# ROTARY TWIN GEAR PUMPS

MAKE IN INDIA

DURGA PUMPS®

Model : DRRN

## PUMPING SOLUTIONS
## ANY WHERE | ANY APPLICATION

*"Always Go For Quality"*

Mfgd. By :
**Apollo Mechanical Industries**
Ahmedabad (Guj.) INDIA.

## ADVANCED TECHNOLOGY FOR PUMPING VISCOUS LIQUID

DURGA PUMPS®

### PUMP CHARACTERISTIC

Gear pump is a rotary positive displacement pump with positive pressure characteristic. The capacity of the pump varies directly with speed but remain constant against pressure, however due to running clearance between the casing & impeller some liquid always by passes to suction causing sleep, which depends upon the differential pressure, viscosity of the liquid & ofcourse the workman-ship. The pumps are capable of handling any viscosity, the sleep reduces with viscosity but the viscous power increases. The pump has a self priming capability however some net positive suction head (NPSH) is always required to avoid cavitations depending upon the viscosity of the liquid to be pumped & the pump speed.

### INTERNAL POWER LOSSES

The power losses in rotary pumps are of two types. The mechanical losses is the power necessary to overcome frictional drag of all the moving part within the pump while viscous losses is power required to overcome fluid viscous drag & shearing action of the fluid, this can be computed from the graph on the opposite side.

### H.P. CALCULATION

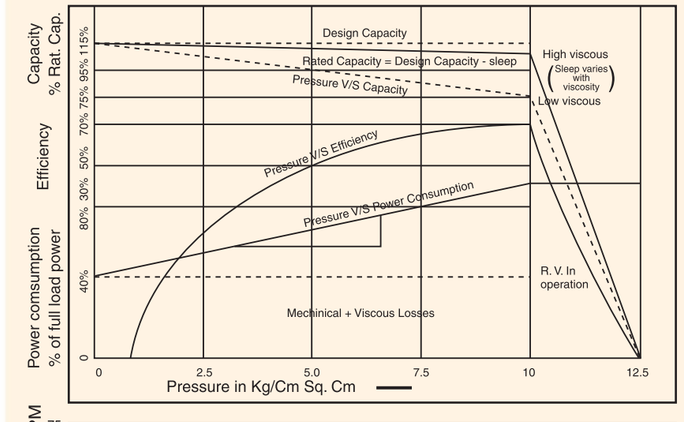
The break horse power required to drive a rotary pump is sum of the theoretical HP & internal power losses. The theoretical horse power is the actual work done in moving the fluid from inlet port to out let pressure condition & is product of Constant C=0.037(capacity-LPM, Pressure kg/cm²) or C=2.3(capacity-GPM, pressure PSI)

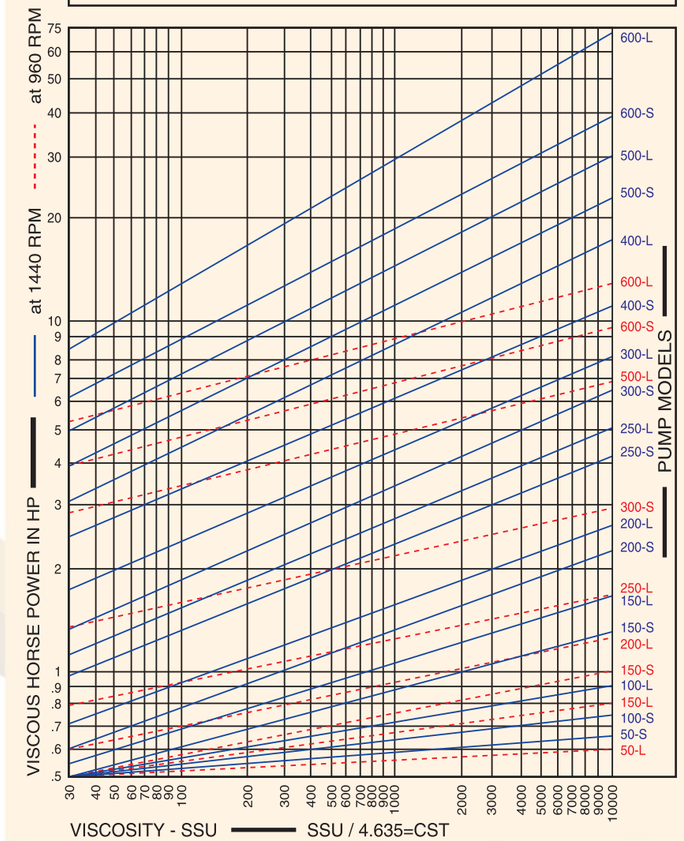
### PUMP SELECTION & USES

The bush bearing type of pump can be used for clean viscous liquid having sufficient lubricating value such as clean lube oil, Vegetable oil, Fish & Animal oil, Gear oil, Glycerine, Hydraulic oil, Honey, ASTM & SAE lubricating oil for intermitting duty. However for continues duty pump with needle roller bearing in **"DRRN"** series should be selected. For liquid having low viscosity, poor lubricating values or Containing dirts or impurities such as Crude oil, Dirty lube oil, HSD, Kerosene, LDO, Paints, Sugar solution, Turpentine, Varnish, Wood Plup, Pump with indepndently lubricated bearing should be selected. For liquid which tends to solidify at room temperature such as Ashphalt, Bituman, Furnace oil, Tar, Cellulose, Starch, LSHS, HPS, Molasses, Naptha, Phenol resin, RFO, Silicate, Soap solution, Viscous, Wax etc. Jacketing construction should be selected to facilitate the heating or the pump by steam or thermic fluid.

### INSPECTION & TESTING

All Pumps are individually tested for its performance as per JIS B-8312-1976.




* All dimensions are in millimeters. Unless otherwise stated, Specifications are subject to change without prior notice as improvements are made from time to time.

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Dealers :

# ADVANCED TECHNOLOGY FOR PUMPING VISCOUS LIQUID

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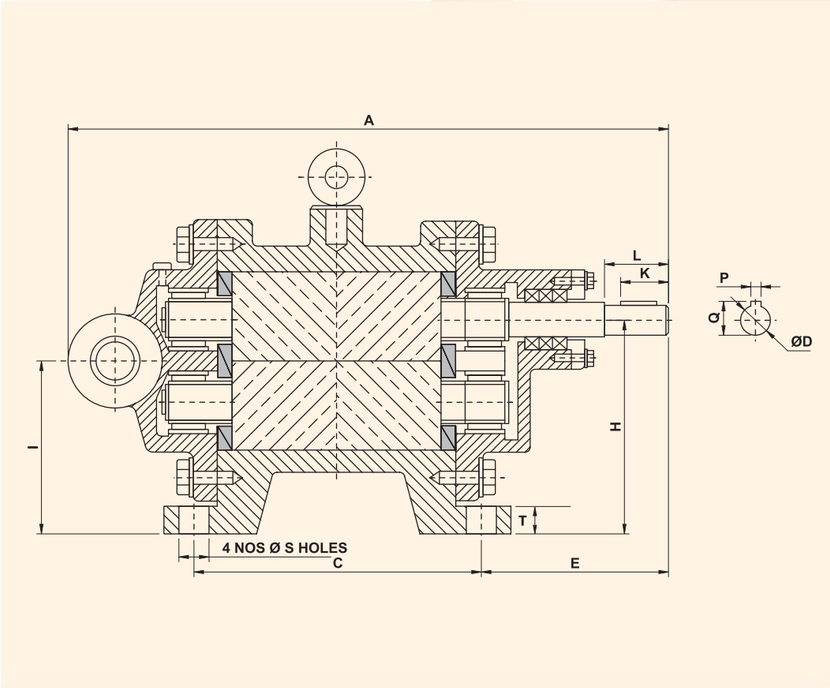
Proven performance & operational economy are prime consideration while evaluating your pumping requirement. When it comes to handling viscous or semi viscous liquids **"DURGA"** rotary gear pump is an obvious choice for the very reasons.

**"DURGA"** rotary gear, twin gear & screw-gear pumps are welknown, widely accepted **"DURGA"** pumps in all the industries for it's efficient performance, operational reliability, compact design & noiseless operation. These pumps have outclassed convenational gear pump & has also broken myth about screw pump offering better overall performance at considerable reduced cost. Many imported gear & screw pump offering better overall performance at considerable reduced cost. Many imported gear & screw pumps are replaced with **"DURGA"** pumps in power stations, steel plants, refineries, oil installation on navy vessels & cargo ship, Popular range of **"DRRN"** series **"DURGA"** rotary screw-gear pumps are redesigned & re-engineered to offer further simplicity with added reliability meeting international standard like API, J1S, DIN & above all, the growing expectations of enlightened customers.

**"DRRN"** series twin gear pump now offer enlarged capacity range with option of self or independently lubricated jacketed or non-jacketed construction with all sizes designed to run at synchronous speed of 4-pole primeover to further reduce the overall cost of the pump set. It will be a wise decision to go for **"DURGA"** rotary twin gear pump even if it amounts to scrapping exisiting pump at your present installation.




## ADVANTAGES

- Herrigbone rotors design eliminate side thrust.
- Modified tooth profile enhances the tooth life.
- Floating gear-design ensures uniform load distribution.
- Low-leakage path by design improve volumetric efficiency.
- Extra thick shaft reduces bending effectively.
- Sleeve on shaft make maintenance economical & easy.

## PARTS LIST WITH MATERIAL OF CONSTRUCTION

| SR. | ITEM | QT. | MATERIAL | SR. | ITEM | QT. | MATERIAL |
|---|---|---|---|---|---|---|---|
| 01 | PUMP CASING | 1 | CI/CS/SS | 12 | R.V. PISTON | 1 | EN-8/SS |
| 02 | FRONT COVER | 1 | CI/CS/SS | 13 | R.V. SPRING | 1 | SPR. ST |
| 03 | BACK COVER | 1 | CI/CS/SS | 14 | R.V.AD. SCREW | 1 | EN-8/SS |
| 04 | GLAND COVER | 1 | CI/CS/SS | 15 | BASE PLATE | 1 | M.S. |
| 05 | ROTARY SHAFT | 1 | EN-9/19/SS | 16 | COUP. GUARD | 1 | ALUMIN. |
| 06 | STATOR SHAFT | 1 | EN-9/19/SS | 17 | COUPLING | 1 | FLEXIBLE |
| 07 | IMPELLER GEAR | 1 | EN-24/SS | 18 | COUP. KEY | 1 | EN-8/SS |
| 08 | NEEDLE BRG. | 4 | INA/IKO | 19 | SEALING SYS. | 2 | OS/MS/GP |
| 09 | WEAR PLATE | 4 | Bronze | 20 | DOWEL PIN | 4 | SILV. ST |
| 10 | LIFTING HOOK | 4 | Steel | 21 | COMP. FLANGE | 2 | MS/SS |
| 11 | R.V. HOUSING | 1 | MAL./RON | 22 | H/T HEX-BOLT | 12 | EN-8/SS |

## AVAILABLE MODEL SIZE & CAPACITY

| SIZE & MODEL | 1440 RPM CAPACITY | | | PUMP GD 2 IN KGM2 | ELE MOTER H.P | FR. SIZE |
|---|---|---|---|---|---|---|
| | LPM | US GPM | M3/HR | | | |
| ½" | 08.30 | 02.20 | 0.50 | 0.0008 | 0.50 | 71M |
| 50 | 16.60 | 04.40 | 1.00 | 0.0009 | 0.75 | 80M |
| S-M-L | 25.00 | 06.60 | 1.50 | 0.0010 | 1.00 | 80M |
| 1" | 33.30 | 08.80 | 2.00 | 0.0007 | 0.75 | 80M |
| 100 | 50.00 | 13.20 | 3.00 | 0.0008 | 1.00 | 80M |
| S-M-L | 60.00 | 15.84 | 3.60 | 0.0009 | 2.00 | 90L |
| 1½" | 83.30 | 22.00 | 5.00 | 0.0008 | 2.00 | 90L |
| 150 | 100.00 | 26.40 | 6.00 | 0.0009 | 3.00 | 100L |
| S-M-L | 125.00 | 33.30 | 7.50 | 0.0032 | 5.00 | 112M |
| 2" | 150.00 | 39.00 | 9.00 | 0.0068 | 3.00 | 100L |
| 200 | 166.00 | 44.00 | 10.00 | 0.0074 | 5.00 | 112M |
| S-M-L | 200.00 | 52.80 | 12.00 | 0.008 | 7.50 | 132S |
| 2½" | 250.00 | 66.00 | 15.00 | 0.01 | 5.00 | 112M |
| 250 | 299.88 | 79.20 | 18.00 | 0.013 | 7.50 | 132S |
| S-M-L | 333.30 | 88.00 | 20.00 | 0.015 | 10.00 | 132M |
| 3" | 415.00 | 105.00 | 25.00 | 0.02 | 10.00 | 132M |
| 300 | 449.82 | 118.00 | 27.00 | 0.024 | 12.50 | 160M |
| S-M-L | 500.00 | 132.00 | 30.00 | 0.027 | 15.00 | 160M |
| 4" | 599.76 | 158.40 | 36.00 | 0.056 | 15.00 | 160M |
| 400 | 666.66 | 176.00 | 40.00 | 0.062 | 20.00 | 160L |
| S-M-L | 833.30 | 220.00 | 50.00 | 0.072 | 25.00 | 180M |
| 5" | 1000.00 | 264.00 | 60.00 | 0.098 | 20.00 | 160L |
| 500 | 1250.00 | 330.00 | 75.00 | 0.112 | 30.00 | 180L |
| S-M-L | 1499.00 | 396.00 | 90.00 | 0.177 | 40.00 | 200L |
| 6" | 1660.00 | 440.00 | 100.00 | 0.27 | 30.00 | 180L |
| 600 | 1832.00 | 484.00 | 110.00 | 0.31 | 50.00 | 225S |
| S-M-L | 2083.00 | 550.00 | 125.00 | 0.335 | 60.00 | 225M |
| 6" | 2499.00 | 660.00 | 160.00 | 0.4561 | 50.00 | 225S |
| 600 | 2915.50 | 770.00 | 175.00 | 0.542 | 75.00 | 280M |
| S-M-L | 3332.00 | 880.00 | 200.00 | 0.601 | 100.00 | 280S |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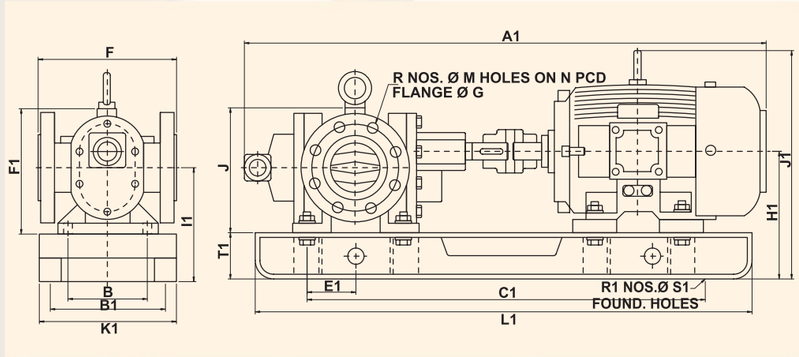
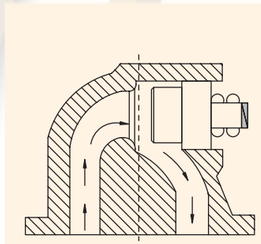
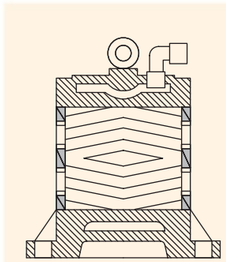
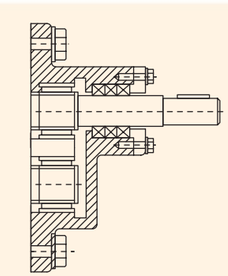


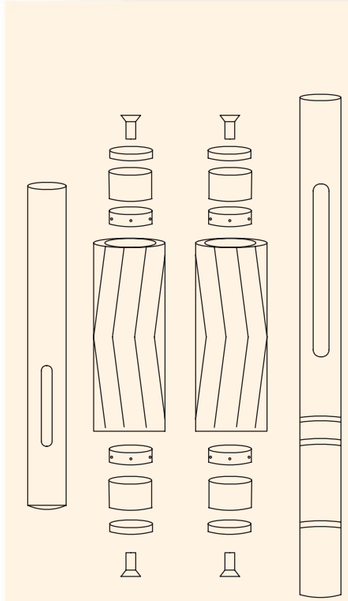
RELIEF VALVE OPERATION



JACKETING CONSTRUCTION



MECHANICAL SEAL IN STUFFING BOX



ROTAR GEAR ASSEMBLY
STATOR GEAR ASSEMBLY

## DIEMENSIONS

| OVERALL | | | | | | MOUNTING | | | | | | | | | | SHAFT | | | FLANGE | | WEIGHT BP-COU PUMP BP-COU IN KG. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A1 | J A | J1 | L1 | K1 | F1 | B C | S S1 | E F | H I | H1 | T1 T | E1 | C1 | B1 | I1 | D R1 | K L | P Q | M N | G R | |
| 503 | 122 | 262 | 500 | 145 | 125 | 80 | 8 | 91 | 80 | 158 | 75 | 37 | 340 | 112 | 147 | 11.5 | 22 | 4 | 16 | 89 | 11.5 |
| 538 | - | 283 | 525 | 170 | 130 | - | - | - | - | 163 | - | 36 | 365 | 125 | 152 | - | - | - | - | - | 8.0 |
| 538 | 239 | 283 | 525 | 170 | 130 | 100 | 15 | 150 | 69 | 163 | 10 | 36 | 365 | 125 | 152 | 40 | 30 | 13 | 60 | 4 | 12.0 |
| 570 | 136 | 288 | 600 | 145 | 139 | 90 | 10 | 100 | 90 | 168 | 75 | 26 | 360 | 120 | 152 | 15 | 25 | 5 | 16 | 108 | 12.2 |
| 570 | - | 288 | 600 | 145 | 139 | - | - | - | - | 168 | - | 26 | 360 | 120 | 152 | - | - | - | - | - | 14.1 |
| 620 | 271 | 315 | 650 | 180 | 146 | 110 | 15 | 160 | 74 | 175 | 10 | 26 | 410 | 140 | 159 | 4 | 30 | 17 | 79 | 4 | 13.1 |
| 667 | 160 | 320 | 625 | 165 | 165 | 105 | 10 | 119 | 100 | 180 | 75 | 30 | 375 | 130 | 160 | 21 | 25 | 6 | 16 | 127 | 14.0 |
| 697 | - | 328 | 750 | 205 | 163 | - | - | - | - | 178 | - | 30 | 500 | 170 | 158 | - | - | - | - | - | 22.5 |
| 742 | 318 | 353 | 750 | 230 | 175 | 130 | 15 | 180 | 80 | 190 | 12 | 26 | 500 | 190 | 170 | 4 | 40 | 23.5 | 98 | 4 | 18.0 |
| 738 | 174 | 340 | 775 | 210 | 177 | 110 | 12 | 133 | 112 | 190 | 75 | 50 | 525 | 170 | 168 | 24 | 39 | 8 | 19 | 152 | 17.5 |
| 783 | - | 353 | 800 | 230 | 177 | - | - | - | - | 190 | - | 65 | 550 | 190 | 168 | - | - | - | - | - | 28.0 |
| 853 | 359 | 398 | 850 | 256 | 197 | 150 | 15 | 200 | 90 | 210 | 14 | 50 | 600 | 216 | 188 | 4 | 50 | 27 | 121 | 4 | 20.8 |
| 842 | 200 | 377 | 800 | 240 | 203 | 130 | 15 | 163 | 132 | 214 | 75 | 35 | 550 | 205 | 184 | 27 | 40 | 8 | 19 | 178 | 18.5 |
| 913 | - | 398 | 900 | 255 | 203 | - | - | - | - | 210 | - | 50 | 650 | 216 | 184 | - | - | - | - | - | 43.0 |
| 953 | 419 | 398 | 950 | 255 | 203 | 160 | 15 | 220 | 106 | 210 | 15 | 50 | 700 | 216 | 184 | 4 | 55 | 30 | 140 | 4 | 22.5 |
| 1015 | 240 | 451 | 1050 | 287 | 243 | 160 | 18 | 168 | 160 | 263 | 100 | 84 | 750 | 240 | 234 | 32 | 49 | 10 | 19 | 190 | 22.0 |
| 1112 | - | 528 | 1100 | 304 | 243 | - | - | - | - | 263 | - | 75 | 800 | 254 | 234 | - | - | - | - | - | 59.0 |
| 1113 | 481 | 528 | 1100 | 304 | 243 | 220 | 19 | 240 | 131 | 263 | 22 | 75 | 800 | 254 | 234 | 4 | 60 | 35 | 152 | 4 | 33.0 |
| 1186 | 274 | 548 | 1200 | 315 | 277 | 180 | 18 | 189 | 180 | 283 | 100 | 58 | 800 | 265 | 248 | 37 | 54 | 10 | 19 | 229 | 40.0 |
| 1231 | - | 548 | 1250 | 310 | 277 | - | - | - | - | 283 | - | 58 | 900 | 254 | 248 | - | - | - | - | - | 82.0 |
| 1296 | 554 | 568 | 1300 | 330 | 277 | 270 | 19 | 280 | 145 | 283 | 25 | 90 | 900 | 279 | 248 | 4 | 65 | 40 | 190 | 8 | 47.2 |
| 1292 | 293 | 603 | 1350 | 300 | 306 | 200 | 19 | 215 | 200 | 338 | 125 | 55 | 950 | 254 | 298 | 47 | 60 | 14 | 22 | 254 | 58.0 |
| 1357 | - | 313 | 1400 | 365 | 296 | - | - | - | - | 328 | - | 125 | 1000 | 300 | 288 | - | - | - | - | - | 150.0 |
| 1447 | 615 | 673 | 1400 | 380 | 296 | 280 | 22 | 300 | 160 | 328 | 25 | 116 | 1000 | 318 | 288 | 4 | 85 | 50.5 | 216 | 8 | 50.5 |
| 1432 | 343 | 643 | 1500 | 305 | 351 | 220 | 20 | 215 | 225 | 358 | 150 | 183 | 1100 | 245 | 311 | 52 | 80 | 16 | 22 | 279 | 50.5 |
| 1608 | - | 728 | 1650 | 420 | 346 | - | - | - | - | 353 | - | 137 | 1150 | 356 | 306 | - | - | - | - | - | 175.0 |
| 1608 | 690 | 728 | 1650 | 420 | 346 | 350 | 22 | 340 | 178 | 353 | 25 | 137 | 1150 | 356 | 306 | 4 | 95 | 56 | 241 | 8 | 76.0 |
| 1667 | 357 | 778 | 1650 | 430 | 360 | 380 | 22 | 230 | 250 | 403 | 150 | 136 | 1150 | 356 | 353 | 57 | 81 | 16 | 22 | 279 | 77.7 |
| 1882 | - | 853 | 1800 | 406 | 406 | - | - | - | - | 433 | - | 126 | 1350 | 457 | 383 | - | - | - | - | - | 190.0 |
| 1882 | 749 | 853 | 1800 | 390 | 390 | 240 | 22 | 360 | 200 | 433 | 28 | 126 | 1350 | 457 | 383 | 4 | 100 | 59 | 241 | 8 | 87.0 |