FANUC System maintenance training materials

Section 1 Analysis of common faults in FANUC CNC system 1. The data input/output interface (RS232) cannot work properly.

For the FANUC system, when the data input and output interface is not normal and an alarm occurs, there are two series of alarm numbers.

3/6/0/16/18/20/power-mate, when an alarm occurs, it displays 85~87 alarm.

10/11/12/15, when an alarm occurs, display 820-823 Alarm When the data output interface cannot work properly, there are generally the following reasons:

1) If the system does not respond when you perform input and output data operations.

Please check whether the system working mode is correct. Please set the system working mode to EDIT mode and open the program protection key, or in the case of input parameters, you can also set the system working mode to emergency stop state.

 $\ensuremath{\mathsf{Please}}$ press FANUC factory data sheet, and re-enter the function selection parameter.

Check whether the system is in RESET state.

2) If an alarm occurs during input/output data operations.

Please check the system parameters

Machine type	Proj ect	CNC, side sett	ing	Portable 3" disk		
	setting	Channel 1	Channel 2	drive or computer side Settings		
FANUC 16/18/21/0i	Channel name	JD5A	JD5B	Port rate =4800 Stop position =2 Parity check bit =		
	Channel Settings	020=1	020=2	even check chan- nel =Rs232		
	Stop bit	0101=1***0**1	0121=1***0**1			
	10 device	0102=3	0102=3			
	Baud rate	0103=10	0123=10			
	Channel name	CD4A or JD5A (15B)	CD4B or JD5B (15B)	Port rate =4800 Stop position =2		
	Channel Settings	020=1 , 021=1	020=2 021=2	Parity check bit = even check chan-		
	l0 Device number	5001=1	5001=1	nel =Rs232		
FANUC 10/11/12/15	10 device	5110=7	5110=7			
	Stop bit	5111=2	5111=2			
	Baud rate	5112=10	5113=10			
	Control code	0000=***0*0**	0000=**0*0**			
FANUE OA/OB/OC/OD	Channel	M5	M74	Port rate =4800		

number name Fit			Stop position =2 Parity check bit = even check chan- nel =Rs232
Number of channel	I/0=0 , I/0=1	1/0=2	

	Stop bit	0002=1****0*1 0012=1****0*1	0050=1**** 0*1	
	10 device	0038=10*****	0038=** 10****	
	Baud rate	0552=10 0553=10	0250=10	
FANUC 3	Number of chan- nel	1/0=0		Port rate = 4800 Stop
	Stop bit	0005=1***0*1		position =2 Parity check bit = even check
	Baud rate	0068=4800		channel =Rs232
FANUC 6	Communication channel	I NPUTDEVI CE=0 I NPUTDEVI CE=1		波特率=4800. Stop
	IO device	0340=3 0341=3		position =2 Parity check
	Stop bit/ baud rate	0312=10011001		check channel =Rs232
OP	Channel name	М5	M74	
	Channel Settings	0340=1 , 0341=1 , 018#1=1	0340=3 0341=3 018#1=1	
	Stop bit/ baud rate	0311=10011001	0312= 10011001	
Power mate A/ B/C	Channel name	JD5		
	Channel Settings	I /0=0		
	Stop bit	1****1		
	Baud rate	0226=10		

Cable wiring

The following figure shows the connection relay terminal from the FANUC system to the machine tool panel CNC side

The machine tool

panel	connects	to	the	relay	terminal	

RD	(03) RD
DR	(06)DR
CS	(05)CS
CD	(08)CD
SD	 (02)SD
ER	 - (20)ER
RS	(04) RS
SG	 - (07)SG
+24V	- (25)+24V

Interface and computer connection cable:

1 25 cores (machine tools) 25 cores (1/0 equipment) 2.25 cores (terminal) 9 cores (1/0) computer



3) Setting errors or hardware failures of external input/output devices The external input and output devices include FANUC paper tape punch, handheld disk box, FANUC P-G, computer and other equipment. When transmitting, you should confirm:

A. Whether the power supply is turned on

b. Whether the baud rate and stop bit match the data input and output parameters set in FANUC system.

C. What is wrong with the hardware?

d. Whether the data transmission format is ISO/EIA.

e. Whether the data bit setting is correct, usually 7 bits.

4) CNC system and communication related printed board

The following table shows the printed boards related to communication interfaces of each system

0	Storage board, or motherboard			
3	Motherboard			
6	Display control board (CRTC board)			
11	Motherboard or monitor screen /MDI co-			
11	ntrol board			
15A	BASE 0			
15B	MAIN CPU Board or OPTI board			
16/18 A/D/C	Communication interface module on the			
10/18 A/B/C	MAIN board			
OIA	I/O interface board, or motherboard			
0IB/C	The motherboard, or CPU board			
21B	1/0, interface board			
16/18 / 21i	The motherboard, or CPU board			
POWER MATE	Basilar plate			

6) When the FANUC system communicates with the computer, note the following:

a. The computer housing is grounded at the same time as the CNC system.

b. Do not unplug the cable while powered on.

c. Do not carry out communication operations during thunderstorms.

d. The communication cable should not be too long.

5) If alarm 85,86,87 occurs, follow these steps to find out:



2. The power unit cannot be opened

There are two indicator lights on the power supply of the FANUC system. One is the power indicator light, which is green; the other is the power alarm light, which is red. The power unit mentioned here includes the power input unit and the power control part.

(1) When the power supply is not turned on, if the power supply indicator light (green) does not light up.

a. The fuse F1 and F2 of the power unit have been broken, which is caused by the high voltage input or the failure of the components of the power unit itself. b. If the input voltage is low, please check the voltage entering the power unit. The allowable value of voltage is AC200v+10%, 50HZ/60HZ \pm 1HZ; or AC220V +10%, 60HZ \pm 1HZ

c. Power unit is faulty

(2) The power indicator light is on, the alarm light also disappears, but the power cannot be turned on. This is because the condition of power ON is not met. The condition of power ON is as follows:



There are three conditions for the power supply to be ON

a. The power ON button is closed and then disconnected

b. Power OFF button is closed

c. The external alarm contact is open

(3) The power unit alarm light is on

+24V output voltage fuse.

a. The 9" display screen uses +24V voltage. Refer to the following figure to check whether the +24V is short circuit to the ground



b.Display/manual data input board unit is faulty

Power unit is faulty

a. Unplug all the output plugs of the power unit, leaving only the power input line and the switch control line.

b. Turn off the entire power supply of the machine tool and remove the power control part as a whole.

c. Turn on the power supply again. If the power supply alarm light is off at this time, it can be considered that the power unit is normal, and if the power supply alarm light is still on, then the power unit is bad.

Note: Do not unplug the 16/18 system power supply for more than half an hour,

as the SRAM backup power is on the power supply. +24E Insurance Fuses

A + 24E is for external input/output signals. Refer to the following figure to check whether the external input/output circuit is short-circuited,



b. External input/output switch causes +24E short circuit or system I/O board failure.

+5V load voltage short circuit

Method of inspection

Remove the +5V power supply load from the system one by one. Each time you remove it, you must turn off the power supply and then turn it on again. Refer to the following figure:



When any +5V power load is removed and the power alarm light goes out, it can be proved that the load and its connecting cable are faulty.

Note: When the plug of the motor encoder is removed, if it is an absolute position encoder, it needs to be reset again before the machine can return to normal.

There is a short circuit in each printing plate of the system

Use a multimeter to measure the resistance between +5V, \pm 15V, +24D and OV. The measurement must be taken when the power supply is off.

a. Pull each printing plate down one by one, then turn on the power supply and check whether the alarm light is still on.

b. If the power alarm light does not light up when a printed board is removed, it can be proved that the printed board has a problem and the printed board should be replaced.

c. For the O system, if +24D is short-circuited with OV, the input/output board and motherboard must be replaced at the same time.

d. When the computer communicates with the CNC system, if the CNC communication interface is burned out, sometimes the system power supply will not be turned on.

3. When returning to the reference point, there is a deviation

(1) The reference point is 1 grid away from the correct position

Proj ect	Possi bl e ons	reas-	How to check	Terms of settlement
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1	The gear block is not in the right position	Use the diagnostic function to monitor the deceleration signal and record the ref- erence point position and the position of the point where the deceleration si- gnal acts	The distance between th- ese two points should be equal to about half the distance the machine tr- avels in one revolution of the motor
2	The deceleration block is too sh- ort	The length of the deceler- ation block is calculated according to the first me- thod	Install the new blocks according to the calcul- ated length
3	The zero switch is faulty	Within a grid, *DECX chan- ges	* The DECX electrical switch is not working properly. Please replace it
		In a grid, the DECX signal does not change	The block is not instal- led correctly

(2) The reference point returns to a random position

Proj ect	Possible reasons	How to check	
1	Disturb	 a) Check whether the fee- dback signal line of the position encoder is shie- lded; b) Check whether the pos- ition encoder is separated from the motor power line 	Screen shielding pos- ition encoder feedback signal line; Separate the position encoder from the motor power line
2	Location encoder The supply vol- tage is too low	Check that the encoder power supply voltage is not lower than 4.8V	
3	The coupling between the mo- tor and the ma- chine is loose	Make a mark on the motor and the screw, then run the shaft and observe the mark	Tighten the coupling
4	Location encoder is faulty		Replace the position encoder and observe whether the fault is eliminated after the deviation is replaced
5	Count back from the reference point The device cap- acity is set incorrectly	Recompute the reference point counter capacity	Especially in a 0.1 μ system, it is import- ant to calculate car- efully according to the instructions
6	Servo control board or The servo inte- rface module is faulty		Replace the servo co- ntrol lever or inter- face module

- 4. The return reference point is abnormal, and Allarm90 appears on the display screen
- When the reference point returns and the position deviation does not exceed 128, the position error can be confirmed in the diagnostic screen. The system diagnosis number for 3/6/0 is 800~ 803; the system diagnosis number for 16/18 is 300

A, check and confirm the fast forward speed

b. Check and confirm the multiplier selection signal for fast forward speed (ROV1, ROV2)

c, check and confirm the reference point deceleration signal (*DECX)

D, check and confirm the external deceleration signal \pm *EDCX

E, too close to the reference point.

2. When the reference point returns, the position deviation exceeds 128.

a) The 1 rotation signal of the position feedback signal has no output.

b) Location encoder is faulty

c) The supply voltage of the position encoder is too low, generally not less than 4.8v

d) The servo control part and the servo interface part are faulty.

5. The machine tool cannot operate in manual or automatic mode check point:

The value of the position screen does not change.

Internal state of CNC

Use the signal diagnostic function of PMC to confirm the input/output signals (1) The value of the position screen does not change

I tom	Causa	Related addresses a	and parameters	
Item	Cause	0	16/18/21/0i	11/12/15
1	The system is in an emerg- ency stop state *ESP	G121.4	G8.4 or G 1008.4	GO. 4
2	The system is in reset mode			
	(1) XR ERS	G121.7	G8.7	GO. 0
	(2) The reset key of the	G104.6	G8.6	GO. 6
	MDI			
3	Confirm the working mode MD	G122#2,1,0	G43#2,1,0	G3
	4, MD2, MD1 JOG=101, AUTO=			
	001 EDIT=011, MDI=000			
4	JOG axis direction select-	G116#3,2	G100	
	ion signal	G118#3.2	G102	
	Check the internal diagno-	DCNZOO		
	sis and confirm	DGN/00	DGN15	
	(1) The signal-to-noise			DGN1000
	ratio is O			Up to
	(2) Implementation checks			1001
	are being carried out			
	(3) Spindle speed arrival			
	signal (SAR)			
	(4) Lock in the signal			
5	Implementation checks are	DGN800>PRM500	DGN300>PRM1826	
	being carried out.			
	Condition: The position			
	error value is greater than			
	the set width of the posi-			
	Interlocking signal input		68.0	
6	*IIK	G117.0	DD. 0 PRM3003#0	GO. 0
			PRM3003#2	
	*ITX	PRM8.7G128	G130	
	± MI TX	642	G132	
		042	G134	
		PRM24#7	PRM3003#3	
_			G010	
7	JOG, speed 0 (JVO to JV7)	G121 PRM3. 4	G011	
8	The system has an alarm			
(2)) Location screen values chan	ge	1	<u> </u>
	The MLK signal was fed into	0117 1	G44.1	
	the system	6117.1	G108	
6. II	n automatic mode, the system of	does not	1	/
rı	JN.			
(1)) Automatically run the			
S	tart light, when it does			
n	ot light up Check poi-			
n	t.			
(^)) is the automatic energia	n start		
(a) I	ight on the machine teel	n Start control		
l n	and Lit?			
p (h)	and III:) Confirm the CNC status			
(U)	, contrain the cive status			

ltem	Cause	Related	addresses	and	parameters

		0 system	16/18/0i	11/12/15
1	Select the confirmation	G122#2, 1, 0	G43#2,1,0	G3
	mode switch			
	MD4, MD2, MD1, equal to 001			
	in automatic mode			
	The automatic run starts			
2	with "START" not entered	G120#2	G7.2	G5.0
	into the system			
	The automatic operation			
3	stop signal *SP is input to	G121.5	G8.5	GO. 5
	the system			

		Related addresse	s and parameters	S
Item	Cause	0	16/18/0i	11/12/15
	Confirm the internal status	DGN700		DGN1000
1	of the CNC	DGN701	DGNO~15	DGN1001
2	Waiting for the auxiliary function completion signal (FIN)	G121.3	G4.3	G5. 1
3	When the operation is aut- omatic, the read shaft mo- vement command is being executed			
4	When running automatically, the pause instruction (GO4) is being executed			
5	The inspection conditions are being implemented in place, and the position error value is greater than the parameter setting value	DGN800>PRM500	DGN300>PRM 1826	
6	The progress speed is 0 (FV0~FV7)	G121	G12PRM3.4	G12
7	Start the locked signal input system STLK	G120. 1	G7.1	G4.6
8	Lock the signal input sys- tem *ILK	G117.0	G8.0 PRM3003#0	GO. 0
9	*ITX	PRM8.7G128	PRM3003#2 G130	
10	CNC is waiting for spindle speed arrival signal (SAR)	G120.4 PRM24#2	G29#4 PRM3708#0	
10	Confirm the ROV1 fast for- ward speed ROV2	PRM518~521 G116#7 G117#7	, PRM1420 G14 G96	
11	Confirm the cutting feed rate. If set to feed per revolution, a spindle pos- ition encoder must be pre-	PRM527	PRM1422	
7. Ur	nder MPG mode, the machine too	ol does not run		
		Related addresse	s and parameters	S
Item	Cause	0	16/18/01	11/12/15
1	The option selection switch MD4, MD2, and MD1 equal 100 in MPG mode	G122#2 , 1 , 0	G43#2 , 1 , 0	G3
2	The axis selection signal HX is selected for the hand pulse	G116#72 G119#7	G18 , G19	G11
3	The multiplier selection signal for the hand pulse is MP2 and MP1	G120#1, 0 (M series) G117.0 G118.0 (T ser- ies) PRM121, PRM699	G19#4 , #5 PRM 7113PRM7114	G6#4 , 3 , 2
4	Confirmation of the hand artery generator. a. The signal line is bro-			

(2) When the automatic operation start indicator is lit

ken and short circuit.		
b. Poor pulse		

Section 2 Maintenance and debugging techniques for FS16/18/01 series

(1) When an alarm is generated, whether the display screen is switched to the alarm screen.

PRM3111#7 (NAP)

(2) If you need to remove the amplifier and motor of one of the control shafts, there are several ways:

- 1 If the program is run in automatic and manual mode, the number on the position screen can also change. PRM2009#0 (SDMY) (built-in encoder) PRM2205 # 2 (PDMY) (External Encoder) PRM1800#1 (CVR) The MLK (G44.1) signal is on
- 2. If the dual-axis servo amplifier is used as the single-axis servo amplifier (sealed servo)

Dual axis servo	Chart out foot	Dlug
amplifier	Short cut root	Pruy
Type A Interface	Short circuit pins 8	Щ _и
Type A Thtertace	and 10	JVX
Type B Interface	Short circuit pins 8	ISv
Type b filterface	and 10	JSX
	Short circuit pins 11	IF
rood juggie	and 12	JFX

3、 You can also set PRM 1023 to-128; PRM1815#5 (APC) = 0.

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4. If you want the system to be in INTERLOCK condition.
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PRM1005#7 (RMB) PRM0012#7 (RMV) PRM1005#6 (MCC)

(3) Whether the hardware OT is used.

PRM3004#4 (OTH)

(4) Release fan alarm (ALM701)

PRM8901#0 (FAN)

(5) After the power supply is connected, the machine tool can run in automatic mode without returning to the reference point.

PRM1005#0 (ZRN)

(6) After the power is connected, the machine tool can run quickly in JOG mode without returning to the reference point.

PRM1401#0 (PDR)

(7) Screen SAVER function.

PRM3123 Set the start time of the screen SAVER

Or press both FUNCTION and CAN keys

(8) STEP FEED operations can be performed even in MPG mode. $7100\#0\mbox{(JH)}$

(9) Is the hand arterial generator directly connected to the system or connected through I/O LINK.

PRM7101#0 (IOL)

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PRM3003#1 (RILK) *RILK, signal (high speed X0.6, 0 not used)

PRM3003#2 (ITx) *IT1~*IT8 (G130 for each axis)

PRM3003#3 (DIT) +MIT1~-MIT4 (G132, G134 in each axis direction)

(11) Connection of the serial spindle

PRM3701#1 (ISI)

(12) Display the program name and type

PRM3107#4 (SOR)
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PRM3107#0 (NAM) (xiii) Types of MDI (small and standard) PRM3100#3 (FKY) (14) 9 "CRT color display information PRM3100#7 (15) Selection of position feedback system PRM1815#1 (OPTx) PRM2023 (number of speed feedback pulses) PRM2024 (number of position feedback pulses) PRM2084 (flexible gear ratio N) PRM2085 (flexible gear ratio M)

Section 3 FANUC Fault analysis of feed servo system FANUC Simple classification of feed servo system:

Order number	Name	Features and characteristics		
1	DC controllable silicon Servo Unit	Only a single axis structure, model A06B-6045-HXXX. The main circuit is composed of two thyristor modules (6 thyristors for domestic produc- ts), 120V three-phase AC input, six thyristor full wave rectification, contactor and three fuses. There are two types of control circuit boards, with and without power supply. Their function is to receive the speed command (0-10V analog voltage) and speed feedback signal of the system, and provide six trigger pulses to the main loop.	For early sys- tems, such as: 5, 7, 330C,200 C,2000C, etc. It is not com- mon in the ma- rket.	
2	DC PWM servo Unit	There are single-axis and double- axis models, model A06B-6047-HXXX. The main circuit uses a rectifier bridge to convert three-phase 185V AC power into 300V DC. The output voltage to the DC servo motor is adjusted by the conduction and cu- toff widths of four high-power tr- ansistors, which regulates the mo- tor speed. It also includes two fuseless circuit breakers, contac- tors, discharge diodes, and disch- arge resistors. The control circuit board works in much the same way.	Earlier syste- ms, such as: 3, 6, 0A and other markets are more comm- on.	
3	Exchange Imitate Servo Unit	There are single axis, double axis or triple axis structures. The mo- del is A06B-6050-HXXX. The main circuit has one more high-power transistor module than the DC PWM servo. Other structures are simil- ar, and the principle of operation of the control board is basically the same as the above. There are single-axis, dual-axis,	Earlier syste- ms, such as: 3, 6, 0A,10/11/ 12,15E,15A,0E,0 B, etc., are common in the market.	
4	Exchange S ser- ies 1 servo unit	or triple-axis structures, with the model number AO6B-6057-HXXX. The main circuit is similar to an AC analog servo, but the control board has significant changes. It only accepts six pulses from the system, amplifies them, and sends them to the base of the transistor in the main circuit. The main circuit co-	O Series 16/18 A,16/18E,15E, 10/11/12, etc. It's more com- mon in the ma- rket.	

1.

		nverts the II and V phase currents	
		of the motor into voltage signals	
		which are then sent to the system	
		via the control board.	
5		There are single axis, double axis or triple axis structures. The mo- del number is A06B-6058-HXXX. The	
	Exchange S ser- ies 2 servo un- its	principle is the same as the S series. The main circuit has been changed to screw the wiring to the printed board, which is convenient for maintenance and easy to disas- semble without causing wiring err- ors. The control board can be used in the above general way.	O Series 16/18 A,16/18E,15E, 10/11/12, etc. It's more com- mon in the ma- rket.
6	Exchange C ser- ies servo units	There is a single-axis and dual- axis structure, model A06B-6066- HXXX. The main circuit volume has been significantly reduced, chang- ing from the original metal frame to a sealed yellow plastic enclos- ure. The circuit board cannot be seen from the outside, and it needs to be opened for maintenance. The main circuit includes a rectifier bridge, an IPM or transistor modu- le, a drive board, an alarm detec- tion board, an interface board, and a power board soldered to the mot- herboard. An external 100V AC power supply is required to provide con- tactor power.	OC,16/18B,15B etc. Not common in the market.
7	Communication series servo units SVU, SVUC	It has single axis, double axis or triple axis structure, and the mo- del is: SVU: A06B-6089-HXXX SVUC: A06B-6090-HXXX, which can replace the C series servo. The structure and appearance of the C series are similar. The circuit board has interface board and main control board. The power supply, drive and alarm detection circuits are all integrated on the main co- ntrol board, without 100V AC input. It is often used in machine tools without FANUC AC spindle motor sy- stem, such as CNC turning, CNC mi- lling, CNC grinding machine, etc.	OC,OD,16/18C,15 B, I series. It's common in the market

			The model of the
Order number	Name	Introduction to the characterist- ics of maintenance products	system to be eq- uipped
8	Communication series servo unit SVM	It has single axis, double axis or triple axis structure, and the model is: SVM: A06B-6079-HXXX The servo system is divided into three modules: PSMi (power module), SPMi (spindle module) and SVM (servo module). The power module converts the 200V AC to 300V DC and 24V DC for the SPM and SVM, as well as for feed- back braking. The SVM cannot work alone and must be used with the PSM. Its structure is: a interface bo- ard, a main control board, an IPM module (intelligent transistor module), no contactor and rectif- ier bridge. PSM will be introduced in the spindle servo system sect- ion.	OC, OD, 16/18C, 15B, I series. Common in the market
9	Connect i series servo unit SVM	It has single axis, double axis or triple axis structure, and the model is: SVM : A06B-6114-HXXX The servo system is divided into three modules: PSM (power module), SPM (spindle module) and SVM (se- rvo module). The power module converts the 200V AC to 300V DC and 24V DC for the SPM and SVM at the back, as well as for the feedback braking task. The SVM cannot work alone and must be used with the PSM, while the SVU and the front AC and DC servo units can be used alone. Its structure is: a interface bo- ard, a main control board, an IPM module (intelligent transistor module), no contactor and rectif- ier bridge. PSMi will be introdu- ced in the spindle servo system section	15/16/18/21/0I-B series, OI-C se- ries
10	Connect to the ß series servo Cell	Single-axis, model: A06B-6093- HXXX, comes in two types: one is I/O LINK control, controlling the tool magazine, turret, or robotic arm, with LED display for alarm numbers. The other is a servo axis, controlled by an axis cont-	OC,OD,16/18C,15B, I series. It's common in the market. It is mainly used for the positio- ning of small CNC

		rol board, which only has an alarm red light lit, no alarm number, but specific alarm numbers can be found on the system's servo diag- nostic screen. External power so- urces include three-phase AC 200V, DC 24V, external emergency stop, external discharge resistor, and its overheat wire. These plugs are easily plugged in incorrectly; once one is inserted incorrectly, it will burn out. There are only two pieces: the interface board and the control board.	machine tools, tool banks and robotic arms.
11	Connect to ßi series servo units	It has single axis, double axis or triple axis structure, and the model is: SVPM: A06B-6134-H30X (three axis), H20X (two axis) SVU: A06B-6130-H00X (single axis only)	15/16/18/21/01-B series, 0 I-C, 01 MATE-B/C series

2. FANUC Analysis of common faults in feed servo system:

2.	1	DC	thyristor	servo	uni t
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Order number	Fault phenom	- Cause	Resol vent
1	Over current al arm (OVC Red light on)	The current output to the servo motor is detected by a current detector CD 1, which is conve- rted into a voltage signal and judged by the control bo- ard whether it is overcurrent. Ther- efore, the trigger circuit and detec- tion circuit from the control board, the main circuit, and the motor may be the fault point.	1 The main circuit or control board failure can be preliminar- ily determined by swapping the control boards (all control boa- rds can be swapped with other axes), and it is generally more likely to be the control board. 2 In addition, check whether the alarm is triggered upon power-up or when the speed is high. If the alarm is triggered upon power-up, it could be due to a burned thy- ristor in the main circuit. This can be determined by testing the thyristor with a multimeter to see if it conducts. A normal th- yristor has an infinite resista- nce across its terminals; if it conducts, it is faulty. If the alarm is triggered at high speeds but not at low speeds, there mi- ght be issues with the control board or motor. This can also be identified by swapping the servo units. 3 If the control circuit board is broken, it must be sent to a FANUC repair point for repair or purchase a new one, because the fragile IC on the board may not be available on the market.
2 Serve the motor Th vibration mo wh ic vi se		The speed of the motor is not stable when it moves, wh- ich will produce vibration and noi- se.	1 The slots of the commutator of the servo motor are filled with carbon powder, or the carbon brush needs to be replaced. 2 Use oscilloscope to measure the CH11-CH3 waveform on the control board. Normally, there are 6 unif- orm sine waves. If one is missing, it is not normal. It may be that the driving circuit or main circuit thyristor on the control board is bad. The control board can be jud- ged by swapping. 3 Adjust the RV7 on the control panel.
3 Ter al a	nperature arm	The servo motor, servo transformer or servo unit ove- rheating switch is	1 The servo motor is overheated, or the thermal protection switch of the servo motor is bad. 2 The servo transformer is overhe-

	off		ated, or the servo transformer th-
			2 The serve unit is everheated or
		off	the servo unit thermal protection
	011.	switch is bad.	
			4 Check whether the overheated co-
			nnecting wires of the above compo-
			nents are broken.

4	Not ready. The system reports 401 or 403 (Servo VRDY OFF).	After the system performs a self- check upon startup, if there is no eme- rgency stop or ala- rm, it sends a PRDY signal to the servo unit. Upon receiving this signal, the servo unit energizes the main contactor and sends back a VRDY signal. If the system does not re- ceive the VRDY sig- nal within the spe- cified time, an al- arm is triggered, and at the same ti- me, the PRDY signals for all axes are disconnected. Ther- efore, all of the aforementioned pat- hways could be pot- ential points of failure.	1 Check that all plugs are in good contact, including the connection bet- ween the control board and the main circuit. 2 Check whether the external AC voltage is normal, including: 3 phase 120V input (terminal A, 1, 2), single phase 100V (terminal 3, 4). Check whether the DC voltage on the control board is normal. If there is any abnormality, it is a fault of the power board. Then check whether the fuse on the board is normal. 3 Carefully observe whether the conta- ctor is energized and then de- energized, or if it does not energize at all. If it is energized and then de- energized, the contactor's contacts may be faulty; replace the contactor. If one does not energize, either the coil of the contactor in that unit is faulty or the control board is faulty. This can be determined by measuring the coil resistance of the contactor. 4 Check whether the 4 and 5 terminals of CN2 are connected, which is an ext- ernal overheating signal, usually a short circuit. If there is no wiring, check whether the short circuit rod S21 must be short circuit, and check whet- her the thermal relay of the main cir- cuit is open. 5 If all of the above are normal, it is a CN1 instruction line or system board failure
5	TG Warning (TG red light on)	Stalling or runaway, that is, the motor speed does not fol- low the command, so there may be a fault in the feedback loop from the command to the speed.	1 The control unit or motor failure can be preliminarily determined by the ex- change unit, which is generally more likely to be the unit. 2 In addition, you can check whether the alarm is triggered when power is on or when the speed is high. If the alarm is triggered when power is on, it may be that the main circuit thyristor is broken. If the alarm is triggered at high speed and the speed is normal at low speed, it may be that there is a problem with the control board or mot- or, which can also be determined by exchanging the servo unit. 3 Observe whether the alarm is always on or occasionally on. If the alarm is always on, the unit or control board is faulty; otherwise, it may be the motor.
6	Aerodyne (1 Turn on	The system does not give instructions to	1 Check whether there is a phase miss- ing in the three-phase input voltage,

	the mach- ine The motor speed ri- ses rapi- dly due to system overload Report to the police and stop)	the servo unit, and the motor moves by itself. This is ca- used by positive feedback or no speed feedback signal, so the servo output, speed feedback and other circuits sho- uld be checked.	or whether the fuse is burnt out. 2 Check whether the external wiring is normal, including: 3 phase 120V input (terminal A, 1, 2) phase sequence UVW is correct, whether the output to the motor +, - (terminal 5, 6, 7, 8) is reversed, whether the CN1 plug is loo- se. 3 Check whether the motor speed feedb- ack is normal, including: whether it is reversed, whether it is broken, and whether there is no feedback. 4 The control circuit board is exchan- ged. If the fault is transferred with the control board, it is a circuit board fault. 5 The system speed detection and conv- ersion loop fault.
7	System displays VRDY ON alarm	The system detects the VRDY signal be- fore the PRDY signal is sent. That is, the servo unit is ready earlier than the system, and the system considers this abnormal.	1 Check whether the contact of the main circuit contactor is not in good cont- act, or CN1 wiring is wrong, 2 Check whether the system instruction port is sealed by maintenance personn- el.

urni ng	sends a command, the servo unit or servo motor does not exe- cute, or because the system detects that the servo deviation value is too large, so wait for this deviation value to become smaller.	stem or servo after giving instructio- ns. If there is an OVC in the servo, it is possible that the mechanical brake is not opened or the mechanical jammed. 2 If there is no alarm from the servo, the system will give an out-of- tolerance alarm. At this point, check whether all the wiring or connection plugs are normal, including the motor power line, CN1 plug, A, 1, 2 three- phase input lines, CN2 plug, and the connection between the control board and the unit. If all are normal, repl- ace the control board for inspection. 3 Check whether the servo motor is no-
	otor not irni ng	otor not After the system sends a command, the servo unit or servo motor does not exe- cute, or because the system detects that the servo deviation value is too large, so wait for this deviation value to become smaller.

22	DC	PWM	servo	uni t
~ ~	20		301 00	un u

Order	Fault phenom-	Cause	Resolvent
number	enon		
1	TG alarm (TG	Stalling or runaw-	1 The single axis can be exchan-
	red light on)	ay, that is, the	ged through the unit, and the
		motor speed does	double axis will exchange the
		not follow the co-	command line and power line of
		mmand, so there may	each axis to preliminarily dete-
		be a fault in the	rmine whether it is a control
		path from the com-	unit or a motor fault. Generally,
		mand to the speed	the possibility of the unit is
		feedback.	greater.
			2 If the alarm is raised when
			power is applied, the main circ-
			uit transistor may be broken. The
			transistor module can be measured
			and replaced by using a multime-
			ter. If the alarm is high speed
			but normal at low speed, there
			may be a problem with the control
			board or motor, which can also be
			determined by exchanging the se-
			rvo unit.
			3 Observe whether it is always
			alarm or occasionally alarm. If
			it is always alarm, it is the
			unit or control board fault; ot-
			herwise, it may be the motor.
	Racing (the	The system does not	1 Check for any missing phase in
	motor speed is	give instructions	the three-phase input voltage.
	high when the	to the servo unit,	2 Check whether the external wi-
	engine starts	and the motor moves	ring is normal, including: whet-

	The degree rose very qu- ickly and st- opped due to system overl- oad reporting)	by itself. This is caused by positive feedback or no sp- eed feedback sign- al, so the servo output and speed feedback circuits should be checked	her the 3-phase 120V input (ter- minal A, 1, 2) and the + and- (terminal 5, 6, 7, 8) output to the motor are reversed, and whe- ther the CN1 plug is loose. 3 Check whether the motor speed feedback is normal, including: whether it is reversed, whether it is short circuit, whether th- ere is no feedback. 4 The control circuit board is exchanged. If the fault is tran- sferred with the control board, it is a circuit board fault.
3	The circuit breaker trips (BRK light on)	The two non-insured circuit breakers in the main circuit detect abnormal current, trip, or detect a fault in the circuit.	<pre>1Check whether the two non- insured circuit breakers at the input end of the main loop power supply are open, which should normally be ON (green). 2 If it does not fit, there is a short circuit in the main circu- it. The rectifier bridge, large capacitor and transistor module of the main circuit should be carefully checked. 3 The control panel alarm circuit is faulty.</pre>

4	Motor not turning Overheat (OH light on)	After the system sends a command, the servo unit or servo motor does not exe- cute, or the system detects that the servo deviation va- lue is too large, so it waits for this deviation value to become smaller. The thermal protec- tion switch of the servo motor, servo transformer, servo unit and discharge unit is turned off.	<pre>1 After the inspection command is giv- en, the system or servo alarm appears. If the servo has OVC alarm, it is possible that the mechanical brake is not opened or the mechanical jamming occurs. 2 If there is no alarm from the servo, the system will give an out-of- tolerance alarm. At this time, check whether all wiring or connection plugs are normal, including the motor power line, CN1 plug, A, 1, 2 three-phase input lines, CN2 plug and the connect- ion between the control board and the unit. If all are normal, replace the control board for inspection. 3 Check whether the servo motor is no- rmal. 4 Check the servo error diagnosis scr- een of the system to see if there is a large value (about 10-20, the normal value should be less than 5). If so, adjust the RV2 (OFFSET) on the control board until the number becomes about 0. 1 The servo motor is overheated, or the servo motor thermal protection switch is bad. 2 The servo transformer or discharge unit is overheated, or the thermal protection switch of the servo transf- ormer or discharge unit is bad. If the transformer or discharge unit overheat line is not connected, S20 (OH) is</pre>
			shorted on the printed board. 3 The servo unit is overheated, or the servo unit thermal protection switch is bad. 4 Check whether the overheated connec- ting wires of the above components are broken.
6	Abnormal current alarm (HCAL red light on)	The 185V AC of the servo unit is rect- ified into 300V DC. There is a detection resistor on the DC side to detect the DC current. If there is a short circuit, an alarm will be generated immediat- ely.	<pre>1 If it always appears, you can use a multimeter to measure whether the main circuit transistor module is short ci- rcuit, and replace the transistor mod- ule by yourself. If there is no short circuit, exchange the control board with other axes. If the control board is transferred, repair the control bo- ard. 2 If the alarm is high speed and the normal speed is low, there may be a problem with the control board or mot- or, which can also be identified by exchanging the servo unit. 3 Observe whether the alarm is always</pre>

			on or occasionally. If the alarm is always on, it is a unit or control board fault; otherwise, it may be the motor.
7	High vol- tage rep- ort Guard ag- ainst (HVAL Red light on)	The servo control board detects that the voltage of the main circuit or co- ntrol circuit is too high. In general, the detection circ- uit is faulty.	1 Check whether the three-phase 185V input voltage is normal. 2 Check whether CN2, 1, 2, 3 AC + and- 18V are normal. 3 The control circuit board is exchan- ged. If the fault is transferred with the control board, it is a circuit board fault.
8	Serve the motor vi- bration	The motor will pro- duce vibration and noise when the speed is not stable.	1 The carbon powder is in the slot of the commutator of the servo motor, or the carbon brush needs to be replaced. 2 Check whether the control circuit boards S1 and S2 are set correctly compared with other good boards. 3 Check whether the control circuit board RV1 is set correctly.

9	Low volt- age alarm (LVAL Red light on)	The servo control board detects that the voltage of the main circuit or co- ntrol circuit is too low, or the detect- ion circuit fault.	<pre>1 Check that the three-phase 185V input voltage is too low. 2 Check whether CN2, 1, 2, 3 AC + and- 18V are normal. 3 Check the main circuit transistors, diodes, capacitors and so on for abno- rmalities. 3 The control circuit board is exchan- ged. If the fault is transferred with the control board, it is a circuit board fault.</pre>
10	Abnormal discharge alarm (DCAL red light on)	The discharge circ- uit (discharge tra- nsistor, discharge resistor, discharge drive circuit) is abnormal, often ca- used by short circ- uit.	<pre>1 Check the main circuit transistor, discharge triode, diode, capacitor and so on for abnormalities. 2 If there is an external discharge resistor, check whether its resistance value is normal. 3 Check whether the servo motor is no- rmal. 4 The control circuit board is exchan- ged. If the fault is transferred with the control board, it is a circuit board fault.</pre>
	Not ready Systematic reporting Display server VRDY OFF.	After the system performs a self- check upon startup, if there is no eme- rgency stop or ala- rm, it sends a PRDY signal to the servo unit. Upon receiving this signal, the servo unit energizes the main contactor and sends back an VRDDY signal. If the system does not re- ceive the VRDDY si- gnal within the sp- ecified time, it triggers this alarm and simultaneously disconnects the PRDY signal from all ax- es. Therefore, all the aforementioned pathways are poten- tial fault points.	1 Check that all plugs are in good contact, including the connection bet- ween the control board and the main circuit. 2 Check whether the external AC voltage is normal, including: 3 phase 185V input (terminal A, 1, 2) and single phase 100V (terminal 3, 4). 3 Check whether the DC voltage on the control board is normal. If there is any abnormality, it is a power board fault. Then check whether the fuse on the board is normal. 4 Carefully observe whether the conta- ctor is energized and then de- energized, or if it does not engage at all. If it engages but then de- energizes, it may indicate poor conta- ctor contacts. Replace the contactor. If one does not engage, it suggests either a faulty contactor coil or a faulty control board. This can be det- ermined by measuring the resistance of the contactor coil. 5 If all of the above are normal, it is a CN1 instruction line or system board failure.
12	System shows VRDY ON alarm	The system has det- ected the VRDY sig- nal before the PRDY signal is issued. That is, the servo	1 Check whether the contact of the main circuit contactor is not in good cont- act, or CN1 wiring is wrong, 2 Check whether the maintenance perso- nnel have sealed the system command

		unit is ready earl- ier than the system, and the system con- siders this abnorm- al.	port or faulty.	whether	the	command	port	is
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Order number	Hi tch	Cause	Resol vent
	TG alarm (TG red light on)	Stalling or runaway, that is, the motor speed does not fol- low the command, so there may be a fault in the path from the command to the speed feedback.	1 The single axis can be exchanged through the unit, and the double axis will exchange the command line and power line of each axis to preliminarily determine whet- her it is a control unit or a motor fault. Generally, the pos- sibility of the unit is greater. 2 If the alarm is raised when power is applied, it may be that the main circuit transistor is broken. The transistor module can be measured and replaced by using a multimeter. If the alarm is high speed but normal at low sp- eed, it may be that there is a problem with the control board or motor, which can also be determ- ined by exchanging the servo un- it. 3 Replace the isolation amplifier A76L-0300-0077. 4 Observe whether the alarm is always on or occasionally. If the alarm is always on, it is a unit or control board fault; otherwi- se, it may be the motor.
2	Racing car (the motor speed starts The degree rose very quickly and stopped due to the syst- em's excess- ive reporti- ng)	The system does not give instructions to the servo unit, and the motor moves by itself. This is ca- used by positive feedback or no speed feedback signal, so the servo output and speed feedback cir- cuits should be ch- ecked.	1 Check for any missing phase in the three-phase input voltage. 2 Check whether the external wir- ing is normal, including: whether the 3-phase 185V input (terminal A, 1, 2) and output to the motor U, V, W, G (terminal 5, 6, 7, 8) are reversed, and whether the CN1 plug is loose. 3 Check whether the motor speed feedback is normal, including: whether it is reversed, whether it is short circuit, whether th- ere is no feedback. 4 The control circuit board is exchanged. If the fault is tran- sferred with the control board, it is a circuit board fault.
3	The circuit breaker trips (BRK light is on)	The two non-insured circuit breakers in the main circuit detect abnormal cu- rrent, trip, or de- tect a fault in the circuit.	1Check whether the two non- insured circuit breakers at the input end of the main circuit power supply have jumped out. Normally, they should be ON (gr- een). 2 If it does not fit, there is a short circuit in the main circu-

2.3 Connect the analog servo unit

			it, and the rectifier bridge, large capacitor, transistor mod- ule and so on in the main circuit should be carefully checked. 3 The control panel alarm circuit is faulty.
4	Motor not turning	After the system sends a command, the servo unit or servo motor does not exe- cute, or because the system detects that the servo deviation value is too large, so wait for this deviation value to become smaller.	<pre>1 After the instruction, the sys- tem or servo alarm occurs. If the servo has OVC alarm, it is poss- ible that the mechanical brake is not opened or the mechanical jam is stuck. 2 If there is no alarm from the servo, the system will give an out-of-tolerance alarm. At this time, check whether all wiring or connection plugs are normal, in- cluding the motor power line, CN1 plug, A, 1, 2 three-phase input lines, CN2 plug, and the connec- tion between the control board and the unit. If all are normal, replace the control board for inspection. 3 Check whether the servo motor is normal. 4 Check the servo error diagnosis screen of the system to see if there is a large value (about 10 -20, the normal value should be less than 5). If so, adjust the RV2 (OFFSET) on the control board until the number becomes about 0.</pre>

5	Overheat (OH light on)	The thermal protec- tion switch of the servo motor, servo transformer, servo unit and discharge unit is turned off.	<pre>1 The AC servo motor is overheated, or the thermal protection switch of the servo motor is bad. 2 The servo transformer or discharge unit is overheated, or the thermal protection switch of the servo transf- ormer or discharge unit is bad. If the transformer or discharge unit is not connected to the hot line, S20 (OH) on the printed board should be short cir- cuit. 3 The servo unit is overheated, or the servo unit thermal protection switch is bad. 4 Check whether the overheated connec- ting wires of the above components are broken.</pre>
6	Abnormal current alarm (HCAL red light on)	The 185V AC of the servo unit is rect- ified into 300V DC. There is a detection resistor on the DC side to detect the DC current. If there is a short circuit, an alarm will be generated immediat- ely.	1 If it always appears, you can use a multimeter to measure whether the main circuit transistor module is short ci- rcuit, and replace the transistor mod- ule by yourself. If there is no short circuit, exchange the control board with other axes. If the control board is transferred, repair the control bo- ard. 2 If the alarm is high speed and the normal speed is low, there may be a problem with the control board or mot- or, which can also be identified by exchanging the servo unit. 3 Observe whether it is always alarm or occasionally. If it is always alarm, it is a unit or control board fault; oth- erwise, it may be the motor.
7	High vol- tage rep- ort Guard ag- ainst (HVAL Red light on)	The servo control board detects that the voltage of the main circuit or co- ntrol circuit is too high. In general, the detection circ- uit is faulty.	1 Check whether the three-phase 185V input voltage is normal. 2 Check whether CN2, 1, 2, 3 AC + and- 18V are normal. 3 The control circuit board is exchan- ged. If the fault is transferred with the control board, it is a circuit board fault.
8	Low volt- age alarm (LVAL Red light on)	The servo control board detects that the voltage of the main circuit or co- ntrol circuit is too low, or the detect- ion circuit fault.	<pre>1 Check that the three-phase 185V input voltage is too low. 2 Check whether CN21,2, 3 AC + and-18V are normal. 3 Check the main circuit transistors, diodes, capacitors and so on for abno- rmalities. 4 The control circuit board is exchan- ged. If the fault is transferred with</pre>
			the control board, it is a circuit board fault.
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9	Abnormal	The discharge circ-	1 Check the main circuit transistor,
	di scharge	uit (discharge tra-	discharge triode, diode, capacitor and
	alarm	nsistor, discharge	so on for abnormalities.
	(DCAL red	resistor, discharge	2 If there is an external discharge
	light on)	drive circuit) is	resistor, check whether its resistance
		abnormal, often ca-	value is normal.
		used by short circ-	3 Check whether the servo motor is no-
		uit.	rmal.
			3 The control circuit board is exchan-
			ged. If the fault is transferred with
			the control board, it is a circuit
			board fault.

10	Not ready	After the system	1 Check that all plugs are in good
	Systematic	performs a self-	contact, including the connection bet-
	reporting	check upon startup,	ween the control board and the main
	Di spl ay	if there is no eme-	circuit.
	server	rgency stop or ala-	2 Check whether the external AC voltage
	VRDY OFF.	rm, it sends a PRDY	is normal, including: 3 phase 185V
		signal to the servo	input (terminal A, 1, 2) and single
		unit. Upon receiving	phase 100V (terminal 3, 4).
		this signal, the	3 Check whether the DC voltage on the
		servo unit energizes	control board is normal. If there is
		the main contactor	any abnormality, it is a fault of the
		and sends back an	power board. Then check whether the
		VRDDY signal. If the	fuse on the board is normal.
		system does not re-	4 Carefully observe whether the conta-
		ceive the VRDDY si-	ctor is energized and then de-
		gnal within the sp-	energized, or if it does not energize
		ecified time, it	at all. If it de-energizes after being
		triggers this alarm	energized, it may indicate poor conta-
		and simultaneously	ctor contacts; replace the contactor.
		disconnects the PRDY	If one of them fails to energize, it
		signals for all ax-	suggests either a faulty contactor coil
		es. Therefore, all	or a faulty control board in the unit.
		of the aforementio-	This can be determined by measuring the
		ned pathways are	resistance of the contactor's coil.
		potential fault po-	5lf all of the above are normal, it is
		ints.	a CN1 instruction line or system board
11	Suctor	The existence has det	failure.
	shows VPDV	The system has det-	1 Check whether the contact of the main
	ON alarm	pal boforo the DDDV	circuit contactor is not in good cont
		signal is issued	act or CN1 wiring is wrong
		That is the serve	2 Check whether the maintenance nerve
		unit is ready earl	nnel have sealed the system command
		ior than the system	nort or whether the command nort is
		and the system con-	faulty
	1		

2.4 Communication S series (including 1, 2)

Order	Fault phenom-	Cause	Resol vent
1	Abnormal ele-	The 185V or 200V AC	11f it always appears, you can
	ctricity	of the servo unit is	use a multimeter to measure wh-
	Call the pol-	rectified into DC	ether the main circuit transis-
	ice	300V. There is a	tor module is short circuit. If
	(HC	detection resistor	the transistor is short circuit,
	Red lights on)	on the DC side to	in general, the drive circuit of
		detect the DC curr-	the control board will also have
		ent. If there is a	a fault. At this time, if you
		short circuit at the	replace the new module, it will
		back, causing inst-	burn out, so it is best to send
		antaneous overcurr-	the whole unit to FANUC for
		ent, the alarm will	repair.
		be generated immed-	2 If the transistor is good, it
		iately.	may be a fault in the control
			board or the energy braking ci-
			rcuit of the main circuit (relay
			or rectifier diode), which can
			be identified by replacing the
			CONTROL DOARD.
			the normal speed is low there
			may be a problem with the cont
			rol board or motor or power
			line which can also be identi-
			fied by switching the servo un-
			it.
			4 Observe whether the alarm is
			always on or occasionally. If
			the alarm is always on, it is a
			unit or control board fault;
			otherwise, it may be the motor.
			5 If the servo unit, motor and
			power line are judged to be
			fault-free through detection and
			interchange, it means that the
			command line or the shaft cont-
			rol board of the system is fau-
			1 Ly.
			I AILER LINE INSTRUCTION, THE
		After the system	the serve has an OVC alarm it
		sends a command the	is possible that the mechanical
		serve unit or serve	hrake is not opened or the mec-
		motor does not exe-	hanical jammed
		cute, or because the	21f there is no alarm from the
2	Motor not tu-	system detects that	servo, the system will give an
_	rning	the servo deviation	out-of-tolerance alarm. At this
		value is too large.	time, check whether all wiring
		so wait for this	or connection plugs are normal,
		deviation value to	including the motor power line,
		become smaller.	CN1 plug, A, 1, 2 three-phase
			input lines, CN2 plug and the
			connection between the control

			board and the unit. If all are normal, replace the control bo- ard for inspection. 3 Check whether the main circuit wiring is normal, and whether there are any breaks in the two resistors, diodes and triodes. 4 Check whether the servo motor is normal.
3	Overheat (OH light on)	The thermal protec- tion switch of the servo motor, servo transformer, servo unit and discharge unit is turned off.	1 The servo transformer or dis- charge unit is overheated, or the thermal protection switch of the servo transformer or disch- arge unit is bad. If the trans- former or discharge unit is not connected to the hot line, S1 (OH) should be short-circuited on the printed board. 2 The servo unit is overheated, or the servo unit thermal prot- ection switch is bad. 3 Check whether the overheated connecting wires of the above components are broken.
4	Low voltage (LV lights up)	The servo control board detects that the voltage of the main circuit or co- ntrol circuit is too low, or the detect- ion circuit fault	1 Check that the three-phase 185 V or 200V input voltage is too low. 2 Check whether the circuit br- eaker at the input end of the main circuit is disconnected. If it does not close, there is a short circuit behind. 3 Check whether CN21,2, 3 AC + and-18V are normal (CN2 is not available in S series 2). 4 Check the main circuit trans- istors, diodes, capacitors and so on for abnormalities. 5 The control circuit board is exchanged. If the fault is tra- nsferred with the control board, it is a circuit board fault.

6	High vol- tage rep- ort Police (HV red light on) Abnormal discharge alarm (DC Red light on)	The servo control board detects that the voltage of the main circuit or co- ntrol circuit is too high. In general, the detection circ- uit is faulty. The discharge circ- uit (discharge tra- nsistor, discharge resistor, discharge drive circuit) is abnormal, often ca- used by short circ- uit.	<pre>1 Check that the three-phase 185V or 200 input voltage is normal. 2 Check whether CN21,2, 3 AC + and-18V are normal. (CN2 is not available in S series 2). 3 The control circuit board is exchan- ged. If the fault is transferred with the control board, it is a circuit board fault. 1 Check the main circuit transistor, discharge triode, diode, capacitor and so on for abnormalities. 2 If there is an external discharge resistor, check whether its resistance value is normal. 3 Check whether the servo motor is no- rmal. 4 The control circuit board is exchan- ged. If the fault is transferred with</pre>
			the control board, it is a circuit
7	Not ready Systematic reporting Display server VRDY OFF.	After the system performs a self- check upon startup, if there is no eme- rgency stop or ala- rm, it sends a *MCON signal to all axis servo units. Upon receiving this sig- nal, the servo units activate the main contactor and send back a *DRDY signal. If the system does not receive a VRDY signal within the specified time, it issues this alarm and simultaneously disconnects all axes * MCON signal, the- refore, all of the above channels are fault points.	board fault. 1 Check that all plugs are in good contact, including the connection bet- ween the control board and the main circuit. 2 Check whether the external AC voltage is normal, including: 3 phase 185V input (terminal A, 1, 2), single phase 100V (terminal 3, 4) 3 Check whether the DC voltage on the control board is normal. If there is any abnormality, it is a power board fault. Then check whether the fuse on the board is normal. 4 Carefully observe whether the conta- ctor is energized and then de-energized (if there are multiple contactors in the main circuit, the alarm will be triggered as soon as one fails to engage), or if it does not engage at all. If it engages but then de- energizes, it may indicate poor contact of the contactor. Replace the contact- or. If only one fails to engage, it suggests either a faulty contactor coil or a faulty control board. This can be determined by measuring the resistance of the contactor's coil. 51f all of the above are normal, it is a CN1 instruction line or system axis control board fault.
8	System shows VRDY ON alarm	The system detects the *MCON signal before it is sent *DRDY signal. That	1 Check whether the contact of the main circuit contactor is not in good cont- act, or CN1 wiring is wrong. 2 Check whether the maintenance perso-

		is, the servo unit	
		is ready before the	nnel have sealed the system command
		system, which the	port or there is a problem with the
		system considers to	command port.
		be abnormal.	
9	The system	Because the U and V	1 Whether the motor coil is burnt out,
	has repo-	phase currents of	use an insulation meter to measure the
	rted an	the servo motor are	insulation, it is infinite, if the re-
	OVC alarm	detected by the se-	sistance is very small then the motor
		rvo unit and sent to	is bad.
		the shaft control	2 Whether the motor power line is not
		board of the system	well insulated.
		for processing, th-	3, Whether the transistor module of
		ere is no alarm di-	the main circuit is faulty.
		splay on the servo	4 The drive circuit or detection circ-
		unit, so the main	uit of the control board is faulty.
		inspection is the	5 The servo motor does not match the
		motor and the servo	servo unit, or the motor code is set
		unit.	incorrectly.
			6 The system shaft control board is
			faulty. It can be judged by exchanging
			the shaft passage of the same model,
			that is, the command line and the motor
			power line are exchanged at the same
			time.

2 5 AC C series, $% \left({\left| {{\left| {{{_{\rm{S}}}} \right|}} \right|} \right)$ series SVU, SVUC, servo unit

Order number	Fault phenome- non	Cause	Resol vent
1	High voltage alarm Police (LED display 1)	The control panel detects high vol- tage on the DC side of the main circuit, which may be due to excess- ive input voltage or a fault in the detection circuit.	 Check whether the three-phase AC 200V is too high. Check whether the rectifier bridge is normal. Replace the alarm detection template (inserted into the large board). Send the entire servo unit to FANUC for repair.
2	Low voltage alarm (LED di- splay 2)	At least one of the +5V, +24V, +15 V, -15V on the control panel is low.	1 Check whether the fuse on the control board is burnt out. 3 Use a multimeter to measure whether the voltage is normal. If there is any abnormality, replace the power board (C series) or send the servo unit to FANUC for repair.
3	DC low voltage alarm (display 3)	The DC 300V is too low, which usually occurs at the mo- ment of the servo unit being absor- bed and cannot be detected by a mu- ltimeter.	<pre>1 Check whether the switch in the upper left corner of the servo unit is in the ON position. 2 Check whether the rectifier bridge, transistor module, large capacitor, white detection resi- stor and contactor of the main circuit are normal. 3 Check whether the external di- scharge resistor and its thermal switch are normal. 4 Check whether all connections are loose. 5. Replace the alarm detection template.</pre>
4	Abnormal disc- harge circuit (display 4)	The discharge ci- rcuit (discharge transistor, disc- harge resistor, discharge drive circuit) is abno- rmal, often caused by short circuit.	1 Check the IPM module, discharge transistor, discharge resistor, diode, capacitor and other comp- onents of the main circuit for any abnormalities. 2 If there is an external disch- arge resistor, check whether its resistance value is normal. 3 Check whether the servo motor is normal.
5	Overheating of discharge loop (display 5)	The internal dis- charge resistor, the external dis- charge resistor or the thermal prot- ection switch of the transformer trips	<pre>1 Check whether the thermal pro- tection switch on the internal discharge resistor is disconnec- ted (it is bundled with the dis- charge resistor). 2 Check whether the thermal swi- tch of the external discharge unit is disconnected. 3 Check whether the thermal pro- tection switch of the transformer</pre>

Durani a buali as		is disconnected. 4 If there is no external disch- arge resistor or transformer th- ermal switch, check whether RC-R1 and TH1-TH2 are shorted (they should be).
The circuit is faulty (Show 7)	aking requires the action of a cont- actor, this alarm occurs when the contacts are not good.	tput contactor is usually not together with other contactors). 2 Check that the wiring between the system and the servo unit is correct.

7	Overcurrent (8, 9, B)	Overcurrent on the DC side (axis 8-L, axis 9-M, B-two axes). In general, B rarely occurs because it is very unlikely that both axes will fail at the same time.	1 Check whether the IPM module is burnt out. Most of these alarms are caused by module short circuit. Use the diode file of the multimeter to measure the conduction voltage drop of U, V and W to + and If it is 0 If the module is burnt out, you can first remove the shell, then remove the screw that fixes the module and replace the module. 2 The C series also requires the replacement of the driver board (DRV), and most of them are small board faults. 3 If there is an alarm number when the power is on, the interface bo- ard is exchanged with other units. If the fault transfer occurs, the interface board is bad. 4 : Exchange control boards with other units. If fault transfer oc- curs, replace the control board or send it to FANUC for repair. 5 Remove the motor power line and try again (if it is a gravity shaft, you must first take protec- tive measures on the side of the machine to prevent the shaft from sliding down). If the alarm disap- pears, it may be a fault of the unit and the power line of the unit of the motor is connec- ted to the unit (servo B type connection), it should also be re- placed. If the alarm number remains unchanged, it is a fault outside the unit. Use an insulation meter to check the motor and power line, and use a multimeter to check the feedback line, command line and shaft control board. 7 Check whether the servo parameter setting of the system is wrong.
8	IPM alarm (8., 9., B.)	Note that there is a small dot in the lower right corner of 8 or 9, indica- ting an alarm sent to the servo unit for IPM module (smart module, wh-	unit may have a broken internal fan. Replace the fan, but other models do not have an internal fan. 2 If it keeps appearing, replace the IPM module or small interface board. This fault condition cannot be detected by multimeter.

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		3 If it is related to time, when
		the machine is shut down for a
		period of time and then turned on,
		the alarm disappears, it may be
		that the IPM is too hot. Check
		whether the load is too large.
		4 Replace the command line of the
		unit and the power line of the
		motor with other axes. If the fee-
		dback line of the motor is connec-
		ted to the unit (servo B type
		connection), it should also be re-
		placed. If the alarm number remains
		unchanged, it is a fault outside
		the unit. Use an insulation meter
		to check the motor and power line,
		and use a multimeter to check the
	ich can determine	feedback line, command line and
	whether there is	shaft control board.
	abnormal current).	5 Check whether the ESP wiring is
		wrong. If the alarm disappears af-
		ter unplugging the plug, the wiring
		is incorrect (when the machine tool
		is installed or moved).
		6 When this alarm occurs, none of
		the above methods can detect it,
		and there is no identical axis to
		the unit or shaft (for example, the
		X and Z axes of a lathe are usually
		not the same size), making complete
		interchangeability impossible. When
		interchanging, first disconnect the
		motor power line. If no result is
		obtained, reconnect the power line
		and switch the servo parameters of
		the two axes in the system before
		making a judgment.
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9 The system has experienced an electrical cu- rrent (OVC) alarm	Because the U and V phase currents of the servo motor are detected by the servo unit and sent to the shaft cont- rol board of the system for proces- sing, there is no alarm display on the servo unit, so the motor and servo unit are mainly checked.	<pre>1 Whether the motor coil is burnt out, use an insulation meter to measure the insulation, it should be infinite. 2 Whether the motor power line is not well insulated. 3, Whether the transistor module in the main circuit is faulty. 4 The drive circuit or detection circuit of the control board is faulty. 5 The servo motor does not match the servo unit, or the motor code is set incorrectly. 6 The system shaft control board is</pre>
	unit are mainly checked.	5 The servo motor does not match the servo unit, or the motor code is set incorrectly. 6 The system shaft control board is faulty. It can be judged by excha- nging the shaft passage of the same model, that is, the command line and the motor power line are exch- anged at the same time.

2.6 Communication	series SVM servo unit
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Order number	Fault phenom-	Cause	Resol vent
1	Fan alarm (LED displays 1 ALM)	The fan is overh- eated, or the fan is dirty, or bro- ken.	1 Check whether there is wind in the fan (above the servo unit). If there is no wind or does not turn, remove the fan blade to see if there is more oil pollution. Clean it with gasoline or alcohol before installing it. If it still does not work, replace the fan. 2. Replace the small interface board. 3 Remove the control board and use a multimeter to measure whether there is a broken line from the fan socket to CN1 (connecting the small interface board).
2	DC LINK Low voltage (LED shows 2 ALM)	The servo unit detects that the DC 300V voltage is too low, the rec- tifier voltage or external AC input voltage is too low, or the alarm detection circuit is faulty.	 Measure whether the three- phase AC voltage is normal (beca- use the DC side has an alarm and the MCC has been disconnected, so it can only be measured from the front of the MCC). Measure whether the MCC cont- act is faulty. Check whether the detection re- sistor on the main control board is burnt out. 4 Replace the servo unit.
3	Power unit low voltage (LED displays 5 ALM)	The servo unit detects that the power unit voltage is too low, which is due to the co- ntrol power volt- age being too low or the detection loop fault.	 Measure whether the three- phase AC voltage of the power supply unit is normal (because the DC side has an alarm and the MCC has been disconnected, so it can only be measured from the front of the MCC). Measure whether the MCC cont- act is faulty. Check whether the detection re- sistor on the main control board is burnt out. 4 Replace the power unit or servo unit.

4	Abnormal current al arm (LED Show 8, 9, A, B, C, D, E)	The servo unit det- ects abnormal curr- ent, which may be a short circuit in the main circuit, or an abnormal drive con- trol circuit, or a fault in the detec- tion circuit. 8-L axis, 9-M axis A-N axis, B-LM two axes, C-LN two axes, D-MN two axes, E-LMN three axes.	1 Check whether the IPM module is burnt out. Most of these alarms are caused by short circuit of the module. Use the diode file of the multimeter to measure the conduction voltage drop of the co- rresponding axis U, V, W to + and If it is 0, the module is burnt out. First, remove the shell, then remove the screw that fixes the module, and replace the module. 2 If there is an alarm number when power is on, the interface board is exchanged with other units. If fault transfer occurs, the interface board is bad. 3: Exchange control boards with other units. If fault transfer occurs, repl- ace the control board or send it to FANUC for repair. 4 Remove the motor power line and try again (if it is a gravity shaft, first take protective measures on the side of the machine to prevent the shaft from sliding down). If the alarm disappears, it may be a fault of the motor or power line. 5 Swap the command lines of the unit and the power lines of the motor with those of other axes. If the feedback line of the motor is connected to the unit (servo B type connection), it should also be swapped. If the alarm number remains unchanged, it indicates a fault outside the unit. Use an insu- lator to check the motor and power lines. Use a multimeter to check for any breaks in the feedback line, comm- and line, and axis control board. 6 Check whether the servo parameter setting of the system is wrong. 7 If it is related to time, when the machine is shut down for a period of time and then turned on, the alarm disappears, it may be that the IPM is too hot. Check whether the load is too large. 8 When this alarm occurs, none of the above methods can detect it, and there is no identical axis to this unit or shaft (for example, the X and Z axes of a lathe are not the same size), making complete interchangeability impossible. In this case, first disconnect the motor power line. If there is still no result, reconnect the power line and switch the servo parameters of the two axes in the system before making a
			judgment.

5 IPM (8., A., D.	al arm , 9. , B。 ,C。 , E。 ,)	Note that there is a small point in the lower right corner of 8 or 9, 8-L axis, 9-M axis A-N axis, B-LM two axes, C-LN two axes, D-MN two axes, E-LMN three axes, which is rep- resented as IPM mo- dule (intelligent module, which can determine whether there is abnormal current) and sent to the servo unit for alarm.	1 If it keeps appearing, replace the IPM module or small interface board. This fault condition cannot be detected by multimeter. 2 If it is related to time, when the machine is shut down for a period of time and then turned on, the alarm disappears, it may be that the IPM is too hot. Check whether the load is too large. 3 Swap the command lines of the unit and the power lines of the motor with those of other axes. If the feedback line of the motor is connected to the unit (servo B type connection), it should also be swapped. If the alarm number remains unchanged, it indicates a fault outside the unit. Use an insu- lator to check the motor and power lines. Test the feedback line and com- mand line with a multimeter to ensure they are not broken. Swap the shaft control boards for inspection. 4 When this alarm occurs, none of the above methods can detect it, and there is no identical axis to the unit or shaft (for example, the X and Z axes of a lathe are not the same size), making complete interchangeability impossible. In this case, first disconnect the motor power line. If there is still no result, reconnect the power line and switch the servo parameters of the two axes in the system before making a judgment.
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6 Spatial control of the servo units. The servo units. The servo units activate the main contractor, the gover unit, and single-phase 200V input (terminal R, S, T) of the gover unit, and single-phase 200V input (terminal R, S, T) of the gover unit, and single-phase 200V input (terminal R, S, T) of the gover unit, and single-phase 200V input (terminal R, S, T) of the gover unit, and single-phase 200V input (terminal R, S, T) of the gover unit, and single-phase 200V input (terminal R, S, T) of the gover unit, and single-phase 200V input (terminal R, S, T) of the gover unit, and single-phase 200V input (terminal R, S, T) of the gover unit, and single-phase 200V input (terminal R, S, T) of the gover unit, and single-phase 200V input (terminal R, S, T) of the gover unit, and single-phase 200V input (terminal R, S, T) of the gover unit, and single-phase 200V input (terminal R, S, T) of the gover unit, and single-phase 200V input (terminal R, S, T) of the gover unit to FANUC for repair. S Carefully observe the power unit to the AD power unit to the adisconnects (the gover unit. Carefully check the connections between each unit. Carefully check the connections between each unit. (The gover unit (the main shaft section. If it the gover unit (the never engages, it could be due to wiring issues, such as loose connections between each unit. (The gover unit (the relay which, and at the same time, and at the same time, the "MoNN signal within the specified time, an alarm is triggered, and at the same time, the "MoNN signal within the specified time, an alarm is triggered, and at the same time, the "MoNN signal within the specified time, an alarm is triggered, and at the same time, the "MoNN signal within the specified time, an alarm is triggered, and at the same time, the "MoNN signal within the specified time, an alarm is triggered, and at the same time at sort to the AC power supply.	
als for all axes are disconnected. Ther- efore, all of the aforementioned pat- hways are potential fault points.	
Check and replace the relay of that unit. If replacing the relay does not resolve the issue, then replace the interface board of the servo unit. 8 Check the LED of all servo units for other alarm numbers. If so, eliminate these alarms first	
9 If it is a dual-axis servo unit, check whether the other axis is not connected or poorly contacted or the servo parameters are sealed (0 system is 800#0 16/18/01 is 2000#0)	
10 Check whether the Settings of S1 and S2 are correct. The Settings of S1 and S2 are as follows: S1-TYPEA, S2-TYPEB. 11 If all of the above are normal, it is a CN1 instruction line or system	

Order number	Fault phenomenon	Cause	Find the method
1	Overvoltage alarm (HV-detected by system diagnost- ics)	The servo unit detects that the input voltage is too high.	<pre>1 Check whether the three-phase AC input voltage of 200V is normal. 2 If there is an external disc- harge unit connected, check whether the connection of the unit is correct (DCP, DCN, DCOH). 3 Measure the external discharge resistance with a multimeter to see if it is consistent with the above marked value. If th- ere is a large difference (more than 20%), replace the new di- scharge unit. 4 Replace the servo amplifier.</pre>
2	Volts d.c Underreporting (LVDC)	The servo unit detects low or no voltage on the DC side (three-phase 200V rectified to DC 300V).	1 Whether the circuit breaker on the input side is operated can be measured whether there is voltage at the output end of the circuit breaker. 2 Use a multimeter to measure the input voltage and see if it is really too low. If it is below 170V, check the transfo- rmer or input cable. 3 Check that the external elec- tromagnetic contactor connect- ion is correct. 4 Replace the servo amplifier.
3	Overheating dur- ing discharge (DCOH)	The servo ampli- fier detects that the thermal pro- tection switch of the discharge circuit is off.	1 Check if an external discharge unit is connected. If not, the connector CX11-6 must be shor- ted. 2 If the alarm is not triggered when the machine is turned on, but is triggered after a cert- ain period of processing, and no alarm is triggered after shutting down and waiting for a period of time, check whether there is a mechanical side fa- ult, or frequent acceleration and deceleration, modify the processing program or mechani- cal maintenance. 3 Check the CX11-6 connector with a multimeter to see if there is a short circuit at both ends. If it is open, rep- lace the discharge unit or co- nnection line. 4 The internal overheating det-

2. 7 AC ß Series servo unit (ordinary type)

			ection circuit of the servo amplifier is faulty, and the servo amplifier is replaced.
4	Overheat Warning (OH)	The servo ampli- fier detects ov- erheating of the main circuit.	1 After shutting down for a pe- riod of time, if no alarm is generated when starting up ag- ain, the mechanical load may be too large or the servo motor is faulty. Repair the machine or replace the servo motor. 2 If there is still an alarm, check whether the thermal pro- tection switch on the radiator of the IPM module is disconne- cted and replace it. 3 Replace the servo amplifier.
5	Wind Fan Warning (FAL)	The servo ampli- fier detects an internal cooling fan failure.	1 Check whether the internal fan is not turning. If it is not turning, remove it and check whether it is dirty. Clean it with gasoline or alcohol before reinstalling it. 2 If there is still an alarm after replacing the fan, repl- ace the servo amplifier.

6	Overcurrent alarm (HC)	Abnormal current detected on the side.	is DC	1 Check whether the servo parameter setting is correct. If it suddenly appears during normal processing and no one has touched the param- eter, do not check. 2 Remove the motor power line, and then check the power supply. If there is still an alarm, replace the servo amplifier. If there is no alarm, swap the motor and power line with other axes to determine whether it is a motor fault or
				power line fault. 3 If the same alarm is generated after the motor is replaced, the servo amplifier is replaced. If the fault is transferred with the amplifier, the amplifier is repl- aced. If it is not transferred, it refers to the fault of the command line or the shaft control board.
7	System 401 (or the third and fourth axes of system 403-0) alarms	After the system starts self-test, if there is no emerge- ncy stop and alarm, *MCON is sent to all the servo units of the axis. After receiving the signal, the servo unit turns on the main relay and sends it back *DRDY signal, if the system does not re- ceive the VRDY sig- nal within the spe- cified time, this alarm is issued and the *MCON signal of each axis is disco- nnected. Therefore, all the above chan- nels are fault poi- nts.		1 Check that all plugs are in good contact, including the command and feedback lines. 2 Check whether the LED is displa- yed. If not, the board cannot be powered or the power circuit is bad. Check whether the external 24 V is normal. 3 Check whether the external AC voltage is normal, including: 3 phase 200V input (connector CX11 -1), 24V DC (connector CX11-4). 4 Check whether the DC voltage on the control board is normal. If there is any abnormality, check whether the fuse and power circuit on the board are burned out. If you cannot repair it by yourself, replace the amplifier or send it to FANUC for repair. 5. Carefully observe whether the REAY green light is brightened (engaged) If it fails to engage at all (al- ways not lit), or if it engages but then disconnects, the issue might be with the relay contacts. In such cases, replace the relay. If this occurs in a woodworking machine or a dusty work environm- ent, it is likely that the relay contacts are faulty. If it fails to engage at all, the problem co- uld be with the relay coil. 6 Check whether the ALM of all servo units is lit. If so, exclude this alarm first. 7 Check if the J5X (*ESP) is abno- rmal. Pull out the plug and meas- ure with a multimeter that pin 17 and 20 should be short circuit. If it is open circuit, there is a fault in the energency stop circ- uit. 8 Check that the CX11-6 thermal control circuit is disconnected. It should normally be shorted or shorted. 9 If all of the above are normal, it is a CN1 instruction line or system axis control board fault. 10 Check whether there are other alarms in the system, such as mo- tor feedback alarm. If so, elimi- nate this alarm first.

2.8	Communicati	on ß Seri	es servo	units (1/0 LI	NK type)
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Order number	Fault phenomenon	Cause	Resol vent
1	Serial encoding Equipment comm- unication error alarm (LED dis- play Figure 5, system PMM screen dis- play 300/301/30 2 alarm)	The unit detects a broken motor enco- der or poor commu- nication.	1 Check whether the encoder feedback line of the motor is correctly connected to the am- plifier and whether it is firm. 2 If the feedback line is nor- mal, replace the servo motor (because the encoder of the motor and the motor are integ- rated and cannot be disassemb- led), and if it is a motor, replace the encoder. 3 If it occurs occasionally, it may be caused by interference. Check whether the shielding line of the motor feedback line is intact.
2 3	Coder pulse Report counting error to the police (LED di- splay Figure 6, system PMM screen dis- play 303/304/30 5/308 alarm) Overheating of the serving am- plifier (LED display Figure 3, system The PMM screen shows alarm 306)	The serial encoder of the servo motor loses pulses or does not count du- ring operation. The thermal prote- ction of the servo amplifier is turned off.	<pre>11f the same alarm occurs when the machine is turned off and turned on again, replace the motor (or encoder if it is motor) or feedback cable. 21f the alarm disappears after reboot, you must return to the reference point before running other commands. 31f the system PMM is 308, it may be caused by interference. Turn off and turn on again. 1 After shutting down for a period of time, if no alarm is generated when starting up ag- ain, the mechanical load may be too large or the servo motor is faulty. Repair the machine or replace the servo motor. 21f there is still an alarm, check whether the thermal pro- tection switch on the radiator of the IPM module is disconne- cted. 3Replace the servo amplifier.</pre>
4	The LED display 11 shows that the system PMM display 319 is alarming	When the servo mo- tor is an absolute encoder, the motor does not rotate more than one turn when it is first powered. This usu- ally occurs after replacing the servo amplifier, motor, encoder or moving the feedback line	<pre>11n the case of starting up, try to make the motor rotate</pre>

			ually rotate the knife disc or the shaft to make this motor rotate more than one turn. Turn off the power and then turn it on again; the alarm will disa- ppear. If there is a braking device, first release the bra- king device. If the braking device is not on the motor, you can remove the motor and rein- stall it after the operation.
5	Low voltage al- arm for battery (LED display Examples 1 or 2, System PMM shows 350 or 351 report to the police)	The battery voltage of the absolute encoder is too low and needs to be replaced.	1 Check whether the battery on the servo amplifier is not en- ough voltage, and replace the battery. 2 Perform the return to refer- ence point operation. Refer to the machine tool manufacturer's manual. If there is no manual, follow the following steps: First, eliminate the alarm of 319 (by the above method), so that the machine goes to the position where it should be, set the 7th bit of PMM parame- ter 11 in the system to 1, shut down and then open the system, and this alarm will disappear.

6	The motor is overheated (LED shows 4, system Unified PMM graphics disp- lay 400 alarm)	The thermal protec- tion of the servo amplifier is turned off.	<pre>1 After shutting down for a period of time, if no alarm is generated when starting up again, the mech- anical load may be too large or the servo motor is faulty. Repair the machine or replace the servo motor. 2 If there is still an alarm, check whether the thermal protection switch on the servo motor is dis- connected or the feedback line is broken. 3 Replace the servo amplifier.</pre>
7	Cooling fan Overheating (LED shows sm- all O, System PMM 403 alarm)	The servo amplifier detects that the motor load is too large (hardware de- tection).	1 Check whether the mechanical load of the motor is too high. 2 Check whether the motor is not flexible (there is mechanical fr- iction).
8	Overheating of discharge unit (LED shows J, system shows 404 al arm)	The servo amplifier detects that the thermal protection of the discharge circuit is disconn- ected.	1 Check if an external discharge unit is connected. If not, the connector CX11-6 must be shorted. 2 If the alarm is not triggered when the machine is turned on, but is triggered after a certain per- iod of processing, and no alarm is triggered after shutting down and waiting for a period of time, ch- eck whether there is a mechanical side fault, or frequent accelera- tion and deceleration, modify the processing program or mechanical maintenance. 3 Check the CX11-6 connector with a multimeter to see if there is a short circuit at both ends. If it is open, replace the discharge unit or connection line. 4 The internal overheating detect- ion circuit of the servo amplifier is faulty, and the servo amplifier is replaced.
9	LED display small n (405)	Reference point re- turns an exception alarm.	Perform the reference point return operation again in the correct manner.
10	The LED displ- ays r (PMM di- splay Figure 410,411)	The servo position error value is too large during the stationary or moving process, which exc- eeds the allowable range.	1 Check that the PMM parameters 110 (static error allowance) and 182 (error allowance during movement) are consistent with those at the time of delivery. 2 If there is an alarm when the machine is started, or the motor does not rotate at all, it may be a fault of the servo amplifier or

			motor. Check the insulation of the
			motor or power line, and whether
			the connecting wires are loose.
11	Over current	An abnormal current	1 Check whether the PMM parameter
	alarm (LED di-	is detected in the	setting is correct: 30 (for motor
	splays small c,	main circuit.	code), 70-72,78,79,84-90. If it
	system		suddenly appears during normal
	The unified PMM		processing and no one has moved
	shows alarm		the parameters, do not check.
	412)		2 Remove the motor power line, and
			then check the power supply. If
			there is still an alarm, replace
			the servo amplifier. If there is
			no alarm, use a megohmmeter to
			check the insulation resistance
			between the three-phase or power
			line and the ground line of the
			motor. If the insulation is abno-
			rmal, replace the motor or power
			line.
			3 If the motor insulation and
			three-phase resistance are normal,
			replace the encoder or servo amp-
			lifier.

12	The syst- em's PMM shows a 401 alarm, and the amplifier shows a small 1	After the system starts self-test, if there is no emerge- ncy stop and alarm, *MCON is sent to the servo ampli- fier. After receiv- ing the signal, the servo amplifier tu- rns on the main re- lay and sends it back *DRDY signal, if the system does not re- ceive the VRDY sig- nal within the spe- cified time, this alarm is issued. Therefore, all the above channels are fault points.	1 Check that all plugs are in good contact, including the command and fe- edback lines. 2 Check whether the LED is displayed. If not, the board is not powered or the power circuit is bad. Check whether the external 24V is normal. 3 Check whether the external AC voltage is normal, including: 3 phase 200V input (connector CX11-1),24V DC (conn- ector CX11-4). 4 Check whether the DC voltage on the control board is normal. If there is any abnormality, check whether the fuse on the board and the power circuit on the board are burned out. If you cannot repair it by yourself, replace the am- plifier or send it to FANUC for repair. 5 Carefully observe whether the REAY green light turns on (engages) and then off, or if it never engages (never lights up). If it engages and then disconnects, it may indicate poor con- tact in the relay. Replace the relay if necessary. In environments with woodw- orking machinery or high dust levels, poor contact in the relay is likely. If it never engages at all, the issue could be with the relay coil, control board, or a broken wire. This can be determined by measuring the resistance of the relay coil. 6 Check whether there are other alarms on the servo unit. If so, eliminate this alarm first. 7 Check if the J5X (*ESP) is abnormal. Pull out the plug and measure with a multimeter that pin 17 and 20 should be short circuit. If it is open circuit, there is a fault in the emergency stop circuit. 8 Check whether there are other alarms in the system, such as motor feedback alarm. If so, eliminate this alarm fi-
13	High vol-	The servo unit det-	1 Check whether the three-phase AC in-
	tage on	ects that the input	put voltage of 200V is normal.
	the DC	voltage is too high.	21f an external discharge unit is

	side (LED display Y, PMM 413 alarm)		<pre>connected, check that the unit connec- tion is correct (DCP, DCN, DCOH). 3 Use a multimeter to measure whether the resistance value of the external discharge resistor is consistent with the above marked. If there is a large difference (more than 20%), replace the new discharge unit. 4 Replace the servo amplifier.</pre>
14	Low volt- age on the DC side (LED dis- play P, PMM 414 alarm)	The servo unit det- ects that the DC side voltage is too low or no voltage.	1 Whether the circuit breaker on the input side is active can be measured by measuring whether there is voltage at the output end of the circuit breaker. 2 Use a multimeter to measure the input voltage and see if it is really too low. If it is below 170V, check the transformer or input cable. 3 Check that the external electromagn- etic contactor connection is correct. 4 Replace the servo amplifier.

15	Parameter setting error (LED shows A, PMM shows 417 alarm)	PMM parameter sett- ing error. It usua- Ily occurs after replacing the servo amplifier or batte- ry, and the parame- ters are not set correctly when res- etting them.	Check whether the following parameters are set correctly: 30 (motor code), 31 (motor positive direction), 106 (motor pulse per revolution), 180 (reference counter capacity). Set according to the original parameter table, or contact the machine tool manufacturer.
16	LED show Three (three) bars, PMM shows 418	The system and servo amplifier detect an output point (DO) fault.	Replace the servo amplifier.
17	Wind fan alarm (LED display), PMM Display 425 alarm)	The servo amplifier detects an internal cooling fan failure.	1 Check whether the internal fan is not turning. If it is not turning, remove it and check whether it is dirty. Clean it with gasoline or alcohol before re- installing it. 2 Check that the fan power cable is correctly connected. 3 Replace the fan, if there is still an alarm after replacing the fan, replace the servo amplifier.

 Connect to the i/βi series servo unit Refer to the corresponding instructions for or β servo amplifiers.

Section 4 General fault analysis of the FANUC spindle drive system

Order number	Name	Features and characteristics	Ine model of the system to be equipped
1	DC controllable silicon spindle servo unit	The model features A06B-6041-HXXX, with the main circuit consisting of 12 thyristors forming two reversi- ble rectifier circuits for forward and reverse operation. It accepts a 200V three-phase AC input, with six thyristors providing full-wave re- ctification, along with a contactor and three fuses. The current dete- ctor and control circuit board (board numbers: A20B-0008-0371~ 0377) receive speed commands (0-10V analog voltage) and forward/reverse commands from the system, as well as speed feedback signals from the motor, to provide 12 trigger pulses to the main circuit. The alarm indicators consist of four red LE- Ds, each displaying different mea- nings	Compatible with early systems such as 3, 6, 5, 7, 330C,200C, 2000C, etc.
2	Connect the analog spindle servo unit	The model is characterized as A06B- 6044-HXXX. The main circuit featu- res a rectifier bridge that conve- rts three-phase 185V AC to 300V DC. The output voltage to the AC spin- dle motor is adjusted by the cond- uction and cutoff widths of six high-power transistors, aiming to regulate the motor speed. Additio- nally, there are two switch trans- istors and three thyristors forming a feedback braking circuit, along with three fuses, contactors, dis- charge diodes, and discharge resi- stors. The control circuit board works in the same way as the above (the plate number is: A20B-0009-0531- 0535 or A20B-1000-0070 ~ 0071). There are four red diodes for alarm indication, which represent 8, 4, 2 and 1 codes respectively, and a total of 15 alarm numbers are for- med.	Earlier systems, such as: 3, 6, 7, OA, etc.
3	communicate with digital spindle servo	6055-HXXX. The main circuit is the same as that of the AC analog	such as: 3, 6, 0A, 10/11/

spindle servo unit, with other st- 12,15E,15A,0E,0

uni t

1. FANUC Simple classification of spindle drive systems

	ructures being similar. The funct- ion principle of the control board is basically the same as mentioned above (part number A20B-1001-0120), but all signals are converted to digital processing. A five-digit display shows the motor speed, al- arm number, and allows for parame- ter display and setting.
4 Exchange S series di tal spindle servo Unit	The model characteristics are A06B- 0 Series 16/18A, 6059-HXXX. The main circuit is a printed circuit board structure, with other components fixed to the board with screws, making mainten- ance easier and disassembly more convenient, thus preventing wiring errors. Subsequent spindle servo units will all adopt this structu- re. The principle is similar to that of AC analog spindle servo units, featuring one drive module and one discharge module (H001-003 does not have a discharge module, only a discharge resistor). The control board is basically similar to an AC digital unit (board numb- ers are A20B-1003-0010 or 120B-1003 -0100). The digital tube displays motor speed and alarm codes, allo- wing parameter settings and setting of detection waveform methods (de- tailed later).
5 Exchange S Series Ser spindle serv Unit	The model characteristics are A06B- 6059-HXXX, and the principle is the same as the S series digital spin- dle servo unit. The main circuit is the same as the S series digital spindle servo unit. The interface of the control board is optical ocable serial interface (board num- ber A20B-1100-XXXX). The digital tube displays the motor speed and alarm number, and can set paramet- ers, as well as set the detection waveform mode and separate operat- ion mode.
6 Transmit so ally	eri - Ine model is characterized by AU6B- 6064-HXXX and is connected to the AC S series

		The main enindle converse in the he	
	Spindle servo unit	sically the same. The volume is reduced.	The market is not common.
7	Communication series spindle servo unit	reduced. The servo system is divided into three modules: PSM (power module), SPM (spindle module) and SVM (servo module). It must be used with PSM. The model characteristics are as follows: The series is A06B- 6078-HXXX, A06B-6088-HXXX, or A06B- 6102-HXXX, while the C series is A06B-6082-HXXX. The main circuit volume has been significantly red- uced, changing from a metal frame to a sealed yellow plastic enclos- ure, making the circuit board inv- isible from the outside. During maintenance, the enclosure must be	Common. OC, OD, 16/18C, 15B, I series.
		opened. The main circuit does not have a rectifier bridge but featu- res one IPM or three transistor modules, a main control board, and an interface board, or a drive bo- ard that plugs into the main cont- rol board. The power module struc- ture is basically the same as the spindle module. The C series sp- indle unit lacks motor speed feed- back signals. The power module co- nverts 200V AC to 300V DC, which is then used for the subsequent SPM and SVM, as well as for feedback braking tasks.	
8	Exchange i series Main axis ampl- ifier	The servo system is divided into three modules: PSMi (power module), SPMi (spindle module) and SVMi (servo module). It must be used with PSM. The model characteristics are as follows: The i series is A06B- 6111-HXXX PSMI, and the A06B-6111- HXXX. It features one IPM or three transistor modules, a main control board, and an interface board, or a drive board that plugs into the main control board. The power mod- ule has a similar structure to the spindle module. The power module rectifies 200V AC to 300V DC and provides 24V DC to the subsequent SPMi and SVMi.	There are occasi- onally I-B/C in the I-B, I-C ser- ies O.
9	Exchange i series Main axis ampl- ifier	SVPM : A06B-6134-HXXX Power supply, servo amplifier and spindle amplifier are integrated into one module to reduce volume and wiring. The interface board for	O I MATE-B/C seri- es.

the three parts is one, the control	
board is also one, and the power	
module for the main circuit is five	
(three servo shafts) or four (two	
servo shafts).	

2 FANUC Analysis of common faults in spindle drive system:

2. 1. DC thyristor spindle servo unit

Order number	Fault phenom- enon	Cause	Resol vent
1	Over speed or overspeed al- arm (LED1 red light on).	The speed of the DC spindle motor is detected to be too high or the motor speed cannot be detected.	<pre>1 Check carefully whether the sp- eed measuring generator of the DC spindle motor has voltage output. 2Check whether the excitation voltage of the motor is normal and stop 13.8V, the current is 2.8A, the voltage is 32V when starting, and the current is 6.8A. 3 Check whether the +15V on the control board is normal. 4 Check for errors in the wiring, including power lines A and H, excitation lines J and K. 5 The control panel is set incor- rectly. Check whether the mainte- nance personnel have changed the setting of the short circuit bar or potentiometer. 6 If the control board is faulty, replace the control board or send it to FANUC for repair.</pre>

2	Over cur-	The current detector	1 Check if the machine is stuck Turn
2	rent or	detects that the	the spindle by hand and it should be
		motor is too high or	vory floviblo
	magnotic	the control heard	Very Hexivie.
		detecto that the	2 check whether the corr resistance of
			the DC spindle motor is normal and
	2 lights)	motor has no excit-	whether the commutator is too dirty. If
		ation current.	it is too dirty, blow it clean with dry
			compressed air.
			3 Check whether the power lines A and H
			are firmly connected.
			4 Check whether the excitation wires J
			and K are firmly connected.
			5 Check whether there is a short circ-
			uit in the 12 thyristors on the main
			circuit. If there is, replace them
			(note that generally more than one is
			bad, and the resistance between posit-
			ive and negative is normally infinite).
			6 Check if there is voltage on the
			control board CH21 (excitation voltage
			command) (2.8V when stopped, voltage
			when started
			6.8V) If not, replace component IC16.
			7 Check for a waveform on the control
			board CH22 (synchronous pulse). If not
			replace component HY21 A-0S02/4
			8 Replace the components on the control
			board $HY7 = 8 = 9 = A - 0.504$ (nin 11 is
			faulty if there is no nulse)
			0 Check whether the $\pm 15V$ on the control
			board is normal
			10 Check whather the nine 12 13 14 and
			15 of components $HV10$ 11 12 on the co
			ntrol board bave pulses of not repl
			aco component A OSO2
			ace component A-0303.
			The check whether there is a purse bet-
			ween prins 9, 10, 12, 13, 15 and 10 or the
			components mild, 10, 17 and 10 on the
			the pulse emplitude is incufficient
			the purse dilipitude is insufficient,
			TCO2 and UV12 14 with A DV05
			Touch the ourfees of the DC or to U.
			niouch the surface of the DC spindle
			hot otop the meshine and turns on the
			not, stop the machine and turn on the
		1 The all south 1	machine after cooling to see if there
		i ine thermal relay	is an alarm.
	Overheat	or the DC spindle	2 The Toad is too Targe. Check whether
3	or overl-	motor operates.	the mechanical load or cutting amount
	oad alarm	2 The internal ther-	is too large.
	(LED4 on)	mal relay of the	3 Check whether there is an alarm when
		servo unit operates.	the machine is turned on. If so, check
			whether CN2 of the control board is not
			inserted properly, and check whether
			the thermal protection switch of the
			motor is disconnected, and whether the

			thermal protection switch TH of the
			unit is disconnected.
4	The motor	1160 is the speed	1 Check whether the motor excitation
	speed sh-	conversion point of	voltage is normal (according to the
	ould not	the motor. When the	above method).
	reach ab-	speed is between O	2 Basically, the excitation circuit of
	ove 1160	and 1160, the exci-	the control board is faulty. Try repl-
	It can go	tation current is	acing IC15, IC16 and IC17.
	up again	constant at 6.8A,	3Replace the control panel.
	Finish	and the main coil	
		voltage of the motor	
		changes from OV to	
		220V. When the speed	
		of the motor is gr-	
		eater than 1160, the	
		main coil voltage of	
		the motor is const-	
		ant at 220V, and the	
		excitation current	
		decreases from 6.8A.	

5	Blown fuse	The main circuit is caused by short ci- rcuit or poor insu- lation, or the main circuit current is too large due to the fault of the control board. During dece- leration, the phase- to-phase short cir- cuit is caused by the fault of the thick film circuit on the board.	1 Check the insulation of the DC servo motor or the main circuit. If the ins- ulation resistance is less than 1M or less, replace the corresponding parts. 2 Check all 12 thyristors in the main circuit with a multimeter to see if there is a short circuit, and replace the corresponding faulty thyristor. 3 If there is an overcurrent alarm at the same time as the insurance burning, check according to the above steps 8, 9, 10, 11. 4 Check the input voltage with a mult- imeter to see if it is too high, not exceeding 250V. 5 Replace the main control board.
6	Motor not turni ng	After the system sends a command, the spindle servo unit or DC spindle motor does not execute, or because the control board detects that the current deviat- ion value is too large, so wait for this deviation value to become smaller.	1 Observe what alarm occurs in the servo unit after the instruction is given. If there is OVC in the servo, it may be mechanically stuck. 1 If there is no alarm from the servo, check whether all wiring or connection plugs are normal, including motor power line, motor excitation line, CN1 plug, R, S, T three-phase input line, CN2 plug and the connection between the control board and the unit. If all are normal, replace the control board for inspection. 5 Check whether the carbon brush of the DC spindle motor is normal and whether it is not in good contact. If it is not good or worn seriously, replace the carbon brush. 6 Check whether there is resistance in the motor excitation circuit or main circuit. If there is no resistance or the resistance is very large, replace the motor. 7 Check whether there is voltage on the CH6 on the control board. Normally, there is no voltage when the machine is prohibited. If there is a voltage close to 15V, the current feedback loop is faulty. Replace the current detector in the main circuit and IC12 on the control board.
7	The main shaft is not stop- ped in the direction	The spindle unit does not receive the encoder signal or magnetic sensor si- gnal, or the system	1 If the encoder is used for orientat- ion, check the encoder signal (there are PA, *PA, PB, *PB, SC, *SC on the orientation board). If it is normal, it is a square wave. If it is abnormal,
	of movem- ent, and an alarm is raised when the time limit is excee- ded (the alarm is set by the machine tool fac- tory).	does not receive the directional comple- tion signal.	check whether the feedback line or encoder is damaged. If so, replace it. 2 If the signal is unchanged but the high and low potentials are normal (if PA is high, *PA is low), check whether the belt connected to the spindle enc- oder is loose or broken. 3 If the magnetic encoder is used for orientation, whether the green indica- tor on the orientation plate alternates when the spindle rotates. If there is no change, replace the magnetic sensor. 4 If the spindle has stopped in the quasi-stop position, but there is still an alarm, the directional plate has not sent a signal of completion of direct- ion, which may be that the relay on the directional plate is broken. Replace it.
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Order	Fault phenom-	Cause	Resol vent
	enon	The everbeeting	1 Chook whather the CN1 plug is
1		The overneating	T Check whether the CNT prug TS
	(LED1 on)	switch of the main	not firmly connected.
		shaft motor is tu-	2 Whether the spindle motor load
		rned off.	is too large, the motor is too
			hot, etc., turn on the machine
			after the temperature drops to
			see if there is still an alarm.
			3. Pull out the control board CN2
			plug, and measure the resistance
			between pin 2 and pin 3 with a
			multimeter. The normal value sh-
			ould be short circuit. If it is
			open circuit, the motor or feed-
			back line is broken. Check the
			thermal protection switch of the
			motor or the feedback line.
			4 If CN12 and 3 are normal, repl-
			ace the thick film circuit (FANUC
			is available) on the control bo-
			ard HV2 and RV05

2. 2 Communication and analog spindle drive unit

			1Do not start the main shaft; instead,
			manually rotate it to get the main
			shaft motor running guickly. Estimate
			the actual speed of the motor and have
			another person use an oscilloscope to
			check the TSA waveform on the main
			shaft control board to see if it matc-
			hes the actual changes. Generally, this
			ranges from 100-300mV If it remains
			largely unchanged, there is likely a
			fault with the motor speed sensor or
			the speed feedback loop. Use the osci-
			lloscope to measure the waveforms at
			terminals PA and PB on the control
			board. Normally, they should show a DC
			2.5V with a 0.5V sinusoidal fluctuati-
			on. If not, remove the speed sensor
			from the main shaft motor (located at
			the back of the motor: remove the fan
			and the cover below the fan to see a
			small printed circuit board with a
			white circular sensor head). If there
			is wear on the sensor head, it is
			faulty and needs replacement (FANUC is
			available for purchase: you can find
			the sensor model based on the motor
			model such as if the last four digits
			of the motor model are B100, then the
			sensor model is A860-0854-V320) Pav
			attention to adjusting the gap between
			the sensor and the speed measurement
			dear which should be between 0.1-0.15
			A 10-yuan coin can be placed in this
			ran to make it very flexible: fold it
			in half and place it there to make it
			vorv tight
		The error value be-	2 If PA and PB waveforms are normal
		tween the actual	but the LED display speed is apportal
		speed of the spindle	then measure DSA and DSP again It
	Vel oci ty	motor and the comm_	cheuld be a square wave. If not adjust
	error	and speed exceeds	notentiometer PV18 or PV10 until PSA
2	Over the	the allowable value	and PAB become square wave
2	large al-	which is generally	all the sneed display is normal check
	arm (LED2	the motor does not	whether the motor or nower line is
	lights up)	rotate or the speed	normal. The nower line can be measured
		cannot do un when	by a multimeter or megohymmeter If th
		starting	are is a problem with the motor it
		Star tring.	will usually give an overcurrent alarm
			instead of this alarm
			AWhether the phase sequence of the
			motor nower line is wrong If not the
			alarm will be raised after the spindle
			rotates back and forth during startup
			5 Check if the main circuit contactor
			is energized. If not measure whether
			there is 200V AC voltage on the conta-
			ctor coil. If there is no voltage, the
			control board is faulty. If there is
			voltage, replace the contactor. If it
			energizes normally, measure whether
			there is 300V DC between the + and -
			terminals of the transistor. If there
			is no voltage, it may be a fault in the
			contactor or rectifier bridge.
			6 Check whether the setting on the
			board is correct, S1 (general short
			circuit), S2 (general short circuit).
			and S4 (if open circuit, at least one
			of ME3 or ME5 has a DA converter. trv
			to replace it, if not, S4 is short
			circuit).
			7 Check whether the-15V on the control
			board is normal. If abnormal, check the
			power circuit on the board.
			8 Measure the values of LR_LS and LW
			on the control board with an oscillos-
			cope or multimeter. They should be 0 in
			static mode. If there is a value or
			waveform, replace the isolation ampli-
			fier ISA1, ISA2 (A76L-0300-0035/T) or
			MH21A, MH21B (1458 opamp) on the board
			9 If conditions exist (i.e., there is
	1		

			10 The spindle unit, interchangeable control board or whole unit, but the contactor coil and transistor module must be measured to avoid short circu- it, otherwise the other control board will be burned out. This will quickly determine whether it is a unit or con- trol board or motor fault.
3	Direct current side pro- tection Fire break alarm (LED 2, LED1 lit)	The three-phase 200V AC is rectified to DC 300V by the rec- tifier bridge, and then it is given to the transistor mod- ule after passing through a fuse. The control board dete- cts the voltage at both ends of the fuse. If it is too large, this alarm will be generated.	<pre>1 Check whether the DC fuse of the spindle servo unit is disconnected with a multimeter. If it is open circuit, replace it and check the large capaci- tor and transistor module behind it. If there is a short circuit, it must be solved before power is on. 2 Check whether the connection socket between the main control board and the unit is tight. 3 Check the D50, R214 on the control board and replace the photocouple PJ14 on the main control board.</pre>
4	Deficiency (LED 4 lit)	If one of the three AC 200V main shafts is missing, the co- ntrol board can de- tect it and issue alarm No.04.	1 Check whether the three-phase AC 200V is normal with a multimeter. 2 Use a multimeter to check if the three input fuses have blown. If they have, replace them, but be sure to check for any other short circuits in the main circuit. It is usually the transistor module at the back that causes a short circuit and blows the fuse. Also, check the drive circuit waveform on the control board (descri- bed in the overcurrent alarm section). 3 If the three-phase insurance and vo- ltage are normal, check whether the connection socket between the control board and the unit is in good contact. 4 Measure the double diodes DB1-DB6 on the control board. If there is a short circuit or open circuit, replace them. If they are all normal, replace the photodiodes PH8-PC14. 5 Replace the main control board or send it for repair.
5	Control source Insurance burnout (LED4, LED 1 lit)	The control panel detects an abnorma- lity in the DC power supply, including +24V, +5V, +15V, -15 V.	1 Check whether AF1, AF2 and AF3 on the control board are burnt out and replace them. If they are still burnt out, check whether there is a short circuit in the diode, transistor, capacitor, T1 and T2 of the power circuit, and repl- ace them if there is. 2 If not, send the control board for repair.

6	Speed al- arm (LED4, 2 lights, or LED1-4 lights)	The control panel detects overspeed from an analog qua- ntity or overspeed from a digital qua- ntity.	1 The alarm is detected by the control board. If this alarm occurs immediately after power on, replace the main cont- rol board or send it for repair. 2 If the alarm occurs after the speed command is given and the flywheel phe- nomenon occurs, solve the flywheel fa- ult first (more on this later).
7	+24V high voltage Press (LED 8 lights up)	The control board detects that the DC power supply +24V voltage is too high, which is generally a fault of the control board.	Replacement of the control board or sending the control board for repair is not common, but it must be a problem with the control board.

8	Unit ove- rload (LED8, 1 on)	The control panel detects that the transistor heat sink is too hot, or that the detection circ- uit is faulty.	1 Observe whether it is related to ti- me. If it occurs after a long time of operation and no alarm occurs after stopping for a period of time, it is because the motor load is too large. Check the mechanical load or motor and observe whether the cutting amount is too large. 2 Use a multimeter to measure the 6 and 7 pins of socket CN5 on the control board. If it is open, check whether the thermal control switch on the unit is broken. If it is short circuit, replace HY3 (RV05) on the control board. 3 There may be a broken wire on the control panel. Check with CN5 6, Connect the 7 feet to the 14 feet of HY3.
9	+15V low voltage alarm (LED 8, 2 lig- hts)	The control board detects that the DC power supply +15V voltage is too low or no voltage, which is generally a fault of the control boa- rd.	<pre>1 Control board failure, use a multim- eter to check the power circuit Q21: (7815) whether abnormal, if so, repla- ce. 2 Check whether there is a short circ- uit in capacitor C45, and replace it if so. 3 Check the control board for circuit faults and replace the control board or send it to repair.</pre>
10	High on the DC side Voltage alarm (LED 8, 2, 1 on)	The control board detects that the DC power supply +300V voltage is too high or the detection circuit is faulty, which is usually a fault of the control board.	1 Check whether the DC voltage of the main circuit is normal at 300V with a multimeter. 2 Replace the control panel or send it for repair.
11	Abnormal current on the DC side (LED 8, 4 lig- hts up)	This fault occurs most often, usually due to the main ci- rcuit transistor burnout	1 Use a multimeter to check the condu- ction voltage drop of each transistor (CE, BE, BC between each other, should be consistent), if there is any abnor- mality (such as short circuit), replace it. 2 After replacing the transistor, mea- sure the output waveform as follows: Remove pin 5 of CN5, power on normally, and send command MO3 to the system. Adjust S5 (reduce the value of S if the spindle unit LED2 lights up). Use an oscilloscope to check the waveforms of CN7 at 2-3, 5-6, 8-9, 11-12, and CN6 at 3-4, 6-7, 9-10, 12-13. Normally, the first six channels should oscillate up and down, and the last two channels should show negative pulses with an

			channel is abnormal, check the diodes, transistors, optocouplers, fuses, etc., in the corresponding drive circuit, and replace them before re-measuring the waveform. Only after everything is no- rmal can you reconnect pin 5 of CN5. 3 Note that the above situation should not be exchanged with other units to avoid cross faults, because if the tr- ansistors are burned out, they will affect each other, and the bad board burns out the unit, and the bad unit burns out the board. 4 If all the transistors are good, the waveform should be measured first. If the waveform is normal, check whether the alarm is triggered when an instru- ction is given. If so, replace the isolation amplifier ISA1, ISA2, A76L- 0300-0035/T. 5 Check whether there is a problem with the spindle motor or power line, incl- uding the speed feedback sensor (the same method as LED2 lights up). Remove the motor power line. If there is still the same alarm, it is a unit fault; if the alarm disappears, it may be a problem with the motor or power line.
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12	CPU alarm (LED8, 4, 1 lit)	The control panel detects a CPU fail- ure.	1 Check whether each component on the control board is properly inserted. You can reinsert it and check again. 2 Replace the control panel or send it for repair.
13	ROM alarm (LED8, 4, 2 lit)	The control panel detects a problem with the ROM insta- llation.	<pre>1Check whether the ROM (MD25,2732) on the control board is installed or not properly inserted. Unplug and reinsert it. 2 Replace the ROM (or swap it with another board first). 3 Replace the control panel or send it for repair.</pre>
14	The cont- rol panel is not displayed	The control panel has no working vol- tage or is not wor- king.	1 Use a multimeter to measure the AC voltage of terminal 19A-CT and 19B-CT on the control board. It should be about 19V normally. If not, check the small transformer or F4 fuse of the unit. If there is a bad one, replace it. 2 If the voltage is correct, measure the +5V on the board again. If there is no voltage, check AF1, AF2, AF3, and replace if burned out.
15	The spin- dle does not rotate and no al arm is di spl ayed	The spindle unit is not engaged, or the system instruction (*ESP, MRDY, forwa- rd/reverse) signal is abnormal.	1 Check whether the main contactor of the spindle unit is engaged. If not, check the emergency stop input, or MRDY (mechanical ready signal) or short ci- rcuit bar S1 setting error. 2 If the suction is on, check whether the forward and reverse signals are issued after the system gives instruc- tions. (There should be a OV between CN 1's 45 or 46 and 14. If both are 24V or OV, there is a problem with the exter- nal circuit. If it is normal, replace HY1 (RV05) on the control board. 3 Use a multimeter to measure the ter- minal DA2 on the board. If there is no voltage, there is an external problem. Check the system to CN1, socket 31 foot. 4 If the ME3 or ME5 on the control board has a DA converter chip and there is no voltage on the DA1 terminal, replace the DA converter. If DA1 has voltage but DA2 has no voltage, the S4 setting is wrong and modify the S2 setting. 5 Measure the 7 feet of the operational amplifier ME8A. If there is no voltage on the 1 foot of the operational ampl- ifier ME8A and there is a voltage on the 1 foot of the operational amplifier ME8B, the external multiplier potenti-

ometer is bad or the shorting bar S2 is
set incorrectly. Modify or replace it.

2. 3 Communication digital spindle drive unit

Order number	Fault phenom-	Cause	Resol vent
1	Overheat al arm (LED di spl ays AL-01)	The overheating switch of the main shaft motor is di- sconnected.	1 Check whether the CN1 plug is not firmly connected. 2 Whether the spindle motor load is too large, the motor is too hot, etc., turn on the machine after the temperature drops to see if there is still an alarm. 3. Pull out the control board CN 2 plug, and measure the resista- nce between pin 2 and pin 3 with a multimeter. The normal resist- ance should be short circuit. If it is open circuit, the motor or feedback line is broken. Check the thermal protection switch of the motor or feedback line. 4 If CN12 and 3 are normal, rep- lace the thick film circuit (FA- NUC is available) on the control board HY4 and RV05.
2	Velocity error Over the new- spaper (LED display	The error value between the actual speed of the spin- dle motor and the command speed exc- eeds the allowable value, usually at startup	1 Do not start the spindle. Turn the spindle by hand to make the spindle motor rotate quickly, estimate the actual speed of the motor, and let another person observe the LED display on the spindle control board

		Check if the values are basically
		consistent, generally ranging from
		100 to 200 revolutions per minute.
		If it is only 1-2 or less than 10
		revolutions, it indicates a fault
		in the motor speed sensor or the
		speed feedback loop. Use an oscil-
		loscope to measure the waveform on
		the PA and PB terminals of the
		control board; normally, it should
		be 2.5V DC with a 0.5V sinusoidal
		riuctuation. If not, remove the
		speed sensor from the main shall
		motor remove the fan and the cover
		helow the fan to see a small prin-
		ted board with a white circular
		sensor head). If there is wear on
		the sensor head, it is faulty and
		needs replacement (FANUC is avail-
		able; you can find the sensor model
		based on the motor model, for exa-
		mple: if the last four digits of
		the motor model are B100, then the
		sensor model is A860-0854-V320).
		Pay attention to adjusting the gap
		between the sensor and the speed
		measurement gear, which should be
		nlaced between them to ensure they
		fit Loosely and then folded in
		half to fit tightly.
		2 If the PA and PB waveforms are
		normal, but the LED display speed
		is abnormal, then measure PAP and
		PBP again, it should be a square
		wave, if not, replace the control
		board or repair.
		3 If the speed display is normal,
		check whether the motor or power
		line is normal. The power line can
		be measured by a multimeter or me-
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3	side protection Fire break alarm (LED displays AL -03)	The three-phase 200V AC is recti- fied to DC 300V by the rectifier br- idge, and then it is given to the transistor module after passing th- rough an insuran- ce. The control board detects the voltage at both ends of the insu- rance, and if it is too large, this alarm is generat- ed.	<pre>1 Check whether the DC fuse of the spindle servo unit is disconnected with a multimeter. If it is open circuit, replace it and check the large capacitor and transistor mo- dule behind it. If there is short circuit, it must be solved before power can be turned on. 2 Check whether the connection so- cket between the main control board and the unit is tight. 3 Replace the optical pair PH14 on the main control board.</pre>
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4	Deficiency (LED dis- play AL -04)	If one of the three AC 200V main shafts is missing, the co- ntrol board can de- tect it and issue alarm No.04.	1 Check whether the three-phase AC 200V is normal with a multimeter. 2 Use a multimeter to check if the three input fuses have blown. If they are open, replace them. However, it is essential to check for any other short circuits in the main circuit, as it is usually the transistor module at the back that causes the fuse to blow due to a short circuit. Also, check the drive circuit waveform on the control board (as described in the AL-12 alarm). 3 If the three-phase insurance and vo- ltage are normal, check whether the connection socket between the control board and the unit is in good contact. 4 Measure the double bipolar tubes DBG 1-DBG6 on the control board. If there is a short circuit or open circuit, replace them. If they are all normal, replace the main control board or send it for repair.
5	Speed al- arm (AL-06 Or AL-07)	The control unit detects that the speed is too high. It is usually a fa- ult of the control board.	Replacing the control board or sending the control board for repair is not common, and it is difficult to find the exact fault point by yourself, but it is definitely the problem of the cont- rol board.
6	+ 24V high voltage (AL-08)	The control board detects that the DC power supply +24V voltage is too high), which is ge- nerally a fault of the control board.	Replacement of the control board or sending the control board for repair is not common, but it must be a problem with the control board.
7	Call the police (AL-09)	The control panel detects that the transistor heat sink is too hot, or that the detection circ- uit is faulty.	<pre>1 Observe whether it is related to ti- me. If it occurs after a long time of operation and no alarm is raised after stopping for a period of time, the motor load is too large. The mechanical load or motor should be checked or the cutting amount is too large. 2 The 6 and 7 pins of socket CN5 on the control board should be short circuit when measured with a multimeter. If it is open circuit, check whether the thermal control switch on the unit is broken. If it is short circuit, replace HY4 (RV05) on the control board. 3 There may be a broken wire on the control panel. Check with CN5 6 7 foot wiring.</pre>

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8	+15V low voltage alarm (AL -10)	The control board detects that the DC power supply +15V voltage is too low or no voltage), wh- ich is generally a fault of the control board.	1 Fault of the control board: check whether Q7:(7815) of the power circuit is abnormal with a multimeter. If yes, replace it. If +15V-OV resistance is zero, replace capacitor CP31-37,45. 2 Check the control board for circuit faults and replace the control board or send it to repair.
9	High on the DC side Voltage warning (AL-11)	The control board detects that the DC power supply +300V voltage is too high or the pressure or the detection circ- uit is faulty, which is generally a fault of the control boa- rd.	1 Check the main circuit DC voltage of 300V with a multimeter to see if it is normal. 2 Check the VDC on the control board with a multimeter. The normal value is 3V DC. If it is too high, replace IS1 (Isolation amplifier A76L-0300-0035/T) or MG16 (1458) If the VDC is normal, replace MG17.

10	Direct current	This fault occurs	3 Check the conduction voltage drop
	side over	most often, usually	(CE, BE, BC between each other,
	Electricity	the main circuit	each should be consistent) of each
	warning	transistor is burned	transistor with a multimeter. If
	(AL-12)	out	there is any abnormality (such as
	(112.12)		short circuit) replace it
			After replacing the transistor
			A AI LEI TEPTACING LIE LIAISISLUI,
			field sure the output waveform as
			TOILOWS: REMOVE PIN 5 OF UN5, PO-
			wer on normally, and send command
			MO3 to the system. Set S5 (reduce
			the value of S if the spindle unit
			has AL-02). Use an oscilloscope to
			check the waveforms of CN7 at 2-3,
			5-6, 8-9, 11-12, and CN6 at 3-4, 6
			-7, 9-10,12-13. Normally, the fi-
			rst six channels should oscillate
			up and down, and the last two
			channels should show negative pu-
			lses with an amplitude of around
			+1.3v -2.0v If any channel is
			abnormal check the diodes tran-
			sistors optocouplers fuses
			etc in the corresponding drive
			circuit and replace them before
			re-measuring the waveform Only
			after everything is normal can you
			reconnect nin 5 of CN5
			E Note that the above situation
			should not be exchanged with other
			units to avoid cross faults be
			units to avoid closs faults, bec-
			ause II the transistors are purned
			out, they will affect each other,
			and the bad board burns out the
			unit, and the bad unit burns out
			the board.
			6 If all the transistors are good,
			the waveform should be measured
			first. If the waveform is normal,
			check whether the alarm is trigg-
			ered by a command. If so, replace
			the isolation amplifier IS2, A76L-
			0300-0077.
			7 Check whether there is a problem
			with the spindle motor or power
			line, including the speed feedback
			sensor (the same method as AL-02).
			Remove the motor power line. If
			the same alarm is still present.
			it is a unit fault. If the alarm
			disappears, it may be a problem
			with the motor or power line.
11	CPU report to	The control panel	1 Check whether each component on

	the police (AL-13)	detects a CPU fail- ure.	the control board is properly in- serted. You can reinsert it and check again. 2 Replace the control panel or send it for repair.
12	ROM report to the police (AL-14)	The control panel detects a problem with the ROM insta- llation.	1 Check whether the ROM (MD25,2732) on the control board is installed or not properly inserted. Unplug and reinsert it. 2 Replace the ROM (or swap it with another board first). 3 Replace the control panel or send it for repair.
13	Select Panel Alarm (AL-15)	The control panel detects an abnorma- lity in the additi- onal selection boa- rd.	1 If there is a selection board, remove the selection board. If there is still an alarm, replace the main control board, otherwise replace the selection board.
14	RAM report to the police (AL-16)	The control panel detects the NVRAM (RAM that stores parameters, power- off protected).	1 Place S1 on the control panel to TEST position and S2 to SET posi- tion (if some panels do not have this terminal, no setting is nee- ded), turn on the power, the LED will change from 11111 to FFFFF in sequence, press "MODE" and "UP", the LED will change to "FC-22", press "SET" for more than 4 seco- nds until it shows "GOOD" and re- lease, turn off the power, reset S 1 and S2, and turn on the power again. 2 Replace MC35 (NRAM: MBM2212). 3 Replace the main control board or send it for repair.

15	RAM, check re- ports Police (AL-17)	RAM exception or control board fail- ure.	1 Place S1 on the control board to TEST position and S2 to SET posi- tion (if some boards do not have this terminal, no setting is nee- ded), turn on the power, the LED will change from 11111 to FFFFF in sequence, press "MODE" and "UP", the LED will change to "FC-22", press "SET" for more than 4 seco- nds until it shows "GOOD" and release, turn off the power, reset S1 and S2, and restart the power. 21f this alarm still exists, rep- lace MC35 (NVRAM: MBM2212) or ma- ster board.
16	ROM, number of checks reported to the police (AL-18)	The control panel detects that the number of ROM is incorrect.	1 Check whether the ROM on the control board is not inserted pr- operly, check again, if there is still an alarm, replace the two ROM. 2 Replace the main control board or send it for repair.
17	U Phase current bias anomaly alarm (AL-19)	U The phase current feedback value is abnormal, usually due to a fault in the control board or a break in the cur- rent detection res- istor.	1 Measure the resistance of pin 1 and pin 2 of CN5 on the control board with a multimeter (do not remove the control board). The normal value should be less than 1 ohm. If the resistance is very large, the U phase current detec- tion resistor is broken and repl- aced. 2 If the resistance value is norm- al, measure the voltage of termi- nal IU after power on. It should be 0 or a few millivolts normally. If it exceeds 1V, replace IS2 (A76 L-0300-0077) or MH23B (amplifier 1458). 3 Use a multimeter to measure whe- ther the-15V voltage on the board is normal. If abnormal, check the DC power circuit.
18	V Phase current bias anomaly alarm (AL-20)	U The phase current feedback value is abnormal, which is usually caused by the control board failure or the cur- rent detection res- istor is disconnec- ted.	1 Measure the resistance of pin 3 and 4 of CN5 on the control board with a multimeter (do not remove the control board). It should be less than 1 ohm normally. If it is very large, the V phase current detection resistor is broken and should be replaced. 2 If the resistance value is norm- al, measure the voltage of termi- nal IV after power on. It should be 0 or a few millivolts normally. If it exceeds 1V, replace IS2 (A76

			L-0300-0077) or MH23B (amplifier 1458). 3 Use a multimeter to measure whe- ther the-15V voltage on the board is normal. If abnormal, check the DC power circuit.
19	Command voltage Abnormal posi- tioning report Police (AL-21)	Abnormal voltage bias of speed comm- and can be basically judged as control board failure.	1. Power on, use the multimeter to measure the terminal VCMD (speed command voltage) value, if there is a value or the value is very large, replace MB11, MB10 (op am- plifier 1458) or MB8 (switch cir- cuit HI201). 2 Send the control panel for rep- air.
20	Rate feedback Abnormal posi- tioning report Police (AL-22)	Speed feedback vol- tage bias is abnor- mal, which can be basically judged as the fault of control board or motor speed sensor	1 Check the speed sensor according to item 1 of sequence number 2. If abnormal, replace it. 2 Replace the control panel or send it for repair.
21	Speed and fin- ger The voltage is biased Abnormal alarm (AL-23)	Generally, when the power is on, it can be judged as a fault of the control board or motor speed sen- sor.	1 Check the speed sensor according to item 1 of sequence number 2. If abnormal, replace it. 2 Check the ER terminal voltage with a multimeter. If it is very high and VCMD and TSA are both very low, replace MD9 (op amp 1458). 3 Replace the control panel or send it for repair.
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22	The cont- rol panel is not displayed	The control panel has no working vol- tage or no working.	3 Use a multimeter to measure the AC voltage of terminal 19A-CT and 19B-CT on the control board. It should be around 19V normally. If not, check the small transformer or F4 fuse of the unit and replace it if found faulty. 4If the voltage is correct, measure the +5V on the board again. If not, check AF1. If burnt out, replace it.
23	The cont- rol panel displays A	The main control board is faulty, or the ROM is faulty.	1 Check whether the ROM (two pieces) is installed, or the ROM is not installed well, or the ROM is broken. 2 The control board is bad, replace the main control board.
24	Turn on the power Burn ins- urance or Check the resistance R1 or R2	If the component is burned before the contactor is sucked in, it should have nothing to do with the control board and motor. The main circuit of the unit should be checked.	1 Check the large capacitance value of the main circuit, and replace it if there is a short circuit. 2 Check for a short circuit in the rectifier bridge. 3 Check whether the contacts of the contactor are normal.
25	The spin- dle does not turn and no al arm is di spl ayed	The spindle unit is not engaged, or the system instruction (*ESP, MRDY, forward and reverse) signal is abnormal.	1 Check whether the main contactor of the spindle unit is engaged. If not, check the emergency stop input, or MRDY (mechanical ready signal) or parameter F01 setting error. 2 If it is sucked, check whether the forward and reverse signals are issued after the system gives instructions. There should be a OV between CN1's 45 or 46 and 14. If both are 24V or both are OV, there is an external problem. If it is normal, replace HY6 (RV05) on the control board. 3 If there is no voltage on terminal DA 2 of the multimeter, there is a problem with the external system. Check whether pin 31 of the socket is disconnected from CN1. 4 If there is a DA converter chip on MA 11 or MA13 on the control board and there is no voltage on DA1 terminal, replace the DA converter. If there is voltage on DA1 but no voltage on DA2, parameter F04 is set incorrectly or MB9 chip is bad, modify the parameter or replace the chip. 5 Measure pin 7 of the operational am- plifier MB10. If there is no voltage, 1 If there is voltage on the foot, it is because the external multiplier po-

		te is it	ntiometer is bad or the parameter FO2 set incorrectly, modify or replace
2.4	Series power modu	le PSM	
Order number	Fault phenomenon	Cause	Resol vent
	PSM shows (two bars), the sys- tem shows 401, and each axis shows DRDY OFF alarm.	After the sys tem starts self-test, if there is no emergency sto and alarm, i will be issued *MCON signal i sent to all SVM. After re ceiving the signal, the main contacto is switched o and the powe unit is sucke in. The LED changes from two bars (to 00 and send the ready sig nal to the se rvo unit, whic is then conne cted again	<pre>1 Check if the SVM is faulty (as described above). 2 Check whether the *ESP of PSM is disconnected. Under normal circu- mstances, it is short circuit. If it is open circuit, check the ex- ternal *ESP electrical circuit. 3 Check with a multimeter whether there is a phase missing in the three-phase 200V (or 380V high voltage type) incoming line of MCC. 4 Check for faults in the MCC con- tacts and coils. 5 Observe whether the MCC is disc- onnected immediately after it is sucked in. If it is not sucked in at all, listen carefully to see if there is a sound from the small relay of PSM. If so, it proves that the PSM itself is good. Rep- lace the relay or check the MCC</pre>

2PSM-5.5 perhaps The LED of PSM- al armAfter the *MCLMCC. 6 Check that the connection lines bet- ween PSM, SPM, and SVM are not incorr- ectly connected or not firmly connect- ed. 7 Replace the power unit control board. If not available, send the PSM to FANUC for repair or replacement.2PSM-5.5 perhaps The LED of PSM- al armThe power mod- uld detects an ult.1 Use a multimeter to check the IPM of the main circuit, and the conduction voltage drop of the module's U, V, W to + and If there is any abnormality, replace the IPM module. Secifical time, this alarm is issued and the *MCON sig- nal of each axis is disco- nnected.2PSM-5.5 perhaps The LED of PSM- al armAbnormal main circuit current circuit cur			Connect the	Output line and AC power supply for
 kerelay is energized, it will be connected or not firmly connect. 7 Replace the power unit control board. If not available, send the PSM to FANUC for repair or replacement. 7 Replace the power unit control board. If not available, send the PSM to FANUC for repair or replacement. 9 PSM-5.5 perhaps The power modiate or modified the "MCON signal of each axis is disconnected. 2 PSM-5.5 perhaps The power modiate or modified the main circuit, and the conduction voltage drop of the module's U, V, W to + and. If there is any abnormality, replace the IPM module. 2 If there is still an alarm after replacing the IPM module. 3 PSM-15 , The LED of PSM- 26 and PAM-30 displays 01 alarm 3 PSM-15 , The LED of PSM- 26 and PAM-30 displays 01 alarm 4 Abnormal main circuit current is detected. 3 PSM-15 , The LED of PSM- 2002 -0390, and check the six sets of drive resistors on the main circuit base plate, which are 6.2 ohms and 10k ohms. If any resistance values are incorrect, replace the drive to are found. Replace the drive to are found. If any abnormal tites are found, replace the flow module. At the same time, replace the drive to are found. First the flow of the conduction or the main circuit base plate, which are 6.2 ohms and 10k ohms. If any resistance values are incorrect, replace the drive to are found. 			relav. After	MCC.
 energized, it will be conne- cted *DRDY signal is sent back to the system. If the system does not receive the *DRDY sig- nal within the specified time, this alarm is issued and the *MCON sig- nal of each axis is disco- mnected. PSM-5.5 perhaps The LED of PSM- ule detects an 11 shows 01 alarm PSM-15 , The LED of PSM- calarm PSM-15 , The LED of PSM- is detected. Abnormal main The LED of PSM- is detected. Abnormal main The LED of PSM- is detected. Abnormal main The LED of PSM- circuit current 26 and PAM-30 displays 01 alarm The LED of PSM- is detected. Abnormal main The LED of PSM- is detected. Abnormal main The LED of PSM- circuit current 26 and PAM-30 displays 01 alarm The LED of PSM- the LED of PSM- is detected. The LED of PSM- circuit current 26 and PAM-30 displays 01 alarm The LED of PSM- circuit current 27 the current 28 the driver board A208-2902 -0390, and check the six sets of drive 29 the driver board A208-2902 -0390, and check the six sets of drive 20 the driver board A208-2902 -0390, and check the six sets of drive 20 the driver board A208-2902 -0390, and check the six sets of drive 20 the driver board A208-2902 -0390, and check the six sets of drive 20 the driver board A208-2902 -0390, and check the six sets of drive 2			the relay is	6 Check that the connection lines bet-
 will be connected DRDY signal is sent back to the system. If the system does not receive the "DRDY signal within the specified time, this alarm is issued and the "MCON signal of each axis is disconnected. PSM-5.5 perhaps The power module detects an 11 shows 01 alarm ult. PSM-15 , The LED of PSM- is detected. Abnormal main circuit current is detected. PSM-15 , The LED of PSM- is detected. Abnormal main circuit current is detected. PSM-15 , The LED of PSM- is detected. The LED of PSM- is detected. PSM-15 , The LED of PSM- is detected. Abnormal main circuit current is detected. The LED of PSM- is detected. Abnormal main circuit current is detected. The LED of PSM- is detected. The			energized, it	ween PSM. SPM. and SVM are not incorr-
 cted *DRDY signal is sent back to the system. If the system lif the system does not receive the *DRDY sig- nal within the specified time, this alarm is issued and the *MCON sig- nal of each axis is disco- nnected. PSM-5.5 perhaps The power mod- ule detects an 11 shows 01 alarm PSM-15 , The LED of PSM- is detected. PSM-16 , The LED of PSM- circuit current is detected. PSM-16 , The LED of PSM- is detected. PSM-16 , The LED of PSM- is detected. PSM-16 , The LED of PSM- circuit current is detected. PSM-16 , The LED of PSM- circuit current is detected. PSM-16 , The LED of PSM- is detected. PSM-16 , The LED of PSM- circuit current is detected. PSM-16 , The LED of PSM- circuit current is detected. PSM-17 , The LED of PSM- circuit current is detected. PSM-18 , The LED of PSM- circuit current is detected. PSM-19 , The LED of PSM- circuit current is detected. PSM-10 , The LED of PSM- circuit current is detected. PSM-10 , The LED of PSM- circuit current is detected. PSM-10 , The LED of PSM- circuit current is detected. PSM-11 , The LED of PSM- circuit current is detected. PSM-12 , The LED of PSM- circuit current is detected. PSM-13 , The LED of PSM- circuit current is detected. PSM-14 , The LED of PSM- circuit current is detected. PSM-15 , The LED of PSM- circuit current is detected. PSM-16 , The LED of PSM- circuit			will be conne-	ectly connected or not firmly connect-
 *DRY signal is sent back to the system. If the system does not receive the *DRY signal is is sued and the *DRY signal within the specified time, this alarm is issued and the *MCON signal of each axis is disconnected. PSM-5.5 perhaps The power modative detects an 11 shows 01 alarm ult. PSM-15 , The LED of PSM- 11 e detects an 11 shows 01 alarm distribution of the term of the main circuit, and the conduction voltage drop of the module's U, V, W to + and If there is any abnormality, replace the IPM module. PSM-15 , The LED of PSM- is detected. PSM-15 , The LED of PSM- is detected. Abnormal main circuit current is detected. PSM-15 , The LED of PSM- 126 and PAM-30 displays 01 alarm 			cted	ed
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the contactor MCC that cumpling newer	3	PSM-15 , The LED of PSM- 26 and PAM-30 displays 01 alarm	Abnormal main circuit current is detected.	1 Use a multimeter to check the condu- ction voltage drop of U, V, and W relative to + and-in the main circuit. If any abnormalities are found, replace the IGBT module. At the same time, replace the driver board A20B-2902 -0390, and check the six sets of drive resistors on the main circuit base pl- ate, which are 6.2 ohms and 10k ohms. If any resistance values are incorrect, replace them. 2 If all three IGBT modules are good, abade whether the contexts or acide of
to the nower module are normal. If not	3	PSM-15 , The LED of PSM- 26 and PAM-30 displays 01 alarm	Abnormal main circuit current is detected.	1 Use a multimeter to check the condu- ction voltage drop of U, V, and W relative to + and-in the main circuit. If any abnormalities are found, replace the IGBT module. At the same time, replace the driver board A20B-2902 -0390, and check the six sets of drive resistors on the main circuit base pl- ate, which are 6.2 ohms and 10k ohms. If any resistance values are incorrect, replace them. 2 If all three IGBT modules are good, check whether the contacts or coils of the contactor MCC that cumplies parent
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1 epi ace linem. 2 Check the control board of the SDM	3	PSM-15 , The LED of PSM- 26 and PAM-30 displays 01 alarm	Abnormal main circuit current is detected.	1 Use a multimeter to check the condu- ction voltage drop of U, V, and W relative to + and-in the main circuit. If any abnormalities are found, replace the IGBT module. At the same time, replace the driver board A20B-2902 -0390, and check the six sets of drive resistors on the main circuit base pl- ate, which are 6.2 ohms and 10k ohms. If any resistance values are incorrect, replace them. 2 If all three IGBT modules are good, check whether the contacts or coils of the contactor MCC that supplies power to the power module are normal. If not, replace them
	3	PSM-15 , The LED of PSM- 26 and PAM-30 displays 01 alarm	Abnormal main circuit current is detected.	1 Use a multimeter to check the condu- ction voltage drop of U, V, and W relative to + and-in the main circuit. If any abnormalities are found, replace the IGBT module. At the same time, replace the driver board A20B-2902 -0390, and check the six sets of drive resistors on the main circuit base pl- ate, which are 6.2 ohms and 10k ohms. If any resistance values are incorrect, replace them. 2 If all three IGBT modules are good, check whether the contacts or coils of the contactor MCC that supplies power to the power module are normal. If not, replace them. 2 Check the control board of the SDW
for a rolay (on the side of the MCC	3	PSM-15 , The LED of PSM- 26 and PAM-30 displays 01 alarm	Abnormal main circuit current is detected.	1 Use a multimeter to check the condu- ction voltage drop of U, V, and W relative to + and-in the main circuit. If any abnormalities are found, replace the IGBT module. At the same time, replace the driver board A20B-2902 -0390, and check the six sets of drive resistors on the main circuit base pl- ate, which are 6.2 ohms and 10k ohms. If any resistance values are incorrect, replace them. 2 If all three IGBT modules are good, check whether the contacts or coils of the contactor MCC that supplies power to the power module are normal. If not, replace them. 3 Check the control board of the SPM for a relaw (on the side of the MCC
for a relay (on the side of the MCC	3	PSM-15 , The LED of PSM- 26 and PAM-30 displays 01 alarm	Abnormal main circuit current is detected.	1 Use a multimeter to check the condu- ction voltage drop of U, V, and W relative to + and-in the main circuit. If any abnormalities are found, replace the IGBT module. At the same time, replace the driver board A20B-2902 -0390, and check the six sets of drive resistors on the main circuit base pl- ate, which are 6.2 ohms and 10k ohms. If any resistance values are incorrect, replace them. 2 If all three IGBT modules are good, check whether the contacts or coils of the contactor MCC that supplies power to the power module are normal. If not, replace them. 3 Check the control board of the SPM for a relay (on the side of the MCC socket, which can easily hump out of the
for a relay (on the side of the MCC socket, which can easily burn out. If	3	PSM-15 , The LED of PSM- 26 and PAM-30 displays 01 alarm	Abnormal main circuit current is detected.	1 Use a multimeter to check the condu- ction voltage drop of U, V, and W relative to + and-in the main circuit. If any abnormalities are found, replace the IGBT module. At the same time, replace the driver board A20B-2902 -0390, and check the six sets of drive resistors on the main circuit base pl- ate, which are 6.2 ohms and 10k ohms. If any resistance values are incorrect, replace them. 2 If all three IGBT modules are good, check whether the contacts or coils of the contactor MCC that supplies power to the power module are normal. If not, replace them. 3 Check the control board of the SPM for a relay (on the side of the MCC socket, which can easily burn out. If it is broken replace it. If it burne
for a relay (on the side of the MCC socket, which can easily burn out. If it is broken, replace it. If it burns hadly, replace the central beard	3	PSM-15 , The LED of PSM- 26 and PAM-30 displays 01 alarm	Abnormal main circuit current is detected.	1 Use a multimeter to check the condu- ction voltage drop of U, V, and W relative to + and-in the main circuit. If any abnormalities are found, replace the IGBT module. At the same time, replace the driver board A20B-2902 -0390, and check the six sets of drive resistors on the main circuit base pl- ate, which are 6.2 ohms and 10k ohms. If any resistance values are incorrect, replace them. 2 If all three IGBT modules are good, check whether the contacts or coils of the contactor MCC that supplies power to the power module are normal. If not, replace them. 3 Check the control board of the SPM for a relay (on the side of the MCC socket, which can easily burn out. If it is broken, replace it. If it burns badly, replace the control board
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for a relay (on the side of the MCC socket, which can easily burn out. If it is broken, replace it. If it burns badly, replace the control board. 1 Check whether the fan is turning or whether there is wind. If it does not	3	PSM-15 , The LED of PSM- 26 and PAM-30 displays 01 alarm	Abnormal main circuit current is detected. The control	1 Use a multimeter to check the condu- ction voltage drop of U, V, and W relative to + and-in the main circuit. If any abnormalities are found, replace the IGBT module. At the same time, replace the driver board A20B-2902 -0390, and check the six sets of drive resistors on the main circuit base pl- ate, which are 6.2 ohms and 10k ohms. If any resistance values are incorrect, replace them. 2 If all three IGBT modules are good, check whether the contacts or coils of the contactor MCC that supplies power to the power module are normal. If not, replace them. 3 Check the control board of the SPM for a relay (on the side of the MCC socket, which can easily burn out. If it is broken, replace it. If it burns badly, replace the control board. 1 Check whether the fan is turning or whether there is wind. If it does not
Image: Antiperson of the PSM shows aFor a relay (on the side of the MCC socket, which can easily burn out. If it is broken, replace it. If it burns badly, replace the control board.Image: Antiperson of the PSM shows aThe control panel detects an integral with and shock whether the blades are shock whether the b	3	PSM-15 , The LED of PSM- 26 and PAM-30 displays 01 alarm The PSM shows a	Abnormal main circuit current is detected. The control panel detects	1 Use a multimeter to check the condu- ction voltage drop of U, V, and W relative to + and-in the main circuit. If any abnormalities are found, replace the IGBT module. At the same time, replace the driver board A20B-2902 -0390, and check the six sets of drive resistors on the main circuit base pl- ate, which are 6.2 ohms and 10k ohms. If any resistance values are incorrect, replace them. 2 If all three IGBT modules are good, check whether the contacts or coils of the contactor MCC that supplies power to the power module are normal. If not, replace them. 3 Check the control board of the SPM for a relay (on the side of the MCC socket, which can easily burn out. If it is broken, replace it. If it burns badly, replace the control board. 1 Check whether the fan is turning or whether there is wind. If it does not turn or the wind is very small, remove it and check whether the hades are
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	3	PSM-15 , The LED of PSM- 26 and PAM-30 displays 01 alarm	Abnormal main circuit current is detected.	1 Use a multimeter to check the condu- ction voltage drop of U, V, and W relative to + and-in the main circuit. If any abnormalities are found, replace the IGBT module. At the same time, replace the driver board A20B-2902 -0390, and check the six sets of drive resistors on the main circuit base pl- ate, which are 6.2 ohms and 10k ohms. If any resistance values are incorrect, replace them. 2 If all three IGBT modules are good, check whether the contacts or coils of the contactor MCC that supplies power to the power module are normal. If not, replace them. 3 Check the control board of the SPM
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for a relay (on the side of the MCC socket, which can easily burn out. If	3	PSM-15 , The LED of PSM- 26 and PAM-30 displays 01 alarm	Abnormal main circuit current is detected.	1 Use a multimeter to check the condu- ction voltage drop of U, V, and W relative to + and-in the main circuit. If any abnormalities are found, replace the IGBT module. At the same time, replace the driver board A20B-2902 -0390, and check the six sets of drive resistors on the main circuit base pl- ate, which are 6.2 ohms and 10k ohms. If any resistance values are incorrect, replace them. 2 If all three IGBT modules are good, check whether the contacts or coils of the contactor MCC that supplies power to the power module are normal. If not, replace them. 3 Check the control board of the SPM for a relay (on the side of the MCC socket, which can easily burn out. If
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for a relay (on the side of the MCC socket, which can easily burn out. If it is broken, replace it. If it burns badly, replace the control board.The control1 Check whether the fan is turning or whether there is wind. If it does not	3	PSM-15 , The LED of PSM- 26 and PAM-30 displays 01 alarm	Abnormal main circuit current is detected. The control	1 Use a multimeter to check the condu- ction voltage drop of U, V, and W relative to + and-in the main circuit. If any abnormalities are found, replace the IGBT module. At the same time, replace the driver board A20B-2902 -0390, and check the six sets of drive resistors on the main circuit base pl- ate, which are 6.2 ohms and 10k ohms. If any resistance values are incorrect, replace them. 2 If all three IGBT modules are good, check whether the contacts or coils of the contactor MCC that supplies power to the power module are normal. If not, replace them. 3 Check the control board of the SPM for a relay (on the side of the MCC socket, which can easily burn out. If it is broken, replace it. If it burns badly, replace the control board. 1 Check whether the fan is turning or whether there is wind. If it does not
Image: The PSM shows aThe PSM shows aThe control panel detectsFor a relay (on the side of the MCC socket, which can easily burn out. If it is broken, replace it. If it burns badly, replace the control board.Image: The control panel detects1 Check whether the fan is turning or whether there is wind. If it does not turn or the wind is very small, remove	3	PSM-15 , The LED of PSM- 26 and PAM-30 displays 01 alarm The PSM shows a	Abnormal main circuit current is detected. The control panel detects	1 Use a multimeter to check the condu- ction voltage drop of U, V, and W relative to + and-in the main circuit. If any abnormalities are found, replace the IGBT module. At the same time, replace the driver board A20B-2902 -0390, and check the six sets of drive resistors on the main circuit base pl- ate, which are 6.2 ohms and 10k ohms. If any resistance values are incorrect, replace them. 2 If all three IGBT modules are good, check whether the contacts or coils of the contactor MCC that supplies power to the power module are normal. If not, replace them. 3 Check the control board of the SPM for a relay (on the side of the MCC socket, which can easily burn out. If it is broken, replace it. If it burns badly, replace the control board. 1 Check whether the fan is turning or whether there is wind. If it does not turn or the wind is very small, remove
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			cleaning and installing, replace the fan. 3 Check whether the power supply of the fan socket is normal. Red line +24V, black line OV, yellow line alarm line, remove 5V, if the voltage is not right, replace the control board.
5	The PSM shows 03 alarm.	PSM overload.	1 After shutting down and waiting for a period of time, check whether there is still an alarm. If the alarm disappea- rs, it may be that the mechanical load is too large. Check whether the spindle or servo mechanical load or cutting amount is too large. 2 Remove the housing and control board, and use a multimeter to measure the resistance between the two screws con- nected to OH on the bottom plate. It should be short circuit. If it is open circuit, replace the thermal control switch. 3 Check whether the connection between the control board and the base plate is loose.
6	The PSM shows a O4 alarm.	The control panel detects a low voltage alarm on the DC side.	<pre>4Replace the control panel. 1 Check for a short circuit fault in the spindle module (PSM) or servo mod- ule (SVM). 2 Check whether the conduction voltage drop of the three IGBTs is normal. If there is any abnormality, replace them and replace the driver board and the bad driver resistor. 3 Check the detection circuit. If the detection resistance is burned out or the photocouple is abnormal, replace it.</pre>

7	The PSM shows O5 alarm.	The DC side discharge cir- cuit of the main circuit is abnormal	1 The discharge module of the main ci- rcuit is faulty and must be replaced. 2 The discharge control circuit is fa- ulty. Replace the SPMR.
8	The PSM shows a O6 alarm.	The input power circuit is out of phase alarm.	1 Check the three-phase AC input with a multimeter for missing phases. 2 Send the power module for repair.
9	The PSM shows a 07 alarm.	The control panel detects a high voltage alarm on the DC side. This us- ually occurs when the spin- dle motor is decelerated, at which time SPM and the upper display shows 11 (ALM light is lit).	1 The function of the power supply mo- dule is to provide power and feedback braking for the subsequent SPM and SVM. When the PSM detects that feedback br- aking needs to be performed but cannot or does not perform it, this alarm will occur. 2 It is likely that the PSM is faulty or the three-phase input lines are not well contacted. Check whether the three-phase input voltage is balanced and whether the terminals or contactors and air switches are firmly connected. 3 Send the power module for repair.
10	The PSM shows an alarm 08.	Control Loop hardware fail- ure.	1Replace the control circuit. 2If it is a small power module, it may be the main circuit board fault.
11	The LED of the PSM is not di- splayed.	Control the power circuit fault of the side panel.	1 Check whether the input AC 200V is normal. If not, check the input circu- it. 2If 200V is normal, replace the power control side panel.

2.5	Series	power	modu	ле	PSMR	
)rdor	Foult n	honomo				

Order	Fault phenome-	Causo	Posolvent
number	non	Cause	Resolvent
Order number	Fault phenome- non The PSMR shows- - (two bars), the system sh- ows 401, and the axes show DRDY OFF alarm.	Cause After the system starts self-test, if there is no emergency stop and alarm, it will be issued *MCON signal is sent to all SVM. After receiving the signal, the main contactor is switched on and the power unit is sucked in. The LED changes from two bars () to OO and sends the ready signal to	Resolvent 1 Check if the SVM is faulty (as described above). 2 Check whether the *ESP of PSM is disconnected. Under normal circumstances, it is short circ- uit. If it is open circuit, check the external *ESP electrical ci- rcuit. 3 Check with a multimeter whether there is a phase missing in the three-phase 200V (or 380V high voltage type) incoming line of MCC. 4 Check for faults in the MCC contacts and coils. 5 Check whether the MCC is disc- onnected immediately after it is sucked in. If it is not sucked in
		ready signal to	sucked in. If it is not sucked in
		the servo unit.	at all, listen carefully to see
		The servo unit	if there is a sound from the
		then switches on	small relay of PSM. If so, it
		the relay and the	proves that the PSM itself is

2	The PSMR shows	The control	1 Check whether the fan is turning or
	an alarm of O2.	panel detects an internal cooling fan (24 V) anomaly.	whether there is wind. If it does not turn or the wind is very small, remove it and check whether the blades are dirty. Clean them with gasoline or al- cohol.
			2 If there is still an alarm after cleaning and installing, replace the fan.
			3 Check whether the power supply of the fan socket 24V is normal (red line +24 V, black line OV, yellow line alarm line, 5V is removed if the voltage is not correct, replace the control board.
3	The PSMR shows an alarm 04.	The control panel detects a low voltage alarm on the DC	1 Check for short circuit faults in the spindle module (PSM) or servo module (SVM).
		side.	drop of the three IGBTs is normal. If there is any abnormality, replace them and replace the driver board and the bad driver resistor. 3 Check the detection resistance and photodiode of the low voltage detection circuit. If abnormal replace it
		The DC side	
4	The PSMR showed a O5 alarm.	discharge cir- cuit of the main circuit is abnormal	2 The discharge module of the main ci- rcuit is faulty and replaced. 2 The discharge control circuit is fa- ulty. Replace the SPMR.
8	The PSMR shows O6 alarm.	Control circ- uit +24V, +15V low voltage.	1 Check whether the safety on the con- trol side panel is burnt out. If so, replace it. 2 Remove all plugs except the 200V po- wer supply from the PSMR. If the alarm disappears, check the SPM or SVM. 3. Replace the control side panel.
9	The PSMR shows an alarm of 07.	The control panel detects a high voltage alarm on the DC side. This us- ually occurs when the spin- dle motor is decelerating, at which time SPM, upper di- splay 11 (ALM red light on).	1 The function of the power supply mo- dule is to provide power and feedback braking for the SPM and SVM. When the PSM detects that feedback braking needs to be performed but cannot or does not perform it, this alarm occurs. 2 It is likely that the PSM is faulty or the three-phase input lines are not well contacted. Check whether the three-phase input voltage is balanced, and whether the terminals or contactors and air switches are firmly contacted. 3 Send the power module for repair. 3 If the alarm occurs during processi-
10	The PSMR shows an alarm of 08.	Abnormal disc- harge alarm	ng, turn off the machine for a period of time and then turn it on again. If the alarm disappears, it is caused by frequent start and stop, resulting in

too much discharge. The processing pr-
ogram can be modified or the cutting
amount can be reduced.
4 The discharge module of the main ci-
rcuit is faulty and replaced.
5 The discharge control circuit is fa-
ulty. Replace the SPMR.

2.0 AI	2.0 Alalin of SPM spinule module in series			
Order number	Fault phenomenon	Cause	Resol vent	
1	The SPM displays A, AO, or A1 to alarm	The control board detects the fai- lure of ROM or RAM or CPU and cannot work nor- mally.	1 Check whether the ROM chip on the control board (the SPM hous- ing can be removed to remove the control board) is not properly inserted or there is no ROM. Reinsert it or purchase a repla- cement. 2 Check whether the pins of the two large integrated chips in the upper left corner of the control board are corroded, because the cooling fan of PSM is directly on this chip. After passing through hot air, it cools into water va- por, which causes corrosion and rust on the pins of the large chip. Purchase a new control bo- ard to replace it.	
2	SPM shows 01	Motor overheating alarm	1 After turning off the machine and waiting for a while, see if there is still an alarm,	

2.6	Alarm	of	SPM	spindle	module	in	series

	(ALM red light		If the alarm disappears, it may be that
			the mechanical load is too large Check
			whether the spindle mechanical load or
			cutting amount is too large
			Cutting amount is too range.
			Z Check that the connector on the SPM S
			JY2 socket is not present or not prop-
			erly inserted.
			3 Use a multimeter to check that the
			resistance between the motor overheat
			protection switch should be short cir-
			cuit. If it is open, replace the ther-
			mal control switch.
			1 Do not start the main shaft: instead.
			manually rotate the main shaft to get
			the motor running quickly. Estimate the
			actual speed of the motor and have
			another person observe the motor speed
			diother person user ve the motor speed
			display on the system's main shaft
			monitoring screen to see if it is
			basically consistent. Generally, it
			should be between 100-200 revolutions
			per minute. If it is only 1-2 revolut-
			ions or less than 10 revolutions, it
			indicates a fault in the motor speed
			sensor or the speed feedback loop.
			Remove the speed sensor from the main
			shaft motor (located at the back of the
			motor; remove the fan and the cover
			below the fan to see a small printed
			board with a white circular sensor
			head). If there is wear on the sensor
		The speed of	head it is faulty and should be repl-
		the spindle	aced (FANIC is available for purchase
	SPM shows 02	motor differs	you can find the sensor model based on
3	(ALM red light	greatly from	the motor model for example if the
	on)	the command	last four digits of the motor model are
		sneed	R100 then the sonser model is A040
			0854 V220) Day attention to adjusting
			the gap between the concer and the
			and monouroment acon which should be
			speed measurement year, which should be
			between 0.1-0.15. A 10-yuan note can be
			praced roosery in this gap, and folding
			IL IN NAIT CAN MAKE IT TIGhter.
			21T The speed display is normal, check
			whether the motor or power line is
			normal. The power line can be measured
			by a multimeter or megohmmeter.
			3 Whether the phase sequence of the
			motor power line is wrong. If not, the
			alarm will be raised after the spindle
			rotates back and forth during startup.
			U and V can be switched.
			4 If conditions are available (i.e.,
			the same AC spindle unit is in the
			workshop), the control board or the
			whole unit can be exchanged, but the

			transistor module must be measured for no short circuit, otherwise another control board will be burned out. This will quickly determine whether the fa- ult is in the unit or the control board or the motor.
4	The LED on the SPM shows 03 (ALM red light on)	The DC fuse blew.	1 Check whether the red indicator light on the DC side of SPM is lit. If not, the DC shorting plate is not properly connected. For example, four screws must not be only two, and should be tightened. Or the power unit is faulty. 2 Remove the casing of the main shaft unit module and measure the DC fuse with a multimeter. If it does not con- duct, replace the fuse. However, there might be a short circuit in the subse- quent circuit causing the fuse to blow. The cause of the short circuit must be addressed first before attempting to measure the IGBT or IPM for any short circuits. If a short circuit is found, replace both the IGBT and IPM, as well as the drive module and drive resistor. 3 It may be that the alarm detection circuit is faulty, so the corresponding circuit must be checked or sent for
5	The LED of SPM shows O4 (the ALM red light is on).	The power input circuit is mi- ssing a phase.	3 Check the three-phase AC input with a multimeter for any missing phase. 4 Send the spindle module for repair.

6	The LED of SPM shows 07 (the ALM red light is on).	The spindle motor is over speed alarm.	11f there is an alarm when the machine is turned on, the detection circuit of the control board is faulty, and the control board is replaced. 2 If this alarm occurs during operati- on, shut down and restart the machine. If the same fault occurs again, replace the spindle unit. 3 If other alarms occur after reboot, solve them according to other alarm solutions.
7	The SPM LED shows 09 (the ALM red light is on).	The spindle module transi- stor feedback is overloaded and alarms.	1 Observe whether it is related to ti- me. If it occurs after a long time of operation and no alarm occurs after a period of shutdown, the motor load is too large. The mechanical load, motor or cutting amount should be checked. 2 Use a multimeter to measure the res- istance between OH1 and OH2 on the control base plate. If it is open cir- cuit, check whether the thermal control switch on the unit is damaged. If it is short circuit, then the control base plate is disconnected or the connection between the control side plate and the base plate connector is poor. Reinsert it or replace the control board.
8	The LED of SPM shows 11 (the ALM red light is on).	The DC side power supply voltage is too high. PSM, th- ere will be 07 AL on it	Check whether the power module or three-phase input power line is not in good contact.
9	The LED of SPM shows 12 (the ALM red light is on).	Abnormal curr- ent in the DC power supply circuit, or abnormal alarm of IPM module.	1 Observe whether the alarm is given when the instruction is given, or the alarm is given after a turn, or high- speed alarm. If it is the latter two, check whether there is a short circuit or insulation abnormality in the spin- dle motor or power line. 2 Remove the IGBT or IPM module and measure whether there is a short circ- uit. If there is, replace it. If there is no short circuit, check whether the PN junction conduction voltage drop is normal. If it is IPM, even if the multimeter measures all points are no- rmal, replace it. 3 After replacing IGBT, replace the drive module (A20B-2902-0390) at the same time, and measure the six sets of drive resistors on the control base plate with a multimeter, two sets of 6.2 ohms and 10k. If burned out, repl- ace it.

10	The SPM LED shows 13 (the ALM red light is on).	CPU internal data storage error, this alarm rarely occurs.	Replace the control side panel of SPM.
11	The LED of SPM shows 19 or 20 (ALM red light is lit).	The U phase or V phase current detector is biased too mu- ch, which usu- ally occurs when the mach- ine is turned on.	1 If there are two main shaft modules with the same function and the control side plate is interchangeable, it can be judged that the control side plate or the control base plate is faulty. 2 Send SPM for repair.
12	The LED of SPM is on and shows 24 (ALM red light is on).	Serial data transmission to the system is abnormal.	1 If the system is shut down, it is a normal alarm. When the system is turned on again, the alarm will disappear. 2 If it does not disappear after rebo- ot, it may be a fault of the connection cable or optical cable, or a fault of the system or control side panel inte- rface. Replace the corresponding comp- onents.

13	The SPM LED is on and shows 27 (the ALM red light is on).	Encoder signal disconnection alarm.	<pre>1 Check the encoder and whether it is abnormal, use oscilloscope to measure the output waveform PA, *PA, PB, *PB, PZ, *PZ of the encoder whether it is normal, if one channel is not, replace the encoder. 2 Use a multimeter to measure whether the feedback line is broken. If so, replace the encoder feedback line. 3. Replace the SPM control side panel.</pre>
14	The SPM LED is on and shows 30 (the ALM red light is lit).	IPM over curr- ent (SPM5.5, SPM11), PSM over current	1 For SPM5.5 and SPM11 (IPM structure, no driver board), replace the IPM mod- ule. 2 For PSM15-30, check the power module
15	The LED of SPM is on and shows 31 (ALM red light is on).	alarm (O1ALM). The spindle motor speed detector is abnormal or the motor does not rotate at the given speed.	<pre>for faults. 11f there is an alarm when the machine is turned on, replace the control side</pre>
16	The SPM LED is on and shows 32 (the ALM red light is lit)	The RAM inside the large panel on the control side is abnor-	geu. Replace the control side panel.

		mal.	
17	The SPM LED is on and shows 33 (the ALM red light is lit). The SPM LED is on and shows 34 (the ALM red light is lit).	The DC side discharge cir- cuit is abnor- mal. Parameter set- ting error al- arm.	<pre>1 Check the power module for any abno- rmalities. 2 To control the side panel fault, re- place it. 1 Check whether the motor code parame- ters are correct (0 system 6633,16/18 system 4133). If correct, whether the initialization is not performed after</pre>
			<pre>modifying the above motor code (6519#7/ 4019#7 is changed to 1, shut down and open), set it correctly and execute the initialization. 2. Replace the control side panel.</pre>
19	The SPM LED shows 51 (the ALM red light is on).	Low voltage alarm on the DC side.	1 Check for 04 (ALM) on the power module. If so, check for PSM failure. 21f there is no alarm on the PSM, check whether the alarm circuit (cont- rol bottom plate or control side plate) is abnormal.

20	The LED on the SPM shows 56 (the ALM red light is lit).	Internal fan is abnormal.	<pre>1 Check whether the fan is turning or whether there is wind. If it does not turn or the wind is very small, remove it and check whether the blades are dirty. Clean them with gasoline or al- cohol. 2 If there is still an alarm after cleaning and installing, replace the fan. 3 Check whether the power supply of the fan socket is normal. Red line +24V, black line OV, yellow line alarm line, 5V is removed if the voltage is wrong, replace the control board.</pre>
21	The LED of SPM is on and shows 62 (ALM red light is on).	Motor speed command overf- low alarm.	1 Check whether the speed command is too large and exceed the allowable va- lue, and modify the processing program. 2. Replace the control side panel.
22	The SPM LED shows 66 (the ALM red light is on).	Abnormal comm- unication alarm between ampli- fiers.	1 Check for errors in the connection lines between SPM, PSM, and SVM. 2. Replace the control side panel.
23	The LED of SPM shows 73 (ALM red light is lit).	The amplitude of the speed detection sig- nal is insuff- icient.	 Check whether there is any error in the parameters of the spindle speed feedback detector of the system, and reset them correctly. Check whether the speed sensor is abnormal and replace it. Replace the control side panel.
24	The SPM LED shows 74,75,78 (ALM red light on).	The control side panel de- tects anomalies such as CPU and CRC.	Replace the control side panel.
25	After the ins- truction, the spindle does not turn and there is no alarm informa- tion.	SPM did not receive the speed command signal or the rotation cond- ition was not met.	 Observe the LED display on SPM. If it is OO, it indicates that there are positive/reverse and emergency stop signals, and check the spindle part of PMC. If the LED of SPM shows "", it indicates that the condition is not met. Check whether the input signals of the spindle diagnosis screen, *ESP, SFR/SRV, SSTP, MRDY are all available. If not, check the corresponding address of PMC.
26	The lathe GO1 is not moving and there is no alarm.	The system did not receive the encoder signal or the feed condition was not met.	1 Check whether GOO is normal. If GO1 is feed per revolution and it is norm- al, change to feed per minute (G98). If it does not turn, check the system diagnosis screen (System O is diagnosis 700) to see if the spindle speed signal has not been received or the feed ratio

			is 0. 2 If the feed per minute (G98) is normal, but the feed per revolution is not, the encoder is bad, or the encod- er, encoder feedback line or interface circuit is bad, replace the correspon- ding part.
27	The spindle orientation does not stop, and the timeout alarm (alarm set by the ma- chine tool fa- ctory) occurs.	The spindle unit did not receive the encoder signal or the system did not receive the directional completion si- gnal.	<pre>1 Turn the spindle by hand or rotate the spindle at a certain speed. Observe whether the spindle speed is normal on the spindle diagnostic screen. If not displayed, replace the position encoder or encoder feedback line. 2 Check whether the belt of the posit- ion encoder is loose or broken. 3 If the display is normal, replace the spindle module control side panel.</pre>
		4	58

28	The spindle rotates with great mechani- cal noise.	Main shaft me- chanical fric- tion or main shaft motor failure.	<pre>1 Observe the spindle diagnosis screen. If the motor speed is stable and the motor load changes, it may be mechani- cal friction of the spindle or the spindle bearing may be broken. 21f the speed and load are stable, it may be that the bearing of the motor is broken. Replace the motor bearing or send the motor for repair. 31f both speed and load change (at low speeds), the drive section of the spi- ndle module may be broken and the SPM should be sent for repair. 4 The spindle parameters are not init- ialized, or the motor code is incorrect during initialization.</pre>
29	LED, no di spl ay	The control panel has no power supply or is not working.	 Observe the LED and whether the IPL green on the left is lit. If not, measure whether the input +24V power supply is available. If yes, replace the control side panel. If no, check the +24V circuit of the power module. 21f the IPL green light is lit and the LED is not displayed, replace the con- trol side panel. 31f the system works normally without alarm, it is because the LED display is not in good contact or broken, replace it.

2.7 Series spindle module SPM error (there are three indicators on the left side of the LED: green (PIL), red (ALM), yellow (ERR). When a number appears on the LED, the yellow ERR light on the left side is lit to indicate an error)

<u> </u>			
1	The SPM LED	The emergency	
	shows 01 ERR	stop or mecha- nical readiness (MRDY) has no input, but a positive/ negative/ directional signal is inp- ut.	1 Check the spindle diagnosis screen status signal, *ESP, MRDY, whether they are all available, if not, check the PMC signal. 2 Parameter (6501#0/4001#0) is set in- correctly. Change it to zero and try again.
2	The SPM LED shows 18 ERR	When the spin- dle encoder is used for orie- ntation, the encoder conne- ction is not set.	1 The check is directed by the encoder mode or other modes. If it is the encoder mode, the check parameter 6503# 0/4003#0 should be set to 0. 2 Check parameter 6501#2/4001#2 (spin- dle position encoder signal) should be set to 1.

2.8 i / i spindle module (or SVPM) refer to the corresponding description of the spindle module.

Analysis and troubleshooting of difficult faults in FANUC system

→System O

→System series 16

→10 / 11 / 12 / 15 system

→Power Mate Series

→3, 6 systems

FANUC 0 System

ber	Failura comptom	Failure cause	Terms of	
R,	raiture symptom		settlement	
1	After the tool	There is no al-	1. Modify parameter 0009 TMF from	
	number is select-	arm, which sho-	0000**** to 0111****, and the fault is	
	ed, the machine	uld be a param-	resolved. When 0009=0000****, TMF=16ms-	
	tool also performs	eter problem.	ec. When 0009=0111****, TMF=128msec.	
	the tool changing		2 In winter, it is possible that the	
	action while mov-		viscosity of lubricating oil is large.	
	ing the X and Y			
	axes. However, the			
	distance of the X			
	and Y axis movem-			
	ent does not match			
	the moving instr-			
	uctions of the X			
	and Y axes, and			
	the difference			
	between the actual			
	moving distance			
	and the moving			
	instructions is			
	different each			
	time			
2	The hand enterny	Hand arterial	1. Confirm that the manual pulse gener-	
	me nanu artery	pulse generator	ator is normal. 2. Replace the storage	
		The signal cir-	board	
	onally fails	cuit is faulty		
	The machine tool	Check parameter	1) Move the machine to the middle of	
2	cannot return to	534, preferably	1) Move the machine to the middle of	
3	the machine refe-	between 200 and	the motor position encoder	
	rence point	500	the motor position encoder	
4	After working on	There is no al-	1) , Modify 8103#2=0 to 1	
	the machine for	arm on the dis-	2) , Modify 8121=120 to 100	
	three hours, a	play screen,		
	vibration sound	which is caused		
	was found on the X	by incorrect		
	axi s	parameter sett-		
		i ng		
5	The feed axis runs	Adjust paramet-	1) Adjust the servo gain parameter;	
	at low speed At times, there is crawling	ers	2) Adjust the load inertia of the motor.	
---	--	------------------------------	--	
6	When the machine	Adjust paramet-	Recalculate and adjust the reference	
	tool returns to	ers	count capacity value, that is, the value	
	the reference po-		of parameter 4 to 7 or parameter 570 to	
	int, it returns to		573	
	the reference po-			
	int each time			
	The timing is di-			
	fferent			
7	When cutting thr-	The location	Parameter 49 is not set correctly. Mod-	
	eads, the screw is	code has been	ify parameter 49#6 from 0 to 1.	
	loose	changed		
		Instrument and		
		spindle servo		
		amplifier		
		When the large		
		device and sto-		
		rage board are		
		i nval i d		
8	Thread cutting cannot be perfor- med	Location encoder feedback	 Change the spindle position encoder; Modify the parameters; 	

	Pare with a kn- ife	Signal lines	
9	In the single- pulse mode, Give the machine tool 1μ instr- uction, Actually walk 30 μ distance.	Parameter prob- lem	Parameter 8103 is set incorrectly. Modify 8103#5 from 1 to 0
10	Lathes: The tool offset cannot be entered using MX	No parameters are set	Parameter 10#7 is set to 1
11	The roundness of X and Y axes is out of tolerance	There were no alarms	Adjust parameters: 1) Servo gain: require two axes to be consistent. 2) Servo Control parameters: see servo parameter spec- ification. 3) Add reverse gap compensation.
12	Hub machining lathe, when the hub is processed at a high pace, the power unit and spindle se- rvo unit modules are often seri- ously burned out	Because the sp- indle frequently starts at high and low speeds	Replace the power drive modules of the power control unit and the spindle servo control unit. Replace the previous power module with A 50L-0001-0303.
13	In vertical ma- chining center, stop the machine and Z axis drops down 2mm	The brake circ- uit of the Z- axis motor is not properly handled	 Design the Z-axis brake circuit correctly according to the servo specification; Check parameters 8X05#6=1, 8X83=200 or so.
14	Processing cen- ter: vibration occurs when the Z-axis moves, and the Z-axis control unit and motor are conf- irmed to be no- rmal through the exchange of pr- inted board ex- periment	Fault caused by parameter sett- ing	1) Adjust parameter 517.2) Check and adjust the parameters between 8300 and 8400.
15	After a period of X axis proc- essing, the X axis coordinate shifts	If the motor encoder replac- ement is ineff- ective, it sho- uld be a mecha- nical failure	 Replacement of the motor encoder is inval- id. 2) Check and adjust the coupling between the screw rod and the motor.
16	ine spinale is	The reedback	I) UNECK AND CONTIRM WHETHER THE Spindle

	unstable at low	signal is not	motor feedback signal plug is loose. 2) Repl-
	speed and cannot	aood	ace the spindle motor encoder. 3) Replace the
	stop accurately	5	magnetic sensor used for positioning.
17	When the simul-		
	ated spindle is		1) Whether the 87103 chip is on the motherb-
	used, no output		oard. 2) Check the value of parameter 0539~542
	is generated		or recalculate and set the gear ratio of the
	from the simul-		spindle housing. 3) Replace the motherboard.
	ated voltage		
18	The control sy-	Output of an	1) Please confirm that SSTP*=1, i.e. G120#6=
	stem has no ou-	analog voltage	1
	tput of simula-	There is a fault	2) Set the parameters corresponding to the
	ted voltage when	in the circuit	highest speed when the simulated voltage is
	the main shaft	or there is a	set to 10V, for example: For T series, set PRM
	is running in	problem with the	540=6000
	simulation	parameters	3) In AUTO or MDI mode, enter the S command
			and use the multimeter to measure the output
			of SVC on the M12 or M26 ports.
			4) If not, replace the motherboard
19	The machine tool		
	oil pump cannot	Thora is a fault	
	start, and the	ine the input (1) Check for obvious signs of burning on the
	cylinder does		components TD62107 on the input/output board
	not move when	output board	2) Replace the input/output card or compone-
	the machine tool	output signai	nts on the input/output card TD62107
	changes the kn-	Гоор	
	ife		
20		The external	1) Measure the resistance to ground of $+5V$,
	The red light of	power supply is	+15V, +24V and +24E.
	the power alarm	short circuit	2) If it is caused by internal short circuit
	is on, and the	Or internal pr-	of the system printed board, all the signal
	display screen	inted board po-	line sockets connected to the printed board
	does not show	wer short circ-	can be unplugged, and then the printed board
		uit	can be removed piece by piece

			Pull it up, turn on the power after each pull,
			until you find that one of the printed boards
			is pulled out and can be powered on. This can
			be considered to be caused by this
			Caused by a short circuit in the power supply
			inside the printing plate.
21			1) Check the emergency stop circuit in the
		Check diagnosis	electrical diagram; 2) check whether the tra-
	The system dis-	G121.4=0, the	vel switch of each axis of the machine tool is
	play screen sh-	emergency stop	broken or not: 3) after clearing all the
	ows NOT READY	circuit is fau-	system parameters and programs, input the sy-
		lty	stem data such as parameters and machining
			programs again.
22	In manual or	1) The numbers	1) Determine whether G121.4 (*ESP signal) is
	automatic mode	displayed on the	equal to 1:
	The machine is	position screen	2) Determine whether G121 7 (ERS signal) is
	not running	do not change	equal to 0.
	list raining	do not change	3) Determine whether G104.6 (RRW signal) is
			oqual to 0:
			4) Determine the status of $G122\#0 \#1$ and $\#2$
			(122 - *****101) indicatos IOC status C
			122 - 101 indicates 500 status. 0
			5) Chack whather the check is being performed
			5) check whether the check is being performed.
			Prease contributing that DGN800 (position deviation
			ON)>PRM500 (Check width).
			6) Check the Interfock Signal diagnosis for
			4) equals 0.
			7) check the ratio signal $G121\#0~\#3$ (001 , 00
			2, 0V4, 0V8). II PRM03#4 (0VRI) =0, WHEN G
			8) Check the JUG multiplier signal G104#U~#3,
			namely JUVI, JUV2, JUV4, and JUV8. When JUVUI
			is to JOV8=0000, its multiplier is
			0%
		dicplayed on the	Check the machine teal look signal and discu
			check the machine tool rock signal and diagn-
		position of the	ose whether GTT/#TTS equal to 0 (T.e., MLK
			signar).
		changes	
) Uneck the signal to determine whether G122#
		0	2, #1 and #0 are 101 (I.e., MD4, MD2 and MD1
			signals);
	in manual mode,	screen	2) Uneck whether the feed axis and its axial
23	the machine ca-	ine position	direction signals have been input into the
	nnot run	aisplay number	system, G116#3, #2, that is, -X, +X signals;
		aoes not change	3) Check whether the positioning is in progr-
			ess and confirm that DGN800 (position deviat-
			ion)>PRM500 (positioning width);

4) Check parameters PRM517 or 512,513,514,515.
Under normal conditions, PRM517 is 3000;
5) Check whether the interlock signal has
worked;
6) Check the ratio signal *OV8, *OV4, *OV2, *
OV1 to diagnose G121#3~#0. If PRM3#4=0, G
121=****1111, the ratio is 0%; when PRM3#4=1,
G121=****0000, the ratio is 100%.
7) Check the JOG multiplier signal, when the
diagnosis G104=****0000, its multiplier is 0%;
8) Check the parameter setting of JOG feed
rate, that is, RM559 to 562; 9) For lathe
machine tools, it should be confirmed whether
the current feed rate is per minute or per
revolution when PRM8#4=0, JOG feed rate is per
minute, otherwise it is per revolution.

24	In automatic		1) Confirm the machine tool operation mode,
	mode, the mach-	1) The start	i.e., G122#2~#0 (MD4, MD2, MD1). If G122=*****
	ine tool cannot	indicator light	001. it is AUTO mode. If G122=****000. it is
	run	of the machine	MDL mode 2) Check whether the operation start
		is also not on	(ST) signal is input i.e. (120#22) Confirm
		(CYCLE START)	(ST) Signal IS Input, T.e., GI20#23) Contribution
			the reed hold signal ("SP), I.e., GI2I#5=1;
		2) The machine	1) Check diagnosis 700
		start indicator	DGN 0700
		light is on, but	A.700#0 (CFIN): M, S, T functions are being
		no alarm	executed b.700#1 (CMTN): Automatic operation
			instructions are being executed
			c.700#2 (CDWL): The pause instruction is being
			executed d.700#3 (CINP): The in-position check
			is being executed e.700#4 (COVZ): The multip-
			lier is 0% f.700#5 (CITL): The interlock sig-
			nal input is being executed
			a 700#6 (CSCT): waiting for spindle speed ar-
			rival signal DNC701#6: CPST is the reset sig
			nal input of operations of a systemal reset
			nal liput of ellergency stop, external reset
			and MDT Reyboard;
			2) Check whether interlock signal input is
			present;
			3) Check whether the start interlock signal,
			namely G120#1, has been input;
			4) When PARAM24#2=1, the spindle speed reac-
			hes the signal SAR is valid, that is, when the
			spindle does not reach the specified speed,
			the machine tool can not run automatically;
			5) Check the fast feed speed PARAM518~521;
			6) Check the fast feed ratio, which also
			depends on the set value of PRM003#4 (OVRI).
			FO=PRM533
			G116#7 (ROV1)
			G117#7 (ROV2)
25	The machine su-	There are sign-	
	ddenly stops in	als such as em-	1) Case di agnosi s 712
	automatic oper-	ergency stop and	2) check up
	ation	external reset	G121.4#4 (ESP) Stop signal G121#7 (ERS) Exte-
		innut	rnal reset signal G104#6 (RRW) Reset reverse
		Input	signal G121#6 (*SP) Pause signal G116#1 (SBK)
			Single segment execution program signal
	After the mach		
	ino io turnad		
	on, some keys on	ine input signal	1) Check whether the MDI keyboard is properly
26	the MDI keyboa-	of the operation	grounded. 2) Replace the storage board A16B-
	rd, such as the	panel is abnor-	2201-010*.
	PAGE key and the	mal	
	cursor key, fail		
	for about half		

	an hour		
27	The MDI mode is	The G90 or G91	In the "SETTING" screen, set ABS (this can
	always G90 or G	mode is set un-	also be done in other systems.)
	91	der the MDI mode	
28	The system is not powered on and the system control panel is removed	Because in com- munication, the communication interface chip	Replace storage board A16B-2201-010* or A16B- 1212-021*, and of course, you need to re-enter the following data:

	One piece of		
	land was unloa-	The short circ-	
	ded and it was	uit between the	a. system parameter,
	found that the	working voltage	b.PMC parameter
	storage board	and OV of $\pm 15V$	c. Programs after 09000, d. Macro variables or
	could be powered	in 75188 and	P-CODE, etc
	after being un-	75189 is caused	
	loaded		
29		Measure the +24D	If the voltage value of +24D is OV, or the
	All switches on	of the input/	resistance between +24D and OV is measured at
	the machine's	output board,	O to tens of ohms when the power is off,
	control panel do	as +24D is the	please replace the motherboard and storage
	not function, i.	operating volt-	board at the same time
	e., all input/	age of the sig-	
	output points do	nal receiver on	
	not function	the input/output	
		board	
	The display sc-	The display sc-	1) The characters on the motherboard show
20	reen characters	reen shows a	whether the ROM is installed; 2) Replace the
50	are not displa-	problem with the	display screen; 3) Adjust the display screen;
	yed properly	Гоор	4) Replace the motherboard.
31	Characters on		
	the display sc-	The display sc-	
	reen are normal,	reen shows a	1) Clean the motherboard.
	but in EDIT mo-	fault in the	2) Replace the motherboard.
	de, there is no	Гоор	
	cursor		
32	The system cra-	The CPU and the	1) Do the full clearing memory experiment,
	shes and the	CPU peripheral	re-enter the parameters and program;
	screen cannot be	circuit cannot	2) Replace the motherboard A20B-2002-065* or
	switched	work properly	A20B-2000-017*.
33	The system has	The display loop	1) Remove the graphics board and connect the
	graphics capab-	of the system is	display screen signal line to the CCX5 of the
	ilities but does	faul ty	storage board. If the picture can be displayed
	not display gr-		normally, replace the graphics board
	aphics, and so-		
	metimes nothing		
	is displayed on		
	the screen		
		Due to external	
		relays and per-	
	The system can-	ipheral voltag-	
	not be powered	es, the TD62107	1) Deploce the institute of the institut
24	on properly, and	on the input/	r) Replace the input/output board. 2) Repl-
54	the input/output	output interface	ace the input/output board
	board has seri-	board is sever-	1D02107。
	ous burn marks	ely burned out	
		and a power sh-	
		ort circuit is	

		caused	
35	The system must		1) Check and confirm whether the battery
	be replaced with	Batteries are	connection cable is damaged; 2) If the battery
	a battery after	for protection	holding circuit on the storage board is bad,
	about half a	The system is	please replace the storage board
	month or a month	not powered on	
	of operation,	In this case,	
	otherwise the	the NC data is	
	parameters will	not lost	
	be lost		
36	The machine tool	The PMC-L ROM	1) Check and confirm whether the PMC-L ROM is
	cannot work no-	was not selected	intact; 2) Replace the storage board, because
	rmally. The ma-	by the system,	the PMC ROM chip select signal line may be
	chine tool has	that is, the	broken.
	the PMC-L func-	PMC-L ROM did	
	tion, and PRM60#	not work	
	2=1, but the		
	ladder diagram		
	cannot be viewed		
	on the display		
	screen		
37	The system shows	The hour hand	1) Confirm the clock display function that
	the clock hand	circuit is not	ic parameters ofter number 000: 2) Deplace
	The function is	normal	the storage board because the clock ship and
	di spl ayed but		the clock control loop are on the storage
	the system time		the crock control loop are on the storage
	is not displayed		poard.

38	Function on MDI		1) Check to see if the MDI cable is damaged;
	keyboard	The signal rec-	2) Replace the storage board, because the
	Some of the keys	eiving circuit	signal receiving circuit of the MDI keyboard
	work, some of	of the MDI key-	is on the storage board. 3) Replace the moth-
	the keys don't	board is faulty	erboard, because the signal control circuit of
	work		the MDI keyboard is on the motherboard
39	There is no al-	The grave of me	
	arm on the dis-	tor foodback	1) Check whether the motor encoder and feed
	play screen, but	Thoro is a pro	cable are in good condition; 2) Replace the
	when the machine	hlom with the	shaft card, because the gray code signal rec-
	tool runs, the		eiving circuit and control circuit of the
	motor runs very		motor encoder are on the shaft card
	l oudl y		
40	During the ope-		1) Replace the system power supply. 2)
	ration of the		Replace the power input unit.
	machine tool,	Power supply	
	the control sy-	system failure	
	stem occasiona-		
	lly has a sudden		
	power failure		
41	Machining cent-	Parameter sett-	
	er: when the	ing	Please check the following parameters:
	spindle is run-		1) PRM14.2=1;
	ning, the actual		2) $PRM/1#0=0/1$; When $PRM/1#0=0$, the feedback
	speed of the		The should be connected to JY4. When PRM/T#U=
	spinare running		I, the reedback line should be connected to M
	cannot be disp-		21. 2) DDM(501#2 1 4) DDM(010 4 1
	display scroop		5) PRM0301#2=1; 4) PRM910.4=1;
42	The system uses	System software	1) Change the character display POM: 2) Cha-
42	a 14 "monitor	and parameters	nge the function parameter of display format
	but the display		inge the function parameter of dispray format.
	format of the		
	monitor screen		
	is the same as		
	that of the 9"		
	monitor screen		
43	Fast moving mu-	Parameter sett-	Modify parameter 41#3 from 1 to 0
	ltiplier,	i ng	
	(ROV1, ROV2)		
	0%, 25%, 50%, 100%		
	opposite		
	When viewing a		
	ladder diagram,		
	the address sy-	 _, , ,	
44	mbol of the la-	ine display sc-	Adjust the [BRIGHT] and [CONT] behind the
	dder diagram	reen is too dark	display screen until it displays properly.
	The number and		
	display screen		

-	1	I	
	The software at		
	the bottom of		
	the screen doe-		
	sn't show up		
45	Some keys on the	The fault is	Replace the control panel of the machine tool
	machine tool	caused by the	operation panel A16B-1310-0380.
	control panel	control panel A	
	work and some do	16B-1300-0380 of	
	not	the machine tool	
		operating panel	
46	After working	Check that the	1) Some components on the motherboard fail;
	for a period of	+5V voltage on	2) Replace the motherboard A20B-2002-065*.
	time, sometimes	the motherboard	
	one day, somet-	is around 4.6~	
	imes even three	4.8V	
	or five days,		
	the machine su-		
	ddenly loses		
	power. After		
	starting up,		
	sometimes the		
	system can work		
	normally, some-		
	times it cannot		
	work normally.		
	The system is in	The system has	1) Check to confirm that the additional DAM
47	general condit-	THE SYSTEM MAS	an the storage board is correctly installed
	i on	KAW	on the storage board is correctly installed;

	It works corre-	Parity error	2) Replace the storage board. Of course, you
	ctly, but when		need to re-enter the following data after
	running programs		replacing the storage board:
	larger than 64K		a. system parameter,
	bytes, it repo-		b.PMC parameter
	rts 910 or 911		c. Programs after 09000,
	alarms		d. Macro variables or P-CODE, etc
48	When the machine	The system has a	1) Hold down the RESET and DELET on MDI while
	is turned on,	RAM parity error	turning on the machine. If the 910 or 911
	910 or 911 alarm		alarm does not appear, re-enter the CNC para-
	appears		meters, PMC parameters, and program, etc., to
			restore the system to normal. 2) If pressing
			RESET and DELETE does not clear the 910 or 911
			alarm, replace the storage board.
49		An even/odd al-	
	The system gen-	arm occurs on	Replace the shaft card AI6B-2200-039 [^] , UC (32
	erates alarm 913	the common RAM	DIT) Series servo; or A16B-2200-036 [°] , UC
	or 914	on the servo	(32bit) S series servo; or A16B-2200-022 [*] , OC
		control board	(16bit) S series servo.
50			1) Replace the ladder diagram editing box. 2)
	Alarm 915 and	RAM parity error	The backup battery of the memory card is less
	916 appear on	occurs in the	than 2.6V, and the "BAT" warning will be
	the display sc-	ladder diagram	displayed on the display screen at the same
	reen	editing box	time. 3) Do a full memory test, then re-input
			parameters, ladder diagram, etc.
51	After the system	Watch dog timer	1) Fasten the fixing screws of the shaft
	is powered on,	Alarm	clamp. 2) Replace the shaft clamp.
	it can work no-		
	rmally, but as		
	long as the sh-		
	aft card or ma-		
	aft card or ma- chine tool is		
	aft card or ma- chine tool is shaken by hand,		
	aft card or ma- chine tool is shaken by hand, there will be		
	aft card or ma- chine tool is shaken by hand, there will be alarm 920		
52	aft card or ma- chine tool is shaken by hand, there will be alarm 920 There are seve-		
52	aft card or ma- chine tool is shaken by hand, there will be alarm 920 There are seve- ral 920 alarms	System Watch dog	1) Please clean the printed board of the
52	aft card or ma- chine tool is shaken by hand, there will be alarm 920 There are seve- ral 920 alarms every day, and	System Watch dog alarm is caused	1) Please clean the printed board of the system. 2) Replace the motherboard A20B-2002-
52	aft card or ma- chine tool is shaken by hand, there will be alarm 920 There are seve- ral 920 alarms every day, and the fault can be	System Watch dog alarm is caused by the control	 Please clean the printed board of the system. Replace the motherboard A20B-2002-065*. Check whether the shielding line of the shielding line shielding line of the shielding line of the shielding line shi
52	aft card or ma- chine tool is shaken by hand, there will be alarm 920 There are seve- ral 920 alarms every day, and the fault can be cleared after	System Watch dog alarm is caused by the control system motherb-	 Please clean the printed board of the system. Replace the motherboard A20B-2002-065*. Check whether the shielding line of each signal line of the system is well group-
52	aft card or ma- chine tool is shaken by hand, there will be alarm 920 There are seve- ral 920 alarms every day, and the fault can be cleared after turning off the	System Watch dog alarm is caused by the control system motherb- oard or interf-	 Please clean the printed board of the system. Replace the motherboard A20B-2002-065*. Check whether the shielding line of each signal line of the system is well grounded. Please separate the signal line from
52	aft card or ma- chine tool is shaken by hand, there will be alarm 920 There are seve- ral 920 alarms every day, and the fault can be cleared after turning off the machine and then	System Watch dog alarm is caused by the control system motherb- oard or interf- erence	 Please clean the printed board of the system. Replace the motherboard A20B-2002-065*. Check whether the shielding line of each signal line of the system is well grounded. Please separate the signal line from the power line or power supply line
52	aft card or ma- chine tool is shaken by hand, there will be alarm 920 There are seve- ral 920 alarms every day, and the fault can be cleared after turning off the machine and then turning it on	System Watch dog alarm is caused by the control system motherb- oard or interf- erence.	 Please clean the printed board of the system. 2) Replace the motherboard A20B-2002- 065*.3) Check whether the shielding line of each signal line of the system is well groun- ded. 4) Please separate the signal line from the power line or power supply line.
52	aft card or ma- chine tool is shaken by hand, there will be alarm 920 There are seve- ral 920 alarms every day, and the fault can be cleared after turning off the machine and then turning it on again	System Watch dog alarm is caused by the control system motherb- oard or interf- erence.	 Please clean the printed board of the system. Replace the motherboard A20B-2002-065*.3) Check whether the shielding line of each signal line of the system is well grounded. Please separate the signal line from the power line or power supply line.
52	aft card or ma- chine tool is shaken by hand, there will be alarm 920 There are seve- ral 920 alarms every day, and the fault can be cleared after turning off the machine and then turning it on again	System Watch dog alarm is caused by the control system motherb- oard or interf- erence.	 Please clean the printed board of the system. 2) Replace the motherboard A20B-2002-065*.3) Check whether the shielding line of each signal line of the system is well grounded. 4) Please separate the signal line from the power line or power supply line. Replace the 7/8 axis servo board. 2) The
52	aft card or ma- chine tool is shaken by hand, there will be alarm 920 There are seve- ral 920 alarms every day, and the fault can be cleared after turning off the machine and then turning it on again The alarm 922	System Watch dog alarm is caused by the control system motherb- oard or interf- erence.	 Please clean the printed board of the system. 2) Replace the motherboard A20B-2002-065*.3) Check whether the shielding line of each signal line of the system is well grounded. 4) Please separate the signal line from the power line or power supply line. Replace the 7/8 axis servo board. 2) The CPU or peripheral circuit has a fault, replace
52	aft card or ma- chine tool is shaken by hand, there will be alarm 920 There are seve- ral 920 alarms every day, and the fault can be cleared after turning off the machine and then turning it on again The alarm 922 appeared on the	System Watch dog alarm is caused by the control system motherb- oard or interf- erence. 7/8 Axis servo	 Please clean the printed board of the system. 2) Replace the motherboard A20B-2002-065*.3) Check whether the shielding line of each signal line of the system is well grounded. 4) Please separate the signal line from the power line or power supply line. Replace the 7/8 axis servo board. 2) The CPU or peripheral circuit has a fault, replace the motherboard. 3) The software cannot work
52	aft card or ma- chine tool is shaken by hand, there will be alarm 920 There are seve- ral 920 alarms every day, and the fault can be cleared after turning off the machine and then turning it on again The alarm 922 appeared on the display screen	System Watch dog alarm is caused by the control system motherb- oard or interf- erence. 7/8 Axis servo system alarm	 Please clean the printed board of the system. 2) Replace the motherboard A20B-2002-065*.3) Check whether the shielding line of each signal line of the system is well grounded. 4) Please separate the signal line from the power line or power supply line. Replace the 7/8 axis servo board. 2) The CPU or peripheral circuit has a fault, replace the motherboard. 3) The software cannot work properly because the storage board cannot work

			power unit is not normal, which may also cause
			an alarm.
54	When the soft operation key is pressed, an al- arm 930 appears	The signal cable of the soft op- eration key is damaged	After investigation: the connection cable of the soft operation key is damaged, and some signal lines are pressed together with the metal panel of the machine tool. Please rewi- re.
55	The alarm 930 appears on the display screen. Even if the ma- chine is turned off and then turned on again, the alarm 930 still appears	The system CPU and its periph- eral circuits are faulty	 Replace the motherboard A16B-2000-017* or A20B-2002-065*. Replace storage board A16B-2200-010* or A 16B-1212-021. Shaft changer A16B-2200-036 or A16B-2200 -036. Replace the input/output interface board.
56	Occasionally, the alarm is reported at 930, sometimes every 10 to 30 minut- es, and someti- mes once or tw- ice a day	930 The alarm system is It is caused by the failure of the system CPU and its periph- eral circuits	 Confirm whether the grounding is correct; Replace the motherboard A20B-2002-065*.
57	940 report to the police	The printing plate is insta- lled incorrectly	 When using the servo software 9030 and the control software 0469 or 0669 later vers- ions, the shaft cards A16B-2200-036* and A16B- 2200-039* can be interchangeable. However, when using version 9040 or hig- her of the servo software, if the system is

			If the axle card is A16B-2200-0360, the 940
			alarm will appear.
58		The connection	1) Check to confirm that the connection is
	The system works	between the st-	tight. 2) Replace the motherboard. 3) Replace
	for one day or	orage board and	the storage board. Of course, you need to re-
	About two days	the motherboard	enter the following data after replacing the
	later, the 941	is poor	storage board: a. system parameters, b.PMC
	alarm appeared		parameters c. programs after 09000, d.Macro
			variables or P-CODE, etc.
59		Serial spindle	
		control unit	1) Check to confirm whether the optical
	The alarm 945 is	The communicat-	cable and optical cable adapter are correct.
	displayed on the	ion between the	2) Check to confirm whether the spindle cont-
	display screen	original and the	rol unit is in good condition. 3) Replace the
		system is inco-	optical cable seat on the storage board.
		rrect	
60	The alarm 945	The communicat-	1) Clean the optical cable socket on the
	appears for one	ion of the ser-	storage board. 2) Replace the storage board.
	day or more, and	ial spindle sy-	3) Replace the optical cable and its adapter.
	can work norma-	stem is raulty	
	lly after shut-		
	ting down and		
	restarting		1. The optical cable from the first spindle
	Alarm 946 appe-	arror accurred	amplifier to the second spindle amplifier is
61	ars on the dis-	on the second	faulty 2 The ontical cable adapter cable is
	play screen	serial spindle	faulty
		The second spi-	1. Check to confirm that the second spindle is
62	946 report to	ndle communica-	correctly connected. 2. Replace the second
	the police	tion error	spindle servo amplifier
63	950 report to		1. Replace the +24E fuse on the power supply.
	the police	The fuse of the	2. It may also be caused by a fault in the
		+24E power sup-	detection circuit of the motherboard and sto-
		ply is blown	rage board +24E, so the motherboard or storage
			board also needs to be replaced.
		The sub CDU and	1. At the same time, press "S" and "Delete" to
	060 roport to	its poriphoral	turn on the machine and check whether the
64	the police		alarm is eliminated. 2. If the alarm cannot be
		faul ty	eliminated, replace the sub-CPU printing boa-
		Taurty	rd.
65	998 The alarm is	ROM parity error	1. Replace the ROM at the displayed location.
	raised and the		2. Replace the storage board.
	ROM number for a		
	particular loc-		
	ation is displ-		
	ayed on the mo-		
	nitor screen		
66	OL system: 603	603 Alarm: PMC	Replace A16B-1212-0270 (laser signal detection
00	and 604 alarms	WATCHDOG Alarm	board).

	appear at the same time	604 Alarm: PMC ROM parity error	
67	Report to the police at irre- gular intervals 401 941 Alarm, 930 alarm	System hardware failure	Repl ace A16B-2201-010*.
68	401 report to	1-2 The DRDY	1. The DRDY circuit of the shaft card is
	the police	signal of the	faulty or there is a broken wire on the shaft
		servo unit can-	card. 2. Replace the shaft card.
		not be fed back	
		to the system.	
		After checking,	
		the servo cont-	
		rol unit of the	
		1-2 axis motor	
		is normal	
69	Processing cen-	There is a pro-	\ensuremath{Please} swap the grating feedback PA, PA* with
	ter: The X axis	blem with the	PB, PB*.
	adopts full fe-	feedback signal	
	edback of grat-	connection	
	ing. When the X		
	axis is moved,		
	the flywheel and		
	410 and 411 al-		
	arm		

diagnosis 7204- in and after board ion of servo board converter on the shaft card. 1. and after motor and servo control unit are normal The return cir- motor and servo cuit is faulty converter on the shaft card. 2. Replace the converter on the shaft card. 71 414 Alarm, check that the motor and servo out is repla- cut circuit of the motor is in overcurrent al- atif 414 Alarm, check diagnosis 72045 1. that is, OVC The motor is in overcurrent al- atif 44, 424 and 434 appeared on the display screen The motor is flooded and the motor is repla- ced. 1 The motor is flooded and the motor is repla- ced. 73 The alarm 414, 424 and 434 appeared on the display screen Check that the spindle amplifier, er and power module are nor- mat The alarm 414, 424 and 434 appeared on the display screen Check that there spindle amplifier, is no .324 out- put on power module Ao84- 6077-H111 Replace power unit A068-6077-H111. 75 Occasionally, di agnosis 70044- re checking, di agnosis 70044- re checking, di agnosis 70044- re checking, di agnosis 70044- aservo and cut on the servo shaft card 1 shows that the is faulty 1. Check to confirm whether the encoder feed- back line of the motor is shielded and groun- ded. 76 The system works for one day or serva flat card, 1 shows that the is faulty Servo low volt- reis faulty 76 The system works for one day or alarm 414, 424, the there is an alarm 414, 424, the can back Servo low volt- age alarm, check the there is an control I is caused by the absence of phas	70	414 Alarm, check	Current detect-	1. Replace the shaft card. 2. Replace the A/D
1, and after board 1, and after board resting, the The return cir- motor and serve cuit is faulty 71 414 Alarm, check The serve has an diagnosis 720%5 1. Replace the shaft card. 2. Replace the command cable. 72 The motor is in overcurrent al- and serve contr- rol unit are normal The motor is in overcurrent al- arm, check the three-phase shi the motor to ground 1. The motor is flooded and the motor is repla- ced. 2. If the Z-axis motor has a brake, it may be that the brake control circuit is faulty, so that the brake is not opened. 73 The alarm 414, 424 and 434 appeared on the display screen Check that the spindle card and the motor feedback line and command line are module are nor- mal 74 The alarm 414, 424 and 434 appeared on the display screen High current alarm, theck that there is no +22V out- mal Replace power unit A068-6077-H111. 75 Occasionally, 414 and 424 al- alarm, the cur- arms occur. Af- for one day or servo shaft card 1 shows that the is faulty High current is faulty 1. Check to confirm whether the encoder feed- back line of the motor is shilded and groun- ded. 2. Replace the shaft clamp. 76 The system works is an untare in no- rmal state Servo low volt- for one day or age alarm, check several days and then there is an control It is caused by the absence of phase in the external switch of the machine tool working voltage, so replace the switch.		diagnosis 720#4=	ion of servo	converter on the shaft card.
testing, the motor and servo cuit is faulty control unit are normal The return circuit is faulty 71 414 Alarm, check that the motor and servo control unit are normal The servo has an normal 1. Replace the shaft card. 2. Replace the command cable. 72 414 Alarm, check that the motor and servo control unit are normal The motor is in overcurrent al and servo cort circuit of the motor to ground 1. The motor is flooded and the motor is replaced. 2. If the Z-axis motor has a brake, it may be that the brake control circuit is faulty, so that the brake control circuit is faulty, so that the brake control circuit is findle amplific and power module are normal 73 The alarm 414,424 and 434 appeared on the display screen indule Adde and the motor is shelded and forth: or it is module are normal The motor feedback line and command line are spindle amplific and power module are normal 74 The alarm 414,424 and 434 appeared on the display screen indule Adde and the motor is shelded and groundare are normal Check that there is faulty 75 Decasionally, High current 414 and 424 al- alarm, the cura main screux and for the is faulty servo shaft card is faulty server and sys and servo cardial unit are in no-rmal state 1. Check to confirm whether the encoder feedback line of t		1, and after	board	
motor and servo control unit are normal cuit is faulty 71 414 Alarm, check that the motor and servo rol unit are normal The servo has an diagnosis 720%- rol unit are normal 1. Replace the shaft card. 2. Replace the command cable. 72 The motor is in overcurrent al- atta Alarm, check diagnosis 720%- it, that is, OVC The motor is in overcurrent al- ort circuit of the motor to ground 73 The alarm 414, 424 and 434 appeared on the display screen Check that the spindle card and servo amplifier, and are ror- module are nor- bitten by mice. The motor feedback line and command line are aged and corroded in the long-term work; or the cable is worn out as the noving parts of ier and power module A068- 6077-H111 74 The alarm 414, 424 and 434 appeared on the display screen Check that ther spindle card and spower module A068- 6077-H111 Replace power unit A068-6077-H11. 75 Occasionally, 414 and 424 al- alarm, the cur- arms occur. Af- rent detection ter checking, diagnosis 700%- servo motor and servo control unit are in no- rmal state 1. Check to confirm whether the encoder feed- back line of the motor is shielded and groun- ded. 2. Replace the shaft clamp. 76 The system works serve alays and motor and serve control unit are in no- rmal state Servo low volt- for one day or age alarm, check motor and serve control unit are in no- rmal state 1. I is caused by the absence of phase in the external switch of the machine tool working voltage, so replace the switch.		testing, the	The return cir-	
control unit are normal normal 71 414 Alarm, check that the motor and serve cont-rol unit are normal The motor is in overcurrent al-arm, check that is, owc 72 414 Alarm, check that is, owc The motor is in overcurrent al-arm, check that the motor to ground 1 The motor is flooded and the motor is replaced. 73 The alarm 414, 424 and 444 appeared on the display screen Check that the spindle amplifier, spindle amplifier, spindle amplifier, appeared on the display screen The motor feedback line and command line are aged and corroded in the long-term work; or the cable is worn out as the moving parts of the motor to ground 74 The alarm 414, 424 and 444 appeared on the display screen Check that there is not even module are normal alarm, the current detection ter checking, display screen Replace power unit A068-6077-H111. 75 Occasionally, High current als servo shaft card 1 shows that the is servo shaft card 1 shows that the is servo shaft card 1 shows that the is rear or normal state 1. Check to confirm whether the encoder feed-back line of the motor is shielded and grounded. 2. Replace the shaft clamp. 76 The system works servo low volt-for on the shaft clamp. 1. It is caused by the absence of phase in the external switch of the machine tool working voltage, so replace the switch. 76 Serva and servo control unit are in no-mal state Servo low volt-for ontrol unit are in no-mal state 76 Serval days and motor and servo control unit are in no-ma		motor and servo	cuit is faulty	
normal 71 414 Alarm, check diagnosis 72045- overload alarm overlo		control unit are	-	
71 414 Alarm, check diagnosis 720/5- rol unit are normal The servo has an overload alarm that the motor and servo cont- rol unit are normal 1. Replace the shaft card. 2. Replace the command cable. 72 The motor is in overcurrent al- arm, check diagnosis 720/5- 1, that is, OVC The motor is flooded and the motor is repla- ced. 2. If the Z-axis motor has a brake, it may be that the brake control circuit is faulty, so that the brake control circuit is faulty, so that the brake control circuit is faulty, so that the brake ontrol circuit is faulty, so that the brake and command line are aged and corroded in the long-term work; or the motor feedback line and command line are aged and corroded in the long-term work; or the machine tool move back and forth: or it is bitten by mice. 74 The alarm 414,424 and 434 appeared on the display screen 74 Check that there module are nor- mal Replace power unit A068-6077-H111. 75 Occasionally, 414 and 424 al- alarm, the cur- arms occur. Af- i shows that the servo shaft card a servo shaft card is faulty 1. Check to confirm whether the encoder feed- back line of the motor is shielded and groun- ded. 2. Replace the shaft clamp. 76 The system works servo control unit are in no- rmal state Servo low volt- age alarm, check motor and servo control unit are in no- rmal state 1. t is caused by the absence of phase in the external switch of the machine tool working voltage, so replace the switch.		normal		
diagnosis 72045- 1, and check that the motor and servo cont- rol unit are normal overload alarm command cable. 72 The motor is in overcurrent al- arm, check diagnosis 72045- 1, that is, OVC The motor is in overcurrent al- arm, check the three-phase sho ort circuit of the motor to ground 1 The motor is flooded and the motor is repla- cod. 2. If the Z-axis motor has a brake, it may be that the brake control circuit is faulty, so that the brake is not opened. 73 The alarm 414,424 and 434 appeared on the display screen Check that the spinile card and servo amplifier, mal The motor feedback line and command line are aged and corroded in the long-term work; or the machine tool move back and forth; or it is bitten by mice. 74 The alarm 414,424 and 434 appeared on the display screen Check that there module A068- 6077-H111 Replace power unit A068-6077-H111. 75 Occasionally, 414 and 424 al- alarm, the cur- arms occur. Af- is show that the is faulty 1. Check to confirm whether the encoder feed- back line of the motor is shielded and groun- ded. 2. Replace the shaft clamp. 76 Servo form and servo control unit are in no- rmal state Servo low volt- age alarm, check motor and servo control unit are in no- rmal state 76 Several days and then there is an alarm 414, 424, and att, eap ba Servo low volt- motor and servo control It is caused by the absence of phase in the external switch of the machine tool working voltage, so replace the switch.	71	414 Alarm, check	The servo has an	1. Replace the shaft card. 2. Replace the
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diagnosis 700#4= servo shaft card 1 shows that the is faulty servo motor and servo control unit are in no- unit are in no- rmal state rmal state The system works Servo low volt- for one day or age alarm, check several days and motor and servo then there is an control alarm 414, 424, The control unit and it can be is in normal is in normal		ter checking,	circuit on the	converter on the shaft clamp.
1 shows that the is faulty servo motor and servo control unit are in no- rmal state The system works Servo low volt- for one day or age alarm, check several days and then there is an alarm 414,424, and it can be is in normal		diagnosis 700#4=	servo shaft card	
servo motor and servo control unit are in no- rmal state in no- rmal state The system works Servo low volt- age alarm, check several days and then there is an alarm 414,424, It is caused by the absence of phase in the external switch of the machine tool working voltage, so replace the switch.		1 shows that the	is faulty	
servo control unit are in no- unit are in no- rmal state The system works Servo low volt- for one day or age alarm, check several days and motor and servo then there is an control alarm 414, 424, The control unit and it can be is in normal is in normal		servo motor and		
unit are in no- rmal stateunit are in no- rmal stateThe system worksServo low volt- age alarm, check motor and servo then there is an alarm 414,424,It is caused by the absence of phase in the external switch of the machine tool working voltage, so replace the switch.		servo control		
rmal stateThe system worksServo low volt- age alarm, check several days and then there is an alarm 414, 424,Servo low volt- age alarm, check motor and servo 		unit are in no-		
76The system works for one day or several days and then there is an alarm 414,424,Servo low volt- age alarm, check motor and servo controlIt is caused by the absence of phase in the external switch of the machine tool working voltage, so replace the switch.		rmal state		
76for one day or several days and then there is an alarm 414, 424,age alarm, check motor and servo controlIt is caused by the absence of phase in the external switch of the machine tool working voltage, so replace the switch.76it can be is in normal		The system works	Servo low volt-	
76several days and then there is an alarm 414,424,and it can be is in normalIt is caused by the absence of phase in the external switch of the machine tool working voltage, so replace the switch.		for one day or	age alarm, check	
76then there is an alarm 414,424,control The control unitexternal switch of the machine tool working voltage, so replace the switch.and it can be is in normal		several days and	motor and servo	It is caused by the absence of phase in the
alarm 414,424, The control unit	76	then there is an	control	external switch of the machine tool working
and it can be is in normal		alarm 414 424	The control unit	voltage, so replace the switch.
		and it can be	is in normal	

	eliminated after the shutdown and restart. Check diagnosis 720#6= 1, 721#6=1	working condit- ion	
77	The alarm 416 is displayed on the display screen	Motor feedback signal disconn- ection alarm	It is necessary to distinguish between hardw- are and software disconnection alarm. If it is a hardware disconnection alarm, please replace the motor encoder or cable; if it is a soft disconnection alarm, only modify the paramet- ers.
78	When the rigid tapping is exe- cuted, alarm 430 appears and the spindle control system is used A06B-6064-H002	When the rigid threading is executed, it is checked that there is no pr- oblem with the system paramet- ers, spindle system hardware and optical ca- ble.	Adjust the spindle system parameter F31 from 0 to 1.
79	The lathe spin- dle uses a high resolution mag- netic sensor, and an alarm 430 is reported when the rigidity tapping occurs	High resolution magnetic trans- mission The feedback signal of the sensor is abno- rmal	 Measure the feedback signal of the high resolution magnetic sensor with an oscillosc- ope and adjust it to the required amplitude. Remember not to install the magnetic drum of the magnetic sensor in reverse.

	Machining cent-		1. The servo control board is faulty 2. The
80	er: 434 alarm	Overload alarm	servo control unit is faulty.
00	di agnosi s 720#5=		3. The brake of the Z-axis motor is not open.
	1	The better	
81		Itage of the	It is best to use high quality batteries.
	There were	absolute posit-	
	317, 327 and 337	ion encoder for	
	calls for police	the X. Y. and Z	
		axes is low	
	0		1. Check whether the motor encoder is waterl-
22		A serial encoder	ogged. 2. Check whether the feedback cable of
82		error occurred	the motor encoder is damaged. 3. Replace the
	porree		motor encoder.
83	When returning	Parameter adju-	
	to zero, 510	stment	Change parameter 700 to 99999999 and parameter
	alarm and 511		704 to-99999999. When the zero is correct,
	alarm often oc-		change it back to its original value.
	cur		1 Clean the optical cable applies at the
84	Occasionally 408	Serial spindle	1. Crean the optical capie socket on the
04	calls the police	connection error	A 16B-2201-0101
85	Alarm 408 is	The system uses	1. Check the cable.
	displayed on the	a serial spind-	2. Check whether the power supply on the
	display screen	le, and the sp-	spindle amplifier is normal;
		indle amplifier	3. When the spindle amplifier shows an alarm
		does not start	of SU-01 or except for AL-24, the CNC power
		working properly	supply is turned on, and alarm 408 will also
		when the power	appear.
		supply is norm-	4. Whether the hardware connection is correct;
		al; if the CNC	5. Under the above conditions 1-4, the second
		is working nor-	spindle will also report alarm 408.
		mally but the	6. If the second spindle is used, set PARAM71#
		spindle amplif-	4=1.
		ier does not	
		work, then alarm	
		945 occurs	
86	The alarm 409 is	This alarm ind-	Once this alarm occurs, we should look at the
	displayed on the	icates that when	alarm number of the spindle amplifier and
	display screen	the spindle am-	troubleshoot according to this alarm number.
		plifier shows	
		alarm AL-XX, if	
		parameter 39/#/=	
		I, alarm 409	
		will be displa-	
		jyeu un the UNC	
			1. Replace the spindle amplifier AO6B-6087-
87	About half an	The system con-	H***.

	hour after the system is powe- red on, the CR T alarm appears. The alarm number of the main sh- aft amplifier is AL-31	trol section is not faulty, but the fault is caused by the feedback signal of the spindle amplifier or spindle motor	 Replace the encoder of the spindle motor. Replace the drive printed board in the spin- dle amplifier.
88	The system side shows alarm 409 and the spindle servo side shows alarm AL-31 NC side shows	 The feedb- ack signal of the axial motor is abnormal wiring error The spindle po- 	 Replace the signal feedback element and cable of the motor; It is also possible that the phase sequence of the motor U, V and W is wrong. Check whether the spindle position encoder
	409 alarm spin-	sition encoder	is installed correctly, including whether th-
	dle servo side	signal is inco-	ere is water in it and whether there is wear. 2. Replace the spindle position encoder.
90	Alarm 700 is displayed on the display screen	The temperature of the system control unit is high, and the temperature de- tector mounted on the motherb- oard has detec- ted it	1. Check whether the fan in the control cabi- net is broken; 2. Check if the temperature in the control cabinet is above 45 degrees Cels- ius. If so, consider opening the door of the control cabinet to dissipate heat or install an air conditioner. 3. If the temperature in the control cabinet is below 45 degrees Cels- ius, the motherboard or the temperature sensor on the motherboard may be faulty.

		High temperatu-	
		res	
91	An alarm 704 is displayed on the display screen The alarm 500~	This alarm ind- icates the main The shaft speed is due to the load It becomes abn- ormal because of the original cause	 Check if the spindle speed is constant. 2. If it is constant, check parameters PARAM 531,532,564,712.3. If the spindle speed is not constant, check if the cutting force is too high. If it is, adjust the cutting conditions. If the cutting volume is small, check if the tool is sharp. 5. Replace the spindle control unit or the spindle motor.
92	599 is displayed on the display screen	MACRO report to the police	macro program executor, dialog program input and other functions. Please refer to the rel- evant manual.
93	Numerical cont- rol system and computing Alarm No.86 oc- curs during co- mmunication be- tween machines	There is a pro- blem with the hardware of the communication interface	Replace A16B-2201-010* or A16B-1212-021* som- etimes along with the motherboard. Since the memory board is replaced, of course, the fol- lowing data needs to be re-entered: a. system parameter, b. PMC parameters, c. Programs after 09000
			d. Macro variables or P-CODE, etc.
94	Numerical cont- rol system and computing An alarm number 87 occurred in the communicat- ion between the machines	Computer numer- ical control system and com- munication Relevant param- eters and calc- ulations There is a com- puter side and communication The parameter settings are not matched	 Check the parameters 2, 12,552 and 553 of the system, as well as the Settings of input/ output =? and ISO =?. Check the Settings of communication related parameters on the comp- uter side (such as stop bit, baud rate and parity check bit). The communication software on the computer side failed.
95	Remote buffer No communication	Remote buffer Communication interface of the control board There is somet- hing wrong with the circuit or communication cable	 Check whether the M73 or M77 port is loose. Check whether the communication cable is too long (generally less than 60m); 3. Check whether the cable connection is correct; 4. Check whether the parameters are set correct- ly.
96	When the DNC2 board is used, DNC2 processing cannot be perf- ormed	The parameter setting is inc- orrect	NC parameter Settings should be set as follo- ws: Parameter 0 (ISO) =1 Parameter 0 (I/O) =10 Parameter 51 =**001*10 Parameter 55 =****0*** Parameter 251=10 parameter 320=5 parameter

	321=5 parameter 323=5 parameter 324=3 parame-
	ter 325=255
	Parameter 396= ****11*1 parameter 490=256
	The DNC2 cable connection is shown in the
	following figure:

			9 8 20 19 17 18 16 7 8 6 1 14 5 FG M77 D-SUB DNC2 Computer
97	When returning	Try to return to	The reason is that the feedback cable of the
	to the reference	the reference	motor is intermittent and not broken, so the
	point, alarm	point, but it is	feedback cable needs to be replaced.
	No.90 appeared,	not complete	
	and it was found		
	that there was		
	no fault in the		
	motor and shaft		
	card, and the		
	ing was correct		
		When writing a	
98	101 report to the police	program to the memory, the po- wer suddenly drops	Hold down the Delete key and turn on the machine to clear all programs, and then enter the part processing program and the program after 09000.
99	Even if parame-	This is because	The method to retrieve the password is as
	ter 10#2=1, the	the program af-	follows:
	program after O	ter 09000 is	1. Place parameter 64#4=1; parameter 629=0.
	9000 is invisi-	password prote-	2. Follow the diagnostic screen.
	ble	cted, but the	3 Find D4A0.
		password is lost	4When you enter A, B, C: press \cdot $% =1.01$ at the
			same time, A appears; press · and 2 at the
			same time, B appears; press - and 3 at the
			same time, trapped s. 5 Replace $D4\Delta\Omega$ with a decimal number to create
			the new password.
			6. Enter the password in parameter 798.
			7. Set parameter 64#4 to 0.
100	The control sy-		
	stem uses 14		The recovery method is: 1. Re-enter the system
	"CRT, and the		selection (function) parameter.
	screen display		2 At the same time, hold down "1" and "4" on
	is 9" format		the operation panel to connect the power sup-
	after full cle-		ply.
	aring		

FANUC 16 System series

0rder ber			Terms of set-
ᄱ	ratione symptom	Failure cause	tlement
1	The knife library		1. Not only should you check the system
	cannot change the	For large machi-	alarm number, but also check the working
	kni fe	ning centers, the	status and alarm status of the powe mate
		tool changing	series.
		device is contr-	2. Check whether the tool bank needs to
		olled by power	return to zero.
		mate	3. Check whether the input and output
			information of the tool bank is normal.
	The system sudd-	The system has	1 Poplace the methorheard
2	enly crashed du-	damaged compone-	2. Poplace the DMC module
	ring processing	nts	
3	16MA, drilling	System components	1. Do a full memory clean experiment and
	center: after the	fail	see if it still crashes.
	system is powered		2. If there is no crash, re-enter NC, PMC
	on, it crashes		parameters and machining program.
	agai n		3. Replace the system control module.
			1. Check *ESP, signal, check diagnosis G
			8#4, under normal condition G8#4=1.
			2. Check reset signal G008#7 G0008#6:
			When G0008#7 (ERS) is 1, an external
			reset signal is input.
			When GOOO8#6 (RRW) is 1, the reset rewind
			signal is input.
			3. Determine the selection signal: G
			0043 #2 #1 #0=MD4 MD2 MD1.
			4. Use the CNC diagnostic function 000~
			015 to confirm: sequential number infor-
	Neither manual		mation display
	nor automatic		000 WAITING FOR FIN SIGNA
	mode can be ope-	There is an eme-	001 MOTION
4	rated, and the	rgency stop sig-	002 DWEIL
	position display	nal or interlock	003 IN-POSITION CHECK
	number is not	signal input	004 FEED RATE OVERRIDE
	movi na		005 INTERLOCK/START LOCK
	5		006 PINPLE SPEED ARRIVAL CHECK
			010 PUNCHING
			011 READING
			012 WAITING FOR CLAMP
			013 JOG FEEDRATE OVERRIDE
			014 WAITING FOR RESET、ESP 、RRW OFF
			015 EXTERNAL PROGRAM NUMBER SEA-
			RCH
			5. On-site inspection:
			When the diagnostic number 0300 (position
			deviation) is greater than the parameter
			No1826 (position width), 003 is displayed

	as 1.
	6. Interlock signals entered: To find out
	which interlock signals are used in the
	machine tool, please check:
	PRM3003 When #0 (ITL) is (0), the inter-
	lock signal (*IT) is valid
	PRM3003#2 (ITX) is valid when (0), inte-
	rlock signal (*ITn) is valid
	PRM3003#3 (DIT) is (0) when the interlo-
	cking signal is (+MITn,

			-MITn) is effective, and then use the diagno-
			stic table to analyze:
			a.F008#0 * When IT is (0), interlock signal is
			input
			B G0130#3 2 1 0 *ITn is 0 interlocked
			signal input
			c Interlocking signals in each axis and dir-
			ection are input (+MITn -MITn)
			7 The manual feed sneed multiplier is zero. G
			G0011#/~#0, *JV15~*JV8
			When the multiplier is 0%, all the above
			addresses are 1 or all 0 8. CNC is in reset
		T I I I I I I I	state.
5	The machine tool	Ine Input/output	1. Check +24V power supply is normal.
	control panel	Interrace board	2. The interface control board for the machine
	does not work	or +24V power	tool operation panel is usually A16B-2200-0660
	The eventer lies	supply is faulty	
	heard is to	ine numeric and	1. Check if the cable is faulty. 2. Replace
6	poard is maltu-	cnaracter keys	the motherboard.
	nctioning	do not work	
7	The LCD screen	LUD SCREEN IS	I. Replace the LCD display. 2. Replace the LCD
	is dark	broken	Tamp tube. 3. Replace the display control
	Light, but still		module. 4. Adjust the brightness of the LCD by
	processabl e		using the variable resistor behind the LCD.
8		Display or mon-	1. Replace the display. 2. Replace the display
	The display sc-	i tor	screen control panel.
	reen is not vi-	The screen dis-	
	sible	play panel is	
		faul ty	
9	The machine tool	The signal to	Findings:
	cannot run in	lock the machine	G044#1 MLK;
	either manual or	is input	G0108#3, 2, 1, 0 MLKn;
	automatic mode,		MLK: The whole axis of the machine tool is
	but the position		locked;
	display value is		MLKn: The machine tool axis is locked;
	changi ng		When the above signal is 1, the machine tool
			lock signal is input.
			1. In the case of no power supply, measure the
			resistance value of +5V, \pm 15V, +24V and +24E
			resistance value of +5V, \pm 15V, +24V and +24E to the ground;
			resistance value of +5V, \pm 15V, +24V and +24E to the ground; 2. If this occurs when data is transmitted
	The control sy-	Dowor shart '	resistance value of $+5V$, $\pm 15V$, $+24V$ and $+24E$ to the ground; 2. If this occurs when data is transmitted between the computer and NC, replace A20B-
10	The control sy- stem is not po-	Power short ci-	resistance value of +5V, \pm 15V, +24V and +24E to the ground; 2. If this occurs when data is transmitted between the computer and NC, replace A20B- 2901-098*, and the computer must be checked
10	The control sy- stem is not po- wered up	Power short ci- rcuit	resistance value of +5V, \pm 15V, +24V and +24E to the ground; 2. If this occurs when data is transmitted between the computer and NC, replace A2OB- 2901-098*, and the computer must be checked and confirmed to be normal before it can be
10	The control sy- stem is not po- wered up	Power short ci- rcuit	resistance value of $+5V$, $\pm 15V$, $+24V$ and $+24E$ to the ground; 2. If this occurs when data is transmitted between the computer and NC, replace A20B-2901-098*, and the computer must be checked and confirmed to be normal before it can be used.
10	The control sy- stem is not po- wered up	Power short ci- rcuit	resistance value of $+5V$, $\pm 15V$, $+24V$ and $+24E$ to the ground; 2. If this occurs when data is transmitted between the computer and NC, replace A20B- 2901-098*, and the computer must be checked and confirmed to be normal before it can be used. 3. Check the alarm light of the system power
10	The control sy- stem is not po- wered up	Power short ci- rcuit	resistance value of $+5V$, $\pm 15V$, $+24V$ and $+24E$ to the ground; 2. If this occurs when data is transmitted between the computer and NC, replace A20B- 2901-098*, and the computer must be checked and confirmed to be normal before it can be used. 3. Check the alarm light of the system power supply and consider replacing the power supp-
10	The control sy- stem is not po- wered up	Power short ci- rcuit	resistance value of $+5V$, $\pm 15V$, $+24V$ and $+24E$ to the ground; 2. If this occurs when data is transmitted between the computer and NC, replace A20B- 2901-098*, and the computer must be checked and confirmed to be normal before it can be used. 3. Check the alarm light of the system power supply and consider replacing the power supp- ly.

			 Check whether there is a short circuit in the strong electric part of the system (such as relay). Check for short circuits in the input/ output board and I/O LINK. Check whether the signal lines are damaged or short circuit with the metal body of the machine tool.
11	There are four status lights and three alarm lights on the 16 C/18C and 16B/18 B motherboards. When the display is not display- ed, you can ju- dge the system fault according to these four status lights and three alarm lights	Four status li- ghts are green and three alarm lights are red	 (1) During the power-on process, the status light displays as follows: ■: ON □: OFF 1. Power off 2. Initialization status when power is turned on (CPU is not working yet) 3. Initialization status when power is turned on (CPU is not working) 4. Check the response of other CPUs (ID set) 5. FANUC, bus initialization 6. The PMC initialization is complete

	Place.		7. All the specifications of printed
			boards have been tested
			8 PMC initialization completed (only
			PMC-RB)
			9 Wait for the digital serve to
			initialize
			10. The system initialization is co-
			mplete and running
			(2) When the alarm is raised, please refer to
			the display status of the alarm light and
			status light below:
			: ON : OFF : Don't care
			1. □■□□
			The odd-even alarm on the main CPU, board RAM
			or RAM module, or the servo alarm on the
			OPTION-2 board
			2.
			Servo alarm generated (i.e. WATCH DOG alarm)
			3. □■□□
			Other control panels generated alarms
			4
			$\diamond \bullet \diamond$
			The system CPU stopped working
			(3) When the NC has a OPTION-2 board (sub-
			CPU), the LED displays the following informa-
			tion
			Basic RAM error on the OPITION-2 board, repl-
			ace the OPTION-2 board
12	16C/18C and 16B/	Please follow	1
	18B OPTION1 bo-	its status light	
	ards: Its main	Use the alarm	The initialization state when the power is on,
	function is re-	light to deter-	the CPU is not working.
	mote communica-	mine the fault	2. ◊◊□■
	tion DNC proce-	of the OPTION1	
	ssing	board	The remote buffer CPU has been initialized and
			is running
			3. ◊◊☆☆
			OPTION1 Communication error in the board
			Among them: : OFF : ON : irrelevant :
			fl ashi ng
	The main funct-	Please follow	(I) When an alarm occurs, the status light and
13	ion of the OPT-	the board's in-	alarm light display the following information:
	10N2 board is to	structions	

add shaft cont-		
rol. The fault	The status light	
can also be de-	and the alarm	
termined accor-	light	RAM parity error alarm
ding to the di-	Display inform-	2.
splay of status	ation to deter-	
and alarm lights	mine where the	Servo alarm (WATCH DOG. etc.)
on the board (16 $% \left(16\right) =1000000000000000000000000000000000000$	fault is locat-	
B/18B and 16C/18	ed.	
C)		

			2
			Other alarms
			(1) When the system is not working properly
			(11) when the system is not working property,
			the status right and aranni right dispray the
			rollowing information:
			1
			RAM parity error
			2.
			DRAM parity error clear replace DRAM, module
			alarm
			3.
			The RAM with a capacity of at least 2M has not
			been installed, or other alarms have occurred.
			Check and replace the DRAM module.
			(I) When the alarm occurs, please check the
			following LED display information.
			: OFF : ON : irrelevant : flashing
			1. ☆☆◇◇
			Other printed boards have NML alarms and check
			the LED display of other printed boards
			The Ladder diagram DAM or working DAM bec an
			The fadder dragram RAM, of working RAM, has all
	The main funct	Prease for tow	
	ine main funct-	the board's In-	$3. \forall \Box \lor \lor$
	Tons of the UP-	structions	
	NUN3 board are	The status light	A bus error occurs. Please replace the OPIION3
	PMC control fu-	and the alarm	board at this time.
14	nction and CAP-	light	4. ∎☆◇◇
	control fun-	Display inform-	
	ction (16B/18B	ation to deter-	A communication error occurs at the input/
	or	mine where the	output LINK. Check the input/output LINK dev-
	16C/18C)	fault is locat-	ice and its cable.
		ed.	5. ☆∎◊◊
			The RAM of the PMC control module has an odd-
			even check error. Please replace the PMC con-
			trol module.
			6. $\Rightarrow \Rightarrow \diamond \diamond$
			The PMC's DRAM could be damaged
			(1) When the OPTION3 has CAP-11 function the
			IFD display information is as follows.
			LED GISPLAY THIOHMATION IS AS TOTTOWS.

The alarm status light 3 and the status 4
light flash at the same time. The other cont-
rol board has an NMI alarm. Please check the
LED display of the other control board.

			2. ◇◇□☆
			Initialize the substorage of CAP-II, which has
			an odd oven error
			Bus error, please replace the OPTION3 board.
			4. ◊◊☆☆
			When status 3 and status 4 lights flash alte-
			rnately, the ROM parity error occurs. Please
			replace the ROM of CAP-II.
			(3) The display information of the alarm light
			of OPTION3 is as follows
			1. □□■
			1/0 link error, please check the 1/0 link
			device and cable.
			2
			The CAP- SRAM has an odd narity error
			Please replace the SRAM module
			The PMC has a DRAM parity error. Prease repi-
			ace the DRAM module.
			The DRAM of CAP- has an odd-even check
			error. Please replace the DRAM module of CAP-
			5. ■□■
			PMC DRAM parity check error, replace the OPT-
			ION3 board or DRAM module.
			6. ■■□
			The PMC's CPU didn't start working properly.
			7
			The PMC module is not working properly.
15	The 64-bit RISC	According to its	
	drawing board of	alarm light	
	16C/18C is used	The condition	
	to control the	can determine	The RISC CPU is not working properly.
	height of the	where the fault	2
	machine tool	is located	SRAM parity error.
	High speed and		3. □□■
	precision cont-		DRAM parity error.
	- an maonining	The graphics	(1) When the nower is on the status light
	The function of	control board is	displays the following information:
	the 16C/18C gr-	equipped with	1 Down off state
16	aphics board is	SRAM DRAM and	1. The CDU is not working property
	to provide gra-		2. The GPU IS NOT WOLKING PLOPELLY.
	phical display	which can be	S. KAW HILLIAH ZALION.
			4. Set the software ID number to ALL

	used to determ-	CLR.				
	ine the location	5.	Wait for	software	initialization	ı 1.
	of the fault	6.	Wait for	software	initialization	ı 2.
	according to the	7.	Wait for	software	initialization	13.
	status of its	(li) When	an alarm	occurs:		
	alarm light					

			RAM parity error.
			(3) When the system cannot work normally, the
			display information of LED is as follows:
			1
			SRAM parity error.
			2.
			DRAM parity error.
17	900 report to	An ROM parity	1. Check the serial number and version number
	the police	error occurred,	of the control software displayed in the upper
		and the FROM&	right corner of the screen;
		SRAM module on	2. When replacing the FROM & SRAM module, the
		the motherboard	new software series and version number should
		or the motherb-	be equal to or higher than the current softw-
		oard is faulty	are version.
			3. When the motherboard or FROM SRAM module on
			the motherboard is replaced the data stored
			in the memory will be lost.
18	910, 911 call		1. Turn off and restart:
10	for police (for		2 If the alarm cannot be eliminated after
	0i) 916 call for	The DRAM's par-	shutting down and restarting consider repla-
	nolice (for 16/	ity error	cing the DRAM module installed on the mother-
	18)		hoard
19	912, 913 report		1. The data stored in SRAM is bad. If the alarm
	SRAM parity er-		occurs immediately every time the power is
	rors (for 0i)		switched on, please clear the memory.
	914 915 alarm		2. If the parity check alarm does not disapp-
	(for 16/18)		ear after the memory is cleared, it is consi-
	910 911 alarm		dered to be SRAM failure.
	(for 16i/18i)		3. If the odd-even alarm cannot be cleared
			after replacing the FROM& SRAM module or mem-
			ory board & spindle module please replace the
			motherboard
			4 When the motherboard is replaced all data
			in the memory will be lost
			5. The above alarm will also occur when the
			battery voltage of the storage device is less
			than 2.6V but a RAT warning will appear on
			the screen at this time
			1 Monitoring times alarm The times that mon
			itors the CPU operation is called the monito
			ring timer Every fixed time the CDU resets
	020 roport to	Monitor circuit	the timer and When an apparmality accurs in
20	the police	or RAM parity error	the CDI or peripheral circuit the timer con
			not be recent and an alarm accurs
			SDAM Old and even arrang Ar alarm arrange
			2. SRAW, out and even errors an alarm occurs
1	1		when an oud and even error is detected in the

			RAM of the servo circuit.
			3. The motherboard is faulty, the monitoring
			timing circuit and other hardware are faulty,
			the detection circuit is abnormal, the misop-
			eration, etc., and other CPU circuit abnorma-
			lities and misoperations will also appear this
			alarm.
			4. The servo module is faulty.
			5. Alarm caused by interference. If the fault
			is caused by interference to the main power
			supply and signal cable, please check the
			grounding of the signal line, the action of
			mechanical, relay, compressor and other inte-
			rference sources, and take measures against
			the interference factors.
21	924 report to	When no convolic	1. Check whether the servo module is installed
	the police	When no servo is installed	on the motherboard, whether the installation
			is wrong and confirm the installation;
	inis alarm occ-	urs in the mod	2. When it is not the cause of 1, it can be
			considered as a servo module failure or a
	ure		motherboard failure

			Bad;
22	Occasional 930	The CPU periph-	1. Check whether the signal lines are well
	calls to the	eral circuit is	grounded;
	pol i ce	faul ty	2. Check for interference sources in the sur-
			rounding area of the system;
			3. Replace the motherboard and re-enter NC,
			PMC and other parameters and machining progr-
			ams.
23	930 report to	An abnormal CPU	1. If the power supply is disconnected and
	the police	interrupt occu-	then connected, it may be caused by interfer-
		rred	ence. Please check the grounding condition of
			the signal line, the action relationship of
			mechanical relays, compressors and other sou-
			rces of interference, and take measures to the
			sources of interference.
			2. The motherboard or CPU board is abnormal.
24	050 conort to	An orror occurs	Please replace the motherboard.
24	the police	when the RAM	1 PMC control module is had: 2 DRAM is had:
		area used by the	3 PMC user program is badFROM is bad ⁻ 4
		test PMC softw-	motherboard is bad.
		are is accessed	
			1. Check whether the DC24V voltage is normal.
		+24V input power	2. Check whether there is a broken or short
25	960 Alert (Oi)	supply is abno-	circuit in the input power cable. 3. Please
		rmal	check whether there is interference in the DC
			24V power supply.
26	970 Alert (Oi)		1. An RAM parity error or an NMI interrupt
		NMI alarm in PMC	occurs in the PMC control module. 2. The PMC
		control module	control module is faulty. 3. The PMC user
			program area is faulty (FROM &SRAM modules are
27	971 Alert (Oi)	Communication	Taulty).
21		alarm occurs	$0 \parallel 1 \times 1$ the connected subunit is faulty 3. In
		between CNC and	EANIC I/O LINK the +24V power supply of the
		FANUCI /O I I NK:	connected subunit is faulty
		NMI alarm occurs	
		in PMC control	
		module	
28	972 Alerts (16 /	An NMI is gene-	
	18)	rated for reas-	1. Each selection board has a fault. 2. $\ensuremath{I}\xspace/0$
		ons other than	LINK has a fault; 3. Power supply interferen-
		the main CPU	ce.
		board	
	16C/18C: When		1. Check whether the signal line of the mach-
	the machine is	Generate an NMI	ine tool is well grounded. 2. Check whether
29	started, alarm		the parameter setting of the computer side and
	972 occurs when		NC side is correct. 3. Replace the DATA SERVER
	runni ng DATA		printed board, usually A16B-2202-0630.4. Rep-

	SERVER		lace the hard disk of DATA SEVER.			
			1. The input/output board is faulty. 2. The			
		An unexplained	motherboard is faulty. 3. The base plate is			
30	973 Alert (Oi)	NMI alert was	faul ty.			
		i ssued	4. It may be that the board inserted in the			
			slot is faulty.			
31	16i / 18i:926	FSSB, malfunct-	Change the shaft control board, usually A2OB-			
51	call the police	i on	3300-0032.			
	16i /18i · 050 al		1. CPU module failure. 2. DRAM module failure.			
32	1017101.950 di-	PMC system alarm	3. FROM module failure. 4. motherboard failu-			
			re.			
33	16i / 18i:951	An WATCH DOG	1. Replace the motherboard.2. When replacing			
	call for help	alarm is gener-	the motherboard, all system parameters will be			
		ated during PMC	lost. Please reset or input NC data (including			
		processi ng	parameters, OFFSET, machining program, etc.).			
34	16i/18i, with		1. Whether the network cable is well grounded.			
	DATA SEVER fun-		2. When alarm, check the alarm and status			
	ction, and the		indicator light of DATA SEVER. 3. Whether the			
	machine tool is		address is the same as a certain address in			
	connected to the		the LAN.			
	company's local					
	area network,					
	occasionally 972					
	alarm occurs					
25	16i/18i:973 re-	Upoyol ai nod NM	1. Replace the motherboard. 2. Each additional			
35	ported an alarm	unexprained NMI	selection board may also be faulty:			
		The interruption	Communication board CPU board Language			
----	------------------	------------------	--			
		occurred	board CAP- motherboard RISC board DATE			
			SEVER board 3. When replacing the CAP- mot-			
			herboard and ladder diagram control, please			
			reset or input the data (parameters, process-			
			ing programs, etc.) on the sub-CPU side.			
36	16i / 18i:974	E-BUS wrong	1. FANUC The bus is faulty. 2. Replace the			
50	call for help		motherboard.			
37	16i / 18i:975	BUS wrong	1. An error occurred on the bus on the mothe-			
	call the police		rboard. 2. Replace the motherboard.			
38	01 / 101.970	L-BUS WIONY	1. The local bus is faulty. 2. Replace the			
			will be lest when replacing the methorhoard			
			with be fost when replacing the motherboard,			
20	16i/18i bas the		prease reset of riput it again.			
39	DATA SEVER fun-		1. Check the system parameter Settings. 2.			
	ction that can-		Check the computer side parameter Settings.			
	not be transmi-		3. Check if the cable socket is loose. 4.			
	tted when data		Check if the cable is connected correctly. 5.			
	is being sent		Replace hard disk A02B-0207-C06X.			
40	Alarm No. 87 oc-	Communication				
	curs during co-	failure	1. Check parameters. 2. Check cables. 3. Check			
	mmunication be-		that the computer is in good condition.			
	tween computer		4. Replace the system communication interface			
	and system		board, A20B-2901-098*.			
41	Alarm 300 is	The absolute	1 If the reference point return function is			
	displayed on the	position remem-	available, the method to manually return the			
	display screen	bered by the	reference point is as follows:			
		serial encoder	Clear other alarms and set PRM1815#5 to O.			
		has been lost	After manually returning to the reference			
		and needs to be	point, press reset.			
		returned to the	21f there is no reference point return funct-			
		reference point	ion, move the machine to the mark according to			
			the marking position of each axis of the			
			machine.			
			3If the absolute serial position encoder is			
			replaced, the grid deviation value (PRM1850)			
			also needs to be changed. The parameters rel-			
			ated to this are:			
			PRM1815#5 (APCX),			
			0: Incremental position encoder			
			1: Absolute position encoder PRM1815#4 (APEX),			
			$\ensuremath{\texttt{0}}$: The parameter point of the absolute posit-			
			ion encoder is not determined.			
			1: It has been confirmed.			
	System 414 rep-		is "8" charactor alarm			
42	orts alarm check	Servo high cur-	13 U Unalacter aldill.			
42	system diagnosis	s rent alarm	z whether the motor power time is grounded of			
1	200 // 1					

			control module.	
43	417 report to	When the digital	1 Please confirm the following parameter sett-	
	the police	servo parameter	ing value:	
		setting is abn-	PRM2020: The model code of the motor	
		ormal, an alarm	PRM2022: Motor rotation direction	
		occurs	PRM2023: The number of pulses for speed feed-	
			back	
			PRM2024: The number of pulses in the position	
			feedback	
			PRM1023: Servo shaft number	
			PRM2084: Flexible feed	
			PRM2085: The flexible feed ratio can also be	
			confirmed in detail by the diagnostic function	
			of CNC.	
			2To prevent this, set PRM2047 to O.	
			3. Reinitialize the parameter setting of the	
			digital servo.	

4 Check diagnosis DGN280 number:	4 Check diagnosis DGN280 number:	
GDN280#0 (MOT): Parameter numbe	r 2020, the set	
electrical model code exceeds	the specified	
range.		
GDN280#2 (PLC): The parameter	set value of	
2023 is less than or equal to 0		
DCN280#3 (PLS). The parameter s	etting value of	
2024 is loss than or equal		
(DLP). The meter rotation direct	ction value set	
by the perspector of 2022 is inc	ction value set	
by the parameter of 2022 is inco	frect.	
DGN280#6 (AXS): The value set	for parameter	
2023 exceeds the number of contri	rol axes.	
44 161 / 181:460 FSSB, connection 1 The FSSB communication cable	e is broken or	
alarm failed broken.		
2 The power supply to the serve	o amplifier was	
suddenly interrupted.		
3 The servo amplifier produces	a low voltage	
alarm		
45 16i / 18i:463 Because of the 1Replace the servo cascaded opt	tical cable.	
calls were made FSSB communica- 2 Check whether the cable seat	t of the servo	
tion error, the cascaded optical cable is dirt	y; if it looks	
servo cannot dirty, clean it.		
accept the cor- 3Check and confirm the servo pa	rameters.	
rect data 4Replace the servo unit.		
46 700 report to The ambient te- 1. Confirm that the fan is work	ing properly.	
the police mperature around 2. Check to see if the ambie	ent environment	
NC increases, around NC is below 45 degrees.		
and the temper- 3. The temperature detection	circuit on the	
ature detection motherboard is faulty, replace	the motherboa-	
detector attac- rd.		
hed to the mot-		
herboard detects		
the high tempe-		
rature, result-		
ing in the ala-		
rm.		
1. Confirm that the spindle sp	eed is constant	
(use tachometer).		
2. If constant, check the foll	owing paramete-	
rs: Parameter 4911: spindle s	speed when the	
Caused by solid actual spindle speed reaches th	he command spe-	
load ed. Parameter 4912: spindle spe	ed at which the	
47 704 The spindle sp- spindle speed fluctuation dete	ction does not	
eed changes ab- alarm. Parameter 4914 time wh	nen the spindle	
normally speed changes to start detection	a spindle sneed	
fluctuation	J Spring of Speed	
3 If the snindle sneed is not	constant check	
whether the cutting conditions	of the machine	

			4. Check if the tool is dull.
			5. Check and confirm whether the spindle servo
			unit and spindle motor are in good condition.
48	After the ladder	The ladder dia-	In the emergency stop state (press the emerg-
	diagram is com-	gram was not	ency stop button), save the ladder diagram to
	piled or trans-	saved	FROM or SRAM according to the method indicated
	mitted from the		in the PMC programming manual.
	computer to the		
	CNC, the ladder		
	diagram is lost		
	after shutting		
	down and start-		
	ing up.		

FANUC 10/11/12/15 system

FANUC10/11/12 When the system shows an alarm under normal circumstances, the alarm number and alarm content will be displayed on the display screen. However, when the display screen does not show, the fault can be judged according to the LED display content on the motherboard.

0rder ber	Folluro cumptom	Failure	Terms of settl-
nun	raiture symptom	cause	ement
1	When the digital	1. The display /MDI unit is	1) Verify that the MDI/display
	tube on the moth-	connected abnormally	unit is connected to the correct
	erboard shows A		cabl e.
			2) Confirm whether the conne-
			ction cable is damaged and rep-
			lace it.
			3) Confirm that the optical
			cable seat is clean and clean
			it.
2	The digital tube	The display /MDI unit does	1) MDI/display unit comes in 9
	on the motherboard	not match the system	"and 14" types. Please confirm
	shows E		whether the MDI/display unit
			matches the software version of
			NC.
			2) Whether the connection to
			the unit is correct.
			3) Check the MDI/display scr-
			een connection cable.
3	The digital tube	Connect the unit to the in-	1) Check whether the cable
	on the motherboard	put/output cards D1D3	connection of the connector unit
	shows F	The connection is abnormal	is correct. Check and confirm
			the optical cable and optical
			cable socket.
			2) Replace the connection
			unit.
			3) Replace the optical cable
			and optical cable seat.
			4) Replace the motherboard.
4	The digital tube D	The connection unit and in-	1) Please check and confirm
	on the motherboard	put/output cards D1D3 do	the version number of NC softw-
	shows H	not match the NC software	are.
		board	2) Please check and confirm
			that the connection unit and the
			cable connected to the connect-
			ion unit are correct.
			3) Replace the connection
			unit.
			1) Please confirm the alarm
	The digital tube	There was an error in the	number information of the cont-
5	on the motherboard	data transmitted over the	rol board connected to the opt-
	shows C	cabl e	ical cable.
			2) Replace the motherboard.

			3) Replace MDI/display control
			panel.
			4) Replace the connection unit
			and input/output unit.
			5) Replace the cable.
			6) If you are debugging the
			PC, replace the PCRAM board.
6	The digital tube	Waiting for the PC to res-	1) Please confirm whether the
	on the motherboard	pond	system is equipped with PC-ROM
	shows J		box PCRAM control board, inter-
			face conversion board and moth-
			erboard.
			2) Whether the above control
			boards are installed correctly.
			3) Replace the PMC-ROM cart-
			ridge
			4) Change the interface conv-
			ersion board
			5) If you are debugging the PC,
			replace the PCRAM control board
7	The digital tube	Wait for the PC to prepare	1) Please confirm whether the
	on the motherboard		system is equipped with a PC-ROM
	shows L		box.
			2) Replace the PCROM and PC-
			ROM case.
			3) If you are debugging the PC,
			replace the PC-ROM control boa-
			rd.
	The digital tube		
8	on the motherboard	KAM parity error	I) Replace the motherboard.

Show B Remove of the ROM/RWI control boasing. 2 The digital tube on the mother content				2) Please replace the additional
Image: second		Show B		memory of the ROM/RAM control boa-
9 The digital tube on the otherboard is on the otherb				rd.
an the notherb- ard shows E 2) Replace NC software. ard shows E 3) Replace the ROM control board. ard shows E The LED on the interboard is displayed as 0 The system is in IPL mode 1 On the notherb- add splayed as 0 The system is in IPL mode 1) Replace the ROM used by the NC software. 1 On the notherb- add splayed as 0 System WATCHOOG alarm genera- lights are on 1) Replace the ROM used by the NC software. 1 On the notherb- or of the fol- conditions in content will be display cortent display screen displays system alarm content will be display cortent According to the content of the system alarm, determine the fault and eliminate it. 1 ADDRESS ERROR The system software is not working properly According to the content of the display cortent working properly 1 BUS ERROR Bus error Intercent of sor is 0 Intercent of the capacity of the sor is 0 1 RAPV INSTRUCTION Inter capacity of the rogister Intercent of sor is 0 Intercent of sor is 0 1 RAPV INSTRUCTION TAP, overflow error Intercent of sor is 0 Intercent of sor is 0 1 INSTRUCTION TAP, overflow error Intercent of sor is 0 Intercent of software. Intercent of	9	The digital tube	System mistake	1) Replace the motherboard.
oard shows E3.) Replace the ROM control board.10The LED on the motherboard is displayed as 0The system is in IPL mode11On the motherbo- oard Watchdog The lights are onSystem WATCHDOS alarm genera- ted1.) Replace the motherboard. 2.) Replace the ROM control board. 3.) Replace the ROM control board.12When the NC has one of the fol- operation, the displayed on the displayes core1.) Replace the ROM control board. 2.) Replace the ROM control board. 3.) Replace the ROM control board. 4.13TAPISWhen a system error occurs in conditions in content and the lower part of the display screen displays diagnostic dataAccording to the content of the system alarm, diagnostic data14ADDRESS ERNORThe system software is not working properlyInvalid instruction register15BUS ERRORBus errorInvalid instruction register16LEGAL INSTRUCTIONIn the calculation, the divi- registerInvalid instruction register18CHECK NSTRUCTIONExceeds the capacity of the registerInvalid instruction register19TRAPV NSTRUCTIONTry to execute an instruction registerInvalid instruction register10Interace table registerInterace state registerInterace state register10RAPN NSTRUCTIONTry to execute an instruction registerInterace state register13RAPE NSTRUCTIONTry to execute an instruction registerInterace state register14INASUNANED N		on the motherb-		2) Replace NC software.
In the LED on the displayed as 0The system is in IPL mode11On the motherbo- dard acrd tedSystem WATCHDOG alarm genera- ted1) Replace the ROM used by the NC software. 3) Replace the ROM control board. 2) Replace the ROM control board. 3) Replace the ROM control board. 3) Replace the ROM control board. 4) Replace the ROM control boa		oard shows E		3) Replace the ROM control board.
10 motherboard is displayed as 0 The system is in IPL mode 11 On the motherboard. System WATCHDOG alarm general ted 1) Replace the motherboard. 0 Natchdog The System WATCHDOG alarm general ted 1) Replace the ROW used by the NC software. 12 When the NC has When a system error occurs in According to the content of the one of the folored in system alarm. determine the fault solay screen displays error content will be display screen system alarm. determine the fault solay screen displays error occurred displays error occurred 13 TAP15 The system software is not working properly and eliminate it. 14 ADDRESS ERROR An address error occurred invalid instruction 15 BUS ERROR Bus error invalid instruction 16 ILEGAL register invalid instruction invalid instruction 17 ZERO DIVIDE FixPer orgister invalid error 18 MISTRUCTION RRP, overflow error invalid instruction 19 TRAPY FixPer orgister invalid error 10 INSTRUCTION RRP, overflow error invalid instruction 11 TRAPY FixPer orgister invalid instruction		The LED on the		
displayed as 0ordord10On the motherbo- System WATCHDOG alarm genera- Natchdog The Hights are on1) Replace the motherboard. Software. 3) Replace the ROW used by the NC software. 3) Replace the ROW control board.12When the NC has one of the fol- NC, the upper part of the di- software is play screen displays error conditions in content and the lower part of diagnostic data content will be displayed on the displayed on the displayed on the displayed on the displayed on the displayed on the display screenThe system software is not working properly13TAPI5The system software is not working properlyInvalid instruction14ADDRESS ERRORAn address error occurredInvalid instruction15BUS ERROR NSTRUCTIONIn the calculation, the divi- sor is 0Invalid instruction17ZERO DIVIDE VIDLATIONIn the calculation, the divi- registerInvalid instruction18CHECK NSTRUCTIONExceeds the capacity of the registerInvalid instruction19PRAPV NSTRUCTIONPrivileg directive error that is not usableInvalid instruction20PRIVILEGE VIDLATIONTry to execute an instruction that is not usableInvalid instruction21ITACEThe CPU is in the trace state that is not usableInvalid instruction23LIIII EMVLTry to execute an instruction that is not usableInvalid instruction24UNASSIGNED NERRUPTAn undefined interrupt is ge- neratedInvalid instruction that is not usable	10	motherboard is	The system is in IPL mode	
11 On the motherb- ord System WATCHDOG alarm genera- ted 1) Replace the motherboard. 20 Replace the ROM used by the NC software. 3) Replace the ROM control board. 12 When the NC has one of the fol- one of the fol- one of the fol- conditions in content will be displayed on the displayed on the display screen Multiplay screen displays and eliminate it. 13 TAPI5 The system software is not working properly and diversion software working properly 14 ADDRESS ERROR Bus error Invalid instruction 16 ILEGCAL INSTRUCTION Invalid instruction Invalid instruction 17 ZERO DIVIDE In the calculation, the divi- sor is 0 Intercestate 18 RECK INSTRUCTION TRAP, overflow error Intercestate 10 TRAPU INSTRUCTION TRAP, overflow error Intercestate 11 TARGE The cecute an instruction that is not usable Intercestate 12 ILHIEGAL INSTRUCTION Try to execute an instruction that is not usable Intercestate 12 UNASSIGNED INASSIGNED An undefined interrupt is ge- merated Intercestate 13 TAPU Try to execute an instruction that is not usable Intere was an unexplained int- err		displayed as 0		
oardted2)Replace the ROM used by the NC software.Natchdog The lights are on	11	On the motherb-	System WATCHDOG alarm genera-	1) Replace the motherboard.
Watchdog The I ights are onsoftware.12When the NC has one of the fol- lowing 13-3 1 conditions in content in the display screen displays system alarm content will be displayed on the display screenAccording to the content of the system alarm, determine the fault and eliminate it.13TAPI5The system software is not working properlyAn address error occurred14ADDRESS ERRORAn address error occurredInvalid instruction sort is 015BUS ERROR Bus errorBus error16ILLEGAL INSTRUCTIONIn the calculation, the divi- sor is 017ZERO DIVIDE VIDLATIONIn the calculation, the divi- sor is 018CHECK VIDLATIONExceeds the capacity of the register19TRAPV INSTRUCTIONPrivilege directive error that is not usable21ITAAPITry to execute an instruction that is not usable22LIOIO EMOL TRAPAn undefined trap instruction that is not usable23LIIII EMVL TRAPTry to execute an instruction that is not usable24UNASSIGNED TRAPAn undefined interrupt is ge- nreated25UNASSIGNED TRERUPTAn undefined interrupt is ge- nerated26SU PRIOUS TRERUPTThere was an unexplained inti- erruption27NON MASK A no unexplained inti- erruption		oard	ted	2) Replace the ROM used by the NC
I lights are onand control board.12When the WC hasWhen a system error occurs in splay screen displays error conditions in content and the lower part of the di- system alarm, determine the fault and eliminate it.13TAPI5The system software is not working properly14ADDRESS ERRORAn address error occurred working properly15BUS ERRORBus error16ILEGAL INSTRUCTIONIn the calculation, the divi- sor is 017ZERO DIVIDEIn the calculation, the divi- sor is 018CHECK INSTRUCTIONExceeds the capacity of the register19TARVE UNASSIGNED A nudefined interupt is not usable20PRIVILEGE UNASSIGNEDPrivilege directive error that is not usable21UNASSIGNED TRAPAn undefined trap instruction that is not usable22UNASSIGNED TRAPAn undefined trap instruction that is not usable23LIHIEMVL TRAPTry to execute an instruction that is not usable24UNASSIGNED TRAPAn undefined interupt is ge- noreated25UNASSIGNED TRAPAn undefined interupt is ge- nerated26SU PRIOUS TRAPN NASK An unexplained inti- erruption27NON MASK An unexplained MIM was produ-		Watchdog The		software.
12 When the MC has When a system error occurs in lowing 13-31 According to the content of the system alarm, determine the fault and eliminate it. 10wing 13-31 splay screen displays error content and the lower part of operation, the display screen displays system alarm content will be displayed on the display screen and eliminate it. 13 TAPI5 The system software is not working properly and dress error occurred 14 ADDRESS ERROR Bus error and dress error occurred 16 ILEGAL INSTRUCTION In the calculation, the divisor is 0 and dress error 17 ZERO DIVIDE In the calculation, the divisor is 0 and dress error 18 CHECK Exceeds the capacity of the register and dress error 19 TRAPV TRAP, overflow error and dress error 10 INSTRUCTION TRAP, overflow error and dress error 11 TRAPV TRAP, overflow error and dress error 12 INSTRUCTION TRAP, overflow error and dress error 13 TAPIS Trap, overflow error and dress error 14 Exceeds the capacity of the register and dress error and dress error 15 INSTRUCTION		lights are on		3) Replace the ROM control board.
one of the fol-NC, the upper part of the di- splay screen displays error conditions in content and the lower part of operation, the display screen displays diagnostic datasystem alarm, determine the fault and eliminate it.13TAPISThe display screen displays diagnostic dataand eliminate it.13TAPISThe system software is not working properlyand14ADDRESS ERRORAn address error occurredand15BUS ERRORBus errorand16ILEGAL INSTRUCTIONIn the calculation, the divi- sor is 0and17ZERO DIVIDE INSTRUCTIONIn the calculation, the divi- sor is 0and18CHECK INSTRUCTIONExceeds the capacity of the registerand19TRAP INSTRUCTIONPrivilege directive errorand20PRIVILEGE VIOLATIONPrivilege directive errorand21TRACEThe CPU is in the trace stateand22L1010 EMOL TRAPTry to execute an instruction that is not usableand23L1111 EMVL TRAPAn undefined trap instruction was executedand24UNASSIGNED An undefined trap instruction TRAPAn undefined interrupt is ge- neratedand25UNASSIGNED INTERRUPT NTERRUPTThere was an unexplained int- erruptionand26SU PRIOUSThere was an unexplained int- erruptionand	12	When the NC has	When a system error occurs in	According to the content of the
Iowing 13-3 1splay screen displays error conditions in content and the lower part of diagnostic dataand eliminate it.operation, the displayed on the display screenthe display screen displays diagnostic dataand eliminate it.13TAP15The system software is not working properlyand address error occurred14ADDRESS ERRORAn address error occurredand address error16ILEGAL INSTRUCTIONInvalid instructionand address error17ZERO DIVIDEIn the calculation, the divi- sor is 0and address error18CHECKExceeds the capacity of the registerand error19TRAPY INSTRUCTIONTRAP, overflow errorand20PRIVILEGE VIOLATIONPrivilege directive errorand21TRACEThe CPU is in the trace state that is not usableand address error22L1010 EMOLTry to execute an instruction that is not usableand address error23L1111 EMVLTry to execute an instruction that is not usableand address error24UNASSIGNED TRAPAn undefined trap instruction that is not usableand address error25UNASSIGNED INTERRUPTAn undefined interrupt is ge- neratedand address error26SU PRIOUS TRERNUPTThere was an unexplained int- erruptionand address error		one of the fol-	NC, the upper part of the di-	system alarm, determine the fault
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26 INTERRUPT erruption 27 NON MASK An unexplained NMI was produ-			There was an unexplained int-	
27 NON MASK An unexplained NMI was produ-	26	INTERRIPT	erruption	
	27	NON MASK	An unexplained NMI was produ-	

	INTERRUPT	ced	
28	WATCHDOG	An watdndog alarm was genera-	
	AIARM	ted	
29	RAM PARITY Rep-	PAM parity orror	Clear the memory and re-enter or
	ort		set the NC data

	Guard against		(Parameters, programs, etc.).
30	ROM PARITY Alarm	ROM parity error	
31	PC report to the police	Alarm on the PC side	
32	Yes	The fault can be determined	Once the following 33-44 conditions
	FANUC10/11/12	based on these display infor-	occur, NC enters the IPL state.
	In terms of the	mation, and the following 33-	Only after troubleshooting accord-
	system, when the	44 items are these alarm inf-	ing to the alarm content can NC
	input power is	ormation.	work normally.
	turned on and a		
	system error		
	occurs, some		
	alarm informat-		
	ion will also be		
	displayed on the		
22	ai spi ay screen.	The DOM northy check areas	
33	FRROR aaa	the ROM partity check effor aaa	1) Please check to confirm whet-
	bbb	bob Is the humber of a	The the bad ROM is installed.
24	DAM TEST.	An error occurred while test	
54	EPDOD At the	ing the RAM	
	same time the		
	digital tube on		
	the motherboard		
	shows b		
		There is no required choice of	1) Please confirm whether the
35	MISSNG OPTION	ROM as hhh i o tho no-	system ROM is installed.
	ROM aaa bbb	cessary ROM number	2) Please confirm that the sele-
			ction parameters are set correctly.
			1) Please confirm that OPTION RAM
36	MISSING	No required RAM	is installed.
	OPTION RAM		2) Whether the selection parame-
27		The number of control avec is	ters are set correctly.
51		set incorrectly	I) CHECK TO CONTINUE that the
	IMPROR		auurrunan sharr cuntrun panen IS
	NUMBER OF		$\begin{array}{c} \begin{array}{c} \begin{array}{c} \begin{array}{c} \end{array} \\ \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} $
	AXIS		selection parameters are set corr-
			ectly.
38	LOAD SYSTEM	An error occurred while read-	Format the magnetic bubble board.
	LABEL: ERROR	ing the data from the bubble	re-input or restart the machine,
	SAVE SYSTEM	board	and then set the NC data (paramet-
	LABEL: ERROR		ers, programs, etc.).
	LOAD PC		
	PARAMETER :		
	ERROR CLEAR		
L	FILE: ERROR		
39	BUBBLE	The necessary magnetic bubble	1) Check to confirm that the

	INITIATION: NO		
	BUB BLEBUB-		
	BLE		magnetic hubble beard is installed
	PREPARAIION:	board was not installed	2) Poplace the magnetic hubble
	NO		2) Replace the magnetic bubble
	BUBBLECLEAR		
	BUBBLE: NO		
	BUBBLE		
40	CHECK BUBBLE	There are many kinds of magn-	Check to see if the magnetic bubble
40	ID: ERROR	etic foam boards	board matches the system.
		38、 After 39 alarms occurred,	
41	BUBBLE	the magnetic bubble was perf-	
		ormed	

	PREPARATION	The status of the alarm gene-		
	NOT READY	rated during access processing		
	CLEAR BUBBLE			
	NOT READ I			
42		There is no system sign, gen-		
		erally speaking, 38,		
	NO SYSTEM	39 Alarm status generated when		
	LABEL	the system flag access proce-		
		ssing is performed after an		
		alarm is reported		
		The storage area of system		
12	CHECK SYSTEM	logo (such as system type,	Please initialize the magnetic bu-	
43	LABEL: ERROR	system composition, etc.) is	bble board.	
		incorrect		
		Document no. n was damaged;		
4.4	FILE#n: DATA	Document no. n was executed	Delate file n and no enter file n	
44	BROKEN	when the power suddenly went	Derete file n'and re-enter file n.	
		out		
	For the compariso	n between FANUC 15A and FANUC 15	B, there is a significant difference	
	in hardware desi	gn. In the manufacturing of	FANUC 15B printed circuit boards,	
	components use la	rge-scale integrated circuits. T	he overall system structure adopts a	
	slot-type design,	with power supplies, PMC contro	ol boards, Main boards, OPT1 boards,	
	RISC boards, etc.	, inserted into each slot. For 15	A/E, it generally consists of a base	
	plate, power supply, axis control board. BASEO, BASE1, BASE2, REMOTE BUFFER boards			
	and separate position detection boards. Whether it is 15A/E or 15B, when a system			
	failure occurs, e	ach board has an alarm light and	a fault light to indicate the issue.	
	Due to the failur	e, the system display cannot sho	w anything: at this point, the fault	
	location must be	determined and resolved based	on the alarm and fault lights. The	
	status light is c	ureen, and the alarm light is req	For 15A/F, the arrangement of the	
	alarm and fault I	inhts is as follows:		
			灯,绿色	
	LEDO			
			* /FA	
	LED1 LED4			
	For FANUC 15B, the alarm light and status light are arranged as follows:			
	The top row is t	he status display light, green;	the bottom row is the alarm light,	
	red. The followin	g 45-57 items are a description c	of common faults of 15A/E.	
		Please judge the location of	1.•0	
	Status lights on	the fault according to the	is the normal state.	
45	the BASO board	display of the status light	2. ••	
	and their causes	and alarm light, and eliminate	•0	
		it.	The CPU of the BASE2 board is in	

		standby mode.
		3. 00
		ROM check.
		4. 00

		DACED	
		BASEZ	ne CPU of the motherboard is
		'''''	
			••
			M test begins (BASE2).
			6. ○●
			00
		The su	b CPU initialization begins.
			7. ●●
			RAM test error.
			8. ○●
			••
		Syst	em error (BASE2 sub-CPU).
			9. ●●
			••
		The p	ower is on, but the BASE2's
		sub-CPL	Jis not working. : OFF :
			ON
46	BASEO Alarm li-	1 The b	ackup battery voltage of the
	ght display and	LED3 me	emory is too low.
	its cause	2 The I	pattery alarm caused by the
		backup	battery of LED2.
		3 L	ED1 is not working on either
		the F-	BUS or the axis BUS module.
		4 A noi	n-silent interrupt was gene-
		rated b	oy any module on the F-BUS of
			LEDO.
			1. ○●
			C RUM Odd and even parity is
		being p	performed, LADDER the program
			bas been completed and the
			n a waiting state
	The board is		
	equipped with a		CNC system is Loading data
	system board ROM		3. 0•
	and		An error occurred in loading
47	PMC ROM. The	d	ata for the CNC system.
	display and ca-		4. ○●
	use of the sta-		••
	tus light of the	Errors	were made on other printed
	BASE I		boards.
			5. ●○
			00
		An erro	or occurred while transmitt-
		ing dat	a between the DI/DO.
			6. ●○

			●○ During CPU operation, a DRAM parity error is generated. 7. ●○ ●● The following errors occur: bus error address error, RAM parity error, etc.
48	BASE1 The alarm		1When LED1 is transmitted in DL/
	light of the		
	board shows the		
	fault origin		2 LEDUBASET The RAM generates an
	Follow		odd-even parity error.
49	BASE2 is divided		
	into two types:		Alarm light display and its cause
	01P8D and 01P8C.		of 01P8D:
	01P8D has more		1The DRAM parity error of the LED3
	control axes		sub-CPU.
	than OP8C 01P8D		2LED2CNC CPU DRAM parity error.
	not only has CNC		3An odd-even error occurs in the
	CPU and its mo		common RAM between CNC CPU and SUB
	more but also		CPU.
	has SUP CDU and		4 The LEDOF-BUS and AXIS BUS gene-
	Has SUB CPU allu		rate unshielded interrupts.
50	01P9C Alarm Li		11ED2 is not used
50	abt display and		21 ED2CNC CDU DDAM parity chock
			2 LEDZCINC CPU DRAW PAIlity Check
	TIS Cause		error.
			A For the LEDO CNC CDU, on NML
			interrunt is generated in F DUS and
			AXIS BUS.
51	On the shaft		1LED3 is not used.
	control panel		22. LED2 servo alarm (axes 3, 4, 7
	Alarm light and		and 8).
	its cause		3. LED1 servo alarm (axes 1, 2, 5,
			6).
			4The parity error of the common
			RAM on the LEDO axis control board.
	When the power		
	is turned on and		
	a system alarm		When the alarm occurs, although the
	is generated,		alarm content can be displayed on
	some alarm inf-		the display screen, the system is
52	ormation and its		in the IPL state and cannot work
	contents will be		normally. At this time, only after
	displayed on the		the cause of the system alarm is
	displav screen		eliminated can it work normally
	For details		
	please refer to		
1		1	1

	the FANUC 15A or	
	15E maintenance	
	manual. For ex-	
	ample: 53 items	
53	When the newer	The system tag symbol is inc- This alarm is caused by the system
	when the power	orrect storage area not being initialized.
	the diambay as	Press "7" and "9" on the operation
		panel at the same time, then turn
	reen snows CHECK	on the machine to clear all files
	SYSTEM	in the storage area,

			The system can return to normal
	LABEL ERROR		operation by re-entering paramete-
			rs, programs and other files.
54	In the system		The upper part of the display scr-
	work the system		een shows the alarm content of the
	alarm suddenly		system while the rest of the dis-
			play coroon will show some diagno
	appears. Prease		pray screen with show some dragho-
	FANUC 15A OF 15E		content and the display information
	maintenance ma-		of the status lights and alarm li-
	nual for the		ghts of each printed board of the
	content of the		system, corresponding processing
	system alarm		means are taken.
55	lt's a system	The system RAM has an odd pa-	All stored contents are deleted
	work glitch	rity error	by:
	However, the		1Hold down the "7" and "9" on the
	system alarm		control panel and turn on the mac-
	occurred		hine.
	And on the dis-		2When the IPL status appears, pr-
	play screen		ess 99.
	Show RAM		3. Then AXIS? Enter the number of
	PARITY ERROR		control axes of the machine tool.
			4 Then OP1, OP2, OP3 Please en-
			ter the OPTION parameter according
			to the data sheet of FANUC when it
			is manufactured. OP1, OP2, OP3
			correspond to 9000 9001 9002
			respectively, and are in BCD data
			format
			5Then enter the system parameters
			PMC parameters machine tool proc-
			essing program and other files
			6 The system is back to normal
			At this time, the corresponding DCD
			an DOM should be replaced according
			to the content displayed on the
			system display screen. When such a
	During system		system alarm occurs, the display
	operation, the		screen will show the following fo-
	system suddenly	The system detects an error in	rmat:
56	alarms and the	the FBUS module. FBUS is the	F15M9A①AAO1A②
	display scroop		SYSTEM AIARM③
	shows CVCTEM		83: 1020: 03: AA01: 0001: 0094HT511
	ALADM		RAM PARITY ERROR indicates the
			model of system 15 indicates the
			software number and version number
			of system 15 indicates the mod-
			ule on the FBUS where the fault
			occurs

④ 83: 1020: 03: AA01: 0001: 094H55
83: indicates the number of slots
in FBUS 00~0F: number of slots in
FBUS (main) 80~8F: number of slots
in FBUS (secondary)
90~90F: AXIS BUS, the number of
slots
1020: Module ID
XX1D: BASE1
XX8C: BASE2
XX1E: BASE0
XX8D: BASE2
XX26: remote buffer
xx21: Talk to the CPU board

			03: Software ID
			00: BASEO
			01: BASE1 (PMC)
			02: BASE2: (CNC)
			03: BASE2 (SUB)
			05: Talk to the CPU (CAP)
			06: REMOTE BUFFER
			FF: Axis control AA01: FANUC15 sy-
			stem software number 0001: The to-
			tal number of software versions
			applied to the module 0094H55: So-
			ftware factory number
			(I) When an alarm is generated, the
			status light is displayed as foll-
			OWS:
			Flashing The mouth light goes
			out. The light comes on
			1. There is an error in the DRAM
			module.
			2. Port port port An error
			occurred in the SRAM module.
			3. An error occurred in the
			DRAM module.
			4. The CNC software does not sup-
			port the display control module
			currently installed in the system.
		MAIN CPU Board is composed of	5 port port The CNC control
	1FD Ctatus and	the following hardware modul-	software does not support the cur-
	ISB Status and	es: 1. Flash	rent installed MAIN CPU board.
	the main CDU	ROM2. SRAM3. DRAM4. Servo co-	6A PC board was illegally instal-
57		ntrol module 5. Display cont-	led on the FANUC bus.
	board	rol module	7 An error occurred in the
	The display and	6, Main shaft and serial com-	system (stack overflow).
	TIS causes	munication interface module	8.000 Illegal modules are
		7 MDI and MPG interface modules	installed in the slots of the FLASH
			ROM module.
			9 🔲 FLASH ROM file format
			error (in CNC area).
			10. Port Port FLASH ROM File
			format error (in PMC area).
			11. The system error causes the
			CNC CPU to generate a NMI interru-
			pt.
			(2) When the alarm is generated,
			the display of the alarm light and
			its cause:
			1 The voltage value of the bac-
			kup battery is lower than the min-
			imum specified value. Please repl-

	ace the battery.
	2The module on the F-BUS produces
	an SYSFAIL error. At this time,
	please take into account the status
	lights and alarm lights displayed
	on other boards

			Consider and find the point of fa-
			ilure.
			3 An alarm has been generated
			by the servo. Please replace the
			servo interface board and servo
			control board, and check the alarm
			status on the servo amplifier.
			4 The following faults occur: 1)
			SRAM parity error. 2) Peripheral
			bus error. 3) DRAM module parity
			error. 4) Multi-axis bus error.
			5) FANUC Bus error.
			5. 口口. SYSEMG occurs, that is, an
			NMI interrupt is generated by a
			module on the E-BUS bus
			6 The DRAM module generates an
			odd-even parity error
			7 The common PAM on the SUB CPU
			heard generates parity errors
			(1) When the alarm is generated
			the status light is displayed. The
			light is on and the light is off
			at the same time it flacked
			Alternating flashes irrelevant
			I. An alarm is generated
			on other substrates.
			2 An error occurred during
			the DI/DU transfer, or in the MAIN
		The PMC board has the follow-	CPU, the DRAM on the board
		ing functional modules: 1.	Module is not good.
		Memory card interface 2.FLASH	3. An odd error in RAM is
	The alarm light	ROM PMC control software 3.PMC	generated in the PMC control modu-
	of PMC board and	working RAM4 PMC control mod-	le.
58	the display of	ule 5. Dialoque function gen-	4.□ An odd error in RAM is
	its status and	eral system ROM6. Dialogue	generated in the PMC control modu-
	the reason	function working DRAM7. Dial-	le.
		oque function using SRAM8	5 PMC ROM is bad, result-
		Dialogue function using CPU	ing in errors such as bus errors
			and address errors.
		liidddi e	(2) When the PMC control board has
			a dialogue function (MF), the CPU
			or other base plate with the dial-
			ogue function has an err-
			or. (3) When the PMC has a dialogue
			function (TF, TFF)
			1 Errors occurred on other
			substrates.
			2 The RAM parity error used
			for the dialogue function.

	3 The ROM used for the
	dialog function is bad.
	4 . The CPU used for the dial-
	ogue function executed an illegal
	processing statement.
	(4) the display of the alarm light
	and its cause
	1 The conversation function uses
	the CPU and generates an SYSFAIL
	error.
	2. Mouth. Mouth PMC CPU produces
	SYSFAIL errors.
	3 The mouth PMC CPU is in the
	stopped state.
	4. Oral. When transmitting DI/DO
	data,

			SLC error was generated.
			5 In PMC the module or PMC
			DRAM, the RAM on the module gener-
			ates an odd-even error.
59	Display of OPT-	OPTION1 It has the following	
	ION1 alarm light	functions: 1. Graphic CPU mo-	When an alarm is generated
	and status light	dule 2. Graphic display cont-	1. mouth
	Describe the	rol module 3. Display screen	Odd-even error in ROM.
	situation and	character display control mo-	2 mouth
	its cause	dule 5. Communication control	RAM test error
		module	3 Mouth
			REMOTE BLIEFER Errors occur during
			communication
			Other hoards generate NML inte-
			5 mouth
			DEMOTE RUFFER The working PAM of
			the communication generates an odd-
			even parity error
60	The status light	The axis CPU board consists of	(1) When an alarm is generated the
	and alarm light	the following functions: 1	status Light shows
	display of the	Servo control module 2. Servo	1 The DRAM on the CPU board has
	axis CPU board	interface module	an error
	and their causes	34. DRAM module 5. Error mov-	2 Port port port An unsuppor-
		ement detection module 6. Sp-	ted module is inserted into the
		indle control module	slot of the DRAM module.
			3. Port port Logical slot is
			set incorrectly.
			4. An error occurred in the syst-
			em.
			(2) When an alarm is generated, the
			alarm light shows:
			1The module on the F-BUS produces
			an SYSFAIL error.
			2 An alarm is generated by the
			servo.
			3. Oral. The module on the F-BUS
			generates an NMI interrupt.
			4 The bus error (F-BUS, servo,
			spindle control) is present.
			5. Or generates an odd-even
			parity error in the DRAM module.
	When the FANUC15		For details, please refer to the
	system fails,		maintenance manual of the FANUC15
61	you can also		system. For example, diagnostic
	view the inter-		internal diagnosis numbers 1007 and
	nal diagnostic		1008 can reflect the fault area, 30

	screen	n4 can reflect faults such as servo
		overcurrent, high voltage, and di-
		sconnection.
		For instance:
		1007: #15#14#13#12#11#10#9#8
		1008: #7 #6 #5 #4 #3 #2 #1#0

			<pre>When one of the positions is 1, it indicates #0: background P/S alarm #1: Background P/S alarm #2: Over- heat alarm #3: Sub-CPU error #4: Synchronization error #5: Parameter write switch is on #6: Overtravel or external data input/output er- ror #7: PMC error #8: External alarm information #9: Not in use # 10: P/S alarm #11: Not in use #12: Servo alarm #13: Input/output er- ror #14: Parameters have been cha- nged, and these parameters require power-off to take effect #15: Sys- tem error</pre>
62	When the power is on, the sys- tem cannot work, and the parame- ter and position	There is a serious hardware or software failure of the system	For details of the system alarm information of 15B, please refer to the appendix of FANUC15B Maintena- nce Manual.
	screen cannot appear. The di- splay screen shows the system fault content		
63	When the power	The CNC system software was	11f the system software fails,
	play screen sh- ows:	main CPU and its SRAM did not work properly	 2. FROM the F-ROM is broken. Method to replace the F-ROM module: Replace the F-ROM module
	The DATA is fl- ashing non-stop		Insert the SRAM (2M) card contain- ing the system software into the
	and the system		slot on the PMC board, while hold- ing down the INPUT and DELETE keys
	to work		or the PAGEUP and PAGEDOWN keys on the operation panel to power on. . When BOOT appears, press 1,
			Loading system date At this point, you can rewrite the system
			SRAM card.
	When the system	Continue cofficience and boundary	For details, please refer to the
61	crasnes and ca-	failures occurred during the	rawww.ibb maintenance manual. Find
04	operation the	operation of the CNC system	and croubleshoot the fault information
	display screen		on the display screen and the sta-

	shows the system alarm informat- ion		tus and alarm lights on the 15B substrate.
65	When the system	The system RAM has an odd pa-	At this point, you have to look at
		rity error	the information displayed after the
	crasnes suddeni y		RAM Parity. There are usually three
	during operati-		
	on, the display		Cases:
	sereen shows		1.File RAM: The RAM that stores the
	SCI EEIT SHOWS.		part program generates an odd-even
	RAM Parity		orror
			error.

	2. DRAM: The DRAM that stores the
	CNC control software generates odd
	and even errors.
	3.SRAM: Stores CNC control softwa-
	re, high speed SRAM generates odd
	and even errors.
	If an odd-even parity error occurs
	in the DRAM, replace the DRAM mod-
	ul e.
	If an SRAM parity error occurs, all
	SRAM contents should be cleared.
	The operation method is as follows:
	Method 1:
	1. Use the memory card to input
	system files. Insert the memory
	card that once stored CNC system
	files into its slot.
	2. Hold down "Input" and "Delete"
	to turn on the power.
	3. The BOOT screen appears on the
	di spl ay.
	4. Multiply by 4, SRAM DATA backup.
	5. Press 2, Restore (MEMORY CNC).
	6. The system is back to normal.
	Method 2:
	System data files are entered using
	external data input/output devices
	through the RS-232 port.
	1. At the same time, hold down the
	"7" and "9" on the operation panel
	to turn on the power.
	2. The display screen shows the IPL
	screen, press 99.
	3. When AXIS=? is displayed, enter
	the number of control axes of the
	machine tool.
	4. when OP1, OP2, OP3 are disp-
	to the factory data choot (Data
	short) of FANIC OD1 OD2 OD2
	are equivalent parameters
	9000,9001, 0002 and it's in PCD format
	5 Prass 6 to and At this time
	the narameter screen and position
	screen annear on the display scre
	en Then re-enter the system para
	meters PMC parameters part proc
	essing program and other data until
	the machine tool returns to normal
1	

FANUC Power Mate Series

The Power Mate series has A, B, C, D, E, and F. Here are some of the differences:

Pow	Α	В	С	D	ĸ	F
er						
Mat						
e						
Unit number	A02B-0118- Bxxx	A02B-0122- BXXX	A02B-0124-B XXX	A02B-0166-B XXX	A02B- 0168-B XXX	A02B-0198-B XXX
RO	8800	8820	8825		8840、	8870
M tie				8830、8831、	8841	
Column numb-				8836		
ers						
Show	Not have	Have	Have	Have	Not	Not have
Device conf-					have	
iguration						
Control						
Number of	1	1	1-2	1-2	1	1
axles						
					AC200V	
NC	AC200V Sha-				Shared	
Source	red with	AC200V	DC24V	DC24V	with	DC24V
	servo				servo	
	Built-in	Built-in	Outlay	Outlay	Built	Outlay
Servo					-in	-
Amplifier						
AC	S series	S series	S series	S series	S se-	S series
Servo					ries	
Any power-						
generating or						
power-driven						
machine						
Any power-	AB each ot-		Serial	Serial	Seria	Serial
generating or	her				1	
power-driven						
machine						
Encoder						
Principal						
axis	Simul taneous	Simulated/	Simul taneous	Simul taneous	Not	Simul taneous
Control	/serial	seri al	/seri al	/seri al	have	/seri al
	The +5V li-	The +5V	EN light on	EN light on	EN	EN light on
Source	aht is on	light is on	3	3	liaht	3
Display lamp	9				on	
	S1 Light	S1 light	The SO light	The SO light	The SO	The SO Light
Voluntarily	flashes	flashes	flashes	flashes	light	flashes
Revol ve	Trashes	TT doneo	Trashes	Trashes	flashos	Trashes
Display lamp					11031163	
Alarm lamp	The SO light	The SO li-	S1 lights	S1 lights	S1	S1 light on
	is on	ght is on	up	up	lights	

					up	
Setting	S1 overhea-	S1 overhe-	RSW: A rot-	RSW: A rot-	Not	Not have
Switch	ting and S2	ating S2	ary switch	ary switch	have	
	di scharge	di scharge	used when	used when		
	unit is ex-	unit is	sharing a	sharing a		
	ternal	external	di spl ay	di spl ay		

General faults of the Power Mate system:

Order ber	Failure symp-	Failure ca-	Terms of sett-
	tom	use	lement
1	In system work,	The PMC program	Method:
	PMC break down	needs to be re-	1) At the same time, press "X" and "O" to
		entered	connect the power supply.
			2) At this time, the system is in the
			receiving state.
			3) Enter the PMC program from an external
			data input device.
			4) Power off and turn on the power again.
			5) Put the system in EDIT mode, turn on
			the program protection key and set PWE to 1
			on the screen.
			6) Find the diagnosis screen.
			7) According to READ, input PMC paramet-
			ers; in addition, please check parameter
			006:
			006#1:0: Do not use standard ladder diagram
			1: Use standard ladder diagram
			006#0: 0: Do not use PMC
			1: Use PMC
2	An OT alarm	Overrun alarm	1) Hold down "P" and "CAN" on the DPL/MDI
	occurs during		to power on.
	work		2) Modify parameter 300 and 302, increase
			parameter 300 in the positive direction and
			parameter 302 in the negative direction,
			and then press RESET key.
			Note: When diagnosing faults of external
			input and output points, the X address is ${\sf X}$
			0X23 and the Y address is Y32Y55
			1. method:
	For Power Mate		1) Install the DPL/MDL.
	A/B/C, if alarm		2) Insert the FA card containing the sys-
	910 or 911 oc-	At this time, all	tem files into the DPL/MDI slot.
	curs, all data	system files are	3) Put the system in an emergency stop
3	files in SRAM	lost. The system	state.
	need to be cl-	can be recovered	4) Set PWE to 1.
	eared. If alarm	with FA card	5) Find the program screen.
	930 occurs, the		6) Enter FXXXXX, or F, and press the READ
	board needs to		key. Then enter the following data accord-
	be replaced		ing to the FXXXXX value:
			FXXXXX (0: no input; 1: input)

↓ ↓ ↓ ↓ ↓ 零件加工程序 NC程序 宏变量 PMCLadder 程 PMCC 参数
2 However, if you want to exchange the
board, you must first output the system
file to the FA card. The method is:
1) Install DPL/MDI.
2) Insert the FA card into the right slot
of the DPL/MDI and turn on write protection

				Switch.
				3) Put the system in FDIT mode
				(1) Put the system in an emerge-
				a) Fut the system in an emerge-
				They stop state.
				5) According to the PRGRM, find
				the program screen.
				6) Press F and WRITE. At this
				time, the DPL/MDI displays (0000~
				FFFF).
4	For Power		It flashes while	
	mate E, the	SO (green)	running automatica-	The system is working normally.
	servo ampli-		lly	
	fier and the			Please determine the location of
	system are		The system has fai-	the fault based on the alarm num-
	made togeth-	S1 (red)	Led	ber and internal diagnostic number
	er and the			displayed on the DPL/MDL
	system nower	FN	If the nower is on	If the indicator light does not
	system power	(hichid	If normal it chows	display check that the power su
			TT HUTHIAT, TT SHOWS	unspray, check that the power su-
	the servo	arthraxon)	up	
	power supply			1) Full clean the experiment,
	share the	WD	Watchdog Alarm	re-input SRAM system files, such
	same power	(red)	5	as parameters, processing progra-
	supply. There			ms, etc. 2) Change the board.
	are also in-		Comuneralification	Check the alarm number displayed
	dicator lig-	НС		on DPL/MDI and determine the loc-
	hts on the	(red)	Overcurrent in the	ation of the fault point according
	system. Fau-		devi ce	to the internal diagnostic number.
	Its should be			Check the alarm information disp-
	iudaed acco-	HV	Servoamplification	laved by DPL/MDI and determine the
	rding to the	(red)	Overvoltage in the	fault based on the internal diag-
	alarm lights		ci rcui t	nostic number
		OUE	Diccharge unit	Check the alarm number displayed
		OHE		on DDI (UDI, to determine where the
		(rea)	Ur external	on DPL/MDI to determine where the
			Discharge unit	fault point is located.
			Overheat alarm occ-	
			urred	
		OH1	Power Mate-E	Check the alarm number displayed
		(red)	Within the unit	on DPL/MDI to determine whether
			Overheat alarm occ-	the fault point is new.
			urred	
				1. The method to restore system
				data using the MEMORY card:
	The indicator			1) Put the system in an emergency
	light WDA on	System alarm is generated Full		stop state.
5	the Power	cleaning or	replacement of the	2) The switch is placed on the
		cubetrata in		LOAD side (at this time both the
		substrate IS	i equi i eu.	red and green indicates lists
				reu anu green indicator lights are
				0TT).
				3) Insert the MEMORY card cont-

	aining the SRAM data into the Po-
	wer Mate-E slot (the green indic-
	ator light is on and the red ind-
	icator light is off).
	4) Put the switch in START sta-
	te. In data reading, the red and
	green indicators flash.
	5) When the data transmission
	ends normally, the red indicator
	light is off and the green indic-
	ator light is on. When the data
	transmission ends abnormally, the
	green indicator light is off and
	the red indicator light is flash-
	i ng.
	6) Set the switch to open NOR-
	MAL state.
	2 Whenever the board needs to be
	replaced, the SRAM data should be
	output first with the MEMORY card.
	The SRAM data includes: CNC para-
	meters, PMC parameters, ladder
	diagram, part processing program,
	etc.

			SRAM data output method:
			1) The system is in an emergency stop state.
			2) The switch is in the SAVE state, and the
			green and red indicators are off.
			3) Insert the MEMORY card into the slot of
			the Power Mate E, and the red indicator light
			goes out.
			4) Put the switch in START state. In data
			reading, the red and green indicators flash
			al ternatel y.
			5) At the end of a normal termination, the
			red indicator is turned off and the green
			indicator is turned on. At the end of an
			abnormal termination, the green indicator is
			turned off and the red indicator flashes.
			Place the switch on the NORMAL side. In this
			way, all SRAM data in the system has been
			output.
6	The alarm of	Reset the servo	Method:
	incorrect para-	parameters	1) Put the system in an emergency stop
	meter setting is		state.
	417		2) Set parameter 1000# (DGPR) to 1.
			3) If you use a high resolution encoder, set
			parameter 22#7 to 1.
			4) Set the number of pulses per encoder
			revolution in parameter 1001.
			5) Set the motor code (value 39-83) in
			parameter 1020.
			6) Set the motor rotation direction in par-
			ameter 1022.
			7) Set the number of speed feedback pulses
			in parameter 1023.
			8) Set the number of position feedback pul-
			ses in parameter 1024.
			9) Turn off the power and then turn it on
			again. After the above steps, the servo para-
			meters are initialized.
			If it is Power C, set the parameters 1084 and
			1085 (flexible gear ratio).

FANUC 3, 6 systems

berder	Failure symptom	Failura causa	Terms of
Ę	rarrure symptom	Fairure Cause	settlement
		1. There is no	1 Check the voltage of the terminals of
		servo unit	servo units 3 and 4.
		100V	2Check the emergency stop switch.
		2. The servo unit	1Check the alarm light on the servo unit
		is in alarm state	to see:
			TGLS: Line break alarm.
			OVC: Overload alarm.
			BRK: The circuit breaker trips without
			insurance.
			HVAL: High voltage input.
			LVAL: The input voltage is too low.
			HCAL: Overcurrent alarm.
			DCAL: The charge and discharge circuit
			is bad or the acceleration and deceler-
			ation frequency is too high.
		3. The system has	1 Check the diagnosis numbers 0023 and
		sent a PRDY sig-	0056.
		nal, but the sy-	The diagnosis number 0023 means as fol-
		stem has not re-	
		cerved a VRDY	0023#/(^VRDY): 1: Do not detect the
	The system is not	signal	speed control unit preparation signal;
	working and the		U: normal.
1	display screen		0023#6 (UVL): 1: OVERTOAD generates SV
	shows SERVO ALA-		NOT alarm; U: normal. UU23#5 (UHM): 1:
	RM: 02 (VROY OFF)		0022#2 (DALX): 1: the exist encoder gen
			oratos a Lino broak alarm: O: pormal
			The significance of diagnostic number 56
			is as follows:
			0056#1 (CMDEN): 1: normal: 0: speed
			control voltage is OV
			0056#0 (PRDY): 1: normal: 0: NC no out-
			put to the speed control unit.
			The meaning of diagnostic number 27 is
			as follows:
			0027#3,2,1
			(PCX): A signal from the X axis position
			encoder.
			(PCP): A signal from the spindle posit-
			ion encoder.
			2. Check to see if the command line is
			broken.
		4. The main boa-	1 Doplace the methorhead 2 Declars
		rd's position	the components on the methorheard if
		control section	
		is faulty	ມດວວາ ກາ ຜ.

			Check and confirm the voltage on the
		5. Supply voltage	speed control unit and motherboard.
2	The WDA light on the motherboard is lit and the	 The motherbo- ard was exposed to bright light 	Turn off the power and turn it on again.
	display screen shows WATCH DOG TIMER	2. There is a lot of oil and dust on the motherbo- ard	Please clean and dry.
		3. The motherbo- ard is bad	Replace the motherboard, re-enter para- meters, PMC parameters, part processing programs, etc., and the setting rod on the new motherboard should be the same as the old one.
3	The system does not work proper- ly. The display screen shows: CPU INTERRUPT	The CPU and the CPU peripheral circuit are fau- Ity	 Turn off the power and restart the machine. Clean the printing plate and dry it. Replace the motherboard, adjust and reset the shorting bar. Re-enter parameters, PMC parameters, part machining programs, etc.
4	ROM report to the police	1. The display shows:	1. Check 012, whether the ROM is inser- ted properly.

		ROM PARITY 012	2. Replace the ROM at location 012.
		2. The display	1. The ROM of the ROM No does not match the
		shows: ROM SER-	system software. Please replace it.
		IES xxx (ROM No)	2. The motherboard is bad.
			1. There is a piece of ROM in the system
		3. The display	software that does not match the version of
		Shows: RUM EDI-	the system software.
		IION 041	2. Replace the ROM at this location.
5	RAM report to	1. The display	1. The location of the job register is in the
	the police	shows: WORK ME-	middle and upper part of the motherboard.
		MORY:	Please replace it.
		PARITY LOW	2. The motherboard is bad
		ORPARITY HIGH	
			1. At the same time, press the "RESET" and
			"DELETE" keys on the operation panel to conn-
			ect the power supply. If the alarm is not
		2.PROGRAM	there, please re-enter CNC parameters, PMC
		MEMORY:	parameters and part processing program data,
		PARITY LOW OR	etc., to restore normal operation.
		PARITY HIGH	2 If the above steps do not work, replace the
			motherboard.
			3 Please check the operating voltage of the
			system.
6	ASR33/43 does	1 operate mode	The operating mode should be in EDIT state or
	not work prope-		emergency stop state.
	rly	2. selection	Check and confirm parameters 0-4, 300-304.
		parameter	
		3 Parameter set-	Check and confirm the following parameters:
		ting error	Parameter 0341=1
			Setting of parameter 310:
			Packet rate: ASR33 set to 11
			ASR43 Set the stop bit to the same as the
			input/output machine: 2 bits
			Output data format: ISO/EIA
			Control code: not used
		4. cable	Check and confirm the cable connection.
		5. Joggle	ASR33/43 Interface board is faulty.
		hubble board bee	1. The defective ring is engroued on the
		a sprious fault	magnetic hubble board. Dieaso noto down the
		and needs to be	defective ring on the magnetic hubble hoard
	The alarm	initialized	2 At the same time hold down "1" and ". "
	901 905 and 906	Note: The magn-	turn on the nower supply and the IPI screen
7	annear on the	etic hubble bo-	annears on the display screen
	display	ard can be ren-	3 Press 4 BUBBLE and the magnetic hubble
	ai spi ay	laced by a RAM	hoard initialization screen appears
		board The ren-	4 Multiply by 2 WRITE RY MANNAI
		lacement table	5 Turn on the BMI write switch of the magne-
		is as follows	tic bubble board.
Magnetic bubble board: A87L-0001-0015 (64K) A87L-0001-0016 (128K) A87L-0001-0017 (256K) A87L-0001-0018 (4*256K)	 6. Enter the bad magnetic ring data. Note that if you press the RESET key during the input, the bubble initialization screen is returned. 7. Press the START key. 8. Put the BMU switch in OFF state, cut off the power supply, and then start up. The magnetic bubble initialization is complete. 9. The system can be restored to normal only after re-entering CNC parameters, PMC parame- ters and other data. 		
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A87L-0001-0084	ters and other data.		

		(1M)		
		A87L-0001-0085		
		(2M)		
		A87L-0001-0086		
		(4M)		
		Replace with the		
		following RAM		
		boards:		
		A16B-2201-0136		
		A16B-2201-0135		
		A16B-2201-0134		
		A16B-2201-0133		
		A 16B-2201-0132		
		A 16B-2201-0131		
		A 16D 2201-0131		
0	The alarm number	The working RAM	When the 910 or 911 alarm occurs press the	
0	910 911 appeared	has an odd-even	START key to start the test Method:	
	on the display	check error	1 Pross "1" and " " at the same time turn	
	on the display	Thoro are four	on the newer supply and the IDL screen appe	
		indicators on	on the power suppry, and the TFL screen appe-	
		the methorboard	ars. 2 Multiply by 6 DAM TEST	
		the motifer board	2. Multiply by 0, NAM ILST.	
		that call be used	5. According to START, the test begins. The	
		to test the wo-	test results are as follows. (UTS III, ATS	
		TKING RAM	extinguished) the wux right is fit, the watc-	
			ndog alarm occurs, and the alarm 920 appears	
			on the display screen.	
			The meaning of LED (light) for you:	
			XXXX normal.	
			XXXO SLAVE READY Signal cut off.	
			Alarm XXOX 900-999 is generated (except 910	
			and 911). XOXX RAM Odd-even parity error.	
			The OXXX O RAM is bad.	
			The OXXO 1 number RAM is bad.	
			The OXOX 2 number RAM is bad.	
			The OXOO 3 RAM is bad.	
			The OOXX 4 number RAM is bad.	
			The OOXO 5 number RAM is bad.	
			The OOOX 6 RAM is bad.	
			The 0000 7 number RAM is bad.	
			OXX Flash 8 RAM is faulty.	
			0 X 9 RAM is faulty due to flashing X.	
			The flashing XXX RAM is on.	
			According to the above test results, take	
			corresponding measures: 1. Replace the RAM at	
			this location. 2. Replace the motherboard.	
	A No.960 alarm appears on the display screen		When the 910 or 911 alarm occurs, press the START key to start the test. Method: 1. Press "1" and "- " at the same time, turn on the power supply, and the IPL screen appe- ars. 2. Multiply by 6, RAM TEST. 3. According to START, the test begins. The test results are as follows: (0 is lit, X is extinguished) The WDA light is lit, the watc- hdog alarm occurs, and the alarm 920 appears on the display screen. The meaning of LED (light) for you: XXXX normal. XXXO SLAVE READY Signal cut off. Alarm XXOX 900-999 is generated (except 910 and 911). XOXX RAM Odd-even parity error. The 0XXX 0 RAM is bad. The 0XXX 1 number RAM is bad. The 0XXX 1 number RAM is bad. The 0XXX 4 number RAM is bad. The 0XXX 4 number RAM is bad. The 0XXX 5 number RAM is bad. The 0XXX FIASH & RAM is faulty. 0 X 9 RAM is faulty due to flashing X. The flashing XXX RAM is on. According to the above test results, take corresponding measures: 1. Replace the RAM at this location. 2. Replace the motherboard. 1. Check and confirm whether the connection between each printed board and the motherboard is loose. Please tighten it. 2. Check whether the motherboard and magnetic	
0		A system error	between each printed board and the motherboard	
9		occurred	is loose. Please tighten it.	
			2. Check whether the motherboard and magnetic	

	bubbl e	board	are	dirty	with	oil,	dust	and
	other d	irt, ar	nd cle	an and	dry t	hem.		
	3. At t	he same	e time	e, pres	s "0"	and	"del ete	" to
	turn on	the p	ower	supply.	ls t	here	any al	arm?
	Note:							

			(1) Hold down "CAN" and "DELETE" to connect	
			the power supply and clear the parameters. (2)	
			Hold down "RESET" and "DELETE" to connect the	
			power supply and clear the program.	
			(3) At the same time, hold down "O" and	
			"DELETE" connect the power supply and clear	
			all	
			4 Poplace the methorheard 5 Poplace the	
			4. Replace the motherboard. 5. Replace the	
10	The evictor gap	The cable is not	The second confirm whether the colle second	
10	nie system gen-		between the retery (concer symphronous cools	
		property conne-		
	and displays on	ctea	signal and the rotary detection board is loo-	
	the monitor sc-		se; whether the signal line is broken; whether	
	reen:		the signal line is short circuit to the grou-	
	414 、 424 The		nd; short circuit between the signal lines.	
	alarm rotation/	The detector		
	sensor synchro-	gain is not ap-	Adjust the gain, adjust VR1.	
	nous scale pos-	propriate		
	ition detection	Phase deviation	Initial phase deviation setting.	
	is abnormal	The rotary int-		
		erface is set	Correct setting.	
		incorrectly		
		Parameter sett-		
		ing is incorrect	Parameter 316#0, 1, Set 1.	
		Adjust the rot-		
		ation of Fmin,	Adjust VR2 (Fmin) and VR3 (Fmax).	
		Fmax		
		The interface of	1After swapping the signal lines of the X-axis	
		the position	and Y-axis rotation, you can find which inte-	
		detection board	rface is faulty	
		is bad	2Replace the interface board.	
		The front ampl-		
		ifier of the		
		induction svnc-	Renewal	
		hronous ruler is		
		faulty		
		Synchronous sy-	Control gap	
		nchronous scale	control gap.	
		dotocti on		
		The gap between		
		the deviace in		
		the devices is		
		The methods		
		ine motherboard	Renewal.	
			Check the calles between the system and the	
11	The system gen- erates an alarm. The display sc- reen shows: 600, alarm No. Data	Cabl e	connection unit	
		The connection		
			Renewal.	
		The motherboard		
		is had	Renewal.	
		່າວັນແມ		

	transmi ssi on	MDI/Display te-	
	error of the	rminal is faulty	Renewal.
12	connection unit The system gen-	Cable	Check to see if the cable connecting the unit
	erates an alarm	Cable	to the monitor screen /MDI is broken or loose
	The display sc-	MDI/Display ma-	Renewal
	reen shows: 607, alarm MDI/disp- lay data trans- mission error	lfunction	
		The motherboard	Renewal.
		TS Dad	
		The connection	Demoural
		unit is faulty	kenewai.