	3000	2180
	3050	60	880					

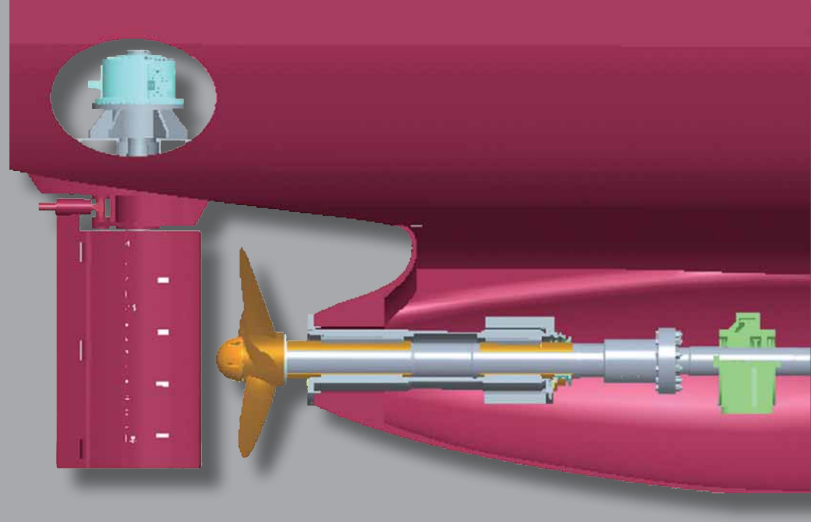
Drive Types

L-Drive Tunnel Thruster



Z-Drive Tunnel Thruster





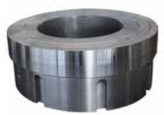
CUSTOM PROPELLERS, SHAFTS & RUDDERS

Custom propeller design

Using the hull dimensions, hull form, ship model test data and main engine information provided by the client, SMPNGC's highly experienced Naval Architects and Engineers can provide high efficiency designs and go on to manufacture fully optimised propellers such as our unique NPT design and then incorporate this into an optimised shaft and rudder system specifically for the client's ship. Stone Marine Cap Fins can also be offered to further increase overall ship efficiency. If the complete package is not required individual components can be supplied.

Max propeller dia.	Max shaft dia.	Max shaft length	Rudder leaf weight
11m	1.6m	16m	100T

NFP Series Shafting



1

Hydraulic nut

Supplied to mount and secure the propeller

2

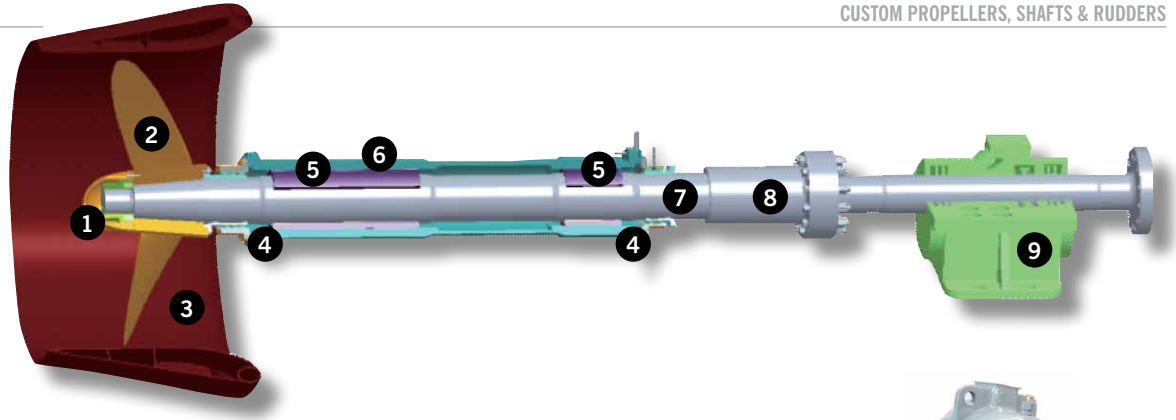
Propeller

NPT design. Optimised for the specific vessel

3

Nozzle

All sizes, fixed, steerable and with stainless steel inserts



4

Sterntube seal

For specific ship applications, water or oil lubricated

5

Bearings

Water and oil lubricated. White metal or composite

6

Sterntubes

Designed to suit the ship type

7

Tailshafts

Steel with liners as required. Or Duplex stainless steel for good corrosion resistance

8

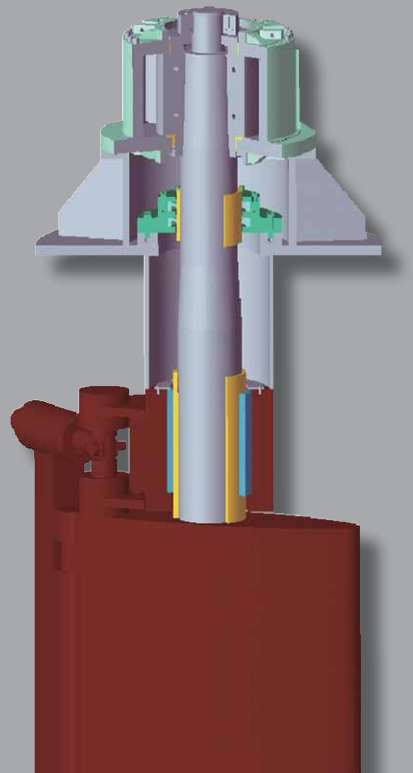
Hydraulic couplings

Flanged and sleeved types in steel or stainless steel for external use

9

Intermediate pedestal bearings

Tilted pad or roller bearing depending on requirements



RUDDER SYSTEM PARTS

Rudder stock bearing sleeves

Bronze or stainless steel

Rudder stocks

With hydraulic, keyed or flange connections

Rudder bearings

Upper and lower composite bearings

Rudders

SMPNGC can design and supply all types of rudders including conventional spade type, flapped and nozzle rudders.

NRV series rotary vane steering gear

Compact design and light weight

Wide rudder angle range, with a maximum steering angle of 2 X 65 degrees

Built-in self-lubricating rudder bearing which can be used as the upper bearing of the rudder stock

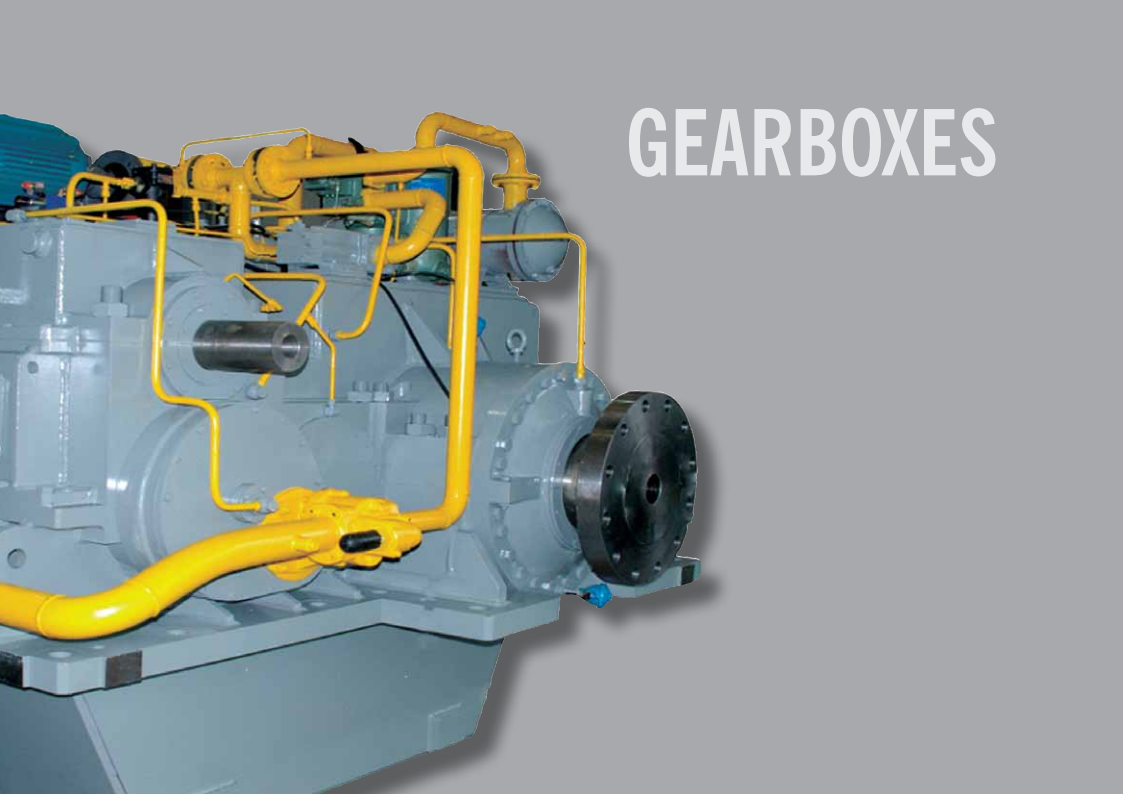
Keyless hydraulic connection with the rudder stock for ease of installation

Unique sealing arrangement and redundant hydraulic power pack ensures product reliability

High precision positioning, and easy to maintain

Type	Max. Working Torque (KN. M)	Max. stock dia. (mm)	Max. rudder angle (deg)	Dimension (mm)		Weight Approx. (kg)
				A	B	
NRV12	120	220	2X65	940	680	1650
NRV16	160	240	2X65	1050	725	2000
NRV20	200	280	2X65	1050	750	2800
NRV25	250	300	2X65	1250	925	3000
NRV32	320	320	2X45	1250	925	3200
NRV40	400	350	2X45	1250	1045	3600
NRV50	500	370	2X45	1500	835	4000
NRV63	630	390	2X45	1500	935	5000
NRV80	800	420	2X45	1500	1015	6000
NRV100	1000	450	2X45	1700	1045	8000
NRV125	1250	470	2X45	1900	1195	9200
NRV160	1600	500	2X45	1900	1620	11000

A: Rudder actuator max .dia.
B: Rudder actuator high



GEARBOXES

Gearboxes

A full range of marine propulsion gearboxes are available; reversible for fixed pitch propellers and non-reversible for CPP systems with power ratings up to 20,000KW.

In addition SMPNGC manufacture a comprehensive range of other gearboxes, each designed to provide excellent performance for the specific task to which they are put. Among those available are pump and jacking gearboxes, dredge pump and dredger gearboxes and pivot shaft and bucket wheel gearboxes.

CGS

CGS Series reversible gearbox

CGC

CGC Series reversible gearbox

CKTS

CKTS Twin-input Single-output gearbox

CVK

CVK Series non-reversible gearbox

CKH

CKH Series non-reversible gearbox

Service and Repair

At Stone Marine Propulsion NGC we provide worldwide support for our products 24 hours a day, 365 days of the year. Our highly trained engineers, and those of our agents, are always ready to respond at very short notice to carry out repairs, or service our equipment, wherever in the world it is currently situated.

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