Intruction manual
Control panel QD690

Art Auto 2

texi

⚠Safety Instruction

1. Users are required to read the operation manual completely and carefully before installation or operation.
2. All the instruction marked with sign ⚠ must be observed or executed; otherwise, bodily injuries might occur.
3. The product should be installed and pre-operated by well-trained persons.
4. For perfect operation and safety, it is prohibited that using extension cable with multi-outlet for power connection.
5. When connecting power supply cords to power sources, it is necessary to make sure that the power voltage matches the rated voltage indicated on the motor's name plate.
6. Don′t operate in direct sun light，outdoors area and where the room temperature is over 45°C or below 5°C.
7. Please avoid operating near the heater at dew area or at the humidity below 30% or above 95%.
8. Don′t operate in area with heavy dust, corrosive substance or volatile gas.
9. Avoid power cord being applied by heavy objects or excessive force, or over bend.
10. The earth wire of power cord must be connected to the system ground of the production plant by proper size of conductions and terminals. This connection should be fixed permanently.
11. All the moving portions must be prevented to be exposed by the parts provided.
12. Turing on the machine in the first time, operate the sewing machine at low speed and check the correct rotation direction.
13. Turn off the power before the following operation：
    a) Connecting or disconnecting any connectors on the control box or motor.
    b) Threading needle.
    c) Raising the machine head.
    d) Repairing or doing any mechanical adjustment.
    e) Machines idling.
14. Repairs and high level maintenance work should only be carried out by electronic technicians with appropriate training.
15. All the spare parts for repair must be provided or approved by the manufacturer.
16. Don't use any objects or force to hit or ram the product.

Guarantee Time
Warranty period of this product is 1 year dated from purchasing, or within 2 years from ex-factory date.

Warranty Detail
Any trouble found within warranty period under normal operation, it will be repaired free of charge. However, maintenance cost will be charged in the following cases even if within warranty period:

1. Inappropriate use, including: wrong connecting high voltage, wrong application, disassemble, repair, modification by incompetent personnel, or operation without the precaution, or operation out of its specification range, or inserting other objects or liquids into the product.
2. Damage by fire, Earth quake, lighting, wind, flood, salt corrosive, moisture, abnormal power voltage and any other damage cause by the natural disaster or by the inappropriate environments.
3. Dropping after purchasing or damage in transportation by customer himself or by customer's shipping agency
   Note: We make our best effort to test and manufacture the product for assuring the quality. However, it is possible that this product can be damaged due to external magnetic interference and electronic static or noise or unstable power source more than expected; therefore the grounding system of operate area must guarantee the good earth and it's also recommended to install a failsafe device.   (Such as residual current breaker)

1 Button Displays and Operating Instructions

1.1 Key Description

Name	key	Indicate
Function Parameter Edit	P	If click, enter or exit the user parameter setting interface. If long-press, it will switch to the password input interface. Enter the correct password, press S key to confirm, you can enter the advanced parameter setting interface.
Setting Parameter Check and Save	S	For the content of the selected parameters check and save: after select parameter press this key to check and modify operation, after modified parameter value press this key to exit and save the parameter.
Parameter Increase	+	If click, increase the parameter. If long-press, continuously Increase the parameter.
Parameter Decrease	−	If click, decrease the parameter. If long-press, continuously decrease the parameter.
Reset	恢复出厂设置 Reset	Long-press can restore factory setting.
Start Back-tacking Selection / Slow Launch Setting		If click, switch AB start back-tacking→ABAB start back-tacking→function off→B start back-tacking successively. If long-press, set used or cancelled slow launch function.
End Back-tacking Selection / Needle Stop Position Selection		If click, switch CD end back-tacking→CDCD end back-tacking→function off→C end back-tacking successively. If long-press, the needle stop position after shift the sewing mode (Up position / Down position).
Free Sewing / Constant Stitch Sewing		If click, set to free sewing mode. If long-press, set to constant stitch sewing mode.
Consecutive Reverse Sewing / Multi-section Sewing		If click, set to consecutive reverse sewing mode. If long-press, set to multi-section sewing mode.
Automatic Presser Foot Lifting Setting / Auto Function		If click, switch function off→automatic presser foot lifting after trimming→automatic presser foot lifting after pause→full function successively. If long-press, set used or cancelled auto function.
Trimming Setting / Clamp Function Setting		If click, set used or cancelled trimming function. If long-press, set used or cancelled clamp function.
Pattern Freedom Sewing Setting	Patt	If click, switch to pattern freedom sewing mode selection interface. If long-press, switch to pattern freedom sewing mode editing interface.
Tight Seam Setting		If click, switch starting tight seam, ending tight seam, full function and function off successively.
Pattern Backing-tacking Setting	A~D	Set used or cancelled pattern backing-tacking function.
Pattern Constant-stitch Sewing Setting	X1~XN	Set used or cancelled pattern constant-stitch sewing function.
Stitches Length Setting	+ 止 − mm	If click, increase or decrease stitches length. If long-press, continuously increase or decrease stitches length.

Speed Increase	⟨rabbit icon⟩	If click, increase the sewing speed.
		If long-press, continuously increase the sewing speed.
Speed Decrease	⟨turtle icon⟩	If click, decrease the sewing speed.
		If long-press, continuously decrease the sewing speed.

1.2 Auxiliary Function

1.2.1 Debugging Mode

On the main interface, long-press S key to enter to the debugging parameter interface.
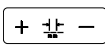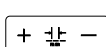
1.2.2 Tight Seam Mode Editing

On the main interface, long-press tight seam key to display "F-1" (start back-tacking), and press the 4th column ⟨+⟩ , ⟨−⟩ to switch between "F-1" (start back-tacking) and "d-2" (end back-tacking), press S to confirm, switch to the editing interface "01 0 0.5", press the 1st or 2nd column ⟨+⟩ , ⟨−⟩ to adjust the number of stitches of 00-12, press the 4th column ⟨+⟩ , ⟨−⟩ to adjust 0 (Normal sewing) -1 (reverse sewing). Press ⟨+ ╫ −⟩ to adjust the stitch length. After the setting is completed, press S key to confirm. Click P key to exit to the main interface.

1.2.3 Pattern Freedom Sewing Mode

On the main interface short-press ⟨Patt⟩ to shift pattern freedom sewing mode selection interface "n1", press ⟨+ ╫ −⟩ to adjust n1-n9.

1.2.4 Pattern Freedom Sewing Editing
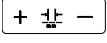
On the main interface long-press ⟨Patt⟩ to shift pattern freedom sewing mode editing interface "n-01 01", short-press the 4th column ⟨+⟩ , ⟨−⟩ to adjust n01-n09, short-press ⟨+ ╫ −⟩ adjust 01-10 segment number, adjust to setting pattern number, segment number, short-press S key to confirm, shift to corresponding pattern number editing interface "01 1 3.0", short press 1st column or 2nd column ⟨+⟩ , ⟨−⟩ to adjust 00-99 stitches, short-press 4th column ⟨+⟩ , ⟨−⟩ 1-9 repeat times, short-press ⟨+ ╫ −⟩ to adjust needle distance, after finished setting short-press S key to confirm. Press P key can exit to interface.

1.2.5 Pattern Backing-tacking Sewing Editing

On the main interface, long press ⟨Patt⟩ to switch the pattern style editing interface "H-01 01", press the 4th column ⟨+⟩ , ⟨−⟩ to adjust the H01-H09 pattern number, and short press ⟨+ ╫ −⟩ to adjust the 01-10 segment number, segment number, short press S key to confirm, switch to the corresponding pattern number

editing interface "01 1 3.0", press the 1st or 2nd column ⊞ , ⊟ to adjust the number of 00-99 stitches, press

the 4th column ⊞ , ⊟ to adjust Repeat 1-9 times, press ⊞ ⎯ ⊟ to adjust the stitch length. After the

setting is completed, press the S key to confirm. Short press P key to exit to the main interface.

1.2.6 Pattern Constant-stitch Sewing Editing

In the multi-section sewing mode, long-press pattern constant-stitch sewing key on the main interface to

switch to pattern constant-stitch sewing editing interface "d-01 3.0", press the fourth column ⊞ , ⊟ to

adjust the d01-d15 segment number, and press ⊞ ⎯ ⊟ to adjust the current segment Stitch length. Short press

P key to exit to the main interface.

2 User Parameter

No.	Items	Range	Default	Description
P01	Maximum sewing speed (rpm)	100-3700	3700	Maximum speed of machine sewing
P02	Set accelerated curve (%)	10-100	80	Set the acceleration slope
P03	Needle UP/ DOWN	UP/DN	DN	UP: Needle stops at Up position DN: Needle stops at Down position
P04	Start back-tacking speed (rpm)	200-3200	2000	
P05	End back-tacking speed (rpm)	200-3200	2000	
P06	Bar-tacking speed (rpm)	200-3200	2000	
P07	Soft start speed (rpm)	200-1500	1500	
P08	Stitch numbers for soft start	1-15	2	
P09	Automatic constant-stitch sewing speed (rpm)	200-4000	3700	Speed adjustment for automatic constant-stitch sewing
P10	Automatic end back-tacking sewing	ON/OFF	ON	ON: After last seam of constant stitch sewing, it will automatic execute the End Back-Tacking sewing function. When turn on, the Stitch-Correction is invalid. OFF: Automatic End Back-Tacking will not execute after last seam, but can be done by pedal manually.
P12	Start back-tacking running mode selection	0-1	1	0: Could be arbitrarily stop and start 1: Automatically perform actions
P13	Ending mode of start back-tacking	CON/STP	CON	CON：Start Back-Tacking is completed automatically continued for next action. STP：After the number of stitches is completed, stop automatically.
P14	Slow start function selection	ON/OFF	OFF	
P15	Manual Switch A	0-6	5	0: OFF 1: half stitch 2: one stitch 3: continuous half stitch 4: continuous one stitch 5: Back-tacking when machine stop or pause 6: Tight seam function
P16	Back-tacking speed limit	0-3200	3000	The function is disabled when the value is less than 100.
P17-N04	Voice language selection	0-1	1	0: Off, 1: Chinese, 2: English, 3: Vietnamese , 4: Portuguese, 5: Turkish, 6: Spanish, 7: Russian , 8: Arabic
P17-N05	Voice finction	0-1	0	0: OFF, 1: ON
P20	End back-tacking running mode selection	0-1	1	1: Manual, pedal controlled, can be stopped and started arbitrarily 2: Automatic, touch the pedal to automatically execute back-tacking

| No.	Items	Range	Default	Description
P21	The position of the pedal for running	30-1000	520	
P22	The position of the pedal for the stop	30-1000	420	
P23	The position of the pedal for lifting presser foot	30-1000	270	
P24	The position of the pedal for thread trimming	30-500	130	
P27	Pattern freedom sewing editing			
P29	The strength of thread trimming stop	1-45	20	
P32	Bar-tacking compensation 5	0-200	167	
P34	Constant-stitch sewing running mode selection	A/M	A	A：Automatically perform actions M：Could be arbitrarily stop and start
P36	Thread slacking function selection	0-1	0	0: OFF 1: ON
P37	Automatic thread wiping function / Automatic thread clamping function selection	0-11	6	0 : OFF 1: Automatic thread wiping Function 2-11: Automatic thread clamping Function and the strength of automatic thread clamping.
P38	Automatic thread trimming function selection	ON/OFF	ON	
P39	Automatic presser foot lifting when pause function selection	UP/DN	DN	
P40	Automatic presser foot lifting after trimming function selection	UP/DN	DN	
P41	Counter display	0-9999	0	Display the quantity of finished sewing piece. Long-press "-" key to clear the count
P42-N01	The control system version number			
P42-N02	The panel version number			
P42-N03	Speed			
P42-N04	The pedal AD			
P42-N05	The mechanical angle(up position)			
P42-N07	Bus bar voltage AD			
P42-N15	Step drive version number			
P44	Brake strength during stopover	1-45	16	
P46	Motor stop with a reverse angle after trimming function	ON/OFF	OFF	
P47	Adjust the reverse angle when motor stop after trimming	10-50	40	Adjusting at reverse direction after trimming.
P48	The minimum speed limit (rpm)	100-500	210	Adjust the minimum speed
P49	Thread trimming speed (rpm)	100-500	300	Adjust thread trimming speed
P50	Toot lifter operation time to full output (ms)	10-990	200	

No.	Items	Range	Default	Description
P51	Presser foot lifter operation duty cycle (%)	1-50	25	Presser foot lifter operate in duty cycle to save electricity and protect the electromagnet from over-heat.
P52	Delay the start of the motor to protect the lowering time of presser foot (ms)	10-990	120	Delay the start time, with automatic presser foot down.
P53	Half back pedaling lifting presser foot function to cancel	0-2	1	0: OFF 1: Back pedaling and half back pedaling with lifting presser foot 2: half back pedaling without lifting presser foot, back pedaling with lifting presser foot
P54	Thread trimming action time (ms)	10-990	200	
P55	Thread wiping action time (ms)	10-990	10	
P56	Power on and positioning	0-2	0	0: Always not to find the up needle position 1: Always to find the up needle position 2: If the motor is not into the up needle position, it will find the up needle position
P57	Presser foot solenoid protection time (s)	1-60	5	Forced shutdown after hold time to prevent the electromagnet from being hot for a long time
P58	Up needle position adjustment	0-359	90	Up position adjustment, the needle will advance stop when the value decreased, the needle will delay stop when the value increased.
P59	Down needle position adjustment	0-359	260	Down position adjustment, the needle will advance stop when the value decreased, the needle will delay stop when the value increased.
P60	Testing speed (rpm)	100-3700	3500	Setting testing speed.
P61	Testing A	ON/OFF	OFF	Continuous running testing.
P62	Testing B	ON/OFF	OFF	Start and stop testing with all functions.
P63	Testing C	ON/OFF	OFF	Start and stop testing without all function.
P64	Test run time	1-250	30	
P65	Test stop time	1-250	10	
P66	Machine protection switch selection	0-2	1	0：Disable 1：Testing zero signal 2：Testing positive signal
P69	Pattern freedom sewing speed	100-3000	2000	
P70	Type		24	
P71	Correction stitches distance of manual button A	0-5.0	0	
P72	Up needle position adjustment	0-359		Adjust up needle position, the displayed value will change with the position of the handwheel, press "S" key to save the current position (value) as up needle position.
P73	Down needle position adjustment	0-359		Adjust down needle position, the displayed value will change with the position of the handwheel, press "S" key to save the current position (value) as down needle position.
P74	Tacking stitch length compensation	-50~50	0	
P75	Back-tacking stitch length compensation	-50~50	0	
P78	The start angle of thread clamping	5-359	100	

No.	Items	Range	Default	Description
P79	The stop angle of thread clamping	5-359	270	
P80	Trimming engage angle	0-359	5	
P83	Stopping strength after trimming	10-100	20	
P86	Up and down needle position distance	15-345	170	Up and down positioning distance angle (1 degree for every 4 values)
P87	Wiping thread return delay time	10-990	50	Make sure the wiper returns to its original position
P88	Stopover distance	10-100	30	
P89	AC overvoltage setting	500-1023	880	
P92	Correct the electrical angle of motor		160	Reading the initial Angle of encoder, the factory default was set, please do not change the values (parameter value cannot be changed manually, random change it will result the control box and motor abnormal or damaged).
P93	The starting time of the half back pedaling function (ms)	10-900	100	
P99	Starting tight seam stitch length	0-5.0	0.5	
P100	Direction of starting tight seam	0-1	0	
P101	The Start angle of thread slacking	1-359	30	Song line start angle (defined as 0°under calculation)
P102	The stop angle of thread slacking	1-359	180	Loose wire end angle (defined as 0°under calculation, must be greater than P101 parameter value)
P103	Thread slacking strength	1-5	3	
P105	Pattern freedom sewing mode selection	0-8	0	0: OFF 1-8: Pattern freedom sewing mode
P107	Starting tight seam speed	100-1200	500	
P108	Starting tight seam stitch number	0-12	1	
P109	The delay time before thread wiping	5-990	5	Interval time before entering thread wiping action after finding the upper positioning
P110	Trimming back time (ms)	60-990	65	Make sure the thread trimming device returns to its original position
P111	Clamp function without any thrum switch	0-1	0	
P112	The delay time before hook thread with clamp function without any thrum	0-990	100	
P113	The hook thread action time with clamp function without any thrum	0-990	30	
P114	The return back time of hook thread with clamp function without any thrum	0-990	30	

No.	Items	Range	Default	Description
P115	Duty cycle for hook thread with clamp function without any thrum	0-100	80	
P116	The suction time for clamp function without any thrum	0-5000	1000	
P117	Duty cycle for pull thread with clamp function without any thrum	0-100	80	
P129	Back-tacking step motor zero-point correction	-500~500	0	
P131	Normal stitch length	0-5.0	3.0	
P132	Manual close stitches distance	0-5.0	2.0	
P138	Foot lifting release buffer duty cycle (%)	0-100	2	
P139	Foot lifting release buffer delay time (ms)	0-200	8	
P143	Tight seam mode selection	0-3	0	0: OFF 1: Starting tight seam 2: Ending tight seam 3: Full function
P149	Back-tacking step motor steady current	0-12	6	
P151	Back-tacking step motor maximum current	0-12	8	
P153	Ending tight seam stitch length	0-5.0	0.5	
P154	Ending tight seam speed	100-1200	500	
P159	Direction of ending tight seam	0-1	0	0: Forward 1: Backward
P160	Ending tight seam stitch number	0-12	1	
P168	Language setting	0-8	1	0: OFF 1: Chinese 2: English 3: Vietnamese 4: Portuguese 5: Turkish 6: Spanish 7: Russian 8: Arabic
P170	Correction stitches distance of manual button B	0-5.0	0	
P174	Manual Switch B	0-6	3	0: OFF 1: half stitch 2: one stitch 3: continuous half stitch 4: continuous one stitch 5: Back-tacking when machine stop or pause 6: Tight seam function

No.	Items	Range	Default	Description
P177	1mm forward stitch length reference value setting	0-200	27	
P178	1mm backward stitch length reference value setting	0-200	28	
P179	2mm forward stitch length reference value setting	0-200	55	
P180	2mm backward stitch length reference value setting	0-200	56	
P181	3mm forward stitch length reference value setting	0-200	75	
P182	3mm backward stitch length reference value setting	0-200	76	
P183	4mm forward stitch length reference value setting	0-200	100	
P184	4mm backward stitch length reference value setting	0-200	99	
P185	5mm forward stitch length reference value setting	0-200	123	
P186	5mm backward stitch length reference value setting	0-200	120	

Note: the initial value of parameters is for reference only, and the actual value of parameters is subject to the real object.

3 Error Code List

Error Code	Problem	Measure
E01	Over-voltage	Turn off the system power and check whether the power supply voltage is correct. (Or whether it exceeds the specified rated voltage).
E02	Low-voltage	Turn off the system power and check whether the power supply voltage is correct. (Or whether it is lower than the specified rated voltage).
E03	Abnormal communication between the main CPU and the driver CPU	Turn off the power and check whether the connector is connected to the operation panel and the cable condition.
E05	Speed control unit connection is abnormal	Please turn off the power and check whether the connector is connected to the speed controller and the cable condition.
E07	Main shaft motor rotating abnormally	Please rotate handwheel to check if the spindle motor is locked. Check if the encoder cable of the motor and the power cable of the motor are connected to the connector. Check if the power supply voltage is normal and whether the sewing speed is too high.
E10	Solenoid over-current protection	Turn off the system power supply, please check the solenoid (solenoid valve) connector or solenoid (solenoid valve) is broken or not.

| E09 E11	Positioning signal error	Turn off the machine, please check if the encoder in bad connection or is too loose. To get it right and turn on. If there are still errors, please replace the control box and call for customer service.
E14	Encoder signal error.	Turn off the system power supply, please check motor encoder connector if loose or fall off, renew to normal then restart system.
E15	Main shaft motor overcurrent error	Turn off the power, and then turn it on again.
E17	Head fall error	Please raise machine head and turn on the power again. Check if the head down switch is damaged.
E20	Main shaft motor rotating abnormally at startup	Turn off the power and check whether the encoder cable of the motor and the power cable of the motor are connected to the connector.
E82	Back-tacking step motor overcurrent	Turn off the power, and then turn it on again.
E84	Back-tacking step motor encoder Z signal abnormal	Turn off the power and check whether the encoder cable of the step motor is connected to the connector.
E85	Back-tacking step motor encoder AB signal abnormal	Turn off the power and check whether the encoder cable of the step motor is connected to the connector.
E86	Back-tacking step motor failed to start	Turn off the power and check whether the encoder cable of the motor and the power cable of the motor are connected to the connector.
E87	Back-tacking step motor locked-rotor	Please check if the step motor is locked.

4 Port Diagram
12P Function Port Description

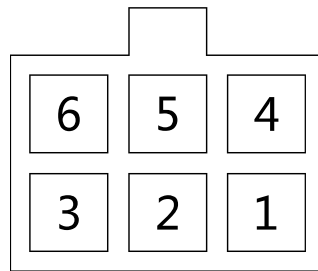| 14	13	12	11	10	9	8
7	6	5	4	3	2	1
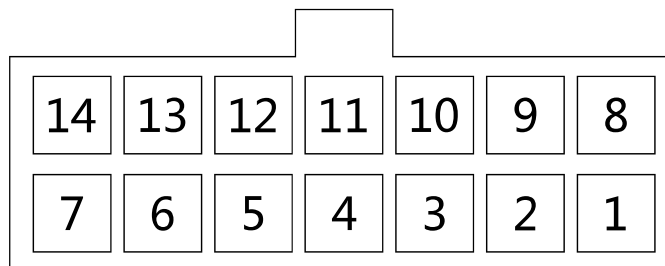
1. Thread trimming electromagnet: 1, 8 (+32V)

2. Thread wiping/ thread clamping electromagnet: 2, 9 (+32V)

3. Thread slacking electromagnet: 3, 10 (+32V)

4. LED Light: 4 (DGND), 11 (+5V)

5. Reverse stitch key: 5 (signal)

6. Mending stitch key: 7 (signal)

2P Function Port Description

```
┌─────────┐
│  ┌───┐  │
│  │ 2 │  │
│  ├───┤  │
│  │ 1 │  │
│  └───┘  │
└─────────┘
```
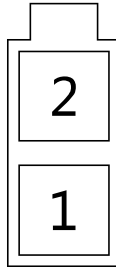
1. Presser foot electromagnet: 1, 2 (+32V)

6P Function Port Description

```
┌─────────────────┐
│ ┌──┐ ┌──┐ ┌──┐  │
│ │6 │ │5 │ │4 │  │
│ ├──┤ ├──┤ ├──┤  │
│ │3 │ │2 │ │1 │  │
│ └──┘ └──┘ └──┘  │
└─────────────────┘
```

1. Pull thread: 1(+24V), 4

2. Hook thread: 2(+24V), 5

3. Suction: 3(+24V), 6