

High Pressure Internal Gear Pumps Series QX



motion and progress

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1 General

1.1 Product description

The QX pumps are the 5th generation of Bucher internal gear pumps, which have proven themselves in thirty years of service around the world. Numerous improvements have been made to the straightforward and robust design.

Advances in the manufacturing process have made it possible - without making higher demands on individual components - to build pumps that are considerably lighter and more compact.

A new tooth profile, conceived and optimised with the help of CAE, has yielded another significant reduction in noise levels. Large sealing areas result in higher efficiencies.

The internal gear ring is supported by a hydrodynamic/ hydrostatic lubricating film, which allows operation at low viscosities or low and high speeds. QX pumps are therefore suitable for use with variable-speed drives, where they can provide variable deliveries.

1.2 Advantages

- High pressures
- Low noise level
- Long service life
- Negligible flow- and pressure-pulsations
- Can be used with fire-resistant fluids (HFB, HFC and HFD = QXV), fuels, biodegradable and low-viscosity fluids
- Insensitive to contamination of the fluid

2 Technical data

2.1 General

Installation attitude	unrestricted
Mounting method (standard)	oval 2-hole flange to ISO 3019/1 (SAE): QX 3-6 oval 2-hole flange to ISO 3019/2 (metric) QX 2+8
Direction of rotation	right, alternatively left (but not reversible)
Pump drive method	in-line, through a flexible coupling
Volumetric efficiency η_v	better than 95%
Fluids	HLP mineral oils to DIN 51524, Part 2 HFC fluids to VDMA 24317 other fluids - contact Bucher Hydraulics
Minimum fluid cleanliness	NAS 1638, Class 9 or ISO 4406, code 20/18/15
Viscosity range	10 ... 300 mm ² /s (cSt) (for values outside this range, contact Bucher Hydraulics)
Fluid temperature range	HLP-mineral oils - 80°C max. HFC 50°C max.
Inlet pressure maximum minimum	1.5 bar absolute (without external drain connection) 0.5 - 0.95 bar absolute (dependent on pump frame size and speed, see example in section 3.3.2, page 8)
Approach against pressure	maximum 20 bar (higher values, contact Bucher Hydraulics)

2.2 Main characteristics for pressure range 1

Effective displacement	Flow rate ¹⁾	Maximum speed	Type	Pressure range 1		Torque ³⁾	Power requirement ⁴⁾
				Mineral oil to DIN 51524	HFC to VDMA 24317		
cm ³ /rev	l/min	rpm		Continuous/Max. interm. press. ²⁾		Nm	kW
10,3	14,9	4500	QX21-010	160/210	130/180	26	4,0
12,6	18,3	4000	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	3600	QX31-020	160/210	130/180	51	7,7
25,3	36,7	3250	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 0.85 bar absolute with viscosity 10... 300 mm²/s

	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	Pressure range 2		Torque ³⁾	Power requirement ⁴⁾
				Mineral oil to DIN 51524 Continuous/Max. interm. press. ²⁾	HFC to VDMA 24317		
cm ³ /rev	l/min	rpm		bar	bar	Nm	kW
5,1 6,3 8,0	7,4 9,1 11,5	5000	QX22-005 QX22-006 QX22-008	210 / 250	180 / 210	17 21 27	2,6 3,2 4,0
10,0 12,6 15,6	14,5 18,3 22,6	4300	QX32-010 QX32-012 QX32-016	210 / 250	180 / 210	34 42 52	5,1 6,4 7,9
20,4 25,1 32,4	29,5 36,4 46,8	3600	QX42-020 QX42-025 QX42-032	210 / 250	180 / 210	68 84 108	10,4 12,7 16,5
39,3 50,6 63,7	56,9 73,2 92,1	3000	QX52-040 QX52-050 QX52-063	210 / 250	180 / 210	132 170 213	19,9 25,7 32,3
80,2 101,0 124,8	116 146 181	2500 ⁷⁾ 2300 ⁷⁾ 2000 ⁷⁾	QX62-080 QX62-100 QX62-125	210 / 250	180 / 210	268 338 417	40,7 51,2 63,4
163,0 201,3 249,2	236 291 361	1800 ⁷⁾ 1750 ⁷⁾ 1500 ⁷⁾	QX82-160 QX82-200 QX82-250	210 / 250	180 / 210	544 672 833	82,7 102,1 126,5

2.4 Main characteristics for pressure range 3

Effective displacement	Flow rate ¹⁾	Maximum speed	Type	Pressure range 3		Torque ³⁾	Power requirement ⁴⁾
				Mineral oil to DIN 51524 Continuous/Max. interm. press. ²⁾	HFC to VDMA 24317		
cm ³ /rev	l/min	rpm		bar	bar	Nm	kW
5,1 6,3 8,0	7,4 9,1 11,5	5000	QX23-005 QX23-006 QX23-008	320 / 400	280 / 350	26 32 41	4,0 4,9 6,2
10,0 12,6 15,6	14,5 18,3 22,6	4300	QX33-010 QX33-012 QX33-016	320 / 400	280 / 350	51 64 80	7,7 9,7 12,1
20,4 25,1 32,4	29,5 36,4 46,8	3600	QX43-020 QX43-025 QX43-032	320 / 400	280 / 350	104 128 165	15,8 19,4 25,0
39,3 50,6 63,7	56,9 73,2 92,1	3000	QX53-040 QX53-050 QX53-063	320 / 400	280 / 350	200 258 321	30,4 39,1 49,3
80,2 101,0 124,8	116 146 181	2500 ⁷⁾ 2300 ⁷⁾ 2000 ⁷⁾	QX63-080 QX63-100 QX63-125	320 / 400	280 / 350	409 514 636	62,0 78,1 96,5
163,0 201,3 249,2	236 291 361	1800 ⁷⁾ 1750 ⁷⁾ 1500 ⁷⁾	QX83-160 QX83-200 QX83-250	320 / 400	280 / 350	830 1025 1270	126,0 155,7 192,7

The operating data are valid for hydraulic oils as well as fire-resistant and environmentally-friendly fluids with a viscosity of 42 mm²/s

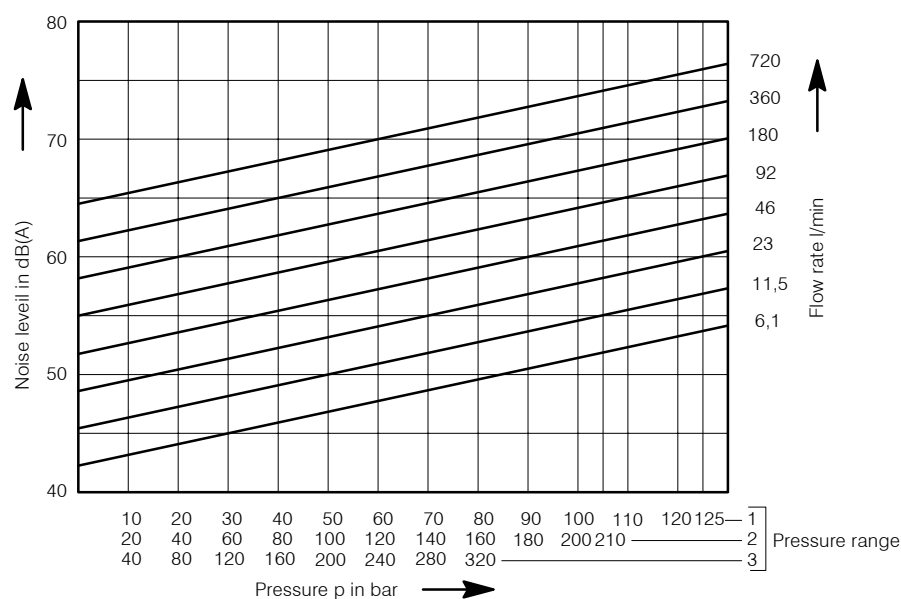
- 1) at speed n = 1450 rpm
- 2) maximum intermittent pressure for max. 20 sec. and not more than 10% of the duty cycle
- 3) theoretical value at the max. permitted continuous pressure for mineral oil
- 4) theoretical value at the max. permitted continuous pressure for mineral oil at n = 1450 rpm
- 5) for speeds higher than 1500 rpm, the minimum permissible inlet pressure is 0.95 bar absolute
- 6) max. speed only possible with second suction port, see section 2.2.1, page 4
- 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

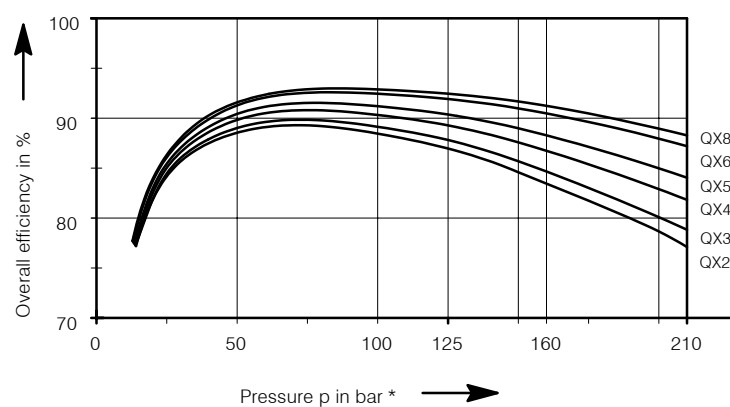
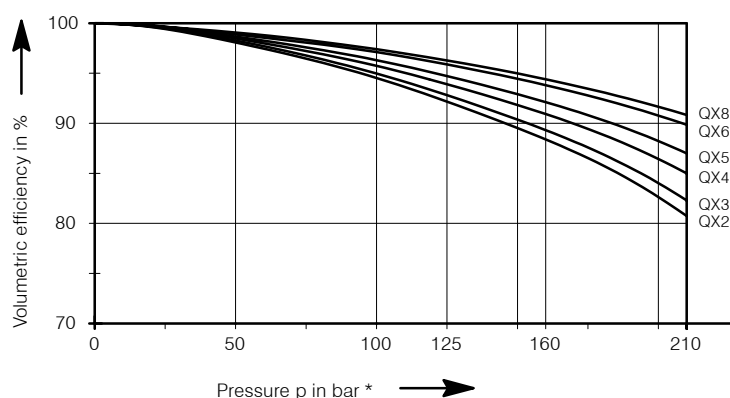
measured to DIN 45635, Part 26, in
Stuttgart University's low-echo noise
measurement chamber;
measurement distance 1 m;
speed $n = 1500$ rpm
viscosity $= 42 \text{ mm}^2/\text{s}$



3.2 Efficiency

3.2.1 Pressure range 1

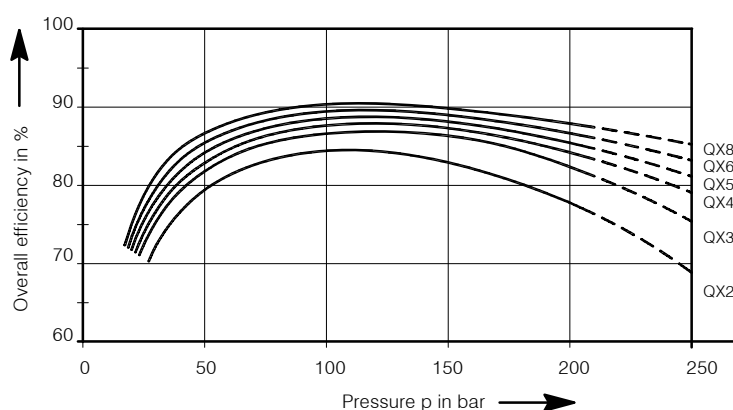
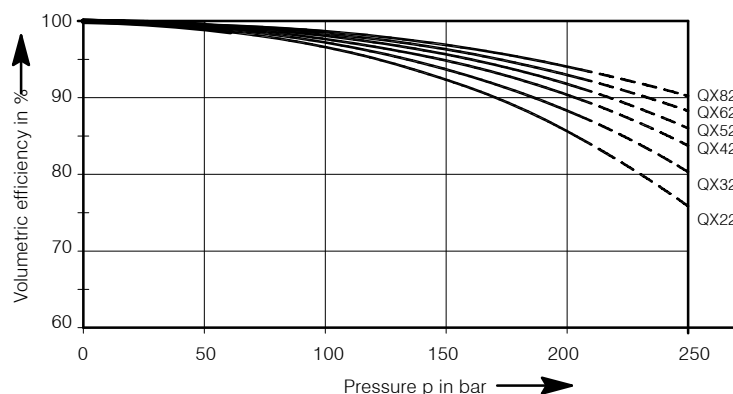
measured at speed 1450 rpm
viscosity $42 \text{ mm}^2/\text{s}$



* Cont.-/Intern. pressure see page 4 (2.2)

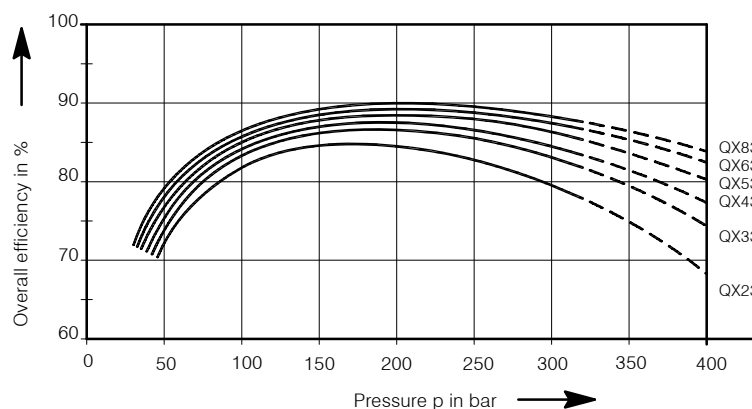
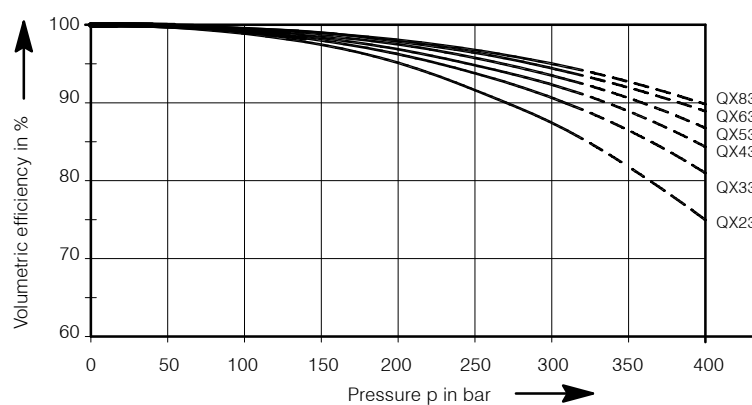
3.2.2 Pressure range 2

measured at speed 1450 rpm
 viscosity 42 mm²/s
 solid line = continuous pressure
 dashed line = maximum intermittent pressure



3.2.3 Pressure range 3

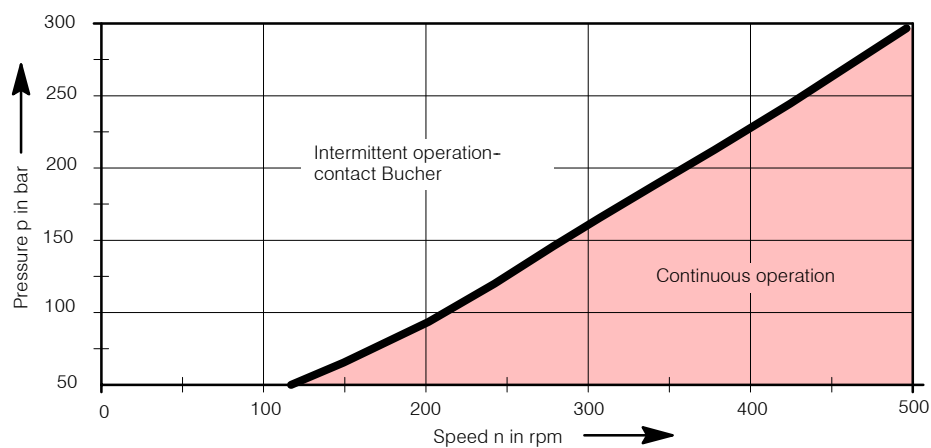
measured at speed 1450 rpm
 viscosity 42 mm²/s
 solid line = continuous pressure
 dashed line = maximum intermittent pressure



3.3 Operation with variable-speed drives

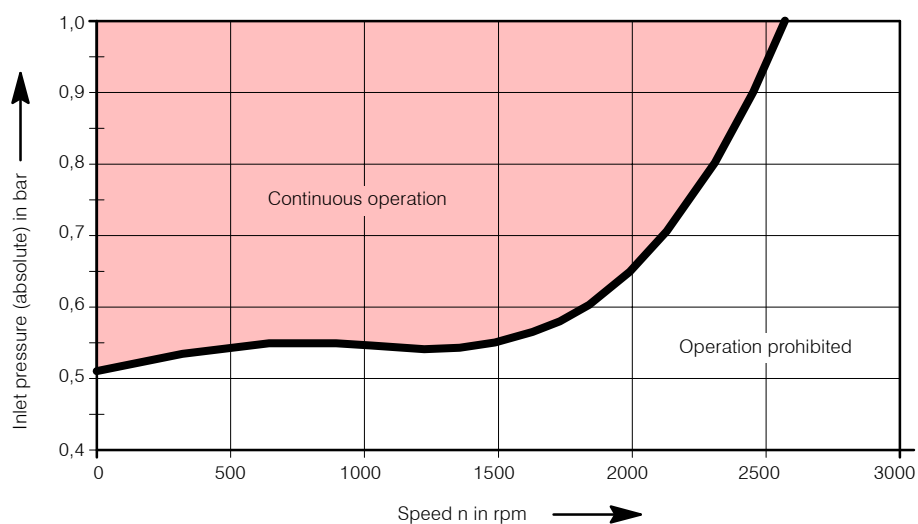
3.3.1 Minimum speed as a function of pressure

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



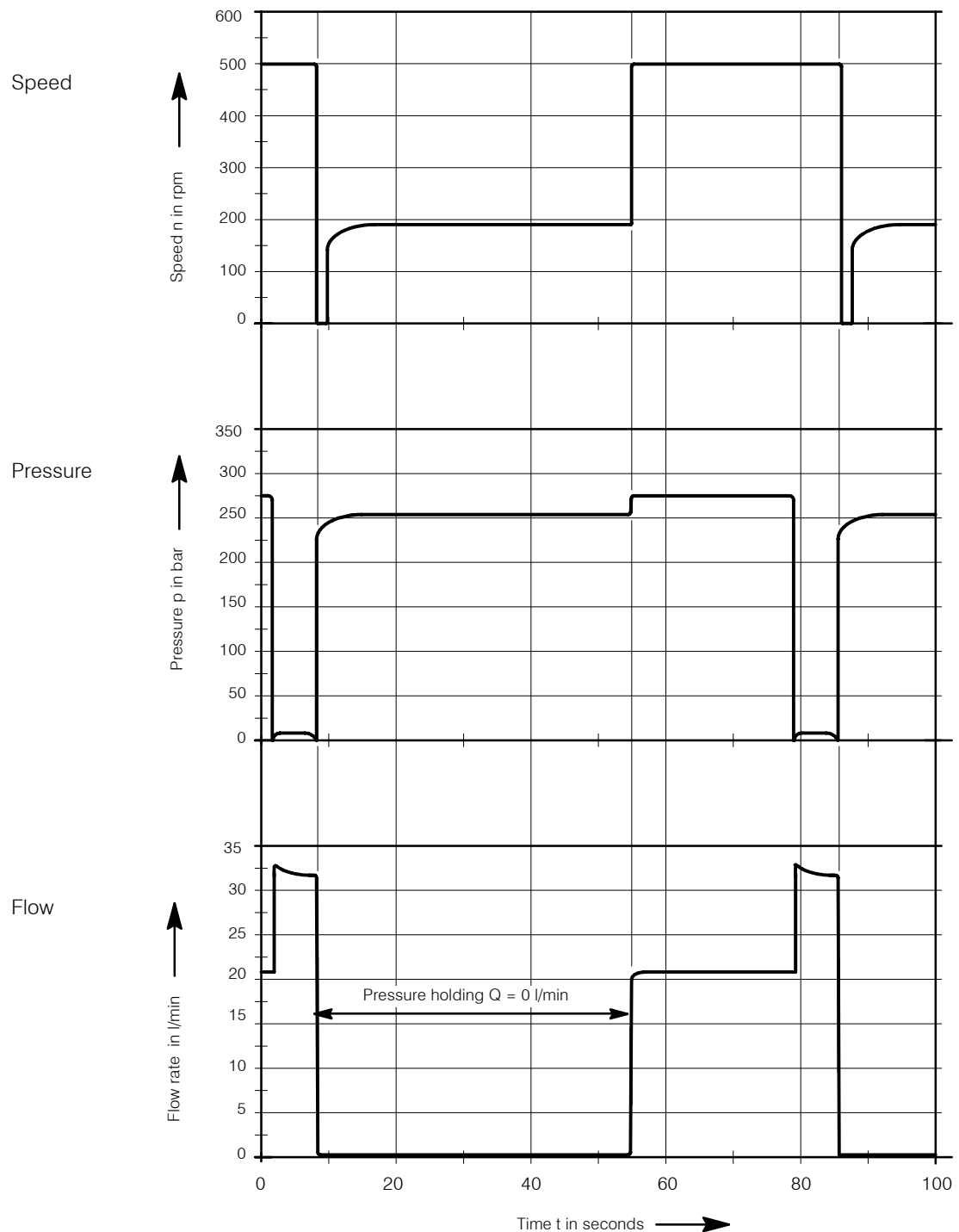
3.3.2 Minimum pressure at suction port as a function of speed

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 ⁸⁾	S	G1" ¹⁰⁾ thread			G1 1/4" ¹⁰⁾ thread			1 1/2"			2"			2 1/2"			3"		
Pressure port: to standard SAE J518 ⁸⁾	P	G1/2" ¹⁰⁾ ¹¹⁾ thread			G3/4" ¹⁰⁾ ¹¹⁾ 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 ⁹⁾	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

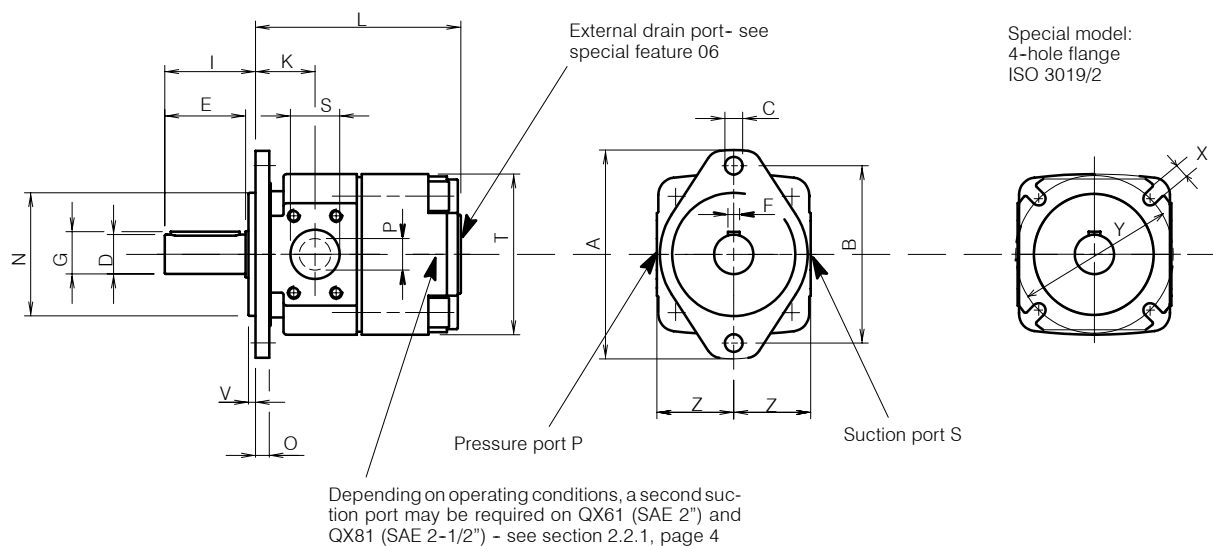
8) for SAE 3000 pipe flange dimensions,
high pressure type up to 420 bar (see section 10.2)
low pressure type for up to 16 bar (see section 10.3)

9) for other shaft ends, contact Bucher Hydraulics

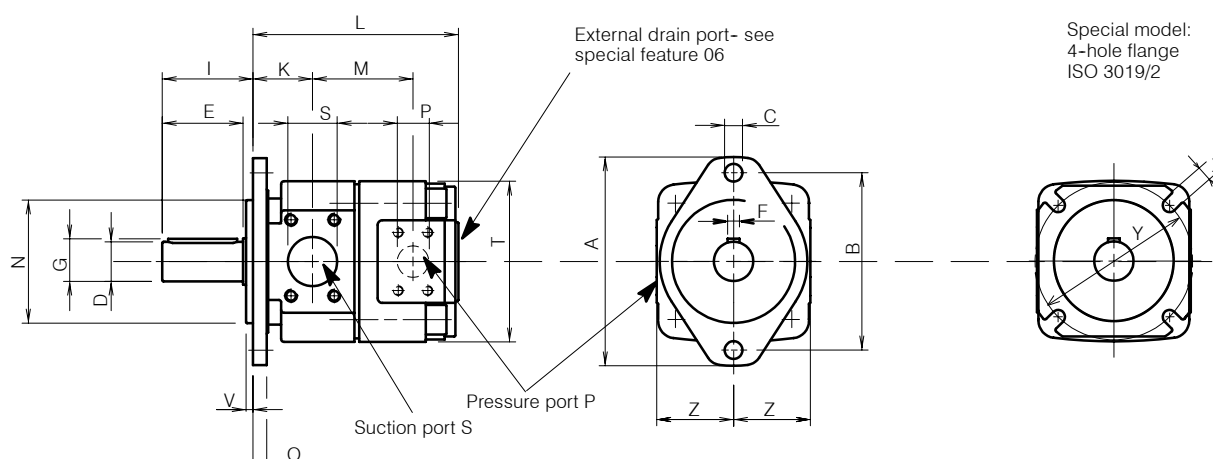
10) threaded port to DIN 3852, Part 2

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

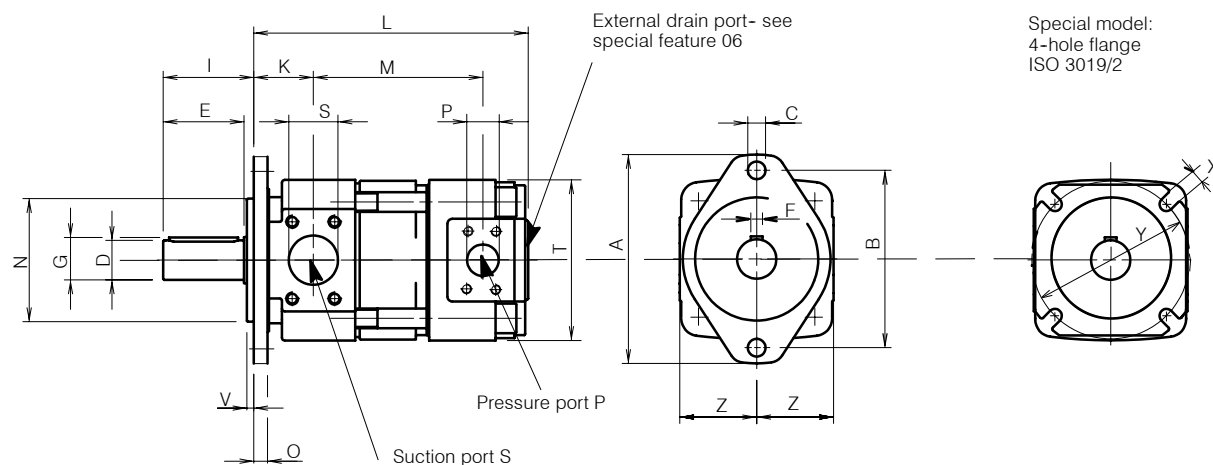
4.2 Pressure range 1



4.3 Pressure range 2



4.4 Pressure range 3



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 (ACW) = L											
Variants / special features (to be inserted by the factory, see section 4.7 for a selection)												

Ordering example:

Required: single pump
Displacement: 40cm³/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)

14 = operating temperatures to 160°C

29 = for HFB and HFC fluids, frame sizes 2 - 5

86 = for HFB and HFC fluids, frame sizes 6 + 8

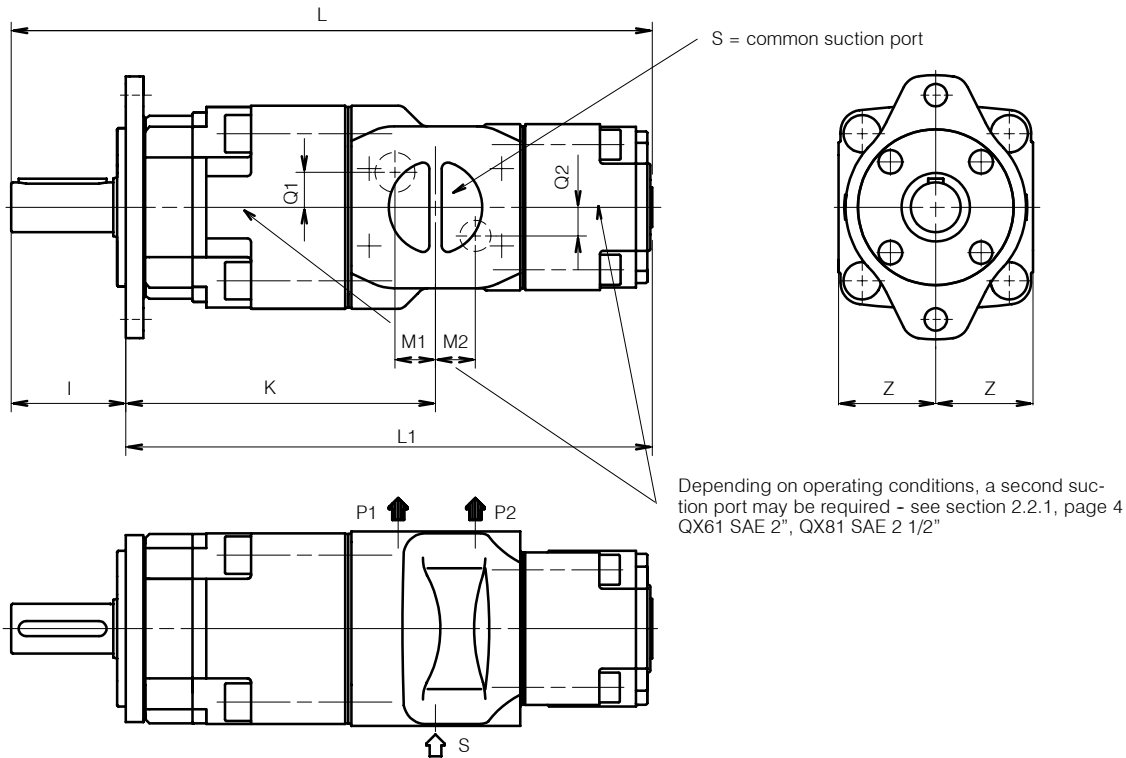
83 = second suction port on:

QX61 = SAE 2"

QX81 = SAE 2 1/2"

5.2 Dimensions

A Double pump QX.1/1



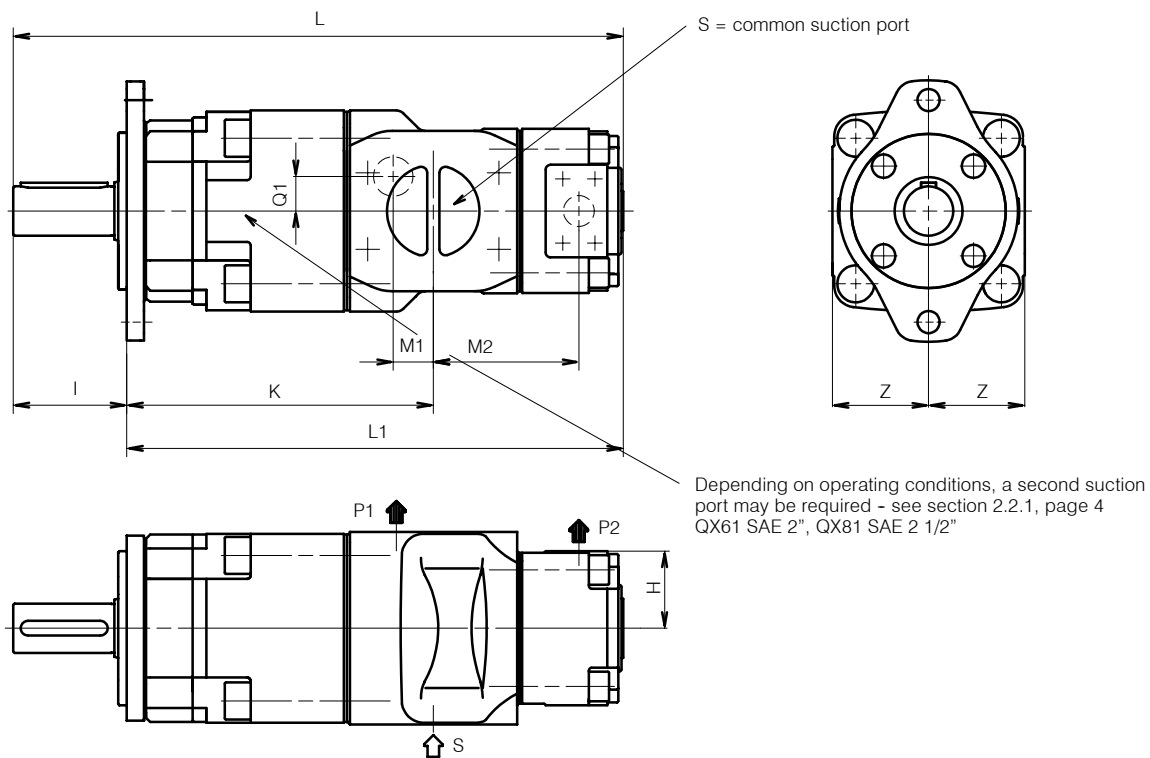
Shaft and mounting dimensions - see section 4

Type	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)	G 1/2" 1) 2)
QX31/21	343	293	171	26	30			50	60	G 1 1/2" 1)	G 3/4" 1) 2)	
QX31/31	358	308			26							G 3/4" 1) 2)
QX41/21	396	328	201	20	35	15	68	63	SAE 2"	SAE 1"	G 1/2" 1) 2)	
QX41/31	411	343			33						G 3/4" 1) 2)	
QX41/41	449	381	208	28	28	23	23	92	78	SAE 2 1/2"	SAE 1 1/4"	1" SAE
QX51/21	468	376	241	23	43	15	-					G 1/2" 1) 2)
QX51/31	483	391			39		15					G 3/4" 1) 2)
QX51/41	521	429	249	30	32	28	23					SAE 1"
QX51/51	547	455			30		28			SAE 1 1/4"		
QX61/31	541	449	287	24	47	17	14	92	98	SAE 3"	SAE 1 1/2"	G 3/4" 1) 2)
QX61/41	564	472		27	39	26	27					SAE 1"
QX61/51	601	509	292	32	40	35	28			SAE 3 1/2"		SAE 1 1/4"
QX61/61	628	536			32		35					SAE 1 1/2"
QX81/41	679	562	359	35	51	25	25	117	125	SAE 4"	SAE 2"	SAE 1"
QX81/51	705	588			47		30					SAE 1 1/4"
QX81/61	732	615		38	45	40	35			SAE 1 1/2"		
QX81/81	774	657			38		40			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

B Double pump QX.1/2



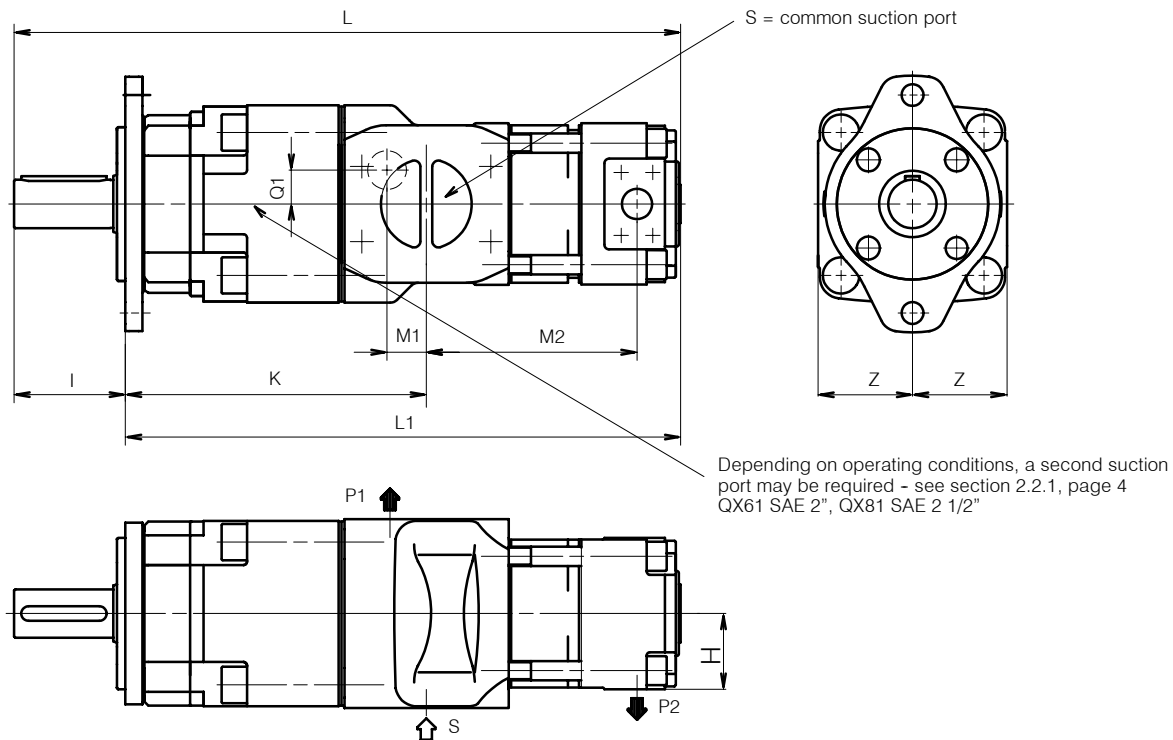
Shaft and mounting dimensions - see section 4

Type	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		G 1 1/2" 1)	G 3/4" 1) 2)		G 3/4" 1) 2)
QX31/32	338	288		87	60					G 3/4" 1) 2)			
QX41/22	378	310	201	20	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		208	28				111			23	63
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	249	30	118	28			63			SAE 3"	SAE 1"
QX51/52	515	423		127	78		SAE 1 1/4"						
QX61/32	521	429	287	24	112	17	92	98	60	SAE 1 1/2"	SAE 1 1/2"	G 3/4" 1) 2)	
QX61/42	538	446		27	123	26			63			SAE 1"	
QX61/52	569	477	292	32	137	35			78			SAE 3 1/2"	SAE 1 1/4"
QX61/62	588	496		149	98		SAE 1 1/2"						
QX81/42	653	536	359	35	141	25	117	125	63	SAE 2"	SAE 2"	SAE 1"	
QX81/52	673	556		150	78				SAE 1 1/4"				
QX81/62	692	575		38	162	40			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+3

C Double pump QX.1/3



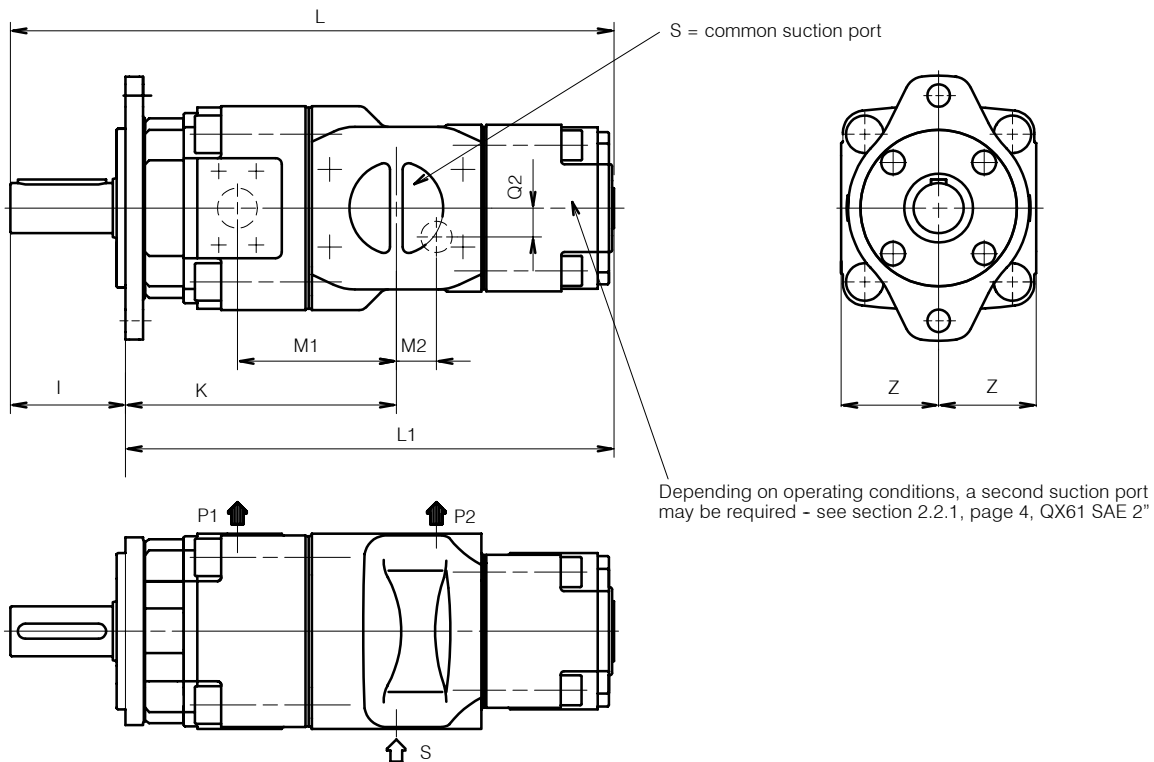
Shaft and mounting dimensions - see section 4

Type	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⁾	
QX31/33	383	333			132				G 3/4" ¹⁾ 2)			
QX41/23	413	345	201	20	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	208	28	167	23			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	63	78	SAE 3"	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 1/2"	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	78	98	SAE 3 1/2"		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 4"	SAE 2"	SAE 1"
QX81/53	743	626			220				78			SAE 1 1/4"
QX81/63	782	665		38	252	40			98			SAE 1 1/2"
QX81/83	839	722			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

D Double pump QX.2/1



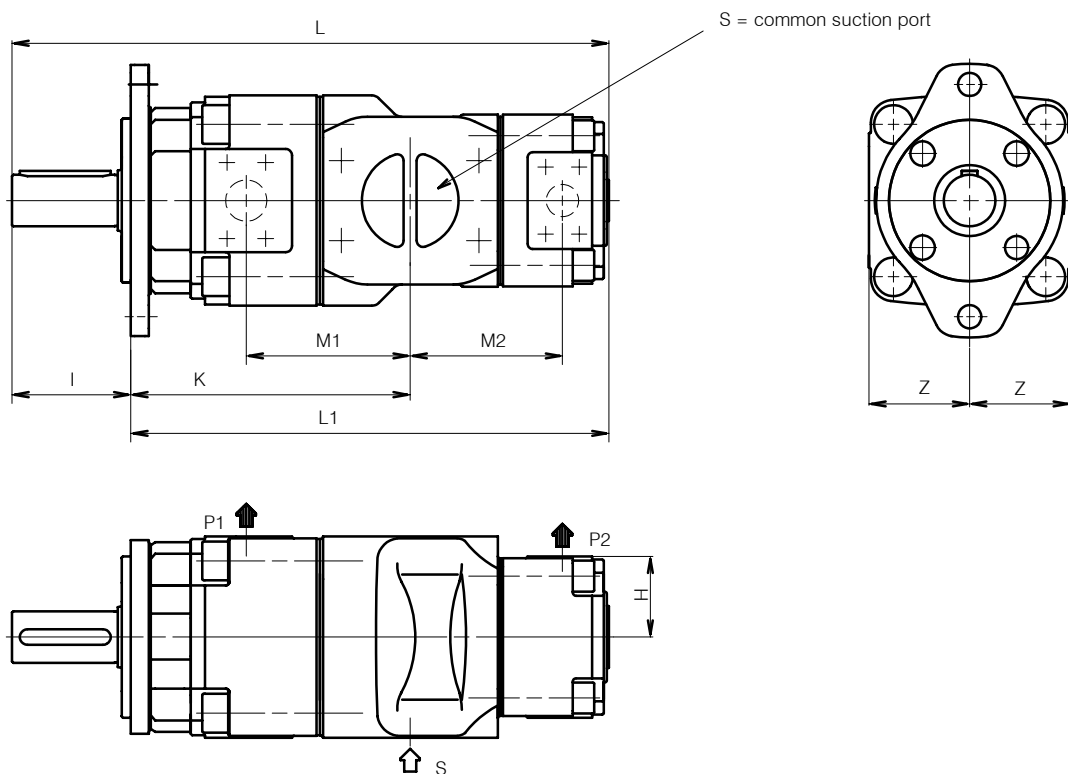
Shaft and mounting dimensions - see section 4

Type	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"	G 3/4" 1) 2)
QX42/31	385	317			33	15					G 1/2" 1) 2)
QX52/21	436	344	209	120	43	-	92	78	SAE 2 1/2"	SAE 1 1/4"	G 3/4" 1) 2)
QX52/31	451	359			39	15					SAE 1"
QX52/41	489	397	247	144	47	14	92	98	SAE 3"	SAE 1 1/2"	G 3/4" 1) 2)
QX62/31	501	409			39	27					SAE 1"
QX62/41	524	432	252	149	40	28	92	98	SAE 3 1/2"	SAE 2"	SAE 1 1/4"
QX62/51	561	469			51	25					SAE 1"
QX82/41	629	512	309	179	47	30	117	125	SAE 4"	SAE 2"	SAE 1 1/4"
QX82/51	655	538			45	35					SAE 1 1/2"
QX82/61	682	565									

1) threaded port to DIN 3852, Part 2

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

E Double pump QX.2/.2



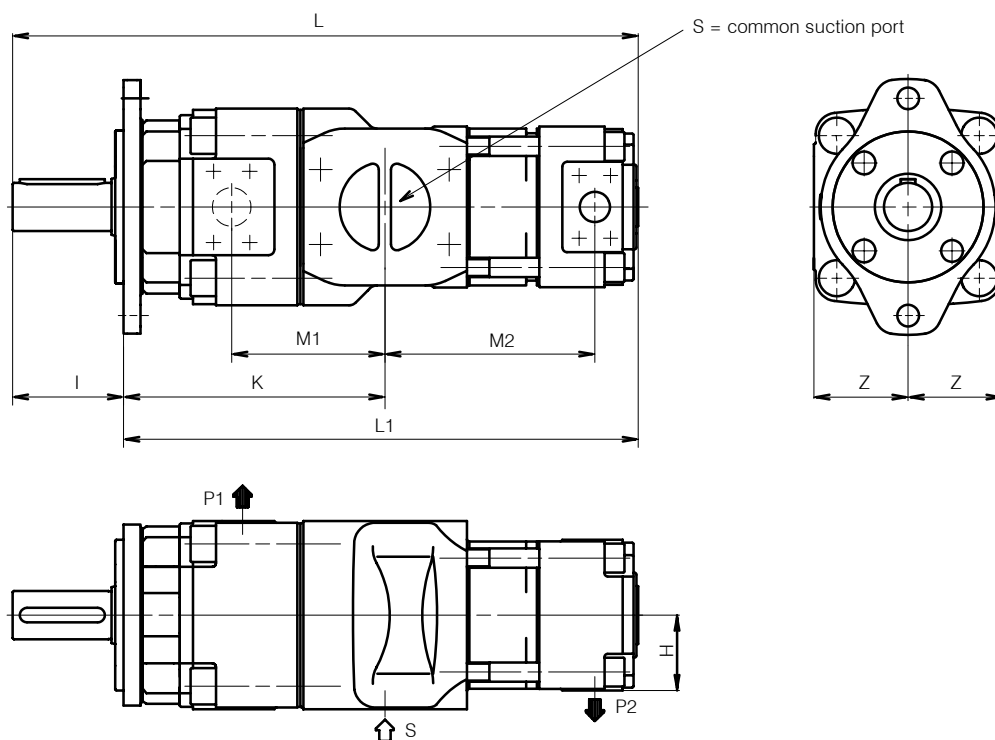
Shaft and mounting dimensions - see section 4

Type	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)		G 3/4" 1) 2)
QX32/32	318	268			87							
QX42/22	352	284	175	103	84	68	63	50			SAE 2"	
QX42/32	365	297			92			60	G 3/4" 1) 2)			
QX42/42	397	329			182			111	111	63		SAE 1"
QX52/22	418	326	209	120	92	92	78	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			78			SAE 1 1/4"	
QX62/32	481	389	247	144	112	92	98	60	SAE 3 1/2"	SAE 1 1/2"	G 3/4" 1) 2)	
QX62/42	498	406			123			63			SAE 1"	
QX62/52	529	437	252	149	137			78	SAE 3 1/2"		SAE 1 1/4"	
QX62/62	548	456			149			98			SAE 1 1/2"	
QX82/42	603	486	309	179	141	117	125	63	SAE 4"	SAE 2"	SAE 1"	
QX82/52	623	506			150			78			SAE 1 1/4"	
QX82/62	642	525			162			98			SAE 1 1/2"	
QX82/82	674	557			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+3

F Double pump QX.2/.3



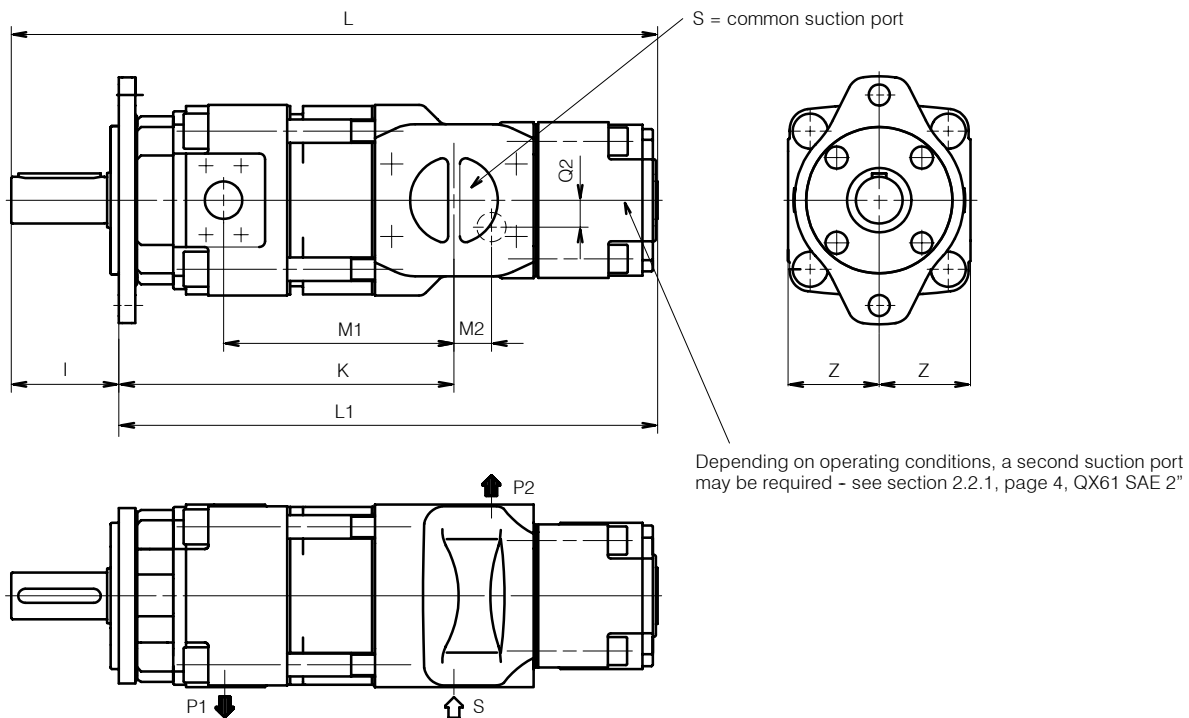
Shaft and mounting dimensions - see section 4

Type	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	60	SAE 2"	SAE 1"	G 3/4" 1) 2)
QX42/33	410	342			137			60			G 3/4" 1) 2)
QX52/23	453	361	209	120	127	92	78	50	SAE 2 1/2"	SAE 1 1/4"	G 1/2" 1) 2)
QX52/33	476	384			145			60			G 3/4" 1) 2)
QX52/43	519	427	217	127	174	92	98	63	SAE 3"	SAE 1 1/2"	SAE 1"
QX62/33	526	434	247	144	157			60			G 3/4" 1) 2)
QX62/43	554	462			179			63			SAE 1"
QX62/53	599	507	252	149	207	117	125	78	SAE 3 1/2"	SAE 2"	SAE 1 1/4"
QX82/43	659	542	309	179	197			63			SAE 1"
QX82/53	693	576			220			78			SAE 1 1/4"
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+3

G Double pump QX.3/1



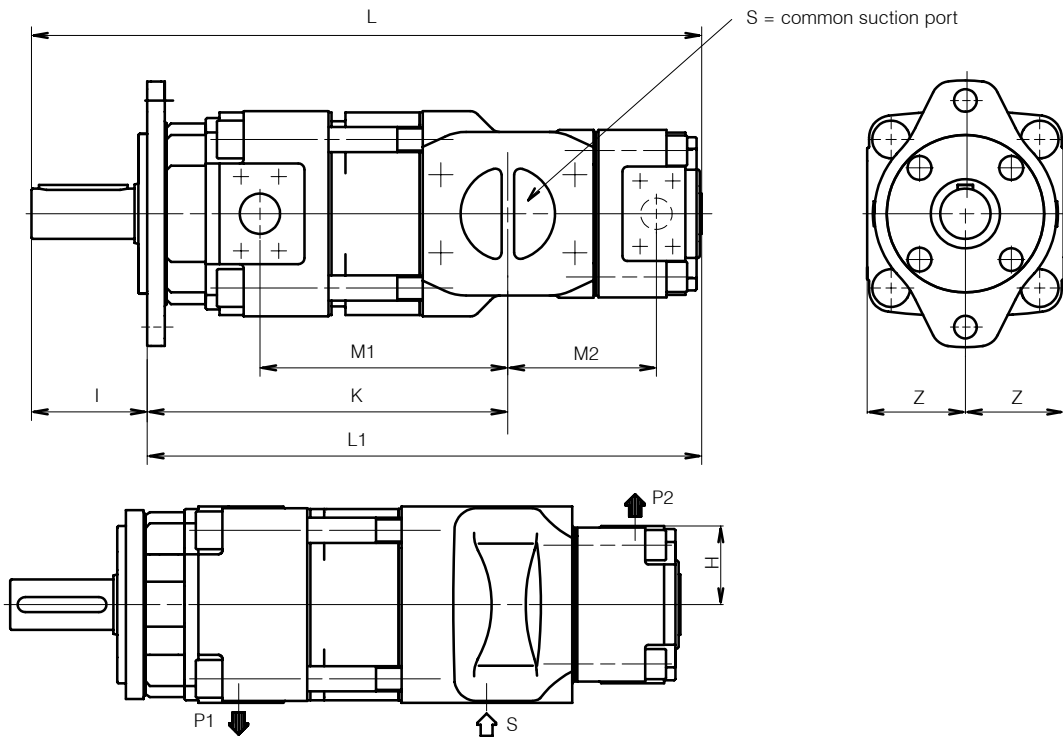
Shaft and mounting dimensions - see section 4

Type	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"	G 3/4" 1) 2)
QX43/31	441	373			33						G 3/4" 1) 2)
QX53/21	506	414	279	190	43	-	92	78	SAE 2 1/2"	SAE 1 1/4"	G 1/2" 1) 2)
QX53/31	521	429			39	15					G 3/4" 1) 2)
QX53/41	559	467	287	197	32	23	92	98	SAE 3"	SAE 1 1/2"	SAE 1"
QX63/31	591	499	337	234	47	14					G 3/4" 1) 2)
QX63/41	614	522			39	27					SAE 1"
QX63/51	651	559	342	239	40	28	117	125	SAE 3 1/2"	SAE 2"	SAE 1 1/4"
QX83/41	744	627	424	294	51	25					SAE 1"
QX83/51	770	653			47	30					SAE 1 1/4"
QX83/61	797	680			45	35			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+3

H Double pump QX.3/.2



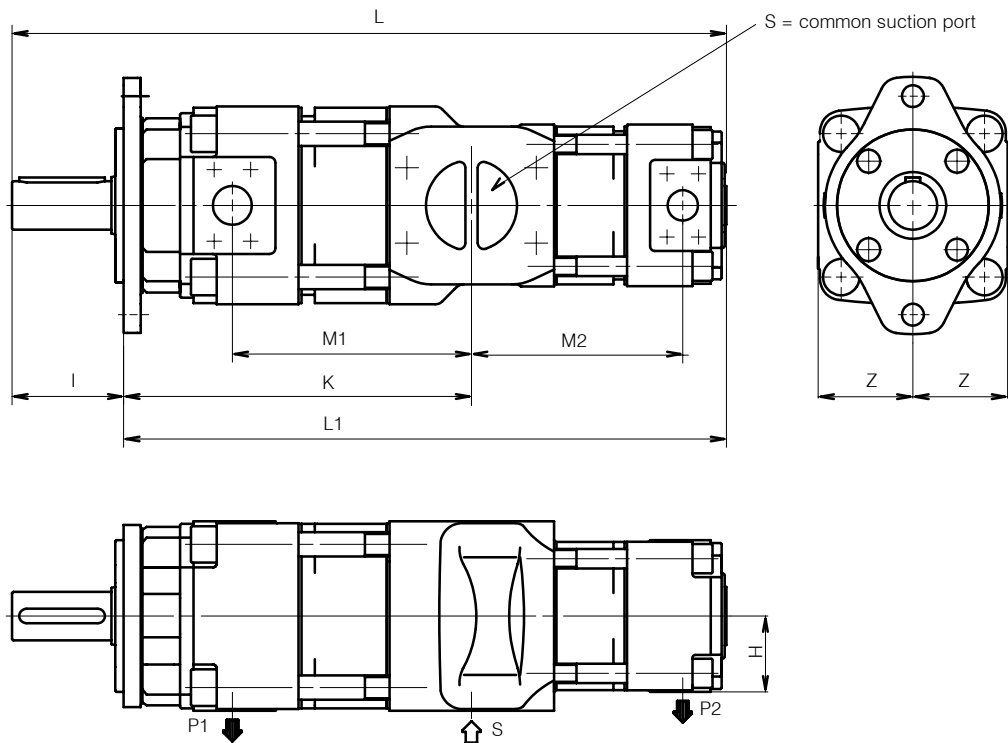
Shaft and mounting dimensions - see section 4

Type	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		G 1 1/2" 1)	G 3/4" 1) 2)		G 3/4" 1) 2)
QX33/32	363	313			87							
QX43/22	408	340	231	159	84	68	63	50			SAE 2"	
QX43/32	421	353			92			60	G 3/4" 1) 2)			
QX43/42	453	385			238			167	111	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			60			G 3/4" 1) 2)	
QX53/42	533	441	287	197	118			63	SAE 3"		SAE 1"	
QX53/52	553	461			127			78			SAE 1 1/4"	
QX63/32	571	479	337	234	112	92	98	60	SAE 3"	SAE 1 1/2"	G 3/4" 1)	
QX63/42	588	496			123			63			SAE 1"	
QX63/52	619	527	342	239	137			78	SAE 3 1/2"		SAE 1 1/4"	
QX63/62	638	546			149			98			SAE 1 1/2"	
QX83/42	718	601	424	294	141	117	125	63	SAE 3 1/2"	SAE 2"	SAE 1"	
QX83/52	738	621			150			78			SAE 1 1/4"	
QX83/62	757	640			162			98	SAE 4"		SAE 1 1/2"	
QX83/82	789	672			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+3

I Double pump QX.3/.3



Shaft and mounting dimensions - see section 4

Type	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		G 1 1/2" 1) 2)	G 3/4" 1) 2)		G 3/4" 1) 2)
QX33/33	408	358			132							
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			63	SAE 3"		SAE 1"	
QX53/53	623	531			197			78			SAE 1 1/4"	
QX63/33	616	524	337	234	157	92	98	60	SAE 3 1/2"	SAE 1 1/2"	G 3/4" 1) 2)	
QX63/43	644	552			179			63			SAE 1"	
QX63/53	689	597	342	239	207			78	SAE 3 1/2"		SAE 1 1/4"	
QX63/63	728	636			239			98			SAE 1 1/2"	
QX83/43	774	657	424	294	197	117	125	63	SAE 2"	SAE 2"	SAE 1"	
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 (ACW) = L																		
Variants / special features (to be inserted by the factory, see section 5.7 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

All of the triple pump combinations that can be supplied are listed in the following table. 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

QX2.	QX3.	Frame size of Pump 1		QX6.	QX8.
		QX4.	QX5.		
QX21/21/2.	QX31/31/3.	QX41/41/4.	QX51/51/5.	QX61/61/6.	QX81/81/8.
QX21/22/22	QX31/32/32	QX41/42/42	QX51/52/52	QX61/62/62	QX81/82/82
QX21/22/23	QX31/32/33	QX41/42/43	QX51/52/53	QX61/62/63	QX81/82/83
QX22/22/22	QX32/32/32	QX42/42/42	QX52/52/52	QX62/62/62	QX82/82/82
QX22/22/23	QX32/32/33	QX42/42/43	QX52/52/53	QX62/62/63	QX82/82/83
QX2./23/23	QX3./33/33	QX4./43/43	QX5./53/53	QX6./63/63	QX8./83/83
	QX31/3./2.	QX41/4./3.	QX51/5./4.	QX61/6./5.	QX81/8./6.
	QX32/32/2.	QX42/42/3.	QX52/52/4.	QX62/62/5.	QX82/82/6.
	QX3./33/2.	QX4./43/3.	QX5./53/4.	QX6./63/5.	QX8./83/6.
	QX3./21/2.	QX41/4./2.	QX51/5./3.	QX61/6./4.	QX81/8./5.
	QX3./22/22	QX42/42/2.	QX52/52/3.	QX62/62/4.	QX82/82/5.
	QX3./22/23	QX4./43/2.	QX5./53/3.	QX6./63/4.	QX8./83/5.
	QX3./23/23	QX4./31/3.	QX51/5./2.*	QX61/6./3.	QX81/8./4.
		QX4./32/32	QX52/52/2.	QX62/62/3.	QX82/82/4.
		QX4./32/33	QX5./53/2.	QX6./63/3.	QX8./83/4.
		QX4./33/33	QX5./41/4.	QX6./51/5.	QX8./61/6.
		QX4./21/2.	QX5./42/42	QX6./52/52	QX8./62/62
		QX4./22/22	QX5./42/43	QX6./52/53	QX8./62/63
		QX4./22/23	QX5./43/43	QX6./53/53	QX8./63/63
		QX4./23/23	QX5./4./2.	QX6./5./3.	QX8./6./4.
			QX5./31/3.	QX6./5./2.	QX8./6./3.
			QX5./32/32	QX6./41/4.	QX8./51/5.
			QX5./32/33	QX6./42/42	QX8./52/52
			QX5./33/33	QX6./42/43	QX8./52/53
			QX5./21/2.	QX6./43/43	QX8./53/53
			QX5./22/22	QX6./4./2.	QX8./5./3.
			QX5./22/23	QX6./31/3.	QX8./5./2.
			QX5./23/23	QX6./32/32	QX8./41/4.
				QX6./32/33	QX8./42/42
				QX6./33/33	QX8./42/43
					QX8./43/43
					QX8./4./2.
65	130	260	520	1050	2100

Maximum permissible drive shaft torque in Nm

In the above type codes, any dots (.) can be replaced by the pressure range 1, 2 or 3.

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

7 Pressure-holding pumps

7.1 Generals

The QX high pressure 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 displacements of 3 and 4 cm³/rev, it extends the low-flow capability of the QX range.

Advantages:

- High pressures
- Low noise level
- Long service life
- Negligible flow- and pressure-pulsations
- Insensitive to contamination of the fluid

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
Viscosity range	20 ... 300 mm ² /s (for values outside this range, consult 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	Flow rate ¹⁾	Maximum speed	Type	Mineral oil to DIN 51524 Cont./Max. interm. pressure ²⁾	HFC to VDMA 24317 interm. pressure ²⁾	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	QX24-005	320 / 400	280 / 350	21	3.2

This operating data is valid for hydraulic oils as well as fire-resistant and environmentally-friendly fluids with a viscosity of 42 mm²/s

3) at speed n = 1450 rpm (theoretical)

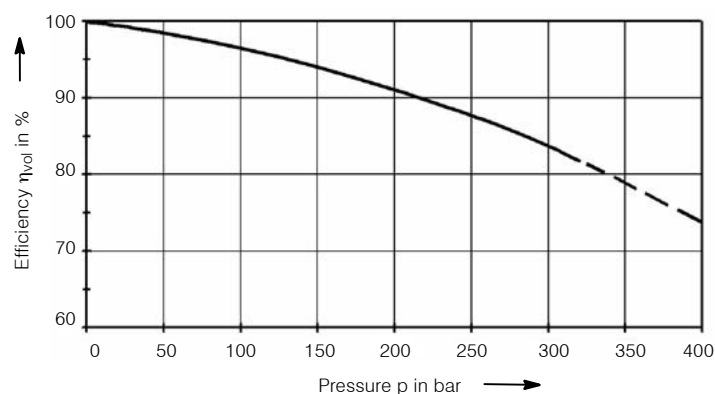
4) maximum intermittent pressure for max. 20 sec. but not more than 10% of the duty cycle

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

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

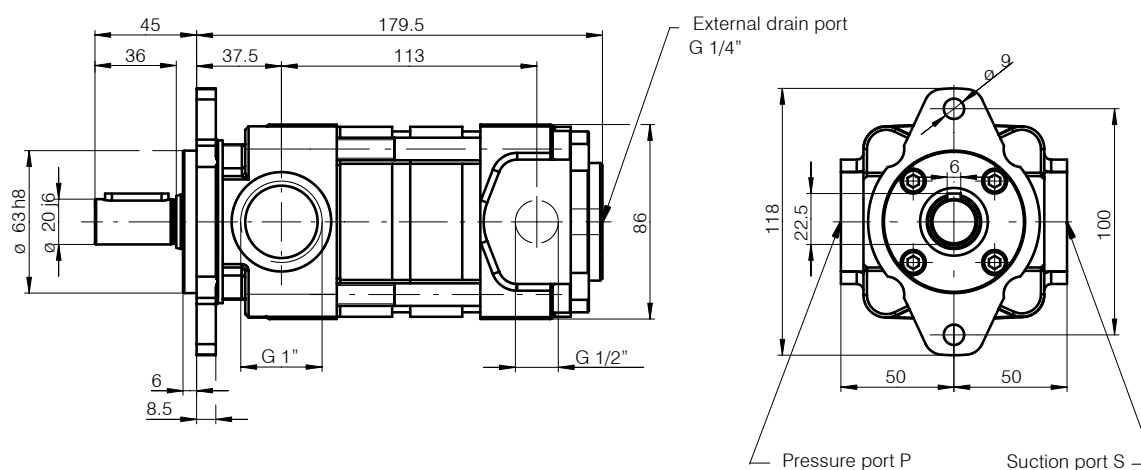
7.4 Efficiency

Measured at speed $n = 1450 \text{ rpm}$
Viscosity $42 \text{ mm}^2/\text{s}$



7.5 Single pump

7.5.1 Dimensions



7.5.2 Ordering code

		Q X 2 4 - 0 0 4 R * *									
Series	= QX										
Size	= 2										
Pressure range	= 4										
Displacement in cm ³ /rev	= 003 and 004										
Direction of rotation	right = R left = L										
Variants / special features (to be inserted by the factory, see section 7.5.4 for a selection)											

Ordering example:

Required: Double pump

Pump 1

Displacement: 40 cm³/rev
Continuous pressure: 160 bar
Type: 41 - 040

Pump 2

Displacement: 4 cm³/rev
Continuous pressure: 250 bar
Type: 24 - 003

For use with mineral oil:

Ordering code: QX41-040/24-004R 324

8 Fluid cleanliness

QX pumps require fluid with a minimum cleanliness level of NAS 1638, Class 9 or ISO 4406, code 20/18/15. This can be achieved with a filter ratio of $\beta_{10} \geq 100$.

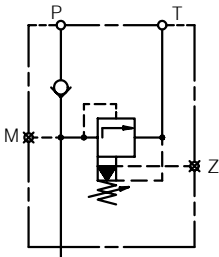
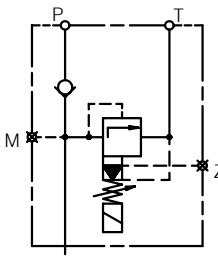
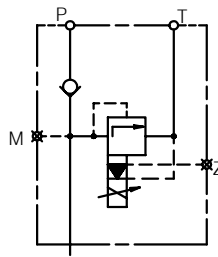
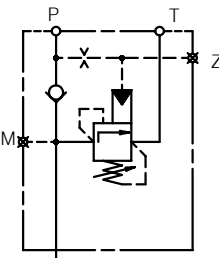
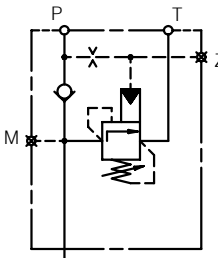
HLP hydraulic oils to DIN 51524, Part 2, can be used without any special restriction as long as they remain within the specified temperature and viscosity ranges. HFC fire-resistant fluids to DIN 51502 can be used with the QR, QT, QX and QXM series. Note that all fire-resistant fluids require special 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 $\geq 30 \text{ N/mm}^2$ to Brügger 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 system are fulfilled. If you have any doubts or questions concerning the use of these pumps, please consult Bucher Hydraulics.

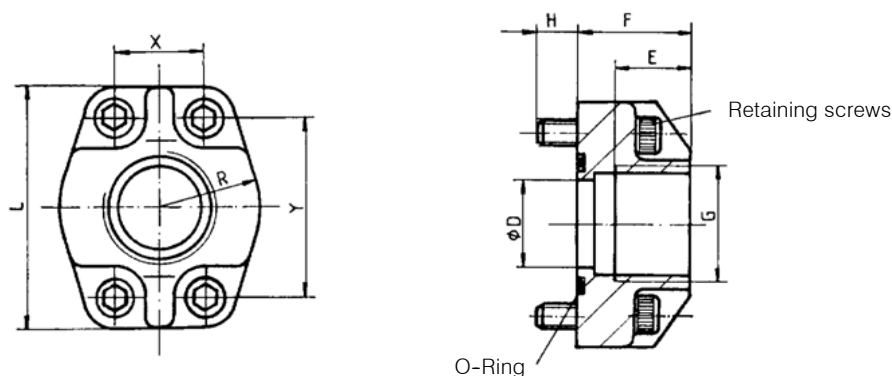
10 Accessories

10.1 Bolt-on valves - SAE 3000 pattern

Ordering details	Pressure relief $A \frac{S}{G} DF / A \frac{S}{G} DH$	Pressure relief solenoid control $A \frac{S}{G} DA / ASDM$	Pressure relief proportional solenoid control $A \frac{S}{G} DP$
Symbols			
Ordering details	Unloading valve $A \frac{S}{G} AF$	Accumulator charging valve $A \frac{S}{G} SF$	S = for pipe flange SAE 3000 pattern R = with threaded port
Symbols			

10.2 Pipe flange - high pressure type for up to 420 bar - SAE 3000 pattern

Dimensions



Threaded pipe flanges are spot-faced for DIN 2353 pipe fittings

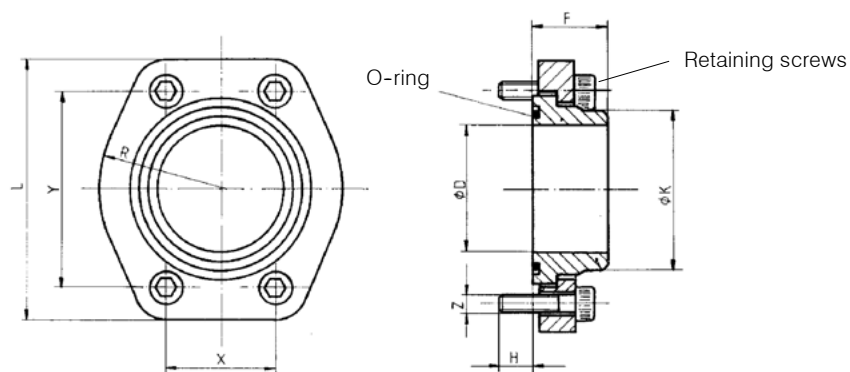
Material: ST37
For Viton seals, contact
Bucher Hydraulics

Ordering number	Ordering code	Size	DØ	E	F	H	L	R	X	Y	O-ring 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	M 8x30	30
037010	RF 02-R10	G 3/4"	20	18	30	12	65	26	22,2	47,6	26,65x2,62	M 10x30	60
037020	RF 03-R11	G 1"	25	20	34	13	70	29	26,2	52,4	32,99x2,62	M 10x35	60
037030	RF 04-R12	G 1 1/4"	32	22	38	14	80	36	30,2	58,6	40,86x3,53	M 10x40	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 for up to 16 bar - SAE 3000 pattern

Dimensions



Material: ST37

For Viton seals, contact Bucher Hydraulics

Ordering number	Ordering code	SAE flange Size	D	K	F	H	L	R	X	Y	O-ring 90 Shore 'A'	Retaining screws DIN 912-8.8	Torque Nm	pipe ¹⁾ O/dia.approx.
062450	RF 07-S	2 1/2"	63	75	35	14	120	57	51	89	69,44x3,53	M 12x30	70	75
063880	RN 08-S	3"	76	88			140,5	68	62	106,5	85,32x3,53	M 16x30	180	88
063890	RN 09-S	3 1/2"	89	100	40	19	158,5	73	70	120,3	98,02x3,53	M 16x40	180	100
063900	RN 10-S	4"	103	115			168	79	78	130	110,72x3,53	M 16x40	180	115

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

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We reserve the right of modification without prior notice.