

# Rotary Gear Pump

## PERFORMANCE TABLE

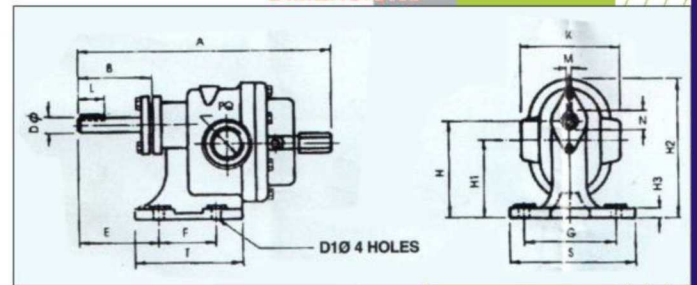
PUMP MODEL	SUCTION & DELIVERY	CAPACITY AT 1440 RPM			RECOMMENDED MOTOR BHP AT DIFFERENTIAL PRESSURE (KG/CM <sup>2</sup> ) WITH 1500 SSU VISCOSITY											WT. OF (APPROX.) BARE PUMP IN KG.
		LPM	US GPM	M <sup>3</sup> /hr	Kg/cm <sup>2</sup>	1	2	3	4	5	6	7	8	9	10	
SV-050	1/2" X 1/2"	20	5.3	1.2	KW	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70	0.75	2.2
					HP	0.5			0.75			1.0				
SV-075	3/4" X 3/4"	30	7.92	1.8	KW	0.37	0.45	0.54	0.62	0.69	0.77	0.85	0.92	1.01	1.09	4.2
					HP	0.75			1.0			1.5				
SV-100	1" X 1"	50	13.2	3.0	KW	0.40	0.50	0.60	0.75	0.89	1.04	1.117	1.30	1.46	1.59	5.0
					HP	1.0			1.5			2.0				
SV-125	1 1/4" X 1 1/4"	75	19.8	4.5	KW	0.7	1.2	1.4	1.5	1.9	1.95	2.15	2.35	2.55	8.0	
					HP	1.5			2.0			3.0				
SV-150	1 1/2" X 1 1/2"	110	29.0	6.6	KW	1.05	1.95	2.10	2.40	2.65	2.95	3.25	3.60	3.75	9.5	
					HP	2.0			3.0			5.0				
SV-200	2" X 2"	225	59.4	13.5	KW	2.0	3.2	3.75	4.3	4.55	5.6	6.2	6.9	7.11	17.2	
					HP	3.0			5.0			7.5				
SV-250	2 1/2" X 2 1/2"	350	92.5	21.0	KW	4.15	6.1	7.3	8.2	9.1	10.3	11.2	12.1	12.25	28.5	
					HP	5.0			10.0			12.5				
SV-300	3" X 3"	500	131.6	30.0	KW	4.5	8.4	9.9	11.1	12.1	13.0	13.9	14.9	15.9	40.0	
					HP	10			15			20				

### MATERIAL OF CONSTRUCTION

PART	STANDARD
Body	IS.210 FG 220 C.I. Grade
Back Cover	IS.210 FG 220 C.I. Grade
Gears	EN-8
Shaft	SAE-8620 H.G.
Bearing	Non Ferrous
(Bushes)	
Seal	Neoprene oil seal

Pressure relief valve will be provided in all models

### DIMENSIONS



MODEL	A	B	E	F	G	S	T	H	H1	H2	H3	L	M	N	D0	D10	K	PQ
SV-050	172	46	51	40	70	90	70	63	50	90	6	22	4	13.5	12	8	70	1/2" B.S.P.
SV-075	215	54	63.5	45	85	110	80	80	66	115	8	25	5	16.0	14	10	90	3/4" B.S.P.
SV-100	236	64	64.5	50	93	125	95	90	73	128	8	27.5	5	19.5	17	10	86	1" B.S.P.
SV-125	266	70	65	60	105	140	110	100	79	140	10	32	6	22.5	20	12	100	1 1/4" B.S.P.
SV-150	290	75	80	70	115	150	130	110	88	155	12	35	6	24.5	22	12	108	1 1/2" B.S.P.
SV-200	360	98	92	100	140	180	160	132	105	192	15	40	8	28	25	15	142	2" B.S.P.
SV-250	420	110	110	120	155	200	185	145	114	215	18	45	8	31	28	17	160	2 1/2" B.S.P.
SV-300	455	125	120	140	180	235	205	160	124	235	20	50	8	33	30	17	170	3" B.S.P.

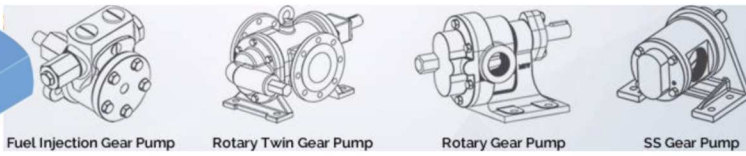
All dimensions are in millimetres. Unless otherwise stated specification are subject to change without prior notice as improvements are made from time to time

CONVERSION: 1 Imperial gallon = 4.5Liters      1U.S. Gallon = 3.78Liters      1P.S.I. = 2.31Feet  
1Kg/Cm<sup>2</sup> = 14.2P.S.I      1Meter = 3.28Feet

contact: 09825277037, 079-22136360, 22134619

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## Fuel Injunction Gear Pump ( FIG )

PUMP MODEL	SUC. & DEL.	CAP. IN LPH AT 1440 RPM	PRESSURE k/g Cm <sup>2</sup>	RECOMMENDED HP. 3 k/gCm <sup>2</sup> 30kg/Cm <sup>2</sup>		
FIG-S05	FIG-S05BT	3/8	50	0 - 30	0.25	1.00
FIG-S08	FIG-S08BT	3/8	80	0 - 30	0.25	1.00
FIG-S15	FIG-S15BT	1/2	150	0 - 30	0.25	1.50
FIG-S30	FIG-S30BT	1/2	300	0 - 30	0.25	1.50
FIG-S45	FIG-S45BT	1/2	450	0 - 30	0.25	2.00
FIG-S60	FIG-S60BT	1/2	600	0 - 30	0.25	2.00
FIG-S100	FIG-S100BT	3/4	1000	0 - 30	0.75	3.00
FIG-S150	FIG-S150BT	3/4	1500	0 - 30	0.75	3.00
FIG-S200	FIG-S200BT	3/4	2000	0 - 30	0.75	5.00
FIG-S250	FIG-S250BT	3/4	2500	0 - 30	0.75	5.00
FIG-S300	-	1"	3000	0 - 30	1.50	7.50
FIG-S450	-	1"	4500	0 - 30	1.50	10.00
FIG-S600	-	1"	6000	0 - 30	1.50	15.00

- Normal flow at 1440 r.p.m. or 2880 r.p.m. with oil viscosity 32 Cst. At 37.5C at normal working temperature and 10 kg/cm pressure.
- Min. viscosity 5 cst.
- Max. viscosity 450 cst.
- Max liquid temperature 200c.
- Capacity/range. 50/6000 LPH. max pressure 30kg/cm.
- The pressure and flow indications are to be considered as basic value. They change with different pipe diameter, length or oil viscosity.
- Direction of rotation clockwise=R, anti-clockwise=L looking from shaft end.

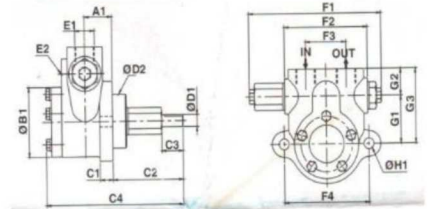
**ADVANTAGES:**

- Pump barrel made of hydraulic cast-iron.
- Gear made of hing quality steel.
- Self inducing.
- With internal bypass.
- Pressure regulator, progressively adjustable.
- Simple attachment with a flange.
- Tight shaft-seal.
- Turning direction to the right or left 1440 or 2880 r.p.m.
- Different mounting position with shaft horizontally or vertically with seal at the bottom.
- Vacuum, pressure and control connections easy to reach.

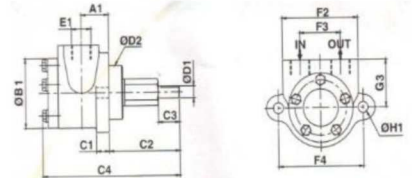
**USES(Applications):**

- Oil burner, hydraulic drive and pressure-pump.
- Pressure and transfer pump.
- Booster pump for diesel locomotion.
- Pump for force feed lubrication.
- Eventually with separate pressure regulating valves.
- For gas oil, medium, heavy and vary heavy oil.
- Filter pumping.
- Pump for PHF units.
- Pump for motor-pump group with flange and coupling parts.

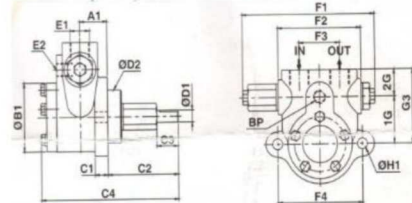
•F01.... Pump With Pressure Relifef Valve & Internal By-pass



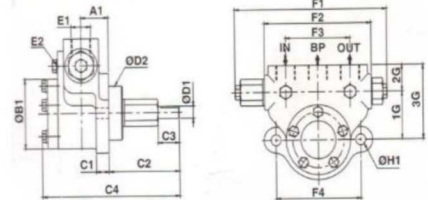
•F02.... Pump without pressure Relief Valve



•F03.... Pump with pressure Relief Valve & External By-pass



•F04.... Pump With Pressure Relifef Valve & External top By-pass



- Pump For lubrication oil and hydraulic oil.
- Pump suitable for LDO, FO, HSD & LSHS

Note: as improvement are made from time to time the specification in this bulletin are subject to alteration without notice.

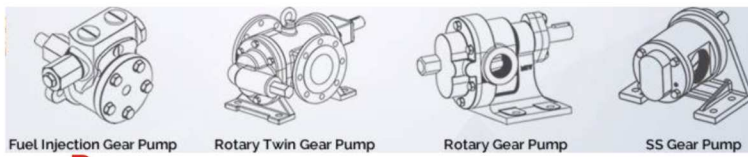
MODEL	CAP. IN LPH AT 1440 RPM	Ø B1	C1	C2	C3	C4	Ø D1	Ø D2	Ø D3	BSP E1	BSP E2	F1	F2	F3	F4	G1	G2	G3	Ø H1	
FIGS-F01	50-80	20	51	14	76	20	132	12	54	80	3/8	-	139	90	38	92	40	27	67	11
FIGA-F01	150-600	30	70	14	76	23	146	12	54	80	1/2	-	143	90	44	92	48	27	75	11
FIGA-F01	150-600	30	70	14	76	23	146	12	54	80	1/2	-	143	82	44	92	48	-	43	11
FIGA-F01	150-600	30	70	14	76	23	146	12	54	80	1/2	1/4	143	90	44	92	48	27	75	11
FIGB-F01	1000-2500	38	96	15	124	29	211	18	60	100	3/4	-	162	118	67	120	55	35	90	13
FIGB-F01	1000-2500	38	96	15	124	29	211	18	60	100	3/4	-	118	67	120	-	-	65	13	13
FIGB-F01	1000-2500	38	96	15	124	29	211	18	60	100	3/4	3/8	162	118	67	120	55	35	90	13
FIGA-BT	150-600	30	70	14	76	23	146	12	54	80	1/2	1/4	165	116	70	92	45	27	72	11
FIGB-BT	1000-2500	38	96	15	124	29	211	18	60	100	3/4	3/8	194	150	100	120	65	40	105	13
FIGC-F01	3000-6000	85	115	18	127	37	275	22	30	120	1"	-	211	150	80	150	80	40	120	15

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# Rotary Gear Pump



## MOTOR PUMP ASSEMBLY

Motor pump assembly is used for oil lubrication especially where continuous and high dosage of oil is required. It is also applied under oil circulation systems. It is used almost in all machines where free flow of oil is required. The also applied under oil circulation systems. It is used almost in all machines where free flow of oil is required. The different specification is available with different model. It can suck the oil from 2 ft. downwards and circulate the oil up to 10 ft. Height. The rotation of motor pump assembly is indicated on the label. Four mounting holes are provided to mount the system. An electrical terminal box on the surface of the motor is provided for connection.

### Technical Specification



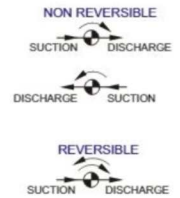
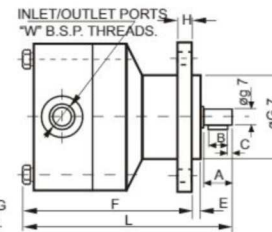
MODELS	Discharge	Max. Pressure	MOTOR Flange Mounted
HVA-1	1 Litres per minute	15Kg/Cm <sup>2</sup>	0.25 HP 415V. AC1500rpm.
HVA-3	3 Litres per minute	15Kg/Cm <sup>2</sup>	0.25 HP 415V. AC1500rpm.
HVA-6	6 Litres per minute	10Kg/Cm <sup>2</sup>	0.50 HP 415V. AC1500rpm.
HVA-10	10 Litres per minute	10Kg/Cm <sup>2</sup>	0.50 HP 415V. AC1500rpm.

ROTARY PUMPS are gerotor type pumps with positive displacement of oil. On the basis of construction they are of two types, flange type and insert type. Function wise these pumps can be classified into two types non reversible and reversible. Non reversible pumps are rotates only on one direction indicated by an arrow where as the reversible pumps are rotates on either direction, clock-wise and anti-clock-wise.

### FLANGE TYPE ROTARY PUMPS (Non Reversible / Reversible)



Dimension ' $\varnothing D^*$ ' for reversible pumps



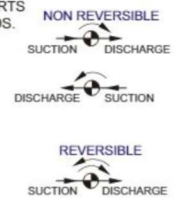
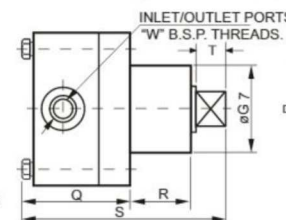
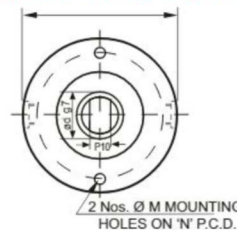
#### Dimensions in mm

MODEL	Discharge at 1500 RPM	A	B	C	$\varnothing D / \varnothing D^*$	$\varnothing d$	E	F	$\varnothing G$	H	J	K	L	M	N	"W" in BSP
HV-0.5	0.5 LPM	16	12	2	50 / 60	7	2	55	30	5	9	2	71	5	39	1/8
HV-1	1 LPM	22	16	3	60 / 70	10	2	70	35	7	11.5	3	95	6.5	47.5	1/4
HV-3	3 LPM	22	16	3	60 / 70	10	2	75	35	7	11.5	3	100	6.5	47.5	1/4
HV-6	6 LPM	30	18	6	80 / 92	12	3	95	45	10	14	4	130	8.5	65	1/4-3/8
HV-10	10 LPM	30	18	6	80 / 92	12	3	105	45	10	14	4	140	8.5	65	1/4-3/8
HV-16	16 LPM	40	25	7	115 / 135	14	4	120	65	14	16	5	150	9	95	1/2"

### INSERT TYPE ROTARY PUMPS (Non Reversible / Reversible)



Dimension ' $\varnothing D^*$ ' for reversible pumps



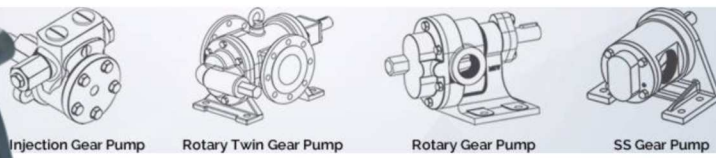
#### Dimensions in mm

MODEL	Discharge at 1500 RPM	$\varnothing D / \varnothing D^*$	$\varnothing d$	$\varnothing G$	M	N	P	Q	R	S	T	"W" in BSP
HV-1	1 LPM	60 / 70	10	35	6.5	47.5	6	48	24	83	10	1/4
HV-3	3 LPM	60 / 70	10	35	6.5	47.5	6	53	24	88	10	1/4
HV-6	6 LPM	80 / 92	12	45	8.5	65	7	65	33	103	12	1/4-3/8
HV-10	10 LPM	80 / 92	12	45	8.5	65	7	75	33	122	12	1/4-3/8

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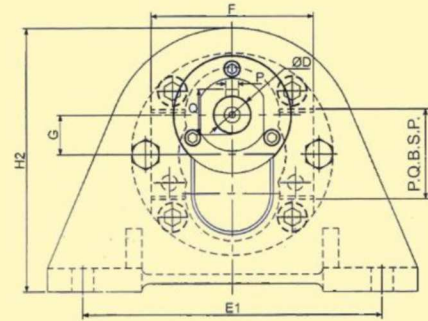
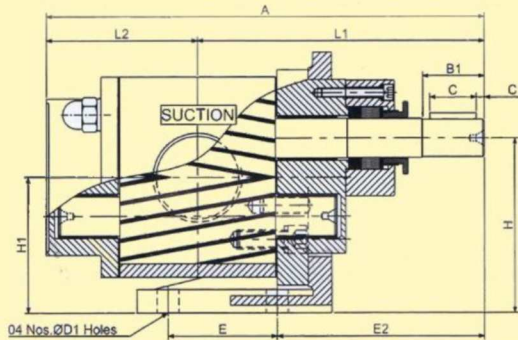
# Stainless Steel Rotary Gear Pump

## ADVANCED TECHNOLOGY FOR PUMPING VISCOUS LIQUID

SV Industries brand gear pump model "SVSS" Which is self priming bi-directional, positive displacement rotary pump in all stainless steel (SS-316) investment casting construction with nitrided gear/shaft & dry-teflon coated DU bush bearing requiring no lubrication. These pump in three piece construction are easily cleanable and maintainable. The back cover can simply be removed by four dom nut or the right angle mounting brackets facilitate foot mounting of the pump on base plate with electric motor appropriate ratings.

### MATERIAL OF CONSTRUCTION

- ★ Pump Body : CF8M-S.S.316
- ★ Front Cover: CF8M-S.S.316
- ★ Back Cover: CF8M-S.S.316
- ★ Gland Cover:CF8M-S.S.316
- ★ R.H & L.H. Gear: ASIS - S.S.316
- ★ Rotor / Stator Shaft: ASIS - S.S.316
- ★ Bush Bearings: Teflon Coated 'DU'
- ★ Mounting Bracket: C.I.Gr. - 20 IS 210
- ★ Dom Nut :ASIS - S.S.316
- ★ Sealing: "Z" Pack teflon
- ★ Packing : Teflon Sheet
- ★ Key for Coupling: AISI S.S. 316



### MODEL & POWER CHART

PUMP MODEL SVSS	SUCTION & DELIVERY	CAPACITY at 1440 RPM			POWER REQ. NOLOAD VISCOS.H.P.at			Unit H.P per Kg. press	PUMP DIMENSION												WT. OF PUMP IN KG.		
									OVER ALL						MOUNTING & SHAFT								
									LPM	US GPM	M3/hr	200 CST	500 CST	750 CST	A	F G	H2	L1	L2	E		E1	E2
015	1/8" X 1/8"	5.0	1.3	0.3	0.14	0.18	0.30	0.015	123	54	101	91	32	40	120	90	63	50.5	11.5	17	4	25	1.80
025	1/4 X 1/4"	8.3	2.2	0.5	0.20	0.25	0.35	0.02	129	12.5	101	94	35	40	120	90	63	50.5	8	3	13	25	2.00
040	3/8" X 3/8"	16.6	4.4	1.0	0.35	0.40	0.55	0.04	134	61	112	98	36	50	120	88	71	57	11.5	17	4	25	3.00
050	1/2" X 1/2"	25	6.6	1.5	0.40	0.50	0.70	0.06	146	14	112	103	41	50	120	88	71	57	8	3	13	25	3.50
075	3/4" X 3/4"	33.3	8.8	2.0	0.45	0.55	0.90	0.09	160	72.5	128	123	46	55	140	92	90	73	14	25	5	35	4.50
100	1" X 1"	50	13.2	3.0	0.50	0.60	1.0	0.13	177	17	128	115	52	55	140	92	90	73	10.5	3	16	35	5.00
125	1 1/4" X 1 1/4"	100	26.4	6.0	0.65	0.85	1.25	0.28	210	90	149	143	66	50	155	111	100	79	18	30	6	38	7.00
150	1 1/2" X 1 1/2"	125	33.0	7.5	0.75	0.95	1.50	0.35	225	21	149	151	73	50	155	111	100	79	12	3	20.5	38	10.50
200	2" X 2"	150	39.6	9.0	0.90	1.15	1.75	0.45	251	103	167	162	85	70	190	131	112	87	24	30	8	40	20.50
200		200	52.8	12.0	1.00	1.25	2.15	0.60	281	25	167	179	97	70	190	131	112	87	14	5	27	40	24.00
250	2 1/2" X 2 1/2"	250	66.0	15.0	1.20	1.40	2.35	0.65	299	122	197	206	93	85	200	161	132	102	28	40	8	50	35.00
250		300	79.25	18.0	1.40	1.65	2.50	0.77	319	30	197	218	101	85	200	161	132	102	16	5	32	50	40.00

### MODEL & POWER CHART

For calculating the power requirement at duty point, multiply the duty point pressure with unit horse power & add no load viscous power of appropriate viscosity, provide safety margin before fixing the rating of the prime mover. for higher viscosity further margin may be kept or the manufacturer may be consulted. All sizes of "SVSS" pumps are designed to run at 1440 RPM up to viscosity of 500 CST. For small Size pump up to 1" same can be safely run at 1440 RPM even at higher viscosity up to 1000 CST with additional horse power. For Size above 1" reduce the speed to 960 RPM for viscosity up to 1000 CST. For higher Viscous liquids, consult the manufacturer to avoid cavitation & over loading problem

### MODEL & POWER CHART

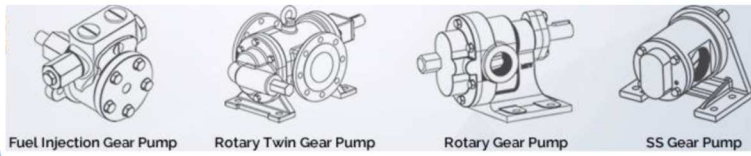
This compact and efficient SS pump can be used for handling viscous food Products like Ghee, Butter, Fruit Pulp, Vegetable Sauce, Starch etc. They are also used in Pharmaceutical industries for handling sugar solution, glycerine, glycol etc. In chemical industries corrosive viscous chemicals can be easily handled with this pump most effectively.

contact: 09825277037, 079-22136360, 22134619

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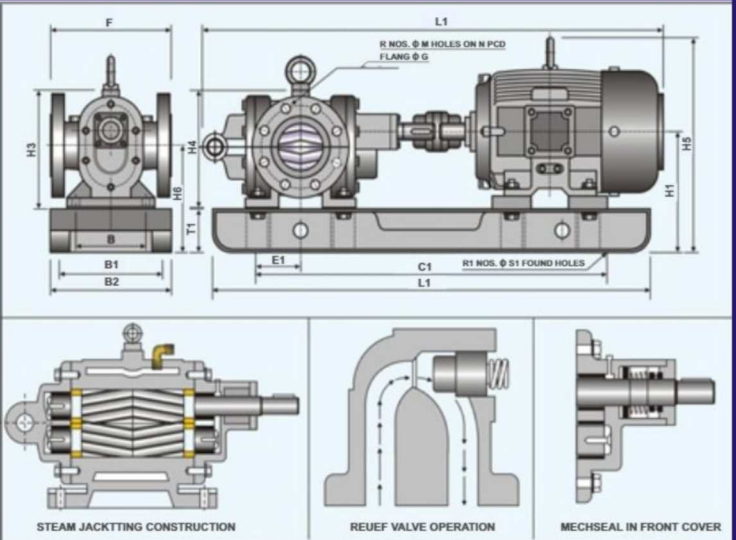
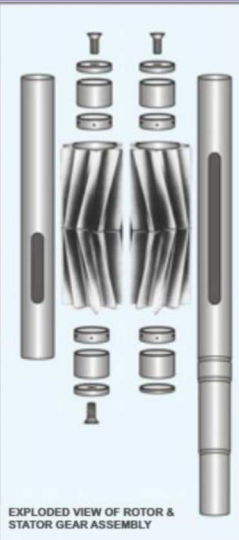
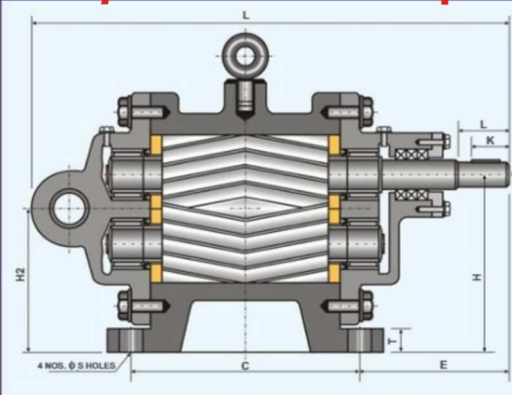






# Rotary Twin Gear Pump

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	BASET PLAE	1	M.S
05	ROTOR SHAFT	1	EN9/19/SS	16	COUP. GUARD	1	ALUMN.
06	STATOR SHAFT	1	EN9/19/SS	17	COUPLING	1	FLEXIBLE
07	IMPELLER GEAR	1	EN-24/SS	18	COUP. KEY	1	EN-8/SS
08	NEEDLE BEARING	4	INAVIKO	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	MALIRON	22	H/T. HEX BOLT	12	EN-8/SS



AVAILABLE MODEL SIZE & CAPACITY						
MODEL & SIZE	CAPACITY AT 1440 RPM			ELE MOTOR H.P	FR. SIZE	PUMP GD2 IN KGM2
	LPM	US GPM	M3/HR			
50 S	08.30	02.20	0.50	0.50	71 M	0.0008
M	16.60	04.40	1.00	0.75	80 M	0.0009
1/2" L	25.00	06.60	1.50	1.00	80 M	0.0010
100 S	33.30	08.80	2.00	0.75	80 M	0.0007
M	50.00	13.20	3.00	1.00	80 M	0.0008
1" L	60.00	15.84	3.60	2.00	90 L	0.0009
150 S	83.30	22.00	5.00	2.00	90 L	0.0028
M	100.00	26.40	6.00	3.00	100 L	0.0029
1 1/2" L	125.00	33.30	7.50	5.00	112 M	0.0032
200 S	150.00	39.00	9.00	3.00	100 L	0.0068
M	166.00	44.00	10.00	5.00	112 M	0.0074
2" L	200.00	52.80	12.00	7.50	132 S	0.008
250 S	250.00	66.00	15.00	5.00	112 M	0.010
M	299.88	79.20	18.00	7.50	132 S	0.013
2 1/2" L	333.30	88.00	20.00	10.00	132 M	0.015
300 S	415.00	105.00	25.00	10.00	132 M	0.02
M	449.82	118.00	27.00	12.50	160 M	0.024
3" L	500.00	132.00	30.00	15.00	160 M	0.027
400 S	599.76	158.40	36.00	15.00	160 M	0.056
M	666.66	176.00	40.00	20.00	160 L	0.062
4" L	833.30	220.00	50.00	25.00	180 M	0.072
500 S	1000.00	264.00	60.00	20.00	160 L	0.098
M	1250.00	330.00	75.00	30.00	180 L	0.112
5" L	1499.00	396.00	90.00	40.00	200 L	0.177
600 S	1660.00	440.00	100.00	30.00	180 L	0.270
M	1832.60	484.00	110.00	50.00	225 S	0.310
6" L	2083.00	550.00	125.00	50.00	225 M	0.355
600 S	2499.00	660.00	150.00	50.00	225 S	0.4561
M	2915.50	770.00	175.00	75.00	250 M	0.542
6" L	3332.00	880.00	200.00	100.00	280 S	0.601

EXPLODED VIEW OF ROTOR & STATOR GEAR ASSEMBLY

STEAM JACKETTING CONSTRUCTION

REUFF VALVE OPERATION

MECHSEAL IN FRONT COVER

DIEMENSIONS																				WEIGHT BP-COU PUMP BP-COU IN KG.	
OVERALL						MOUNTING						SHAFT				FLANGE					
A1	J A	J1	L1	K1	F1	B C	S S1	E F	H I	H1	T1 T	E1	C1	B1	II	D R1	K L	P Q	M N	G R	
503	122	265	500	145	125	80	8	91	80	158	75	37	340	112	147	11.5	22	4	16	89	11.5
538	-	285	525	170	130	-	-	163	-	163	-	36	365	125	152	-	-	-	-	-	9.00
538	239	285	525	170	130	100	15	150	68	163	10	36	365	125	152	4	30	13	60	4	12.00
570	136	285	600	145	139	90	10	100	90	168	75	26	360	120	152	15	25	5	16	109	12.2
570	-	285	600	145	139	-	-	168	-	168	-	26	360	120	152	-	-	-	-	-	10.0
620	271	315	650	180	146	100	15	160	74	175	10	26	410	140	159	4	30	17	79	4	13.1
667	160	315	625	165	167	105	10	119	100	180	75	30	375	130	160	21	25	6	16	127	14.0
697	-	328	750	205	165	-	-	178	-	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	58	4	19.0
738	174	346	775	210	176	110	12	133	112	190	75	50	525	170	168	24	39	8	19	152	17.5
738	-	351	800	230	176	-	-	-	-	210	-	65	550	190	168	-	-	-	-	-	23.00
853	369	396	850	256	198	150	15	200	90	214	14	50	600	216	188	4	50	27	121	4	20.8
842	200	376	800	240	283	130	15	163	132	210	75	35	605	205	194	27	40	8	19	179	18.5
913	-	298	900	255	203	-	-	-	-	210	-	50	650	218	194	-	-	-	-	-	43.00
953	419	398	950	255	203	160	15	220	106	263	15	50	700	218	184	4	58	30	140	4	22.5
1015	240	449	1050	287	245	160	18	168	160	263	100	84	750	240	234	32	49	10	19	190	22.0
1113	-	473	1100	304	285	-	-	-	-	263	-	75	800	254	234	-	-	-	-	-	59.00
1113	481	523	1100	304	245	220	19	240	131	263	22	75	800	254	234	4	60	35	162	4	33.00
1185	274	523	1200	315	278	180	18	189	180	283	100	58	800	265	248	37	54	10	19	229	40.0
1231	-	559	1250	310	278	-	-	-	-	283	-	58	900	254	248	-	-	-	-	-	82.0
1296	564	559	1300	330	278	270	19	280	145	283	25	90	900	279	248	4	65	40	190	8	47.2
1292	293	568	1350	300	305	200	19	215	200	338	125	55	950	254	298	47	60	14	22	254	58.0
1357	-	539	1400	365	297	-	-	-	-	328	-	125	1000	300	298	-	-	-	-	-	150.0
1447	615	672	1400	380	297	280	22	300	160	328	25	116	1000	318	298	4	85	50.5	215	8	50.0
1432	343	642	1500	305	352	220	20	215	225	358	150	183	1100	245	311	52	80	16	22	279	50.5
1608	-	723	1650	420	348	-	-	-	-	353	-	137	1150	356	306	-	-	-	-	-	175.0
1608	690	728	1650	430	348	350	22	340	178	353	25	137	1150	356	306	4	95	56	241	8	76.0
1667	367	778	1650	430	358	240	22	231	250	403	150	136	1150	356	353	57	81	16	22	279	77.7
1882	-	853	1800	480	435	-	-	-	-	433	-	126	1350	457	393	-	-	-	-	-	190.0
1882	749	853	1850	530	390	380	22	360	200	433	28	126	1350	457	393	4	100	59	241	8	87.00