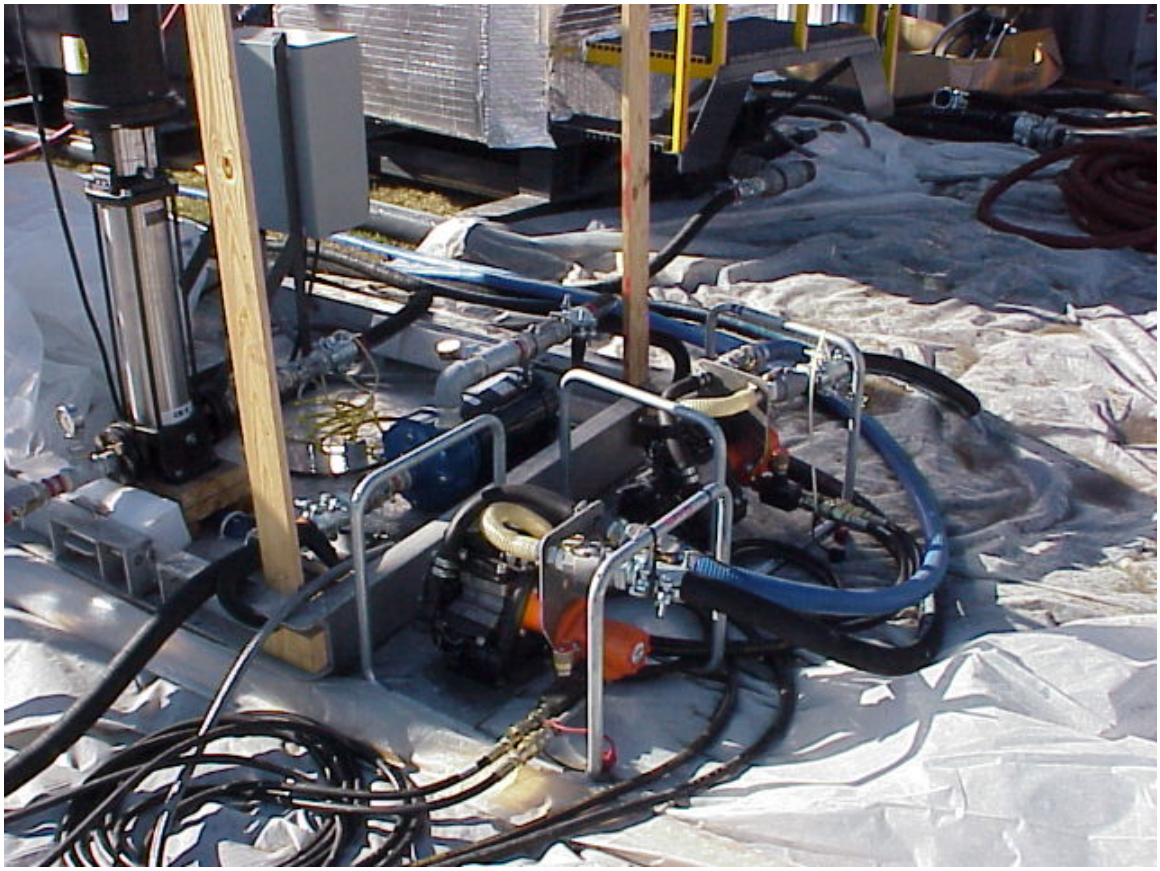
## APPENDIX K Water Lubrication Injection Pumps

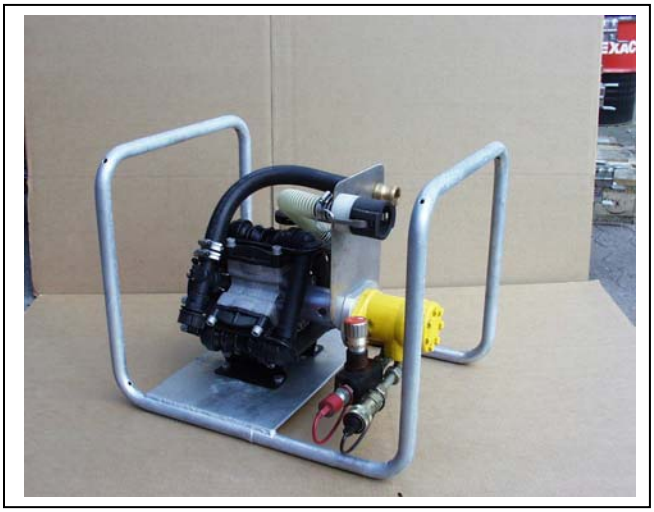


Water Lubrication Injection Pumps at JVOPS were located centrally and served both USCG and CCG test lines.

The two cold water pumps on the right are hydraulically powered. The Hot water high pressure and hot water low pressure pump, mounted to the platform on the left, are electrically motor driven and were supplied with an control panel. The insulated hot lubrication water tank is shown in the background.

## 1. COLD WATER INJECTION PUMPS

**For both high pressure (outlet-side) and low pressure(inlet-side) annular water injection**



Hydraulic Powered AWI Pump

| | |
|---|---|
| Length | 550 mm |
| Width | 450 mm |
| Height | 470 mm |
| Weight | 25 kg |
| | |
| Comet Water Pump | BP105 |
| Max. Capacity | 104 litre/min |
| Max Pressure | 20 bar |
| Relief Setting | 15 bar |
| Max. Water Temp | 40 deg C |
| | |
| Danfoss Hydr. motor | OMP 50 |
| Hydraulic Flow, Press | 25 l/m, 90 bar |
| Power requirement. | 4 kW |

Comet Model BP105, 3-Stage Diaphragm Pump for cold water. Parts in contact with liquid are made in plastic material and plastic coated aluminum resistant to chemical products. The pump has a pressure accumulator which must be charged with compressed air to between 75 to 100 psi in order to deliver outlet side AWI water at 145 to 250 psi.

The pump Coupled to hydraulic motor and pump flow rate is controlled by hydraulic flow with max power consumption 4 kW and maximum hydraulic oil requirement of 25 lpm @ 170 bar. At 500 rpm the pump yields approximately 100 l/min with a maximum outlet pressure of 20 bar (pump is equipped with a 20 bar excess pressure valve).

| | 0 bar - 0 p.s.i. | | | | 5 bar - 72 p.s.i. | | | | 10 bar - 145 p.s.i. | | | | 15 bar - 217 p.s.i. | | | | 20 bar - 290 p.s.i. | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| R.P.M. | Delivery | | Power | | Delivery | | Power | | Delivery | | Power | | Delivery | | Power | | Delivery | | Power | | Weight | |
| | l/min | U.S. g.p.m. | CV | kW | l/min | U.S. g.p.m. | CV | kW | l/min | U.S. g.p.m. | CV | kW | l/min | U.S. g.p.m. | CV | kW | l/min | U.S. g.p.m. | CV | kW | Kg | lb |
| 400 | 81 | 21,4 | 0,6 | 0,4 | 79 | 20,9 | 1,2 | 0,9 | 78 | 20,6 | 2,1 | 1,5 | 77 | 20,3 | 3,0 | 2,2 | 76 | 20,1 | 4,0 | 2,9 | 9,8 | 21,6 |
| 450 | 88 | 23,2 | 0,8 | 0,6 | 87 | 23,0 | 1,5 | 1,1 | 86 | 22,7 | 2,5 | 1,8 | 85 | 22,5 | 3,5 | 2,6 | 85 | 22,5 | 4,5 | 3,3 | | |
| 500 | 97 | 25,6 | 1,1 | 0,8 | 96 | 25,4 | 1,7 | 1,3 | 95 | 25,1 | 2,9 | 2,1 | 94 | 24,8 | 4,0 | 2,9 | 93 | 24,6 | 5,1 | 3,8 | | |
| 550 | 107 | 28,3 | 1,3 | 1,0 | 106 | 28,0 | 2,0 | 1,5 | 105 | 27,7 | 3,1 | 2,3 | 105 | 27,7 | 4,5 | 3,3 | 104 | 27,5 | 5,5 | 4,0 | | |

## 2. HOT WATER INJECTION PUMPS

**Low Pressure (Inlet-side AWI)**

Scot Pump, Model 50
2” x 1.5” Centrifugal Pump
Cast Iron Construction
Viton/Ceramic-carbon seal
5 Hp 240/460/3 phase electric motor
28 GPM @ 150 ft TDH
(See attached performance data)

**High Pressure (Outlet-side AWI)**

Vertical Multistage Centrifugal Pump
Grundfoss Model CR5-20
Cast Iron and 304 Stainless Steel Construction
Operating Temperature -20 to +121 deg C
7.5 Hp 240/460/3 phase TEFC electric motor
27.5 GPM @ 513 ft TDH
(See attached performance data)

George W Wirth Company
Pat Wirth

PUMP-FLO ver: 6.02
10/10/03

**PUMP DATA SHEET**
Scot Division of Ardox Corp.

**Selection file:** (untitled)
**Catalog:** SCOT60HZ.MPC v 6.7

**Design Point:** Flow: 28 US gpm
Head: 150 ft

**Pump:** Endsuct-Encl - 3500 Size: 050-6.5-2.0x1.5
Speed: 3500 rpm Dia: 6.125 in

**Limits:** Temperature: 300 °F Sphere size: --- in
Pressure: 175 $psi_g$ Power: --- bhp

**Specific Speed:** Ns: --- Nss: ---

**Dimensions:** Suction: 2 in Discharge: 1.5 in

**Motor: --- hp** NEMA Standard TEFC Enclosure
sized for Max Power on Design Curve

**Fluid: Water** Temperature: 205 °F
SG: 0.962
Viscosity: 0.2938 cP
Vapor pressure: 12.77 $psi_a$
Atm pressure: 14.7 $psi_a$

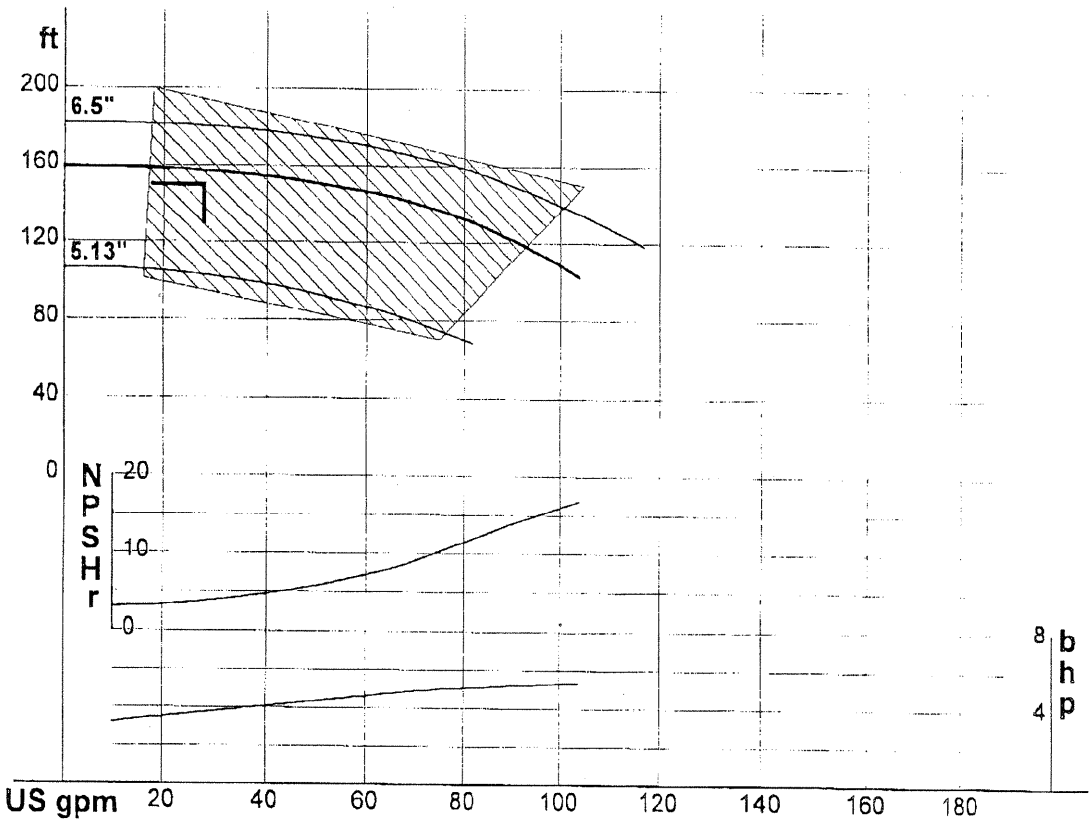
**NPSHa: --- ft**

**Piping:** System: ---
Suction: --- in
Discharge: --- in

**---- Data Point ----**
Flow: 28 US gpm
Head: 155 ft
Eff: 25%
Power: 3.72 bhp
NPSHr: 4.4 ft

**-- Design Curve --**
Shutoff Head: 159 ft
Shutoff dP: 66.3 psi
Min Flow: - US gpm
BEP: 51% eff
@ 80.5 US gpm
NOL Pwr: 5.34 bhp
@ 104 US gpm

**-- Max Curve --**
Max Pwr: 6.84 bhp
@ 117 US gpm




**--- PERFORMANCE EVALUATION ---**

| Flow US gpm | Speed rpm | Head ft | Pump %eff | Power bhp | NPSHr ft | Motor %eff | Motor hp | Hrs/yr | Cost /kW |
|---|---|---|---|---|---|---|---|---|---|
| 33.6 | 3500 | 154 | 29 | 3.87 | 4.84 | | | | |
| 28 | 3500 | 155 | 25 | 3.72 | 4.4 | | | | |
| 22.4 | 3500 | 156 | 21 | 3.56 | 3.96 | | | | |
| 16.8 | 3500 | 157 | 17 | 3.41 | 3.53 | | | | |
| 11.2 | 3500 | 159 | 13 | 3.25 | 3.09 | | | | |

# SCOT
ARDOX

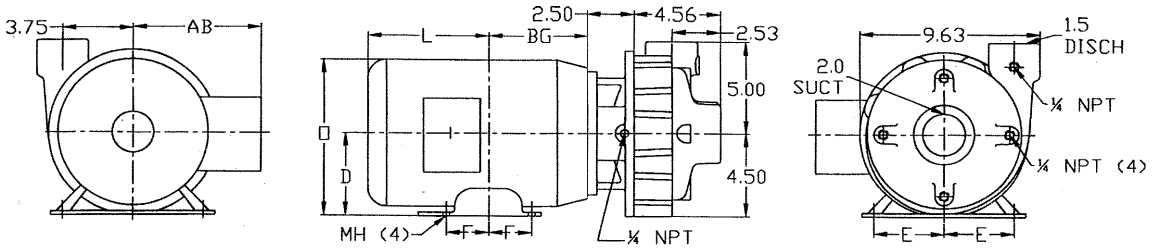
# MOTORPUMP™ — 3500 RPM
## 60 HERTZ, 2 X 1.5 X 6.5 NPT

50
JM

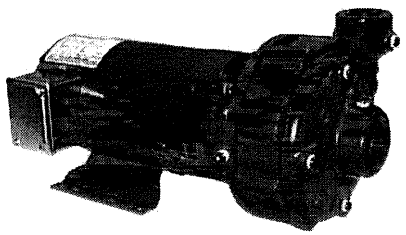
### MOTOR DIMENSIONS
### 3500 RPM NEMA JM FRAME 3 PHASE

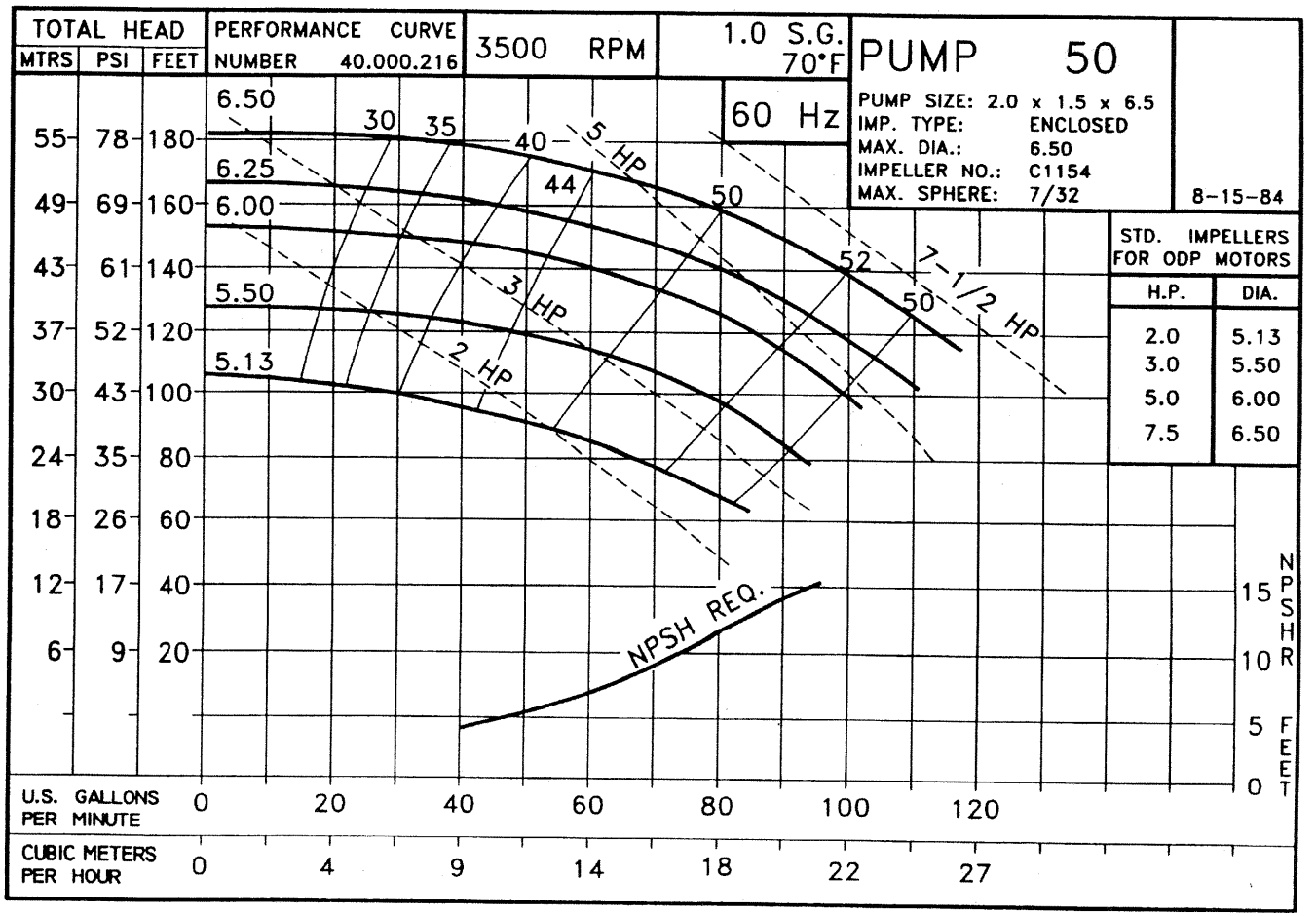
| HP | TYPE | FRAME | D | E | F | O | AB | BG | L | MH |
|---|---|---|---|---|---|---|---|---|---|---|
| 2.0 | ODP | JM145 | 3.50 | 2.75 | 2.00 | 6.75 | 3.75 | 4.88 | 6.31 | .34 |
| 3.0 | ODP | JM145 | 3.50 | 2.75 | 2.00 | 6.75 | 3.75 | 4.88 | 6.31 | .34 |
| 5.0 | ODP | JM182 | 4.50 | 3.75 | 2.25 | 8.50 | 6.84 | 5.22 | 6.44 | .34 |
| 7.5 | ODP | JM184 | 4.50 | 3.75 | 2.75 | 8.50 | 5.88 | 6.38 | 5.44 | .44 |
| 2.0 | TEFC | JM145 | 3.50 | 2.75 | 2.00 | 7.16 | 6.09 | 4.75 | 5.13 | .34 |
| 3.0 | TEFC | JM182 | 4.50 | 3.75 | 2.25 | 9.28 | 7.50 | 4.97 | 8.38 | .34 |
| 5.0 | TEFC | JM184 | 4.50 | 3.75 | 2.75 | 9.28 | 7.50 | 5.47 | 7.88 | .44 |
| 7.5 | TEFC | JM184 | 4.50 | 3.75 | 2.75 | 9.28 | 7.50 | 5.47 | 7.88 | .44 |

D050JM182 DRAWING DEPICTS 5HP JM182 ODP MOTOR




**ALL DIMENSIONS IN INCHES.**
AUTOCAD DRAWING TO SCALE AVAILABLE FROM FACTORY.





# Seal Options — Type 21 — 1½", 1¾"

| | 1½" & 1¾" | | | | | 1½" | | 1¾" | |
|---|---|---|---|---|---|---|---|---|---|
| | BN-CARB/CM | VN-CARB/CM | EPDM-CARB/CM | VN-SIL/SIL | EPDM-SIL/SIL | VN-CARB/SIL | EPDM-CARB/SIL | VN-CARB/NR | EPDM-CARB/NR |
| *BELLOWS* | BUNA N | Viton | EPDM | Viton | EPDM | Viton | EPDM | Viton | EPDM |
| *SPRING* | Stainless Steel | Stainless Steel | Stainless Steel | Stainless Steel | Stainless Steel | Stainless Steel | Stainless Steel | Stainless Steel | Stainless Steel |
| *WASHER* | Carbon | High Temp Carbon | High Temp Carbon | Silicon Carbide | Silicon Carbide | High Temp Carbon | High Temp Carbon | High Temp Carbon | High Temp Carbon |
| *SEAT* | Ceramic | Ceramic | Ceramic | Silicon Carbide | Silicon Carbide | Silicon Carbide | Silicon Carbide | Ni-Resist | Ni-Resist |
| *SEAT GASKET* | BUNA N Cup | Viton O-Ring | EPDM O-Ring | Viton O-Ring | EPDM O-Ring | Viton O-Ring | EPDM O-Ring | Viton O-Ring | EPDM O-Ring |
| *MIN TEMP* | 0° F | 0° F | -40° F | 0° F | -40° | 0° F | -40° F | 0° F | -40° F |
| *MAX TEMP* | 212° F | 240° F | 250° F | 240° F | 300° F | 240° F | 250° F | 240° F | 250° F |
| *DUTY* | General | Mild Abrasives | Mild Abrasives | Severe Duty | Severe Duty | High Temp | High Temp | High Temp | High Temp |

| | | |
|---|---|---|
| BN-CARB/CM: | BUNA Carbon / Ceramic | This is our standard seal and is supplied with the pump if an optional seal is not specified. This seal is a general duty seal and is designed for use with clear, low temperature water or water/ethylene glycol solutions. This seal should not be used with chemicals, abrasives, temperature differentials greater than 100° F, or temperatures exceeding 200° F. |
| VN-CARB/CM: | Viton Carbon / Ceramic | This viton rubber seal is resistant to most oils, acids and chemicals. The ceramic seat is a relatively hard material and can withstand mild abrasives. Silicon carbide should be used for severe abrasive applications. Contact factory for liquid compatibility with viton. |
| EPDM-CARB/CM: | EPDM Carbon / Ceramic | This mild duty seal performs similar to EPDM-CARB/NR. The ceramic seat is harder than ni-resist and tends to handle mild abrasives better than ni-resist. It should not be used with oils (or any petroleum based fluid), temperature differences greater than 100° F or severe abrasive liquid solutions. |
| VN-SIL/SIL: | Viton Silicon Carbide / Silicon Carbide | For severe duty use. Like the VN-CARB/CM seal, this seal performs well in oils, acids and chemical applications. The silicon carbide rotating ring in the head of this seal is significantly harder than the carbon ring found in the carbon/silicon carbide and ceramic seals. This hard ring riding against a silicon carbide seat offers greater protection for abrasive applications. In addition, these faces are graphite loaded, which offers higher thermal conductivity and lower coefficient of friction, resulting in the coolest running seal available. The carbide against carbide offers the hardest materials for mild to severe abrasive applications. While viton performs well with most chemicals, it does not perform in steam applications. Contact factory for liquid compatibility with viton. |
| EPDM-SIL/SIL: | EPDM Silicon Carbide / Silicon Carbide | For severe duty use. The silicon carbide rotating ring in the head of this seal is significantly harder than the carbon ring found in the carbon/silicon carbide and ceramic seals. This hard ring riding against a silicon carbide seat offers greater protection for abrasive applications. In addition, these faces are graphite loaded, which offers higher thermal conductivity and lower coefficient of friction, resulting in the coolest running seal available. This seal should not be used with oils (or any petroleum base fluid). |
| **1½"** | | |
| VN-CARB/SIL: | Viton Carbon / Silicon | This viton rubber seal is resistant to most oils, acids and chemicals. The seal seat is graphite loaded and performs well in high temperature differential applications. Contact factory for liquid compatibility with viton. |

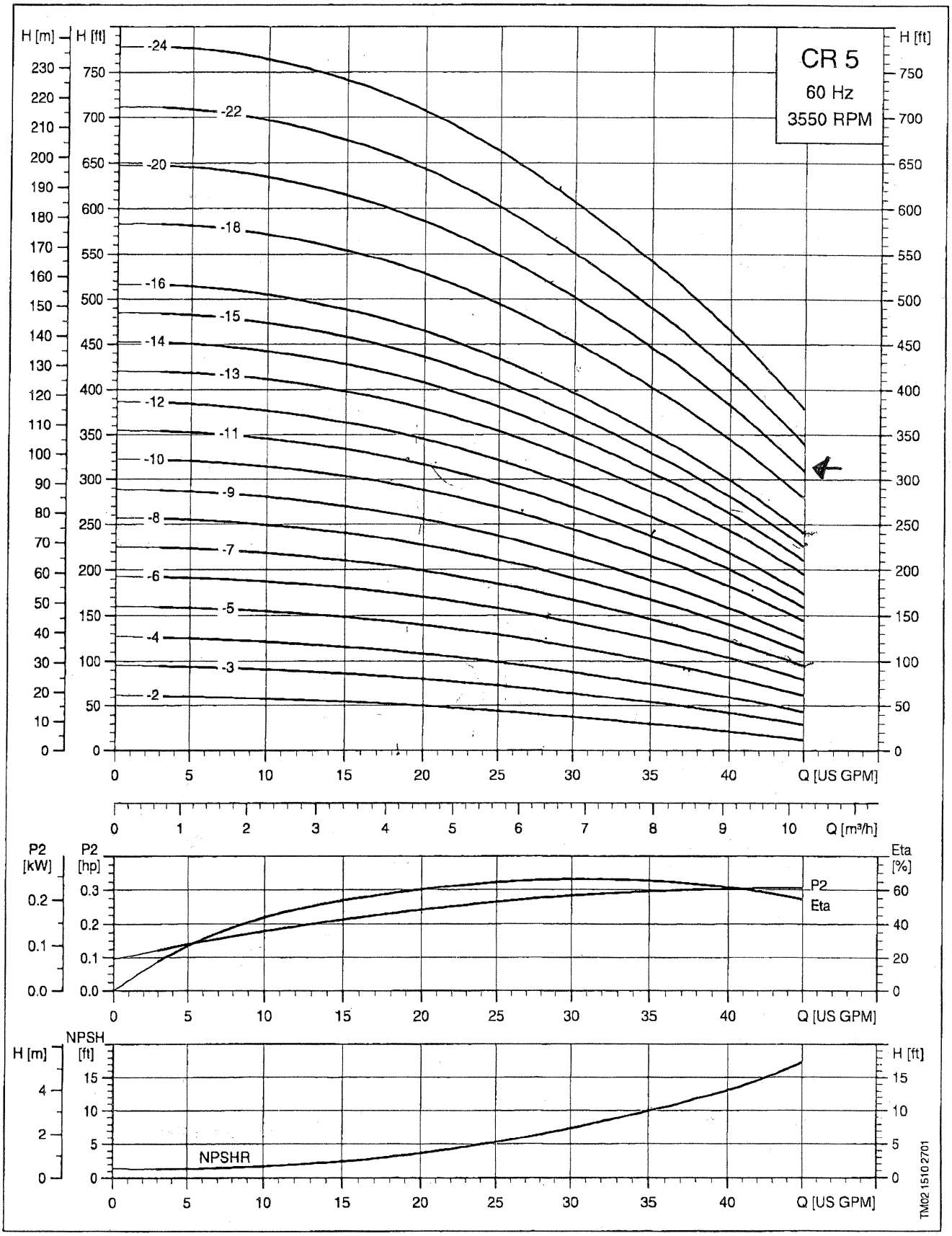
| | | |
|---|---|---|
| | Carbide | |
| EPDM-CARB/SIL: | EPDM Carbon / Silicon Carbide | This seal is generally used in water, water/glycol solutions in temperatures up to 250° F. The seal seat is graphite loaded and performs well in high temperature differential applications. Water applications at temperatures above 200° F tend to have very poor lubricating qualities. The EPDM-SIL/SIL seal performs better in water only application. This seal should not be used with oils (or any petroleum base fluid) or liquids with mild to severe abrasives. This includes rust scale commonly found in most piping systems. |
| 1 3/4" | | |
| VN-CARB/NR: | Viton Carbon / Ni-Resist | This viton rubber seal is resistant to most oils, acids and chemicals. The seal seat is "soft" and performs well in high temperature differential applications. Contact factory for liquid compatibility with viton. |
| EPDM-CARB/NR: | EPDM Carbon / Ni-Resist | This seal is generally used in water, water/glycol solutions in temperatures up to 250° F. The seal seat is "soft" and performs well in high temperature differential applications. Water applications at temperatures above 200° F tend to have very poor lubricating qualities. The EPDM-SIL/SIL seal performs better in water only application. This seal should not be used with oils (or any petroleum base fluid) or liquids with mild to severe abrasives. This includes rust scale commonly found in most piping systems. |

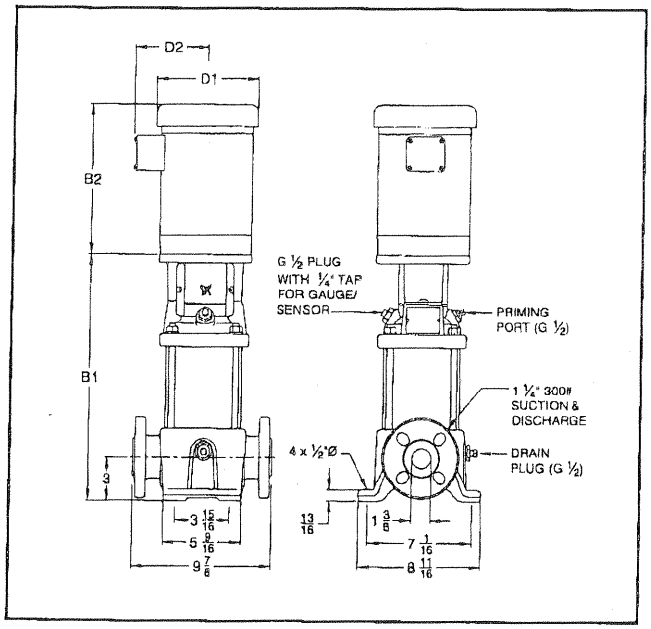
*Close Window*

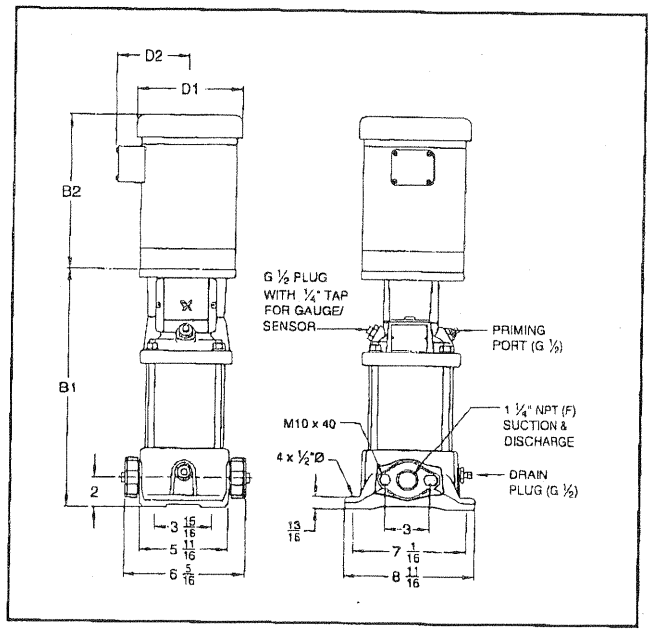
ED1021 A3

# PERFORMANCE CURVES — GRUNDFOS CR 5

① HIGH TEMP / HIGH PRESS PUMP: CR5-20





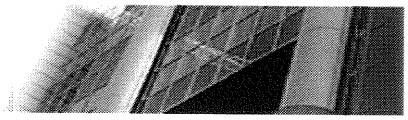




| Pump Type | HP | PH | Voltage | NEMA Frame Size | Oval B1 | ANSI B1 | ODP B2 | D1 | D2 | TEFC B2 | D1 | D2 | Oval ODP B1+B2 | Oval TEFC B1+B2 | ANSI ODP B1+B2 | ANSI TEFC B1+B2 | Oval Ship Wt.[1] [lbs.] | ANSI Ship Wt.[1] [lbs.] | Oval Ship Vol.[1] [ft³] | ANSI Ship Vol.[1] [ft³] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CR 5-2 | 3/4 | 1 | 115/208-230 | 56C | 11 | 12 | 10 3/4 | 6 1/4 | 4 1/2 | 10 | 6 1/4 | 4 5/8 | 21 3/4 | 21 | 22 3/4 | 22 | 53.9 | 62.9 | 1.8 | 1.8 |
| | | 3 | 208-230/460 | 56C | 11 | 12 | 9 1/4 | 6 1/4 | 4 1/2 | 9 3/8 | 6 1/4 | 4 5/8 | 20 1/4 | 20 3/8 | 21 1/4 | 21 3/8 | 53.9 | 62.9 | 1.8 | 1.8 |
| CR 5-3 | 1 | 1 | 115/208-230* | 56C | 12 1/8 | 13 1/8 | 11 3/8 | 6 1/4 | 4 1/2 | 11 1/4 | 7 1/4 | 5 1/4 | 23 1/2 | 23 3/8 | 24 1/2 | 24 3/8 | 56.5 | 65.6 | 1.8 | 1.8 |
| | | 3 | 208-230/460 | 56C | 12 1/8 | 13 1/8 | 9 1/4 | 6 1/4 | 4 1/2 | 9 3/8 | 6 1/4 | 4 5/8 | 21 3/8 | 21 1/2 | 22 3/8 | 22 1/2 | 56.5 | 65.6 | 1.8 | 1.8 |
| CR 5-4 | 1 1/2 | 1 | 115/208-230 | 56C | 13 1/8 | 14 1/8 | 11 1/4 | 7 1/4 | 5 1/8 | 11 1/4 | 7 1/4 | 5 1/4 | 24 3/8 | 24 3/8 | 25 3/8 | 25 3/8 | 63.6 | 72.6 | 1.8 | 1.8 |
| | | 3 | 208-230/460 | 56C | 13 1/8 | 14 1/8 | 10 3/4 | 6 1/4 | 4 1/2 | 10 1/4 | 7 1/4 | 5 1/4 | 23 7/8 | 23 3/8 | 24 7/8 | 24 3/8 | 63.6 | 72.6 | 1.8 | 1.8 |
| CR 5-5 | 1 1/2 | 1 | 115/208-230 | 56C | 14 1/4 | 15 1/4 | 11 1/4 | 7 1/4 | 5 1/8 | 11 1/4 | 7 1/4 | 5 1/4 | 25 1/2 | 25 1/2 | 26 1/2 | 26 1/2 | 66.2 | 76.3 | 1.8 | 2.1 |
| | | 3 | 208-230/460 | 56C | 14 1/4 | 15 1/4 | 10 3/4 | 6 1/4 | 4 1/2 | 10 1/4 | 7 1/4 | 5 1/4 | 25 | 24 1/2 | 26 | 25 1/2 | 66.2 | 76.3 | 1.8 | 2.1 |
| CR 5-6 | 2 | 1 | 115/208-230* | 56C | 15 1/4 | 16 1/4 | 11 1/4 | 7 1/4 | 5 1/8 | 12 1/8 | 7 1/4 | 5 1/4 | 26 1/2 | 27 3/8 | 27 1/2 | 28 3/8 | 73.3 | 83.4 | 2.1 | 2.7 |
| | | 3 | 208-230/460 | 56C | 15 1/4 | 16 1/4 | 10 1/4 | 7 1/4 | 5 1/8 | 11 1/4 | 7 1/4 | 5 1/4 | 25 1/2 | 26 1/2 | 26 1/2 | 27 1/2 | 73.3 | 83.4 | 2.1 | 2.7 |
| CR 5-7 | 2 | 1 | 115/208-230* | 56C | 16 3/8 | 17 3/8 | 11 1/4 | 7 1/4 | 5 1/8 | 12 1/8 | 7 1/4 | 5 1/4 | 27 5/8 | 28 1/2 | 28 5/8 | 29 1/2 | 76.0 | 85.0 | 2.7 | 2.7 |
| | | 3 | 208-230/460 | 56C | 16 3/8 | 17 3/8 | 10 1/4 | 7 1/4 | 5 1/8 | 11 1/4 | 7 1/4 | 5 1/4 | 26 5/8 | 27 5/8 | 27 5/8 | 28 5/8 | 76.0 | 85.0 | 2.7 | 2.7 |
| CR 5-8 | 3 | 1 | 115/208-230 | 182TC | 18 1/2 | 19 1/2 | 13 3/4 | 8 1/2 | 5 7/8 | 13 3/4 | 8 1/2 | 6 | 32 1/4 | 32 1/4 | 33 1/4 | 33 1/4 | 93.9 | 103.0 | 2.7 | 2.7 |
| | | 3 | 208-230/460 | 182TC | 18 1/2 | 19 1/2 | 11 1/2 | 7 1/4 | 5 1/8 | 12 3/8 | 8 1/2 | 6 | 30 | 30 7/8 | 31 | 31 7/8 | 93.9 | 103.0 | 2.7 | 2.7 |
| CR 5-9 | 3 | 1 | 115/208-230 | 182TC | 19 1/2 | 20 1/2 | 13 3/4 | 8 1/2 | 5 7/8 | 13 3/4 | 8 1/2 | 6 | 33 1/4 | 33 1/4 | 34 1/4 | 34 1/4 | 94.8 | 103.8 | 2.7 | 2.7 |
| | | 3 | 208-230/460 | 182TC | 19 1/2 | 20 1/2 | 11 1/2 | 7 1/4 | 5 1/8 | 12 3/8 | 8 1/2 | 6 | 31 | 31 7/8 | 32 | 32 7/8 | 94.8 | 103.8 | 2.7 | 2.7 |
| CR 5-10 | 3 | 1 | 115/208-230 | 182TC | 20 5/8 | 21 5/8 | 13 3/4 | 8 1/2 | 5 7/8 | 13 3/4 | 8 1/2 | 6 | 34 3/8 | 34 3/8 | 35 3/8 | 35 3/8 | 95.7 | 104.7 | 2.7 | 2.7 |
| | | 3 | 208-230/460 | 182TC | 20 5/8 | 21 5/8 | 11 1/2 | 7 1/4 | 5 1/8 | 12 3/8 | 8 1/2 | 6 | 32 1/8 | 33 | 33 1/8 | 34 | 95.7 | 104.7 | 2.7 | 2.7 |
| CR 5-11 | 5 | 1 | 208-230** | 213TC | 21 5/8 | 22 5/8 | 15 3/8 | 8 1/2 | 7 3/8 | 15 3/8 | 10 5/8 | 7 1/2 | 37 | 37 | 38 | 38 | 102.7 | 111.7 | 2.7 | 2.7 |
| | | 3 | 208-230/460 | 184TC | 21 5/8 | 22 5/8 | 14 1/8 | 7 1/4 | 5 1/8 | 16 | 8 1/2 | 6 | 35 3/4 | 37 5/8 | 36 3/4 | 38 5/8 | 102.7 | 111.7 | 2.7 | 2.7 |
| CR 5-12 | 5 | 1 | 208-230** | 213TC | 22 3/4 | 23 3/4 | 15 3/8 | 8 1/2 | 7 3/8 | 15 3/8 | 10 5/8 | 7 1/2 | 38 1/8 | 38 1/8 | 39 1/8 | 39 1/8 | 103.5 | 112.5 | 2.7 | 2.7 |
| | | 3 | 208-230/460 | 184TC | 22 3/4 | 23 3/4 | 14 1/8 | 7 1/4 | 5 1/8 | 16 | 8 1/2 | 6 | 36 7/8 | 38 3/4 | 37 7/8 | 39 3/4 | 103.5 | 112.5 | 2.7 | 2.7 |
| CR 5-13 | 5 | 1 | 208-230** | 213TC | 23 3/4 | 24 3/4 | 15 3/8 | 8 1/2 | 7 3/8 | 15 3/8 | 10 5/8 | 7 1/2 | 39 1/8 | 39 1/8 | 40 1/8 | 40 1/8 | 104.9 | 115.0 | 2.7 | 3.8 |
| | | 3 | 208-230/460 | 184TC | 23 3/4 | 24 3/4 | 14 1/8 | 7 1/4 | 5 1/8 | 16 | 8 1/2 | 6 | 37 7/8 | 39 3/4 | 38 7/8 | 40 3/4 | 104.9 | 115.0 | 2.7 | 3.8 |
| CR 5-14 | 5 | 1 | 208-230** | 213TC | 24 7/8 | 25 7/8 | 15 3/8 | 8 1/2 | 7 3/8 | 15 3/8 | 10 5/8 | 7 1/2 | 40 1/4 | 40 1/4 | 41 1/4 | 41 1/4 | 107.4 | 116.4 | 3.8 | 3.8 |
| | | 3 | 208-230/460 | 184TC | 24 7/8 | 25 7/8 | 14 1/8 | 7 1/4 | 5 1/8 | 16 | 8 1/2 | 6 | 39 | 40 7/8 | 40 | 41 7/8 | 107.4 | 116.4 | 3.8 | 3.8 |
| CR 5-15 | 5 | 1 | 208-230** | 213TC | 25 7/8 | 26 7/8 | 15 3/8 | 8 1/2 | 7 3/8 | 15 3/8 | 10 5/8 | 7 1/2 | 41 1/4 | 41 1/4 | 42 1/4 | 42 1/4 | 108.8 | 117.8 | 3.8 | 3.8 |
| | | 3 | 208-230/460 | 184TC | 25 7/8 | 26 7/8 | 14 1/8 | 7 1/4 | 5 1/8 | 16 | 8 1/2 | 6 | 40 | 41 7/8 | 41 | 42 7/8 | 108.8 | 117.8 | 3.8 | 3.8 |
| CR 5-16 | 5 | 1 | 208-230** | 213TC | 27 | 28 | 15 3/8 | 8 1/2 | 7 3/8 | 15 3/8 | 10 5/8 | 7 1/2 | 42 3/8 | 42 3/8 | 43 3/8 | 43 3/8 | 110.2 | 119.2 | 3.8 | 3.8 |
| | | 3 | 208-230/460 | 184TC | 27 | 28 | 14 1/8 | 7 1/4 | 5 1/8 | 16 | 8 1/2 | 6 | 41 1/8 | 43 | 42 1/8 | 44 | 110.2 | 119.2 | 3.8 | 3.8 |
| CR 5-18 | 7 1/2 | 1 | 208-230 | 213TC | | 30 1/2 | 15 3/8 | 10 3/8 | 7 1/2 | 15 3/8 | 10 1/4 | 7 1/2 | | | 45 7/8 | 45 7/8 | | 151.7 | | 3.8 |
| | | 3 | 208-230/460 | 215TC | | 30 1/2 | 14 1/2 | 8 1/2 | 5 7/8 | 16 | 8 1/2 | 6 | | | 45 | 46 1/2 | | 151.7 | | 3.8 |
| CR 5-20 | 7 1/2 | 1 | 208-230 | 213TC | | 32 5/8 | 15 3/8 | 10 3/8 | 7 1/2 | 15 3/8 | 10 1/4 | 7 1/2 | | | 48 | 48 | | 154.4 | | 3.8 |
| | | 3 | 208-230/460 | 215TC | | 32 5/8 | 14 1/2 | 8 1/2 | 5 7/8 | 16 | 8 1/2 | 6 | | | 47 1/8 | 48 5/8 | | 154.4 | | 3.8 |
| CR 5-22 | 7 1/2 | 1 | 208-230 | 213TC | | 34 3/4 | 15 3/8 | 10 3/8 | 7 1/2 | 15 3/8 | 10 1/4 | 7 1/2 | | | 50 1/8 | 50 1/8 | | 156.7 | | 3.8 |
| | | 3 | 208-230/460 | 215TC | | 34 3/4 | 14 1/2 | 8 1/2 | 5 7/8 | 16 | 8 1/2 | 6 | | | 49 1/4 | 50 3/4 | | 156.7 | | 3.8 |
| CR 5-24 | 7 1/2 | 1 | 208-230 | 213TC | | 36 7/8 | 15 3/8 | 10 3/8 | 7 1/2 | 15 3/8 | 10 1/4 | 7 1/2 | | | 52 1/4 | 52 1/4 | | 161.3 | | 3.8 |
| | | 3 | 208-230/460 | 215TC | | 36 7/8 | 14 1/2 | 8 1/2 | 5 7/8 | 16 | 8 1/2 | 6 | | | 51 3/8 | 52 7/8 | | 161.3 | | 3.8 |

*TEFC voltage is 115/230 (**230)

[1]Weights and Volumes based on Pump with 3-phase ODP Motor (see price list for individual weights)

# Industrial Application



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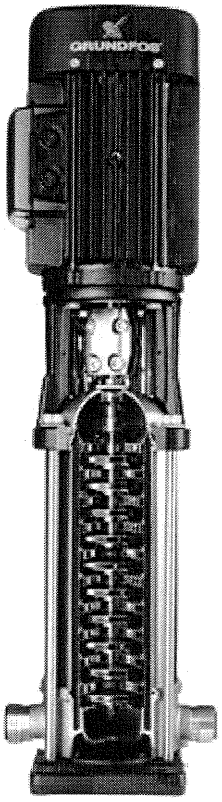

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Grundfoss CRS-20
7.5 HP 3PH TEFC Motor
27.5 GPM @ 513' TDH
(225 PSI)