SPECIALIST ROTARY

SCREW COMPRESSOR
CONTROLLER OPERATING MANUAL
VEICHI SERIES CONTROLLER AND PROTECTION SYSTEMS
FOR CZ AND EZ-SERIES INTEGRATED VARIABLE SPEED
SCREW COMPRESSORS WITH
AP150 CONTROL SYSTEM

1. General

First of all, we would lile to extend our sincere gratitude to you for purchasing the AP150-series integrated air compressor designed and manufactured by Suzhou Veichi Electric Co., Ltd. This manual will describe the proper method to use this product, so our costomers can get good benefit from it. Please be sure to read this manual carefully before using the product (installation, wiring, operation, maintenance, inspection, etc.). That is to say, please don't use the product until the safety precautions described in this manual are fully understood.

The wall-mounting type AP150-series integrated air compressor are covered with plastic shell and designed with simple and convenient installation and debugging, among which pluggable terminals are adopted in the circuit added with anti-misplacing design; This product highly integrates the host computer and the oil cooling fan control into one body, in which 220VAC AC power supply is designed and anti-overcurrent fuses are used for the transformer to produce 24V external output; Integrated PT100 temperature & pressure sensors are built in to detect and protect circuits. Dedicated softwares that can communicate with HMI, IOT and other devices without debugging are used in this product thus one-key start is achieved.

Please understand the safety precautions described in this manual before acutally using this product for safe, reliable and reasonable operation.

2.1 Technical Specification

Items		Specifications
Power input	voltage & frequency	three-phase 380V 50/60Hz
	admissible fluctuation	voltage: ±15%; Frequency: ±5% distortion rate meets IEC61800-2 requirements
	closing striking current	Smaller than the rated current
	drive efficiency	≥96%
Output	output voltage	3 phases output under rated conditions between 0 and input voltage and deviation between the actual voltage output and setpoint less than 5%.
	output frequency range	0 ~ 600.00Hz
	output frequency accuracy	maximum frequency $\pm 0.5\%$
	overload capacity	133% of rated current for 4 min
	motor control mode	open-loop vector control w/o PG, V/F control
	modulation	optimized space vector PWM modulation
	carrier frequency	0.6~15.0kHz，random carrier modulation

Main control performance	speed control range	vector control w/o PG, rated load 1：100
	steady-state speed accuracy	vector control w/o PG: ≤1% of rated synchronous speed
	frequency accuracy	digital set: maximum frequency × ±0.01%, analog set: maximum frequency × ±0.2%
	frequency resolution	digital set: 0.01Hz analog set: maximum frequency×0.05%
	improved torque	automatic torque improved from 0.0% to 100.0%; manual torque improved from 0.0% to 25.0%
	rated output voltage	the set rated output voltage range varying from 50% to 100% of the motor's rated voltage via the supply voltage compensation function (output voltage can not exceed input value).
	automatic voltage regulation	automatic constant voltage kept during grid voltage fluctuation
	automatic energy consumption regulation	automatic output voltage optimization according to the load condition to reduce energy consumption.
	automatic current limiting	automatic current limitation to prevent trippings caused by frequent overcurrent
	instantaneous power-down handling	uninterrupted operation through busbar voltage control during instantaneous power failure

	Input command signal	signal of oil temperature detected via PT100 and of pressure detection with input current varying from 4 to 20 mA
	External output signal	2-way relay outputs including the loading valve and oil pump start/stop switch
Protections	input and output phase loss protection, host overcurrent and overload protection, oil cooling fan overload protection, anti-demagnetization protection of the motor etc.	
Environment	installation site	indoor, not higher than 1000m above sea level, no corrosive gas and direct sunlight
	temperature & humidity	-10 ~ +50℃, 20%-95% RH (no condensation)
	vibration	smaller than 0.5g below 20Hz
	storage temperature	-25 ~ +60℃
	installation method	wall-mounting
	cooling method	forced air cooling

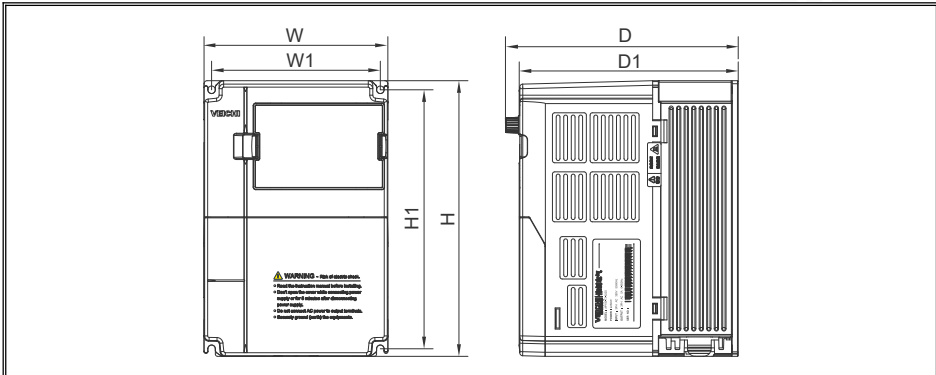Table 2-1 Technical specification

2.2 Rated Output Current of the Integrated Air Compressor

Host power (KW)	Rated output current (A)	Oil cooling fan power (KW)	Rated output current (A)
7.5	17	0.75	2.1
11	25	0.75	2.1
15	32	0.75	2.1

| 22 | 45 | 1.5 | 3.8 |
| 37 | 75 | 1.5 | 3.8 |

Table 2-2 Rated output current

2.3 Product Dimensions

Inverter model	Outline dimensions(mm)				Installation holes(mm)		Installation apertures
	W	H	D	D1	W1	H1	
AP150-T3-7R5S	159	246	157.5	148	147.2	236	φ5.5
AP150-T3-011S	195	291	167.5	158	179	275	φ7
AP150-T3-015S							
AP150-T3-022S	230	330	200	190	208	315	φ7

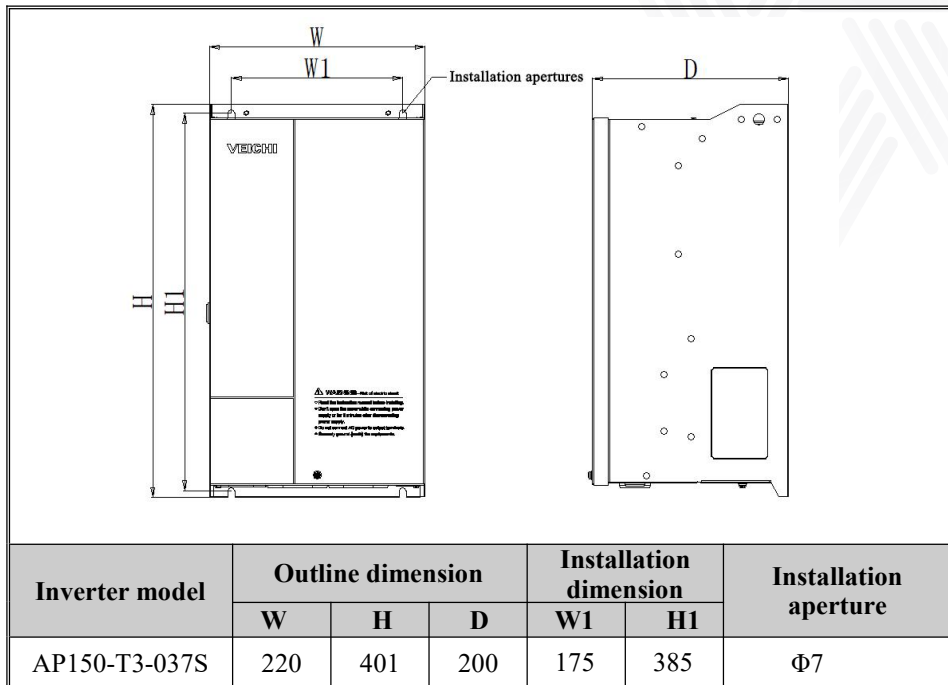| Inverter model	Outline dimension			Installation dimension		Installation aperture
	W	H	D	W1	H1	
AP150-T3-037S	220	401	200	175	385	Φ7

Figure 2-1 Wall - mounted outline and installation dimensions diagram

Notes	● Do not test the insulation of the drive and cables connected to the drive with high-voltage insulation test equipment. ● Measure the insulation resistance to ground with a 500-volt megohmmeter before the driver and peripheral devices (filters, reactors, etc.) need insulation testing, and the insulation resistance should not be less than 4MΩ.

2.4 Main Loop Terminals

7.5~22KW Arrangement order of main circuit terminals
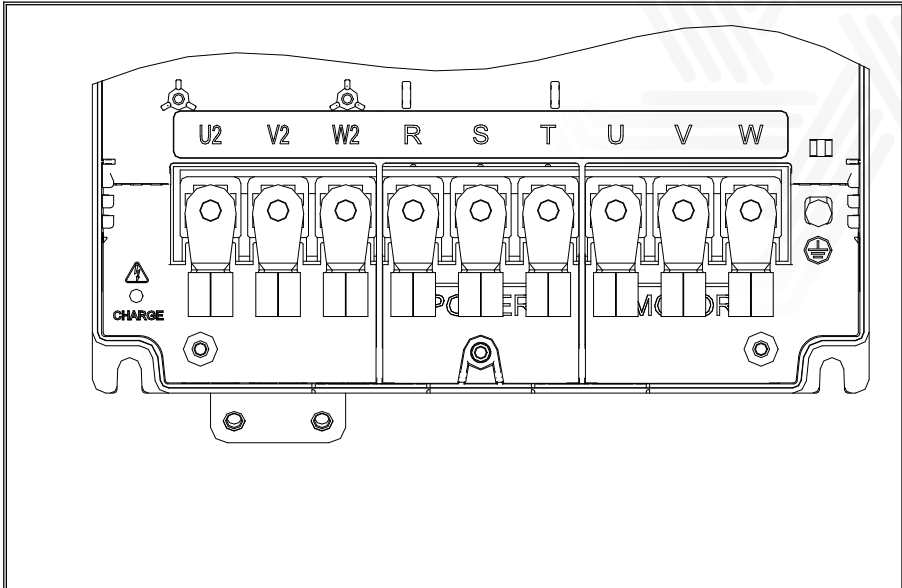
Terminal symbol	Terminal name	Terminal function definition
U2 V2 W2 oil cooling fan	oil cooling fan output terminals	on drives of oil cooling fans
R S T power	drive input terminals	On connection to AC380 three-phase AC input power
U V W master motor	master motor output terminals	on driving the master motor
⏚	grounding terminals	Grounding terminals with grounding resistance <10 ohms

Figure 2-2 Main circuit terminal definition and distribution (different ground terminals between AP150-T3-022S and other models)
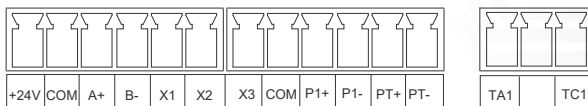
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2.4.1 Definition of Control Terminals

Figure 2-3 Terminal distribution diagram of 7.5~22KW single inverter S model control board
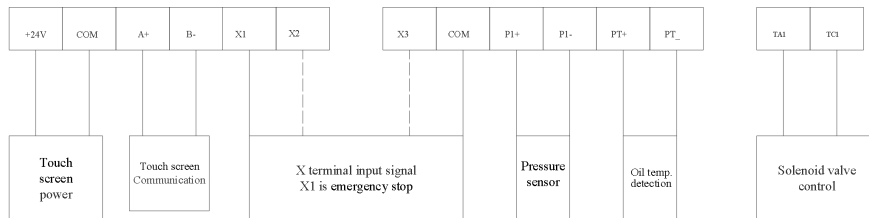
● **Description on Control Terminals**

Classification	Terminal symbol	Terminal function description	Technical specifications
Digital input	X1~X3	Multi-function input terminals, X1 for emergency stop, X2 for running, X3 for motor overheat signal input.	Isolated bipolar digital signal input, level input voltage range: 10 to 30V, input impedance 4.4KΩ
	COM	Multifunctional input terminal to ground	
Power output	24V	External 24V power supply	+24V power output, accuracy ±5%, external output capacity 0.4A
	COM	24V power supply common terminal (DC24V-)	
	PE	Ground wire for	Grounding terminal,

		touch screen	grounding resistance <10 ohms
485 communication	A+	RS485 communication+	Half-duplex RS485 communication, baud rate <250KBPS, connected to the touch screen communication port
	B-	RS485 communication-	
Temp. detection input	PT+, PT-	PT100 oil temp. detection terminal	detection range -20℃~250℃, temperature error ±5℃
Pressure signal input	P1+，P1-	Pressure sensor signal 1	4~20mA input, 24V DC power output, accuracy ±1%, external output 0.1A
Relay output	TA1, TC1	Relay output as solenoid valve switch, on by default	Built-in 220VAC power supply, power capacity 20VA, the total output current not bigger than 0.1A.

Table 2-3 Description on control terminals

2.4.2 Wiring Diagram of Control Terminals

AP150 control board terminal wiring diagram

+24V	COM	A+	B-	X1	X2		X3	COM	P1+	P1-	PT+	PT_		TA1	TC1

Touch screen power	Touch screen Communication	X terminal input signal X1 is emergency stop	Pressure sensor	Oil temp. detection	Solenoid valve control

Note: The solid line in the diagram indicates the minimum wiring when the system is running, and the dotted line indicates that the application is optional.

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Figure 2-3 Terminal wiring diagram of 7.5~22KW single inverter .

3 Touch Screen Display and Operation

3.1 Basic Operation and Display on the Touch Screen

Any operations of AP150-series intergrated machines are done and displayed on the touch screenAP150. The status interface is displayed on the touch screen when power is on.
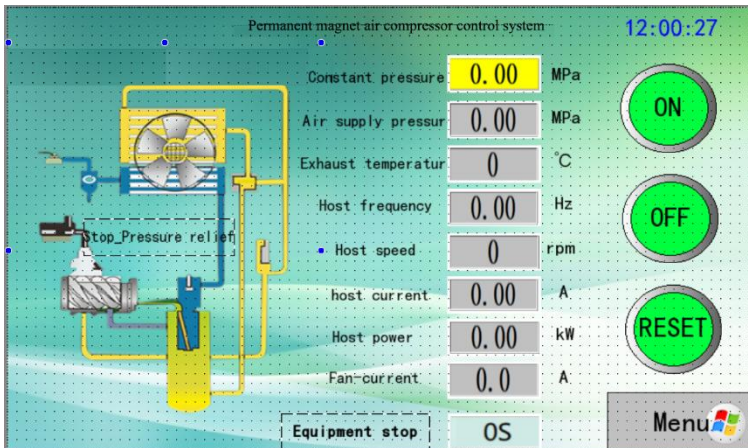
3.1.1 Status Displayed on the Touch Screen

Figure 3-1: Status on the interface

The status interface shows the basic information of the compressor on which starting/ stopping the compressor pressure value setting are completed. Press and hold the "On" button for more than 1 second in the shutdown state to turn on the compressor; press the "Off/Reset" button in the running state to shut down the compressor; press the "Off/Reset" button after clearing all the faults, and then the alarm on the screen will be lifted.

Tap on "Set Pressure" to set the desired pressure value. Under the automatic loading mode, the compressor will automatically load and unload according to the current pressure. Tap on"Menu" to enter the corresponding parameters on the

pop-up interfaces.

When a fault is detected on the compressor, an alarm will appear on the touch screen and the compressor will be stopped automatically until the fault is cleared and reset as prompted.
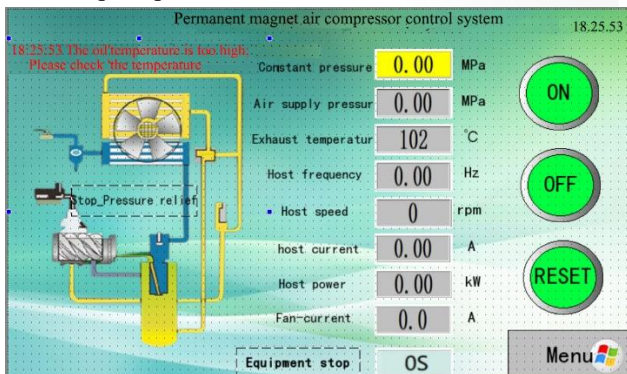

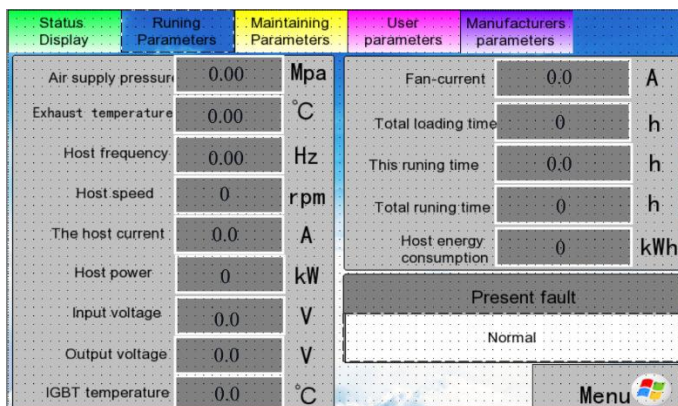Figure 3-2：Alarm message

3.1.2 Running Parameters

Figure 3-3: Running parameters

Running parameters display detailed air compressor status and "This fault" here displays the current fault information on the air compressor.
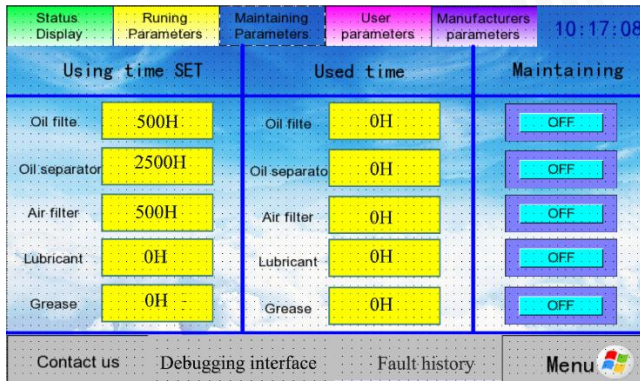
3.1.3 Maintenance Parameters.

Figure 3-4: Maintenance parameters

On that interface, maintenance durations and service durations of each part in the air compressor will be displayed.

When actual duration is longer than available duarion and the according maintenance setting is set "off", then there will be a red promp on the the status interface on the touch screen but the compressor will go on running. If the according maintenance setting is set "on", then the touch screen will show an alarm and the compressor will be stopped. Please replace and maintain the related parts in time when actual duarion is longer than actual duration.

It's judged as an invalid maintance if the available duration is set as "0". Under this case, there will be no any prompt or alarm at all even when acutal duration is shorter than the available duaration.

Parameters of actual duration, available duraion and maintance setting can be changed after maintenance is completed.

3.1.4 Protection Pareameters

The operators only need to enter the passwords of different access levels provided by the compressor manufacturer to perform the corresponding

operation. If the access level is not high enough, please contact the compressor manufacturer to get a new password for further operations. All accesses will be cleared after returning to the status interface, thus passwords need to be entered again if users need to enter the pages of Protection parameters and Factory parameters.

Figure 3-5 User parameter

The user parameter interface is mainly for air compressor manufacturers and agents to set parameters of, like the compressor charging/unloading pressure, fan start/stop temperature, loading valve and others.

No-load delay: the controller starts timing when the air compressor is unloaded, and when it exceeds the " No-load delay ", the master motor stops and enters the dormant state. The master motor under the dormant state will start again. when the air supply pressure is lower than the loading pressure,

Shutdown delay: the controller starts timing when the compressor stop button is pressed or the whole machine protection function is on, and when it exceeds the "shutdown delay", the whole machine will stop.

Restart delay: the controller starts timing when the compressor is shut down, and when it exceeds the "restart delay", the master motor is ready for the second start.
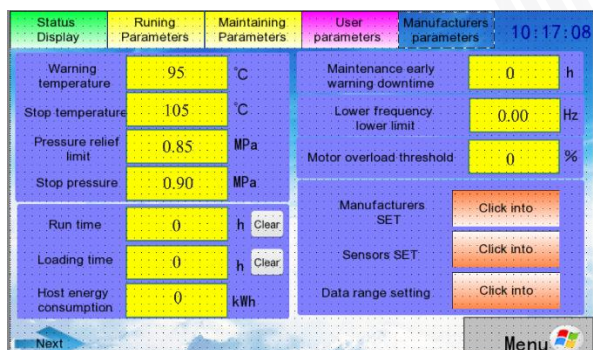
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3.1.5 Factory Parameters
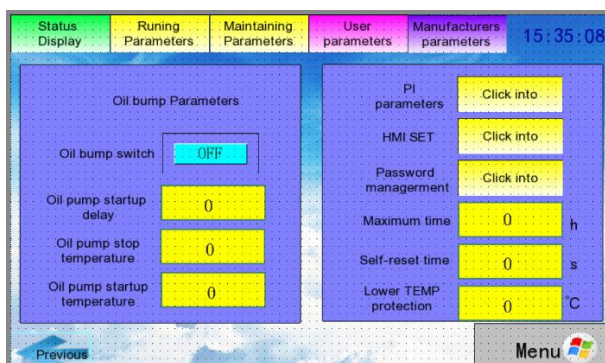

Figure 3-6: Factory parameter interface1

Figure 3-7: Factory parameter interface 2

Factory parameters are mainly the parameters set by the air compressor manfacturer. The parameters on this interface are passwords protected in different ways according to the requirements of the air compressor manufacturer.

Warning temperature and Shutdown temperature: When the oil temperature is higher than the "warning temperature", there will be a red prompt on the the status interface while when the oil temperature is higher than the "shutdown temperature", there will be an alarm on the touch screen and the machine will be stopped.

Unloading pressure upper limit and Shutdown pressure: The upper limit is the maximum value of the unloading pressure, and the unloading pressure

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among the user parameters is limited by this. When the supply pressure is higher than the shutdown pressure, the compressor stops with an alarm.

Oil pump switch: Low pressure air compressors sometimes need independent oil pumps and the oil pump control is effective when the oil pump switch is turned on. When the oil temperature is higher than the "oil pump start temperature", the oil pump turns on while when the oil temperature is lower than the "oil pump stop temperature", the oil pump stops. Oil pump start-up delay is used to set the delay of oil pump start signal.

Gain parameters: AP150 PID parameters can be adapted to a variety of applications thus this parameter does not need to be adjusted.

Touch screen parameters: Used to set touch screen-related parameters, such as system clock, buzzer, etc.

Maximum time and reset time: When the running time of the air compressor is longer than the maximum time, the touch screen will show an alarm and the machine will be stopped; the reset time is the fault self-resetting time.

3.1.6 Sensor Parameters
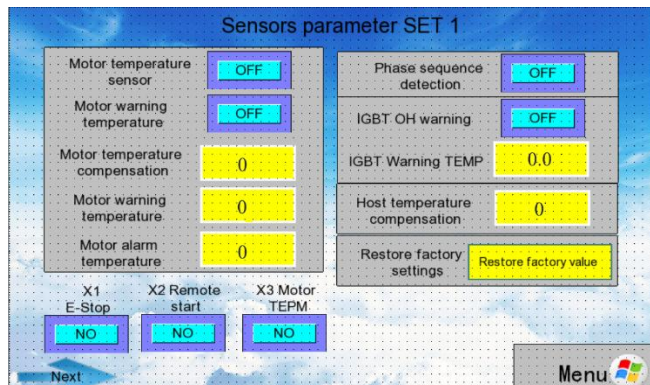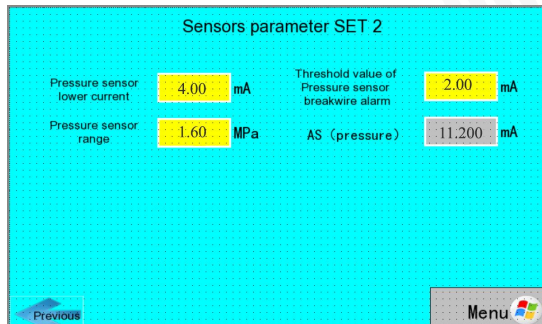

Figure 3-8 Sensor parameters interface 1

Figure 3-9 Sensor parameters interface 2

Tap on the sensor parameters among the factory parameters to enter the sensor parameters interface that includes paramters related to the digital input, temperature sensor and pressure sensor of the compressor.

Digital input polarity： Some digital switches of the air compressor are normally open and some are normally closed. Please set the polarity of the relevant digital input terminals according to your needs. As to the erminals that are not used, please set them to normally open, otherwise they will cause false operation or false alarm of the air compressor.

Motor temperature detection: When the external motor temperature detection is judged to be higher than the "motor warning temperature", signal will be input via X3 terminal of the control panel and then there will be an alarm on the touch screen and the machine will be stopped.

Temperature compensation: The measurement may lead to some deviations and when it's too large, it needs to be corrected. The specific oil temperature is: the temperature measured by the oil temperature sensor plus temperature compensation of the master motor.

Phase-sequence protection: AP150 is designed with the power phase sequence detection function, and the default state is on.

Module overheating warning: When it is on, module temperature of the drive higher than the "module warning temperature" will lead to a prompt on the status interface while the machine will not not stop. This function is

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designed for application in the harsh environments. When the drive air duct is blocked, the user will be prompted to clean it to avoid shutdowns due to the high temperature protection, and that might lead to unnecessary losses to the user.

Factory data reset: Tap on "Restore factory settings", and the touch screen parameters will be restored to original factory settings including maintenance parameters but not the fault records. Before restoring factory settings, please record the maintenance parameter values and then enter them manually. (This action is to prevent missing out on maintenance time of the parts in the air compressor.)

Pessure sensor:
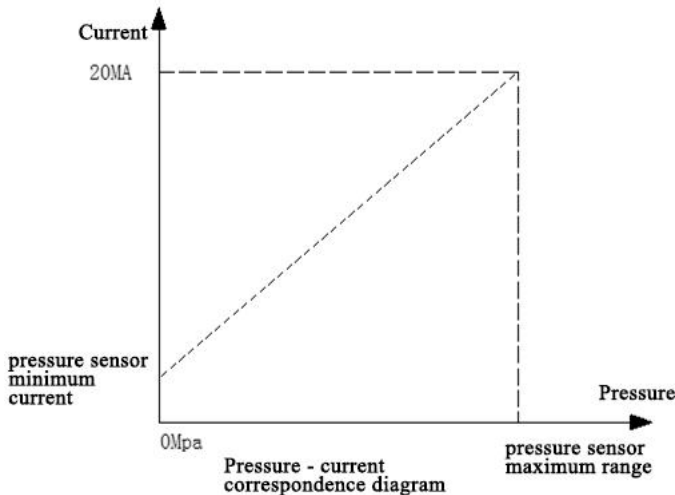
Figure 3-10：Pressure-current correspondence diagram

Figure 3-10 shows the relationship between pressure sensor current and corresponding pressure, "pressure sensor minimum current" is the output current when pressure sensor detects 0Mpa; "pressure sensor maximum range" means the corresponding pressure from the sensor when the current reaches 20mA；When the AS detection current value is smaller than the "pressure disconnection

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threshold", the system judges that the pressure sensor has disconnected and thus it will send an alarm and stop automatically, and in this case, AS value is the current detected; Please adjust the "pressure sensor minimum current" and "pressure sensor maximum range" to correct the error of the sample data from the pressure sensor.
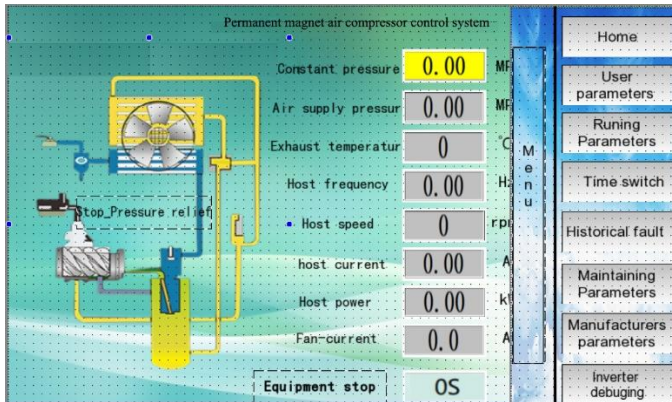
3.1.7 Variable Frequency Debugging

Figure 3-11 Variable frequency debugging

Tap on the "menu" on any interface, and then select the "variable frequency debugging" to enter the correct interface. On this interface, users can complete the setting and test run of the drive parameters.

3.2 Motor Parameters

Figure 3-12: Master motor-motor parameter

Select the motor control mode, and input the parameters on the motor nameplate into the corresponding box correctly but not the number of motor polest since the system will automatically calculate the number of motor poles according to the speed and frequency. Tap the "Start" icon and then the drive starts to learn the motor parameters, and "start" icon turns into "learning". Learning is completed after about 10 seconds, and the icon turns back to "start". If there is something wrong with the learning process, tap on the learning icon to stop the motor immediately.

Notes: (1) The control method is usually set by default, so it needs no further setting.
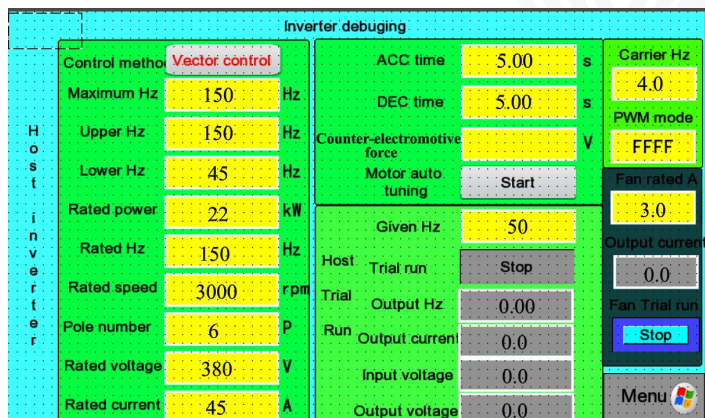
Figure 3-13: Master motor-test run

After learning the motor parameters, users can also complete the test run of the motor on this interface: firstly, set the "given frequency", then tap on "host test run" to check if the motor runs along correct direction. If it is not correct, please tap on the test run icon again to stop the drive and switch any two phases of the motor cable. Set the upper/lower limit frequency, lower limit frequency operation mode, stop mode, etc. when test run performs normally.

3.2.1 Fan Parameters

Enter the current parameters on the fan motor nameplate into the rated current parameter of the fan, and then tap the icon below the "test run" icon to see if the fan direction is correct. If not, please stop first and then switch the fan phase sequence, and then try to run again to check the fan direction and current operation.

Figure 3-14 Fan- parameters setting

3.2.2 Fault Parameters

Figure 3-15 Master motor-fault parameters

Figure 3-16: Fan- fault parameters

The fault parameters include the current and previous fault status of the master motor drive and the oil cooler drive respectively for the manufacturer's reference.

4. Functional Parameters

4.1 Function Codes

"●": indicates that the parameter is changeable while the drive is running;

"○": indicates that the parameter is not changeable while the drive is in running;

"×": indicates that the parameter can only be read but can not be changed

"–": indicates that the parameter is a "factory parameter" and can only be changed by manufacturers;

"※": indicates that the parameter is related to the model of the drive;

Function code	Designation	Range and definition of setting value	Factory setting	Attr	Comm. address
F21.00	air compressor control mode selection	ones-place:　0: general-purpose inverter 　　　　　　1: air compressor mode 　　　　　　2: debugging mode tens-place: oil cooling fan hundreds-place:　contactor　(master motor fan) thousands-place: reservedd	0001	●	0x5500/21760
F21.01	loading pressure	0.00Mpa ~ setting pressure	0.65Mpa	●	0x5501/21761
F21.02	setting pressure	loading pressure ~ unloading pressure	0.72Mpa	●	0x5502/21762
F21.03	unloading pressure	setting pressure ~ upper limit pressure	0.78Mpa	●	0x5503/21763
F21.04	upper limit pressure	unloading pressure ~ shutdown alarm pressure	0.85Mpa	●	0x5504/21764
F21.05	shutdown alarm pressure	upper limit pressure ~ 5.00Mpa	0.90Mpa	●	0x5505/21765
F21.06	host fan stop temp.	0℃ ~ setting temperature	75℃	●	0x5506/21766
F21.07	setting temperature	host fan stop temp. ~ host fan startup temp.	80℃	●	0x5507/21767
F21.08	host fan startup temperature	setting temperature ~ 150℃	85℃	●	0x5508/21768
F21.09	warning temperature	0℃ ~ shutdown alarm temperature	95℃	●	0x5509/21769
F21.10	shutdown alarm temperature	warning temperature~200℃	105℃	●	0x550A/21770

F21.11	oil filter actual duration	0~65535h	0	●	0x550B/21771
F21.12	oil filter maintenance duration	0~65535h; 0 means invalid	500	●	0x550C/21772
F21.13	oil separator actual duration	0~65535h	0	●	0x550D/21773
F21.14	oil separator maintenance duration	0~65535h; 0 means invalid	2500	●	0x550E/21774
F21.15	air fiilter actual duration	0~65535h	0	●	0x550F/21775
F21.16	air fiilter maintenance duration	0~65535h; 0 means invalid	500	●	0x5510/21776
F21.17	lube actual duration	0~65535h	0	●	0x5511/21777
F21.18	lube maintenance duration	0~65535h; 0 means invalid	500	●	0x5512/21778
F21.19	grease actual duration	0~65535h	0	●	0x5513/21779
F21.20	grease maintenance duration	0~65535h; 0 means invalid	2000	●	0x5514/21780
F21.21	maintenance action setting 1	ones-place: oil filter; 0: warning 1: alarm & stop tens-place: oil part; 0: warning, 1: alarm & stop hundreds-place: air filter; 0: warning 1: alarm & stop thousands-place: lube;0: warning, 1: alarm & stop	0000	●	0x5515/21781
F21.22	maintenance action setting 2	ones-place: grease; 0: warning 1: alarm & stop tens-place: reservedd hundreds-place: reservedd thousands-place:0: immediate alarm 1: alarm & stop	0000	●	0x5516/21782
F21.23	fault self-reset number	0~10 times	3 times	●	0x5517/21783
F21.24	fault self-reset duration	0~1000S	10S	●	0x5518/21784

F21.25	system function settings	ones-place: 0: fault self-reset off 　　　　1: reset except OC, SC fault; 　　　　2: reset except SC fault, 　　　　3: reset all faults tens-place: overspeed enable hundreds-place: difference between setting pressure and unloading pressure thousands-place: modification limit between maximum frequency and lower limit frequency	0002	●	0x5519/21785
F21.26	loading delay	0~5000S	10S	●	0x551A/21786
F21.27	no-load delay	0~5000S	300S	●	0x551B/21787
F21.28	shutdown delay	0~5000S	15S	●	0x551C/21788
F21.29	restart delay	0~5000S	30S	●	0x551D/21789
F21.30	lower running duration	0~65535S (total running duration = F21.31 × 65535 + F21.30)	0h	●	0x551E/21790
F21.31	running duration	0~65535h	0h	●	0x551F/21791
F21.32	cumulative power consumption	0~65535Kwh	0Kwh	●	0x5520/21792
F21.33	max running time setting	0~65535h; 0 means invalid	0h	●	0x5521/21793
F21.34	loading duration	0~65535h	0h	●	0x5522/21794
F21.35	startup loading method setting	LED ones-place: loading method 　　　0: automatic; 1: manuual LED tens-place: manual loading & unloading 　　　0: inactive;1: active LED hundreds-place: reservedd LED thousands-place: reservedd	0000	●	0x5523/21795
F21.37	lower limit of pressure sensor	0.00~20.00ma	4.00ma	●	0x5525/21797
F21.38	max range of pressure sensor	0.00~10.00Mpa	1.60Mpa	●	0x5526/21798
F21.39	pressure disconnection alarm threshold	0.00~10.00ma	1.00ma	●	0x5527/21799
F21.40	master motor temperature compensation	-50~50℃	0℃	●	0x5528/21800
F21.41	motor warning temperature	20℃~ motor alarm temperature	80℃	●	0x5529/21801

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F21.42	motor alarm temperature	motor warning temperature ~200℃	100℃	●	0x552A/21802
F21.43	motor temperature compensation	-50~50℃	0℃	●	0x552B/21803
F21.44	motor fan start-up delay	0~5000S	3S	●	0x552C/21804
F21.45	motor fan shut-down delay	0~5000S	10S	●	0x552D/21805
F21.46	oil pump start-up delay	0~5000S	5S	●	0x552E/21806
F21.47	oil pump shut-down temp.	0℃~ oil pump start-up temperature	77℃	●	0x552F/21807
F21.48	oil pump start-up temperature	oil pump shut-down temperature ~200℃	87℃	●	0x5530/21808
F21.51	module warning temperature	0~200.0℃	70.0℃	●	0x5533/21811
F21.52	low protection temperature	-30~100℃	-20℃	●	0x5534/21812
F21.53	sensor channel selection	LED ones-place: hardware input loss 0: off;1: warning;2: on LED tens-place: phase sequence protection 0: off;1: forward;2: reverse LED hundreds-place: module temperature warning 0: off; 1: on LED thousands-place: motor temperature warning 0: off;1: on	0110	●	0x5535/21813
F21.54	current phase sequence	0: none;1: forward;2: reserse	0	×	0x5536/21814
F21.55	inter-phase detection voltage	0~999.9V	0V	×	0x5537/21815
F21.56	pressure control ratio gain KP	0.00~10.00	2.00	●	0x5538/21816
F21.57	pressure control integral gain KI	0.00~10.00	5.00	●	0x5539/21817
F21.58	pressure filter	0.00~50.000S	0.100S	●	0x553A/21818

F21.59	PID setting	LED ones-place: nonlinear PI control of pressure 0: on; 1: off LED tens-place: PI control lower limit of pressure 0:3/4; 1:0 LED hundreds-place: nonlinear PI control of temperature 0: on; 1: off LED thousands-place: PI control lower limit of temperature 0:3/4; 1:0	0110	●	0x553B/21819
F21.60	reserved			●	0x553C/21820
F21.61	temp. control ratio gain KP	0.00~10.00	2.00	●	0x553D/21821
F21.62	temp. control integral gain KP	0.00~10.00	1.00	●	0x553E/21822
F21.63	PT temp. filter	0.00~50.00S	1.00S	●	0x553F/21823
F21.65	reserved			●	0x5541/21825
F21.66	fan frequency power	set by model		※	0x5542/21826
F21.67	modification of parameter addresses	0~0xFFFF	0xFFFF	●	0x5543/21827
F21.68	modification of parameter values	0~65535	0	●	0x5544/21828
F21.69	fan control parameters	LED ones-place: oil cooler control 0: automatic; 1: manual LED tens- place: oil cooler operation 0: off; 1: on LED hundreds- place: reservedd LED thousands-place: reservedd	0000	●	0x5545/21829
F21.70	fan setting frequency	0.00~300.00Hz	25.00Hz	※	0x5546/21830
F21.71	fan lower frequency limit	0.00~50.00Hz	15.00Hz	※	0x5547/21831
F21.72	fan acceleration time	0.00~600.00	20.00S	※	0x5548/21832
F21.73	fan deceleration time	0.00~600.00	20.00S	※	0x5549/21833
F21.74	fan carrier wave	1.0~10.0Khz	4.0Khz	※	0x554A/21834
F21.75	rated frequency of fan motor	0.00~300.00Hz	50.00hz	※	0x554B/21835

F21.76	rated voltage of fan motor	0~1500V	380v	※	0x554C/21836
F21.77	rated current of fan motor	0~100.0A	3.0A	※	0x554D/21837
F21.78	rated speed of fan motor	0~5000RPM	1450RPM	※	0x554E/21838
F21.79	lower cumulative power consumption	0~65535h	0	●	0x554F/21839
F21.80	higher cumulative power consumption	0~65535h	0	●	0x5550/21840
F21.81	consumables maintenance timeout shutdown setting	0~30000h (0 means not working)	0h	●	0x5551/21841
F21.82	warning duration	0~30000h (0 means not working)	50h	●	0x5552/21842
F21.83	MIN frequency delay	0~5000S (0 means not working)	0S	●	0x5553/21843
F21.84	pressure correction factor	50%-200%	100%	●	0x5554/21844
F21.85	inverter overvoltage point	0.0~600.0V (0 means not working)	0V	●	0x5555/21845
F21.86	inverter undervoltage point	0.0~600.0V (0 means not working)	0V	●	0x5556/21846
F21.87	no-load running selection	0: off; 1:no-load running on	1	●	0x5557/21847
F21.88~F21.100	reserved				0xE58

table 4-1: Functional parameters

4.2 Monitering Codes

Holding the PRG button for over 2 seconds and then enter the "C" parameter group to checking the current status of the inverter.

Function code	Designation	Unit and definition	Comm. address	Function code	Designation	Unit and definition	Comm. address
C01.00	fault type	see fault information code table for details	0x2200	C01.12	frequency of previous fault	0.00~ max frequency	0x2212
C01.01	fault diagnosis information	see fault information code table	0x2201	C01.13	output voltage of previous	0~1500V	0x2213

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		for details			fault		
C01.02	fault frequency	0.00~max frequency	0x2202	C01.14	output current of previous fault	0.1~2000.0A	0x2214
C01.03	fault output voltage	0~1500V	0x2203	C01.15	voltage bus of previous fault	0~3000V	0x2215
C01.04	fault output current	0.1~2000.0A	0x2204	C01.16	module temp. of previous fault	0~100℃	0x2210
C01.05	fault bus voltage	0~3000V	0x2205	C01.17	inverter status of previous fault	LED ones-place: running direction 0: forward;1: reverse LED tens-place: running status 0: shut down;1:speed stabilizing 2: accelerate; 3: decelerate LED hundreds -& thousands -place: reservedd	0x2211
C01.06	fault module temperature	0~100℃	0x2206	C01.18	input terminal of previous fault	see the input terminal status diagram	0x2212

C01.07	faulty inverter status	LED ones-place：running direction 0: forward 1: reverse LED tens-place: running status 0: shut down 1: accelerate 2: decelerate 3: constant speed LED hundreds & thousands-place: reserved	0x2207	C01.19	output terminal of previous fault	see the output terminal status diagram	0x22 13
C01.08	fault input terminal status	see the input terminal status diagram	0x2208	C01.20	fault type of previous two faults		0x22 14
C01.09	fault output terminal status	see the output terminal status diagram	0x2209	C01.21	diagnostic information of previous two faults	see fault information code table for details	0x22 15
C01.10	previous fault type	see fault information code table for details	0x2210	C01.22			0x22 16
C01.11	previous diagnostic information	see fault information code table for details	0x2211	C01.23	diagnostic information of previous three faults		0x22 17

table 4-2 C01-fault record monitoring group

4.3 Fault Codes

Display	Comm. Code	Fault type	Display	Comm. Code	Fault type	Display	Comm. Code	Fault type

Code	No.	Description	Code	No.	Description	Code	No.	Description
E. SC	1	system error	E.oC	4	over-current in acceleration	E.oC2	5	over-current in deceleration
E.oC3	6	constant speed overcurrent	E.oU1	7	over-voltage in acceleration	E.oU2	8	over-voltage in deceleration
E.oU3	9	constant speed over-voltage	E.LU2	10	Running undervoltage	E.oL1	11	motor overloading
E.oL2	12	inverter overload	E.iLF / A.iLF	13/65	input loss（alarm/warning）	E.oLF	14	output loss
E.oH2	15	rectifier bridge overheating	E.oH1	16	inverter overheating	E. EF	17	inverter external fault
E. CE / A. CE	18/74	abnormal Rs485 communication	E.HAL	19	current detection fault	E.rE	20	motor detection fault
E.EEP / A.EEP	21/69	storage fault	E.rE	25	motor detection fault	E.CPE	26	abnormal parameter copy
E. PG	27	abnormal PG card connection (alarm/warning)	E.oU4	28	over-voltage during shutdown	EPA	/	keyboard comm. fault
L.iFE	30	reserved	E.iAE	31	initial position angle learning failure	E.dEF / A.dEF	32/70	Excessive speed deviation (alarm/warning

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E.SPd / A.SPd	33/71	motor stalling	E.Ld / A.Ld	34/67	load protection 1	E.Ld2 / A.Ld2	35/68	load protection 2
E.CPU	36	CPU timeout	E.LoC	37	OTP verification fault	E.038	38	synchronizer out of step
L.U.1	64	low voltage during shutdown	A.072	72	GPS locking	A.073	73	GPS disconnection
E.oH3 / A.oH3	41/76	motor over-heating	E. 50	39	short circuit to ground	E.F50	40	fan short-circuit

Table 4-3: Fault code list

4.4 Air Compressor Fault Sub-codes

Fault code	Description	Fault code	Description	Fault code	Description
6001	phase sequence error (external detection input)	6011	lube maintenance	6021	high module temperature
6002	oil cooler overloading	6012	reserved	6022	high master motortemperature (temp detection)
6003	host moter overheating (external terminal)	6013	grease maintenance	6023	motor fan overloading
6004	inverter failure	6014	pressure sensor failure	6024	phase sequence error (internal detection)
6005	over-pressure	6015	reserved	6025	reserved

6006	excessive high oil temperature	6016	oil filter failure	6026	reserved
6007	excessive low oil temperature	6017	oil separator failure	6027	reserved
6008	oil filter maintenance	6018	air filter failure	6028	over-pressure
6009	oil separator maintenance	6019	Reaching set running time	6029	under-pressure
6010	air filter maintenance	6020	reserved	6030	reserved

Table 4-4: Air compressor fault sub-codes

Notes: The above faults will all lead to shutdowns.

4.5 Air Compressor Alarm Codes

Fault Code	Fault Definition	Fault Code	Fault Definition	Fault Code	Fault Definition
A.FA1	oil filter	A.FA3	oil filter	A.FA5	grease
A.FA2	oil separator	A.FA4	lube	A.088	emergency stop activated
A.089	Service timeout				

Table 4-5：Air compressor alarm codes

Notes: The above alarms codes excluding A.088 will not cause any shutdowns but please check immediately once prompted.

4.6 C04 - Air Compressor Application Monitoring Group

Function codes	Designation	Unit & definition	Comm. address	Function codes	Designation	Unit & definition	Comm. address
C04.00	air supply pressure	0.01Mpa	0x2500	C04.12	fan current fault	----	0x250C
C04.01	discharge temp.	1℃	0x2501	C04.13	fan frequency conversion temp.	0.1℃	0x250D
C04.02	motor temp.	1℃	0x2502	C04.14	fan program version	----	0x250E

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C04.03	air compressor status	0: shut down 1:no load 2: load 3: sleep	0x2503	C04.15	current power consumption	1kWh	0x250F
C04.04	air compressor status		0x2504	C04.16	total running time-minute	Min	0x2510
C04.05	countdown info.	1Sec	0x2505	C04.17	total running time-second	Sec	0x2511
C04.06	picture display		0x2506	C04.18	total loading time -miniute	Min	0x2512
C04.07	alarm info.		0x2507	C04.19	total loading time -second	Sec	0x2513
C04.08	pressure setting	0.01Mpa	0x2508	C04.20	air filter available time -minute	Min	0x2514
C04.09	fan rotation speed	1RPM	0x2509	C04.21	lube available time -minute	Min	0x2515
C04.10	fan conversion	0.01Hz	0x250A	C04.22	grease available time -minute	Min	0x2516
C04.11	fan current	0.1A	0x250B				

Table 4-6: Air compressor application monitering codes

5.Quality Assurance

5.1 Period and Scope of Warranty

5.1.1 Warranty Period

Refer to DetroitAir warranty policy at www.detroitcompressors.com

5.1.2 Warranty Scope

Refer to DetroitAir warranty policy at www.detroitcompressors.com.

5.2 Liability Exemption

Refer to DetroitAir warranty policy at www.detroitcompressors.com

5.3 Application Scope of the Product

● This product is not designed and manufactured to be used in urgent and significant occasions about human life.

● Please contact our sales department if this product will be applied especially for manned mobile devices, medical, aerospace, nuclear, electric power, or submarine transit communication equipment or systems, etc. Accidents caused by unauthorized use in the occasions mentioned above shall not within in the liability scope of Veichi.

●The product is manufactured under strict quality control, however, there is

no guarantee that this product is absolutely free from any failure. Please configure a backup device if you hav e more safety requirements and reliability requirements, and please insure the relevant properties or personnels if you need higher safety guarantees.