IWAKI PUMPS

Iwaki Flow Checker

The FCM

Instruction manual

Read through this instruction manual before use!

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■Safety instructions

Turn off power!

Be sure to turn off power to stop the pump and related devices before work. Otherwise, liquid may gushes out.

Wear protective clothing!

Getting wet with chemicals may result in a chemical burn. Always wear chemical clothing such as a protective mask and gloves in order to reduce the risk.

Do not remodel the pump!

Remodelling this product carries a high degree of risk.

Specified application only!

Do not use this product to any application other than specified one. Otherwise, personal injury or property damage may result.

Specified power only!

Risk of fire or failure. Do not apply any power other than the specified one.

Restriction on installation!

This product is not watertight. Do not place this product in a humid place or wet it with liquid. Otherwise, electrical shock or failure may result.

Non-freezing!

Risk of failure. Do not allow liquid to freeze in the flow path of this product. Keep the liquid warm by the heater when an ambient temperature is very low.

Power cord!

Risk of electrical shock or fire. Do not use a damaged cord.

Damaged product!

Risk of electrical shock or leak. Do not use a damaged product.

Observe these safety instructions. Otherwise, personal injury or property damage may result!

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■Specification

Model*1		FCM-VC-1, 2, 7	FCM-VH-1, 2, 7
Power voltage		5-24VDC	
Wet ends	Body	PVC	
	Plate		
	Float		
	O ring	FKM	EPDM
Min flow rate		0.1 ml/shot*2	
Min discharge pressrue		0.2MPa*2	
Output		NPN open collector	
Max consumption current		8mA	
Max load capacity		15mA	
Cable	Length	5m	
	Cross section	0.08 mm^2	
Connection bore		ø4×ø9, ø4×ø6, ø1/4"×ø3/8"*1	
Conditions	Ambient temp.	0-40deg.C	
	Humidity	35-85%RH	
	Liquid temp.	0-40deg.C	
	Viscosity	20mPa•s or below	
	Storage temp.	-10 - 50deg.C	

*1 Underbars show hose connection code
1:ø4×ø9, 2:ø4×ø6, 7:ø1/4"×ø3/8"

*2 Max discharge pressure & flow rate depend on specification.

■Product outline

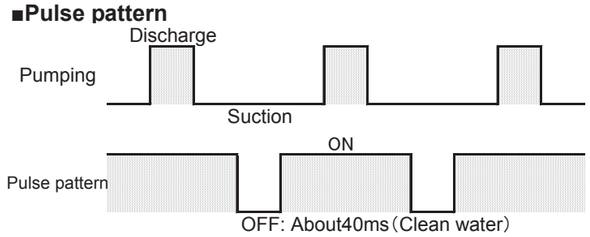
This product is to be mounted to the inlet of an electromagnetic metering pump and to output the pulse signal along with pulsation The number of pulsations are monitored by a float action. The minimum flow rate for the pulse signal output is 0.1ml/shot.
The pulse signal output stops in the following cases.

1. When the pump has stopped
   Pump/Power failure
2. Closed discharge
   Crushed discharge tube/Clogging
3. Air lock
   Poor flow due to imperfect degassing or air ingress

■Applicable pump

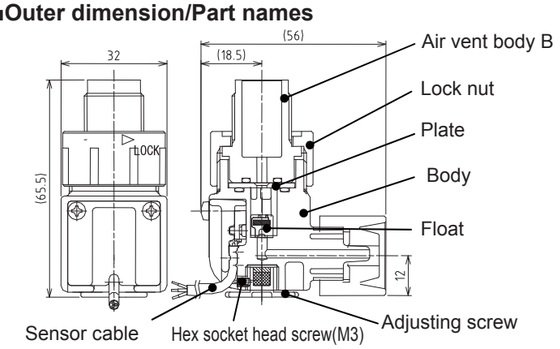
This product is applicable for the following pumps.
Iwaki electromagnetic metering pump: EHN-B/C-11/16/21 EW-F/G-11/16/21

■Pulse pattern



*Off time changes with the flow rate and viscosity.

■Outer dimension/Part names



■Installation (when the pump is already used.)

Turn off power and check the pump has stopped before work!
Release the discharge pressure before work!

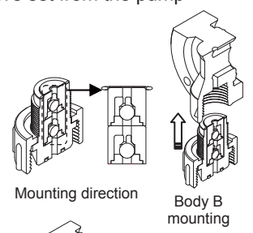
Remove tubes from outlet, inlet and air vent port. Take care not to get wet with chemicals. And then release the pump base.

*See an instruction manual for the pump installation and pipework.

1. Remove the Lock nut and the Air vent Body B.
2. Remove the fitting and take out the valve set from the pump head.

*Do not drop the valve set.

3. Place the valve set into the air vent Body B and screw them into the pump head over the Lock nut. (*Tightening torque: 3.5N•m)
4. Connect the Body and the pump head via the Lock nut. Turn the Lock nut anticlockwise to tighten them. Take care not to drop the Plate, O ring or Float. Note that the Float has a mounting direction. Install the float into the Body B with a red-marked face upwards.
5. Run the pump and check for chemical leak or the operation of the flow checker.



*When the pulse signal output from the flow checker is unstable, loosen the hex socket head screw (M3) and adjust the float position by loosing or removing the adjusting screw.

■Wiring

Be sure to disconnect the flow checker from the power source!

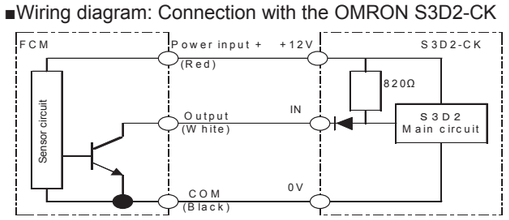
*See an instruction manual for pump wiring.

Conduct wiring work based on the following information, checking corresponding terminals.

Red……Power input+
White……Output（Open collector）
Black……COM

Induced noise may cause malfunction. Do not band or lay on the cable together with a high power cable!
Induced noise may cause malfunction. Do not install this product close to high power equipment or the motor!
A reverse polarity protection or a surge protection is not provided. Be careful about faulty wiring and overload!

■Wiring diagram: Connection with the OMRON S3D2-CK



Set the S3D2-CK as below for checking the pulse signal output and the alarm output.

IN1=INV, IN2=NORM, MODE=OR, TIMER=ON, TIMER MODE=ON•D, RANGE=10S, TIME ADJ.=Max

See an instruction manual for detail information on the OMRON S3D2-CK.

■Precautions

1. Observe 0.1mL/shot is observed and set stroke length to 100%.
2. Install a check valve when the back pressure is zero. Otherwise, failure may result.
3. Adjust the float position by an adjusting screw according to liquid viscosity.
4. A magnetic proximity switch is subject to magnetic force. Do not place a magnet or magnetized body near the flow checker. Otherwise, float motion may be affected.
5. Clean the inside of the flow checker before a long period of stoppage.

■Maintenance/Adjustment

Check the following points during operation and stop the operation upon sensing abnormalities. See “Troubleshooting” below in order to remove problems.

Item	States	Points to be checked	How to check
1	Pulse output	If liquid is pumped.	Flow meter/Visual check
2	Leak	Check for leak and tighten joints.	Visual check
3	Air ingress from a suction line	Check and tighten joints.	

■Troubleshooting

States	Possible causes	Solutions
Pulse signal output is unstable.	A tube line is disconnected or broken.	Fix or replace the tube line. Adjust an adjusting screw.
	A check valve is detached.	Attach a check valve. Adjust an adjusting screw.
No pulse signal output	Faulty wiring/Disconnection	Correct wiring.
	A crushed tube line or clogging	Correct or replace as necessary.
	Air ingress.	Tighten tube joints and then conduct degassing.
	Foreign matter interfusion	Dismantle and clean the pump.
	A magnet or magnetized body near the flow meter	Keep them away.
	The float does not act.	Adjust an adjusting screw.
Liquid leaks.	O ring is out of place.	Fit the O ring.

■Warranty/Repair service

Scope

1. Warranty period: One year after delivery
2. Repair without charge: Any failed or damaged product occurred within the warranty period due to a design or constructional problem will be repaired without charge.
3. Repair with charge: Any repair of the failed or damaged product which falls under the following cases will be charged.
   a. The product is out of warranty period.
   b. Failure or damage is due to incorrect handling.
   c. Failure or damage due to the use of any part other than those specified by us.
   d. Failure or damage due to repair or modification by a third person other than us or our representative.
   e. Failure or damage due to act of providence such as earthquake or fire.
4. We are not responsible for any failure or damage on the product which is developed based on the specifications or materials specified by you.
5. The materials we selected for the product are recommendable ones. We are not responsible for any chemical corrosion or wear.
6. We are not responsible for any property damage and related expenses due to product failure.

Repair

Stop operation upon sensing abnormal condition and check/solve problems. An early check and corrective action will help prevent a failure or accident.

1. Read this instruction manual thoroughly before repairs.
2. Contact us or your host machine maker (when built-in application) for repair.
3. Flush the inside of the pump to remove residual chemicals before return.
4. Contact us for repair with the following information.
   a. Model code and Mfg. number: See nameplate.
   b. Operating period and condition (Liquid, concentration, temperature, slurry, piping layout or so)
   c. Failure detail and state.