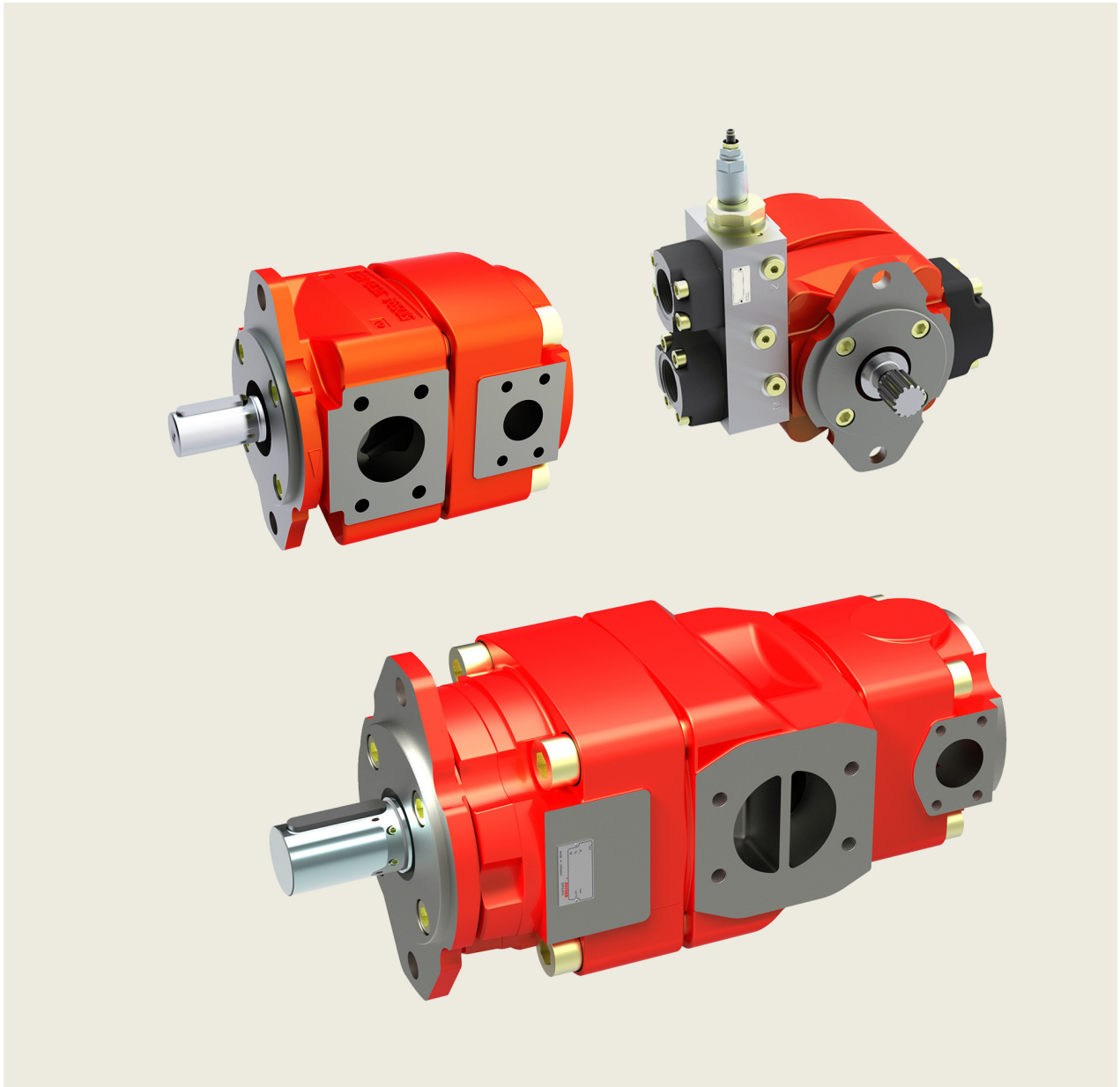


Internal Gear Pumps

Series QX



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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 ring gear is supported by a hydrodynamic/ hydrostatic lubrication 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 flow rates.

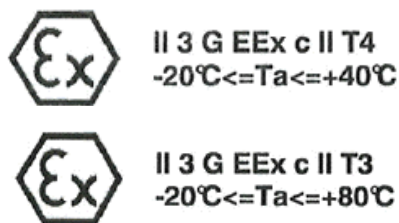
1.3 ATEX compliant explosion protection

The internal gear pumps QX are suitable for application in hazardous areas and complies with the following guidelines:

ATEX directive	2014/34/EU
group	II
equipment category	3
atmosphere	G
temperature class	T3 and T4

1.2 Advantages

- extremely long service life
- volumetric efficiency up to 98%
- suitable for use with variable speed drivers
- can be used with fire resistant fluids (HFB, HFC and HFD), fuels, biodegradable and low-viscosity fluids
- certifications by ATEX 2, ABS, DNV, GL, LR, NK, ...
- low flow and pressure pulsations



2 Technical data

2.1 General (deviating values according manufacturer's specification)

General characteristics	Unit	Description, value
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		CW alternatively CCW (but not reversible)
Pump drive method		in-line, through a flexible coupling
Volumetric efficiency η_v		up to 98%
Fluids		HLP mineral oils to DIN 51524, Part 2, HFC fluids to VDMA 24317
Maximum admissible level of contamination of the hydraulic fluid		ISO 4406 code 20/18/15
Operating viscosity	S.U.S	50 ... 750 *
Starting viscosity		50 ... 1500 * *other values on request
Fluid temperature range	°F	HLP-mineral oils min. -4 / max. +176 (considering viscosity field) HFC max. +122.
Inlet pressure	maximum minimum	PSI 21.75 absolute (without external drain connection) 7.25-14.21 absolute (dependent on pump frame size and speed. (see example in section 3.3.2)
Startup against pressure	PSI	maximum 290, for higher values contact Bucher Hydraulics GmbH
Seal material	PSI	NBR = standard, FKM (Viton) = option 09

IMPORTANT: The main characteristics are valid for hydraulic oils DIN 51524 with a viscosity of 20 ... 50 mm²/s. The operating pressure at the pump outlet side is specified also for fire-resistant and environment friendly fluids (HFC).

2.2 Main characteristics for pressure range 1

Displacement		Flow rate	Maximum speed	Code	Max. operating pressure at the pump outlet side				Torque	Input power
effective		1450 rpm p = 0 PSI			Continuous [PSI]		Intermittent [PSI] ²⁾			
[cm ³ /rev][in ³ /rev] ₁₎	[GPM] (US)	[rpm]			Mineral oil	HFC	Mineral oil	HFC	[lb-in] ³⁾	[HP] ⁴⁾
10,3 (0.63)	4,62	3600	QX21-010	2320	1885	3045	2610	230	5.4	
12.6 (0.77)	5,82	3600	QX21-012	1813	1450	2320	1958	221	5.1	
15.9 (0.97)	7,35	3600	QX21-016	1450	1160	1813	1450	221	5.2	
20.0 (1.22)	9,25	3000	QX31-020	2320	1885	3045	2610	451	10.3	
25.3 (1.54)	11,70	3000	QX31-025	1813	1450	2320	1958	443	10.3	
31.2 (1.90)	14,42	3000	QX31-032	1450	1160	1813	1450	443	10.1	
40.7 (2.48)	18,82	3000	QX41-040	2320	1885	3045	2610	921	21.0	
50.3 (3.07)	23,25	2600	QX41-050	1813	1450	2320	1958	885	20.7	
64.7 (3.95)	29,92	2300	QX41-063	1450	1160	1813	1450	912	20.9	
78.6 (4.80)	36,34	2300	QX51-080	2320	1885	3045	2610	1770	40.7	
101.1 (6.17)	46,74	2100	QX51-100	1813	1450	2320	1958	1779	40.9	
127.3 (7.77)	58,85	1800 ⁵⁾	QX51-125	1450	1160	1813	1450	1767	41.3	
160.5 (9.80)	74,20	1800 ⁶⁾	QX61-160	2320	1885	3045	2610	3620	83.0	
202.1 (12.33)	93,43	1800 ⁶⁾	QX61-200	1813	1450	2320	1958	3558	81.7	
249.7 (15.24)	115,44	1800 ⁶⁾	QX61-250	1450	1160	1813	1450	3514	80.9	
326.0 (19.89)	150,97	1750 ⁶⁾	QX81-315	2320	1885	3045	2610	7346	168.8	
402.6 (24.57)	186,12	1750 ⁶⁾	QX81-400	1813	1450	2320	1958	7090	162.9	
498.5 (30.42)	158,03	1750 ⁶⁾	QX81-500	1450	1160	1813	1450	7019	161.5	

1) Due to manufacturing tolerances, there may be slight variations in the displacement.

2) maximum 20 second 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 < 1450 rpm. the minimum permissible inlet pressure is 13.77 PSI absolute. For HFC application a second suction port may be required

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

2.2.1 Suction arrangements for pump types QX61 and QX81

IMPORTANT: Minimum inlet pressure is 0.95 bar absolute with viscosity 1... 100 mm²/s (other values on request)

	Speed 1500 rpm Suction height		Speed 1800 rpm Suction height	
	up to 5.9 in	over 5.9 in	up to 59 in	over 59 in
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

Displacement		Flow rate	Maximum speed	Code	Max. operating pressure at the pump outlet side				Torque	Input power
effective		1450 rpm p = 0 PSI			Continuous [PSI]		Intermittent [PSI] ²⁾			
[cm ³ /rev][in ³ /rev] ¹⁾		[GPM] (US)	[rpm]		Mineral oil	HFC	Mineral oil	HFC	[lb-in] ³⁾	[HP] ⁴⁾
5.1	(0.31)	2,35	3600	QX22-005					150	3.5
6.3	(0.38)	2.91	3600	QX22-006	3045	2610	3625	3045	186	4.3
8.0	(0.49)	3.70	3600	QX22-008					239	5.4
10.0	(0.61)	4,62	3400	QX32-010					301	6.8
12.6	(0.77)	5,82	3400	QX32-012	3045	2610	3625	3045	372	8.6
15.6	(0.95)	7,21	3400	QX32-016					460	10.6
20.4	(1.24)	9,43	3200	QX42-020					602	13.9
25.1	(1.53)	11,6	3200	QX42-025	3045	2610	3625	3045	743	17.0
32.4	(1.98)	14,98	3200	QX42-032					956	22.1
39.3	(2.40)	18,17	2800	QX52-040					1168	26.7
50.6	(3.09)	23,39	2800	QX52-050	3045	2610	3625	3045	1505	34.4
63.7	(3.89)	29,45	2800	QX52-063					1885	43.3
80.2	(4.89)	37,08	2500 ⁷⁾	QX62-080					2372	54.5
101.0	(6.16)	46,69	2300 ⁷⁾	QX62-100	3045	2610	3625	3045	2992	68.6
124.8	(7.62)	57,70	2000 ⁷⁾	QX62-125					3631	85.0
163.0	(9.95)	75,36	1800 ⁷⁾	QX82-160					4815	110.8
201.3	(12.28)	93,06	1750 ⁷⁾	QX82-200	3045	2610	3625	3045	5948	136.8
249.2	(15.21)	79,00	1500 ⁷⁾	QX82-250					7373	169.5

2.4 Main characteristics for pressure range 3

Displacement		Flow rate	Maximum speed	Code	Max. operating pressure at the pump outlet side				Torque	Input power
effective		1450 rpm p = 0 PSI			Continuous [PSI]		Intermittent [PSI] ²⁾			
[cm ³ /rev][in ³ /rev] ¹⁾		[GPM] (US)	[rpm]		Mineral oil	HFC	Mineral oil	HFC	[lb-in] ³⁾	[HP] ⁴⁾
5.1	(0.31)	1.96		QX23-005					230	5.7
6.3	(0.38)	2.40	3600	QX23-006	4640	4060	5800	5075	283	6.6
8.0	(0.49)	3.04		QX23-008					363	8.3
10.0	(0.61)	4,62		QX33-010					451	10.3
12.6	(0.77)	5,82	3400	QX33-012	4640	4060	5800	5075	566	13.0
15.6	(0.95)	7,21		QX33-016					708	16.2
20.4	(1.24)	9,43		QX43-020					921	21.2
25.1	(1.53)	11,6	3200	QX43-025	4640	4060	5800	5075	1133	26.0
32.4	(1.98)	14,98		QX43-032					1460	33.5
39.3	(2.40)	18,17		QX53-040					1770	40.7
50.6	(3.09)	23,39	2800	QX53-050	4640	4060	5800	5075	2284	52.4
63.7	(3.89)	29,45		QX53-063					2841	66.0
80.20	(4.89)	37,08	2500 ⁵⁾	QX63-080					3620	83.1
101.0	(6.16)	46,69	2300 ⁵⁾	QX63-100	4640	4060	5800	5075	4549	104.7
124.8	(7.62)	57,70	2000 ⁵⁾	QX63-125					5629	129.3
163.0	(9.95)	75,36	1800 ⁵⁾	QX83-160					7346	168.8
201.3	(12.28)	93,06	1750 ⁵⁾	QX83-200	4640	4060	5800	5075	9072	208.6
249.2	(15.21)	79,00	1500 ⁵⁾	QX83-250					11241	258.2

1) Due to manufacturing tolerances, there may be slight variations in the displacement.

2) maximum 20 second 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 < 1450 rpm. the minimum permissible inlet pressure is 13.77 PSI absolute.

2.5 Main characteristics for pressure range 4

Displacement		Flow rate	Maximum speed	Code	Max. operating pressure at the pump outlet side				Torque	Input power		
effective		1450 rpm p = 0 PSI			Continuous [PSI]		Intermittent [PSI] ²⁾					
[cm ³ /rev][in ³ /rev] ¹⁾	[GPM] (US)	[rpm]			Mineral oil	HFC	Mineral oil	HFC	[lb-in] ³⁾	[HP] ⁴⁾		
3,3 (0.31)	1.27	3600	QX24-003	4640	4060	5800	5075	150	3,5			
4,2 (0.26)	1,64									QX24-004	186	4,3
5,1 (0.20)	1.96	3600	QX24-005	4640	4060	5800	5075	257	5.9			
6.3 (0.38)	2.40									QX24-006	319	7,4
8.0 (0.49)	3.04									QX24-008	407	9,4
10.0 (0.61)	4.62	3400	QX34-010	4640	4060	5800	5075	504	11,7			
12.6 (0.77)	5.82									QX34-012	637	14,8
15.6 (0.95)	7,21									QX34-016	788	18,2
20.4 (1.24)	9,43	3200	QX44-020	4640	4060	5800	5075	1036	23,7			
25.1 (1.53)	11,6									QX44-025	1275	29,2
32.4 (1.98)	14,98									QX44-032	1646	37,8
39.3 (2.40)	18,17	2800	QX54-040	4640	4060	5800	5075	1885	43,3			
50.6 (3.09)	23,39									QX54-050	2425	55,8
63.7 (3.89)	29,45									QX54-063	3054	70,1
80.2 (4.89)	37,08	2500 ⁵⁾	QX64-080	4640	4060	5800	5075	3726	85,8			
101.0 (6.16)	46,69	2300 ⁵⁾								QX64-100	4691	108,0
124.8 (7.62)	57,70	2000 ⁵⁾								QX64-125	5797	133,4
163.0 (9.95)	75,36	1800 ⁵⁾	QX84-160	4640	4060	5800	5075	7576	174,3			
201.3 (12.28)	93,06	1750 ⁵⁾								QX84-200	9355	215,2
249.2 (15.21)	79,00	1500 ⁵⁾								QX84-250	11586	266,5

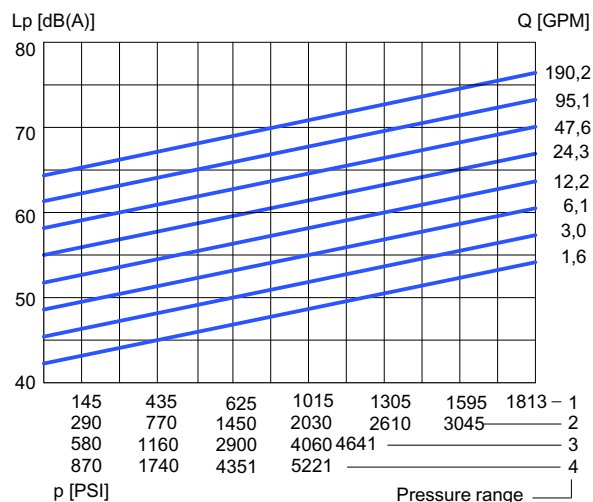
- 1) Due to manufacturing tolerances, there may be slight variations in the displacement.
- 2) maximum 20 second and not more than 10% of the duty cycle
- 3) theoretical value at the max. permitted continuous pressure for mineral oil
- 4) theoretical value at the max. permitted continuous pressure for mineral oil at n = 1450 rpm
- 5) for speeds < 1450 rpm. the minimum permissible inlet pressure is 13.77 PSI absolute.

3 Performance graphs

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

3.1 Noise level (Lp)

measured to DIN 45635. Part 26. in Stuttgart University's low-echo noise measurement chamber;
measurement distance 1 m; speed n = 1500 rpm; viscosity = 210 S.U.S



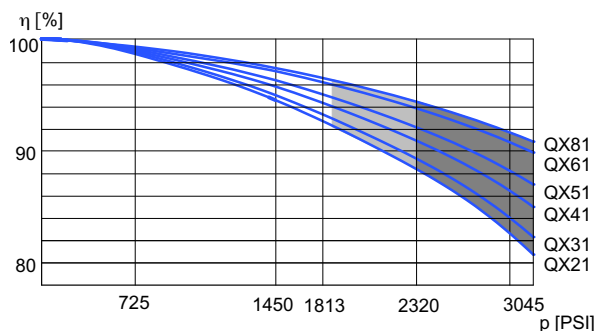
* Max. continuous operating pressure for pressure range 4 see section 2.5

3.2 Efficiency (η)

measured at speed 1450 rpm, viscosity 210 S.U.S

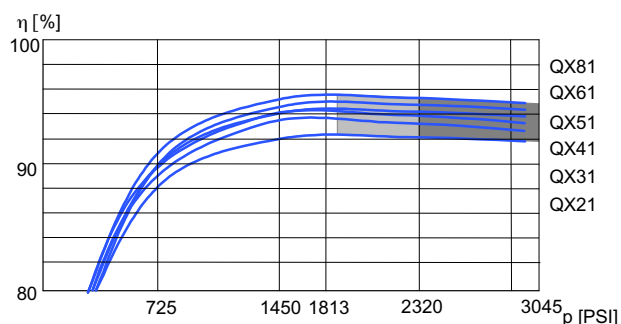
3.2.1 Pressure range 1

3.2.1.1 Volumetric efficiency



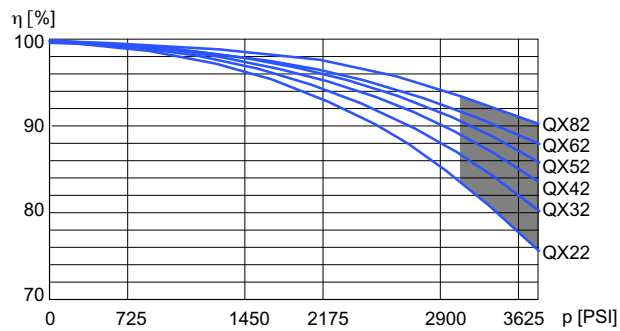
intermittent operating pressure as a function of displacement (see section 2.2)

3.2.1.2 Hydromechanical efficiency



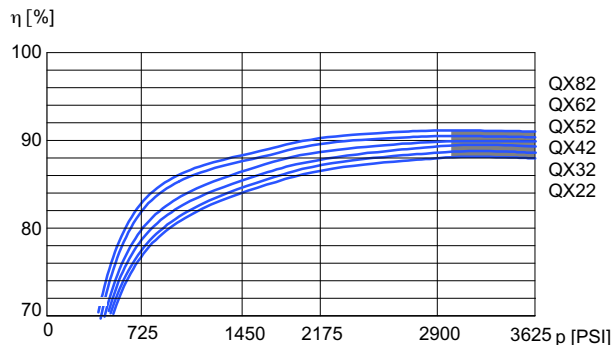
3.2.2 Pressure range 2

3.2.2.1 Volumetric efficiency



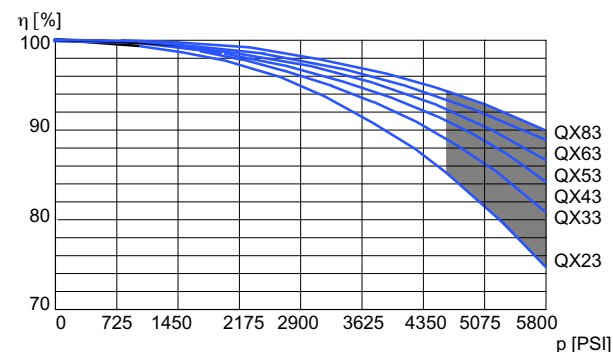
intermittent operating pressure

3.2.2.2 Hydromechanical efficiency



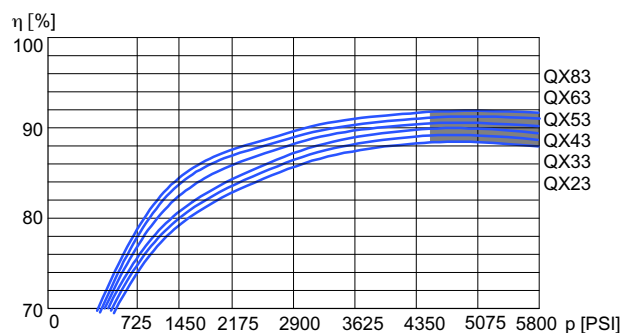
3.2.3 Pressure range 3

3.2.3.1 Volumetric efficiency



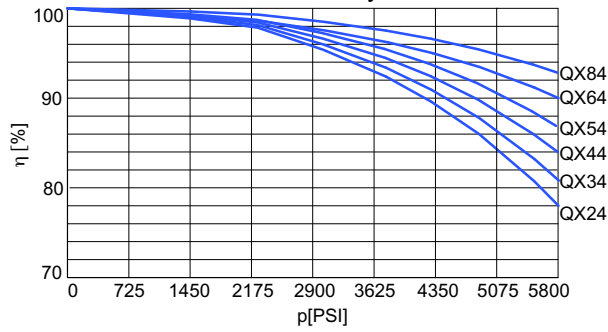
intermittent operating pressure

3.2.3.2 Hydromechanical efficiency

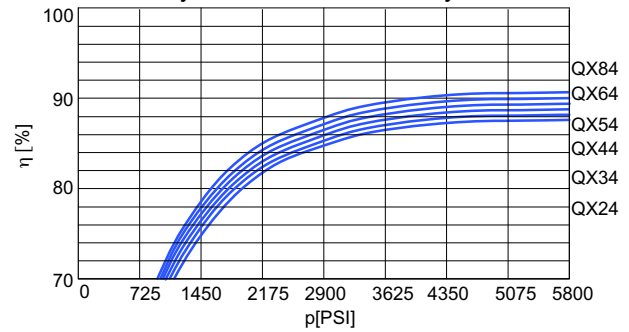


3.2.4 Pressure range 4

3.2.4.1 Volumetric efficiency



3.2.4.2 Hydromechanical efficiency

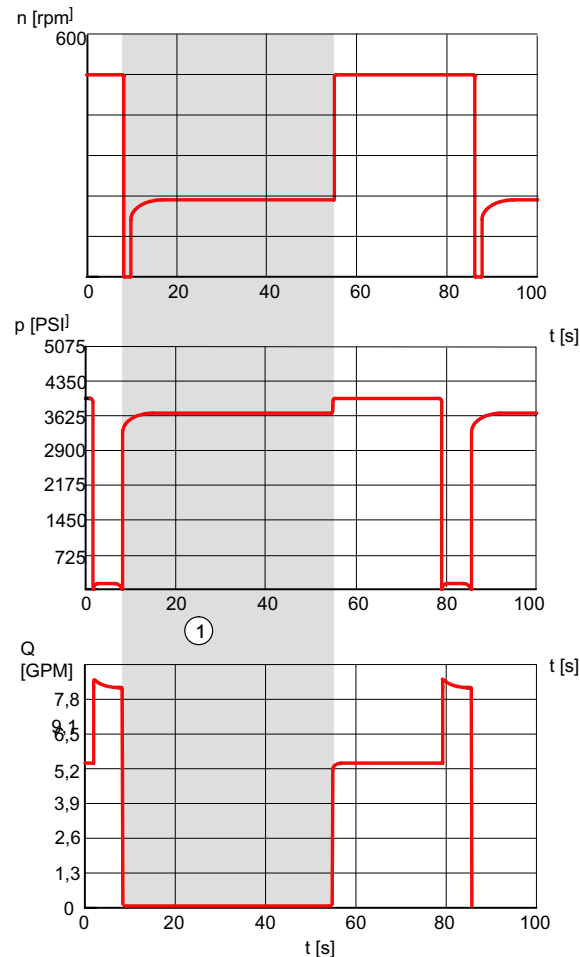


3.3 Operation with variable-speed drives

IMPORTANT: The following main characteristics are to be understood as examples only. They are valid only for the specified pump models and parameters. We would be very happy to advise you on the layout of your drive. QX pumps with variable-speed drive all contain an external drain port.

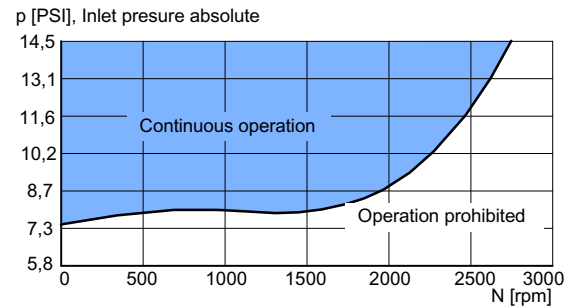
3.3.1 Typical loading cycle for a QX pump with variable-speed drive

Pump QX53-063 measured: with viscosity 210 S.U.S



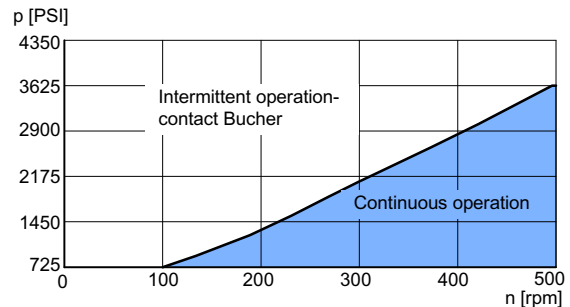
3.3.2 Minimum speed as a function of pressure

Pump QX53-063 measured: with viscosity 210 S.U.S



3.3.3 Minimum pressure at suction port as a function of speed

Pump QX53-063 measured with viscosity 42 mm²/s



1 pressure-holding operation
Q = 0 GPM for up to 60 s

4 Single pumps

4.1 Dimensions [inch] frame size 2 - 4

Frame size		2				3				4			
Pressure range		1	2	3	4 ⁵⁾	1	2	3	4	1	2	3	4
Suction port: to SAE J518 ¹⁾	S	G1" ³⁾ thread				G1 ¼" ³⁾ thread				1½"			
Pressure port: to SAE J518 ¹⁾	P	G ½" ³⁾ 4) thread				G ¾" ³⁾ 4) thread				1"			
External drain port (option 06) pressure range 1-3 optional pressure range 4 standard	①	G ¼"				G ¼"				G ¼" G ¼" G ¼"			
Mounting: oval 2-hole flange to ISO 3019/1 (SAE) ISO 3019/2 (metric)	A	7,15				5,20				6,70			
	B (SAE)	-				4,17				5,75			
	B (Metr.)	3,93				4,29				5,51			
	C	0,35				0,43				0,55			
	N (SAE)	-				3,25 -0,002				4 -0,002			
	N (Metr.)	2,48 (h8)				3,15 (h8)				3,93 (h8)			
	O	0,33				0,33				0,41			
4-hole flange ISO 3019/2	X (Metr.)	0,35				0,35				0,47			
	Y (Metr.)	3,35				4,06				4,92			
Shaft end: parallel, to ISO/R775 ²⁾	D	0,79 (j6)				0,98 (j6)				1,26 (j6)			
	E	1,42				1,65				2,28			
	F	0,24				0,31				0,39			
	G	0,89				1,10				1,38			
	I	1,77				1,97				2,68			
Housing	K	1,49				1,73				2,04			
	L	5,4	4,6	6,0	7,5	6,5	5,7	7,4	9,1	7,9	6,9	9,1	11,2
	M	-	2,2	3,4	4,9	-	2,7	4,5	6,3	-	3,4	5,6	7,8
	T1	1,69				2,12				2,63			
	T2	1,69				2,12	2,36			2,63	2,75		
	Z	3,93				4,72				4,92			
	W	3,15				3,93				5,35			
Weight	lbs	13,2	13,2	15,4	17,6	22	22	28,7	33,1	44,1	39,7	48,5	59,5

- 1) Pipe flange dimensions, SAEJ518 code 61 / ISO 6162-1
High pressure type up to 6090 PSI (see section 12.2)
Low pressure type for up to 232 PSI (see section 12.3)
- 2) For other shaft ends. contact Bucher Hydraulics GmbH
- 3) Threaded port to DIN 3852. Part 2
- 4) Pressure port to SAEJ518 code 61 / ISO 6162-1 can be supplied for pressure ranges 2+3.
- 5) The dimensions are not valid for low-flow capability pumps (3,3 cm³/U and 4,2 cm³/U, see chapter 4.7).

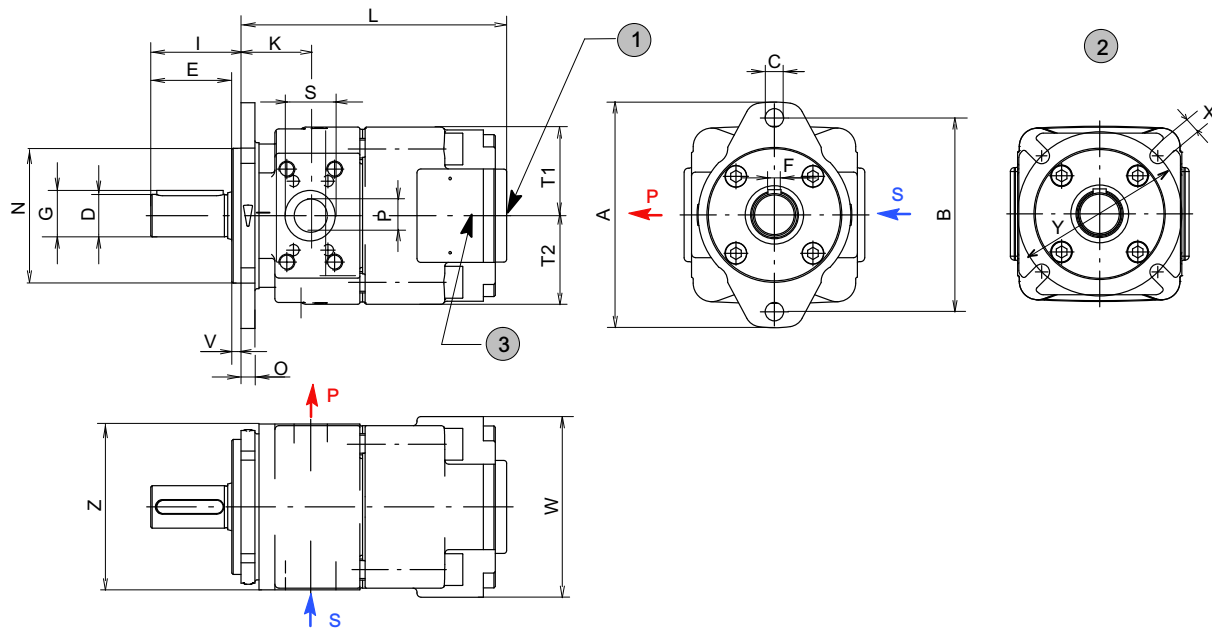
4.2 Dimensions frame size 5 - 8

Frame size		5				6				8			
Pressure range		1	2	3	4	1	2	3	4	1	2	3	4
Suction port: to SAE J518 ¹⁾	S	2"				2½"				3"			
Pressure port: to SAE J518 ¹⁾	P	1¼"				1½"				2"			
External drain port (option 06) pressure range 1-3 optional pressure range 4 standard	①	G ¼"				G ⅜"				G ½"			
Mounting: oval 2-hole flange to ISO 3019/1 (SAE) ISO 3019/2 (metric)	A	8,35				10,51				12,99			
	B (SAE)	7,13				9,02				-			
	B (Metr.)	7,09				8,82				11,02			
Mounting: oval 2-hole flange to ISO 3019/1 (SAE) ISO 3019/2 (metric)	C	0,71				0,87				1,02			
	N (SAE)	5 _{-0,002}				6 _{-0,002}				-			
	N (Metr.)	4,92 (h8)				6,30 (h8)				7,87 (h8)			
	O	0,49				0,65				0,79			
	V	0,28				0,28				0,35			
4-hole flange ISO 3019/2	X (Metr.)	0,55				0,71				0,87			
	Y (Metr.)	6,30				7,87				9,84			
Shaft end: parallel, to ISO/R775 ²⁾	D	1,57 (j6)				1,97 (j6)				2,48 (j6)			
	E	3,23				3,23				4,13			
	F	0,47				0,55				0,71			
	G	1,69				2,10				2,64			
	I	3,62				3,62				4,61			
Housing	K	2,36				2,91				3,54			
	L	9,5	8,3	11,0	13,7	11	9,8	13	16,7	14	13	17	17,6
	M	-	4,0	6,8	9,5	-	4,7	8,2	11,7	-	5,9	10	10,5
	T1	3,5				4,21	4,33			5,39	5,43		
	T2	3,5				4,21	4,33			5,39	5,43		
	Z	6,1				7,6				9,84			
	W	6,5			6,1	8,0				10,1			
Weight	lbs	79,4	70,5	90,4	110,2	141,1	125,7	169,8	198,4	286,6	260,1	352,7	440,9

1) Pipe flange dimensions, SAEJ518 code 61 / ISO 6162-1
 High pressure type up to 6090 PSI (see section 12.2)
 Low pressure type for up to 232 PSI (see section 12.3)

2) For other shaft ends. contact Bucher Hydraulics GmbH

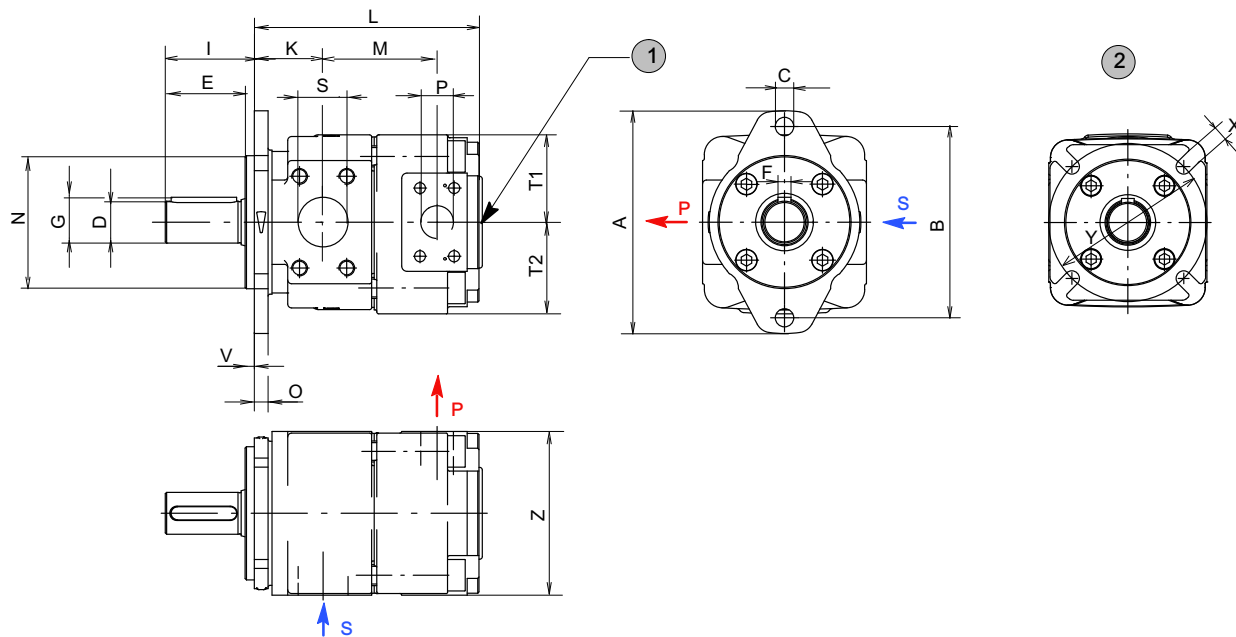
4.3 Pressure range 1



1	option 06 = external drain port
2	option 66 = 4-hole flange ISO 3019/2

3	depending on operating conditions, a second suction port may be required on: QX51=SAE 1¼", QX61=SAE 2"; QX81=SAE 2½" - see section 2.2.1
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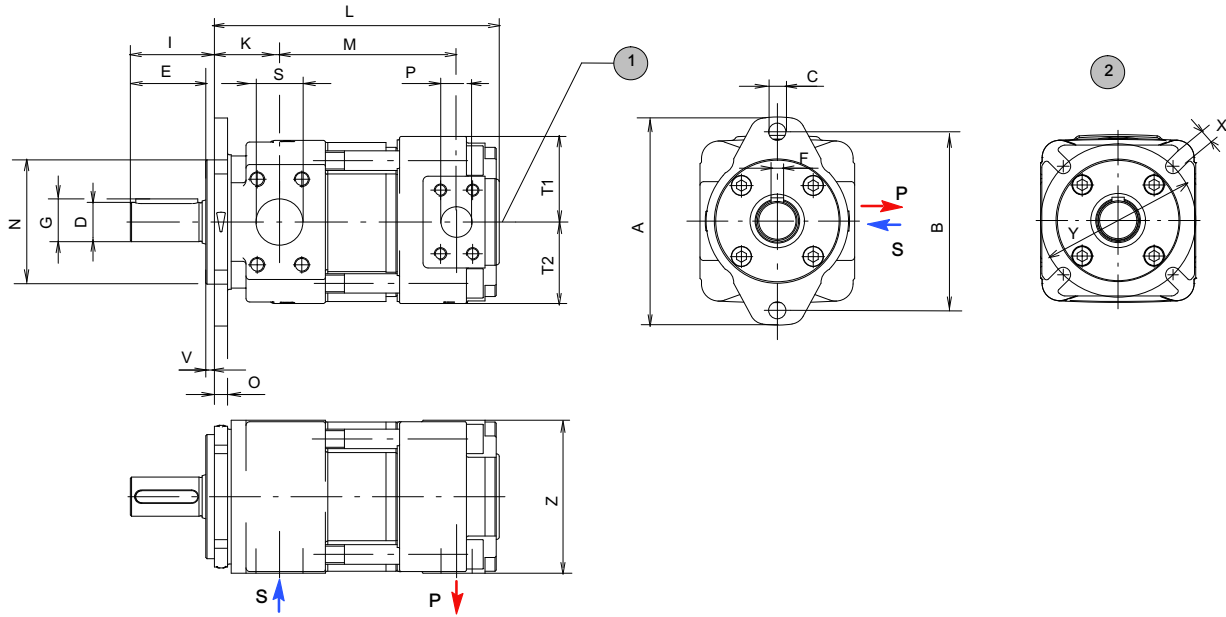
4.4 Pressure range 2



1	option 06 = external drain port
---	---------------------------------

2	option 66 = 4-hole flange ISO 3019/2
---	--------------------------------------

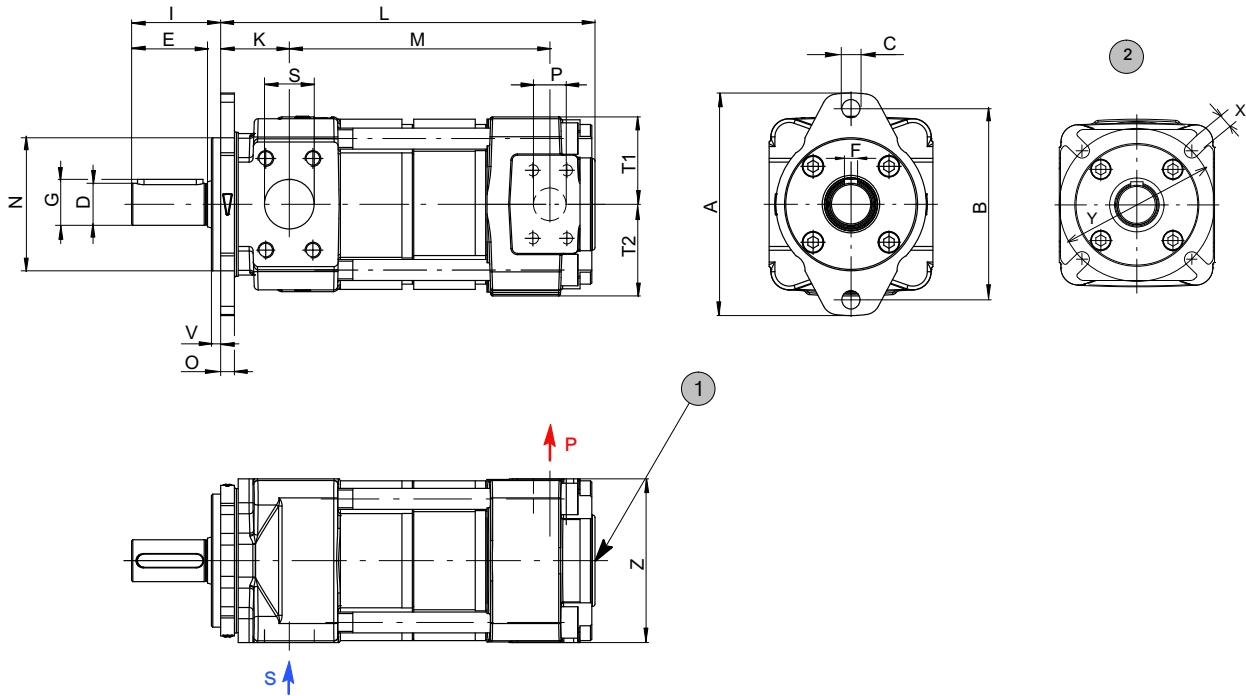
4.5 Pressure range 3



1 option 06 = external drain port

2 option 66 = 4-hole flange ISO 3019/2

4.6 Pressure range 4

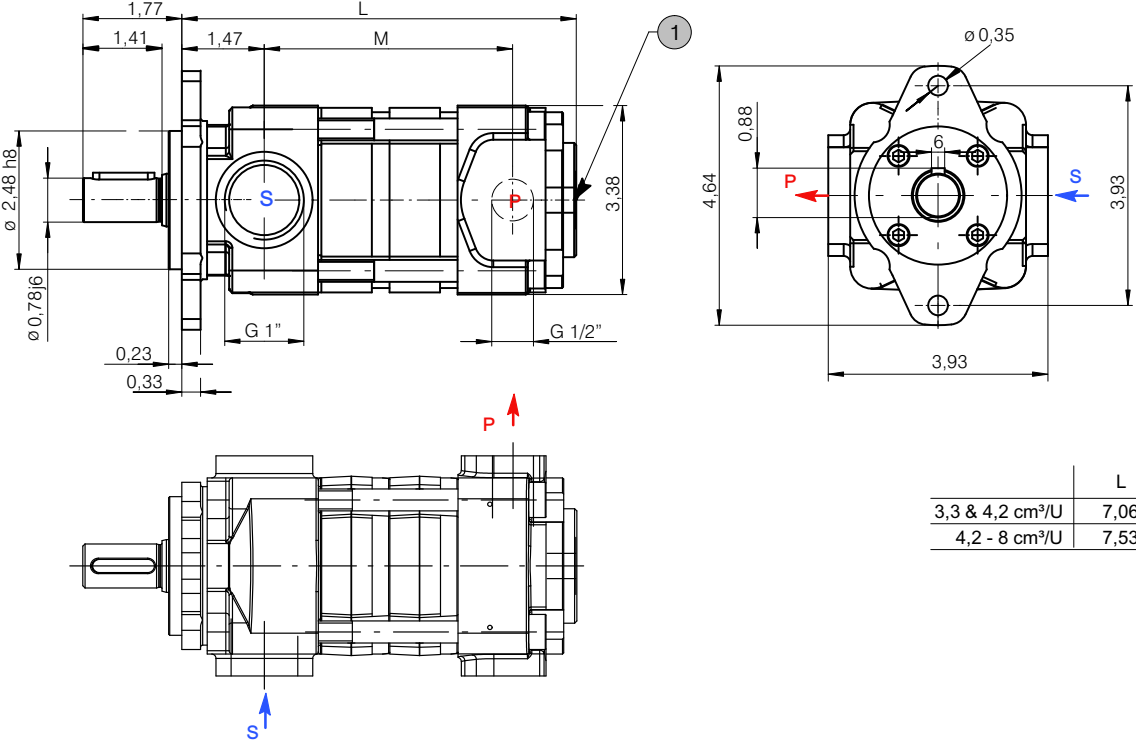


1 option 06 = external drain port

2 option 66 = 4-hole flange ISO 3019/2

4.7 Pressure range 4 with low-flow capability

QX24 with displacements from 3 and 4 cm³/U.



	L	M
3,3 & 4,2 cm ³ /U	7,06	4,44
4,2 - 8 cm ³ /U	7,53	4,92

1 external drain port G 1/4"

4.8 Ordering code for single pumps

		Q	X	5	3	-	0	4	0	R	*	*
Series	= QX											
Frame size	= 2 / 3 / 4 / 5 / 6 / 8											
Pressure range	= 1 / 2 / 3 / 4											
Displacement [cm ³ /rev]	= 003 - 500											
Rotation viewed from shaft end	CW (right) = R (standard) CCW (left) = L											
Options / special features	see section 4.8.3											

4.8.1 Ordering example:

Required: single pump
 Displacement: 39.3 cm³/rev (2.40 in³/rev)
 Continuous pressure: 4350 PSI
 for use with mineral oil
 Ordering code: QX53-040R

4.8.2 Standard configuration

- direction of rotation - CW (right)
- 2-hole mounting flange to ISO 3019/1 (SAE): sizes QX 3-6
- 2-hole mounting flange to ISO 3019/2 (metric): sizes QX 2 and 8
- Nitrile seals
- cylindrical shaft end to ISO/R775
- black priming, flange without priming

4.8.3 Options

- O = without priming
- 06 = external drain port in the pump rear cover
 QX 2-5 G 1/4"
 QX 6 G 3/8"
 QX 8 G 1/2"
- 09 = FKM (Viton) seals
- 12 = 2-hole mounting flange to ISO 3019/2 (metric): size QX3-6
- 29 = for HFB and HFC fluids, frame sizes 2-5
- 66 = 4-hole mounting flange to ISO 3019/2 (metric)
- 83 = second suction port on:
 QX51=SAE 1 1/4"
 QX61 = SAE 2"
 QX81 = SAE 2 1/2"
- 86 = for HFB and HFC fluids, frame sizes 6+8
- 117 = pressure port to SAE J518 code 61 / ISO 6162-1 can be supplied for frame size 2+3 with pressure ranges 2+3

Further options on request.

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 1. 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.

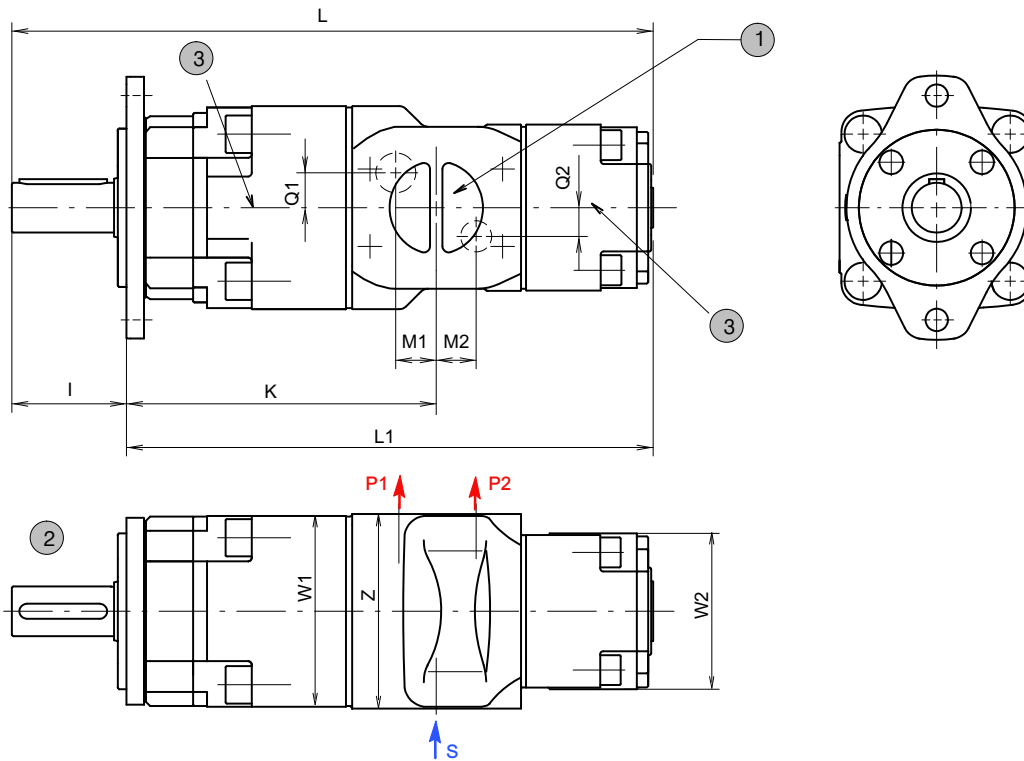
IMPORTANT: Double pumps with pressure range 4 on request.

5.1 Selection table

			Pump 2																	Maximum permissible drive shaft torque [lb-in]		
			Displacement [in ³ /rev]																			
			0.3 0.4 0.5	0.6 0.7 1	1.2 1.5 2	2.4 3 3.8	4.9 6.1 7.6	9.8 12.2 15.3	19.2 24.4 30.5	Maximum pressure [PSI]												
Pump 1	Displacement [in ³ /rev]	Maximum pressure [PSI]	3625	5800	1813/2320/3045	3625	5800	1813/2320/3045	3625	5800	1813/2320/3045	3625	5800	1813/2320/3045	3625	5800	1813/2320/3045	3625	5800	1813/2320/3045	Maximum permissible drive shaft torque [lb-in]	
			QX22...	QX23...	QX21...	QX32...	QX33...	QX31...	QX42...	QX43...	QX41...	QX52...	QX53...	QX51...	QX62...	QX63...	QX61...	QX82...	QX83...	QX81...		
			QX22...	QX23...	QX21...	QX32...	QX33...	QX31...	QX42...	QX43...	QX41...	QX52...	QX53...	QX51...	QX62...	QX63...	QX61...	QX82...	QX83...	QX81...		
Pump 1	0.3/0.4/0.5	3625	QX22..	E																	575	
		5800	QX23..	H	I																	
	0.6/0.7/1	1813/2320/3045	QX21..	B	C	A																1151
		3625	QX32..	E	F	D	E															
	1.2/1.5/2	5800	QX33..	H	I	G	H	I														2301
		1813/2320/3045	QX31..	B	C	A	B	C	A													
	2.4/3/3.8	3625	QX42..	E	F	D	E	F	D	E												4603
		5800	QX43..	H	I	G	H	I	G	H	I											
	4.9/6.1/7.6	1813/2320/3045	QX41..	B	C	A	B	C	A	B	C	A										9394
		3625	QX52..	E	F	D	E	F	D	E	F	D	E									
	9.8/12.2/15.3	5800	QX53..	H	I	G	H	I	G	H	I	G	H	I								18587
		1813/2320/3045	QX51..	B	C	A	B	C	A	B	C	A	B	C	A							
	19.2 24.4 30.5	1813/2320/3045	3625	QX62..			E	F	D	E	F	D	E	F	D	E						18587
			5800	QX63..			H	I	G	H	I	G	H	I	G	H	I					
		1813/2320/3045	3625	QX61..			B	C	A	B	C	A	B	C	A	B	C	A				18587
			5800	QX82..						E	F	D	E	F	D	E	F	D	E			
		1813/2320/3045	3625	QX83..						H	I	G	H	I	G	H	I	G	H	I		18587
			5800	QX81..						B	C	A	B	C	A	B	C	A	B	C	A	

5.2 Dimensions (inch)

A Double pumps QX.1/1



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

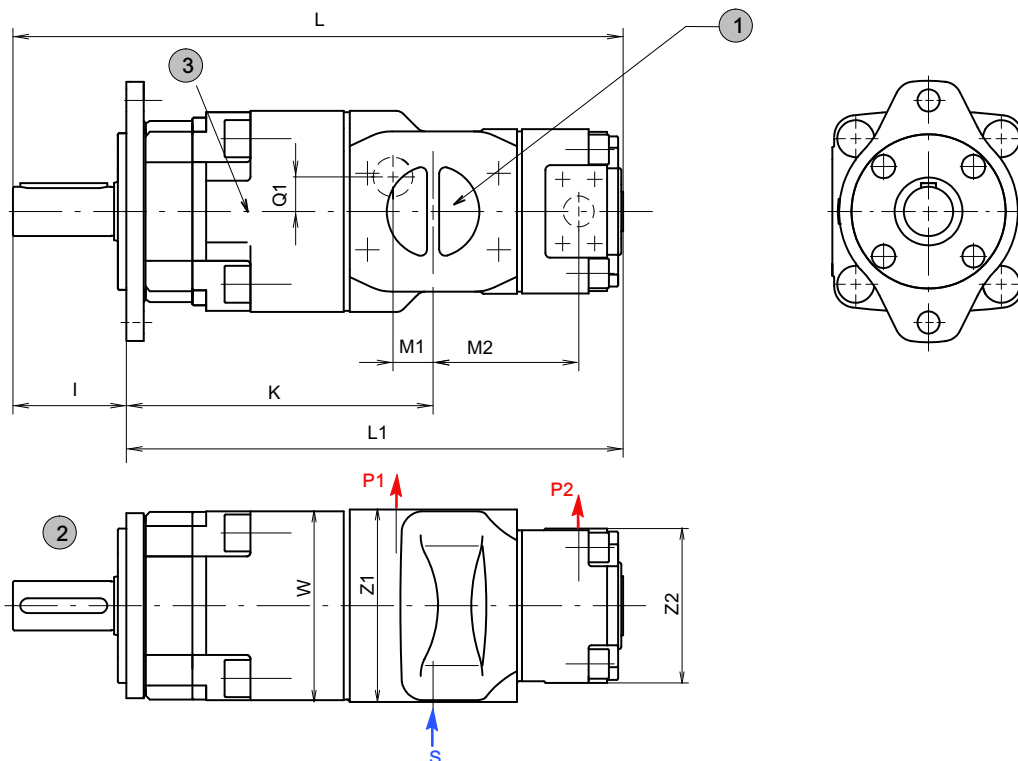
3	depending on operating conditions, a second suction port may be required - see section 2.2.1: QX51=SAE 1 1/4", QX61=SAE 2", QX81=SAE 2 1/2"
---	---

Type	L	L1	K	M1	M2	Q1	Q2	I	Z	W1	W2	S	P1	P2
QX21/21	11.7	9.88	5.55	0.71	0.71	-	-	1.77	3,93	3,15	3,15	G 1/4" 1)	G 1/2" 1) 2)	G 1/2" 1) 2)
QX31/21	13.5	11.5	6.73	1.02	1.18			1.97	4,72	3,93	3,15	G 1/2" 1)	G 3/4" 1) 2)	G 3/4" 1) 2)
QX31/31	14.1	12.1			1.02	0.59	0.59	2.68	4,92	5,35	3,93	SAE 2"	SAE 1"	G 3/4" 1) 2)
QX41/21	15.6	12.9	7.97	0.75	1.37	0.91	0.91	2.68	4,92	5,35	3,15	SAE 2"	SAE 1"	G 1/2" 1) 2)
QX41/31	16.2	13.5			1.30					5,35	3,93			G 3/4" 1) 2)
QX41/41	17.7	15.0	8.19	1.02	1.02	0.91	0.91	3.62	6,14	5,35	5,35	SAE 2 1/2"	SAE 1 1/4"	SAE 1"
QX51/21	18.4	14.8	9.49	0.90	1.69	-	6,49			3,15	G 1/2" 1) 2)			
QX51/31	19.0	15.4			1.54	0.59	0.59	6,49	3,93	G 3/4" 1) 2)				
QX51/41	20.5	16.9	9.80	1.18	1.26	1.10	1.10	3.62	7,67	6,49	5,35	SAE 3"	SAE 1 1/2"	SAE 1"
QX51/51	21.5	17.9			1.18	1.10	1.10			6,49	6,49			SAE 1 1/4"
QX61/31	21.3	17.7	11.3	0.94	1.85	0.67	0.55	3.62	7,67	7,99	3,93	SAE 3 1/2"	SAE 2"	G 3/4" 1) 2)
QX61/41	22.2	18.6		1.06	1.54	1.02	1.06			7,99	5,35			SAE 1"
QX61/51	23.7	20.0	11.5	1.26	1.57	1.37	1.10	3.62	7,67	7,99	6,49	SAE 3 1/2"	SAE 1 1/2"	SAE 1 1/4"
QX61/61	24.7	21.1			1.26	1.37	1.37			7,99	7,99			SAE 1 1/2"
QX81/41	26.7	22.1	14.1	1.38	2.00	0.98	0.98	4.61	9,84	250	5,35	SAE 3 1/2"	SAE 2"	SAE 1"
QX81/51	27.8	23.1			1.85	0.98	1.18			250	6,49			SAE 1 1/4"
QX81/61	28.8	24.2	1.49	1.77	1.57	1.37	4.61	9,84	250	7,99	SAE 4"	SAE 2"	SAE 1 1/2"	
QX81/81	30.5	25.9			1.49	1.57			1.57	256			10,07	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 pumps QX.1/2



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

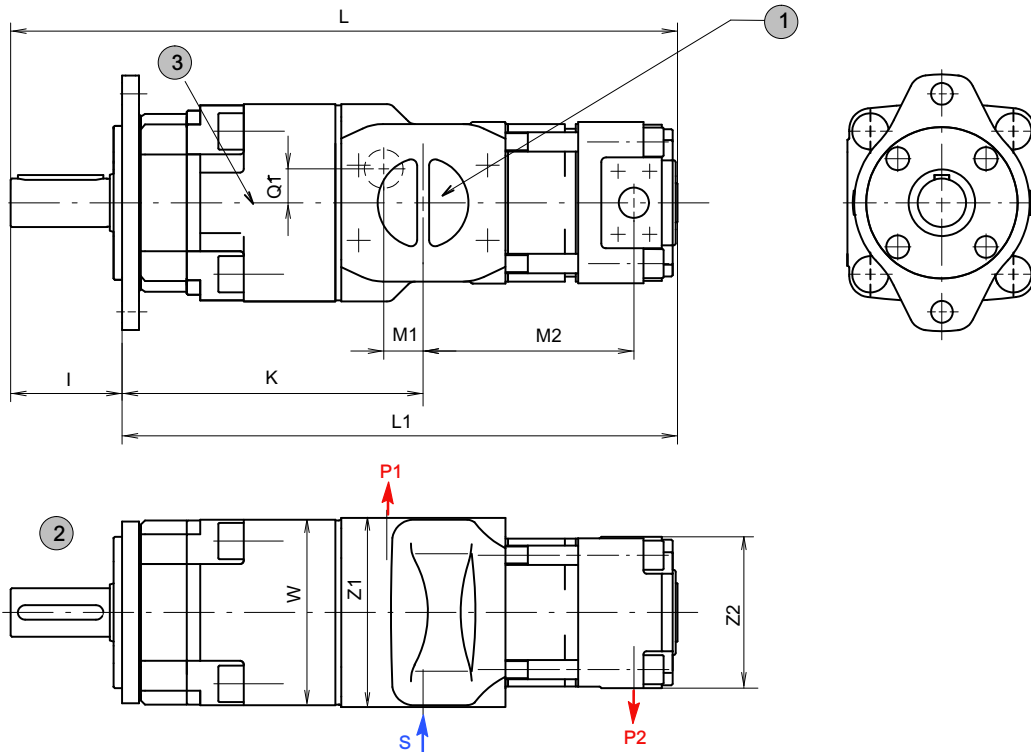
- 3** depending on operating conditions, a second suction port may be required - see section 2.2.1:
QX51=SAE 1 1/4", QX61=SAE 2",
QX81=SAE 2 1/2"

Type	L	L1	K	M1	M2	Q1	I	Z1	Z2	W	S	P1	P2
QX21/22	10.9	9.2	5.6	0.7	2.6	-	1.8	3,93	3,93	3,15	G 1 1/4" 1)	G 1/2" 1) 2)	G 1/2" 1) 2)
QX31/22	12.8	10.8	6.7	1.0	3.1		2.0	4,72					
QX31/32	13.3	11.3				7.9			0.75	3.3	2.7	4,92	4,72
QX41/22	14.9	12.2	8.2	1.02	4.4		0.9	3,93					
QX41/32	15.4	12.7				9.5			0.9	3.6	0.6	3,6	6,14
QX41/42	16.7	14.0	9.8	1.2	4.6		1.1	4,72					
QX51/22	17.7	14.1				11.3			0.9	4.4	0.7	3,6	7,67
QX51/32	18.2	14.6	11.5	1.1	4.8		0.8	4,72					
QX51/42	19.5	15.9				14.1			1.3	5.4	1.4	4,92	6,14
QX51/52	20.3	16.7	1.4	5.6	5.9		1.0	4,92					
QX61/32	20.5	16.9				1.5			7.0	7.0	1.6	7,75	9,84
QX61/42	21.2	17.6	1.5	7.0	7.0		1.6	7,75					
QX61/52	22.4	18.8				1.5			7.0	7.0	1.6	7,75	9,84
QX61/62	23.1	19.5	1.5	7.0	7.0		1.6	7,75					
QX81/42	25.7	21.1				1.5			7.0	7.0	1.6	7,75	9,84
QX81/52	26.5	21.9	1.5	7.0	7.0		1.6	7,75					
QX81/62	27.2	22.6				1.5			7.0	7.0	1.6	7,75	9,84
QX81/82	28.5	24.0	1.5	7.0	7.0		1.6	7,75					

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 pumps QX.1/3



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

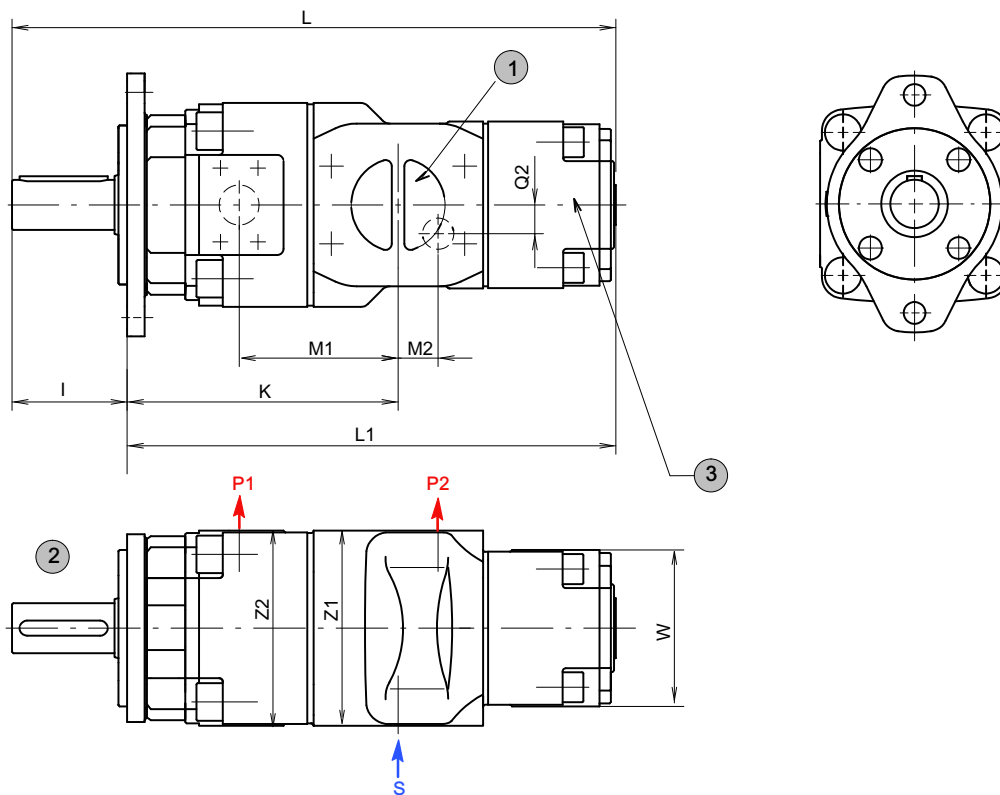
3	depending on operating conditions, a second suction port may be required - see section 2.2.1: QX51= 1¼", QX61=SAE 2", QX81=SAE 2½"
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Type	L	L1	K	M1	M2	Q1	I	Z1	Z2	W	S	P1	P2
QX21/23	12.3	10.6	5.6	0.7	4.0	-	1.8	3,93	3,93	3,15	G 1¼" 1)	G ½" 1) 2)	G ½" 1)2)
QX31/23	14.2	12.2	6.7	1.0	4.5		2.0	4,72		3,93	3,93	G 1½" 1)	
QX31/33	15.1	13.1			5.2	0.6			2.7				4,92
QX41/23	16.3	13.6	7.9	0.75	4.7		3,93	4,92		5,35	SAE 2"	SAE 1"	
QX41/33	17.2	14.5	8.2	1.02	5.4	4,92			4,92				5,35
QX41/43	18.9	16.2	9.5	0.9	6.6		0.9	3,6		6,14	3,93	6,49	
QX51/23	19.1	15.5			5.0	1.1			3.6				6,14
QX51/33	20.0	16.4	5.7	1.1	3.6		6,14	4,92		6,49	SAE 3"	SAE 1¼"	
QX51/43	21.7	18.1	6.9			1.1			3.6				6,14
QX51/53	23.0	19.4	7.8	1.1	3.6		7,67	4,72		7,99	SAE 3"	SAE 1½"	
QX61/33	22.3	18.7	11.3			0.9			6.2				0.7
QX61/43	23.4	19.8	11.5	1.1	7.0	0.8	6,14	7,99	SAE 3"	SAE 1½"	SAE 1"		
QX61/53	25.1	21.5		1.3	8.1	1.4						3.6	6,14
QX61/63	26.7	23.1	9.4	9.4	1.4		4.6	9,84	7,75	SAE 3½"	SAE 2"		
QX81/43	27.9	23.3	14.1	1.4		7.8						1.0	4,92
QX81/53	29.3	24.6		8.7	1.5	4.6	9,84	6,14	10,07	SAE 4"	SAE 2"	SAE 1¼"	
QX81/63	30.8	26.2	9.9	1.5									4.6
QX81/83	33.0	28.4	11.6		1.6	9,84	1.6	9,84	10,07	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+3

D Double pumps QX.2/1



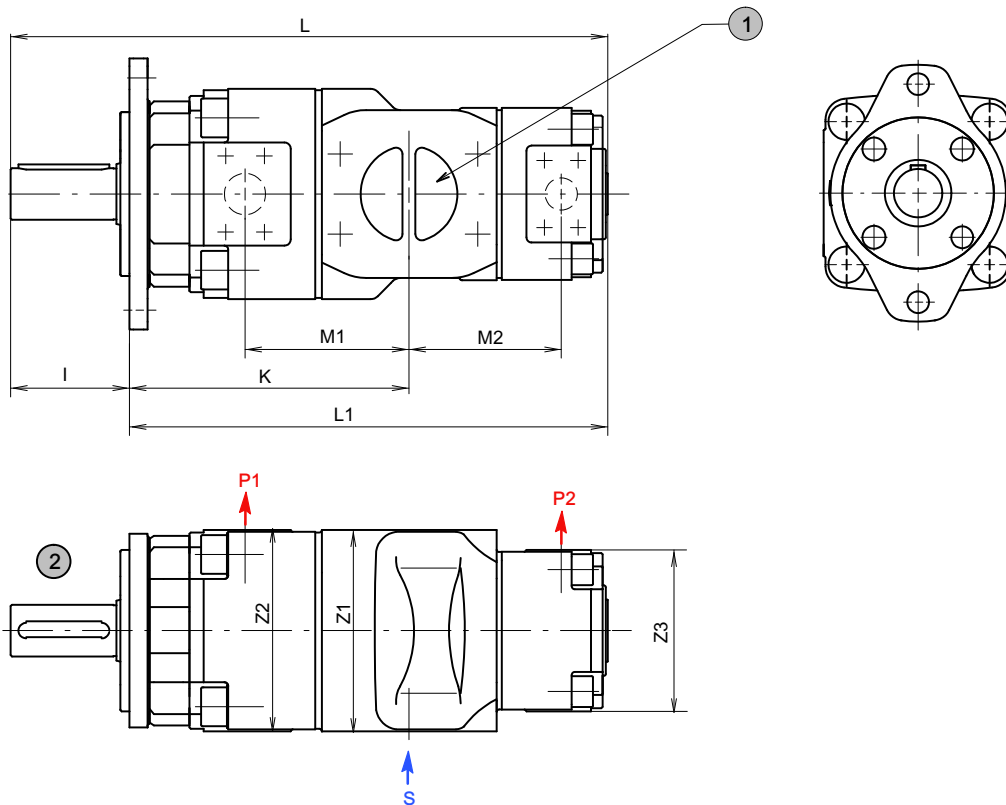
1	S = common suction port
2	shaft and mounting dimensions see section 4

3	depending on operating conditions, a second suction port may be required - see section 2.2.1: QX51=SAE 1¼", QX61=SAE 2"
----------	--

Type	L	L1	K	M1	M2	Q2	I	Z1	Z2	W	P1	P2	
QX32/21	12.7	10.7	5.9	3.4	1.2	-	2.0	4,72	4,72	3,15	G ¾" 1) 2)	G ½" 1) 2)	
QX42/21	14.6	11.9	6.9	4.1	1.4	0.6	2.7	4,92	4,92	3,93	SAE 1"	G ¾" 1) 2)	
QX42/31	15.2	12.5			1.3								
QX52/21	17.2	13.5	8.2	4.7	1.7	-	3.6	6,14	6,14	3,15	SAE 1¼"	G ½" 1) 2)	
QX52/31	17.8	14.1			1.5					0.6		3,93	G ¾" 1) 2)
QX52/41	19.3	15.6			1.3					0.9		5,35	SAE 1"
QX62/31	19.7	16.1	9.7	5.7	1.9	0.5	3.6	7,67	7,75	3,93	SAE 1½"	G ¾" 1) 2)	
QX62/41	20.6	17.0			1.5					1.1		5,35	SAE 1"
QX62/51	22.1	18.5			1.6					1.1		6,49	SAE 1¼"
QX82/41	24.8	20.2	12.2	7.0	2.0	1.0	4.6	9,84	9,84	5,35	SAE 2"	SAE 1"	
QX82/51	25.8	21.2			1.9					1.2		6,49	SAE 1¼"
QX82/61	26.9	22.2			1.8					1.4		7,99	SAE 1½"

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 pumps QX.2/1.2



1 S = common suction port

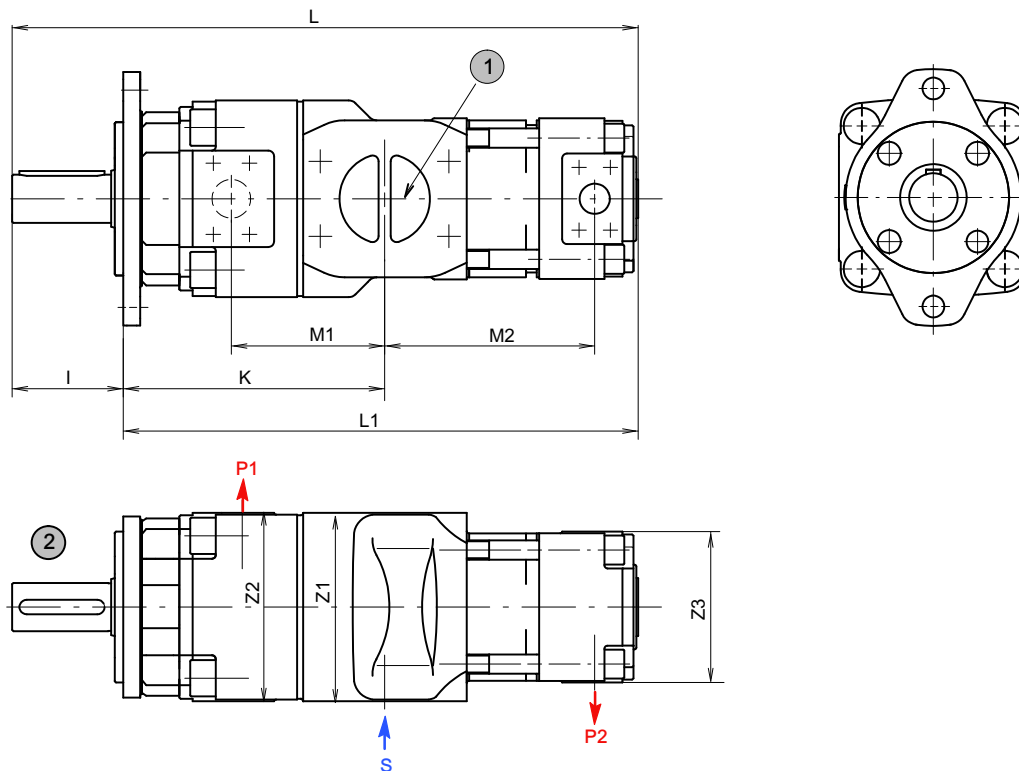
2 shaft and mounting dimensions - see section 4

Type	L	L1	K	M1	M2	I	Z1	Z2	Z3	S	P1	P2
QX22/22	10.2	8.5	4.8	2.6	2.6	1.8	3,93		3,93	G 1¼" 1)	G ½" 1) 2)	G ½" 1)2)
QX32/22	12.0	10.0	5.9	3.4	3.1	2.0	4,72			4,72	G 1½" 1)	
QX32/32	12.5	10.6			3.4		4,72		4,92			4,72
QX42/22	13.9	11.2	6.9	4.1	3.3	2.7	4,92			4,72	SAE 2"	
QX42/32	14.4	11.7			3.6		4,92		4,92			SAE 2"
QX42/42	15.6	13.0	7.2	4.4	4.4	3.6	6,14			3,93	SAE 2½"	
QX52/22	16.5	12.8			8.2		4.7	3.9	3.6			6,14
QX52/32	16.9	13.3	8.5	5.0	4.6	3.6	6,14			4,92	SAE 3"	SAE 1¼"
QX52/42	18.2	14.6			5.0		5.0	6,14				
QX52/52	19.0	15.4	9.7	5.7	4.4	3.6	7,67	7,75	4,72	SAE 3"	SAE 1½"	G ¾" 1) 2)
QX62/32	18.9	15.3			5.7							4.4
QX62/42	19.6	16.0	9.9	5.9	4.8	3.6	7,75		6,14	SAE 3½"	SAE 1½"	SAE 1¼"
QX62/52	20.8	17.2			5.9		5.4	7,75				7,75
QX62/62	21.6	18.0	12.2	7.0	5.9	4.6	9,84		4,92	SAE 4"	SAE 2"	
QX82/42	23.7	19.1			7.0		5.6	9,84				6,14
QX82/52	24.5	19.9	12.2	7.0	5.9	4.6	9,84		6,14	SAE 4"	SAE 2"	
QX82/62	25.3	20.7			7.0		6.4	9,84				7,75
QX82/82	26.5	21.9	12.2	7.0	7.0	4.6	9,84		9,84	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+3

F Double pumps QX.2/3



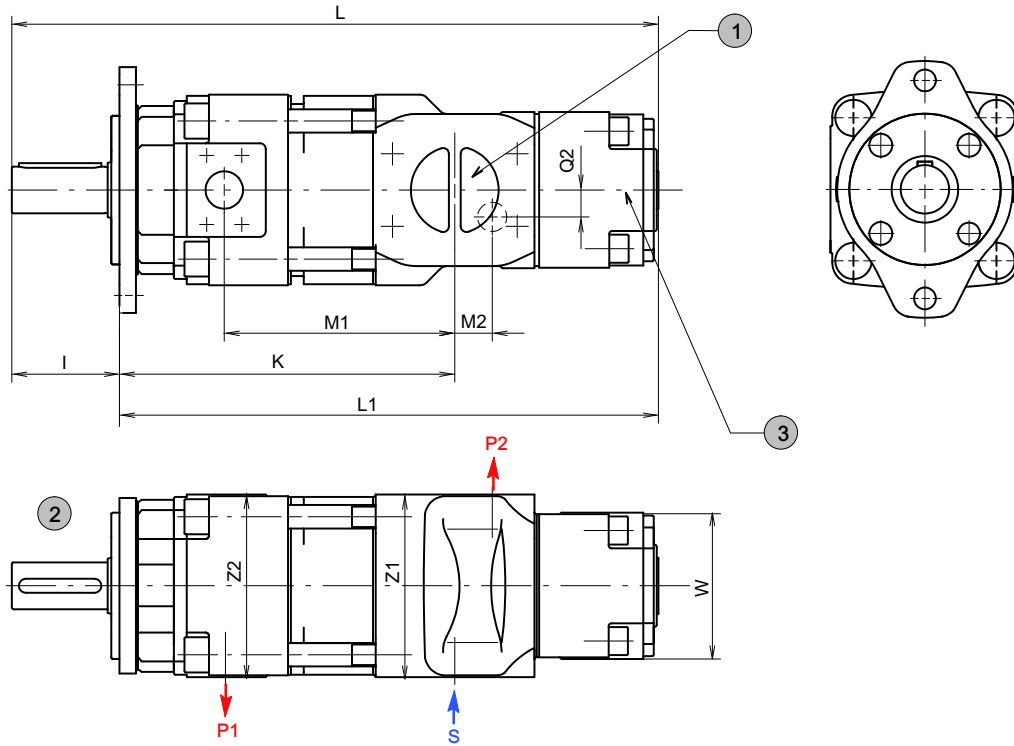
1 S = common suction port

2 shaft and mounting dimensions - see section 4

Type	L	L1	K	M1	M2	I	Z1	Z2	Z3	S	P1	P2
QX32/23	13.4	11.4	5.9	3.4	4.5	2.0	4,72		3,93	G 1½" 1)	G ¾" 1) 2)	G ½" 1) 2)
QX42/23	15.2	12.6	6.9	4.1	4.7	2.7	4,92			4,72	SAE 2"	
QX42/33	16.1	13.5			5.4				3.6			6,14
QX52/23	17.8	14.2	8.2	4.7	5.0	3.6	6,14			4,72	SAE 2½"	
QX52/33	18.7	15.1			5.7				6.9			4,92
QX62/33	20.4	16.8	9.7	5.0	6.2	3.6	7,67	7,75		4,72	SAE 3"	
QX62/43	20.7	17.0			5.7				7.0			4.6
QX62/53	21.8	18.2	9.9	5.9	8.1	3.6	9,84		6,14	SAE 3½"	SAE 2"	
QX82/43	23.6	20.0			12.2							7.0
QX82/53	25.9	21.3	7.8	7.0		8.7	4.6	9,84		6,14	SAE 4"	
QX82/63	27.3	22.7			9.9	7.0						9.9
	28.8	24.2										

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 pumps QX.3/1



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

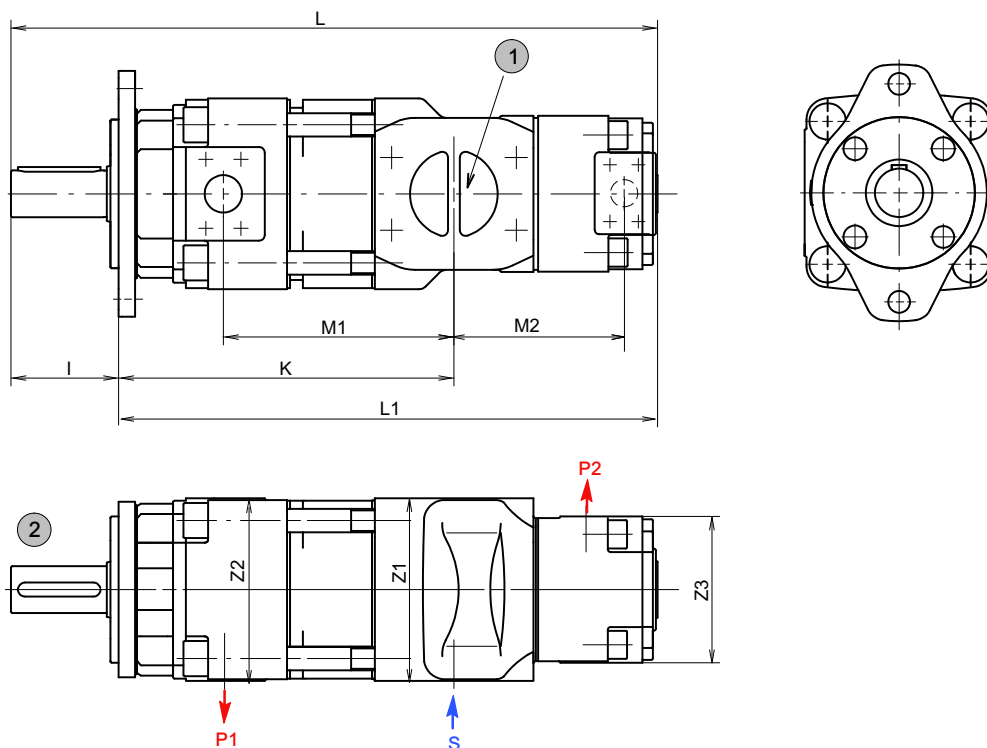
3	depending on operating conditions, a second suction port may be required - see section 2.2.1 QX61=SAE 2"
---	--

Type	L	L1	K	M1	M2	Q2	I	Z1	Z2	W	S	P1	P2
QX33/21	14.5	12.5	7.7	5.2	1.2	-	2.0	4,72	4,72	3,15	G 1½" 1)	G ¾" 1) 2)	G ½" 1) 2)
QX43/21	16.8	14.1	9.1	6.3	1.4	0.6	2.7	4,92	4,92	3,93	SAE 2"	SAE 1"	G ¾" 1) 2)
QX43/31	17.4	14.7			1.3								
QX53/21	19.9	16.3	11.0	7.5	1.7	-	3.6	6,14	6,14	3,15	SAE 2½"	SAE 1¼"	G ½" 1) 2)
QX53/31	20.5	16.9			1.5								
QX53/41	22.0	18.4	11.3	7.8	1.3	0.9	3.6	7,67	7,75	5,35	SAE 3"	SAE 1½"	SAE 1"
QX63/31	23.3	19.6			1.9								
QX63/41	24.2	20.6	13.3	9.2	1.5	1.1	4.6	9,84	9,84	5,35	SAE 3½"	SAE 2"	SAE 1"
QX63/51	25.6	22.0			1.6								
QX83/41	29.3	24.7	16.7	11.6	2.0	1.0	4.6	9,84	9,84	5,35	SAE 3½"	SAE 2"	SAE 1"
QX83/51	30.3	25.7			1.9								
QX83/61	31.4	26.8	16.7	11.6	1.8	1.4	4.6	9,84	9,84	7,99	SAE 4"	SAE 2"	SAE 1½"

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 pumps QX.3/.2



1 S = common suction port

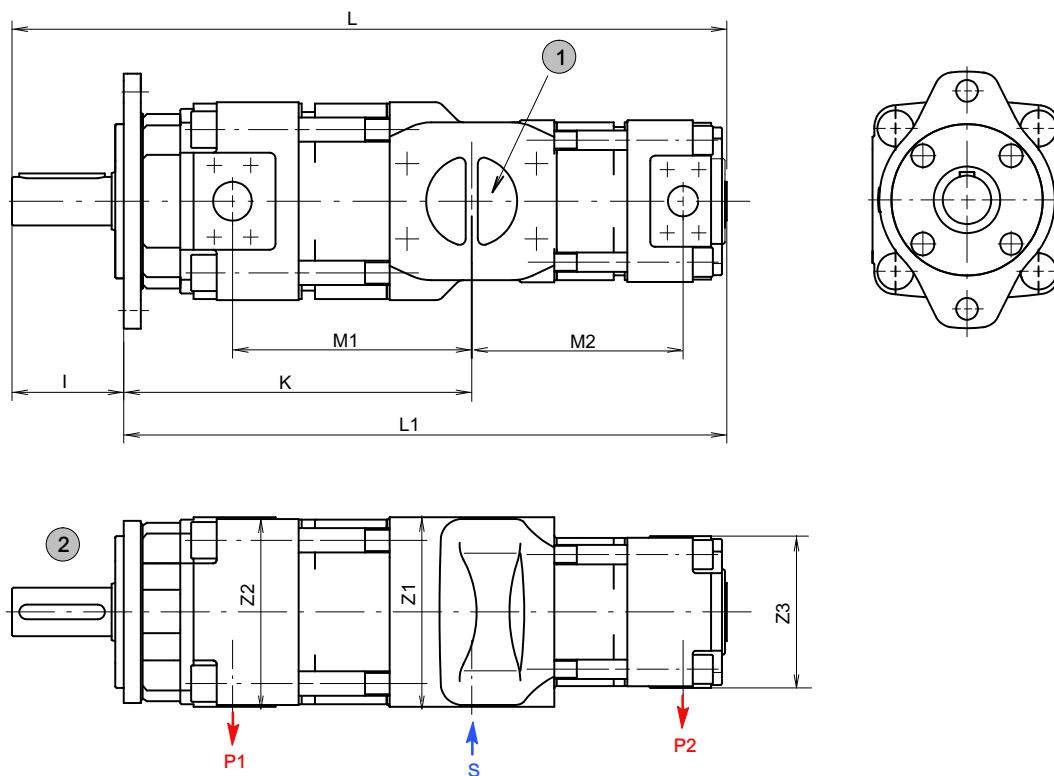
2 shaft and mounting dimensions - see section 4

Type	L	L1	K	M1	M2	I	Z1	Z2	Z3	S	P1	P2
QX23/22	11.6	9.8	6.2	4.0	2.6	1.8	3,93		3,93	G 1¼" 1)	G ½" 1) 2)	G ½" 1) 2)
QX33/22	13.8	11.8	7.7	5.2	3.1	2.0	4,72			4,72	G 1½" 1)	
QX33/32	14.3	12.3			3.4		3.3	2.7	4,92		4,92	SAE 2"
QX43/22	16.1	13.4	9.1	6.3	3.6	4,92			4,92	SAE 2"		
QX43/32	16.6	13.9				9.4	6.6	4.4			4,92	
QX43/42	17.8	15.2	11.0	7.5	3.6				6,14		3,93	SAE 2½"
QX53/22	19.2	15.6				7.8	4.6	3.6	6,14			
QX53/32	19.7	16.1	11.3	5.0	3.6				6,14		4,92	SAE 3"
QX53/42	21.0	17.4				13.3	9.2	4.4	7,67			
QX53/52	21.8	18.1	13.5	9.4	4.8				7,67		7,75	SAE 3"
QX63/32	22.5	18.9				9.2	5.4	3.6	7,67			
QX63/42	23.1	19.5	9.4	5.9	3.6				7,67		7,75	SAE 3½"
QX63/52	24.4	20.7				13.5	5.9	4.6	9,84			
QX63/62	25.1	21.5	16.7	11.2	5.6				9,84		7,75	SAE 3½"
QX83/42	28.3	23.7				11.2	5.9	4.6	9,84			
QX83/52	29.1	24.4	7.0	7.0	4.6				9,84		9,84	SAE 4"
QX83/62	29.8	25.2				7.0	7.0	4.6	9,84			
QX83/82	31.1	26.5	7.0	7.0	4.6				9,84		9,84	SAE 4"

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 pumps QX.3/3



1 S = common suction port

2 shaft and mounting dimensions - see section 4

Type	L	L1	K	M1	M2	I	Z1	Z2	Z3	S	P1	P2
QX23/23	330	285	6.2	4.0	1.0	1.8	3,93		3,93	G 1¼" 1) 2)	G ½" 1) 2)	G ½" 1) 2)
QX33/23	385	335	7.7	5.2	4.5	2.0	4,72		4,72	G 1½" 1) 2)	G ¾" 1) 2)	G ¾" 1) 2)
QX33/33	408	358			5.2							
QX43/23	442	374	9.1	6.3	4.7	2.7	4,92		3,93	SAE 2"	SAE 1"	G ½" 1) 2)
QX43/33	466	398			5.4			4,72				G ¾" 1)
QX43/43	509	441			6.6			4,92				SAE 1"
QX53/23	523	431	11.0	7.5	5.0	3.6	6,14		3,93	SAE 2½"	SAE 1¼"	G ½" 1) 2)
QX53/33	546	454			5.7			4,72				G ¾" 1) 2)
QX53/43	589	497	11.3	7.8	6.9			4,92	6,14	SAE 3"		SAE 1"
QX53/53	623	531			7.8			6,14				SAE 1¼"
QX63/33	616	524	13.3	9.2	6.2	3.6	7,67		4,72	SAE 3½"	SAE 1½"	G ¾" 1) 2)
QX63/43	644	552			7.0			4,92				SAE 1"
QX63/53	689	597	13.5	9.4	8.1			6,14	6,14			SAE 1¼"
QX63/63	728	636			9.4			7,75				SAE 1½"
QX83/43	774	657	16.7	11.2	7.8	4.6	9,84		4,92	SAE 3½"	SAE 2"	SAE 1"
QX83/53	808	691			8.7			6,14	SAE 1¼"			
QX83/63	847	730			9.9			7,75	SAE 1½"			
QX83/83	904	787			11.6			9,84	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 / 4 ¹⁾																						
Displacement [cm ³ /rev]	= 005 - 500																						
			Frame size	= 2 / 3 / 4 / 5 / 6 / 8																			
			Pressure range	= 1 / 2 / 3 / 4 ¹⁾																			
			Displacement [cm ³ /rev]	= 005 - 500																			
Rotation (viewed from shaft end)	CW (right)	= R (standard)																					
	CCW (left)	= L																					
Options	see section 5.3.3																						

1) Pressure range 4 on request.

5.3.1 Ordering example:

Required: double pump

Pump 1

Displacement: 80.2 cm³/rev (4.89 in³/rev)
Continuous pressure: 4350 PSI
Type: 63-080

Pump 2

Displacement: 20.0 cm³/rev (1.22 in³/rev)
Continuous pressure: 2320 PSI
Type: 31-020

for use with mineral oil

Ordering code: QX63-080/31-020R

5.3.2 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
- black priming, flange without priming

5.3.3 Options

- O = without priming
- 06 = external drain port in the pump rear cover
 - QX 2-5 = G ¼"
 - QX 6 = G ⅜"
 - QX 8 = G ½"
- 09 = FKM (Viton) seals and without priming
- 12 = 2-hole mounting flange to ISO 3019/2 (metric): size QX3-6
- 29 = for HFB and HFC fluids, frame sizes 2-5, without priming
- 66 = 4-hole mounting flange to ISO 3019/2 (metric)
- 83 = second suction port on:
 - QX51=SAE 1 ¼"
 - QX61 = SAE 2"
 - QX81 = SAE 2½"
- 86 = for HFB and HFC fluids, frame sizes 6+8, without priming
- 117 = pressure port to SAE J518 code 61 / ISO 6162-1 can be supplied for frame size 2+3 with pressure ranges 2+3

Further options on request.

6 Triple pumps

The following table shows the triple-pump combinations that can be supplied (other triple-pumps on request). 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.

IMPORTANT: Triple pumps with pressure range 4 on request.

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	
575	1151	2301	4603	4603	9294	18587

Maximum permissible drive shaft torque [lb-in]

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

6.2 Ordering code for triple pumps

Triple pumps can only be supplied after consulting Bucher Hydraulics GmbH.

		Q	X	5	1	-	1	2	5	/	5	1	-	0	8	0	/	2	1	-	0	1	2	R	*	*
	Series	= QX																								
	Frame size	= 2 / 3 / 4 / 5 / 6 / 8																								
pump 1	Pressure range	= 1 / 2 / 3 / 4 ¹⁾																								
	Displacement [cm ³ /rev]	= 005 - 500																								
pump 2	Frame size	= 2 / 3 / 4 / 5 / 6 / 8																								
	Pressure range	= 1 / 2 / 3 / 4 ¹⁾																								
	Displacement [cm ³ /rev]	= 005 - 500																								
pump 3	Frame size	= 2 / 3 / 4 / 5 / 6 / 8																								
	Pressure range	= 1 / 2 / 3 / 4 ¹⁾																								
	Displacement [cm ³ /rev]	= 005 - 500																								
Rotation (viewed from shaft end)	CW (right)	=	R																							
	CCW (left)	=	L																							
Options	see section 6.2.3																									

1) Pressure range 4 on request.

6.2.1 Ordering example:

Required: triple pump

Pump 1	Displacement:	127.3 cm ³ /rev (7.77 in ³ /rev)
	Continuous pressure:	1160 PSI
	Type:	51-125
Pump 2	Displacement:	78.6 cm ³ /rev (4.80 in ³ /rev)
	Continuous pressure:	2175 bar
	Type:	51-080
Pump 3	Displacement:	12 cm ³ /rev (0.49 in ³ /rev)
	Continuous pressure:	125 bar
	Type:	21-012

For use with mineral oil

Referring to the selection table in sect. 6.1.
QX51/51/21 is an obtainable combination.
Ordering code: QX51-125/51-080/21-012R

6.2.2 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
- cylindrical shaft end to ISO R775
- black priming, flange without priming

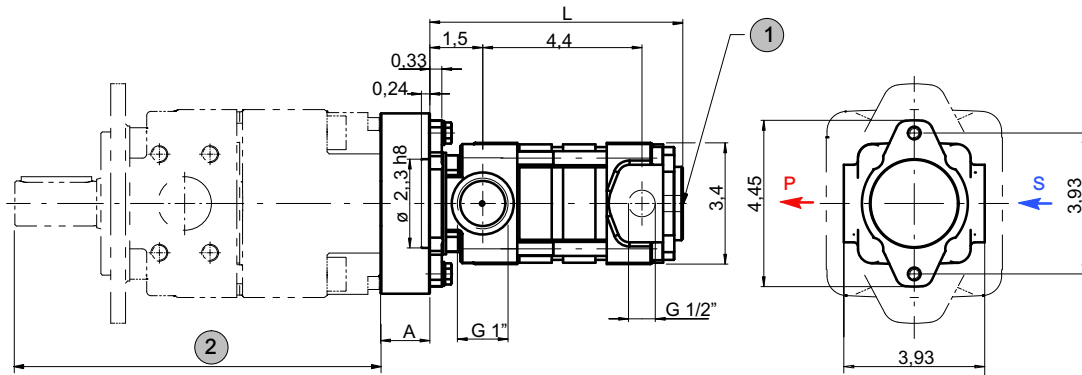
6.2.3 Options

- O = without priming
- 06 = external drain port in the pump rear cover
QX 2-5 = G 1/4", QX 6 = G 3/8", QX 8 = G 1/2"
- 09 = FKM (Viton) seals and without priming
- 12 = 2-hole mounting flange to ISO 3019/2 (metric): size QX3-6
- 29 = for HFB and HFC fluids, frame sizes 2-5, without priming
- 66 = 4-hole mounting flange to ISO 3019/2 (metric)
- 83 = second suction port on:
QX51=SAE 1 1/4", QX61=SAE 2", QX81=SAE 2 1/2"
- 86 = for HFB and HFC fluids, frame sizes 6+8, without priming
- 117 = pressure port to SAE J518 code 61 / ISO 6162-1 can be supplied for frame size 2+3 with pressure ranges 2+3

Further options on request.

7 Low-flow capability pump in combination with other QX-single pumps

7.1 Dimensions (inch)

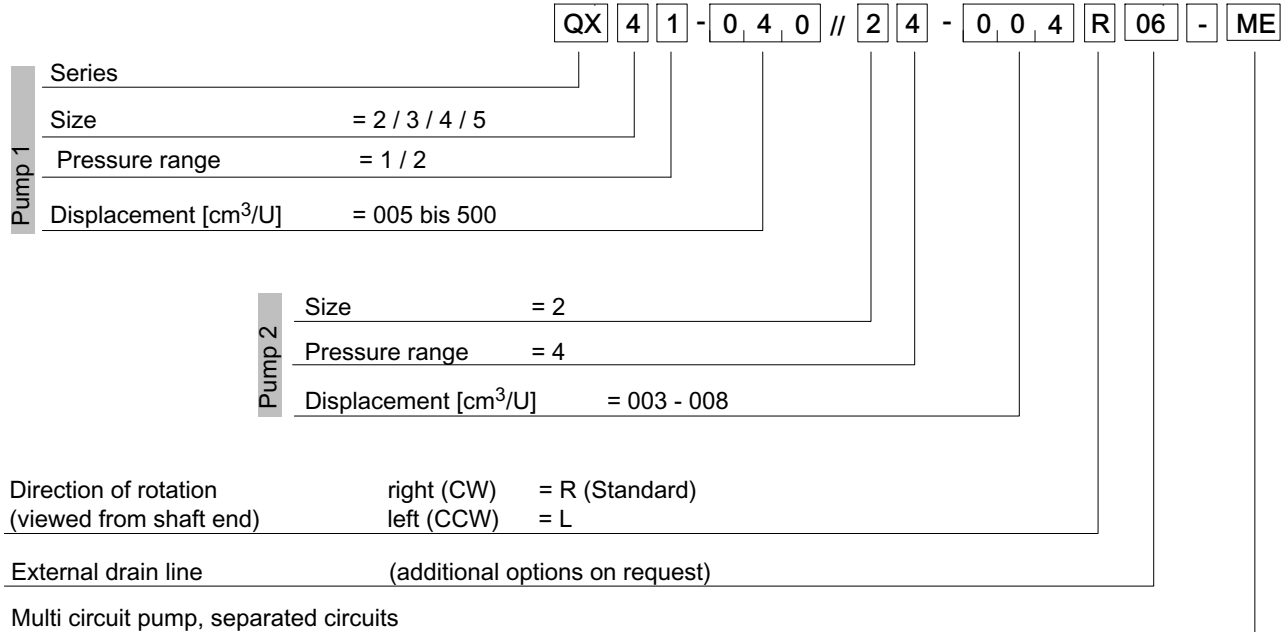


QX pump	A
QX21-...	1.32
QX22-...	1.04
QX31-...	1.34
QX32-...	1.02
QX41-...	1.38
QX42-...	1.10
QX52-...	1.02

- 1** external drain port G ¼"
- 2** dimensions see section 4

- 3** dimension A depends on the driving QX pump model (2)

7.2 Ordering code



7.2.1 Ordering example:

Requird: Double pump

Pump 1

Displacement: 40.7 cm³/rev (2.48 in³/rev)
 Continuous pressure: 2320 PSI
 Type: 41 - 040

Pump 2

Displacement: 3.3 cm³/rev (0.2 in³/rev)
 Continuous pressure: 3625 PSI
 Type: 24 - 004

For use with mineral oil

Ordering code: QX41-040//24-004R06-ME

8 Fluid cleanliness

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

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 Brugger DIN 51347-2.

9 Fluid cleanliness

Cleanliness class (RK) onto ISO 4406 and NAS 1638

Code ISO 4406	Dirt particle number / 100 ml			
	$\geq 4 \mu\text{m}$	$\geq 6 \mu\text{m}$	$\geq 14 \mu\text{m}$	NAS 1638
23/21/18	8000000	2000000	250000	12
22/20/18	4000000	1000000	250000	-
22/20/17	4000000	1000000	130000	11
22/20/16	4000000	1000000	64000	-
21/19/16	2000000	500000	64000	10
20/18/15	1000000	250000	32000	9
19/17/14	500000	130000	16000	8
18/16/13	250000	64000	8000	7
17/15/12	130000	32000	4000	6
16/14/12	64000	16000	4000	-
16/14/11	64000	16000	2000	5
15/13/10	32000	8000	1000	4
14/12/9	16000	4000	500	3
13/11/8	8000	2000	250	2

10 Operational reliability

To guarantee the reliable operation and a long service life of the pump, a maintenance schedule must be prepared for the power unit, machine or system. The maintenance schedule must make sure that the provided or permissible operating conditions of the pump are adhered to over the period of use.

In particular, compliance with the following operating parameters must be ensured:

- required oil cleanliness
- operating temperature range
- fluid level

Moreover, the pump and the system must be inspected at regular intervals for changes in the following parameters:

- Vibration
- Noise
- Differential temperature of pump – fluid in the tank
- Foaming in the tank
- Leak tightness

Changes in these parameters indicate wear of components (e.g. drive motor, coupling, pump, etc.). The cause must be immediately pinpointed and eliminated.

To provide high operational reliability of the pump in the machine or system, we recommend continuous, automatic checks of the above parameters and an automatic shut-down in the case of changes that exceed the usual fluctuations within the provided operating range.

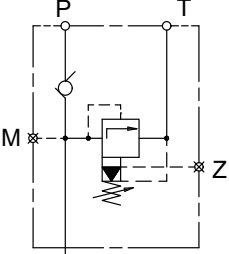
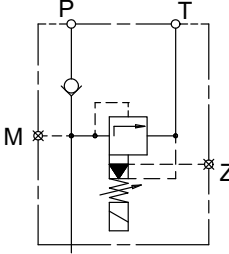
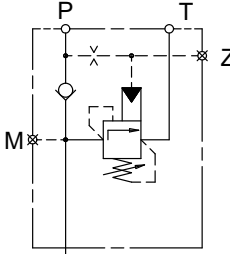
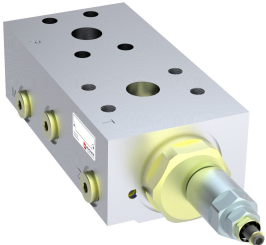

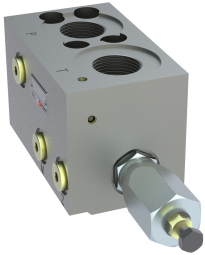
Make sure that the plastic components of the coupling will be exchanged regularly (no later than 5 years). The manufacturer's instructions must be given priority.

11 Note

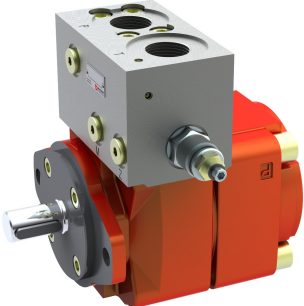
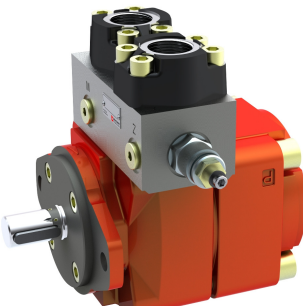
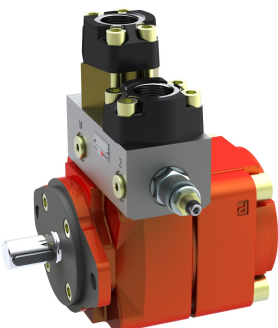
This catalogue is intended for users with specialist knowledge. The user must check the suitability of the equipment described herein in order to ensure that all of the conditions necessary for the safety and proper functioning of the system are fulfilled. If you have any doubts or questions concerning the use of these pumps, please consult Bucher Hydraulics GmbH.

12 Accessories

12.1 Bolt-on valves - SAE J518 code 61 / ISO 6162-1 pattern

Pressure relief A $\frac{S}{G}$ DF	Pressure relief solenoid control A $\frac{S}{G}$ DA	Accumulator charging valve AGSF
		
		
<p>Technical data sheet 100-P-000123</p>	<p>Technical data sheet 100-P-000119</p>	<p>Technical data sheet 100-P-0000124</p>

12.1.1 Examples for Bolt-on valves, mounted on QX Internal Gear Pumps

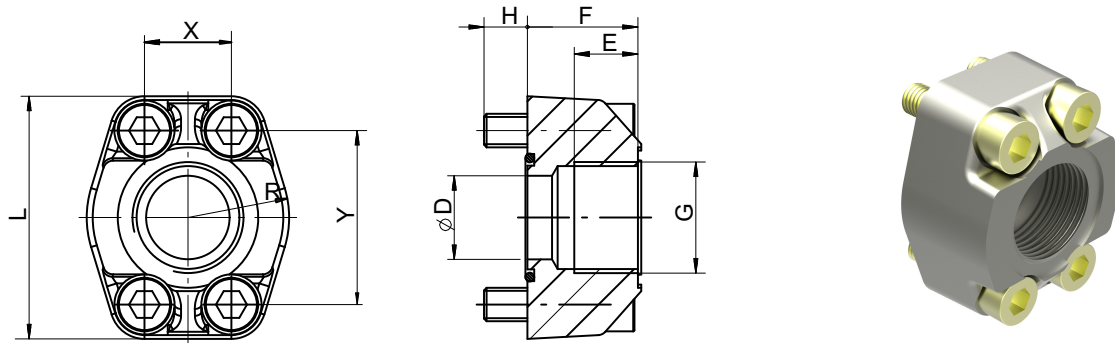
Bolt-on valve with threaded ports AGDF	Bolt-on valves with pipe flanges SAE ¹⁾ ASDF+RF	Bolt-on valve with pipe flanges SAE + RVS ²⁾ ASDF+RF+RVS+DPSAE+ZPSAE
		

1) Pipe flange see section 12.2 and 12.3

2) Please ask Bucher Hydraulics GmbH for check valves

IMPORTANT: For detailed informations on bolt-on valves see www.bucherhydraulics.com

12.2 Pipe flange - high pressure type



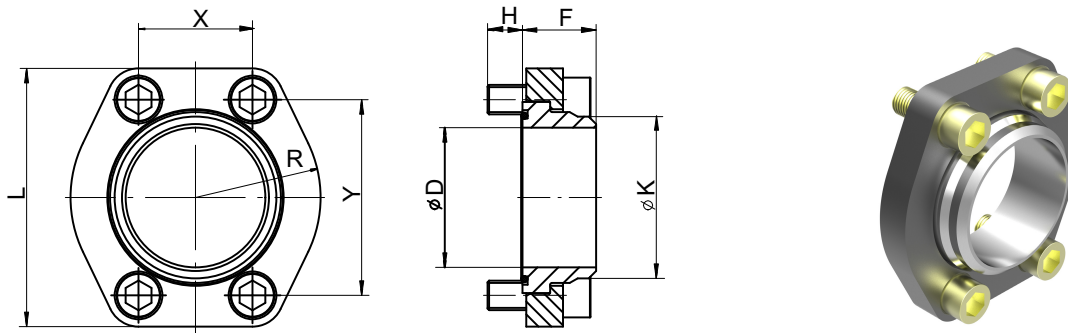
- Max. operating pressure 6090 PSI
- Flange size SAE J518 code 61 / ISO 6162-1

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

Ordering-number	Ordering code	Size	D \varnothing	E	F	H	L	R	X	Y	Viton seal 90 Shore 'A'	Retaining screws DIN912-12.9	Torque lb-in
037000	RF 01-R08	G 1/2"	0.5	0.6	1.1	0.5	2.1	0.9	0.69	1.49	0.79x0.10	M8 x 30	266
037010	RF 02-R10	G 3/4"	0.8	0.7	1.2	0.47	2.6	1.0	0.87	1.87	1.05x0.10	M10 x 30	531
037020	RF 03-R11	G 1"	1.0	0.8	1.3	0.5	2.7	1.1	1.03	2.06	1.29x0.10	M10 x 35	531
037030	RF 04-R12	G 1 1/4"	1.3	1.0	1.5	0.6	3.1	1.4	1.19	2.31	1.61x0.14	M10 x 40	531
037040	RF 05-R13	G 1 1/2"	1.5	0.9	1.6	0.7	3.7	1.6	1.41	2.76	1.73x0.14	M12 x 45	1062
037050	RF 06-R14	G 2"	1.9	1.1	1.8	0.8	4.0	1.9	1.69	3.06	2.36x0.14	M12 x 50	1062
055470 *	RF 07-R16	G 2 1/2"	2.5	1.2	1.9	0.7	4.5	2.2	1.99	3.50	2.86x0.14	M12 x 45	1062

* at RF07 only to 3045 PSI be allowed

12.3 Pipe flange - low pressure type



- Max. operating pressure 232 PSI
- Flange size SAEJ518 code 61 / ISO 6162-1

Material: ST37 / for Viton seals contact Bucher Hydraulics GmbH

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 lb-in	pipe ¹⁾ O/di-a.aprox.
062450	RN 07-S	2½"	2.5	2.9	1.3	0.6	4.7	2.5	2.0	3.5	2.73 x 0.14	M12 x 30	620	2.95
063880	RN 08-S	3"	3.0	3.5			5.53	2.7	2.4	4.19	3.36 x 0.14	M16 x 40	1593	3.46
063890	RN 09-S	3½"	3.5	3.9	1.6	0.7	6.23	2.9	2.8	4.74	3.86 x 0.14	M16 x 40	1593	3.93
063900	RN 10-S	4"	4.1	4.5			6.6	3.1	3.1	5.1	4.36 x 0.14	M16 x 40	1593	4.53

1) We recommend the use of seamless precision steel tube to DIN 2391 with wallthick. max 0.24 in

info.kl@bucherhydraulics.com

www.bucherhydraulics.com

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