

### Features

- High torque at low speeds with smooth operation
- Orbital Rotor and Roller gear set providing low pressure start up with efficient and reliable operation
- Bi-directional rotation
- Rotation speed from 5 to 1950 rpm
- Continuous torque to 1900 N-m (1401 ft.-lbs)
- Painted black as standard.



### Ordering Details

M	F	OS	50-	K1.2-	2A-	O10	F-	B-	PH	( )
Motor	Fixed Displacement	1	2	3	4	5	6	7	8	Options

Reference Page		1	2	3	4				5		6	7	8	
Max. torque continuous	Max. Speed, continuous	Design Type	Volume	*Shaft Options	Flange Option 1	Flange Option 2	Wheel Mount Flange	Port		Port Location	Rotation	Frame Type	Drawing Page	
								SAE O-ring	4 Bolt Flange					
Nm(Ft.-Lbs.)	rpm		cc/rev											
11(8.1)	1950	OS	8	K0.6, 9T	2A0	2A1	-	O6		R or B	B	M	3	
16(11.8)	1550	OS	12.5	K0.6, 9T	2A0	2A1	-	O6		R or B	B	M	3	
25(18.4)	1000	OS	20	K0.6, 9T	2A0	2A1	-	O6		R or B	B	M	3	
40(29.5)	630	OS	32	K0.6, 9T	2A0	2A1	-	O6		R or B	B	M	3	
45(33)	500	OS	40	K0.6, 9T	2A0	2A1	-	O6		R or B	B	M	3	
72(53)	1250	ORS	36	K1, W1, 6T	2A	M4A	-	O10	/FA	F	B	S	5	
89(65)	1150	OS	50	K1, W1, 6T	2A	-	-	O10		F	B	PH	4	
126(93)	667	ORD	65	W1, T1, 6T	2A	-	W	O10	FB	F	R or L	E2	6	
146(107)	770	OS	80	K1, W1, 6T	2A	-	-	O10		F	B	PH	4	
194(143)	810	ORD	80	K1.2, T1.3, 6T	2A	M4A	W	O10	/FC	B	B	3	7	
225(166)	800	ORD	80	K1, K1.2, 14T	2A, 4A	M4A	-	O10	/FD	B	B	Y	8	
242(178)	750	ORD	100	K1.2, T1.3, 6T	2A	M4A	W	O10	/FC	B	B	3	7	
290(214)	748	ORD	100	K1.2, 14T	2A	M4A	W	O10	/FD	B	B	Y	8	
325(239)	360	ORD	125	K1.2, T1.2, 6T	-	M4A	W	O10	FB	F	R or L	R	9	
360(265)	600	ORD	125	K1, K1.2, 14T	2A, 4A	M4A	W	O10	/FD	B	B	Y	8	
450(332)	625	ORD	160	K1.2, T1.6, 17T	4B	-	W	O12		B	B	4	12	
510(376)	366	ORS	200	K1.2, 14T	2A	M4A	-	O10	/F10	F	B	H	10	
565(416)	765	ORD	200	K1.5, T1.7, 17T	4C	-	W	O16		B	B	6	11	
625(461)	290	ORD	230	K1.2, T1.2, 14T	-	M4A	W	O10	FB	F	R or L	R	9	
670(494)	536	ORD	250	K1.5, 17T	4C	-	W	O12		B	B	T	13	
710(523)	610	ORD	250	K1.5, T1.7, 17T	4C	-	W	O16		B	B	6	11	
810(597)	250	ORD	300	K1.2, T1.2, 6T	-	M4A	W	O10	FB	F	R or L	R	9	
920(678)	480	ORD	315	K1.5, T1.7, 17T	4C	-	W	O16		B	B	6	11	
1008(743)	305	ORD	400	K1.2, T1.6, 17T	4B	-	W	O12		B	B	4	12	
1108(817)	500	ORD	400	K1.5, T2.4, 17T	4C	-	W	O16		B	B	5	14	
1385(1021)	400	ORD	500	K1.5, T2.4, 17T	4C	-	W	O16		B	B	5	14	
1570(1158)	315	ORD	630	K1.5, T2.4, 17T	4C	-	W	O16		B	B	5	14	
1773(1307)	250	ORD	800	K1.5, T2.4, 17T	4C	-	W	O16		B	B	5	14	
1900(1401)	160	ORD	985	K1.5, T2.4, 17T	4C	-	W	O16		B	B	5	14	
				*Shaft Details									15	
Cross Port Relief valves and accessories													16	

Example Part Number: MFOS50-K1.2-2A-O10SSF-B-H

# Section 1 – Technical Data

Max. torque continuous	Max. Torque Intermittent	Volume cc/rev	Frame Type	Max. Speed,		Max. Speed Intermittent	Min. Speed	Max. Flow		Max. Pres-		Max. Power Continuous	Weight
				continuous	rpm			rpm	rpm	lpm	lpm		
11	15	8	M	1950	2450	50	16	20	100	140	2.6	1.9	
16	23	12.5	M	1550	1940	40	20	25	100	140	3.2	2.0	
25	35	20	M	1000	1250	30	20	25	100	140	3.2	2.1	
40	57	32	M	630	800	30	20	25	100	140	3.2	2.2	
45	70	40	M	500	630	25	20	25	100	140	3.2	2.3	
72	83	36	S	1250	1520	30	45	55	140	165	8.5	6.5	
89	110	50	PH	800	990	10	40	75	140	175	7	5.6	
126	176	65	E2	667	842	*	45	57	140	190	8.3	6.4	
146	186	80	PH	770	960	10	60	75	140	175	10	5.7	
194	218	80	3	810	*	10	65	*	175	200	14	9.8	
225	305	80	Y	800	988	8	65	80	205	275	16	9.8	
242	283	100	3	750	*	10	75	*	175	200	16	10.0	
290	390	100	Y	748	900	8	75	90	205	275	18	10.0	
325	380	125	R	360	490	*	45	60	205	240	12	10.6	
360	480	125	Y	600	720	8	75	90	205	275	18	10.3	
450	559	160	4	625	*	10	100	*	200	240	20.1	20.3	
510	579	200	H	366	439	30	75	90	175	200	16	10.5	
565	840	200	6	765	865	*	150	170	200	300	*	26.3	
625	710	230	R	290	365	*	70	85	205	240	16	11.3	
670	821	230	T	536	643	30	125	150	210	250	34.7	20.4	
710	1080	250	6	610	830	*	150	205	200	300	*	26.8	
810	930	300	R	250	315	*	80	95	205	240	18	11.6	
920	1325	315	6	480	690	*	150	225	200	300	*	27.3	
1008	1255	400	4	305	*	6	125	*	180	210	22	23.0	
1108	1440	400	5	500	*	9	200	*	200	240	40	31.5	
1385	1783	500	5	400	*	8	200	*	200	240	40	32.4	
1570	1951	630	5	315	*	6	200	*	180	210	40	33.6	
1773	2122	800	5	250	*	5	200	*	160	180	35	35.2	
1900	2133	985	5	160	*	5	160	*	140	160	24	37.2	

\*Consult Factory

Calculation Torque at different Pressures:  
 Torque (Nm) = (Pressure drop (bar) x Volume (cc/rev) x .9)/(62.8)

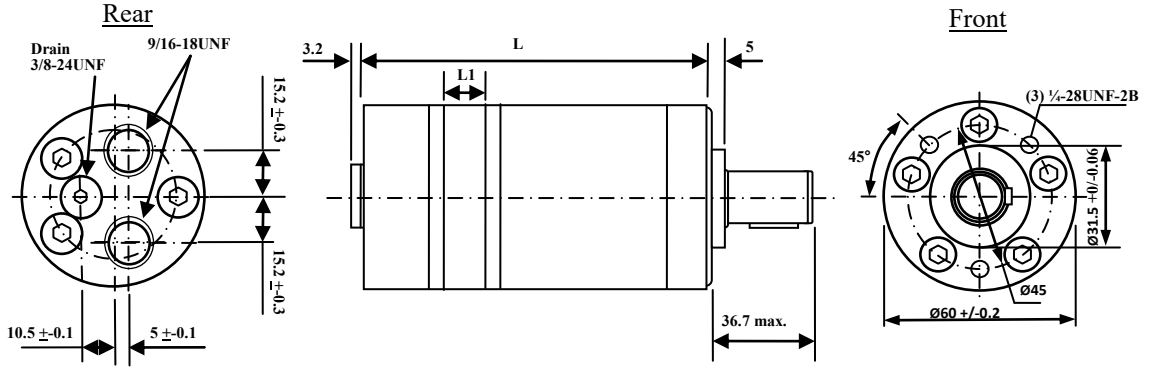
**Section 2 – Dimensional Data “M” Frame (mm), with internal drain check**

**“R” Rear Port “K.06” or “9T” Shaft:**

**“2AO” Flange:**

cc/rev	L (mm)	L1 (mm)
8	104	3.5
12.5	106	5.5
20	109	8.5
32	114	13.5
40	117.5	17
*50	122	21.5

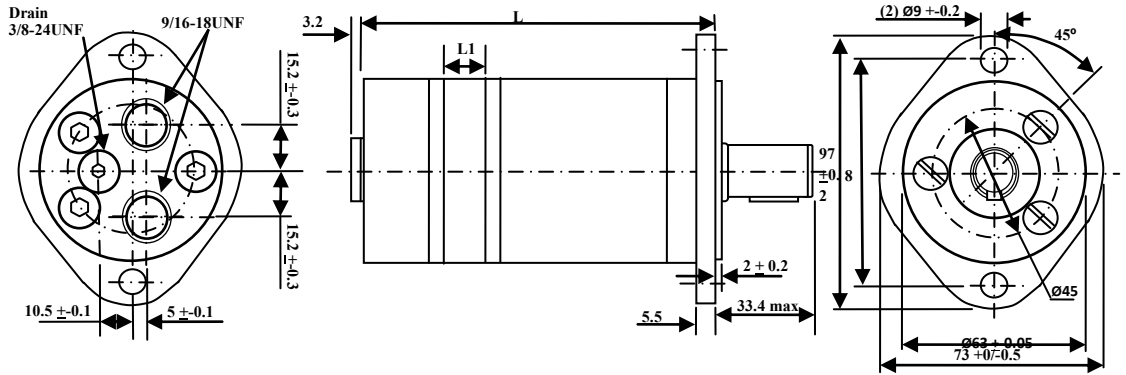
\*Not a spotlight size.



**“2A1” Flange:**

cc/rev	L (mm)	L1 (mm)
8	107.5	3.5
12.5	109.5	5.5
20	112.5	8.5
32	117.5	13.5
40	121	17
*50	125.5	21.5

\*Not a spotlight size.

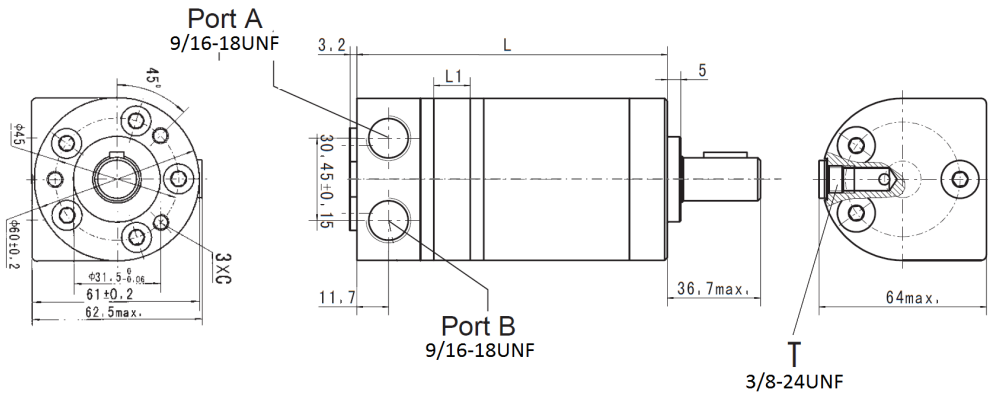


**“B” Same Side Back Ports “K.06” or “9T”:**

**“2AO” Flange:**

cc/rev	L (mm)	L1 (mm)
8	105	3.5
12.5	107	5.5
20	110	8.5
32	115	13.5
40	118.5	17
*50	123	21.5

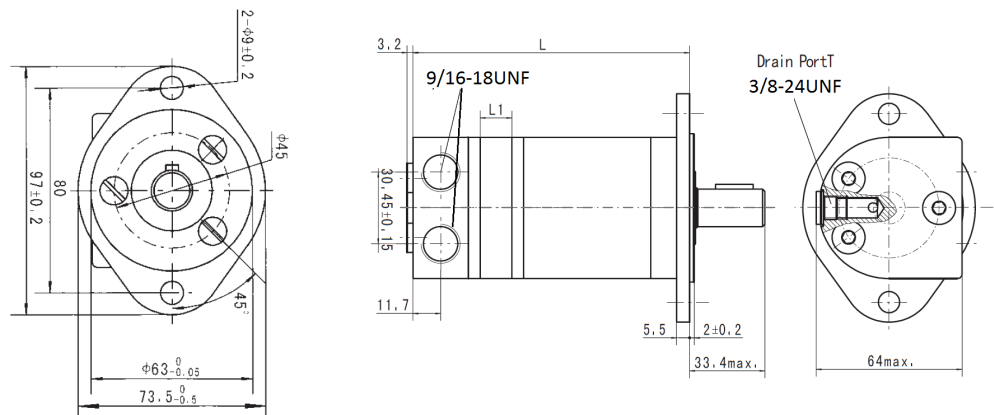
\*Not a spotlight size.



**“2A1” Flange:**

cc/rev	L (mm)	L1 (mm)
8	108.5	3.5
12.5	110.5	5.5
20	113.5	8.5
32	118.5	13.5
40	122	17
*50	126.5	21.5

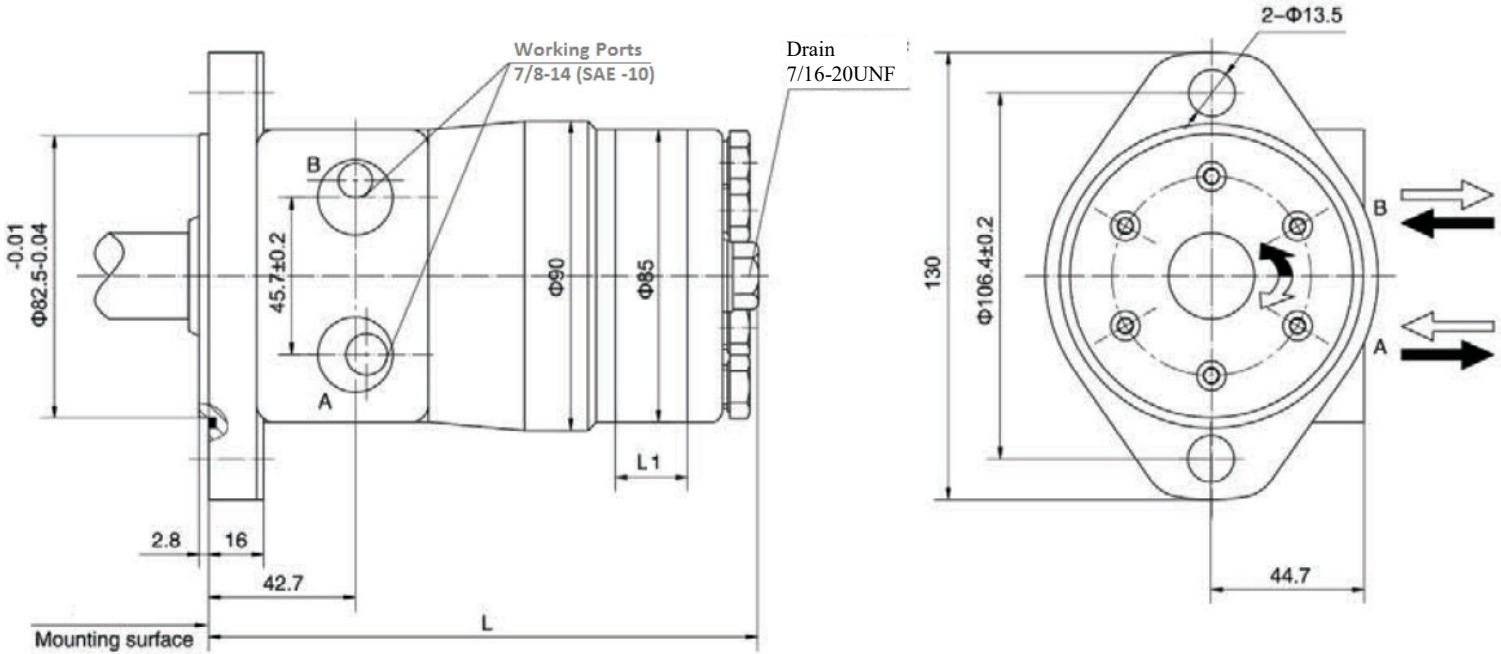
\*Not a spotlight size.



Note: Without the drain line connected, the shaft seal exceeds the pressure in the return line slightly. With the drain connected, the pressure of the shaft seal equals the pressure in the drain line.

**Section 2 – Dimensional Data “PH” Frame (mm), external Drain**

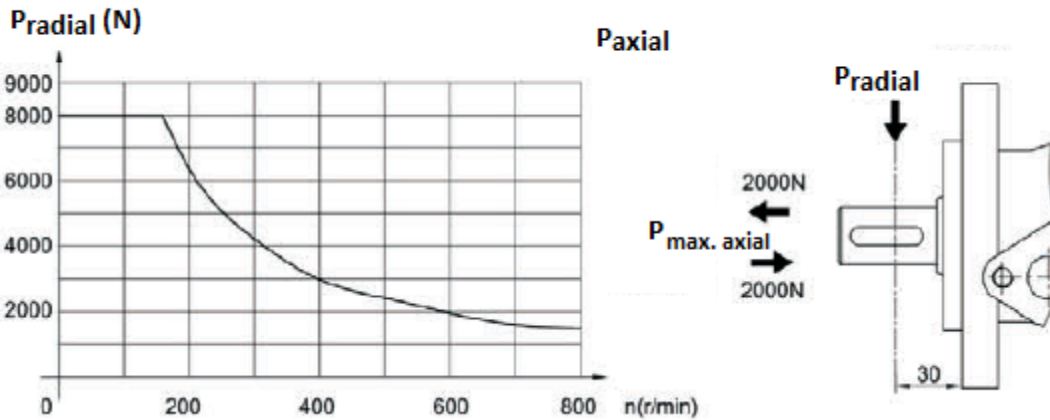
**“2A” SAE A 2-bolt Flange “K1” or “6T” Shaft:**



Size, cc/rev	*50	80	*100	*125	*160	*200	*250	*315	*400
Dimension L (mm)	148	151	154	157	162	167	173	183	193
Dimension L1 (mm)	7	11	13	16	21	26	32		

\*Not a spotlight size.

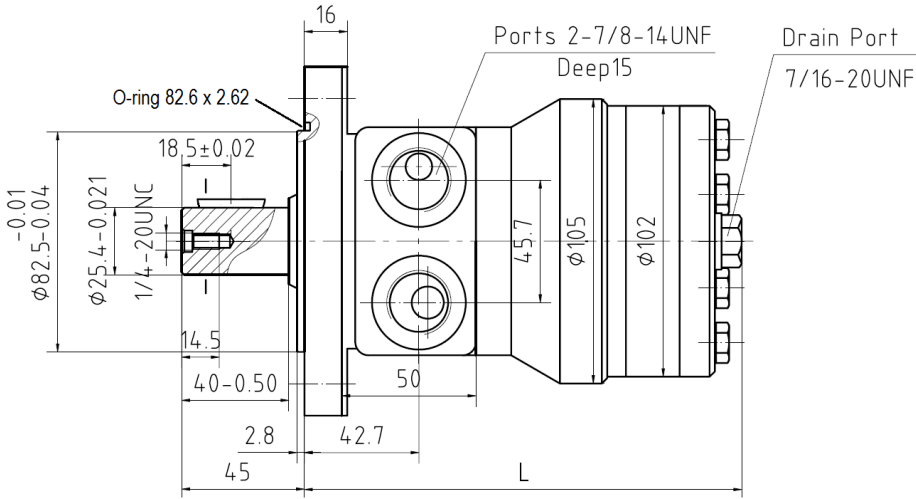
**Permissible Shaft Loads**



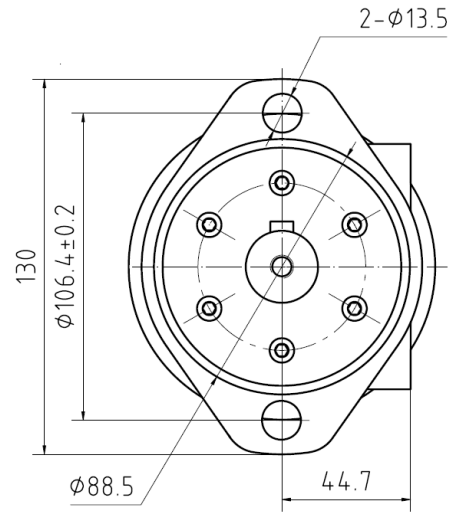
Note: Without the drain line connected, the shaft seal exceeds the pressure in the return line slightly. With the drain connected, the pressure of the shaft seal equals the pressure in the drain line.

**Section 2 – Dimensional Data “S” Frame (mm), with internal drain check**

**“O10” Threaded Port: with “2A” SAE 2 bolt Flange:**



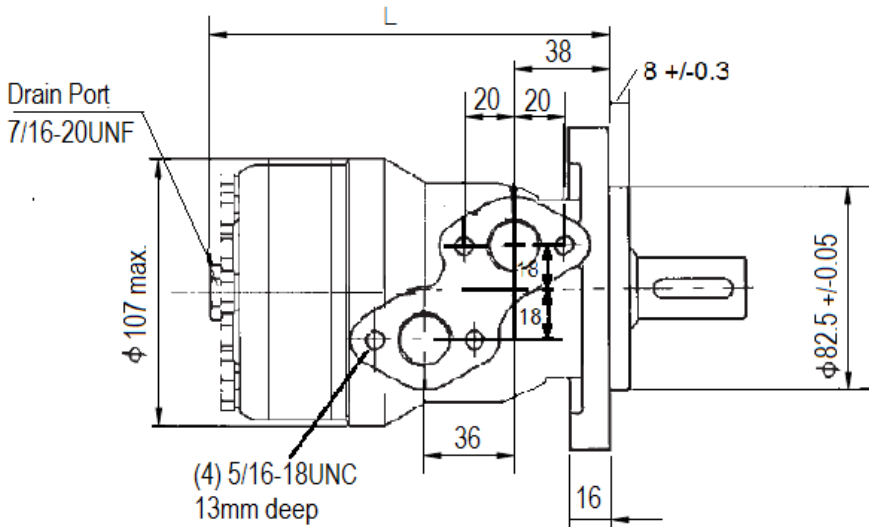
**“2A” SAE A 2-bolt Flange:**



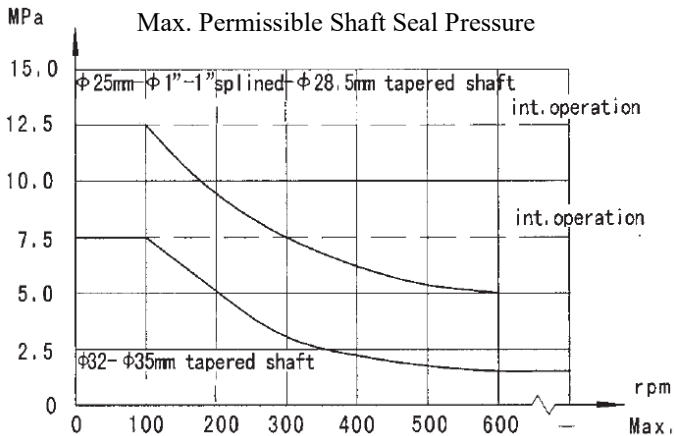
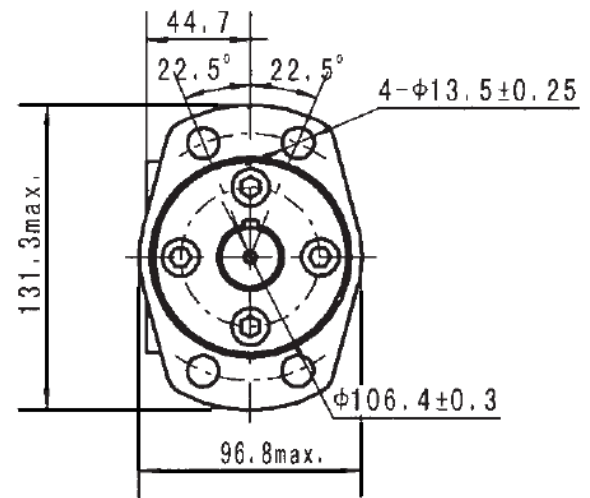
Size, cc/rev	36	*50	*80	*100	*125	*160	*200	*250	*315	*400
Dimension L (mm)	141	149	154	158	162	168	175	184	196	210

\*Not a spotlight size.

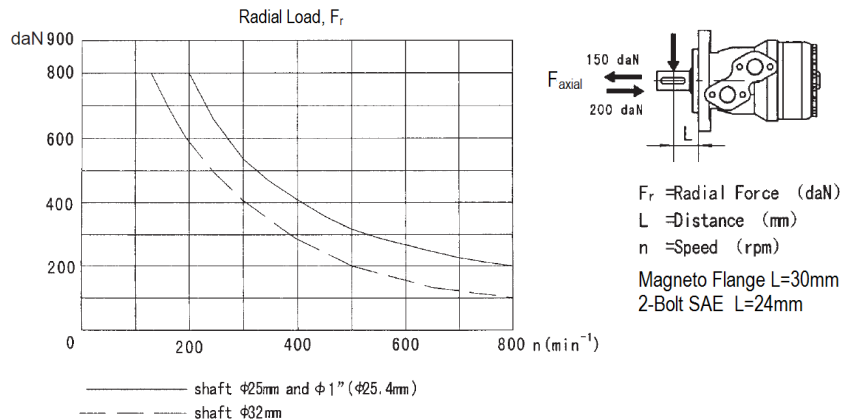
**“O10/FA” Port with “M4A” flange:**



**“M4A” Magneto 4-Bolt Flange “K1.2” or “6T”**



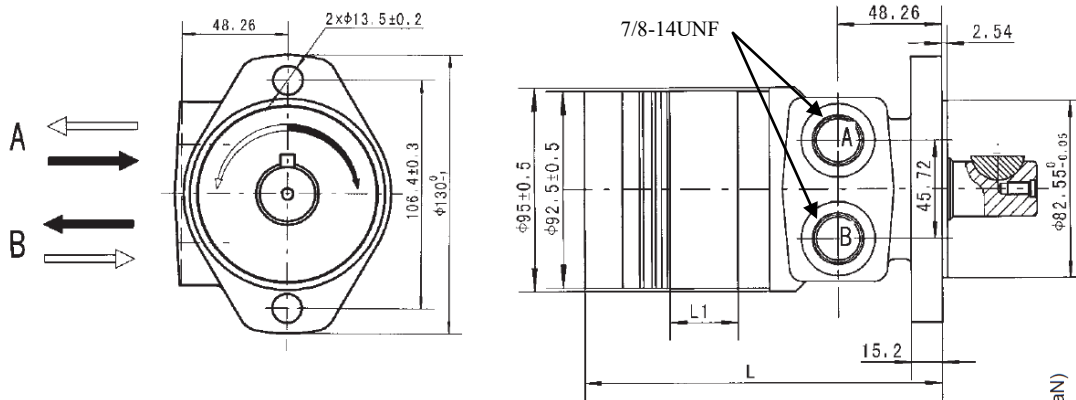
**Max. Permissible Shaft Loading**



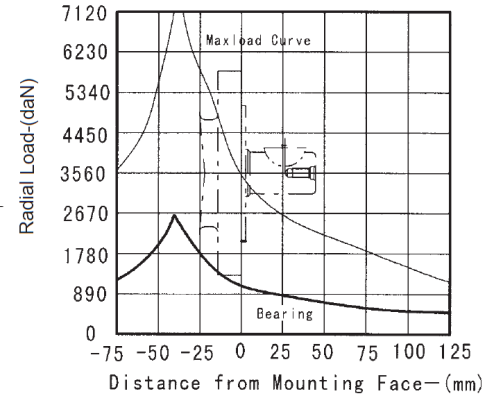
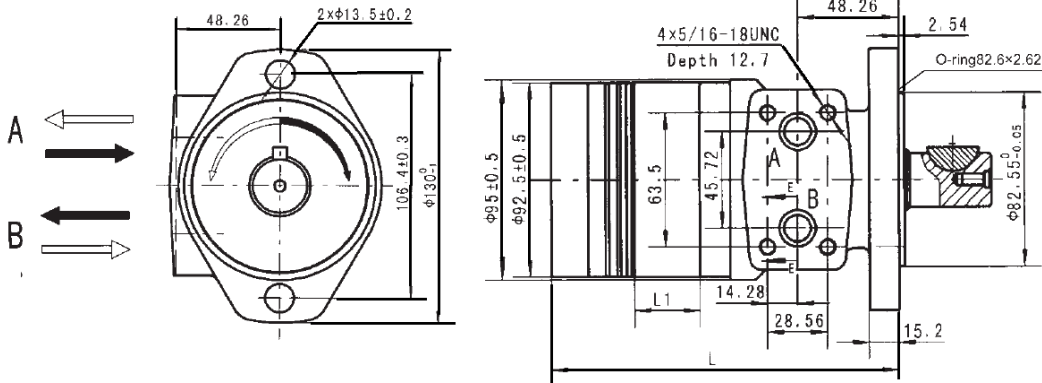
Note: Without the drain line connected, the shaft seal exceeds the pressure in the return line slightly. With the drain connected, the pressure of the shaft seal equals the pressure in the drain line.

## Section 2 – Dimensional Data “E2” Frame (mm), no drain

### “O10” Threaded Port: with “2A” SAE A 2 bolt flange:



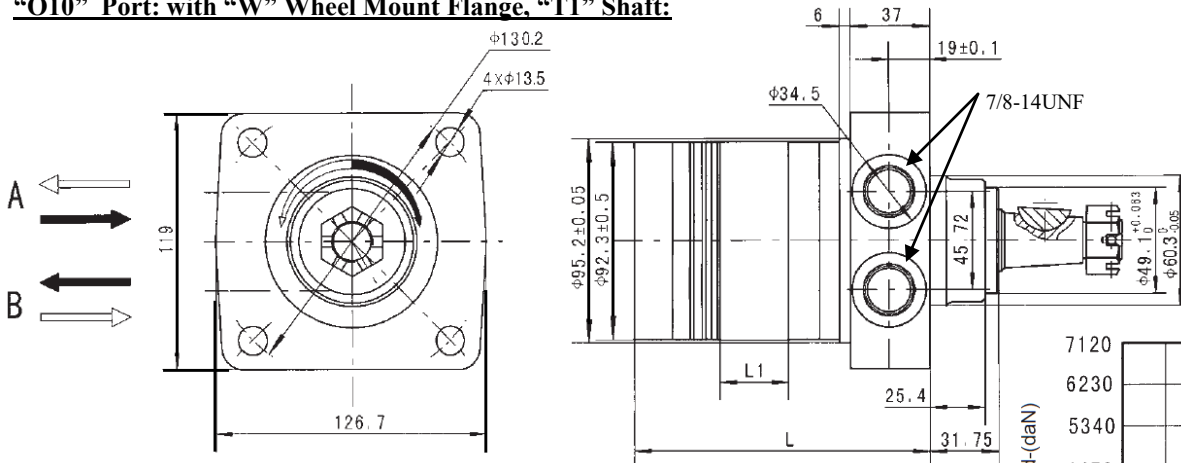
### “FB” Port: with “2A” SAE A 2 bolt flange:



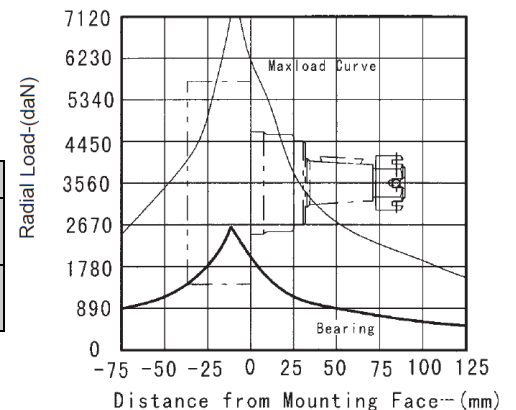
Size, cc/rev	*65	*80	*100	*125	*160	*200	*230	*250	*295	*315	*375
Dimension L (mm)	149	152	156	161	166.5	174	180	186	192	198	210
Dimension L1 (mm)	13	16	20	25	30.5	38.1	44	50	56	62	74

\*Not a spotlight size.

### “O10” Port: with “W” Wheel Mount Flange, “T1” Shaft:



Max. Permissible Shaft Loading

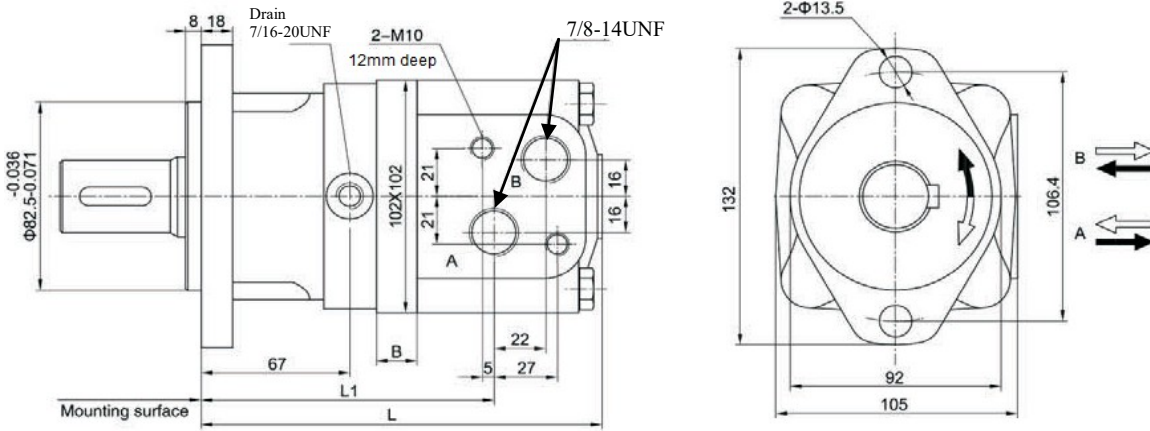


Size, cc/rev	*65	*80	*100	*125	*160	*200	*230	*250	*295	*315	*375
Dimension L (mm)	119	122	126	131	136.5	144	150	156	162	168	180
Dimension L1 (mm)	13	16	20	25	30.5	38.1	44	50	56	62	74

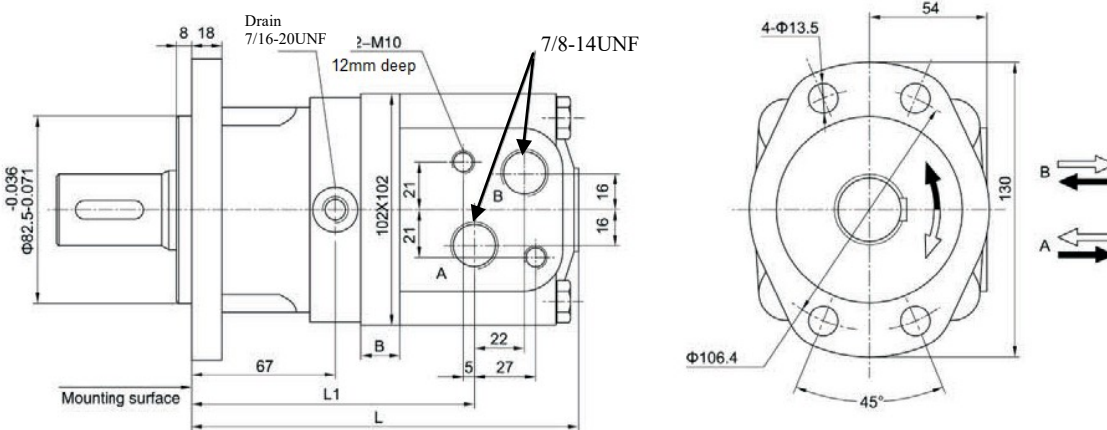
\*Not a spotlight size.

## Section 2 – Dimensional Data “3” Frame (mm), with internal drain check

### “O10/FC” Port: with “2A” SAE A 2 bolt flange:



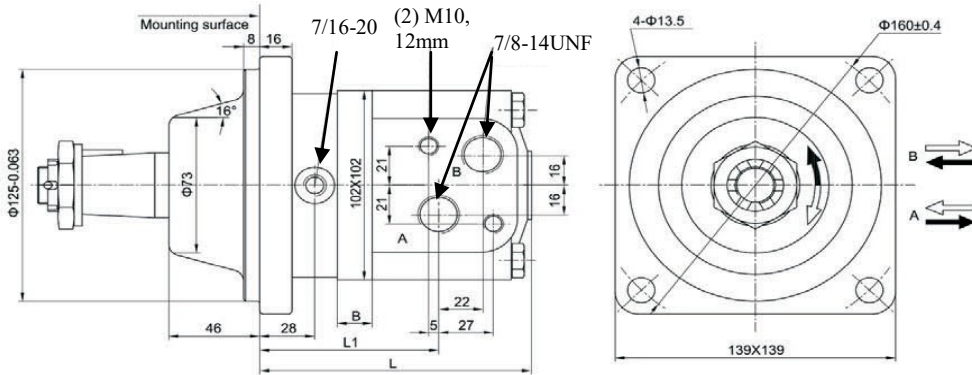
### “O10/FC” Port: with “M4A” Magneto A 4 bolt flange:



Size, cc/rev	80	100	*125	*160	*200	*250	*315	*400	*500
Dimension L (mm)	167	170.5	175	181	188	197	209	223	236
Dimension L1 (mm)	124	127.5	132	138	145	154	166	180	193

\*Not a spotlight size.

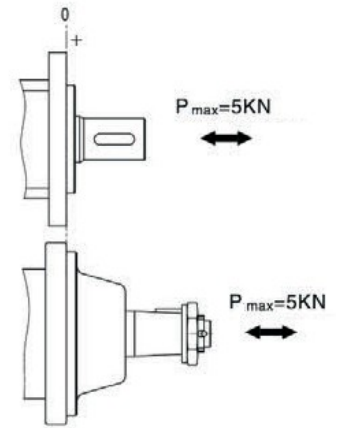
### “O10/FC” Port: with “W” Wheel mount flange, “T1.3” Shaft:



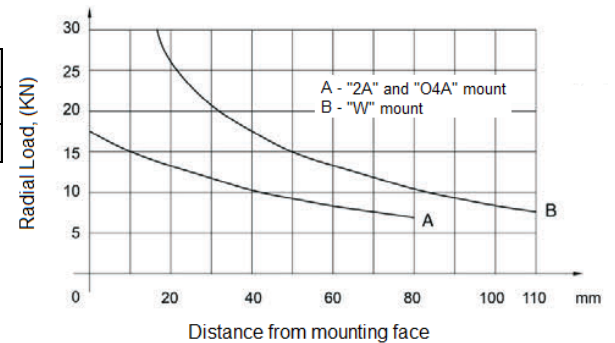
Size, cc/rev	80	100	*125	*160	*200	*250	*315	*400	*500
Dimension L (mm)	167	170.5	175	181	188	197	209	223	236
Dimension L1 (mm)	124	127.5	132	138	145	154	166	180	193

\*Not a spotlight size.

Axial Load

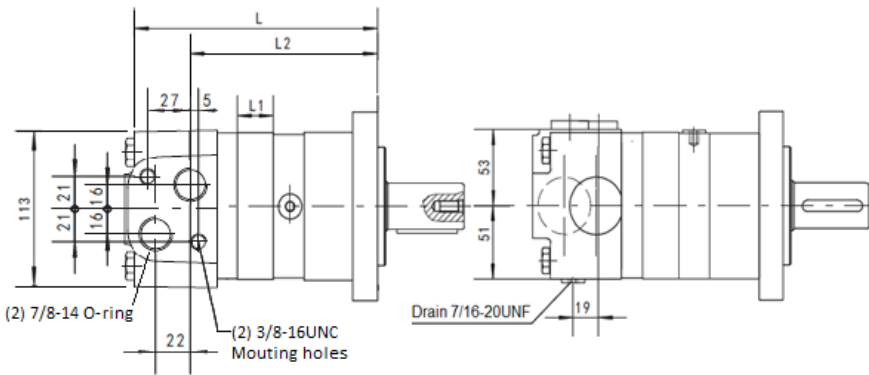


Radial Load

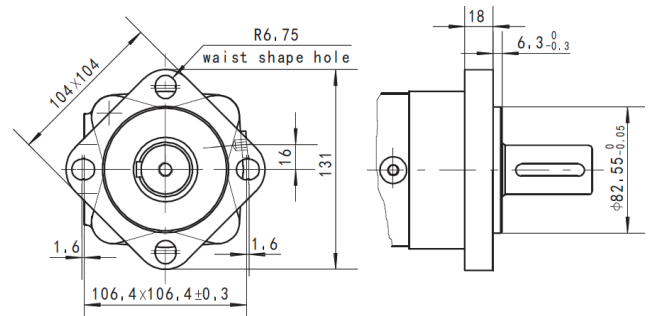


**Section 2 – Dimensional Data “Y” Frame (mm), with internal drain check**

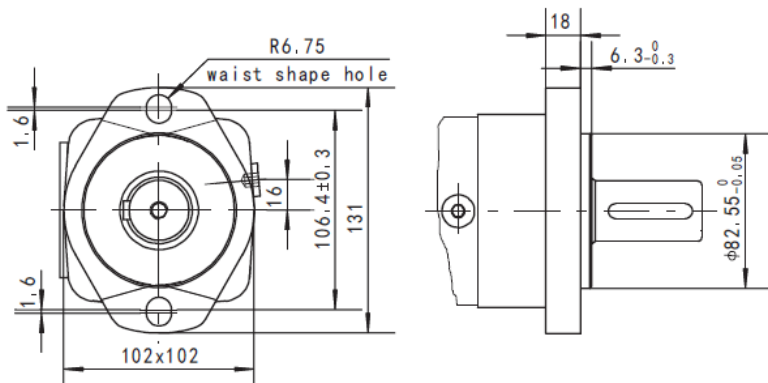
**“O10/FD”**



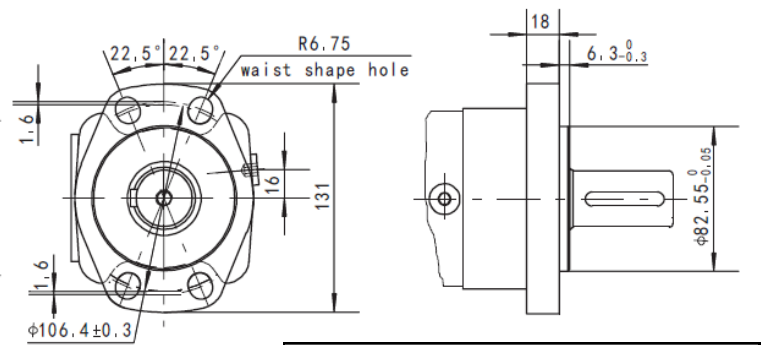
**“4A” SAEA 4 bolt flange:**



**“2A” SAE A 2 bolt flange:**



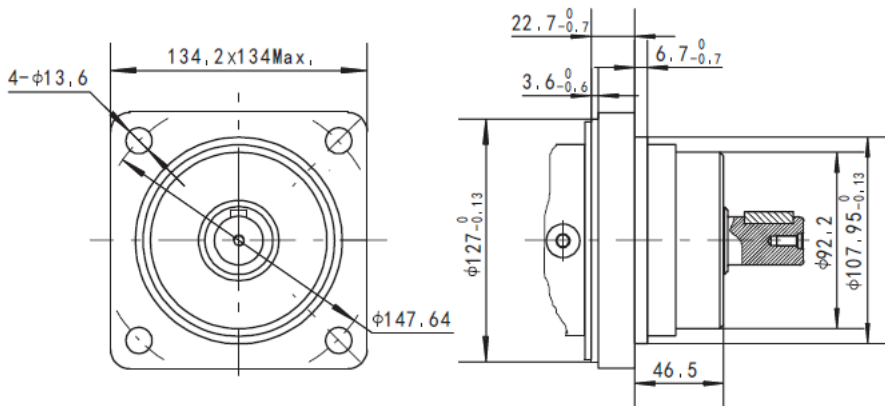
**“M4A” Magneto 4 bolt flange:**



Size, cc/rev	80	100	125	*160	*200	*250	*315	*400	*475
Dimension L (mm)	177	181	186	188	195	203	215	230	244
Dimension L1 (mm)	16	20	25	27	34	42	54	69	83
Dimension L2 (mm)	126.5	130.5	135.5	137.5	144.5	152.5	164.5	179.5	193.5

\*Not a spotlight size.

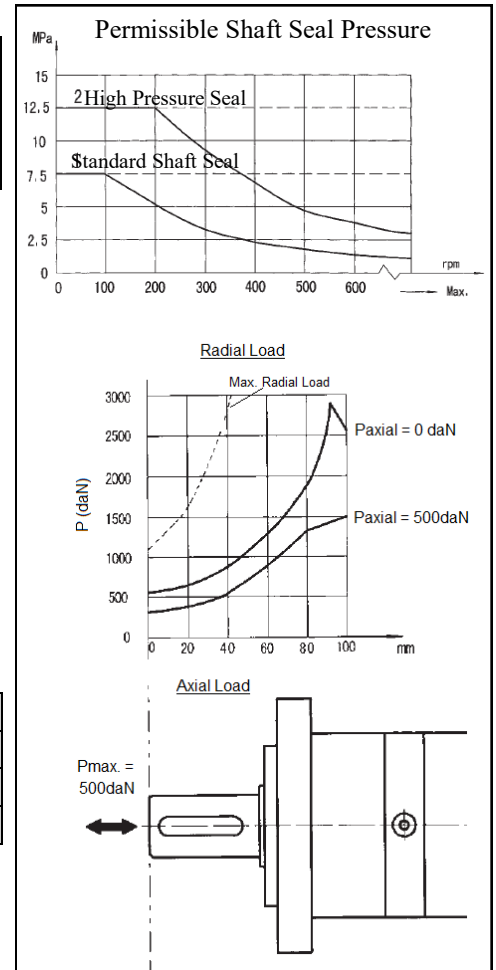
**“W” Wheel mount flange:**



Size, cc/rev	80	100	125	*160	*200	*250	*315	*400	*475
Dimension L (mm)	148.5	152.5	157.5	159.5	166.5	174.5	186.5	201.5	215.5
Dimension L1 (mm)	16	20	25	27	34	42	54	69	83
Dimension L2 (mm)	98	102	107	109	116	124	136	151	165

\*Not a spotlight size.

Note: Without the drain line connected, the shaft seal exceeds the pressure in the return line slightly. With the drain connected, the pressure of the shaft seal equals the pressure in the drain

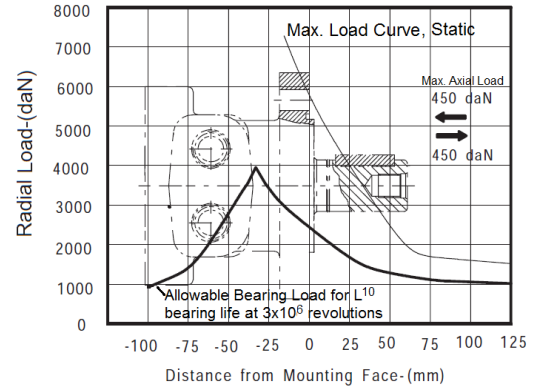
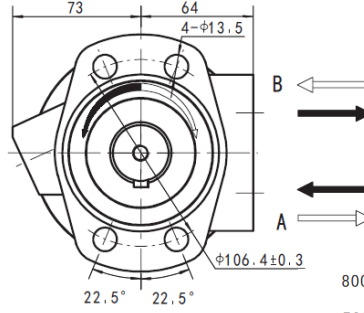
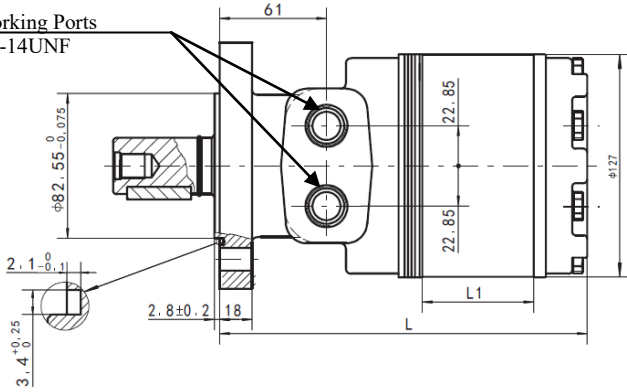




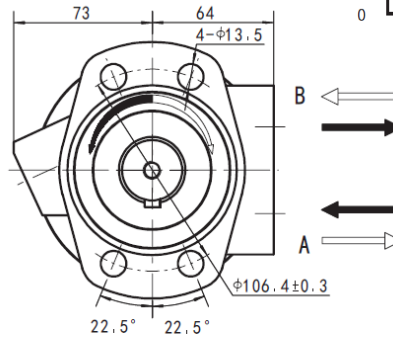
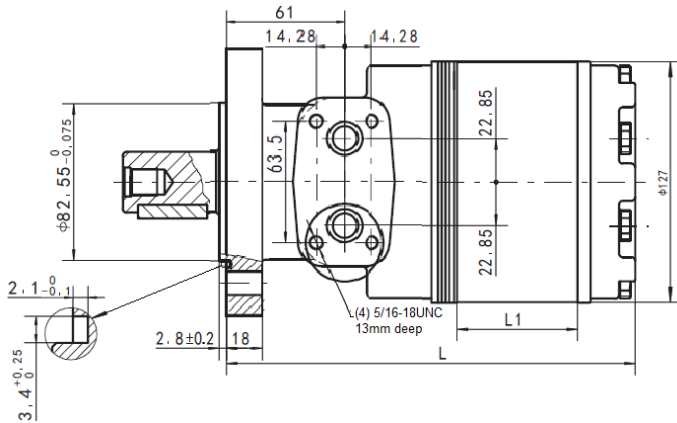
## Section 2 – Dimensional Data “R” Porting (mm), no drain

### “M4A” Magneto 4-Bolt Flange, “O10” SAE Ports:

Working Ports  
7/8-14UNF



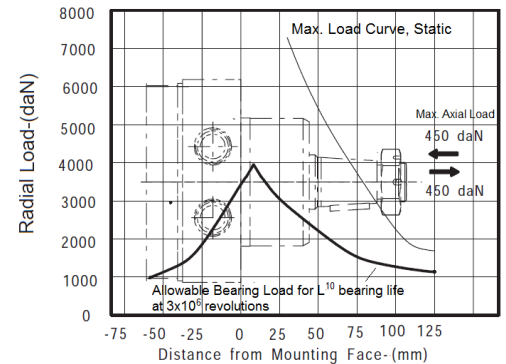
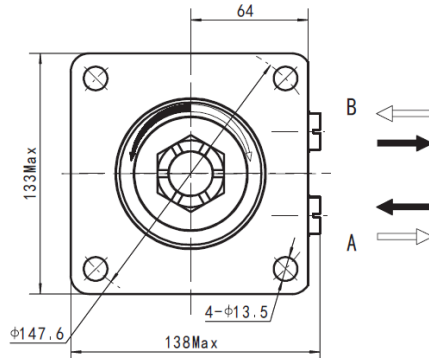
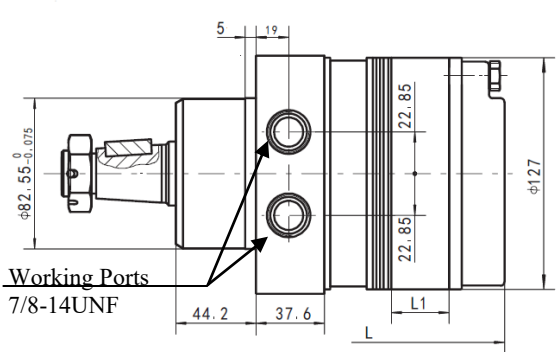
### “M4A” Magneto 4-Bolt Flange, “FB” Flange Ports:



Size, cc/rev	125	*160	*200	230	*250	300	*350	*375	*475	*540	*750
Dimension L (mm)	157	160	163.5	166	168.5	172	176	178.5	186	194	210
Dimension L1 (mm)	10.2	13.5	17	19.5	22	25.4	29.5	31.8	39.4	47.3	63.5

\*Size available on Special Request

### “W” Wheel Flange, “F” Flange “O10” SAE Ports, “T1.2” Shaft:

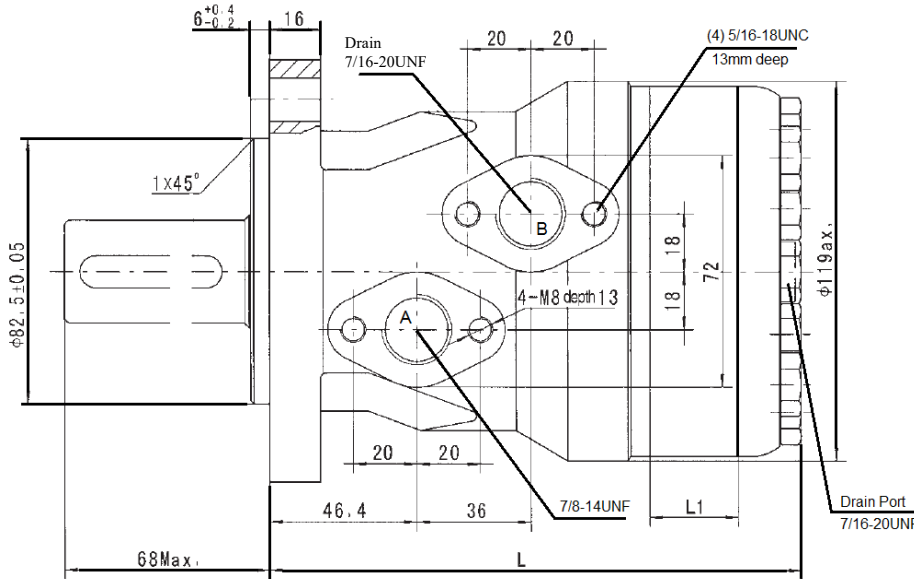


Size, cc/rev	125	*160	*200	230	*250	300	*350	*375	*475	*540	*750
Dimension L (mm)	119	122	125.5	128	130.5	134.5	138	14.5	148	156	176
Dimension L1 (mm)	10.2	13.5	17	19.5	22	25.4	29.5	31.8	39.4	47.3	63.5

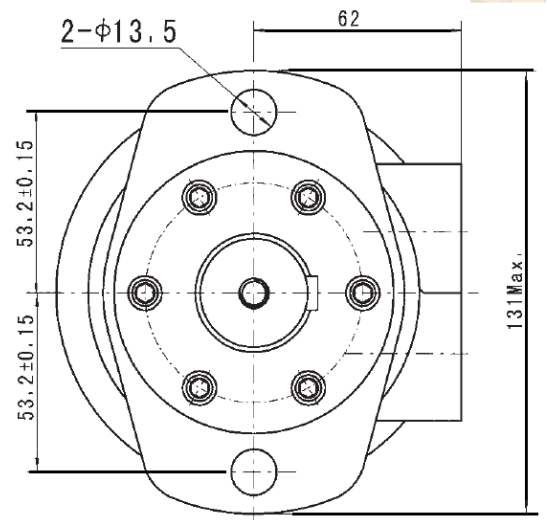
\*Size available on Special Request

**Section 2 – Dimensional Data “H” Frame (mm), with internal drain check**

**“O10” SAE Ports:**



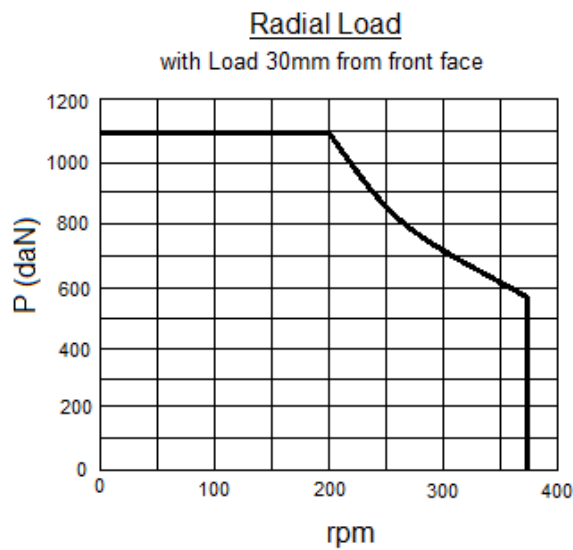
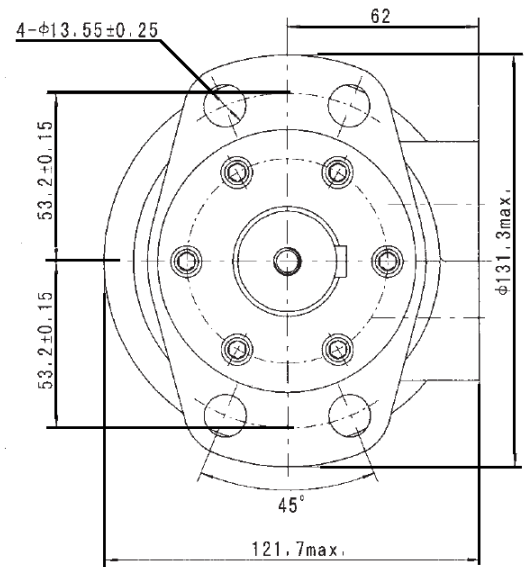
**“2A” SAE A 2 bolt flange:**



Size, cc/rev	*160	200	*250	*315	*400	*500
Dimension L (mm)	162	168	175	184	195	206
Dimension L1 (mm)	21	27	34	42	54	65

\*Not a spotlight size.

**“M4A” Magneto 4 bolt flange:**



$$F_r = 1100/n \times 25000(103.5+L)$$

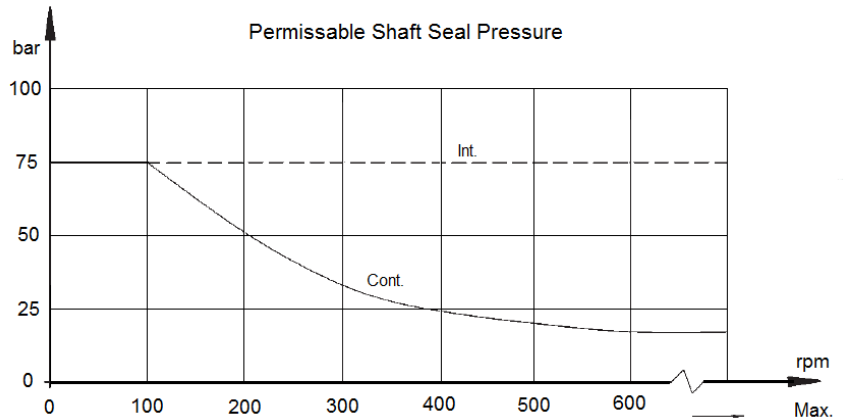
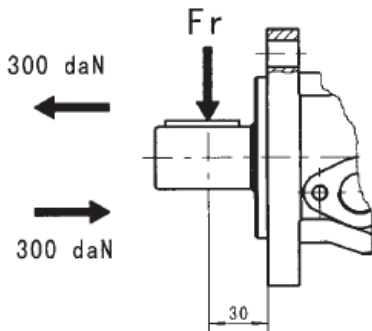
$F_r$  = radial force

L = distance

n = rpm

L < 60mm, n > 200rpm

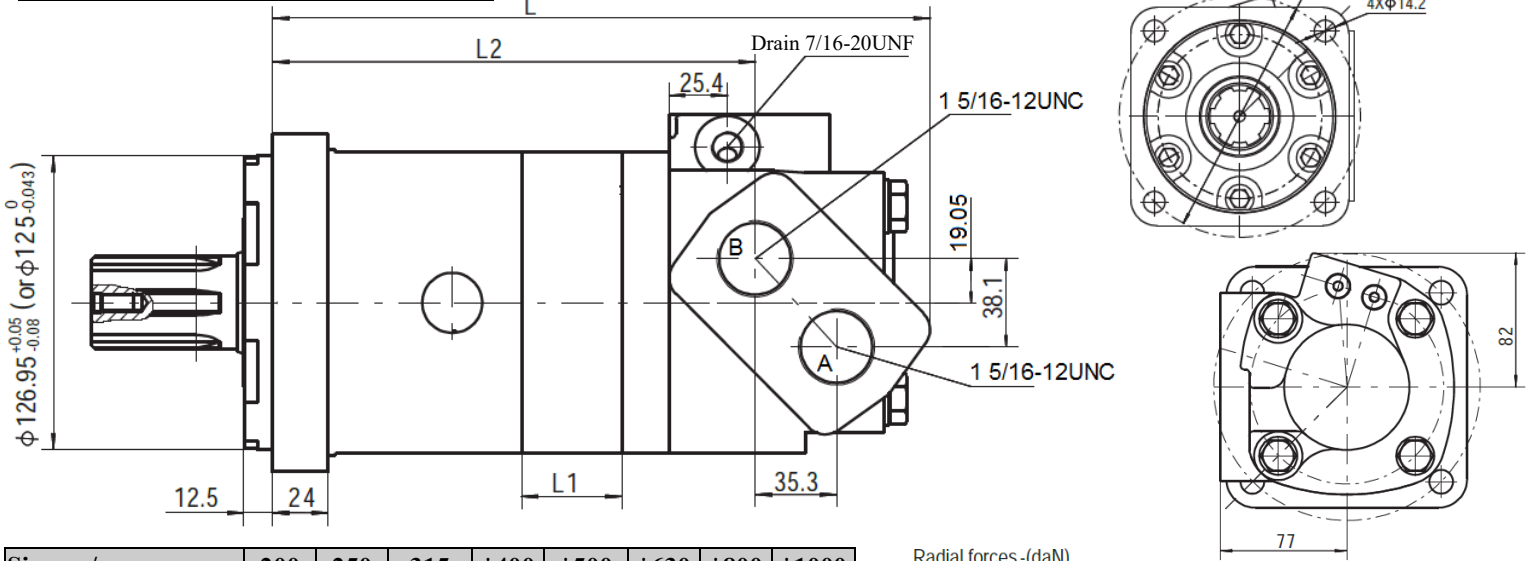
**Axial Force**



Note: Without the drain line connected, the shaft seal exceeds the pressure in the return line slightly. With the drain connected, the pressure of the shaft seal equals the pressure in the drain line.

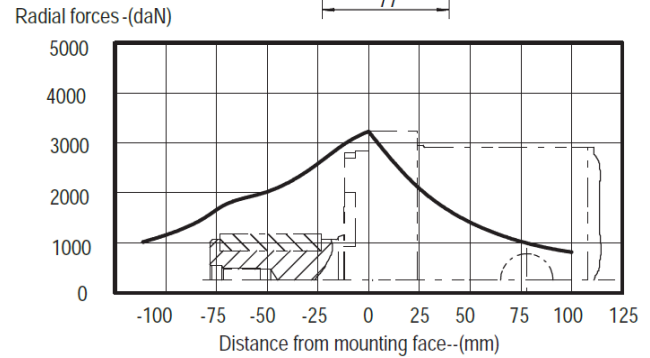
## Section 2 – Dimensional Data “6” Frame (mm), with internal drain check

### “4C” SAE C, 4 bolt Flange, “O16” Ports:

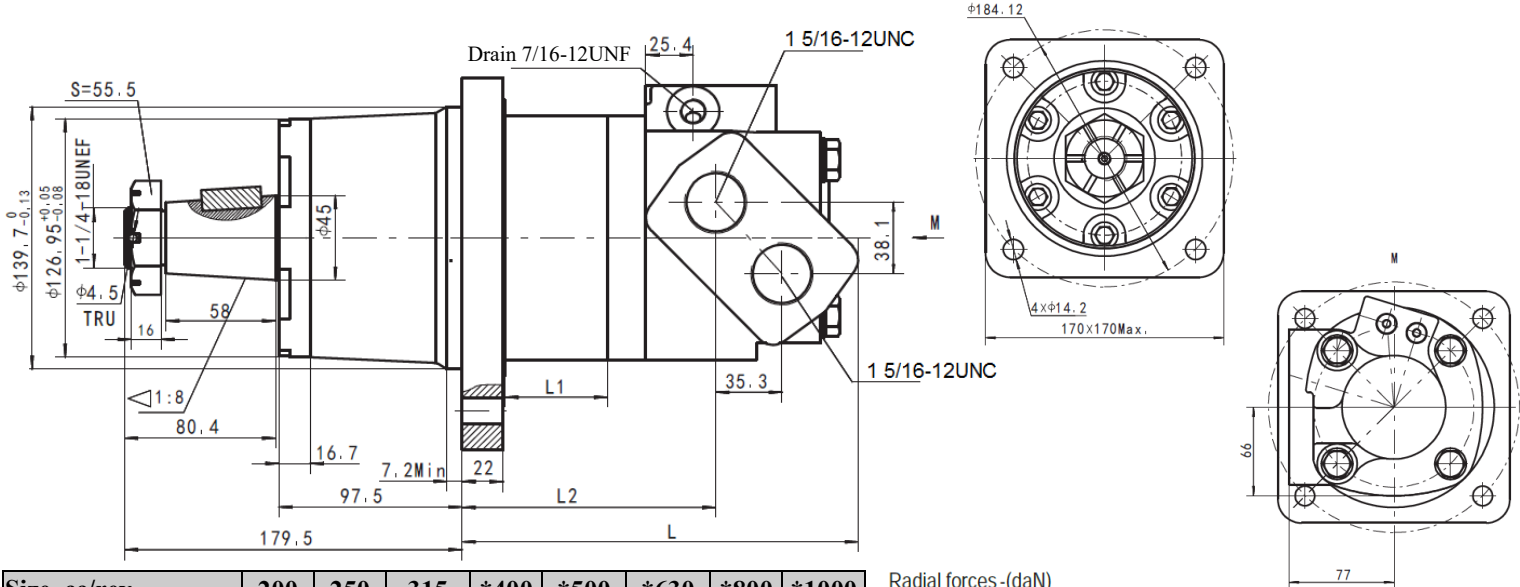


Size, cc/rev	200	250	315	*400	*500	*630	*800	*1000
Dimension L (mm)	265	271	278	287	298	313	333	353
Dimension L1 (mm)	21.7	27.3	34.5	43.4	54.4	69.1	89	108.9
Dimension L2 9mm	187.5	193.1	200.3	209.2	220.2	234.8	254.8	274.7

\*Not a spotlight size.

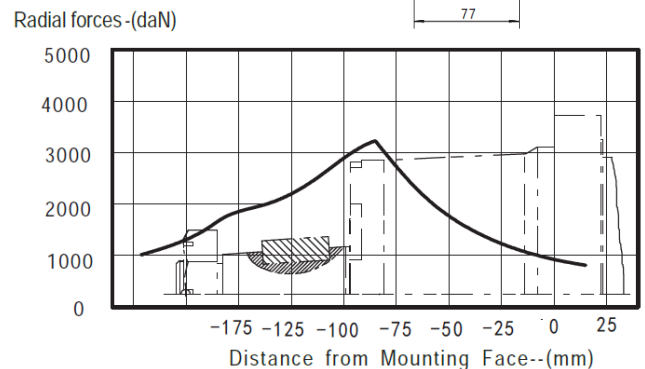


### “W” Wheel Flange, “O16” Ports, “T1.7”



Size, cc/rev	200	250	315	*400	*500	*630	*800	*1000
Dimension L (mm)	179	185	192	201	212	226.7	246.5	266.5
Dimension L1 (mm)	21.7	27.3	34.5	43.4	54.4	69.1	89	108.9
Dimension L2 9mm	102.5	108	115.5	124.5	135.5	150.2	170	190

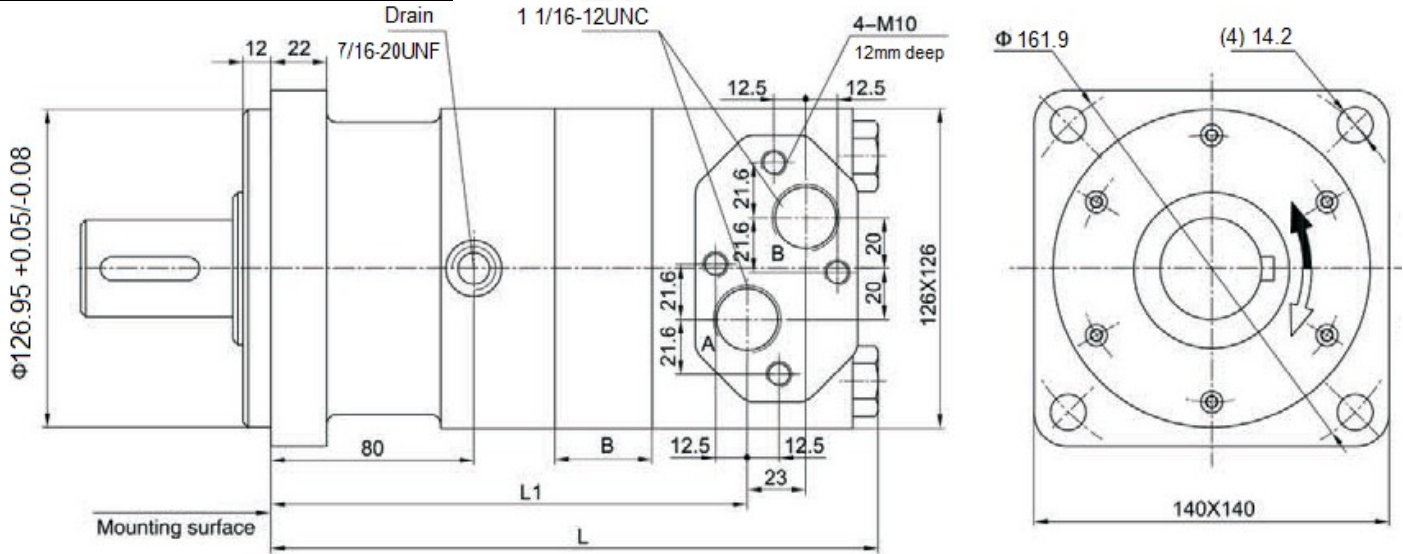
\*Not a spotlight size.



Note: Without the drain line connected, the shaft seal exceeds the pressure in the return line slightly. With the drain connected, the pressure of the shaft seal equals the pressure in the drain line.

## Section 2 – Dimensional Data “4” Frame (mm), internal Drain

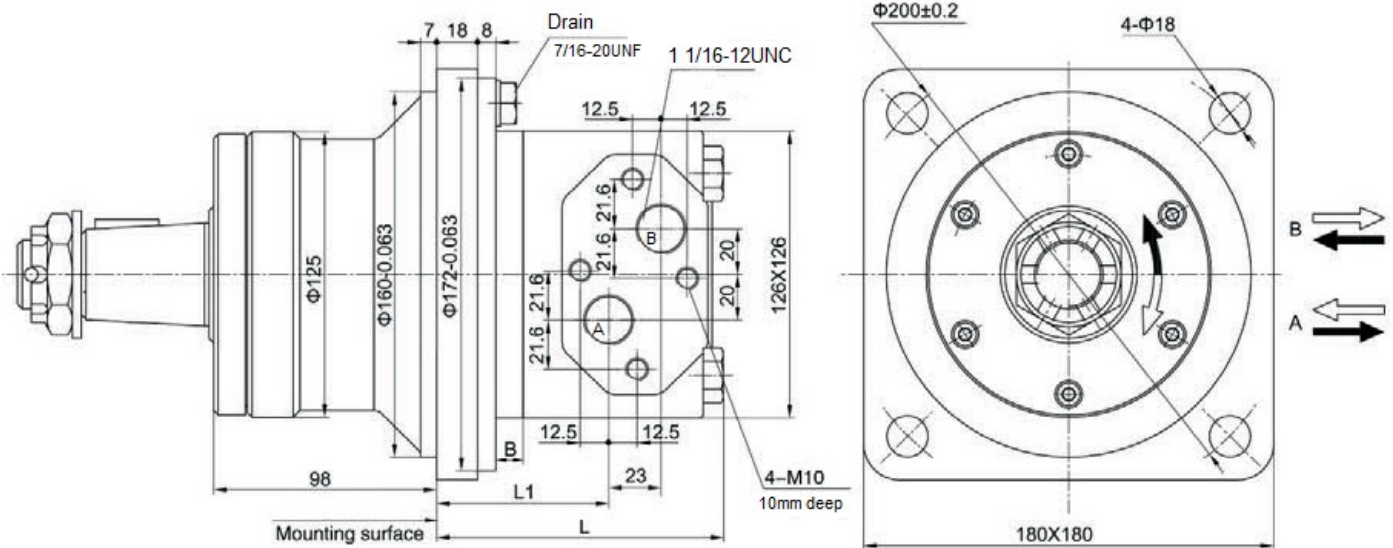
### “4B” SAE B, 4-bolt Flange, “O12” Ports:



Size, cc/rev	160	*200	*250	*320	400	*500
Dimension L (mm)	213	217.5	223	230	239	257.5
Dimension L1 (mm)	163	167	173	180	189	207

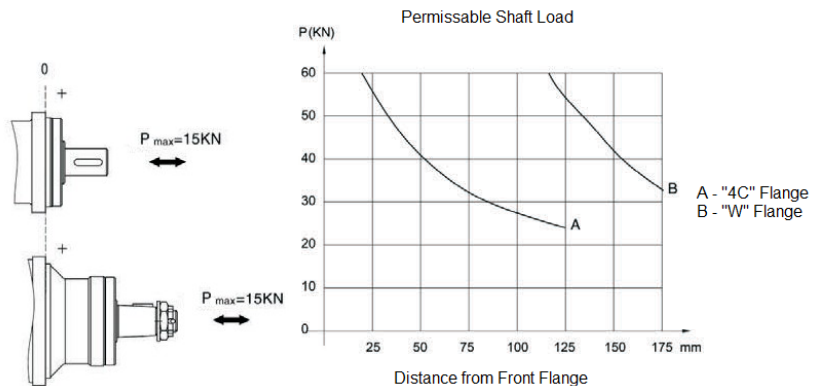
\*Not a spotlight size.

### “W” Wheel Flange, “O12” Ports, “T1.6” Shaft:



Size, cc/rev	*160	*200	*250	*320	400	*500
Dimension L (mm)	127	131.5	138	145	154	172
Dimension L1 (mm)	76.5	81	86.5	93.5	102.5	121

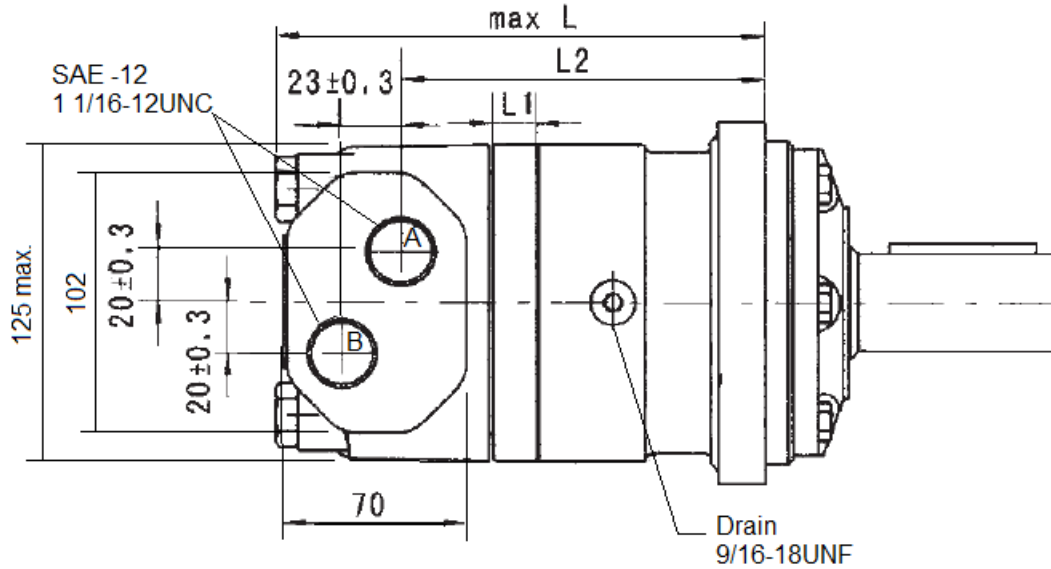
\*Not a spotlight size.



Note: Without the drain line connected, the shaft seal exceeds the pressure in the return line slightly. With the drain connected, the pressure of the shaft seal equals the pressure in the drain line.

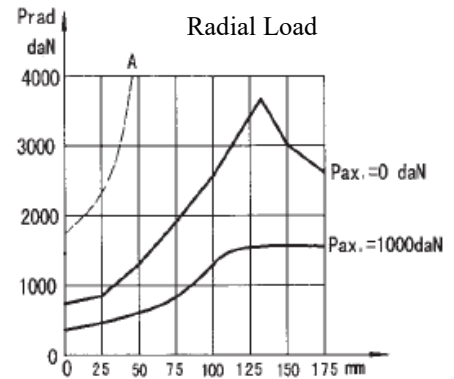
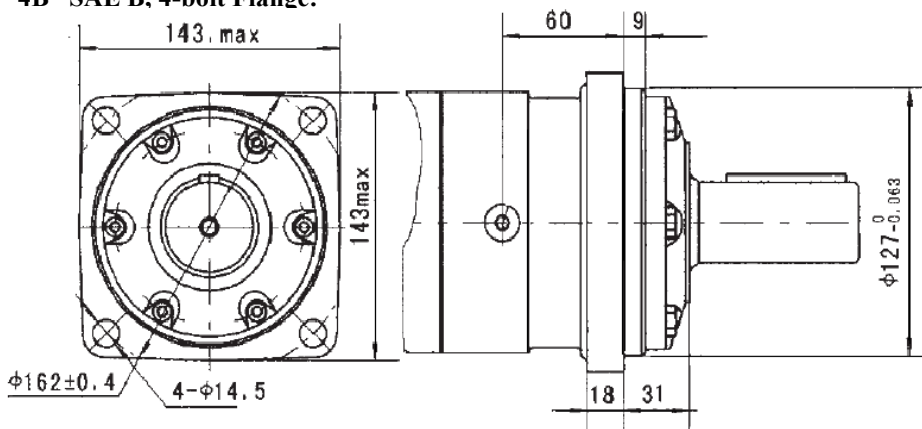
**Section 2 – Dimensional Data “T” Frame (mm), external Drain**

**“O12” Ports:**

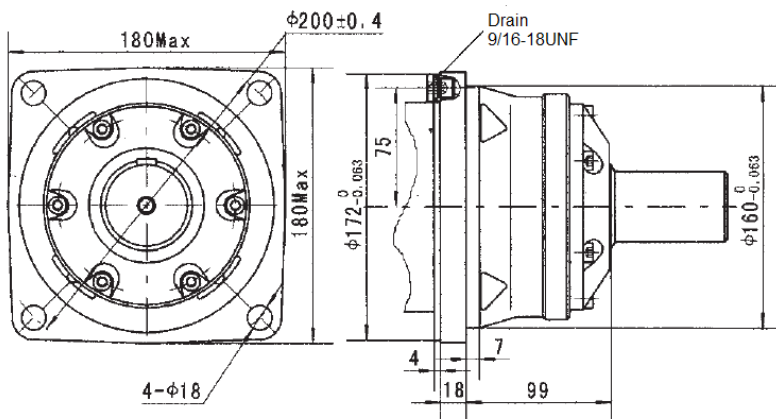


Size, cc/rev	160	200	250	315	400	500	630	800
Dimension L (mm)	193	197	204	210	217	225	237	248
Dimension L1 (mm)	17	21	14	20	27	35	47	58
Dimension L2 (mm)	142.5	146.5	152.5	158.5	165.5	173.5	185.5	196.5

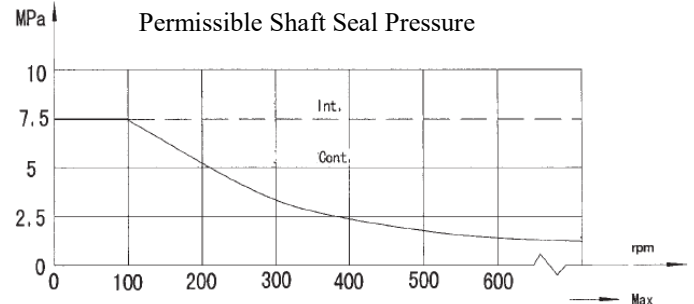
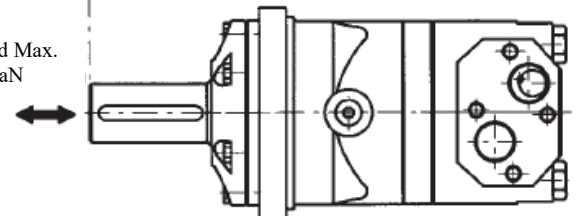
**“4B” SAE B, 4-bolt Flange:**



**“W” Wheel Flange:**



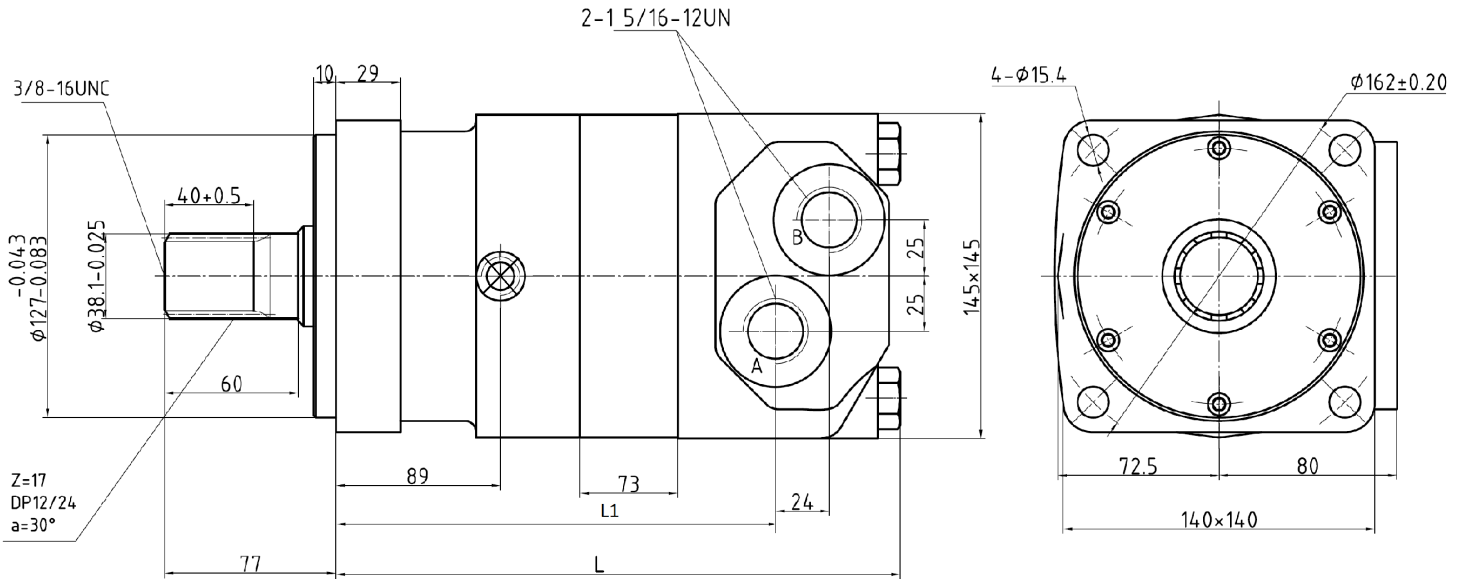
Axial Load Max.  
= 1000daN



Note: Without the drain line connected, the shaft seal exceeds the pressure in the return line slightly. With the drain connected, the pressure of the shaft seal equals the pressure in the drain line.

## Section 2 – Dimensional Data “5” Frame (mm), internal Drain

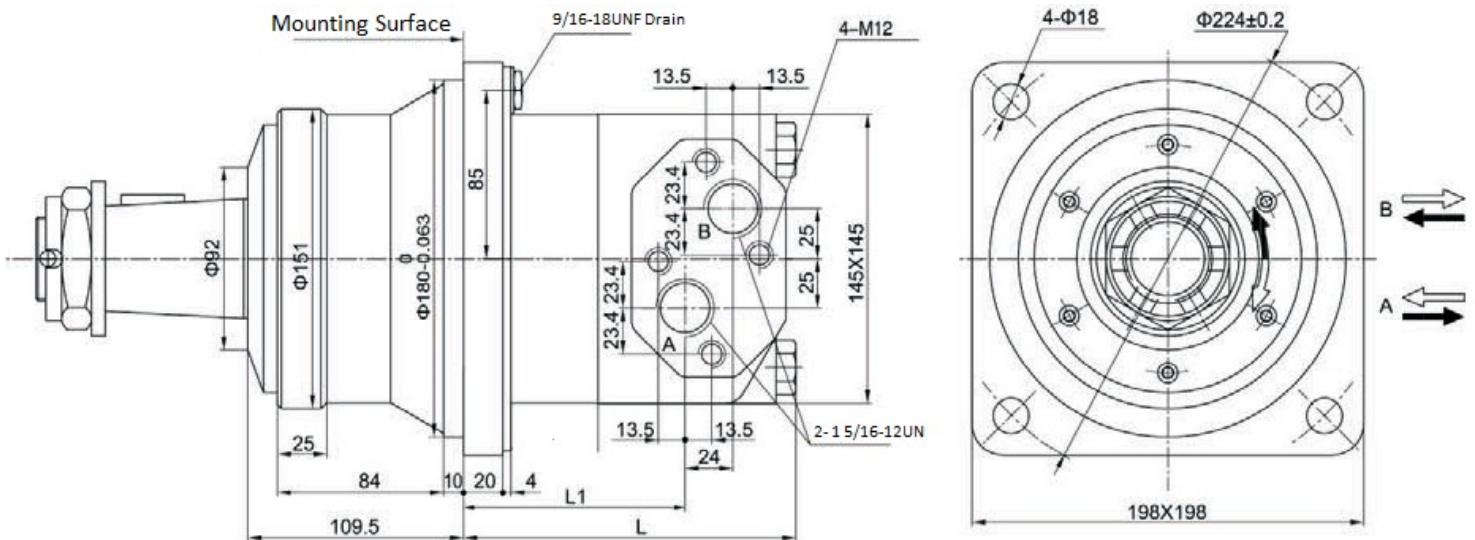
### “4B” Flange:



Size, cc/rev	*315	400	500	630	800	985
Dimension L (mm)	244	251	260	270	283	298
Dimension L1 (mm)	186	193	201	211	225	240

\*Not a spotlight size.

### “W” Flange (Wheel Flange):



Size, cc/rev	*315	400	500	630	800	985
Dimension L (mm)	146	251	260	270	283	298
Dimension L1 (mm)	96	93	101	111	125	140

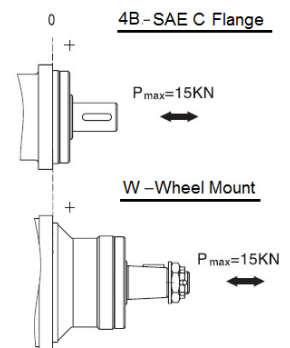
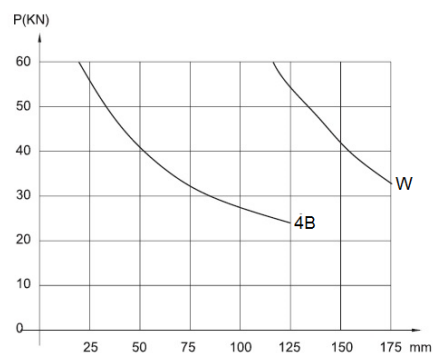
\*Not a spotlight size.

Maximum Continuous Case Pressure = 20bar

Maximum Intermittent Case Pressure (<10% every minute) = 60bar

Note: Without the drain line connected, the shaft seal exceeds the pressure in the return line slightly. With the drain connected, the pressure of the shaft seal equals the pressure in the drain line.

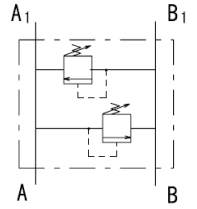
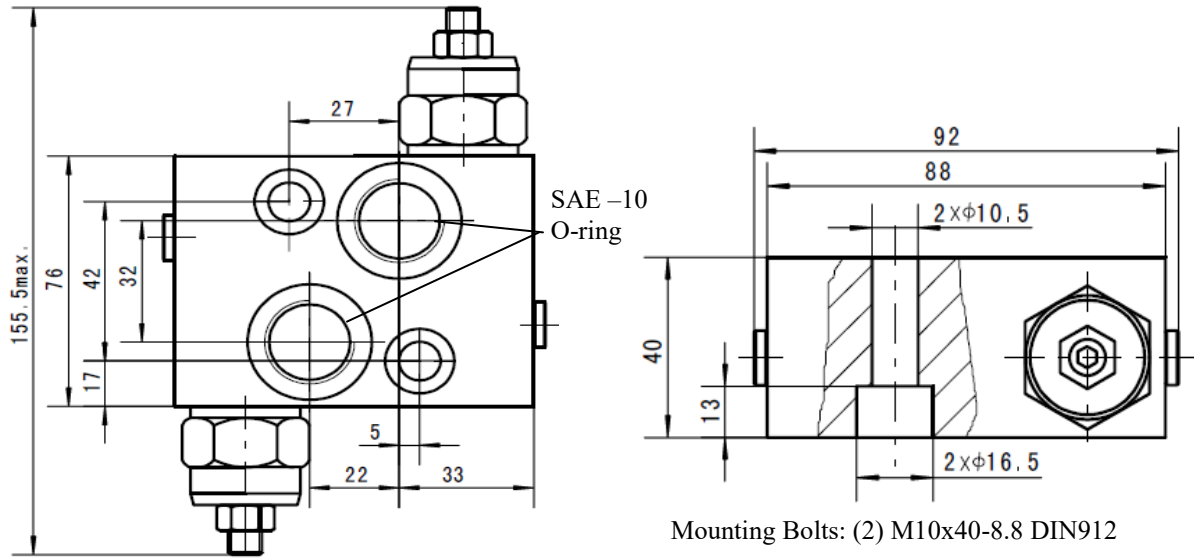
### ■ PERMISSIBLE SHAFT LOADS



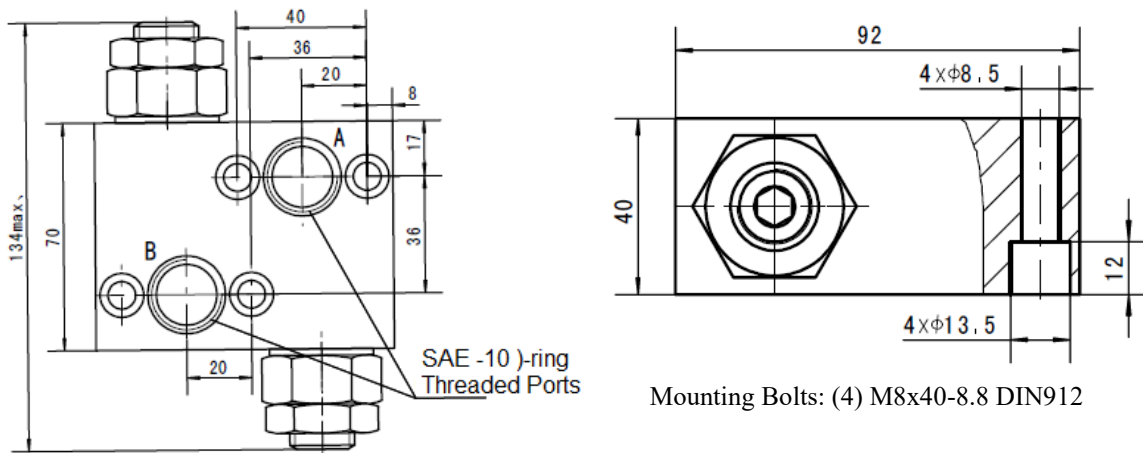


### Section 3 – Cross Port Relief Valves

Part No.: VFRMP-10-H210-3, for frame Type “3” and “Y”



Part No.: VFRMP-10-H210-S, for fame Type “S”



Part No.: VFRMP-10-H210-4, for frame Type “4”

