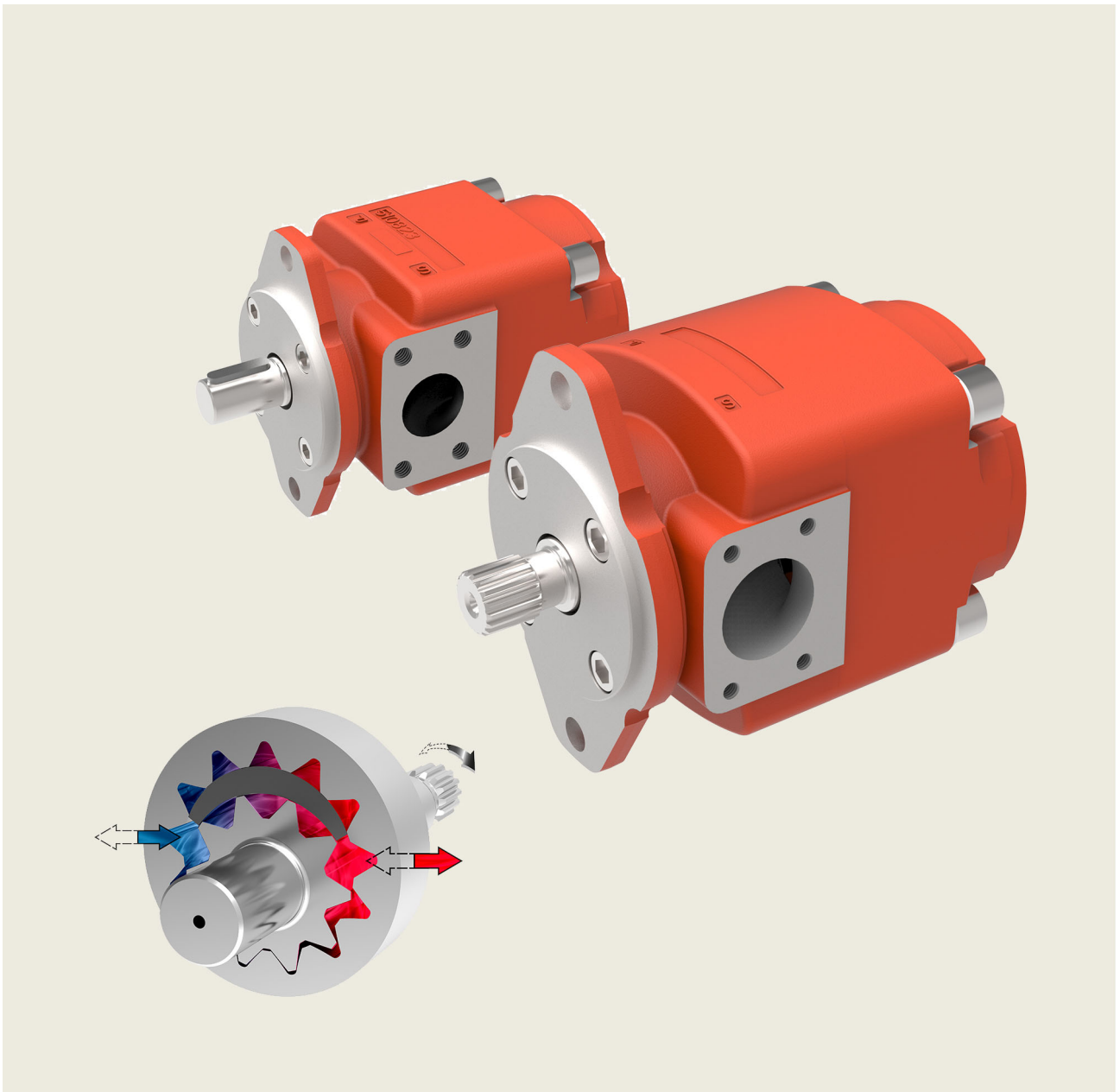


Internal Gear Pumps

New Generation QXEHX



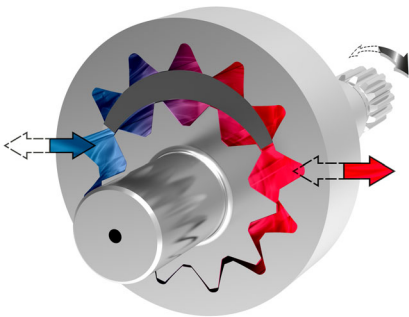
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1 General

1.1 Product description

The newly developed QXEHX pump series is the successor to the QXEH and offers several new advantages.

In addition to the proven reliability and very low noise level of all Bucher Hydraulics internal gear units, the new QXEHX series has been specially developed for very high speeds. The maximum speeds have been increased by around 20%. The hydrodynamic lubrication has been improved still more, increasing the operational reliability of the pump many times over. Overlapping displacements now offer a greater choice, so you can always find the optimum pump size for every application. Bucher Hydraulics has also succeeded in making the new QXEHX even quieter.



1.2 Advantages

- Speeds up to 4600 rpm
- Maximum reliability, even in reversing operation
- Very long service life even with cyclic loading
- Cavitation-resistant with critical fluids
- Very low noise levels
- Ideally suited for use with variable-speed drives
- Heavy-duty materials; can thus be used in difficult environments and with various fluid

1.3 Application examples

- Injection moulding machines
- Plastics-processing machines
- Die casting machines
- Hydraulic forming presses
- Hydraulic power units
- Machine tools
- Waste compactors
- Wind turbines
- Lift/elevator drives

2 Technical data

2.1 General

For other values, please contact Bucher Hydraulics

General characteristics	Unit	Description, Value
Installation attitude		unrestricted
Mounting method (standard)		oval 2-hole flange to ISO 3019/1 (SAE)
Direction of rotation		CW (clockwise)
Reverse mode		for pressure control / pressure relief (for the application limits, please contact Bucher Hydraulic)
Pump drive method		in-line, through a flexible coupling, or direct connection via SAE splines
Fluids		HLP mineral oils to DIN 51524 Part 2 HFC fluids to VDMA 24317
Minimum fluid cleanliness level		ISO 4406 code 20/18/15 (see section 9)
Viscosity range	mm ² /s	Operating viscosity 10 ... 100 / starting viscosity 10 ... 300
Fluid temperature range (note viscosity limits)	°C	HLP-mineral oils -20 ... +80 / Option 09: -20... +100 HFC fluids -20 ... +50 Range for max. service life +30 ... +60
Inlet pressure at suction port	bar	maximum 100 absolute / minimum 0.5 ... 0.98 absolute (dependent on displacement and speed)
Pressure at the drain port	bar	max. 1.5 absolute
Seal material		NBR = standard / FPM (Viton) = option

2.2 Main characteristics

IMPORTANT: The main characteristics are valid for hydraulic oils to DIN 51524 with a viscosity of 20 ... 50 mm²/s and HFC fire-resistant fluids to VDMA 24317.

Displacement	Flow rate at speed	Maximum speed		Code	Operating pressure at P				Power consumption
		Mineral oil	HFC		continuous [bar]		intermittent [bar] ²⁾		
[cm ³ /rev] ¹⁾	[l/min]	[rpm] ³⁾	[rpm] ³⁾		Mineral oil	HFC	Mineral oil	HFC	[kW] ⁴⁾
20,3	29,5	4600	4300	QXEHX42-020	250	220	280	240	12,3
25,1	36,4	4250	3950	QXEHX42-025	250	220	280	240	15,2
32,3	46,8	3900	3550	QXEHX42-032	250	220	280	240	19,5
40,6	58,8	3500	3050	QXEHX42-040	210	180	250	200	20,6
39,1	56,9	3600	3200	QXEHX52-040	250	220	280	240	23,6
50,3	73,2	3400	3000	QXEHX52-050	250	220	280	240	30,4
63,4	92,1	3250	2800	QXEHX52-063	250	220	280	240	38,3
78,3	113,5	2950	2450	QXEHX52-080	210	180	250	200	39,7

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

2) Max. 20 second per minute, and not more than 40% of the duty cycle.

3) Value for inlet pressure of min. 0.95 bar absolute and outlet pressure > 100 bar

4) Theoretical value (without considering efficiencies) at the maximum permitted continuous pressure for mineral oil at n = 1450 rpm

3 Characteristic curves

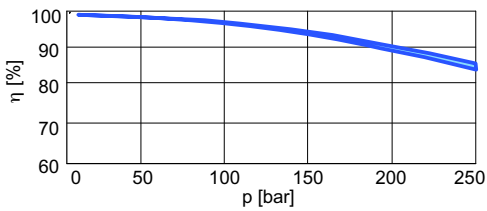
IMPORTANT. The performance graphs shown are valid for the specified pump models and parameters. For other pump sizes and operating conditions, contact Bucher Hydraulics.

3.1 Efficiencies [η]

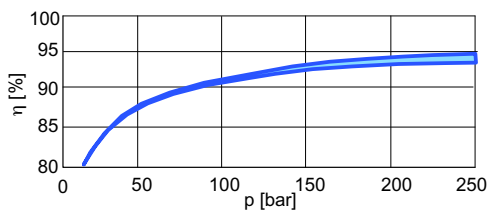
IMPORTANT. measured at viscosity 42 mm²/s and speed n = 1450 rpm.

3.1.1 QXEHX42

Volumetric efficiency

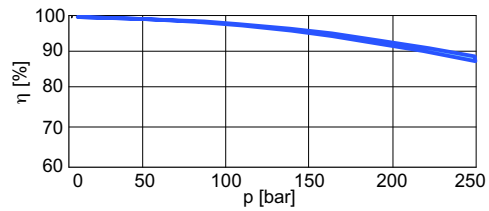


Hydromechanical efficiency

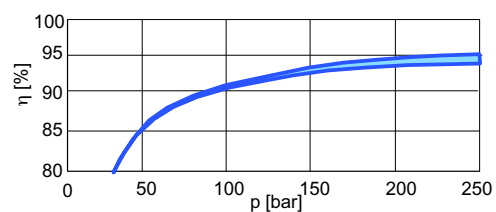


3.1.2 QXEHX52

Volumetric efficiency



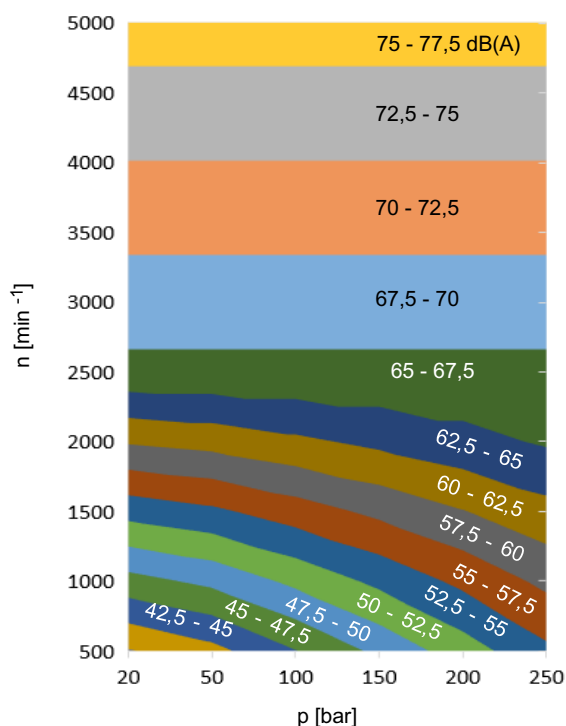
Hydromechanical efficiency



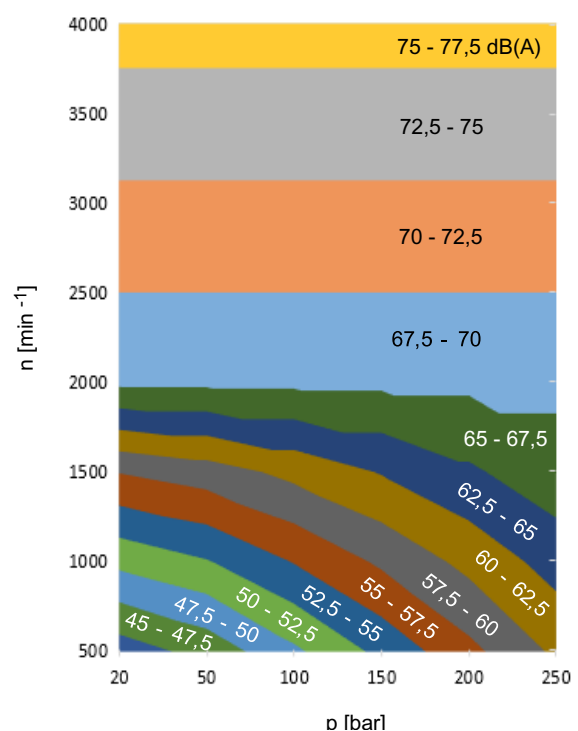
3.2 Noise level (L_p)

IMPORTANT. Measured to DIN 45635, Part 26, in an anechoic noise measurement chamber; with HLP46 and viscosity = 42 mm²/s (cSt). Values valid for single pumps with deviations of $\pm 1,5$ dB(A).

3.2.1 QXEHX42



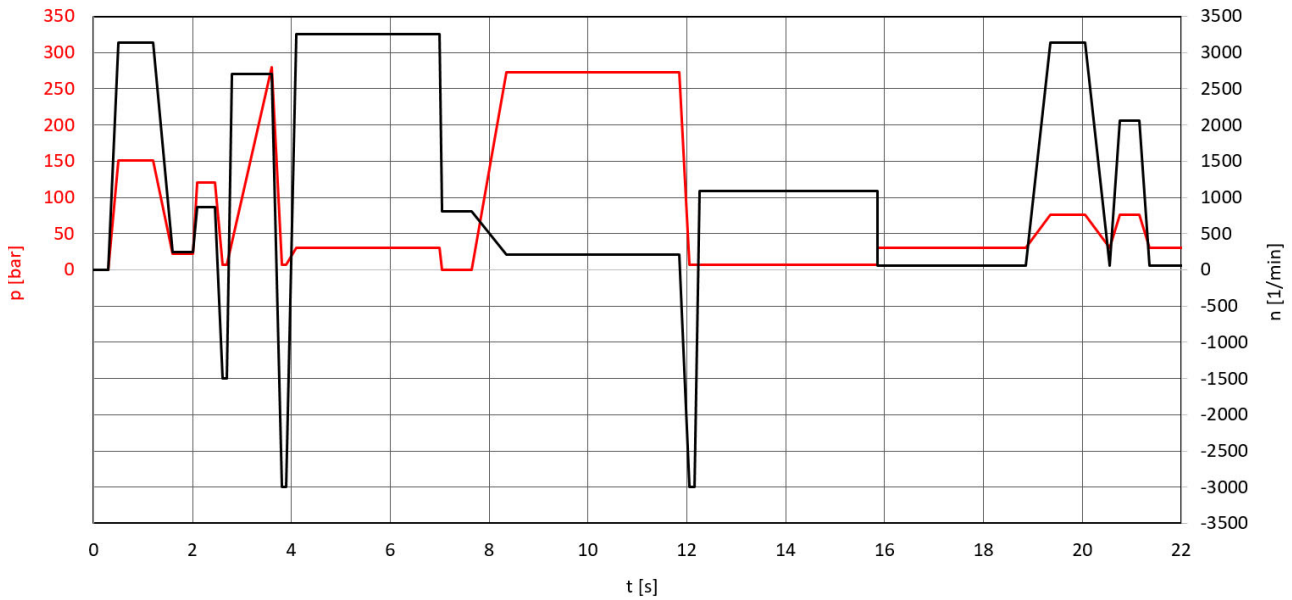
3.2.2 QXEHX52



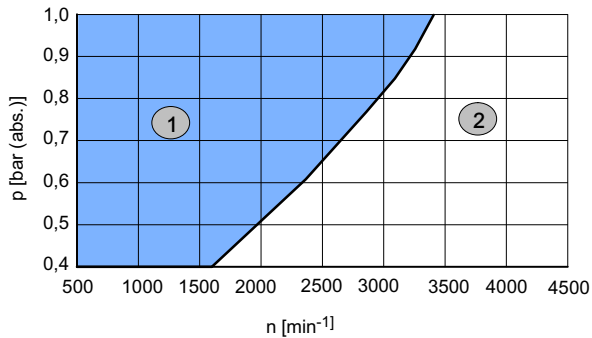
3.3 Operation with variable-speed drives

IMPORTANT: The following main characteristics are to be understood as examples only. They are valid only for the QXEHX52-063R with a viscosity of 42 mm²/s.
We would be very happy to advise you on the layout of your drive.

3.3.1 Typical load cycle for injection moulding machine

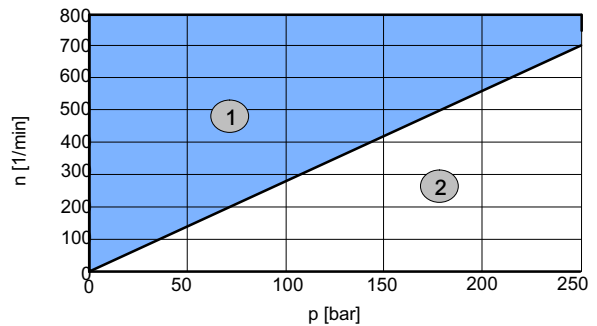


3.3.2 Minimum pressure (absolute) at pump inlet as a function of speed



1	Continuous operation
2	No operation (risk of cavitation)

3.3.3 Minimum speed as a function of pressure at outlet port P

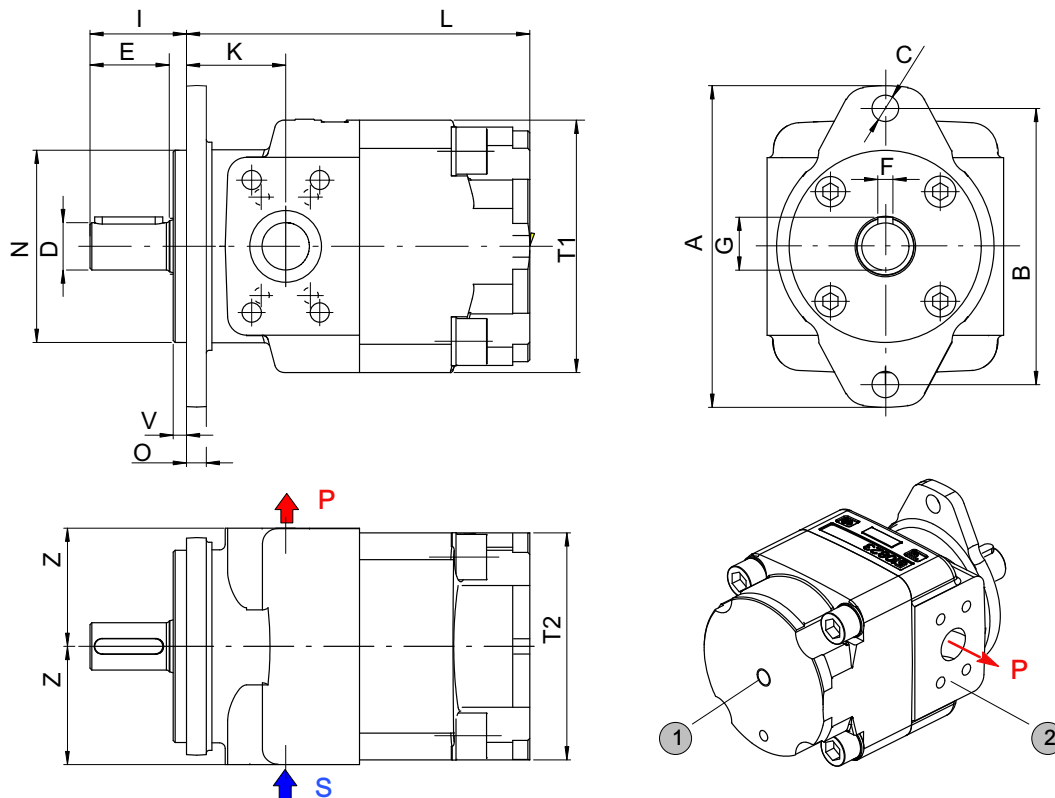


1	Continuous operation
2	Operation only with time limit. Clarify detailed application limits with Bucher Hydraulics

4 Dimensions

Frame size		QXEHX42	QXEHX52
Suction port	S	1½" 1)	2" 1)
Pressure port	P	1" 1)	1¼" 1)
External drain port (option)	①	G¼"	G¼"
Mounting method: oval 2-hole flange to ISO 3019/1 (SAE) ISO 3019/2 (metric)	A	170	212
	B (SAE)	146	181
	B (Metr.)	140	180
	C	14	18
	N (SAE)	101,6 - 0,05	127 - 0,05
	N (Metr.)	100 h8	125 h8
	O	10,5	12,5
	V	7	7
Shaft end: parallel, to ISO/R775 (other shaft ends on application)	D	25 j6	32 j6
	E	42	58
	F	8	10
	G	28	35
	I	51	68
Body	K	52,5	60,5
	L	181,5	210
	T1	133	177
	T2	120	152
	Z	62,5	79
Weight	kg	17	32

1) Pipe flange dimensions, SAE J518 code 61 bzw. ISO 6162-1: High-pressure type for up to 420 bar (see section 10.1)



1	External drain port = standard	2	Pipe flange dimensions to SAE J518 code 61 or ISO 6162-1
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5 Ordering code

		Q X E H X	5	2	-	0	5	0	R	0	9	-		
Series	=	QXEHX												
Frame size	=	4 and 5												
Pressure range	=	2												
Displacement cm ³ /rev	=	020 - 080												
Direction of rotation (viewed from the shaft end) right / cw (standard)	=	R												
Option:														see section 5.3

5.1 Ordering example:

Required:	single pump	Seal material:	FPM (Viton)
Displacement	50 cm ³ /rev	For use with mineral oil	
Continuous pressure	250 bar	Ordering Code:	QXEHX52-050R09

5.2 Standard configuration

- direction of rotation - right (cw)
- external drain port G1/4"
- 2-hole mounting flange to ISO 3019/1 (SAE)
- Nitrile seals (NBR)
- cylindrical shaft end to ISO R775
- black primer to RAL9004, flange without primer

5.3 Options

-O	=	pump without primer	11	=	shaft end with spline shaft SAE ANSI B92.1, DIN ISO 3019-1
09	=	seal material FPM (Viton), pump without primer	29	=	pump without primer for HFC fluids

6 Fluid

QX pumps require fluid with a minimum cleanliness level of 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. This is particularly important in applications with variable-speed drives and speeds $< 1000 \text{ rpm}$.

7 Fluid cleanliness class

Cleanliness class to ISO 4406

Code ISO 4406	Number of dirt particles / 100 ml		
	$\geq 4 \mu\text{m}$	$\geq 6 \mu\text{m}$	$\geq 14 \mu\text{m}$
23/21/18	800000	200000	25000
22/20/18	400000	100000	25000
22/20/17	400000	100000	13000
22/20/16	400000	100000	6400
21/19/16	200000	50000	6400
20/18/15	100000	26000	3200
19/17/14	50000	13000	1600
18/16/13	25000	6400	800
17/15/12	13000	3200	400
16/14/12	6400	1600	400
16/14/11	6400	1600	200
15/13/10	3200	800	100
14/12/9	1600	400	50
13/11/8	800	200	25

8 Operational reliability

To guarantee the reliable operation and long service life of the QXEHX internal gear 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 QXEHX internal gear pump in the machine or system, we recommend continuous, automatic checks of the above parameters and an automatic shutdown in the case of changes that exceed the usual fluctuations within the provided operating range.

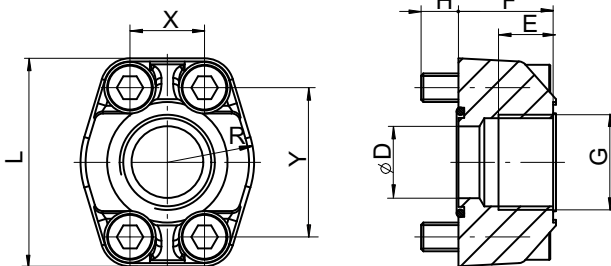
Make sure that the plastic components of the coupling are replaced regularly (no later than 5 years). The manufacturer's instructions must be given priority.

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 contact Bucher Hydraulics GmbH.

10 Accessories

10.1 Pipe flanges - high pressure type



- 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 FPM (Viton) seals, contact Bucher Hydraulics GmbH.

Ordering number	Ordering code	Size	D \varnothing	E	F	H	L	R	X	Y	O-ring 90 Shore A	Retaining screws DIN912-12.9 / [Nm]
100037020	RF 03-R11	G1"	25	20	34	13	70	29	26,2	52,4	32,99x2,62	M10x35 60
100037030	RF 04-R12	G1¼"	32	22	38	14	80	36	30,2	58,6	40,86x3,53	M10x40 60
100037040	RF 05-R13	G1½"	38	24	41	19	94	41	35,7	70	44,04x3,53	M12x45 120
100037050	RF 06-R14	G2"	50	26	45	20	102	48	42,9	77,8	59,92x3,53	M12x50 120

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

IMPORTANT: The following bolt-on valves are available for all QX internal gear units, sizes 3 and 4.
For future information about bolt-on valves contact www.bucherhydraulics.com

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

10.2.1 Examples of bolt-on valves, mounted on QX internal gear pumps

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

1) Pipe flange see section 12.2

2) Please contact Bucher Hydraulics GmbH for suitable check valves.

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