CKD

SM-3546-A/2

INSTRUCTION MANUAL

MULTILEX VALVE

ADK12E4－15A～25A

- Please read this instruction manual carefully before using this product, particularly the section describing safety.
- Retain this instruction manual with the product for further consultation whenever necessary.

CKD Corporation

FOR SAFETY USE

The Product is to be used by those who has a basic knowledge about material, fluid, piping electricity regarding Control Valves (solenoid valves, motor valves, air operated valves and so on.)

Never use this Product by those who have no knowledge or are not well trained about Control Valves.

Should be any trouble or accident caused by a wrong selection and/or wrong use of the Product even by a person of basic knowledge about Control Valves, we are not responsible therefore.

Since any customer of the Product have a variety of its application, we are not in a position to get all the information on how and where the Product is used. There may be the cases where that the Product may not meet customers' requirement or may cause any trouble or accident, by fluid, piping or other condition that are not within the specifications of the Product.
Under such a circumstance, select with their responsibility the most suitable application and use of the Product according to the customers' requirements.

The Product incorporates a various safety arrangement, however miss-handling of the product may lead to any trouble or accident on customers side. **To avoid any possible trouble, read this INSTRUCTION MANUAL carefully and understand it fully.**

Pay your attention to the items described in this Text, as well as the items indicated below.

⚠ CAUTIONS

- **When energized, heat is generated at coil portion of solenoid valves and motor valves particularly "Class H" coil where may have a high temperature.**

- **There my have electric shock when wire connecting portion of solenoid valves or motor valves are touched. In case of disassembly or inspection, turn off power supply beforehand. Don't touch live portion by wet hands.**

- **Make piping so as not to have leakage and check for no leakage before use, because in case of control valves for high temperature fluid like steam, leakage may cause heat injury.**

Thank you very much for purchasing the CKD's explosion-proof type MULTILEX VALVE "Pilot series ADK12E4 type.

This explosion-proof type MULTILEX VALVE is so designed to operate at such places usually not allowed to use due to existence of combustible gas or vapor of flammable liquid (explosive gas).

This INSTRUCTION MANUAL deals with the basic items regarding the installation, operation, maintenance, etc. required for bringing the efficiency of the MULTILEX VALVE into full play.

You are requested to thoroughly read through this INSTRUCTION MANUAL before using the valve, and to perform correct operation and maintenance.

Content

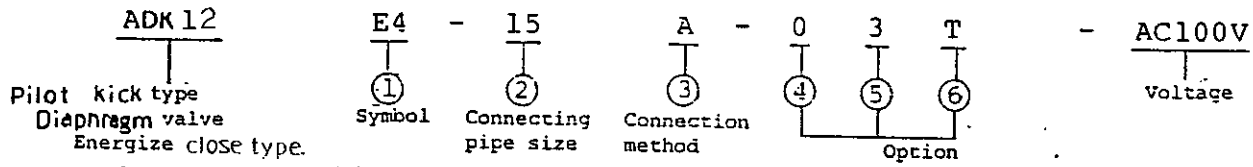
1 Specifications of electromagnetic valve

1-1 Standard specifications

Item \ Type	ADK12E4-15A-03T	ADK12E4-20A-03T	ADK12E4-25A-03T
Type	Pilot kick type 2 port valve (diaphragm type)		
Structural withstanding pressure	Water pressure 40 kgf/cm^2		
Fluid	Air, water, kerosene, oil (less than 50 cst), vacuum ($^{10\sim760}_{torr}$)		
Fluid temp.	- 10 ~ 60°C (not to freeze)		
Min. working pressure difference	0 kgf/cm^2		
Max. working pressure difference	(For AC power) Air : 6 kgf/cm^2, Water & kerosene : 6 kgf/cm^2, oil : 5 kgf/cm^2		
	(For DC power) Air : 6 kgf/cm^2, Water & kerosene : 6 kgf/cm^2, oil : kgf/cm^2		
Max. working pressure	20 kgf/cm^2		
Leakage from valve seat	0 NCC/min. (Air pressure at 6 kgf/cm^2)		
Rated voltage	AC 100V 50/60Hz, AC 200V 50/60Hz DC 12, DC 48V, DC 24V		
Voltage fluctuation	Within - 10 ~ + 5%		
Apparent power	150 VA (50Hz)	120 VA (60Hz) at start-up	
	25 VA (50Hz)	21 VA (60Hz) at holding	
Power consumption AC	12 W (50Hz)	10 W (60Hz)	
Power consumption DC	15 W		
Insulation grade	B		
Wire connection	By means of conduit tube screw (G 1/2)		
Ambient temp.	- 10 ~ 50°C		

Item \ Type	ADK12E4-15A-03T	ADK12E4-20A-03T	ADK12E4-25A-03T
Ambient humidity	90% or below		
Ambient condition	indoor, outdoor, explosive gas, etc.		
Mounting style	Free		
Connecting screw	Rc 1/2 (15A)	Rc 3/4 (20A)	Rc 1 (25A)
Orifice	16	23	28
Cv value (effective area mm^2)	4.5 (88)	8.6 (162)	12 (231)
Weight (kgf)	1.5 kgf/cm^2	1.7 kgf/cm^2	2.1 kgf/cm^2

1-2 HOW TO SEE MODEL NUMBER



Above model gives the followings: explosion proof d2G4, connecting pipe size; Rc1/2, body material; brass, seat material; NBR, and conduit; G1/2 and voltage AC 100V 50/60Hz.

①	Symbol for explosion-proof
E4	d2G4 (Withstanding pressure & explosion proof structure, grade 2 explosion, degree of ignition G2)

②③	Connecting pipe size and connection method
15A	Rc1/2 (screw in)
20A	Rc3/4 (screw in)
25A	Rc1 (screw in)

④	Option (body and seat material combination)	
	Body material	Seat material
O	Brass	Nitrile rubber
B		Fluorine rubber
D	Stainless	Nitrile rubber
E		Fluorine rubber

In the case of the process prohibiting the use of oil with the same combination of materials as given above, the symbol 4 changes as shown below:

O -- H, B -- J, C -- K, D -- L, E -- M, F -- N

⑤	Option (coil type)	Remarks
3	Grade B coil	E4 only
5	Grade B coil with diode	E4 only, AC to DC, all waves rectified

⑥	Option (Cable lead-in system)	Figs. 1 and 2
T	Conduit screw (G1/2) connection	
L	Pressure proof packing (G1/2) connection	Cable O.D. 7.5 - 8.4 (Unit: mm)
M		Cable O.D. 8.5 - 9.4
N		Cable O.D. 9.5 - 10.4
P		Cable O.D. 10.5 - 11.4
V	Pressure proof packing (G3/4) connection	Cable O.D. 7.5 - 8.4
W		Cable O.D. 8.5 - 9.4
X		Cable O.D. 9.5 - 10.4
Y		Cable O.D. 10.5 - 11.4

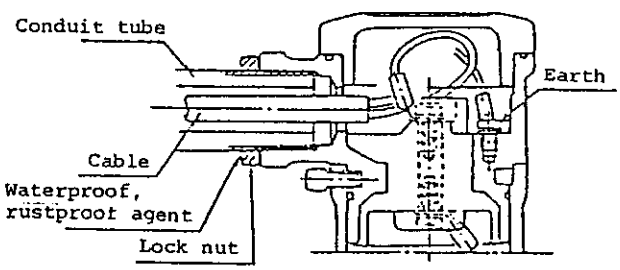


Fig. 1. Conduit screw connection

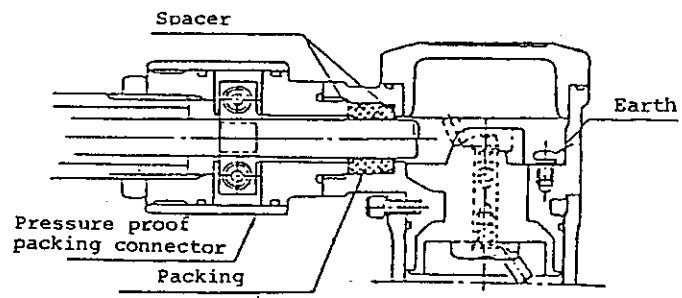
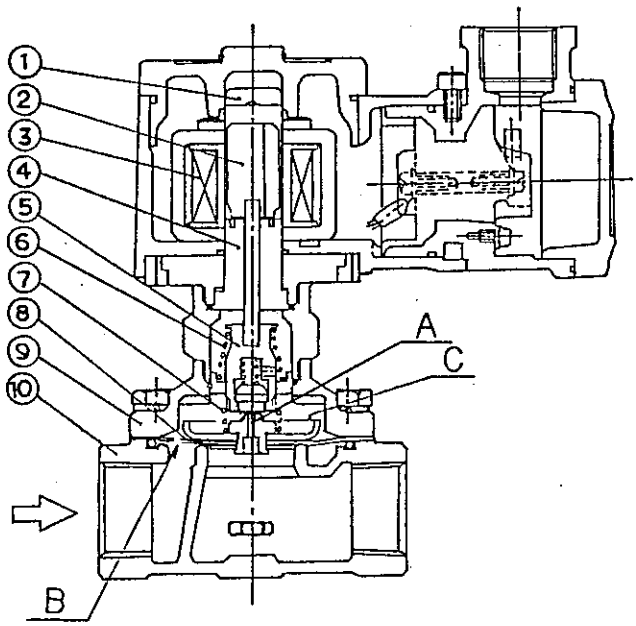


Fig. 2. Pressure proof packing lead in type

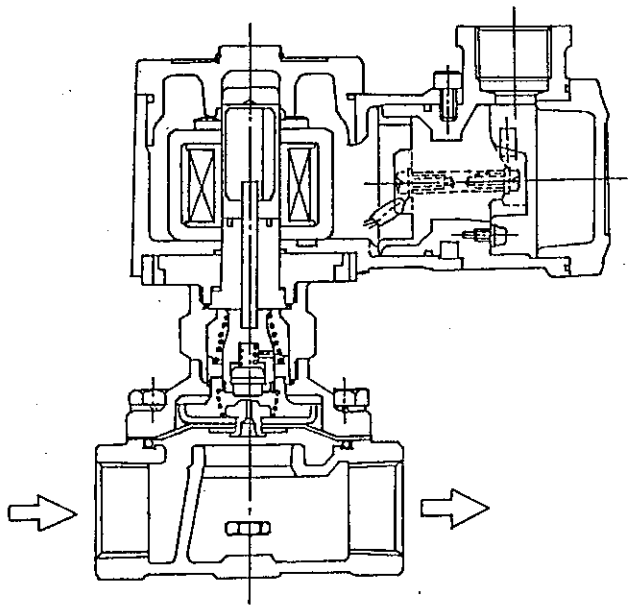
2. Working principle

o Closing movement



When the coil is energized, the fixed iron core ④ absorbs the plunger ② and thus the pilot valve seat Ⓐ closes. This will supply the IN side pressure to the diaphragm chamber Ⓒ through the bleed hole Ⓑ, and therefore the pressure at IN side becomes higher than the OUT side. Therefore the diaphragm ⑧ is pressed against the valve seat of the body and the valve closes. In case the pressure difference is small, the inner spring inside the NO valve ⑤ pushes the diaphragm and closes the valve completely.

o Opening movement



When a power supplied to the coil ③ is stopped, the fixed iron core ④ separates from the plunger ② by the force of outer spring ⑥, so the pilot valve seat Ⓐ opens and the pressure in the diaphragm chamber Ⓒ is discharged to the OUT side. At this moment, the pressure in the diaphragm chamber Ⓒ becomes lower than the IN side. Due to the pressure difference between the IN side and the diaphragm chamber Ⓒ, the diaphragm is pushed up and thus the valve opens. In case the pressure difference is small, the tension spring ⑦ pushes up the diaphragm ⑧.

Part No.	Part name	Material
1	Core assembly	SUS403
2	Plunger	SUS405
3	Coil assembly	
4	Fixed iron core	SUS405, C1100P
5	NO valve	SUS303, NBR (Fluoric rubber)
6	Outer spring	SUS304
7	Kick spring [Tension spring]	SUS304
8	Diaphragm [Valve]	NBR (Fluoric rubber)
9	Stuffing	BC6 (SCS)
10	Body	BC6 (SCS)

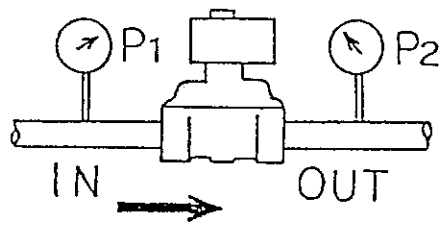
Item with brackets show options.

3. CAUTIONS FOR USE

3-1 Cautions for Operation

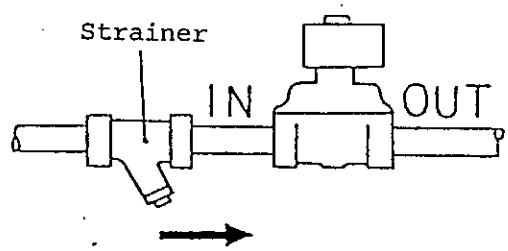
(1) Do not install the valve where there are much corrosive gas, explosive gas, or where rain water directly falls over such as outdoor.

(2) Be sure to operate within a specified pressure range. If not used within the specified pressure range, it may cause malfunction.

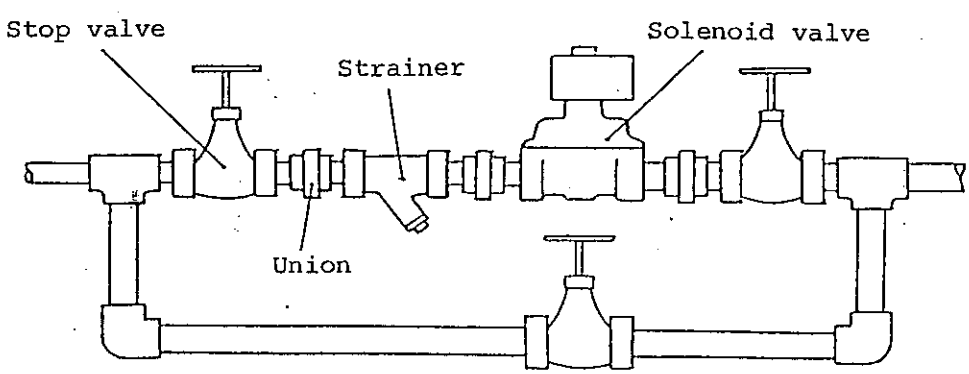


(3) Be sure to keep the ambient temperature and fluid temperature within the specified temperature range while in use. If there is a chance that the fluid may freeze, try to keep the temperatures within the specified range by using an heat insulating material.

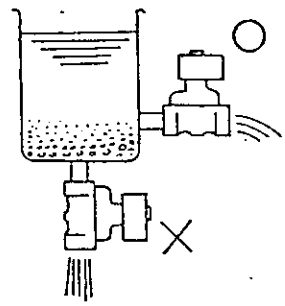
(4) If there is a chance that the dust, foreign matter, etc. may be mixed in the fluid, or inside the pipe may corrode, be sure to provide a strainer (filter) of 100 meshes at IN-side of the solenoid valve.



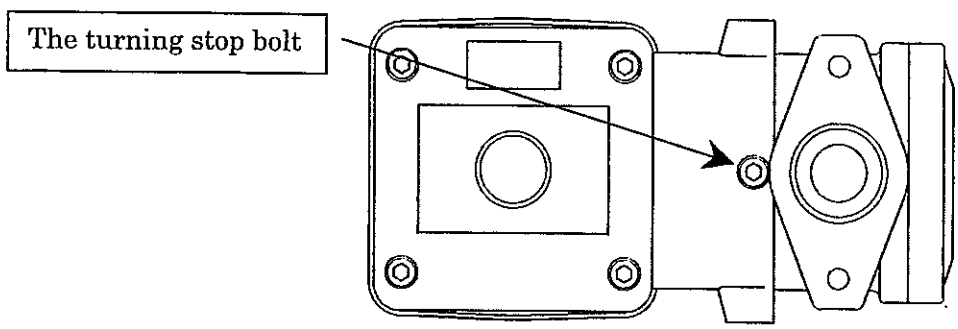
(5) For piping, use a by-pass circuit. This will make the maintenance and repair easy.



(6) For control of the water discharged in the tank, install the valve a little way up from the bottom. Installation of the valve to the same level with the tank bottom tends to cause valve failure due to the sludge accumulated on the tank bottom flown into the valve.

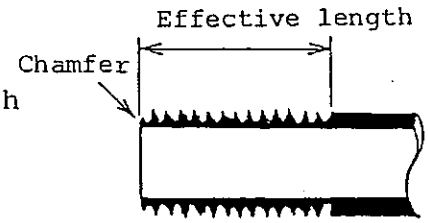


(7) The turning stop bolt used should be tightened to the torque of 0.6 to 0.8 Nm.
The turning stop bolt, if loose, may fall off during operation.
Also, terminal box turning may cause damage to the rotating portion and lead to internal wiring disconnection.
Avoid loosening other bolts than the turning stop bolt; otherwise the explosion protecting performance may be unable to be guaranteed.

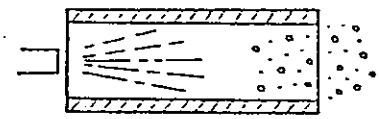


3-2 Cautions for piping

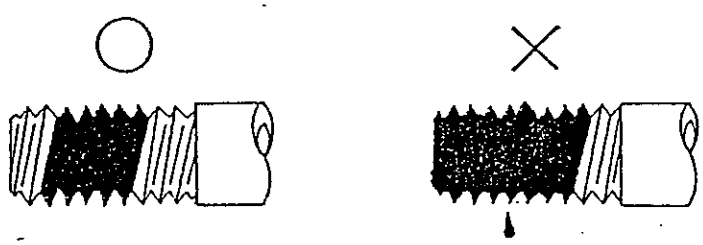
(1) Connect the pipe using the full effective screw length.
Also chamfer off about half a pitch of the screw at the pipe end.



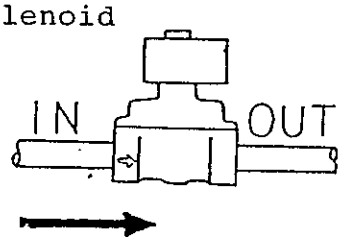
(2) Flush out foreign matter, chip etc. from the pipe.



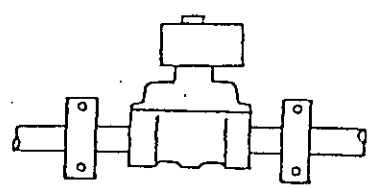
(3) When connecting the pipe with the valve, carefully see that sealant or seal tape does not slip into the pipe.



(4) Match the flow direction of the fluid with "IN" and "OUT" of the solenoid valve.



(5) If the pipe vibrates due to the water hammer as you switch on or off the valve, fix the pipe firmly.



(6) After piping, check for leakage.

3-3 Cautions for wiring

(1) Use the electric wire of nominal sectional area of more than 0.5 mm^2.

(2) Adopt the switching circuit which does not produce any chattering at contact points.

(3) Use 1A fuse.

(4) The voltage used shall be within the range from - 10 ~ + 5% of the rating.

(5) When a non-contact point relay circuit is used, be careful of its current leakage.

For AC coil, select a switch whose current leakage is lower than 30% of the rated current. For DC coil, select a switch whose current leakage is lower than 30% of the rated current.

4. Maintenance and inspection

4-1 Periodical inspection

(1) In order to use the solenoid valve in the best possible condition, perform inspection once or twice a year.

(2) What to be inspected.

(a) Check to see if no dust or foreign matter is accumulated or no high viscosity substance is adhered in the valve.

If such is observed, disassemble the valve and clean it.

(b) Check to see if no damage, abnormal wear, etc. is observed on the valve seat for a plunger and diaphragm assembly in the actuator part.

If such is observed, replace the parts.

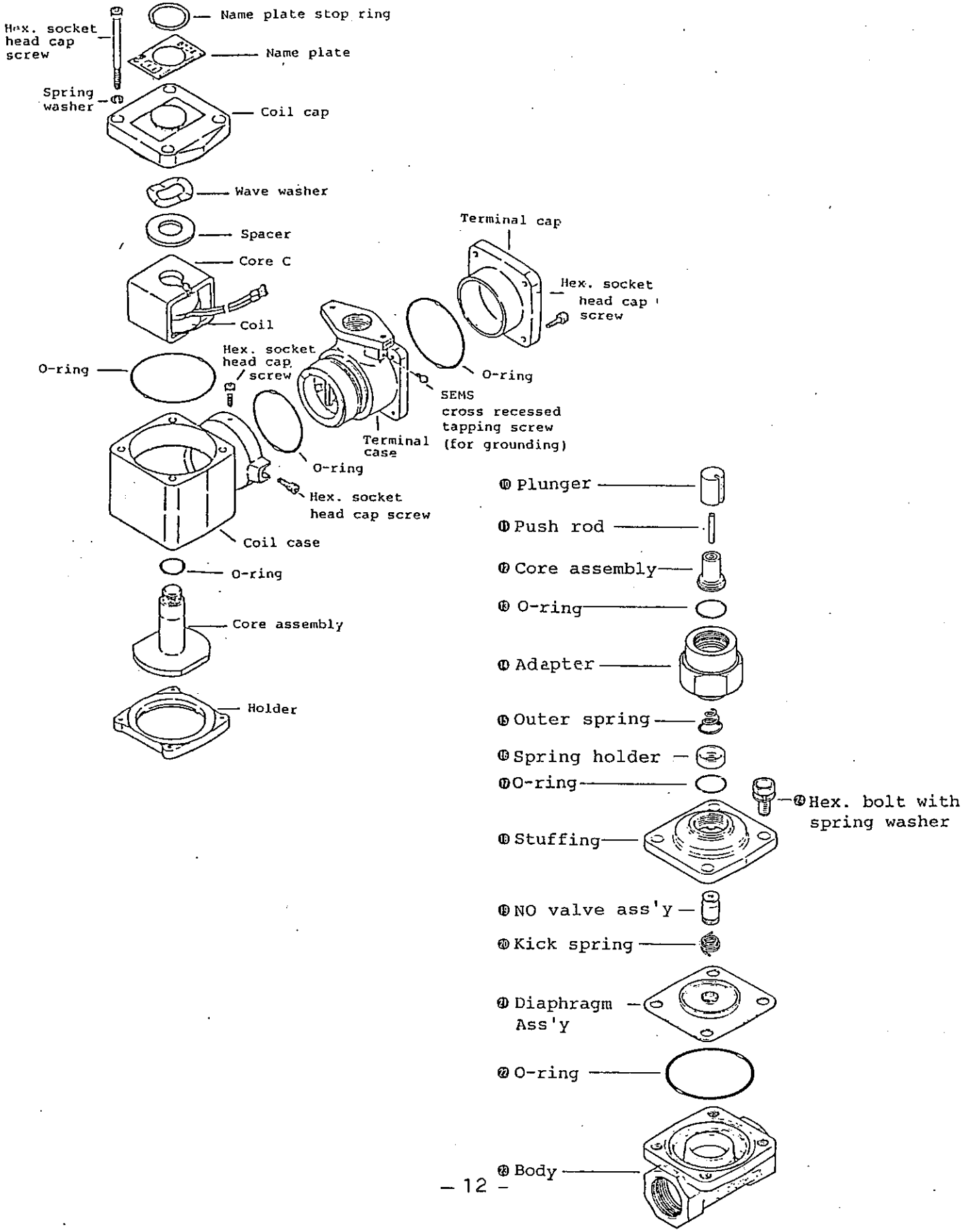
(3) Should any necessity be arose for disassembly of withstanding pressure type explosion proof structure coil case during inspection, consult the nearest CKD dealer. In case of disassembly without prior consultation with us, we will take any responsibility to the accident due to such a disassembly.

4-2 Troubleshooting

Phenomenon	Cause	Countermeasure
Fluid does not stop.	Power is not turned ON.	Check the power switch.
	The fluid flowing direction and solenoid valve installing direction are not correct.	Change the direction.
	The bleed orifice is clogged.	Disassemble and clean.
	The plunger is clogged with foreign matter.	Disassemble and clean.
	The valve seat of plunger is damaged.	Replace the plunger.
	The diaphragm is damaged.	Replace the diaphragm assembly.
Fluid does not flow.	Power is not turned OFF.	Check the power switch.
	The pressure at IN side is beyond the specified pressure range.	Correct Change the type to the specified one.
	The valve seat orifice at pilot part is clogged.	Disassemble and clean.
	The plunger does not move due to the accumulated foreign matters.	Disassemble and clean.

4-3 Constituting parts

Constituting parts for ADK12E4-15A, 20A, 25A



5. REFERENCE INFORMATION

5-1 5000 Maintenance of Explosion Proof Electrical Facility

5100 General items

5110 Applicable range

This section is applied to the maintenance of the electrical facilities described below and the environment such facilities are used.

(1) The electrical equipment and wirings used at a danger place.

(2) Electrical wiring for related equipment and circuit used at non danger place.

(3) The protective devices essential for keeping the explosion proof ability of the electrical facilities used at a danger place.

However even if a work to be carried out is a general type of maintenance, this section is applied if the work is related to the explosion proof of electrical facilities in some way.

(Explanation)

(1) This section stipulates the maintenance related to explosion proof of electrical facilities. This does not include mere inspection, service and repair for maintaining the function of electrical facilities. As for maintenance of oil explosion proof construction electrical equipment, there is not much information available.

(2) A word "environment" here includes dust, corrosive gas, fluid, temperature, humidity, vibration, etc. in regard to the explosion proof of electrical facility.

(3) As a protective device, an internal pressure protective device, a temperature protective device and an overload protective device, etc. are available.

5120 Definitions of key terms used

Definitions of key terms used in this manual are as follow.

(1) Maintenance

Inspection and maintenance or repair based on inspection which are carried out to the electrical facility and the environment that such facility is

used to maintain explosion proof of electrical facility. Remodeling of electrical equipment is not considered as maintenance.

(2) Inspection

Checking existence of abnormality of electrical facility, or the environment that the facility is used by means of visual, auditory, touching, or using an instrument.

(3) Servicing

The work carried out for recovering to the original state by replacing the consumable parts for maintaining explosion proof performance of the electrical facility without replacing the durable parts.

(Explanation)

The work for recovering to the original state without replacing the durable parts includes cleaning, replacement of consumable part, and servicing by opening the inspection cover or terminal box.
The packing, lamp, brush, lubricating oil, contact point, brake shoe, etc. are considered as consumable parts.

(4) Repair

The work carried out for the purpose of maintaining explosion proof performance of the electrical facility by disassembling the electrical facility and recovering the damaged or worn durable parts as close to the original state as possible within the specified restriction.

(Explanation)

(1) The specified restriction means that the range that the recovering of the explosion proof performance is possible and the recovered state can be confirmed with a reliable manner.
However if the specified restriction is exceeded, it is considered as remodeling.

(2) The concrete example of repair is replacement of bearing for motor, lamp protective cover for lighting equipment, etc.

5130 Classification of Maintenance and Basic Items for Execution

5131 Classification of maintenance

Frequency of maintenance shall be determined by taking the kind of electric equipment and explosion construction, wiring method, using condition, environment condition, and past result into consideration.

Generally accepted maintenance is as shown below.

(1) Daily maintenance

A maintenance work carried out to the electrical facility every day, placing importance on inspection.

(2) Periodic maintenance

A maintenance work carried out to the electrical facility periodically, placing importance on servicing and repairing.

(3) Non regular maintenance

Besides daily maintenance and periodic maintenance, a maintenance work carried out to the electrical facility any time the necessity for maintenance arises. The contents of work are the same as above (1) and (2).

(Explanation)

(1) Here the maintenance work is divided into three - daily, periodic and non regular maintenance. Execute the daily and periodic maintenance sufficiently to lessen the non regular maintenance.

(2) Determine the maintenance frequency by taking the life of consumable part, damage and wear of durable part, environment condition, using condition, past result, etc. into consideration.

5132 Basic items for maintenance

As for maintenance of electrical facility, take each of the following items as a basis holding the user himself subjectivity to carry out the maintenance work independently.

(1) Carry out the maintenance work totally by taking not only the remarkable point of view on explosion proof construction, but also the function of electrical facility into consideration.

(2) Execute the maintenance work by taking the type of electrical equipment and explosion proof construction, wiring method, environmental condition, etc. under proper plan.

(3) Execute the maintenance work by whom sufficient knowledge about the electrical facility is obtained.

(4) Understand that there is a limit for maintaining the explosion proof performance only by the maintenance work. If judged hard to maintain the explosion proof performance, replace the electrical facility promptly.

(Explanation)

Maintenance of the electrical equipment shall be done by the person who uses. Particularly if recovery of explosion proof performance by disassembly and reassembly, consult the manufacturer in advance to determine concretely a maintenance worker, contents and method of maintenance, method for confirmation of recovered explosion proof performance.

5140 Preparation for maintenance and its execution

5141 Preparation of maintenance documents

Select the documents thought to be necessary for maintenance in an appropriate manner from the following items, taking the type of electrical facility and explosion proof construction, and other conditions into consideration.

(1) Drawings which show hazardous location.

(2) Electrical wiring diagram

(3) Structural diagram of the device

(4) External dimension diagram of the device

(5) Information regarding characteristics of protective device

(6) Information regarding spare parts

(7) Operating instructions

(8) Test results

(9) Maintenance record

(10) Other necessary information

5142 Important matter for maintenance worker

The worker who carries out the maintenance work shall have sufficient knowledge about the following items.

(1) Principle and function of explosion proof construction
(2) Knowledge about explosion proof in regard to electrical wiring
(3) Methods for control, operation, disassembly, reassembly, etc. of the device.
(4) Precautions for maintenance
(5) Items and methods for maintenance
(6) Related regulations

5143 Maintenance and energization

Determine whether the valve shall be kept energized or not at maintenance in accordance with the following items.

(1) Ordinary periodic maintenance is mainly for inspection purpose, so the valve can be energized.
(2) Periodic and non regular maintenance are mainly for service and repair purposes, so the valve should not be energized.

However the maintenance work can be carried out with the valve being energized, under the following conditions.

(a) If it is obvious that the electrical facility does not become a source for ignition without de-energizing.
(b) It is confirmed that there is no chance that the work to be carried out does not produce any dangerous atmosphere at the site that the maintenance work of electrical facility are to be carried out.

In that case, the site is handled as non hazardous location temporarily.

5144 Precautions for maintenance

Precautions for maintenance vary depending upon type of electrical facility and explosion proof construction, etc.

(c) Determination and confirmation of necessity of de-energizing and the range of power failure

(d) Existence of explosive gas and handling of non hazardous location

(e) Knowledge and skill of worker

(2) Things to be noted during work

(a) In case of inspection work during energizing, do not open the body of the electrical equipment, terminal box, transparent window, etc. However this rule does not apply to the device meeting the safety explosion proof construction.

(b) It is desirable that the service or repair work be carried out at the non hazardous location. In case the work can not be carried out such a place, apply item 51453 (2).

(c) In case of execution of maintenance work at hazardous location, do not produce any impact spark.

(d) In case of service and repair, they accompany disassembly and reassembly in connection with explosion proof performance of the device. So be careful not to deteriorate the explosion proof performance of other parts.

(e) The electrical measuring instruments used for maintenance at hazardous location shall be of explosion proof construction.

(3) Things to be noted after work

(a) Reconstruct the explosion proof performance of the device as a whole.

(b) Confirm that the device conforms with the corresponding items stipulated by 2700.

5150 Maintenance in regard to atmosphere

As for dusts, corrosive gas, temperature, humidity which affect explosion proof performance of the device, refer to the table 51.1 and properly execute the periodic or non regular maintenace.

However this table is applicable to 5200 and 5300 commonly.

Table 51.1 Inspection items in regard to atmosphere

Item	Method	Inspection	Remark
Ambient temp.	Touch, thermometer	Should not exceed the specified value.	
Moisture humidity	Visual, touching	No wetting, nor immersion of water	
Dust	Visual	No contamination, accumulation	
Corrosive gas	Visual, smell	No leakage	Gas detection if necessary
Explosive gas	Visual, smell	No leakage	Gas detection if necessary
Vibration	Visual, touching	No particular vibration	

5200 Maintenance of Electrical Equipment

5210 Withstanding pressure type explosion proof construction electrical equipment

5211 Maintenance of withstanding pressure type explosion proof performance

Withstanding pressure type explosion proof construction of electrical equipment has been ensured by each item of 3200. Therefore in order to maintain withstanding pressure type explosion proof performance, refer to table 52.1 and carry out the periodic and non regular maintenance particularly on strength of vessel, clearance of bonded section, temperature rise of external surface of vessel.

Table 52.1 Inspection items of withstanding pressure type explosion proof construction electrical equipment

Item	Method	Inspection	Remark
Vessel	Visual	No rust, damage	Clean, anticorrosive treatment
Transparent window	Visual	No damage	Replace
Bonded section	Visual	No damage, rough surface due to corrosion	Clean
Clamp screw	Visual, touching	No looseness, adhesion of dust, rust	Retighten & clean
Packings	Visual	No crack nor deformation	Replace
Bearing	Visual	No leakage nor deterioration of oil, grease.	Replace
Conductor lead-in section	Visual,	No damage, nor deterioration	Replace
Movable wire lead-in section	Visual, touching	No damage, deterioration, nor looseness	Retighten & replace
Terminal	Visual, touching	No looseness on connection, or stain on insulation	Retighten, tape, & clean

Item	Method	Inspection	Remark
Gounding terminal	Visual, touching	No looseness nor damage	Retighten & replace
Temperature rise	Thermometer, touching	Temperature rise of vessel outer surface shall be below the specified value.	Find the cause.

5212 Confirmation of recovered withstanding pressure type explosion proof performance

Confirm mainly the following points for recovery of withstanding pressure type explosion proof performance.

(1) No damage on bonded section of the vessel.

(2) Gap and length of flamepass shall ensure necessary figures for explosion proof construction.

(3) No damage nor crack on outer surface of vessel and transparent plate.

(4) See if the clamping screws are tightened uniformly and properly.

(5) See if anticorrosive treatment is sufficiently performed.

5-2 Classification of explosive gas

The table 1 classifies the grade of explosion and degree of ignition of explosive gas.

Table 1 Classification of explosive gas

Easy to ignite

Explosive energy becomes greater

Degree of ignition		Classification by ignition temperature				
		450 °C or over	450 ~ 300 °C	300 ~ 200 °C	200 ~ 135 °C	135 ~ 100 °C
		G1	G2	G3	G4	G5
	1	Acrylonitrile	Methyl acrylate	* Butyl chloride	Acetaldehyde	
		Acetonitrile	Ethyl acrylate	Octane	Ethyl ether	
		Acetone	Acethyl acetone	Cyclohexene	Dibutyl ether	
		Ammonia	Iso octane	Dimetyl ether	Dibutyl ether	
		Isoputyl ketone	Isobutanol	Tetrahydrofuran		
		Carbon monoxide	Isobutane	Decan		
		Etane	Ethanol	Butyraldehyde		
		Ethyl methyl ketone	Epichlorohydrin	1-hexanol		
		*Isopropyl chloride	Vinyl chloride	Hexane		
		O-xylene	* Isobontyl acetate	Hebutane		
		m-xylene	* Vinyl acetate	1-pentanol		
		p-xylene	* Butyl acetate	Pentane		
		Chlorobenzene	* Propyl acetate	2-Methylhexane		
		Acetic acid	* Bentyl acetate	3-Methylhexane		
		* Ethyl acetate	Cyclohexanone	Gasoline		
		* Methyl acetate	Di isoproyl ether			
		Hydrogen cyanide	1,4-dioxyson			
		Ethyl bromide	1,2-dichloro ethane			
		1,1-Dichloro ethylene	Thiophene			
		Stylene	Furan			
		1,2,4-trimethyl benzene	1-butanol			
		Triene	Butan			
		Propane	2-propanol			
		Benzene	Propylene			
		Benzotrifloride	Acetic anhydride			
		Methanol	Methyl metha-crylate			
	2	1,2-dichloro ethylene	Ethylene Eth	Isopulene		
		Coal gas	Ethylene oxide	* Hydrogen sulfide		
			1,3-butadiene			
			Propylene oxide			
	3	Hydrogen	Acetylene			Carbon disulfide
		Water gas				

(Note 1) The explosive gas with * mark is also a corrosive gas, so avoid using it as much as possible.

(Note 2) The material of explosion proof construction of Multi explosion proof type solenoid valve is made of aluminum die cast (ADC12). The corrosive gas may corrode O-ring (NBRetc), body material, etc. So it can not be used.

5-3 Classification of Hazardous Location

The hazardous location is a place that there is a chance to produce dangerous atmosphere by mixing the explosive gas and air, which may either explode or burn.

The locations can be classified into three, as shown below depending upon the period of dangerous atmosphere and frequency

Table 2 Classification of hazardous location

Type	Atmosphere	Example
O grade	Density of explosive gas is beyond the lower limit continuously or for a long period of time at the place where produces dangerous atmosphere continuously or there is a chance to produce such an atmosphere.	1. A vessel for flammable solution or an empty space on top of solution in the tank. 2. Inside of vessel, tank, etc. of flammable gas. 3. Near solution surface of flammable solution of opened vessel.
1 grade	A place where there is a chance of producing dangerous atmosphere under normal condition.	1. An explosive gas accumulates at the lid when opening and closing it for taking the products out, or operation of safety valve, etc. 2. A place where there is a chance of accumulation of explosive gas due to repair, maintenance or leakage.
2 grade	A place where there is a chance of producing dangerous atmosphere under abnormal condition.	1. An explosive gas or flammable liquid has been handled regularly. But those are sealed in the vessel of facility. Such vessel or facility is damaged due to accident or mis-handling, and therefore the place is possible to be filled with such a gas or liquid. 2. Though a place is well ventilated by a ventilator, there is a chance that eplosive gas may accumulate due to break down of ventilator.

Table cont'd

Type	Atmosphere	Example
		3. In the room near or adjacent to the 1 grade location, an explosive gas may enter and fill upto the dangerous density.

(Note 1) The Multi explosion proof type solenoid valve (withstanding pressure type explosion proof construction) can be used at grades 1 and 2 locations in the table 2.