

# Vane pump V3/12

NS 12 |  $p_{\max}$  10 MPa |  $Q_{\max}$  13 dm<sup>3</sup>/min | WK 414 501



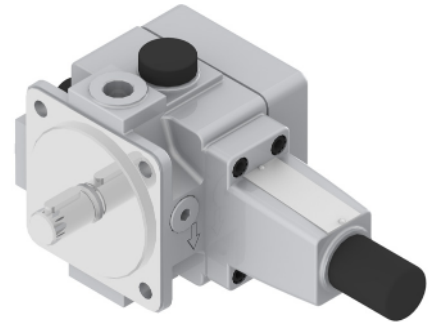
## DATA SHEET - INSTRUCTION MANUAL

### APPLICATION

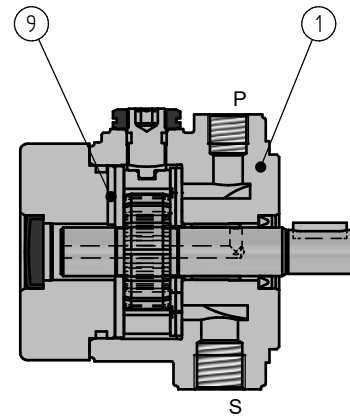
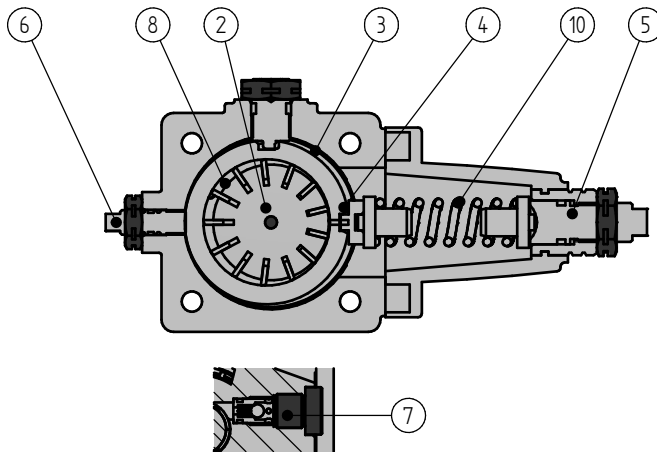
Vane pump type V3 is used for generation oil flow in hydraulic devices and systems.

Advantages of the pump:

- easy start-up thanks to automatic air bleeding
- low noise level
- long bearing life thanks to hydrodynamically lubricated plain bearings
- good sliding properties of control discs thanks to bronze-coating and semi-fluid friction.



### DESCRIPTION OF OPERATION



Hydraulic pumps type V3 are vane pumps of variable displacement and settable pressure. The pump V3/12 consists of the body 1, rotor 2 with vanes 3, stator 4, pressure setting 5, volume screw 6, valve for automatic air bleed 7 and control discs 9.

#### Suction and pumping

The chambers 8 used for moving the working fluid are created by two vanes 3, rotor 2, stator 3 and the discs 9. By rotation of the rotor in the right direction, the chambers 8 are separated from the suction side. When the rotation continues, they become connected with the pressure size, their volume decreases and the fluid is delivered through the pressure port P to the hydraulic system. The setting screw 6 is used for limiting the maximum volume of the fluid flow.

#### Setting up the pressure

The circular ring of the stator 4 is held by the spring 10 in eccentric position. The required maximum pressure in the system is set up by using the spring 10. After reaching the set-up pressure, the stator 4 shifts (overcoming the tension of the spring 10) changing the eccentricity of the position, until obtaining minimal flow com-

pensating the leakages. After a pressure drop in the system, the stator 4 goes back to its eccentric position and the pump obtains the full value of the set-up capacity.

#### Installation

Vane pumps type V3 can be installed in any positions. The pump may be connected to hydraulic systems only by means of flexible hydraulic hoses.

#### Drive

The axes of the pump and motor shafts must be in line (they must be coaxial). Make sure that the pump shaft ends do not transmit any axial or radial forces. The pump can be connected to the electric motor only by means of a flexible coupling with compliance with the coaxiality conditions as specified by the manufacturer of the coupling.

#### Oil tank

Capacity of the tank must be selected in such a way as to prevent excessive temperature rise of the oil. If it is not possible, oil coolers should be used.

### Suction line

The suction line should be designed in such a way as not to exceed the values of inlet pressure, specified in the table below. The leakage lines should be fitted minimum 100 mm above the suction line and should be formed in such a way that the leakages do not get immediately sucked back into the pump. The suction

lines and the leakage lines should be at least 200 mm apart. The pipe ends should be cut at a 45° angle and should not reach within 50 mm of the tank bottom. All pipelines even at the minimum oil level in the tank must be dipped minimum 50 mm in order to avoid the build-up of foam.

## TECHNICAL PARAMETERS

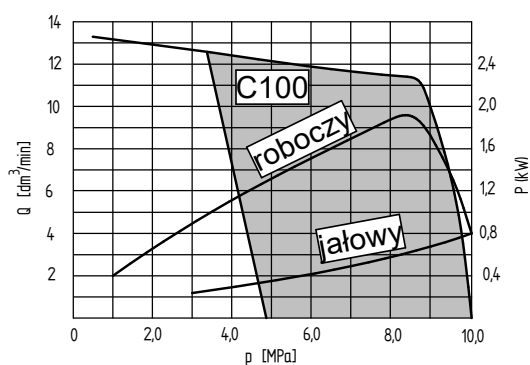
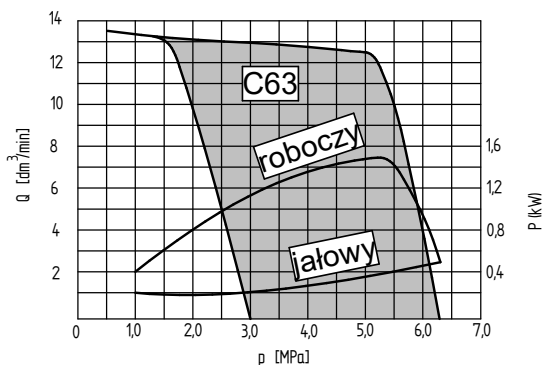
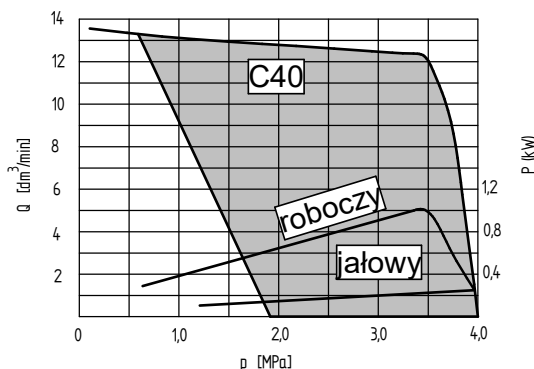
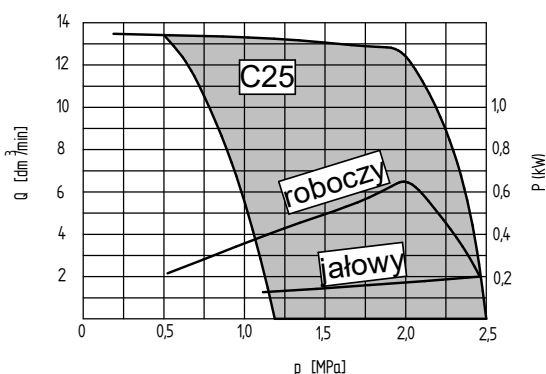
|                                   |                                                              |                                              |                                                     |
|-----------------------------------|--------------------------------------------------------------|----------------------------------------------|-----------------------------------------------------|
| hydraulic fluid                   | mineral oil                                                  | number of rotations per minute               | 1000 ÷ 1800 min <sup>-1</sup>                       |
| required cleanliness class of oil | ISO 4406 class 20/18/15                                      | pressures range depending on the spring type | C25 1,2 ÷ 2,5 MPa                                   |
| nominal fluid viscosity           | 37 mm <sup>2</sup> /s at temp. 55°C                          |                                              | C40 2,0 ÷ 4,0 MPa                                   |
| viscosity range                   | p <sub>rob</sub> < 6,3 MPa 16 ÷ 160 mm <sup>2</sup> /s       |                                              | C63 3,0 ÷ 6,3 MPa                                   |
|                                   | p <sub>rob</sub> > 6,3 MPa 25 ÷ 160 mm <sup>2</sup> /s       |                                              | C100 5,0 ÷ 10 MPa                                   |
| fluid temp. range (in the tank)   | 40 ÷ 55°C                                                    | mounting method                              | flange mounting                                     |
| ambient temperature range         | -10 ÷ 70°C                                                   | direction of rotation                        | right                                               |
| max. flow capacity                | 13 dm <sup>3</sup> at n = 1450 min <sup>-1</sup> p = 1 MPa   | connection method                            | threaded connections                                |
| pressure                          | at the inlet - 0,02 (underpressure) ÷ 0,5 MPa (overpressure) |                                              |                                                     |
|                                   | at the outlet max. 10 MPa                                    | shaft loading                                | the shaft cannot transfer any axial or radial loads |
| leakage pressure                  | max. 0,2 MPa                                                 | weight                                       | 6,25 kg                                             |
| torque                            | max. 54 Nm                                                   |                                              |                                                     |

assembly and operation requirements at: [www.operating-conditions.ponar.pl](http://www.operating-conditions.ponar.pl)

## PERFORMANCE CURVES

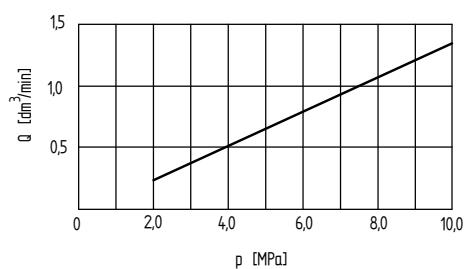
measured at viscosity  $\nu = 41 \text{ mm}^2/\text{s}$  and temperature  $t = 50^\circ\text{C}$

performance curves of flow rate in relation to working pressure and power consumption for working and constant (leakage) flow rate, measured at 1450 min<sup>-1</sup>

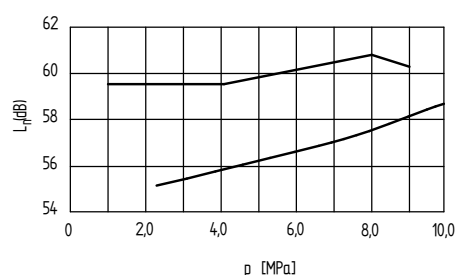


## PERFORMANCE CURVES cd.

leakages in relation to working pressure.

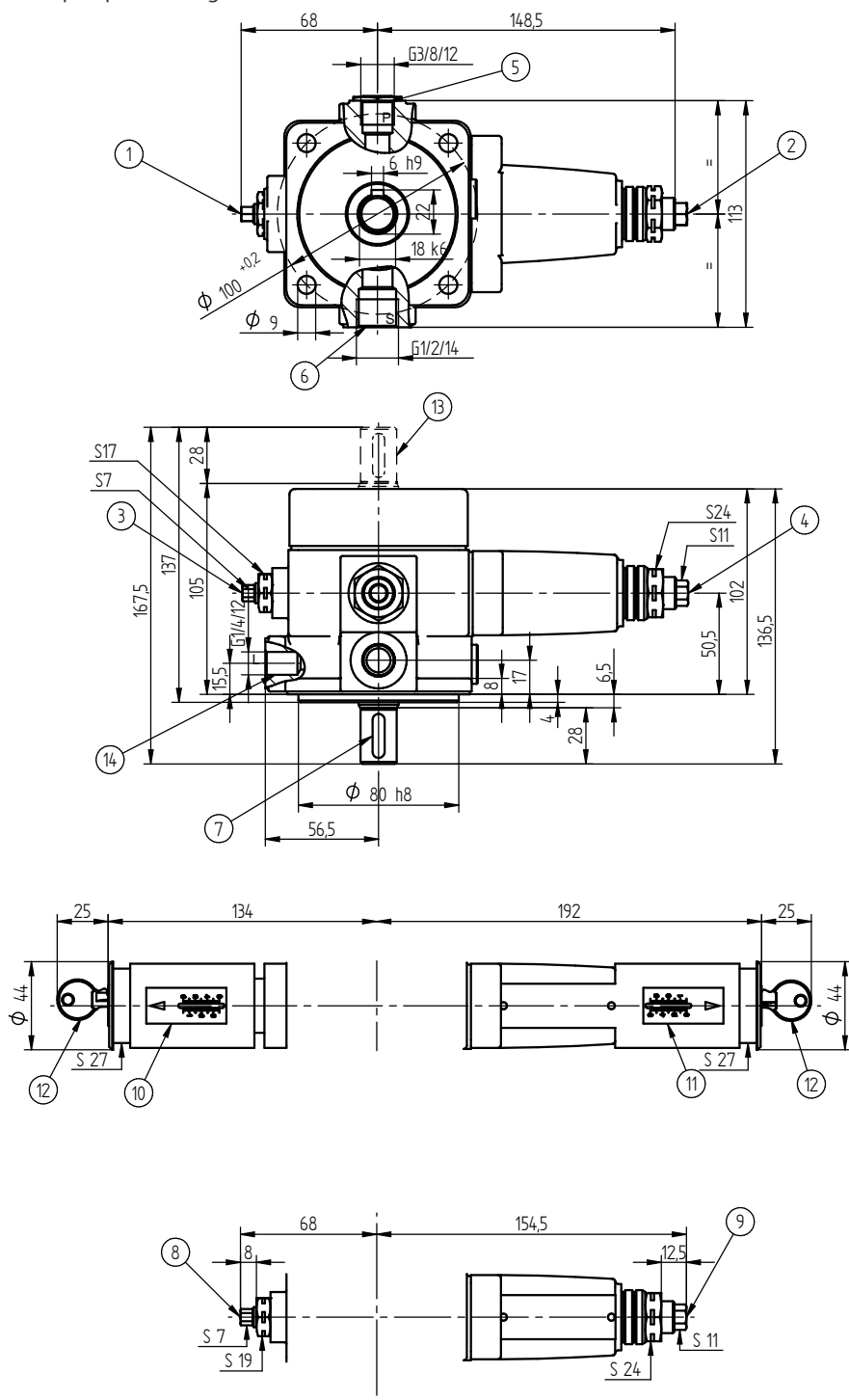


noise level in relation to working pressure at resetting and pumping.  
Measured at the distance of 1m.



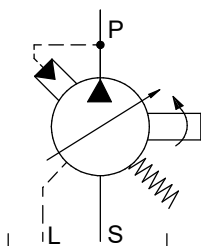
## OVERALL AND CONNECTION DIMENSIONS

pump with flange connection



1. flow rate setting:
  - rotation to the right decreases flow rate
  - rotation to the left increases flow rate
2. pressure setting:
  - rotation to the right increases working pressure
  - rotation to the left decreases working pressure
3. flow rate setting (by means of a setting screw A)
4. pressure setting (by means of a setting screw C)
5. pressure connection
6. suction connection
7. drive shaft for version with right directions
8. flow rate setting with an external square end H
9. pressure setting with an external square end H
10. flow rate setting with a key lock S
11. pressure setting with a key lock S
12. key length 43 mm
13. second end of the shaft
14. leakage drain

## HYDRAULIC DIAGRAM



## HOW TO ORDER

1PV2V3 —  /  12   1       1 \*

1                      2                      3                      4                      5                      6                      7                      8                      9                      10

### 1 series number

**series 31 =** **31**  
(30 ÷ 39) - connection and installation dimensions unchanged

### 2 nominal output size (NS)

NS12 = **12**

### 3 direction of rotation

**right =** **R**  
version with 2 shaft ends = **D**

### 4 connection type

threaded connection = **1**

### 5 seal type

**NBR (for fluids on mineral oil base) =** **M**  
FKM (for fluids on phosphate ester base) = **V**

### 6 pressure setting method

**with a hexagon head screw =** **C**  
with a square head screw = **H**  
pressure adjustment with a key lock = **S**

### 7 zero stroke pressure range

2,5 MPa = **25**  
4,0 MPa = **40**  
6,3 MPa = **63**  
10,0 MPa = **100**

### 8 flow setting

**with a hexagon head screw =** **A**  
with a square head screw = **H**  
flow regulator with a key lock = **S**

### 9 air bleed valve

air bleed valve = **1**

### 10 further requirements = \*

(to be agreed upon with the manufacturer)

Ø indicates that the box should be left blank.

The symbols in **bold** are the preferred versions available in short delivery time.

Coding example: **1PV2V3-31/12R1MC100A1**

## CONTACT

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