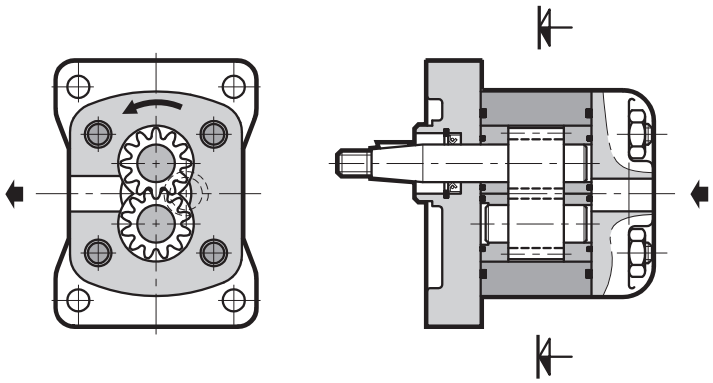
Зміст

1P
EXTERNAL GEAR PUMPS
SERIES 11

OPERATING PRINCIPLE



— The 1P pumps are fixed displacement external gear pumps with axial clearance compensation.

— They give high volumetric efficiency even with high operating pressures, a low noise level, and they have a high endurance thanks to the balancing system of the loads on the guide bushings.

— They are available with displacements going from 1,1 to 8,0 cm^3/rev and with operating pressures of up to 230 bar.

— They are available with clockwise rotation direction and with tapered shaft.

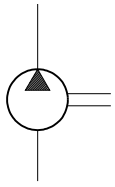
— The hydraulic connection is with BSP threaded ports type.

TECHNICAL SPECIFICATIONS

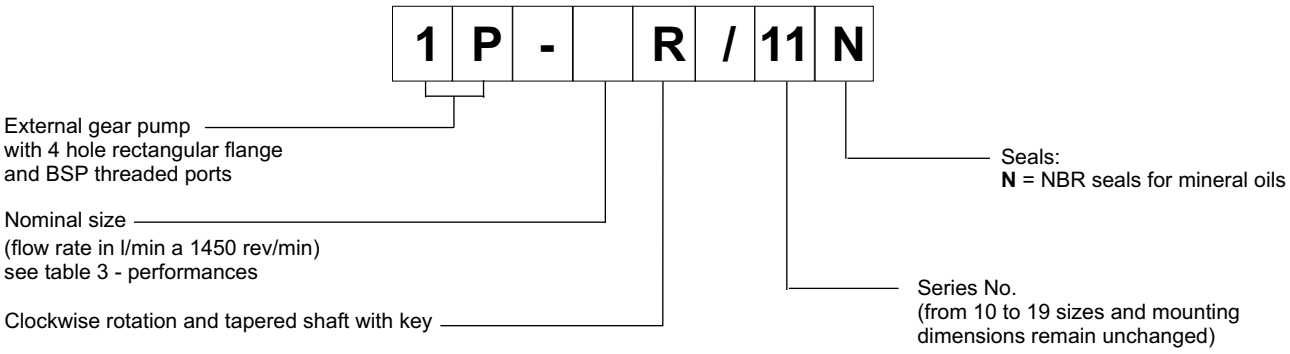
PUMP SIZE		1P
Displacement range	cm^3/rev	1,1 ÷ 8,0
Flow rate and operating pressures		see table 3 - Performances
Rotation speed		see table 3 - Performances
Rotation direction		clockwise (seen from the shaft side)
Loads on the shaft		radial and axial load are not allowed
Hydraulic connection		threaded ports BSP
Type of mounting		4 hole flange - rectangular type
Mass	kg	approx. 1,6

Ambient temperature range	°C	–20 / +50
Fluid temperature range	°C	–15 / +80
Fluid viscosity range	see par. 2.2	
Recommended viscosity	cSt	25 ÷ 100
Degree of fluid contamination	see par. 2.3	

HYDRAULIC SYMBOL



1 - IDENTIFICATION CODE



2 - HYDRAULIC FLUID

2.1 - Type of fluid

Use mineral oil based hydraulic fluids with anti-foam and antioxidant additives, in conformity with the requisites of the following standards:
- FZG test - 11th stage - DIN 51525 - VDMA 24317

For use with other types of fluid (water glycol, phosphate esters and others), consult our technical dept.

Operation with fluid at a temperature greater than 80°C causes a premature deterioration of the fluid quality and of the seals. The physical and chemical properties of the fluid must be maintained.

2.2 - Fluid viscosity

The operating fluid viscosity must be within the following range:

minimum viscosity	12 cSt	referred to the maximum fluid temperature of 80 °C
optimum viscosity	25 ÷ 100 cSt	referred to the operating temperature of the fluid in the tank
maximum viscosity	1600 cSt	limited to only the start-up phase of the pump

2.3 - 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, the use of a filter with $\beta_{10} \geq 100$ is recommended.

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 paragraph 6.

The suction filter must be equipped with a by-pass valve and, if possible, with a clogging indicator.

3 - PERFORMANCES

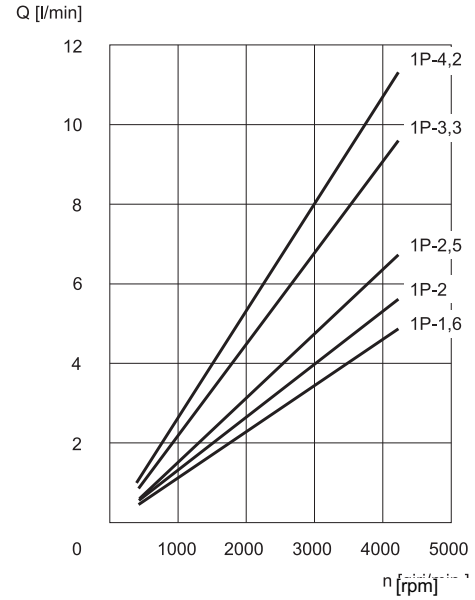
(values obtained with mineral oil with viscosity of 36 cSt at 50°C)

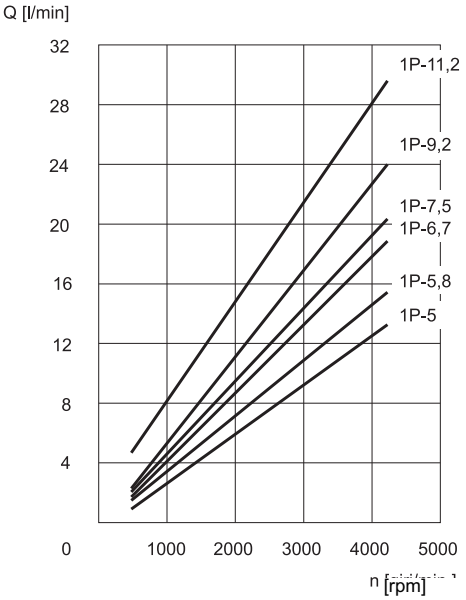
PUMP SIZE	NOMINAL SIZE	DISPLACEMENT [cm³/rev]	MAX. FLOW RATE (at 1500 rpm) [l/min.]	MAX. OPERATING PRESSURE (ar 1500 rpm) [bar]	MAX. PEAK PRESSURE (at 1500 rpm.) [bar]	MAX.ROTATION SPEED [rpm]	MIN.ROTATION SPEED [rpm]
1P	**1,6**	1,1	1,6	230	270	6000	1000
	2	1,3	2,0				
	2,5	1,6	2,4				
	3,3	2,1	3,2				
	4,2	2,7	4,0				800
	5	3,2	4,8	210	250	5000	
	5,8	3,7	5,6			4500	
	6,7	4,2	6,4			4000	
	7,5	4,8	7,2	190	230	3500	600
	9,2	5,8	8,7			3000	
	11,5	8,0	11,9	160	200	2100	

4 - CURVES AND CHARACTERISTIC DATA OF GROUP 1P PUMPS

(values obtained with mineral oil with viscosity of 36 cSt at 50°C)

4.1 - Flow rate curves Q = f (n) obtained with operating pressure 0 bar





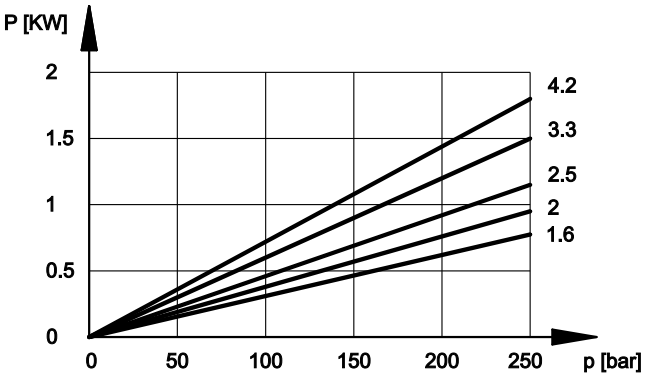
4.2 - Efficiencies

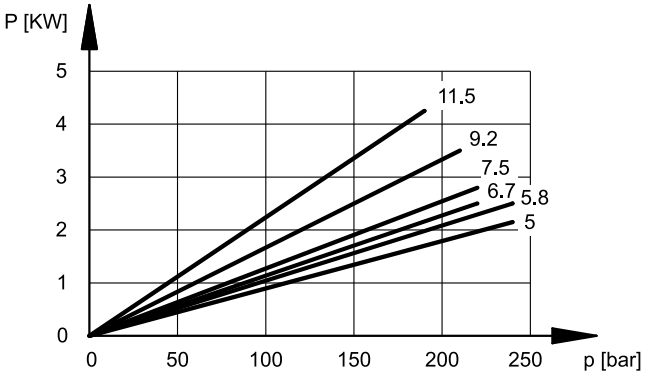
PUMP NOMINAL SIZE	VOLUMETRIC EFFICIENCY [%]	TOTAL EFFICIENCY [%]
1,6	0,96	0,85
2	0,94	0,87
2,5	0,94	0,87
3,3	0,96	0,90
4,2	0,96	0,90
5	0,96	0,90
5,8	0,96	0,89
6,7	0,97	0,92
7,5	0,97	0,93
9,2	0,95	0,89
11,5	0,94	0,89

4.3 - Noise level (at 1500 rpm)

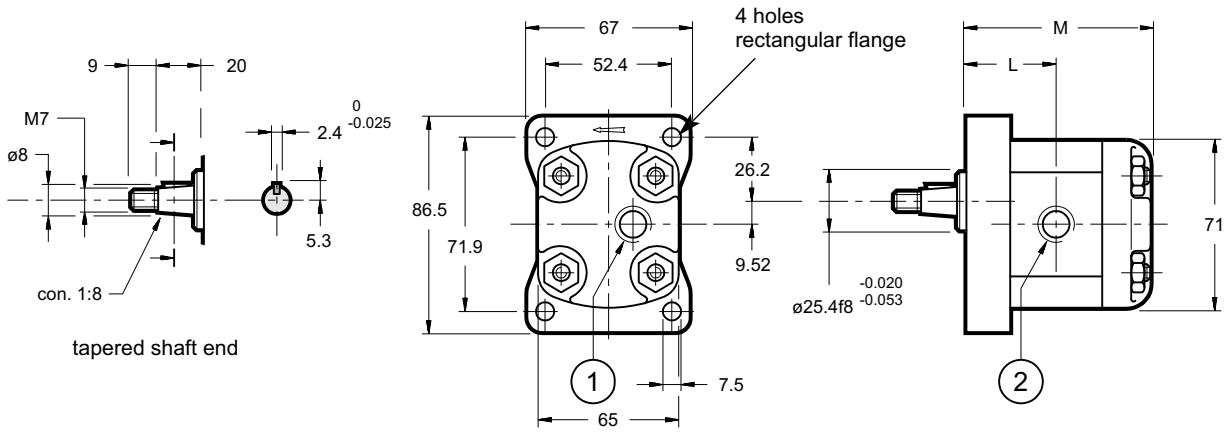
PUMP NOMINAL SIZE	NOISE LEVEL [dB (A)]
1,6	55
2	58
2,5	58
3,3	60
4,2	65
5	66
5,8	66
6,7	68
7,5	72
9,2	72
11,5	74

4.4 - Absorbed power / pressure (at 1500 rpm)





5 - OVERALL AND MOUNTING DIMENSIONS



dimensions in mm

Pump code	Pump nominal dimension	L	M	1	2
0710842	1P-1,6	34	75	suction port: 3/8" BSP clockwise rotation direction	delivery port: 3/8" BSP clockwise rotation direction
0710843	1P-2	34,5	76		
0710844	1P-2,5	35	77		
0710845	1P-3,3	36	79		
0710846	1P-4,2	37	81		
0710847	1P-5	38	83		
0710848	1P-5,8	39	85		
0710849	1P-6,7	40	87		
0710850	1P-7,5	41	89		
0710851	1P-9,2	43	93		
0710852	1P-11,5	47	101		

6 - INSTALLATION

- The 1P gear pumps can be installed with the shaft oriented in any position.
- Be sure the control rotation direction corresponds to the direction of the arrow marked on the pump before putting the pump into operation.
- It is necessary to vent the air from the delivery connection before operating it the first time.
- The pump start up, especially at a cold temperature, should occur with the pump unloading.
- The suction line must be suitably sized to facility the flow of the oil. Bends and restrictions or an excessive line length can impede correct operation of the pump. It is advisable that the speed of 1 ÷ 2 m/sec is not exceeded in the suction line.
- The minimum suction pressure allowed is -0,3 bar relative. The pumps can not function with suction pressure.
- The gear pumps must not operate with a rotation rating of less than the minimum rotation speed (see table 3 - performances). They must be filled with the same plant operation oil before installation. Filling is done through the connection lines. If necessary, rotate the pump manually.
- The motor-pump connection must be carried out directly with a flexible coupling able to compensate any offsets. Couplings that generate axial or radial loads on the pump shaft are not allowed.

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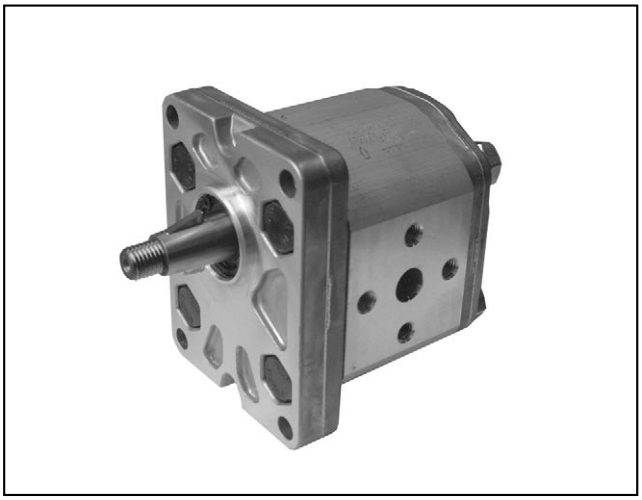
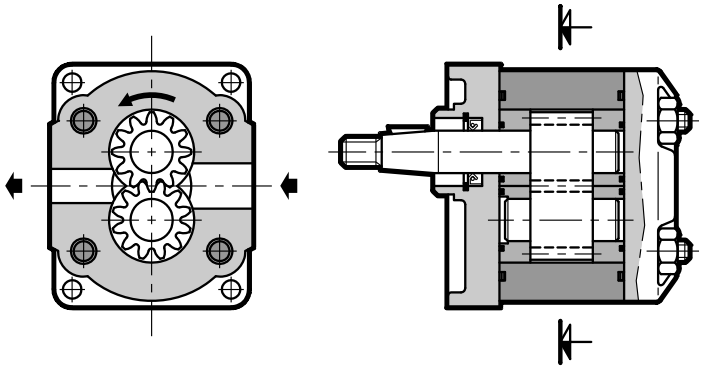


GP
EXTERNAL GEAR PUMPS
SERIES 20

OPERATING PRINCIPLE



— The GP pumps are fixed displacement external gear pumps with axial clearance compensation.

— They give high volumetric efficiency even with high operating pressures, a low noise level, and they have a high endurance thanks to the balancing system of the loads on the guide bushings.

— They are divided into three size groups, with displacements of up to 9.1 - 27.9 and 87.6 cm^3/rev respectively, and with operating pressures of up to 250 bar (standard) and up to 310 bar (H version for high pressure).

— They are available with clockwise, anticlockwise and reversible rotation, with tapered shaft (standard). Other kind of shaft are available upon request.

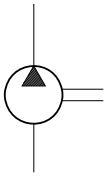
— They are available in multiple versions, and can be combined in multi-flow groups, with a splined connection motion system that guarantees high power performances.

TECHNICAL SPECIFICATIONS

GP PUMP SIZE		GP1	GP2	GP3
Displacement range	cm^3/rev	1.3 ÷ 9.1	7 ÷ 27.9	20.7 ÷ 87.6
Flow rate and operating pressures		see table 3 - Performances		
Rotation speed		see table 3 - Performances		
Rotation direction		clockwise, anticlockwise or reversible (seen from the shaft side)		
Loads on the shaft		radial and axial load are not allowed		
Max torque applicable to the shaft		see paragraph 14.1		
Hydraulic connection		flanged fittings (see paragraph 16)		
Type of mounting		4-holes flange - rectangular type		
Mass: standard version H version	kg	1.2 ÷ 1.6 1.9 ÷ 2.3	2.6 ÷ 3.5 3.8 ÷ 4.7	6 ÷ 8.5 8.7 ÷ 11.2

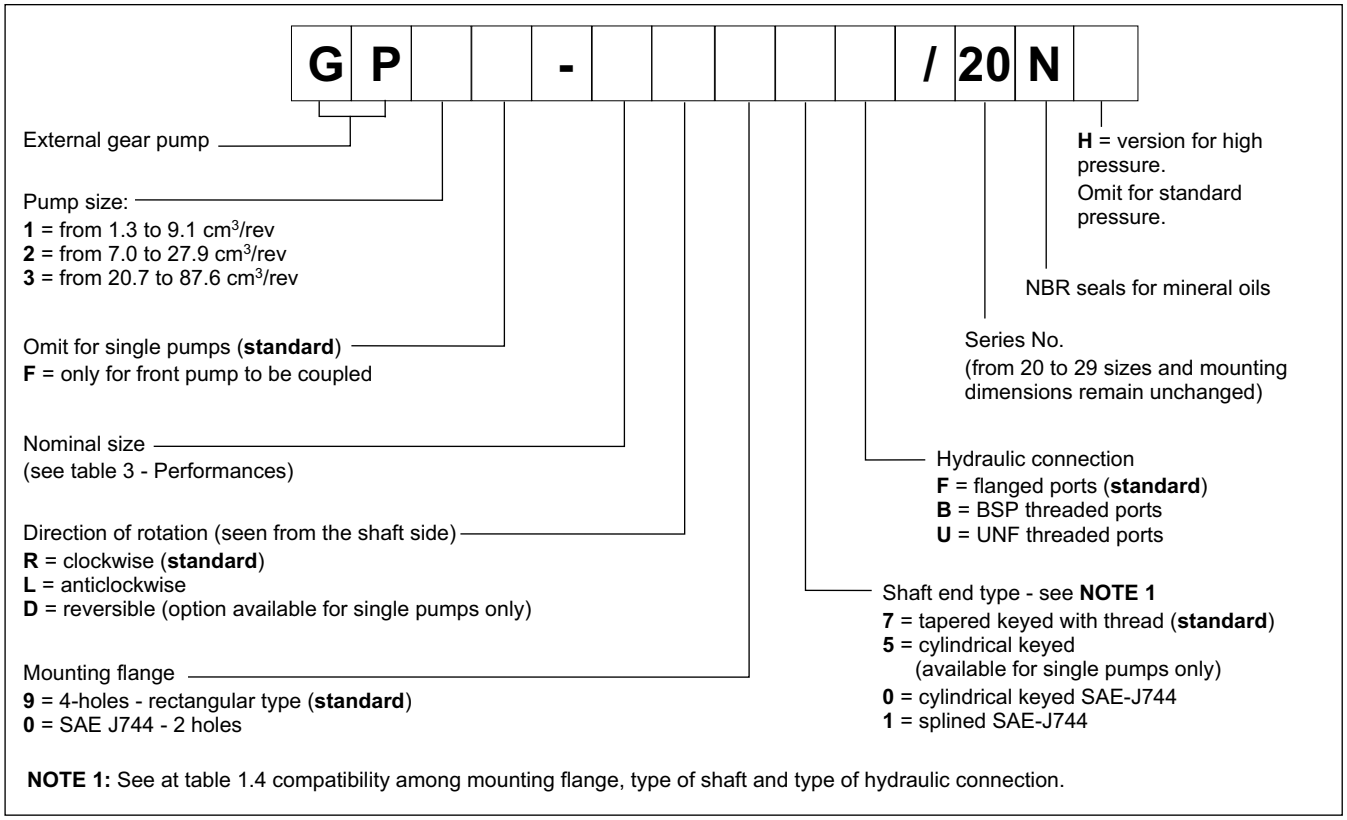
Ambient temperature range	°C	-20 / +50
Fluid temperature range	°C	-15 / +80
Fluid viscosity range	see paragraph 2.2	
Fluid contamination degree	see paragraph 2.3	
Recommended viscosity	cSt	25 ÷ 100

HYDRAULIC SYMBOL



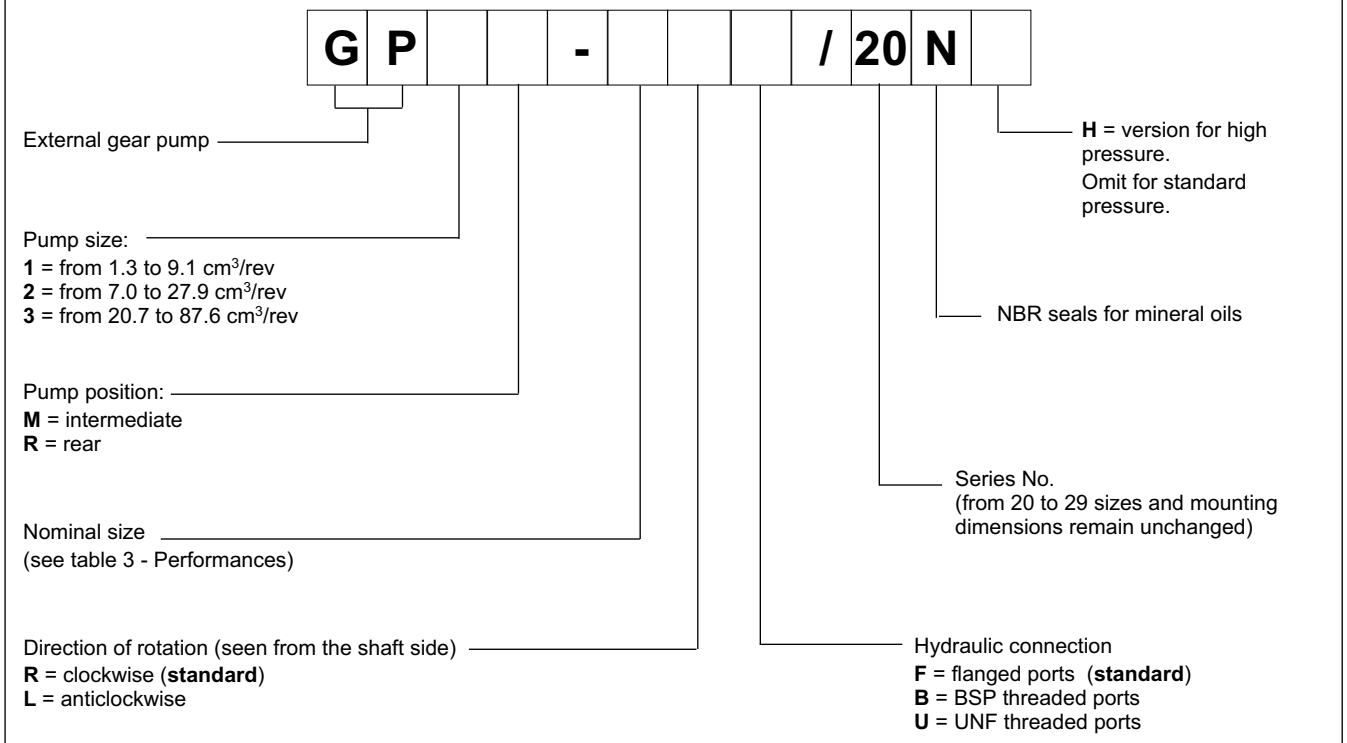
1 - IDENTIFICATION CODE

1.1 - Identification code for single and front pumps



NOTE 1: See at table 1.4 compatibility among mounting flange, type of shaft and type of hydraulic connection.

1.2 - Identification code for intermediate and rear pumps



NOTE 2: Front, intermediate and rear pumps for multiple groups are supplied without mating joint, which must be ordered separately (see paragraph 1.5). To order a group of one or more pumps completely assembled see paragraph 1.3.

1.3 - Identification code for multiple pumps

identification code front pump	+	identification code intermediate pump (omit for double pumps)	+	identification code rear pump

1.4 - Compatibility among mounting flange, type of shaft and type of hydraulic connection

FLANGE CODE	SHAFT CODE				HYDRAULIC CONNECTION CODE		
	7	5	0	1	F	B	U
9	yes	yes	no	no	yes	yes	no
0	no	no	yes	yes	yes	no	yes

1.5 - Identification code for mating joints

FIRST PUMP	SECOND PUMP		
	GP1	GP2	GP3
GP1	3101100003	-	-
GP2	3101100004	3101100005	-
GP3	3101100006	3101100007	3101100008

1.6 - Examples

a) single pump size 1 - 1.3 cm^3/rev - anticlockwise rotation - standard flange and shaft
GP1-0013L97F/20N

b) single pump size 2 - 14 cm^3/rev - clockwise rotation - standard flange and shaft
GP2-0140R97F/20N

c) single pump size 3 - 22.5 cm^3/rev - clockwise rotation - SAE flange and shaft
GP3-0225R01F/20N

d) double pump made of:
- pump size 2 - 7 cm^3/rev -clockwise rotation
- pump size 1 - 2 cm^3/rev - high pressure

GP2F-0070R97F/20N + GP1R-0020RF/20NH

e) triple pump made of:
- pump size 3 - 22.5 cm^3/rev
- pump size 2 - 14 cm^3/rev
- pump size 1 - 2 cm^3/rev

GP3F-0225R97F/20N + GP2M-0140RF/20N + GP1R-0020RF/20N

2 - HYDRAULIC FLUID

2.1 Type of fluid

Use mineral oil based hydraulic fluids with anti-foam and antioxidant additives, in conformity with the requisites of the following standards:
- FZG test - 11th stage
- DIN 51525
- VDMA 24317

For use with other types of fluid (water glycol, phosphate esters and others), consult our technical dept. Operation with fluid at a temperature greater than 80°C causes a premature deterioration of the fluid quality and of the seals. The physical and chemical properties of the fluid must be maintained.

2.2 - Fluid viscosity

The operating fluid viscosity must be within the following range:

minimum viscosity	12 cSt	referred to the maximum fluid temperature of 80 °C
optimum viscosity	25 ÷ 100 cSt	referred to the operating temperature of the fluid in the tank
maximum viscosity	1600 cSt	limited to only the start-up phase of the pump

2.3 - 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, use of a filter with $\beta_{10} \geq 100$ is recommended.

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 paragraph 13.

The suction filter must be equipped with a by-pass valve and, if possible, with a clogging indicator.

3 - PERFORMANCE RATINGS

(values obtained with mineral oil with viscosity of 36 cSt at 50°C)

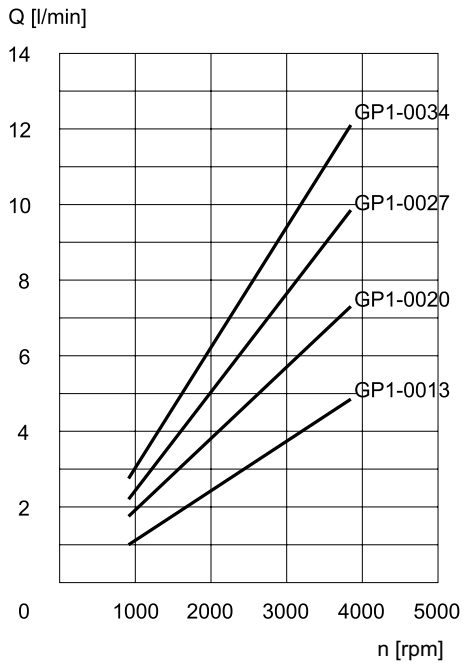
Values in brackets refer to the version **H,** for high pressure. The max pressure values for reversible high pressure pumps (rotation type **D**) must be reduced by 15%.

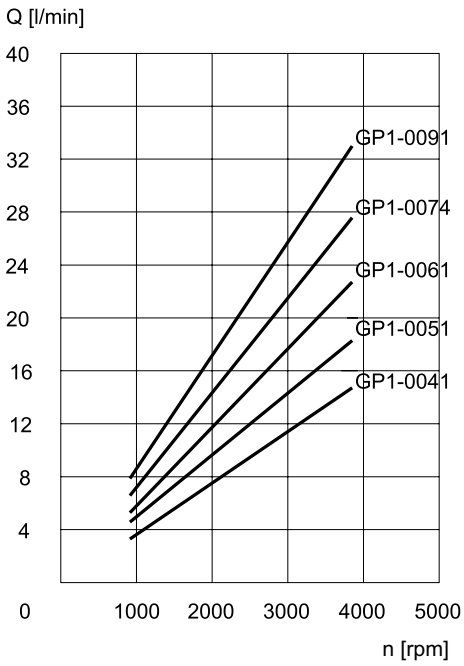
PUMP SIZE	**NOMINAL SIZE**	**DISPLACEMENT** [cm^3/rev]	**MAX FLOW RATE** at 1500 rpm [l/min]	**MAX PRESSURE** at 1500 rpm [bar]		**SPEED** [rpm]		
				continuous operating	**peak**	**max** flange = **9**	**max** flange = **0**	**min**
GP1	**0013**	1.3	2.0	250 (270)	290 (310)	6000	6000	800
	0020	2.0	3.0					
	0027	2.7	4.0			5000	5000	
	0034	3.4	5.1					
	0041	4.1	6.1			4000	4000	
	0051	5.1	7.6	230 (260)	260 (290)	4000	3500	
	0061	6.1	9.1			3800	3000	
	0074	7.4	11.1	200 (230)	230 (290)	3200	3500	600
	0091	9.1	13.6	180 (210)	210 (240)	2600	3000	
GP2	**0070**	7.0	10.5	250 (280)	290 (310)	4000	4000	600
	0095	9.5	14.2			3000		
	0113	11.3	16.9	230 (280)	270 (310)	4000	4000	
	0140	14.0	21.0	230 (260)	270 (300)		3200	
	0158	15.8	23.7	210 (260)	240 (290)		3800	500
	0178	17.8	26.7			3600	2500	
	0208	20.8	31.2	180 (230)	210 (260)	3200	2200	
	0234	23.4	35.1			3000	2000	
	0279	27.9	41.8	170 (200)	200 (230)	2500	1800	
GP3	**0207**	20.7	31.0	230 (280)	270 (310)	3500	3500	500
	0225	22.5	33.7					
	0264	26.4	39.6			3000	3300	
	0337	33.7	50.5	230 (270)	270 (300)			
	0394	39.4	59.1	220 (260)	260 (290)		3000	
	0427	42.7	64.0	210 (250)	250 (280)	2800	2800	400
	0514	51.4	77.1	200 (230)	240 (260)	2400	2500	
	0600	60.0	90.0	190 (210)	220 (240)	2800	2800	
	0696	69.6	104.4	170 (200)	200 (230)	2500	2500	
	0776	77.6	116.4	160 (180)	190 (210)	2300	2300	
	0876	87.6	131.4	140 (160)	170 (190)	2000	2000	

4 - CURVES AND CHARACTERISTIC DATA OF GROUP GP1 PUMPS

(values obtained with mineral oil with viscosity of 36 cSt at 50°C)

4.1 - Flow rate curves Q = f (n) obtained with operating pressure 0 bar





4.2 - Efficiencies

PUMP NOMINAL SIZE	VOLUMETRIC EFFICIENCY [%]	TOTAL EFFICIENCY [%]
0013	0.90	0.82
0020	0.90	0.85
0027	0.95	0.90
0034	0.91	0.87
0041	0.94	0.90
0051	0.96	0.92
0061	0.96	0.92
0074	0.96	0.90
0091	0.96	0.88

The volumetric and total efficiencies for the various nominal dimensions of the Group GP1 pumps, measured at 1500 rpm and with 150 bar operating pressure, are shown in the table.

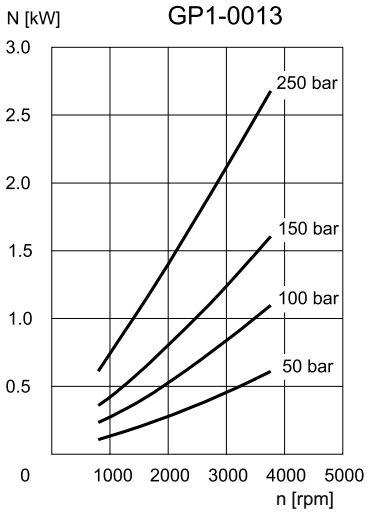
The total efficiency considers the volumetric efficiency and the mechanical efficiency of the pump in the specified operating conditions.

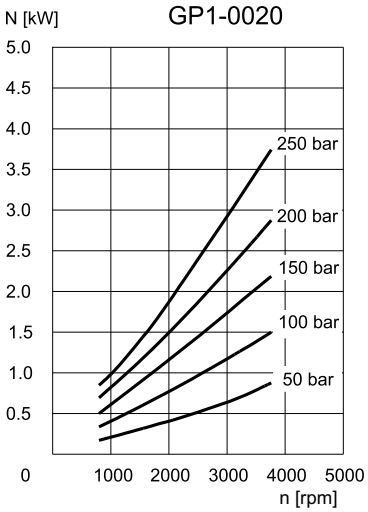
4.3 - Noise level

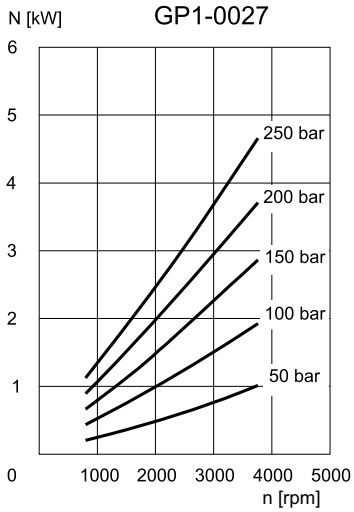
PUMP NOMINAL SIZE	NOISE LEVEL [dB (A)]
0013	65
0020	66
0027	68
0034	68
0041	70
0051	73
0061	73
0074	73
0091	77

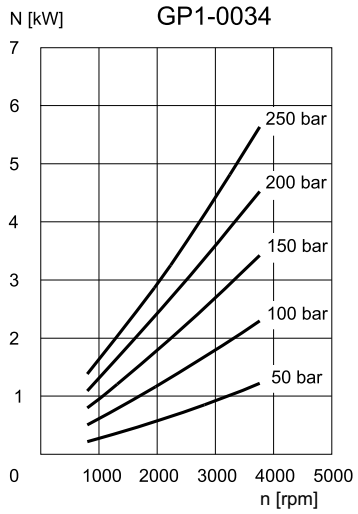
The noise levels for the various nominal dimensions of the Group GP1 pumps, measured at 1500 rpm, with 150 bar operating pressure and measured at a distance of 1 metre from the pump, are shown in the table.

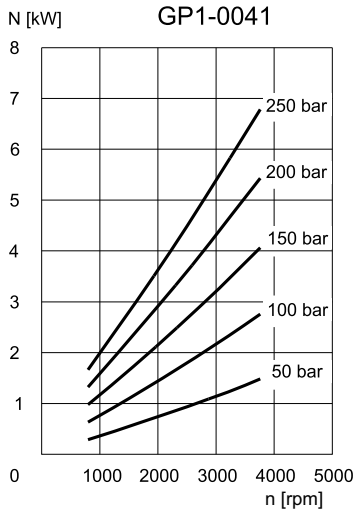
4.4 - Absorbed power curves N = f(n), obtained with operating pressures from 50 to 250 bar

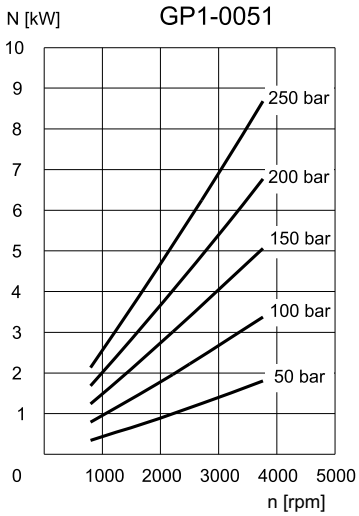


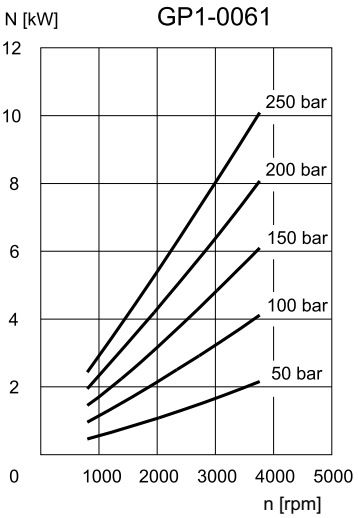


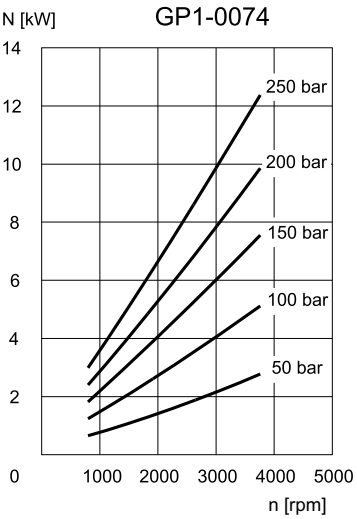


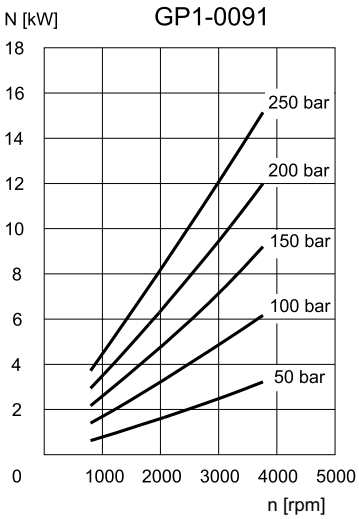








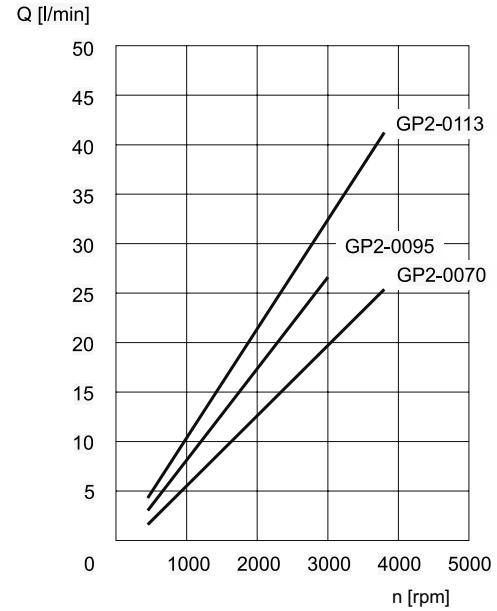


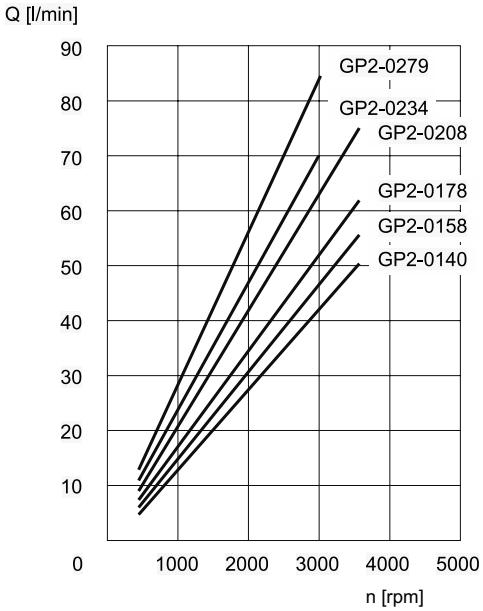


5 - CURVES AND CHARACTERISTIC DATA OF GROUP GP2 PUMPS

(values obtained with mineral oil with viscosity of 36 cSt at 50°C)

5.1 - Flow rate curves Q = f(n) obtained with operating pressure 0 bar





5.2 - Efficiencies

PUMP NOMINAL SIZE	VOLUMETRIC EFFICIENCY [%]	TOTAL EFFICIENCY [%]
0070	0.92	0.87
0095	0.95	0.88
0113	0.95	0.87
0140	0.93	0.87
0158	0.95	0.86
0178	0.93	0.85
0208	0.93	0.88
0234	0.97	0.89
0279	0.94	0.85

The volumetric and total efficiencies for the various nominal dimensions of the Group GP2 pumps, measured at 1500 rpm and with 150 bar operating pressure, are shown in the table.

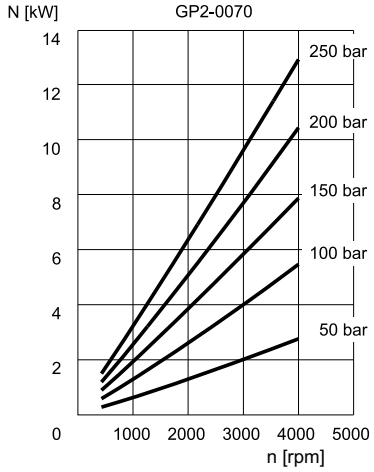
The total efficiency considers the volumetric efficiency and the mechanical efficiency of the pump in the specified operating conditions.

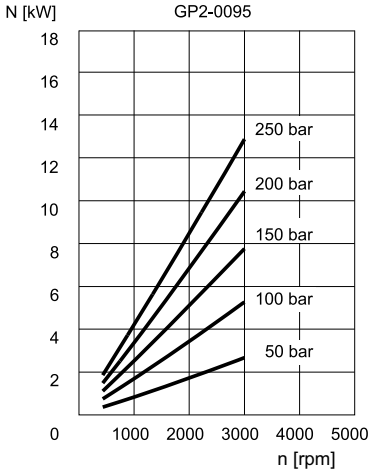
5.3 - Noise level

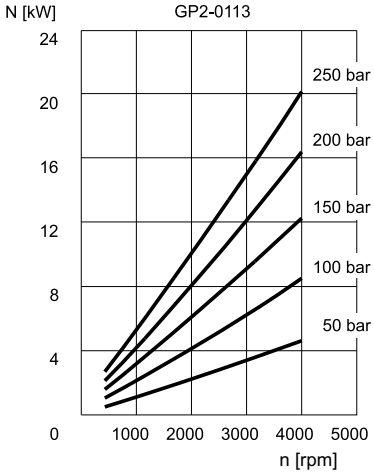
PUMP NOMINAL SIZE	NOISE LEVEL [dB (A)]
0070	75
0095	77
0113	77
0140	72
0158	72
0178	73
0208	74
0234	76
0279	76

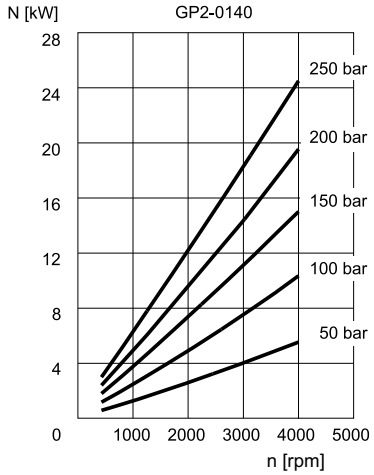
The noise levels for the various nominal dimensions of the Group GP2 pumps, measured at 1500 rpm, with 150 bar operating pressure and measured at a distance of 1 metre from the pump, are shown in the table.

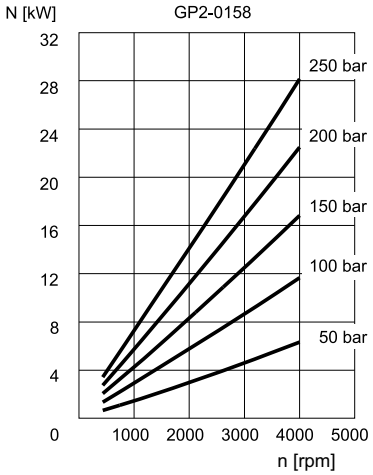
5.4 - Absorbed power curves N = f(n), measured with operating pressures from 50 to 250 bar

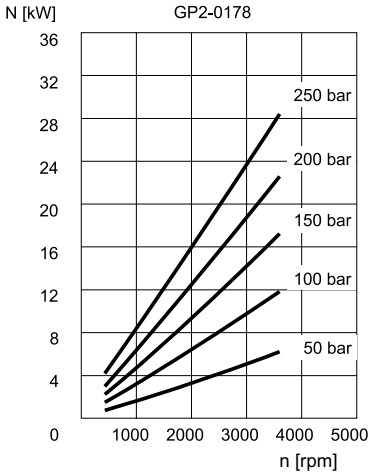


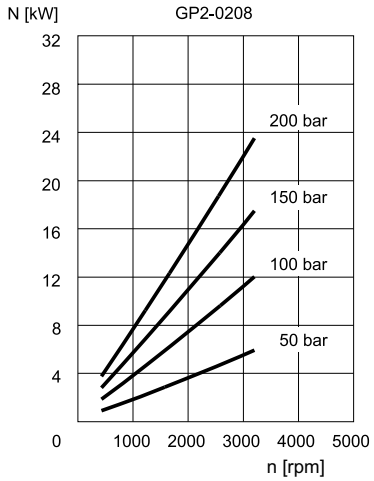


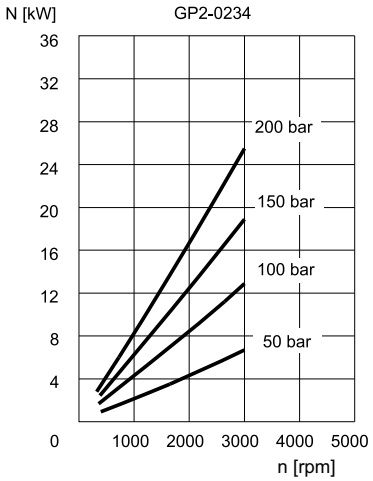


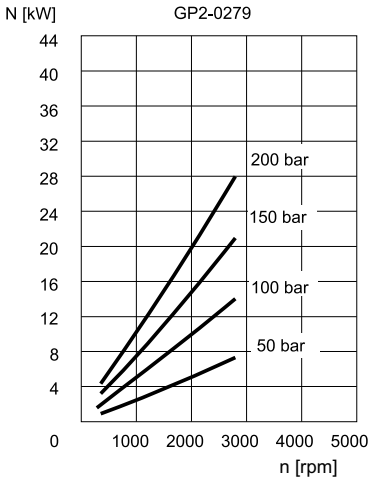








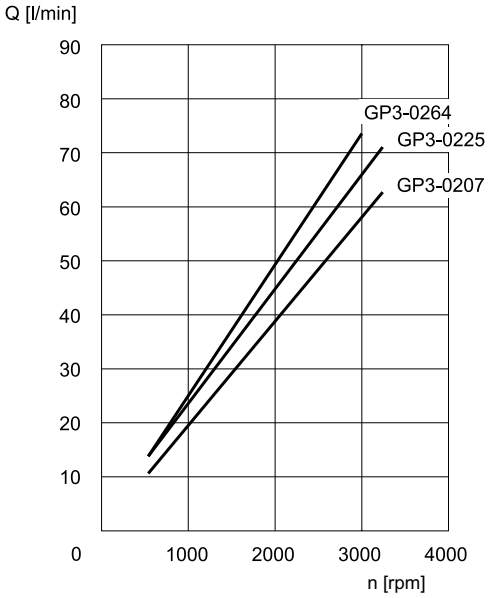


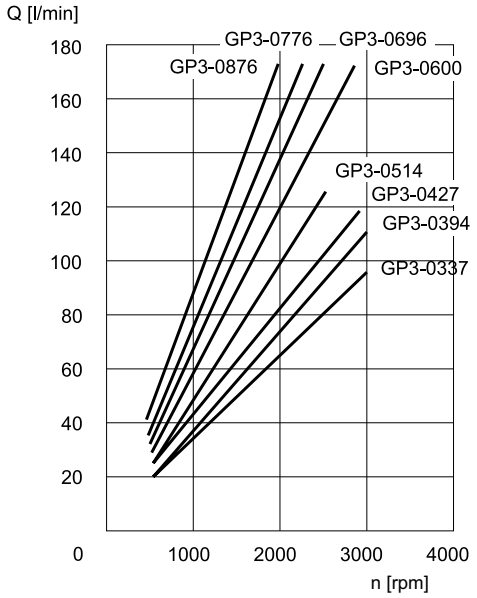


6 - CURVES AND CHARACTERISTIC DATA OF GROUP GP3 PUMPS

(values obtained with mineral oil with viscosity of 36 cSt at 50°C)

6.1 - Flow rate curves Q = f(n) obtained with operating pressure 0 bar





6.2 - Efficiencies

PUMP NOMINAL SIZE	VOLUMETRIC EFFICIENCY [%]	TOTAL EFFICIENCY [%]
0207	0.88	0.83
0225	0.97	0.92
0264	0.90	0.84
0337	0.92	0.87
0394	0.91	0.86
0427	0.92	0.82
0514	0.93	0.83
0600	0.85	0.82
0696	0.95	0.90
0776	0.93	0.87
0876	0.89	0.84

The volumetric and total efficiencies for the various nominal dimensions of the Group GP3 pumps, measured at 1500 rpm and with 150 bar operating pressure, are shown in the table.

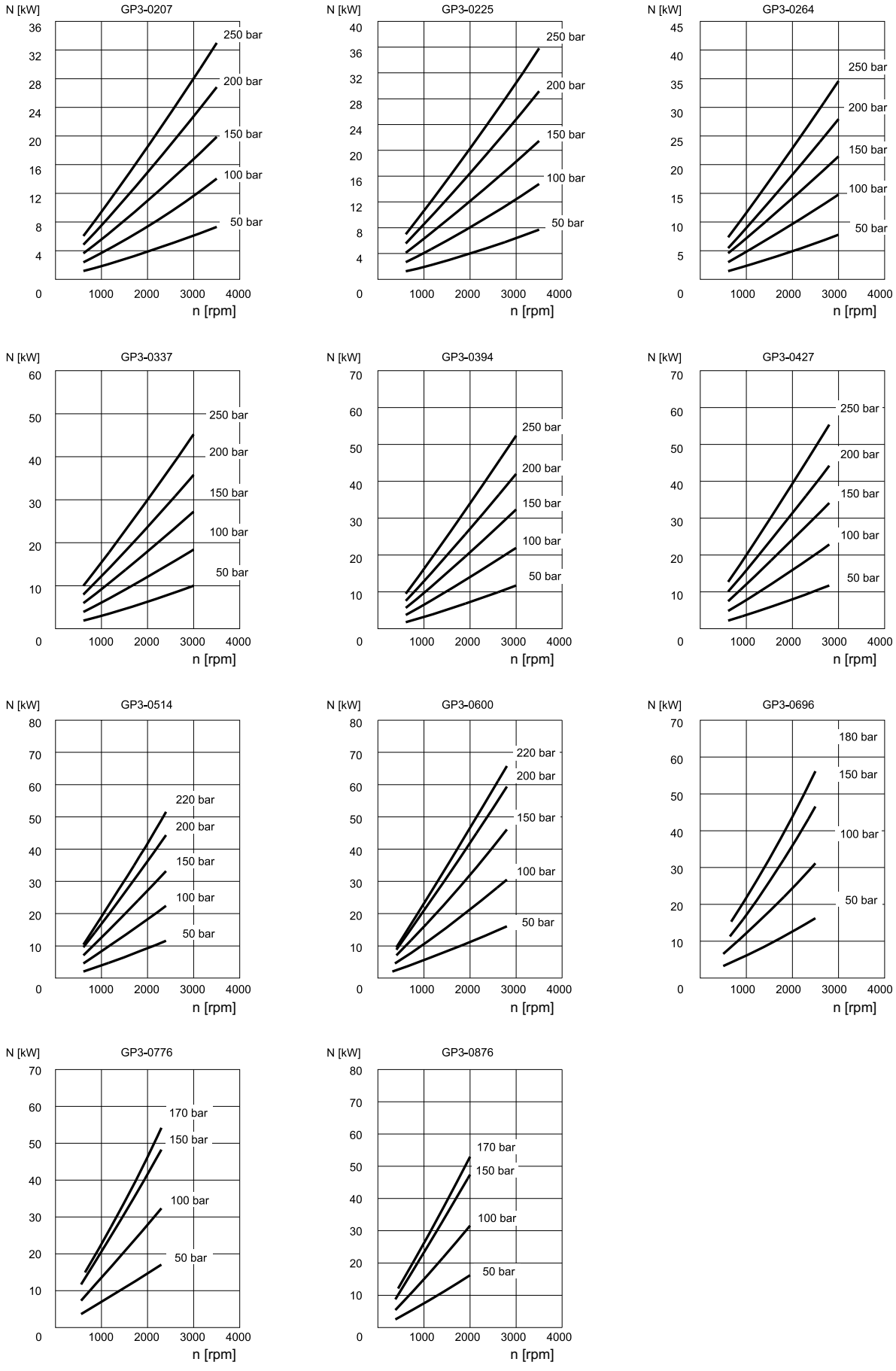
The total efficiency considers the volumetric efficiency and the mechanical efficiency of the pump in the specified operating conditions.

6.3 - Noise level

PUMP NOMINAL SIZE	NOISE LEVEL [dB (A)]
0207	75
0225	75
0264	76
0337	72
0394	72
0427	73
0514	75
0600	77
0696	77
0776	76
0876	78

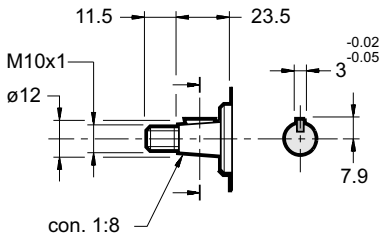
The noise levels for the various nominal dimensions of the Group GP3 pumps, measured at 1500 rpm, with 150 bar operating pressure and measured at a distance of 1 metre from the pump, are shown in the table.

6.4 - Absorbed power curves N = f(n), obtained with operating pressures from 50 to 250 bar

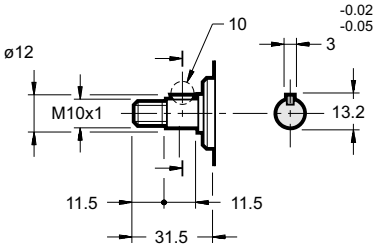


7 - GP1 PUMPS WITH STANDARD FLANGE - OVERALL AND MOUNTING DIMENSIONS

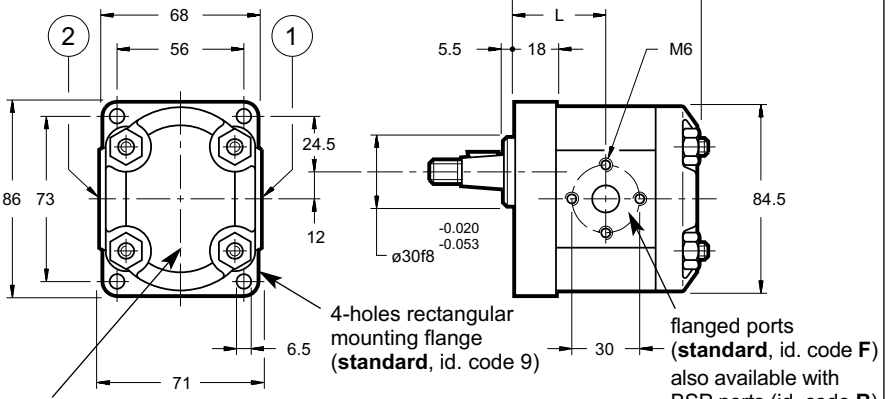
dimensions in mm



tapered shaft end with thread
(**standard**, id. code **7**)



cylindrical keyed shaft end with thread
(id. code **5**)

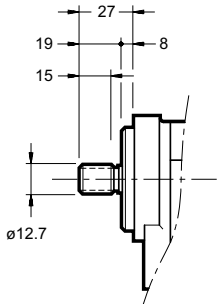


Pump nominal dimension	L	M	**1** suction port (clockwise rotation)		**2** delivery port (clockwise rotation)	
			flange	BSP	flange	BSP
0013	40	80.5	Ø13	1/2"	Ø13	3/8"
0020	41	82.5				
0027	42	84.5				
0034	43	86.5				
0041	44	88.5				1/2"
0051	45.5	91.5				
0061	47	94.5				
0074	49	98.5				
0091	51.5	103.5				

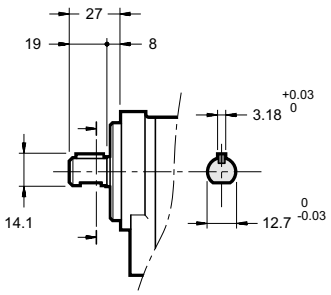
NOTE:
1. Ports (1) and (2) are reversed on pumps with anticlockwise rotation
2. On reversible pumps the delivery port has the same size of the suction

8 - GP1 PUMPS WITH SAE FLANGE - OVERALL AND MOUNTING DIMENSIONS

splined SAE A-A
20/40 d.p. - 9T
(**standard**, id. code **1**)

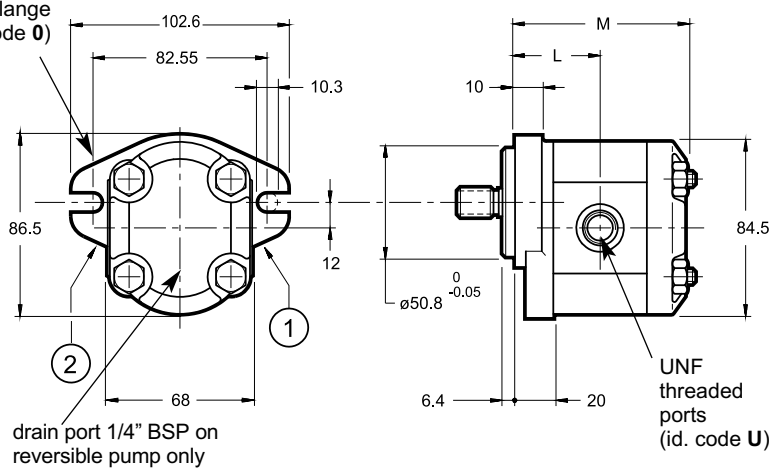


cylindrical keyed SAE A-A
(id. code **0**)



dimensions in mm

SAE A-A
2-holes flange
(id. code **0**)



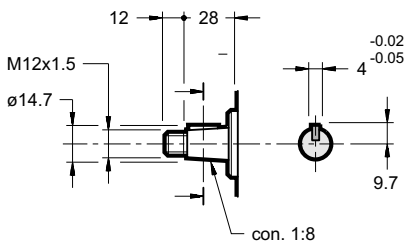
Pump nominal dimension	L	M	**1** suction port (clockwise rotation)		**2** delivery port (clockwise rotation)	
			flange	UNF	flange	UNF
0013	42	82.5	Ø13	3/4-16	Ø13	9/16-18
0020	43	84.5				
0027	44	86.5				
0034	45	88.5				
0041	46	90.5				
0051	47.5	93.5				
0061	49	69.5				
0074	51	100.5		7/8-14		3/4-16
0091	53.5	105.5				

NOTE:
1. Ports (1) and (2) are reversed on pumps with anticlockwise rotation
2. On reversible pumps the delivery port has the same size of the suction

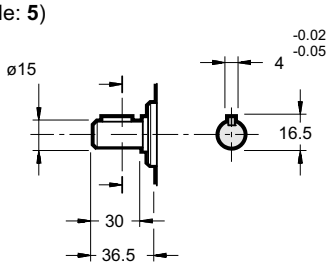
9 - GP2 PUMPS WITH STANDARD FLANGE - OVERALL AND MOUNTING DIMENSIONS

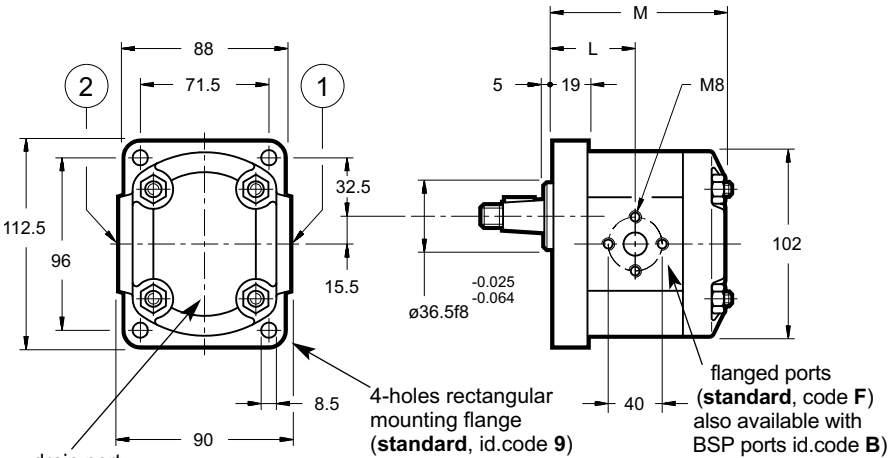
dimensions in mm

tapered shaft end with thread
(**standard**, id. code **7**)



cylindrical keyed shaft end
(id code: **5**)





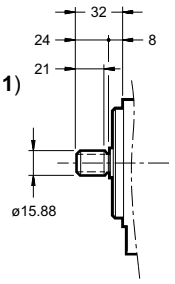
Pump nominal dimension	L	M	1 suction port (clockwise rotation)		**2** delivery port (clockwise rotation)	
			flange	BSP	flange	BSP
0070	47.5	97.5	Ø13	1/2"	Ø13	1/2"
0095	49.5	101.5				
0113	51	104.5	Ø19	3/4"		
0140	53	108.5				
0158	54.5	111.5				
0178	56	114.5				
0218	58.5	119.5			Ø19	
0234	60.5	123.5				
0279	64	130.5				

NOTE:
1. Ports (1) and (2) are reversed on pumps with anticlockwise rotation
2. On reversible pumps the delivery port has the same size of the suction port

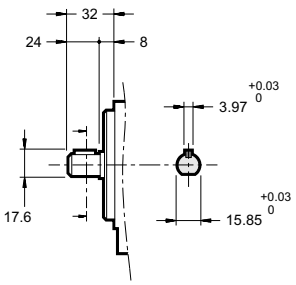
10 - GP2 PUMPS WITH SAE FLANGE - OVERALL AND MOUNTING DIMENSIONS

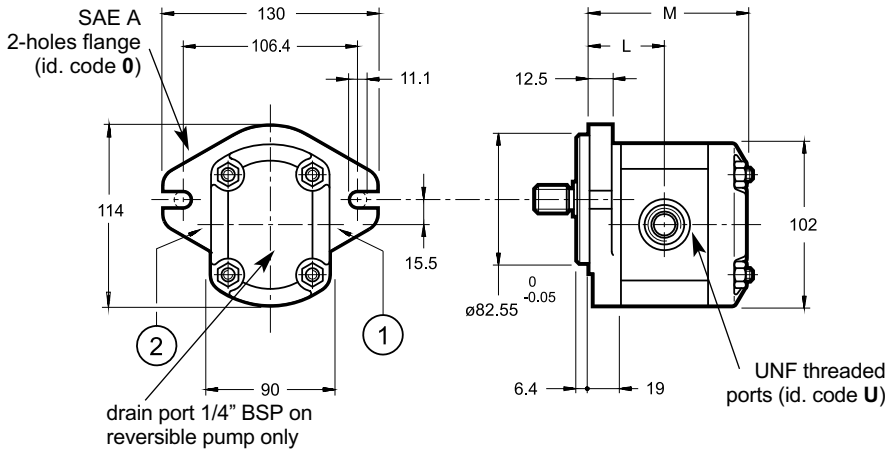
dimensions in mm

splined SAE A
16/32 d.p. - 9T
(**standard**, id. code **1**)



cylindrical keyed
SAE A
(id. code **0**)



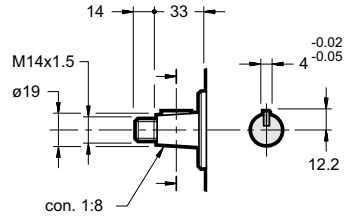


Pump nominal dimension	L	M	1 suction port (clockwise rotation)		**2** delivery port (clockwise rotation)	
			flange	UNF	flange	UNF
0070	47.5	97.5	Ø13	1 1/16-12	Ø13	7/8-14
0095	49.5	101.5				
0113	51	104.5	Ø19			
0140	53	108.5				
0158	54.5	111.5				
0178	56	114.5				
0218	58.5	119.5			Ø19	
0234	60.5	123.5				
0279	64	130.5				

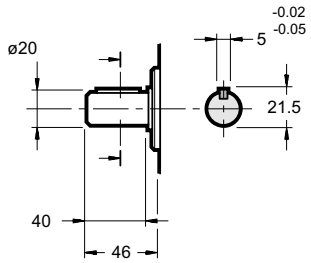
NOTE:
1. Ports (1) and (2) are reversed on pumps with anticlockwise rotation
2. On reversible pumps the delivery port has the same size of the suction port

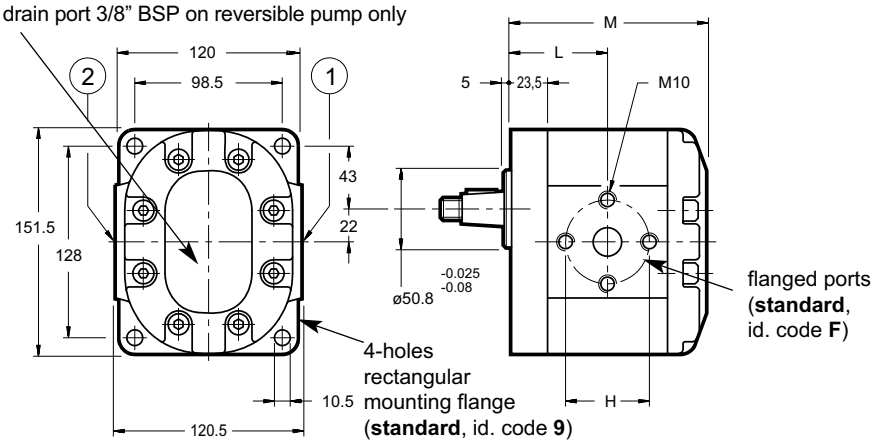
11 - GP3 PUMPS WITH STANDARD FLANGE - OVERALL AND MOUNTING DIMENSIONS

tapered shaft end with thread
(**standard**, id. code **7**)



cylindrical keyed shaft end
(id code: **5**)





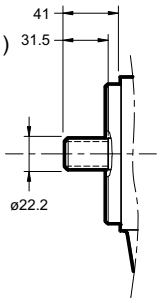
NOTE:
1. Ports (1) and (2) are reversed on pumps with anticlockwise rotation
2. On reversible pumps the delivery port has the same size of the suction port
3. Values marked with * refer to the suction port only, whereas the value for delivery port is 51 mm

dimensions in mm

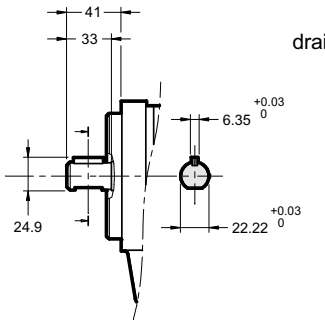
Pump nominal dimension	L	M	H	**1** suction port (clockwise rotation)		**2** delivery port (clockwise rotation)	
				flange	BSP	flange	BSP
0207	64	129.5	56	Ø27	3/4"	Ø19	3/4"
0225	64.5	130.5	56				
0264	66	133.5	56		1"		
0337	68.5	138.5	56				
0394	70.5	142.5	56				
0427	72	145.5	51		1 1/4"	Ø27	1"
0514	75	151.5	62*				
0600	78	157.5	62*	Ø33			
0696	81.5	164.5	62*		1 1/2"		1 1/4"
0776	84	169.5	62*				
0879	87	175.5	62*				

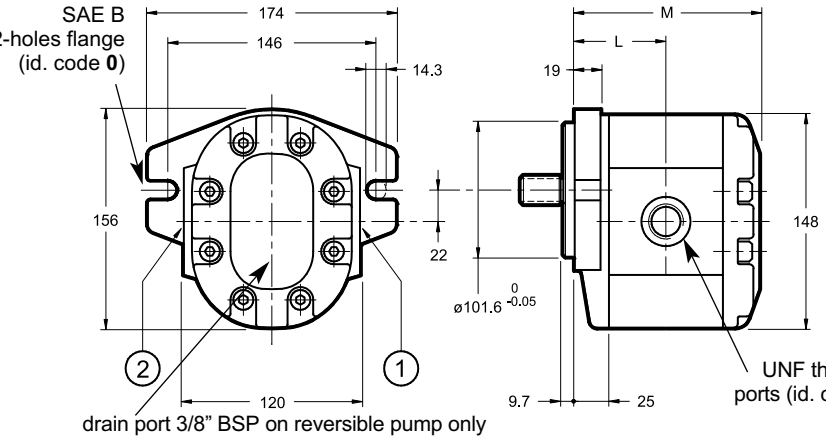
12 - GP3 PUMPS WITH SAE FLANGE - OVERALL AND MOUNTING DIMENSIONS

splined SAE B
16/32 d.p. - 13T
(**standard**, id. code **1**)



cylindrical keyed
SAE B
(id. code **0**)





NOTE:
1. Ports (1) and (2) are reversed on pumps with anticlockwise rotation
2. On reversible pumps the delivery port has the same size of the suction
3. Values marked with * refer to the suction port only, whereas the value for delivery port is 51 mm

dimensions in mm

Pump nominal dimension	L	M	H	**1** suction port (clockwise rotation)		**2** delivery port (clockwise rotation)	
				flange	UNF	flange	UNF
0207	65	130.5	56	Ø27	1 5/16-12	Ø19	1 1/16-12
0225	65.5	131.5	56				
0264	67	134.5	56				
0337	69.5	139.5	56				
0394	71.5	143.5	56		1 5/8-12		
0427	73	146.5	51			Ø27	
0514	76	152.5	62*				
0600	79	158.5	62*	Ø33	1 7/8-12		1 5/16-12
0696	82.5	165.5	62*				
0776	85	170.5	62*				
0879	88	176.5	62*				

13 - INSTALLATION

– The GP gear pumps can be installed with shaft oriented in any position.

– Check that the rotation direction of the motor corresponds to the direction of the arrow marked on the pump before commissioning.

– Before the first start up vent the air from the delivery port.

– The pump start up, especially at a cold temperature, should occur with the pump unloading.

– The suction pipe must be suitably sized to facilitate the passage of the fluid. Bends and restrictions or an excessive length of the pipeline can affect the correct operation of the pump. It is advisable not to exceed the speed of 1 ÷ 2 m/sec in suction hose.

– The minimum permissible suction pressure is -0.3 bar relative. Standard pumps cannot work with pressure at suction port, excerpt reversible pumps, which are able to withstand pressurized inlet

– Gear pumps must not operate with a rotation speed lower than the minimum rotation speed indicated in table 3 - performance. **The pumps must be filled with the same operating fluid as the circuit before being installed.** Filling can be done through the ports connections. Rotate the pump manually if needed.

– The motor-pump connection must be carried out directly with a flexible coupling able to compensate any offsets. Couplings that generate axial or radial loads on the pump shaft are not allowed.

– The drain port of the reversible pumps must always be connected to the tank. Maximum permitted pressure rise is 6 bar

14 - MULTIPLE PUMPS

It's possible to create multi-flow groups with independent hydraulic circuits coupling several pumps together. While sizing multiple pumps the following conditions must be taken into account:

– Assembly can take place between pumps of the same group, or in decreasing order of size.

– The max. rotation speed is determined by the pump with the lowest speed.

– The values of the max. applicable torque can not be exceeded.

14.1 - Maximum applicable torque

The input torque (M) is given for each pump by the following ratio:

$$M = \frac{9550 \cdot N}{n} = [Nm]$$

n = rotation speed [rpm]

where the absorbed power (N) is given by:

$$N = \frac{Q \cdot \Delta p}{600 \cdot \eta\,tot} = [kW]$$

Q = flow rate [l/min]

Δp = differential pressure between the pump suction and delivery [bar]

η_{tot} = total efficiency (see diagrams in par. 4.2 - 5.2 - 6.2).

or it can be obtained from the diagrams ABSORBED POWER (see paragraphs 4.4 - 5.4 - 6.4).

If several pumps are coupled, the torque of each single pump has to be added to the torque of subsequent pumps when they are loaded simultaneously.

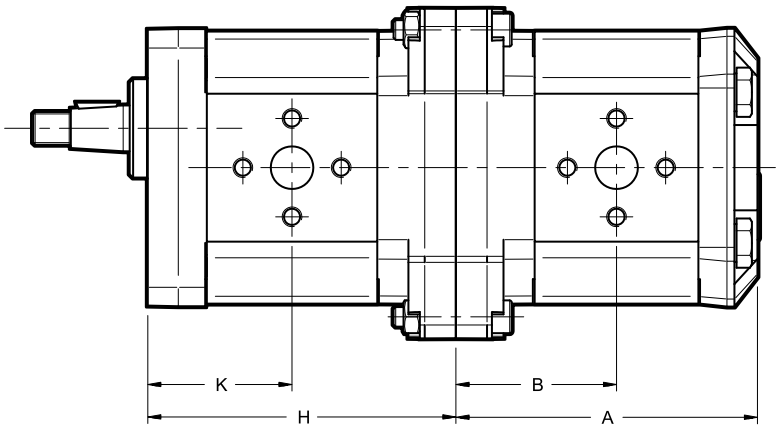
The obtained torque value for each pump has to be lower than the value specified in the table below.

If the obtained torque values are higher than those stated in the table, reduce the working pressure value or replace the overloaded pump with a pump suitable to bear the required torque.

	MAX APPLICABLE TORQUE [Nm]					
	Front pump shaft type			Intermediate / rear pump		
front pump size	tapered, keyed code **7**	SAE J744 splined code **1**	SAE J744 cylindrical keyed code **0**	**GP1**	**GP2**	**GP3**
GP1	90	55	55	50	-	-
GP2	145	110	105		110	-
GP3	280	405	295			230

15 - MULTIPLE PUMPS OVERALL DIMENSIONS

Dimensions below are concerning to standard pumps (clockwise rotation, rectangular flange, tapered keyed with thread shaft end and flanged ports). Please consult our Technical Dept. for different configurations and for overall dimensions of groups composed by three or more pumps.



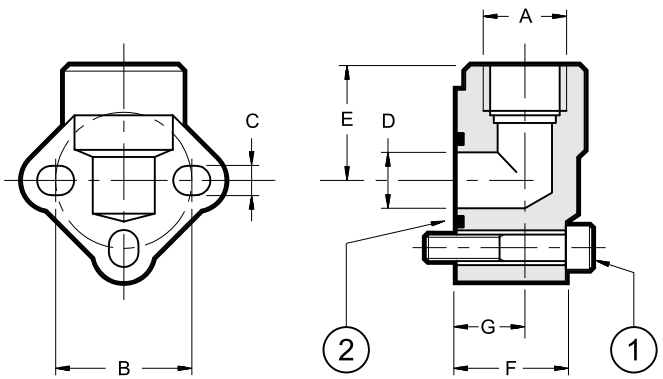
dimensions in mm

PUMP SIZE	NOMINAL SIZE	FRONT PUMP		REAR PUMP	
		H	K	A	B
GP1	**0013**	86	40	86,5	46
	0020	88	41	88,5	47
	0027	90	42	90,5	48
	0034	92	43	92,5	49
	0041	94	44	94,5	50
	0051	97	45,5	97,5	51,5
	0061	100	47	100,5	53
	0074	104	49	104,5	55
	0091	109	51,5	109,5	57,5
GP2	**0070**	101	47,5	103,5	53,5
	0095	105	49,5	107,5	55,5
	0113	108	51	110,5	57
	0140	112	53	114,5	59
	0158	115	54,5	117,5	60,5
	0178	118	56	120,5	62
	0208	123	58,5	125,5	64,5
	0234	127	60,5	129,5	66,5
	0279	134	64	136,5	70
GP3	**0207**	135,5	64	137	71,5
	0225	136,5	64,5	138	72
	0264	139,5	66	141	73,5
	0337	144,5	68,5	146	76
	0394	148,5	70,5	150	78
	0427	151,5	72	153	79,5
	0514	157,5	75	159	82,5
	0600	163,5	78	165	85,5
	0696	170,5	81,5	172	89
	0776	175,5	84	177	91,5
	0876	181,5	87	183	94,5

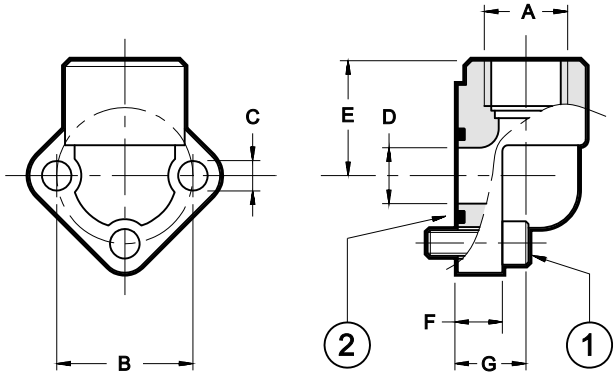
NOTE: Add 11 mm to both A and B quotes on assembled multiple pumps made by GP3+GP1 pumps to calculate the correct overall.

16 - CONNECTION FLANGES

dimensions in mm



ALUMINIUM FLANGES
type **RP**



STEEL FLANGES
type **RPA**

Fastening bolt and O-rings included

ALUMINIUM FLANGES TYPE RP

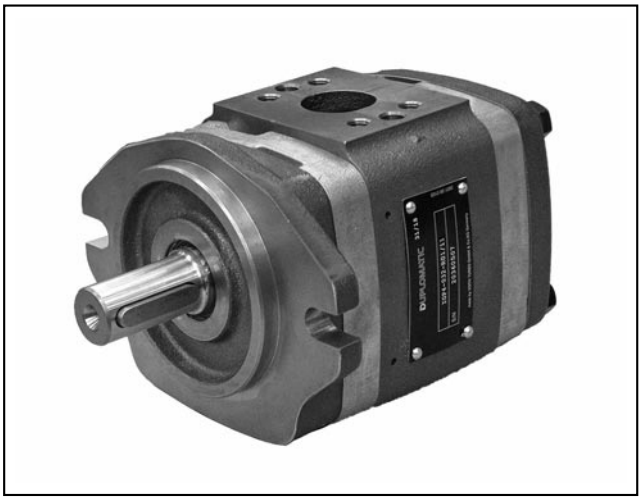
	Flange code	Flange description	p_{max} [bar]	ØA	B	C	ØD	E	F	G	(1) SHC bolts	(2) seals
GP1	0610506	RP1 - 38	180	3/8" BSP	30	6.5	12.5	30	26	18	n°3 - M6x35	OR 121 (15.88x2.62)
	0610248	RP1 - 12		1/2" BSP	30	6.5	12.5	30	26	18		
GP2	0610508	RP2 - 12		1/2" BSP	40	8.5	18.5	40	31	20	n°3 - M8x45	OR 130 (22.22x2.62)
	0610249	RP2 - 34		3/4" BSP	40	8.5	18.5	40	31	20		
GP3	0610717	RP3 - 34		3/4" BSP	51	10.5	25	46	43	26	n°3 - M10x60	OR 4118 (29.75x3.53)
	0610250	RP3 - 100		1" BSP	56	10.5	25	46	43	26		

STEEL FLANGES TYPE RPA

	Flange code	Flange description	p_{max} [bar]	ØA	B	C	ØD	E	F	G	(1) SHC bolts	(2) seals
GP1	0771048	RPA1 - 38	315	3/8" BSP	30	6.5	12	24	17	9.5	n°3 - M6x20	OR 121 (15.88x2.62)
	0771049	RPA1 - 12		1/2" BSP	30	6.5	12	24	17	9.5		
GP2	0771050	RPA2 - 12		1/2" BSP	40	8.5	20	36	22	11.5	n°3 - M8x25	OR 132 (23.81x2.62)
	0770615	RPA2 - 34		3/4" BSP	40	8.5	20	36	22	11.5		
GP3	0771051	RPA3 - 34A		3/4" BSP	51	10.5	24	46	26	13	n°3 - M10x30	OR 3125 (31.42x2.62)
	0770617	RPA3 - 100A		1" BSP	51	10.5	24	46	26	13		
	0770618	RPA3 - 34B		3/4" BSP	56	10.5	24	46	26	13		
	0770619	RPA3 - 100B		1" BSP	56	10.5	24	46	26	13		
	0771052	RPA35 - 114A		1" ¼ BSP	62	13	31	55	35	17	n°3 - M10x35	

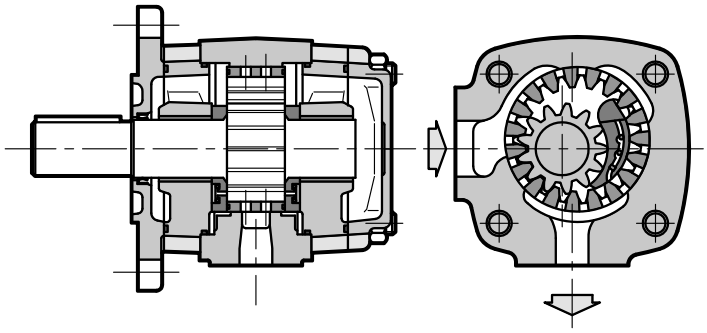
DUPLOMATIC MOTION SOLUTIONS

DUPLOMATIC MS S.p.A.
via M. Re Depaolini 24 ▪ 20015 PARABIAGO (MI) ▪ ITALY
tel. +39 0331.895.111 ▪ www.duplomatic.com ▪ e-mail: sales.exp@duplomatic.com



IGP
INTERNAL GEAR PUMPS
SERIES 11

OPERATING PRINCIPLE



— IGP pumps are volumetric displacement pumps with internal gears, available in five sizes, each divided into a range of different displacement.

— 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.

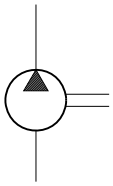
— IGP pumps are also available in multiple versions which can be combined to make multi-flow groups.

TECHNICAL SPECIFICATIONS

PUMP SIZE		**3**	**4**	**5**	**6**	**7**
Displacement range	cm³/rev	3,6 ÷ 10,2	13,3 ÷ 32,6	33,1 ÷ 64,9	64,1 ÷ 126,2	125,8 ÷ 251,7
Flow rate range (at 1500 rpm)	l/min	5,4 ÷ 15,3	19,9 ÷ 48,9	49,6 ÷ 97,3	96,1 ÷ 189,3	188,7 ÷ 377,5
Operating pressures	bar	see table 2 - performances				
Rotation speed	rpm	see table 2 - performances				
Rotation direction		clockwise or counterclockwise				
Loads on the shaft		refer to our technical dept. for permitted axial and radial loads				
Hydraulic connections		SAE J518 c fittings, flanged (see point 9)				
Mounting flange type		SAE J744 - ISO 3019-1				
Mass (single pump)	kg	4 ÷ 4,8	8,6 ÷ 11	15,5 ÷ 18,7	29,2 ÷ 35	46,5 ÷ 59

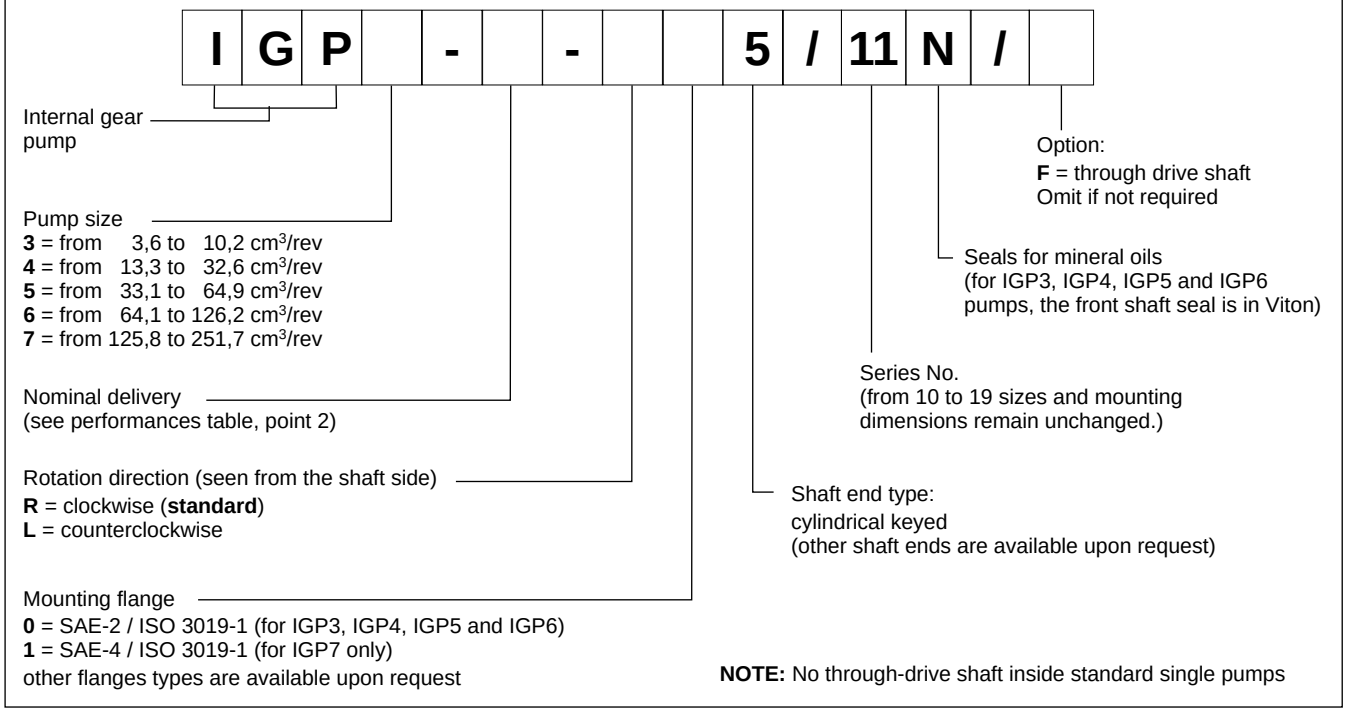
Ambient temperature range	°C	-20 / +60
Fluid temperature range	°C	-20 / +80
Degree of fluid contamination	see point 3.2	
Recommended viscosity	cSt	25 ÷ 100

HYDRAULIC SYMBOL



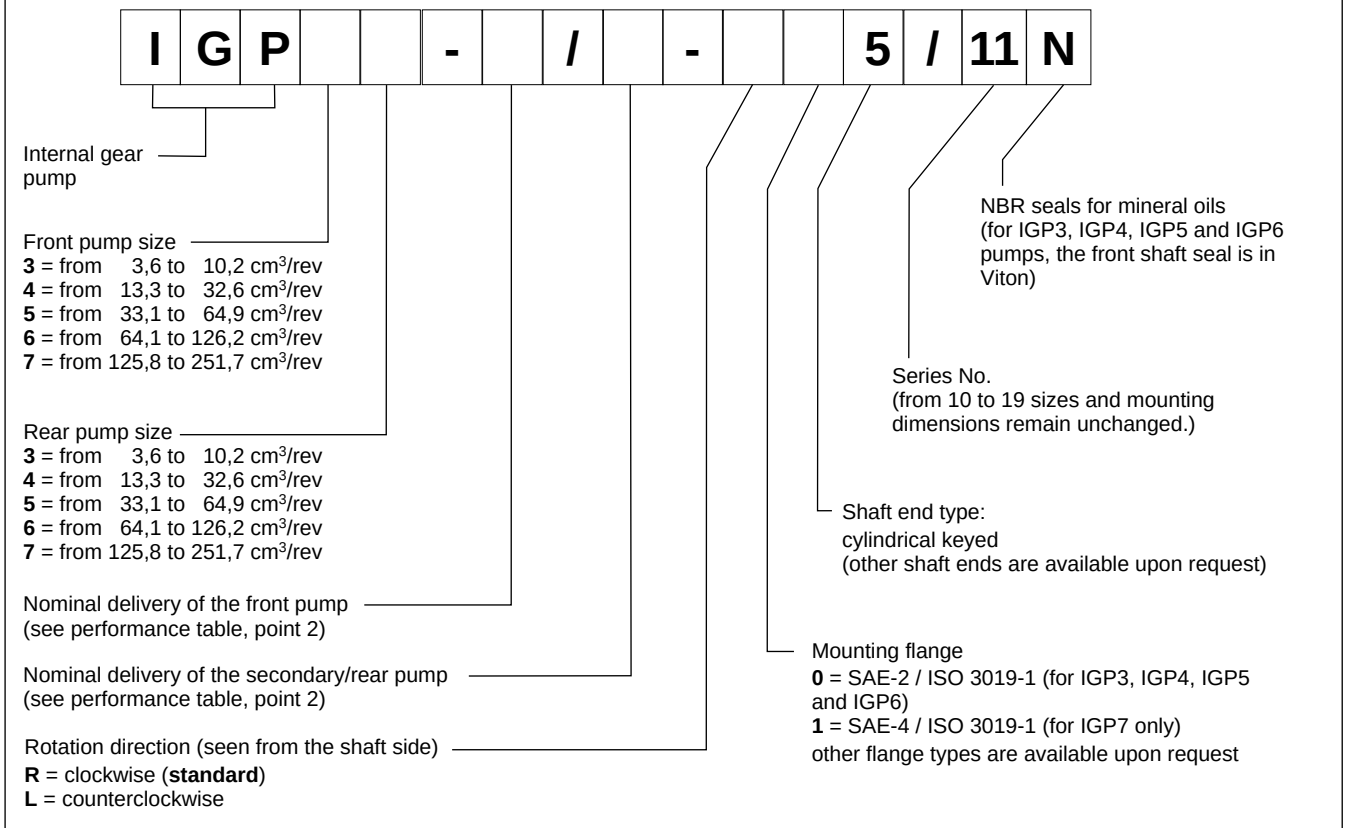
1 - IDENTIFICATION CODE

1.1 - Single pump



NOTE: No through-drive shaft inside standard single pumps

1.2 - Multiple pump



NOTE: Secondary / rear pumps are available as spare parts. All secondary pumps are provided with through drive shaft. The coupling is not included.

To order, put the code together by adding an **R** at the end of the identification code, after the size, delivery, direction of rotation, series and seals.

Code example: **IGP4- 020-R/11N/R**

2 - PERFORMANCES

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

PUMP SIZE	NOMINAL DELIVERY	DISPLACEMENT [cm³/rev] NOTE 2	FLOW RATE at 1500 rpm [l/min]	PRESSURE [bar] NOTE 3		ROTATION SPEED [rpm] NOTE 4	
				steady	peak	max	min
IGP3	003	3,6	5,4	330	345	3600	400
	005	5,2	7,8				
	006	6,4	9,6				
	008	8,2	12,3				
	010	10,2	15,3				
IGP4	013	13,3	19,9	330	345	3600	400
	016	15,8	23,7			3400	
	020	20,7	31,0			3200	
	025	25,4	38,1	300	330	3000	
	032	32,6	48,9	250	280	2800	
IGP5	032	33,1	49,6	315	345	3000	400
	040	41	61,5			2800	
	050	50,3	75,4	280	315	2500	
	064	64,9	97,3	230	250	2200	
IGP6	064	64,1	96,1	300	330	2600	400
	080	80,7	121,0	280	315	2400	
	100	101,3	151,9	250	300	2100	
	125	126,2	189,3	210	250	1800	
IGP7	125	125,8	188,7	300	330	2200	400
	160	160,8	241,2	280	315	2000	
	200	202,7	304,0	250	300	1800	
	250	251,7	377,5	210	250		

NOTE 1: Under continuous operating conditions, the allowed suction pressure range is 0.8 ÷ 3 bar abs. For shorter time, a minimum suction pressure of 0,6 bar abs is allowed.

NOTE 2: Production tolerances can reduce the displacement by 1,5% max. The flow rate at 1500 rpm shown in the table, considers operation with pressure of 10 bar.

NOTE 3: The continuous and peak pressures are valid for rotation speeds between 400 and 1500 rpm. For speeds of more than 1500 rpm the peak pressure must be reduced. The peak pressure is applicable for 15% of the operating time, with a maximum cycle time of 1 minute.

NOTE 4: Variable speeds require pressure limitations if they are out of 400 ÷ 1500 rpm range. Contact our technical department for applications of this kind.

3 - HYDRAULIC FLUID

3.1 - 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 ≤ 40%)	- The pumps are tested with mineral oil. An appropriate cleaning cycle is required. - The values shown in the performance table must be reduced by at least 20% - The maximum speed of the fluid in the suction line must not exceed 1 m/s. - The suction pressure must not be less than 0,8 bar absolute. - The maximum fluid temperature must be at less than 50°C
HFD (phosphate esters)	NOT ALLOWED

3.2 - 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.

3.3 - 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 **NOTE 1** of the table in point 2.

The suction filter must be equipped with a by-pass valve and, if possible, with a clogging indicator.

4 - CHARACTERISTIC CURVES

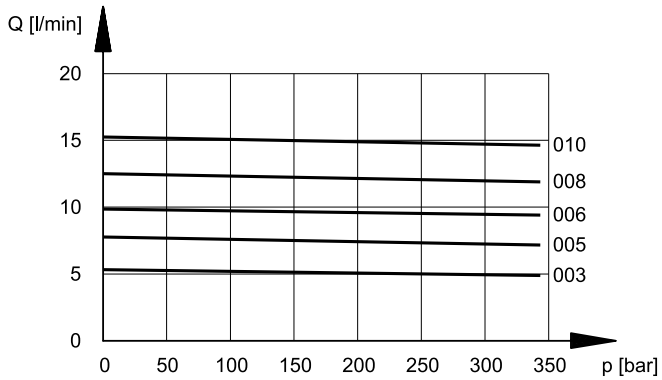
(values obtained with mineral oil with viscosity of 46 cSt at 40°C)

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

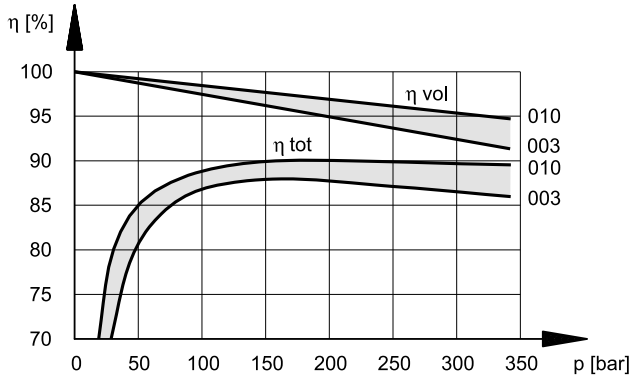
Noise pressure levels were measured in a semi-anechoic room, at an axial distance of 1 m from the pump. The shown values must be reduced by 5 dB(A) if they are to be considered in a completely anechoic room.

4.1 - IGP3

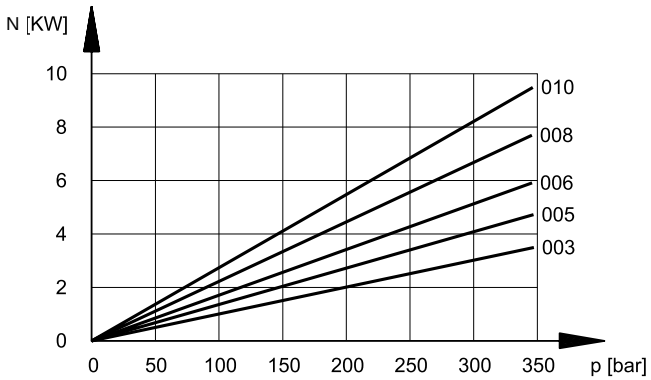
FLOW RATE/PRESSURE CURVES



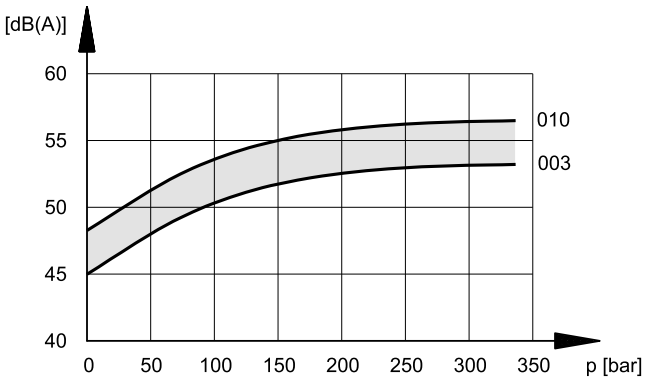
VOLUMETRIC AND TOTAL EFFICIENCY



ABSORBED POWER

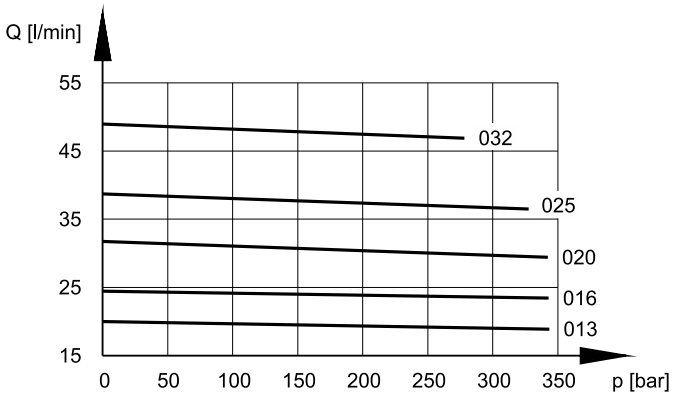


NOISE LEVEL

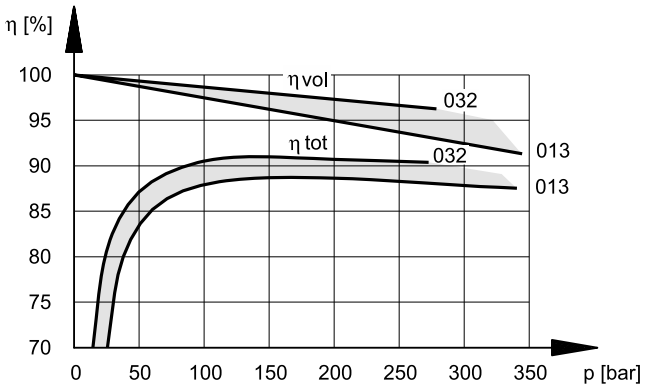


4.2 - IGP4

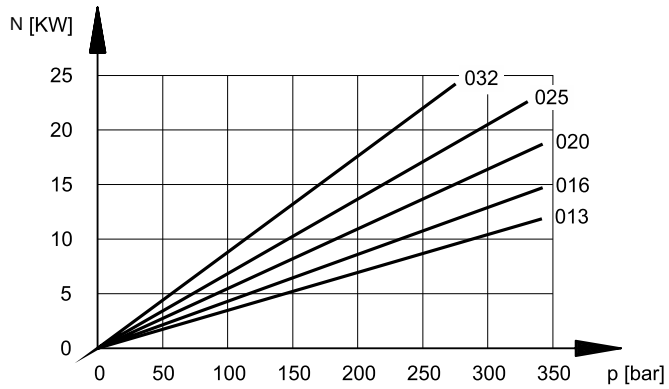
FLOW RATE/PRESSURE CURVES



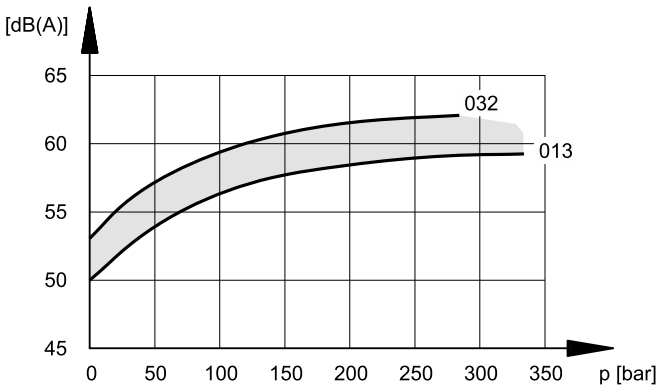
VOLUMETRIC AND TOTAL EFFICIENCIES



ABSORBED POWER

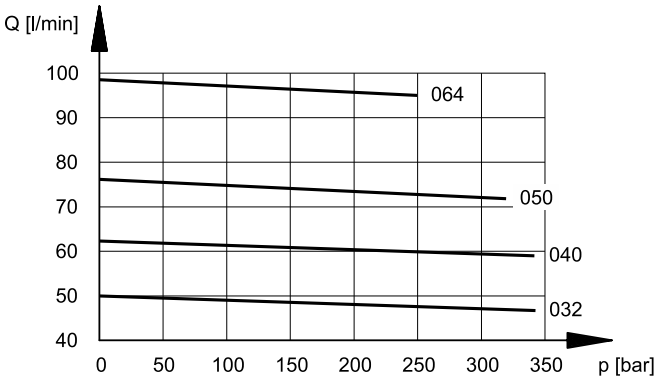


NOISE LEVEL

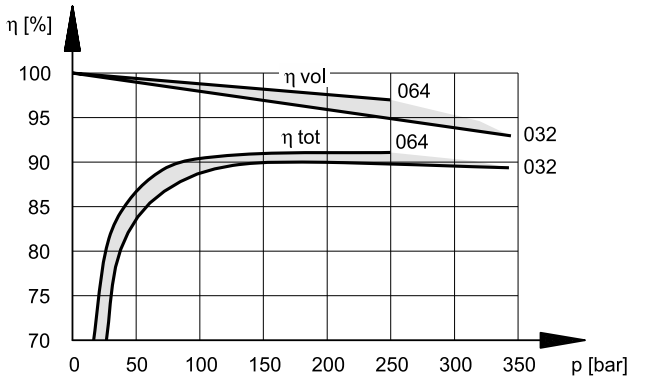


4.3 - IGP5

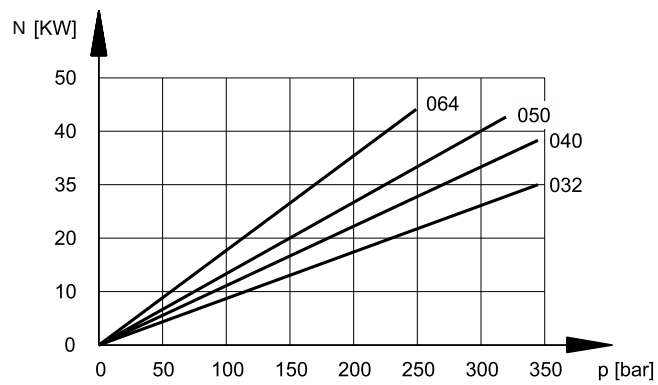
FLOW RATE/PRESSURE CURVES



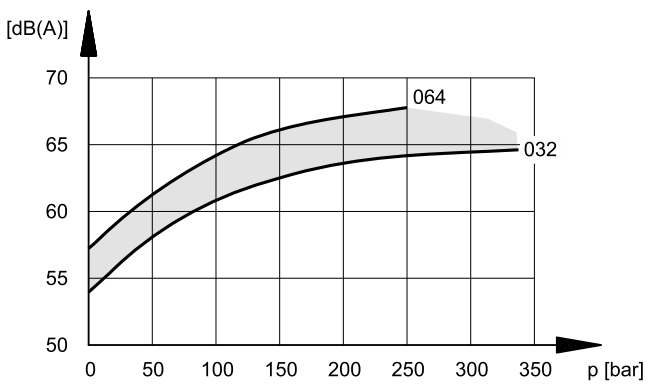
VOLUMETRIC AND TOTAL EFFICIENCIES



ABSORBED POWER

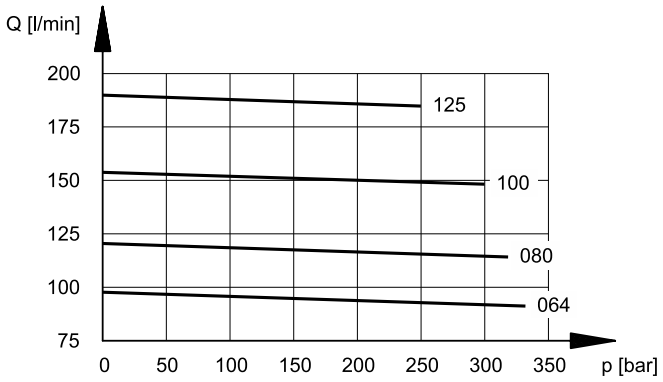


NOISE LEVEL

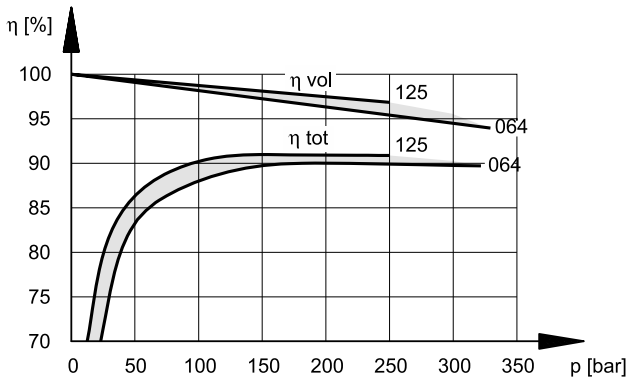


4.4 - IGP6

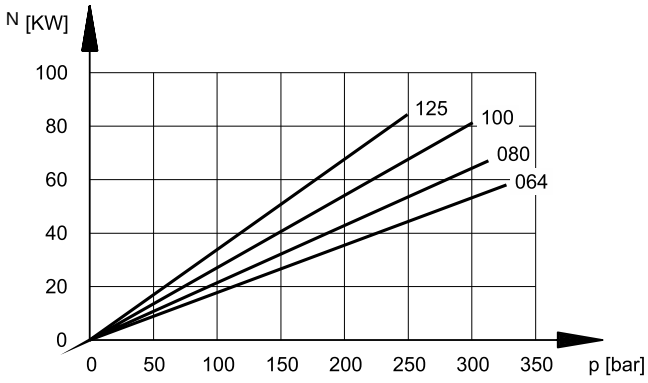
FLOW RATE/PRESSURE CURVES



VOLUMETRIC AND TOTAL EFFICIENCIES



ABSORBED POWER



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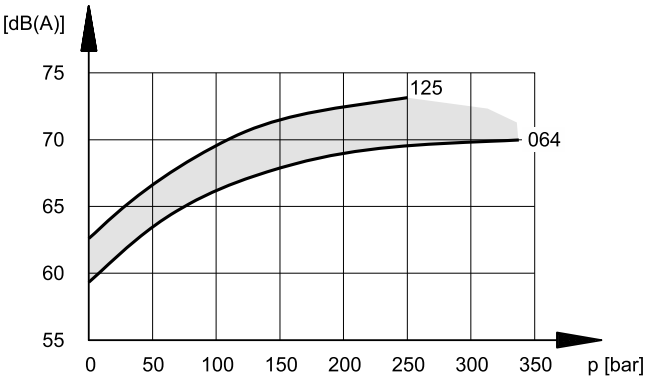
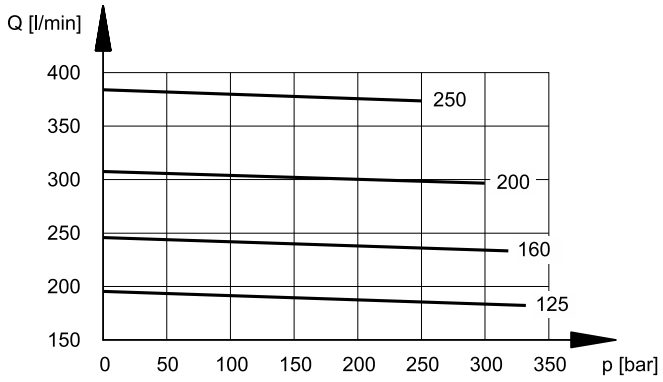
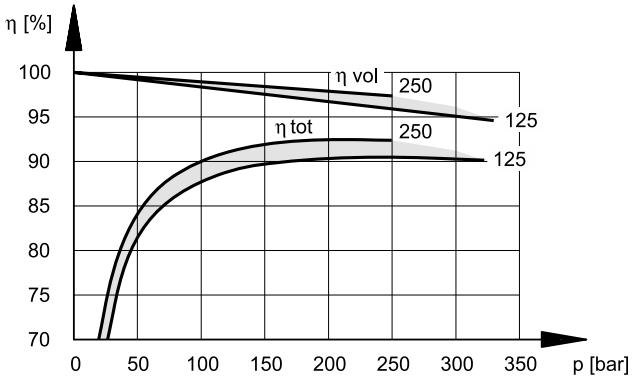


4.5 - IGP7

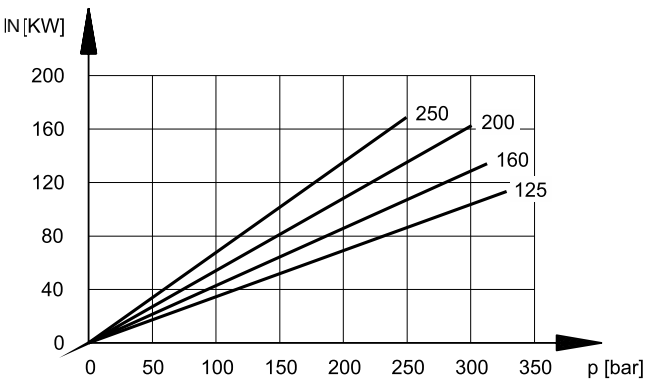
FLOW RATE/PRESSURE CURVES



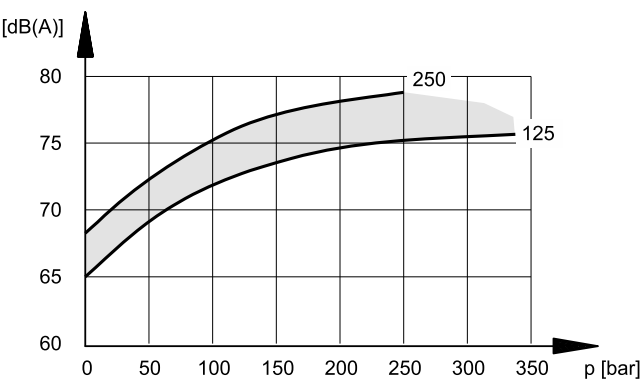
VOLUMETRIC AND TOTAL EFFICIENCIES



ABSORBED POWER



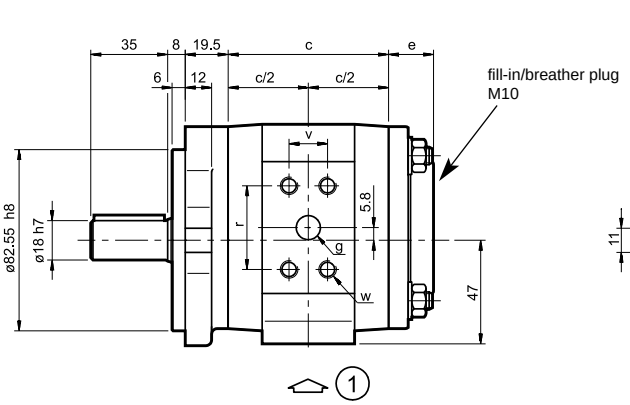
NOISE LEVEL

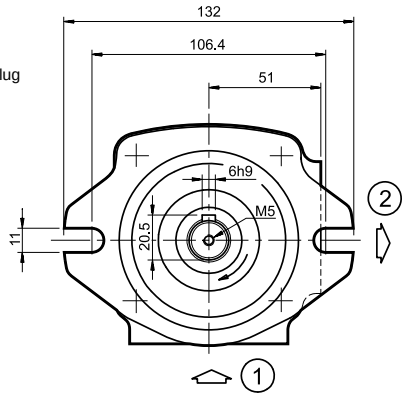


5 - OVERALL MOUNTING AND DIMENSIONS

5.1 - IGP3

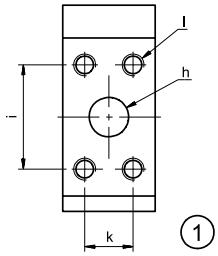
dimensions in mm





1	Suction port
2	Delivery port

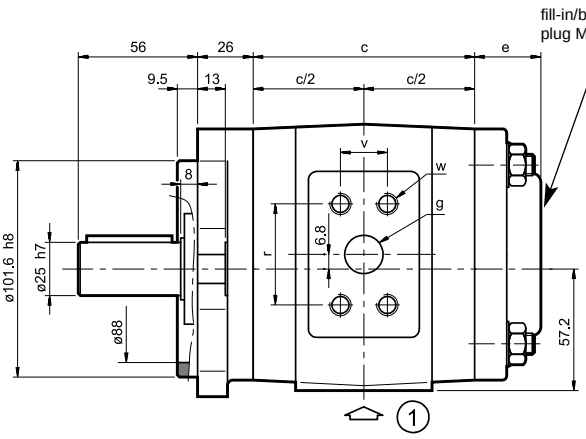
NOTE: the pump is shown in the clockwise rotation configuration
For the counterclockwise configuration, the delivery port (2) is on the opposite side of the pump

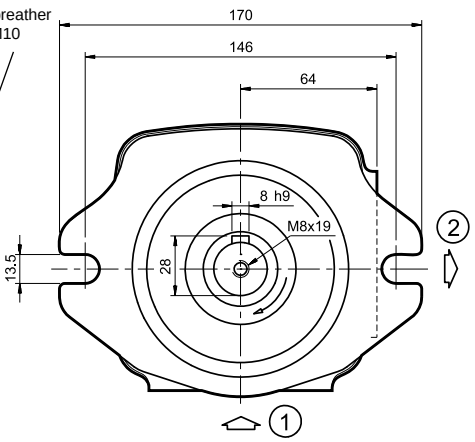


											CONNECTION FLANGES (see point9)	
	c	e	g	h	i	k	l	r	v	w	delivery	suction
IGP3-003	66	20.5	9	14	38.1	17.5	M8x13	38.1	17.5	M8x13	0610718	0610718
IGP3-005	70	20.5	11	14	38.1	17.5	M8x13	38.1	17.5	M8x13		
IGP3-006	73	20.5	11	19	47.6	22.3	M10x15	38.1	17.5	M8x13		0610719
IGP3-008	77.5	20.5	13	19	47.6	22.3	M10x15	38.1	17.5	M8x13		
IGP3-010	82.5	20.5	13	21	52.4	26.2	M10x15	38.1	17.5	M8x13		0610713

5.2 - IGP4

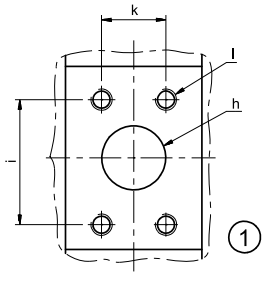
dimensions in mm





1	Suction port
2	Delivery port

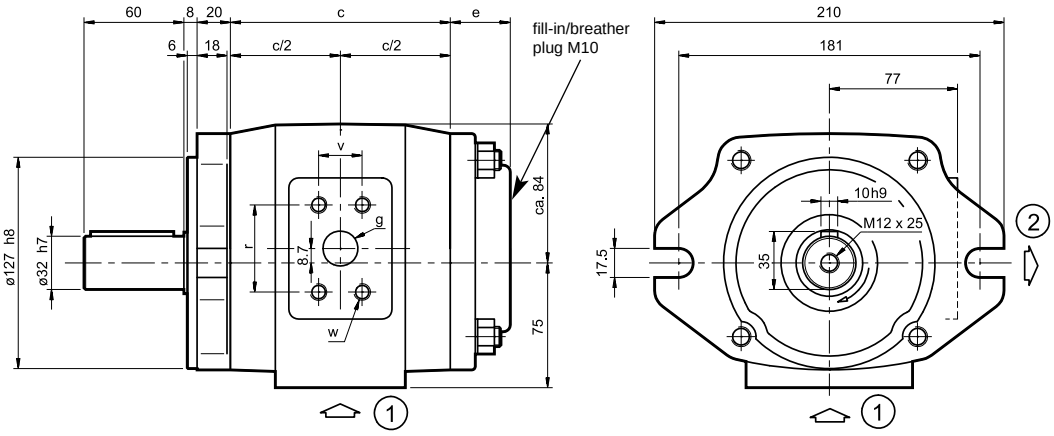
NOTE: the pump is shown in the clockwise rotation configuration
For the counterclockwise configuration, the delivery port (2) is on the opposite side of the pump



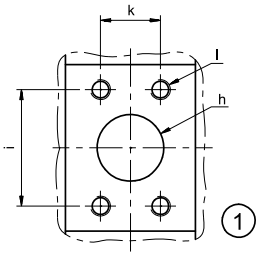
											CONNECTION FLANGES (see point9)	
	c	e	g	h	i	k	l	r	v	w	delivery	suction
IGP4-013	88.5	31	13	23	52.4	26.2	M10x15	38.1	17.5	M8x13	0610718	0610713
IGP4-016	92.5	31	14	25	52.4	26.2	M10x15	38.1	17.5	M8x13		
IGP4-020	98	31	18	27	58.7	30.2	M10x15	47.6	22.3	M10x15	0610719	0610720
IGP4-025	104	31	18	30	58.7	30.2	M10x15	47.6	22.3	M10x15		
IGP4-032	113	31	18	32	58.7	30.2	M10x15	47.6	22.3	M10x15		

5.3 - IGP5

dimensions in mm



1	Suction port
2	Delivery port

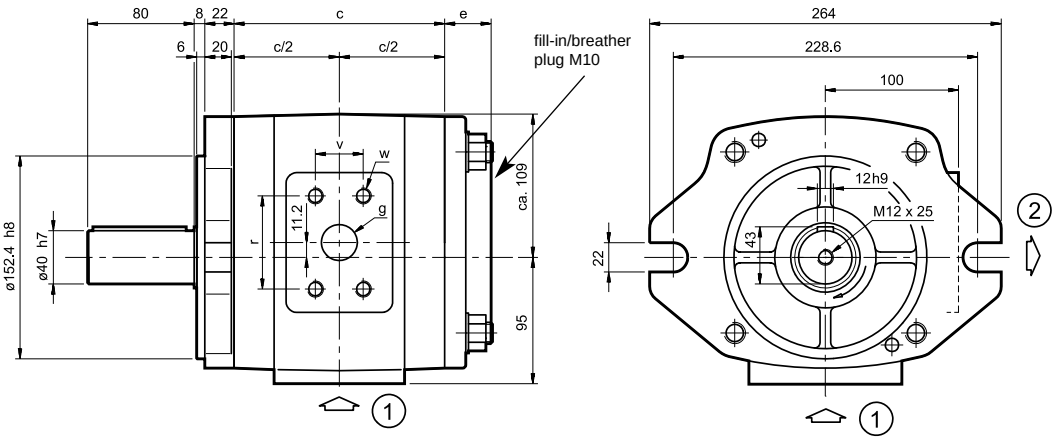


NOTE: the pump is shown in the clockwise rotation configuration
For the counterclockwise configuration, the delivery port (2) is on the opposite side of the pump

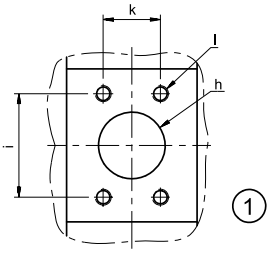
											CONNECTION FLANGES (see point9)	
	c	e	g	h	i	k	l	r	v	w	delivery	suction
IGP5-032	119	36	18	32	58.7	30.2	M10x15	47.6	22.3	M10x15	0610719	0610720
IGP5-040	125	36	19	35	69.9	36	M12x20	52.4	26.2	M10x15	0610713	0610714
IGP5-050	132	36	21	40	69.9	36	M12x20	52.4	26.2	M10x15		
IGP5-064	143	36	23	40	69.9	36	M12x20	52.4	26.2	M10x15		

5.4 - IGP6

dimensions in mm



1	Suction port
2	Delivery port

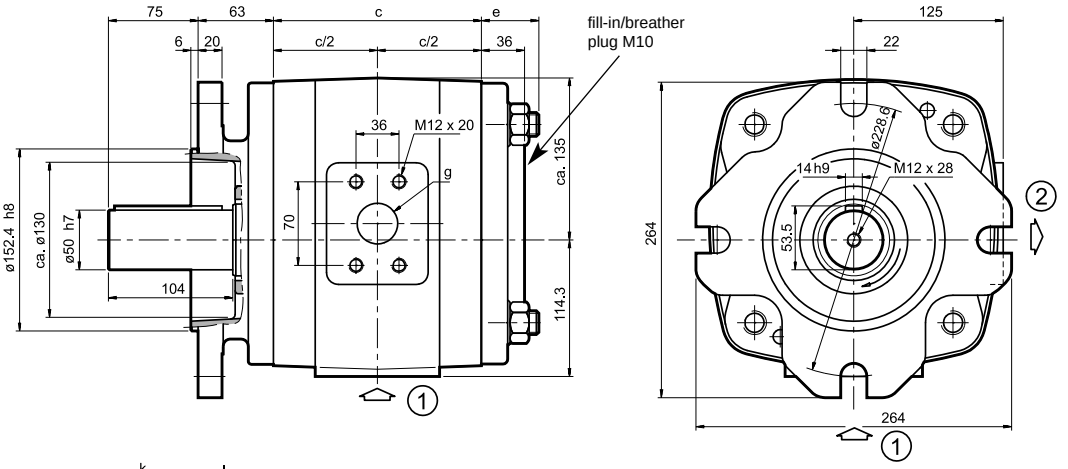


NOTE: the pump is shown in the clockwise rotation configuration
For the counterclockwise configuration, the delivery port (2) is on the opposite side of the pump

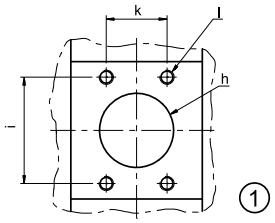
											CONNECTION FLANGES (see point9)	
	c	e	g	h	i	k	l	r	v	w	delivery	suction
IGP6-064	140	40	23	40	69.9	35.7	M12x20	52.4	26.2	M10x15	0610713	0610714
IGP6-080	148	35	23	45	77.8	42.9	M12x20	69.9	35.7	M12x20	0610714 **NOTE 5**	0610721
IGP6-100	158	35	27	50	77.8	42.9	M12x20	69.9	35.7	M12x20		
IGP6-125	170	40	30	50	77.8	42.9	M12x20	69.9	35.7	M12x20		

5.5 - IGP7

dimensions in mm



1	Suction port
2	Delivery port



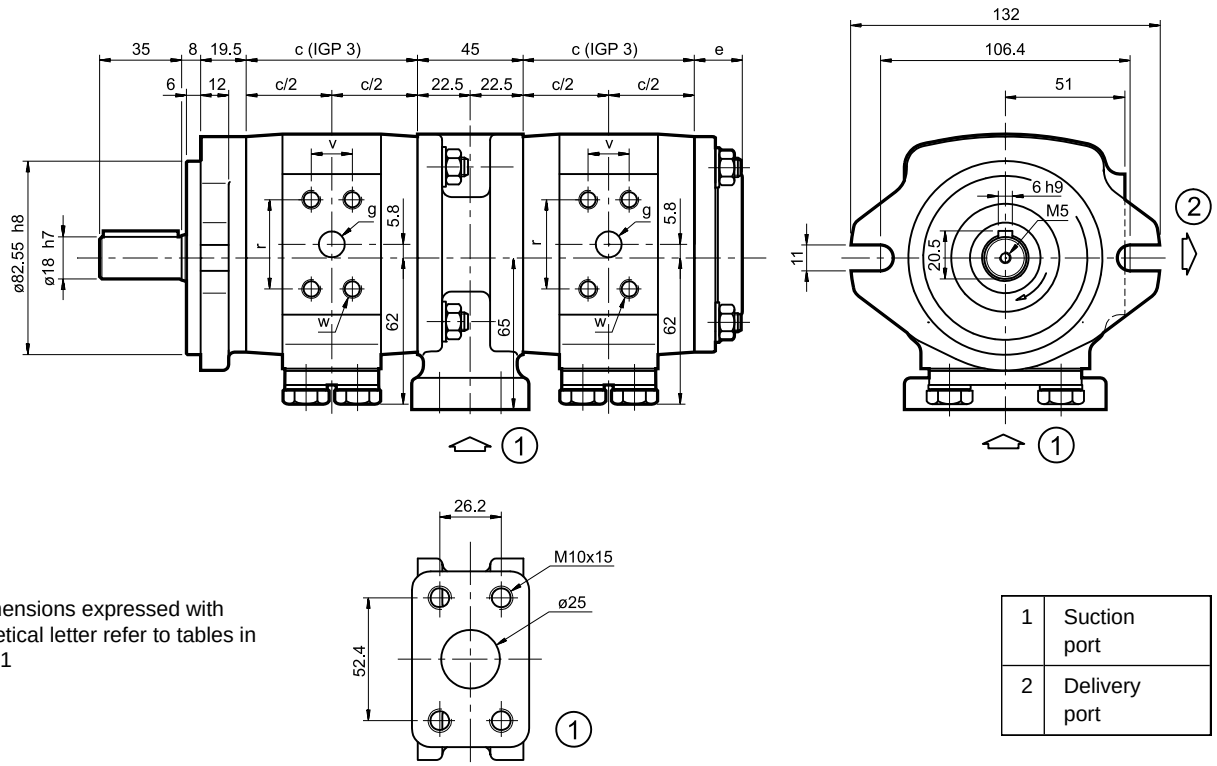
NOTE: the pump is shown in the clockwise rotation configuration
For the counterclockwise configuration, the delivery port (2) is on the opposite side of the pump

											CONNECTION FLANGES (see point9)	
	c	e	g	h	i	k	l	r	v	w	delivery	suction
IGP7-125	152	48	30	50	77.5	42.9	M12x20	69.9	35.7	M12x20	0610714 **NOTE 5**	0610721
IGP5-160	162	48	30	56	88.9	50.8	M12x20	69.9	35.7	M12x20		0610722
IGP5-200	174	46	34	62	88.9	50.8	M12x20	69.9	35.7	M12x20		0610722
IGP5-250	188	42	38	72	106.9	62	M16x25	69.9	35.7	M12x20		0610723

NOTE 5: For applications with delivery pressure > 200 bar, a special connection flange cod. 0610725 is required.

6 - DOUBLE PUMPS OVERALL MOUNTING AND DIMENSIONS

6.1 - IGP33



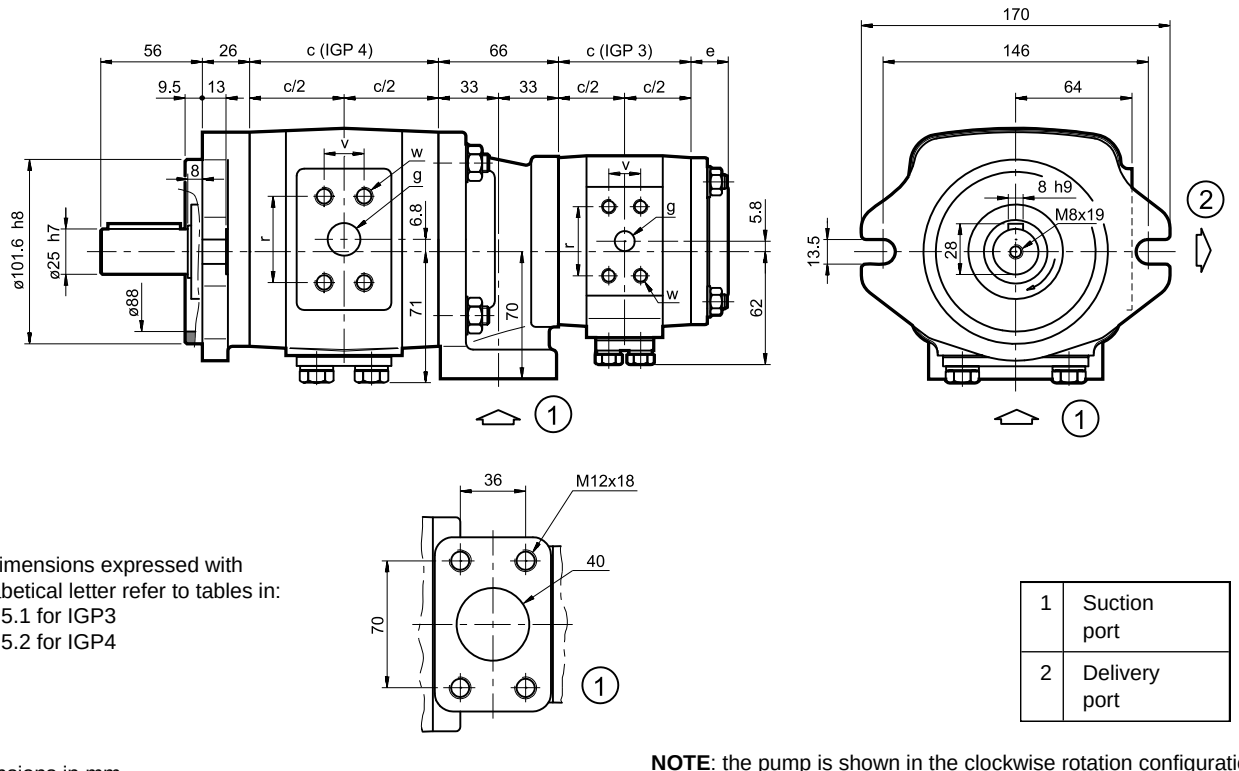
For dimensions expressed with alphabetical letter refer to tables in point 5.1

1	Suction port
2	Delivery port

dimensions in mm

NOTE: the pump is shown in the clockwise rotation configuration
For the counterclockwise configuration, the delivery port (2) is on the opposite side of the pump

6.2 - IGP43



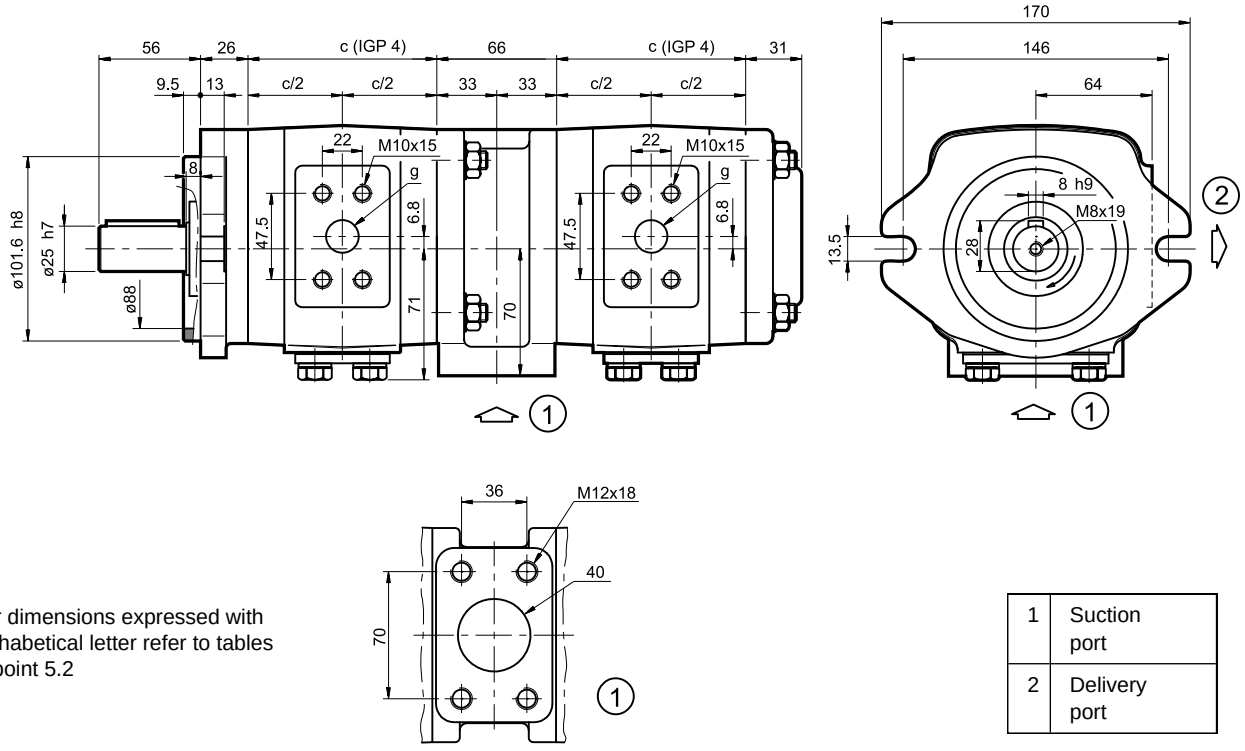
For dimensions expressed with alphabetical letter refer to tables in:
point 5.1 for IGP3
point 5.2 for IGP4

1	Suction port
2	Delivery port

dimensions in mm

NOTE: the pump is shown in the clockwise rotation configuration
For the counterclockwise configuration, the delivery port (2) is on the opposite side of the pump

6.3 - IGP44



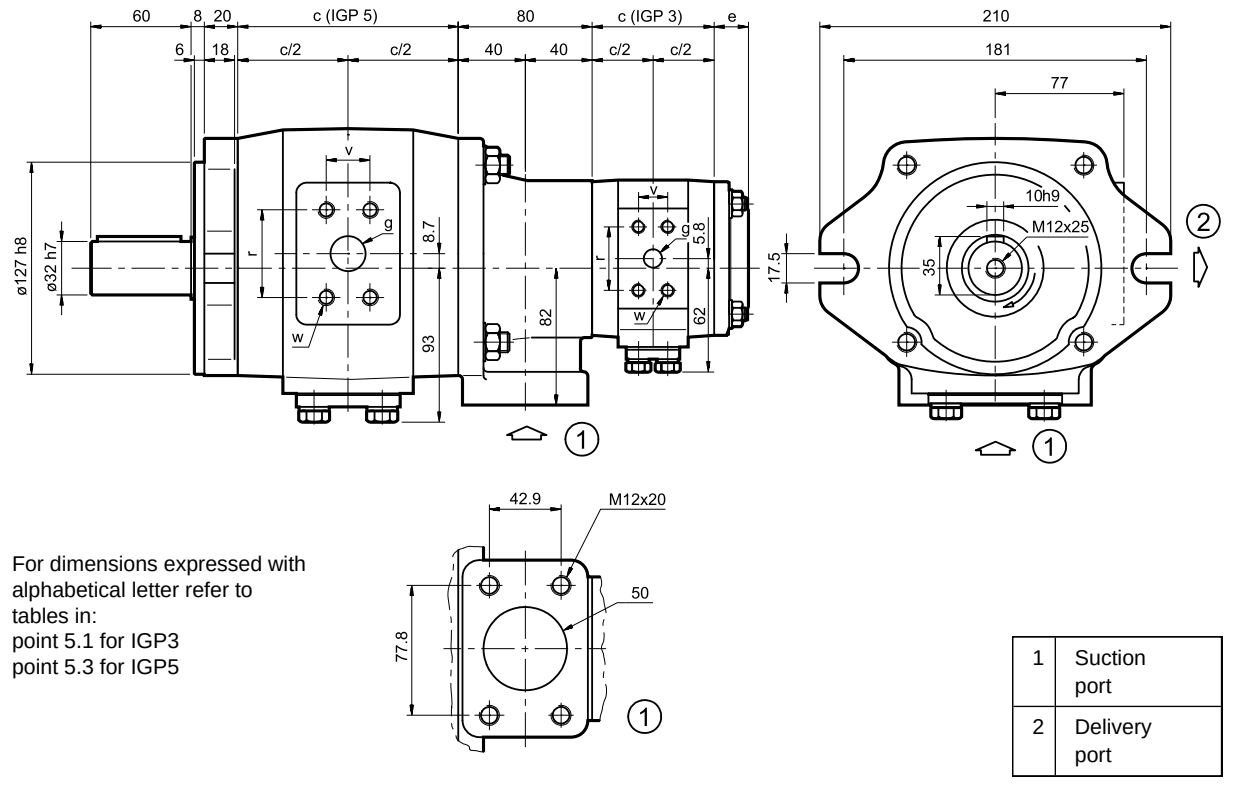
For dimensions expressed with alphabetical letter refer to tables in point 5.2

1	Suction port
2	Delivery port

dimensions in mm

NOTE: the pump is shown in the clockwise rotation configuration
For the counterclockwise configuration, the delivery port (2) is on the opposite side of the pump

6.4 - IGP53



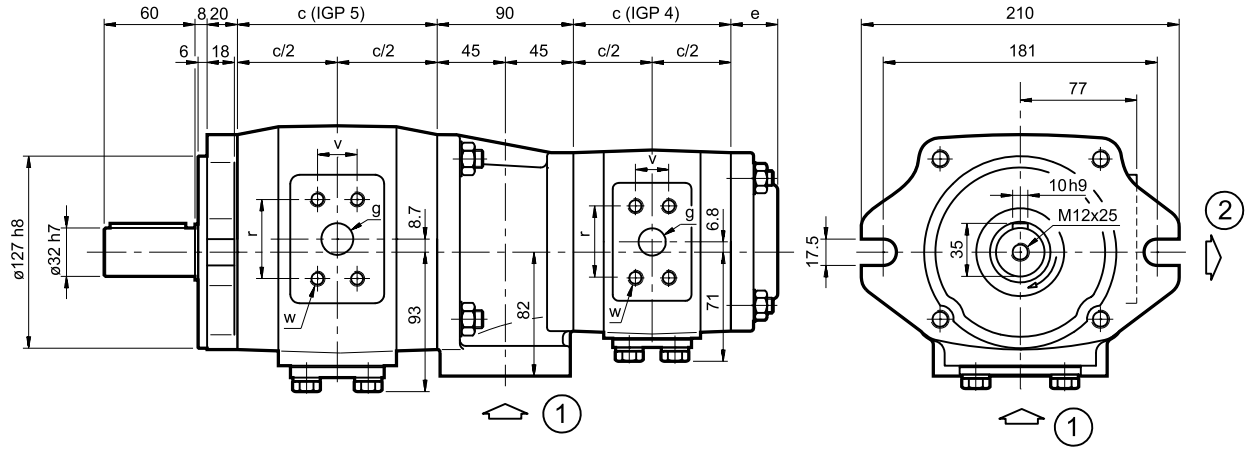
For dimensions expressed with alphabetical letter refer to tables in:
point 5.1 for IGP3
point 5.3 for IGP5

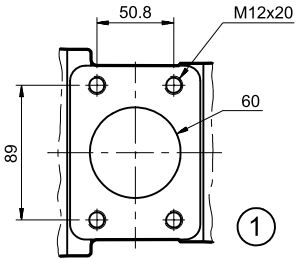
1	Suction port
2	Delivery port

dimensions in mm

NOTE: the pump is shown in the clockwise rotation configuration
For the counterclockwise configuration, the delivery port (2) is on the opposite side of the pump

6.5 - IGP54





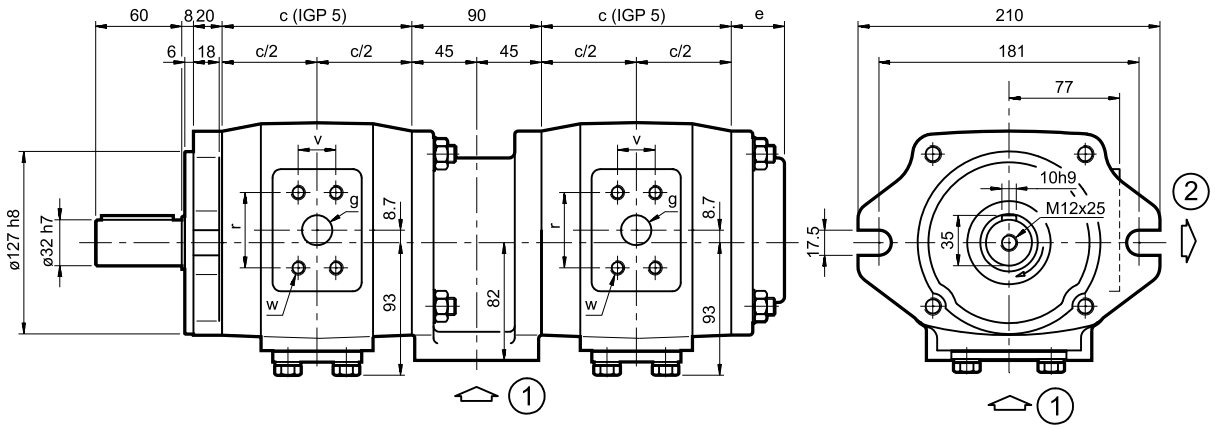
For dimensions expressed with alphabetical letter refer to tables in:
point 5.2 for IGP4
point 5.3 for IGP5

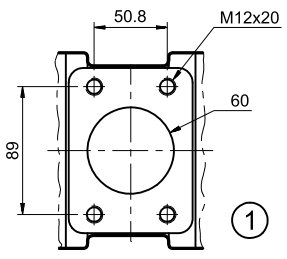
1	Suction port
2	Delivery port

dimensions in mm

NOTE: the pump is shown in the clockwise rotation configuration
For the counterclockwise configuration, the delivery port (2) is on the opposite side of the pump

6.6 - IGP55





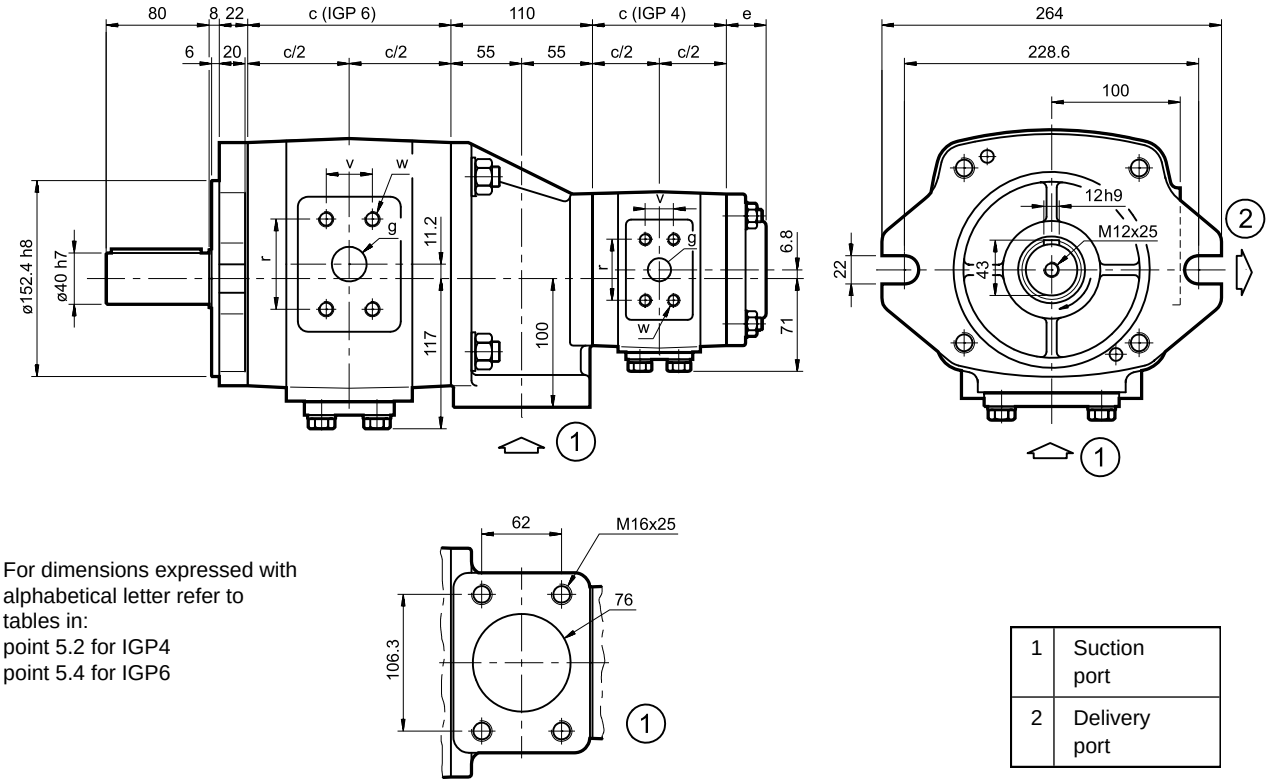
For dimensions expressed with alphabetical letter refer to tables in:
point 9 for IGP3
point 11 for IGP5

1	Suction port
2	Delivery port

dimensions in mm

NOTE: the pump is shown in the clockwise rotation configuration
For the counterclockwise configuration, the delivery port (2) is on the opposite side of the pump

6.7 - IGP64



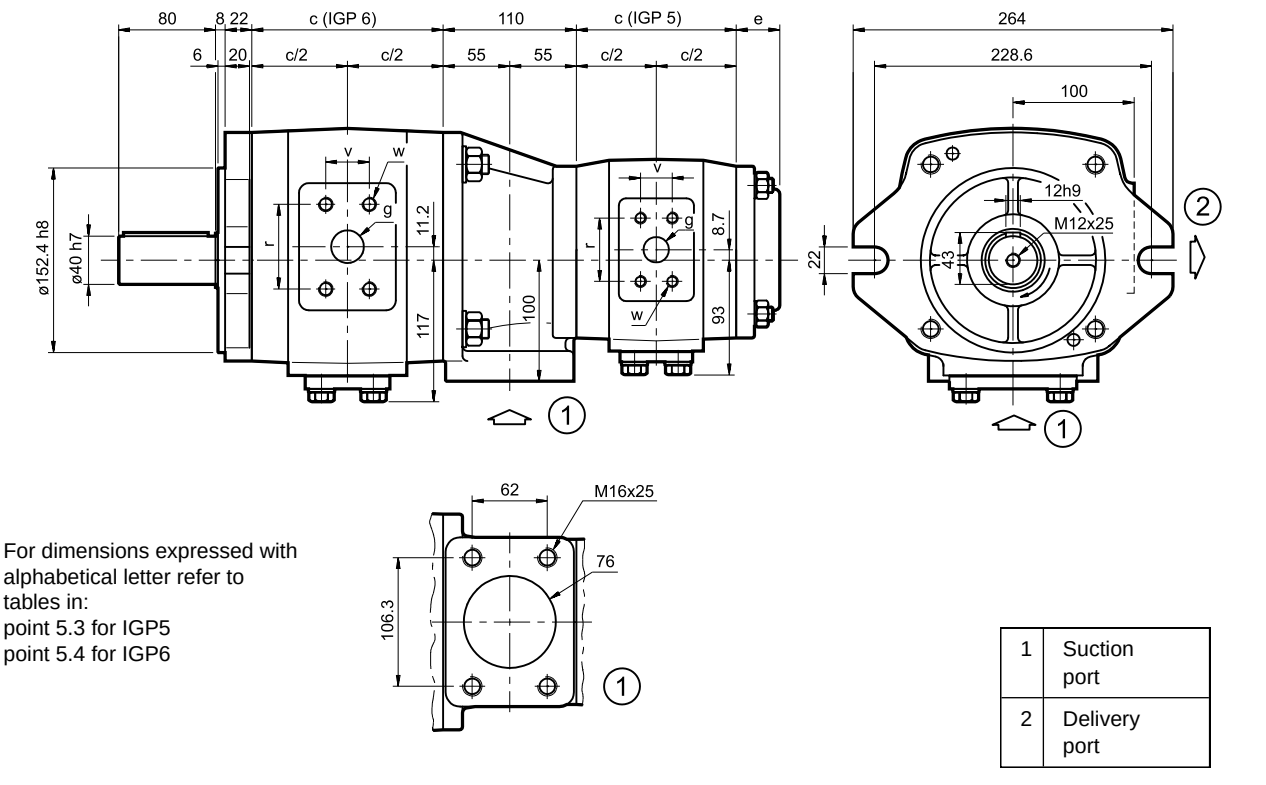
For dimensions expressed with alphabetical letter refer to tables in:
point 5.2 for IGP4
point 5.4 for IGP6

1	Suction port
2	Delivery port

dimensions in mm

NOTE: the pump is shown in the clockwise rotation configuration
For the counterclockwise configuration, the delivery port (2) is on the opposite side of the pump

6.8 - IGP65



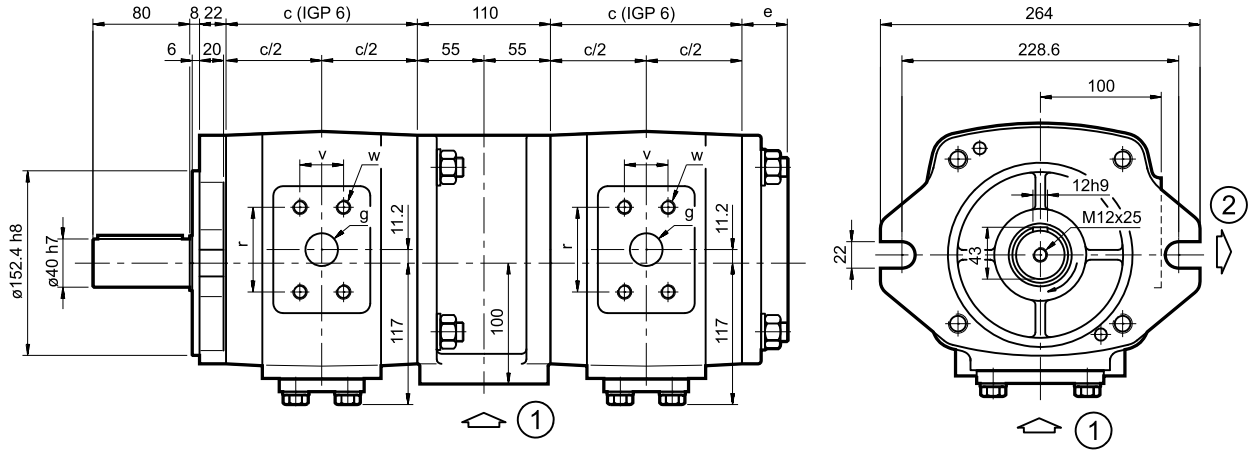
For dimensions expressed with alphabetical letter refer to tables in:
point 5.3 for IGP5
point 5.4 for IGP6

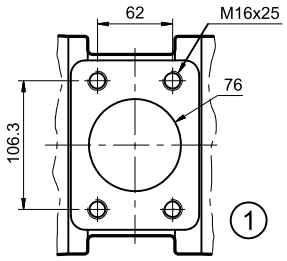
1	Suction port
2	Delivery port

dimensions in mm

NOTE: the pump is shown in the clockwise rotation configuration
For the counterclockwise configuration, the delivery port (2) is on the opposite side of the pump

6.9 - IGP66





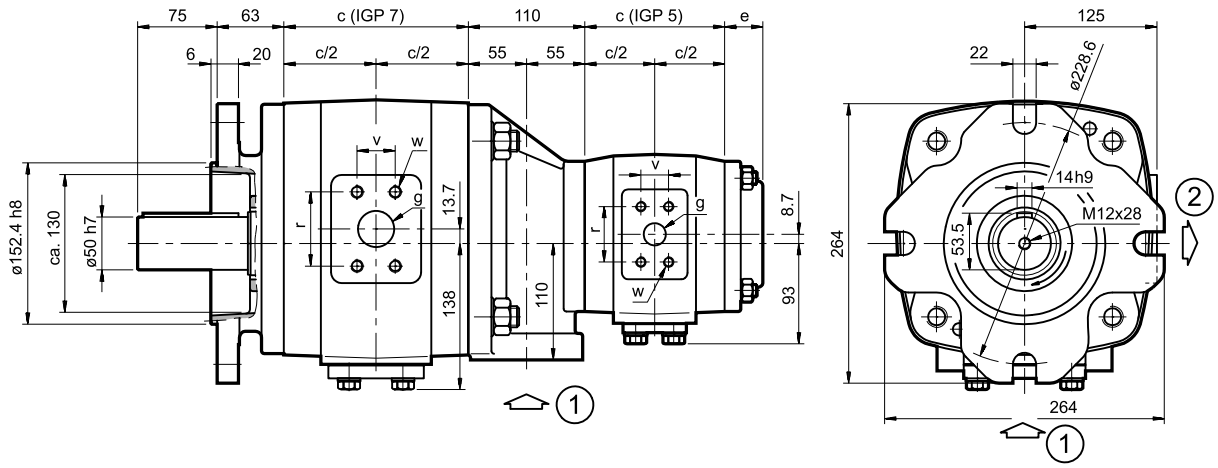
For dimensions expressed with alphabetical letter refer to tables in point 5.4

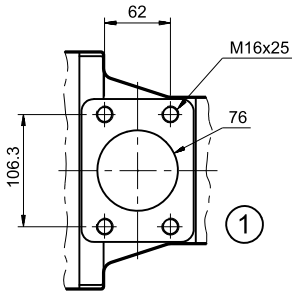
1	Suction port
2	Delivery port

dimensions in mm

NOTE: the pump is shown in the clockwise rotation configuration
For the counterclockwise configuration, the delivery port (2) is on the opposite side of the pump

6.10 - IGP75





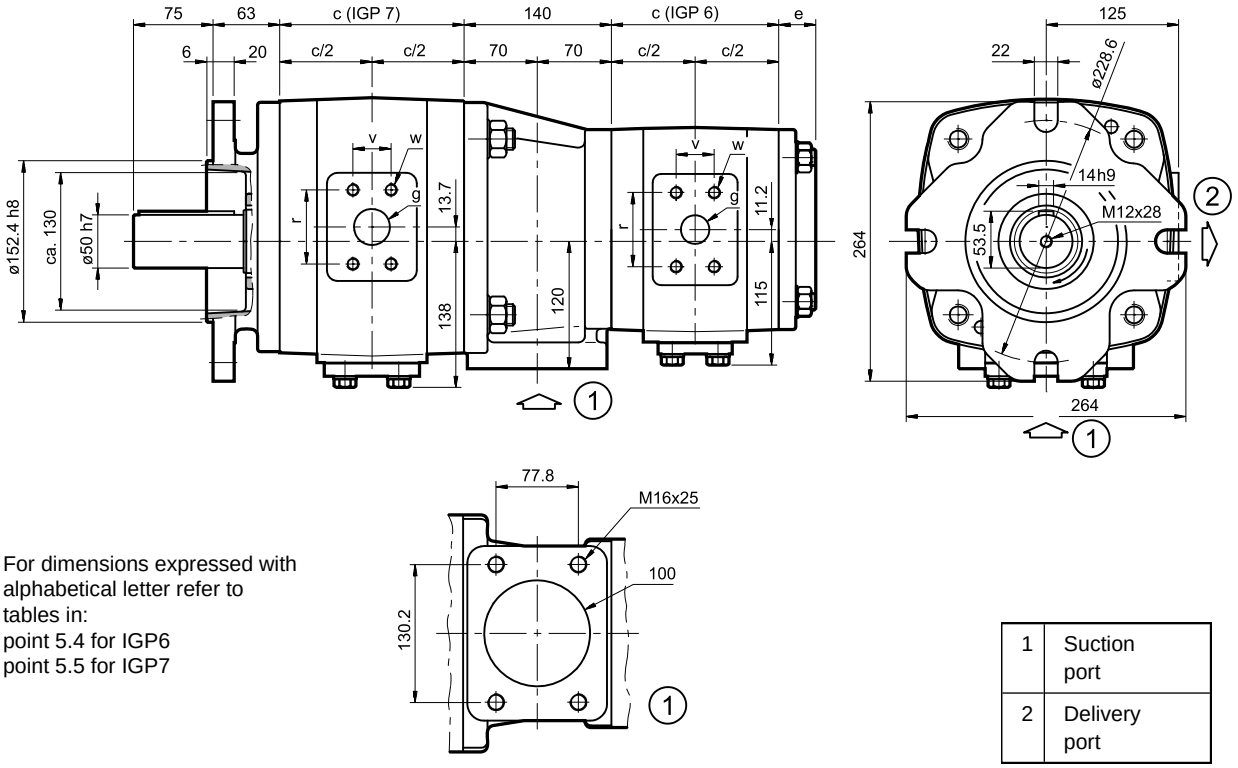
For dimensions expressed with alphabetical letter refer to tables in:
point 5.3 for IGP5
point 5.5 for IGP7

1	Suction port
2	Delivery port

dimensions in mm

NOTE: the pump is shown in the clockwise rotation configuration
For the counterclockwise configuration, the delivery port (2) is on the opposite side of the pump

6.11 - IGP76

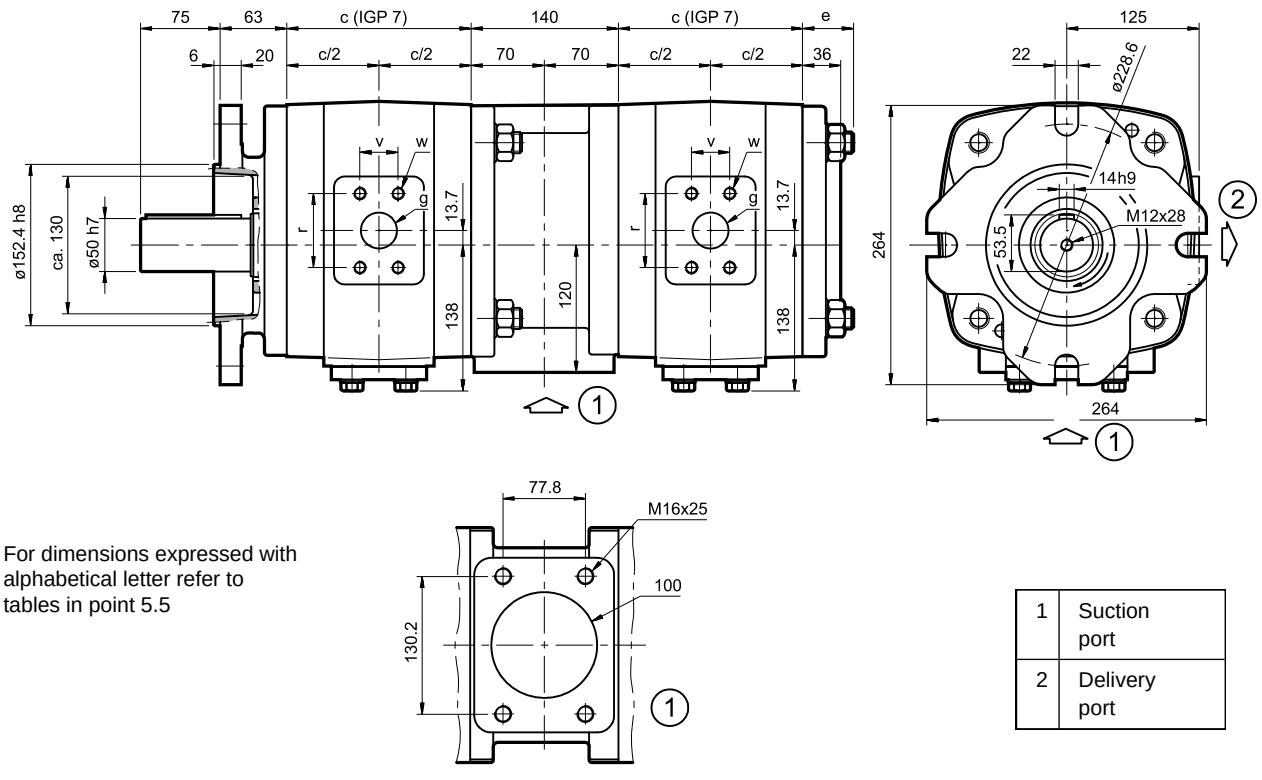


For dimensions expressed with alphabetical letter refer to tables in:
point 5.4 for IGP6
point 5.5 for IGP7

1	Suction port
2	Delivery port

dimensions in mm

6.12 - IGP77



For dimensions expressed with alphabetical letter refer to tables in point 5.5

1	Suction port
2	Delivery port

dimensions in mm

7 - INSTALLATION

— The IGP pumps can be installed in any position.

— Before putting the pump into operation, check that the rotation direction of the motor is according to the direction of the arrow marked on the pump body.

— The suction line must be sized so that the speed of the fluid does not exceed 1 m/s (1,5 m/s with positive pressure at the pump inlet) and must be placed in the tank at least at 50 mm below the minimum oil level.

Any bends and restrictions or an excessive line length can impair correct working of the pump.

The height of suction from the bottom of the tank must not be less than 50 mm.

— The IGP pumps are self-priming in the entire operating speed range specified. At the first start-up of the pump, it is necessary to vent the air from the delivery line. The pump starting operation, especially at low temperatures, must be undertaken at the minimum pressure inside the system.

— There is a plug M10 (SW5) on the pump, for the filling or the breathing of the pump casing, according to the installation position.
Be sure that the plug is closed (couple 10Nm) when the pump is operating. If a check valve with cracking pressure of >1 bar is installed on the delivery line, it is necessary to vent the air from the circuit branch between the check valve and the pump at the time of start-up.

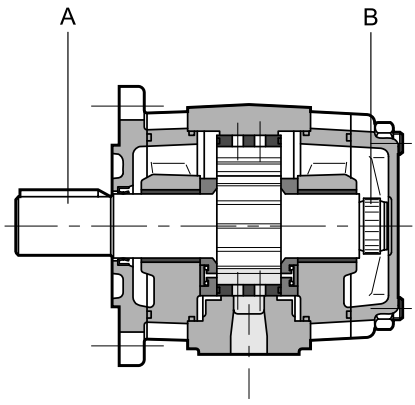
— The motor-pump connection must be carried out directly with a flexible coupling.

Consult our technical dept. for installations that generate axial or radial loads on the pump shaft.

The coupling must be mounted without axially forcing the pump shaft. Be sure that the joint coupling diameter be made with a K7 tolerance.

— Refer to point 3.3 for the characteristics and installation of the filtering elements.

8 - MAXIMUM APPLICABLE TORQUE



PUMP SIZE	MAX. TORQUE APPLIED TO THE SHAFT [Nm]	
	primary shaft **A**	secondary shaft **B**
IGP3	160	80
IGP4	335	190
IGP5	605	400
IGP6	1050	780
IGP7	1960	1200

NOTE: The pumps must be connected in decreasing order of displacement and size.

8.1 - Maximum applicable torque for double pumps

In case of double pumps, even of the same displacement, each pump can operate at the maximum PERFORMANCES specified in point 2.

8.2 - Maximum applicable torque for multiple pumps

The torque (M) at the inlet of each pump is given by the following equation:

$$M = \frac{9549 \cdot N}{n} = [Nm]$$

where the absorbed power (N) is given by:

$$N = \frac{Q \cdot \Delta p}{600 \cdot \eta tot} = [kW]$$

n = rotation speed [rpm]

Q = delivery [l/min]

Δp = differential pressure on the pump [bar]

η tot = total efficiency (noted from the relative diagrams in point 4)

or can be derived from the ABSORBED POWER diagrams (see point 4).

In case of multiple pumps, the torque of the single pump must be added to the torque generated by the downstream pumps.

The torque value thus calculated for each pump must be less than the relative value specified in the above table, taking what follows into account:

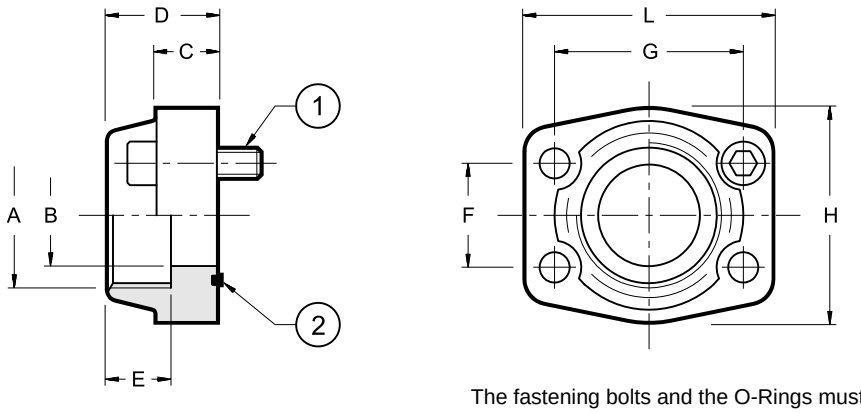
1st pump = refer to the specified values for primary shaft A

2nd, 3rd, 4th pump = refer to the specified values for secondary shaft B

In the event that the calculated torque values are higher than those shown in the table, it is necessary to reduce the operating pressure or to replace the overloaded pump with one that can support the required torque.

9 - CONNECTION FLANGES SAE J518

dimensions in mm



The fastening bolts and the O-Rings must be ordered separately.

	Flange code	Flange description	p_{max} [bar]	ØA	ØB	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 ¼”	276	1 ¼” BSP	32	21	41	22	30.2	58.7	68	79	n° 4 - M10x35	OR 4150 (37.69x3.53)
	0610714	SAE - 1 ½”	207	1 ½” BSP	38	25	45	24	35.7	69.9	78	93	n° 4 - M12x40	OR 4187 (47.22x3.53)
	0610725	SAE - 1 ½”	345	1 ½” 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 ½”	172	2 ½” 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 - 4”	34	4” BSP	99	27	48	34	77.8	130.2	146	162	n° 4 - M16x50	OR 4437 (110.70x3.53)

NOTE: Flange code 0610725 is a special flange which differs from SAEJ518 standards.

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