

# Model 3656 M&L-Group Close-Coupled Unit

## TYPICAL ENGINEERING SPECIFICATIONS

### I. SCOPE

The contractor shall provide \_\_\_\_\_ (quantity) close coupled, end suction centrifugal pump unit/s, Model 3656 M&L-Group as manufactured by Goulds Water Technology or equal.

All pump units shall be of one manufacturer and provided complete including electric motor drive.

### II. CONDITIONS OF SERVICE

A. Equipment item number	_____	_____	_____
B. Flange Inside Diameter	_____	_____	_____
Suction (inches) FF	_____	_____	_____
Discharge (inches) FF	_____	_____	_____
C. Primary Service Condition	_____	_____	_____
Capacity (GPM)	_____	_____	_____
Total Head (feet)	_____	_____	_____
Efficiency (%)	_____	_____	_____
D. Minimum Total Head at Shutoff (feet)	_____	_____	_____
E. Maximum Impeller Diameter (inches)	_____	_____	_____
F. Operating Speed (RPM)	_____	_____	_____
G. Maximum Motor HP	_____	_____	_____

### III. PUMP CONSTRUCTION

Each pump shall be designed for clockwise rotation viewed from driven end and include the following design features.

#### A. PUMP END COMPONENTS

##### A.1. Casing

The pump casing shall be spiral volute type, back pull-out design with ANSI Class 150 flat faced flanged suction and discharge connections above 2½" size and shall be constructed of Cast Iron, ASTM A48 CL30 material.

The pump discharge nozzle shall be tangentially oriented.

The complete pump unit shall be supported by the power frame.

A pump casing drain shall be provided with a (zinc plated steel) pipe plug.

##### A.2. Wear Ring

Replaceable casing and seal housing wear ring of \_\_\_\_\_, (Cast Iron ASTM A48 CL20 or Lead Free Bismuth Bronze) shall be provided and held securely by means of interference fits.

#### **A.3. Impeller**

The pump impeller shall be of enclosed design, constructed of \_\_\_\_\_, (Cast Iron ASTM A48 CL20 or Lead Free Sil-Brass ASTM B584) material and key driven. A stainless steel bolt and washer shall provide positive attachment of the impeller to the motor shaft.

#### **A.4. Seal Housing/Adapter**

The seal housing and motor adapter shall be of 1-piece design, constructed of Cast Iron, ASTM A48 CL20. Registered mating fits to the pump casing and power frame shall maintain positive unit alignment and support. Sealing of casing pressure shall be maintained by an "O-ring" of BUNA-N, EPR or Viton material. Motor and casing connection shall be held securely by means of grade 5, high strength hex cap screws.

A bottom drainage port shall be provided to allow condensation or seal leakage to drain and not be retained within the adapter.

#### **A.5. Mechanical Seal**

The pump shaft seal shall be a John Crane Type 21 mechanical seal or equal constructed of the following materials. Packed box shaft sealing is also available.

<b>Seal Type</b>	<b>Stationary Face</b>	<b>Rotating Face</b>	<b>Elastomers</b>	<b>Metal Components</b>	
Standard	Ceramic	Sil-Carbide	BUNA-N	18-8 SS	
Option	Carbon		EPR		
Option			Viton		
Option	Sil-Carbide				

#### **A.6. Shaft Sleeve**

The pump shaft sleeve shall be constructed of AISI Type 303 stainless steel and shall be of the hook type design, locked in place by the impeller without necessity of other mechanical locking devices.

### **IV. ELECTRIC MOTOR**

The pump drive motor shall be non-overloading of NEMA standard design JM-frame suitable for horizontal mounting and close coupled to the pump unit as described above.

The motor rating shall be:

\_\_\_\_\_ HP, \_\_\_\_\_ RPM  
\_\_\_\_\_ phase, \_\_\_\_\_ Hz, \_\_\_\_\_ volts

Totally enclosed, fan cooled enclosure  
1.15 Service Factor  
High Efficiency

### **V. TESTING**

- A. Each pump casing shall be hydrostatically tested by the manufacturer in accordance with Hydraulic Institute Standards at 250 PSIG.
- B. Production performance testing will be conducted by the manufacturer on each pump unit. Head at three operating points (70% of BEP, BEP and 120% of BEP) will be measured at design speed to verify performance.

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