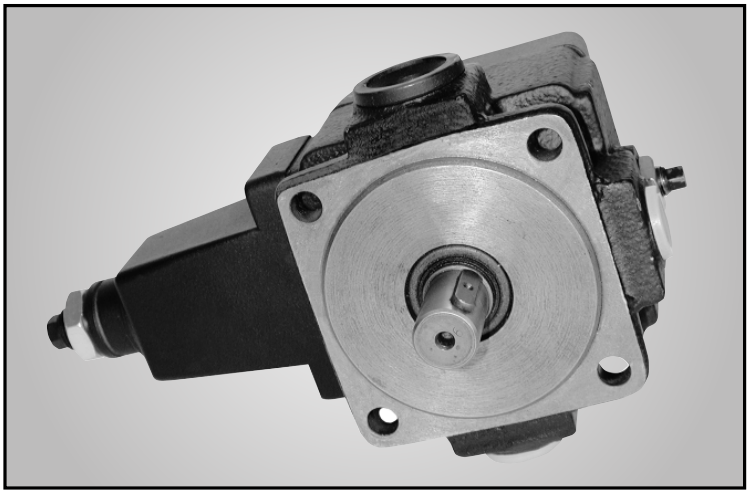
V3 (series 30 & 40)



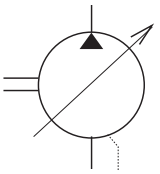
VARIABLE VANE PUMPS

|KE 1015| 09/13 |

V_g = 8.5; 19; 32; 47 cm³/rev | p_n < 10 MPa

Hydraulic pumps of type V3 are rotating vane pumps with simple vanes and adjustable displacement enabling fixed pressure regulation.

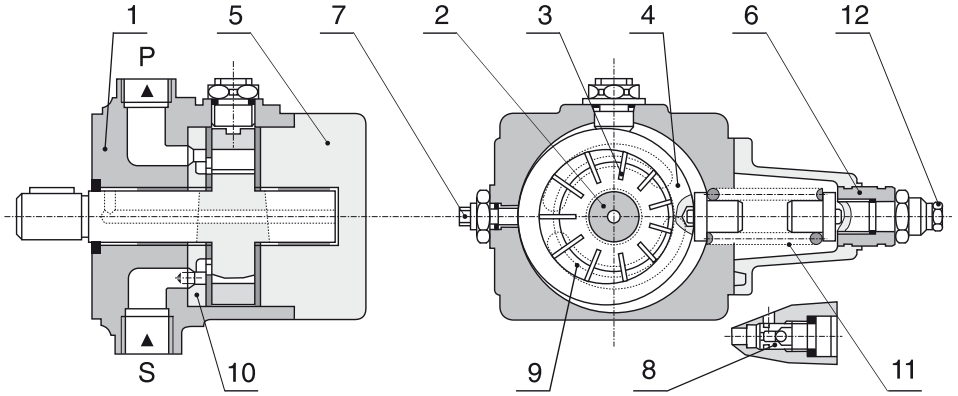
n = 950 ~ 1800 | p_n up to 10 MPa | low noise level | high bearing durability | high reliability | automatic air bleed valve



FUNCTIONAL DESCRIPTION

Variable vane pumps of type V3 consist of a housing **1**, rotor **2** with simple vanes **3**, stator **4**, cover **5**, pressure regulator **6**, volume adjustment screw **7** and the automatic air bleed valve **8**. The chambers **9** for the fluid transport are each formed by two vanes **3**, the rotor **2** , the stator **4**, the control plates **10** and the cover **5**. These chambers **9** are rotated with the rotation of the rotor **2** and as they become larger are filled with fluid from the suction channel. When the maximum volume is reached, the chambers **9** are separated from the suction side. Further rotation of the rotor **2** causes connection of the chambers to the pressure side. As the chambers **9** reduce their volume the fluid is delivered to the pressure port P. Desired output flow can be adjusted by volume adjustment screw **7**.

P - Pressure
S - Suction



ORDERING CODE

1 P V 2 V 3 – □□ / □□ R A 0 1 M C □□ □ 1 *

1 P V	Vane pumps with variable geometrical displacement
2	Flange mounting
V3	Vane pumps type V3
30	Series 30 - nominal size 40, 63
40	Series 40 - nominal size 12, 25
	NOMINAL SIZE
12	8.5 cm³/rev
25	19 cm³/rev
40	32 cm³/rev
63	47 cm³/rev
R	Clockwise rotation (shaft-side view)
A	One cylindrical shaft end
	P & S PORT CONNECTION
01	Pipe cylindrical threads (see dimensions)
*	Further details
1	With air bleed valve
	DISPLACEMENT ADJUSTMENT METHOD
A	Fine hex adjustment screw
	PRESSURE AT ZERO STROKE
100	10 MPa
63	6.3 MPa
40	4 MPa
25	2.5 MPa
	OPERATING PRESSURE ADJUSTMENT METHOD
C	Fine hex adjustment screw
	OPERATING FLUID
M	Mineral oil according to DIN 51 524

PRESSURE REGULATION

The stator ring is held in an excentric position by spring **11**, which set the maximum working pressure of the system. Any resistance to the flow in the system creates a pressure within the pressure side of the pump and thereby on the internal running surface of the stator against the force of the spring **11**. As soon as the pressure force reaches the set spring force, the stator ring **4** is moved out of its excentric position in direction to zero flow position. The output flow then adjusts itself to a value which maintains this condition. If the spring reaches its highest set pressure, the pump output becomes almost zero, i.e. the working pressure is maintained and only the leakage oil is replaced. By this means, power loss and heat input and heat loss transfer to the fluid is kept as low as possible.

INSTALLATION, SERVICE AND MAINTENANCE

The pump can be installed in any desired position. The shaft ends of both pump and motor must be in line. Please note that no longitudial or radial load may be applied to the shaft of the pump, therefore the drive must be transmitted via a flexible coupling. Rotex or Bowex flexible couplings are recommended.

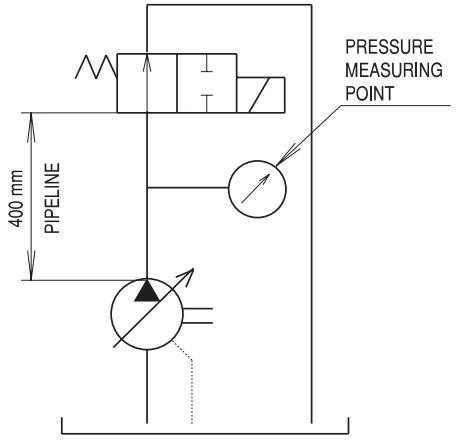
OIL TANK AND FILTRATION

The contents of the tank must accomplish the drive requirements, so that the working temperature must not exceed recommended level. if necessary a cooler must be fitted. Usage of pressure oil filter or a filter in return channel T is recommended. If a suction filter is used then an underpressure switch must be fitted.

PIPELINES AND CONNECTIONS

The suction line should be fitted so that the given values are not exceeded. A maximum speed in pipes is 0.5 m/s. A permissible underpressure level must not be exceeded in case of long pipes or when the suction filters are used. All return and leakage lines should be arranged so that return oil may not, under any conditions, be immediately sucked back into the pump. All lines must finish sufficiently far bellow the minimum oil level in the tank (approx. 50 mm) in order to avoid the build-up of foam. The pipe end should be cut at 45° angle, and should not come within 50 mm of the tank bottom, so that any dirt lying there does not get sucked up. The case drain line should be arranged approx. 100 mm higher than the suction line, and should be turned through 90° so that the case drain oil cannot come in direct contact with the suction stream. If possible, both pipe openings should be at least 200 mm apart. Furthermore the leakage line must be drained to the tank without pressure. When the pump isreducing towards zerostroke position, pressure peaks can occur. For the circuit illustrated, the following values were measured.

Stall pressure	Pressure peaks			
	V3/12	V3/25	V3/40	V3/63
100 Bar	175 Bar	180 Bar	190 Bar	210 Bar
63 Bar	125 Bar	130 Bar	140 Bar	130 Bar
40 Bar	105 Bar	110 Bar	120 Bar	120 Bar
25 Bar	65 Bar	70 Bar	80 Bar	80 Bar



HYDRAULIC MEDIUM

High quality oil is recommended (see technical data). Oil should not be mixed with other types. It would result in their decomposing and reducing lubricating capabilities. In certain periods it is necessary to change oil and clean up the tank from deposits.

BEFORE FIRST OPERATION

Make sure the equipment is clean and properly assembled. Hydraulic medium must be put into the tank only through a filter. Mind a direction of rotation. Start the pump unloaded and let it work several seconds in this state to secure sufficient lubrication. If the pump delivers foamed oil with bubbles after 20 seconds, it is necessary to checkup whole system, especially the suction line.

AIR BLEEDING

It is necessary to bleed the hydraulic system at first pump starting, especially when the outlet pipe system is closed. This is reached by an automatic bleed valve mounted by a standard way. Closing pressure of the valve is 5 bar, opening 1 bar. If the pressure in outlet port falls under 5 bar then part of oil flows through the bleed valve to leakage pipe. Then the valve must be replaced by a plug.

ATTENTION !

In case that difference of temperature between the hydraulic oil and the pump is more than 20°C during a start of the pump it is recommended to start the pump by short pulses (switch on approx. 1 sec. and switch off approx. 5 sec.) to prevent of seizure. In the case that hydraulic oil is heated by meaning of heater it is necessary to switch on the pump in the same time.

DELIVERY & MATERIAL

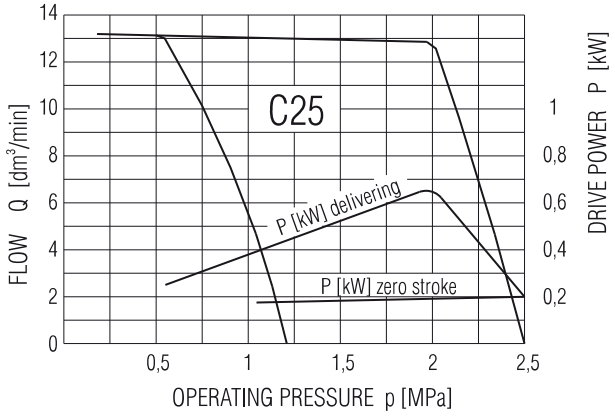
The pumps are delivered assembled, the outer surfaces of the pumps are primed. The pump top coat can be carried out in agreement with the producer. The spare parts, fastening bolts and connections are not parts of delivery. Production matrials used are cast iron, steel and non-ferrous metals.

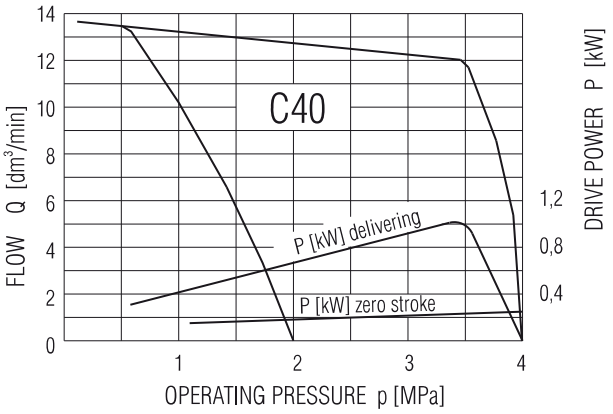
TECHNICAL DATA

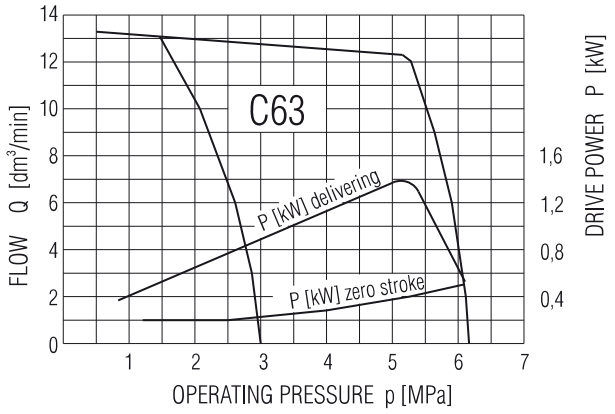
Technical data	**Symbol**	**Units**	**Nominal sizes**			
			V3/12	V3/25	V3/40	V3/63
Nominal displacement	V_g	cm^3/rev	8,5	19	32	47
Nominal output flow at n = 1450 rpm, p = 1MPa	Q_n	dm^3/min	13	27,5	47	67
Speed range	n	min^{-1}	950 up to 1800			
Spring type			C25, C40, C63, C100			
Pressure range	p	MPa	1,2...2,5 2,0...4,0 3,0...6,3 5,0...10			
Operating pressure: input outlet	p	MPa	0,02 (underpressure) up to 0.5 (overpressure) max. 10,0 (by the spring) – continuous op. pressure			
Leakage port	p	MPa	max. 0,2			
Max. torque (drive shaft)	M_k	Nm	54	61,8	235	353
Hydraulic medium			mineral oils HLP DIN 51 524 part 2			
Temperature range	t_{po}	°C	–10 up to +70			
Fluid filtration		µm	25 ($ß_{20} \geq 100$) 10 µm is recommended in order to achieve long working life with heavy loading, high duty and low viscosity			
Oil viscosity range	ν	m^2/s	$16 \cdot 10^{-6}$ up to $160 \cdot 10^{-6}$ at operation temperature and zero stroke pressure < 6,3 MPa $25 \cdot 10^{-6}$ up to $160 \cdot 10^{-6}$ at operation temperature and zero stroke pressure > 6,3 MPa max. $800 \cdot 10^{-6}$ when starting up and oil delivering max. $200 \cdot 10^{-6}$ when starting up at zero stroke			
Efficiency			See Efficiency curves			
Weight	kg	m	6.25	11.1	26.5	29.5

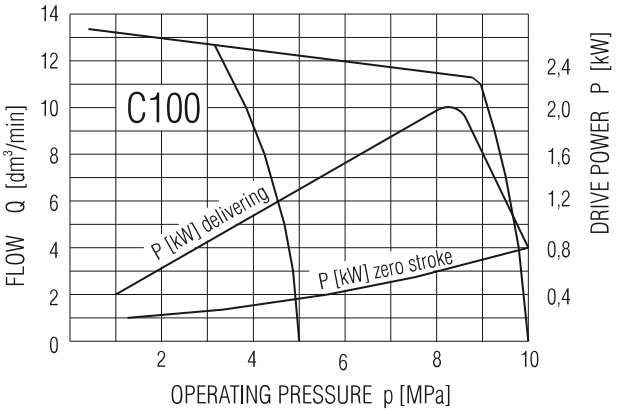
PERFORMANCE CURVES V3/12

Note: measured at n = 1450 rpm, ν = 36mm2/s, t = 50°C



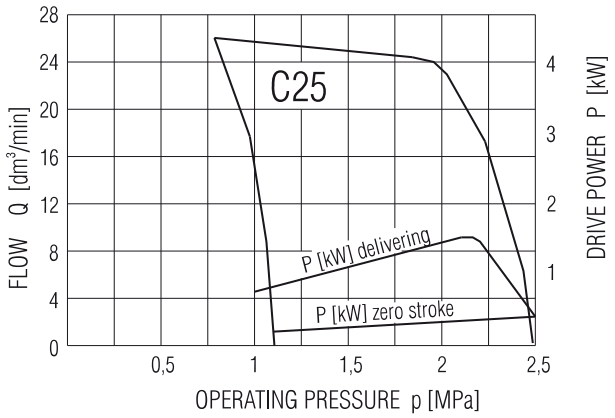


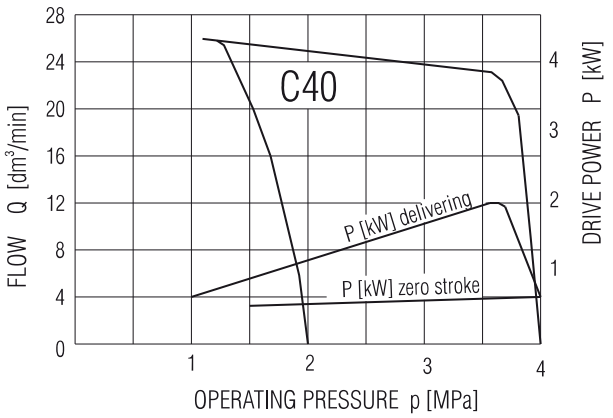


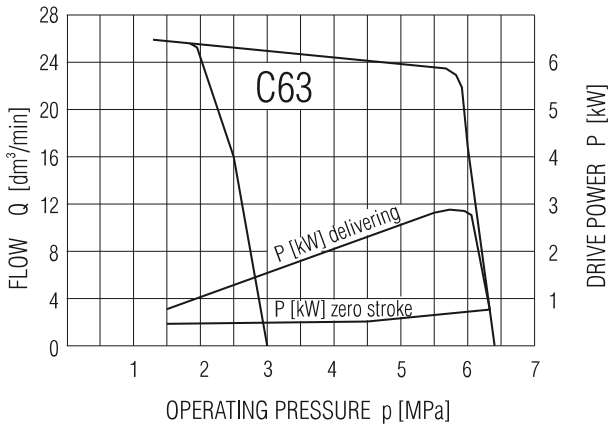


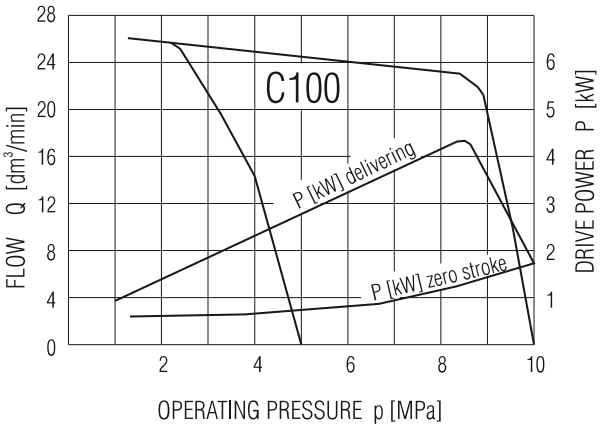
PERFORMANCE CURVES V3/25

Note: measured at n = 1450 rpm, ν = 36mm2/s, t = 50°C

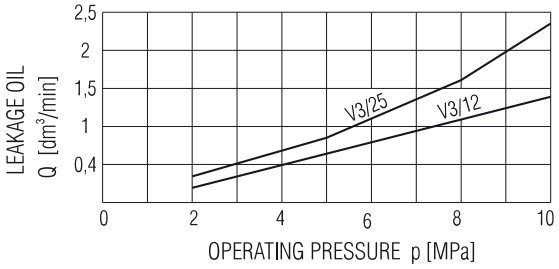




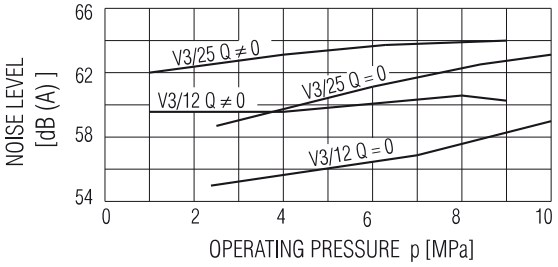




measured after 10 min. at zero stroke

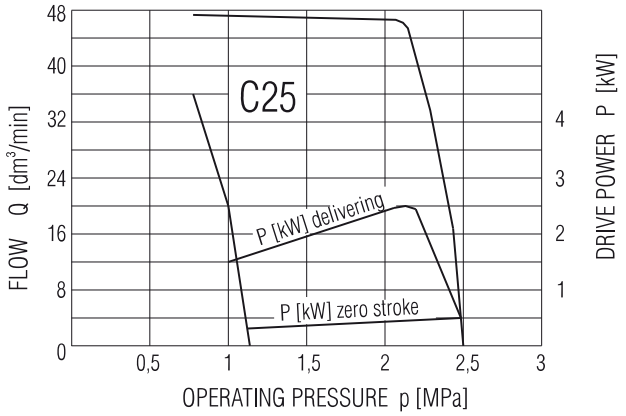


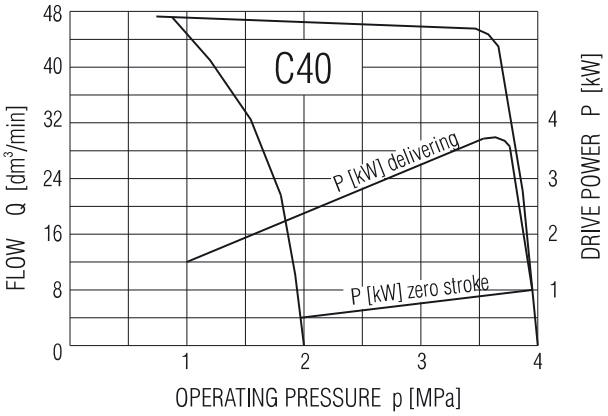
measured in noise measurement chamber DIN 45 635 sheet 1
measured at distance of 1 m from the pump

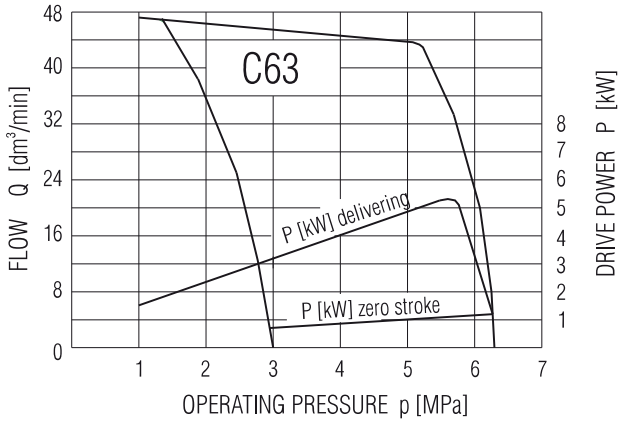


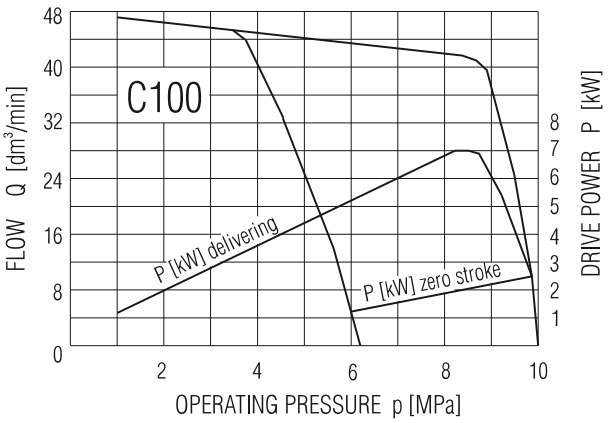
PERFORMANCE CURVES V3/40

Note: measured at n = 1450 rpm, ν = 36mm2/s, t = 50°C

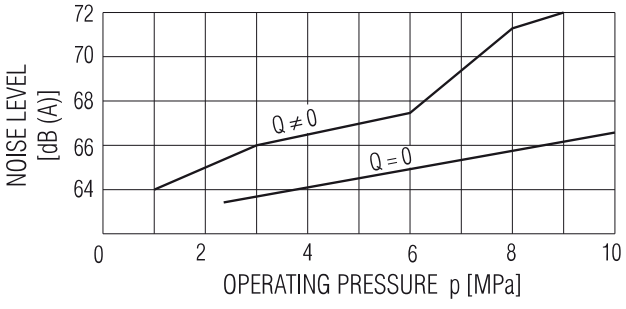




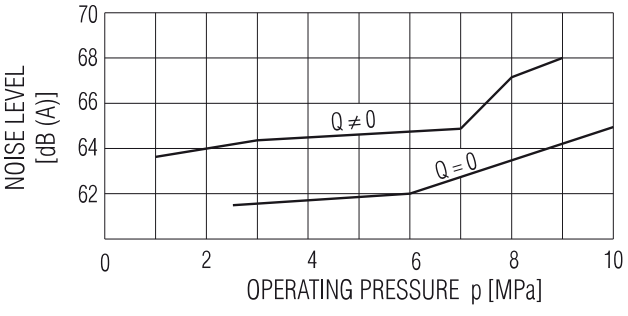




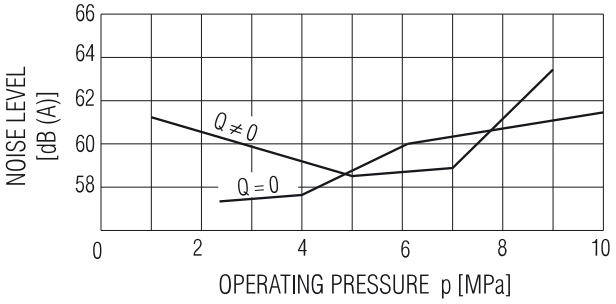
measured in noise measurement chamber DIN 45 635 sheet 1
at distance 1m from the pump at n = 1800 rpm



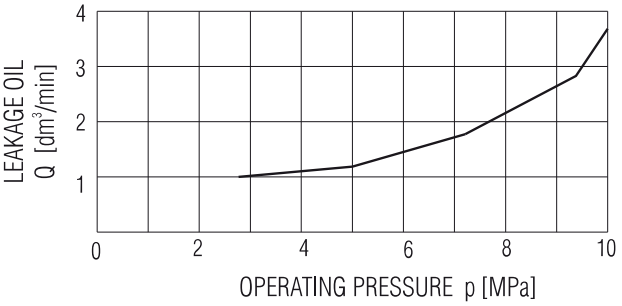
at n = 1450 rpm



at n = 1000 rpm

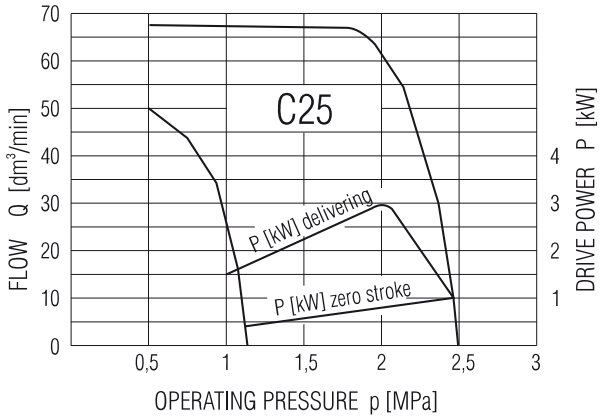


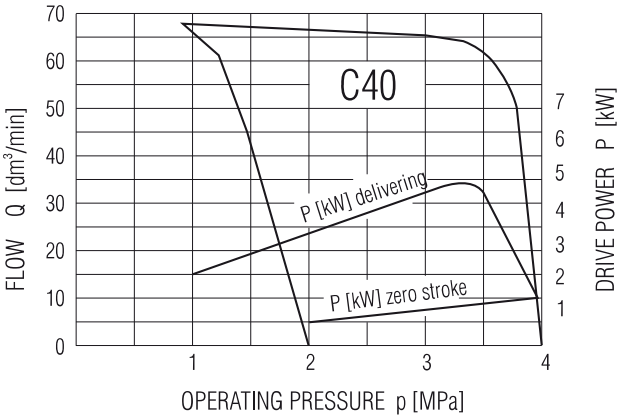
measured after 10 minutes at zero stroke

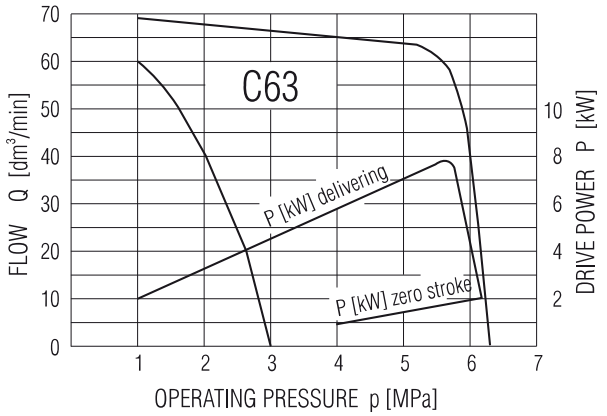


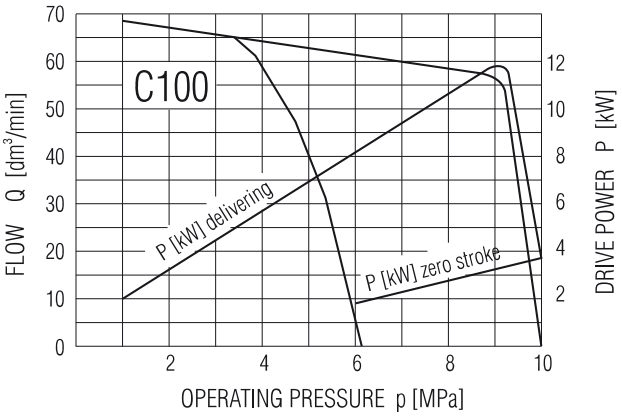
PERFORMANCE CURVES V3/63

Note: measured at n = 1450 rpm, ν = 36mm2/s, t = 50°C

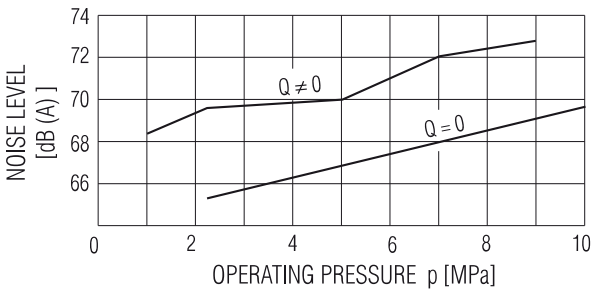




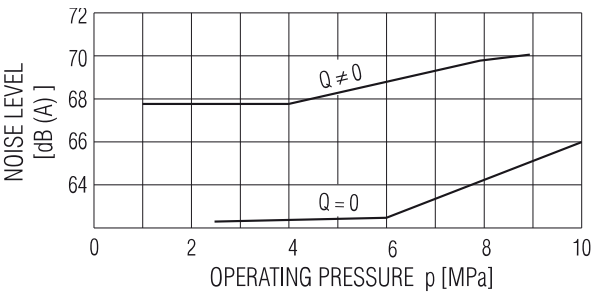




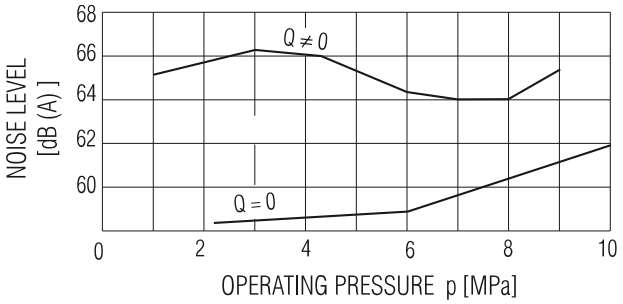
measured in noise measurement chamber DIN 45 635 sheet 1
measured at distance of 1 m from the pump
at n = 1800 rpm



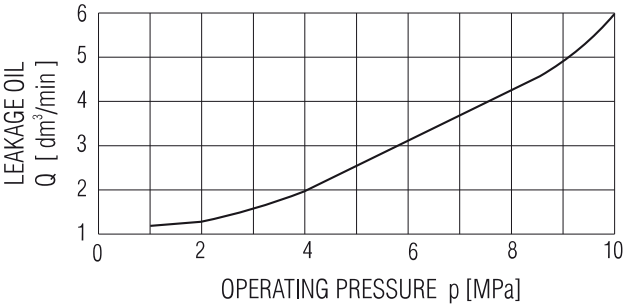
at n = 1450 rpm



at n = 1000 rpm



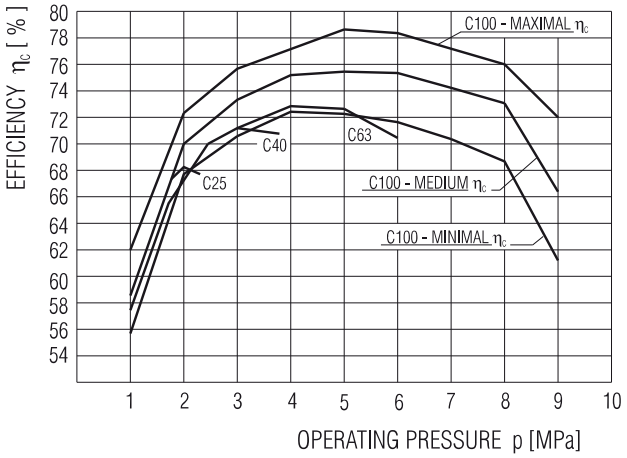
measured after 10 minutes at zero stroke



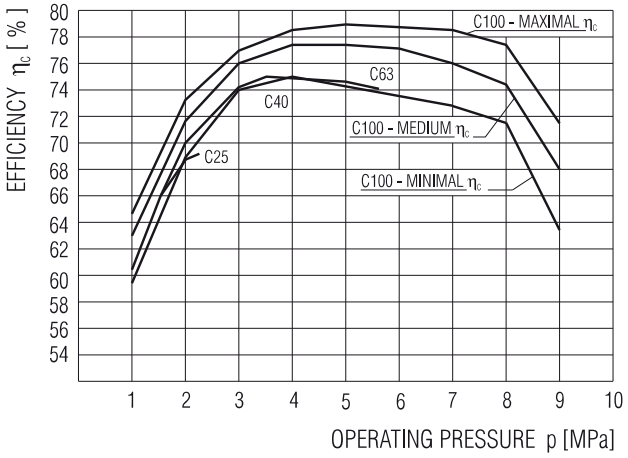
EFFICIENCY CURVES

Note: measured at n = 1500 rpm, ν = 36mm2/s, t = 50°C

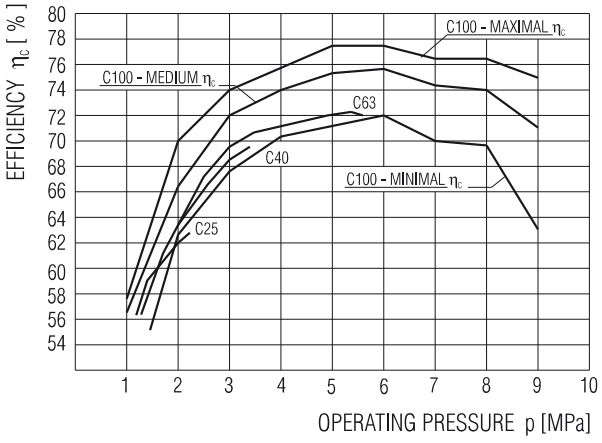
V3/12



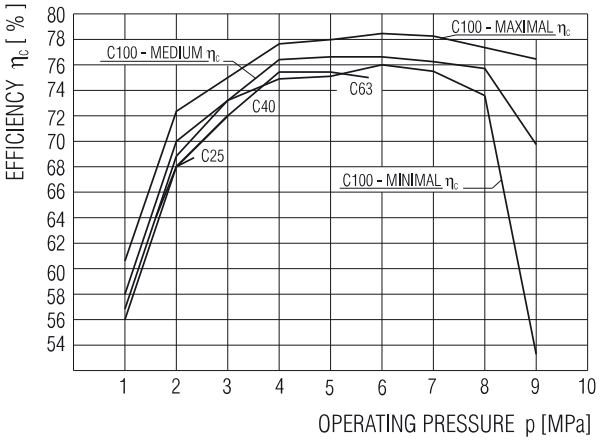
V3/25



V3/40

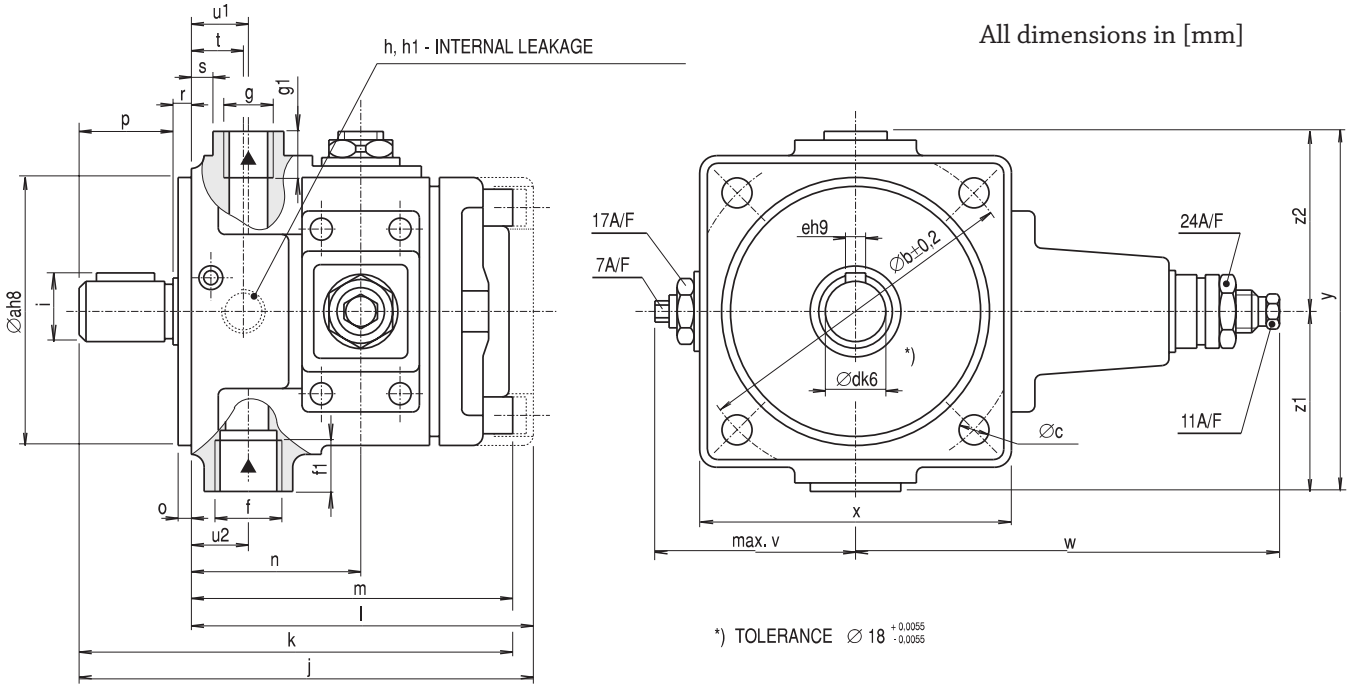


V3/63



INSTALLATION DIMENSIONS

All dimensions in [mm]



Pump type	Dimension [mm]													
	a	b	c	d*	e	f	g	h	i	j	k	l	m	n
1PV2V3-40/12	80	100	9	18*	6	G1/2"	G3/8"	G1/4"	20,5	136,5	-	102	-	50,5
1PV2V3-40/25	100	125	11	19	6	G3/4"	G1/2"	G1/4"	21,5	168,5	158,5	134	124	65
1PV2V3-30/40	125	160	14	28	8	G1 1/4"	G3/4"	G3/8"	31	218	211	166	159	81
1PV2V3-30/63	125	160	14	32	10	G1 1/2"	G1"	G3/8"	35,3	249	242	181	174	91

Dimension [mm]													Thread depth [mm]			Weight
o	p	r	s	t	u1	u2	v	w	x	y	z1	z2	f1	g1	h1	[kg]
4	28	6,5	8	15,5	17	20,5	68,5	156	93	113	56,5	56,5	14	12	12	6,25
4	28	6,5	10	20	25	25	78	164	115	130	65	65	16	14	12	11,1
4	42	10	8,5	27	32	32	95	201	148	188	94	94	20	16	12	26,5
4	58	10	12	27	34	34	95	201	148	191	97	94	22	18	12	29,5

NOTES

Consultancy service is provided by: **PQS Technology, Ltd.**
Sales department: tel.: +420 313 526 236 e-mail: export@pqstechnology.co.uk
Technical support: tel.: +420 313 526 378 e-mail: info@pqstechnology.co.uk
Fax: +420 313 513 091
www.pqstechnology.co.uk

The data is subject to change. The manufacturer reserves the right to make changes and/or improvements without prior notice. It is understood that the information in this datasheet is being used at one's own risk.