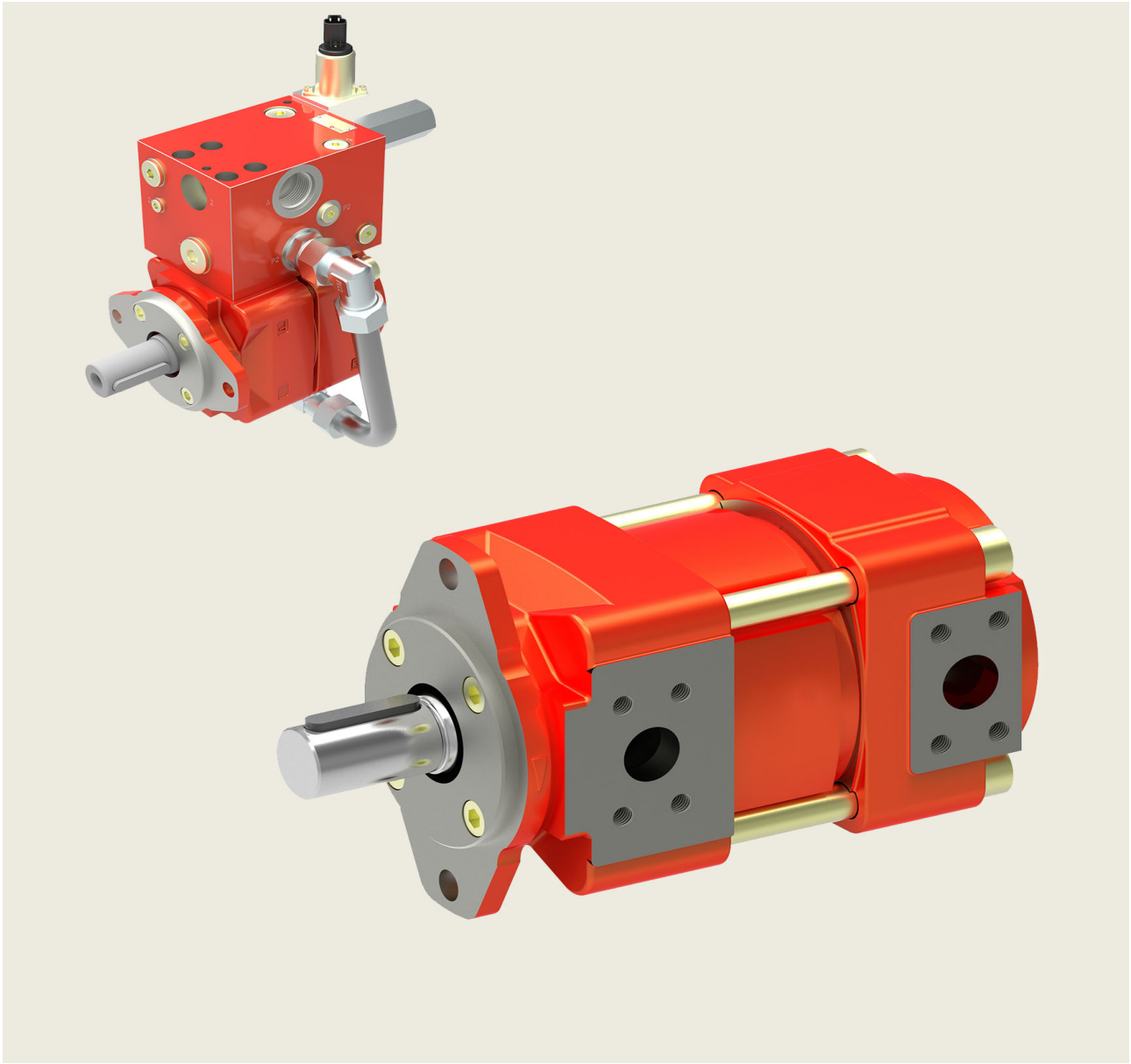
BUCHER hydraulics

Internal Gear Unit

for motor/pump function
Series QXM



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1 General

1.1 Product description

The QXM drive unit can be used in open- and closed-loop hydrostatic drives, and can operate both as a pump and as a motor.

This flexibility offers possibilities for various applications, one example being the raising and lowering of loads. The QXM works as a pump to lift the load and recovers energy when the load is being lowered.

Used as a fully bi-directional pump/motor (four-quadrant operation), the unit controls a complete motion cycle of a cylinder. Fast acceleration/deceleration sequences can be achieved.
The unit is based on the well-known QX internal gear pump, which is distinguished by its very low noise levels and almost imperceptible pressure pulsations. The large number of closely spaced sizes ensures that the right size is always available for every application.

1.2 Advantages

- very low noise levels
- negligible pressure pulsations
- 5802 PSI maximum pressure
- hydrodynamic bearing support ensures long service life
- suitable for special fluids such as HFB, HFC, HFD and bio-degradables
- suitable for variable-speed operation
- 2- and 4-quadrant operation is possible
- optimised flow path cross-sections and special gear profile give low susceptibility to cavitation

1.3 Application

- Injection molding machines
- Hydraulic presses
- Flight simulators
- Wind-power plants
- Lift / elevator drives
- Winches

1.4 ATEX compliant explosion protection

The internal gear unit QXM is 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

II 3G Ex h IIC T3 Gc X
-20°C ≤ T_a ≤ +80°C

II 3G Ex h IIC T4 Gc X
-20°C ≤ T_a ≤ +40°C

2 Technical data

2.1 General

Characteristics	Unit	Description, value
Installation attitude		unrestricted
Mounting method (standard)		oval 2-hole flange to ISO 3019/1 (SAE): QXM 3-6 oval 2-hole flange to ISO 3019/2 (metric) QXM 2+8
Direction of rotation		unrestricted
Drive method		in-line, by a flexible coupling
Hydraulic fluid		HLP mineral oils to DIN 51524, Part 2 HFB, HFD and HFC fluids to VDMA 24317 other fluids - contact Bucher Hydraulics
Max. admissible level of contamination of the hydraulic fluid		ISO 4406 class 20/18/15

Characteristics	Unit	Description, value
Operating viscosity Starting viscosity	ft^2/s (mm^2/s)	1.08 … 10.76 (10 … 100 mm^2/s) 1.08 … 32.29 (10 … 300 mm^2/s) (higher values, contact Bucher Hydraulics)
Hydraulic fluid temperature	°F (°C)	HLP-mineral oils -4 (-20°C) min. / +176 (+80°C) max. / HFC +122 (+50°C) max. range for max. long life cycle +86 … +140 (+30°C … +6°C considering viscosity field
Max. pressure at drain port	PSI (bar)	22 (1,5 bar) absolute (higher values, contact Bucher Hydraulics)
Accumulated pressure restriction		Port P_1 + Port P_2 ≤ continuous-/intermittent pressure

IMPORTANT: The main characteristics are valid for hydraulic oils DIN 51524 with a viscosity of 42mm^2/s.

2.2 Main characteristics for pressure range 1

Type	Displacement $in^3/rev(cm^3/U)$		minimum Motor Speed [5] RPM (min^{-1})		max. Speed [3] RPM (min^{-1})		Operating ressure PSI (bar)		Torque [2] lb-in (Nm)
	nominal	effective [6]	Operating pressure on inlet side		Pump [4] operating	Motor operating	continuous	Intermittend [1]	
			...50%	...100%					
QXM21-010 QXM21-012 QXM21-016	0.61 (010) 0.73 (012) 0.97 (016)	0.62 (10.3) 0.76 (12.6) 0.97 (15.9)	1000	2500	4000 3600 3200	5500	2321 (160) 1813 (125) 1450 (100)	3045 (210) 2320 (160) 1813 (125)	221 (25)
QXM31-020 QXM31-025 QXM31-032	1.22 (020) 1.52 (025) 1.95 (032)	1.22 (20.0) 1.53 (25.2) 1.95 (32.1)	800	2000	3200 3000 2700	5000	2321 (160) 1813 (125) 1450 (100)	3045 (210) 2320 (160) 1813 (125)	443 (50)
QXM41-040 QXM41-050 QXM41-063	2.44 (040) 3.05 (050) 3.84 (063)	2.47 (40.6) 3.06 (50.2) 3.93 (64.5)	600	1500	2700 2350 2050	4600	2321 (160) 1813 (125) 1450 (100)	3045 (210) 2320 (160) 1813 (125)	885 (100)
QXM51-080 QXM51-100 QXM51-125	4.88 (080) 6.10 (100) 7.62 (125)	4.83 (79.3) 6.13 (100.6) 7.73 (126.7)	600	1500	2050 1900 1620	4000	2321 (160) 1813 (125) 1450 (100)	3045 (210) 2320 (160) 1813 (125)	1770 (200)
QXM61-160 QXM61-200 QXM61-250	9,76 (160) 12.20 (200) 15.25 (250)	9,74 (159.7) 12.27 (201.1) 15.15 (248.4)	600	1500	1500 1350 1200	3200	2321 (160) 1813 (125) 1450 (100)	3045 (210) 2320 (160) 1813 (125)	3540 (400)
QXM81-315 QXM81-400 QXM81-500	19,22 (315) 24.40 (400) 30.51 (500)	19,76 (323.9) 24.41 (400.1) 30.23 (495.4)	600	1200	1200 1100 1000	3000	2321 (160) 1813 (125) 1450 (100)	3045 (210) 2320 (160) 1813 (125)	7081 (800)

1) Intermittent pressure for max. 20 sec/min but not more than 10% of the duty cycle.

2) Theoretical value at the maximum permitted continuous pressure. For starting torques, see section 3.

3) For higher speed contact us.

4) Min. inlet pressure 1 bar absolute.

5) Recommended speed. For less speed the pressure must be reducing (linear rate). For customized working cycle contact Bucher Hydraulics.

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

2.3 Main characteristics for pressure range 2

Type	Displacement in³/rev (cm³/U)		minimum Motor Speed 5) RPM (min⁻¹)		Max. Speed 3) RPM (min⁻¹)		Operating ressure on outlet side 1) PSI (bar)		Torque 2) lb-in (Nm)
	nominal	effective 6)	Operating pressure on inlet side ...50%	...100%	Pump 4) operating	Motor operating	continuous	Intermittend 1)	
QXM22-005	0.30 (005)	0.31 (5.1)	1650	3000	3250	6000	3046 (210)	3626 (250)	150 (17)
QXM22-006	0.38 (006)	0.38 (6.3)							186 (21)
QXM22-008	0.48 (008)	0.48 (8.0)							235 (26.5)
QXM32-010	0.61 (010)	0.61 (10.0)	1400	2500	3050	5500	3046 (210)	3626 (250)	296 (33.5)
QXM32-012	0.73 (012)	0.76 (12.6)							372 (42)
QXM32-016	0.97 (016)	0.95 (15.6)							460 (52)
QXM42-020	1.22 (020)	1.20 (20.3)	1000	1800	2900	5000	3046 (210)	3626 (250)	602 (68)
QXM42-025	1.52 (025)	1.53 (25.1)							743 (84)
QXM42-032	1.95 (032)	1.97 (32.3)							956 (108)
QXM52-040	2.44 (040)	2.38 (39.1)	1000	1800	2500	4500	3046 (210)	3626 (250)	1159 (131)
QXM52-050	3.05 (050)	3.06 (50.3)							1496 (169)
QXM52-063	3.84 (063)	3.86 (63.4)							1876 (212)
QXM62-080	4.88 (080)	4.86 (79.8)	1000	1800	2250	4000	3046 (210)	3626 (250)	2732 (268)
QXM62-100	6.10 (100)	6.13 (100.5)			2050				2983 (337)
QXM62-125	7.62 (125)	7.57 (124.2)			1800				3682 (416)
QXM82-160	9,76 (160)	9,87 (161.9)	1000	1800	1600	3500	3046 (210)	3626 (250)	4815 (544)
QXM82-200	12.20 (200)	12.20 (200)			1500				5939 (671)
QXM82-250	15.25 (250)	15.11 (247.7)			1350				7364 (832)

2.4 Main characteristics for pressure range 3

Type	Displacement in³/Rev (cm³/U)		minimum Motor Speed 5) RPM (min⁻¹)		max. Speed 3) RPM (min⁻¹)		Operating ressure on outlet side PSI (bar)		Torque 2) lb-in (Nm)
	nominal	effective 6)	Operating pressure on inlet side ...50%	...100%	Pump 4) operating	Motor operating	continuous	Intermittend 1)	
QXM23-005	0.30 (005)	0.31 (5.1)	1200	2500	3250	6000	4641 (320)	5802 (400)	230 (26)
QXM23-006	0.36 (006)	0.38 (6.3)							283 (32)
QXM23-008	0.48 (008)	0.48 (7.9)							363 (41)
QXM33-010	0.61 (010)	0.61 (10.0)	1000	2000	3050	5500	4641 (320)	5802 (400)	451 (51)
QXM33-012	0.73 (012)	0.76 (12.6)							566 (64)
QXM33-016	0.97 (016)	0.95 (15.6)							708 (80)
QXM43-020	1.22 (020)	1.23 (20.3)	750	1500	2900	5000	4641 (320)	5802 (400)	912 (103)
QXM43-025	1.52 (025)	1.53 (25.1)							1133 (128)
QXM43-032	1.95 (032)	1.97 (32.3)							1452 (164)
QXM53-040	2.44 (040)	2.38 (39.1)	750	1500	2500	4500	4641 (320)	5802 (400)	1770 (200)
QXM53-050	3.05 (050)	3.06 (50.3)							2275 (257)
QXM53-063	3.84 (063)	3.86 (63.4)							2859 (323)
QXM63-080	4.88 (080)	4.86 (79.8)	750	1500	2250	4000	4641 (320)	5802 (400)	3611 (408)
QXM63-100	6.10 (100)	6.13 (100.5)			2050				4549 (514)
QXM63-125	7.62 (125)	7.57 (124.2)			1800				5620 (635)
QXM83-160	9.76 (160)	9.87 (161.9)	750	1500	1600	3500	4641 (320)	5802 (400)	7328 (828)
QXM83-200	12.20 (200)	12.20 (200.0)			1500				9054 (1023)
QXM83-250	15.25 (250)	15.11 (247.7)			1350				11214(1267)

1) Intermittent pressure for max. 20 sec/min but not more than 10% of the duty cycle.

2) Theoretical value at the maximum permitted continuous pressure. For starting torques, see section 3.

3) For higher speed contact us.

4) Min. inlet pressure 1 bar absolute.

5) Recommended speed. For less speed the pressure must be reducing (linear rate). For customized working cycle contact Bucher Hydraulics.

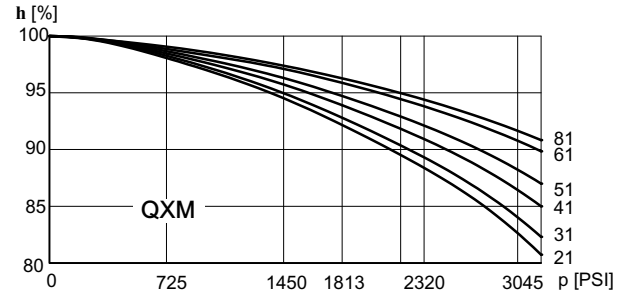
6) Due to manufacturing tolerances, there may be slight variations in the displacement.

3 Performance graphs

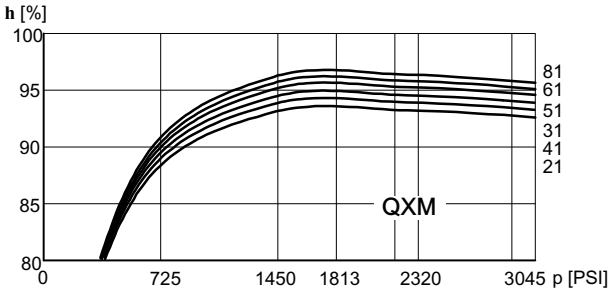
3.1 Pressure range 1

3.1.1 Volumetric efficiency

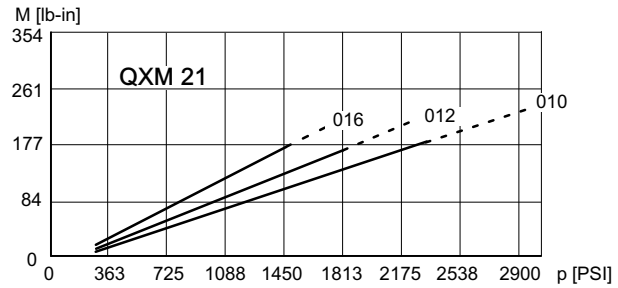
Measured with n = 1450 RPM (min$^{-1)}$
Viscosity 210 S.U.S (42 mm^2/s)

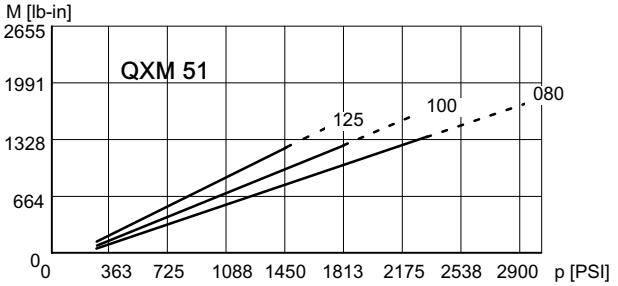


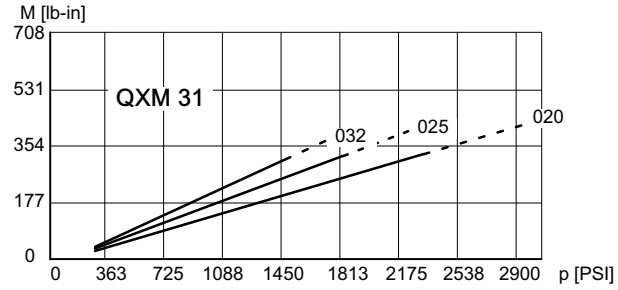
3.1.2 Hydro-mechanical efficiency

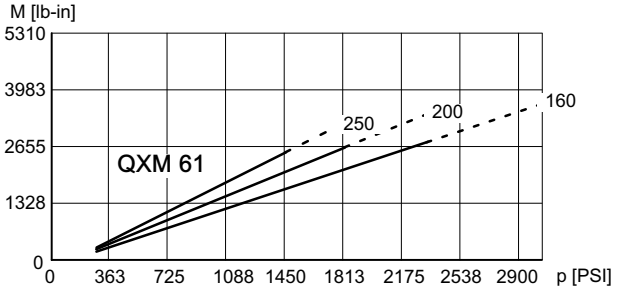


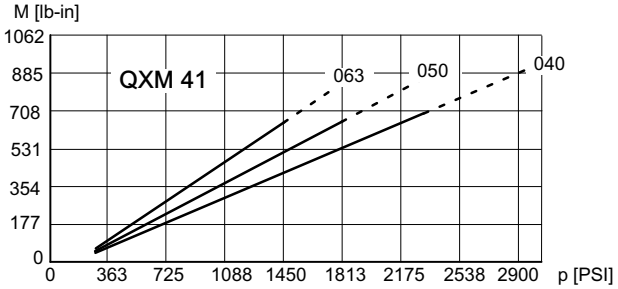
3.1.3 Starting torque

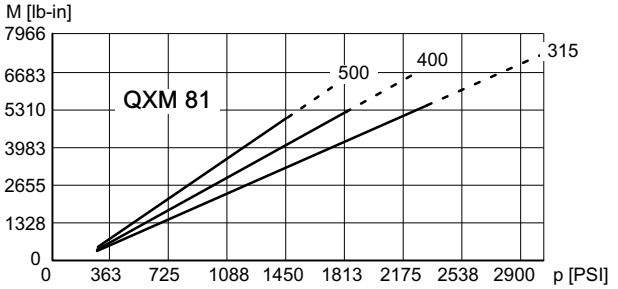




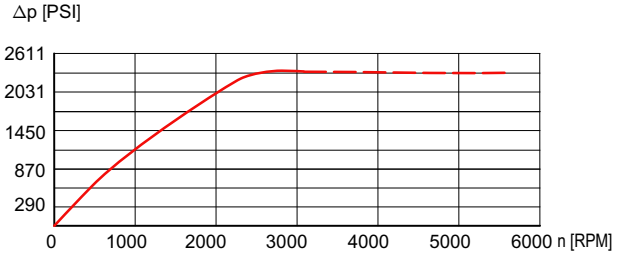








3.1.4 Maximum pressure accumulation at $P_1 + P_2$

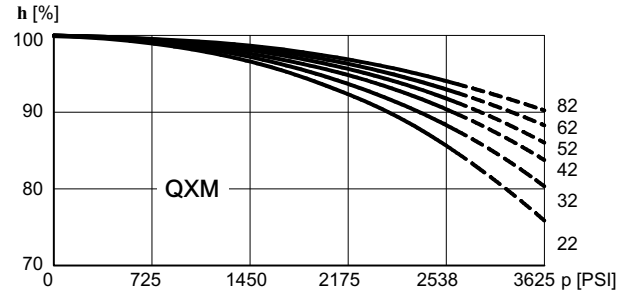


= Dependent on frame size (see 2.2)

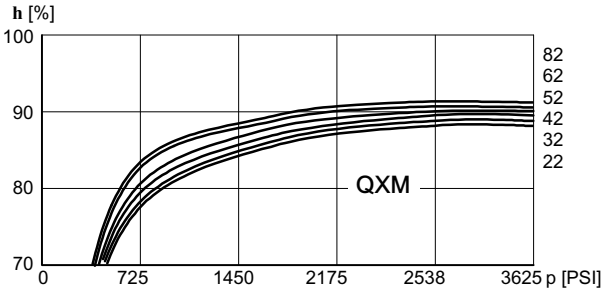
3.2 Pressure range 2

3.2.1 Volumetric efficiency

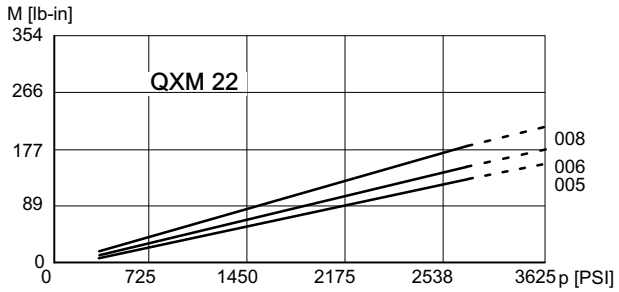
Measured with viscosity 42 mm^2/s, speed 1450 RPM (min^{-1})
Solid line = continous pressure / dashed line = max. intermittent pressure

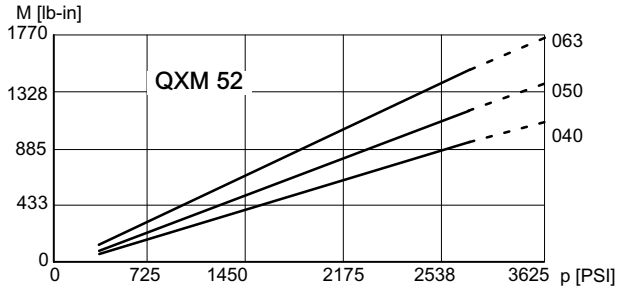


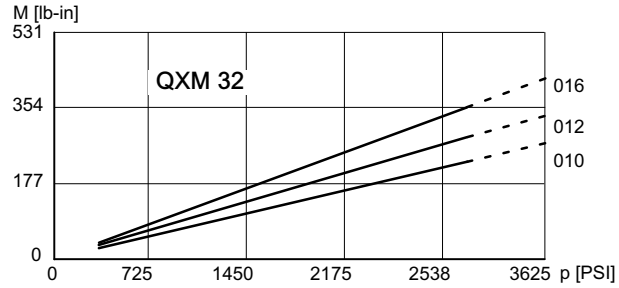
3.2.2 Hydro-mechanical efficiency

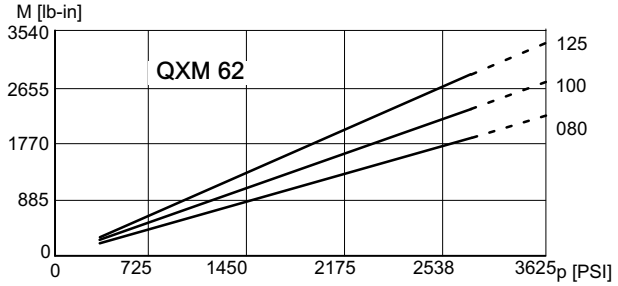


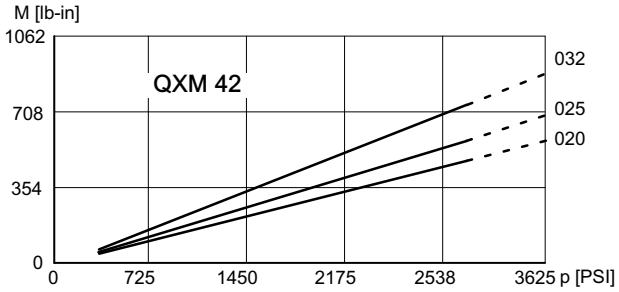
3.2.3 Starting torque

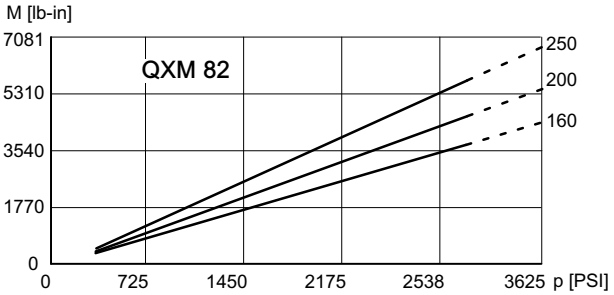




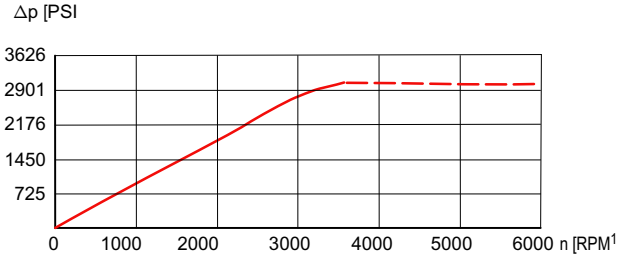








3.2.4 Maximum pressure accumulation at $P_1 + P_2$

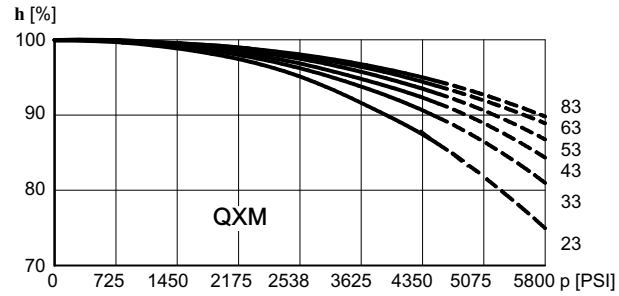


= Dependent on frame size (see 2.3)

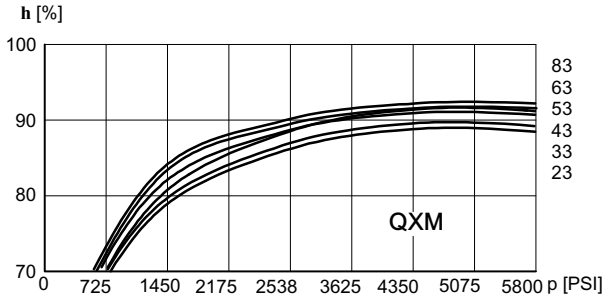
3.3 Pressure range 3

3.3.1 Volumetric efficiency

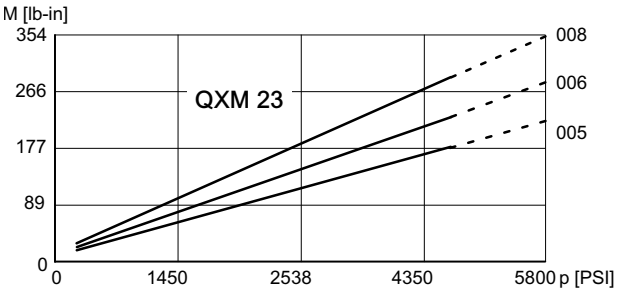
Measured with viscosity 42 mm^2/s, speed 1450 RPM (min^{-1})
Solid line = continous pressure / dashed line = max. intermittend pressure

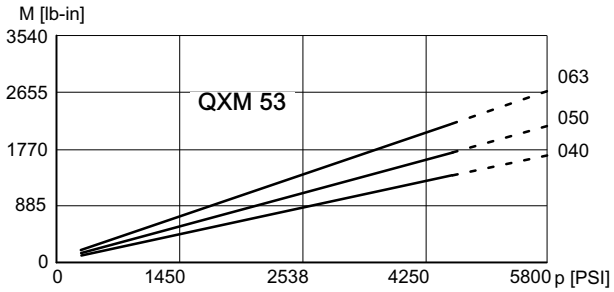


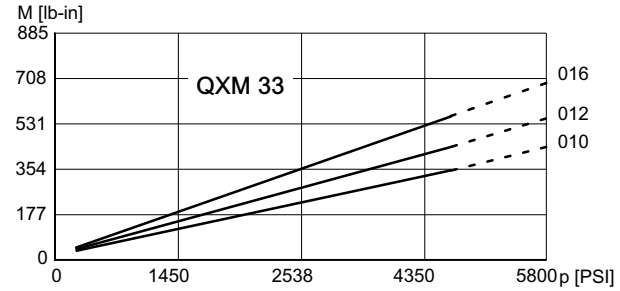
3.3.2 Hydro-mechanical efficiency

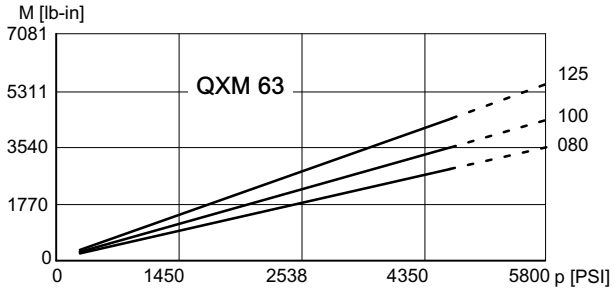


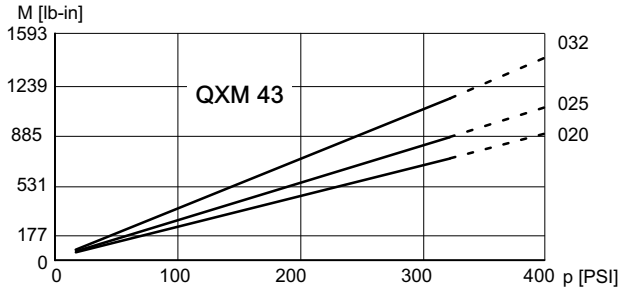
3.3.3 Starting torque

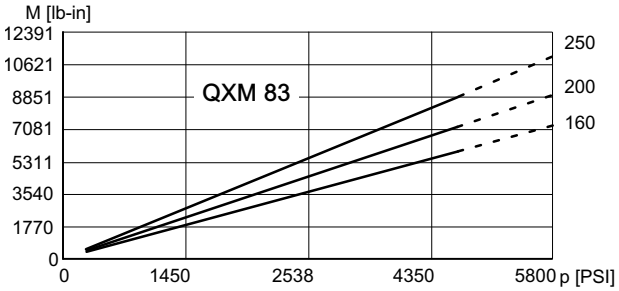




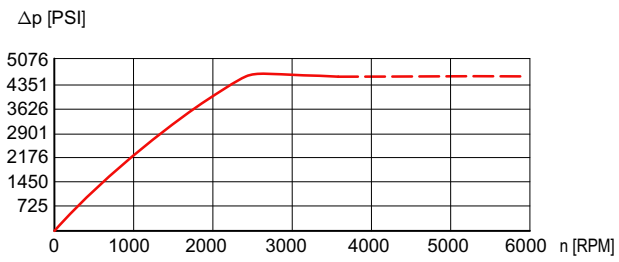






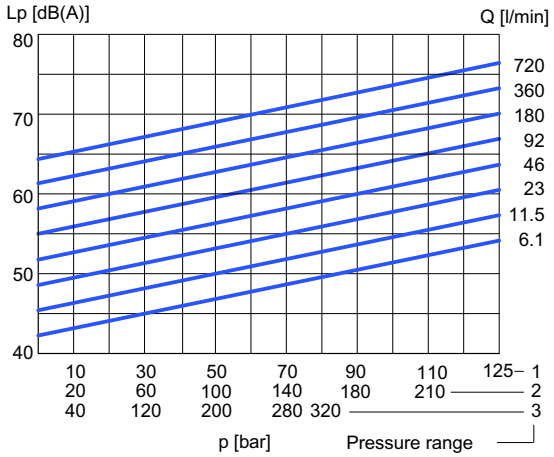


3.3.4 Maximum pressure accumulation at $P_1 + P_2$



= Dependent on frame size (see 2.4)

3.4 Noise level (L_p)



Measured to DIN 45635 Part 26, in low-echo noise Measurement chamber; measurement distance 1 m; speed n = 1500 rpm; viscosity = 210 S.U.S (42 mm^2/s)

4 Dimensions in inch (mm)

4.1 Size 2 - 4

Frame size		2			3			4		
Pressure range		1	2	3	1	2	3	1	2	3
Service ports to SAE J518 [1]	P1, P2	G1/2“ [3] thread			G 3/4” [3] thread			1”		
Drain port to DIN 3852 Part 2	P_L	G1/4”								
Mounting: oval 2-hole flange toISO 3019/1 (SAE-size 3-6) ISO 3019/2 (Metr.-sizes 2+8)	A	7.15 (118)			5.20 (132)			6.70 (170)		
	B (SAE)	-			4.17 (106)			5.75 (146)		
	B (Metr.)	3.93 (100)			4.29 (109)			5.51 (140)		
	C	0.35 (9)			0.43 (11)			0.55 (14)		
	N (SAE)	-			3.25 $^{-0.002}$ (82.55 $^{-0.05}$)			4 $^{-0.002}$ (101.6 $^{-0.05}$)		
	$N_{(Metr.)}$	2.48 h8 (63 h8)			3.15 h8 (80 h8)			3.93 h8 (100 h8)		
	O	0.33 (8.5)						0.41 (10.5)		
	V	0.24 (6)						0.28 (7)		
Shaft end: parallel, to ISO/R775 [2]	D	0.79 j6 (20 j6)			0.98 j6 (25 j6)			1.26 j6 (32 j6)		
	E	1.42 (36)			1.65 (42)			2.28 (58)		
	F	0.24 (6)			0.31 (8)			0.39 (10)		
	G	0.89 (22.5)			1.10 (28)			1.38 (35)		
	I	1.77 (45)			1.97 (50)			2.68 (68)		
Housing	K	1.48 (37.5)			1.73 (44)			2.07 (52.5)		
	L	5.49 (139.5)	4.78 (121.5)	6.16 (156.5)	6.51 (165.5)	5.72 (145,5)	7.5 (190.5)	8.01 (203.5)	7.00 (178)	9.19 (233.5)
	M	-	2.16 (55)	3.54 (90)	-	2.73 (69.5)	4.50 (114.5)	-	3.42 (87)	5.63 (143)
	T1	1.69 (43)			2.10 (53.5)			2.61 (66.5)		
	T2	1.69 (43)			2.10 (53.5)			2.61 (66.5)		
	Z	3.93 (100)			4.72 (120)			4.92 (125)		
	W	3.15 (80)			3.93 (100)			4.84 (123)		
Weight	[lbs] (kg)	13 (6)	12 (5)	14 (6.5)	22 (10)	20 (9)	27 (12)	42 (19)	38 (17)	44 (20)

1) For SAE J518 code 61 bzw. ISO6162-1 pipe flange dimensions see section 9.

2) For other shaft ends contact Bucher Hydraulics.

3) Threaded ports to DIN 3852 Part 2.

4.2 Size 5 - 8

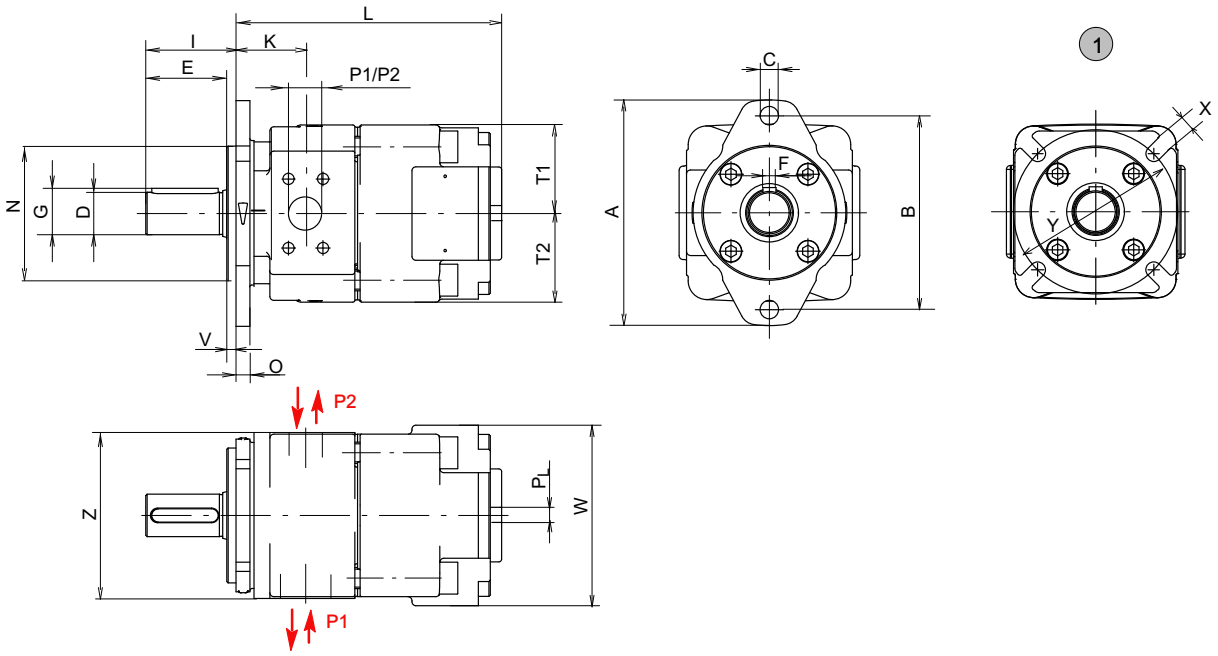
Frame size		5			6			8		
Pressure range		1	2	3	1	2	3	1	2	3
Service ports to SAE J518 1)	P1, P2	1 1/4”			1 1/2”			2”		
Drain port to DIN 3852 Teil 2 Part 2	P_L	G1/4”			G 3/8”			G1/2”		
Mounting: oval 2-hole flange to ISO 3019/1 (SAE - size 3-6) ISO 3019/2 (Metr. - sizes 2+8)	A	8.35 (212)			10.51 (267)			12.99 (330)		
	$B_{(SAE)}$	7.13 (181)			9.02 (229)			-		
	$B_{(Metr.)}$	7.09 (180)			8.82 (224)			11.02 (280)		
	C	0.71 (18)			0.87 (22)			1.02 (26)		
	$N_{(SAE)}$	5 $^{-0.002}_{(127\ ^{-0.05})}$			6 $^{-0.002}_{(152.4\ ^{-0,05})}$			-		
	$N_{(Metr.)}$	4.92 h8 (125 h8)			6.30 h8 (160 h8)			7.87 h8 (200 h8)		
	O	0.49 (12.5)			0.65 (16.5)			0.79 (20)		
	V	0.28 (7)			0.28 (7)			0.35 (9)		
Shaft end: parallel, to ISO/R775 2)	D	1.57 j6 (40 j6)			1.97 j6 (50 j6)			2.48 j6 (63 j6)		
	E	3.23 (82)						4.13 (105)		
	F	0.47 (12)			0.55 (14)			0.71 (18)		
	G	1.69 (43)			2.10 (53,5)			2.64 (67)		
	I	3.62 (92)						4.61 (117)		
Housing	K	2.38 (60.5)			2.91 (74)			3.54 (90)		
	L	9.58 (243.5)	8.32 (211.5)	11.08 (281.5)	11.33 (288)	9.80 (249)	13.34 (339)	14.21 (361)	13.03 (331)	16.89 (429)
	M	-	4.01 (102)	6.77 (172)	-	4.68 (119)	8.22 (209)	-	5.94 (151)	10.47 (266)
	T1	3.48 (88.5)			4.21 (107)	4.33 (110)		5.41 (137.5)		
	T2	3.48 (88.5)			4.21 (107)	4.33 (110)		5.41 (137.5)		
	Z	6.14 (156)			7.67 (195)			9.84 (250)		
	W	6.49 (165)			7.99 (203)			1039 (264)		
Weight	[lbs] (kg)	75 (34)	68 (31)	90 (41)	130 (59)	124 (56)	168 (76)	284 (129)	269 (122)	342 (155)

1) For SAE J518 code 61 bzw. ISO6162-1 pipe flange dimensions see section 9.

2) For other shaft ends contact Bucher Hydraulics.

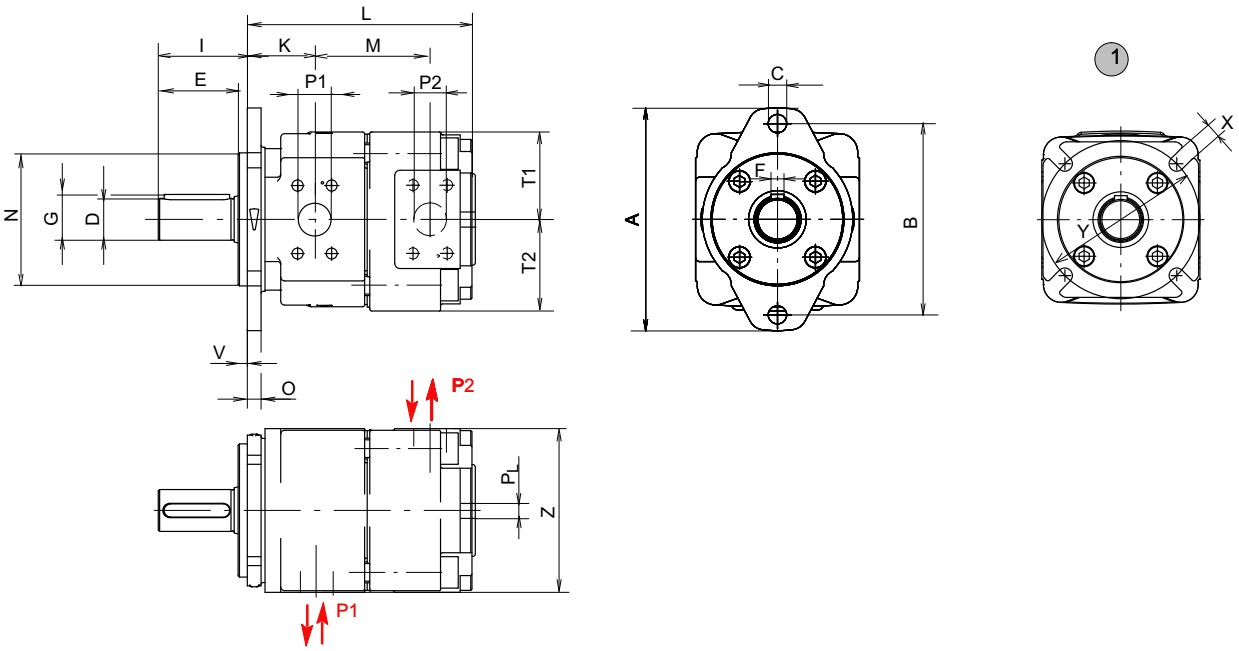
3) Threaded ports to DIN 3852 Part 2.

4.3 Pressure range 1



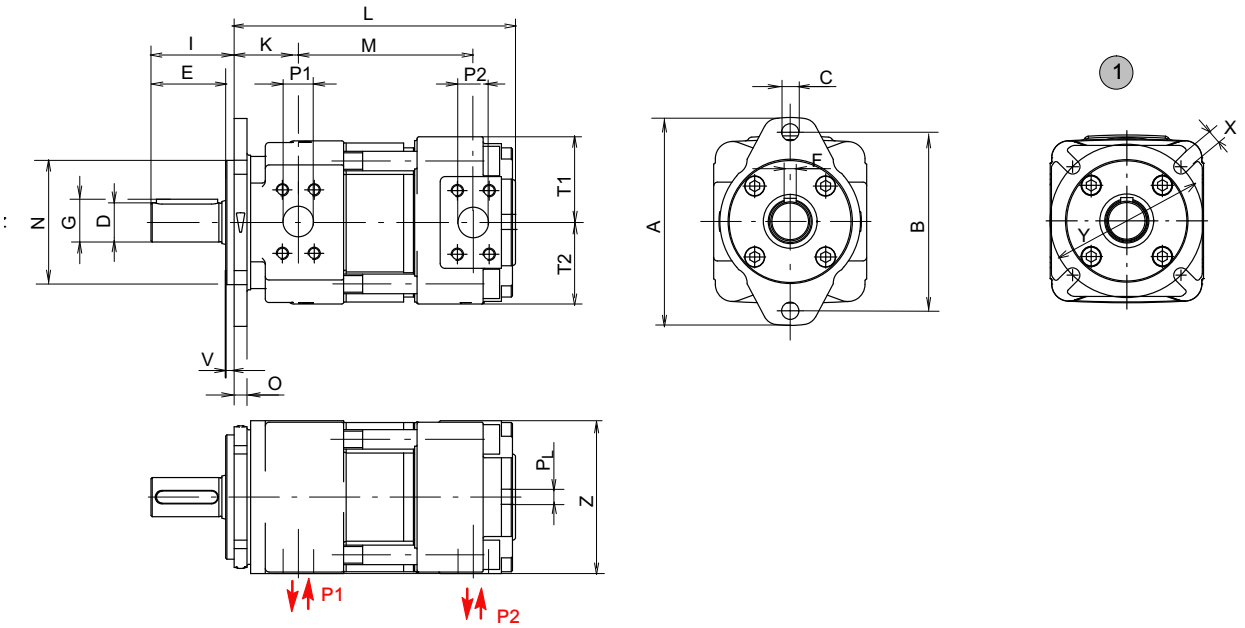
1	special model: 4-hole flange ISO 3019/2

4.4 Pressure range 2



1	special model: 4-hole flange ISO 3019/2

4.5 Pressure range 3



1	special model: 4-hole flange ISO 3019/2

4.6 Ordering details

Q	X	M
5	3	-
0	4	0
N	*	*
		*

Internal gear unit	= QXM
Frame size	= 2 / 3 / 4 / 5 / 6 / 8
Pressure range	= 1 / 2 / 3
Geom. Displ./Consump. in in^3/Rev (cm^3/rev)	= 0.31 - 30.23 (5,1 - 495,4)
Direction of rotation, unrestricted	= N (see section 4.10)
Option	(to be inserted by the factory, see section 4.9 for a selection)

4.7 Ordering example

Required:	Internal gear unit QXM
Displ./Consump.:	2.40 in^3/rev (40 cm^3/rev)
Continuous pressure:	4350 PSI (300 bar)
For use with mineral oil:	HLP
Ordering code:	QXM53-040 N

4.8 Standard configuration

- Direction of rotation - unrestricted
- 2-hole mounting flange to ISO 3019/1;
  Frame size QXM 3-6
  2-hole mounting flange to ISO 3019/2;
  Frame size QXM 2+8
- Nitrile seals
- Cylindrical shaft end to ISO R775
- Separate drain port in rear cover
- Ports P_1 + P_2 both the same size
- High pressure shaft seal
- Black priming, flange without priming

4.9 Options

-O = without priming

09 = FKM (Viton) seals, without priming

130 = 2-quadrant operation, service port dimensions as per QX pumps
2-hole mounting flange to ISO 3019/2 (metric)

For other special features contact Bucher Hydraulics.

4.10 Direction of rotation

Direction of rotation: right
(clockwise, viewed from the shaft end) = oil flows from P_1 to P_2

Direction of rotation: left
(counterclockwise, viewed from the shaft end) = oil flows from P_2 to P_1

5 Fluid cleanliness

QXM internal gear units require a 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 N/mm^2 to Brugger DIN 51347-2.

6 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.

7 Fluid cleanliness

Cleanliness class (RK) as per ISO 4406.

Code ISO 4406	Dirt particle number / 100 ml		
	≥ 4 µm	≥ 6 µm	≥ 14 µm
23/21/18	8000000	2000000	250000
22/20/18	4000000	1000000	250000
22/20/17	4000000	1000000	130000
22/20/16	4000000	1000000	64000
21/19/16	2000000	500000	64000
20/18/15	1000000	250000	32000
19/17/14	500000	130000	16000
18/16/13	250000	64000	8000
17/15/12	130000	32000	4000
16/14/12	64000	16000	4000
16/14/11	64000	16000	2000
15/13/10	32000	8000	1000
14/12/9	16000	4000	500
13/11/8	8000	2000	250

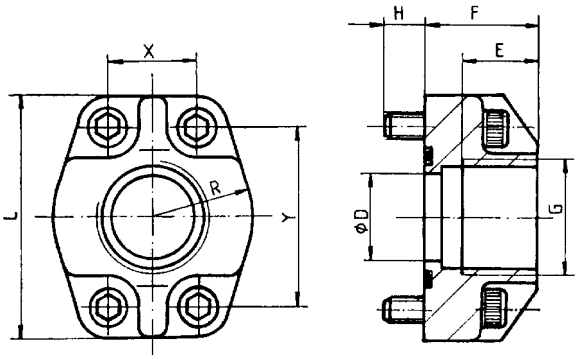
8 Operational reliability

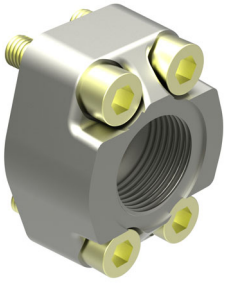
To ensure a reliable operation and a long service life, a maintenance schedule must be prepared for the power unit, machine or system. The maintenance schedule must make sure that the provided or permissible operating conditions are adhered to over the period of use.
In particular, compliance with the following operating parameters must be ensured:
– The required oil cleanliness
– The operating temperature range
– The fluid level
Moreover, the QXM internal gear units and the system must be inspected at regular intervals for changes in the following parameters:
– Vibration
– Noise
– Differential temperature – fluid in the tank
– Foaming in the tank
– Freedom from leakage
Changes in these parameters indicate wear of components (e.g. drive motor, coupling, internal gear unit, etc.). The cause must be immediately pinpointed and eliminated.
To provide high operational reliability 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.

Commissioning see Operating Instructions 100-B-000014

9 Accessories

9.1 Pipe flanges - high pressure type





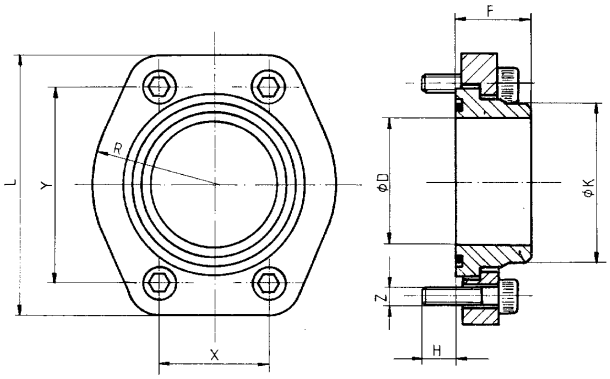
- Max. operating pressure 6092 PSI
- Flange size SAE J518 code 61 / ISO 6162-1
- Material: HST37
- for FKM (Viton) seals contact Bucher Hydraulics

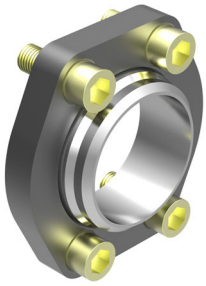
Threaded pipe flanges are spot-faced for DIN 2353 pipe fitings.

Order number	Ordering code	G (size)	D∅	E	F	H	L	R	X	Y	Viton seal 90 Shore 'A'	Retaining screws DIN912-12.9/ Torque lb-in(Nm)	
037000	RF 01-R08	G ½“	0.5 (12,5)	0.6 (16)	1.1 (27)	0.5 (13)	2.1 (54)	0.9 (23)	0.69 (17,5)	1.49 (38)	0.79x0.10 (20,24x2,62)	M8x30	266 30
037010	RF 02-R10	G ¾“	0.8 (20)	0.7 (18)	1.2 (30)	0.47 (12)	2.6 (65)	1.0 (26)	0.87 (22,2)	1.87 (47,6)	1.05x0.10 (26,65x2,62)	M10x30	531 (60)
037020	RF 03-R11	G 1”	1.0 (25)	0.8 (20)	1.3 (34)	0.5 (13)	2.7 (70)	1.1 (29)	1.03 (26,2)	2.06 (52,4)	1.29x0.10 (32,99x2,62)	M10x35	531 (60)
037030	RF 04-R12	G 1¼“	1.3 (32)	1.0 (22)	1.5 (38)	0.6 (14)	3.1 (80)	1.4 (36)	1.19 (30,2)	2.31 (58,6)	1.61x0.14 (40,86x3,53)	M10x40	531 (60)
037040	RF 05-R13	G 1½“	1.5 (38)	0.9 (24)	1.6 (41)	0.7 (19)	3.7 (94)	1.6 (41)	1.41 (35,7)	2.76 (70)	1.73x0.14 (44,04x3,53)	M12x45	1062 (120)
037050	RF 06-R14	G 2”	1.9 (50)	1.1 (26)	1.8 (45)	0.8 (20)	4.0 (102)	1.9 (48)	1.69 (42,9)	3.06 (77,8)	2.36x0.14 (59,92x3,53)	M12x50	1062 (120)
055470*	RF 07-R16	G 2½“ *	2.5 (63)	1.2 (30)	1.9 (50)	0.7 (18)	4.5 (114)	2.2 (57)	1.99 (50,8)	3.50 (89)	2.86x0.14 (72,62x3,53)	M12x45	1062 (120)

* At RF07 only to 3045 PSI (210 bar) be allowed.

9.2 Low pressure type



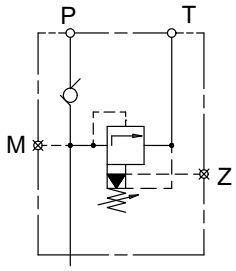
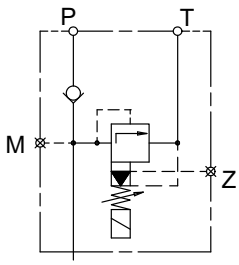
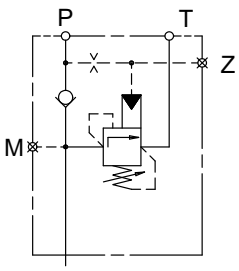
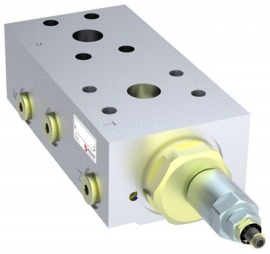


- Max. operating pressure 232 PSI
- Flange size SAE J518 code 61 / ISO 6162-1
- Material: ST37
- For FKM (Viton) seals contact Bucher Hydraulics

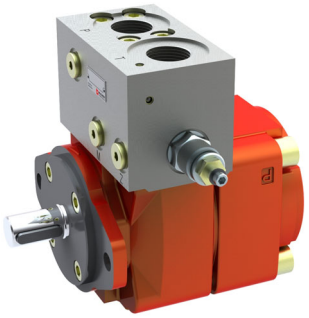
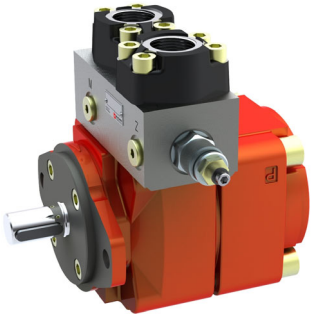
Order number	Order code	SAE flange size	D	K	F	H	L	R	X	Y	Viton seal 90 Shore 'A'	Retaining screws DIN 912-8.8 Torque Nm		Pipe[1] O/dia approx
062450	RN 07-S	2½“	2.5 (63)	2.9 (75)	1.3 (35)	0.6 (14)	4.7 (120)	2.5 (57)	2.0 (51)	3.5 (89)	2.73 x 0.14 (69,44x3,53)	M12x30	620 (70)	2.95 (75)
063880	RN 08-S	3½“	3.0 (76)	3.5 (88)			5.53 (140,5)	2.7 (68)	2.4 (62)	4.19 (106,5)	3.36 x 0.14 (85,32x3,53)	M16x40	1593 (180)	3.46 (88)
063890	RN 09-S	3½“	3.5 (89)	3.9 (100)	1.6 (40)	0.7 (19)	6.23 (158,5)	2.9 (73)	2.8 (70)	4.74 (120,3)	3.86 x 0.14 (98,02x3,53)	M16x40	1593 (180)	3.93 (100)
063900	RN 10-S	4”	4.1 (103)	4.5 (115)			6.6 (168)	3.1 (79)	3.1 (78)	5.1 (130)	4.36 x 0.14 (110,72x3,53)	M16x40	1593 (180)	4.53 (115)

1) We recommend the use of seamless precision steel tube to DIN 2391 with-wallthick. max 0.24 in (6 mm).

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

Pressure relief valve A SG DF / ASDH	Pressure relief valve solenoid control A SG DA	Accumulator charging valve AGSF
		
		
Technical data sheet 100-P-000123	Technical data sheet 100-P-000119	Technical data sheet 100-P-0000124

9.3.1 Examples for mounted bolt-on valves

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
		

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

Classification: 420.245.200