

## Pump Performance Datasheet

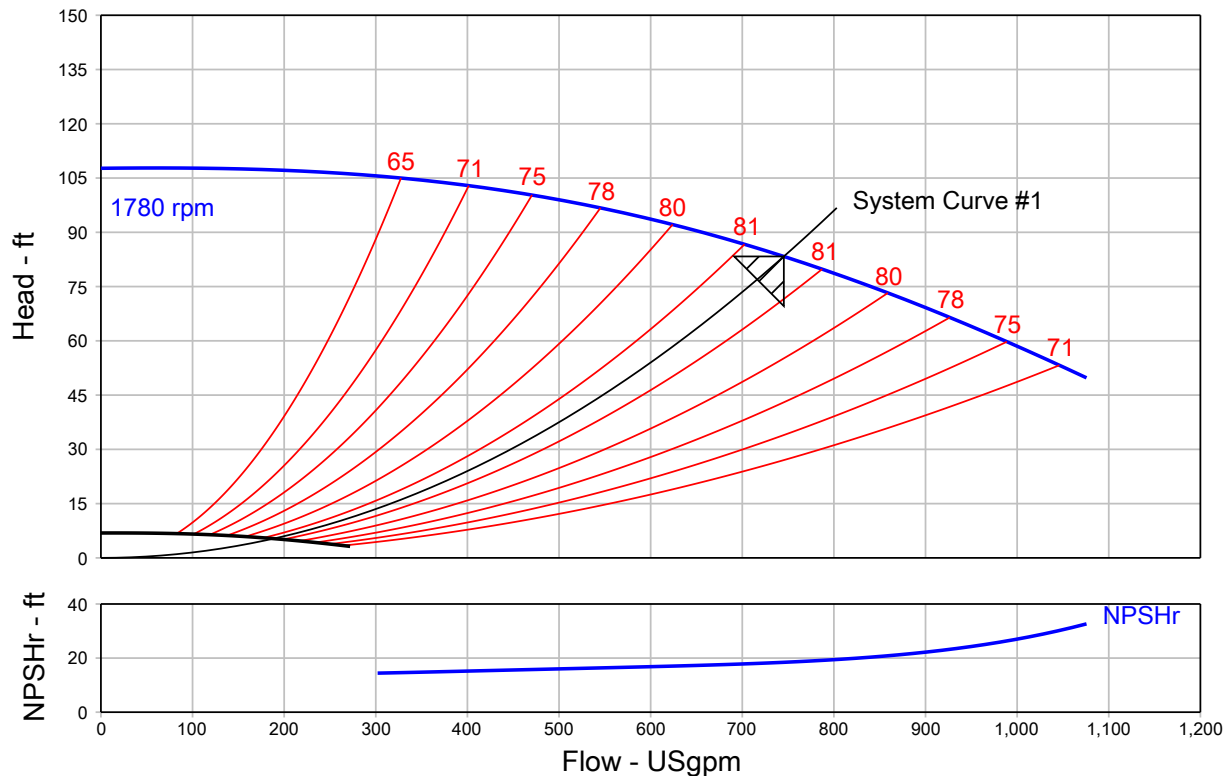
|                                 |                         |                       |
|---------------------------------|-------------------------|-----------------------|
| Customer :                      | Quote Number / ID :     | 1141840               |
| Customer ref. / PO :            | Model :                 | 4012A-4P-20HP LCSE    |
| Tag Number : Hurley Engineering | Stages :                | 1                     |
| Service : HYDRONIC              | Based on curve number : | RC9919-SS-10.32 Rev 0 |
| Quantity : 1                    | Basic model number :    | -                     |
|                                 | Date last saved :       | 03/30/2020 5:28 PM    |

| Operating Conditions                            |                     | Liquid                          |                    |
|---|---------------------|---------------------------------|--------------------|
| Flow, rated                                     | : 745.4 USgpm       | Liquid type                     | : Cold Water       |
| Differential head / pressure, rated (requested) | : 83.33 ft          | Additional liquid description   | :                  |
| Differential head / pressure, rated (actual)    | : 83.33 ft          | Solids diameter, max            | : 0.00 in          |
| Suction pressure, rated / max                   | : 0.00 / 0.00 psi.g | Solids concentration, by volume | : 0.00 %           |
| NPSH available, rated                           | : Ample             | Temperature, max                | : 68.00 deg F      |
| Frequency                                       | : 60 Hz             | Fluid density, rated / max      | : 1.000 / 1.000 SG |

| Performance              |            | Material          |             |
|--------------------------|------------|-------------------|-------------|
| Speed, rated             | : 1780 rpm | Material selected | : Cast Iron |
| Speed, maximum           | : 1780 rpm |                   |             |
| Speed, minimum           | : 450 rpm  |                   |             |
| Impeller diameter, rated | : 10.32 in |                   |             |
| Efficiency               | : 81.15 %  |                   |             |

| Performance                            |                             | Pressure Data                      |               |
|--|-----------------------------|------------------------------------|---------------|
| NPSH required / margin required        | : 18.44 / 0.00 ft           | Maximum working pressure           | : 46.64 psi.g |
| nq (imp. eye flow) / S (imp. eye flow) | : 34 / 106 Metric units     | Maximum allowable working pressure | : 175.0 psi.g |
| MCSF                                   | : 258.5 USgpm               | Maximum allowable suction pressure | : 175.0 psi.g |
| Head maximum, rated speed              | : 107.8 ft                  | Hydrostatic test pressure          | : 263.0 psi.g |
| Head rise to shutoff                   | : 29.24 %                   |                                    |               |
| Flow, best eff. point                  | : 745.4 USgpm               |                                    |               |
| Flow ratio, rated / BEP                | : 100.00 %                  |                                    |               |
| Speed ratio (rated / max)              | : 100.00 %                  |                                    |               |
| Head ratio (rated speed / max speed)   | : 100.00 %                  |                                    |               |
| Cq/Ch/Ce/Cn [ANSI/HI 9.6.7-2010]       | : 1.00 / 1.00 / 1.00 / 1.00 |                                    |               |
| Selection status                       | : Acceptable                |                                    |               |

| Energy Indexes |        | Driver & Power Data (@Max density) |                               |
|----------------|--------|------------------------------------|-------------------------------|
| PEI (VL)       | : 0.49 | Motor sizing specification         | : Max power (non-overloading) |
| ER (VL)        | : 51   | Margin over specification          | : 0.00 %                      |
|                |        | Service factor                     | : 1.00 (used)                 |
|                |        | Power, hydraulic                   | : 15.68 hp                    |
|                |        | Rated power (based on duty point)  | : 19.32 hp                    |
|                |        | Max power (non-overloading)        | : 19.93 hp                    |
|                |        | Nameplate motor rating             | : 20.00 hp / 14.91 kW (Fixed) |



## Grundfos Series LCSE - Split Coupled End Suction Pump with Integrated VFD

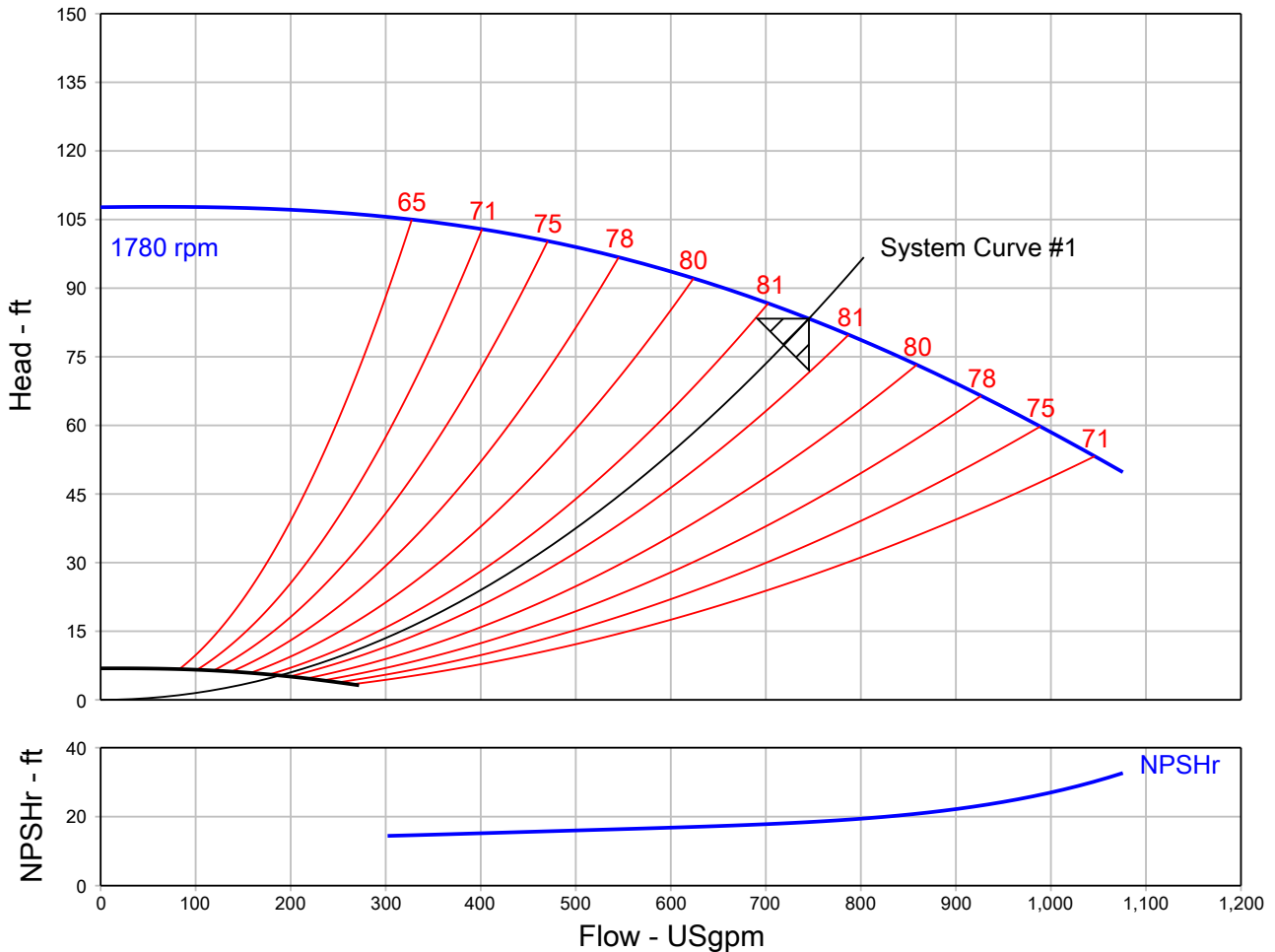
|                           |                             |            |
|---------------------------|-----------------------------|------------|
| QUOTE NUMBER / ID 1141840 | UNIT TAG Hurley Engineering | QUANTITY 1 |
|                           | SERVICE HYDRONIC            |            |
| REPRESENTATIVE            | SUBMITTED BY                | DATE       |
| ENGINEER                  | APPROVED BY                 | DATE       |
| CONTRACTOR                | ORDER #                     | DATE       |



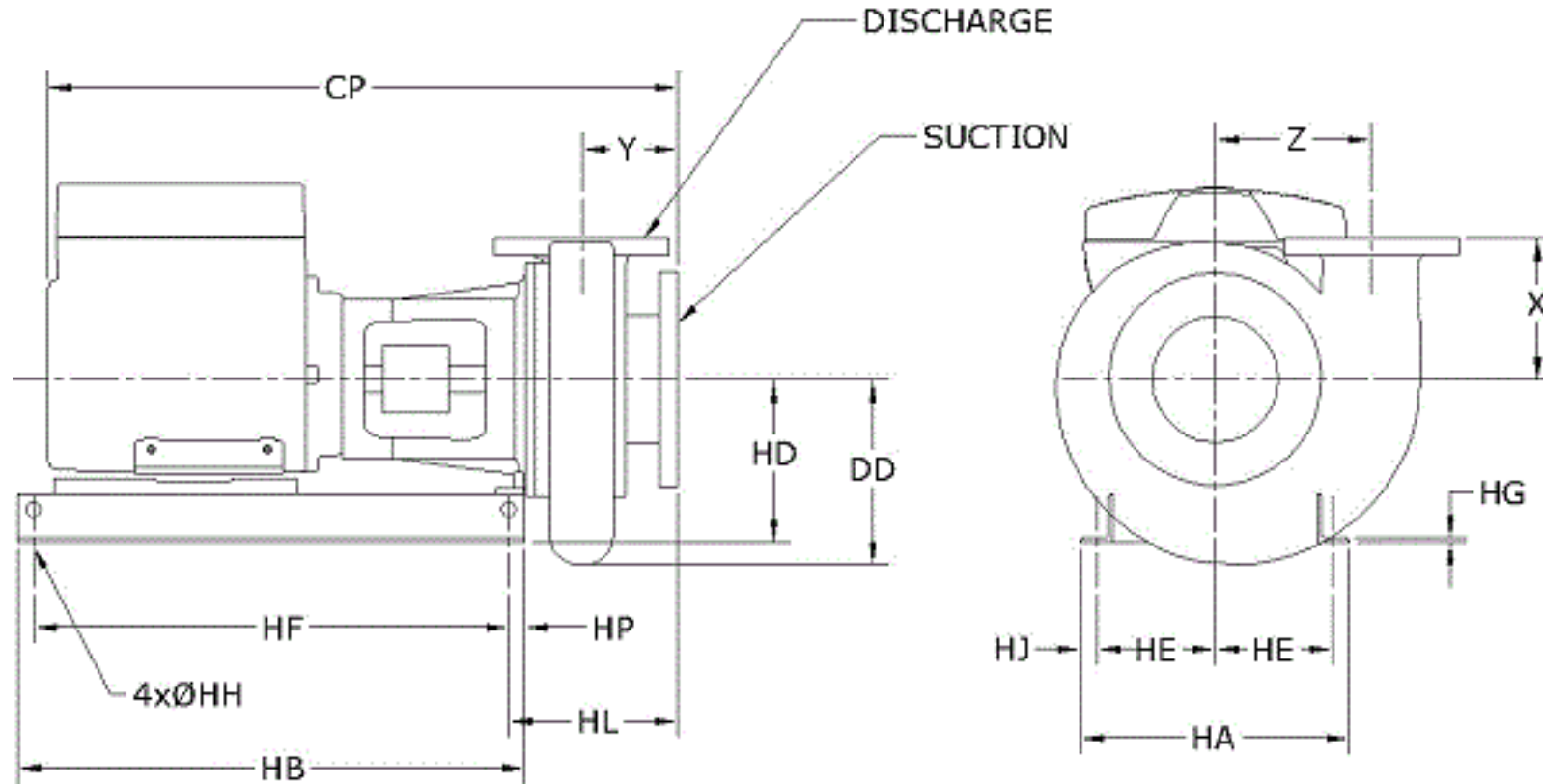
**LCSE 4012A-4P-20HP**  
**1780 rpm**

Part Number N/A

| Conditions of Service |             | Pump Data         |          | Motor Data |         |
|-----------------------|-------------|-------------------|----------|------------|---------|
| Flow                  | 745.4 USgpm | Impeller Diameter | 10.32 in | Motor HP   | 20 HP   |
| Head                  | 83.33 ft    | Efficiency        | 81.15 %  | BHP        | 19.32   |
| Liquid                | Cold Water  | Suction           | 5 in.    | Enclosure  | TEFC    |
| Temperature           | 68.00 deg F | Discharge         | 4 in.    | Voltage    | 460 V   |
| NPSHr                 | 18.44 ft    | PEI (VL)          | 0.49     | Phase      | 3 Phase |
| Viscosity             | 1.00 cP     | ER (VL)           | 51       | Cycle      | 60      |
| Specific Gravity      | 1.000 SG    |                   |          | Frame Size | 256TC   |



**Grundfos Series LCSE - Split Coupled End Suction Pump with Integrated VFD**



NOT FOR CONSTRUCTION, unless certified and referenced on order

| Units  | Frame | Suct | Disch | CP    | DD    | HA    | HB    | HD    | HE   | HF    | HG   | HH   | HJ   | HL   | HP   | X     | Y    | Z    |
|--------|-------|------|-------|-------|-------|-------|-------|-------|------|-------|------|------|------|------|------|-------|------|------|
| inches | 256TC | 5    | 4     | 41.00 | 10.70 | 17.00 | 32.00 | 11.00 | 7.50 | 30.00 | 0.25 | 0.63 | 1.00 | 8.75 | 1.00 | 10.00 | 5.18 | 8.38 |

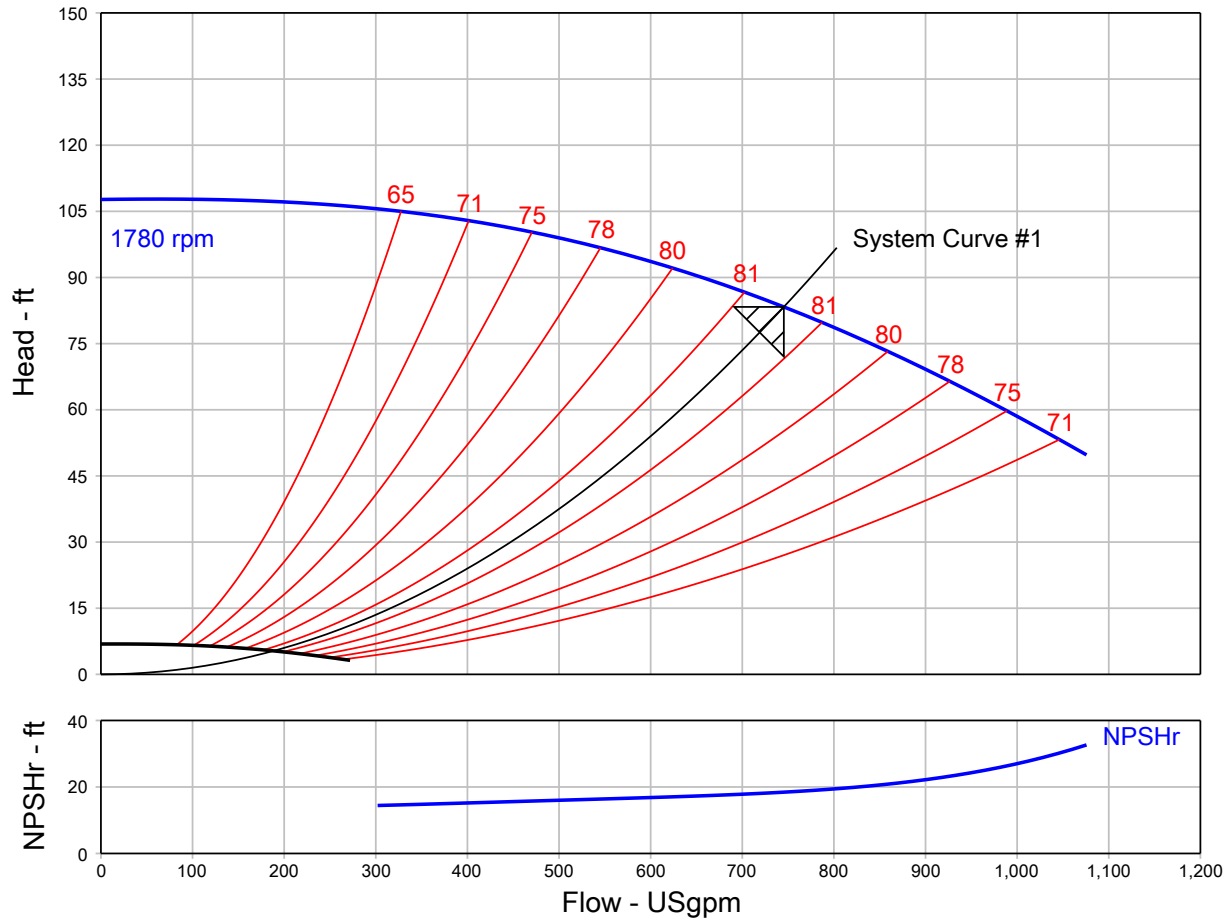
**Grundfos Series LCSE - Split Coupled End Suction Pump with Integrated VFD**

|                                  |                                    |                           |
|----------------------------------|------------------------------------|---------------------------|
| <b>QUOTE NUMBER / ID 1141840</b> | <b>UNIT TAG Hurley Engineering</b> | <b>LCSE 4012A-4P-20HP</b> |
|----------------------------------|------------------------------------|---------------------------|

| <b>MATERIALS OF CONSTRUCTION</b> |                            |                    |  |
|----------------------------------|----------------------------|--------------------|--|
| <b>PART</b>                      | <b>MATERIAL</b>            | <b>PART</b>        | <b>MATERIAL</b>                          |
| Rotation Options                 | Clockwise                  | Impeller Washer    | S.S., AISI-303                           |
| Base/Stand Type                  | Steel Base / Cast Iron     | Impeller Key       | Steel, AISI 1045                         |
| Bushing                          | Vesconite                  | Coupling Options   | Rigid Aluminum<br>Axially Split Coupling |
| Wear Ring Material               | Vesconite                  | Pump Coatings      | Standard Paint                           |
| Seal Type                        | Type 21                    | Seal Material      | Ceramic/Carbon/Buna                      |
| O-Rings                          | Buna N                     | Casing             | Cast Iron, ASTM-A48, CL 30               |
| Backplate/Seal Plate             | Cast Iron, ASTM-A48, CL 30 | Seal Flush Options | External Flush, plastic tubing           |
| Gaskets                          | Vegetable Fiber            | Motor Bracket      | Cast Iron, ASTM-A48, CL 30               |
| Casing Bolts                     | Steel, Grade 5             | Impeller           | Stainless Steel, AISI-304                |
| Impeller Cap Screw               | S.S., AISI-303             |                    |  |

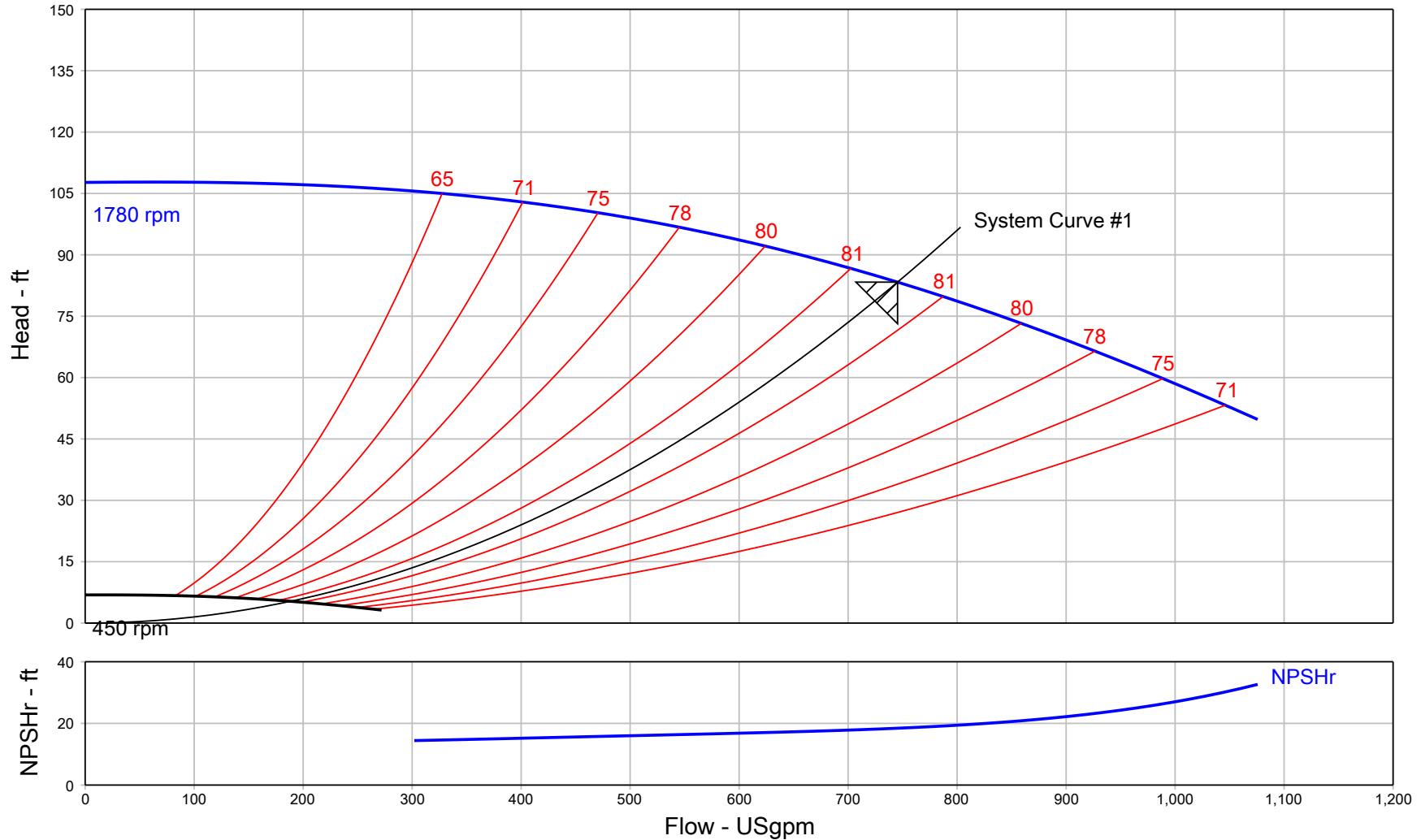
\* All materials based on STANDARD configuration

**Pump Performance Curve**



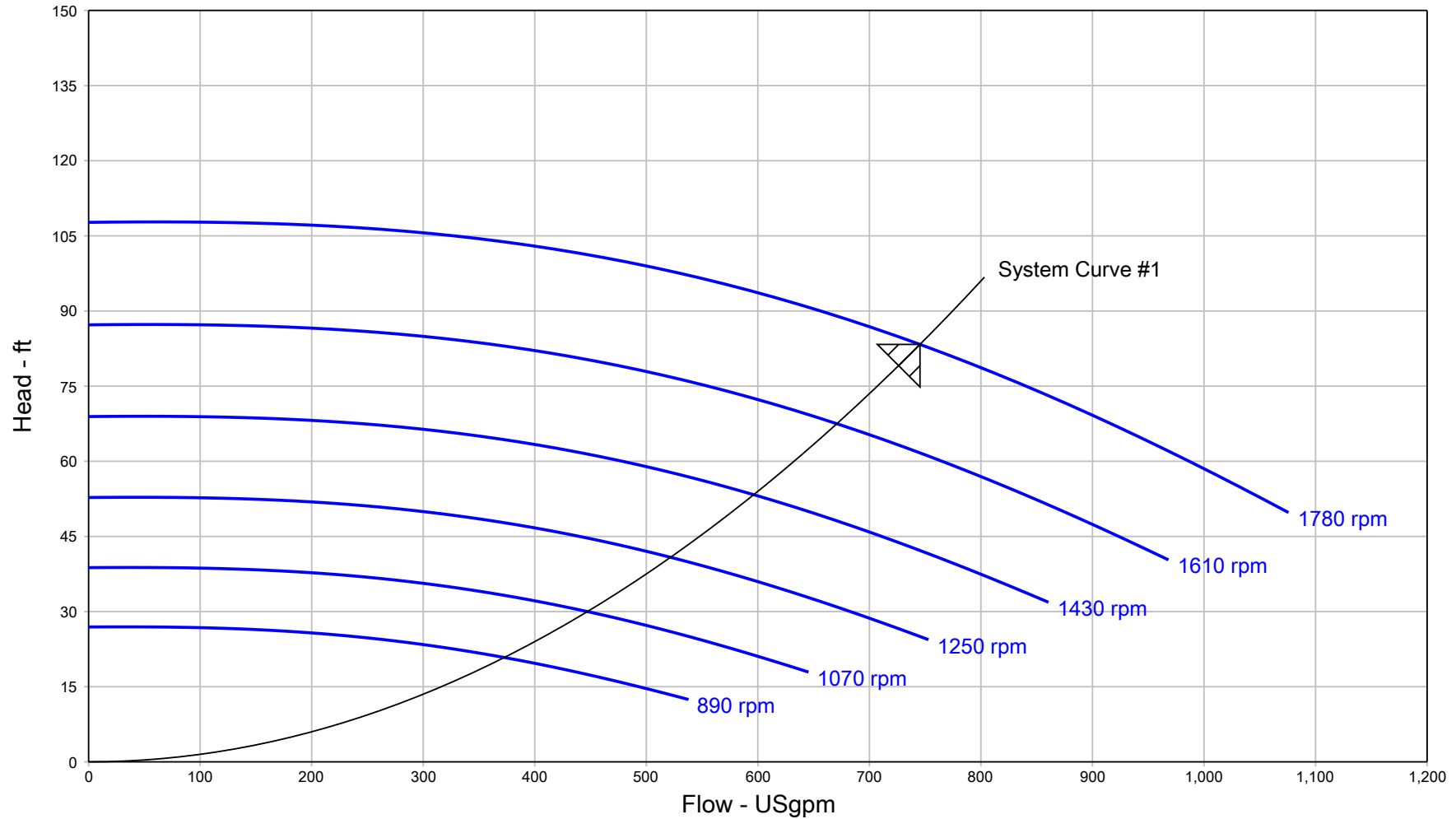
|  |                                     |                           |
|--|-------------------------------------|---------------------------|
| Customer :                                     | Model :                             | 4012A-4P-20HP LCSE        |
| Customer ref. / PO :                           | Stages :                            | 1                         |
| Tag Number : Hurley Engineering                | Speed, rated :                      | 1780 rpm                  |
| Service : HYDRONIC                             | Based on curve number :             | RC9919-SS-10.32 Rev 0     |
| Quantity : 1                                   | Efficiency :                        | 81.15 %                   |
| Quote Number / ID : 1141840                    | Rated power (based on duty point) : | 19.32 hp                  |
| Date last saved : 03/30/2020 5:28 PM           | NPSH required :                     | 18.44 ft                  |
| Flow, rated : 745.4 USgpm                      | Viscosity :                         | 1.00 cP                   |
| Differential head / pressure, rated : 83.33 ft | Cq/Ch/Ce/Cn [ANSI/HI 9.6.7-2010] :  | 1.00 / 1.00 / 1.00 / 1.00 |
| Fluid density, rated / max : 1.000 / 1.000 SG  | Impeller diameter, rated :          | 10.32 in                  |
|  | PEI (VL) :                          | 0.49                      |
|  | ER (VL) :                           | 51                        |

**Pump Performance Curve**



|   |   |  |
|---|---|--|
| Project name : LCSE Project NC                | Tag Number : Hurley Engineering                       | Flow, rated : 745.4 USgpm                      |
| Consulting engineer :                         | Service : HYDRONIC                                    | Differential head / pressure, rated : 83.33 ft |
| Customer :                                    | Model : 4012A-4P-20HP LCSE                            | Rated power (based on duty point) : 19.32 hp   |
| Customer ref. / PO :                          | Quantity : 1  | Max power (non-overloading) : 19.93 hp         |
| Quote Number / ID : 1141840                   | Quoted By (Sales Office) : HURLEY ENGINEERING COMPANY | Efficiency : 81.15 %                           |
| Date last saved : 03/30/2020 5:28 PM          | Quoted By (Sales Engineer) : Steven Leingang          | Impeller diameter, rated : 10.32 in            |
| Based on curve number : RC9919-SS-10.32 Rev 0 | Stages : 1  | PEI (VL) : 0.49                                |
|   | Speed, rated : 1780 rpm                               | ER (VL) : 51                                   |

**Multi-Speed Performance Curve**



|                     |                      |                            |                              |                                     |                             |
|---------------------|----------------------|----------------------------|------------------------------|-------------------------------------|-----------------------------|
| Project name        | : LCSE Project NC    | Tag Number                 | : Hurley Engineering         | Speed, rated                        | : 1780 rpm                  |
| Consulting engineer | :                    | Service                    | : HYDRONIC                   | Flow, rated                         | : 745.4 USgpm               |
| Customer            | :                    | Model                      | : 4012A-4P-20HP LCSE         | Differential head / pressure, rated | : 83.33 ft                  |
| Customer ref. / PO  | :                    | Quantity                   | : 1                          | Fluid density, rated / max          | : 1.000 / 1.000 SG          |
| Quote Number / ID   | : 1141840            | Quoted By (Sales Office)   | : HURLEY ENGINEERING COMPANY | Viscosity                           | : 1.00 cP                   |
| Date last saved     | : 03/30/2020 5:28 PM | Quoted By (Sales Engineer) | : Steven Leingang            | Cq/Ch/Ce/Cn [ANSI/HI 9.6.7-2010]    | : 1.00 / 1.00 / 1.00 / 1.00 |
|                     |                      | Stages                     | : 1                          | Based on curve number               | : RC9919-SS-10.32 Rev 0     |

**Construction Datasheet**

|                     |                              |                            |                              |
|---------------------|------------------------------|----------------------------|------------------------------|
| Project name        | : LCSE Project NC            | Tag Number                 | : Hurley Engineering         |
| Consulting engineer | :                            | Service                    | : HYDRONIC                   |
| Customer            | : HURLEY ENGINEERING COMPANY | Model                      | : 4012A-4P-20HP LCSE         |
| Customer ref. / PO  | :                            | Quantity                   | : 1                          |
| Quote Number / ID   | : 1141840                    | Quoted By (Sales Office)   | : HURLEY ENGINEERING COMPANY |
| Date last saved     | : 03/30/2020 5:28 PM         | Quoted By (Sales Engineer) | : Steven Leingang            |

| Construction |            |                      |       | Motor Information |                |
|--------------|------------|----------------------|-------|-------------------|----------------|
| Nozzle       | Size (in.) | Nozzle Configuration | Pos'n | Manufacturer      | : Grundfos MLE |
| Suction      | 5          | 125# ANSI            | -     | Frame Size        | : 256TC        |
| Discharge    | 4          | 125# ANSI            | -     | Power             | : 20.00 hp     |

|                             |                 |                           |                                     |
|-----------------------------|-----------------|---------------------------|-------------------------------------|
| Orientation / Configuration | : Horizontal    | RPM                       | : 1800 rpm                          |
| Rotation                    | : Clockwise     | Enclosure                 | : TEFC                              |
| Wear Ring Configuration     | : Single - Case | Operating Power Supply    | : 460/3/60                          |
| Discharge Elbow Size        | : -             | Efficiency                | : Energy/IE2                        |
| Subplate                    | : -             | Service factor            | : 1.15                              |
| Sump Depth (feet)           | : -             | Motor Application         | : Suitable for Variable Speed Drive |
| Bearing Frame               | : -             | Motor Options/Accessories | : -                                 |
| Bearing Frame Foot          | : -             | Cord Length (feet)        | : -                                 |

| Materials                     |                                    |
|-------------------------------|------------------------------------|
| Case                          | : Cast Iron, ASTM A48 - Class 30   |
| Motor Bracket                 | : Cast Iron, ASTM-A48, CL 30       |
| Impeller                      | : Stainless Steel, AISI-304 (H304) |
| Impeller Cap Screw and Washer | : Stainless Steel, AISI-303        |
| Impeller Key                  | : Stainless Steel, AISI 316        |
| Case wear ring                | : Vesconite                        |

| Baseplate, Coupling and Guard |  |
|-------------------------------|--|
| Baseplate                     | : Welded Steel Fabrication                     |
| Drip Pan                      | : No drip pan                                  |
| Coupling                      | : Rigid, Axial Split Coupling (aluminum) RASC3 |
| Guard                         | : OSHA Approved                                |

| Seal & Packing Construction |  |
|-----------------------------|--|
| Sealing Method              | : Single Seal, Type 21                       |
| Seal Material               | : Buna Carbon Ceramic SS-Spring and Hardware |
| Packing Gland               | : -  |
| Lantern Ring                | : -  |
| Recirculation Lines         | : Nylon Tubing with Brass Fittings           |

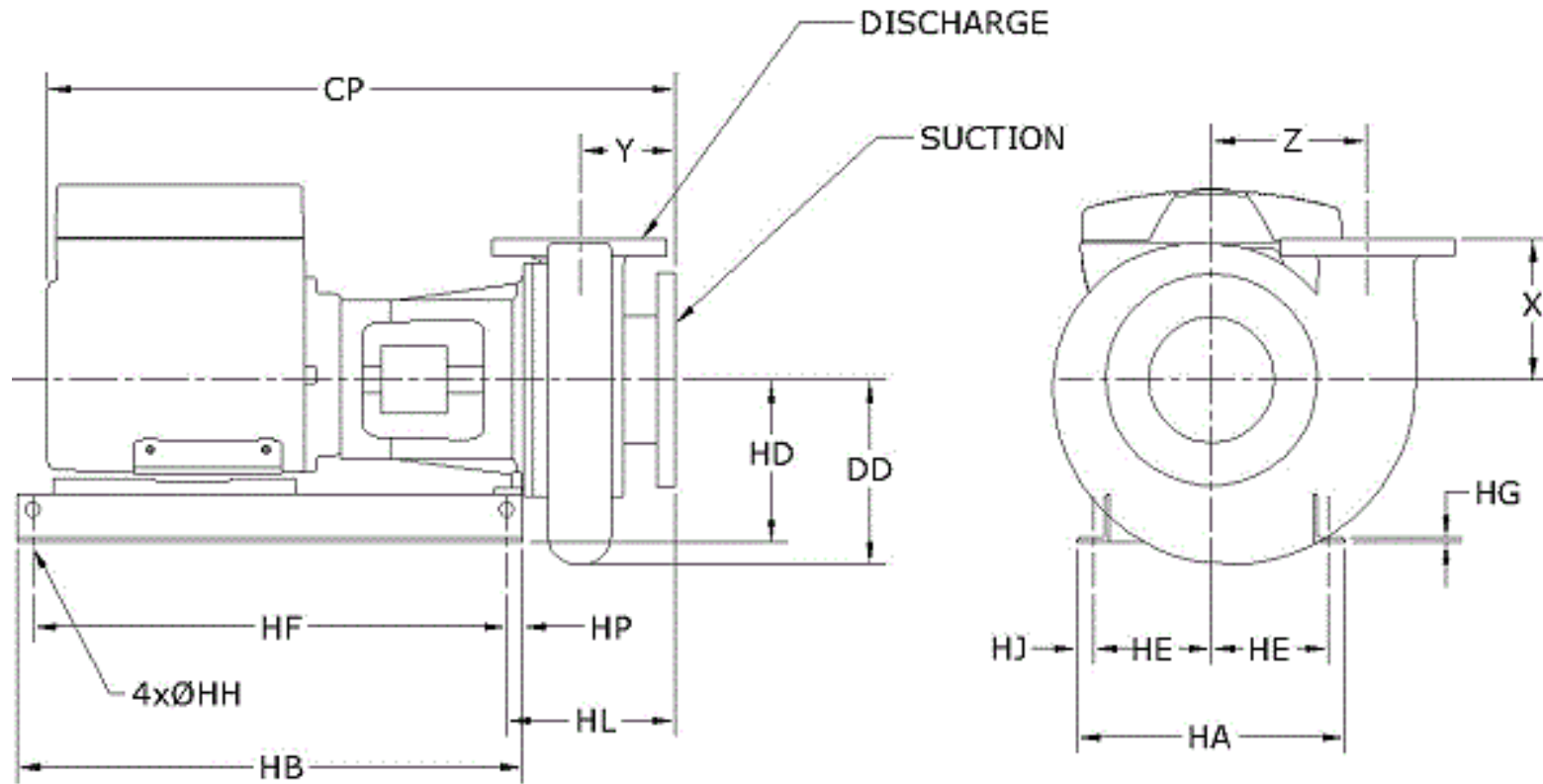
| Weights (Approx.)               |            |
|---------------------------------|------------|
| Pump                            | : 248.0 lb |
| Baseplate                       | : 29.00 lb |
| Driver                          | : 331.0 lb |
| Estimated Shipping gross weight | : 608.0 lb |

|                 |                                 |
|-----------------|---------------------------------|
| Pump Shaft      | : Stainless Steel, AISI-303     |
| Sleeve          | : -                             |
| Line Shaft      | : -                             |
| Column          | : -                             |
| Discharge Pipe  | : -                             |
| Discharge Elbow | : -                             |
| Suction Elbow   | : -                             |
| Subplate        | : -                             |
| Hardware        | : Steel, Grade 5                |
| O Rings         | : Buna N                        |
| Pump Coatings   | : Standard Manufacturer's Paint |



**General Arrangement**

|                     |                              |                            |                              |
|---------------------|------------------------------|----------------------------|------------------------------|
| Project name        | : LCSE Project NC            | Tag Number                 | : Hurley Engineering         |
| Consulting engineer | :                            | Service                    | : HYDRONIC                   |
| Customer            | : HURLEY ENGINEERING COMPANY | Model                      | : 4012A-4P-20HP LCSE         |
| Customer ref. / PO  | :                            | Quantity of pumps          | : 1                          |
| Quote Number / ID   | : 1141840                    | Quoted By (Sales Office)   | : HURLEY ENGINEERING COMPANY |
| Date last saved     | : 03/30/2020 5:28 PM         | Quoted By (Sales Engineer) | : Steven Leingang            |



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| Units  | Frame | Suct(in) | Disch(in) | CP    | DD    | HA    | HB    | HD    | HE   | HF    | HG   | HH   | HJ   | HL   | HP   | X     | Y    | Z    | Weight ea |
|--------|-------|----------|-----------|-------|-------|-------|-------|-------|------|-------|------|------|------|------|------|-------|------|------|-----------|
| inches | 256TC | 5        | 4         | 41.00 | 10.70 | 17.00 | 32.00 | 11.00 | 7.50 | 30.00 | 0.25 | 0.63 | 1.00 | 8.75 | 1.00 | 10.00 | 5.18 | 8.38 | 608.0     |

| Conditions of Service |                    |               |            | Motor Data   |                        |  |  |
|-----------------------|--------------------|---------------|------------|--------------|------------------------|--|--|
| Flow: 745.4 USgpm     | Fluid: Cold Water  | HP: 20        | Encl: TEFC | Phase: 3     | Efficiency: Energy/IE2 |  |  |
| TDH: 83.33 ft         | Temp.: 68.00 deg F | RPM: 1780 rpm | Hz: 60     | Voltage: 460 | S.F.: 1.15             |  |  |