

# SALES ACKNOWLEDGEMENT

# SULZER

Print Date 10/13/2000

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|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                    |                                                                                                                                          |                                      |                                                    |                                       |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|----------------------------------------------------|---------------------------------------|
| <b>SULZER PROCESS PUMPS (CANADA) INC.</b><br>5055, rue Levy, Saint-Laurent, Québec<br>H4R 2N9, Canada<br>Phone 514-333-7760 Fax 514-333-6324                                                                                                                                                                                                                                                                                                                                                                                              |                                    | Sulzer Order No.<br><b>CAE2000075</b>                                                                                                    |                                      | Item #<br><b>010</b>                               | Order Date<br><b>10/11/2000</b>       |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                    | Customer P.O. No.<br><b>445014</b>                                                                                                       |                                      | P.O. Date<br><b>09/22/2000</b>                     |                                       |
| Bill to<br><b>ALLIANCE FOREST PRODUCTS U.S. CORP.</b><br><br><b>17589 PLANT ROAD</b><br><br><b>COOSA PINES, AL 35044-0555</b>                                                                                                                                                                                                                                                                                                                                                                                                             |                                    | Equipment Number<br><b>310-1140-012/M94145</b>                                                                                           |                                      |                                                    |                                       |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                    | Serial Number                                                                                                                            | Currency<br><b>USD</b>               | Net Amount<br><b>33302.00</b>                      |                                       |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                    | Terms of Payment<br><b>SPECIAL TERMS, SEE NOTE</b>                                                                                       |                                      |                                                    |                                       |
| Ship to<br><b>ALLIANCE FOREST PRODUCTS U.S. CORP.</b><br><br><b>17589 PLANT ROAD</b><br><br><b>COOSA PINES, AL 35044-0555</b>                                                                                                                                                                                                                                                                                                                                                                                                             |                                    | Terms of Delivery<br><b>DDP (INCOTERMS 2000)</b><br><b>COOSA PINES, AL, PREPAID</b>                                                      |                                      |                                                    |                                       |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                    | Way of Delivery<br><b>Truck</b>                                                                                                          |                                      | Onsite Date<br><b>02/16/2001</b>                   |                                       |
| Marks and Tagging<br><b>PUMP, A-LINE P3</b><br><b>FLOTATION CELL FEED</b><br><b>310-1140-012 / M94145</b><br><b>445014</b><br><b>4121001112</b><br><b>CAE2000 075 10</b>                                                                                                                                                                                                                                                                                                                                                                  |                                    | Order Contact<br><b>TONY LIANE</b><br><br>Sales Contact<br><b>TONY GEDEON</b><br><br>Document Requirements<br><b>4 Copies in English</b> |                                      |                                                    |                                       |
| Pump Size<br><b>APT61-24</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | N.Am. Pump Size<br><b>24X24-28</b> | Casing Material<br><b>A890 3A</b>                                                                                                        | Consistency<br><b>0.8-1.13 % BD</b>  | Pumped liquid<br><b>ONP/OMG REP. STOCK</b>         |                                       |
| Capacity Q<br><b>15051 USGPM</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Head H<br><b>44 ft</b>             | NPSH av<br><b>26 ft</b>                                                                                                                  | NPSH req<br><b>16.8 ft</b>           | pH<br><b>7-9</b>                                   |                                       |
| Capacity in alternative unit<br><b>6 to 87.51 m³/h</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                    | Efficiency<br><b>81 %</b>                                                                                                                | Temperature<br><b>125 F</b>          | Dimensional drawing<br><b>P20058</b>               | Characteristic curve<br><b>K02321</b> |
| Impeller Type<br><b>Special open</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Impeller No.<br><b>286876</b>      | Impeller diameter<br><b>615 mm</b>                                                                                                       | Pump power P<br><b>212 HP</b>        | Base plate type<br><b>Pump Motor/Steel/Zinc</b>    |                                       |
| Coupling Type<br><b>Rex-Omega ES</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Mechanical seal type               | Coupling Guard material<br><b>S + Z EN10025</b>                                                                                          | Dynamic seal power                   | Shaft Seal Fitting<br><b>P02</b>                   |                                       |
| Motor IEC/NEMA code<br><b>315L</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Power<br><b>250 HP</b>             | Rotational Speed<br><b>720 RPM</b>                                                                                                       | Manufacturer<br><b>TOSHIBA</b>       | Future motor IEC/NEMA code<br><b>355L</b>          |                                       |
| Frequency<br><b>60 Hz</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Voltage<br><b>2.3KV</b>            | Enclosure<br><b>TEFC</b>                                                                                                                 | Motor Supplied by<br><b>Customer</b> | Bearing Unit Lubrication<br><b>Oil lubrication</b> |                                       |
| Order Remarks:<br>TERMS OF PAYMENT:<br>-----<br>ALL PAYMENTS ARE DUE NET THIRTY (30) DAYS AFTER<br>COMPLETION OF EACH EVENT AND RECEIPT OF INVOICE<br>COMPLETE WITH SUPPORTING DOCUMENTATION, WHICHEVER<br>OCCURS LAST<br>90% UPON DELIVERY OF EACH PUMP THAT HAS BEEN<br>RELEASED AND THE CORRESPONDING CHANGE ORDER ISSUED<br>10% HOLD BACK UNTIL COMMISSIONING AND ACCEPTANCE<br>BY BUYER<br>=====<br>PRICING:<br>-----<br>FOR NON-MENA MOTORS, FINAL PRICES ARE SUBJECT TO<br>CONFIRMATION AFTER RECEIPT OF CERTIFIED MOTOR<br>PRINTS |                                    |                                                                                                                                          |                                      |                                                    |                                       |
| =====<br>INSPECTION LOCATION:<br>-----<br>FOR INSPECTION PURPOSES PLEASE CONTACT:<br>MR. SAM SEWELL<br>SULZER PROCESS PUMPS (US)<br>155 AHLSTROM WAY (PUE FACTORY)<br>EASLEY, SC, USA, 29640<br>TEL: (864) 855-9090, FAX: (864) 855-9095<br>=====<br>PAINTING:<br>-----<br>SULZER STANDARD FACTORY APPLIED PAINTING WITH<br>THE RAL 5019 (CAPRI BLUE) COLOR & GUARDS IN<br>RAL 1021 (SAFETY YELLOW) AT NO EXTRA CHARGE<br>=====<br>FINAL IMPELLER TRIMS:                                                                                  |                                    |                                                                                                                                          |                                      |                                                    |                                       |

GAS CONTAINER

**SULZER****SALES ACKNOWLEDGEMENT**

Print Date 10/13/2000

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|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                     |                               |                                                                                                                                                                                                                                 |               |                        |                               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|------------------------|-------------------------------|
| <b>SULZER PROCESS PUMPS (CANADA) INC.</b><br>5055, rue Levy, Saint-Laurent, Québec<br>H4R 2N9, Canada<br>Phone 514 - 333-7760 Fax 514 - 333-6324                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Sulzer Order No.<br><b>CAE2000075</b>                                               | Item #<br><b>010</b>          | Order Date<br><b>10/11/2000</b>                                                                                                                                                                                                 |               |                        |                               |
| Bill to<br><b>ALLIANCE FOREST PRODUCTS U.S. CORP.</b><br><br><b>17589 PLANT ROAD</b><br><br><b>COOSA PINES, AL 35044-0555</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Customer P.O. No.<br><b>445014</b>                                                  |                               | P.O. Date<br><b>09/22/2000</b>                                                                                                                                                                                                  |               |                        |                               |
| Ship to<br><b>ALLIANCE FOREST PRODUCTS U.S. CORP.</b><br><br><b>17589 PLANT ROAD</b><br><br><b>COOSA PINES, AL 35044-0555</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Equipment Number<br><b>310-1140-012/M94145</b>                                      |                               | <table border="1"> <tr> <td data-bbox="834 463 1084 527">Serial Number</td> <td data-bbox="1084 463 1256 527">Currency<br/><b>USD</b></td> <td data-bbox="1256 463 1513 527">Net Amount<br/><b>33302.00</b></td> </tr> </table> | Serial Number | Currency<br><b>USD</b> | Net Amount<br><b>33302.00</b> |
| Serial Number                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Currency<br><b>USD</b>                                                              | Net Amount<br><b>33302.00</b> |                                                                                                                                                                                                                                 |               |                        |                               |
| Marks and Tagging<br><b>PUMP, A-LINE P3</b><br><b>FLOTATION CELL FEED</b><br><b>310-1140-012 / M94145</b><br><b>445014</b><br><b>4121001112</b><br><b>CAE2000 075 10</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Terms of Payment<br><b>SPECIAL TERMS, SEE NOTE</b>                                  |                               |                                                                                                                                                                                                                                 |               |                        |                               |
| Remarks Continued                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Terms of Delivery<br><b>DDP (INCOTERMS 2000)</b><br><b>COOSA PINES, AL, PREPAID</b> |                               |                                                                                                                                                                                                                                 |               |                        |                               |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Way of Delivery<br><b>Truck</b>                                                     |                               | Onsite Date<br><b>02/16/2001</b>                                                                                                                                                                                                |               |                        |                               |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Order Contact<br><b>TONY LIANE</b>                                                  |                               |                                                                                                                                                                                                                                 |               |                        |                               |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Sales Contact<br><b>TONY GEDEON</b>                                                 |                               |                                                                                                                                                                                                                                 |               |                        |                               |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Document Requirements<br><b>4 Copies in English</b>                                 |                               |                                                                                                                                                                                                                                 |               |                        |                               |
| <p>-----</p> <p>MUST BE PROVIDED SIX (6) WEEKS PRIOR TO DELIVERY<br/>EXCEPT FOR APT6, APT54 &amp; APT55 WHICH WILL REQUIRE<br/>THEM NINE (9) WEEKS PRIOR TO DELIVERY</p> <p>=====</p> <p>MOTOR MOUNTING:</p> <p>-----</p> <p>SULZER WILL DRILL BASE PLATES AS PER CERTIFIED<br/>MOTOR PRINTS BY CUS. SULZER WILL MOUNT CUS.<br/>SUPPLIED NEMA MOTORS AT EASLEY, SC FACTORY<br/>CUS. RESPONSABLE FOR MOUNTING NON-NEMA MOTORS</p> <p>=====</p> <p><b>GAS CONTENT:</b></p> <p><i>DESIGN Flow is 14090 USGPM @ DESIGN HEAD OF 37 FT</i></p> <p><i>WITH 6% AIR BY VOLUME. FEED AND HEAD ARE GIVEN</i></p> <p><i>TO 2051 USGPM @ 44 FT HEAD WITH 0% AIR</i></p> <p><i>BY VOLUME FOR IMPELLER SELECTION.</i></p> |                                                                                     |                               |                                                                                                                                                                                                                                 |               |                        |                               |

|                                                 |                                     |            |        |
|-------------------------------------------------|-------------------------------------|------------|--------|
| <b>PRODUCT SPECIFICATION</b>                    | Description <i>APT61-24</i>         |            | Page 1 |
|                                                 | Serial Number                       |            |        |
|                                                 | Time of delivery/EXW                | 02/09/2001 |        |
| Date printed                                    | 10/13/2000                          |            |        |
| Customer<br>ALLIANCE FOREST PRODUCTS U.S. CORP. | ALLIANCE FOREST PRODUCTS U.S. CORP. |            |        |
| 17589 PLANT ROAD                                | 17589 PLANT ROAD                    |            |        |
| COOSA PINES, AL 35044-0555                      | COOSA PINES, AL 35044-0555          |            |        |
| UNITED STATES                                   | UNITED STATES                       |            |        |
| Cust. order # 445014                            |                                     |            |        |
| Cust. PO Line # ZOR                             |                                     |            |        |
| Country code US                                 | Equipment No 310-1140-012/M94145    |            |        |

## PROCESS DATA

|                          |                    |                       |             |
|--------------------------|--------------------|-----------------------|-------------|
| Mill                     | 13                 | NPSH av               | 26 ft       |
| Process                  | 270                | Capacity Q            | 15051 USGPM |
| Application              | P2 FLOTATION CELL  | Head H                | 44 ft       |
| Pumped liquid            | ONP/OMG REP. STOCK | Characteristic curve  | K02321      |
| Temperature              | 125 F              | Pump power P          | 212 HP      |
| pH                       | 7-9                | Motor power           | 250 HP      |
| Consistency              | 0.8-1.13 % BD      | Efficiency            | 81 %        |
| Gas content              | 6 TO 8 %           | Pump rotational speed | 710 RPM     |
| Min head on suction side | 2 ft               | Variable speed        | No          |
| Max head on suction side | 7 (STATIC) ft      | NPSH req              | 16.8 ft     |

## PUMP

|                        |                          |
|------------------------|--------------------------|
| Supplier               | Easley                   |
| Dimensional drawing    | P20058                   |
| Conformity             | 89/392/EEC machinery /US |
| Version                | 09                       |
| Pump Size              | APT61-24                 |
| Impeller Type          | Special open             |
| Impeller No.           | 286876                   |
| Impeller diameter      | 615 mm                   |
| Impeller turning angle | 22 °                     |
| Impeller max.diameter  | 700 mm                   |
| Flange Drilling        | ASME B16.5 CLASS 150     |

*IMPELLER MATERIAL A8903A*  
*SHAFT MATERIAL SS 2324*

|                            |                   |
|----------------------------|-------------------|
| Casing Material            | A890 3A           |
| Gasket Material            | Klinger SIL-4430  |
| O-ring Material            | NBR               |
| Bearing Unit Lubrication   | Oil lubrication   |
| Bearing unit model         | 01 SS2324/NotSpec |
| Constant level oiler 638   | Yes               |
| Shaft Seal Fitting         | P02               |
| Customer documents lang./q | EN/04             |
| Component documents lang./ | EN/04             |
| Special parts              | METCO 16 SLEEVE   |

## DRIVE MOTOR For Information Only

|                   |          |                  |         |
|-------------------|----------|------------------|---------|
| Motor Supplied by | Customer | Rotational Speed | 720 RPM |
| Manufacturer      | TOSHIBA  | Power            | 250 HP  |

SULZER PROCESS PUMPS (CANADA) INC.  
 5055, rue Levy  
 Saint-Laurent, Québec  
 H4R 2N9  
 Canada

|                |                           |
|----------------|---------------------------|
| Contact Person | TONY GEDEON               |
| LBU Order #    | CAE2000075                |
| LBU Position   | 010                       |
| Telephone      | 514 - 333-7760            |
| Telefax        | 514 - 333-6324 (bomcust1) |



|                                                                                                                                                                                              |                                                                                                                                                        |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>PRODUCT SPECIFICATION</b>                                                                                                                                                                 | <b>Description</b> APT61-24<br>Serial Number<br>Time of delivery/EXW 02/09/2001<br>Date printed 10/13/2000 Page 2                                      |
| Customer<br>ALLIANCE FOREST PRODUCTS U.S. CORP.<br><br>17589 PLANT ROAD<br><br>COOSA PINES, AL 35044-0555<br>UNITED STATES<br>Cust. order # 445014<br>Cust. PO Line # ZOR<br>Country code US | ALLIANCE FOREST PRODUCTS U.S. CORP.<br><br>17589 PLANT ROAD<br><br>COOSA PINES, AL 35044-0555<br>UNITED STATES<br><br>Equipment No 310-1140-012/M94145 |

## COUPLING

Coupling Type Rex-Omega ES

## COUPLING GUARD

Coupling Guard material S+Z EN10025

## BASE PLATE

Base plate type Pump Motor/Steel/Zinc Foundation screw type Grouted

*ENTIRE MOTOR ASSEMBLY 355L*

## MOTOR ALIGNMENT BLOCK

## ORDER REMARKS

### TERMS OF PAYMENT:

-----  
 ALL PAYMENTS ARE DUE NET THIRTY (30) DAYS AFTER  
 COMPLETION OF EACH EVENT AND RECEIPT OF INVOICE  
 COMPLETE WITH SUPPORTING DOCUMENTATION, WHICHEVER  
 OCCURS LAST

90% UPON DELIVERY OF EACH PUMP THAT HAS BEEN  
 RELEASED AND THE CORRESPONDING CHANGE ORDER ISSUED  
 10% HOLD BACK UNTIL COMMISSIONING AND ACCEPTANCE  
 BY BUYER

=====

### PRICING:

-----  
 FOR NON-MENA MOTORS, FINAL PRICES ARE SUBJECT TO  
 CONFIRMATION AFTER RECEIPT OF CERTIFIED MOTOR  
 PRINTS

=====

### INSPECTION LOCATION:

|                                                                                                    |                                                                                                                                               |
|----------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| SULZER PROCESS PUMPS (CANADA) INC.<br>5055, rue Levy<br>Saint-Laurent, Québec<br>H4R 2N9<br>Canada | Contact Person TONY GEDEON<br>LBU Order # CAE2000075<br>LBU Position 010<br>Telephone 514 - 333-7760<br><br>Telefax 514 - 333-6324 (bomcust1) |
|----------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|

|                                                                                                                                                                                              |                                                                                                                                                        |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>PRODUCT SPECIFICATION</b>                                                                                                                                                                 | Description: APT61-24<br>Serial Number<br>Time of delivery/EXW 02/09/2001<br>Date printed 10/13/2000 Page 3                                            |
| Customer<br>ALLIANCE FOREST PRODUCTS U.S. CORP.<br><br>17589 PLANT ROAD<br><br>COOSA PINES, AL 35044-0555<br>UNITED STATES<br>Cust. order # 445014<br>Cust. PO Line # ZOR<br>Country code US | ALLIANCE FOREST PRODUCTS U.S. CORP.<br><br>17589 PLANT ROAD<br><br>COOSA PINES, AL 35044-0555<br>UNITED STATES<br><br>Equipment No 310-1140-012/M94145 |

-----  
 FOR INSPECTION PURPOSES PLEASE CONTACT:  
 MR. SAM SEWELL  
 SULZER PROCESS PUMPS (US)  
 155 AHLSTROM WAY (PUE FACTORY)  
 EASLEY, SC, USA, 29640  
 TEL: (864) 855-9090, FAX: (864) 855-9095  
 =====

PAINTING:

-----  
 SULZER STANDARD FACTORY APPLIED PAINTING WITH  
 THE RAL 5019 (CAPRI BLUE) COLOR & GUARDS IN  
 RAL 1021 (SAFETY YELLOW) AT NO EXTRA CHARGE  
 =====

FINAL IMPELLER TRIMS:

-----  
 MUST BE PROVIDED SIX (6) WEEKS PRIOR TO DELIVERY  
 EXCEPT FOR APT6, APT54 & APT55 WHICH WILL REQUIRE  
 THEM NINE (9) WEEKS PRIOR TO DELIVERY  
 =====

MOTOR MOUNTING:

-----  
 SULZER WILL DRILL BASE PLATES AS PER CERTIFIED  
 MOTOR PRINTS BY CUS. SULZER WILL MOUNT CUS.  
 SUPPLIED NEMA MOTORS AT EASLEY, SC FACTORY  
 CUS. RESPONSABLE FOR MOUNTING NON-NEMA MOTORS  
 =====

P A I N T I N G

Painting E180/3-Fe Sa2 1/2 SFS4962  
 Color Shade RAL-5019

|                                                                                                    |                                                                                                                                           |
|----------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|
| SULZER PROCESS PUMPS (CANADA) INC.<br>5055, rue Levy<br>Saint-Laurent, Québec<br>H4R 2N9<br>Canada | Contact Person TONY GEDEON<br>LBU Order # CAE2000075<br>LBU Position 010<br>Telephone 514 - 333-7760<br>Telefax 514 - 333-6324 (bomcust1) |
|----------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|


**AHLSTROM**

Version 01&gt; / en / 920908 / Replaces 901101 / K02321

[illegible]

PUMP A-LINE P3 LOCATION WILL BE

|                 |                                   |                |            |
|-----------------|-----------------------------------|----------------|------------|
| SERVICE:        | Atline P3 Plotation Cell Feed P.- | FLOW (USGPM)   | TDH (R)    |
| EQUIP. No.:     | 310-1140-012 / M94145             | 1505.00 15,051 | 44.00      |
| CUST. P.O. No.: | 445014                            | EFF. (%)       | Power (HP) |
| API-C JOB No.:  | CAE2000 075 10                    | 81             | 250.0      |
| DATE / REV.:    | OCT-16-2000 / R. 0                | NEMA PR.       | NEMA FUT.  |
|                 |                                   | BY OWNER       | BY OWNER   |

# APT Process Pumps

## Dimensional drawing P20058

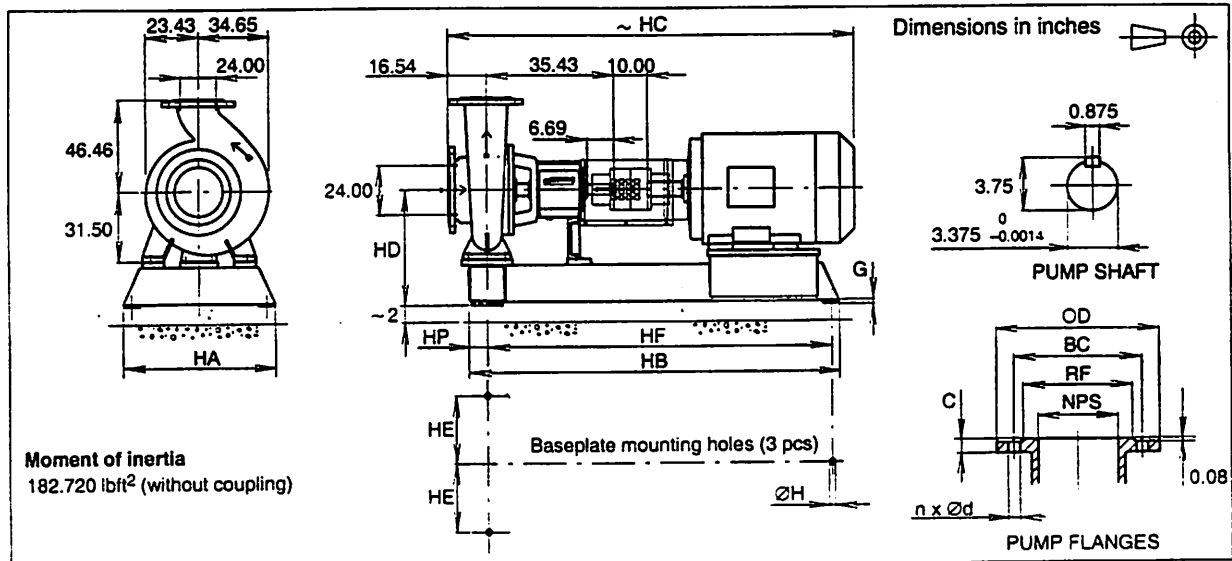


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Version 04 > / 940221 / en / P20058

**APT61-24 (24x24-28)**

Steel baseplate pump and motor



| DIMENSIONS          |                 |      |           |       |        |        |      |        |       |       |      |      |                           |
|---------------------|-----------------|------|-----------|-------|--------|--------|------|--------|-------|-------|------|------|---------------------------|
| Primary motor frame | Max motor frame |      | Baseplate | HD    | HC     | HB     | HP   | HF     | HA    | HE    | H    | G    | Weight lbs <sup>(3)</sup> |
| (1)                 | (2)             |      |           |       |        |        |      |        |       |       |      |      |                           |
| 447T                | 5011LL          | 449T | 13        | 43.20 | 110.00 | 117.25 | 5.00 | 110.00 | 52.75 | 24.00 | 1.50 | 0.69 | 5710                      |
| 449T                | 5011LL          | -    | 13        | 43.20 | 116.00 | 117.25 | 5.00 | 110.00 | 52.75 | 24.00 | 1.50 | 0.69 | 5710                      |
| 449TS               | 509LS           | -    | 12        | 43.20 | 113.00 | 106.25 | 5.00 | 99.00  | 52.75 | 24.00 | 1.50 | 0.69 | 5580                      |

| DRILLING OF FLANGES   |       |       |      |       |                       |                  |       |      |                  |
|-----------------------|-------|-------|------|-------|-----------------------|------------------|-------|------|------------------|
| ANSI B 16.1 Class 125 |       |       |      |       | ANSI B 16.5 Class 150 |                  |       |      |                  |
| NPS                   | OD    | RF    | C    | BC    | d                     | n <sup>(4)</sup> | BC    | d    | n <sup>(4)</sup> |
| 24.00                 | 33.27 | 26.97 | 1.88 | 29.50 | 1.42                  | 20               | 29.50 | 1.42 | 20               |

1. Max. NEMA motor frame, which can be installed onto the baseplate.
2. Max. NEMA motor frame with the same shaft height as primary motor.
3. Weight without coupling and motor.
4. Flange bolting straddles centerline.

FOR REFERENCE

|                   |                                   |
|-------------------|-----------------------------------|
| SERVICE:          | A Line P3 Flotation Cell Feed P.  |
| EQUIP. No.:       | 310-1140-012 / M94145             |
| CUST. P.O. No.:   | 445014                            |
| API-C JOB No.:    | CAE2000 075 10                    |
| HP / RPM / FRAME: | 212.0 / 710 / <del>HP OWNER</del> |

|                            |                    |
|----------------------------|--------------------|
| CERTIFIED FOR CONSTRUCTION |                    |
| DATE / REV.:               | OCT-16-2000 / R. 0 |
| SIGNED:                    |                    |

315L

# APT Process Pumps

## Shaft sealing



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Version 09 > / 960601 / en / N12559

## Gland packings

### Fitting P02

2 braids + lantern ring + 2 braids. Standard casing cover. Installed onto the shaft wearing sleeve.

### Characteristics of fitting

|          |                                                                                                                                           |
|----------|-------------------------------------------------------------------------------------------------------------------------------------------|
| <b>E</b> | External flushing that prevents pumped liquid from precipitating in the sealing housing. Flushing liquid is mixed with the pumped liquid. |
|----------|-------------------------------------------------------------------------------------------------------------------------------------------|

|                                                     |                            |
|-----------------------------------------------------|----------------------------|
| <b>Pumped liquid</b>                                | Impure liquids, stock, lye |
| <b>Temperature (°F)</b>                             | max 250                    |
| <b>Stuffing box pressure <math>p_T</math> (psi)</b> | Positive or negative       |

|                          |                                                                                                                               |
|--------------------------|-------------------------------------------------------------------------------------------------------------------------------|
| <b>Sealing waters</b>    |                                                                                                                               |
| <b>Connection No.</b>    | 020                                                                                                                           |
| <b>Size (NPT)</b>        | 3/8 - 18                                                                                                                      |
| <b>Quality</b>           | External clean water, maximum particle size 0.002 in, maximum solid material content (PPM-value) 0.00027 lb/in <sup>3</sup> . |
| <b>Flow rate (USGPM)</b> | 0.5 - 0.8                                                                                                                     |
| <b>Pressure (psi)</b>    | $p_T + 7$ psi<br>min. 7 psi                                                                                                   |

### Seal size (Ø in)

| Bearing unit        |                 |                     |                     |                     |                     |
|---------------------|-----------------|---------------------|---------------------|---------------------|---------------------|
| 1                   | 2               | 3                   | 4                   | 5                   | 6                   |
| 1 5/8 x 2 3/8 x 3/8 | 2 x 2 3/4 x 3/8 | 2 3/8 x 3 3/8 x 1/2 | 2 3/4 x 3 3/4 x 1/2 | 3 1/2 x 4 3/4 x 5/8 | 3.937 x 5.198 x 5/8 |

Pressure behind the impeller can approximately be calculated from the formula

$$p_T = p_0 - 0.725 \text{ psi}$$

Where  $p_T$  = pressure behind the impeller (psi)  
 $p_0$  = inlet pressure (psi)

Atmospheric pressure used as reference pressure = 0 psi.

PUMP, A-LINE P3 FLOTATION CELL FEED

|                        |                                  |
|------------------------|----------------------------------|
| <b>SERVICE:</b>        | A-Line P3 Flotation Cell Feed P. |
| <b>EQUIP. No.:</b>     | 310-1140-012 / M94145            |
| <b>CUST. P.O. No.:</b> | 445014                           |
| <b>MODEL / SPEED:</b>  | APT61-24 / 710                   |
| <b>API-C JOB No.:</b>  | CAE2000 075 10                   |



# APT Process Pumps

## Design data



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**Table 7 Bearing unit size 6**

| Pump type                                                 | 61-20 |  | 61-24       |  | 62-16 |  |
|-----------------------------------------------------------|-------|--|-------------|--|-------|--|
| Shaft diameters                                           |       |  |             |  |       |  |
| At impeller                                               |       |  | 2.953       |  |       |  |
| Under sleeve                                              |       |  | 3.543       |  |       |  |
| Between bearings                                          |       |  | 4.80        |  |       |  |
| At coupling                                               |       |  | 3.375       |  |       |  |
| Bearings                                                  |       |  |             |  |       |  |
| Radial bearing type                                       |       |  | NUP 320     |  |       |  |
| Thrust bearing type                                       |       |  | 2x7322 BECB |  |       |  |
| Radial brg. life (HRS. x 10 <sup>3</sup> ) <sup>(1)</sup> | 1000  |  | 500         |  | 500   |  |
| Thrust brg. life (HRS. x 10 <sup>3</sup> ) <sup>(1)</sup> | 150   |  | 100         |  | 100   |  |
| Bearing span                                              |       |  | 13.20       |  |       |  |
| Shaft overhang                                            |       |  | 11.80       |  |       |  |
| Stuffing box                                              |       |  |             |  |       |  |
| Bore                                                      |       |  | 5.197       |  |       |  |
| Depth                                                     |       |  | 3.937       |  |       |  |
| Shaft sleeve dia.                                         |       |  |             |  |       |  |
| Packing                                                   |       |  | 3.947       |  |       |  |
| Mechanical seal, general                                  |       |  | 3.750       |  |       |  |
| Mech. seal, ready-fitted <sup>(2)</sup>                   |       |  | 3.543       |  |       |  |
| Packing size                                              |       |  | 0.625       |  |       |  |
| No. of packing rings                                      |       |  | 4           |  |       |  |
| Lantern ring width                                        |       |  | 0.79        |  |       |  |
| Neck bush clearance                                       |       |  | 0.042       |  |       |  |
| Distance to nearest obstruction                           |       |  | 3.94        |  |       |  |
| Wear ring clearance                                       |       |  | -           |  |       |  |
| Impeller                                                  |       |  |             |  |       |  |
| Front clearance (open impeller)                           |       |  | 0.020       |  |       |  |
| Back clearance                                            |       |  | 0.040       |  |       |  |
| Eye area (in <sup>2</sup> )                               |       |  |             |  |       |  |
| Closed                                                    |       |  | -           |  |       |  |
| Open                                                      | 302.0 |  | 308.0       |  | 308.0 |  |
| Special open                                              | 302.0 |  | 308.0       |  | 308.0 |  |
| Max. diameter solids (in)                                 |       |  |             |  |       |  |
| Closed                                                    |       |  | -           |  |       |  |
| Open                                                      | 3.39  |  | 5.19        |  | 5.19  |  |
| Special open                                              | 4.21  |  | 5.19        |  | 5.19  |  |
| Max. shaft deflection at st. box                          |       |  | 0.002       |  |       |  |
| Casing                                                    |       |  |             |  |       |  |
| Type (single or dual)                                     | DV    |  | DV          |  | DV    |  |
| Casing thickness (iron)                                   | 0.95  |  | 0.95        |  | 0.95  |  |
| Casing thickness (steel)                                  | 0.93  |  | 0.71        |  | 0.71  |  |
| Bearing unit weight (LBS)                                 |       |  | 333         |  |       |  |
| HP/100 rpm (shaft SS2324)                                 |       |  | 120         |  |       |  |

- 1) Min. L10h-life, full impeller dia., max. speed, direct coupled and 50 - 100 % BEP
- 2) Installed on the pump shaft

*Pump, A-Line P3 FLOTATION Cell Feed*

|                 |                                  |
|-----------------|----------------------------------|
| SERVICE:        | A-Line P3 Flotation Cell Feed P. |
| EQUIP. No.:     | 310-1140-012 / M94145            |
| CUST. P.O. No.: | 445014                           |
| MODEL / SIZE:   | APT61-24 / 24x24-28              |
| APL-C JOB No.:  | CAE2000 075 10                   |