TYPE CODE

	K10V	O	18	DR	/	11	R	–	V	S	C	12	N00	
01	02	03	04	05		06	07		08	09	10	11	12	13

HYDRAULIC FLUIDS

		10	18	28	45	63	71	72	85	100	140	
01	Standard	●	●	●	●	○	●	○	●	●	●	
	High-speed version	–	–	–	●[1]	–	●[1]	–	–	●[1]	●[1]	H

AXIAL PISTON UNIT

		10	18	28	45	63	71	72	85	100	140	
02	Swash-plate design, variable pump	●	●	●	●	○	●	○	●	●	●	K10V

OPERATING MODE

03	Pump, open circuit	O

SIZE

		10	18	28	45	63	71	72	85	100	140
04	Geometric displacement $q_{v,max}$ [mL/r]	10.5	18	28	45	63	71	72	85	100	140

CONTROL DEVICE

					10	18	28	45	63	71	72	85	100	140	
05	Direct operated **two-point control**				–	●[1]	●[1]	●[1]	–	●	–	–	●[1][3]	●	DG
	Pressure control				●	●	●	●	○	●	○	●	●	●	DR
	with flow controller	port **X-T** open			●	●[1]	●[1]	●[1]	–	●[1]	–	–	●[1]	●[1]	DFR
					–	○[2]	○[2]	○[2]	○	●[3]	○	●[4]	●[2][3]	●[3]	DRF
		port **X-T** plugged			●	●[1]	●[1]	●[1]	–	●[1]	–	–	●[1]	●[1]	DFR1
			with flushing		–	○[2]	○[2]	○[2]	○	●[3]	○	●[4]	●[2][3]	●[3]	DRS
			without flushing		●	○[2]	○[2]	○[2]	○	–	○	●	○[2]	–	DRSC
	with pressure cut-off	hydraulic remote controlled			●	●	●	●	○	●	○	●	●	●	DRG
		electric negative control		U=12 V	–	●	●	●	○	●	○	●	●	●	ED71
				U=24 V	–	●	●	●	○	●	○	●	●	●	ED72
		electric positive control		U=12 V	–	●	●	●	○	●	○	●	●	●	ER71
				U=24 V	–	●	●	●	○	●	○	●	●	●	ER72
	Differential **pressure control**	electric negative control		U=12 V	–	●	●	●	○	●	○	●	●	●	EF71
				U=24 V	–	●	●	●	○	●	○	●	●	●	EF72
	Pressure/Flow/Power control				–	–	●[1]	●[1]	–	●[1]	–	–	●[1]	●[1]	DFLR
	Power control with pressure cut-off,	control starts at:	10~35 bar		–	○[2]	○[2]	○[2]	○	●[3]	○	●	●[2][3]	●[3]	LA5D
			36~70 bar		–	○[2]	○[2]	○[2]	○	●[3]	○	●	●[2][3]	●[3]	LA6D
			71~105 bar		–	○[2]	○[2]	○[2]	○	●[3]	○	●	●[2][3]	●[3]	LA7D
			106~140 bar		–	○[2]	○[2]	○[2]	○	●[3]	○	●	●[2][3]	●[3]	LA8D
			141~230 bar		–	○[2]	○[2]	○[2]	○	●[3]	○	●	●[2][3]	●[3]	LA9D
		hydraulic remote controlled, control starts at:	10~35 bar		–	○[2]	○[2]	○[2]	○	●[3]	○	●	●[2][3]	●[3]	LA5DG
			36~70 bar		–	○[2]	○[2]	○[2]	○	●[3]	○	●	●[2][3]	●[3]	LA6DG
			71~105 bar		–	○[2]	○[2]	○[2]	○	●[3]	○	●	●[2][3]	●[3]	LA7DG
			106~140 bar		–	○[2]	○[2]	○[2]	○	●[3]	○	●	●[2][3]	●[3]	LA8DG
			141~230 bar		–	○[2]	○[2]	○[2]	○	●[3]	○	●	●[2][3]	●[3]	LA9DG

NOTE: ● available; ○ upon request; – unavailable; preferred. **1)** 11 series; **2)** 13 series; **3)** 12 series; **4)** Only with D flange.

	K10V	O	18	DR	/	11	R	–	V	S	C	12	N00	
01	02	03	04	05		06	07		08	09	10	11	12	13

	CONTROL DEVICE				10	18	28	45	63	71	72	85	100	140	
05	**Power control** with pressure cut-off and flow control,	port X-T plugged, with flushing, control starts at:	10~35 bar		–	○[1]	○[1]	○[1]	○	●[2]	○	●	●[1)2)]	●[2]	LA5DS
			36~70 bar		–	○[1]	○[1]	○[1]	○	●[2]	○	●	●[1)2)]	●[2]	LA6DS
			71~105 bar		–	○[1]	○[1]	○[1]	○	●[2]	○	●	●[1)2)]	●[2]	LA7DS
			106~140 bar		–	○[1]	○[1]	○[1]	○	●[2]	○	●	●[1)2)]	●[2]	LA8DS
			141~230 bar		–	○[1]	○[1]	○[1]	○	●[2]	○	●	●[1)2)]	●[2]	LA9DS
		port X-T plugged, without flushing, control starts at:	10~35 bar		–	○[1]	○[1]	○[1]	○	–	○	●	–	–	LA5DC
			36~70 bar		–	○[1]	○[1]	○[1]	○	–	○	●	–	–	LA6DC
			71~105 bar		–	○[1]	○[1]	○[1]	○	–	○	●	–	–	LA7DC
			106~140 bar		–	○[1]	○[1]	○[1]	○	–	○	●	–	–	LA8DC
			141~230 bar		–	○[1]	○[1]	○[1]	○	–	○	●	–	–	LA9DC
	Power control with separate flow control,	port X-T plugged, control starts at:	10~35 bar		–	○[1]	○[1]	○[1]	–	●[2]	–	–	●[1)2)]	●[2]	LA5S
			36~70 bar		–	○[1]	○[1]	○[1]	–	●[2]	–	–	●[1)2)]	●[2]	LA6S
			71~105 bar		–	○[1]	○[1]	○[1]	–	●[2]	–	–	●[1)2)]	●[2]	LA7S
			106~140 bar		–	○[1]	○[1]	○[1]	–	●[2]	–	–	●[1)2)]	●[2]	LA8S
			141~230 bar		–	○[1]	○[1]	○[1]	–	●[2]	–	–	●[1)2)]	●[2]	LA9S
	Power control with differential pressure control,	port X-T plugged, control starts at:	10~35 bar		–	○[1]	○[1]	○[1]	○	–	○	●	○[1]	–	LA5EF
			36~70 bar		–	○[1]	○[1]	○[1]	○	–	○	●	○[1]	–	LA6EF
			71~105 bar		–	○[1]	○[1]	○[1]	○	–	○	●	○[1]	–	LA7EF
			106~140 bar		–	○[1]	○[1]	○[1]	○	–	○	●	○[1]	–	LA8EF
			141~230 bar		–	○[1]	○[1]	○[1]	○	–	○	●	○[1]	–	LA9EF
	Electrical control with proportional solenoid,	positive pressure controlled		U=12V	–	○[1]	○[1]	○[1]	○	–	○	●	○[1]	–	EP1D
				U=24V	–	○[1]	○[1]	○[1]	○	–	○	●	○[1]	–	EP2D
		pressure & flow controlled with load-sensing	port X-T open	U=12V	–	○[1]	○[1]	○[1]	○	–	○	●	○[1]	–	EP1DF
				U=24V	–	○[1]	○[1]	○[1]	○	–	○	●	○[1]	–	EP2DF
			port X-T plugged	U=12V	–	○[1]	○[1]	○[1]	○	–	○	●	○[1]	–	EP1DS
				U=24V	–	○[1]	○[1]	○[1]	○	–	○	●	○[1]	–	EP2DS
		electric hydraulic pressure controlled		U=12V	–	○[1]	○[1]	○[1]	○	–	○	●	○[1]	–	EP1ED
				U=24V	–	○[1]	○[1]	○[1]	○	–	○	●	○[1]	–	EP2ED
	Electrical control with proportional solenoid & pressure cut-off,	positive pressure controlled		U=12V	–	○[1]	○[1]	○[1]	○	–	○	●	○[1]	–	EK1D
				U=24V	–	○[1]	○[1]	○[1]	○	–	○	●	○[1]	–	EK2D
		pressure & flow controlled with load-sensing	port X-T open	U=12V	–	○[1]	○[1]	○[1]	○	–	○	●	○[1]	–	EK1DF
				U=24V	–	○[1]	○[1]	○[1]	○	–	○	●	○[1]	–	EK2DF
			port X-T plugged	U=12V	–	○[1]	○[1]	○[1]	○	–	○	●	○[1]	–	EK1DS
				U=24V	–	○[1]	○[1]	○[1]	○	–	○	●	○[1]	–	EK2DS
		electric hydraulic pressure controlled		U=12V	–	○[1]	○[1]	○[1]	○	–	○	●	○[1]	–	EK1ED
				U=24V	–	○[1]	○[1]	○[1]	○	–	○	●	○[1]	–	EK2ED

	SERIES	10	18	28	45	63	71	72	85	100	140	
06	Nominal pressure p_N 280 [bar]; Maximum pressure p_{max} 350 [bar].	–	●	●	●	–	●	–	–	●	●	11
		–	–	–	–	–	●	–	–	●	●	12
	Working pressure p_N 250 [bar] and p_{max} 315 [bar].	●	○	○	○	○	–	○	●	○	–	13

NOTE: ● available; ○ upon request; – unavailable; preferred. **1)** 13 series; **2)** 12 series.

	K10V	O	18	DR	/	11	R	–	V	S	C	12	N00	
01	02	03	04	05		06	07		08	09	10	11	12	13

DIRECTION OF ROTATION

07	View on drive shaft	clockwise	R
		counterclockwise	L

SEALING

08	[DIN ISO 1629] Fluoroelastomer (FKM), for operation with HFD hydraulic fluid	V

DRIVE SHAFT

			10	18	28	45	63	71	72	85	100	140	
09	[ANSI B92.1a] splined shaft	standard shaft	●	●	●	●	○	●	○	●	●	●	S
		similar to S for higher torque	–	●	●	●	○	●	○	○	○[2)]	–	R
		reduced diameter, single pump	●	●	●	●	○	●[1)]	○	●	●	○[1)]	U
		same as U for higher torque	–	–	●	●	○	●[1)]	○	●	●	○[1)]	W
	[DIN 6885] parallel keyed shaft, single pump		●	○[2)]	○[2)]	○[2)]	–	–	–	–	○[2)]	–	P

MOUNTING FLANGE

			10	18	28	45	63	71	72	85	100	140	
10	[ISO 3019-2] flange	2-hole	●	–	–	–	–	–	–	–	–	–	A
	[ISO 3019-1] flange	2-hole	●	●	●	●	○	●	○	●	●	●	C
		4-hole	–	–	–	–	○	●[3)]	○	●	●[2)3)]	●	D

WORKING PORT (metric fastening thread)

			10	18	28	45	63	71	72	85	100	140	
11	[ISO 6162] SAE flange ports at rear	single pump	–	○[2)]	●	●	○	●[3)]	○	●	●	●	11
			–	–	–	–	–	●[1)]	–	–	–	–	41
	SAE flange ports laterally opposite	for through-drive	–	●	●	●	○	●[3)]	○	●	●	●	12
			–	–	–	–	–	●[1)]	–	–	–	–	42
	SAE flange ports at side, offset 90°	single pump	–	–	–	○[2)]	–	–	–	–	–	–	13[4)]
	Metric threaded ports at rear	single pump	●	–	–	–	–	–	–	–	–	–	14

THROUGH-DRIVE

			10	18	28	45	63	71	72	85	100	140	
12	Single pump	without through-drive	●	●	●	●	○	●	○	●	●	●	N00
	2nd pump's flange	2nd pump's splined shaft											
	[ISO 3019-1] 82-2	[SAE A] ⅝"-9T-16/32DP	–	●	●	●	○	●	○	●	●	●	K01
		[SAE A-B] ¾"-11T-16/32DP	–	●	●	●	○	●	○	●	●	●	K52
	[ISO 3019-1] 101-2	[SAE B] ⅞"-13T-16/32DP	–	–	●	●	○	●	○	●	●	●	K68
		[SAE B-B] 1"-15T-16/32DP	–	–	–	●	○	●	○	●	●	●	K04
	[ISO 3019-1] 127-2	[SAE C] 1¼"-14T-12/24DP	–	–	–	–	–	●	–	●	●	●	K07
		[SAE C-C] 1½"-17T-12/24DP	–	–	–	–	–	–	–	●	●	●	K24
	[ISO 3019-1] 127-4	[SAE C] 1¼"-14T-12/24DP	–	–	–	–	○	○[3)]	○	●	●[3)]	●[3)]	K15
		[SAE C-C] 1½"-17T-12/24DP	–	–	–	–	–	–	–	●	–	–	K16
	[ISO 3019-1] 152-4	[SAE D] 1¾"-13T-8/16DP	–	–	–	–	–	–	–	–	–	●	K17

CONNECTOR FOR SOLENOID

			10	18	28	45	63	71	72	85	100	140	
13	Without connector, only for hydraulic control		●	●	●	●	○	●	○	●	●	●	
	Deutsch-molded connector without suppressor diode		–	●	●	●	○	●	○	●	●	●	P

NOTE: ● available; ○ upon request; – unavailable; preferred. **1)** 11 series; **2)** 13 series; **3)** 12 series; **4)** Only for L rotated pump.

01 HYDRAULIC FLUIDS

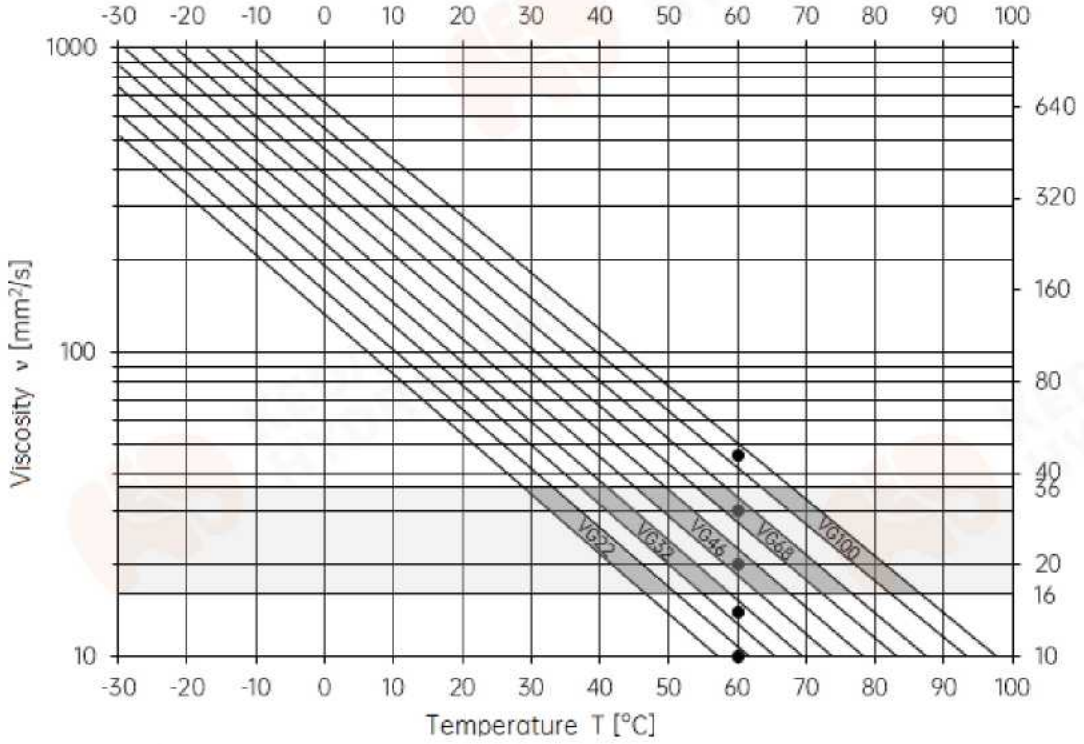
K10VO pump is design for operation with [DIN 51524] HLP mineral oil. Selection of environmentally acceptable hydraulic fluids is allowed but must be specified when ordering. The axial piston unit is NOT suitable for operation with water-free HFD hydraulic fluids or water-containing HFA/HFB/HFC hydraulic fluids. Please contact us if any technical parameter cannot be adhered to.

1. Viscosity and temperature of hydraulic fluids

Operation	Temperature	Viscosity	Remarks
Cold start	t_{min}=−25 °C	ν_{max}=1600 mm²/s	t<3 min, p≤30[1]|50[2] bar, n≤1000 rpm
Warm-up		ν=400~1600 mm²/s	t≤15 min, p≤0.7 p_N, n≤0.5 n_{max}
Continuous	t=−25~+110 °C	ν=10~400 mm²/s	at port **L**/L_1
Short-term	t_{max}=+110 °C	ν_{min}=7[1]/7~10[2] mm²/s	t<1[1]/3[2] min, p≤0.3 p_N, at port **L**/L_1

NOTE: **1)** 11 series; **2)** 12 and 13 series.

2. Selection diagram



Before selection, figure out the relationship between ambient temperature and oil temperature in reservoir in an open circuit. Make sure that any temperature in system must NOT exceed 110 °C.

The hydraulic fluid should be selected so that the operating viscosity in the operating temperature range is within the optimum range ν_{opt}=16~36 mm²/s (shaded area in selection diagram) and its viscosity grade should be as high as possible. For example: whereat oil temperature in reservoir is 60 °C, both viscosity grades VG46 and VG68 are within the optimum range (2 spots in shaded area of selection diagram), in this case, VG68 is preferred.

3. Filtration of hydraulic fluids

Finer filtration improves the cleanliness level of the hydraulic fluid, which increases the service life of the axial piston unit. An [ISO 4406] cleanliness level of at least **20/18/15** is to be maintained during continuous operation; In case of high temperature (90~110 °C) during short-term operation, cleanliness level of **19/17/14** is required.

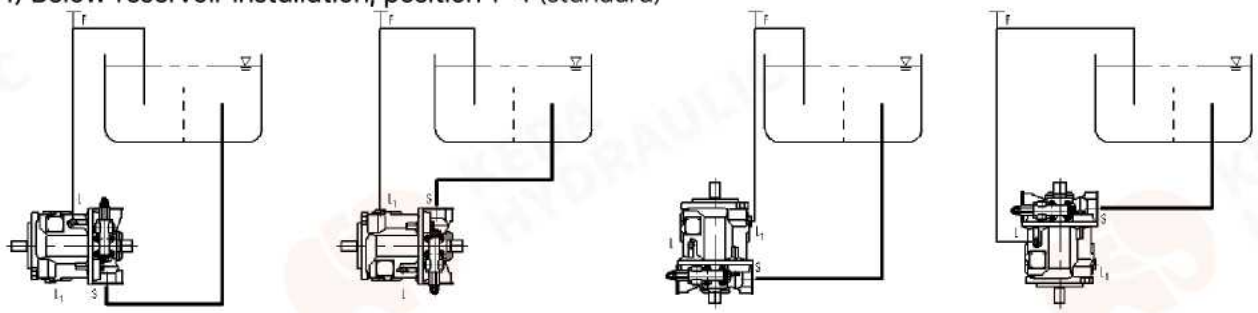
INSTALLATION INSTRUCTIONS

GENERAL

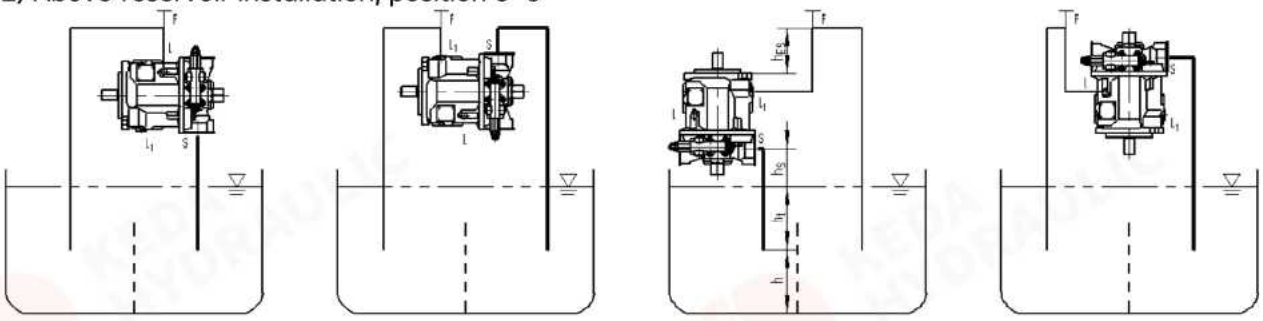
— The axial piston unit must be filled with hydraulic fluid and vented during commissioning and operation. This must also be observed during longer standstills, as the axial piston unit can empty itself via the hydraulic lines.
— Installation positions see the following examples 1~12. We recommend installation position 1 and 2.

Installation position	1	2	3	4	5	6	7	8	9	10	11	12
Filling	L(F)	L_1(F)	L_1(F)	L(F)	L(F)	L_1(F)	L_1(F)	L(F)	L/L_1	L/L_1	L/L_1	L/L_1
Air bleed	F	F	F	F	F	F	F	F	L	L_1	L_1	L

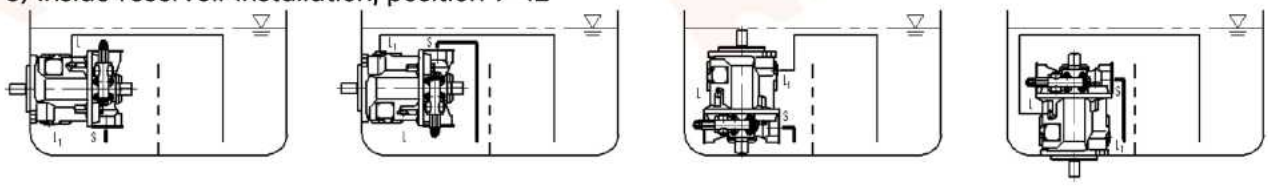
1) Below-reservoir installation, position 1~4 (standard)



2) Above-reservoir installation, position 5~8



3) Inside-reservoir installation, position 9~12



NOTICE

Installation dimension	Permissible suction height	Required immersion depth	Distance to reservoir bottom
Height limit	$h_{S,\,max}$=800 mm	$h_{t,\,min}$=200 mm	h_{min}=100 mm

— Installation dimensions refer to position 7.
— To prevent the axial piston unit from draining, a height difference h_{ES} of at least 25 mm is required in position 7.
— Because complete air bleeding and filling are not possible in position 12, the pump should be air bled and filled in a horizontal position before installation.
— Port F is part of the external piping and must be provided on customer side to make filling and air bleeding easier.
— For reservoir design, ensure that there is an adequate distance between the suction line and the drain line. Using a baffle plate in between can improve the air separation ability as it gives the hydraulic fluid more time for desorption, and prevent the heated returning flow from being drawn directly back into the suction line.

02 TECHNICAL DATA

1. Working pressure range (when using hydraulic fluid based on mineral oils)

Pressure	K10VO	Remarks
Suction $p_{S, abs}$	0.8~10[6]|0.8~5[4] bar	Minimum pressure at suction port **S** (inlet) is required to prevent damage to the axial piston unit.
Nominal p_N	280[6]|250[4] bar	At working port **B** (outlet) corresponds to the maximum design pressure.
Maximum p_{max}	350[6]|315[4] bar	At working port **B** (outlet) corresponds to the maximum working pressure within a single operating period.
Minimum p_{min}	10 bar	Minimum pressure at the working port **B** (outlet) is required to prevent damage to the axial piston unit.
Case p_L	$p_{S, abs}$+0.5 bar ≤ 2 bar	Case pressures at drain port **T** must be greater than the ambient pressure at shaft seals. A drain line to the reservoir is required.

2. Other technical data (when using mineral-oil-based fluids at ν_{opt}=16~36 mm²/s and $\Delta p_{S, abs}$=1 bar)

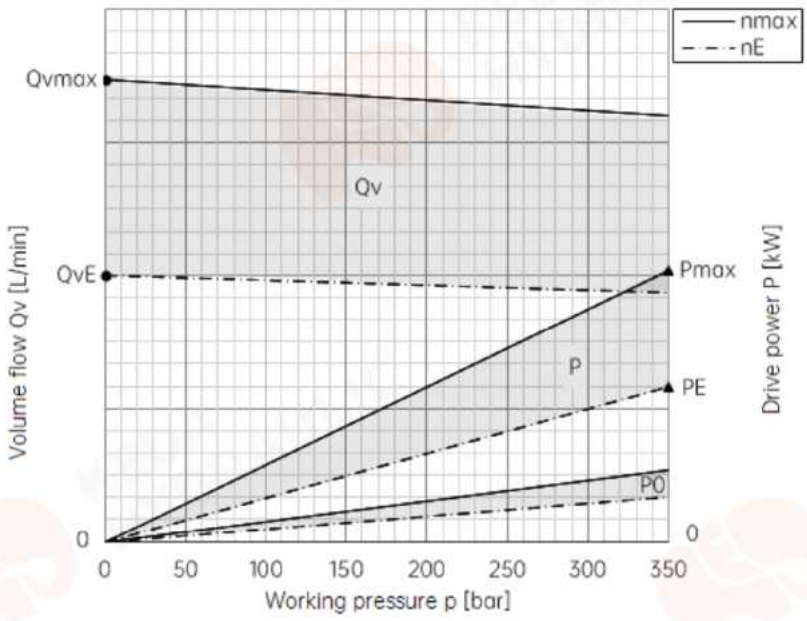
Parameter (in case)		Size		10	18	28	45(H)	63	71(H)	72	85	100(H)	140(H)
Geom. displacement		$q_{V, max}$	mL/r	10.5	18	28	45	63	71	72	85	100	140
Rotational speed	$q_{V, max}$	n_{max}	rpm	3600	3300	3000	2600 (3000)	2600	2200 (2550)[5]	2600	2500	2000 (2300)[4][5]	1800 (2050) 2200[5]
	q_V	$n_{max, all}$	rpm	4320	3900 3960[4]	3600	3100 (3300) 3120[4]	3140	2600 (2800)[5]	3140	3000	2400 (2500)[4][5]	2100 (2200)
Flow	n_{max}	$Q_{V, max}$	L/min	37	59	84	117(135)	163	156 (181)[5]	187	212	200 (230)[4][5]	252(287) 308[5]
	n_E[1]	Q_{VE}	L/min	15	27	42	68	95	107	108	128	150	210
Power	n_{max} Δp_N[2]	P_{max}	kW	16	30|25[4]	39|35[4]	55(63) 49[4]	68	73(85)[5]	77	89	93|96[4] (107)[5]	118(134) 144[5]
	n_E Δp_N[2]	P_E	kW	7	12.6|11[4]	20|18[4]	32|28[4]	39	50	45	53	70|62[4]	98
Torque	Δp_N[2]	T_{max}	Nm	42	80|71[4]	125|111[4]	200 179[4]	250	316	286	338	445[6] 398[4]	623
	Δp_E[3]	T	Nm	17	30|29[4]	45	72	100	113	114	135	159	223
Input torque	*S shaft*	$T_{E, max}$	Nm	126	124	198	319	630	626	630	1157	1104[6] 1157[4]	1620
	R shaft	$T_{E, max}$	Nm	–	160	250	400	650	644	650	1215	1215	–
	U shaft	$T_{E, max}$	Nm	60	59	105	188	306	300	306	628	595[6] 628[4]	△
	W shaft	$T_{E, max}$	Nm	–	–	140	220	396	394	383	650	636[6] 650[4]	△
	P shaft	$T_{E, max}$	Nm	90	88	137	200	–	–	–	–	857	–
Through-drive torque	*S shaft*	$T_{D, max}$	Nm	–	108	160	319	484	492	484	698	778[6] 698[4]	1266
	R shaft	$T_{D, max}$	Nm	–	120	176	365	484	548	484	698	△	–
	U shaft	$T_{D, max}$	Nm	–	59	105	188	306	300	306	628	595[6] 628[4]	△
	W shaft	$T_{D, max}$	Nm	–	–	140	220	396	394	383	650	636[6] 650[4]	△

NOTE: – unavailable; △ pending; **(H)** parameters for high-speed version; **1)** n_E=1500 rpm; **2)** Δp_N=280 bar (11 & 12 series) or 250 bar (13 series); **3)** Δp_E=100 bar; **4)** 13 series; **5)** 12 series; **6)** 11 & 12 series.
Other unmentioned parameters of high-speed version or available structures are same as those of 11 series (default value).

Parameter (in case)				Size 10	18	28	45(H)	63	71(H)	72	85	100(H)	140(H)
Rotary stiffness of drive shaft	*S shaft*	c	kNm/rad	9200	11087	22317	37500	65500	71884	65500	143000	121142[6] 143000[4]	169537
	R shaft	c	kNm/rad	–	14850	26360	41025	69400	76545	69400	152900	152900	–
	U shaft	c	kNm/rad	6800	8090	16695	30077	49200	52779	49200	102900	91093[6] 102900[4]	△
	W shaft	c	kNm/rad	–	–	19898	34463	54000	57460	54000	117900	101847[6] 117900[4]	165594
	P shaft	c	kNm/rad	10700	13158	25656	41232	–	–	–	–	188406	–
Rotary moment of inertia		J	kgm^2	0.0006	0.00093	0.0017	0.0033	0.0056	0.0083	0.0056	0.012	0.0167 0.012[4]	0.0242
Angular acceleration		α	rad/s^2	8000	6800	5500	4000	3300	2900	3300	2700	2400[6] 2700[4]	2700 2000[5]
Case volume		V	L	0.2	0.4|0.25[4]	0.7|0.3[4]	1|0.5[4]	0.8	1.6	0.8	1	2.2[6]|1[4]	3
Weight	*single pump*	m	kg	8	12|11.5[4]	18|15[4]	23.5|18[4]	22	35.2|40.4[5]	22	36	49.5|36[4] 56.4[5]	60|70.5[5]
	tandem pump	m	kg	–	14|13[4]	19.3|18[4]	25.1|24[4]	28	38|43.3[5]	28	45	55.4|45[4] 62.6[5]	79.5[5]
±Fax		Axial force $F_{ax,\,max}$	N	400	700	1000	1500	2000	2400	1500	3000	4000[6] 3000[4]	4800
Fq, a		*Radial force (at a/2)* $F_{q,\,max}$	N	250	350	1200	1500	1700	1900	1500	2000	2300[6] 2000[4]	2800

NOTE: refer to last page.

3. Drive power and flow (when using hydraulic fluid ISO VG 46 according to DIN 51519, t=50 °C)



◀ Characteristic curve

4 spots in figure locate respectively at $Q_{V,\,max}$/Q_{VE}/P_{max}/P_E. These can be found in table above.

An example for explaination for K10VO 18:
— When at maximum speed n_{max} = 3300 rpm, the corresponding maximum flow $Q_{V,max}$ = 59 L/min and maximum power P_{max} = 30 kW;
— When at equivalent speed n_E = 1500 rpm, the corresponding equivalent flow Q_{VE} = 27 L/min and equivalent power P_E = 12.6 kW.

4. Determination of characteristics

Operation above the maximum values or below the minimum values may result in loss of function, reduced service life or destruction of the axial piston unit. Check out all the permissible values by means of following calculation, etc.

Parameter	Formula	Unit
Geometric displacement per revolution	q_V	[mL/r]
Differential pressure	$\Delta p = p - p_{S,\,abs}$	[bar]
Rotational speed	n	[rpm]
Volumetric efficiency	$\eta_V = \frac{Q_V}{Q_{V,\,theor}}$	[%]
Hydraulic-mechanical efficiency	η_{mh}	[%]
Total efficiency	$\eta_t = \frac{Q_V \times p}{600 \times P_{Qv,\,max}} = \eta_V \times \eta_{mh}$	[%]
Flow	$Q_V = \frac{q_V \times n \times \eta_V}{1000}$	[L/min]
Torque	$T = \frac{q_V \times \Delta p}{20\,\pi \times \eta_{mh}}$	[Nm]
Power	$P = \frac{2\pi \times T \times n}{60000} = \frac{Q_V \times \Delta p}{600 \times \eta_t}$	[kW]

03 OPERATING MODE

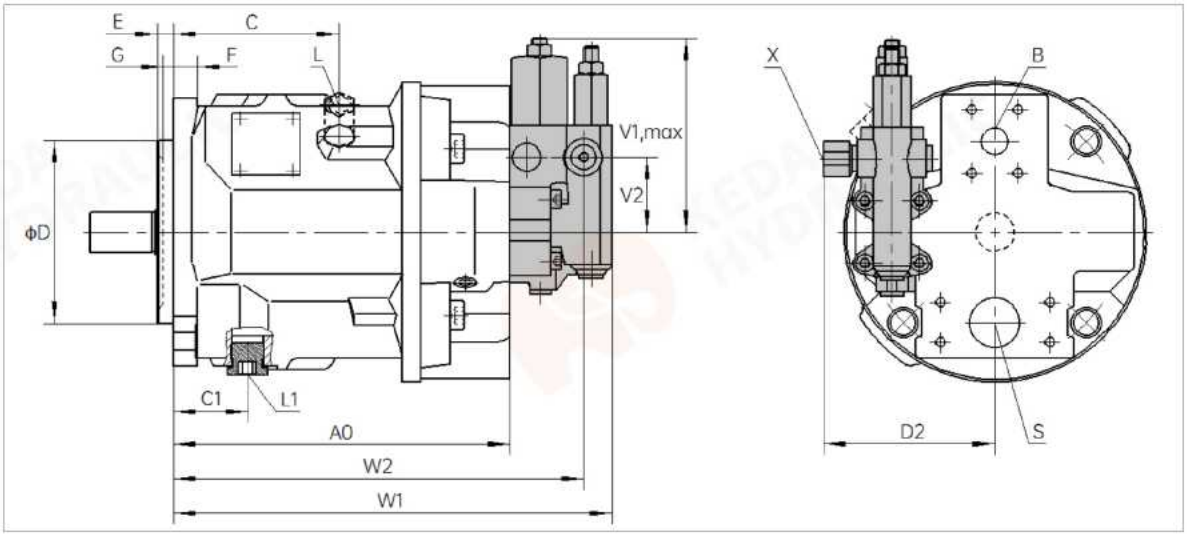
K10VO pump is designed to be used in open circuits. If pumps for close circuits are required, choose K4VSG or K4VG instead. Please contact us for special version or any supplementary information.

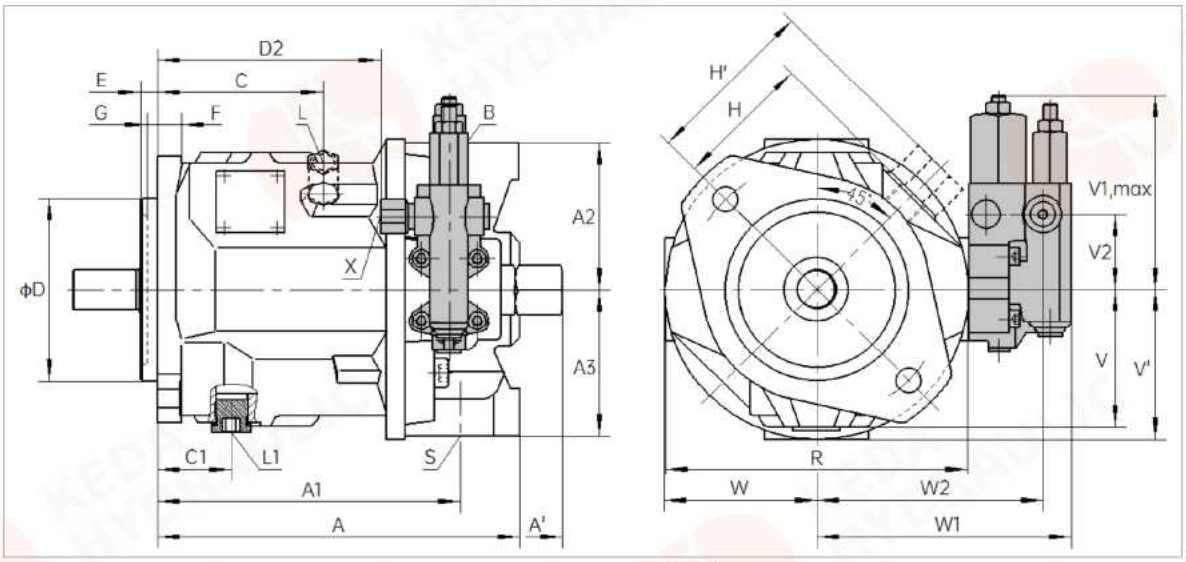
04 SIZE & DIMENSIONS

Following figures are about K10VO pumps' dimensions of all sizes, classified by their control devices. Other variants of control device are shown in gray or dash outlines, referred to notes. Fig. 1~4 for 11 & 12 series while Fig. 5~9 for 13 series. Missing dimensions in Fig. 2~4 or 6~9 referred to Fig. 1 or 5.

Pumps with direction of rotation R are demonstrated as examples. In case of a counterclockwise rotated pump L, the control device (shaded) and relevant parts should be in their horizontally symmetric place. In addition, the port plate rotates 180°. Other exceptions refer to notes.

Fig. 1. Dimensions, DR/11, DFR/11, DFR1/11, DRG/11, DR/12, DRF/12, DRS/12, DRSC/12, DRG/12
(above: port code 11 or 41; below: port code 12 or 42)

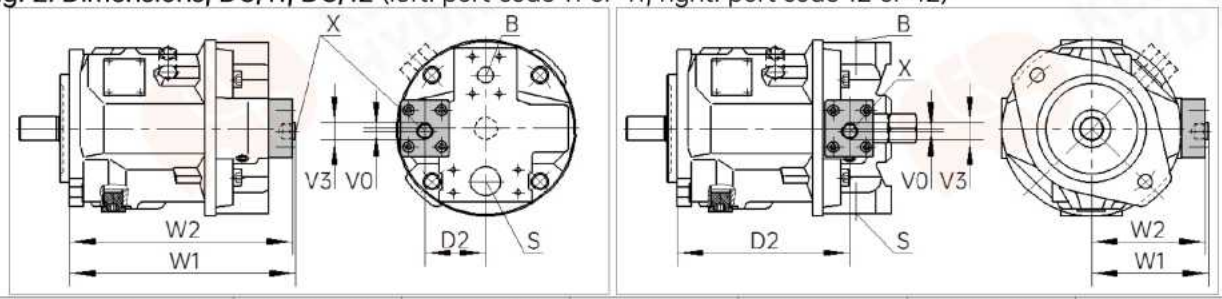




Size+Port / Control/Series		K10VO18		K10VO28		K10VO45		K10VO71		K10VO100		K10VO140[1]	
		11	12	11	12	11	12	41/11	42/12	11	12	11	12
	A	–	△	–	194	–	219	–	257	–	317|302	–	343
	A'	–	195	–	△	–	△	–	△	–	△	–	△
	A_0	–	–	170	–	189	–	223	–	288|273	–	293	–
	A_1	–	145	–	164	–	184	–	217	–	275|260	–	301
	A_2	–	63	△	80	△	90	△	104	△	100	△	110
	A_3	–	63	79	80	△	90	△	104	△	100	△	110
	C	–	83	90	90	96	96	115	115	175|149.5	175|149.5	173	199
	C_1	–	43	40	40	45	45	53	53	95|80	95|80	78	104
	ΦD	–	Φ82.55	Φ101.6	Φ101.6	Φ101.6	Φ101.6	Φ127	Φ127	Φ127	Φ127	Φ152.4	Φ127
	D_2	–	108	95	118	103	133	113|92	161|183	121|100	229|234	118|107	270[3]|275
DR/11	E	–	6.3	9.5	9.5	9.5	9.5	12.7	12.7	12.7	12.7	12.7	12.7
DFR/11	F	–	11.5	14	14	14	14	18	18	20	20	21|24	20
DFR1/11	G	–	–	6.3	6.3	6.3	6.3	6	6	6|5.7	6|5.7	6.4	6.4
DRG/11	H	–	66	△	△	△	△	△|98	△|98	△|114.5	△|114.5	△|127.5	△|118.5
DR/12	H'	–	–	96	96	109	109	124|–	124|–	136|–	136|–	148.5|–	148.5|–
DRF/12	V	–	64	79	74	88	80.5	△	92	△|99	△|99	△	108
	V'	–	69	–	△	–	△	–	△	–|103	△|103	–	112
DRS/12	$V_{1,max}$	–	110	113	110	110	110	110	110	110	110	126|108	126|99
DRSC/12	V_2	–	40	43	40	40	40	40	40	40	40	26|38	26[3]|29
DRG/12	W	–	76	–	83.5	–	93.5	–	107.5	–	118|119	–	131
	W_1	–	126	226	136	245	146	279	160	344|329	165	379[2]|349	209[3]|180
	W_2	–	109	209	119	228	129	262	143	327|312	148.5	353[2]|332	183[3]|163
	R	–	–	△	Φ164	△	Φ184	△	Φ210	△	210|236	△	210
	Suction S	1"		1 ¼"		1 ½"		2"		2 ½"		2 ½"	
	Working B	¾"		¾"		1"		1"		1 ¼"		1 ¼"	
	Drain L	M16X1.5X12		M18X1.5X12		M22X1.5X14		M22X1.5X14 ⅞"-12T-14UNF-2B		M27X2X16 1 1/16"-15T-12UNF-2B		M27X2X16 1 1/16"-15T-12UNF-2B	
	Drain L_1	M16X1.5X12		¾"-14T-16UNF-2B		⅞"-16T-14UNF-2B		⅞"-16T-14UNF-2B ⅞"-12T-14UNF-2B		1 1/16"-18T-12UNF-2B 1 1/16"-15T-12UNF-2B		1 1/16"-18T-12UNF-2B 1 1/16"-15T-12UNF-2B	
	Pilot X	M14X1.5X12		M14X1.5X12		M14X1.5X12		M14X1.5X12 7/16"-12T-20UNF-2B		M14X1.5X12 7/16"-12T-20UNF-2B		M14X1.5X12 7/16"-12T-20UNF-2B	

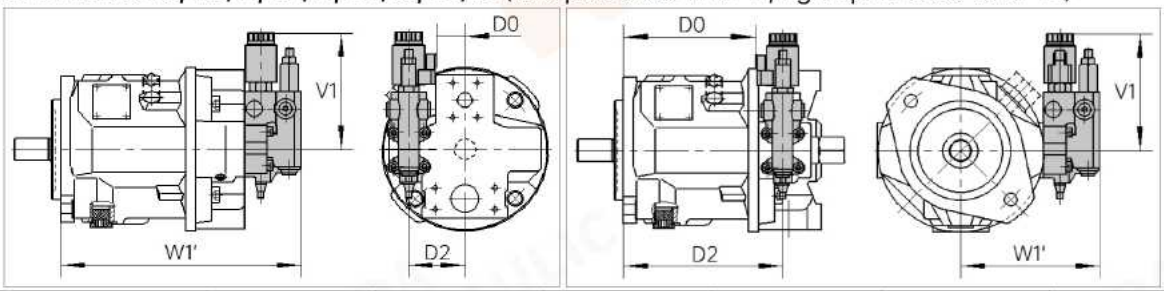
NOTE: – unavailable; △ pending. **1)** Examples demonstrated for port code 11 with D flange & for port code 12 with C flange, missing parameters in similar way; **2)** For DR/DRG: W_1=339, W_2=313; **3)** For DR/DRG: port X to rear, D_2=292, V_2=56, W_1=170, W_2=144. Dimensions of 12 series behind "|" or in 2nd row. Unmentioned parameters same to those of 11 series (default value).

Fig. 2. Dimensions, DG/11, DG/12 (left: port code 11 or 41; right: port code 12 or 42)



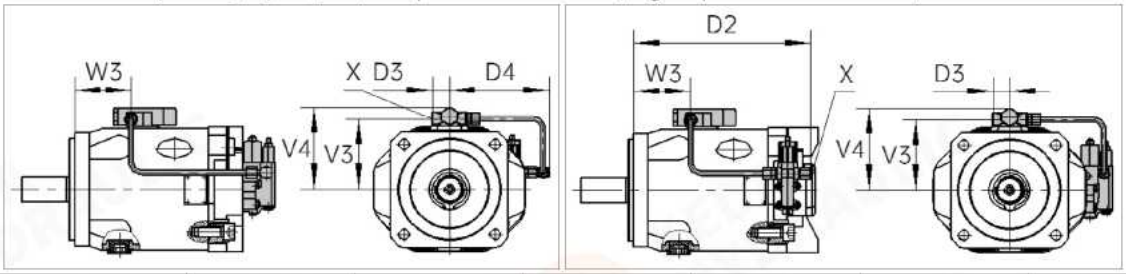
Control/Series	Size+Port	K10VO18 11	K10VO18 12	K10VO28 11	K10VO28 12	K10VO45 11	K10VO45 12	K10VO71 41/11	K10VO71 42/12	K10VO100 11	K10VO100 12	K10VO140[1] 11	K10VO140[1] 12
DG/11 DG/12	D_2	–	148	55	158	63.5	173	73.5	201|202	81	268|253	94|88	268|294
	V_0	–	3	3	3	3	3	3	3	3	3	2.6|5	2.6|14
	V_3	–	$\Phi25^{+0.4}$	$\Phi25^{+0.4}$	$\Phi25^{+0.4}$	$\Phi25^{+0.4}$	$\Phi25^{+0.4}$	$\Phi25^{+0.4}$	$\Phi25^{+0.4}$	$\Phi25^{+0.4}$	$\Phi25^{+0.4}$	△	△
	W_1	–	97	197	103.5	216	117	250	127.5	315|300	132.5|136	327|△	158|150
	W_2	–	89	189.5	99.5	208.5	110	242.5	123.5	308|△	128.5|△	322|320	153|△

Fig. 3. Dimensions, ED/11, ER/11, ED/12, ER/12 (left: port code 11 or 41; right: port code 12 or 42)



Control/Series	Size+Port	K10VO18 11	K10VO18 12	K10VO28 11	K10VO28 12	K10VO45 11	K10VO45 12	K10VO71 41/11	K10VO71 42/12	K10VO100 11	K10VO100 12	K10VO140 11	K10VO140 12
ED/11	D_0	–	184[3]	△	122.2	27.5	△	37.5|109[3]	165	117[3]	232.4	130.6|124[3]	△
ER/11	D_2	–	△	△	157.8	63.5	△	73.5	201	81.4	268	95	△
ED/12	V_1	–	140	143	140	140	140	140	140	140	140	124|138	129
ER/12	W_1' [2]	–	161	260	170.9	279	180.5	314	195	379|364	200	384[4]	214[5]

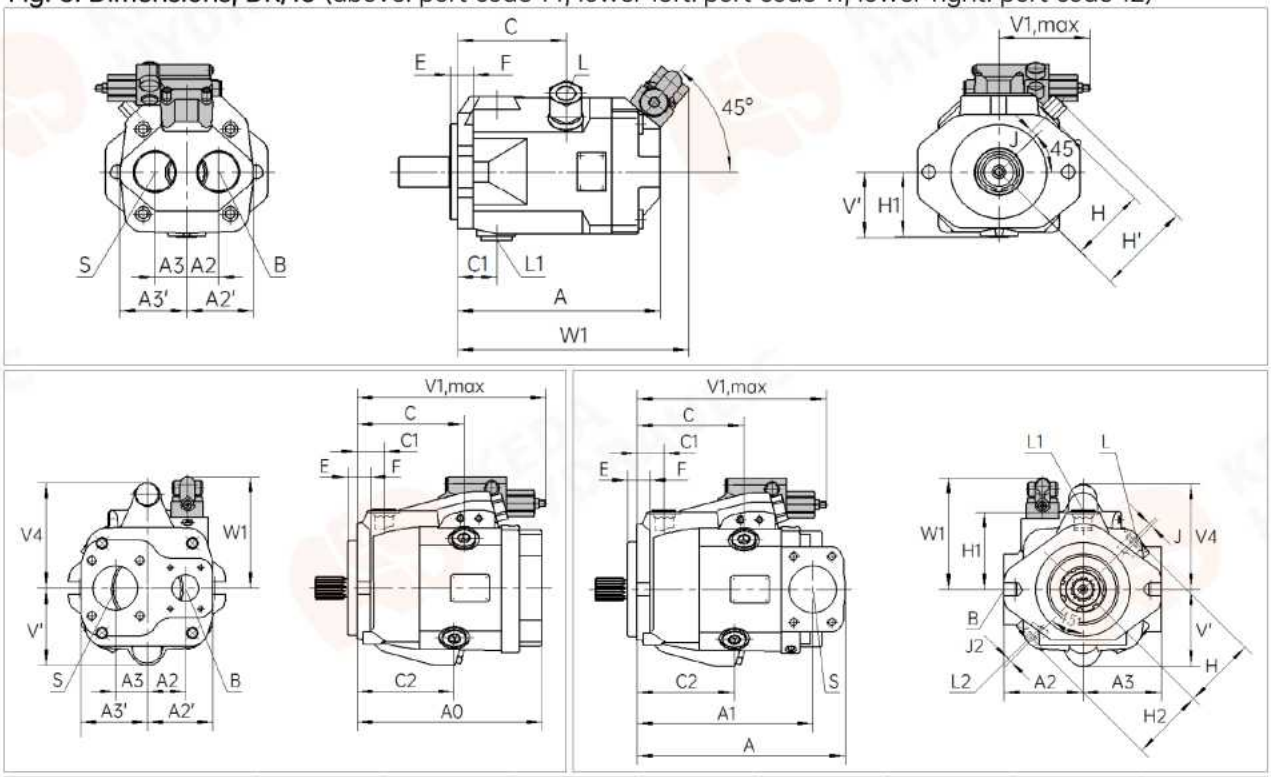
Fig. 4. Dimensions, DFLR/11, LA/12 (left: port code 11 or 41; right: port code 12 or 42)



Control/Series	Size+Port	K10VO18 11	K10VO18 12	K10VO28 11	K10VO28 12	K10VO45 11	K10VO45 12	K10VO71 41/11	K10VO71 42/12	K10VO100 11	K10VO100 12	K10VO140 11	K10VO140 12[6]
DFLR/11 LA/12	D_2	–	–	–	198	–	213	–	242|239	–	308|291	–	314|332
	D_3	–	–	49	49	49	49	49	49	49	49	49|47	49|47
	D_4	–	–	119	–	128	–	138	–	145	–	163|154	–
	V_3	–	–	86	86	91	91	103	103	108.5|112.5	108.5|112.5	119	119
	V_4	–	–	△	△	112	112	124	124|126.5	129|133	129|133	139.5	139.5
	W_3	–	–	48	48	54	54	69	69	111|96	111|96	99	99|125

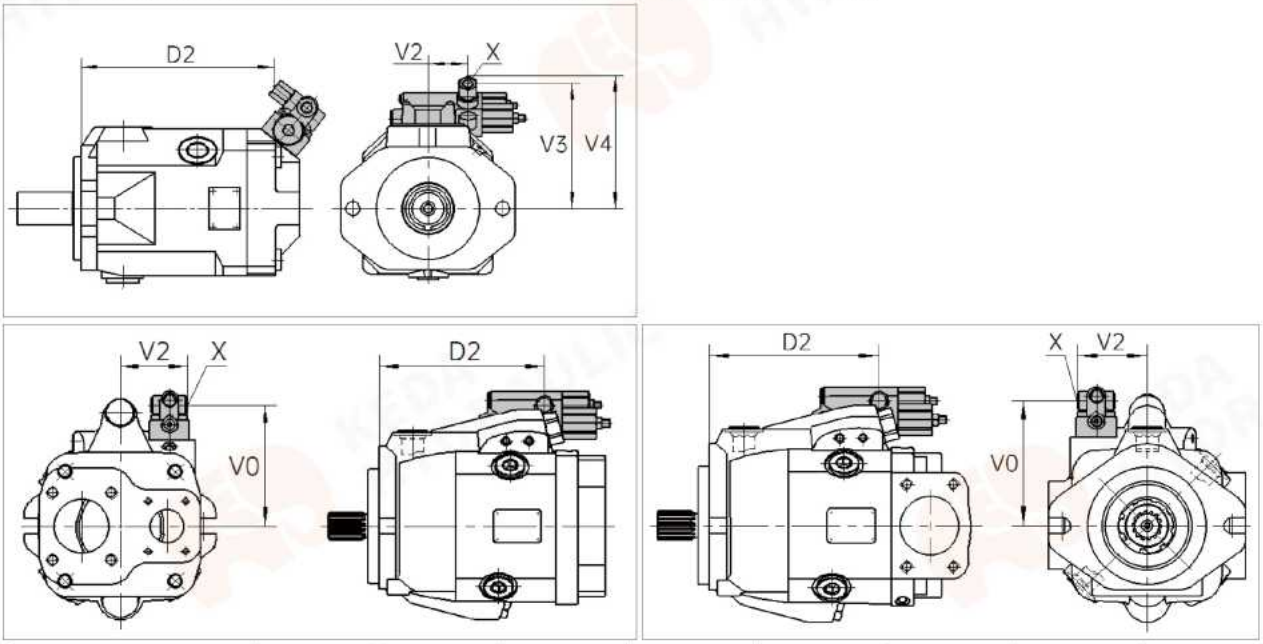
NOTE: – unavailable; △ pending. **1)** Extra high-pressure measuring port M_H M14X1.5X12 at a distance of 28 mm below port X; **2)** W_1' for the width plus intermediate plate DBV (pressure relief valve) under ER control, otherwise $W_1'=W_1$; **3)** Port X in opposite direction; **4)** W_1=349 unlike others; **5)** W_1=179 unlike others; **6)** Port X at a distance of 56 mm above axis, i.e. V_2=56 (refer to Fig. 1. right).

Fig. 5. Dimensions, DR/13 (above: port code 14; lower-left: port code 11; lower-right: port code 12)



Control/Series \ Size+Port		K10VO10	K10VO18		K10VO28		K10VO45		K10VO63		K10VO72		K10VO85		K10VO100	
		14	11	12	11	12	11	12	11	12	11	12	11	12	11	12
DR/13	A	148	–	170	–	△	–	211	–	239.5	–	239.5	–	277	–	277
	A_0	–	156	–	170	–	189	–	208	–	208.2	–	245	–	245	–
	A_1	–	–	143	–	160	–	178	–	201.5	–	201.5	–	235	–	235
	A_2	28.6	33	56.5	33	66	38	90	46	72	46	72	45	85	45	85
	A_3	28.6	32	56.5	33	66	38	90	33	72	33	72	50	95	50	95
	A_2'	51	–	–	–	–	–	–	75	–	–	–	△	–	–	–
	A_3'	51	–	–	–	–	–	–	75	–	–	–	△	–	–	–
	C	73	83		90		99		115.5		115.5		143		143	
	C_1	24	24.5		–		30		39		39		36		36	
	C_2	–	83		27		–		115.5		115.5		130		130	
	E	6.4	7.8		9.5		9.5		9.5		9.5		12.7		12.7	
	F	11	10		12		12		15		15		20		20	
	H	56	61.5		69		78		79		79		95		95	
	H'	79	–		–		–		–		–		–		–	
	H_1	53.5	72		–66		77		89		89		101		101	
	H_2	–	61.5		–		–		77.5		77.5		95		95	
	J	9	2.5		0		0		2.8		2.8		4		4	
	J_2	–	△		–		–		0		0		4		4	
	$V_{1,max}$	110	183		209.5		220.5		220.5		220.5		251.5		251.5	
	V'	56	63		73		68.5		88		220.5		102.5		102.5	
	V_4	△	△		△		△		111		111		126		126	
	W_1	180	122		123.5		131.5		140		140.4		150		150	
	Suction S	M27X2X16	1 ¼"		1 ¼"		1 ½"		2"		2"		2 ½"		2 ½"	
	Working B	M27X2X16	¾"		¾"		1"		1"		1"		1 ¼"		1 ¼"	
	Drain $L/L_1/L_2$	M16X1.5X12	¾"-12T-16UNF-2B						⅞"-13T-14UNF-2B				1 1/16"-15T-12UNF-2B			
	Pilot X	7/16"-11.5T-20UNF-2B			7/16"-11.5T-20UNF-2A				7/16"-11.5T-20UNF-2A				7/16"-11.5T-20UNF-2A			

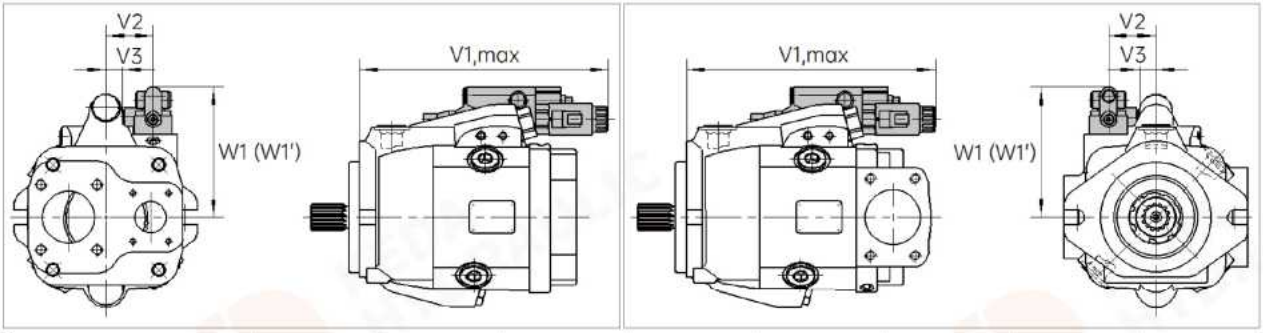
Fig. 6. Dimensions, DRG/13, DFR/13, DRF/13, DFR1/13, DRS/13, DRSC/13
(upper-left: port code 14; lower-left: port code 11; lower-right: port code 12)



Control/Series \ Size+Port		K10VO10	K10VO18		K10VO28		K10VO45		K10VO63		K10VO72		K10VO85		K10VO100	
		14	11	12	11	12	11	12	11	12	11	12	11	12	11	12
DRG/13 DFR/13 DRF/13 DFR1/13 DRS/13 DRSC/13	D_2	132	113		139.5		150.5		150.5		150.5		171.5		181.5	
	V_0	–	106		107		115		121		124		133		139.5	
	V_2	40	62		63		68		65		65		74		74	
	V_3	110	△		△		△		△		△		△		△	
	V_4	118	△		△		△		△		△		△		△	

NOTE: – unavailable; △ pending.

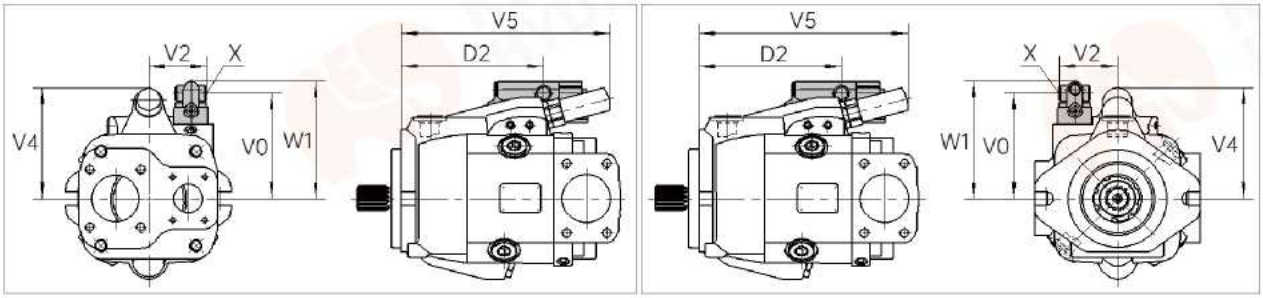
Fig. 7. Dimensions, ED/13, ER/13 (left: port code 11; right: port code 12)



Control/Series \ Size+Port		K10VO10	K10VO18		K10VO28		K10VO45		K10VO63		K10VO72		K10VO85		K10VO100	
		14	11	12	11	12	11	12	11	12	11	12	11	12	11	12
ED/13 ER/13	V_2	–	△		△		△		△		△		55		△	
	V_3	–	△		△		△		△		△		19.4		△	
	$V_{1,max}$	–	214		240		250		251		250.5		271.4		251	
	W_1	–	122		130		132		137		140.5		156		156	
	W_1' [1)]	–	157		159		167		172		175.5		191		191	

NOTE: – unavailable; △ pending. **1)** W_1' for the width plus intermediate plate DBV (pressure relief valve) under ER control.

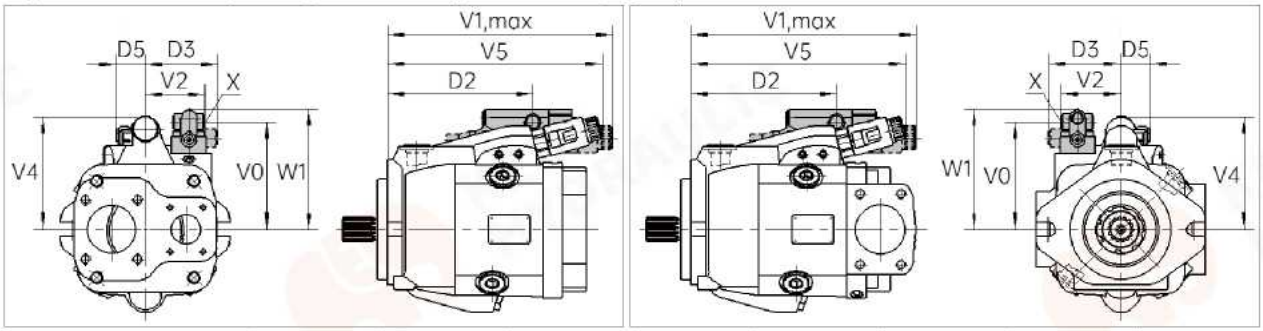
Fig. 8. Dimensions, LA/13 (left: port code 11; right: port code 12)



Control/Series	Size+Port	K10VO10 14	K10VO18 11	K10VO18 12	K10VO28 11	K10VO28 12	K10VO45 11	K10VO45 12	K10VO63 11	K10VO63 12	K10VO72 11	K10VO72 12	K10VO85 11	K10VO85 12	K10VO100 11	K10VO100 12
LA/13	D_2	–	113		140		146		150		150		181.5		181.5	
	V_0	–	106		114		116.4		124		124		133.4		133.4	
	V_2	–	62		63		68		65		65		74		74	
	V_4	–	113		△		△		128		128		145		145	
	V_5	–	225		231		235		247		247		271		271	
	W_1	–	122		130		133		140		140		149.9		149.9	

NOTE: – unavailable; △ pending.

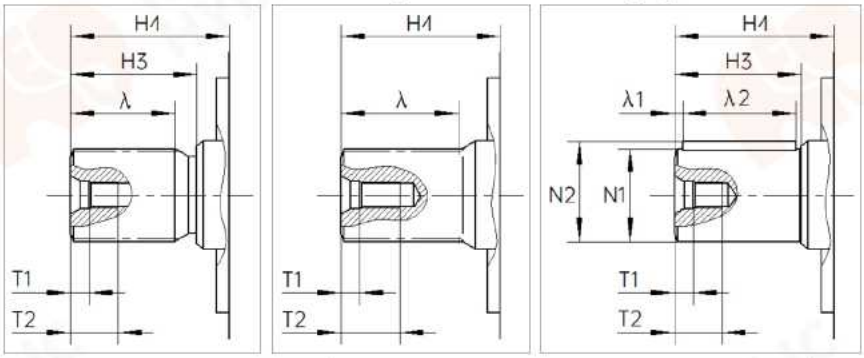
Fig. 9. Dimensions, EP/13, EK/13 (left: port code 11; right: port code 12)



Control/Series	Size+Port	K10VO10 14	K10VO18 11	K10VO28 12	K10VO28 11	K10VO45 12	K10VO45 11	K10VO63 12	K10VO63 11	K10VO72 12	K10VO72 11	K10VO85 12	K10VO85 11	K10VO100 12	K10VO100 11
EP/13 EK/13	D_2	–	113	140		146		151		151		181.5		181.5	
	D_3 1)	–	△	△		85		82		82		△		△	
	D_5	–	△	△		35		35.6		35.6		36		36	
	V_0	–	106	114		116		123.9		123.9		133		133	
	$V_{1,max}$ 1)	–	220	240		246		250.5		250.5		281		281	
	V_2	–	62	63		68		64.8		64.8		74		74	
	V_4	–	110	117		119		125		125		142		142	
	V_5	–	218.5	224		228		241		241		267		267	
	W_1	–	122	130		133		140.4		140.4		150		150	

NOTE: – unavailable; △ pending. **1)** Only for EP1ED, EP2ED, EK1ED and EK2ED. $V_{1,max}$ for other EP or EK control is pending.

09 DRIVE SHAFT (left: S/U shaft; middle: R/W shaft; right: P shaft)



Size+Shaft / Dimension	K10VO10			K10VO18				K10VO28	
	S shaft	U shaft	P shaft	S shaft[1]	R shaft	U shaft	P shaft	S shaft	R shaft
H_3	30	23.8	$28^{+0.2}$	30	–	23.8	$28^{+0.3}$	33.1	–
H_4	38	31.8	36	38	38	31.8	36	41	41
λ	22	15.8	–	21|22[2]	21	15.8	–	25.1	25
λ_1	–	–	2	–	–	–	2	–	–
λ_2	–	–	25	–	–	–	25	–	–
N_1	–	–	$18^{+0.008}_{-0.003}$	–	–	–	$18^{+0.009}_{-0.004}$	–	–
N_2	–	–	$20.5_{-0.2}$	–	–	–	$20.5_{-0.2}$	–	–
T_1	5	△	△	5|△[2]	5	△	△	5	5
T_2	14	△	△	14|△[2]	14	△	△	16	16
Spline X9g	¾"-11T-16/32	⅝"-9T-16/32	–	¾"-11T-16/32	¾"-11T-16/32	⅝"-9T-16/32	–	⅞"-13T-16/32	1⅛"-13T-16/32
Parallel key	–	–	A6X6X25	–	–	–	A6X6X25	–	–
Center hole	¼-20UNC-2B	R3.15X6.7	R3.15X6.7	¼-20UNC-2B	¼-20UNC-2B	R3.15X6.7	R3.15X6.7	¼-20UNC-2B	¼-20UNC-2B

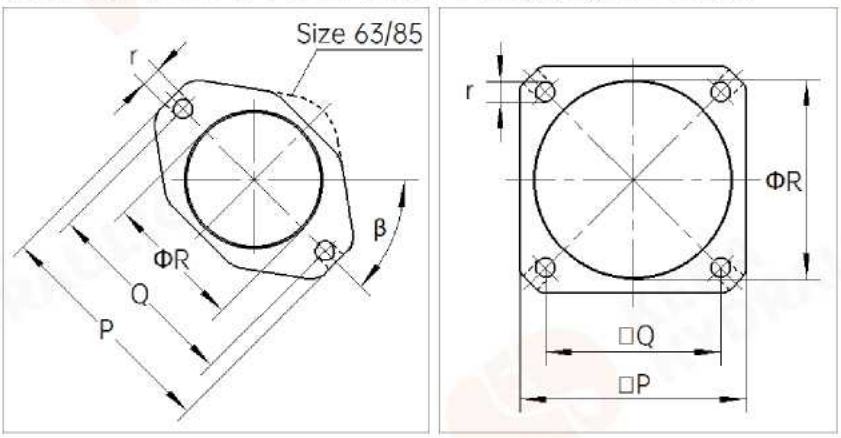
Size+Shaft / Dimension	K10VO28			K10VO45					K10VO63	
	U shaft	W shaft	P shaft	S shaft	R shaft	U shaft	W shaft	P shaft	S shaft	R shaft
H_3	30	–	△	38	–	33.1	–	△	47.5	–
H_4	38	38	△	45.9	45.9	41	41	△	55.4	55.4
λ	22	21	–	30	29.5	25.1	25	–	39.5	40
λ_1	–	–	△	–	–	–	–	△	–	–
λ_2	–	–	△	–	–	–	–	△	–	–
N_1	–	–	△	–	–	–	–	△	–	–
N_2	–	–	△	–	–	–	–	△	–	–
T_1	5	5	△	5	5	5	5	△	6	6
T_2	14	14	△	16	16	16	16	△	19	19
Spline X9g	¾"-11T-16/32DP		–	1"-15T-16/32DP		⅞"-13T-16/32DP		–	1¼"-14T-12/24DP	
Parallel key	–		△	–		–		△	–	
Center hole	¼-20UNC-2B		△	¼-20UNC-2B		¼-20UNC-2B		△	5/16-18UNC-2B	

Size+Shaft / Dimension	K10VO63		K10VO71				K10VO72			
	U shaft	W shaft	S shaft	R shaft	U shaft	W shaft	S shaft	R shaft	U shaft	W shaft
H_3	38	–	47.5	–	38	–	47.5	–	38	–
H_4	45.9	45.9	55.4	55.4	45.9	45.9	55.4	55.4	45.9	45.9
λ	30	29	39.5	38	30	30	39.5	40	30	29
T_1	5	5	5|6[3]	5|6[3]	5	5	6	6	5	5
T_2	16	16	19	19	16	16	19	19	16	16
Spline X9g	1"-15T-16/32DP		1¼"-14T-12/24DP		1"-15T-16/32DP		1¼"-14T-12/24DP		1"-15T-16/32DP	
Center hole	¼-20UNC-2B		5/16-18UNC-2B		¼-20UNC-2B		5/16-18UNC-2B		¼-20UNC-2B	

NOTE: – unavailable; △ pending. **1)** Center hole on S shaft of K10VO 18 (13 series) is R3.15X6.7; **2)** 13 series; **3)** 12 series.

Size+Shaft / Dimension	K10VO85				K10VO100					140[1]
	S shaft	R shaft	U shaft	W shaft	S shaft	R shaft	U shaft	W shaft	P shaft	S shaft
H_3	54	–	47.5	–	54	–	47.5	–	△	67
H_4	61.9	61.9	55.4	55.4	61.9	△|61.9[2]	55.4	55.4	△	75
λ	43.5	42	35	33	43.5	△|42[2]	35	35|33[2]	–	53
λ_1	–	–	–	–	–	–	–	–	△	–
λ_2	–	–	–	–	–	–	–	–	△	–
N_1	–	–	–	–	–	–	–	–	△	–
N_2	–	–	–	–	–	–	–	–	△	–
T_1	9.5	9.5	6	6	5|9.5[2]	△|9.5[2]	5|6[2]	5|6[2]	△	5
T_2	28	28	19	19	28	△|28[2]	19	19	△	32
Spline X9g	1½"-17T-12/24DP		1¼"-14T-12/24DP		1½"-17T-12/24DP		1¼"-14T-12/24DP		–	1¾"-13T-8/16
Parallel key	–		–		–		–		△	–
Center hole	7/16-14UNC-2B		5/16-18UNC-2B		7/16-14UNC-2B		5/16-18UNC-2B		△	½-13UNC-2B

10 MOUNTING FLANGE (left: A/C flange; right: D flange)

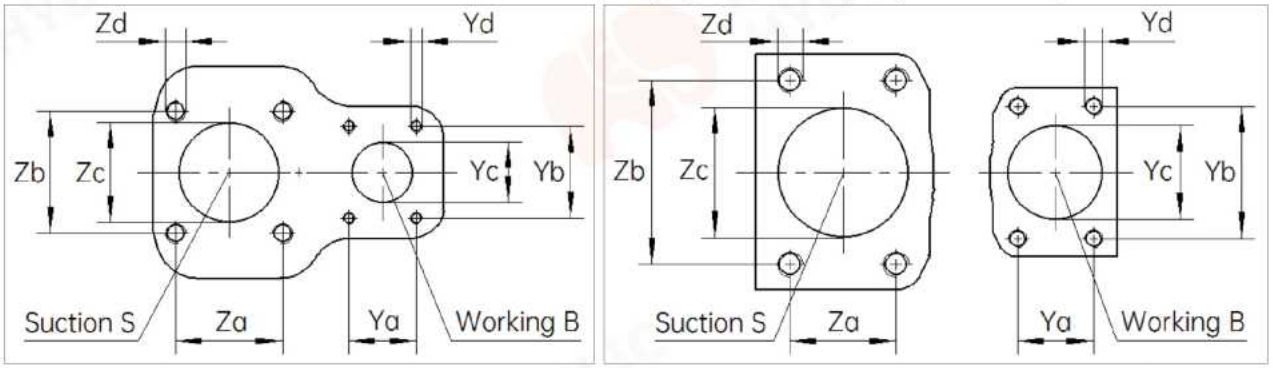


Size+Flange / Dimension	K10VO10		K10VO18	K10VO28	K10VO45	K10VO63		K10VO71	
	A flange	C flange	C flange	C flange	C flange	C flange	D flange	C flange	D flange
β	0°	0°	45°|0°[2]	45°|0°[2]	45°|0°[2]	0°	–	45°	–
P	134	134	136	172	172	172	□146	210	□146
Q	109	106.4	106.4	146	146	146	□114.5	181	□114.5
R	$\Phi80_{-0.046}$	$\Phi82.55_{-0.054}$	$\Phi82.55_{-0.054}$	$\Phi101.6_{-0.054}$	$\Phi101.6_{-0.054}$	$\Phi101.6_{-0.054}$	$\Phi127_{-0.063}$	$\Phi127_{-0.063}$	$\Phi127_{-0.063}$
r[3]	Φ11	Φ11	11	Φ14|14.3[2]	Φ14|14.3[2]	14.3	14	Φ18	Φ14.3

Size+Flange / Dimension	K10VO72		K10VO85		K10VO100			K10VO140	
	C flange	D flange	C flange	D flange	C flange	D flange	D flange[2]	C flange	D flange
β	0°	–	0°	–	0°	–	–	0°	–
P	172	□146	210	□146	210X152	□200	□146	210X152	□200
Q	146	□114.5	181	□114.5	181	□161.6	□114.5	181	□161.6
R	$\Phi101.6_{-0.054}$	$\Phi127_{-0.063}$	$\Phi127_{-0.063}$	$\Phi127_{-0.063}$	$\Phi127_{-0.063}$	$\Phi152.4_{-0.063}$	$\Phi127_{-0.063}$	$\Phi127_{-0.063}$	$\Phi152.4_{-0.063}$
r[3]	14.3	14	17.5	14.3	17.5|Φ17.5[3]	Φ20.6	14.3	17.5	Φ20.6

NOTE: – unavailable; △ pending. **1)** Dimensions of K10VO140 with U/W shaft are pending; **2)** 13 series; **3)** r without Φ note for slots.

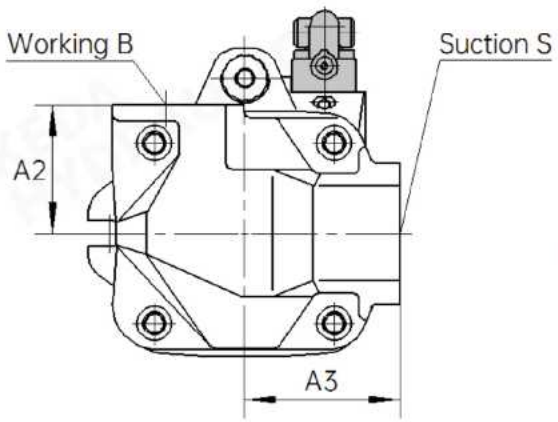
11 WORKING PORT (left: 11/41 port; right: 12/42/13 port; unlisted: 14 port[1])



Size+Port / Dimension	K10VO18		K10VO28		K10VO45		K10VO63		K10VO71
	11 port	12 port[2]	11 port	12 port	11 port[3]	12/13 port	11 port	12 port	11/41 port
Y_a	22.2	22.2	22.2	22.2	26.2	26.2	26.2	26.2	52.4
Y_b	47.6	47.6	47.6	47.6	52.4	52.4	52.4	52.4	26.2
Y_c	Φ20	Φ20	Φ20	Φ20	Φ25	Φ25	Φ25	Φ25	Φ25
Y_d	M10X1.5X17	M10X1.5X17	M10X1.5X17	M10X1.5X17	M10X1.5X17	M10X1.5X17	M10X1.5X17	M10X1.5X17	M10X1.5X17
Z_a	30.2	26.2	30.2	30.2	35.7	35.7	42.9	42.9	42.9
Z_b	58.7	52.4	58.7	58.7	69.9	69.9	77.8	77.8	77.8
Z_c	Φ32	Φ25	Φ32	Φ32	Φ40|Φ38[4]	Φ40|Φ38[4]	Φ50	Φ50	Φ50
Z_d	M10X1.5X17	M10X1.5X17	M10X1.5X17	M10X1.5X17	M12X1.75X20	M12X1.75X20	M12X1.75X20	M12X1.75X20	M12X1.75X20

Size+Port / Dimension	K10VO71	K10VO72		K10VO85		K10VO100		K10VO140	
	12/42 port	11 port	12 port	11 port	12 port	11 port	12 port	11 port	12 port
Y_a	52.4	26.2	26.2	31.8	31.8	31.8	31.8	31.8	31.8
Y_b	26.2	52.4	52.4	66.7	66.7	66.7	66.7	66.7	66.7
Y_c	Φ25	Φ25	Φ25	Φ32	Φ32	Φ32	Φ32	Φ32	Φ32
Y_d	M10X1.5X17	M10X1.5X17	M10X1.5X17	M14X2X19	M14X2X19	M14X2X19	M14X2X19	M14X2X19	M14X2X19
Z_a	42.9	42.9	42.9	50.8	50.8	50.8	50.8	50.8	50.8
Z_b	77.8	77.8	77.8	88.9	88.9	88.9	88.9	88.9	88.9
Z_c	Φ50	Φ50	Φ50	Φ60	Φ63	Φ60	Φ60	Φ63	Φ63
Z_d	M12X1.75X20	M12X1.75X20	M12X1.75X20	M12X1.75X17	M12X1.75X17	M12X1.75X17	M12X1.75X17	M12X1.75X17	M12X1.75X17

Addition: Distribution and dimensions[1] of 13 port



NOTE: **1)** Refer to "04 SIZE & DIMENSIONS" Fig. 5. and corresponding table; **2)** For 13 series: dimensions same as 11 port; **3)** For 13 series: patterns of fastening thread rotate 30° clockwise, around suction port S and working port B respectively; **4)** 13 series.

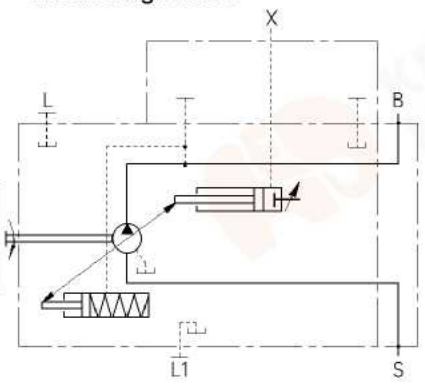
05 CONTROL DEVICE

K10VO pumps can be equipped with various control devices, like direct operated two-point control DG, pressure control DR, pressure/flow/power control DFLR, electrohydraulic pressure control ED/ER, power control LA, electric proportional control with/without pressure cut-off EP/EK and so forth.

1. DG – Direct operated two-point control

The variable pump can be set to a minimum swivel angle by connecting an external switching pressure to port **X**. A minimum control pressure of $p_{St} \geq 50$ bar is required, which depends directly on the actual working pressure p at port **B**. This will supply control fluid directly to the stroking piston and switch pump displacement between $V_{g,max}$ and $V_{g,min}$.

▼Circuit diagram DG



▼Availability for DG control of all sizes

Control \ Size	10	18	28	45	63	71	72	85	100	140
D G	–	●1)	●1)	●1)	–	●	–	–	●1)3)	●

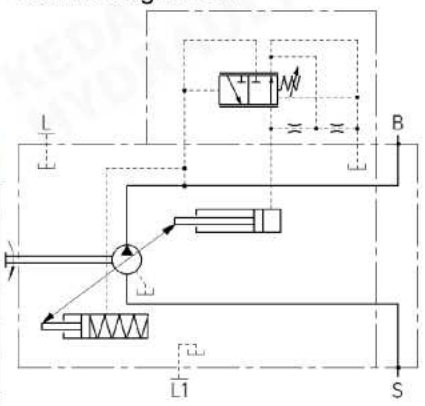
NOTE: ● available; – unavailable. **1)** 11 series; **3)** 12 series.

2. DFLR – Pressure/Flow/Power control

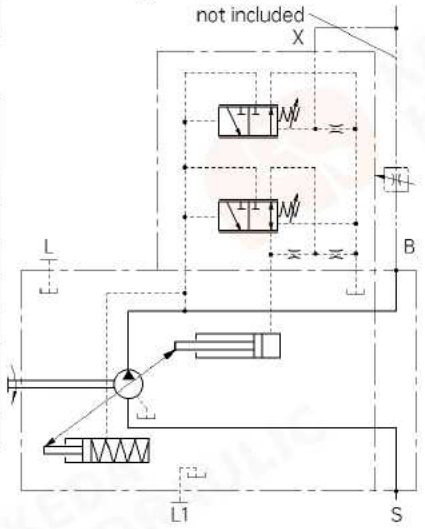
The pressure controller **DR** limits the maximum pressure p_{max} at pump outlet within the control range 50~280 bar (default 280 bar) of variable pump. If the working pressure exceeds the pressure command value at pressure valve, the pump will regulate to smaller displacement to reduce the control differential. The flow controller **FR** adjusts the displacement of the pump to the volume required by the consumer. Flow control is possible below the power control curve. Initial position in depressurized state: $V_{g,max}$.

D						Pressure
	F					Flow
		L				Power
			R			Controller
				G		, remotely operated
				F		, with hydraulic flow control
					1	
					S	
					SC	

▼Circuit diagram DR



▼Circuit diagram DFR/DFR1

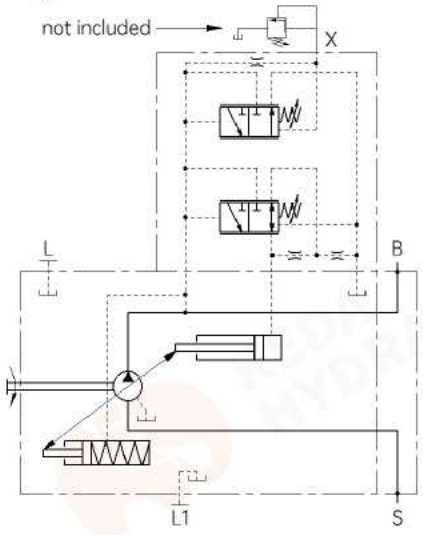


▼Availability for DFLR control of all sizes

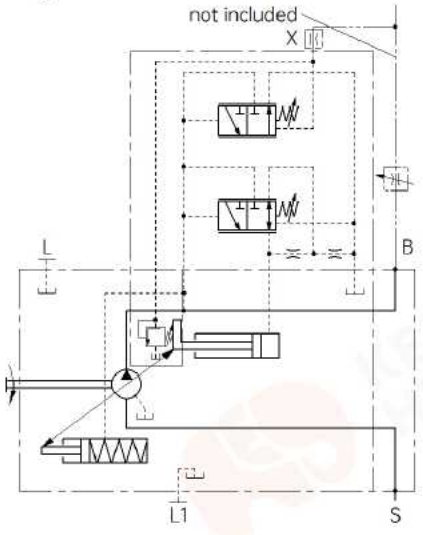
Control \ Size	10	18	28	45	63	71	72	85	100	140
D R	●	●	●	●	○	●	○	●	●	●
D F R	●	●1)	●1)	●1)	–	●1)	○	–	●1)	●1)
D R F	–	○2)	○2)	○2)	○	●3)	○	●	●2)3)	●3)
D F R 1	●	●1)	●1)	●1)	–	●1)	–	–	●1)	●1)
D R S	–	○2)	○2)	○2)	○	●3)	○	●	●2)3)	●3)
D R SC	●	○2)	○2)	○2)	○	–	○	●	○2)	–
D R G	●	●	●	●	○	●	○	●	●	●
D F L R	–	–	●1)	●1)	–	●1)	–	–	●1)	●1)

For example, **DFR1** means "pressure and flow control, with port **X** plugged and disconnected to reservoir".

▼Circuit diagram DRG



▼Circuit diagram DFLR



3. ED/ER – Electrohydraulic pressure control

The **ED/ER** valve can be set to a certain control pressure by specified variable solenoid current. According to changes to actuator, i.e. in load pressure, the swivel angle and the flow increase or decrease until pressure reaches the specified setting value again. The pump only delivers as much hydraulic fluid as the consumers can take. If the solenoid current drops towards zero, the pressure will be limited to p_{max}=280[1]|250[2] bar (for **ED**) or p_{min}=14[3] bar (for **ER**) by an adjustable hydraulic pressure cut-off.

The **ED** control was optimized for the application in a fan drive system.

E			**Electric controller** with proportional solenoid
	D		, plus negative pressure cut-off
	R		, plus positive pressure cut-off
		71	, solenoid current U=12 V
		72	, solenoid current U=24 V

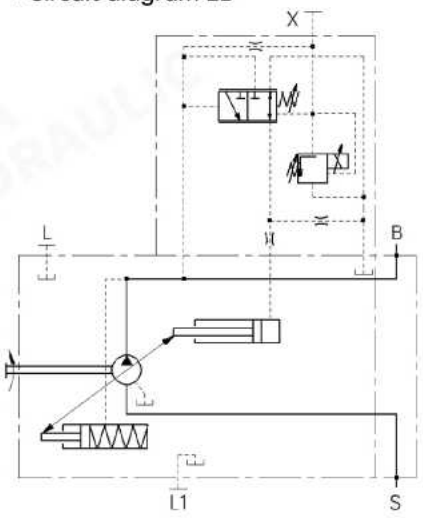
▼Availability for ED/ER control of all sizes

Control		Size	10	18	28	45	63	71	72	85	100	140
E	D	71	–	●	●	●	○	●	○	●	●	●
E	D	72	–	●	●	●	○	●	○	●	●	●
E	R	71	–	●	●	●	○	●	○	●	●	●
E	R	72	–	●	●	●	○	●	○	●	●	●

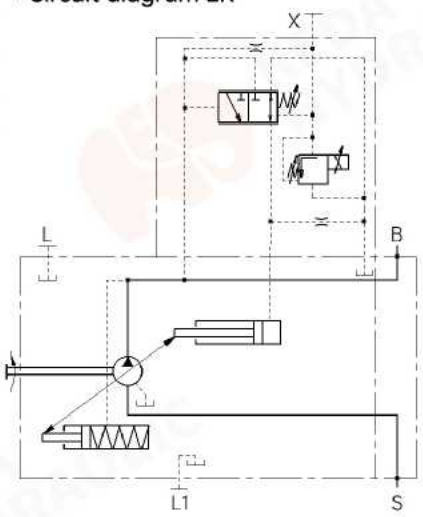
NOTE: ● available; ○ upon request; – unavailable. **1)** 11/12 series; **2)** 13 series; **3)** Default, other setting value upon request.

For example, **ED71** means "electric control with proportional solenoid, plus negative pressure cut-off, solenoid current U=12 V".

▼Circuit diagram ED



▼Circuit diagram ER



12 THROUGH-DRIVE

K10VO pump can be combined with K10VO pumps. Hub for splined shaft, mounting bolts, O-rings and mounting plates (when available) are in the scope of delivery.

The first rows of following tables refer to the 1st pumps, while the second rows after "+" refer to the 2nd pumps and their drive shafts.

	K10VO18					K10VO28							K10VO45									
TD +	10S	10U	18S	18R	18U	10S	10U	18S	18R	18U	28S	28R	10S	10U	18S	18R	18U	28S	28R	45S	45R	45U
K01	–	●	–	–	●	–	●	–	–	●	–	–	–	●	–	–	●	–	–	–	–	–
K52	●	–	●	●	–	●	–	●	●	–	–	–	●	–	●	●	–	–	–	–	–	–
K68	–	–	–	–	–	–	–	–	–	–	●	●	–	–	–	–	–	●	●	–	–	●
K04	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	●	–

	45	K10VO63															K10VO71					
TD +	45W	10S	10U	18S	18R	18U	28S	28R	45S	45R	45U	45W	63S	63R	63U	63W	10S	10U	18S	18R	18U	28S
K01	–	–	○	–	–	○	–	–	–	–	–	–	–	–	–	–	–	●	–	–	●	–
K52	–	○	–	○	○	–	–	–	–	–	–	–	–	–	–	–	●	–	●	●	–	–
K68	●	–	–	–	–	–	○	○	–	–	○	○	–	–	–	–	–	–	–	–	–	●
K04	–	–	–	–	–	–	–	–	○	○	–	–	–	–	○	○	–	–	–	–	–	–
K15	–	–	–	–	–	–	–	–	–	–	–	–	○	○	–	–	–	–	–	–	–	–

	K10VO71											K10VO72										
TD +	28R	45S	45R	45U	45W	63S	63R	63U	63W	71S	71R	10S	10U	18S	18R	18U	28S	28R	45S	45R	45U	45W
K01	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	○	–	–	–	–	–	–
K52	–	–	–	–	–	–	–	–	–	–	–	○	–	○	○	–	–	–	–	–	–	–
K68	●	–	–	●	●	–	–	–	–	–	–	–	–	–	–	–	○	○	–	–	○	○
K04	–	●	●	–	–	–	–	●	●	–	–	–	–	–	–	–	–	–	○	○	–	–
K07	–	–	–	–	–	–	–	–	–	●	●	–	–	–	–	–	–	–	–	–	–	–
K15	–	–	–	–	–	○[1]	○[1]	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

	K10VO72				K10VO85																	
TD +	63S	63R	63U	63W	10S	10U	18S|R	18U	28S	28R	45S	45R	45U	45W	63S	63R	63U	63W	71S	71R	85S	85U
K01	–	–	–	–	–	●	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–
K52	–	–	–	–	●	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
K68	–	–	–	–	–	–	–	–	●	●	–	–	●	●	–	–	–	–	–	–	–	–
K04	–	–	○	○	–	–	–	–	–	–	●	●	–	–	–	–	●	●	–	–	–	–
K07	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	●	–	●
K24	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–
K15	○	○	–	–	–	–	–	–	–	–	–	–	–	–	●	●	–	–	–	–	–	–
K16	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–

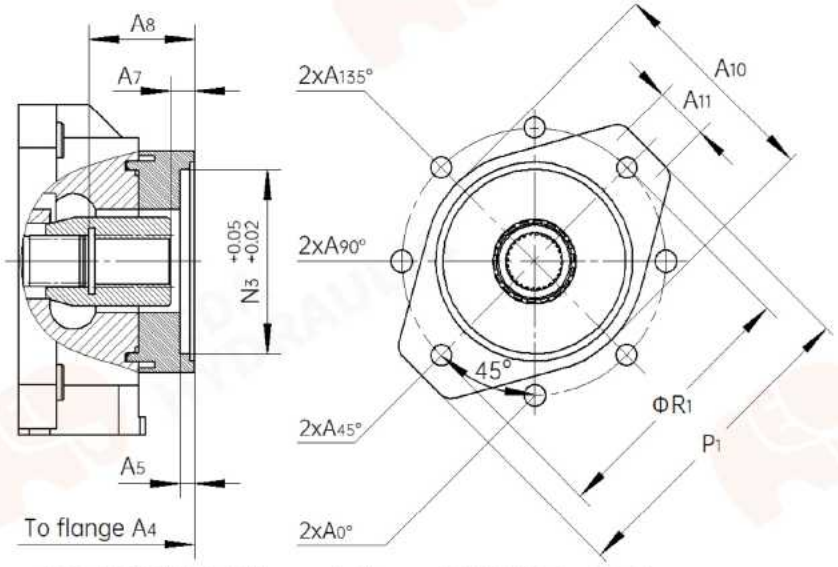
	K10VO100																					
TD +	10S	10U	18S	18R	18U	28S	28R	45S	45R	45U	45W	63S	63R	63U	63W	71S	71R	85S	85U	85W	100S	100U
K01	–	●	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
K52	●	–	●	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
K68	–	–	–	–	–	●	●	–	–	●	●	–	–	–	–	–	–	–	–	–	–	–
K04	–	–	–	–	–	–	–	●	●	–	–	–	–	●	●	–	–	–	–	–	–	–
K07	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	●	–	●	●	–	●
K24	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	●	–
K15	–	–	–	–	–	–	–	–	–	–	–	●[1]	●[1]	–	–	–	–	–	–	–	–	–

NOTE: ● available; ○ upon request; – unavailable. **1)** Only for 1st pump in 12 series.

TD \ +	K10VO140																					
	10S	10U	18S|R	18U	28S	28R	45S	45R	45U	45W	63S	63R	63U	63W	71S	71R	85S	85U	85W	100S	100U	140S
K01	–	●	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
K52	●	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
K68	–	–	–	–	●	●	–	–	●	●	–	–	–	–	–	–	–	–	–	–	–	–
K04	–	–	–	–	–	–	●	●	–	–	–	–	●	●	–	–	–	–	–	–	–	–
K07	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	●	–	●	●	–	●	–
K24	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	●	–	–
K15	–	–	–	–	–	–	–	–	–	–	●[1]	●[1]	–	–	–	–	–	–	–	–	–	–
K17	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●

NOTE: ● available; ○ upon request; – unavailable. **1)** Only for 1st pump in 12 series.

▼ Dimensions of mounting plate/2nd pump's flange/hub for splined shaft/... of all size



Code K01 (2nd pump K10VO10U/18U; 2nd pump's flange ISO 3019-1 – 82-2)

1st pump / Dimension	K10VO18	K10VO28	K10VO45	K10VO63	K10VO71	K10VO72	K10VO85	K10VO100	K10VO140
N_3	Φ82.55	Φ82.55	Φ82.55	Φ82.55	Φ82.55	Φ82.55	Φ82.55	Φ82.55	Φ82.55
A_4	182	204	229	255	267	255	302	338	350
A_5	10	10	10	10	10	10	10	10	10
A_7	10	10	10.7	8.7	11.8	9.5	8.7	10.5	10.8
A_8	43.3	33.7	53.4	58.2	61.3	59	67.2	65	77.3
$A_{0°}$	M10X1.5X14.5	M10X1.5X16	M10X1.5X16	–	M10X1.5X20	–	–	M10X1.5X16	M10X1.5X16
$A_{45°}$	M10X1.5X14.5	M10X1.5X16	M10X1.5X16	M10X1.5X16	M10X1.5X20	M10X1.5X16	M10X1.5X20	M10X1.5X16	M10X1.5X16
$A_{90°}$	M10X1.5X14.5	M10X1.5X16	M10X1.5X16	M10X1.5X16	M10X1.5X20	M10X1.5X16	M10X1.5X20	M10X1.5X16	M10X1.5X16
$A_{135°}$	–	–	–	M10X1.5X16	–	M10X1.5X16	M10X1.5X20	–	–
A_{10}	95	95	95	95	95	95	95	95	95
A_{11}	18	18	18	18	18	18	18	18	18
R_1	Φ106.5	Φ106.5	Φ106.5	Φ106.5	Φ106.5	Φ106.5	Φ106.5	Φ106.5	Φ106.5
P_1	130	130	130	130	130	130	130	130	130
HubX8H	△	△	△	△	△	△	△	△	△
	⅝"-9T-16/32	⅝"-9T-16/32	⅝"-9T-16/32	⅝"-9T-16/32	⅝"-9T-16/32	⅝"-9T-16/32	⅝"-9T-16/32	⅝"-9T-16/32	⅝"-9T-16/32

NOTE: – unavailable; △ pending.

Code K52 (2nd pump K10VO10S/18S/18R; 2nd pump's flange ISO 3019-1 – 82-2)

1st pump / Dimension	K10VO18	K10VO28	K10VO45	K10VO63	K10VO71	K10VO72	K10VO85	K10VO100	K10VO140
N_3	Φ82.55	Φ82.55	Φ82.55	Φ82.55	Φ82.55	Φ82.55	Φ82.55	Φ82.55	Φ82.55
A_4	182	204	229	255	267	255	302	338	350
A_5	10	10	10	10	10	10	10	10	10
A_7	18.8	18.8	18.9	18.4	21.3	18.9	21.5	19	18.9
A_8	38.7	38.7	38.7	39.4	41.4	39.4	42.5	38.9	38.6
$A_{0°}$	M10X1.5X14.5	M10X1.5X16	M10X1.5X16	–	M10X1.5X20	–	–	M10X1.5X16	M10X1.5X16
$A_{45°}$	M10X1.5X14.5	M10X1.5X16	M10X1.5X16	M10X1.5X16	M10X1.5X20	M10X1.5X16	M10X1.5X20	M10X1.5X16	M10X1.5X16
$A_{90°}$	M10X1.5X14.5	M10X1.5X16	M10X1.5X16	M10X1.5X16	M10X1.5X20	M10X1.5X16	M10X1.5X20	M10X1.5X16	M10X1.5X16
$A_{135°}$	–	–	–	M10X1.5X16	–	M10X1.5X16	M10X1.5X20	–	–
A_{10}	95	95	95	95	95	95	95	95	95
A_{11}	18	18	18	18	18	18	18	18	18
R_1	Φ106.5	Φ106.5	Φ106.5	Φ106.5	Φ106.5	Φ106.5	Φ106.5	Φ106.5	Φ106.5
P_1	130	130	130	130	130	130	130	130	130
HubX8H	△	△	△	△	△	△	△	△	△
	¾"-11T-16/32	¾"-11T-16/32	¾"-11T-16/32	¾"-11T-16/32	¾"-11T-16/32	¾"-11T-16/32	¾"-11T-16/32	¾"-11T-16/32	¾"-11T-16/32

NOTE: – unavailable; △ pending.

Code K68 (2nd pump K10VO28S/28R/45U/45W; 2nd pump's flange ISO 3019-1 – 101-2)

1st pump / Dimension	K10VO18	K10VO28	K10VO45	K10VO63	K10VO71	K10VO72	K10VO85	K10VO100	K10VO140
N_3	–	Φ101.6	Φ101.6	Φ101.6	Φ101.6	Φ101.6	Φ101.6	Φ101.6	Φ101.6
A_4	–	204	229	255	267	255	302	338	350
A_5	–	10	10	10	10	10	10	10	10
A_7	–	17.8	17.9	17.4	20.3	17.9	20.5	18	17.8
A_8	–	41.7	41.7	42.4	44.1	42.4	45.5	41.9	41.6
$A_{0°}$	–	–	M12X1.75X18	–	M12X1.75X20	–	–	M12X1.75X20	M12X1.75X20
$A_{45°}$	–	M12X1.75	M12X1.75X18	M12X1.75X18	M12X1.75X20	M12X1.75X18	M12X1.75X20	M12X1.75X20	M12X1.75X20
$A_{90°}$	–	–	M12X1.75X18	M12X1.75X18	M12X1.75X20	M12X1.75X18	M12X1.75X20	M12X1.75X20	M12X1.75X20
$A_{135°}$	–	–	–	M12X1.75X18	–	M12X1.75X18	M12X1.75X20	–	–
A_{10}	–	120	120	120	120	120	120	120	120
A_{11}	–	25	25	25	25	25	25	25	25
R_1	–	Φ146	Φ146	Φ146	Φ146	Φ146	Φ146	Φ146	Φ146
P_1	–	174	174	174	174	174	174	174	174
HubX8H	–	△	△	△	△	△	△	△	△
	–	⅞"-13T-16/32	⅞"-13T-16/32	⅞"-13T-16/32	⅞"-13T-16/32	⅞"-13T-16/32	⅞"-13T-16/32	⅞"-13T-16/32	⅞"-13T-16/32

NOTE: – unavailable; △ pending.

Code K04 (2nd pump K10VSO45S/45R/63U/63W; 2nd pump's flange ISO 3019-1 – 101-2)

1st pump / Dimension	K10VO18	K10VO28	K10VO45	K10VO63	K10VO71	K10VO72	K10VO85	K10VO100	K10VO140
N_3	–	–	Φ101.6	Φ101.6	Φ101.6	Φ101.6	Φ101.6	Φ101.6	Φ101.6
A_4	–	–	229	255	267	255	302	338	350
A_5	–	–	10	10	10	10	10	10	10
A_7	–	–	18.4	17.9	20.8	18.4	20.7	18.2	18.3
A_8	–	–	46.7	47.4	49.1	47.4	50.2	46.6	45.9

NOTE: – unavailable.

1st pump / Dimension	K10VO18	K10VO28	K10VO45	K10VO63	K10VO71	K10VO72	K10VO85	K10VO100	K10VO140
$A_{0°}$	–	–	M12X1.75X18	–	M12X1.75X20	–	–	M12X1.75X20	M12X1.75X20
$A_{45°}$	–	–	M12X1.75X18	M12X1.75X18	M12X1.75X20	M12X1.75X18	M12X1.75X20	M12X1.75X20	M12X1.75X20
$A_{90°}$	–	–	M12X1.75X18	M12X1.75X18	M12X1.75X20	M12X1.75X18	M12X1.75X20	M12X1.75X20	M12X1.75X20
$A_{135°}$	–	–	–	M12X1.75X18	–	M12X1.75X18	M12X1.75X20	–	–
A_{10}	–	–	120	120	120	120	120	120	120
A_{11}	–	–	25	25	25	25	25	25	25
R_1	–	–	Φ146	Φ146	Φ146	Φ146	Φ146	Φ146	Φ146
P_1	–	–	174	174	174	174	174	174	174
HubX8H	–	–	△	△	△	△	△	△	△
	–	–	1"-15T-16/32	1"-15T-16/32	1"-15T-16/32	1"-15T-16/32	1"-15T-16/32	1"-15T-16/32	1"-15T-16/32

NOTE: – unavailable; △ pending.

Code K07 (2nd pump K10VO71S/71R/85U/85W/100U; 2nd pump's flange ISO 3019-1 – 127-2)

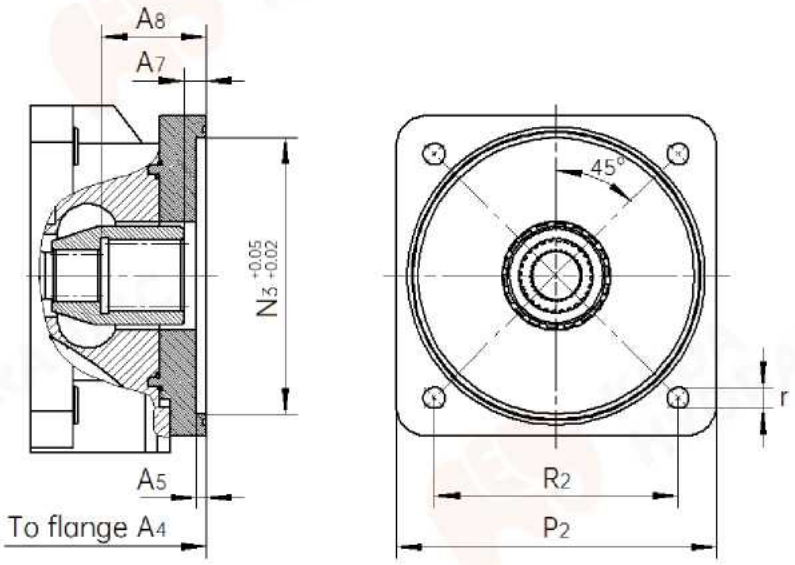
1st pump / Dimension	K10VO18	K10VO28	K10VO45	K10VO63	K10VO71	K10VO72	K10VO85	K10VO100	K10VO140
N_3	–	–	–	–	Φ127	–	Φ127	Φ127	Φ127
A_4	–	–	–	–	267	–	301.5	338	350
A_5	–	–	–	–	13	–	13	13	13
A_7	–	–	–	–	21.8	–	22	19.5	19.3
A_8	–	–	–	–	58.6	–	60	56.4	56.1
$A_{45°}$	–	–	–	–	–	–	M12X1.75	M16X2[1)]	M16X2X24
$A_{90°}$	–	–	–	–	M16X2	–	M12X1.75	M16X2[1)]	M16X2X24
A_{10}	–	–	–	–	148	–	148	148	148
A_{11}	–	–	–	–	31	–	31	31	31
R_1	–	–	–	–	Φ181	–	Φ181	Φ181	Φ181
P_1	–	–	–	–	213	–	213	213	213
HubX8H	–	–	–	–	△	–	△	△	△
	–	–	–	–	1¼"-14T-12/24	–	1¼"-14T-12/24	1¼"-14T-12/24	1¼"-14T-12/24

NOTE: – unavailable; △ pending. **1)** For 13 series: fastening thread M12X1.75.

Code K24 (2nd pump K10VO85S/100S; 2nd pump's flange ISO 3019-1 – 127-2)

1st pump / Dimension	K10VO18	K10VO28	K10VO45	K10VO63	K10VO71	K10VO72	K10VO85	K10VO100	K10VO140
N_3	–	–	–	–	–	–	Φ127	Φ127	Φ127
A_4	–	–	–	–	–	–	302	338	350
A_5	–	–	–	–	–	–	13	13	13
A_7	–	–	–	–	–	–	12.8	10.5	10.8[2)]
A_8	–	–	–	–	–	–	67.2	65	75[2)]
$A_{45°}$	–	–	–	–	–	–	M16X2X24	M16X2X24	M16X2X24
$A_{90°}$	–	–	–	–	–	–	M16X2X24	M16X2X24	M16X2X24
$A_{135°}$	–	–	–	–	–	–	M16X2X24	–|M16X2X24[3)]	–
A_{10}	–	–	–	–	–	–	148	148	148
A_{11}	–	–	–	–	–	–	31	31	31
R_1	–	–	–	–	–	–	Φ181	Φ181	Φ181
P_1	–	–	–	–	–	–	213	213	213
HubX8H	–	–	–	–	–	–	△	△	△
	–	–	–	–	–	–	1½"-17T-12/24	1½"-17T-12/24	1½"-17T-12/24

NOTE: – unavailable; △ pending. **2)** If block in hub: A_7=10.3, A_8=69.1; **3)** 13 series.



Code K15 (2nd pump K10VO63S/63R; 2nd pump's flange ISO 3019-1 – 127-4)

1st pump / Dimension	K10VO18	K10VO28	K10VO45	K10VO63	K10VO71	K10VO72	K10VO85	K10VO100	K10VO140
N_3	–	–	–	Φ127	△	Φ127	Φ127	Φ127	Φ127
A_4	–	–	–	255	△	255	301.5	338	350
A_5	–	–	–	13	△	13	13	13	13
A_7	–	–	–	17.9	△	8	22	17.9	17.9
A_8	–	–	–	55.9	△	59	60	56.5	56.5
r	–	–	–	M12X1.75X16	△	M12X1.75X16	M12X1.75	M12X1.75X22	M12X1.75X22
R_2	–	–	–	□114.5	△	□114.5	□114.5	□114.5	□114.5
P_2	–	–	–	△	△	△	△	△	△
HubX8H	–	–	–	△	△	△	△	△	△
	–	–	–	1¼"-14T-12/24	△	1¼"-14T-12/24	1¼"-14T-12/24	1¼"-14T-12/24	1¼"-14T-12/24

NOTE: – unavailable; △ pending.

Code K16 (2nd pump K10VO85S; 2nd pump's flange ISO 3019-1 – 127-4)

1st pump / Dimension	K10VO18	K10VO28	K10VO45	K10VO63	K10VO71	K10VO72	K10VO85	K10VO100	K10VO140
N_3	–	–	–	–	–	–	Φ127	–	–
A_4	–	–	–	–	–	–	301.5	–	–
A_5	–	–	–	–	–	–	13.4	–	–
A_7	–	–	–	–	–	–	12.8	–	–
A_8	–	–	–	–	–	–	67.2	–	–
r	–	–	–	–	–	–	M12X1.75	–	–
R_2	–	–	–	–	–	–	□114.5	–	–
P_2	–	–	–	–	–	–	△	–	–
HubX8H	–	–	–	–	–	–	△	–	–
	–	–	–	–	–	–	1½"-17T-12/24	–	–

NOTE: – unavailable; △ pending.

Code K17 (2nd pump K10VO140S; 2nd pump's flange ISO 3019-1 – 152-4)

1st pump / Dimension	K10VO18	K10VO28	K10VO45	K10VO63	K10VO71	K10VO72	K10VO85	K10VO100	K10VO140
N_3	–	–	–	–	–	–	–	–	Φ152.4 $^{+0.05}_{+0.02}$
A_4	–	–	–	–	–	–	–	–	350
A_5	–	–	–	–	–	–	–	–	13
A_7	–	–	–	–	–	–	–	–	11
A_8	–	–	–	–	–	–	–	–	77.3
r	–	–	–	–	–	–	–	–	M16X2
R_2	–	–	–	–	–	–	–	–	□161.6
P_2	–	–	–	–	–	–	–	–	△
HubX8H	–	–	–	–	–	–	–	–	△
	–	–	–	–	–	–	–	–	1¾"-13T-8/16

NOTE: – unavailable; △ pending.

COMBINATION PUMP

K10VO pump can be combined with K10VO pumps. A tandem pump with two pumps of equal size is permissible. Please specify the designations for 1st and 2nd pumps and join by a "+" when ordering. Order example:

K10V O 71 DFR1 / 11 R – V S C 12 K04 + K10V O 45 DFR / 11 R – V S C 12 N00

13 CONNECTOR FOR SOLENOID

Deutsch-molded 2-pin connector without bidirectional suppressor diode DT04-2P-EP04, as well as its mating connector DT06-2S-EP04, are not included in the scope of delivery but can be supplied upon request.

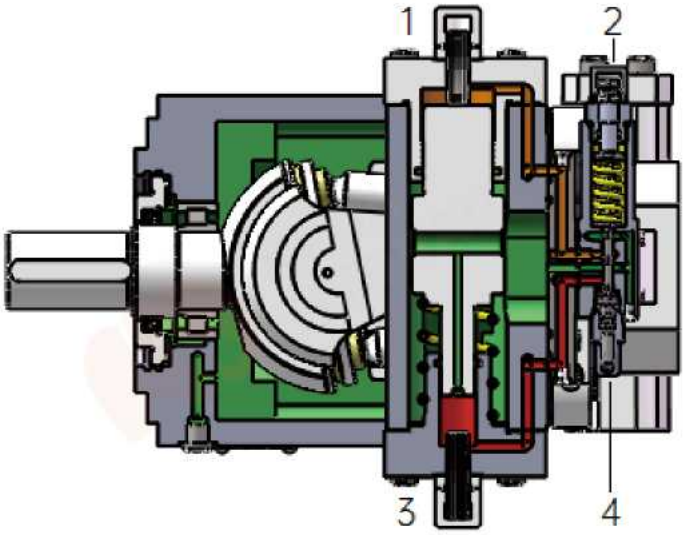
The connectors offer 2 types of protection: IP67 according to DIN EN 60529 and IP69K according to DIN 40050-9.

SERVICE

Guangdong KEDA Hydraulic Technology Co., LTD. is a recognized premier provider of hydraulic parts and service in southern China. We are committed to develop high pressure axial piston pumps & motors, lay out hydraulic power units and come up with system solutions. Our team of qualified experts and skilled technicians can help you to get customized solutions for actual applications as well as reliable, affordable, competitive & innovative hydraulic products. Further requirements like maintenance or reformation of equipment/system are also welcome. Please feel free to contact us!

COMMISSIONING

Cap nut	Remarks
1	To adjust the maximum displacement.
2	For **DR** control: adjust working pressure For **DRG** control: adjust control pressure (20bar)
3	To adjust the minimum displacement. (CAUTION: Default setting! Don't move!)
4	To adjust the response time.



COUPLING ASSEMBLY

1. Install the specified coupling half onto the drive shaft of the axial piston unit following instructions.
2. Clamp the coupling hub onto the drive shaft or ensure a permanent lubrication of the drive shaft. This prevents the formation of frictional corrosion and the associated wear.
3. Transport the axial piston unit to the installation location and remove dirt and contaminants there.
4. Install the coupling on the drive shaft of the machine/system in accordance with the specifications. Fix the axial piston unit (may not be bolted down until the coupling has been correctly installed).
5. Do not install the coupling hub onto the drive shaft of the axial piston unit by striking it.

TRANSPORTATION

▲via lifting strap

▲via hooks

▲via forklift