

Stager Controller 2.1

Manual



JKmatic Co., Ltd

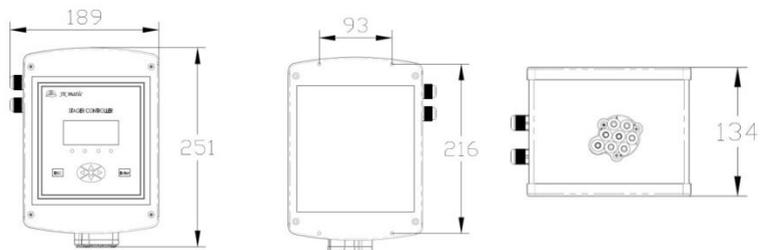
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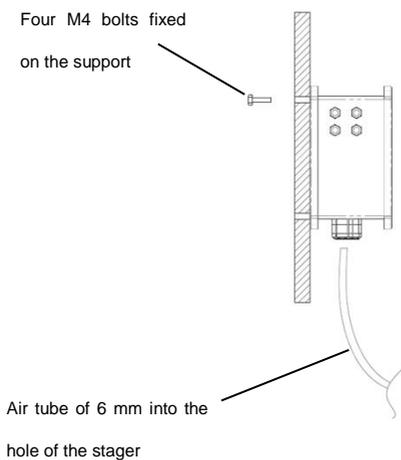
Important Please Read:

- ★ The information, specifications and illustrations in this manual are based on the latest information available at the time of printing. The manufacturer reserves the right to make changes at any time without notice.
- ★ This manual is intended as a guide for service of the controller only. System installation requires information from a number of suppliers not known at the time of control manufacture. This product should be installed by a plumbing professional.
- ★ This product must be installed in compliance with all state and municipal plumbing and electrical codes. Permits may be required at the time of installation.
- ★ If daytime operating pressure exceeds 80 psi, nighttime pressures may exceed pressure limits. a pressure reducing valve must be installed if pressure exceeds 125 psi.
- ★ Do not install the unit where temperatures may drop below 32°F (0°C) or above 110°F(43°C).
- ★ Do not strike the controller or any of the components.
- ★ We are responsible for the failure of manufacturing defects of controller.
- ★ A prefilter should be used on installations in which free solids are present.
- ★ Correct and constant voltage must be supplied to the controller to maintain proper function.
- ★ The plug of the controller's ground wire must be grounded.
- ★ Current protector should be used with controller's electric source. The maximum current is 1A.
- ★ If it be set at outdoor, please make sure have method of rain prevention and protection of sunshine.
- ★ Altitude < 2000m

Controller Dimension(mm)



Installation



1. Installed on the support bracket or in the control cabinet.
2. The bracket needs to be fastened firmly to prevent safety risks caused by vibration.
3. 200mm space both on the left and right side of controller needed for the sake of maintenance.
4. No less than 500 mm space needed below the controller to install a control hose.

Specifications:

PW: 230V/110V 50/60HZ 20W (To be confirmed)

Max Humidity: 75%RH, non-condensing

Temperature : >32°F (0°C) <140°F (60°C)

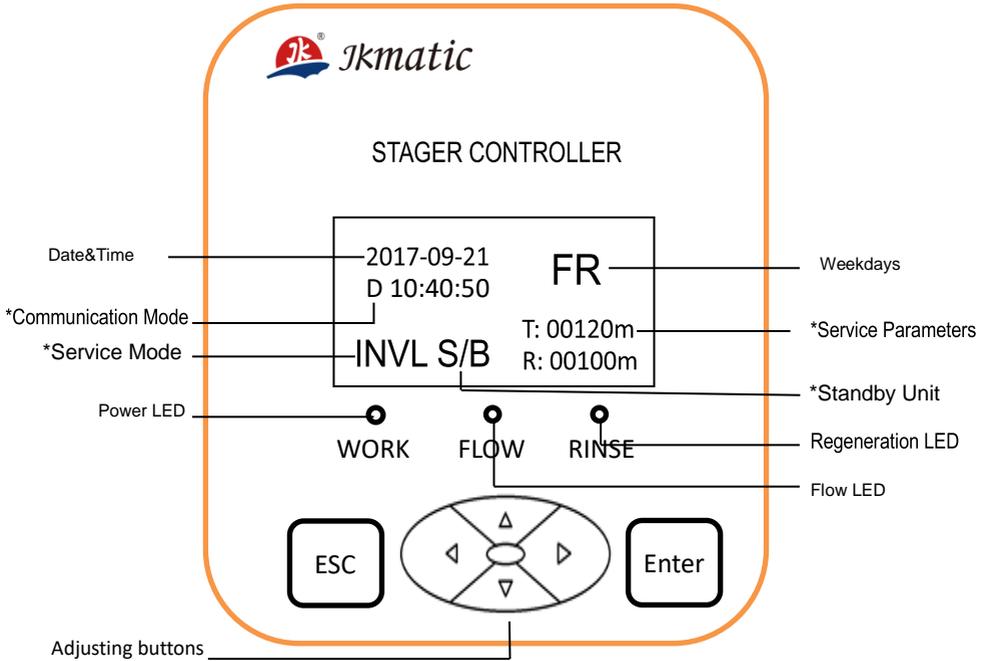
Maximum control pressure: 118 PSI (8 Bar)

Weight: 3Kg

Features:

1. JKA2.1 stager controller has multi-function, developed specifically for water filtration, softening, desalination and other water treatment system ;
2. Easy to operate, no need for expertise;
3. The settled parameters are protected by password, Not free to change;
4. Various regeneration initiating modes (including weakly timer mode, interval timer mode, Flow Rate Equipped Mode and remote control mode), the regeneration choice made accordingly. Under specific circumstances, manual regeneration is chosen.
5. The controller can memorize, all displays and programming during a power failure are stored for use upon power re-application. It retains all values, without loss.
6. To accommodate the field environment, the generation cycle could be adjusted.

Display Features



★ **Communication Mode:**

S: Single tank mode

E: All tanks in parallel service and regeneration sequentially

D: Multiple tanks in service and one in standby

X: Communication system failure

★ **Service Mode:**

INVL: Interval mode

Vol: Flow mode

NEXT FRI: Week mode

Remote: regeneration only by signal

★ **Service Parameter:** service parameters under different service mode

★ **Standby:** display only when the controller is in standby state

Network/Communication Cables & Connections

CAN	CAN-	01
	CAN+	02
Pluse	GND	03
	P	04
	12V	05
Remote	YC-	06
	YC+	07
S3	N.O	08
		09
S2	N.O	10
		11
S1	N.O	12
		13
Stager	N	14
	M1C	15
	M2C	16
	M2C	17
	M1C	18
	M1O	19
Power 230V/110V	N	20
	L	21
	PE	22



- ★ Power Pack 230VAC 50HZ or 110VAC 60HZ, please confirm power specification **before use**. And contact distributors or manufacturer if it is inconsistent.
 - ★ Range of power supply within $\pm 10\%$ nominal voltage. Stabilized voltage supply might be necessary if the voltage fluctuation beyond the default, otherwise any damages caused are excluded in warranty coverage.
 - ★ Working temperature: $5^{\circ}\text{C}\sim 60^{\circ}\text{C}$.
 - ★ Output S1 (12, 13), S2 (10, 11), S3 (08, 09) are dry contact. Electric relay have to use if the voltage above 20W, otherwise (load power= $<20\text{W}$) the controller could be connected directly.
 - ★ Pulse zone Flow meter connection:
A sensor with JKTT: Connect the Red Line of Flow meter to Terminal "05"+12v; connect sensor black (white) line to point P of terminal "04"; connect shield line to point "GND" of terminal "03".
 - ★ Remote input terminal (06,07): when terminal 06 and terminal 07 is short circuit by external circuit, the system is forced to start regenerating.
 - ★ Communication interface. Multiple sets of controller are communicated by shielded twisted pair, "D" model or "E" model is realized.
 - ★ When several controllers are online, the white buttons where is the first controller and the controller at the end are should be placed in the "ON" position, as shown below:
- 
- ★ It is recommended that all wiring terminals should use RVVP/2x0.3 specification cable except power line.

Operation

1. Time setting

Use (◀▶) to move the cursor, use keys of(▲▼) to change value. Change "0000" to "2017" then press (ENTER)

:

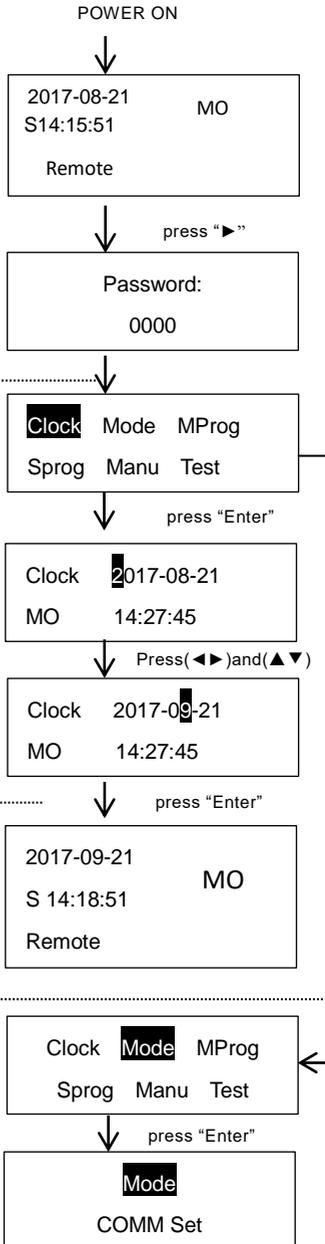
If press key(ESC) get back to main screen without adjustment.

2. Setting of service mode:

Use(◀▶)to move cursor to "Mode", press key(Enter) to enter "Mode" setting.

Setting of Volume Mode :

Note: The Selection of regeneration mode should according to specific processing of technique. Volume mode needs coordination of JKTT flow meter (manufactured by Jkmatic)



If use volume mode to start regeneration, press(◀▶)to move cursor to " Volume "

↓ press "Enter"

```

Mode:  Volume
Week  INVL Remote
    
```

PS: K: Refer to the K-value table in Flow-meter brochure .

P : Periodic water yield.

Σ - Total accumulated water production by volume mode.

↓ press "Enter"

```

K: 000.000  Σ
P: 000000.0  t
    
```

Use (◀▶) and (▲▼) to enter the value of " K " and value of " P "

Maximum P can be set: 99999.9t.

↓ press "Enter"

```

K: 001.500  Σ
P: 00100.0t
    
```

To enquire the accumulative flow rate, use (◀▶) to move the cursor to " Σ " ,

↓ press "Enter"

```

Mode:  Volume
Week  INVL Remote
    
```

←

```

K: 001.500  Σ
P: 00100.0t
    
```

" CLR00100 " : Number of regeneration times by " volume " mode is 100

" 00050000.0 t " : Total water production of this unit is 50000.0m

PS:its total maximum accumulated volume is 99999999m³ .

↓ press "Enter"

```

Σ: (CLR00100)
00050000.0 t
    
```

↓ press "ESC"

```

K: 001.500  Σ
P: 00100.0 t
    
```

↓ press "ESC"

Q: Current flow rate

S: Periodic water yield

During service, " S " will decrease gradually. It starts regeneration when the value reaches to " 00000t/h

2017-09-21	MO
S 14:18:51	
Vol	Q:0.000t/h
	S:00100.0t/h

A screen-shot of service in process:

2017-09-21	MO
S 14:18:51	
Vol	Q:25.30t/h
	S:0053.5t/h

Setting of Week Mode

If use weekly timing mode to start regeneration, use (◀▶) move cursor to " Week "

Mode:	Volume
Week	INVL Remote

press "Enter"

Press(◀▶) to move the cursor to select a date for regeneration(the cursor on selected date will flick frequently and shadowed on the background)

SU	MO	TU	WE	TH	FR	SA
-	-	-	-	-	-	-

SU	MO	TU	WE	TH	FR	SA
-	-	█	-	-	-	-

Press(▲▼) to change "-" to "*" :

"-": regeneration is closed

"*": regeneration is opened

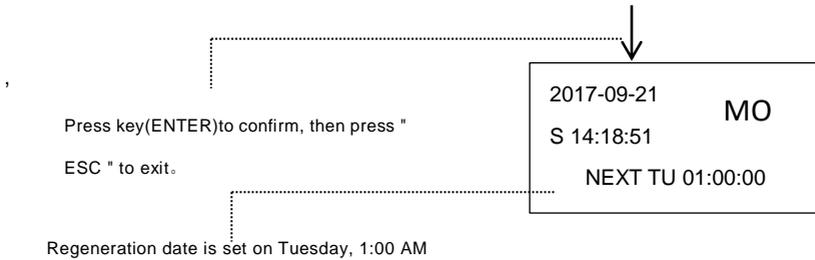
SU	MO	TU	WE	TH	FR	SA
-	-	█*	-	-	-	-

press "Enter"

Press(◀▶)and(▲▼) to set time of regeneration on that very date

Time
00:00:00

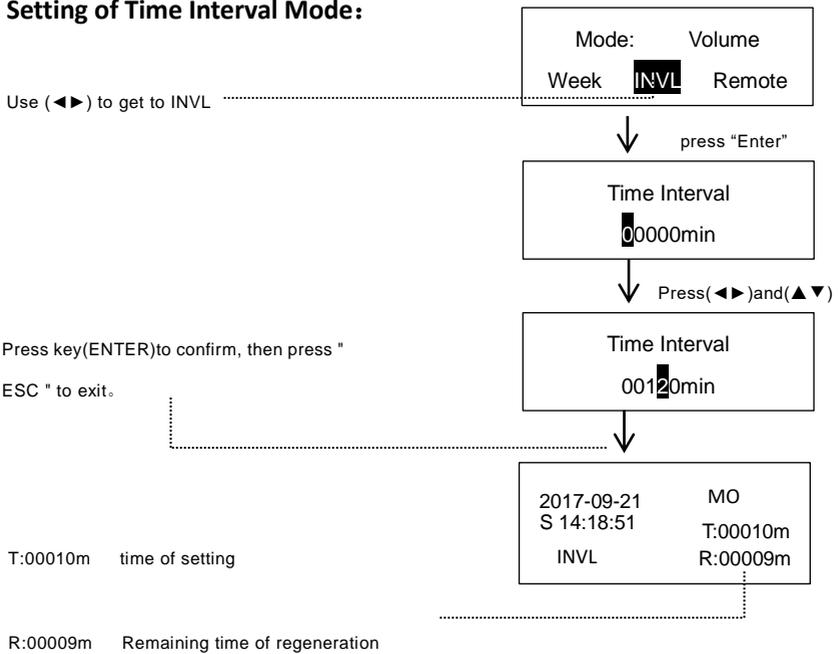
Time
01:00:00



Note: In " Week " mode, it is allowed for regeneration only once in a day, and specific regeneration time for each day has to be set every day.

If it's necessary to regenerate many times in one day, please select INVL Mode.

Setting of Time Interval Mode:

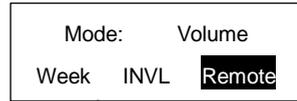


Setting of Remote Mode:

Under Remote mode regeneration setting, press(◀▶) get to "Remote "

Press key(ENTER)to confirm, then press " ESC " to exit.

PS :In the Remote Mode , ONLY regeneration by Remote signal.



PS: Above four types of regeneration modes, Remote Mode has its priority

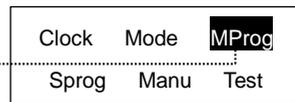
3 . Setting of "M" Program:

" MProg " is to control duration of each technical process in Filtration or Softening system.

Such as Ion-exchange softening, the process includes three main steps: Backwash, brine, slow washing and rinse. By Setting up the " MProg " to control the time period of each step.

Use (◀▶) to get to MProg

set the step (1-19 step)



press "Enter"



Press (▲▼)



press "Enter"



press "Enter"

PS: The total number of steps needed are based on actual technique. Such as, Two steps Filtration include Process of Backwash and Rinse, and 3 steps Softening includes process of Backwash, brine/exchange, and Rinse.

" Time " setting of the 1st step step:

ProgStep: 01/03
Time: 0010 S

↓ Press(◀▶)and(▲▼)

ProgStep: 01/03
Time: 0900 S

↓ press "Enter"

ProgStep: 01/03
Time: 0900 S

↓ Press(▶)

And press(▶)to start the setting of 2nd step same as 1st step .step:

ProgStep: 02/03
Time: 0010 S

↓ Press(ESC)

Clock Mode MProg
Sprog Manu Test

4 . Setting of SProg:

When the controller needs to output dry contact (e.g. S1,S2) SProg setting is a necessary step.

Clock Mode MProg
Sprog Manu Test

Use (◀▶) to get to SProg

↓ press "Enter"

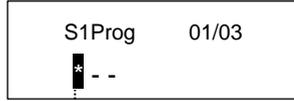
Sprog
S1 S2 S3

Use (◀▶) to get to S1 or S2

↓ press "Enter"

S1Prog 01/03
- - -

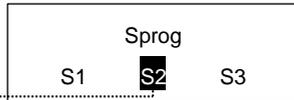
Press(◀▶) to move cursor to corresponding "-" , where needs to output signal to assist in main program, then press (▲▼) to change "-" to "*" .



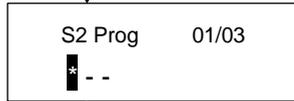
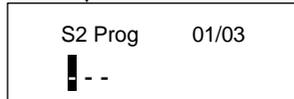
The 1st step of regeneration, terminal " S1 " needs to output a signal (dry contact) .The total steps of " MProg " is THREE

Setting of S2

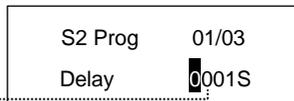
Press(◀▶) to move cursor to corresponding "-" , where needs to output signal to assist in main program, then press (▲▼) to change "-" to "*" .



press "Enter"

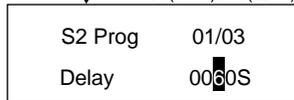


press "Enter"

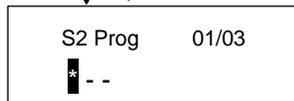


Time setting of signal output. (dry contact)

Press(◀▶)and(▲▼)



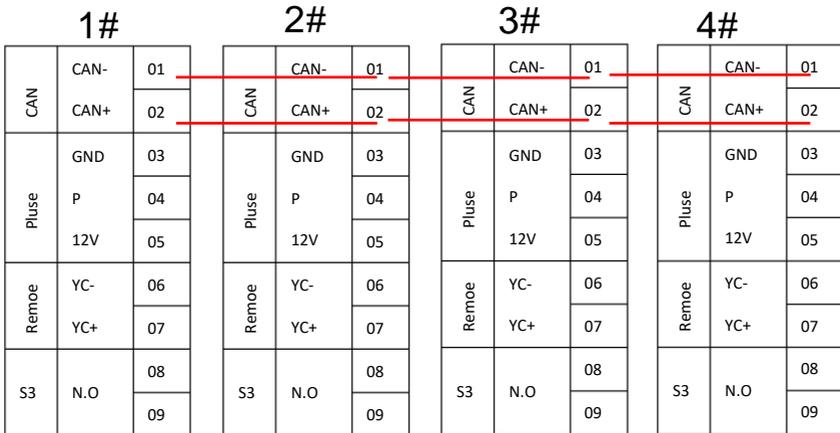
press "Enter"



PS: " S3" does not have to be set, as it's default, the signal always is output during all the process of regeneration.

5.Setting of COMM mode

In order to adapt to high-flow Filtration or Softener, the JKA2.1 is designed with a communication function. Not only can it realize process of "multiple tanks in service and one in standby " but also "all tanks in parallel service and regeneration sequentially" by connection of terminal "01" and terminal"02".



PS: *Prior to setting, please make sure each controller is connected by twisted pair, which must be greater than 1mm².*

There are two Communication modes of " D " mode and " E " mode.

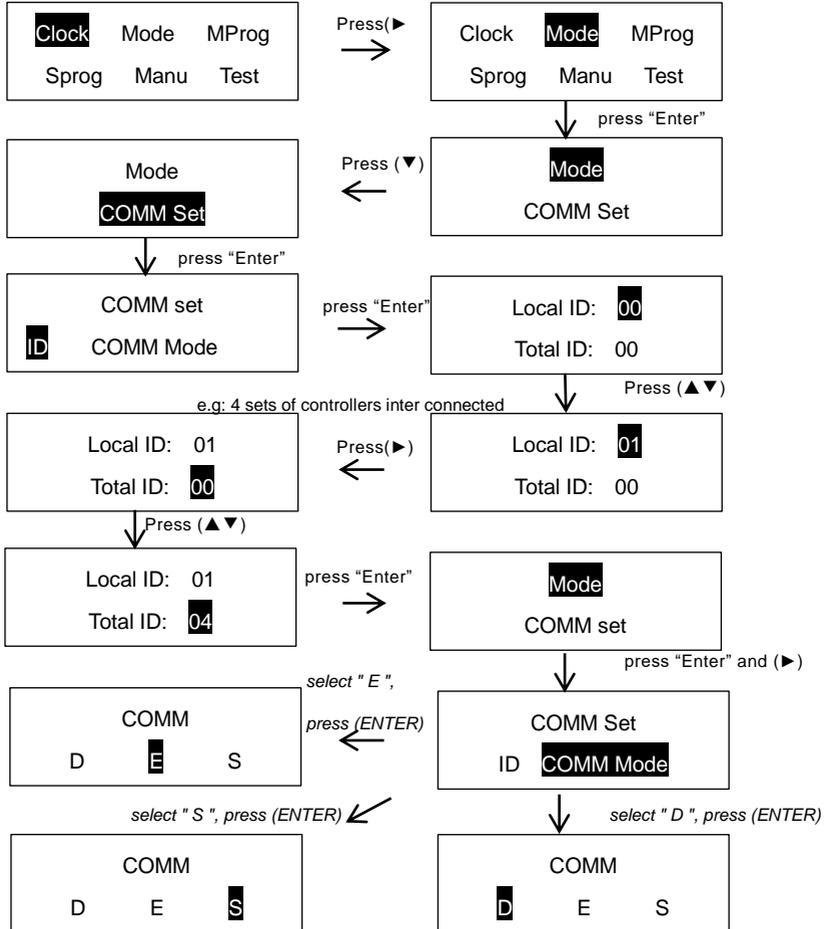
D mode --"Multiple tanks in service and one in standby" , once regeneration cycle is complete, the regenerated tank will enter standby state. There is always one tank in standby and the rest tanks all in service. The standby tank begins service to maintain flow rate enough for regeneration, once other in-service tank starts regeneration process.

E mode -- "All tanks in parallel service and regeneration sequentially " Every tank is back washed sequentially by E mode and no more than one tank in regeneration at the same time. When the regeneration cycle is complete, the regenerated tank will begin in service immediately.

Mode of " D " and " E " are not applicable in setting of"Week"mode.

Setting for Communication

PS: Connect the controllers according to the above Connection-diagram, the maximum quantity of devices is 10 sets.



PS: Local "ID" is unique, same "ID" is unacceptable in one system. Otherwise, Communication will fail.

In addition, the local ID value must be smaller than the total ID value.

then press "ESC" back to main screen, Local Setting is complete.

PS: "S" is the factory default mode. The setting of other controllers are same as above.

"D" and "E" are alternative modes, only one mode can be selected.

When 4 or more than 4 stager controllers interconnected, it will appear simultaneous regeneration of two controllers, and the next operating cycle will return back to the set.

"D" Mode has to use solenoid-valve to realize standby state.

"ID" value of controller-No.1 is "01"; "ID" value of controller-No.2 is "02";

"ID" value of controller-No.3 is "03"; "ID" value of controller-No.4 is "04".

"ID" value has to match its position in system. (See Connection-diagram above)

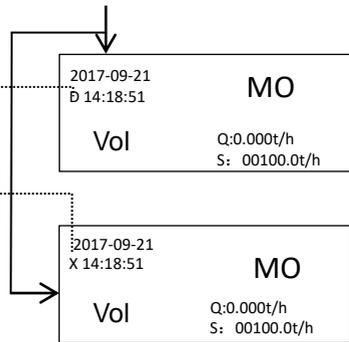
Screen shot of completed communication setting:

(e.g. "D" mode)

It's a failure if the screen displays "X": (Please review and reset again)

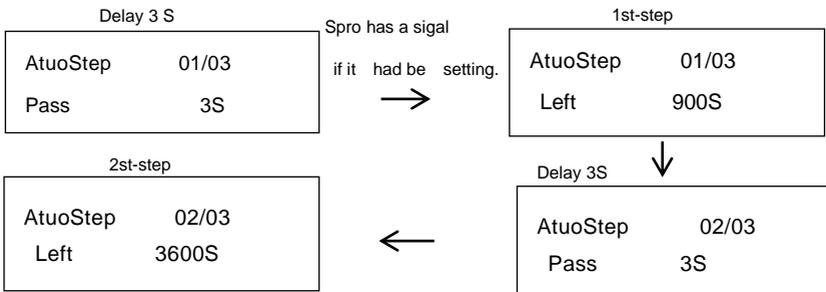
The screen shot of completed setting of "S" mode

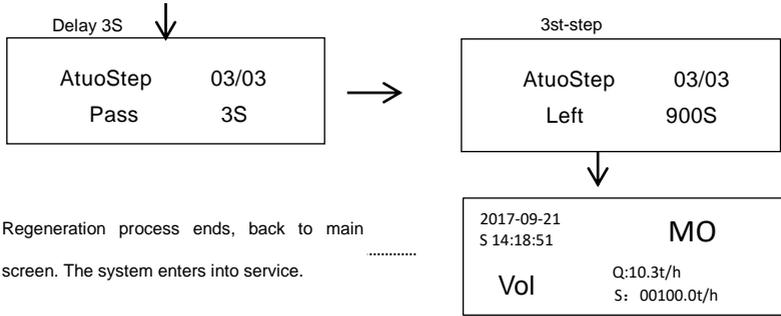
(Single Machine/Default):



Process detection

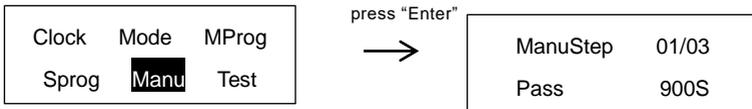
When the remaining-time/volume reach the preset value, or inputting a remote signal, the controller will start the regeneration process, the screen will display the different stages in the regeneration state. The following example is a main screen display under the process of time mode regeneration:



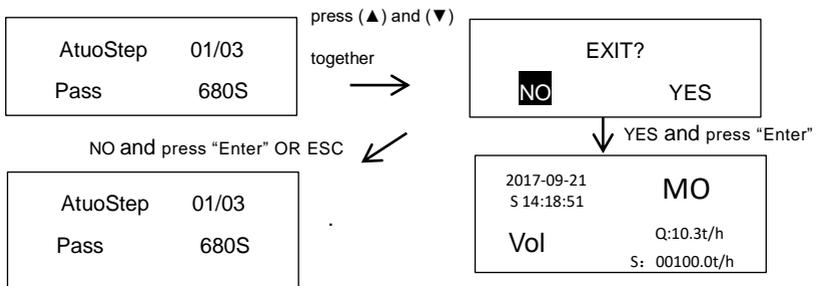


Manual operation

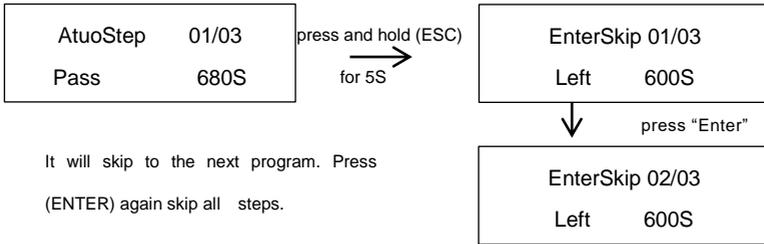
If a regeneration process is initiated manually, "Manu" should be selected in Main screen. Press (◀▶) to get to "Manu"



Emergency Stop



Skip Process



Appendix

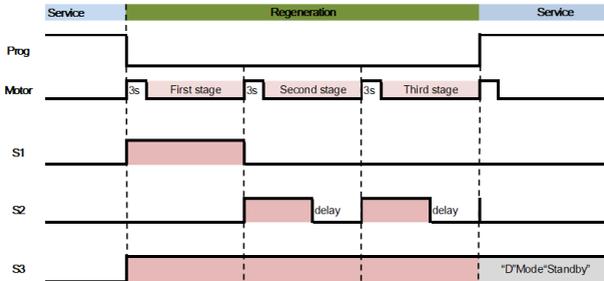
K value reference table

(This table conforms to national PN10 and metric PVC pipe standard.)

PVC Pipeline	DN40/ 1.5"	DN50/ 2"	DN65/ 2.5"	DN80/ 3"	DN100/ 4"
K (recommended)	8.9	5.1	3.4	2.4	1.5

The K value in the table above is only for reference, it will be different among various pipeline.

Principle diagram of control



JKmatic Co., Ltd

Add: NO.5 Huaiying Street, Shahe Industrial Zone, Changping District, Beijing, China

Tel: 0086-10-69730336

E-mail: jk@kangjiezc.com

<http://www.jk-matic.com/>