



**DIPLOMATIC
HYDRAULICS**

11 110/102 ED

1P

**EXTERNAL GEAR PUMPS
SERIES 10**



OPERATING PRINCIPLE

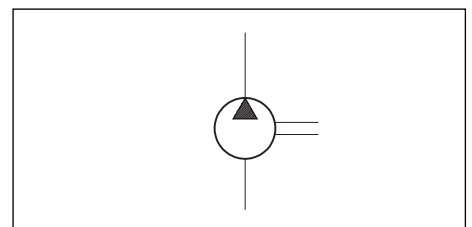
- The 1P pumps are fixed displacement external gear pumps with axial clearance compensation.
- They give high volumetric flows even with high operating pressures, a low noise level, and they have a high endurance thanks to the balancing system of the loads on the guide bushings.
- They are available with displacements going from 1,1 to 7,9 cm³/rev and with operating pressures of up to 210 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 ÷ 7,9
Flow rate and operating pressures		see table 3 - Performance ratings
Rotation speed		see table 3 - Performance ratings
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

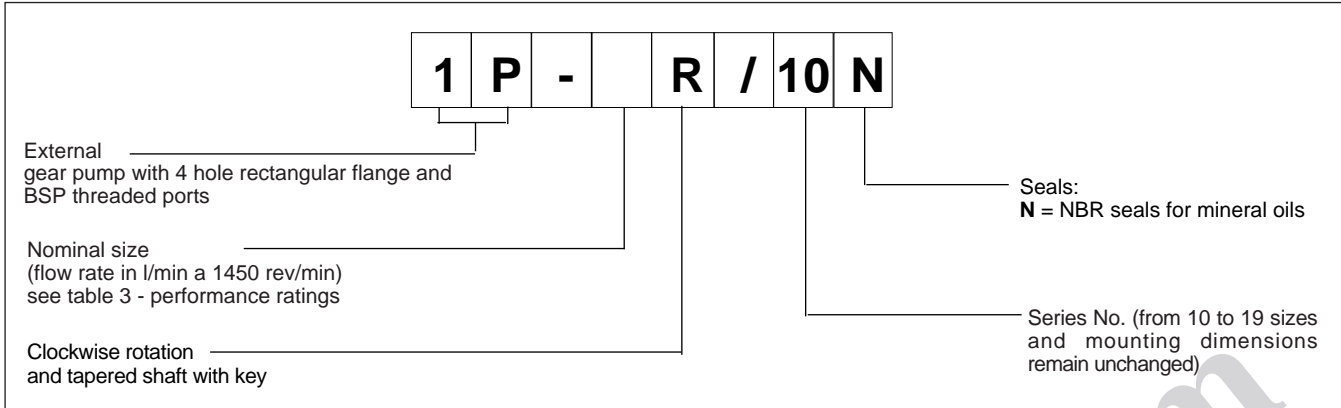
Ambient temperature range	°C	-20 ÷ +50
Fluid temperature range	°C	-15 ÷ +80
Fluid viscosity range	see par. 2.2	
Recommended viscosity	cSt	25 ÷ 100
Degree of fluid contamination	see par. 2.3	

HYDRAULIC SYMBOL





1 - CODIFICATION



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 70°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 NAS 1638 class 9; therefore, use of a filter with $\beta_{20} \geq 75$ is recommended. A degree of maximum fluid contamination according to NAS 1638 class 7 is recommended for optimum endurance of the pump. Hence, use of a filter with $\beta_{10} \geq 100$ is recommended.

In the event a filter is installed on the suction line, be sure that the pressure at the pump inlet is not lower than the values specified in par. 13. The suction filter must be equipped with a by-pass valve and, if possible, with a clogging indicator.

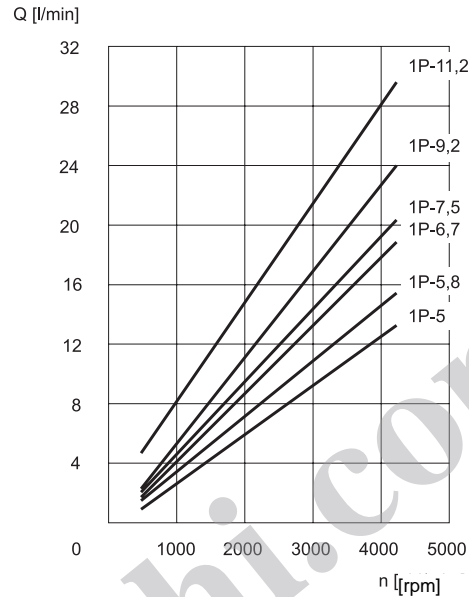
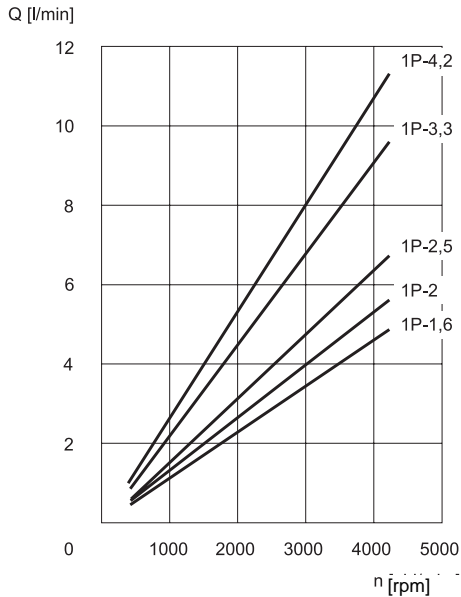
3 - PERFORMANCE RATINGS (values obtained with mineral oil with viscosity of 36 cSt at 50°C)

PUMP SIZE	NOMINAL SIZE	DISPALCEMENT [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	210	250	6000	600
	2	1,3	2,0				
	2,5	1,6	2,4				
	3,3	2,1	3,2				
	4,2	2,6	3,9	200	240	5000	
	5	3,2	4,8				
	5,8	3,7	5,5	180	220	4000	
	6,7	4,2	6,3				
	7,5	4,8	7,1				
	9,2	5,8	8,7	170	210	4000	
11,5	7,9	11,9	150	190	3000		



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



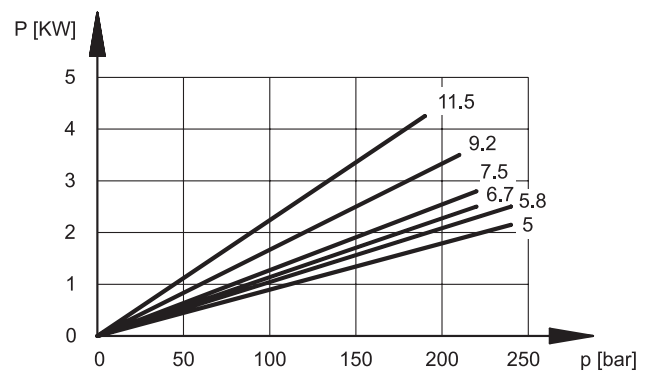
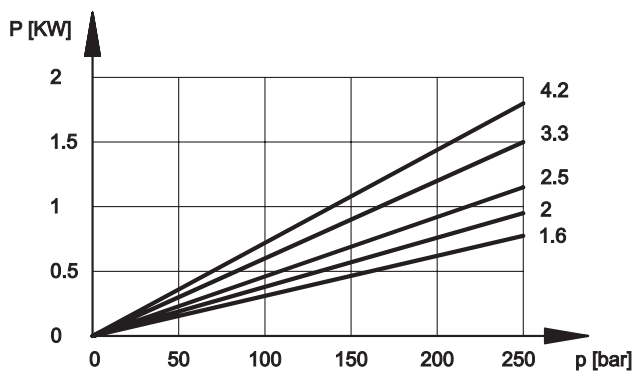
4.2 - Efficiencies

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)

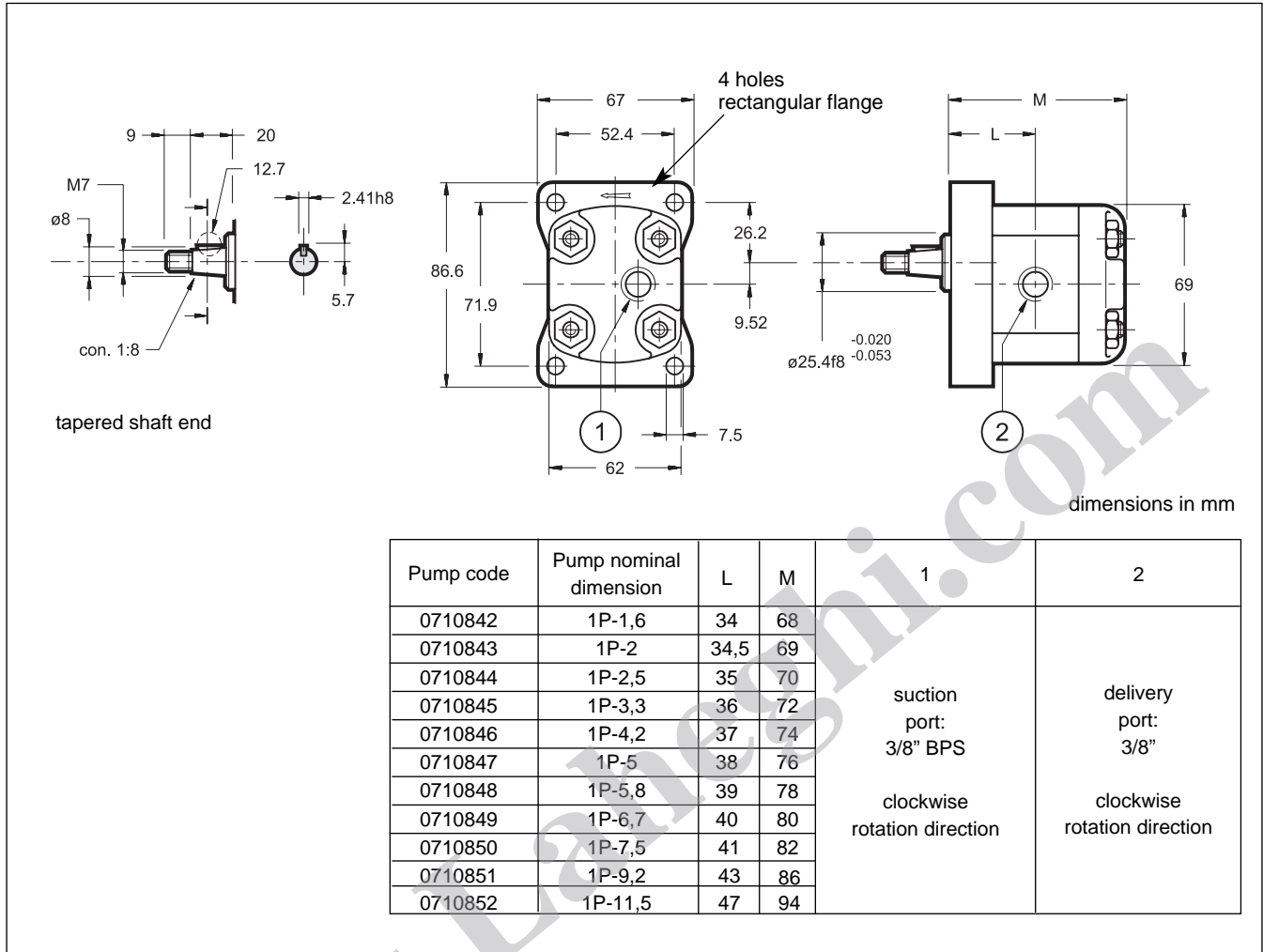
PUMP NOMINAL SIZE	NOISE LEVEL [dB (A)]
1,6	55
2	58
2,5	58
3,3	60
4,2	65
5	66
5,8	66
6,7	68
7,5	72
9,2	72
11,5	74

4.4 - Absorbed power / pressure (at 1500 rpm)





5 - OVERALL AND MOUNTING DIMENSIONS



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 2 ÷ 3 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 - performance ratings). 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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