1 Operation Panel Instruction

Operation Panel is divided with two areas（See Fig1-1）：LCD display areas and key operation area.

Fig.1-1

The LCD area is located at upper of the left side, indicates the current status of the system(Fig.1-1). It including sewing mode, stitches, start/end back-tackings, presser foot lifting, needle stop position, thread trimming, thread wiping and slow start operation set. The operation system automatically power on that HMI will a self-test, then all icons will flash once in the LCD display areas and only display the current settings of the system, the other did not choose that the icon will not be lighted, see figure 1-2.

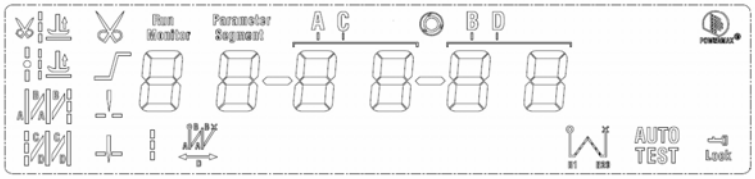


Fig.1-2

Table 1: Following form is the instruction of each key：

No	Appearance	Description
1		**Function key**：Major operation to determine and confirm working, and work with other key to set a higher level of the parameter.
2		**start back tacking key**：Every effective press the key once; round with single start back tacking, double start back tacking, four start back tacking and close start back tacking. The current status is displayed on the left of LCD. Detailed see "2.1.2 before and after sewing settings instruction.
3		**end back tacking key**：Every effective press the key once; round with single end back tacking, double end back tacking, four end back tacking and close end back tacking. The current status is displayed on the left of LCD. Detailed see "2.1.2 before and after sewing settings instruction.
4		**Free sewing mode key**：Every effective pushed the key once; the system selects free sewing mode. The free sewing status is displayed below LCD. Detailed see "2.1.1 model sets of sewing."
5		**Multi-segment sewing mode key:** Every effective pushed the key once; the system selects multi-segment sewing mode, pressed **P** key into the number of the needled setting. The multi-segment sewing status is displayed below LCD. Detailed see "2.1.1 model sets of sewing."

No	Appearance	Description
6		**W sewing mode key**：Every effective pushed the key once; the system selects W sewing mode. The **W** sewing status is displayed below LCD screen. Detailed see "2.1.1 model sets of sewing."
7		**Soft start key:** Select soft start function. It will show soft start status on top of LCD screen.
8		**Press foot lifting key:** Every effective pushed the key once; round with trimming after press foot lifting, sewing end press foot lifting and manual press foot lifting. The current status is displayed on top of LCD screen. Detailed see "2.1.4 press foot lifting set.
9		**Trimming key**：Select/Cancel automatic trimming. The trimming status is displayed on top of LCD screen. Detailed see "2.1.5 trimming set.
10		**One-Shot-Sewing key**：Select/Cancel one-Shot-Sewing, it is effective only into multi-segment sewing mode, when chose one-shot sewing, one-shot foot pedal can complete one needle of multi-segment sewing；The one-shot-sewing status is displayed on top of LCD screen. Detailed see "2.1.6 trigger set.
11		**Stop position key**：Select up/down stop position. The up/down stop position is displayed on top of LCD screen. Detailed see "2.1.7 stop position set. [Note: automatic trimming back, the system is always on the up of needle position.]
12		**Lamp key**：Select switch on/off lamp. When floodlights are light and HMI supply 5V lamp light.
13		**Stitch compensation key**：Start stitch compensation if press, stop stitch compensation if loose.
14		**Temporary accelerate speed key**：Press the button to temporary increased sewing speed.
15		**Temporary deceleration speed key:** Press the button to temporary reduced sewing speed.
16		**Parameter/Index accelerate key:** Press the button to increased parameter value/index.
17		**Parameter/Index decelerate accelerate key:** Press the button to reduced parameter value/index

2 Optional User Mode

2.1 Operator Mode

In this mode, various sewing modes are available after technical parameters settings. As the default setting, the system enters this mode when it starts. Under this mode, such basic functions as normal sewing work and modes change can be realized but no change inside parameters and setting.

Note: During working, if long time without press button, HMI will change to idle status automatically, and will cancel the operation before.

2.1.1 Sewing Mode Setup：

Free sewing mode: Press key, free sewing mode icon is lightened in LCD area. LCD indicates free sewing mode has been selected; it is ready just step the pedal for operation.

Multi-segment sewing mode: Press key, constant-stitch sewing icon is lightened in LCD area. LCD is multi-segment sewing status。Use the last and key to choice the N segment, and press key to entry multi-segment sewing stitch number of each segment setup status. You may use the third and the fourth and to choice the need to modify number of segment, use the fifth and sixth and to modify number of needle in multi-segment sewing stitch setup status.

W sewing mode：Press key, constant-stitch sewing icon is lightened in LCD area. LCD is W sewing setup status. You may use the third and the fourth and to choice needle in A area and set rang 1-99 stitches; use the fifth and sixth and to choice needle in B area and set rang 1-99 stitches. Press key, can be used to choice A B D segment, LCD, use the fifth and sixth and to choice needle in B area and set rang 1-99 stitches.

2.1.2 start/end back tacking setup：

Step 1: Press key

Start back tacking has following four modes:

（ ）None start back tacking；（ ）Single start back tacking

（ ）Double start back tacking；（ ）Four start back tacking

Step 2: Stop pressing to confirm, then this back tacking mode has been selected.

Step 3: Change the corresponding parameters (A and B values) by using and key, the value range is 1-99 stitches. It set pin number to be completed before star back tacking.

Note: End back tacking setting method is similar with start back tacking setting method basically, except the key.

2.1.3 Soft start setup：

Press key, entry into soft start status. If choice soft starts, the icon is lightened in LCD

areas. Press this key again to exit soft start status, the icon will off.

2.1.4 Press foot lifting key:

Press key, entry into foot lifting status, total four different status, no automatic foot lifting、automatic foot lifting after trimming（）、automatic foot lifting if stop during sewing（）、automatic foot lifting if trimming and stop during sewing. Use key to choice foot lifting setup status and stop press key to confirm. Foot lifting had compiled.

2.1.5 Trimming key:

If press key entry into press trimming status, select/non-select trimming. Press key repeat, the icon is lightened/ disappeared in LCD area. Whether it choice trimming that the icon is lightened or disappeared.

2.1.6 One-Shot-Sewing key

Use key: select/non-select one-shot-sewing statues. The icon will light if select one-shot-sewing in LCD areas, press will disappear.

2.1.7 Stop position key

Use key: select up/down stop position. Press key repeat, between up/down stop position to switch. Choose need to stop position and stop press key to confirm. Stop position had compiled.

2.1.8 Lamp key:

Use key: select switch on/off lamp which was powered by the operation panel.

2.1.9 Stitch compensation key

Use key: press this key to start stitch compensation. Compensation half needle or a half needle due to the press time. If you keep press that compensation needle always until release button.

2.2 Technician Mode

In this mode, technical parameters corresponding to various functions can be adjusted or reset according to practical needs so that the system may run in the best condition. Parameters setting under technician mode:

Step 1: Under operator mode, press key and key, the LCD will display psd-0000, and then set the password by administrator.

Step 2: Use the last four keys and keys to input the password, and then press key. If the password is correct then enter technician mode, otherwise, it will return to operator mode.

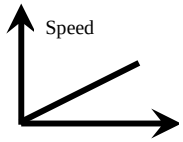
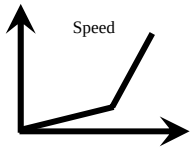
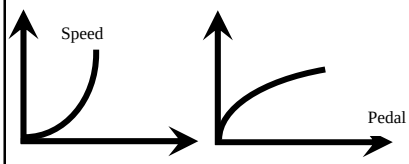
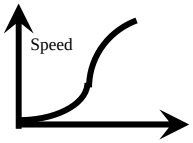
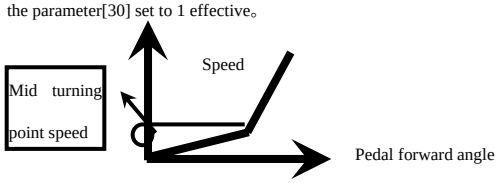
Step 3: Change technician parameters by the second and the third key and keys. The parameters are shown in table 2.

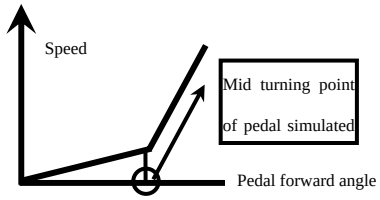
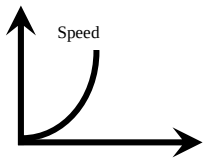
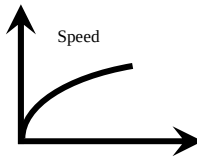
Step 4: Parameters values can be changed by the last four keys and keys.

Step 5: Under technician mode, press  key, the panel will return to operator mode.

Table 2: Technician mode parameter:

	Parameter1	Parameter 2	Default	Comment（Rang）
speed	0	0	200	Minimum sewing speed(100 ~800)
		1	3500	Maximum sewing speed(200 ~5000)
		2	3000	Maximum constant sewing speed(200 ~5000)
		3	3000	Maximum manual back tacking speed(200 ~5000)
		4	200	Stitch compensation speed(100 ~800)
		5	250	Trimming speed(100 ~500)
		6	0	Soft start Mode setup: 0：Soft start only after trimming 1：Soft start after both trimming and stop
		7	2	Soft start stitch number(1 ~9)
		8	200	Soft start speed(100 ~800)
		9	20	System accelerate sensitivity （Direct drive transmission can be set up to a large value ； belt transmission don't set large value or too much noise and vibration. This parameter do not affect the electrical）(1 ~20)
		A	20	System decelerate sensitivity （Direct drive transmission can be set up to a large value ； belt transmission don't set large value or too much noise and vibration. This parameter do not affect the electrical ）(1~20)
Back tacking setup	1	0	1800	Start back tacking speed(200 ~2200)
		1	1800	End back tacking speed(200 ~2200)
		2	1800	Continuous back tacking speed(200 ~2200)
		3	24	Start back tacking stitch compensation 1(0 ~70)
		4	20	Start back tacking stitch compensation 2(0 ~70)
		5	24	End back tracking stitch compensation 1(0 ~70)
		6	20	End back tracking stitch compensation 2(0 ~70)
				Pedal Curve mode setup (0 /1 / 2 / 3)：0：Auto Calculated liner Curve （According to the highest speed automatic computation）

	Parameter1	Parameter 2	Default	Comment（Rang）
Pedal	3	0	0	
				1：Two segment liner Curve. (You shall be free to set slow start after fast or fast start after slow, the parameters "31" and "32" cooperate with use ） 
				2：Arithmetic Curve（ the parameters [33] cooperate with use） 
				3：S curve（the operate control is very well, slow start after fast ） 
		1	3000	Two segment controls the speed slope：(200 ~4000) mid turning point speed RPM（two segment of turning point speed），the parameter[30] set to 1 effective。 
			800	Two segment controls the speed slope：(0 ~1024) mid turning point of pedal Simulated value，the parameter[30] set to 1 effective, the value is between[38]and[39].

	Parameter1	Parameter 2	Default	Comment（Rang）
				
		3	2	Arithmetic Curve supplementary parameter：（1 /2） the parameter[30] set to 2 effective, 1：Square（the low speed control is very well, slow start after fast）； 
				2：Square root（Responding speed is fast, fast start after slow）； 
		4	90	Pedal trimming position set, See 2-1. (0 ~1024) （the value is not higher than the parameter [30]）
		5	300	Press foot lifting, See 2-1. (0 ~1024) （the value is between[34]and[36].）
		6	419	Pedal back mid position，see 2-1. (0 ~1024) （the value is between[35]and[37].）
		7	510	Pedal step upon running position，see 2-1. (0 ~1024) （the value is between[36]and[38]）
		8	578	Pedal low speed running position（upper）,see 2-1 (0 ~1024) （the value is between[37]and[39]）
		9	962	Pedal simulation the largest of value, see 2-1 (0 ~1024) （the value is not lower than the parameter [38]）
		A	100	Pedal press foot lifting confirms time. (0 ~800)
		B	0	Pedal back mid and thread trimming selection： 0：off 1：on

	Parameter1	Parameter 2	Default	Comment（Rang）
		C	1	Press foot lifterpress foot function selection：0：no action 1：action
		D	1	Thread trimming position, press foot function selection：0：no action 1：action
custom setup	4	0	1	Run to up needle position after Power on：0: no action 1: action
		1	1	Automatically reinforcing functions chose ：（the machine head is not automatically reinforcing functions, the best way is prohibit）0：prohibit 1：allow
		2	0	Back to sewing by hand when the function mode selection: 0：Juki mode. In sewing or in the end of the action 1：Brother mode. It acts only in sewing.
		3	0	Special Running Mode setup：(0／1／2／3) 0：operator select，1：simple sewing mode 2：calculate initial angle of motor (do not uninstall strap) 3：calculate motor/machine head run rate mode (synchronizer, do not uninstall strap)
		4	0	Torque boost up at low speed: (0—31) 0：no action 1~31：31 levels Torque boost up
		5	1	Stop pin mode： 0：Constant speed tackle mode (in the belt transmission, Parking is not precision)，1：back pull mode（PMX）
		6	100	Command button to fill half-needle time(0 ~800)
		7	150	Command button to fill a needle time(0 ~800)
Counting mode	5	0	1	Stitch counter ratio selection(1~100)
		1	1	Stitch count values(1~9999)
		2	0	stitch counter Mode Selection：(0~4)，0：No counting，1：Up count on stitch, the count number automatically reset on matching set number，2：Down count on stitch, the count number automatically reset on matching set number，3：Up count on stitch, automatically stop the motor on count number matching set number，4：Down count on stitch, automatically stop the motor on count number matching set number.
		3	1	Trimming counter ratio selection (1~100)

	Parameter1	Parameter 2	Default	Comment（Rang）
		4	1	Trimming count values(1~9999)
		5	0	Trimming counter Mode Selection：(0~4) 0：no counting 1:Trimming up count on stitch, the count number automatically reset on matching set number. 2:Trimming down count on stitch, the count number automatically reset on matching set number. 3：Trimming up count on stitch, automatically stop the motor on count number matching set number t. 4：Trimming down count on stitch, automatically stop the motor on count number matching set number.
Operation	6	0	0	Running time reset: input 4000 reset running time reset
		1	0	Translating Parameter (0／1／2) 0：no action，1：Download parameters(the panel will parameter from panel to controller)，2：Upload parameters (the panel will parameter from controller to panel)
		2	0	Restore storage parameter(Only restore parameters to operators, and vendors and maintenance) 1, 2, XXXX Belt flat 1000/ Direct drive flat 2000
		3	0	Backup current parameter as user parameter for restore (restore) (1, 2)
		4	0	Passport（0~9999）
		Note: Above such “6x ”parameter to operate is not saved.		

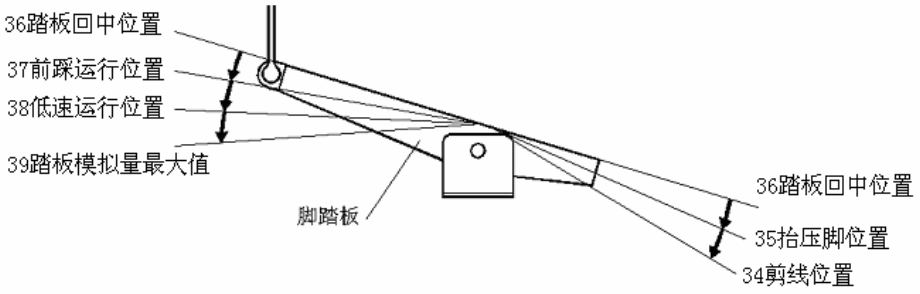


Fig2-1 Pedal action parameter the position of the diagram

2.3 Administrator Mode

In this mode, various solenoid parameters set can be regulated according to the practical need so that the servo system can normally run on every sewing machine. Parameters setting under technician mode:

Step 1: Under operator mode, press and keys to enter administrator mode in LCD **PD**-0000.

Step 2: The password is entered using the last four keys and keys, then press key. If the password is correct, enter into the technician mode, or return to the operator mode.

Step 3: Change administrator parameters index by the second and the third key and key under administrator mode. The details of technician parameters are shown in table3.

Step 4: Parameters values can be changed by the last four keys and keys.

Step 5: Under administrator mode, press key, the panel will return to operator mode.

Table 3: Administrator mode parameter：

	Parameter1	Parameter2	Default	Comment（Rang）
Trimming mode	0	2	1	Mode selection for trimming sequence.（0／1／2／3） 0： According to the parameters 【03】 set angles is trimming, until up position delayed【06】time off. 1：According to the parameters【03】set angles is trimming, until【04】set angles off. 2：According to the parameters【03】set angles is trimming, it delayed【06】off. 3：Down position signal delayed the parameter【05】set angles is trimming, it delayed 【06】off.
		3	10	The start angles of trimming (relative down position of angle) (5-359)
		4	120	The end angles of trimming (relative down position of angle, Need to greater than the system of parameters【03】) (10-359)
		5	10	Trimming start delay time T1（ms）（1-999）
		6	60	Trimming end delay time T2（ms）（1-999）
	1	0	0	Mode selection for tension-release sequence: （0／1／2／3／4） 0：According to the parameters [11] set angles is tension release, until up position delayed [14] time off. 1：According to the parameters【11】set angles is tension release, until【12】set angles off.

	Parameter1	Parameter2	Default	Comment（Rang）
				【14】off. 3:Down position signal delayed the parameter【13】set angles is trimming, it delayed 【14】off. 4: Up position signal delayed the parameter【13】set angles is trimming, it delayed 【14】off.
		1	25	The start angles of tension release(relative down position of angle)（5-359）
		2	350	The end angles of tension release（relative down position of angle, Need to greater than the system of parameters【11】）（10-359）
Tension release、Wiper and Clamp mode		3	1	Tension release solenoid start delay timeT1（ms）（1-999）
		4	10	Tension release solenoid up position delay time T2（ms）（1-999）
		5	1	selection for Wiper function 0: off 1: on
		6	10	Clamp /Wiper delay time ms（1-999）
		7	70	Clamp /Wiper holding time ms（1-9999）
		8	50	Clamp /Wiper revert time ms（1-999）
		9	0	Thread Clamp function: 0: off 1: on
		10	70	Clamp start angle（0-359）
		11	140	Clamp end angle（0-359）
Stop mode	3	0	360	Trimming after stop position(It can realize the trimming pull back function)（200-360）
		1	0	The automatic test mode selection ： 0: order stitches 1: order time
		2	300	The safety SW alarm confirm time ms(the same way does not distinguish between direct-drive safety SW and flat lock trim of protection SW)（0~1000）
		3	50	The safety SW restore confirm time ms（0~1000）
		4	0	Motor rotation direction setup：1：Forward 0：Reverse
		5	0	The sewing needle NO. will continuing before emergency-stop (according to the speed and number of needle set different , actuality may be larger than it)（0-999）
		6	0	The customer will restart that it after the emergency-stop: 0: Do not start again, need to power on 1: The sewing was started again

	Parameter1	Parameter2	Default	Comment（Rang）
				after signal was cancelled
		7	360	Intermediate stops, up needle position adjustment（200-360）
Mode selection	3	0	0	Presser foot lifting control mode 0: button to move the switch;1: the button always press is effective;
		1	0	Automatic test mode selection: 0: fixed pins, 1: fixed time
		2	300	Safety switch alarm time ms (do not distinguish between direct drive double switch and sewing scissors protection switch, uniform processing)（0~1000）
		3	50	Safety switch resume time MS（0~1000）
		4	0	Motor steering: 0 : forward 1: inversion
		10	0	Edge detector operating mode: （0/1/2/3） 0: do not use edge detector 1: edge detector to work in manual mode 2: edge detector work on automatic startup mode 3: edge detector in dual tangential manual speed control mode
		11	50	Automatic mode boot confirmation time (ms)（10~3000）
		12	3	The needle NO. is not respond after the start（0~999）
		13	3	The double tangent of the first time of tangent pin number（0~999）
		14	3	Signal void continues after the sewing needles (according to the speed and number of needle set may be larger than the number of different, actually)（0~999）
		15	0	Automatic reverse sewing- patterns. 0: automatic reverse sewing to keep the current tight seam condition; 1: automatic reverse sewing shut tight seam;
Machine head parameter	4	0	1000	motor/machine head run rate: 0.001（0 - 9999）
				(if automatic calculation of motor/machine head run rate has done, the Parameter value in control box maybe different with that in HMI)
		2	0	Up needle position adjusted angle（compare to up position sensor position excursion）（0 - 359）
		3	175	Down needle position mechanical angle（0 - 359）
		4	200	Press down delay time(ms)（0 - 800）

	Parameter1	Parameter2	Default	Comment（Rang）
		5	9	Thick material reinforcing start angle（0-359）
		6	57	Thick material reinforcing end angle（0-359）
		7	0	Gas alert time (hours. 0: turn off this function)（0-2000）
		8	0	Gas alarm, prohibit running time（0-4000） (hours. 0: turn off this function)
Input function definition	5	0	1	1'st input function definition
		1	1	Effective level on the 1st input 0 / 1
		2	0	2'nd input function definition
		3	0	Effective level on the 2 input 0 / 1
		4	0	3'rt input function definition
		5	0	Effective level on the 3 input 0 / 1
		【50】-【55】Parameter definition		0: forbidden; 1: manual reverse stitching; 2: safety switch; 3: emergency stop; 4: edge sensor signal check; 5: input shear line; 6: input pressure foot; 7: fill needle; 8: before and after reinforcement reversal; 9: presser foot interaction volume 10: lift; sealing; 11: counter reset;
Output function definition	6	0	1	1 solenoid output function definition
		1	3	2 solenoid output function definition
		2	4	3 solenoid output function definition
		3	5	4 solenoid output function definition
		4	2	5 solenoid output function definition
		【60】-【65】Parameter definition		0: Output Disable 1: thread trimming; 2: thread wiping; 3: back tacking 4: presser foot lifter;5: loose line; 6: thread clamp; 7: air suction ; 8: blowing; 10: presser foot interaction volume lifter; 11: Condense-stitch; 12: strengthening reverse suspension state; 13: amount of interaction raised state; 14: close joint state;

2.4 Monitor mode

During HMI idle, Press key, then press key, entry monitor mode. Use the first and second （ and ） key to switch to watch the parameters. About the monitor parameter, please refer the sheet 4, HMI will back to idle if no wheel or no press the key in regulates time.

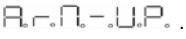
Table 4: monitor mode parameter

	Parameter High byte	Parameter Low byte	unit	comment
Monitor status	1	0		Counter stitches
		1		Counter trimming
	2	0	V	DC Bus Voltage
		1	RPM	Motor speed
		2	0.01A	One phase current
		3	degree	Initial angle
		4	degree	Mechanical angle
		5	——	Sampling value of pedal voltage
		6	0.001	motor/machine head run ratio
		7	hour	Motor total run time
		8	——	Sampling value of potentiometer at machine head
	3	0 - 7	——	History Error Code Recorder 8

2.5 Wrong warning mode

If the HMI detects something wrong from controller, it will jump automatically to warning mode, and show error code by 8-segment.see  。During wrong warning mode, the user can set technician parameter change, administrator parameter and HMI parameter self-change or monitor mode. Exit these modes not back to idle but back to wrong warning mode. It will return normal status after fixing error and resetting power.

2.6 Safety switch warning mode

If HMI test safety switch warning, it will jump automatically to safety switch warning mode, see  . During wrong safety switch warning mode, the user can set technician parameter, administrator parameter and HMI parameter self-change or monitor mode. Exit these modes not back to idle but back to wrong warning mode.（AH58 reunification with the switch input, does not distinguish between safety switch, scissors protection switch）

3 Operation after control system installation：

1、after control system installation, one ‘automatic calculate motor/machine head run rate’ need work. (because of machining precision, different plant have different effective radius of engine hand-wheel, even direct drive do not have 1:1“motor/machine head run rate”)。Entry technician parameter No.43, setup this parameter as 3. Press pedal forward, system work with middle speed about 10cycles and stop, the result of calculation save in control box. Then restore technician parameter No.43 to 0.

If can confirmation the value of “motor/machine head run rate”，can setup administration parameter No.40 directly. Real “motor/machine head run rate” in control box can read by monitor parameter No.26.

2、New control system in the needle position stop no longer rely on sensor signal to determine the down-stop needle, but by administration parameter No.43, this parameter confirms the mechanical angle from down needle position to up needle position. Current mechanical angle can read by monitor parameter No.24, mechanical angle of up needle position is 0.（After power on , control system will work at least one time by up needle position to revise mechanical angle, for example: Round to up needle position. Value of “motor/machine head run rate” will effect the calculation of mechanical angle. Suggest adjust down needle position after confirm right “motor/machine head run rate”.

3、New control design used to 5 solenoid drive output. Each drive output can setup its function freely. Before use please confirm if the administrator 6x parameter setup the function of each driver output same as the connection with solenoid; and confirm administrator 7x 8x parameter, otherwise perhaps happen solenoid power not enough. （the default parameter is according to normal solenoid connection）

4 Control system restores storage parameter

4.1 Restore storage parameter for factory of control

Step 1: Under operator mode, press and keys, LCD **PD**-0000; user type the passport.

Step 2: The password is entered using the last four keys and keys, then press key. If the password is correct, enter into the technician mode, or return to the operator mode.

Step 3: Change administrator parameters index to【62】by the first and the second key and key under administrator mode, then press key to set parameter. Restore storage parameter for factory of control can be changed by the last four keys and keys, usually it is four bit.

Step 4: The parameter confirms correct, press key until the red light of HMI are bright or buzz produces a long loud, release key, HMI and the whole system restore storage parameter.

4.2 Restore default user’s own parameter

The parameter【63】of HMI can be used to set the customer is own parameters, following methods of operation ：

Step 1: Under operator mode, press and keys, LCD **PD**-0000; you required to type the passport.

Step 2: The password is entered using the last four keys and keys, then press key. If the password is correct, enter into the technician mode, or return to the operator mode.

Step 3: Change administrator parameters index to【62】by the first and the second key and key under administrator mode, then press key to set parameter. The value is changed 1or 2 by the last keys and keys.

Note: when it set 1, the follow-up to the user to customize the parameter is used 1; when it set 2, the follow-up to the user to customize the parameter is used 2.

Step 4: Press key keep 5 second, HMI and the whole system will the current parameter set restore the user to customize storage parameter.

When the parameter cause to the control system error, the user can restore the custom of the parameters, the methods of operation as “4.1 Restore storage parameter for factory of control” .The parameter【62】 is changed 1or 2, Press key keep 5 second again, the system will restore the user to customize storage parameter.

Note：

1、 After power on, HMI 50 only download **operator mode** parameter, but not **technician** and **administrator** parameter. If all parameter is needed, **technician** parameter 61 can used to download all current working parameter of HMI 50.

2、 If restore other parameter of HMI50 storage, **technician** 62 can be used to make it current working parameter, and download initiative.

3、 After single parameter modification, HMI will download the value that is different with old value of parameter.

4、 Recover default parameters, the system the best in the clear once again.

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