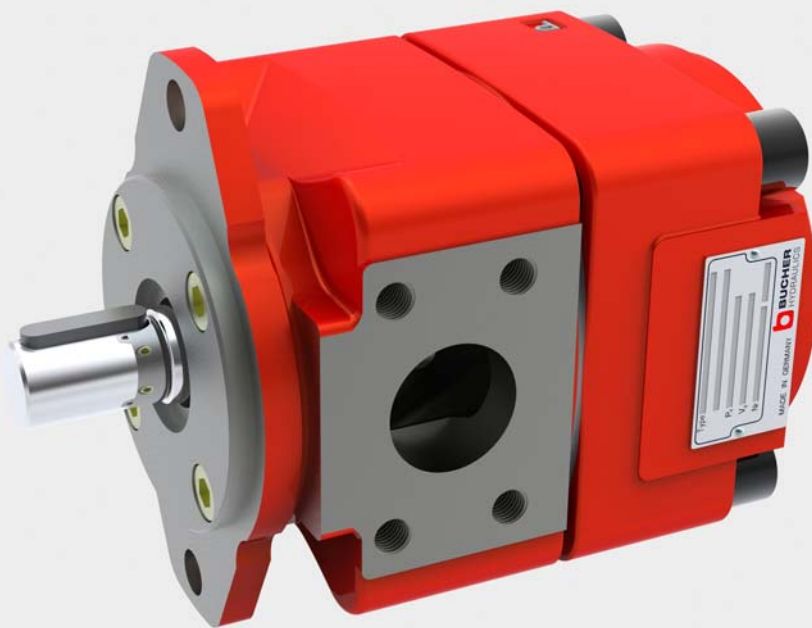


Internal Gear Pump

| | | |
|--------|--------|--------|
| Series | QXEH32 | QXEH42 |
| | QXEH52 | QXEH62 |



- Industrial model
- For variable-speed drives

motion and progress

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
- 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

| | |
|---|--|
| Mounting attitude | unrestricted |
| Mounting method (standard) | oval 2-hole flange to ISO 3019/1 (SAE) |
| Direction of rotation | CW (not reversible) |
| 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 (for other fluids consult Bucher Hydraulics) HFC oils to VDMA 24317 |
| Minimum fluid cleanliness | at least 20/18/15 to ISO 4406 or NAS 1638, Class 9 |
| Operating viscosity Start-up viscosity | 10 to 100 mm ² /s (cSt) 10 to 300 mm ² /s (cSt) (for values outside these ranges consult Bucher) |
| Hydraulic fluid temperature | min -20°C, max. +80°C (but comply with viscosity limits) Ideal range: +30°C ... +60°C Code 09: -20°C ... +100°C |
| Inlet pressure; suction port | maximum 1.5 bar absolute (without external drain connection) minimum 0.5 to 0.98 bar 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 | maximum 20 bar (for higher pressures, consult Bucher Hydraulics) |
| Seal material | 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



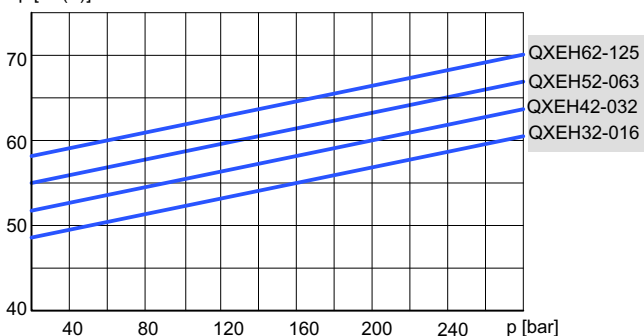
IMPORTANT. The performance graphs shown are valid for the specified pump models. For data for other pump sizes, contact Bucher Hydraulics.

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)]

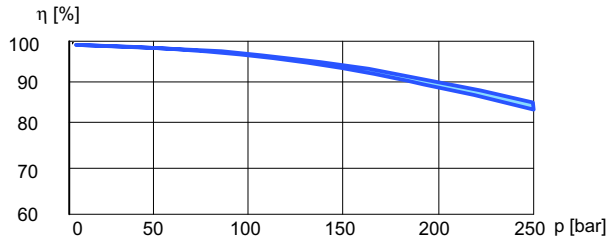


3.2 Efficiencies [η]

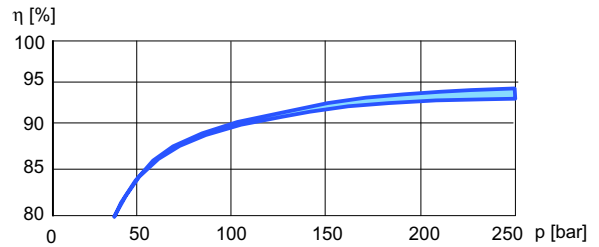
Measured at viscosity 42 mm²/s (cSt), speed 1450 rpm

3.2.1 QXEH32

Volumetric efficiency

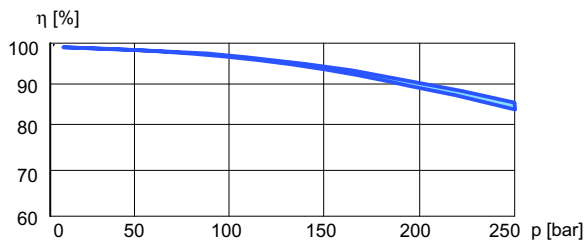


Hydromechanical efficiency

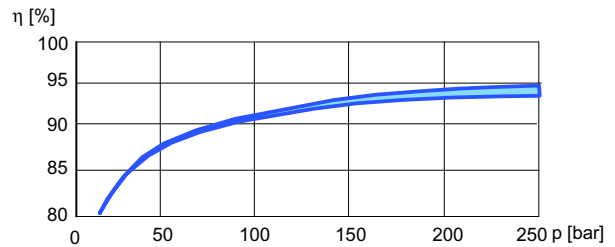


3.2.2 QXEH42

Volumetric efficiency

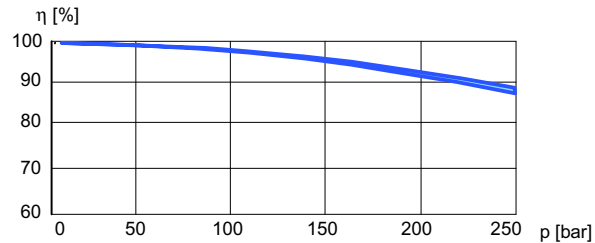


Hydromechanical efficiency

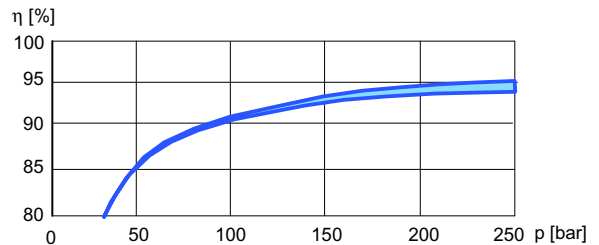


3.2.3 QXEH52

Volumetric efficiency

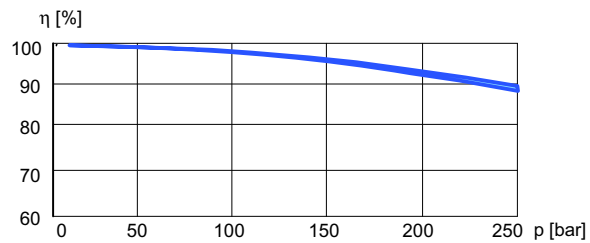


Hydromechanical efficiency

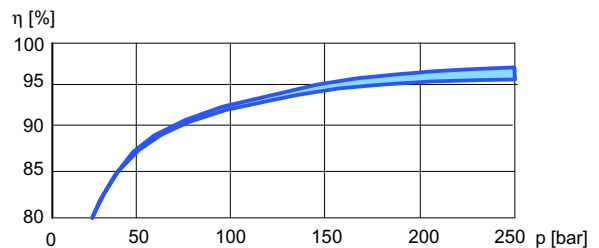


3.2.4 QXEH62

Volumetric efficiency



Hydromechanical efficiency



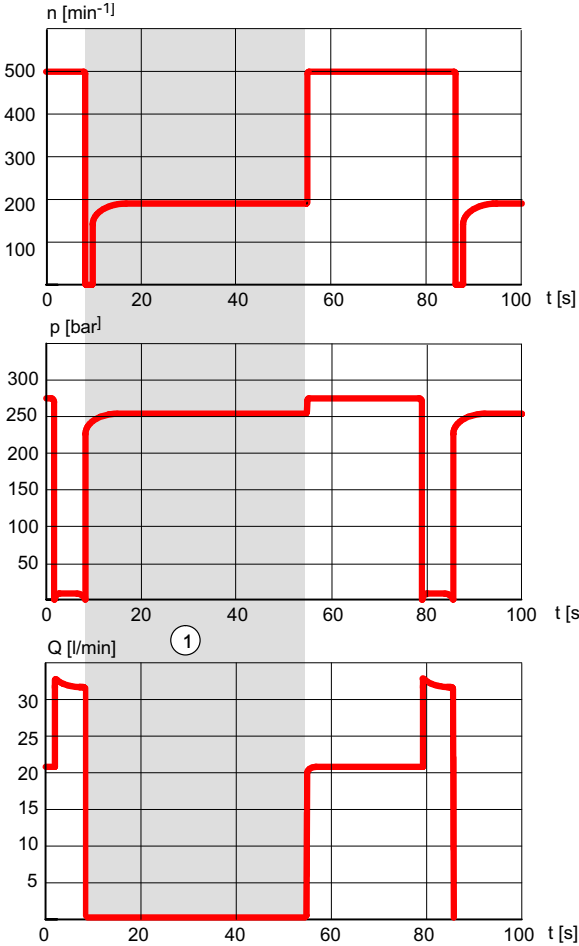
3.3 Operation with variable-speed drives



IMPORTANT. Only possible with option 06

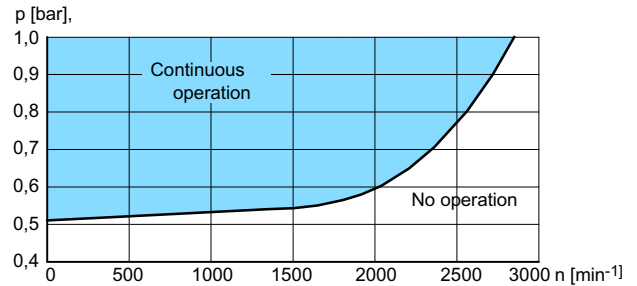
3.3.1 Typical load cycle for in pressure-holding operation

QXEH52-063R06 pump with separate drain port, measured with viscosity of 40 mm²/s (cSt)

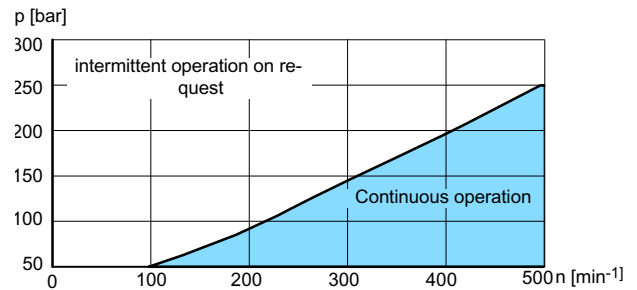


1 Pressure-holding operation $Q = 0$ l/min for up to 60 s

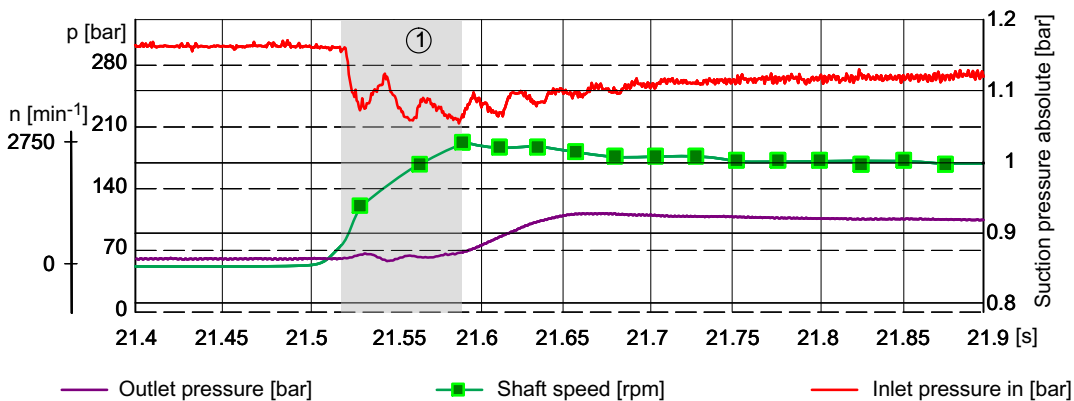
3.3.2 Minimum pressure (absolut) at pump inlet as a function of speed



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

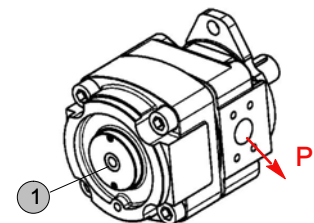
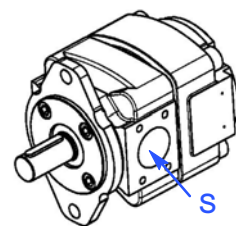
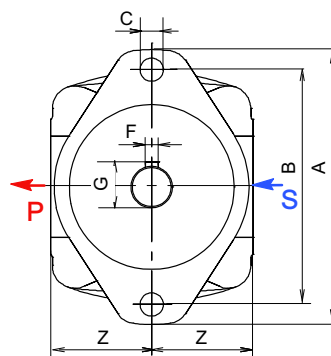
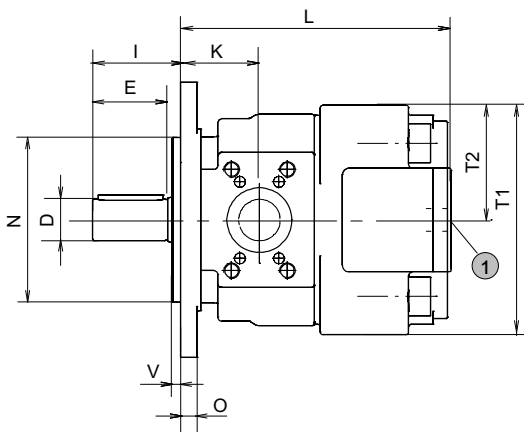
3.5 Dimensions

| 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 | | | |
|------------------|-------------------------------|----------------------|-----------------------|----------|
| | $\leq 4 \mu\text{m}$ | $\leq 6 \mu\text{m}$ | $\leq 14 \mu\text{m}$ | 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 | 1300000 | 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.

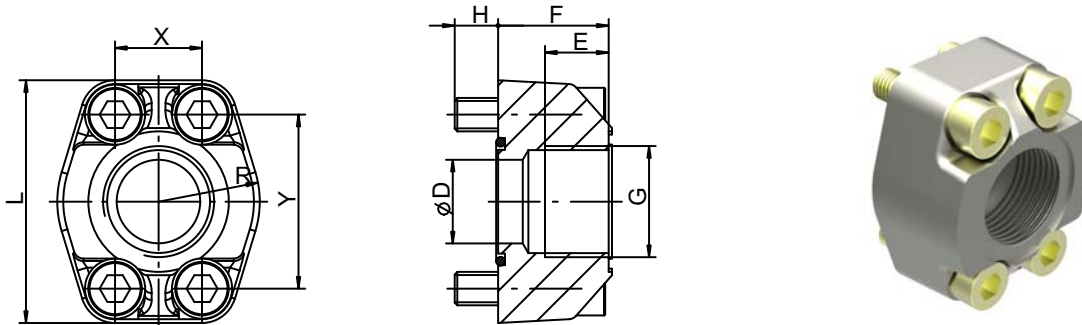
To provide high operational reliability of the QXEH in the machine or system, we recommend continuous, automatic checks of the above parameters and an automatic shutdown in the case of changes that exceed the usual fluctuations within the provided operating range.

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)

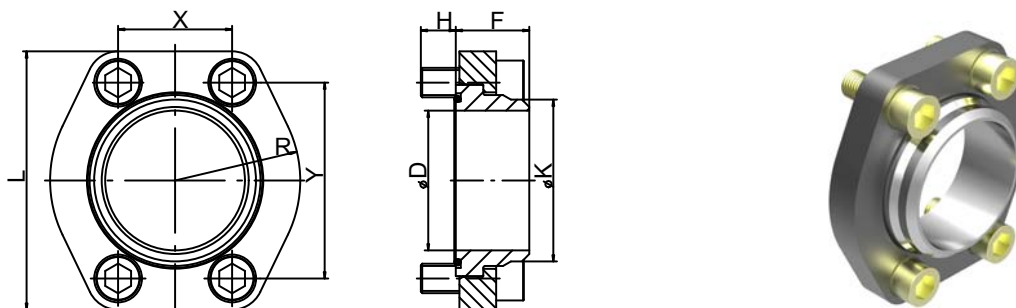


- Max. operating pressure 420 bar
- Flange size SAE J518 code 61 / ISO 6162-1

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

| Ordering-number | Ordering code | Size | DØ | 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)

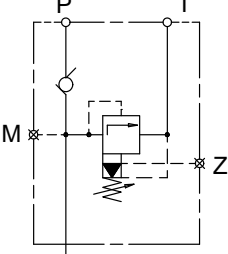
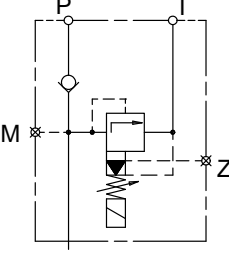
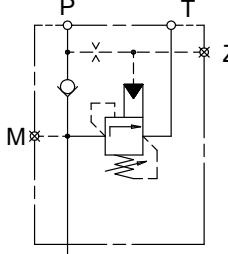





- Max. operating pressure 16 bar
 - Flange size SAE J518 code 61 / ISO 6162-1
- Material: HST37 / For Viton seals, contact Bucher Hydraulics

| 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. approx. |
|-----------------|---------------|-----------------|----|----|----|----|-------|----|----|-------|-------------------------|--|-----|-----------------------------------|
| 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 ^S DF / ASDH | Pressure relief valve solenoid control A _G ^S DA | Accumulator charging valve AGSF |
|---|---|---|
|  |  |  |
|  |  |  |
| Technical data sheet 100-P-000123- | Technical data sheet 100-P-000119- | Technical data sheet 100-P-000124- |

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