

The built-in 4/2- and 4/3-way directly operated proportional solenoid valves, direct operated spool without electrical position feedback Type VNKPV and VNKPV-IE
Nominal sizes 6 and 10
Maximum operating pressure 315bar Maximum flow 42L/min (DN6)
Maximum flow 75L/min (DN10)

Technical characteristics

Model		VNKPV	VNKPV-IE
Installation position		optional, preferably horizontal	
Storage temperature range °C		-20 -80	
Ambient temperature range °C		-20-70	-20-50
Weight (kg)	DN06	2	2,2
	DN10	6,6	7

Hydraulic

Operating pressure (bar)	Ports A, B, P	315
	Port T	210
Nominal flow (L/min)	DN06	7, 15 and 26
When q_{max} at $\Delta p=10$ bar	DN10	30 and 60
Flow (Max. Permissible) (L/min)	DN06	42 (with double flow 42) 80
	DN10	75 (with double flow 75) 140
Pressure fluid		Mineral oil (HL, HLP) to DIN 51 524; For other fluid please consult with us.
Fluid temp. Range °C		-20-80(+40-+50 is preference)
Viscosity range mm ² /s		20-380 (30-46 is preference)
Hysteresis %		<5
Reversal span %		<1
Response sensitivity %		<0,5
Cleanliness		Maximum permissible degree of fluid contamination to NAS 1638 to class 9

Electrical

Model		VNKPV	VNKPV-IE
Voltage type		Direct voltage	
VNKPV-IE	Voltage input "A1" (V)	± 10	± 10
Command signal	Current input "F1" (mA)	4~20	4~20
Max. current per solenoid (A)		2,5	2,5
Solenoid coil Resistance t n)	Cold value at 20°C	6DN2	10DN2
	Max. warm value	6DN3	10DN3
Duty cycle (%)		100	
Max. Coil temperature 2)		Up to 150	
Electrical connection		Plug-in connector to DIN EN 175301-803 and	Plug-in connector to DIN 43 563
Insulation of valve to DIN 40		IP65	

Control electronics

VNKPV	Analogue amplifier in Eurocard	Details refer to proportional amplifier	
	Digital amplifier in Eurocard former	Details refer to proportional amplifier	
VNKPV-IE (type)	Analogue command value module	Integrated into the valves	
Supply voltage	Nominal voltage VDC	24	
	VNKPV-IE Lower limiting value	V	21/22 19
	VNKPV" Upper limiting value	V	35
Amplifier current consumption	/ max	A	1,8
	Max. impulse current	A	3

Due to the occurring surface temperature of the solenoid coils, the European Standards DIN EN 563 a must be taken into account! With VINCKE control electronics

Ordering code

VNKPV — * — * — * — * — — **G24** — *

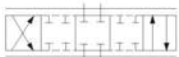

Directional proportional valve



No code Without integrated electronics
IE With integrated electronics

02 DN 6
03 DN 10



Spool symbols



A B
a 0 b
P T

  = E

  = J

A B
a 0 b
P T

  = EA

  = JA

With spool symbols: E and J
P→A: qvmax B→T: qv/2
P→B: qv/2 A→T: qvmax

Note:
With spools J and JA, there is a flow from A to T and B to T with approx. 3 % of the corresponding nominal cross section in zero position.

²¹K4 Electrical connection For BFW (type) with plug component DIN EN 175301-803 See page A.3.3
²²K31 with plug component DIN 43 650-AM2 See page A.3.4

24V 24 VDC

2X Component series 20 to 29 (20 to 29 unchanged installation and connection dimensions)

Nominal flow at valve pressure differential $\Delta p = 10$ bar

	DN 6
07	7 L/min
15	15 L/min
30	26 L/min
	DN 10
30	30 L/min
60	60 L/min

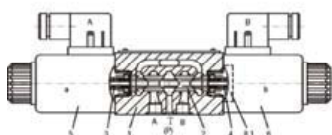
1. Other types of electrical protection on request

Structure and function description, section

The 4/2-way and 4/3-way proportional directional valves are designed as direct operated components for subplate mounting. They are actuated by means of proportional solenoid with central removable coil. The solenoid are controlled either by external control electronics (type VNKPV) or integrated control electronics (type VNKPV-IE).

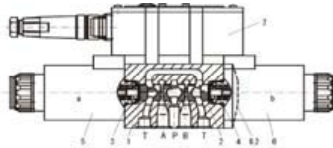
Design:	Function:
<p>The valves basically consist of:</p> <ul style="list-style-type: none"> —Body (1) with mounting surface —Control spool (2) with compression springs (3 and 4) Solenoids (5 and 6) with central coil —Optional integrated electronics (7) 	<ul style="list-style-type: none"> —When solenoids (5 and 6) do not work, the control spool (2) is held in the central position by compression springs (3 and 4) —Direct actuation of the control spool (2) by energising a proportional solenoid E.g. When the solenoid "b" power is on (6) — The control spool (2) is moved to the left in proportion to the electrical input signal —connection from P to A and B to T via orifice-like crosssections with progressive flow characteristics When the solenoid power is off (6) — The control spool (2) is returned to the central position by compression spring (3)

Model VNKPV-06



In theory, the function of this valve is the same to the valve with 3 positions. However, the valves with 2 positions are only fitted with solenoid "a".
For DN6 valve, there is a plug (8.1) fixed in the second solenoid, but for DN10, it is a cover (8.2) instead

Model VNKPV-IE-10



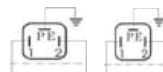
Note for type VNKPV-06
Draining of tank line is to be avoided. With the appropriate installation conditions, a back pressure valve is to be installed (back pressure approx. 2 bar).

Electrical connection, plug—in connectors

Connection on component plug

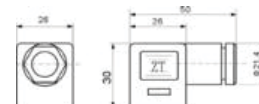


Connection on plug-in connector

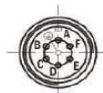
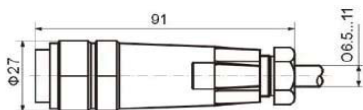


To amplifier To amplifier

Plug-in connector: CECC 75 301-803-A002FA-H3D08-G/DIN EN 175 301-803 and ISO 4400

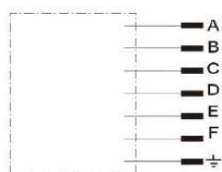


Electrical connection, plug-in connectors type VNKPV-IE



Plug-in connector:
DIN 43 563-BF6-3/Pg11

Integrated electronics for type VNKPV-IE

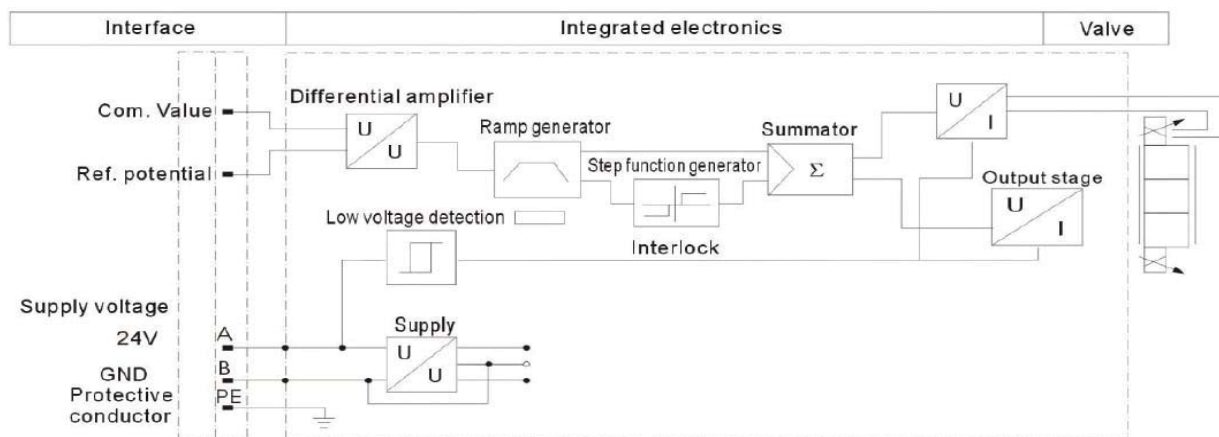


	Contact	Signal
Supply voltage	A	24VDC (19~35VDC)
	B	GND
	C	n.c. ⁽¹⁾
Differential amplifier input	D	Com. value (±10V/4-20mA)
	E	reference potential
	F	n.c. ⁽¹⁾

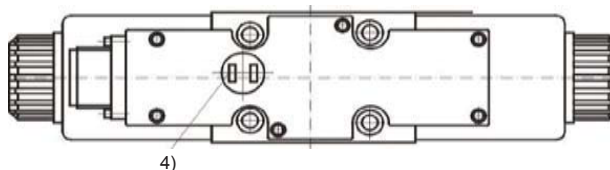
Positive command value (0 to 10 V or 12 to 20 mA) at D and reference potential to E causes flow from P to A and B to T. Negative command value (0 to 10 V or 12 to 4 mA) at D and reference potential to E causes flow from P to B and A to T. For valves with a solenoid on side "a" (spool variants EA and JA) a positive command value at D and reference potential to E causes flow from P to B and A to T. For valves with a solenoid on side "b" (spool variants EB and JB) a positive command value at D and reference potential to E causes flow from P to A and B to T.

Recommendation:
- up to 25 m cable length type LiYCY 5 x 0.75 mm²
- up to 50 m cable length type LiYCY 5 x 1.0 mm² External diameter 6.5 to 11 mm
Connect screen to PE only on the supply side

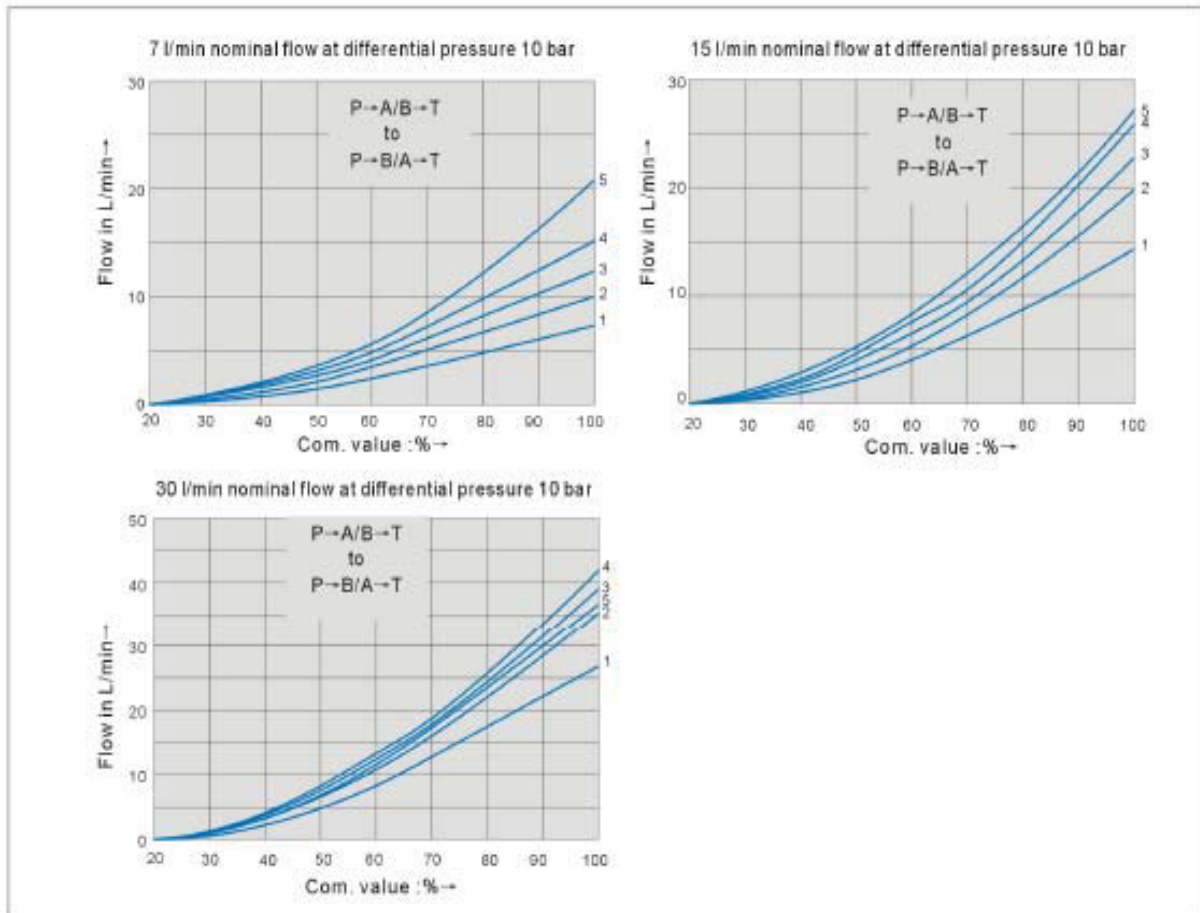
Block circuit diagram / connection allocation



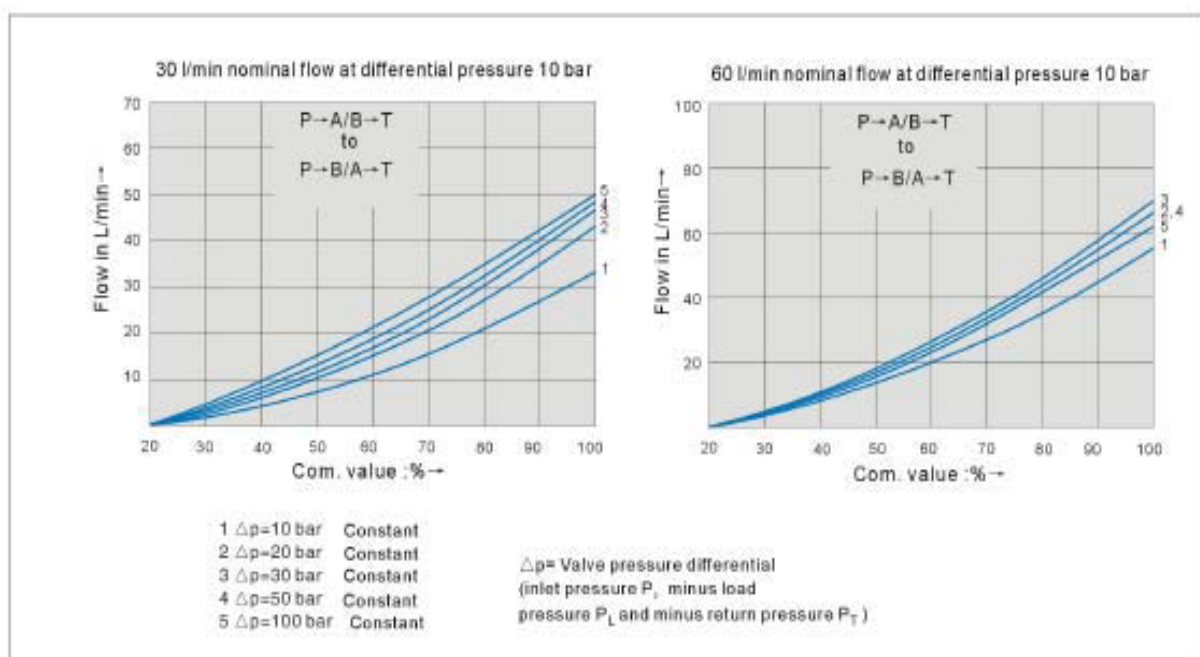
- 1) Contacts C and F must not be connected!
- 2) PE is connected to the cooling body and the valve housing
- 3) Protective conductor screwed to the valve housing and cover
- 4) Ramp can be externally adjusted from 0 to 2.5s; the same applies for T_{up} and T_{down}
- 5) Output stages current regulated
- 6) Low voltage detection is not carried out for component type VNKPV-IE-10



Characteristic curves (measured with HLP46) DN6

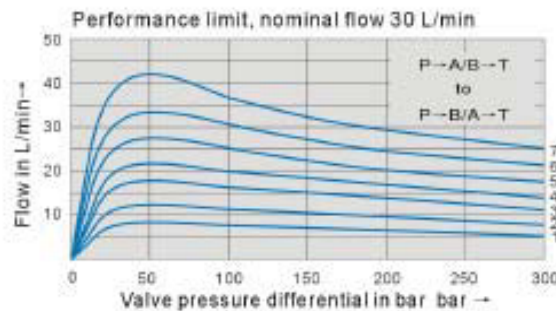
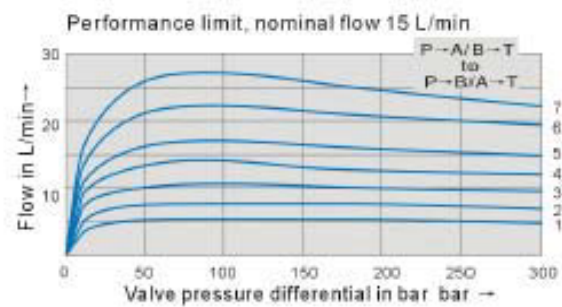
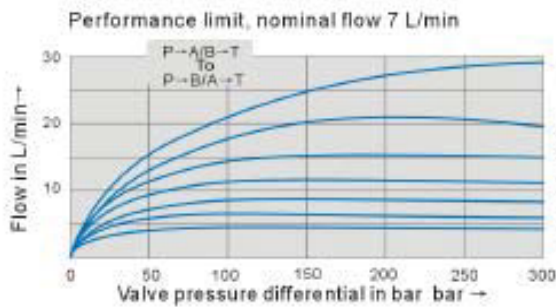
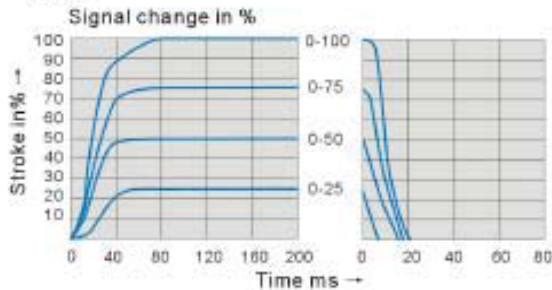


Characteristic curves (measured with HLP46) DN10



Transition functions with electrical step input signals VNKPV and VNKPV-EI

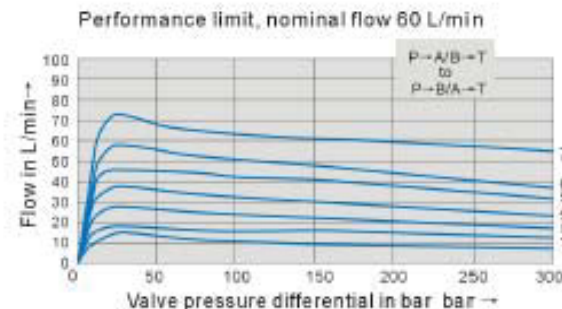
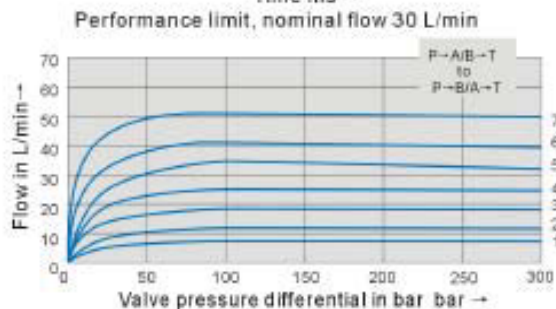
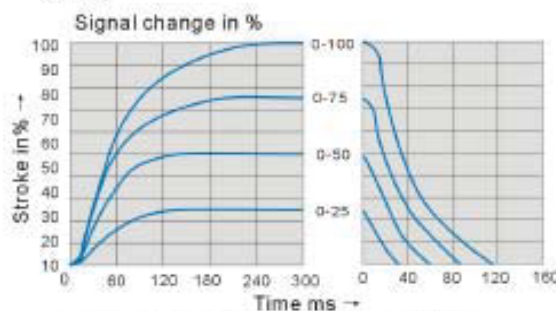
6DN



- 1 Com. Value=40%
- 2 Com. Value=50%
- 3 Com. Value=60%
- 4 Com. Value=70%
- 5 Com. Value=80%
- 6 Com. Value=90%
- 7 Com. Value=100%

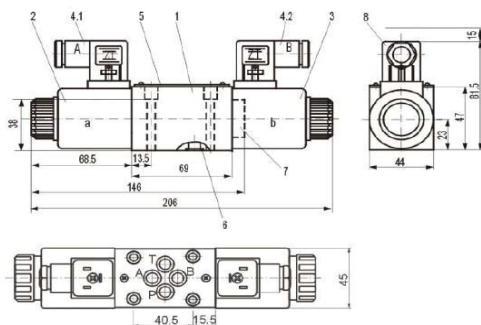
If the performance limits are exceeded, then the movement of spool will be unstable.

10DN



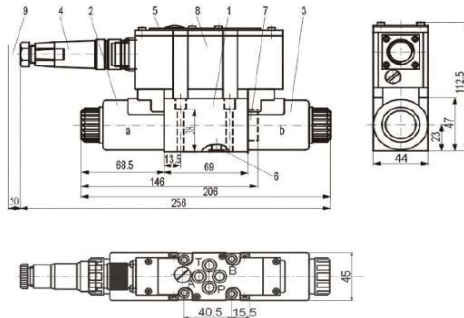
Unit dimensions size 06, Cetop 3

VNKPV-6



- 1 Valve body
 - 2 Proportional solenoid "a"
 - 3 Proportional solenoid "b"
 - 4.1 4.2 Plug-in connector, colour black, separate order
 - 5 Nameplate
 - 6 8.73 x 1.78 I seal rings for ports A, B, P and T
 - 7 Plug for valves with one solenoid (2 positions, spool type EA or JA)
 - 8 Space required to remove the plug-in connector
 - 9 Machined valve mounting surface, connection location to DIN 24340A, 1504401 (and) CETOP-RP 121 H
- Valve fixing screws: 4tM5x 45 DIN 912-12.9; M..=8.9 Nm

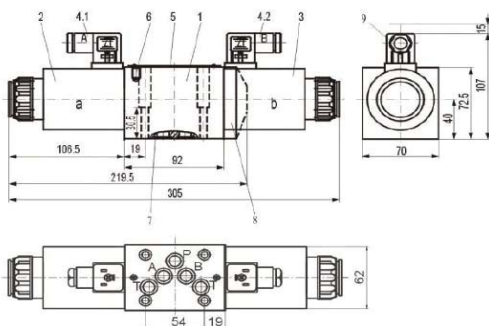
VNKPV-IE-6



- 1 Valve body
- 2 Proportional solenoid
- 3 Proportional solenoid
- 4 Plug-in connector to E DIN 43 563-BF6-3/Pg11,
- 5 Nameplate
- 6 8.73 x 1.78 O Identical seal rings for ports A, B, P and T
- 7 Plug for valves with one solenoid (2 switched positions, spool type EA or JA)
- 8 Integrated electronics
- 9 Space required for the connection cable and to remove the plug-in connector
- 10 Machined valve mounting surface, connection location

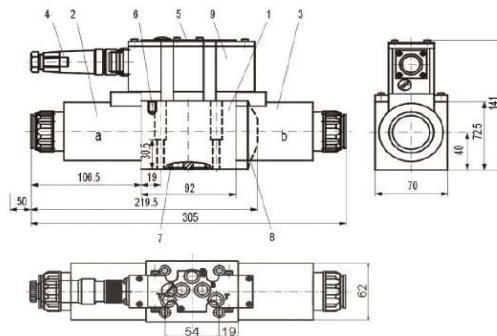
Unit dimensions size 10, Cetop 5

VNKPV-10



- 1 Valve body
 - 2 Proportional solenoid "a"
 - 3 Proportional solenoid "b"
 - 4.1 4.2 Plug-in connector, colour black, separate order
 - 5 Nameplate
 - 6 Valve deflation screw
 - 7 12 x 2 seal rings for ports A, B, P and T
 - 8 Plug for valves with one solenoid (2 positions spool type EA or JA)
 - 9 Space required to remove the plug-in connector
 - 10 Machined valve mounting surface, connection location to DIN 24 340A, 1804401 (and) CETOP-RP 121 H
- Valve fixing screws: 4tM6x 40 DIN 912-12.9;

VNKPV-IE-10



- 1 Valve body
- 2 Proportional solenoid "a"
- 3 Proportional solenoid "b"
- 4 Plug-in connector, to E DIN43563-BF6-31Pg11
- 5 Nameplate
- 6 Valve deflation screw
- 7 12 x 210 identical seal rings for ports A, B, P and T
- 8 Plug for valves with one solenoid (2 positions spool type EA or JA)
- 9 Integrated electronics
- 10 Space required for the connection cable and to remove the plug-in connector
- 11 Machined valve mounting surface, connection location to DIN 24 340A, ISO4401 (and) CETOP-RP 121 H