Piston Diaphragm System KMS

General

Reciprocating displacement pumps are mainly used for metering liquid chemicals. As diaphragm pumps are free of leakage and have a simple construction, they have replaced piston metering pumps in many applications. Where higher pressures and accuracy are required, the use of piston pumps is still preferred. But system-related leakage and sensitivity to abrasive media reduce the range of applications for piston pumps.

The KMS piston diaphragm system combines the advantages of both systems but without incorporating their constructional disadvantages. The maximum back-pressure of plastic piston diaphragm systems remains at 10 bar because of the resistances of the metering head materials used. With a stainless steel metering head, back-pressures of up to 40 bar are permitted depending on the gear capacity.

Description

The KMS piston diaphragm system is available in three nominal sizes: KMS I for max. 45 l/h, KMS II for max. 245 l/h and KMS III for max. 800 l/h. The KMS can be mounted on the JESCO metering pumps belonging to REKOS KR and KARDOS KN family. As the KMS can replace the standard piston metering head, pumps, which are already in operation but where leakage is not allowed or accepted anymore, can be retrofitted. JESCO KMS use glycerin instead of the normal transmission lubricant between piston and diaphragm. In the case of a diaphragm failure, it is ensured that the liquid to be metered is not mixed with the lubricant from the gear. If intense reactions of the media to be metered with the glycerin are likely, any other neutral sealing liquid may also be filled into the KMS. Of course attention must be paid to viscosity, steam pressure, temperature resistance, compressibility and corrosion resistance of the sealing liquid.

If the electric conductivity of the medium to be metered is completely different from the one of the sealing liquid, a leakage probe can be installed in the drain socket of the KMS surge chamber. A diaphragm failure will then be indicated by a change in conductivity using an evaluation relay.

The consumption of sealing liquid due to leakage of the piston packing is very low because the escaping sealing liquid is returned to the supply bin via a recirculating channel. The metering capacity and the maximum back-pressure depend on the size of the gear driving the KMS.

For detailed information on the drives, gears, valves, and connections, refer to the following data sheets:

REKOS KR	MB 1 08 02
KARDOS KN	MB 1 09 01

Technical Data

Pump Type	KMS Size		KMS I up to 45l/h			KMS II up to 245 l/h				KMS III up to 800 l/h		
REKOS	Type: KR		(8)	20	40	75	125	180	(220)	295	420	725
	Max. bar, plastic		10			10				10		5
	Max. bar, SS		40			40	30	20	16	12	10	5
	At 5 bar	l/h	11.4	20	40	75	125	180	220	295	420	725
		ml/stroke	1.9	3.4	6.8	12.5	21.5	30.5	37.3	50	71.3	122
	Strokes/min.		100			100				100		
	Piston ø		9	12	17	23	30	36	40	46	55	72
KARDOS	Type: KN		(10)	23	45	85	150	210	(260)	350	500	850
	Max. bar, plastic		10			10				10		6.5
	Max. bar, SS		40			40		25	20	16	11	6.5
	At 5 bar	l/h	12.3	22	45	82	140	200	245	325	465	800
		ml/stroke	1.9	3.4	6.8	12.5	21.2	30.5	37.7	50	71.3	122
	Strokes/min.		110			110				110		
	Piston ø		9	12	17	23	30	36	40	46	55	72

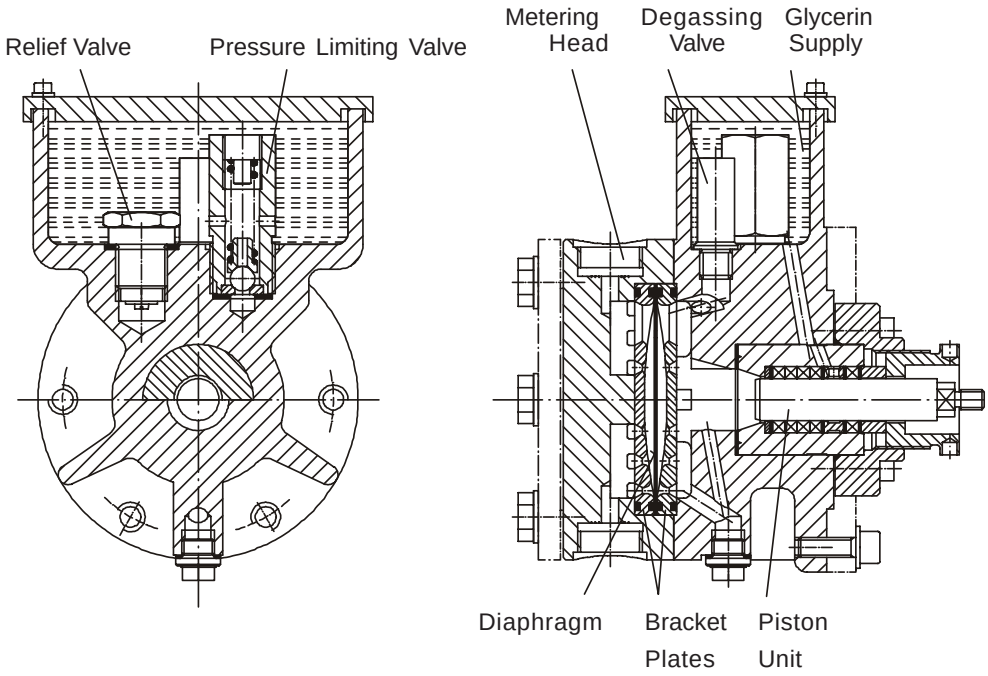
( ) currently only on request

Functional Description

The function of the piston diaphragm pump is very similar to the function of a standard piston pump. The piston does, however, not plunge into the liquid to be metered but just displaces the glycerin. The glycerin volume displaced by the piston moves the diaphragm back and forth. Due to the closed surge chamber and the incompressibility of the glycerin, the diaphragm is hydraulically connected directly to the piston and transfers the pump movement to the liquid to be metered. The separating diaphragm is tightened between two spherically perforated bracket plates and can expand freely in both directions within these limits. The possible stroke volume of the diaphragm is at least 50% higher than the stroke volume of the relevant piston. Therefore the diaphragm does not touch the bracket plates with every stroke. During operation, sealing liquid gets lost in the surge chamber due to the degassing valve and the system-related leakage of the piston packing, but is returned into the supply bin via a recirculating channel. While working, the diaphragm is moving in the direction of the piston-sided bracket plate until it touches the bracket plate with its whole surface. At this time, the piston is still carrying out a suction stroke movement. The pressure is decreasing, thus opening the relief valve set to a vacuum of 0.7 to 0.8 bar in order to compensate for the sealing liquid losses in the surge chamber and to allow the system to work correctly during the following discharge stroke.

In the case of a clogged or locked suction line, there may be a congestion in the surge chamber between the piston and the diaphragm, causing the diaphragm to strike the front bracket plate during the discharge stroke. In this case, the pressure limiting valve also located in the upper part of the sealing liquid bin opens and allows the surplus glycerin to return. If the discharge line is blocked, the pressure limiting valve responds as well.

Piston Diaphragm System KMS



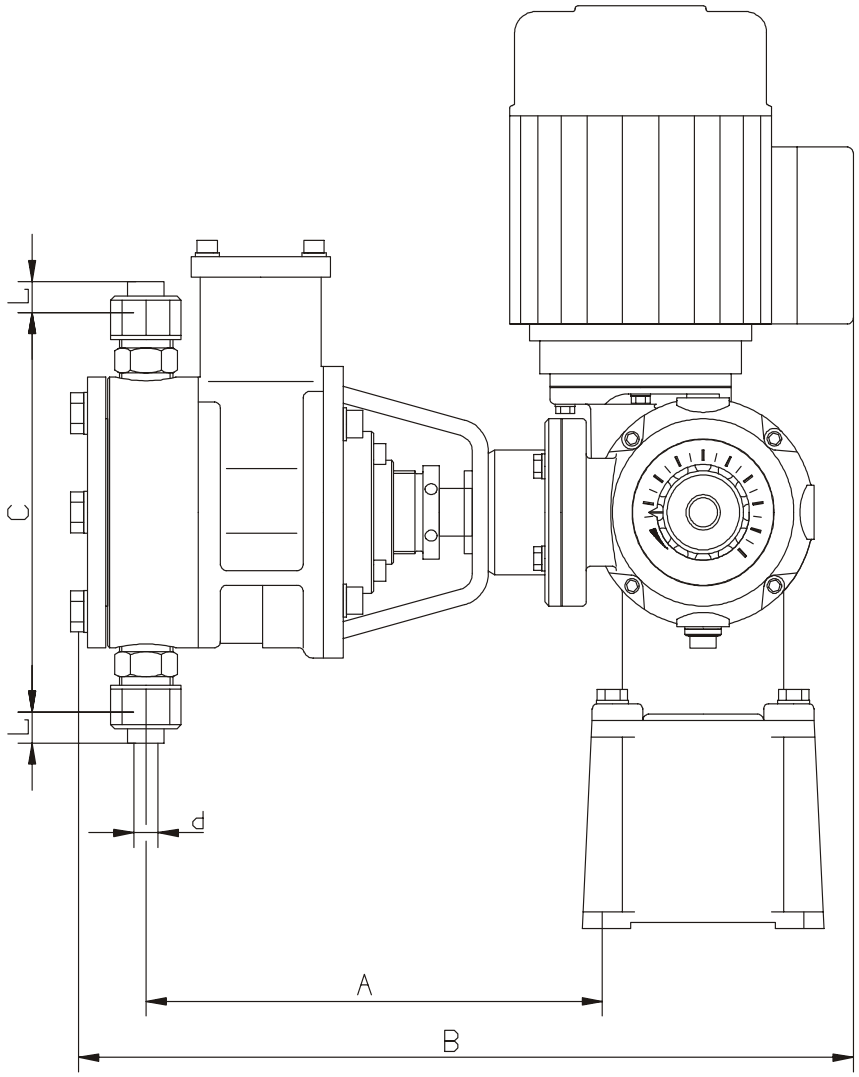
Selection Table

KMS sizes l/h	Type of Pump		Part No.	
	Rekos	Kardos	Metering Head Material	
	KR*	KN*	Plastic	Stainless Steel
I	(8)	(10)	(14029473)	(14029488)
up to 45 l/h	20	23	14029474	14029489
*	40	45	14029475	14029490
	75	85	14029479	14029494
II	125	150	14029480	14029495
up to 245 l/h	180	210	14029481	14029496
	(220)	(260)	(14029482)	(14029497)
	295	350	14029483	14029498
III	420	500	14029484	14029499
up to 800 l/h	725	850	14029486	14029501

( ) only on request

*) When using the KMS metering head size I in connection with a REKOS KR or KARDOS KN, a piston extension is required:
for REKOS KR: Part No. 26353
for KARDOS KN: Part No. 26352

Dimensions



For dimensions L and d, see Table 5 (connections) of the relevant pump data sheet. The pump dimensions can be found in the data sheets as well.

KMS Size	Pump Type	Material	A	B	C	KMS Size	Pump Type	Material	A	B	C
KMS I	Rekos KR	Plastic	284	477	192	**KMS II**	Rekos KR	Plastic	319	525	312
	SS	284	467	173				SS	316	504	312
	Kardos KN	Plastic	269	573	192		Kardos N	Plastic	304	680	312
	SS	269	563	173				SS	301	661	312
						KMS III	Rekos KR	Plastic	385	628	330
								SS	404	613	302
							Kardos KN	Plastic	355	779	330
								SS	374	755	302