TYPE CODE

K11V	L	O	190	DR	/	10	R	–	N	Z	D	12	N00	V	P	–	K
01	02	03	04	05		06	07		08	09	10	11	12	13	14		15

AXIAL PISTON UNIT

01	Swash-plate design, variable, nominal pressure p_N 350 [bar], maximum pressure p_{max} 400 [bar]	K11V

CHARGE PUMP

		40	60	75	95	130	145	190	260	
02	Without charge pump	○	○	○	●	○	○	○	○	
	With charge pump	–	–	–	–	○	●	●	●	L

OPERATING MODE

03	Pump, open circuit	O

SIZE	40	60	75	95	130	145	190	260
04 Geometric displacement $q_{v,max}$ [mL/r]	42	58.5	74	93.5	130	145	193	260

CONTROL DEVICE

				40	60	75	95	130	145	190	260					
05	Pressure control			○	○	○	●	○	●	●	●	DR	—			
	with load sensing			○	○	○	●	○	●	●	●	DRS				
	hydraulic remote control			○	○	○	●	○	●	●	●	DRG				
	for parallel operation			○	○	○	●	○	●	●	●	DRL				
	Power control			○	○	○	●	○	●	●	●	LR				
	override	high pressure dependent	negative	○	○	○	●	○	●	●	●	LR3				
		cross sensing	negative	○	○	○	●	○	●	●	●	LR		C		
		pilot-pressure related	negative	○	○	○	●	○	●	●	●	LG1				
			positive	○	○	○	●	○	●	●	●	LG2				
		electric U=12V	negative	○	○	○	●	○	●	●	●	LE1				
		electric U=24V	negative	○	○	○	●	○	●	●	●	LE2				
	with pressure cut-off			○	○	○	●	○	●	●	●		D			
		secondary		○	○	○	●	○	●	●	●		E			
		hydraulic remote control		○	○	○	●	○	●	●	●				G	
	with load sensing			○	○	○	●	○	●	●	●					S
		electric prop. override		○	○	○	●	○	●	●	●					S2
		hydraulic prop. override		○	○	○	●	○	●	●	●					S5
	with hydraulic stroke limiter	negative	Δp=25bar	○	○	○	●	○	●	●	●					H1
			Δp= 10bar	○	○	○	●	○	●	●	●					H5
		positive	Δp=25bar	○	○	○	●	○	●	●	●					H2
			Δp= 10bar	○	○	○	●	○	●	●	●					H6
	with electric stroke limiter	positive	U= 12V	○	○	○	●	○	●	●	●					U1
			U=24V	○	○	○	●	○	●	●	●					U2

NOTE: ● available ○ upon request – unavailable preferred — left blank

K11V	L	O	190	DR	/	10	R	–	N	Z	D	12	N00	V	P	–	K
01	02	03	04	05		06	07		08	09	10	11	12	13	14		15

CONTROL DEVICE

				40	60	75	95	130	145	190	260			
05	Pilot-pressure related hydraulic control	positive	Δp= 10bar	○	○	○	●	○	●	●	●	HD1		—
			Δp=25bar	○	○	○	●	○	●	●	●	HD2		
	Electrical control with proportional solenoid	positive	U= 12V	○	○	○	●	○	●	●	●	EP1		
			U=24V	○	○	○	●	○	●	●	●	EP2		
	with pressure cut-off			○	○	○	●	○	●	●	●		D	
	hydraulic remote controlled cut-off			○	○	○	○	○	○	●	●		G	

SERIES

06	Standard	10

DIRECTION OF ROTATION

07	View on drive shaft	clockwise	R
		counterclockwise	L

SEALING

08	Fluoroelastomer (FKM) as shaft seals; Nitrile rubber (NBR) for others.	N

DRIVE SHAFT

			40	60	75	95	130	145	190	260	
09	[DIN 6885] parallel keyed shaft		○	○	○	●	○	●	●	●	P
	[DIN 5480] splined shaft		○	○	○	●	○	●	●	●	Z
	[ANSI B92.1a] splined shaft	single pump	○	○	○	●	○	●	●	●	S
		combined pumps	–	–	–	●	○	●	–	–	S
			○	○	○	–	–	–	●	●	T

MOUNTING FLANGE

			40	60	75	95	130	145	190	260	
10	[SAE J744] flange	2-hole	○	○	–	–	–	–	–	–	C
		4-hole	–	–	○	●	○	●	●	●	D
	[SAE J617] flange	12-hole	–	–	–	●	○	●	●	–	G

WORKING PORT

		40	60	75	95	130	145	190	260	
11	[SAE] pressure and suction ports at opposite sides; [DIN 13] metric fastening thread; [DIN 3852] metric fastening thread with profile sealing ring.	○	○	○	●	○	●	●	●	12

THROUGH-DRIVE

			40	60	75	95	130	145	190	260	
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	○	○	○	●	○	●	●	●	K02
		[SAE B–B] 1"-15T-16/32DP	○	○	○	●	○	●	●	●	K04
		W35X2X16X9g	○	○	○	●	○	●	●	●	K79

NOTE: ● available ○ upon request – unavailable preferred — left blank

K11V	L	O	190	DR	/	10	R	–	N	Z	D	12	N00	V	P	–	K
01	02	03	04	05		06	07		08	09	10	11	12	13	14		15

	THROUGH-DRIVE		40	60	75	95	130	145	190	260	
	2nd pump's flange	2nd pump's splined shaft									
12	[ISO 3019-1] 127-2	[SAE C] 1¼"-14T-12/24DP	–	○	○	●	○	●	●	●	K07
		[SAE C–C] 1½"-17T-12/24DP	–	–	–	●	○	●	●	●	K24
		W30X2X14X9g	–	○	○	●	○	●	●	●	K80
		W35X2X16X9g	–	○	○	●	○	●	●	●	K61
	[ISO 3019-1] 152-4	[SAE C] 1¼"-14T-12/24DP	–	–	○	●	○	●	●	●	K86
		[SAE D] 1¾"-13T-8/16DP	–	–	–	–	○	●	●	●	K17
		W40X2X18X9g	–	–	○	●	○	●	●	●	K81
		W45X2X21X9g	–	–	–	●	○	●	●	●	K82
		W50X2X24X9g	–	–	–	–	○	●	●	●	K83
	[ISO 3019-1] 165-4	[SAE D] 1¾"-13T-8/16DP	–	–	–	–	–	–	●	●	K72
		W50X2X24X9g	–	–	–	–	–	–	●	●	K84
		W60X2X28X9g	–	–	–	–	–	–	–	●	K67

	SWIVEL ANGLE SENSOR	40	60	75	95	130	145	190	260	
13	Without swivel angle sensor	○	○	○	●	○	●	●	●	
	With optical swivel angle sensor	○	–	○	●	○	●	●	●	V
	With electric swivel angle sensor	○	–	○	●	○	●	●	●	R

	CONNECTOR FOR SOLENOID	40	60	75	95	130	145	190	260	
14	DEUTSCH – molded connector 2-pin, without suppressor diode	○	○	○	●	○	●	●	●	P

	VERSION		
15	Standard version	(without dash or code)	
		with combined pump or parts	K
	Special version		S
		with combined pump or parts	SK

NOTE: ● available ○ upon request – unavailable preferred

HYDRAULIC FLUIDS

K11VO pump is design for operation with [DIN 51524] HLP mineral oil. Selection of environmentally acceptable hydraulic fluids or fire-resistant, water-containing hydraulic fluids HFD (HFA/HFB/HFC excluded) is allowed but must be specified when ordering.

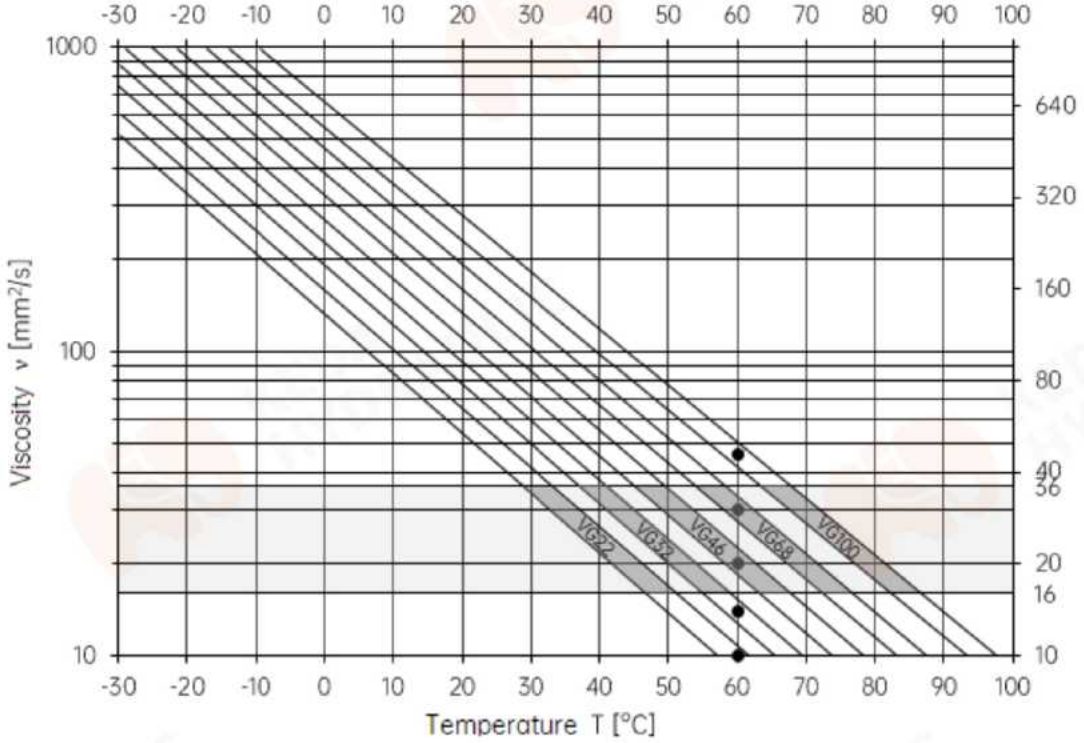
Please contact us if any technical parameter cannot be adhered to.

1. Viscosity and temperature of hydraulic fluids

Operation	Temperature	Viscosity	Remarks
Cold start	t_{min}=−25°C/−40 °C*	ν_{max}=1600 mm²/s	t<3 min, p≤50 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_{max}=+115°C/+85 °C*	ν=10~400 mm²/s	at port T
Short-term	t_{max}=+115°C/+85 °C*	ν_{min}=7~10 mm²/s	t<3 min, p≤0.3 p_N, at port T

NOTE: * NBR as shaft seals, please contact us.

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 115 °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 (90~115 °C) during short-term operation, cleanliness level of **19/17/14** is required.

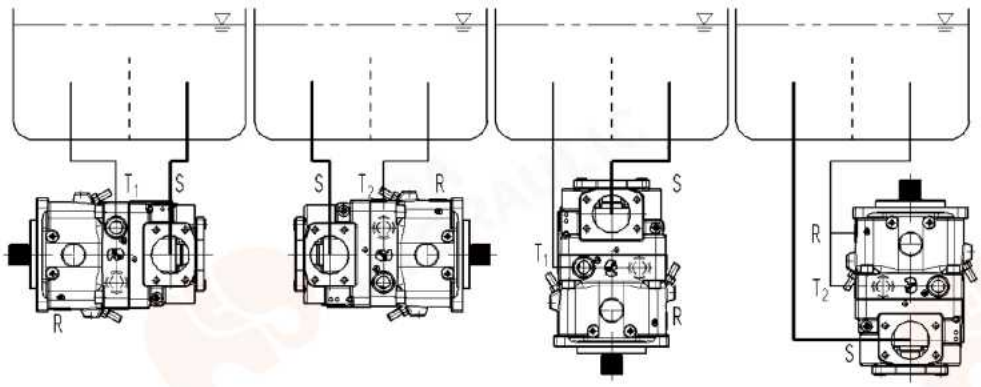
INSTALLATION INSTRUCTIONS

GENERAL

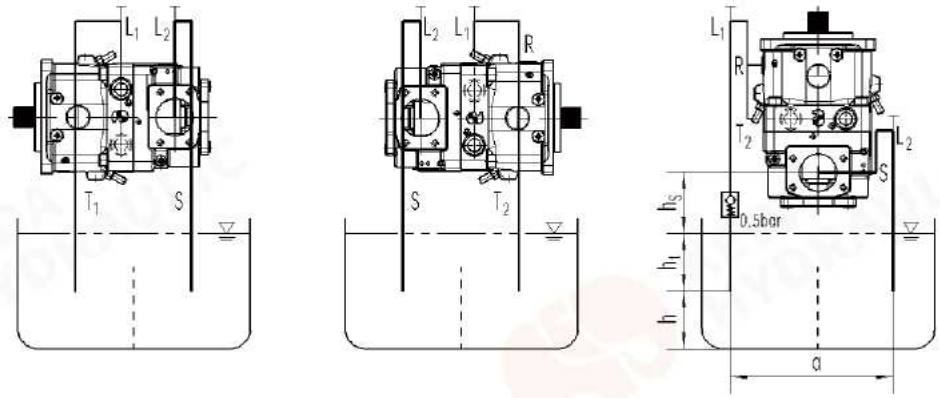
— The axial piston unit must be filled with hydraulic fluid and vented during commissioning and operation. This must also be observed during longer standstills, as the axial piston unit can empty itself via the hydraulic lines.
— Installation positions see the following examples **1~10**. We recommend installation position **1** and **2**.

Installation position	1	2	3	4	5	6	7	8	9	10
Filling	$S+T_1$	$S+T_2$	$S+T_1/T_2$	$S+T_1/T_2$	$S+T_1$	$S+T_2$	$S+T_1/T_2$	automatic via all ports		
Air bleed	T_1	R	T_1/T_2	R	L_1+L_2	$R+L_2$	L_1+L_2	T_1	R	R

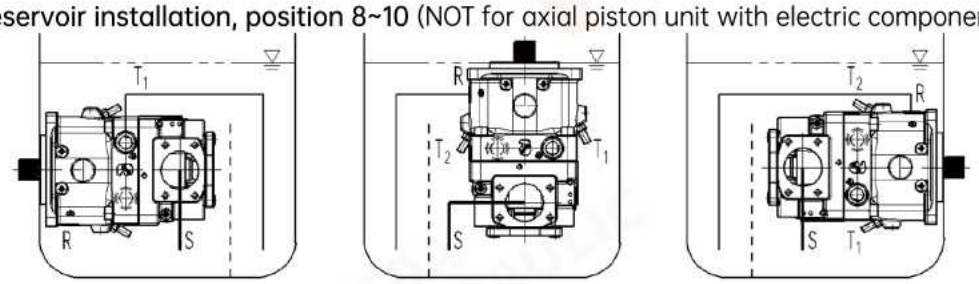
1) Below-reservoir installation, position 1~4 (standard)



2) Above-reservoir installation, position 5~7 (NOT intended for K11VLO with charge pump!)



3) Inside-reservoir installation, position 8~10 (NOT for axial piston unit with electric components!)



NOTICE

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

— Recommendation for installation position **7** (shaft upward): A check valve in the drain line (cracking pressure 0.5 bar) can prevent draining of the housing area. A height difference $h_{ES,\,min}$ of at least 25 mm at port **R** to prevent axial piston unit from draining is required.
— For the reservoir design, ensure that there is an adequate distance **a** 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.

TECHNICAL DATA

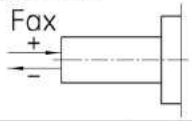
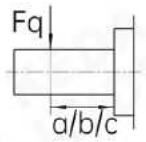
1. Working pressure range (when using hydraulic fluid based on mineral oils)

Pressure	K11VO	K11VLO	Remarks
Suction $p_{S, abs}$	0.8~30 bar	0.6~2 bar	Minimum pressure at suction port **S** (inlet) is required to prevent damage to the axial piston unit.
Nominal p_N	350 bar	350 bar	at working port **A/B** (outlet)
Maximum p_{max}	400 bar	400 bar	at working port **A/B** (outlet)
Minimum p_{min}	≤18 bar	≤20 bar	Minimum pressure at working port **A/B** (outlet) is required to prevent damage to the axial piston unit.
Case $p_{L, max}$	≤2 bar	$p_{S, abs}$+1.2 bar ≤ 2 bar	Case pressures at drain ports T_1/T_2 must be greater than the ambient pressure at shaft seals. A drain line to the reservoir is required.

2. Other technical data

Parameter (in case) \ Size				40	60	75	95	130 (L)	145 (L)	190 (L)	260 (L)
Geom. displacement		$q_{V, max}$	mL/r	42	58.5	74	93.5	130	145	193	260
Rotational speed	$q_{V, max}$	n_{max} [1]	rpm	3000	2700	2550	2350	2100 (2500)	2200 (2500)	2100 (2500)	1800 (2300)
	q_V	$n_{max, all}$	rpm	3500	3250	3000	2780	2500	2500	2500	2300
Flow	n_{max}	$Q_{V, max}$	L/min	126	125	189	220	273(325)	319(363)	405(483)	468(598)
Flushing flow [2]		$Q_{V, flush}$	L/min	2	3	3	4	4	4	5	6
Power [3]	$Q_{V, max}$	P_{max}	kW	74	92	110	128	159(190)	186(211)	236(281)	273(349)
Torque [3]	$q_{V, max}$	T_{max}	Nm	234	326	412	521	724	808	1075	1448
Drive shaft	*P*			Φ32	Φ35	Φ40	Φ45	Φ50	Φ50	Φ55	Φ60
	Z			W35	W35	W40	W45	W50	W50	W50	W60
	S			1"	1 ¼"	1 ¼"	1 ¾"	1 ¾"	1 ¾"	1 ¾"	1 ¾"
	T			1 ¼"	1 ⅜"	1 ⅜"	–	–	–	2"	2 ¼"
Input torque [4]	*P*	$T_{E, max}$	Nm	468	648	824	1044	1448	1448	2226	2787
	Z	$T_{E, max}$	Nm	912	912	1460	2190	3140	3140	3140	5780
	S	$T_{E, max}$	Nm	314	602	602	1640	1640	1640	1640	1640
	T	$T_{E, max}$	Nm	602	970	970	–	–	–	2670	4070
Through-drive torque [5]		$T_{D, max}$	Nm	314	521	660	822	1110	1110	1760	2065
Rotary stiffness of drive shaft	*P*	c	kNm/rad	87467	107888	143104	196435	312403	312403	383292	653835
	Z	c	kNm/rad	88894	102440	145836	199601	302495	302495	346190	686465
	S	c	kNm/rad	58347	86308	101921	173704	236861	236861	259773	352009
	T	c	kNm/rad	74476	102440	125603	–	–	–	301928	567115
Rotary moment of inertia		J	kgm^2	0.0048	0.0082	0.0115	0.0173	0.0318 (0.0337)	0.0341 (0.036)	0.055 (0.0577)	0.0878 (0.0895)
Angular acceleration [6]		α	rad/s^2	22000	17500	15000	13000	10500	9000	6800	4800
Case volume		V	L	1.1	1.35	1.85	2.1	2.9	2.9	3.8	4.6
Weight [6]		m	kg	32	40	45	53	66(72)	76(73)	95(104)	125(138)

NOTE: – unavailable; **(L)** with charge pump. **1)** Apply for $p_{S, abs}$=1bar (K11VO) or 0.8bar (K11VLO). **2)** If K11VO (K11VLO excluded) with control device EP/HD or with stroke limiter H1/H5/H2/H6/U1/U2 is operated for over 10min with zero flow or under working pressure <15bar, case flushing via connections T_1/T_2/R is required. **3)** Δp_N=350bar and efficiency not considered. **4)** Free of radial force. **5)** Note maximum input torque for shaft S! **6)** Valid for single pump. The load capacity of the connection parts must be considered.

Parameter		Size	40	60	75	95	130	145	190	260
Center of gravity 	X	mm	0	10	10	10	10	10	10	10
	Y	mm	20	15	10	10	10	10	10	10
	Z	mm	122	140	130	142	170	170	170	185
Axial force 	$F_{ax, max}$	N	1500	2200	2750	3500	4800	4800	6000	4150
Radial force *(at a/b/c from shaft collar)* 	a	mm	17.5	17.5	20	20	22.5	22.5	26	29
	$F_{q, max}$	N	3600	5000	6300	8000	11000	11000	16925	22000
	b	mm	30	30	35	35	40	40	46	50
	$F_{q, max}$	N	2891	4046	4950	6334	8594	8594	13225	16809
	c	mm	42.5	42.5	50	50	57.5	57.5	66	71
	$F_{q, max}$	N	2416	3398	4077	5242	7051	7051	10850	13600

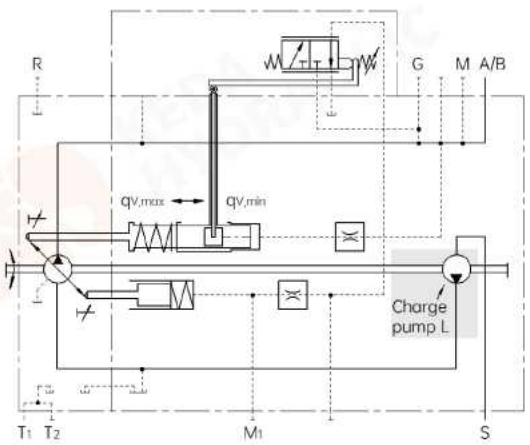
3. Determination of characteristics

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]

02 CHARGE PUMP

The charge pump (impeller) is a centrifugal pump with which the K11VLO130~260 is filled and therefore can be operated at higher rotation speed. This also simplifies cold starting at low temperature and high viscosity of hydraulic fluid. Therefore, increasing the inlet pressure externally is unnecessary in most cases. Charging the reservoir with compressed air is at 2 bar permissible.



03 OPERATING MODE

K11VO pump is designed to be used in open circuits. If pumps for close circuits are required, choose K4VG or K4VSG instead. Please contact us for special version or any supplementary information.

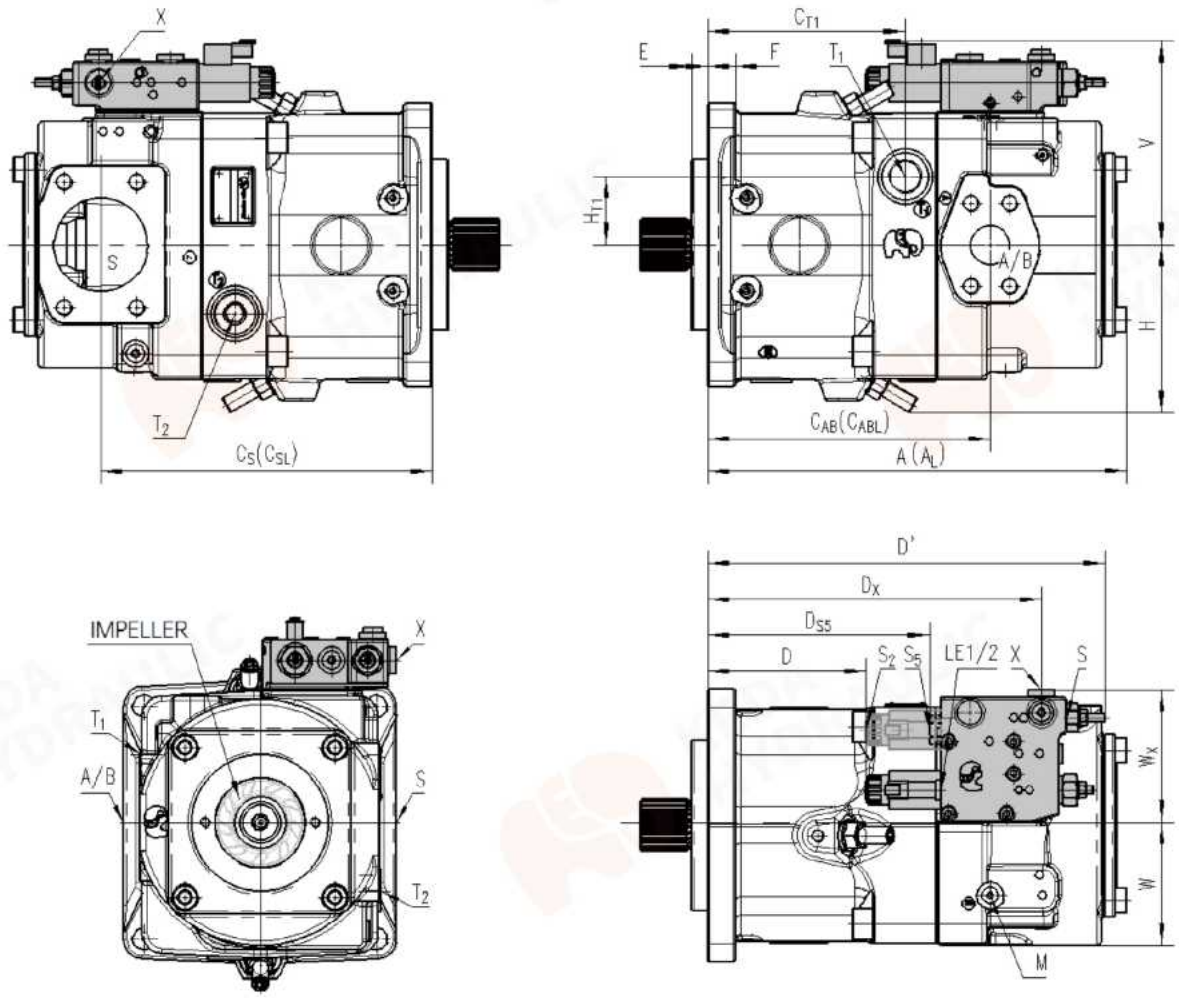
04 SIZE & DIMENSIONS

Following figures 1~6 are about K11VO 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.

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°.

Missing dimensions in figure 2~6 referred to figure 1. Other exceptions refer to notes.

Fig. 1. Dimensions, LE1S/LE2S/LE2S2/LE1S5/LE2S5 (above: LHSV/RHSV; below: FV/PLAN)



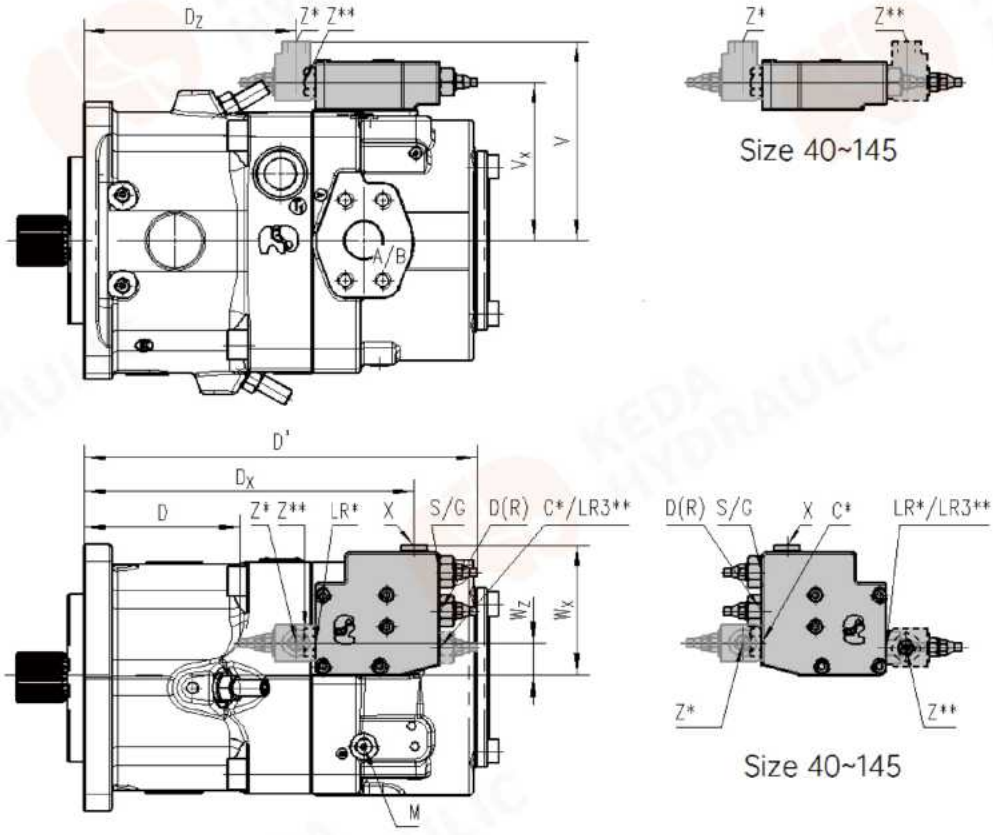
Control \ Size		K11VO40	K11VO60	K11VO75	K11VO95	K11VO130	K11VO145	K11VO190	K11VO260
LE1S LE2S	A	225	242	260	287	310	310	346.8	372.1
	A_L	–	–	–	–	358	358	395	428
	C_S	183	198	215	234	255	255	281.3	307
	C_{SL}	–	–	–	–	287	287	319	346
	C_{AB}	183	198	215	234	255	255	281.3	307
	C_{ABL}	–	–	–	–	244	244	272	329.5
	C_{T1}	123	136	148	155	174	174	190.5	214
	H_{T1}	39	46	50	50	58	58	66	72
	E	9.7	12.7	12.7	12.7	12.7	12.7	15.9	15.9
	F	15	19	19	20	21	21	27	30
	H	103	111	117	125	135	135	163.2	176.2
	V	141.5	150	156.5	169.5	178.5	178.5	192	203.5
	D	25.5	39	54	62.5	83.5	83.5	156.5	183
	D_X	111	124.5	138.5	233	254	254	321.5	348
	D'	248	261.5	276	293	316	316	383	409.5
	W	75	82	88.5	77 [1)]	104	104	116	130
	W_X	110	112	113.5	121	124	124	133	137
Drain T_1/T_2		M22X1.5X14	M22X1.5X14	M22X1.5X14	M26X1.5X16	M26X1.5X16	M26X1.5X16	M33X2X18	M33X2X16
Air bleed R		M22X1.5X14	M22X1.5X14	M22X1.5X14	M26X1.5X16	M26X1.5X16	M26X1.5X16	M33X2X18	M33X2X16
Measure M/M_1		M12X1.5X12	M12X1.5X12	M12X1.5X12	M12X1.5X12	M12X1.5X12	M12X1.5X12	M12X1.5X12	M12X1.5X12
Pilot X		M14X1.5X12	M14X1.5X12	M14X1.5X12	M14X1.5X12	M14X1.5X12	M14X1.5X12	M14X1.5X12	M14X1.5X12
Pilot Y		M14X1.5X12	M14X1.5X12	M14X1.5X12	M14X1.5X12	M14X1.5X12	M14X1.5X12	M14X1.5X12	M14X1.5X12
Pilot Z		M14X1.5X12	M14X1.5X12	M14X1.5X12	M14X1.5X12	M14X1.5X12	M14X1.5X12	M14X1.5X12	M14X1.5X12
Control G		M14X1.5X12	M14X1.5X12	M14X1.5X12	M14X1.5X12	M14X1.5X12	M14X1.5X12	M14X1.5X12	M14X1.5X12

NOTE: – unavailable; △ pending; L charge pump; Without S2 or S5 port; Port S for size 40/60/75 located in S5.
1) One-side width W usually equals the other, but here width of the other side W=96.

Control \ Size		K11VO40	K11VO60	K11VO75	K11VO95	K11VO130	K11VO145	K11VO190	K11VO260
LE2S2 LE1S5 LE2S5	A	–	–	–	287	310	310	346.8	372.1
	A_L	–	–	–	–	358	358	395	428
	C_S	–	–	–	234	255	255	281.3	307
	C_{SL}	–	–	–	–	287	287	319	346
	C_{AB}	–	–	–	234	255	255	281.3	307
	C_{ABL}	–	–	–	–	244	244	272	329.5
	C_{T1}	–	–	–	155	174	174	190.5	214
	H_{T1}	–	–	–	50	58	58	66	72
	E	–	–	–	12.7	12.7	12.7	15.9	15.9
	F	–	–	–	20	21	21	27	30
	H	–	–	–	125	135	135	163.2	176.2
	V	–	–	–	169.5	178.5	178.5	192	203.5
	D	–	–	–	62.5	83.5	83.5	156.5	183
	D_{S5}	–	–	–	110	131	131	198.5	230.5
	D_X	–	–	–	233	254	254	321.5	348
	D'	–	–	–	293	316	316	383	409.5
	W	–	–	–	77 [1)]	104	104	116	130
	W_X	–	–	–	121	124	124	133	137

NOTE: – unavailable; △ pending; L charge pump; Gray outline = LE2S2; Dash outline = LE1S5/LE2S5.
1) One-side width W usually equals the other, but here width of the other side W=96.

Fig. 2. Dimensions, DRS/DRG/LR3DS/LRDCS (above: RHSV; below: PLAN)



Control	Size	K11VO40	K11VO60	K11VO75	K11VO95	K11VO130	K11VO145	K11VO190	K11VO260
DRS DRG	V	134	138.5	142.5	157	166	166	178	189.5
	D	52	66.5	80	91	112	112	223	△
	D_X	111	125.5	138.5	150	171	171	319	345.5
	D'	209	223.5	238.5	255	276	276	379	408.5
	W_X	110	112	113.5	115	118	118	131	137

NOTE: △ pending; Without any * marked ports; Only with ports D(R), S/G and X.

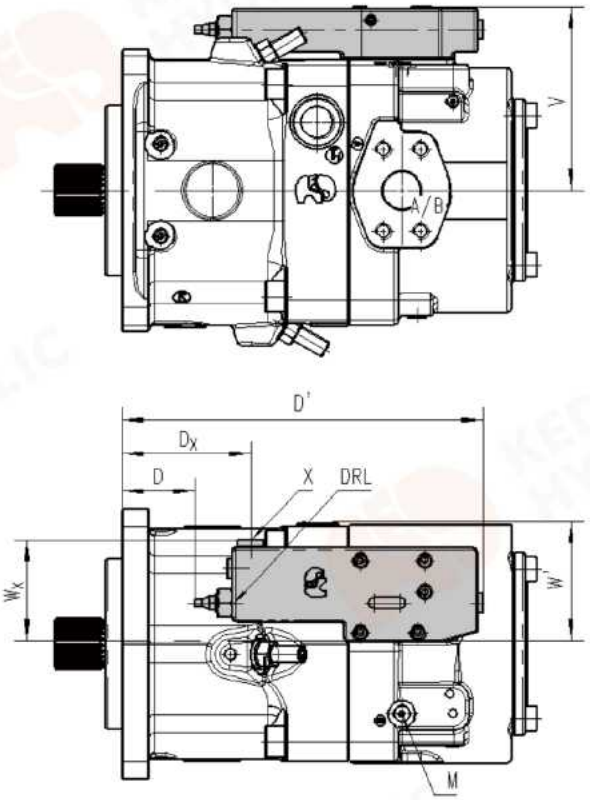
Control	Size	K11VO40	K11VO60	K11VO75	K11VO95	K11VO130	K11VO145	K11VO190	K11VO260
LR3DS	V	140	148	154.5	166	175.5	175.5	178	189.5
	D	52	65.5	80	91	112	112	207	235
	D_X	111	124.5	138.5	150	171	171	319	345.5
	D_Z	228	241	255.5	271.5	293	293	207	235
	D'	290	312	326.5	342.5	364	364	379	408.5
	W_X	110	112	113.5	115	118	118	131	137
	W_Z	21	23	24.5	26	28	28	34	40

NOTE: Dash outline and ** marked ports for LR3DS; Port D(R) = D; Port S/G = S; With port X and Z.

Control	Size	K11VO40	K11VO60	K11VO75	K11VO95	K11VO130	K11VO145	K11VO190	K11VO260
LRDCS	V	146	154	160	172.5	181.5	181.5	196	205.5
	V_X	100	108	117	139	148	148	156	137
	D	28.3	41.5	56	48	69	69	139.8	166.5
	D_X	111	124.5	138.5	150	171	171	318.8	346
	D_Z	74	88	105	113	134	134	203.5	△
	D'	248	261.5	276	292	313	313	379	408.5
	W_X	110	112	113.5	115	118	118	131	137
	W_Z	21	23	24.5	26	29	29	34	34

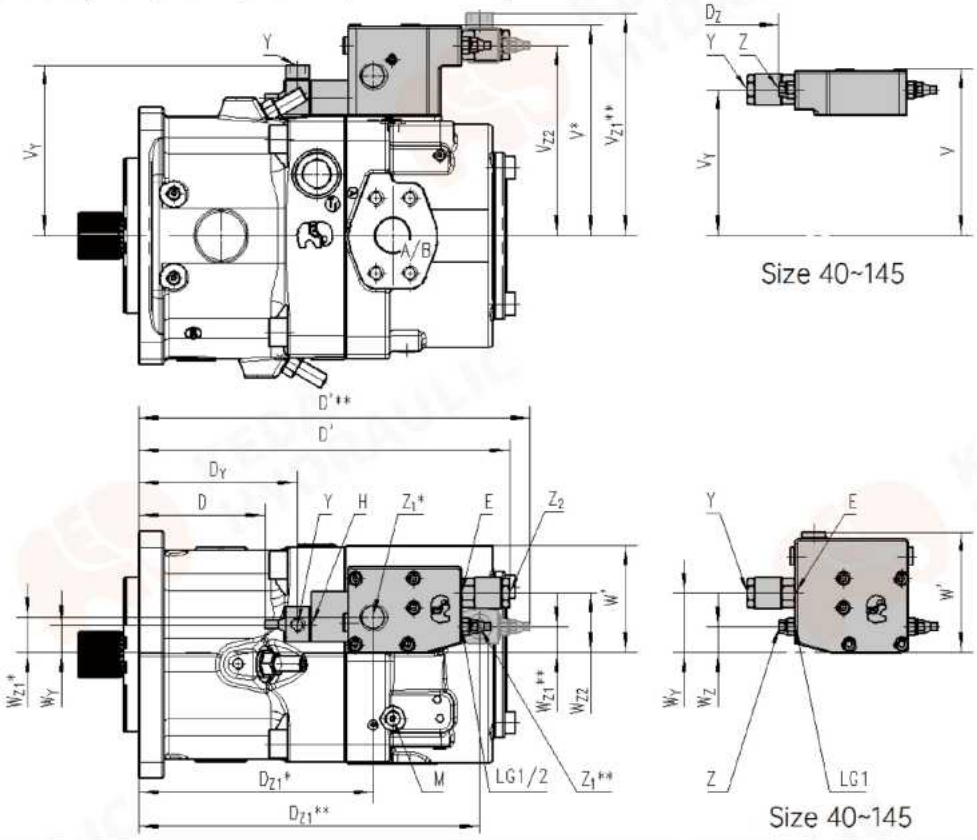
NOTE: △ pending; Gray outline and * marked ports for LRDCS; Port D(R) = D; Port S/G = S; With port X and Z.

Fig. 3. Dimensions, DRL (above: RHSV; below: PLAN)



Control	Size	K11VO40	K11VO60	K11VO75	K11VO95	K11VO130	K11VO145	K11VO190	K11VO260
DRL	V	135	137	144.5	153	162	162	178	189.5
	D	−3	10.5	25.5	36.5	57.5	57.5	79.5	106
	D_X	74	87.5	102.5	113.5	134.5	134.5	161.5	188
	D'	211.5	225	240	255	276	276	315.5	342
	W'	81	83	89.5	97	105	105	118.5	132.5
	W_X	75	76.5	78	79.5	82.5	82.5	89.5	95.5

Fig. 4. Dimensions, LG1E/LG1EH/LG2EH (above: RHSV; below: PLAN)



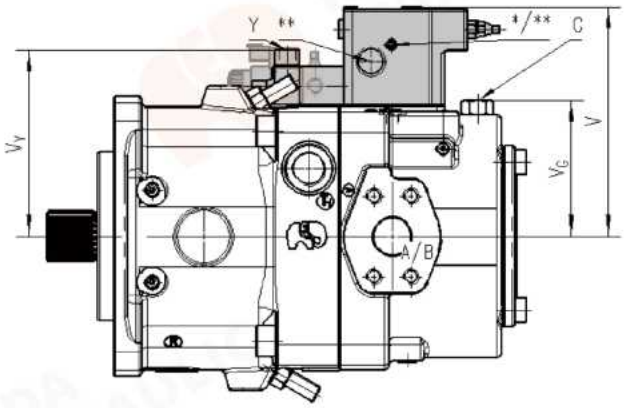
Control	Size	K11VO40	K11VO60	K11VO75	K11VO95	K11VO130	K11VO145	K11VO190	K11VO260
LG1E	V	131	136	142.5	157	166	166	–	–
	V_Y	107.5	114	120.5	132.5	△	△	–	–
	D	35	48	62	73	94	94	–	–
	D_Z	70.5	83.5	97.5	108.5	129.5	129.5	–	–
	D'	248	261.5	276	292	313	313	–	–
	W'	115	117	118.5	120	123	123	–	–
	W_Y	56	58	59.5	61	63	63	–	–
	W_Z	21	23	24.5	26	28	28	–	–

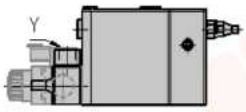
NOTE: – unavailable; △ pending.

Control	Size	K11VO40	K11VO60	K11VO75	K11VO95	K11VO130	K11VO145	K11VO190	K11VO260
LG1EH LG2EH	V	–	–	–	–	–	–	227.5	239/246
	V_Y	–	–	–	–	–	–	176	187.5
	V_{Z2}	–	–	–	–	–	–	200.5/△	212
	D	–	–	–	–	–	–	109	135.5
	D_Y	–	–	–	–	–	–	148	174.5
	D_{Z1}	–	–	–	–	–	–	242/365	268.5/391.6
	D_{Z2}	–	–	–	–	–	–	△/399	△
	D'	–	–	–	–	–	–	392/442.5	419.6/469.2
	W'	–	–	–	–	–	–	118.5	132.5
	W_Y	–	–	–	–	–	–	34	40
	W_{Z1}	–	–	–	–	–	–	44/△	50/△
	W_{Z2}	–	–	–	–	–	–	69	75

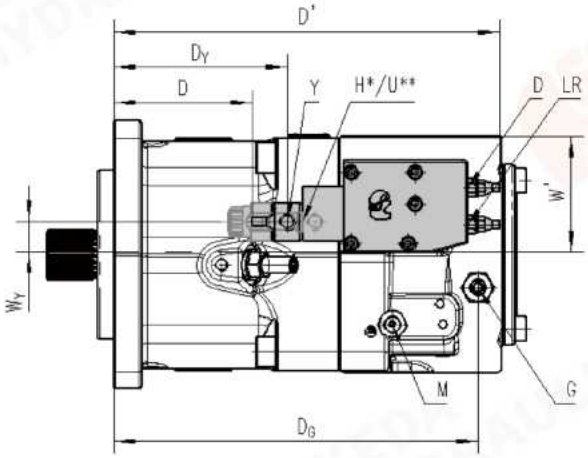
NOTE: – unavailable; △ pending; * marked ports for LG1EH; Gray outline and ** marked ports for LG2EH; Dimensions of LG1EH before "/" and of LG2EH after "/".

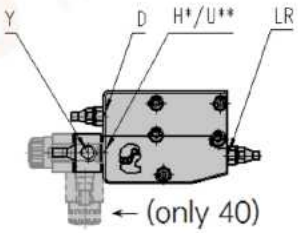
Fig. 5. Dimensions, LRDH1/LRDH5/LRDH2/LRDH6/LRDU1/LRDU2 (above: RHSV; below: PLAN)





Size 40~145





Size 40~145

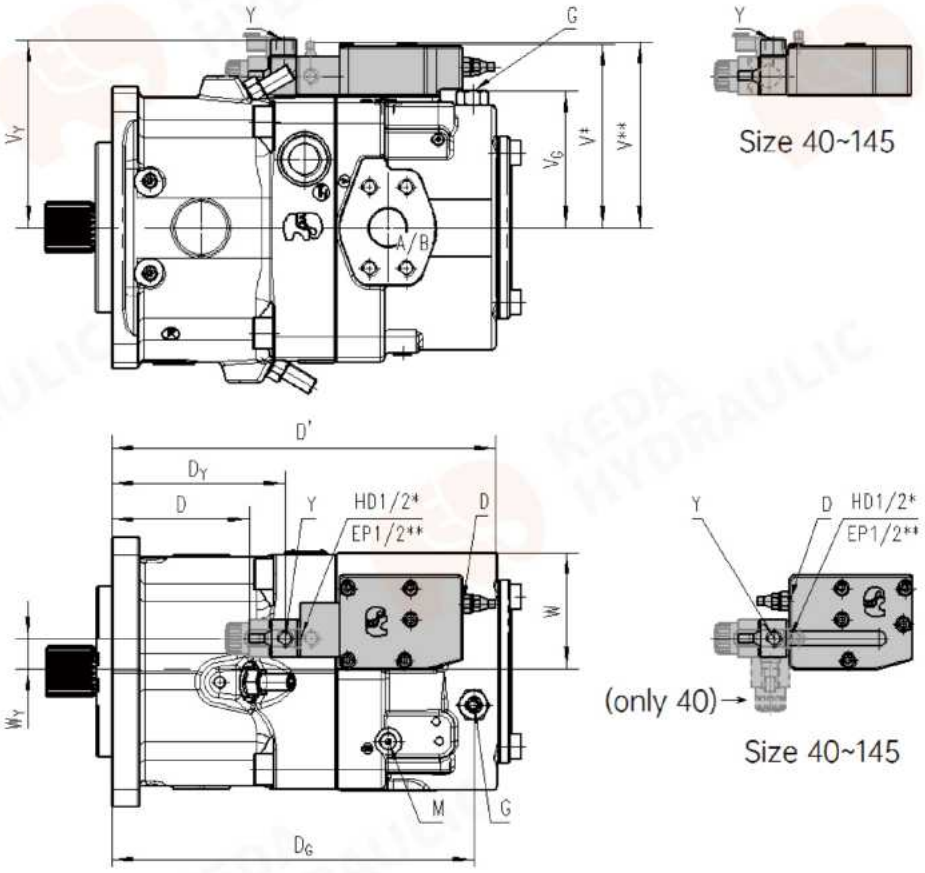
Control \ Size		K11VO40	K11VO60	K11VO75	K11VO95	K11VO130	K11VO145	K11VO190	K11VO260
	V	153	161	167.5	180	189	189	227.5	239
	V_Y	131	139	145.5	155	164	164	176	187.5
LRDH1	V_G	106	110.5	109	115	115	115	142.5	153
LRDH5	D	5.5/21.5	17/35	31/49	△/58.5	△/79.5	△/79.5	91/109	116/135.5
LRDH2	D_Y	58	73.5	87.5	97.5	118.5	118.5	148	174.5
LRDH6	D_G	206	225	239	262	283	283	321.5	351
	D'	248	261.5	276	292	313	313	379	408.5
	W'	78	83	89.5	97	105	105	118.5	132.5
	W_Y	21	23	24.5	26	28	28	34	40

NOTE: △ pending; Black outline and * marked ports for LRDH; Port H/U = H1/H5/H2/H6; Dimensions of LRDH1/LRDH5 before "/" and of LRDH2/LRDH6 after "/".

Control \ Size		K11VO40	K11VO60	K11VO75	K11VO95	K11VO130	K11VO145	K11VO190	K11VO260
	V	153	161	167.5	180	189	189	227.5	239
	V_G	106	110.5	109	115	115	115	142.5	153
LRDU1	D	29	2.5	15	32	48	48	77.5	104.5
LRDU2	D_G	206	225	239	262	283	283	321.5	351
	D'	248	261.5	276	292	313	313	379	408.5
	W'	78	83	89.5	97	105	105	118.5	132.5

NOTE: Gray outline and ** marked ports for LRDU; Port H/U = U1/U2; Without port Y. Dash outline for partial deviation for size 40.

Fig. 6. Dimensions, HD1D/HD2D/EP1D/EP2D (above: RHSV; below: PLAN)



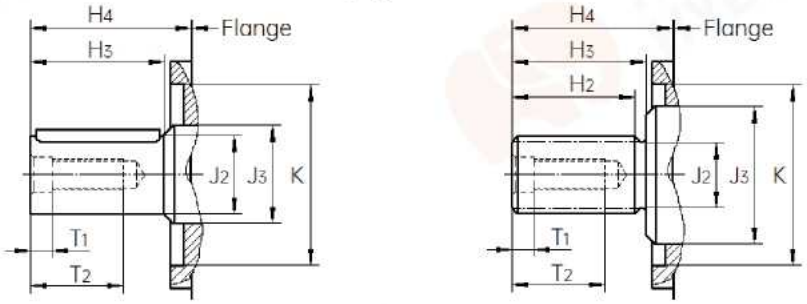
Control	Size	K11VO40	K11VO60	K11VO75	K11VO95	K11VO130	K11VO145	K11VO190	K11VO260
HD1D HD2D	V	134	139	145.5	155	164	164	183	194
	V_Y	△	△	△	△	△	△	178	187.5
	V_G	106	110.5	109	115	115	115	142.5	152.5
	D	23	38	50.5	62	96	96	109	135.5
	D_Y	62	75.5	89.5	101	125	125	148	174.5
	D_G	206	221.5	235.5	252	273	273	321.5	351
	D'	208	225	239	262	283	283	379	408.5
	W'	78	83	89.5	97	105	105	118.5	132.5
	W_Y	21	23	24.5	26	28	28	34	40

NOTE: △ pending; Black outline and * marked ports for HD; Port HD/EP = HD1/HD2.

Control	Size	K11VO40	K11VO60	K11VO75	K11VO95	K11VO130	K11VO145	K11VO190	K11VO260
EP1D EP2D	V	150.5	158.5	165	174.9	184	184	187.5	199
	V_G	106	110.5	109	114.8	115	115	142.5	152.5
	D	33	5.5	20.5	31.5	52.5	52.5	77.5	104.5
	D_G	206	221.5	235.5	252	273	273	321.5	351
	D'	208	225	239	262	283	283	379	408.5
	W'	78	83	89.5	97	105	105	118.5	132.5

NOTE: Gray outline and ** marked ports for EP; Port HD/EP = EP1/EP2; Without port Y. Dash outline for partial deviation for size 40.

09 DRIVE SHAFT (left: P shaft; right: Z/S/T shaft)



Size	K11VO40				K11VO60				K11VO75	
Dimension	P shaft	Z shaft	S shaft	T shaft	P shaft	Z shaft	S shaft	T shaft	P shaft	Z shaft
H_2	–	32	30	40	–	32	40	40	–	37
H_3	58	40	38	48	58	40	48	48	82	45
H_4	66	50	46	56	66	50	56	56	90	55
J_2	Φ32	△	△	△	$Φ_{35}$	△	△	△	Φ40	△
J_3	Φ40	Φ40	Φ40	Φ40	Φ45	Φ45	Φ45	Φ45	Φ45	Φ45
K	Φ80.5	Φ80.5	Φ80.5	Φ80.5	Φ91	Φ91	Φ91	Φ91	Φ96	Φ96
T_1	7.5	9.5	7.5	9.5	9.5	9.5	9.5	9.5	12	12
T_2	22	28	22	28	28	28	28	28	36	36
Parallel key	AS10X8X56	–	–	–	AS10X8X56	–	–	–	AS12X8X80	–
Spline X9g	–	W35X2X16	1"-15T-16/32	1¼"-14T-12/24	–	W35X2X16	1¼"-14T-12/24	1⅜"-21T-16/32	–	W40X2X18
Center bore	M12X1.75	M12X1.75	⅜-16UNC-2B	7/16-14UNC-2B	M12X1.75	M12X1.75	7/16-14UNC-2B	7/16-14UNC-2B	M16X2	M16X2

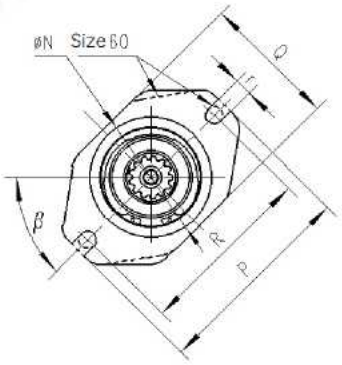
Size	K11VO75		K11VO95			K11VO130			K11VO145	
Dimension	S shaft	T shaft	P shaft	Z shaft	S shaft	P shaft	Z shaft	S shaft	P shaft	Z shaft
H_2	40	40	–	42	55	–	44	55	–	44
H_3	48	48	82	50	67	82	55	67	82	55
H_4	56	56	90	60	75	90	65	75	90	65
J_2	△	△	Φ45	△	△	Φ50	△	△	Φ50	△
J_3	Φ45	Φ45	Φ55	Φ55	Φ55	Φ60	Φ60	Φ60	Φ60	Φ60
K	Φ96	Φ96	Φ101	Φ101	Φ101	Φ107	Φ107	Φ107	Φ107	Φ107
T_1	9.5	9.5	12	12	12	12	12	12	12	12
T_2	28	28	36	36	36	36	36	36	36	36
Parallel key	–	–	AS14X9X80	–	–	AS14X9X80	–	–	AS14X9X80	–
Spline X9g	1¼"-14T-12/24	1⅜"-21T-16/32	–	W45X2X21	1¼"-13T-8/16	–	W50X2X24	1¼"-13T-8/16	–	W50X2X24
Center bore	7/16-14UNC-2B	7/16-14UNC-2B	M16X2	M16X2	⅝-11UNC-2B	M16X2	M16X2	⅝-11UNC-2B	M16X2	M16X2

Size	K11VO145	K11VO190				K11VO260			
Dimension	S shaft	P shaft	Z shaft	S shaft	T shaft	P shaft	Z shaft	S shaft	T shaft
H_2	55	–	44	55	66	–	47	55	66
H_3	67	105	55	67	80	105	58	67	80
H_4	75	113	65	75	88	113	66	75	88
J_2	△	Φ55	△	△	△	Φ60	△	△	△
J_3	Φ60	Φ60	Φ60	Φ60	Φ60	Φ70	Φ70	Φ70	Φ70
K	Φ107	Φ126	Φ126	Φ126	Φ126	Φ131	Φ131	Φ131	Φ131
T_1	12	15	12	12	12	15	15	12	15
T_2	36	42	36	36	36	42	42	36	42
Parallel key	–	AS16X10X100	–	–	–	AS18X11X100	–	–	–
Spline X9g	1¾"-13T-8/16	–	W50X2X24	1¾"-13T-8/16	2"-15T-8/16	–	W60X2X28	1¾"-13T-8/16	2¼"-17T-8/16
Center bore	⅝-11UNC-2B	M20X2.5	M16X2	⅝-11UNC-2B	⅝-11UNC-2B	M20X2.5	M20X2.5	⅝-11UNC-2B	¾-10UNC-2B

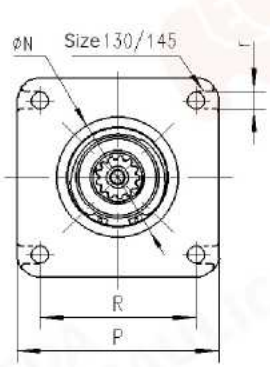
NOTE: – unavailable; △ pending.

10 MOUNTING FLANGE

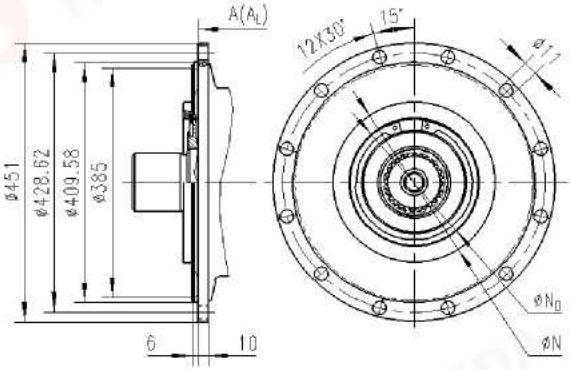
C flange



D flange



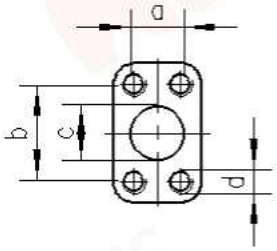
G flange*



Size / Dimension	K11VO40	K11VO60	K11VO75	K11VO95		K11VO130/145		K11VO190		K11VO260
	C flange	C flange	D flange	D flange	G flange	D flange	G flange	D flange	G flange	D flange
β	45°	0°	–	–	–	–	–	–	–	–
N	Φ101.6	Φ127	Φ152.4	Φ152.4	Φ130	Φ152.4	Φ130	Φ165.1	Φ155	Φ165.1
N_0	△	△	△	△	Φ101	△	Φ106	△	Φ126	△
P	177	213	□200	□200	Φ451	□204	Φ451	□262.5	Φ451	□262.5
Q	120	△	–	–	–	–	–	–	–	–
R	146	181	□161.6	□161.6	Φ428.62	□161.6	Φ428.62	□224.5	Φ428.62	□224.5
r**	14	Φ17	Φ21	Φ21	Φ11	21	Φ11	Φ21	Φ11	Φ21
A	225	242	260	287	287	310	305	346.8	341.8	372.1
A_L	–	–	–	–	–	358	353	395	390	428
SAE J744 flange	101-2(B)	127-2(C)	152-4(D)	152-4(D)	–	152-4(D)	–	165-4(E)	–	165-4(E)

NOTE: – unavailable; △ pending; * for SAE J617 G flange mounting to flywheel case of internal combustion engine; ** r without Φ note for slots.

11 WORKING PORT



Size / Dimension	K11VO40		K11VO60		K11VO75		K11VO95		K11VO130/145	
	Suction	Working	Suction	Working	Suction	Working	Suction	Working	Suction	Working
a	42.9	23.8	42.9	23.8	50.8	27.8	61.9	27.8	61.9	27.8
b	77.8	50.8	77.8	50.8	88.9	57.2	106.5	57.2	106.5	57.2
c	Φ50	Φ19	Φ50	Φ19	Φ63	Φ25	Φ75	Φ25	Φ75	Φ25
d	M12X1.75X20	M10X1.5X17	M12X1.75X20	M10X1.5X17	M12X1.75X17	M12X1.75X17	M16X2X24	M12X1.75X17	M16X2X24	M12X1.75X17
SAE J518 port	2"	¾"	2"	¾"	2 ½"	1"	3"	1"	3"	1"
Size / Dimension	K11VLO130/145		K11VO190		K11VLO190		K11VO260		K11VLO260	
	Suction	Working	Suction	Working	Suction	Working	Suction	Working	Suction	Working
a	61.9	31.8	69.9	36.5	69.9	36.5	69.9	36.5	77.8	36.5
b	106.5	66.7	120.7	79.4	120.7	79.4	120.7	79.4	130.2	79.4
c	Φ75	Φ32	Φ90	Φ38	Φ90	Φ38	Φ90	Φ38	Φ100	Φ38
d	M16X2X24	M14X2X19	M16X2X24	M16X2X21	M16X2X24	M16X2X21	M16X2X24	M16X2X21	M16X2X21	M16X2X21
SAE J518 port	3"	1 ¼"	3 ½"	1 ½"	3 ½"	1 ½"	3 ½"	1 ½"	4"	1 ½"

05 CONTROL DEVICE

K11VO pumps can be equipped with various control devices, for instance, pressure control DR, power control LR, pilot-pressure related hydraulic control HD, electrical control with proportional solenoids EP and so forth. Please specify the controller setting range in plain text when ordering.

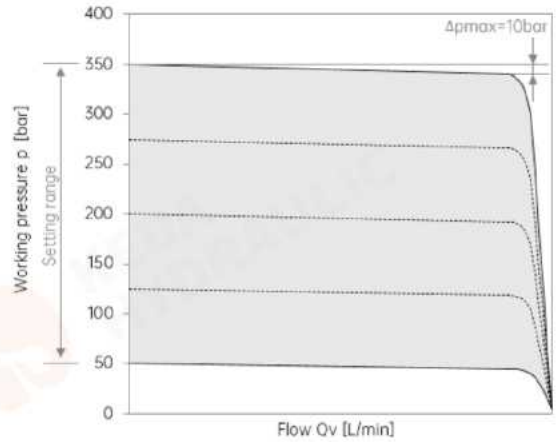
1-1. DR – Pressure control

The pressure controller limits the maximum pressure at the pump outlet within the control range of the variable pump. The variable pump only supplies as much hydraulic fluid as required by the consumers. If working pressure exceeds the pressure command value at the pressure valve, the pump will regulate to a smaller displacement to reduce the control differential.

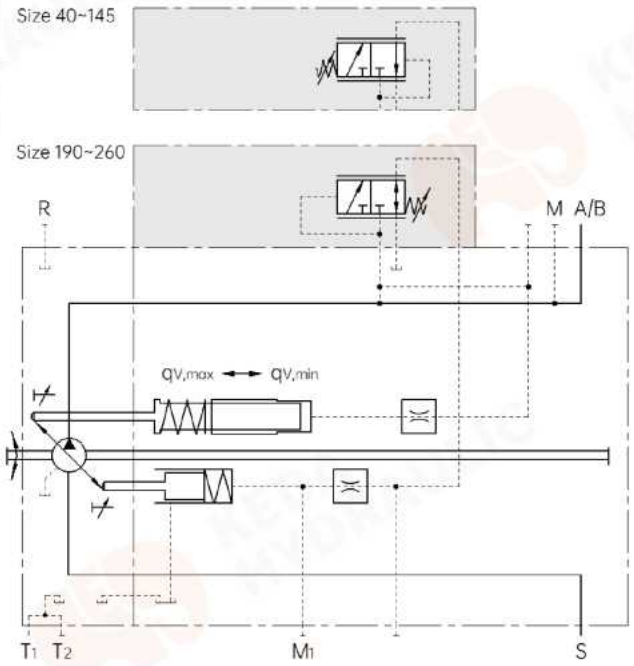
— Basic position in depressurized state: $q_{V,max}$;

— Setting range for pressure control: 50~350 bar.

▼Characteristic curve DR



▼Circuit diagram DR



1-2. DRS – Pressure control with load sensing

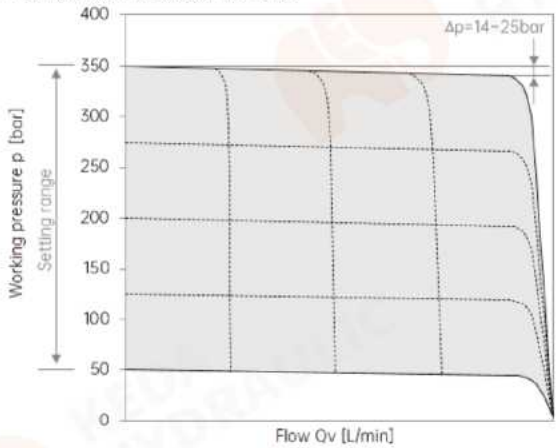
The flow of the pump is dependent on the cross section of the external metering orifice, which is separately located between the pump and the consumer.

Load sensing controller compares the pressure upstream the metering orifice to the one downstream the orifice and keeps the pressure drop Δp and the flow constant.

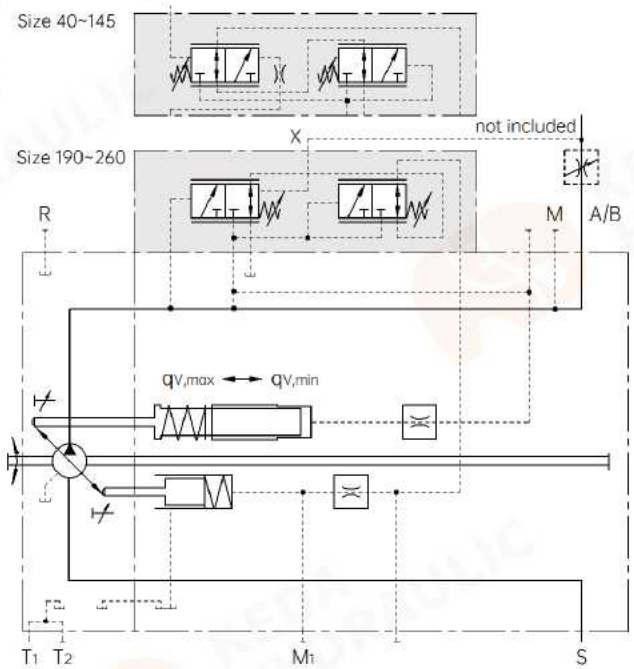
$$\Delta p_{metering\ orifice} = p_{pump} - p_{consumer}$$

— Setting range for Δp: 14~25 bar (standard 18 bar).

▼Characteristic curve DRS



▼Circuit diagram DRS

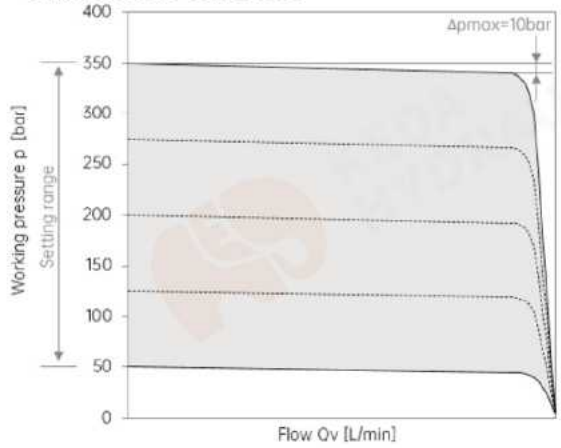


1-3. DRG – Hydraulically remote pressure control

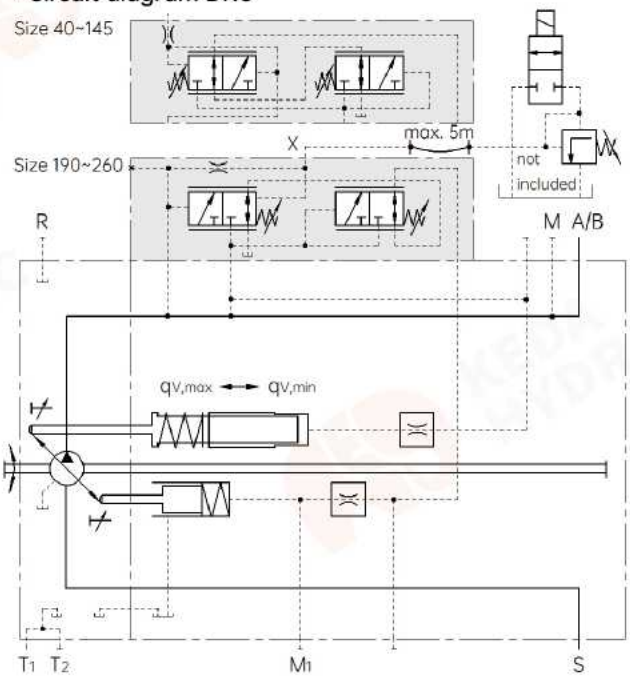
The setting can be overridden by a separate pressure relief valve to set to lower value. A separately configured 2/2 directional valve can be operated to start the pump at standby pressure. Both functions can be used individually or in combination.

— Setting range for Δp: 14~25 bar (standard 22 bar).

▼Characteristic curve DRG



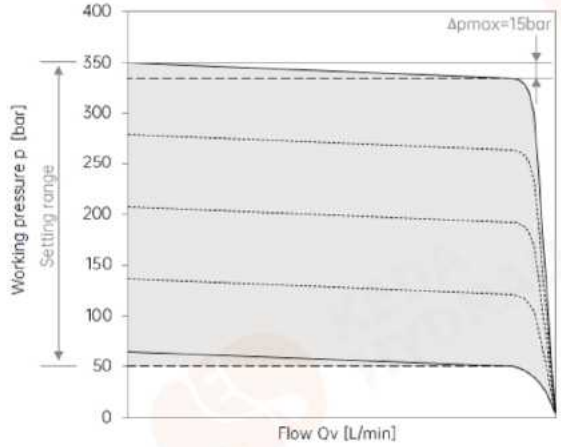
▼Circuit diagram DRG



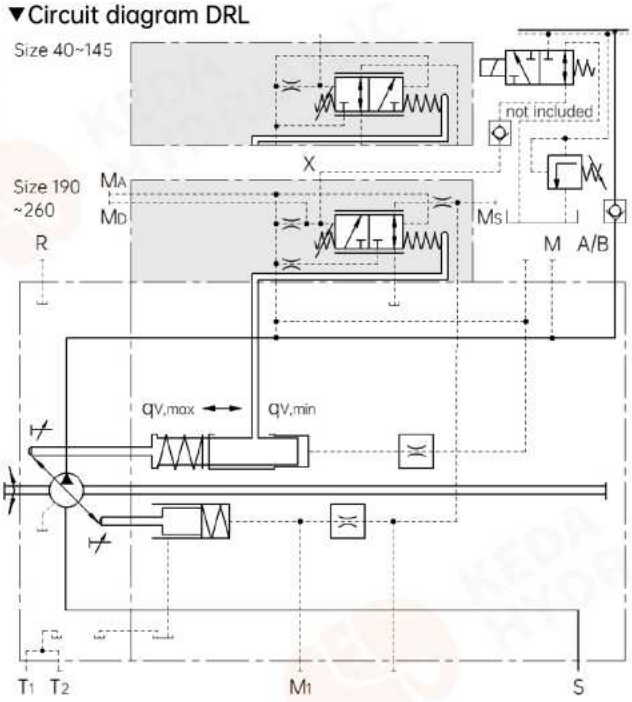
1-4. DRL – Pressure control for parallel operation

Suitable for pressure control of several pumps in parallel operation pumping into a common pressure line. With the externally installed pressure relief valve the nominal pressure command value of all pumps is adjusted to the same value. Each pump can be individually unloaded from the system by a separately installed 3/2 directional valve. The check valves in the working line (A/B) or control line (connection X) must be generally provided.

▼Characteristic curve DRL



▼Circuit diagram DRL



2-1. LR – Power control

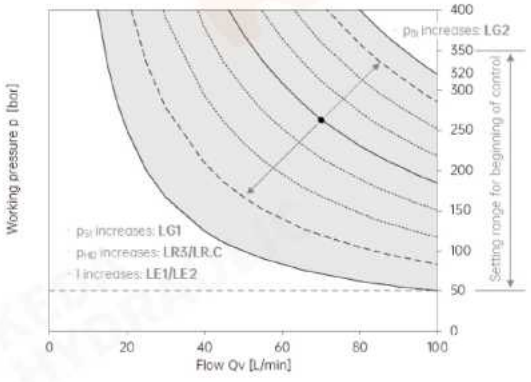
The displacement of pump is regulated depending on the working pressure thus given drive power is not exceeded at constant drive speed.

Working pressure p × Displacement q_v = constant

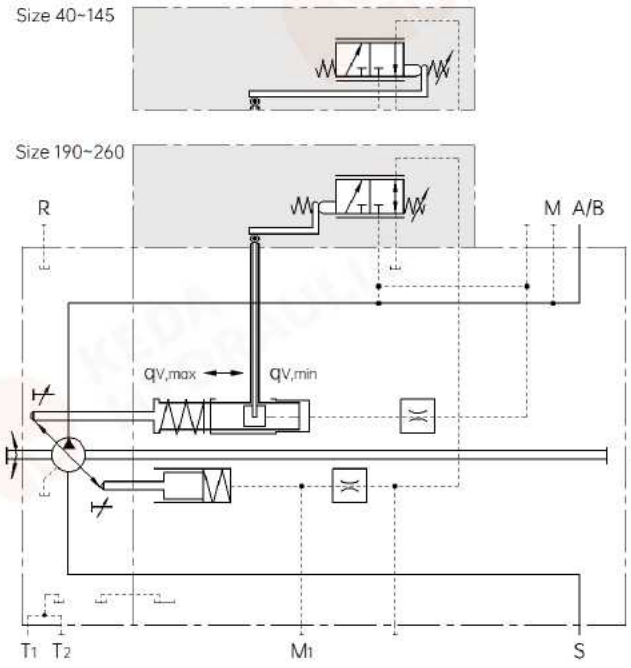
The hydraulic output power is influenced by the efficiency of the pump. With a hyperbolic characteristic curve, the precise control provides optimum utilization of available power. When ordering, please specify:

— **Drive power P** [kW];
— **Drive speed n** [rpm];
— **Maximum flow $Q_{v,max}$** [L/min].

▶ Characteristic curve LR

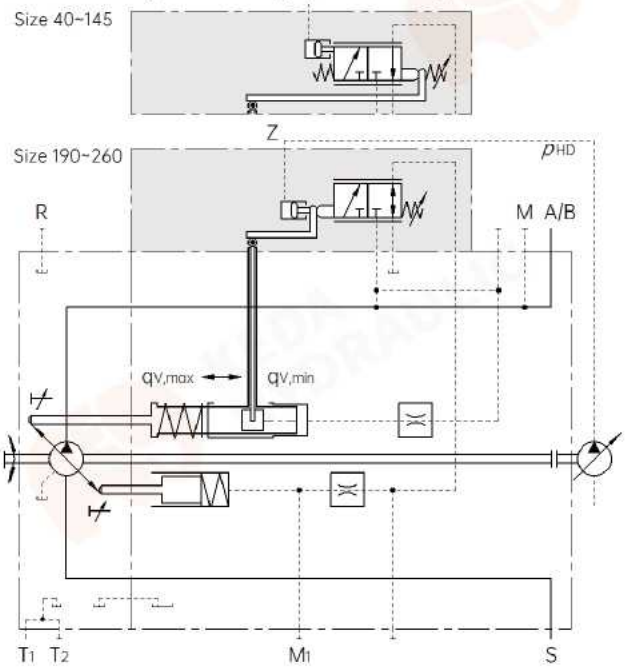


▼ Circuit diagram LR



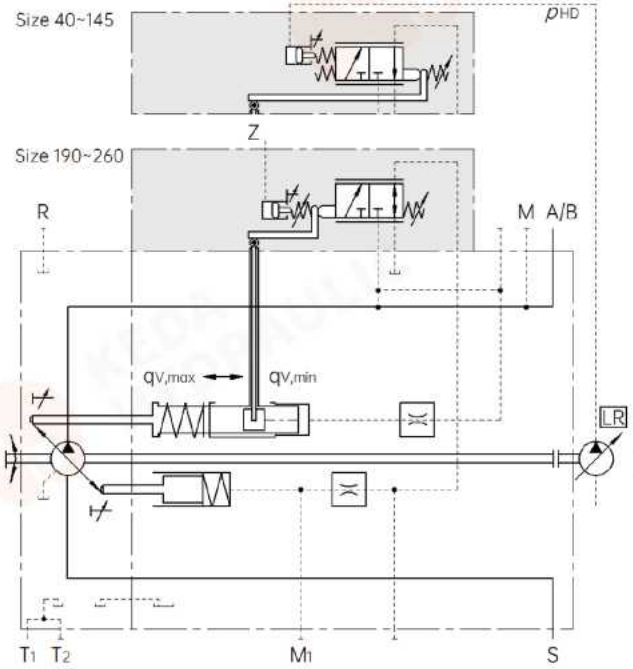
The working pressure acts on a rocker via a measuring spool. An externally adjustable spring force counteracts this. If working pressure exceeds the set spring force, the control valve will be actuated and the pump will swivel back from the depressurized basic position $V_{g,\ max}$ toward $V_{g,\ min}$.

▼ Circuit diagram LR3 high-pressure-dependent override



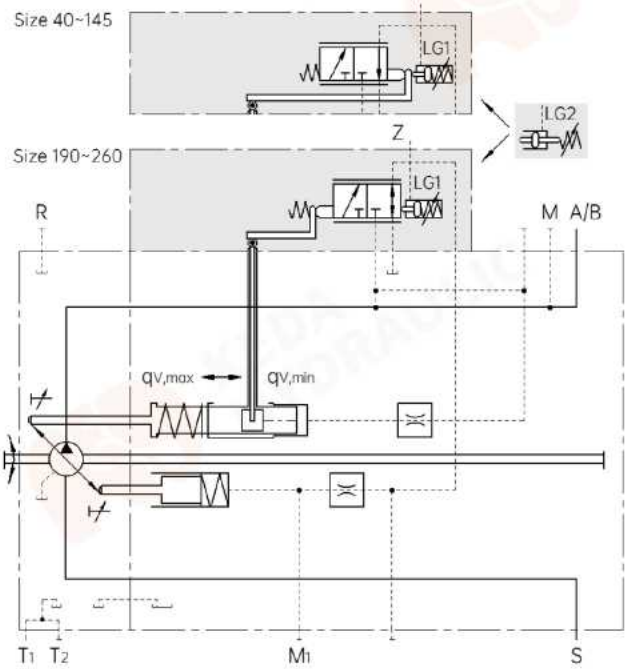
LR3 is a total power control where the working pressure of a mounted fixed pump is applied to the power setting (via port Z). The fixed pump has priority in the total power setting. The power setting of the K11VO is reduced proportionally to the load-dependent increase in working pressure of the fixed pump.

▼ Circuit diagram LR.C override with cross sensing



Cross sensing is a high-pressure dependent total capacity control that connects two equally sized K11VO pumps with LR.C controllers in power control. If one pump is operated below setting pressure, the unused power is available for the other pump, A total power is distributed between two consumers according to demand.

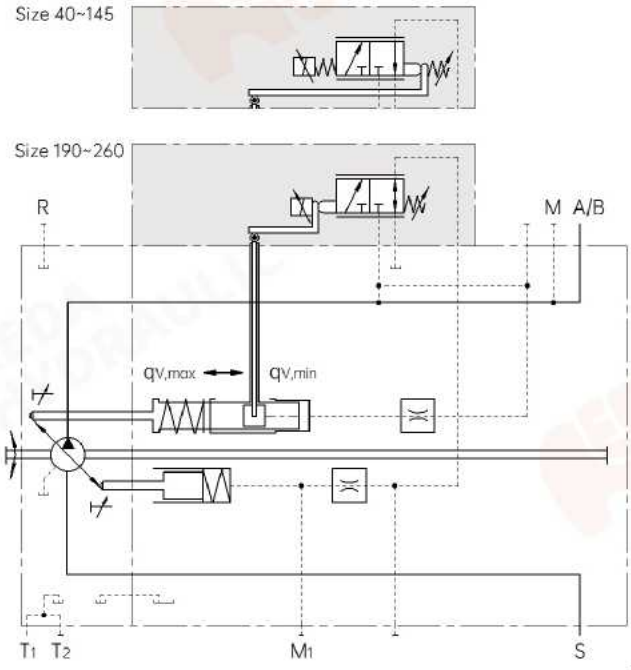
▼ Circuit diagram LG pilot-pressure related override



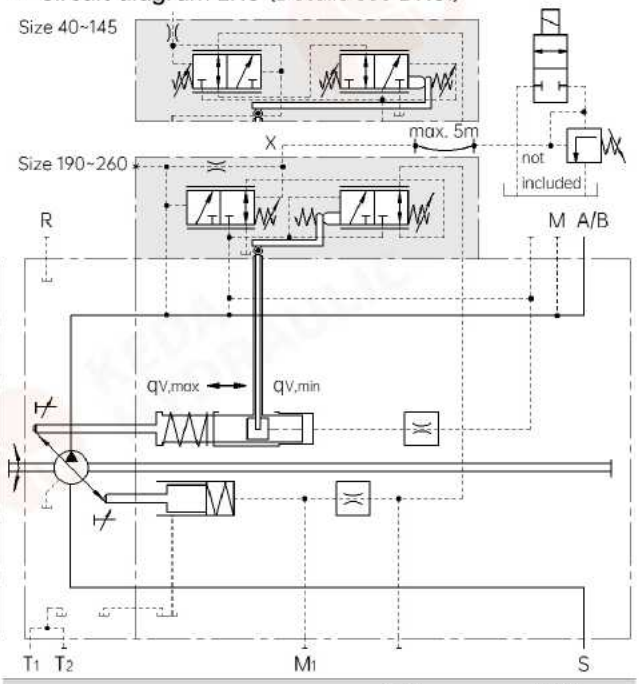
An external pilot-pressure acts on the setting spring of the power controller via port Z. The mechanically adjusted basic power setting can be varied by means of different pilot pressure settings.

— For **LG1**, higher pilot-pressure = reduced power;
— For **LG2**, higher pilot-pressure = increased power.

▼ Circuit diagram LE electrically proportional override



▼ Circuit diagram LRG (Details see DRG.)



▶ Technical data of solenoid

		LE1	LE2
Voltage		12±2.4 V	24±4.8 V
Control current	starts at	400 mA	200 mA
	ends at	1200 mA	600 mA
Current limit		1.54 A	0.77 A
Nominal resistance at 20℃		5.5 Ω	22.7 Ω
Dither frequency		100 Hz	100 Hz
Duty cycle		100 %	100 %

A control current acts against the adjustment spring of the power controller via a proportional solenoid. The mechanically adjusted power setting can be reduced by means of different control current settings.

— For **LE1**, increasing control current = increased power;

— For **LE2**, increasing control current = reduced power.

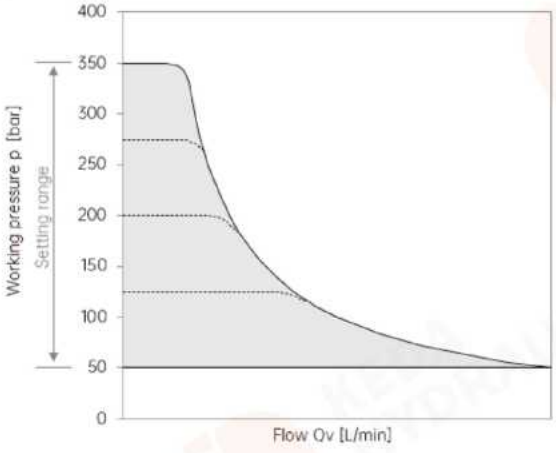
LRD – Power control with pressure cut-off

The pressure cut-off is a pressure control which adjusts the displacement of pump back to $V_{g,\ min}$ after reaching pressure command value. This function overrides power controller, the power control function is executed below the pressure command value.

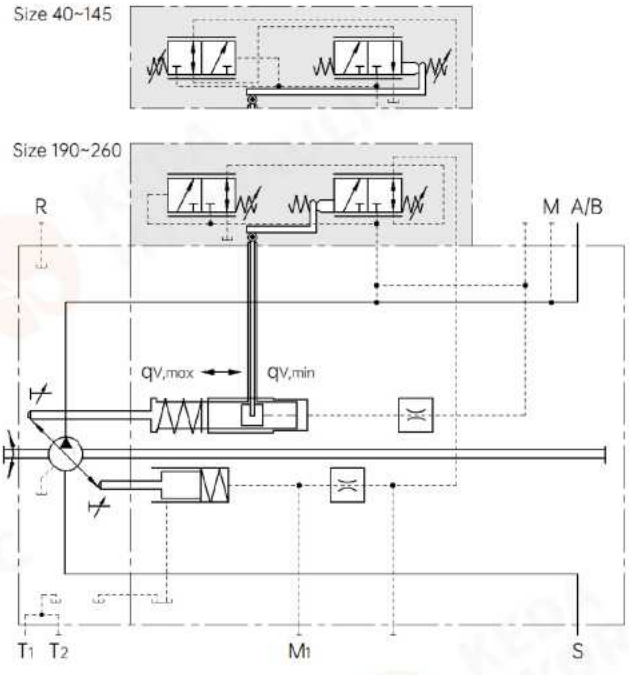
—The valve for pressure cut-off is integrated in controller housing and is permanently set to a pressure command value at the factory;

— Setting range for pressure control: 50~350 bar.

▼Characteristic curve LRD



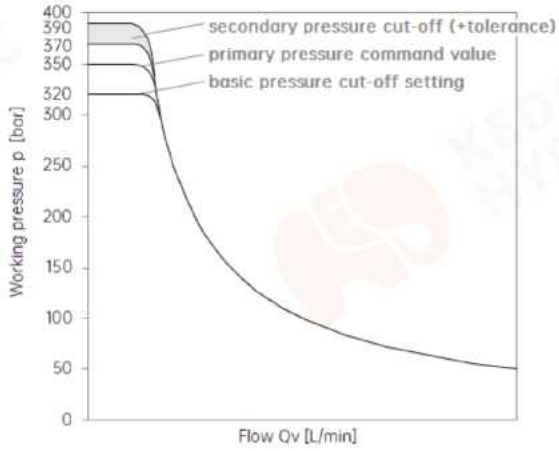
▼ Circuit diagram LRD



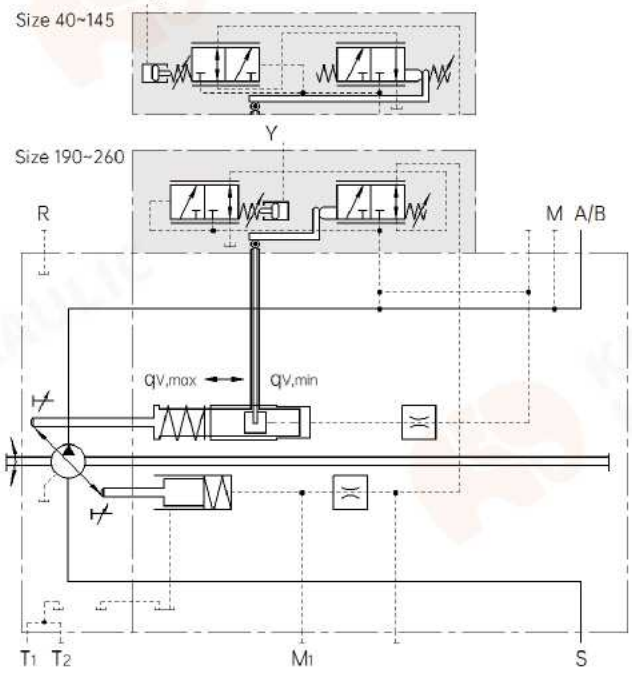
LRE – Power control with secondary pressure cut-off

An external pilot-pressure acts on the setting spring of the power controller via port Y. The mechanically adjusted basic cut-off setting can be raised by 50~70 bar to set to a secondary pressure cut-off (usually higher than the set pressure command value of the primary valve). The pilot-pressure signal at port Y must be 20~50 bar.

▼Characteristic curve LRE



▼ Circuit diagram LRE



LRDS – Power control with pressure cut-off/load sensing

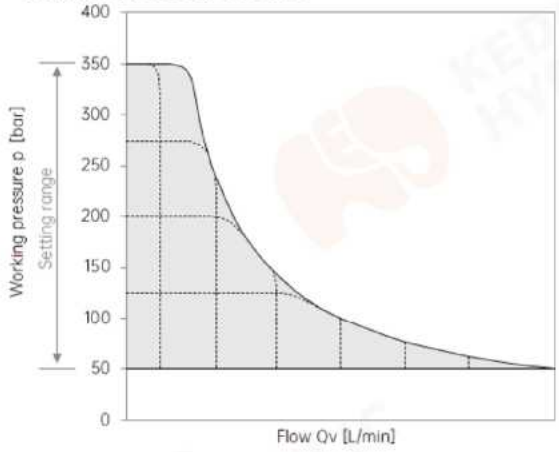
In standard LS system, the pressure cut-off is integrated in the pump controller. In an LUDV system, the pressure cut-off is integrated in the LUDV valve block.

The load sensing controller is influenced by load-pressure and adjusts the displacement of the pump as required, depending on cross section of external metering orifice between the pump and the consumer.

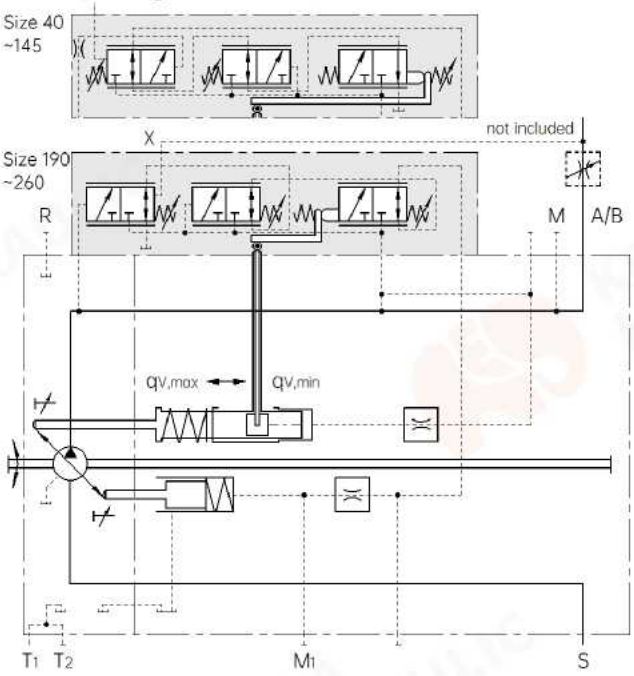
The flow is independent of load pressure below the power curve and the setting of pressure cut-off, and within the control range of the pump. The load sensing controller compares the pressure before and after the metering orifice and keeps the differential pressure Δp across the orifice and the flow constant.

— Setting range for Δp: 14~25 bar (standard 18 bar).

▼Characteristic curve LRDS



▼ Circuit diagram LRDS



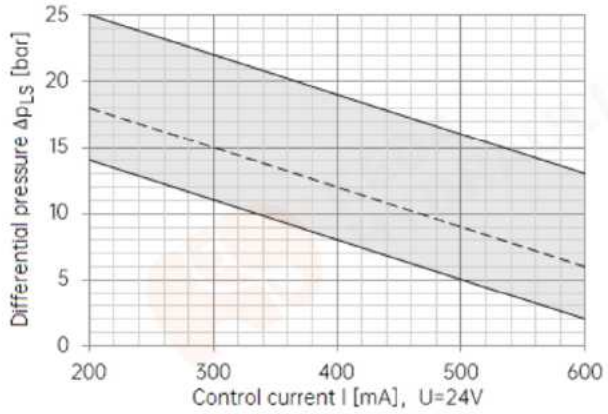
LRS2 – With electrically overridden load sensing

By connecting a control current on proportional solenoid, the differential pressure Δp of load sensing control can be overridden proportionally.

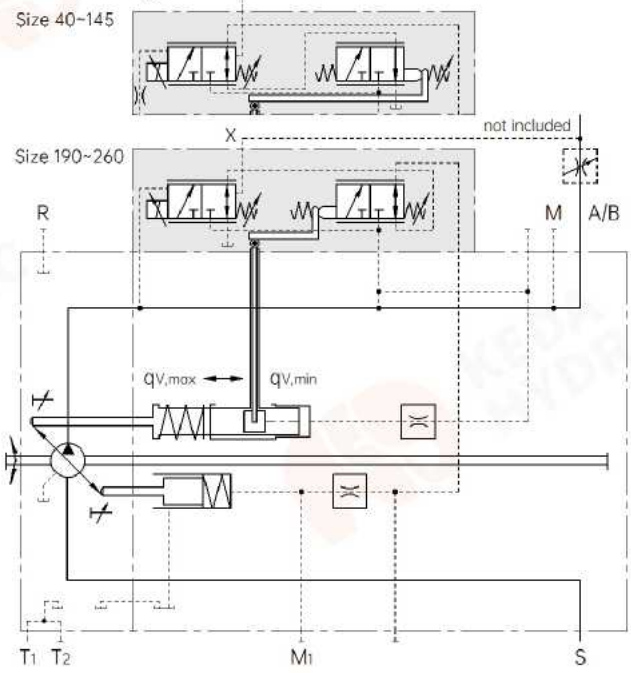
— For **LRS2**, increasing current = lower Δp setting;

— For technical data of solenoid, see **LE2**.

▼Characteristic curve LRS2



▼ Circuit diagram LRS2

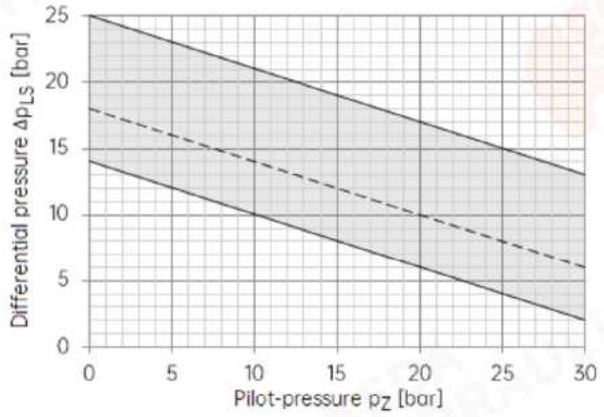


LRS5 – With hydraulically overridden load sensing

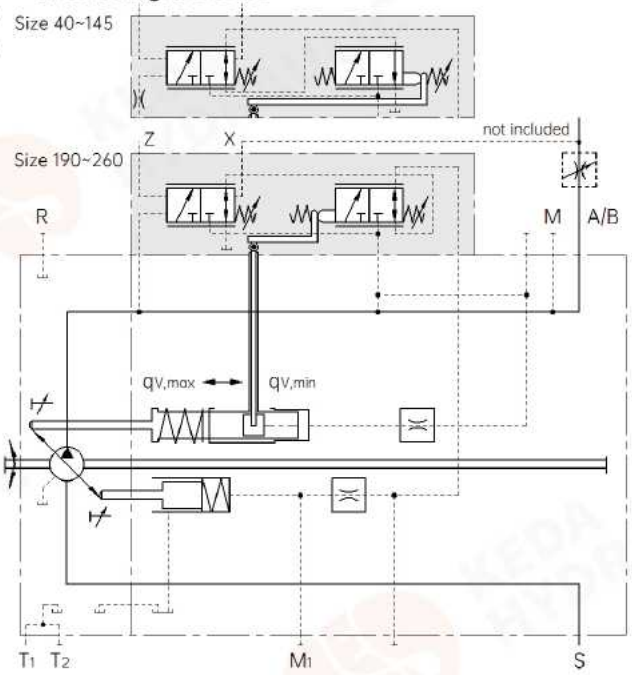
By connecting an external pilot-pressure to port Z, the differential pressure Δp of the load sensing control can be overridden proportionally.

— For **LRS5**, increasing pilot-pressure = lower Δp setting.

▼Characteristic curve LRS5



▼ Circuit diagram LRS5

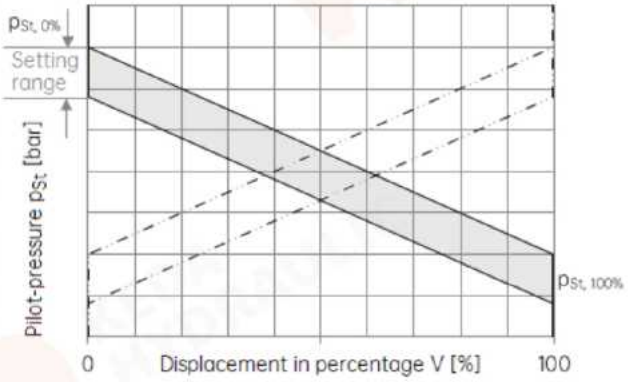


2-2. LR.H. – With hydraulic stroke limiter

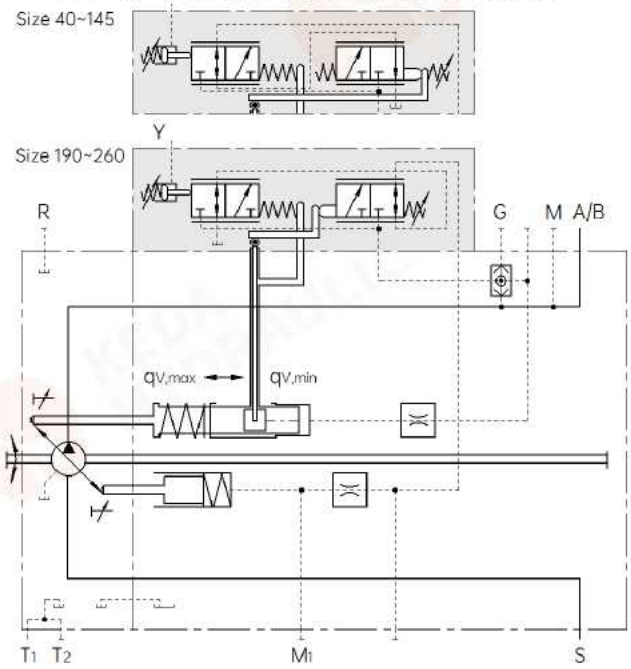
Due to the stroke limiter, the displacement is adjusted across the entire control range proportionally to the pilot-pressure p_{St} (≤40 bar) applied at port Y. The stroke limiter is overridden by the power controller, i.e. below the power control characteristic curve, the displacement is adjusted depending on the pilot-pressure. If the set flow or working pressure exceeds, power control overrides and reduces the displacement along the curve.

The required control power is taken from the working pressure or the external control pressure of about 30 bar applied to port G (at a low working pressure of <30 bar). If no external control pressure is connected to G, the shuttle valve must be removed or relieved to the reservoir.

▼ Characteristic curve LR.H.

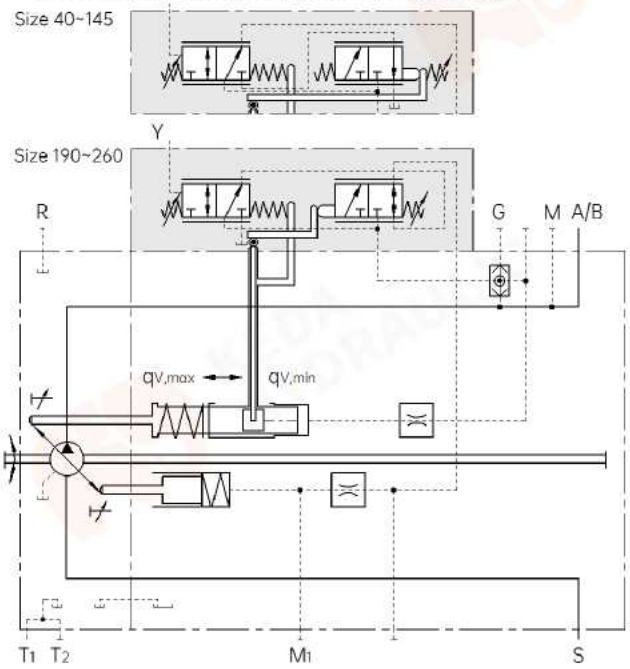


▼ Circuit diagram LRH1[1]/LRH5[2] negative control



With an increasing pilot-pressure, the pump swivels to a smaller displacement. Basic position without pilot-signal is $V_{g,\,max}$.
— Setting range for beginning of control: $p_{St,\,100\%}$=4~10bar;
— Setting range for end of control: $p_{St,\,0\%}$= 29~35 bar[1] or 14~20 bar[2];

▼ Circuit diagram LRH2[3]/LRH6[4] positive control

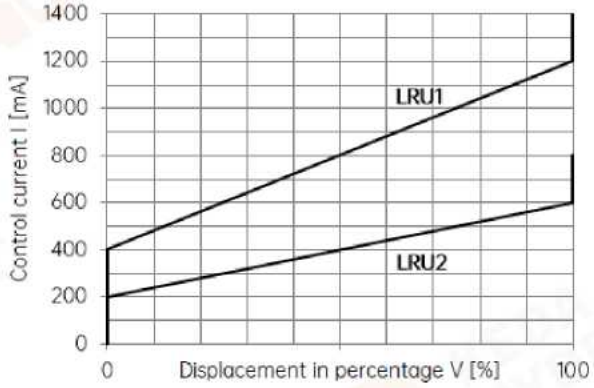


With an increasing pilot-pressure, the pump swivels to a larger displacement. Basic position without pilot-signal at working pressure/external control pressure >30bar, is $V_{g,\,min}$.
— Setting range for beginning of control: $p_{St,\,0\%}$= 4~10 bar;
— Setting range for end of control: $p_{St,\,100\%}$= 29~35 bar[3] or 14~20 bar[4];

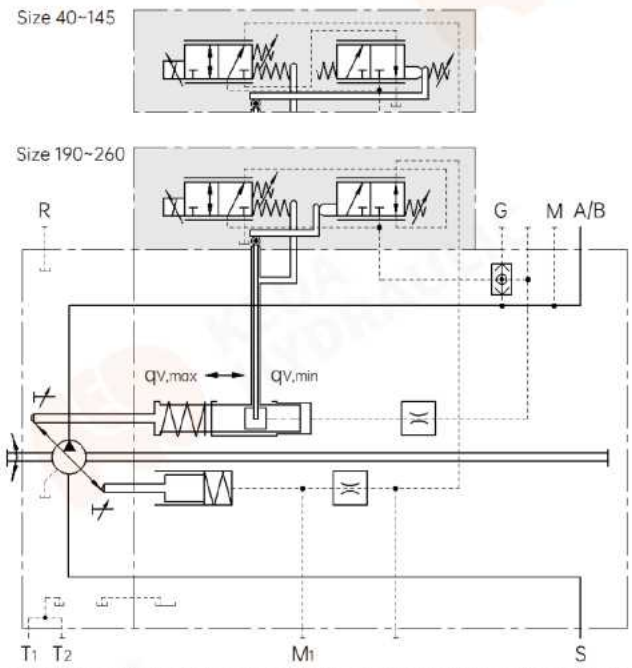
2-3. LR.U. – With electric stroke limiter

Due to the stroke limiter, the displacement is adjusted across the entire control range by the control current applied at the proportional solenoid. The stroke limiter is overridden by the power controller, i.e. below the power control characteristic curve, the displacement is adjusted depending on control current. If the set flow or working pressure exceeds, power control overrides and reduces the displacement along the curve.
The required control power is taken from the working pressure or the external control pressure of about 30 bar applied to port G when working pressure <30 bar. If no external control pressure is connected to G, the shuttle valve must be removed or relieved to the reservoir.

▼ Characteristic curve LR.U.



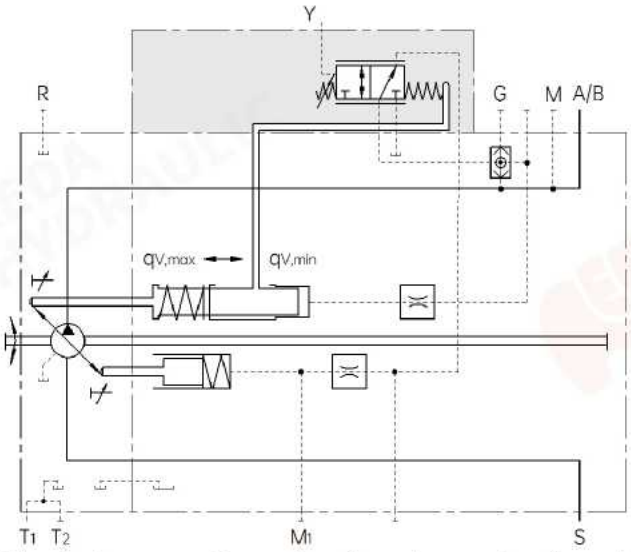
▼ Circuit diagram LRU1[5]/LRU2[6] positive control



With an increasing control current, the pump swivels to a larger displacement. Basic position without pilot-signal at working pressure/external control pressure >30bar, is $V_{g,\,min}$.
— Setting range for beginning of control: $I_{0\%}$;
— Setting range for end of control: $I_{100\%}$;

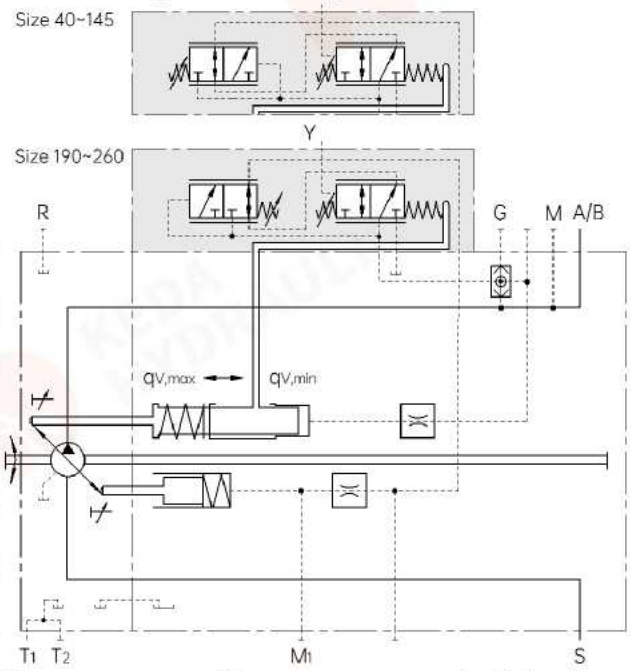
3. HD – Pilot-pressure related hydraulic control

▼ Circuit diagram HD



The displacement of pump is adjusted proportionally and continuously with a pilot-pressure applied at port Y. Start of adjustment without pilot-signal at working pressure or external control pressure >30bar, is $V_{g,\,min}$. With increasing pilot-pressure, the pump swivels to a larger displacement.
— Control pressure see **LR.H.**;

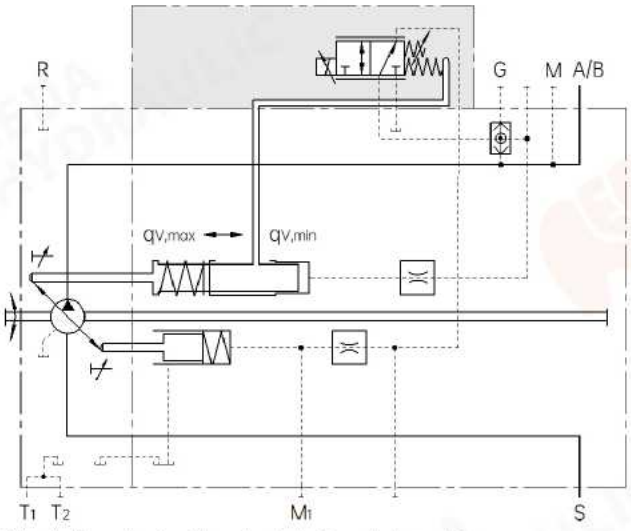
▼ Circuit diagram HD.D with pressure cut-off



The pressure cut-off is a pressure control which adjusts the displacement of pump back to $V_{g,\,min}$ after reaching the set pressure command value. This function overrides hydraulic stroke control, i.e. the stroke control function is executed below the pressure command value.
— Valve for pressure cut-off see **LRD**;
— Characteristic curve see **DR.**

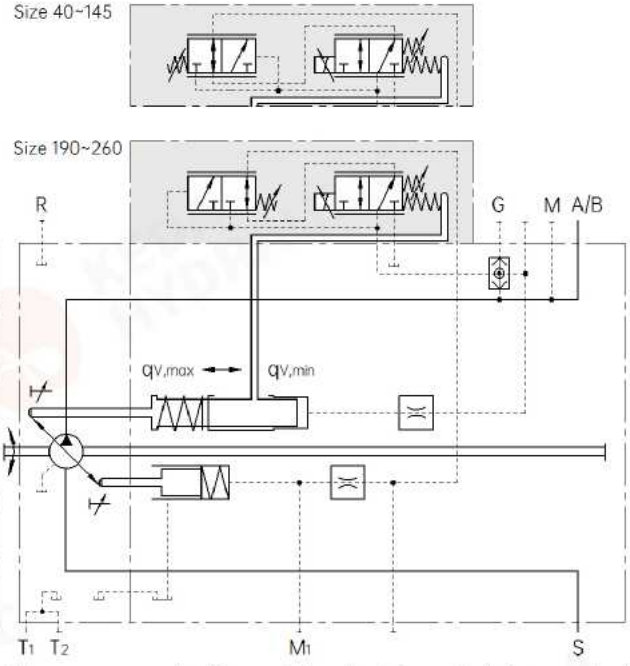
4. EP – Electrical control with proportional solenoid (only for operation with mineral oil & reservoir temperature <80°C!)

▼ Circuit diagram EP



Start of control without pilot-signal at working pressure or external control pressure > 30 bar, is $V_{g,\,min}$. With increasing control current, pump swivels to a larger displacement.

▼ Circuit diagram EP.D with pressure cut-off



The pressure cut-off overrides electric control, is executed below the pressure command value.
— Valve for pressure cut-off see **LRD**;
— Characteristic curve see **DR.**

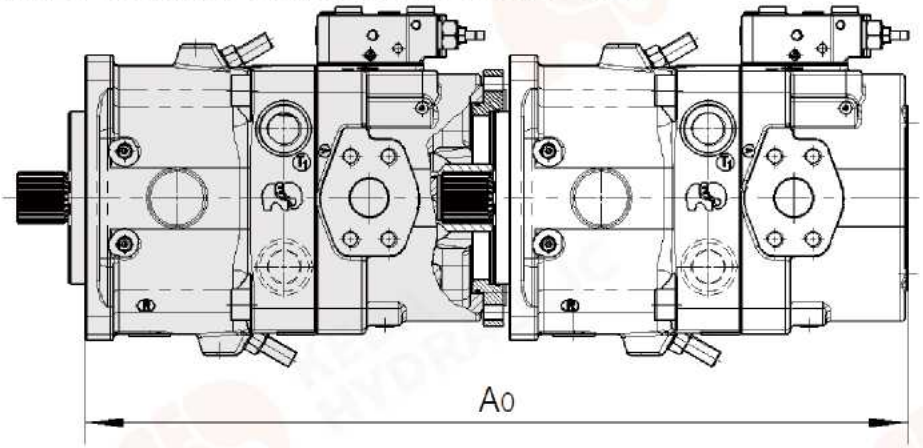
COMBINATION PUMP

K11VO pump can be combined with K11VO/K10VO/K4VG/K4FO/gear pumps, etc. A tandem pump with two pumps of equal size is permissible. Please specify the designations for the 1st and the 2nd pumps and join by a "+" when ordering. Order example:

K11V L O 190 LRDS / 10 R – N Z D 12 K72 P + K11V L O 190 LRDS / 10 R – N S D 12 N00 P

The first row of following table refers to the 1st pump (P). For informations about the through-drives (TD), see part 12.

▼ Total length A_0 of an example pump combination K11VO+K11VO



1st P / +2nd P	TD	K11VO60	K11VO75	K11VO95	K11VO 130/145	K11VLO 130/145	K11VO190	K11VLO190	K11VO260	K11VLO260
		A_0	A_0	A_0	A_0	A_0	A_0	A_0	A_0	A_0
K11VO40	K04 K79	490	–	528	551	585	586.8	619	620	662.5
K11VO60	K07 K61	507	525	560	572	606	609.8	642	633.5	675.5
K11VO75	K86 K81	–	550	577	600	634	652	684	677	719
K11VO95	K17 K82	–	–	604	627	661	679	711	704	746
K11VO130	K17 K83	–	–	–	650	684	702	734	727	769
K11VLO130	K17 K83	–	–	–	698	732	750	782	775	817
K11VO145	K17 K83	–	–	–	650	684	702	734	727	769
K11VLO145	K17 K83	–	–	–	698	732	750	782	775	817
K11VO190	K72 K84	–	–	–	–	–	723.6	755.8	746.8	789.3
K11VLO190	K72 K84	–	–	–	–	–	772.3	804.5	795.5	838
K11VO260	K72 K67	–	–	–	–	–	–	–	772	814.5
K11VLO260	K72 K67	–	–	–	–	–	–	–	828	870.5

NOTE: – unavailable.

12 THROUGH-DRIVE

K11VO pump can be combined with K11VO/K10VO/K4VG/K4FO/gear pumps, etc. 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.

1. Available through-drives for K11VO+K11VO

1st P	K11VO60				K11VO75				K11VO95								130
TD +	40S	40Z	60S	60Z	60S	60Z	75S	75Z	40S	40Z	60S	60Z	75S	75Z	95S	95Z	40S
K04	○	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	○
K79	–	○	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–
K07	–	–	○	–	○	–	–	–	–	–	○	–	–	–	–	–	–
K61	–	–	–	○	–	○	–	–	–	–	–	○	–	–	–	–	–
K86	–	–	–	–	–	–	○	–	–	–	–	–	○	–	–	–	–
K17	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–
K81	–	–	–	–	–	–	–	○	–	–	–	–	–	○	–	–	–
K82	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–

1st P	K11VO130									K11VO145							
TD +	40Z	60S	60Z	75S	75Z	95S	95Z	130S	130Z	40S	40Z	60S	60Z	75S	75Z	95S	95Z
K04	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–
K79	○	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–
K07	–	○	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–
K61	–	–	○	–	–	–	–	–	–	–	–	–	○	–	–	–	–
K86	–	–	–	○	–	–	–	–	–	–	–	–	–	○	–	–	–
K17	–	–	–	–	–	○	–	○	–	–	–	–	–	–	–	●	–
K81	–	–	–	–	○	–	–	–	–	–	–	–	–	–	○	–	–
K82	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	●
K83	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–

1st P	K11VO145				K11VO190												
TD +	130S	130Z	145S	145Z	40S	40Z	60S	60Z	75S	75Z	95S	95Z	130S	130Z	145S	145Z	190S
K04	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–
K79	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–
K07	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–
K61	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–
K86	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–
K17	○	–	●	–	–	–	–	–	–	–	●	–	○	–	●	–	–
K81	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–
K82	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–
K83	–	○	–	●	–	–	–	–	–	–	–	–	–	○	–	●	–
K72	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●

NOTE: ● available; ○ upon request; – unavailable.

1st P	190	K11VO260															
TD +	190Z	40S	40Z	60S	60Z	75S	75Z	95S	95Z	130S	130Z	145S	145Z	190S	190Z	260S	260Z
K04	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
K79	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–
K07	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–
K61	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–
K86	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–
K17	–	–	–	–	–	–	–	●	–	○	–	●	–	–	–	–	–
K81	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–
K82	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–	–
K83	–	–	–	–	–	–	–	–	–	–	○	–	●	–	–	–	–
K72	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	–
K84	●	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–
K67	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●

NOTE: ● available; ○ upon request; – unavailable.

2. Available through-drives for K11VO+K10VO

1st P	K11VO40				K11VO60								K11VO75						
TD +	18S[1]	18U[1]	28S	28R	18S[1]	18U[1]	28S	28R	45S	45R	45U	45W[2]	18S[1]	18U[1]	28S	28R	45S	45R	45U
K01	–	○	–	–	–	○	–	–	–	–	–	–	–	○	–	–	–	–	–
K52	○	–	–	–	○	–	–	–	–	–	–	–	○	–	–	–	–	–	–
K02	–	–	○	○	–	–	○	○	–	–	○	○	–	–	○	○	–	–	○
K04	–	–	–	–	–	–	–	–	○	○	–	–	–	–	–	–	○	○	–

1st P	K11VO75						K11VO95												
TD +	45W[2]	63S[3]	63U	63W	71S[1]	71R[1]	18S[1]	18U[1]	28S	28R	45S	45R	45U	45W[2]	63S[3]	63U	63W	71S[1]	71R[1]
K01	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–
K52	–	–	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–	–	–
K02	○	–	–	–	–	–	–	–	●	●	–	–	●	○	–	–	–	–	–
K04	–	–	○	○	–	–	–	–	–	–	●	●	–	–	–	○	○	–	–
K07	–	○	–	–	○	○	–	–	–	–	–	–	–	–	○	–	–	●	●

1st P	K11VO95		K11VO130																
TD +	85S	85U	18S[1]	18U[1]	28S	28R	45S	45R	45U	45W[2]	63S[3]	63U	63W	71S[1]	71R[1]	85S	85U	100S[1]	100U[1]
K01	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
K52	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
K02	–	–	–	–	○	○	–	–	○	○	–	–	–	–	–	–	–	–	–
K04	–	–	–	–	–	–	○	○	–	–	–	○	○	–	–	–	–	–	–
K07	–	●	–	–	–	–	–	–	–	–	○	–	–	○	○	–	○	–	○
K24	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	○	–

1st P	K11VO145/190/260																
TD +	18S[1]	18U[1]	28S	28R	45S	45R	45U	45W[2]	63S[3]	63U	63W	71S[1]	71R[1]	85S	85U	100S[1]	100U[1]	140S[1]
K01	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
K52	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
K02	–	–	●	●	–	–	●	○	–	–	–	–	–	–	–	–	–	–
K04	–	–	–	–	●	●	–	–	–	○	○	–	–	–	–	–	–	–
K07	–	–	–	–	–	–	–	–	○	–	–	●	●	–	●	–	●	–
K24	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	●	–	–
K17	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●

NOTE: ● available; ○ upon request; – unavailable.
1) Only for K10VO/11 series; **2)** Only for K10VO/13 series; **3)** Only for 2nd pump with 4-hole mounting flange.

3. Available through-drives for K11VO+K4VG

1st P / TD +	K11VO40				K11VO60							K11VO75								
	28S	40Z	40A	40S	28S	40Z	40A	40S	56Z	56A	56S	28S	40Z	40A	40S	56Z	56A	56S	71Z	71S
K04	○	–	–	–	○	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–
K07	–	–	–	○	–	–	–	○	–	–	○	–	–	–	○	–	–	○	–	○
K80	–	○	–	–	–	○	–	–	○	–	–	–	○	–	–	○	–	–	–	–
K61	–	–	○	–	–	–	○	–	–	○	–	–	–	○	–	–	○	–	○	–

1st P / TD +	K11VO95											K11VO130/145								
	28S	40Z	40A	40S	56Z	56A	56S	71Z	71S	90A	90S	28S	40Z	40A	40S	56Z	56A	56S	71Z	71S
K04	○	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–
K07	–	–	–	○	–	–	○	–	○	–	–	–	–	–	○	–	–	○	–	○
K80	–	○	–	–	○	–	–	–	–	–	–	–	○	–	–	○	–	–	–	–
K61	–	–	○	–	–	○	–	○	–	–	–	–	–	○	–	–	○	–	○	–
K17	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–
K82	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–

1st P / TD +	K11VO130/145					K11VO190													
	90A	90S	125Z	125A	125S	28S	40Z	40A	40S	56Z	56A	56S	71Z	71S	90A	90S	125Z	125A	125S
K04	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–
K07	–	–	–	–	–	–	–	–	○	–	–	○	–	○	–	–	–	–	–
K80	–	–	–	–	–	–	○	–	–	○	–	–	–	–	–	–	–	–	–
K61	–	–	–	–	–	–	–	○	–	–	○	–	○	–	–	–	–	–	–
K17	–	○	–	–	○	–	–	–	–	–	–	–	–	–	–	○	–	–	○
K81	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–
K82	○	–	–	○	–	–	–	–	–	–	–	–	–	–	○	–	–	○	–

1st P / TD +	K11VO190		K11VO260																	
	180Z	180S	28S	40Z	40A	40S	56Z	56A	56S	71Z	71S	90A	90S	125Z	125A	125S	180Z	180S	250S
K04	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
K07	–	–	–	–	–	○	–	–	○	–	○	–	–	–	–	–	–	–	–
K80	–	–	–	○	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–
K61	–	–	–	–	○	–	–	○	–	○	–	–	–	–	–	–	–	–	–
K17	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	○	–	–	–
K81	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–
K82	–	–	–	–	–	–	–	–	–	–	–	○	–	–	○	–	–	–	–
K72	–	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	○
K84	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–

NOTE: ● available; ○ upon request; – unavailable.

4. Available through-drives for K11VO+K4FO

1st P / TD +	K11VO40/60/75/130			K11VO95/145/190/260		
	K4FO16...S	K4FO22...S	K4FO28...S	K4FO16...S	K4FO22...S	K4FO28...S
K02	○	○	○	●	●	●

NOTE: ● available; ○ upon request.

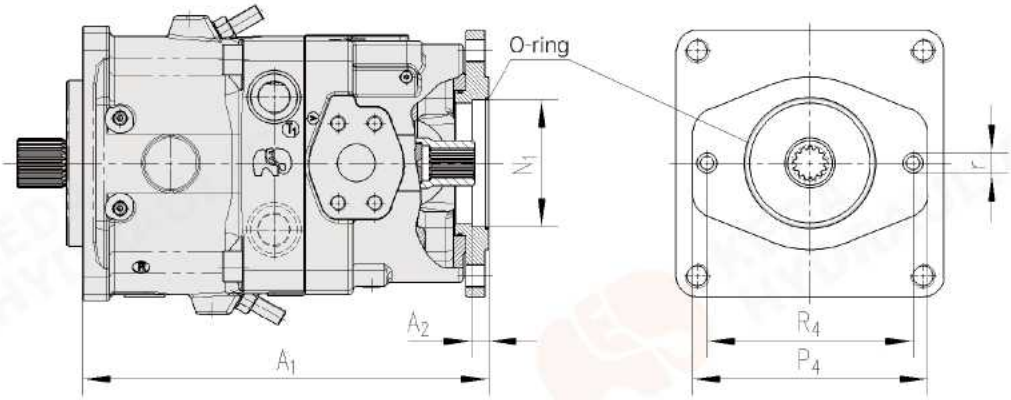
5. Available through-drives for K11VO+gear pump

1st P / TD +	K11VO40/60/75/130			K11VO95/145/190/260		
	(F) 4~22	(N) 20~32	(G) 38~45	(F) 4~22	(N) 20~32	(G) 38~45
K01	○	–	–	●	–	–
K02	–	○	○	–	●	●

NOTE: ● available; ○ upon request; – unavailable.

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

6.

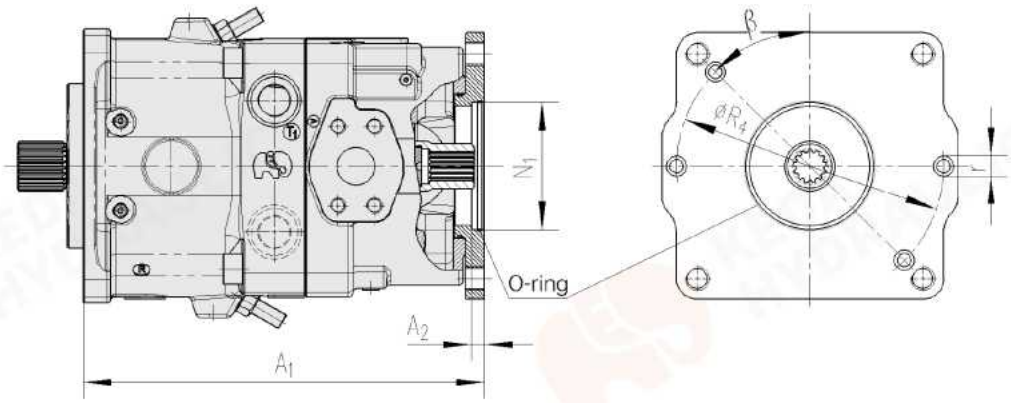


Code K01 (2nd pump K10VO18U[1] or gear pump F series 4~22; 2nd pump's flange ISO 3019-1 – 82-2)

1st P / Dimension	K11VO40	K11VO60	K11VO75	K11VO95	K11VO 130/145	K11VLO 130/145	K11VO190	K11VLO190	K11VO260	K11VLO260
N_1	Φ82.5	Φ82.5	Φ82.5	Φ82.5	Φ82.5	Φ82.5	Φ82.5	Φ82.5	Φ82.5	Φ82.5
A_1	240	257	275	306	329	363	359.8	394	385	427.3
A_2	8	–	–	–	–	–	–	–	–	–
R_4	106.4	106.4	106.4	106.4	106.4	106.4	106.4	106.4	106.4	106.4
P_4	130	130	130	130	130	130	130	130	130	130
r	M10X1.5X15	M10X1.5X15	M10X1.5X15	M10X1.5X12.5	M10X1.5X12.5	M10X1.5X12.5	M10X1.5X13	M10X1.5X13	M10X1.5X13	M10X1.5X13
Hub	△	△	△	△	△	△	△	△	△	△
K01	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	⅝"-9T-16/32
K52	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	¾"-11T-16/32

NOTE: – unavailable; △ pending; **1)** For K10VO/11 series.

7.



Code K02 (2nd pump K10VO28S/28R/45U/45W[2], K4FO16S/22S/28S or gear pump N series 20~32 & G series 38~45; 2nd pump's flange ISO 3019-1 – 101-2)

1st P / Dimension	K11VO40	K11VO60	K11VO75	K11VO95	K11VO 130/145	K11VLO 130/145	K11VO190	K11VLO190	K11VO260	K11VLO260
N_1	Φ101.6	Φ101.6	Φ101.6	Φ101.6	Φ101.6	Φ101.6	Φ101.6	Φ101.6	Φ101.6	Φ101.6
A_1	244	261	279	303	326	360	371.8	404	395	437.5
A_2	10	10	10	10	10	10	–	–	–	–
R_4	106.4	106.4	106.4	106.4	106.4	106.4	106.4	106.4	106.4	106.4
β	45°	45°	45°	45°	45°	45°	90°	90°	90°	90°
r	M12X1.75X19	M12X1.75X19	M12X1.75X19	M12X1.75X16	M12X1.75X16	M12X1.75X16	M12X1.75X15	M12X1.75X15	M12X1.75X15	M12X1.75X15
Hub	△	△	△	△	△	△	△	△	△	△
	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	⅞"-13T-16/32	⅞"-13T-16/32

NOTE: – unavailable; △ pending; **2)** For K10VO/13 series.

Code K04 (2nd pump K11VO40S, K10VO45S/45R/63U[2)]/63W[2)], K4VG28S; 2nd pump's flange ISO 3019-1 – 101-2)

1st P / Dimension	K11VO40	K11VO60	K11VO75	K11VO95	K11VO 130/145	K11VLO 130/145	K11VO190	K11VLO190	K11VO260	K11VLO260
N_1	Φ101.6	Φ101.6	Φ101.6	Φ101.6	Φ101.6	Φ101.6	Φ101.6	Φ101.6	Φ101.6	Φ101.6
A_1	244	261	279	303	326	360	369.8	404	395	437.5
A_2	10	10	10	10	10	10	–	–	–	–
R_4	106.4	106.4	106.4	106.4	106.4	106.4	106.4	106.4	106.4	106.4
β	45°	45°	45°	45°	45°	45°	90°	90°	90°	90°
r	M12X1.75X19	M12X1.75X19	M12X1.75X19	M12X1.75X16	M12X1.75X16	M12X1.75X16	M12X1.75X15	M12X1.75X15	M12X1.75X15	M12X1.75X15
Hub	△	△	△	△	△	△	△	△	△	△
	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	1"-15T-16/32	1"-15T-16/32	1"-15T-16/32

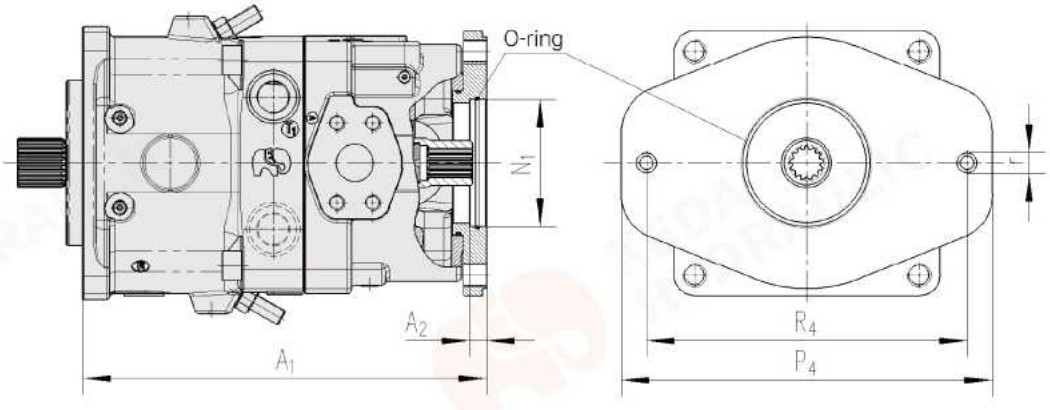
NOTE: – unavailable; △ pending; 2) For K10VO/13 series.

Code K79 (2nd pump K11VO40Z; 2nd pump's flange ISO 3019-1 – 101-2)

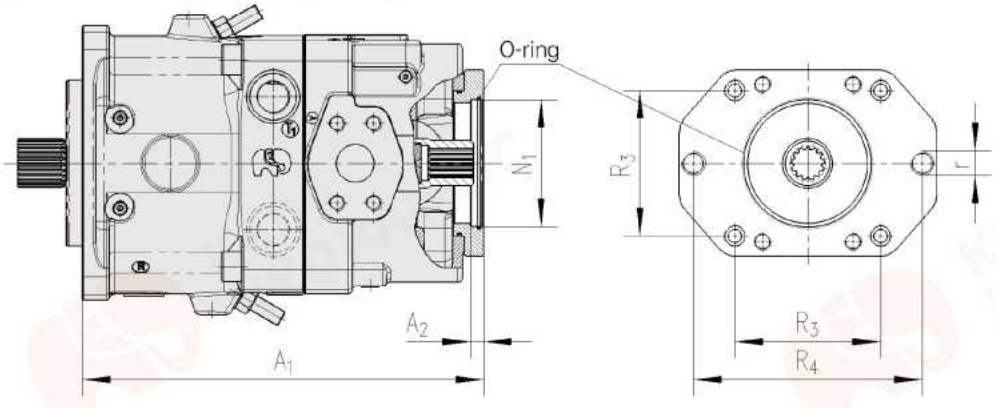
1st P / Dimension	K11VO40	K11VO60	K11VO75	K11VO95	K11VO 130/145	K11VLO 130/145	K11VO190	K11VLO190	K11VO260	K11VLO260
N_1	Φ101.6	Φ101.6	Φ101.6	Φ101.6	Φ101.6	Φ101.6	Φ101.6	Φ101.6	Φ101.6	Φ101.6
A_1	△	261	△	303	326	360	361.8	394	395	437.5
A_2	10	10	10	10	10	10	–	–	–	–
R_4	106.4	106.4	106.4	106.4	106.4	106.4	106.4	106.4	106.4	106.4
β	45°	45°	45°	45°	45°	45°	90°	90°	90°	90°
r	M12X1.75X19	M12X1.75X19	M12X1.75X19	M12X1.75X16	M12X1.75X16	M12X1.75X16	M12X1.75X15	M12X1.75X15	M12X1.75X15	M12X1.75X15
Hub	△	△	△	△	△	△	△	△	△	△
	N35X2X16	N35X2X16	N35X2X16	N35X2X16	N35X2X16	N35X2X16	N35X2X16	N35X2X16	N35X2X16	N35X2X16

NOTE: – unavailable; △ pending.

8–1. 1st pump size 60~145 (2nd pump's flange ISO 3019-1 – 127-2)



8–2. 1st pump size 190~260 (2nd pump's flange ISO 3019-1 – 127-2+4)

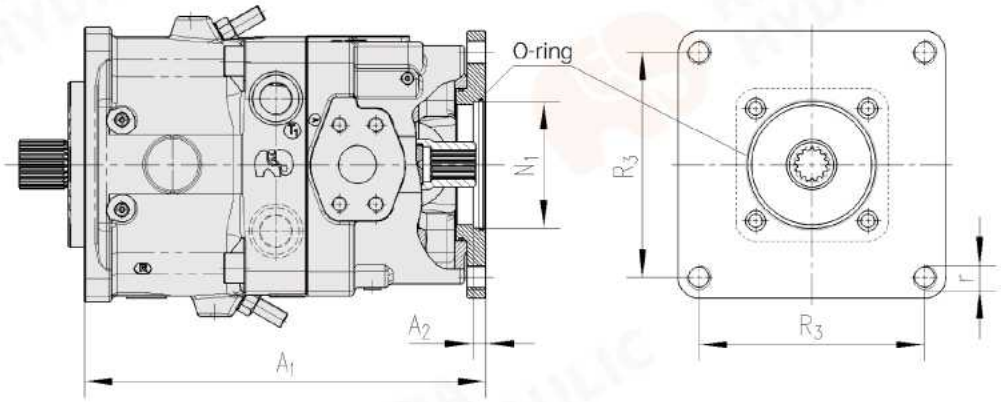


Code K07 (2nd pump K11VO60S, K10VO63S[2)]/71S[1)]/71R[1)]/85U/100U[1)], K4VG40S/56S/71S; 2nd pump's flange ISO 3019-1 – 127-2 or 127-2+4)
Code K24 (2nd pump K10VO85S/100S[1)]; 2nd pump's flange ISO 3019-1 – 127-2 or 127-2+4)
Code K80 (2nd pump K4VG40Z/56Z; 2nd pump's flange ISO 3019-1 – 127-2 or 127-2+4)
Code K61 (2nd pump K11VO60Z, K4VG40A/56A/71Z; 2nd pump's flange ISO 3019-1 – 127-2 或 127-2+4)

1st P / Dimension		K11VO40	K11VO60	K11VO75	K11VO95	K11VO 130/145	K11VLO 130/145	K11VO190	K11VLO190	K11VO260	K11VLO260
N_1		–	Φ127	Φ127	Φ127	Φ127	Φ127	Φ127	Φ127	Φ127	Φ127
A_1		–	272[3)]/–[4)]/265	290[3)]/–[4)]/283	318	330	364	367.8	400	391.5	433.5
A_2		–	13	13	13	13	13	13	13	13	13
R_3		–	–	–	–	–	–	□115	□115	□115	□115
R_4		–	181	181	181	181	181	181	181	181	181
P_4		–	213	213	213	213	213	–	–	–	–
r		–	M16X2X20	M16X2X20	M16X2X16	M16X2X20	M16X2X20	M16X2X19	M16X2X19	M16X2X19	M16X2X19
		–	△	△	△	△	△	△	△	△	△
Hub	K07	–	1¼"-14T-12/24	1¼"-14T-12/24	1¼"-14T-12/24	1¼"-14T-12/24	1¼"-14T-12/24	1¼"-14T-12/24	1¼"-14T-12/24	1¼"-14T-12/24	1¼"-14T-12/24
	K24	–	1½"-17T-12/24	1½"-17T-12/24	1½"-17T-12/24	1½"-17T-12/24	1½"-17T-12/24	1½"-17T-12/24	1½"-17T-12/24	1½"-17T-12/24	1½"-17T-12/24
	K80	–	N30X2X14	N30X2X14	N30X2X14	N30X2X14	N30X2X14	N30X2X14	N30X2X14	N30X2X14	N30X2X14
	K61	–	N35X2X16	N35X2X16	N35X2X16	N35X2X16	N35X2X16	N35X2X16	N35X2X16	N35X2X16	N35X2X16

NOTE: – unavailable; △ pending; **1)** For K10VO/11 series; **2)** For K10VO/13 series; **3)** A_1 for code K07; **4)** No code K24 for size 60/75.

9.



Code K86 (2nd pump K11VO75S; 2nd pump's flange ISO 3019-1 – 152-4)
Code K81 (2nd pump K11VO75Z, K4VG125Z; 2nd pump's flange ISO 3019-1 – 152-4)
Code K82 (2nd pump K11VO95Z, K4VG90A/125A; 2nd pump's flange ISO 3019-1 – 152-4)
Code K83 (2nd pump K11VO130Z/145Z; 2nd pump's flange ISO 3019-1 – 152-4)

1st P / Dimension		K11VO40	K11VO60	K11VO75	K11VO95	K11VO 130/145	K11VLO 130/145	K11VO190	K11VLO190	K11VO260	K11VLO260
N_1		–	–	Φ152.4	Φ152.4	Φ152.4	Φ152.4	Φ152.4	Φ152.4	Φ152.4	Φ152.4
A_1		–	–	290/–[5) 6)]	317/–[6)]	340	374	392	424	417	459
A_2		–	–	13	30	30	30	13	13	13	13
R_3		–	–	□161.6	□161.6	□161.6	□161.6	□161.6	□161.6	□161.6	□161.6
r		–	–	M20X2.5X28	M20X2.5X25	M20X2.5X25	M20X2.5X25	M20X2.5X22	M20X2.5X22	M20X2.5X22	M20X2.5X22
		–	–	△	△	△	△	△	△	△	△
Hub	K86	–	–	1¼"-14T-12/24	1¼"-14T-12/24	1¼"-14T-12/24	1¼"-14T-12/24	1¼"-14T-12/24	1¼"-14T-12/24	1¼"-14T-12/24	1¼"-14T-12/24
	K81	–	–	N40X2X18	N40X2X18	N40X2X18	N40X2X18	N40X2X18	N40X2X18	N40X2X18	N40X2X18
	K82	–	–	N45X2X21	N45X2X21	N45X2X21	N45X2X21	N45X2X21	N45X2X21	N45X2X21	N45X2X21
	K83	–	–	N50X2X24	N50X2X24	N50X2X24	N50X2X24	N50X2X24	N50X2X24	N50X2X24	N50X2X24

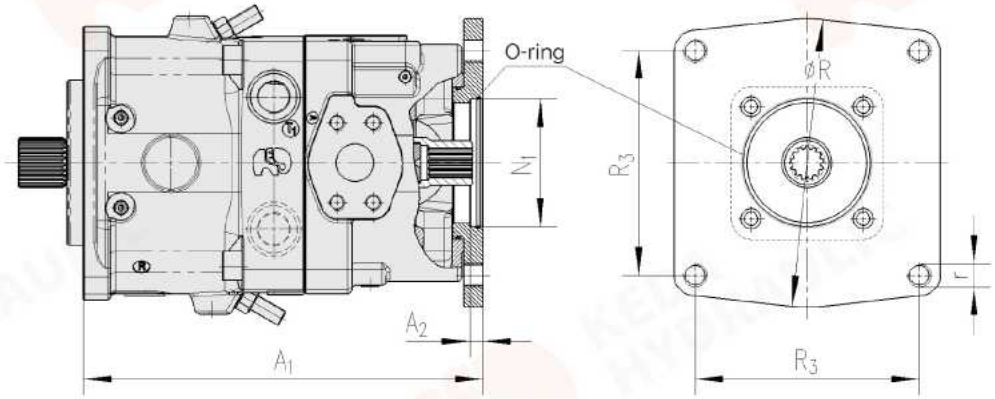
NOTE: – unavailable; △ pending; **1)** For K10VO/11 series; **5)** No code K82 for size 75; **6)** No code K83 for size 75/95.

Code K17 (2nd pump K11VO95S/130S/145S, K10VO140S[1)], K4VG90S/125S; 2nd pump's flange ISO 3019-1 – 152-4)

1st P / Dimension	K11VO40	K11VO60	K11VO75	K11VO95	K11VO 130/145	K11VLO 130/145	K11VO190	K11VLO190	K11VO260	K11VLO260
N_1	–	–	–	Φ152.4	Φ152.4	Φ152.4	Φ152.4	Φ152.4	Φ152.4	Φ152.4
A_1	–	–	–	327	350	384	392	424	417	459
A_2	–	–	–	30	30	30	13	13	13	13
R_3	–	–	–	□161.6	□161.6	□161.6	□161.6	□161.6	□161.6	□161.6
r	–	–	–	M20X2.5X25	M20X2.5X25	M20X2.5X25	M20X2.5X22	M20X2.5X22	M20X2.5X22	M20X2.5X22
Hub	–	–	–	△	△	△	△	△	△	△
	–	–	–	1¾"-13T-16/32	1¾"-13T-16/32	1¾"-13T-16/32	1¾"-13T-16/32	1¾"-13T-16/32	1¾"-13T-16/32	1¾"-13T-16/32

NOTE: – unavailable; △ pending; **1)** For K10VO/11 series.

10.



Code K72 (2nd pump K11VO190S/260S, K4VG180S/250S, 2nd pump's flange ISO 3019-1 – 165-4)
Code K84 (2nd pump K11VO190Z, K4VG180Z, 2nd pump's flange ISO 3019-1 – 165-4)
Code K67 (2nd pump K11VO260Z, 2nd pump's flange ISO 3019-1 – 165-4)

1st P / Dimension	K11VO40	K11VO60	K11VO75	K11VO95	K11VO 130/145	K11VLO 130/145	K11VO190	K11VLO190	K11VO260	K11VLO260
N_1	–	–	–	–	–	–	Φ165.1	Φ165.1	Φ165.1	Φ165.1
A_1	–	–	–	–	–	–	376.8/–[3)]	409/–[3)]	417[2)]/400	459[2)]/442.5
A_2	–	–	–	–	–	–	19	19	19	19
R_3	–	–	–	–	–	–	□224.5	□224.5	□224.5	□224.5
R	–	–	–	–	–	–	Φ270	Φ270	Φ270	Φ270
r	–	–	–	–	–	–	M20X2.5X20	M20X2.5X20	M20X2.5X20	M20X2.5X20
Hub	–	–	–	–	–	–	△	△	△	△
K72	–	–	–	–	–	–	1¾"-13T-16/32	1¾"-13T-16/32	1¾"-13T-16/32	1¾"-13T-16/32
K84	–	–	–	–	–	–	N50X2X24	N50X2X24	N50X2X24	N50X2X24
K67	–	–	–	–	–	–	N60X2X28	N60X2X28	N60X2X28	N60X2X28

NOTE: – unavailable; △ pending; **2)** A_1 for code K72; **4)** No code K67 for size 190.

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.