

# MAGNETIC DRIVE PUMP VERTICAL PUMP

마그네틱펌프 / 버티칼펌프



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**CY MAG**  
CHEMICAL PUMP

**B<sup>+</sup>** NABOTHTEC  
나보스텍

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# MAGNETIC DRIVE PUMP

## FEATURE

### CMX/CMD/CMH/CAMX SERIES



#### ● 우수한 내산성과 내알칼리성

펌프의 재질은 CFRPP(Carbon fiber polypropylene), GFRPP(Glass Fiber Filled Polypropylene), PVDF(Natural PVDF), CFRETFE(Carbon Fiber Filled ETFE)로 나누어 지고 화학용액의 농도와 특성에 따라 선택사용이 가능합니다. GFRPP, CFRPP 재질은 75도 이하 PVDF는 90도 이하 CFRTFE는 100도 이하에서 사용가능합니다. 모든 종류의 화학용액을 안전하게 이동할 수 있습니다.

#### Super acid and alkali resistance

Main materials of pumps are divided into CFRPP(Carbon fiber polypropylene), GFRPP(Glass Fibre Filled Polypropylene), PVDF (Natural PVDF), CFRETFE(CarbonFiber Filled ETFE). Material of the main part of pumps is selected according to PH value of chemical liquid. CFRPP, GFRPP may withstand 75°C, PVDF may withstand 90°C and CFRETFE is resistant to 100°C. Almost all types of chemicals can be transmitted safely.

#### ● 활용의 다양성

마그네틱펌프는 CMD 시리즈 (45W -260W), CMH 시리즈 (0.4 Kw -3.75 Kw), CMX 시리즈 (180W-260W) (0.4 Kw -2.2 Kw), CAMX 시리즈 (0.4 Kw ~3.75 Kw)가 있으며 저유량/고양정 및 고유량/저양정에서 사용가능합니다.

많은 산업분야의 PCB 장비는 물론 에칭, 전기도금, 하수처리등에서 탁월한 성능을 발휘합니다.

#### Versatile Applications

Magnetic force driving pumps are divided into CMD series (45W-260W), CMH series (0.4 Kw-3.75Kw) and CMX series (180W-260W) (0.4 Kw-2.2 Kw ) CAMX series (0.4 Kw-3.75 Kw), and can be used for requirement of high flowrate/low lift or low flowrate/high lift.

Its excellent performance and durability can be utilized fully for many types of industrial processes such as PCB processing, etching, electroplating, surface treatment, sewage treatment.



#### ● 효율적인 내구성

마그네틱 펌프는 전력 소비량이 적고 효율이 높습니다. 매끄러운 씰링처리로 강한 내구성을 가지며 고온으로 인한 모터의 손상을 감소 시켰습니다. 또한 프리미엄 전폐형 모터로써 높은 성능과 효율성이 보장됩니다.

#### Efficient and durable

Magnetic force synchronous drive features small power consumption and high efficiency. The sealed static seal free of shaft sealing eliminates medium leakage completely. Heat radiation structure is designed inside pumps. Adoption of quality and professional anti-explosive motor ensures high efficiency and durability.

#### ● 내부식성

펌프 모터의 표면은 높은 등급의 부식 방지 처리가 되어 있고 주요 부품은 우수한 내부식성을 갖고 있습니다. 펌프의 Spindle은 SIC와 CERAMIC 두가지 종류가 있으며 CERAMIC은 일반적인 부식성 액체에, SIC는 고부식성 액체 (불산)에 사용합니다.

#### Corrosion Resisting

The surface of pump motor is painted with high-grade anti-corrosive paint. Main accessories of the pumps feature outstanding corrosion-resist capability. For example, the pump spindle can be made from ceramic and SIC. The ceramic spindle is generally applied for low corrosion liquid. The SIC spindle is excellent for high corrosion liquid.

#### ● 간편한 조립

마그네틱펌프는 작고 경제적인 구조를 특징으로 합니다. 펌프 내부의 부품은 분해 및 조립이 용이하며, 쉬운 부품 교체를 가능하게 하여 설치, 유지보수, 해체 및 검사를 손쉽게 수행할 수 있습니다.

#### Easy assembly

Magnetic pumps feature compact structure. Parts inside pumps are standardized to enable exquisite structure and easy dismantling and assembly and part replacement. Installation, maintenance, dismantling and inspection can be performed easily.



**CMX SERIES**

**MODEL IDENTIFICATION**



**CMX - C - 400 - S - V - 6**  
 ① ② ③ ④ ⑤ ⑥

- ① **MODEL :** CMX
- ② **MATERIAL :** C-CFRPP G-GRPP K-PVDFE-CFRETFE
- ③ **IN-OUTLET POWER :** 25180-25A X 25A180W  
 25250-25A X 25A260W / 250- 25A X25A 0.4Kw  
 251 - 25A X 25A 0.75K / 400- 40A X10A 0.4Kw  
 401 - 40A X10A 0.75Kw / 402,402H - 50A X 40A 1.5K  
 403,403H -50A X 40A2.2Kw
- ④ **BEARING :** A-CERAMIC C-CARBON P-PVDFE-SIC
- ⑤ **RUBBER :** V-VITON EEPDM P-PFA
- ⑥ **FREQUENCY :** 5-50HZ 6-60HZ

**CMH SERIES**

**MODEL IDENTIFICATION**



**CMH - C - 44 - 0 - S - V - 6**  
 ① ② ③ ④ ⑤ ⑥ ⑦

- ① **MODEL :** CMH
- ② **MATERIAL :** C-CFRPP G-GRPP K-PVDFE-CFRETFE
- ③ **IN-OUTLET :** 44 -40 X 40mm / 4550 X40mm  
 56 -65 X 50mm
- ④ **POWER :** 0-1/2HP 1-1HP 2-2HP 3-3HP 5-5HP
- ⑤ **BEARING :** A-CERAMIC C-CARBON P-PVDFE-SIC
- ⑥ **RUBBER :** V-VITON EEPDM P-PFA
- ⑦ **FREQUENCY :** 5-50HZ 6-60HZ

**CMD SERIES**

**MODEL IDENTIFICATION**



**CMD - C - 40R - S - S - V - 6**  
 ① ② ③ ④ ⑤ ⑥ ⑦

- ① **MODEL :** CMD
- ② **MATERIAL :** C-CFRPP G-GRPP K-PVDFE-CFRETFE
- ③ **IN-OUTLET POWER :** 30R - 20X 20A45W  
 40R - 20A X 20A 65W 55R - 26A X 26A90W  
 70R - 26A X 26A 180W100R - 26AX 26A 260W
- ④ **CONNECTION :** S-SCREW H-HOSE
- ⑤ **SPINDLE :** A-CERAMIC S-SIC
- ⑥ **RUBBER :** V-VITON E-EPDM P-PFA
- ⑦ **FREQUENCY :** 5-50HZ 6-60HZ

**CAMX SERIES**

**MODEL IDENTIFICATION**



**CAMX - C - 5 4 2 - S - V - 6**  
 ① ② ③ ④ ⑤ ⑥ ⑦ ⑧

- ① **MODEL :** CAMX
- ② **MATERIAL :** C-CFRPP G-GRPP K-PVDFE-CFRETFE
- ③ **IN :** 4 - 40A / 5 - 50A / 6 - 65A
- ④ **OUTLET :** 4 - 40A / 5 - 50A
- ⑤ **POWER :** 0-1/2HP 1-1HP 2-2HP 3-3HP5-5HP
- ⑥ **BEARING :** A-CERAMIC C-CARBON P-PVDFE-SIC
- ⑦ **RUBBER :** V-VITON E-EPDM P-PFA
- ⑧ **FREQUENCY :** 5-50HZ 6-60HZ

# MAGNETIC DRIVE PUMP

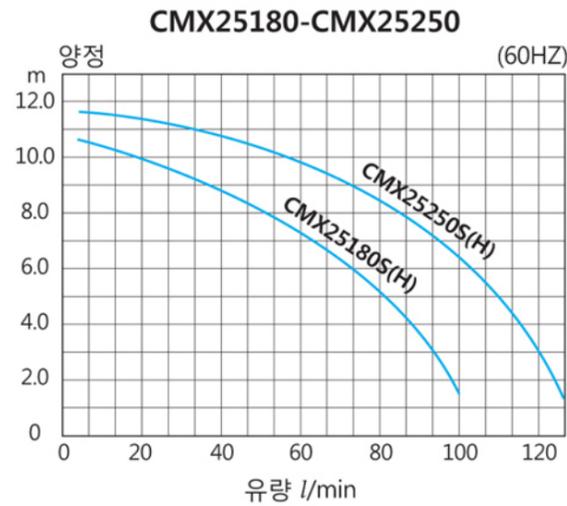
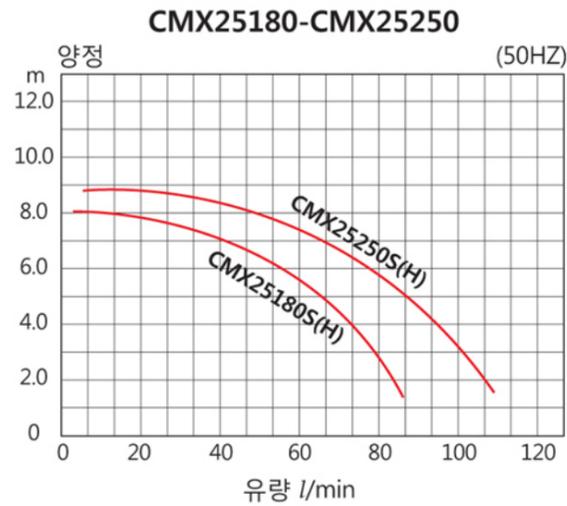
## PERFORMANCE CURVE SPECIFICATIONS

### CMX SERIES



#### CMX SERIES

#### PERFORMANCE CURVE CHART



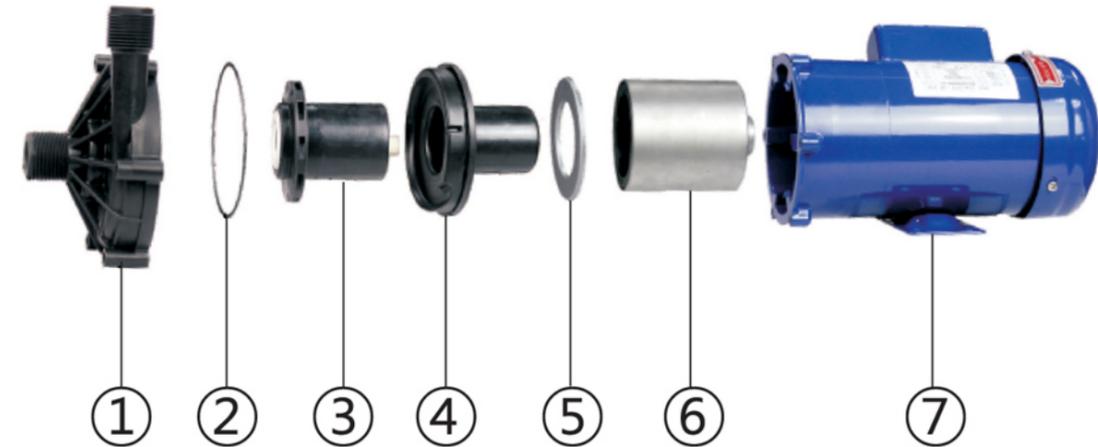
#### CMX SERIES

#### SPECIFICATIONS

MODEL		CMX-25180S(H)	CMX-25250S(H)
S.G.		1.2	1.2
Hose Connected	IN (mm)	25	25
	OUT (mm)	25	25
Screwed Diameter	IN (Inch)	1	1
	OUT (Inch)	1	1
Max. Capacity	50 Hz (L/min)	90	110
	60 Hz (L/min)	100	125
Max. Head	50 Hz (M)	8.0	8.6
	60 Hz (M)	10.8	11.8
Standard Duty Point	50 Hz (M-L/min)	5.4-50	6-70
	60 Hz (M-L/min)	7.8-50	9-70
Motor 50Hz/60Hz	Output (W)	150/180	260/260
	Phase (Ø)	1 or 3	1 or 3
Weight	kg	6.5	8.7

#### CMX SERIES

#### PART CHART



NO	Description	Material			
		CMX-C Series	CMX-G Series	CMX-K Series	CMX-E Series
1	Front Casing	CFRPP	GFRPP	PVDF	CFRETFE
2	O-ring	EPDM/VITON/PFA			
3	Impeller	CFRPP		PVDF	CFRETFE
4	Rear Capsule	CFRPP	GFRPP	PVDF	CFRETFE
5	Retainer Ring	SUS 304			
6	Drive Magnet	Isotropic-Ferrite			
7	Motor				

# MAGNETIC DRIVE PUMP

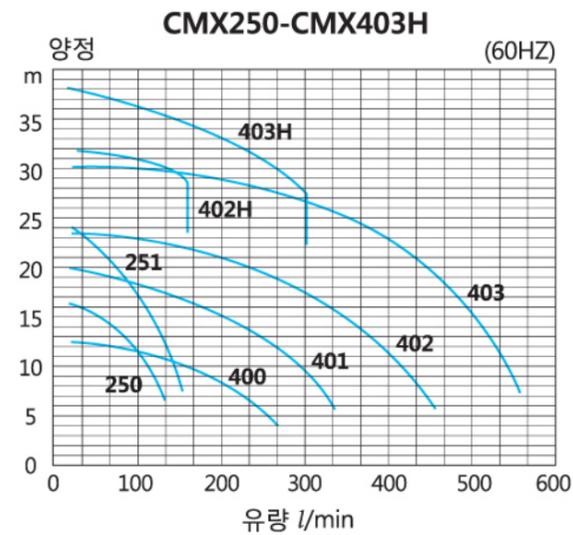
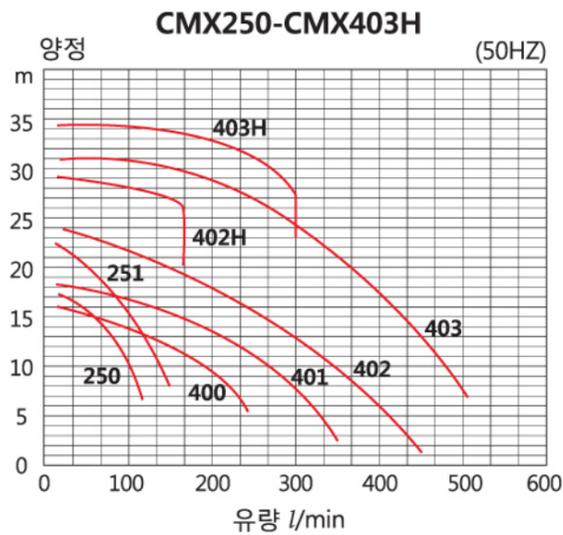
## PERFORMANCE CURVE SPECIFICATIONS

### CMX SERIES



#### CMX SERIES

#### PERFORMANCE CURVE CHART



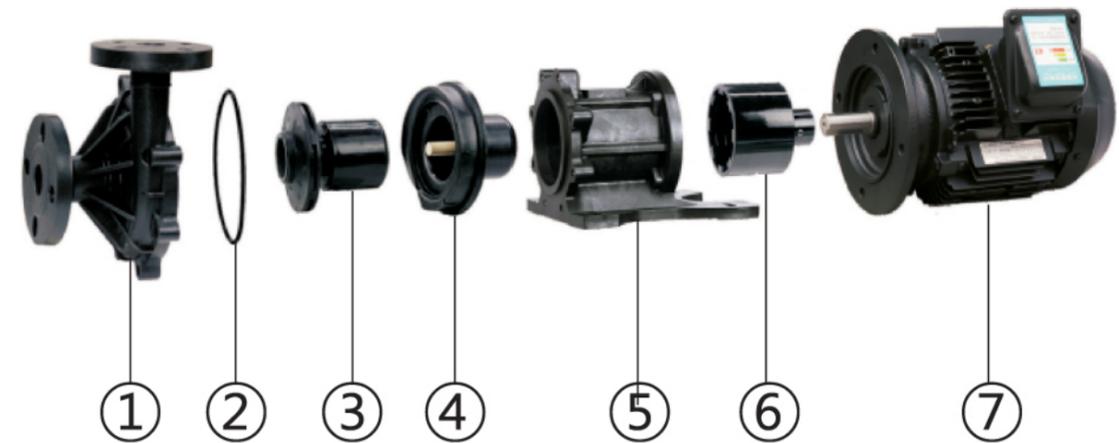
#### CMX SERIES

#### SPECIFICATIONS

MODEL		CMX-250	CMX-251	CMX-400	CMX-401	CMX-402	CMX-402H	CMX-403	CMX-403H
<b>S.G.</b>		1.0	1.0	1.2	1.2	1.2	1.0	1.2	1.0
<b>In-Out Diameter</b>	IN(mm)	25	25	40	40	50	50	50	50
	OUT(mm)	25	25	40	40	40	40	40	40
<b>Max. Capacity</b>	50Hz(L/min)	120	140	260	320	450	160	500	300
	60Hz(L/min)	120	140	260	320	450	160	500	300
<b>Max. Head</b>	50Hz(M)	17.5	22.5	15.5	17.5	23.5	31	31	35
	60Hz(M)	16.5	24	12.5	19	23.5	30	30	36.5
<b>Standard Duty Point</b>	50Hz(M-L/min)	14-50	19-70	13.5-100	14.5-150	20-250	28-100	23-250	34-100
	60Hz(M-L/min)	13.5-50	19-75	11-100	14.5-190	20-240	30-100	25-250	35-100
<b>Motor</b>	Output (kw)	0.37	0.75	0.37	0.75	1.50	1.50	2.20	2.20
<b>Weight</b>	kg	11.8	17.0	12.0	17.0	22.60	22.60	25.0	25.0

#### CMX SERIES

#### PART CHART



NO	Description	Material										
		CMX-C Series			CMX-G Series			CMX-K Series		CMX-E Series		
		CC	CP	CA	CC	CP	CA	CC	CP	CA	SS	SS
1	Front Casing	CFRPP			GFRPP			PVDF		CFRETFE		
2	O-ring	EPDM/VITON/PFA										
3	Impeller	CFRPP					PVDF		CFRETFE			
4	Rear Capsule	CFRPP			GFRPP			PVDF		CFRETFE		
5	Frame	GFRPP										
6	Drive Magnet	Isotropic-Ferrite										
7	Motor											

# MAGNETIC DRIVE PUMP

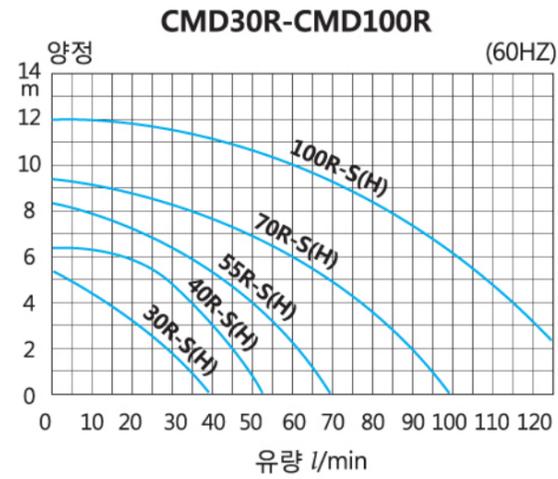
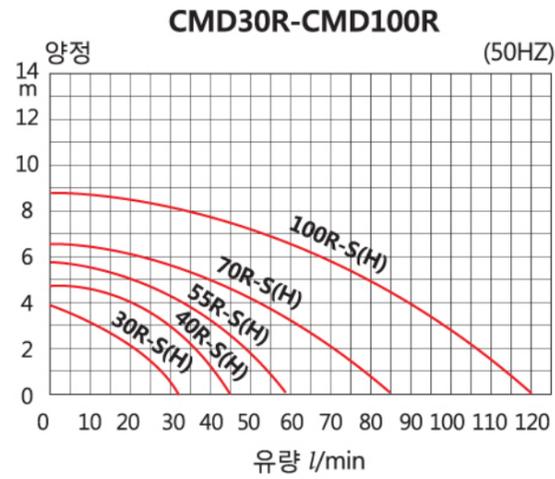
## PERFORMANCE CURVE SPECIFICATIONS

### CMD SERIES



#### CMD SERIES

#### PERFORMANCE CURVE CHART



#### CMD SERIES

#### SPECIFICATIONS

MODEL		CMD-30R	CMD-40R	CMD-55R	CMD-70R	CMD-100R
<b>S.G.</b>		1.3	1.1	1.2	1.0	1.2
<b>Hose Connected</b>	IN (mm)	20	20	26	26	26
	OUT (mm)	20	20	26	26	26
<b>Screwed Diameter</b>	IN (Inch)	3/4	3/4	1	1	1
	OUT (Inch)	3/4	3/4	1	1	1
<b>Max. Capacity</b>	50 Hz (L/min)	32	45	60	86	120
	60 Hz (L/min)	38	52	70	97	135
<b>Max. Head</b>	50 Hz (M)	3.8	4.6	5.6	6.7	8.6
	60 Hz (M)	5.4	6.5	8.2	9.7	11.9
<b>Standard Duty Point</b>	50 Hz (M-L/min)	2.5-16	4-22	4-30	4-50	6.5-60
	60 Hz (M-L/min)	2.5-24	4-34	4-45	4-72	9-70
<b>Motor 50Hz/60Hz</b>	Output (W)	45	65	90	150/180	255/265
	Input (W)	60/80	90/130	130/170	210/300	245/365
	Phase (Ø)	1	1	1 or 3	1 or 3	1 or 3
<b>Weight</b>	kg	4.1	4.4	6.0	6.4	8.0

#### CMD SERIES

#### PART CHART



NO	Description	Material			
		CMD-C Series	CMD-G Series	CMD-K Series	CMD-E Series
1	Front Casing	CFRPP	GFRPP	PVDF	CFRETFE
2	O-ring	EPDM/VITON/PFA			
3	Impeller	CFRPP		PVDF	CFRETFE
4	Rear Capsule	CFRPP	GFRPP	PVDF	CFRETFE
5	Retainer Ring	SUS 304			
6	Drive Magnet	Isotropic-Ferrite			
7	Motor				

# MAGNETIC DRIVE PUMP

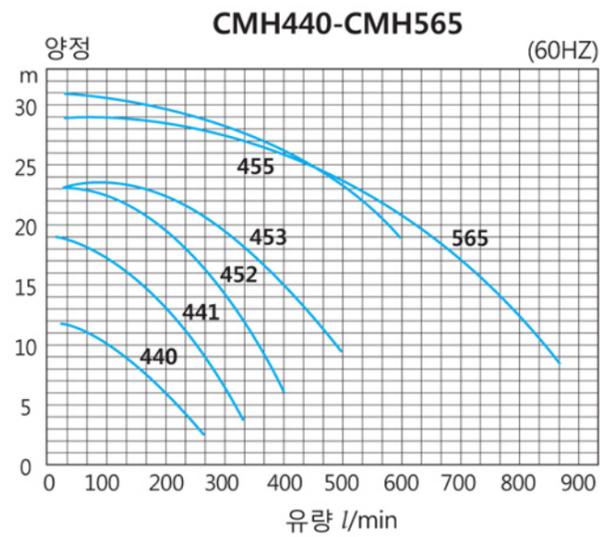
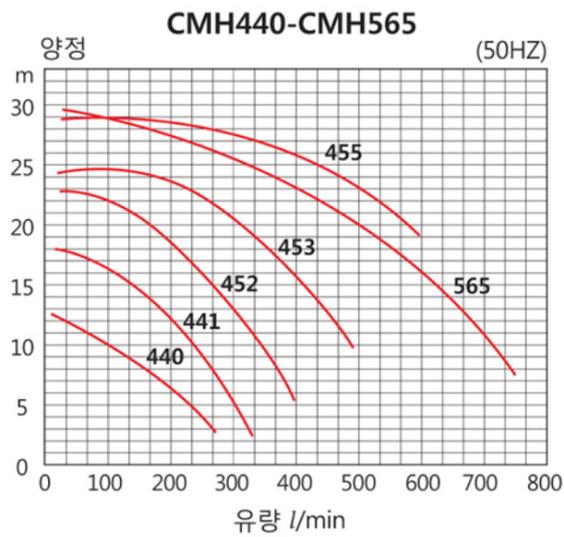
## PERFORMANCE CURVE SPECIFICATIONS

### CMH SERIES



#### CMH SERIES

#### PERFORMANCE CURVE CHART



#### CMH SERIES

#### SPECIFICATIONS

MODEL		CMH-440	CMH-441	CMH-452	CMH-453	CMH-455	CMH-565
<b>S.G.</b>		1.0	1.0	1.2	1.2	1.0	1.0
<b>In-Out Diameter</b>	IN(mm)	40	40	50	50	50	65
	OUT(mm)	40	40	40	40	40	50
<b>Max. Capacity</b>	50Hz(L/min)	280	330	400	500	600	730
	60Hz(L/min)	280	320	400	500	600	800
<b>Max. Head</b>	50Hz(M)	12.5	18	23	24	29	28.6
	60Hz(M)	11.5	18.5	22	22.5	31	29.4
<b>Standard Duty Point</b>	50Hz(M-L/min)	8.5-150	12-200	18.5-200	20.5-300	25.5-400	18.5-500
	60Hz(M-L/min)	8.5-150	12.5-200	18.5-200	19-300	26.5-400	22.0-500
<b>Motor</b>	Output (W)	0.37	0.75	1.50	2.20	3.75	3.75
<b>Weight</b>	kg	11.6	19.0	24.0	24.90	47.4	48.6

#### CMH SERIES

#### PART CHART



NO	Description	Material										
		CMH-C Series			CMH-G Series			CMH-K Series		CMH-E Series		
		CC	CP	CA	CC	CP	CA	CC	CP	CA	SS	SS
1	Front Casing	CFRPP			GFRPP			PVDF		CFRETFE		
2	O-ring	EPDM/VITON/PFA										
3	Impeller	CFRPP					PVDF		CFRETFE			
4	Rear Capsule	CFRPP			GFRPP			PVDF		CFERTFE		
5	Retainer Ring	SUS 304										
6	Frame	GFRPP										
7	Drive Magnet	Isotropic-Ferrite										
8	Motor											

# MAGNETIC DRIVE PUMP

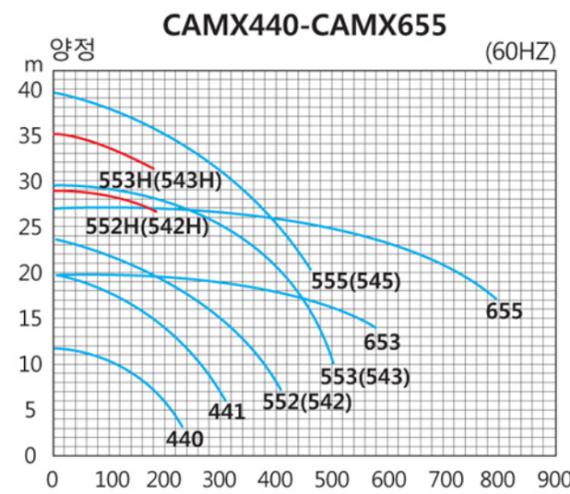
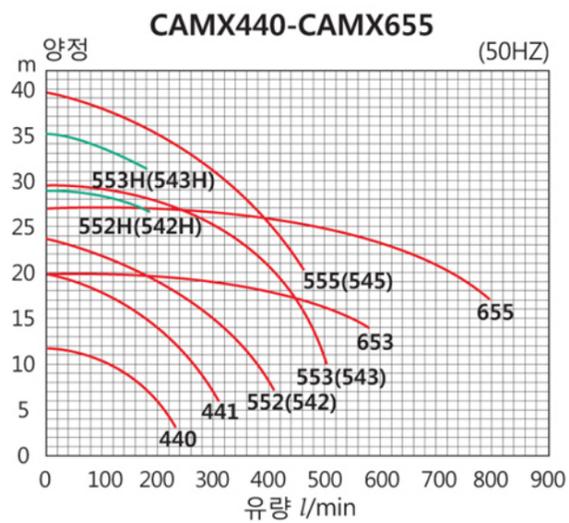
## PERFORMANCE CURVE SPECIFICATIONS

### CAMX SERIES



#### CAMX SERIES

#### PERFORMANCE CURVE CHART



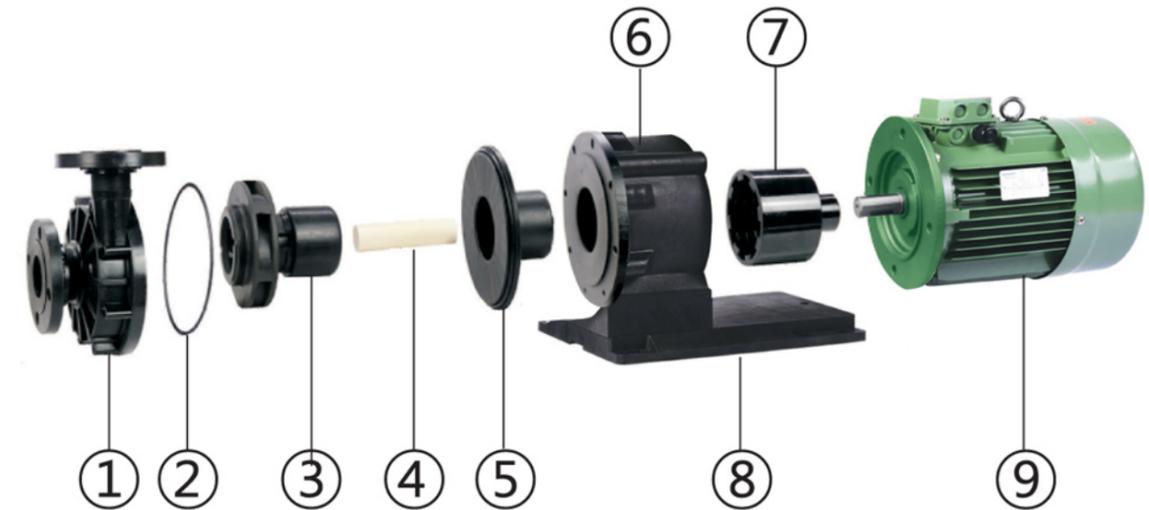
#### CAMX SERIES

#### SPECIFICATIONS

MODEL	IN-OUTLET (mm)		MAX. FLOW (L/min)		MAX. HEAD (m)		POWER (Kw)
	IN	OUT	50HZ	60HZ	50HZ	60HZ	
CAMX-440	40	40	110	110	11	11	0.4
CAMX-441	40	40	160	160	16	16	0.75
CAMX-542	50	40	210	210	21	22	1.5
CAMX-552	50	50	210	210	21	22	1.5
CAMX-542H	50	40	110	110	26	29	1.5
CAMX-552H	50	50	110	110	26	29	1.5
CAMX-543	50	40	260	260	26	27	2.2
CAMX-553	50	50	260	260	26	27	2.2
CAMX-543H	50	40	160	160	32	34	2.2
CAMX-553H	50	50	160	160	32	34	2.2
CAMX-545	50	40	260	260	31	36	3.75
CAMX-555	50	50	260	260	31	36	3.75
CAMX-653	65	50	510	510	17	17	2.2
CAMX-655	65	50	510	510	26	26	3.75

#### CAMX SERIES

#### PART CHART



NO	Description	Material										
		CAMX-C Series			CAMX-G Series			CAMX-K Series		CAMX-E Series		
		CC	CP	CA	CC	CP	CA	CC	CP	CA	SS	SS
1	Front Casing	CFRPP			GFRPP			PVDF		CFRETFE		
2	O-ring	EPDM/VITON/PFA										
3	Impeller	CFRPP					PVDF		CFRETFE			
4	Spindle	Cermic sic										
5	Rear Capsule	CFRPP			GFRPP			PVDF		CFRETFE		
6	Frame	GFRPP										
7	Drive Magnet	Isotropic-Ferrite										
8	Supporting Plate	GFRPP										
9	Motor											

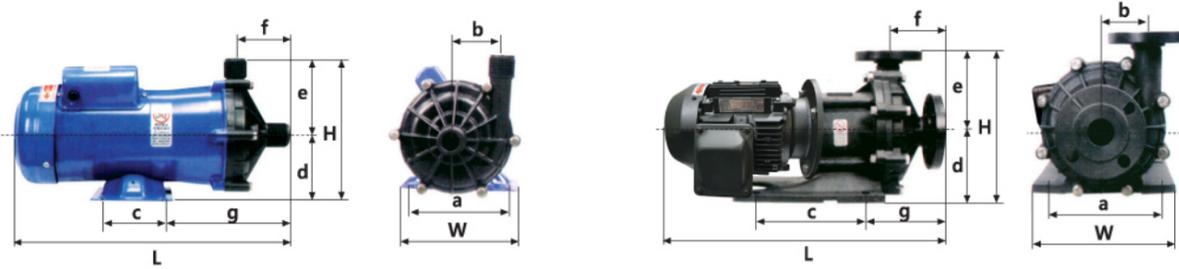
# MAGNETIC DRIVE PUMP

## CMX/CMD/CMH/CAMX SERIES



### CMX SERIES

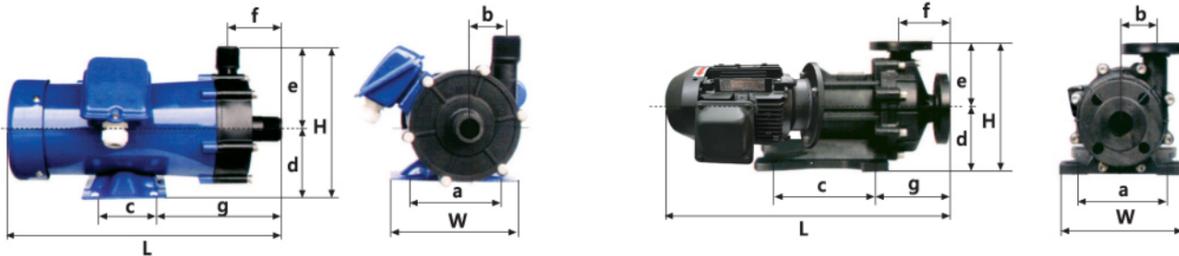
### DIMENSION



MODEL	L	H	W	a	b	c	d	e	f	g
CMX-25180	330	157	136	106	48	40	67	90	51	155
CMX-25250	370	173.5	150	106	51	70	72	101.5	61	158
CMX-250	452	257	190	146	65	132	116.5	140.5	90	165
CMX-251	466	257	192	128	65	130	116.5	140.5	90	158
CMX-400	452	225	156	130	54	128	98	127	85	156
CMX-401	479	257	192	130	72	130	115	142	103	175
CMX-402	516	280	260	208	80	200	120	160	89	157
CMX-402H	516	280	260	208	80	200	120	160	89	157
CMX-403	516	280	260	208	80	200	120	160	89	157
CMX-403H	516	280	260	208	80	200	120	160	89	157

### CMD/CMH SERIES

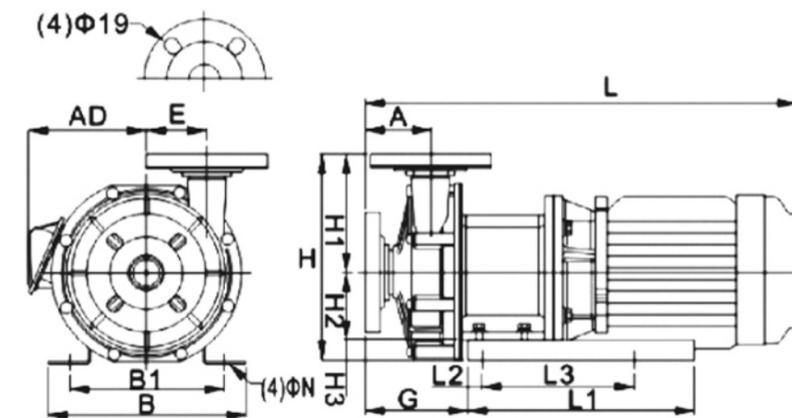
### DIMENSION



MODEL	L	H	W	a	b	c	d	e	f	g
CMD-30R	282	133.5	120	100	31	40	62	71.5	47	148
CMD-40R	282	133.5	120	100	31	40	62	71.5	47	148
CMD-55R	301.5	155	120	100	43	40	65	90	62	180
CMD-70R	278	157	130	110	42	40	68	89	51	155
CMD-100R	334	170	156	110	43	70	71	99	64.5	163
CMH-440	418.5	217	140	110	48.5	99	96	121	85.5	135.5
CMH-441	528	259.5	160	132	52	132	145.5	114	108	182
CMH-452	557	255	265	210	69	104	141	114	96	158
CMH-453	557	255	265	210	69	104	141	114	96	158
CMH-455	620	281	257	228	69	261	141	140	96	178
CMH-565	641.5	297.5	264	230	65	275	135.5	162	111	170.5

### CAMX SERIES

### DIMENSION

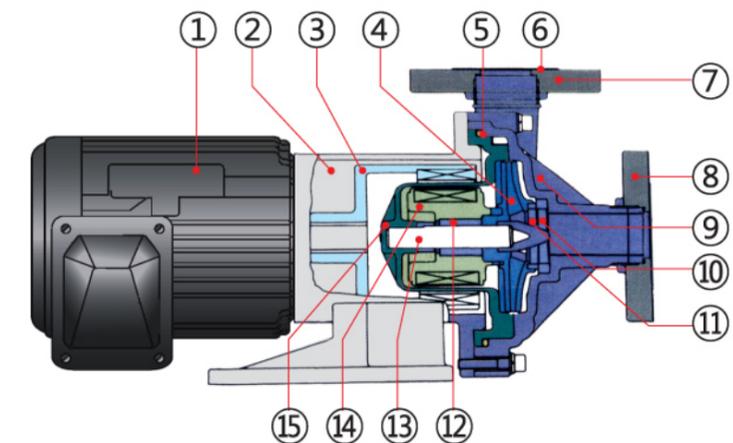


MODEL	Dimension(mm)															Bore(mm)		Flange(mm)	
	A	AD	B	B1	E	G	H	H1	H2	H3	L	L1	L2	L3	N	Inlet	Outlet	Inlet	Outlet
CAMX-440	87.5	133	140	110	54	130.5	225.5	130.5	75	20	470	200	20	98	12	36	36	40	40
CAMX-441	103.5	144	160	130	72	149.5	255.5	140.5	85	30	491	210	35	130	12	40	40	40	40
CAMX-552	89.5	157	260	204	80	135.5	280.5	160.5	90	30	571	300	20	200	14	50	40	50	40
CAMX-552(H)	89.5	157	260	204	80	135.5	280.5	160.5	90	30	571	300	20	200	14	50	40	50	50
CAMX-553	89.5	157	260	204	80	135.5	280.5	160.5	90	30	571	300	20	200	14	50	40	50	50
CAMX-553(H)	89.5	157	260	204	80	135.5	280.5	160.5	90	30	571	300	20	200	14	50	40	50	50
CAMX-555	89.5	189	250	220	80	116.5	322.5	160.5	132	30	630.5	360	30	300	14	50	40	50	50
CAMX-653	94	157	250	220	80	128	322.5	170.5	132	30	583.5	360	30	300	14	65	50	65	50
CAMX-655	94	189	250	220	80	128	322.5	170.5	132	30	645	360	30	300	14	65	50	65	50

### CMX/CMD/CMH/CAMX SERIES

### PART CHART

- 1 Motor
- 2 Frame
- 3 Drive Magnet
- 4 Impeller
- 5 O-ring
- 6 O-ring
- 7 Outlet Flange
- 8 Inlet Flange
- 9 Front Casing
- 10 Mouth Ring
- 11 Thrust Ring
- 12 Bearing
- 13 Spindle
- 14 Magnet Capsule
- 15 Rear Capsule



# MAGNETIC DRIVE PUMP

## CMX/CMD/CMH/CAMX SERIES

## INTERIOR PARTS FEATURES OF CRITICAL PARTS

### FRONT CASING :

CMX/CMD/CMH/CAMX 시리즈 제품의 앞커버는 내부식 재료로 구성되어 있으며 CMX/CMD 앞커버의 흡입 토출은 수요에 따라 유니온 또는 호스를 연결할 수 있습니다.

### BEARING :

베어링 재질은 CARBON, PTFE, CERAMIC 및 SIC가 있으며 약품 특성에 따라 펌프재질을 선택하여 각종 작업 공정에 적용할 수 있습니다.

### IMPELLER :

임펠러 재질은 CFRPP, GFRPP, PVDF, CFRETEF이며 임펠러의 치수는 약품비중과 전압빈도에 따라 설계되어 있습니다.

### REAR CASING :

CMX/CMD/CMH/CAMX 시리즈의 펌프 뒷커버는 내부식 재료로 만들어 졌으며 모터와 펌프내부는 뒷커버로 분리시켜 누설로 인한 환경오염을 방지합니다.

### FRONT CASING :

The front casing of CMX/CMD/CMH/CAMX series pump is integral molded by corrosion resistant material. The front casing on CMX/CMD/CMH/CAMX series is screwed for connecting with a flange or union, the front casing on CMX/CMD series is screwed or hose type for connecting with a union of flexible hose.

### BEARING :

The bearing provide various materials to choose from, such as CARBON, PTFE, CERAMIC and SIC to suit various types of liquid, properly select bearing material combined with correct pump body material according to your industrial processing.

### IMPELLER :

The impeller is manufactured from acid/alkaline resistant GFRPP, PVDF or CFRETEFE material, impeller sizes are designed according to solution specific weight, voltage and frequency to achieve outstanding performance.

### REAR CASING :

The rear casing of CMX/CMD/CMH/CAMX series pump is integral molded by corrosion resistant material. The motor and pump interior are separated by the rear casing eliminate environmental pollution caused by liquid leakage.

### O-RING :

오링의 재질은 EPDM, VITON 및 PFA 재질을 사용하여 내부식성이 강합니다.

### MAGNET CAPSULE :

임펠러에 장착되어 있으며 자석이 플라스틱 재질에 완전히 밀봉되어 철분부식을 방지하고 강한 힘을 발휘합니다.

### DRIVE MAGNET :

모터 샤프트에 장착되어 임펠러의 피구동 마그네트 힘을 형성하여 임펠러를 가동 시켜줍니다.

### MOTOR :

CMX/CMD/CMH/CAMX 시리즈는 열보호장치가 장착되어 있고 밀폐식을 채용하여 고객수요에 따라 전폐형 모터를 사용합니다.

### SHAFT :

샤프트 재질은 CERAMIC, TI, SIC이며 뒤커버와 일체형으로 형성되어 있습니다. 또한 샤프트에 베어링을 장착하여 펌프의 성능을 향상시키고 NPSHr을 감소시킵니다.

### O-RING :

The EPDM and VITON O-ring features outstanding corrosion resistance.

### MAGNET CAPSULE :

The magnet capsule is mounted on impeller, the extra powerful magnet is totally enclosed in the plastic material to avoid rusting or corrosion. Also the driven magnet can provide sufficient torque.

### DRIVE MAGNET :

The magnet capsule is mounted on the motor shaft. Its powerful magnetism combined with the magnet capsule on the impeller produce a coupled torque for driving impeller running.

### MOTOR :

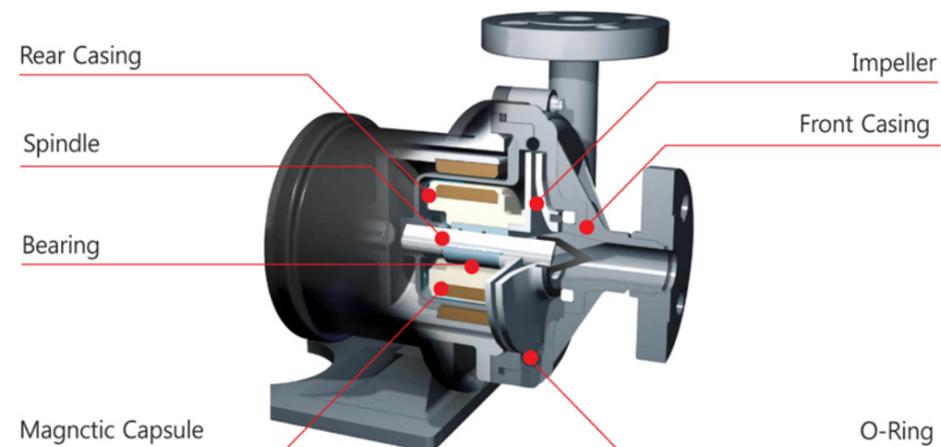
The motor used on the CMX/CMD/CMH/CAMX series pump features over-heat protection. The series pump employs TEFC indoor type motor. Upon request, an explosion-proof motor is available.

### SHAFT :

The shaft material provides CERAMIC, SIC to choose from. On the series pump, the shaft is integral fabricated to the rear casing and the bearing is mounted on it. The shaft on the series is integral fabricated to the impeller. Both types of shaft on the series are specially designed to boost pump performance while reducing NPSHr.

### CMX/CMD/CMH/CAMX SERIES

### INTERIOR PART



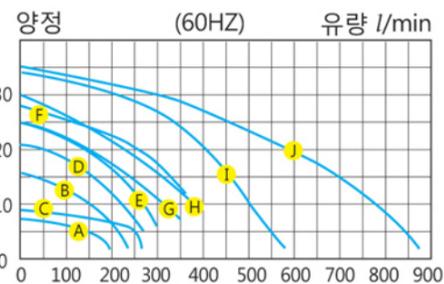
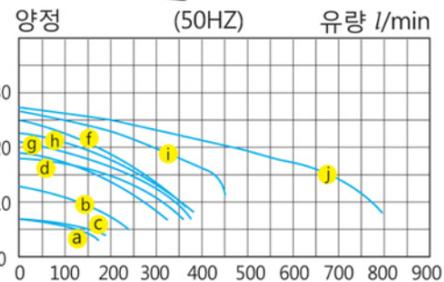
# HORIZONTAL CENTRIFUGAL PUMP

CB

## DIMENSIONS

### 특징 및 효율성 Features and Benefits

- ◆ 펌프는 전달되는 약액에 따라 부식 방지 재질인 FRPP, CFRPP, CPVC, PVDF로 되어 있습니다.
- ◆ 특수한 샤프트 씰 설계-내장형 Teflon bellow seal의 자동 냉각식 설계입니다.
- ◆ 사양은 표준 40-40mm, 50-50mm, 75-75mm 플랜지 조인트가 있으며 고효율 펌프는 누액이 없어 저렴한 운영비용으로 유지 보수가 가능합니다.
- ◆ 자흡식 설계- 강력한 자흡력을 가지며 Check-valve가 내장되어 액체의 역류를 방지합니다.
- ◆ 산/알칼리성에 강합니다.
- ◆ FRPP, CFRPP, CPVC, PVDF material depending on what kind of sending chemical liquid.
- ◆ The motor shaft extension is coupled to a standard motor and is made of 316SS, a Teflon sleeve is installed over the shaft, there is no solution contact between the shaft assembly and the chemicals or solution being pumped.
- ◆ The seal is cooled by the solution in the pump which running, by the design of the pump housing, the mechanical seal is always submerged in solution, so crystals cannot be formed around the seal when the pump is turned off.
- ◆ The pump connections are standard 40-40mm, 50-50mm, 75-75mm flange connections depending on model and size.



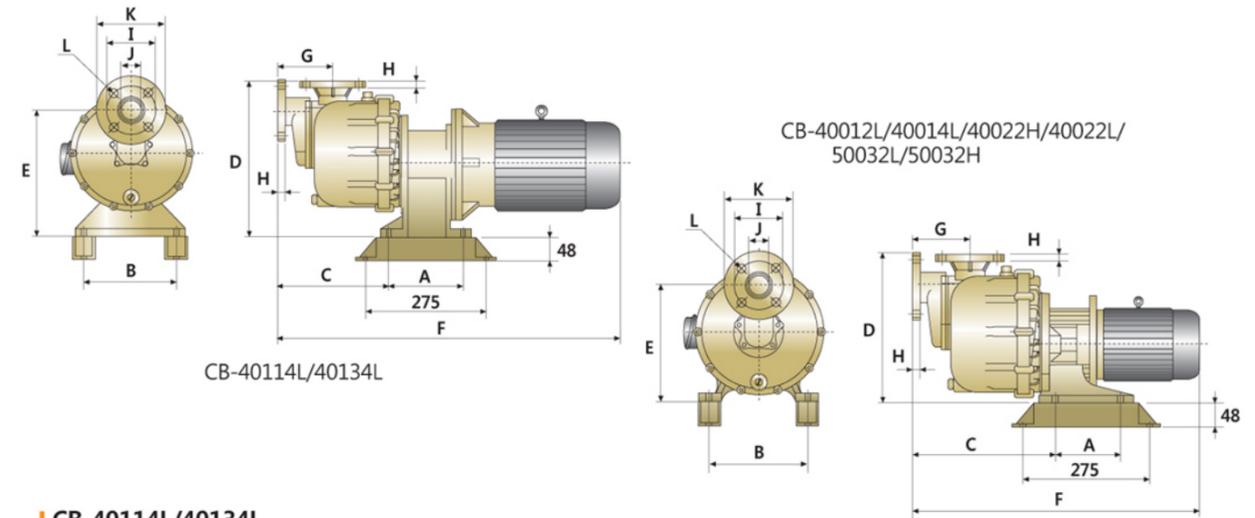
**CB - 40 - 02 - 2 - V - B - L - C - S - H - 6**

1. CB Type
2. In-Outlet : 40-40mm, 50-50mm, 75-75mm
3. Power : (1Ø) : 11-1/2HP (3Ø) : 13-1/2HP, 01-1HP, 02-2HP, 03-3HP, 05-5HP
4. Pole : 2-2P 4-4P
5. Rubber material : V-VITON E-EPDM, N-NBR
6. B-No tongue check valve, A-Tongue check valve
7. L- Low head, H-High head
8. Staining ring : C-CERAMIC, S-SIC
9. Rotating ring : C-Carbon, S-SIC
10. Spring : H-HASTELLOY-C, S-SUS316
11. Frequency : 5-50Hz, 6-60Hz

### 기술사양 Specification

(SPECIFIC WEIGHT : 1.0) Test : Water

Item Type	IN-Outlet (Inch)	Phase	Pole	Kw	50HZ			60HZ			Weight (Kg)
					Curve	Max.Head (m)	Max.Flow (l/min)	Curve	Max.Head (m)	Max.Flow (l/min)	
CB-40114L	40 X 40	1Ø	4	0.37	a	7	185	A	7	200	31
CB-40134L	40 X 40	3Ø	4	0.37	a	7	185	A	7	200	31
CB-40012L	40 X 40	3Ø	2	0.75	b	13	240	B	16	240	32
CB-40014L	40 X 40	3Ø	4	0.75	c	7	210	C	9	270	32
CB-40022L	40 X 40	3Ø	2	1.5	d	18	360	D	21	270	40
CB-40022H	40 X 40	3Ø	2	1.5	e	19	330	E	25	305	40
CB-40032H	40 X 40	3Ø	2	2.2	f	25	380	F	28	365	44
CB-50032L	50 X 50	3Ø	2	2.2	g	21	380	G	25	360	44
CB-50032H	50 X 50	3Ø	2	2.2	h	22.5	400	H	30	400	44
CB-50052H	50 X 50	3Ø	2	3.75	i	26.5	450	I	34	550	56
CB-75052H	75 X 75	3Ø	2	3.75	j	27	800	J	35	860	57

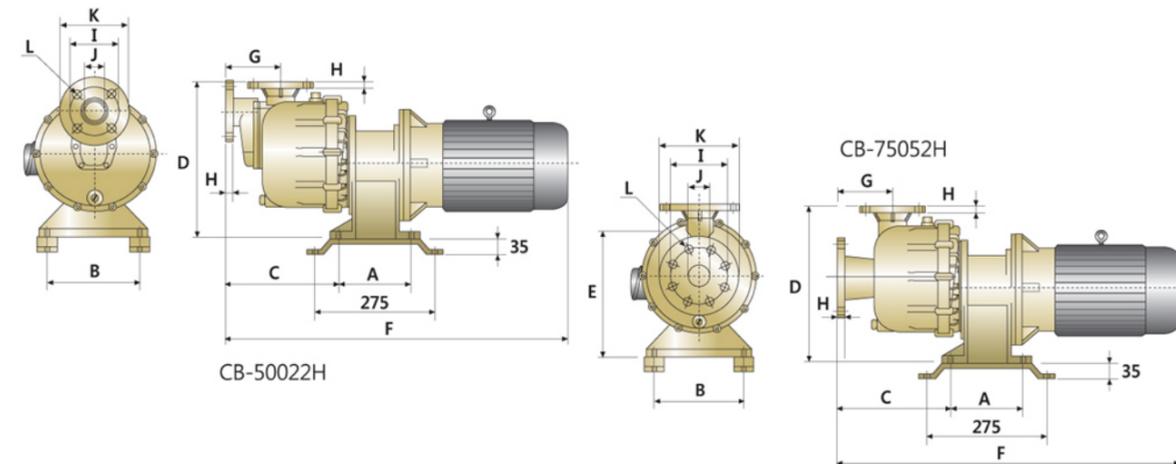


#### CB-40114L/40134L

MODEL	A	B	C	D	E	F	G	H	I	J	K	L
CB-40114L	150	203	317	322	245	636	130	16	Ø103	Ø40	Ø138	Ø20
CB-40134L	150	203	317	245	636	130	130	16	Ø103	Ø40	Ø138	Ø20

#### CB-40012L/40014L/40022H/40022L/50032L/50032H

MODEL	A	B	C	D	E	F	G	H	I	J	K	L
CB-40012L	142	214	320	322	250	626	130	16	Ø103	Ø40	Ø138	Ø20
CB-40014L	142	214	320	322	250	626	130	16	Ø103	Ø40	Ø138	Ø20
CB-40022H	142	220	320	322	250	705	130	16	Ø103	Ø40	Ø138	Ø20
CB-40022L	142	220	320	322	250	705	130	16	Ø103	Ø40	Ø138	Ø20
CB-40032H	142	220	320	322	250	705	130	16	Ø103	Ø40	Ø138	Ø20
CB-50032L	142	214	320	322	250	705	130	16	Ø118	Ø50	Ø154	Ø20
CB-50032H	142	214	320	322	250	705	130	16	Ø118	Ø50	Ø154	Ø20



#### CB-50022H/75052H

MODEL	A	B	C	D	E	F	G	H	I	J	K	L
CB-50052H	168	213	272	370	290	783	130	18	Ø118	Ø50	Ø154	Ø20
CB-75052H	168	213	298	368	200	815	110	18	Ø150	Ø75	Ø185	Ø20

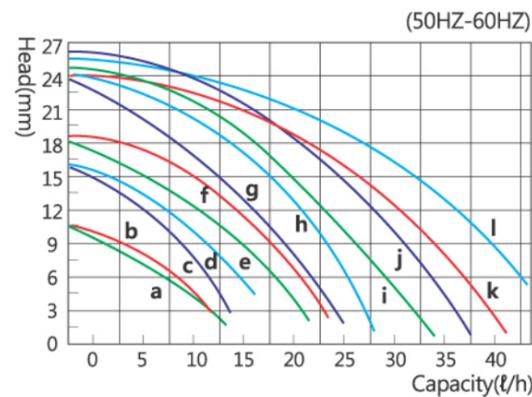
# MAGNETIC PUMP

## CM

### 특징 및 효율성

### Features and Benefits

- ◆ 마그네틱 펌프는 깨끗한 산성 및 알칼리성 액체 공급에 적합합니다.
- ◆ 펌프 본체 부분은 가혹한 조건에서도 품질의 안정성을 확보할 수 있으며, 부품공급의 신속화를 구현합니다.
- ◆ 강산 및 알칼리에 내열성이 강해 대부분의 화학적 성질을 견딜 수 있고 약액 필터와 함께 사용할 수 있습니다.
- ◆ 자력으로 구동되어 씰링이 좋으며 누액이 없습니다.
- ◆ 간단한 구조로 쉬운 유지보수가 용이하며 표준 사양 모터 IP55 보호 등급입니다.
- ◆ Zero escaper : Unlike the conventional centrifugal pump, the seamless design on the magnetic drive pump has a corrosion-resistant rear casing that separates the drive magnet and the magnet capsule . This may avoid liquid leakage, pollution or corrosion problems.
- ◆ Corrosion resisting : The pump body is made of raw material from Europe, stronger corrosion-resistant. The pump spindle can be made from ceramic and SIC. The ceramic spindle is generally applied for low corrosion. The SIC spindle is excellent for high corrosion liquid.
- ◆ Maximum Durability : The geometry of impeller and casing are fine tuned by professional hydraulic program to reduce hydraulic loss and increase pump efficiency.
- ◆ Easy to Assemble : The parts are standard, easy to assembling,checking, maintaining, more convenient and saving more time.



**CM - 40 - 32 - V - P - 0.37 - S - S - 3 - 6**

1. CM Type
2. In-Outlet(mm) : 40-32, 50-32, 50-40, 63-50
3. Rubber material : V-VITON, E-EPDM
4. Pump body : P-PP, K-PVDF
5. Power : 0.37-1/2HP, 0.75-1HP, 1.5-2HP, 2.2-3HP, 3.7-5HP, 4.0-5.4HP
6. Static ring meaterial : S-Silicon carbide, C-Ceramic
7. Ring meaterial : S-Silicon carbide, C-Ceramic
8. Voltage : 3-220V/380V 3Ø
9. Frequency : 5-50Hz, 6-60Hz

### 기술사양

### Specification

(SPECIFIC WEIGHT : 1.1) Test : Water

Item Type	IN-Outlet (Inch)	Power (kw)	50HZ			60HZ		
			Curve	Max.Head (m)	Max.Flow (l/min)	Curve	Max.Head (m)	Max.Flow (l/min)
CM-0.37	40-32/50-32	0.37	a	10.5	250	b	10.5	265
CM-0.75	40-32/50-40	0.75	c	16	280	d	16	300
CM-1.5	50-40	15	e	18	370	f	18	400
CM-2.2	50-40	22	g	24	420	h	24	450
CM-3.7	63-50	37	i	25	480	j	25	500
CM-4.0	63-50	40	k	26	520	l	26	600

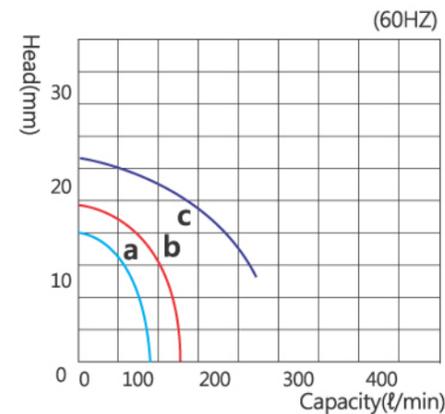
# VERTICAL PUMP

## NBV-INT

### 특징 및 효율성

### Features and Benefits

- ◆ 본체에 고 내식성 수지를 사용하여 내열, 내식성이 우수하며 다종의 약액에 폭넓게 쓰입니다.
- ◆ 특수 이중씰은 부식성 증기가 베어링을 쉽게 침범하지 않으므로 모터를 보호하고 모터의 수명을 연장 시킵니다. 화학, 산 및 알칼리 저항의 대부분을 저항할 수 있는 PP, PVDF 및 기타 플라스틱 강재를 사용합니다.
- ◆ 다양한 산 및 알칼리 액체 순환, 냉각, 스프레이 세척 장비, 폐가스 타워, 에칭 기계, 무전해 도금, 무전해 니켈 및 기타 특수 조합에 적합하게 설계되어 있습니다.
- ◆ 유체로부터 분리된 스테인리스강 모터 샤프트는 SUS 304, SUS 316, 티타늄 샤프트로 이루어져 있으며, 특수 가공을 통해 사용합니다.
- ◆ Molded parts are out of PP, PVDF applicable for various chemicals.
- ◆ The lightweight and mounting plate structure is suitable for in-tank applications.
- ◆ Special double vapor seals stop corrosive vapor to reach the motor bearing perfectly.
- ◆ Closed impeller, fastened independent of rotational direction.
- ◆ The design of high head, suitable for PCB, cleaning equipment.
- ◆ Stainless steel shaft separated from the fluid by a thick-walled thermoplastic Protection tube.
- ◆ Radial and axial forces are absorbed by reinforced motor bearings.



**NBV-INT - 25 - V - P - 1 - 6 - S**

1. NBV-INT Type
2. In-Outlet : 25-1", 32-1-1/4"
3. O-ring : V-VITON, E-EPDM, N-NBR
4. Pump body : P-PP, K-PVDF
5. Power : 0.5-1/2HP, 1-1HP, 2-2HP
6. Frequency : 5-50Hz, 6-60Hz
7. Axis material : T-Titanium, S-Stainless steel

### 기술사양

### Specification

(SPECIFIC WEIGHT : 1.1) Test : Water

Item Type	Gravity	Outlet (Inch)	Power		60HZ		
			Phase	HP	Curve	Max.Head (m)	Max.Flow (l/min)
NBV-INT-25VP-05	1.1	1"	3	1/2HP	a	15	140
NBV-INT-25VP-1	1.1	1"	3	1HP	b	16	240
NBV-INT-32VP-2	1.1	1-1/4"	3	2HP	c	24	320

# VERTICAL ANTI ACID ALKALI PUMP

## INSTALLATION DIMENSIONS

ND

### 특징 및 효율성 Features and Benefits

- ◆ 부식 저항성 : 대부분의 산성, 알칼리성에 내성이 있는 특수 재료로 제작된 FRPP, CFRPP, CPVC, PVDF 사용.
- ◆ 액체류는 필터 연결과 함께 사용할 수 있습니다.
- ◆ 모든 종류의 산성 및 알칼리 액체 주기, 스프레이 세척 장비, 가스 타워, 에칭 기계, 폐기물처리 및 다양한 특수 도금 액체의 재활용 용도에 적합합니다.
- ◆ Corrosion resistance: using FRPP, CFRPP, CPVC, PVDF made of special material, resistant to most acidic alkaline.
- ◆ No liquid can run, can be used with the filter connection.
- ◆ Suitable for all kinds of acid and alkali liquid cycle, spray washing equipment, gas tower, etching machine, waste water treatment, and a variety of special plating liquid recycling use.



### ND MODEL IDENTIFICATION

**ND - 65 - SK - 7.5 - 6 - V - G**

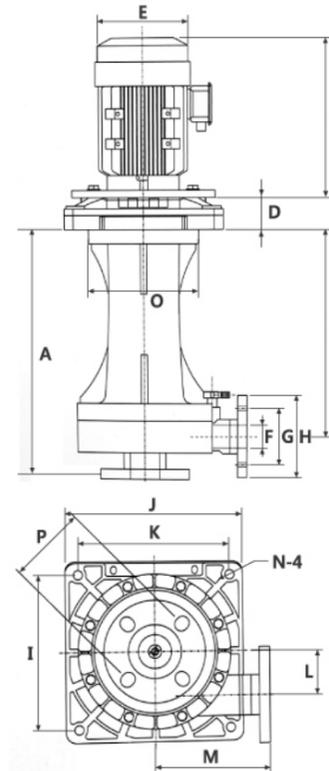
① ② ③ ④ ⑤ ⑥ ⑦

1. ND type
2. In-Outlet : 41-50/40, 42-50/40, 50-65/50, 65-80/65, 100-100/80
3. Specific Weight : SK-1.1, SP-1.4
4. Power : 1-1HP, 2-2HP, 3-3HP, 5-5HP, 7.5-7.5HP, 10-10HP, 15-15HP
5. Frequency : 5-50HZ, 6-60HZ
6. O-ring : V-VITON, N-NBR, E-EPDM
7. Material : G-GFRPP, K-PVDF, A-CPVC, C-CFRPP

### 기술사양 Specification (SPECIFIC WEIGHT : 1.0) Test : Water

Item Type	IN-Outlet (Inch)	HP	50HZ				60HZ				Weight (Kg)		
			Curve	Head (M)		Flow (L/min)		Curve	Head (M)			Flow (L/min)	
				SK	SP	SK	SP		SK	SP		SK	SP
ND-41SK-1-6	50/40	1	A	6	/	175	/	a	8	/	120	/	29
ND-42SK-2-6	50/40	2	B	12	/	190	/	b	10	/	300	/	38
ND-42SK-3-6	50/40	3	C	12	/	270	/	c	14	/	350	/	41
ND-50SK(P)-3-6	65/50	3	D	12	12	330	290	d	/	12	/	300	41
ND-50SK(P)-5-6	65/50	5	E	14	14	470	400	e	15	15	550	430	55
ND-65SK-5-6	80/65	5	F	14	/	500	/	f	15	/	650	/	55
ND-65SK(P)-7.5-6	80/65	7.5	G	16	18	590	500	g	18	16	780	600	95
ND-65SK(P)-10-6	80/65	10	H	18	18	590	570	h	20	18	890	800	106
ND-100SK(P)-15-6	100/80	15	I	27	29	1000	800	i	25.5	29	1200	1000	155

### ND PART CHART



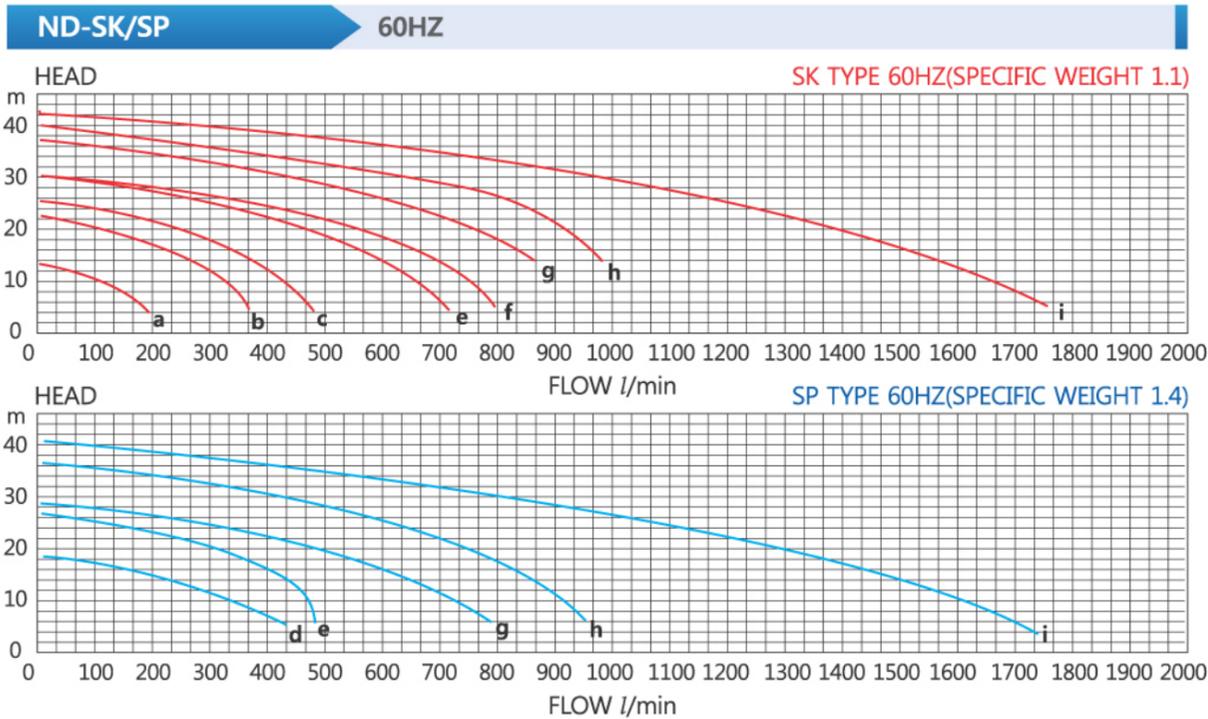
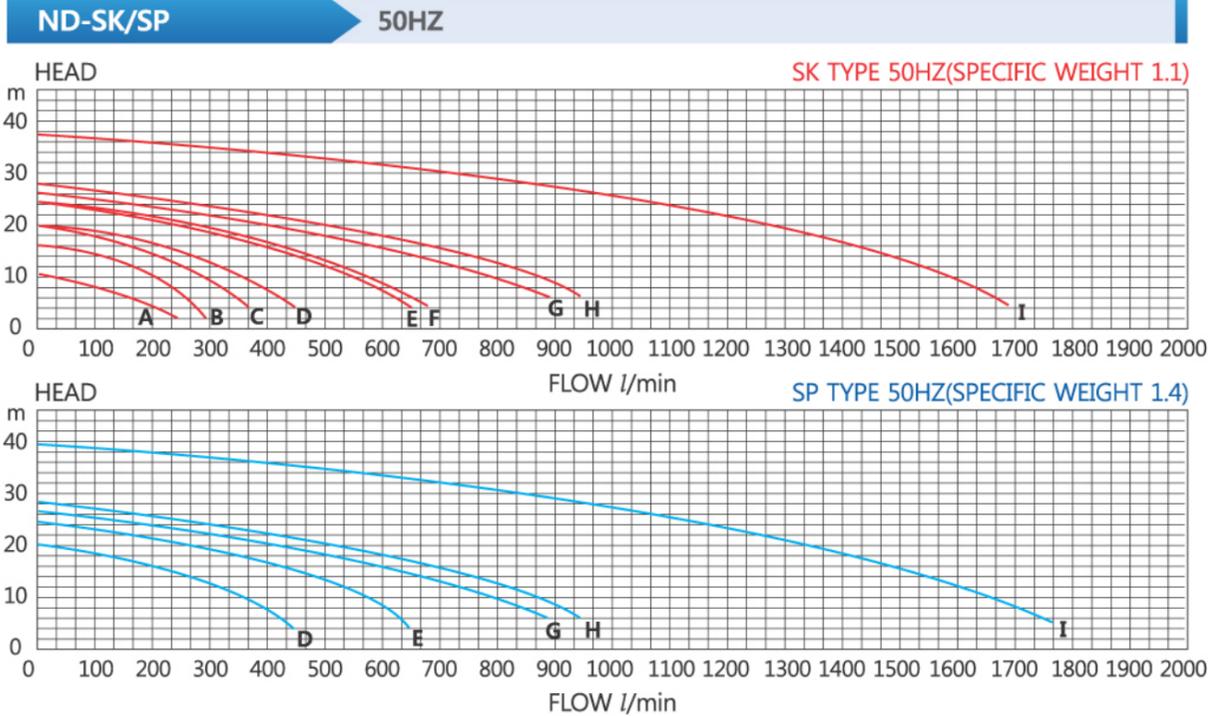
1. Motor
2. Sealed ceramic
3. Spindle
4. liquid ring
5. Shaft core sleeve
6. Motor base
7. Pump body
8. O-ring
9. Impeller shaft
10. Impeller
11. Nut O-ring
12. Impeller nut
13. Flange
14. Front Casing

### 제품규격

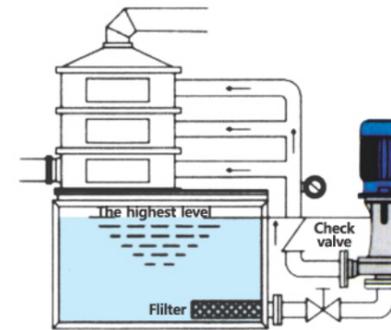
MODEL	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
ND-41SK-1	423	353	275	16	170	40	105	145	222	260	222	65	170	15	185
ND-42SK-2	423	353	328	16	202	40	105	145	222	260	222	65	170	15	185
ND-42SK-3	423	353	328	16	202	40	105	145	222	260	222	65	170	15	185
ND-50SP-3	427	352	363	16	202	50	120	155	212	260	222	65	170	15	185
ND-50SK(P)-5	427	352	363	16	243	50	120	155	222	260	222	65	200	15	185
ND-65SK-5	427	352	363	16	243	65	140	175	222	260	222	65	200	15	185
ND-65SK(P)-7.5	427	352	435	20	285	65	140	175	300	350	300	62	200	18	185
ND-65SK(P)-10	427	352	435	20	285	65	140	175	300	350	300	62	200	18	185
ND-100SK(P)-15	425	350	415	56	312	100	174.5	211	330	350	330	62	220	18	188
ND-41SK-1-B	423	353	268	52	173	40	105	145	222	260	222	68	165	15	185
ND-42SK-2-B	423	353	310	52	195	40	105	145	222	260	222	68	165	15	185
ND-42SK-3-B	423	353	310	52	195	40	105	145	222	260	222	68	165	15	185
ND-50SK-3-B	427	352	310	52	195	50	120	155	222	260	222	65	195	15	185
ND-50SK(P)-5-B	427	352	340	52	195	50	120	155	222	260	222	65	195	15	185
ND-65SK-5-B	427	352	340	52	195	65	140	175	222	260	222	64	198	15	185
ND-65SK(P)-7.5-B	427	352	364	53	270	65	140	175	300	350	300	64	198	18	185
ND-65SK(P)-10-B	427	352	364	53	270	65	140	175	300	350	300	64	198	18	185
ND-100SK(P)-15-B	440	350	415	56	312	100	174.5	211	330	350	330	62	200	18	188

# VERTICAL ANTI ACID ALKALI PUMP

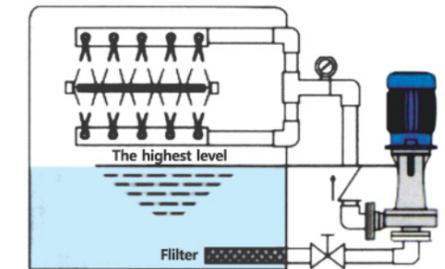
## ND Performance Curve Chart



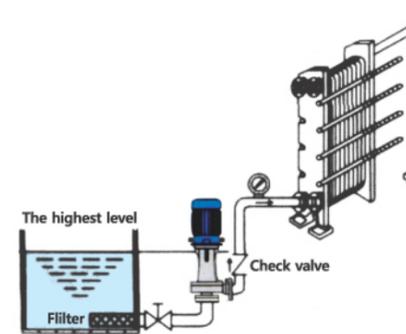
For cleaning waste gas.



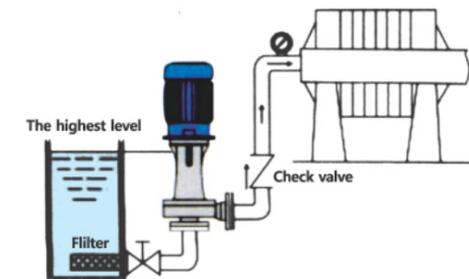
Application spray pump etching



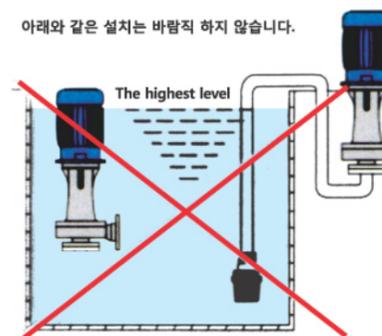
For heat exchanger



Application for cleaning tower



Wrong application



사용상 주의사항

1. SK/SP펌프는 Non-Seal방식으로 액면 레벨이 펌프부 모터 프랜지면 부근보다 위에 있으면 펌프 위쪽에서 누액이 발생하므로, 펌프 설치 시 위의 매뉴얼을 참고하여 주십시오.
2. Casing 및 흡입 배관내에 공기가 있으면 펌프는 양수불능이 되는 경우가 있으므로, 반드시 펌프에 부착되어 있는 Air-Cock로 공기를 빼내고 액을 펌프 Casing내까지 충전시킨 뒤 시작하여 주십시오.
3. Slurry 혼입액에도 모두 사용이 가능하지만, 가급적 Slurry 전용 펌프를 사용해 주시기 바랍니다. 부득이 표준압형펌프로 사용시에는 흡입 측에 스트레이너를 장착해 주십시오.
4. 탱크내 설치의 Casing 취부시 BOLT/NUT, HT-PVC, PPS BOLT/NUT를 사용하여 주십시오.

# FILTER

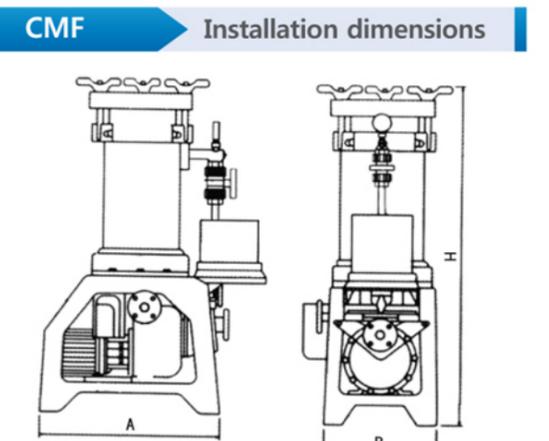
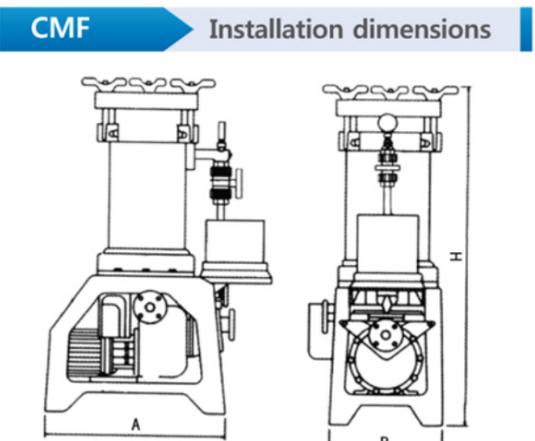
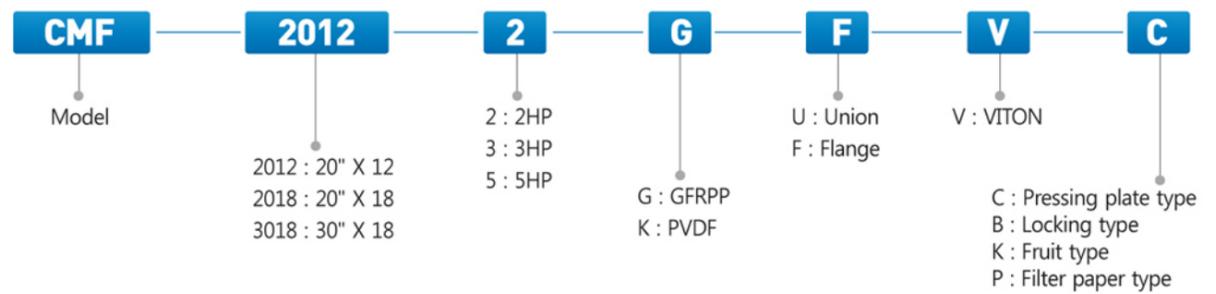
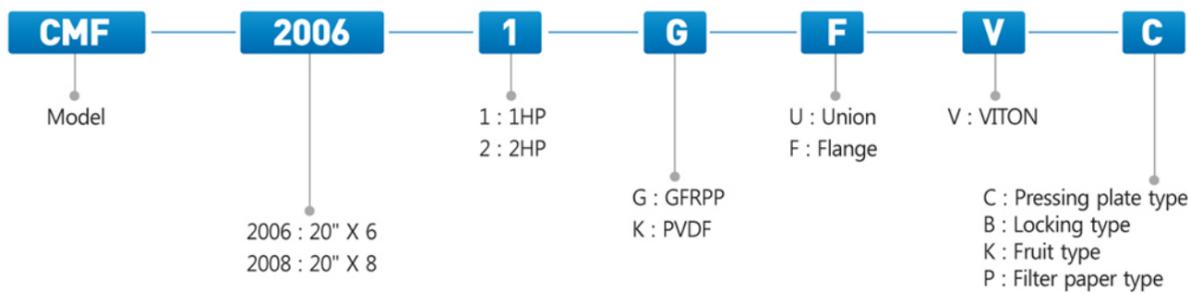
## CMF Series

### 제품특징

### Product Discription

- ◆ PP 재질의 사출성형으로 내열성이 좋고 산성 및 알칼리성 용액에 사용 가능합니다.
- ◆ 필터는 광범위, 고정밀, 고효율성을 가지며 조작이 편리합니다.
- ◆ 각 모델마다 부품 호환이 가능하며 필터 및 재료를 조건에 맞게 변경할 수 있습니다.
- ◆ 잠금장치타입, 종이필터타입, 활성탄소 처리장치 및 다른 장치도 추가할 수 있습니다.  
(압력 디스크 필터 : 플레이트 타입 필터, 튜브 타입 필터, Fruit 타입)

- ◆ PP material injection molding. High temperature resistance, acid and alkali resistance.
- ◆ Filter precision is high, the filter area, high efficiency, simple operation.
- ◆ Can be used according to the customer to choose a variety of conditions for the use of a variety of different filter materials.
- ◆ The same model can do different filter change pressure disc filters : Plate type filter, Tube plate type filter, Fruit type. Locking type, Filter paper type the activated carbon processing device, easy to operate.



### 기술사양

### Specification

MODEL	CMF-2006-1	CMF-2008-1	CMF-2008-2
Plating bath	1-2	1-2	1.5-3
Plating bath (L/min)	150	180	220
Material	PP	PP	PP
Filter material	20" X 6	20" X 8	20" X 8
Temperature(O°C)	70	70	70
KW	0.75	0.75	1.5
Machine base Size(mm)	Lenght (A)	730	730
	Width (B)	450	450
Height (H)	1450	1450	1450
Weight (KG)	75	82	86
Export caliber	1-1/2"	1-1/2"	1-1/2"

### 기술사양

### Specification

MODEL	CMF-2012-2	CMF-2018-3	CMF-3018-5
Plating bath	2.5-4	4-6.5	6.5-7.5
Plating bath (L/min)	220	330	500
Material	PP	PP	PP
Filter material	20" X 12	20" X 18	30" X 18
Temperature(O°C)	70	70	70
KW	1.5	2.2	3.75
Machine base Size(mm)	Lenght (A)	825	825
	Width (B)	585	585
Height (H)	1500	1500	1760
Weight (KG)	98	118	128
Export caliber	2"	2"	2"

# FILTER

## CMF Series

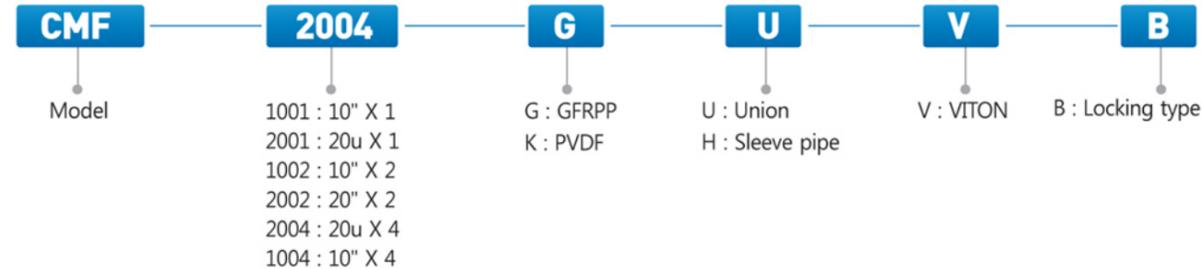
# 내약품 일람표

## CORROSION RESISTANCE CHART

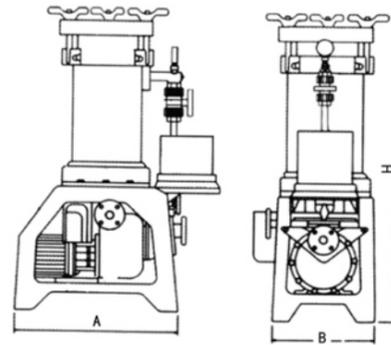
### 제품특징

### Product Discription

- ◆ PP 재질의 사출성형으로 내열성이 좋고 산성 및 알칼리성 용액에 사용 가능합니다.
- ◆ 누수가 없는 마그네틱 펌프를 사용합니다.
- ◆ 필터는 광범위, 고정밀, 고효율성을 가지며 조작이 편리합니다.
- ◆ 모터 가드는 산성 환경에서 쉽게 부식되지 않습니다.
- ◆ PP material injection molding. High temperature resistance, acid and alkali resistance.
- ◆ The pump adopts magnetic pump, ensure no leakage.
- ◆ Filter area wide, high efficiency, simple operation.
- ◆ Motor guard avoids the corrosion of motor in acid environment.



### CMF Installation dimensions



### 기술사양

### Specification

MODEL	CMF-1001	CMF-2001	CMF-1004	CMF-2004
Plating bath	200	400	600	800
Plating bath (L/min)	15	30	60	80
Material	PP	PP	PP	PP
Filter material	10" X 1	20" X 1	10" X 4	20" X 4
Temperature(O°C)	70	70	70	70
W	30/45	65/100	150/180	250/260
Machine base Size(mm)	Lenght (A)	396	396	575
	Width (B)	295	295	365
Height (H)	735	1060	800	1065
Weight (KG)	16	18	29	31
Export caliber	1/2"	1/2"	1"	1"

약품명 CHEMICAL NAME	농도% CONE	온도°C TEMP	PLASTIC MATERIAL CASING부 재질					SEAL MATERIAL 축수재질			O-RING		
			FRPP	CFRPP	CPVC	PVDF	CFRTEFE	Ceramic	Carbon	SIC	NBR	EPDM	VITON
황산 / H <sub>2</sub> SO <sub>4</sub> Sulfuric acid	30	40	●	●	●	●	●	●	●	●	●	●	●
		60	●	●	●	●	●	●	●	●	●	●	
		80	●	●	○	●	●	●	●	●	○	●	
	60	40	●	●	●	●	●	●	●	●	●	●	●
		60	●	●	●	●	●	●	●	●	●	●	●
		80	○	○	△	●	●	●	●	●	○	●	
	98	40			X	●	●	○	●				●
		60			X	○	●	○	●				●
		80				○	●	○	●				●
염산 / HCl Hydrochloric acid	15	40	●	●	●	●	●	●	●	●	●	●	●
		60	●	●	●	●	●	●	●	●	●	○	
		80	○	○	○	●	●	●	●	●	●	△	△
	32	40	●	●	●	●	●	●	●	●	●	△	△
		60	●	●	●	●	●	●	●	●	●	△	△
		80	○	○	△	●	●	●	●	●	●	△	△
산화크롬 / CrO <sub>3</sub> Chromic acid	20	40			●	●	●	●	●	●	●	●	●
		60			●	●	●	●	●	●	●	●	
		80			△	●	●	●	●	●	●	○	
질산 / HNO <sub>3</sub> Nitric acid	20	40	●	●	●	●	●	●	●	●	●	●	●
		60	○	○	●	●	●	○	●	●	●	●	
		80	○	○	○	●	●	●	●	●	●	●	
	50	40	●	●	X	●	●	●	●	●	●	●	
		60	○	○	X	●	●	●	●	●	●	●	
		80	○	○	X	●	●	●	●	●	●	●	
인산 / H <sub>3</sub> PO <sub>4</sub> Phosphoric acid	25	40	●	●	●	●	●	●	●	●	●	●	●
		60	●	●	●	●	●	●	●	●	○	●	
		80	○	○	△	●	●	●	●	●	●	○	
	50	40	●	●	●	●	●	●	●	●	●	●	●
		60	●	●	●	●	●	●	●	●	●	○	●
		80	○	○	△	●	●	●	●	○	●	○	
치아염소산나트륨 / NaOCl Sodium Hypochlorite	10	40	○	○	●	●	●	△	○	●	●	●	
		60	△	△	●	●	●	X	△	●	●	●	
		80	X	△	△	●	●	X	X	●	●	●	
초산 / CH <sub>3</sub> COOH Acetic acid	25	40	●	●	●	●	●	●	●	●	●	●	
		60	●	●	○	●	●	●	●	●	●	X	
		80	○	○	X	●	●	●	●	●	●	X	
불화수소산 / HF Hydrofluoric	25	40	X	●	X	●	●	X	△	●	●	●	
		60	X	○	X	●	●	X	△	●	●	●	
		80	X	X	X	●	●	X	△	●	○	●	
염산+질산 / HCl+HNO <sub>3</sub> Aquaregia	3:1	40	X	X	●	●	●	○	X	●	X	○	
		60	X	X	●	●	●	○	X	●	X	○	
		80	X	X	●	●	●	○	X	●	X	○	
과산화수소 / H <sub>2</sub> O <sub>2</sub> Hydrogen Peroxide	10	40	●	●	●	●	●	○	X	●	X	●	
		60	○	○	●	●	●	○	X	●	X	●	
		80	X	X	X	●	●	△	X	●	X	●	
가성소다 / NaOH Caustic soda	45	40	●	●	●	●	●	△	●	●	●	○	
		60	○	○	●	○	●	X	○	●	○	△	
		80	○	○	△	X	●	X	○	●	○	△	
염화철 / FeCl <sub>3</sub> Ferric chloride		40	●	●	●	●	●	●	●	●	●	●	
		60	●	●	●	●	●	●	●	○	●	●	
		80	●	●	△	●	●	●	●	●	●	●	
시아니화구리 / Cu(CN) <sub>2</sub> Copper cyanide		40	●	●	●	●	●	△	●	●	●	●	
		60	●	●	●	●	●	△	●	●	●	●	
		80	●	●	●	●	●	△	●	●	●	●	
염화아연 / ZnCl <sub>2</sub> Zinc Chlorate		40	●	●	●	●	●	●	●	●	●	●	
		60	●	●	●	●	●	●	●	●	●	●	
		80	●	●	●	●	●	●	●	●	●	●	
황산니켈 / NiSO <sub>4</sub> Nickel Sulfate		40	●	●	●	●	●	●	●	●	●	●	
		60	●	●	●	●	●	●	●	●	●	●	
		80	●	●	●	●	●	●	●	●	●	●	

● : 사용가능 ○ : 설정조건을 지키면서 사용가능 △ : 사용에 주의를 요함 X : 사용불가  
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