

## Electromagnetic metering pumps EK series



# Electromagnetic metering pumps with 100% watertight construction

IP67



The EK series electromagnetic metering pumps are constructed to be perfectly watertight. Conventional electromagnetic pumps are thought to be vulnerable to exposure to external liquids, which means that they are unsuitable for outdoor use. To address this weak point, we have done our best to make the controller unit and the drive unit fully watertight and moisture proof. As a result, the EK series is the world's first plastic resin electromagnetic metering pumps that are capable of being used outdoors. They can be used widely in various facilities and plants for water treatment, surface treatment and so forth.

### Waterproof structure (equivalent to IP67)

By integrating a one-piece pump body, sealing portions are reduced in number to prevent liquids from entering due to sealing defects. A rubber gasket is provided between the pump head and the bracket to prevent water from entering through the periphery of the pump head.

To keep the controller unit watertight, a plastic cover with gasket is provided as standard equipment.

The adoption of membrane switches for the controller panel is another measure for the prevention of liquid penetration.

### Moistureproof structure

The electronic parts and printed board have been molded from resin. This prevents dew condensation and short-circuiting caused by atmospheric gas.

### High resolution

For discharge flow adjustment, a dual control system which controls the length of stroke and the number of strokes is employed. Since stroke by stroke adjustment is possible, the discharge rate can be controlled in a wide range from a minimal flow rate to a maximum discharge.

### Controller

The controller has a CPU. Both the stop function and the external function are included as standard equipment. As the display for the number of strokes, a high-temperature resistant LCD is employed to allow long-term exposure to the direct rays of the sun.



EK-10



# High-tech combination of pump technology and electronics technology



## Pump unit

### Pump head

Four types, PVC, GFRPP, PVDF and Stainless steel 316 are available.



### Diaphragm

A flat diaphragm with less dead volume. Made of EPDM covered by fluororesin, it is highly corrosion-resistant and remarkably durable.



### Valve

A two-stage valve system, which has high checking ability, is used. There are two types of valve assemblies, i.e., for acid liquid and for alkaline liquid.

### Air vent valve

The smaller flow rate types (to the EK-□20) have air vent valves as standard equipment. Air in the pump chamber can be easily released simply by turning knob.



Note: For SUS316 type, airvent valve is available for all pump sizes.

## Drive unit

### Solenoid

A coil and a thermal protector, insert-molded from resin, ensure insulation. For the convenience in recycling, the resin portion and the metal portion are constructed to be easily separable.

### Pump body

The body is in a PPE case; this material offers strong protection against ultraviolet rays and has high chemical resistance. All of the assembled portions are attached with rubber seals; its watertightness is equivalent to IP67.

## Controller unit

### Controller

A CPU is mounted to raise the resolution and promote functional diversity.

### Control panel

An LCD suitable for use under high temperature is also weather-tight and easy for the operator to read. To protect the controller portion from external liquids, membrane switches are used.

### Stroke length adjusting dial

The large adjusting dial is easy to operate. Dual control of the number of strokes as well as the length of stroke allows a wide range of discharge adjustment.

### Controller cover

All the models have controller covers as standard equipment.

### Connector

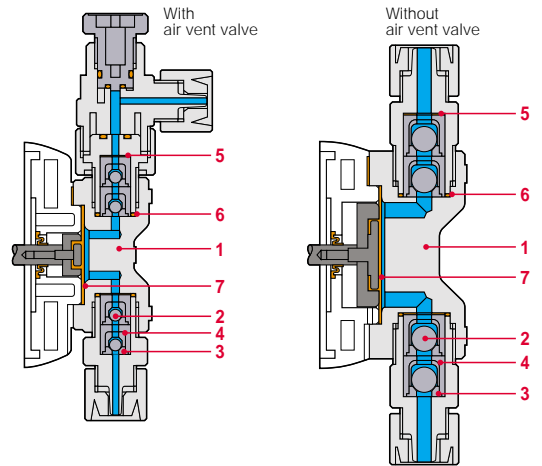
Sealability has been improved by the adoption of an IP68 connector.



## Wet-end materials

	VC	VH	PC	PH	TC	SH
1 Pump head	PVC	PVC	GFRPP	GFRPP	PVDF	SUS316
2 Valve	Alumina ceramic	Hasteloy C276	Alumina ceramic	Hasteloy C276	Alumina ceramic	Hasteloy C276
3 Valve seat	FKM	EPDM	FKM	EPDM	PCTFE	SUS316
4 Valve guide	PVC	PVC	GFRPP	GFRPP	PVDF	SUS316
5 Valve gasket	PTFE					
6 O ring	FKM	EPDM	FKM	EPDM	-	-
7 Diaphragm	PTFE coated EPDM					

Note : Illustration shows PVC, GFRPP and PVDF type.



## Pump identification

EK - B 10 VC - 20E P R 2  
 ① ② ③ ④ ⑤ ⑥ ⑦ ⑧

### ① Series name

Iwaki electromagnetic metering pump EK series

### ② Drive unit symbol

Average power consumption / Length of stroke  
 B : 20W / 1mm C : 22W / 1.25mm

### ③ Effective diameter of diaphragm

10: 10mm 15: 15mm 20: 20mm  
 30: 30mm 35: 35mm

### ④ Wet-end material symbol

For details, see the table of materials.

### ⑤ Power supply voltage symbol

100: AC100/110/115V single phase 50/60Hz  
 20E: AC220V/230V/240V single phase 50/60Hz

### ⑥ Power cord terminal

P: With plug  
 No code: Solderless terminal

### ⑦ Controller unit type

R: R type

### ⑧ Diameter of connecting tube (mm)

1: 4x9 2: 4x6 3: 6x8 4: 8x13 5: 9x12  
 6: 10x12 9: Rc1/4"

## Specifications of pump

Model		B10	B15	B20	B30	C15	C20	C30	C35	
Capacity	VC, VH, PC, PH	L/hr	2.4	3.9	6.9	12.6	4.8	8.7	16.2	25.2
		mL/min	40	65	115	210	80	145	270	420
		mL/shot	0.11	0.18	0.31	0.58	0.22	0.4	0.75	1.17
	TC, SH	L/hr	2.4	-	6.9	-	-	8.1	16.2	24.0
		mL/min	40	-	115	-	-	135	270	400
		mL/shot	0.11	-	0.31	-	-	0.38	0.75	1.11
Max. discharge pressure	MPa	1.0	0.7	0.4	0.2	1.0	0.7	0.35	0.2	
Stroke length (Effective adjustment range)	mm	1 (40-100%)				1.25 (30-100%)				
Stroke rate		1-360spm								
Power supply (common to 50/60Hz)		AC100V / 110V / 115V or 220V / 230V / 240V single phase								
Insulation type, etc.		E type insulation / with built-in thermal protector / with 1.5m power cord								
Average power consumption	W	20				22				
Connection (Applicable tube diameter)	VC, VH	mm	4x6, 4x9, 6x8			8x13, 9x12		4x6, 4x9, 6x8		8x13, 9x12
	PC, PH	mm	4x6, 4x9			8x13, 9x12		4x6, 4x9		8x13, 9x12
	TC, SH	mm	4x6	-	4x6	-	-	4x6	10x12	
Thread connection	SH		Rc1/4"	-	Rc1/4"	-	-	Rc1/4"		
Mass	kg	2.8				3.7				

Note 1: The maximum discharges are values with clear water and under maximum discharge pressures. Under lower discharge pressures, larger amounts than the above are discharged.

Note 2: To prevent overfeeding, discharge pressure should be 0.12 MPa or higher. (For B30 and C35, however, it should be 0.05 MPa or higher.) If these levels are not reached, make sure to use a check valve, which is an optional item.

Note 3: Above mass are PVC, GFRPP & PVDF type. Please contact Iwaki for SUS316 type.

### Operating Conditions

- Liquid temperature range VC/VH : 0 to 40°C, PC/PH/TC/SH : 0 to 60°C (Without dew condensation.)
- Ambient temperature range VC/VH : 0 to 45°C, PC/PH/TC/SH : 0 to 50°C

## Specifications of controller

Operational function	Function	MANUAL (Manual operation) EXT (Operation by external signals) STOP (Operation to be stopped by external signals)
	Switching	Selection by operating keys (UP and DOWN keys) START / STOP key (Membrane)
Control function	Setting	• MANUAL The number of strokes between 1 and 360 spm • EXTERNAL Digital input operation 1 : 1 (No pulse to be stored; the highest SPM at the time of overflow)
	Stop	Stop contact input stops pump operation.
	Highest SPM	360 spm.
Input	Pulse	No-voltage contact or open collector
	Stop	Level sensor : No-voltage contact or open collector
Connection	External connection	Terminal connector connection (Original type)

### Operating Conditions

- Ambient temperature range : 0 to 50°C
- Ambient humidity range : 35 to 95% RH (Without dew condensation inside the controller.)

**Accessories**

**Check valve CA /CB / CS**

This has the function of a nonreturn valve and prevents siphon and overfeed.

**CA** : Available in PVC and CFRPP.



**CB** : In-line type to be connected in the middle of a hose; made of PVC or CFRPP.



**CS** : Made of stainless steel for SH type.



**Specifications**

Model	Connection		Set pressure MPa	Material			Applicable pump
	Inlet mm	Outlet mm		Body	Spring	O-ring	
CA-1VC (1V)	4x6	R3/8 and R1/2	0.17 ± 0.04	PVC (CFRPP)	Hastelloy C276	FKM	EK-B10, B15, B20, C15, C20
CA-1VE (1E)	4x9 6x8					EPDM	
CA-2VC (2V)	8x13	R3/8 and R1/2	0.17 ± 0.04	PVC (CFRPP)	Hastelloy C276	FKM	EK-C30
CA-2VE (2E)	9x12					EPDM	
CA-2VCL (2VL)	8x13	R3/8 and R1/2	0.05 ± 0.03	PVC (CFRPP)	Hastelloy C276	FKM	EK-B30, C35
CA-2VEL (2EL)	9x12					EPDM	
CB-1VC (1V)	4x6	4x6	0.17 ± 0.04	PVC (CFRPP)	Hastelloy C276	FKM	EK-B10, B15, B20, C15, C20
CB-1VE (1E)	4x9 6x8	4x9 6x8				EPDM	
CB-2VC (2V)	8x13	8x13	0.17 ± 0.04	PVC (CFRPP)	Hastelloy C276	FKM	EK-C30
CB-2VE (2E)	9x12	9x12				EPDM	
CB-2VCL (2VL)	8x13	8x13	0.05 ± 0.03	PVC (CFRPP)	Hastelloy C276	FKM	EK-B30, C35
CB-2VEL (2EL)	9x12	9x12				EPDM	
CS-1S	Rc1/4	Rc1/4	0.2 ± 0.03	SUS304	Hastelloy C276	EPDM	EK-B10, B15, B20, C15, C20, C30
CS-1SL			0.05 ± 0.03				EK-B30, C35

**Siphon preventing valve BVC**

Made of PVC or GFRPP consisting of non-metallic parts.



**Specifications**

Model	Connection		Set pressure MPa	Material			Applicable pump
	Inlet mm	Outlet		Body	Spring	O-ring	
Note: BVC-1 □□	4x6 6x8 9x12	R3/8 or R1/2	0.2 or 0.05	PVC	-	FKM or EPDM	All models

Note : Different models are available. Please contact for particulars.

**Air vent valve AV**

This is for EK-B30, C30 and C35.



**Specifications**

Model	Tube connection	Material	Applicable pump
AV-LVC	8x13mm 9x12mm	PVC, FKM	EK-B30, C30, C35-VC
AV-LVH		PVC, EPDM	EK-B30, C30, C35-VH
AV-LPC		GFRPP, FKM	EK-B30, C30, C35-PC
AV-LPH		GFRPP, EPDM	EK-B30, C30, C35-PH

**Multi-function valve MFV**

This valve has the multi-function of air vent, pressure release inside pipe and back pressure valve.



**Specifications**

Model	Tube connection	Set pressure	Material	Applicable pump
MFV-SVC	4x6mm 6x8mm 4x9mm	0.2 ± 0.05MPa	PVC / FKM / PTFE	EK-B10, B15, B20, C15, C20
MFV-SVH			PVC / EPDM / PTFE	
MFV-SPC			GFRPP / FKM / PTFE	
MFV-SPH			GFRPP / EPDM / PTFE	

**Foot valve FS / FSP**

This foot valve with a strainer is made of PVC or GFRPP.



**Specifications**

Model	Tube connection	Material	Applicable pump
FSV	4x6mm 6x8mm 4x9mm 8x13mm 9x12mm	PVC / FKM / Alumina ceramic	All models
FSE		PVC / EPDM / HastelloyC276	
FSPV		GFRPP / FKM / Alumina ceramic	
FSPE		GFRPP / EPDM / HastelloyC276	

**Chemical tank CT**

This is a light and strong polyethylene round tank. 25L, 50L, and 100L models are available.



CT-100A

CT-50A

CT-25A

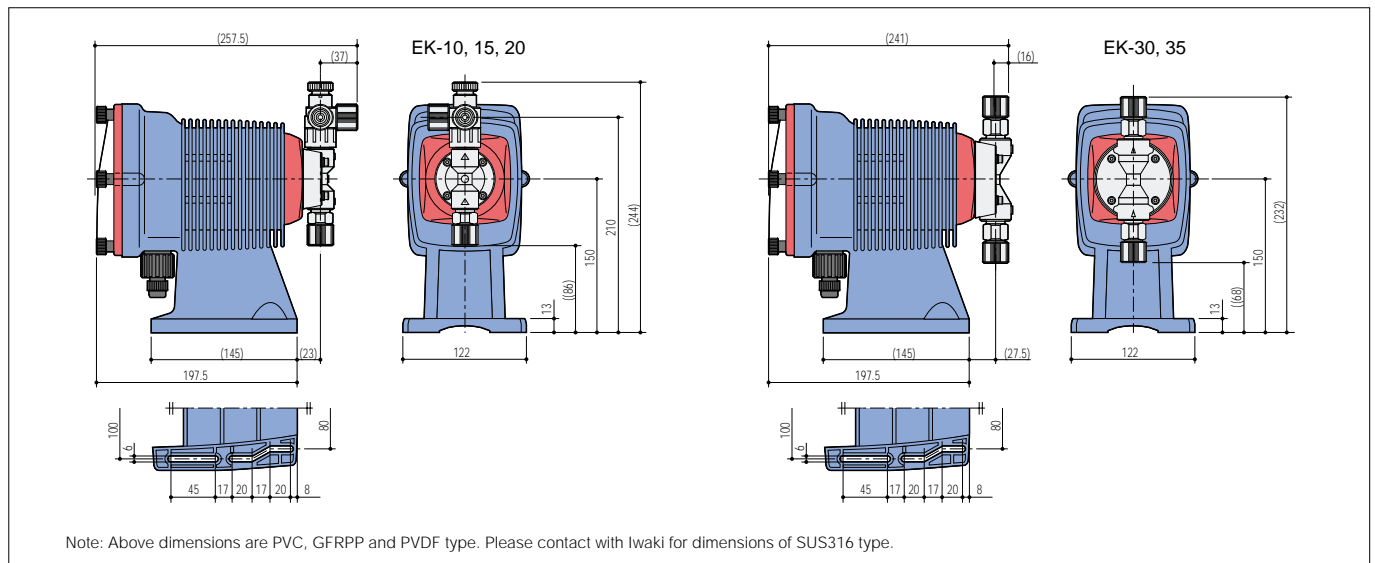
**Chemical tank CT-U120N**

This is square polyethylene tank with a pump located below it. This tank can be used safely, as it is free from gas-lock problems.

Capacity : 110L



## Dimensions in mm



## EK-HV models

### HV type handles high viscosity application.

The EK-HV models are specially designed for accurate feeding of high viscous chemicals. Special shape of flow pass on pump chamber, spring-loaded stainless steel valve balls and special shape of valve seat achieve to handle high viscous chemical.

### Specifications

- Max. discharge capacity: 7.44L/hr (124mL/min)
- Max. discharge pressure: 0.35 MPa
- Max. stroke rate: 240 spm
- Main materials: GFRPP / EPDM / SUS316

Note: Above discharge capacity is the value when handling clear water. When handling actual viscous liquid, discharge capacity is increased. When is required larger volume than EK-HV type, EH-E35 with HV type pump head is available. For details, please contact us.

