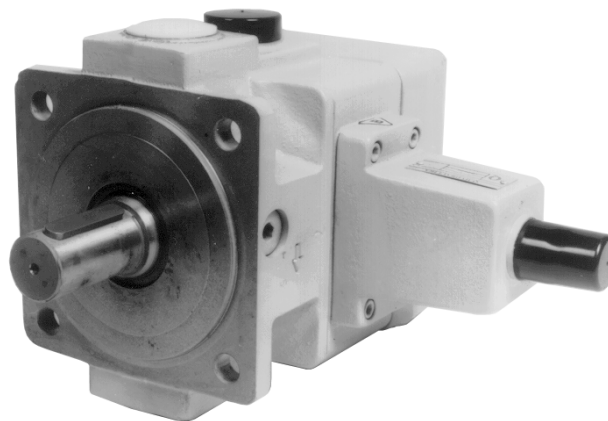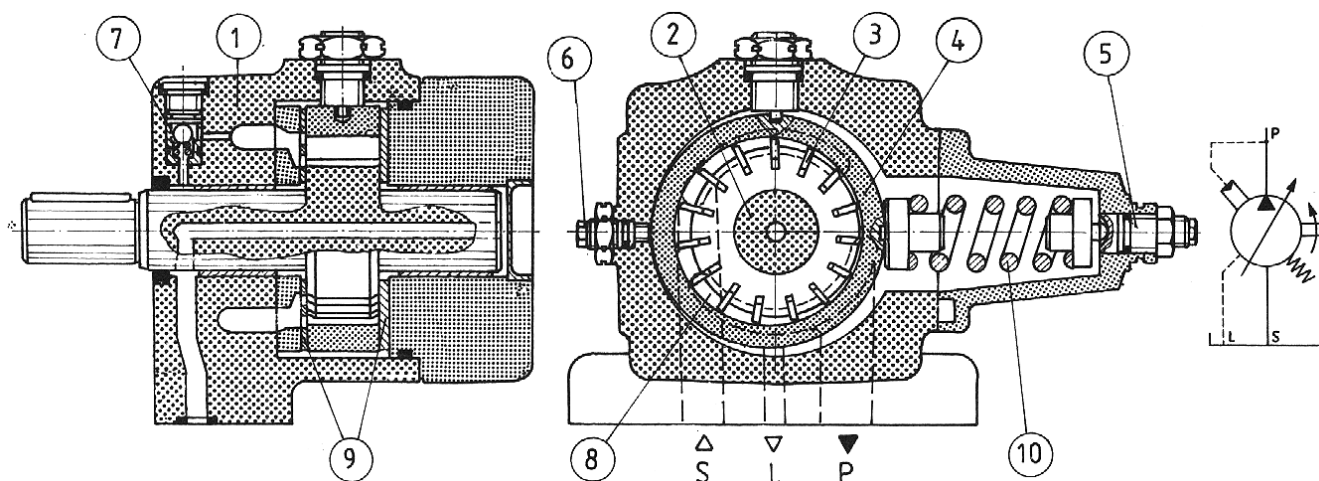Vane pumps type PV serve to generate an oil flow in hydraulic systems.

ADVANTAGES

- easy commissioning by automatic air bleeding
- low noise level
- hydrodynamically lubricated bearings for long bearing life
- good sliding characteristics of control discs due to bronze coating and semi-fluid friction.

DESCRIPTION OF OPERATION

Hydraulic pumps type V3 are vane pumps with variable displacement and pressure control. Pumps type V3/40 are composed of a housing 1, rotor 2 with simple vanes 3, stator 4, pressure regulator 5, volume screw 6, valve for automatic air bleed 7 and control discs 9.

Suction and delivery

Two vanes 3, the rotor 2, the stator 4 and the discs 9 form the chambers for the transport of the fluid. By moving the rotor 2 to the right the chambers 8 increase, starting from the suction channel and they fill up with fluid. When these chambers have reached their maximum volume they are separated from the suction side by means of the control discs. When the rotor further turns to the right the chambers are connected to the pressure side. They decrease their volume and thus fluid is pushed to the pressure channel P and into the system. Volume setting screw 6 is designed for limiting the maximum flow of the pump.

Pressure setting

The circular stator ring is kept in an eccentric position by means of the spring 10. Maximum working pressure required in the system is adjusted by the spring 10. On reaching the set pressure the stator 4 (overcoming resistance of the spring 10) moves out of its eccentric position. The eccentricity decreases till the minimum flow replacing the leakage oil is obtained. After a pressure drop in the systam the stator 4 returns to the eccentric position and the pump delivers the full value of the set output flow.

Installation

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

Drive

The pump may be connected to motor only by means of a flexible coupling. All the coaxial conditions formulated by the coupling manufacturer must be maintained.
The shaft ends of both pump and motor may not transmit any longitudinal or radial forces.

Oil tank

The tank capacity must be properly selected so that the working temperature of oil do not exceed recommendations. If that is impossible a cooler must be installed.

Pipelines

The suction line should be designed so that the gives values of inlet pressure are not exceeded. The leakage lines should be fitted minimum 100 mm above the suction line and should be formed so that the leakages do not get immediately sucked back into the pump.
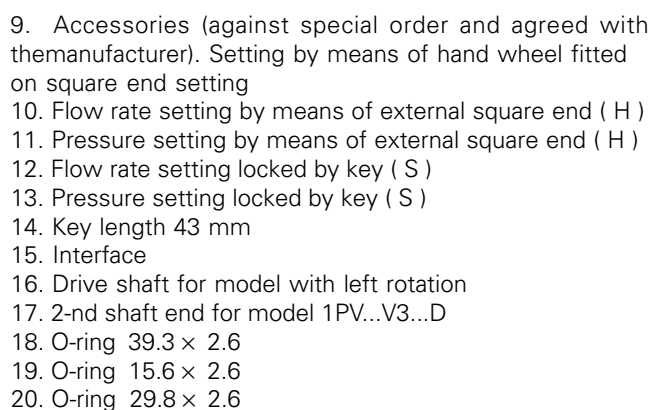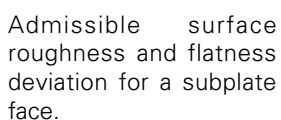The suction lines and the leakage lines should be at least 200 mm apart. The pipe ends should be cut at a 45° angle and should not reach within 50 mm of the tank bottom.

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 DATA

Hydraulic fluid		
Nominal output flow	dm³/ min	47 at n = 1450 min⁻¹ p = 1 MPa
Inlet pressure	MPa	- 0,02 to + 0,5
Outlet pressure	MPa	max. 10
Leakage pressure	MPa	max. 0,2
Torque (drive shaft)	Nm	max 235
Revolution per minute	min⁻¹	1000 do 1800
Nominal viscosity range - at pzero stroke < 6.3 MPa - at pzero stroke > 6.3 MPa	mm²/ s mm²/ s	16 to 160 25 to 160
Working temperature (fluid in a tank)	K	313 - 328
Fluid temperature range	K	263 - 343
Filtration	µm	16 (recommended 10 for long working life)
Pressure range related to spring force	MPa	C 25 from 1,2 to 2,5 C 40 from 2,0 to 4,0 C 63 from 3,0 to 6,3 C100 from 5,0 to 10,0
Mounting method		flange mounting
Direction		right
Pipe connections		threaded connections
Shaft loading		radial or axial loads can not be transferred
Weight	kg	26,5

OVERALL AND MOUNTING DIMENSIONS

Pump for subplate mounting -
overall dimensions in mm

☐ 0,01/100mm

Admissible surface roughness and flatness deviation for a subplate face.

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 operating pressure
   - rotation to the left decreases operating pressure
3. Flow rate setting (by means of screw A)
4. Pressure setting (by means of screw C)
5. Pressure port
6. Leakage port
7. Suction port
8. Drive shaft for model with right rotation

9. Accessories (against special order and agreed with themanufacturer). Setting by means of hand wheel fitted on square end setting
10. Flow rate setting by means of external square end (H)
11. Pressure setting by means of external square end (H)
12. Flow rate setting locked by key (S)
13. Pressure setting locked by key (S)
14. Key length 43 mm
15. Interface
16. Drive shaft for model with left rotation
17. 2-nd shaft end for model 1PV...V3...D
18. O-ring 39.3 × 2.6
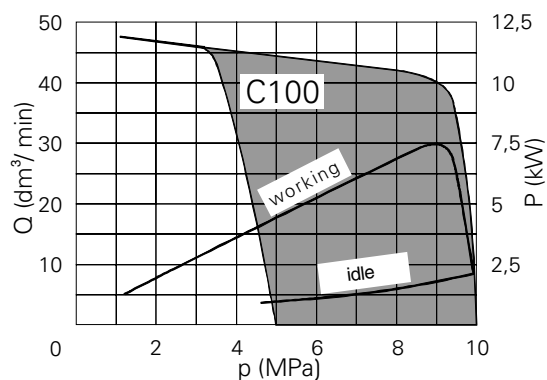19. O-ring 15.6 × 2.6
20. O-ring 29.8 × 2.6

OVERALL AND MOUNTING DIMENSIONS

Pump for flange mounting - overall dimensions in mm

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 operating pressure
   - rotation to the left decreases operating pressure
3. Flow rate setting (by means of screw A)
4. Pressure setting (by means of screw C)
5. Pressure port
6. Leakage port
7. Suction port
8. Drive shaft for model with right rotation
9. Accessories (against special order and agreed with the manufacturer). Setting by means of hand wheel fitted on square end setting
10. Flow rate setting by means of external square end (H)
11. Pressure setting by means of external square end (H)
12. Flow rate setting locked by key (S)
13. Pressure setting locked by key (S)
14. Key length 43 mm
15. 2-nd shaft end for model 1PV...V3...D

PERFORMANCE CURVES : measured at $\nu = 41$ mm ^{2}/s and T = 323 K and n = 1450 min^{-1}

Flow - operating pressure - drive power curves for delivering and zero stroke.

C25

Q (dm³/ min)

P (kW)

50 40 30 20 10

5 2,5

working

idle

0   0,5   1   1,5   2   2,5

p (MPa)

C40

Q (dm³/ min)

P (kW)

50 40 30 20 10

12,5 10 7,5 5 2,5

working

idle

0   1   2   3   4

p (MPa)

C63

Q (dm³/ min)

P (kW)

50 40 30 20 10

12,5 10 7,5 5 2,5

working

idle

0   1   2   3   4   5   6   7

p (MPa)

C100

Q (dm³/ min)

P (kW)

50 40 30 20 10

12,5 10 7,5 5 2,5
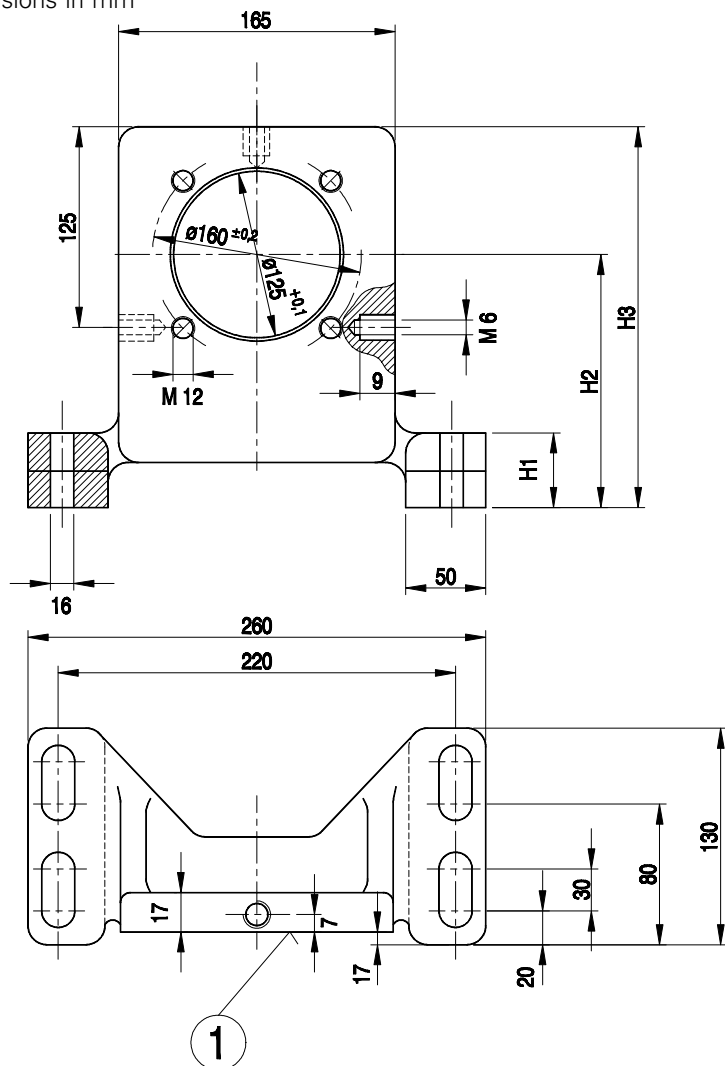
working

idle

0   2   4   6   8   10

p (MPa)
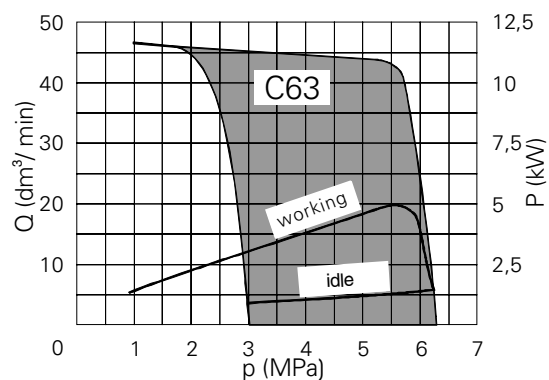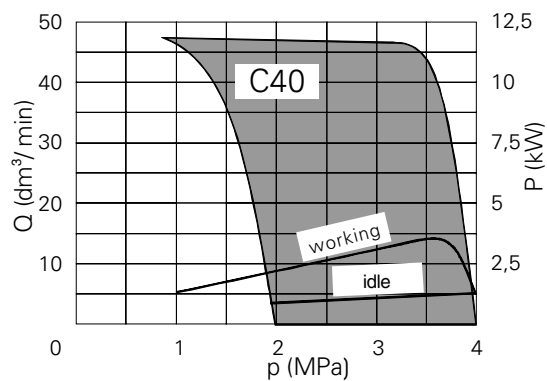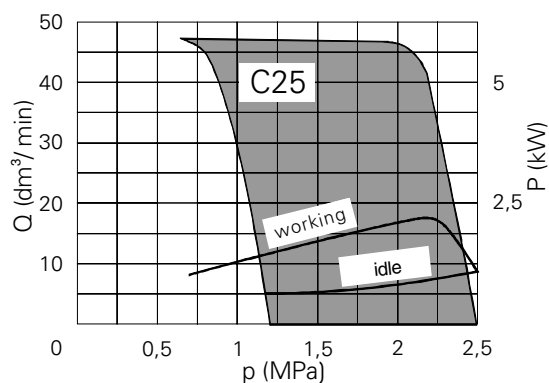
Leakage - operating pressure curve
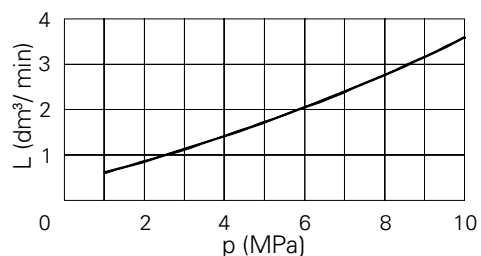
Noise level - operating pressure curves at zero stroke and delivering, measured at distance of 1 m from pump.

L (dm³/ min)

4 3 2 1

0   2   4   6   8   10

p (MPa)

(dB$_A$)

70 65 60 55

①
②

0   2   4   6   8   10

p (MPa)
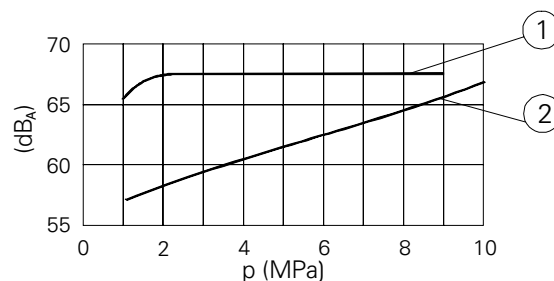
1 - noise level when delivering
2 - noise level at zero stroke

Single-flange bracket - overall dimensions in mm

1 - pump side

Overall dimensions for single-flange bracket related to motor size

Drive power in kW	H1	H2	H3
5,5 ... 7,5	15	132 $^{\pm0,2}$	207
11 ... 15	43	160 $^{\pm0,2}$	235
18,5 ... 22	63	180 $^{\pm0,2}$	255

Subplate - overall dimensions in mm

1- mounting face

Two-flange bracket - overall dimensions
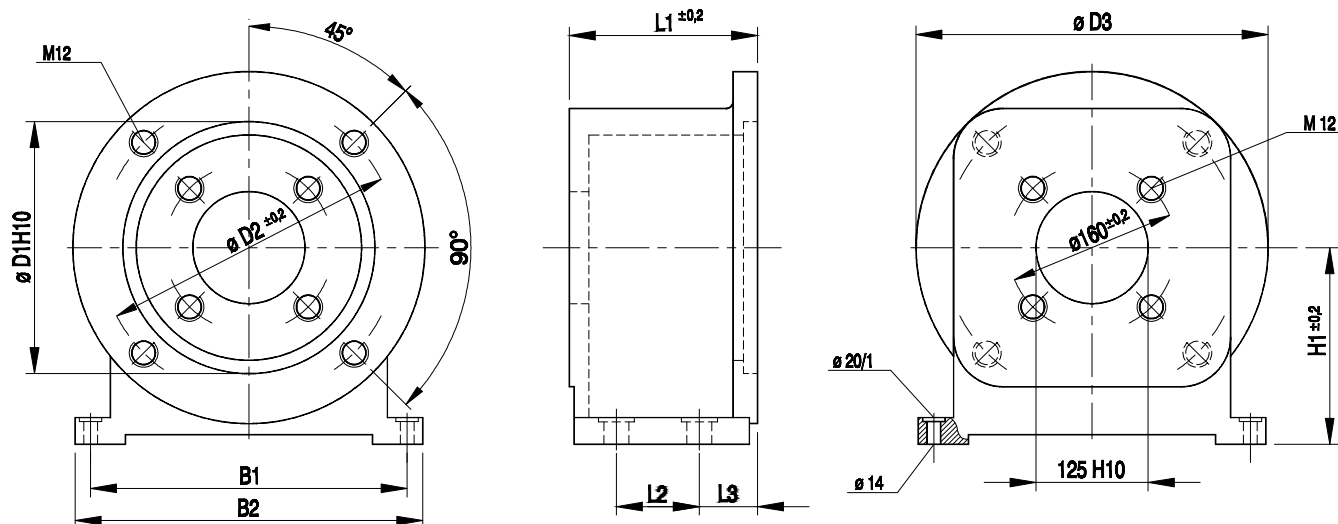
1- pump flange
2. motor flange

Drive power in kW	B1 ±0.2	B2	D1	D2	D3	H1	L1	L2	L3	Weight
2,2 ... 4	220	250	180H10	215	250	132	122	60	42	4 kg
5,5 ... 7,5	260	290	230H10	265	304	160	142	80	32	5,5 kg

WK 144 618

HOW TO ORDER

Orders coded in the way showed below should be forwarded to the manufacturer.

1 PV		V3–	/40								*

Mounting method
Flange = 2
Subplate = 6

Series number
20 = 20
(20 - 29) - Installation and connection dimensions unchanged

Rotation direction :
Right = R
Left = L
Model with double shaft = D

Connection method
Threaded connections = 1
Subplate = 8

Sealing
For fluids on mineral oil base = M
For fluids on phosphate ester base = V

Pressure setting
With hexagon end screw = C
With square end scr = H
Lockable pressure regulator = S

Zero stroke pressure range
10 MPa zero stroke pressure = 100
6.3 MPa zero stroke pressure = 63
4.0 MPa zero stroke pressure = 40
2.5 MPa zero stroke pressure = 25

Flow setting
With hexagon end screw = A
With square end screw = H
Lockable flow regulator = S

Air bleed valve = 1

Additional requirements in clear text (to be agreed with the manufacturer)

Coding example : 1PV2V3-20/40R1MC100A1

WK 144 618