

# Internal Gear Flow Divider

## Series QXT



- extremely high division accuracy
- exceptionally quiet operation
- negligible pressure pulsations
- long service life
- high efficiency, since operating principle ensures there are no throttling losses
- wide range of outlet flows are available
- suitable for special fluids such as HFC, environmentally friendly and low viscosity fluids

## 1 General

### 1.1 Product description

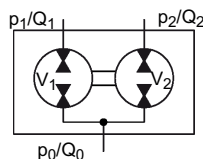
Series QXT flow dividers are internal gear units that can divide a flow into as many as four portions. The division ratios are constant and are unaffected by the loads at the actuators. They can be used, for example, to provide synchronised movement of unequally loaded cylinders. Several hydraulic motors can be driven at the same speed, irrespective of their external loads. Since they operate on the principle of the rotating internal gear set, these flow dividers work without any throttling losses, which is in strong contrast to spool-type flow dividers. The QXT flow divider can also

be used to produce pressure intensification i.e. the outlet pressure from the flow divider is higher than its inlet pressure. This takes place at high efficiency, since the operating principle ensures that the only losses that can possibly occur are proportional to the pressure difference across the unit. 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 Application examples

- Air conditioning Systems
- Track laying machinery
- Waste compactors
- Hydraulic presses

## 2 Symbol



## 3 Technical data

Characteristics	Unit	Description, value
Installation attitude		unrestricted
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, or NAS 1638 class 9

Operating viscosity Starting viscosity	mm <sup>2</sup> /s	10 ... 100 10 ... 300 (higher values, contact Bucher Hydraulics)
Hydraulic fluid temperature	°C	HLP mineral oil - 80 max. HFB, HFD and HFC 50 max.

### 3.1 Flow dividers with outlet flows of equal sizes

These operating data are valid for mineral oils with 42 mm<sup>2</sup>/s.

Please contact Bucher if you require unequal outlet flows.

Type	Outlet displacement cm <sup>3</sup> /U	Cont./ Interm. pressure <sup>1)</sup> bar	Speed n <sub>max</sub> / n <sub>min</sub> min <sup>-1</sup>	Maximum inlet flow Q <sub>0 max</sub>		
				2 outlet flows l/min	3 outlet flows <sup>2)</sup> l/min	4 outlet flows <sup>2)</sup> l/min
QXT22-005/22-005	5	250/320	6300/1250	63	95	125
QXT22-006/22-006	6			80	120	160
QXT22-008/22-008	8			100	150	200
QXT32-012/32-012	12	250/320	5000/1000	120	180	240
QXT32-016/32-016	16			160	240	320
QXT42-025/42-025	25	250/320	4000/800	200	300	400
QXT42-032/42-025	32			250	380	500
QXT52-050/52-050	50	250/320	3200/630	320	480	640
QXT52-063/52-063	63			400	600	800
QXT62-100/62-100	100	250/320	2500/500	500	750	1000
QXT62-125/62-125	125			630	950	1260
QXT82-200/82-200	200	250/320	2000/400	800	1200	1600
QXT82-250/82-250	250			1000	1500	2000

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

2) for 3 and 4 outlet flow please contact Bucher Hydraulics

### 3.2 Choose the optimal flow divider

These operating data are valid for mineral oils with 42 mm<sup>2</sup>/s.

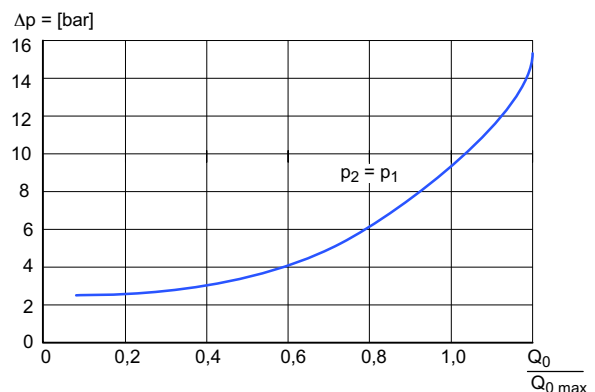
For the highest division accuracy as well as the lowest cost, choose the smallest possible flow divider running near its maximum speed. The speed n in rev/min is calculated from:

$$n = \frac{Q_0 \times 10^3}{V_1 + V_2 + V_3 + \dots}$$

where Q<sub>0</sub> = inlet flow rate in l/min and V<sub>1</sub> = outlet displacement in cm<sup>3</sup>/rev. The minimum permissible inlet flow rate is calculated from:

$$Q_{0 \min} = \frac{n_{\min}}{n_{\max}} \times Q_{0 \max}$$

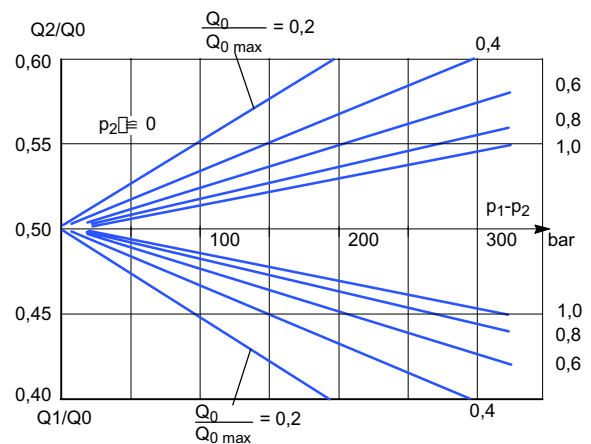
In the case of the flow dividers with unequal outlet displacements, use the largest displacement for determining n<sub>max</sub>, the smallest for n<sub>min</sub>. Since rotary flow dividers are also pressure intensifiers, each outlet circuit must be provided with a pressure relief valve. Bucher Hydraulics series VT relief valves mount directly on the flow divider and are therefore particularly suitable (please request the data sheet 100-D-402850).



## 4 Performance curves

These operating data are valid for mineral oils with 42 mm<sup>2</sup>/s.

Tests carried out on a QXT flow divider, type 32-016/32-016, produced the results shown below. For the same speed, larger flow dividers have a better accuracy while smaller ones display a bigger difference between the two outlet flows. The division accuracy of the outlet flows Q1 and Q2 depends mainly on the pressure difference between the two outlet lines and the ratio  $Q_0 / Q_{0 \max}$ . The pressure drop across the flow divider is dependent on  $Q_0 / Q_{0 \max}$ . Using the curves, the accuracy of flow division and the pressure drop can be optimised.



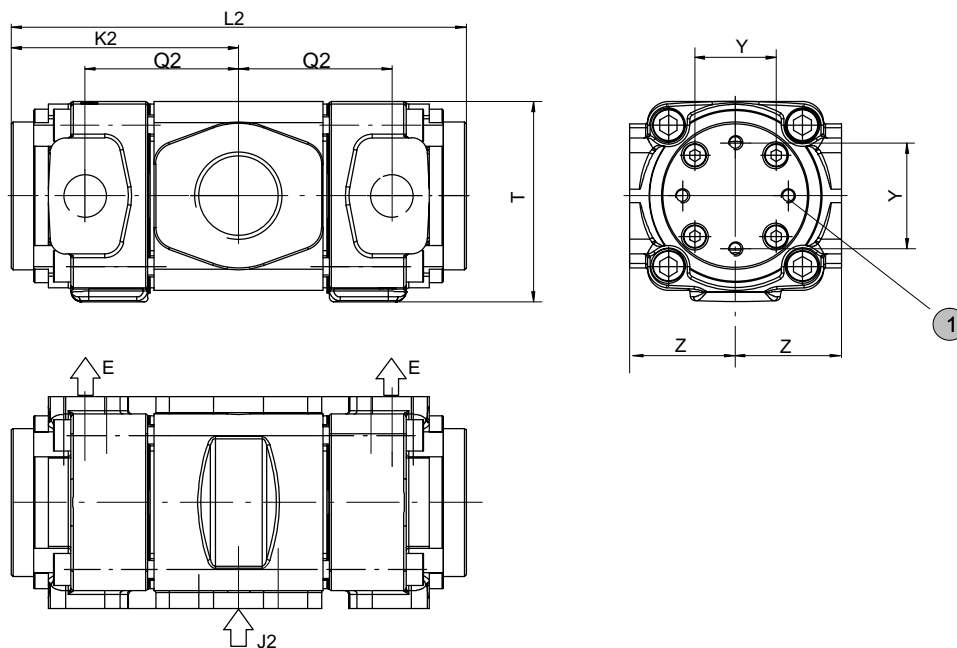
## 5 Dimensions

### 5.1 For flow divider with 2 displacements

Frame size	2	3	4	5	6	8
J2	G 1 1/4" thread	G 1 1/2" thread	2" SAE J518 <sup>1)</sup>	2" SAE J518 <sup>1)</sup>	2" SAE J518 <sup>1)</sup>	G 2 1/2" thread
E	G 1/2" thread	G 3/4" thread	1" SAE J518 <sup>1)</sup>	1 1/4" SAE J518 <sup>1)</sup>	1 1/2" SAE J518 <sup>1)</sup>	2" SAE J518 <sup>1)</sup>
G	M8x12	M8x12	M10x16	M10x20	M16x28	M20x30
K2	102	129	159,5	190	230,5	282,5
L2	204	258	319	380	461	565
Z	50	60	62,5	78	97,5	125
Q2	67	87	110,5	127	149	178,5
Y	55	60	75	90	112	140
T	85	107	133	177	220	275

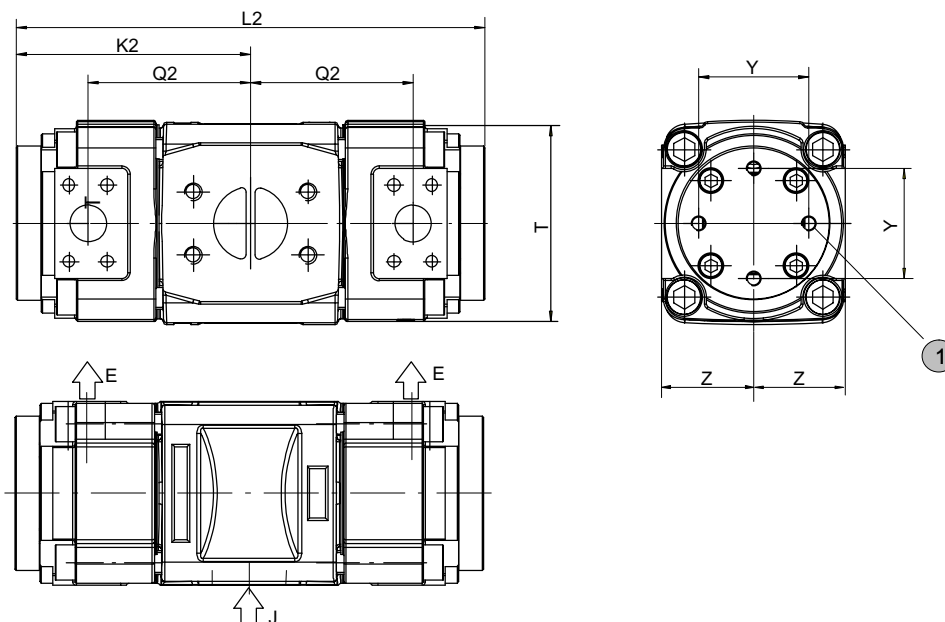
1) for SAE J518 code 61 / ISO 6162-1 pipe flange (see section 7.2)

5.2 Frame size 2 - 3



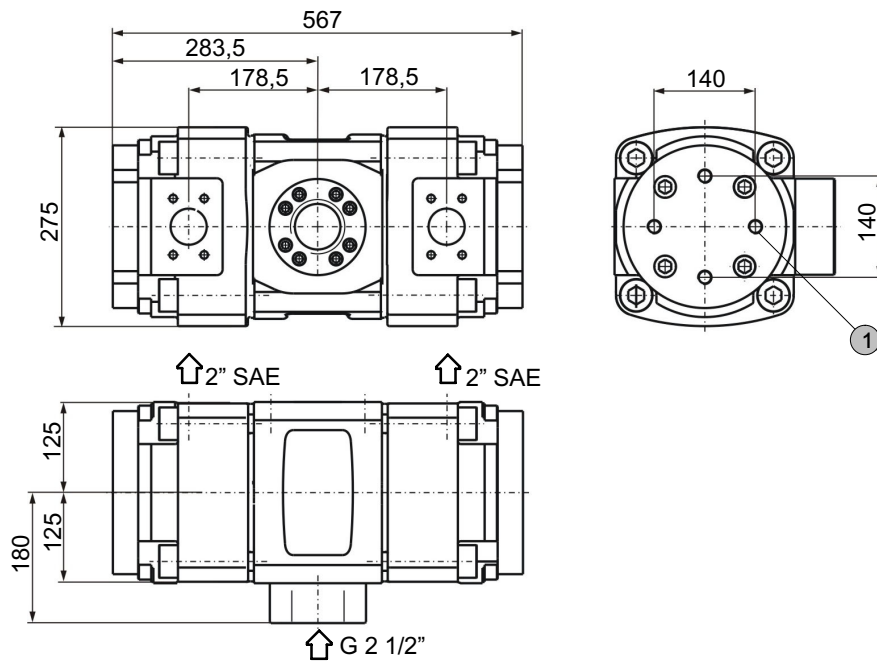
1 Mounting threads  
4 x dimensions 'G' - both ends

5.3 Frame size 4 - 6



1 Mounting threads  
4 x dimensions 'G' - both ends

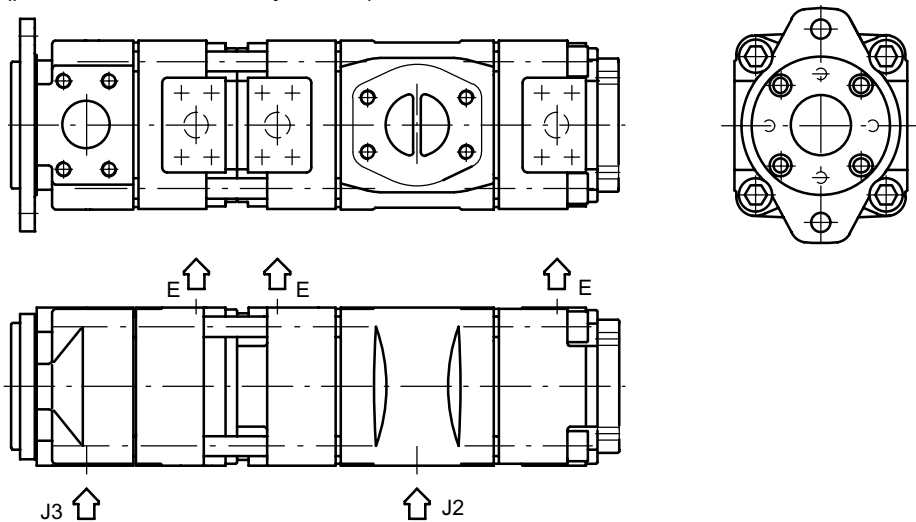
### 5.4 Frame size 8



- 1 Mounting threads  
4 x dimensions 'G' - both ends

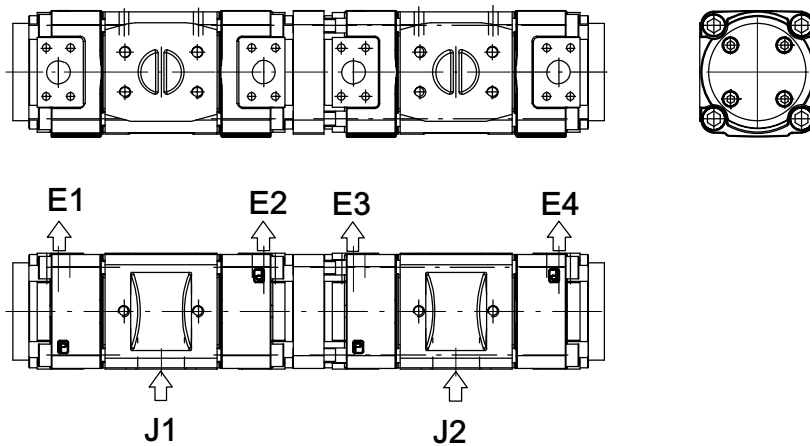
### 5.5 Flow divider with 3 displacements

(please contact Bucher Hydraulics)



### 5.6 Flow divider with 4 displacements

(please contact Bucher Hydraulics)



## 6 Ordering code for 2 displacements

		Q	X	T	3	2	-	0	1	2	/	3	2	-	0	1	2	/	
Series	QXT																		
Frame size	2 / 3 / 4 / 5 / 6 / 8																		
Pressure range 2	2																		
Outlet displacement	005 - 250 (see chapter 3.1)																		
Frame size	2 / 3 / 4 / 5 / 6 / 8																		
Pressure range 2	2																		
Outlet displacement	005 - 250 (see chapter 3.1)																		
Special features	(see section 6.2)																		

### 6.1 Ordering example

For dividers with 3 outlet flows:  
QXT22-005 / 22-005 / 22-005

For dividers with 4 outlet flows:  
QXT62-100 / 62-100 / 62-100 / 62-100

Flow divider combinations must contain the same frame sizes, pressure ranges and outlet flows.

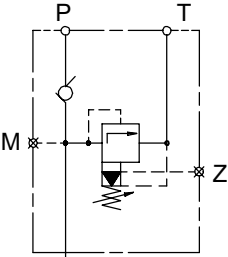
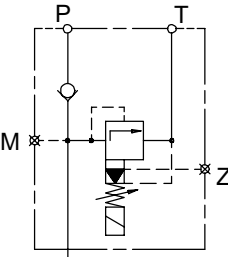
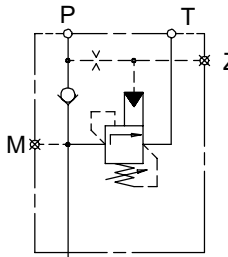
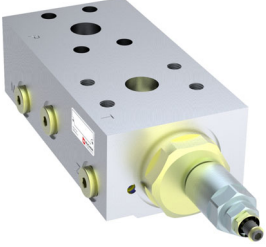

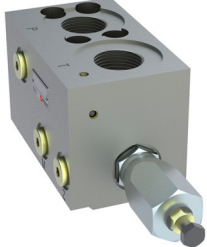
If 3, 4 or unequal flows are required, please contact Bucher Hydraulics

### 6.2 Special features

- O = without priming
- 09 = Viton seals and without priming
- 117 = port at outlet (E) in SAE J518 code 61 / ISO 61621 at assembly group 2+3

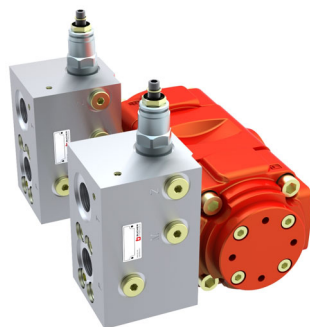
## 7 Accessories

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

Pressure relief valve A $\frac{S}{G}$ DF	Pressure relief valve 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>

#### 7.1.1 Example for Bolt-on valves, mounted on QXT flow divider

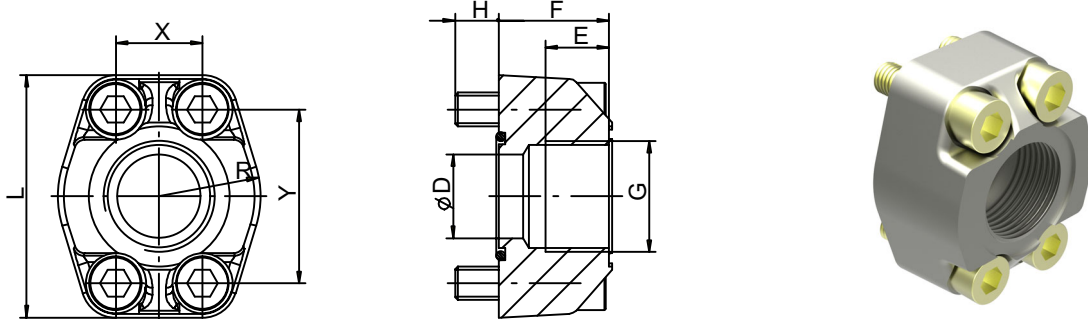
Bolt-on valve with threaded ports  
QXT32 + AGDF



**IMPORTANT:** For detailed informations on Bolt-on valves see [www.bucherhydraulics.com](http://www.bucherhydraulics.com)

### 7.2 Pipe flange - high pressure type

- up to 420 bar
- SAE J518 code 61 / ISO 6162-1 pattern



Threaded pipe flanges are spot-faced for pipe fittings.

Material: ST37 / For Viton seals, contact Bucher Hydraulics

Ordering-number	Ordering code	Size	D $\emptyset$	E	F	H	L	R	X	Y	Viton seal 90 Shore 'A'	Retaining screws DIN912-12.9 M [Nm]	
037000	RF 01-R08	G 1/2"	12,5	16	27	13	54	23	17,5	38	20,24x2,62	M8x30	30
037010	RF 02-R10	G 3/4"	20	18	30	12	65	26	22,2	47,6	26,65x2,62	M10x30	60
037020	RF 03-R11	G 1"	25	20	34	13	70	29	26,2	52,4	32,99x2,62	M10x35	60
037030	RF 04-R12	G 1 1/4"	32	22	38	14	80	36	30,2	58,6	40,86x3,53	M10x40	60
037040	RF 05-R13	G 1 1/2"	38	24	41	19	94	41	35,7	70	44,04x3,53	M12x45	120
037050	RF 06-R14	G 2"	50	26	45	20	102	48	42,9	77,8	59,92x3,53	M12x50	120

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