

Thin pilot operated
2-port solenoid valve
for compressed air

SP Series



Thin and low pressure, but realizes large flow rates

Patented



SP-10 (Fitting type)

Width	Weight
10mm	37g



SP-10
(Actuator type)

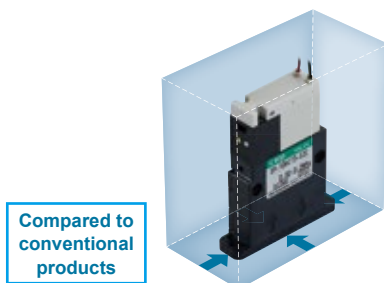
Width	Weight
10mm	29g



SP-13
(Actuator type)

Width	Weight
13mm	31g

Thin, lightweight, space saving
Space saving and various layouts are possible.



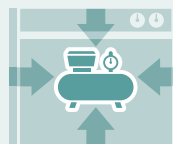
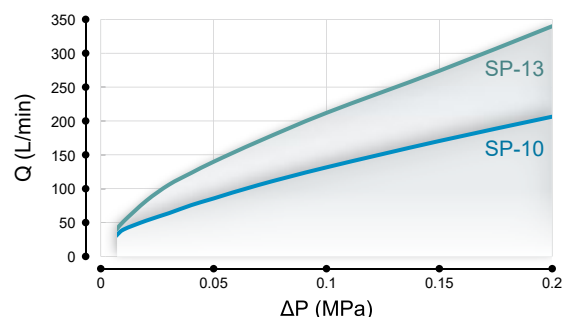
Compared to
conventional
products

Width	Volume	Weight
1/3	1/2	1/2



Contributes to downsizing
and lightening of your
equipment!

Low pressure, large flow rate
The required flow rates even at low pressures.



Downsize and lighten
the air source!

CKD Corporation

CC-1506A



For compressed air
Thin pilot operated 2-port solenoid valve

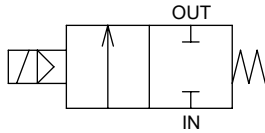
SP Series

- NC (open when energized)
- Diaphragm drive
- Port size: Actuator (SP-10/SP-13)
Push-in fitting (SP-10)



JIS symbol

- NC (open when energized)

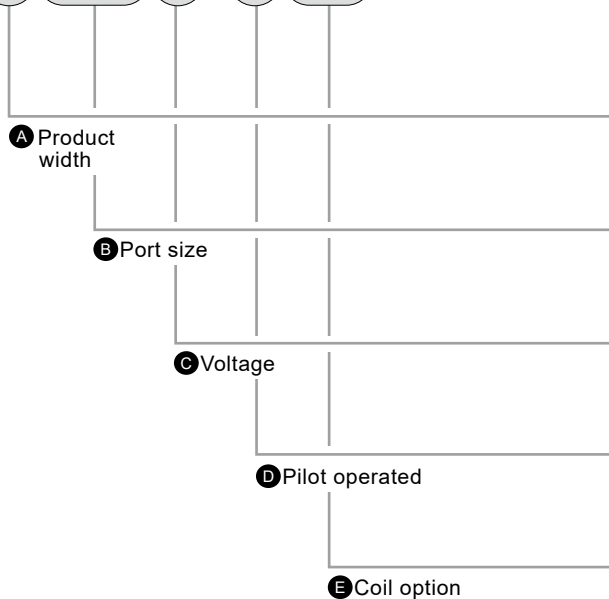


Specifications

Item		SP-10	SP-13
Working fluid		Compressed air	
Working pressure differential	MPa	0.02 to 0.2	
Max. working pressure	MPa	0.2	
Proof pressure	MPa	0.3	
Fluid temperature	°C	0 to 70 (no freezing)	
Ambient temperature	°C	0 to 60	
Atmosphere		Place free of corrosive gas/explosive gas and not exposed to water	
Valve structure		Pilot operated diaphragm drive	
Internal leakage	cm ³ /min	2 or less	
External leakage	cm ³ /min	·2 or less	
Mounting orientation		Unrestricted	
C[dm ³ /(S·bar)]		1.0	1.4
Electrical specifications			
Rated voltage		24 VDC, 12 VDC	
Voltage fluctuation range		±10%	
Power consumption	W	0.6	
Rating		Intermittent (50%duty)	
Thermal class		Class 130 (B)	

How to order

SP - 10 06K 3 - E 2C



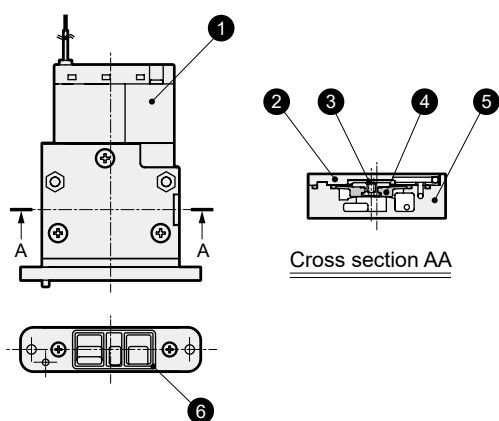
Code	Description
A Product width	
10	10mm
13	13mm
B Port size	
ACT	Actuator
06K	Ø6 Push-in fitting *1
C Voltage	
3	24 VDC
4	12 VDC
D Pilot operated	
E	External exhaust specifications
R	Internal exhaust specifications *2
E Coil option	
2C	Lead wire (without both lamp/surge suppressor)

*1 Available only for SP-10

*2 Available only for SP-13

The internal exhaust specifications is such that the pilot chamber does not exhaust to the atmosphere, but to the OUT side circuit.

Internal structure and parts list

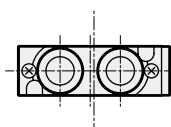
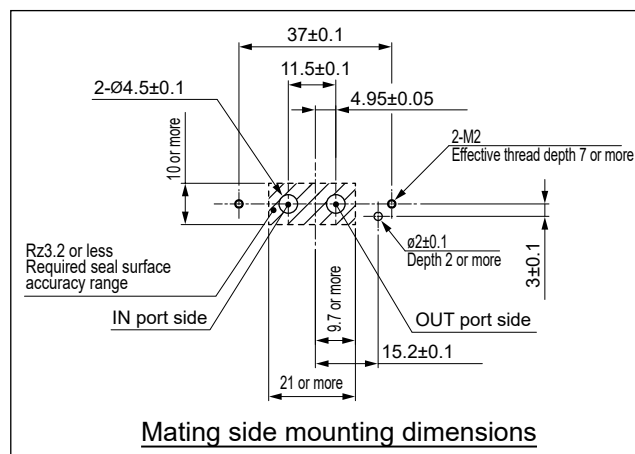
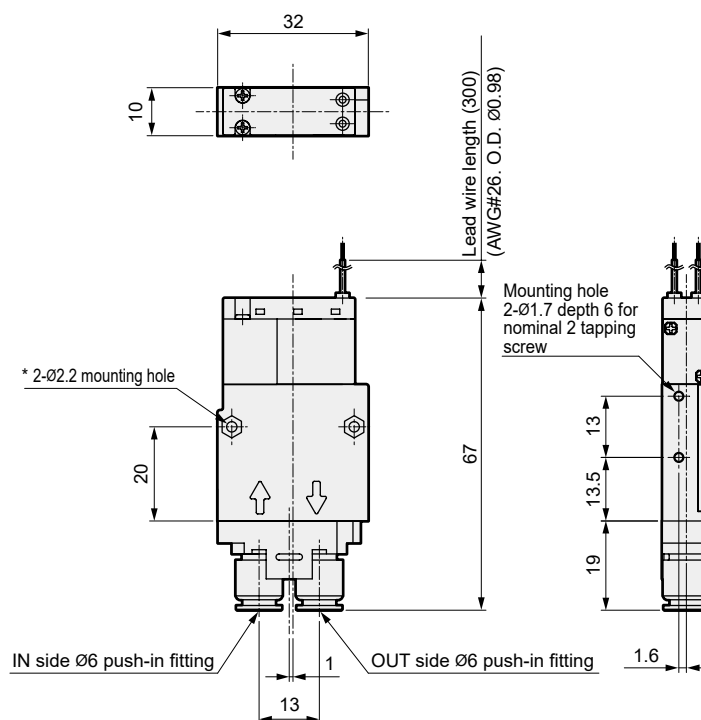
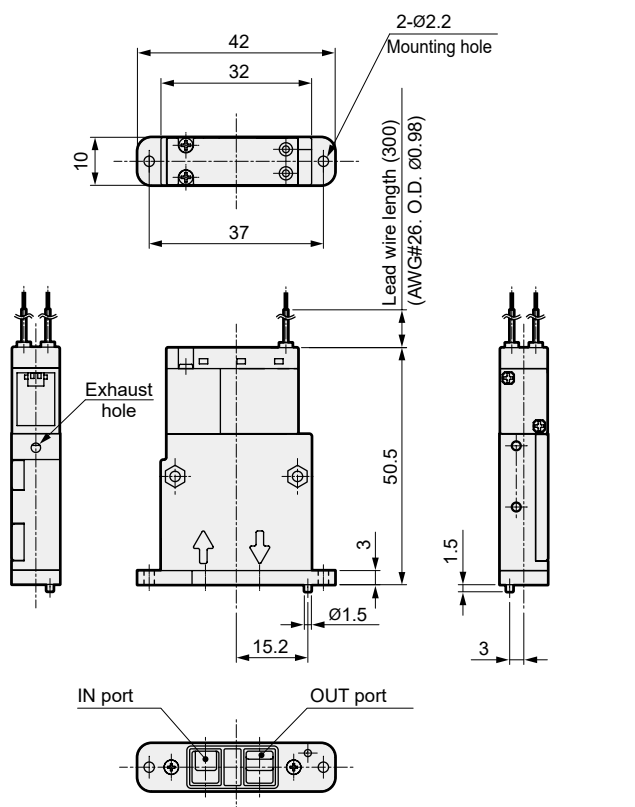


Part No.	Part name	Material	
1	Coil assembly	-	-
2	Stuffing	PPS	Polyphenylene sulfide
3	Spring	SUS	Stainless steel
4	Diaphragm assembly	H-NBR/PPS	Hydrogenated nitrile rubber/ Polyphenylene sulfide
5	Body	PPS	Polyphenylene sulfide
6	Gasket	H-NBR	Hydrogenated nitrile rubber

Dimensions

●SP-10 Actuator

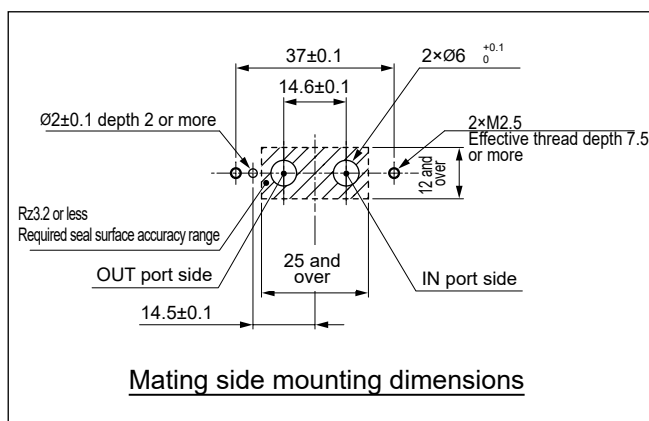
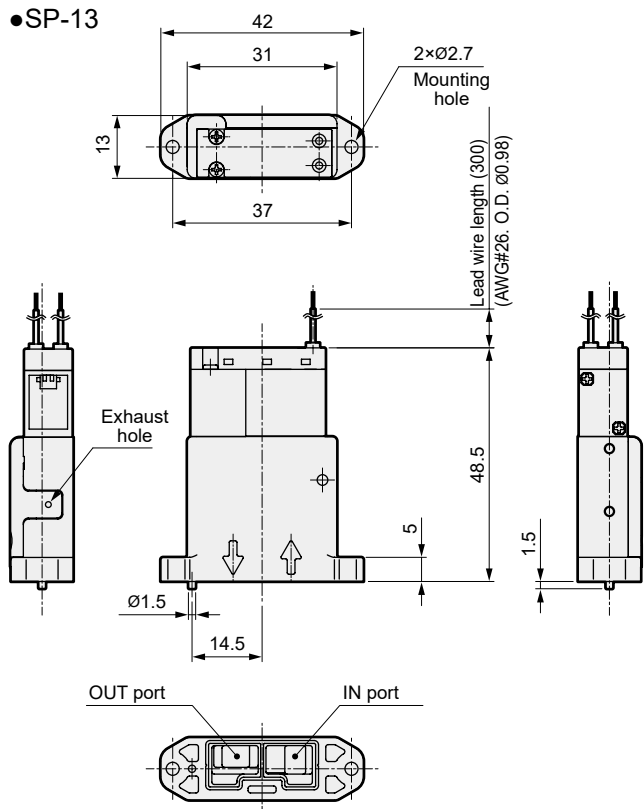
ø6 Push-in fitting



* For M2 screw
Can also be fixed with M2 nut

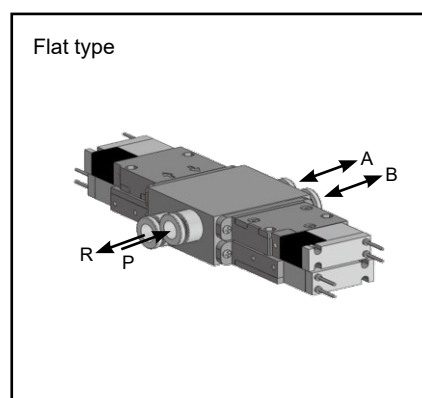
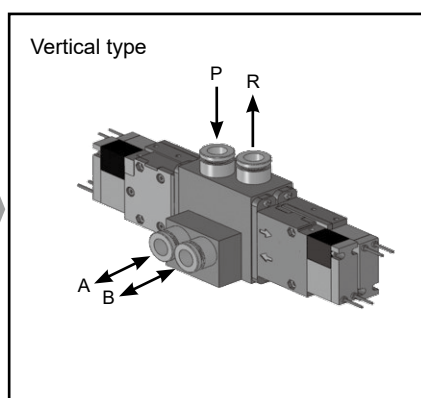
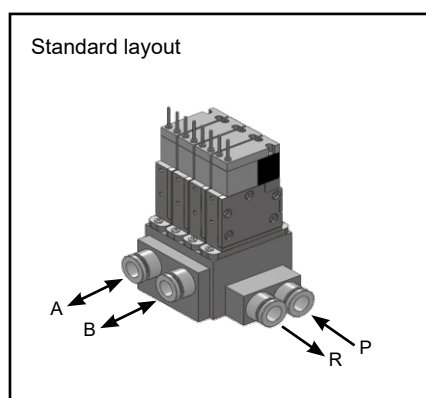
Dimensions

•SP-13

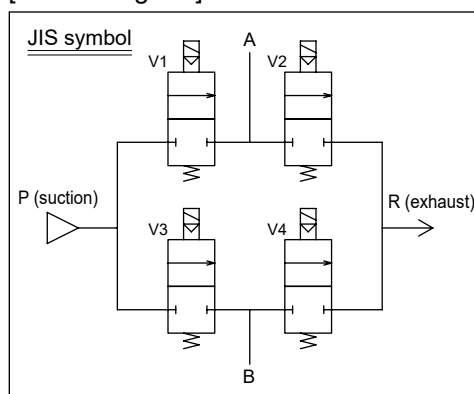


Manifold layout example (switching valve for oxygen concentrator)

Supports a variety of manifold variations according to your equipment space!



[Circuit diagram]



Effective layout utilizing side gaps or top or bottom surface gaps within the unit is possible.



Install in places where it was too tight before!

• Manifolds available as custom made. Contact CKD for details.



Safety precautions

Fluid Control Components: Warnings and Cautions

Read the handling precautions and safety precautions described in the latest "General Purpose Valves" (Catalog No.CB-03-1SA) before use.

Product-specific cautions: Pneumatic pilot operated 2-port solenoid valve SP Series

Design/selection

1. Checking the specifications

WARNING

- Use the product in the range of conditions specified for the product. Use with pressure or temperature outside the specifications range may result in damage or operation faults. (Refer to specifications)
To use fluids other than compressed air, contact CKD.
- Working fluids
Active gases cannot be used, so contact CKD when these applications are required.
- If the product is used under conditions where the pressure differential between the primary side and secondary side while the valve is open is below 0.02MPa, the diaphragm may vibrate, resulting in a short service life. When using under conditions where there is a chance that the differential pressure or flow rate can become very small as described below, contact CKD for details.
 - When the primary or secondary side of solenoid valve has a needle valve
 - When multiple solenoid valves piped in parallel are opened simultaneously (Differential pressure between primary and secondary sides does not develop due to the drop in solenoid valve source pressure.)

2. Safety design

WARNING

- Take measures to prevent physical harm or property damage in the event of failure of this product.

CAUTION

- Check leakage current to prevent malfunction caused by leakage current from other fluid control components.
 - When using a programmable controller, leakage current may affect the solenoid valve and cause malfunction. Note that the values that are affected by leakage current depend on the solenoid valve.
- | | |
|-----------|----------------|
| At 12 VDC | 1.5 mA or less |
| At 24 VDC | 1.8 mA or less |
- Observe the following precautions when using nylon or urethane tubes as the piping material.
 - Use flame-resistant tubes where they could come in contact with spatter.
 - When using the standard push-in fitting on the spiral tube, fix the base of the tube with a hose clamp. Rotation may occur, causing a reduction in holding force.

3. Working environment

- Use clean air.
 - Do not use the compressed air if it contains chemicals, synthetic oils containing organic solvents, salt, or corrosive gas, as it can cause damage and/or operation failure.
 - The ozone content in the compressed air should be 0.1 ppm or below. A higher ozone content may cause malfunction and leakage.

4. Durability

WARNING

- Using the solenoid valve with continuous energizing can cause a deterioration of performance. Contact CKD when using the solenoid valve under such conditions.

5. Pneumatic source

CAUTION

- Install a pneumatic filter just before the pneumatic component in the circuit.
- Do not supply anything other than compressed air.
- Use clean compressed air that does not contain corrosive gases.
- Use dry compressed air that does not cause moisture inside the piping.
 - Moisture will occur if the temperature drops in the pneumatic piping or pneumatic components.
 - Operation failure could occur if moisture enters the air flow path of pneumatic components and temporarily blocks passage.
 - Moisture could cause rust, making the pneumatic components fail.
- Use compressed air that does not contain oil oxides, tar, carbon, etc., from the air compressor.
 - If oil oxides, tar, or carbon enter the pneumatic components and solidify, resistance at the sliding section will increase, leading to operation failure.
- Use compressed air that does not contain solid foreign matter.
 - Any solid foreign matter in the compressed air can enter the pneumatic components and cause wear, locking or internal leakage in the sliding parts.

Mounting, installation and adjustment

1. Mounting

⚠ WARNING

- When mounting a valve, do not use a mounting method that relies on support from the piping.
 - Mount and fix the valve body.
- After mounting, do not clean or paint with water or solvent.
 - Otherwise some resin parts may be damaged.
- Do not remove the solenoid valve package until you are ready to connect to the piping.
 - Removing the package before starting piping work may cause foreign matter to enter inside the solenoid valve from the piping port, resulting in failure or malfunction.
- Do not block the exhaust hole.
 - This may cause malfunction.
- When using the products in a row, set intervals of distance of 1 mm or more.

2. Pre-operation confirmation

⚠ CAUTION

- When supplying compressed air after connecting pipes, do not suddenly apply high pressure.
 - The pipe connection could dislocate, causing the pipe to fly off, risking accidents.
- Before supplying compressed air after connecting pipes, check that there are no air leaks at any pipe connections.
 - Apply a leakage detection agent on pipe connections with a brush and check for air leaks before use.

3. Piping

- Connect the piping so that connections are not dislocated by equipment movement, vibration, tension, etc.
 - Cut the push-in fitting tube at right angles with a dedicated tool.
 - Confirm that the tube has been inserted properly, and make sure that there is no tension during use. The tube could be dislocated or damaged if there is any tension.
- Make sure that there is no torsion, tension or moment load applied to the fitting or the tube.
- Check that the tubing is not worn or damaged.
 - Tubing could collapse, rupture, or become dislocated.
- Use the designated tube.
 - Designated nylon tube: F-1500 Series
 - Designated urethane tube: U-9500 Series
- Securely insert the tube completely to the end, and make sure that the tube cannot be pulled out.
- Cut the tube with a dedicated cutter and always at a right angle.

4. Lead wire connection

⚠ CAUTION

- Connect the lead wire appropriately.

The following lead wire should be used:

Electrical connection code	Description	Conductor size	Conductor sectional area	O.D.
2C	Grommet lead wire	AWG#26	0.13 or equiv.	0.98

Use/maintenance

⚠ CAUTION

- Sudden leakage

With the pilot operated 2-port valve, if the pressure is suddenly applied when the compressor starts while the valve is closed, the valve may open for an instant causing fluid to leak. Caution is required during use.
- Disassembly

Do not disassemble this valve. Once disassembled, the valve may not retain its valve performance.
- The coil will heat up while the valve is energized and immediately after energization. Do not touch these parts with your hands or other body parts.

- Pressure differential

Under the following conditions, make sure to set the pressure so that the pressure differential while the valve is open does not drop below 0.02 MPa. If a pressure difference (between the primary side and secondary side) of at least 0.02 MPa cannot be secured while the valve is open, the diaphragm may vibrate, resulting in a short service life.

 - When a needle valve is mounted on the secondary side
 - When multiple solenoid valves connected in parallel piping (module and manifold connection) are opened simultaneously (The drop in source pressure causes the pressure differential between the primary side and the secondary side to diminish.)
 - If sufficient pressure differential between the primary side and the secondary side cannot be ensured while the valve is open, or if the pressure differential is unknown, contact CKD for details.

- When installing the valve, make sure that no tension is applied to the coil lead wire.
- When carrying the product, hold the body.
(Do not dangle the product from the lead wire when carrying it.)
- When the regulator and solenoid valve are directly coupled, the parts could mutually vibrate, causing resonance and chattering.
- If the piping cross-sectional area on the fluid inlet is reduced, the operation may become unstable due to differential pressure failure during valve operation. For the fluid supply side, use piping of a piping size that matches the port size of the valve.
- Depending on the conditions of your usage, the operation of the solenoid valve may become unstable after being left unattended for an extended period of time.
Be sure to perform a test run before use.
- Avoid using the product for applications that involve continuous fitting rotation or oscillations. Fittings may become damaged.
- Do not drop this product or use it as footing. The product may fail or break.

Related products

Proportional solenoid valve A2-6500 Series

- By controlling the gas flow rate steplessly in proportion to the operation current value, "multi-step flow rate control" and "appropriate amount control" are possible.
- Ideal for the automation of flow rate adjustments using proportional control of air and oxygen for ventilators.

Catalog No. CB-03-1SA



Compact flow rate controller (RAPIFLOW) FCM Series

- IO-Link communication enables remote operation from the host as well as data collection
- Compact/high speed/high precision
- Compatible with various fluids
- Capable of 0.5 sec high speed control
- Equipped digital display makes control status visible at a glance
- Multiple models realized with built-in microcomputer

Catalog No. CB-024SA





CKD Corporation

Website <https://www.ckd.co.jp/>

ASIA

喜開理(上海)機器有限公司

CKD(SHANGHAI) CORPORATION

● 営業部 / 上海浦西事務所 (SALES HEADQUARTERS / SHANGHAI PUXI OFFICE)

Room 601, 6th Floor, Yuanzhongkeyan Building, No. 1905 Hongmei Road, Xinhui District, Shanghai 200233, China
PHONE +86-21-61911888 FAX +86-21-60905357

● 上海浦東事務所 (SHANGHAI PUDONG OFFICE)

- 寧波事務所 (NINGBO OFFICE)
- 杭州事務所 (HANGZHOU OFFICE)
- 無錫事務所 (WUXI OFFICE)
- 昆山事務所 (KUNSHAN OFFICE)
- 蘇州事務所 (SUZHOU OFFICE)
- 南京事務所 (NANJING OFFICE)
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- 大連事務所 (DALIAN OFFICE)
- 北京事務所 (BEIJING OFFICE)
- 天津事務所 (TIANJIN OFFICE)
- 青島事務所 (QINGDAO OFFICE)
- 瀋陽事務所 (SHENYANG OFFICE)
- 濟南事務所 (JINAN OFFICE)
- 烟台事務所 (YANTAI OFFICE)

CKD INDIA PRIVATE LTD.

● HEADQUARTERS

Unit No. 607, 6th Floor, Welldone Tech Park, Sector 48, Sohna Road, Gurgaon-122018, Haryana, India
PHONE +91-124-418-8212
● BANGALORE OFFICE
● PUNE OFFICE

PT CKD TRADING INDONESIA

● HEAD OFFICE

Menara Bidakara 2, 18th Floor, Jl. Jend. Gatot Subroto Kav. 71-73, Pancoran, Jakarta 12870, Indonesia
PHONE +62-21-2938-6601 FAX +62-21-2906-9470
● BEKASI OFFICE
● KARAWANG OFFICE
● SURABAYA OFFICE

□ 2-250 Uji, Komaki City, Aichi 485-8551, Japan

□ PHONE +81-568-74-1338 FAX +81-568-77-3461

CKD KOREA CORPORATION

● HEADQUARTERS

(3rd Floor), 44, Sinsu-ro, Mapo-gu, Seoul 04088, Korea
PHONE +82-2-783-5201~5203 FAX +82-2-783-5204

- 水原營業所 (SUWON OFFICE)
- 天安營業所 (CHEONAN OFFICE)
- 蔚山營業所 (ULSAN OFFICE)

M-CKD PRECISION SDN.BHD.

● HEAD OFFICE

Lot No.6, Jalan Modal 23/2, Seksyen 23, Kawasan MIEL, Fasa 8, 40300 Shah Alam, Selangor Darul Ehsan, Malaysia
PHONE +60-3-5541-1468 FAX +60-3-5541-1533
● JOHOR BAHRU BRANCH OFFICE
● PENANG BRANCH OFFICE

CKD SINGAPORE PTE. LTD.

No.33 Tannery Lane #04-01 Hoesteel Industrial Building, Singapore 347789, Singapore
PHONE +65-67442623 FAX +65-67442486

CKD CORPORATION BRANCH OFFICE

No.33 Tannery Lane #04-01 Hoesteel Industrial Building, Singapore 347789, Singapore
PHONE +65-67447260 FAX +65-68421022

CKD THAI CORPORATION LTD.

● HEADQUARTERS

19th Floor, Smooth Life Tower, 44 North Sathorn Road, Silom, Bangkok, Bangkok 10500, Thailand
PHONE +66-2-267-6300 FAX +66-2-267-6304-5

- RAYONG OFFICE
- NAVANAKORN OFFICE
- EASTERN SEABOARD OFFICE
- LAMPHUN OFFICE
- KORAT OFFICE
- AMATANAKORN OFFICE
- PRACHINBURI OFFICE
- SARABURI OFFICE

台灣喜開理股份有限公司

TAIWAN CKD CORPORATION

● HEADQUARTERS

16F-3, No. 7, Sec. 3, New Taipei Blvd., Xinzhuang Dist., New Taipei City 242, Taiwan
PHONE +886-2-8522-8198 FAX +886-2-8522-8128

- 新竹營業所 (HSINCHU OFFICE)
- 台中營業所 (TAICHUNG OFFICE)
- 台南營業所 (TAINAN OFFICE)
- 高雄營業所 (KAOHSIUNG OFFICE)

CKD VIETNAM ENGINEERING CO., LTD.

18th Floor, CMC Tower, Duy Tan Street, Cau Giay District, Hanoi, Vietnam
PHONE +84-24-3795-7631 FAX +84-24-3795-7637

EUROPE

CKD EUROPE B.V.

● HEADQUARTERS

Beechavenue 125A, 1119 RB Schiphol-Rijk, the Netherlands
PHONE +31-23-554-1490
● GERMANY OFFICE
● CZECH.O.Z.

CKD CORPORATION EUROPE BRANCH

Beechavenue 125A, 1119 RB Schiphol-Rijk, the Netherlands
PHONE +31-23-554-1490
● UK OFFICE

NORTH AMERICA & LATIN AMERICA

CKD MEXICO, S. DE R.L. DE C.V.

Cerrada la Noria No. 200 Int. A-01, Querétaro Park II, Parque Industrial Querétaro, Santa Rosa Jáuregui, Querétaro, C.P. 76220, México
PHONE +52-442-161-0624

CKD USA CORPORATION

● HEADQUARTERS

1605 Penny Lane, Schaumburg, IL 60173, USA
PHONE +1-847-648-4400 FAX +1-847-565-4923

- LEXINGTON OFFICE
- SAN ANTONIO OFFICE
- SAN JOSE OFFICE/ TECHNICAL CENTER
- DETROIT OFFICE
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