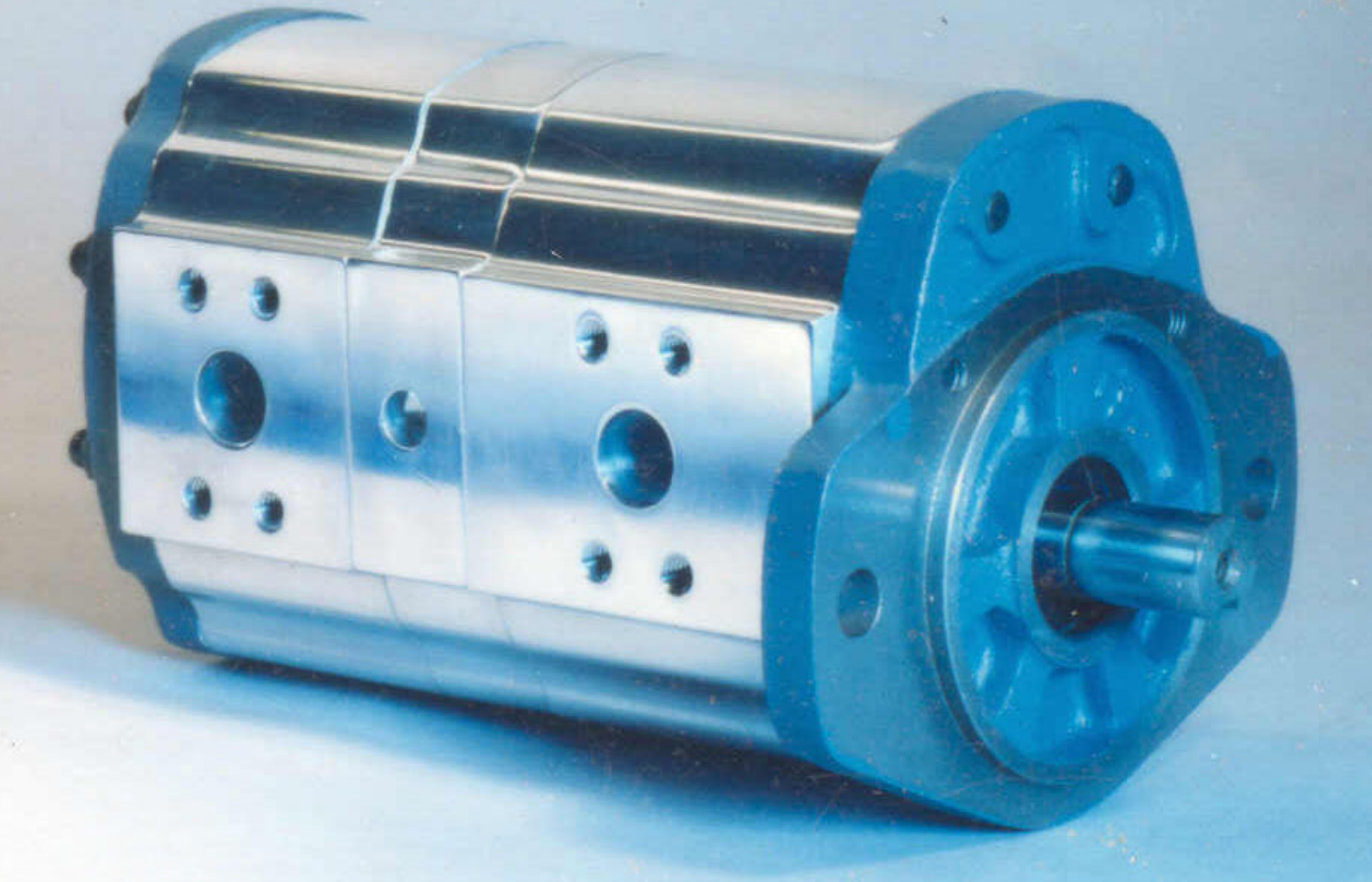
TANDEM PUMP

P3000



PUMP CODIFICATION CHART - TANDEM PUMPS

0P	OP	3003	3003	C	P	S	T	T	B	N
Frame Size - Front Pump	Frame Size - Rear Pump	Displace-ment - Front Pump	Displace-ment - Rear Pump	Direction of Rotation	Shaft	Mounting Flange	Inlet & Outlet Ports - Front Pump	Inlet & Outlet Ports - Rear Pump	End Cover	Seals

EXAMPLE OF ORDERING CODE

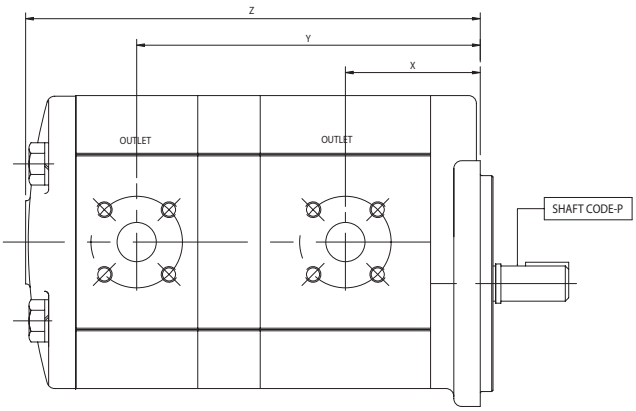
0P	OP	3015	3008	C	P	S	T	T	B	N
Frame Size - Front Pump	Frame Size - Rear Pump	Displace-ment - Front Pump	Displace-ment - Rear Pump	Direction of Rotation	Shaft	Mounting Flange	Inlet & Outlet Ports - Front Pump	Inlet & Outlet Ports - Rear Pump	End Cover	Seals

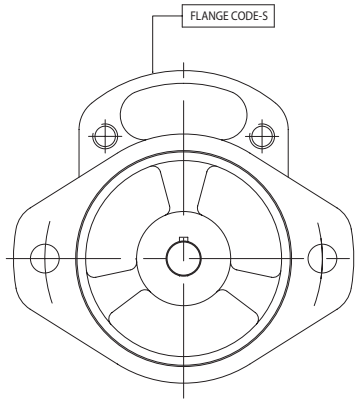
This order code specifies a Tandem pump of

- 0P Frame Size
- P3000 Series
- 4.53 cc/rev front pump capacity
- 2.27 cc/rev rear pump capacity
- Clockwise Rotation
- Parallel Shaft
- SAE Mounting Flange
- BSP Ported Body - Front Pump
- BSP Ported Body - Rear Pump
- Standard End Cover
- Nitrile Seals

TANDEM 0P - 0P

INSTALLATION DIMENSIONS



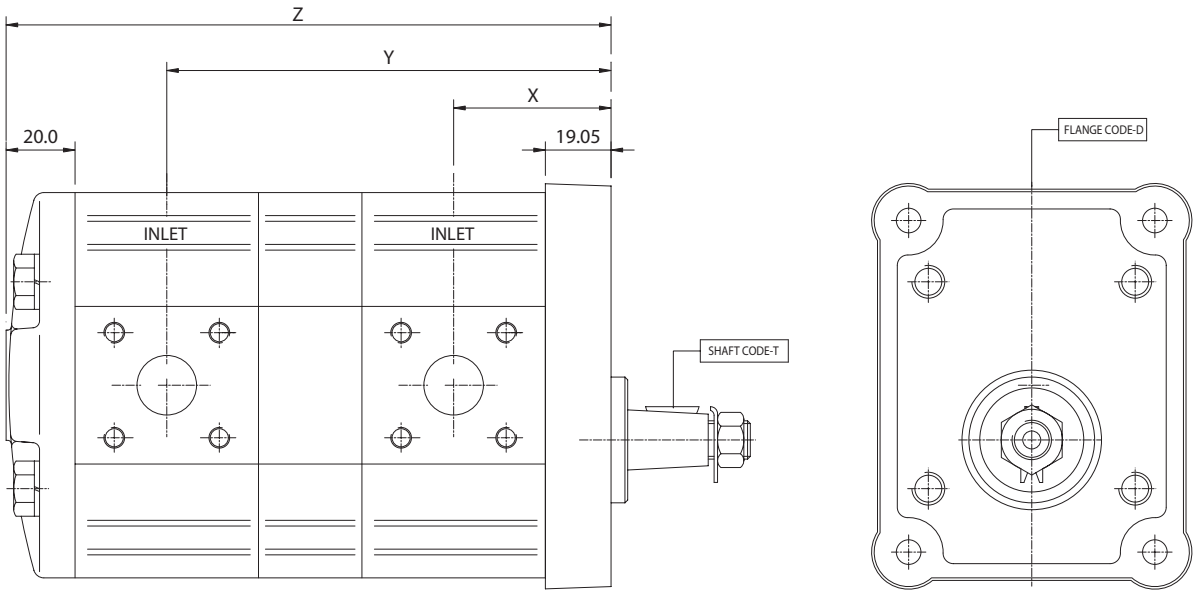


PUMP TYPE OP - OP	DIMENSIONS		
	X	Y	Z
3015-3015	42.3	113.8	156.0
-3013	"	113.1	154.6
-3011	"	112.4	153.2
-3008	"	111.4	151.2
-3006	"	110.6	149.8
-3004	"	110.1	148.7
-3003	"	109.7	147.8
3013-3013	41.6	111.7	153.2
-3011	"	111.0	152.0
-3008	"	110.0	150.0
-3006	"	109.2	148.3
-3004	"	108.7	147.2
-3003	"	108.2	146.4
3011-3011	40.9	109.6	150.5
-3008	"	108.6	148.5
-3006	"	107.9	147.0
-3004	"	107.3	146.0
-3003	"	106.9	145.0
3008-3008	39.9	106.6	146.5
-3006	"	105.9	145.0
-3004	"	105.3	144.0
-3003	"	104.9	143.0
3006-3006	39.2	104.4	143.5
-3004	"	103.8	142.4
-3003	"	103.4	141.5
3004-3004	38.6	102.7	141.3
-3003	"	102.3	140.5
3003-3003	38.2	101.4	139.6

ALL DIMENSIONS ARE IN MM UNLESS SPECIFIED.

TANDEM 1P - 1P

INSTALLATION DIMENSIONS



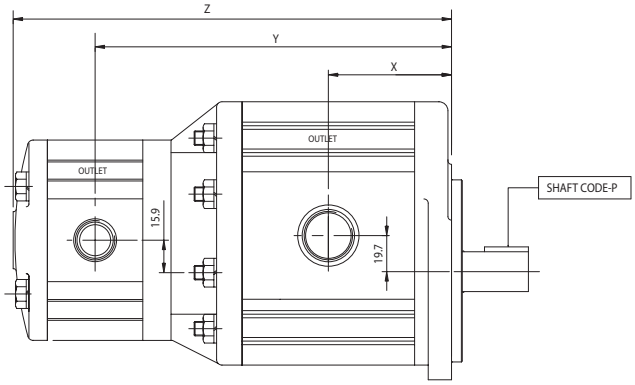
PUMP TYPE.	DIM-X	DIM-Y	DIM-Z
3090-3090	63.4	182.1	246.4
-3072	"	178.7	239.7
-3060	"	176.4	235.1
-3052	"	174.9	232.0
-3044	"	173.4	229.0
-3036	"	164.3	211.0
-3028	"	162.8	207.9
-3020	"	161.3	204.8
-3017	"	160.5	203.2
3072-3072	60.1	172.1	233.0
-3060	"	169.8	228.5
-3052	"	168.2	225.4
-3044	"	166.7	222.3
-3036	"	157.7	204.3
-3028	"	156.1	201.2
-3020	"	154.6	198.1
-3017	"	153.8	196.6
3060-3060	57.8	165.2	224.0
-3052	"	163.6	221.0
-3044	"	162.1	218.0
-3036	"	153.1	200.0
-3028	"	151.5	197.0
-3020	"	150.0	193.5
-3017	"	149.2	192.0

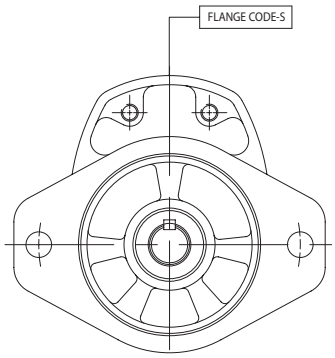
PUMP TYPE.	DIM-X	DIM-Y	DIM-Z
3052-3052	56.2	160.6	218.0
-3044	"	159.0	215.0
-3036	"	150.0	197.0
-3028	"	148.5	193.5
-3020	"	147.0	190.5
-3017	"	146.2	189.0
3044-3044	54.7	156.0	211.6
-3036	"	147.0	193.5
-3028	"	145.4	190.5
-3020	"	143.9	187.4
-3017	"	143.1	185.8
3036-3036	45.7	128.9	175.5
-3028	"	127.3	172.4
-3020	"	125.8	169.3
-3017	"	125.0	167.8
3028-3028	44.1	124.3	169.3
-3020	"	122.7	166.3
-3017	"	121.9	164.7
3020-3020	42.6	119.6	163.2
-3017	"	118.2	161.6
3017-3017	41.8	117.3	160.0

ALL DIMENSIONS ARE IN MM UNLESS SPECIFIED.

TANDEM 2P - 1P

INSTALLATION DIMENSIONS





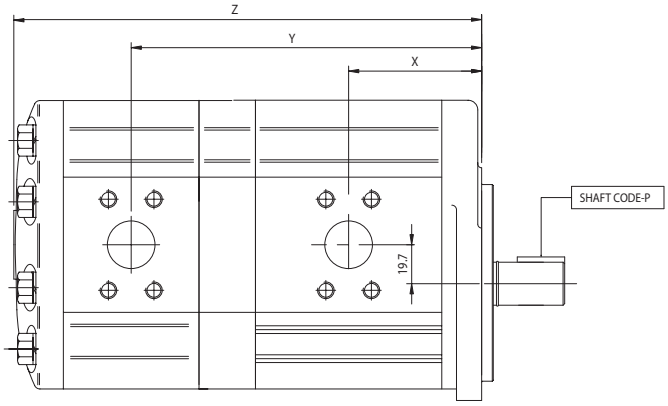
PUMP TYPE 2P-1P	DIMENSIONS		
	X	Y	Z
3220-3090	81.7	241.6	305.9
-3072	"	238.3	299.3
-3060	"	236.0	294.7
-3052	"	234.5	291.7
-3044	"	232.9	288.5
-3036	"	223.9	270.5
-3028	"	222.4	267.5
-3020	"	220.8	264.3
-3017	"	220.1	262.9
3158-3090	74.3	226.7	291.0
-3072	"	223.4	284.4
-3060	"	221.1	279.8
-3052	"	219.6	276.8
-3044	"	218.0	273.6
-3036	"	209.0	255.6
-3028	"	207.5	252.6
-3020	"	205.9	249.4
-3017	"	205.2	248.0
3146-3090	72.8	223.7	288.0
-3072	"	220.4	281.4
-3060	"	218.1	276.8
-3052	"	216.6	273.8
-3044	"	215.0	270.6
-3036	"	206.0	252.6
-3028	"	204.5	249.6
-3020	"	202.9	246.4
-3017	"	202.2	245.0
3120-3090	69.7	217.6	281.9
-3072	"	214.3	275.3
-3060	"	212.0	270.7
-3052	"	210.5	267.7
-3044	"	208.9	264.5
-3036	"	199.9	246.5
-3028	"	198.4	243.5
-3020	"	196.8	240.3
-3017	"	196.1	238.9

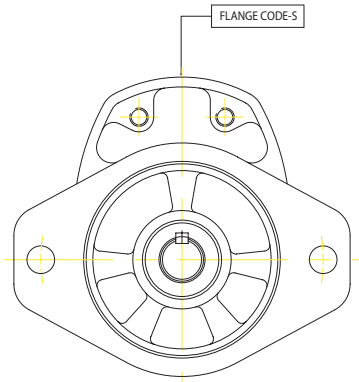
PUMP TYPE 2P-1P	DIMENSIONS		
	X	Y	Z
3105-3090	67.9	213.8	278.1
-3072	"	210.5	271.5
-3060	"	208.2	266.9
-3052	"	206.7	263.9
-3044	"	205.1	260.7
-3036	"	196.1	242.7
-3028	"	194.6	239.7
-3020	"	193.0	236.5
-3017	"	192.3	235.1
3090-3090	59.1	196.4	260.7
-3072	"	193.1	254.1
-3060	"	190.8	249.5
-3052	"	189.3	246.6
-3044	"	187.7	243.3
-3036	"	178.7	225.3
-3028	"	177.2	222.3
-3020	"	175.6	219.1
-3017	"	174.9	217.7
3070-3060	56.6	185.9	244.6
-3052	"	184.4	241.6
-3044	"	182.8	238.4
-3036	"	173.8	220.4
-3028	"	172.3	217.4
-3020	"	170.7	214.2
-3017	"	170.0	212.8
3050-3044	54.3	178.0	233.6
-3036	"	169.0	215.6
-3028	"	167.5	212.6
-3020	"	165.9	209.4
-3017	"	165.2	208.0

ALL DIMENSIONS ARE IN MM UNLESS SPECIFIED.

TANDEM 2P - 2P

INSTALLATION DIMENSIONS



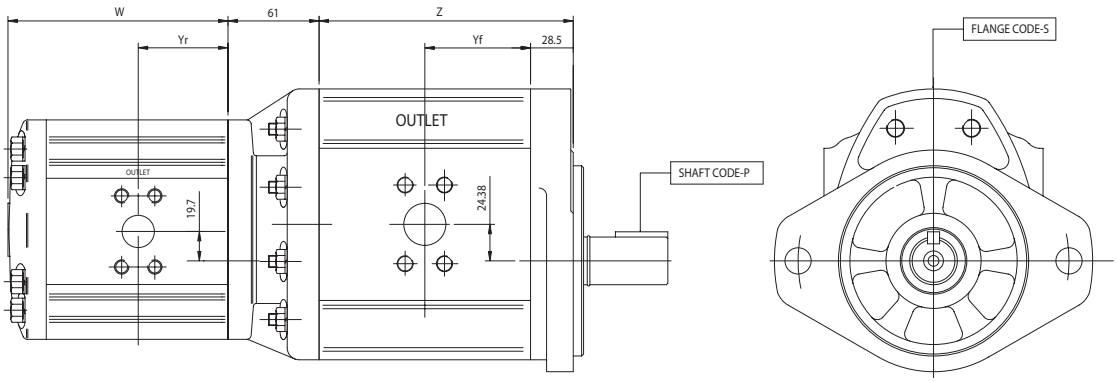


PUMP TYPE 2P - 2P	DIMENSIONS		
	X	Y	Z
3158-3158	74.3	212.8	291.2
-3146	"	211.2	288.0
-3120	"	208.2	282.0
-3105	"	206.3	278.3
-3090	"	197.6	261.0
-3070	"	195.1	256.0
-3050	"	192.7	251.0
3146-3146	72.8	208.2	285.0
-3120	"	205.1	279.0
-3105	"	203.3	275.3
-3090	"	194.5	257.7
-3070	"	192.1	252.9
-3050	"	189.7	248.1
3120-3120	69.7	199.0	272.8
-3105	"	197.2	269.2
-3090	"	188.4	251.6
-3070	"	186.0	246.8
-3050	"	183.6	241.9
3105-3105	67.9	193.5	265.5
-3090	"	184.7	248.0
-3070	"	182.3	243.1
-3050	"	179.9	238.3
3090-3090	59.1	167.2	230.4
-3070	"	164.8	225.6
-3050	"	162.4	220.8
3070-3070	56.7	160.0	220.8
-3050	"	157.5	216.0
3050-3050	54.3	152.7	211.1

ALL DIMENSIONS ARE IN MM UNLESS SPECIFIED.

TANDEM 3P - 2P

INSTALLATION DIMENSIONS



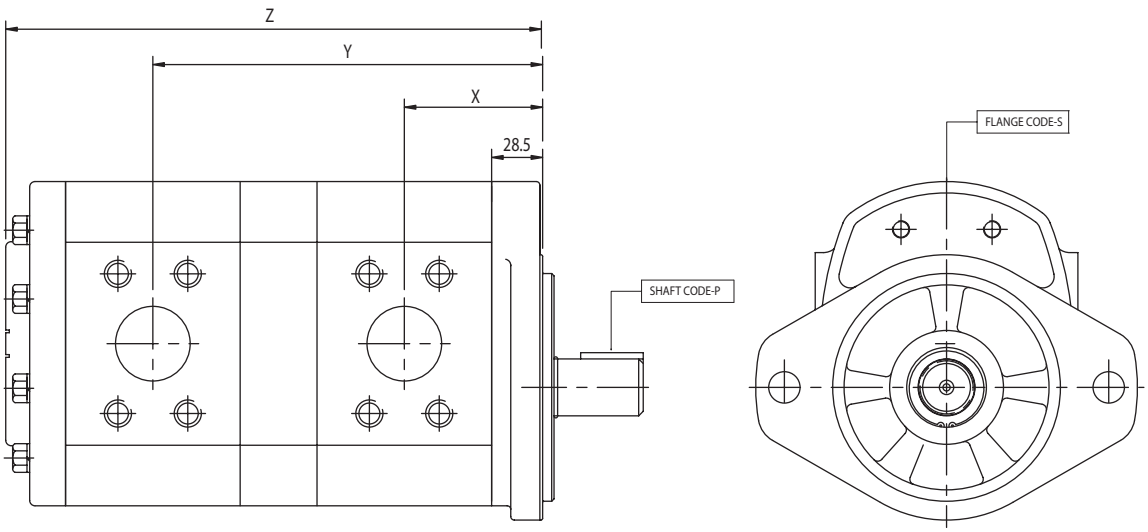
PUMP TYPE 3P-2P	DIMENSIONS			
	Z	Y-FRONT	Y-REAR	W
3500-3220	67.9	213.8	60.2	146.0
-3158	"	52.7	54.4	131.0
-3146	"	51.3	51.3	128.0
-3120	"	48.3	48.3	122.3
-3105	"	46.5	46.5	118.6
-3090	"	37.6	37.6	101.0
-3070	"	35.0	35.0	96.2
-3050	"	32.8	32.8	91.5
3380-3220	148.8	60.2	60.2	146.0
-3158	"	54.4	54.4	131.0
-3146	"	51.3	51.3	128.0
-3120	"	48.3	48.3	122.3
-3105	"	"	46.5	118.6
-3090	"	"	37.6	101.0
-3070	"	"	35.0	96.2
-3050	"	"	32.8	91.5
3330-3220	140.8	56.14	60.2	146.0
-3158	"	"	54.4	131.0
-3146	"	"	51.3	128.0
-3120	"	"	48.3	122.3
-3105	"	"	46.5	118.6
-3090	"	"	37.6	101.0
-3070	"	"	35.0	96.2
-3050	"	"	32.8	91.5
3300-3220	135.6	53.6	60.2	146.0
-3158	"	"	54.4	131.0
-3146	"	"	51.3	128.0
-3120	"	"	48.3	122.3
-3105	"	"	46.5	118.6
-3090	"	"	37.6	101.0
-3070	"	"	35.0	96.2
-3050	"	"	32.8	91.5

PUMP TYPE 3P-2P	DIMENSIONS			
	Z	Y-FRONT	Y-REAR	W
3250-3220	127.7	49.6	60.2	146.0
-3158	"	"	54.4	131.0
-3146	"	"	51.3	128.0
-3120	"	"	48.3	122.3
-3105	"	"	46.5	118.6
-3090	"	"	37.6	101.0
-3070	"	"	35.0	96.2
-3050	"	"	32.8	91.5
3210-3158	121.34	46.4	54.4	131.0
-3146	"	"	51.3	128.0
-3120	"	"	48.3	122.3
-3105	"	"	46.5	118.6
-3090	"	"	37.6	101.0
-3070	"	"	35.0	96.2
-3050	"	"	32.8	91.5
3180-3158	116.5	44.0	54.4	131.0
-3146	"	"	51.3	128.0
-3120	"	"	48.3	122.3
-3105	"	"	46.5	118.6
-3090	"	"	37.6	101.0
-3070	"	"	35.0	96.2
-3050	"	"	32.8	91.5
3150-3146	111.6	41.6	51.3	128.0
-3120	"	"	48.3	122.3
-3105	"	"	46.5	118.6
-3090	"	"	37.6	101.0
-3070	"	"	35.0	96.2
-3050	"	"	32.8	91.5

ALL DIMENSIONS ARE IN MM UNLESS SPECIFIED.

TANDEM 3P - 3P

INSTALLATION DIMENSIONS



PUMP TYPE.	DIM-X	DIM-Y	DIM-Z
3500-3500	98.9	280.4	384.3
-3380	"	270.2	363.8
-3330	"	266.1	355.8
-3300	"	263.6	350.6
-3250	"	259.6	342.7
-3210	"	256.4	336.3
-3180	"	254.0	331.5
-3150	"	251.6	326.6
3380-3380	88.6	249.6	343.3
-3330	"	245.6	335.3
-3300	"	243.0	330.1
-3250	"	239.1	322.2
-3210	"	235.9	315.8
-3180	"	233.5	311.0
-3150	"	231.1	306.1
3330-3330	84.6	237.6	327.2
-3300	"	235.0	322.0
-3250	"	231.1	314.1
-3210	"	227.9	307.8
-3180	"	225.5	302.9
-3150	"	223.1	298.1

PUMP TYPE.	DIM-X	DIM-Y	DIM-Z
3300-3300	82.1	229.9	316.9
-3250	"	225.9	309.0
-3210	"	222.7	302.6
-3180	"	220.3	297.8
-3150	"	217.9	292.9
3250-3250	78.1	218.0	301.1
-3210	"	214.8	294.7
-3180	"	212.4	289.9
-3150	"	210.0	285.0
3210-3210	74.9	208.5	288.4
-3180	"	206.0	283.6
-3150	"	203.6	278.6
3180-3180	72.5	201.2	278.7
-3150	"	198.8	273.8
3150-3150	70.1	193.9	269.0

ALL DIMENSIONS ARE IN MM UNLESS SPECIFIED.

TANDEM PUMP PRESSURE LIMITATION RATING

The pressure ratings of tandem pumps are limited by the torque capacity of the drive shaft and the intermediate connecting spline.

In order to determine these limitations:

1. Multiply the pressure on each section of the pump by the displacement of each section. This gives the PQ rating for each pump section.The sum of both PQ values must not exceed that given for the type of input drive shaft selected.

2 The PQ rating for the rear pump must not exceed the value given for the tandem spline coupling.

PUMP	SHAFT	PQ psi x in3/rev	PQ bar x cc/rev
0P	Taper code T Parallel code P Tandem Spline	2,500 2,500 1,600	2,820 2,820 1,810
1P	Taper code T & K Parallel code P Spline code S Tandem Spline	5,550 5,550 4,355 4,350	6,270 6,270 4,920 5,790
2P	Taper code T Parallel code P Spline code S Spline code Q Tandem Spline	11,100 11,100 13,800 13,800 9,260	12,470 12,470 15,600 15,600 10,400
3P	Taper code T Parallel code P Spline code S Tandem Spline	21,100 34,400 42,200 16,590	23,900 38,800 47,600 8,800

Example 1: 1P1P 3090 3044 CPSTTB

3090 pump

Pressure rating – 100 bar
Displacement – 28.12 cc/rev
PQ = 100 * 28.12 = **2812**

3044 pump

Pressure rating – 200 bar
Displacement – 14.33 cc/rev

PQ = 200 * 14.33 = **2866**

Total PQ = 2812 + 2866 = **5678**

Maximum Allowable value for 1P Parallel Shaft is 6270, actual value calculated for the pump is 5678, which is within allowable limits and hence suitable.

Maximum Allowable value for Tandem Spline is 4910, actual value calculated for the rear pump is 2866, which is within allowable limits and hence suitable.

Example 2: 1P1P 3036 3090 CPSTTB

3036 pump

Pressure rating – 100 bar
Displacement – 11.90 cc/rev
PQ = 100 * 11.90 = **1190**

3090 pump

Pressure rating – 180 bar
Displacement – 28.12 cc/rev

PQ = 180 * 28.12 = **5062**

Total PQ = 1190 + 5062 = **6252**

Maximum Allowable value for 1P Parallel Shaft is 6270, actual value calculated for the pump is 6252, which is within allowable limits and hence suitable

Maximum Allowable value for Tandem Spline is 4910, actual value calculated for the rear pump is 5062, which is beyond allowable limits and hence **NOT** suitable

QUESTIONNAIRE - TANDEM PUMPS

1.	Customer		
2.	Pump Model		
3.	Flow (gpm/lpm)	Front Pump	Rear Pump
4.	Application		
5.	Rated rpm	Minimum	Maximum
6.	Working Pressure (Front Pump)	Minimum	Maximum
7.	Working Pressure (Rear Pump)	Minimum	Maximum
8.	Working Pressure (Peak)	Front Pump	Rear Pump
9.	Oil Used		
10.	Viscosity		
11.	Reservoir Capacity		
12.	Oil Temperature		
13.	Filtration (Suction/any other)		
14.	Suction Head (vacuum)		
15.	Cavitation (if any)		
16.	Direction of Rotation		
17.	Type of Shaft		
18.	Length of Shaft from flange face		
19.	Drive Mechanism		
20.	Power takeoff from Gearbox/Crankshat/camshaft/ driveshaft/Universal joint)		
21.	Whether bearing support required		
22.	Flange details		
23.	Suction Port details	Front Pump	Rear Pump
24.	Delivery port details	Front Pump	Rear Pump
25.	Type of piping		
26.	Space restrictions (if any)		
27	Remarks / Suggestions		

POSSIBLE MULTIPLE PUMP GROUP COMBINATIONS

- 0P 0P
- 0P 0P 0P
- 0P 0P 0P 0P
- 1P 0P
- 1P 1P
- 1P 1P 1P
- 1P 1P 1P 1P
- 2P 0P
- 2P 1P
- 2P 2P
- 2P 1P 1P
- 2P 2P 1P
- 2P 2P 2P
- 3P 1P
- 3P 2P
- 3P 3P
- 3P 2P 2P
- 3P 3P 2P
- 3P 3P 3P