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benzlers 

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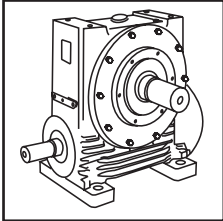
Roloid Gear Pump



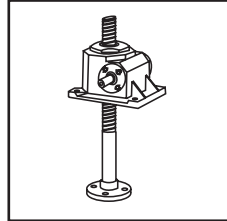
Gear Pump
CRP-2.01GB1501

PRODUCTS IN THE RANGE

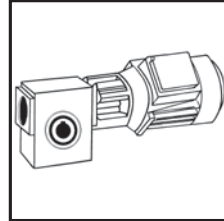
Serving an entire spectrum of mechanical drive applications from food, energy, mining and metal; to automotive, aerospace and marine propulsion, we are here to make a positive difference to the supply of drive solutions.



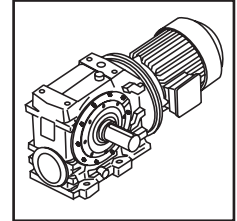
Series A
Worm Gear units
and geared motors
in single & double
reduction types



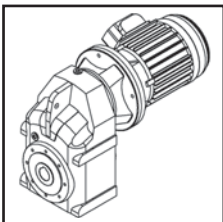
Series BD
Screwjack worm
gear unit



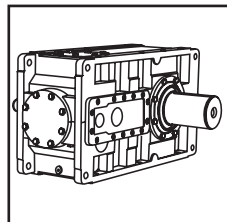
Series BS
Worm gear unit



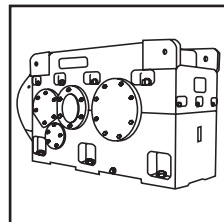
Series C
Right angle drive
helical worm geared
motors & reducers



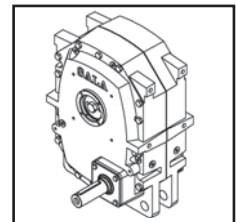
Series F
Parallel angle helical
bevel helical geared
motors & reducers



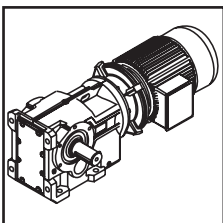
Series G
Helical parallel shaft
& bevel helical right
angle drive gear
units



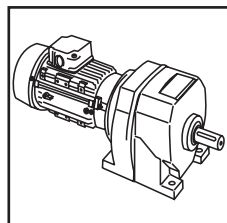
Series H
Large helical parallel
shaft & bevel helical
right angle drive units



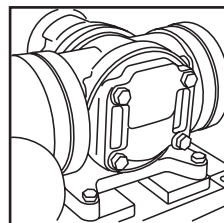
Series J
Shaft mounted
helical speed
reducers



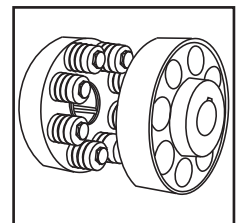
Series K
Right angle helical
bevel helical geared
motors & reducers



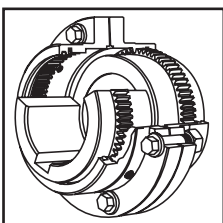
Series M
In-line helical geared
motors & reducers



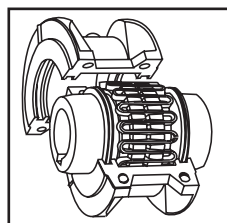
Roloid Gear Pump
Lubrication and fluid
transportation pump



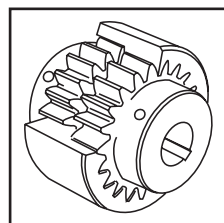
**Series X
Cone Ring**
Pin and bush
elastomer coupling



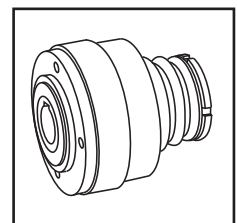
**Series X
Gear**
Torsionally rigid,
high torque coupling



**Series X
Grid**
Double flexing steel
grid coupling



**Series X
Nylon**
Gear coupling with
nylon sleeve



**Series X
Torque Limiter**
Overload protection
device



We offer a wide range of repair services and many years experience of repairing demanding and highly critical transmissions in numerous industries.

We can create custom engineered transmission solutions of any size and configuration.

ROLOID GEAR PUMP

EXPLANATION & USE OF RATINGS & SERVICE FACTORS

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ROLOID GEAR PUMP

INTRODUCTION

The Roloid Gear Pump is robust, compact and versatile. It is easy to install, extremely reliable, and requires little maintenance during service.

The pump design and product range have matured over many years and in combination with Radicon excellence, represents an economic and reliable solution to lubrication and fluid transportation requirements.

Roloid Gear Pumps are suitable for pumping a wide variety of liquids which have some lubricating property.

Our application engineers will gladly assist in selecting a pump that will give trouble free operation.

Roloid Gear Pumps Can Be Used For Lubrication Of:

- Engines
- Compressors
- Gearboxes
- Rolling Mills
- Machine Tools
- Process Plant
- Pumping Sets
- Turbines

Roloid Gear Pumps Can Be Used For Pumping The Following Liquids:

- Fuel Oils
- Open Circuit Servo
- Quenching
- Cutting and Cooling Fluids
- Oil/Water Emulsions
- Viscous Vegetable and Animal Fats
- Bitumen
- Wax
- Paint
- Lacquers
- Viscose

Features

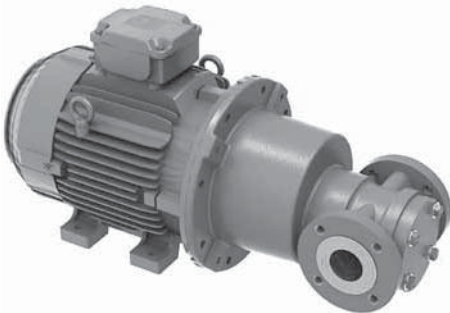
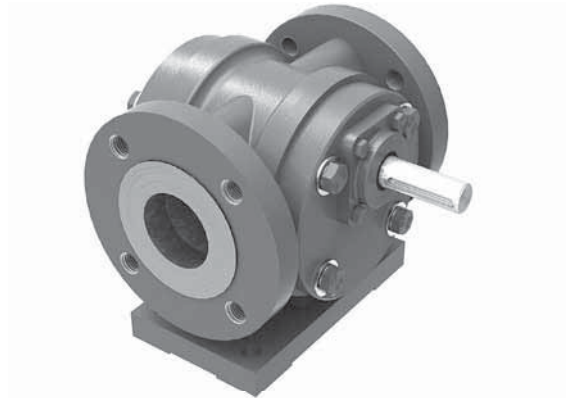
- Double helical rotors for low noise and non pulsating flow.
- Accurate manufacture of rotors and housings for high efficiency, providing self priming and discharge pressures up to 20 bar.
- Robust journal roller bearings for long life and durability.
- Designed to rotate in either direction.
- Numerous attachments accessories and materials variants available for special orders. Motorised bracket base and flange mounted or pumps are available as standard.
- Housing motor or special baseplate or tank top designs are available.
- Special baseplate or tank top designs are available on request.

ROLOID GEAR PUMP

AVAILABLE PUMP VARIATIONS

Base Mounted Unit

The Base Mounted Roloid Gear Pump is available as standard in 7 sizes (90 to 25) giving output flow rates between 3.9L/min to 1052L/min, A further 2 sizes (20 and 15) are available upon special request for achieving flow rates up to 2546L/min. All pumps come as standard with Ansi B16.5 Class 150 connection flanges and a base plate to give secure mounting to a flat surface.

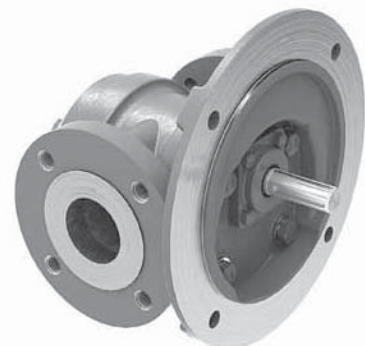


Motor Mounted Unit

The Motor Mounted Roloid Gear Pump is available as standard in 7 sizes (90 to 25) giving output flow rates between 3.9L/min to 1052L/min using IEC Motor frame sizes Between 90 and 250. A further 2 sizes (20 and 15) are available upon special request for achieving flow rates up to 2546L/min. All pumps come as standard with Ansi B16.5 Class 150 connection flanges. The Motor Mounted Unit comes as an enclosed unit and utilises the motor feet to mount the unit on a flat surface. A motor ready option is also available to allow the end user to fit a specific motor of their choice.

Flange Mounted Unit

The Flange Mounted Roloid Gear Pump is available as standard in 7 sizes (90 to 25) giving output flow rates between 3.9L/min to 1052L/min, A further 2 sizes (20 and 15) are available upon special request for achieving flow rates up to 2546L/min. All pumps come as standard with Ansi B16.5 Class 150 connection flanges and is designed to be mounted directly to machinery using the IEC Sized input flange.



ROLOID GEAR PUMP

PRODUCT AND APPLICATION INFORMATION

HST 'T' RANGE ROLOID PUMPS

HST Unit

The HST Roloid Gear Pumps are available in 3 out of the 7 sizes (50, 40 & 30). They are an enhanced version of the standard gear pump with their design specifically engineered and manufactured for the arduous requirements of lubrication systems used for refrigeration compressors. The HST models cover flow rates between 28L/min to 608L/min and are designed to be configured as either base mounted, motor mounted or flange mounted. HST units come with input and output flanges made to ANSI B16.5 class 150

Design and Manufacturing Specifications

Sealing

Mechanical seals and 'O' rings are used due to high inlet pressures and to resist the corrosive nature of the refrigerant gasses.

Bearings

Special bearing arrangement - incorporating taper roller bearings to accommodate high thrust loads encountered due to high inlet pressures. All bearings are steel caged.

Copper-based Alloys

To achieve compatibility with the refrigerant gasses entrained in the lubrication oil, no copper or copper-based alloys are used in the construction of the pump.

Testing

All 'HST' pumps are hydrostatically tested at up to double the operating pressures to ensure reliable, leak-free operation.

Selection Guidelines - HST Roloid Pumps

In all cases selection of HST pumps should be referred to our application engineers.

API ROLOID PUMP ASSEMBLIES

Background

Special API Roloid pump assemblies are order pumps designed to meet the exacting standards of API 676 specification, the API version of the Roloid Pump is a special adaption of the HST range of pumps and shares the same extensive features and benefits.

Housings

All housings are manufactured from high quality steel.

Flanges

Flange interfaces conform to ANSI B16.5 class 150 standards.

Configuration

The pump assembly is baseplate mounted, with motor, coupling and guard. Membrane type couplings are used to facilitate replacement of the coupling without disturbing the pump or motor.

Sealing

Mechanical seals to API 614.

Bearings

All bearings selected to give in excess of 25,000 hours L10 life.

Quality Control & Documentation

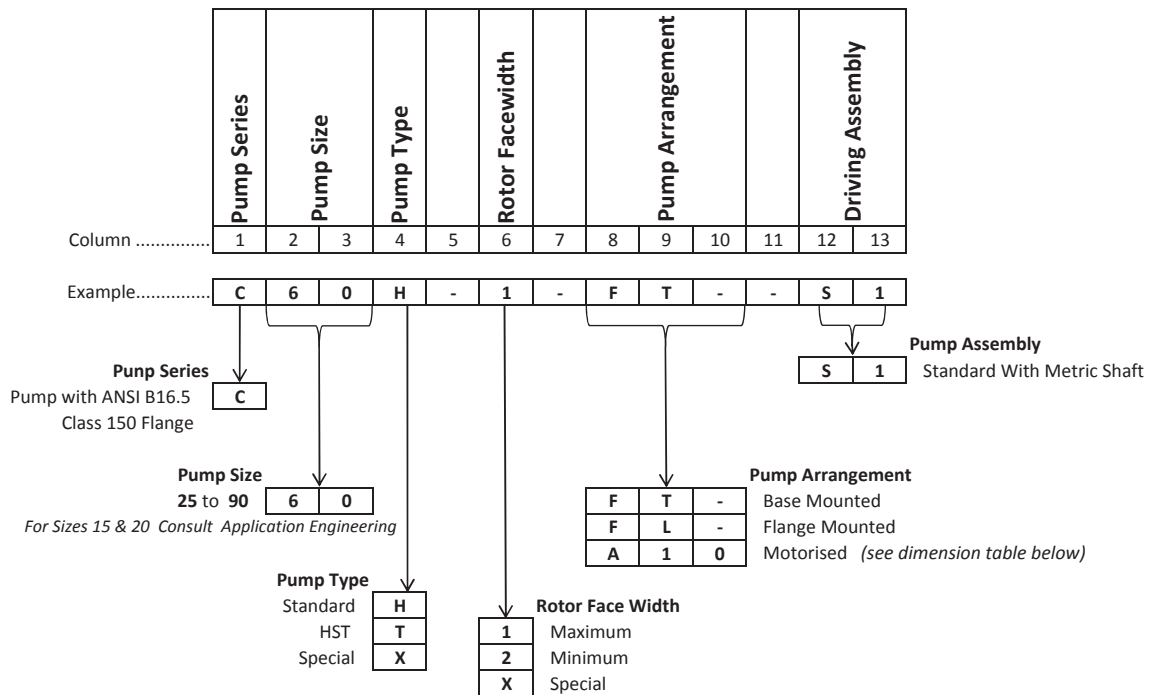
Our quality systems ensure we can meet the exacting requirements for quality control and documentation called for by API 676. Each order is manufactured to its own specific quality plan, which can be audited at any stage by the customer. Full mechanical and chemical test certification can be supplied where required.

Selection Guidelines - API Roloid Pumps

In all cases selection of API pumps should be referred to our application engineers.

ROLOID GEAR PUMP

ROLOID PUMP DESIGNATIONS



This designation series may be used only for standard pumps sizes 25 to 90
 For non-standard and pump sizes 15 and 20 consult our Application Engineering
 To ensure correct selection, please contact our Application Engineers
 Please provide the following information:

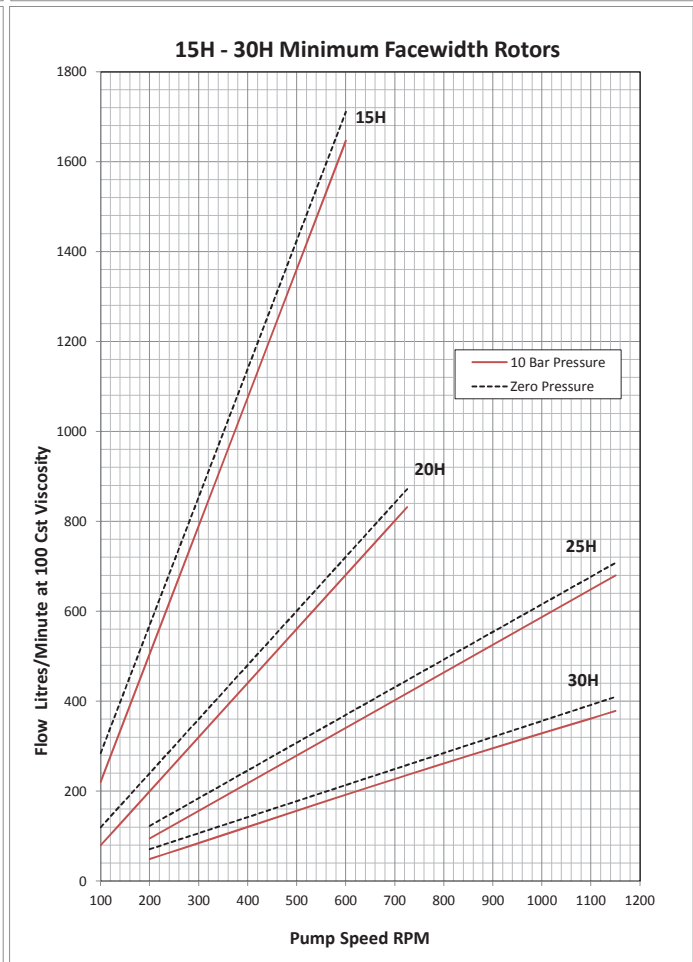
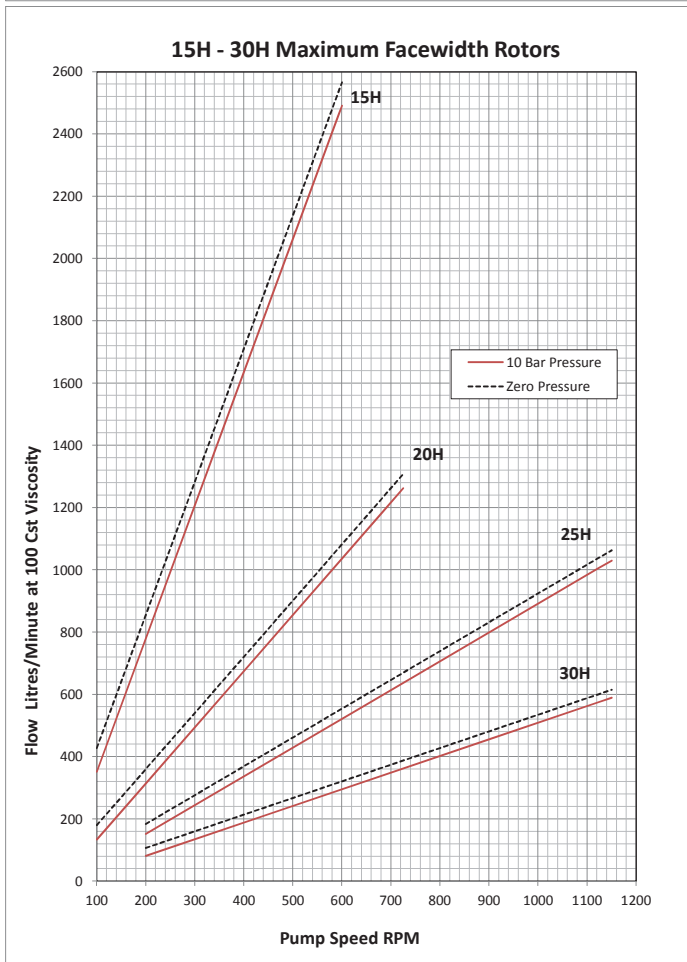
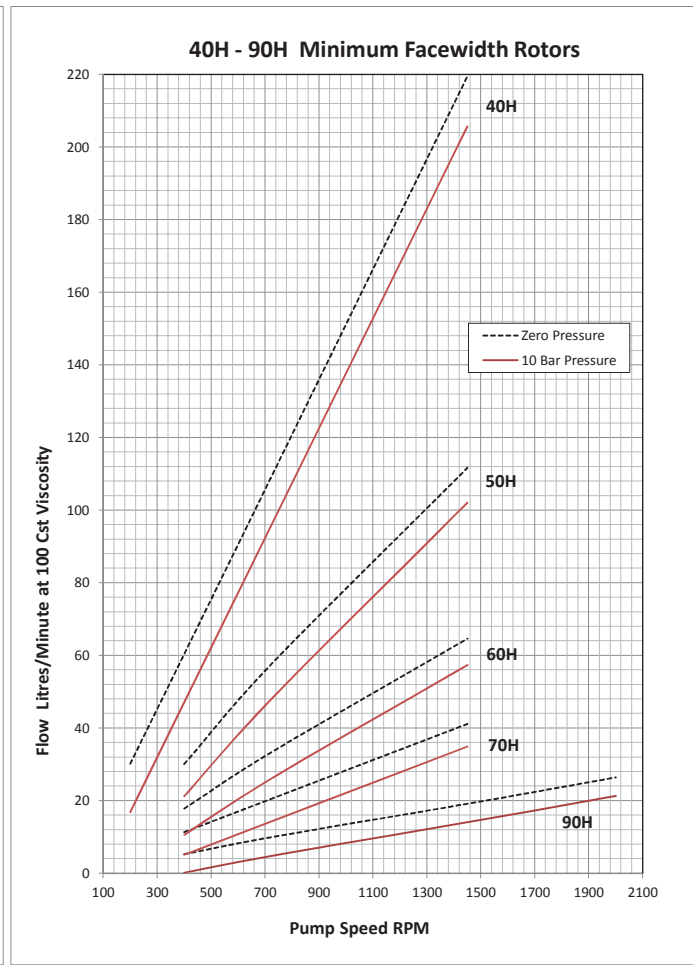
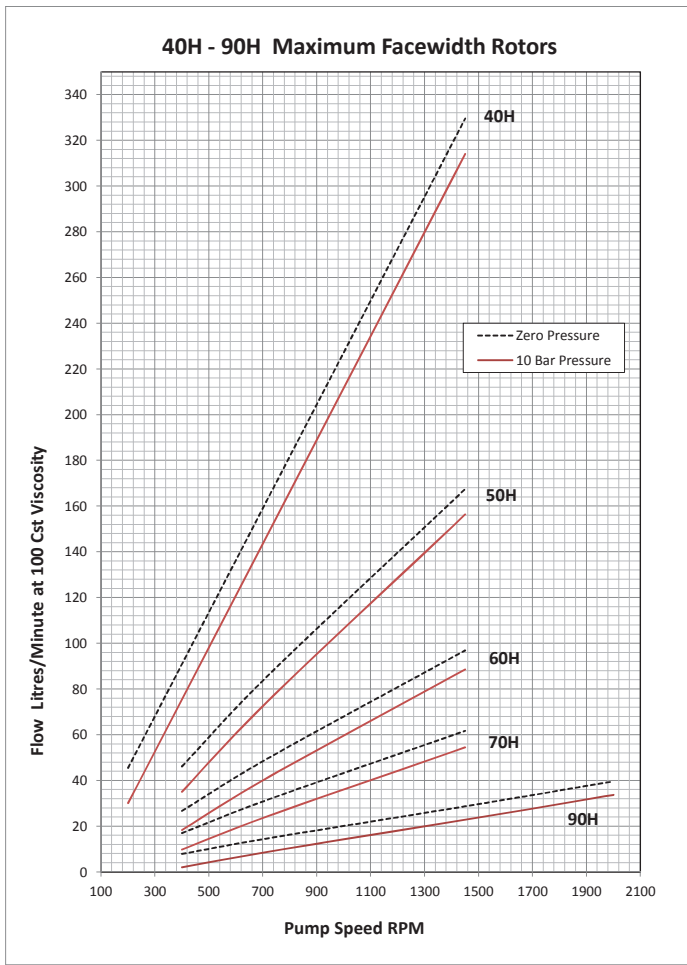
1. Discharge (Flow) Rate
2. Pump Speed
3. Details of Operating Environment (Ambient Temp, Application, Location etc..)
4. Operating Pressure
5. Inlet Pressure or Suction Lift
6. Operating Temp max/min
7. Pumped Fluid Type and Viscosity
8. Input Drive arrangement (Electric Motor, Gear Driven etc...)
9. Special Mounting Instructions, (Flanges, Brackets, Other etc...)

Roloid Pump Size	Motor Frame size	No. of Poles		Motor Power (KW)				Column 8
90	90	4	Motor Ready	1.1	1.5			10
		6		0.75	1.1			11
		8		0.37	0.55			12
60	70	4		2.2	3	4		13
		6		1.5	2.2			14
		8		0.75	1.1			15
		4		4	5.5			16
		6		2.2	3			17
		8		1.5				18
40	50	4		5.5	7.5	9	11	19
		6		3	4	5.5		20
		8		2.2	3			21
		4		11	15	18.5		22
		6		7.5	11	15		23
		8		4	7.5			24
		4		18.5	22	30		25
		6		15	18.5			26
		8		11				27
25	30	6		18.5	22	30		28
		8		15	30			29
		6		30				30
		8		18.5	22			31
		6		37				32
		8		30				33
					Column 8	A	B	C

ROLOID GEAR PUMP

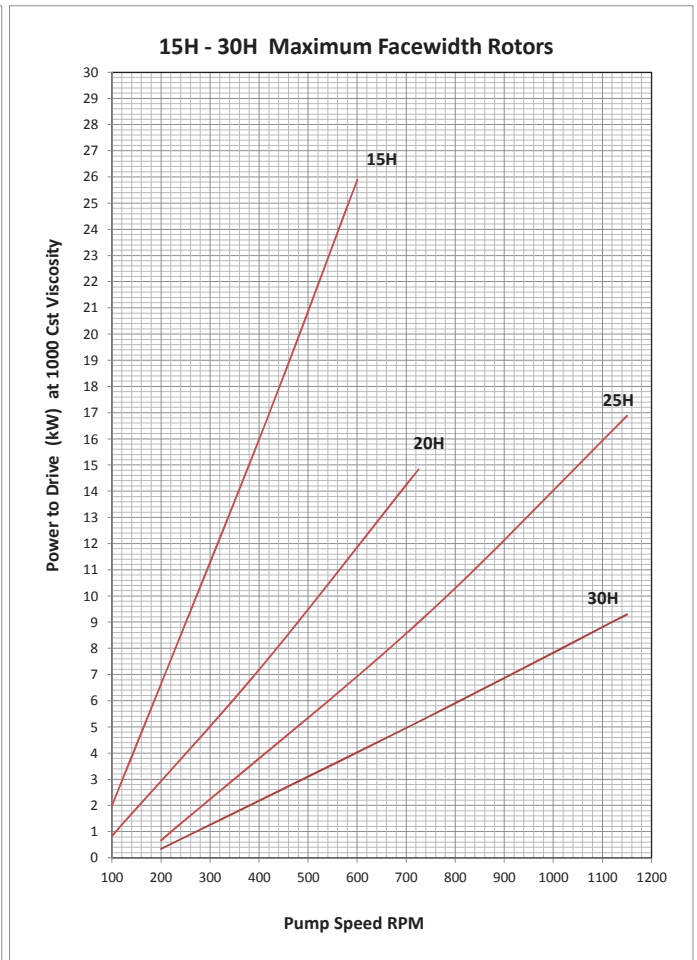
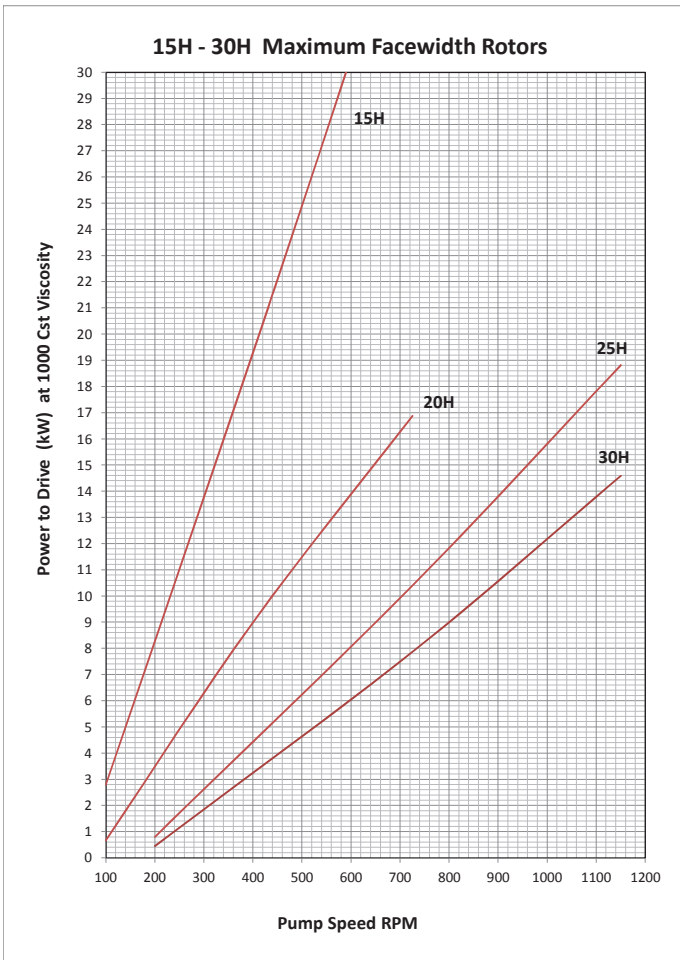
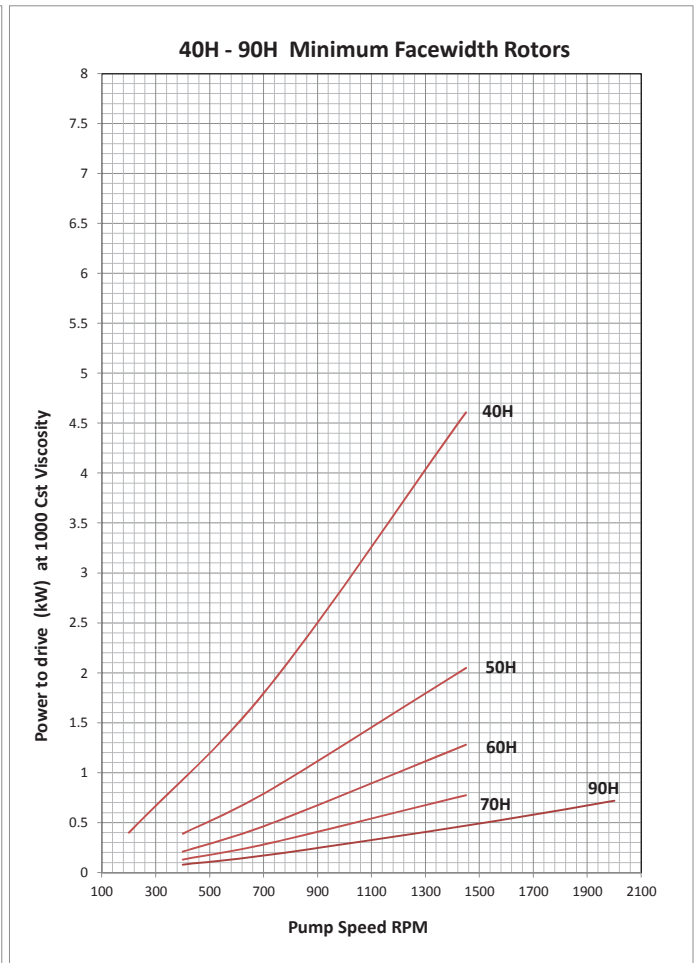
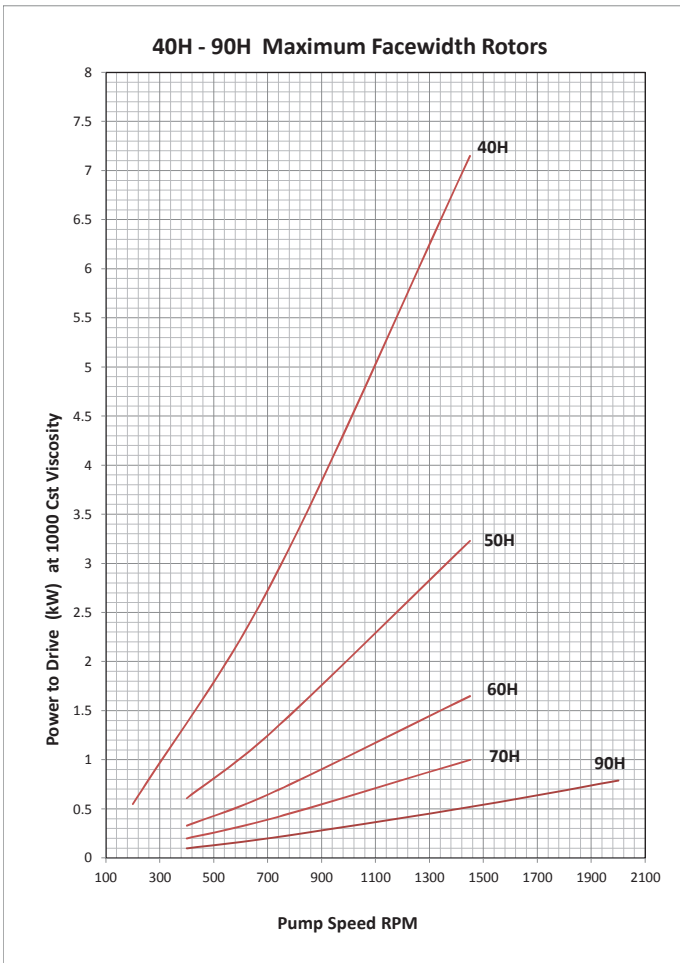
ROLOID PUMP

NOMINAL FLOW SELECTION GUIDE



ROLOID GEAR PUMP

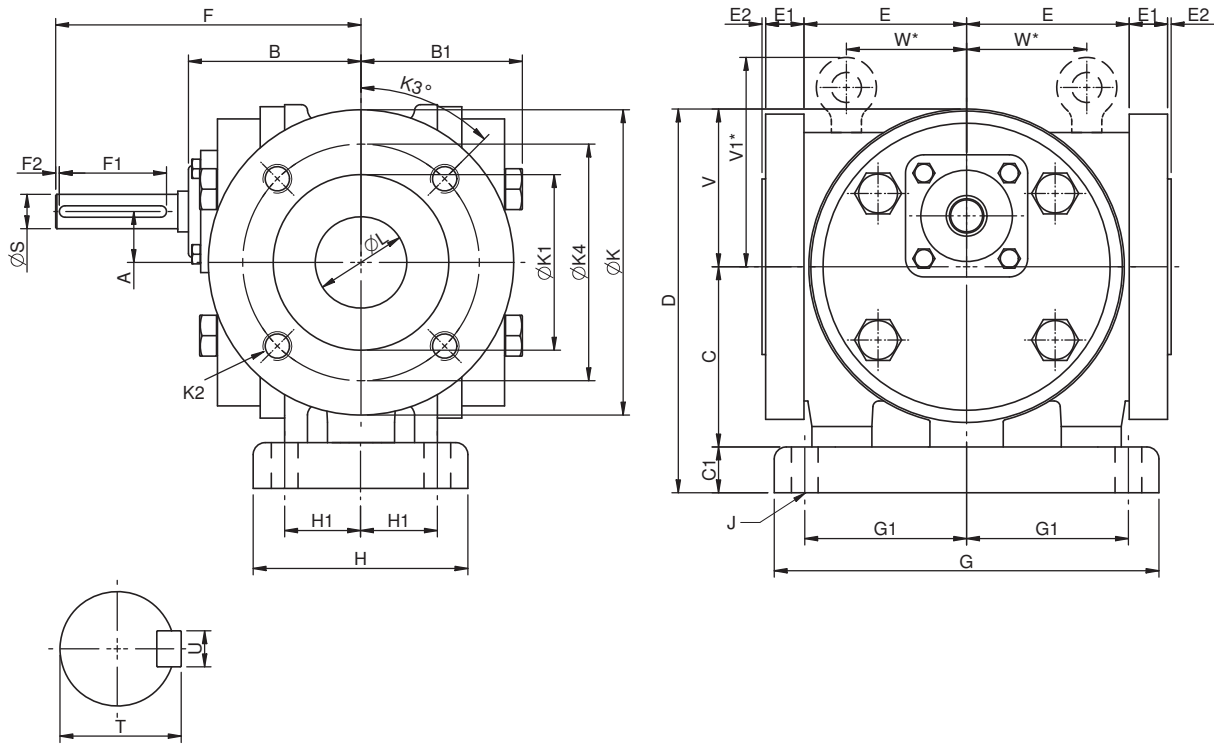
ROLOID PUMP POWER TO DRIVE AT 3 BAR



ROLOID GEAR PUMP

DIMENSIONS

BASE MOUNTED STANDARD PUMP TYPE - H



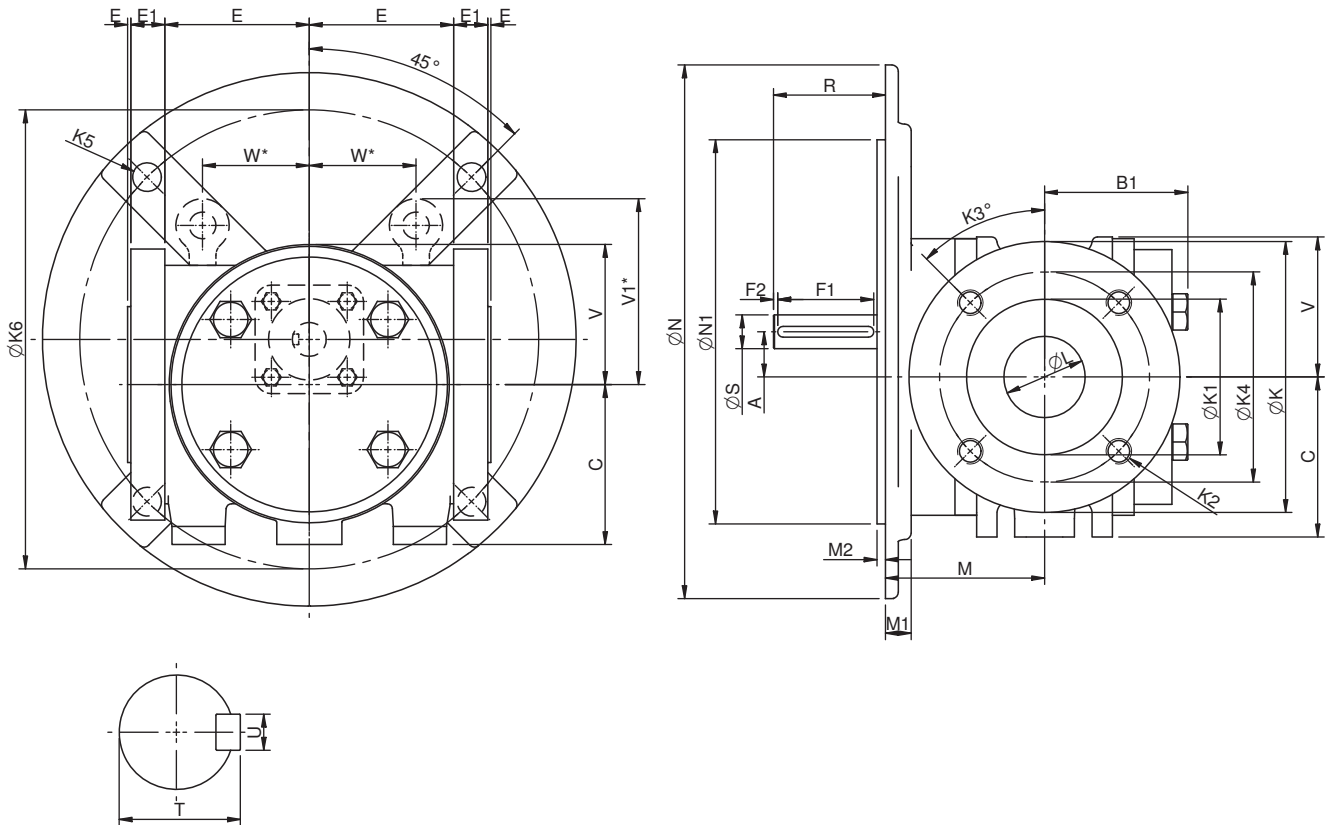
Pump Size	Pump Details																						
	Flange Size	A	B	B1	C	C1	D	E	E1	E2	F	G	G1	H	H1	J	øK	øK1	K2	K3°	øK4	øL	V
C90H	1	14.1	62	55	65	14.3	127	50	14.3	1.5	101.6	127	54	70	25.4	4 x 9.5	108	50.8	4 x M12	45°	79.4	25.4	47.6
C70H	1.25	18.1	64	60	70	16.5	147	62.5	16	1.5	114.3	152.4	64.7	88.9	33	4 x 11	117.5	63.5	4 x M12	45°	88.9	31.8	60.3
C60H	1.5	21.2	72	68	75	19.1	160	67.6	16	1.5	127	160	67.5	89.3	31.6	4 x 11	127	73	4 x M12	45°	98.6	38.1	65.6
C50H	2	25.4	86.5	82	90	20.3	184	76.2	19.1	1.5	139.7	177.8	73.7	104.1	36.8	4 x 12.7	152.4	92.0	4 x M16	45°	120.7	50.8	77.7
C40H	2.5	31.8	99	93	100	22.9	212	92.5	21	1.5	165.1	218.4	94	127	48.3	4 x 14	177.8	104.7	4 x M16	45°	139.7	63.5	88.9
C30H	3.5	42.3	120	125	120	29.2	264.2	118.1	30.3	1.5	203.2	271.8	118.1	170.2	67.3	4 x 17	215.9	139.7	8 x M16	22.5°	177.8	88.9	115.6
C25H	4	50.8	138.5	140	142.2	35.6	317.5	148.0	28	1.5	228.6	330.2	142.2	203.2	78.7	4 x 21	228.6	156.9	8 x M16	22.5°	190.5	101.6	139.7
20H	Consult Radicon Application Engineers																						
15H	Consult Radicon Application Engineers																						

Pump Size	Shaft Details					Eyebolt		Net	Gross
	øS	T	U	F1	F2	V1*	W*	KG	KG
C90H	11 (k6)	12.5	4	20	2	n/a	n/a	6.4	11
C70H	14 (k6)	16	5	45	2	n/a	n/a	10	17
C60H	16 (k6)	19	5	45	2	n/a	n/a	14	21
C50H	19 (k6)	21.5	6	45	2	n/a	n/a	18	26
C40H	22 (k6)	25	6	55	2	85.1	62.5	32	40
C30H	31 (k6)	35	10	55	2	94	70	74	93
C25H	35 (k6)	38	10	60	2	102	96	111	150
20H	Consult Radicon Application Engineers								
15H	Consult Radicon Application Engineers								

ROLOID GEAR PUMP

DIMENSIONS

FLANGE MOUNTED STANDARD PUMP TYPE - H



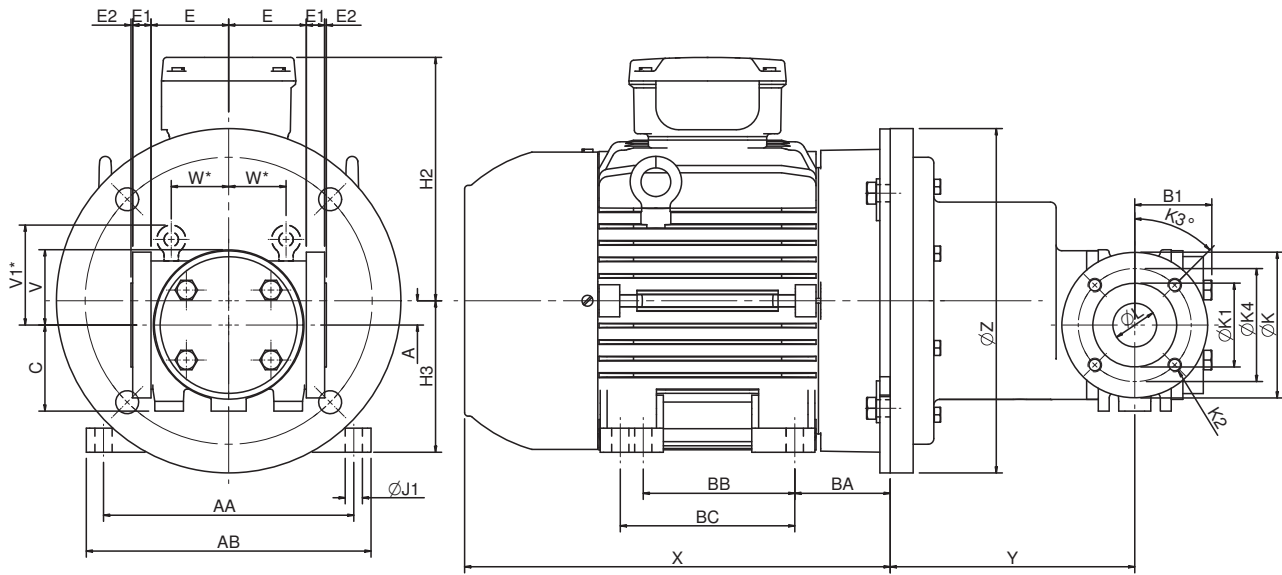
Pump Size	Pump Details																Shaft Details				
	Flange Size	A	B1	C	D	E	E1	E2	F	ϕK	$\phi K1$	K2	$K3^\circ$	$\phi K4$	ϕL	V	ϕS	T	U	F1	F2
C90H	1	14.1	55	65	127	50	14.3	1.5	101.6	108	50.8	4 x M12	45°	79.4	25.4	47.6	11 (k6)	12.5	4	20	2
C70H	1.25	18.1	60	70	147	62.5	16	1.5	114.3	117.5	63.5	4 x M12	45°	88.9	31.8	60.3	14 (k6)	16	5	45	2
C60H	1.5	21.2	68	75	154	67.6	16	1.5	127	127	73	4 x M12	45°	98.6	38.1	65.6	16 (k6)	19	5	45	2
C50H	2	25.4	82	90	184	76.2	19.1	1.5	139.7	152.4	92	4 x M16	45°	120.7	50.8	77.7	19 (k6)	21.5	6	45	2
C40H	2.5	31.8	93	100	212	99.3	21	1.5	165.1	177.8	104.7	4 x M16	45°	139.7	63.5	88.9	22 (k6)	25	6	55	2
C30H	3.5	42.3	121	120	264.2	118.1	30.3	1.5	203.2	215.9	139.7	8 x M16	22.5°	177.8	88.9	115.6	31 (k6)	35	10	55	2
C25H	4	50.8	140	142.2	318	148	28	1.5	228.6	228.6	156.9	8 x M16	22.5°	190.5	101.6	139.7	35 (k6)	38	10	60	2
20H	Consult Radicon Application Engineers																				
15H																					

Pump Size	Flange Details								Eyebolt	Net	Gross	
	M	M1	M2	ϕN	$\phi N1$	K5	K6	R				V1*
C90H	67	12	3.5	160	110	4 x 9	130	34.7	n/a	n/a	9	14
C70H	76.7	12	3.5	200	130	4 x 11	165	37.6	n/a	n/a	11.5	18.5
C60H	74.5	12	4	250	180	4 x 13.5	215	52.5	n/a	n/a	17.5	24.5
C50H	91.2	16	4	250	180	4 x 13.5	215	48.5	n/a	n/a	20	28
C40H	107.9	20	4	300	230	4 x 13.5	265	57.2	85.1	62.5	35.5	43.5
C30H	129	20	5	400	300	4 x 17.5	350	74.2	94	70	79	98
C25H	137.3	20	6	450	350	4 x 19	400	91.3	102	96	114.5	153.5
20H	Consult Radicon Application Engineers											
15H												

ROLOID GEAR PUMP

DIMENSIONS

MOTORISED STANDARD PUMP TYPE - H



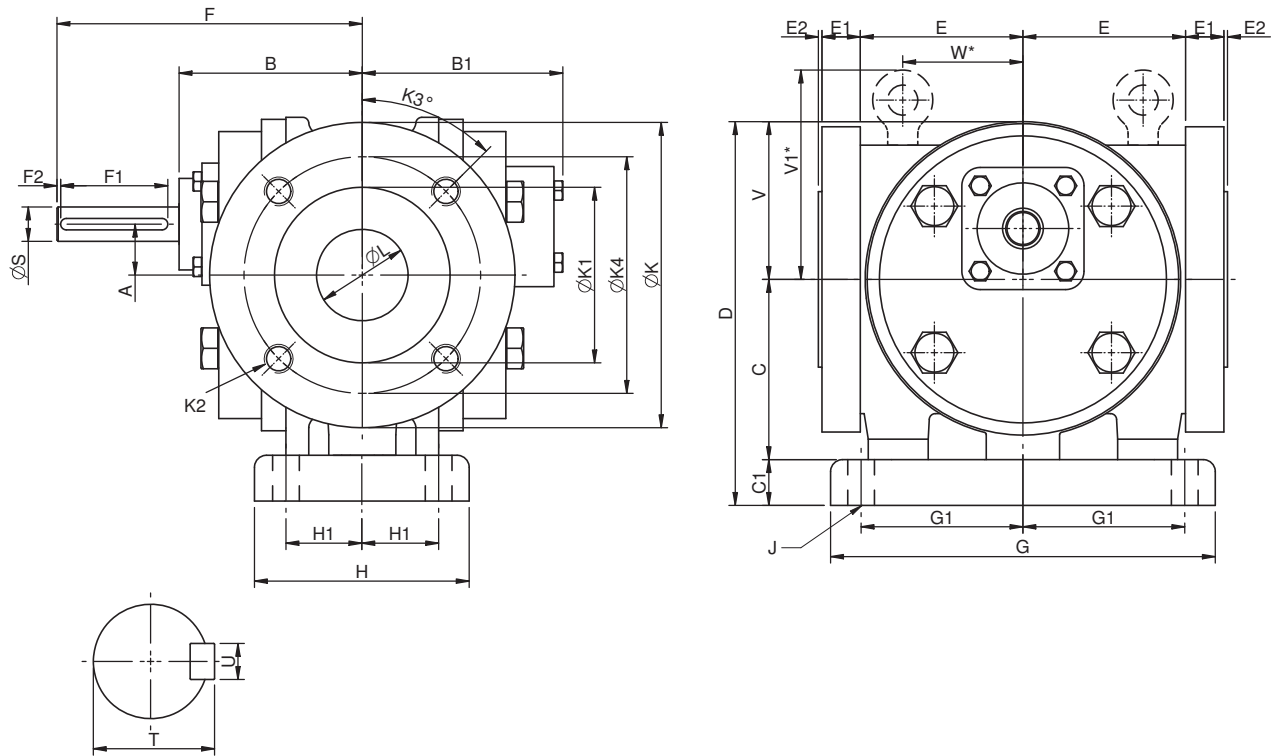
Pump Size	Pump Details													Eyebolt		
	Ansi Flange Size	Motor Size	A	B1	C	E	E1	E2	ϕK	$\phi K1$	K2	$K3^\circ$	$\phi K4$	V	V1*	W*
C90H	1	90S	14.1	55	65	50	14	1.5	108	50.8	4 x M12	45°	79.4	47.6	n/a	n/a
		90L														
		100L														
C70H	1.25	100L	18.1	60	70	62.5	16	1.5	117.5	63.5	4 x M12	45°	88.9	60.3	n/a	n/a
		112M														
C60H	1.5	112M	21.2	68	75	67.6	16	1.5	127	73	4 x M12	45°	98.6	65.6	n/a	n/a
		132S														
		132M														
C50H	2	132S	25.4	82	90	76.2	19.1	1.5	152	92	4 x M16	45°	120.7	77.7	n/a	n/a
		160M														
		160L														
C40H	2.5	160M	31.8	93	100	92.5	21	1.5	178	104.7	4 x M16	45°	140	88.9	85.1	62.5
		160L														
		180M														
C30H	3.5	180M	42.3	121	120	118	30.3	1.5	216	139.7	8 x M16	22.5°	178	116	94	70
		180L														
		200L														
C25H	4	225M	50.8	140	142.5	148	28.0	1.5	229	156.9	8 x M16	22.5°	191	140	102	96
		200L														
		225M														
20H	Consult Radicon Application Engineers															
15H	Consult Radicon Application Engineers															

Pump Size	Motor IEC B5 Flange										Net	Gross	
	AA	AB	BA	BB	BC	$\phi J1$	H2	H3	X	Y	ϕZ	KG	KG
C90H	140	180	56	100	N/A	10	159	90	265	158	200	23	28
	140	180	56	125	N/A	10	159	90	290	158	200	23	28
	160	205	63	140	N/A	12	177	100	357	173	250	37	42
C70H	160	205	63	140	N/A	12	177	100	357	180	250	40.5	47.5
	190	230	70	140	N/A	12	189	112	340	180	250	48.5	55.5
C60H	190	230	70	140	N/A	12	189	112	340	193	250	51	58
	216	270	89	140	N/A	12	214	132	380	213	300	81	88
	216	270	89	270	N/A	12	214	132	420	213	300	81	88
C50H	216	270	89	140	N/A	12	214	132	380	228	300	84	92
	216	270	89	270	N/A	12	214	132	420	228	300	84	92
	254	320	110	210	N/A	15	270	160	500	258	350	138	145.5
C40H	254	320	110	254	N/A	15	270	160	540	258	350	138	145.5
	254	320	110	210	N/A	15	270	160	500	283	350	140	148
	254	320	110	254	N/A	15	270	160	540	283	350	140	148
C30H	279	355	121	241	N/A	15	285	180	590	283	350	224	232
	279	355	121	279	N/A	15	285	180	630	283	350	224	232
	279	355	121	241	N/A	15	285	180	590	316	350	275	294
C25H	279	355	121	279	N/A	15	285	180	630	316	350	275	294
	318	395	133	305	N/A	19	305	200	660	316	400	384	402.5
	356	435	149	311	N/A	19	480	225	750	346	450	472	491
C25H	318	395	133	305	N/A	19	305	200	660	342	400	410	449
	356	435	149	311	349	19	480	225	750	372	450	486	525
20H	406	504	168	311	349	24	490	250	825	372	550	594	633
15H	Consult Radicon Application Engineers												

ROLOID GEAR PUMP

DIMENSIONS

HST BASE MOUNTED STANDARD PUMP TYPE - T



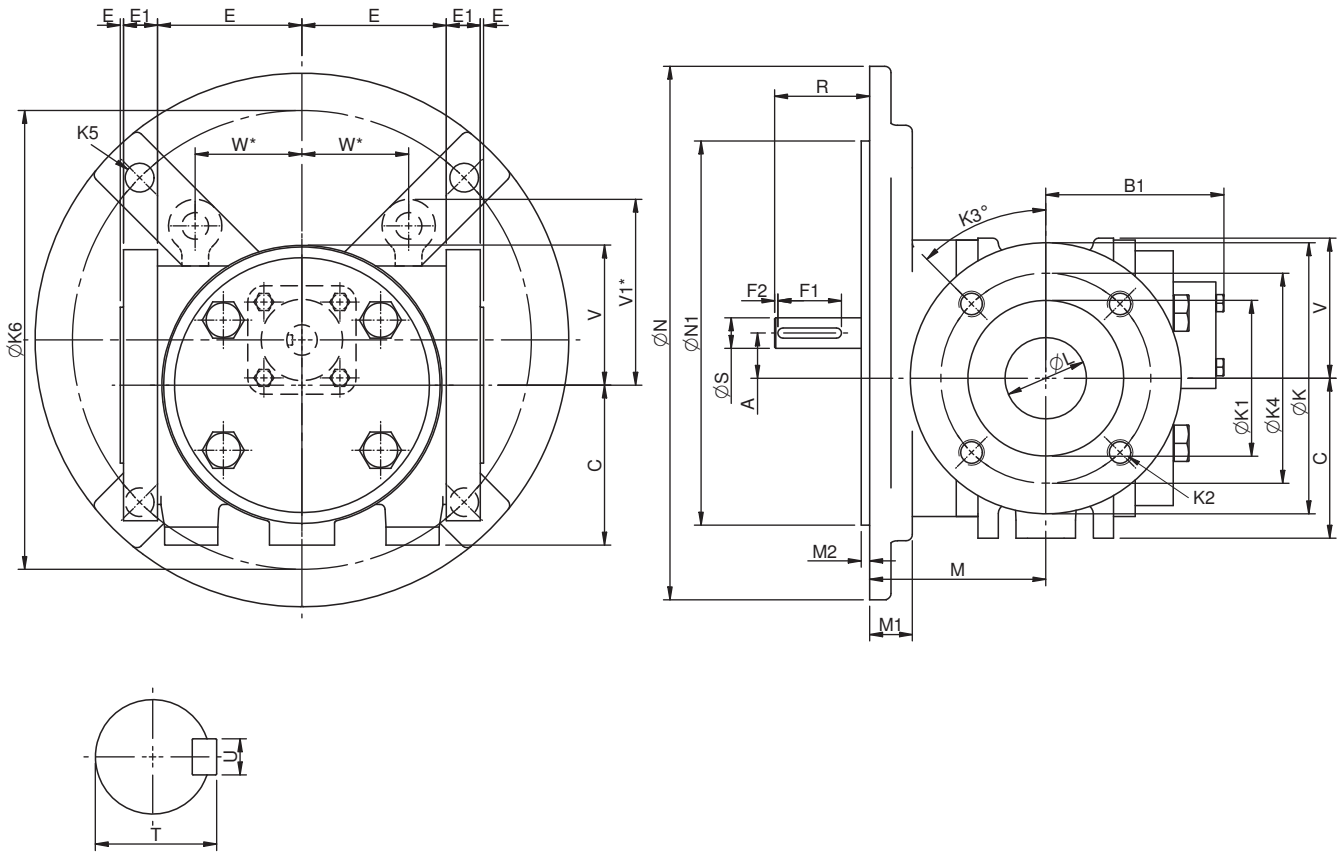
Pump Size	Pump Details																						
	Flange	A	B	B1	C	C1	D	E	E1	E2	F	G	G1	H	H1	J	ϕK	$\phi K1$	K2	$K3^\circ$	$\phi K4$	ϕL	V
C50T	2	25.4	98	90	90	20.3	184	76.2	19.1	1.5	139.7	177.8	73.7	104.1	36.8	4 x 12.7	152.4	92.0	4 x M16	45°	120.7	50.8	77.7
C40T	2.5	31.8	190	100	100	22.9	212	92.5	21	1.5	165.1	218.4	94	127	48.3	4 x 14	177.8	104.7	4 x M16	45°	139.7	63.5	88.9
C30T	3.5	42.3	150	130	120	29.2	264.2	118.1	30.3	1.5	203.2	271.8	118.1	170.2	67.3	4 x 17	215.9	139.7	8 x M16	22.5°	177.8	88.9	115.6
C2.5T	Consult Application Engineers																						

Pump Size	Shaft Details					Eyebolt		Net	Gross
	ϕS	T	U	F1	F2	V1*	W*	KG	KG
C50T	19 (k6)	21.5	6	35	2	n/a	n/a	18	26
C40T	22 (k6)	25	6	45	2	85.1	62.5	32	40
C30T	31 (k6)	35	10	45	2	94	70	74	93
C2.5T	Consult Application Engineers								

ROLOID GEAR PUMP

DIMENSIONS

HST FLANGE MOUNTED STANDARD PUMP TYPE - T



Pump Size	Pump Details																Shaft Details				
	Flange	A	B1	C	D	E	E1	E2	F	K	$\phi K1$	K2	$K3^\circ$	K4	ϕL	V	ϕS	T	U	F1	F2
C50T	2	25.4	90	90	184	76.2	19.1	1.5	139.7	152.4	92	4 x M16	45°	120.7	50.8	77.7	19 (k6)	21.5	6	35	2
C40T	2.5	31.8	100	100	212	92.5	21	1.5	165.1	177.8	104.7	4 x M16	45°	139.7	63.5	88.9	22 (k6)	25	6	47	2
C30T	3.5	42.3	130	120	264.2	118.1	30.3	1.5	203.2	215.9	139.7	8 x M16	22.5°	177.8	88.9	115.6	31 (k6)	35	10	47	2
C25T	Consult Application Engineers																				

Pump Size	Flange Details							Eyebolt	Net	Gross		
	M	M1	M2	ϕN	$\phi N1$	K5	$\phi K6$				R	V1*
C50T	91.2	16	4	250	180	4 x 13.5	215	48.5	n/a	n/a	20	28
C40T	107.9	20	4	300	230	4 x 13.5	265	57.2	85.1	62.5	35.5	43.5
C30T	129	20	5	400	300	4 x 17.5	350	74.2	94	70	79	98
C25T	Consult Application Engineers											

ROLOID GEAR PUMP

PRODUCT SAFETY

IMPORTANT

Product Safety Information

General - The following information is important in ensuring safety. It must be brought to the attention of personnel involved in the selection of power transmission equipment, those responsible for the design of the machinery in which it is to be incorporated and those involved in its installation, use and maintenance.

Our equipment will operate safely provided it is selected, installed, used and maintained properly. As with any power transmission equipment proper precautions must be taken as indicated in the following paragraphs, to ensure safety.

Potential Hazards - these are not necessarily listed in any order of severity as the degree of danger varies in individual circumstances. It is important therefore that the list is studied in its entirety:-

- 1) Fire/Explosion
 - (a) Oil mists and vapour are generated within gear units. It is therefore dangerous to use naked lights in the proximity of gearbox openings, due to the risk of fire or explosion.
 - (b) In the event of fire or serious overheating (over 300 °C), certain materials (rubber, plastics, etc.) may decompose and produce fumes. Care should be taken to avoid exposure to the fumes, and the remains of burned or overheated plastic/rubber materials should be handled with rubber gloves.
- 2) Guards - Rotating shafts and couplings must be guarded to eliminate the possibility of physical contact or entanglement of clothing. It should be of rigid construction and firmly secured.
- 3) Noise - High speed gearboxes and gearbox driven machinery may produce noise levels which are damaging to the hearing with prolonged exposure. Ear defenders should be provided for personnel in these circumstances. Reference should be made to the Department of Employment Code of Practice for reducing exposure of employed persons to noise.
- 4) Lifting - Where provided (on larger units) only the lifting points or eyebolts must be used for lifting operations (see maintenance manual or general arrangement drawing for lifting point positions). Failure to use the lifting points provided may result in personal injury and/or damage to the product or surrounding equipment. Keep clear of raised equipment.
- 5) Lubricants and Lubrication
 - (a) Prolonged contact with lubricants can be detrimental to the skin. The manufacturer's instruction must be followed when handling lubricants.
 - (b) The lubrication status of the equipment must be checked before commissioning. Read and carry out all instructions on the lubricant plate and in the installation and maintenance literature. Heed all warning tags. Failure to do so could result in mechanical damage and in extreme cases risk of injury to personnel.
- 6) Electrical Equipment - Observe hazard warnings on electrical equipment and isolate power before working on the gearbox or associated equipment, in order to prevent the machinery being started.
- 7) Installation, Maintenance and Storage
 - (a) In the event that equipment is to be held in storage, for a period exceeding 6 months, prior to installation or commissioning, we must be consulted regarding special preservation requirements. Unless otherwise agreed, equipment must be stored in a building protected from extremes of temperature and humidity to prevent deterioration.
The rotating components (gears and shafts) must be turned a few revolutions once a month (to prevent bearings brinelling).
 - (b) External gearbox components may be supplied with preservative materials applied, in the form of a "waxed" tape overwrap or wax film preservative. Gloves should be worn when removing these materials. The former can be removed manually, the latter using white spirit as a solvent.
Preservatives applied to the internal parts of the gear units do not require removal prior to operation.
 - (c) Installation must be performed in accordance with the manufacturer's instructions and be undertaken by suitably qualified personnel.
 - (d) Before working on a gearbox or associated equipment, ensure that the load has been removed from the system to eliminate the possibility of any movement of the machinery and isolate power supply. Where necessary, provide mechanical means to ensure the machinery cannot move or rotate. Ensure removal of such devices after work is complete.
 - (e) Ensure the proper maintenance of gearboxes in operation. Use only the correct tools and our approved spare parts for repair and maintenance. Consult the Maintenance Manual before dismantling or performing maintenance work.
- 8) Hot Surfaces and Lubricants
 - (a) During operation, gear units may become sufficiently hot to cause skin burns. Care must be taken to avoid accidental contact.
 - (b) After extended running the lubricant in gear units and lubrication systems may reach temperatures sufficient to cause burns. Allow equipment to cool before servicing or performing adjustments.
- 9) Selection and Design
 - (a) Where gear units provide a backstop facility, ensure that back-up systems are provided if failure of the backstop device would endanger personnel or result in damage.
 - (b) The driving and driven equipment must be correctly selected to ensure that the complete machinery installation will perform satisfactorily, avoiding system critical speeds, system torsional vibration, etc.
 - (c) The equipment must not be operated in an environment or at speeds, powers, torques or with external loads beyond those for which it was designed.
 - (d) As improvements in design are being made continually the contents of this catalogue are not to be regarded as binding in detail, and drawings and capacities are subject to alterations without notice.

The above guidance is based on the current state of knowledge and our best assessment of the potential hazards in the operation of the gear units.

Any further information or clarification required may be obtained by contacting our Application Engineers.

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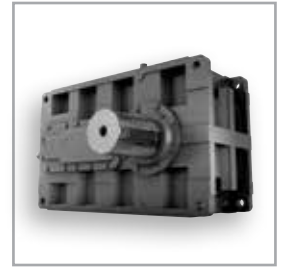
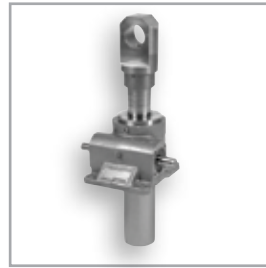
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