

Cheonsei

METERING PUMPS **KD/VD/KM/KA/KS/AX/KP**
정량펌프

SMOOTHY METERING PUMPS **PDS/PKD/PKP**
스무디 연속류 정량펌프

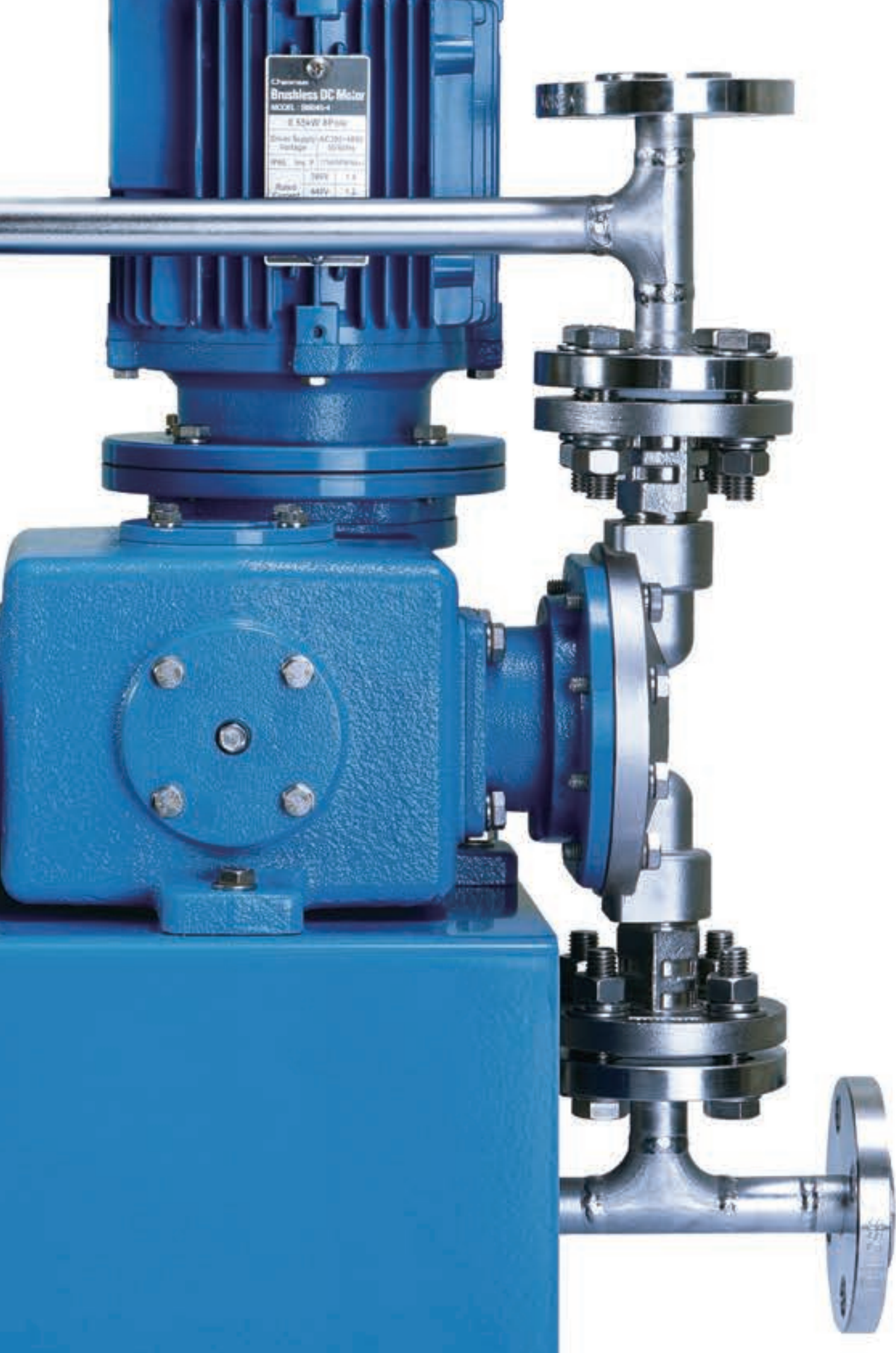
HYDRAULIC METERING PUMP **BKH/KH**
유압 정량펌프

SOLENOID METERING PUMP **SP**
솔레노이드 정량펌프

DRUM PUMPS **DR/VDR**
드럼 펌프

WATER QUALITY INSTRUMENT **MESTAR+/MESTAR**
수질 계측기





PRODUCT INTRODUCTION

● SMOOTHY METERING PUMPS	p.06 _ PDS _ PKD _ PKP
● DIAPHRAGM METERING PUMPS	p.14 _ KD _ VD _ KM
● SMALL DIAPHRAGM METERING PUMPS	p.22 _ AX
● AUTOMATIC CONTROL METERING PUMP	p.24 _ KA
● SOLENOID METERING PUMP	p.26 _ SP
● HYDRAULIC METERING PUMP	p.32 _ BKH _ KH
● PLUNGER METERING PUMP	p.38 _ KP
● DRUM PUMPS	p.40 _ DR _ VDR
● WATER QUALITY INSTRUMENT	p.52 _ MESTAR+ _ MESTAR



We are striving to expand to the industries related to chemical dosing pumps and water measuring systems which are the technology derived from years experience to meet industrial diversity and high advancement.



We have obtained the certificates which technical skills are required such as NET, NEP, EPC, and a number of patents including a pulseless metering pump with an plane cam which is a highly accurate diaphragm type.



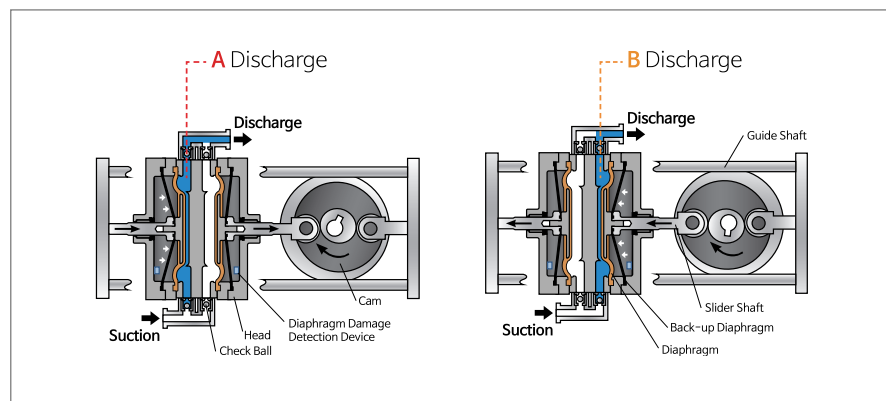
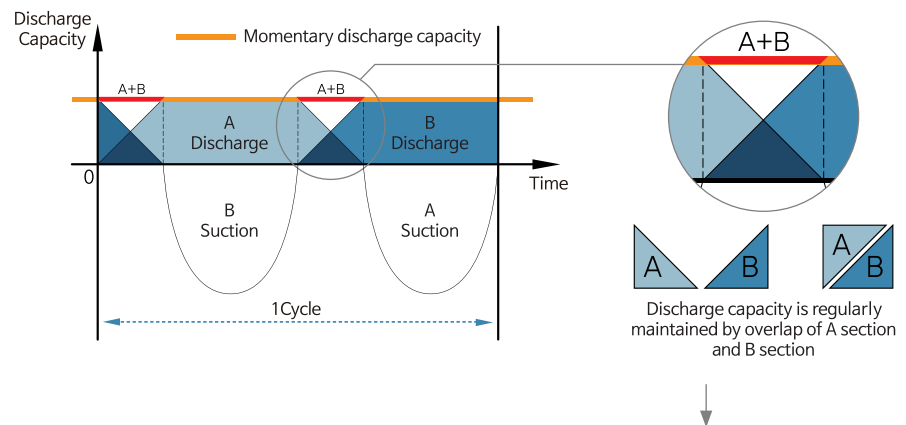
There are a head office, branches, and agents in Korea. Also, there are a joint venture company in China and 15 overseas agents.

PDS

- Available up to maximum 20,000mPa · s
- Attaching bldc motor of high control
- Ability pulse rate within $\pm 3\%$
- A built-in diaphragm breakage detection device can detect diaphragm damage, improving user safety and contributing to maintaining system productivity.



Operation Principle



Model code

MODEL OPTION

PDS-10-SS-FWS/12

1
 2 a 2 b
 3
 4
 5
 6
 7

1 CAPACITY

006 : 0.065 L/min 1 : 1.2 L/min 20 : 23 L/min
 01 : 0.1 L/min 3 : 2.5 L/min 40 : 37 L/min
 02 : 0.2 L/min 5 : 5.5 L/min 50 : 52 L/min
 05 : 0.5 L/min 10 : 10.5 L/min

2 LIQUID END MATERIAL**(a) Head**

P : PVC S : SSC14A
 F : PVDF X : Special

(b) Check ball

C : CERAMIC S : STS316 X : Special

3 CONNECTION

F : Flange C : Clamp
 X : Special

4 VISCOSITY

W : Standard
 V : High Viscosity

5 POWER SUPPLY (BLDC)

S : 3Ø, 380~480V
 A : 1Ø, 3Ø, 200~240V
 X : Special

6 OPTION

0 : Excluded
 X : Diaphragm Damage
 Detection Device

7 REMOTE CONTROL TYPE OF DISCHARGE CAPACITY

0 : None
 1 : Inverter Motor
 2 : BLDC M/C UNIT (AUTO)
 3 : BLDC M/C UNIT (MANU)

SPECIFICATIONS		PDS - Series										
		006	01	02	05	1	3	5	10	20	40	50
Max. Capacity	L/min	0.065	0.1	0.2	0.5	1.2	2.5	5.5	10.5	23	37	52
Max. Discharge Pressure	bar	10(145)				5(72.5)						
Pulse Rate	%	± 3.0 (based on clean water at 100% speed)										
Stroke Length	mm	3	4		5.5		8		15			
Max. Stoke Num	spm	72	96						87		116	
Connection Discharge / Suction (High viscosity type)	FLANGE	KS 10K 15A / KS 10K 15A			KS 10K 15A / KS 10K 15A (25A)		KS 10K 25A / KS 10K 25A (40A)	KS 10K 25A / KS 10K 40A	KS 10K 40A / KS 10K 50A	KS 10K 40A / KS 10K 65A	KS 10K 50A / KS 10K 65A	
	CLAMP	1.5S 15A / 1.5S 15A			1.5S 20A / 1.5S 20A (25A)		1.5S 25A / 1.5S 25A (32A)	1.5S 25A / 1.5S 32A	2S 40A / 2.5S 50A	2S 40A / 3S 65A	2.5S 50A / 3S 65A	
Max. Liquid Temp.	°C	SS, FC : 0~80°C / PC : 0~50°C / Ambient temperature : 0~40°C										
Max. Viscosity	mPa·s	10,000	20,000									
BLDC M/C UNIT	Motor	0.2 kW / FR 63						0.55 kW / FR 71	0.75 kW / FR 80	1.5 kW / FR 90		
		8 Poles Brushless DC / Max. rpm: 1750 / Insulation Class: F										
	Power Supply	200V Class: 1Ø/3Ø/AC200~240 50/60Hz, 400V Class: 3Ø/AC380~480V 50/60Hz										
	Input Signal (Auto)	RPM : DC4~20mA, RUN/STOP : CLOSE-RUN, OPEN-STOP										
	Output Signal (Auto)	RPM : DC4~20mA (Insulated. Load Resistance Below 500Ω) Operation Setting : REMOTE, LOCAL, AUTO, MANU Dry Contact (1a) Operation Status : RUN, TRIP Dry Contact (Run : 1a, TRIP : 1a1b) Capacity of contact : AC250V5A DC30V5A										
	Protection Function	Over Current : E.oC, Shot Circuit : E.SC, Problem of Hall Sensor : E.HS Problem of Analog Input Signal : E.or, Overheat inside Driver : E.tE										
	Control range	10% to 100% compared to maximum RPM (20 to 100% when inverter is applied)										
Protection Class		IP66 (Motor and Driver)										
Weight	kg	25			42		48	56	175	180	182	

Note

1. The max. discharge capacity is based on standard conditions(room temperature, clean water) at the max. discharge pressure.
2. The weight is based on the flange (SS Type) connection type including the standard motor.
3. Specifications and designs are subject to change without prior notice for purposes of quality improvement or product enhancement.
4. The coating color is Munsell No. 6.51 B 4.99/9.55 (Note: Motor color follows the manufacturer's standard).

Material & Connection

· PVC Flange



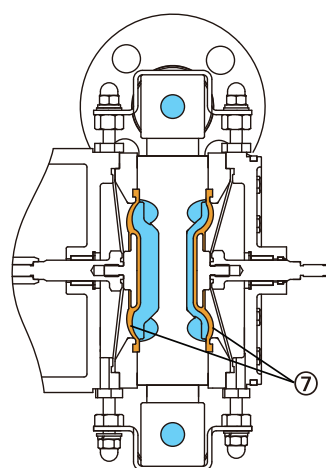
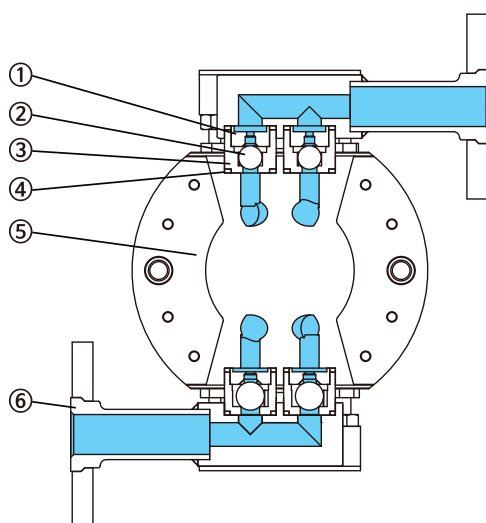
· SSC14A Clamp



· PVDF Flange



Liquid End Material

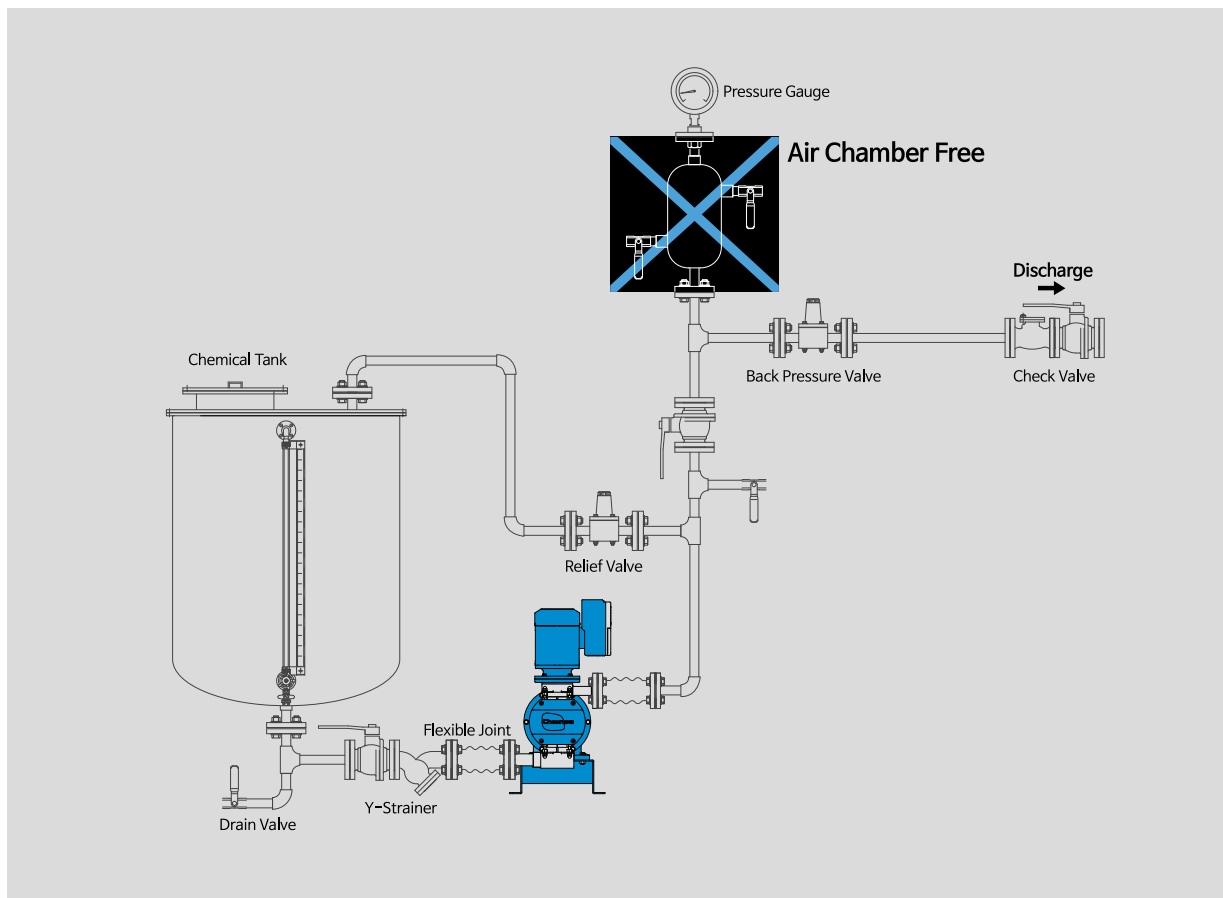


Parts Name	PC	FC	SS
① Ball stopper	PVC	PVDF	STS316
② Check ball	CERAMIC	CERAMIC	STS316
③ Ball guide	PVC	PVDF	STS316
④ O-ring, Packing	FKM	FEP(+SIL)	FEP(+SIL)
⑤ Head	PVC	PVDF	SSC14A
⑥ Diaphragm	PTFE	PTFE	PTFE
⑦ Joint	PVC	PVDF	STS316

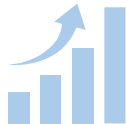
Note

1. Non-Standard material specifications are made to order. Please consult us separately.
2. All the information mentioned above can be revised for improvement without prior notice.

Piping Diagram



Possible to achieve production process with high quality



It is possible to implement an automatic process, and the defect rate can be lowered owing to the immediate discharge response during start/stop operations.

Cost and space can be reduced by simplified piping installation



It is economical because the piping length can be shortened and installation space can be easily secured, as there is no need for an air chamber and back pressure valve.

No need for Air Chamber



Because the constant velocity cam's operating method removes the source of pulsation, an air-chamber is not necessary.

Easy maintenance



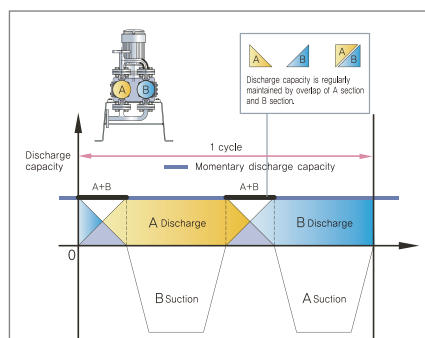
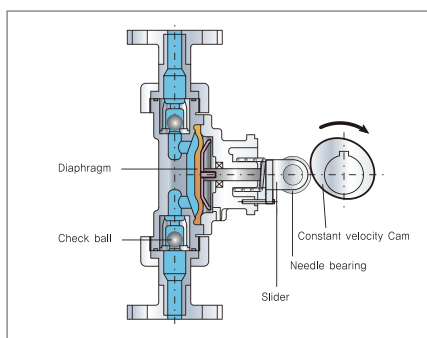
CHEONSEI Smoothy Metering Pumps using constant velocity cam provides convenience for maintenance. Because it does not need to fill up air for the function maintenance of Air Chamber.

PKD

- BLDC motor which has excellent speed (discharge capacity) control ability has been installed.
- Increased confidence of discharge capacity by RPM Feedback control
- Proportion remote control by 4~20mA input signal
- No need for concern about motor damage at low speed operation
- Simplified electric equipment, possible to control the discharge rate to minimum 10% operation of full scale

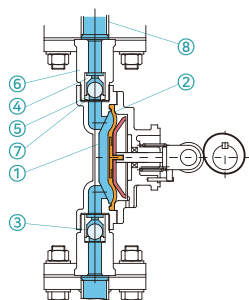


Operation Principle



Discharge waves of Smoothy Metering Pumps

Liquid End Material



SPECIFICATIONS	PTC		FTC		STS (6T6)		
	500~102	212~813	500~333	423~813	500~102	212~113	203~813
① Head	PP	PVC	PVDF	PVDF (PTFE)	SSC13A (SSC14A)		
② Diaphragm	PTFE		PTFE		PTFE		
③ Check ball	CERAMIC		CERAMIC		STS316		
④ Ball guide	PP	PVC	PVDF	PVDF	PVDF	SSC14A	
⑤ Ball seat	FKM (EPDM)	PVC	PTFE (PVDF)		PTFE	STS316	
⑥ Joint	PP	PVC	PVDF		SSC14A		STS304 (STS316)
⑦ O-ring, Packing	FKM (EPDM)	FKM	PTFE		PTFE		
⑧ Junction pipe	PVC		PVDF		STS304 (STS316)		

Note

Non-Standard material specifications are made to order. Please consult us separately.

Model code

PKD-212-STS-FWS/12

1 a 1 b 1 c 2 a 2 b 2 c 3 4 5 6 7

1 CAPACITY

$a \times 10^{c+1} + b \times 10^c = 21 \times 10^2 = 2100(\text{mL/min})$

2 LIQUID END MATERIAL**(a) Pump Head**

P: PVC F: PVDF(PTFE) S: SSC13A 6: SSC14A

(b) Diaphragm

T: PTFE E: EPDM

(c) Check Ball

C: Ceramic S: STS316 6: STS316

3 CONNECTION TYPE

F: Flange X: Special

4 VISCOSITY LIMIT

W: Standard V: High Viscosity

5 POWER SUPPLY

S: 3Ø, 380~480V X: Special
A: 1Ø, 3Ø, 200~240V

6 JUNCTION PIPE

0: Excluded
1: Attached
2: Attached + Relief Valve

7 REMOTE CONTROL METHOD

0: None
1: Inverter Motor
2: BLDC M/C Unit (Auto)
3: BLDC M/C Unit (Manual)

SPECIFICATIONS		PKD - Series																
		500	121	241	521	102	212	412	702	143	113	203	243	333	423	613	813	
Max. capacity	mL/min	50	120	240	520	1040	2100	4100	7000	14900	11200	20700	24000	33000	42000	61000	81000	
Max. Discharge Pressure	bar (PSI)	10						8	5	3	7	5	7	5	5	3		
Pulse Rate	%	± 5.0 (based on clean water at 100% speed)																
Stroke Length	mm	3	4		6				10			15	12.5	17.5		15	20	
Stroke Number	SPM	58		116	58	116	58	116	58	116	87							
Connection	FLANGE	KS10K15A							KS10K25A				KS10K40A			KS10K50A		
Max. Liquid Temp.	°C	STS, 6T6 : 0~80 / PTC, FTC : 0~50 / Ambient temperature : 0~40°C																
Weight	kg	37		38		53		60		90	95	130		140	170	175		
Motor		0.55kW, FR71									0.75kW, FR80		1.5kW, FR90				2.2kW, FR90	
		8 Poles Brushless DC / Max. rpm: 1750 / Insulation Class: F																
		TENV*															TEFC*	
BLDC M/C UNIT	Driver	Power Supply	200V Class: 1Ø/3Ø/AC200~240 50/60Hz, 400V Class: 3Ø/AC380~480V 50/60Hz															
		Input Signal (Auto)	RPM : DC4~20mA RUN/STOP : CLOSE-RUN, OPEN-STOP															
		Output Signal (Auto)	RPM : DC4~20mA (Insulated. Load Resistance Below 500Ω) Operation Setting : REMOTE, LOCAL, AUTO, MANU Dry Contact (1a) Operation Status : RUN, TRIP Dry Contact (Run : 1a, TRIP : 1a1b) Capacity of contact : AC250V5A DC30V5A															
		Protection Function	Over Current : E.oC, Shot Circuit : E.SC, Problem of Hall Sensor : E.HS Problem of Analog Input Signal : E.or, Overheat inside Driver : E.tE															
		Control range	10% to 100% compared to maximum RPM (20 to 100% when inverter is applied)															
	Protection Class		IP66 (Motor and Driver)															
Painting		Munsell No. 6.51 B 4.99/9.55 (The color of the motor is manufacturer standard.)																
Self priming		1m/Never use this pump to transfer liquid containing slurry or solid																

Note

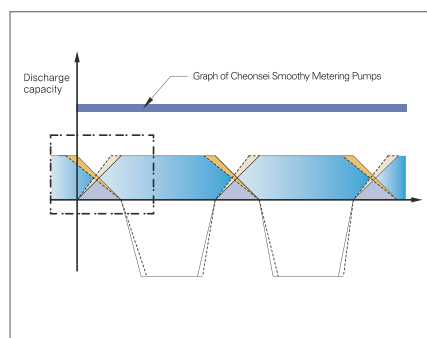
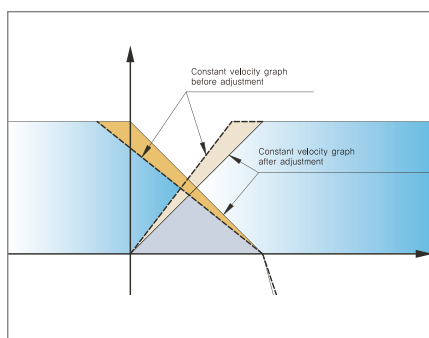
- Specifications and designs are subject to change without prior notice for purposes of quality improvement or product enhancement.
- TENV(Totally Enclosed, Non Ventilated) / TEFC (Totally Enclosed, Fan Cooled)

PKP

- BLDC motor which has excellent speed (discharge capacity) control ability has been installed.
- Adjustment of precise injection under high pressure by double check valve type
- Increased confidence of discharge capacity by RPM Feedback control
- Proportion remote control by 4~20mA input signal
- No need for concern about motor damage at low speed operation
- Simplified electric equipment, possible to control the discharge rate to minimum 5% operation of full scale

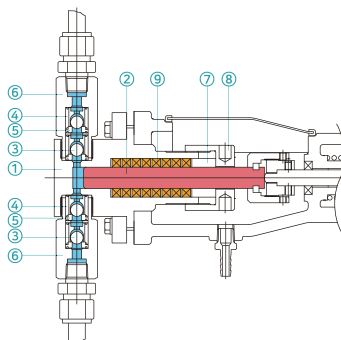


Patent Principle of adjustment for constant velocity cam



Achievement of the best pulse rate through compensation graph for distorted phenomenon caused by change of contact points between cam bearing.

Liquid End Material



SPECIFICATIONS	MATERIAL
① Head	STS316
② Plunger	STS316+HCr
③ Check ball	STS316
④ Ball guide	SSC14A
⑤ Ball seat	STS316
⑥ Joint	STS316
⑦ Gland Ring	STS316
⑧ Gland Nut	STS316
⑨ Gland Packing	PTFE + ARAMID

Model code

PKP-121L-SF-S/12

1 2 3 4 5 6 7 8

1 Plunger Diameter

12 : 12mm

2 STROKE NUMBER

1 : 58SPM

2 : 116SPM

(If the driving box size is M, 1 : 87SPM)

3 DRIVING BOX SIZE

L : 0.55kW

M : 0.75kW

4 LIQUID END MATERIAL

S : STS316

X : Other

5 CONNECTION TYPE

F : Flange

X : Special

T : Thread

6 POWER SUPPLY

S : 3Ø, 380~480V

A : 1Ø, 3Ø, 200~240V

X : Special

7 JUNCTION PIPE

0 : Excluded

1 : Attached

2 : Attached + Relief Valve

8 REMOTE CONTROL METHOD

0 : None

1 : Inverter Motor

2 : BLDC M/C Unit (Auto)

3 : BLDC M/C Unit (Manual)

SPECIFICATIONS		PKP - Series																
		061L	062L	121L	122L	161L	162L	221L	222L	301L	302L	061M	121M	161M	221M	301M	401M	501M
Max. capacity	mL/min	26	52	110	220	200	410	390	800	700	1480	60	255	480	920	1660	3070	4835
Max. Discharge Pressure	bar	160					100	104	52	56	28	200	225	160	123	68	38	24
Pulse Rate	%	± 2.0 (based on clean water at 100% speed)																
Stroke Length	mm	10										15						
Connection	THREAD	Rc 1/4"				Rc 3/8"				Rc 1/2"		Rc 1/4"		Rc 3/8"		Rc 1/2"		Rc 3/4"
	FLANGE	63K15A					40K15A		20K15A		-		63K15A		40K15A	20K20A		
Motor		0.55kW, FR71										0.75kW, FR80						
		8 Poles Brushless DC / Max. rpm: 1750 / Insulation Class: F																
		TENV (Totally Enclosed-Non Ventilated)																
BLDC M/C UNIT	Power Supply	200V Class: 1Ø/3Ø/AC200~240 50/60Hz, 400V Class: 3Ø/AC380~480V 50/60Hz																
	Input Signal (Auto)	RPM : DC4~20mA RUN/STOP : CLOSE-RUN, OPEN-STOP																
	Output Signal (Auto)	RPM : DC4~20mA (Insulated. Load Resistance Below 500Ω) Operation Setting : REMOTE, LOCAL, AUTO, MANU Dry Contact (1a) Operation Status : RUN, TRIP Dry Contact (Run : 1a, TRIP : 1a1b) Capacity of contact : AC250V5A DC30V5A																
	Protection Function	Over Current : E.oC, Shot Circuit : E.SC, Problem of Hall Sensor : E.HS Problem of Analog Input Signal : E.or, Overheat inside Driver : E.tE																
	Control range	10% to 100% compared to maximum RPM (20 to 100% when inverter is applied)																
	Protection Class	IP66 (Motor and Driver)																
	Painting	Munsell No. 6.51 B 4.99/9.55 (The color of the motor is manufacturer standard.)																

Note

1. The max. discharge capacity is based on standard conditions(room temperature, clean water) at the max. discharge pressure.
2. The flow control range is 10~100% when using a BLDC motor, and 20~100% when using an external inverter.
3. The self-priming capability is 1 meter, and slurries cannot be handled.
4. The flange connection specification refers to the discharge side, while the suction side is configured with a KS 10K flange.
5. Specifications and designs are subject to change without prior notice for purposes of quality improvement or product enhancement.

Diaphragm

METERING PUMPS

KD

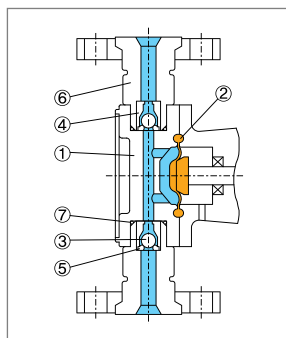
It has solved chemical corrosion and leakage problem by precise design and adopting chemical resistance material.

- For Chemical Dosing
- Wide Capacity Range
- Accurate Adjustment
- Simple Operation
- Easy Maintenance

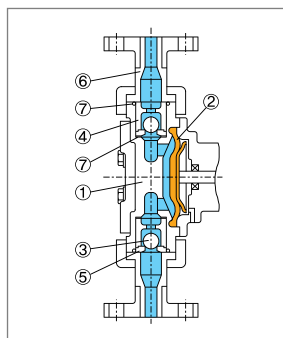


Liquid End Material

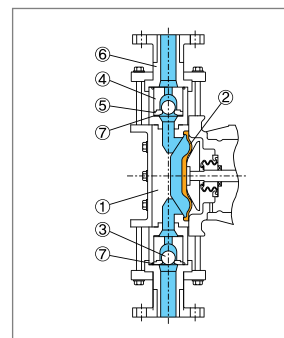
• KD-21H~82H-PTC



• KD-13H~14M-PTC



• KD-14H~54L-PTC



PART NAME	PTC(PES)		FTC		STS(6T6)		
	21H~82H	13H~54L	21H~14M	14H~54L	21H~82H	13H~73H	43H~54L
① Head	PP	PVC	PVDF	PVDF (PTFE)	SSC13A(SSC14A)		
② Diaphragm	PTFE (EPDM)		PTFE		PTFE		
③ Check ball	CERAMIC (STS316)		CERAMIC		STS316		
④ Ball guide	PP	PVC	PVDF		PVDF	SSC14A	
⑤ Ball seat	FKM (EPDM)	PVC	PTFE (PVDF)		PTFE	STS316	
⑥ Joint	PP	PVC	PVDF		SSC14A		STS304 (STS316)
⑦ O-ring, Packing	FKM (EPDM)		PTFE		PTFE		

Model code

KD V- -33H-PTC-FWS

1

2

3 a

3 b

4 c

5 a

5 b

5 c

6

7

8

1 CONSTRUCTION

V : Vertical H : Horizontal

2 OPTIONNo Mark : No Option E : Air Relief Valve
A : BLDC M/C UNIT F : Relief Valve**3 NOMINAL CAPACITY** $a \times 10^b = 3 \times 10^3 = 3000(\text{mL/min})$ **4 DISCHARGE PRESSURE RANK**H : High L : Low
M : Middle S : Special**5 LIQUID-END MATERIALS**

(a) Head

P : PP(PVC) S : SSC13A
F : PVDF(PTFE) 6 : SSC14A

(b) Diaphragm

T : PTFE E : EPDM

(c) Check ball

C : Ceramic
S : STS316
6 : STS316**6 CONNECTION TYPE**

F : Flange

H : Hose

T : Thread

X : Special

7 VISCOSITY LIMIT

W : Standard

V : High Viscosity

8 POWER SUPPLYS : 3 ϕ , 220/380V3 ϕ , 440V

X : Special

SPEC	Max. Capacity (mL/min)		Max. Discharge Pressure (Bar)	Stroke Frequency (SPM)		Diameter of Diaphragm (mm)	Stroke Length (mm)	Connection				Motor (kW)	Weight (kg) Vert. (Hori.)			
	50Hz	60Hz		Hose				Flange	Thread							
				PVC	PTFE											
KD-21H	20	25	10	48	58	30	3	Ø6xØ11	Ø10xØ12	KS10K15A	-	0.2	14(17)			
KD-61H	50	60	10	48	58	36	4									
KD-12H	100	120	10	96	116	36	4									
KD-22H	210	260	10	48	58	55	6	Ø12xØ18			Ø12xØ14			Rc3/8	15(18)	
KD-52H	420	520	10	96	116	55	6									
KD-82H	700	840	10	96	116	68	5									
KD-13H	850	1020	10	48	58	100	6				Rc1/2	17(20)				
KD-23H	1700	2040	8	96	116	100	6									
KD-33L	2900	3480	5	48	58	130	10									
KD-43L	3400	4100	5	96	116	130	6				-		KS10K25A	Rc1	19(22)	
KD-73L	6200	7440	3	96	116	130	10									
KD-53L	4800	5800	5	96	116	130	8									
KD-63L	5450	6550	4	96	116	130	9				0.4	20(22)				
KD-33H	2900	3480	10	48	58	130	10									
KD-73H	6200	7440	7	96	116	130	10									
KD-43H	3600	4400	8	48	58	145	10				-		KS10K25A	Rc1	0.4	47(51)
KD-63H	5500	6600	7	48	58	145	15									
KD-93M	7500	9100	5	96	116	145	10									
KD-14N	9800	11800	4	96	116	145	12.5									
KD-14M	11500	13800	5	96	116	145	15									
KD-14H	9000	10800	7	48	58	177	17.5	-	KS10K25A	Rc1	0.4	40(44)				
KD-14G	13300	16000	5	96	116	145	15									
KD-14G	13300	16000	5	96	116	177	12.5									
KD-24L	18400	22000	3	96	116	177	17.5									
KD-24S	23300	28000	3	96	116	195	17.5									
KD-24H	18400	22000	7	96	116	177	17.5	-	KS10K40A	-	0.75	86				
KD-34H	26600	32000	5	96	116	195	20									
KD-54L	45000	54000	3	96	116	250	20									
													KS10K50A	-	1.5	88

Note

- The max. discharge capacity is based on standard conditions(room temperature, clean water) at the max. discharge pressure.
- The effective flow control range applies to 20% to 100% of the stroke length.
- The self-priming capability is 1 meter (Note: For models KD-21 to KD-12, initial priming is required).
- Specifications are subject to change without prior notice for reasons such as product improvement or enhancement.
- The coating color is Munsell No. 6.51 B 4.99/9.55 (motor color follows the manufacturer's standard color).
- Threaded connection type is only available when the Liquid End material specification is P□□.

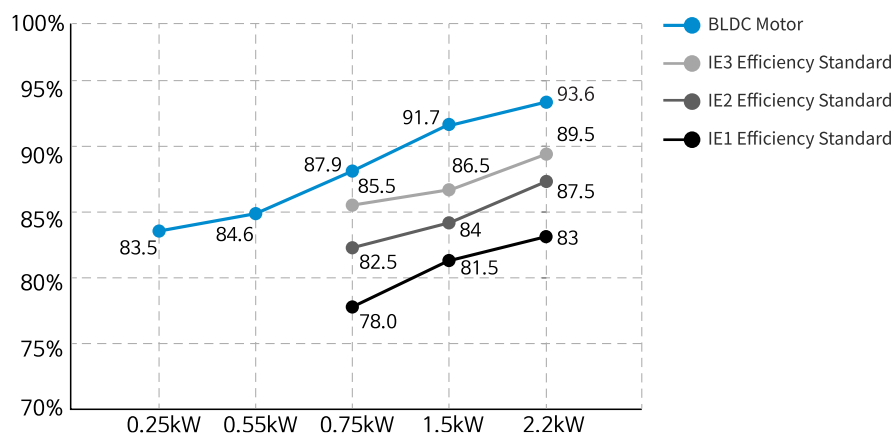
BLDC Motor



- It is possible to do stable & accurate control in proportion to Input Signal because Motor RPM is controlled by PID.
- Save energy cost by high efficiency operation.
- It is optimally designed for Metering Pumps in order that it makes high torque at low RPM.
- It can be remotely controlled by simple connection
- It is simple to install as all-in one structure

PARTS NAME		0.12kW	0.25kW	0.55kW	0.75kW	1.5kW	2.2kW
Voltage	220v Class	1Ø, AC200~240V 50/60Hz	1Ø, 3Ø AC200~240V 50/60Hz		3Ø AC200~240V 50/60Hz		-
	400v Class	-	3Ø AC380~480V 50/60Hz				
Motor	Type	Brushless DC Motor(Sensored SPM)					
	Enclosure	TENV					TEFC
	Pole	10Poles	8 Poles				
	Insulation	F					
Protection Class		IP54	IP66				
Weight		2.6	5.2	10	13.5	15.5	17

Efficiency Standard Grade of BLDC Motor



- The value of between IE1 and IE3 is a efficiency value of 4 Pole/60Hz Motor under IEC60034-30 standard.
- The BLDC Motor is not a regulated item for High Efficiency.
- Save energy cost since it is possible to do High performance & high efficiency operation as BLDC(Brushless DC) Motor is Synchronous Motor in which permanent magnet is embedded.

Model code

AC-V15A

1

2

3

4

1 MODEL

AC : Air Chamber
 BV : Back Pressure Valve
 RV : Relief Valve

2 BODY MATERIALS

V : PVC
 VE : PVC (Packing : EPDM)
 S : STS304
 6 : STS316
 F : PVDF
 STS304+ETFE (Air Chamber)

3 FLANGE SIZE

15 : KS 10K 15A
 20 : KS 10K 20A
 25 : KS 10K 25A
 40 : KS 10K 40A
 KS 10K 40P
 50 : KS 10K 50A

4 CAPACITY

A : Standard
 P : Special

※ 40p is size of 40A but the capacity is specially big.

**1. Air Chamber**

Reciprocating pump has a peculiar pulsation which results in vibration of piping and overfeed phenomena. Air Chamber will be used to solve such problems caused by pulsation.

MODEL	Net Capacity (cm ²)	Max. discharge pressure(bar)	
		PVC	STS
AC-□15A	500	10	10
AC-□20A	1,000	10	10
AC-□25A	2,000	10	10
AC-□40A	4,000	9	10
AC-□40P	6,000	6	10
AC-□50A	10,000	5	10

**2. Back Pressure Valve**

According to the conditions of the piping, the discharge rate may be excessive or the pumping liquid may be continuously leaked in spite of stopping the pump which is caused by overfeed or siphon phenomena. The back pressure valve is for preventing such things.

MODEL	Pressure Control Range(bar)	Standard Setting Pressure(bar)
BV-□15A	0.5~3	1
BV-□20A	0.5~3	1
BV-□25A	0.5~3	1
BV-□40A	0.5~3	1
BV-□40P	0.5~3	1
BV-□50A	0.5~3	1

**3. Relief Valve**

When the discharge pressure increased to more than a setting point due to choking the valve with debris or closing the valve, the safety valve will open automatically to relieve the pressure. Relief valve prevents pump and piping from damages.

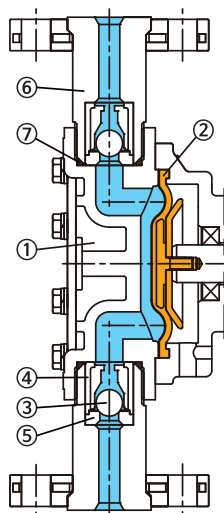
MODEL	Pressure Control Range(bar)	Standard Setting Pressure(bar)
RV-□15A	3~10	5
RV-□20A	3~10	5
RV-□25A	3~10	5
RV-□40A	3~10	5
RV-□40P	3~8	5
RV-□50A	3~8	3

VD

- Diaphragm breakage detection device ensures safety and stable operation.
- Various liquid end materials compatible with site-specific chemicals.
- BLDC M/C UNIT provides precise and stable discharge control.
- Simple dial operation for accurate adjustment anytime.
- Precision-designed gears reduce friction/noise and enhance durability.



Liquid End Material



Classification	PTC	FTC	STS(6T6)
① Head	PVC	PVDF	SSC13A(SSC14A)
② Diaphragm	PTFE(+EPDM)	PTFE(+EPDM)	PTFE(+EPDM)
③ Check Ball	CERAMIC	CERAMIC	STS316
④ Ball Guide	PVC	PVDF	SSC14A
⑤ Ball Seat	PVC	PTFE	STS316
⑥ Joint	PVC	PVDF	STS304(STS316)
⑦ O-Ring & Packing	FKM	FEP(+SIL)	FEP(+SIL)/PTFE

Note

Non-Standard material specifications are made to order. Please consult us separately.

Model Code

VDS-A-342-STS-FWS/0

1 2 3 a 3 b 4 a 4 b 4 c 5 6 7 8

1 DRIVE PART MOTOR

S : FR 63, FR 71
E : FR 80, FR 90

2 OPTION

A : BLDC M/C UNIT
D : Diaphragm Breakage
Detection Sensor
No mark : No Option

3 CAPACITY

a x 10^b = 34 x 10²
= 3400 (mL/min)

4 LIQUID END MATERIAL

(a) Head
P : PVC
F : PVDF
S : STS304(SSC13)
6 : STS316(SSC14)
(b) Diaphragm
T : PTFE
(c) Check ball
C : CERAMIC
S : STS316
6 : STS316

5 CONNECTION

F : Flange
T : Thread
X : Special

6 VISCOSITY LIMIT

W : Standard
V : High Viscosity

7 POWER SUPPLY

S : Standard (3Ø 4P 60Hz 220/380V, 440V)
X : Special

8 BED

0, No mark : Standard (Excluded)
1 : Included

SPEC MODEL	Max. Capacity (mL/min)		Max. Discharge Pressure (bar)	Stroke Frequency (SPM)		Diameter of Diaphragm (mm)	Stroke Length (mm)	Connection		Motor (kW)	Weight (kg)
	50Hz	60Hz		50Hz	60Hz			Thread	Flange		
VD-121	100	120	12	40	48	Ø55	4	Rc3/8"	15A	0.2	13
VD-201	160	200	12	40	48		6				
VD-401	330	400	12	80	97		6				
VD-601	500	600	12	120	145		6				
VD-112	910	1100	12	80	97	Ø90	5	Rc1/2"			14
VD-212	1750	2100	9	120	145		6				
VD-342	2800	3400	7	120	145	Ø120	5	Rc1"	25A	0.4	19
VD-482	4000	4800	7	120	145		7				
VD-642	5300	6400	6	120	145		9				

Note

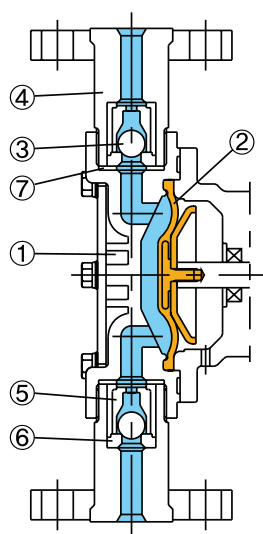
1. The max. discharge capacity is based on standard conditions(room temperature, clean water) at the max. discharge pressure.
2. The effective flow control range applies to 20% to 100% of the stroke length.
3. The self-priming capability is 1 meter.
4. The weight is based on the PTC liquid end type including the standard motor and base.
5. Specifications are subject to change without prior notice for reasons such as product improvement or enhancement.
6. The coating color is Munsell No. 6.51 B 4.99/9.55 (motor color follows the manufacturer's standard color).

KM

- Various Liquid End Materials available to inject all kinds of chemical liquids.
- Efficiently durable and hermetic driving part structure for out-door installation.
- Excellent durability in a continuous running for long time, with a reduction gear by the way of oil bath lubricant.
- A small noise by the helical gear which made by a precised processing.
- The dial by the micrometer method, makes it possible to adjust the capacity precisely during operation.



Liquid End Material



PART NAME	MATERIALS		PTC(PE6)		FTC	ST6(6T6)	
	CAPACITY		500~102	212	500~102	500~102	212
① Head			PP	PVC	PVDF	SSC13A(SSC14A)	
② Diaphragm			PTFE(EPDM)		PTFE	PTFE	
③ Check ball			CERAMIC(STS316)		CERAMIC	STS316	
④ Joint			PP	PVC	PVDF	SSC14A	STS304(STS316)
⑤ Ball guide			PP	PVC	PVDF	PVDF	SSC14A
⑥ Ball seat			FKM(EPDM)	PVC	PTFE	PTFE	STS316
⑦ O-ring,			FKM(EPDM)		PTFE	PTFE	

Note

Non-Standard material specifications are made to order.
Please consult us separately.

Model code

KM- -521-PTC-FWS

1

2 a

2 b

2 c

3 a

3 b

3 c

4

5

6

1 OPTION

No mark : No Option
 E : Air Relief Valve
 F : Relief Valve

2 NORMINAL CAPACITY

abx10^c→52x10¹=520(mL/min)

3 OPTION**(a) Head**

P : PP(PVC)
 F : PVDF

S : SSC13A

6 : SSC14A

X : Special

(b) Diaphragm

T : PTFE
 E : EPDM

X : Special

(c) Check Ball

C : CERAMIC
 S : STS316

6 : STS316

X : Special

4 CONNECTION TYPE

F : Flange H : Hose X : Special

5 VISCOSITY LIMIT

W : Standard (0~100mPa·s)

V : High Viscosity (100~2,000mPa·s)

6 POWER SUPPLY

S : 1Ø, 220V

A : 3Ø, 220V/380V

B : 3Ø, 440V

X : Special

SPEC MODEL	Max. Capacity (mL/min)		Max. Discharge Pressure (bar)	Stroke Number(SPM)		Stroke length (mm)	Diameter of diaphragm (mm)	Connection		Flange	Motor	Weight (kg)
	50Hz	60Hz		50Hz	60Hz			Hose				
								PVC	PTFE			
KM-500	42	50	10	95	114	3	30	Ø6xØ11	Ø10xØ12	KS10K15A	60W	8.6
KM-121	104	125	10	95	114	4	36					8.6
KM-251	213	255	10	95	114	5	45					8.6
KM-521	433	520	7	95	114	6	55	Ø12xØ18	Ø12xØ14			8.9
KM-102	854	1025	5	95	114	6	68					8.9
KM-212	1792	2150	3	95	114	7	90					9.9

Note

1. The max. discharge capacity is based on standard conditions(room temperature, clean water) at the max. discharge pressure.
2. The effective flow control range is 25% to 100% of the stroke length for KM-500 and 121, and 20% to 100% for models KM-251 ~ 212.
3. PVC hoses can only be connected to PTC and PE6 Liquid End, and PTFE hoses can only be connected to FTC, ST6, and 6T6 Liquid End.
4. The allowable temperature range of the handled liquid is 0~50°C for head materials made of PVC or PVDF, and 0~80°C for SSC13A or SSC14A.
5. The allowable ambient temperature during operation is 0~40°C.
6. The self-priming capability is 1 meter for models KM-500 and 121, and 2 meters for models KM-251 ~ 121.
7. The coating color is Munsell No. 6.51 B 4.99/9.55 (motor color follows the manufacturer's standard).
8. Specifications are subject to change without prior notice for reasons such as product improvement or enhancement.

Small Diaphragm

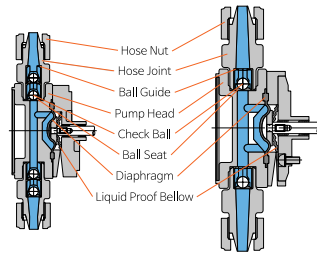
METERING PUMPS

AX

A reciprocating diaphragm metering pump constructed of top-quality chemical-resistant liquid-end materials and a highly-robust body.



Leak Proof Liquid End



- Use Special engineering plastic of high strength
- Superior chemical resistance
 - PFC(strengthened PP resin): General corrosion resistance
 - FTC(fluoride resin): Special corrosion resistance
- Perfect sealing by Diaphragm assembled with O-ring
- Block chemical to pass through the Driving Part by Bellows

Features

Easy Dial Setting

Discharge capacity can be easily adjusted by dial



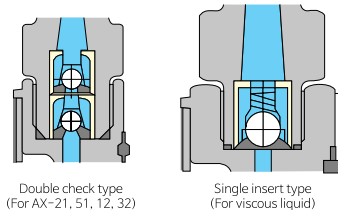
Safe Driving Motor

Built-in thermal protector protects the motor in case of overload by carelessness

Two types of motor by usage
(Shaded Pole Motor)
(Totally Enclosed Self Cooling Motor)

Precise Valve Construction

Maximize precision by double Check Ball type and Spring insert type



Durable Driving Part

Frame(aluminum die casting)and Planetary Gear (wear-resistant materials)for semi-permanent durability

Application of Multiplex Head

Pulseless Pump (Triplex)



Two Liquid Injection Pump (Duplex)



- Freely available according to chemical types and discharge capacity
- Extra precise control is possible if it is double Head combined by large and small capacity

Model code

AX1-12-PFC-HWS-K

1

2

3 a

3 b

3 c

4 a

4 b

4 c

5

1 HEAD NUMBER

- 1 : Single
2 : Duplex
3 : Triplex

2 MODEL NO. FOR CAPACITY

1 2 = 1 0 0 ml/min

1 is the figure on the left and
2 is the no. of zero following.
For duplex and triplex, this refers
to the capacity of each head.

3 LIQUID-END MATERIALS**(a) Head**

P : PP F : PVDF 6 : SSC14A
S : SSC13A X : Special

(b) Ball seat

F : FKM E : EPDM
T : PTFE X : Special

(c) Check ball

C : CERAMIC S : STS316
6 : STS316 X : Special

4 SPECIFICATION**(a) Joint type**

H : Hose F : Flange X : Special

(b) Viscosity limit

W : Standard (Less than 50mPa·s)
V : High Viscosity (50 to 1,000mPa·s)

(c) Others

S : Standard A : Air relief valve
B : Boiler specifications F : Relief Valve
C : A+B type G : F+B type

5 MOTOR TYPE

K : Shaded pole motor X : Special
Z : Totally enclosed non-ventilated motor

Note

1. The combination of liquid materials is not unlimited. Please refer to the "Standard Liquid End Materials Table" for each model.
2. The diaphragm material is PTFE for all models.
3. For AX-21 and AX-51 models with hose connections, an air relief valve must be installed. (Except for S□□ and 6□□ Liquid End)
4. For boiler specifications, the siphon check valve is made of a heat-resistant material.
5. For Liquid End materials, please refer to the "Standard Liquid End Materials Table." Non-standard materials are available as custom orders; please consult us for details.

SPECIFICATIONS			AX1-21	AX1-51	AX1-12	AX1-32	AX1-52	AX1-13
Max. Capacity	50Hz		20	40	90	300	460	1040
	60Hz		25	50	110	360	550	1250
Max. Discharge Pressure(bar)			15	15	10	5	3	3
Stroke number(SPM)	50Hz		57	114	114	114	114	114
	60Hz		68	136	136	136	136	136
Stroke Length(mm)			3	3	3	6	6	6
Connection	PVC Hose	HWS	Ø6xØ11	Ø6xØ11	Ø6xØ11	Ø6xØ11	Ø12xØ18	Ø12xØ18
		HVS	Ø12xØ18	Ø12xØ18	Ø12xØ18	Ø12xØ18	Ø12xØ18	Ø12xØ18
	PTFE Hose	HWS	Ø10xØ12	Ø10xØ12	Ø10xØ12	Ø10xØ12	Ø10xØ12	Ø10xØ12
		Flange	FWS	KS 10K 15A	KS 10K 15A	KS 10K 15A	KS 10K 15A	KS 10K 15A
Motor(W)	Totally enclosed non-ventilated motor		25	25	25	25	25	37
	Shaded pole motor		6	14	14	14	14	20
Weight(kg) (PFC-HWS-Z)			3.4	3.4	3.4	3.4	3.8	4.1
Painting			Munsell No.6.51 B 4.99/9.55					

Note

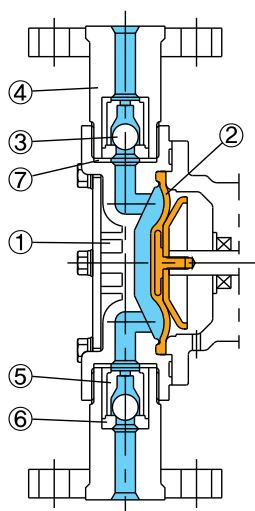
1. The max. discharge capacity is based on standard conditions(room temperature, clean water) at the max. discharge pressure.
2. This pump is designed for indoor installation. If it must be installed outdoors, be sure to cover it properly.
3. This pump is not suitable for transferring liquids containing slurry.
4. For the AX-13 model, dual or triple-head is not applicable. Please contact us separately for further information.
5. Specifications are subject to change without prior notice for reasons such as product improvement or enhancement.

KA

- High Efficiency BLDC Motor
- Oilless Structure
- Automatic stop when overpressure occurs
- As Lightweight & Compact design, easy installation and maintenance
- Various Liquid End Materials and connection type
- Simple operation and easy wiring
- Small noise by the helical gear



Liquid End Material



PART NAME	MATERIALS	PTC(PE6)		FTC	STS(6T6)	
	CAPACITY	521~102	212	521~212	521~102	212
① Head		PP	PVC	PVDF	SSC13A(14A)	
② Diaphragm		PTFE(EPDM)		PTFE	PTFE	
③ Check ball		CERAMIC(STS316)		CERAMIC	STS316	
④ Joint		PP	PVC	PVDF	SSC14A	STS304(316)
⑤ Ball guide		PP	PVC	PVDF	PVDF	SSC13A(14A)
⑥ Ball seat		FKM(EPDM)	PVC	PTFE	PTFE	STS304(316)
⑦ O-ring		FKM(EPDM)		PTFE	PTFE	

Note

Material other than standard can be used for special purpose pump.

Model code

KA-521-PTC-FWS

1 a 1 b 1 c 2 a 2 b 2 c 3 4 5

1 NORMAL CAPACITY

$ab \times 10^a \rightarrow 52 \times 10^1 = 520 (\text{mL/min})$

2 OPTION

(a) Head

P: PP(PVC) S: SSC13A

F: PVDF 6: SSC14A

X: Special

(b) Diaphragm

T: PTFE X: Special

E: EPDM

(c) Check Ball

C: CERAMIC 6: STS316

X: Special

3 CONNECTION TYPE

F: Flange H: Hose X: Special

4 VISCOSITY LIMIT

W: Standard (0~100mPa·s)

V: High Viscosity (100~2,000mPa·s)

5 POWER SUPPLY

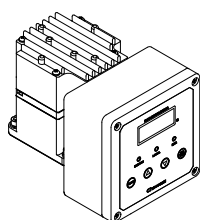
S: 1 $\varnothing$, 200~240V

SPECIFICATIONS MODEL	Max. Capacity (m/L min)	Max. Discharge Pressure (bar)	Stroke Number(SPM)	Stroke length (mm)	Diameter of diaphragm (mm)	Connection			Motor	Weight (kg)
						Hose		Flange		
						PVC	PTFE			
KM-521	520	10	116	6	55	Ø12xØ18	Ø10xØ12	KS10K15A	120W	7.8
KM-102	1025	7	116	6	68		Ø10xØ12			7.9
KM-212	2150	5	116	7	90		Ø12xØ14			8.8

Note

1. The max. discharge capacity is based on standard conditions(room temperature, clean water) at the max. discharge pressure.
2. Effective control range of flow rate is 10~100%.
3. PVC hose is only applicable for PTC&PE6 Liquid End Type, and PTFE hose is only applicable for FTC, ST6&6T6 Liquid End Type.
4. The limits of liquid temperature are 0~50°C for PTC&FTC Liquid End Type and 0~80°C for ST6&6T6 Liquid End Type
5. The allowable ambient temperature during operation is 0~40°C.
- 6.. The self-priming capability is 2 meter
7. The coating color is Munsell No. 6.51 B 4.99/9.55 (motor color follows the manufacturer's standard color).
8. Specifications and designs are subject to change without prior notice for purposes of quality improvement or product enhancement.

Motor Specifications



SPECIFICATION	
Power	120W
Voltage	1 $\varnothing$ AC200~240V
Type	Brushless DC Motor(Sensored SPM)
Enclosure	TENV (Totally Enclosed Non-Ventilated)

SPECIFICATION	
Pole	10 Class
Insulation Class	F
Protection Class	IP54

SP

- Precise injection and flow control by the dual control of Stroke Length & Stroke Numbers
- The operation status can be checked with Status Lamp(LED)
- Sealing and Accuracy are improved by double check Valve
- Can cope with difficult environments by robust IP65 class and casing material of chemical resistance
- Various auto-control function(Optional)
 - Ratio Control by input signal of PULSE
 - Multiplication&Division input signal of PULSE
 - Ratio Control by input signal of 4~20mA
 - Alarm for Low Level & Signal Error
 - Remote Start&Stop



Easy&Safe Air Vent Valve



Prevent Gas Lock Phenomenon
Support priming

Relief Valve (Option)



When over pressure, valve is automatically opened and pump & piping can be protected.

Function of Air Vent Valve is included

Model code

SP-B30-PFC-1WS-110

1 2 3 a 3 b 3 c 4 5 6 7 8 9

1 CONTROL PANEL TYPE

B : Basic C : Common Display
D : Deluxe Display

2 NOMINAL CAPACITY

20 : 20mL/min
(In case of 500H, "H" means High Pressure type)

3 LIQUID END MATERIAL

(a) Pump Head (c) Check Ball
P : PP F : PVDF C : CERAMIC
S : STS316
(b) Ball Seat
F : FKM V : FKM(ETP) ※ "V : FKM(ETP)"
E : EPDM T : PTFE is not applied to SP-D

4 HOSE STANDARD

1 : Ø4×Ø6(PTFE) 2 : Ø4×Ø9(Braided PVC) 3 : Ø6×Ø8(PE,PTFE)
4 : Ø6×Ø11(Braided PVC) 5 : Ø5×Ø8 6 : Ø8×Ø12(Braided PVC)
7 : Ø8×Ø10(PTFE) 8 : Ø9×Ø12(PE) 9 : Ø10×Ø12(PTFE)
A : Ø12×Ø18(Braided PVC)
※ "5 : Ø5×Ø8" is not applied to SP-D

5 VALVE STRUCTURE

SP-B,C SP-D
W : Standard (0~70mPa·s) W : Standard (0~100 mPa·s)
V : High Viscosity (70~700mPa·s) V : High Viscosity (100~1000mPa·s)
※ In case of the valve for high viscosity, spring is installed in the valve.

6 GENERAL SPECIFICATION

S : Standard B : Boiler F : Relief Valve G : B + F
※ In case of Boiler type, discharge hose is nylon and the body of Anti-siphon Check Valve is PPS.
※ Relief Valve is not applied to SP-B200, SP-C200, SP-D300, SP-D500, SP-D500H, SP-D700, SP-D1000

7 CONTROL SPECIFICATION

SP-B SP-C
1 : Manual 1 : Manual 3 : PULSE(or 4~20mA)+Add. Func.(1)
4 : PULSE(or 4~20mA)+Add. Func.(2)
※ Add. Func.(1) : Input of Level Switch(or REMOTE START/STOP)
※ Add. Func.(2) : Input of Level Switch, REMOTE START/STOP, Output of Alarm

SP-D

3 : PULSE(or 4~20mA)+Add. Func.(1)
4 : PULSE(or 4~20mA)+Add. Func.(2)

8 POWER SUPPLY

1 : AC220 (198~242V) 2 : AC240V (216~264V) 3 : AC115V (104~127V)
※ Common data : 1Ø 50/60Hz

9 POWER CORD

0 : 2m of power cord
1 : 2m of power cord & Plug

SP-C

MODEL		SP-C30	SP-C50	SP-C70	SP-C100	SP-C200
SPECIFICATIONS						
Max. Capacity (mL/min)		25	55	75	140	200
Max. Discharge Pressure(bar)		16	12	9	5.5	3
Stroke Rate (SPM)		1~240				
Hose	Suction-Discharge	Ø4×Ø6, Ø4×Ø9		Ø6×Ø8, Ø6×Ø11, Ø5×Ø8		
	Air Vent	Ø4×Ø6				
Self-priming (m)		1	1.5			2
Viscosity Limit (mPa·s)	Standard	50		70		
	High Viscosity	300		700	600	400
Weight (kg)	PP Material	2	2.4			
	PVDF Material	2.1	2.4		2.5	
Operation temperature		Ambient Temperature 0~40°C Liquid Temperature 0~50°C				
Electrical Data	Average Power Consumption(W)	15	17			
	Rated Current(A)	0.4	0.5			
	Protection & Insulation Class	IP65 F				

Note

1. The max. discharge capacity is based on at the max. discharge pressure.
2. Repeatability is ±2%F.S.(Full Scale) and noise is within 70dB.
3. Setting pressure of Relief Valve is ±10% of max. discharge pressure.
4. Specifications and designs are subject to change without prior notice for purposes of quality improvement or product enhancement.

SP-B

MODEL		SP-B30	SP-B50	SP-B70	SP-B100	SP-B200
SPECIFICATIONS						
Max. Capacity (mL/min)		25	55	70	135	240
Max. Discharge Pressure(bar)		14	8	6	3.5	2
Stroke Rate (SPM)		240				
Stroke Length (mm)		1.0 (40~100%)				
Hose	Suction-Discharge	Ø4×Ø6, Ø4×Ø9		Ø6×Ø8, Ø6×Ø11, Ø5×Ø8		
	Air Vent	Ø4×Ø6				
Self-priming (m)		1	1.5			2
Viscosity Limit (mPa·s)	Standard	50		70		
	High Viscosity	300		700	600	400
Weight (kg)	PP Material	2.1				
	PVDF Material	2.2				
Operation temperature		Ambient Temperature 0~40°C Liquid Temperature 0~50°C				
Electrical Data		Average Power Consumption (W)	Rated Current (A)	Protection Class		Insulation Class
		15	0.4	IP65		F

MODEL		SP-B30H	SP-B50H	SP-B70H	SP-B100H
SPECIFICATIONS					
Max. Capacity (mL/min)		30	55	75	130
Max. Discharge Pressure(bar)		16	12	8	5
Stroke Rate (SPM)		240			
Stroke Length (mm)		1.0 (40~100%)			
Hose	Suction-Discharge	Ø4×Ø6, Ø4×Ø9		Ø6×Ø8, Ø6×Ø11, Ø5×Ø8	
	Air Vent	Ø4×Ø6			
Self-priming (m)		1	1.5		
Viscosity Limit (mPa·s)	Standard	50		70	
	High Viscosity	300		700	600
Weight (kg)	PP Material	2.4			2.5
	PVDF Material	2.5			2.6
Operation temperature		Ambient Temperature 0~40°C Liquid Temperature 0~50°C			
Electrical Data		Average Power Consumption (W)	Rated Current (A)	Protection Class	Insulation Class
		17	0.5	IP65	F

Note

1. The max. discharge capacity is based on at the max. discharge pressure.
2. Repeatability is $\pm 2\%$ F.S.(Full Scale) and noise is within 70dB.
3. Setting pressure of Relief Valve is $\pm 10\%$ of max. discharge pressure.
4. Specifications and designs are subject to change without prior notice for purposes of quality improvement or product enhancement.

SP-D

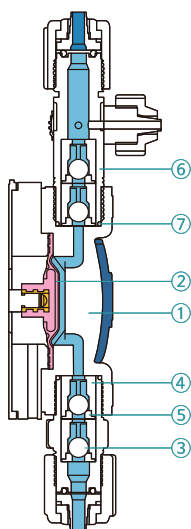
MODEL		SP-D50	SP-D100	SP-D200	SP-D300	SP-D500
SPECIFICATIONS						
Max. Capacity (mL/min)		50	105	200	370	580
Max. Discharge Pressure(bar)		20	10	6	3	2
Stroke Rate (SPM)		1~240				
Stroke Length (mm)		1.0 (40~100%)	1.5 (20~100%)			
Hose	Suction-Discharge	Ø4×Ø6, Ø4×Ø9	Ø6×Ø8, Ø6×Ø11		Ø8×Ø12, Ø8×Ø10, Ø9×Ø12	
	Air Vent	Ø4×Ø6				-
Self-priming (m)		1.5	2			
Viscosity Limit (mPa·s)	Standard	100	200		100	
	High Viscosity	500	800		500	400
Weight (kg)	PP Material	3.9				4.0
	PVDF Material	4.0				4.1
Operation temperature		Ambient Temperature 0~40℃ Liquid Temperature 0~50℃				
Electrical Data		Average Power Consumption (W)	Rated Current (A)	Protection Class	Insulation Class	
		30	0.9	IP65	F	

MODEL		SP-D300H	SP-D500H	SP-D700	SP-D1000
SPECIFICATIONS					
Max. Capacity (mL/min)		290	500	780	1100
Max. Discharge Pressure(bar)		10	7	4	2.5
Stroke Rate (SPM)		1~240			
Stroke Length (mm)		1.5 (20~100%)			
Hose	Suction-Discharge	Ø8×Ø10, Ø8×Ø12, Ø9×Ø12		Ø10×Ø12, Ø12×Ø18	
	Air Vent	Ø4×Ø6	-		
Self-priming (m)		2			
Viscosity Limit (mPa·s)	Standard	100			
	High Viscosity	500	400	500	400
Weight (kg)	PP Material	9.0	9.1	9.2	
	PVDF Material	9.1	9.2	9.4	
Operation temperature		Ambient Temperature 0~40°C Liquid Temperature 0~50°C			
Electrical Data		Average Power Consumption (W)	Rated Current (A)	Protection Class	Insulation Class
		40	1.3	IP65	F

Note

- 1.The max. discharge capacity is based on at the max. discharge pressure.
2. Repeatability is $\pm 2\%$ F.S.(Full Scale) and noise is within 75dB.
3. Setting pressure of Relief Valve is $\pm 10\%$ of max. discharge pressure.
4. Specifications and designs are subject to change without prior notice for purposes of quality improvement or product enhancement.

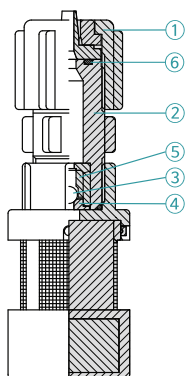
Liquid End Material



PART \ TYPE	PEC	PFS	PEC	FVC	FTC
① Head	PP			PVDF	
② Diaphragm	PTFE (+EPDM)				
③ Check ball	CERAMIC	STS316	CERAMIC		
④ Ball guide	PP			PVDF	
⑤ Ball seat	FKM		EPDM	FKM(ETP)	PTFE
⑥ Joint	PP			PVDF	
⑦ O-ring	FKM		EPDM	FKM(ETP)	
Hose	Standard	Discharge: PE, Suction: Transparent PVC			PTFE
		Braided PVC			
	Boiler	Discharge: NYLON, Suction: Transparent PVC			

※ "FVC" is not available for SP-D

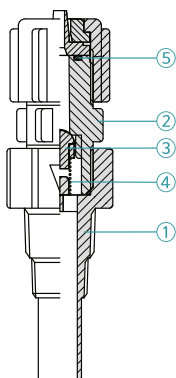
Strainer Foot Valve Material



PART \ TYPE	PFC	PFS	PEC	FVC*	FTC
① Body	PP			PVDF	
② Jonit	PP			PVDF	
③ Check ball	CERAMIC				
④ Ball seat	FKM		EPDM	FKM(ETP)	PTEF
⑤ Ball guide	PP			PVDF	
⑥ O-ring	FKM		EPDM	FKM(ETP)	

※ "FVC" is not available for SP-D

Anti-siphon Check valve Material



PART \ TYPE	PFC	PFS	PEC	FVC	FTC	Boiler		
						PE□	PF□	PT□
① Body	PP			PVDF		PPS		
② Joint	PP			PVDF		PPS		
③ Plug head	FKM		EPDM	FKM(ETP)		EPDM	FKM(B)	FKM(ETP)
④ Spring	HC-276			HC-276+PTFE		HC-276		
⑤ O-ring	FKM		EPDM	FKM(ETP)		EPDM	FKM	FKM(ETP)

EPDM : Ethylene propylene diene monomer rubber

FKM(ETP) : Fluoro rubber of ETP type

PPS : Polyphenylene sulfide

PVC : Polyvinyl chloride

FKM : Fluoro rubber

PE : Polyethylene

PTFE : Polytetrafluoroethylene

PVDF : Polyvinylidene fluoride

PP : Polypropylene

Accessories



1 Anti-siphon Check Valve

It is installed at the end of discharge hose and prevents overfeeding, flowing backward, & siphon phenomenon.



2 Hose

Suction Hose 1m,
Discharge Hose 2m,
Air Vent Hose 1m



3 Level Switch (Option)

When liquid level in tank is low,
It generates alarm signal.



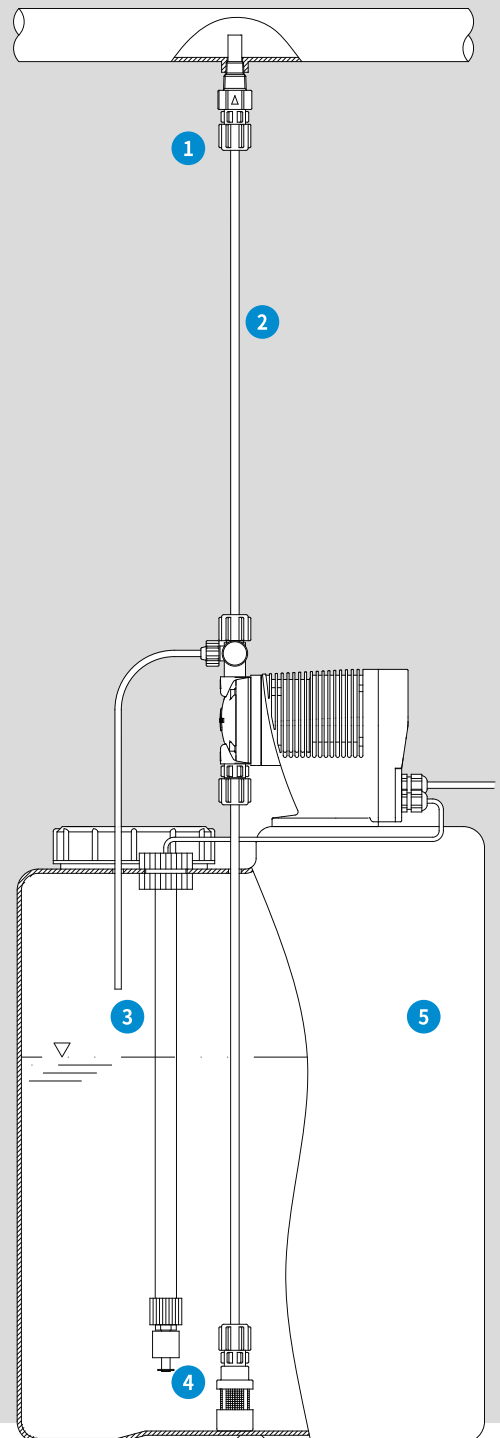
4 Strainer Foot Valve

It is installed at the end of suction hose and prevents foreign substance & flow backward.



5 Liquid Tank (Option)

MODEL	Volume(L)	Diameter	Height
SPN-50L	50~65	420	580
SPN-100L	100~120	520	690
EN-200	200	590	860

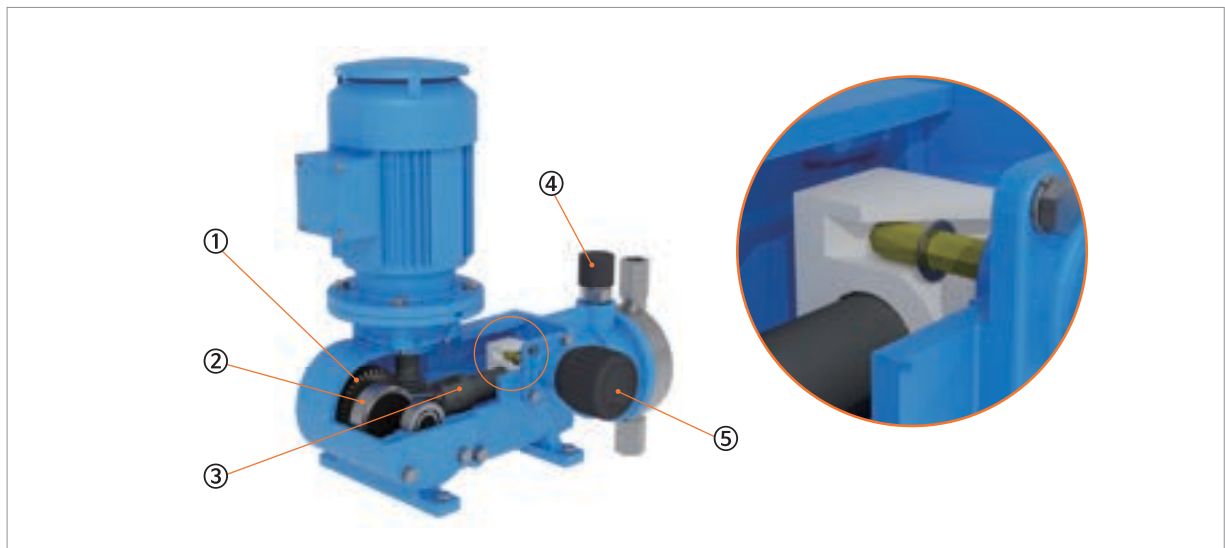


BKH

- Diaphragm Rupture Detection by pressure gauge is installed to prevent problems that may occur during the process.
- By applying own precision-developed diaphragm, it has high quantitative performance and can be used for a long time.
- The built-in relief valve can protect the pump and piping under overpressure conditions
- A double diaphragm is applied to secure the durability of the diaphragm.
- BKH is designed and manufactured according to the API 675 standard.
- Injection is possible up to 130bar.



Structure & Function of Pump



① Reducer

The rotation of the Motor is reduced by Worm Gear and gets the high torque.

② Eccentric device

As Crank System, it change rotation motion to reciprocation motion and it is characterized by high durability.

③ Rod

While Rod is reciprocating Hydraulic Oil is flowed into Driving Part and discharged to Oil Chamber through Bypass Hole and Hydraulic Oil makes suction & discharge of pump as Piston principle.

④ Hydraulic Regulator

Relief Valve prevents pump damage, when abnormal pressure occurs during operation. Air Vent Valve discharges certain amount of Hydraulic Oil & bubble every stroke.

⑤ Adjustment of Discharge Flow

By dial adjustment, open & close section of Bypass Hole is controlled and volume of hydraulic oil is changed. Diaphragm momentum and discharge flow are controlled according to this variation in amount of hydraulic oil.

Model code

BKH- -101A-SS- -FS

1

2 a

2 b

2 c

3 a

3 b

4

5

6

1 CONTROL OPTION

No mark : No Option
A : BLDC M/C Unit
B : Servo Unit

2 TYPE**(a) Plunger**

10, 15, 22, 32, 42, 55, 70

(b) Gear Ratio

1, 2, 3, 4

(c) Driving Box Size

A : 0.2kW **B** : 0.4kW **C** : 0.75kW **D** : 1.5kW

3 LIQUID END MATERIAL**(a) Head**

P : PVC **F** : PVDF
S : SSC14A **X** : Special

(b) Check ball

C : Ceramic **S** : STS316 **X** : Special

4 LIQUID END OPTION

No mark : No Option

1 : Diaphragm Rupture

Detection by pressure gauge

X : Special

5 CONNECTION

F : Flange

T : Thread

X : Special

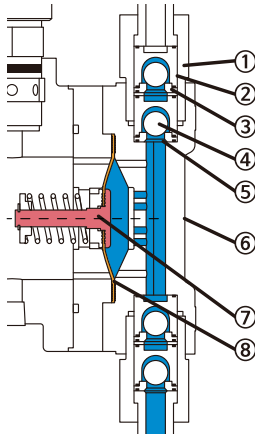
6 POWER SUPPLY

S : 3 ϕ , 220/380V

A : 3 ϕ , 440V

X : Special

Liquid End Material



PART NAME	PC		FC	SS
	10, 15	22~70		
① Joint	PVC	PVC	PVDF	STS316
② Ball Guide	PP	PVC	PVDF	SSC14A
③ Ball Seat	FKM	PVC	PTFE	STS316
④ Check Ball	CERAMIC	CERAMIC	CERAMIC	STS316
⑤ Gasket	FKM	FKM	PTFE	PTFE
⑥ Head	PVC	PVC	PVDF	SSC14A
⑦ Diaphragm Support	SSC14A (ETFE Coating)	SSC14A (ETFE Coating)	SSC14A (ETFE Coating)	SSC14A
⑧ Diaphragm*	PTFE	PTFE	PTFE	PTFE

* A double diaphragm is applied to secure the durability of the diaphragm.



PC



FC



SS

Specifications (Gear Ratio A,B)

MODEL	Max. Capacity [L/h, (mL/min)]				Max. Discharge Pressure (bar)		Stroke Frequency (SPM)		Weight (kg)
	50Hz		60Hz						
	PVC-PVDF	SSC14A	PVC-PVDF	SSC14A	PVC-PVDF	SSC14A	50Hz	60Hz	
BKH-101A	3 (50)	1.8 (30)	3.6 (60)	2.1 (35)	15	110	40	48	36
BKH-102A	6 (100)	4.5 (75)	7.2 (120)	5.4 (90)	15	100	80	97	
BKH-103A	9.5 (160)	7.5 (125)	11.4 (190)	9 (150)	15	90	120	145	
BKH-104A	12.5 (210)	10.3 (170)	15 (250)	12.3 (205)	15	80	160	193	
BKH-151A	7 (115)	5.3 (78.5)	8.4 (140)	6.3 (105)	15	70	40	48	36
BKH-152A	14.5 (240)	13.3 (220)	17.4 (290)	15.9 (265)	15	50	80	97	
BKH-153A	22.3 (370)	21 (350)	26.7 (445)	25.2 (420)	15	40	120	145	
BKH-154A	29.8 (495)	28.5 (475)	35.7 (595)	34.2 (570)	15	35	160	193	
BKH-221A	15.0 (250)	14.4 (240)	18.0 (300)	17.4 (290)	15	32	40	48	38
BKH-222A	31.8 (530)		38.4 (640)		15	23	80	97	
BKH-223A	47.4 (790)		57.0 (950)		15	19	120	145	
BKH-224A	62.4 (1040)		75.0 (1250)		15	16	160	193	
BKH-321A	33.0 (550)		39.6(660)		15	15	40	48	40
BKH-322A	67.8 (1130)		81.6 (1360)		11	11	80	97	
BKH-323A	102.3 (1705)		123.0 (2050)		9	9	120	145	
BKH-324A	135.0 (2250)		162.0 (2700)		8	8	160	193	
BKH-101B	4.5 (75)	3.3 (55)	5.4 (90)	3.9 (65)	15	120	40	48	48
BKH-102B	9.3 (155)	6.5 (110)	11.1 (185)	7.8 (130)	15	120	80	97	
BKH-103B	13.8 (230)	12 (200)	16.5 (275)	14.4 (240)	15	110	120	145	
BKH-104B	19.5 (325)	15.3 (255)	23.4 (390)	18.3 (305)	15	100	160	193	
BKH-151B	10.8 (180)	9 (150)	12.9 (215)	10.8 (180)	15	100	40	48	48
BKH-152B	22.3 (370)	19.3 (320)	26.7 (445)	23.1 (385)	15	70	80	97	
BKH-153B	34 (565)	31 (515)	40.8 (680)	37.2 (620)	15	58	120	145	
BKH-154B	45.3 (755)	77 (735)	54.3 (905)	52.8 (880)	15	50	160	193	
BKH-221B	24.0 (400)	22.8 (380)	28.8 (480)	27.6 (460)	15	46	40	48	51
BKH-222B	47.4 (790)	46.5 (775)	57.0 (960)	55.8 (930)	15	34	80	97	
BKH-223B	72.0 (1200)	69.9 (1165)	86.4 (1440)	84.0 (1400)	15	27	120	145	
BKH-224B	97.5 (1625)		117.0 (1950)		15	23	160	193	
BKH-321B	49.8 (830)		60.0 (1000)		15	22	40	48	52
BKH-322B	102.3 (1705)		123.0 (2050)		15	16	80	97	
BKH-323B	152.4 (2540)		183.0 (3050)		13	13	120	145	
BKH-324B	204.9 (3415)		246.0 (4100)		11	11	160	193	
BKH-421B	90.0 (1500)		108.0 (1800)		13	13	40	48	54
BKH-422B	180.0 (3000)		216.0 (3600)		9	9	80	97	
BKH-423B	270.0 (4500)		324.0 (5400)		7	7	120	145	
BKH-424B	360.0 (6000)		432.0 (7200)		6	6	160	193	

Specifications (Gear Ratio C,D)

MODEL	Max. Capacity [L/h, (mL/min)]				Max. Discharge Pressure (bar)		Stroke Frequency (SPM)		Weight (kg)
	50Hz		60Hz						
	PVC-PVDF	SSC14A	PVC-PVDF	SSC14A	PVC-PVDF	SSC14A	50Hz	60Hz	
BKH-151C	12.3 (205)	9.9 (165)	15.0 (250)	12.0 (200)	15	130	40	48	70
BKH-152C	24.9 (415)	21.3 (355)	30.0 (500)	25.8 (430)	15	120	80	97	
BKH-153C	39.0 (650)	34.8 (580)	46.8 (780)	42.0 (700)	15	95	120	145	
BKH-154C	52.5 (875)	48.3 (790)	63.0 (1050)	57.0 (950)	15	85	160	193	
BKH-221C	30.0 (500)	26.4 (440)	36.0 (600)	31.8 (530)	15	80	40	48	73
BKH-222C	60.0 (1000)	54.9 (915)	72.0 (1200)	66.0 (1100)	15	55	80	97	
BKH-223C	87.3 (1455)	82.5 (1375)	108.0 (1800)	99.0 (1650)	15	45	120	145	
BKH-224C	120.0 (2000)	112.5 (1875)	144.0 (2400)	135.0 (2250)	15	40	160	193	
BKH-321C	62.4 (1040)	60.0 (1000)	75.0 (1250)	72.0 (1200)	15	36	40	48	74
BKH-322C	124.8 (2080)		150.0 (2500)		15	26	80	97	
BKH-323C	187.5 (3125)		225.0 (3750)		15	21	120	145	
BKH-324C	250.0 (4165)		300.0 (5000)		15	18	160	193	
BKH-421C	107.4 (1790)		129.0 (2150)		15	21	40	48	77
BKH-422C	219.9 (3665)		264.0 (4400)		15	15	80	97	
BKH-423C	330.0 (5500)		396.0 (6600)		12	12	120	145	
BKH-424C	435.0 (7250)		522.0 (8700)		11	11	160	193	
BKH-551C	184.8 (3080)		222.0 (3700)		13	13	40	48	82
BKH-552C	375.0 (6250)		450.0 (7500)		9	9	80	97	
BKH-553C	564.9 (9415)		678.0 (11300)		7	7	120	145	
BKH-554C	765.0 (12750)		918.0 (15300)		6	6	160	193	
BKH-221D	40.0 (665)	31.5 (525)	48.0 (800)	37.8 (630)	15	130	48	58	82
BKH-222D	79.8 (1330)	72.3 (1205)	96.0 (1600)	87.0 (1450)	15	95	96	116	
BKH-223D	120.0 (2000)	114.9 (1915)	144.0 (2400)	138.0 (2300)	15	80	144	174	
BKH-321D	87.3 (1455)	82.5 (1375)	105.0 (1750)	99.0 (1650)	15	65	48	58	83
BKH-322D	174.9 (2915)	169.8 (2830)	210.0 (3500)	204.0 (3400)	15	45	96	116	
BKH-323D	262.5 (4375)	255.0 (4250)	315.0 (5250)	306.0 (5100)	15	38	144	174	
BKH-421D	150.0 (2500)	144.9 (2415)	180.0 (3000)	174.0 (2900)	15	36	48	58	85
BKH-422D	294.9 (4915)		354.0 (5900)		15	26	96	116	
BKH-423D	435.0 (7250)		522.0 (8700)		15	22	144	174	
BKH-551D	249.9 (4165)		300.0 (5000)		15	22	48	58	92
BKH-552D	510.0 (8500)		612.0 (10200)		15	15	96	116	
BKH-553D	774.9 (12915)		930.0 (15500)		13	13	144	174	
BKH-701D	420.0 (7000)		504.0 (8400)		14	14	48	58	95
BKH-702D	849.9 (14165)		1020.0 (17000)		10	10	96	116	
BKH-703D	1290.0 (21500)		1548.0 (25800)		8	8	144	174	

Note

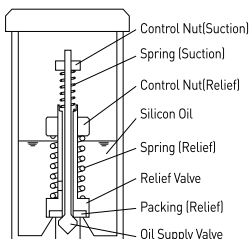
1. The max. discharge capacity is based on standard conditions(room temperature, clean water) at the max. discharge pressure.
2. The flow rate control range is 10% to 100%, with an accuracy of $\pm 1\%$ FS and linearity within $\pm 3\%$ FS.
3. The weight is based on the flange connection type (SS type), including the standard motor.
4. The allowable ambient temperature during operation is 0–40°C.
5. The allowable temperature range of the handled liquid is 0–50°C when the head material is PVC, and 0–80°C when it is PVDF or stainless steel (STS).
6. The coating color is Munsell No. 6.51 B 4.99/9.55 (motor color follows the manufacturer's standard).
7. Specifications and designs are subject to change without prior notice for purposes of quality improvement or product enhancement.
8. For accurate metering, a back pressure of at least 2 bar must be maintained.

KH

- Increase safety&durability by Hydraulic Regulator
- Application merits of diaphragm pumps for various liquids and plunger pumps for high pressure&precision
- Flow rate control by manual&remote flow rate control by available Inverter-Unit & BLDC M/C UNIT.
- It is possible to select Vertical type pumps&Horizontal type pumps in accordance with field condition.
- Use for chemical injection in the process line of Petrochemical Industry & Food Sanitation



Operation Principles



Eccentric Cam which reduces motor rotation by Worm Gear makes the reciprocating motion of Piston connected to the Slider Shaft. This reciprocal motion of Piston is transmitted to the working Oil(Silicon Oil) isolated by Diaphragm and the liquid is sucked&discharged. A Hydraulic Regulator built-in Relief Valve adjusts the Working Oil Pressure in order to prevent pump damage when abnormal pressure occurs during operation. If abnormal pressure occurs, Relief Valve will be open when discharge cycle, then the Working Oil in the Hydraulic Regulator will be raised to a certain level in order to prevent pump damage, and Oil will be filled in the Working Oil Chamber, Piston will be moved smoothly. And it will resume to normal operational status when the abnormal pressure is removed. Working Oil Pressure can be easily adjusted by Control Nut.

Model code

KHV1- -33S-PTC-FS

1 2 3 4 a 4 b 5 6 a 6 b 6 c 7 8

1 CONSTRUCTION

V : Vertical H : Horizontal

2 HEAD NUMBER

1 : Single 2 : Duplex

3 OPTIONNo mark : None D : Inverter UNIT
A : BLDC M/C UNIT E : Air Relief Valve**4 NOMINAL CAPACITY**ax 10^b → 3 x 10³ = 3000 (mL/min)**5 DIAPHRAGM NUMBER**

S : Single

6 LIQUID END MATERIAL**(a) Head Material**P : PVC F : PVDF S : STS304
6 : STS316 X : Special**(b) Diaphragm Material**

T : PTFE X : Special

(c) Check ball MaterialC : CERAMIC S : STS316
6 : STS316 X : Special**7 CONNECTION**

F : Flange X : Special

8 POWER SUPPLYS : 3Ø, 220V/380V
A : 3Ø, 440V
X : Special**Note**

- For dual-head models, the discharge capacity is twice the indicated value.
(e.g., For model KHV2-33S, the discharge capacity is 6000 mL/min.)
- Dual-head is available only in vertical type. For triple-head or higher, please consult us separately

SPEC. MODEL	Max. Capacity (mL/min)		Max. Discharge Pressure(bar)		Stroke Frequency(SPM)		Dia. of Piston (mm)	Stroke Length (mm)	Connection (STS)	Motor (kW)	Weight(kg) Vert./Hori. (STS)
	50Hz	60Hz	PTC · FTC	STS	50Hz	60Hz					
KH-51	40	50	10	30	48	58	12	10	KS 20K 15A	0.2	19.5/22
KH-12	80	100	10	30	96	116	12	10			
KH-32	300	360	10	25	48	58	30	10			20/22.5
KH-72	600	720	10	20	96	116	30	10			
KH-13	915	1100	10	20	48	58	40	17.5		0.4	61.5/67
KH-23	1830	2200	10	15	96	116	40	17.5			
KH-33	2830	3400	10	12	48	58	68	17.5	KS 10K 25A		63/68.5
KH-63	5660	6800	7	7	96	116	68	17.5	KS 20K 25A	0.75	
KH-33H	2830	3400	10	20	48	58	68	17.5			
KH-63H	5660	6800	10	14	96	116	68	17.5			
KH-14	8750	10500	8	8	48	58	122	17.5	KS 10K 40A		98
KH-24	17500	21000	4	4	96	116	122	17.5			

Note

- The max. discharge capacity is based on standard conditions(room temperature, clean water) at the max. discharge pressure.
- The effective flow control range is 10% to 100%, with an accuracy of ±1% F.S. and linearity within ±2% F.S.
- The coating color is Munsell No. 6.51 B 4.99/9.55 (motor color follows the manufacturer's standard color).
- Specifications and designs are subject to change without prior notice for purposes of quality improvement or product enhancement.

Plunger

METERING PUMPS

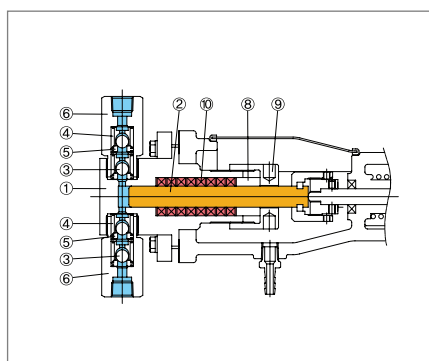
KP

- High pressure injection up to 225bar
- Adjustment precise injection in range of 10-3,000mL/min
- Fine control in high pressure by utilizing double check valve
- Minimized leakage by self aligning design, hard & grinded surface of plunger
- Closed construction for treatment of small leakage
- Excellent durability due to robust design

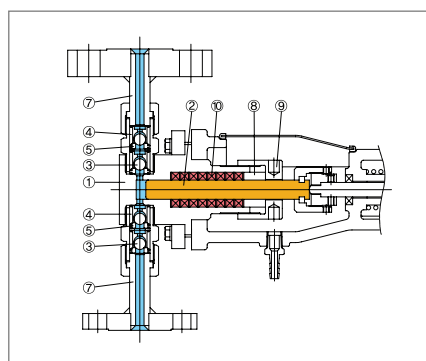


Liquid End Material

• Thread Type



• Flange Type



PART NAME	MATERIALS
① Head	STS316
② Plunger	STS316+HCr
③ Check ball	STS316
④ Ball guide	STS316
⑤ Ball seat	STS316

PART NAME	MATERIALS
⑥ Joint(Thread)	STS316
⑦ Joint(Flange)	STS316
⑧ Gland Ring	STS316
⑨ Gland Nut	STS316
⑩ Gland Packing	PTFE + ARAMID

Model code

KPV- -301L-ST-S

1 2 3 4 5 6 7 8

1 DRIVE BOX TYPE

V : Vertical
H : Horizontal

4 STROKE SPEED

1 : 58(48)SPM 2 : 116(96)SPM
※ () is 50Hz

8 CONNECTION

T : Thread X : Special
F : Flange

2 OPTION

No mark : No option A : BLDC M/C UNIT

5 DRIVE BOX SIZE

L : 0.2kW M : 0.4kW

9 POWER SUPPLY

S : 3Ø, 220/380V
A : 3Ø, 440V
X : Special

3 PLUNGER DIAMETER

30 : Plunger Dia. 30mm

7 LIQUID END MATERIAL

S : Standard X : Special

SPEC. MODEL	Max. Capacity (mL/min)		Max. Discharge Pressure(bar)	Stroke Frequency(SPM)		Stroke Length (mm)	Plunger Diameter (mm)	Connection		Motor (kW)	Weight(kg) Vert./Hori. (STS)
	50Hz	60Hz		50Hz	60Hz			Thread	Flange		
KP-061L	10.5	13	160	48	58	10	6	Rc1/4	63K15A	0.2	18/23
KP-062L	21	26	160	96	116						
KP-121L	45	55	160	48	58						
KP-122L	90	110	160	96	116		12				18/23
KP-161L	83	100	160	48	58		16	Rc3/8	40K15A		19/24
KP-162L	170	205	100	96	116						
KP-221L	162	195	104	48	58						
KP-222L	332	400	52	96	116		22				19/24
KP-301L	290	350	56	48	58						
KP-302L	614	740	28	96	116		30	Rc1/2	20K15A		21/26
KP-061M	16.5	20	200	48	58	15	6	Rc1/4	-	0.4	41/44
KP-062M	33	40	200	96	116						
KP-121M	70	85	225	48	58						
KP-122M	140	170	225	96	116		12				41/44
KP-161M	133	160	160	48	58		16	Rc3/8	63K15A		42/45
KP-162M	266	320	160	96	116						
KP-221M	253	305	160	48	58						
KP-222M	510	615	85	96	116		22				42/45
KP-301M	448	540	90	48	58		30	Rc1/2	40K15A		44/47
KP-302M	930	1120	45	96	116						
KP-401M	845	1020	50	48	58		40		20K15A		47/50
KP-402M	1700	2050	25	96	116						
KP-501M	1310	1575	32	48	58						
KP-502M	2710	3260	16	96	116		50	Rc3/4	20K20A		48/51

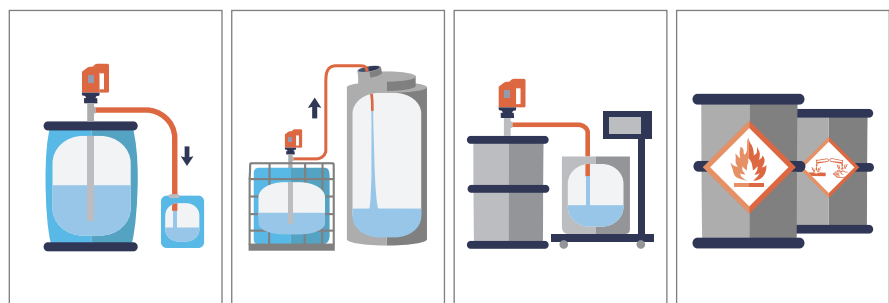
Note

1. The max. discharge capacity is based on standard conditions(room temperature, clean water) at the max. discharge pressure.
2. The effective flow control range is 10% to 100% of the stroke length, with an accuracy of $\pm 1\%$ F.S. and linearity within $\pm 2\%$ F.S.
3. Explosion-proof or other special-order motors (excluding voltage and frequency) are available only for horizontal drive.
4. The flange connection specification refers to the discharge side; the suction side is equipped with a KS 10K flange.
5. The weight is based on the threaded connection type, including the standard motor.
6. Self-priming capability: 1 meter for plungers with $\varnothing 6$ mm, 2 meters for $\varnothing 12$ – $\varnothing 22$ mm, and 3 meters for $\varnothing 30$ – $\varnothing 50$ mm.
7. Viscosity limits: 500 cP for plungers with $\varnothing 6$ – $\varnothing 12$ mm, and 1000 cP for $\varnothing 16$ – $\varnothing 50$ mm.
8. The coating color is Munsell No. 6.51 B 4.99/9.55 (motor color follows the manufacturer's standard).
9. Specifications and designs are subject to change without prior notice for purposes of quality improvement or product enhancement.

DR



- Removing unstable elements of pump performance with sealless structure.
- Preventing motor damage by installing of dual safety device in the motor
- Easy operation and simple part replacement.
- The material of motor casing with strong chemical resistance and shock resistance.
- Transfer flammable liquid by using ex. proof motor or air motor.
- Transfer various raw materials and chemicals



Splitting easily
into smaller

Transferring
quickly

Measuring amount
easily

For transferring
flammable or
corrosive liquid



Before



After

Electric Motor



- Dual prevention of motor from damage caused by overload through installing Thermal Protection device(TP) and over current breaker internally.
- Dual wall type motor housing prevents damage from external impacts
- By installing low voltage release device(Optional), preventing motor damage caused by low voltage.
- 5m long power cable is equipped with plug as standard item

Motor	Power	Voltage	Frequency	Current	Protection Grade	Insulation Grade	Weight
U5	560W	220~230VAC	50/60Hz	2.8A	IP44	F	3.0kg
U8	840W	220~230VAC	50/60Hz	4.2A	IP44	F	3.9kg



Speed Control Device(Optional)

Flow can be controlled easily with the motor speed (RPM) dial, so that stability can be improved in transferring corrosive liquid, and operating coast can be reduced as well by decreasing of motor power consumption with the low speed.

Air Motor



- Simple structure
- Can be used for dangerous areas of explosion
- Lighter than electric motor
- Easy speed control by supply pressure
- Suction Dia : Rc1/4, Discharge Dia.:Rc1/2



Motor	Power	Supply Pressure	Air Consumption	Weight
A4	460W	3~6bar	920L/mind	1.2kg

※ Explosion Proof Grade: Ex II 2G Ex h IIC T6 Gb (Cert No.0425 ATEX 005330-00)

Ex-Proof Motor



- Can be used for dangerous area of explosion.(Ex de II C T6)
- Dual prevention of motor from damage caused by overload through installing Thermal Protection device(TP) and over current breaker internally.
- By installing low voltage release device(Optional), preventing motor damage caused by low voltage.
- Dual wall type motor housing prevents damage from external impacts.
- 5m long power cable is equipped with plug as standard item.(Non-Ex.Proof)

Motor	Power	Voltage	Frequency	Current	Protection Grade	Insulation Grade	Weight
E4	420~430W	220~230VAC	50/60Hz	2.8A	IP54	F	5.2kg

※Explosion Proof Grade: Ex de IIC T6 (Cert No.18-GA2B0-0494X)

Electric Motor (500W Class)

PP



PVDF



STS316



Application

For transferring acid, alkali and neutral

Examples

Chemicals, Cosmetics raw material, Plating solution, Lubrication oil&etc

Application

For transferring Strong Corrosive chemicals

Examples

Chemicals for acid washing, Strong corrosive chemicals, Toxic chemicals&etc

Application

For transferring oils, alkali and neutral.

Examples

Cosmetics raw material, Chemicals raw material, Food additives raw material, Spice, Detergent, Water paint, Coating solution, Diesel & etc.

SPECIFICATIONS		DR-PL	DR-PH
Max. Flow rate (L/min)		130	80
Max. Head (m)		8	21
Max. Viscosity (mPa·s)		200	800
Max. Specific Gravity		1.3	1.6
Dia. of Insertion (mm)		44	44
Dia. for Hose Connection (mm)		25	25
Limit of liquid Temp. (°C)		50	50
Weight (kg)	700mm	4.0	4.0
	1,000mm	4.2	4.2
	1,200mm	4.4	4.4

SPECIFICATIONS		DR-FL	DR-FH
Max. Flow rate (L/min)		130	80
Max. Head (m)		8	21
Max. Viscosity (mPa·s)		200	800
Max. Specific Gravity		1.3	1.6
Dia. of Insertion (mm)		44	44
Dia. for Hose Connection (mm)		32	25
Limit of liquid Temp. (°C)		80	80
Weight (kg)	700mm	4.2	4.2
	1,000mm	4.5	4.5
	1,200mm	4.7	4.7

SPECIFICATIONS		DR-SL	DR-SH
Max. Flow rate (L/min)		160	90
Max. Head (m)		7.5	17
Max. Viscosity (mPa·s)		150	600
Max. Specific Gravity		1.3	1.6
Dia. of Insertion (mm)		45	45
Dia. for Hose Connection (mm)		25	25
Limit of liquid Temp. (°C)		100	100
Weight (kg)	700mm	5.9	5.9
	1,000mm	6.6	6.6
	1,200mm	7.2	7.2

Model code

DR-PLS-10-U5S-S

1 2 3 4 5 6 7 8

1 PIPE MATERIAL

P: PP F: PVDF S: STS316

4 PIPE LENGTH07: 700mm 12: 1200mm
10: 1000mm**7 MOTOR OPTION**S: Standard A: Speed Control
B: Speed Control & Low voltage release**2 CAPACITY FEATURES**

L: Low head H: High head

5 MOTOR TYPE

U: Electric Motor

8 MOTOR VOLTAGE

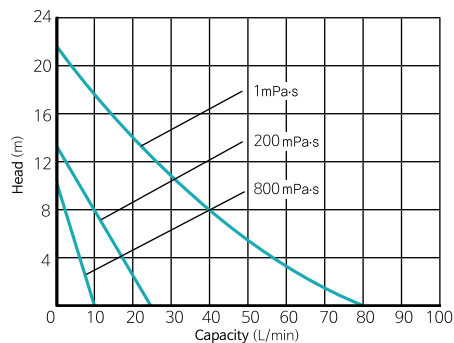
S: 220~230V

3 SHAFT MATERIALS: STS316 H: HASTELLOY
T: TITANIUM**6 MOTOR POWER**

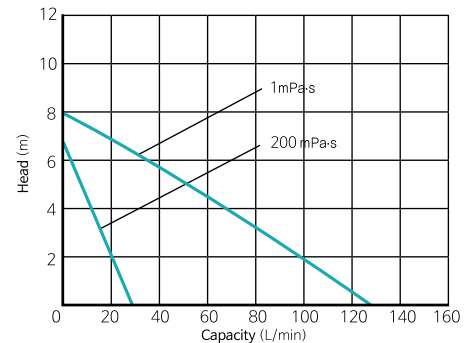
5: 500W Class

Performance Curves

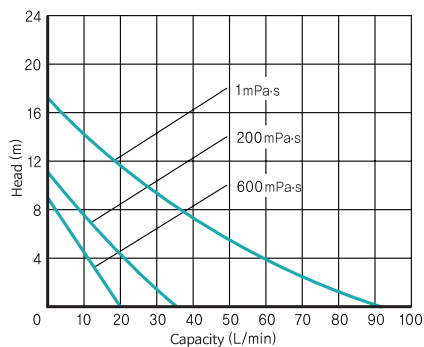
PH, FH(High head)



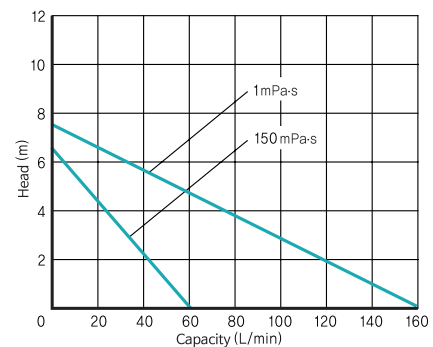
PL, FL(Low head)



SH(High head)



SL(Low head)

**Note**

※Performance curves can be somewhat different accordance with application of job site.

Electric Motor (800W Class)

PP



PVDF



STS316



Application

For transferring acid, alkali and neutral

Examples

Chemicals, Cosmetics raw material, Plating solution, Lubrication oil&etc

Application

For transferring Strong Corrosive chemicals

Examples

Chemicals for acid washing, Strong corrosive chemicals, Toxic chemicals&etc

Application

For transferring oils, alkali and neutral.

Examples

Cosmetics raw material, Chemicals raw material, Food additives raw material, Spice, Detergent, Water paint, Coating solution, Diesel & etc.

SPECIFICATIONS		DR-PL	DR-PH
Max. Flow rate (L/min)		160	95
Max. Head (m)		10	24
Max. Viscosity (mPa·s)		350	1200
Max. Specific Gravity		1.7	1.9
Dia. of Insertion (mm)		44	44
Dia. for Hose Connection (mm)		25	25
Limit of liquid Temp. (°C)		50	50
Weight (kg)	700mm	4.9	4.9
	1,000mm	5.1	5.1
	1,200mm	5.3	5.3

SPECIFICATIONS		DR-FL	DR-FH
Max. Flow rate (L/min)		160	95
Max. Head (m)		10	24
Max. Viscosity (mPa·s)		350	1200
Max. Specific Gravity		1.7	1.9
Dia. of Insertion (mm)		44	44
Dia. for Hose Connection (mm)		32	25
Limit of liquid Temp. (°C)		80	80
Weight (kg)	700mm	5.1	5.1
	1,000mm	5.4	5.4
	1,200mm	5.6	5.6

SPECIFICATIONS		DR-SL	DR-SH
Max. Flow rate (L/min)		185	105
Max. Head (m)		8.5	22
Max. Viscosity (mPa·s)		600	1400
Max. Specific Gravity		1.7	1.9
Dia. of Insertion (mm)		45	45
Dia. for Hose Connection (mm)		25	25
Limit of liquid Temp. (°C)		100	100
Weight (kg)	700mm	6.8	6.8
	1,000mm	7.5	7.5
	1,200mm	8.1	8.1

Model code

DR-PLS-10-U8S-S

1 2 3 4 5 6 7 8

1 PIPE MATERIAL

P: PP F: PVDF S: STS316

4 PIPE LENGTH07: 700mm 12: 1200mm
10: 1000mm**7 MOTOR OPTION**

S: Standard A: Speed Control

2 CAPACITY FEATURES

L: Low head H: High head

5 MOTOR TYPE

U: Electric Motor

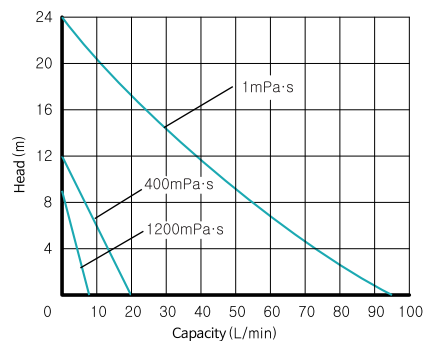
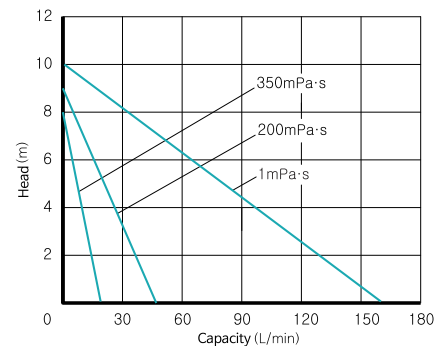
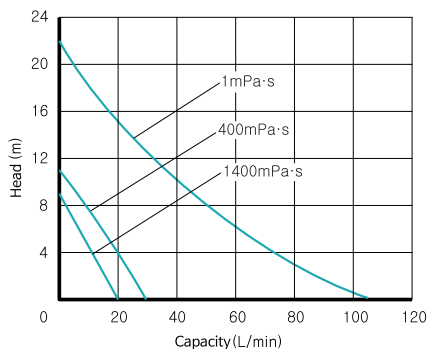
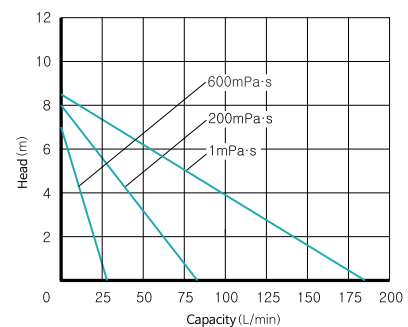
8 MOTOR VOLTAGE

S: 220~230V

3 SHAFT MATERIALS: STS316 H: HASTELLOY
T: TITANIUM**6 MOTOR POWER**

8: 800W Class

Performance Curves

PH, FH(High head)**PL, FL(Low head)****SH(High head)****SL(Low head)****Note**

※Performance curves can be somewhat different accordance with application of job site.

AIR Motor (400W Class)

PP



PVDF



STS316



Application

For transferring acid, alkali and neutral

Examples

Chemicals, Cosmetics raw material, Plating solution, Lubrication oil&etc

Application

For transferring Strong Corrosive chemicals

Examples

Chemicals for washing acid, Strong corrosive chemicals, Toxic chemicals, flammable liquid &etc

Application

For transferring oils, alkali and neutral.

Examples

Cosmetics raw material, Chemicals raw material, Food additives raw material, Spice, Detergent, Water paint, Coating solution, Diesel & etc.

SPECIFICATIONS		DR-PL	DR-PH
Max. Flow rate (L/min)		135	85
Max. Head (m)		8.5	22
Max. Viscosity (mPa·s)		1000	1200
Max. Specific Gravity		1.4	1.8
Dia. of Insertion (mm)		44	44
Dia. for Hose Connection (mm)		25	25
Limit of liquid Temp. (°C)		50	50
Weight (kg)	700mm	2.1	2.1
	1,000mm	2.3	2.3
	1,200mm	2.5	2.5

SPECIFICATIONS		DR-FL	DR-FH
Max. Flow rate (L/min)		135	85
Max. Head (m)		8.5	22
Max. Viscosity (mPa·s)		1000	1200
Max. Specific Gravity		1.4	1.8
Dia. of Insertion (mm)		44	44
Dia. for Hose Connection (mm)		32	25
Limit of liquid Temp. (°C)		80	80
Weight (kg)	700mm	2.3	2.3
	1,000mm	2.6	2.6
	1,200mm	2.8	2.8

SPECIFICATIONS		DR-SL	DR-SH
Max. Flow rate (L/min)		165	95
Max. Head (m)		8	18
Max. Viscosity (mPa·s)		400	800
Max. Specific Gravity		1.4	1.8
Dia. of Insertion (mm)		45	45
Dia. for Hose Connection (mm)		25	25
Limit of liquid Temp. (°C)		100	100
Weight (kg)	700mm	4.0	4.0
	1,000mm	4.8	4.8
	1,200mm	5.3	5.3

Model code

DR-PLS-10-A4-1

1

2

3

4

5

6

7

1 PIPE MATERIAL

P: PP F: PVDF S: STS316

4 PIPE LENGTH

07: 700mm 10: 1000mm 12: 1200mm

7 VALVE TYPE

1: Ball Valve

2 CAPACITY FEATURES

L: Low head H: High head

5 MOTOR TYPE

A: Air Motor

3 SHAFT MATERIAL

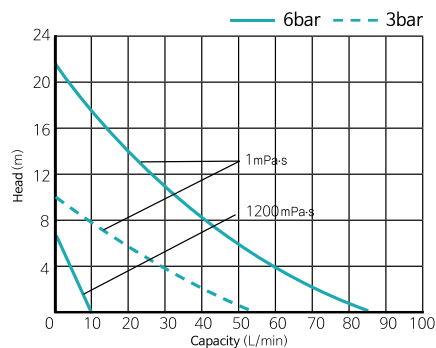
S: STS316 H: HASTELLOY T: TITANIUM

6 MOTOR POWER

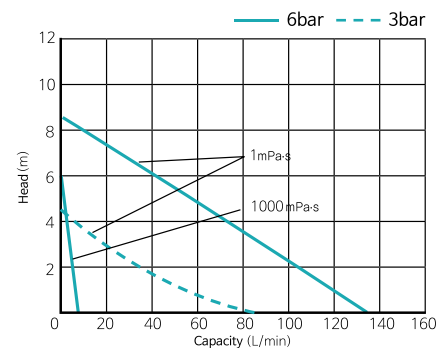
4: 400W Class

Performance
Curves

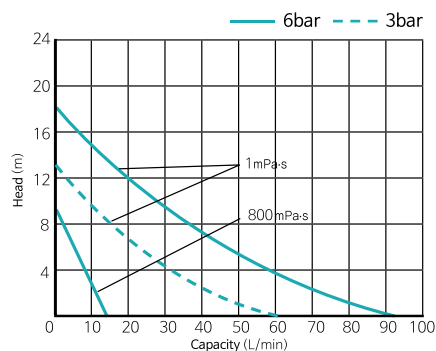
PH, FH(High head)



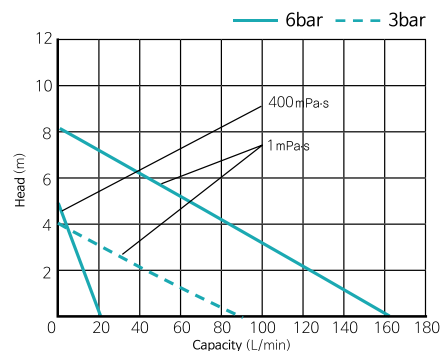
PL, FL(Low head)



SH(High head)



SL(Low head)



Note

※Performance curves can be somewhat different accordance with application of job site.

Ex-Proof Motor (400W Class)



DR-SLS-10-E4S-S

1 2 3 4 5 6 7 8

1 PIPE MATERIAL

S : STS316

2 CAPACITY FEATURES

L : Low head H : High head

3 SHAFT MATERIAL

S : STS316

4 PIPE LENGTH

07 : 700mm 10 : 1000mm
12 : 1200mm

5 MOTOR TYPE

E : Ex-Proof Motor

6 MOTOR POWER

4 : 400W Class

7 MOTOR OPTION

S : Standard
C : Low Voltage Release

8 MOTOR VOLTAGE

S : 220~230V

Application

For transferring flammable liquid

Examples

Coating solution, Ink, Flammable liquid (Alcohol, Thinner, Solvent, etc), Lubricating oil or dangerous liquid in explosion area, chemicals companies, military area & etc.

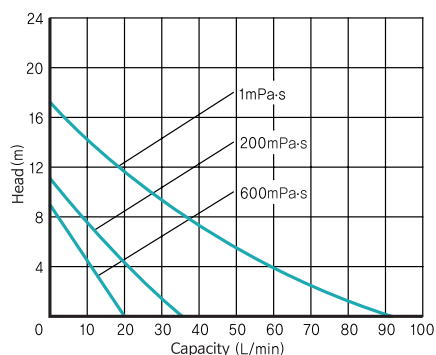
※ Only STS316 Pipe is available for Ex. Proof Motor type Drum Pump.

※ Performance curves can be somewhat different accordance with application of job site.

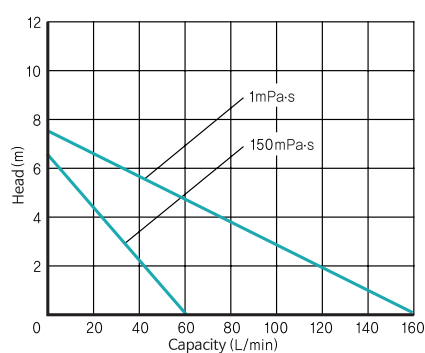
SPECIFICATIONS	DR-SH	DR-SL
Max. Flow rate (L/min)	90	160
Max. Head (m)	17	7.5
Max. Viscosity (mPa·s)	600	150
Max. Specific Gravity	1.6	1.3
Dia. of Insertion (mm)	45	45
Dia. for Hose Connection (mm)	25	25
Limit of liquid Temp. (°C)	100	100
Weight (kg)	700mm	8.1
	1,000mm	8.9
	1,200mm	9.4

Performance Curve

SH(High head)



SL(Low head)



Note

※ Performance curves can be somewhat different accordance with application of job site.

Drum Pump Pipe (Sealless Structure)

PP/PVDF

STS316

- 1 Designed by flexible coupling
- 2 Motor & Pump Pipe can be easily disassembled with Union Nut
- 3 Various Hose connection & Screw connection is easy
- 4 Pipe material have strong durability & corrosion resistance
- 5 Guide Bearing
- 6 Guide Bushing
- 7 Drive Shaft
- 8 Relief port prevents the pumped liquid from rising between Inner Pipe & Shaft and drain the liquid easily
- 9 Adopting Pure Carbon having strong corrosion resistance
- 10 High Head Type (Radial Flow)
- 11 Low Head Type (Axial Flow)



Eccentric Screw

DRUM PUMPS

VDR

- This is a single-axle eccentric screw pump, consisting of rotor and a stator, that enables fast transfer.
- Preventing motor damage by installing of dual safety device in the motor.
- Easy operation and simple part replacement.
- The material of motor casing with strong chemical resistance and shock resistance.
- Transfer various viscous materials and chemicals.
- Transfer flammable liquid by using ex. proof motor or air motor



Motors



Motor	Power	Voltage	Frequency	Current	Protection Grade	Insulation Grade	Weight
U5	560W	220~230VAC	50/60Hz	2.8A	IP44	F	3.0kg
U8	840W	220~230VAC	50/60Hz	4.2A	IP44	F	3.9kg

Motor	Power	Supply Pressure	Air Consumption	Weight
A4	460W	3~6bar	920L/mind	1.2kg

※Explosion Proof Grade: Ex II 2G Ex h IIC T6 Gb (Cert No.0425 ATEX 005330-00)

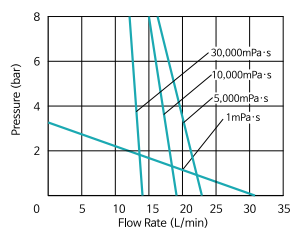
Motor	Power	Voltage	Frequency	Current	Protection Grade	Insulation Grade	Weight
E4	420~430W	220~230VAC	50/60Hz	2.8A	IP54	F	5.2kg

※Explosion Proof Grade: Ex de IIC T6 (Cert No.18-GA2B0-0494X)

Performance Curve

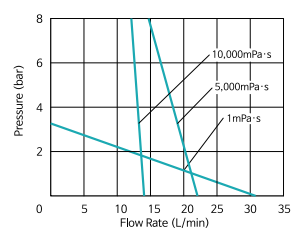
VDR-31T-U8S

800W (Electric Motor)



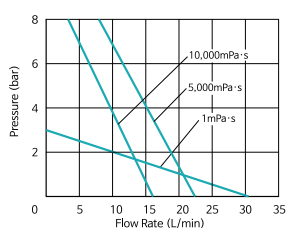
VDR-31T-U4S(E4S)

420~430W (Electric & Ex. Proof Motor)



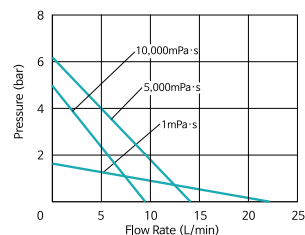
VDR-31T-A4S

460W (Air Motor, 6bar)



VDR-31T-A4S

460W (Air Motor, 3bar)



Note

※Performance curves can be somewhat different accordance with application of job site.

Model Code

VDR-31T-10-U8S-S

1 2 3 4 5 6 7 8

1 MAX. FLOW RATE

3 : 30L/min

4 PIPE LENGTH

10 : 1,000mm 12 : 1,200mm

7 MOTOR OPTION

S : Standard

2 STAGES

1 : 1-Stage

5 MOTOR TYPE

U : Electric Motor
 A : Air Motor
 E : Ex-Proof Motor

8 VOLTAGE

S : 1Ø220~230V 50/60Hz
 1 : Ball Valve

3 STATOR MATERIAL

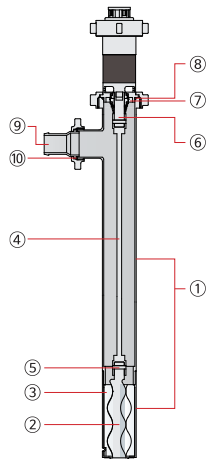
T : PTFE

6 MOTOR POWER

4 : 400W Class
 5 : 500W Class
 8 : 800W Class

SPECIFICATIONS		VDR-31T-U4	VDR-31T-E4	VDR-31T-U8	VDR-31T-A4
Max. Flow rate (L/min)		30			
Max. Discharge Pressure (bar)		8			
Max. Viscosity (mPa·s)		10,000		30,000	10,000
Dia. of Insertion (mm)		51			
Dia. for Hose Connection (mm)		32			
Limit of liquid Temp. (°C)		140			
Noise(dB)		Based on 85 (11,000 RPM)			
Weight (kg)	1000mm	8.2	10.4	9.1	6.4
	1200mm	8.7	10.9	9.6	6.9

Liquid End Material



No.	PART NAME	MATERIAL
①	Pipe	STS316
②	Rotor	STS316
③	Stator	PTFE
④	Drive Shaft	STS316
⑤	Pin	STS316
⑥	Counter Shaft	STS316
⑦	Mechanical Seal	CERAMIC / SIC / STS316
⑧	O-Ring	FEP(+SIL)
⑨	Hose Connector	SSC14
⑩	Packing	PTFE

MESTAR⁺

- MESTAR+ can measure the value of pH/ORP, Residual Chlorine(RC), Dissolved Oxygen (DO) and Electrical Conductivity(EC)
- It is applicable in a variety of industrial site such as sewage treatment plant and power plant
- Simple Calibration and Highly Reliable Digital Type Controller.
- Easy installation with DIN(96·96mm) Standard Size Case and High Legibility by 3inch Segment Display.
- Figure Out the Causes of Error Through Self Diagnostic Function by Data Back-UP



SPECIFICATIONS		CONTENTS
Display		3in. LCD Segment Display (White Back Light)
Measuring Range	pH/ORP	0.00 ~ 14.00pH / -1999~1999mV / -10.0 ~ 100°C (Option)
	RC	0.00 ~ 2.00ppm
	DO	0.00 ~ 20.00mg/L / -10.0 ~ 100°C
	EC	0.00 ~ 10.00mS/cm
Resolution	pH/ORP	0.01pH / 1mV / 0.1°C
	RC	0.01ppm
	DO	0.01 mg/L / 0.1°C
	EC	0.01mS/cm
Analog Output	pH/ORP	DC 4~20mA 2Channels / pH / ORP Meas. Value, Temp. (Option)
	RC	DC 4~20mA 1Channels / ppm Meas. Value
	DO	DC 4~20mA 2Channels / mg/L Meas. Value, Temp. (Option)
	EC	DC 4~20mA 2Channels / EC Meas. Value, Temp. (Option)
Alarm Output		High, Low Alarm (1a1b)
Case		Anti-static ABS
Power		AC85~245V, 50/60Hz, Power Consumption 3W
Weight		Approx. 450g

Model Code

pH/ORP

MESTAR⁺ P -

1 2 3 4

1 CONTROLLER

P : pH/ORP

2 CONTROLLER OPTION

B : Standard
T : Temp. Compensation
C : Communication (RS-485)
X : Communication+
Temp. Compensation

3 OUTPUT OPTION

0 : Standard
1 : Temp. (4~20mA)

4 ELECTRODE

1 : CPP 21 7 : CPP 12
3 : CPM 11 8 : CPP 13
4 : CPP 22 9 : CPP 14
6 : CPP 11

※ Antimony type cannot select output and electrode. (MESTAR+ PA0-0)

RC

MESTAR⁺ R -

1 2 3 4

1 CONTROLLER

R : RC
(Residual Chlorine)

2 CONTROLLER OPTION

B : Standard
C : Communication (RS-485)

3 OUTPUT OPTION

0 : Standard

4 ELECTRODE

1 : CPR 11

DO

MESTAR⁺ D -

1 2 3 4

1 CONTROLLER

D : DO
(Dissolved Oxygen)

2 CONTROLLER OPTION

B : Standard (Temp. Compensation)
C : Communication (RS-485)

3 OUTPUT OPTION

0 : Standard
1 : Temp. (4~20mA)

4 ELECTRODE

1 : CPD 11

EC

MESTAR⁺ E -

1 2 3 4

1 CONTROLLER

R : EC
(Electrical Conductivity)

2 CONTROLLER OPTION

B : Standard (Temp. Compensation)
C : Communication (RS-485)

3 OUTPUT OPTION

0 : Standard
1 : Temp. (4~20mA)

4 ELECTRODE

1 : CPE 11
2 : CPE 12

MESTAR

- MESTAR is capable of measuring pH and ORP values.
- Applicable to various industrial sites such as wastewater treatment plants and power plants.
- Equipped with a convenient auto calibration function
- Configurable relay output with high/low limit setting and deadband adjustment.
- Isolated analog output:
(PROCESS: pH or ORP measurement value / TEMP: Temperature measurement value)



Model Code

► Controller (Controller Options)

MESTAR-HS

1

1 Controller

S : Standard
T : Temperature Compensation
C : Compensation
A : Antimony
X : Compensation
+ Temperature Compensation

► Set (Electrodes)

MESTAR-HS1

1 2

1 Controller

S : Standard
T : Temperature Compensation
C : Compensation
X : Compensation
+ Temperature Compensation

2 Electrode

1 : CPP 21
2 : CPP 22
3 : CPP 11
4 : CPP 12
5 : CPP 13
6 : CPM 11

Controller Specifications

SPECIFICATIONS		CONTENTS
Measuring Method	pH	Glass
	ORP	Platinum
Measuring Range / Resolution	pH	0.00 ~ 14.00pH / 0.01pH
	ORP	-1999 ~ 1999mV / 1mV
	Temperature	0.0 ~ 100.0°C / 0.1°C (Option)
Display		4 Digit LED Segment Display * 2
Relay Output		2 Point De-Energized Relay Output SPDT (1C) 3A/28VDV, 5A/125VAC, 3A/250VAC
Communication		RS-485 Two-Wire (Half-Duplex) (Option)
Calibration		2 Point Automatic or Manual
Power		85~245VAC 50/60Hz 3W
Weight		450g
Installation		Indoor (Case: Anti-Static ABS)

Electrodes

pH



ORP



RC



DO



EC



CONTROLLER	MODEL	Temp. Compensation	Operating Temperature	Material	Supplement	Method of Measurement	Internal Liquid	Cable Length	
pH	CPP 21	X	0~80°C	Glass	Required	Glass Sensor	3.3mol KCl	5M	
	CPP 22	O							
	CPP 11	X		PC	Supplement free				
	CPP 12	O							
	CPP 13	O							Glass
	CPP 14	X							PC
ORP	CPM 11	X	Glass	Platinum					
RC	CPR 11	X	2~45°C	Glass		Constant Voltage	10M		
DO	CPD 11	O	0~50°C	ABS	Required	Galvanic	0.5mol NaOH	5M	
EC	CPE 11	O	0~80°C	ABS	-	2 Pole	-		
	CPE 12	O							

Note

CPP13 is for Hydrofluoric Acid.



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