

A Series TechBook

HOMA[®]
P U M P T E C H N O L O G Y



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General Company Information



PUMP TECHNOLOGY, INC.
390 Birmingham Boulevard
Ansonia, Connecticut 06401
www.homapump.com
TEL (203) 736-8890 FAX (203) 736-8899

Profile - Germany

HOMA Pumpenfabrik GmbH is a privately held company owned by the Hoffmann family. Their business is located in Neunkirchen – Seelscheid in western Germany approximately 20 miles from Cologne. The primary manufacturing is of submersible pumps, motors and mixers.



The business got its start in 1946 as an electric motor manufacture and repair company. In 1962 the company started manufacturing its first submersible drainage pumps. In 1965 the first submersible sewage pumps were manufactured. Shortly after this time, submersible sewage pumps became the primary focus of the company.

Today HOMA Pumpenfabrik exports to over 60 countries worldwide. There are three main sales companies located in the Netherlands, France and in North America. HOMA has dozens of exclusive agents operating in countries worldwide. To date, HOMA Pump Technology located in Ansonia Connecticut has become the largest single outlet of product for the company. As a result, the

Ansonia location has become instrumental in controlling product development and manufacturing requirements for the US products.

HOMA is an engineering oriented company that prides itself on delivering a quality product. They have broad product recognition in Germany and other countries as a quality manufacture of goods.

HOMA has been made significant commitment to the US market in terms of inventory, product enhancements and development.

The HOMA Pumpenfabrik production facility is regularly updated and expanded to utilize new, more efficient production methods. As a result, the facility has grown from a small motor shop run out of a single building to a thriving campus.



HOMA's humble beginnings in 1948



The current HOMA campus, with the original office still up front

As a family-owned company from its beginning, it is important to HOMA to keep in touch with its history and its roots. The original motor shop used by founder Hans Hoffman still welcomes visitors to the factory, and employees are still treated like part of the family.



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Profile – North America

HOMA Pump Technology is a U.S. corporation headquartered in Ansonia, Connecticut. The business was formed in 1982 with a mission to provide our customers in North America with the highest quality submersible pump products and service at a competitive price. Since the beginning, we have seen continued growth in our selected markets. With significant growth in our target markets, we are very well positioned to continue our expansion into a number of new market segments while maintaining the quality of service and support HOMA Pump Technology has become known for.



HOMA Pump Technology's Ansonia, CT warehouse and production facility

The activities of our business currently center on the marketing, assembly, testing, service and support of HOMA pumps. In our Ansonia location, we maintain extensive inventories of all product lines in semi-finished state. This permits us to customize the final product to each customer's specific requirements, yet be able to ship the finished product very quickly. Over 90% of our total orders ship within 1 week of customer release.

Our inventory program also assures that EVERY spare part for a standard HOMA pump is available for immediate shipment. And, because we believe that HOMA pumps should be maintained rather than replaced, our spare parts are economical to purchase.



A small selection of motors in stock, waiting for assembly

HOMA's \$10 million plus dollar inventory is only one facet of the organization. Quality technical support, field service, and customer service personnel are always available to our customers before, during, or after a sale. Our engineering group is aggressively working on new product designs and developments to meet the current and future demands of our customers.



Only one aisle in our over 20,000 sq. ft. warehouse

HOMA Pump Technology is firmly committed to the North American market, and we are here to serve you.



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Market Position Statement

HOMA has positioned itself in the market as a product and service leader. HOMA has the unique position of being one of the few remaining submersible pump manufacturers which is a privately held company. This has allowed HOMA to focus its efforts on product engineering, customer value, and allowing the pumps to be some of the most versatile and reliable in the market.

The HOMA wastewater products have been designed and built with the philosophy of being a High Value Provider of the Highest Quality Products. This allows for our sales efforts to be successful competing against a wide range of products and applications. HOMA's versatility and engineering expertise have provided our customers with an option to select a premier product at an attractive price.

Our North American headquarters, located in Ansonia, Connecticut, is over 40,000 square feet. This facility houses inventory, assembly, light machining and testing. The advanced manufacturing factory in Germany supplies the Ansonia facility with primary pump components for final assembly and test as needed for the North American market. The Ansonia facility houses over 10 million dollars in inventory, making it arguably the greatest submersible pump inventory in the states. The inventory is capable of producing approximately 3000 complete pump units at any time.

Our local dealers, who vary in size but not commitment, augment our service to our customer base. It is a HOMA requirement that all sales efforts be backed by a reputable dealer who services the end customer. Their efforts are supported by local service shops, factory authorized motor rewind facilities, and by the Ansonia factory itself.

The complete package of Products, Sales Support, Application Know-How, Start-up Service, and "After the Sale" service are what make up our commitment to our end users.



Certifications and Specifications

CERTIFICATE OF CONFORMITY



1. **HAZARDOUS (CLASSIFIED) LOCATION ELECTRICAL EQUIPMENT PER US REQUIREMENTS**
2. **Certificate No:** FM16US0160
3. **Equipment:** AM and CAM Submersible Wastewater Pump Motors
(Type Reference and Name)
4. **Name of Listing Company:** Homa Pumpenfabrik GmbH
5. **Address of Listing Company:** Industriestraße 1
D-53819
Neunkirchen-Seelscheid
Germany
6. The examination and test results are recorded in confidential report number:

1X9A1.AE dated 15th November 1996
7. FM Approvals LLC, certifies that the equipment described has been found to comply with the following Approval standards and other documents:

FM Class 3600:2018, FM Class 3615:2018, FM Class 3650:2013, ANSI/IEC 60529:2004
8. If the sign 'X' is placed after the certificate number, it indicates that the equipment is subject to specific conditions of use specified in the schedule to this certificate.
9. This certificate relates to the design, examination and testing of the products specified herein. The FM Approvals surveillance audit program has further determined that the manufacturing processes and quality control procedures in place are satisfactory to manufacture the product as examined, tested and Approved.
10. **Equipment Ratings:**

The AM120, 121, 122, 135, 136, 171, 173, 200, 202, 204, 240, 243, 300, 303, 375 and 376 Submersible Wastewater Pump Motors are rated as Explosionproof for Class I, Division 1, Groups C and D hazardous (classified) locations, IP68.

The CAM120, 121, 122, 136 and 173 Submersible Wastewater Pump Motors are rated as Explosionproof for Class I, Division 1, Groups C and D hazardous (classified) locations, IP68.

Certificate issued by:

J.E. Marquedant
VP, Manager, Electrical Systems

19 February 2019

Date

To verify the availability of the Approved product, please refer to www.approvalguide.com

THIS CERTIFICATE MAY ONLY BE REPRODUCED IN ITS ENTIRETY AND WITHOUT CHANGE

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SCHEDULE



US Certificate Of Conformity No: FM16US0160

11. The marking of the equipment shall include:

Class I Division 1, Groups C and D; T4 / T3C* Ta = -20°C to +40°C; IP68

*T-code T3C for 208 volt motor option and 202 mm frame size.

12. **Description of Equipment:**

General - The Model AM and CAM Series Submersible Wastewater Pump Motors are designed for wastewater pump applications. They are available in single and three phase, 208V to 575V, 60 Hz, with horsepower ratings from 1.6 to 184 hp. For individual motor voltage specifications, refer to control document TU FM 92.

Construction - The Model AM and CAM Series Submersible Wastewater Pump Motors consist of an explosionproof cast iron (AM Series) and stainless steel (CAM Series) housing, cable entry, junction chamber and, for the larger motors, an outer cooling jacket. The motors, as a part of a complete pump assembly, may be installed entirely or partially submerged in a wet pit and non-submerged in a dry pit. The complete pump assembly can be lowered along vertical guide bars into a pit and automatically connected to the discharge connection mounting flange. These mechanical parts and accessories were not included in the scope of this program as requested by the manufacturer.

Environmental - For Submersible Wastewater Pump Motor Model AM and CAM Series, the motors, as a part of a complete pump assembly may be installed entirely or partially submerged in a wet pit and non-submerged in a dry pit. The complete pump assembly is rated for submersion to 10m (32.8ft). In the event of moisture leakage occurring into the motor housing assembly, the pump motors are provided with an optional leakage detector located in the external wall of the oil chamber and supplied by a separate cable. The maximum rated ambient operating temperature of the pump motor is rated at 104°F (40°C), therefore liquids being pumped are limited to this maximum temperature.

AMa.b/c/d e (f) FM. Submersible Wastewater Pump Motors.

a = Frame size (stator diameter in mm): 120, 121, 122, 135, 136, 171, 173, 200, 202 240, 300, 375.

b = Motor Horsepower: 1.6 to 184.

c = Operating Speed (Motor Poles): 2, 4, 6, or 8.

d = Number of Phases: 1 or 3.

e = Internal Identifier of Motor frame (Optional): T, P, F, G, H, R, or S.

f = Internal Identifier for Dry Pit Construction: (U) or blank.

AM204.ab(c)/(C)/d/3-eFM. Submersible Wastewater Pump Motors.

a = Motor Horsepower 11.5 to 42.

b = Internal Identifier of Motor frame (Optional) T, P, F, G, H, R, or S.

c = Internal Identifier for Dry Pit Construction (U) or blank.

d = Operating Speed (Motor Poles) 2, 4, 6 or 8.

e = Code for pump Hydraulic 3/2 or 1.

AM243.ab(c)/(C)/d/3-eFM. Submersible Wastewater Pump Motors.

a = Motor Horsepower 20 to 65.

b = Internal Identifier of Motor frame (Optional) T, P, F, G, H, R, or S.

c = Internal Identifier for Dry Pit Construction (U) or blank.

d = Operating Speed (Motor Poles) 2, 4, 6 or 8.

e = Code for pump Hydraulic 3/2 or 1.

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AM303.ab(c)/d/3FM. Submersible Wastewater Pump Motors.

a = Motor Horsepower 33 to 130.

b = Internal Identifier of Motor frame (Optional) T, P, F, G, H, R, or S.

c = Internal Identifier for Dry Pit Construction (U) or blank.

d = Operating Speed (Motor Poles) 4, 6, or 8.

AM376.ab(c)/d/3FM. Submersible Wastewater Pump Motors.

a = Motor Horsepower 89 to 230.

b = Internal Identifier of Motor frame (Optional) T, P, F, G, H, R, or S.

c = Internal Identifier for Dry Pit Construction (U) or blank.

d = Operating Speed (Motor Poles) 4, 6, or 8.

CAMa.bc(d)/e/f FM. Submersible Wastewater Pump Motors.

a = Frame size (stator diameter in mm): 120, 122, 136 and 173.

b = Motor Horsepower: 1.6 to 19.

c = Internal Identifier of Motor frame (Optional): C, D or T.

d = Internal Identifier for Dry Pit Construction: U or blank.

e = Operating Speed (Motor Poles): 2, 4, 6, or 8.

f = Number of Phases: 1 or 3.

13. Specific Conditions of Use:

None

14. Test and Assessment Procedure and Conditions:

This Certificate has been issued in accordance with FM Approvals US Certification Requirements.

15. Schedule Drawings

A copy of the technical documentation has been kept by FM Approvals.

16. Certificate History

Details of the supplements to this certificate are described below:

Date	Description
15 th November 1996	Original Issue.
26 th July 2016	<u>Supplement 8:</u> Report Reference: – 3054624 dated 26 th July 2016 Description of the Change: Addition of new stainless steel Submersible Wastewater Pump Motor Models CAM120, CAM122, CAM136 and CAM173.
28 th September 2016	<u>Supplement 9:</u> Report Reference: - 3053631 dated 28 th September 2016 Description of the Change: Addition of 2 and 8 pole motors to the AM204 and AM243 Series and increase HP to 65 to AM243 Series Submersible Wastewater

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SCHEDULE



US Certificate Of Conformity No: FM16US0160

	Pump Motors. Also corrected errors in Model code indicators for leak detector and 3 phase.
27 th January 2017	<u>Supplement 10:</u> Report Reference: - RR208164 dated 27 th January 2017 Description of the Change: Correction of AM204 and AM243 Model codes.
19 th February 2019	<u>Supplement 11:</u> Report Reference: - PR450021 dated 19 th February 2019 Description of the Change: Addition of 208 volt motor option with a T3C T-code and removal of Intrinsically Safe level switch/moisture detector with I.S. Entity parameters for Models AM204, AM243, AM303 and AM376.

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SCOPE

Furnish Qty. ____ HOMA Model _____, ____ inch discharge, electric submersible wastewater pump(s), each consisting of a single stage, non-clog, centrifugal pump, close-coupled to a squirrel cage induction type electric motor assembled in a single-body, watertight aggregate, capable of maintaining its watertight integrity submerged under 65 feet of water. The pumps(s) shall be designed to handle raw, unscreened sewage, storm water, sludge, or similarly contaminated liquid at an operating point of ____ GPM at ____ ft. TDH with a hydraulic efficiency of at least ____ %. Shut-off head shall be ____ ft. minimum. As this pump is utilized for solids handling, it must be capable of repeatedly passing non-compressible, spherical solids up to ____ inch in diameter. The motor shall be ____ HP designed for operation with a ____ phase, 60 HZ, ____ volt electrical supply. Each motor shall be connected for operation with ____ feet of power and control cable.

When the application requires, the motor shall be approved for operation in Class 1 Division 1, Groups C & D Areas by Factory Mutual (FM).

PUMP CONSTRUCTION

All major castings shall be of ASTM A-48, Class 40B gray, cast iron with smooth surfaces devoid of porosity, irregularities, or other defects. All exposed fasteners shall be of AISI 304 stainless steel. All exterior surfaces not constructed of stainless steel shall be protected by a factory-applied, two-part, high solids epoxy paint.

Sealing design between castings shall incorporate Nitrile (Buna-N) O-rings in controlled compression in two planes of the sealing interface. The interfaces shall be machined, metal-to-metal contacts and shall not require a specific torque on the securing fasteners to ensure sealing. Rectangular cross sectioned gaskets which require specific torque limits to achieve compression are susceptible to uneven compression and may be compressed beyond the point of permanent deformation; therefore they shall not be acceptable.

WET WELL INSTALLATION

For automatic operation in a wet well, an auto-coupling assembly shall be supplied for the retrieval of pumps, to eliminate the need for entering the wet well for service. This system shall consist of a permanently installed base elbow in the wet well and a removable guiding flange to be attached to the pump discharge. The auto-coupling discharge flange shall be ANSI Class 125 lb. cast iron in ____ inch size. Both the base elbow and the guiding flange shall be made of ASTM A-48, Class 40B cast iron. The guiding flange shall utilize a dual rail system with two rigid guide pipes connected to the base elbow to reliably provide a self-engaging, firm, leak-proof coupling between the

A Series Jacketed Sample Spec

pump discharge and the elbow. In order to maximize reliability of this sealing, systems that utilize a single rail, or non-rigid guiding systems such as cable or line shall not be considered acceptable.

Sealing shall be accomplished through the use of a field-replaceable, Nitrile (Buna-N) profile gasket that is axially and evenly compressed upon contact to positively seal the pump discharge against the base elbow. Sealing systems that rely on metal-to-metal contact faces are subject to leaking and blow-by and shall not be considered acceptable.

For ground or portable installation, a ring stand shall be supplied to attach to the bottom of the pump in order to prevent any part of the pump from bearing directly on the basin floor.

IMPELLER

The impeller shall be cast as one piece of ASTM A-48, Class 40B Cast Iron, statically and dynamically balanced. The impeller shall be of the single-vane closed (double-shrouded), multi-vane closed (double-shrouded), or multi-vane open (single-shrouded) non-clog design, and shall meet the Ten State Standards requirement for minimum solids passage of 3 inches. Upon request, the manufacturer must certify a test of a static solids passing test to confirm the supplied pump is capable of passing 3" non-compressible solids in a static configuration. Impellers that are not capable of passing a 3 inch, non-compressible solid in a static state, or which require axial movement in order to pass shall not be considered acceptable. Impellers that require adjustment over time in order to maintain proper tolerance to the volute shall not be acceptable.

VOLUTE

The volute shall be cast in one piece of ASTM A-48, Class 40B Cast Iron with smooth contours and surfaces to provide obstruction-free passageways with low friction losses. The discharge flange of the volute shall have a standard ANSI or DIN bolt pattern. Proprietary bolt patterns shall not be acceptable.

WEAR RING

On single-vane closed (double-shrouded) and multi-vane closed (double-shrouded) impellers, tolerance between the nose of the impeller and the suction flange of the volute shall be controlled by a pair of replaceable wear rings. A stationary wear ring cast from ASTM B505 Bronze shall be press fit into the volute suction, and an integral wear ring shall be cast into the nose of the impeller in ASTM A-48, Class 40B Cast Iron. Wear

systems that require routine adjustment in order to maintain tolerances shall not be acceptable.

BEARINGS

The shaft shall be supported by pre-lubricated, anti-friction bearings. These bearings shall be non-proprietary and shall be produced and branded by a major manufacturer of bearings. The bearings shall have an L-10 life of 100,000 hours at the pump's Best Efficiency Point (BEP). The lower, impeller-side bearing shall be a double-row, deep groove, angular contact ball bearing, axially-retained, to sustain both axial and radial loads. The upper, motor-end bearing shall be a single-row, deep groove ball bearing, axially floating, to sustain radial loads only.

SEALS

The motor shall be protected from water intrusion by a tandem mechanical seal arrangement. The mechanical seals shall be of a non-proprietary design and shall be produced and branded by a major manufacturer of mechanical seals. The seals shall operate in an isolated oil chamber, which shall provide lubrication and cooling. One seal shall prevent intrusion from the pumped medium into the oil chamber, and the second seal shall prevent intrusion from the oil chamber into the motor. Each seal shall utilize one stationary silicon-carbide seal face, and one rotating silicon carbide seal face positively driven by its own spring and utilize Nitrile (Buna-N) elastomers. The springs shall be protected from the pumped medium, and under no circumstances shall solid particles accumulate on the external spring and hamper its effectiveness. Seals shall not require routine maintenance except periodic inspection of the oil chamber.

In order to prevent damaging particles in the pumped media from interfering with the seal, the top shroud of the impeller shall maintain a close tolerance to a matching surface in the wall of the volute. This tolerance shall be small enough that potentially damaging particles in the pumped media are unable to pass. Arrangements that rely on cutting systems to reduce the size of particles or those that rely on directing particles away from the seal shall not be acceptable

Seal systems that utilize a common single or double spring acting between the upper and lower seal, any system that utilizes pressure differential to ensure proper sealing, seals utilizing mechanical locking devices such as set screws or pins to hold the seal in place, and any proprietary seal not produced and branded by a major mechanical seal manufacturer shall not be allowed.

SEAL FAILURE EARLY WARNING SYSTEM

In order to warn of seal failure and allow the pump to be shut down before moisture reaches the motor, the pump shall be supplied with an early warning system, consisting of a conductive seal probe to be installed in the seal oil chamber. This probe shall monitor for leakage and shall provide early warning of potential seal failure before moisture reaches the motor. Systems which utilize less reliable mechanical leakage detectors shall not be acceptable. Systems which rely upon detectors in the motor housing shall not be considered an early warning system and shall not be acceptable.

MOTOR

The motor shall be an air-filled, submersible, squirrel cage, induction-type motor of the NEMA type B design. The motor shall be housed in a watertight enclosure capable of continuous operation at a submergence of 65 feet, and made of ASTM A-48, Class 40B Cast Iron. Fitting the stator into the enclosure with the use of bolts, pins, or other fastening devices which would require penetration of the housing shall not be acceptable.

The stator windings shall be insulated with moisture-resistant Class-H insulation. In each phase winding, there shall be embedded a bi-metallic temperature sensor, wired in series and interlocked with the motor overload protection in the control panel. Any of these thermal switches shall cut out electric power if the temperature in its winding exceeds 140°C (284°F), and shall automatically reset when the winding temperature returns to normal conditions.

The motor shall be non-overloading through the selected performance curve and shall perform in accordance with NEMA MG1, Part 30. The motor shall be rated for continuous operation in environments up to 104°F or intermittently up to 140°F, and shall be capable of sustaining 15 starts per hour. Motors shall be available to meet NEMA MG1, Part 31 and VFD-rated if required.

When the application requires, the motor shall be approved for operation in Class 1 Division 1, Group C & D Areas by Factory Mutual (FM).

SHAFT

The pump and motor shaft shall be an integral, one-piece unit composed of AISI 430 Stainless Steel. Shafts that utilize carbon steel, two-piece or sleeved construction shall not be considered acceptable. The maximum allowable shaft deflection at the shaft seal shall not be more than 0.002 inches while within operating range.

CABLE ENTRY

Each cable entry assembly shall contain a cylindrical elastomer grommet, flanked by two washers, closely fitted to the cable O.D. A watertight seal shall be maintained by screwing a threaded cable entry gland into a cable inlet flange which bolts into the motor cap. The cable entry shall not require a specific torque to ensure watertight integrity. The gland shall incorporate a strain-relief and anti-kink feature that shall function independently from the separate sealing action. For pumps over 10.5 horsepower, an isolated junction chamber containing the terminal board shall be sealed from the motor by means of a watertight isolation plate.

When the application requires, the cable entry shall be drilled and potted to completely prevent gas intrusion. The assembly shall be non-removable to ensure the integrity is preserved, and shall be approved for operation in Class 1 Division 1, Group C & D Areas by Factory Mutual (FM).

COOLING

Motor cooling shall be accomplished through a cooling jacket encircling the motor housing. The jacket is filled during operation with the pumped liquid to provide sufficient cooling of the motor at any operating point on the selected performance curve. Directly utilizing the pumped liquid for cooling ensures the best possible transfer of heat. Impeller back vanes shall force circulation throughout the cooling jacket, and an air vent shall ensure air is not entrapped within the jacket. Cooling shall not require the use of external heat exchangers, fans, or an external supply of cooling liquid.

SCOPE

Furnish Qty. ____ HOMA Model _____, ____ inch discharge, electric submersible wastewater pump(s), each consisting of a single stage, non-clog, centrifugal pump, close-coupled to a squirrel cage induction type electric motor assembled in a single-body, watertight aggregate, capable of maintaining its watertight integrity submerged under 65 feet of water. The pumps(s) shall be designed to handle raw, unscreened sewage, storm water, sludge, or similarly contaminated liquid at an operating point of ____ GPM at ____ ft. TDH with a hydraulic efficiency of at least ____ %. Shut-off head shall be ____ ft. minimum. As this pump is utilized for solids handling, it must be capable of repeatedly passing non-compressible, spherical solids up to ____ inch in diameter. The motor shall be ____ HP designed for operation with a ____ phase, 60 HZ, ____ volt electrical supply. Each motor shall be connected for operation with ____ feet of power and control cable.

When the application requires, the motor shall be approved for operation in Class 1 Division 1, Groups C & D Areas by Factory Mutual (FM).

PUMP CONSTRUCTION

All major castings shall be of ASTM A-48, Class 40B gray, cast iron with smooth surfaces devoid of porosity, irregularities, or other defects. All exposed fasteners shall be of AISI 304 stainless steel. All exterior surfaces not constructed of stainless steel shall be protected by a factory-applied, two-part, high solids epoxy paint.

Sealing design between castings shall incorporate Nitrile (Buna-N) O-rings in controlled compression in two planes of the sealing interface. The interfaces shall be machined, metal-to-metal contacts and shall not require a specific torque on the securing fasteners to ensure sealing. Rectangular cross sectioned gaskets which require specific torque limits to achieve compression are susceptible to uneven compression and may be compressed beyond the point of permanent deformation; therefore they shall not be acceptable.

WET WELL INSTALLATION

For automatic operation in a wet well, an auto-coupling assembly shall be supplied for the retrieval of pumps, to eliminate the need for entering the wet well for service. This system shall consist of a permanently installed base elbow in the wet well and a removable guiding flange to be attached to the pump discharge. The auto-coupling discharge flange shall be ANSI Class 125 lb. cast iron in ____ inch size. Both the base elbow and the guiding flange shall be made of ASTM A-48, Class 40B cast iron. The guiding flange shall utilize a dual rail system with two rigid guide pipes connected to the base elbow to reliably provide a self-engaging, firm, leak-proof coupling between the

A Series Non-Jacketed Sample Spec

pump discharge and the elbow. In order to maximize reliability of this sealing, systems that utilize a single rail, or non-rigid guiding systems such as cable or line shall not be considered acceptable.

Sealing shall be accomplished through the use of a field-replaceable, Nitrile (Buna-N) profile gasket that is axially and evenly compressed upon contact to positively seal the pump discharge against the base elbow. Sealing systems that rely on metal-to-metal contact faces are subject to leaking and blow-by and shall not be considered acceptable.

For ground or portable installation, a ring stand shall be supplied to attach to the bottom of the pump in order to prevent any part of the pump from bearing directly on the basin floor.

IMPELLER

The impeller shall be cast as one piece of ASTM A-48, Class 40B Cast Iron, statically and dynamically balanced. The impeller shall be of the single-vane closed (double-shrouded), multi-vane closed (double-shrouded), or multi-vane open (single-shrouded) non-clog design, and shall meet the Ten State Standards requirement for minimum solids passage of 3 inches. Upon request, the manufacturer must certify a test of a static solids passing test to confirm the supplied pump is capable of passing 3" non-compressible solids in a static configuration. Impellers that are not capable of passing a 3 inch, non-compressible solid in a static state, or which require axial movement in order to pass shall not be considered acceptable. Impellers that require adjustment over time in order to maintain proper tolerance to the volute shall not be acceptable.

VOLUTE

The volute shall be cast in one piece of ASTM A-48, Class 40B Cast Iron with smooth contours and surfaces to provide obstruction-free passageways with low friction losses. The discharge flange of the volute shall have a standard ANSI or DIN bolt pattern. Proprietary bolt patterns shall not be acceptable.

WEAR RING

On single-vane closed (double-shrouded) and multi-vane closed (double-shrouded) impellers, tolerance between the nose of the impeller and the suction flange of the volute shall be controlled by a pair of replaceable wear rings. A stationary wear ring cast from ASTM B505 Bronze shall be press fit into the volute suction, and an integral wear ring shall be cast into the nose of the impeller in ASTM A-48, Class 40B Cast Iron. Wear

A Series Non-Jacketed Sample Spec

systems that require routine adjustment in order to maintain tolerances shall not be acceptable.

BEARINGS

The shaft shall be supported by pre-lubricated, anti-friction bearings. These bearings shall be non-proprietary and shall be produced and branded by a major manufacturer of bearings. The bearings shall have an L-10 life of 100,000 hours at the pump's Best Efficiency Point (BEP). The lower, impeller-side bearing shall be a double-row, deep groove, angular contact ball bearing, axially-retained, to sustain both axial and radial loads. The upper, motor-end bearing shall be a single-row, deep groove ball bearing, axially floating, to sustain radial loads only.

SEALS

The motor shall be protected from water intrusion by a tandem mechanical seal arrangement. The mechanical seals shall be of a non-proprietary design and shall be produced and branded by a major manufacturer of mechanical seals. The seals shall operate in an isolated oil chamber, which shall provide lubrication and cooling. One seal shall prevent intrusion from the pumped medium into the oil chamber, and the second seal shall prevent intrusion from the oil chamber into the motor. Each seal shall utilize one stationary silicon-carbide seal face, and one rotating silicon carbide seal face positively driven by its own spring and utilize Nitrile (Buna-N) elastomers. The springs shall be protected from the pumped medium, and under no circumstances shall solid particles accumulate on the external spring and hamper its effectiveness. Seals shall not require routine maintenance except periodic inspection of the oil chamber.

In order to prevent damaging particles in the pumped media from interfering with the seal, the top shroud of the impeller shall maintain a close tolerance to a matching surface in the wall of the volute. This tolerance shall be small enough that potentially damaging particles in the pumped media are unable to pass. Arrangements that rely on cutting systems to reduce the size of particles or those that rely on directing particles away from the seal shall not be acceptable

Seal systems that utilize a common single or double spring acting between the upper and lower seal, any system that utilizes pressure differential to ensure proper sealing, seals utilizing mechanical locking devices such as set screws or pins to hold the seal in place, and any proprietary seal not produced and branded by a major mechanical seal manufacturer shall not be allowed.

SEAL FAILURE EARLY WARNING SYSTEM

In order to warn of seal failure and allow the pump to be shut down before moisture reaches the motor, the pump shall be supplied with an early warning system, consisting of a conductive seal probe to be installed in the seal oil chamber. This probe shall monitor for leakage and shall provide early warning of potential seal failure before moisture reaches the motor. Systems which utilize less reliable mechanical leakage detectors shall not be acceptable. Systems which rely upon detectors in the motor housing shall not be considered an early warning system and shall not be acceptable.

MOTOR

The motor shall be an air-filled, submersible, squirrel cage, induction-type motor of the NEMA type B design. The motor shall be housed in a watertight enclosure capable of continuous operation at a submergence of 65 feet, and made of ASTM A-48, Class 40B Cast Iron. Fitting the stator into the enclosure with the use of bolts, pins, or other fastening devices which would require penetration of the housing shall not be acceptable.

The stator windings shall be insulated with moisture-resistant Class-H insulation. In each phase winding, there shall be embedded a bi-metallic temperature sensor, wired in series and interlocked with the motor overload protection in the control panel. Any of these thermal switches shall cut out electric power if the temperature in its winding exceeds 140°C (284°F), and shall automatically reset when the winding temperature returns to normal conditions.

The motor shall be non-overloading through the selected performance curve and shall perform in accordance with NEMA MG1, Part 30. The motor shall be rated for continuous operation in environments up to 104°F or intermittently up to 140°F, and shall be capable of sustaining 15 starts per hour. Motors shall be available to meet NEMA MG1, Part 31 and VFD-rated if required.

When the application requires, the motor shall be approved for operation in Class 1 Division 1, Group C & D Areas by Factory Mutual (FM).

SHAFT

The pump and motor shaft shall be an integral, one-piece unit composed of AISI 430 Stainless Steel. Shafts that utilize carbon steel, two-piece or sleeved construction shall not be considered acceptable. The maximum allowable shaft deflection at the shaft seal shall not be more than 0.002 inches while within operating range.

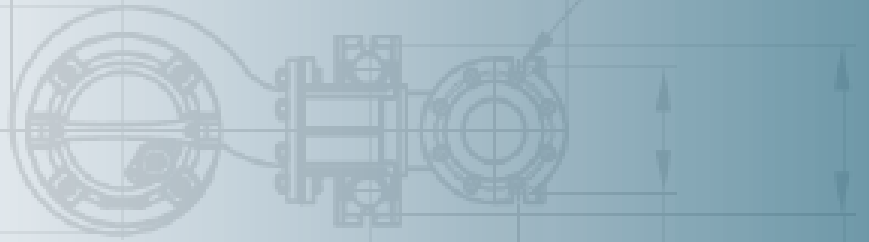
CABLE ENTRY

Each cable entry assembly shall contain a cylindrical elastomer grommet, flanked by two washers, closely fitted to the cable O.D. A watertight seal shall be maintained by screwing a threaded cable entry gland into a cable inlet flange which bolts into the motor cap. The cable entry shall not require a specific torque to ensure watertight integrity. The gland shall incorporate a strain-relief and anti-kink feature that shall function independently from the separate sealing action. For pumps over 10.5 horsepower, an isolated junction chamber containing the terminal board shall be sealed from the motor by means of a watertight isolation plate.

When the application requires, the cable entry shall be drilled and potted to completely prevent gas intrusion. The assembly shall be non-removable to ensure the integrity is preserved, and shall be approved for operation in Class 1 Division 1, Group C & D Areas by Factory Mutual (FM).



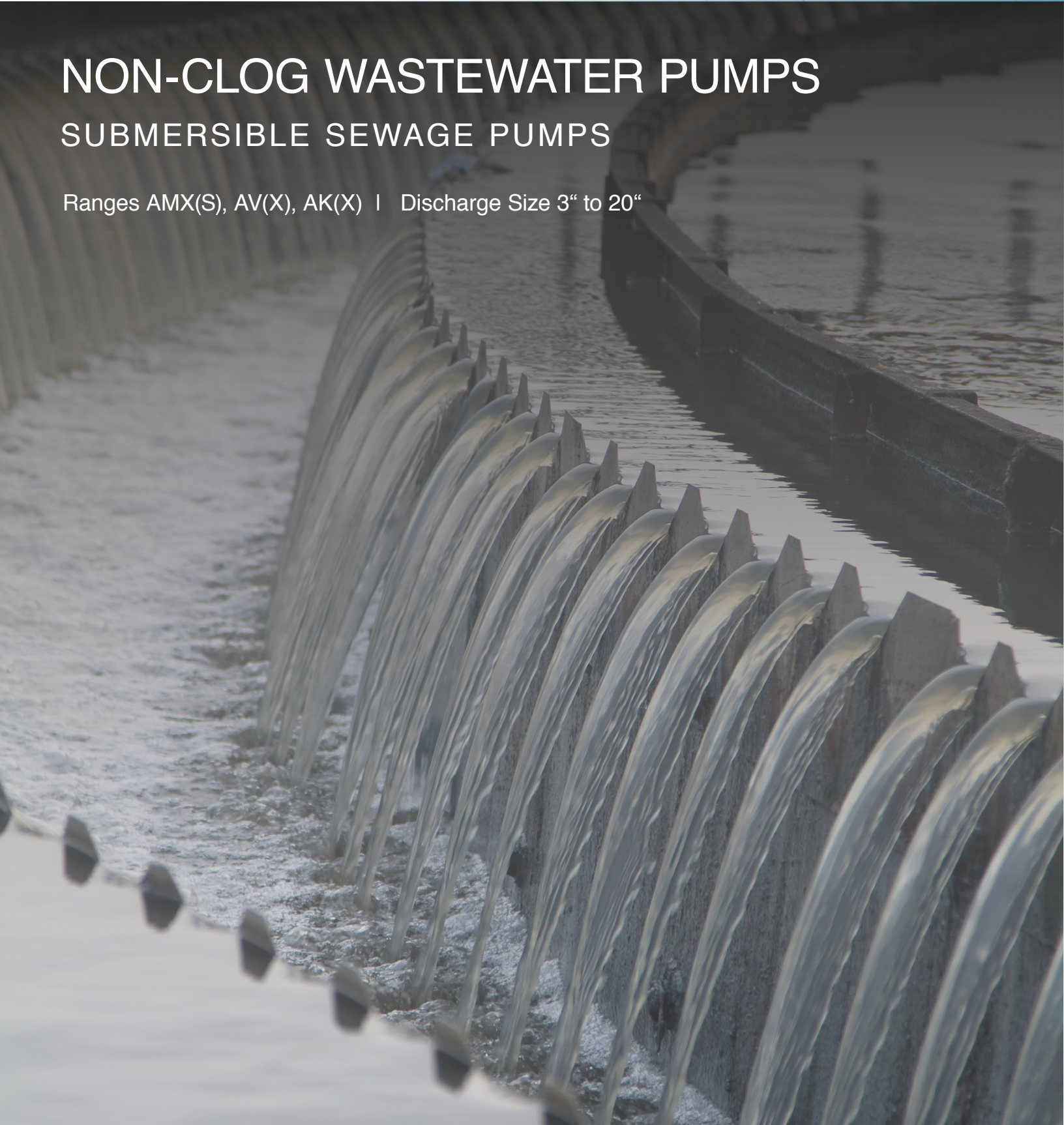
A Series Overview



NON-CLOG WASTEWATER PUMPS

SUBMERSIBLE SEWAGE PUMPS

Ranges AMX(S), AV(X), AK(X) | Discharge Size 3" to 20"





HIGHER PERFORMANCE TO MEET EVERY CHALLENGE

COMMITMENT TO QUALITY

HOMA submersible wastewater pumps operate worldwide in numerous domestic, municipal, and industrial applications.

Decades of experience in the design and manufacturing of submersible pumps, plus uncompromising attention to quality in every detail, ensure the utmost reliability and long service life of all HOMA products.

FLEXIBLE SYSTEM COMPONENTS FOR PROBLEM-FREE INSTALLATIONS

HOMA combines efficiency, reliability, and robust design with a flexibility to fit every project. With a wide variety of pumps for various applications and installations, as well as modifications available upon request, HOMA can help provide a solution for your pumping problem.

For operation in hazardous locations, HOMA pumps are also available in explosion proof variants.

PROVEN TECHNOLOGY FOR YOUR APPLICATION

MULTIPLE CHALLENGES INDIVIDUAL SOLUTIONS

HOMA submersible wastewater pumps are designed for pumping sewage, sludge, effluent, or surface water, including liquids containing high solids or fibrous content.

They are installed in domestic, municipal, industrial, and agricultural pumping applications. For chemically aggressive liquids, specific components like impellers, volutes or complete units are also available in corrosion resistant materials like 316 or duplex stainless steels, and bronze. HOMA submersible pumps can be supplied for a wide range of tough applications:

- Municipal Wastewater
- Industrial Wastewater
- Domestic Wastewater
- Treatment Plants
- Large Pump Stations
- Industrial Applications
- Oil and Gas
- Power Plants
- Mining
- Chemical Processing
- Shipbuilding / Offshore

MORE POWER FOR EVERY APPLICATION

Whether for water supply in power plants, for mining leachate applications, for aggressive media dewatering, for industrial wastewater, or for ballast water in the shipbuilding sector, the “A” series provides proven features, such as:

- Various impeller designs, depending on the pumped liquid
- Motors for continuous operation, with or without cooling jacket
- High-quality materials
- Robust and reliable construction



For chemically aggressive liquids: Stainless steel submersible pumps.



Pumps are tested in our modernized test center in order to guarantee HOMA's renowned quality standards.



FOR GREATER RELIABILITY AND LONGEVITY

MORE ADVANTAGES IN ALL OPERATING MODES

The motors are designed for continuous operation duty, or intermittent duty with up to 15 starts per hour. In addition to a fully submerged motor housing in wet well installation, a jacket cooled motor-variant is available for operation with a non-fully submerged motor or for dry well installation. Pumps with enclosed single-channel impellers are designed for intermittent operation, normally in automatic level-controlled wet or dry well sump installations.

They are also suitable for limited continuous operation. Enclosed multichannel impeller pumps are designed for unlimited continuous operation, such as industrial water supply.

HIGH QUALITY IN DESIGN AND MATERIALS – LESS MAINTENANCE AND FAILURES

Quality can be measured – HOMA submersible wastewater pumps are characterized by the robust design and high quality materials of all components.

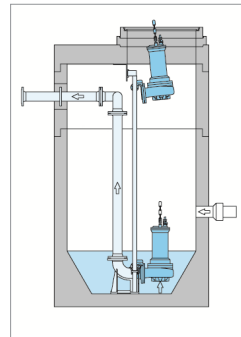


THE RIGHT INSTALLATION FOR EVERY PUMP STATION

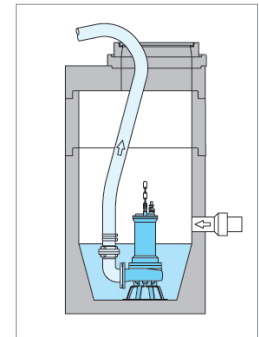
MOTOR SELECTION

PERMANENT WET WELL INSTALLATION

Submerged autocoupling guide rail system for automatic connection and disconnection of the pump from the pipework without needing to enter the sump. All maintenance or repair work can be done outside the sump. When lowered into operating position, the weight of the pump ensures leak-proof discharge connection.



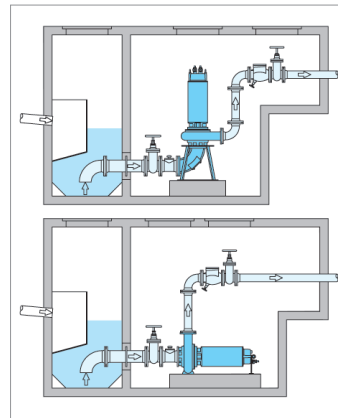
Permanent wet well installation



Transportable wet well installation

TRANSPORTABLE WET WELL INSTALLATION

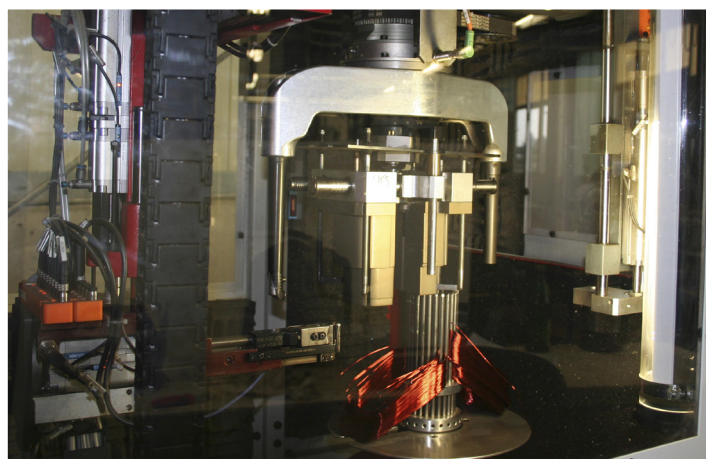
Submerged pump mounted on a ring base stand or temporary, service, or emergency operation. Discharge connection with pipe or hose.



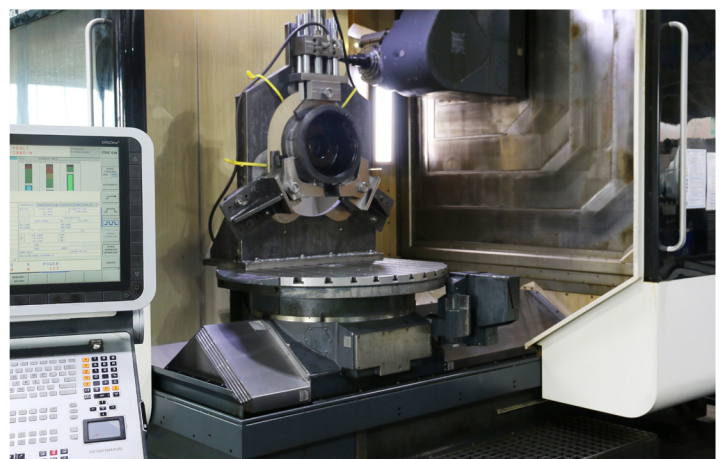
Permanent dry well installation

PERMANENT DRY WELL INSTALLATION, VERTICAL OR HORIZONTAL

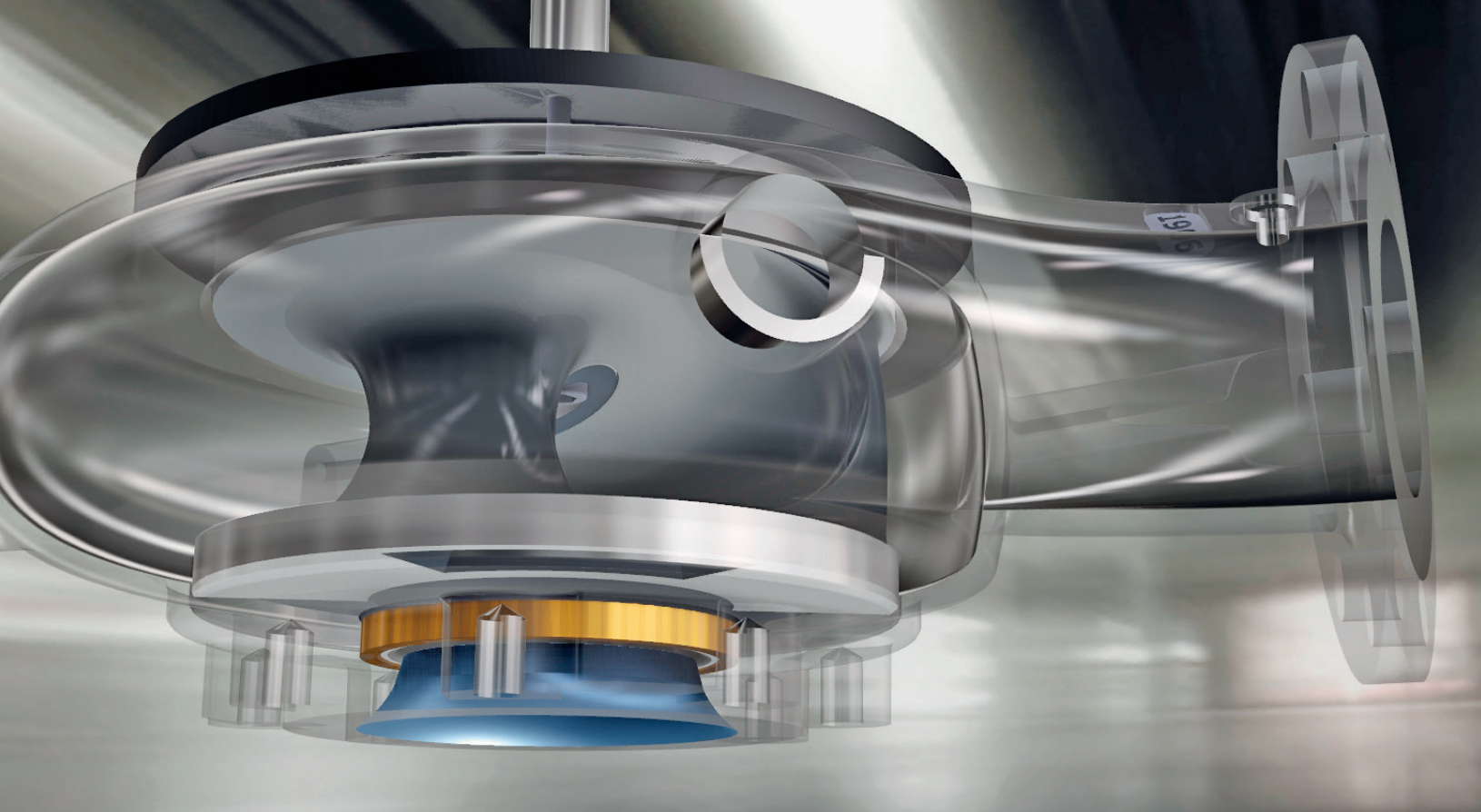
Flood-proof installation for pump stations with separate collection sump. Fixed flanged connection of suction and discharge pipe.



In-house motor production allows various voltages and frequencies.



By machining all needed components in our own workshop on modern precision equipment we are able to assure efficiency and flexibility.



EFFTEC MOTORS AND AMS HYDRAULICS

AMS: IMMUNITY TO CLOGGING

The makeup of wastewater has changed greatly in recent years, with a substantial increase in solids content due to water conserving fixtures and more robust throwaway cleaning products. In order to ensure reliable operation in these environments, our new AMS hydraulics rely on a closed, single-vane impeller with large solids passages.

Our impellers and pump housings have been redesigned and optimized with the latest flow-simulation software and validated with extensive field testing. The result is improved hydraulic efficiencies of up to 81 percent, with a low risk of blockage resulting in sustained performance. In combination with HOMA's proven submersible motors, the new AMS hydraulics provide the next level of clog-free operation.

EFFTEC: INNOVATIVE TECHNOLOGY

In order to achieve the highest possible overall efficiency while maintaining low energy consumption we introduced the new EffTec series of motors. In combination with the new AMS hydraulics, the new pump generation is setting new standards in economic efficiency and reliability.

The newly developed PermaCool® system is forward thinking. This permanent motor cooling now provides the option of fitting the units for submerged or drywell installation. The new design (patent pending) ensures that the cooling jacket cannot be clogged with solids.

Together with the low running temperature of the EffTec motors, the PermaCool system puts a low thermal load on all components, thus ensuring their long lifetime.

GREATER RELIABILITY THROUGH INTELLIGENT ACCESSORIES

VICON: FOR A LONG PUMP LIFE

Monitoring the condition of equipment is a key element where quality, reliability, energy savings, and targeted maintenance play an important role. Submersible pumps, which are submerged in the pumped media are a special case. Unplanned repairs can be costly, often resulting in an unacceptable timeline. HOMA VICON provides permanent and reliable monitoring, as well as early detection of blockages and any damage that may occur.

HOMA VICON can detect an obstruction or damage to the hydraulics, poor operating points, bearing damage, or piping problems. It displays these problems to the operator, and can also stop the pump in case of an emergency. By optimizing the system and providing early detection of unfavorable operating conditions, HOMA VICON contributes to energy savings and life cycle cost reduction.

FLUSH VALVES: A CLEAN SOLUTION

Pump stations must be cleaned regularly due to sedimentation or the formation of a scum layer. The results are unpleasant odors, clogged level controllers and a reduction in operating performance, as well as high costs due to downtime and necessary cleaning or maintenance work. HOMA provides the solution for these problems. The new HOMA flushing valves FV 25 and FV 50 reliably prevent the accumulation of solids and grease in pits.

When the pumping process starts, a portion of the pumped liquid is routed back into the pit through the opened valve. This creates a stream that disperses any solids in the media and allows them to be pumped out without difficulty. The valve nozzle can be directed either at the bottom of the pit to prevent sedimentation or upwards to prevent the formation of a scum layer, especially on liquids with high grease content.



Reliable Monitoring - the integrated pump vibration diagnostic system
HOMA VICON



Connection for automatic flush valve FV (optional)



RANGES AND PUMP TYPES

MOTOR SELECTION

SPEED:

For the standard hydraulic range, the motors are designed with the following speeds.

- 3450 rpm = 2-pole
- 1750 rpm = 4-pole
- 1160 rpm = 6-pole

Motors are available standard in 230 or 460V, with additional operating voltages available upon request.

SOFT START DEVICES AND VFDS:

All motors are available upon request as VFD rated for operation with frequency converter.

EXPLOSION PROTECTION:

In addition to the standard version, motors are also available explosion proof according to FM Class 1, Div. 1, Groups C & D Hazardous Area Classifications.

DRY WELL VARIANT:

Besides the version for submerged operation, all pumps are also available with cooling jacket for dry well or non-submerged operation.

MOTOR MONITORING:

All motors are supplied with temperature sensors in the winding, bi-metallic sensors (standard) or PTC sensors (on request).

Additional monitoring devices (bearing temperature, motor housing moisture) on request.

PUMP TYPE CODE

Impeller	Discharge	Spherical clearance	Speed	Motor power	Motor frame size	Jacket cooled	Monitoring devices	Explosion proof
				Motor				
AMX(S)	4	4	4	5.5	T	(U)	(C) + (S)	FM
AMX(S) = enclosed single channel AV(X) = Vortex AK(X) = enclosed multi channel	3 = 3" (DN 80) 4 = 4" (DN 100) 6 = 6" (DN150)	3 = 3" (80 mm) 4 = 4" (100 mm)	2-pole = 3450 rpm 4-pole = 1750 rpm 6-pole = 1160 rpm	P2 (hp)	C, D, T, P, F, G, H	Motor with cooling jacket U = open circuit pumped liquid cooling	C = Oil chamber seal condition monitoring probe S = moisture sensor in stator chamber	

RANGES AND HYDRAULICS

HYDRAULIC SELECTION

Discharge and suction flange

- 3 inch - 20 inch

Reducing adapters for different auto-coupling system and valve dimensions are available.

IMPELLER:

A range of different impeller designs are available to provide optimum performance and reliability with various liquids and operating conditions.

IMPELLER SPHERICAL CLEARANCE:

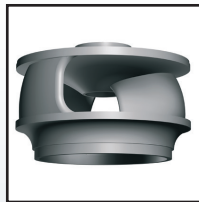
The pumps are available with impeller spherical clearances from 3 to 4 inches according to pump range.



AMX(S)

Enclosed single channel impeller

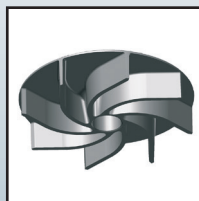
For liquids containing impurities and sludge with solid particles or long fibers. New generation of non clogging impellers with increased hydraulic efficiencies.



AK(X)

Enclosed Multi Channel Impeller

For liquids containing impurities and sludge with solid particles.



AV(X)

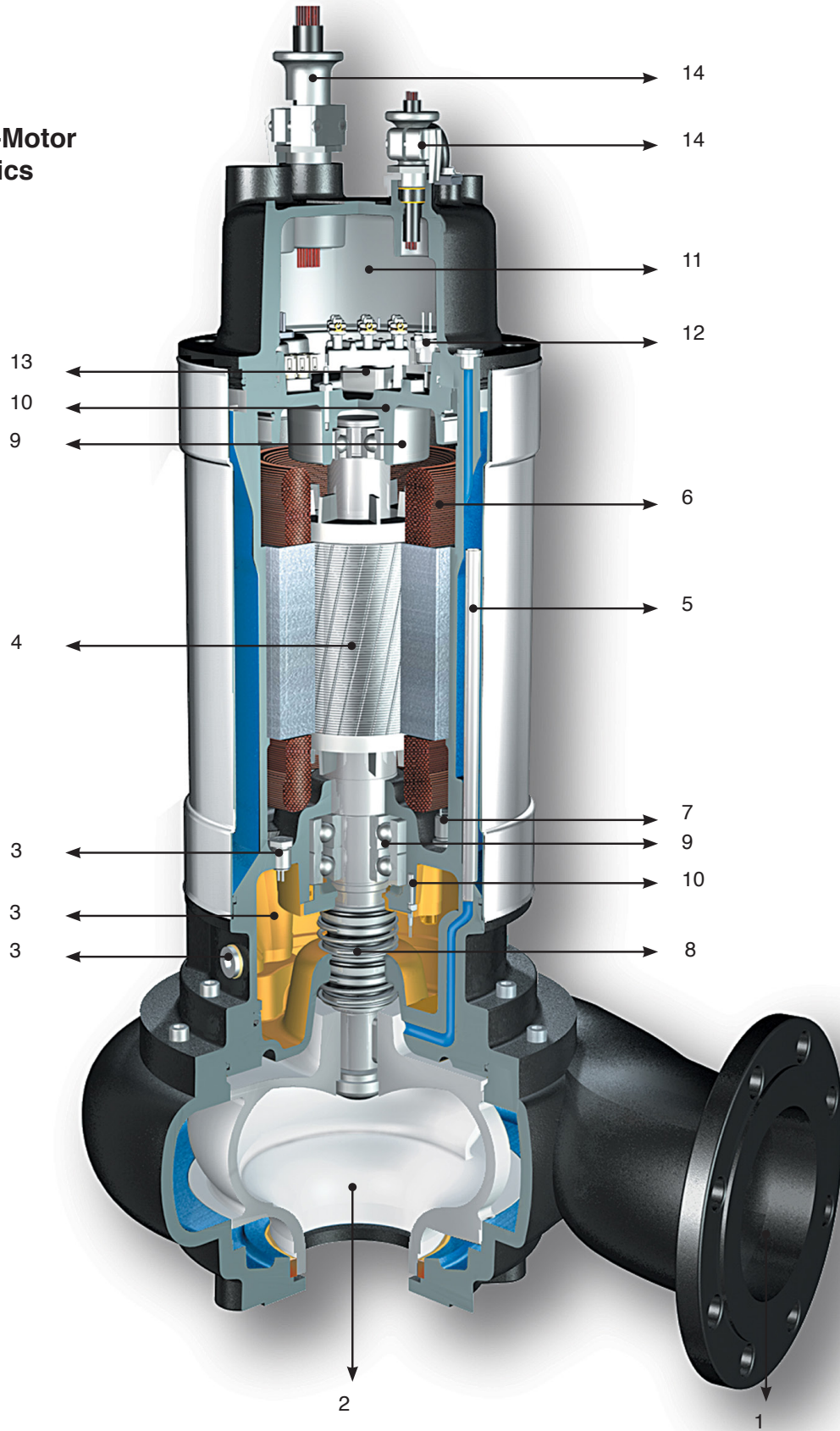
Vortex impeller

For liquids containing a high level of impurities or fibrous matter.

HOMA A-SERIES PUMPS - PROVEN QUALITY

Quality can be measured – HOMA submersible wastewater pumps are characterized by their robust design, and high quality materials of all components.

**Model shown: PU-Motor
with AMX Hydraulics**



HIGH QUALITY MATERIALS

1. DISCHARGE

- Class 125 lb ANSI/DIN Flange in 3 in - 20 in

2. NON-CLOGGING IMPELLERS

- Enclosed single channel impeller with replaceable wear ring
- Enclosed multi channel impeller with replaceable wear ring
- Vortex impeller

3. OIL CHAMBER

Separate large oil chamber, lubricating and cooling the mechanical seals. Electronic seal condition monitoring is standard.

4. MOTOR

Single or three phase electric motor with 2, 4 or 6-pole winding. Class H Insulation, IP 68 Protection.

Explosion protection (FM):

In addition to the standard version, motors are also available explosion proof according to FM Class 1, Div. 1, Groups C & D Hazardous Area Classifications.

5. MOTOR COOLING

Motors for submerged operation are cooled by the surrounding liquid. For dry well or non-submerged operation, motors are available with a cooling jacket, providing a cooling circulation of water from the pump volute (model U).

Alternatively, a closed circuit liquid cooling system is available without directly using the pumped liquid for the cooling circuit, providing the heat exchange through a contact surface between heat exchange chamber and pump chamber.

MATERIALS

Motor housing	ASTM A48 Class 40B cast iron
Pump housing	ASTM A48 Class 40B cast iron
Impeller	ASTM A48 Class 40B cast iron
Wear rings	Bronze ¹⁾
Motor shaft	Stainless steel
Mechanical seals	Silicon-carbide / Silicon-carbide
Motor cooling jacket (model U and L)	Stainless steel
Seals and O-rings	Nitrile (Buna N)
Cable	H07RN-F (Plus) ⁴⁾

1) also available in stainless steel
2) also available in bronze

3) also available in Viton
4) shielded cable on request

6. THERMAL SENSOR (BI-METAL)

Embedded in the motor winding.
PTC sensors available on request.

7. MOISTURE MONITORING IN STATOR CHAMBER

Available on request.

8. SHAFT SEALS

Two independently working silicon-carbide mechanical seals in tandem arrangement.

9. SHAFT BEARING

Maintenance-free, pre-lubricated ball bearings with a B10 life of 100,000 hours.

10. TEMPERATURE MONITORING OF THE SHAFT BEARINGS

Available on request.

11. CABLE JUNCTION CHAMBER

Separate junction chamber standard from 13 hp and larger.

12. ELECTRONIC MOISTURE SENSOR IN JUNCTION CHAMBER

Available on request.

13. HOMA VICON - PUMP VIBRATION DIAGNOSTIC SYSTEMS

HOMA VICON can detect an obstruction or damage to the hydraulics, poor operating points, bearing damage, or piping problems. It displays these problems to the operator, and can also stop the pump in case of an emergency.

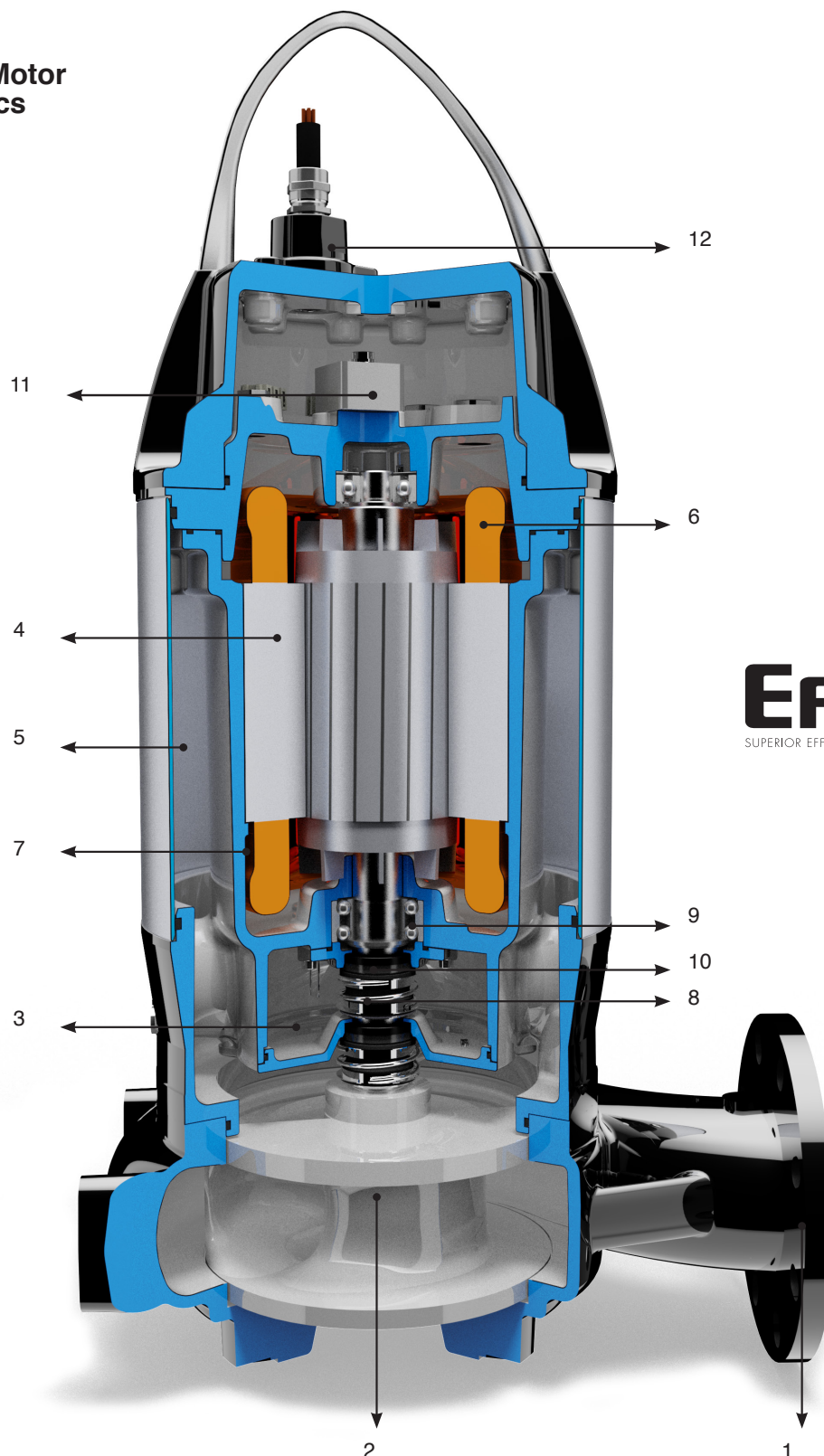
14. PRESSURE SEALED, STRAIN RELIEF CABLE ENTRY

Available on request.

NEW EFFTEC-MOTORS: INNOVATIVE TECHNOLOGY - GREAT EFFICIENCY

All motors in the EffTec series are equipped with the newly developed PermaCool® system. This permanent motor cooling now gives you the option of fitting the units for submerged or drywell installation. The new design - patent pending - ensures that the cooling jacket cannot be clogged with solids. In combination with our new AMS hydraulics, the new EffTec series of pumps sets a trend for economic efficiency and reliability.

Model shown: ET-Motor with AMS-Hydraulics



EFFTEC[®]
SUPERIOR EFFICIENCY - SUPERIOR PERFORMANCE

PERMANENT MOTOR COOLING:
PERMACOOL®

1. DISCHARGE

- Class 125 lb ANSI/DIN Flange in 3 in, 4 in, or 6 in

2. NON-CLOGGING IMPELLERS

- Enclosed single channel impeller with large spherical clearance. Replaceable wear ring.
- Available for installation on all A Series non-clog hydraulics from 3 to 13 horsepower.

3. OIL CHAMBER

Oil-filled seal chamber with port for visual inspection. Electronic seal condition monitoring is standard.

4. MOTOR

Single or three phase electric motor with 2, 4-or 6-pole winding. Class H Insulation, IP 68 Protection.

Explosion protection (FM):

In addition to the standard version, all motors are also available explosion proof according to FM Class 1, Div. 1, Groups C & D Hazardous Area Classifications.

5. MOTOR COOLING PERMACOOL

This permanent motor cooling now gives you the option of fitting the units for submerged or drywell installation. Together with the low motor temperature of the EffTec motors, the PermaCool system puts a low thermal load on all components, thus ensuring their long useful lifetime.

MATERIALS

Motor housing	ASTM A48 Class 40B cast iron
Pump housing	ASTM A48 Class 40B cast iron
Impeller	ASTM A48 Class 40B Cast Iron 1) 2)
Wear rings	Bronze 1)
Motor shaft	Stainless steel
Mechanical seals	Silicon Carbide/Silicon Carbide
Cooling jacket	Stainless steel
Seals and O-rings	Nitrile (Buna N)
Cable	H07RN-F (Plus) 4)

1) also available in stainless steel
2) also available in bronze

3) also available in Viton
4) shielded cable on request

6. THERMAL SENSOR (BI-METAL)

Embedded in the motor winding. PTC sensors available on request.

7. MOISTURE MONITORING
IN STATOR CHAMBER

Available on request.

8. SHAFT SEALS

Two independently working silicon-carbide mechanical seals in tandem-arrangement.

9. SHAFT BEARING

Maintenance-free, prelubricated ball bearings with a B10 life of 100,000 hours.

10.TEMPERATURE MONITORING OF
THE SHAFT BEARINGS

Available on request.

11.HOMA VICON - PUMP VIBRATION
DIAGNOSTIC SYSTEMS

HOMA VICON can detect an obstruction or damage to the hydraulics, poor operating points, bearing damage, or conduit problems. It displays these problems to the operator, and can also stop the pump in case of an emergency.

12. PRESSURE SEALED, STRAIN RELIEF
CABLE ENTRY

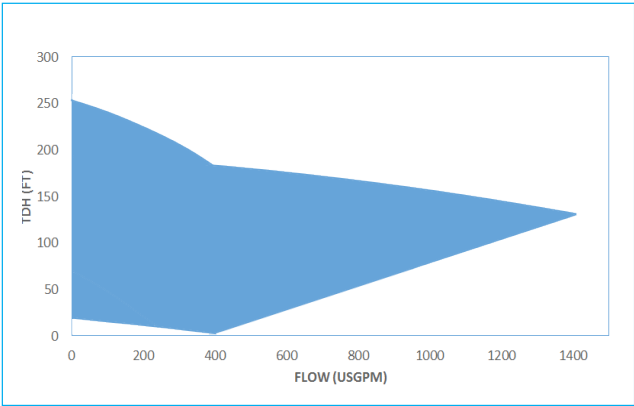
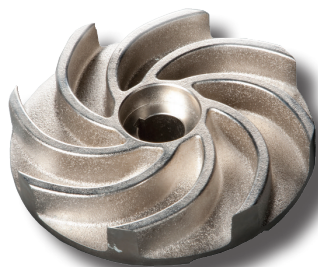
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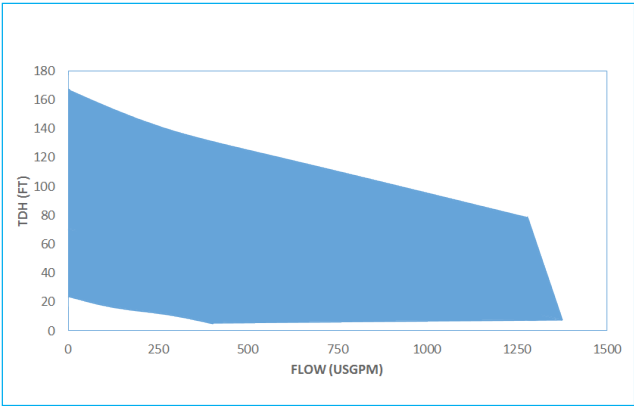
The new innovative PermaCool motor cooling

HYDRAULIC RANGES

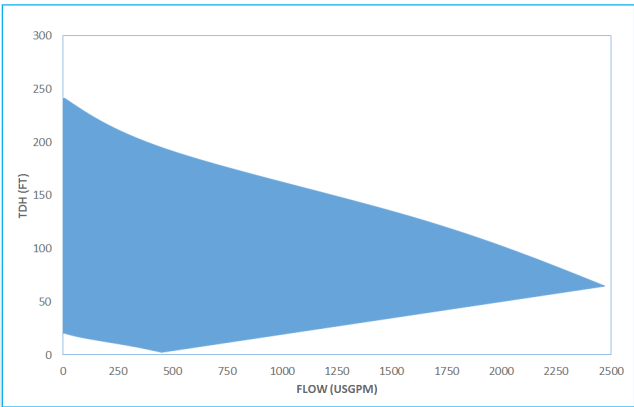
AV(X)



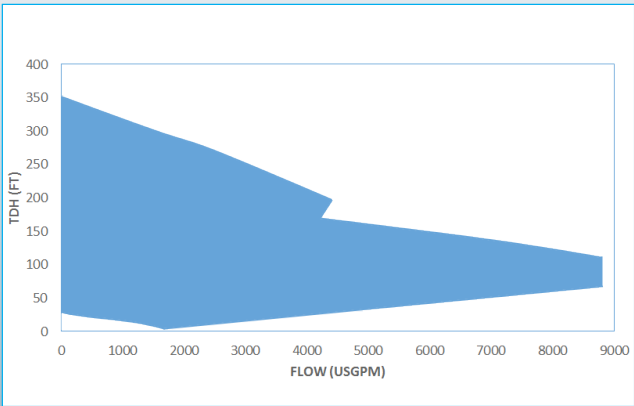
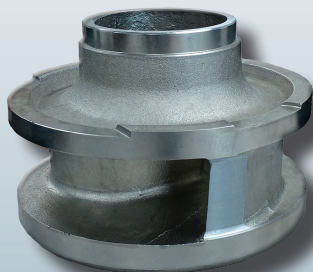
AMS



AMX



AK(X)



OPTIONS AND ACCESSORIES

Every problem has a unique solution. In order to fit the specific needs of your installation, HOMA offers a wide variety of options and accessories for your pump, as well as additional products, such as mixers.

STAINLESS STEEL WEAR RING SETS

Hardened 410 stainless steel wear ring system provides long lasting wear ring configuration resistant to both erosion and corrosion, maintaining pump efficiency.



IMPELLER & VOLUTE COATINGS/ TREATMENTS

Belzona, Teflon, Plasma Ion and various ceramic coatings are offered to protect impeller & volute from wear or corrosion. Smooth finish serves to prevent ragging while wear resistant impeller surfaces maintain efficiency.



STAINLESS STEEL SUMP FLUSH VALVES

Sump Flush Valves keep rags and sedimentation to a minimum, preventing build-up of large entwined solids and floating debris. Keeps pumps operating at their peak efficiencies and avoids costly pump clogs.



STAINLESS STEEL MIXERS

The HOMA CHRS Series of mixers brings the proven and durable design of our stainless pump series to our line of submersible mixers.





STAINLESS STEEL MIXERS CHRS

HOMA CHRS-Series stainless steel mixers have application in municipal and industrial wastewater treatment, industrial processing, agriculture, and many others. The robust design of the mixers assure trouble-free operation even under the most demanding conditions.

The hydraulically optimized design of the propeller and motor unit results in outstanding efficiency and excellent mixing performance with minimal flow losses.



HOMA PRODUCT RANGE

- Propeller pumps
- Submersible sewage pumps
- Wastewater disposal units
- Mixers and flow generators
- Submersible wastewater pumps
- Injector systems for tank cleaning
- Submersible grinder pumps with cutter system



FIND US ON FACEBOOK!
facebook.com/homapumpen



WORLDWIDE PRESENCE

HOMA pumps are installed in more than 60 countries around the world – in countless applications.

Our products comply with international safety and quality standards and are certified by many institutions and organizations responsible for national wastewater treatment standards.



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e-Mail: info@homa-pumpen.de Internet: www.homa-pumpen.de

We reserve the right to alter our specifications without notice!

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PTI2215-0618

The following application limitations are provided to establish a working range for applying HOMA Submersible Pumps. ***They do not represent the absolute application limits of the pumps.*** For applications that exceed these limits, or for any special applications, please consult the HOMA Application Engineering Group.

Duty Cycle:

Continuous Duty: More than 8 Hrs. of continuous operation or more than 12 hrs. per 24 hr. period.

Intermittent Duty: Less than 8 Hrs. of continuous operation with a total of less than 12 hrs. per 24 hr. period.

Maximum Allowable Number of Starts per Hour:

15, or more depending on the motor size, ambient and operating conditions.

Operating Temperature Limits:

Wet Pit

Continuous Duty: 110° F

Intermittent Duty: 155° F

Dry Pit

Internally Cooled: 110° F Liquid Temperature

Externally Cooled: 160° F or Consult Factory

Note: Pumps can withstand a short duration of elevated temperature well beyond the limits published (ex. Boiler Blowdown into sump). Please consult factory with specific application parameters.

Minimum Submergence:

For optimal cooling, motor should be completely submerged at all times. In pump-down systems, fluid level should not fall below one discharge diameter above the top of the volute, and pump must be re-submerged between cycles. For continuous operation with a VFD, level should not be maintained below the top of the motor and fluid level should not fall below one discharge diameter above the top of the volute.

Percentage of Solids by Weight: 4% (Maximum)

PH Range: 6 - 11 for standard construction pumps.

Viscosity Limitations: Consult Factory above 100SSU.

Specific Gravity Limitation: Consult Factory above 1.1 S.G.

Voltage Supply Variation: +5%/-10% of the pump nameplate voltage.

Frequency Supply Variation: +/- 1% of the Pump Nameplate frequency.



External

HOMA provides, as standard, pump and motor cast iron components in ASTM A48 Class 40 Cast Iron. While ASTM A48 Class 30 is more commonly used in pump component applications due its ease of machining, HOMA believes that the additional strength and hardness are of sufficient benefit to our customers to warrant its use.

ASTM A48 Grade	Ultimate Tensile Strength (UTS)	Brinell Hardness
Class 30	30,000 psi	187-241
Class 35	35,000 psi	207-255
Class 40	40,000 psi	217-269

For extreme applications, HOMA offers 316 stainless steel or a variety of Duplex stainless steel castings with pump curves and hydraulic characteristics identical to cast iron.



HOMA offers several impeller designs in the A series: the AMS and AMX single vane impellers, the AK and AKX multi-vane impellers, and the AV and AVX vortex impellers, all balanced according to ISO standard 1940 Grade 6.3. The standard material is ASTM A48 Class 40 Cast Iron, however optional materials include Ductile Iron, Bronze, 316 Stainless Steel, and High Chrome Iron. Other options include various surface hardening treatments, such as Plasma Ion Nitriding, or special coatings for aggressive applications, such as Belzona Supermetalgilde.

AMS

The AMS impeller has a single vane with 3" to 4" spherical solids capacity depending on the model.



AK(X)

The AK and AKX impellers are 2 or 3 vane impellers with a range of 3" solids capacity up to 6" on the largest models.

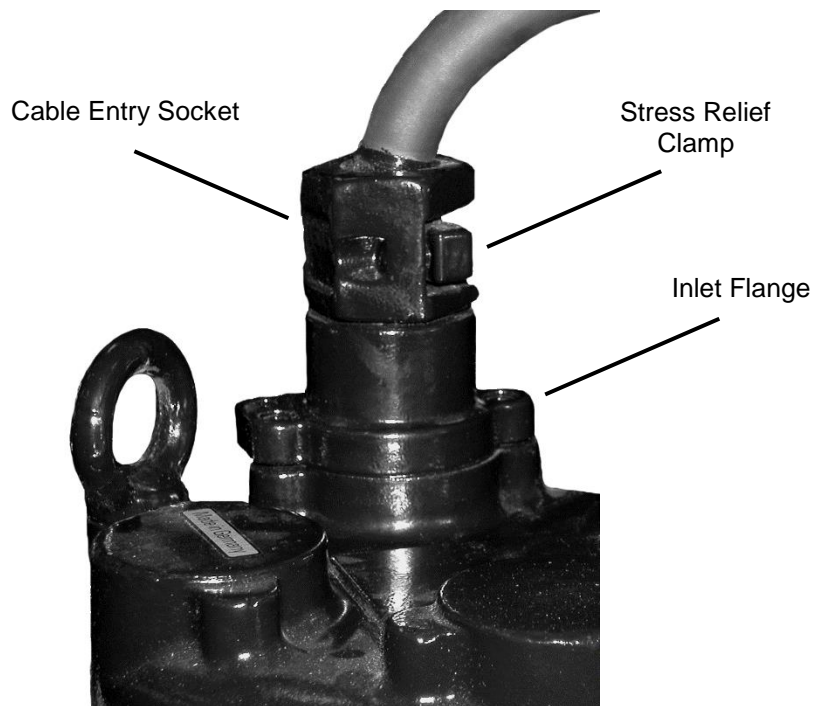


AV(X)

The AV and AVX impellers are vortex impellers, which results in superior passage of stringy and fibrous materials.



HOMA pumps are manufactured with a replaceable and field serviceable, bolt-on cable entry gland. It is designed with an FM approved strain relief to prevent damage in a typical, harsh wet well environment, a ground lug as standard that may be used for explosion proof pumps, and is engineered to be both durable and easily replaceable.



The design of the HOMA cable entry is a heavy duty design that bears against the shoulder of the pump to reduce pressure on the threads. A fully captured O-ring, along with two flanking washers, and a fully captured grommet (Buna-N standard, with optional Viton or Teflon) provide protection from water intrusion down to 105 feet of submergence.

HOMA pumps are assembled with a black, high quality, neoprene, submersible cable on standard pumps. For more severe applications, or on explosion proof pumps, a yellow, MSHA-approved, abrasion-resistant, PCP rubber, submersible cable is installed. All leads in both cables are either color-coded or numbered in accordance with HOMA wiring diagrams.

Maximum Operating Temperature: Yellow-90°C, Black-60°C
Maximum Voltage: Yellow-600V Black-750V
Minimum Bending Radius: Yellow-15xO.D. Black-15xO.D.

Cable Sizes

Cable Size	Jacket Color	Part Number	Jacket Dia. (mm)	Jacket Dia. (in)	Conductor Sheath Diameter (in) approx.
4 x 1.5	Black	1041541	11	0.43	.115 - .125
5 x 1.5	Black	1041551	12	0.47	.115 - .125
7 x 1.5 (Old)	Black	1042871	13	0.5	.115 - .125
7 x 1.5	Black	1041871	16	0.62	.115 - .125
7 x 2.5	Black	1041872	18	0.7	.145 - .152
7 x 4	Black	1041874	22	0.86	.180 - .188
10 x 1.5	Black	1041916	19	0.74	.115 - .125
10 x 2.5	Black	1041926	21	0.82	.145 - .152
10 x 4	Black	1041940	24	0.94	.180 - .188
5 x 6	Black	1041561	19	0.74	.205 - .215
4 x 2.5	Black	1041542	13	0.5	.145 - .152
4 x 4	Black	1041745	16	0.6	.180 - .188
4 x 6	Black	1041746	18	0.7	.205 - .215
4 x 10	Black	1041411	23	0.9	.262 - .270
4 x 16	Black	1041416	28	1.09	.308-.315
4 x 25	Black	1041426	32	1.25	.330-.345
4 x 1.5	Yellow	1046041	13	0.5	.115 - .125
5 x 1.5	Yellow	1046050	15	0.55	.115 - .125
7 x 1.5	Yellow	1046071	17	0.66	.115 - .125
7 x 2.5	Yellow	1046072	19	0.74	.145 - .152
10 x 1.5	Yellow	1046115	19	0.74	.115 - .125
5 x 6	Yellow	1046056	22	0.85	.205 - .215
3x6 + 3x1.5	Yellow	1046036	21	0.82	.205 - .215 & .115 - .125
4 x 2.5	Yellow	1046042	17	0.67	.145 - .152
4 x 4	Yellow	1046044	18	0.71	.180 - .188
4 x 6	Yellow	1046046	20	0.77	.205 - .215
4 x 10	Yellow	1046047	23	0.9	.262 - .270
4 x 16	Yellow	1046048	29	1.14	.308-.315
4 x 25	Yellow	1046080	34	1.3	.330-.345
4 x 35	Yellow	1046035	35	1.35	.410-.418

For more extreme applications, HOMA offers optional cable sheathings, such as Viton sheathing and stainless braid with Teflon lining.

Hardware, Wear Rings

Hardware

As standard, HOMA pumps are manufactured with AISI 304 stainless steel A2 socket head cap screws external to the pump.



The standard hardware can be substituted with optional materials as required by the customer, or as special requirements for a job.

Wear Rings

The HOMA wear ring system, as standard, utilizes an ASTM B144 bronze wear ring installed on the suction opening of the volute to decrease the gap to the nose of the impeller, thus increasing efficiency. The wear ring is mounted with an, on average, 0.4mm tolerance between the surfaces. As contact between the surfaces causes wear, the wear ring is easily replaceable and the pump can quickly be returned to service.

For special applications, the impeller may be supplied with the integral wear-ring portion machined to accept a heat shrink fitted, replaceable wear-ring.



HOMA offers several non-standard wear ring materials and installations as options based on customer or job requirements, including corrosion resistant stainless steel, hardened stainless steel, and matched 400 Series Stainless Steel impeller and volute wear rings which are heat treated to a minimum of 50 Brinell hardness difference.

HOMA pumps are painted as standard with Amerlock 2 high solids epoxy. This is a self-priming, black, semi-gloss epoxy with the following typical properties:

Abrasion Resistance (ASTM D4060):	1kg/1000 cycles CS-17 wheel weight loss = 102mg
Impact Resistance (ASTM D2794):	Direct-24 in·lb Reverse-6 in·lb
Moisture Vapor Transmission:	4.0 gm/m ² /day
Surface Preparation:	SSPC-SP1 & SSPC-SP3
Surface Profile:	2.6x10 ⁻⁴ mm per SSPC-SP2 (Prior process includes SSPC-SP2 and SSPC-SP3)
DFT:	4-8 mils (per coat)
Coats:	2
Qualifications:	1. USDA-Incidental Food Contact 2. NSF Standard 61-For Use in Drinking Water (with restrictions) 3. FDA 21 CFR 175.300-Extraction Test for Direct Food Contact

Environment:	Immersion	Splash & Spillage	Fumes & Weather
Acidic	*	F	G
Alkaline	*	E	E
Solvents	*	G	E
Salt water	E	E	E
Water/Wastewater	E	E	E

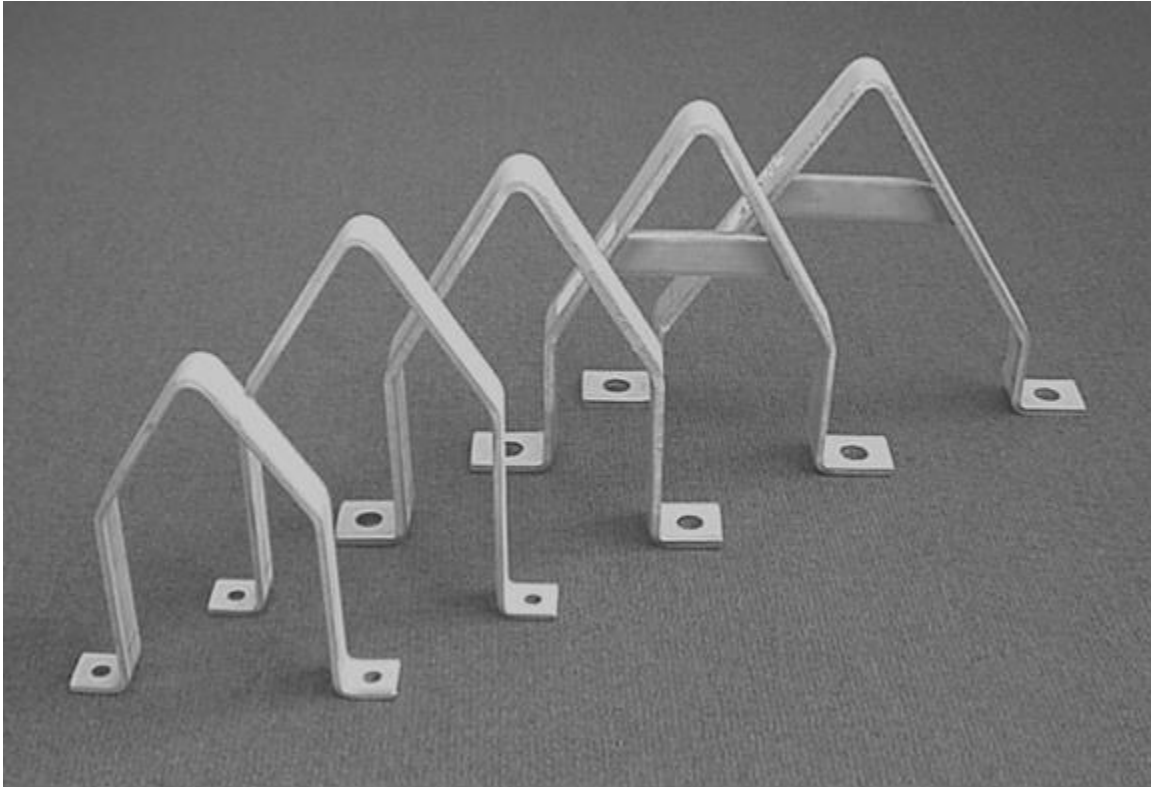
*- Not Recommended F-Fair G-Good E-Excellent

After casting, parts are subjected to post-machining, finishing processes (SSPC-SP3) in preparation for painting and final assembly. Prior to the application of Amerlock 2, castings undergo a Hebrolan solvent cleaning (SSPC-SP1).

For specific customer requirements, HOMA can provide a variety of alternate coatings and epoxies to fit the application. These include, but are not limited to, powder coating, zinc-rich urethane, coal tar epoxy, chlorinated rubber, NSF-certified potable water coatings, as well as most sprayable epoxy coatings. Please consult the factory with specific requirements for assistance in choosing a coating.

Lifting Handles

HOMA offers stainless steel lifting handles for all A-Series pumps. These lifting handles are 304 stainless steel with stainless hardware and at minimum ¼" thick.



Depending on customer requirements and demand, HOMA can provide handles in different materials and designs, such as 316 stainless steel and round stock handles.



Internal

HOMA motors are air-filled, submersible, squirrel cage, high-efficiency units of the NEMA type B design. All motors use class H insulation and have a 1.15 service factor. The stator is shrink-fitted into the stator housing so as not to penetrate or compromise the housing.

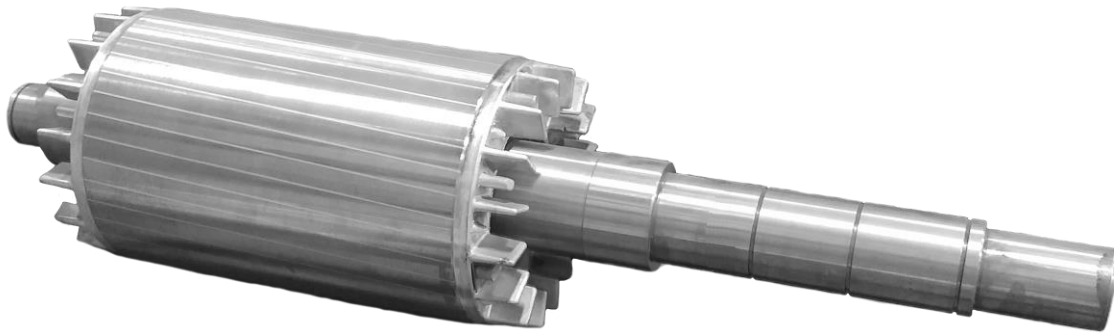


The motors are capable of continuous operation in environments up to 104°F or intermittently up to 140°F, and are capable of sustaining 15 starts per hour. They are rated to operate for a minimum of 20,000 continuous hours

Options include IE3 Premium Efficient motor rating, VFD specific windings, VPI (Vacuum Pressure Impregnation) Insulation to 99% fill factor, and explosion proof motors for Class 1, Division 1, Group C&D area classifications with FM or ATEX approvals. Many motors are suitable for use with a VFD as standard.

Precision Engineering, Unparalleled Support

HOMA shaft rotor assemblies are one piece, oversized, dynamically balanced with shafts made of AISI 430F stainless steel. The shafts use precision machined shoulders to positively support the bearings and impeller.



The combination of a short overhang and large diameter shaft results in extremely low deflection and minimizes vibration in order to provide superior seal and bearing life.

As standard, HOMA uses a single row, deep groove upper bearing in conjunction with a pair of single row angular contact lower bearings working in tandem to handle thrust and radial forces. All bearings are supplied from SKF and FAG, have a bearing life in excess of 100,000 hours, and use high temperature grease.



For special applications, insulated, roller, or other optional bearings can be installed, as well as optional PT100 thermal probes to monitor temperature.



Max. Bearing Temperatures

Upper Bearing	105°C
Lower Bearing	90°C

Mechanical Seals

HOMA uses silicon carbide by silicon carbide Burgmann MG1 mechanical seals with Buna N elastomers as standard in a tandem seal arrangement operating in an oversized oil chamber. This system utilizes independent spring systems and positively driven rotating assemblies to prolong seal life.



Burgmann mechanical seals feature several superior elements: the bellows is not subjected to any torsional stress and its design incorporates several functions, such as a seal face carrier, secondary sealing element and drive collar. The seal face is driven through the spring and “L”-rings (spring collar). There are no bonded joints and all the face materials are interchangeable without having to modify any dimensions.

Temperature Rating: -4°F to 284°F

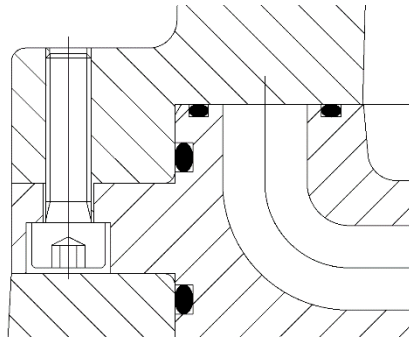
Pressure Rating: -7.25 PSI (Vacuum) to 230 PSI

As standard, HOMA uses silicon carbide by silicon carbide seal faces, as they provide superior abrasion and temperature resistance. Upon request, HOMA can provide tungsten carbide or stainless steel seal faces as well as optional Viton elastomers.

O-Rings, Sensor Location

O-Rings

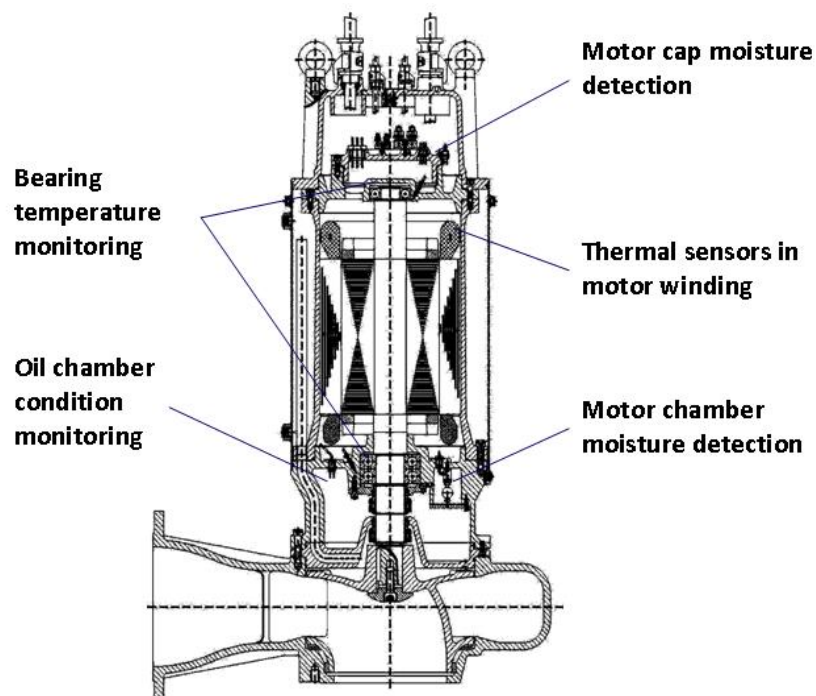
All HOMA O-ring seals are fully captured on all sides and do not require specific torque levels for sealing.



Standard material for O-rings is BUNA N (nitrile). For special applications, Teflon encapsulated and Viton O-rings are available as an option.

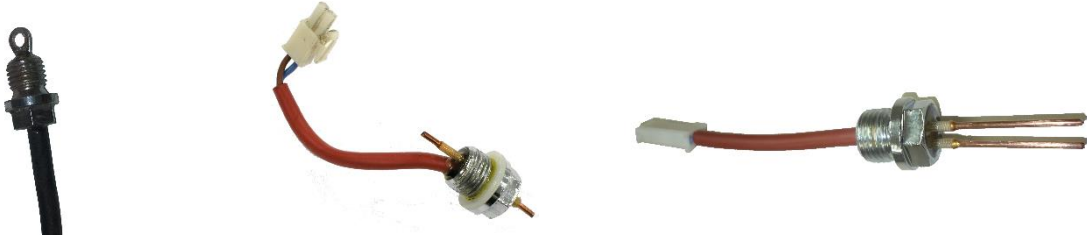
Sensor Location

Shown below are the locations where moisture or temperature sensors may be mounted in a HOMA pump.



Moisture Monitoring

HOMA pumps are equipped with standard and optional leak detectors in several configurations including single wire, tandem wire, and double wire. Probes may be mounted internal to the pump and wired through the pump control cable, or external to the pump with a dedicated cable.



Single wire leak detectors (above-left) have one leg submerged in the oil chamber. They function as a normally open circuit, measuring resistance between the probe and the body of the pump. When more conductive water enters the chamber, the resistance decreases and a sensor relay identifies the change. Tandem arrangements (above-center) have one probe in the oil chamber and one probe in the stator housing. Both arrangements isolate the probe from the pump body with a dielectric epoxy.

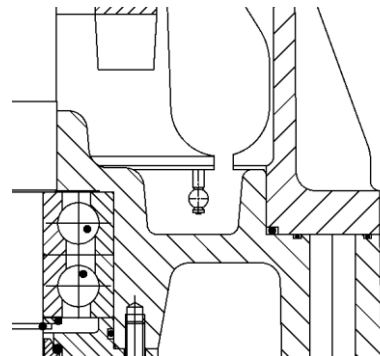
Double wire leak detectors (above-right) work similarly to single wire detectors, but instead of completing the circuit through pump casing, both legs are attached to probes in the desired chamber that are isolated from one another and the pump casing by a dielectric epoxy. When the resistance between the two probes decreases due to the presence of water, a sensor relay identifies the change.

Recommended Relay Setting: 50K Ω in oil-filled chamber, 10K Ω in air-filled chamber
Sensor Relay Required
Thread: M16 x 1.5mm
Isolating Epoxy: Stycast 2651 Epoxy



An optional, normally closed, stainless steel float switch can be fitted in a seal chamber. In the presence of fluid, the float rises and opens the circuit.

Rated Pressure: 217.5 PSI
Max Temp.: 212°F
Close Circuit: 10VA/250V AC/DC/0.5A
Mounting Attitude: $\pm 30^\circ$ from vertical



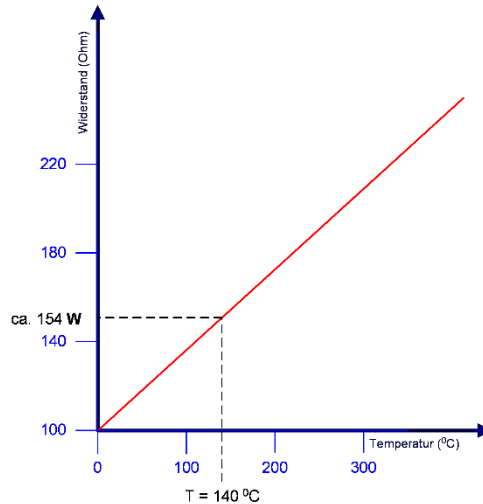
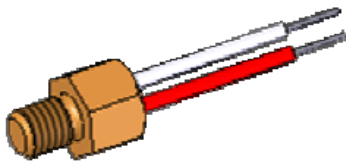
Thermal Protection

As standard, HOMA pumps are manufactured with Thermik SNM auto-reset, thermal switches in triplex configuration embedded in each phase of the winding. These normally closed switches open at 150°C and reset at about 130°C.

Insulation: Myler Nomex Shrink
Max. Operating Voltage: 30 VDC
High Voltage Insulation: 2.5 kV



Optional thermistor or PT100 sensors can be installed to monitor the upper and/or lower bearing, and in the stator as a supplement to the standard thermal switches.



The PT100 sensor shown above operates by measuring the resistance in a circuit and correlating that to a temperature according to the above graph.

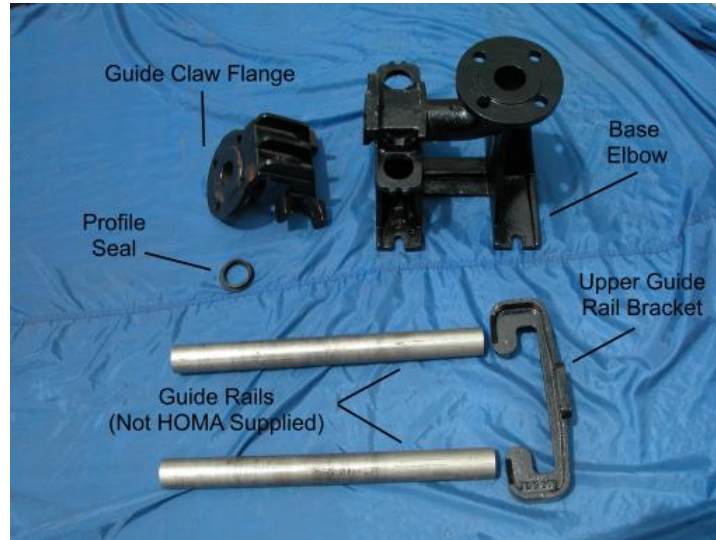
Temperature Range: -60°C to 300°C
Thread Size: M8
Sensor Relay Required



Mounting Options

Wet Pit Installation

For wet pit installations HOMA can provide an autocoupling pump retrieval system. The autocoupling system consists of a base elbow, a guide claw flange to bolt to the pump discharge, a rubber profile gasket to provide a leak-free seal between the discharge and the elbow, and an upper bracket to mount a pair of guide rails.



The base elbow retains and supports the guide rails at the bottom of the pit through a pair of “ears” that completely surround the rail between 6 and 8 inches from the bottom of the base. This means that if the guide rails snag slightly during removal and lift several inches, they will remain in place and will not need to be re-centered.

Autocouplings are available for pumps up to 12 inch discharge with a variety of options, such as 304 and 316 stainless steel upper and intermediate guide rail brackets in all sizes, complete 316 stainless steel construction in 3, 4, and 6 inch sizes, and non-sparking bronze guide claws.



For non-permanent or transportable installations, pumps can be ordered with ring stands mountable on the suction of the pump.

Dry Pit Installation

HOMA is able to supply a variety of solutions for mounting pumps in dry pit environments. These include elbows with and without cleanout ports, reducing elbows, steel mounting stands for pumps up to 10" discharge, and frames for horizontal installation.



Quickly and easily upgrade to a HOMA pump without changing your guide rail system. HOMA offers a variety of adapters designed to easily allow our products to be installed onto existing guide rail systems from other manufacturers. Retrofit your installation with non-clog, reliable operation.





Xylem (Flygt) Adapters



◀ Xylem (Flygt) 2" Threaded Adapter
With Profile Seal

Xylem (Flygt) 4" Flanged
Adapter with Profile Seal ▶



Available Adapters

2" Threaded Adapter
3" Adapter
4" Adapter
4" x 6" Adapter for 2" Guide Rails
4" x 6" Adapter for 3" Guide Rails
6" Adapter for 2" Guide Rails
6" Adapter for 3" Guide Rails
8" Adapter
10" Adapter
12" Adapter
12" x 14" Adapter

Part Number

7326261
7321161
7320961
7321861
7321931
7321921
7320981
7321891
7322311
7323601
73236011



Ebara Adapters



 2" EBARA Adapter

Available Adapters

2" Adapter
3" Top-Mount Claw Adapter
3" Flange-Mount Claw Adapter
4" Adapter
6" Adapter

Part Number

LL50EBARA
LL80EBARA
LM80EBARA
LL100EBARA
8M0215001



ABS and KSB Adapters



▲ KSB 2" Flanged Adapter



▲ ABS Piranha Adapter

▼ KSB 2" Threaded Adapter



Available Adapters

ABS Piranha Adapter
ABS 4" Adapter
KSB 2" Threaded Adapter
KSB 2 1/2" Flanged Adapter

Part Number

7323864
88470125
7324485
2215051.31



Myers, Hydromatic, Fairbanks, and Yeomans Adapters



Myers SRA-125 Adapter



Myers 2 1/2" Flanged Adapter and
1 1/4" Threaded Adapter



Fairbanks Morse 4" Adapter

Available Adapters

Myers 1 1/4" Adapter
Myers SRA-125 Adapter
Myers 2 1/2" Flanged Adapter
Myers 3" Adapter
Hydromatic 1 1/4" Adapter
Fairbanks Morse 4" Adapter
Yeomans 6" Adapter

Part Number

88470160
88470175
88470150
88470180
88470165
88470195
88470110



Mixer Adapters



HOMA Mixers fit on standard
2 inch square tubing

Available Brackets

HRS 10, 15
HRS 23, 27, 29
CHRS 10, 25
CHRS 23, 27, 29

Part Number

8607070
8607075
8607270
8607275



Options and Accessories

The HOMA ASC Cutter system is an option available on 3 and 4 inch AMS, AMX, and AK pumps. It can be installed for especially difficult applications with long and stringy solids.

The impeller is installed with two hardened cutter blades attached to its inlet, and a bottom plate with a stationary cutter blade which is attached into the suction of the volute. These form a scissor action that slices solids in the pumped media.

The combination of large solids passage and the ASC Cutter system provides double protection against clogging or obstruction of pumps, fittings, or piping.



The HOMA Flush Valve is an automated sump flushing system designed to prevent sedimentation and the formation of a scum layer in basins. It is mounted on older models on a flange between the pump discharge and the guide claw or discharge pipe, and on newer models on a boss in the volute casting.

The flush valve functions by diverting a portion of the pumped liquid through a nozzle that can be directed to mix sediment and create a current to effectively disperse solids in the basin. This results in more solids being pumped out of the basin.

The flush valve does not require external power or controls, and can be adjusted with a desired flushing time between 20 and 50 seconds. After the pump is shut off, the flush valve automatically resets for the next start.

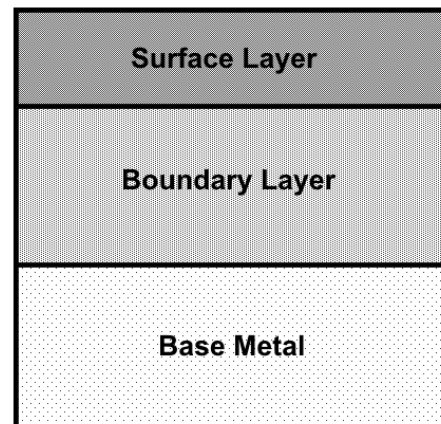


Plasma Ion Nitriding

In difficult applications, it is sometimes necessary to utilize harder materials for hydraulic components, including the impeller, volute, and pressure cover. These harder components can resist wear in order to ensure a reliable lifetime even when pumping abrasive media. In order to supply materials that can stand up to these rigorous demands, HOMA offers standard components hardened using plasma ion nitriding. Instead of using expensive, custom castings with leadtimes to match, plasma ion nitriding allows for comparable or even greater hardness levels with off-the-shelf components.

- » Surface hardness of 650 BHN
- » Improved corrosion resistance
- » Hardened surface keeps components from being overly brittle
- » Does not change dimensions of the part
- » Allows for machining to be performed while the metal is still soft and then hardened in its final dimensions.
- » Low impact on standard product lead time
- » Not a surface coating, the process hardens the cast metal

Plasma Ion Nitriding is a gas impregnation process wherein parts are immersed in a vacuum chamber filled with a precise atmosphere of gases. A high voltage is applied to the gas, forming a plasma which bombards the surface layer of the metal with positive ions. These ions form nitrides in the surface layer of the metal which increase the hardness, as well as diffuse into the part to create a boundary layer between the original material and the hardened surface.



The HOMA GO switch pump protection and monitoring modules are designed to provide a low-cost, flexible solution for protecting HOMA submersible sewage pumps against thermal and seal-failure conditions. Separate LED indication and relay contact outputs for each function are included. Flexible model options enable protection of any submersible sewage pump with heat sensor and/or seal-failure sensing devices installed.

The GO Switch may be powered by 24 or 240 VAC, 50/60 Hz with no modifications. Standard models are available for monitoring via resistance probes, seal-failure float switches, Klixon thermal switches, RTDs and thermistors. Custom modules may also be factory configured.



Model	Channel A	Channel B
GS1050	100K resistance probe (seal-fail)	NC Klixon (thermal)
GS1250	NC seal chamber float switch (seal-fail)	NC Klixon (thermal)
GS1010	100K resistance probe (seal-fail)	100K resistance probe (seal-fail)
GS1212	NC seal chamber float switch (seal-fail)	NC seal chamber float switch (seal-fail)
GS5454	Thermistor DIN44082/01D463 (thermal)	Thermistor DIN44082/01D463 (thermal)
GS1052	100K resistance probe (seal-fail)	Pt100 RTD (thermal)
GS1252	NC seal chamber float switch (seal-fail)	Pt100 RTD (thermal)
GS5252	Pt100 RTD (thermal)	Pt100 RTD (thermal)
GS5452	Thermistor DIN44082/01D463 (thermal)	Pt100 RTD (thermal)

In order to provide a convenient and easy option for retrofitting Flygt pump stations, HOMA offers the PMR5 Pump Monitor Relay. The PMR5 Pump Monitor Relay provides thermal and seal leakage monitoring for submersible pumps. It is ideal for use in retrofit applications where a Flygt MiniCAS relay was used previously. The PMR5 fits directly into a MiniCAS socket, and requires only small wiring modifications.

The relay provides options for both manual and automatic reset in overtemp situations, as well as adjustable resistance monitoring for seal leakage from 4.7k Ω to 100k Ω .



SPECIFICATIONS

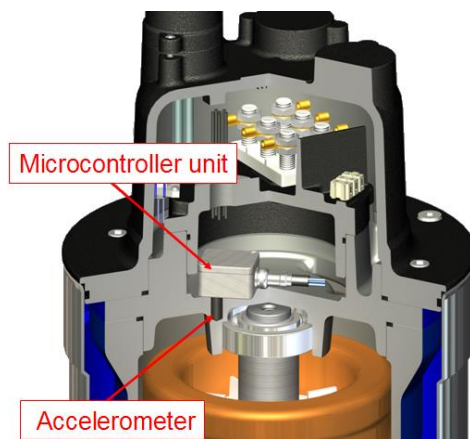
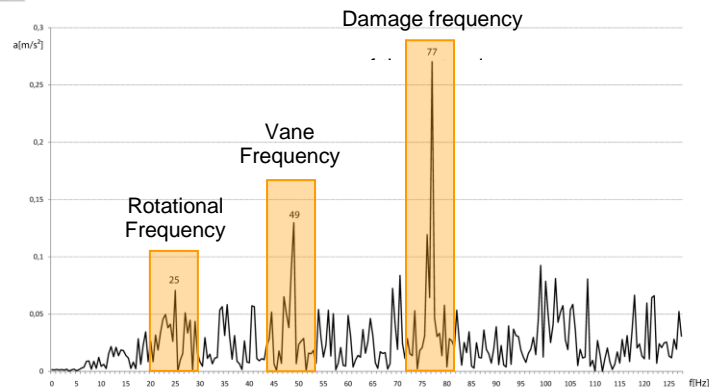
Input power:	120VAC \pm 10%, 7.0 VA max
Output Rating:	8A Resistive @ 120VAC
Operating Temp:	-20°C to +65°C
Storage Temp:	-45°C to +85°C
Temp Sensor Voltage:	6.6 VDC \pm 10%
Leak Sensor Voltage:	4.7 VAC \pm 10%
Enclosure:	White Lexan
Base:	Phenolic

HOMA can supply, as an option, its VICON vibration monitoring system. This system uses sensors mounted throughout the pump to measure vibration frequency and amplitude. It then diagnoses issues both internal and external to the pump by two separate methods.



The first method requires taking a reference value of vibrations at pump startup (a_{REF}). The system then monitors vibrations over time (a_{IST}), and can trigger an alarm if vibrations exceed a given percent ($\frac{a_{REF}}{a_{IST}} [\%]$).

The second method examines the total frequency spectrum and references it against known operating frequencies of components such as bearings or the shaft. It then triggers an alarm if these frequencies deviate from the expected values.



The VICON system uses an accelerometer mated to a microcontroller mounted in the motor cap to measure vibration frequency, as well as 3-axis motion. This sensor communicates with the other half of the integrated system, the HOMA-supplied control panel, which analyzes the data for irregularities or potential failures. From this panel, the customer can monitor operation, set parameters, and download data to an SD card for archiving.

HOMA can supply VICON systems on pumps starting at 30 hp. For special applications, pumps less than 30 hp may be fitted as well.