

Commercial Workboat & Military

AIR CONDITIONING & SANITATION SYSTEMS



 **Dometic**
GROUP



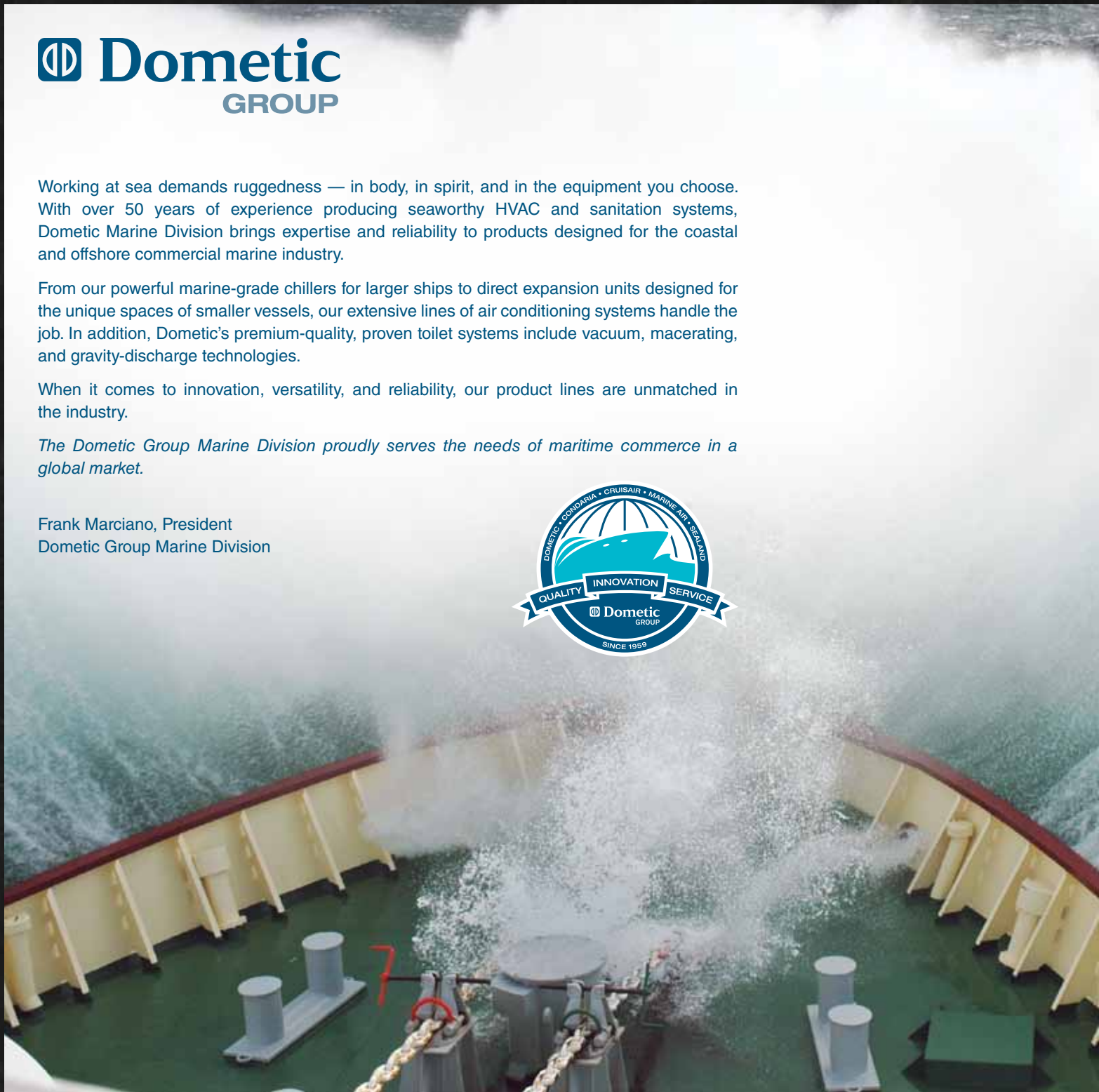
Working at sea demands ruggedness — in body, in spirit, and in the equipment you choose. With over 50 years of experience producing seaworthy HVAC and sanitation systems, Dometic Marine Division brings expertise and reliability to products designed for the coastal and offshore commercial marine industry.

From our powerful marine-grade chillers for larger ships to direct expansion units designed for the unique spaces of smaller vessels, our extensive lines of air conditioning systems handle the job. In addition, Dometic's premium-quality, proven toilet systems include vacuum, macerating, and gravity-discharge technologies.

When it comes to innovation, versatility, and reliability, our product lines are unmatched in the industry.

The Dometic Group Marine Division proudly serves the needs of maritime commerce in a global market.

Frank Marciano, President
Dometic Group Marine Division



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Environmental Policy

Since 1994, the Dometic Group Marine Division has provided air conditioning and refrigeration systems with green refrigerants. We lead the industry in the development of globally compliant marine air conditioning systems.

Dometic Marine is committed to minimizing the environmental impact of our products through regular assessment of energy and material demands, emissions, waste generation, and recyclable resources.

For many years we have proudly displayed our "Environmentally Responsible" logo, which indicates our commitment to the environment.



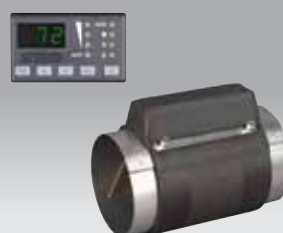
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The Critical Role of Air Conditioning

A reliable and ample air conditioning system is essential in any workboat design. Not only does the system provide a comfortable cabin climate for the health and morale of the crew, it also maintains the required temperature range for the operation of critical electronic equipment.

The air conditioning system must be engineered for the unique characteristics of each workboat, military or commercial vessel — addressing climate control with as much attention and expertise as you give to the design of the ship itself.

Assessing real-world air conditioning requirements takes experience and specialized knowledge, so look to Dometic Group Marine Division for the resources and expertise you need. Our senior engineers can design your vessel's air conditioning system or review your design and specifications to make sure everything is correct.

The Three Biggest Challenges When Choosing the Right Manufacturer

With over 50 years of experience, Dometic Marine has provided the most proven, innovatively engineered marine air conditioning systems in the world.

We understand the three biggest challenges faced by naval architects and ship owners when choosing the right company for their air conditioning equipment: Support, Selection, and Service.

Challenge #1: Support — Trust Dometic Marine's expert engineering team to review your drawings and specifications to ensure all measurements and load calculations are correct. Or, we can layout your entire system, size all the appropriate capacities, and design the most suitable system for your vessel. Dometic Marine can also supervise the installation of your air conditioning system and provide on-site training and documentation to your crew.

Challenge #2: Selection — Dometic Marine provides the world's broadest range of chilled water systems, including air handlers and controls. Our chillers provide up to 2.4 million BTUs of cooling or heating and come in a variety of configurations, with custom designs available. Our air handlers feature "WhisperCool" technology and are available in unique vertical and horizontal configurations that maximize space. Network-capable controls can be incorporated into most ship-automation solutions.

Challenge #3: Service — Dometic Marine has the world's largest network of trained and certified sales and service teams to support you no matter where you build or navigate. All products are in accordance with NMMA and ASHRAE standards, and our company is ISO 9001:2008 certified.



Dometic Marine can size, design, and build the right chiller for your vessel. Our certified worldwide sales and service network will keep your system running at peak efficiency no matter where you build or navigate

Modular Chillers

Proven in thousands of marine installations, modular chillers by Dometic Marine range from 16,000 (under two tons) to 396,000 (33 tons) BTU/hr. For larger, custom cooling and heating capacities, their modular design allows multiplexing in multi-stage systems capable of up to 2.4 million BTU/hr (200 tons). Please refer to the following pages for additional multi-stage chiller information.

Dometic Marine single-stage chillers feature a compact footprint and are available in space-saving low-profile and fully-enclosed designs. Stainless-steel components and other tough, marine-grade materials are used in construction. Condensers are available in standard co-axial coil and shell-and-tube configurations.

KEY BENEFITS OF A DOMETIC CHILLED WATER SYSTEM

- Refrigerant gas circuit is contained within the chiller
- Allows more focused heat removal in interior spaces
- Reverse-cycle or electric immersion heating
- Scroll or rotary compressors in all standard voltages
- Multi-stage chillers are available in custom capacities and configurations
- Multi-stage chillers have built-in redundancy – the system will still function even if one of the circuits malfunctions
- Water- and air-cooled chillers available



MTS



TWC



MCG Low-Profile



MCG



MTD

| CHILLER SERIES | SINGLE MODULE CAPACITY RANGE | MAX. MULTI-STAGE CAPACITY | COMPRESSOR TYPE | CONDENSER TYPE | SPECIAL FEATURES |
|-----------------|--|-------------------------------|---|--------------------------------|--|
| MTS | 120,000 – 396,000 (10 to 33 ton) | 2,400,000 BTU/hr (200 ton) | Hermetically-Sealed Scroll | Cupronickel Shell-and-Tube | <ul style="list-style-type: none"> ■ Easy maintenance access to condenser ■ High capacity in a space-saving design |
| TWC | 24,000 – 72,000 BTU/hr (2 to 6 ton) | 432,000 BTU/hr (36 ton) | Hermetically-Sealed Rotary or Scroll | Spiral-Fluted Cupronickel Coil | <ul style="list-style-type: none"> ■ Compact, enclosed design ■ Large condenser coil for superior performance |
| MCG Low-Profile | 36,000 – 180,000 BTU/hr (3 ton to 15 ton) | 1,080,000 BTU/hr (90 ton) | Hermetically-Sealed Scroll | Spiral-Fluted Cupronickel Coil | <ul style="list-style-type: none"> ■ Fits into height-restrictive spaces ■ Corrosion-resistant, removable PVC water headers |
| MCG | 24,000 – 180,000 BTU/hr (2 to 15 ton) | 1,080,000 BTU/hr (90 ton) | Hermetically-Sealed Scroll | Spiral-Fluted Cupronickel Coil | <ul style="list-style-type: none"> ■ Small footprint allows installation flexibility ■ Lightweight, durable aluminum chassis |
| MTD | 24,000 – 120,000 BTU/hr (2 to 10 ton) | 720,000 BTU/hr (60 ton) | Hermetically-Sealed Scroll | Spiral-Fluted Cupronickel Coil | <ul style="list-style-type: none"> ■ Flexible hose for water connections ■ Thermal expansion valves optimize performance in a wide range of conditions |

Multi-Stage Chillers

Multi-stage chillers combine two or more chiller modules on a single platform for capacities of up to 2.88 million BTU/hr.

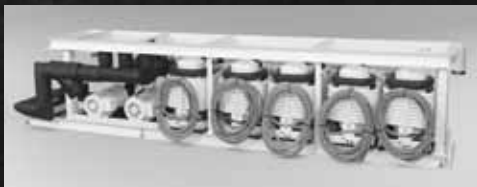
Multi-stage chillers have built-in redundancy, ensuring the system will function even if one of the circuits malfunctions. They feature sophisticated, networkable controls for local or remote monitoring,

and are available on tough, marine-grade aluminum-alloy frames that can be constructed in virtually unlimited configurations.

The systems pictured on these pages are examples of multi-stage chillers built to custom requirements. Please contact us to discuss the system we could design and build for you.



■ MCW 4-Stage 192,000 BTU/hr (16 ton)



■ MCW-LP 5-Stage 360,000 BTU/hr (30 ton)



■ MTC 2-Stage 120,000 BTU/hr (10 ton)



■ MTC 5-Stage 300,000 BTU/hr (25 ton) in Japanese Coast Guard green



■ MCW-LP 6-Stage 360,000 BTU/hr (30 ton)



■ STS 3-Stage 432,000 BTU/hr (36 ton)



■ MTS 2-Stage 480,000 BTU/hr (40 ton)



■ MCW 3-Stage 540,000 BTU/hr (45 ton)



■ STS 3-Stage 540,000 BTU/hr (45 ton)



■ STS 4-Stage 576,000 BTU/hr (48 ton)



■ SCW 4-Stage 720,000 BTU/hr (60 ton)



■ MCW-LP 5-Stage 900,000 BTU/hr (75 ton)

For large vessels, Dometic Marine can design and build chilled water systems with capacities up to 2.88 million BTU/hr. These chillers typically have shell-and-tube heat exchangers and accessible semi-hermetic compressors which can be opened for maintenance to ensure peak performance throughout the life of the system. Each compressor is driven by a frequency inverter which controls the starting electrical current peak and the frequency/speed range while running. The WM-S chillers below are examples of these higher-capacity systems.



■ WM-S/FCL 180003 540,000 BTU/hr (45 ton)



■ (PC)WM-S/FCL 240004 960,000 BTU/hr (80 ton)



■ WM-S/FCL 240004 4-Stage 960,000 BTU/hr (80 ton)



■ WM-S/FCL 360004 4-Stage 1,440,000 BTU/hr (120 ton)

HVAC Case Study:

Overcoming Extreme Temperatures & Tight Installation Spaces

The Challenges

Dometic Marine faced two key challenges when designing an HVAC system for 135-ft. patrol boats:

- The ships would patrol waters in the Middle East, a region with very high air and water temperatures – a significant problem as seawater acts as a coolant in marine HVAC systems.
- The HVAC system had to fit very tight space allowances.

The Solutions

The builder chose Dometic Marine because of the following uniquely engineered solutions:

- To overcome the high-temperature challenge, Dometic engineers designed a custom chiller with boosted capacity by putting 10-ton condensing coils on each of the 7.5-ton modules.
- To conquer the space limitations, Dometic Marine engineers designed the chiller to produce the required capacity in the small space available in the engine room. In addition, slim-profile ATV air handlers (pg. 8) were installed to accommodate the ship's interior areas.

The Result

MCG 270,000 BTU/hr (22.5-ton) three-stage chiller with on-board electronics (below).



Air Handlers for Chilled Water

Dometic Marine chilled water air handlers are available in a wide range of BTU capacities and space-saving configurations.

The high-efficiency blowers are high-velocity (HV) or brushless DC "WhisperCool" types with internal motors for decreased depth. Anti-slosh, "positive-flow" drain pans remove condensate water quickly and are insulated against secondary condensation. Electric heat is optional on all air handlers.

KEY BENEFITS OF DOMETIC AIR HANDLERS FOR CHILLED WATER

- High-velocity (HV) or brushless DC "WhisperCool" blowers
- Internal blower motors reduce width for installation flexibility
- Anti-slosh "positive-flow" drain pans
- Exceptional dehumidification
- Vibration-isolation mounting
- Configurations to fit any space

AT Air Handlers

The Standard In Ductable Chilled Water Air Handlers

AT air handlers feature many engineering improvements that eliminate condensate drain challenges, including a sloped, "positive-flow" design and larger drain connections.

With capacities up to 36,000 BTU/hr, the AT series is available with high-velocity (HV) or "WhisperCool" brushless DC blowers, both with internal motors to decrease unit depth.



AT-DC

Low-Profile ATL & ABL Air Handlers

Engineered for Overhead and Other Height-Restrictive Installations

The ATL series of air handlers are low-profile, dual-blower ductable units ideal for overhead applications or anywhere the installation space is height restrictive. The blowers are mounted horizontally for an exceptionally low-profile package. Vibration-isolation mounts allow ATL units to be suspended from above or supported from beneath. An "open top" configuration is available which allows easier service access on a flat surface.

The low-profile ABL series has its blowers set at a 90° angle to the coil for reduced depth. ABL air handlers can be suspended from above or supported from beneath. Vibration-isolation mounts are sold separately.



ATL



ABL

Slim-Profile ATV Air Handlers

Minimal Depth for Installation In Walls and Other Tight Spaces

Featuring a unique vertical layout which places the blower above the evaporator coil, the ATV series takes advantage of tight spaces previously not thought of for air handler installation.

A "4-pipe" version of the ATV has dedicated cooling and heating circuits designed to work seamlessly between chilled water cooling and heating via a separate boiler system (see hydronic diesel boiler on pg. 14).



ATV

| AIR HANDLER SERIES | CAPACITY RANGE | OPTIONAL ELECTRIC HEAT* | SPECIAL FEATURES |
|--------------------|--|-------------------------|---|
| AT-HV AT-DC | 6,000 – 36,000 BTU/hr 6,000 – 36,000 BTU/hr | Yes Yes | <ul style="list-style-type: none"> ■ The standard in chilled water air handlers with compact footprint, improved dehumidification, vibration isolation, and positive-flow drain pan ■ Insulated against secondary condensation |
| ABL-HV ABL-DC | 18,000 and 24,000 BTU/hr | Yes Yes | <ul style="list-style-type: none"> ■ Dual-blower, low-profile design with reduced depth ■ Insulated against secondary condensation; positive-flow drain pan |
| ATL-HV ATL-DC | 6,000 – 36,000 BTU/hr | Yes Yes | <ul style="list-style-type: none"> ■ Enclosed, dual-blower low-profile design with exceptionally low height ■ Insulated against secondary condensation; positive-flow drain pan |
| ATV-HV ATV-DC | 6,000 – 36,000 BTU/hr | Yes Yes | <ul style="list-style-type: none"> ■ Unique slim-profile vertical configuration fits into walls and other tight spaces ■ Insulated against secondary condensation; positive-flow drain pan ■ "4-pipe" configuration provides dedicated cooling and dedicated heating circuits designed to work seamlessly between chilled water cooling and heating via separate boiler system |

*Amount of heat available depends on the model and BTU capacity of the air handler. Please contact a Dometic representative for more information.

Controls for Chilled Water

Dometic provides sophisticated, microprocessor-based controls for the precise operation and monitoring of single and multi-stage chilled water systems. Up to six chiller stages are supported.

These controls offer central push-button operation of all chiller modules and monitor important information such as water temperatures and diagnostic faults. For added convenience, ship-wide chiller operation is available via PC interface or over the internet via Modbus/TCP Ethernet protocol.

KEY BENEFITS OF DOMETIC CHILLED WATER CONTROLS

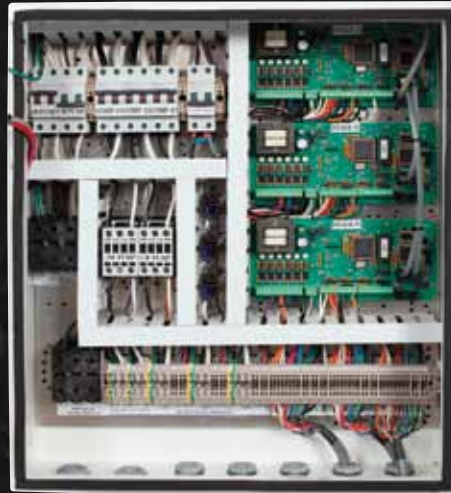
- Provide central control and monitoring for up to six chiller modules
- Control over all cooling/heating functions including operation of seawater and chilled water pumps, coordination of the compressor(s), and more
- Provides monitoring of inlet/outlet water temperature, compressor run times, diagnostic faults, and more
- Remote control via PC interface, ship-wide Modbus/TCP Ethernet protocol
- Circuitry is coated for high resistance to damage and corrosion



Tempered Water Logic (TWLC) & Chilled Water Master (CWMC) Controls

TWLC and CWMC chilled water controls offer different features and convenience-added options. Dometic can design the right control system in a custom enclosure (above, at right) to satisfy your operational and budget requirements.

TWLC and CWMC controls support up to six chiller stages and will keep the system running in case a module fails. Easy-to-



read LEDs (shown above) monitor water temperatures, compressor run times, diagnostic faults, and more.



Chiller Gateway Interface

The Chiller Gateway Interface allows complete remote control and monitoring of the chiller – including individual air handlers – via CAN bus network adapter and Modbus/TCP Ethernet protocol.

Available with graphical touch screen, the Gateway's web server makes chiller control possible from your home or office.

Standard and Bypassable Variable Frequency Drives (VFD)



Standard VFD

Eliminates Compressor Starting Inrush

A VFD eliminates the large starting inrush of compressor current by ramping up voltage and frequency in a controlled time period, protecting the generator from overload and allowing running on limited dockside power.



Bypassable VFD

Eliminates Electrical Interference

These units provide the benefits of a standard VFD but bypass themselves after compressor ramp-up to eliminate harmonic distortion and RFI. They will re-engage the compressor for a smooth ramp-down and stop.

KEY BENEFITS OF VARIABLE FREQUENCY DRIVES

- Protects the generator from overload and allows running on limited dockside power
- 208/230V 3-phase output with 1- or 3-phase input
- Full 60Hz capacity even at 50Hz input (230V only)
- Low electronic noise, CE approved
- 380/480V 3-phase models available

KEY BENEFITS OF BYPASSABLE VARIABLE FREQUENCY DRIVES

- Smooth compressor starts and stops without harmonic distortion or RFI.
- Eliminates the need for line reactors and conditioners.
- While bypassed, can ramp-up or ramp-down an additional compressor.
- One bypassable VFD can control up to four compressors.
- Available in 5HP to 25HP for 208V/240V or 380V/460V systems.

Air-Cooled Air Conditioning

Dometic Marine offers several types of rugged, marinated air conditioning systems designed for air-cooled applications. These units are designed for exterior installation and are engineered for exceptional resistance to harsh marine environments.

Available in split and self-contained configurations, air-cooled systems require no plumbing and are ideal for replacing non-marinated systems.

KEY BENEFITS OF DOMETIC AIR-COOLED AIR CONDITIONING

- Designed for exterior installation on rooftop, deck, or pedestal
- Split and self-contained configurations
- Exterior components take up no interior space*
- No plumbing required
- Rugged, durable systems have components dipped in corrosion-resistant coating to withstand harsh marine environments

*Evaporators connected to DuraSea condenser are installed in interior areas



DuraSea Rooftop

DuraSea Rooftop Air Conditioner

15,000 BTU/hr Commercial-Grade Air-Cooled System Requires No Plumbing or Duct

The DuraSea Rooftop A/C system is built to resist harsh marine conditions. Designed for rooftop or deck mounting, it provides 15,000 BTU/hr of cooling to the space directly below it. The condenser and evaporator coils are coated with the ElectroFin® E-coat process for superior resistance to corrosion and UV damage. The compressor is stabilized to endure extreme motion, and vibration-isolation mounts reduce noise and vibration. An optional electric heating kit is available.



SSA16

SSA16 Pedestal-Mounted Air Conditioner

Ductable 16,000 BTU/hr System In a Stainless-Steel Cabinet

Originally designed for rooftop or pedestal installation on jack boats, this 16,000 BTU/hr self-contained system can be ducted to one or more areas and has a remote-mounted digital control.

The SSA16 features a 304-grade, 18-ga. stainless-steel cabinet, corrosion-resistant-coated components, four-row high-efficiency evaporator coil, and 1.5 kW of electric heat.



DCA120

DuraSea Condensing Units

The Only Truly Marinated Air-Cooled Condenser

DuraSea condensing units provide long service life and energy-efficient performance in a durable package designed for rooftop or on-deck installation.

The 304-grade stainless-steel cabinet resists heavy salt-spray while providing UV protection.

To further fortify the unit from severe marine conditions, corrosion-resistant stainless-steel fasteners are used, and all other external components have a protective coating.

DuraSea condensers work with Dometic Marine and other standard evaporating units. The optional risers elevate the unit above the mounting surface to protect the coil from salt water and debris.



| PRODUCT NAME | CAPACITY RANGE | ELECTRIC HEAT | SPECIAL FEATURES |
|--------------------------|-------------------------|--|--|
| Rooftop Self-Contained | 15,000 BTU/hr | Optional | <ul style="list-style-type: none"> ■ Corrosion-resistant components in a rugged, streamlined, lightweight enclosure ■ Vibration-free performance with compressor stabilization to protect against extreme motion |
| SSA16 Self-Contained | 16,000 BTU/hr | 1.5 kW Standard | <ul style="list-style-type: none"> ■ 304-grade 18-ga. stainless-steel cabinet and corrosion-resistant components ■ Four-row, high-efficiency evaporator coil and long-life DC blower motor |
| DuraSea Condensing Units | 36,000 – 120,000 BTU/hr | Can be installed on evaporating units, sold separately (see facing page) | <ul style="list-style-type: none"> ■ 304-grade stainless-steel cabinet ■ Hermetically-sealed scroll compressor with internal overload protection ■ High-efficiency copper tube/aluminum fin coil coated to exceed 1,000-hour salt spray test ■ Copper tube/copper finned coils available for ultimate durability ■ Optional risers elevate the unit to provide excellent water drainage and protect the coil from wash-down |

Split-Gas Air Conditioning

Dometic Marine's water-cooled split-gas air conditioning systems are the most durable and energy-efficient available for marine use.

Consisting of a central condensing unit and one or more remote evaporating units, split-gas systems are designed for cooling and heating larger interior areas. As the condensing unit is typically installed in an engine room, air conditioning noise and vibration is practically non-existent in living quarters.

KEY BENEFITS OF DOMETIC SPLIT-GAS AIR CONDITIONING

- Compact and extremely energy-efficient
- Capacities from 6,000 - 72,000 BTU/hr of reverse-cycle cooling and heating
- Central condensing unit reduces plumbing for easier installation
- Quiet evaporating units with vibration-isolation mounting available
- "Positive-flow" anti-slosh condensate drain pans
- Rust-free, composite molded drain pans (Emerald and TurboVap series only)



Emerald 48K

Emerald Series Condensers

Innovative Chassis Conquers Installation Challenges

Emerald series condensers were engineered to remove installation and maintenance challenges and to maximize the performance benefits of R-410A, an environmentally safe refrigerant. The square chassis minimizes footprint, and the reversing valve, pressure switches, and service ports are centrally located for easy maintenance access from any side.

Emerald condensers are extremely energy efficient with up to 41% less power draw (6K-16K models). The rust-free, composite molded drain pan has specially-designed drain channels and two large drain fittings to rapidly remove condensate, resulting in up to 85% less standing water.

| CAPACITY RANGE | VAC/CYCLE/PHASE (6K-16K MODELS) | VAC/CYCLE/PHASE (24K-72K MODELS) | SPECIAL FEATURES |
|-----------------------|--|--|---|
| 6,000 – 72,000 BTU/hr | 115/60Hz/1 208-230/60Hz/1 220-240/50Hz/1 | 230/60Hz/1 240/50Hz/1 230/60Hz/3 460/60Hz/3 380/50Hz/3 | <ul style="list-style-type: none"> ■ Reverse-cycle cooling and heating ■ Compact, square chassis is only 13 x 13 in. (6K-16K models) or 16 x 16 in. (24K-72K models) ■ Rust-free molded composite drain pan with "positive-flow" drain channels that result in up to 85% less standing water ■ Up to 41% more energy efficient and up to 32% reduced start-up amps (6K-16K models) ■ Centrally-located reversing valve, pressure switches, and service ports for easy maintenance access from any side |

Split-Gas Evaporators

Quiet and Efficient Units With High-Velocity Blowers

Dometic evaporators feature vibration-isolation mounts to reduce noise and are insulated against secondary condensation.

The TurboVap series boasts the latest engineering improvements in marine design, such as a rust-free, "positive-flow" molded composite drain pan and a high-velocity blower that is rotatable in the field with a single adjustment screw. The TurboVap's ultra-compact size is up to 15% lighter and up to 19% smaller in height than other units of equal capacity.



TurboVap16



EBE18

| EVAPORATOR SERIES | CAPACITY RANGE | ELECTRIC HEAT RANGE | SPECIAL FEATURES |
|-------------------|------------------------|---------------------|--|
| TurboVap | 4,000 – 16,000 BTU/hr | N/A | <ul style="list-style-type: none"> ■ Rust-free molded composite drain pan with "positive-flow", anti-slosh drain channels that result in up to 85% less standing water ■ Up to 28% reduced amps, up to 15% lighter, and up to 17% reduction in height ■ Reverse-cycle cooling and heating |
| EBE | 18,000 – 36,000 BTU/hr | N/A | <ul style="list-style-type: none"> ■ The new standard in compact, ductable evaporators with insulated, "positive-flow" anti-slosh drain pan and vibration-isolating mounts ■ High-efficiency, rotatable, variable-speed blowers with larger inlet for increased air flow across the coil |
| EBHE (not shown) | 6,000 – 36,000 BTU/hr | 1.0 – 3.0 kW | <ul style="list-style-type: none"> ■ The EBE series with up to 3.0 kW of electric heat standard |
| EBLE (not shown) | 12,000 – 36,000 BTU/hr | 2.0 kW | <ul style="list-style-type: none"> ■ Low-profile design featuring insulated, dual high-velocity blowers with vibration-isolating mounts ■ Available with return-air plenum for cycling air from below the installation space (EBLEP shown on pg. 13) ■ 2.0 kW of electric heat available with 16,000 and 24,000 BTU/hr models (EBHLE) |
| EBDE (not shown) | 30,000 – 72,000 BTU/hr | N/A | <ul style="list-style-type: none"> ■ Available with vertical or horizontal discharge ■ 48,000 – 72,000 BTU/hr models feature dual return air inlets and evaporator coils ■ EBDE units work with Emerald series condensers |

Self-Contained Air Conditioning

Self-contained direct expansion air conditioning systems by Dometic Marine are engineered for the cooling or heating of small or confined interior spaces, or as auxiliary units to cool an engine room, electronics storage, or exterior deck area.

The compact size of self-contained systems make them ideal for installation under a bunk or bench or in a locker or closet, yet are powerful enough to be ducted to two or more areas.*

*Depending on the size of each area and load factor



Turbo Self-Contained Series

Powerful, Compact, and Quiet

The award-winning Turbo series revolutionized self-contained cooling and heating with the newest innovations in air conditioning system design. The rust-free, molded composite drain pan features sloped channels which route water rapidly to three drain locations.

An advanced cushioning system results in quieter, virtually vibration-free operation. The enclosed blower motor eliminates overhang to provide easier installation. Further reduce noise by up to 50% with the optional sound shield, which completely encloses the compressor.



Low-Profile Self-Contained

Designed for Cockpit, Engine Room, and On-Deck Installation

The low-profile self-contained air conditioning unit features an innovative horizontal compressor. Standing only 8 in. (203 mm) high, this unit is easily installed in confined spaces and delivers 16,000 BTU/hr of cooling or heating. A split-gas evaporator is available.

The 304-grade stainless-steel drain pan and drain fittings contribute to long service life.



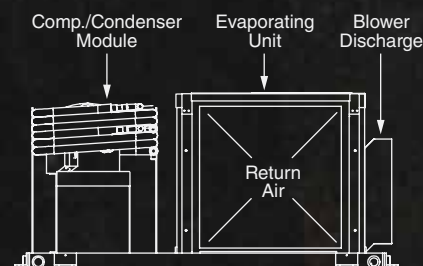
Framed Package Self-Contained

3-, 4-, 5- and 6-Ton Units Available In Horizontal or Vertical Configurations

Framed Package (FP) systems are high-capacity self-contained units consisting of two split-gas modules – a seawater-cooled, reverse-cycle compressor/condenser and an evaporator/blower – mounted on a single 3/16 in. aluminum frame. They are available in 36,000, 48,000, 60,000, and 72,000 BTU/hr capacities, and vertical (at left) and horizontal configurations.

FP systems are engineered to provide reliable cooling and heating performance in the most extreme marine environments. They will perform at the fully-rated capacity in 90°F (32°C) seawater in cooling mode, and as low as 40°F (4.4°C) seawater in heating mode.

Featuring vibration-isolation mounts for the compressor and evaporator/blower, FP systems come in 230V/50 or 60Hz/1- or 3-phase, 230V/50 or 60Hz/3-phase, and 460V/50 or 60Hz/3-phase models.



**Framed Package
Horizontal (FPH)**

KEY BENEFITS OF DOMETIC SELF-CONTAINED AIR CONDITIONING

- Ideal for smaller or confined interior areas, or for cooling engine room, electronics storage, or exterior deck area
- All major components mounted on a single chassis
- Small footprint and compact size is ideal for installation under a bunk or bench, or in a locker or closet
- Capacities up to 72,000 BTU/hr of reverse-cycle cooling or heating
- Can be ducted to one or more areas

Multi-Ton Self-Contained

Up to 30,000 BTU/hr On a Single Compact Chassis

The VCD series of self-contained air conditioning systems deliver 18,000, 27,000, and 30,000 BTU/hr in a more cost effective, compact, and easier-to-install package than two separate units.

These systems have fully insulated, high-velocity blowers in a single or dual blower (30K only) configuration. The high-efficiency compressors have cushioned mounts to reduce vibration and noise, and the optional stainless-steel chassis (SVCD) provides added durability.



SVCD30



VCD27

The SVCD30 (shown at right) has a unique design with a single 30,000 BTU/hr compressor/condenser and dual 16,000 BTU/hr evaporators mounted back-to-back. Each blower can be ducted to two or more areas. Optional Heresite-coating on the evaporator coil provides excellent corrosion resistance.

| PRODUCT | CAPACITY RANGE | VAC/CYCLE/PHASE | SPECIAL FEATURES |
|----------------|----------------------------------|--|---|
| Turbo | 6,000 – 16,000 BTU/hr | 115/60Hz/1 208-230/60Hz/1 220-240/50Hz/1 | <ul style="list-style-type: none"> Rust-free molded composite drain pan with "positive-flow" drain channels that result in up to 85% less standing water Up to 27% more energy efficient Cushioning mounts reduce vibration and noise Optional sound shield further reduces compressor noise by up to 50% |
| Low-Profile | 16,000 BTU/hr (60Hz) | 115/60Hz/1 208-230/60Hz/1 220-240/50Hz/1 | <ul style="list-style-type: none"> Stands only 8 in. (203 mm) high thanks to innovative horizontal compressor High-efficiency dual blowers can be ducted to separate areas 304-grade stainless-steel drain pan and drain fittings Oversized four-row coil for excellent heat removal under low fan speeds |
| Framed Package | 36,000 – 72,000 BTU/hr | 208-230/50 or 60Hz/1 208-230/50 or 60Hz/3 460/60Hz/3 | <ul style="list-style-type: none"> Vertical or horizontal configurations on a sturdy, 3/16-in. aluminum frame Vertical or horizontal blower discharge Modular layout allows easy maintenance access and replacement of components |
| Multi-Ton | 18,000, 27,000 and 30,000 BTU/hr | 208-230/60Hz/1 220-240/50Hz/1 | <ul style="list-style-type: none"> Powerful yet efficient reverse-cycle unit on a single compact, stainless-steel chassis (optional) Dual high-velocity blowers Exposed components are coated with Heresite for corrosion protection (optional) |

HVAC Case Study:

An HVAC System for Both Extreme Heat & Subfreezing Destinations

The Challenges

The Marine Group, a builder of US Navy Torpedo Recovery Vessels, faced these challenges when specifying HVAC systems for three new boats:



- Outdoor working decks must be cleared of HVAC equipment, eliminating the use of air-cooled systems.
- Worldwide patrol regions with very hot temperatures (100°F/38°C) and very cold temperatures (0°F/-18°C).
- Evaporating units must fit into narrow overhead spaces.
- HVAC equipment must draw minimal amps.

The Solutions

The Marine Group contracted Dometic Marine for a direct expansion (DX) system with space-saving evaporators and custom heaters:



EBLEP Evaporator

- A water-cooled DX split system provided more installation options than an air-cooled HVAC system.
- Custom three-phase heaters kept amp draw low and met temperature specifications.
- Shallow overhead spaces contained Dometic's low-profile evaporators with integrated return-air plenums (shown above). The plenum connects directly to an overhead return-air grille to increase system efficiency by cooling only the cabin air.
- Entire system supported by the world's largest marine HVAC global service network.

Special Applications

Many workboats have unique needs requiring specialized equipment. Trust Dometic Marine to engineer the right solution.

This can be seen in products such as the Radome ECU, which cools the critical components inside the radar domes, or the large CF850 portable refrigerator that serves many functions.

Auxiliary electric heat warms cabins in cold climates, and multi-duct defrosters maintain visibility in the helm for safe maneuvering.

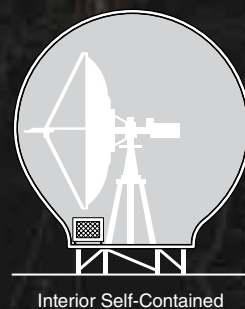
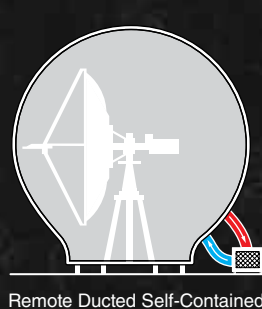
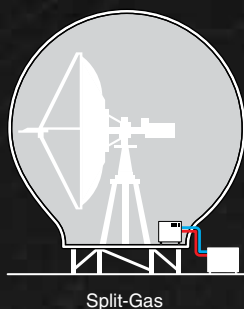
KEY BENEFITS OF DOMETIC SPECIAL APPLICATIONS PRODUCTS

- #1 engineering team provides unique solutions for unique requirements
- Specialized cooling and heating equipment for almost any marine environment
- Rugged equipment to maintain ideal temperatures for provisions and sensitive electronics
- Electric or diesel-powered auxiliary heating

Radome Environmental Control Unit (ECU)

Exceeds the Cooling Requirements of Commercial and Military Vessels

The air-cooled Radome ECU is specifically designed to maintain optimum temperatures for the sensitive electronics within a dome enclosure, and exceeds cooling requirements of workboats and military vessels. Small and lightweight, the ECU has corrosion-resistant components and is available in three configurations:



Hydronic Diesel Boilers

Quiet, Fuel-Efficient Heater Designed to Work With Chilled Water Air Handlers

Dometic's hydronic diesel boilers provide 3.0 or 3.5 kW of heating to the vessel in seawater conditions that are unfavorable for reverse-cycle heating or when electric heat is unavailable.

The boiler supplies water at a temperature of 120°F/45°C to chilled water air handlers with a dedicated heating circuit, such as the ATV (see pg. 8).

Dometic hydronic diesel boilers offer an ideal alternative for commercial vessels operating in northern extremes where heating must be run for extended periods. Easily retrofittable, these boilers provide fuel-efficient heating wherever shorepower may be limited, and maintain comfortable on-board temperatures at night when the primary generator may be shut down.



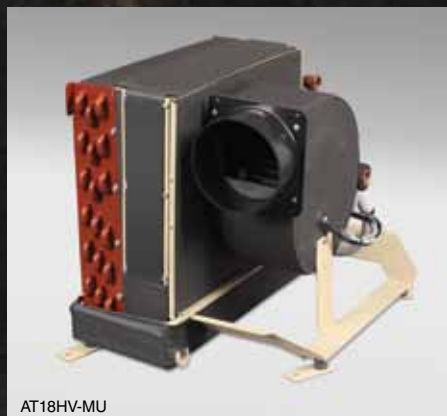
Auxiliary Heat Module

Providing Ductable Electric Heat In Extremely Cold Conditions

Dometic's auxiliary heat modules provide additional heating when the vessel is in extremely cold seawater. These ductable units also permit specific compartments on the boat to be heated when the circulated water system is in cooling mode.

Available in one to four kilowatts of heat and 115V or 230V power, auxiliary heat modules have fintube heating elements, two-stage thermal protection, and an insulated interior.





Fresh-Air Make-Up Air Handlers

Ducts In, Treats, and Supplies Outside Air to Refresh Interior Spaces

Dometic fresh-air make-up air handlers (AT-MU series) work within chilled water air conditioning systems to help keep the air inside the vessel from going stale.

AT-MU units duct in outside air, cool and dehumidify it, then re-heat it to room temperature and duct it to various interior spaces. Typically, crew cabins two or more levels below deck will benefit from the use of these systems.

Available in 18,000, 24,000, and 36,000 BTU/hr capacities, AT-MU units have corrosion-resistant coating on the coil, blower, and other exposed components, and include vibration isolation mounting. Available with high-velocity (HV) or brushless DC blowers.

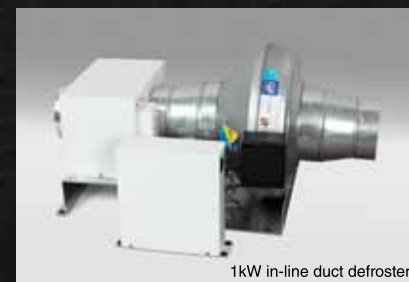


Defrosters

Dedicated Window Defrosting Units For Multiple Ducts or In-Line Ducting

Dometic offers two types of dedicated defrosting units for the rapid treatment of pilot house windows.

Typically installed under the coaming area, lightweight PHDCM defrosters (left) feature up to six individual ducts to treat each pane of glass in the pilot house. Featuring a quiet and efficient squirrel-cage fan, PHDCM units have fan-only and fan-with-heat modes.



The second type of defroster is an in-line ductable model with external controls (above) typically used within the ducting of a chilled water system. The large blower provides the needed back pressure to push the hot air through the small grilles directed at the glass.



CF850 Portable Provisioning Refrigerator

29.3 ft³ Capacity With An 8-Hour Battery

Ideal for the transport of food, medical supplies, and other temperature-sensitive products, the CF850 provides 29.3 ft³/0.83 m³ of portable AC/DC refrigeration. Use the digital controls (below at left) to precisely set the cooling temperature between 32°F/0°C and 54°F/12°C.

With a pre-cooled load, the refrigerator's integrated battery provides eight hours of operation without any power supply (at an ambient temperature of 77°F/25°C). That's long enough for a full day at sea, whether for use on board or for transporting provisions to a remote site.

The CF850 can be installed and removed without tools. The provided belt set enables quick and safe anchoring, and the durable PE cabinet resists external damage.

Safety features include an optical temperature alarm system, double-magnet door seal, and a door lock that can be opened from the inside.



Digital Cabin Controls

Dometic provides microprocessor-based, easy-to-use cabin controls for the precise monitoring and control of the temperature and humidity levels of interior spaces. Our controls work with all types of Dometic air conditioning systems.

The optional CAN bus adapter allows control over multiple air handlers, evaporators, or self-contained air conditioners via the ship-wide network.



Cruisair Qht (left) and Q3 keypad/displays

KEY BENEFITS OF DOMETIC MICROPROCESSOR CABIN CONTROLS

- Automatic humidity control
- Cool-only, heat-only, and automatic modes plus multiple fan-speed control
- Displays ambient and set-point temperature in Fahrenheit or Celsius
- Internal circuitry is resistant to corrosion
- Optional CAN bus adapter puts multiple cabin control on the vessel's network (except Marine Air Passport I/OCompact)



Marine Air Elite (left) and Passport Compact keypad/displays

Accessories for Dometic Air Conditioning Systems

SmartStart™ Single-Phase Soft Starter

Eliminate Startup Spikes

The SmartStart™ is a unique device that uses dynamic feedback control to reduce single-phase A/C compressor startup power demand by up to 65%. No other soft starter in the industry provides better performance.



Small and lightweight, the SmartStart may eliminate the need to invest thousands in a

KEY BENEFITS OF THE SMARTSTART SINGLE-PHASE SMART STARTER

- Reduces strain on the power source during A/C compressor start-up
- May enable an inverter to power A/C
- May eliminate the need for generator upgrade
- Inexpensive, small, and lightweight

larger generator. For boats without a generator, the SmartStart may allow the option of powering an air conditioning system from an inverter.

Breathe Easy™ In-Duct Air Purifier

Eliminate Boat Odors and Improve Air Quality

Dometic's in-duct Breathe Easy™ Air Purifier uses innovative photocatalytic nano-mesh technology with ultraviolet (UV) light to eliminate on-board odors and reduce biological and chemical contaminants.

Working silently within the A/C ducting, the Breathe Easy Air Purifier uses a frequency of UV light that does not produce ozone.



The in-duct Breathe Easy™ Air Purifier installed under a berth within the air conditioner's duct work

How It Works:

- 1 Chemical and biological contaminants enter the air purifier through the A/C duct.
- 2 UV light activates the photocatalytic nano-mesh, reconfiguring impurities into non-toxic elements. Vortex action maximizes contact with the nano-mesh structure.
- 3 Harmless water vapor and carbon dioxide exit the air purifier

KEY BENEFITS OF THE IN-DUCT BREATHE EASY AIR PURIFIER

- Eliminates unpleasant odors
- Up to 100% reduction in diesel fumes, acetone, benzene, formaldehyde, and other volatile organic compounds
- Up to 100% reduction in bacteria, fungi, mold, and pollen
- UV light produces no harmful ozone
- Portable version is effective up to 100 sq. ft. and operates on AC or DC power



VacuFlush® Toilet Systems

Odor-Free Performance With Ultra-Low Water Consumption

VacuFlush® technology uses stored vacuum energy to clear the bowl instantly and propel waste to the holding tank, resulting in odor-free, clog-free performance.

VacuFlush toilets use very little water per flush (as low as one pint). This not only extends the fresh water supply, but also increases the time between holding tank pump-outs — a significant advantage for vessels operating in waters with overboard discharge restrictions.

KEY BENEFITS OF A VACUFLUSH TOILET SYSTEM

- Uses powerful vacuum energy for odor-free, clog-free performance
- Extremely low water use — as low as 1 pint per flush
- All-ceramic toilets with adult-size seats and deep bowls
- Electronic one-touch control or pedal-flush models
- Pedal-operated toilets draw a mere 6 amps per flush
- Fresh water use reduces maintenance and odors associated with raw-water systems



140 series low-profile toilet



J series vacuum generator



5000 series toilet



S series low-profile vacuum generator

Dometic can supply a complete VacuFlush system, including vacuum generator(s) and holding tank (see pg. 18). For space-saving convenience on smaller boats, we offer vacuum holding tanks (VHT series) that combine the vacuum generator and holding tank in a single compact package.



VHT12 6.5-gal.
(25-liter) vacuum
holding tank

Sanitation Case Study:

Supplying a Sophisticated Solution to the US Navy's Moose Boats

The Challenges

The United States Navy asked Moose Boats, a manufacturer of vessels for law enforcement, port security, fire and rescue, and the military, to explore a more sophisticated, plumbed solution to their existing portable heads requiring manual discharge.



- Smaller patrol vessels like Moose Boats typically have limited capacity for a toilet system with holding tank.
- Exceptionally small head space.
- Moose Boats patrol in demanding environments, requiring rugged and durable equipment.

The Solutions

Dometic's VacuFlush technology was chosen because of its superior performance, and for the value it adds to the reputation of a manufacturer whose success depends on the reliability of its boats and all on-board systems.

"Dometic's VacuFlush toilet systems have proven to offer exceptional functionality aboard, complementing our vessels perfectly," said Abbie Walther, VP of Moose Boats.

- VacuFlush provides far more functionality than competing low-cost systems while offering long-term benefits such as the reduction of odors and greater flushing capacity.
- Exceptionally low water consumption (1 pint per flush).
- Pedal-operated toilet draws a mere 5 amps per flush.
- Dometic offers a wealth of experience and specialized know-how to the marine market.



Compact 140 series VacuFlush toilet
installed in a Moose Boat head

MasterFlush™ Toilet Systems

Quiet, No-Clog Performance With 64% Less Power Use



8100 series low-profile toilet and toggle switch control

Dometic's MasterFlush™ system pulverizes waste with less power than competing toilet systems.

The 18-blade macerator turbine grinds waste into a fine effluent with no clogging, then propels it to the holding tank, which can be installed up to 98 ft. (30 m) away.

KEY BENEFITS OF A MASTERFLUSH TOILET SYSTEM

- Uses optimized macerator engineering for clog-free performance
- All-ceramic toilets with adult-size seats and deep bowls
- 64% less power consumption and 33% lower amp draw per flush
- Electronic flush controls
- Uses fresh water to reduce the maintenance and eliminate the odors caused by raw-water systems
- Flat or sloped bulkhead-mating profiles
- 98 ft. (30 m) maximum distance to holding tank increases installation flexibility

Gravity-Discharge Toilet Systems

Designed For Vessels With Direct Discharge To a Holding Tank

Dometic offers a versatile range of high-quality gravity-discharge toilets with electronic and pedal-flush options.



510+PS



711-M28

KEY BENEFITS OF A GRAVITY DISCHARGE TOILET SYSTEM

- Electronic and pedal-operated flush toilets
- Full-size, standard-height models
- Pedal-operated models with compact footprint in standard height or low profile
- Patented flush mechanism creates an airtight seal between head and holding tank
- Low water usage — as low as 1 pint per flush

The 711-M28 gravity-flush toilet (shown at left) is a self-contained system with built-in holding tank. Just connect the fresh-water supply, discharge plumbing, and vent line and it's ready to use.

Standard Holding Tanks

Odor-Free, Premium-Quality Performance

Ship builders and owners can now realize the benefits of a user-friendly, properly-sized sanitation holding tank system by Dometic.

With a wide range of sizes, custom shapes, and capacities, our holding tanks feature top-mounted fittings and diptube discharge plumbing to prevent leaks. Multiple discharge outlets eliminate the need for complex plumbing and extra discharge line connections.

KEY BENEFITS OF A DOMETIC HOLDING TANK

- Standard holding tanks (HTS) and tanks with built-in discharge pump (HTS-T)
- Corrosion-proof, leak-proof, and odor-proof high-density polyethylene construction
- "Diptube-style" discharge fittings for thorough, leak-proof pump out
- Easy to install — no solvent-bond connection required
- Capacities from 10 gallons (38 liters) to 80 gallons (302 liters)
- ISO/USCG compliant



HTS-T 28-gal. (106-liter) holding tank with built-in discharge pump and vent filter



HTS 28-gal. (106-liter) holding tank



Dometic's SaniGard™ holding tank vent filters out-perform competing filters by 2.4 times, providing the safest and surest way to long-lasting, odor-free, and trouble-free performance from your sanitation system.



To find out how we can meet your HVAC or sanitation needs, please contact us by phone or email. We look forward to hearing from you.

Phone: 954-973-2477

Email: MarineSales@DometicUSA.com





Dometic GROUP is a customer-driven, world-leading provider of leisure products for the RV, automotive, truck, and marine markets.

We supply the industry and aftermarket with a complete range of air conditioners, refrigerators, awnings, cookers, sanitation systems, lighting, mobile power equipment, comfort and safety solutions, windows, doors, and other products that make life more comfortable away from home.

Dometic GROUP supplies a wide range of workshop equipment for service and maintenance of built-in air conditioners. We also provide specially designed refrigerators for hotel rooms, offices, wine storage, and transport and storage of medical products.

Our products are sold in almost 100 countries and are produced mainly in wholly-owned production facilities around the world.

Certified Worldwide Sales & Service Network



DOMETIC GROUP, MARINE DIVISION

2000 N. Andrews Ave. Ext. | Pompano Beach, FL 33069 USA
Tel. 954-973-2477 | Fax 954-979-4414
www.DometicUSA.com | MarineSales@DometicUSA.com

24/7 TECHNICAL SUPPORT FOR UNITED STATES & CANADA

8:00 AM to 5:00 PM Eastern Time: 800-542-2477 | After hours and weekends: 888-440-4494

INTERNATIONAL SALES & SERVICE

Europe & Middle East: Call +44(0)870-330-6101

All other areas find the nearest distributor at www.dometic.com/marinedealers

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