



TRANSMITTAL

DATE: DECEMBER 8, 2011

TO: Waste Management
Prairie View RDF 15505 Shively Rd
Berman, IN 46595

REFERENCE: Jay County Landfill

WE ARE SENDING YOU THE FOLLOWING:

- Submittal one electronic copy
- For Approval
- For Record-signed terms & conditions
- Revised for Resubmission, 6 copies each for submersible pumps
- Approved as Submitted
- Approved as Noted
- Rejected
- Revise and Resubmit () copies for approval
- Operation and Maintenance Manuals
- Other:
- Please return (1) copies of the reviewed submittal, stamped with approval to proceed as submitted; or noting any changes and/or discrepancies to the address listed below.

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XYLEM INC
7615 West New York Street
Indianapolis, IN 46214
PHONE: 317-273-4470
FAX: 317-273-4483
CELL: 317-402-2851
don.tewell@xyleminc.com



SUBMITTAL

PROJECT: Jay County Landfill

CUSTOMER: Waste Management
Prairie View RDF 15505 Shively Rd
Berman, IN 46595
Contact: Chastity Montalvo
PHONE: 574-546-4475
FAX: 574-546-5186

ENGINEER: AECOM
5555 Glen Wood Hills Parkway
Grand Rapids, MI 49512
Contact: Eric VanOrman
PHONE: 616-940-4446

SUPPLIED BY: XYLEM INC
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Indianapolis, IN 46214
PHONE: 317-273-4470
FAX: 317-273-4483

Prepared by: Jennifer Bell
XYLEM INC
Flygt Products

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ITT

December 8, 2011

Waste Management
Indiana Landfill Division
Wyatt, Indiana 46595

Attn: Chastity Montalvo
Phone: 574-276-8824

Re: Jay County Landfill

ITT Water & Wastewater U.S.A. Flygt Products

7615 West New York Street
Indianapolis, IN 46214
Tel 317/273-4470
Fax 317/273-4483

Quote # 2011-IND-0540

ITT Water & Wastewater U.S.A. is pleased to provide the following Flygt equipment.

Section 11310 Centrifugal Pumps (Equalization Transfer Pump P-100)

| Qty | Description |
|-----|--|
| 1 | Flygt Model NZ-3102.181 4" volute Submersible pump equipped with a 460 Volt / 3 phase / 60 Hz 3.7 HP 1750 RPM motor, 465 impeller, 1 x 50 Ft. length of SUBCAB 12AWG/7 submersible cable |
| 1 | Horizontal Mounting Stand for NZ-3102.181 Dry Pit Installation |
| 1 | Factory Certified Pump Performance Test Report |
| 1 | Factory Certified Pump Hydrostatic Test Report |

Section 11310 Centrifugal Pumps (WAS Pump P-300)

| Qty | Description |
|-----|--|
| 1 | Flygt Model NZ-3085.183 3" volute Submersible pump equipped with a 460 Volt / 3 phase / 60 Hz 2.3 HP 1750 RPM motor, 463 impeller, 1 x 50 Ft. length of SUBCAB 14AWG/7 submersible cable |
| 1 | Horizontal Mounting Stand for NZ-3085.183 Dry Pit Installation |
| 1 | Factory Certified Pump Performance Test Report |
| 1 | Factory Certified Pump Hydrostatic Test Report |

Start Up for Section 11310 Centrifugal Pumps

| Qty | Description |
|-----|---|
| 1 | Flygt Field Service Start Up (One Man / Two Days) |



Sectin 11312 Submersible Nonclog Pumps (Wet Installation) (P-500, P-510)

| Qty | Description |
|-----|---|
| 2 | Flygt Model NP-3102.090 4" volute Submersible pump equipped with a 460 Volt / 3 phase / 60 Hz 5 HP 1750 RPM motor, 464 impeller, 1 x 50 Ft. length of SUBCAB 12AWG/7 submersible cable, FLS leakage detector, volute is prepared for Flush Valve, Explosion proof |
| 2 | Cast Iron Discharge Connection 4" x 4" ANSI Flange |
| 2 | 2" (304SS) Upper Guide Rail Bracket |
| 4 | Guide Rail 2" Sch'd 40 (304SS) x 20ft (contractor to cut to suit) |
| 1 | Heavy Duty (316SS) Cable Hanger |
| 2 | Lifting Chain Safety Hook Assembly (316SS) |
| 2 | 3/16" Lifting Chain (316SS) x 15ft |
| 2 | Lifting Chain Shackle Kit (316SS) |
| 1 | Lifting Chain Grip Eye |
| 2 | Flygt Mini-CAS Thermal and Leakage Sensor Relay 120/24 Vac, 24 Vdc (installed in pump control panel by contractor) |
| 2 | Mini-CAS Back Mount Socket (installed in pump control panel by contractor) |

Start Up for Section 11312 Submersible Nonclog Pumps

| Qty | Description |
|-----|---|
| 1 | Flygt Field Service Start Up (One Man / One Days) |

Submittal: Approximately 2 working weeks after receipt of order.

Time of delivery: Approximately 7 to 9 working weeks after receipt of approved submittal.

Terms of delivery: Freight Prepaid

Terms of payment: Net 30 Standard

Taxes: State, local and other applicable taxes are not included in this quotation.

Installation: This quotation does not include installation.

Exclusions: This Quote includes only the items listed specified above, anchor bolt and installation hardware, pipe, pipe fittings (excluding base elbows for wet installation), valves, controls (excluding Flygt Mini-CAS), and interconnecting wiring (excluding pump SUBCAB cable) by others.

Please feel free to call if you have any questions or if you require assistance.

Sincerely,



Don Tewell
Sales Representative
Phone: 317/273-4470

don.tewell@itt.com



Greg Stark
Inside Sales Associate
Phone: 262/544-1922 Ext. 345

gregory.stark@itt.com



DIRECT SALES
OFFICES



Jay County Landfill

LOCAL SALES REPRESENTATIVE LOCAL PARTS SUPPLIER

FOR SALES, 24-HOUR SERVICE AND REPLACEMENT PARTS:

ITT Water & Wastewater U.S.A., Flygt Products
7615 West New York St.
Indianapolis, IN 46214
Phone: 317-273-4470 / Fax: 317-273-4480

CONTACTS

TECHNICAL & PRICING

Sales: Don Tewell (317-402-2851) don.tewell@xyleminc.com

BACK UP FOR SALES

Branch Manager: David Gut (317-273-4470) david.gut@xyleminc.com

SUBMITTALS, O&M'S, EXPEDITING and ORDER INQUIRIES

Inside Sales Associate: Jennifer Bell 262-506-2364 jennifer.bell@xyleminc.com

TERMS & CONDITIONS

Customer Service Manager: Karen Hoffman (262-506-2367) karen.hoffmann@xyleminc.com

REPLACEMENT PARTS

Branch Manager: Dave Gut (317-217-5124) david.gut@xyleminc.com

STARTUP and SERVICE

Service Supervisor: Lucas Gibson (317-439-8452) lucas.gibson@xyleminc.com



Flygt Product Direct Sales Offices

To find a Flygt product sales office near you, visit:

<http://www.xyleminc.com>



Corporate Headquarters

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Flygt Products
14125 South Bridge Circle
Charlotte, NC 28273
Tel: (704) 409-9700
Fax: (704) 295-9080
flygt_nc@xyleminc.com
<http://www.xyleminc.com>

Flygt Product Direct Sales Offices

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Georgia:

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Pewaukee, WI 53072
Tel: (262) 544-1922
Fax: (262) 544-1399

<http://www.xyleminc.com>

WARRANTY INFORMATION

See following pages



WARRANTY

For the period defined, XYLEM INC. offers a commercial warranty to the original End Purchaser against defects in workmanship and material on Flygt Products. Warranty covers Flygt parts and labor as outlined in **ADDENDUM – A**.

COVERAGE:

XYLEM INC. will pay the cost of parts and labor during the warranty period, provided that the Flygt product, with cable attached, is returned prepaid to an XYLEM INC. Authorized Service Facility for Flygt Product repairs. Coverage for Flygt parts and labor will be provided for the period shown in **ADDENDUM - A**. The warranty period will begin from date of shipment or date of a valid Start-up (For permanently installed pumps only). In cases where the Start-up date is used as the beginning of the warranty on a permanently installed Flygt pump, a Start-up Report completed by an approved service technician from an XYLEM INC. Authorized Service Facility for Flygt products must be received by the I XYLEM INC. Area Service Manager for Flygt Products within thirty (30) days of the initial onset of the unit placed into service. If not received, the beginning of the warranty coverage will default to the Flygt product ship date. A Start-up for a permanently installed Flygt pump must occur within one (1) year from the date of shipment from an XYLEM INC. authorized facility for Flygt Products or warranty will automatically default to ship date as start of warranty. (See **STORAGE** section) When using the start-up date as the beginning of the warranty, a copy of the Start-up Report will be required to support any Warranty Claims. Warranty on Flygt Dewatering pumps will begin with ship date only. No other date on Flygt Dewatering pumps will be considered.

XYLEM INC. sole obligation under this Warranty for Flygt Products shall be to replace, repair or grant credit for Flygt Products upon XYLEM INC. exclusive determination that the Flygt Product does not conform to the above warranty. In the event that the Flygt product is replaced, warranty on the replacement product will be equal to the balance remaining on the original product or ninety (90) days, which ever is greater.

MISUSE:

This Warranty shall not apply to any Flygt product or part of Flygt product which (i) has been subjected to misuse, misapplication, accident, alteration, neglect, or physical damage (ii) has been installed, operated, used and/or maintained in a manner which is in an application that is contrary to XYLEM INC. printed instructions as it pertains to installation, operation and maintenance of Flygt Products, including but without limitation to (iii) operation of equipment without being connected to monitoring devices supplied with specific products for protection; or (iv) damaged due to a defective power supply, improper electrical protection, faulty installation or repair, ordinary wear and tear, corrosion or chemical attack, an act of God, an act of war or by an act of terrorism; or (v) has been damaged resulting from the use of accessory equipment not sold by XYLEM INC. or not approved by XYLEM INC. in connection with Flygt products.

WEAR PARTS:

This warranty does not cover costs for standard and/or scheduled maintenance performed, nor does it cover Flygt parts that, by virtue of their operation, require replacement through normal wear (aka: Wear Parts), unless a defect in material or workmanship can be determined by XYLEM INC. Wear Parts are defined as Cutters, Cutting Plates, Impellers, Agitators, Diffusers, Wear Rings (Stationary or Rotating), Volutes (when used in an abrasive environment), oil, grease, cooling fluids and/or any items deemed necessary to perform and meet the requirements of normal maintenance on all Flygt equipment.



DISCLAIMERS:

(i) XYLEM INC., warranties are null and void when Flygt Products are exported outside of the United States of America without the knowledge and written consent of XYLEM INC.; (ii) XYLEM INC. makes no independent warranty or representation with respect to parts or products manufactured by others and provided by XYLEM INC. (however, XYLEM INC. will extend to the Purchaser any warranty received from XYLEM INC. supplier for such parts or products).

LIMITATIONS:

XYLEM INC. NEITHER ASSUMES, NOR AUTHORIZES ANY PERSON OR COMPANY TO ASSUME FOR XYLEM INC., ANY OTHER OBLIGATION IN CONNECTION WITH THE SALE OF ITS FLYGT EQUIPMENT. ANY ENLARGEMENT OR MODIFICATION OF THIS WARRANTY BY A FLYGT PRODUCT DISTRIBUTOR, OR OTHER SELLING AGENT SHALL BECOME THE EXCLUSIVE RESPONSIBILITY OF SUCH ENTITY.

THE FOREGOING WARRANTY IS EXCLUSIVE AND IN LIEU OF ANY AND ALL OTHER EXPRESS OR IMPLIED WARRANTIES, GUARANTEES, CONDITIONS OR TERMS OF WHATEVER NATURE RELATING TO FLYGT PRODUCT(S), INCLUDING AND WITHOUT LIMITATION ANY IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE WHICH ARE HEREBY EXPRESSLY DISCLAIMED AND EXCLUDED. PURCHASER'S EXCLUSIVE REMEDY AND ITT WATER & WASTEWATER'S AGGREGATE LIABILITY FOR BREACH OF ANY OF THE FOREGOING WARRANTIES IS LIMITED TO REPAIRING OR REPLACING FLYGT PRODUCTS AND SHALL IN ALL CASES BE LIMITED TO THE AMOUNT PAID BY THE PURCHASER HEREUNDER. IN NO EVENT IS ITT WATER & WASTEWATER LIABLE FOR ANY OTHER FORM OF DAMAGES, WHETHER DIRECT, INDIRECT, LIQUIDATED, INCIDENTAL, CONSEQUENTIAL, PUNITIVE, EXEMPLARY OR SPECIAL DAMAGES, INCLUDING BUT NOT LIMITED TO LOSS OF USE, LOSS OF PROFIT, LOSS OF ANTICIPATED SAVINGS OR REVENUE, LOSS OF INCOME, LOSS OF BUSINESS, LOSS OF PRODUCTION, LOSS OF OPPORTUNITY OR LOSS OF REPUTATION.

XYLEM INC. WILL NOT BE HELD RESPONSIBLE FOR TRAVEL EXPENSES, RENTED EQUIPMENT, OUTSIDE CONTRACTOR'S FEES, OR ANY EXPENSES ASSOCIATED WITH A FLYGT PRODUCT REPAIR SHOP NOT AUTHORIZED BY XYLEM INC.. REIMBURSEMENT COSTS FOR CRANES AND/OR ANY SPECIAL EQUIPMENT USED IN CONJUNCTION FOR THE REMOVAL AND/OR REINSTALLATION OF ANY FLYGT EQUIPMENT IS NOT COVERED UNDER THIS WARRANTY.

ANY UNAUTHORIZED ALTERATIONS TO SUPPLIED FLYGT EQUIPMENT USED WITHOUT XYLEM INC. SUPPLIED FLYGT BRAND CABLE OR CONTROLS WILL NOT BE COVERED UNDER THIS WARRANTY, UNLESS IT CAN BE PROVEN SUCH ANCILLARY EQUIPMENT IS SUITABLE FOR THE PURPOSE AND EQUAL TO XYLEM INC. SUPPLIED FLYGT BRAND CABLES OR CONTROLS THAT WOULD ORIGINALLY HAVE BEEN SUPPLIED WITH THE TYPE OF EQUIPMENT IN USE.

REQUIREMENTS:

A copy of Electrical System Schematics of the Control used (including a Control's Bill of Material) could be required to support a Warranty Claim when a non Flygt Brand Control is used. In addition, a written record, hereby known as "the log", will be associated with each unit serial number and must be maintained by the organization having product maintenance responsibility. The log must record each preventative maintenance activity and any repair activity during the life of the warranty or verification that an XYLEM INC. authorized Service Contract for Flygt Products is in force and must be available for review and/or auditing. Failure to meet these conditions could render this warrant null and void. Such logs could be required to determine warranty coverage.



STORAGE:

Should a delay occur between ship date and the date of start-up, maintenance as outlined in XYLEM INC. Care & Maintenance Manual for Flygt Products must be performed by the "CONTRACTOR" and/or "OWNER" during any such period of storage. Documentation providing proof and outlining what maintenance was performed must be provided to XYLEM INC. or its Flygt Products representative within thirty (30) days of said maintenance, or the XYLEM INC. warranty for Flygt Products could be considered void.

CONTROLS:

Warranty coverage for permanently installed controls will start for the end purchaser on the date of shipment.. This warranty does not apply to controls that have been damaged due to a defective and/or improper input power supply, improper electrical protection, accidental damage, improper or unauthorized installation and/or repair, unauthorized alteration, negligence, environmental corrosion or chemical attack, improper maintenance or storage of control, any act of God, an act of war, an act of terrorism or damage resulting from the use of accessory equipment not approved by XYLEM INC.. Further, this warranty does not apply in the event an adjustment is found to correct the alleged defect.

Solid state devices will be covered for a period of one (1) year. Electrical control panels containing controllers, PLC's, drives, soft starts, and other computerized equipment will require Transient Voltage Surge Suppression (TVSS) protection in order to satisfy the requirements of this warranty. The protection equipment associated with the control must be kept in working condition during the life of the warranty. Auxiliary equipment supplied with the control (air-conditioners etc.) is limited by the respective original equipment manufacturer's warranty offered. Consumable items such as: light bulbs, fuses, and relays are covered under normal operating conditions. Electrical surges experienced during startups and/or during normal operating use of the control panel will cause the consumable items not to be covered under this warranty policy. Components not supplied by XYLEM INC. will not covered by this warranty.

TOP (The Optimum Pump Station)

XYLEM INC. will warrant the Flygt TOP pre-engineered fiberglass pump station components against defects in material and workmanship for a period of one (1) year from date of start-up or eighteen (18) months from date of shipment and is valid only to the original owner of the station. Warranty shall cover the cost of labor and materials required to correct any warrantable defect, excluding any removal and reinstallation costs, FOB XYLEM INC. authorized warranty service location for Flygt's TOP.

Flygt Products contained within a TOP pre-engineered fiberglass pump station will carry the standard XYLEM INC. warranty for Flygt products and/or accessories installed in the TOP pre-engineered fiberglass pump station.

All Flygt Product restrictions and/or limitations as outlined and described within the context of this warranty are germane to all sections of this XYLEM INC. Warranty document.

XYLEM INC.



ADDENDUM – WARRANTY COVERAGE BY PRODUCT

| PRODUCT | PRODUCT SERIES AND CONFIGURATION | Months | Months | Months | Months | Months |
|---|--|-----------------------|------------------|---------|---------|--------|
| | | 1 - 12 | 13 - 18 | 19 - 36 | 37 - 39 | Months |
| Axial Flow/ Mixed Flow/ Centrifugal Pumps & Mixers | 3000 Series (CP, NP, DP, CT, NT, CZ, LL) 4000 Series (SR, PP) 7000 Series (PL) | 100% | 50% | | | 25% |
| Electrical Control Panels (permanently installed) | WWW Manufactured Control Panels - 3 - Years | 100% - 1 YR | LIMITED - 2 - YR | | | |
| Abrasion/Corrosion Resistant & Chopper/ Grinder Pumps | 3000 Series (MP, MF, MH, FS, FP, HP, HS) 5000 Series (HF, HS) 8000.280 Series (DP, DZ, DT, DS, DF) | 100% | | | | |
| Dewatering Pumps | 2000 Series (BS, KS) 3000 Series (CS, NS, DS) 8000.280 Series (DS, DF) | 100% (From Ship Date) | | | | |
| TOPS | Fiberglass Pump Station | 100% (From Ship Date) | | | | |
| Accessories | Permanent / Portable | 100% (From Ship Date) | | | | |
| Hydro ejectors/Aerators | HE, JA | 100% | | | | |
| Portable Pump Controls | Control Boxes (Nolta, MSHA etc.) | 100% (From Ship Date) | | | | |
| Small Pumps | 3045, 3057, SX | 100% (From Ship Date) | | | | |
| Parts - * | All new spare parts | 100% (From Ship Date) | | | | |

* - Parts that fail where used in a repair are warranted for one (1) year from the date of the repair for the failed part only – no labor.



SUBMITTAL

CUSTOMER: Waste Management
Prairie View RDF 15505 Shively Rd
Berman, IN 46595

PROJECT: Jay County Landfill

THE FOLLOWING PUMPS WILL BE SUPPLIED FOR THE ABOVE PROJECT:

Equalization Transfer Pump

| | |
|---------------------|--------------|
| QUANTITY: | One |
| MODEL: | NZ 3102.181 |
| HORSEPOWER | 3.7 |
| VOLTAGE: | 460 Volt |
| PHASE: | 3 PH |
| IMPELLER: | 465 Impeller |
| POWER CABLE: | 50' per pump |

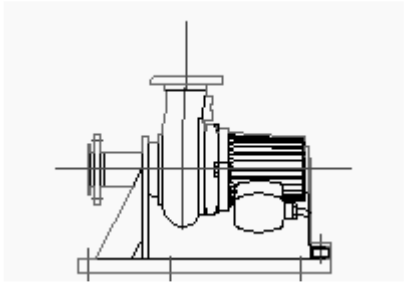
PLEASE REVIEW THE ELECTRICAL CHARACTERISTICS AND CABLE LENGTH SUBMITTED. ITT FLYGT CORPORATION WILL NOT BE HELD RESPONSIBLE FOR INCORRECT VOLTAGES, CYCLES, PHASES OR CABLE LENGTH. PLEASE NOTE ANY CHANGES ON THIS SUBMITTAL PRIOR TO RELEASE.

THE FOLLOWING ITEMS WILL ALSO BE SUPPLIED FOR THIS PROJECT:

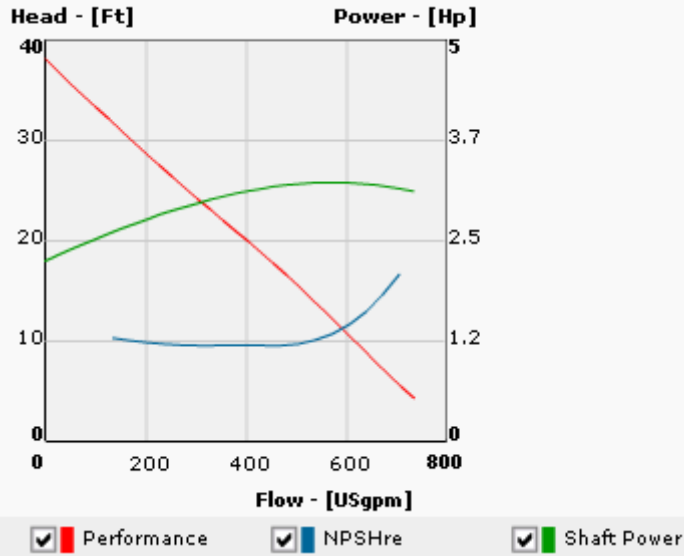
- (1) Z Stand - Stationary (See Dimensional Drawing)
- (1) Certified Performance Test, Duty Conditions of 250 GPM at 24' TDH (for reference)
- (1) Hydrostatic test (for reference)
- (1) ½ Day of Startup Service (for reference)

PRODUCT: NZ 3102 MT

Product picture



Curves Enlarge



Pump Data

Curve id: 63-465-00-3703 Impeller: 465 Poles: 4 - pole Motor: 18-11-4AL Frequency: 60 Hz

Motor Data

| Rated output power Hp (kW) | Ø | Nominal voltage (V) | Full load current (A) | Locked rotor current (A) | Locked rotor kVA | Locked rotor code letter kVA/HP | Poles/rpm |
|-------------------------------|--------------|------------------------|--------------------------|-----------------------------|------------------|------------------------------------|-------------------|
| 3.7 (2.8) | 3 | 460 | 5.4 | 42 | 33 | K | 4/1760 |
| 3.7 (2.8) | 3 | 230 | 11 | 83 | 33 | K | 4/1760 |
| Pump motor Hp | Efficiency | | | Power factor | | | |
| | 100% load | 75% load | 50% load | 100% load | 75% load | 50% load | |
| 3.7 | 85 | 84 | 80.5 | 0.75 | 0.67 | 0.54 | |

Cable Data

| HP | Cables | Volts | Max. length (Ft) | Cable size/Nominal OD. | Conductors (In one cable) | Type | Part number |
|-----|--------|-----------------------|------------------|-------------------------|--|------|-------------|
| 3.7 | 1 | 230 460 | 230 935 | #12/7 0.83"-(21.0mm) | (3) 12 AWG (PWR) (2) 12 AWG (CTRL) (1) 12 AWG (GND) (1) 12 AWG (GC) | STD | 942104 |

Available Outlet and Inlet Sizes

| | |
|-----------------------|----|
| Outlet Drilled Flange | 4" |
| Inlet Drilled Flange | 4" |



ITT

NZ 3102 MT 3~ 465

Performance curve



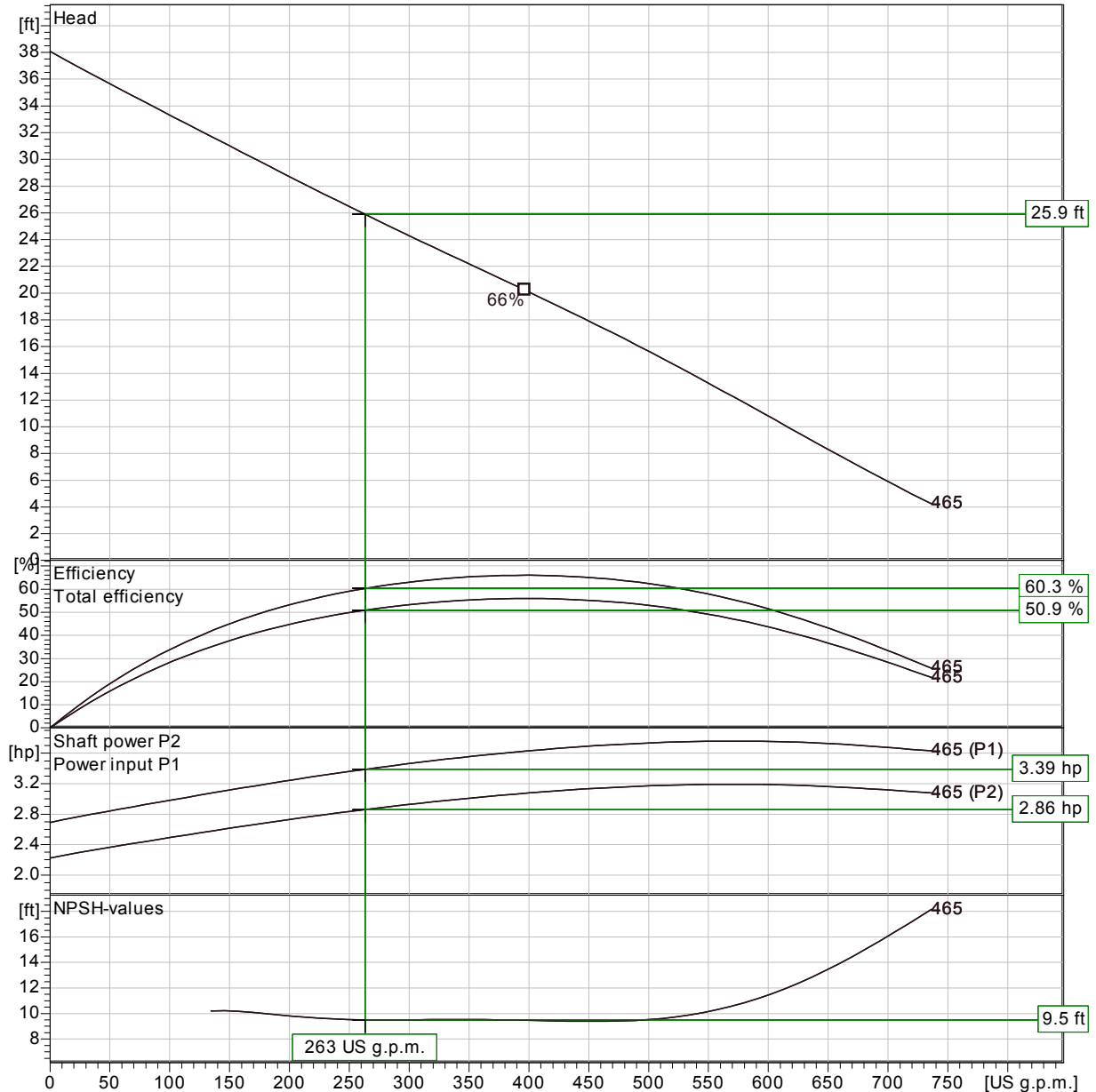
Pump

Outlet diameter 3¹⁵/₁₆"
 Inlet diameter 100 mm
 Impeller diameter 6"
 Number of blades 2
 Throughtlet diameter

Motor

Motor # N3102.181 18-11-4AL-D 3,7hp
 Stator variant
 Frequency 60 Hz
 Rated voltage 460 V
 Number of poles 4
 Phases 3~
 Rated power 3.7549 hp
 Rated current 5.4 A
 Starting current 42.012 A
 Rated speed 1760 rpm

Power factor
 1/1 Load 0.75
 3/4 Load 0.67
 1/2 Load 0.54
 Efficiency
 1/1 Load 85 %
 3/4 Load 84 %
 1/2 Load 80.5 %



Curve according to: ISO 9906 grade 2 annex 1

Duty point

Flow 250 US g.p.m. Head 24 ft

Shaft power NPSHre

Hyd eff. %

Guarantee

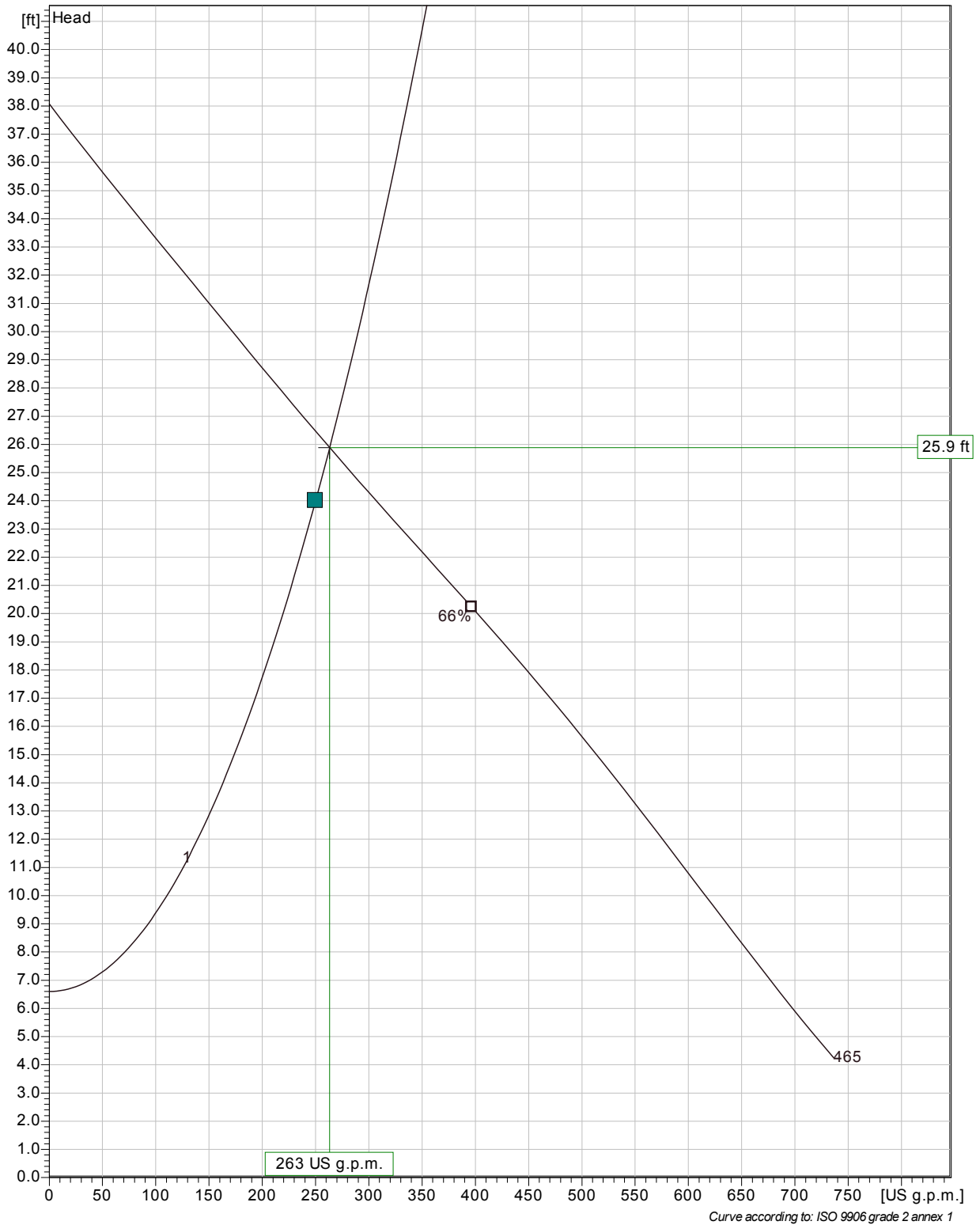
ISO_9906_Grade_2
 No

| | | | | |
|---------|------------|------------|--------------------------|-------------|
| Project | Project ID | Created by | Created on 2011-10-19 | Last update |
|---------|------------|------------|--------------------------|-------------|



ITT

NZ 3102 MT 3~ 465 Duty Analysis



| Pumps running /System | Individual pump | | | Total | | | | | |
|-----------------------|-----------------|---------|-------------|---------------|---------|-------------|-----------|------------------|--------|
| | Flow | Head | Shaft power | Flow | Head | Shaft power | Hyd. eff. | Specific energy | NPSHre |
| 1 | 263 US g.p.m. | 25.9 ft | 2.86 hp | 263 US g.p.m. | 25.9 ft | 2.86 hp | 60.3 % | 0.0423 kWh/US MG | 9.5 ft |

| | | | | |
|---------|------------|------------|---------------------------------|-------------|
| Project | Project ID | Created by | Created on 2011-10-19 | Last update |
|---------|------------|------------|---------------------------------|-------------|

NZ 3102 SPECS.

REQUIREMENTS

Furnish and install one submersible non-clog wastewater pump. Each pump shall be equipped with a 3.7 HP submersible electric motor connected for operation on 460 volts, 3 phase, 60 hertz, 7 wire service, with 50 feet of submersible cable (SUBCAB) suitable for submersible pump applications. The power cable shall be sized according to NEC and ICEA standards and have P-MSHA Approval.

PUMP DESIGN CONFIGURATION (Dry pit installation)

The pump shall be supplied with a capable of delivering 250 GPM at 24 FT. TDH. Pump shall be capable of operating in a continuous non submerged condition in horizontal (CZ, NZ) or vertical (CT, NT) (select one) position in a dry pit installation and permanently connected to inlet and outlet pipes. Pump shall be of submersible construction and will continue to operate satisfactorily should the dry pit be subjected to flooding.

PUMP CONSTRUCTION

Major pump components shall be of grey cast iron, ASTM A-48, Class 35B, with smooth surfaces devoid of blow holes or other irregularities. The lifting handle shall be of stainless steel. All exposed nuts or bolts shall be AISI type 316 stainless steel construction. All metal surfaces coming into contact with the pumpage, other than stainless steel or brass, shall be protected by a factory applied spray coating of acrylic dispersion zinc phosphate primer with a polyester resin paint finish on the exterior of the pump. Sealing design shall incorporate **metal-to-metal contact** between machined surfaces. Critical mating surfaces where watertight sealing is required shall be machined and fitted with Nitrile or optional Viton rubber O-rings. Fittings will be the result of controlled compression of rubber O-rings in two planes and O-ring contact of four sides without the requirement of a specific torque limit. Rectangular cross sectioned gaskets requiring specific torque limits to achieve compression shall not be considered as adequate or equal. No secondary sealing compounds, elliptical O-rings, grease or other devices shall be used.

COOLING SYSTEM

Motors are sufficiently cooled by the surrounding environment or pumped media. A water jacket is not required.

CABLE ENTRY SEAL

The cable entry seal design shall preclude specific torque requirements to insure a watertight and submersible seal. The cable entry shall consist of a single cylindrical elastomer grommet, flanked by washers, all having a close tolerance fit against the cable outside diameter and the entry inside diameter and compressed by the body containing a strain relief function, separate from the function of sealing the cable. The assembly shall provide ease of changing the cable when necessary using the same entry seal. **The cable entry junction chamber and motor shall be separated by a stator lead sealing gland or terminal board, which shall isolate the interior from foreign material gaining access through the pump top. Epoxies, silicones, or other secondary sealing systems shall not be considered acceptable.**

MOTOR

The pump motor shall be a NEMA B design, induction type with a squirrel cage rotor, shell type design, housed in an air filled, watertight chamber. The stator windings shall be insulated with moisture resistant Class H insulation rated for 180°C (356°F). The stator shall be insulated by the trickle impregnation method using Class H monomer-free polyester resin resulting in a winding fill factor of at least 95%. The motor shall be inverter duty rated in accordance with NEMA MG1, Part 31. The stator shall be heat-shrink fitted into the cast iron stator housing. The use of multiple step dip and bake-type stator insulation process is not acceptable. The use of bolts, pins or other fastening devices requiring penetration of the stator housing is not acceptable. The motor shall be designed for continuous duty handling pumped media of 40°C (104°F) and capable of no less than 30 evenly spaced starts per hour. The rotor bars and short circuit rings shall be made of cast

aluminum. Thermal switches set to open at 125°C (260 °F) shall be embedded in the stator end coils to monitor the temperature of each phase winding. These thermal switches shall be used in conjunction with and supplemental to external motor overload protection and shall be connected to the control panel. The junction chamber containing the terminal board, shall be hermetically sealed from the motor by an elastomer compression seal. Connection between the cable conductors and stator leads shall be made with threaded compression type binding posts permanently affixed to a terminal board. The motor and the pump shall be produced by the same manufacturer. The combined service factor (combined effect of voltage, frequency and specific gravity) shall be a minimum of 1.15. The motor shall have a voltage tolerance of plus or minus 10%. The motor shall be designed for operation up to 40°C (104 °F) ambient and with a temperature rise not to exceed 80°C. A performance chart shall be provided upon request showing curves for torque, current, power factor, input/output kW and efficiency. This chart shall also include data on starting and no-load characteristics. The power cable shall be sized according to the NEC and ICEA standards and shall be of sufficient length to reach the junction box without the need of any splices. The outer jacket of the cable shall be oil resistant chlorinated polyethylene rubber. The motor and cable shall be capable of continuous submergence underwater without loss of watertight integrity to a depth of 65 feet or greater. The motor horsepower shall be adequate so that the pump is non-overloading throughout the entire pump performance curve from shut-off through run-out.

BEARINGS

The pump shaft shall rotate on two bearings. Motor bearings shall be permanently grease lubricated. The upper bearing shall be a single deep groove ball bearing. The lower bearing shall be a two row angular contact bearing to compensate for axial thrust and radial forces. **Single row lower bearings are not acceptable.**

MECHANICAL SEAL

Each pump shall be provided with a tandem mechanical shaft seal system consisting of two totally independent seal assemblies. The seals shall operate in a lubricant reservoir that hydro-dynamically lubricates the lapped seal faces at a constant rate. The lower, primary seal unit, located between the pump and the lubricant chamber, shall contain one stationary and one positively driven rotating, corrosion resistant **tungsten-carbide** ring. The upper, secondary seal unit, located between the lubricant chamber and the motor housing, shall contain one stationary and one positively driven rotating, corrosion resistant **tungsten-carbide** seal ring. Each seal interface shall be held in contact by its own spring system. The seals shall require neither maintenance nor adjustment nor **depend on direction of rotation for sealing**. The position of both mechanical seals shall depend on the shaft. Mounting of the lower mechanical seal on the impeller hub will not be acceptable. For special applications, other seal face materials shall be available. **The following seal types shall not be considered acceptable or equal to the dual independent seal specified:** shaft seals without positively driven rotating members, or conventional double mechanical seals containing either a common single or double spring acting between the upper and lower seal faces. No system requiring a pressure differential to offset pressure and to effect sealing shall be used. Each pump shall be provided with a lubricant chamber for the shaft sealing system. The lubricant chamber shall be designed to prevent overfilling and to provide lubricant expansion capacity. The drain and inspection plug, with positive anti-leak seal shall be easily accessible from the outside. The seal system shall not rely upon the pumped media for lubrication. **The motor shall be able to operate dry without damage while pumping under load. Seal lubricant shall be FDA Approved, nontoxic.**

PUMP SHAFT

Pump and motor shaft shall be the same unit. The pump shaft is an extension of the motor shaft. Couplings shall not be acceptable. The pump shaft shall be stainless steel – ASTM A479 S43100-T. If a shaft material of lower quality than stainless steel – ASTM A479 S43100-T is used, a shaft sleeve of stainless steel – ASTM A479 S43100-T is used to protect the shaft material. However, shaft sleeves only protect the shaft around the lower mechanical seal. No

protection is provided for in the oil housing and above. Therefore, the use of stainless steel sleeves will not be considered equal to stainless steel shafts.

IMPELLER (for N - pumps)

The impeller shall be of (ASTM A-48, Class 35B gray iron or ASTM A-532 (Alloy III A) 25% chrome cast iron) dynamically balanced, semi-open, multi-vane, back swept, screw-shaped, non-clog design. The impeller leading edges shall be mechanically self-cleaned automatically upon each rotation as they pass across a spiral groove located on the volute suction. The screw-shaped leading edges of the gray iron impeller shall be hardened to Rc 45 and shall be capable of handling solids, fibrous materials, heavy sludge and other matter normally found in wastewater. The screw shape of the impeller inlet shall provide an inducing effect for the handling of up to 5% sludge and rag-laden wastewater. The impeller to volute clearance shall be readily adjustable by the means of a single trim screw. The impellers shall be locked to the shaft, held by an impeller bolt and shall be coated with alkyd resin primer.

VOLUTE / SUCTION COVER (for N - pumps)

The pump volute shall be a single piece gray cast iron, ASTM A-48, Class 35B, non-concentric design with smooth passages of sufficient size to pass any solids that may enter the impeller. Minimum inlet and discharge size shall be as specified. The volute shall have a replaceable suction cover insert ring in which are cast spiral-shaped, sharp-edged groove(s). The spiral groove(s) shall provide trash release pathways and sharp edge(s) across which each impeller vane leading edge shall cross during rotation so to remain unobstructed. The insert ring shall be cast of (ASTM A-48, Class 35B gray iron or ASTM A-532 (Alloy III A) 25% chrome cast iron) and provide effective sealing between the multi-vane semi-open impeller and the volute housing.

PROTECTION

All stators shall incorporate thermal switches in series to monitor the temperature of each phase winding. The thermal switches shall open at 125°C (260°F), stop the motor and activate an alarm. A leakage sensor shall be available as an option to detect water in the stator chamber. The Float Leakage Sensor (FLS) is a small float switch used to detect the presence of water in the stator chamber. When activated, the FLS will stop the motor and send an alarm both local and/or remote. **USE OF VOLTAGE SENSITIVE SOLID STATE SENSORS AND TRIP TEMPERATURE ABOVE 125°C (260°F) SHALL NOT BE ALLOWED.** The thermal switches and FLS shall be connected to a Mini CAS (Control and Status) monitoring unit. The Mini CAS shall be designed to be mounted in any control panel.

Note: FLS not available in CZ, NZ configurations.

MODIFICATIONS

1. Explosion-proof Pumps (X).
2. Warm Liquid Applications (WL).
3. Dry Pit Installations (CT).

Refer to the General Guide Specifications for additional information.

N PUMP - GENERAL GUIDE SPECIFICATION

GENERAL

The general guide specification is intended to cover the items applying to all ITT Flygt pumps for this project. Pump specifications follow the general section. Thus; Quality, Technical Support, Testing, and Experience apply to all ITT Flygt pumps for this project.

SCOPE

The specifications shall govern all work necessary to furnish, install and place into operation the electrical submersible pump required to complete this project. This section includes electric submersible pump(s) to be supplied with motor, close coupled volute, cast iron discharge elbow, guide bar brackets, power cable and accessories. The pumps are available for wet pit (CP or NP), dry pit (CT, CZ, NT or NZ) and portable (CS, NS) installations.

QUALITY ASSURANCE

The pump shall be heavy duty, electric submersible, centrifugal non-clog units designed for handling raw, unscreened sewage and wastewater and shall be fully guaranteed for this use. The pumps provided shall be capable of operating in an ambient liquid temperature of **104 DEGREES F**. Since the high temperature of **104 DEGREES F** is specified by the National Electrical Manufacturers Association (NEMA) and Factory Mutual (FM), motors with a maximum ambient temperature rating below **104 DEGREES F** shall not be acceptable. The pump and motor unit shall be suitable for continuous operation at full nameplate load while the motor is completely submerged, partially submerged or totally non-submerged. The use of shower systems, secondary pumps or cooling fans to cool the motor shall not be acceptable. The pump, mechanical seals and motor units provided under this specification shall be from the same manufacturer in order to achieve standardization of operation, maintenance, spare parts, manufacturer's service and warranty.

SUBMITTALS

Submittal data shall be provided to show compliance with these specifications, plans or other specifications that will influence the proper operation of the pump.

Standard submittal data for approval must consist of:

- a. Pump Performance Curves.
- b. Pump Outline Drawing.
- c. Station Drawing for Accessories.
- d. Electrical Motor Data.
- e. Control Drawing and Data.
- f. Access Frame Drawing.
- g. Typical Installation Guides.
- h. Technical Manuals.
- i. Parts List.
- j. Printed Warranty.
- k. Manufacturer's Equipment Storage Recommendations.
- l. Manufacturer's Standard Recommended Start-Up Report Form.

Lack of the above requested submittal data is cause for rejection.

TESTING

Testing performed upon each pump shall include the following inspections:

- a. Impeller, motor rating and electrical connections shall be checked for compliance with this specification.
- b. Prior to submergence, each pump shall be run dry to establish correct rotation.
- c. Each pump shall be run submerged in water.
- d. Motor and cable insulation shall be tested for moisture content or insulation defects.

Upon request, a written quality assurance record confirming the above testing/inspections shall be supplied with each pump at the time of shipment. Each pump (when specified) shall be tested in accordance with the latest test code of the Hydraulic Institute (H.I.) at the manufacturer to

determine head vs. capacity and kilowatt draw required. Witness tests shall be available at the factory upon request. The pump shall be rejected if the above requirements are not satisfied.

START-UP SERVICE

The equipment manufacturer shall furnish the services of a qualified factory trained field service engineer for 8-hour working day(s) at the site to inspect the installation and instruct the owner's personnel on the operation and maintenance of the pumping units. After the pumps have been completely installed and wired, the contractor shall have the manufacturer do the following:

- a. Megger stator and power cables.
- b. Check seal lubrication.
- c. Check for proper rotation.
- d. Check power supply voltage.
- e. Measure motor operating load and no load current.
- f. Check level control operation and sequence.

During this initial inspection, the manufacturer's service representative shall review recommended operation and maintenance procedures with the owner's personnel.

FACTORY SERVICE

Factory-Approved service facilities with qualified factory-trained mechanics shall be available for prompt emergency and routine service.

GUARANTEE

See individual market sector **Warranty** policies as presented under **General Information** in this catalog. The warranty shall be in printed form and previously published as the manufacturer's standard warranty for all similar units manufactured.

EXPERIENCE

The pump manufacturer shall have a minimum of 10,000 heavy-duty submersible wastewater pumps installed and operating for no less than 5 years in the United States.

MANUFACTURERS

- a. The pump, mechanical seals and motor shall be from the same manufacturer.
- b. The pump, mechanical seals and motor manufacturer shall be ITT Flygt.

MODIFICATIONS:

- a. **DRY PIT INSTALLATION (CT, CZ, NT, or NZ):**
Motor cooling shall be sufficient for continuous operation under full nameplate load in a dry environment. The pump(s) shall be capable of handling pumped media up to **104 DEGREES F.**

OIL FILLED MOTORS - Since the complete motor requires total oil immersion for adequate heat dissipation, **oil filled motors shall not be considered for dry pit installations.**

DRY TYPE - EXTERNAL FAN COOLED MOTORS - When external fan cooling is required, two **SEPARATE** motors are required one for the pump and one for the fan. This results in higher input power, increased operating costs and possible fan motor failure. A submersible pump is used for dry pit installation because of the high possibility of flooding. If the fan motor is operating when submerged, the down thrust developed will damage the fan motor. A pump motor of about **200 HP DEPENDS** on the performance of a **3 HP** fan motor. **Thus, air cooled fans shall not be considered for dry pit installations.**



Water & Wastewater

N-3102.181

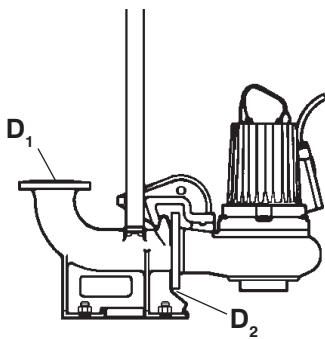
Impeller/Motor/ Nominal Sizes

Issued: 8/08

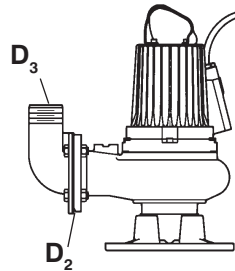
Supersedes: 9/07

| PUMP MODEL | IMPELLER CODE | HP RATING | | | | VAC | D1 | D2 | D3 | D4 |
|------------|-----------------------------|----------------|----------------|----------------|-----|-------------------------------|----------------|----------------|----------------|----|
| | | NP | NS | NT | NZ | | | | | |
| 3102 3Ø | 422 LT 423 LT | 5.0 | 5.0 | -- | -- | 200 230, <u>460</u> 575 | 4" or 6" | 4" or 6" | 4" or 6" | -- |
| | 462 MT | 5.0 | 5.0 | -- | -- | | 4" | 4" | 4" | 4" |
| | 463 MT | 5.0 | 5.0 | 3.7 | 3.7 | | 4" | 4" | 4" | 4" |
| | 464 MT 465 MT | 5.0 | 5.0 | 3.7 | 3.7 | | 4" | 4" | 4" | 4" |
| | 256 SH | 6.5 | 6.5 | -- | -- | | 3" | 3" | 3" | 4" |
| | 257 SH | 6.5 | 6.5 | 4.6 | -- | | | | | |
| | | | | | | | | | | |
| 3102 1Ø | 464 MT 465 MT | 3.9 | 3.9 | -- | -- | 230 | 4" | 4" | 4" | -- |

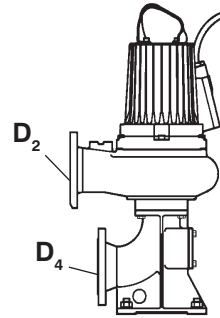
LT = High Volume MT = Standard SH = Super High Head



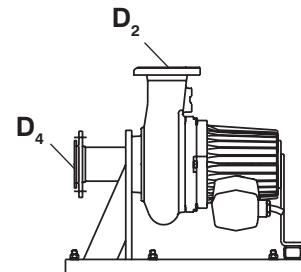
NP



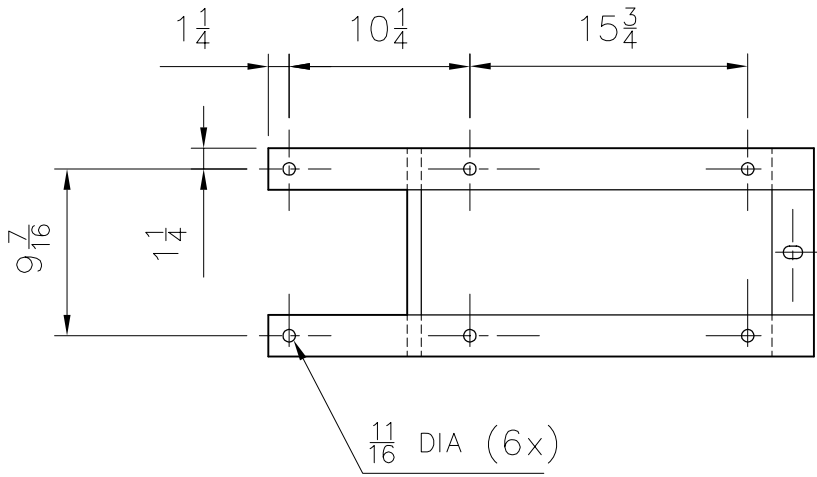
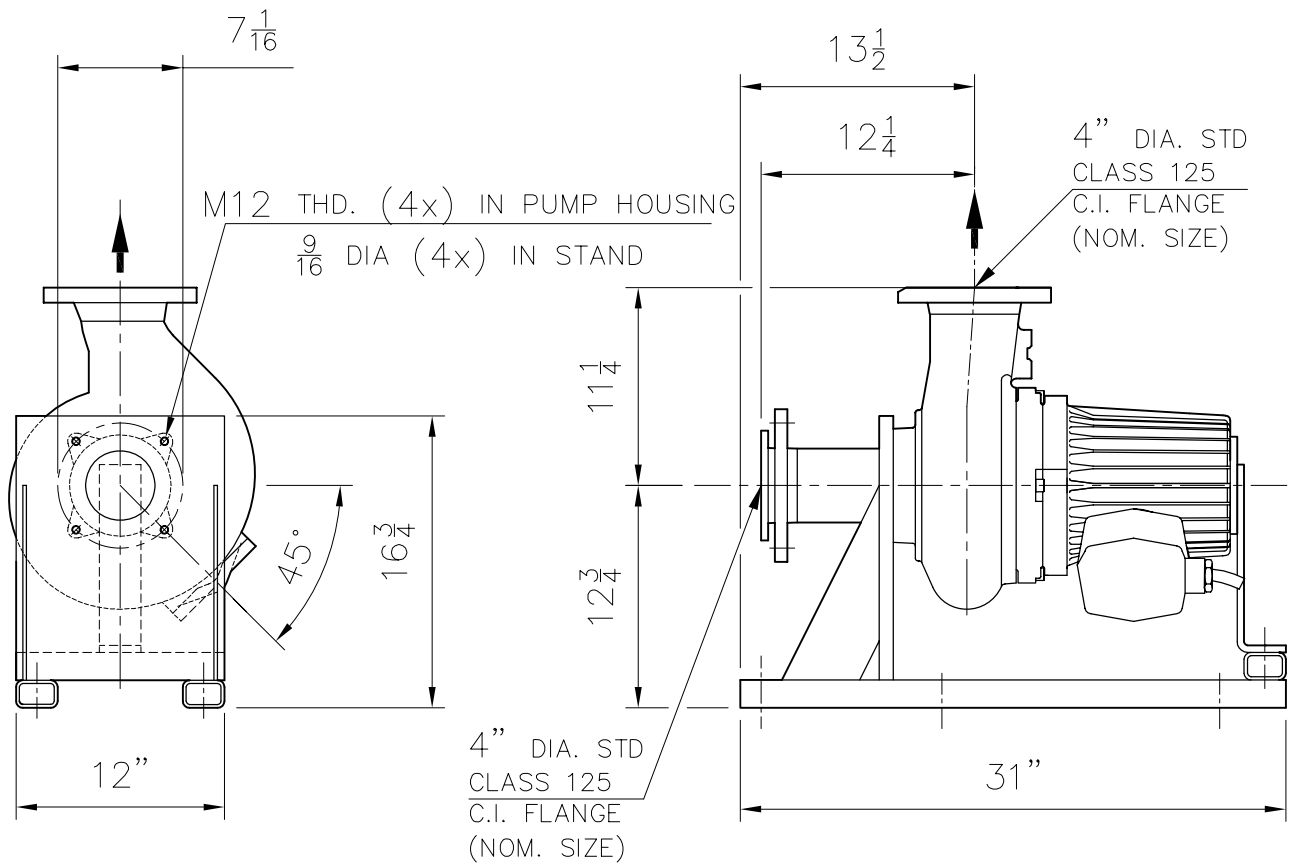
NS



NT



NZ



ALL DIMENSIONS IN INCHES

| Weight (LBS) | |
|--------------|-------|
| Pump | Stand |
| 225 | 90 |

| | | | | |
|--|------------------|-----------|------------|-------------|
| | Denomination | Drawn by | Checked by | Date |
| | Dimensional drwg | Sors | RB | 000905 |
| | NZ 3102 MT | Scale | | Reg no 5399 |
| | 4" / 4" | 660 26 00 | | B |



Water & Wastewater

CZ, NZ, HZ Stands

Accessories

Issued: 8/10

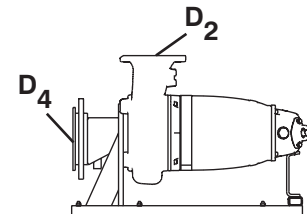
Supersedes: 11/09

CZ, NZ Stands

| Model | Version | D2 | D4 | Impellers | Part number |
|-------|-----------|--------|-----|------------------------------|-----------------|
| 3085 | MT | 3" | 4" | 436, 438, 440 | 6359402 |
| 3102 | MT | 4" | 4" | 433, 465 | 6321405 |
| | LT | 6" | 6" | 422, 423 | 6321104 |
| 3127 | HT-1 | 4" | 4" | 485, 489 | 6360505 |
| | HT-2 | 4" | 4" | 462, 463 | 6360605 |
| | MT | 4"/ 6" | 6" | 433, 434, 435, 436 | 6360704 |
| | LT | 6" | 8" | 412 | 6321605 |
| 3153 | HT | 4" | 6" | 452, 453, 454, 455, 456, 457 | 6556404 |
| | MT | 6" | 8" | 432, 433, 434, 435, 436 | 6556305 |
| | LT-4 pole | 8" | 8" | 412, 423, 414, 415 | 6561405 |
| | LT-6 pole | 10" | 12" | 622, 623, 624, 625 | 6589005 |
| | SH | | | Consult Factory | |
| 3171 | HT | 4" | 4" | 452, 453, 454, 455 | 6601605 |
| | MT | 6" | 6" | 433, 434, 435, 436, 437 | 6601505 |
| | LT | | | 613, 614, 615 | 6786105 |
| | SH | | | Consult Factory | |
| 3202 | HT | 6" | 10" | 458, 460, 462 | 6630205 |
| | MT | 8" | 12" | 640, 641, 642, 643 | 6630305 |
| | LT | 12" | 16" | 612, 614, 616, 618 | 6635905 |
| 3301 | HT | 6" | 10" | 454, 456, 458, 459 | 6059311 |
| | MT | 10" | 14" | 634, 636, 638, 639 | 6059305 |
| | LT-6 pole | 12" | 16" | 624, 626, 628 | 6059317 |
| | LT-8 pole | 14" | 16" | 814, 816, 818 | Consult Factory |

HZ Stands

| Model | D2 | D4 | Impellers | Part number |
|-------|----|---------|-----------|---------------|
| 5520 | 4" | 7-1/16" | 438 | 1409487700006 |



NOTE: All stand flanges are drilled to ANSI standard. Consult factory for availability of other drill patterns.



SUBMITTAL

CUSTOMER: Waste Management
Prairie View RDF 15505 Shively Rd
Berman, IN 46595

PROJECT: Jay County Landfill

THE FOLLOWING PUMPS WILL BE SUPPLIED FOR THE ABOVE PROJECT:

WAS Pump

| | |
|---------------------|--------------|
| QUANTITY: | One |
| MODEL: | NZ 3085.183 |
| HORSEPOWER | 2.3 |
| VOLTAGE: | 460 Volt |
| PHASE: | 3 PH |
| IMPELLER: | 463 Impeller |
| POWER CABLE: | 50' per pump |

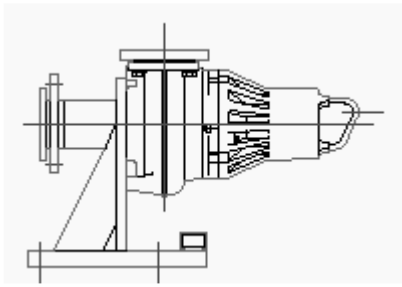
PLEASE REVIEW THE ELECTRICAL CHARACTERISTICS AND CABLE LENGTH SUBMITTED. ITT FLYGT CORPORATION WILL NOT BE HELD RESPONSIBLE FOR INCORRECT VOLTAGES, CYCLES, PHASES OR CABLE LENGTH. PLEASE NOTE ANY CHANGES ON THIS SUBMITTAL PRIOR TO RELEASE.

THE FOLLOWING ITEMS WILL ALSO BE SUPPLIED FOR THIS PROJECT:

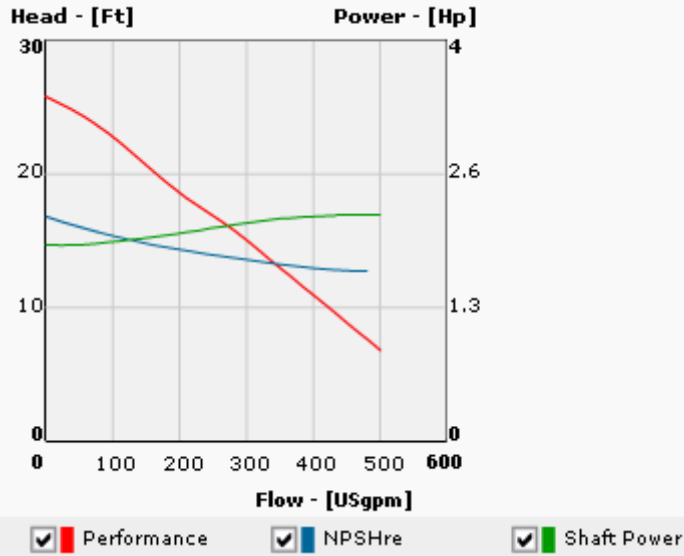
- (1) Z Stand - Stationary (See Dimensional Drawing)
- (1) Certified Performance Test, Duty Conditions of 100 GPM at 15' TDH (for reference)
- (1) Hydrostatic test (for reference)
- (1) ½ Day of Startup Service (for reference)

PRODUCT: NZ 3085 MT

Product picture



Curves Enlarge



Pump Data

Curve id: 63-463-00-5306 Impeller: 463 Poles: 4 - pole Motor: 15-10-4AL Frequency: 60 Hz

Motor Data

| Rated output power Hp (kW) | Ø | Nominal voltage (V) | Full load current (A) | Locked rotor current (A) | Locked rotor kVA | Locked rotor code letter kVA/HP | Poles/rpm |
|-------------------------------|--------------|------------------------|--------------------------|-----------------------------|------------------|------------------------------------|-------------------|
| 2.3 (1.7) | 3 | 460 | 3.5 | 22 | 18 | J | 4/1725 |
| 2.3 (1.7) | 3 | 230 | 7 | 44 | 18 | J | 4/1725 |
| Pump motor Hp | Efficiency | | | Power factor | | | |
| | 100% load | 75% load | 50% load | 100% load | 75% load | 50% load | |
| 2.3 | 79 | 78 | 74.5 | 0.78 | 0.7 | 0.58 | |

Cable Data

| HP | Cables | Volts | Max. length (Ft) | Cable size/Nominal OD. | Conductors (In one cable) | Type | Part number |
|-----|--------|-----------------------|------------------|-------------------------|--|------|-------------|
| 2.3 | 1 | 230 460 | 220 880 | #14/7 0.75"-(19.0mm) | (3) 14 AWG (PWR) (2) 14 AWG (CTRL) (1) 14 AWG (GND) (1) 14 AWG (GC) | STD | 942102 |

Available Outlet and Inlet Sizes

| | |
|-----------------------|----|
| Outlet Drilled Flange | 3" |
| Inlet Drilled Flange | 4" |

NZ 3085 MT 3~ 463

Performance curve

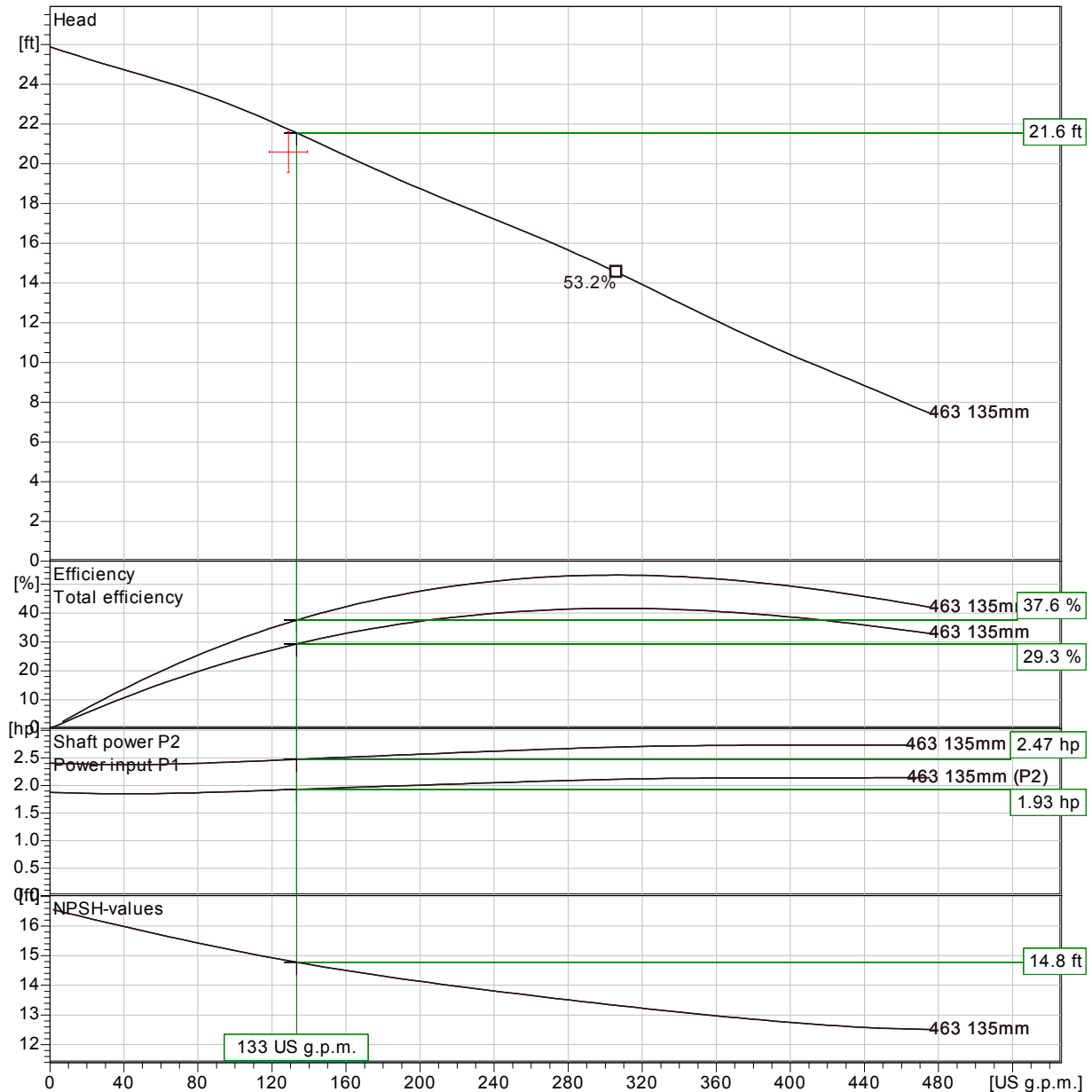
Pump

Outlet width 3 1/8 inch
Inlet diameter 111 mm
Impeller diameter 5⁵/₁₆"
Number of blades 2
Throughlet diameter

Motor

Motor # N3085.183 15-10-4AL-D 2,3hp
Stator variant
Frequency 60 Hz
Rated voltage 460 V
Number of poles 4
Phases 3~
Rated power 2.3 hp
Rated current 3.7 A
Starting current 25 A
Rated speed 1730 rpm

Power factor
1/1 Load 0.75
3/4 Load 0.66
1/2 Load 0.54
Efficiency
1/1 Load 78.0 %
3/4 Load 77.0 %
1/2 Load 73.0 %



Curve according to: ISO 9906

Duty point

Flow 129 US g.p.m. Head 20.6 ft

Shaft power NPSHre

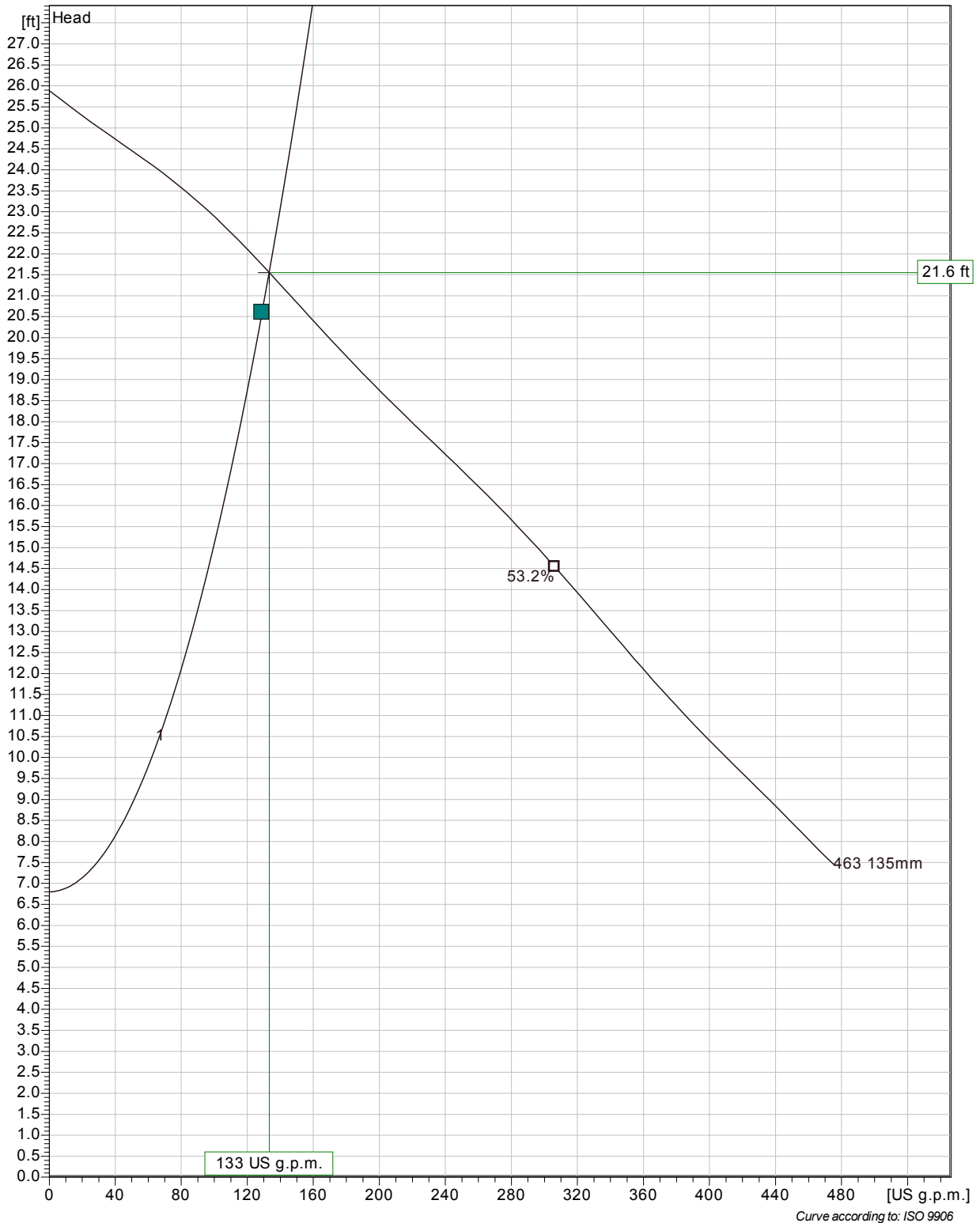
Hyd eff. %

Guarantee

ISO_9906_Grade_2
No

| | | | | |
|---------|------------|------------|---------------------------------|-------------|
| Project | Project ID | Created by | Created on 2011-12-08 | Last update |
|---------|------------|------------|---------------------------------|-------------|

NZ 3085 MT 3~ 463
Duty Analysis



| Pumps running /System | Individual pump | | | Total | | | | | |
|-----------------------|-----------------|---------|-------------|---------------|---------|-------------|----------|---------------------------|--------|
| | Flow | Head | Shaft power | Flow | Head | Shaft power | Hyd eff. | Specific energy | NPSHre |
| 1 | 133 US g.p.m. | 21.6 ft | 1.93 hp | 133 US g.p.m. | 21.6 ft | 1.93 hp | 37.6 % | 0.000277 kWh/Imp g# .8 ft | |

| | | | | |
|---------|------------|------------|---------------------------------|-------------|
| Project | Project ID | Created by | Created on 2011-12-08 | Last update |
|---------|------------|------------|---------------------------------|-------------|

C/D/N 3085 SPECS.

REQUIREMENTS

Furnish and install ___ submersible non-clog wastewater pump(s). Each pump shall be equipped with a ___ HP, submersible electric motor connected for operation on _____ volts, ___ phase, 60 hertz, _____ wire service, with _____ feet of submersible cable (SUBCAB) suitable for submersible pump applications. The power cable shall be sized according to NEC and ICEA standards and also meet with P-MSHA Approval.

PUMP DESIGN CONFIGURATION (Dry pit installation)

Pump shall be capable of operating in a continuous non submerged condition in horizontal (CZ, NZ) or vertical (CT, NT) (select one) position in a dry pit installation and permanently connected to inlet and outlet pipes. Pump shall be of submersible construction and will continue to operate satisfactorily should the dry pit be subjected to flooding.

PUMP DESIGN CONFIGURATION (Wet pit installation)

The pump shall be supplied with a mating cast iron _____ inch discharge connection and be capable of delivering _____ GPM at _____ FT. TDH. An additional point on the same curve shall be _____ GPM at _____ feet total head. Shut off head shall be _____ feet (minimum). The pump(s) shall be automatically and firmly connected to the discharge connection, guided by no less than two guide bars extending from the top of the station to the discharge connection. There shall be no need for personnel to enter the wet-well. Sealing of the pumping unit to the discharge connection shall be accomplished by a machined metal to metal watertight contact. **Sealing of the discharge interface with a diaphragm, O-ring or profile gasket will not be acceptable.** No portion of the pump shall bear directly on the sump floor. Each pump shall be fitted with _____ feet of _____ lifting chain or stainless steel cable. The working load of the lifting system shall be 50% greater than the pump unit weight.

PUMP CONSTRUCTION

Major pump components shall be of grey cast iron, ASTM A-48, Class 35B, with smooth surfaces devoid of blow holes or other irregularities. The lifting handle shall be of stainless steel. All exposed nuts or bolts shall be AISI type 316 stainless steel construction. All metal surfaces coming into contact with the pumpage, other than stainless steel or brass, shall be protected by a factory applied spray coating of acrylic dispersion zinc phosphate primer with a polyester resin paint finish on the exterior of the pump.

Sealing design shall incorporate **metal-to-metal contact** between machined surfaces. Critical mating surfaces where watertight sealing is required shall be machined and fitted with Nitrile or optional Viton rubber O-rings. Fittings will be the result of controlled compression of rubber O-rings in two planes and O-ring contact of four sides without the requirement of a specific torque limit.

Rectangular cross sectioned gaskets requiring specific torque limits to achieve compression shall not be considered as adequate or equal. No secondary sealing compounds, elliptical O-rings, grease or other devices shall be used.

COOLING SYSTEM

Motors are sufficiently cooled by the surrounding environment or pumped media. A water cooling jacket is not required.

CABLE ENTRY SEAL

The cable entry seal design shall preclude specific torque requirements to insure a watertight and submersible seal. The cable entry shall consist of a single cylindrical elastomer grommet, flanked by washers, all having a close tolerance fit against the cable outside diameter and the entry inside diameter and compressed by the body containing a strain relief function, separate from the

function of sealing the cable. The assembly shall provide ease of changing the cable when necessary using the same entry seal.

MOTOR

The pump motor shall be a NEMA B design, induction type with a squirrel cage rotor, shell type design, housed in an air filled, watertight chamber. The stator windings shall be insulated with moisture resistant Class H insulation rated for 180°C (356°F). The stator shall be insulated by the trickle impregnation method using Class H monomer-free polyester resin resulting in a winding fill factor of at least 95%. The motor shall be inverter duty rated in accordance with NEMA MG1, Part 31. The stator shall be heat-shrink fitted into the cast iron stator housing. The use of multiple step dip and bake-type stator insulation process is not acceptable. The use of bolts, pins or other fastening devices requiring penetration of the stator housing is not acceptable. The motor shall be designed for continuous duty handling pumped media of 40°C (104°F) and capable of no less than 30 evenly spaced starts per hour. The rotor bars and short circuit rings shall be made of cast aluminum. Thermal switches set to open at 125°C (260°F) shall be embedded in the stator end coils to monitor the temperature of each phase winding. These thermal switches shall be used in conjunction with and supplemental to external motor overload protection and shall be connected to the control panel. The motor and the pump shall be produced by the same manufacturer.

The combined service factor (combined effect of voltage, frequency and specific gravity) shall be a minimum of 1.15. The motor shall have a voltage tolerance of plus or minus 10%. The motor shall be designed for operation up to 40°C (104°F) ambient and with a temperature rise not to exceed 80°C. A performance chart shall be provided upon request showing curves for torque, current, power factor, input/output kW and efficiency. This chart shall also include data on starting and no-load characteristics.

The power cable shall be sized according to the NEC and ICEA standards and shall be of sufficient length to reach the junction box without the need of any splices. The outer jacket of the cable shall be oil resistant chlorinated polyethylene rubber. The motor and cable shall be capable of continuous submergence underwater without loss of watertight integrity to a depth of 65 feet or greater.

The motor horsepower shall be adequate so that the pump is non-overloading throughout the entire pump performance curve from shut-off through run-out.

BEARINGS

The pump shaft shall rotate on two bearings. Motor bearings shall be permanently grease lubricated. The upper bearing shall be a single deep groove ball bearing. The lower bearing shall be a two row angular contact bearing to compensate for axial thrust and radial forces. **Single row lower bearings are not acceptable.**

MECHANICAL SEAL

Each pump shall be provided with a tandem mechanical shaft seal system consisting of two totally independent seal assemblies. The seals shall operate in a lubricant reservoir that hydrodynamically lubricates the lapped seal faces at a constant rate. The lower, primary seal unit, located between the pump and the lubricant chamber, shall contain one stationary and one positively driven rotating, corrosion resistant **tungsten-carbide** ring. The upper, secondary seal unit, located between the lubricant chamber and the motor housing, shall contain one stationary **tungsten-carbide** seal ring and one positively driven rotating **tungsten-carbide** seal ring. Each seal interface shall be held in contact by its own spring system. The seals shall require neither maintenance nor adjustment nor **depend on direction of rotation for sealing**. The position of both mechanical seals shall depend on the shaft. Mounting of the lower mechanical seal on the impeller hub will not be acceptable. For special applications, other seal face materials shall be available.

The following seal types shall not be considered acceptable or equal to the dual independent seal specified: shaft seals without positively driven rotating members, or conventional double mechanical seals containing either a common single or double spring acting between the upper and lower seal faces. No system requiring a pressure differential to offset pressure and to effect sealing shall be used.

Each pump shall be provided with a lubricant chamber for the shaft sealing system. The lubricant chamber shall be designed to prevent overfilling and to provide lubricant expansion capacity. The drain and inspection plug, with positive anti-leak seal shall be easily accessible from the outside. The seal system shall not rely upon the pumped media for lubrication. **The motor shall be able to operate dry without damage while pumping under load.**

Seal lubricant shall be FDA Approved, nontoxic.

PUMP SHAFT

Pump and motor shaft shall be the same unit. The pump shaft is an extension of the motor shaft. Couplings shall not be acceptable. The pump shaft shall be stainless steel – ASTM A479 S43100-T.

If a shaft material of lower quality than stainless steel – ASTM A479 S43100-T is used, a shaft sleeve of stainless steel – ASTM A479 S43100-T is used to protect the shaft material. However, shaft sleeves only protect the shaft around the lower mechanical seal. No protection is provided in the lubricant housing and above. Therefore, the use of stainless steel sleeves will not be considered equal to stainless steel shafts.

IMPELLER (for C series - pumps)

The impeller(s) shall be of gray cast iron, Class 35B, dynamically balanced, double shrouded non-clogging design having a long throughlet without acute turns. The impeller(s) shall be capable of handling solids, fibrous materials, heavy sludge and other matter found in wastewater. Whenever possible, a full vaned, not vortex, impeller shall be used for maximum hydraulic efficiency; thus, reducing operating costs. Impeller(s) shall be retained with an Allen head bolt and shall be capable of passing a minimum ___ inch diameter solid.

WEAR RINGS (for C series - pumps)

A wear ring system shall be used to provide efficient sealing between the volute and suction inlet of the impellers. The wear ring shall be stationary and made of brass, which is drive fitted to the volute inlet.

This pump shall also have a stainless steel impeller wear ring heat-shrink fitted onto the suction inlet of the impeller.

VOLUTE (for C series - pumps)

Pump volute(s) shall be single-piece grey cast iron, Class 35, non-concentric design with smooth passages large enough to pass any solids that may enter the impeller. Minimum inlet and discharge size shall be as specified.

IMPELLER (for D series - pumps)

The Impeller(s) shall be of gray cast iron, dynamically balanced, semi-open vortex design.

IMPELLER (for N series - pumps)

The impeller(s) shall be of gray cast iron, Class 35B, dynamically balanced, semi-open, multi-vane, back-swept, non-clog design. The impeller vane leading edges shall be mechanically self-cleaned upon each rotation as they pass across a spiral groove located on the volute bottom. The internal volute bottom shall provide effective sealing between the pump volute and the multi-vane, semi-open impeller. The sharp spiral groove(s) shall provide the shearing edge(s) across which each impeller vane leading edge shall cross during its rotation in order to remain unobstructed.

The clearance between the internal volute bottom and the impeller leading edges shall be adjustable.

The impeller(s) vanes shall have screw-shaped leading edges that are hardened to Rc 45 and shall be capable of handling solids, fibrous materials, heavy sludge and other matter found in waste water. The screw shape of the impeller inlet shall provide an inducing effect for the handling of sludge and rag-laden wastewater. Impellers shall be locked to the shaft and held by an impeller bolt.

PROTECTION

All stators shall incorporate thermal switches in series to monitor the temperature of each phase winding. The thermal switches shall open at 125 °C (260 °F), stop the motor and activate an alarm.

A leakage sensor shall be available as an option to detect water in the stator chamber. The Float Leakage Sensor (FLS) is a small float switch used to detect the presence of water in the stator chamber. When activated, the FLS will stop the motor and send an alarm both local and/or remote. **USE OF VOLTAGE SENSITIVE SOLID STATE SENSORS AND TRIP TEMPERATURE ABOVE 125 °C (260 °F) SHALL NOT BE ALLOWED.**

The thermal switches and FLS shall be connected to a Mini CAS (Control and Status) monitoring unit. The Mini CAS shall be designed to be mounted in any control panel.

Note: FLS not available in CZ, NZ Configurations.

MODIFICATIONS

1. Explosion-proof Pumps (X).
2. Warm Liquid Applications (WL).

Refer to the General Guide Specifications for additional information.

N PUMP - GENERAL GUIDE SPECIFICATION

GENERAL

The general guide specification is intended to cover the items applying to all ITT Flygt pumps for this project. Pump specifications follow the general section. Thus; Quality, Technical Support, Testing, and Experience apply to all ITT Flygt pumps for this project.

SCOPE

The specifications shall govern all work necessary to furnish, install and place into operation the electrical submersible pump required to complete this project. This section includes electric submersible pump to be supplied with motor, close coupled volute, cast iron discharge elbow, guide bar brackets, power cable and accessories. The pumps are available for wet pit (CP or NP), dry pit (CT, CZ, NT or NZ) and portable (CS, NS) installations.

QUALITY ASSURANCE

The pump shall be heavy duty, electric submersible, centrifugal non-clog units designed for handling raw, unscreened sewage and wastewater and shall be fully guaranteed for this use. The pumps provided shall be capable of operating in an ambient liquid temperature of **104 DEGREES F**. Since the high temperature of **104 DEGREES F** is specified by the National Electrical Manufacturers Association (NEMA) and Factory Mutual (FM), motors with a maximum ambient temperature rating below **104 DEGREES F** shall not be acceptable. The pump and motor unit shall be suitable for continuous operation at full nameplate load while the motor is completely submerged, partially submerged or totally non-submerged. The use of shower systems, secondary pumps or cooling fans to cool the motor shall not be acceptable. The pump, mechanical seals and motor units provided under this specification shall be from the same manufacturer in order to achieve standardization of operation, maintenance, spare parts, manufacturer's service and warranty.

SUBMITTALS

Submittal data shall be provided to show compliance with these specifications, plans or other specifications that will influence the proper operation of the pump(s).

Standard submittal data for approval must consist of:

- a. Pump Performance Curves.
- b. Pump Outline Drawing.
- c. Station Drawing for Accessories.
- d. Electrical Motor Data.
- e. Control Drawing and Data.
- f. Access Frame Drawing.
- g. Typical Installation Guides.
- h. Technical Manuals.
- i. Parts List.
- j. Printed Warranty.
- k. Manufacturer's Equipment Storage Recommendations.
- l. Manufacturer's Standard Recommended Start-Up Report Form.

Lack of the above requested submittal data is cause for rejection.

TESTING

Testing performed upon each pump shall include the following inspections:

- a. Impeller, motor rating and electrical connections shall be checked for compliance with this specification.
- b. Prior to submergence, each pump shall be run dry to establish correct rotation.
- c. Each pump shall be run submerged in water.
- d. Motor and cable insulation shall be tested for moisture content or insulation defects.

Upon request, a written quality assurance record confirming the above testing/inspections shall be supplied with each pump at the time of shipment. Each pump (when specified) shall be tested in accordance with the latest test code of the Hydraulic Institute (H.I.) at the manufacturer to

determine head vs. capacity and kilowatt draw required. Witness tests shall be available at the factory upon request. The pump shall be rejected if the above requirements are not satisfied.

START-UP SERVICE

The equipment manufacturer shall furnish the services of a qualified factory trained field service engineer for 8-hour working day(s) at the site to inspect the installation and instruct the owner's personnel on the operation and maintenance of the pumping units. After the pumps have been completely installed and wired, the contractor shall have the manufacturer do the following:

- a. Megger stator and power cables.
- b. Check seal lubrication.
- c. Check for proper rotation.
- d. Check power supply voltage.
- e. Measure motor operating load and no load current.
- f. Check level control operation and sequence.

During this initial inspection, the manufacturer's service representative shall review recommended operation and maintenance procedures with the owner's personnel.

FACTORY SERVICE

Factory-Approved service facilities with qualified factory-trained mechanics shall be available for prompt emergency and routine service.

GUARANTEE

See individual market sector **Warranty** policies as presented under **General Information** in this catalog. The warranty shall be in printed form and previously published as the manufacturer's standard warranty for all similar units manufactured.

EXPERIENCE

The pump manufacturer shall have a minimum of 10,000 heavy-duty submersible wastewater pumps installed and operating for no less than 5 years in the United States.

MANUFACTURERS

- a. The pump, mechanical seals and motor shall be from the same manufacturer.
- b. The pump, mechanical seals and motor manufacturer shall be ITT Flygt.

MODIFICATIONS:

- a. **DRY PIT INSTALLATION (CT, CZ, NT, or NZ):**
Motor cooling shall be sufficient for continuous operation under full nameplate load in a dry environment. The pump shall be capable of handling pumped media up to **104 DEGREES F.**

OIL FILLED MOTORS - Since the complete motor requires total oil immersion for adequate heat dissipation, **oil filled motors shall not be considered for dry pit installations.**

DRY TYPE - EXTERNAL FAN COOLED MOTORS - When external fan cooling is required, two **SEPARATE** motors are required one for the pump and one for the fan. This results in higher input power, increased operating costs and possible fan motor failure. A submersible pump is used for dry pit installation because of the high possibility of flooding. If the fan motor is operating when submerged, the down thrust developed will damage the fan motor. A pump motor of about **200 HP DEPENDS** on the performance of a **3 HP** fan motor. **Thus, air cooled fans shall not be considered for dry pit installations.**



Water & Wastewater

N-3085.183

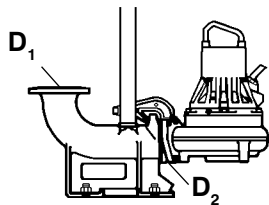
Impeller/Motor/ Nominal Sizes

Issued: 8/11

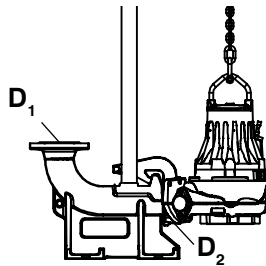
Supersedes: 10/10

| PUMP MODEL | IMPELLER CODE | HP RATING | | | | | VAC | D1 | D2 | D3 | D4 |
|--------------|-------------------|---------------------|---------------------|----------------|----------------|---------------------|-----------------------|------------------|---------------|---------------|---------------|
| | | NP | NS | NT | NZ | NF | | | | | |
| N-3085 3Ø | 462 MT | 3.0 | 3.0 | -- | -- | 3.0 | 200 230/460 575 | 3, 4" | 3" | 3" | -- |
| | 463 MT | 2.2, 3.0 | 2.2, 3.0 | 2.3 | 2.3 | 2.2, 3.0 | | 3, 4" | 3" | 3" | 4" |
| | 466 MT | 2.2, 3.0 | 2.2, 3.0 | 2.3 | 2.3 | 3.0 | | 3, 4" | 3" | 3" | -- |
| | 255 SH 256 SH | 4.0 | 4.0 | -- | -- | -- | | 3" | 3" | 3" | -- |
| N-3085 1Ø | 463 MT 466 MT | 2.4 | 2.4 | -- | -- | 2.4 | 230 | 3" | 3" | 3" | -- |

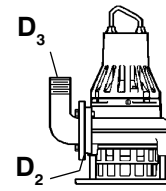
MT= Standard SH= Super High Head



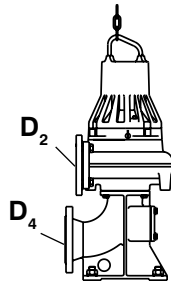
NP
(MT)



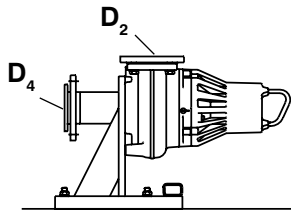
NP
(SH)



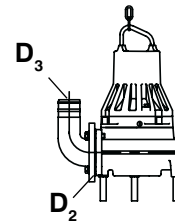
NS
(MT)



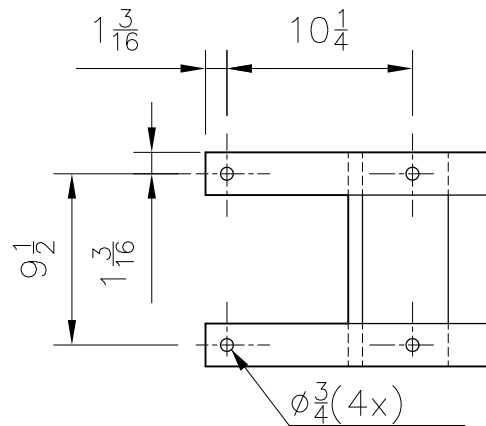
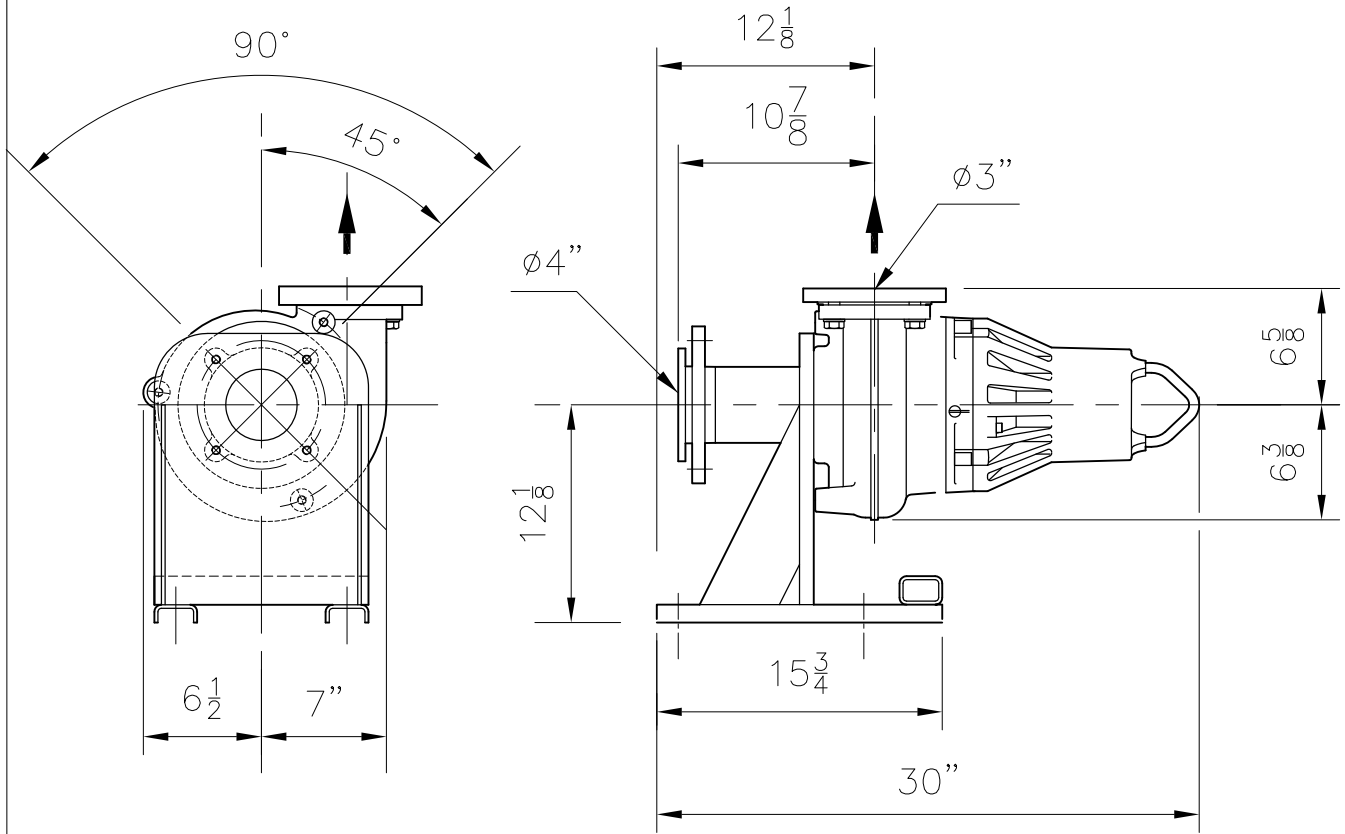
NT
(MT)



NZ
(MT)



NF
(MT)



| Weight (lbs) | |
|--------------|-------|
| Pump | Stand |
| 135 | 60 |

| | | | | |
|---|---|----------------------|---|--------------|
|  AUTOCAD DRAWING | Denomination Dimensional drwg NZ 3085 MT $\phi 4''/\phi 3''$ | Drawn by NK Scale | Checked by RB Date 100225 Reg no 5399 | 6602200 5 |
|---|---|----------------------|---|--------------|



Water & Wastewater

CZ, NZ, HZ Stands

Accessories

Issued: 8/10

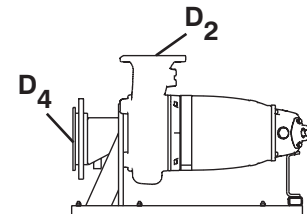
Supersedes: 11/09

CZ, NZ Stands

| Model | Version | D2 | D4 | Impellers | Part number |
|-------|-----------|--------|-----|------------------------------|-----------------|
| 3085 | MT | 3" | 4" | 436, 438, 440, 463 | 6359402 |
| 3102 | MT | 4" | 4" | 433, 463 | 6321405 |
| | LT | 6" | 6" | 422, 423 | 6321104 |
| 3127 | HT-1 | 4" | 4" | 485, 489 | 6360505 |
| | HT-2 | 4" | 4" | 462, 463 | 6360605 |
| | MT | 4"/ 6" | 6" | 433, 434, 435, 436 | 6360704 |
| | LT | 6" | 8" | 412 | 6321605 |
| 3153 | HT | 4" | 6" | 452, 453, 454, 455, 456, 457 | 6556404 |
| | MT | 6" | 8" | 432, 433, 434, 435, 436 | 6556305 |
| | LT-4 pole | 8" | 8" | 412, 423, 414, 415 | 6561405 |
| | LT-6 pole | 10" | 12" | 622, 623, 624, 625 | 6589005 |
| | SH | | | Consult Factory | |
| 3171 | HT | 4" | 4" | 452, 453, 454, 455 | 6601605 |
| | MT | 6" | 6" | 433, 434, 435, 436, 437 | 6601505 |
| | LT | | | 613, 614, 615 | 6786105 |
| | SH | | | Consult Factory | |
| 3202 | HT | 6" | 10" | 458, 460, 462 | 6630205 |
| | MT | 8" | 12" | 640, 641, 642, 643 | 6630305 |
| | LT | 12" | 16" | 612, 614, 616, 618 | 6635905 |
| 3301 | HT | 6" | 10" | 454, 456, 458, 459 | 6059311 |
| | MT | 10" | 14" | 634, 636, 638, 639 | 6059305 |
| | LT-6 pole | 12" | 16" | 624, 626, 628 | 6059317 |
| | LT-8 pole | 14" | 16" | 814, 816, 818 | Consult Factory |

HZ Stands

| Model | D2 | D4 | Impellers | Part number |
|-------|----|---------|-----------|---------------|
| 5520 | 4" | 7-1/16" | 438 | 1409487700006 |



NOTE: All stand flanges are drilled to ANSI standard. Consult factory for availability of other drill patterns.



SUBMITTAL

CUSTOMER: Waste Management
Prairie View RDF 15505 Shively Rd
Berman, IN 46595

PROJECT: Jay County Landfill

THE FOLLOWING PUMPS WILL BE SUPPLIED FOR THE ABOVE PROJECT:

Jay County Recycle Lift Station Pumps

| | |
|---------------------|--------------|
| QUANTITY: | Two |
| MODEL: | NP 3102.090 |
| HORSEPOWER | 5 |
| VOLTAGE: | 460 Volt |
| PHASE: | 3 PH |
| IMPELLER: | 464 Impeller |
| POWER CABLE: | 50' per pump |

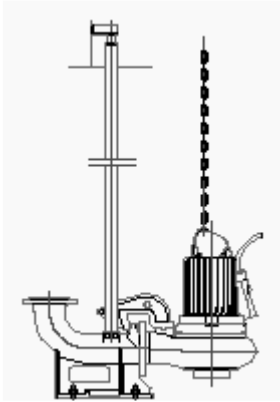
PLEASE REVIEW THE ELECTRICAL CHARACTERISTICS AND CABLE LENGTH SUBMITTED. ITT FLYGT CORPORATION WILL NOT BE HELD RESPONSIBLE FOR INCORRECT VOLTAGES, CYCLES, PHASES OR CABLE LENGTH. PLEASE NOTE ANY CHANGES ON THIS SUBMITTAL PRIOR TO RELEASE.

THE FOLLOWING ITEMS WILL ALSO BE SUPPLIED FOR THIS PROJECT:

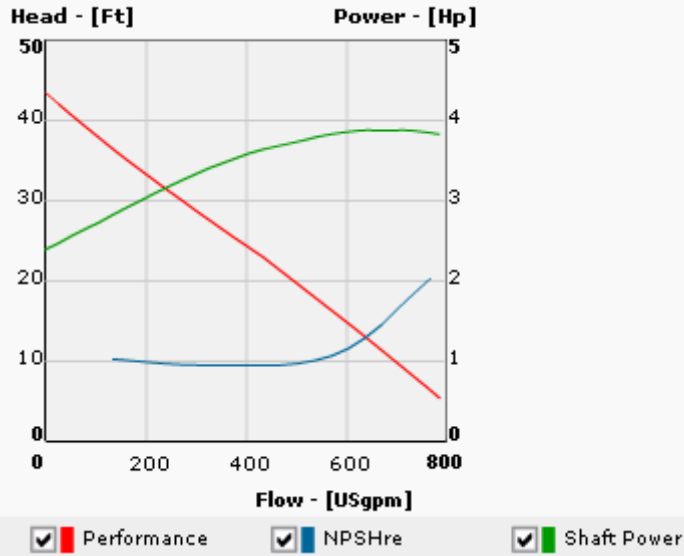
- (2) One FLS Leakage Detectors (installed in pumps)
- (2) Discharge Connection, 4x4 CI and Hardware Assembly
- (2) Upper 2" Guide Bar Bracket, 304 Stainless Steel
- (80') 2" Guide Rail, 304 Stainless Steel (for reference)
- (2) Cable Holder, 316 Stainless Steel
- (2) Safety Hook Assembly, Stainless Steel
- (30') Lifting Chain, 3/16" x 316SS
- (2) Chain Fitting Kit 316SS
- (1) Grip Eye
- (2) One Mini-CAS Units
- (2) One 11 PIN Socket
- (1) Day of Startup Service (for reference)

PRODUCT: NP 3102 MT

Product picture



Curves Enlarge



Pump Data

Curve id: 63-464-00-3703 Impeller: 464 Poles: 4 - pole Motor: 18-11-4AL Frequency: 60 Hz

Motor Data

| Rated output power Hp (kW) | Ø | Nominal voltage (V) | Full load current (A) | Locked rotor current (A) | Locked rotor kVA | Locked rotor code letter kVA/HP | Poles/rpm |
|-------------------------------|--------------|------------------------|--------------------------|-----------------------------|------------------|------------------------------------|-------------------|
| 5 (3.7) | 3 | 460 | 6.8 | 42 | 33 | A | 4/1745 |
| 5 (3.7) | 3 | 230 | 14 | 83 | 33 | A | 4/1745 |
| Pump motor Hp | Efficiency | | | Power factor | | | |
| | 100% load | 75% load | 50% load | 100% load | 75% load | 50% load | |
| 5 | 85 | 85 | 83.5 | 0.81 | 0.75 | 0.63 | |

Cable Data

| HP | Cables | Volts | Max. length (Ft) | Cable size/Nominal OD. | Conductors (In one cable) | Type | Part number |
|----|--------|-----------------------|------------------|-------------------------|--|------|-------------|
| 5 | 1 | 230 460 | 165 690 | #12/7 0.83"-(21.0mm) | (3) 12 AWG (PWR) (2) 12 AWG (CTRL) (1) 12 AWG (GND) (1) 12 AWG (GC) | STD | 942104 |

Available Discharge Connection Outlet Size

| | |
|-----------------------|----|
| Outlet Drilled Flange | 4" |
|-----------------------|----|



ITT

NP 3102 MT 3~ 464

Performance curve



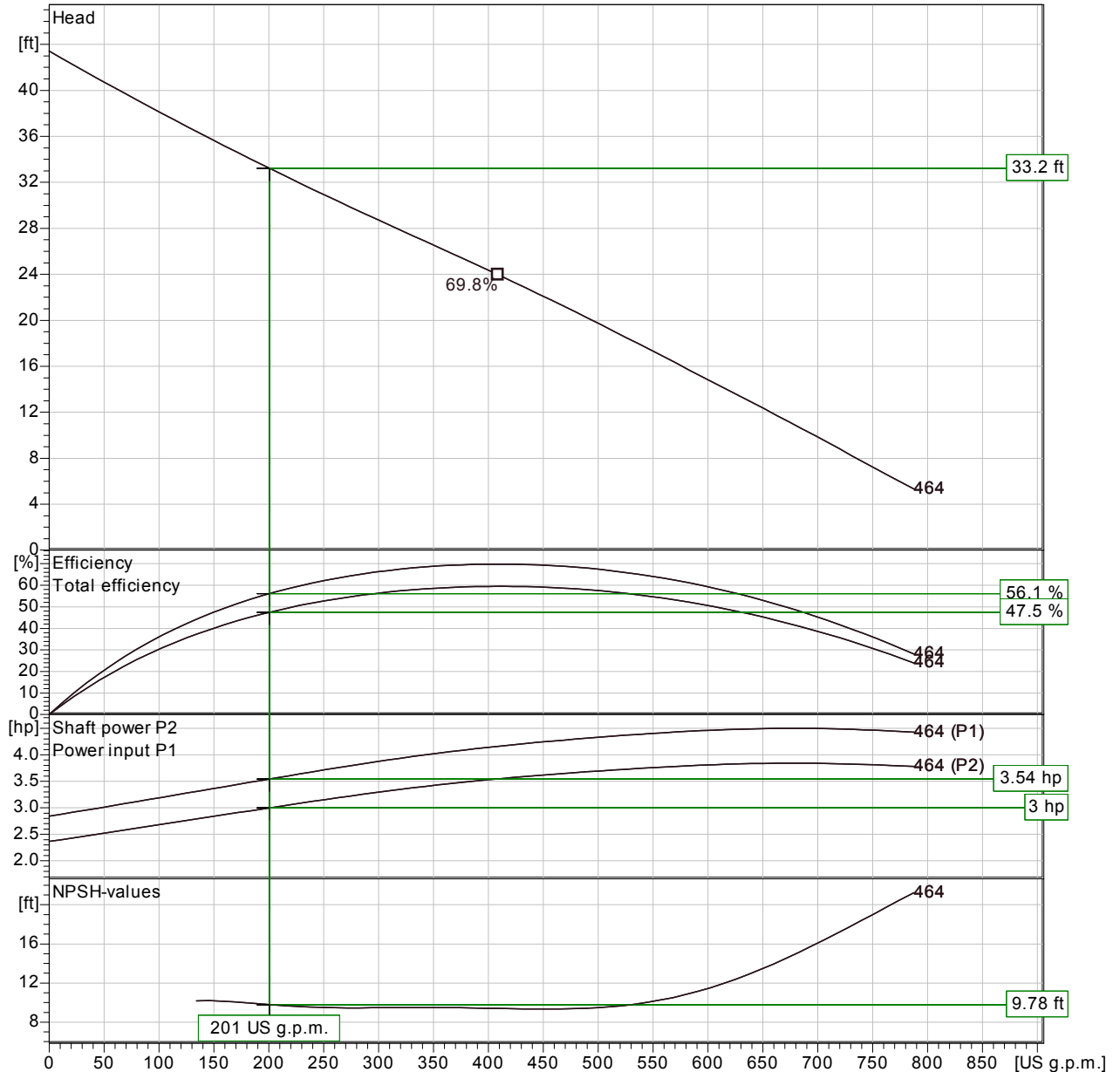
Pump

Outlet diameter 3¹⁵/₁₆"
 Inlet diameter 100 mm
 Impeller diameter 6³/₈"
 Number of blades 2
 Throughtlet diameter

Motor

Motor # N3102.090 18-11-4AL-W 5hp
 Stator variant
 Frequency 60 Hz
 Rated voltage 460 V
 Number of poles 4
 Phases 3~
 Rated power 4.9618 hp
 Rated current 6.8 A
 Starting current 42.024 A
 Rated speed 1745 rpm

Power factor
 1/1 Load 0.81
 3/4 Load 0.75
 1/2 Load 0.63
 Efficiency
 1/1 Load 85 %
 3/4 Load 85 %
 1/2 Load 83.5 %



Curve according to: ISO 9906 grade 2 annex 1

Duty point

Flow 200 US g.p.m. Head 33 ft

Shaft power <3.1 hp

NPSHre

Hyd eff. 56.2 %

Guarantee

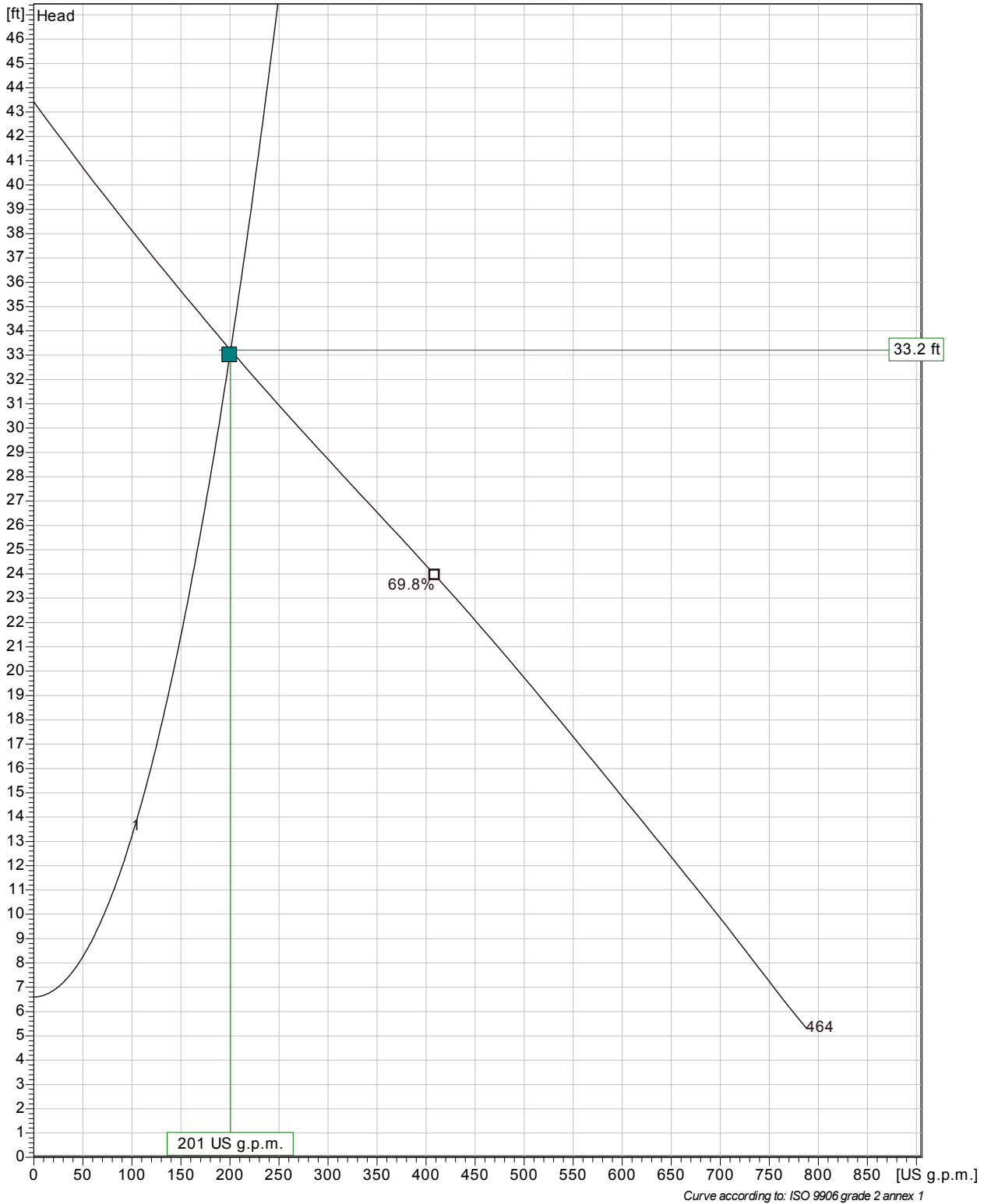
ISO_9906_Grade_2
 Yes

| | | | | |
|---------|------------|------------|--------------------------|-------------|
| Project | Project ID | Created by | Created on 2011-10-19 | Last update |
|---------|------------|------------|--------------------------|-------------|



ITT

NP 3102 MT 3~ 464 Duty Analysis



Curve according to: ISO 9906 grade 2 annex 1

| Pumps running /System | Individual pump | | | Total | | | | | |
|-----------------------|-----------------|---------|-------------|---------------|---------|-------------|-----------|------------------|---------|
| | Flow | Head | Shaft power | Flow | Head | Shaft power | Hyd. eff. | Specific energy | NPSHre |
| 1 | 201 US g.p.m. | 33.2 ft | 3 hp | 201 US g.p.m. | 33.2 ft | 3 hp | 56.1 % | 0.0579 kWh/US MG | 9.78 ft |

| | | | | |
|---------|------------|------------|---------------------------------|-------------|
| Project | Project ID | Created by | Created on 2011-10-19 | Last update |
|---------|------------|------------|---------------------------------|-------------|

N-3102 SPECS.

REQUIREMENTS

Furnish and install 2 submersible non-clog wastewater pumps. Each pump shall be equipped with a 5 HP submersible electric motor connected for operation on 460 volts, 3 phase, 60 hertz, wire service, with 50 feet of submersible cable (SUBCAB) suitable for submersible pump applications. The power cable shall be sized according to NEC and ICEA standards and have P-MSHA Approval.

PUMP DESIGN CONFIGURATION (Dry pit installation)

Pump shall be capable of operating in a continuous non submerged condition in horizontal (CZ, NZ) or vertical (CT, NT) (select one) position in a dry pit installation and permanently connected to inlet and outlet pipes. Pump shall be of submersible construction and will continue to operate satisfactorily should the dry pit be subjected to flooding.

PUMP DESIGN CONFIGURATION (Wet pit installation)

The pump shall be supplied with a mating cast iron 4 inch discharge connection and be capable of delivering 201 GPM at 33.2 FT. TDH. The pumps shall be automatically and firmly connected to the discharge connection, guided by no less than two guide bars extending from the top of the station to the discharge connection. There shall be no need for personnel to enter the wet-well. Sealing of the pumping unit to the discharge connection shall be accomplished by a machined metal to metal watertight contact. **Sealing of the discharge interface with a diaphragm, O-ring or profile gasket will not be acceptable.** No portion of the pump shall bear directly on the sump floor. Each pump shall be fitted with 15 feet of 3/16 lifting chain or stainless steel cable. The working load of the lifting system shall be 50% greater than the pump unit weight.

PUMP CONSTRUCTION

Major pump components shall be of grey cast iron, ASTM A-48, Class 35B, with smooth surfaces devoid of blow holes or other irregularities. The lifting handle shall be of stainless steel. All exposed nuts or bolts shall be AISI type 316 stainless steel construction. All metal surfaces coming into contact with the pumpage, other than stainless steel or brass, shall be protected by a factory applied spray coating of acrylic dispersion zinc phosphate primer with a polyester resin paint finish on the exterior of the pump. Sealing design shall incorporate **metal-to-metal contact** between machined surfaces. Critical mating surfaces where watertight sealing is required shall be machined and fitted with Nitrile or optional Viton rubber O-rings. Fittings will be the result of controlled compression of rubber O-rings in two planes and O-ring contact of four sides without the requirement of a specific torque limit. Rectangular cross sectioned gaskets requiring specific torque limits to achieve compression shall not be considered as adequate or equal. No secondary sealing compounds, elliptical O-rings, grease or other devices shall be used.

COOLING SYSTEM

Motors are sufficiently cooled by the surrounding environment or pumped media. A water jacket is not required.

CABLE ENTRY SEAL

The cable entry seal design shall preclude specific torque requirements to insure a watertight and submersible seal. The cable entry shall consist of a single cylindrical elastomer grommet, flanked by washers, all having a close tolerance fit against the cable outside diameter and the entry inside diameter and compressed by the body containing a strain relief function, separate from the function of sealing the cable. The assembly shall provide ease of changing the cable when necessary using the same entry seal. **The cable entry junction chamber and motor shall be separated by a stator lead sealing gland or terminal board, which shall isolate the interior from foreign material gaining access through the pump top. Epoxies, silicones, or other secondary sealing systems shall not be considered acceptable.**

MOTOR

The pump motor shall be a NEMA B design, induction type with a squirrel cage rotor, shell type design, housed in an air filled, watertight chamber. The stator windings shall be insulated with moisture resistant Class H insulation rated for 180°C (356°F). The stator shall be insulated by the trickle impregnation method using Class H monomer-free polyester resin resulting in a winding fill factor of at least 95%. The motor shall be inverter duty rated in accordance with NEMA MG1, Part 31. The stator shall be heat-shrink fitted into the cast iron stator housing. The use of multiple step dip and bake-type stator insulation process is not acceptable. The use of bolts, pins or other fastening devices requiring penetration of the stator housing is not acceptable. The motor shall be designed for continuous duty handling pumped media of 40°C (104°F) and capable of no less than 30 evenly spaced starts per hour. The rotor bars and short circuit rings shall be made of cast aluminum. Thermal switches set to open at 125°C (260°F) shall be embedded in the stator end coils to monitor the temperature of each phase winding. These thermal switches shall be used in conjunction with and supplemental to external motor overload protection and shall be connected to the control panel. The junction chamber containing the terminal board, shall be hermetically sealed from the motor by an elastomer compression seal. Connection between the cable conductors and stator leads shall be made with threaded compression type binding posts permanently affixed to a terminal board. The motor and the pump shall be produced by the same manufacturer. The combined service factor (combined effect of voltage, frequency and specific gravity) shall be a minimum of 1.15. The motor shall have a voltage tolerance of plus or minus 10%. The motor shall be designed for operation up to 40°C (104°F) ambient and with a temperature rise not to exceed 80°C. A performance chart shall be provided upon request showing curves for torque, current, power factor, input/output kW and efficiency. This chart shall also include data on starting and no-load characteristics. The power cable shall be sized according to the NEC and ICEA standards and shall be of sufficient length to reach the junction box without the need of any splices. The outer jacket of the cable shall be oil resistant chlorinated polyethylene rubber. The motor and cable shall be capable of continuous submergence underwater without loss of watertight integrity to a depth of 65 feet or greater. The motor horsepower shall be adequate so that the pump is non-overloading throughout the entire pump performance curve from shut-off through run-out.

BEARINGS

The pump shaft shall rotate on two bearings. Motor bearings shall be permanently grease lubricated. The upper bearing shall be a single deep groove ball bearing. The lower bearing shall be a two row angular contact bearing to compensate for axial thrust and radial forces. **Single row lower bearings are not acceptable.**

MECHANICAL SEAL

Each pump shall be provided with a tandem mechanical shaft seal system consisting of two totally independent seal assemblies. The seals shall operate in a lubricant reservoir that hydro-dynamically lubricates the lapped seal faces at a constant rate. The lower, primary seal unit, located between the pump and the lubricant chamber, shall contain one stationary and one positively driven rotating, corrosion resistant **tungsten-carbide** ring. The upper, secondary seal unit, located between the lubricant chamber and the motor housing, shall contain one stationary and one positively driven rotating, corrosion resistant **tungsten-carbide** seal ring. Each seal interface shall be held in contact by its own spring system. The seals shall require neither maintenance nor adjustment nor **depend on direction of rotation for sealing**. The position of both mechanical seals shall depend on the shaft. Mounting of the lower mechanical seal on the impeller hub will not be acceptable. For special applications, other seal face materials shall be available.

The following seal types shall not be considered acceptable or equal to the dual independent seal specified: shaft seals without positively driven rotating members, or conventional double mechanical seals containing either a common single or double spring acting between the upper and lower seal faces. No system requiring a pressure differential to offset pressure and to effect sealing shall be used. Each pump shall be provided with a lubricant

chamber for the shaft sealing system. The lubricant chamber shall be designed to prevent overfilling and to provide lubricant expansion capacity. The drain and inspection plug, with positive anti-leak seal shall be easily accessible from the outside. The seal system shall not rely upon the pumped media for lubrication. **The motor shall be able to operate dry without damage while pumping under load. Seal lubricant shall be FDA Approved, nontoxic.**

PUMP SHAFT

Pump and motor shaft shall be the same unit. The pump shaft is an extension of the motor shaft. Couplings shall not be acceptable. The pump shaft shall be stainless steel – ASTM A479 S43100-T. If a shaft material of lower quality than stainless steel – ASTM A479 S43100-T is used, a shaft sleeve of stainless steel – ASTM A479 S43100-T is used to protect the shaft material. However, shaft sleeves only protect the shaft around the lower mechanical seal. No protection is provided for in the oil housing and above. Therefore, the use of stainless steel sleeves will not be considered equal to stainless steel shafts.

IMPELLER (for N - pumps)

The impeller shall be of (ASTM A-48, Class 35B gray iron or ASTM A-532 (Alloy III A) 25% chrome cast iron) dynamically balanced, semi-open, multi-vane, back swept, screw-shaped, non-clog design. The impeller leading edges shall be mechanically self-cleaned automatically upon each rotation as they pass across a spiral groove located on the volute suction. The screw-shaped leading edges of the gray iron impeller shall be hardened to Rc 45 and shall be capable of handling solids, fibrous materials, heavy sludge and other matter normally found in wastewater. The screw shape of the impeller inlet shall provide an inducing effect for the handling of up to 5% sludge and rag-laden wastewater. The impeller to volute clearance shall be readily adjustable by the means of a single trim screw. The impellers shall be locked to the shaft, held by an impeller bolt and shall be coated with alkyd resin primer.

VOLUTE / SUCTION COVER (for N - pumps)

The pump volute shall be a single piece gray cast iron, ASTM A-48, Class 35B, non-concentric design with smooth passages of sufficient size to pass any solids that may enter the impeller. Minimum inlet and discharge size shall be as specified. The volute shall have a replaceable suction cover insert ring in which are cast spiral-shaped, sharp-edged groove(s). The spiral groove(s) shall provide trash release pathways and sharp edge(s) across which each impeller vane leading edge shall cross during rotation so to remain unobstructed. The insert ring shall be cast of (ASTM A-48, Class 35B gray iron or ASTM A-532 (Alloy III A) 25% chrome cast iron) and provide effective sealing between the multi-vane semi-open impeller and the volute housing.

PROTECTION

All stators shall incorporate thermal switches in series to monitor the temperature of each phase winding. The thermal switches shall open at 125°C (260°F), stop the motor and activate an alarm. A leakage sensor shall be available as an option to detect water in the stator chamber. The Float Leakage Sensor (FLS) is a small float switch used to detect the presence of water in the stator chamber. When activated, the FLS will stop the motor and send an alarm both local and/or remote. **USE OF VOLTAGE SENSITIVE SOLID STATE SENSORS AND TRIP TEMPERATURE ABOVE 125°C (260°F) SHALL NOT BE ALLOWED.** The thermal switches and FLS shall be connected to a Mini CAS (Control and Status) monitoring unit. The Mini CAS shall be designed to be mounted in any control panel.

MODIFICATIONS

1. Explosion-proof Pumps (X).
2. Warm Liquid Applications (WL).
3. Dry Pit Installations (CT).

Refer to the General Guide Specifications for additional information.

N PUMP - GENERAL GUIDE SPECIFICATION

GENERAL

The general guide specification is intended to cover the items applying to all ITT Flygt pumps for this project. Pump specifications follow the general section. Thus; Quality, Technical Support, Testing, and Experience apply to all ITT Flygt pumps for this project.

SCOPE

The specifications shall govern all work necessary to furnish, install and place into operation the electrical submersible pumps required to complete this project. This section includes electric submersible pumps to be supplied with motor, close coupled volute, cast iron discharge elbow, guide bar brackets, power cable and accessories. The pumps are available for wet pit (CP or NP), dry pit (CT, CZ, NT or NZ) and portable (CS, NS) installations.

QUALITY ASSURANCE

The pumps shall be heavy duty, electric submersible, centrifugal non-clog units designed for handling raw, unscreened sewage and wastewater and shall be fully guaranteed for this use. The pumps provided shall be capable of operating in an ambient liquid temperature of **104 DEGREES F**. Since the high temperature of **104 DEGREES F** is specified by the National Electrical Manufacturers Association (NEMA) and Factory Mutual (FM), motors with a maximum ambient temperature rating below **104 DEGREES F** shall not be acceptable. The pump and motor unit shall be suitable for continuous operation at full nameplate load while the motor is completely submerged, partially submerged or totally non-submerged. The use of shower systems, secondary pumps or cooling fans to cool the motor shall not be acceptable. The pump, mechanical seals and motor units provided under this specification shall be from the same manufacturer in order to achieve standardization of operation, maintenance, spare parts, manufacturer's service and warranty.

SUBMITTALS

Submittal data shall be provided to show compliance with these specifications, plans or other specifications that will influence the proper operation of the pump(s).

Standard submittal data for approval must consist of:

- a. Pump Performance Curves.
- b. Pump Outline Drawing.
- c. Station Drawing for Accessories.
- d. Electrical Motor Data.
- e. Control Drawing and Data.
- f. Access Frame Drawing.
- g. Typical Installation Guides.
- h. Technical Manuals.
- i. Parts List.
- j. Printed Warranty.
- k. Manufacturer's Equipment Storage Recommendations.
- l. Manufacturer's Standard Recommended Start-Up Report Form.

Lack of the above requested submittal data is cause for rejection.

TESTING

Testing performed upon each pump shall include the following inspections:

- a. Impeller, motor rating and electrical connections shall be checked for compliance with this specification.
- b. Prior to submergence, each pump shall be run dry to establish correct rotation.
- c. Each pump shall be run submerged in water.
- d. Motor and cable insulation shall be tested for moisture content or insulation defects.

Upon request, a written quality assurance record confirming the above testing/inspections shall be supplied with each pump at the time of shipment. Each pump (when specified) shall be tested in accordance with the latest test code of the Hydraulic Institute (H.I.) at the manufacturer to

determine head vs. capacity and kilowatt draw required. Witness tests shall be available at the factory upon request. The pumps shall be rejected if the above requirements are not satisfied.

START-UP SERVICE

The equipment manufacturer shall furnish the services of a qualified factory trained field service engineer for 8-hour working day(s) at the site to inspect the installation and instruct the owner's personnel on the operation and maintenance of the pumping units. After the pumps have been completely installed and wired, the contractor shall have the manufacturer do the following:

- a. Megger stator and power cables.
- b. Check seal lubrication.
- c. Check for proper rotation.
- d. Check power supply voltage.
- e. Measure motor operating load and no load current.
- f. Check level control operation and sequence.

During this initial inspection, the manufacturer's service representative shall review recommended operation and maintenance procedures with the owner's personnel.

FACTORY SERVICE

Factory-Approved service facilities with qualified factory-trained mechanics shall be available for prompt emergency and routine service.

GUARANTEE

See individual market sector **Warranty** policies as presented under **General Information** in this catalog. The warranty shall be in printed form and previously published as the manufacturer's standard warranty for all similar units manufactured.

EXPERIENCE

The pump manufacturer shall have a minimum of 10,000 heavy-duty submersible wastewater pumps installed and operating for no less than 5 years in the United States.

MANUFACTURERS

- a. The pump, mechanical seals and motor shall be from the same manufacturer.
- b. The pump, mechanical seals and motor manufacturer shall be ITT Flygt.

MODIFICATIONS:

- a. **EXPLOSION-PROOF PUMPS (X):**

The pump system including the pump, motor and power cable shall be approved for use in areas classified as hazardous locations in accordance with the NEC Class I, Div. 1, Group C and D service as determined and approved by a U.S. nationally recognized testing laboratory (U.L., FM, CSA) at the time of the bidding of the project. As required by Factory Mutual (FM) the motor shall be capable of operating in pumped media up to **104 DEGREES F**. Motor thermal switches shall monitor and protect the motor from excessive temperature. An internal Float Switch shall be available, as an option, in the motor chamber. Service of explosion-proof submersible units shall be performed by qualified FM experienced personnel. **The pump manufacturer must provide training schools to qualify personnel in the proper service and repair of explosionproof pumps.**

OIL FILLED MOTORS - Since the complete motor requires total oil immersion for adequate heat dissipation, **oil filled motors shall not be considered for dry pit installations.**



Water & Wastewater

N-3102.090

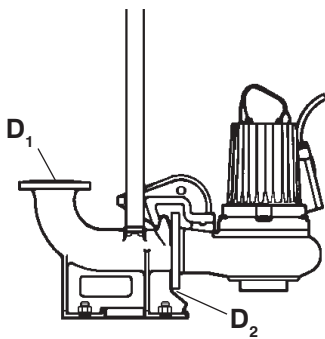
Impeller/Motor/ Nominal Sizes

Issued: 8/08

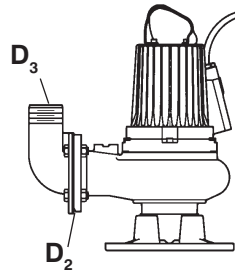
Supersedes:

| PUMP MODEL | IMPELLER CODE | HP RATING | | | | VAC | D1 | D2 | D3 | D4 |
|------------|------------------|-----------|-----|-----|-----|----------------------------------|----------------|----------------|----------------|----|
| | | NP | NS | NT | NZ | | | | | |
| 3102 3Ø | 422 LT 423 LT | 5.0 | 5.0 | -- | -- | 200 230/460 575 | 4" or 6" | 4" or 6" | 4" or 6" | -- |
| | 462 MT | 5.0 | 5.0 | -- | -- | | 4" | 4" | 4" | 4" |
| | 463 MT | 5.0 | 5.0 | 3.7 | 3.7 | | 4" | 4" | 4" | 4" |
| | 464 MT | 5.0 | 5.0 | 3.7 | -- | | 4" | 4" | 4" | 4" |
| | 465 MT | 5.0 | 5.0 | 3.7 | 3.7 | | 4" | 4" | 4" | 4" |
| | 256 SH | 6.5 | 6.5 | 4.6 | -- | | 3" | 3" | 3" | 4" |
| | 257 SH | 6.5 | 6.5 | 4.6 | -- | | 3" | 3" | 3" | 4" |
| 3102 1Ø | 464 MT 465 MT | 3.9 | 3.9 | -- | -- | 230 | 4" | 4" | 4" | -- |

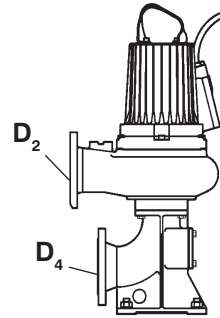
LT = High Volume MT = Standard SH = Super High Head



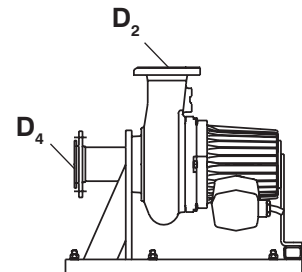
NP



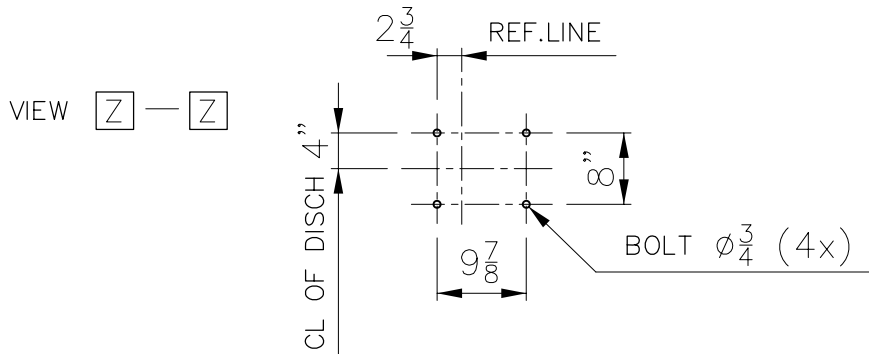
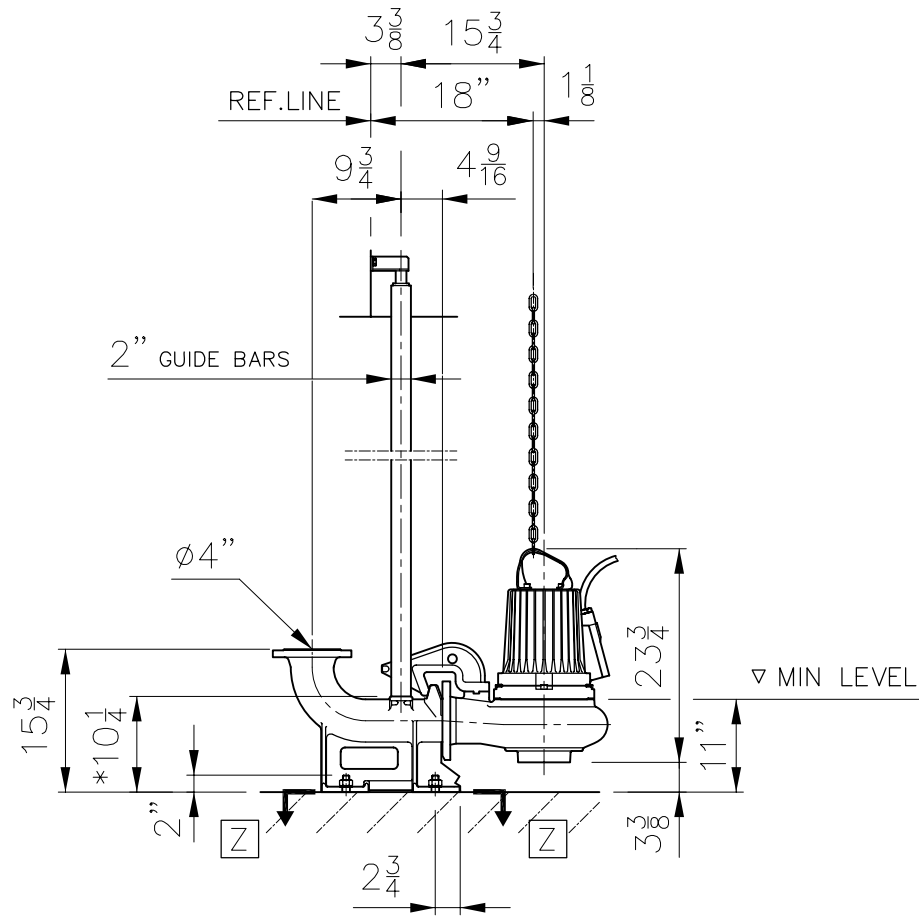
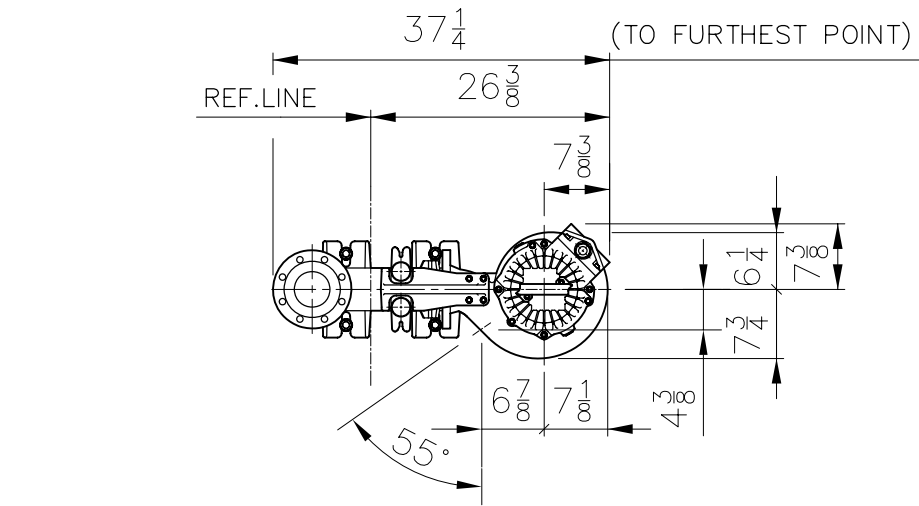
NS



NT



NZ



* DIMENSION TO ENDS OF GUIDE BARS

| Weight (lbs) | |
|--------------|-----|
| Pump | 240 |
| Disch | 80 |



Denomination
Dimensional drwg
NP 3102 MT
 $\phi 4$ "

| | | |
|-------------|------------|-------------|
| Drawn by NK | Checked by | Date 080813 |
| Scale | | Reg no 5399 |
| 6602300 | | 1 |



Water & Wastewater

CP/DP/NP-3102

Lift Station Dimensions

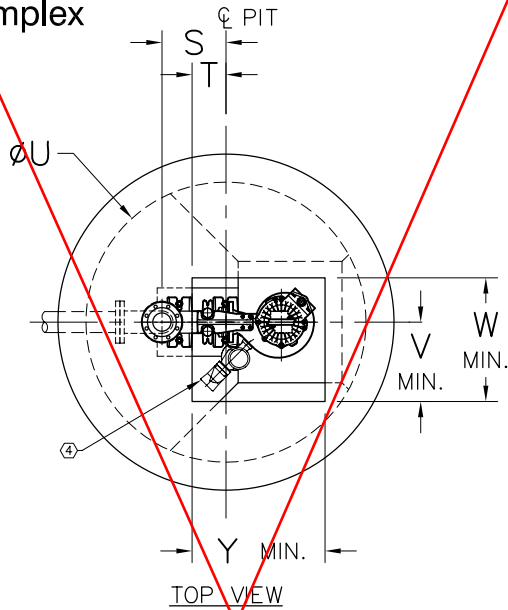
Issued: 2/09

Supersedes: 8/08

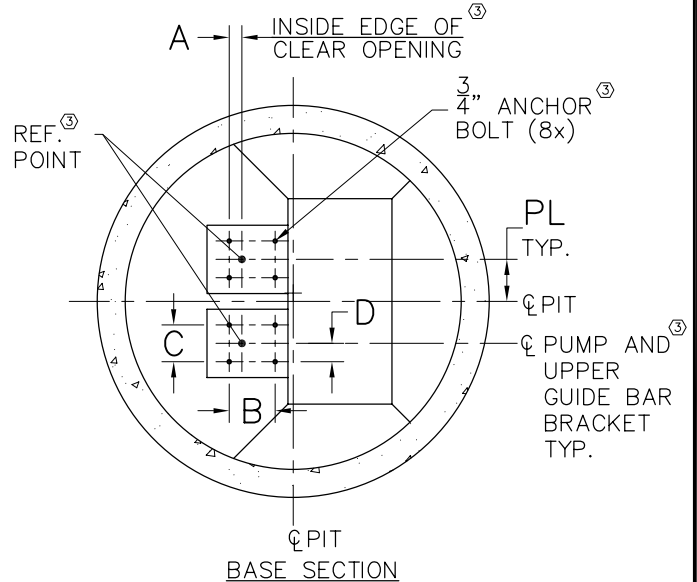
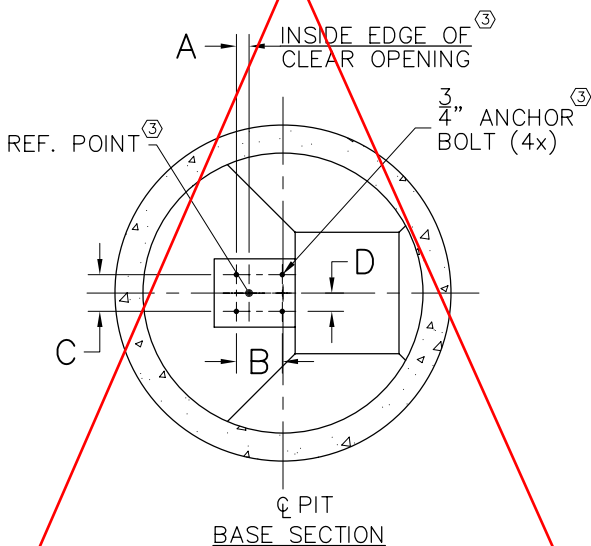
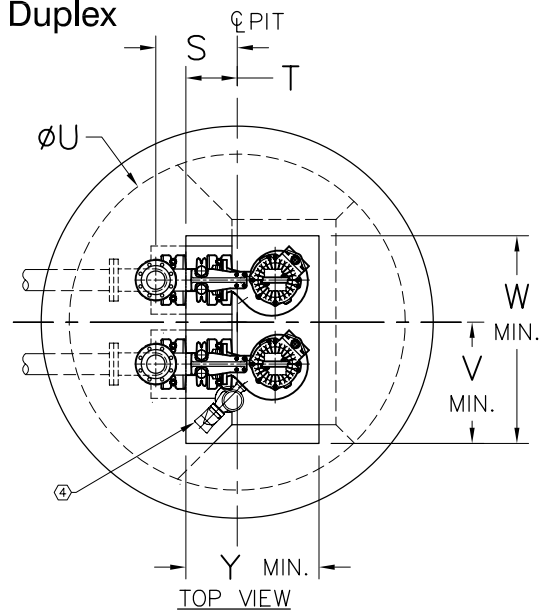
NOTES:

1. CONFIGURATION AND DIMS. SHOWN ARE SUGGESTED REQUIREMENTS ONLY. ALL DETAILS, INCLUDING SIZING OF PIT, TYPE, LOCATION AND ARRANGEMENT OF VALVES AND PIPING, ETC. ARE TO BE SPECIFIED BY THE CONSULTING ENGINEER AND ARE SUBJECT TO THEIR APPROVAL.
2. REFERENCE GENERIC DUPLEX LIFT STATION LAYOUT FOR ELEVATION VIEW.
3. LOCATE ANCHOR BOLTS USING INSIDE EDGE OF CLEAR OPENING AND PUMP CENTERLINE AS REFERENCE POINT. BOLT LOCATIONS MUST BE HELD TO MAINTAIN EXACT POSITION OF PUMP TO CLEAR OPENING.
4. ITT FLYGT MIX-FLUSH VALVE.

Simplex



Duplex



ALL DIMENSIONS ARE IN INCHES

| MODEL | NOM. SIZE | VERSION | SIMPLEX | | | | | | | | | DUPLEX | | | | | | | |
|----------|-----------|---------|-----------------|-----------------|----|---|------------------|-----------------|----|------------------|------------------|------------------|------------------|------------------|----|----|------------------|------------------|------------------|
| | | | A | B | C | D | S | T | U | V | W | Y | S | T | U | PL | V | W | Y |
| CP/NP | 3" | HT/SH | 2 $\frac{3}{8}$ | 9 $\frac{7}{8}$ | 8 | 4 | 15 $\frac{5}{8}$ | 9 $\frac{1}{2}$ | 60 | 17 | 26 $\frac{1}{2}$ | 28 $\frac{1}{2}$ | 19 $\frac{3}{8}$ | 13 $\frac{1}{2}$ | 72 | 9 | 26 | 44 $\frac{1}{2}$ | 28 $\frac{1}{2}$ |
| CP/DR/NP | 4" | MT | 2 $\frac{3}{4}$ | 9 $\frac{7}{8}$ | 8 | 4 | 13 $\frac{3}{4}$ | 7 $\frac{1}{4}$ | 60 | 17 | 26 $\frac{1}{2}$ | 28 $\frac{1}{2}$ | 17 $\frac{1}{2}$ | 11 | 72 | 9 | 26 | 44 $\frac{1}{2}$ | 28 $\frac{1}{2}$ |
| CP/NP | 4" | LT | 2 $\frac{3}{4}$ | 9 $\frac{7}{8}$ | 8 | 4 | 13 $\frac{3}{4}$ | 7 $\frac{1}{4}$ | 60 | 16 | 25 $\frac{1}{2}$ | 28 $\frac{1}{2}$ | 17 $\frac{1}{2}$ | 11 | 72 | 9 | 25 | 43 $\frac{1}{2}$ | 28 $\frac{1}{2}$ |
| CP/NP | 6" | LT | 4 $\frac{1}{4}$ | 11 | 10 | 5 | 11 | 3 $\frac{3}{8}$ | 60 | 17 $\frac{1}{2}$ | 27 | 28 $\frac{1}{2}$ | 14 $\frac{3}{8}$ | 6 $\frac{3}{4}$ | 72 | 9 | 26 $\frac{1}{2}$ | 45 | 28 $\frac{1}{2}$ |
| CP | 8" | LT | 5 $\frac{1}{2}$ | 11 | 10 | 5 | 8 $\frac{7}{8}$ | 0 | 60 | 17 $\frac{1}{2}$ | 27 | 28 $\frac{1}{2}$ | 11 $\frac{3}{8}$ | 2 $\frac{1}{2}$ | 72 | 9 | 26 $\frac{1}{2}$ | 45 | 28 $\frac{1}{2}$ |



Water & Wastewater

Standard CP/NP Discharge Connections (Cast Iron)

Accessories

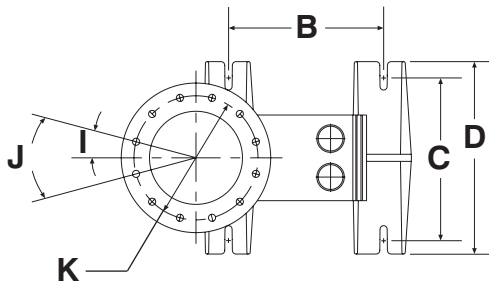
Issued: 10/10

Supersedes: 7/10

All dimensions (inches)

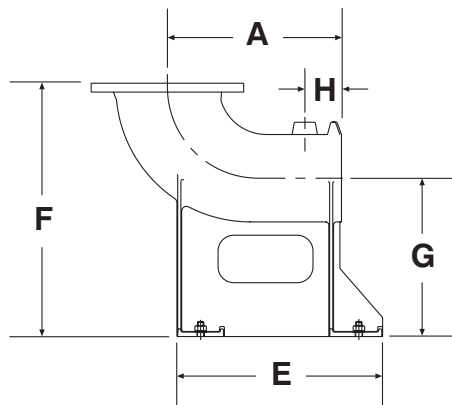
| Pump Model | Part Number | Disch. Inlet | Disch. Outlet | A | B | C | D | E | F | G | H | I | J | K |
|--|-------------|--------------|---------------|----------|--------|--------|---------|----------|--------|---------|--------|-------|---------|--------|
| 2" - 3045, 3057, CP/FP-3068. | 486 55 01 | 2" | 2"-11 1/2 NPT | 3 13/16 | 4 | 4 1/2 | 5 1/2 | 7 1/4 | 6 3/4 | 3 15/16 | 7/8 | --- | --- | --- |
| 2 1/2" - DP/FP-3068. | 493 17 06 | 2 1/2" | 2 1/2" | 11 5/8 | 7 7/8 | 6 1/2 | 7 7/8 | 11 7/16 | 9 7/8 | 6 1/2 | 4 9/16 | 45° | 90° x 4 | 5 5/8 |
| 3" - 3057, CP-3068. | 555 48 01 | 2" | 3-8 NPT | 6 3/4 | 5 1/2 | 4 1/8 | 5 1/2 | 10 3/4 | 6 3/4 | 3 15/16 | 7/8 | --- | --- | --- |
| 3" - DP-3068, 3080, 3085, 3102, 3127, 3153. | 444 68 05 | 3" | 3" | 14 | 9 7/8 | 8 | 10 5/8 | 15 3/8 | 15 3/4 | 7 7/8 | 4 9/16 | 45° | 90° x 4 | 6 |
| 4" - 3080, 3085, 3102, 3127, 3153, 3171, 3202. | 540 13 05 | 4" | 4" | 14 3/8 | 9 7/8 | 8 | 10 5/8 | 15 3/8 | 15 3/4 | 7 7/8 | 4 9/16 | 22.5° | 45° x 8 | 7 1/2 |
| 6" - 3102, 3127(MT), 3153, 3171. | 444 70 06 | 5 1/2" | 6" | 15 9/16 | 11 | 10 | 12 3/16 | 15 3/8 | 17 3/4 | 9 7/8 | 4 9/16 | 22.5° | 45° x 8 | 9 1/2 |
| 6" - 3153, 3171, 3202. | 602 33 06 | 5 1/2" | 6" | 15 9/16 | 11 | 10 | 12 3/16 | 15 15/16 | 17 3/4 | 9 7/8 | 4 9/16 | 22.5° | 45° x 8 | 9 7/16 |
| 6" - R3231 | 388 25 06 | 6" | 6" | 20 11/16 | 19 3/4 | 15 3/4 | 19 3/4 | 23 5/8 | 15 3/4 | 7 7/8 | 6 7/8 | 22.5° | 45° x 8 | 9 7/16 |
| 6" - 3127(LT), 3301, 3315. | 604 56 06 | 6" | 6" | 15 9/16 | 11 1/8 | 10 | 12 3/16 | 15 15/16 | 18 | 10 1/8 | 4 9/16 | 22.5° | 45° x 8 | 9 7/16 |

Note: Alternative discharge connections may be available, contact Flygt Application Engineering.



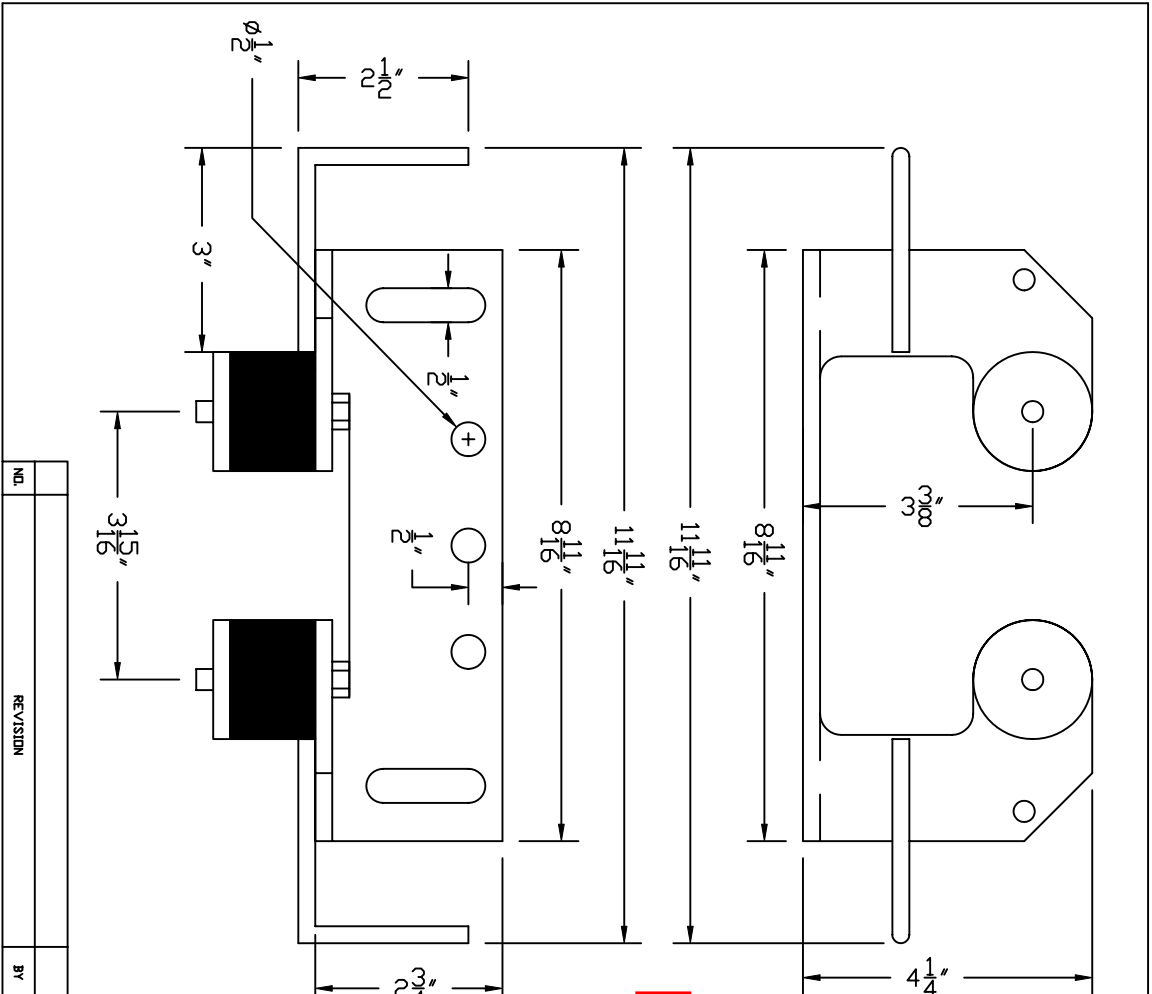
Caution:

Contact Flygt applications engineering department when making a pump/discharge connection combination other than those paired in the chart above.



Note:

The discharge connection shown here is typical in appearance for most pumps.



NOTES:

- 1.) STAINLESS STEEL UNITS SHALL BE GRADE 304 OR GRADE 316 STAINLESS STEEL, PER NOTE 5.
- 2.) FOR GALVANIZED UNITS, ALL OTHER MATERIAL SHALL BE HOT ROLLED STEEL CONFORMING TO A.S.T.M. A-36.
- 3.) GALVANIZED UNITS SHALL BE HOT DIP GALVANIZED PER A.S.T.M. 123.
- 4.) PLEASE SPECIFY REQUIRED MATERIAL:

- GALVANIZED (F-UGRB-GALV-2')
- 304 STAINLESS STEEL (F-UGRB-304SS-2')
- 316 STAINLESS STEEL (F-UGRB-316SS-2')

| NO. | REVISION | BY | DATE | APVD. | DATE |
|-----|----------|----|------|-------|------|
| | | | | | |

| DRAWN | BY | DATE | CHKD. | BY | DATE | PROJ. ENGR. | BY | DATE | APVD. | BY | DATE |
|-------|-----|----------|-------|----|------|-------------|----|------|-------|----|------|
| | ARD | 05/16/03 | | | | | | | | | |

FLYGT

ITT FLYGT CORPORATION, TRUMBULL, CONNECTICUT 06611

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2' UPPER GUIDERAIL BRACKET

FABRICATED

REF: FUGRB-2 NUMBER

SCALE: 1/4" = 1'-0" DRAWN TO FIT



ITT

Water & Wastewater

Lifting Chain (Stainless Steel)

(for: CP/DP/NP, BS/CS/DS/NS installations only)

Accessories

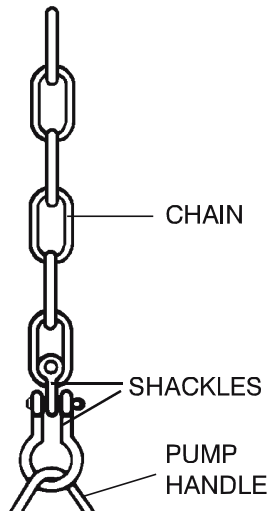
Issued: 11/09

Supersedes: 10/08

2000, 3000 & 8000 Series Pumps

| Pump Models: | Stainless Steel Chain Size | Chain Part Number | Chain Fittings Kit Part Number |
|---|--------------------------------|-------------------|--------------------------------|
| 2060, 2730, 2740, 2750, 3060, 3068, 3080, 3102, 3127, 8021, 8022, 8024, 8042, 8044. | 3/16" 316 (stainless steel) | 14-48 71 13 | 14-58 72 08 |
| 3152, 3153, 3171, 3201, 3202. | 5/16" 316 (stainless steel) | 14-48 71 17 | 14-58 72 09 |
| 3300(+), 3301. | 1/2" 316 (stainless steel) | 14-48 71 18 | 14-58 72 10 |

(+) Not for use on pumps with .6xx series drive units.





Water & Wastewater

Flygt Pump Lift™ Lifting System

Accessories

Issued: 11/09

Supersedes: 4/08

The normal method of lowering and raising a CP pump in and out of a lift station is by use of a chain or cable attached to the pump. The length of the chain or cable is dependent on the depth of the station. The average length would probably be between 18 to 20 ft. and in certain cases may be much longer. In many cases, depending on the lifting device (usually a hoist), the operator may have to take a second or third bite on the pump chain in order to lift the pump clear of the station.

An added accessory to the Flygt line is the patented Flygt Pump Lift™ System which consists of 33 ft. of nylon line, a short length of high tensile strength stainless steel chain and a forged "Grip-Eye" of wrought alloy steel.

The operation of this positive recovery system is as follows:

1. Connect the small eye of the grip-eye to the end of the hoist cable.
2. Slip the end of the nylon line through the large eye of the grip-eye. The nylon line simply acts as a guide for the grip-eye on its way down to the short length of the pump lifting chain.
3. While keeping the nylon line (guide line) taut, proceed to lower the grip-eye until it is well positioned over the pump lifting chain.
4. Release the tension on the nylon guide line. The lifting chain will now take a position to become engaged in the grip-eye.
5. Gradually take up tension on the hoist cable and the grip-eye will make a positive grip on the pump lifting chain. Continue hoisting until the pump is clear of the station.

Caution: The Grip-Eyes may only be used with the corresponding special Flygt Chain Sling Units.

Grip-Eyes are not warranted if other chains are used.

Refer to the following pages for pump models and correct assembly.

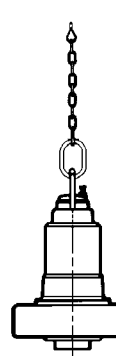
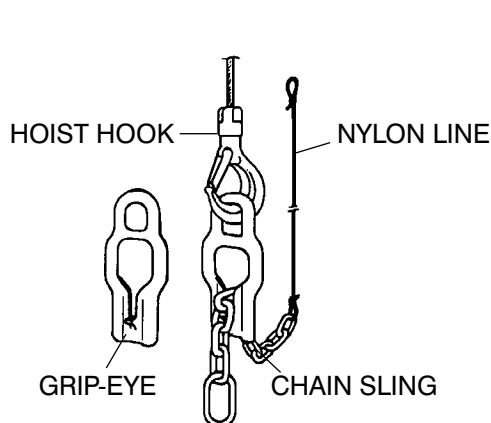


FIG. 1
(Standard) The end ring of the Chain Sling is slipped over the pump lifting handle.

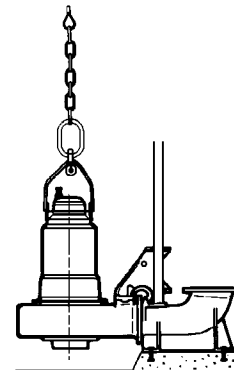


FIG. 2
(Customer to supply extra shackle) A shackle can be used in conjunction with the standard ring should customer choose not to remove and replace pump handle.



Water & Wastewater

Flygt Pump Lift™ Lifting System

Accessories

Issued: 8/00

Supersedes: 5/97

Fig. 1

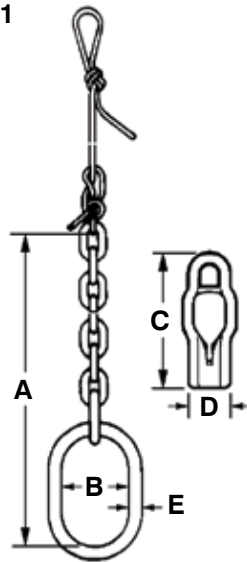
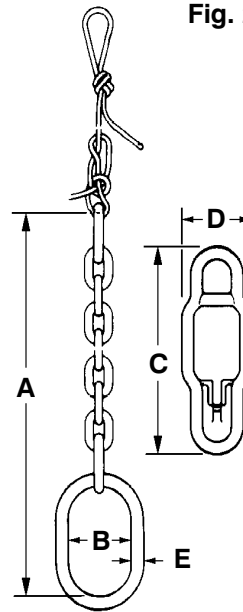


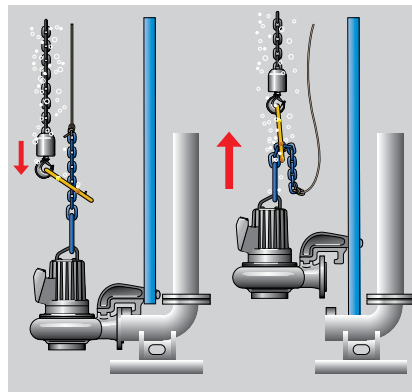
Fig. 2



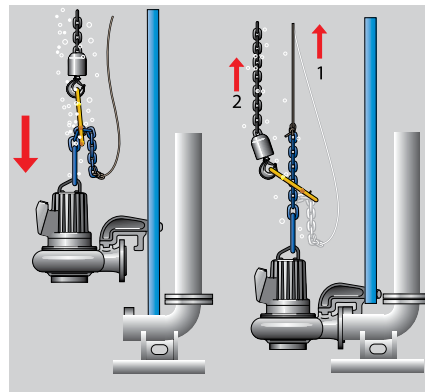
| Item | Fig. 1 | | Fig. 2 |
|--------------------------|-----------|------------|----------------------|
| Chain Sling Ass'y | 442 18 00 | *442 18 06 | *442 18 05 |
| Grip-Eye | 620 09 00 | 620 09 00 | 620 09 01 |
| A | 13-1/2 | 11-1/4 | 24-13/16 |
| B | 2-3/8 | 2-3/4 | 2-3/16 |
| C | 7-7/8 | 7-7/8 | 13-3/4 |
| D | 2-3/8 | 2-3/8 | 4-3/4 |
| E | 1/2 | 5/8 | 7/8 |

All dimensions are in inches

*Stainless Steel



Lifting the pump



Lowering the pump

**ITT**

Water & Wastewater

Flygt Pump Lift™ Lifting System

Accessories

Issued: 2/11

Supersedes: 7/10

Flygt Chain Sling Units and Grip-Eye Combinations

| Pump Model | Chain Sling Assy. | Grip-Eye | Max. Useful Load (lbs.) |
|---------------|-------------------|-----------|-------------------------|
| CP-3045 | 442 18 00 | 620 09 00 | 2,646 |
| CP-3057 | " | " | " |
| CP/FP-3068 | " | " | " |
| DP-3080 | " | " | " |
| CP/NP/FP-3085 | " | " | " |
| CP/NP/FP-3102 | " | " | " |
| CP/NP/FP-3127 | " | " | " |
| NP/FP-3153 | " | " | " |
| NP/FP-3171 | " | " | " |
| NP-3202 | " | " | " |
| NP-3301 | " | " | " |
| DP-8050 | " | " | " |
| DP-8053 | " | " | " |
| DP-8056 | " | " | " |
| DP-8058 | " | " | " |

Combinations with Chain Sling Assembly in Stainless Steel

| Pump Model | Chain Sling Assy. in Stainless Steel | Grip-Eye | Max. Useful Load (lbs.) |
|--------------|--------------------------------------|-----------|-------------------------|
| CP-3060 (SS) | 442 18 06 (SS) | 620 09 00 | 992 |
| DP-8050 | " | " | " |
| DP-8053 | " | " | " |
| DP-8056 | " | " | " |
| DP-8058 | " | " | " |
| | 442 18 05 (SS) | 620 09 01 | 4,410 |



ITT

Water & Wastewater

Flygt Pump Lift™ Lifting System

Accessories

Issued: 7/10

Supersedes: 11/09

Flygt Pump Lift™ System Specification

Submersible pump shall be furnished with a pump lifting-chain positive-recovery system consisting of the following components:

1. Minimum of 10 meters (33 ft.) of nylon line, of diameter matching weight of lifting chain required, connected to a short length (approximately ten links long) of high tensile strength proof-tested chain of required capacity, connected to the lifting eye or lifting bail of the submersible pump.
2. A forged “grip-eye” of wrought alloy steel, provided separately to connect to the end of the lifting cable or chain of the pump lifting device.

The operation of the pump lifting-chain positive-recovery system shall be as follows:

1. Connect small eye of grip-eye to end of chain or cable of external mechanical of lifting device.
2. Slip top end of nylon line through large eye of grip-eye.
3. Lower grip-eye to top of pump while maintaining a taut nylon line, making sure short length of chain fastened to pump is also taut.
4. Release tension on nylon line when grip-eye has reached pump top. Make certain upper end of nylon line has been secured.
5. Take up tension on cable or chain of lifting device, grip-eye will engage links of short chain and lift pump.

Device shall be the same as the “Flygt Pump Lift™” manufactured by ITT Water & Wastewater, Shelton, Connecticut or approved equal.

Black Box Specification - Flygt Pump Lift™ System

Furnish with each submersible pump one complete Flygt Pump Lift™ system or approved equal. The system shall consist of 10 meters (33 ft.) nylon line, short length of high tensile strength proof-tested chain and forged steel Grip-Eye for use with mechanical lifting device (furnished by others). System shall be appropriately sized for weight of pump to be lifted.

Mini-CAS 120

PART NO. 14-407129



Features:

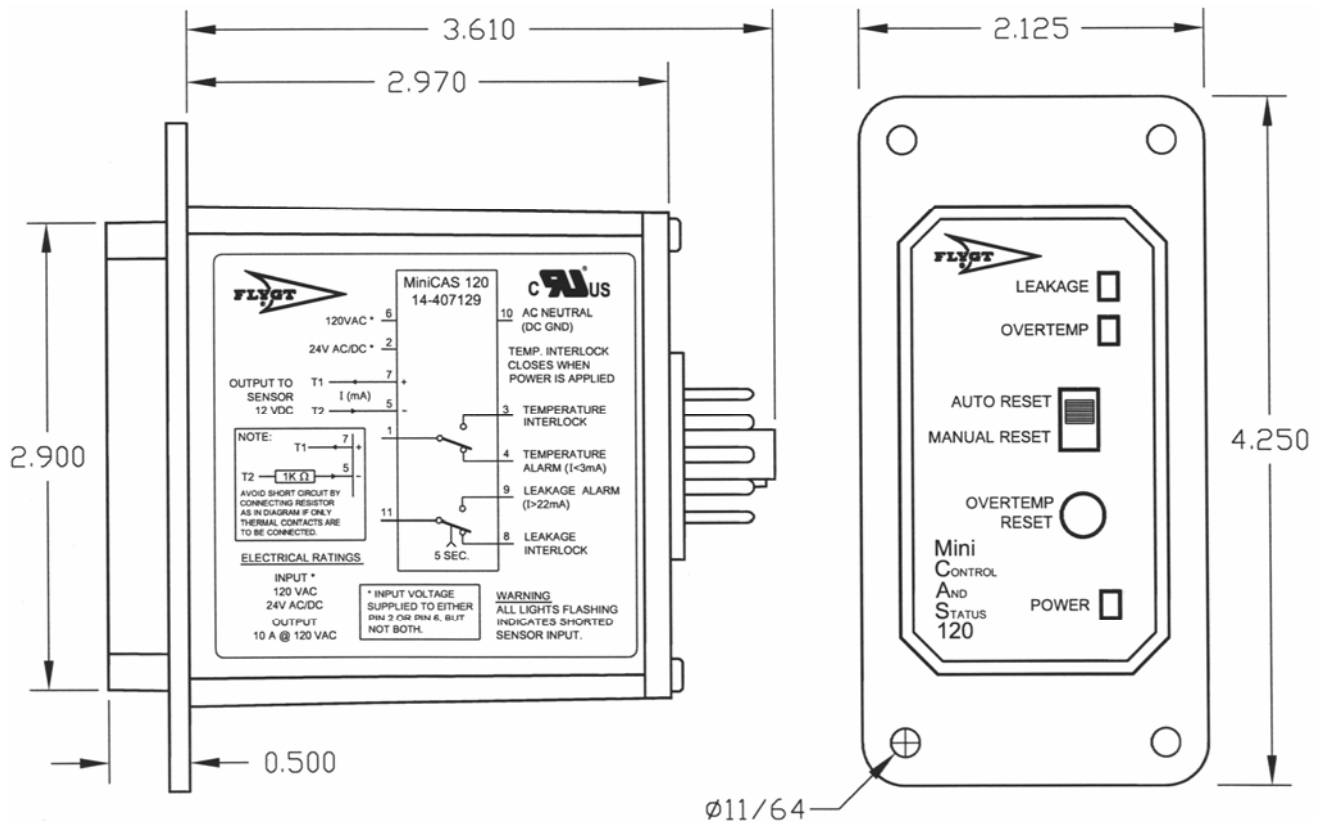
- Plug in replacement for existing MiniCAS / FUS unit
- 120 VAC, 24 VAC, or 24 VDC powered
- Durable plastic enclosure with flange for mounting on door of pump control enclosure
- Highly visible red LEDs for indication of Leakage and Temperature alarms
- Green LED for indication power is applied
- Temperature alarm reset mode select switch, for selection of Manual or Auto reset modes
- Temperature alarm reset push-button on front of unit
- Input power transient protected
- Sensor input circuit transient protected
- Sensor input circuit short circuit protected
- Noise Filter on Sensor Input
- Sensor circuit supply voltage regulated to 12 VDC
- Detailed connection diagram on side of unit



ITT FLYGT CORPORATION
35 Nutmeg Drive
Trunbull, Connecticut 06611
Phone (203) 380-4700
FAX (203) 380-4705

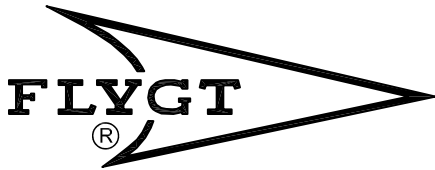
Mini-CAS 120

PART NO. 14-407129

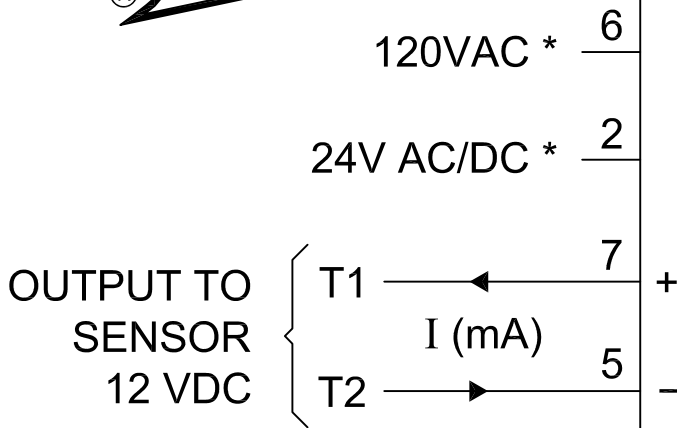


Specifications:

- Input Power: 120 VAC $\pm 10\%$, 7.0 VA max
24 VAC $\pm 10\%$, 3.5 VA max
24 VDC $\pm 10\%$, 125 mA max
- Input Power Transient Protection: Metal Oxide Varistor
- Sensor Input Transient Protection: Metal Oxide Varistor
- Relay Contact Rating: 10A @ 250 VAC
- Relay Contact Material: Silver Cadmium Oxide (AgCdO)
- Ambient Operating Temperature: -20°C to $+65^{\circ}\text{C}$ (-4°F to $+149^{\circ}\text{F}$)
- Agency Approvals: UL 508, CAN/CSA (Pending)
- Alarm Indicators: Super Bright Red LED
- Power On Indicator: Green LED
- Enclosure: Blue Lexan (141R) or Noryl (PX9406)
- Faceplate Overlay: Silver Lexan with Black Text
- Side Label: Silver Lexan with Black Text
- Sensor Circuit Supply Voltage: Regulated 12 VDC $\pm 10\%$,
- Weight 11.75 oz (334 grams)
- Temperature Alarm Trip Point: Sensor Current ≤ 3 mA $\pm 5\%$
- Leak Alarm Trip Point: Sensor Current ≥ 22 mA $\pm 5\%$



MiniCAS 120
14-407129



10 AC NEUTRAL
(DC GND)

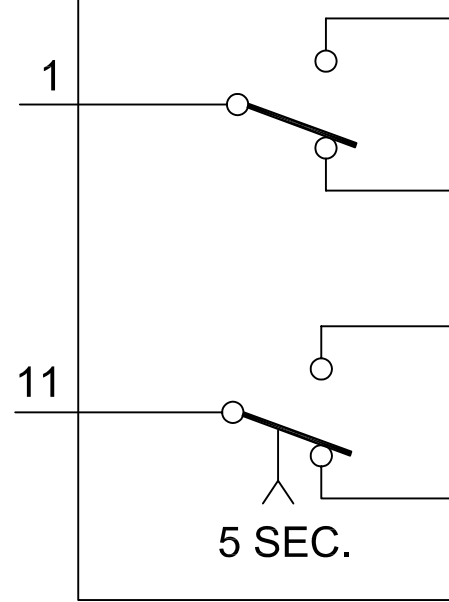
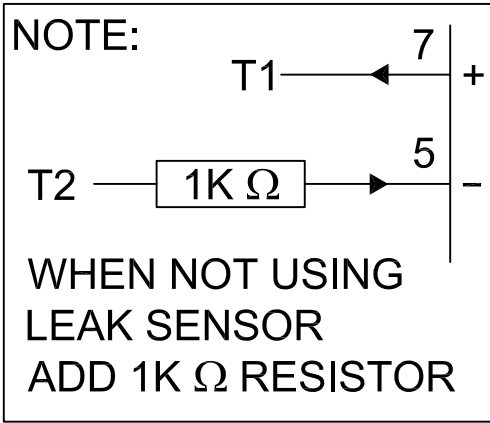
TEMP. INTERLOCK
CLOSES WHEN
POWER IS APPLIED

3 TEMPERATURE
INTERLOCK

4 TEMPERATURE
ALARM ($I < 3\text{mA}$)

9 LEAKAGE ALARM
($I > 22\text{mA}$)

8 LEAKAGE
INTERLOCK



ELECTRICAL RATINGS

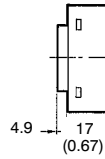
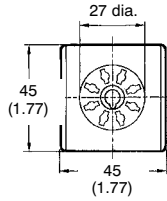
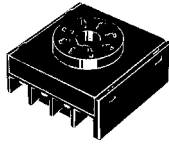
INPUT *
120VAC
24V AC/DC

OUTPUT
10 A @ 240 VAC

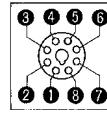
* INPUT VOLTAGE
SUPPLIED TO EITHER PIN
2 OR PIN 6, BUT
NOT BOTH.

WARNING
ALL LIGHTS FLASHING
INDICATES SHORTED
SENSOR INPUT.

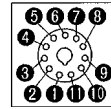
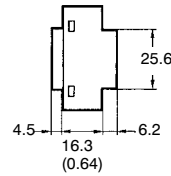
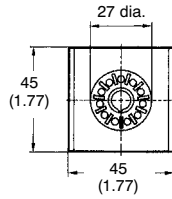
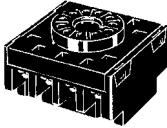
**Back-Mounting Socket
P3G-08**



**Terminal Arrangement/
Internal Connections
(Bottom View)**



P3GA-11

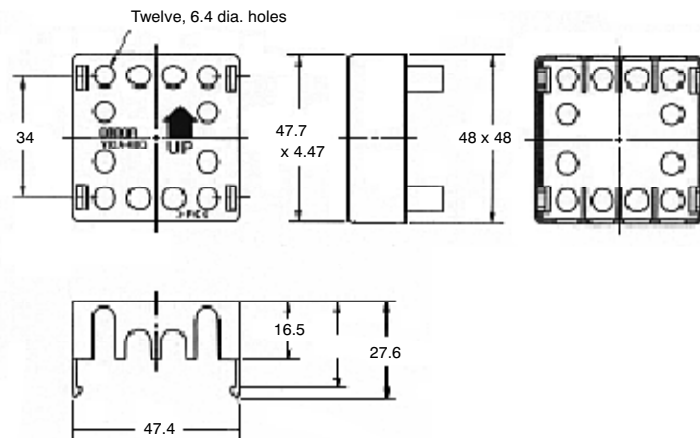
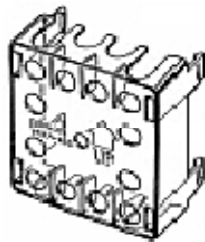


PROTECTIVE COVERS

Finger-Safe Terminal Cover for P3G(A)

Conforming to VDE0106/P100

Y92A-48G



Y92A-48B Protective Cover

The hard plastic protective cover prevents accidental resetting. It also shields the front panel from dirt and water. The cover is intended for use in areas where unusual service conditions do not exist. The Y92A-48B cover cannot be used with the Y92P Panel Covers.

