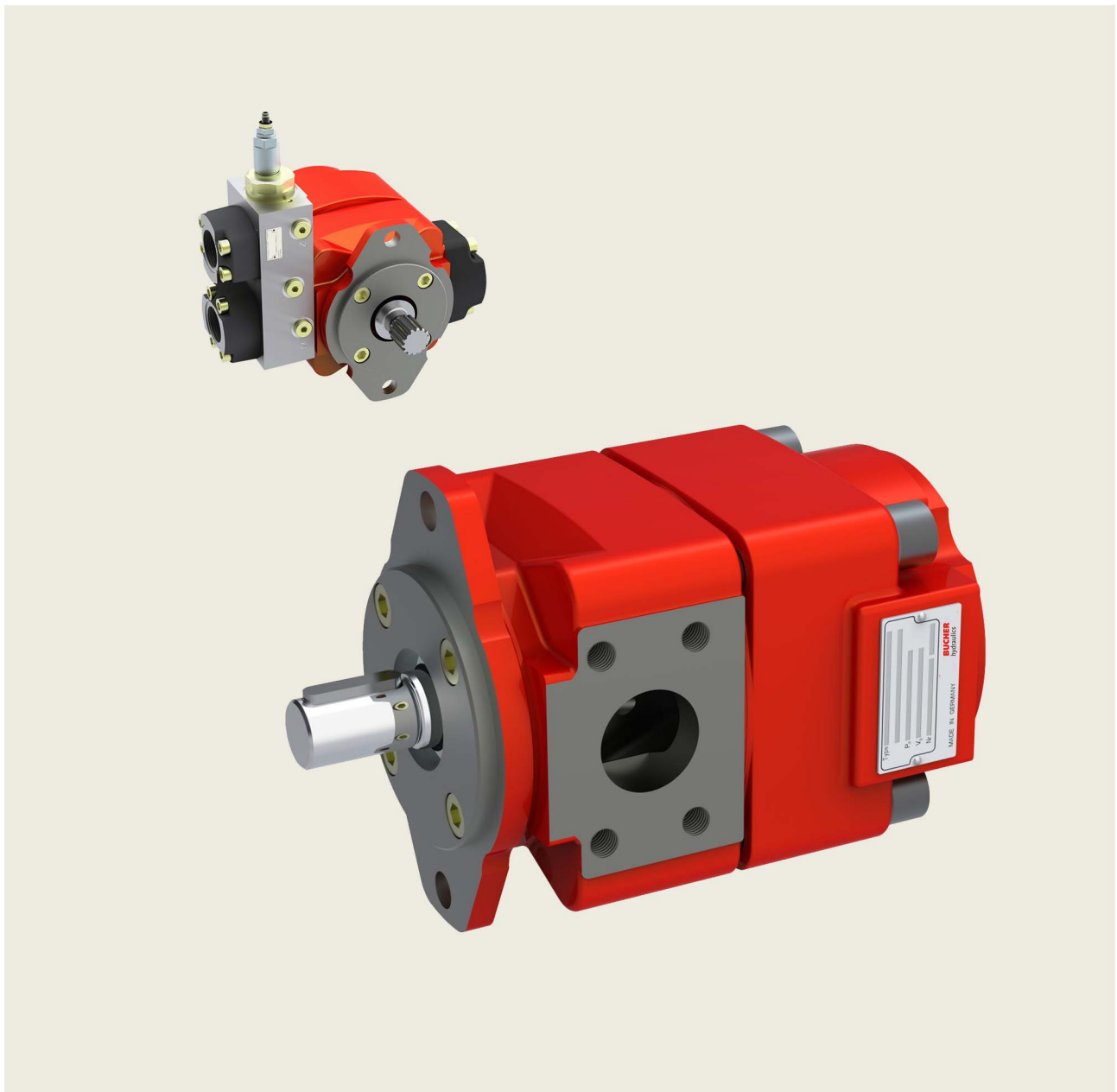


Internal Gear Pump

Series	QXEH32	QXEH42
	QXEH52	QXEH62



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1 General

1.1 Product description

The pumps in the new QXEH range are single-stage units that use just one pair of gear wheels. Their compact and heavy-duty construction introduces a new and pioneering benchmark for pumps. The improved dimensional stability of all rotating components results in higher overall rigidity levels, and this in turn decisively enhances the performance ratings of the QXEH pumps. In addition, a vital improvement to the hydrodynamic lubrication of the ring gear has been implemented by regulating the flow profiles in the critical bearing areas by means of selective oil supply. The good inlet characteristics, and the extremely low noise emissions, even at high speed, are ensured by our tried and tested special gear-tooth technology.



1.2 Advantages

- Generates high pressures in just one stage
- Simple and compact construction
- Resists cavitation with critical fluids
- Very low noise levels
- Maximum reliability, also for reverse mode
- Extremely long service life
- Pressure and flow pulsations are minimal
- ideally suited for use with variable-speed drives

1.3 Application examples

- Hydraulic presses
- Injection moulding machines
- Machine tools
- Waste compactors
- Lift/elevator drives
- Pressure diecasting machines
- Plastics-processing machines
- Hydraulic power units

2 Technical data

2.1 General technical data

General characteristics	Unit	Description, value
Installation attitude		unrestricted
Mounting method (standard)		oval 2-hole flange to ISO 3019/1 (SAE)
Direction of rotation		CW
Reverse mode		for pressure control / pressure relief, concerning the application limits please contact Bucher Hydraulics
Pump drive method		in-line, through a flexible coupling or direct connection with SAE tooth spline
Fluids		HLP mineral oils to DIN 51524, Part 2 (other fluids on request) HFC fluids to VDMA 24317
Maximum admissible level of contamination of the hydraulic fluid		NAS 1638, class 9 or ISO 4406, code 20/18/15
Operating viscosity Start-up viscosity	mm ² /s	10 ... 100 10 ... 300 (other values on request)
Hydraulic fluid temperature range	°C	min -20 / max +80 (but comply with viscosity limits) ideal range: +30 ... +60 / Code 09: -20°C ... +100°C
Inlet pressure: suction port	bar	max 1.5 absolute (without external drain connection) min 0.5 ... 0.98 absolute (dependent on flow rate and speed, please contact Bucher Hydraulics) Code 06 (external drain port): inlet pressure up to 100 bar
Start-up under load	bar	max. 20 (for higher pressures consult Bucher Hydraulics)
Startup against pressure		NBR (Nitrile) = standard, Viton = option 09

2.2 Main characteristics

IMPORTANT. The main characteristics are valid for mineral oils DIN 51524 with a viscosity of 20 to 50 mm²/s

Displacement	Flow rate at speed	Maximum speed		Code	Continuous pressure				Torque	Input power
		Mineral oil	HFC		[bar] continuous		[bar] ²⁾ intermittent			
effective	1450 min ⁻¹ p = 0 bar				Mineral oil	HFC	Mineral oil	HFC	[Nm] ³⁾	[kW] ⁴⁾
[cm ³ /rev] ¹⁾	[l/min]	[rpm] ⁵⁾	[rpm] ⁵⁾							
10,0	14,5	4600	3600	QXEH32-010	250	220	280	240	39,8	6,0
12,6	18,3	4200	3300	QXEH32-012	250	220	280	240	50,2	7,6
15,6	22,6	3800	3000	QXEH32-016	250	220	280	240	62,1	9,4
20,4	29,5	4000	3200	QXEH42-020	250	220	280	240	81,2	12,3
25,1	36,4	3700	2900	QXEH42-025	250	220	280	240	99,9	15,2
32,4	46,8	3400	2700	QXEH42-032	250	220	280	240	129,0	19,6
39,3	56,9	3200	2500	QXEH52-040	250	220	280	240	156,4	23,7
50,6	73,2	3000	2400	QXEH52-050	250	220	280	240	201,4	30,6
63,7	92,1	2800	2200	QXEH52-063	250	220	280	240	253,6	38,5
80,2	116	2700	2100	QXEH62-080	250	220	280	240	319,3	48,5
101,0	146	2500	2000	QXEH62-100	250	220	280	240	402,1	61,0
124,8	181	2300	1800	QXEH62-125	250	220	280	240	496,8	75,4
160,5	232	2300	1800	QXEH62-160	160	130	200	170	447,0	67,9

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

2) Maximum intermittent pressure for a maximum of 20 seconds, but not for more than 40% of the duty cycle.

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

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

5) Maximum rated speeds for inlet pressure > 0.95 bar (abs.) and outlet pressure > 100 bar.

3 Characteristic curves

IMPORTANT. The performance graphs shown are valid for the specified pump models.

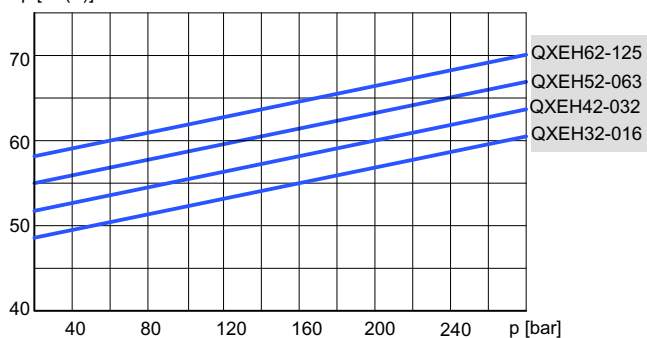
For data for other pump sizes, contact Bucher Hydraulics.

3.1 Noise level (L_p)

Measured to DIN 45635, Part 26, in Stuttgart University's anechoic noise measurement chamber;

Measurement distance 1 m; speed n = 1450 rpm; viscosity = 42 mm²/s (cSt)

L_p [dB(A)]

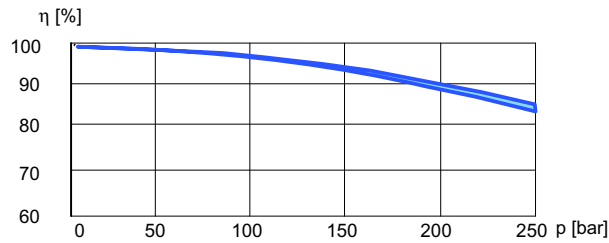


3.2 Efficiencies [η]

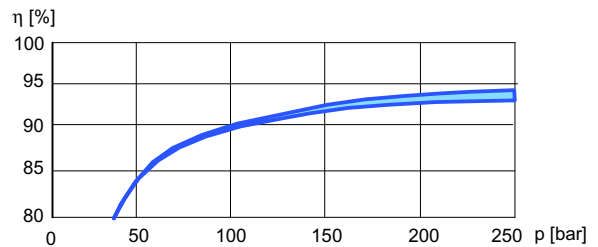
Measured at viscosity 42 mm²/s (cSt), speed 1450 rpm

3.2.1 QXEH32

Volumetric efficiency

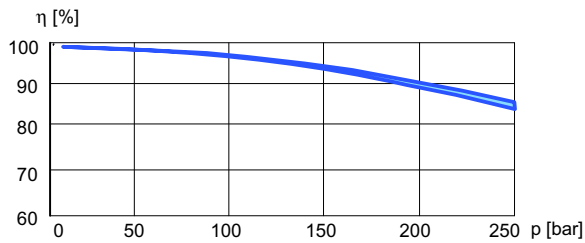


Hydromechanical efficiency

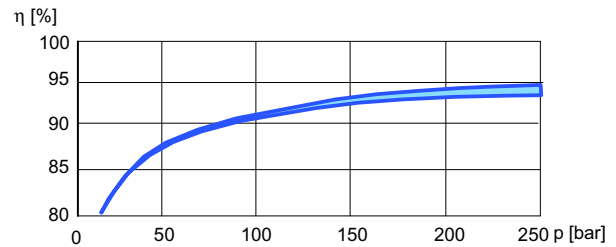


3.2.2 QXEH42

Volumetric efficiency

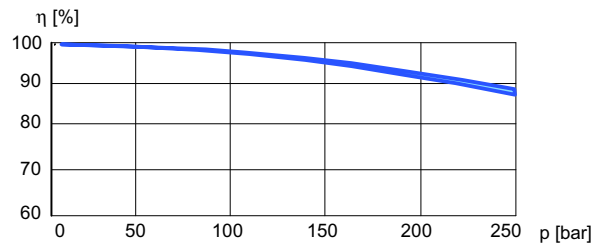


Hydromechanical efficiency

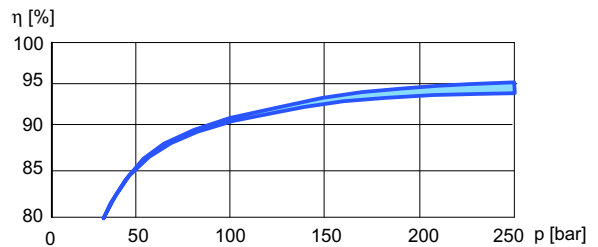


3.2.3 QXEH52

Volumetric efficiency

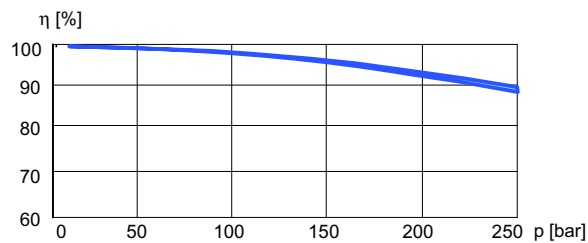


Hydromechanical efficiency

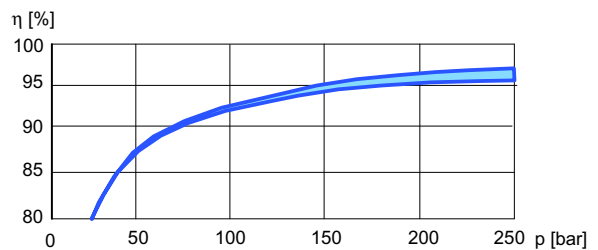


3.2.4 QXEH62

Volumetric efficiency



Hydromechanical efficiency

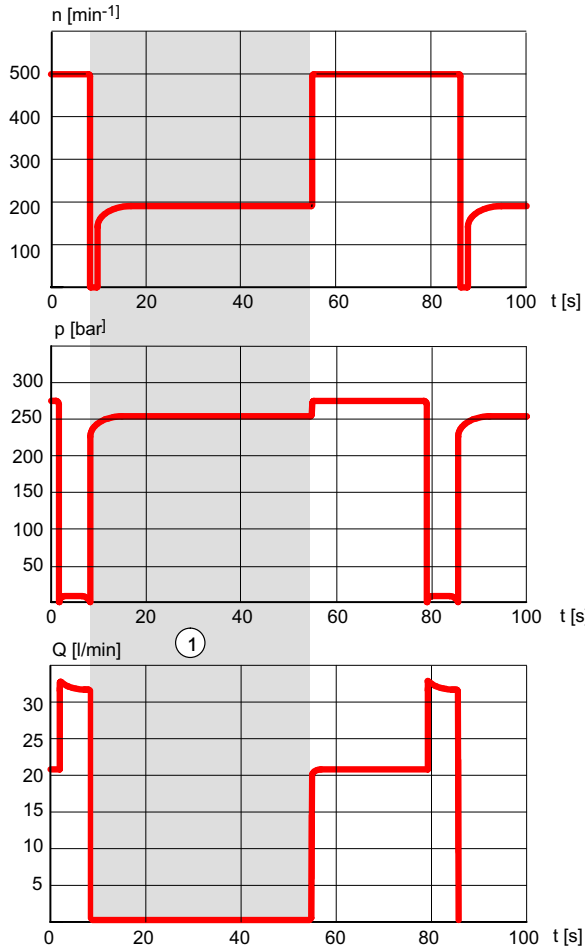


3.3 Operation with variable-speed drives

IMPORTANT. Only possible with option 06

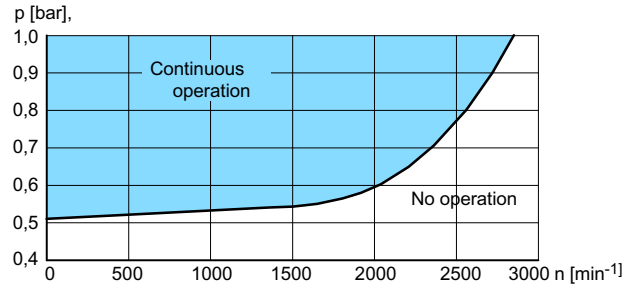
3.3.1 Typical load cycle for in pressure-holding operation

QXEH52-063R06 pump with separate drain port, measured with viscosity of $40 \text{ mm}^2/\text{s}$ (cSt)

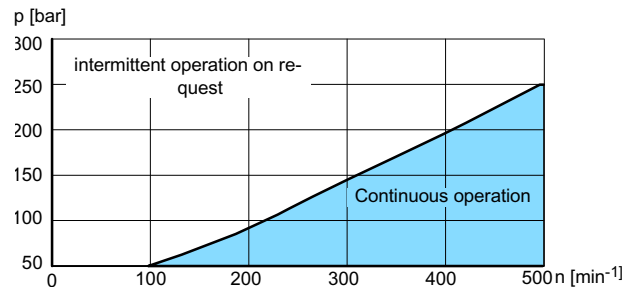


1 Pressure-holding operation $Q = 0 \text{ l/min}$ for up to 60 s

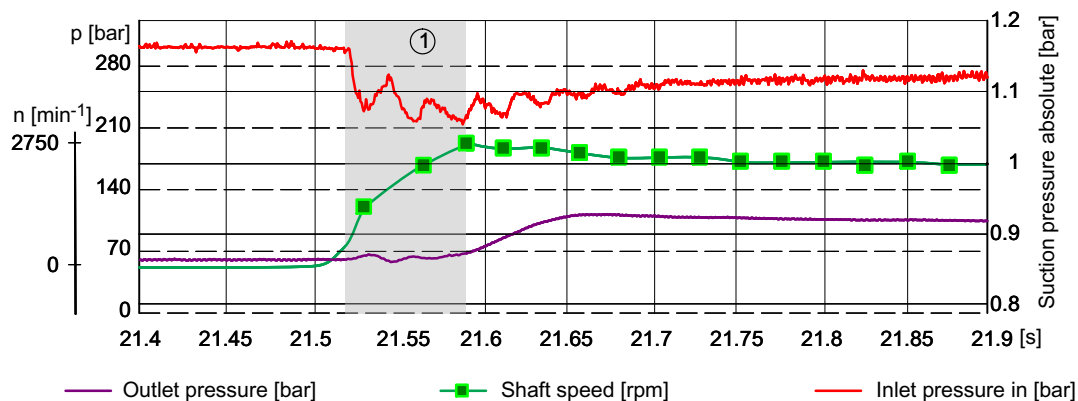
3.3.2 Minimum pressure (absolute) at pump inlet as a function of speed



3.3.3 Minimum speed as a function of pressure



3.4 Accelerations graph with QXEH62



1 Acceleration from 0 to 2750 min^{-1} in 70 ms

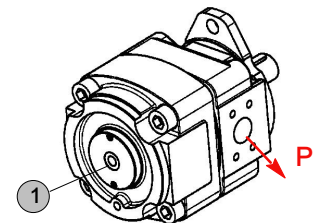
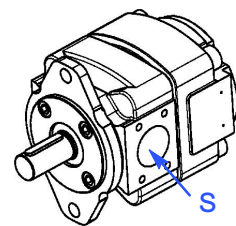
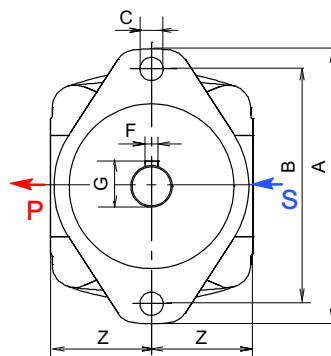
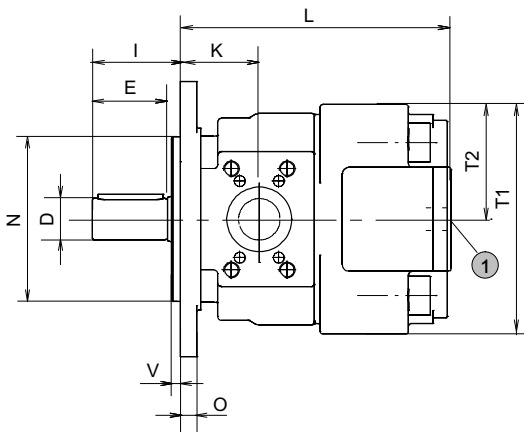
3.5 Dimensions

Frame size		3	4	5	6
Suction port	S	G1-1/4" ³⁾ thread	1 1/2" ¹⁾	2" ¹⁾	2 1/2" ¹⁾
Pressure port	P	G3/4" ³⁾ thread	1" ¹⁾	1 1/4" ¹⁾	1 1/2" ¹⁾
External drain port (option)	①	G1/4"	G1/4"	G1/4"	G3/8"
Mounting method: oval 2-hole flange to ISO 3019/1 (SAE) ISO 3019/2 (metric)	A	132	170	212	267
	B (SAE)	106	146	181	229
	B (Metr.)	109	140	180	224
	C	11	14	18	22
	N (SAE)	82,55 - 0,05	101,6 - 0,05	127 - 0,05	152,4 - 0,05
	N (Metr.)	80 h8	100 h8	125 h8	160 h8
	O	8,5	10,5	12,5	16,5
	V	6	7	7	7
Shaft end: parallel, to ISO/R775 ²⁾	D	20 j6	25 j6	32 j6	40 j6
	E	36	42	58	82
	F	6	8	10	12
	G	22,5	28	35	43
	I	44	51	68	92
Body	K	44	52,5	60,5	74
	L	142,5	176	210	249
	T1	114	137	177	220
	T2	54	67	88,5	110
	Z	60	62,5	78	98,5
Weight	kg	9,5	17	31	60

1) Pipe flange dimensions, SAE J518 code 61 bzw. ISO 6162-1
 - high-pressure type for up to 420 bar (see section 8.1)
 - low-pressure type for up to 16 bar (see section 8.2)

2) For other shaft ends please consult Bucher Hydraulics

3) Threaded port to DIN 3852, Part 2



1 External drain port on models with option 06

4 Fluid

The oil for QXEH products must have a minimum cleanliness level of 20/18/15 to ISO 4406 or class 9 to NAS 1638. We recommend the use of fluids that contain anti-wear additives for operation with boundary lubrication. Fluids without appropriate additives reduce the service life of pumps and motors. The user is responsible for maintaining, and regularly checking, the fluid quality. Bucher Hydraulics recommends a Brugger EN/DIN 51347 load capacity ≥ 30 N/mm². This is particularly important in applications with variable-speed drives and speeds < 1000 rpm.

5 Fluid cleanliness

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

Cleanliness class (RK) onto ISO 4406 and NAS 1638

6 Operational reliability

To guarantee the reliable operation and a long service life of the QXEH, 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:

- The required oil cleanliness
- The operating temperature range
- The 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
- Freedom from leakage

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

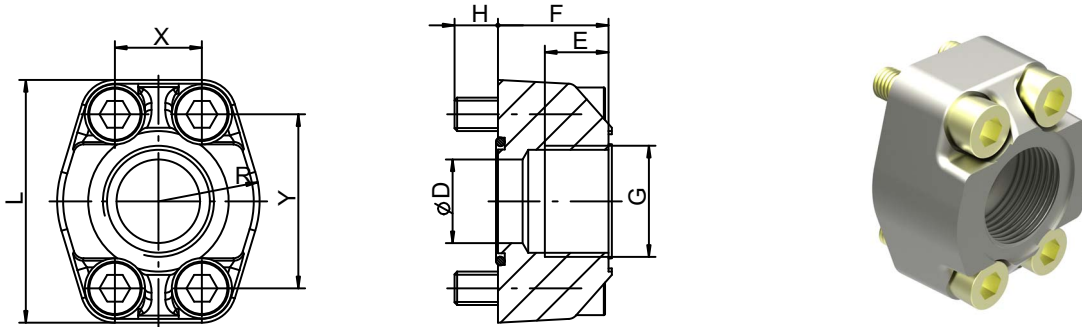
To provide high operational reliability of the QXEH in the machine or system, we recommend continuous, automatic checks of the above parameters and an automatic shut-down in the case of changes that exceed the usual fluctuations within the provided operating range.

7 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.

8 Accessories

8.1 Pipe flanges - high pressure type (thread flange)

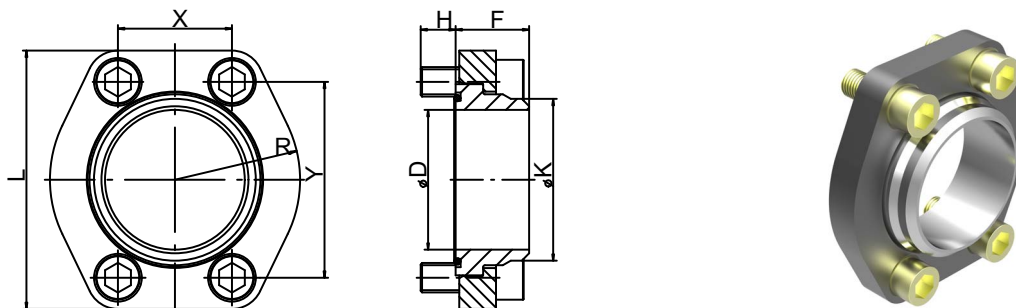


- Max. operating pressure 420 bar
- Flange size SAE J518 code 61 / ISO 6162-1

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

Ordering-number	Ordering code	Size	D ϕ	E	F	H	L	R	X	Y	Viton seal 90 Shore 'A'	Retaining screws DIN912-12.9 / Nm	
100037000	RF 01-R08	G 1/2"	12,5	16	27	13	54	23	17,5	38	20,24x2,62	M8x30	30
100037010	RF 02-R10	G 3/4"	20	18	30	12	65	26	22,2	47,6	26,65x2,62	M10x30	60
100037020	RF 03-R11	G 1"	25	20	34	13	70	29	26,2	52,4	32,99x2,62	M10x35	60
100037030	RF 04-R12	G 1 1/4"	32	22	38	14	80	36	30,2	58,6	40,86x3,53	M10x40	60
100037040	RF 05-R13	G 1 1/2"	38	24	41	19	94	41	35,7	70	44,04x3,53	M12x45	120
100037050	RF 06-R14	G 2"	50	26	45	20	102	48	42,9	77,8	59,92x3,53	M12x50	120

8.2 Pipe flanges - low pressure type (welding flange)

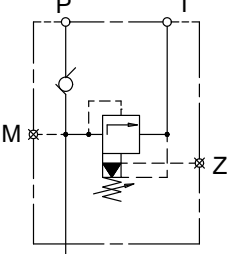
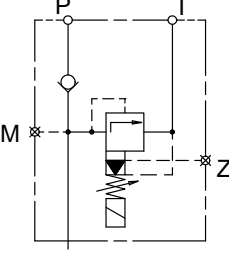
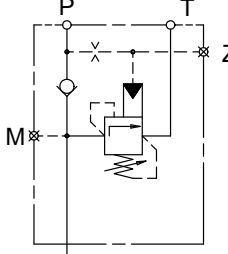





- Max. operating pressure 16 bar
 - Flange size SAE J518 code 61 / ISO 6162-1
- Material: HST37 (for Viton seals contact Bucher Hydraulics)



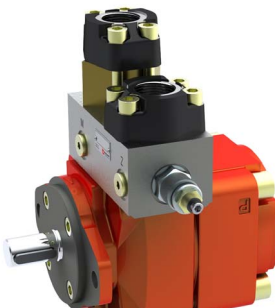
Ordering number	Ordering code	SAE flange Size	D	K	F	H	L	R	X	Y	Viton seal 90 Shore 'A'	Retaining screws DIN 912-8.8 Torque Nm		pipe ¹⁾ O/dia. ap- prox.
100062450	RN 07-S	2 1/2"	63	75	35	14	120	57	51	89	69,44x3,53	M12 x 30	70	75
100063880	RN 08-S	3"	76	88			140,5	68	62	106,5	85,32x3,53	M16 x 40	180	88

1) For connection pipes, we recommend the use of seamless precision steel tube to DIN 2391 with a wall thickness of 6 mm max.

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

Pressure relief valve A _G DF	Pressure relief valve solenoid control A _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-000124-</p>

8.3.1 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 + RVSAE ²⁾ ASDF+RF+RVSAE+DPSAE+ZPSAE
		

1) Pipe flange see chapter 8

2) Please ask BUCHER HYDRAULICS for check valves

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

info.kl@bucherhydraulics.com

www.bucherhydraulics.com

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Classification: 410.100. 000