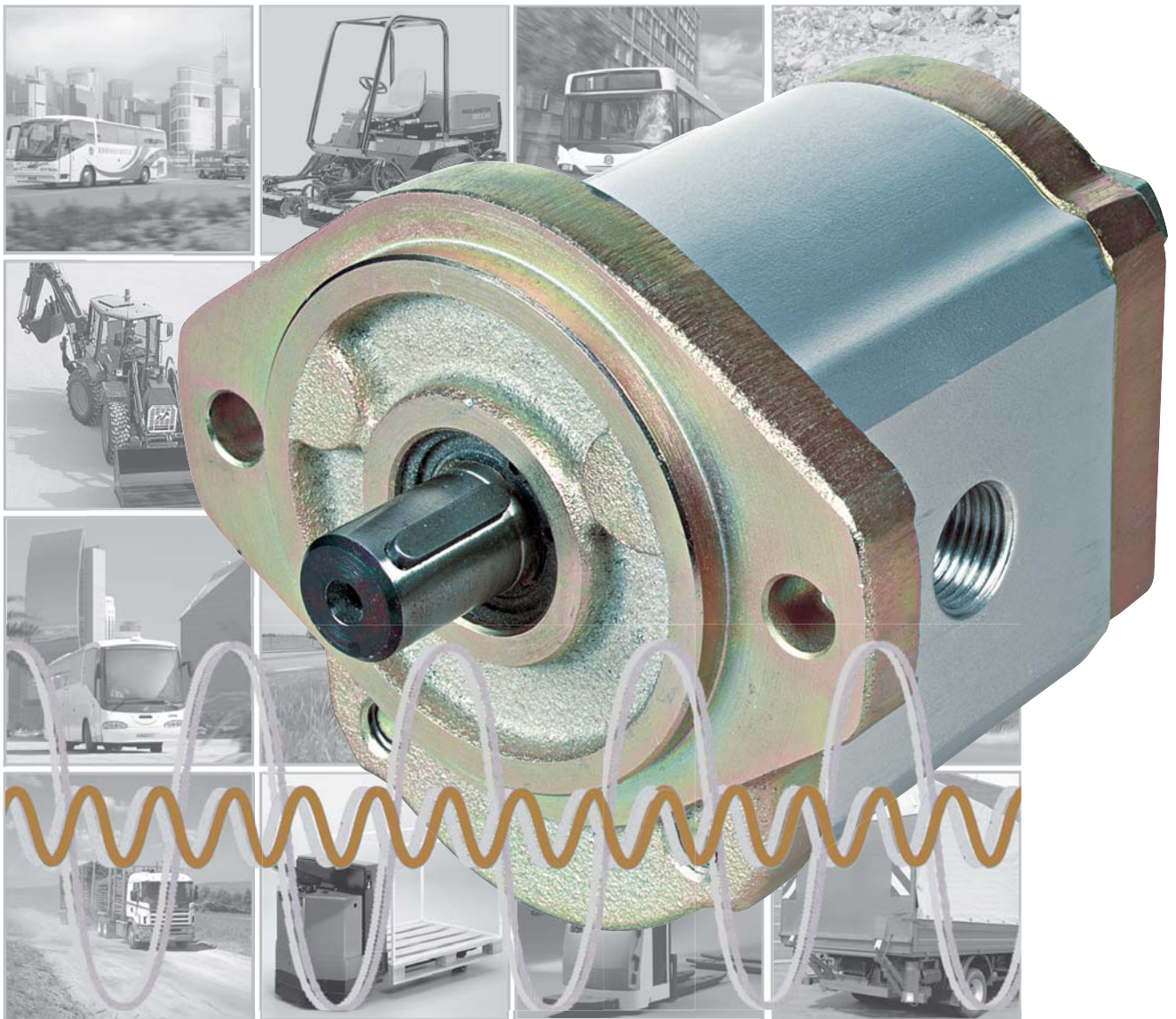




## HIGH PRESSURE GEAR PUMP WQ900 SUPER QUIET & LOW PULSATION





## THE POWER OF THE WQ900 A SERIES

Concentric is one of the world's leading manufacturers of hydraulic pumps. In recent years we have focused on important markets, such as materials handling and vehicles, and now the result are in: a series of high performance hydraulic pumps. The WQ900 series builds on the versatile technical platform represented by the W series. WQ900 High Pressure Gear Pumps are optimized for demanding work, with harsh weather conditions, rugged operations and long service intervals. The WQ900 series is a range of cost-efficient group II pumps for all applications in which the customer's demands for quality and reliability are particularly high.

The "Q" stands for super "quiet" operation and outstanding properties of the WQ900 result from:

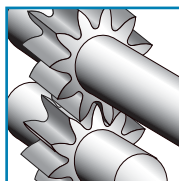
- 1<sup>st</sup> a new and carefully engineered tooth geometry.
- 2<sup>nd</sup> an innovative approach to gear flank engagement.
- 3<sup>rd</sup> a reduced volume of trapped oil and
- 4<sup>th</sup> advanced trapped oil management.

The size of pressure pulsation from the pumps is reflected in the pump noise level and the pressure pulsation is minimized to 25%. We achieved a reduction for the pressure pulsation of 75% by the newly developed, computer generated gear design for the WQ900 pumps. The noise levels are shown on page 10-11.



**FLANGE CODE 03, 06, 07, 12**

**4 - 8**



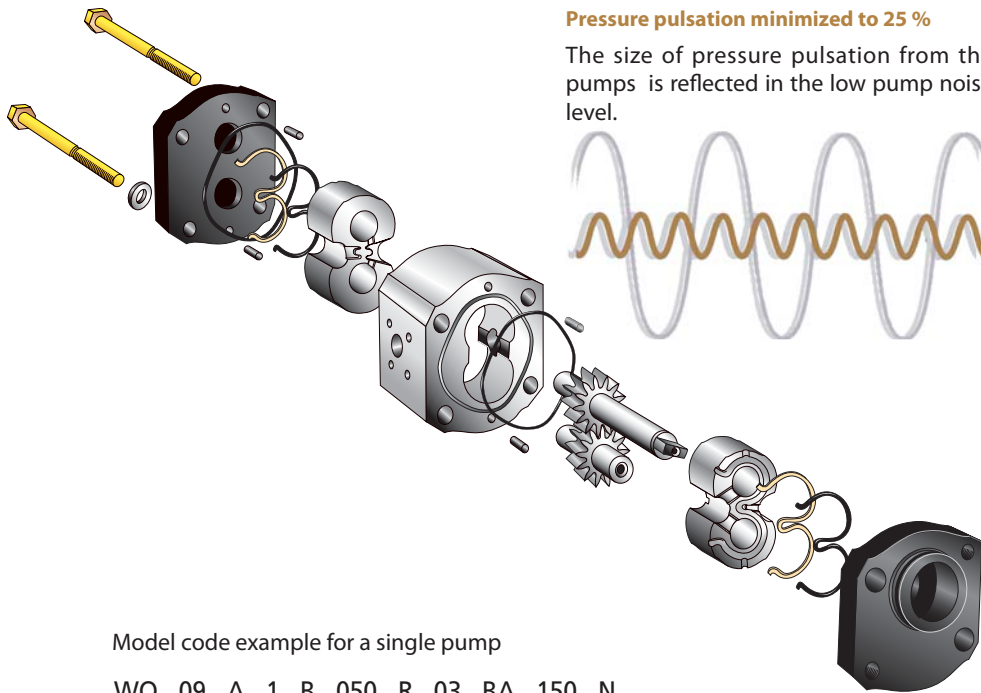
**MULTIPLE PUMPS**

**9**

**SOUND POWER CURVES**

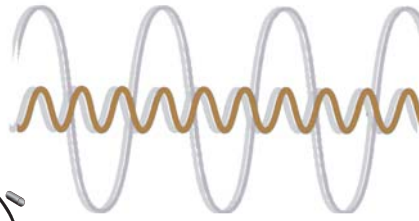
**10 - 11**

Pictures on front page are used with the kind permission of eg: Atlet, BT, Huddig, Scania, Toro and Volvo Construction Equipment. The right to modifications for technical improvements is reserved.



### Pressure pulsation minimized to 25 %

The size of pressure pulsation from the pumps is reflected in the low pump noise level.



Model code example for a single pump

WQ 09 A 1 B 050 R 03 BA 150 N  
 ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪

- |                              |                     |
|------------------------------|---------------------|
| ① = Type                     | ⑦ = Rotation        |
| ② = Range                    | ⑧ = Mounting flange |
| ③ = Design                   | ⑨ = Drive shaft     |
| ④ = # of sections            | ⑩ = Portings        |
| ⑤ = Seal material            | ⑪ = Valve options   |
| ⑥ = Displacement per section |                     |

## WQ900 DESCRIPTION

The WQ900 pumps are part of the W-family of gear pumps. The WQ900 pumps come in single or multiple configuration of up to four sections. The basic pump is of a three piece modular design. Mounting flange and rear cover are of cast iron. The pump body is manufactured from high strength aluminium alloy.

For optimum strength, gears and shafts are precision machined in one piece. The 13-tooth gear geometry has been optimized for low noise level.

All shaft bearing surfaces are Teflon® coated and designed for long service life. They are continually cooled and lubricated by a controlled flow of fresh oil. This enables operation across a wide speed range at very high loads.

Multiple pumps in the WQ900 range are very compact. The drive shaft is capable of transmitting high torque even to the rear section. Each section has its own inlet and pressure ports. Single inlet features are optional for 2 and 3 section unit.

A wide range of mounting flanges and port sizes are available to meet international standards.

### General data

Displacement $V$	5 - 23 cc/rev
Speed $n$	500 - 4000 rpm
Pressure	
rated pressure $p_i$	up to 230 bar
intermittent pressure $p_{ii}$	up to 255 bar
peak pressure $p_{iii}$	up to 276 bar
Operating temperatures $t$	up to 105°C
Average volumetric efficiency	97%

The maximum values for  $n$ ,  $p_i$  and  $t$  for a given pump specification may be applied simultaneously.

### Options

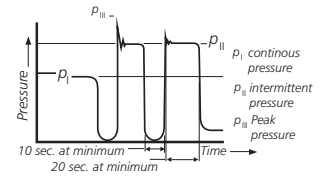
- SAE mounting flange, through bolt model.
- Rectangular flanges
- Splined, tapered or straight shaft with key, tang shaft.
- Thread ports or flange ports.
- Clockwise or anti-clockwise rotation.
- Integrated valve features.
- Single inlet for multiple units.

## PERFORMANCE DATA

### Operating pressure range

**Inlet port:** continuous, minimum -0,20 bar  
 intermittent, minimum -0,35 bar  
 maximum +2,00 bar

**Outlet port** (See tables on pages 4-7)



Product has been tested to 1,000,000 cycles at  $p_i$ . Pressure  $p_{ii}$  is permitted at maxi. 20 sec loaded following 10 sec minimum unloaded.

Product has been tested to 500,000 cycles at  $p_{iii}$ .

Above represents performance which can be expected from units incorporating flange port styles.

### Speed range

Minimum speed for all pump sizes is  $n = 500$  rpm at maximum pressure  $p_i$ .

Maximum speed for single pumps depends on the pump model in question and can be identified from tables on pages 4-7 for respective models.

Maximum speed for multiple pumps is the lowest one specified (See tables on pages 4-7) for any section of the configuration in question.

Noise performance data according to page 10-11. Hydraulic fluids. The use of HL- or HLP-hydraulic oil according to DIN 51 524 is recommended.

The permissible viscosity for all WQ9A pumps ranges from 750 to 10 mm<sup>2</sup>/s. The recommended operating viscosity range is from 40 to 16 mm<sup>2</sup>/s.

The permissible cold start viscosity is 2000 mm<sup>2</sup>/s.

We recommend to contact Concentric before using fire resistant or bio-degradable fluids.

### Temperature range

Ambient temperature mini. -25° C  
 maxi. +80° C

Fluid temperature  
 continuous operation maxi. +90° C  
 short term operation maxi. +105° C

### Please note

Viscosities -when operating at above temperature limits-have to remain within the range specified under "Hydraulic Fluids".

### Fluid cleanliness

Fluid cleanliness according to ISO 4406/1986 Code 18/14 or better is required in order to assure the pump's high level of efficiency in the long term.

### Drive arrangement

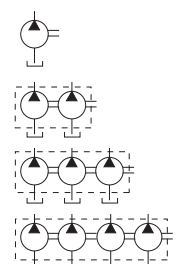
Flexible couplings are preferred for direct drives. Please contact Concentric for indirect drive requirements. Pumps with outboard side load bearing are available.

### Mounting position

As required.

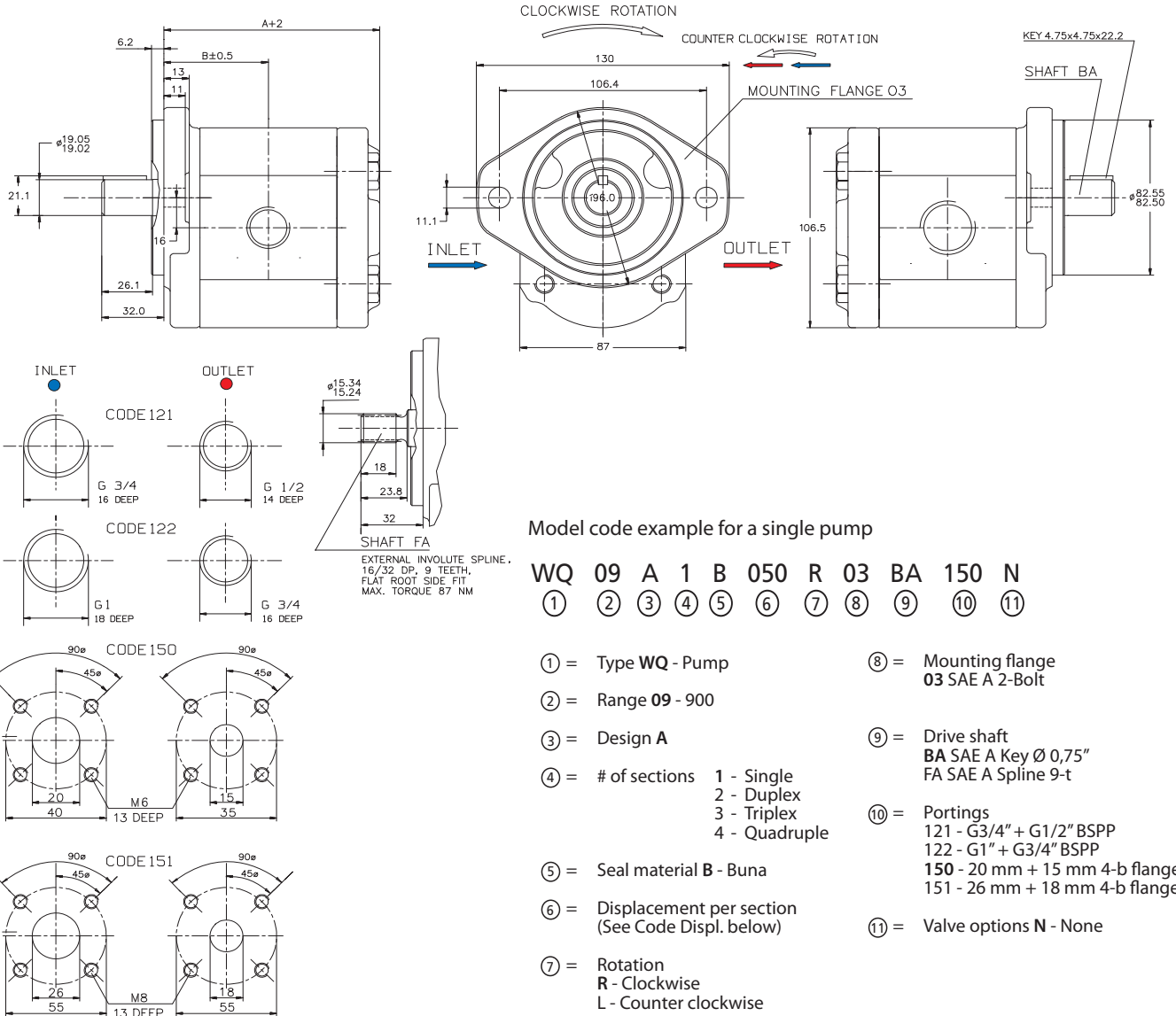
### Symbols

Single pump  
 Double pump  
 Triple pump  
 Quadruple pump





## FLANGE CODE 03 (SAE A 2 BOLT)



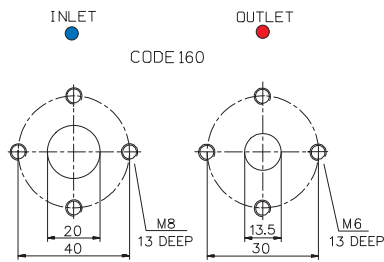
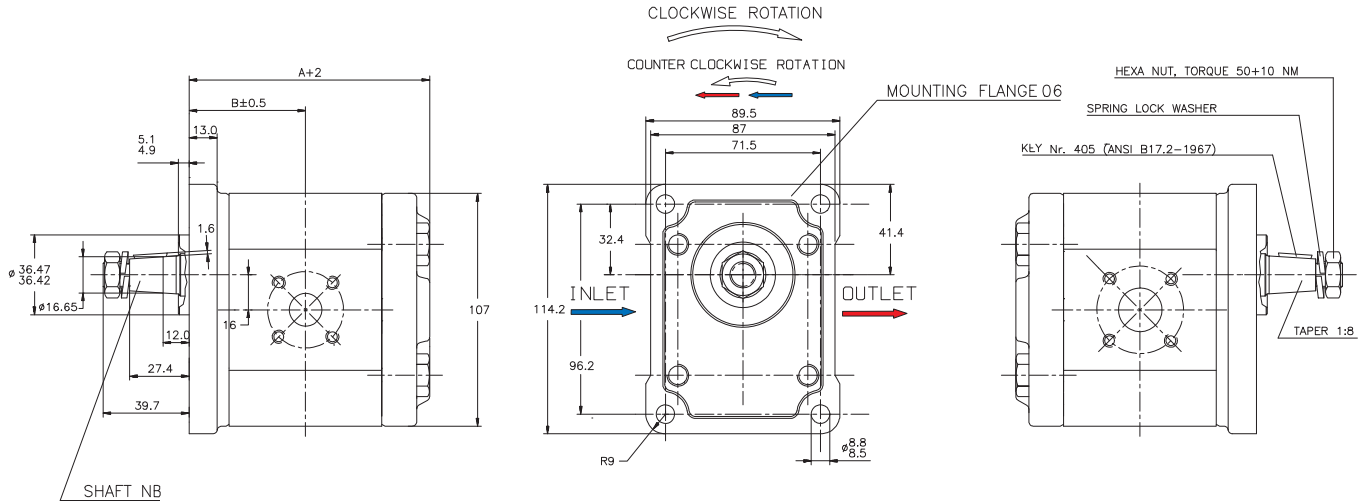
Size	Rated pressure * (bar)		Maximum speed (rpm)		Dimensions		Weight (approx.) [kg]
	Shaft 'BA'	Shaft 'FA'	Port. '121'/'150'	Port. '122'/'151'	A [mm]	B [mm]	
050 - 5,1cc	230	230	4000	-	90,1	43,3	3,7
060 - 6,2cc	230	230	4000	-	91,6	44,0	3,8
080 - 8,3cc	230	230	4000	-	94,6	45,5	3,9
110 - 11,3cc	230	230	3600	-	99,0	47,7	4,1
140 - 14,5cc	230	230	3300	-	103,5	50,0	4,2
160 - 16,5cc	230	230	3000	-	106,4	51,4	4,3
190 - 19,6cc	230	230	3000	-	110,9	53,7	4,4
230 - 23,7cc	207	207	2800	3500	116,8	56,6	4,6

\* **PLEASE NOTE:** On threaded ports max pressure is limited to 210 bar for size 5,0 cc - 23,0 cc displ

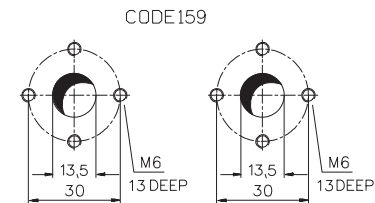




## FLANGE CODE 06



For pump displacement 050-080



Model code example for a single pump

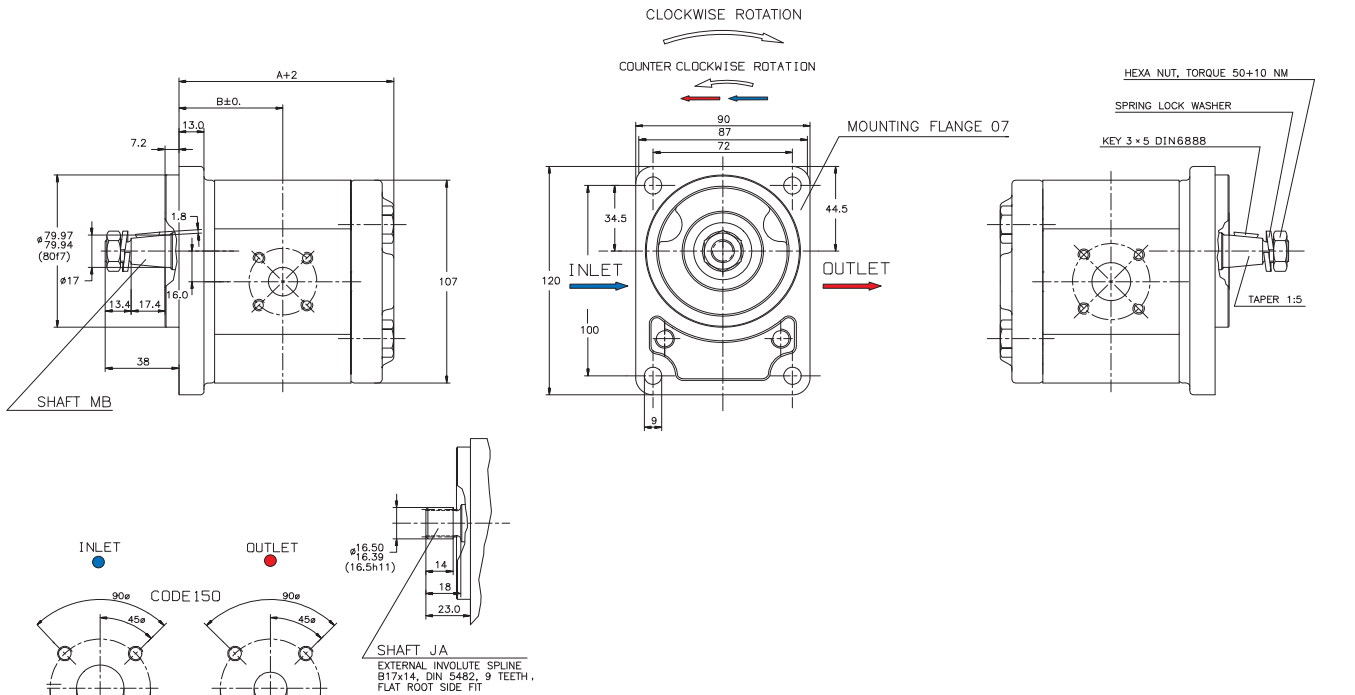
**WQ 09 A 1 B 050 R 06 NB 160 N**  
 ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪

- ① = Type **WQ** - Pump
- ② = Range **09** - 900
- ③ = Design **A**
- ④ = # of sections  
 1 - Single  
 2 - Duplex  
 3 - Triplex  
 4 - Quadruple
- ⑤ = Seal material **B** - Buna
- ⑥ = Displacement per section  
 (See Code Displ. below)
- ⑦ = Rotation  
**R** - Clockwise  
**L** - Counter clockwise
- ⑧ = Mounting flange  
**06** Rect. Ø 36,5 mm pilot
- ⑨ = Drive shaft  
**NB** European Tapered shaft 1:8
- ⑩ = Portings  
**160** - 20 mm + 13,5 mm
- ⑪ = Valve options **N** - None

Size	Rated pressure (bar)	Maximum speed (rpm)	Dimensions		Weight (approx.) [kg]
			A [mm]	B [mm]	
050 - 5,1cc	230	4000	90,1	43,3	3,7
060 - 6,2cc	230	4000	91,6	44,0	3,8
080 - 8,3cc	230	4000	94,6	45,5	3,9
110 - 11,3cc	230	3600	99,0	47,7	4,1
140 - 14,5cc	230	3300	103,5	50,0	4,2
160 - 16,5cc	230	3000	106,4	51,4	4,3
190 - 19,6cc	230	3000	110,9	53,7	4,4
230 - 23,7cc	207	2800	116,8	56,6	4,6



## FLANGE CODE 07



Model code example for a single pump

**WQ 09 A 1 B 060 R 07 MB 150 N**  
 ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪

- ① = Type **WQ** - Pump
- ② = Rated **09** - 900
- ③ = Design **A**
- ④ = # of sections **1** - Single
- ⑤ = Seal material **B** - Buna
- ⑥ = Displacement per section (See table below)
- ⑦ = Rotation  
**R** - Clockwise  
**L** - Counter clockwise
- ⑧ = Mounting flange  
**07** Rect. Ø 80 mm pilot
- ⑨ = Drive shaft  
**MB** European Tapered shaft 1:5  
**JA** DIN 5482 Spline 9-t  
**HA** DIN 5480 Spline 14-t
- ⑩ = Portings  
**150** - 20 mm + 15 mm 4-b flange  
**151** - 26 mm + 18 mm 4-b flange
- ⑪ = Valve options **N** - None

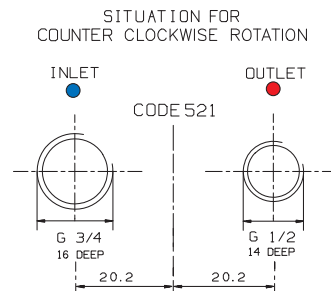
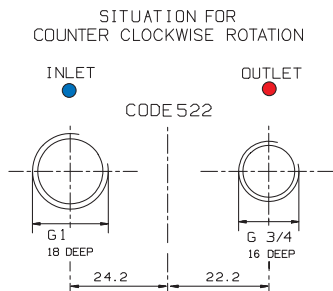
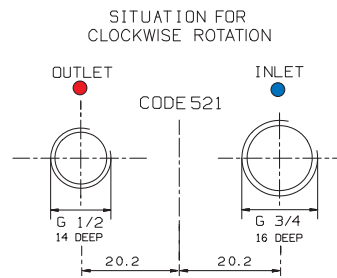
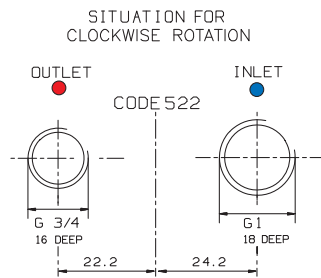
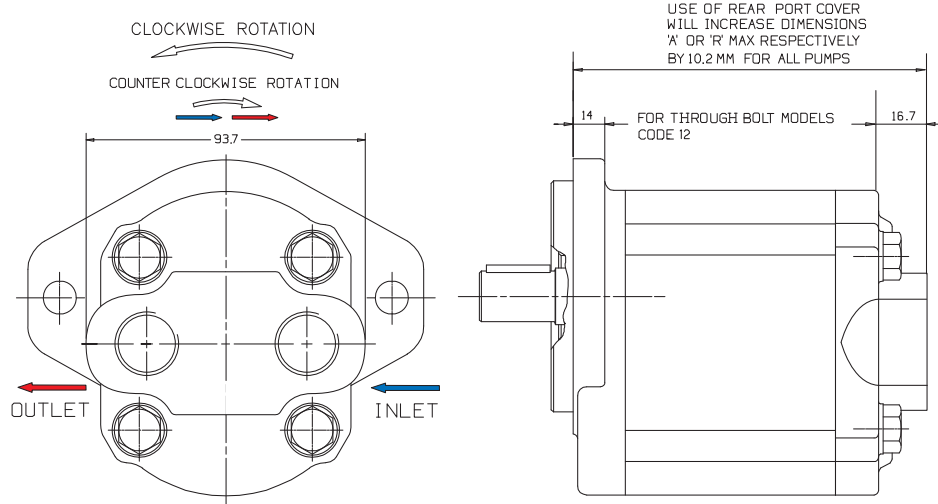
Size	Rated pressure (bar)	Maximum speed (rpm)		Dimensions		Weight (approx.) [kg]
		Port. c. '150'	Port. c. '151'	A [mm]	B [mm]	
050 - 5,1cc	230	4000	-	90,1	43,3	3,7
060 - 6,2cc	230	4000	-	91,6	44,0	3,8
080 - 8,3cc	230	4000	-	94,6	45,5	3,9
110 - 11,3cc	230	3600	-	99,0	47,7	4,1
140 - 14,5cc	230	3300	-	103,5	50,0	4,2
160 - 16,5cc	230	3000	-	106,4	51,4	4,3
190 - 19,6cc	230	3000	-	110,9	53,7	4,4
230 - 23,7cc	207	2800	3500	116,8	56,6	4,6





## REAR PORT

Rear port end cover can be combined with all flange and shaft options. All technical data from the preceding pages apply to this model.



Size	Rated pressure (bar)	Maximum speed (rpm)		Weight (approx.) [kg]
		Port. '521'	Port. '522'	
050 - 5,1cc	can be taken from Tables on pages 4-7	4000	-	3,7
060 - 6,2cc		4000	-	3,8
080 - 8,3cc		4000	-	3,9
110 - 11,3cc		3600	-	4,1
140 - 14,5cc		3300	-	4,2
160 - 16,5cc		3000	-	4,3
190 - 19,6cc		3000	-	4,4
230 - 23,7cc		2800	3500	4,6





## MULTIPLE PUMPS

The two following parameters are of the utmost importance when selecting multiple pumps and must never be exceeded:

- Drive shaft load index "A"
- Internal coupling load index "K"

Maxi. load index K 5240  
for double pump

$$K = (p_2 \times V_2)$$

for triple pump

$$K = (p_2 \times V_2) + (p_3 \times V_3)$$

for quadruple pump

$$K = (p_2 \times V_2) + (p_3 \times V_3) + (p_4 \times V_4)$$

-Maximum drive shaft load index "A", see table below for double pump

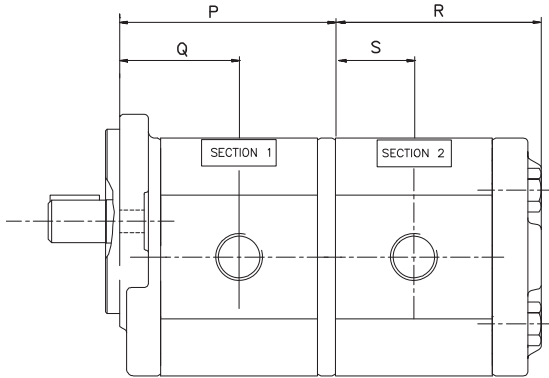
$$A = (p_1 \times V_1) + (p_2 \times V_2)$$

for triple pump

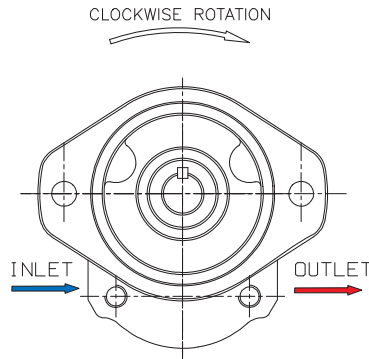
$$A = (p_1 \times V_1) + (p_2 \times V_2) + (p_3 \times V_3)$$

for quadruple pump

$$A = (p_1 \times V_1) + (p_2 \times V_2) + (p_3 \times V_3) + (p_4 \times V_4)$$

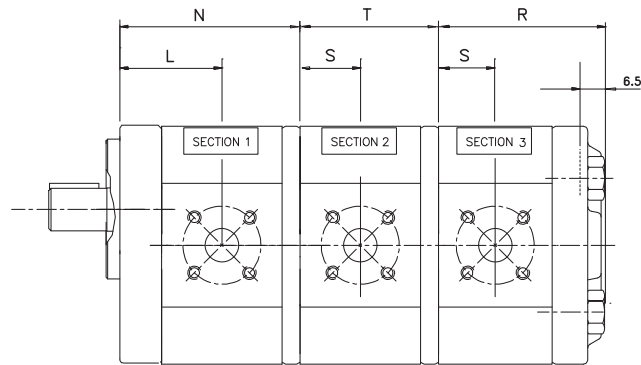
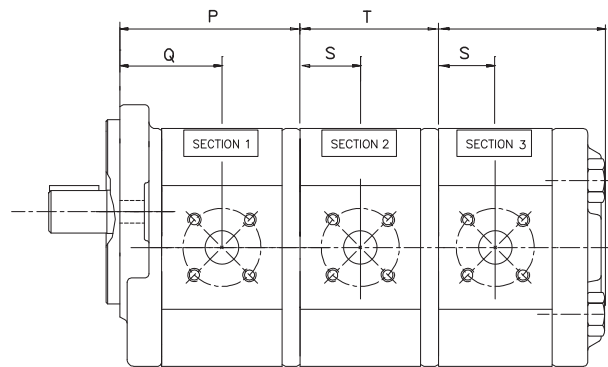


Shaft end section



Drive shaft	Load index A	Drive shaft	Load index A
<b>BA</b>	<b>10488</b>	<b>MB</b>	<b>10488</b>
<b>FA</b>	<b>5100</b>	<b>NB</b>	<b>10488</b>
<b>JA</b>	<b>6215</b>	<b>QB</b>	<b>5012</b>

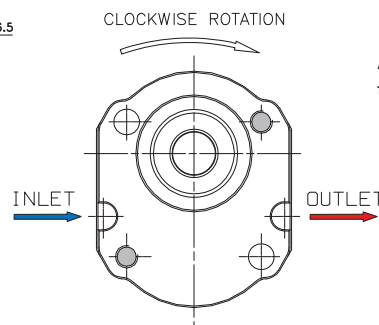
Note: P = actual pressure in bar,  
V = applicable displacement  
from Table page 4-7.



In multiple pumps, shaft end section must have largest displacement. Each consecutive section must have displacement equal to or smaller than section proceeding.

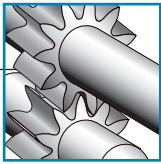
Concentric multiple pumps are also available with reduced number of inlets. Please contact Concentric for details.

Please, contact Concentric for pump applications requiring independently sealed sections.



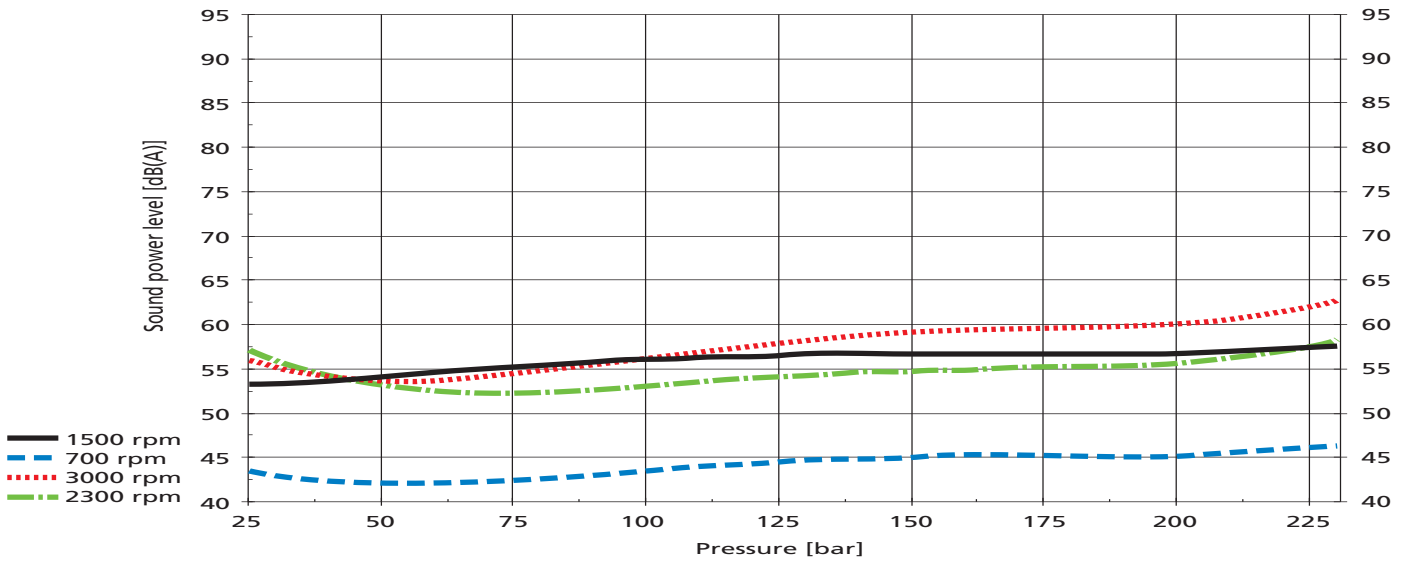
At left are shown the dimensions for the through bolt type pumps.

Size	P mm	Q mm	Weight kg Shaft end section	R mm	S mm	Weight kg Rearsection	T mm	Weight kg 2nd & 3rdsection	N mm	L mm	Weight kg A1-section	
060 -	6,2cc	77,6	44,0	3,1	73,4	25,6	2,7	59,1	1,8	75,1	41,5	2,7
080 -	8,3cc	80,0	45,5	3,2	76,4	27,0	2,8	62,1	1,9	78,1	41,5	2,7
110 -	11,3cc	85,0	47,7	3,4	80,8	29,2	3,0	66,5	2,1	82,5	45,2	3,0
140 -	14,5cc	89,5	50,0	3,5	85,2	31,5	3,1	71,0	2,2	87,0	47,5	3,1
160 -	16,5cc	92,4	51,4	3,6	88,1	33,0	3,2	73,9	2,3	89,9	48,9	3,2
190 -	19,6cc	96,9	53,7	3,7	92,7	35,2	3,4	78,4	2,4	94,4	51,2	3,4
230 -	23,7cc	102,8	56,6	3,9	98,6	38,2	3,5	84,3	2,6	100,3	54,1	3,5

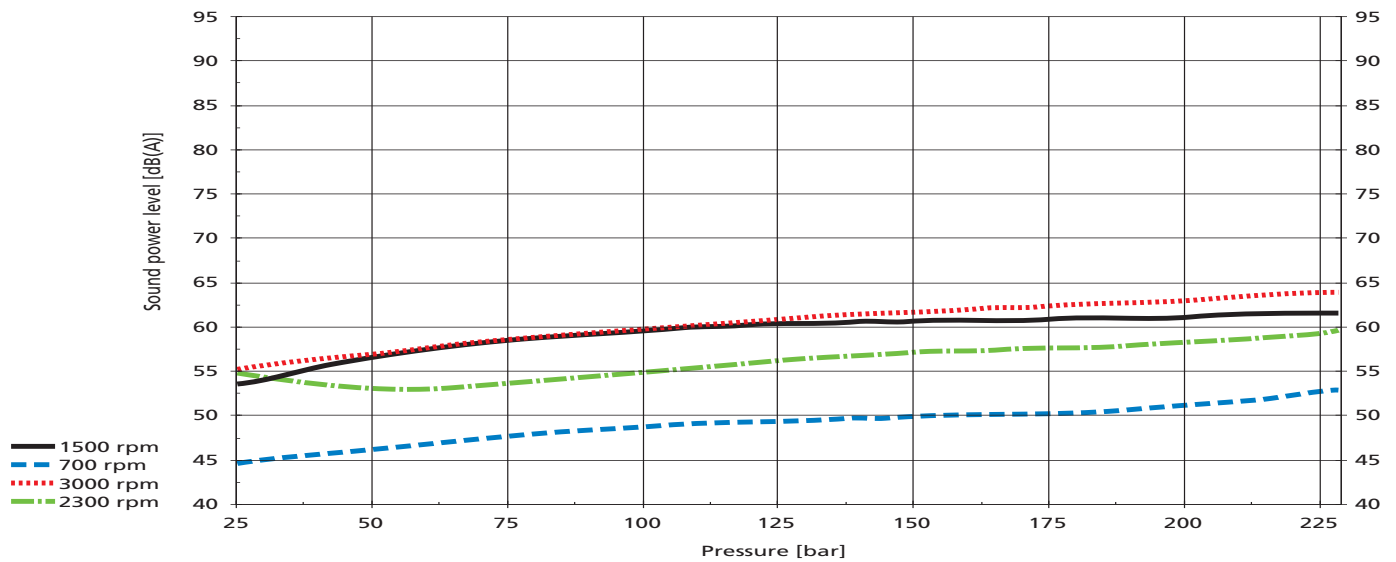


# SOUND POWER LEVEL ACCORDING TO DIN 45635, AT 50°C, 40 cSt

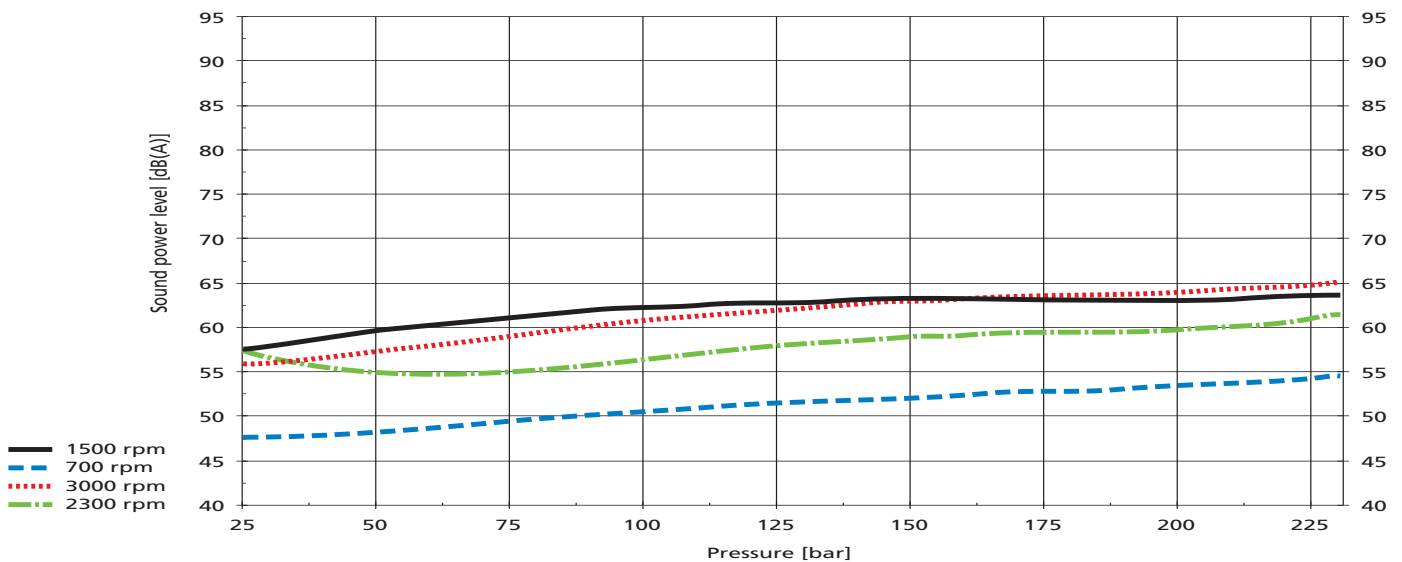
WQ9A1-8



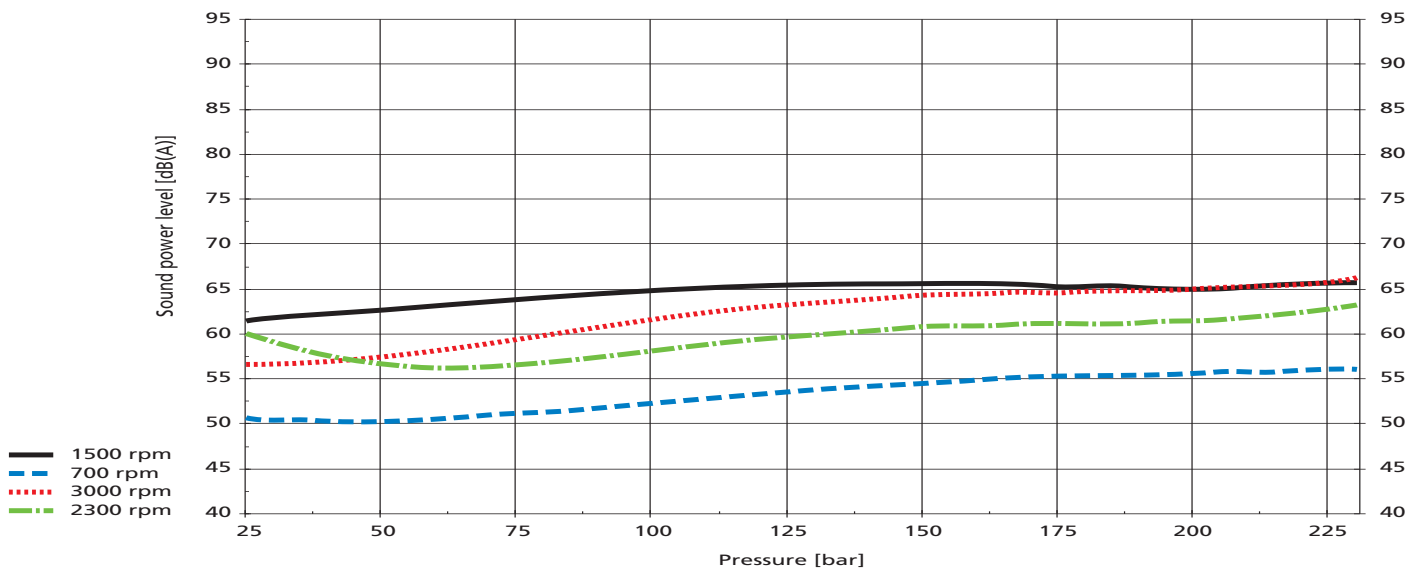
WQ9A1-11



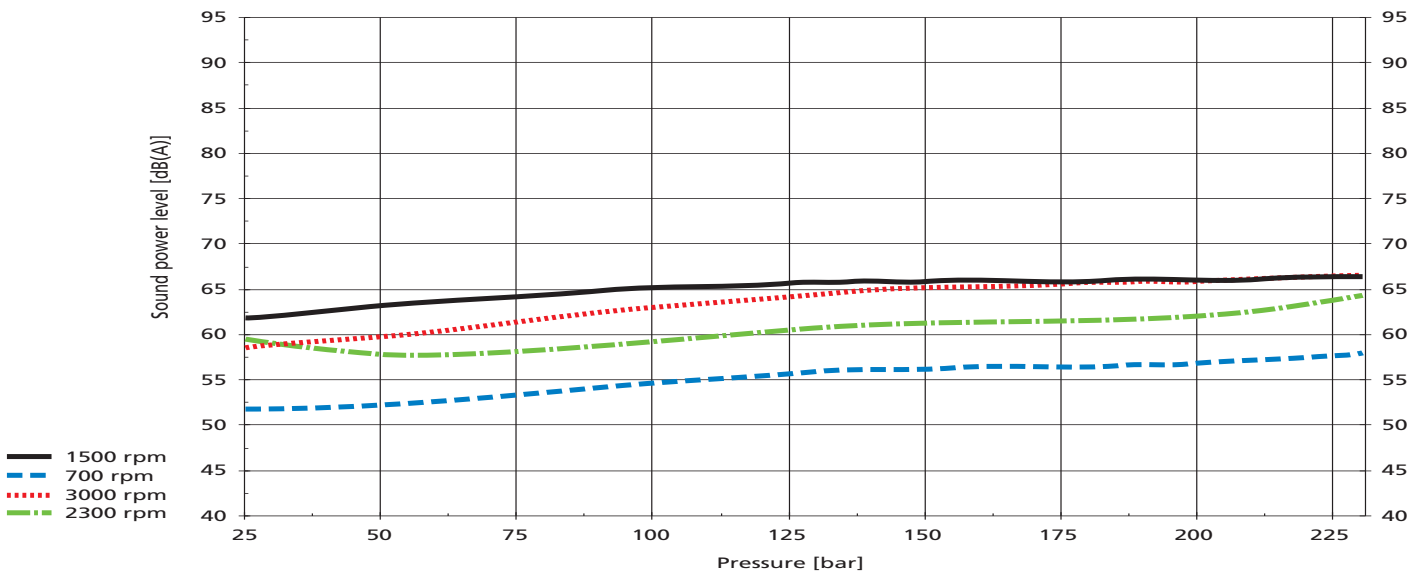
WQ9A1-14



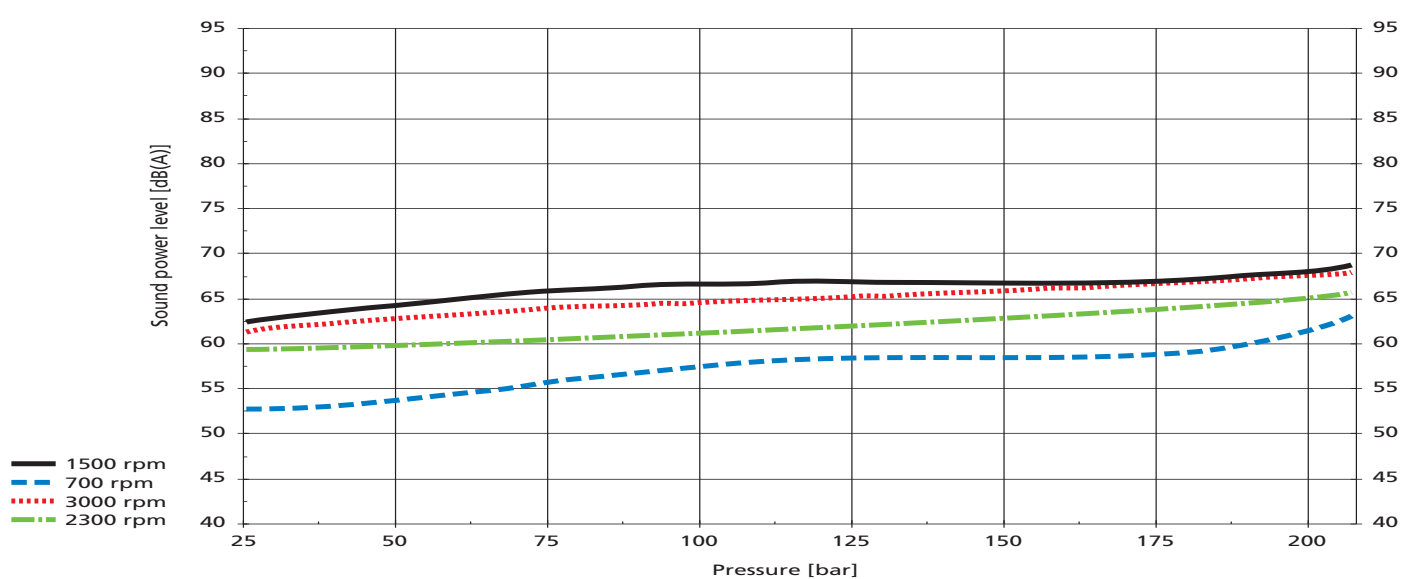
WQ9A1-16



WQ9A1-19



WQ9A1-23



## PRODUCT RANGE

### HE Powerpacks

12/24/48 VDC 0.3 – 4.5 kW and  
0.75 – 3 kW AC modular power packs

### HE Box Powerpacks

12/24/48 VDC modular powerpacks  
in weatherproof boxes

### Pressure Switches

5 - 350 bar, connecting/disconnecting

### W100 Hydraulic pumps

0,5 - 2,0 cc 227 bar

### W300 Hydraulic pumps

0,8 – 5,7 cc 230 bar

### W600 Hydraulic pumps / motors

3 – 12 cc 276 bar

### W900 Hydraulic pumps / motors

5 – 31 cc/section 276 bar

### Calma The new quiet pumps

6,2 - 23,7 cc/section 250 bar

### WQ900 The quiet pumps

5 - 23 cc/section 230 bar

### WP900X Hydraulic pumps

16 - 31 cc/section 276 bar

### W1500 Hydraulic pumps / motors

19 - 50 cc/section 276 bar

### F12 FERRA Heavy duty pumps

16 - 41 cc/section 276 bar

### F15 FERRA Heavy duty pumps

19 - 50 cc/section 276 bar

### F20/F30 (LS) Hydraulic pumps / motors

23 – 161 cc/section 276 bar

### GPA Internal Gear pumps

1,7 – 63 cc/section 100 bar

### GC Hydraulic pumps / motors

1,06 – 11,65 cc/section 276 bar

### D Hydraulic pumps

3,8 – 22,9 cc/section 207 bar

### H Hydraulic pumps

9,8 – 39,4 cc/section 207 bar

### II-Stage Hydraulic pumps

4,2 – 22,8 cc/section 276 bar

### Rotary Flow Dividers

3,8 – 13,3 cc/section 300 bar

### Transmission pumps

[www.concentricAB.com](http://www.concentricAB.com)



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