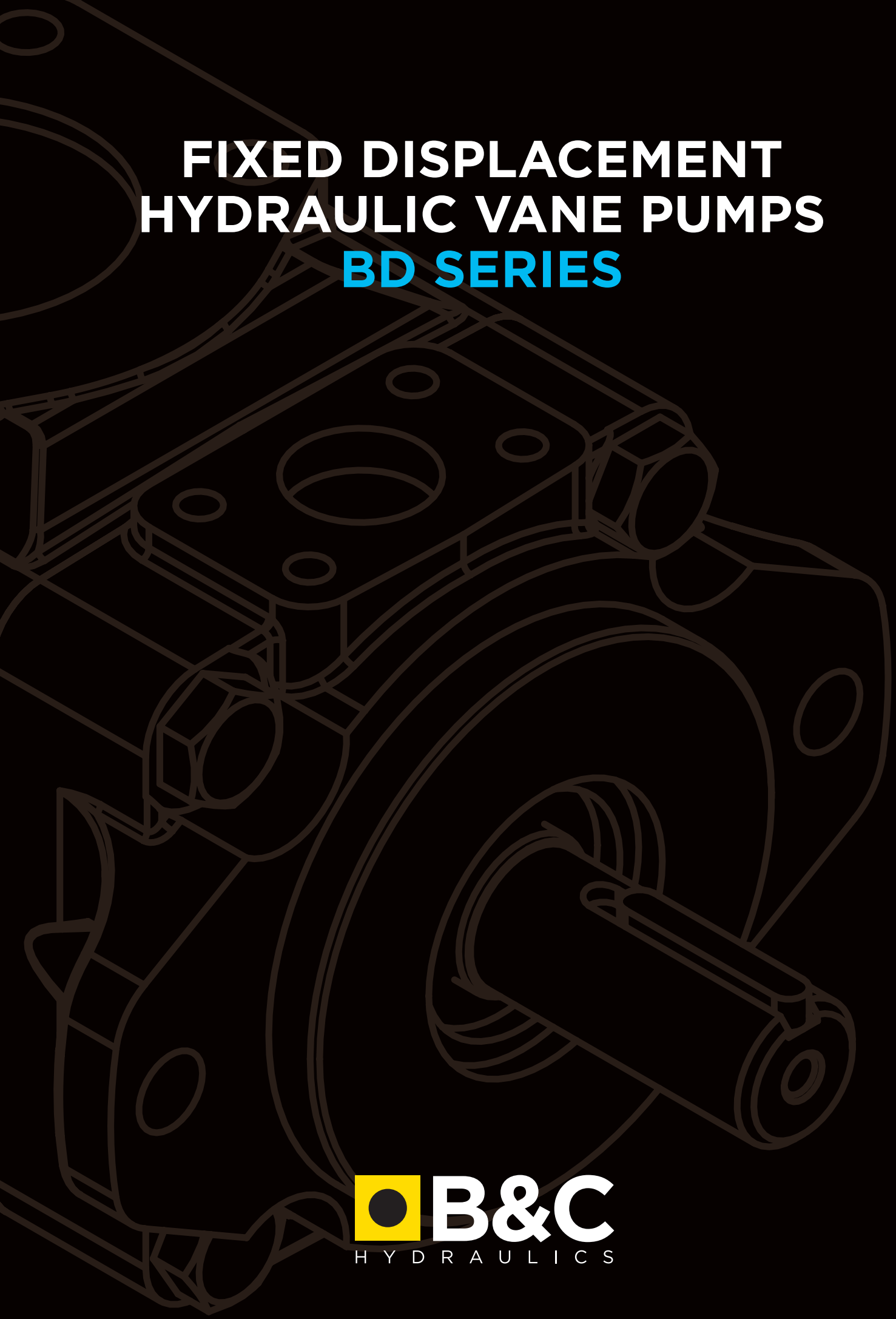
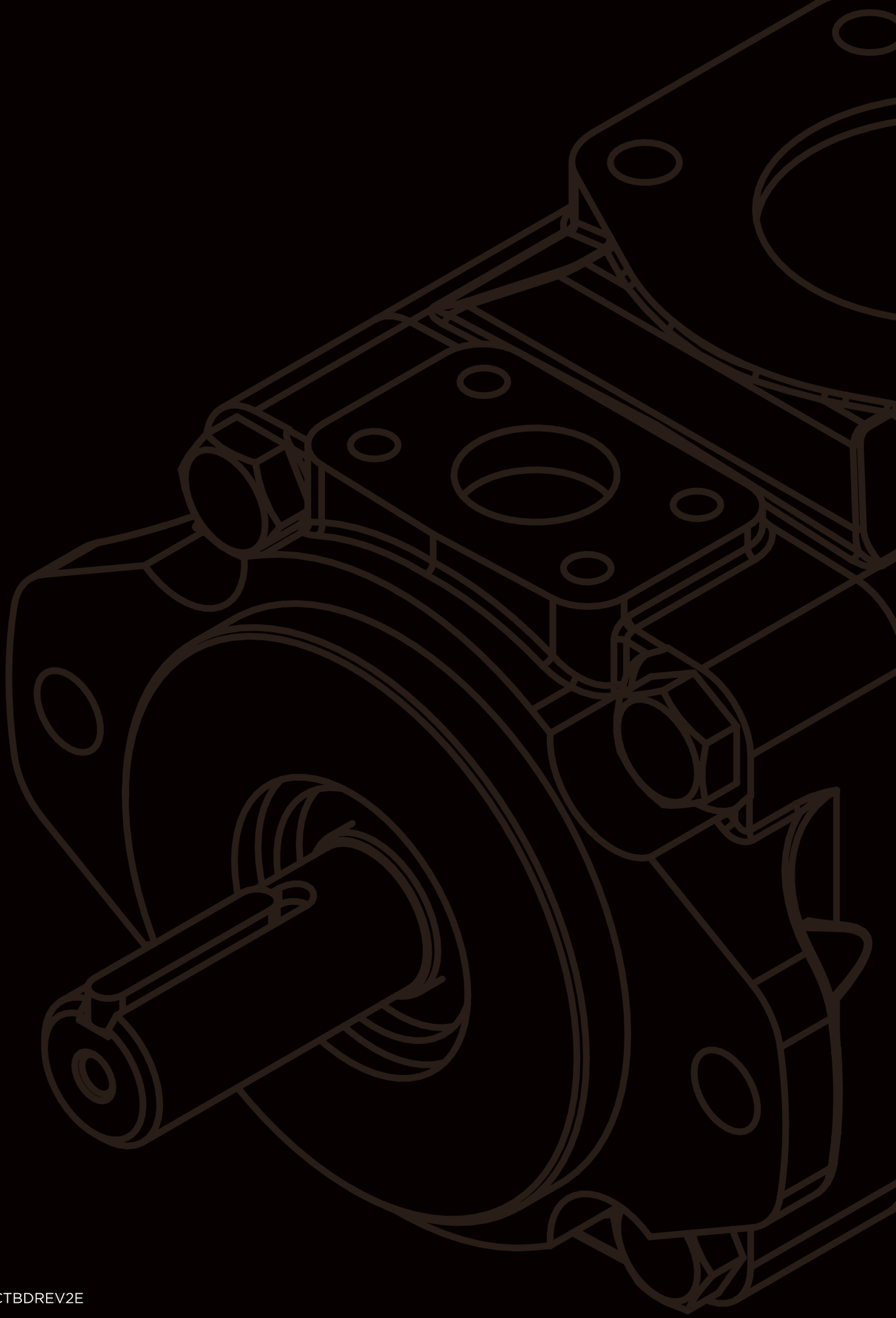
FIXED DISPLACEMENT HYDRAULIC VANE PUMPS

BD SERIES



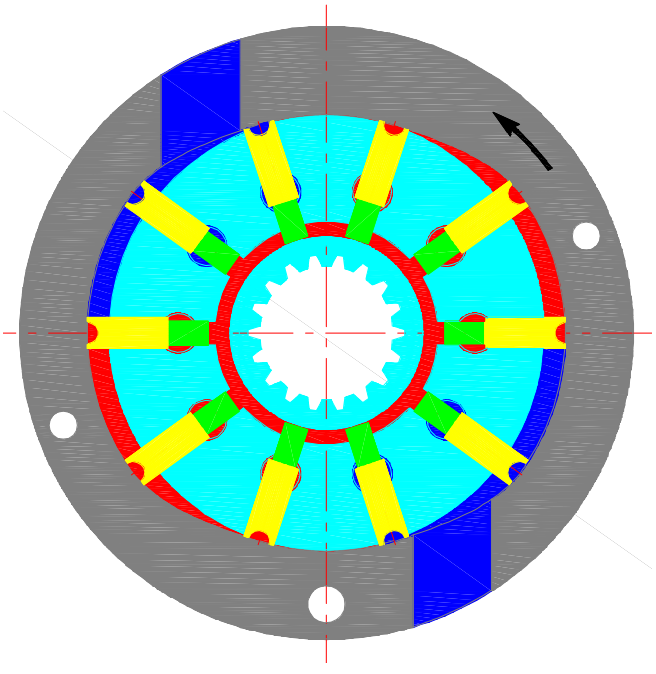
B&C HYDRAULICS



CTBDREV2E

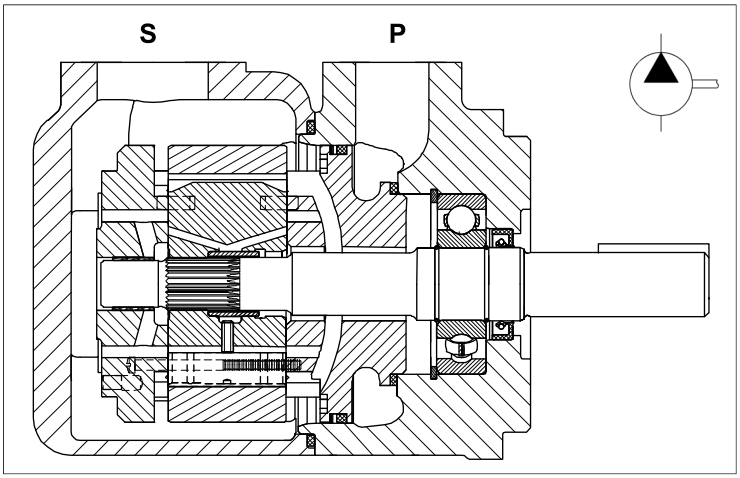
HIGH PRESSURE HYDRAULIC VANE PUMPS BD SERIES

Versatility, power, compactness and low running costs are the main characteristics of BD vane pumps. All the components subject to wear are contained in a cartridge unit that can be easily removed for inspection and/or replacement without disconnecting the pump from the circuit, drastically reducing expensive machine down time. The cartridge contains a rotor, vanes and pins, a cam ring and two supports. During operation the rotor is driven by a splined shaft coupled to the drive unit. As the rotation speed increases, centrifugal forces, in combination with the pressure generated behind the vanes, push the vanes outwards, where they follow the profile of the cam with a sufficient contact pressure to ensure adequate hydraulic sealing. The two opposed pumping chambers formed by the elliptical profile of the cam cancel out radial loads on the shaft bearings, thereby giving them extremely long lifetimes. The special design of the double-lip vanes renders the BD series pumps particularly suitable for applications requiring high pressure levels and very low noise emissions.



The BD series is available in three versions of single pump (from 10 to 227 l/min at 1000 rpm) and four versions of double pump (from 20 to 385 l/min total, at 1000 rpm), with input powers of over 328 KW at max pressure and speed. The BD series pumps are extremely compact and are supplied with SAE norm hydraulic flanges and shafts. This makes them very easy to install and guarantees their interchangeability with other similar pumps.

contents



General description

Fixed displacement vane pump, hydraulically balanced, with capacity determined by the type of cartridge used and the speed of rotation. The pump is available in 13 different displacements from 16 to 150 l/min (from 4 to 40 gpm) at 1500 rpm and pressure 0 bar.

Technical characteristics

Cartridge model	Geometric displacement		Rated capacity at 0 bar				Maximum pressure				Speed range
			1200 rpm		1500 rpm		intermittent		continuos		
	ml/rev.	(in^3/r)	l/min	(gpm)	l/min	(gpm)	bar	(psi)	bar	(psi)	rpm
03	10,8	(0.66)	12,93	(3.42)	16,2	(4.29)	275	(4000)	240	(3500)	400 - 2800
05	17,2	(1.05)	20,60	(5.45)	25,8	(6.83)	275	(4000)	240	(3500)	400 - 2800
06	21,3	(1.30)	25,52	(6.75)	31,9	(8.44)	275	(4000)	240	(3500)	400 - 2800
08	26,4	(1.61)	31,64	(8.37)	39,6	(10.48)	275	(4000)	240	(3500)	400 - 2800
10	34,1	(2.08)	40,86	(10.81)	51,1	(13.52)	275	(4000)	240	(3500)	400 - 2800
12	37,1	(2.26)	44,45	(11.76)	55,6	(14.71)	275	(4000)	240	(3500)	400 - 2800
14	46,0	(2.81)	55,11	(14.58)	69,0	(18.25)	275	(4000)	240	(3500)	400 - 2800
17	58,3	(3.56)	69,85	(18.48)	87,4	(23.12)	275	(4000)	240	(3500)	400 - 2800
20	63,8	(3.89)	76,47	(20.23)	95,7	(25.32)	275	(4000)	240	(3500)	400 - 2800
22	70,3	(4.29)	84,26	(22.29)	105,4	(27.88)	275	(4000)	240	(3500)	400 - 2800
25	79,3	(4.84)	95,03	(25.14)	118,9	(31.46)	275	(4000)	240	(3500)	400 - 2500
28	88,8	(5.42)	106,41	(28.15)	133,2	(35.24)	210	(3000)	160	(2300)	400 - 2500
31	100,0	(6.10)	119,83	(31.70)	150,0	(39.68)	210	(3000)	160	(2300)	400 - 2500

Hydraulic fluids: antiwear petroleum base, synthetic fluid, water glycols and invert emulsions.

Viscosity range / Viscosity index: with antiwear petroleum base, from 10 to 2000 cSt. (10 to 108 cSt. recommended). Other fluids from 18 to 2000 c.St. (18 to 108 c.St. recomm.). Choose 30 c.St. for max lifetime. *Viscosity index*: 90° min.

Filtration: to maintain contamination level to ISO 18/14 or NAS 1638 class 8.
Filters: for the inlet, use strainer with mesh not less than 149 micron abs. (omit strainer with application requiring cold start or when using fire resistant fluids); for the return line - 25 micron abs. or better.

Water contamination level: max 0.10% for mineral oil. With other fluids, max 0.05%

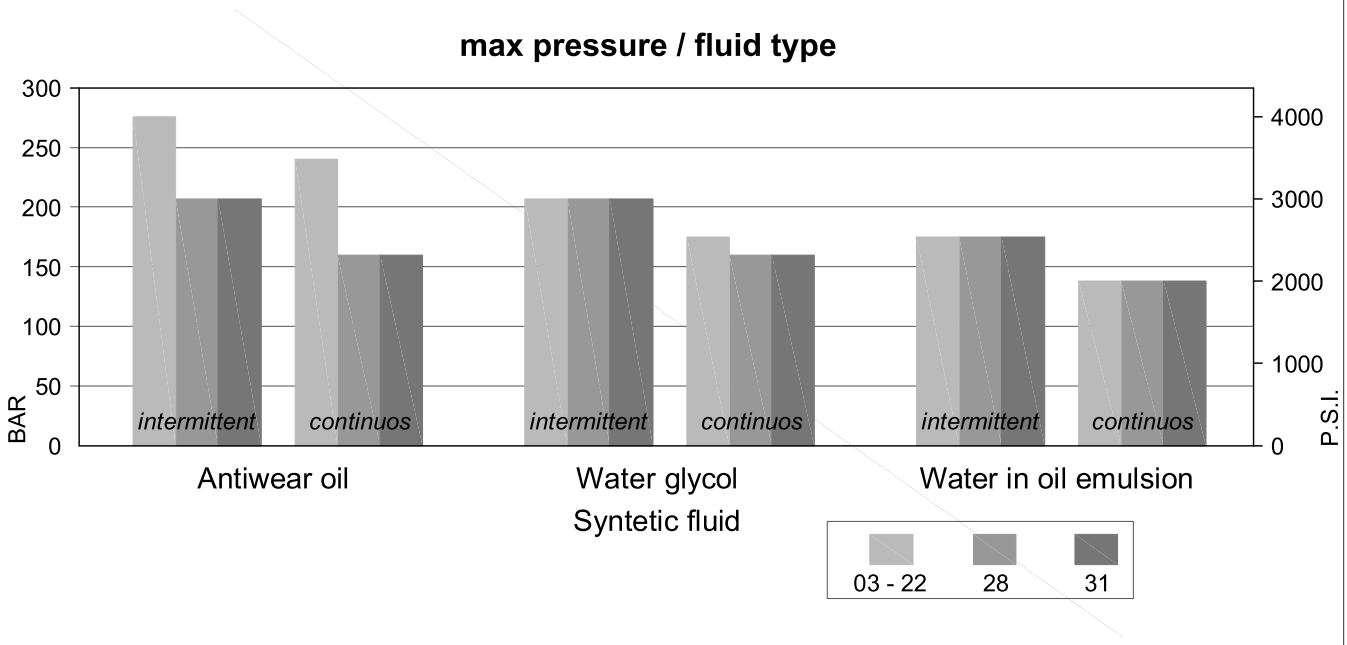
Intermittent pressure: typically the working time permitted at such pressure is < 30% of the duty cycle. With duty cycles longer than 15 minutes, please contact the technical office of B&C.

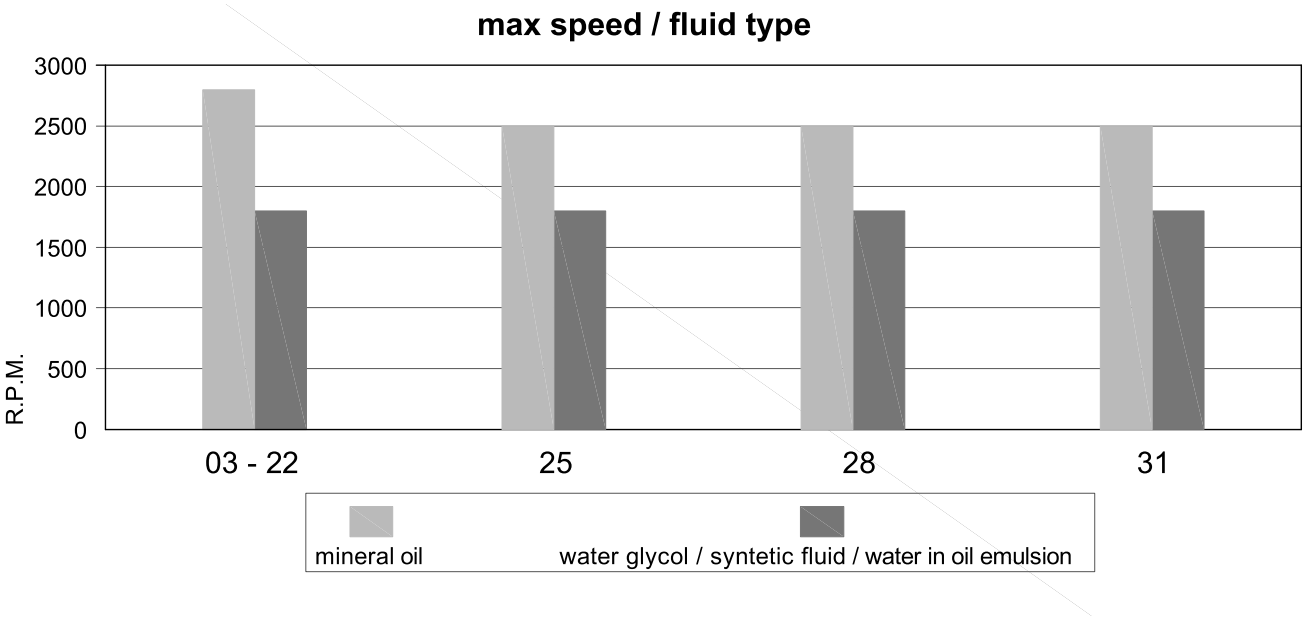
Minimum inlet pressure: (with mineral oil 10-65 c.St.): 0,8 bar abs. (3 psi abs.). In the biggest displacements of each series and with the highest speeds, is required an higher inlet pressure. Please consult the specific section for details. In case of tandem pump, supply the inlet port with the highest pressure requested among the pump stages.

Operating temperature: with “antiwear petroleum base” the permitted temperature is: from -18 to +100° C; with water glycol and “water in oil emulsion”: from +10 to +50°C; with syntetic fluid: from -18 to +70°C; with rapeseed and esters: from-20 to + 70°C. During cold start the pumps should be operated at low speed and pressure until fluid warms up to an acceptable viscosity for full power operation.

Drive: direct and coaxial by means of a flexible coupling. Low axial and radial loads allowed. Consult specific section for more detail.

Main operating data





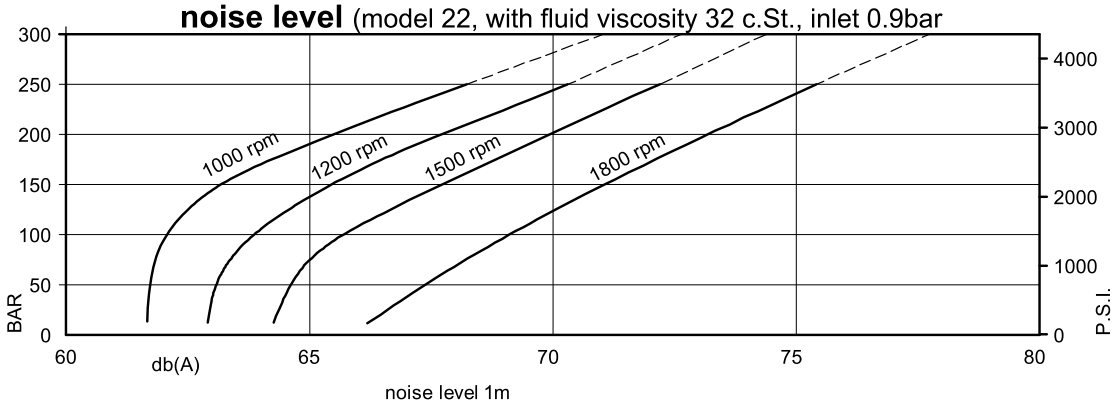
min. allowable inlet pressure / rotation speed (abs. bar)*

Speed r.p.m.	from 03 to 10	12	14	17	20	22	25	28	31
2800	1.00	1.00	1.00	1.03	1.03	1.05			
2500	0.90	0.92	0.95	0.95	0.95	0.98	1.05	1.08	1.11
2300	0.80	0.85	0.85	0.90	0.90	0.90	0.95	0.98	1.0
2200	0.80	0.80	0.80	0.85	0.85	0.90	0.95	0.98	0.90
2100	0.80	0.80	0.80	0.80	0.80	0.85	0.90	0.90	0.85
1800	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
1500	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
1200	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80

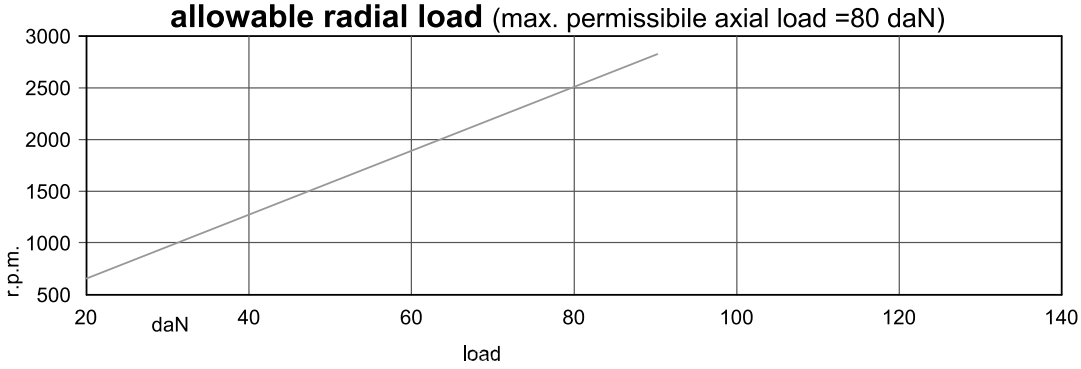
* measured inside the inlet flange; with petroleum base fluid (visc. 10 to 65 cSt.).
Multiply the abs. pressure by 1.25 when using water-glycol or “water in oil emulsion”, by 1.35 with synthetic fluids, and by 1.1 with ester or rapeseed base.

Main operating data

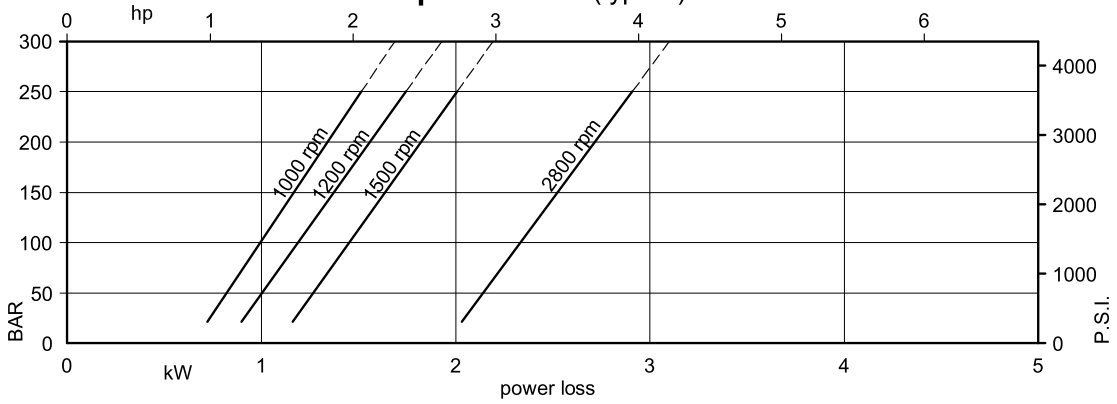
noise level (model 22, with fluid viscosity 32 c.St., inlet 0.9bar



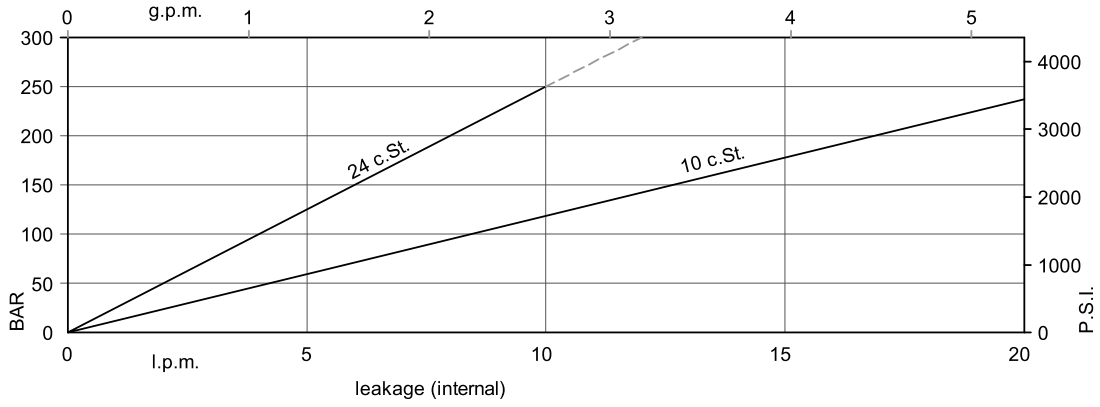
allowable radial load (max. permissibile axial load =80 daN)



power loss (typical)



Typical internal leakage *



* If the internal leakage is more than 50% of the theoretical flow, do not operate the pump

Specific operating data

Typical: 24 c.St. (115 SUS)

Cartridge model	Geometric displacement		Speed rpm	140 bar		240 bar		Input power (kW)		
	ml/rev.	(in^3/r)		l/min	(gpm)	l/min	(gpm)	7 bar (100 psi)	140 bar (2000 psi)	240 bar (3500 psi)
03	10,8	(0.66)	1000	-	-	-	-	1.00	-	-
			1200	-	-	-	-	1.05	-	-
			1500	10,7	(2.84)	-	-	1.30	5.30	-
			1800	13,6	(3.61)	-	-	1.55	8.45	-
05	17,2	(1.05)	1000	11,7	(3.09)	-	-	1.10	5.10	-
			1200	15,1	(3.99)	-	-	1.14	8.17	-
			1500	20,3	(5.37)	15,8	(4.18)	1.40	7.50	12.2
			1800	25,1	(6.65)	21,0	(5.56)	1.68	12.0	14.4
06	21,3	(1.30)	1000	15,80	(4.18)	11,30	(2.99)	1.10	6.00	10.00
			1200	19,73	(5.22)	15,61	(4.13)	1.19	7.13	11.86
			1500	26,50	(7.01)	22,00	(5.82)	1.50	8.90	14.70
			1800	32,51	(8.60)	28,39	(7.51)	1.76	10.50	17.33
08	26,4	(1.61)	1000	20,90	(5.53)	16,40	(4.34)	1.20	7.20	12.10
			1200	25,86	(6.84)	21,74	(5.75)	1.26	8.51	14.29
			1500	34,10	(9.02)	29,60	(7.83)	1.60	10.70	17.70
			1800	41,66	(11.02)	37,54	(9.93)	1.87	12.58	20.98
10	34,1	(2.08)	1000	28,60	(7.57)	24,10	(6.38)	1.30	8.90	15.10
			1200	35,08	(9.28)	30,96	(8.19)	1.37	10.61	17.96
			1500	45,70	(12.09)	41,20	(10.90)	1.70	13.40	22.30
			1800	55,53	(14.69)	51,41	(13.60)	2.03	15.72	26.47
12	37,1	(2.26)	1000	31,60	(8.36)	27,10	(7.17)	1.30	9.60	16.30
			1200	38,67	(10.23)	34,55	(9.14)	1.41	11.42	19.38
			1500	50,20	(13.28)	45,70	(12.09)	1.70	14.40	24.10
			1800	60,90	(16.11)	56,78	(15.02)	2.09	16.95	28.62
14	46,0	(2.81)	1000	40,50	(10.71)	36,00	(9.52)	1.40	11.70	19.90
			1200	49,33	(13.05)	45,21	(11.96)	1.53	13.85	23.62
			1500	63,50	(16.80)	59,00	(15.61)	1.90	17.60	29.50
			1800	76,92	(20.35)	72,80	(19.26)	2.27	20.58	34.97
17	58,3	(3.56)	1000	52,80	(13.97)	48,30	(12.78)	1.60	14.50	24.80
			1200	64,07	(16.95)	59,95	(15.86)	1.70	17.19	29.47
			1500	82,00	(21.69)	77,50	(20.50)	2.10	21.90	36.90
			1800	99,04	(26.20)	94,92	(25.11)	2.52	25.60	43.76
20	63,8	(3.89)	1000	58,30	(15.42)	53,80	(14.23)	1.60	15.80	27.00
			1200	70,69	(18.70)	66,57	(17.61)	1.77	18.68	32.09
			1500	90,20	(23.86)	85,70	(22.67)	2.20	23.80	40.20
			1800	108,90	(28.81)	103,65	(27.42)	2.63	27.84	47.68
22	70,3	(4.29)	1000	64,80	(17.14)	60,30	(15.95)	1.70	17.30	29.60
			1200	78,47	(20.76)	74,35	(19.67)	1.86	20.46	35.18
			1500	100,00	(26.46)	95,50	(25.26)	2.30	26.10	44.10
			1800	120,58	(31.90)	116,46	(30.81)	2.76	30.49	52.32
25 [1]	79,3	(4.84)	1000	73,80	(19.52)	69,30	(18.33)	1.80	19.30	33.20
			1200	89,25	(23.61)	85,13	(22.52)	1.99	22.90	39.47
			1500	113,50	(30.03)	109,00	(28.84)	2.50	29.20	49.50
			1800	136,76	(36.18)	132,64	(35.09)	2.95	34.16	58.75
28 [1]	88,8	(5.42)	1000	83,30	(22.04)	80,10 [2]	(21.19) [2]	1.90	21.90	32.50 [2]
			1200	100,62	(26.62)	97,75 [2]	(25.86) [2]	2.11	25.49	37.77 [2]
			1500	127,70	(33.78)	124,50 [2]	(32.94) [2]	2.80	32.70	48.50 [2]
			1800	153,85	(40.70)	150,97 [2]	(39.94) [2]	3.14	38.04	56.42 [2]
31 [1]	100,0	(6.10)	1000	94,50	(25.00)	91,30 [2]	(24.15) [2]	2.00	24.40	36.40 [2]
			1200	114,04	(30.17)	111,17 [2]	(29.41) [2]	2.26	28.53	42.34 [2]
			1500	144,50	(38.23)	141,30 [2]	(37.38) [2]	2.80	36.50	54.40 [2]
			1800	173,99	(46.03)	171,12 [2]	(45.27) [2]	3.37	42.61	63.28 [2]

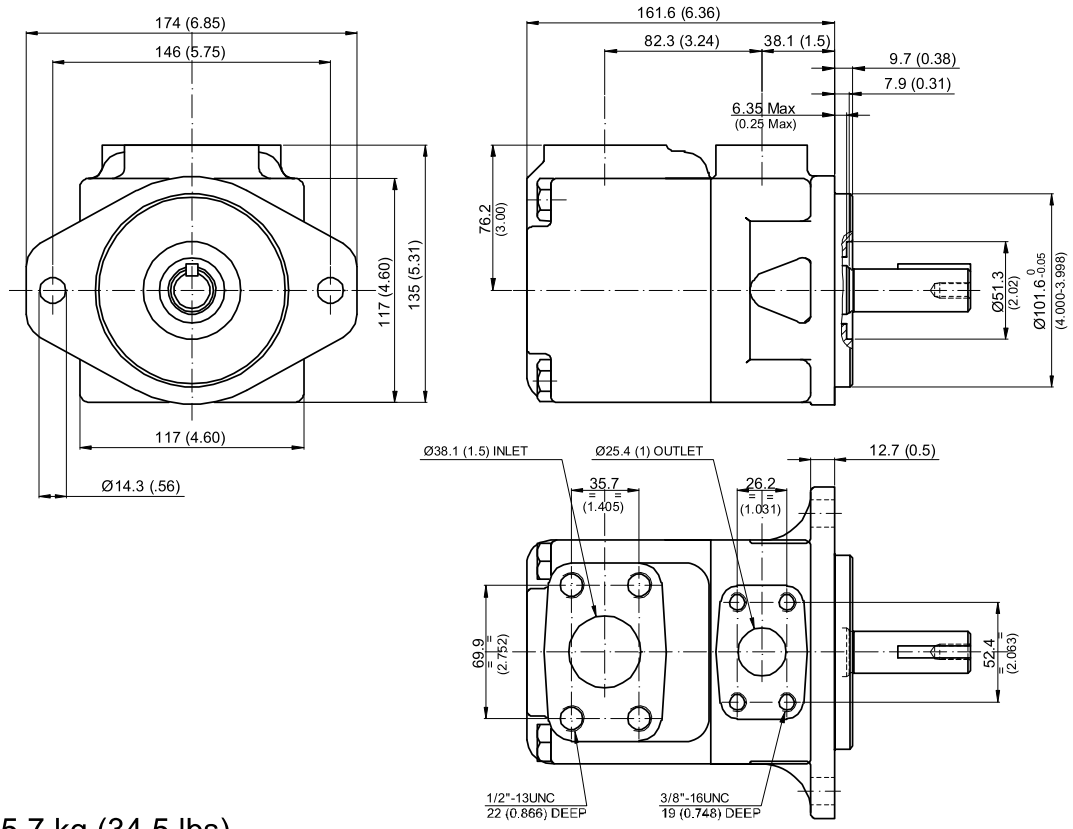
- Internal leakage exceeding 50% of the theoretical flow

1) 2500 r.p.m. max.

2) referred to 210 bar (3000 p.s.i.)

Installation dimensions

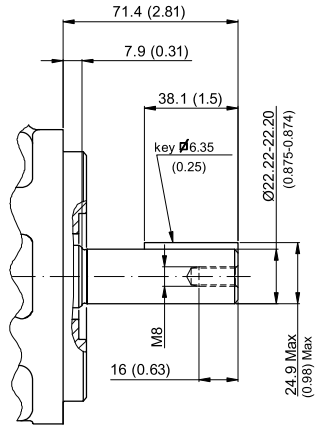
mm (inches)



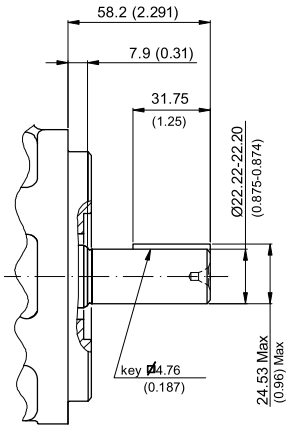
Approx weight: 15.7 kg (34.5 lbs)

Shaft options

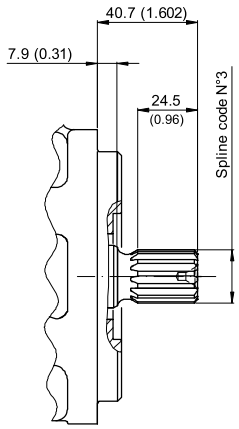
mm (inches)



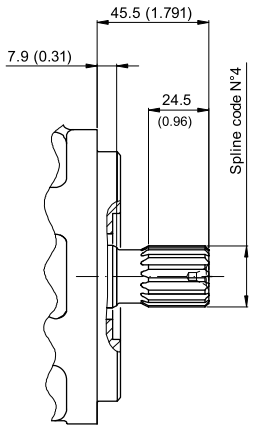
Shaft No.1



Shaft No.2



Shaft No.3



Shaft No.4

lc l ion o e pe i ed o e
(a oid to exceed)

Shaft No.	(ml/re) x bar	(in3/re) x psi
1	16500	14473
2	14300	12666
3	20600	18246
4	21821	19309

Spline code	**3**	**4**
Designation	Sae B	Sae B-B
Pressure angle	30°	30°
No. of teeth	13	15
Pitch	16/32 d.p.	16/32 d.p.
Spline type	flat root side fit	flat root side fit
Class	1- J498 b	1- J498 b

Model code breakdown

BD 02 G ** * * ** *

Pump series

Pump type

Design

Cartridge model

03 05 06 08 10 12 14 17 20 22 25 28 31

Shaft end options

1 = keyed (Sae B)
2 = Keyed (No Sae)
3 = Splined (Sae B)
4 = Splined (Sae B-B)

Pump rotation
(viewed from shaft-end)

R = Right hand rotation CW
L = Left hand rotation CCW

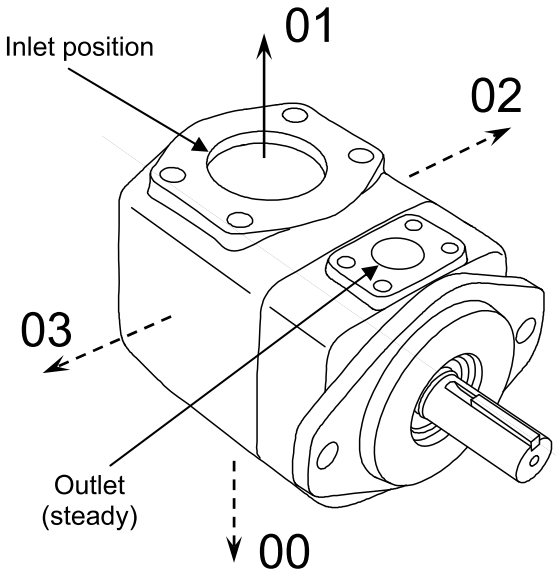
Port orientations
(compared to the outlet)

00 = Inlet opposite
01 = Inlet inline
02 = Intlet 90°CW (viewed from shaft-end)
03 = Intlet 90°CCW (viewed from shaft-end)

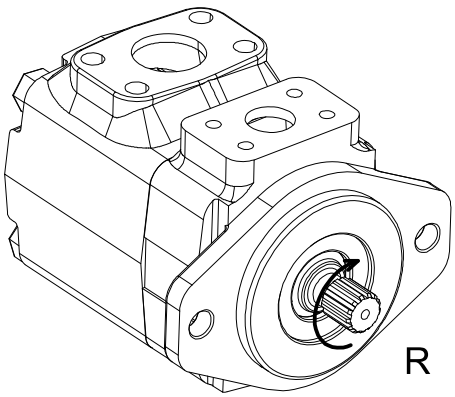
Seals

1 = NBR

Port orientations



Pump rotation



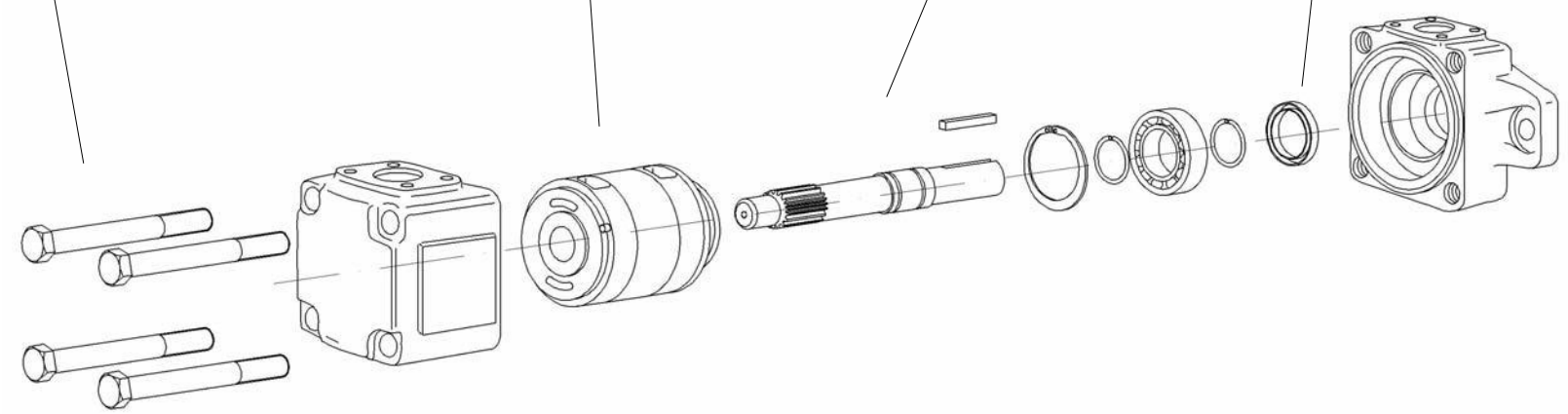
Id. codes of pump components

Screw	
Part No.	M3002070
Torque at 159 Nm (1418 lb.in.)	

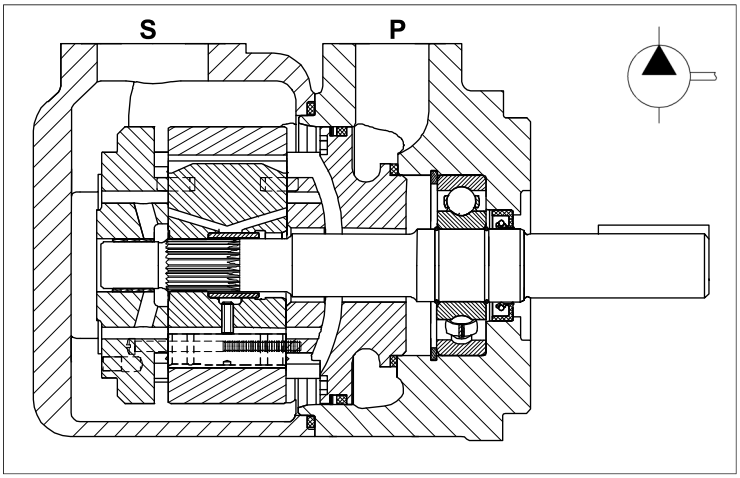
Cartridge			
Type	**Model**	**Pump rotation**	
		Right hand	**Left hand**
BD02	03	N0100010	N0100020
	05	N0100030	N0100040
	06	N0100050	N0100060
	08	N0100070	N0100080
	10	N0100090	N0100100
	12	N0100110	N0100120
	14	N0100130	N0100140
	17	N0100150	N0100160
	20	N0100170	N0100180
	22	N0100190	N0100200
	25	N0100210	N0100220
	28	N0100230	N0100240
	31	N0100250	N0100260

Shaft	
Model	**Part No.**
01	K6021000
02	K6022000
03	K6023000
04	K6024000

Shaft seal	
Part No.	**type**
M3020060	NBR



Pump seal kit	
Part No.	**Type**
M3002500	NBR



General description

Fixed displacement vane pump, hydraulically balanced, with capacity determined by the type of cartridge used and the speed of rotation. The pump is available in 10 different displacements from 71 to 237 l/min (from 19 to 63 gpm) at 1500 rpm and pressure 0 bar.

Technical characteristics

Cartridge model	Geometric displacement		Rated capacity at 0 bar				Maximum pressure				Speed range
			1200 rpm		1500 rpm		intermittent		continuos		
	ml/rev.	(in^3/r)	l/min	(gpm)	l/min	(gpm)	bar	(psi)	bar	(psi)	rpm
14	47,6	(2.90)	57,04	(15.09)	71,4	(18.89)	240	(3500)	210	(3000)	400 - 2500
20	66,0	(4.03)	79,08	(20.92)	99,0	(26.19)	240	(3500)	210	(3000)	400 - 2500
24	79,5	(4.85)	95,26	(25.20)	119,3	(31.56)	240	(3500)	210	(3000)	400 - 2500
28	89,7	(5.47)	107,50	(28.44)	134,5	(35.58)	240	(3500)	210	(3000)	400 - 2500
31	98,3	(6.00)	117,82	(31.17)	147,4	(38.99)	240	(3500)	210	(3000)	400 - 2500
35	111,0	(6.77)	133,02	(35.19)	166,5	(44.05)	240	(3500)	210	(3000)	400 - 2500
38	120,3	(7.34)	144,17	(38.14)	180,4	(47.72)	240	(3500)	210	(3000)	400 - 2500
42	136,0	(8.30)	162,99	(43.12)	204,0	(53.97)	240	(3500)	210	(3000)	400 - 2200
45	145,7	(8.89)	174,60	(46.19)	218,5	(57.80)	240	(3500)	210	(3000)	400 - 2200
50	158,0	(9.64)	189,34	(50.09)	237,0	(62.70)	210	(3000)	160	(2300)	400 - 2200

Hydraulic fluids: antiwear petroleum base, synthetic fluid, water glycols and invert emulsions.

Viscosity range / Viscosity index: with antiwear petroleum base, from 10 to 2000 cSt. (10 to 108 cSt. recommended). Other fluids from 18 to 2000 c.St. (18 to 108 c.St. recomm.). Choose 30 c.St. for max lifetime. *Viscosity index*: 90° min.

Filtration: to maintain contamination level to ISO 18/14 or NAS 1638 class 8.
Filters: for the inlet, use strainer with mesh not less than 149 micron abs. (omit strainer with application requiring cold start or when using fire resistant fluids); for the return line - 25 micron abs. or better.

Water contamination level: max 0.10% for mineral oil. With other fluids, max 0.05%

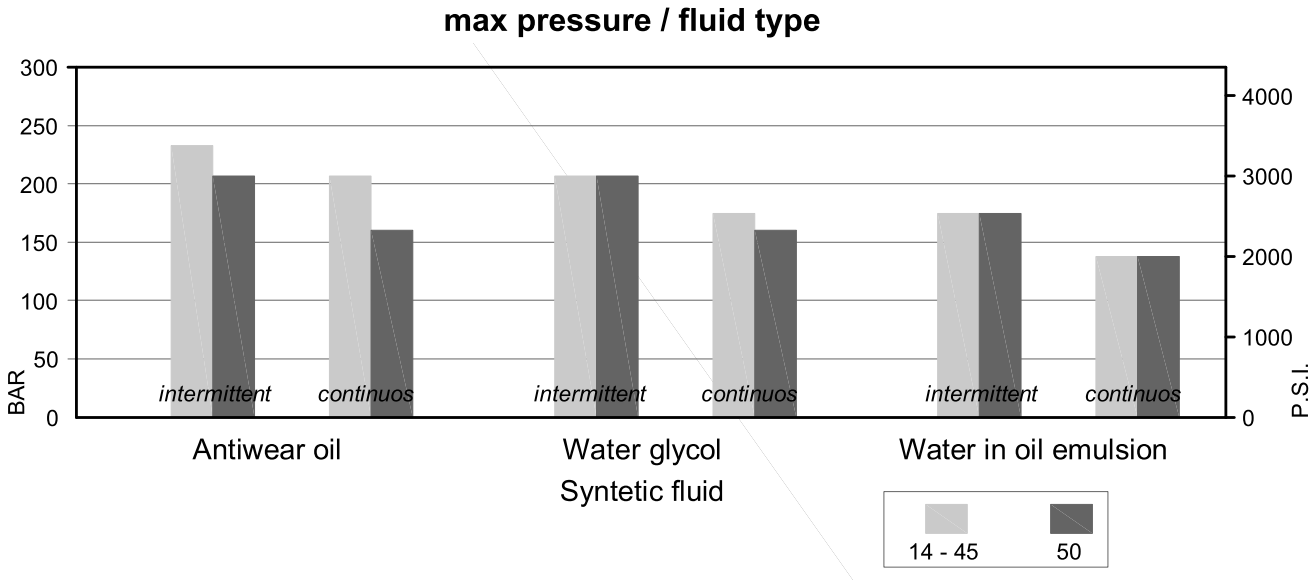
Intermittent pressure: typically the working time permitted at such pressure is < 30% of the duty cycle. With duty cycles longer than 15 minutes, please contact the technical office of B&C.

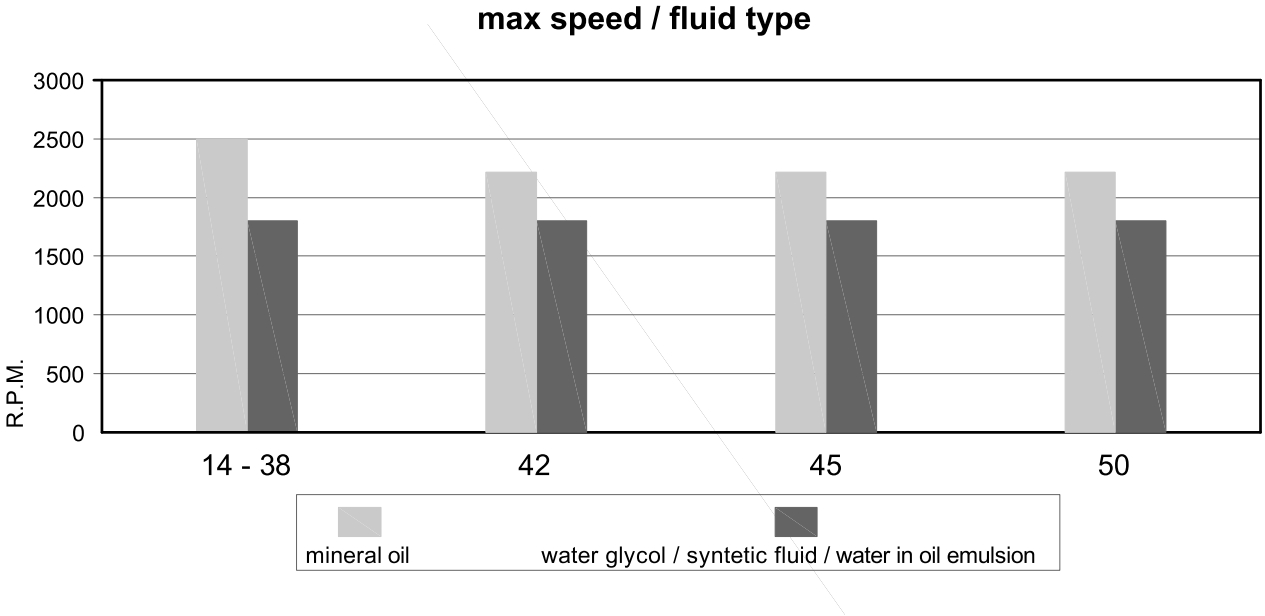
Minimum inlet pressure: (with mineral oil 10-65 c.St.): 0,8 bar abs. (3 psi abs.). In the biggest displacements of each series and with the highest speeds, is required an higher inlet pressure. Please consult the specific section for details. In case of tandem pump, supply the inlet port with the highest pressure requested among the pump stages.

Operating temperature: with “antiwear petroleum base” the permitted temperature is: from -18 to +100° C; with water glycol and “water in oil emulsion”: from +10 to +50°C; with syntetic fluid: from -18 to +70°C; with rapeseed and esters: from-20 to + 70°C. During cold start the pumps should be operated at low speed and pressure until fluid warms up to an acceptable viscosity for full power operation.

Drive: direct and coaxial by means of a flexible coupling. Low axial and radial loads allowed. Consult specific section for more detail.

Main operating data





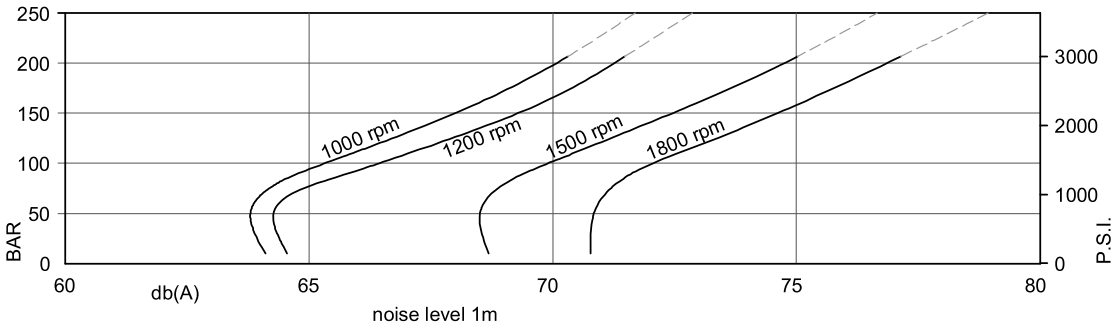
min. allowable inlet pressure / rotation speed (abs. bar)*

Speed r.p.m.	from 14 to 20	24	28	31	35	38	42	45	50
2500	1.00	1.10	1.18	1.23	1.29	1.29	-	-	-
2300	0.95	0.95	1.00	1.00	1.02	1.05	1.08	-	-
2200	0.88	0.88	0.92	0.95	0.98	1.00	1.02	1.05	1.09
2100	0.80	0.82	0.85	0.90	0.92	0.95	0.95	0.98	1.02
1800	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.85	0.85
1500	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
1200	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80

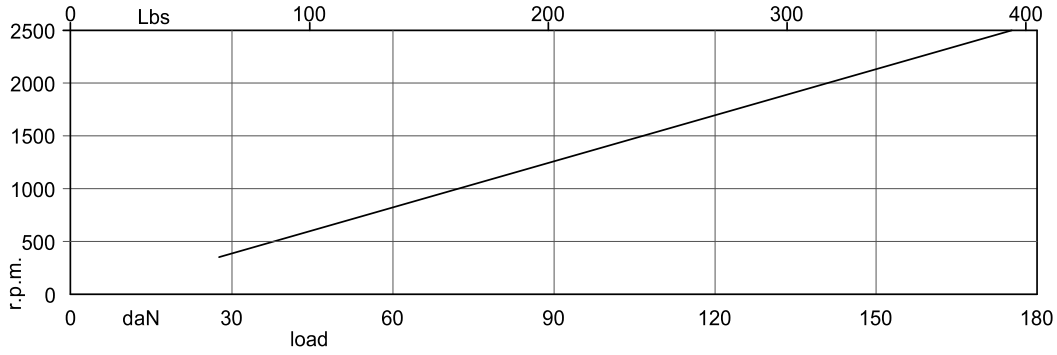
* measured inside the inlet flange; with petroleum base fluid (visc. 10 to 65 cSt.).
Multiply the abs. pressure by 1.25 when using water-glycol or “water in oil emulsion”, by 1.35 with synthetic fluids, and by 1.1 with ester or rapeseed base.

Main operating data

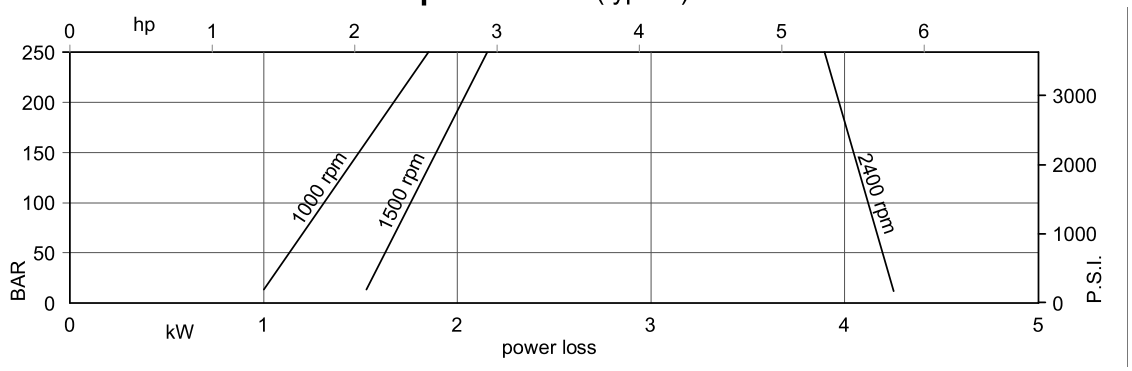
noise level (model 38 with fluid viscosity 32 c.St., inlet 0.9 bar abs.)



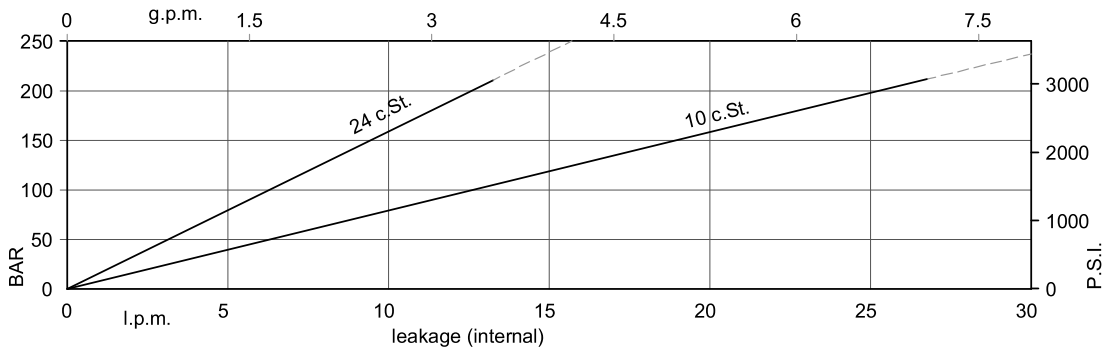
allowable radial load (max. permissibile axial load =80 daN)



power loss (typical)



Typical internal leakage *



* If the internal leakage is more than 50% of the theoretical flow, do not operate the pump

Main operating data

Typical: 24 c.St. (115 SUS)

Cartridge model	Geometric displacement		Speed rpm	140 bar		240 bar		Input power (kW)		
	ml/rev.	(in^3/r)		l/min	(gpm)	l/min	(gpm)	7 bar (100 psi)	140 bar (2000 psi)	240 bar (3500 psi)
14	47,6	(2.90)	1000	38,3	(10.13)	32,1	(8.49)	1.50	12.50	20.70
			1200	48,8	(12.91)	42,6	(11.27)	1.80	14.43	24.44
			1500	62,1	(16.43)	55,9	(14.79)	2.30	18.50	30.60
			1800	77,3	(20.46)	71,1	(18.82)	2.96	21.57	36.31
20	66,0	(4.03)	1000	56,7	(15.00)	50,5	(13.36)	1.70	16.80	28.00
			1200	70,8	(18.74)	64,6	(17.10)	2.05	19.44	33.20
			1500	89,7	(23.73)	83,5	(22.09)	2.80	24.90	41.70
			1800	110,4	(29.21)	104,2	(27.57)	3.33	29.09	49.47
24	79,5	(4.85)	1000	70,2	(18.57)	64,0	(16.93)	1.90	19.90	33.40
			1200	87,02	(23.02)	80,8	(21.38)	2.23	23.11	39.63
			1500	110,0	(29.10)	103,8	(27.46)	3.00	29.60	49.80
			1800	134,7	(35.63)	128,5	(33.99)	3.61	34.61	59.12
28	89,7	(5.47)	1000	80,4	(21.27)	74,2	(19.63)	2.00	22.30	37.50
			1200	99,3	(26.26)	93,1	(24.62)	2.37	25.89	44.49
			1500	125,2	(33.12)	119,0	(31.48)	3.20	33.20	55.90
			1800	153,0	(40.48)	146,1	(38.64)	3.82	38.77	66.41
31	98,3	(6.00)	1000	89,0	(23.54)	82,8	(21.90)	2.10	24.30	40.90
			1200	109,6	(28.99)	103,4	(27.35)	2.49	28.23	48.59
			1500	138,1	(36.53)	131,9	(34.89)	3.30	36.20	61.00
			1800	168,5	(44.57)	162,3	(42.93)	4.00	42.28	72.55
35	111,0	(6.77)	1000	101,7	(26.90)	95,5	(25.26)	2.30	27.30	46.00
			1200	124,8	(33.01)	118,6	(31.37)	2.66	31.68	54.64
			1500	157,2	(41.59)	151,0	(39.95)	3.50	40.70	68.70
			1800	191,3	(50.61)	185,1	(48.97)	4.25	47.47	81.63
38	120,3	(7.34)	1000	111,0	(29.37)	104,8	(27.72)	2.40	29.40	49.80
			1200	135,9	(35.96)	129,7	(34.32)	2.79	36.42	59.07
			1500	171,1	(45.26)	164,9	(43.62)	3.70	43.90	74.30
			1800	208,0	(55.03)	201,8	(53.39)	4.45	51.27	88.28
42 [1]	136,0	(8.30)	1000	126,7	(33.52)	120,5	(31.88)	2.60	33.10	56.00
			1200	154,7	(40.94)	148,6	(39.30)	3.00	38.49	66.56
			1500	194,7	(51.51)	188,5	(49.87)	4.00	49.40	83.70
			1800	236,3	(62.50)	230,1	(60.86)	4.76	57.68	99.50
45 [1]	145,7	(8.89)	1000	136,4	(36.08)	130,2	(34.44)	2.70	35.30	59.90
			1200	166,4	(44.01)	160,2	(42.37)	3.14	41.14	71.18
			1500	209,2	(55.34)	203,0	(53.70)	4.10	52.80	89.50
			1800	253,7	(67.11)	247,5	(65.47)	4.96	61.64	106.43
50 [1]	158,0	(9.64)	1000	148,7	(39.34)	145,0 [2]	(38.36) [2]	2.80	38.20	56.80 [2]
			1200	181,1	(47.91)	176,6 [2]	(46.73) [2]	3.30	44.48	66.19 [2]
			1500	227,7	(30.24)	224,0 [2]	(59.26) [2]	4.40	57.00	85.00 [2]
			1800	275,8	(72.96)	271,3 [2]	(71.78) [2]	5.21	66.67	99.02 [2]

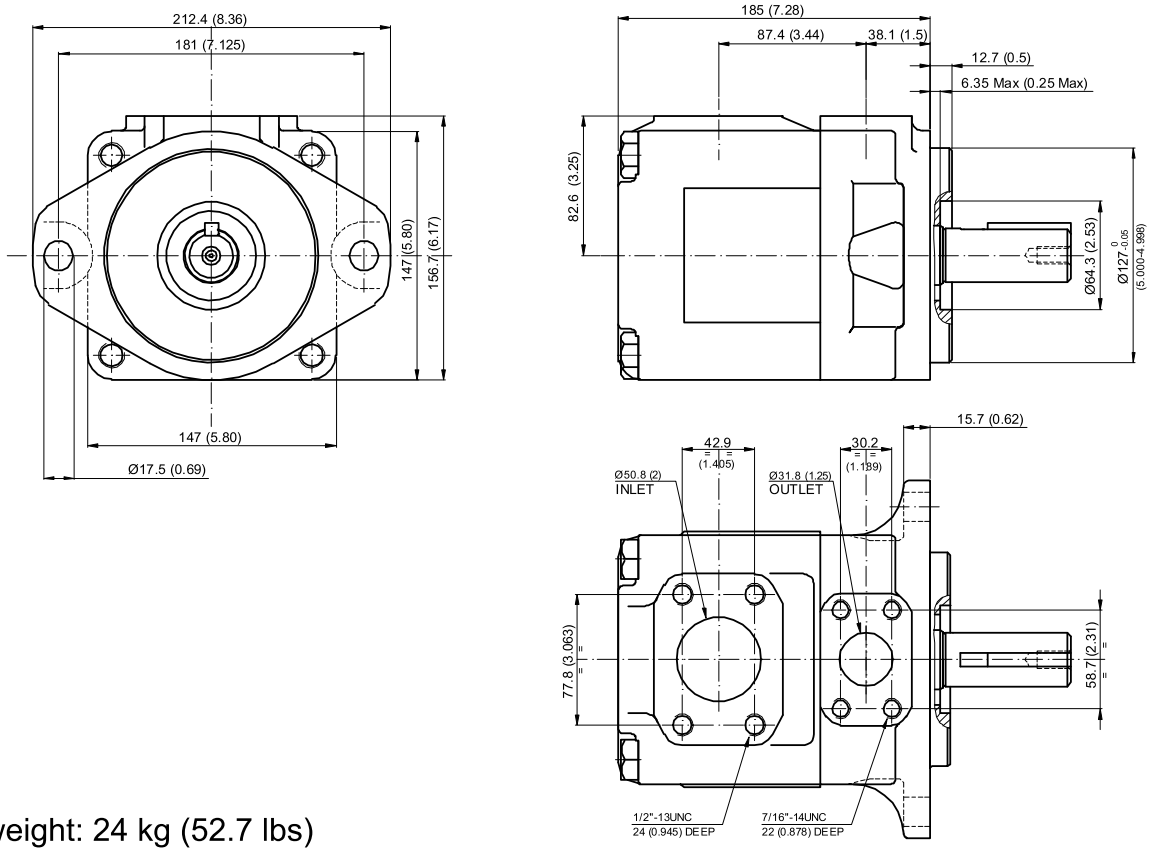
- Internal leakage exceeding 50% of the theoretical flow

1) 2200 r.p.m. max.

2) referred to 210 bar (3000 p.s.i.)

Installation dimensions

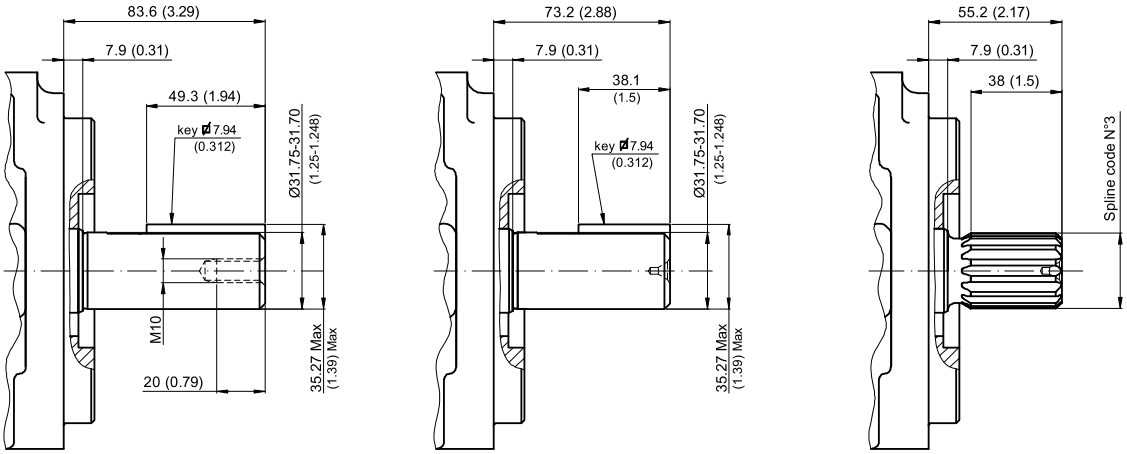
mm (inches)



Approx weight: 24 kg (52.7 lbs)

Shaft options

mm (inches)



Shaft No.1 Shaft No.2 Shaft No.3

Calculation of the max permitted torque:
(avoid to exceed)

Shaft No.	(ml/rev) x bar	(in3/rev) x psi
1	43283	38299
2	34590	30638
3	61200	54207

Spline code	**3**
Designation	Sae C
Pressure angle	30°
No. of teeth	14
Pitch	12/24 d.p.
Spline type	flat root side fit
Class	1- J498 b

Model code breakdown

BD 04 G ** * * ** *

Pump series

Pump type

Design

Cartridge model

14 20 24 28 31 35 38 42 45 50

Shaft end options

1 = keyed (Sae C)
2 = Keyed (No Sae)
3 = Splined (Sae C)

Rotation
(viewed from shaft-end)

R = Right hand rotation CW
L = Left hand rotation CCW

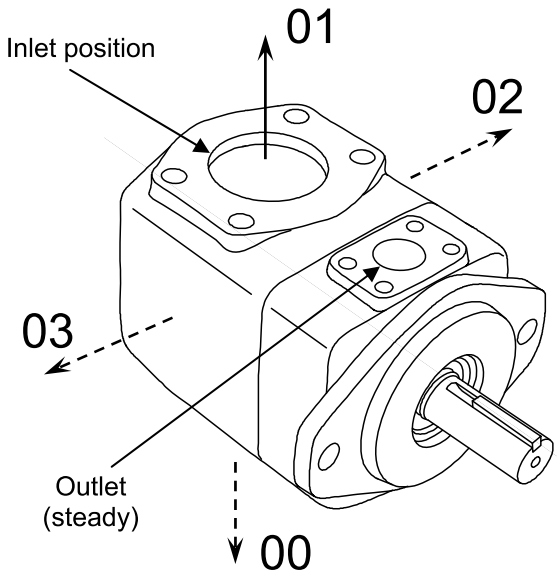
Port orientations
(Viewed from cover end)

00 = Inlet opposite outlet
01 = Inlet inline with outlet
02 = Intlet 90°CW from outlet
03 = Intlet 90°CCW from outlet

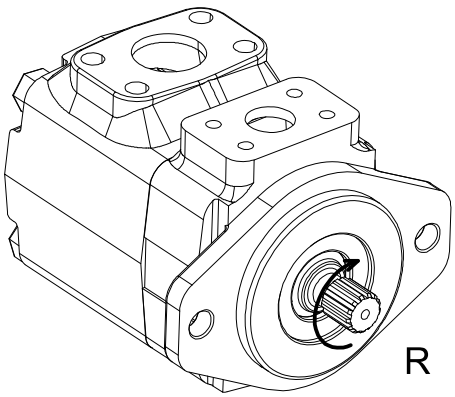
Seals

1 = NBR

Port orientations



Pump rotation



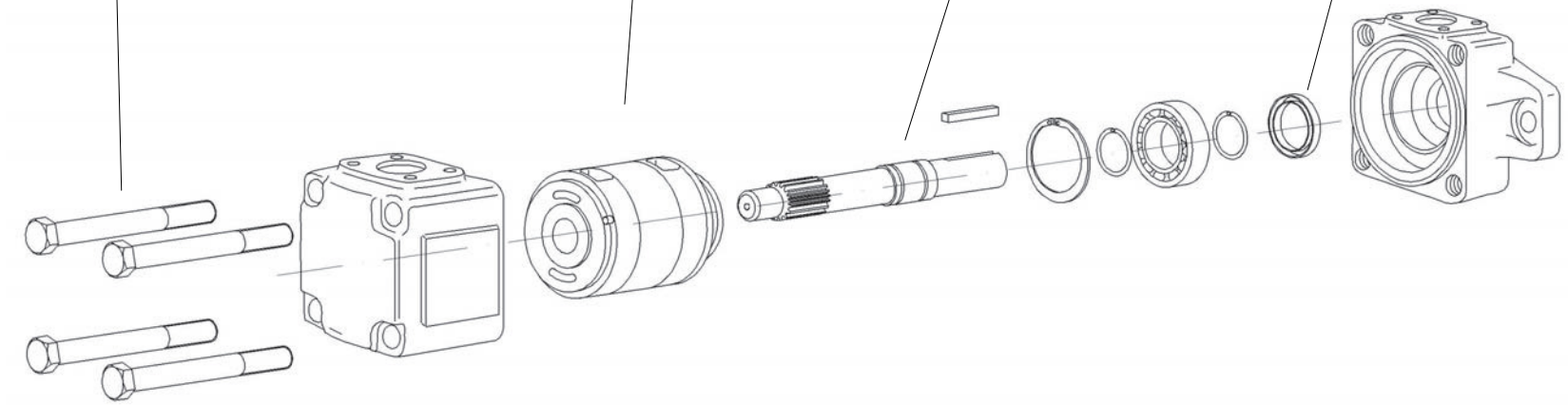
Id. codes of pump components

Screw	
Part No.	M3040070
Torque at 187 Nm (1668 lb.in.)	

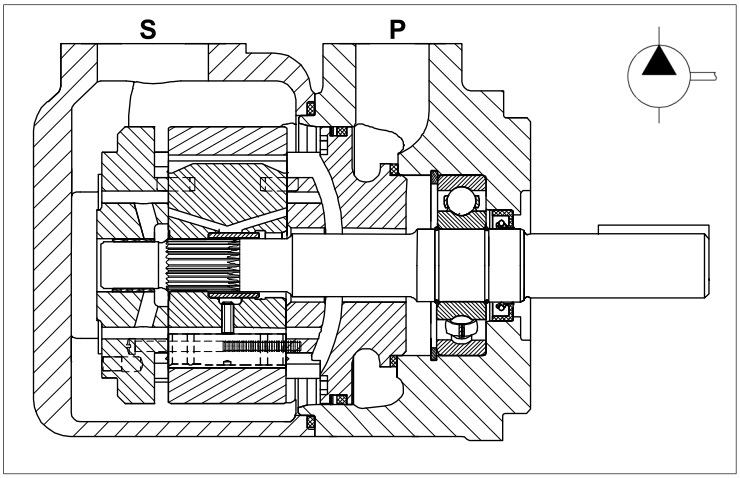
Cartridge			
Type	**Model**	**Pump rotation**	
		Right hand	**Left hand**
BD04	14	N0200010	N0200020
	20	N0200050	N0200060
	24	N0200070	N0200080
	28	N0200090	N0200100
	31	N0200110	N0200120
	35	N0200130	N0200140
	38	N0200150	N0200160
	42	N0200170	N0200180
	45	N0200190	N0200200
	50	N0200210	N0200220

Shaft	
Model	**Part No.**
01	K6041000
02	K6042000
03	K6043000

Shaft seal	
Part No.	**type**
M8040193	NBR



Pump seal kit	
Part No.	**Type**
M3004500	NBR



General description

Fixed displacement vane pump, hydraulically balanced, with capacity determined by the type of cartridge used and the speed of rotation. The pump is available in 10 different displacements from 198 to 403 l/min (from 52 to 107 gpm) at 1500 rpm and pressure 0 bar.

Technical characteristics

Cartridge model	Geometric displacement		Rated capacity at 0 bar				Maximum pressure				Speed range
			1200 rpm		1500 rpm		intermittent		continuos		
	ml/rev.	(in^3/r)	l/min	(gpm)	l/min	(gpm)	bar	(psi)	bar	(psi)	rpm
42	132,3	(8.07)	158.8	(42.00)	198.5	(52.51)	240	(3500)	210	(3000)	400 - 2200
45	142,4	(8.70)	170.7	(45.15)	213.6	(56.51)	240	(3500)	210	(3000)	400 - 2200
50	158,5	(9.67)	190.2	(50.25)	237.7	(62.88)	240	(3500)	210	(3000)	400 - 2200
52	164,8	(10.00)	197.5	(52.25)	247.2	(65.40)	240	(3500)	210	(3000)	400 - 2200
54	171,0	(10.43)	205.2	(54.29)	256.5	(67.86)	240	(3500)	210	(3000)	400 - 2200
57	183,3	(11.18)	220.0	(58.19)	275.0	(72.74)	240	(3500)	210	(3000)	400 - 2200
62	196,7	(12.00)	235.7	(62.36)	295.0	(78.04)	240	(3500)	210	(3000)	400 - 2200
66	213,3	(13.02)	255.6	(67.62)	319.9	(84.63)	240	(3500)	210	(3000)	400 - 2200
72	227,1	(13.86)	272.2	(72.00)	340.6	(90.11)	240	(3500)	210	(3000)	400 - 2200
85	268,7	(16.4)	322.4	(85.30)	403.0	(106.63)	90	(1300)	75	(1100)	400 - 2000

Hydraulic fluids: antiwear petroleum base, synthetic fluid, water glycols and invert emulsions.

Viscosity range / Viscosity index: with antiwear petroleum base, from 10 to 2000 cSt. (10 to 108 cSt. recommended). Other fluids from 18 to 2000 c.St. (18 to 108 c.St. recommended). Choose 30 c.St. for max lifetime. *Viscosity index*: 90° min.

Filtration: to maintain contamination level to ISO 18/14 or NAS 1638 class 8.
Filters: for the inlet, use strainer with mesh not less than 149 micron abs. (omit strainer with application requiring cold start or when using fire resistant fluids); for the return line - 25 micron abs. or better.

Water contamination level: max 0.10% for mineral oil. With other fluids, max 0.05%

Intermittent pressure: typically the working time permitted at such pressure is < 30% of the duty cycle. With duty cycles longer than 15 minutes, please contact the technical office of B&C

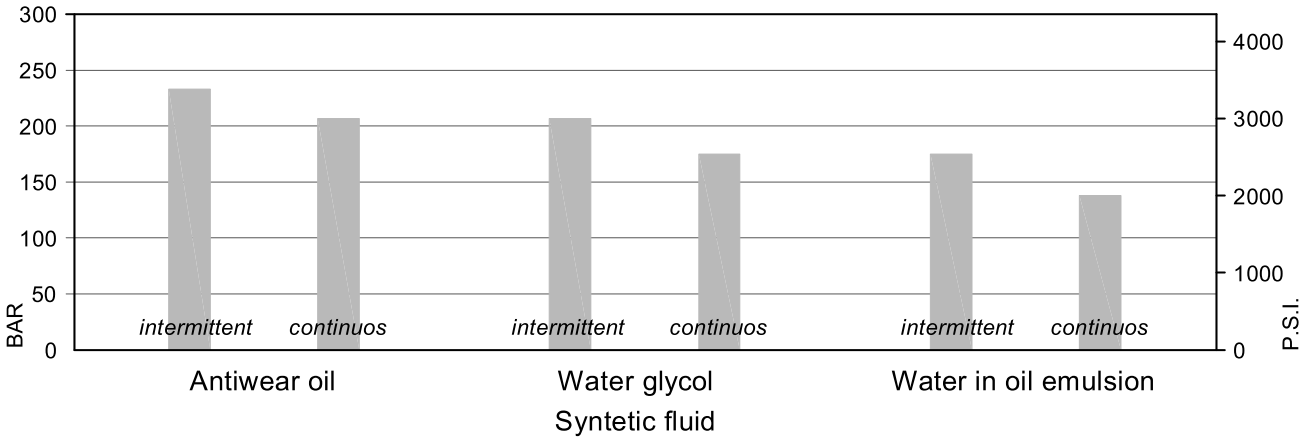
Minimum inlet pressure (with mineral oil 10-65 c.St.): 0,8 bar abs. (3 psi abs.). In the biggest displacements of each series and with the highest speeds, is required an higher inlet pressure. Please consult the specific section for details. In case of tandem pump, supply the inlet port with the highest pressure requested among the pump stages.

Operating temperature: with “antiwear petroleum base” the permitted temperature is: from -18 to +100°C; with water glycol and “water in oil emulsion”: from +10 to +50°C; with syntetic fluid: from -18 to +70°C; with rapeseed and esters: from-20 to + 70°C. During cold start the pumps should be operated at low speed and pressure until fluid warms up to an acceptable viscosity for full power operation.

Drive: direct and coaxial by means of a flexible coupling. Low axial and radial loads allowed. Consult specific section for more detail.

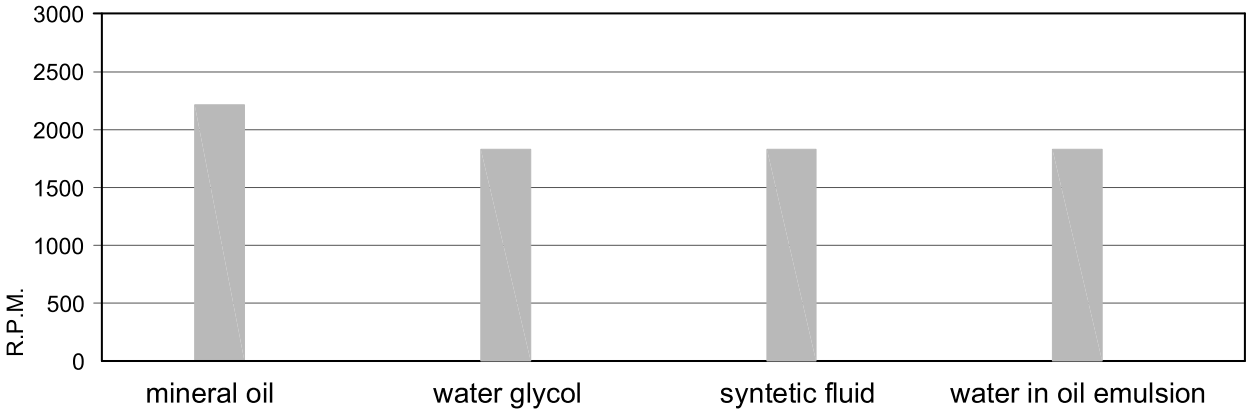
Main operating data

max pressure / fluid type



Note: with antiwear oil, the max intermittent pressure of the model 85 (displ. 268.7 c.c.) is 90 bar and the max continuos pressure is 75 bar; with the other fluids the max pressure is 75 bar.

max speed / fluid type



Note: with mineral oil, the max rotation speed of the model 85 (displ. 268.7 c.c.) is 2000 rpm; with the other fluids refer the above graph.

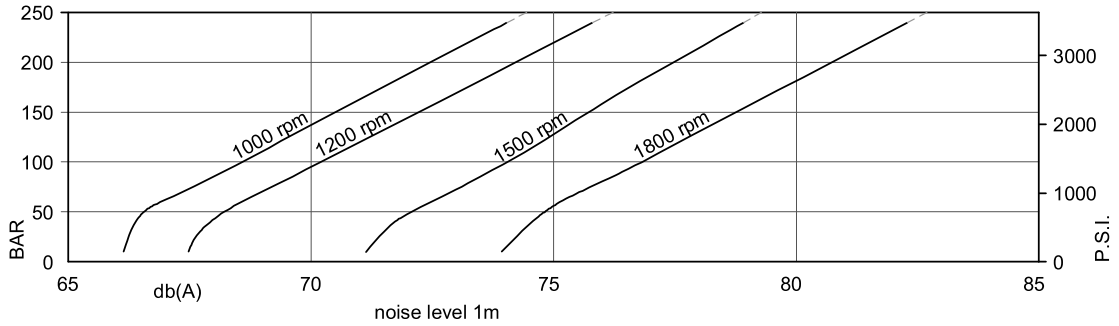
min. allowable inlet pressure / rotation speed (abs. bar)*

Speed r.p.m.	42	45	50	52	54	57	62	66	72	85
2200	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.09	1.05	-
2100	0.90	0.90	0.90	0.90	0.90	0.95	0.95	1.00	1.00	-
1800	0.80	0.80	0.80	0.80	0.80	0.85	0.85	0.95	0.85	1.00
1500	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.85	0.85	0.90
1200	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.85	0.85	0.90

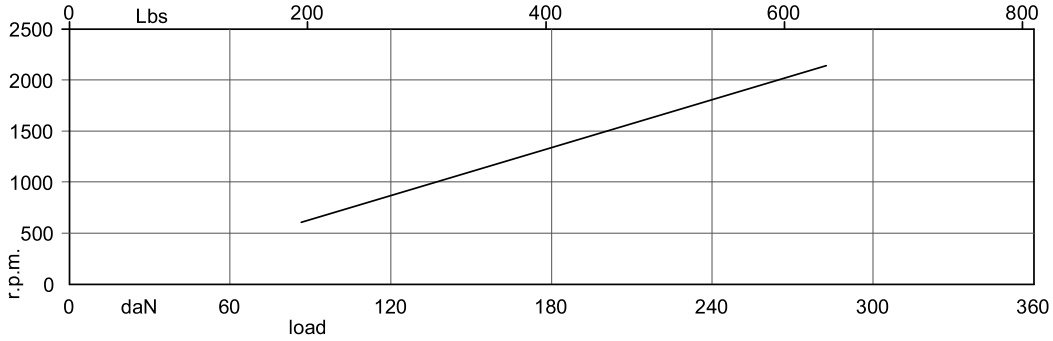
* measured inside the inlet flange; with petroleum base fluid (visc. 10 to 65 cSt.). Multiply the abs. pressure by 1.25 when using water-glycol or “water in oil emulsion”, by 1.35 with synthetic fluids, and by 1.1 with ester or rapeseed base.

Main operating data

noise level (model 50, with fluid viscosity 32 c.St., inlet 0.9 bar abs.)

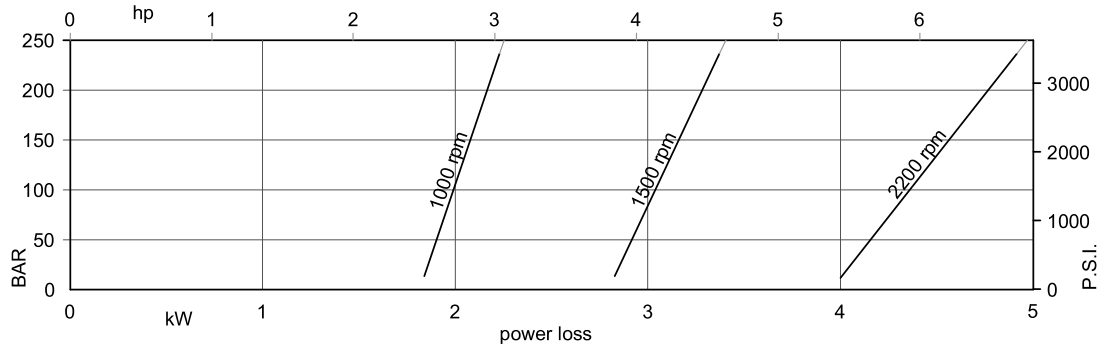


allowable radial load * (max. permissibile axial load =200 daN)

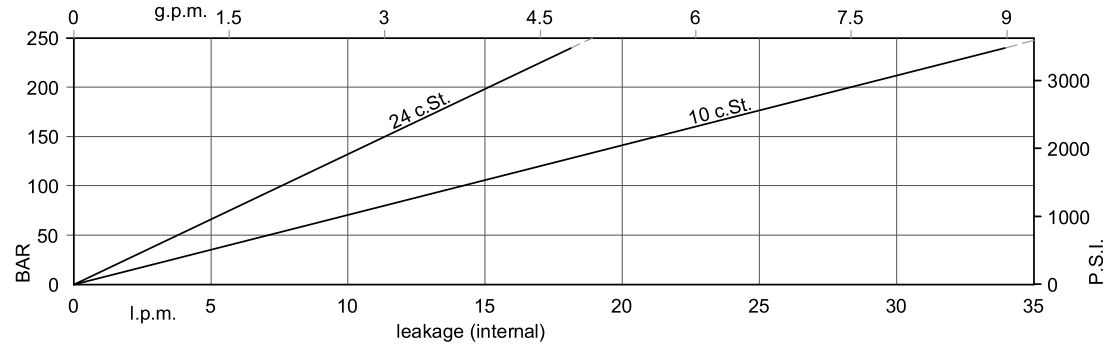


* Positioned in the middle of the key, in the No. 1 shaft

power loss (typical with 24 c.St.)



Typical internal leakage



Main operating data

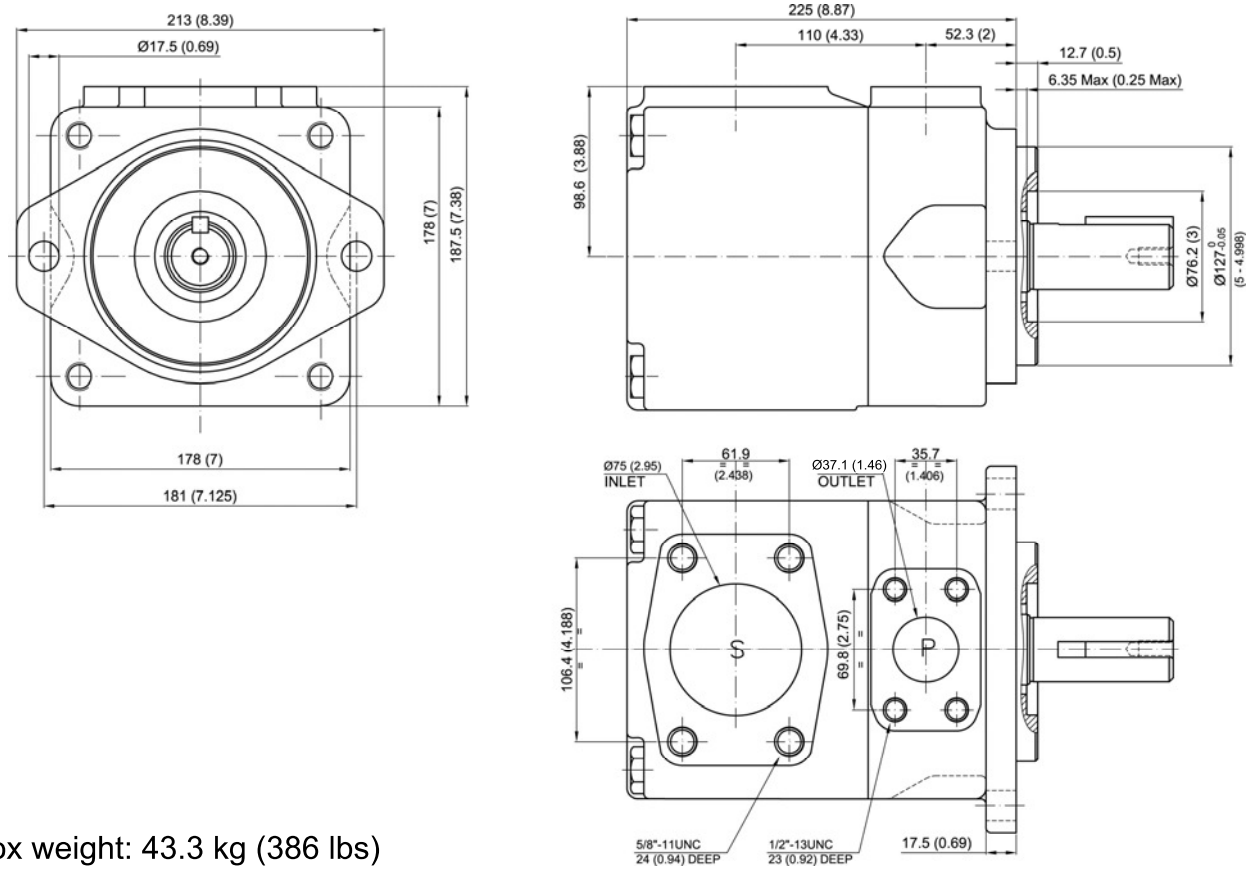
Typical: 24 c.St. (115 SUS)

Cartridge model	Geometric displacement		Speed rpm	140 bar		240 bar		Input power (kW)		
	ml/rev.	(in^3/r)		l/min	(gpm)	l/min	(gpm)	7 bar (100 psi)	140 bar (2000 psi)	240 bar (3500 psi)
42	132,3	(8.07)	1000	122,3	(32.35)	115,2	(30.48)	3.20	32.9	55.2
			1200	148,9	(39.39)	141,9	(37.54)	3.60	38.4	65.6
			1500	188,5	(49.90)	181,3	(47.96)	4.50	49.4	82.6
			1800	228,2	(60.37)	220,8	(58.42)	4.90	57.6	98.3
45	142,4	(8.69)	1000	132,4	(35.03)	125,3	(33.15)	3.40	35.30	59.20
			1200	161,0	(42.60)	154,0	(40.75)	3.70	40.24	69.43
			1500	203,6	(53.86)	196,5	(51.98)	4.60	52.90	88.70
			1800	246,3	(65.17)	239,3	(63.32)	5.05	60.36	104.05
50	158,5	(9.67)	1000	148,5	(39.29)	141,4	(37.41)	3.50	39.00	65.60
			1200	180,3	(47.70)	173,3	(45.85)	3.80	44.62	77.10
			1500	227,7	(60.24)	220,6	(58.36)	5.70	58.50	98.30
			1800	275,3	(72.83)	268,3	(70.98)	5.38	66.93	115.55
52	164,8	(10.06)	1000	154,8	(40.95)	147,7	(39.07)	3.60	40.50	68.20
			1200	187,9	(49.70)	180,9	(47.85)	3.95	46.33	80.10
			1500	237,2	(62.75)	230,1	(60.87)	5.80	60.80	102.10
			1800	286,6	(75.82)	279,6	(73.97)	5.51	69.50	120.05
54	171,0	(10.43)	1000	161,0	(42.59)	153,0	(40.77)	3.70	41.91	70.66
			1200	212,8	(56.30)	204,3	(50.04)	4.00	48.03	82.97
			1500	246,5	(65.21)	239,4	(63.30)	5.90	63.00	105.80
			1800	299,3	(79.18)	292,1	(77.28)	6.00	72.00	124.45
57	183,3	(11.18)	1000	173,2	(45.82)	164,5	(43.52)	3.82	44.93	70.59
			1200	210.8	(55.77)	202,4	(53.55)	4.17	51.49	88.94
			1500	265,0	(70.11)	257,9	(68.23)	6.10	67.30	113.20
			1800	320,8	(84.87)	313,1	(82.83)	6.20	77.15	133.31
62	196,7	(12.00)	1000	186,7	(49.39)	179,6	(47.51)	4.00	47.90	80.90
			1200	226,1	(59.81)	219,1	(57.96)	4.30	55.01	95.28
			1500	285,0	(75.40)	277,9	(73.52)	6.30	71.90	121.30
			1800	343,9	(90.99)	336,9	(89.14)	6.40	82.51	142.83
66	213,3	(13.02)	1000	203,3	(53.78)	196,2	(51.90)	4.20	51.80	87.60
			1200	246,0	(65.07)	239,0	(63.22)	4.55	59.52	103.18
			1500	309,9	(81.98)	302,8	(80.11)	6.70	77.70	131.20
			1800	373,8	(98.89)	366,8	(97.04)	6.50	89.29	154.68
72	227,1	(13.86)	1000	217,1	(57.43)	210,0	(55.56)	4.30	55.00	93.10
			1200	262,5	(69.45)	255,5	(67.60)	4.80	63.27	109.75
			1500	330,6	(87.46)	323,5	(85.58)	6.90	82.60	139.50
			1800	398,6	(105.45)	391,6	(103.60)	6.78	94.92	164.54
85	268,7	(16.39)	1000	258,0*	(68.25)*	-	-	4.82	41.2*	-
			1200	310,6*	(82.17)*	-	-	5.79	49.6*	-
			1500	392,0*	(103.70)*	-	-	7.23	62.5*	-
			1800	476.8*	(126.13)*	-	-	8.73	76.5*	-

* Referred to 90 bar (1300 p.s.i.)

Installation dimensions

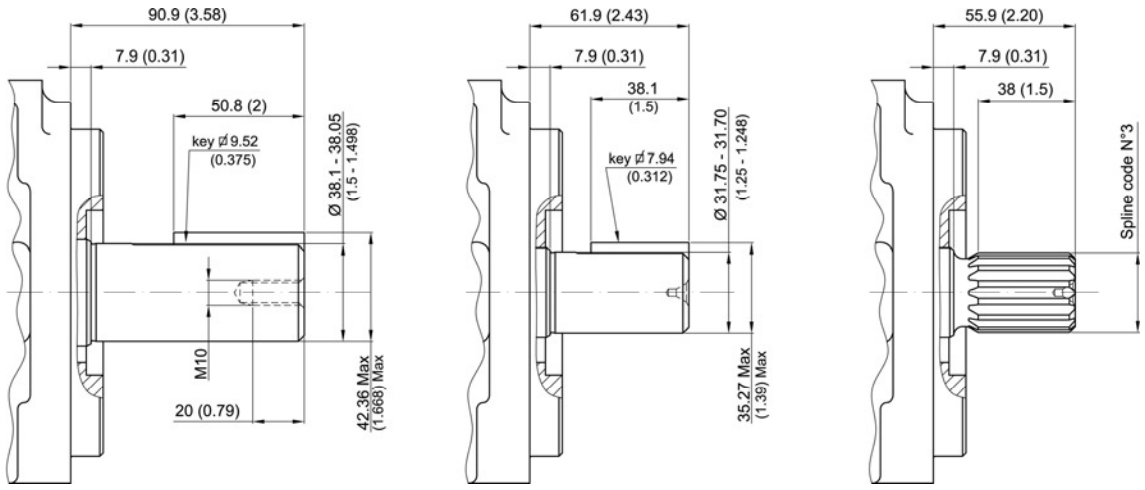
mm (inches)



Approx weight: 43.3 kg (386 lbs)

Shaft options

mm (inches)



Shaft No.1 Shaft No.2 Shaft No.3

Calculation of the max permitted torque:
(avoid to exceed)

Shaft No.	(ml/rev) x bar	(in3/rev) x psi
1	54555	48273
2	34590	30638
3	61200	54207

Spline code	**3**
Designation	Sae C
Pressure angle	30°
No. of teeth	14
Pitch	12/24 d.p.
Spline type	flat root side fit
Class	1- J498 b

Model code breakdown

BD 05 G ** * * ** *

Pump series

Pump type

Design

Cartridge model

42 45 50 52 54 57 62 66 72 85

Shaft end options

1 = keyed (Sae C)
2 = Keyed (No Sae)
3 = Splined (Sae C)

Rotation
(viewed from shaft-end)

R = Right hand rotation CW
L = Left hand rotation CCW

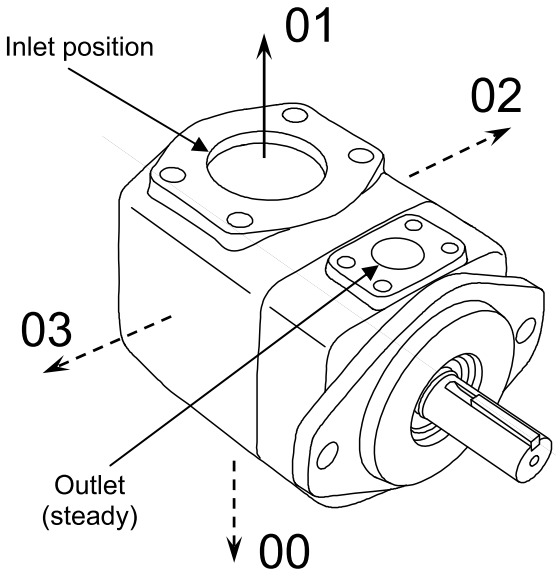
Port orientations
(Viewed from cover end)

00 = Inlet opposite outlet
01 = Inlet inline with outlet
02 = Intlet 90°CW from outlet
03 = Intlet 90°CCW from outlet

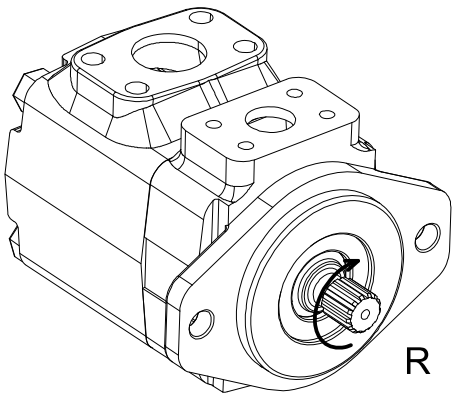
Seals

1 = NBR

Port orientations



Pump rotation



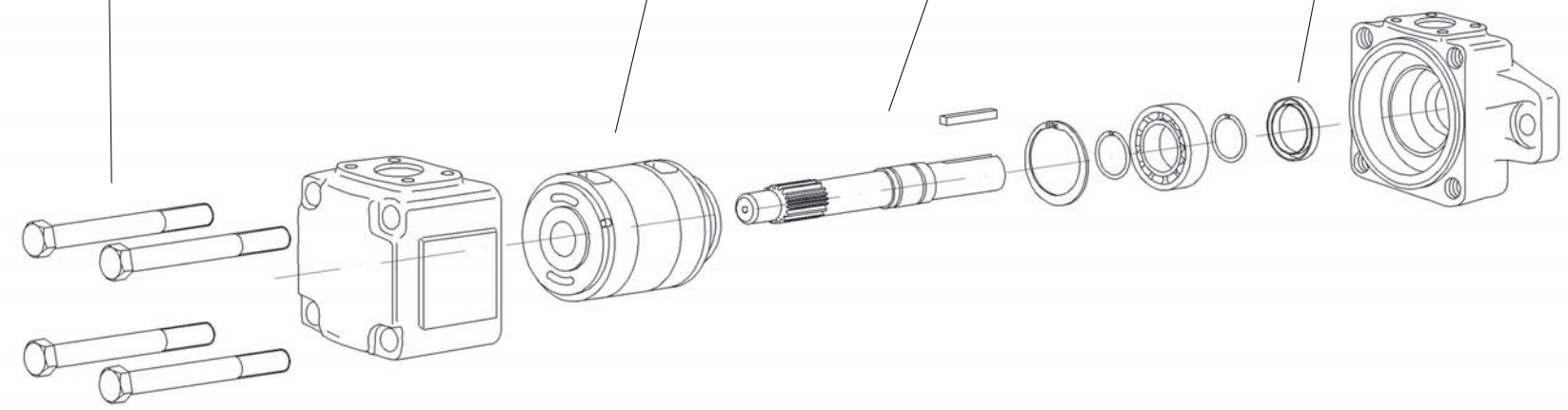
Id. codes of pump components

Screw	
Part No.	M3050070
Torque at 187 Nm (1668 lb.in.)	

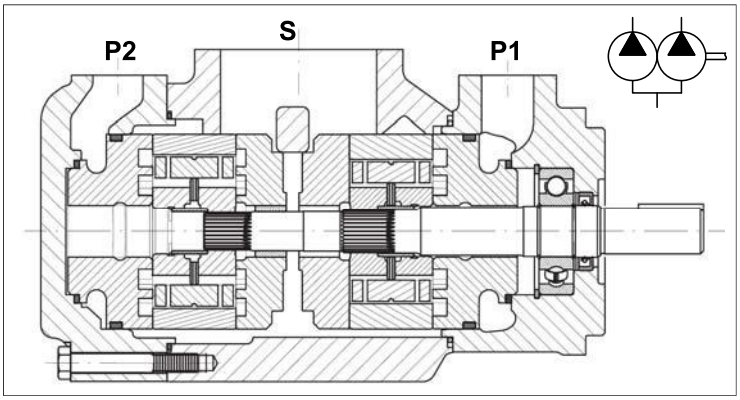
Cartridge			
Type	Model	Pump rotation	
		Right hand	Left hand
BD05	42	N0300010	N0300020
	45	N0300030	N0300040
	50	N0300050	N0300060
	52	N0300070	N0300080
	54	N0300090	N0300100
	57	N0300110	N0300120
	62	N0300130	N0300140
	66	N0300150	N0300160
	72	N0300170	N0300180
	85	N0300190	N0300200

Shaft	
Model	Part No.
01	K6051000
02	K6052000
03	K6053000

Shaft seal	
Part No.	type
M3050300	NBR



Pump seal kit	
Part No.	Type
M3005500	NBR



General description

Fixed displacement vane pump, hydraulically balanced, with capacity determined by the type of cartridge used and the speed of rotation. The pump is available in several versions with rated capacity from 32 to 300 l/min (from 8 to 80 gpm) at 1500 rpm and pressure 0 bar.

Technical characteristics (P1 and P2 sections)

03	10,8	(0.66)	12,93	(3.42)	16,2	(4.29)	275	(4000)	240	(3500)	400 - 2800
05	17,2	(1.05)	20,60	(5.45)	25,8	(6.83)	275	(4000)	240	(3500)	400 - 2800
06	21,3	(1.30)	25,52	(6.75)	31,9	(8.44)	275	(4000)	240	(3500)	400 - 2800
08	26,4	(1.61)	31,64	(8.37)	39,6	(10.48)	275	(4000)	240	(3500)	400 - 2800
10	34,1	(2.08)	40,86	(10.81)	51,1	(13.52)	275	(4000)	240	(3500)	400 - 2800
12	37,1	(2.26)	44,45	(11.76)	55,6	(14.71)	275	(4000)	240	(3500)	400 - 2800
14	46,0	(2.81)	55,11	(14.58)	69,0	(18.25)	275	(4000)	240	(3500)	400 - 2800
17	58,3	(3.56)	69,85	(18.48)	87,4	(23.12)	275	(4000)	240	(3500)	400 - 2800
20	63,8	(3.89)	76,47	(20.23)	95,7	(25.32)	275	(4000)	240	(3500)	400 - 2800
22	70,3	(4.29)	84,26	(22.29)	105,4	(27.88)	275	(4000)	240	(3500)	400 - 2800
25	79,3	(4.84)	95,03	(25.14)	118,9	(31.46)	275	(4000)	240	(3500)	400 - 2500
28	88,8	(5.42)	106,41	(28.15)	133,2	(35.24)	210	(3000)	160	(2300)	400 - 2500
31	100,0	(6.10)	119,83	(31.70)	150,0	(39.68)	210	(3000)	160	(2300)	400 - 2500

Hydraulic fluids: antiwear petroleum base, synthetic fluid, water glycols and invert emulsions.

Viscosity range / Viscosity index: with antiwear petroleum base, from 10 to 2000 cSt. (10 to 108 cSt. recommended). Other fluids from 18 to 2000 c.St. (18 to 108 c.St. recomm.). Choose 30 c.St. for max lifetime. *Viscosity index*: 90° min.

Filtration: to maintain contamination level to ISO 18/14 or NAS 1638 class 8.
Filters: for the inlet, use strainer with mesh not less than 149 micron abs. (omit strainer with application requiring cold start or when using fire resistant fluids); for the return line - 25 micron abs. or better.

Water contamination level: max 0.10% for mineral oil. With other fluids, max 0.05%

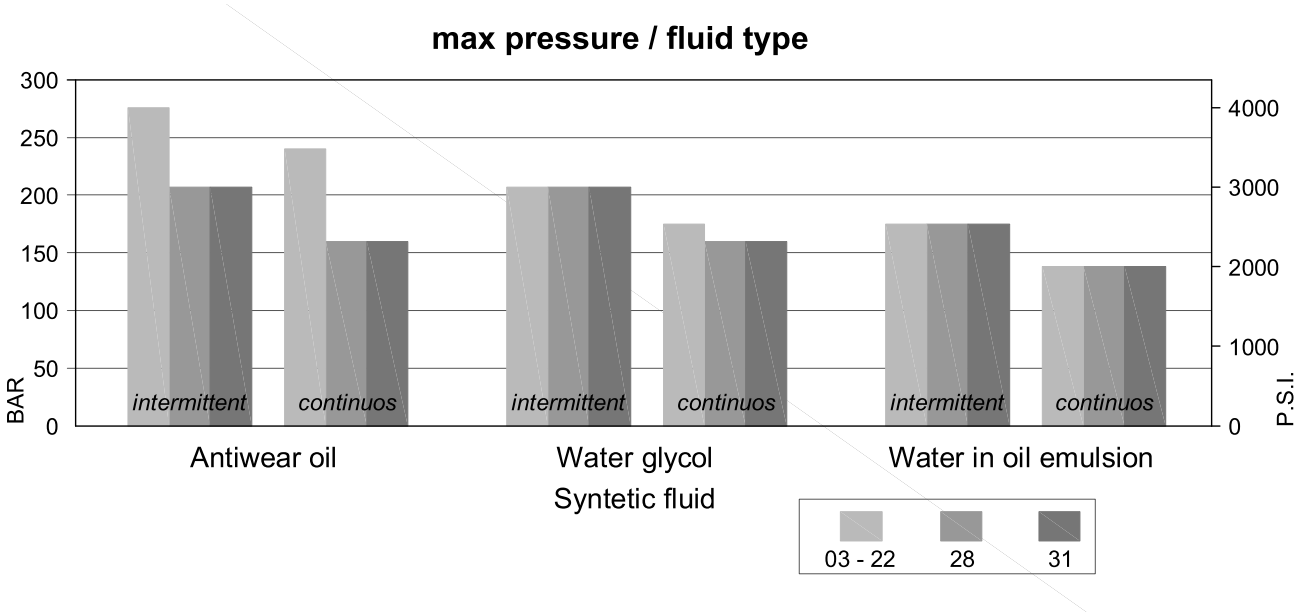
Intermittent pressure: typically the working time permitted at such pressure is < 30% of the duty cycle. With duty cycles longer than 15 minutes, please contact the technical office of B&C.

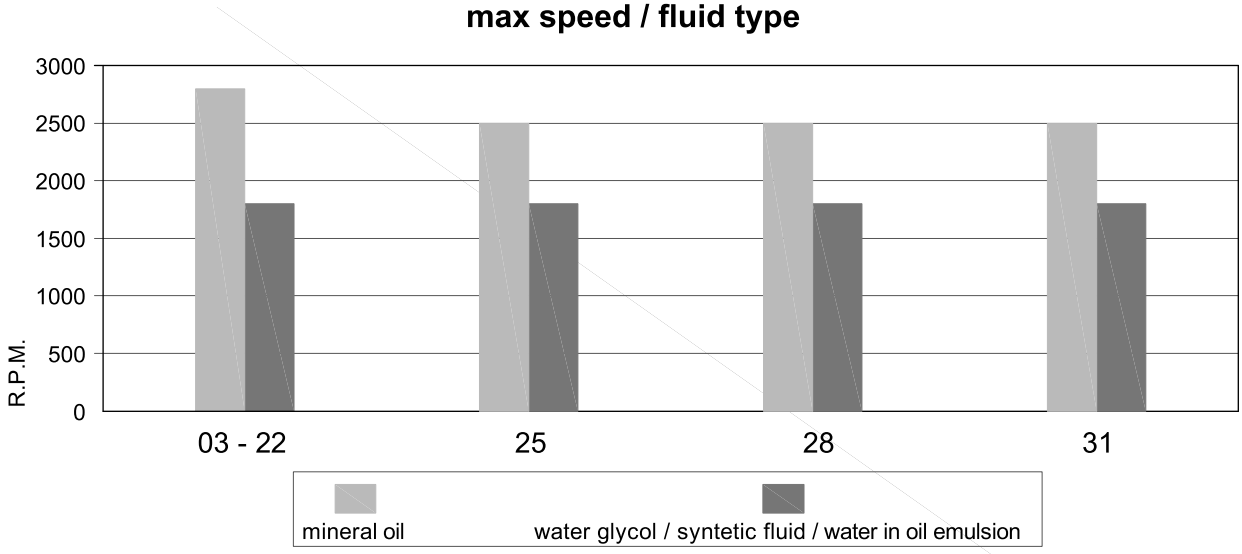
Minimum inlet pressure: (with mineral oil 10-65 c.St.): 0,8 bar abs. (3 psi abs.). In the biggest displacements of each series and with the highest speeds, is required an higher inlet pressure. Please consult the specific section for details. In case of tandem pump, supply the inlet port with the highest pressure requested among the pump stages.

Operating temperature: with “antiwear petroleum base” the permitted temperature is: from -18 to +100° C; with water glycol and “water in oil emulsion”: from +10 to +50°C; with syntetic fluid: from -18 to +70°C; with rapeseed and esters: from-20 to + 70°C. During cold start the pumps should be operated at low speed and pressure until fluid warms up to an acceptable viscosity for full power operation.

Drive: direct and coaxial by means of a flexible coupling. Low axial and radial loads allowed. Consult specific section for more detail.

Main operating data





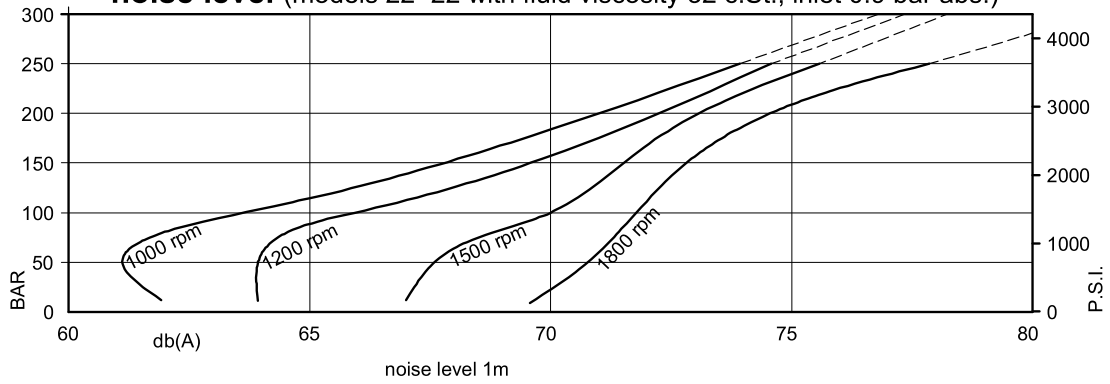
min. allowable inlet pressure / rotation speed (abs. bar)*

Speed r.p.m.	from 03 to 10	12	14	17	20	22	25	28	31
2800	1.00	1.00	1.00	1.03	1.03	1.05			
2500	0.90	0.92	0.95	0.95	0.95	0.98	1.05	1.08	1.11
2300	0.80	0.85	0.85	0.90	0.90	0.90	0.95	0.98	1.0
2200	0.80	0.80	0.80	0.85	0.85	0.90	0.95	0.98	0.90
2100	0.80	0.80	0.80	0.80	0.80	0.85	0.90	0.90	0.85
1800	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
1500	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
1200	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80

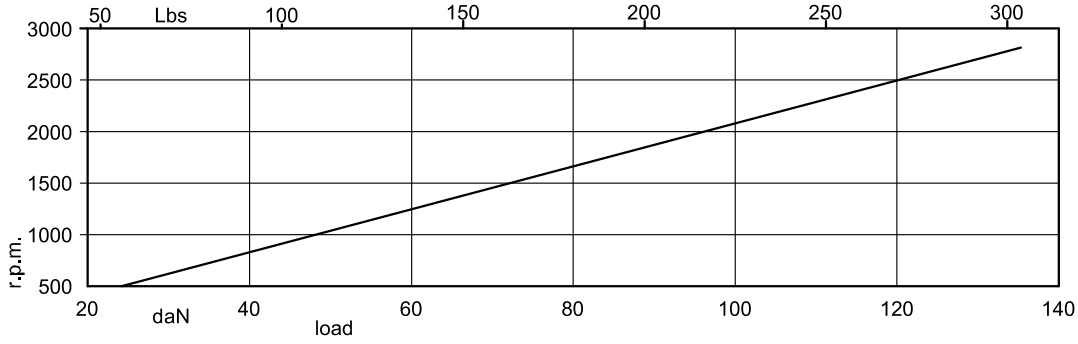
* measured inside the inlet flange; with petroleum base fluid (visc. 10 to 65 cSt.).
Multiply the abs. pressure by 1.25 when using water-glycol or “water in oil emulsion”, by 1.35 with synthetic fluids, and by 1.1 with ester or rapeseed base.

Main operating data

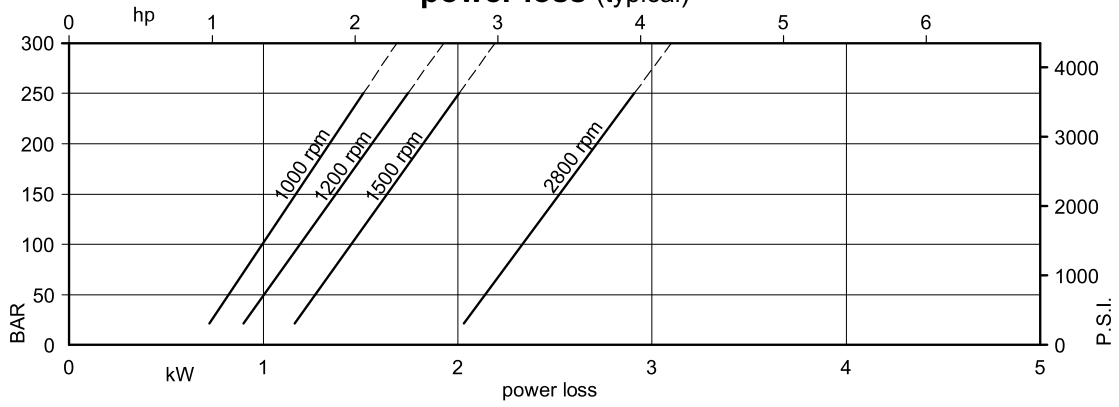
noise level (models 22+22 with fluid viscosity 32 c.St., inlet 0.9 bar abs.)



allowable radial load (max. permissibile axial load =80 daN)

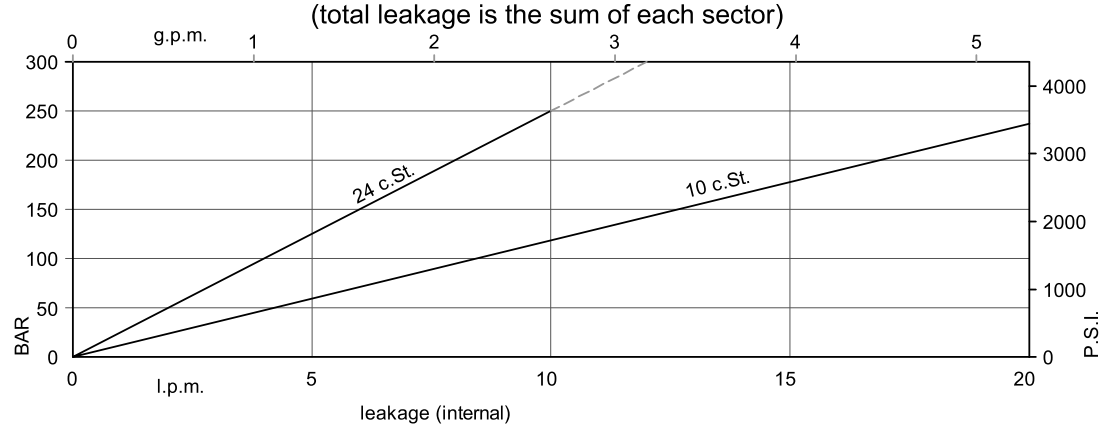


power loss (typical)



Typical internal leakage *

(total leakage is the sum of each sector)



* If the internal leakage is more than 50% of the theoretical flow, do not operate the pump

Main operating data (P1 and P2 sections)

Typical: 24 c.St. (115 SUS)

Cartridge model	Geometric displacement		Speed rpm	140 bar		240 bar		Input power (kW)		
	ml/rev.	(in^3/r)		l/min	(gpm)	l/min	(gpm)	7 bar (100 psi)	140 bar (2000 psi)	240 bar (3500 psi)
03	10,8	(0.66)	1000	-	-	-	-	1.00	-	-
			1200	-	-	-	-	1.05	-	-
			1500	10,7	(2.84)	-	-	1.30	5.30	-
			1800	13,6	(3.61)	-	-	1.55	8.45	-
05	17,2	(1.05)	1000	11,7	(3.09)	-	-	1.10	5.10	-
			1200	15,1	(3.99)	-	-	1.14	8.17	-
			1500	20,3	(5.37)	15,8	(4.18)	1.40	7.50	12.2
			1800	25,1	(6.65)	21,0	(5.56)	1.68	12.0	14.4
06	21,3	(1.30)	1000	15,80	(4.18)	11,30	(2.99)	1.10	6.00	10.00
			1200	19,73	(5.22)	15,61	(4.13)	1.19	7.13	11.86
			1500	26,50	(7.01)	22,00	(5.82)	1.50	8.90	14.70
			1800	32,51	(8.60)	28,39	(7.51)	1.76	10.50	17.33
08	26,4	(1.61)	1000	20,90	(5.53)	16,40	(4.34)	1.20	7.20	12.10
			1200	25,86	(6.84)	21,74	(5.75)	1.26	8.51	14.29
			1500	34,10	(9.02)	29,60	(7.83)	1.60	10.70	17.70
			1800	41,66	(11.02)	37,54	(9.93)	1.87	12.58	20.98
10	34,1	(2.08)	1000	28,60	(7.57)	24,10	(6.38)	1.30	8.90	15.10
			1200	35,08	(9.28)	30,96	(8.19)	1.37	10.61	17.96
			1500	45,70	(12.09)	41,20	(10.90)	1.70	13.40	22.30
			1800	55,53	(14.69)	51,41	(13.60)	2.03	15.72	26.47
12	37,1	(2.26)	1000	31,60	(8.36)	27,10	(7.17)	1.30	9.60	16.30
			1200	38,67	(10.23)	34,55	(9.14)	1.41	11.42	19.38
			1500	50,20	(13.28)	45,70	(12.09)	1.70	14.40	24.10
			1800	60,90	(16.11)	56,78	(15.02)	2.09	16.95	28.62
14	46,0	(2.81)	1000	40,50	(10.71)	36,00	(9.52)	1.40	11.70	19.90
			1200	49,33	(13.05)	45,21	(11.96)	1.53	13.85	23.62
			1500	63,50	(16.80)	59,00	(15.61)	1.90	17.60	29.50
			1800	76,92	(20.35)	72,80	(19.26)	2.27	20.58	34.97
17	58,3	(3.56)	1000	52,80	(13.97)	48,30	(12.78)	1.60	14.50	24.80
			1200	64,07	(16.95)	59,95	(15.86)	1.70	17.19	29.47
			1500	82,00	(21.69)	77,50	(20.50)	2.10	21.90	36.90
			1800	99,04	(26.20)	94,92	(25.11)	2.52	25.60	43.76
20	63,8	(3.89)	1000	58,30	(15.42)	53,80	(14.23)	1.60	15.80	27.00
			1200	70,69	(18.70)	66,57	(17.61)	1.77	18.68	32.09
			1500	90,20	(23.86)	85,70	(22.67)	2.20	23.80	40.20
			1800	108,90	(28.81)	103,65	(27.42)	2.63	27.84	47.68
22	70,3	(4.29)	1000	64,80	(17.14)	60,30	(15.95)	1.70	17.30	29.60
			1200	78,47	(20.76)	74,35	(19.67)	1.86	20.46	35.18
			1500	100,00	(26.46)	95,50	(25.26)	2.30	26.10	44.10
			1800	120,58	(31.90)	116,46	(30.81)	2.76	30.49	52.32
25 [1]	79,3	(4.84)	1000	73,80	(19.52)	69,30	(18.33)	1.80	19.30	33.20
			1200	89,25	(23.61)	85,13	(22.52)	1.99	22.90	39.47
			1500	113,50	(30.03)	109,00	(28.84)	2.50	29.20	49.50
			1800	136,76	(36.18)	132,64	(35.09)	2.95	34.16	58.75
28 [1]	88,8	(5.42)	1000	83,30	(22.04)	80,10 [2]	(21.19) [2]	1.90	21.90	32.50 [2]
			1200	100,62	(26.62)	97,75 [2]	(25.86) [2]	2.11	25.49	37.77 [2]
			1500	127,70	(33.78)	124,50 [2]	(32.94) [2]	2.80	32.70	48.50 [2]
			1800	153,85	(40.70)	150,97 [2]	(39.94) [2]	3.14	38.04	56.42 [2]
31 [1]	100,0	(6.10)	1000	94,50	(25.00)	91,30 [2]	(24.15) [2]	2.00	24.40	36.40 [2]
			1200	114,04	(30.17)	111,17 [2]	(29.41) [2]	2.26	28.53	42.34 [2]
			1500	144,50	(38.23)	141,30 [2]	(37.38) [2]	2.80	36.50	54.40 [2]
			1800	173,99	(46.03)	171,12 [2]	(45.27) [2]	3.37	42.61	63.28 [2]

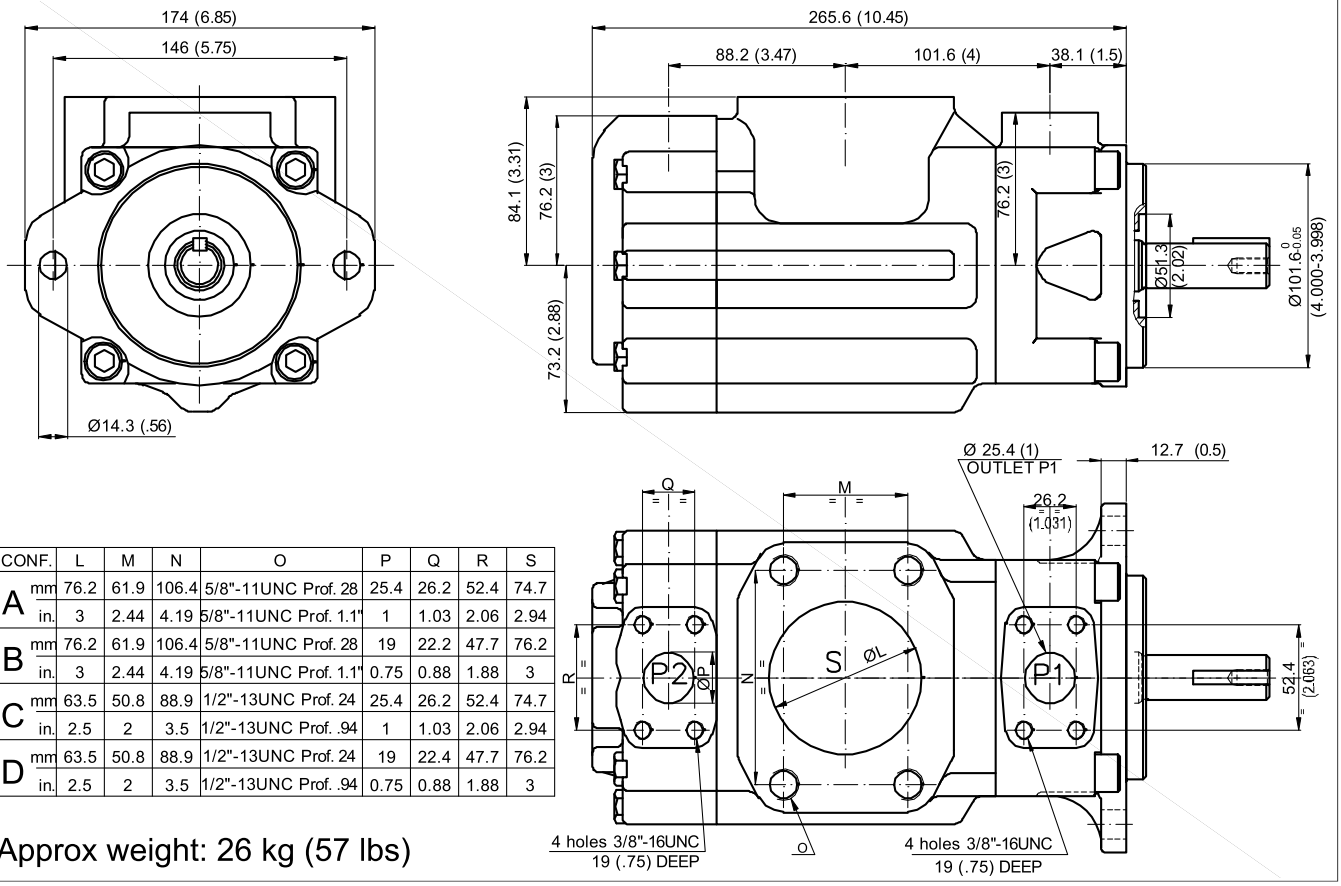
- Internal leakage exceeding 50% of the theoretical flow

1) 2500 r.p.m. max.

2) referred to 210 bar (3000p.s.i.)

Installation dimensions

mm (inches)

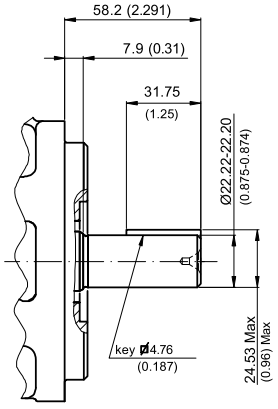


CONF.		L	M	N	O	P	Q	R	S
A	mm	76.2	61.9	106.4	5/8"-11UNC Prof. 28	25.4	26.2	52.4	74.7
	in.	3	2.44	4.19	5/8"-11UNC Prof. 1.1"	1	1.03	2.06	2.94
B	mm	76.2	61.9	106.4	5/8"-11UNC Prof. 28	19	22.2	47.7	76.2
	in.	3	2.44	4.19	5/8"-11UNC Prof. 1.1"	0.75	0.88	1.88	3
C	mm	63.5	50.8	88.9	1/2"-13UNC Prof. 24	25.4	26.2	52.4	74.7
	in.	2.5	2	3.5	1/2"-13UNC Prof. .94	1	1.03	2.06	2.94
D	mm	63.5	50.8	88.9	1/2"-13UNC Prof. 24	19	22.4	47.7	76.2
	in.	2.5	2	3.5	1/2"-13UNC Prof. .94	0.75	0.88	1.88	3

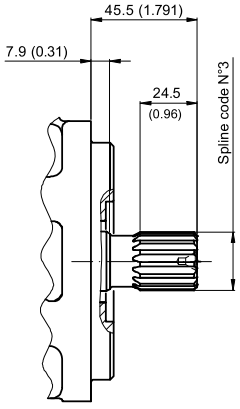
Approx weight: 26 kg (57 lbs)

Shaft options

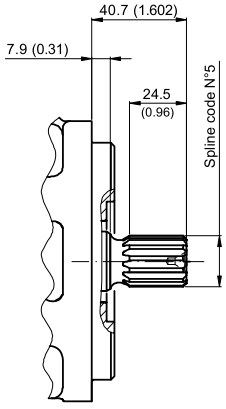
mm (inches)



Shaft No.1



Shaft No.3



Shaft No.5

Calculation of the max permitted torque
(avoid to exceed)

Shaft No.	(ml/rev) x bar P1+P2	(in3/rev) x psi P1+P2
1	14300	12666
3	32670	28937
5	20600	18246

Spline code	**3**	**5**
Designation	Sae B-B	Sae B
Pressure angle	30°	30°
No. of teeth	15	13
Pitch	16/32 d.p.	16/32 d.p.
Spline type	flat root side fit	
Class	1- J498 b	1- J498 b

Model code breakdown

BD 22 G ** ** * * ** * *

Pump series

Pump type

Design

Cartridge model
(P1 and P2 sections)
03 05 06 08 10 12 14 17 20 22 25 28 31

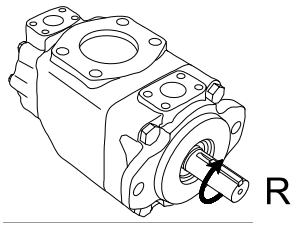
Shaft end options
1 = keyed (No Sae)
3 = Splined (Sae B-B)
5 = Splined (Sae B)

Port dimensions
(S=2"½ - max. 126 ml/rev. tot.)
(P2=3/4" - max. 46 ml/rev. in P2)
A S=3"; P1=1"; P2=1"
B S=3"; P1=1"; P2=3/4"
C S=2"½; P1=1"; P2=1"
D S=2"½; P1=1"; P2=3/4"

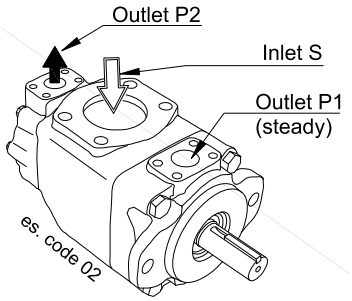
Seals **1** = NBR

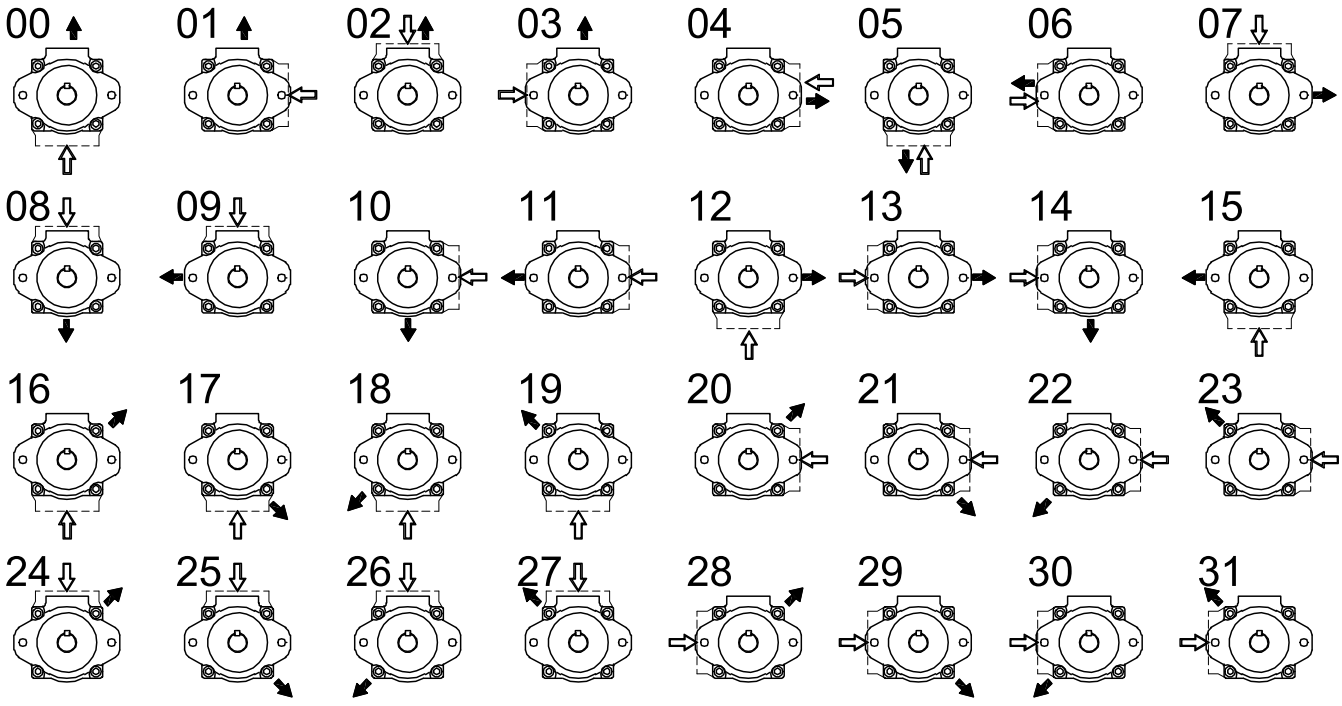
Port orientations
(Look at the table below)
00 = Standard

Rotation
(viewed from shaft-end)
R = Right hand rotation CW
L = Left hand rotation CCW



Port orientations





Id. codes of pump components

Rear cartridge			
Type	Model	Pump rotation	
		Right hand	Left hand
BD22	03	N0400270	N0400280
	05	N0400290	N0400300
	06	N0400310	N0400320
	08	N0400330	N0400340
	10	N0400350	N0400360
	12	N0400370	N0400380
	14	N0400390	N0400400
	17	N0400410	N0400420
	20	N0400430	N0400440
	22	N0400450	N0400460
	25	N0400470	N0400480
	28	N0400490	N0400500
	31	N0400510	N0400520

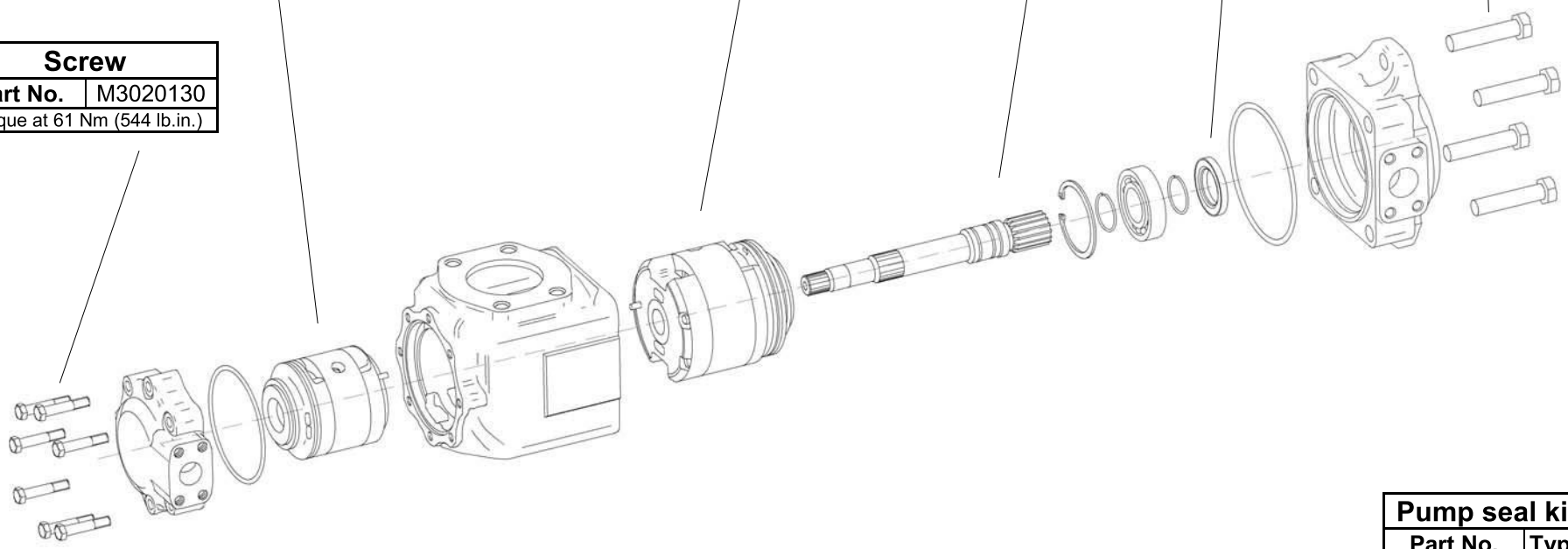
Front cartridge			
Type	Model	Pump rotation	
		Right hand	Left hand
BD22	03	N0400010	N0400020
	05	N0400030	N0400040
	06	N0400050	N0400060
	08	N0400070	N0400080
	10	N0400090	N0400100
	12	N0400110	N0400120
	14	N0400130	N0400140
	17	N0400150	N0400160
	20	N0400170	N0400180
	22	N0400190	N0400200
	25	N0400210	N0400220
	28	N0400230	N0400240
	31	N0400250	N0400260

Shaft	
Model	Part No.
01	K6211000
03	K6213000
05	K6215000

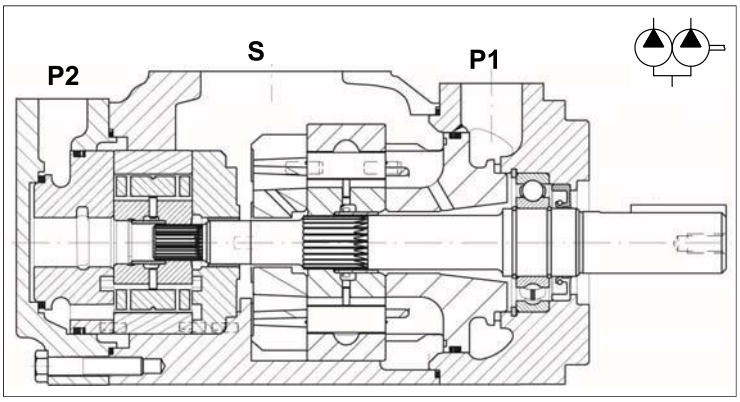
Screw	
Part No.	M3020140
Torque at 159 Nm (1418 lb.in.)	

Shaft seal	
Part No.	type
M3020060	NBR

Screw	
Part No.	M3020130
Torque at 61 Nm (544 lb.in.)	



Pump seal kit	
Part No.	Type
M3022500	NBR



General description

Fixed displacement vane pump, hydraulically balanced, with capacity determined by the type of cartridge used and the speed of rotation. The pump is available in several versions with rated capacity from 87 to 300 l/min (from 8 to 80 gpm) at 1500 rpm and pressure 0 bar.

Technical characteristics

Cartridge model		Geometric displacement		Rated capacity at 0 bar				Maximum pressure				Speed range
				1200 rpm		1500 rpm		intermittent		continuos		
		ml/rev.	(in^3/r)	l/min	(gpm)	l/min	(gpm)	bar	(psi)	bar	(psi)	rpm
P1	14	47,6	(2.90)	57,04	(15.09)	71,4	(18.89)	240	(3500)	210	(3000)	400 - 2500
	20	66,0	(4.03)	79,08	(20.92)	99,0	(26.19)	240	(3500)	210	(3000)	400 - 2500
	24	79,5	(4.85)	95,26	(25.20)	119,3	(31.56)	240	(3500)	210	(3000)	400 - 2500
	28	89,7	(5.47)	107,50	(28.44)	134,5	(35.58)	240	(3500)	210	(3000)	400 - 2500
	31	98,3	(6.00)	117,82	(31.17)	147,4	(38.99)	240	(3500)	210	(3000)	400 - 2500
	35	111,0	(6.77)	133,02	(35.19)	166,5	(44.05)	240	(3500)	210	(3000)	400 - 2500
	38	120,3	(7.34)	144,17	(38.14)	180,4	(47.72)	240	(3500)	210	(3000)	400 - 2500
	42	136,0	(8.30)	162,99	(43.12)	204,0	(53.97)	240	(3500)	210	(3000)	400 - 2200
	45	145,7	(8.89)	174,60	(46.19)	218,5	(57.80)	240	(3500)	210	(3000)	400 - 2200
	50	158,0	(9.64)	189,34	(50.09)	237,0	(62.70)	210	(3000)	160	(2300)	400 - 2200
P2	03	10,8	(0.66)	12,93	(3.42)	16,2	(4.29)	275	(4000)	240	(3500)	400 - 2800
	05	17,2	(1.05)	20,60	(5.45)	25,8	(6.83)	275	(4000)	240	(3500)	400 - 2800
	06	21,3	(1.30)	25,52	(6.75)	31,9	(8.44)	275	(4000)	240	(3500)	400 - 2800
	08	26,4	(1.61)	31,64	(8.37)	39,6	(10.48)	275	(4000)	240	(3500)	400 - 2800
	10	34,1	(2.08)	40,86	(10.81)	51,1	(13.52)	275	(4000)	240	(3500)	400 - 2800
	12	37,1	(2.26)	44,45	(11.76)	55,6	(14.71)	275	(4000)	240	(3500)	400 - 2800
	14	46,0	(2.81)	55,11	(14.58)	69,0	(18.25)	275	(4000)	240	(3500)	400 - 2800
	17	58,3	(3.56)	69,85	(18.48)	87,4	(23.12)	275	(4000)	240	(3500)	400 - 2800
	20	63,8	(3.89)	76,47	(20.23)	95,7	(25.32)	275	(4000)	240	(3500)	400 - 2800
	22	70,3	(4.29)	84,26	(22.29)	105,4	(27.88)	275	(4000)	240	(3500)	400 - 2800
	25	79,3	(4.84)	95,03	(25.14)	118,9	(31.46)	275	(4000)	240	(3500)	400 - 2500
	28	88,8	(5.42)	106,41	(28.15)	133,2	(35.24)	210	(3000)	160	(2300)	400 - 2500
	31	100,0	(6.10)	119,83	(31.70)	150,0	(39.68)	210	(3000)	160	(2300)	400 - 2500

Hydraulic fluids: antiwear petroleum base, synthetic fluid, water glycols and invert emulsions.

Viscosity range / Viscosity index: with antiwear petroleum base, from 10 to 2000 cSt. (10 to 108 cSt. recommended). Other fluids from 18 to 2000 c.St. (18 to 108 c.St. recomm.). Choose 30 c.St. for max lifetime. *Viscosity index*: 90° min.

Filtration: to maintain contamination level to ISO 18/14 or NAS 1638 class 8.
Filters: for the inlet, use strainer with mesh not less than 149 micron abs. (omit strainer with application requiring cold start or when using fire resistant fluids); for the return line - 25 micron abs. or better.

Water contamination level: max 0.10% for mineral oil. With other fluids, max 0.05%

Intermittent pressure: typically the working time permitted at such pressure is < 30% of the duty cycle. With duty cycles longer than 15 minutes, please contact the technical office of B&C.

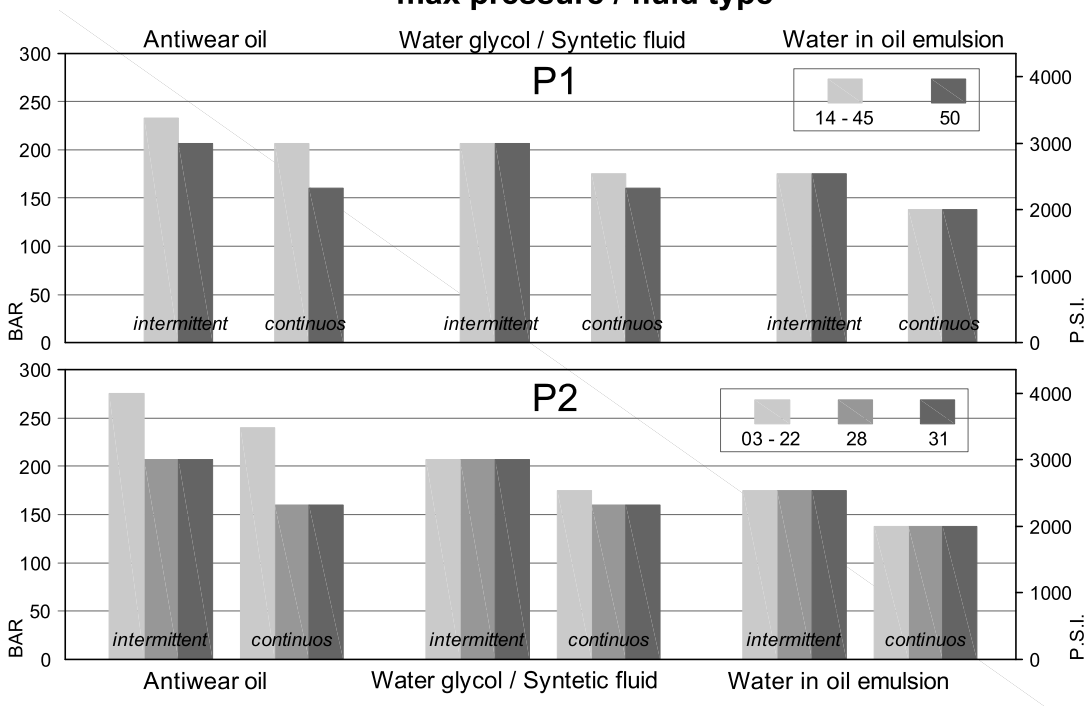
Minimum inlet pressure: (with mineral oil 10-65 c.St.): 0,8 bar abs. (3 psi abs.). In the biggest displacements of each series and with the highest speeds, is required an higher inlet pressure. Please consult the specific section for details. In case of tandem pump, supply the inlet port with the highest pressure requested among the pump stages.

Operating temperature: with “antiwear petroleum base” the permitted temperature is: from -18 to +100°C; with water glycol and “water in oil emulsion”: from +10 to +50°C; with syntetic fluid: from -18 to +70°C; with rapeseed and esters: from-20 to + 70°C. During cold start the pumps should be operated at low speed and pressure until fluid warms up to an acceptable viscosity for full power operation.

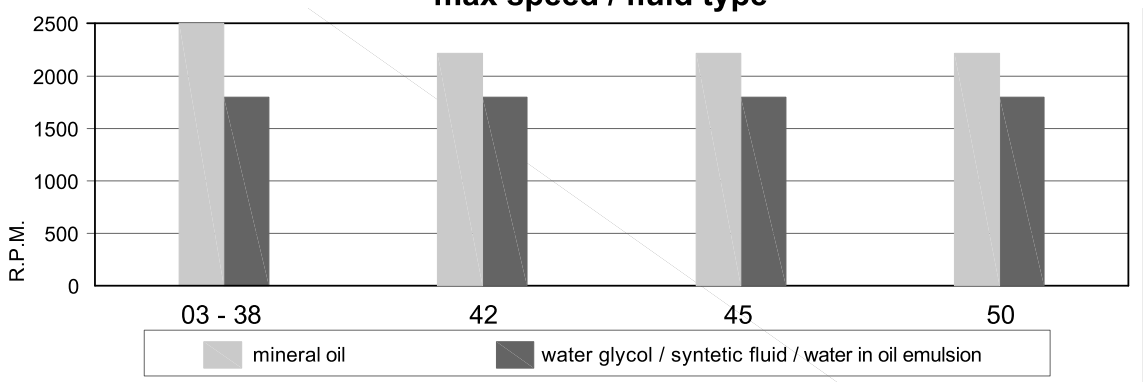
Drive: direct and coaxial by means of a flexible coupling. Low axial and radial loads allowed. Consult specific section for more detail.

Main operating data

max pressure / fluid type



max speed / fluid type



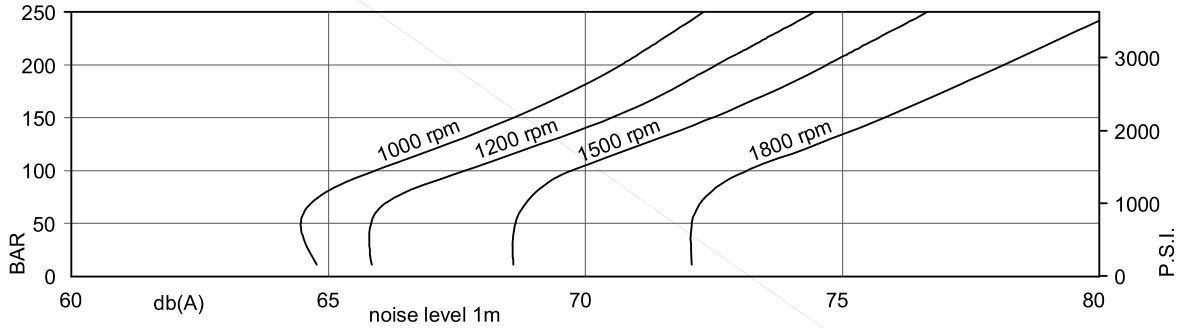
min. allowable inlet pressure / rotation speed (abs. bar)*

	Speed r.p.m.	from 14 to 20	24	28	31	35	38	42	45	50
P1	2500	1.00	1.10	1.18	1.23	1.29	1.29	-	-	-
	2300	0.95	0.95	1.00	1.00	1.02	1.05	1.08	-	-
	2200	0.88	0.88	0.92	0.95	0.98	1.00	1.02	1.05	1.09
	2100	0.80	0.82	0.85	0.90	0.92	0.95	0.95	0.98	1.02
	1800	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.85	0.85
	1500	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
	1200	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
	Speed r.p.m.	**from 03 to 10**	**12**	**14**	**17**	**20**	**22**	**25**	**28**	**31**
P2	2800	1.00	1.00	1.00	1.03	1.03	1.05			
	2500	0.90	0.92	0.95	0.95	0.95	0.98	1.05	1.08	1.11
	2300	0.80	0.85	0.85	0.90	0.90	0.90	0.95	0.98	1.0
	2200	0.80	0.80	0.80	0.85	0.85	0.90	0.95	0.98	0.90
	2100	0.80	0.80	0.80	0.80	0.80	0.85	0.90	0.90	0.85
	1800	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
	1500	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
	1200	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80

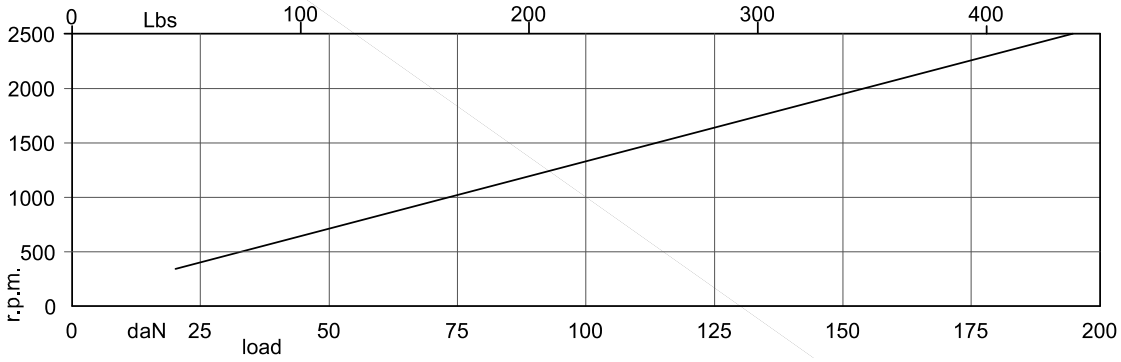
* measured inside the inlet flange; with petroleum base fluid (visc. 10 to 65 cSt.). Multiply the abs. pressure by 1.25 when using water-glycol or “water in oil emulsion”, by 1.35 with synthetic fluids, and by 1.1 with ester or rapeseed base.

Main operating data

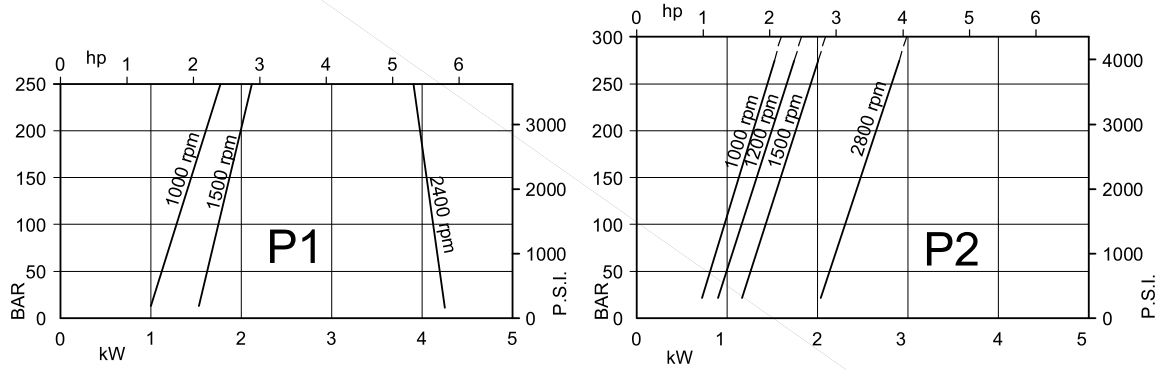
noise level (model 38+22, with fluid viscosity 32 c.St., inlet 0.9 bar abs.)



allowable radial load (max. permissibile axial load =120 daN)

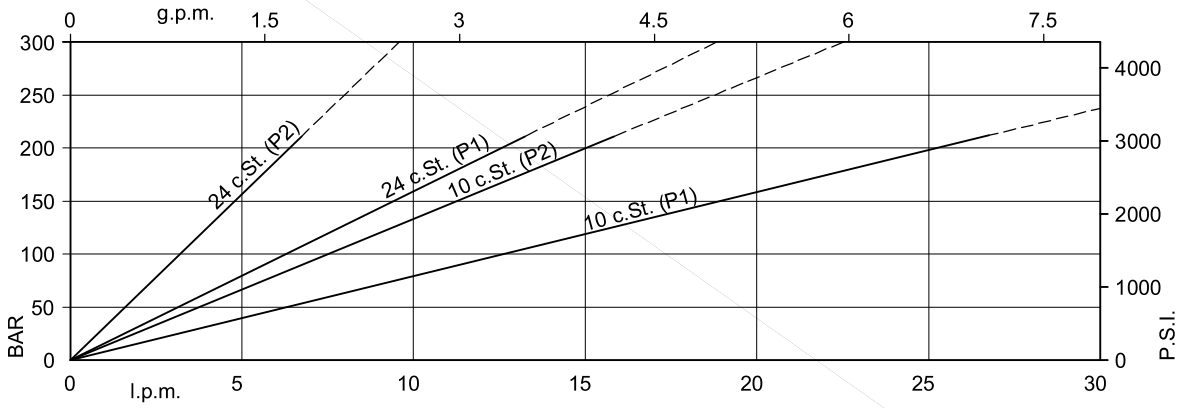


power loss (typical)



Typical internal leakage *

(total leakage is the sum of each sector)



* If the internal leakage is more than 50% of the theoretical flow, do not operate the pump

Main operating data

P1 section

Typical: 24 c.St. (115 SUS)

Cartridge model	Geometric displacement		Speed rpm	140 bar		240 bar		Input power (kW)		
	ml/rev.	(in^3/r)		l/min	(gpm)	l/min	(gpm)	7 bar (100 psi)	140 bar (2000 psi)	240 bar (3500 psi)
14	47,6	(2.90)	1000	38,3	(10.13)	32,1	(8.49)	1.50	12.50	20.70
			1200	48,8	(12.91)	42,6	(11.27)	1.80	14.43	24.44
			1500	62,1	(16.43)	55,9	(14.79)	2.30	18.50	30.60
			1800	77,3	(20.46)	71,1	(18.82)	2.96	21.57	36.31
20	66,0	(4.03)	1000	56,7	(15.00)	50,5	(13.36)	1.70	16.80	28.00
			1200	70,8	(18.74)	64,6	(17.10)	2.05	19.44	33.20
			1500	89,7	(23.73)	83,5	(22.09)	2.80	24.90	41.70
			1800	110,4	(29.21)	104,2	(27.57)	3.33	29.09	49.47
24	79,5	(4.85)	1000	70,2	(18.57)	64,0	(16.93)	1.90	19.90	33.40
			1200	87,02	(23.02)	80,8	(21.38)	2.23	23.11	39.63
			1500	110,0	(29.10)	103,8	(27.46)	3.00	29.60	49.80
			1800	134,7	(35.63)	128,5	(33.99)	3.61	34.61	59.12
28	89,7	(5.47)	1000	80,4	(21.27)	74,2	(19.63)	2.00	22.30	37.50
			1200	99,3	(26.26)	93,1	(24.62)	2.37	25.89	44.49
			1500	125,2	(33.12)	119,0	(31.48)	3.20	33.20	55.90
			1800	153,0	(40.48)	146,1	(38.64)	3.82	38.77	66.41
31	98,3	(6.00)	1000	89,0	(23.54)	82,8	(21.90)	2.10	24.30	40.90
			1200	109,6	(28.99)	103,4	(27.35)	2.49	28.23	48.59
			1500	138,1	(36.53)	131,9	(34.89)	3.30	36.20	61.00
			1800	168,5	(44.57)	162,3	(42.93)	4.00	42.28	72.55
35	111,0	(6.77)	1000	101,7	(26.90)	95,5	(25.26)	2.30	27.30	46.00
			1200	124,8	(33.01)	118,6	(31.37)	2.66	31.68	54.64
			1500	157,2	(41.59)	151,0	(39.95)	3.50	40.70	68.70
			1800	191,3	(50.61)	185,1	(48.97)	4.25	47.47	81.63
38	120,3	(7.34)	1000	111,0	(29.37)	104,8	(27.72)	2.40	29.40	49.80
			1200	135,9	(35.96)	129,7	(34.32)	2.79	36.42	59.07
			1500	171,1	(45.26)	164,9	(43.62)	3.70	43.90	74.30
			1800	208,0	(55.03)	201,8	(53.39)	4.45	51.27	88.28
42 [1]	136,0	(8.30)	1000	126,7	(33.52)	120,5	(31.88)	2.60	33.10	56.00
			1200	154,7	(40.94)	148,6	(39.30)	3.00	38.49	66.56
			1500	194,7	(51.51)	188,5	(49.87)	4.00	49.40	83.70
			1800	236,3	(62.50)	230,1	(60.86)	4.76	57.68	99.50
45 [1]	145,7	(8.89)	1000	136,4	(36.08)	130,2	(34.44)	2.70	35.30	59.90
			1200	166,4	(44.01)	160,2	(42.37)	3.14	41.14	71.18
			1500	209,2	(55.34)	203,0	(53.70)	4.10	52.80	89.50
			1800	253,7	(67.11)	247,5	(65.47)	4.96	61.64	106.43
50 [1]	158,0	(9.64)	1000	148,7	(39.34)	145,0 [2]	(38.36) [2]	2.80	38.20	56.80 [2]
			1200	181,1	(47.91)	176,6 [2]	(46.73) [2]	3.30	44.48	66.19 [2]
			1500	227,7	(30.24)	224,0 [2]	(59.26) [2]	4.40	57.00	85.00 [2]
			1800	275,8	(72.96)	271,3 [2]	(71.78) [2]	5.21	66.67	99.02 [2]

1) 2200 r.p.m. max.
2) referred to 210 bar (3000p.s.i.)

Main operating data

P2 section

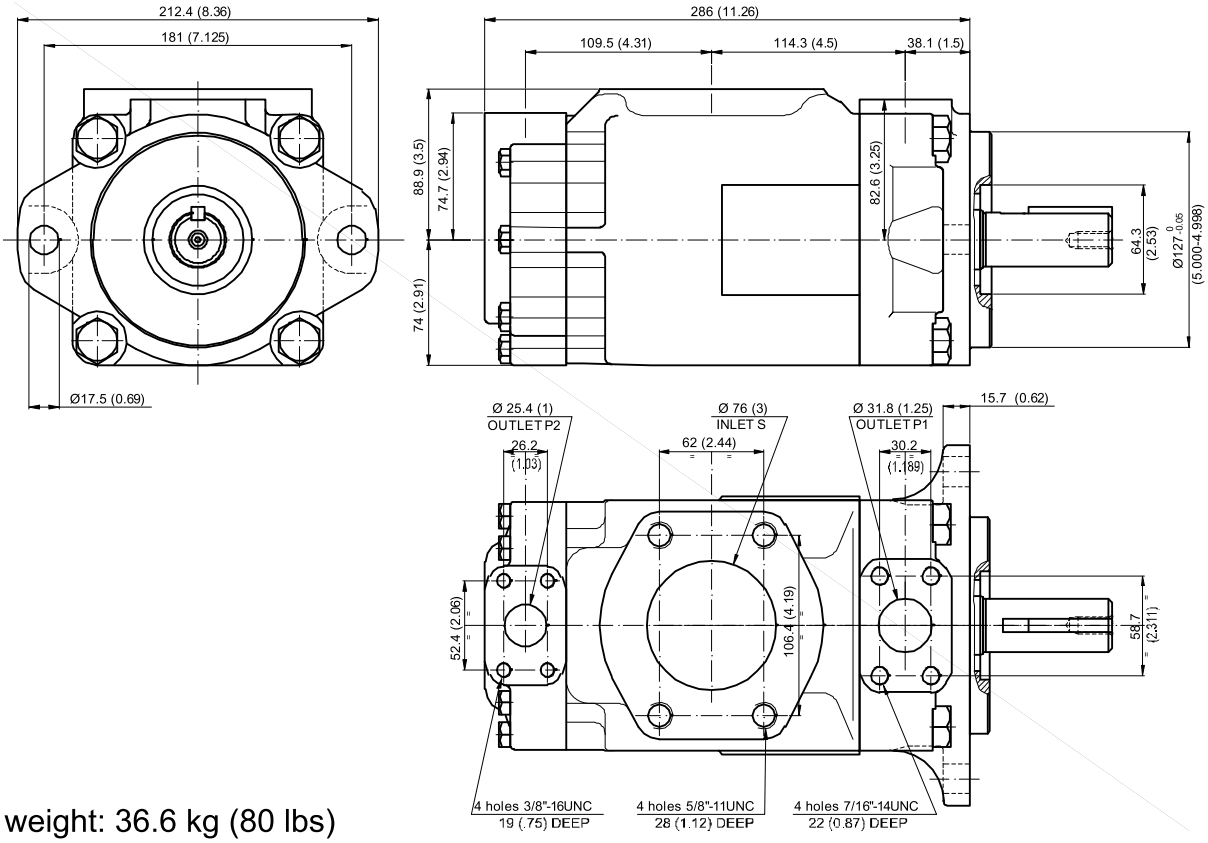
Typical: 24 c.St. (115 SUS)

Cartridge model	Geometric displacement		Speed rpm	140 bar		240 bar		Input power (kW)		
	ml/rev.	(in^3/r)		l/min	(gpm)	l/min	(gpm)	7 bar (100 psi)	140 bar (2000 psi)	240 bar (3500 psi)
03	10,8	(0.66)	1000	-	-	-	-	1.00	-	-
			1200	-	-	-	-	1.05	-	-
			1500	10,7	(2.84)	-	-	1.30	5.30	-
			1800	13,6	(3.61)	-	-	1.55	8.45	-
05	17,2	(1.05)	1000	11,7	(3.09)	-	-	1.10	5.10	-
			1200	15,1	(3.99)	-	-	1.14	8.17	-
			1500	20,3	(5.37)	15,8	(4.18)	1.40	7.50	12.2
			1800	25,1	(6.65)	21,0	(5.56)	1.68	12.0	14.4
06	21,3	(1.30)	1000	15,80	(4.18)	11,30	(2.99)	1.10	6.00	10.00
			1200	19,73	(5.22)	15,61	(4.13)	1.19	7.13	11.86
			1500	26,50	(7.01)	22,00	(5.82)	1.50	8.90	14.70
			1800	32,51	(8.60)	28,39	(7.51)	1.76	10.50	17.33
08	26,4	(1.61)	1000	20,90	(5.53)	16,40	(4.34)	1.20	7.20	12.10
			1200	25,86	(6.84)	21,74	(5.75)	1.26	8.51	14.29
			1500	34,10	(9.02)	29,60	(7.83)	1.60	10.70	17.70
			1800	41,66	(11.02)	37,54	(9.93)	1.87	12.58	20.98
10	34,1	(2.08)	1000	28,60	(7.57)	24,10	(6.38)	1.30	8.90	15.10
			1200	35,08	(9.28)	30,96	(8.19)	1.37	10.61	17.96
			1500	45,70	(12.09)	41,20	(10.90)	1.70	13.40	22.30
			1800	55,53	(14.69)	51,41	(13.60)	2.03	15.72	26.47
12	37,1	(2.26)	1000	31,60	(8.36)	27,10	(7.17)	1.30	9.60	16.30
			1200	38,67	(10.23)	34,55	(9.14)	1.41	11.42	19.38
			1500	50,20	(13.28)	45,70	(12.09)	1.70	14.40	24.10
			1800	60,90	(16.11)	56,78	(15.02)	2.09	16.95	28.62
14	46,0	(2.81)	1000	40,50	(10.71)	36,00	(9.52)	1.40	11.70	19.90
			1200	49,33	(13.05)	45,21	(11.96)	1.53	13.85	23.62
			1500	63,50	(16.80)	59,00	(15.61)	1.90	17.60	29.50
			1800	76,92	(20.35)	72,80	(19.26)	2.27	20.58	34.97
17	58,3	(3.56)	1000	52,80	(13.97)	48,30	(12.78)	1.60	14.50	24.80
			1200	64,07	(16.95)	59,95	(15.86)	1.70	17.19	29.47
			1500	82,00	(21.69)	77,50	(20.50)	2.10	21.90	36.90
			1800	99,04	(26.20)	94,92	(25.11)	2.52	25.60	43.76
20	63,8	(3.89)	1000	58,30	(15.42)	53,80	(14.23)	1.60	15.80	27.00
			1200	70,69	(18.70)	66,57	(17.61)	1.77	18.68	32.09
			1500	90,20	(23.86)	85,70	(22.67)	2.20	23.80	40.20
			1800	108,90	(28.81)	103,65	(27.42)	2.63	27.84	47.68
22	70,3	(4.29)	1000	64,80	(17.14)	60,30	(15.95)	1.70	17.30	29.60
			1200	78,47	(20.76)	74,35	(19.67)	1.86	20.46	35.18
			1500	100,00	(26.46)	95,50	(25.26)	2.30	26.10	44.10
			1800	120,58	(31.90)	116,46	(30.81)	2.76	30.49	52.32
25 [1]	79,3	(4.84)	1000	73,80	(19.52)	69,30	(18.33)	1.80	19.30	33.20
			1200	89,25	(23.61)	85,13	(22.52)	1.99	22.90	39.47
			1500	113,50	(30.03)	109,00	(28.84)	2.50	29.20	49.50
			1800	136,76	(36.18)	132,64	(35.09)	2.95	34.16	58.75
28 [1]	88,8	(5.42)	1000	83,30	(22.04)	80,10 [2]	(21.19) [2]	1.90	21.90	32.50 [2]
			1200	100,62	(26.62)	97,75 [2]	(25.86) [2]	2.11	25.49	37.77 [2]
			1500	127,70	(33.78)	124,50 [2]	(32.94) [2]	2.80	32.70	48.50 [2]
			1800	153,85	(40.70)	150,97 [2]	(39.94) [2]	3.14	38.04	56.42 [2]
31 [1]	100,0	(6.10)	1000	94,50	(25.00)	91,30 [2]	(24.15) [2]	2.00	24.40	36.40 [2]
			1200	114,04	(30.17)	111,17 [2]	(29.41) [2]	2.26	28.53	42.34 [2]
			1500	144,50	(38.23)	141,30 [2]	(37.38) [2]	2.80	36.50	54.40 [2]
			1800	173,99	(46.03)	171,12 [2]	(45.27) [2]	3.37	42.61	63.28 [2]

-) Internal leakage exceeding 50% of the theoretical flow
1) 2500 r.p.m. max.
2) referred to 210 bar (3000p.s.i.)

Installation dimensions

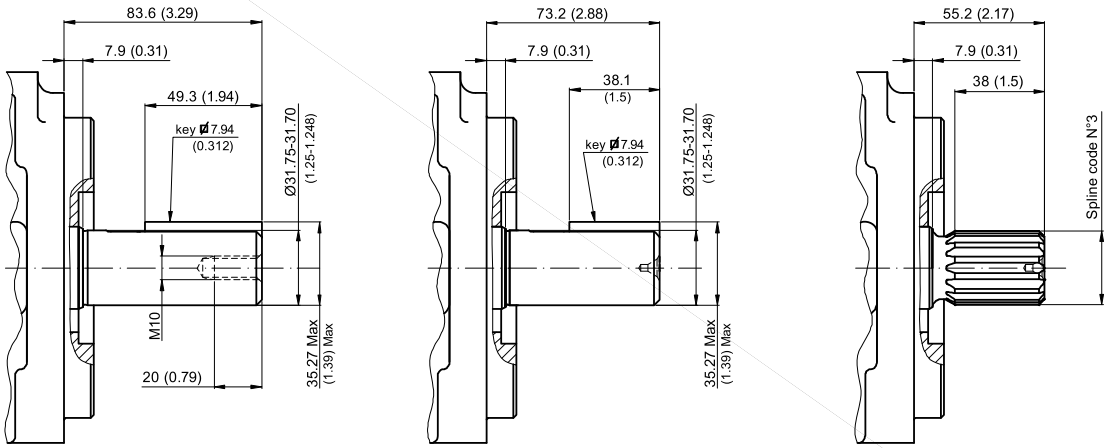
mm (inches)



Approx weight: 36.6 kg (80 lbs)

Shaft options

mm (inches)



Shaft No.1 Shaft No.2 Shaft No.3

Calculation of the max permitted torque:
(avoid to exceed)

Shaft No.	(ml/rev) x bar P1+P2	(in3/rev) x psi P1+P2
1	43240	38300
2	34590	30638
3	61200	54207

Spline code	**3**
Designation	Sae C
Pressure angle	30°
No. of teeth	14
Pitch	12/24 d.p.
Spline type	flat root side fit
Class	1- J498 b

Model code breakdown

BD 42 G ** ** * * ** *

Pump series

Pump type

Design

Cartridge model

(P1 section)

14 20 24 28 31 35 38 42 45 50

(P2 section)

03 05 06 08 10 12 14 17 20 22 25 28 31

Shaft end options

1 = keyed (Sae C)
2 = keyed (No Sae)
3 = Splined (Sae C)

Seals

1 = NBR

Port orientations

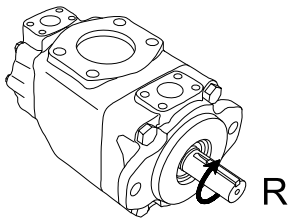
(Look at the table below)

00 = Standard

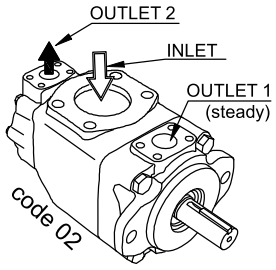
Rotation

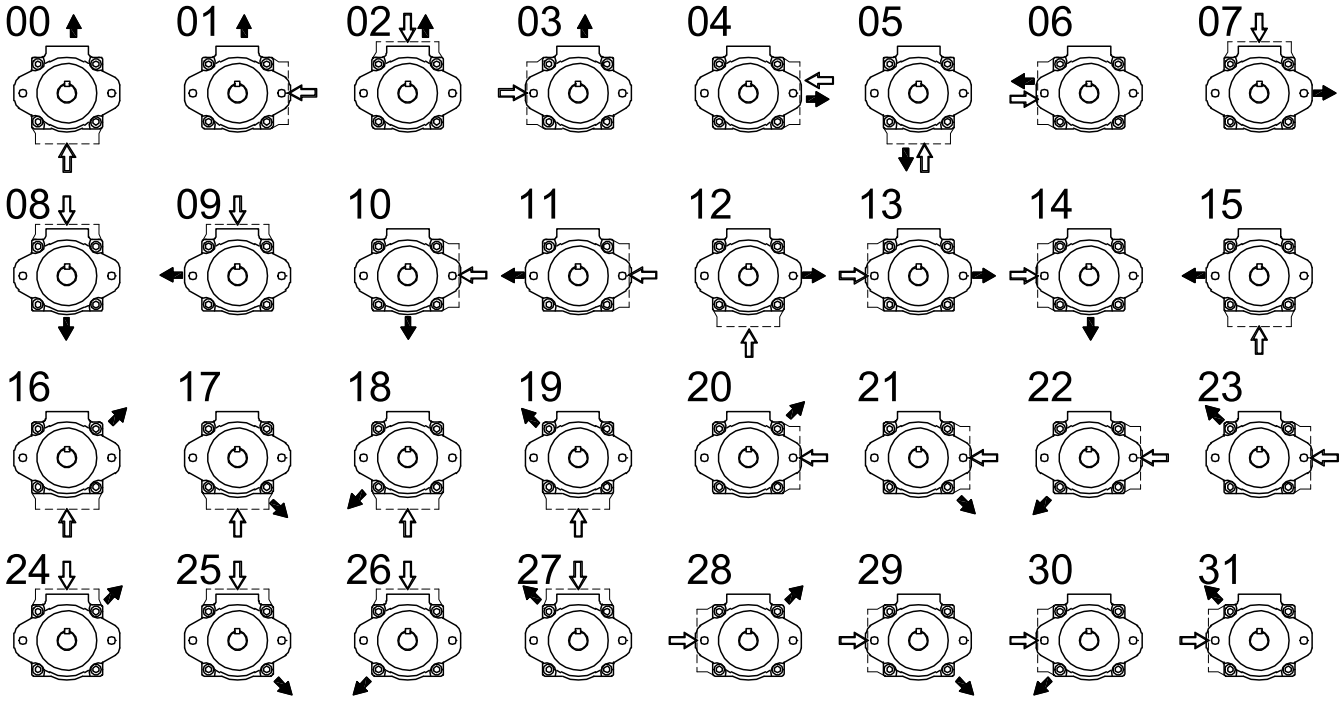
(viewed from shaft-end)

R = Right hand rotation CW
L = Left hand rotation CCW



Port orientations





Id. codes of pump components

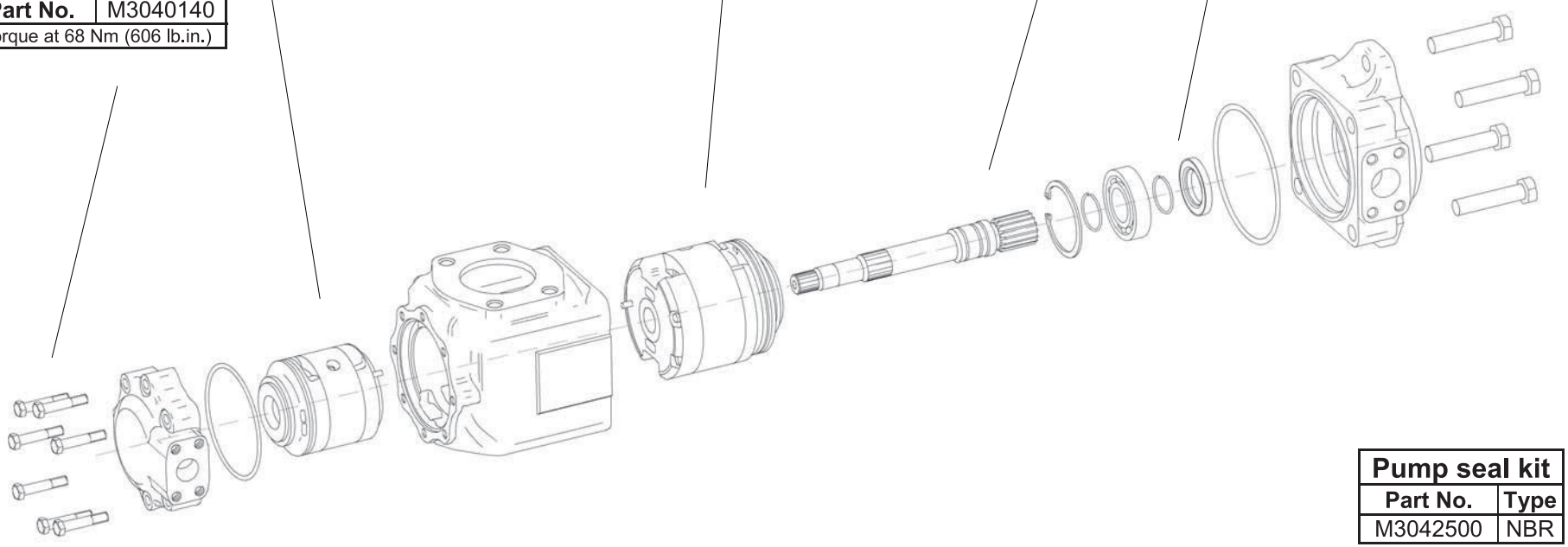
Rear cartridge			
Type	Model	Pump rotation	
		Right hand	Left hand
BD42	03	N0500230	N0500240
	05	N0500250	N0500260
	06	N0500270	N0500280
	08	N0500290	N0500300
	10	N0500310	N0500320
	12	N0500330	N0500340
	14	N0500350	N0500360
	17	N0500370	N0500380
	20	N0500390	N0500400
	22	N0500410	N0500420
	25	N0500430	N0500440
	28	N0500450	N0500460
	31	N0500470	N0500480

Front cartridge			
Type	Model	Pump rotation	
		Right hand	Left hand
BD42	14	N0500010	N0500020
	20	N0500050	N0500060
	24	N0500070	N0500080
	28	N0500090	N0500100
	31	N0500110	N0500120
	35	N0500130	N0500140
	38	N0500150	N0500160
	42	N0500170	N0500180
	45	N0500190	N0500200
	50	N0500210	N0500220

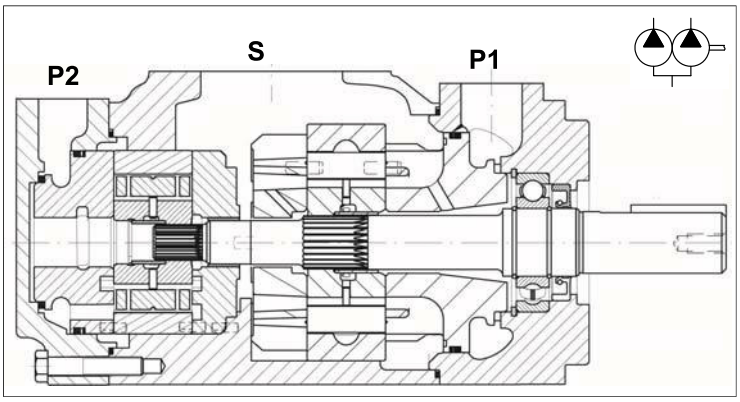
Shaft		Shaft seal	
Model	Part No.	Part No.	type
01	K6421000	M8040193	NBR
02	K6422000	M3050300	NBR
03	K6423000	M8040193	NBR

Screw	
Part No.	M3040130
Torque at 187 Nm (1668 lb.in.)	

Screw	
Part No.	M3040140
Torque at 68 Nm (606 lb.in.)	



Pump seal kit	
Part No.	Type
M3042500	NBR



General description

Fixed displacement vane pump, hydraulically balanced, with capacity determined by the type of cartridge used and the speed of rotation. The pump is available in several versions with rated capacity from 215 to 553 l/min (from 57 to 146 gpm) at 1500 rpm and pressure 0 bar.

Technical characteristics

Cartridge model		Geometric displacement		Rated capacity at 0 bar				Maximum pressure				Speed range
				1200 rpm		1500 rpm		intermittent		continuos		
		ml/rev.	(in^3/r)	l/min	(gpm)	l/min	(gpm)	bar	(psi)	bar	(psi)	rpm
P1	42	132,3	(8.07)	158,8	(42.00)	198,5	(52.51)	240	(3500)	210	(3000)	400 - 2200
	45	142,4	(8.69)	170,7	(45.15)	213,6	(56.51)	240	(3500)	210	(3000)	400 - 2200
	50	158,5	(9.67)	189,9	(50.25)	237,7	(62.88)	240	(3500)	210	(3000)	400 - 2200
	52	164,8	(10.06)	197,5	(52.25)	247,2	(65.40)	240	(3500)	210	(3000)	400 - 2200
	54	171,0	(10.43)	205,2	(54.29)	256,5	(67.86)	240	(3500)	210	(3000)	400 - 2200
	57	183,3	(11.18)	220,0	(58.19)	275,0	(72.74)	240	(3500)	210	(3000)	400 - 2200
	62	196,7	(12.00)	235,7	(62.36)	295,0	(78.04)	240	(3500)	210	(3000)	400 - 2200
	66	213,3	(13.02)	255,6	(67.62)	319,9	(84.63)	240	(3500)	210	(3000)	400 - 2200
	72	227,1	(13.86)	272,2	(72.00)	340,6	(90.11)	240	(3500)	210	(3000)	400 - 2200
	85	268,7	(16.4)	322,4	(85.30)	403,0	(106.63)	90	(1300)	75	(1100)	400 - 2000
P2	03	10,8	(0.66)	12,93	(3.42)	16,2	(4.29)	275	(4000)	240	(3500)	400 - 2800
	05	17,2	(1.05)	20,60	(5.45)	25,8	(6.83)	275	(4000)	240	(3500)	400 - 2800
	06	21,3	(1.30)	25,52	(6.75)	31,9	(8.44)	275	(4000)	240	(3500)	400 - 2800
	08	26,4	(1.61)	31,64	(8.37)	39,6	(10.48)	275	(4000)	240	(3500)	400 - 2800
	10	34,1	(2.08)	40,86	(10.81)	51,1	(13.52)	275	(4000)	240	(3500)	400 - 2800
	12	37,1	(2.26)	44,45	(11.76)	55,6	(14.71)	275	(4000)	240	(3500)	400 - 2800
	14	46,0	(2.81)	55,11	(14.58)	69,0	(18.25)	275	(4000)	240	(3500)	400 - 2800
	17	58,3	(3.56)	69,85	(18.48)	87,4	(23.12)	275	(4000)	240	(3500)	400 - 2800
	20	63,8	(3.89)	76,47	(20.23)	95,7	(25.32)	275	(4000)	240	(3500)	400 - 2800
	22	70,3	(4.29)	84,26	(22.29)	105,4	(27.88)	275	(4000)	240	(3500)	400 - 2800
	25	79,3	(4.84)	95,03	(25.14)	118,9	(31.46)	275	(4000)	240	(3500)	400 - 2500
	28	88,8	(5.42)	106,41	(28.15)	133,2	(35.24)	210	(3000)	160	(2300)	400 - 2500
	31	100,0	(6.10)	119,83	(31.70)	150,0	(39.68)	210	(3000)	160	(2300)	400 - 2500

Hydraulic fluids: antiwear petroleum base, synthetic fluid, water glycols and invert emulsions.

Viscosity range / Viscosity index: with antiwear petroleum base, from 10 to 2000 cSt. (10 to 108 cSt. recommended). Other fluids from 18 to 2000 c.St. (18 to 108 c.St. recomm.). Choose 30 c.St. for max lifetime. *Viscosity index*: 90° min.

Filtration: to maintain contamination level to ISO 18/14 or NAS 1638 class 8.
Filters: for the inlet, use strainer with mesh not less than 149 micron abs. (omit strainer with application requiring cold start or when using fire resistant fluids); for the return line - 25 micron abs. or better.

Water contamination level: max 0.10% for mineral oil. With other fluids, max 0.05%

Intermittent pressure: typically the working time permitted at such pressure is < 30% of the duty cycle. With duty cycles longer than 15 minutes, please contact the technical office of B&C.

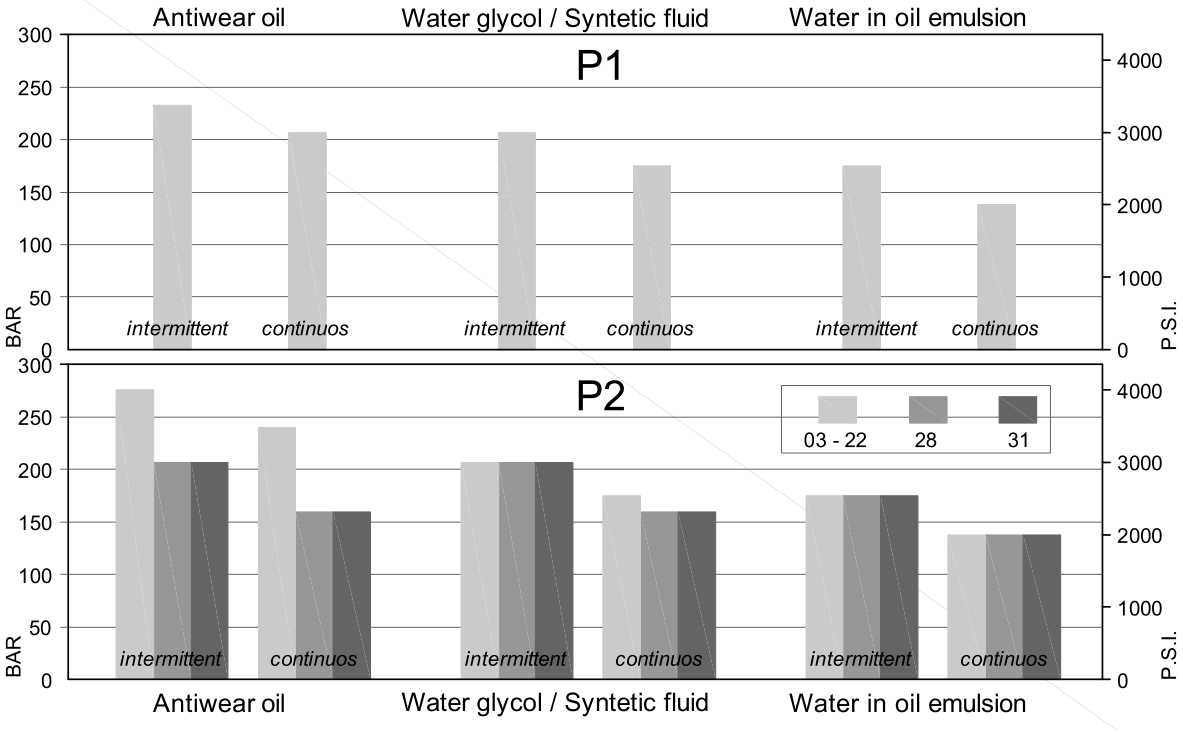
Minimum inlet pressure: (with mineral oil 10-65 c.St.): 0,8 bar abs. (3 psi abs.). In the biggest displacements of each series and with the highest speeds, is required an higher inlet pressure. Please consult the specific section for details. In case of tandem pump, supply the inlet port with the highest pressure requested among the pump stages.

Operating temperature: with “antiwear petroleum base” the permitted temperature is: from -18 to +100°C; with water glycol and “water in oil emulsion”: from +10 to +50°C; with syntetic fluid: from -18 to +70°C; with rapeseed and esters: from-20 to + 70°C. During cold start the pumps should be operated at low speed and pressure until fluid warms up to an acceptable viscosity for full power operation.

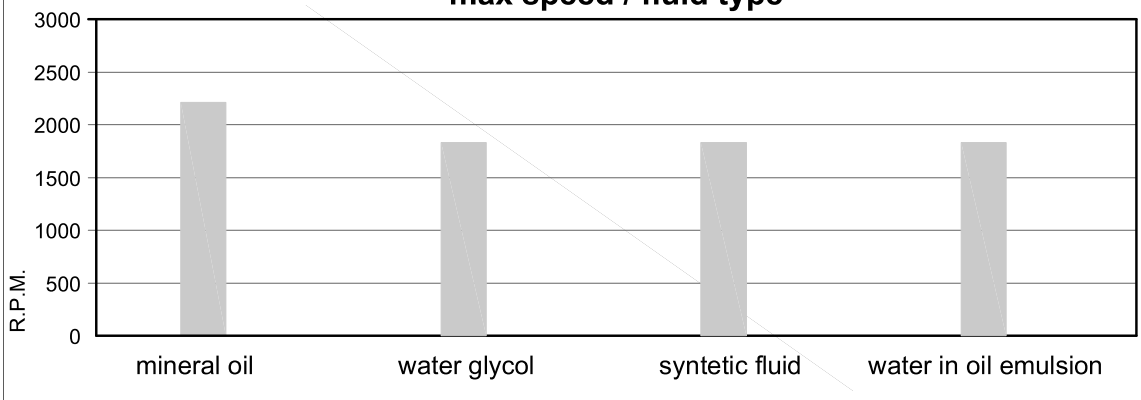
Drive: direct and coaxial by means of a flexible coupling. Low axial and radial loads allowed. Consult specific section for more detail.

Main operating data

max pressure / fluid type[a)]



max speed / fluid type[b)]



Note [a)] for the model 85 (268.7 cc) in P1: with antiwear oil, the max intermittent pressure is 90 bar and the max continuos pressure is 75 bar; with the other fluids the max pressure is 75 bar.
Note [b)] for the model 85 (268.7 cc): With mineral oil, the max rotation speed is 2000 rpm; with the other fluids refer the beside graph.

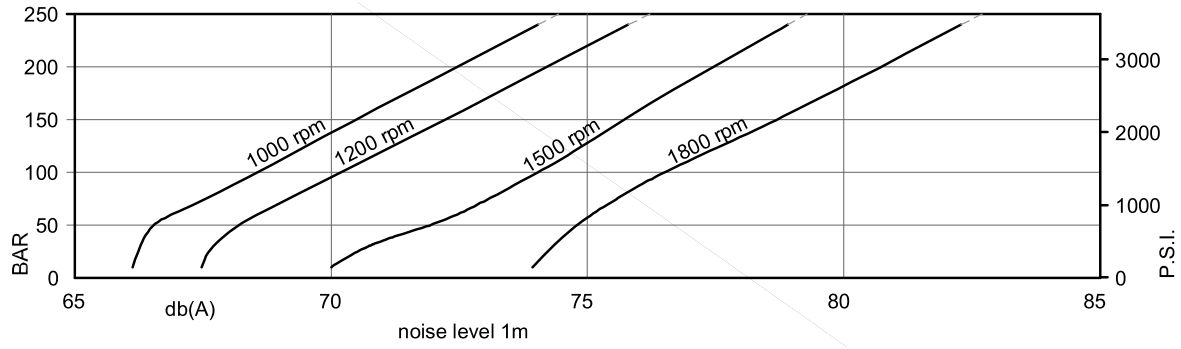
min. allowable inlet pressure / rotation speed (abs. bar)*

	Speed r.p.m.	42 - 45	50	52	54	57	62	66	72	85
P1	2200	1.00	1.00	1.00	1.00	1.00	1.00	1.09	1.05	-
	2100	0.90	0.90	0.90	0.90	0.95	0.95	1.00	1.00	-
	1800	0.80	0.80	0.80	0.80	0.85	0.85	0.95	0.85	1.00
	1500	0.80	0.80	0.80	0.80	0.80	0.80	0.85	0.85	0.90
	1200	0.80	0.80	0.80	0.80	0.80	0.80	0.85	0.85	0.90
P2	Velocità r.p.m.	da 03 a 10	12	14	17	20	22	25	28	31
	2800	1.00	1.00	1.00	1.03	1.03	1.05			
	2500	0.90	0.92	0.95	0.95	0.95	0.98	1.05	1.08	1.11
	2300	0.80	0.85	0.85	0.90	0.90	0.90	0.95	0.98	1.0
	2200	0.80	0.80	0.80	0.85	0.85	0.90	0.95	0.98	0.90
	2100	0.80	0.80	0.80	0.80	0.80	0.85	0.90	0.90	0.85
	1800	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
	1500	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
	1200	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80

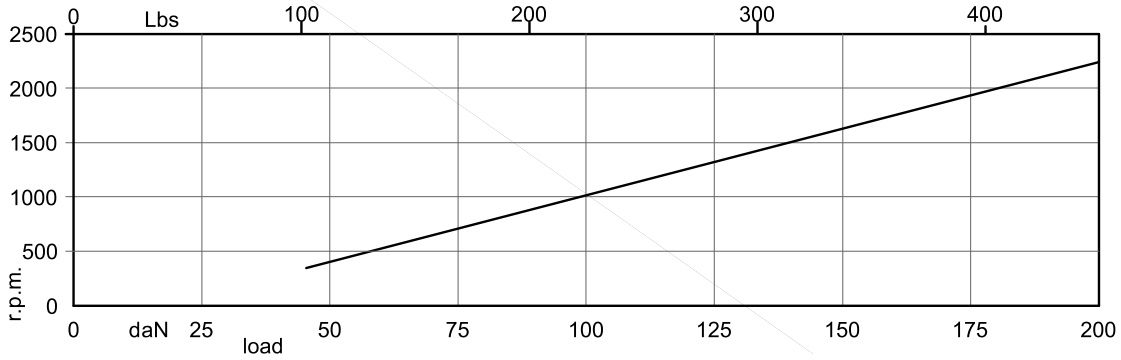
* measured inside the inlet flange; with petroleum base fluid (visc. 10 to 65 cSt.).
Multiply the abs. pressure by 1.25 when using water-glycol or “water in oil emulsion”, by 1.35 with synthetic fluids, and by 1.1 with ester or rapeseed base.

Main operating data

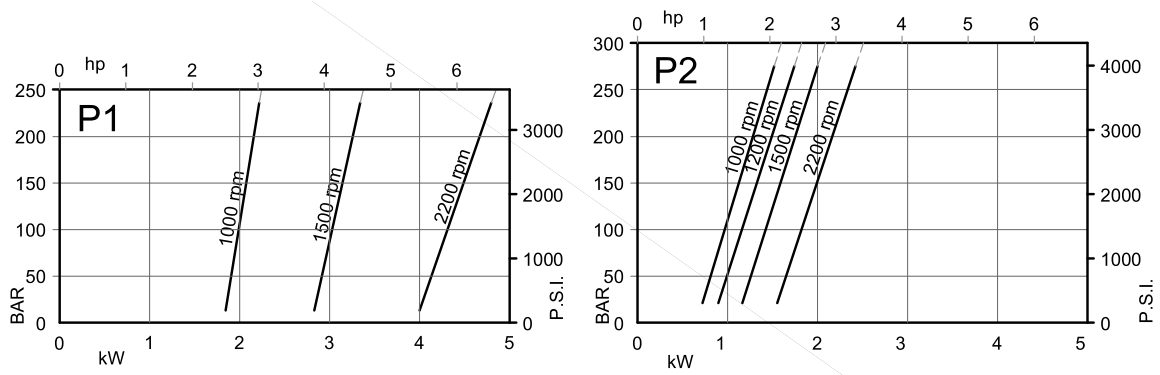
noise level (model 50 + 22, with fluid viscosity 32 c.St., inlet 0.9 bar abs.)



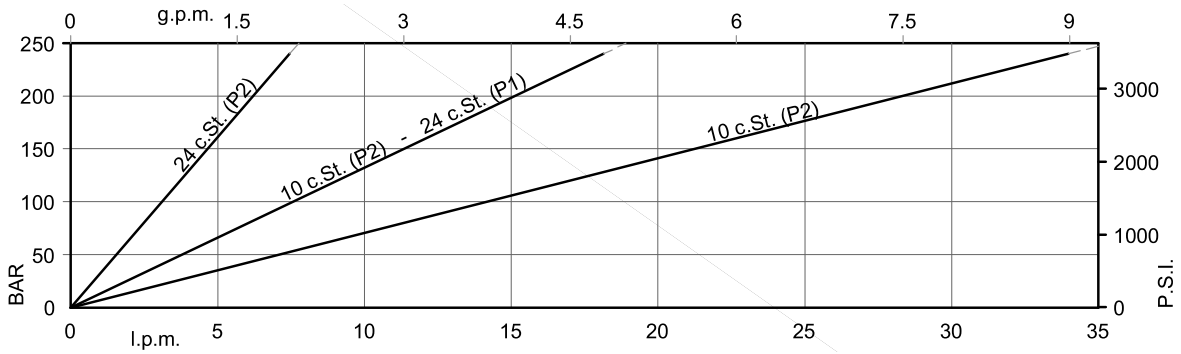
allowable radial load (max. permissibile axial load =200 daN)



power loss (typical)



Typical internal leakage *
(total leakage is the sum of each sector)



* If the internal leakage is more than 50% of the theoretical flow, do not operate the pump

Main operating data

P1 section

Typical: 24 c.St. (115 SUS)

Cartridge model	Geometric displacement		Speed rpm	140 bar		240 bar		Input power (kW)		
	ml/rev.	(in^3/r)		l/min	(gpm)	l/min	(gpm)	7 bar (100 psi)	140 bar (2000 psi)	240 bar (3500 psi)
42	132,3	(8.07)	1000	122,3	(32.35)	115,2	(30.48)	3.20	32.9	55.2
			1200	148,9	(39.39)	141,9	(37.54)	3.60	38.4	65.6
			1500	188,5	(49.90)	181,3	(47.96)	4.50	49.4	82.6
			1800	228,2	(60.37)	220,8	(58.42)	4.90	57.6	98.3
45	142,4	(8.69)	1000	132,4	(35.03)	125,3	(33.15)	3.40	35.30	59.20
			1200	161,0	(42.60)	154,0	(40.75)	3.70	40.24	69.43
			1500	203,6	(53.86)	196,5	(51.98)	4.60	52.90	88.70
			1800	246,3	(65.17)	239,3	(63.32)	5.05	60.36	104.05
50	158,5	(9.67)	1000	148,5	(39.29)	141,4	(37.41)	3.50	39.00	65.60
			1200	180,3	(47.70)	173,3	(45.85)	3.80	44.62	77.10
			1500	227,7	(60.24)	220,6	(58.36)	5.70	58.50	98.30
			1800	275,3	(72.83)	268,3	(70.98)	5.38	66.93	115.55
52	164,8	(10.06)	1000	154,8	(40.95)	147,7	(39.07)	3.60	40.50	68.20
			1200	187,9	(49.70)	180,9	(47.85)	3.95	46.33	80.10
			1500	237,2	(62.75)	230,1	(60.87)	5.80	60.80	102.10
			1800	286,6	(75.82)	279,6	(73.97)	5.51	69.50	120.05
54	171,0	(10.43)	1000	161,0	(42.59)	153,0	(40.77)	3.70	41.91	70.66
			1200	212,8	(56.30)	204,3	(50.04)	4.00	48.03	82.97
			1500	246,5	(65.21)	239,4	(63.30)	5.90	63.00	105.80
			1800	299,3	(79.18)	292,1	(77.28)	6.00	72.00	124.45
57	183,3	(11.18)	1000	173,2	(45.82)	164,5	(43.52)	3.82	44.93	70.59
			1200	210.8	(55.77)	202,4	(53.55)	4.17	51.49	88.94
			1500	265,0	(70.11)	257,9	(68.23)	6.10	67.30	113.20
			1800	320,8	(84.87)	313,1	(82.83)	6.20	77.15	133.31
62	196,7	(12.00)	1000	186,7	(49.39)	179,6	(47.51)	4.00	47.90	80.90
			1200	226,1	(59.81)	219,1	(57.96)	4.30	55.01	95.28
			1500	285,0	(75.40)	277,9	(73.52)	6.30	71.90	121.30
			1800	343,9	(90.99)	336,9	(89.14)	6.40	82.51	142.83
66	213,3	(13.02)	1000	203,3	(53.78)	196,2	(51.90)	4.20	51.80	87.60
			1200	246,0	(65.07)	239,0	(63.22)	4.55	59.52	103.18
			1500	309,9	(81.98)	302,8	(80.11)	6.70	77.70	131.20
			1800	373,8	(98.89)	366,8	(97.04)	6.50	89.29	154.68
72	227,1	(13.86)	1000	217,1	(57.43)	210,0	(55.56)	4.30	55.00	93.10
			1200	262,5	(69.45)	255,5	(67.60)	4.80	63.27	109.75
			1500	330,6	(87.46)	323,5	(85.58)	6.90	82.60	139.50
			1800	398,6	(105.45)	391,6	(103.60)	6.78	94.92	164.54
85	268,7	(16.39)	1000	258,0*	(68.25)*	-	-	4.82	41.2*	-
			1200	310,6*	(82.17)*	-	-	5.79	49.6*	-
			1500	392,0*	(103.70)*	-	-	7.23	62.5*	-
			1800	476.8*	(126.13)*	-	-	8.73	76.5*	-

* Referred to 90 bar (1300 p.s.i.).

Main operating data

P2 section

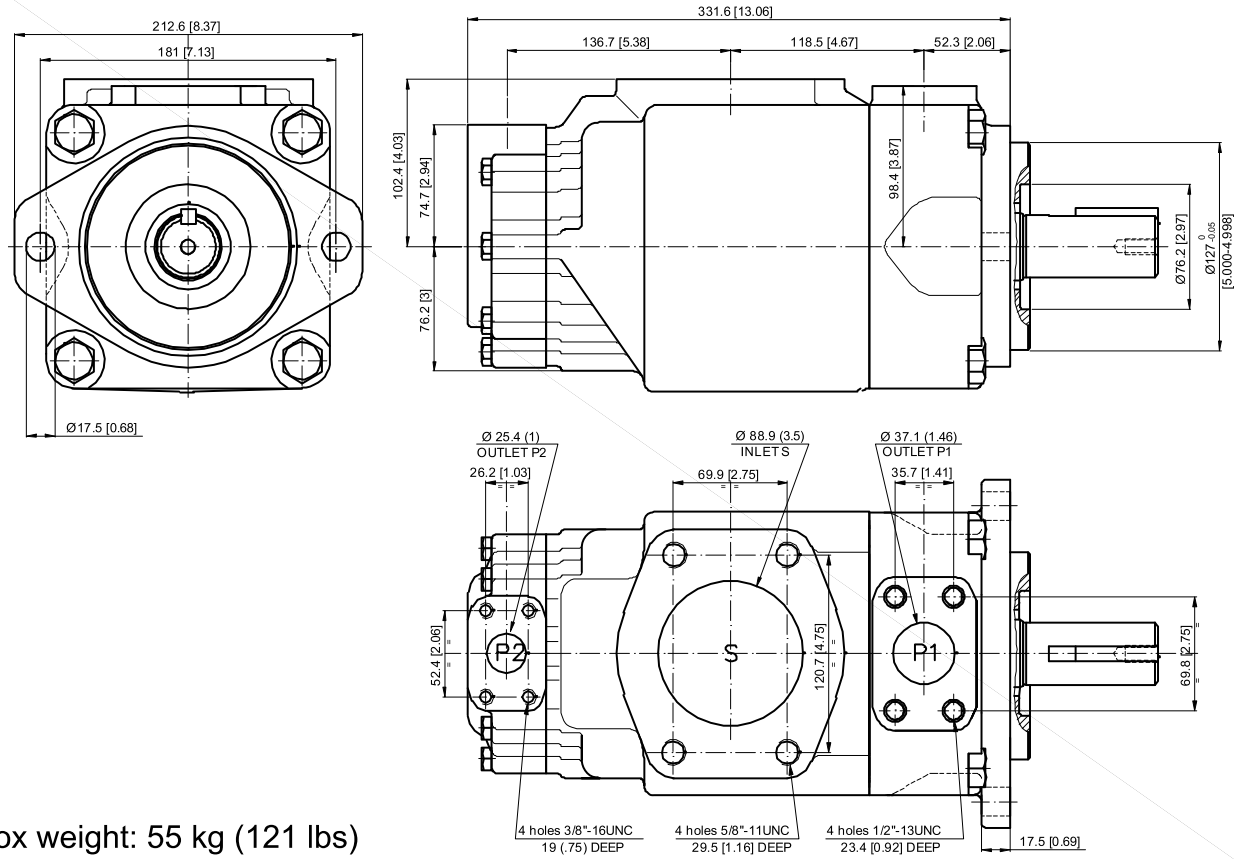
Typical: 24 c.St. (115 SUS)

Cartridge model	Geometric displacement		Speed rpm	140 bar		240 bar		Input power (kW)		
	ml/rev.	(in^3/r)		l/min	(gpm)	l/min	(gpm)	7 bar (100 psi)	140 bar (2000 psi)	240 bar (3500 psi)
03	10,8	(0.66)	1000	-	-	-	-	1.00	-	-
			1200	-	-	-	-	1.05	-	-
			1500	10,7	(2.84)	-	-	1.30	5.30	-
			1800	13,6	(3.61)	-	-	1.55	8.45	-
05	17,2	(1.05)	1000	11,7	(3.09)	-	-	1.10	5.10	-
			1200	15,1	(3.99)	-	-	1.14	8.17	-
			1500	20,3	(5.37)	15,8	(4.18)	1.40	7.50	12.2
			1800	25,1	(6.65)	21,0	(5.56)	1.68	12.0	14.4
06	21,3	(1.30)	1000	15,80	(4.18)	11,30	(2.99)	1.10	6.00	10.00
			1200	19,73	(5.22)	15,61	(4.13)	1.19	7.13	11.86
			1500	26,50	(7.01)	22,00	(5.82)	1.50	8.90	14.70
			1800	32,51	(8.60)	28,39	(7.51)	1.76	10.50	17.33
08	26,4	(1.61)	1000	20,90	(5.53)	16,40	(4.34)	1.20	7.20	12.10
			1200	25,86	(6.84)	21,74	(5.75)	1.26	8.51	14.29
			1500	34,10	(9.02)	29,60	(7.83)	1.60	10.70	17.70
			1800	41,66	(11.02)	37,54	(9.93)	1.87	12.58	20.98
10	34,1	(2.08)	1000	28,60	(7.57)	24,10	(6.38)	1.30	8.90	15.10
			1200	35,08	(9.28)	30,96	(8.19)	1.37	10.61	17.96
			1500	45,70	(12.09)	41,20	(10.90)	1.70	13.40	22.30
			1800	55,53	(14.69)	51,41	(13.60)	2.03	15.72	26.47
12	37,1	(2.26)	1000	31,60	(8.36)	27,10	(7.17)	1.30	9.60	16.30
			1200	38,67	(10.23)	34,55	(9.14)	1.41	11.42	19.38
			1500	50,20	(13.28)	45,70	(12.09)	1.70	14.40	24.10
			1800	60,90	(16.11)	56,78	(15.02)	2.09	16.95	28.62
14	46,0	(2.81)	1000	40,50	(10.71)	36,00	(9.52)	1.40	11.70	19.90
			1200	49,33	(13.05)	45,21	(11.96)	1.53	13.85	23.62
			1500	63,50	(16.80)	59,00	(15.61)	1.90	17.60	29.50
			1800	76,92	(20.35)	72,80	(19.26)	2.27	20.58	34.97
17	58,3	(3.56)	1000	52,80	(13.97)	48,30	(12.78)	1.60	14.50	24.80
			1200	64,07	(16.95)	59,95	(15.86)	1.70	17.19	29.47
			1500	82,00	(21.69)	77,50	(20.50)	2.10	21.90	36.90
			1800	99,04	(26.20)	94,92	(25.11)	2.52	25.60	43.76
20	63,8	(3.89)	1000	58,30	(15.42)	53,80	(14.23)	1.60	15.80	27.00
			1200	70,69	(18.70)	66,57	(17.61)	1.77	18.68	32.09
			1500	90,20	(23.86)	85,70	(22.67)	2.20	23.80	40.20
			1800	108,90	(28.81)	103,65	(27.42)	2.63	27.84	47.68
22	70,3	(4.29)	1000	64,80	(17.14)	60,30	(15.95)	1.70	17.30	29.60
			1200	78,47	(20.76)	74,35	(19.67)	1.86	20.46	35.18
			1500	100,00	(26.46)	95,50	(25.26)	2.30	26.10	44.10
			1800	120,58	(31.90)	116,46	(30.81)	2.76	30.49	52.32
25	79,3	(4.84)	1000	73,80	(19.52)	69,30	(18.33)	1.80	19.30	33.20
			1200	89,25	(23.61)	85,13	(22.52)	1.99	22.90	39.47
			1500	113,50	(30.03)	109,00	(28.84)	2.50	29.20	49.50
			1800	136,76	(36.18)	132,64	(35.09)	2.95	34.16	58.75
28	88,8	(5.41)	1000	83,30	(22.04)	80,10 [1)]	(21.19) [1)]	1.90	21.90	32.50 [1)]
			1200	100,62	(26.61)	97,75 [1)]	(25.86) [1)]	2.11	25.49	37.77 [1)]
			1500	127,70	(33.78)	124,50 [1)]	(32.94) [1)]	2.80	32.70	48.50 [1)]
			1800	153,85	(40.70)	150,97 [1)]	(39.94) [1)]	3.14	38.04	56.42 [1)]
31	100,0	(6.10)	1000	94,50	(25.00)	91,30 [1)]	(24.15) [1)]	2.00	24.40	36.40 [1)]
			1200	114,04	(30.17)	111,17 [1)]	(29.41) [1)]	2.26	28.53	42.34 [1)]
			1500	144,50	(38.23)	141,30 [1)]	(37.38) [1)]	2.80	36.50	54.40 [1)]
			1800	173,99	(46.03)	171,12 [1)]	(45.27) [1)]	3.37	42.61	63.28 [1)]

-) Not to use because the internal leakage exceeding 50% of the theoretical flow
1) Referred to 210 bar (3000p.s.i.)

Installation dimensions

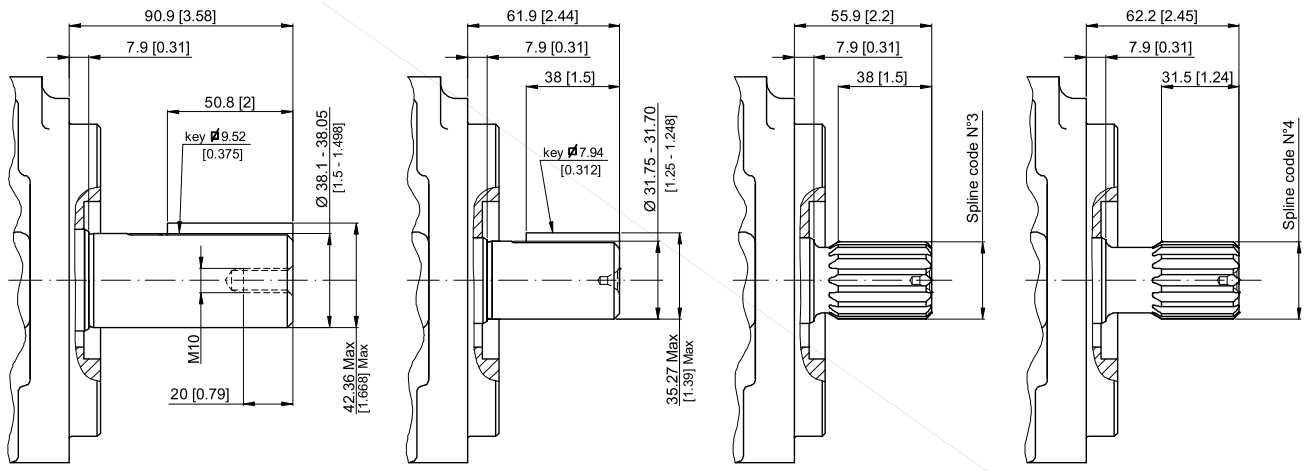
mm (inches)



Approx weight: 55 kg (121 lbs)

Shaft options

mm (inches)



Shaft No.1 Shaft No.2 Shaft No.3 Shaft No.4

Calculation of the max permitted torque:
(avoid to exceed)

Shaft No.	(ml/rev) x bar P1+P2	(in3/rev) x psi P1+P2
1	72306	64044
2	34590	30638
3	61200	54207
4	76376	67582

Spline code	**3**	**4**
Designation	Sae C	No Sae
Pressure angle	30°	30°
No. of teeth	14	17
Pitch	12/24 d.p.	12/24 d.p.
Spline type	flat root side fit	flat root side fit
Class	1- J498 b	1- J498 b

Model code breakdown

BD 52 G ** ** * * ** *

Pump series

Pump type

Design

Cartridge model
(P1 section)
42 45 50 54 57 52 62 66 72 85
(P2 section)
03 05 06 08 10 12 14 17 20 22 25 28 31

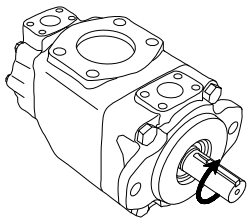
Shaft end options

1 = keyed (Sae CC)
2 = keyed (No Sae)
3 = Splined (Sae C)
4 = Splined (no Sae)

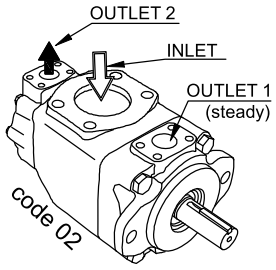
Rotation
(viewed from shaft-end)
R = Right hand rotation CW
L = Left hand rotation CCW

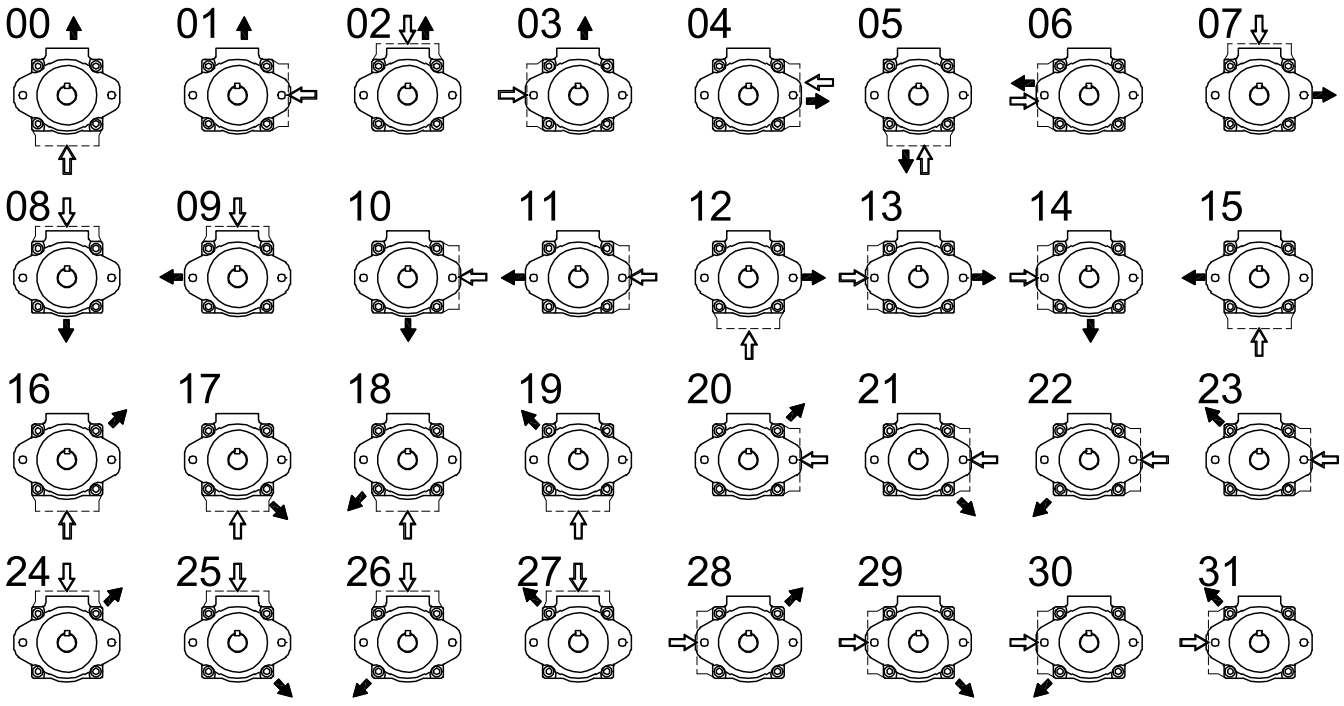
Port orientations
(Look at the table below)
00 = Standard

Seals
1 = NBR



Port orientations





Id. codes of pump components

Rear cartridge			
Type	Model	Pump rotation	
		Right hand	Left hand
BD52	03	N0500230	N0500240
	05	N0500250	N0500260
	06	N0500270	N0500280
	08	N0500290	N0500300
	10	N0500310	N0500320
	12	N0500330	N0500340
	14	N0500350	N0500360
	17	N0500370	N0500380
	20	N0500390	N0500400
	22	N0500410	N0500420
	25	N0500430	N0500440
	28	N0500450	N0500460
	31	N0500470	N0500480

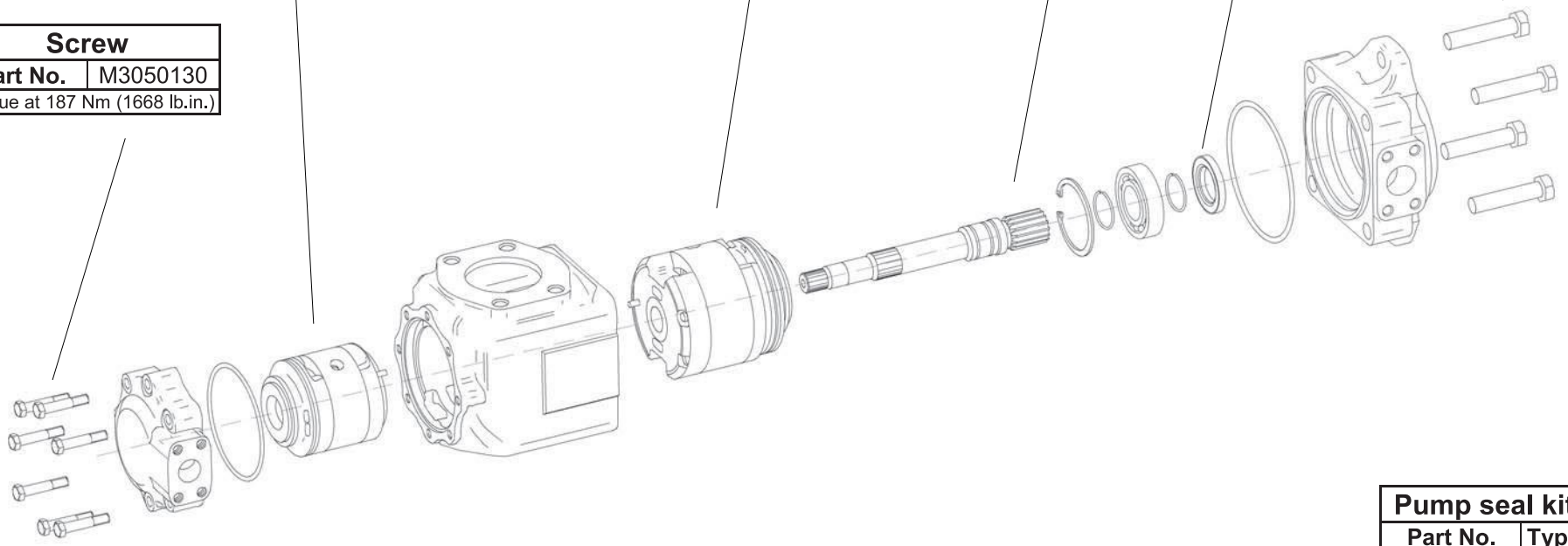
Front cartridge			
Type	Model	Pump rotation	
		Right hand	Left hand
BD52	42	N0600010	N0600020
	45	N0600030	N0600040
	50	N0600050	N0600060
	52	N0600070	N0600080
	54	N0600090	N0600100
	57	N0600110	N0600120
	62	N0600130	N0600140
	66	N0600150	N0600160
	72	N0600170	N0600180
	85	N0600190	N0600200

Shaft	
Model	Part No.
01	K6511000
02	K6512000
03	K6513000
04	K6514000

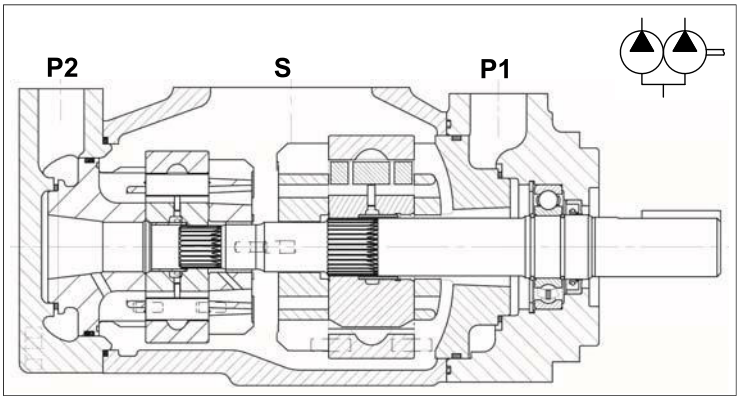
Screw	
Part No.	M3040140
Torque at 68 Nm (606 lb.in.)	

Shaft seal	
Part No.	type
M3050300	NBR

Screw	
Part No.	M3050130
Torque at 187 Nm (1668 lb.in.)	



Pump seal kit	
Part No.	Type
M3052500	NBR



General description

Fixed displacement vane pump, hydraulically balanced, with capacity determined by the type of cartridge used and the speed of rotation. The pump is available in several versions with rated capacity from 270 to 640 l/min (from 71 to 169 gpm) at 1500 rpm and pressure 0 bar.

Technical characteristics

Cartridge model		Geometric displacement		Rated capacity at 0 bar				Maximum pressure				Speed range
				1200 rpm		1500 rpm		intermittent		continuos		
		ml/rev.	(in^3/r)	l/min	(gpm)	l/min	(gpm)	bar	(psi)	bar	(psi)	rpm
P1	**42**	132,3	(8.07)	158,8	(42.00)	198,5	(52.51)	240	(3500)	210	(3000)	400 - 2200
	45	142,4	(8.69)	170,7	(45.15)	213,6	(56.51)	240	(3500)	210	(3000)	400 - 2200
	50	158,5	(9.67)	189,9	(50.25)	237,7	(62.88)	240	(3500)	210	(3000)	400 - 2200
	52	164,8	(10.06)	197,5	(52.25)	247,2	(65.40)	240	(3500)	210	(3000)	400 - 2200
	54	171,0	(10.43)	205,2	(54.29)	256,5	(67.86)	240	(3500)	210	(3000)	400 - 2200
	57	183,3	(11.18)	220,0	(58.19)	275,0	(72.74)	240	(3500)	210	(3000)	400 - 2200
	62	196,7	(12.00)	235,7	(62.36)	295,0	(78.04)	240	(3500)	210	(3000)	400 - 2200
	66	213,3	(13.02)	255,6	(67.62)	319,9	(84.63)	240	(3500)	210	(3000)	400 - 2200
	72	227,1	(13.86)	272,2	(72.00)	340,6	(90.11)	240	(3500)	210	(3000)	400 - 2200
	85	268,7	(16.4)	322,4	(85.30)	403,0	(106.63)	90	(1300)	75	(1100)	400 - 2000
P2	**14**	47,6	(2.90)	57,04	(15.09)	71,4	(18.89)	240	(3500)	210	(3000)	400 - 2500
	20	66,0	(4.03)	79,08	(20.92)	99,0	(26.19)	240	(3500)	210	(3000)	400 - 2500
	24	79,5	(4.85)	95,26	(25.20)	119,3	(31.56)	240	(3500)	210	(3000)	400 - 2500
	28	89,7	(5.47)	107,50	(28.44)	134,5	(35.58)	240	(3500)	210	(3000)	400 - 2500
	31	98,3	(6.00)	117,82	(31.17)	147,4	(38.99)	240	(3500)	210	(3000)	400 - 2500
	35	111,0	(6.77)	133,02	(35.19)	166,5	(44.05)	240	(3500)	210	(3000)	400 - 2500
	38	120,3	(7.34)	144,17	(38.14)	180,4	(47.72)	240	(3500)	210	(3000)	400 - 2500
	42	136,0	(8.30)	162,99	(43.12)	204,0	(53.97)	240	(3500)	210	(3000)	400 - 2200
	45	145,7	(8.89)	174,60	(46.19)	218,5	(57.80)	240	(3500)	210	(3000)	400 - 2200
	50	158,0	(9.64)	189,34	(50.09)	237,0	(62.70)	210	(3000)	160	(2300)	400 - 2200

Hydraulic fluids: antiwear petroleum base, synthetic fluid, water glycols and invert emulsions.

Viscosity range / Viscosity index: with antiwear petroleum base, from 10 to 2000 cSt. (10 to 108 cSt. recommended). Other fluids from 18 to 2000 c.St. (18 to 108 c.St. recomm.). Choose 30 c.St. for max lifetime. *Viscosity index*: 90° min.

Filtration: to maintain contamination level to ISO 18/14 or NAS 1638 class 8. Filters: for the inlet, use strainer with mesh not less than 149 micron abs. (omit strainer with application requiring cold start or when using fire resistant fluids); for the return line - 25 micron abs. or better.

Water contamination level: max 0.10% for mineral oil. With other fluids, max 0.05%

Intermittent pressure: typically the working time permitted at such pressure is < 30% of the duty cycle. With duty cycles longer than 15 minutes, please contact the technical office of B&C.

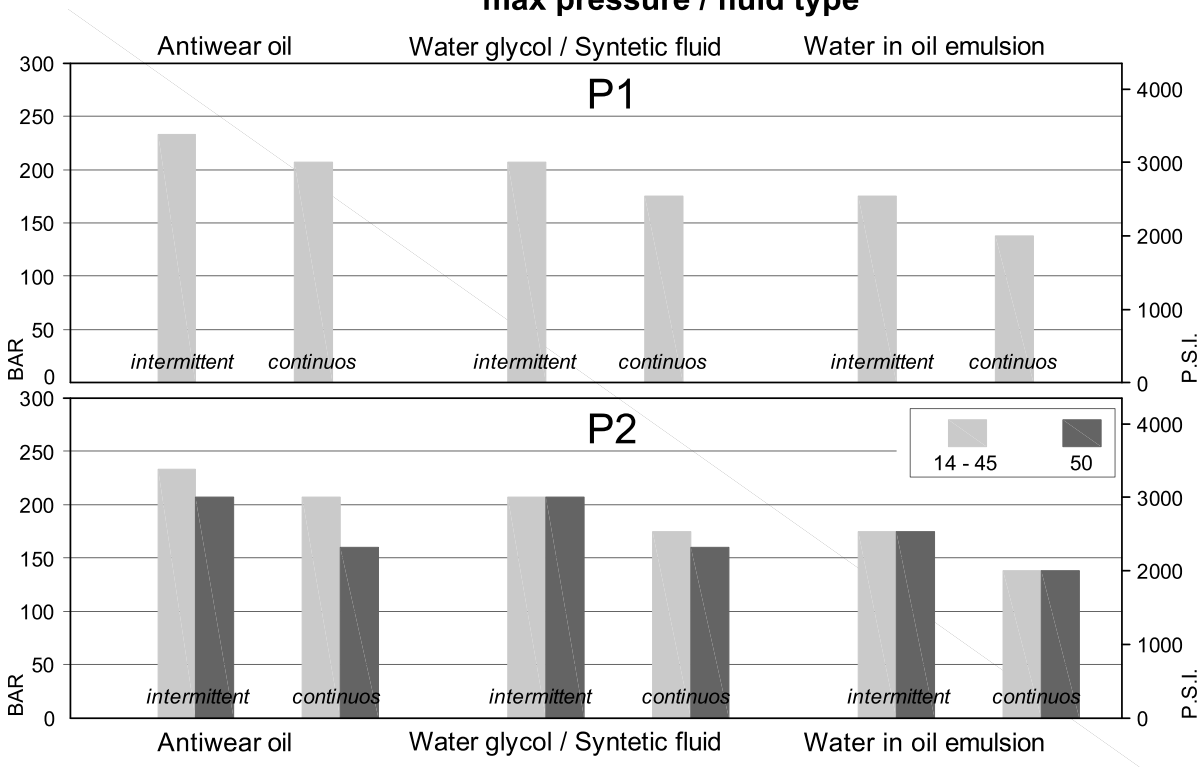
Minimum inlet pressure: (with mineral oil 10-65 c.St.): 0,8 bar abs. (3 psi abs.). In the biggest displacements of each series and with the highest speeds, is required an higher inlet pressure. Please consult the specific section for details. In case of tandem pump, supply the inlet port with the highest pressure requested among the pump stages.

Operating temperature: with “antiwear petroleum base” the permitted temperature is: from -18 to +100° C; with water glycol and “water in oil emulsion”: from +10 to +50°C; with syntetic fluid: from -18 to +70°C; with rapeseed and esters: from-20 to + 70°C. During cold start the pumps should be operated at low speed and pressure until fluid warms up to an acceptable viscosity for full power operation.

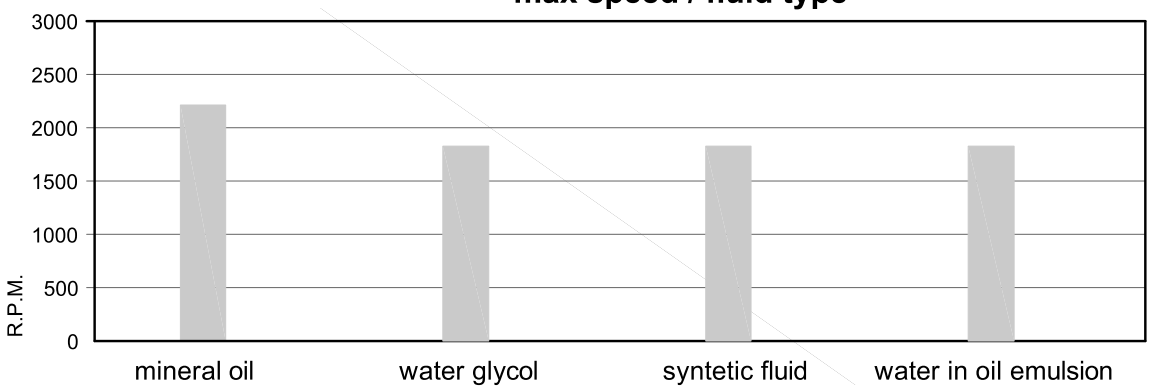
Drive: direct and coaxial by means of a flexible coupling. Low axial and radial loads allowed. Consult specific section for more detail.

Main operating data

max pressure / fluid type[a)]



max speed / fluid type[b)]



Note [a)] for the model 85 (268.7 cc) in P1: with antiwear oil, the max intermittent pressure is 90 bar and the max continuos pressure is 75 bar; with the other fluids the max pressure is 75 bar.

Note [b)] for the model 85 (268.7 cc): With mineral oil, the max rotation speed is 2000 rpm; with the other fluids refer the beside graph.

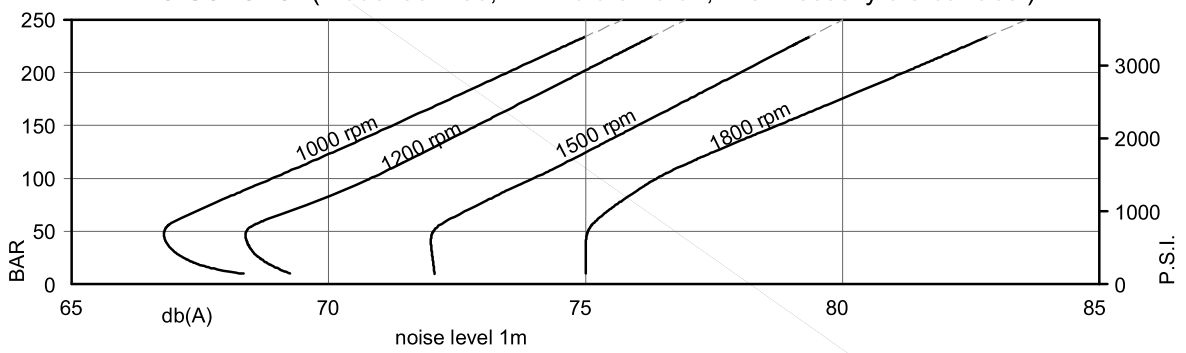
min. allowable inlet pressure / rotation speed (abs. bar)*

	Speed r.p.m.	42 - 45	50	52	54	57	62	66	72	85
P1	2200	1.00	1.00	1.00	1.00	1.00	1.00	1.09	1.05	-
	2100	0.90	0.90	0.90	0.90	0.95	0.95	1.00	1.00	-
	1800	0.80	0.80	0.80	0.80	0.85	0.85	0.95	0.85	1.00
	1500	0.80	0.80	0.80	0.80	0.80	0.80	0.85	0.85	0.90
	1200	0.80	0.80	0.80	0.80	0.80	0.80	0.85	0.85	0.90
	Speed r.p.m.	**from 14 to 20**	**24**	**28**	**31**	**35**	**38**	**42**	**45**	**50**
P2	2500	1.00	1.10	1.18	1.23	1.29	1.29	-	-	-
	2300	0.95	0.95	1.00	1.00	1.02	1.05	1.08	-	-
	2200	0.88	0.88	0.92	0.95	0.98	1.00	1.02	1.05	1.09
	2100	0.80	0.82	0.85	0.90	0.92	0.95	0.95	0.98	1.02
	1800	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.85	0.85
	1500	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
	1200	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80

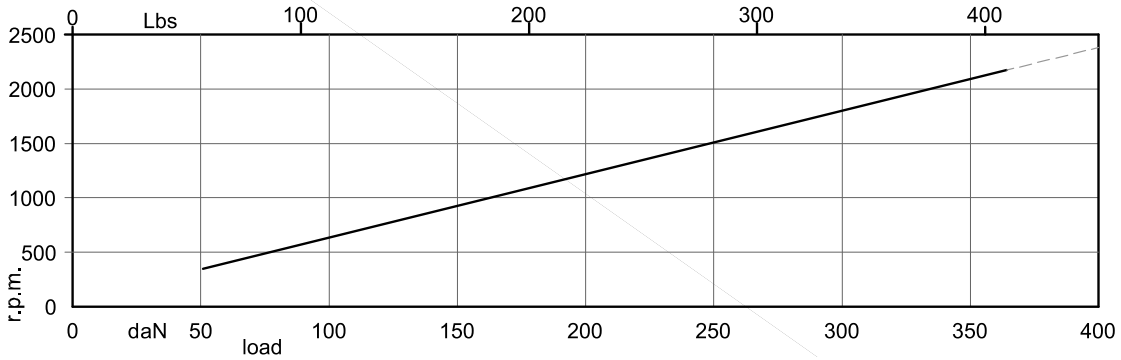
* measured inside the inlet flange; with petroleum base fluid (visc. 10 to 65 cSt.).
Multiply the abs. pressure by 1.25 when using water-glycol or “water in oil emulsion”, by 1.35 with synthetic fluids, and by 1.1 with ester or rapeseed base.

Main operating data

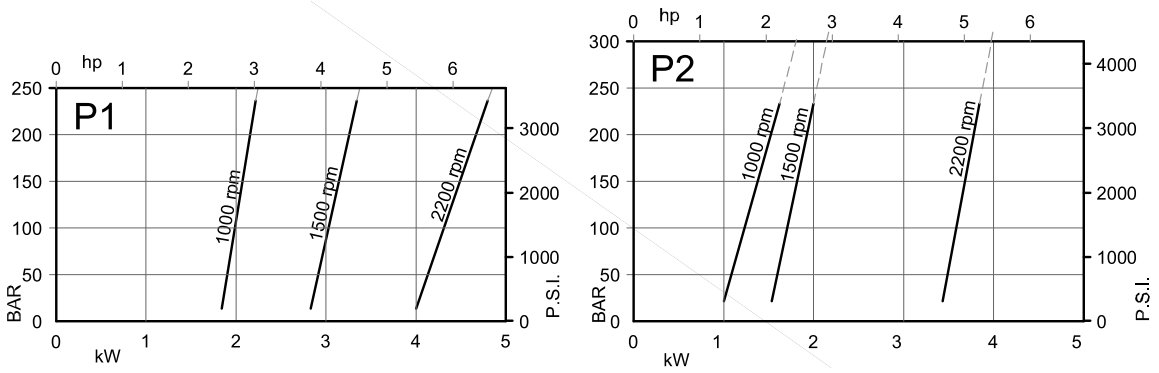
noise level (model 50 + 38, with fluid 32 c.St., inlet viscosity 0.9 bar abs.)



allowable radial load (max. permissibile axial load =200 daN)

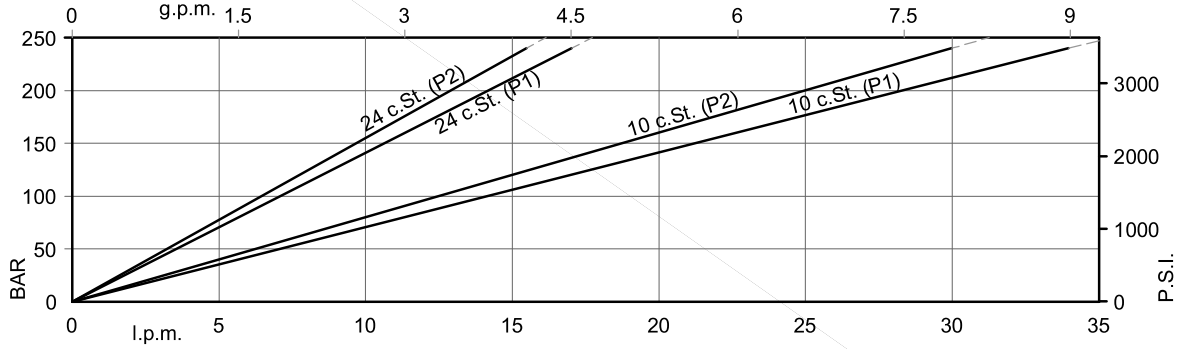


power loss (typical)



Typical internal leakage *

(total leakage is the sum of each sector)



* If the internal leakage is more than 50% of the theoretical flow, do not operate the pump

Main operating data

P1 section

Typical: 24 c.St. (115 SUS)

Cartridge model	Geometric displacement		Speed rpm	140 bar		240 bar		Input power (kW)		
	ml/rev.	(in^3/r)		l/min	(gpm)	l/min	(gpm)	7 bar (100 psi)	140 bar (2000 psi)	240 bar (3500 psi)
42	132,3	(8.07)	1000	122,3	(32.35)	115,2	(30.48)	3.20	32.9	55.2
			1200	148,9	(39.39)	141,9	(37.54)	3.60	38.4	65.6
			1500	188,5	(49.90)	181,3	(47.96)	4.50	49.4	82.6
			1800	228,2	(60.37)	220,8	(58.42)	4.90	57.6	98.3
45	142,4	(8.69)	1000	132,4	(35.03)	125,3	(33.15)	3.40	35.30	59.20
			1200	161,0	(42.60)	154,0	(40.75)	3.70	40.24	69.43
			1500	203,6	(53.86)	196,5	(51.98)	4.60	52.90	88.70
			1800	246,3	(65.17)	239,3	(63.32)	5.05	60.36	104.05
50	158,5	(9.67)	1000	148,5	(39.29)	141,4	(37.41)	3.50	39.00	65.60
			1200	180,3	(47.70)	173,3	(45.85)	3.80	44.62	77.10
			1500	227,7	(60.24)	220,6	(58.36)	5.70	58.50	98.30
			1800	275,3	(72.83)	268,3	(70.98)	5.38	66.93	115.55
52	164,8	(10.06)	1000	154,8	(40.95)	147,7	(39.07)	3.60	40.50	68.20
			1200	187,9	(49.70)	180,9	(47.85)	3.95	46.33	80.10
			1500	237,2	(62.75)	230,1	(60.87)	5.80	60.80	102.10
			1800	286,6	(75.82)	279,6	(73.97)	5.51	69.50	120.05
54	171,0	(10.43)	1000	161,0	(42.59)	153,0	(40.77)	3.70	41.91	70.66
			1200	212,8	(56.30)	204,3	(50.04)	4.00	48.03	82.97
			1500	246,5	(65.21)	239,4	(63.30)	5.90	63.00	105.80
			1800	299,3	(79.18)	292,1	(77.28)	6.00	72.00	124.45
57	183,3	(11.18)	1000	173,2	(45.82)	164,5	(43.52)	3.82	44.93	70.59
			1200	210.8	(55.77)	202,4	(53.55)	4.17	51.49	88.94
			1500	265,0	(70.11)	257,9	(68.23)	6.10	67.30	113.20
			1800	320,8	(84.87)	313,1	(82.83)	6.20	77.15	133.31
62	196,7	(12.00)	1000	186,7	(49.39)	179,6	(47.51)	4.00	47.90	80.90
			1200	226,1	(59.81)	219,1	(57.96)	4.30	55.01	95.28
			1500	285,0	(75.40)	277,9	(73.52)	6.30	71.90	121.30
			1800	343,9	(90.99)	336,9	(89.14)	6.40	82.51	142.83
66	213,3	(13.02)	1000	203,3	(53.78)	196,2	(51.90)	4.20	51.80	87.60
			1200	246,0	(65.07)	239,0	(63.22)	4.55	59.52	103.18
			1500	309,9	(81.98)	302,8	(80.11)	6.70	77.70	131.20
			1800	373,8	(98.89)	366,8	(97.04)	6.50	89.29	154.68
72	227,1	(13.86)	1000	217,1	(57.43)	210,0	(55.56)	4.30	55.00	93.10
			1200	262,5	(69.45)	255,5	(67.60)	4.80	63.27	109.75
			1500	330,6	(87.46)	323,5	(85.58)	6.90	82.60	139.50
			1800	398,6	(105.45)	391,6	(103.60)	6.78	94.92	164.54
85	268,7	(16.39)	1000	258,0*	(68.25)*	-	-	4.82	41.2*	-
			1200	310,6*	(82.17)*	-	-	5.79	49.6*	-
			1500	392,0*	(103.70)*	-	-	7.23	62.5*	-
			1800	476.8*	(126.13)*	-	-	8.73	76.5*	-

* Referred to 90 bar (1300 p.s.i.).

Main operating data

P2 section

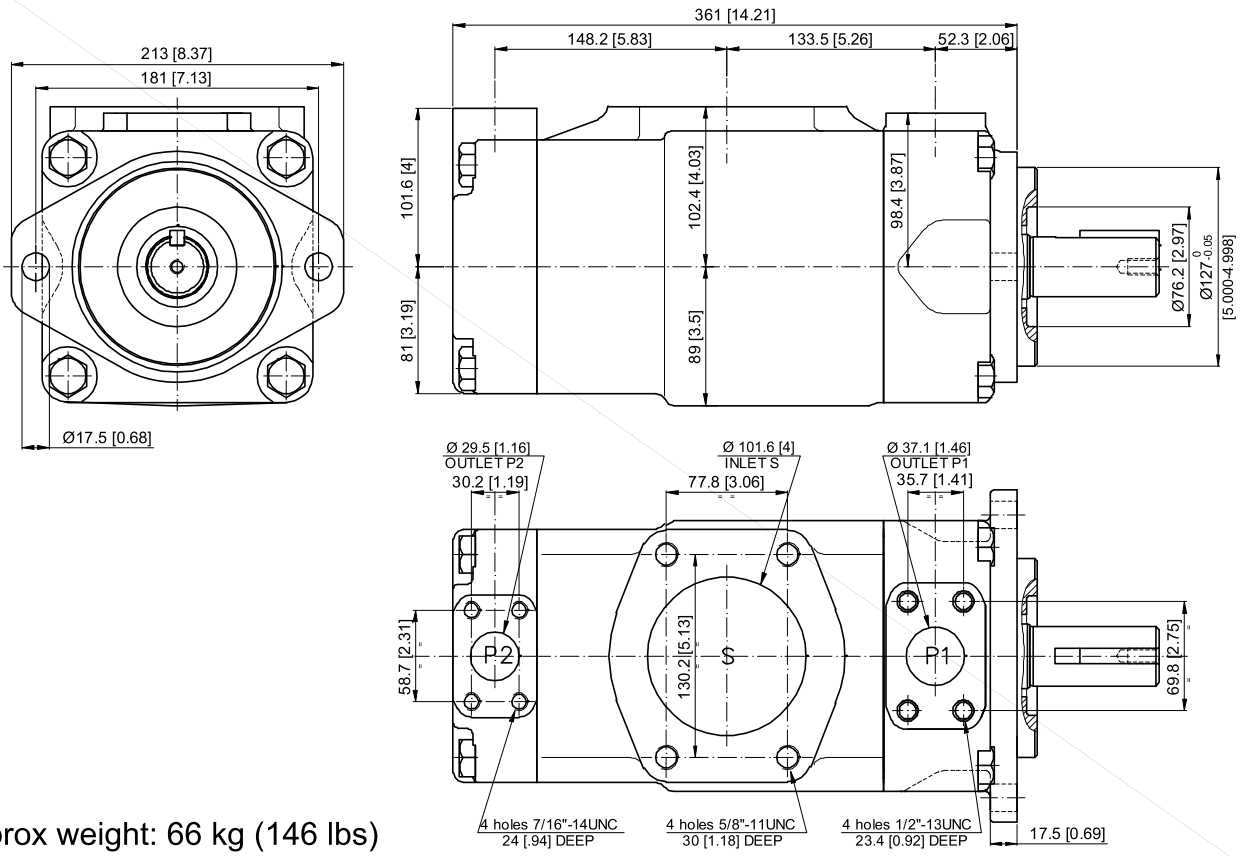
Typical: 24 c.St. (115 SUS)

Cartridge model	Geometric displacement		Speed rpm	140 bar		240 bar		Input power (kW)		
	ml/rev.	(in^3/r)		l/min	(gpm)	l/min	(gpm)	7 bar (100 psi)	140 bar (2000 psi)	240 bar (3500 psi)
14	47,6	(2.90)	1000	38,3	(10.13)	32,1	(8.49)	1.50	12.50	20.70
			1200	48,8	(12.91)	42,6	(11.27)	1.80	14.43	24.44
			1500	62,1	(16.43)	55,9	(14.79)	2.30	18.50	30.60
			1800	77,3	(20.46)	71,1	(18.82)	2.96	21.57	36.31
20	66,0	(4.03)	1000	56,7	(15.00)	50,5	(13.36)	1.70	16.80	28.00
			1200	70,8	(18.74)	64,6	(17.10)	2.05	19.44	33.20
			1500	89,7	(23.73)	83,5	(22.09)	2.80	24.90	41.70
			1800	110,4	(29.21)	104,2	(27.57)	3.33	29.09	49.47
24	79,5	(4.85)	1000	70,2	(18.57)	64,0	(16.93)	1.90	19.90	33.40
			1200	87,02	(23.02)	80,8	(21.38)	2.23	23.11	39.63
			1500	110,0	(29.10)	103,8	(27.46)	3.00	29.60	49.80
			1800	134,7	(35.63)	128,5	(33.99)	3.61	34.61	59.12
28	89,7	(5.47)	1000	80,4	(21.27)	74,2	(19.63)	2.00	22.30	37.50
			1200	99,3	(26.26)	93,1	(24.62)	2.37	25.89	44.49
			1500	125,2	(33.12)	119,0	(31.48)	3.20	33.20	55.90
			1800	153,0	(40.48)	146,1	(38.64)	3.82	38.77	66.41
31	98,3	(6.00)	1000	89,0	(23.54)	82,8	(21.90)	2.10	24.30	40.90
			1200	109,6	(28.99)	103,4	(27.35)	2.49	28.23	48.59
			1500	138,1	(36.53)	131,9	(34.89)	3.30	36.20	61.00
			1800	168,5	(44.57)	162,3	(42.93)	4.00	42.28	72.55
35	111,0	(6.77)	1000	101,7	(26.90)	95,5	(25.26)	2.30	27.30	46.00
			1200	124,8	(33.01)	118,6	(31.37)	2.66	31.68	54.64
			1500	157,2	(41.59)	151,0	(39.95)	3.50	40.70	68.70
			1800	191,3	(50.61)	185,1	(48.97)	4.25	47.47	81.63
38	120,3	(7.34)	1000	111,0	(29.37)	104,8	(27.72)	2.40	29.40	49.80
			1200	135,9	(35.96)	129,7	(34.32)	2.79	36.42	59.07
			1500	171,1	(45.26)	164,9	(43.62)	3.70	43.90	74.30
			1800	208,0	(55.03)	201,8	(53.39)	4.45	51.27	88.28
42	136,0	(8.30)	1000	126,7	(33.52)	120,5	(31.88)	2.60	33.10	56.00
			1200	154,7	(40.94)	148,6	(39.30)	3.00	38.49	66.56
			1500	194,7	(51.51)	188,5	(49.87)	4.00	49.40	83.70
			1800	236,3	(62.50)	230,1	(60.86)	4.76	57.68	99.50
45	145,7	(8.89)	1000	136,4	(36.08)	130,2	(34.44)	2.70	35.30	59.90
			1200	166,4	(44.01)	160,2	(42.37)	3.14	41.14	71.18
			1500	209,2	(55.34)	203,0	(53.70)	4.10	52.80	89.50
			1800	253,7	(67.11)	247,5	(65.47)	4.96	61.64	106.43
50	158,0	(9.64)	1000	148,7	(39.34)	145,0 [1)]	(38.36) [1)]	2.80	38.20	56.80 [1)]
			1200	181,1	(47.91)	176,6 [1)]	(46.73) [1)]	3.30	44.48	66.19 [1)]
			1500	227,7	(30.24)	224,0 [1)]	(59.26) [1)]	4.40	57.00	85.00 [1)]
			1800	275,8	(72.96)	271,3 [1)]	(71.78) [1)]	5.21	66.67	99.02 [1)]

1) referred to 210 bar (3000p.s.i.)

Installation dimensions

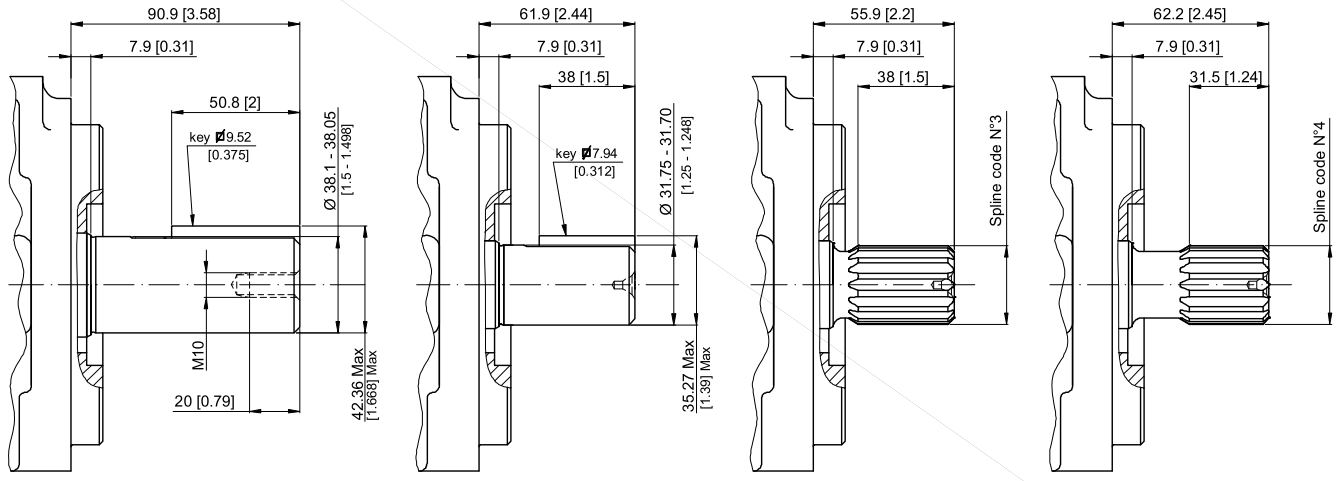
mm [inches]



Approx weight: 66 kg (146 lbs)

Shaft options

mm [inches]



Shaft No.1 | Shaft No.2 | Shaft No.3 | Shaft No.4

Calculation of the max permitted torque:
(avoid to exceed)

Shaft No.	(ml/rev) x bar P1+P2	(in3/rev) x psi P1+P2
1	72306	64044
2	34590	30638
3	61200	54207
4	76376	67582

Spline code	**3**	**4**
Designation	Sae C	No Sae
Pressure angle	30°	30°
No. of teeth	14	17
Pitch	12/24 d.p.	12/24 d.p.
Spline type	flat root side fit	flat root side fit
Class	1- J498 b	1- J498 b

Model code breakdown

BD 54 G ** ** * * ** *

Pump series

Pump type

Design

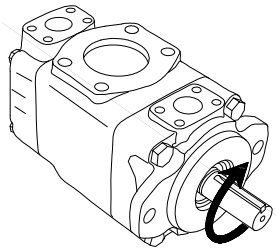
Cartridge model
(P1 section)
42 45 50 52 54 57 62 66 72 85
(P2 section)
14 20 24 28 31 35 38 42 45 50

Shaft end options
1 = keyed (Sae CC)
2 = keyed (No Sae)
3 = Splined (Sae C)
4 = Splined (no Sae)

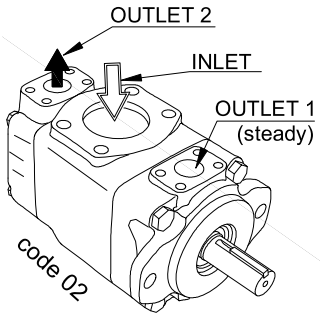
Rotation
(viewed from shaft-end)
R = Right hand rotation CW
L = Left hand rotation CCW

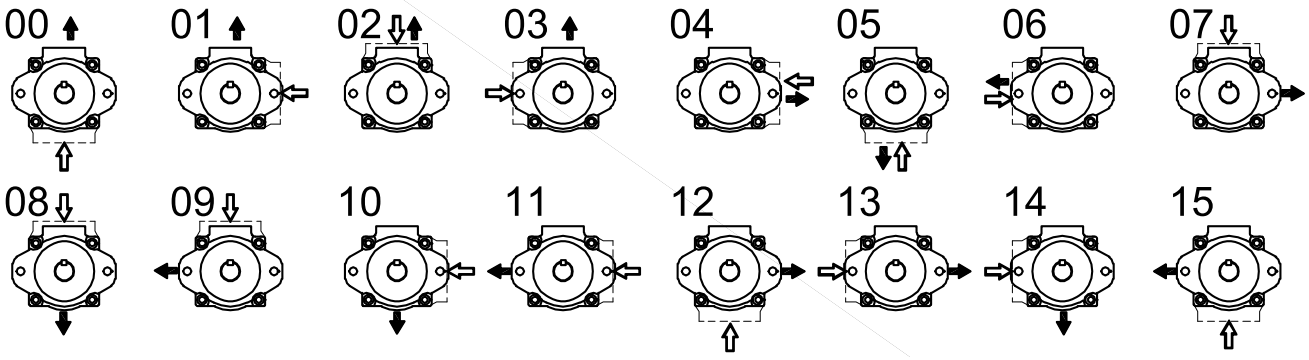
Port orientations
(Look at the table below)
00 = Standard

Seals
1 = NBR


R

Port orientations





Id. codes of pump components

Rear cartridge			
Type	Model	Pump rotation	
		Right hand	Left hand
BD54	14	N0600210	N0600220
	20	N0600250	N0600260
	24	N0600270	N0600280
	28	N0600290	N0600300
	31	N0600310	N0600320
	35	N0600330	N0600340
	38	N0600350	N0600360
	42	N0600370	N0600380
	45	N0600390	N0600400
	50	N0600410	N0600420

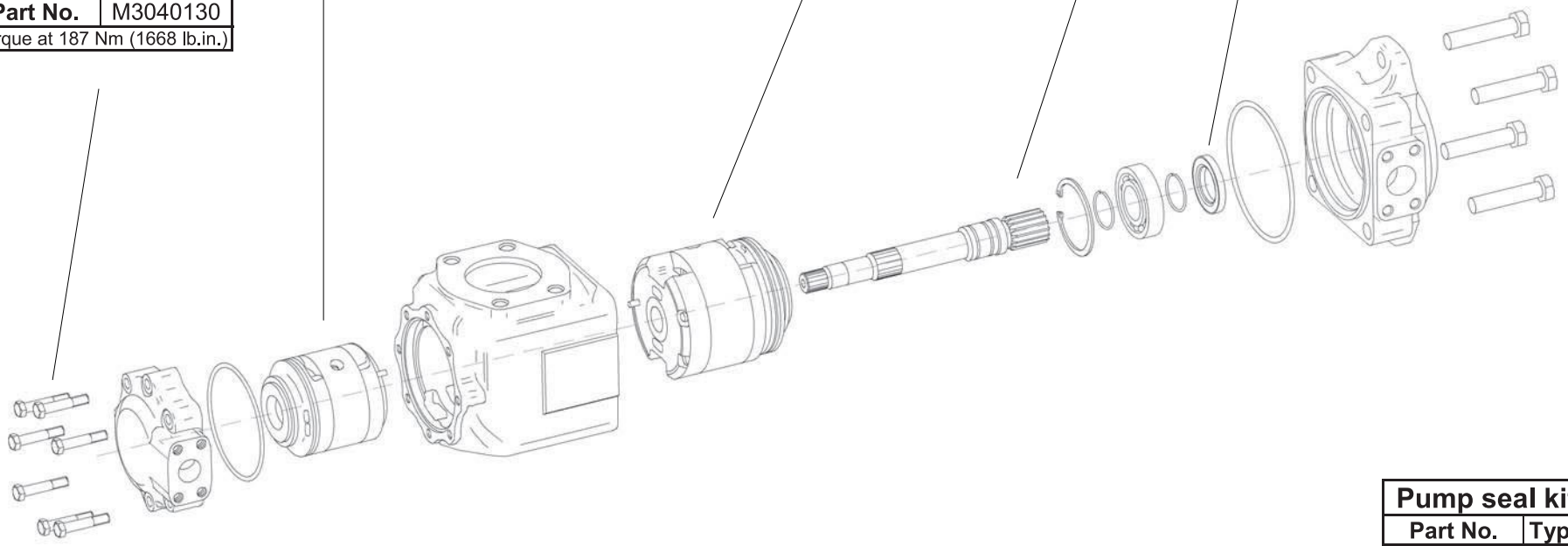
Front cartridge			
Type	Model	Pump rotation	
		Right hand	Left hand
BD54	42	N0600010	N0600020
	45	N0600030	N0600040
	50	N0600050	N0600060
	52	N0600070	N0600080
	54	N0600090	N0600100
	57	N0600110	N0600120
	62	N0600130	N0600140
	66	N0600150	N0600160
	72	N0600170	N0600180
	85	N0600190	N0600200

Shaft	
Model	Part No.
01	K6521000
02	K6522000
03	K6523000
04	K6524000

Screw	
Part No.	M3050130
Torque at 187 Nm (1668 lb.in.)	

Shaft seal	
Part No.	type
M3050300	NBR

Screw	
Part No.	M3040130
Torque at 187 Nm (1668 lb.in.)	



Pump seal kit	
Part No.	Type
M3054500	NBR

Operating instructions

Maximum speed: the maximum speeds given in this catalogue are valid for an atmospheric pressure of 1 bar (14.7psi), fluid viscosity between 10 to 65 cSt., and ambient temperature in the range of +30°C to +50°C. Sustained excess speed causes a rapid deterioration of the internal components reducing the lifetime of the cartridge.

Minimum speed: In general, the min. speed for all pumps is 400 rpm. However, it is possible to operate at lower speeds with certain pump configurations and with appropriate operating temperatures.

Inlet pressure: the inlet pressure, measured at the inlet port, should remain within the prescribed limits. Note that pressures lower than minimum limit cause cavitation and pressures above the maximum limit cause abnormal loads on the shaft and the bearings. In both cases this causes a significant reduction in the lifetime of the cartridge.

Maximum outlet pressure: the maximum continuos outlet pressure is different for each type of fluid used as can be seen from the corresponding diagrams. If fluid viscosity, pump speed and contamination level are respected, an intermittent pressure of +15% is permissible for a maximum time of 80% of the duty cycle lasting 15 minutes. For longer duty cycles, please consult our technical office.

Mounting and drive connections: consider the following indications when preparing the installation drawings:
Pump with keyed shaft: the pump with keyed shaft has to be coupled axially and by means of a flexible coupling to the drive; the clearance between the keyed shaft and the corresponding sleeve coupling has to be between 0.004 and 0.030 mm; avoid axial and radial loads on the shaft; the mounting flange has to be perpendicular to the drive shaft, with a maximum error of 0.18 mm every 100 mm.
Pump with splined shaft: the female spline must be hardened (30 to 45 R.C.) and should be free to float to find its own center; the clearance between splines has to be between 0.013 and 0.051 mm on the pitch diameter; the max angular misalignment between the two spline axes must less than ± 0.05 per 25 mm radius. The coupling spline must be lubricated with grease or similar lubricant.

Hydraulic circuit: always install a pressure relief valve on the supply line to prevent the pressure from exceeding the allowed maximum. Normally, it is set in accordance with the weakest component in the system. (In the case where it is the pump, set the valve to a pressure 15% higher than the maximum pressure rating of the pump.) Inlet line tubing must have the sections that permits a fluid velocity between 0.5 and 1.9 m/sec. It is advisable to keep the tube connecting the pump to the reservoir as short possible. Particular care has to be taken with the inlet line which must be hermetically sealed to avoid entraining air into the circuit; this varies the characteristics of the hydraulic fluid causing the operating parts to become damaged.

Filtration: the inlet line filter must have a flow rate capacity that is higher than that of the pump at its maximum operating speed. The use of a filter by-pass is recommended for cold starts and should avoid the filter become clogged. Proper maintenance of the filter elements are essential for the correct operation of the entire system. In normal conditions replace the filter element after the first 50 hours of operation. Subsequently, replace it at least every 500 hours. Regarding the filter on the return line, apply the same general conditions as for the inlet line and it should be positioned in an accessible location for ease of maintenance.

Tank: if possible, the reservoir should be positioned above the pump. Otherwise, ensure that the minimum level of the fluid contained in it is higher than the pump inlet line opening. It is important to avoid draining the inlet line with the pump at standstill. The opening of the return line into the reservoir must remain below the minimum level of the fluid in the reservoir. It must not be positioned too close to the opening of the inlet line to avoid the possibility of any air bubbles passing into the inlet line. Baffles inside the reservoir may be useful in avoiding the problem. Rapid temperature changes can cause condensation on the underside of the lid of the reservoir with the formation of droplets of water that can fall into the oil. To avoid this problem it is recommended that the lid should have small vents so that the air space in the reservoir is ventilated. The vents have to be screened, though, to prevent the entry of dust or the sudden expulsion of fluid.

Start-up: use the following procedure when the pump is started-up for the first time:completely fill the pump and the inlet line with fluid; start the motor at lower speed for approximately one second a number of times at regular intervals of approximately 2 or 3 seconds until the noise level reduces, thereby confirming that it has been primed; with a manometer check to ensure that the outlet pressure increases slightly; once the pump has been primed, maintain low pressure levels activating all parts of the circuit a number of times until air bubbles disappear completely from the return line to the reservoir. This procedure should be carefully applied because any residual air inside the pump can quickly cause the rotor to seize. After long stops (>1 week) the start up procedure must be repeated.

Cold starting: when starting the pump, especially with low ambient temperatures, operate with moderate speed and pressure until the average temperature in the entire circuit is within the given limits. Make sure the fluid viscosity is within the limits, by consulting the specific pump model in this catalogue.

Vertical installation: The pump cannot work in vertical position (vertical shaft), unless the hydraulic circuit is equipped by devices to fill the pump completely before each starting.

NOTE

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