KHB3K Three-way High

Description

KHB3K is a two-position three-way forged steel hydraulic high-pressure ball valve that meets international standards; it is a component designed specifically for switching between three different oil circuits in hydraulic systems. Unlike the KHB two-position ball valve, this valve features three oil ports, and the direction of the oil flow is altered, as well as flow division and isolation, through a 90° rotation of the ball core. It comes in two types of ball core configurations – L and Tee – and can serve as a substitute for imported three-way ball valves. It is widely used for switching oil circuits, in accumulator circuits, and for switching between two supply sources.

Core Technical Parameters

1. Pressure grade: the rated working pressure is 315 bar, and the instantaneous maximum pressure resistance is 500bar ; ; The valve body is formed by integral forging, which bears uniform pressure, resists hydraulic impact and is not easy to deform and leak.

2. Range of pipe diameters: standard sizes of DN04, DN06, DN08, DN10, DN12, DN16, DN20, DN25, DN32, DN40, DN50, covering the pipeline needs of small and medium-sized hydraulic equipment.

3. Applicable media and temperatures: Common media include hydraulic oil and lubricating oil; water-ethylene glycol mixtures as well as low-viscosity flame-retardant hydraulic media can also be used.

4. NBR nitrile seal as standard: the applicable temperature is -10℃ ~ 80℃, and FKM fluororubber seal is optional: the applicable temperature is -30℃ ~ 170℃, which is resistant to high temperature and chemical corrosion.

Body Structure & Sealing Principle

Main material: The standard valve body is forged from 45# carbon steel, with a zinc-phosphating coating applied to its surface to prevent rust; for applications subject to severe corrosion, valve bodies made of 304 or 316 stainless steel can be used. The ball inside the valve is quenched and then coated with hard chromium, giving it high hardness and resistance to wear and scratches, thus preventing leakage due to wear over time.

Sealing structure: It features a floating ball together with polytetrafluoroethylene preload ball seats on both sides of the ball; the higher the pressure, the tighter the fit between the ball seats and the ball, which ensures zero internal leakage in both flow directions. The valve stem is equipped with multiple layers of sealing rings that prevent dust from entering and oil from leaking out, thus avoiding any external oil leakage.

Operation method: Standard manual lever handle; a 90° rotation is sufficient to fully open or close it. It features a mechanical stop mechanism to prevent excessive twisting that could damage the seal.

Ball Port Function Differentiation

L ball valve (the most commonly used type) allows for 90° rotation to switch between channels; one channel is open while the other is closed.

Application: Switching between two oil circuits, with no possibility of connecting three circuits together. It is often used for switching between two oil circuits or for reversing the direction of flow in hydraulic cylinders. Tee ball valve enables connection among three circuits, as well as splitting and combining flows; it allows any two circuits to be connected to each other.

Application: Splitting and combining fluids, as well as switching between multiple oil supply circuits.

Connection Interface Types

Thread connection: M: JB987-77, G:ISO 228, SAE thread: SAE JS514, NPT: ANSIB1.20.1

Sleeve Connection: DIN2353 Light, Heavy type sleeve port connection

Application Scenarios

Hydraulic pump stations, injection molding machinery, construction equipment, metallurgical equipment, machine tools, testing benches, and ship hydraulic systems.

Uses: switching of accumulator oil circuits, reversing of dual actuation oil circuits, switching to backup oil circuits, isolating oil circuits for maintenance, and changing the circuits of hydraulic clamps.

Order Selection Table

KHB3K G1/2 L 1 1 1 2 04 A

High Pressure Ball Valve

KHB3K = Valve block reversing ball valve DN04-50/

Connection Types

Thread specification or
OD of the pipe and connection type

Ball Port Options

L = L Type 90° flow direction
T = T Type 180° flow direction

Valve Body & Connector Material

1 = Carbon steel
4 = Stainless steel

Body&Spindle Material

1 = Carbon steel
4 = Stainless steel

Body Sealing Material

1 = POM
4 = PIFE
5 = PEEK

Connector Seal & Spindle Seal

2 = NBR
4 = PIFE
6 = FKM

Handle Type

01 = Aluminum alloy crank handle
02 = Aluminum alloy straight handle
03 = Zinc alloy crank handle
04 = Zinc alloy straight handle
05 = Steel crank handle
06 = Steel straight handle

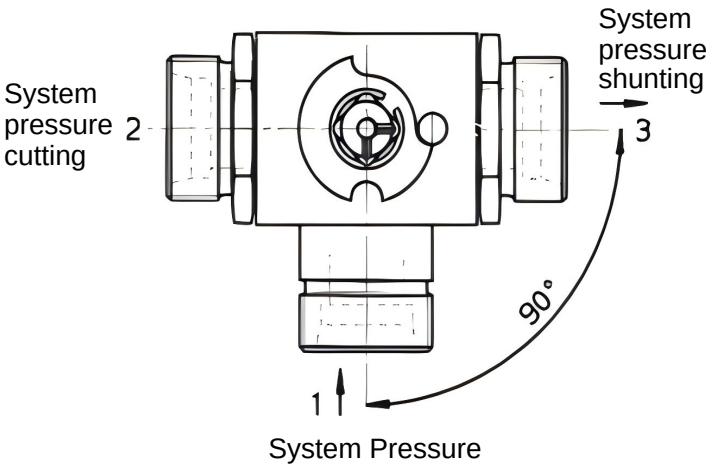
Finish Treatment

A = Plated Zinc
ZN = Customized

Technical Parameters

Type	KHB3K DN04-50
Connection	Threads: M JB987-77, G ISO 228,NPT, SAE ANSIB1.20.1 Sleeves: DIN2353 Light, Heavy type sleeve connection port
Installed Direction	All direction availible
Nominal Pressure	Max. PN500
Media	Mineral oil
Working Temperature	-10 °C - +80 °C
Fluid Direction	All direction availible

Steering function



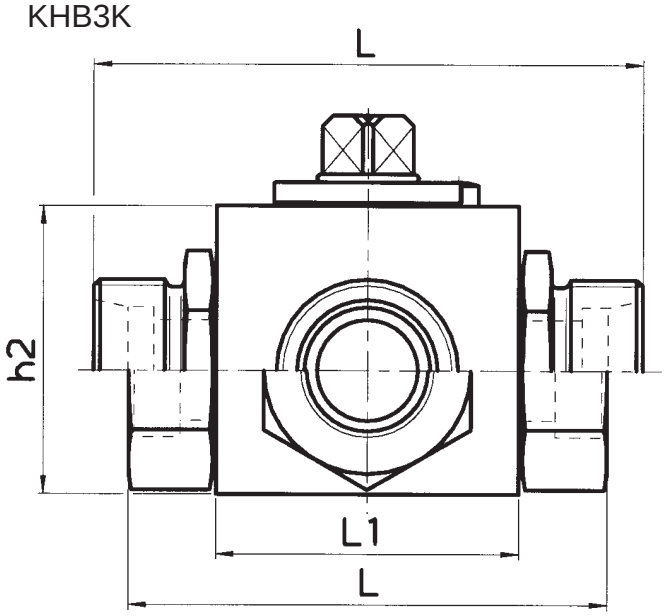
Operation method: Standard manual lever handle; a 90° rotation is sufficient to fully open or close it. It features a mechanical stop mechanism to prevent excessive twisting that could damage the seal.

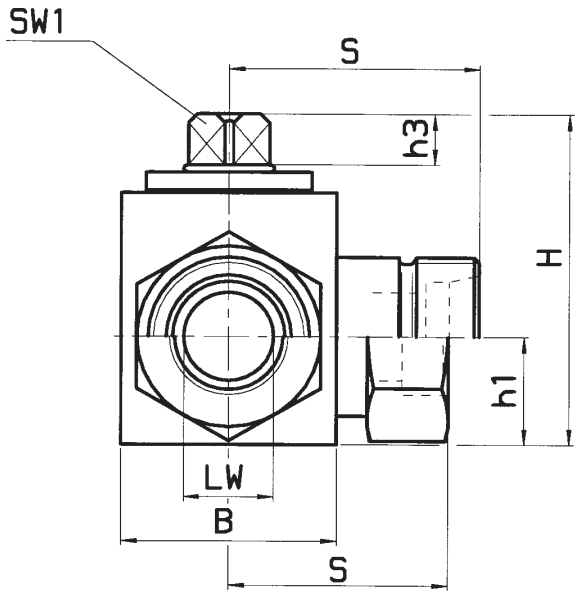
System pressure presses the sphere against the unpressurized side of the sealing cup, thereby achieving leak-free flow isolation between port 1 and ports 2 or 3.

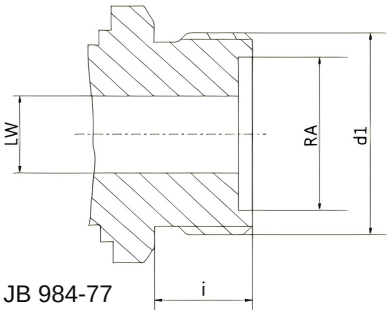
When the fluid flows from port 2 or port 3 to port 1, leakage may occur to a certain extent depending on the pressure levels. During the switching process, all three ports remain connected (negative switching overlap).

Overall Dimensions

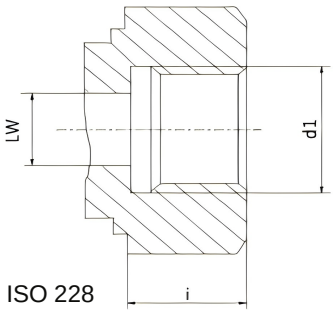
KHB3K



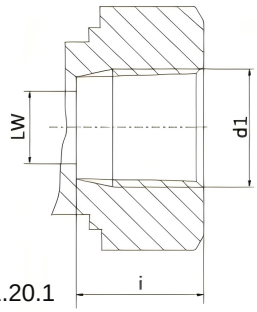




JB 984-77



ISO 228



ANSI B1.20.1

JB984-77 Seal for female thread

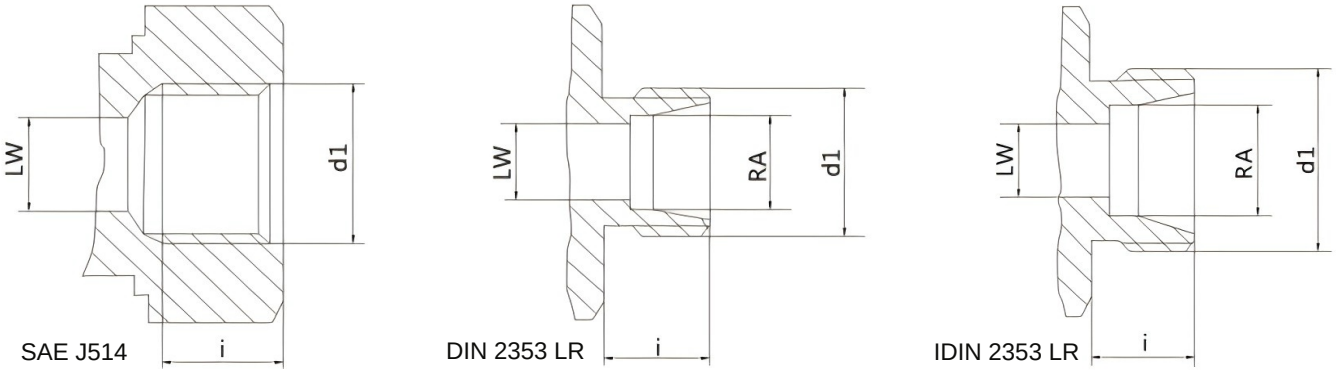
Model	DN	PN	LW	RA	d1	i	L	L1	B	H	h1	h2	h3	SW	S
KHB3K M12x1.25	4	315	4	8	M12x1.25	9	61	39	28	44.5	13	34	8	9	35
KHB3K M16x1.5	6	315	6	11	M16x1.5	11	69	39	28	44.5	13	34	8	9	35
KHB3K M22x1.5	8	315	8	16	M22x1.5	12	76	43	32	52.5	17	40	8	9	38
KHB3K M27x1.5	10	315	10	20	M27x1.5	12	76	43	32	52.5	17	40	8	9	38
KHB3K M30x1.5	16	315	15	24	M30x1.5	13	84	48	38	63.5	19	43	11	12	42
KHB3K M36x2	20	315	20	30	M36x2	15	103	61	48	75	24	54	12	12	52
KHB3K M42x2	25	315	25	35	M42x2	18	116	66	55	82	28.5	61	12	12	58
KHB3K M52x2	32	315	30	40	M52x2	20	149	84	75	104.5	37.5	84	14	14	72
KHB3K M60x2	40	315	38	50	M60x2	22	174	92	85	115.5	42.5	95	14	17	79.5
KHB3K M72x2	50	315	48	60	M72x2	24	178	100	105	133	52.5	112.5	14	17	89

ISO 228 Female thread

Model	DN	PN	LW	d1	i	L	L1	B	H	h1	h2	h3	SW	S
KHB3K G1/8	4	315	6	G1/8	10	69	39	28	44.5	13	34	8	9	35
KHB3K G1/4	6	315	6	G1/4	14	69	39	28	44.5	13	34	8	9	35
KHB3K G3/8	10	315	10	G3/8	14	72	43	32	52.5	17	40	8	9	36
KHB3K G1/2	13	315	13	G1/2	16	83	49	35	52.5	17	40	8	9	40
KHB3K G1/2	16	315	15	G1/2	16	83	48	38	63.5	19	43	11	12	42
KHB3K G3/4	20	315	20	G3/4	18	95	61	48	75	24	54	12	12	49
KHB3K G1	25	315	25	G1	20.5	113	66	55	82	28.5	61	12	12	56.5
KHB3K G11/4	25/32	315	25	G11/4	22	120	66	60	82	28.5	61	12	14	60
KHB3K G11/4	32	315	30	G11/4	22	110	84	75	104.5	37.5	84	14	17	55
KHB3K G11/2	40	315	38	G11/2	24	130	94	85	115.5	42.5	95	14	17	65
KHB3K G2	50	315	48	G2	26	140	100	105	133	52.5	112.5	14	17	70

ANSI B1.20.1 Female Thread

Model	DN	PN	LW	d1	i	L	L1	B	H	h1	h2	h3	SW	S
KHB3K 1/8NPT	4	315	6	1/8NPT	10.5	69	39	28	44.5	13	34	8	9	35
KHB3K 1/4NPT	6	315	6	1/4NPT	14	69	39	28	44.5	13	34	8	9	35
KHB3K 3/8NPT	10	315	10	3/8NPT	14	72	43	32	52.5	17	40	8	9	36
KHB3K 1/2NPT	13	315	13	1/2NPT	17	83	49	35	52.5	17	40	8	9	40
KHB3K 3/4NPT	20	315	20	3/4NPT	19	95	61	48	75	24	54	12	12	49
KHB3K 1NPT	25	315	25	1NPT	22.5	113	66	55	82	28.5	61	12	12	56.5
KHB3K 11/4NPT	25/32	315	25	11/4NPT	22.5	120	66	60	82	28.5	61	12	12	60
KHB3K 11/4NPT	32	315	30	11/4NPT	25	120	84	75	104.5	37.5	84	14	14	60
KHB3K 11/2NPT	40	315	38	11/2NPT	25	130	94	85	115.5	42.5	95	14	17	70
KHB3K 2NPT	50	315	48	2NPT	30	140	100	105	133	52.5	112.5	14	17	75



SAE J514UN/UNF Female thread

Model	DN	PN	LW	d1	i	L	L1	B	H	h1	h2	h3	SW1	S
KHB3KSAE4	6	315	6	SAE4	12	69	39	28	44.5	13	34	8	9	35
KHB3KSAE6	10	315	10	SAE6	13	72	43	32	52.5	17	40	8	9	36
KHB3KSAE8	13	315	13	SAE8	15	83	49	37	52.5	17	40	8	9	40
KHB3KSAE12	20	315	20	SAE12	20	95	61	48	75	24	54	12	12	49
KHB3KSAE16	25	315	25	SAE16	20	113	66	55	82	28.5	61	12	12	56.5
KHB3KSAE20	25/32	315	25	SAE20	20	120	66	60	82	28.5	61	12	12	60
KHB3KSAE20	32	315	30	SAE20	20	120	84	75	104.5	37.5	84	14	14	60
KHB3KSAE24	40	315	38	SAE24	20	130	94	85	115.5	42.5	95	14	17	70
KHB3KSAE32	50	315	48	SAE32	20	140	100	105	133	52.5	112.5	14	17	75

DIN 2353 Light Type

Model	DN	PN	LW	RA	d1	i	L	L1	B	H	h1	h2	h3	SW1	S
KHB3K 06LR	4	315	4	6	M12x1.5	10	67	39	28	44.5	13	32	8	9	34.5
KHB3K 08LR	6	315	6	8	M14x1.5	10	67	39	28	44.5	13	32	8	9	34.5
KHB3K 10LR	8	315	8	10	M16x1.5	11	74	43	32	52.5	17	40	8	9	37
KHB3K 12LR	10	315	10	12	M18x1.5	11	74	43	32	52.5	17	40	8	9	37
KHB3K 15LR	13	315	13	15	M22x1.5	12	82	49	37	52.5	17	43	8	9	40
KHB3K 18LR	13	315	13	18	M26x1.5	12	82	49	37	52.5	17	43	8	9	42
KHB3K 18LR	16	315	15	18	M26x1.5	12	82	48	38	63.5	19	46	11	9	42
KHB3K 22LR	20	315	19	22	M30x2	14	101	61	48	75	24	54	12	12	52
KHB3K 28LR	25	315	25	28	M36x2	14	108	66	55	82	28.5	61	12	12	54
KHB3K 35LR	25/32	315	25	35	M45x2	16	112	66	60	82	28.5	64	12	14	56

DIN2353 Heavy Type

Model	DN	PN	LW	RA	d1	i	L	L1	B	H	h1	h2	h3	SW1	S
KHB3K 06SR	4	315	5	8	M16x1.5	12	73	39	28	44.5	13	34	8	9	37
KHB3K 08SR	6	315	6	10	M18x1.5	12	73	39	28	44.5	13	34	8	9	37
KHB3K 10SR	8	315	8	12	M20x1.5	12	76	43	32	52.5	17	40	8	9	38
KHB3K 12SR	10	315	10	14	M22x1.5	14	80	43	32	52.5	17	40	8	9	40
KHB3K 15SR	13	315	13	16	M24x1.5	14	86	49	35	52.5	17	40	8	9	43.5
KHB3K 18SR	13	315	13	20	M30x2	16	90	49	35	52.5	17	40	8	9	45.5
KHB3K 18SR	16	315	15	22	M30x2	16	90	48	38	63.5	19	46	11	12	45.5
KHB3K 22SR	20	315	19	25	M36x2	18	109	61	48	75	24	54	12	12	56
KHB3K 28SR	25	315	25	30	M42x2	20	120	66	55	82	28.5	61	12	12	60
KHB3K 35SR	25/32	315	25	38	M52x2	22	124	66	60	82	28.5	64	12	14	62