

SP600 Series

Air Compressor Integrator User Manual

Foreword

Thank you for choosing SP600 series air compressor integrator.

SP600 series air compressor integrator using sheet metal structure, floor and wall supports two kinds of installation, ease of installation; commissioning wiring products easy to operate, wherein the control circuit terminal plug-in connector terminals, and mistake proofing plug design; high integration products: built-in DC reactors to reduce the external interference, improve the power factor; built-in 220V AC power supply, transformer anti-over current fuses provide 24V DC external output; the other built-in integrated PT100 and PTC, and other detection circuit and protection circuit. Product software uses special software, communications equipment HMI, and other things with no debugging achieve a key to start.

This guide describes the SP600 series air compressor integrator basic information and use instructions, please be sure to carefully read this manual before use.

Precautions

- The illustrations in this manual are for illustrative purposes only, and may differ from the product you ordered.
- The company is committed to continuous improvement of products, will continue to upgrade product function, the information provided is subject to change without notice.
- If you use with a problem, please contact our agents in each region, please contact customer service with the company.

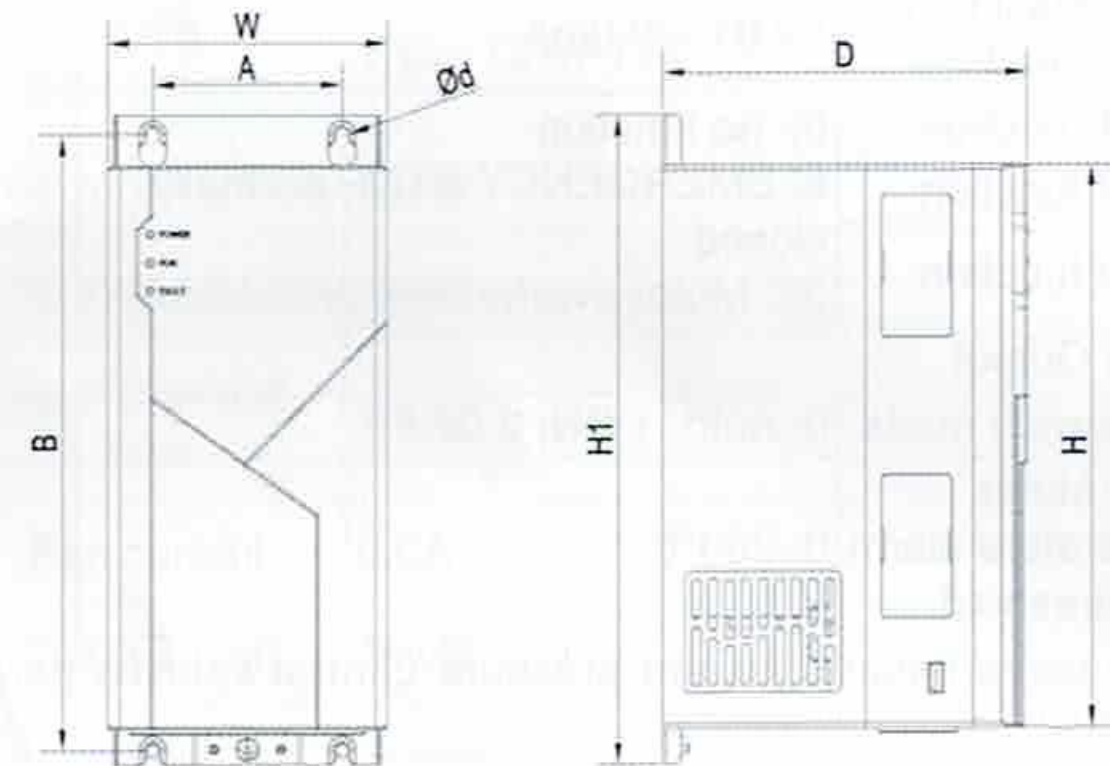
1 Basic Specifications

Item	specification
Control mode	Open loop vector control, V / F control
Maximum frequency	Open loop vector control: 0~ 600Hz, V / F control: 0~ 3200Hz
Carrier frequency	0.5kHz~ 15kHz , The carrier frequency is automatically adjusted based on the load features.
Input frequency resolution	Digital setting: 0.01Hz Analog setting: maximum frequency x 0.025%
Startup torque	0.5 Hz/150%
Speed range	1:100
Speed stability accuracy	± 0.2%
Torque control accuracy	±10%
Overload capacity	60s for 150% of the rated current, 3s for 180% of the rated current.
Torque boost	Fixed boost Customized boost 0.1%~30.0%
V/F curve	Straight-line V/F curve Multi-point V/F curve N-power V/F curve (1.2-power, 1.4-power, 1.6-power, 1.8-power, square)
V/F separation	Two types: complete separation; half separation
Ramp mode	Straight-line ramp S-curve ramp Four groups of acceleration/deceleration time with the range of 0.0~6500.0s
Communication methods	RS485
JOG control	JOG frequency range: 0.00~50.00 Hz JOG acceleration/deceleration time: 0.0~6500.0s
Built-in PID	It realizes process-controlled closed loop control system easily.
Auto voltage regulation (AVR)	It can keep constant output voltage automatically when the mains voltage changes.
Frequency source	Digital setting

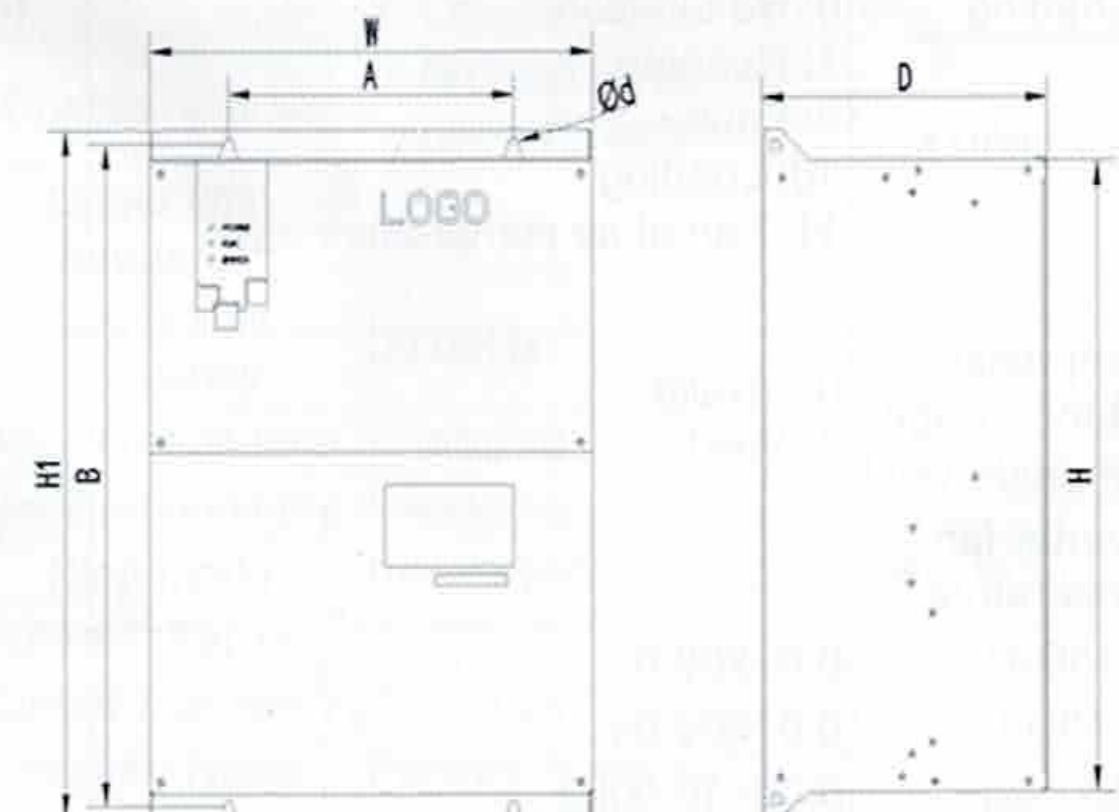
Item	specification	
Input and output interfaces	Analog Input	1 pressure sensor: 4 ~ 20mA input 2 temperature sensor: PT100
	Digital input	2 digital input 1 PTC circuit protection (compatible with normal digital inputs)
	Digital Output	1 normally open relay output (built in 220VAC voltage)
	LED diode display	Standard 3 LED display
protection	Motor overheating protection (PTC), the power-to-ground short-circuit protection, inverter over-current, overload, over voltage, under voltage, over temperature, output phase, communication fault, fault current detection, EEPROM write failure and so on.	
Environment	Installation location	Indoor, free from direct sunlight, dust, corrosive gas, combustible gas, oil smoke, vapor, drip or salt.
	Altitude	Lower than 1000 m
	Ambient temperature	-10°C ~ 40°C (Downshift if the ambient temperature is between 40°C and 50°C)
	Humidity	Less than 95%RH, without condensing
	Vibration	Less than 5.9 m/s ² (0.6 g)
	Storage temperature	-20°C~ 60°C

2 Dimensions

2.1 Closet dimensions



MODEL	W	H	H1	D	A	B	Φd
SP600T-3R7KY-2	118	238	274	154	80	260	5.5
SP600T-5R5KY-4							
SP600T-7R5KY-4							
SP600T-5R5KY-2	145	293	335	172	100	320	7
SP600T-7R5KY-2							
SP600T-11KY-4							
SP600T-15KY-4	168	338	380	172	100	365	7
SP600T-11KY-2							
SP600T-18KY-4							
SP600T-22KY-4	217	400	--	216	202	385	7
SP600T-15KY-2							
SP600T-18KY-2							
SP600T-30KY-4	338	436	470	240	270	455	9
SP600T-37KY-4							

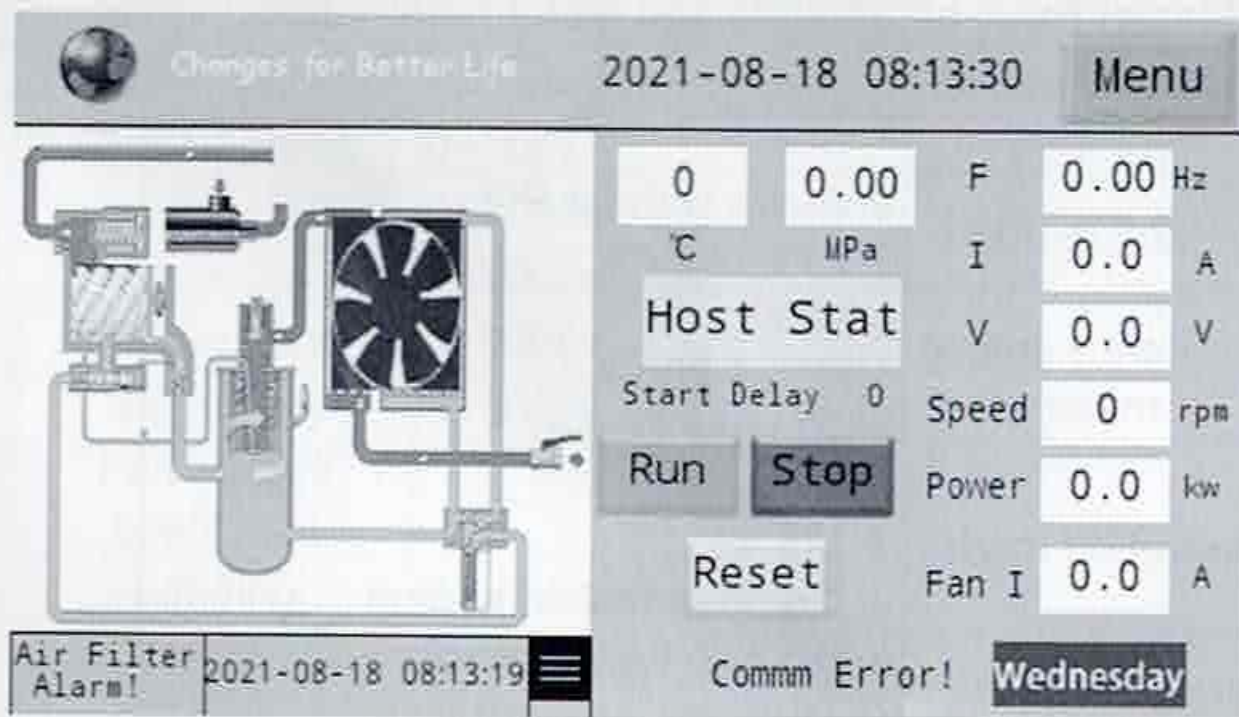
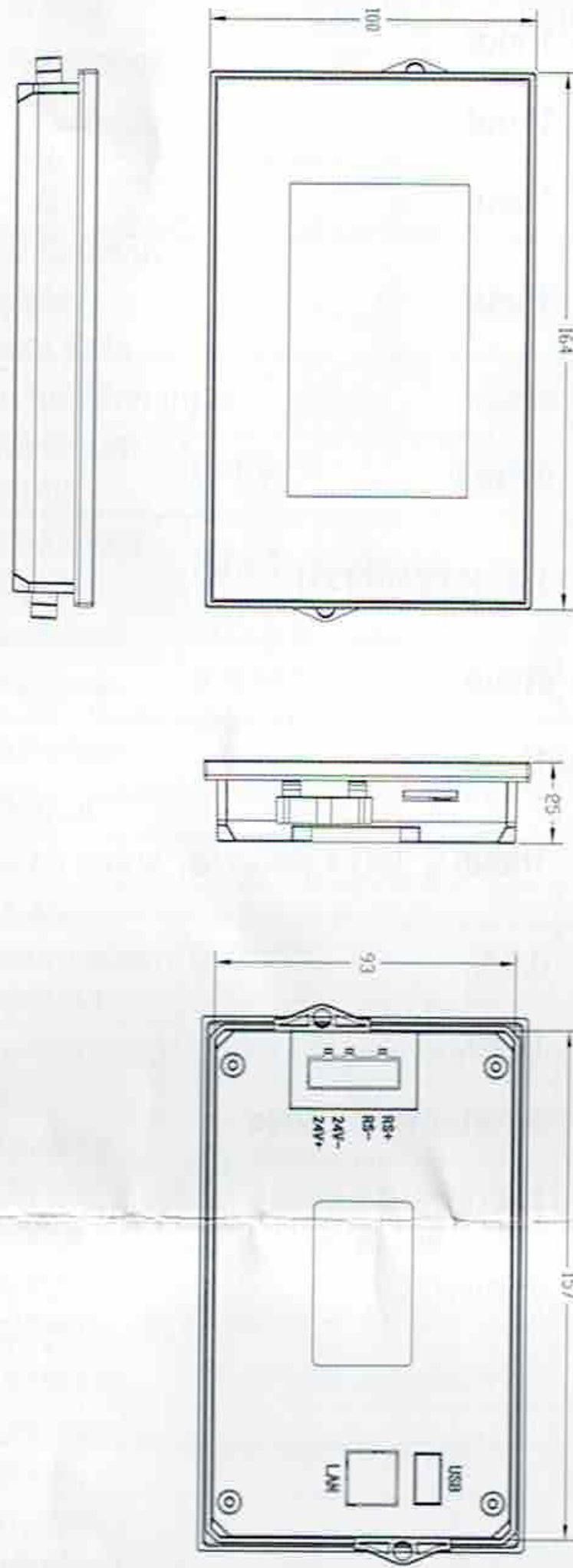


MODEL	W	H	H1	D	A	B	Φd
SP600T-22KY-2	300	440	470	275	210	455	9
SP600T-30KY-2							
SP600T-45KY-4							
SP600T-55KY-4	338	436	470	240	270	455	9
SP600T-37KY-2							
SP600T-75KY-4							

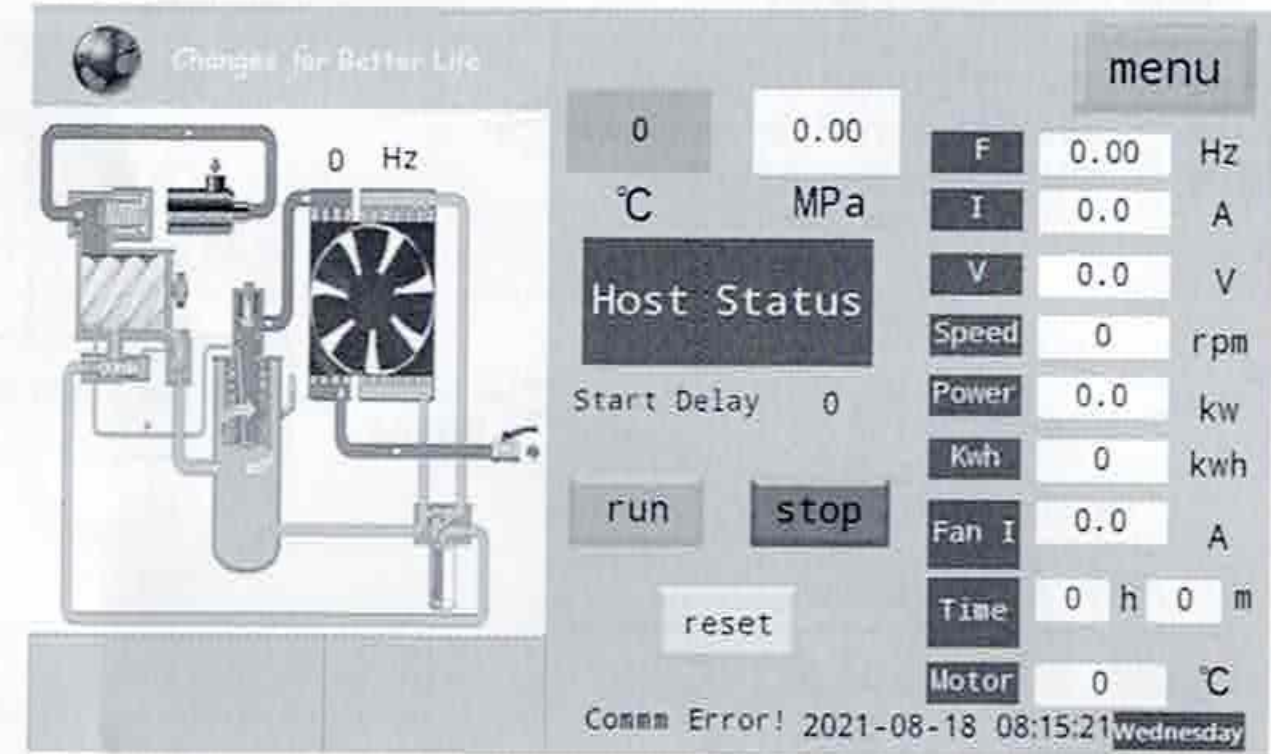
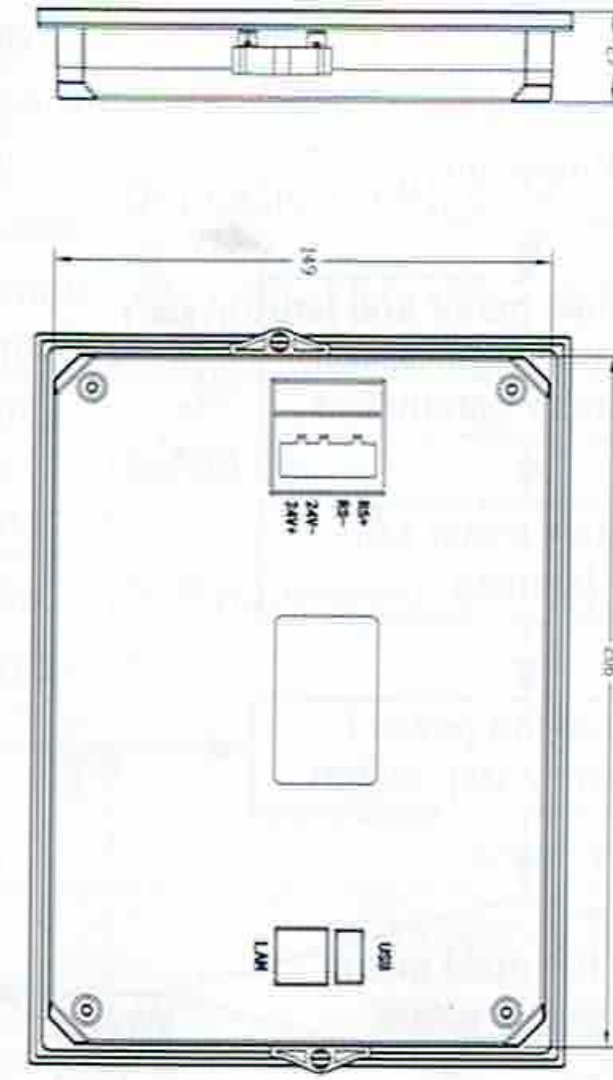
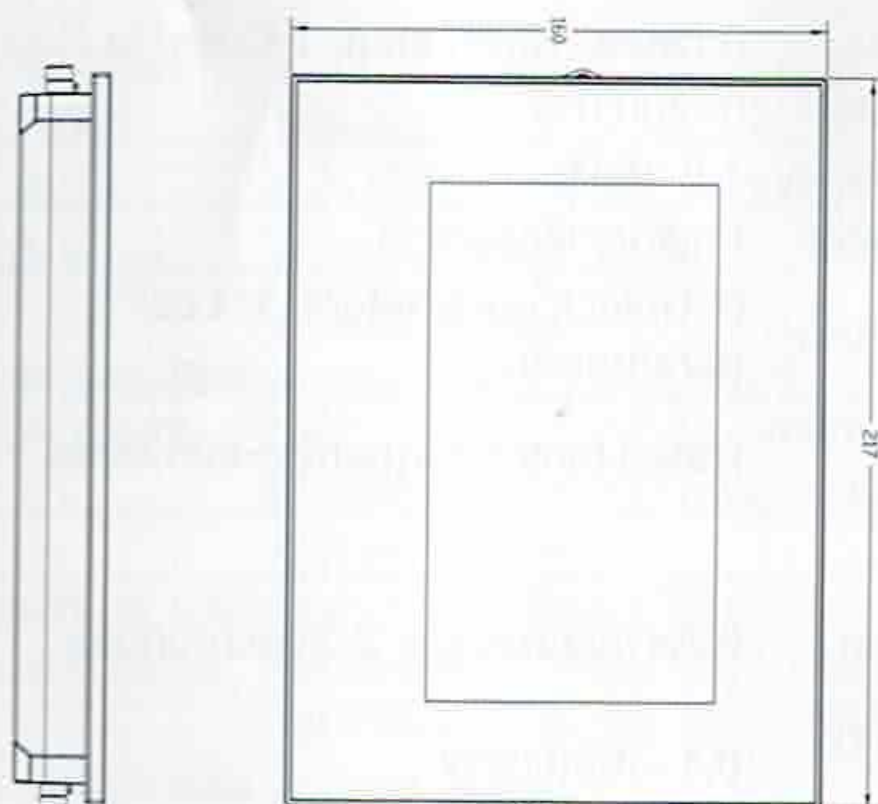
MODEL	W	H	H1	D	A	B	Φd
SP600T-45KY-2	275	590	630	310	200	612	9
SP600T-55KY-2							
SP600T-90KY-4							
SP600T-110KY-4							
SP600T-132KY-4	300	610	650	310	200	633	9
SP600T-75KY-2	400	675	715	310	320	695	11
SP600T-160KY-4							

2.2 HMI installation dimension

2.2.1 HMI-600TN (4.3 inch)

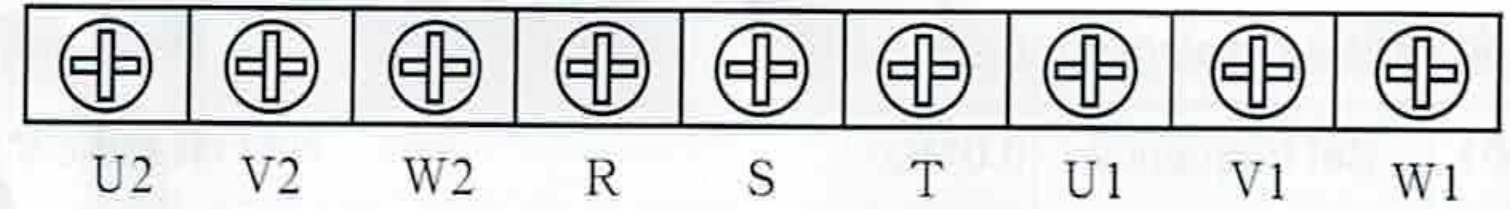


2.2.2 HMI-680TN (7 inch)



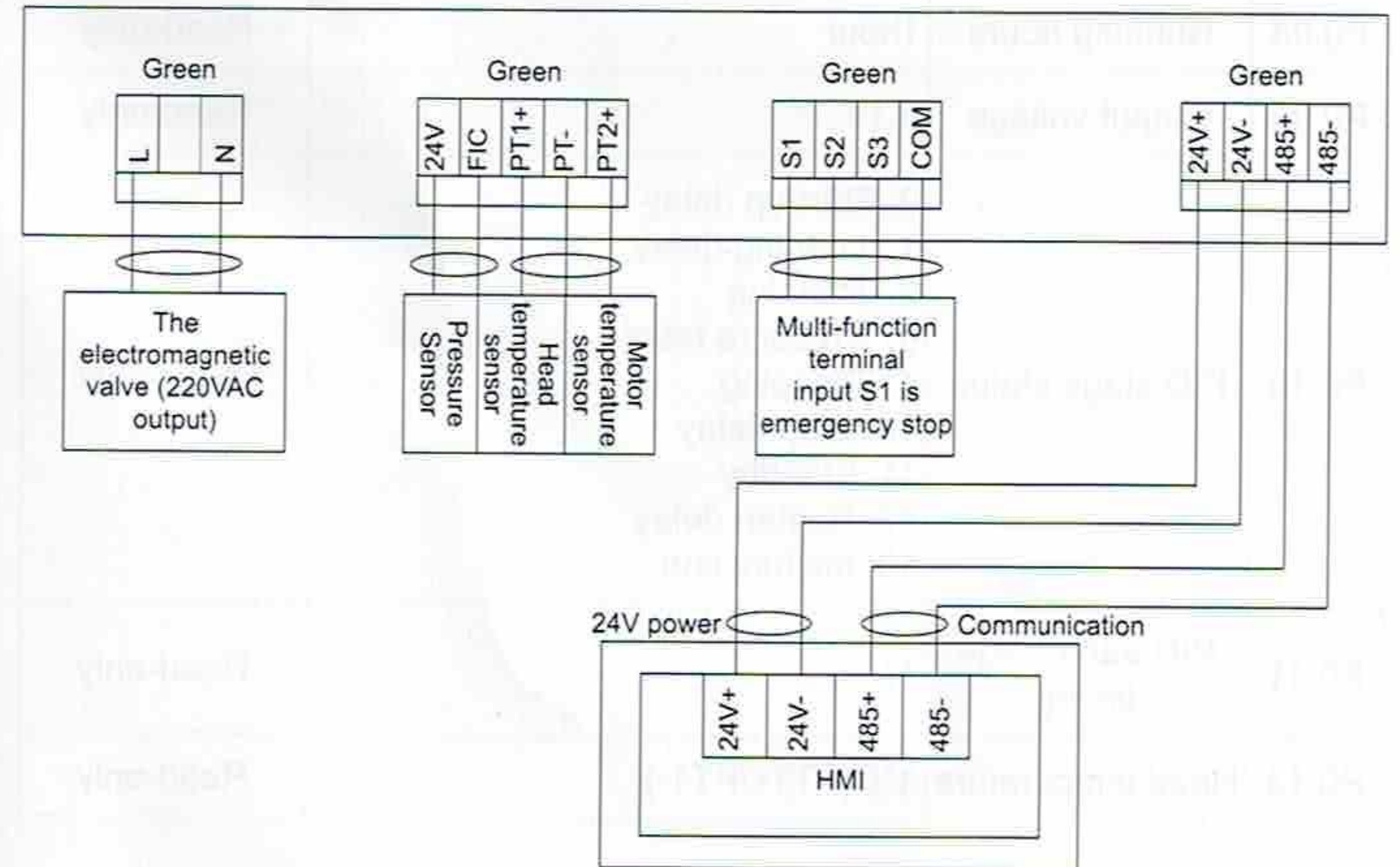
3 Terminal Definition

3.1 Main circuit terminal definitions



Terminal symbol	Terminal functions
R, S, T	Three-phase AC input terminals
U1, V1, W1	The master three-phase AC inverter output terminals
U2, V2, W2	Fan-phase AC output terminal
PE	Ground terminal

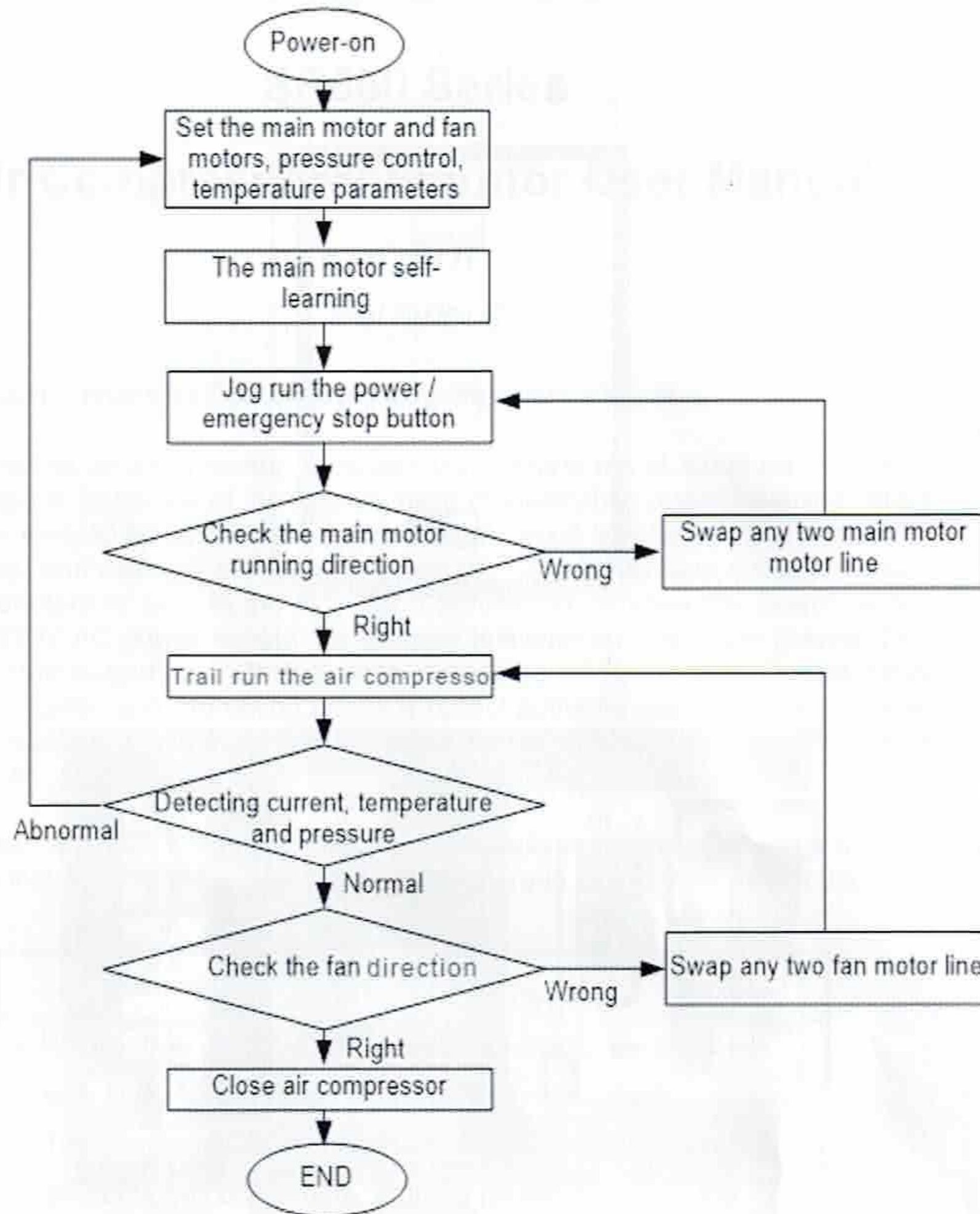
3.2 Definition of the control terminal and wiring



Note:

- 1) PT2 +, PT 2- are motor PT100 terminals, please shorted missed, otherwise it will report motor overheating fault.
- 2) S6 is the Motor PTC terminals, please COM shorted missed (or set P212 = 0), otherwise it will be reported to the motor overheating fault.

4 Debugging Process



5 Function parameter

Code	Function	Accuracy	type of data
Group P0 Monitoring Preferences			
P0.00	Display selection	0-32	Read-only
P0.01	Set frequency	0.01Hz	Read-only
P0.02	Output frequency	0.1Hz	Read-only
P0.03	Output current	0.1A	Read-only
P0.04	Running speed	1rpm	Read-only
P0.05	DCV	0.1V	Read-only
P0.06	Inverter temperature	1°C	Read-only
P0.07	Pressure compressor	0.01MPa	Read-only
P0.08	Running hours	1hour	Read-only
P0.09	Output voltage	0.1V	Read-only
P0.10	PID stage status	0: Start-up delay 1: Loading delay 2: Running 3: Pressure relief 4: Sleeping 10: Stop delay 11: Standby 12: Restart delay 13: malfunction	Read-only
P0.11	PID each stage timing	1s	Read-only
P0.13	Head temperature	1°C(PT1+/PT1-)	Read-only

Code	Function	Accuracy	type of data
P0.14	Inverter fault	Bit0: Inverter fault Bit1: Air Compressor overheating Bit2: Air Compressor over pressure Bit3: EMERGENCY Bit4: Fan status Bit5: Phase sequence fault Bit6: Pressure sensor failure(<2Ma) Bit7: Motor overheating PT100 Bit8: Motor failure PTC Bit9: Communication fault Bit10: Electromagnetic valve Bit11: Reserved Bit12: Fan motor over current alarm Bit13: Fan inverter alarm	Read-only
P0.15	Air filter used time	1hour	Read-only
P0.16	Oil filter used time	1hour	Read-only
P0.17	Splitter used time	1hour	Read-only
P0.18	Lubricants used time	1hour	Read-only
P0.19	Grease used time	1hour	Read-only
P0.20	Power	0.1KW	Read-only
P0.21	Motor temperature	1°C(PT2+/PT2-)	Read-only
P0.22	Total running time	1hour	Read-only
P0.23	Total loading time	1hour	Read-only
P0.24	Total uninstal time	1hour	Read-only
P0.25	Fan current	0.0A	Read-only
P0.26	Energy used	1kwh	Read-only
P0.27	Fault code	Inverter fault codes	Read-only
P0.28	Inverter status	1: Forward running 2: Reverse running 3: Stop	Read-only
P0.29	Running time in minutes		
P0.32	Main inverter fault code		Read-only

Code	Function	Setting range	Factory default
Group P1 Master basic parameters and motor parameters			
P1.00	Keyboard setting frequency	0~P1.05	00.00Hz
P1.01	Control method	0:Vector without PG 1:V / F control	0
P1.02	Frequency setting mode	0:KEY 1:FIC: 4-20mA 2:Communication	0
P1.03	Operation mode	0: KEY 1: I/O 2: Communication control	0
P1.04	Enable reverse	0: Prohibit Reverse 1: Allow Reverse	0
P1.05	Upper limit frequency	50.00Hz	50.00Hz
P1.06	Lower limit frequency	00.00Hz	00.00Hz
P1.07	Acceleration time	Changing	30.00s
P1.08	Deceleration time	Changing	30.00s
P1.09	Stop mode	0-Deceleration stop; 1-Coast to stop	0
P1.12	Power Factor	0~200.0%	100.0%
P1.13	Carrier frequency	1.0-16.0k	change
P1.17	Factory Reset	Factory Reset=08	0
P1.18	Parameter lock	0: Unlock parameters 1: Lock parameters	0
P1.19	Inverter maximum frequency	Rated motor frequency~500.00hz	50Hz
Master parameters			
P1.20	Motor type	0-Asynchronous; 2-Synchronous	Refer to the motor
P1.21	Rated motor power	0.1~1000.0kW	Refer to the motor

Code	Function	Setting range	Factory default
P1.22	Rated motor voltage	0~690V	Refer to the motor
P1.23	Rated motor current	0.01~655.35A	Refer to the motor
P1.24	Rated motor frequency	0.00~500.00HZ	Refer to the motor
P1.25	Rated motor speed	0~65536rpm	Refer to the motor
P1.26	Motor Back EMF	0~380V	Refer to the motor
P1.28	Rated fan current	When select inverter fan, Inverter read current	Refer to the motor
P1.29	Minimum percentage of fan	0-100%	40.0%
P1.30	Auto-tune	1: Static state 2: dynamic state	0
P1.31	Stator resistance RS		
P1.32	LD		
P1.33	LQ		
P1.34	Inverter function code		
P1.35	Inverter data		
Group P2 Multi-function input / output			
P4.13	FIC Minimum input	0~F2.01	2.00V
P4.15	FIC Maximum input	F2.01~20.0mA	10.00V
P4.00	S1 function	0: no function	8
P4.01	S2 function	8: EMERGENCY STOP normally closed	00
P4.02	S3 function	32: Motor overheating protection	33
Multi-function Output			
F2.30	Fan switch mode	0: Auto; 1 ON; 2 OFF	0
F2.34	Motor temperature alarm threshold	0~200°C	125°C
Group P5 Air compressor constant pressure control specific parameters (set P6.00 = 1 is valid)			
P5.00	Frequency pressure	P5.02~P5.01	7.00kgf/cm ²
P5.01	Unloading pressure	P5.00~P5.03	8.00kgf/cm ²
P5.02	Loading pressure	0~P5.00	6.50kgf/cm ²
P5.03	Stop pressure	P5.01~30.00kgf/cm ²	10.00kgf/cm ²
P5.04	Pressure gauge range	0.00~30.00kgf/cm ²	16.00kgf/cm ²
P5.05	Fan start temperature	Fan stop temperature~120.0°C	80°C
P5.06	Fan stop temperature	0~Fan start temperature	70°C
P5.07	Stop Temperature	Fan start temperature~180°C	100°C
P5.08	Start-up delay	0~100s	3s
P5.09	Loading delay	0~3000s	20s
P5.10	Uninstall delay	0~3000s	120s
P5.11	Restart delay	0~3000s	5s
P5.12	Stop delay	0~3000s	30s
P5.22	Fan current coefficient		
P5.53	Loading	0: No function	10 (loading)
P5.54	3phase 380V fan	1: Running 2: Fault 10: Loading 11: Fan of air compressor	11
Group P 6			
P6.00	Compressor constant voltage control mode valid	0- Invalid 1- Valid	0
P6.02	Inverter fan temperature		75°C
P6.07	PID-P	0.0~200.0	100.0
P6.08	PID-I	0.0~200.0s	0.5s
P6.10	PID Steps	0.00~10.00Hz	2.50Hz
P621	PID feedback loss alarm mode	0: No warning 1: Warning but not stop, fault code "20" 2: warning and stop, fault code "20"	0
P622	PID feedback loss detection value	Range :0~10.0V (If 4~20mA is selected, it is disconnected if it is less than 2mA; set P622=2mA*500Ω=0.50V)	1.00V
P623	PID feedback loss detection value	0.0s~20.0s	1.0s

Code	Function	Setting range	Factory default
P6.24	PID setting		
Group P8 Advanced parameters			
P8.00	Group P8 Parameter Lock	0- LOCK 1- UNLOCK	1
P8.13	Phase sequence detection times	0~1000	300
P8.14	Temperature correction coefficient	0-200.0%	100%
P8.15	Inverter type	0- Synchronous, 1- Asynchronous	0
P8.16	Fan work mode	1	1
Air Compressor Fault Type			
H-OP		Over voltage alarm	
H-OH		Over-temperature alarm	
NOTO		Motor overheating protection	
ES		EMERGENCY stop	
CO		Communication failure (inverter)	
PHAS		Phase sequence fault	
NNA		Pressure Sensor disconnection fault	
djoH		Motor overtemperature alarm	
Master inverter fault			
oC1 oC2 oC3		Over current	
oU1 oU2 oU3		Over voltage	
LU		Under voltage	
CBC		Rapid current limit timeout	
Lo		Output phase loss	
oL1		Motor overload	
oL2		Inverter overload	
oH		Inverter overheat	
IE		Current detection abnormal	
CE		Communication timeout	
EF		External fault	
RAY		Relay abnormal	
Inverter fan fault			
FoC1, FoC2, FoC3		Output short circuit	
FUC1,FUC2,FUC3		Output short circuit	
FoU1,FoU2,FoU3		Over voltage	
FLU		Under voltage	
Flo		Output phase loss	
FoL1,FoL2,FoL3		Inverter overload	
FoH		Inverter overheat	