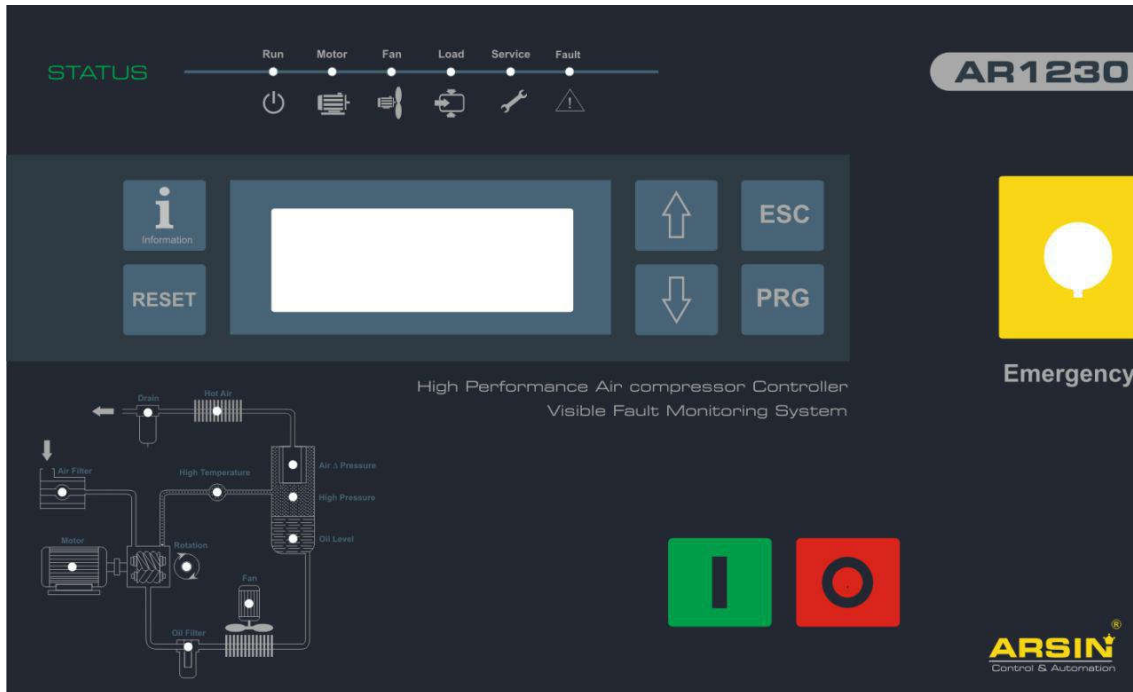


Air Compressor Controller Unit

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CAUTION

For proper and safe use of the compressor, please follow all instructions and safety precautions as identified in this manual, along with general safety regulations and practices. Before installing and starting the compressor, read and understand this manual.

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1. General Safety Warnings

Note! The instructions provided in this manual have been written to assist the operator throughout the use and maintenance of the compressor and its controller (AR1710).

Important instructions for the safe use of the compressor warning: the inappropriate use and poor maintenance of the compressor and its controller may cause physical injury to the user. You are recommended to carefully follow the instructions provided hereafter to avoid such risks.

- ◆ Do not touch moving parts. Never put your hands, fingers or other parts of the body near moving parts of the compressor.
- ◆ Never use the compressor without the safety guards fitted. Never use the compressor without all the safety guards fitted perfectly in their correct place (i.e. panelling, belt guard, safety valve). If these parts are to be removed for maintenance or servicing purposes, ensure that they are put back in their original place perfectly before using the compressor again.
- ◆ Always wear safety goggles. Always wear goggles or equivalent eye protection means. Never direct compressed air towards any part of your body or that of others.
- ◆ Protect yourself against electric shocks. Avoid accidentally touching the metal parts of the compressor with your body, such as pipes, the tank or metal parts connected to earth. Never use the compressor where there is water or in damp rooms.
- ◆ Disconnect the compressor. Disconnect the compressor from the electric power supply and completely discharge the pressure from the tank before carrying out any service, inspection, maintenance, cleaning, replacing or inspection jobs of each part.
- ◆ Never move the compressor while it is connected to the electrical power supply or when the tank is pressurized. Ensure that the main switch is turned off before connecting the compressor to the electrical power supply.
- ◆ Store the compressor and its controller appropriately. When the compressor is not in use, it must be stored in a dry room away from atmospheric agents.
- ◆ Keep the work area clean and remove any tools that are not required. Keep the work area sufficiently ventilated. Never use the compressor in the presence of flammable liquids or gas. The compressor may produce sparks while running. Do not use the compressor where there may be paints, gasoline, chemical compounds, glues and any other flammable or explosive material.
- ◆ Do not wear unsuitable clothing, ties or jewellery as these may get caught up in moving parts. Wear caps to cover your hair if necessary.

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- ◆ Do not disconnect the power supply plug by pulling on the cable. Keep the cable away from heat, oil and sharp edges. Do not stand on the electrical cable or squash it under heavy weights.
- ◆ Follow the maintenance instructions. Inspect the power supply cable on a periodic basis and if damaged it must be repaired or replaced by an authorised service centre. Visually check the outside appearance of the compressor, ensuring that there are no visual anomalies. Contact your nearest service centre if necessary.
- ◆ Pay attention to everything you do. Use your common sense.
- ◆ Do not use the compressor if you are tired. The compressor must never be used if you are under the effect of alcohol, drugs or medicines, which could make you tired.
- ◆ Use the compressor and its controller exclusively for the applications specified in this instruction manual.
- ◆ Operate the compressor in compliance with the instructions provided in this manual. Do not allow children to use the compressor or those who are not familiar with it.
- ◆ Ensure that each screw, bolt and guard is firmly secured in place.
- ◆ Keep the in-take grids clean. Keep the motor ventilation grids clean. Regularly clean these grids if the work area is particularly dirty.
- ◆ Operate the compressor at the rated voltage. Operate the compressor at the voltage specified on the electric data plate. You could damage or burn-out the motor and other electric components if the compressor is operated at a higher or lower voltage than its rated voltage.
- ◆ Never use the compressor if it is faulty. If the compressor is noisy or vibrates excessively when running or it seems to be faulty, stop it immediately and check its efficiency or contact your nearest authorised service centre.
- ◆ Do not clean plastic parts using solvents. Solvents such as gasoline, thinners, gas oil or other compounds that contain hydrocarbons may damage the plastic parts. Clean them with a soft cloth and soapy water or other suitable liquids.
- ◆ Turn the compressor off when it is not in use. When the compressor is not in use turn the main on/off switch off.
- ◆ Keep this instruction manual carefully and give them to personnel wishing to use the compressor!
- ◆ We reserve the right to make modifications where necessary without notice.

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2. Technical specifications

Input Power	AC 220V 50/60Hz
Power Consumption	7 VA
CPU	AT mega 128, 16MHz
LCD	192 × 65 Graphic LCD
No. of Analog Inputs	4
No. of Digital Inputs	8
No. of Analog Output	1

Other Features:

- Relay Output 16 Amp.
- Main Thermistor Input
- Soft Starter Output
- Real Time Clock

Installation Conditions:

- Installation Place Indoor
- Operating Temperature 0 ~ +70°C
- Storage Temperature -30 ~ +80°C
- Operating Humidity 5 ~ 95% (Non- condensable)

3. Operation

3.1. Compressor start-up

In normal operation, the detected delivery pressure controls regulation of the compressor once the compressor has been started by pushing the start button, or by a remote start command if enabled. The controller will perform safety checks and start the compressor if no inhibiting conditions are detected.

If a start inhibiting condition exists the compressor will not enter the started condition and a start inhibit message is displayed. If a run inhibiting condition exists the compressor will enter the started condition but a main motor start is inhibited; the compressor will remain in the standby condition and a run inhibit message is displayed. If a load request is present, in accordance with internal pressure settings or by remote command, the main motor is started in a star/delta sequence. When running in delta configuration, after the star/delta time (adjustable) has expired, the load delay time (adjustable) prevents loading for a period to allow motor speed to stabilize. The load delay time can be set to one second if required. When the load delay time has expired

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the load valve output is energized and the compressor will load. If the unload pressure setting is reached, or a remote unload command is received, the load valve output is de-energized and the compressor will run offload for the standby run on time (adjustable) before the main motor stops and the compressor enters Standby mode. The compressor will load again if pressure falls below the load setting before the standby run on time expires. If in Standby mode, a motor start sequence followed by the load delay time is executed before loading.

In the event of a motor stop, initiated by a stop command or when entering standby mode, a blow down timer (adjustable) is started. If a start request is made during the blow down time the compressor will enter standby mode until the blow down time expires. If already in standby mode and a load request is present, the compressor will remain in standby mode until the blow down time has expired. For units with internal pressure detection enabled, a minimum internal re-start pressure can also be set to prevent a motor start sequence before internal pressure is vented. In the event internal pressure fails to fall below the set minimum re-start pressure within two minutes after the set blow down time has expired, a blow down fault is generated and the compressor will shutdown. After an unload event a re-load timer (adjustable) is initiated that will prevent reloading, this time can be adjusted to a minimum of one second if required. Normal automated operation is ended by pushing the stop button, a remote stop command or in the event of a shutdown fault.

When stopped manually, or by a remote command, the load valve is de-energized and the main motor allowed to run-on for the stop run on time (adjustable). This time can be adjusted to a minimum of one second if required. Safety checks are made continuously, if there is a condition detected that presents a hazardous or damaging situation an immediate stop is performed and the reason displayed as a shutdown error message. If a warning condition is detected an Alarm message is displayed and normal operation continues.

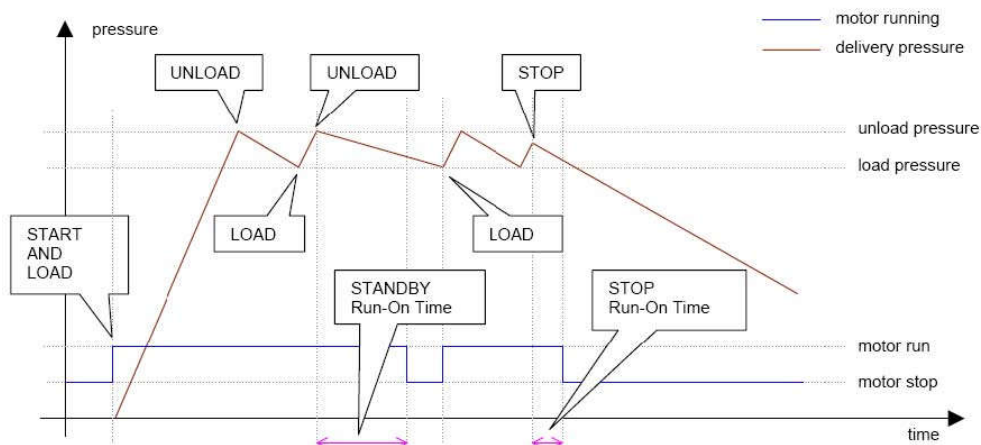


Figure 1: Compressor Start/Stop Sequences

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3.2. Display panel

The following information is shown on controller display panel.

- 1) Compressor Status & Faults
- 2) Oil Temperature
- 3) Air Pressure: Discharge air pressure is shown in barg.
- 4) Oil Pressure: Oil pressure of compressor crankcase is shown in barg.
- 5) Air Temperature: Discharge air temperature is shown in barg.
- 6) Time & Weekday
- 7) 3-Phase Power Current
- 8) Operation Time from 1st Startup: number of compressor running hours is shown.
- 9) Compressor Health Status: the compressor status is shown.

3.3. Panel Buttons

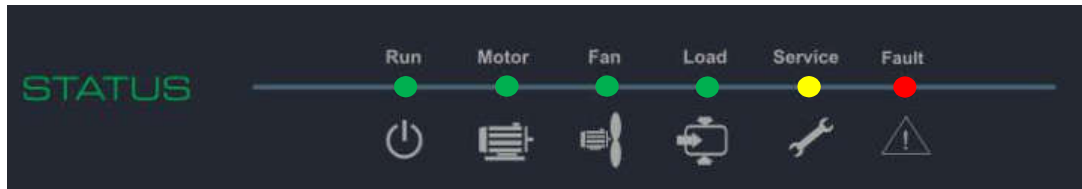
Start/Stop		The equipment starts/stops when pushing the buttons.
Program		Entering to programming / enter to new menu
Reset		Reset when trip (the trip reset automatically doesn't need to push reset button)
Up/Down		Increase / Decrease Selected Value Select Menu Items
Escape		Exit from current menu
Info		Show operating information

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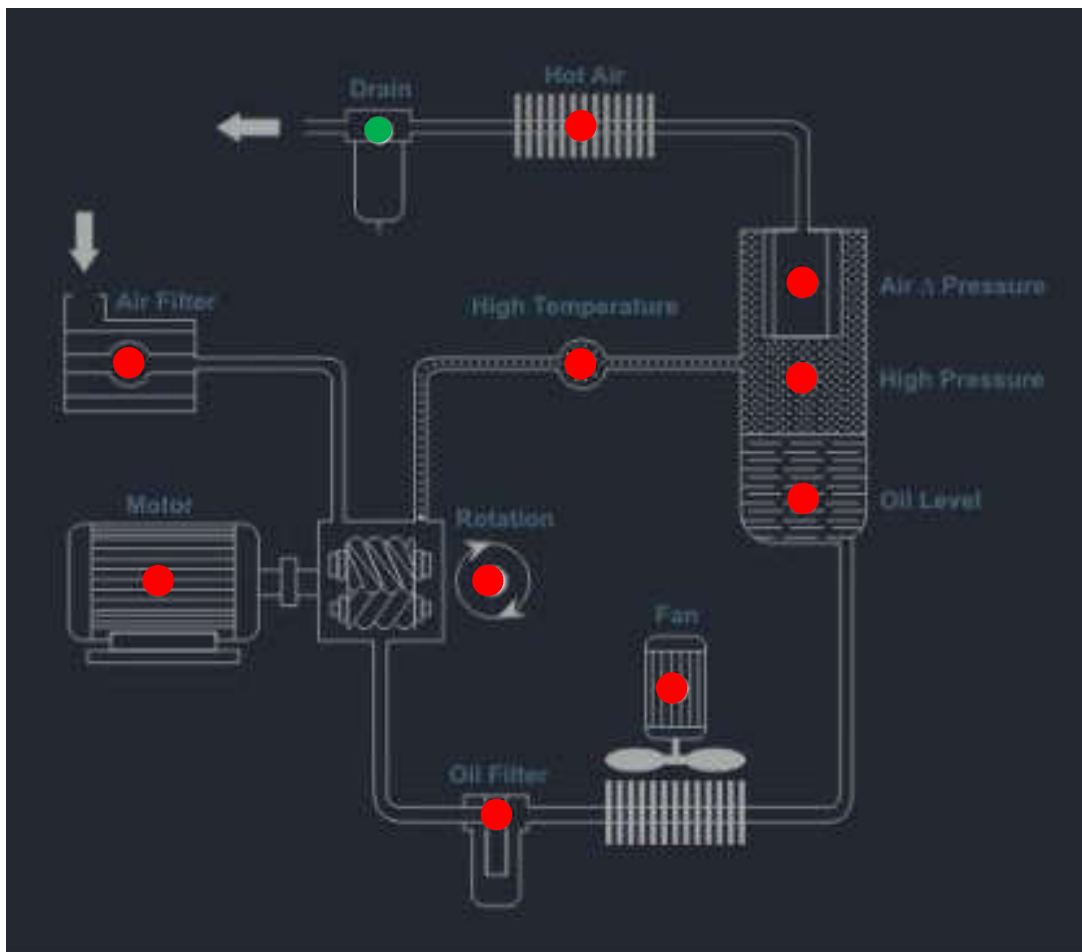
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3.4. Panel Status Lights

The panel Status lamps shows that the compressor components are ready for operation and also the compressor fault or service requirements as shown in below picture.



In case of any malfunction, the fault will be shown by red light on the part of system which has error.



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4. Controller installation

4.1. Input/Output Connections

The following figure shows controller back-cover. The I/O connections are categorized and numerated as shown in below table.



Figure 2: Controller Back Cover

Table 1: Input/Output Terminals

Cat.	Pin Name	Function	Type	Active state / Range
Display Output	GND	RS232, GND		
	TXD	RS232, TXD		
	RXD	RS232, RXD		
	A	RS485, A		
	B	RS485, B		
Power Supply	R	Main Power		
	N	Main Power		
Digital Inputs	COM	Input Common Terminal		
	RMT	Remote Input Signal		Remote (close)
	ROT	Rotation Fault Signal		Alarm (close)
	EMS	Emergency Stop Signal		Alarm (close)
	MOT	Motor Bimetal Fault Signal		Alarm (close)
	FAN	Fan Bimetal Fault Signal		Alarm (close)

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Cat.	Pin Name	Function	Type	Active state / Range
	PSW	Pressure Switch Signal		Alarm (close)
	TSW	Thermo Switch Signal(Motor)		Alarm (close)
	OIL	Oil Level Sensor Signal		Alarm (close)
Analog Inputs	TMP1	Oil Temperature Sensor (1)	Pt1000	-50 ~ +150 °C
	TMP1	Oil Temperature Sensor (2)	Pt1000	-50 ~ +150 °C
	TMP2	Air Temperature Sensor (1)	Pt1000	-50 ~ +150 °C
	TMP2	Air Temperature Sensor (2)	Pt1000	-50 ~ +150 °C
	+12V	Oil Pressure Transmitter (+)	4~20mA	Adjustable
	PR1	Oil Pressure Transmitter (-)	4~20mA	Adjustable
	+12V	Air Pressure Transmitter (+)	4~20mA	Adjustable
	PR2	Air Pressure Transmitter (-)	4~20mA	Adjustable
	PT100	Motor Temp. Sensor	4~20mA	Adjustable
	Motor Therm	Motor Thermistor	4~20mA	Adjustable
Inverter	Enb	Main Motor VFD		
	Enb	Main Motor VFD		
	Gnd	Main Motor VFD		
	10V	Main Motor VFD		
Power Outputs	COM	Power Common Terminal		
	STU	Status		
	AUX	Auxiliary		
	DRN	Drain		
	FAN	Fan Motor Output		
	Δ	Delta Contactor Output		
	Y	Star Contactor Output		
	NOR	Normal Contactor Output		
	TR1	Temp. Relay		

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4.2. Wiring Diagram

The following figure shows the wiring diagram of the controller.

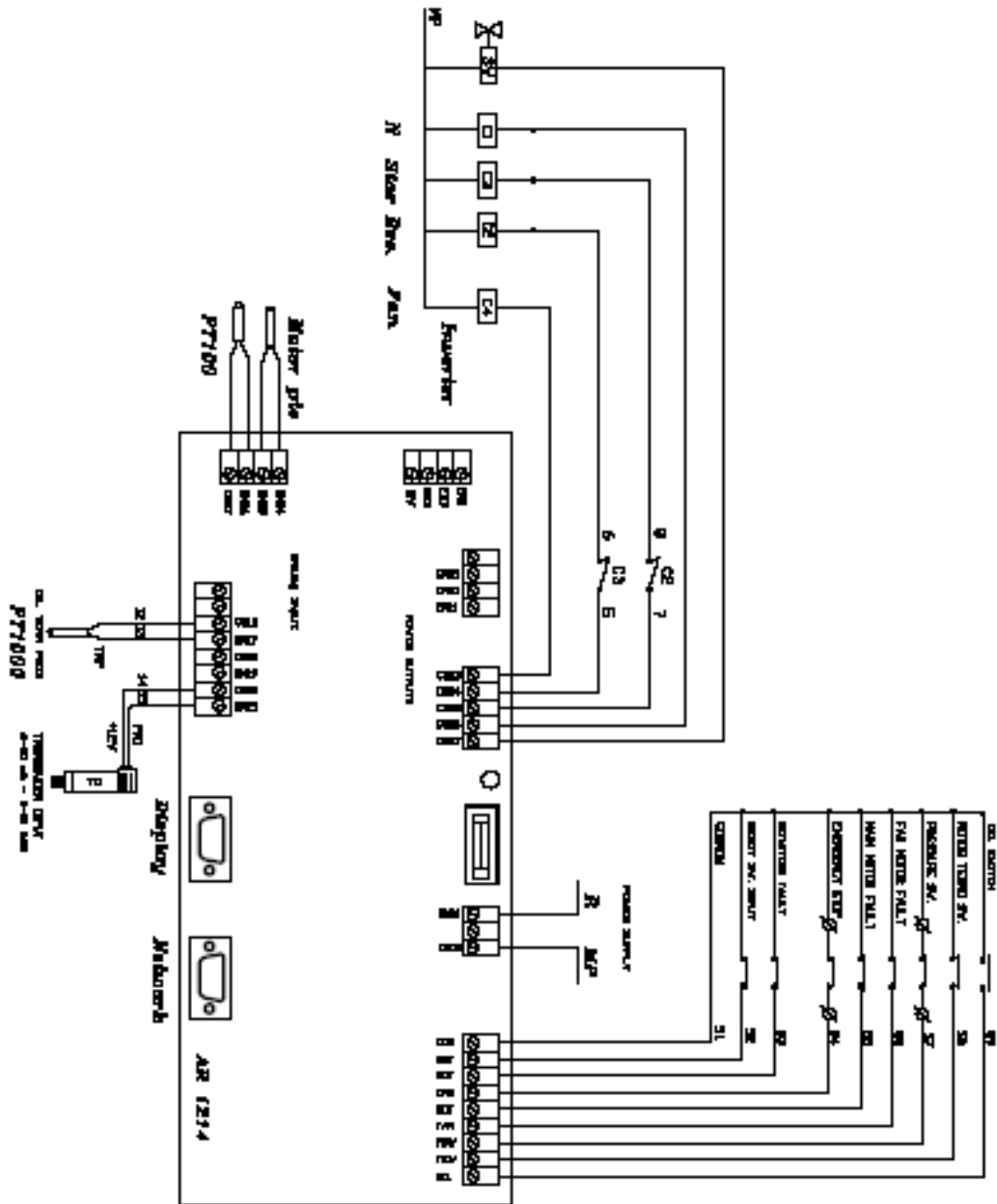


Figure 3: Controller Wiring Diagram

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4.3. Controller Menu

The following list shows the controller menus in different access levels.

Table 2: Controller Menu Items

Access Level	Menu Item	Set-point Range/Description
Operator	1. USER SETTING	
	1.1. Contrast	35 ~ 63
	1.2. Load/Unload Pressure	
	1.2.1. Load Pressure	2.0 ~ 7.5 bar
	1.2.2. Unload Pressure	2.5 ~ 10 bar
	1.3. Show Alert	fault no./time/date/fault description
	1.4. Reset Maintenance	Info
	1.4.1. Oil Filter	
	1.4.2. Air Filter	
	1.4.3. Sep. Filter	
	1.4.4. Oil Change	
	1.5. Units	bar / psi
	1.6. Clock	
	1.6.1. Time setting	
	1.6.2. Date setting	
	1.7. Buzzer Enable	yes / no
	1.8. Change Password	
	Operator	2. INSTALLATION
2.1. Times		
2.1.1. Delta/Star		1 ~ 60 sec.
2.1.2. Start Time		1 ~ 60 sec.
2.1.3. Stop Time		1 ~ 60 sec.
2.1.4. Standby		1 ~ 50 min.
2.1.5. Load Delay		1 ~ 60 sec.
2.1.6. Oil Pressure Delay		0 ~ 291 sec.
2.1.7. Discharge Time		1 ~ 50 sec.
2.1.8. Condensate (Drain) On		1 ~ 50 sec.
2.1.9. Condensate (Drain) Off		1 ~ 50 min.
2.2. Pressure Setting		
2.2.1. Start Pressure		0.2 ~ 3.0 bar

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2.2.2. Trans. Adj.	2.0 ~ 49 bar
2.2.3. Pd Offset	0 ~ 1.5 bar
2.2.4. Pi Offset	0 ~ 1.5 bar
2.2.5. Dif. Pressure Al.	0.5 ~ 2.5 bar
2.2.6. Dif. Pressure Ft	3.0 ~ 10 bar
2.2.7. Dif. Delay	10 ~ 250 sec.
2.3. Temperature	
2.3.1. Fan on	55 ~ 80 °C
2.3.2. Fan off	120 ~ 50 °C
2.3.3. High Temp. Fault	83 ~ 100 °C
2.3.4. Temp. Offset	-10 ~ +10 °C
2.3.5. High Temp. Alarm	60 ~ 82 °C
2.3.6. Min. Temp. Start	-20 ~ +10 °C
2.4. Maintenance Interval	Adjustable working Hours
2.4.1. Oil Filter	-
2.4.2. Air Filter	-
2.4.3. Sep. Filter	-
2.4.4. Oil Change	-
2.5. Transducers	
2.5.1. Pd #1	4 ~ 20 mA / none
2.5.2. Pi # 2	4 ~ 20 mA / none
2.5.3. Temp. Sensor Type	Pt100 / Pt1000
2.5.4. Temp2 Sensor	Enable / Disable
2.6. Weekly Program	Week days working hour adj.
2.7. Various Networks	
2.7.1. High Pressure	
2.7.2. Fan Overload Active	
2.7.3. Voltage Detect	
2.7.4. Motor Thermistor	
2.7.5. Auto Restart	
2.7.6. Enable Maintenance	
2.7.7. Weekly Program	
2.7.8. TSW Enable	

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Supervisor	3. MANUFACTURER	
	3.1. Safety Parameter	
	3.1.1. Pd Max.	2.0 ~ 18 bar
	3.1.2. Sep. Pressure	0.5 ~ 4.0 bar
	3.1.3. Max. Temp.	80 ~ 120 °C
	3.1.4. Pi Max.	5.0 ~ 20 bar
	3.2. Hour Counter	shows working hours
	3.3. Manufacturer Test	Rotation Test
	3.4. Reset Configuration	Reset all settings
	3.5. Operating Mode	Select Start Command
	3.6. Relay Program1 (MF1)	Warning/Fault/F+W/Heater/Drain Valve/Fan/Standby/Main Motor Run/Load&Unload/Start/2 nd Fan/Disch. Sep. Valve
	3.7. Relay Program2 (MF2)	Warning/Fault/F+W/Heater/Drain Valve/Fan/Standby/Main Motor Run/Load&Unload/Start/2 nd Fan/Disch. Sep. Valve
	3.8. Relay Program3 (MF3)	Fault/Warning