

Internal Gear Pumps

Series QX



motion and progress

1	General	5
	1.1 Product description	5
	1.2 Advantages	5
2	Technical data	5
	2.1 General (deviating values according manufacturer's specification)	5
	2.2 Main characteristics for pressure range 1	6
	2.3 Main characteristics for pressure range 2	7
	2.4 Main characteristics for pressure range 3	7
3	Performance graphs	8
	3.1 Noise level (Lp)	8
	3.2 Efficiency (h)	8
	3.3 Operation with variable-speed drives	9
4	Single pumps	10
	4.1 Dimensions	10
	4.2 Pressure range 1	11
	4.3 Pressure range 2	11
	4.4 Pressure range 3	12
	4.5 Ordering code for single pumps	12
	4.6 Standard configuration	12
	4.7 Special features	12
5	Double pumps	13
	5.1 Selection table	13
	5.2 Dimensions	14
	5.3 Ordering code for double pumps	23
6	Triple pumps	24
	6.1 Selection table	24
	6.2 Ordering code for triple pumps	25
7	Low-flow capability pumps	26
	7.1 Generals	26
	7.2 Technical data	26
	7.3 Main characteristics	26
	7.4 Volumetric efficiency (h)	27
	7.5 Single pumps	27
	7.6 QX24 pumps combined with other QX-pumps	28

8	Fluid cleanliness	30
9	Note	30
10	Accessories	30
	10.1 Bolt-on valves - SAE 3000 pattern	30
	10.2 Pipe flanges - high pressure type	31
	10.3 Low pressure type	31

2.2 Main characteristics for pressure range 1

Effective displacement	Flow rate ¹⁾	Maximum speed	Type	Mineral oil to	HFC to	Torque ³⁾	Power requirement ⁴⁾
				DIN 51524	VDMA 24317		
				Continuous/Max. interm. press. ²⁾			
cm ³ /rev	l/min	rpm		bar	bar	Nm	KW
10,3	14,9	3600	QX21-010	160/210	130/180	26	4,0
12,6	18,3	3600	QX21-012	125/160	100/135	25	3,8
15,9	23,0	3600	QX21-016	100/125	80/100	25	3,9
20,0	29,0	3000	QX31-020	160/210	130/180	51	7,7
25,3	36,7	3000	QX31-025	125/160	100/135	50	7,7
31,2	45,2	3000	QX31-032	100/125	80/100	50	7,5
40,7	59,0	3000	QX41-040	160/210	130/180	104	15,7
50,3	72,9	2600	QX41-050	125/160	100/135	100	15,2
64,7	93,8	2300	QX41-063	100/125	80/100	103	15,6
78,6	114	2300	QX51-080	160/210	130/180	200	30,4
101,1	146	2100	QX51-100	125/160	100/135	201	30,5
127,3	184	1800 ⁵⁾	QX51-125	100/125	80/100	203	30,8
160,5	232	1800 ⁶⁾	QX61-160	160/210	130/180	409	62,0
202,1	293	1800 ⁶⁾	QX61-200	125/160	100/135	402	61,0
249,7	362	1800 ⁶⁾	QX61-250	100/125	80/100	397	60,4
326,0	472	1750 ⁶⁾	QX81-315	160/210	130/180	830	126,0
402,6	583	1750 ⁶⁾	QX81-400	125/160	100/135	801	121,6
498,5	722	1500 ⁶⁾	QX81-500	100/125	80/100	793	120,5

2.2.1 Suction arrangements for pump types QX61 and QX81

Minimum inlet pressure is 0.95 bar absolute with viscosity
10... 100 mm²/s (other values, contact Bucher Hydraulics)

	Speed 1500 rpm Suction height		Speed 1800 rpm Suction height	
	up to 150 mm	over 150 mm	up to 150 mm	over 150 mm
QX61-160	I	I	I	II
QX61-200	I	I	I	II
QX61-250	I	II	II	II
QX81-315	I	II	II	II
QX81-400	II	II	II	-
QX81-500	II	II	-	-

I = standard pump with one suction port

II = model with two suction ports

All pump types coded II can be used without the second suction port up to 1200 rpm

2.3 Main characteristics for pressure range 2

Effective displacement	Flow rate ¹⁾	Maximum speed	Type	Mineral oil to DIN 51524 Continuous/Max.	HFC to VDMA 24317 interm. press. ²⁾	Torque ³⁾	Power requirement ⁴⁾
cm ³ /rev	l/min	rpm		bar	bar	Nm	KW
5,1	7,4	3600	QX22-005			17	2,6
6,3	9,1	3600	QX22-006	210 / 250	180 / 210	21	3,2
8,0	11,5	3600	QX22-008			27	4,0
10,0	14,5	3400	QX32-010			34	5,1
12,6	18,3	3400	QX32-012	210 / 250	180 / 210	42	6,4
15,6	22,6	3400	QX32-016			52	7,9
20,4	29,5	3200	QX42-020			68	10,4
25,1	36,4	3200	QX42-025	210 / 250	180 / 210	84	12,7
32,4	46,8	3200	QX42-032			108	16,5
39,3	56,9	2800	QX52-040			132	19,9
50,6	73,2	2800	QX52-050	210 / 250	180 / 210	170	25,7
63,7	92,1	2800	QX52-063			213	32,3
80,2	116	2500 ⁷⁾	QX62-080			268	40,7
101,0	146	2300 ⁷⁾	QX62-100	210 / 250	180 / 210	338	51,2
124,8	181	2000 ⁷⁾	QX62-125			417	63,4
163,0	236	1800 ⁷⁾	QX82-160			544	82,7
201,3	291	1750 ⁷⁾	QX82-200	210 / 250	180 / 210	672	102,1
249,2	361	1500 ⁷⁾	QX82-250			833	126,5

2.4 Main characteristics for pressure range 3

Effective displacement	Flow rate ¹⁾	Maximum speed	Type	Mineral oil to DIN 51524 Continuous/Max.	HFC to VDMA 24317 interm. press. ²⁾	Torque ³⁾	Power requirement ⁴⁾
cm ³ /rev	l/min	rpm		bar	bar	Nm	KW
5,1	7,4		QX23-005			26	4,0
6,3	9,1	3600	QX23-006	320 / 400	280 / 350	32	4,9
8,0	11,5		QX23-008			41	6,2
10,0	14,5		QX33-010			51	7,7
12,6	18,3	3400	QX33-012	320 / 400	280 / 350	64	9,7
15,6	22,6		QX33-016			80	12,1
20,4	29,5		QX43-020			104	15,8
25,1	36,4	3200	QX43-025	320 / 400	280 / 350	128	19,4
32,4	46,8		QX43-032			165	25,0
39,3	56,9		QX53-040			200	30,4
50,6	73,2	3000	QX53-050	320 / 400	280 / 350	258	39,1
63,7	92,1		QX53-063			321	49,3
80,2	116	2500 ⁷⁾	QX63-080			409	62,0
101,0	146	2300 ⁷⁾	QX63-100	320 / 400	280 / 350	514	78,1
124,8	181	2000 ⁷⁾	QX63-125			636	96,5
163,0	236	1800 ⁷⁾	QX83-160			830	126,0
201,3	291	1750 ⁷⁾	QX83-200	320 / 400	280 / 350	1025	155,7
249,2	361	1500 ⁷⁾	QX83-250			1270	192,7

The main characteristics are valid for hydraulic oils as well as fire-resistant and environmentally-friendly fluids with a viscosity of 20 to 50 mm²/s

1) at speed n = 1450 rpm

2) maximum intermittent pressure for max. 20 sec. and not more than 10% of the duty cycle

3) theoretical value at the max. permitted continuous pressure for mineral oil

4) theoretical value at the max. permitted continuous pressures for mineral oil at n = 1450 rpm

5) for speeds higher than 1500 rpm, the min. permissible inlet pressure is 0.95 bar absolute, und bei HFC Anwendung 2. Sauganschluss erforderlich

6) max. speed only possible with second suction port, see section 2.2.1

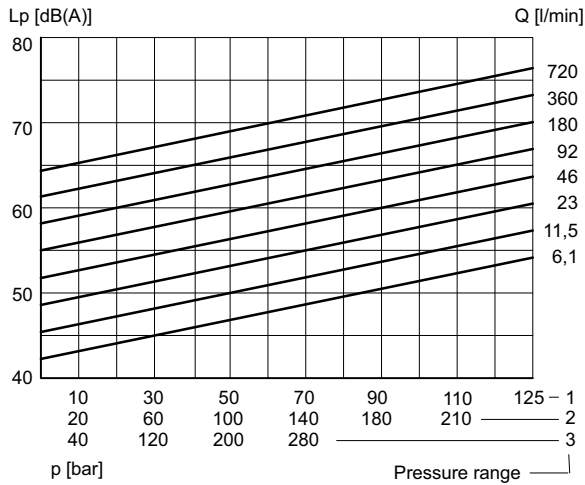
7) for max. speed minimum permissible inlet pressure is 0.95 bar absolute, for speeds higher contact Bucher Hydraulics

3 Performance graphs

The performance graphs shown are valid for the specified pump models.
For other pump sizes, contact Bucher Hydraulics.

3.1 Noise level (L_p)

measured to DIN 45635, Part 26, in Stuttgart University's low-echo noise measurement chamber;
measurement distance 1 m; speed $n = 1500$ rpm; viscosity = 42 mm²/s

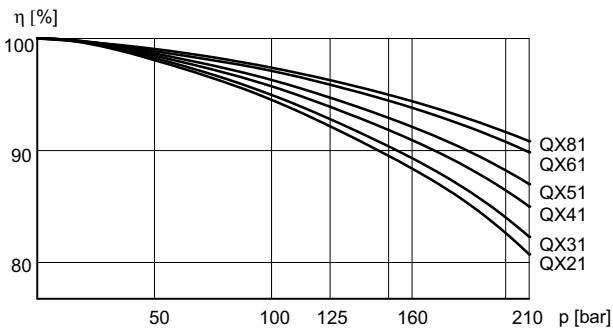


3.2 Efficiency (η)

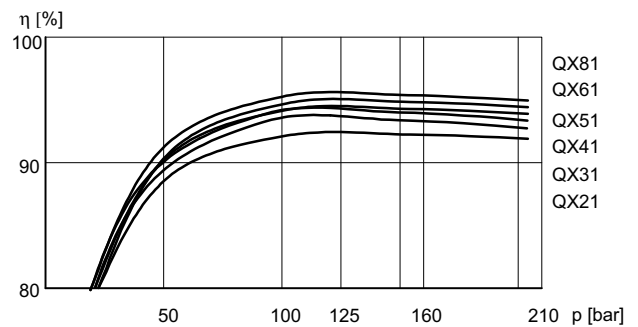
Measured at speed 1450 rpm, viscosity 42 mm²/s

3.2.1 Pressure range 1

Volumetric efficiency

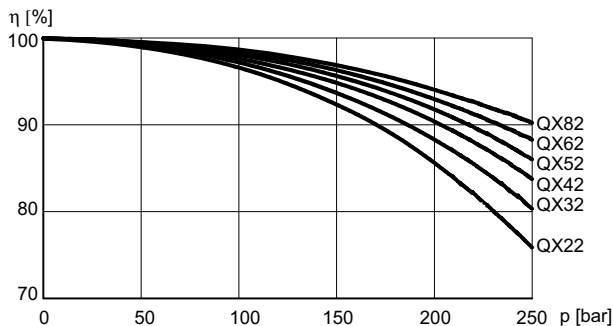


Overall efficiency

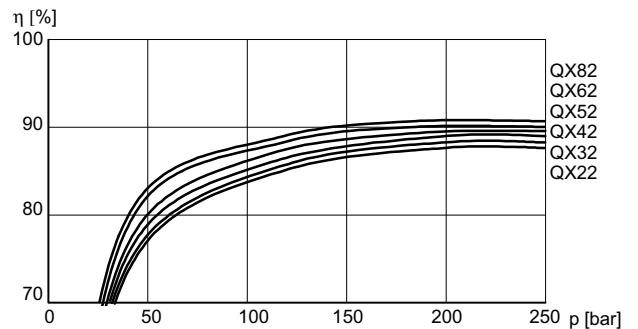


3.2.2 Pressure range 2

Volumetric efficiency

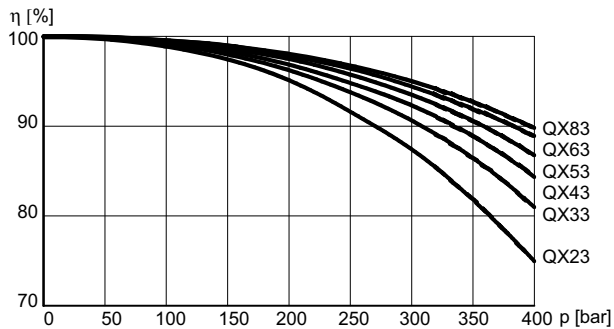


Overall efficiency

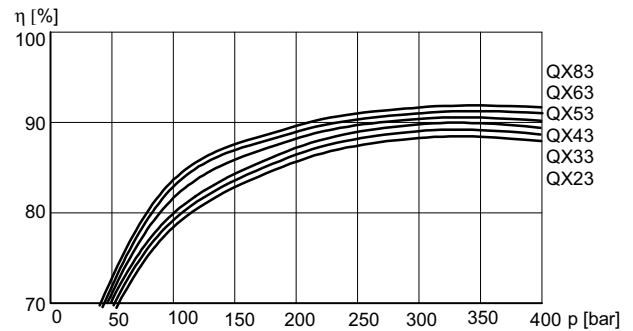


3.2.3 Pressure range 3

Volumetric efficiency



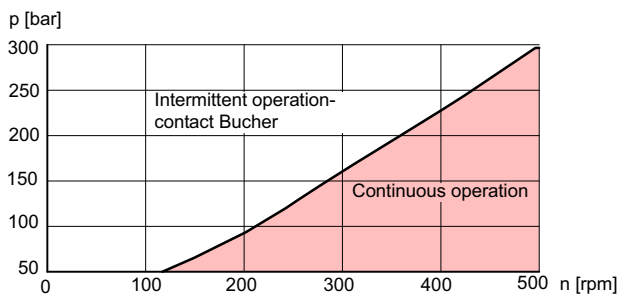
Overall efficiency



3.3 Operation with variable-speed drives

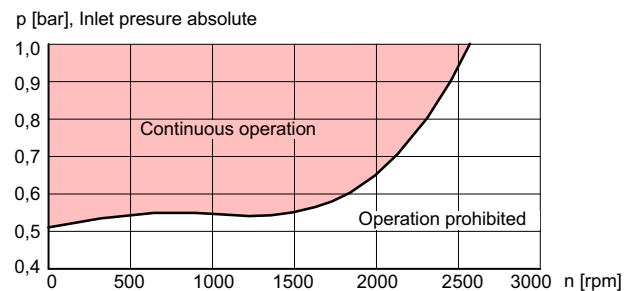
3.3.1 Minimum speed as a function of pressure

Pump QX52-063 measured: with viscosity 42 mm²/s



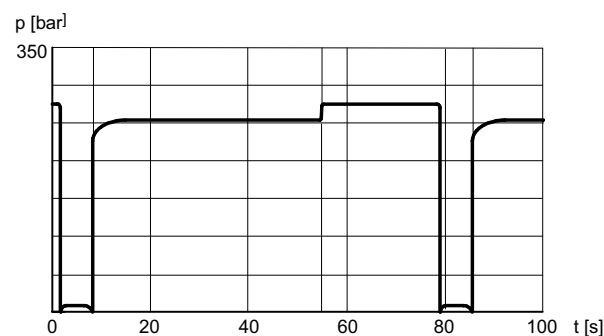
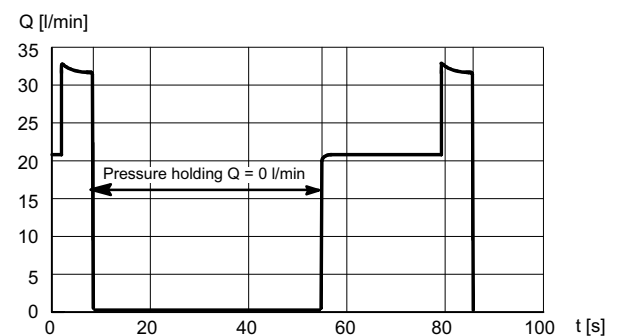
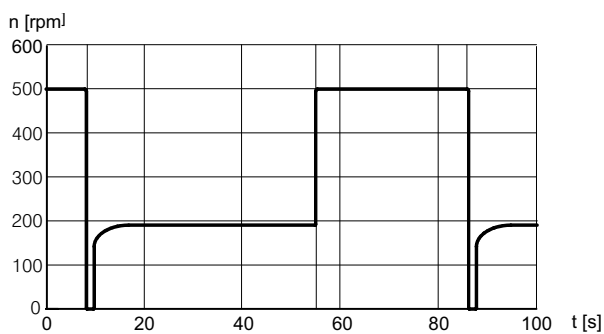
3.3.2 Minimum pressure at suction port as a function of Speed

Pump QX52-063 measured with viscosity 42 mm²/s



3.3.3 Typical loading cycle for a QX pump with variable-speed drive

Pump QX53-063 with separate drain connection measured with: viscosity 20 mm²/s



4 Single pumps

4.1 Dimensions

Frame size	2			3			4			5			6			8			
Pressure range	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	
Suction port: to standard SAE J518 ¹⁾	S	G1" ³⁾ thread			G1 1/4" ³⁾ thread			1 1/2"			2"			2 1/2"			3"		
Pressure port: to standard SAE J518 ¹⁾	P	G1/2" ³⁾ ⁴⁾ thread			G3/4" ³⁾ ⁴⁾ thread			1"			1 1/4"			1 1/2"			2"		
Mounting: oval 2-hole- flange to ISO 3019/1 (SAE) ISO 3019/2 (metric)	A	118			132			170			212			267			330		
	B (SAE)	-			106			146			181			229			-		
	B (Metr.)	100			109			140			180			224			280		
	C	9			11			14			18			22			26		
	N (SAE)	-			82,55 - 0,05			101,6 - 0,05			127 - 0,05			152,4 - 0,05			-		
	N (Metr.)	63 h8			80 h8			100 h8			125 h8			160 h8			200 h8		
	O	8,5			8,5			10,5			12,5			16,5			20		
V	6			6			7			7			7			9			
4-hole flange ISO 3019/2	X (Metr.)	9			9			12			14			18			22		
	Y (Metr.)	85			103			125			160			200			250		
Shaft end: parallel, to ISO/R775 ²⁾	D	20 j6			25 j6			32 j6			40 j6			50 j6			63 j6		
	E	36			42			58			82			82			105		
	F	6			8			10			12			14			18		
	G	22,5			28			35			43			53,5			67		
	I	45			50			68			92			92			117		
Housing	K	37,5			44			52,5			60,5			74			90		
	L	136	118	153	164	144	189	202	176	232	242	210	280	288	248	338	361	331	446
	M	-	55	90	-	69,5	114	-	87	143	-	102	172	-	119	209	-	151	266
	T	85			107			133			177			214	220	220	273	275	275
	Z	50			60			62,5			78			97,5			125		
Weight	kg	5	5	6,5	10	9,5	12,5	18	17	22	33	31	40	64	60	76	130	120	160

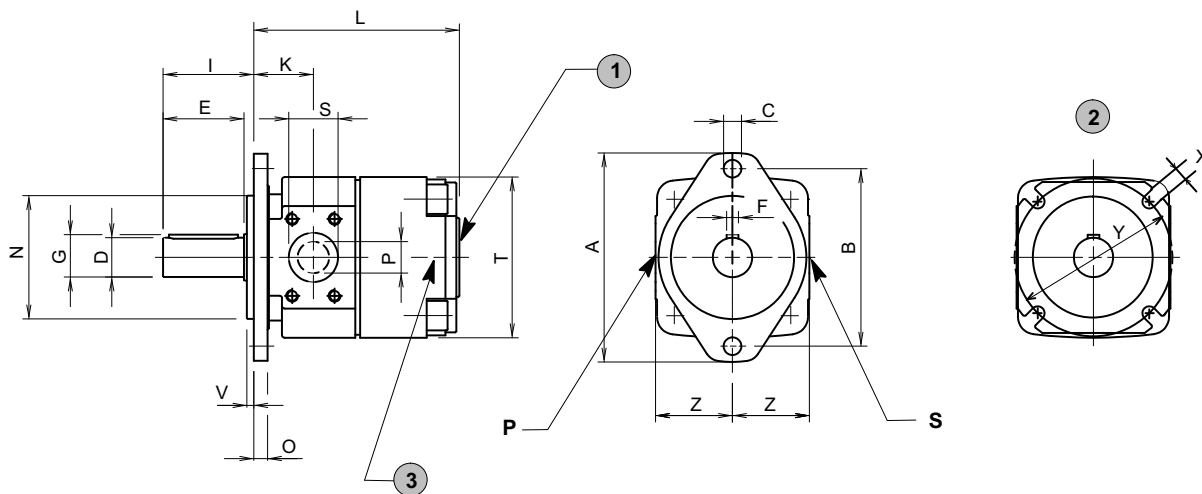
1) for SAE 3000 pipe flange dimensions,
high pressure type up to 420 bar (see section 10.2)
low pressure type for up to 16 bar (see section 10.3)

2) for other shaft ends, contact Bucher Hydraulics

3) threaded port to DIN 3852, Part 2

4) pressure port to SAE J 518 can be supplied for pressure ranges 2 and 3

4.2 Pressure range 1

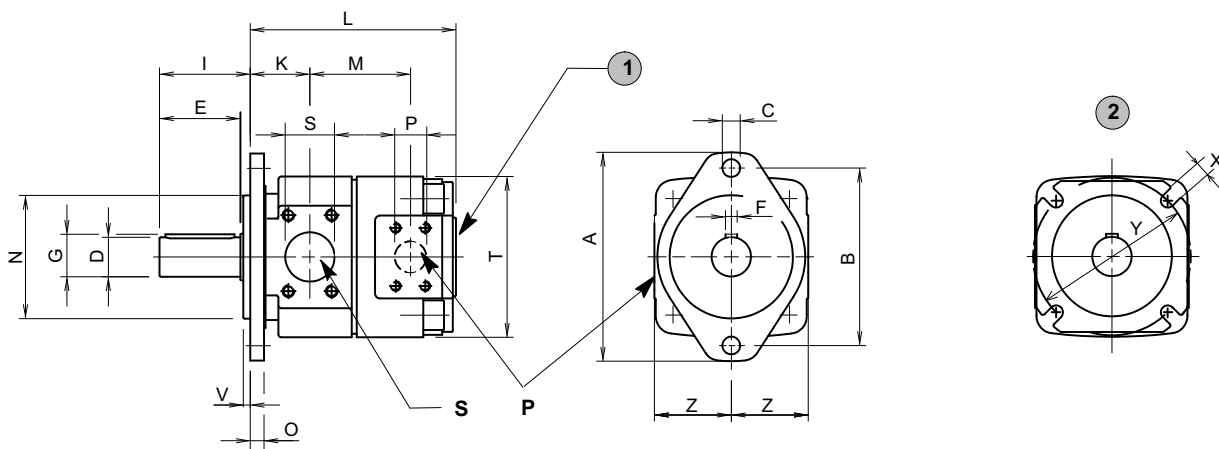


1 external drain port - see special feature 06

2 Special model: 4-hole flange ISO 3019/2

3 Depending on operating conditions, a second suction port may be required on QX61 (SAE 2") and QX81 (SAE 2 1/2") - see section 2.2.1

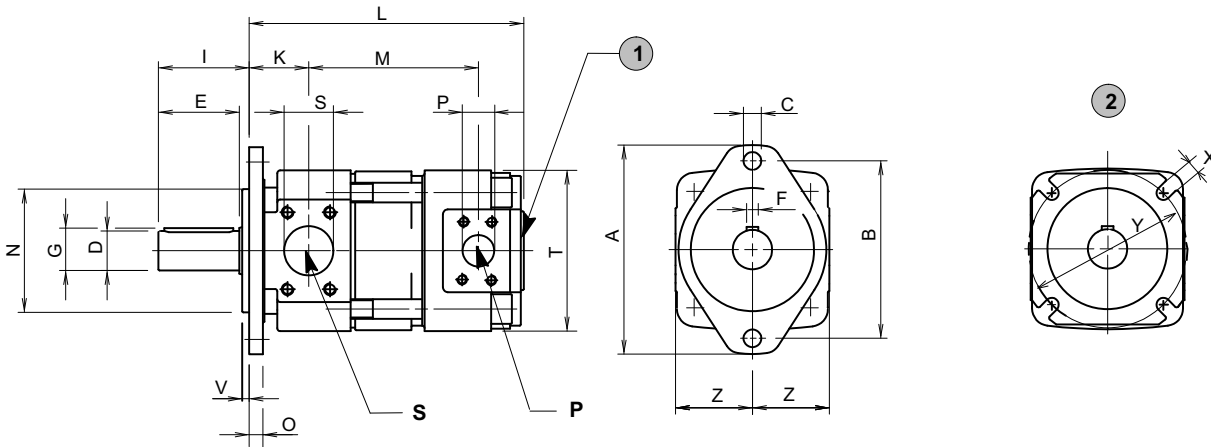
4.3 Pressure range 2



1 external drain port - see special feature 06

2 Special model: 4-hole flange ISO 3019/2

4.4 Pressure range 3



1 external drain port - see special feature 06

2 Special model: 4-hole flange ISO 3019/2

4.5 Ordering code for single pumps

Series	= QX	Q	X	5	3	-	0	4	0	R	*	*
Frame size	= 2 / 3 / 4 / 5 / 6 / 8											
Pressure range	= 1 / 2 / 3											
Displacement in cm ³ /rev	= 005 - 500											
Rotation (viewed from shaft end)	right (CW) = R left (CCW) = L											
Variants / special features (to be inserted by the factory, see section 4.7 for a selection)												

Ordering example:

Required: single pump
 Displacement: 40 cm³/rev
 Continuous pressure: 300 bar
 for use with mineral oil
 Ordering code: QX53-040R

4.6 Standard configuration

- direction of rotation - right (CW)
- 2-hole mounting flange to ISO 3019/1 (SAE): sizes QX 3-6
- 2-hole mounting flange to ISO 3019/2 (metr.): sizes QX 2+8
- Nitrile seals
- parallel shaft end to ISO/R775

4.7 Special features

- 06 = separate drain port in the pump rear cover
 QX 2-5 G1/4"
 QX 6 G3/8"
 QX 8 G1/2"
- 09 = Viton seals
- 12 = 2-hole mounting flange to ISO 3019/2 (metric): size QX3-6
- 66 = 4-hole mounting flange to ISO 3019/2 (metric)
- 29 = for HFB and HFC fluids, frame sizes 2 to 5
- 86 = for HFB and HFC fluids, frame sizes 6 and 8
- 83 = second suction port on:
 QX61 = SAE 2"
 QX81 = SAE 2 1/2"

5 Double pumps

QX double pumps consist of two single pumps mounted on a common drive shaft. Hydraulically, the two pumps operate independently of one another but they share a common suction port in the pump's centre section. The larger pump of the combination is situated at the shaft end (the drive side) and is referred to as Pump I. With equal frame sizes, the pump with the larger displacement is situated at the drive side.

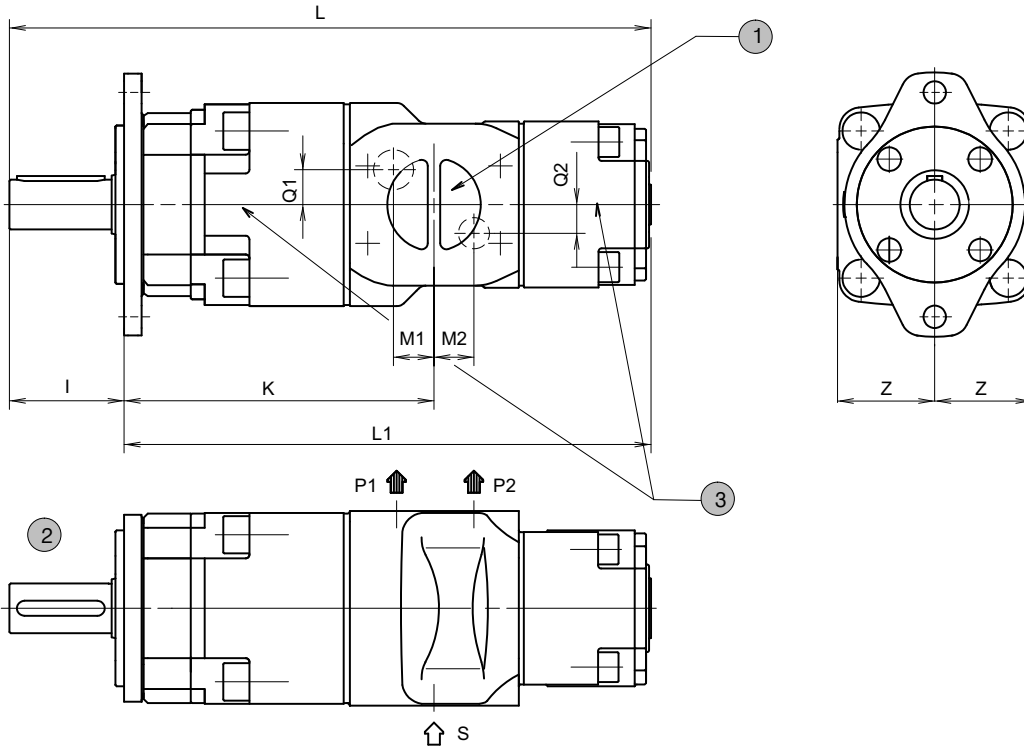
Double pumps can be combined as shown in the following table. If a letter is shown at the intersection point of the two pumps, the letter identifies the page in section 5.2 that contains the relevant dimensional drawing. If there is no letter at the intersection point, then that pump combination is not possible.

5.1 Selection table

Pump 1		Pump 2																Maximum permissible drive shaft torque (Nm)			
		Displacement in cm ³ /rev																			
		5/6/8		10/12/16		20/25/32		40/50/63		80/100/125		160/200/250		315	400	500					
		Maximum intermittent pressure in bar																			
		250	400	125 160 210	250	400	125 160 210	250	400	125 160 210	250	400	125 160 210	250	400	125 160 210	250	400	125 160 210		
		QX22..	QX23..	QX21..	QX32..	QX33..	QX31..	QX42..	QX43..	QX41..	QX52..	QX53..	QX51..	QX62..	QX63..	QX61..	QX82..	QX83..	QX81..		
Displacement in cm ³ /rev	5/6/8	250	QX22..	E																65	
		400	QX23..	H	I																
			125/160 210	QX21..	B	C	A														130
			250	QX32..	E	F	D	E													
			400	QX33..	H	I	G	H	I												
			125/160 210	QX31..	B	C	A	B	C	A											
			250	QX42..	E	F	D	E	F	D	E										
			400	QX43..	H	I	G	H	I	G	H	I									
		40/50/63	125/160 210	QX41..	B	C	A	B	C	A	B	C	A								
			250	QX52..	E	F	D	E	F	D	E	F	D	E							
			400	QX53..	H	I	G	H	I	G	H	I	G	H	I						
			125/160 210	QX51..	B	C	A	B	C	A	B	C	A	B	C	A					
	80/100/125	250	QX62..				E	F	D	E	F	D	E	F	D	E					
		400	QX63..				H	I	G	H	I	G	H	I	G	H	I				
	160/200/250	125/160 210	QX61..				B	C	A	B	C	A	B	C	A	B	C	A			
		250	QX82..							E	F	D	E	F	D	E	F	D	E		
		400	QX83..							H	I	G	H	I	G	H	I	G	H	I	
		125/160 210	QX81..							B	C	A	B	C	A	B	C	A	B	C	

5.2 Dimensions

A Double pumps QX.1/1



1	S = common suction port
2	shaft and mounting dimensions see section 4

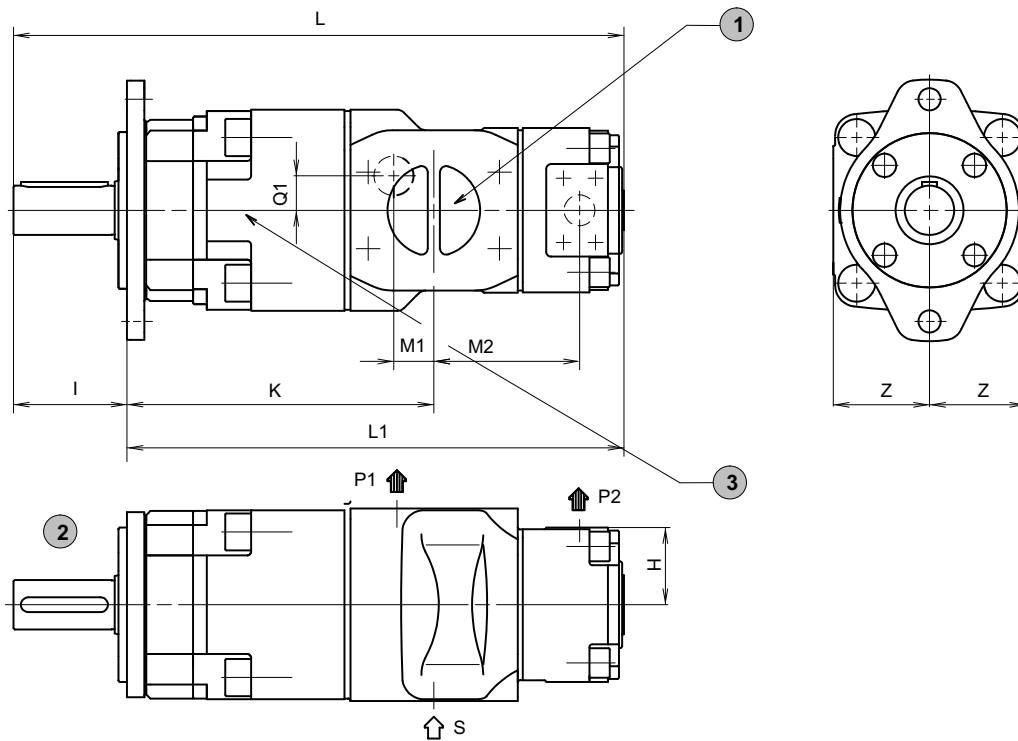
3	depending on operating conditions, a second suction port may be required - see section 2.2.1, QX61 SAE 2", QX81 SAE 2 1/2"
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Typ	L	L1	K	M1	M2	Q1	Q2	I	Z	S	P1	P2
QX21/21	296	251	141	18	18			45	50	G 1 1/4" 1)	G 1/2" 1) 2)	
QX31/21	343	293			30							G 1/2" 1) 2)
QX31/31	358	308	171	26	26	-	-	50	60	G 1 1/2" 1)	G 3/4" 1) 2)	G 3/4" 1) 2)
QX41/21	396	328			35							G 1/2" 1) 2)
QX41/31	411	343	201	19	33	15	15	68	63	SAE 2"	SAE 1"	G 3/4" 1) 2)
QX41/41	449	381	208	26	26	23	23					1" SAE
QX51/21	468	376			43		-					G 1/2" 1) 2)
QX51/31	483	391	241	23	39	15	15	92	78	SAE 2 1/2"	SAE 1 1/4"	G 3/4" 1) 2)
QX51/41	521	429			32		23					SAE 1"
QX51/51	547	455	249	30	30	28	28			SAE 3"		SAE 1 1/4"
QX61/31	541	449		24	47	17	14					G 3/4" 1) 2)
QX61/41	564	472	287	27	39	26	27	92	98		SAE 1 1/2"	SAE 1"
QX61/51	601	509			40		28					SAE 1 1/4"
QX61/61	628	536	292	32	32	35	35			SAE 3 1/2"		SAE 1 1/2"
QX81/41	679	562			51		25					SAE 1"
QX81/51	705	588	359	35	47	25	30	117	125		SAE 2"	SAE 1 1/4"
QX81/61	732	615			45		35					SAE 1 1/2"
QX81/81	774	657		38	38	40	40			SAE 4"		SAE 2"

1) threaded port to DIN 3852, Part 2

2) pressure port to SAE J 518 can be supplied for pressure ranges 2 and 3

B Double pumps QX.1/2



- 1** S = common suction port
- 2** shaft and mounting dimensions see section 4

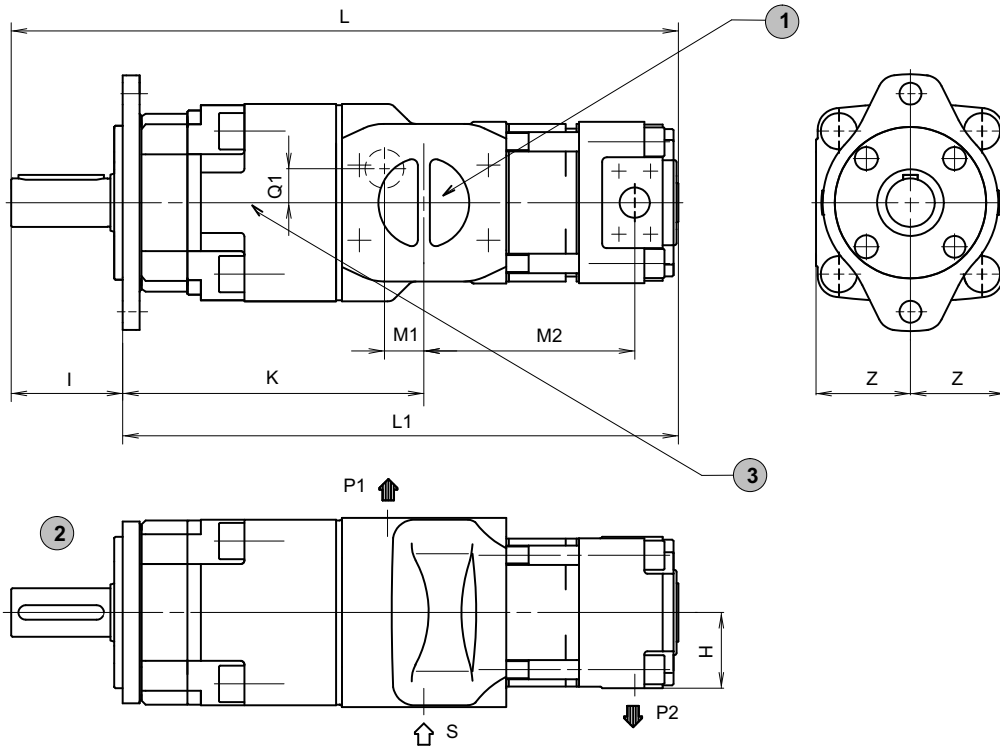
- 3** depending on operating conditions, a second suction port may be required - see section 2.2.1, QX61 SAE 2", QX81 SAE 2 1/2"

Typ	L	L1	K	M1	M2	Q1	I	Z	H	S	P1	P2
QX21/22	278	233	141	18	67	-	45	50	50	G 1 1/4" 1)	G 1/2" 1) 2)	G 1/2" 1) 2)
QX31/22	325	275	171	26	79		50	60	60	G 1 1/2" 1)	G 3/4" 1) 2)	G 3/4" 1) 2)
QX31/32	338	288			87		68	63	60	SAE 2"	SAE 1"	SAE 1"
QX41/22	378	310	201	19	84	15	68	63	50	SAE 2"	SAE 1"	G 1/2" 1) 2)
QX41/32	391	323			92				60			G 3/4" 1) 2)
QX41/42	423	355			111				63			SAE 1"
QX51/22	450	358	241	23	92	15	92	78	50	SAE 2 1/2"	SAE 1 1/4"	G 1/2" 1) 2)
QX51/32	463	371			100				60			G 3/4" 1) 2)
QX51/42	495	403			118				63			SAE 1"
QX51/52	515	423	249	30	127	28	92	98	78	SAE 3"	SAE 1 1/2"	SAE 1 1/4"
QX61/32	521	429			24				60			G 3/4" 1) 2)
QX61/42	538	446			112				63			SAE 1"
QX61/52	569	477	292	32	137	35	92	98	78	SAE 3 1/2"	SAE 1 1/2"	SAE 1 1/4"
QX61/62	588	496			149				98			SAE 1 1/2"
QX81/42	653	536			141				63			SAE 1"
QX81/52	673	556	359	35	150	25	117	125	78	SAE 2"	SAE 2"	SAE 1 1/4"
QX81/62	692	575			162				98			SAE 1 1/2"
QX81/82	724	607			179				125			SAE 2"

1) threaded port to DIN 3852, Part 2

2) pressure port to SAE J 518 can be supplied for pressure ranges 2 and 3

C Double pumps QX.1/3



1	S = common suction port
2	shaft and mounting dimensions see section 4

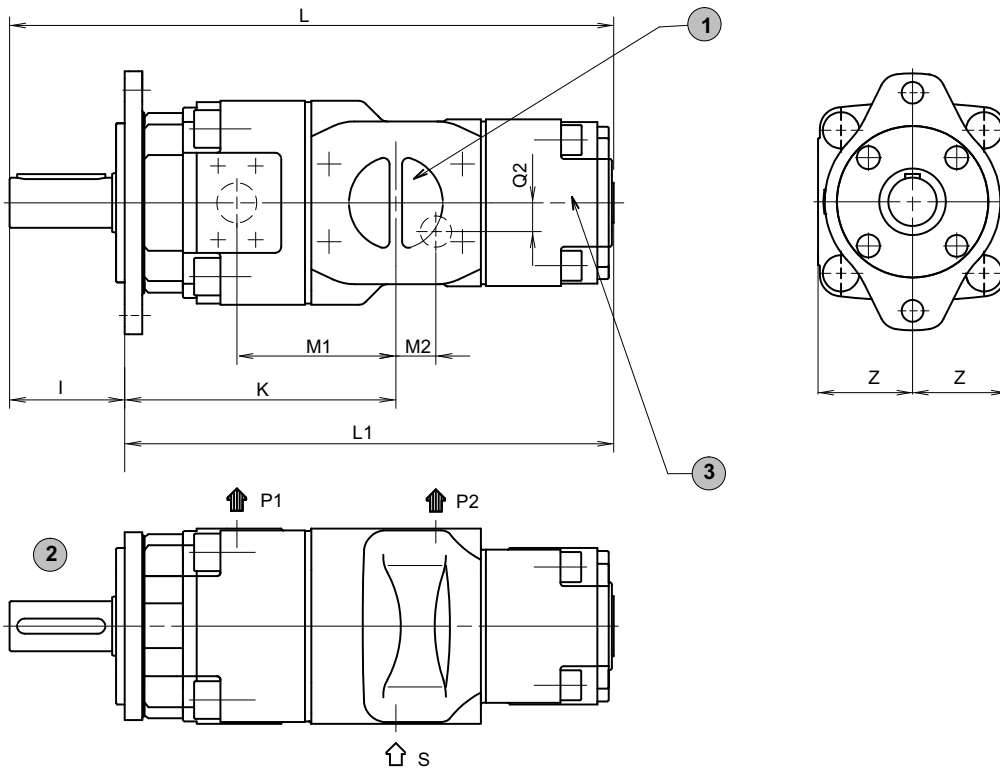
3 depending on operating conditions, a second suction port may be required - see section 2.2.1, QX61 SAE 2", QX81 SAE 2 1/2"

Typ	L	L1	K	M1	M2	Q1	I	Z	H	S	P1	P2	
QX21/23	313	268	141	18	102	-	45	50	50	G 1 1/4" 1)	G 1/2" 1) 2)	G 1/2" 1) 2)	
QX31/23	360	310	171	26	114	-	50	60	60	G 1 1/2" 1)	G 3/4" 1) 2)	G 3/4" 1) 2)	
QX31/33	383	333			132								
QX41/23	413	345	201	19	119	15	68	63	50	SAE 2"	SAE 1"	G 1/2" 1) 2)	
QX41/33	436	368			137							60	G 3/4" 1) 2)
QX41/43	479	411			167							63	SAE 1"
QX51/23	485	393	241	23	127	15	92	78	50	SAE 2 1/2"	SAE 1 1/4"	G 1/2" 1) 2)	
QX51/33	508	416			145							60	G 3/4" 1) 2)
QX51/43	551	459	249	30	174	28	92	78	63	SAE 3"	SAE 1 1/4"	SAE 1"	
QX51/53	585	493			197							78	SAE 1 1/4"
QX61/33	566	474	287	24	157	17	92	98	60	SAE 3"	SAE 1 1/2"	G 3/4" 1) 2)	
QX61/43	594	502		27	179	26						63	SAE 1"
QX61/53	637	545	292	32	207	35	92	98	78	SAE 3 1/2"	SAE 2"	SAE 1 1/4"	
QX61/63	678	586			239							98	SAE 1 1/2"
QX81/43	709	592	359	35	197	25	117	125	63	SAE 3 1/2"	SAE 2"	SAE 1"	
QX81/53	743	626			220							78	SAE 1 1/4"
QX81/63	782	665		252	98	SAE 1 1/2"							
QX81/83	839	722		294	125	SAE 4"	SAE 2"						

1) threaded port to DIN 3852, Part 2

2) pressure port to SAE J 518 can be supplied for pressure ranges 2 and 3

D Double pumps QX.2/1



1	S = common suction port
2	shaft and mounting dimensions see section 4

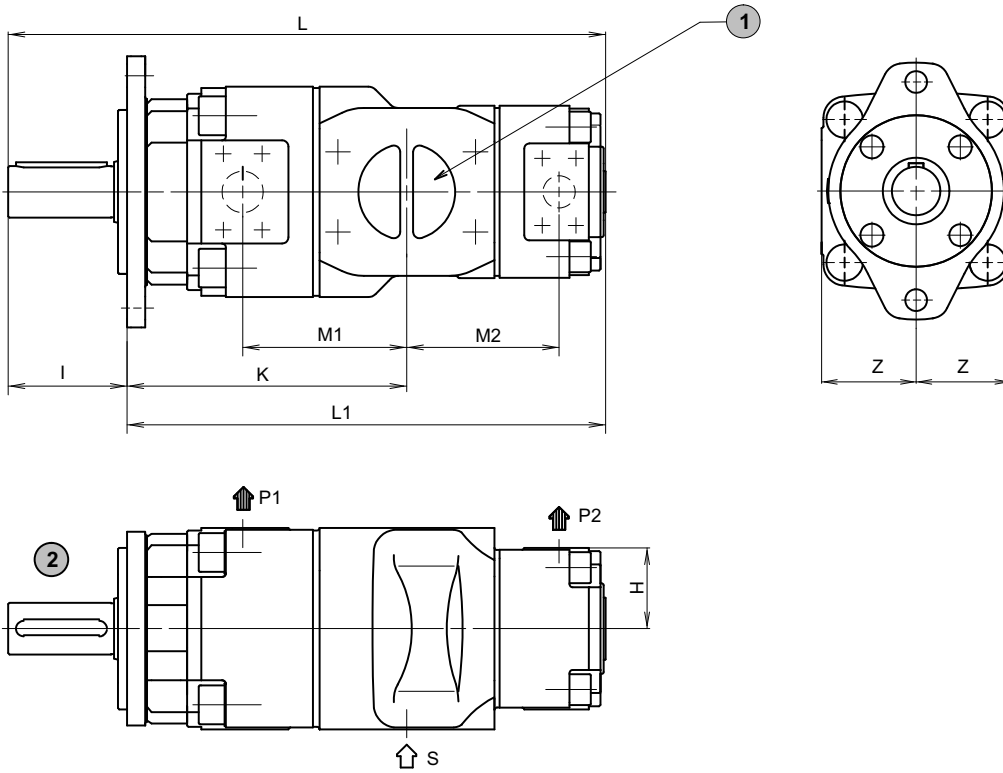
3	depending on operating conditions, a second suction port may be required - see section 2.2.1, QX61 SAE 2"
---	---

Typ	L	L1	K	M1	M2	Q2	I	Z	S	P1	P2
QX32/21	323	273	151	87	30	-	50	60	G 1 1/2" 1)	G 3/4" 1) 2)	G 1/2" 1) 2)
QX42/21	370	302	175	103	35		68	63	SAE 2"	SAE 1"	
QX42/31	385	317			33	15					
QX52/21	436	344	209	120	43	-	92	78	SAE 2 1/2"	SAE 1 1/4"	G 1/2" 1) 2)
QX52/31	451	359			39						
QX52/41	489	397	217	127	32	23	92	98	SAE 3"	SAE 1 1/2"	SAE 1"
QX62/31	501	409			247	144					
QX62/41	524	432	39	27			SAE 1"				
QX62/51	561	469	252	149	40	28		SAE 1 1/4"			
QX82/41	629	512	309	179	51	25	SAE 1"				
QX82/51	655	538			47	30		SAE 1 1/4"			
QX82/61	682	565	45	35	SAE 1 1/2"						

1) threaded port to DIN 3852, Part 2

2) pressure port to SAE J 518 can be supplied for pressure ranges 2 and 3

E Double pumps QX.2/2



1 S = common suction port

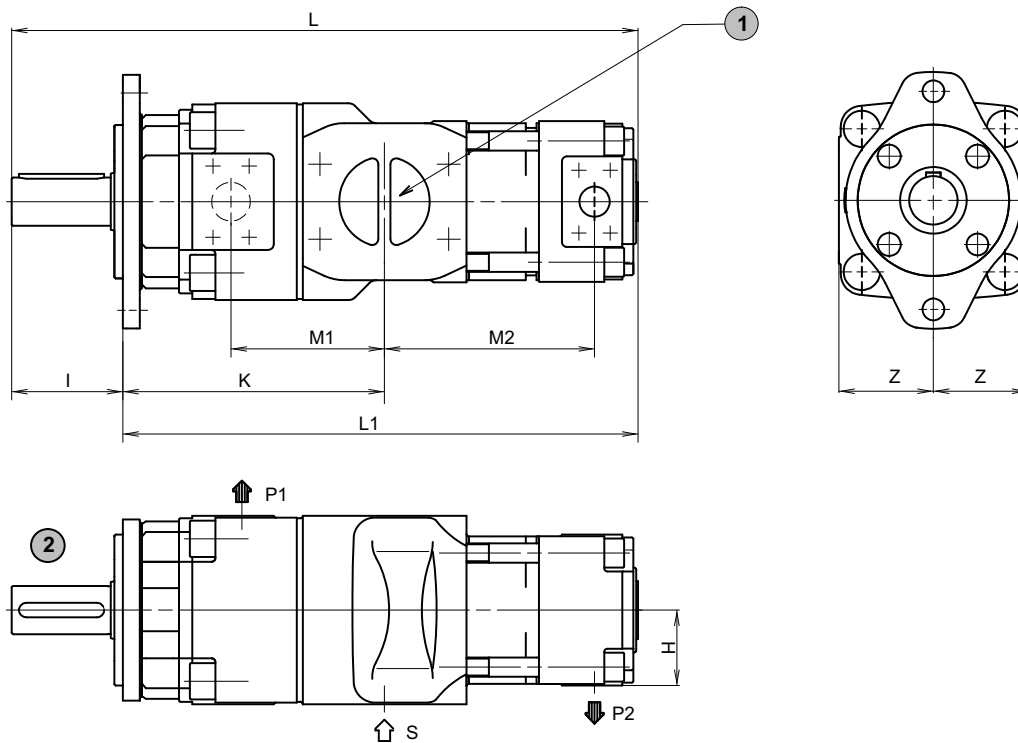
2 Shaft and mounting dimensions - see section 4

Typ	L	L1	K	M1	M2	I	Z	H	S	P1	P2			
QX22/22	260	215	123	67	67	45	50	50	G 1 1/4" 1)	G 1/2" 1) 2)	G 1/2" 1) 2)			
QX32/22	305	255	151	87	79	50	60		G 1 1/2" 1)	G 3/4" 1) 2)				
QX32/32	318	268			87			68			63	50	SAE 2"	SAE 1"
QX42/22	352	284	84	G 3/4" 1) 2)										
QX42/32	365	297	92		SAE 1"									
QX42/42	397	329	111	111		63	92	78	SAE 2 1/2"	SAE 1 1/4"	SAE 1"			
QX52/22	418	326	209	120	92	50					SAE 2 1/2"	SAE 1 1/4"	G 1/2" 1) 2)	
QX52/32	431	339			100								60	G 3/4" 1) 2)
QX52/42	463	371	217	127	118	63					SAE 3"	SAE 1"		
QX52/52	483	391			127		92	98	78	SAE 3 1/2"			SAE 1 1/2"	SAE 1 1/4"
QX62/32	481	389	247	144	112	60					SAE 3 1/2"	SAE 1 1/2"		G 3/4" 1) 2)
QX62/42	498	406			123									63
QX62/52	529	437	252	149	137	78	SAE 3 1/2"	SAE 1 1/2"	SAE 1 1/4"					
QX62/62	548	456			149				92	125	98	SAE 3 1/2"	SAE 2"	SAE 1 1/2"
QX82/42	603	486	309	179	141	63	SAE 2"	SAE 2"						SAE 1"
QX82/52	623	506			150									78
QX82/62	642	525	162	117	125	98	SAE 4"	SAE 2"	SAE 1 1/2"					
QX82/82	674	557	179						179	125	SAE 4"	SAE 2"	SAE 2"	

1) threaded port to DIN 3852, Part 2

2) pressure port to SAE J 518 can be supplied for pressure ranges 2 and 3

F Double pumps QX.2/3



1 S = common suction port

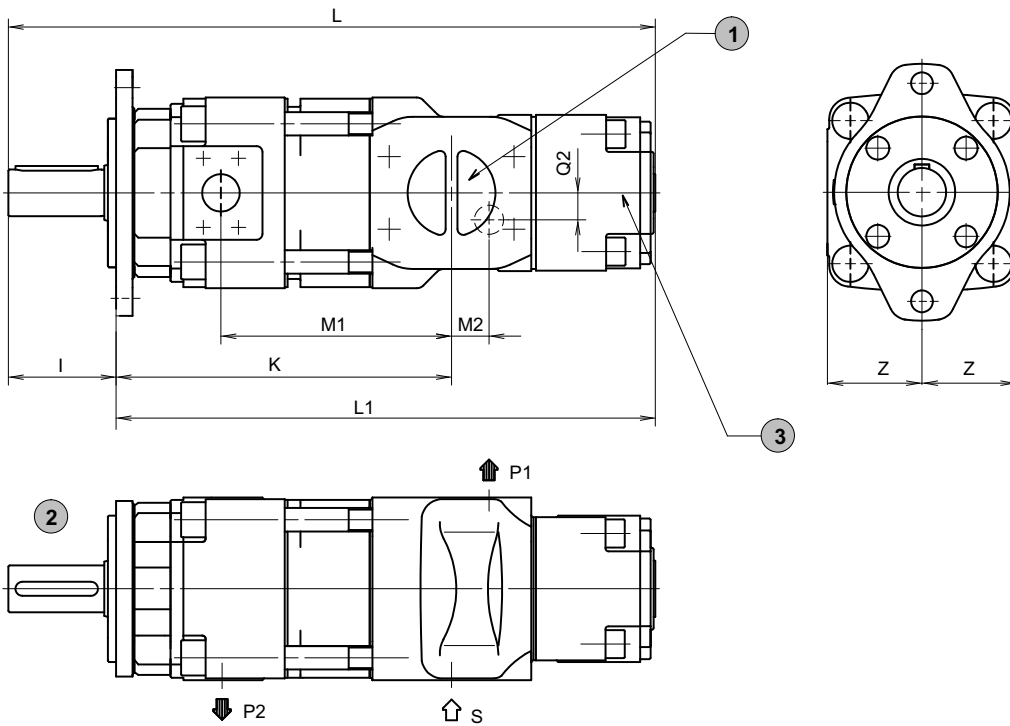
2 Shaft and mounting dimensions - see section 4

Typ	L	L1	K	M1	M2	I	Z	H	S	P1	P2
QX32/23	340	290	151	87	114	50	60	50	G 1 1/2" ¹⁾	G 3/4" ^{1) 2)}	G 1/2" ^{1) 2)}
QX42/23	387	319	175	103	119	68	63		SAE 2"	SAE 1"	
QX42/33	410	342			137			92			78
QX52/23	453	361	209	120	127	92	78		50	SAE 2 1/2"	
QX52/33	476	384			145			92			98
QX52/43	519	427	217	127	174	92	98		63	SAE 3"	
QX62/33	526	434	247	144	157			92			98
QX62/43	554	462			179	207	117		125	63	
QX62/53	599	507	252	149	207			125			78
QX82/43	659	542	309	179	197	117	125		63	SAE 3 1/2"	
QX82/53	693	576			220			252			98
QX82/63	732	615	252	98	SAE 4"	SAE 1 1/2"					

1) threaded port to DIN 3852, Part 2

2) pressure port to SAE J 518 can be supplied for pressure ranges 2 and 3

G Double pumps QX.3/1



1	S = common suction port
2	dimensions see section 4

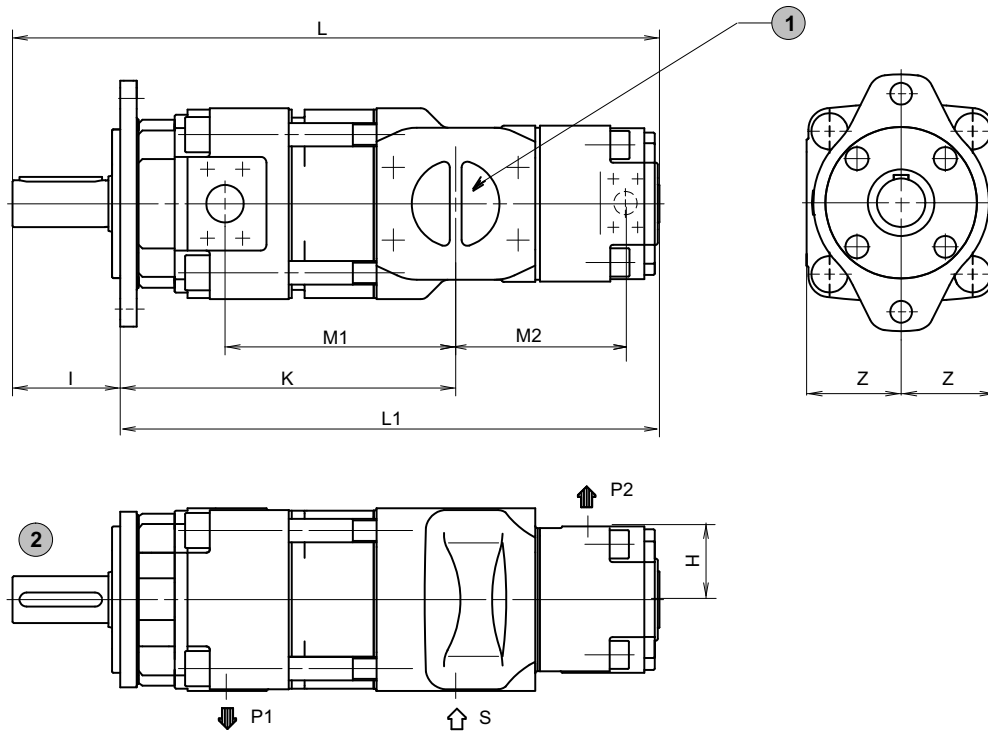
3	depending on operating conditions, a second suction port may be required - see section 2.2.1 QX61 SAE 2"
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Typ	L	L1	K	M1	M2	Q2	I	Z	S	P1	P2
QX33/21	368	318	196	132	30	-	50	60	G 1 1/2" 1)	G 3/4" 1) 2)	G 1/2" 1) 2)
QX43/21	426	358	231	159	35	15	68	63	SAE 2"	SAE 1"	
QX43/31	441	373			43						-
QX53/21	506	414	279	190	39	15	92	78	SAE 2 1/2"	SAE 1 1/4"	G 3/4" 1) 2)
QX53/31	521	429			32	23					92
QX53/41	559	467	287	197	47	14	92	98	SAE 3"	SAE 1 1/2"	
QX63/31	591	499	337	234	39	27					92
QX63/41	614	522			40	28	92	98	SAE 3"	SAE 1 1/2"	
QX63/51	651	559	342	239	40	28					92
QX83/41	744	627	424	294	51	25	117	125	SAE 3 1/2"	SAE 2"	
QX83/51	770	653			47	30					117
QX83/61	797	680	45	35	117	125	SAE 4"	SAE 2"	SAE 2"	SAE 1 1/2"	

1) threaded port to DIN 3852, Part 2

2) pressure port to SAE J 518 can be supplied for pressure ranges 2 and 3

H Double pumps QX.3/2



1 S = common suction port

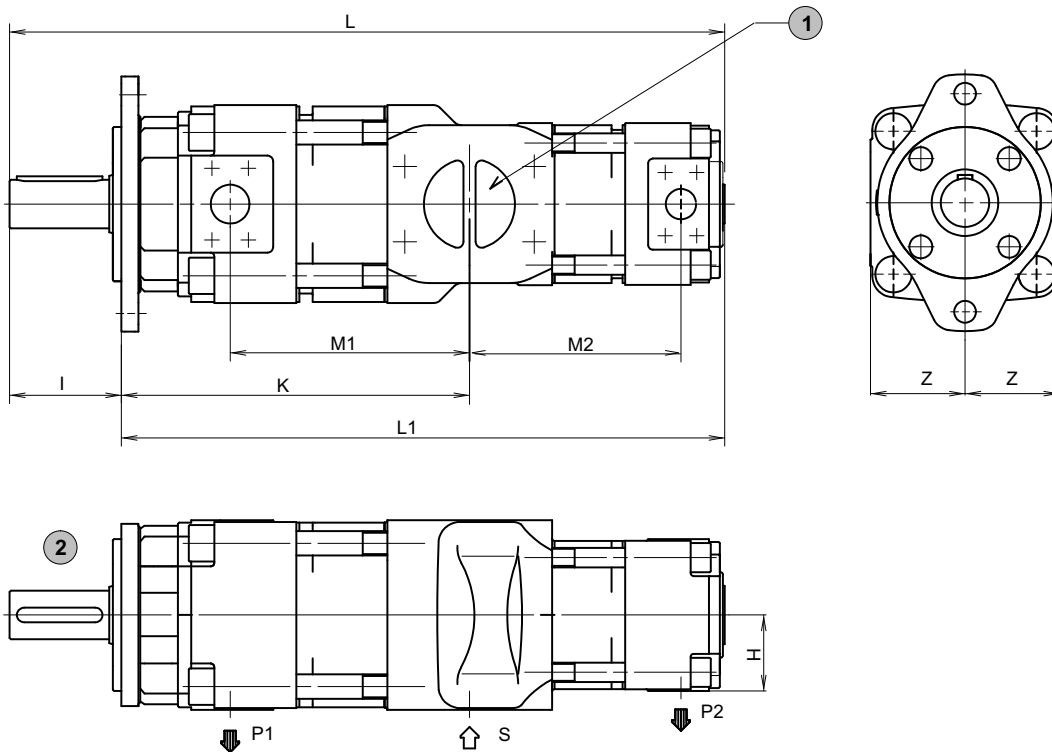
2 Shaft and mounting dimensions - see section 4

Typ	L	L1	K	M1	M2	I	Z	H	S	P1	P2	
QX23/22	295	250	158	102	67	45	50	50	G 1 1/4" 1)	G 1/2" 1) 2)	G 1/2" 1) 2)	
QX33/22	350	300	196	132	79	50	60	60	G 1 1/2" 1)	G 3/4" 1) 2)	G 3/4" 1) 2)	
QX33/32	363	313			87			50			G 1 1/2" 1)	G 3/4" 1) 2)
QX43/22	408	340	231	159	84	68	63	50	SAE 2"	SAE 1"	G 1/2" 1) 2)	
QX43/32	421	353			92			60			60	G 3/4" 1) 2)
QX43/42	453	385			111			63			63	SAE 1"
QX53/22	488	396	279	190	92	92	78	50	SAE 2 1/2"	SAE 1 1/4"	G 1/2" 1) 2)	
QX53/32	500	408			100			78			60	G 3/4" 1) 2)
QX53/42	533	441	287	197	118	92	98	63	SAE 3"	SAE 1 1/2"	SAE 1"	
QX53/52	553	461			127			98			78	SAE 1 1/4"
QX63/32	571	479			337			234			112	92
QX63/42	588	496	123	98		63	SAE 1"					
QX63/52	619	527	342	239	137	117	125	78	SAE 3 1/2"	SAE 2"	SAE 1 1/4"	
QX63/62	638	546			149			125			98	SAE 1 1/2"
QX83/42	718	601	424	294	141	117	125	63	SAE 4"	SAE 2"	SAE 1"	
QX83/52	738	621			150			125			78	SAE 1 1/4"
QX83/62	757	640			162			125			98	SAE 1 1/2"
QX83/82	789	672			179			125			125	SAE 2"

1) threaded port to DIN 3852, Part 2

2) pressure port to SAE J 518 can be supplied for pressure ranges 2 and 3

I Double pumps QX.3/3



1 S = common suction port

2 Shaft and mounting dimensions - see section 4

Typ	L	L1	K	M1	M2	I	Z	H	S	P1	P2
QX23/23	330	285	158	102	102	45	50	50	G 1 1/4" 1) 2)	G 1/2" 1) 2)	G 1/2" 1) 2)
QX33/23	385	335	196	132	114	50	60	50	G 1 1/2" 1) 2)	G 3/4" 1) 2)	G 1/2" 1) 2)
QX33/33	408	358			132			60			G 3/4" 1) 2)
QX43/23	442	374	231	159	119	68	63	50	SAE 2"	SAE 1"	G 1/2" 1) 2)
QX43/33	466	398			137			60			G 3/4" 1)
QX43/43	509	441			167			63			SAE 1"
QX53/23	523	431	279	190	127	92	78	50	SAE 2 1/2"	SAE 1 1/4"	G 1/2" 1) 2)
QX53/33	546	454			145			60			G 3/4" 1) 2)
QX53/43	589	497	287	197	174	92	98	63	SAE 3"	SAE 1 1/4"	SAE 1"
QX53/53	623	531			197			78			SAE 1 1/4"
QX63/33	616	524			337			234			157
QX63/43	644	552	179	63		SAE 1"					
QX63/53	689	597	342	239	207	92	98	78	SAE 3 1/2"	SAE 1 1/2"	SAE 1 1/4"
QX63/63	728	636			239			98			SAE 1 1/2"
QX83/43	774	657			424			294			197
QX83/53	808	691	220	78		SAE 1 1/4"					
QX83/63	847	730	252	98		SAE 1 1/2"					
QX83/83	904	787	294	125		SAE 2"					

1) threaded port to DIN 3852, Part 2

2) pressure port to SAE J 518 can be supplied for pressure ranges 2+3

5.3 Ordering code for double pumps

		Q	X	6	3	-	0	8	0	/	3	1	-	0	2	0	R	*	*
Series	= QX																		
Frame size	= 2 / 3 / 4 / 5 / 6 / 8																		
Pressure range	= 1 / 2 / 3																		
Displacement in cm ³ /rev	= 005 - 500																		
	Frame size	= 2 / 3 / 4 / 5 / 6 / 8																	
	Pressure range	= 1 / 2 / 3																	
	Displacement in cm ³ /rev	= 005 - 500																	
Rotation (viewed from shaft end)	right (CW) = R left (CCW) = L																		
Variants / special features (to be inserted by the factory, see section 4.7 for a selection)																			

Ordering example:

Required: double pump

Pump 1
 Displacement: 80 cm³/rev
 Continuous pressure: 300 bar
 Type: 63-080

Pump 2
 Displacement: 20 cm³/rev
 Continuous pressure: 160 bar
 Type: 31-020

for use with mineral oil

Ordering code: QX63-080/31-020R

6 Triple pumps

The following table shows the triple-pump combinations that can be supplied. Other triple-pump combinations can be assembled after consultation with the factory. The individual pumps 1, 2 and 3 must be specified in accordance with the main characteristics shown in section 2.

The largest pump of the combination is situated at the shaft end and is referred to as Pump 1. For equal frame sizes, the pump with the larger displacement is situated at the drive side. Pumps 2 and 3 have a common suction port.

6.1 Selection table

Frame size of Pump 1

QX2.	QX3.	QX4.	QX5.	QX5.	QX6.	QX8.
QX21/21/21	QX31/21/21	QX41/21/21	QX51/22/23	QX52/52/31	QX61/31/33	QX81/42/23
QX21/21/22	QX31/21/22	QX41/21/23	QX51/23/23	QX52/52/42	QX61/41/21	QX82/42/43
QX21/21/23	QX31/21/23	QX41/22/22	QX52/23/23	QX52/52/43	QX61/41/42	QX82/51/53
QX21/22/22	QX31/22/22	QX41/23/23	QX53/22/22	QX52/52/52	QX61/42/23	QX83/51/53
QX21/22/23	QX31/22/23	QX42/22/22	QX51/31/33	QX52/52/53	QX61/42/43	QX81/61/61
QX21/23/23	QX31/23/22	QX43/22/22	QX51/33/33	QX52/53/31	QX61/43/43	QX81/62/63
QX22/22/22	QX31/23/23	QX43/23/22	QX51/41/23	QX52/53/53	QX62/41/22	QX81/63/33
QX23/23/23	QX32/22/22	QX43/23/23	QX51/41/42	QX53/53/23	QX62/42/42	QX82/61/61
	QX32/22/23	QX41/31/33	QX51/41/43	QX53/53/33	QX62/43/43	QX82/62/52
	QX32/23/23	QX41/33/22	QX51/42/22		QX63/43/22	QX82/62/62
	QX33/21/22	QX41/33/33	QX51/42/43		QX61/52/53	QX82/63/31
	QX33/21/23	QX42/31/32	QX51/43/21		QX61/53/23	QX83/61/61
	QX33/23/23	QX42/32/32	QX51/43/22		QX61/53/31	QX83/63/61
	QX31/31/21	QX42/33/32	QX51/43/23		QX62/52/32	QX81/81/61
	QX31/31/22	QX43/31/31	QX51/43/43		QX62/52/52	QX81/81/81
	QX31/31/23	QX43/33/33	QX52/42/23		QX62/53/22	QX82/82/52
	QX31/31/31	QX41/41/33	QX52/42/42		QX62/53/23	QX82/82/62
	QX31/31/33	QX41/42/21	QX52/43/22		QX62/53/31	QX82/82/63
	QX31/32/22	QX41/42/23	QX52/43/23		QX62/53/33	QX83/83/53
	QX31/33/33	QX41/42/42	QX52/43/43		QX63/51/51	
	QX32/32/22	QX41/43/21	QX53/41/22		QX63/53/53	
	QX32/32/23	QX41/43/22	QX53/41/23		QX61/61/31	
	QX32/32/32	QX41/43/23	QX53/42/22		QX61/61/33	
	QX32/32/33	QX42/42/22	QX53/42/43		QX61/61/41	
	QX33/33/23	QX42/42/23	QX53/43/23		QX61/61/53	
	QX33/33/33	QX42/42/31	QX51/51/21*		QX61/62/42	
		QX42/42/32	QX51/51/32		QX61/62/63	
		QX42/42/33	QX51/51/33		QX61/63/32	
		QX42/42/42	QX51/52/32		QX61/63/33	
		QX42/42/43	QX51/52/33		QX61/63/41	
		QX43/43/43	QX51/52/42		QX61/63/42	
			QX51/52/43		QX62/62/33	
			QX51/53/22		QX62/62/43	
			QX51/53/23		QX62/62/53	
			QX51/53/31		QX62/62/62	
			QX51/53/33		QX62/62/63	
			QX51/53/41		QX62/63/63	
			QX51/53/43		QX63/63/32	
			QX51/53/52		QX63/63/43	
			QX52/52/23		QX63/63/53	
65	130	260	520	520	1050	2100

Maximum permissible drive shaft torque in Nm

* this pump is used as the ordering example in section 6.2

7 Low-flow capability pumps

7.1 Generals

The QX24 internal gear pump is a further development of the Bucher internal gear pump, which has proven itself in more than 30 years of service around the world. With dis-

placements from 3,3 to 5,1 cm³/rev, it extends the low-flow capability of the QX range.

7.2 Technical data

Mounting attitude	unrestricted
Mounting method (standard)	oval 2-hole flange to ISO 3019/2 (metric)
Direction of rotation	right, alternatively left (but not reversible)
Pump drive method	in-line, by flexible coupling
Fluids	HLP mineral oils to DIN 51524, Part 2 HFC fluids to VDMA 24317 other fluids - consult Bucher Hydraulics
Minimum fluid cleanliness	NAS 1638, class 9 or ISO 4406, code 20/18/15
Operating viscosity	20 - 100 mm ² /s *
Starting viscosity	20 - 300 mm ² /s * * higher values, contact Bucher Hydraulics
Fluid temperature	HLP mineral oils 80 °C max. HFC 50 °C max.
Minimum inlet pressure	0.85 bar absolute
Maximum pressure at drain port	1.5 bar absolute
External drain port	is always provided

7.3 Main characteristics

Effective displacement effectif	Flow rate 1)	Maximum speed	Type	Mineral oil to DIN 51524 Cont./Max. interm. pressure 2)	HFC to VDMA 24317	Torque 3)	Power requirement 4)
cm ³ /rev	l/min	rpm		bar	bar	Nm	KW
3,3	4,8	3600	QX24-003	320/400	280/350	17	2,6
4,2	6,2	3600	QX24-004	320/400	280/350	21	3,2
5,1	7,4	3600	QX24-005	320/400	280/350	26	4,0

This main characteristics is valid for hydraulic oils as well as fire-resistant and environmentally-friendly fluids with a viscosity of 20 to 50 mm²/s

1) At speed n = 1450 rpm (theoretical)

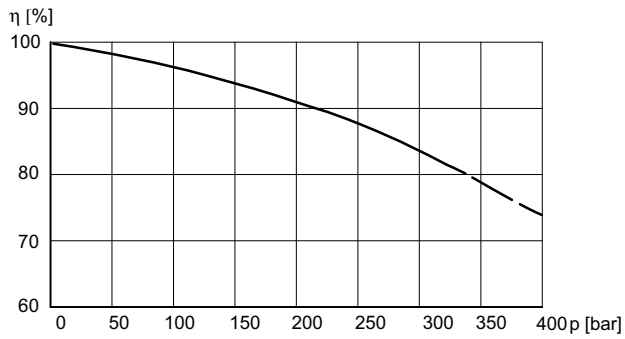
2) Maximum intermittent pressure for max. 20 sec. but not more than 10% of the duty cycle

3) Theoretical value at the max. permitted continuous pressure for mineral oil

4) Theoretical value at the max. permitted continuous pressure for mineral oil at n = 1450 rpm

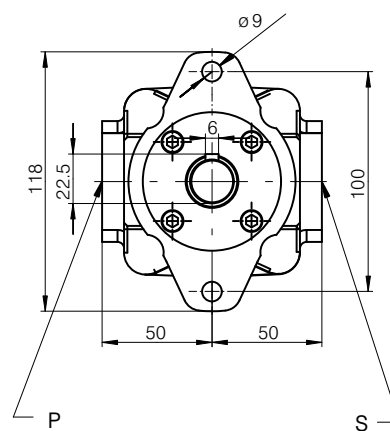
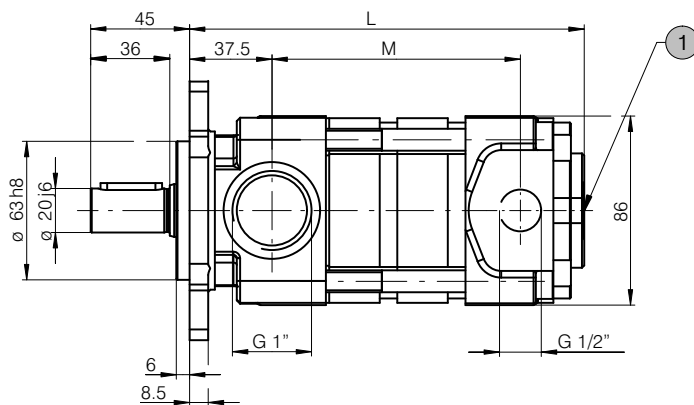
7.4 Volumetric efficiency (η)

measured at speed 1450 rpm; viscosity 42 mm²/s



7.5 Single pumps

7.5.1 Dimensions



	L	M
QX24-003	179,5	113
QX24-004	179,5	113
QX24-005	191,5	125

1 external drain port G 1/4"

8 Fluid cleanliness

QX pumps require fluid with a minimum cleanliness level of NAS 1638, Class 9 or ISO 4406, code 20/18/15.

HLP hydraulic oils to DIN 51524, Part 2, can be used without any special restriction as long as they remain within the specified temperature and viscosity ranges. HFC fire-resistant fluids to DIN 51502 can be used with the QR, QT, QX and QXM series. Note that all fire-resistant fluids require special versions of the pumps or motors and must be approved by

Bucher Hydraulics. We recommend the use of fluids that contain anti-wear additives for mixed-friction operating conditions. Fluids without appropriate additives can reduce the service life of pumps and motors. The user is responsible for maintaining, and regularly checking, the fluid quality. Bucher Hydraulics recommends a load capacity of ≥ 30 N/mm² to Brugger DIN 51347-2.

9 Note

This catalogue is intended for users with specialist knowledge. The user must check the suitability of the equipment described herein in order to ensure that all of the conditions necessary for the safety and proper functioning of the sys-

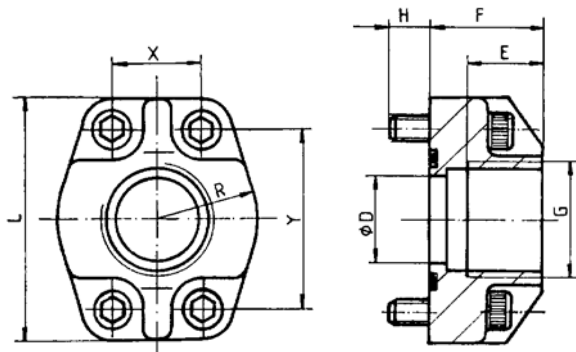
tem are fulfilled. If you have any doubts or questions concerning the use of these pumps, please consult Bucher Hydraulics.

10 Accessories

10.1 Bolt-on valves - SAE 3000 pattern

	Pressure relief A _G ^S DF / A _G ^S DH	Pressure relief solenoid control A _G ^S DA / ASDM	Pressure relief proportional solenoid control A _G ^S DP
Ordering details			
Symbols			
Ordering details	Unloading valve Accumulator charging valve A _G ^S AF A _G ^S SF		S = for pipe flange SAE 3000 pattern (all size) G = with threaded port, G 1" (size QX2, 3 and 4)
Symbols			

10.2 Pipe flanges - high pressure type



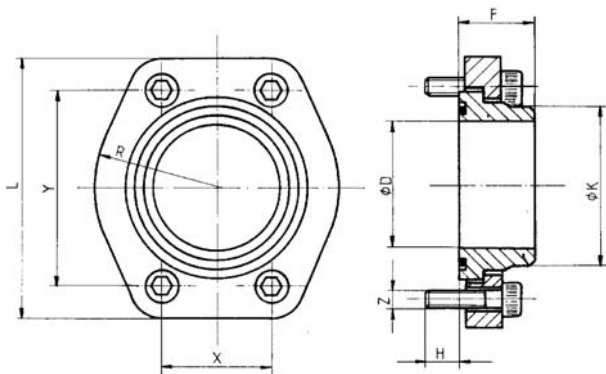
- Max. operating pressure 420 bar
- SAE flange size, PSI 3000

Threaded pipe flanges are spot-faced for DIN 2353 pipe fittings
Material: ST37 / For Viton seals, contact Bucher Hydraulics

Ordering number	Ordering code	Size	DØ	E	F	H	L	R	X	Y	Viton seal 90 Shore 'A'	Retaining screws DIN912-12.9 / Torque Nm
037000	RF 01-R08	G 1/2"	12,5	16	27	13	54	23	17,5	38	20,24x2,62	M8x30 30
037010	RF 02-R10	G 3/4"	20	18	30	12	65	26	22,2	47,6	26,65x2,62	M10x30 60
037020	RF 03-R11	G 1"	25	20	34	13	70	29	26,2	52,4	32,99x2,62	M10x35 60
037030	RF 04-R12	G 1 1/4"	32	22	38	14	80	36	30,2	58,6	40,86x3,53	M10x40 60
037040	RF 05-R13	G 1 1/2"	38	24	41	19	94	41	35,7	70	44,04x3,53	M12x45 120
037050	RF 06-R14	G 2"	50	26	45	20	102	48	42,9	77,8	59,92x3,53	M12x50 120
055470*	RF 07-R16	G 2 1/2" *	63	30	50	18	114	57	50,8	89	72,62x3,53	M12x45 120

* at RF07 only to 210 bar be allowed

10.3 Low pressure type



- Max. operating pressure 16 bar
- SAE flange size, PSI 3000

Material: ST37 / For Viton seals, contact Bucher Hydraulics

Ordering number	Ordering code	SAE flange Size	D	K	F	H	L	R	X	Y	Viton seal 90 Shore 'A'	Retaining screws DIN 912-8.8 Torque Nm	pipe ¹⁾ O/dia. approx.
062450	RN 07-S	2 1/2"	63	75	35	14	120	57	51	89	69,44x3,53	M12 x 30 70	75
063880	RN 08-S	3"	76	88			140,5	68	62	106,5	85,32x3,53	M16 x 40 180	88
063890	RN 09-S	3 1/2"	89	100	40	19	158,5	73	70	120,3	98,02x3,53	M16 x 40 180	100
063900	RN 10-S	4"	103	115			168	79	78	130	110,72x3,53	M16 x 40 180	115

1) We recommend the use of seamless precision steel tube to DIN 2391 with-wallthick. max 6 mm

info.kl@bucherhydraulics.com

www.bucherhydraulics.com

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Classification: 410.100. 000