



# IGS

## INTERNAL GEAR PUMPS

### SERIES 10

#### OPERATING PRINCIPLE

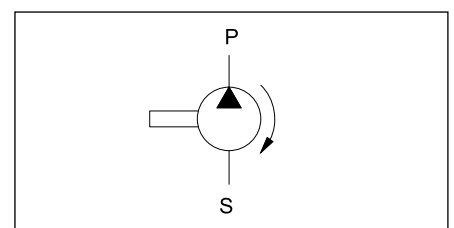
- IGS pumps are volumetric displacement pumps with internal gears, available in three sizes, each divided into a range of different displacement. Double pumps are also available.
- The pumps feature high volumetric performance levels, thanks to both radial and axial compensation in proportion to operating pressure, in addition to low noise levels.
- Optimal load distribution and special friction bearings enable continuous duty at high pressures and ensure extended pump lifetime.
- The toothing with involute flanks features a long meshing length for low flow and pressure pulsation and therefore ensures low noise operation.

#### TECHNICAL SPECIFICATIONS

PUMP SIZE		2	3	5
Displacement range	cm <sup>3</sup> /rev	8.2 ÷ 24.0	25.3 ÷ 63.7	81.4 ÷ 162.8
Flow rate range (at 1500 rpm)	l/min	12 ÷ 36	38 ÷ 95	120 ÷ 245
Operating pressures	bar	see table 3 - performances		
Rotation speed	rpm	see table 3 - performances		
Rotation direction		clockwise or counterclockwise		
Loads on the shaft		axial and radial loads not allowed		
Hydraulic connections		SAE J518 c fittings, flanged (see point 10)		
Mounting flange type		SAE 2 - ISO 3019-1		
Mass (single pump)	kg	see table 3 - performances		

Ambient temperature range	°C	-20 / +60
Fluid temperature range	°C	-10 / +80
Degree of fluid contamination	see point 4.3	
Recommended viscosity	cSt	25 ÷ 100

#### HYDRAULIC SYMBOL





## 1 - IDENTIFICATION CODE

### 1.1 - Single pump

	<b>IGS</b>		-		-		/	<b>10</b>	
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Internal gear pump \_\_\_\_\_

Pump size \_\_\_\_\_  
**2** = from 8.2 to 24.0 cm<sup>3</sup>/rev  
**3** = from 25.3 to 63.7 cm<sup>3</sup>/rev  
**5** = from 81.4 to 162.8 cm<sup>3</sup>/rev

Rotation direction (seen from the shaft side) \_\_\_\_\_  
**R** = clockwise (**standard**)  
**L** = counterclockwise

Nominal displacement: \_\_\_\_\_  
 See performances table, point 3

Seals:  
**N** = NBR seals for mineral oils (**standard**)  
**V** = FPM seals for special fluids

Series No.  
 (from 10 to 19 sizes and mounting dimensions remain unchanged.)

Mounting flange and shaft end:  
 SAE J744 flange 2-holes and cylindrical keyed shaft-end  
**AP20** = for IGS2 pumps  
**BP25** = for IGS3 pumps  
**DP40** = for IGS5 pumps

**NOTE:** Splined shaft ends ANSI B92.1 are available upon request

### 1.2 - Double pump

	<b>IGS</b>		-		/		-		/	<b>10</b>	
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Internal gear pump \_\_\_\_\_

Front pump size \_\_\_\_\_  
 (see table at point 2)  
**3** = from 25.3 to 63.7 cm<sup>3</sup>/rev  
**5** = from 81.4 to 162.8 cm<sup>3</sup>/rev

Rear pump size \_\_\_\_\_  
 (see table at point 2)  
**2** = from 8.2 to 24.0 cm<sup>3</sup>/rev  
**3** = from 25.3 to 63.7 cm<sup>3</sup>/rev  
**5** = from 81.4 to 162.8 cm<sup>3</sup>/rev

Rotation direction (seen from the shaft side) \_\_\_\_\_  
**R** = clockwise (**standard**)  
**L** = counterclockwise

Front pump nominal displacement: \_\_\_\_\_  
 See performances table, point 3

Rear pump nominal displacement: \_\_\_\_\_  
 See point 2 for available matches

Seals:  
**N** = NBR seals for mineral oils (**standard**)  
**V** = FPM seals for special fluids

Series No.  
 (from 10 to 19 sizes and mounting dimensions remain unchanged.)

Mounting flange and shaft end:  
 SAE J744 flange 2-holes and cylindrical keyed shaft-end  
**BP25** = for IGS32 and IGS33 pumps  
**DP40** = for IGS53 and IGS55 pumps

**NOTE:** Splined shaft ends ANSI B92.1 are available upon request

Identification code example: **IGS32-R063/020-BP25/10N**



**2 - AVAILABLE DOUBLE PUMPS**

		REAR PUMP																
		NOMINAL DISPLACEMENT	IGS2						IGS3					IGS5				
			008	010	013	016	020	024	025	032	040	050	063	080	100	125	145	162
FRONT PUMP	IGS3	025	■	■	■	■	■	■	■									
		032	■	■	■	■	■	■	■	■								
		040	■	■	■	■	■	■	■	■	■							
		050	■	■	■	■	■	■	■	■	■	■						
		063	■	■	■	■	■	■	■	■	■	■	■					
	IGS5	080							■	■	■	■	■	■				
		100							■	■	■	■	■	■	■			
		125							■	■	■	■	■	■	■	■		
		145							■	■	■	■	■	■	■	■	■	
		162							■	■	■	■	■	■	■	■	■	

**3 - PERFORMANCES**

(obtained with mineral oil with viscosity within 25 + 100 cSt)

PUMP SIZE	NOMINAL DISPLACEMENT	DISPLACEMENT [cm <sup>3</sup> /rev]	FLOW RATE at 1500 rpm [l/min]	PRESSURE [bar]		ROTATION SPEED [rpm]		WEIGHT [kg] (single pump)
				rated	max NOTE 1	max	min NOTE 2	
IGS2	008	8.2	12.3	315	350	3000	400	4.6
	010	10.2	15.3					4.8
	013	13.3	20					4.9
	016	16.0	24					5.2
	020	20.0	30	250	300			5.6
	024	24.0	36					6.0
IGS3	025	25.3	38	315	350	3000	200	14.5
	032	32.7	49.1					15
	040	40.1	60.2					16
	050	50.7	76.1					17
	063	63.7	95.6	250	300			18.5
IGS5	080	81.4	122.1	315	350	3000	200	43.5
	100	100.2	150.3					45.5
	125	125.3	188					48
	145	145.2	217.8	250	280			50
	162	162.8	244.2	210	260			52

**NOTE 1:** The maximum operation time under maximum pressure is 5 seconds.

**NOTE 2:** The continuous pressures are valid for minimum rotation speeds. Variable speeds require pressure limitations if they are lower than the minimum rotation speed. The minimum allowable rotation speed can be reduced to 50 rpm for a duration of no more than 30 seconds, limiting the maximum pressure to 175 bar; otherwise the pump will overheat and consequently wear out faster.



## 4 - HYDRAULIC FLUID

### 4.1 - Fluid type

Use mineral oil based hydraulic fluids with anti-foam and antioxidant additives. Limitations apply with other fluid types. See the table below or consult our Technical Department for authorization of use.

FLUID TYPE	NOTES
HFC (water glycol solutions with proportion of water $\leq 40\%$ )	<ul style="list-style-type: none"><li>- The pumps are tested with mineral oil. An appropriate cleaning cycle is required.</li><li>- The values shown in the performance table must be reduced by at least 20%.</li><li>- The maximum speed of the fluid in the suction line must not exceed 1 m/s.</li><li>- Input speed n maximum 2000 rpm.</li><li>- The suction pressure must not be less than 0,8 bar absolute.</li><li>- The maximum fluid temperature must be less than 50°C.</li></ul>

### 4.2 - Fluid viscosity

The operating fluid viscosity must be within the following range:

minimum viscosity	10 cSt	referred to the maximum fluid temperature of 80 °C
optimum viscosity	25 ÷ 100 cSt	referred to the fluid working temperature in the tank
maximum viscosity	2000 cSt	limited to the start-up phase of the pump only

When selecting the fluid type, be sure that the true viscosity is within the range specified above at the operating temperature.

### 4.3 - Degree of fluid contamination

The maximum degree of fluid contamination must be according to ISO 4406:1999 class 20/18/15; therefore, use of a filter with  $\beta_{20} \geq 75$  is recommended. A degree of maximum fluid contamination according to ISO 4406:1999 class 18/16/13 is recommended for optimum endurance of the pump. Hence, we recommend the use of a filter with  $\beta_{10} \geq 100$ .

If there is a filter installed on the suction line, be sure that the pressure at the pump inlet is not lower than the values specified in point 8. The suction filter must be equipped with a by-pass valve. A clogging indicator is also recommended.

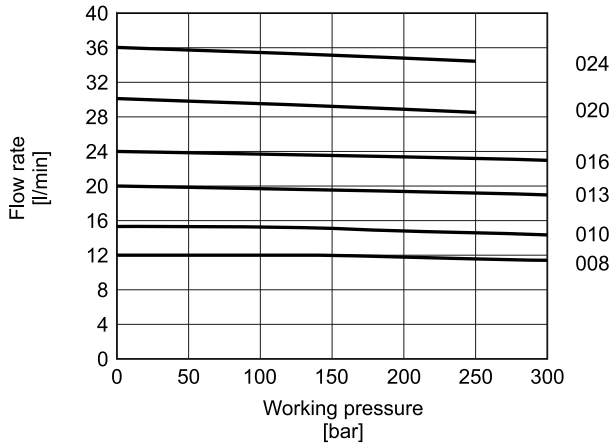
## 5 - CHARACTERISTIC CURVES

(values obtained with mineral oil with viscosity of 46 cSt at 40 °C)

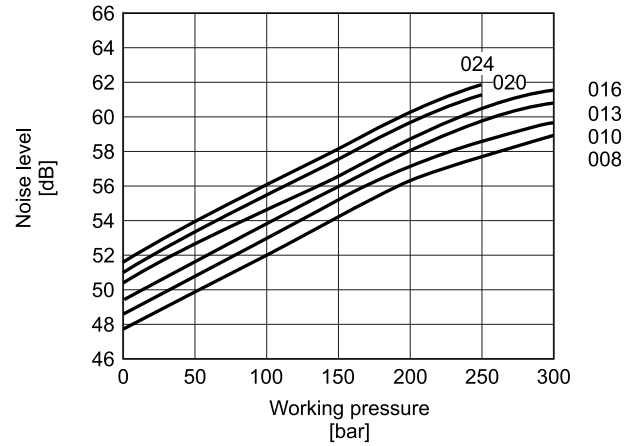
The data in the diagrams were noted with pump rotation speed = 1500 rpm.

### 5.1 - IGS2

**FLOW RATE/PRESSURE CURVES**

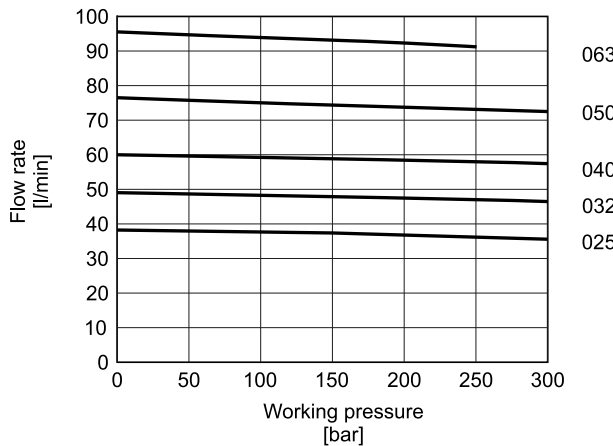


**NOISE LEVEL**

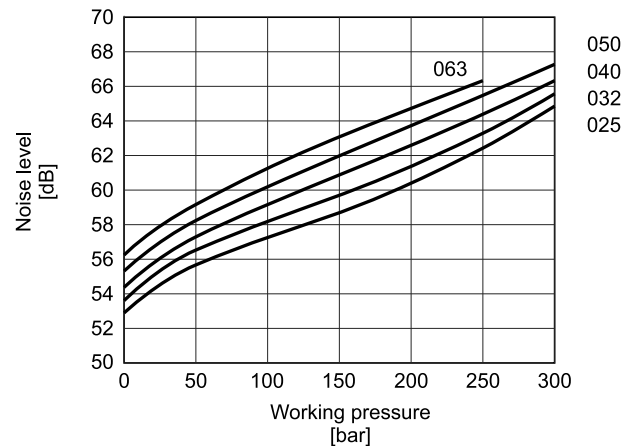


### 5.2 - IGS3

**FLOW RATE/PRESSURE CURVES**

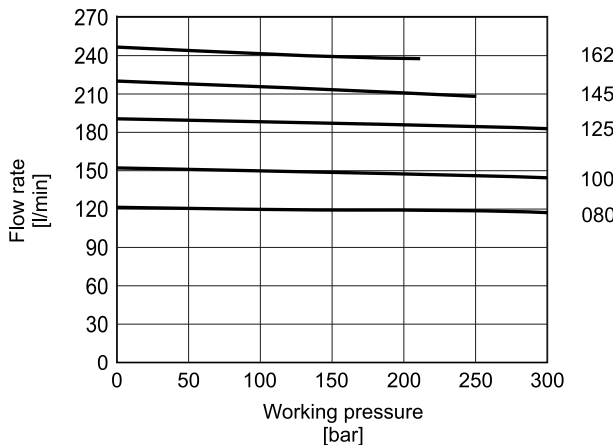


**NOISE LEVEL**

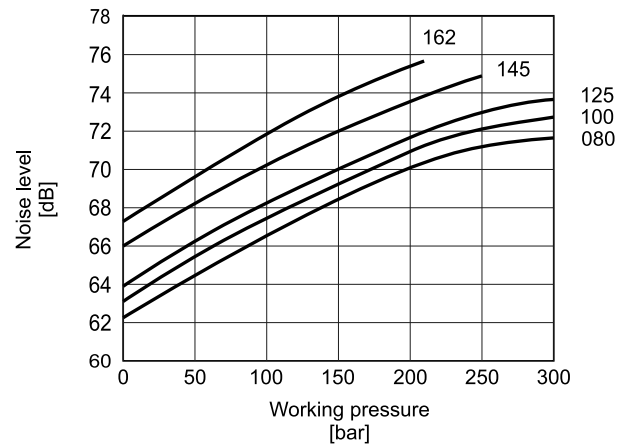


### 5.3 - IGS5

**FLOW RATE/PRESSURE CURVES**

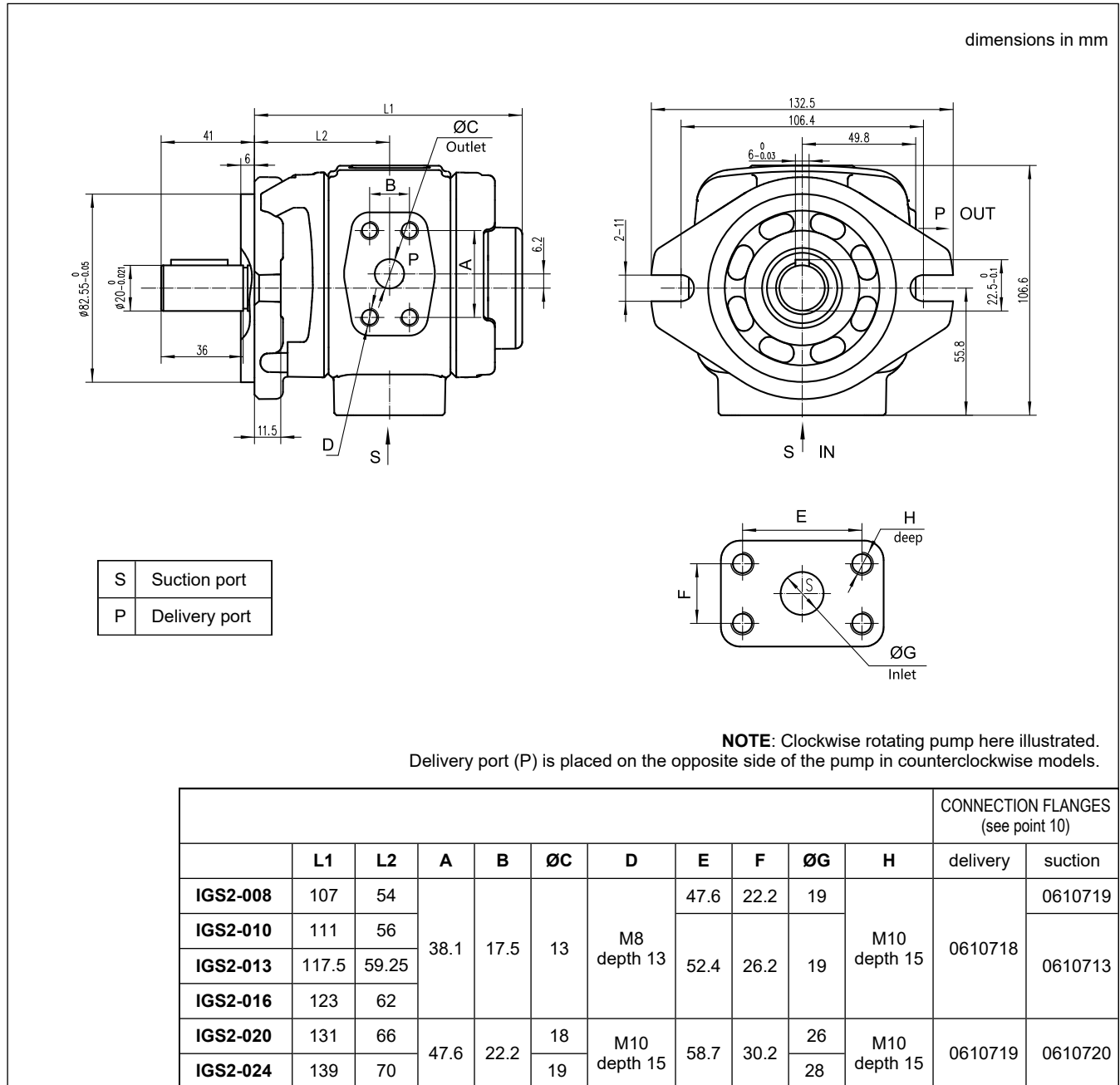


**NOISE LEVEL**

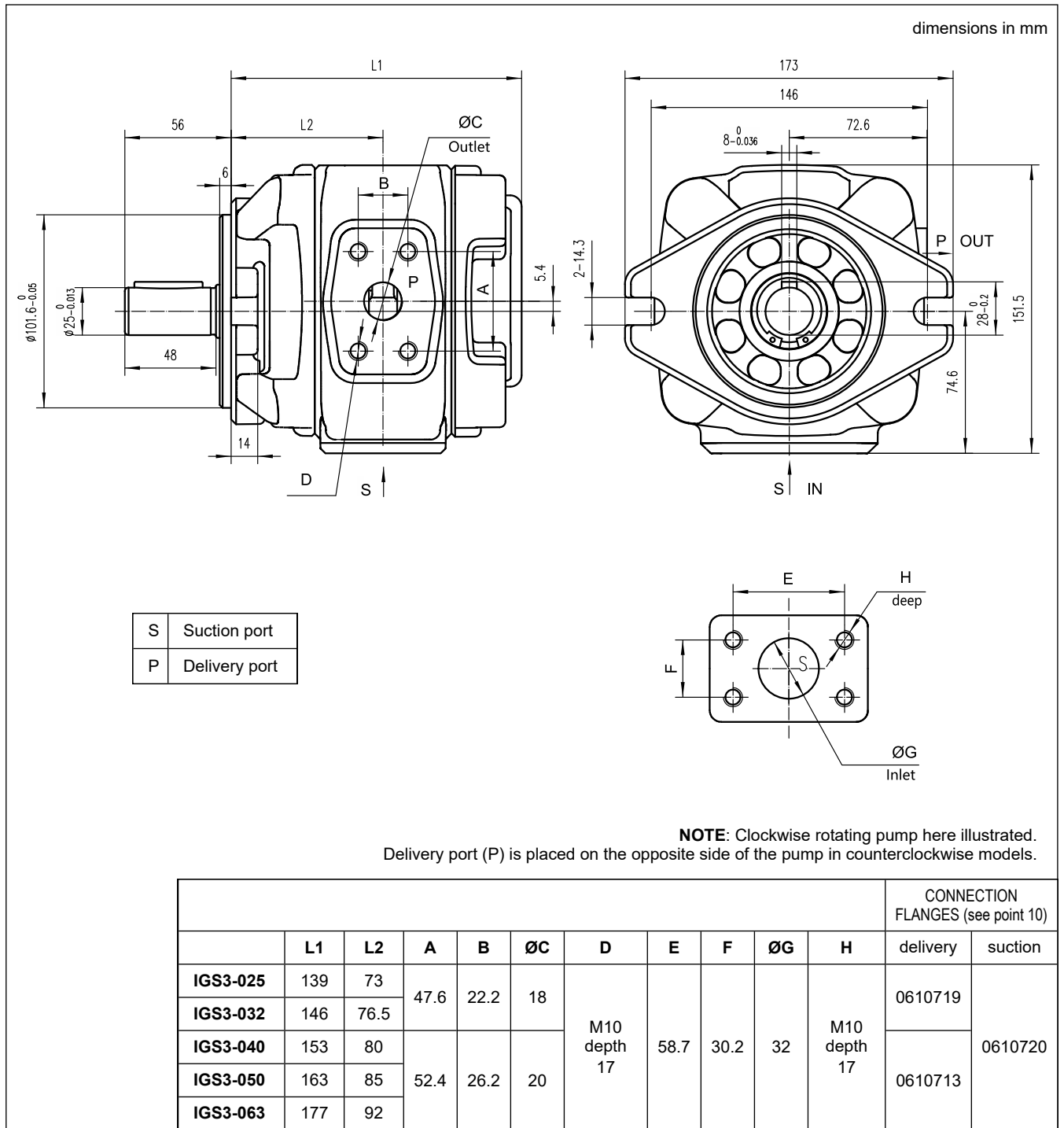


## 6 - SINGLE PUMPS - OVERALL MOUNTING AND DIMENSIONS

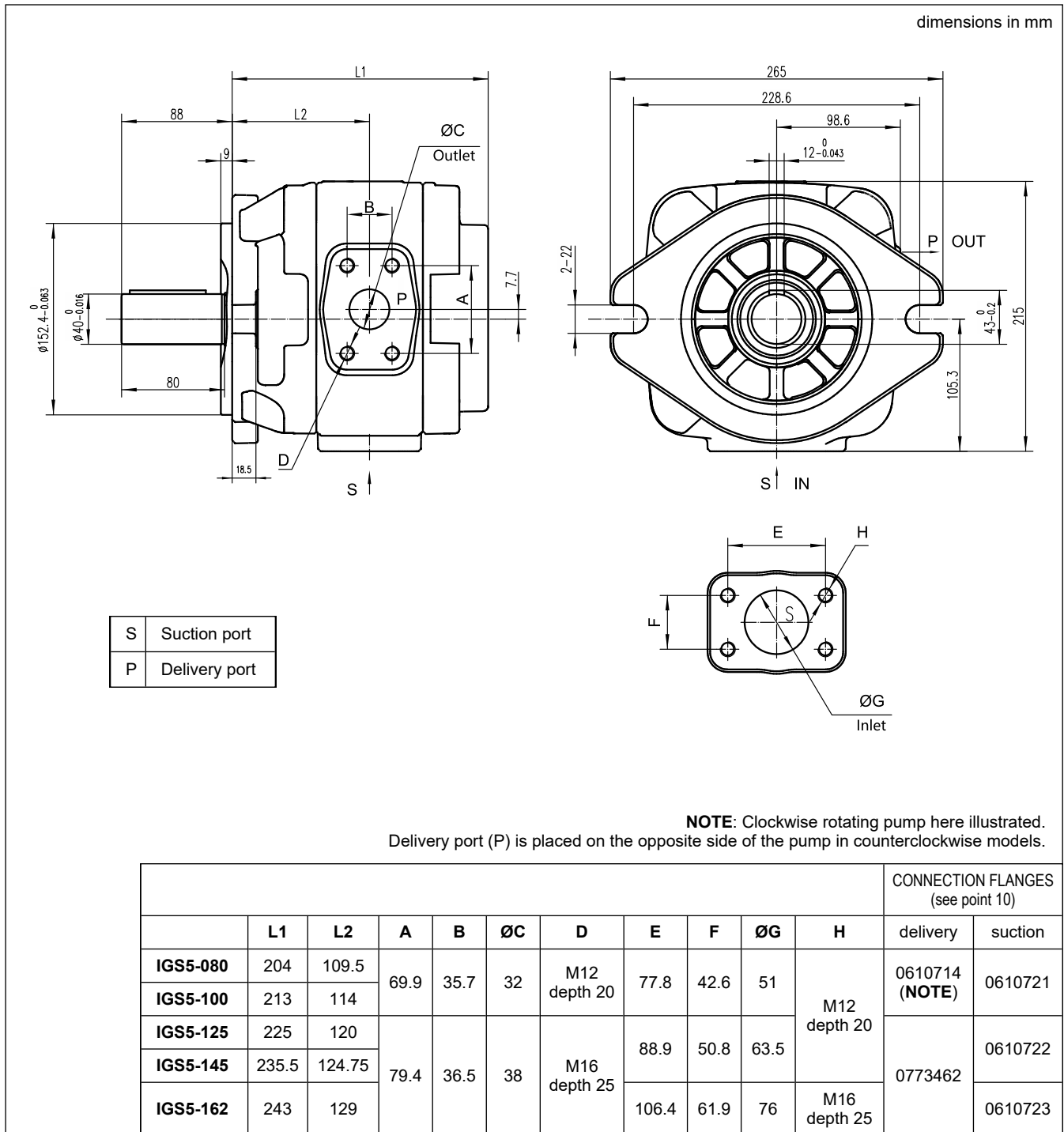
### 6.1 - IGS2 (SAE A J744 flange mounting)



## 6.2 - IGS3 (SAE B J744 flange mounting)



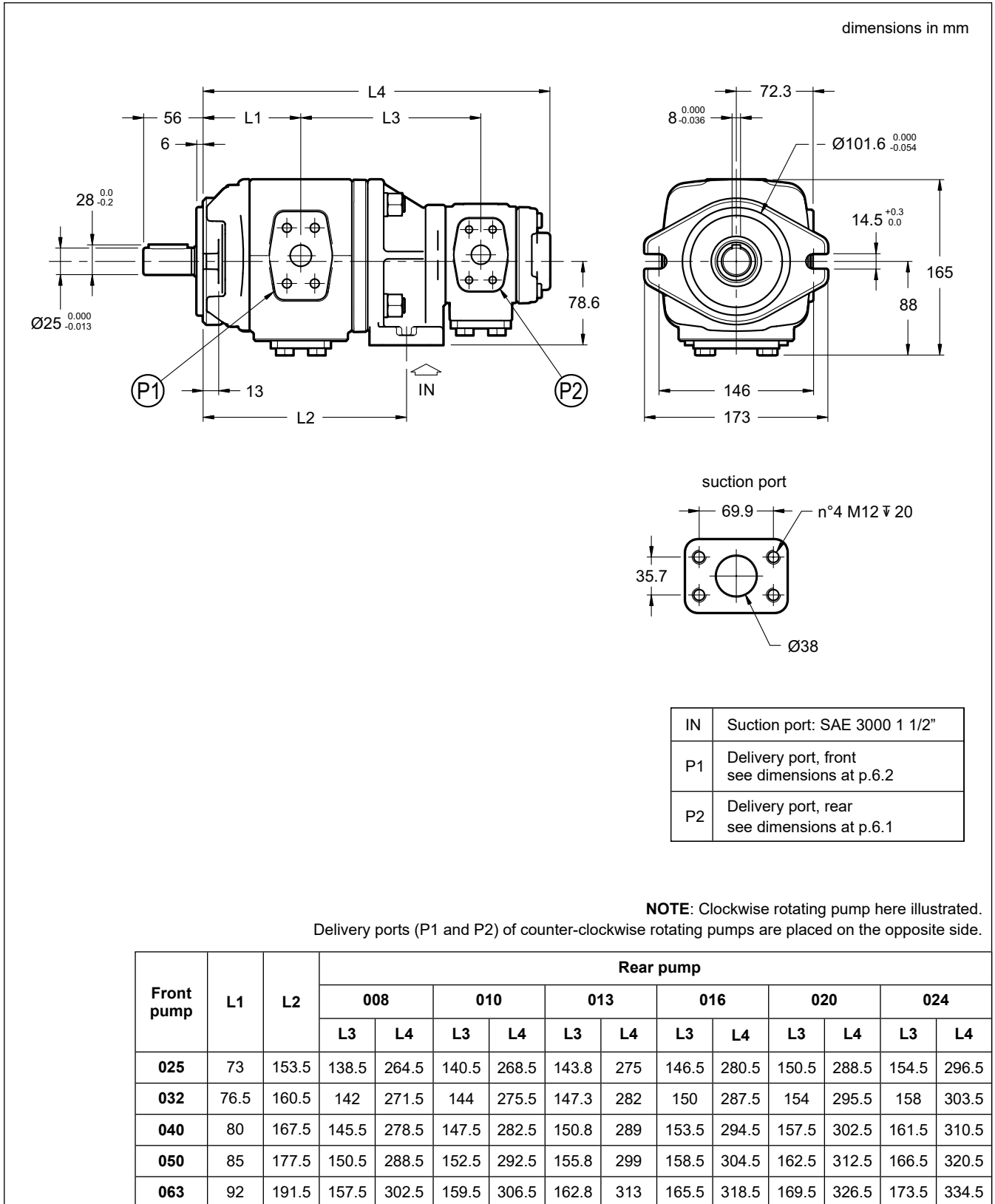
### 6.3 - IGS5 (SAE D J744 flange mounting)



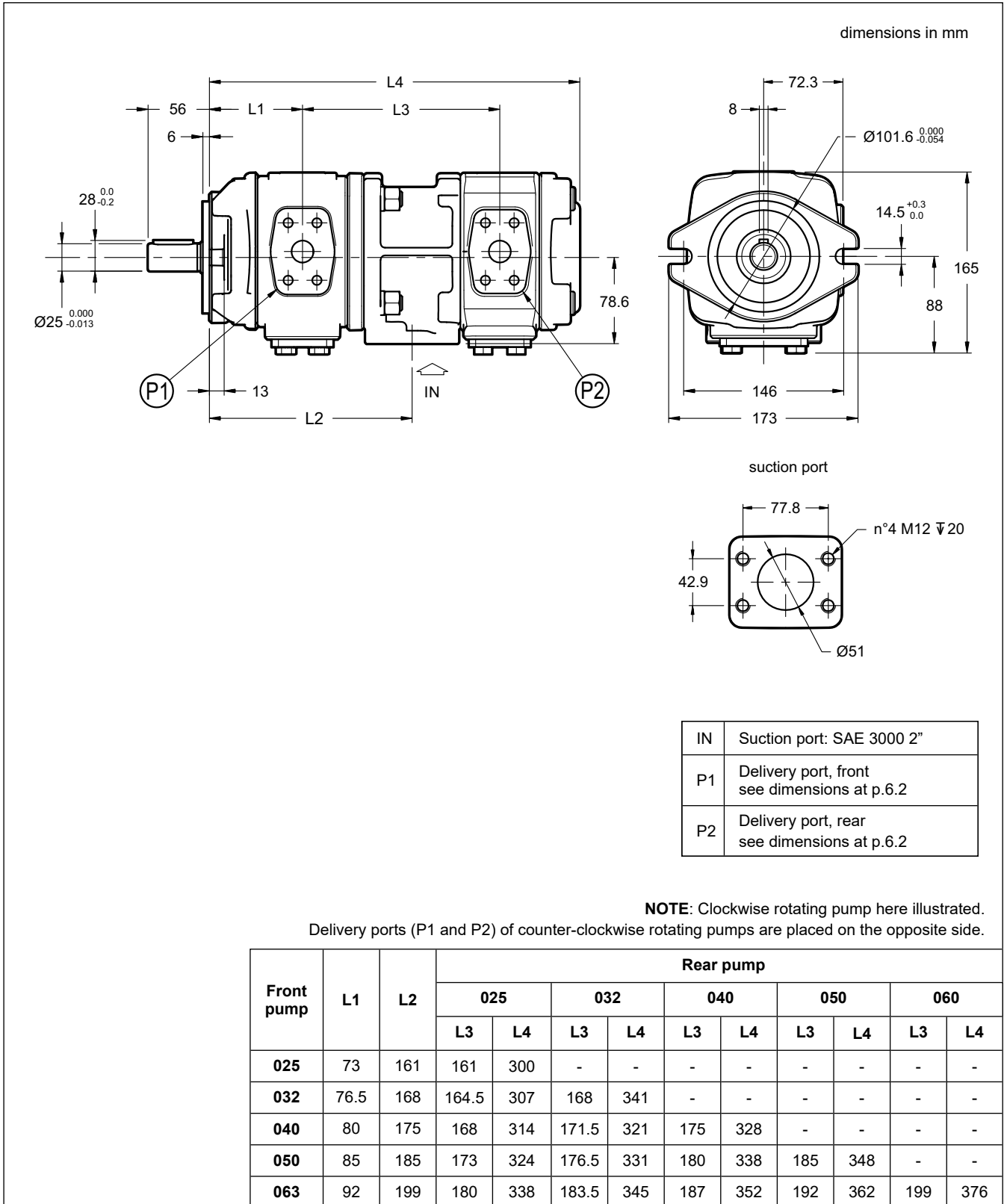
**NOTE:** Applications with delivery pressure > 200 bar require the special flange cod. 0610725.

## 7 - DOUBLE PUMPS - OVERALL MOUNTING AND DIMENSIONS

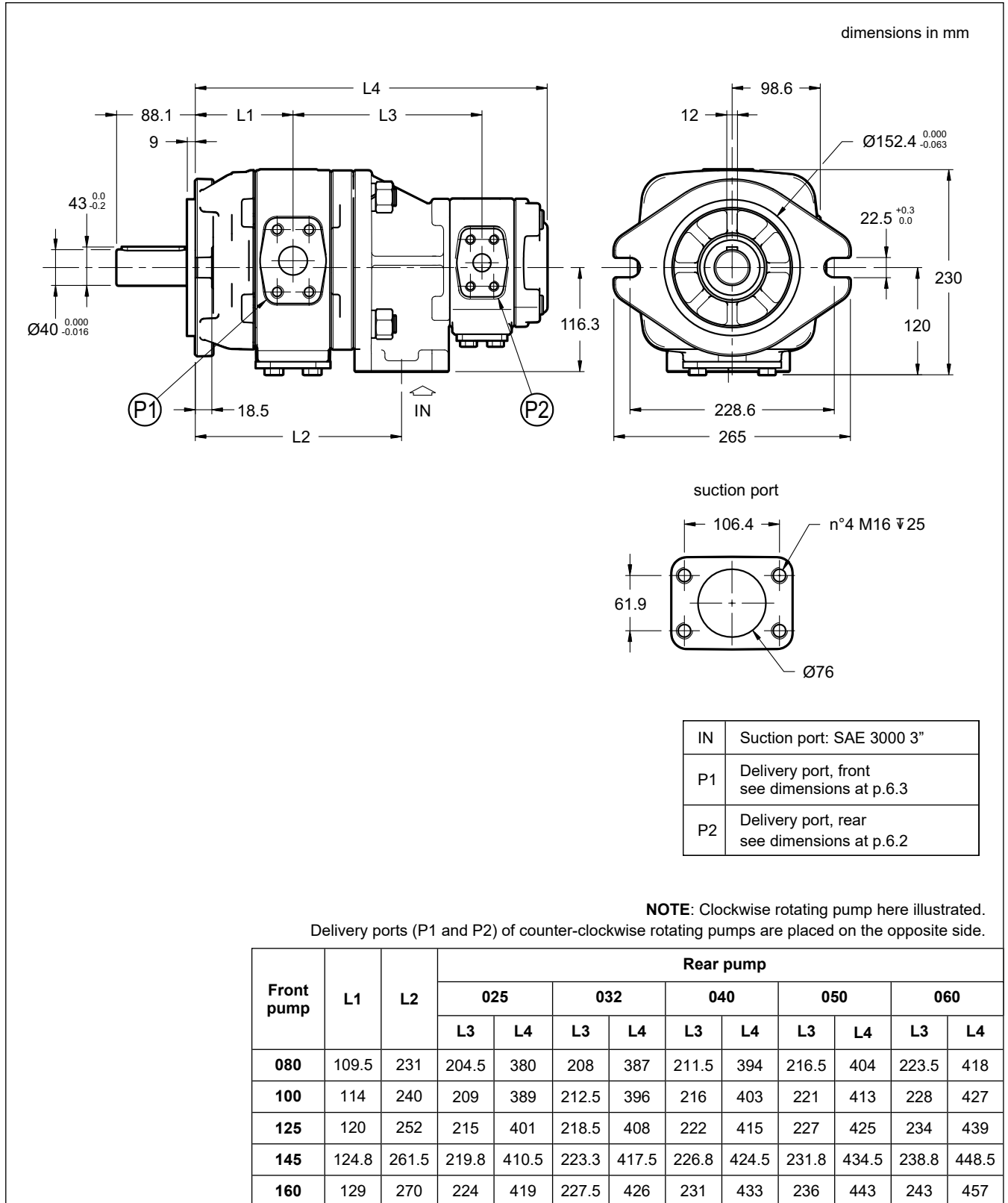
### 7.1 - IGS32 (SAE B J744 flange mounting)



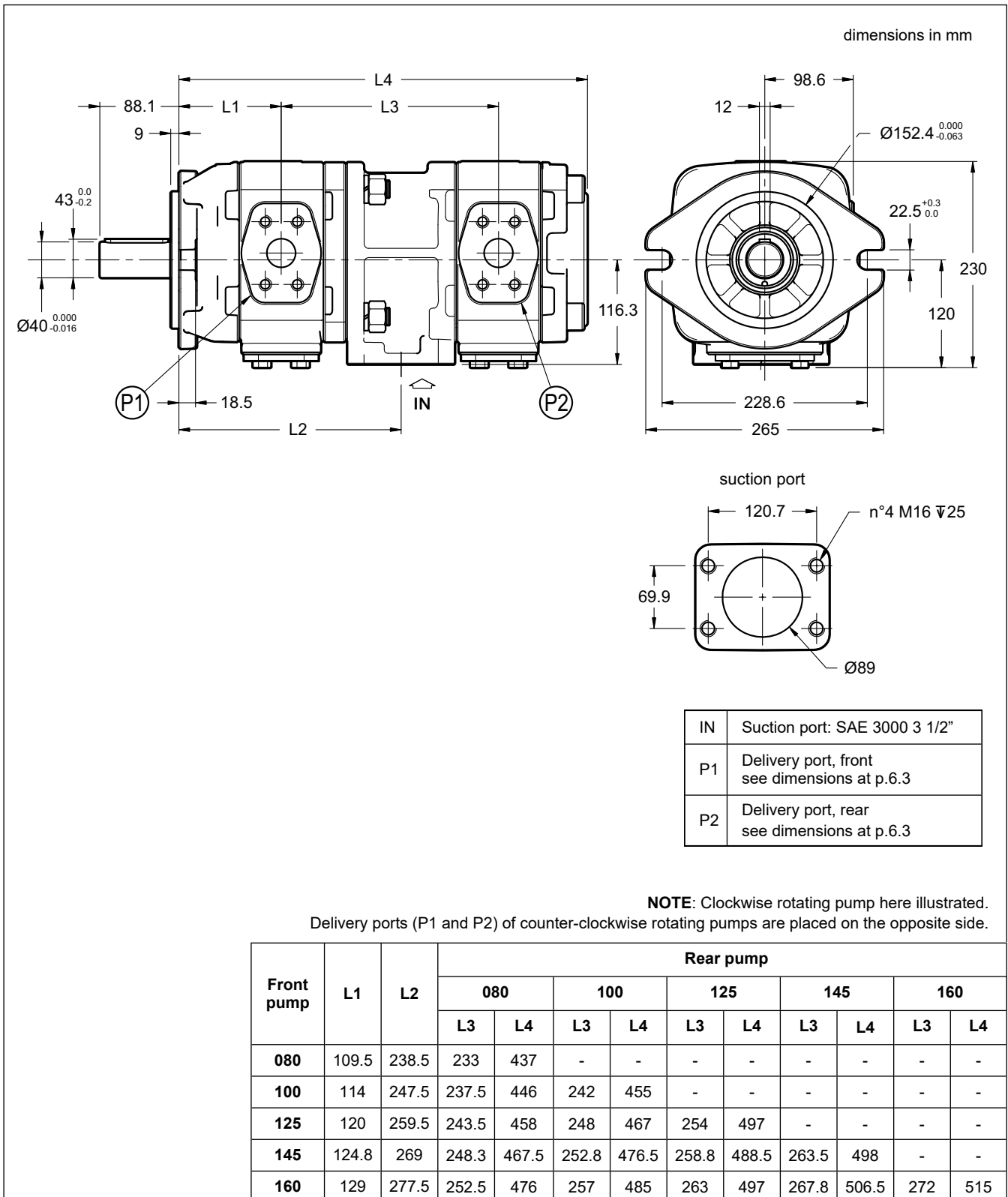
## 7.2 - IGS33 (SAE B J744 flange mounting)



### 7.3 - IGS53 (SAE D J744 flange mounting)



### 7.4 - IGS55 (SAE D J744 flange mounting)



**8 - INSTALLATION**

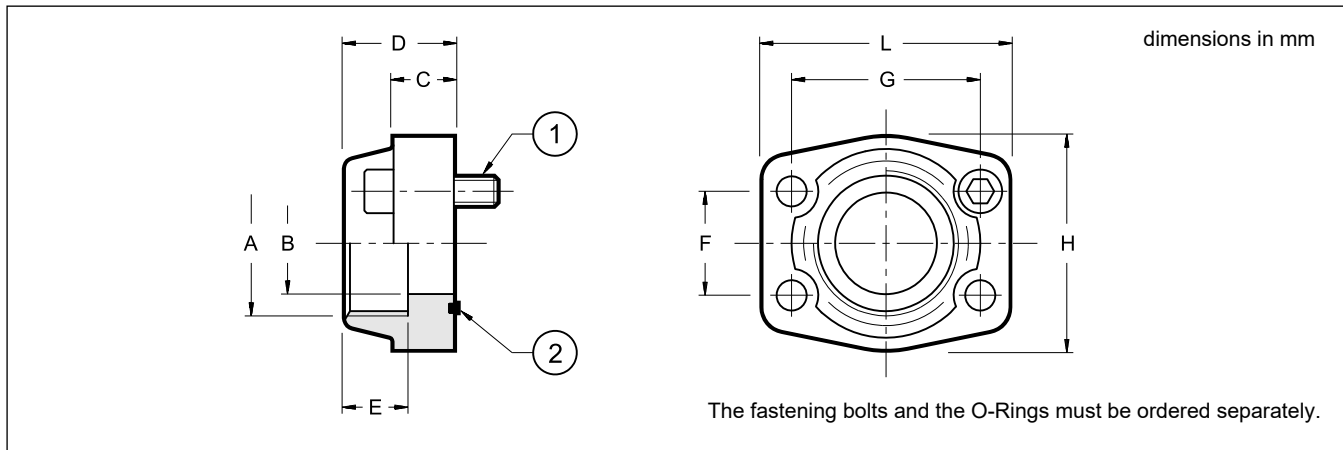
- When connecting the pump shaft and motor shaft, use a flexible coupling to avoid bending moments or axial thrusts. The maximum allowable coaxiality error between the pump shaft and the motor shaft is 0.15 mm when installing the coupling. It is strictly forbidden to use blows or strong pressure for installation.
- Check that the rotation direction of the motor is according to the direction of the arrow marked on the pump body before putting the pump into operation.
- Select the inner diameter of the suction piping according to the size of the pump suction port (optimal suction flow rate is 0.6~1.2 m/s) and taking into account the allowable suction pressure (the value is between 0.8 bar and 2 bar absolute). Suction line must be immersed in the tank, at least below the minimum oil level and 50 mm from the tank bottom. Any bends and restrictions or an excessive line length may impair correct operation of the pump.
- The IGS pumps are self-priming in the entire operating speed range specified.
- Before start-up, fill the pump body with hydraulic oil through the suction port or through the delivery port; open the relief valve of the system to vent the air from the delivery line. Run the motor intermittently without load, until the pump is fully lubricated, vent the air in the pipeline. (If the circuit branch is not equipped with a relief valve, the method of slightly loosening the pump discharge connection to cause leakage can be adopted. When no more bubbles appear in the leaked oil, tighten the loosened part according to the specified torque.)  
**NOTE:** Apply this method only under low pressure conditions, making sure the pressure cannot rise during the start-up. The pump starting operation, especially at low temperatures, must be undertaken at the minimum pressure in the system.
- Refer to point 4.3 for characteristics and installation of the filtering elements.

**9 - MAXIMUM APPLICABLE TORQUE**

The table shows values for cylindrical keyed shafts-ends. In case of double pumps, even of the same displacement, each pump can operate at the maximum PERFORMANCES specified in point 3.

PUMP SIZE	MAX. TORQUE APPLICABLE TO THE SHAFT [Nm]
IGS2	250
IGS3	450
IGS5	1100

## 10 - SAE J518 CONNECTION FLANGES



	Flange code	Flange description	$p_{max}$ [bar]	$\varnothing A$	$\varnothing B$	C	D	E	F	G	H	L	1 bolts ISO 4762	2
SAE 3000	0610718	SAE - 1/2"	345	1/2" BSP	13	16	36	19	17.5	38.1	46	57	n° 4 - M8x30	OR 4075 (18.64x3.53)
	0610719	SAE - 3/4"	345	3/4" BSP	19	18	36	19	22.2	47.6	50	65	n° 4 - M10x35	OR 4100 (24.99x3.53)
	0610713	SAE - 1"	345	1" BSP	25	18	38	22	26.2	52.4	55	70	n° 4 - M10x35	OR 4131 (32.93x3.53)
	0610720	SAE - 1 1/4"	276	1 1/4" BSP	32	21	41	22	30.2	58.7	68	79	n° 4 - M10x35	OR 4150 (37.69x3.53)
	0610714	SAE - 1 1/2"	207	1 1/2" BSP	38	25	45	24	35.7	69.9	78	93	n° 4 - M12x40	OR 4187 (47.22x3.53)
	0610725	SAE - 1 1/2"	345	1 1/2" BSP	38	50	50	24	35.7	69.9	82	98	n° 4 - M12x55 class 10.9	OR 4187 (47.22x3.53)
	0610721	SAE - 2"	207	2" BSP	51	25	45	30	43	77.8	90	102	n° 4 - M12x40	OR 4225 (56.74x3.53)
	0610722	SAE - 2 1/2"	172	2 1/2" BSP	63	25	50	30	50.8	89.0	105	114	n° 4 - M12x45	OR 4275 (69.44x3.53)
	0610723	SAE - 3"	138	3" BSP	73	27	50	34	61.9	106.4	124	134	n° 4 - M16x50	OR 4337 (85.32x3.53)
	0610724	SAE - 3 1/2"	34	3 1/2" BSP	89	27	48	34	69.9	120.7	136	152	n° 4 - M16x50	OR 4387 (98.02x3.53)
SAE 6000	0773462	SAE - 1 1/2"	420	1 1/2" BSP	38	30	94	26	36.5	79.3	94	112	n° 4 - M16x55	OR 4187 (47.22x3.53)

**NOTE:** Flange code 0610725 is a special flange which differs from the SAE J518 standard.