

MSV Fennica



Vessel specification



ARCTIA OFFSHORE – POWER AT SEA

Globally unique multipurpose icebreakers Fennica and Nordica are well-equipped and suited for demanding offshore work that requires a high degree of manoeuvrability and accuracy. Both are excellent vessels for ice management tasks in polar areas.

Arctia Offshore's experience is not limited to the North Sea, Arctic Ocean or other polar regions. Vessels sailing under the Arctia's flag have also worked in the Gulf of Mexico, West Africa and in the Mediterranean Sea.

Our expertise is founded on experienced staff and specialised vessels. These two enable us to offer first class services to our customers.

Arctia Offshore is a part of Arctia Group, a specialised shipping company offering icebreaking, ice management, offshore services and marine construction using multipurpose icebreakers and conventional icebreakers. We also offer oil-spill and harbour icebreaking services.

Arctia fleet consists of

- 2 oil-recovery icebreakers
- 4 conventional icebreakers
- 2 multipurpose icebreakers



MSV FENNICA SHORT VESSEL DESCRIPTION

Fennica is a multifunctional vessel based on a modified icebreaker design with diesel-electric propulsion. The vessel is specially designed for a wide range of offshore related work.

The vessel is designed to carry out offshore installation tasks and may be equipped for laying pipes, cables and umbilicals. The optional 120T SWL A-Frame is well suited for deploying trenching machines and ploughs. Her great bollard pull strength and strong winches make Fennica ideal for ploughing operations and towing.

ICEBREAKING

Fennica is a part of Arctia Group's icebreaker fleet, one of the most powerful in the world. Icebreaking services include ice management, assistance, towing, securing vessel traffic safety, and traffic control for vessels proceeding in icy conditions.

Fennica's icebreaking capability is excellent. The 15 MW diesel generators produce power for two Aquamaster azimuth-thrusters to make the vessel easily manoeuvrable. Fennica is excellent for DP work, all kinds of marine operations and for towing merchant vessels in harsh icy conditions.

VESSEL DETAILS

IMO No.	9043615
Call Sign	OJAD
Type of Vessel	Ice Breaker & Multipurpose Support
Type of Fuel	HFO / DO / ULSDO option
Flag State	Finland
Port of Registry	Helsinki
Owners	Arctia Offshore
Built	1993
Lightweight	7.935 T
Deadweight (approx.)	4.800 T
Displacement	12 800 T
Gross tonnage	9392 T
LOA	116.0 m
LWL	96.7 m
Breadth Moulded	26.0 m
Depth Moulded	12.5 m
Draught (Scantling)	8.4 m
Airdraft	38.0 m

CLASSIFICATION

DNV 1A1 POLAR10 Icebreaker Tug Supply Vessel
SF HELDK EPR EO DYNPOS-AUTR

HELIDECK

Helideck' D' Value	22 m / 12.8 T year 2012
Rated	Sikorsky S92
HMS	Vaisala HMS
Weather station	Vaisala AWS 430

CAPACITIES AND CONSUMABLES

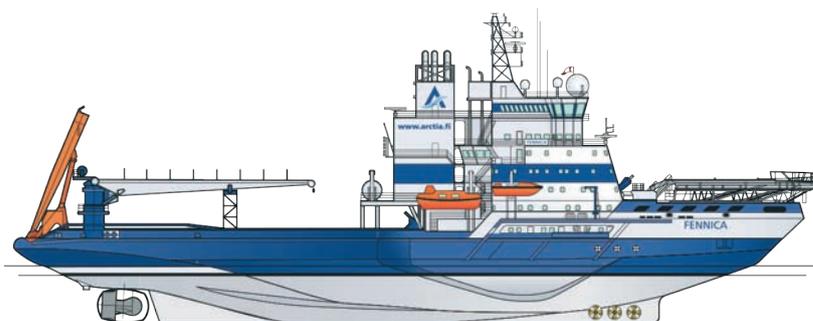
Fuel Oil (Dual Fuel)	approx. 1690 m ³ HFO/DO approx. 817 m ³ DO
Lubricating Oil	approx. 85 m ³
Fresh Water	approx. 400 m ³
Water Ballast	approx. 2200 m ³
F.W. Making Capability	approx. 25 T / day

Consumables, 8.4 m Draught:

Type of Fuel (Dual Fuel)	HFO / DO / ULSDO option
Fuel Consumption, 13 knots	42 T / day
Fuel Consumption, 11 knots	30 T / day
Fuel Consumption, DP	15 T / day
Duration, 13 knots	45 days
Duration, 11 knots	67 days

ENVIROMENTAL

SCR Catalysators X 4 Mainengine
Urea tank capacity: 100 m³



PROPULSION

Power	16 V 32 / 6000 kW Wärtsilä Vasa x 2 12 V 32 / 4500 kW Wärtsilä Vasa x 2
Propeller Type	Fixed pitch, variable rpm
Nozzle Fitted	2 pcs (for Aquamasters)
El.Prop Motor	2
Type	2 pcs ABB Strömberg Drives
Rating	Both rated at 7500 kW

BOW THRUSTERS

Number	3
Make	Brunvoll
Type	FU-80 LTC-2250
Power	1150 kW
Propeller Type	Variable Pitch

SWITCHBOARDS

Make	ABB distribution
Type	6.3 kV prod. 6989C S001
Transformers	2 x 2000 kva 6300 / 400 V 50 Hz + 1250 kva 6300 / 400 V 50 Hz

GENERATORS (MAIN)

Number	4
Make	ABB Strömberg Drives
Type	2 x HSG 1120 MP8 2 x HSG 900 LR8
Rating	8.314 kVA / 6.3kV / 750 rpm 6.235 kVA / 6.3kV / 750 rpm

GENERATORS (HARBOUR SET)

Diesel	
Number	1
Make	Wärtsilä
Type	Vasa 4R22/26
Rating	710 kW / 1000 rpm
Generator Type	ALPC 500 AG
Rating	840 kVA / 400V GENERATORS (EMERGENCY)

GENERATORS (EMERGENCY)

Number	1
Make	Caterpillar
Type	3412
Rating	300 kW / 1500 rpm / 400 v / 50 Hz

BOLLARD PULL

Bollard pull / Aquamaster About 230 tonnes

ROLL REDUCTION

INTERING Upgraded 2016
Antiheeling / Stabilizer / Ice-Heeling 720 m3



DYNAMIC POSITIONING

The vessel is equipped with a Kongsberg K-POS DP-22 dynamic positioning system.

The vessel also has an integrated redundant joystick control system. Classification is DNV under the DynPos AUTR class (Dynamic Positioning with Automatic Redundancy). This includes the DP system itself and its power supply plus the vessel's general switchboard and emergency power supply and the mode operation, both in normal and warning / alarm states.

DP -AND AUTOMATION HARDWARE

Type (DP)	Kongsberg K-POS DP-22 (Installed 2009)
Operator stations (OS)	2 pcs
Dual redundant controller	1 pc (one cabinet with separated controllers)
Redundant joystick (cJoy)	1 pc (with own independent cJoy -controller)
Process/field stations (FS)	8 pcs (for thrusters and power/propulsion plant)
Network Distribution Units	6 pcs
Type (Automation)	Kongsberg K-Chief (Installed 2009)
Operator Stations	5 pcs
Automation / K-Chief stations are part of the K-POS -system	
DP History station	

REFERENCE SYSTEMS / EQUIPMENTS

The DP -system is supported by the following reference systems:

Hydro acoustic	1 pc Kongsberg HiPaP 500
Tautwire	1 pc Kongsberg LTW MK15/500
Satellite positioning	2 pcs Kongsberg DPS -type receivers DPS 232 (IALA, SPOT, Glonass) High Precision corrections possible upon separate agreement
Fanbeam	1 pc Fanbeam optional
Vertical Reference	3 pcs Kongsberg, MRU2 / MRU5 / HMS -types
Gyro	3 pcs Ixsea Octans (Fiber Optic Gyros)
Anemometer	2 pcs GILL Ultrasonic wind sensors

MAIN OPERATING MODES

Joystick Mode	Manual Positioning using the three-axis joystick
Mixed Joystick / Auto Mode	Selecting any of the three degrees of vessel movement, as manual and / or auto
Auto Position Mode	Station keeping at selected heading and position
Follow Target Mode	Automatic following of moving target
Auto Track (low speed) Mode	Track keeping in low speed
Auto Track (high speed) Mode	Track keeping in medium or high speed
Alongships External Force Compensation by Joystick	Manual input of force in tonnes by the joystick is used e.g. towing and cable laying
Autopilot-mode	

BRIDGE EQUIPMENT

THE VESSEL'S INTEGRATED NAVIGATION SYSTEM IS EQUIPPED WITH

- Multi-Sensor radar and positioning system
- Type approved Dual ECDIS system

SYSTEM PROVIDES

- Flexible route planning, steering and monitoring
- Continuous calculations of own position and display on ECDIS
- Continuous target tracking by radars and AIS
- Continuous target presentation by ECDIS

EXTERNAL COMMUNICATION SYSTEM

COMPRISING

GMDSS A4 radio station
Marlink VSAT C & KU-band
Fleet broadband Ok
Iridium
Aviation VHF

SEARCHLIGHT

The following Xenon remote controlled search lights are provided:

- 2 x 1600 W (360 dgr)
- 2 x 3000 W (360 dgr)
- 1 x 1000 W

INTERNAL COMMUNICATION SYSTEM

AUTOMATIC TELEPHONE SYSTEM

The telephone system consists of automatic exchange and phone sets. In addition to the land lines there are mobile cellular and ship's satellite communication system connected to the PABX. All cabins fitted with telephones.

4 pcs outside telephone lines available for Project / Client
Radio / TV cable network

Radio / TV cable network receives terrestrial radio / TV broadcasts as well as satellite broadcasts, which are further distributed to the ship's cable network and TV sets.

DATA NET (CLIENT)

The network is connected to the Norsat KU band communication system onboard.
(May change between projects)

THE NETWORK HAS OUTLETS ON THE FOLLOWING LOCATIONS ONBOARD

<u>Bridge</u>	
<u>Operation Center</u>	<u>4th Bridge deck</u>
<u>Conference Room</u>	<u>2nd deck</u>
<u>Owners cabins</u>	
<u>Aft Deck</u>	
<u>Hospital</u>	<u>2nd Bridge deck</u>





DECK LAYOUT

Shark Jaw	2 pcs (adapters 38 mm 86 mm 95 mm)
Karmoy pins	2 pcs
Air on Deck	16 connecting points 300 m ³ / h, 7 bar
Air Receiver	1000 l
Sea Water	4 connecting points 40 m ³ / h, 7 bar
Fresh Water	1 connecting point, 30 m ³ / h, 4 bar
MS3 Panel Outlets	4 pcs 63 A 8 pcs 125 A 4 pcs 250 A 2 pcs 200 A

ELECTRICITY ON DECK

Power Outlets 400 V (± 10%) / 50 Hz

1 pc	1600 A	Bolt connection
2 pcs	630 A	Bolt connection
1 pcs	400 A	Bolt connection
4 pcs	250 A	Plug connection
8 pcs	125 A	Bolt connection
4 pcs	63 A	Plug connection

Power Outlets 230 V (± 5%) / 50 Hz

8 pcs	16 A Plug connection
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Extrenal communicatios system

GMDSS	A4 Radio Station
Telenor SEALINK 2 on Dual Band	
Inmarsat-B	
Iridium	
Aviation VHF 2 fixed 3 portables	

DECK CRANES

MAIN CRANE

Manufacturer	HYDRALIFT ASA
Main hook	30 T Double fall / 11m radius 15 T Single fall / 20m radius 5 T / 38m radius
Wire length	650m
Working depth	approx. 350m / Single fall approx. 180m / Double fall
Wire size	32mm

SECONDARY CRANE (OPTIONAL)

Manufacturer	MELCAL
Main hook	5 T / 25m at port 3.5 T / 25m Offshore 1.5 T / 25m Manriding
Wire length	65mm
Wire size	18mm

A-FRAME (optional)

Safe Working Load (SWL)	120 T
Clearance between legs	15m
Vertical clearance	12m



WINCHING CAPACITIES

DECK LOADING

Deck Area	approx. 1100 m ²
Capacity	10 T / m ² (defined loading area)

ANCHOR HANDLING DRUM

	First Layer	Outmost Layer
	1084 mm	2030 mm
Maker	Aquamaster-Rauma	
Type	TAW 3000/3000E	
Drive	Electric, 2 DC motors each 225 kW	
Pay out/in speed	Stepless from 0 to max speed	
Cable lifters	2, for 84 mm Ø stud link chain, 1 on each drum	

A) At low gear stalling pull 2 min	3750 kN	1765 kN
Nominal load S1	3000 kN	1412 kN
At speed	0-8 m / min	0-17 m / min
Maximum Speed	18 m / min	38 m / min
At load	1325 kN	623 kN
Safety Clutch	66 m / min	140 m / min
Max speed	2.1 knots	4.5 knots

B) At high gear stalling pull 2 min	1656 kN	779 kN
Nominal load S1	1325 kN	623 kN
At speed	0-18 m / min	0-38 m / min
Maximum Speed	40 m / min	85 m / min
At load	585 kN	275 kN
Safety Clutch	148 m / min	314 m / min
Max speed	4.7 knots	10 knots

C) Band Brake static holding load	4500 kN	2118 kN
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TOWING

TOWING

In auto-tension mode or with brake engaged
Interfaced to DP

	First Layer	Outmost Layer
TOWING DRUM	1283 mm	2577 mm

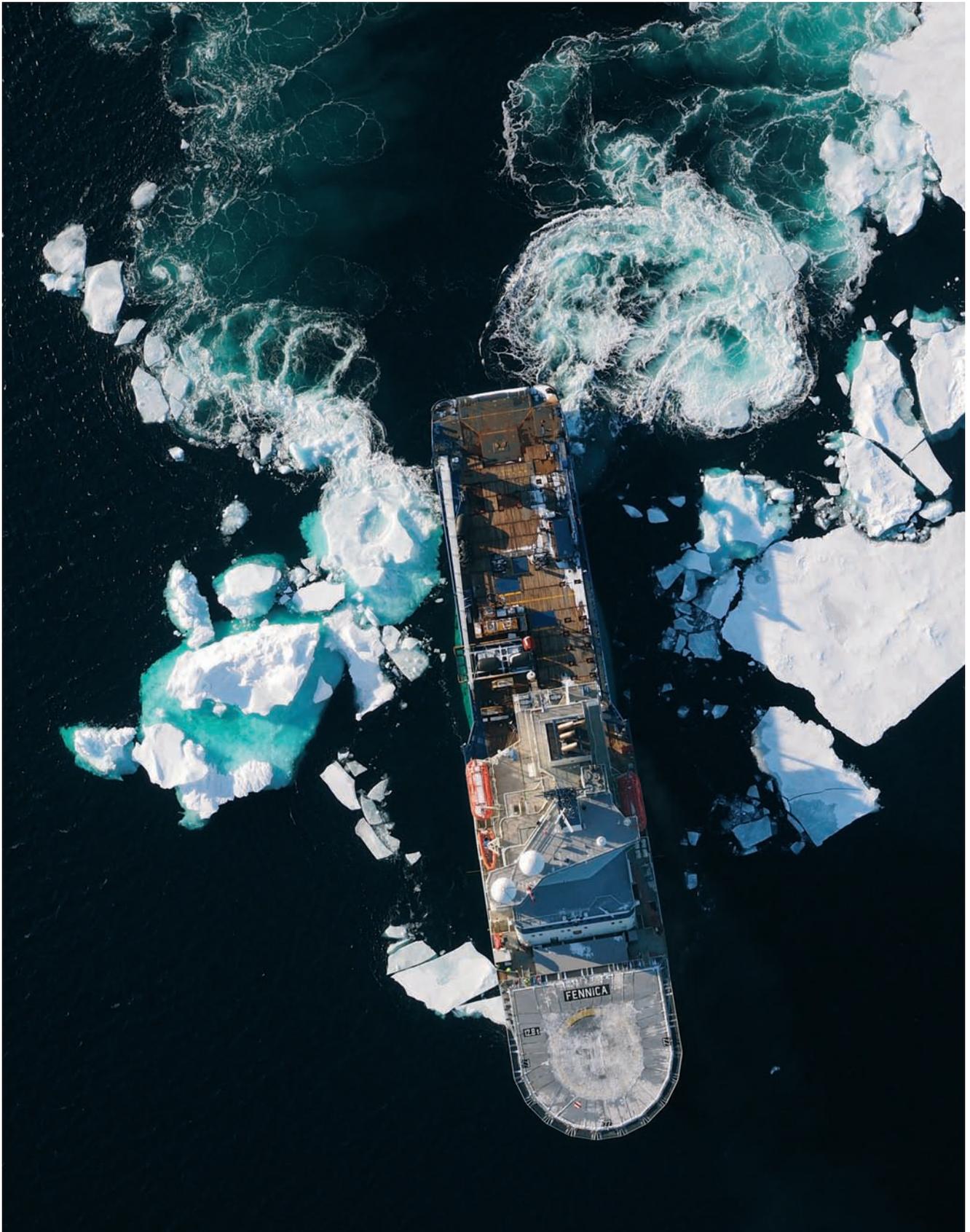
A) At low gear

At low gear stalling pull	3750 kN	1867 kN
Nominal load S1	3000 kN	1495 kN
At speed	0-8 m / min	0-16 m / min
Maximum Speed	18 m / min	36 m / min
At load	1325 kN	660 kN
Safety Clutch	66 m / min	133 m / min
Max speed	2.1 knots	4.3 knots

b) At high gear stalling pull 2 min

At high gear stalling pull 2 min	1656 kN	824 kN
Nominal load S1	1325 kN	660 kN
At speed	0-18 m / min	0-36 m / min
Maximum Speed	40 m / min	80 m / min
At load	585 kN	291 kN
Safety Clutch	148 m / min	296 m / min
Max speed	4.7 knots	9.6 knots

c) Band Brake static holding load	4500 kN	2240 kN
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ACCOMMODATION

Total Accommodation 77 persons incl. crew (normally 48 client beds)

Day Room / Mess for client:

Day Room	5th Bridge deck
Messroom and cafeteria	Upper deck
Laundry Room	2nd deck (+ Laundry stations on different decks)
Gym	1st Bridge deck + Fennica Arena
Sauna	2nd deck
Kiosk	Upper deck
Operation Center	4th Bridge deck
Saloon Room	5th Bridge deck
Client Office / Conference Room	1 x 20 m2 Office, 2nd deck
Reception (deck office)	Upper deck
Hospital	2nd Bridge deck

SURVEY FACILITIES

The MSV Fennica has no permanent ROV system on board, but it does have the capability for an ROV system should the project require it.

MANNING

Master	1
Chief Officer / DPO	1
First Officer / DPO	1
Second Officer / DPO jr.	2
Chief Engineer	1
1st Engineer	2
Electrical Engineer	1
Electrician	1
Boatswain	1
Deck Repairman	2
Engine Repairman	2
Motorman	1
Cook Steward	1
1st Cook	2
2nd Cook	2
Catering Assistants	2
Crane ops.	2
Total Marine Crew	21-25 persons depending on projects.

LIFE SAVING, FIREALARM AND RESCUE EQUIPMENT

Lifeboats	2 pcs, 82 persons each
Type	Waterman 371
Dimensions	L 9.35 m / B 3.26 m / draught 1.22 m
Weight including Equipment	4730 kg
Engine	Sabb N4.295
Regulation	NMD
Lifeboat Davit	Davit int.type D-NP.120
FRB Boat	1 pc, 6 persons, S-side
Type	Boomeranger FRBD C-600
Dimensions	L 6.05 m / B 2.45 m
Engine	Steyer MO164M40 / 163 hp
Speed	32 knots
Regulation	Solas
FRB Boat Davit	Vest Davit PLR-3600
Liferafts	8 x 25 persons
Type	Viking Life -saving
Life raft Davit	2 pcs Davit D-RB.21
Fire Alarm system	1 pc Autronica BK-30 IB44

The vessel is equipped with an automatic fire detection system



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Power at Sea

