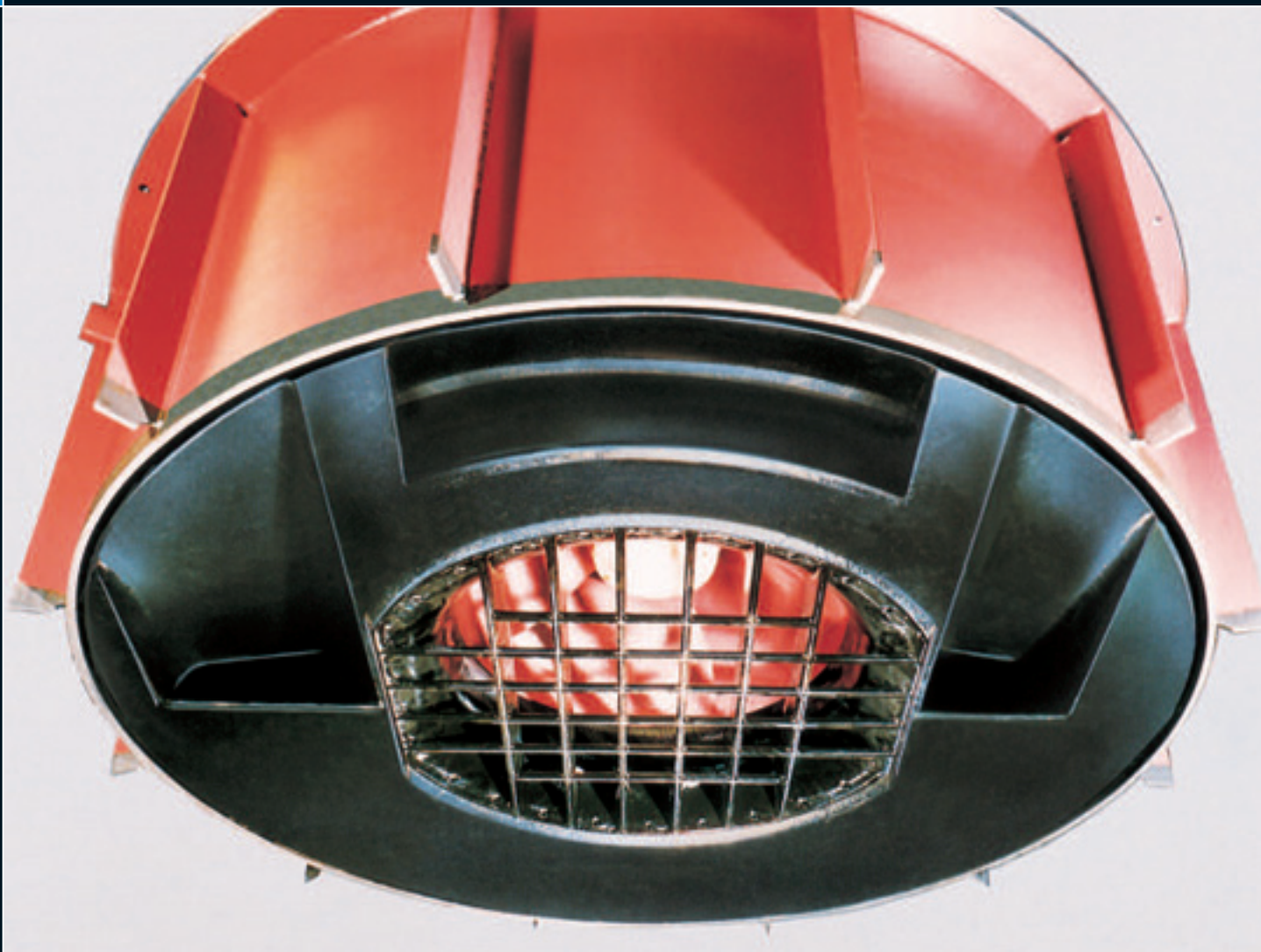
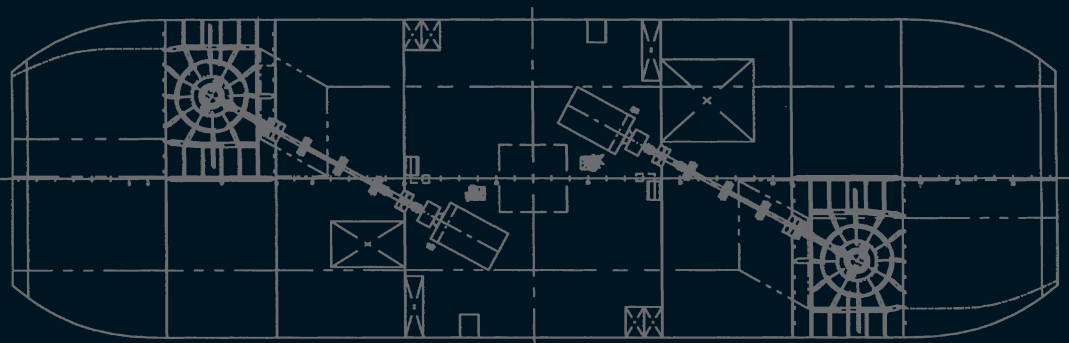


SPJ

SCHOTTEL Pump-Jet



**Application-oriented
propulsion systems**



The SCHOTTEL Pump-Jet - the proven propulsion and manoeuvring system even for extreme operating conditions

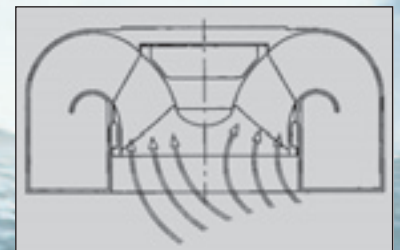
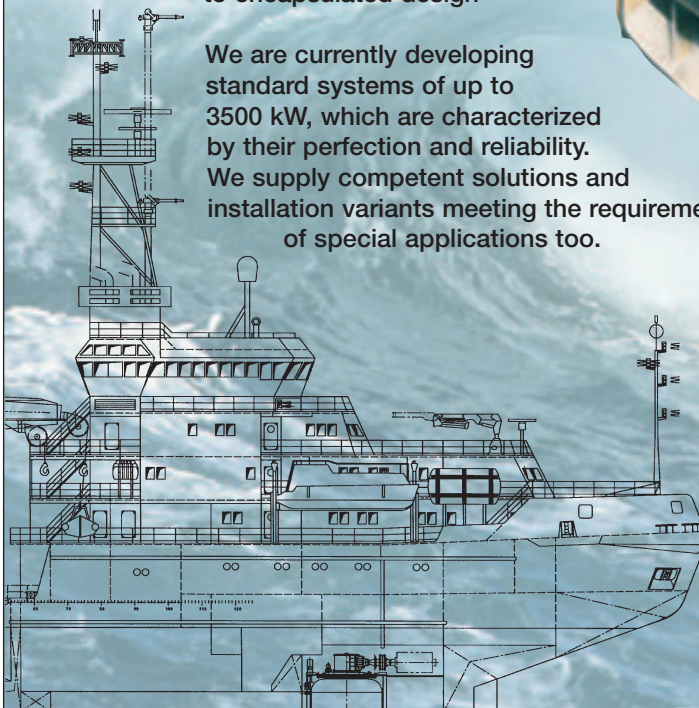
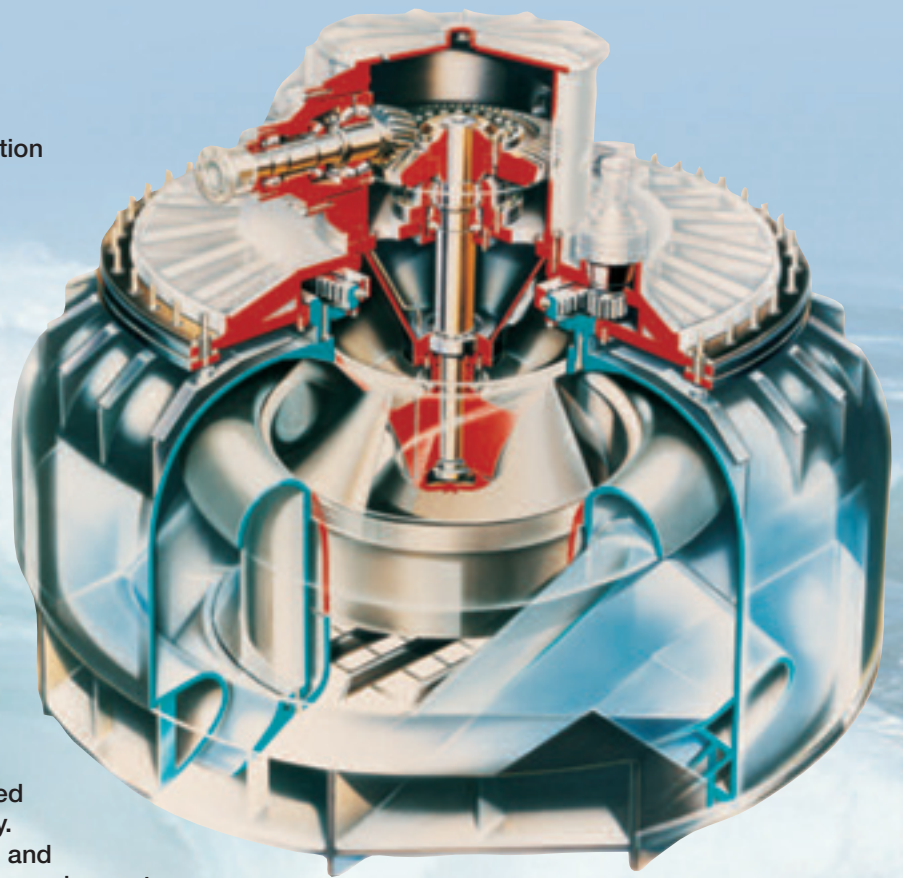
Many extremely shallow waters cannot be navigated with conventional propulsion systems. SCHOTTEL recognized this problem at an early stage and developed the Pump-Jet (SPJ) as a solution. The SPJ not only sets standards as a shallow-water propulsion system but is also increasingly used as a robust, powerful and reliable manoeuvring system on ships and vessels of all kinds operating under exceptional conditions.

The Pump-Jet operates reliably and with full thrust at a minimum immersion of only 150 to 750 mm, depending on the model involved, and can be powered by engines or motors of any type. It can be rotated through 360°, providing full thrust in all directions and ensuring excellent manoeuvring performance with utmost smoothness and comfort.

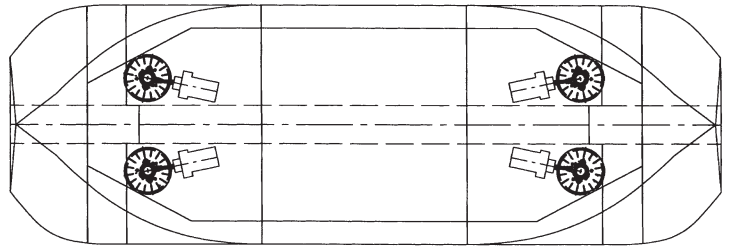
The application-specific characteristics

- Compact construction, space-saving installation and easy maintenance
- Minimum loss of displacement, especially significant for lightweight shallow-draft vessels
- Simple installation flush with the hull
- Operation in water depths < 0.5 m and beaching possible
- Reduced suction effect in shallow water on account of the much lower volume flow as compared with propeller-driven vessels
- As a manoeuvring aid in the bow, the SPJ can be used for main and auxiliary propulsion (take-home device), as required
- Virtually no risk of damage due to grounding or floating debris
- Low-noise and low-vibration operation due to encapsulated design

We are currently developing standard systems of up to 3500 kW, which are characterized by their perfection and reliability. We supply competent solutions and installation variants meeting the requirements of special applications too.



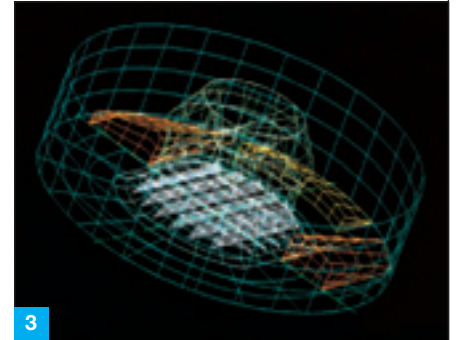
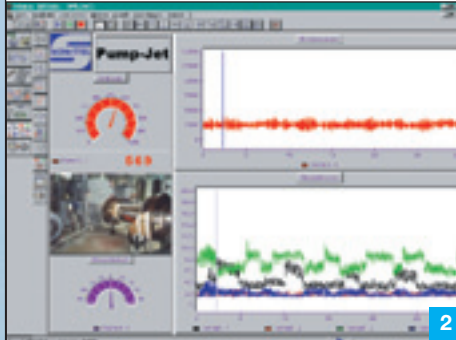
An impeller sucks in water through the intake funnel, a protective grid in the bottom plate preventing foreign bodies from entering the Pump-Jet.



Steering and control systems



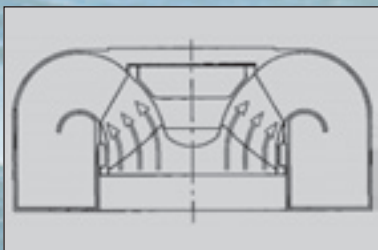
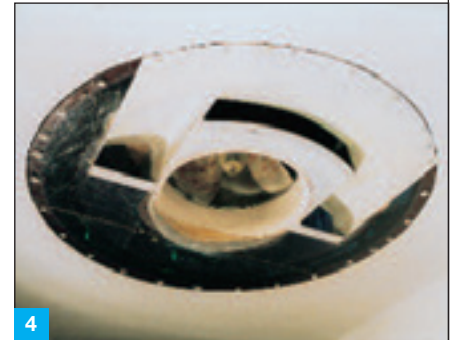
Research and Development



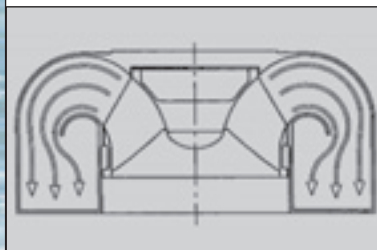
Quality

The application of CAD in development and design, the implementation of advanced manufacturing technologies, the use of high-grade materials, skilful assembly and professional installation on site are the major foundations for the top quality of our products. This is impressively confirmed by the certification of our quality management system according to DIN EN ISO 9001 by American Bureau of Shipping, Bureau Veritas, Det Norske Veritas and Germanischer Lloyd.

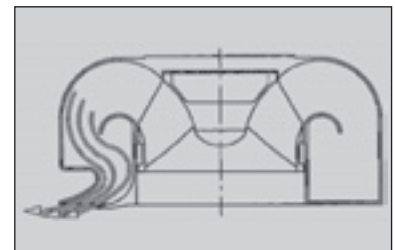
- 1 Our tailored steering and control systems have been service-proven and type-tested for decades.
- 2 Measured-data acquisition onboard using the DIADEM software
- 3 Existing Pump-Jet models are optimized and new types developed using state-of-the-art calculation methods.
- 4 In close cooperation with internationally renowned research institutes we constantly upgrade our Pump-Jets so that they are always acknowledged throughout the industry as trendsetting.
- 5 Testing in the HSVA ice tank in Hamburg



The impeller forces the energized water into a diffuser, as a result of which kinetic energy is converted into pressure energy.



This energy transformation process is continued in the diffuser, and the water is collected in the pressure casing.



The water is finally expelled through the outlet nozzles at an angle of 15°, and thrust is generated which can be steered through 360°.

Operating principle

SPJ for main propulsion Passenger ships, ferries



4

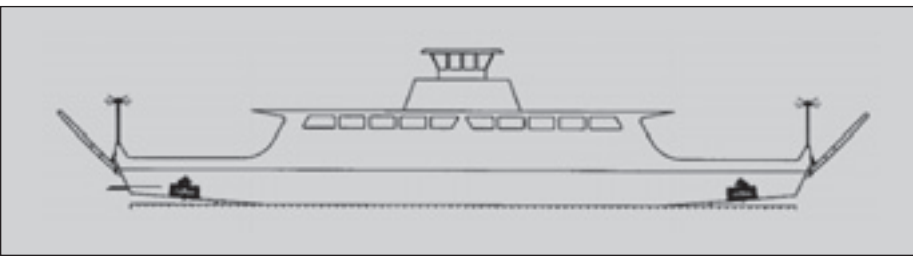
River cruise vessel (0.90 m draught), 3 x SPJ 82 (340 kW each) stern installation, 1 x SPJ 57 (190 kW) bow installation
Shipyard: DWE Deggendorfer Werft & Eisenbau GmbH, Germany
Owner: Peter Deilmann Reederei GmbH & Co., Germany



Double-ended ferry (1.40 m draught), 2 x SPJ 132 (505 kW each)
Shipyard: McTay Marine Ltd., United Kingdom
Owner: Caledonian MacBrayne, United Kingdom



Double-ended ferry (0.75 m draught), 2 x SPJ 57 (178 kW each)
Shipyard: Schmitt Stahlbau GmbH, Germany
Owner: Fährbetrieb Michael Schnaas, Germany



1



6

1 Double-ended ferry (1.70 m draught),
4 x SPJ 220 (640 kW each)
Shipyard: Scheepswerf Bijlsma,
The Netherlands
Owner: Wagenborg Passagiersdiensten BV,
The Netherlands



2



4

2 Ferry (0.75 m draught),
4 x SPJ 57 (178 kW each)
Shipyard: Schiffswerft Lux, Germany
Owner: Rheinfähre Königswinter GmbH,
Germany



3



5

3 Double-ended ferry (0.85 m draught),
4 x SPJ 57 (178 kW each)
Shipyard: P&A Ruitenberg BV, The Netherlands
Owner: Fährbetrieb Hirzmann GmbH,
Germany

4 Underwater viewing boat (1.90 m draught),
2 x SPJ 132 (634 kW each)
Shipyard: Cantieri Navali Vittoria S.r.l., Italy
Owner: Italian owner

5 Double-ended ferry (0.90 m draught),
4 x SPJ 57 (186 kW each)
Shipyard: Ship Constructors Ltd.,
New Zealand
Owner: Far North District Council,
New Zealand

6 Double-ended ferry (1.70 m draught),
4 x SPJ 57 (180 kW each), Navigator version
Shipyard: Damen Shipyards, The Netherlands
Owner: Gambia Public Transport Corporation,
Gambia

SPJ 82



Passenger vessel (0.95 m draught), 2 x SPJ 82 (340 kW each) stern installation,
1 x SPJ 22 (60 kW) bow installation
Shipyard: Deutsche Binnenwerften GmbH, Germany
Owner: Sächsische Dampfschiffahrts GmbH & Co. Conti Elbschiffahrts KG,
Germany



SPJ for main propulsion

Other typical applications

6



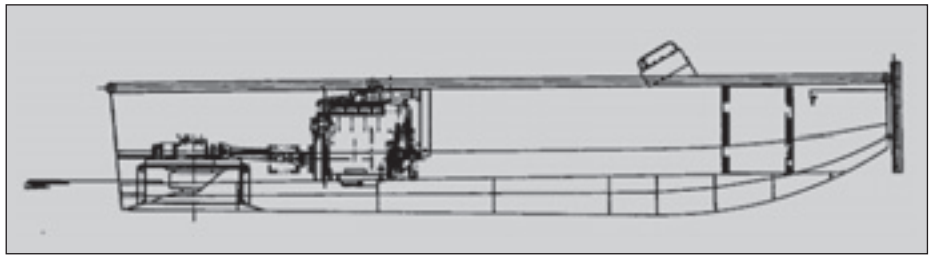
Inland water tanker (2.50 m draught), 2 x SPJ 82 (340 kW each)
Conversion yard: Slob & Dolderman, The Netherlands
Owner: VTR Verenigde Tankrederij Rotterdam, The Netherlands



Bridge erection boat (0.45 m draught), 2 x SPJ 55 M (131 kW each)
Shipyard: SCHOTTEL GmbH & Co. KG, Germany
Owner: German Federal Armed Forces



Diving support vessel (1.50 m draught), 1 x SPJ 57 (250 kW)
Shipyard: Vervako BV, The Netherlands
Owner: Royal Dutch Navy



1 Cockle fishing vessel (0.35 m draught),
2 x SPJ 57 stern installation (215 kW each),
1 x SPJ 57 bow installation (74 kW)
Shipyard: Sandfirden Technics,
The Netherlands
Owner: Dirk Visser, The Netherlands

2 Work boat (0.50 m draught),
2 x SPJ 32 (88 kW each)
Shipyard and owner: SCHOTTEL
GmbH & Co. KG, Germany

3 Passenger vessel (0.60 m draught),
2 x SPJ 57 (200 kW each)
Shipyard: Chantier Galian, France
Owner: French owner

4 Amphibious Floating Bridge M 3,
2 x SPJ 55 M (110 kW each)
Shipyard: EWK Eisenwerke Kaiserslautern,
Germany
Owner: German Army, British Rhine Army,
Taiwanese Army



Smaller Standard Vessel (1.64 m draught), 2 x SPJ 82 (370 kW each)
Shipyard: Danyard Aalborg AS, Denmark
Owner: Royal Danish Navy



5 Antenna handling ship (1.20 m draught),
2 x SPJ 57 (215 kW each)
Shipyard: Chaudronnerie Industrielle de
Bretagne, France
Owner: French Navy



6 Landing Craft Utility (1.50 m draught),
2 x SPJ 82 (400 kW each)
Shipyard: Scheepswerf Visser B.V.,
The Netherlands
Owner: Royal Dutch Navy



7 Oil recovery boat (0.70 m draught),
2 x SPJ 22 (94 kW each)
Shipyard: Compelmada, Portugal
Owner: Sines Port Authority, Portugal

8 Fire-fighting boats (0.35 m draught),
1 x SPJ 22 each (60 kW each)
Shipyard: Bodan-Werft, Germany
Owners: German fire-brigades



SPJ for auxiliary propulsion Manoeuvring and take-home device



1 Survey vessel (3.60 m draught),
1 x SPJ 220 (1000 kW)
Shipyard: Kröger-Werft GmbH & Co.
KG, Germany
Owner: Bundesamt für Seeschifffahrt
und Hydrographie, Germany

2 Fishery research vessel
(5.50 m draught),
1 x SPJ 220 (1000 kW)
Shipyards: Peene-Werft / Detlef-
Hegemann Rolandwerft, Germany
Owner: Bundesamt für Ernährung und
Forstwirtschaft, Germany

3 Ethylene tanker (2.50 m draught),
1 x SPJ 132 (375 kW)
Shipyard: Bodewes Scheepswerf
Volharding Foxhol BV, The Netherlands
Owner: Reliance Industries Ltd., India

4 Motor coaster (3.39 m draught),
1 x SPJ 57 (194 kW)
Shipyard: Shinwa Sangyo Company
Ltd., Japan
Owner: Japanese owner

8



2

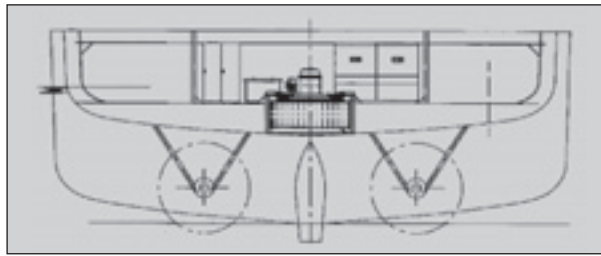


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SPJ 220



4



- 1** Laboratory vessel (0,80 m draught),
1 x SPJ 22 (59 kW)
Shipyard: Neue Germersheimer
Schiffswerft GmbH, Germany
Owner: Umweltministerium Rheinland-
Pfalz, Germany
- 2** Motor yacht (4.00 m draught),
1 x SPJ 57 (195 kW)
Shipyard: Peene-Werft, Germany
Owner: Private
- 3** Sailing vessel, 2 x SPJ 22 (94 kW each)
Shipyard and owner: Bootswerft
Rathjen / Jugend in Arbeit e.V., Germany
- 4** 23.1 m rescue cruiser , 1 x SPJ 15 (75 kW)
Shipyard: Schweers Schiffs- und
Bootswerft GmbH & Co., Germany
Owner: Deutsche Gesellschaft zur Rettung
Schiffbrüchiger (DGzRS), Germany
- 5** Survey vessel (0.90 m draught),
2 x SPJ 32 (74 kW each)
Shipyard: Heinrich Grube Schiffswerft,
Germany
Owner: GKSS, Forschungszentrum
Geesthacht, Germany
- 6** Paddle-wheel steamer, 1 x SPJ 57 (195 kW)
Conversion yard: Scheepswerf en
Maschinefabrik De Biesbosch-
Dordrecht BV, The Netherlands
Owner: Köln-Düsseldorfer Deutsche
Rheinschiffahrt AG, Germany





1

10



2

1 Ice-breaking multi purpose vessel (5,70 m draught),
1 x SPJ 520 (2600 kW)
Shipyard: Volkswerft GmbH, Stralsund, Germany
Owner: Wasser- und Schifffahrtsdirektion Nord, Germany

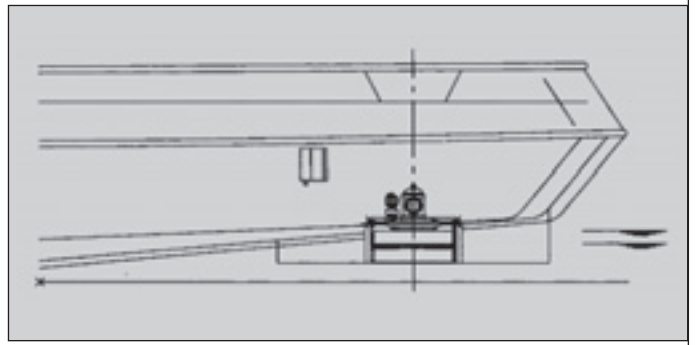
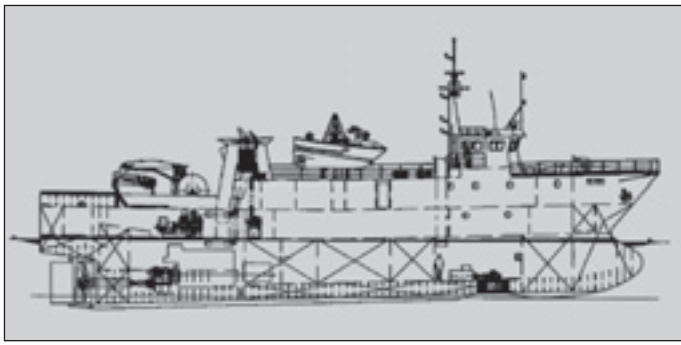
2 Research vessel (3.95 m draught),
1 x SPJ 132 (620 kW)
Shipyard: Detlef Hegemann Rolandwerft, Germany
Owner: Bundesministerium für Forschung und Technologie, Biologische Anstalt Helgoland, Germany

3 Sea-going ferry (3.60 m draught),
2 x SPJ 220 (1000 kW each)
Shipyard: Astilleros de Huelva SA, Spain
Owner: Trasmediterranea, Spain

SPJ 520



3



1 Ro-Ro vessel (8.40 m draught),
2 x SPJ 220 (850 kW each)
Owner: DFDS AS, Denmark

2 15 000 dwt barge (6.50 m draught),
1 x SPJ 220 (858 kW)
Shipyard: Keppel Singmarine Dockyard
Pte Ltd., Singapore
Owner: P.T. Freeport, Indonesia

3 Chemical tanker (6.10 m draught),
1 x SPJ 82 (400 kW), Navigator installation
Conversion yard: Svendborg Vaerft AS,
Denmark
Owner: Prime Commercial Investment Ltd.,
Isle of Man



3

Standard types

Specification is subject to change without notice. Status: July 2007.

| Type | Rating* Leistung* | Input power Eingangsleistung max. [kW] | Input speed Eingangsdrehzahl [r.p.m./Upm] | Well Brunnen Ø [mm] | Weight Gewicht [kg]** |
|-----------|----------------------|--|---|---------------------------|-----------------------------|
| SPJ 15*** | A | 49 | 1470 | 660 | 360 |
| | B | 64 | 1600 | | |
| | C | 75 | 1690 | | |
| SPJ 22 | A | 72 | 1950 | 900 | 380 |
| | B | 94 | 2130 | | |
| | C | 110 | 2250 | | |
| SPJ 57 | A | 168 | 1390 | 1300 | 1570 |
| | B | 223 | 1520 | | |
| | C | 257 | 1600 | | |
| SPJ 82 | A | 272 | 1060 | 1680 | 3000 |
| | B | 357 | 1160 | | |
| | C | 420 | 1230 | | |
| SPJ 132 | A | 422 | 1010 | 2160 | 5250 |
| | B | 555 | 1110 | | |
| | C | 650 | 1170 | | |
| SPJ 220 | A | 650 | 1020 | 2700 | 8900 |
| | B | 850 | 1110 | | |
| | C | 1000 | 1170 | | |
| SPJ 320 | A | 1430 | 850 | 3400 | 28000 |
| | B | 1880 | 930 | | |
| | C | 2200 | 980 | | |
| SPJ 520 | A | 2270 | 870 | 4300 | 40500 |
| | B | 2990 | 950 | | |
| | C | 3500 | 1000 | | |

SPJ installation in a skeg



* Rating A Full power continuous rating 24 hours service
 Rating B Intermittent service with occasional full load
 Rating C Auxiliary installations
 ** Weight only SPJ with oil (without outer well and resilient mounting)
 *** Vertical power Input only

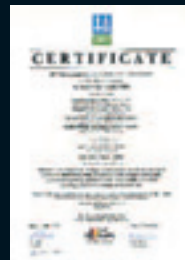
SCHOTTEL for the Shipping World

- n Constant customer support
- n Professional commissioning world-wide
- n Preventive maintenance and repairs
- n State-of-the-art modernizations
- n Reconditioned second-hand units
- n Close-knit sales and service network



Our product information provides you with explanations and data for planning plants, incorporating units from our current programme. On account of the modifications associated with upgrading, the contents of a specific edition will remain valid for a limited time only. Binding for the application concerned are the data given in our tender specification.

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