



The AMERIFLO vertical turbine product line has the most diverse hydraulic, third party certified coverage offered in the fire protection industry. With third party certified flows from 100 GPM through an incredible 6,000 GPM, you will not find a more complete offering anywhere in the world. With state of the art design and manufacturing facilities, AMERIFLO uses computational fluid dynamics and solid works software to design the most efficient product available today.

All product is designed using 3D modeling to make the most efficient use of space at the job site. These products are fully compliant with NFPA 20 and are available in a variety of third party certified materials for sea water applications.



TYPICAL INSTALLATIONS:

- Residential buildings
- Commercial
- Hospitals
- Hotels
- Oil & gas
- Airports
- Power stations
- Sea water

TYPICAL APPLICATIONS:

- Water curtains
- Sprinkler
- Monitor systems
- Water curtains



SERIES 5040

MODEL VT

VERTICAL TURBINE

Sizes: 4" to 16" Discharge
Flows: 100 GPM to 6,000 GPM
Heads: 40 PSI to 610 PSI
Temp: To 250°F

Services:
Fire Protection



DISCHARGE HEAD

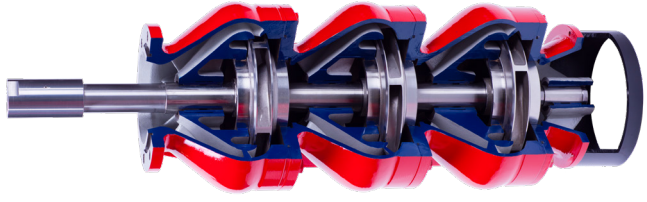
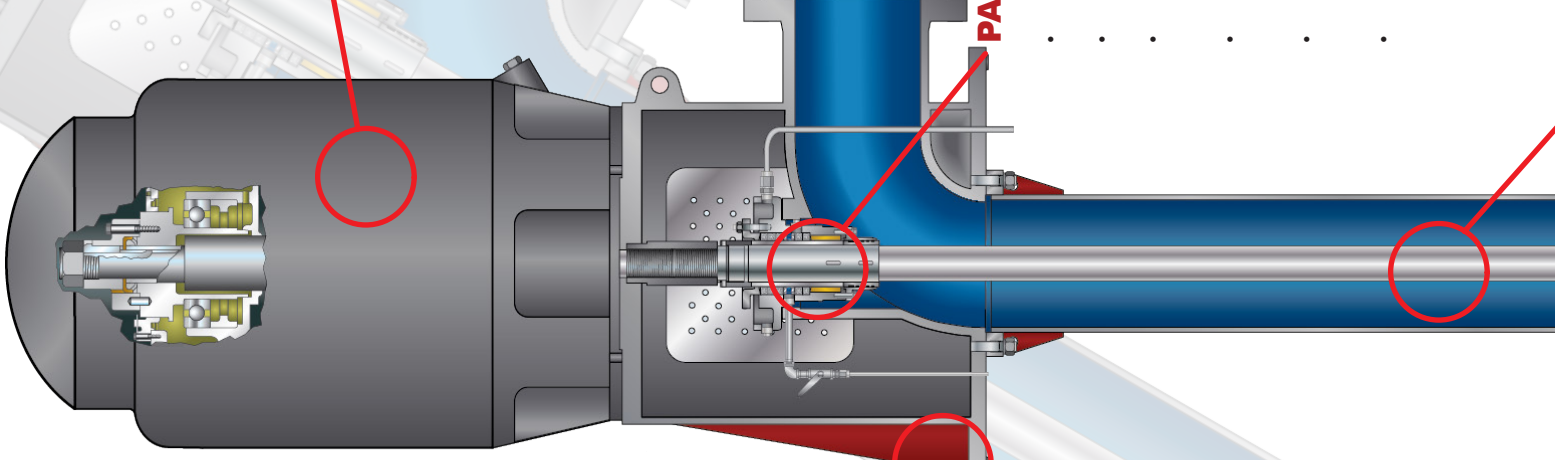
- Supplied standard in ASTM A36 carbon steel
- All discharge heads feature a dual safety guard designed to completely protect the user from all rotating parts
- Dedicated support for the nameplate allows for a high visibility design
- Discharge gauge package with 304 stainless steel buffer tube, fittings and ball valves
- Discharge flanges supplied in 250 PSI rating with raised face for high pressure applications
- Integral drip basin with threaded connection collects all packing leakage
- Alternate metallurgy options available upon request

DRIVER

- Vertical hollowshaft (VHS), vertical solid shaft (VSS) or right angle gear drive (RAG)(when Diesel engine driven) driver construction
- Options include non-reverse ratchet (NRR) or self release coupling (SRC)
- Thrust bearing designed to carry all axial thrust generated by vertical turbine bowl assembly
- The top adjusting nut (VHS orientation) allows for the adjustment of lateral

PACKING HOUSING KIT

- Modular design maximizes the sharing of common components
- 304 stainless steel shaft sleeves completely protect the shaft from wear and corrosion
- 304 stainless steel gland assemblies ensure that packing can be adjusted without the worry of corrosion
- High pressure bypass port minimizes packing leakage on high pressure applications
- Labyrinth style design for lower and upper throat bushings keep pressure losses at a minimum
- 304 stainless steel shaft sleeve nuts are located outside of the fluid chamber minimizing corrosion and allowing for an easier disassembly when the need for service arises



BOWL ASSEMBLY

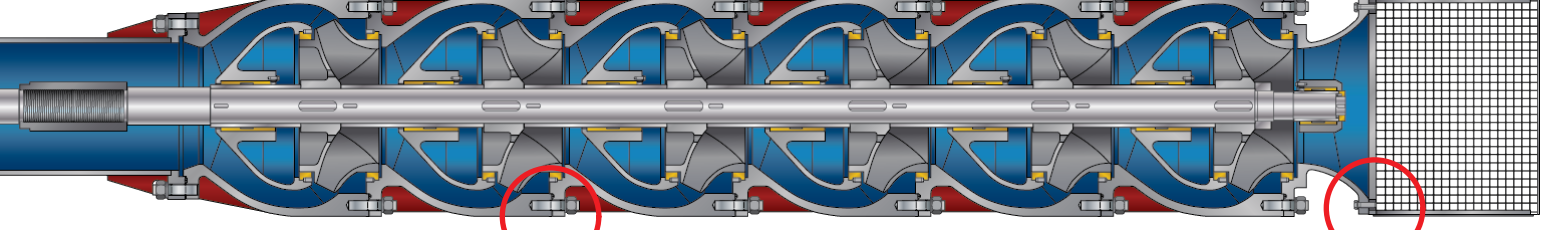
- Supplied standard in ASTM A536 ductile iron
- Heavy wall thickness for corrosion allowance and high pressure applications
- Includes investment cast, 304 stainless steel, single suction impellers with hydraulic balancing holes to minimize axial thrust
- Pinned dual case wear rings (1 upper and 1 lower) completely protecting the bowl assembly
- 304 stainless steel shaft sleeves completely protect the shaft from wear and corrosion
- Francis impeller design allows for broad band, high efficiency performance
- Impellers are machined and dynamically balanced prior to assembly
- 4340 quenched and tempered high chrome steel shaft is stronger than standard carbon steel and has superior corrosion resistance
- Keyed impeller construction for high pressure applications
- Bronze bowl bearings
- All stages feature o-ring construction making sure no leakage is present
- Alternate metallurgy options available upon request

STRAINER

- Supplied standard in 304 stainless steel construction
- Protects the bowl assembly from large solids that may be present in the pumped fluid
- Alternate metallurgy options available upon request

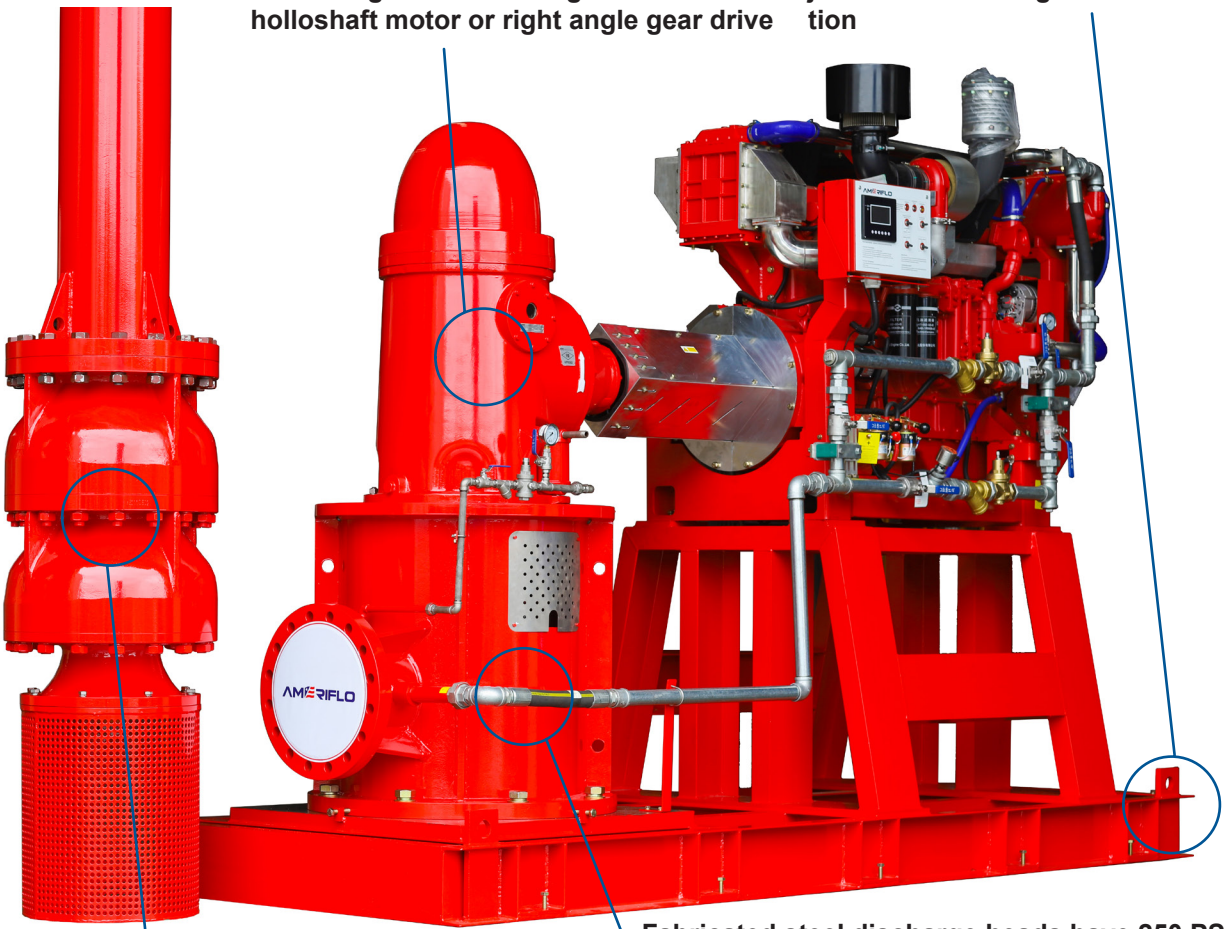
COLUMN ASSEMBLY

- Heavy wall, carbon steel construction
- Flanged construction makes assembly and disassembly very easy
- 4340 quenched and tempered high chrome steel shaft is stronger than standard carbon steel and has superior corrosion resistance
- Product lubricated lineshaft bearings with integral 304 stainless steel lineshaft sleeve
- Overall length (OAL) is engineered to meet the requirements at the job-site
- All flanges feature o-ring construction making sure no leakage is present
- Smaller HP models feature threaded lineshaft couplings while larger sizes have keyed lineshaft couplings standard
- Alternate metallurgy options available upon request



Flexible design allows for electric or Diesel engine driver using a vertical hollowshaft motor or right angle gear drive

Fabricated steel I-beam bases feature jack-screw leveling to aid in field installation



Flanged bowl assemblies with o-ring construction feature hydraulically balanced, investment cast 304 stainless steel impellers, upper and lower bowl wear rings, heavy duty bowl bearings with retainers and 304 stainless steel basket strainer

Fabricated steel discharge heads have 250 PSI ANSI raised face flanges, integral coupling guard and easy to adjust high pressure packing housing kit with double shaft sleeve construction



SERIES 5040 BOWL ASSEMBLY VERTICAL TURBINE

Bowls: 10" to 22" Diameter
Flows: To 6,000 GPM
Heads: To 377 PSI

Services:
Fire Protection

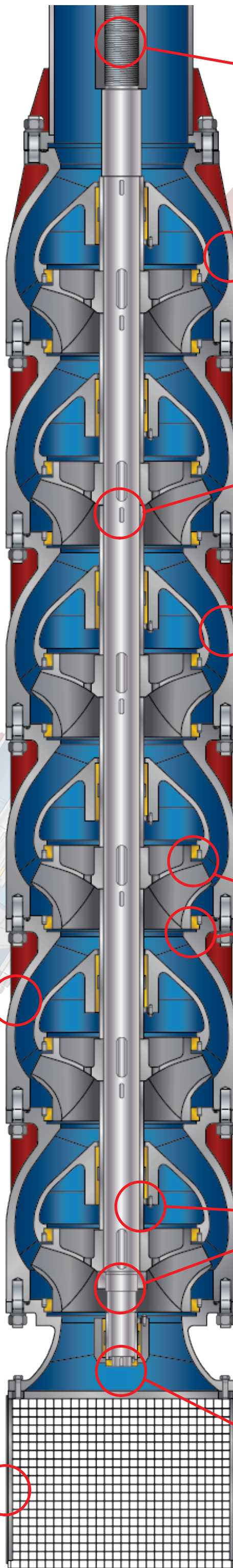


BOWL ASSEMBLY

- Supplied standard in ASTM A536 ductile iron
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- Includes investment cast, 304 stainless steel, single suction impellers with hydraulic balancing holes to minimize axial thrust
- Pinned dual case wear rings (1 upper and 1 lower) completely protecting the bowl assembly
- 304 stainless steel shaft sleeves completely protect the shaft from wear and corrosion
- Francis impeller design allows for broad band, high efficiency performance
- Impellers are machined and dynamically balanced prior to assembly
- 4340 quenched and tempered high chrome steel shaft is stronger than standard carbon steel and has superior corrosion resistance
- Keyed impeller construction for high pressure applications
- Bronze bowl bearings
- All stages feature o-ring construction making sure no leakage is present
- Flanged construction with jackscrew threads for easy assembly and disassembly
- Alternate metallurgy options available upon request

STRAINER

- Supplied standard in 304 stainless steel construction
- Protects the bowl assembly from large solids that may be present in the pumped fluid
- Alternate metallurgy options available upon request



LINESHAFT COUPLINGS

- Smaller HP models feature threaded lineshaft couplings while larger sizes have keyed lineshaft couplings standard
- Alternate metallurgy options available upon request

TOP STAGE

- ASTM A536 ductile iron bowl construction with investment cast, 304 stainless steel, single suction impellers with hydraulic balancing holes to minimize axial thrust
- Dedicated top stage does not have lower wear ring and is designed to transition flow from the bowl assembly to the column assembly
- 304 stainless steel shaft sleeve completely protects the shaft from wear and corrosion (in each bearing location)
- Bronze sleeve bearing can be supplied in optional metallurgy upon request
- Bowl o-ring standard between top stage and first piece of column

BOWL SHAFT

- Oversized, 420 stainless steel bowl shaft standard
- 18% stronger than standard carbon steel
- All impellers and bowl shaft sleeves are keyed to lock parts to the shaft assembly
- Unique shaft sleeve design with bowl shaft locknut and lockwasher does not require axial key at each impeller location

INTERMEDIATE STAGES

- ASTM A536 ductile iron bowl construction with investment cast, 304 stainless steel, single suction impellers with hydraulic balancing holes to minimize axial thrust
- Bowls & impellers can be supplied in optional metallurgy upon request
- Bowl o-ring standard between each stage
- 304 stainless steel shaft sleeve completely protects the shaft from wear and corrosion (in each bearing location)
- Bronze sleeve bearing can be supplied in optional metallurgy upon request
- Integral bearing retainer ensures that the bearing cannot rotate within the cast housing
- 304 stainless steel key, locknut and lockwasher lock shaft sleeve into position and keeps the rotating assembly in the proper axial position

UPPER & LOWER BOWL WEAR RING

- Heavy wall, ASTM B584 Alloy 836 upper and lower bowl wear rings pinned in location so the wear ring cannot rotate within the bowl assembly
- Alternate metallurgy options available for all wear rings upon request

FIRST STAGE

- ASTM A536 ductile iron bowl construction with investment cast, 304 stainless steel, single suction impellers with hydraulic balancing holes to minimize axial thrust
- Bowls & impellers can be supplied in optional metallurgy upon request
- Bowl o-ring standard between each stage
- 304 stainless steel shaft sleeve completely protects the shaft from wear and corrosion (in each bearing location)
- Bronze sleeve bearing can be supplied in optional metallurgy upon request
- Integral bearing retainer ensures that the bearing cannot rotate within the cast housing
- 304 stainless steel key, locknut and lockwasher lock shaft sleeve into position and keeps the rotating assembly in the proper axial position

SUCTION BEARING

- 304 stainless steel shaft sleeve completely protects the shaft from wear and corrosion
- Bronze sleeve bearing can be supplied in optional metallurgy upon request
- Integral bearing retainer ensures that the bearing cannot rotate within the cast housing
- 304 stainless steel key, locknut and lockwasher lock shaft sleeve into position

SERIES 5040

MODEL VT

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Bowls: 10" to 22" Diameter
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Services:
Fire Protection



DISCHARGE HEAD

- Supplied standard in ASTM A36 carbon steel
- All discharge heads feature a dual safety guard designed to completely protect the user from all rotating parts
- Dedicated support for the nameplate allows for a high visibility design
- Discharge gauge package with 304 stainless steel buffer tube, fittings and ball valves
- Discharge flanges supplied in 250 PSI rating with raised face for high pressure applications
- Integral drip basin with threaded connection collects all packing leakage
- Alternate metallurgy options available upon request

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- Keyed impeller construction for high pressure applications
- Bronze bowl bearings
- All stages feature o-ring construction making sure no leakage is present
- Flanged construction with jackscrew threads for easy assembly and disassembly
- Alternate metallurgy options available upon request

STRAINER

- Supplied standard in 304 stainless steel construction
- Protects the bowl assembly from large solids that may be present in the pumped fluid
- Alternate metallurgy options available upon request

DRIVER

- Vertical hollowshaft (VHS), vertical solid shaft (VSS) or right angle gear drive (RAG)(when Diesel engine driven) driver construction
- Options include non-reverse ratchet (NRR) or self release coupling (SRC)
- Thrust bearing designed to carry all axial thrust generated by vertical turbine bowl assembly
- The top adjusting nut (VHS orientation) allows for the adjustment of lateral

PACKING HOUSING KIT

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- High pressure bypass port minimizes packing leakage on high pressure applications
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COLUMN ASSEMBLY

- Heavy wall, carbon steel construction
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- 4340 quenched and tempered high chrome steel shaft is stronger than standard carbon steel and has superior corrosion resistance
- Product lubricated lineshaft bearings with integral 304 stainless steel lineshaft sleeve
- Overall length (OAL) is engineered to meet the requirements at the job-site
- All flanges feature o-ring construction making sure no leakage is present
- Flanged construction with jackscrew threads for easy assembly and disassembly
- Smaller HP models feature threaded lineshaft couplings while larger sizes have keyed lineshaft couplings standard
- Alternate metallurgy options available upon request

SERIES 4810/4820/4830/5040 STUFFING BOX

VERTICAL TURBINE
MIXED FLOW
AXIAL FLOW

LINESHAFT COUPLINGS

- Threaded or flanges lineshaft couplings based on required horsepower
- Adjustable spacer couplings can be supplied upon request when using vertical solid shaft (VSS) motors

SHAFT SLEEVE

- 304 stainless steel shaft sleeve completely protects the shaft from wear and corrosion
- 304 stainless steel locking collar with set screws ensures that the shaft sleeve remains in place

GLAND ASSEMBLY

- Supplied standard in investment cast, 304 stainless steel
- Heavy wall thickness for corrosion allowance and high pressure applications
- Split for easy removal to access packing

INTEGRAL DRIP BASIN

- Oversized, 420 stainless steel bowl shaft standard
- 18% stronger than standard carbon steel
- All impellers and bowl shaft sleeves are keyed to lock parts to the shaft assembly
- Unique shaft sleeve design with bowl shaft locknut and lockwasher does not require axial key at each impeller location

HOUSING

- Supplied standard in class 30 cast iron
- Heavy wall thickness for corrosion allowance and high pressure applications
- 304 stainless steel high pressure bypass port with adjustable valve minimizes packing leakage on high pressure applications

PACKING OR MECHANICAL SEAL

- Packing with 304 stainless steel lantern ring supplied standard
- Optional mechanical seals can be supplied in a component or cartridge design

LOWER BEARING

- Bronze sleeve bearing can be supplied in optional metallurgy upon request
- Installed in a location to breakdown pressure from the pump and rides on a 304 stainless steel shaft sleeve for maximum life

THROAT BUSHING

- Removable and replaceable throat bushing assembly provides superior pressure breakdown and packing housing box protection
- Labyrinth style design for throat bushing keep pressures in the packing housing to a minimum

SHAFT

- 4340 quenched and tempered high chrome steel shaft is stronger than standard carbon steel and has superior corrosion resistance
- 304 stainless steel keys for shaft sleeve and for throat bushing

FLUSH LINES

- Supplied standard in 304 stainless steel construction
- High pressure bypass line with valve is plumbed back to the sump and allows the end user to dial in the pressure that the packing housing operates under
- Drip basing leakage line is plumbed back to the sump keeping fluid from leaking onto the floor of the job-site

**Specifications for Vertical Fire Pumps
VT Vertical Turbine Type**



GENERAL:

The pumps furnished for fire protection service shall be supplied with the specified drivers, controls and pump accessory items by the pump manufacturer to ensure single source responsibility. The pump, driver and controls shall be:

- Underwriters Laboratories (UL) Listed
- Factory Mutual Laboratories (FM) Approved

The pumping equipment shall be installed as recommended in the NFPA 20, Standard for the Installation of Centrifugal Fire Pumps. AMERIFLO Pump model shall be furnished with driver, controllers and accessories as detailed in this specification. Pump manufacturer shall have unit responsibility for the proper operation of the complete unit assembly as indicated by field acceptance tests.

Pump performance requirements:

- the maximum net pressure for a fire pump shall not exceed 140 percent of rated head
- inlet pressure less than than -6.9 PSI [-47.7 KPA]. A pump shall develop not less than 65 percent of rated total head when discharging at 1-1/2 times rated flow
- a test is to be conducted with a positive suction pressure sufficient to achieve the maximum brake horsepower
- the shutoff head shall not be less than 99% of Max head

[Application Standard: UL 448, FM 1311]

MANUFACTURER'S FACTORY TEST:

Each individual pump shall be hydrostatically tested for not less than 5 minutes and run tested prior to shipment. The pump shall be hydrostatically tested at a pressure of not less than 2 times the no flow (shut off) head of the pump's maximum diameter impeller plus the maximum allowable suction head but in no case less than 40 psi.

[Application Standard: UL 448, FM 1311]

FIELD ACCEPTANCE TEST:

A field acceptance performance test shall be conducted upon completion of pump installation. The test shall be made by flowing water through calibrated nozzles, approved flow meters or other such accurate devices as may be selected by the authority having jurisdiction. The test shall be conducted as recommended in NFPA 20 by

- the installing contractor
- the owner
- the owner's representative
- (other) _____

in the presence of the authority having jurisdiction and with that authority's final approval and acceptance. Failure to submit documentation of factory and field tests will be just cause for equipment rejection.

[Application Standard: NFPA 20]

VERTICAL CENTRIFUGAL PUMPS:

The fire pump shall be of vertical centrifugal (single stage) (multistage) splitcase with construction specifically labeled for fire service and shall be an AMERIFLO pump model _____. The pump shall be connected to the (fire standpipe) (fire sprinkler) (underground fire main) system. The suction supply for the fire pump shall be from a (public service water main) (ground storage tank) (underground reservoir) at a maximum at a maximum underground length of _____ feet and a minimum submergence of _____ feet. The pump discharge head shall be carbon steel with _____ inch ASME B16.1 CLASS 250 rated discharge flange machined to American Society of Mechanical Engineers (ASME).

Pump features include:

- precision investment cast 304 stainless steel impeller
- flanged column pipe
- ductile cast iron suction bell
- Teflon guide bearings
- 304 stainless steel flush lines and ball valves for packing lubrication
- factory installed packing leakage drainage piped to a single connection
- factory installed packing shaft guards
- sea water materials are available upon request

[Application Standard: UL 448, FM 1311]

ELECTRIC MOTORS:

The pump driver shall be (UL listed) specifically for fire pump service, vertical mounted, P-base, ball bearing induction motor rated for _____ horsepower, 3 phase, (50) (60) Hertz with open drip-proof NEMA _____ enclosure for operation on _____ volt (single) (three) phase service. The motor locked rotor current shall not exceed the values stated in NFPA 20. The motor shall be mounted on a steel base common to the pump and shall be connected to the pump with a flexible coupling protected by a suitable guard. The fire pump manufacturer shall accurately align the pump and motor shafts prior to shipment. After field installation, but prior to grouting the base, a millwright or similarly qualified person shall check and verify for correct shaft alignment.

The motor capacity in horsepower shall be such that the maximum motor horsepower located anywhere on the pump curve shall not exceed the motor-rated full-load horsepower multiplied by the motor service factor.

[Application Standard: UL 1004]

ELECTRIC MOTOR CONTROLLERS:

The automatic electric motor controller shall be (UL Listed) (FM Approved) specifically for fire pump service. The controller shall be designed for:

- across the line
- reduced voltage, part winding
- reduced voltage, primary resistor
- auto-transformer
- wye-delta open transition
- wye-delta closed transition
- auto-transformer
- reduced voltage, soft

type starting. The controller shall be rated for the horsepower specified in this specification's electric motors section.

The controller shall be capable of interrupting a short circuit current of at least equal to the available short circuit current in the controller supply circuit. This fire pump controller installation requires a withstand rating of not less than _____ amps RMS symmetrical at an operating voltage of _____ volts. The controller shall be:

- floor or wall mounted for electrical connection to the motor by the equipment installer
- mounted on a common base with the fire pump and wired to the motor by the pump manufacturer
- according to NFPA 20 pressure sensing line

[Application Standard: UL 218, FM 1321, FM 1323, NFPA 20]

DIESEL ENGINES:

The driver shall be (UL Listed) (FM Approved) specifically for fire pump service and a horizontal shaft type internal combustion diesel engine Model _____ manufactured by:

_____ rated _____ RPM, clockwise rotation as viewed from the end opposite of the pump. The horsepower rating of the diesel engine shall have a 4-hour minimum horsepower rating not less than 10 percent greater than the listed horsepower on the diesel engine nameplate. The diesel engine shall provide the required power to operate the pump at the rated speed and maximum pump load under any flow condition on the pump curve. Diesel engine derating for elevation and temperature are as follows:

- a deduction of 3 percent from the diesel engine horsepower rating at standard SAE conditions shall be made for each 1000 FT [300 M] of elevation above 300 FT [91 M];
- a deduction of 1 percent from the diesel engine horsepower rating as corrected to standard SAE conditions shall be made

DATE **APRIL 2021**

for every 10°F [5.6°C] above 77°F [25°C] ambient temperature.

The engine shall be provided by the pump manufacturer with, at a minimum, the following accessories for automatic operation.

- cooling water lines, pressure regulator, strainer, bypass lines and necessary fittings for engine cooling system, pre-piped and factory mounted
- digital display, electronic instrument panel factory installed
- UL Listed & FM Approved emergency DC contactor factory installed
- vibration isolation diesel engine cradle
- flexible exhaust connector
- residential exhaust silencer
- engine jacket water heater, factory installed
- fire resistant, flexible piping with threaded connection for fuel supply and fuel return lines
- fuel storage tank sized to provide a minimum supply of one gallon of fuel per engine maximum rated horsepower plus 5% for sump area plus 5% for expansion area. The fuel tank shall be furnished (with) (without) horsepower plus 5% for sump area plus 5% for expansion area. The tank shall be furnished (with) (without) legs for floor mounting and with a direct reading fuel level gauge. Fuel tank shall be (single wall) (double wall) UL Listed
- the engine shall be run tested for at least one hour by the pump manufacturer prior to shipment
- engine shall be same brand name as the pump
- sea water fire pump engines are available upon request

[Application Standard: UL 1247, FM 1333]

RIGHT ANGLE GEAR DRIVE:

All right angle gear drives shall be FM approved and equipped with a non-reverse ratchet mechanism rated by the manufacturer at a load equal to the maximum horsepower and thrust of the pump. Water cooled gear drives shall be equipped with a visual means to determine whether water circulation is occurring.

[Application Standard: FM 1338, NFPA 20]

ENGINE CONTROLLERS:

The automatic engine controller shall be (UL listed) (FM approved) specifically for fire pump service. The diesel engine controller must contain the following features:

- UL Listed/FM Approved built in battery charger
- run-time clock for weekly automatic test
- system pressure recorder
- power failure start
- low fuel level switch
- pump room audible and visual alarm output signals
- the controller shall be wired to the diesel engine terminals and shall be mounted on a common base with the diesel engine and pump. A complete run test of the base mounted diesel engine controller shall be performed by the pump manufacturer prior to shipment
- the diesel engine controller shall be floor mounted for electrical connection to the diesel engine by the equipment installer
- according to NFPA 20 pressure sensing line

[Application Standard: UL 218, FM 1321, FM1323, NFPA 20]

FITTINGS:

The pump manufacturer shall furnish piping accessory items for the pump installation which will adapt the pump connections to the fire protection system and test connections as follows. Fittings subjected to pump discharge pressure shall be ASME B16.1 CLASS (□150 □250) rating. Fittings subjected to suction pressure shall be ASME B16.1 CLASS 150 rating.

- concentric tapered discharge increaser
- UL Listed/FM Approved hose valve test header
- hose valves with caps and chains
- UL Listed/FM Approved pump casing relief valve
- UL Listed/FM Approved automatic air release valve
- UL Listed/FM Approved discharge pressure gauge
- with buffer tube and 1/2-inch stainless steel components
- aluminum, non sparking coupling guard
- common base level jackscrew adjusting bolts & milled pads at pump & driver locations
- alignment jackscrews on pump and electric motor (when supplied) locations

Additional accessories required when pump is engine driven:

- UL Listed/FM Approved main relief valve:
 - direct acting (spring actuated)
 - pilot operated (hydraulically actuated)
 - relief valve waste cone, enclosed type with dual sight glasses
 - discharge tee with elbow (for mounting relief valve)

[Application Standard: NFPA 20]

