



# FAIRBANKS NIJHUIS™ FIRE PUMPS



## FAIRBANKS NIJHUIS™

Long established as a leading fire pump manufacturer, Fairbanks Nijhuis offers a broad range of horizontal and vertical split case, vertical in-line, end suction and vertical turbine designs over a wide range of rated capacities and pressures...pumps for every fire pump application. Split case, end suction and vertical turbine pumps have the option of being driven via either an electric motor or diesel engine. All pumps are furnished as a complete package with driver, controller, jockey pump and its controller, as well as standard fire pump system accessories.

Fairbanks Nijhuis fire pumps are Underwriters Laboratories Listed and Factory Mutual Approved specifically for fire pump service, continually meeting the agencies' stringent inspection, testing and record-keeping standards. Split case rated capacities range from 250 GPM through 5000 GPM, vertical in-line rated capacities range from 50 GPM through 1500 GPM, and vertical turbine fire pumps cover 250 GPM through 4500 GPM, all with a wide range of rated pressures.

The Fairbanks Nijhuis sales family includes highly qualified distributors and representatives experienced in fire pump systems, who provide prompt and accurate quotations, submittals and acceptance testing as required. These fire protection professionals stand ready to address and meet your fire pump needs, and are backed by factory knowledge and experience.

### HORIZONTAL AND VERTICAL SPLIT CASE

#### Pump Features:

- Bronze impeller
- Cast iron or ductile iron casings
- Clockwise or counterclockwise rotation (electric only)
- Casing wear rings
- Renewable shaft sleeves
- Grease lubricated long life bearings
- Packed stuffing box



Horizontal Split Case Rated Performance

Rated Capacity	Rated Pressure
250 – 5000 GPM	40 – 506 PSI



Vertical Split Case Rated Performance

Rated Capacity	Rated Pressure
250 – 2500 GPM	40 – 200 PSI

# Pump Selection

## VERTICAL IN-LINE

### Pump Features:

- Bronze impeller
- One-piece, in-line casing
- Clockwise rotation
- Casing wear ring
- Renewable shaft sleeve
- Integral vertical motor
- Packed stuffing box



### Vertical In-Line Rated Performance

Rated Capacity	Rated Pressure
50 – 1500 GPM	40 – 160 PSI

## END SUCTION

### Pump Features:

- Stainless steel impeller
- Renewable shaft sleeve
- Ductile iron casing
- Carbon steel shaft
- Packed stuffing box
- Grease lubricated long life bearings
- NEMA-HI T-frame motor
- Diesel engine drive option
- Casing feet for easy back pullout



### End Suction Rated Performance

Rated Capacity	Rated Pressure
50 – 1500 GPM	40 – 225 PSI

## VERTICAL TURBINE

### Pump Features:

- Cast iron bowl (multi-stage)
- Stainless steel bowl shaft
- Carbon steel open lineshaft
- Steel column pipe
- Cast iron or fabricated steel discharge heads
- Brass suction strainer
- Packed stuffing box

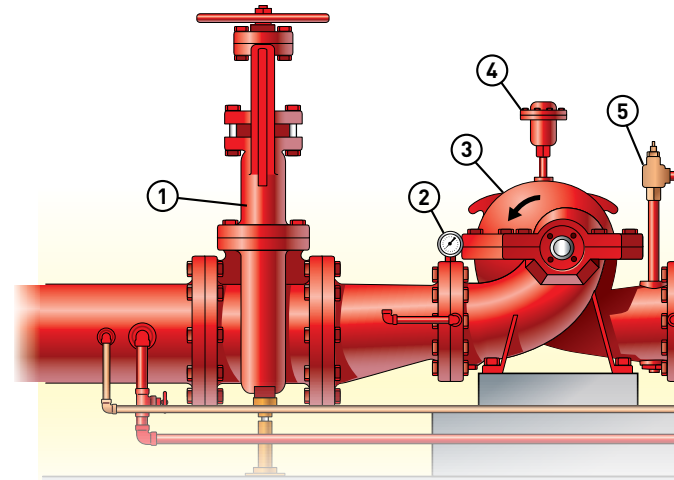


### Vertical Turbine Rated Performance

Rated Capacity	Rated Pressure
250 – 4500 GPM	75 – 387 PSI

# Typical Horizontal Split Case Fire Pump System

1. OS & Y Gate Valve with Tamper Switch
2. Compound Suction Gauge
3. Horizontal Split Case Fire Pump, Electric Motor Driven
4. Automatic Air Release Valve
5. Casing Relief Valve
6. Discharge Pressure Gauge
7. Low Suction Pressure Shutoff Valve
8. Fire Pump Controller
9. Check Valve
10. Jockey Pump Controller
11. Jockey Pump
12. Isolation Valves with Tamper Switches
13. Ball Drip Valve
14. Test Valve Manifold with Hose Valves, Caps and Chains



**Pump:** Horizontal split case, double-suction, UL Listed, FM Approved, mounted on a common base with and flexibly coupled to an electric motor. Pump sized for rated capacity and head. Also must be capable of producing 150% rated flow at not less than 65% rated head and not to exceed 140% rated head at a shutoff or no-flow condition.

**Controller:** Electric motor controller starts the motor automatically on a loss of system pressure. System pressure is monitored via a sensing line from the system side of the check valve. Controller can also be manually started. The type of motor starting, and therefore the type of controller, varies depending upon the specifics of the application. Common types of controllers include across-the-line, primary resistor, part-winding, wye-delta, auto-transformer and soft start. Controllers are UL Listed and FM Approved specifically for fire pump service.

**Base:** Fabricated steel design base capable of adequately supporting the weight of the pump and driver. After pump has been fully piped and accurately aligned with the motor, the base should be fully grouted into place.

**Electric Motor:** UL Listed fire pump motor sized so as to not overload at any point on the pump hydraulic curve as per NFPA #20. Motors have a 1.15 service factor, wound for the correct voltage. Motor to be compatible with the type of controller (i.e., starting method).

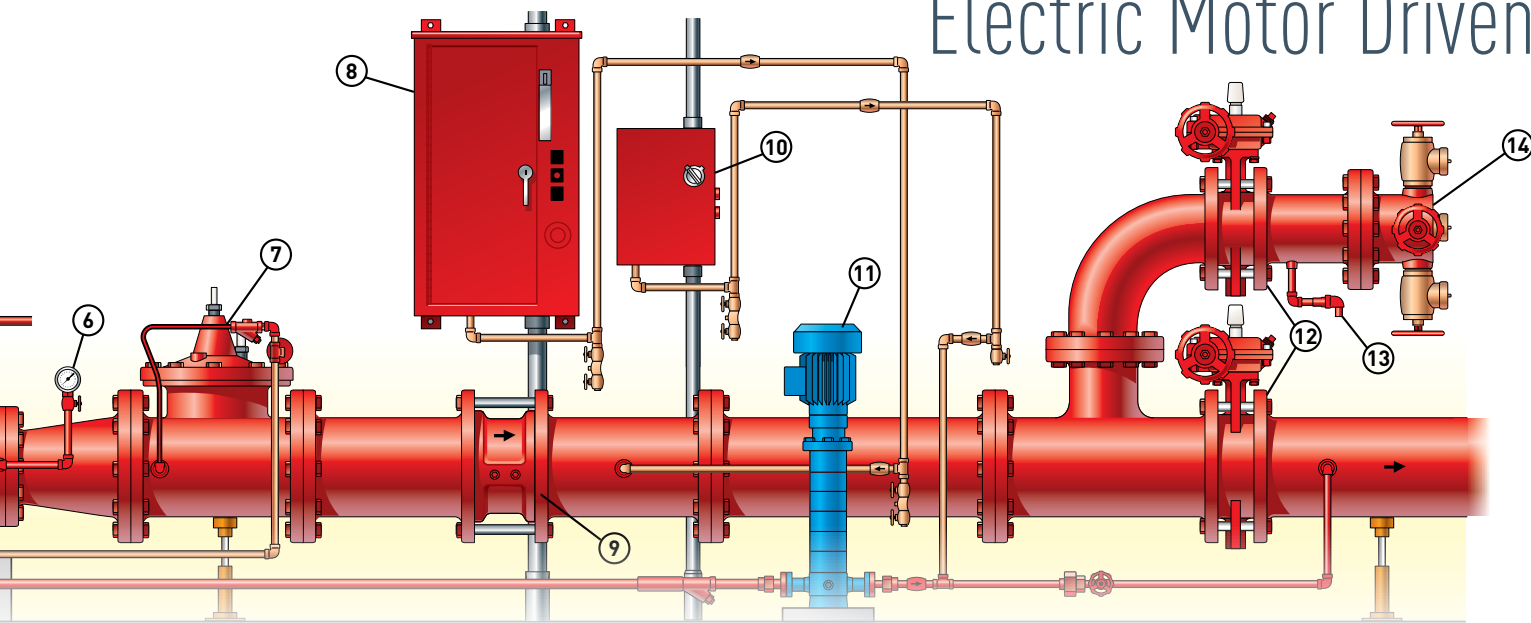
**Coupling:** Flexible type, sized to transmit the horsepower requirements of the pump. Coupling shall be furnished with an OSHA-design coupling guard.

**Standard Accessories:** Accessories furnished with the fire pump system include suction and discharge gauges, casing relief valve and automatic air release valve. Other accessories commonly furnished as part of the fire pump package include hose valve manifold with hose valves, caps and chains, flowmeter, city bypass, low suction control valve, ball drip valve, eccentric suction reducer and concentric discharge increaser.

**Jockey Pump:** Jockey pump keeps pressure in the system to prevent the main fire pump from operating to maintain system pressure. Jockey pumps are sized about 1% of flow to overcome small system leaks and typically sized for 10 PSI greater than the rated pressure of the main fire pump. Jockey pumps are not required to be UL Listed or FM Approved.

**Jockey Pump Controller:** Starts the jockey pump across the line by sensing the system pressure via a sensing line from the system side of the check valve. This sensing line must be independent from the main fire pump controller sensing line. Controller is sized per the jockey pump motor horsepower and voltage. Jockey pump controllers are UL Listed specifically for this service.

# Electric Motor Driven

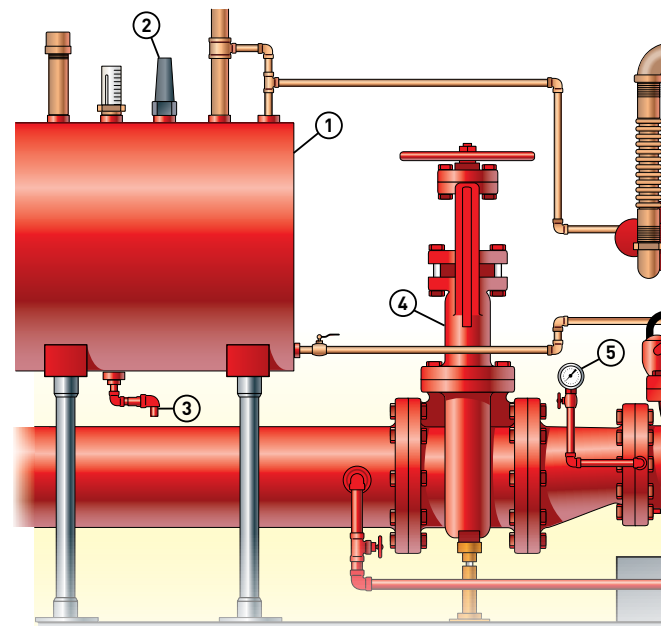


Approved Controller Starting Methods

Type Starting	Characteristics	Advantages	Restrains	Starting Current (% Motor Full Load Starting Current)	Starting Torque (% Locked Rotor Torque)	Type Transition
Across the line	Connects motor directly to power source. Full voltage applied to motor when controller is actuated.	<ul style="list-style-type: none"> <li>* Least expensive</li> <li>* Highest starting torque</li> <li>* Low maintenance</li> <li>* Standard motor used</li> </ul>	<ul style="list-style-type: none"> <li>* High inrush current</li> </ul>	600%	100%	N/A
Primary Resistance Reduced Voltage	When controller is actuated, a resistance is connected to each phase. Resistors are bypassed after a time delay and motor then runs at full voltage.	<ul style="list-style-type: none"> <li>* Smooth starting</li> <li>* Low shock to motor</li> <li>* Standard motor used</li> </ul>	<ul style="list-style-type: none"> <li>* High power loss through resistors</li> <li>* Must dissipate heat</li> <li>* Low torque per ampere input</li> <li>* Medium relative cost</li> <li>* Not recommended for transfer switch applications</li> </ul>	300%	25%	Closed
Part Winding	Motor starts on one winding. After a time delay, second winding is connected in parallel to the line.	<ul style="list-style-type: none"> <li>* Low relative cost</li> <li>* Low starting torque</li> <li>* Low maintenance</li> </ul>	<ul style="list-style-type: none"> <li>* Not recommended for frequent starting</li> <li>* Low starting torque</li> <li>* Special motor required</li> </ul>	390%	42%	Closed
Wye-Delta Open-Transition	On controller activation, motor windings wye-connected for starting. After a time delay, automatically converts to delta connection for running, applying full voltage to motor windings. Most often used with transfer switch/emergency generator applications.	<ul style="list-style-type: none"> <li>* Moderate to low relative cost</li> <li>* Low motor stress</li> <li>* Low starting current</li> </ul>	<ul style="list-style-type: none"> <li>* Medium starting torque</li> <li>* Special motor required for 200V-208V</li> <li>* Power line transients</li> <li>* Can affect other equipment sharing same power source</li> </ul>	200%	33%	Open
Wye-Delta Closed-Transition	Same sequence as Open Transition. Connected to resistors in each phase during transition from wye to delta.	<ul style="list-style-type: none"> <li>* Moderate to high relative cost</li> <li>* Low motor stress</li> <li>* Low starting current</li> <li>* No line transients</li> </ul>	<ul style="list-style-type: none"> <li>* Medium starting torque</li> <li>* Special motor may be required for 200V-208V</li> </ul>	200%	33%	Open
Auto Transformer Reduced Voltage w/50% tap w/ 65% tap w/80% tap	Starters supply reduced voltage starting at motor terminals through use of tapped, 3-phase autotransformer. A timing relay causes transfer of motor from reduced voltage start to line voltage operation without disconnecting motor from power source.	<ul style="list-style-type: none"> <li>* Good for heavy starting loads</li> <li>* Highest starting torque</li> <li>* Standard motor used</li> <li>* Low starting current</li> <li>* Starting torque adjustable</li> </ul>	<ul style="list-style-type: none"> <li>* High relative cost</li> <li>* Large heavy cabinet</li> <li>* Legacy technology</li> </ul>	150% 252% 384%	25% 42% 64%	Closed
Soft Start/Stop	Reduces inrush current to motor with adjustable ramp time. Stop sequence reduces possibility of surges occurring in the system.	<ul style="list-style-type: none"> <li>* Low inrush current</li> <li>* Adjustable ramp time</li> <li>* Reduces system surges</li> <li>* Standard motor used</li> </ul>	<ul style="list-style-type: none"> <li>* High relative cost</li> </ul>	Adjustable 50-500%	Varies, down to 30%	Closed

# Horizontal Split Case Fire Pump System

1. Fuel Tank, Diesel Engine
2. Low Fuel Level Switch
3. Leak Detection Switch
4. OS & Y Gate Valve with Tamper Switch
5. Compound Suction Gauge
6. Automatic Air Release Valve
7. Diesel Engine
8. Horizontal Split Case Fire Pump
9. Discharge Pressure Gauge
10. Enclosed Waste Cone with Sight Glasses
11. Main Relief Valve
12. Fire Pump Controller
13. System Check Valve
14. Jockey Pump Controller
15. Jockey Pump
16. Isolation Valves with Tamper Switches
17. Ball Drip Valve
18. Test Valve Manifold with Hose Valves, Caps and Chains



**Pump:** Horizontal split case, double-suction, UL Listed, FM Approved, mounted on a common base with and flexibly coupled to a diesel engine. Pump sized for rated capacity and head. Also must be capable of producing 150% rated flow at not less than 65% rated head and not to exceed 140% rated head at a shutoff or no-flow condition.

**Diesel Engine:** UL Listed, FM Approved diesel engine adequately sized so as to not overload at any point on the pump hydraulic curve. Consideration must be given and de-rates applied based on job site elevation and ambient temperature. Engines must be specifically designed for fire protection service.

**Coupling:** Flexible type, sized to transmit the horsepower requirements of the pump. Coupling shall be furnished with an OSHA-design coupling guard.

**Controller:** Diesel engine controller starts the engine automatically on a loss of system pressure. System pressure is monitored via a sensing line from the system side of the check valve. Controller can also be manually started. Controllers are UL Listed and FM Approved specifically for fire pump service.

**Base:** Fabricated steel design base capable of adequately supporting the weight of the pump and driver. After pump has been fully piped and accurately aligned with the engine, the base should be fully grouted into place.

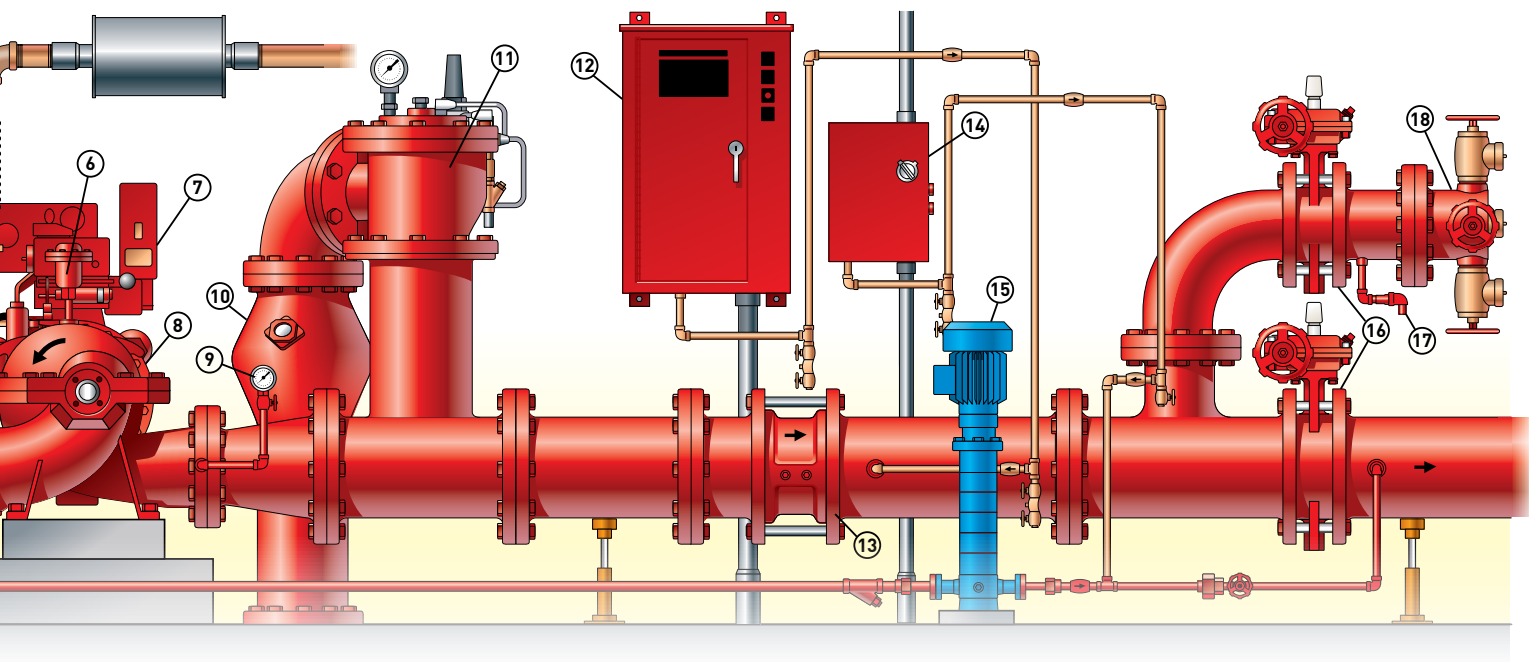
**Standard Pump Accessories:** Accessories furnished with the fire pump system include suction and discharge gauges and automatic air release valve. Other accessories commonly furnished as part of the fire pump package include hose valve manifold with hose valves, caps and chains, flowmeter, city bypass, main relief valve and enclosed waste cone, ball drip valve, eccentric suction reducer and concentric discharge increaser.

**Standard Engine Accessories:** Accessories furnished with the diesel engine include engine starting batteries, battery rack, battery cables, engine exhaust flexible connector and silencer.

**Jockey Pump:** Jockey pump keeps pressure in the system to prevent the main fire pump from operating to maintain system pressure. Jockey pumps are sized about 1% of flow to overcome small system leaks and typically sized for 10 PSI greater than the rated pressure of the main fire pump. Jockey pumps are not required to be UL Listed or FM Approved.

**Jockey Pump Controller:** Starts the jockey pump across the line by sensing the system pressure via a sensing line from the system side of the check valve. This sensing line must be independent of the main fire pump controller sensing line. Controller is sized per the jockey pump motor horsepower and voltage. Jockey pump controllers are UL Listed specifically for this service.

# Diesel Engine Driven



## PACKAGED FIRE PUMP SYSTEMS

When the application calls for a completely packaged fire pump system, Fairbanks Nijhuis™ has the capability to meet these requirements. Systems include the pump, driver, controller, jockey pump and jockey pump controller all mounted on a common base. Controller is prewired to the driver, sensing lines are prepped from the controllers to the system side of the check valve, and suction and discharge piping is piped to the edge of the common base. Isolation valves, check valve and test header piping (and/or flowmeter piping) can be supplied as required. For diesel engine driven units, the package would also include the mounting of the fuel tank, wiring of fuel alarms, piping of fuel lines to the engine, connection of batteries to the engine, all the latest NFPA20 and NEC requirements.

Should your requirements specify the packaged fire pump system to include an enclosure, Fairbanks Nijhuis can provide the protective structure to house the system. Packaged systems can be designed for use with all fire pump designs and constructed to accommodate container shipments.





800 AIRPORT ROAD,  
NORTH AURORA, ILLINOIS 60542  
[www.FairbanksNijhuis.com](http://www.FairbanksNijhuis.com)

3601 FAIRBANKS AVENUE,  
KANSAS CITY, KANSAS 66106  
[www.FairbanksNijhuis.com](http://www.FairbanksNijhuis.com)

PARALLELWEG 4  
7102 DE WINTERSWIJK, THE NETHERLANDS  
[www.FairbanksNijhuis.com](http://www.FairbanksNijhuis.com)

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