

#### **CENTRIFUGAL PUMPS FOR INDUSTRY, MARINE BUILDING TRADE AND MUNICIPAL SERVICES**

- ▶ Axially Split Case Pumps – Single & Two Stage
- ▶ End Suction Pumps - ISO2858 and Larger Sizes
- ▶ Horizontal Mixed Flow Pumps
- ▶ Vertical Inline Pumps
- ▶ Fifi Pumps for external fire fighting in ships and FPSO Fire Pumps
- ▶ Vertical and Horizontal Dry Pit Sewage Pumps
- ▶ Pump Services



## Beginnings











History of PUMPSENSE goes back to 1995 when a group of professionals working in large international pump companies decided to team together. At PUMPSENSE, we are united through a common vision to build an excellent pump company through which we can express ourselves fully and freely. Each one of us has an abiding interest in one aspect or the other of the pump business —right from hydraulic design to applications engineering, product development to marketing. We also share a common conviction that with our skills, passion and commitment, we can redefine the existing norms and standards of customer satisfaction. We wish to work, learn and create value in a nourishing and fulfilling environment for our customers, business associates and ourselves. PUMPSENSE exists to fulfill this collective dream, based on a core set of values which are our guiding philosophy in creating this organization.

## Guiding Philosophy

The business of PUMPSENSE is to provide centrifugal pumps and related services. We will constantly strive to increase the delivered value to our customer by careful attention to details, by continuous improvement of our core capabilities and by our commitment to delight the customer at every point of contact. The quality of our products and services will reflect the improvement in the quality of life that we are able to bring to our employees – we will provide them with an informal and liberal work environment, where they can constantly learn and grow. We recognize that our suppliers play a key role in the quality of our products and services. We will work closely with our suppliers so that they share our energy and focus to serve the customer with excellence. Above all we will strive to create an organization where there are no barriers amongst customer, employees and suppliers and all of us work together to create value, to grow, to learn and to enhance the quality of our lives.

## Products

The present product range of PUMPSENSE includes the following :

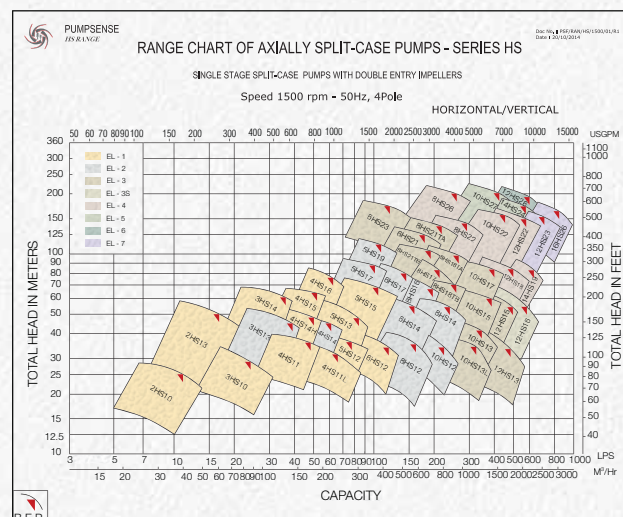
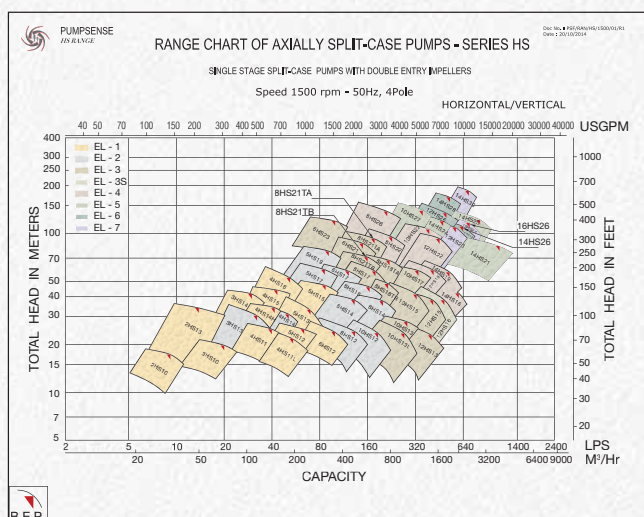
| Product Group  | Approximate no of sizes | Capacity up to m³/hr. | Head up to m | Speed up to RPM | Application Areas   | Representative Pump   |
|--|-------------------------|-----------------------|--------------|-----------------|---|---|
| Standard Split Case Pumps. Series - HS   | 67                      | 4300                  | 200          | 3000            | Air-conditioning<br>Water Supply<br>Industrial Applications       |   |
| Compact Split Case Pumps. Series - CSC   | 29                      | 1400                  | 85           | 2100            | Air-conditioning<br>Water Supply<br>Industrial Applications       |  |
| Two Stage Split Case Pumps. Series - HST   | 20                      | 1250                  | 400          | 1800            | High Pressure Cleaning<br>Water Supply<br>Industrial Applications |  |
| Split Case NFPA 20 Fire Pumps. Series - HF/HFT   | 15                      | 2000                  | 280          | 3000            | Fire Protection of Buildings and Industrial Installations         |  |
| Large End Suction Pumps. Series - ESL  | 31                      | 3200                  | 200          | 1800            | Air-conditioning<br>Water Supply<br>Industrial Applications       |  |
| ISO 2858 End Suction Pumps. Series - ES  | 37                      | 500                   | 150          | 3000            | Air-conditioning<br>Fire Protection<br>Industrial Applications    |  |
| Horizontal and Vertical Dry Pit Sewage Pumps. Series -SW                               | 20                      | 3000                  | 100          | 1800            | Municipal Sewage<br>Industrial Effluent                           |  |
| Vertical Inline Pumps. Series - IL   | 8                       | 350                   | 120          | 3600            | Air-conditioning<br>Fire Protection                               |  |
| External Fire Pumps for ships (FiFi pumps) Split Case and End Suction Pumps-SF/SFM/ESF | 24                      | 3000                  | 170          | 2600            | Used in ships for external fire fighting                          |  |
| End Suction Mixed Flow Pumps -EMF  | 4                       | 1600                  | 13           | 1500            | Flood Irrigation<br>Water Harvesting<br>Drainage                  |  |

## Services

- **Pump specification and pump selection services** – We assist large pump users to prepare detailed pump specifications and to select and procure right centrifugal pumps for critical applications.
- **Training in centrifugal pumps** – We offer structured and group- specific training programs in the selection, operation and maintenance of centrifugal pumps.
- **Retrofit & pump upgrade services** – This service also includes performance and energy audit of existing pumping installations.
- **Trouble-shooting** - Diagnostics of problems in pumping systems & their resolution.
- **Repair Services** – This service includes performance testing of repaired pumps in our fully equipped test bed.



# Series HS – Single Stage Split Case Pumps – Horizontal/Vertical



## Range Description

Discharge NB : 50 to 500 mm  
Capacity : Up to 4300 m³/hr.  
Head : Up to 200 m  
Speed : Up to 3000 rpm

## Applications

1. Air Conditioning
2. Water Supply
3. Fire Protection
4. Drainage
5. Industrial Application
6. Irrigation

## Options

**Materials**- CI, Ductile Iron, Bronze, Stainless Steel, Ni Resist

**Stuffing Box** - Packed Gland, Mechanical Seal

**Orientation** - Horizontal/Vertical

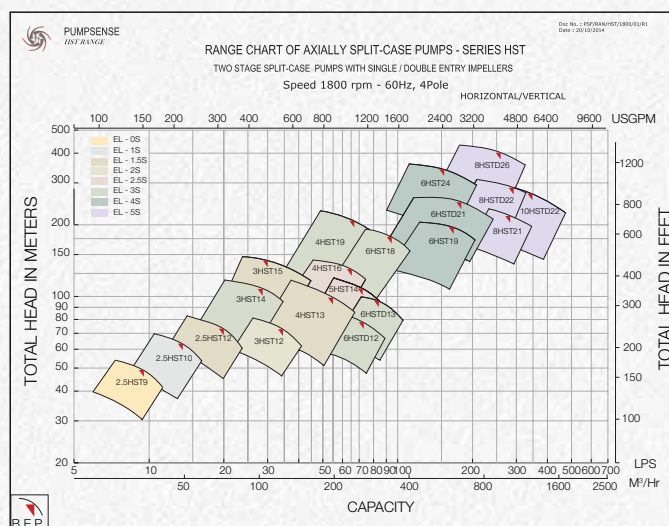
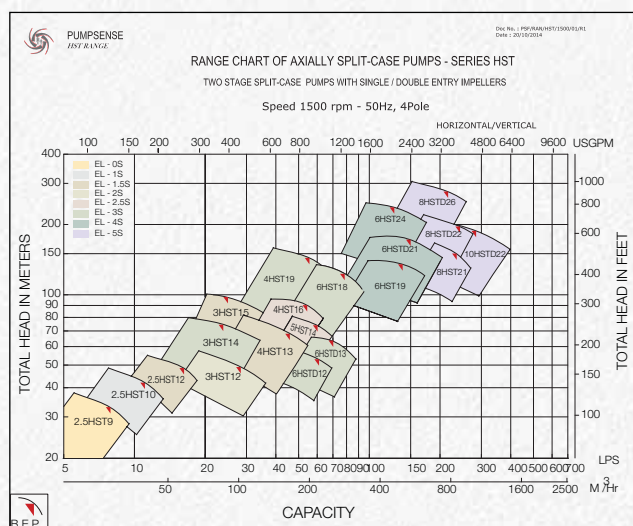
**Constructional Features** - Foot/Center line mounting, Bearing options, Cooling options, Staggered vane and special impellers

## Features

1. Optimum efficiency
2. Low NPSHr
3. Stable characteristics
4. Over 67 sizes ensure optimum selection for all duties
5. Quick customization possible to meet special system requirements.
6. High head units have double volute casings to reduce radial thrust.



# Series HST - Two Stage Split Case Pumps - Horizontal / Vertical



## Range Description

Discharge NB : 65 to 250 mm

Capacities : Up to 1250 m<sup>3</sup>/hr.

Head : Up to 400m

Speed : Up to 2100 rpm

## Applications

1. Mine Dewatering
2. Water Supply
3. Fire Protection
4. High Pressure Cleaning

## Options

**Materials** - CI, DI, Bronze, SS, Ni Resist

**Stuffing Box** - Packed Gland, Mechanical Seal

**Orientation** - Horizontal/Vertical

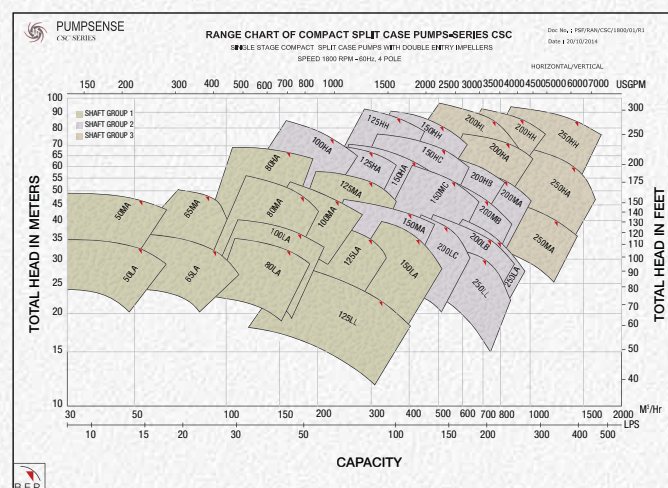
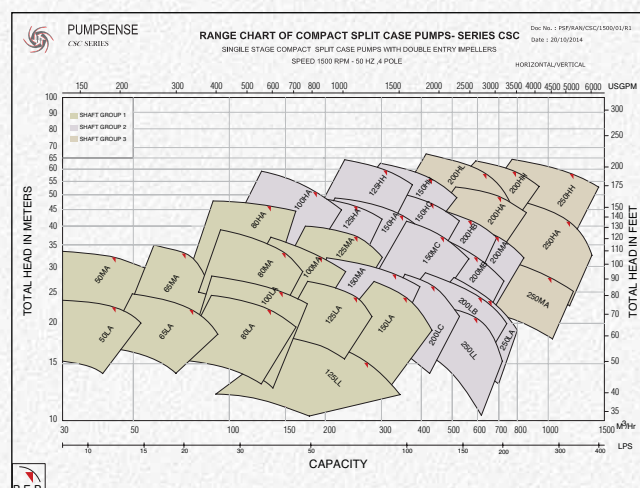
**Constructional Features** - Foot/Center Line Mounting, Bearing options, cooling options, staggered vane and special impellers

## Features

1. High Efficiency
2. Both integral & external inter-stage cross-over passages are used to ensure optimum performance.
3. Two single/double entry impellers are placed back to back to eliminate radial thrust.
4. Head characteristics more stable and efficiency higher compared to single stage units for similar duties.
5. Special custom-built units.



# Series CSC - Compact Split Case Pumps - Horizontal / Vertical



## DEVELOPMENT OBJECTIVES

Environmental concerns increasingly demand highest possible efficiency in pumps.

Universal efforts to reduce or eliminate stand-by units for energy and life-cycle-cost optimization demand optimum hydraulic and mechanical reliability.

## Application Areas:

Where, the pumps are required for long un-interrupted service with minimum of maintenance Where, mechanical seal fitted pumps are a natural choice Where, the energy costs constitute a significant portion of the life-cycle cost of an industrial plant:

- Industrial & Urban Water Supply
- Air-conditioning
- Process Industry



## DESIGN FEATURES

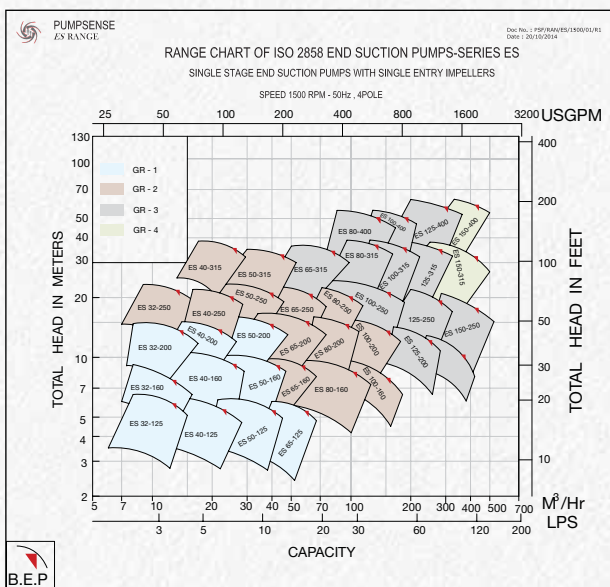
- **Compact Design** - Shorter shaft span reduces shaft deflection and increases seal and bearing lives. Casing machining is simplified, eliminating chances of machining errors and reducing machining time. Requires lesser installation space – releases expensive retail space for revenue generation. Permits faster assembly & dismantling.
- **Optimum Efficiency** – Hydraulic Institute norms have been used as bench mark. Established hydraulic designs have been used where the benchmark was achieved or exceeded.
- **Optimized Selection** - A large number of sizes help to find a pump with optimum efficiency for any duty cluster. Pump selection is always possible in the B.E.P zone (+10% to -15% of B.E.P).
- **Use of Double Volute Casing** - Double volute casing design has been adopted for 100 mm delivery branch size & above, to minimize radial thrust. This is a distinct advantage for air-con applications where over-specification of head and varying load leads to operation of pump at part or over flow conditions.

## CONSTRUCTION OPTIONS

- High-pressure (HP) version for high working pressure in tall buildings. HP version is equipped with external bearing brackets and cartridge balanced mechanical seals.
- Vertical Version (VE) is available as a pre-engineered unit.
- Packed Gland Version (PG) is available with external bearing bracket.



# Series ES - ISO 2858 End Suction Pumps

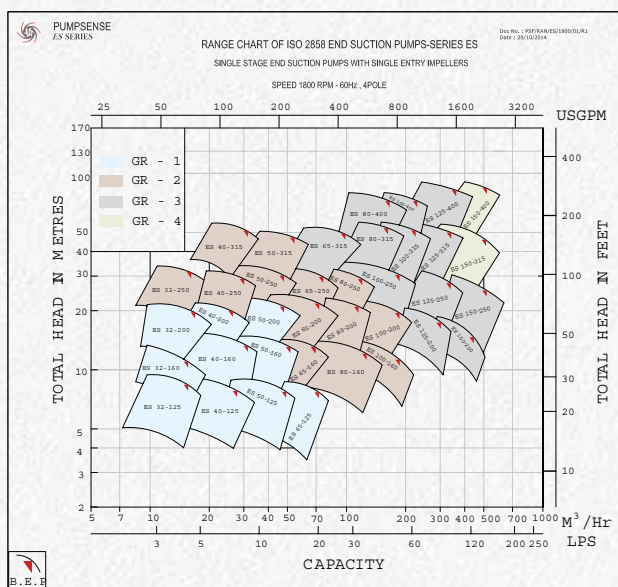


## Range Description

Discharge NB : 32 to 150 mm  
Capacity : Up to 500 m³/hr.  
Head : Up to 150m  
Speed : Up to 3000 rpm

## Applications

1. Air Conditioning
2. Water Supply
3. Fire Protection
4. Process Industries



## Options

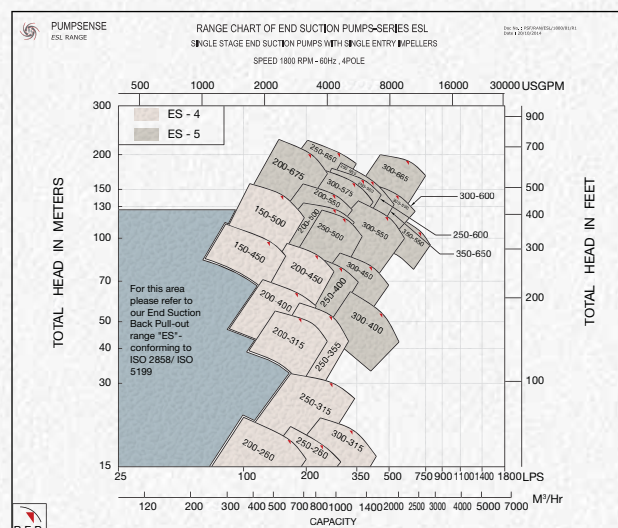
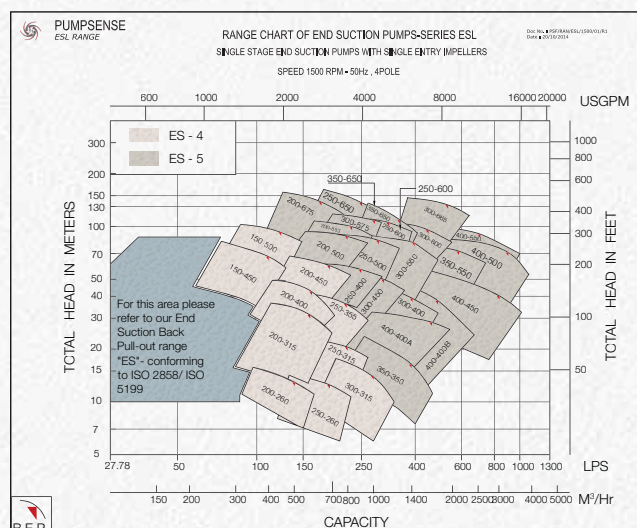
Materials - CI, DI, Bronze, SS, Ni Resist  
Stuffing Box- Packed Gland, Mechanical Seal  
Constructional Features - Foot/Center Line Mounting,  
Bearing options, cooling options, Open & semi-open  
impellers

## Features

1. Conforms to ISO 2858
2. Conforms to ISO 5199
3. High Efficiency, Low NPSHr
4. Over 37 frames ensures optimum selection for all duties
5. Quick Customization possible to ensure optimum operation.



# Series ESL - Large End Suction Pumps



## Range Description

Size : 150 to 400 mm  
Capacities : Up to 3200 m<sup>3</sup>/hr.  
Head : Up to 200m  
Speed : Up to 1800 rpm

## Applications

1. Air Conditioning
2. Water Supply
3. Fire Protection
4. Process Industries
5. Mine Dewatering
6. Power Generation

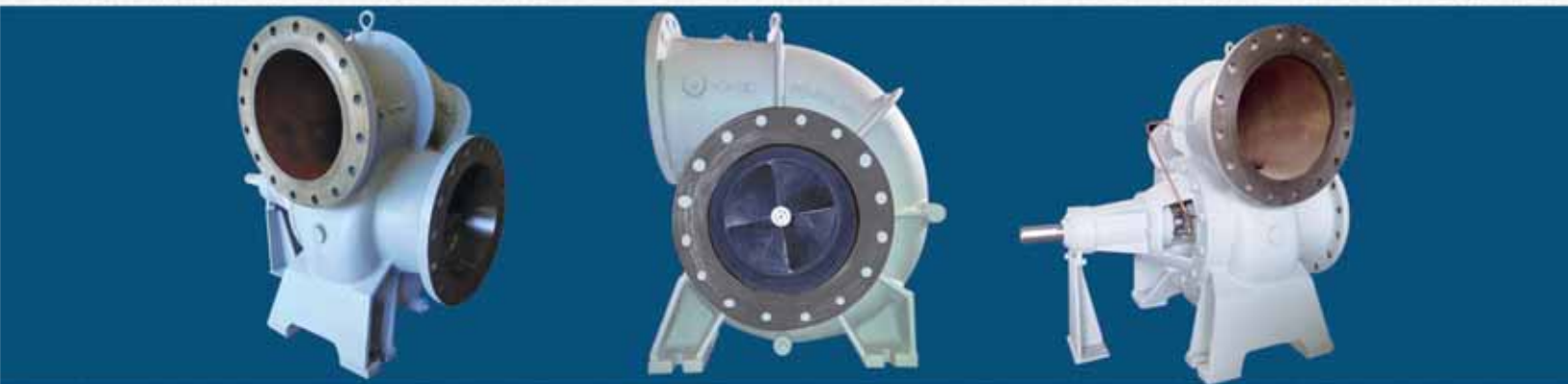
## Options

Materials - CI, DI, Bronze, SS, Ni Resist  
Stuffing Box - Packed Gland, Mechanical Seal  
Constructional Features - Foot/Center Line Mounting, Bearing options, cooling options, Open & semi-open impellers

## Features

1. High head pumps incorporate double volute design to reduce radial load and improve seal /bearing lives.
2. Conforms to ISO 5199
3. High Efficiency, Low NPSHr
4. Over 31 frames ensures optimum selection for all duties
5. Quick Customization possible to ensure optimum operation.

# Series EMF - End Suction Mixed Flow Pumps



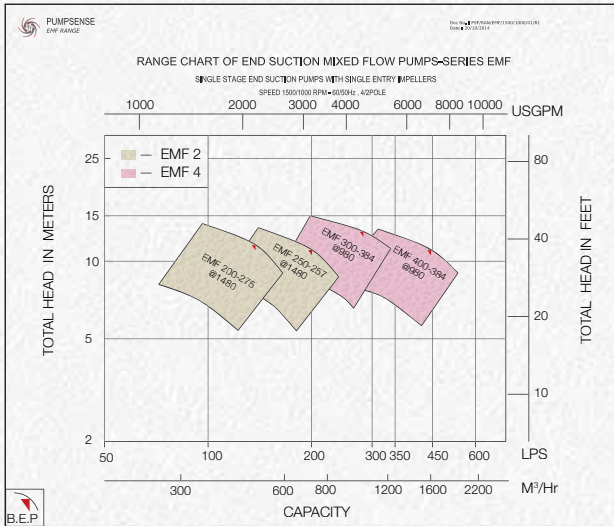
## General

Series EMF (End Suction Mixed Flow) pumps have been designed for efficiently handling large volumes of water at low and medium heads – they are available in sizes 8", 10", 12" and 16".

## Operational Limits

Pumps are suitable for clean, chemically and mechanically non-aggressive liquids

- maximum content of suspended solids, with hardness and granulometry of slit: 40 gm/m<sup>3</sup>
- maximum temperature of pumped liquids: 80°C
- maximum operating pressure: 10 bar
- coaxial drive only, by flexible coupling or cardan shaft



## Range Description

|            |                     |
|------------|---------------------|
| Size       | : 200 to 400 mm     |
| Capacities | : Up to 1650 m3/hr. |
| Head       | : Up to 16m         |
| Speed      | : Up to 1500 rpm    |

## Applications

1. Flood Irrigation
2. Water Harvesting
3. Drainage
4. Waste Disposal

## Options

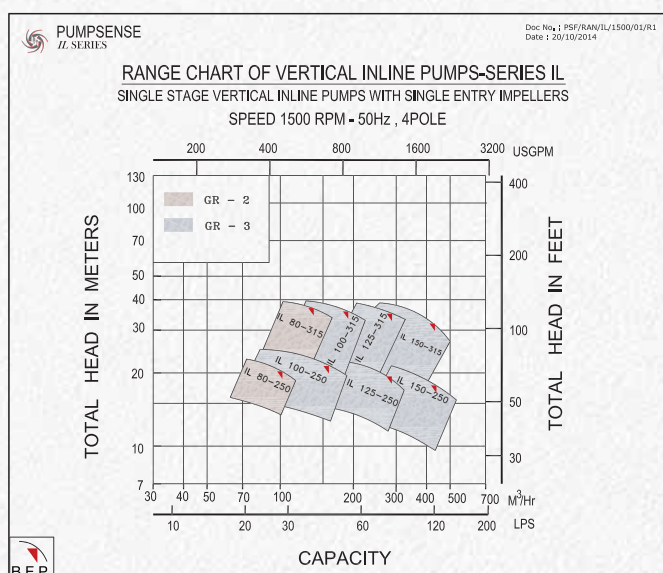
Materials - CI, DI, Bronze, SS, Ni Resist  
Stuffing Box - Packed Gland, Mechanical Seal  
Constructional Options - Bearing options, cooling options, special impellers

## Features

1. Stable head-capacity characteristics
2. Non-overloading power curve
3. High Efficiency, Low NPSHr
4. Rugged heavy duty construction
5. Quick Customization possible for specific applications.



# Series IL - Vertical Inline Pumps

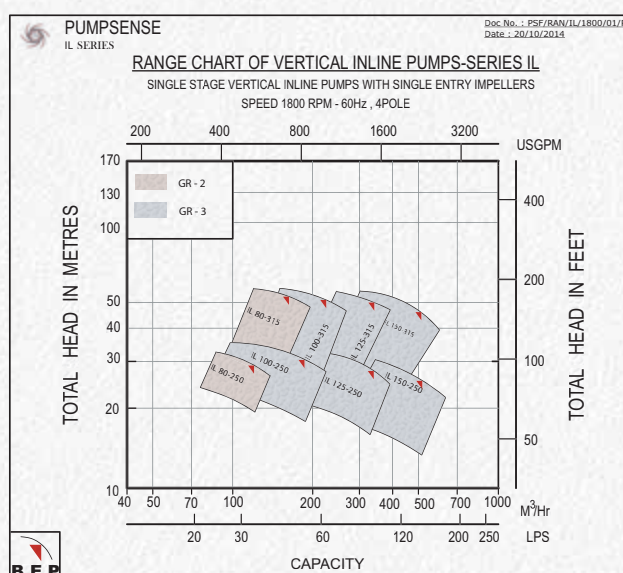


## Range Description

Discharge NB : 80 to 150 mm  
Capacities : Up to 350 m³/hr.  
Head : Up to 120m  
Speed : Up to 3600 rpm

## Applications

1. General Water Supply
2. Water Circulation for air conditioning systems
3. Petro-Chemical Industry
4. Industrial Cooling System
5. Process Industry



## Options

Materials - CI, DI, Bronze, SS, Ni Resist  
Stuffing Box - Packed Gland, Mechanical Seal  
Constructional Features - Horizontal & vertical orientation, Compact close-coupled design is an optional construction.

## Features

1. Suction and discharge connections are in-line and are of the same size to simplify piping. This enabling easy installation and minimizes installation space.
2. Pump is provided with its own independent thrust bearing and is flexibly coupled to the motor shaft
3. Smallest foot print – utilizes the least amount of floor space.
4. Quick Customization possible to ensure optimum operation.



# NFPA20 FIRE PUMP SELECTION TABLE

We offer one of the most comprehensive range of NFPA 20 fire pumps from the smallest to the largest high capacity/high head unit. The range is constantly being upgraded to optimize driver rating, range coverage and reliability.



| NFPA 20 Fire Pump Selection Table - 500 GPM to 5000 GPM ( SPLIT CASE ) |         |              |         |            |                  |                  |                  |               |     |
|--|---------|--------------|---------|------------|------------------|------------------|------------------|---------------|-----|
| DUTY DETAILS   |         |              |         | PUMP MODEL |                  | DRIVER RATING    |                  |               |     |
| Flow   |         | Head         |         | SPEED      | PUMP MODEL       | PUMP TYPE        |                  |               |     |
| USGPM  | M³/HR.  | PSIG         | M       | RPM        |                  |                  |                  |               |     |
| 500  | 114     | 50-85        | 35-60   | 1500       | 4HS16            | HSC SINGLE STAGE | 45               | 60            |     |
|  |         | 50-102       | 35-72   |            | 4HST13           | HSC TWO STAGE    | 45               | 60            |     |
|  |         | 95-150       | 68-105  |            | 4HST16           | HSC TWO STAGE    | 75               | 101           |     |
|  |         | 128-228      | 90-160  |            | 4HST19           | HSC TWO STAGE    | 110              | 147           |     |
|  |         | 57-99.5      | 40-70   | 1800       | 4HS15            | HSC SINGLE STAGE | 45               | 60            |     |
|  |         | 85-170       | 60-120  |            | 4HST13           | HSC TWO STAGE    | 75               | 101           |     |
|  |         | 170-227      | 120-160 |            | 4HST16           | HSC TWO STAGE    | 110              | 147           |     |
|  |         | 50-78        | 35-55   | 2100       | 4HF11            | HSC SINGLE STAGE | 37               | 50            |     |
|  |         | 71-135       | 50-95   |            | 3HF15            | HSC SINGLE STAGE | 55               | 74            |     |
|  |         | 114-220      | 80-155  |            | 3HF15            | HSC SINGLE STAGE | 90               | 121           |     |
|  |         | 57-163       | 40-115  | 3000       | 3HF11            | HSC SINGLE STAGE | 60               | 80            |     |
|  |         | 163-291      | 115-205 |            | 3HF15            | HSC SINGLE STAGE | 132              | 177           |     |
|  |         | 127-298      | 90-210  |            | 3HFT12           | HSC TWO STAGE    | 132              | 177           |     |
|  |         | 291-469      | 205-330 |            | 3HFTD14          | HSC TWO STAGE    | 200              | 268           |     |
|  |         | 99-241       | 70-170  | 3600       | 3HF11            | HSC SINGLE STAGE | 110              | 147           |     |
| DUTY DETAILS   |         |              |         | PUMP MODEL |                  | DRIVER RATING    |                  |               |     |
| Flow   |         | Head         |         | SPEED      | PUMP MODEL       | PUMP TYPE        |                  |               |     |
| USGPM  | M³/HR.  | PSIG         | M       | RPM        |                  |                  |                  |               |     |
| 750  | 170     | 28-57        | 20-40   | 1500       | 5HS13            | HSC SINGLE STAGE | 30               | 40            |     |
|  |         | 77-115       | 54-81   |            | 5HST14           | HSC TWO STAGE    | 75               | 101           |     |
|  |         | 95-199       | 95-140  |            | 6HST18           | HSC TWO STAGE    | 132              | 177           |     |
|  |         | 213-355      | 150-250 |            | 6HST24           | HSC TWO STAGE    | 275              | 369           |     |
|  |         | 50-85        | 35-60   | 1800       | 5HS13            | HSC SINGLE STAGE | 55               | 74            |     |
|  |         | 85-114       | 60-80   |            | 5HS15            | HSC SINGLE STAGE | 75               | 101           |     |
|  |         | 123-178      | 87-125  |            | 5HST14           | HSC TWO STAGE    | 110              | 147           |     |
|  |         | 213-312      | 150-220 |            | 4HST19           | HSC TWO STAGE    | 225              | 302           |     |
|  |         | 64-114       | 45-80   | 2100       | 4HF14            | HSC SINGLE STAGE | 75               | 101           |     |
|  |         | 99-184       | 70-130  | 2600       | 4HF14            | HSC SINGLE STAGE | 132              | 177           |     |
|  |         | 97-157       | 68-110  | 3000       | 4HF11            | HSC SINGLE STAGE | 110              | 147           |     |
|  |         | 157-270      | 110-190 |            | 3HF15            | HSC SINGLE STAGE | 132              | 177           |     |
|  |         | 142-305      | 100-215 |            | 4HFT12           | HSC TWO STAGE    | 200              | 268           |     |
|  |         | 149-238      | 105-168 |            | 3600             | 4HF11            | HSC SINGLE STAGE | 150           | 201 |
|  |         | DUTY DETAILS |         |            |                  | PUMP MODEL       |                  | DRIVER RATING |     |
| Flow   |         | Head         |         | SPEED      | PUMP MODEL       | PUMP TYPE        |                  |               |     |
| USGPM  | M³/HR.  | PSIG         | M       | RPM        |                  |                  |                  |               |     |
| 1000   | 227     | 50-93        | 35-65   | 1500       | 5HS17            | HSC SINGLE STAGE | 75               | 101           |     |
|  |         | 74-118       | 52-83   |            | 5HS19            | HSC SINGLE STAGE | 90               | 121           |     |
|  |         | 121-180      | 85-127  |            | 6HS23            | HSC SINGLE STAGE | 150              | 201           |     |
|  |         | 227-348      | 160-245 |            | 6HST24           | HSC TWO STAGE    | 350              | 469           |     |
|  |         | 78-135       | 55-95   | 1800       | 5HS17            | HSC SINGLE STAGE | 132              | 177           |     |
|  |         | 121-185      | 85-130  |            | 5HS19            | HSC SINGLE STAGE | 150              | 201           |     |
|  |         | 185-270      | 130-190 |            | 6HS23            | HSC SINGLE STAGE | 275              | 369           |     |
|  |         | 348-540      | 245-380 |            | 6HST24           | HSC TWO STAGE    | 550              | 737           |     |
|  |         | 45-85        | 32-60   | 2100       | 6HF12            | HSC SINGLE STAGE | 75               | 101           |     |
|  |         | 112-227      | 79-160  |            | 6HFTD13          | HSC TWO STAGE    | 180              | 241           |     |
|  |         | 106-177      | 75-125  |            | 6HF14            | HSC SINGLE STAGE | 180              | 241           |     |
|  |         | 88-149       | 62-105  | 3000       | 4HF11            | HSC SINGLE STAGE | 132              | 177           |     |
|  |         | 114-187      | 80-132  |            | 5HF12            | HSC SINGLE STAGE | 160              | 214           |     |
|  |         | 135-234      | 95-165  |            | 4HF14            | HSC SINGLE STAGE | 180              | 241           |     |
|  |         | 227-341      | 160-240 |            | 6HFTD12          | HSC TWO STAGE    | 180              | 241           |     |
| 177-284  | 125-200 | 3600         | 5HF12   |            | HSC SINGLE STAGE | 250              | 335              |               |     |
| DUTY DETAILS   |         |              |         |            | PUMP MODEL       |                  | DRIVER RATING    |               |     |
| Flow   |         | Head         |         |            | SPEED            | PUMP MODEL       | PUMP TYPE        |               |     |
| USGPM  | M³/HR.  | PSIG         | M       | RPM        |                  |                  |                  |               |     |
| 1250   | 284     | 60-88        | 42-62   | 1500       | 6HS17            | HSC SINGLE STAGE | 90               | 121           |     |
|  |         | 90-139       | 64-98   |            | 6HS21            | HSC SINGLE STAGE | 150              | 201           |     |
|  |         | 227-348      | 160-245 |            | 6HST24           | HSC TWO STAGE    | 400              | 536           |     |
|  |         | 92-135       | 65-95   | 1800       | 6HS17            | HSC SINGLE STAGE | 132              | 177           |     |
|  |         | 116-179      | 82-126  |            | 5HS19            | HSC SINGLE STAGE | 180              | 241           |     |
|  |         | 179-270      | 126-190 |            | 6HS23            | HSC SINGLE STAGE | 315              | 422           |     |
|  |         | 340-540      | 240-380 |            | 6HST24           | HSC TWO STAGE    | 675              | 905           |     |
|  |         | 257-386      | 181-272 | 2100       | 6HST18           | HSC TWO STAGE    | 425              | 570           |     |
|  |         | 65-100       | 45-70   | 2350       | 8HF12H           | HSC SINGLE STAGE | 110              | 147           |     |
|  |         | 108-200      | 76-141  | 2400       | 5HS15            | HSC SINGLE STAGE | 225              | 302           |     |
|  |         | 99-173       | 70-122  | 2600       | 6HF14            | HSC SINGLE STAGE | 180              | 241           |     |
|  |         | 92-258       | 65-120  | 3000       | 6HF12            | HSC SINGLE STAGE | 180              | 241           |     |
|  |         | 128-220      | 90-155  |            | 4HF14            | HSC SINGLE STAGE | 200              | 268           |     |
|  |         | 227-334      | 160-235 |            | 6HFTD12          | HSC TWO STAGE    | 350              | 469           |     |
|  |         | 334-454      | 235-320 |            | 3600             | 6HFTD13          | HSC TWO STAGE    | 575           | 771 |
| DUTY DETAILS   |         |              |         |            | PUMP MODEL       |                  | DRIVER RATING    |               |     |
| Flow   |         | Head         |         |            | SPEED            | PUMP MODEL       | PUMP TYPE        |               |     |
| USGPM  | M³/HR.  | PSIG         | M       | RPM        |                  |                  |                  |               |     |
| 1500   | 341     | 61-99        | 43-70   | 1500       | 8HS17            | HSC SINGLE STAGE | 132              | 177           |     |
|  |         | 88-138       | 62-97   |            | 6HS21            | HSC SINGLE STAGE | 180              | 241           |     |
|  |         | 227-340      | 160-240 |            | 6HST24           | HSC TWO STAGE    | 450              | 603           |     |
|  |         | 88-135       | 62-95   | 1800       | 6HS17            | HSC SINGLE STAGE | 180              | 241           |     |
|  |         | 142-217      | 100-153 |            | 6HS21            | HSC SINGLE STAGE | 275              | 369           |     |
|  |         | 241-270      | 170-190 |            | 6HS23            | HSC SINGLE STAGE | 350              | 469           |     |
|  |         | 336-540      | 237-380 |            | 6HST24           | HSC TWO STAGE    | 725              | 972           |     |
|  |         | 65-100       | 45-70   | 2350       | 8HF12H           | HSC SINGLE STAGE | 110              | 147           |     |
|  |         | 105-196      | 74-138  | 2400       | 5HS15            | HSC SINGLE STAGE | 250              | 335           |     |
|  |         | 99-163       | 70-115  | 2600       | 8HF14            | HSC SINGLE STAGE | 180              | 241           |     |
|  |         | 85-170       | 60-120  | 3000       | 6HF12            | HSC SINGLE STAGE | 180              | 241           |     |
|  |         | 142-213      | 100-150 |            | 6HF14            | HSC SINGLE STAGE | 250              | 335           |     |
|  |         | 128-200      | 90-140  |            | 6HF14H           | HSC SINGLE STAGE | 275              | 369           |     |
|  |         | 227-326      | 160-230 |            | 6HFTD12          | HSC TWO STAGE    | 400              | 536           |     |
|  |         | 227-454      | 160-320 |            | 3600             | 6HFTD13          | HSC TWO STAGE    | 575           | 771 |



# NFPA20 FIRE PUMP SELECTION TABLE



| DUTY DETAILS |                     |         |         | PUMP MODEL |            | DRIVER RATING    |                  |      |
|--------------|---------------------|---------|---------|------------|------------|------------------|------------------|------|
| Flow         |                     | Head    |         | SPEED      | PUMP MODEL | PUMP TYPE        | Kw               | HP   |
| USGPM        | M <sup>3</sup> /HR. | PSIG    | M       | RPM        |            |                  |                  |      |
| 1500         | 341                 | 61-99   | 43-70   | 1500       | 8HS17      | HSC SINGLE STAGE | 132              | 177  |
|              |                     | 88-138  | 62-97   |            | 6HS21      | HSC SINGLE STAGE | 180              | 241  |
|              |                     | 227-340 | 160-240 |            | 6HST24     | HSC TWO STAGE    | 450              | 603  |
|              |                     | 88-135  | 62-95   |            | 6HS17      | HSC SINGLE STAGE | 180              | 241  |
|              |                     | 142-217 | 100-153 | 1800       | 6HS21      | HSC SINGLE STAGE | 275              | 369  |
|              |                     | 241-270 | 170-190 |            | 6HS23      | HSC SINGLE STAGE | 350              | 469  |
|              |                     | 336-540 | 237-380 |            | 6HST24     | HSC TWO STAGE    | 725              | 972  |
|              |                     | 65-100  | 45-70   |            | 2350       | 8HF12H           | HSC SINGLE STAGE | 110  |
|              |                     | 105-196 | 74-138  | 2400       | 5HS15      | HSC SINGLE STAGE | 250              | 335  |
|              |                     | 99-163  | 70-115  | 2600       | 8HF14      | HSC SINGLE STAGE | 180              | 241  |
|              |                     | 85-170  | 60-120  |            | 6HF12      | HSC SINGLE STAGE | 180              | 241  |
|              |                     | 142-213 | 100-150 |            | 6HF14      | HSC SINGLE STAGE | 250              | 335  |
|              |                     | 128-200 | 90-140  |            | 6HF14H     | HSC SINGLE STAGE | 275              | 369  |
|              |                     | 227-326 | 160-230 | 3000       | 6HFTD12    | HSC TWO STAGE    | 400              | 536  |
|              |                     | 227-454 | 160-320 |            | 6HFTD13    | HSC TWO STAGE    | 575              | 771  |
| DUTY DETAILS |                     |         |         | PUMP MODEL |            | DRIVER RATING    |                  |      |
| Flow         |                     | Head    |         | SPEED      | PUMP MODEL | PUMP TYPE        | Kw               | HP   |
| USGPM        | M <sup>3</sup> /HR. | PSIG    | M       | RPM        |            |                  |                  |      |
| 2000         | 454                 | 57-92   | 40-65   | 1500       | 8HS17      | HSC SINGLE STAGE | 150              | 201  |
|              |                     | 80-106  | 57-75   |            | 8HS18      | HSC SINGLE STAGE | 180              | 241  |
|              |                     | 114-145 | 80-102  |            | 8HS21      | HSC SINGLE STAGE | 250              | 335  |
|              |                     | 64-106  | 45-75   |            | 8HS16      | HSC SINGLE STAGE | 180              | 241  |
|              |                     | 106-142 | 75-100  | 1800       | 8HS17      | HSC SINGLE STAGE | 225              | 302  |
|              |                     | 142-210 | 100-148 |            | 6HS21      | HSC SINGLE STAGE | 350              | 469  |
|              |                     | 121-199 | 85-140  |            | 8HS17      | HSC SINGLE STAGE | 325              | 436  |
|              |                     | 85-152  | 60-107  |            | 8HF14      | HSC SINGLE STAGE | 200              | 268  |
|              |                     | 142-163 | 70-115  | 2600       | 8HF12      | HSC SINGLE STAGE | 275              | 369  |
|              |                     | 142-294 | 100-160 |            | 8HF14      | HSC SINGLE STAGE | 375              | 503  |
| DUTY DETAILS |                     |         |         | PUMP MODEL |            | DRIVER RATING    |                  |      |
| Flow         |                     | Head    |         | SPEED      | PUMP MODEL | PUMP TYPE        | Kw               | HP   |
| USGPM        | M <sup>3</sup> /HR. | PSIG    | M       | RPM        |            |                  |                  |      |
| 2500         | 568                 | 92-149  | 65-105  | 1500       | 8HS22      | HSC SINGLE STAGE | 275              | 369  |
|              |                     | 122-213 | 86-150  |            | 8HS26      | HSC SINGLE STAGE | 415              | 556  |
|              |                     | 199-312 | 140-220 |            | 10HSTD22   | HSC TWO STAGE    | 600              | 804  |
|              |                     | 57-81   | 40-57   |            | 8HS14      | HSC SINGLE STAGE | 180              | 241  |
|              |                     | 81-138  | 57-97   | 1800       | 8HS17      | HSC SINGLE STAGE | 250              | 335  |
|              |                     | 169-213 | 119-150 |            | 8HS21      | HSC SINGLE STAGE | 425              | 570  |
|              |                     | 185-320 | 130-225 |            | 8HS26      | HSC SINGLE STAGE | 675              | 905  |
|              |                     | 114-193 | 80-136  |            | 8HS17      | HSC SINGLE STAGE | 350              | 469  |
|              |                     | 97-155  | 68-109  | 2100       | 8HF12      | HSC SINGLE STAGE | 315              | 422  |
|              |                     | 123-223 | 87-157  |            | 8HF14      | HSC SINGLE STAGE | 400              | 536  |
| DUTY DETAILS |                     |         |         | PUMP MODEL |            | DRIVER RATING    |                  |      |
| Flow         |                     | Head    |         | SPEED      | PUMP MODEL | PUMP TYPE        | Kw               | HP   |
| USGPM        | M <sup>3</sup> /HR. | PSIG    | M       | RPM        |            |                  |                  |      |
| 3000         | 682                 | 30-44   | 21-31   | 1500       | 10HS13     | HSC SINGLE STAGE | 160              | 214  |
|              |                     | 47-71   | 33-50   |            | 10HS15     | HSC SINGLE STAGE | 180              | 241  |
|              |                     | 64-92   | 45-65   |            | 10HS17     | HSC SINGLE STAGE | 225              | 302  |
|              |                     | 106-163 | 75-115  |            | 10HS22     | HSC SINGLE STAGE | 450              | 603  |
|              |                     | 185-298 | 130-210 | 1800       | 10HSTD22   | HSC TWO STAGE    | 675              | 905  |
|              |                     | 85-199  | 60-140  |            | 8HS22      | HSC SINGLE STAGE | 475              | 637  |
|              |                     | 199-312 | 140-220 |            | 8HS26      | HSC SINGLE STAGE | 650              | 871  |
|              |                     | 284-440 | 200-310 |            | 10HSTD22   | HSC TWO STAGE    | 1050             | 1407 |
|              |                     | 114-185 | 80-130  | 2100       | 8HS17      | HSC SINGLE STAGE | 375              | 503  |
|              |                     | 199-298 | 140-210 |            | 8HS22      | HSC SINGLE STAGE | 700              | 938  |
|              |                     | 90-152  | 63-107  |            | 8HF12      | HSC SINGLE STAGE | 350              | 469  |
| DUTY DETAILS |                     |         |         | PUMP MODEL |            | DRIVER RATING    |                  |      |
| Flow         |                     | Head    |         | SPEED      | PUMP MODEL | PUMP TYPE        | Kw               | HP   |
| USGPM        | M <sup>3</sup> /HR. | PSIG    | M       | RPM        |            |                  |                  |      |
| 3500         | 795                 | 47-68   | 33-48   | 1500       | 10HS15     | HSC SINGLE STAGE | 180              | 241  |
|              |                     | 62-89   | 44-63   |            | 10HS17     | HSC SINGLE STAGE | 250              | 335  |
|              |                     | 71-99   | 50-70   |            | 12HS18     | HSC SINGLE STAGE | 275              | 369  |
|              |                     | 102-165 | 72-116  |            | 10HS22     | HSC SINGLE STAGE | 475              | 637  |
|              |                     | 142-227 | 100-160 | 1800       | 10HS27     | HSC SINGLE STAGE | 600              | 804  |
|              |                     | 170-290 | 120-204 |            | 10HSTD22   | HSC TWO STAGE    | 725              | 972  |
|              |                     | 64-104  | 45-73   |            | 10HS15     | HSC SINGLE STAGE | 300              | 402  |
|              |                     | 104-163 | 73-115  |            | 10HS18     | HSC SINGLE STAGE | 450              | 603  |
|              |                     | 163-241 | 115-170 | 2100       | 10HS22     | HSC SINGLE STAGE | 800              | 1072 |
|              |                     | 284-426 | 200-300 |            | 10HSTD22   | HSC TWO STAGE    | 1150             | 1541 |
|              |                     | 48-85   | 34-60   |            | 10HS13L    | HSC SINGLE STAGE | 225              | 302  |
|              |                     | 186-297 | 131-209 |            | 8HS22      | HSC SINGLE STAGE | 775              | 1039 |
| DUTY DETAILS |                     |         |         | PUMP MODEL |            | DRIVER RATING    |                  |      |
| Flow         |                     | Head    |         | SPEED      | PUMP MODEL | PUMP TYPE        | Kw               | HP   |
| USGPM        | M <sup>3</sup> /HR. | PSIG    | M       | RPM        |            |                  |                  |      |
| 4000         | 909                 | 61-89   | 43-63   | 1500       | 10HS17     | HSC SINGLE STAGE | 275              | 369  |
|              |                     | 68-96   | 48-68   |            | 12HS18     | HSC SINGLE STAGE | 275              | 369  |
|              |                     | 100-163 | 70-115  |            | 10HS22     | HSC SINGLE STAGE | 500              | 670  |
|              |                     | 163-220 | 115-155 |            | 10HS27     | HSC SINGLE STAGE | 675              | 905  |
|              |                     | 68-101  | 48-71   | 1800       | 10HS15     | HSC SINGLE STAGE | 300              | 402  |
|              |                     | 96-136  | 68-96   |            | 10HS17     | HSC SINGLE STAGE | 450              | 603  |
|              |                     | 105-146 | 74-103  |            | 12HS18     | HSC SINGLE STAGE | 450              | 603  |
|              |                     | 213-338 | 150-238 |            | 10HS27     | HSC SINGLE STAGE | 1100             | 1474 |
|              |                     | 270-426 | 190-300 | 3000       | 10HSTD22   | HSC TWO STAGE    | 1250             | 1675 |
|              |                     |         |         |            |            |                  |                  |      |
| DUTY DETAILS |                     |         |         | PUMP MODEL |            | DRIVER RATING    |                  |      |
| Flow         |                     | Head    |         | SPEED      | PUMP MODEL | PUMP TYPE        | Kw               | HP   |
| USGPM        | M <sup>3</sup> /HR. | PSIG    | M       | RPM        |            |                  |                  |      |
| 4500         | 1022                | 35-49   | 50-70   | 1500       | 12HS18     | HSC SINGLE STAGE | 300              | 402  |
|              |                     | 53-70   | 75-100  |            | 12HS22     | HSC SINGLE STAGE | 450              | 603  |
|              |                     | 63-105  | 90-150  |            | 12HS26     | HSC SINGLE STAGE | 800              | 1072 |
|              |                     | 35-49   | 50-70   | 1800       | 12HS15     | HSC SINGLE STAGE | 325              | 436  |
|              |                     | 49-70   | 70-100  |            | 12HS18     | HSC SINGLE STAGE | 475              | 637  |
|              |                     | 81-105  | 115-150 |            | 12HS22     | HSC SINGLE STAGE | 850              | 1139 |
|              |                     | 105-176 | 150-250 |            | 10HS27     | HSC SINGLE STAGE | 1100             | 1474 |
| DUTY DETAILS |                     |         |         | PUMP MODEL |            | DRIVER RATING    |                  |      |
| Flow         |                     | Head    |         | SPEED      | PUMP MODEL | PUMP TYPE        | Kw               | HP   |
| USGPM        | M <sup>3</sup> /HR. | PSIG    | M       | RPM        |            |                  |                  |      |
| 5000         | 1136                | 42-68   | 30-48   | 1500       | 12HS16     | HSC SINGLE STAGE | 225              | 302  |
|              |                     | 64-92   | 45-65   |            | 12HS18     | HSC SINGLE STAGE | 315              | 422  |
|              |                     | 99-147  | 70-104  |            | 12HS22     | HSC SINGLE STAGE | 550              | 737  |
|              |                     | 113-184 | 80-130  |            | 14HS24     | HSC SINGLE STAGE | 700              | 938  |
|              |                     | 118-213 | 83-150  | 1800       | 12HS26     | HSC SINGLE STAGE | 800              | 1072 |
|              |                     | 39-59   | 28-42   |            | 12HS13     | HSC SINGLE STAGE | 225              | 302  |
|              |                     | 66-93   | 47-66   |            | 12HS15     | HSC SINGLE STAGE | 350              | 469  |
|              |                     | 71-99   | 50-70   |            | 12HS16     | HSC SINGLE STAGE | 400              | 536  |
|              |                     | 99-137  | 70-97   |            | 12HS18     | HSC SINGLE STAGE | 500              | 670  |
|              |                     | 156-225 | 110-160 |            | 12HS22     | HSC SINGLE STAGE | 875              | 1173 |

For the selection of NFPA-20 End Suction Fire Pump please refer to PUMPSENSE.



# MARINE EXTERNAL FIRE PUMPS (FIFI PUMPS)



**Range Coverage** - Pumpsense has the most extensive range of ships external firefighting pumps. The hydraulics of the range is based on our very successful split-case and end suction range of pumps. A large number of pump sizes allow us to optimize selection based on available engine rating and speed.

**Pump Types and product variants** - Pumps are offered in a large variety of construction options, such as:

- Axially split case -Side Suction/Side Delivery - CW /CCW
- Axially split case -Side Suction/ Top Delivery - CW/CCW
- Axially split case - Bottom Suction/ Side Delivery - CW/CCW
- Axially Split Case - Bottom Suction/ Top Delivery - CW/CCW
- Axially Split Case Vertical Shaft

**End Suction Pumps** - CW/CCW with several suction branch options.

**Customization/Special Design** - We work closely with customers to design “space optimized” special designs such as clutch mounted pumps, pumps with lip seals in place of conventional packing/ mechanical seal, pumps specially designed for a specific engine rating or speed, etc.

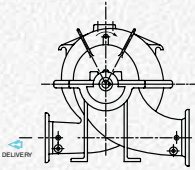
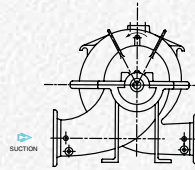
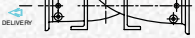
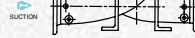

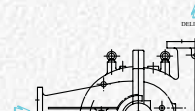
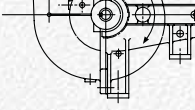
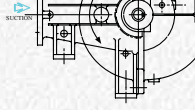


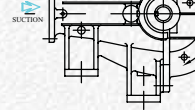
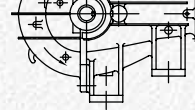






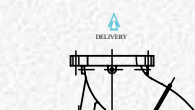

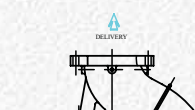

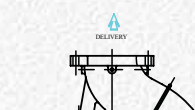

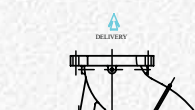

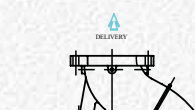

**Material of Construction** - Pumps are offered in a variety of material options such as Ductile Iron, Nickel Aluminum Bronze, Duplex Stainless Steel, etc.

**Certification** - Pumps are certified by agencies such as ABS, Lloyds, BV, DNV, KR, CCS, etc. When required product/type approvals are also obtained from these agencies.

**FPSO Fire Pumps** - Our Range include engineered NFPA20 FPSO fire and lift pumps in a variety of material options.

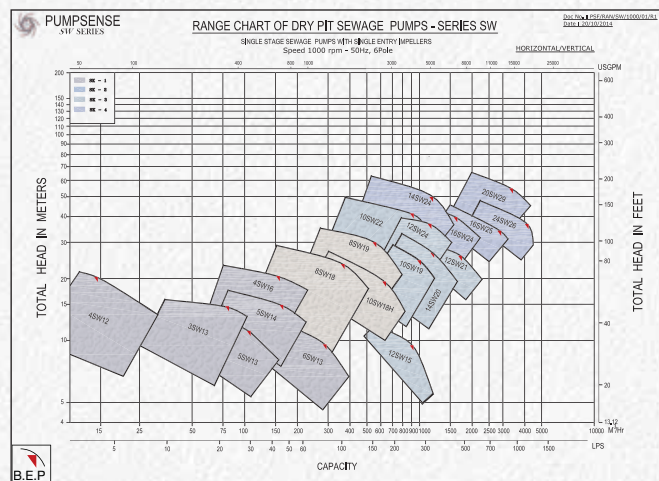
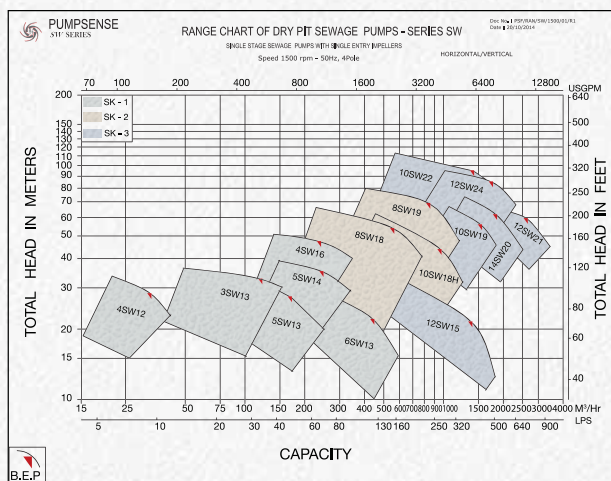




| Product Available |                  |                         |                               |             | Available option for marine fire pump flange orientation |  |   |
|-------------------|------------------|-------------------------|-------------------------------|-------------|--|--|---|
| Capacity (m3/hr.) | Head Range (Bar) | End Suction (ESF Range) | Split Case (HS/SF/ SFM) Range | Speed Range | Type   | CW looking from DE   | CCW looking from DE   |
| 300               | 12-14            | ESF 125-500             | 5SF20                         | 1800-2100   | Horizontally Split Case                                  |    |    |
| 400               | 12-14            | ESF 150-500             | 5SF19                         | 1800-2100   |  |  |   |
| 600               | 12-14            | ESF 150-500             | 6SF21                         | 1800-2100   |  |  |   |
| 750               | 12-14            | ESF 200-500             | 8SF22                         | 1800-2100   | Side Suction/ Side Delivery                              |    |    |
|                   | 12-14            | ESF 200-550             | 8SF22                         | 1800-2100   | Horizontally Split Case                                  |    |    |
| 900               | 12-14            | ESF 200-500             | 8SF22                         | 1800-2100   | Side Suction/ Top Delivery                               |    |    |
|                   | 12-14            | ESF 200-550             | 8SF26                         | 1800        | Horizontally Split Case                                  |   |   |
| 1200              | 12-14            | ESF 250-500             | 10SF22                        | 1800        | Side Suction/ Top Delivery (Mirror version)              |  |  |
|                   | 12-14            | ESF 250-600             | 10SF27                        | 1800        |  |  |   |
| 1500              | 12-14            | ESF 250-500             | 10SF22                        | 1800        | Bottom Suction/ Top Delivery                             |  |  |
|                   | 12-14            | ESF 250-600             | 10SF27                        | 1800        |  |  |   |
| 1600              | 12-14            | ESF 300-550             | 10SF22                        | 1800        | End Suction/ Top Delivery (Center Mounted)               |  |  |
|                   | 12-14            | ESF 300-600             | 10SF27                        | 1800        |  |  |   |
| 1800              | 12-14            | ESF 300-550             | 12SF23                        | 1800        | End Suction/ Top Delivery (Foot Mounted)                 |  |  |
|                   | 12-14            | ESF 300-665             | 12SF23                        | 1800        |  |  |   |
| 2100              | 12-14            | ESF 300-665             | 12SF23                        | 1800        | End Suction/ Top Delivery (Foot Mounted)                 |  |  |
| 2400              | 12-14            | ESF 400-500             | 12SF23                        | 1800        | End Suction/ Top Delivery (Foot Mounted)                 |  |  |
|                   | 12-14            | ESF 400-600             | 12SF23                        | 1800        |  |  |   |
| 2700              | 12-14            | ESF 400-500             | 16SF26                        | 1800        | End Suction/ Top Delivery (Foot Mounted)                 |  |  |
|                   | 12-14            | ESF 400-600             | 16SF28                        | 1800        |  |  |   |
| 3000              | 12-14            | ESF 400-500             | 16SF26                        | 1800        | End Suction/ Top Delivery (Foot Mounted)                 |  |  |
|                   | 12-14            | ESF 400-600             | 16SF28                        | 1800        |  |  |   |
| 3600              | 12-14            | ESF 400-600             | 16SF26                        | 1800        | End Suction/ Top Delivery (Foot Mounted)                 |  |  |
|                   | 12-14            | ESF 400-600             | 16SF28                        | 1800        |  |  |   |



# Series SW - Non-clog Dry Pit Sewage Pumps



## Range Description

Size : 80 to 600 mm  
Capacities : Up to 4000 m<sup>3</sup>/hr.  
Head : Up to 100m  
Speed : Up to 1800 rpm

## Applications

1. General Water Supply
2. Water Circulation for air conditioning system
3. Petro-Chemical Industry
4. Industrial Cooling System
5. Light Textile Industry

## Options

**Materials** - CI, DI, Bronze, SS, Ni Resist

**Stuffing Box** - Packed Gland, Mechanical Seal

**Constructional Features** - Centrifugal, Horizontal/vertical model, open shrouded design with supplementary vanes, minimum no of vanes for solid handling capacity.



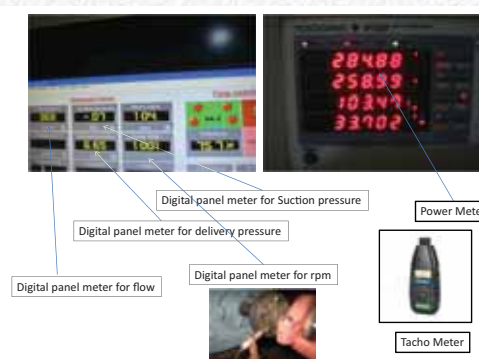
Two Vane Non-Clog Impeller

## Features

1. High Energy Efficiency
2. Optimum Mechanical Reliability
3. Large Solid Handling Capacity
4. Large Number of Pumps for optimum selection
5. Horizontal, Vertical and Cardan Shaft option



## Quality Assurance & Testing



For each order executed by Pumpsense, detailed quality plan is drawn up to reflect special conditions of the order and customers specific QA requirements. As a minimum, the following QA documents are available for each pump manufactured by Pumpsense and the customer may access these documents at any time:

1. Dimensional conformance report & "as built" general arrangement drawing.
2. Physical and chemical test certificates for major pump components such as casing, impeller and shaft.
3. Dynamic balancing report for the rotating element.
4. Hydrostatic pressure test report
5. Seal integrity test report
6. Performance test report

In-house Non-destructive test facilities -

1. Dynamic balancing machine
2. Liquid penetrant test arrangement
3. Ultrasonic test equipment



Hydrostatic Pressure Test & Seal Integrity Test -

- All pump casings are pressure tested as per applicable code/customer's order.
- Fully assembled mechanical seal fitted pumps are subjected to a second hydrostatic test at the maximum allowable seal pressure or casing hydrostatic test pressure, whichever is lower, to check leak free operation of seals under pressure.

Performance Test - All pumps are tested for performance as per ISO 9906 Grade 1. Pumpsense is equipped with a state of the art test bed with the following key features:

1. **Test Tank** - The tank which is partly underground and partly overground ensures adequate NPSHA for performance test. The tank size is 23ft(L) X 10ft(W) X 12ft(W) and holds 80 m3 of potable water for testing. The test tank has been specially designed as per the guidelines of the Hydraulic Institute Standards and is provided with necessary flow stabilizers, separate return chambers, etc. in order to ensure vortex free suction condition.
2. **Test Lines** - There are two test lines of 250 mm and 150 mm capable of measuring flows up to 1500 m3/hr.
3. **Flow Measurement** - Flow measurement is done primarily by magnetic flow meters. However, the test lines are also equipped with orifice meters supported by differential pressure transducers for flow measurements/calibration. Ultrasonic flow meter provides a third means of flow measurement in the test bed.
4. **Pressure Measurement** - This is done by both pressure transducers and bourdon type pressure gauge.
5. **Power Measurement** - Power is measured by YOKOGAWA power meter. For non-synchronous motor speeds the power is also measured by S. HIMMELSTEIN make torque meter.
6. **Speed** - Pump speed is measured by stroboscope.
7. **Vibration** - Vibration data is obtained by a Bruel & Kjaer vibration analyzer
8. **Speed Variation** - Speed variation for testing is achieved through a 132kW VFD supplied by Fuji
9. **Flow control** - Flow control is achieved by actuator operating globe and butterfly valves.
10. **Data acquisition and control panel** - A specially designed control panel with the state-of-the-art instrumentation is used for data acquisition and test sheet/test curve generation. The system uses proprietary software for pump testing.
11. **NPSH test** - NPSH test is conducted by a 3% head-decay method by throttling the suction globe valves.



## PUMPSENSE - RETROFIT SERVICES

### RETROFIT PROCEDURE

Condition monitoring  
Analysis of problems  
Establish system characteristics



Identification of constraints  
– Prime mover rating  
– Available NPSH  
– Range of operation



Measurement of Internal dimensions  
of the pump  
Inspection of the pump internals for  
diagnostics and material/  
design parameter selection



Estimation of performance of new  
Impeller/rotating element, energy  
consumption, suction performance



Design and Development



Testing and commissioning



## PUMPSENSE – CORE VALUE PROPOSITION

1. Over 35 years of accumulated learning and experience in the field of centrifugal pumps.
2. Sophisticated understanding of the pump business.
3. Highly experienced hydraulic designers with a large pool of proven pump designs.
4. Ability to develop new pumps quickly and competitively.
5. Over five thousand pumps in operation in Asia Pacific, Middle East, Europe, Americas and South Asia.
6. Ability to quickly customize pumps and offer product variants competitively.
7. Well developed supply chain, experienced pattern makers, specialized foundries, pump serviceproviders.

## SPECIAL PUMPS AND SERVICES

**PACKAGED PUMP SETS**– Packaged pump sets are supplied with fabricated steel base plates, couplings and guards. Driver selection includes speed torque and rotor dynamic analysis.

**SPECIAL PUMPS** – special pumps are designed and built to meet specific needs of customers.

**DESIGN & DEVELOPMENT** – We have developed split case, end suction, vertical and horizontal inline pumps for other pump makers. This service includes complete hydraulic and mechanical design, development of patterns and prototype. The service usually extends to commercial production on behalf of the customer.

**RETROFIT** – Retrofit division of PUMPSENSE provides performance enhancement of your existing pumps.

**PUMP COMPONENTS** – Supply of fully machined pump components.

## PUMPSENSE FLUID ENGINEERING PVT. LTD

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