AIRMASTER

FORM Configuration Manual

Positive Displacement Compression

Version Revision notes:

Release date	Edition	Bug Fix	Added Feature
17/05/22	E01	• Drain 2 functionality • Chain framework update	• Expand/collapse functionality of the active function icons on status bar. • Form software able to show the 3 pre-set dashboard from the display designer.
24/06/22	E02		• Remote start/stop a Set availability flag for IoT Webpages has been added. • IoT that is connect to the internet will set the timestamp of the Form controller. • P11.26 Y/D Transition Time now able to make visible on HMI.
09/09/22	E02 rev01	• Incorrect behaviour on P15.01 • A2837, incorrect behaviour after power cycle.	• P27 introduced for IP settings • A2837 – IoT Unsynced introduced • MAC address of IoT is available on the FORM (P06.21.06)
28/09/22	E02rev02	• Pressure schedule – incorrect use cases • GET FROM via CS – controller not ready to send data	
25/01/23	E03rev00	• P20, no Hz reading (appeared in E02rev02)	• Extend status parameters for IoT P02.04 and P02.05 • ANA 5/6 (IO extension card) can be set for Temperature functions with 4 – 20 mA signal
12/05/23	E03rev01	• Adjust HMI sensitivity	
21/06/23	E03rev02	• Defect D#6556 has been fixed	• Add (Over)Heating protection (P12.37) • Expand FAN MTR protection – possible to select location : Coil and Line • Status FORM on Aero/Metacentre still visible if Aero/Metacentre is stopped • A message pops up (to restart the controller) when CS has send a GUI-related file

12/07/2023	E03rev4		• Adding 5 Ai functions
			  ○ Inlet Vacuum
			  ○ Oil Temperature
			  ○ Delivery Temperature
			  ○ Oil Pressure
			  ○ Oil Filter Differential

20/11/2023	E03rev5	• Power in KW can now be shown even if Current is below 5.4A	• Update the ZHT & ZHS language
19/02/2024	E03rev6	• ISC : Manual rotation P00.24.02 after power drop	• Expand the amount of Configuration in Compressor table from 99 to max 250 • P10.31 CS link PIN code (1802)
02/04/2024	E03rev7	• Fieldbus table : IO numbers are different in CS versus HTML • DI functions forced NO or NC	• XPM model selection in P10.10.02 For extra IO on the FORM
19/04/2024	E03rev8		• Adaption on the Cooling DP – see P10.07 • Inlet vacuum higher resolution when range is set for 2 bar or lower. • New fieldbus register for the XPM modules • Adjustments on FAN CONTROL logic

25/04/2024	E03rev9		• Adding 4 Ai functions
			  ○ Oil Cooler Discharge (sensor)
			  ○ Oil Cooler Approach (calculated)
			  ○ After Cooler Discharge (sensor)
			  ○ After Cooler Approach (calculated)

			• Adjust the Ambient RUN Inhibit into LOAD inhibit • Add P10.02 Force Offload function
25/04/2024	E03rev10		• Extend the range of P08 Graph to a month of data • Adding DI function “RUN ENABLE”
11/07/2024	E03rev11	• DI RUN ENABLE fixed • AC power supply with noise can be accepted.	• Temperature offset can now be set to -100 °C

Contents

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1.0 Safety


Danger – High Voltage


Caution


Advisory


Refer to Manual


Emergency Stop


Protective Earth

Do not configure and/or operate the Airmaster™ until you and all personnel concerned have read and understand the correct use and operation of the product detailed in this manual.

Operation may only be done by trained personnel according to safe engineering practises and with the observance of all relevant local health and safety requirements and regulations.

A requirement of fault-free operation and fulfilment of any right to claim under guarantee is that documentation is observed.

This document is subject to change without notice, if in doubt, do not proceed.

2.0 General Description

2.1 Airmaster™ FORM

The controller is a machine controller for use with industrial machines that comply with the European Machine EMC Directive EMC 2014/30/EU and LVD 2014/35/EU.

The controller is a component that can not operate without other components. The controller is not a machine or a safety component.

The controller can be used in areas of pollution degree 1 or 2.

No part of the controller is under pressure and the controller is not a safety device; there is no requirement for the controller, as a component, to comply with European Pressure Equipment Directive 2014/68/EU.

The controller is not intended for use in military, maritime or explosive environment applications.

2.2 Airmaster™ RS485 Option Module

One RS485 option module can be added to the Airmaster™ FORM. The RS485 option module supports the Airbus485™ (proprietary) or Modbus RTU protocol. Modbus RTU Slave and Master mode is support. Consult your product supplier, or visit **www.controlcompressors.com**, for the applicable field bus register set for the appropriate Airmaster™ FORM application and model type.

2.3 Airmaster™ IoT Option Module

One IoT option module can be added to the Airmaster™ FORM. The IoT option module supports TCP/IP protocol web browser hosting over Ethernet.

2.4 Airmaster™ IO Option Module

Airmaster™ IO option module provide additional analogue/digital inputs and relay outputs.

2.5 Airmaster™ Network Option Cards

Airmaster™ network cards support networking with field bus protocols (Profibus and DeviceNet for example) not directly supported by the Airmaster™ FORM Series; consult your product supplier or visit:
www.controlcompressors.com

2.6 System Management Control

CMC System Management Control products are used to fully integrate, optimise and manage multiple equipment systems. Consult your product supplier or visit:
www.metacentre.eu

3.0 User Interface

3.1 Keypad

Start **Stop** **Reset**

Enter **Up** **Down**

Escape

Icon: Image	Icon: Function
APM	Advanced Power Monitoring
C&C	Command & Control = System control
MODBUS	MODBUS Compatible
ACA	Advanced Control Algorithms
ISC	Internal System Control
IoT	Internet of Thinks

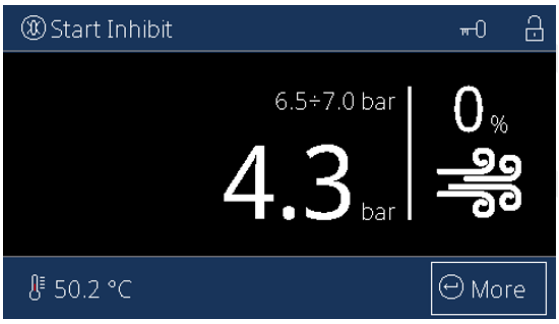
Icon: LED	LED: Function
	ON : FORM controller Powered (X08) OFF : FORM controller NOT Powered (X08)
	OFF = Motor is not Running Flash Slow = Motor running or started state ON = running LOADED
	ON = Maintenance is required OFF = No Maintenance is required
	Flash Slow = Warning Active (A:….) Fast Flash = Immediate stop Active (E:….)

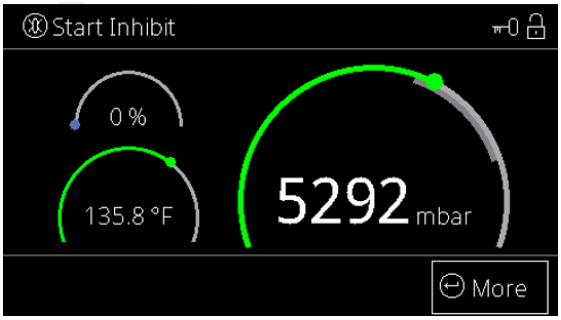
3.2 Graphic Display (display designer Tool CS)

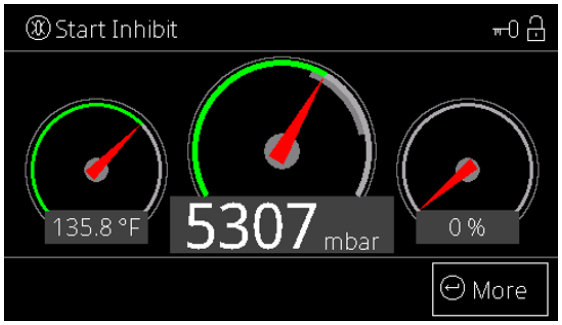
After a period of non-use (60 sec) the graphic display light level will reduce until a key is pressed.

The Home screen is the default view page after power up and where the display will return after a period (period P10.24 Logout Time) of no keypad use.

Below some Pre-set home screens that can be selected via the display designer tool on Control Studio

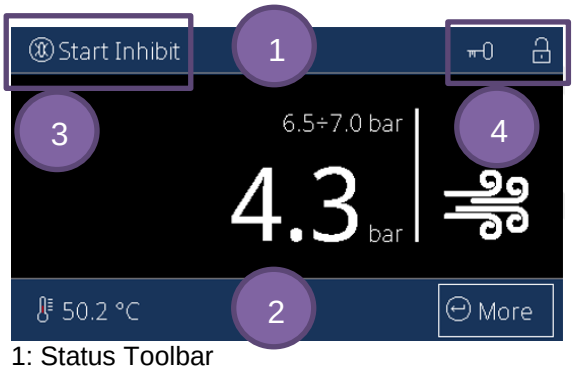






Each pre-set shows the important values of the compressor:

- Delivery pressure
- Outlet temperature
- % Load of the compressor
- Status of compressor
- Active functions (e.g. Clone key)
- Active warning or Immediate stop



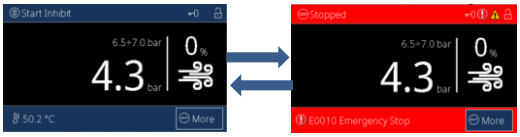
1: Status Toolbar
2: Navigation Toolbar
3: Status
4: Active Function Icons

If more than 4 Active Functions icons are active, and the status text is to large to fit before the icons position, the icons are collapsed. The symbol '**<<**' indicates more icons active. When user touched '**<<**' the icons are expanded, symbol '**>>**' is shown. If touched again icons are collapse again etc…

Note: if 4 Active Functions icons are active, and status text is again smaller, collapse icon '**>>**' disappears.
Note: FORM without touch (7 keys) uses the key combination up+down to toggle between expand/collaps of the icons.
Below the list of Active Function icons available from high to low priority.

Function Icon	Explanation
	Locked or Unlocked
	Service
	Warning
	Fault
	Drain Valve
	Remote control (P10.11 Start Source = DI or P10.11 Load Source = communication and ISC is active)
	Remote pressure Control (P10.11 Load Source = DI and 1 DI need to have REM LOAD/OFFLOAD function)
	ISC Master Active
	Fan
	Autorestart
	Run Schedule
	IoT module
	Clone key

When an alarm or fault has been detected by the FORM controller the status toolbar and navigation toolbar will start to flash from Red to blue.



To reset an alarm or fault that has been resolved you need to push once the RESET-Button when the display shows the home screen.

3.3 User Account Controls (User Configurator Tool CS)

Airmaster™ FORM is supplied with a 'Default' user account, an 'ADMIN' user account and a further 10 configurable User accounts. Only the 'ADMIN' user can configure additional User accounts.

The 'Default' user account does not require a PIN code. The Default user can view menus 00 – 09 only. These menus cannot be edited.

All other User accounts are protected by a 4 digit PIN code. If you enter a 4 digit PIN code incorrectly, after pressing ENTER the user will be returned to Menu P09.01 (i.e. default user)

Default 'ADMIN' User PIN Code: 2308

The 'ADMIN' user PIN Code can be changed as required. The reset 'ADMIN' User PIN code feature is intentionally not printed. If you do not know or require the reset 'ADMIN' User PIN Code, contact your product supplier.

The 'ADMIN' User name cannot be changed and remains 'ADMIN' User.

Use 'ADMIN' User access to configure additional User accounts and User account preferences as required.

Item	Edit
P09.04~13.01	Edit user name
P09.04~13.02	User PIN code
P09.04~13.03	Language
P09.04~13.04	Time format
P09.04~13.05	Date format
P09.04~13.06	Pressure unit
P09.04~13.07	Temperature unit
P09.04~13.09 ~ 18	No edit
P09.04~13.19 ~ 44	Access: Not available Read access Edit access

In addition to personal preferences, the 'ADMIN' User can configure menu access rights for each Additional User.

Menu access configuration options are:

"Not available"	invisible to the User
"Read access"	visible but NOT editable by the User
"Edit access"	visible and editable by the User.

Note:
This manual describes all menus and menu items. If menus are not visible, check User access configuration before troubleshooting elsewhere.

To return to 'Default' User, navigate to Menu item P09.02 'Initial user' and press 'ENTER'; access is returned to 'Initial' user access.

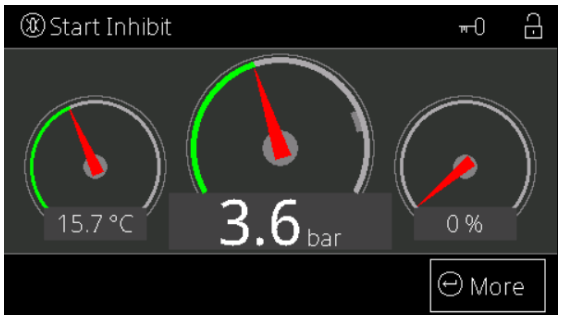
Use 'ADMIN' user access to edit the Initial User configuration. Use the parameters menu location to adjust the 'Initial' User configuration.

Notes:
Understand how to edit the 'Initial' User Account which is done differently from the 'ADMIN' or Additional user accounts.
The Initial User can be set in CS via P09.02 In the Parameter configurator.

Monitor which User account is active When evaluating configuration or menu Access restrictions.

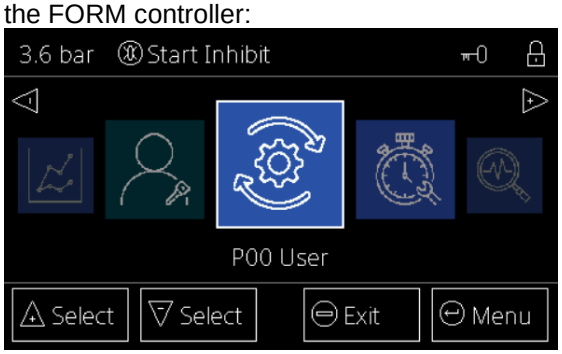
After a period of non-use the Airmaster™ will Always return to the 'Initial' user.

3.4 Menu Navigation

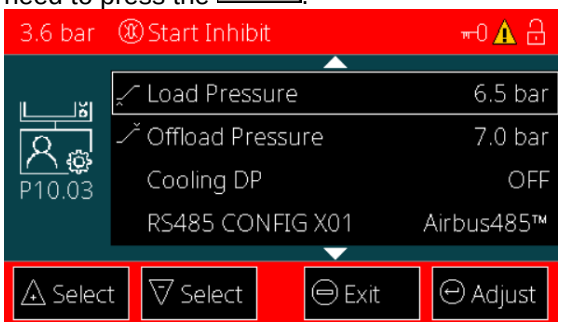


After power-up, the controller will display the 'Home' screen.
In order to get into the menu structure of the FORM controller you need to press the More button in the navigation bar.

This will give you access to the menu pages of the FORM controller:

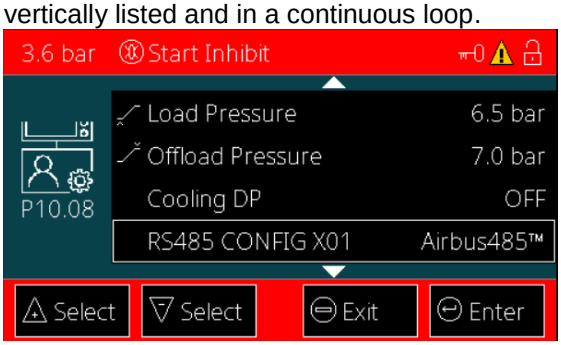


Menu tabs are arranged sequentially and in a continuous loop.
Use the Select or Select to navigate between the different menu tabs.
By pressing the Exit you will return to the Home screen.
In order to get in the selected Menu tab you need to press the Menu.

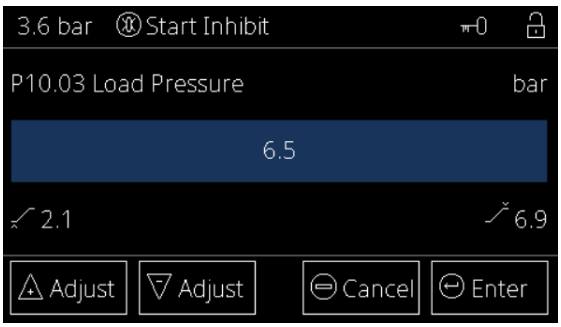


Entering the menu highlights the first item of the menu.

Use the Select and Select keys to navigate between menu items or press the menu item you need on the HMI. Menu content items are vertically listed and in a continuous loop.



To enter the submenu of a parameter the Enter button will be shown.
To edit an accessible and editable menu item the Adjust button will be shown. By pressing Adjust :

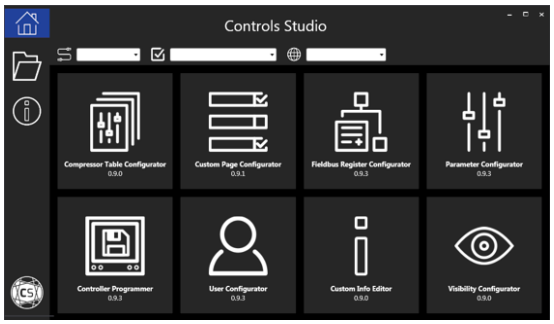


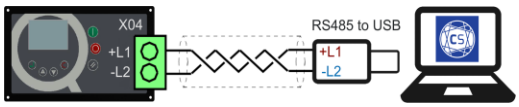
An edit menu popup window will appear. Use the Adjust and Adjust keys to select an available option or increment and decrement a value. Press and hold the Adjust or Adjust key to increase the speed at which a selectable value is changed. Press the Enter key to confirm a selection or use the Cancel key to exit without modifying the selection or value. With the popup window displayed, press and hold the ' Enter button to alternate between display text and display value.

To exit a menu and highlight the menu page tab selection, press Cancel.

3.5 Controls Studio

Controls Studio is a Windows™ PC software application that allows configuration of an Airmaster™ FORM Series from a PC environment.





Access code to establish communication between CS and Controller is **1802** (see P10.31 CS Link Pin code)

CS KIT File Overview

The core application, graphical user interface and default setup 'System Files', and all 'User Configurable' files, are available within a single CS KIT (.kit) file. A CS KIT file is for use with Controls Studio only; the CS KIT file is not stored within the Airmaster™ FORM Series. When an Airmaster™ controller is programmed Controls Studio will automatically extract the individual files and program them separately.

A CS KIT file consists of the following files:

System Files:

.hex
: Application

HMI_FONT.bin
: Graphical interface text fonts

LANGUAGE.bin
: Graphical interface languages

.utf-8
: Controls Studio interface/translation

.pt
: Default parameter settings.
(custom modifications to the '.pt' file are saved as a '.cpb' file)

.ct
: Default controller menu
(Is the menu structure of the FORM controller)

User Configurable Files:

.cpb
: Parameter settings.

.cpba
: Login user account profiles.

.cpbu
: OEM equipment data and Service Provider information.

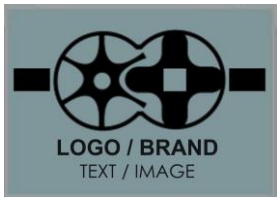
.vis
: All user menu item visibility

.cmt
: Compressor tables

.men
: P40-44 menu item definitions

.fbt
: Custom field bus (Modbus RTU) table

.bmp *(if applicable)*
: Initialisation screen bitmap image



Optional bitmap image that is displayed during power up initialisation.

.dcf
: Drive configuration (register who are used to control the MAIN or FAN drive)

.did
: Display designer (with this you select which pre-set of own design you want on the home screen of the FORM controller)

Pre-Configured CS KIT Files

A number of pre-configured CS KIT files, to suit a wide selection of generic equipment types, are available. A generic pre-configured CS KIT file can be used 'as is' or as a starting point for the construct of a fully customised file set to suit any applicable target application.

- *Some configuration parameters and settings, dependant on model and/or software variant, may only be editable using Controls Studio.*

4.0 Menus and Menu Items

4.1 Menu Map *(display menus may vary in relation to Airmaster™ configuration)*

Menu Colour Key:	**Read Only Menu**	**Read and Edit Menu (Keyboard or Controls Studio)**
Item Key:	▽ Editable in stopped state only	
↵ (Enter Symbol)	Sub Menu: Press ENTER key to access sub menu items	

P00 – User	**P01 – Service Timers**	**P02 – Utilisation**	**P03 – Error Log**	**P04 – Event Log**	**P05 – Service Provider**
01 Active Alarm/Fault	01 Load / Offload hours	01 EQUIP Status	01 Error 1↵	01 Event 1↵	01 Company Name
02 Alarm/Fault 1	02 Load hours	02 Load / Offload Hours			02 Company Name
03 Alarm/Fault 2	03 Offload hours	03 Last 24 Hours↵			03 Street Name
04 Alarm/Fault 3	04 Stopped hours	04 Motor starts↵			04 Street Name
05 Control Mode	05 Service hours 1 (in hrs)	05 Load Frequency↵	…	…	05 City
09 Ai3 function	06 Service hours 2 (in hrs)	10 VSD Average RPM↵	50 Error 50↵	200 Event 200↵	06 State / Province
10 Ai1 : Delivery Pressure	07 Service hours 3 (in hrs)				07 ZIP / Postal
11 Ai2 function	08 Service hours 4 (in hrs)				08 Country
12 DIFF Pressure	09 Service hours 5 (in hrs)				09 Telephone
13 Ai4 : Temperature	10 Service hours 6 (in hrs)				10 Fax
14 Oil/Air Sep DP	11 Service hours 7 (in hrs)				11 E-Mail
15 Main MTR phase current	12 Service hours 8 (in hrs)				12 Web
16 Main Motor Power	13 Weekly Service				
17 FAN MTR phase current	14 Annual Service				
18 Fan Motor Power	15 Bi-annual SERV				
19 Package Power	16 Service hours 1 (in %)				
20 Line Voltage	17 Service hours 2 (in %)				
21 Time	18 Service hours 3 (in %)				
22 Date	19 Service hours 4 (in %)				
24 ISC Sequence↵	20 Service hours 5 (in %)				
25 ISC Sequence hours	21 Service hours 6 (in %)				
26 ISC System Pressure	22 Service hours 7 (in %)				
27 Ai5 function	23 Service hours 8 (in %)				
28 Ai6 function	24 Service : Pressure vessel				
29 Ai7 function	25 Service : Safety valve				
30 Ai8 function					
35 Force Offload					

P06 – Controller Data	P07 – Asset Data	P08 – Graph	P09 – Access	P10 – Settings 1	P11 – Settings 2
01 Controller ID	01 MANUF Name		01 Active user / Logout	01 Control mode	01 Star Delta TRANS
02 Serial Number	02 EQUIP Model		02 Initial user	02 Force offload	02 MIN MTR Run Time
03 Software ID	03 MDL SER Number		03 ADMIN USER ↵	03 Load pressure	03 Load INH Time
04 Software Version	04 MDL Rated PRESS		04 USER 1 ↵	04 Offload pressure	04 Reload INH Time
05 Software Time	05 MDL Rated Output		05 USER 2 ↵	05 Run period	05 Offload Run Time
06 Software Date	06 MDL YR MANUF		06 USER 3 ↵	06 Offload period	06 Stop MIN Time
07 Software CONFIG	07 COMP SER NUM		07 USER 4 ↵	07 Cooling DP	07 Vent Time
08 Software ©	08 COMP YR MANUF		08 USER 5 ↵	08 RS485 X01 CONFIG ↵	08 AUTO Restart INH
09 CS File 1 (LANGUAGE file)	09 MTR SER NUM		09 USER 6 ↵	09 RS485 X02 CONFIG ↵	09 Drain1 Type ↵
10 CS File 2 (FONT file)	10 MTR YR MANUF		10 USER 7 ↵	10 Extension module ↵	10 Drain2 Type ↵
11 CS File 3 (Parameter config)	11 CLR SER NUM		11 USER 8 ↵	11 Start Source	11 HI MTR STR HR ↵
12 CS File 4 (User config)	12 CLR YR MANUF		12 USER 9 ↵	12 Load Source	12 DP Inhibit Time
13 CS File 5 (Compressor table)	13 PV Inspect Date		13 USER 10 ↵	13 Language	13 Service Hours 1 ↵
14 CS File 6 (Custom page)				14 Time	14 Service Hours 2 ↵
15 CS File 7 (Fieldbus file)				15 Time Format	15 Service Hours 3 ↵
16 CS File 8 (Bootscreen file)				16 Daylight saving	16 Service Hours 4 ↵
17 CS File 9 (Visibility file)				17 Date	17 Service Hours 5 ↵
18 CS File 10 (Custom info)				18 Date Format	18 Service Hours 6 ↵
19 CS File 11 (Drive config)				19 LCD Light Level	19 Service Hours 7 ↵
20 CS File 12 (Display Designer file)				20 Pressure Unit	20 Service Hours 8 ↵
21 IOT card Device ID ↵				21 Temperature Unit	21 Weekly Service ↵
22 Clone key ↵				22 VSD Target Pressure	22 Annual Service ↵
				24 Logout Time	23 Bi-annual Service ↵
				25 Performance Derating	25 Loss of Signal Enable
				26 Function button 1	26 Y/D Transition time
				27 Function button 2	27 Service: Pressure vessel ↵
				28 Function button 3	28 Service: Safety valve ↵
				29 Modulation Mode	
				30 Modulation Pressure	
				31 CS Link PIN code	

P12 – Settings 3	P13 – VSD Settings	P14 – Motor Protection	P15 – Inhibits	P16 – Warning Alarm	P17 – IMM Stop Alarm
01 ▽Parameter Reset	01 ▽VSD Control Mode	01 Protect Main MTR	01 ▽Operator	01 Service Hours 1	01 COMP OUT TEMP
02 ▽Save as CONFIG	02 ▽VSD Target PRES	02 Main MTR connection	02 Door Open	02 Service Hours 2	02 TEMP Rise CONFIG ↵
03 Compressor Table	03 ▽VSD MAX Speed	03 Phase detection	03 Low Temperature	03 Service Hours 3	03 EQUIP OUT PRESS
04 Error log Reset	04 ▽VSD MIN Speed	04 OVLD protect Main MTR	04 INT PRESS High	04 Service Hours 4	04 EQUIP INT PRESS
05 Event log Reset	05 Electronic Gearing ↵	05 FLC Main Motor	05 Ambient Temp Low	05 Service Hours 5	06 DIFF Pressure
06 Clone key Function	06 Current Max speed	06 Loc to overl fact Main MT	06 Internal Temp Low	06 Service Hours 6	07 Door Open

08 Set Load Hours	07 Current Min speed	07 ROT LOC fact Main MTR	08 Long Stand still	07 Service Hours 7	08 Fan Motor IMM Stop
09 Set Offload Hours	09 VSD Optimum Speed	08 PH IMB Dev Main MTR	09 Load inhibit Temp	08 Service Hours 8	09 COOL WTR IMM Stop
10 Set Stopped Hours	10 VSD Offload Speed	09 CT # loops Main MTR		09 Weekly Service ↵	10 Oil LVL IMM Stop
11 ISC Available	13 VSD P Factor	10 CT Range Main MTR		10 Annual Service ↵	11 Belt Drive SERV
12 Fan Temp High	14 VSD I Factor	11 CT Location Main MTR		11 Bi-annual SERV ↵	12 Dryer IMM Stop
13 Fan Temp Low	15 VSD D Factor	12 Protect Fan MTR		12 COMP OUT TEMP	13 Water flow IMM Stop
14 Fan Run Period	17 VSD MAX RMP Rate	13 OVLD protect Fan MTR		13 EQUIP OUT PRESS ↵	14 Inverter IMM Stop
19 Restart Reminder	24 VSD VIA Comms	14 OVLD INH time Fan MTR		14 EQUIP INT PRESS ↵	15 Main MTR TEMP HI
20 Dryer Type	25 Slave address	15 FLC Fan MTR		15 DIFF Pressure	16 EQUIP out Temp
21 Dryer Off Temp	26 Comms Retry	16 CT # loops Fan MTR		16 Oil Air SEP DP HI	17 Colling system
22 Dryer On Temp	28 Drive table	17 CT Range Fan MTR		17 Hi MTR Starts Per Hour	18 Main MTR IMM Stop
23 Max Dryer starts		18 Max Flow		18 Door Open	19 Conf IMM Stop 1 ↵
24 Resume DI Start		19 Min Flow		19 Cabint Filter Differential	20 Conf IMM Stop 2 ↵
25 Run Check delay		20 Ancill. Losses – Static		20 Air Filter Differential	21 Conf IMM Stop 3 ↵
26 Limit Schedule Function		21 Ancill. Losses – Running		21 Oil Filter Differential	25 VSD Fan MTR OVLD
27 Press switch Low		24 Fan MTR connection		22 SEP Filter Diff HI	26 Fan MTR OVLD
28 Press switch High		25 CT location Fan MTR		23 Fan Motor Alarm	27 Oil Temp Hi IMM Stop
30 Fan Temp High 2				24 CNDS Drain1 warning ↵	28 Dew Point IMM Stop
31 Fan Temp Low 2				25 Cool water warning	32 Voltage Low IMM Stop
32 2nd Fan Function				26 Oil Level warning	33 Drain 1 IMM Stop ↵
33 Modbus Fan Control				27 Dryer warning	34 Ambient Temp Hi
34 Fan Run On Time				28 Line FTR DP warning	35 Air Filter DP
37 Heating protection				29 FTR Drain warning	36 Oil Filter DP ↵
				30 Oil/WTR SEP warning	37 Inverter Fault
				31 Ambient Temp HI	40 Stage Pressure
				32 Conf Warning 1 ↵	41 Stage1 Temp
				33 Conf Warning 2 ↵	42 Group Fault
				34 Conf Warning 3 ↵	45 EQUIP OUT PRESS
				35 VSD Fan MTR OVLD	46 Dryer power Supply
				36 Fan MTR OVLD	47 MTR protect IMM Stop
				37 Oil Temp HI warning	54 Vibration HI IMM Stop
				41 Main MTR Temp High	55 MTR Winding Temp Hi
				42 Voltage low warning	56 Enclosure TEMP Hi
				43 Ambient Temp High	61 Drain 2 IMM Stop ↵
				44 Dew Point warning	62 Dryer Off delay
				45 Dryer power Supply	67 Inlet Vacuum HI
				53 CNDS Drain2 warning ↵	68 Oil TEMP HI
				54 Dryer Off delay	69 Delivery temp HI
				55 Service: Pressure vessel ↵	70 Oil P Limits ↵
				56 Service: Safety valve ↵	71 Oil Filter DP HI

				62 Inlet Vacuum HI warning	72 Oil Cooler Discharge HI
				63 Oil TEMP HI warning	73 Oil Cooler Approach HI
				64 Delivery temp HI	74 After Cooler Discharge HI
				65 Oil P Limits ↵	75 After Cooler Approach HI
				66 Oil Filter DP HI ↵	
				67 Oil Cooler Discharge HI	
				68 Oil Cooler Approach HI	
				69 After Cooler Discharge HI	
				70 After Cooler Approach HI	

P18 – I/O CONFIG	**P19 – Sensor CONFIG**	**P20 - Diagnostics**	**P21 – Run Schedule**	**P22 – Modbus Fan Control**	**P23 – Modbus VSD Info**
01 Analog Input 1 function	01 P1 Pressure ↵	01 Analog Input 1 (amps)	01 Run Schedule	01 Slave Address	01 VSD Speed % Main MTR ↵
02 Analog Input 1 Type	02 P2 Pressure ↵	02 Analog Input 1 (Volts)	02 Workday Edit ↵	02 Start Temperature	02 VSD Speed % Fan MTR ↵
03 Analog Input 2 function	03 T1 Temperature ↵	03 Analog Input 2 (Amps)	03 Parameter Reset	03 Target temperature	
04 Analog Input 2 Type	04 T2 Temperature ↵	04 Analog Input 2 (Volts)	04 Schedule Entry 1 ↵	04 Control Mode	
05 Analog Input 3 function		05 Analog Input 3 (Ohms)	...	05 Maximum Speed	
06 Analog Input 3 Type		06 Analog Input 4 (Ohms)	31 Schedule Entry 28 ↵	06 Minimum Speed	
07 Analog Input 4 function		07 Analog Output		07 Speed RPM	
08 Analog Input 4 Type		08 Digital Input 1		08 P Factor	
09 AO Function		09 Digital Input 2		09 I Factor	
10 DI2 Function		10 Digital Input 3		10 D Factor	
11 DI2 Configuration ↵		11 Digital Input 4		11 Speed %	
12 DI3 Function		12 Digital Input 5		12 Maximum Ramp rate	
13 DI3 Configuration ↵		13 Digital Input 6		13 Drive Table	
14 DI4 Function		14 Digital Input 7			
15 DI4 Configuration ↵		15 Digital Input 8			
16 DI5 Function		16 Digital Input 9			
17 DI5 Configuration ↵		17 Relay Output 1			
18 DI6 Function		18 Relay Output 2			
19 DI6 Configuration ↵		19 Relay Output 3			
20 DI7 Function		20 Relay Output 4			

21 DI7 Configuration ↵		21 Relay Output 5			
22 DI8 Function		22 Relay Output 6			
23 DI8 Configuration ↵		23 Relay Output 7			
24 DI9 Function		24 Relay Output 8			
25 DI9 Configuration ↵		25 Relay Output 9			
26 Relay 1 Function		26 Relay Output 10			
27 Relay 2 Function		27 Supply Voltage AI/DI			
28 Relay 3 Function		28 Main CT1 (mA)			
29 Relay 4 Function		29 Main CT2 (mA)			
30 Relay 5 Function		30 Main CT3 (mA)			
31 Relay 6 Function		31 Fan CT (mA)			
32 Relay 7 Function		32 L1 Voltage			
33 Relay 8 Function		33 L2 Voltage			
34 Relay 9 Function		34 L3 Voltage			
35 Relay 10 Function		35 Power Factor Main ↵			
		36 Power Factor Fan ↵			
		37 L1 Frequency (Hz)			
		38 L2 Frequency (Hz)			
		39 L3 Frequency (Hz)			
		40 L1 Phase Angle			
		41 L2 Phase Angle			
		42 L3 Phase Angle			
		43 Key Switch test			
		44 LED Test			
		45 IO Extension ↵			

P24 – IO Extension	P25 – IO Sensor Config	P26 – RS485 Extension	P27 – IOT Settings	P28 – I/O XPM	P29 – I/O XPM sensor Config
01 Analog Input 5 function	01 Analog Input 5 ↵	01 RS485 Config X14 ↵	01 IP Settings ↵	01 Analog Input 1 function	01 Analog Input 1 ↵
02 Analog Input 5 Type	02 Analog Input 6 ↵	02 RS485 Config X15 ↵	02 Remote Access Enable	02 Analog Input 1 Type	02 Analog Input 2 ↵
03 Analog Input 6 function	03 Analog Input 7 ↵			03 Analog Input 2 function	03 Analog Input 3 ↵
04 Analog Input 6 Type	04 Analog Input 8 ↵			04 Analog Input 2 Type	04 Analog Input 4 ↵
05 Analog Input 7 function				05 Analog Input 3 function	
06 Analog Input 7 Type				06 Analog Input 3 Type	
07 Analog Input 8 function				07 Analog Input 4 function	

08 Analog Input 8 Type				08 Analog Input 4 Type	
09 DI10 Function				09 AO Function	
10 DI10 Configuration ↵				10 DI2 Function	
11 DI11 Function				11 DI2 Configuration ↵	
12 DI11 Configuration ↵				12 DI3 Function	
13 DI12 Function				13 DI3 Configuration ↵	
14 DI12 Configuration ↵				14 DI4 Function	
15 DI13 Function				15 DI4 Configuration ↵	
16 DI13 Configuration ↵				16 DI5 Function	
17 DI14 Function				17 DI5 Configuration ↵	
18 DI14 Configuration ↵				18 DI6 Function	
19 DI15 Function				19 DI6 Configuration ↵	
20 DI15 Configuration ↵				20 DI7 Function	
21 DI16 Function				21 DI7 Configuration ↵	
22 DI16 Configuration ↵				22 DI8 Function	
23 DI17 Function				23 DI8 Configuration ↵	
24 DI17 Configuration ↵				24 Relay 1 Function	
25 Relay 11 Function				25 Relay 2 Function	
26 Relay 12 Function				26 Relay 3 Function	
27 Relay 13 Function				27 Relay 4 Function	
28 Relay 14 Function					

P40-44 – User DEF 1 to 5	P80 – ISC Main Menu	P81 – ISC Settings	P82 – ISC Priority
	01 ISC Enabled	01 ISC # Compressors	01 Priority 1
	02 Offload Pressure	02 ISC Start Delay	02 Priority 2
	03 Load Pressure	03 ISC Damping	03 Priority 3
	04 Rotation Interval	04 ISC XPM pressure ↵	04 Priority 4
		05 ISC PRESS SENS	05 Priority 5
		06 Load tolerance	06 Priority 6
		07 Unload tolerance	07 Priority 7
			08 Priority 8

4.2 Menu Items

Menu name	Menu code	Menu text	Additional information
	P00.01	Active Alarm/Fault	The most recent active alarm/fault. NOTE : If more than one active alarm/fault exists they will be displayed in chronological order from P00.01 – P00.04 Active alarm(s)/Fault(s) are displayed until reset.
	P00.02	Alarm/Fault 1	Alarm/fault occurred before most recent alarm/fault
	P00.03	Alarm/Fault 2	Alarm/fault occurred before alarm/fault 1
	P00.04	Alarm/Fault 3	Alarm/fault occurred before alarm/fault 2
	P00.05	Control Mode	The selected control mode
	P00.09	ANA IN 3 Function	Analog input 3 value
	P00.10	ANA IN 1 Function	Analog input 1 value
	P00.11	ANA IN 2 Function	Analog input 2 value
	P00.12	DIFF Pressure	The differential pressure between outlet and internal (EQUIP INT PRESS minus EQUIP OUT PRESS)
	P00.13	ANA IN 4 Function	Analog input 4 value
	P00.14	Oil/Air SEP DP	Oil/Air Separator differential
	P00.15	Main MTR phase Current	The main motor phase current value
	P00.16	Main Motor Power	The main motor power value
	P00.17	Fan MTR phase Current	The fan motor phase current value
	P00.18	Fan Motor Power	The fan motor power value
	P00.19	Package Power	Total Power of the Compressor (Main Motor Power + Fan Motor Power)
	P00.20	Line Voltage	Line voltage value measured (potential difference between two phases or lines)
	P00.21	Time	The current time (configured)
	P00.22	Date	The current date (configured)
	P00.24	ISC Sequence	Indicates if ISC System Management Control function is ON or OFF. When ON, shows the active Sequence assignment.
	P00.24.01	ISC enabled	To activate the ISC function this parameter need to be seet ON.
	P00.24.02	ISC sequence change	A manual sequence rotation can be performed by setting the parameter from OFF to ON and to validate the change.
	P00.25	ISC sequence hours	Time until next ISC sequence rotation event
	P00.26	ISC System Pressure	The ISC System pressure sensor value
	P00.27	ANA IN 5 Function	Analog input 5 value
	P00.28	ANA IN 6 Function	Analog input 6 value
	P00.29	ANA IN 7 Function	Analog input 7 value
	P00.30	ANA IN 8 Function	Analog input 8 value
	P00.35	Force Offload	To manually Force the compressor into a Offload state (only visible if P10.02 Force Offload is activated)
P01 **Service Timers**	**Service Timers**		
	P01.01	Load / Off Load Hours	Hour counter, Load / off load hours indicates the number of hours the device has operated in any load or off

P01 **Service Timers**			load state
	P01.02	Load Hours	Hour counter, Load hours indicates the number of hours the device has operated in any load state
	P01.03	Off Load Hours	Hour counter, Off load hours indicates the number of hours the device has operated in any off load state
	P01.04	Stopped Hours	Hour counter, Standby hours indicates the number of hours the device has operated in any stopped state
	P01.05	Service Hours 1	Hour counter, visible when configured and displays assignment (e.g. routine service)
	P01.06	Service Hours 2	Hour counter, visible when configured and displays assignment (e.g. cabinet filter)
	P01.07	Service Hours 3	Hour counter, visible when configured and displays assignment (e.g. air filter)
	P01.08	Service Hours 4	Hour counter, visible when configured and displays assignment (e.g. oil filter)
	P01.09	Service Hours 5	Hour counter, visible when configured and displays assignment (e.g. oil service)
	P01.10	Service Hours 6	Hour counter, visible when configured and displays assignment
	P01.11	Service Hours 7	Hour counter, visible when configured and displays assignment
	P01.12	Service Hours 8	Hour counter, visible when configured and displays assignment
	P01.13	Weekly Service	Time counter, visible when configured
	P01.14	Annual Service	Time counter, visible when configured
	P01.15	Bi-annual SERV	Time counter, visible when configured
	P01.16	Service Hours 1	Percentage counter (‘passed’ or ‘to go’), visible when configured (via Parameter P11.13.06 – Display type)
	P01.07	Service Hours 2	Percentage counter (‘passed’ or ‘to go’), visible when configured (via Parameter P11.14.06 – Display type)
	P01.18	Service Hours 3	Percentage counter (‘passed’ or ‘to go’), visible when configured (via Parameter P11.15.06 – Display type)
	P01.19	Service Hours 4	Percentage counter (‘passed’ or ‘to go’), visible when configured (via Parameter P11.16.06 – Display type)
	P01.20	Service Hours 5	Percentage counter (‘passed’ or ‘to go’), visible when configured (via Parameter P11.17.06 – Display type)
	P01.21	Service Hours 6	Percentage counter (‘passed’ or ‘to go’), visible when configured (via Parameter P11.18.06 – Display type)
	P01.22	Service Hours 7	Percentage counter (‘passed’ or ‘to go’), visible when configured (via Parameter P11.19.06 – Display type)
	P01.23	Service Hours 8	Percentage counter (‘passed’ or ‘to go’), visible when configured (via Parameter P11.14.06 – Display type)
	P01.24	Service : Pressure vessel	Time counter, visible when configured
	P01.25	Service : Safety valve	Time counter, visible when configured
P02 **Utilisation**	**Utilisation Timers**		
	P02.01	EQUIP Status	Equipment status, Consult this manual
	P02.02	Load / Offload Hours	Hour counter, Load / offload hours indicates the number of hours the device has operated in any load or offload state
	P02.03	Last 24 Hours	These parameters will be linked to the IoT card in the near future.
	P02.03.01	Onload	Frequency counter, number of times the device went in a LOAD state in the prior 24 hours of utilisation
	P02.03.02	Offload	Frequency counter, number of times the device went in a OFFLOAD state in the prior 24 hours of utilisation
	P02.03.03	Available	Frequency counter, number of times the device went in an AVAILABLE state in the prior 24 hours of utilisation
	P02.03.04	Not available	Frequency counter, number of times the device went in a NOT AVAILABLE state in the prior 24 hours of utilisation
	P02.03.05	Motor starts	Frequency counter, number of times the device main motor starts in the prior 24 hours of utilisation
	P02.04	Motor starts	
	P02.04.01	MTR STR last HR	Frequency counter, number of times the device main motor starts in the prior 1 hour of utilisation
	P02.04.02	MTR STR last 24H	Frequency counter, number of times the device main motor starts in the prior 24 hours of utilisation

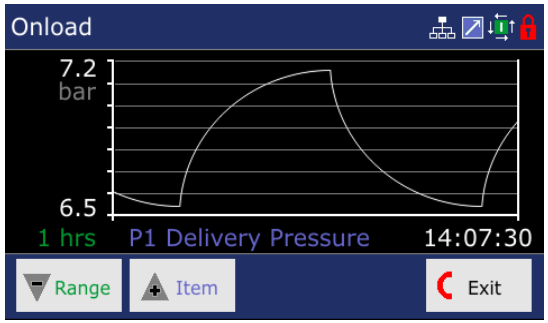
	P02.05	Load Frequency ↵	Frequency counter, number of times the device moves from the offload state to the load state
	P02.05.01	Load Last Hour	Total of load state in the prior Last hour
	P02.05.02	Load Last 24 Hours	Total of load state in the prior Last 24 hours
	P02.05.03	Load Last 7 days	Total of load state in the prior Last 7 days
	P02.05.04	Load Last 30 days	Total of load state in the prior Last 30 days
	P02.10	VSD Average RPM ↵	VSD average RPM 1 – 100% expressed as a percentage
	P02.10.01	VSD Average RPM ##%	VSD average RPM 1 – 25% expressed as a percentage
	P02.10.02	VSD Average RPM ##%	VSD average RPM 26 – 50% expressed as a percentage
	P02.10.03	VSD Average RPM ##%	VSD average RPM 51 – 75% expressed as a percentage
	P02.10.04	VSD Average RPM ##%	VSD average RPM 76 – 100% expressed as a percentage
P03 **Error Log**	**Error Log** Error conditions can be grouped into 4 categories; Warning (Alarm), Immediate Stop (Shutdown / Trip), Start Inhibit and Run Inhibit. Error Log: error code and condition text (see Error Codes and Condition Text). When an error occurs, the error is immediately logged, with key data information, and stored in the internal memory of the Airmaster™. The error log stores 50 entries in chronological order, beginning with the most recent at menu item P03.01**.** Note: The storage of some key data items are dependent on device setup		
	P03.01 ~ 50	Error Log 1 – 50	Error condition code and condition text
	P03.##.01	Error Code / Description	Where ## = 01 to 50, Error message code and short description of error
	P03.##.02	Time	Where ## = 01 to 50, Time when error occurred
	P03.##.03	Date	Where ## = 01 to 50, Date when error occurred
	P03.##.04	Status	Where ## = 01 to 50, Equipment status when error occurred
	P03.##.05	Analog Input 1	Where ## = 01 to 50, Value of the analog input 1 when error occurred
	P03.##.06	Analog Input 2	Where ## = 01 to 50, Value of the analog input 2 when error occurred
	P03.##.07	Analog Input 3	Where ## = 01 to 50, Value of the analog input 3 when error occurred
	P03.##.08	Analog Input 4	Where ## = 01 to 50, Value of the analog input 4 when error occurred
	P03.##.09	Main MTR phase Current	Where ## = 01 to 50, Main Motor phase current when error occurred
	P03.##.10	Fan MTR phase Current	Where ## = 01 to 50, Fan Motor phase current when error occurred
	P03.##.11	Package Power	Where ## = 01 to 50, Package Power when error occurred
	P03.##.12	Line Voltage	Where ## = 01 to 50, Line Voltage when error occurred
	P03.##.13	Load/offload hrs	Where ## = 01 to 50, Load/offload hrs compressor has when error occurred
P04 **Event Log**	**Event Log** Historical log of event conditions include START button pressed, STOP button pressed, Parameter adjustment and USER ACCESS. When an event condition occurs, the event and key data is immediately logged and stored in the internal memory of the Airmaster™. The event log stores 200 events in chronological order beginning with the most recent event at menu item P04.01.		
	P04.01 ~ 200	Event log 1 - 200	Event
	P04.###.01	Event Description	Where ### = 001 – 200, Description of the event
	P04.###.02	Time	Where ### = 001 – 200, Time when event occurred

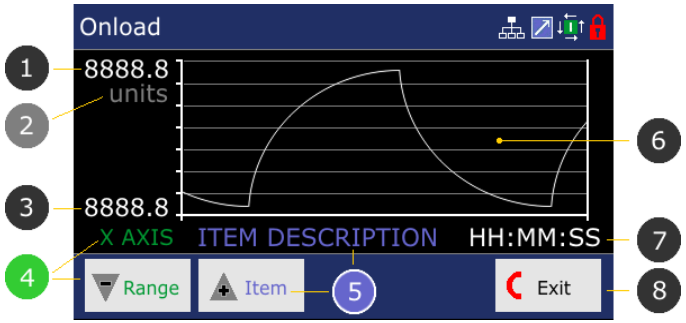
	P04.###.03	Date	Where ### = 001 – 200, Date when event occurred
P05 **Service Provider**	**Service Provider and Airmaster™ Information** Note: menus items can only be modified by using the Airmaster™ Controls Studio application.		
	P05.01	Company Name	Service provider, company name
	P05.02	Company Name	Service provider, company name
	P05.03	Street Name	Service provider, street name
	P05.04	Street Name	Service provider, street name
	P05.05	City	Service provider, city
	P05.06	State / Province	Service provider, state or province
	P05.07	ZIP / Postal	Service provider, ZIP or postal
	P05.08	Country	Service provider, Country
	P05.09	Telephone	Service provider, Telephone
	P05.10	Fax	Service provider, Fax
	P05.11	E-mail	Service provider, Email
	P05.12	Web	Service provider, Web
P06 **Controller Data**	P06.01	Controller ID	Airmaster™ FORM part number
	P06.02	Serial Number	Airmaster™ serial number
	P06.03	Software ID	Airmaster™ software ID
	P06.04	Software Version	Airmaster™ software version
	P06.05	Software Time	Time when software version installed
	P06.06	Software Date	Date when software version installed
	P06.07	Software CONFIG	Software configuration file name
	P06.08	Software ©	Software copyright
	P06.09	CS File 1	Language file version
	P06.10	CS File 2	Font File version
	P06.11	CS File 3	Parameter Configurator file
	P06.12	CS File 4	User Configurator file
	P06.13	CS File 5	Compressor table file
	P06.14	CS File 6	Custom page file
	P06.15	CS File 7	Fieldbus table file
	P06.16	CS File 8	Bootscreen file
	P06.17	CS File 9	Visibility file
	P06.18	CS File 10	Custom info Editor file
	P06.19	CS File 11	Drive configurator file
	P06.20	CS File 12	Display designer file
	P06.21	IoT card Device ID ↵	
	P06.21.01	Status	Status of the IoT module 0 = IoT module detect not detect by FORM controller 1 = IoT module is not connected (no RJ45/no internet or Aircloud connection)

P07 **Asset Data**			2 = IoT module has detect a RJ45 cable on X 4 = IoT module is connected to the internet 8 = IoT module is connected to Aircloud 10 = IoT module used for Control Studio over LAN connection
	P06.21.02	IoT card IPv4 address	Airmaster™IoT module IP address
	P06.21.03	IoT card Device ID	Airmaster™IoT module part number
	P06.21.04	IoT card Serial Number	Airmaster™IoT module serial number
	P06.21.05	IoT card Software version	Airmaster™IoT module software version
	P06.21.06	IoT card MAC Address	Airmaster™IoT module MAC Address
	P06.22	Clone Key↵	
	P06.22.01	Clone key serial number	Airmaster™Clone key serial number
	P06.22.02	Controller serial number	Airmaster™FORM serial number (same as P06.02)
	P06.22.03	Controller software ID	Airmaster™FORM software ID (same as P06.03)
	P06.22.04	Controller software version	Airmaster™FORM software version (same as P06.04)
	P06.22.05	Controller software time	Time when software version installed (same as P06.05)
	P06.22.06	Controller software date	Date when software version installed (same as P06.06)
	P07.01	MANUF Name	Name of the original equipment manufacturer
	P07.02	EQUIP Model	Equipment (Package) model
	P07.03	MDL SER Number	Model serial number
	P07.04	MDL Rated PRESS	Model rated pressure
	P07.05	MDL Rated Output	Model rated output
	P07.06	MDL YR MANUF	Model year of manufacture
	P07.07	COMP SER NUM	Compressor serial number
	P07.08	COMP YR MANUF	Compressor year of manufacture
	P07.09	MTR SER NUM	Main motor serial number
	P07.10	MTR YR MANUF	Main motor year of manufacture
	P07.11	CLR SER NUM	Cooler serial number
	P07.12	CLR YR MANUF	Cooler year of manufacture
	P07.13	PV Inspect Date	Pressure vessel inspection date

P08
Graph

Graph
The FORM includes a 'graph' feature that will show a selection of 'dynamic' historical analogue value trends.
The graph feature will generally be utilised for the 'diagnostic' (health) mode of the compressor.





1) **Y Axis Maximum Value**
   The maximum Y axis value is determined dynamically on the maximum plot value to be displayed. The maximum value is a sensible 'rounded up' sub-unit value of the maximum plot value that will be displayed.
   For example: if the maximum plot value to be displayed is 7.15bar then the maximum Y axis value should be 7.2bar; where the 'sub-unit' for this pressure unit type is considered to be 0.1bar.
2) **Y Axis Value 'units'**
   The set 'units' preference for the graph plot values to be displayed.
3) **Y Axis Minimum Value**
   The minimum Y axis value is be determined dynamically on the minimum plot value to be displayed. The minimum value is a sensible 'rounded down' sub-unit value of the minimum plot value that will be displayed.
   For example: If the minimum plot value to be displayed is 6.55bar then the minimum Y axis value should be 6.5bar; where the 'sub-unit' for this pressure unit type is considered to be 0.1bar.
4) **Range (X axis time span)**
   Ranges:

30 min	each point plot / pixel = average over 5 seconds
1 Hrs	each point plot / pixel = average over 10 seconds
6 Hrs	each point plot / pixel = average over 60 seconds (1 minute)
12 Hrs	each point plot / pixel = average over 120 seconds (2 minutes)
24 Hrs	each point plot / pixel = average over 240 seconds (4 minutes)
Each 24 Hrs	each point plot / pixel = average over 240 seconds (4 minutes)

P08
Graph

NOTE: P08 Graph has a range of a month of data than can be shown.

For example: If the selected 'range' time is 1 hour then the far left hand side represents 'now - 1 hr'. All graph plots are 'live' and 'dynamic' with the plot scrolling from the right to the left hand side in real time. The graph plot continuously updates and scrolls with the latest value appearing on the far left hand side each time the plot time appropriate to the selected 'range' passes. For a graph 'range' of 1 hour, at 360 pixel graph horizontal width, this will equate to once every 10 seconds (each pixel representing the average value over a 10 second period of time).

5) **Item (the variable being displayed)**
The plot item to be displayed (e.g. P1 Delivery Pressure)
Press the 'UP - Item' button selects the next item value in a rotating list of available item.
When a new item is selected the selected 'range' will remain unchanged so that direct visual comparisons from one item to another is immediately established.
Items:
p1: Delivery Pressure
p2: Internal Pressure
DP: Differential Pressure (p2-p1)
T1: Temperature function of analog input 3
T2: Temperature function of analog Input 4
VSD speed % : speed % main motor (only visible when control mode (P10.01) is set for variable speed.
Package Power: Total power (Main + Fan + Ancillary)
Line voltage
Main Motor phase current
6) **Graph Plot**
The visualization of the item in the selected range that has been selected
7) **Time**
The time (HH:MM:SS) the graph was last updated. The graph is continuously update 'live'
8) **Exit**
Exit-button used to return to the main selection menu.

P09
Access

Access
Manage and administer user access rights and determine which menu pages can be viewed by each user (requires ADMIN access rights to modify).
Default ADMIN Access Code: “2308”

P09.01	Active: ########	The current user
P09.02	Initial user	Press ‘ENTER’ to clear current user access and return to the default user access level
P09.03↵	ADMIN user	Use to enter the ‘ADMIN’ user account. Press ‘ENTER’ to access the ‘ADMIN’ User PIN code sub menu
P09.03.01	User name	Not editable
P09.03.02	User PIN code	The ‘ADMIN’ User PIN code is a four digit numeric number

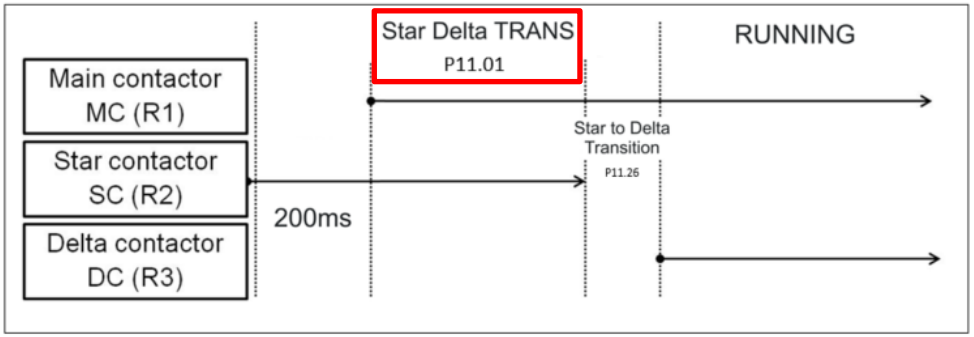
P09 **Access**	P09.03.03	Language	Menu list
	P09.03.04	Time Format	24:00 (24 hour) or 12:00 a/p (12 hour AM / PM)
	P09.03.05	Date Format	'DD/MM/YYYY', 'MM/DD/YYYY' or YYYY/MM/DD' DD = Day, MM = Month, YYYY = Year
	P09.03.06	Pressure Unit	'BAR', 'PSI', 'kPA' or 'MPA'
	P09.03.07	Temperature Unit	°C or °F
	P09.03.08	Initial User	Select Initial User at startup from the list of users
	P09.04↵	User 1	Enter User 1 account settings
	P09.04.01	User Name	Eight alphanumeric characters
	P09.04.02	User PIN Code	Four digit numeric number
	P09.04.03	Language	Menu list selection
	P09.04.04	Time Format	24:00 (24 hour) or 12:00 a/p (12 hour AM / PM)
	P09.04.05	Date Format	'DD/MM/YYYY', 'MM/DD/YYYY' or YYYY/MM/DD' DD = Day, MM = Month, YYYY = Year
	P09.04.06	Pressure Unit	'BAR', 'PSI', 'kPA' or 'MPA'
	P09.04.07	Temperature Unit	°C or °F
	P09.04.09	P00 Home	Locked, 'Edit access'
	P09.04.10	P01 Service Timers	Locked, No edit 'Read access'
	P09.04.11	P02 Utilisation	Locked, No edit 'Read access'
	P09.04.12	P03 Error Log	Locked, No edit 'Read access'
	P09.04.13	P04 Event Log	Locked, No edit 'Read access'
	P09.04.14	P05 Service Provider	Locked, No edit 'Read access'
	P09.04.15	P06 Controller Data	Locked, No edit 'Read access'
	P09.04.16	P07 Equipment Data	Locked, No edit 'Read access'
	P09.04.17	P08 Message Codes	Locked, No edit 'Read access'
	P09.04.18	P09 Access	Locked, 'Edit access'
	P09.04.19	P10 Equip Settings 1	'Not Available', 'Read Access' or 'Edit Access'
	P09.04.20	P11 EQUIP Settings 2	'Not Available', 'Read Access' or 'Edit Access'
	P09.04.21	P12 EQUIP Settings 3	'Not Available', 'Read Access' or 'Edit Access'
	P09.04.22	P13 VSD Settings	'Not Available', 'Read Access' or 'Edit Access'
	P09.04.23	P14 Motor Protection	'Not Available', 'Read Access' or 'Edit Access'
	P09.04.24	P15 Inhibits	'Not Available', 'Read Access' or 'Edit Access'
	P09.04.25	P16 Warning Alarm	'Not Available', 'Read Access' or 'Edit Access'
	P09.04.26	P17 IMM Stop Alarm	'Not Available', 'Read Access' or 'Edit Access'
	P09.04.27	P18 I/O CONFIG	'Not Available', 'Read Access' or 'Edit Access'
	P09.04.28	P19 Sensor CONFIG	'Not Available', 'Read Access' or 'Edit Access'
	P09.04.29	P20 Diagnostics	'Not Available', 'Read Access' or 'Edit Access'
	P09.04.30	P21 Run Schedule	'Not Available', 'Read Access' or 'Edit Access'
	P09.04.32	P23 Modbus VSD info	'Not Available', 'Read Access' or 'Edit Access'
	P09.04.33	P24 IO Extension	'Not Available', 'Read Access' or 'Edit Access'
	P09.04.34	P25 IO Sensor CONFIG	'Not Available', 'Read Access' or 'Edit Access'

	P09.04.35	P26 RS485 Extension	'Not Available', 'Read Access' or 'Edit Access'
	P09.04.36	P27 IoT Settings	'Not Available', 'Read Access' or 'Edit Access'
	P09.04.37	P40 User DEF 1	'Not Available', 'Read Access' or 'Edit Access'
	P09.04.38	P41 User DEF 2	'Not Available', 'Read Access' or 'Edit Access'
	P09.04.39	P42 User DEF 3	'Not Available', 'Read Access' or 'Edit Access'
	P09.04.40	P43 User DEF 4	'Not Available', 'Read Access' or 'Edit Access'
	P09.04.41	P44 User DEF 5	'Not Available', 'Read Access' or 'Edit Access'
	P09.04.42	P80 ISC Main Menu	'Not Available', 'Read Access' or 'Edit Access'
	P09.04.43	P81 ISC Settings	'Not Available', 'Read Access' or 'Edit Access'
	P09.04.44	P82 ISC Priority	'Not Available', 'Read Access' or 'Edit Access'
	P09.05↵	User 2	User 2 sub menu (sub-menu items as described for User 1)
	P09.06↵	User 3	User 3 sub menu (sub-menu items as described for User 1)
	P09.07↵	User 4	User 4 sub menu (sub-menu items as described for User 1)
	P09.08↵	User 5	User 5 sub menu (sub-menu items as described for User 1)
	P09.09↵	User 6	User 6 sub menu (sub-menu items as described for User 1)
	P09.10↵	User 7	User 7 sub menu (sub-menu items as described for User 1)
	P09.11↵	User 8	User 8 sub menu (sub-menu items as described for User 1)
	P09.12↵	User 9	User 9 sub menu (sub-menu items as described for User 1)
	P09.13↵	User 10	User 10 sub menu (sub-menu items as described for User 1)
P10 **Equipment Settings 1**	**Equipment Settings** Equipment settings are grouped in a number of 'Equipment Settings' menus providing the option to administer menu access rights for each group separately. **Equipment Settings Menu 1: Routine Operating Parameters**		
	P10.01	Control Mode	See 5.1 'State Diagram' and 5.2 'Control Modes' 'Load / Offload', 'Continuous Run', 'Pressure Decay / No Load', 'Dynamic / No Load', 'Variable Speed', 'Modulation' Note: for 'Variable Speed' the parameters in menu P13 must be set accordingly!
	P10.02	Force Offload	When active (ON) this feature allows any operator to manually force the equipment from the load state to the offload state and remain in the offload state until manually returned to normal operation. To force off load, press and hold the 'START' key and then press the 'DOWN' key. The equipment will unload and remain in the offload state until the force offload condition is removed. If the offload run period expires during the force offload condition the equipment will vent and go to the Standby state. To remove the force offload condition repeat the key stroke sequence. Stopping the equipment will cancel the force offload condition. ON or OFF
	P10.03	Load Pressure	Pressure set point to load the compressor. When the pressure reading is below the load pressure set point the compressor will start and will go into a loaded state.(air produced)

P10 **Equipment Settings 1**			Note:The minimum differential between Load Pressure and Off Load Pressure is 0.2 Bar.
	P10.04	Offload Pressure	Pressure set point to offload the compressor. When the pressure reading is above the offload pressure set point the compressor will go into a offloaded state.(no air is produced) Note:The minimum differential between Load Pressure and Off Load Pressure is 0.2 Bar.
	P10.05	Run Period	See 5.1 'State Diagram' and 5.2 'Control Modes' (Pressure Decay / No Load) 60 to 3600 seconds
	P10.06	Off Load Period	See 5.1 'State Diagram' and 5.2 'Control Modes' (Pressure Decay / No Load) 60 to 3600 seconds
	P10.07	Cooling DP	The Cooling DP is a value that is used in compressors with an aftercooler. In compressors with an aftercooler, the compressed air is cooled after the air is compressed. From physics, as air is cooled, the pressure of the air increases. The value at P10.07 represents the increase in pressure from this extra coolant. The value at P10.07 thus needs to be calculated first in regard to the specifications of the aftercooler in use. When an **Ai function is set for internal pressure** P10.07 will be activated/visible. Set a value into P10.07 and the Oil/Air separator Diff pressure (Oil/Air Sepp DP) will be visible on P00.14 **P00.14 = internal pressure (P00.11) – outlet pressure (P00.10) – cooling DP value (P10.07).** The alarm/warning P16.16 Oil Air SEP DP HI will be shown. **P16.16 = Oil/Air Sepp DP (P00.14) – Outlet pressure (P00.10)** When P00.14 exceeds the set value of P16.16 an alarm/warning is triggered, A:2036 will be shown on the display of the FORM controller. The warning A:2036 can only be triggered if the following conditions are true **1:** Delivery pressure (P00.10) > Load Pressure (P10.03) – {Oil/Air Sep DP HI (P16.16) + Cooling DP (P10.07)} **2:** A:2036 can only be triggered of the outlet temp < 50°C **3:** DP (P00.14) must continuously exceed the limit of P16.16 for more than 10 seconds. NOTE : the Oil Air Sep DP (P00.14) need only to show positive value's.
	P10.08↵	RS485: X01 CONFIG	Press 'ENTER' to enter the RS485: X01 configuration sub menu
	P10.08.01	RS485: X01 CONFIG	Airbus485™, MODBUS Master or MODBUS Slave or MODBUS XPM (default = Airbus485)
	P10.08.02	MODBUS Baud Rate	2400, 4800, 9600, 14400, 19200, 38400, 57600, 115200 (default = 57600)
	P10.08.03	MODBUS Parity	'none', 'odd', 'even' (default = None)
	P10.08.04	MODBUS DATA Bits	8
	P10.08.05	MODBUS End Bits	1
	P10.08.06	X01 Address	1 – 127
	P10.08.07	X01 Diagnostic	This is to check the stability of the communication. When the controller detects a message, who have been received or sent correctly the value will increase. Note: To set the value back to 0 a power cycle of the FORM controller is required.
	P10.08.08	X01 Errors	This is to check the stability of the communication.

P10 **Equipment Settings 1**			When the controller detects a bad message, who have been received or sent the value will increase. Note: To set the value back to 0 a power cycle of the FORM controller is required.
	P10.09↵	RS485: X02 CONFIG	Press 'ENTER' to enter the RS485: X02 configuration sub menu
	P10.09.01	RS485: X02 CONFIG	MODBUS Master or MODBUS Slave or MODBUS XPM (default = Modbus Slave)
	P10.09.02	MODBUS Baud Rate	2400, 4800, 9600, 14400, 19200, 38400, 57600, 115200 (default = 57600)
	P10.09.03	MODBUS Parity	'none', 'odd', 'even' (default = None)
	P10.09.04	MODBUS DATA Bits	8
	P10.09.05	MODBUS End Bits	1
	P10.09.06	X02 Address	1 – 127
	P10.09.07	X02 Diagnostic	This is to check the stability of the communication. When the controller detects a message, who have been received or sent correctly the value will increase. Note: To set the value back to 0 a power cycle of the FORM controller is required.
	P10.09.08	X02 Errors	This is to check the stability of the communication. When the controller detects a bad message, who have been received or sent the value will increase. Note: To set the value back to 0 a power cycle of the FORM controller is required.
	P10.10	Extension Module	Here you let the FORM controller know which option module is connect. SLOT module or XPM module.
	P10.10.01	Slot Module	Here you select which Slot module is installed on the FORM controller: - OFF - IoT Module - I/O Module - RS485 Module
	P10.10.02	I/O XPM	Here you select which I/O XPM module is connected via communication to the FORM controller: - OFF - XPM-Ai4 - XPM-Di8R4 - XPM-Ai4 + XPM Di8R4
	P10.11	Start Source	The place/location the equipment can be started from; only one start place is allowed at any one time: 'Keypad', 'Equipment DI' or 'Communications' Keypad: local keypad 'START' button Equipment DI: digital input (a digital input must be configured for Start/Stop function) Communications: if AirMaster™ is not equipped with RS485 an optional RS485 module is required Note[1]: if set for 'communications', the start source will not revert to keypad if communications is lost/disrupted Note[2]: all available Stop functions remain active at all times regardless of selected Start Source.
	P10.12	Load Source	'EQUIP OUT PRESS', 'Equipment DI' or 'Communications' Equipment DI: digital input (a digital input must be configured for Remote Load/Unload function) Remote Load/Unload: Active (ON): equipment will Load regardless of pressure Not Active (OFF): equipment will Unload regardless of pressure.
	P10.13	Language	Language you want to use instead off the login user.

P10 **Equipment Settings 1**			Menu list selection. Note: when you power cycle the controller and login back with same user, the language that will be used is the one set in P09.
	P10.14	Time	Internal 'Real Time Clock' Time
	P10.15	Time Format	24:00 (24 hour) or 12:00 a/p (12 hour AM / PM)
	P10.16	Daylight Saving	'+0h' or '+1h'
	P10.17	Date	Internal 'Real Time Clock' Date sub-menu
	P10.18	Date Format	DD/MM/YYYY – MM/DD/YYYY – YYYY/MM/DD DD = Day, MM = Month, YYYY = Year
	P10.19	LCD Light Level	0 to 10
	P10.20	Pressure Unit	'BAR', 'PSI', 'MPA' , 'kPA' or "mbar'
	P10.21	Temperature Unit	°C or °F
	P10.22	VSD target pressure	VSD Target pressure is only visible when control mode P10.01 is set for variable speed. The VSD target pressure setting is the point where the compressor will start to regulate between his minimum speed and maximum speed. Once the pressure goes above the VSD target pressure settings the compressor will regulate between max and min speed. When the pressure goes below the VSD target pressure the compressor will run at MAX speed.
	P10.24	Logout Time	The logout time is a safety setting. As a user finished a configuration on the controller, P10.24 counts down. When the countdown ends and thus reached 0 s, the controller: • Logs out that active user • Activates the initial user that is selected at P09.03.08 This is a safety setting to prevent that users change settings to which they normally have no access to. 1min to 60min
	P10.25	Performance Derating	The Performance Derating parameter is only visible when control mode P10.01 is set for variable speed. The Performance Derating limits the performance by reducing the maximum speed of the VSD in %. 1% – 25%
	P10.26	Function button 1	(only available with a KEYPAD) Activating 1 of the function from the dropdown list with 1 simple button press instead of navigating to the parameter on the FORM controller. Selection : - OFF – Not used - ISC Sequence – Linked to P00.24.01 - ISC Sequence change – Linked to P00.24.02 - Start Source – linked to P10.11, change the setting to DI&COMM and back to KEYPAD - Load Source – linked to P10.12, change the setting EQUIP OUT PRESS to EQUIP DI and vice versa - Modulation Mode – linked to P10.29 - Run schedule – Linked to P21.01

			- VSD control Mode – When in VSD mode you can change P13.01 from VSD to FIX speed - ISC Enabled – linked to P80.01 - LOAD Source comm - linked to P10.12, change the setting EQUIP OUT PRESS to Communication and vice versa - Force offload – linked to P00.35 to activate the Force offload
	P10.27	Function button 2	See function button 1
	P10.28	Function button 3	See function button 1
	P10.29	Modulation Mode	Activation of the Modulation Mode ON = relay “Modulation” will be De-energized = valve will be open and outlet pressure go back to the inlet via a valve control. OFF = relay “Modulation” will be energized = valve will be closed and outlet pressure will not go back to the inlet
	P10.30	Modulation Pressure	When the system pressure is above the modulation pressure and the Machine is in a Loaded state the compressor status will change into “Onload modulation” Pressure value can only be set between Load and offload pressure
	P10.31	CS Link PIN code	This is the code you need to use in Control Studio to establish the communication between Control Studio and the FORM controller in order to send or program the controller. Default = 1802
P11 **Equipment Settings 2**	**Equipment Settings Menu 2: Important Operating Parameters**		
	P11.01	Star Delta TRANS	Time the star/delta starter will remain in the STAR state during a motor start sequence. 1 to 60 seconds  Note: all relay functions can be chosen as you wish, none of the relays have a specific fixed configuration.

P11 **Equipment Settings 2**	P11.02	MIN MTR Run Time	Minimum main motor run time once started. The Off Load Run Time will be dynamically extended if the minimum main motor run time has not been exceeded during the current running cycle of operation. OFF or 1 to 60 seconds. The time starts when the compressor either runs or is in loaded state. If for example the following is configured: • P11.02 the minimal motor run time is 60 s • P11.05 the offload run time is 10 s The minimal motor run time is respected, even if in less time the required pressure is reached. If the compressor runs for example 20 s in either run state or loaded state and the configured load pressure is reached after those 20 s, than the compressor runs for 10 s in offload run time and 30 s in stand-by state. The calculation at that moment is: • For 20 s the compressor ran in either run state or loaded state • For 10 s the compressor runs in offload run time in accordance to the configured parameter at P11.05 • The previous combined is 30 s and as the minimal motor run time is configured to 60 s to the parameter P11.02 then 60 s minus 30 s, is 30 s • The compressor thus runs for 30 s in stand-by state
	P11.03	Load INH Time	The equipment will remain offload for the' Load IHN Time' after a motor start sequence regardless of pressure or remote load command. This delay time only applies after a motor start sequence. OFF or 1 to 30 seconds
	P11.04	Reload INH Time	The equipment will remain off load for at least the 'Reload INH Time' after unloading from the loaded state regardless of pressure or remote load command. OFF or 1 to 10 seconds
	P11.05	Off Load Run Time	The time the equipment will continue to run continuously offload before stopping to the Standby state. 3 to 3600 seconds
	P11.06	Stop MIN Time	Parameter P11.06 determines as activated the minimal time that the equipment remains in the stopped 'standby' state. By default, is the minimal stop time 30 s. The function can be configured to 'off' with the on/off-key in Controls Studio. The minimal stop time: • Is regardless of either pressure or a remote load command • Counts after an automated stop of the main motor occurred • Does not apply for: ○ Manual commands on the equipment with the 'stop/start' button

P11 **Equipment Settings 2**			○ Remote commands to the equipment OFF or 1 to 3600 seconds
	P11.07	Vent Time	Vent time (blow down time): The minimum period of time required to vent internal pressure after a main motor stop (to the Stopped or Standby state) before the main motor is allowed to re-start. OFF or 1 to 120 seconds
	P11.08	AUTO Restart INH	If an AUTO Restart INH time is set the automatic restart after power failure function will operate. If the equipment was in a started state prior to the power failure (Standby, Running Offload, Loaded) the equipment will automatically restart when power returns. When power returns the restart will be delayed by the set time. If the equipment was not in a started state at the time of the power failure the equipment will not restart when power returns. OFF or 1 to 60 Seconds
	P11.09↵	Drain1 Type	A relay output must be configured for the 'DRAIN' function. The 'Drain' output will energise and de-energise in a continuous cycle in accordance with the set condensate drain times.
	P11.09.01	Drain1 Type	1) Solenoid valve (Drain will be activated based on the timers P11.09.02 → P11.09.05) 2) Automatic (Drain state is always on) Equipment State Transitions: Off Load to On Load: the remaining interval time, if any, from the previous loaded state is remembered and the remaining time applied. On Load to Off Load: the cycle is restarted beginning with the set interval time.
	P11.09.02	LOAD drain1 open	LOAD Drain1 Open - Drain Open Time: OFF or 1 to 60 seconds The time the 'Drain' output will energise each cycle when the equipment is loaded.
	P11.09.03	LOAD drain1 INT	LOAD Drain1 INT - Drain Interval Time: 1 to 600 seconds The time the 'Drain' output will remain de-energised each cycle when the equipment is loaded.
	P11.09.04	OFFL drain1 open	Off Load - Drain Off Load Time: Off or 1 to 60 seconds The time the 'Drain' output will energise each cycle when the equipment is not loaded.
	P11.09.05	OFFL drain1 INT	OFFLOAD Drain1 INT - Drain Interval Time: 1 to 3600 seconds The time the 'Drain' output will remain de-energised each cycle when the equipment is not loaded.
	P11.10↵	Drain2 Type	A relay output must be configured for the 'DRAIN' function. The 'Drain' output will energise and de-energise in a continuous cycle in accordance with the set condensate drain times.
	P11.10.01	Drain2 Type	1) Solenoid valve (Drain will be activated based on the timers P11.10.02 → P11.10.05)

P11 **Equipment Settings 2**			2) Automatic (Drain state is always on) Equipment State Transitions: Off Load to On Load: the remaining interval time, if any, from the previous loaded state is remembered and the remaining time applied. On Load to Off Load: the cycle is restarted beginning with the set interval time.
	P11.10.02	LOAD drain2 open	LOAD Drain2 Open - Drain Open Time: OFF or 1 to 60 seconds The time the 'Drain' output will energise each cycle when the equipment is loaded.
	P11.10.03	LOAD drain2 INT	LOAD Drain2 INT - Drain Interval Time: 1 to 600 seconds The time the 'Drain' output will remain de-energised each cycle when the equipment is loaded.
	P11.10.04	OFFL drain2 open	Off Load - Drain Off Load Time: Off or 1 to 60 seconds The time the 'Drain' output will energise each cycle when the equipment is not loaded.
	P11.10.05	OFFL drain2 INT	OFFLOAD Drain2 INT - Drain Interval Time: 1 to 3600 seconds The time the 'Drain' output will remain de-energised each cycle when the equipment is not loaded.
	P11.11↵	High motor starts per ho	High motor starts per hour: The parameter P11.11 holds the maximal amount of permissible starts of the main motor in one (1) chronological hour. The function logs the amount of starts of the main motor and the clock time of each start within the last hour.
	P11.11.01	High motor starts per Ho	The maximal amount of permissible starts of the main motor in one (1) chronological hour. The function logs the amount of starts of the main motor and the clock time of each start within the last hour. If the amount of permissible starts per hour is reached, P11.11.02 High motor start action will be followed. This to avoid that another automated start occurs until the amount of starts within the last hour reduces by one (1). OFF or 1 to 20
	P11.11.02	HI MTR ST Action	1) 'keep running' than the motor runs on and thus the offload run time is extended. 2) 'Inhibit new start' than a new start is inhibited.

<table>
<tr><td rowspan="11">P11
Equipment Settings 2</td><td>P11.12</td><td>DP Inhibit Time</td><td>Parameter P11.12 is the Differential Pressure (DP) inhibit time.

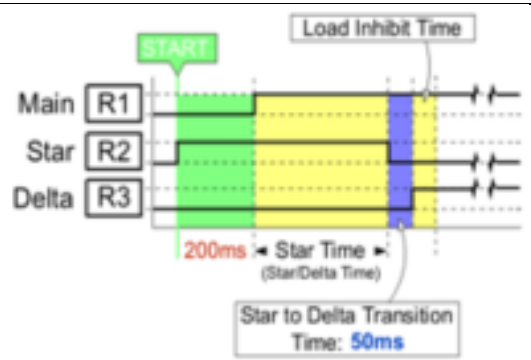
The DP is measured between the ‘equipment outlet pressure’ and the ‘equipment internal pressure’.
As the DP either reaches or exceeds the configured ‘differential pressure limit’,either an alarm or an immediate stop occurs.
This either alarm or immediate stop holds a delay time, an inhibit time.
State at parameter P11.12 the time for this inhibit in s from either one (1) s to 600 s.
Mark that the default inhibit time is 10 s.
The inhibit time is measured for the period that the DP remains at or is above the configured DP.</td></tr>
<tr><td>P11.13↵</td><td>Service Hours 1</td><td>Service Hours 1 sub menu</td></tr>
<tr><td>P11.13.01</td><td>Service hours 1</td><td>In this sub menu of the Service hours you need to select the function/description of service.
You can select the next service types :
<table>
<tr><td>OFF</td><td>Service: Grease</td><td>Service: COMP BRG (compressor bearing service)</td></tr>
<tr><td>Service: Cabinet Filters</td><td>Service: Valves</td><td>Service: COMP AIREND (compressor air-end service)</td></tr>
<tr><td>Service: Air Filter</td><td>Service: Belt drive</td><td>Service: Dryer</td></tr>
<tr><td>Service: Oil Filter</td><td>Service: ELEC SYS(electrical system service)</td><td>Service: Oil</td></tr>
<tr><td>Service: Air/Oil Filter</td><td>Service: MTR bearing(motor bearing service)</td><td>Service: Cooler</td></tr>
<tr><td>Service: Oil/Fog SEP(Oil-water separator service)</td><td>Service: Routine</td><td>Service: Major prev MAINT(Major preventive maintenance)</td></tr>
<tr><td>Service: Pre COALESC FTR(The coalescing filter before a fridge dryer, if present)</td><td>Service: Post COALESC FTR(The coalescing filter after a fridge dryer, if present)</td><td>Service: ACT carbon FTR(Active carbon filter)</td></tr>
<tr><td>Service: Purifier Filter</td><td>Service: Routine</td><td>Service: Weekly</td></tr>
<tr><td>Service: Annual(service every 1 year)</td><td>Service: Bi-annual(service every 2 year)</td><td>Service: Pressure vessel</td></tr>
<tr><td>Service: Safety valve</td><td></td><td></td></tr>
</table>
Note: set the Service Hours time in menu P16.01</td></tr>
<tr><td>P11.13.02</td><td>Pre Condition</td><td>Indicates the service hours will become due the set number of hours before the service hours due time is reached (Pre-Warning) if the immediate stop enable (IMM Stop Enable) is set to ON. This function will not provide a pre-warning if the immediate stop enable is OFF.

OFF or 10 to 200 hours</td></tr>
<tr><td>P11.13.03</td><td>IMM Stop Enable</td><td>ON: Immediate Stop
OFF: Alarm</td></tr>
<tr><td>P11.13.04</td><td>Time Limit</td><td>ANNUAL or BI-ANNUAL
Annual: if the time since the last service due event will exceed one calendar year the service hours is automatically reduced so that the service due will occur at one calendar year since the last service due event.
Bi-Annual: if the time since the last service due event will exceed six calendar months the service hours is automatically reduced so that the service due will occur at six calendar months since the last service due event.</td></tr>
<tr><td>P11.13.05</td><td>Time Limit</td><td>By selecting the P11.13.04 Time limit for annual or bi-annual service a date will automatically be set.</td></tr>
</table>

P11 **Equipment Settings 2**			That that of service is shown on P11.13.05
	P11.13.06	Display Type	Via this parameter, you can select how you want to show the time remaining for the service timer. - Hours to go - Percent passed - Percent to go
	P11.13.07	Reset to defaults	When a maintenance/service has been done you can reset the service timer back to the default hours that you have set in P16.01 This need to be done via the HMI of the Airmaster FORM controller.
	P11.14↵	Service Hours 2	Service Hours 2 sub menu
	P11.14.01	Service Hours 2	as 'Service Hours 1' Note: set the Service Hours time in menu P16.02
	P11.14.02	Pre Condition	as 'Service Hours 1'
	P11.14.03	IMM Stop Enable	as 'Service Hours 1'
	P11.14.04	Time Limit	as 'Service Hours 1'
	P11.14.05	Time Limit	By selecting the P11.14.04 Time limit for annual or bi-annual service a date will automatically be set. That that of service is shown on P11.14.05
	P11.14.06	Display Type	as 'Service Hours 1'
	P11.14.07	Reset to defaults	When a maintenance/service has been done you can reset the service timer back to the default hours that you have set in P16.02 This need to be done via the HMI of the Airmaster FORM controller.
	P11.15↵	Service Hours 3	Service Hours 3 sub menu
	P11.15.01	Service Hours 3	as 'Service Hours 1' Note: set the Service Hours time in menu P16.03
	P11.15.02	Pre Condition	as 'Service Hours 1'
	P11.15.03	IMM Stop Enable	as 'Service Hours 1'
	P11.15.04	Time Limit	as 'Service Hours 1'
	P11.15.05	Time Limit	By selecting the P11.15.04 Time limit for annual or bi-annual service a date will automatically be set. That that of service is shown on P11.15.05
	P11.15.06	Display Type	as 'Service Hours 1'
	P11.15.07	Reset to defaults	When a maintenance/service has been done you can reset the service timer back to the default hours that you have set in P16.03 This need to be done via the HMI of the Airmaster FORM controller.
	P11.16↵	Service Hours 4	Service Hours 4 sub menu
	P11.16.01	Service Hours 4	as 'Service Hours 1' Note: set the Service Hours time in menu P16.04
	P11.16.02	Pre Condition	as 'Service Hours 1'
	P11.16.03	IMM Stop Enable	as 'Service Hours 1'
	P11.16.04	Time Limit	as 'Service Hours 1'
	P11.16.05	Time Limit	By selecting the P11.16.04 Time limit for annual or bi-annual service a date will automatically be set. That that of service is shown on P11.16.05
	P11.16.06	Display Type	as 'Service Hours 1'
	P11.16.07	Reset to defaults	When a maintenance/service has been done you can reset the service timer back to the default hours that you

P11 **Equipment Settings 2**			have set in P16.04 This need to be done via the HMI of the Airmaster FORM controller.
	P11.17↵	Service Hours 5	Service Hours 5 sub menu
	P11.17.01	Service Hours 5	as 'Service Hours 1' Note: set the Service Hours time in menu P16.05
	P11.17.02	Pre Condition	as 'Service Hours 1'
	P11.17.03	IMM Stop Enable	as 'Service Hours 1'
	P11.17.04	Time Limit	as 'Service Hours 1'
	P11.17.05	Time Limit	By selecting the P11.17.04 Time limit for annual or bi-annual service a date will automatically be set. That that of service is shown on P11.17.05
	P11.17.06	Display Type	as 'Service Hours 1'
	P11.17.07	Reset to defaults	When a maintenance/service has been done you can reset the service timer back to the default hours that you have set in P16.05 This need to be done via the HMI of the Airmaster FORM controller.
	P11.18↵	Service Hours 6	Service Hours 6 sub menu
	P11.18.01	Service Hours 6	as 'Service Hours 1' Note: set the Service Hours time in menu P16.06
	P11.18.02	Pre Condition	as 'Service Hours 1'
	P11.18.03	IMM Stop Enable	as 'Service Hours 1'
	P11.18.04	Time Limit	as 'Service Hours 1'
	P11.18.05	Time Limit	By selecting the P11.18.04 Time limit for annual or bi-annual service a date will automatically be set. That that of service is shown on P11.18.05
	P11.18.06	Display Type	as 'Service Hours 1'
	P11.18.07	Reset to defaults	When a maintenance/service has been done you can reset the service timer back to the default hours that you have set in P16.06 This need to be done via the HMI of the Airmaster FORM controller.
	P11.19↵	Service Hours 7	Service Hours 7 sub menu
	P11.19.01	Service Hours 7	as 'Service Hours 1' Note: set the Service Hours time in menu P16.07
	P11.19.02	Pre Condition	as 'Service Hours 1'
	P11.19.03	IMM Stop Enable	as 'Service Hours 1'
	P11.19.04	Time Limit	as 'Service Hours 1'
	P11.19.05	Time Limit	By selecting the P11.19.04 Time limit for annual or bi-annual service a date will automatically be set. That that of service is shown on P11.19.05
	P11.19.06	Display Type	as 'Service Hours 1'
	P11.19.07	Reset to defaults	When a maintenance/service has been done you can reset the service timer back to the default hours that you have set in P16.07 This need to be done via the HMI of the Airmaster FORM controller.
	P11.20↵	Service Hours 8	Service Hours 8 sub menu
	P11.20.01	Service Hours 8	as 'Service Hours 1' Note: set the Service Hours time in menu P16.08
	P11.20.02	Pre Condition	as 'Service Hours 1'

P11 **Equipment Settings 2**	P11.20.03	IMM Stop Enable	as 'Service Hours 1'
	P11.20.04	Time Limit	as 'Service Hours 1'
	P11.20.05	Time Limit	By selecting the P11.20.04 Time limit for annual or bi-annual service a date will automatically be set. That that of service is shown on P11.20.05
	P11.20.06	Display Type	as 'Service Hours 1'
	P11.20.07	Reset to defaults	When a maintenance/service has been done you can reset the service timer back to the default hours that you have set in P16.08 This need to be done via the HMI of the Airmaster FORM controller.
	P11.21↵	Service Weekly	
	P11.21.01	Service Weekly	ON or OFF Note: set the Weekly Service time in menu P16.09
	P11.21.02	Pre Condition	as 'Service Hours 1'
	P11.21.03	Time Limit	as 'Service Hours 1'
	P11.21.04	Reset to defaults	When a maintenance/service has been done you can reset the service timer back to the default hours that you have set in P16.09 This need to be done via the HMI of the Airmaster FORM controller.
	P11.22↵	Annual Service	
	P11.22.01	Annual Service	ON or OFF Note: set the Annual Service time in menu P16.10
	P11.22.02	Pre Condition	as 'Service Hours 1'
	P11.22.03	Time Limit	as 'Service Hours 1'
	P11.22.04	Reset to defaults	When a maintenance/service has been done you can reset the service timer back to the default hours that you have set in P16.10 This need to be done via the HMI of the Airmaster FORM controller.
	P11.23↵	Bi-Annual Service	
	P11.23.01	Bi-Annual Service	ON or OFF Note: set the Bi-Annual Service time in menu P16.11
	P11.23.02	Pre Condition	as 'Service Hours 1'
	P11.23.03	Time Limit	as 'Service Hours 1'
	P11.23.04	Reset to defaults	When a maintenance/service has been done you can reset the service timer back to the default hours that you have set in P16.11 This need to be done via the HMI of the Airmaster FORM controller.
	P11.25	Loss of signal enabled	ON – OFF parameter Related to the loss of signal of the Ai sensor. When set ON you will receive an Error code when a sensor is disconnected or when there is a wiring fault. When set OFF you will receive NO error code when a sensor is disconnected or when there is a wiring fault.
	P11.26	Y/D Transition Time	Timer/delay between the transition from STAR to DELTA connection. 10 to 50 msec

P11 **Equipment Settings 2**			 Note: all relay functions can be chosen as you wish, none of the relays have a specific fixed configuration.
	P11.27↵	Service: Pressure vessel	
	P11.27.01	Service: Pressure vessel	ON – OFF parameter to activate this service by year (via P16.55 1 to 10 year)
	P11.27.02	Pre Condition	as ‘Service Hours 1’
	P11.27.03	IMM Stop Enable	as ‘Service Hours 1’
	P11.27.04	Reset to defaults	When a maintenance/service has been done you can reset the service timer back to the default hours that you have set in P16.55 This need to be done via the HMI of the Airmaster FORM controller.
	P11.28↵	Service: Safety valve	
	P11.28.01	Service: Safety valve	ON – OFF parameter to activate this service by year (via P16.56 1 to 10 year)
	P11.28.02	Pre Condition	as ‘Service Hours 1’
	P11.28.03	IMM Stop Enable	as ‘Service Hours 1’
	P11.28.04	Reset to defaults	When a maintenance/service has been done you can reset the service timer back to the default hours that you have set in P16.56 This need to be done via the HMI of the Airmaster FORM controller.

P12 **Equipment Settings 3**	**Equipment Settings Menu 3: Critical Operating Parameters**		
	P12.01	Parameter Reset	Reset parameters to Default. Parameter default values are defined by the installed application software configuration file. Soft Reset: resets all operator parameters to default; does not reset IO configuration P18/P19, Communication port settings, ISC settings, all type of hours (service/load/offload/standby/…), compressor tables or commissioning date. Hard Reset: resets everything including commissioning date except the CS files. FLT Reset: resets everything including all the CS files The Airmaster™ will power cycle following a parameter reset.
	P12.02	Save as CONFIG	Yes: creates a new 'Configuration File' (CPB-file) from the current parameter settings. When parameter adjustment(s) are made the new modified values are stored separately. If a 'Reset to Defaults' is initiated the original values from the 'Configuration File' replace any modified values. If a new 'Configuration File' is made any modified parameter values are incorporated within the new configuration file. After a new configuration file is created, a 'Reset to Defaults' will replace all parameter values with values existing at the time the new 'Configuration File' was saved. Note: when a new 'Configuration File' is created all previous parameter values stored within the original configuration file are lost.
	P12.03	Compressor Table	Compressor table exist of multiple configuration (max is 99) Via P12.03 you can select the configuration you want for the type of machine the FORM controller has been installed.
	P12.04	Error Log Reset	YES: delete the Error Log file, clear the error log
	P12.05	Event log reset	YES: delete the Event Log file, clear the event log
	P12.06	Clone Key Function	**Clone key** This will explain the Clone key function in order to STORE and RESTORE the Error and Event logs, KIT configuration & local settings of your FORM controller. **STORE function**

P12 **Equipment Settings 3**			In order to STORE the settings correctly on the Clone key you need to follow the steps which are described below. **NOTE**: Upon first use, the controller is already in STORE mode. **To start** Before you want to send your Control Studio files via CS you need to be sure that: • The Clone key icon is visible on the status bar (=clone key present & working) • The Clone key icon is not flashing in the status bar • E2866 Clone key S/N mismatch is not active • P12.06 Clone key function is set as STORE **Inactive store mode** In some cases the store function will not be storing the settings to the Clone Key. This is a safety to prevent overwriting existing data on the Clone Key. When this is the case & there is no need to keep the data on the Clone Key, execute the steps below to activate the Store function again. **When** • P12.06 Clone Key function is set to STORE • Clone Key icon still flashing in status bar • E2866 Clone key S/N mismatch active **Activate STORE function** • Select P12.06 and press the ENTER button • Select in the menu OFF and press the ENTER button • Now the FORM controller will ask again if you are sure, please select YES and press the ENTER button. (P12.06 is now set to OFF) • Select once again P12.06 and press the ENTER button • Select in the menu STORE and press the ENTER button • Now the FORM controller will ask again if you are sure, please select YES and press the ENTER button. (P12.06 is now set to STORE) • Now press the RESET button on the FORM controller and you will see that the Clone key icon is not flashing and the E2866 fault has disappear. The controller is now ready to receive and store the Control Studio files. **Keep in mind** In order to give the Clone key the time to process & save the uploaded files & local settings you need to follow the next instruction carefully.

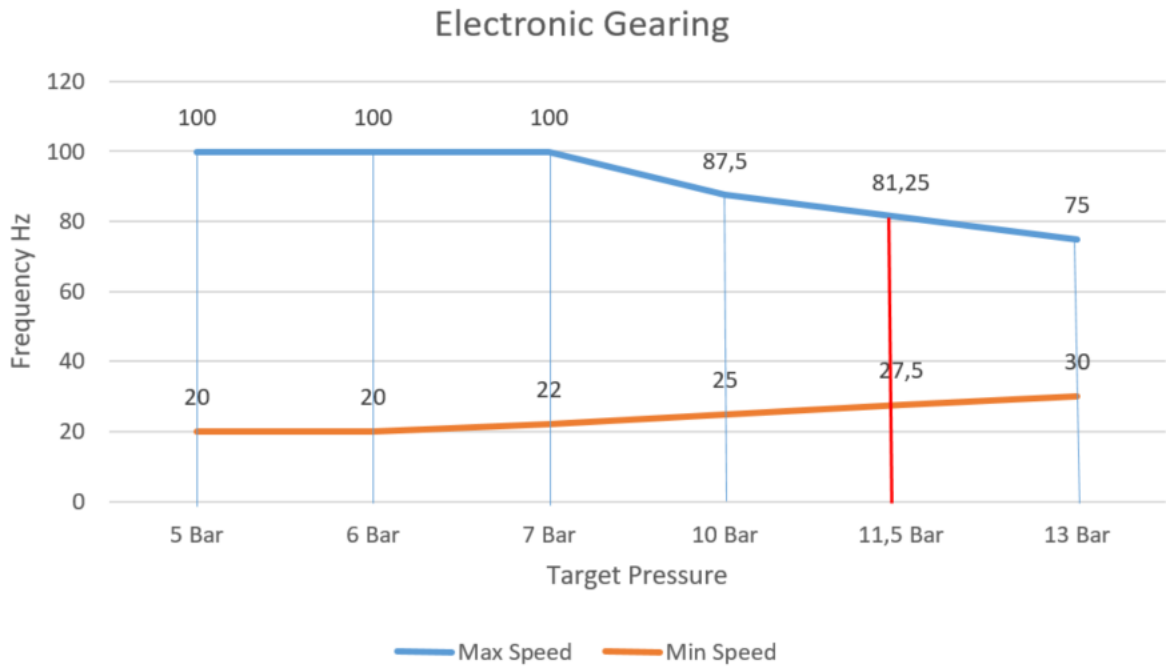
P12 **Equipment Settings 3**			 • When all Control studio files have been send to the FORM controller you need to disconnect Control Studio with the FORM controller, this mean that S3502 Start inhibit is not active on the HMI in P00 or P03! • Once the S3502 is not visible on the HMI you need to wait at least 30 seconds before you do a power cycle. (During these 30 seconds the Clone key will STORE all the CS files) If you do a power cycle to early the clone key will have not the time to STORE all the files. • When the 30 seconds have past, the settings are saved on the Clone key and a power cycle can be done. **Restore function** When your controller is damaged/broken you can remove the Clone key from the FORM controller and use the saved Control Studio files in a new FORM controller. **NOTE**: Both FORM controllers (damaged and new one) need to have the same software version/edition. *(i.e. if damaged controller has software version F2CMCSTD_E03 new controller need to be programmed with F2CMCSTD_E03) otherwise the restore function cannot work.* Below you can find the steps that you need to follow in order to RESTORE the files into the new FORM controller. a) Remove the Clone key from the damage/broken Form controller and place it in the new FORM controller. b) Now you will see that the Clone key icon is flashing on the upper right side and you will receive the E2866 Clone key S/N mismatch in P00 or P03. **NOTE**: This mean that you need to activate and select the Clone key function in P12.06 c) Adjust TIME (P10.14) and DATE (P10.17) so it matches up with the previous controller. d) Go to P12.06 and set to RESTORE by following the instructions below.  • First you will see that the function is set as STORE. **NOTE**: This doesn't mean that the controller is storing. Because you have the E2866 fault nothing can happen on the Clone key. • Select P12.06 and press the ENTER button • Select in the menu OFF and press the ENTER button • Now the FORM controller will ask again if you are sure, please select YES and press the ENTER button. (P12.06 is now set to OFF) • Select once again P12.06 and press the ENTER button • Select in the menu RESTORE and press the ENTER button • Now the FORM controller will ask again if you are sure, please select YES and press the ENTER button. (P12.06 is now set to RESTORE) As long as P12.06 is showing "RESTORE", the RESTORE is in progress, do not remove

			power, wait till the status goes "OFF", then RESTORE process has finished. **NOTE**: the E2866 fault can now be reset and the Clone key icon is not flashing anymore. e) In order to verify that the RESTORE was successful you can go to menu P06 and see if the CS files are visible or check the local parameter settings. **Format function** This function will format your Clone key to factory settings. Be aware when using this function in the field, you will lose all previous stored data. The format function can be found in P12.06 Clone Key functions. After selecting this function the controller will automatically reboot and the clone key format is finished. If you want to use the Clone Key again after the format you need to set P12.06 back to STORE (after format P12.06 is set to OFF)
	P12.08	Set Load Hours	Modify 'Load' hour counter
	P12.09	Set Off Load HRS	Modify 'Off Load' hours counter
	P12.10	Set Stopped Hours	Modify 'Stopped' hours counter
P12 **Equipment Settings 3**	P12.11	ISC Available	Internal System Management Control ON or OFF When enabled, the Airmaster™ internal system management control menu's P80, P81 and P82 become available.
	P12.12	Fan TEMP High	Fan High Temperature set point The relay output must be assigned for 'Fan Control' function. When COMP OUT TEMP ≥ Fan TEMP High the relay output assigned to 'Fan Control' function is activated.
	P12.13	Fan TEMP Low	Fan Low Temperature set point When relay output must be assigned for the 'Fan Control' function. When COMP OUT TEMP ≤ Fan TEMP Low the relay output assigned to 'Fan Control' function is activated.
	P12.14	Fan Run Period	The minimum run time of the Fan once started regardless of fan temperature settings. OFF 1 to 600 seconds.
	P12.19	Restart Reminder	Parameter P12.19 dictates the management of alarms after the electric power is restored in regard to a previous electric power failure. Parameter P12.19 holds three (3) different configurations: • Off • Warning alarm • 'Imm stop alarm', this is 'immediate stop alarm' As 'off' is selected, any alarm or immediate stop that was present when the failure of the electric power occurred is discarded. As 'warning alarm' is selected, any alarm or immediate stop that was present when the failure of the electric power occurred is shown on the display. As 'imm stop alarm' is selected, the following is applicable:

P12 **Equipment Settings 3**			• If an immediate stop condition existed at the moment of the failure of electric power, this immediate stop is reinstated as the electric power comes on again. • The alarm is to be reset before to initiate a start
	P12.20	Dryer Type	Continuous Dryer: runs continuously when the equipment is running Refrigerant Dryer: uses the dryer on/off settings in P12.28 & P12.29
	P12.21	Dryer Off Temperature	Dryer off temperature set point
	P12.22	Dryer on temperature	Dryer on temperature set point
	P12.23	Max Dryer Starts	The maximum permissible number of dryer starts within one rolling chronological hour The number of dryer starts, and the clock time of each start, within the last hour is logged. If the number of permissible starts per hour is reached the dryer will continue to run, regardless of any temperature set point settings, to avoid another dryer start from occurring until the number of starts within the last rolling hour reduces by one. Off or 1 to 20 Note: this feature will not prevent a dryer from being started; only the run time once started is temporarily modified regardless of any temperature set point settings.
	P12.24	Resume DI Start	When power is returned after a power failure, and the digital input Remote Start is still active: OFF: do not start, wait for the remote start to de-activate and re-activate again before starting ON: start
	P12.25	Run Check Delay	If a digital input is selected for 'Motor Relay Feedback' function; delay time for motor relay feedback to occur after the motor relay output is energised. 0 to 30 seconds
	P12.26	Limit Schedule Functions	This function is by default 'off' thus not active. When the function P12.26 is 'off', all run schedule functions are available. When the function P12.26 is 'on', the amount of schedule functions is limited. The functions available for the run schedule are: 'default PH/PL', 'schedule PH/PL' and 'standby'. The functions that are able to automatically start the equipment from the stopped state are not available.
	P12.27	P Switch Low	When COMP OUT PRESS ≤ 'P Switch Low' setting the relay output assigned to 'P Switch' function is de-activated
	P12.28	P Switch High	When COMP OUT PRESS ≥ 'P Switch High' the relay output assigned to 'P Switch' function is activated
	P12.30	Fan Temp High 2	2nd Fan High Temperature set point The relay output must be assigned for 'Fan Control2' function. When COMP OUT TEMP ≥ Fan TEMP High the relay output assigned to 'Fan Control2' function is activated.

P12 **Equipment Settings 3**	P21.31	Fan Temp Low 2	2nd Fan Low Temperature set point When relay output must be assigned for the 'Fan Control2' function. When COMP OUT TEMP ≤ Fan TEMP Low the relay output assigned to 'Fan Control2' function is activated.
	P12.32	2nd Fan Function	To activate the 2nd FAN control you need to set a DO as FAN control 2 NO/NC The 2nd Fan will work with the Ai = COMP OUT TEMP You can set the high and low temperature via P12.44 Fan 2 temp high P12.43 Fan 2 temp low Temperature needs to be higher than settings of FAN 1, it's not possible to set the temperature below the settings of FAN 1. P12.19 Fan Run period = Is the minimum time the FAN need to run before it can stop (this is the timer for FAN1 and FAN2) P12.46 2nd FAN FUNCTION Here you have 3 options 1)2ND FAN OFF = FAN 2 will not work but only FAN 1 2)Exclusive = Only FAN 2 will work and not FAN1 3)Inclusive = FAN 2 and FAN 1 will both run This 2nd fan function has been created for compressors with 2 FAN's on motor cooling. When first FAN is active and temperature is still raising the second FAN will help to drop the temperature. This is when compressors use 2 small FAN's and not 1 Big FAN. So they can reduce the FAN consumption. One BIG FAN is consume 7 kW and 1 small FAN will consume maybe 3 KW. If compressor is working on 7 bar they have enough with 1 small FAN and they don't need 1 BIG FAN.
	P12.33	Modbus Fan Control	ON or OFF setting OFF communication between FORM controller and Fan is disabled (P23.02 not visible) ON communication between FORM controller and Fan is enabled (P23.02 visible)
	P12.34	Fan Run On Time	Mind that the P12.34 'Fan run on time' only can be enabled when a Digital Output (DO) is assigned as control function "fan". As the DO control function of the fan is used, the fan runs after a stop of the main motor for the time that is configured at P12.34 'Fan run on time'. Mind that the following Digital Outputs (DO) function are used: • DO 'Fan' is used for the fan to operate continuously • DO 'Fan control' is used for the fan to operate based on a temperature This means that if the fan is to operate for a pre-set time, the DO 'Fan' is to be used not 'Fan control'.
	P12.37	Heating Protection	ON – OFF parameter

P12 **Equipment Settings 3**			The operation of the 'Fan' output or 'Fan Control' mode selected (optional) and the P12.37 heating protection (optional). This latter function is intended to reactivate the Fan when the temperature exceeds the P16.12 Temp warning setting. Once the temperature drops below the P16.12 setting minus 10°C, we will deactivate the Fan or the Fan will follow its normal functionality based on which relay function is used. This function is to prevent overheating security to keep the temperature under control. ON (default)
P13 **VSD Settings**	**Variable Speed/Frequency Drive (VSD) Settings**		
	P13.01	VSD Control mode	VAR Speed CTRL = Variable Speed Control regulation (default) Fixed Speed CTRL = Fixed Speed Control regulation = LOAD/OFFLOAD compressor
	P13.02	VSD Target PRESS	VSD target pressure. (same as P10.22) Maximum permissible value = Equipment outlet pressure alarm value minus 0.2 bar (or other unit of measure)
	P13.03	VSD MAX Speed	VSD maximum speed. In HZ Step = 1 Hz
	P13.04	VSD MIN Speed	VSD minimum speed. In Hz Step = 1 Hz
	P13.05↵	Electronic Gearing	'Electronic Gearing' feature that will make the VSD speed range depending on the target pressure. Purpose of this feature: *Have a VSD that maximizes its air delivery, so making use of its full available installed power, independent of its target pressure setting. Traditionally compressors of a higher pressure rating are bought, this in order to have some margin on pressure, and this resulted in under-usage because of the pressure range being designed for the compressors' maximum pressure setting.* Small explanation of the functionality :

P13 **VSD Settings**			 Settings for the Electronic Gearing function : P13.03 Max speed = 100Hz P13.04 Min Speed = 20 Hz P13.05.02 Max p at Max Speed = 7 Bar P13.05.03 Max p at Min Speed = 6 Bar P13.05.04 Max speed at rated p = 75 Hz P13.05.05 Min speed at rated p = 30 Hz P13.05.06 Comp rated p = 13 Bar Example for 11.5 Bar VSD Target Pressure: When we set the Target pressure (P10.22 or P13.02) equal to 11,5 Bar (See red line) the control will calculate the new MIN and MAX speed based on the above settings. P13.06 Calculated MAX Speed = 81.25 Hz P13.07 Calculated MIN Speed = 27.5 Hz Note: During the recalculation, the software will look at the Offload speed and when the Calculated Min speed is higher than the offload speed we will automatically adjust and set the offload speed equal to the Min speed.

P13 **VSD Settings**			During the recalculation, the software will look at the Optimum speed and when the Calculated Max speed is lower than the Optimum speed we will automatically adjust and set the Optimum speed equal to the Max speed.
	P13.05.01	Electronic Gearing	ON = Activate Electronic Gearing (see parameters related to Electronic Gearing) OFF = Electronic Gearing is not used.
	P13.05.02	Max p. at Max speed	Maximum pressure at maximum speed
	P13.05.03	Max p. at Min speed	Maximum pressure at minimum speed
	P13.05.04	Max speed at rated p	Maximum speed at rated pressure
	P13.05.05	Min speed at rated p	Minimum speed at rated pressure
	P13.05.06	Comp rated p	Compressor rated pressure
	P13.06	Calculated MAX speed	New MAX speed , calculated related to the Electronic Gearing settings
	P13.07	Calculated MIN speed	New MIN speed , calculated related to the Electronic Gearing settings
	P13.09	VSD OPT Speed	VSD optimum speed. In Hz Step = 1 Hz
	P13.10	VSD Off Load Speed	VSD off load speed. In Hz Step = 1 Hz
	P13.13	VSD P Factor	VSD PID control - Proportional Factor 0 to 300
	P13.14	VSD I factor	VSD PID control - Integration Factor 0 to 200
	P13.15	VSD D factor	VSD PID control - Derivative Factor 0 and 200
	P13.16	VSD Speed %	Variable speed drive percent maximum speed; no edit, view only
	P13.17	VSD MAX RMP Rate	Variable speed drive maximum ramp rate. Value between 0.1 to 10.0 With 0.1 slow ramp rate and 10 fast ramp rate.
	P13.24	VSD VIA Comms	This parameter is only in use for compressors with a Variable Speed Drive (VSD) motor. ON = When it is the intend that an inverter communicates with the controller over Modbus ® OFF = Analog Output will be used to send out the 4 – 20 mA signal to the inverter
	P13.25	Slave address	Inverter communications node address
	P13.26	Comms Retry	Parameter will tell how long the controller should retry to re-establish communication when communication has been lost. This parameter can be set OFF. Minimum time is 1 sec and maximum time is 20 sec
	P13.27	Drive Table	Via the Drive Table parameter you can select the drive/inverter configuration you want to use. The drive configuration need to be created by DRIVE TOOL 2.0 or higher version (available in CS 4.3.0.0) The Drive Table can show up to MAX 10 different configuration for a drive/inverter.

P14 **Motor Protection**	**Motor Protection** Motor protection is part of Airmaster™ Advanced Power Monitoring feature: 1) Frequency and Phase protection, 2) Phase Angle, Under Current, Rotor Lock Overload and Phase Imbalance protection Advanced Power Monitoring offers protection equivalent to 'Trip Class 10A' for the main and fan motor.		
	P14.01	Protect Main MTR	Protection Main Motor: Via CT / OFF parameter Via CT = Activate the Main Motor protection in P14
	P14.02	Main MTR connection	Main Motor connection: This function is required for direct compressors (DOL – Direct Online) On these compressors the connection of the Main Motor is not always DELTA this is why we need to make it possible to select the Main MTR connection → STAR or in DELTA. **NOTE:** This adjustment has only an influence when the CT location Main MTR (P14.11) is set in LINE. It has no influence when CT location is set for Coil (in coil current is same during star and delta connection)
	P14.03	Phase detection	Phase detection: ON/OFF parameter ON = phase order (L1>L2>L3) is incorrect OR loss of phase
	P14.04	OVLD protect Main MTR	Overload protection Main Motor: ON/OFF parameter ON = motor overload determined by P14 menu values. When the measured phase current is higher than FLC Main MTR (P14.05), the Main MTR overload will trigger = E0082. The higher the value of the measured phase current above the FLC Main MTR (P14.05) setting, the faster the fault will be triggered.
	P14.05	FLC Main MTR	Full Load Current Main Motor: FORMULA to calculate the FLC: **FLC = ('Rated Nominal Motor Power' x 'Service Factor') / ('3-Phase Voltage' x 'Power Factor' x 1.732)** Example: Main Motor: 37kW, 1.05 Service Factor, 400 Volts, 0.85 Power Factor: (37000W * 1.05) / (400V * 0.85 * 1.732) = 66 A
	P14.06	Loc to overl fact Main M	Main Motor Star Delta Transition Time factor: During a motor start sequence, rotor lock protection is active for a period determined by the 'Star Delta Transition' time factor (P14.06): The period of time the motor lock protection is active is calculated as follow: **Period of time (activation of rotor lock protection) = P11.01 star delta time x P14.06 Main MTR SD Trans Time F.** After this "**period of time**" rotor lock protection is deactivated and overload protection is activated for the remainder of the motor running period.

P14 **Motor Protection**			Example : P11.01(star delta time) 5 sec x P14.06 (Main MTR SD Trans Time F) 2.0 = 10 sec (period of time motor lock protection is active)
	P14.07	Rot Loc fact Main MTR	Main Motor rotor lock protection factor: See extra explanation on P43/44 During the connection from STAR to DELTA connection high Current peaks can be produced. With this parameter we want to make sure that these peaks will not be to high. This will be checked only during the start up time.
	P14.08	PH IMB Dev Main MTR	Phase Imbalance Deviation Main Motor: This parameter is a can be OFF parameter. Checked the CT mA values. When taking the average of CT1/2/3 take into account the % of P14.08 to determine the range before the error code can be triggered for each phase = E0083 Condition Average current needs to be less than 3/2 of the FLC Main current.
	P14.09	CT# loops Main MTR	Current Transformer # loops Main Motor: Main Motor Current Transformer number of pass-through. Number of times the phase cable is passed through (looped through) the current transformer.
	P14.10	CT RNG Main MTR	Current Transformer Range Main Motor: Main motor Current Transformer Maximum Measurement Current Range. Set to match the current transformer maximum current rating = CT range
	P14.11	CT location Main MTR	Current Transformer location Main Motor: Motor coil = If CT is placed on the motor leads **between starter and motor**, typical for OEM production, then select 'motor coil' Line = If CT is **placed on the supply cables towards the compressor cubicle**, typical for field upgrade, then select 'line'. In this case, the measured current is $\sqrt{3}$ higher then the motor phase current and needs to be corrected accordingly.
	P14.12	Protect Fan MTR	Protection Fan Motor: VIA CT/OFF parameter VIA CT = Activate the FAN Motor Protection of P14
	P14.13	OVLD protect Fan MTR	Overload protection Fan Motor: ON/OFF parameter ON = motor overload determined by P14 menu values When the measured phase current is higher than FLC Fan MTR (P14.15) setting, the Fan MTR overload will be triggered = E0086. The higher the measured value of the phase current above the FLC Fan MTR (14.15) setting, the faster the fault will be triggered. How to simulate: P14.12 Protect Fan MTR = VIA CTS P14.13 OVLD protect Fan MTR = ON A relay need to be configured as FAN NO/NC of FAN CONTROL NO/NC P14.14 OVLD INH time Fan MTR has reach 0 seconds
	P14.14	OVLD INH time Fan MTR	Overload Inhibit time Fan Motor:

P14 **Motor Protection**			Once OVLD protect FAN MTR has been detected, the OVLD INH time Fan MTR will start counting down. Once the timer reach 0 sec the OVLD protect FAN MTR will be triggered = E0086 This can be used when a delay is necessary on the OVLD protect FAN MTR.
	P14.15	FLC Fan MTR	Full Load Current Fan Motor: FORMULA to calculate the FLC: **FLC = ('Rated Nominal Motor Power' x 'Service Factor') / ('3-Phase Voltage' x 'Power Factor' x 1.732)**
	P14.16	CT# loops Fan MTR	Current Transformer # loops Fan Motor: Number of times the phase cable is passed through (looped through) the current transformer.
	P14.17	CT RNG Fan MTR	Current Transformer Range Fan Motor: FAN motor Current Transformer Maximum Measurement Current Range. Set to match the current transformer maximum current rating = CT range
	P14.18	Max Flow	Max Flow: (Only used for IoT) Power consumption of the compressor at full load (100%) This is needed for VSD and Fix speed compressors
	P14.19	Min Flow	Min Flow: (Only used for IoT) Power consumption of the compressor at min load This is for VSD compressors only. Note: Minimum load % is calculated by the FORM controller. We use the Speed settings in P13 for the correct calculation.
	P14.20	Ancill. losses – Static	Ancillary losses – static: Power consumers on the device that must be taken into account when the motor is not running. The power consumption will be add to the total package power (P00.19) This is a can be OFF parameter
	P14.21	Ancill. losses – Running	Ancillary losses – Running: Power consumers on the device that must be taken into account when the motor is running. The power consumption will be add to the total package power (P00.19) This is a can be OFF parameter
	P14.24	Fan MTR connection	Fan Motor connection: This function is required for direct compressors (DOL – Direct Online) On these compressors the connection of the FAN Motor is not always DELTA this is why we need to make it possible to select the FAN MTR connection → STAR or in DELTA. **NOTE:** This adjustment has only an influence when the CT location FAN MTR (P14.25) is set in LINE. It has no influence when CT location is set for Coil (in coil current is same during star and delta connection)
	P14.25	CT location Fan MTR	Current Transformer location Fan Motor: Motor coil = If CT is placed on the motor leads **between starter and motor**, typical for OEM production, then select 'motor coil' Line = If CT is **placed on the supply cables towards the compressor cubicle**, typical for field upgrade, then select 'line'. In this case, the measured current is $\sqrt{3}$ higher then the motor phase current and needs to be corrected

			accordingly.

P14
Motor Protection

Current Transformer (CT) Selection:

A comprehensive range of CT's, from 5 to 650 Amps, are available from CMC.
Select a CT where the 'Motor Nominal Current' exceeds 40% of the CT maximum rating but no greater than 80% of the maximum CT rating.

For the main motor example above (Motor Nominal Current = 66A) a CT with a maximum rating greater than 82A, but no greater than 165A, is appropriate.

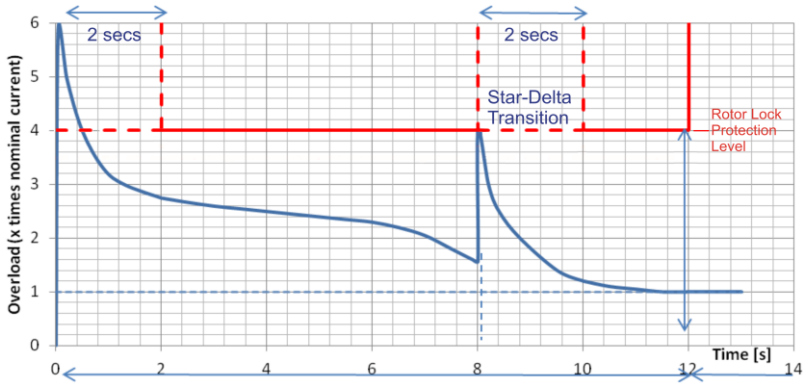
Loop or wind the motor phase cable through the CT more than once to increase the detected current above 40% if necessary (1 x = current, 2 x = 2 x current, 3 x = 3 x current etc).

For the fan motor example above (Motor Nominal Current = 2 Amps) if the motor phase cable is passed through the CT two times, the CT will detect 4 Amps when the actual phase current is 2 Amps. The Airmaster™ will automatically correct for this if the Fan Motor 'CT# loops Fan MTR' parameter (P14.16) is set to '2'.

Note: Consult the Airmaster™ installation guide for a comprehensive guide to main and fan motor C.T. physical location

Rotor Lock Protection:

Rotor lock protection will immediately stop the motor if the current becomes excessive during a motor start. The protection has a 2 second delay time to allow for the current peak that will occur when the motor is initially started (typically 6 x FLC) and another 2 second delay to allow for the transition current peak that will occur during the starter 'star to delta' configuration transition (typically 4 x FLC). After the 'star to delta' transition lock rotor protection remains active for a short period to ensure the motor accelerates to full speed successfully.



The nominal 'Lock Rotor Current' for a typical industrial 3-phase induction motor = 6 x 'FLC Main MTR'
example – Main Motor: 37kW, 66A FLC Main MTR
66A x 6 =396 Amps
example – Fan Motor: 1.1kW, 2A FLC Fan MTR
2A x 6 = 12 Amps

Nominal Lock Rotor Protection Level Factor = ('Lock Rotor Current' / ' FLC Main MTR) x 0.667

P14
Motor Protection

example – Main Motor: 37kW, 66A FLC Main MTR, 264A Lock Rotor Current
(396A / 66A) * 0.667 = 4.0

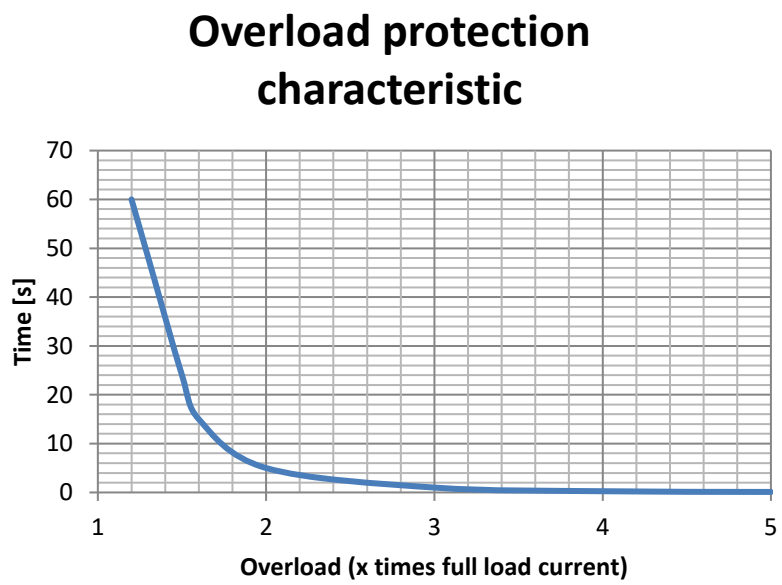
Enter the 'Lock Rotor Protection Level Factor' in parameter (P14.07)

If nuisance 'Lock Rotor' Immediate Stop events occur it may be necessary to increase the 'Lock Rotor Protection Factor' by 1.0

Overload Protection:

The 'Overload Protection' feature activates immediately after the 'Lock Rotor Protection' period or, for the Fan Motor, when the 'Overload Protection Inhibit' period ends.

It is not necessary to set parameters for overload protection, the Airmaster™ will do this automatically in accordance with the set motor characteristics.



Overload factor	Time [s]
1,2	60
1,3	48
1,5	24
1,6	15
2	5
3	1
4	0,25
5	0,1

Under Current Detection:

The Airmaster™ monitors the presence of current in any running state. If the detected current is less than 20% of the 'Nominal Motor Current' the Airmaster™

<table>
<tr><td></td><td colspan="3">will assume this to be an abnormal under current condition and an immediate stop event will occur.

Main Motor Phase Imbalance Protection:

Main motor phase imbalance protection measures any deviation in the phase currents. If any phase deviates by more than the configured percentage (P14.08) an immediate stop event will occur.

Main Motor Phase Angle Protection:

The Airmaster™ monitors the sequential of Phase L1, L2 and L3 and the corresponding angle of each phase.

L1 = 0°, L2 phase angle = 100° and 140°, L3 phase angle = 220° and 260°

If a phase angle error occurs an immediate stop event will occur.

Current Sensor or Wiring Error Protection:

If the measured current is less than 20% of the ‘FLC Main MTR’ when the motor is running, the Airmaster™ will assume a current sensor fault, phase loss or wiring fault.</td></tr>
<tr><td rowspan="10">P15
Inhibits</td><td colspan="3">Inhibits
Inhibits do not generate an error condition, an inhibit prevents an action or progression to another operational state.</td></tr>
<tr><td>P15.01</td><td>Operator</td><td>The operator inhibit is intended for operators to intentionally inhibit the equipment from operation.
Requires a digital input to be assigned for the ‘Operator’ function.
ON or OFF</td></tr>
<tr><td>P15.02</td><td>Door Open Warning</td><td>Prevents operation if an equipment door(s) is open.
Requires a digital input to be assigned for the ‘Door Open’ function.
ON or OFF</td></tr>
<tr><td>P15.03</td><td>Low Temperature</td><td>Prevents an equipment start if the COMP OUT TEMP is less than the set temperature.
-20°C to +10°C</td></tr>
<tr><td>P15.04</td><td>INT PRESS High</td><td>Prevents an equipment start if the ‘Internal (Sump) Pressure’ is above the set pressure.
0.1 BAR to 2.0 BAR</td></tr>
<tr><td>P15.05</td><td>Ambient T° RI L</td><td>Ambient Temperature Load Inhibit Low
Prevents an equipment to Load if the Ambient Temp is less than the set temperature.
-20°C to +10°C</td></tr>
<tr><td>P15.06</td><td>EIT Load INH LL</td><td>Equipment Internal Temperature Load Inhibit Low Low
Prevents an equipment to Load if the Internal Temp is less than the set temperature.
-40°C to +240°C</td></tr>
<tr><td>P15.08</td><td>Long stand still</td><td>Prevents an equipment to start if the compressor stand still (hasn’t run) is more than the set Long stand still
1 day to 60 day</td></tr>
<tr><td>P15.09</td><td>Load Inhibit Temp.</td><td>Prevents an equipment to Load if the Outlet temperature is less than the set temperature.
0 °C to P16.12 (Temperature warning)</td></tr>
</table>

P16 **Warning Alarms**	**Airmaster™ WARNING ALARM Conditions.** Warning Alarm: will generate and log an Alarm indication but will not stop the equipment from operating.		
	P16.01	Service Hours 1	0 to 30,000 hours The default value can be set only via CS. Note: to function the relevant service hours timer must be enabled in menu P11
	P16.02	Service Hours 2	
	P16.03	Service Hours 3	
	P16.04	Service Hours 4	
	P16.05	Service Hours 5	
	P16.06	Service Hours 6	
	P16.07	Service Hours 7	
	P16.08	Service Hours 8	
	P16.09↵	Weekly Service	Weekly service warning alarm sub menu. Note: to function the weekly service hours timer must be enabled in menu P11
	P16.09.01	AUTO SCH Service	Automatically schedules the next service due event. YES: the next weekly service is set once the Parameter configurator has been send to the controller via CS; 7 calendar days will be added to the current date on the controller
	P16.09.02	Year	Manually configure the Year of the next service. YEAR
	P16.09.03	Month	Manually configure the Month of the next service. MONTH
	P16.09.04	Day	Manually configure the Day of the next service. DAY
	P16.09.05	Time	Manually configure the Time of the next service. TIME
	P16.10↵	Annual Service	Annual service warning alarm sub menu Sub menu items are the same as P16.09 Weekly Service, see Weekly Service Sub Menu Note: to function the weekly service hours timer must be enabled in menu P11
	P16.11↵	Bi-Annual Service	Bi-Annual service warning alarm sub menu Sub menu items are the same as P16.09 Weekly Service, see Weekly Service Sub Menu Note: to function the weekly service hours timer must be enabled in menu P11
	P16.12	COMP OUT TEMP	Analogue input value: When the outlet temperature exceed the value that has been set an alarm will be triggered. ON or OFF MIN = 36°C MAX = P17.01 – 1°C
	P16.13↵	EQUIP OUT PRESS	Safety function on the Equip OUT Pressure HI : When the pressure reach his alarm value (example P16.13.01 = 9.5 BAR) - on the alarm we have hardcoded a delay time of 2 sec. And if the pressure drops again in less than 2 sec under 9.5 BAR a hardcoded delay of 10 sec is activated.

P16 **Warning Alarms**			During these 10 sec the controller is forced to run into a Offload state (Offload run timer) even if the pressure is below the Load pressure setting. When the 10 sec have expired, the controller will follow its normal course and will start to load when pressure is below Load pressure setting.
	P16.13.01	EQUIP OUT PRESS HI	Analogue input value: When the outlet Pressure exceed the value that has been set, an alarm will be triggered. ON or OFF MIN = P10.04 + 0.1bar MAX = P17.03 – 0.1bar
	P16.13.02	EQUIP OUT PRESS LO	Analogue input value: When the outlet Pressure drops below the value that has been set, an alarm will be triggered. ON or OFF MIN = 2bar MAX = P10.03 – 0.1bar Note: When the compressor gets a start command the compressor delay for 60 sec the alarm in order that the pressure gets time to build-up.
	P16.13.03	Delay PRESS LO	A delay timer can be introduced for the activation of the warning on the EQUIP OUTLET PRESSURE LOW. MIN = 30 sec MAX = 500 sec DEFAULT = 60 sec
	P16.14↵	EQUIP INT PRESS	
	P16.14.01	EQUIP INT PRESS HI	Analogue input value: When the Internal Pressure exceed the value that has been set, an alarm will be triggered. ON or OFF MIN = P10.04 + 0.1bar MAX = P17.04 – 0.1bar
	P16.14.02	EQUIP INT PRESS LO	Analogue input value: When the outlet Pressure exceed the value that has been set, an alarm will be triggered. ON or OFF MIN = 2bar MAX = P10.03 – 0.1bar Note: When the compressor gets a start command the compressor delay for 60 sec the alarm in order that the pressure gets time to build-up.
	P16.14.03	Load inhibit	ON or OFF ON = when the compressor want to go into a Loaded state and the internal pressure is above P16.14.01 a Load inhibit will be activated instead of an alarm. OFF = when the compressor want to go into a Loaded state and the internal pressure is above P16.14.01 an alarm will be activated and NO inhibit will be activated.
	P16.14.04	Delay PRESS LO	A delay timer can be introduced for the activation of the warning on the EQUIP INTERNAL PRESSURE LOW. MIN = 30 sec MAX = 500 sec DEFAULT = 60 sec

P16 **Warning Alarms**	P16.15	DIFF Pressure	Differential Pressure Warning: EQUIP INT PRESS minus EQUIP OUT PRESS ON or OFF MIN = 0.1bar MAX = P17.06 – 0.1bar Note1: The differential pressure alarm can only be activated if Delivery pressure > (load pressure P10.03 – Differential pressure alarm P16.15) Note2: Differential Pressure must continuously exceed the limit for more than 30 seconds
	P16.16	Oil Air SEP DP HI	Oil / Air Separator Differential Pressure High Warning: Oil Air SEP DP HI minus EQUIP OUT PRESS ON or OFF MIN = 0.01 Bar MAX = 2.00 Bar Note1: Differential Pressure Warning is disabled when delivery temperature is below 50°C Note2: Differential Pressure must continuously exceed the limit for more than 10 seconds
	P16.17	HI MTR STR HR	High Main Motor Starts per Hour Warning 1 to 240
	P16.18	Door Open Warning	Door Open Warning Alarm ON or OFF Note: requires appropriate digital input assignment, see Menu P18
	P16.19	CAB Filter DP Warning	Equipment Cabinet Filter Differential Pressure High Warning ON or OFF Note: requires appropriate digital input assignment, see Menu P18
	P16.20	Air Filter DP Warning	Air Filter Differential Pressure High Warning ON or OFF Note: requires appropriate digital input assignment, see Menu P18
	P16.21↵	Oil Filter DP Warning	
	P16.21.01	Oil Filter DP Warning	Oil Filter Differential Pressure High Warning ON or OFF Note: requires appropriate digital input assignment, see Menu P18
	P16.21.02	Oil level warning	Can be set OFF MIN = 0°C MAX = 250 °C Oil Filter DP Warning will be activated when Analog input – Comp OUT Temp is above the P16.21.02 setting Note: Still requires appropriate digital input assignment, see Menu P18
	P16.22	SEP Filter DP HI	Separator Filter Differential Pressure High Warning ON or OFF Note: requires appropriate digital input assignment, see Menu P18
	P16.23	Fan Motor warning	Fan Motor Warning ON or OFF Note: requires appropriate digital input assignment. See Menu P18
	P16.24↵	CNDS Drain1 warning	
	P16.24.01	CNDS Drain1 warning	Condensate Drain Warning ON or OFF Note: requires appropriate digital input assignment. See Menu P18

P16 **Warning Alarms**	P16.24.02	Drain1 fault DLY	Drain1 fault delay: A delay timer can be introduced for the activation of the warning MIN = 0 sec MAX = 60 sec
	P16.24.03	Drain1 fault CON	Drain1 fault Condition: In which condition the warning need to be activated Always = In all states Onload = only in a Loaded state
	P16.25	COOL Water warning	Cooling Water Warning ON or OFF Note: requires appropriate digital input assignment. See Menu P18
	P16.26	Oil Level warning	Oil Level Warning ON or OFF Note: requires appropriate digital input assignment. See Menu P18
	P16.27	Dryer warning	Dryer Warning ON or OFF Note: requires appropriate digital input assignment. See Menu P18
	P16.28	Line FTR DP warning	Line Filter Differential High Warning ON or OFF Note: requires appropriate digital input assignment. See Menu P18
	P16.29	FTR Drain warning	Filter Drain Warning ON or OFF Note: requires appropriate digital input assignment. See Menu P18
	P16.30	Oil/WTR SEP warning	Oil/Water Separator Warning ON or OFF Note: requires appropriate digital input assignment. See Menu P18
	P16.31	Ambient TEMP HI warning	Ambient Temperature High Warning ON or OFF Note: requires appropriate digital input assignment. See Menu P18
	P16.32↵	Conf warning 1	
	P16.32.01	Conf warning ON	Configurable Warning #1 ON or OFF Note: requires appropriate digital input assignment. See Menu P18
	P16.32.02	Warning name edit	Able to customize the name of the warning Use of **max 8** characters /characters you can **use a – z/A – Z/0 – 9**
	P16.33↵	Conf warning 2	
	P16.33.01	Conf warning ON	Configurable Warning #2 ON or OFF Note: requires appropriate digital input assignment. See Menu P18
	P16.33.02	Warning name edit	Able to customize the name of the warning Use of **max 8** characters /characters you can **use a – z/A – Z/0 – 9**
	P16.34↵	Conf warning 3	

P16 **Warning Alarms**	P16.34.01	Conf warning ON	Configurable Warning #3 ON or OFF Note: requires appropriate digital input assignment. See Menu P18
	P16.34.02	Warning name edit	Able to customize the name of the warning Use of **max 8** characters /characters you can **use a – z/A – Z/0 – 9**
	P16.35	VSD Fan MOT OVLD warning	VSD Fan Motor Overload Warning ON or OFF Note: requires appropriate digital input assignment. See Menu P18
	P16.36	Fan Motor OVLD warning	Fan Motor Overload Warning ON or OFF Note: requires appropriate digital input assignment. See Menu P18
	P16.37	Oil TEMP HI warning	Oil Temperature High Warning ON or OFF Note: requires appropriate digital input assignment. See Menu P18
	P16.41	Main MTR TEMP HI warning	Lain Motor Temperature High Warning ON or OFF Note: requires appropriate digital input assignment. See Menu P18
	P16.42	Voltage Low warning	Voltage Low warning ON or OFF Note: requires appropriate digital input assignment. See Menu P18
	P16.43	Ambient T HI	Analog Input value of the Ambient Temperature High. If the measured value of the Analog function – Ambient Temperature is above the set value of P16.43 a warning will be activated. MIN = P15. + 1°C MAX = P17.34 -1°C
	P16.44	Dew point warning	Dew point Warning ON or OFF Note: requires appropriate digital input assignment. See Menu P18
	P16.45	Dryer power SUP warning	Dryer power supply Warning ON or OFF Note: requires appropriate digital input assignment. See Menu P18
	P16.53↵	CNDS drain2 warning	
	P16.53.01	CNDS Drain2 warning	Condensate Drain Warning ON or OFF Note: requires appropriate digital input assignment. See Menu P18
	P16.53.02	Drain2 fault DLY	Drain2 fault delay: A delay timer can be introduced for the activation of the warning MIN = 0 sec MAX = 60 sec
	P16.53.03	Drain2 fault CON	Drain2 fault Condition: In which condition the warning need to be activated Always = In all states Onload = only in a Loaded state

P16 **Warning Alarms**	P16.54	Dryer Off Delay	If the dryer does not run for a certain time, ice may form on the dryer system and mechanical damage may also occur. With P16.54 Dryer Off delay (as warning), we can inform the system and end-user that the dryer is not functioning. ON or OFF MIN = 1 sec MAX = P17.62 – 1 sec
	P16.55↵	Service: Pressure vessel	When the Service: Pressure vessel has been activated via P11.27 you need to set the time when you want to be informed for the next maintains. This can be done in 2 ways 1) By selecting how many years before maintenance. (use only P16.55.01) 2) By setting a specific day in the future (use P16.55.02 – P16.55.05)
	P16.55.01	Service years	Setting the number of years before service is due MIN = 1 (default) MAX = 10
	P16.55.02	Year	Setting in which year service is due MIN = 2010 MAX = 2399
	P16.55.03	Month	Setting in which Month service is due MIN = 1 MAX = 12
	P16.55.04	Day	Setting which day service is due MIN = 1 MAX = 31
	P16.55.05	Time	Setting at which Time service is due – In minutes MIN = 0 MAX = 1439
	P16.56↵	Service: Safety valve	When the Service: Safety valve has been activated via P11.28 you need to set the time when you want to be informed for the next maintains. This can be done in 2 ways 1) By selecting how many years before maintenance. (use only P16.56.01) 2) By setting a specific day in the future (use P16.56.02 – P16.56.05)
	P16.56.01	Service years	Setting the number of years before service is due MIN = 1 (default) MAX = 10
	P16.56.02	Year	Setting in which year service is due MIN = 2010 MAX = 2399
	P16.56.03	Month	Setting in which Month service is due MIN = 1 MAX = 12

P16 **Warning Alarms**	P16.56.04	Day	Setting which day service is due MIN = 1 MAX = 31
	P16.56.05	Time	Setting at which Time service is due – In minutes MIN = 0 MAX = 1439
	P16.62	Inlet Vacuum HI	Analogue input value: When the Inlet Vacuum Pressure exceed the value that has been set, an alarm will be triggered. ON or OFF Default = OFF
	P16.63	Oil Temp HI	Analogue input value: When the Oil Temperature exceed the value that has been set, an alarm will be triggered. ON or OFF MIN = 0.0 °C MAX = P17.68 – 1 °C Default = OFF
	P16.64	Delivery TEMP HI	Analogue input value: When the Delivery Temperature exceed the value that has been set, an alarm will be triggered. ON or OFF MIN = 0.0 °C MAX = P17.69 – 1 °C Default = OFF
	P16.65↵	Oil P Limits	
	P16.65.01	Oil P HI Limit	Analogue input value: When the Oil Pressure exceed the value that has been set, an alarm will be triggered. ON or OFF MIN = P16.65.03 + 0.1 bar MAX = 10 bar Default = 4.5
	P16.65.02	PRESS Build-up Time	Is the BUILD-UP time (delay timer) at initial START for the activation of the Oil P Low limit warning. ON or OFF MIN = 1 sec MAX = 60 sec Default = 30
	P16.65.03	Oil P LO limit	Analogue input value: When the Oil Pressure drops below the value that has been set, an alarm will be triggered. ON or OFF MIN = 0 bar MAX = 16.65.01 – 0.1 bar Default = OFF
	P16.65.04	LO Limit delay	A delay timer can be introduced for the activation of the warning on the OIL PRESSURE LOW. MIN = 1 sec MAX = 30 sec

P16 **Warning Alarms**			DEFAULT = 15 sec
	P16.66	Oil Filter DP HI	
	P16.66.01	Oil Filter DP HI	Analogue input value: When the Oil Filter differential exceed the value that has been set, an alarm will be triggered. ON or OFF MIN = 0.1 MAX = 17.71 – 0.1 bar Default = 0.4 bar
	P16.66.02	Oil TEMP HI	If Oil temperature has exceed the value that has been set, the Oil Filter differential warning can be triggered MIN = 0 °C MAX = P16.63 – 1 °C Default = 0 °C
	P16.67	Oil Cooler Discharge HI	Analogue input value: When the Oil Cooler Discharge Temperature exceed the value that has been set, an alarm will be triggered. ON or OFF MIN = 0.0 °C MAX = P17.72 – 1 °C Default = OFF
	P16.68	Oil Cooler Approach HI	Analogue input value: When the Oil Cooler Approach Temperature exceed the value that has been set, an alarm will be triggered. Is a calculated value → Oil Cooler Approach = Oil Cooler Discharge – Ambient Temperature ON or OFF MIN = 0.0 °C MAX = P17.73 – 1 °C Default = OFF
	P16.69	After Cooler Discharge HI	Analogue input value: When the After Cooler Discharge Temperature exceed the value that has been set, an alarm will be triggered. ON or OFF MIN = 0.0 °C MAX = P17.74 – 1 °C Default = OFF
	P16.70	After Cooler Approach HI	Analogue input value: When the After Cooler Approach Temperature exceed the value that has been set, an alarm will be triggered. Is a calculated value → After Cooler Approach = After Cooler Discharge – Ambient Temperature ON or OFF MIN = 0.0 °C MAX = P17.75 – 1 °C Default = OFF

P17 **IMM Stop Alarms**	**Airmaster™ IMMEDIATE STOP ALARM Conditions.** Immediate Stop (Shutdown, Trip): will immediately shutdown the equipment and generate and log an Immediate Stop indication		
	P17.01	COMP OUT TEMP	Analogue input value: When the outlet temperature exceed the value that has been set an IMM stop will be triggered. ON or OFF MIN = P16.12 + 1°C MAX = 240°C
	P17.02↵	TEMP Rise Config	High Temperature Rate of Rise Immediate Stop sub menu
	P17.02.01	Delta TEMP	Temperature Delta Rise (over Delta Time) Immediate Stop MIN = 1°C MAX = 60°C
	P17.02.02	Delta Time	MIN = 1 sec MAX = P17.02.03 – 1 sec
	P17.02.03	Active Time	Time the 'High Temperature Rate of Rise' monitoring remains active after a main motor start MIN = P17.02.02 – 1 sec MAX = 60 sec
	P17.03	EQUIP OUT PRESS	Analogue input value: When the outlet Pressure exceed the value that has been set, an IMM stop will be triggered. ON or OFF MIN = P16.13.01 + 0.1bar MAX = P19.01.04 – 0.1bar
	P17.04	EQUIP INT PRESS	Analogue input value: When the Internal Pressure exceed the value that has been set, an IMM stop will be triggered. ON or OFF MIN = P16.14.01 + 0.1bar MAX = P19.02.04 – 0.1bar
	P17.06	DIFF Pressure	Differential Pressure Warning: EQUIP INT PRESS minus EQUIP OUT PRESS ON or OFF MIN = P16.15 + 0.1bar MAX = P17.03 – 0.1bar Note1: The differential pressure alarm can only be activated if Delivery pressure > (load pressure P10.03 – Differential pressure alarm P16.15) Note2: Differential Pressure must continuously exceed the limit for more than 30 seconds
	P17.07	Door Open IMM stop	Door Open Immediate stop ON or OFF Note: requires appropriate digital input assignment, see Menu P18
	P17.08	Fan Motor IMM stop	Fan Motor Immediate Stop ON or OFF

P17 **IMM Stop Alarms**			Note: requires appropriate digital input assignment, see Menu P18
	P17.09	COOL water IMM stop	Cooling Water Immediate Stop ON or OFF Note: requires appropriate digital input assignment, see Menu P18
	P17.10	Oil LVL IMM stop	Oil Level Immediate Stop ON or OFF Note: requires appropriate digital input assignment, see Menu P18
	P17.11	Belt Drive SERV IMM stop	Drive Belt Service Due Immediate Stop ON or OFF Note: requires appropriate digital input assignment, see Menu P18
	P17.12	Dryer IMM stop Alarm	Dryer Immediate Stop ON or OFF Note: requires appropriate digital input assignment, see Menu P18
	P17.13	Water Flow IMM stop	Water Flow Immediate Stop ON or OFF Note: requires appropriate digital input assignment, see Menu P18
	P17.14	Inverter Fault IMM stop	VSD Inverter Fault Immediate Stop ON or OFF Note: requires appropriate digital input assignment, see Menu P18
	P17.15	Main MTR Temp HI IMM stop	Main Motor Temperature High Immediate Stop ON or OFF Note: requires appropriate digital input assignment, see Menu P18
	P17.16	EQUIP Out TEMP HI IMM stop	Equipment Outlet Temperature High Immediate Stop ON or OFF Note: requires appropriate digital input assignment, see Menu P18
	P17.17	Cooling system IMM stop	Cooling System Immediate Stop ON or OFF Note: requires appropriate digital input assignment, see Menu P18
	P17.18	Main Motor IMM stop	Main Motor Immediate Stop ON or OFF Note: requires appropriate digital input assignment, see Menu P18
	P17.19↵	Conf IMM stop 1	
	P17.19.01	Conf IMM stop ON	Configurable Immediate Stop #1 ON or OFF Note: requires appropriate digital input assignment, see Menu P18
	P17.09.02	Warning name edit	Able to customize the name of the warning Use of **max 8** characters /characters you can **use a – z/A – Z/0 – 9**
	P17.20↵	Conf IMM stop 2	
	P17.20.01	Conf IMM stop ON	Configurable Immediate Stop #2 ON or OFF Note: requires appropriate digital input assignment, see Menu P18
	P17.20.02	Warning name edit	Able to customize the name of the warning

P17 **IMM Stop Alarms**			Use of **max 8** characters /characters you can **use a – z/A – Z/0 – 9**
	P17.21↵	Conf IMM stop 3	
	P17.21.01	Conf IMM stop ON	Configurable Immediate Stop #3 ON or OFF Note: requires appropriate digital input assignment, see Menu P18
	P17.21.02	Warning name edit	Able to customize the name of the warning Use of **max 8** characters /characters you can **use a – z/A – Z/0 – 9**
	P17.25	VSD Fan MOT OVLD IMM stop	VSD Fan Motor Immediate Stop ON or OFF Note: requires appropriate digital input assignment, see Menu P18
	P17.26	Fan Motor OVLD IMM stop	Fan Motor Immediate Stop ON or OFF Note: requires appropriate digital input assignment, see Menu P18
	P17.27	Oil TEMP HI IMM stop	Oil Temperature High Immediate Stop ON or OFF Note: requires appropriate digital input assignment, see Menu P18
	P17.28	Dew Point IMM stop	Oil Dew Point Immediate Stop ON or OFF Note: requires appropriate digital input assignment, see Menu P18
	P17.32	Voltage low IMM stop	Voltage low Immediate Stop ON or OFF Note: requires appropriate digital input assignment, see Menu P18
	P17.33↵	Drain1 IMM stop	
	P17.33.01	Drain1 IMM stop	Drain1 Immediate Stop ON or OFF Note: requires appropriate digital input assignment. See Menu P18
	P17.33.02	Drain1 fault DLY	Drain1 fault delay: A delay timer can be introduced for the activation of the warning MIN = 0 sec MAX = 60 sec
	P17.33.03	Drain1 fault CON	Drain1 fault Condition: In which condition the warning need to be activated Always = In all states Onload = only in a Loaded state
	P17.34	Ambient T HI	Analog Input value of the Ambient Temperature High. If the measured value of the Analog function – Ambient Temperature is above the set value of P17.34 a Immediate Stop will be activated. MIN = P16.43 + 1°C MAX = 60°C
	P17.35	Air filter DP IMM Stop	Air Filter Differential Pressure High Immediate Stop ON or OFF Note: requires appropriate digital input assignment, see Menu P18

P17 **IMM Stop Alarms**	P17.36↵	Oil filter DP IMM Stop	
	P17.36.01	Oil filter DP IMM Stop	Oil Filter Differential Pressure High Immediate Stop ON or OFF Note: requires appropriate digital input assignment, see Menu P18
	P17.36.02	Oil LVL IMM Stop	Can be set OFF MIN = 0°C MAX = 250 °C Oil Filter DP Immediate Stop will be activated when Analog input – Comp OUT Temp is above the P17.36.02 setting Note: Still requires appropriate digital input assignment, see Menu P18
	P17.37	INV FLT MAN IMM stop	Inverter Fault Manual Immediate Stop ON or OFF Note: requires appropriate digital input assignment, see Menu P18
	P17.40	Stage pressure IMM stop	Stage pressure Immediate Stop ON or OFF Note: requires appropriate digital input assignment, see Menu P18
	P17.41	Stage 1 TEMP IMM stop	Stage 1 Temperature Immediate Stop ON or OFF Note: requires appropriate digital input assignment, see Menu P18
	P17.42	Group fault IMM stop	Group fault Immediate Stop ON or OFF Note: requires appropriate digital input assignment, see Menu P18
	P17.45	EQUIP OUT PRESS IMM stop	Equipment Outlet Pressure Immediate Stop ON or OFF Note: requires appropriate digital input assignment, see Menu P18
	P17.46	Dryer power SUP IMM stop	Dryer power Supply Immediate Stop ON or OFF Note: requires appropriate digital input assignment, see Menu P18
	P17.47	MTR prot IMM stop	Motor protection Immediate Stop ON or OFF Note: requires appropriate digital input assignment, see Menu P18
	P17.54	Vibration HL IMM stop	Vibration High Level Immediate Stop ON or OFF Note: requires appropriate digital input assignment, see Menu P18
	P17.55	MTR Winding T° HL IMM stop	Motor Winding Temperature High Level Immediate Stop ON or OFF Note: requires appropriate digital input assignment, see Menu P18
	P17.56	Enclosure T° HL IMM stop	Enclosure Temperature High Level Immediate Stop ON or OFF Note: requires appropriate digital input assignment, see Menu P18
	P17.61↵	Drain2 IMM stop	
	P17.61.01	Drain2 IMM stop	Drain Immediate Stop

P17 **IMM Stop Alarms**			ON or OFF Note: requires appropriate digital input assignment. See Menu P18
	P17.61.02	Drain2 fault DLY	Drain2 fault delay: A delay timer can be introduced for the activation of the warning MIN = 0 sec MAX = 60 sec
	P17.61.03	Drain2 fault CON	Drain2 fault Condition: In which condition the warning need to be activated Always = In all states Onload = only in a Loaded state
	P17.62	Dryer Off Delay	If the dryer does not run for a certain time, ice may form on the dryer system and mechanical damage may also occur. With P17.62 Dryer Off delay (as Immediate Stop), we can stop the system when dryer is not functioning for the set time. ON or OFF MIN = P16.54 + 1 sec MAX = 900 sec
	P17.67	Inlet Vacuum HI	Analogue input value: When the Inlet Vacuum Pressure exceed the value that has been set, an Immediate Stop will be triggered. ON or OFF Default = OFF
	P17.68	Oil Temp HI	Analogue input value: When the Oil Temperature exceed the value that has been set, an Immediate Stop will be triggered. ON or OFF MIN = 0.0 °C MAX = P17.68 – 1 °C Default = OFF
	P17.69	Delivery TEMP HI	Analogue input value: When the Delivery Temperature exceed the value that has been set, an Immediate Stop will be triggered. ON or OFF MIN = 0.0 °C MAX = P17.69 – 1 °C Default = OFF
	P17.70↵	Oil P Limits	
	P17.70.01	Oil P HI Limit	Analogue input value: When the Oil Pressure exceed the value that has been set, an Immediate Stop will be triggered. ON or OFF MIN = P16.65.03 + 0.1 bar MAX = 10 bar Default = 4.5
	P17.70.02	PRESS Build-up Time	Is the BUILD-UP time (delay timer) at initial START for the activation of the Oil P Low limit Immediate Stop. ON or OFF MIN = 1 sec

P17 **IMM Stop Alarms**			MAX = 60 sec Default = 30
	P17.70.03	Oil P LO limit	Analogue input value: When the Oil Pressure drops below the value that has been set, an Immediate Stop will be triggered. ON or OFF MIN = 0 bar MAX = 16.65.01 – 0.1 bar Default = OFF
	P17.70.04	LO Limit delay	A delay timer can be introduced for the activation of the Immediate Stop on the OIL PRESSURE LOW. MIN = 1 sec MAX = 30 sec DEFAULT = 15 sec
	P17.70.05	Oil P delay timer	A delay timer can be introduced for the activation of the Immediate Stop on the OIL PRESSURE HIGH limit. MIN = 1 sec MAX = 30 sec DEFAULT = 15 sec
	P17.71	Oil Filter DP HI	Analogue input value: When the Oil Filter differential exceed the value that has been set, an Immediate Stop will be triggered. ON or OFF MIN = 0.1 MAX = 17.71 – 0.1 bar Default = 0.4 bar
	P17.72	Oil TEMP HI	If Oil temperature has exceed the value that has been set, the Oil Filter differential Immediate Stop can be triggered MIN = 0 °C MAX = P16.63 – 1 °C Default = 0 °C
	P17.73	Oil Cooler Discharge HI	Analogue input value: When the Oil Cooler Discharge Temperature exceed the value that has been set, an Immediate Stop will be triggered. ON or OFF MIN = 0.0 °C MAX = P17.72 – 1 °C Default = OFF
	P17.74	Oil Cooler Approach HI	Analogue input value: When the Oil Cooler Approach Temperature exceed the value that has been set, an Immediate Stop will be triggered. Is a calculated value → Oil Cooler Approach = Oil Cooler Discharge – Ambient Temperature ON or OFF MIN = 0.0 °C MAX = P17.73 – 1 °C

P17 **IMM Stop Alarms**			Default = OFF
	P17.75	After Cooler Discharge HI	Analogue input value: When the After Cooler Discharge Temperature exceed the value that has been set, an Immediate Stop will be triggered. ON or OFF MIN = 0.0 °C MAX = P17.74 – 1 °C Default = OFF
	P17.77	After Cooler Approach HI	Analogue input value: When the After Cooler Approach Temperature exceed the value that has been set, an Immediate Stop will be triggered. Is a calculated value → After Cooler Approach = After Cooler Discharge – Ambient Temperature ON or OFF MIN = 0.0 °C MAX = P17.74 – 1 °C Default = OFF
P18 **I/O (Input / Output) CONFIG**	**Airmaster™ Input / Output Configuration Options** **Note:** When configuring I/O assignments in menu P18 the associated functions in the respective menus must also be enabled. For example: if digital input 2 (P18.10) is configured for 'Oil Filter DP warning' the 'Oil Filter DP warning' function in menu (P16.21.01) must also be enabled. De-enegise = no output, OFF; Energise = output to energise relay coil, ON The coil of a relay (external to the controller), with a coil energise current no greater than 20mA, can be connected to the analogue output terminals.		
	P18.01	ANA IN 1 FUNCT	Analog Input 1 Function – Can be set OFF Fixed Delivery Pressure
	P18.02	ANA input 1 type	Analog input 1 type: 4 – 20mA or 0 – 10V
	P18.03	ANA IN 2 FUNCT	Analog Input 2 Function – Can be set OFF Selection between : Internal Pressure – Inlet Vacuum – Oil Pressure – Oil Filter DP
	P18.04	ANA input 2 type	Analog input 2 type: 4 – 20mA or 0 – 10V
	P18.05	ANA IN 3 FUNCT	Analog Input 3 Function – Can be set OFF Selection between : Temperature – Dryer Temp – EQUIP INT TEMP – Ambient T° - Oil Temperature – Delivery Temperature – Oil Cooler Discharge – After Cooler Discharge
	P18.06	ANA input 3 type	Analog input 3 type: PT100 – PT1000 – KTY – NTC
	P18.07	ANA IN 4 FUNCT	Analog Input 4 Function – Can be set OFF Selection between : Temperature – Dryer Temp – EQUIP INT TEMP – Ambient T° - Oil Temperature –

<table>
<tr><td rowspan="4">P18
I/O
(Input / Output)
CONFIG</td><td></td><td></td><td>Delivery Temperature – Oil Cooler Discharge – After Cooler Discharge</td></tr>
<tr><td>P18.08</td><td>ANA input 4 type</td><td>Analog input 4 type:
PT100 – PT1000 – KTY – NTC</td></tr>
<tr><td>P18.09</td><td>AO Function</td><td>Analog Output function :

<table><tr><th>Selection function</th><th>Signal send via AO</th></tr><tr><td>Blower Speed</td><td>Repeat: blower speed, 4-20mA</td></tr><tr><td>Inlet Pressure</td><td>Repeat: inlet pressure, 4-20mA</td></tr><tr><td>EQUIP OUT PRESS</td><td>Repeat: ‘Equipment Output Pressure’ value; 4-20mA</td></tr><tr><td>EQUIP INT PRESS</td><td>Repeat: ‘Equipment Internal Pressure’ value; 4-20mA</td></tr><tr><td>COMP OUT TEMP</td><td>Repeat: ‘Compressor Output Temperature’ value; 4-20mA</td></tr><tr><td>Fan MTR Current</td><td>Repeat: ‘Fan Motor Current’ value; 4-20mA</td></tr><tr><td>Main MTR Current</td><td>Repeat: Main Motor Current value; 4-20mA</td></tr></table></td></tr>
<tr><td>P18.10</td><td>DI2 function</td><td>Digital inputs function that can be select:<table><tr><th>DI functions</th><th>Parameter you need to activate in order to be able to use the Digital input.</th></tr><tr><td>OFF</td><td>NO parameter</td></tr><tr><td>Doors open warning</td><td>P16.18</td></tr><tr><td>Doors open IMM Stop</td><td>P17.07</td></tr><tr><td>CAB filter DP warning</td><td>P16.19</td></tr><tr><td>Air filter DP warning</td><td>P16.20</td></tr><tr><td>Oil filter DP warning</td><td>P16.21.01</td></tr><tr><td>SEP filter DP warning</td><td>P16.22</td></tr><tr><td>Fan motor warning</td><td>P16.23</td></tr><tr><td>Fan MTR IMM stop</td><td>P17.08 – Can only be used as a NC contact</td></tr><tr><td>CNDS drain1 warning</td><td>P16.24.01</td></tr><tr><td>COOL water warning</td><td>P16.25</td></tr><tr><td>COOL WTR IMM stop</td><td>P17.09</td></tr><tr><td>Oil level warning</td><td>P16.26</td></tr><tr><td>Oil LVL IMM stop</td><td>P17.10</td></tr><tr><td>V belt IMM stop</td><td>P17.11</td></tr><tr><td>Dryer warning</td><td>P16.27</td></tr><tr><td>Dryer IMM stop</td><td>P17.12</td></tr><tr><td>Line FTR DP warning</td><td>P16.28</td></tr><tr><td>Line FTR DP IMM stop</td><td></td></tr></table></td></tr>
</table>

P18 **I/O** **(Input / Output)** **CONFIG**			FTR drain warning	P16.29
			Oil/WTR SEP warning	P16.30
			Run SCH On/Off	Can only be used as a NO contact
			DI Remote Start	Can only be used as a NO contact
			REM load enable	Can only be used as a NO contact
			REM load/offload	Can only be used as a NO contact
			Main MTR OVLD IMM stop	Can only be used as a NC contact
			CONF Warning 1	P16.32
			CONF Warning 2	P16.33
			CONF Warning 3	P16.34
			User IMM Stop 1	P17.19
			User IMM Stop 2	P17.20
			User IMM Stop 3	P17.21
			Water flow IMM stop	P17.13
			Inverter IMM Stop	P17.14
			Ambient T HI warning	P16.31
			Main MTR TEMP HI IMM stop	P17.15 – Can only be used as a NC contact
			EQUIP Out TEMP IMM stop	P17.16
			Main motor IMM stop	P17.18 – Can only be used as a NC contact
			Cooling system IMM stop	P17.17
			Run feedback warning	
			Run CHK IMM stop	
			Clear active FLT	
			VSD Fan MOT OVLD warning	P16.35
			VSD Fan MOT OVLD IMM stop	P17.25 – Can only be used as a NC contact
			FAN MOTOR OVLD warning	P16.36
			FAN MOTOR OVLD IMM stop	P17.26 – Can Only be used as a NC contact
			Oil TEMP HI warning	P16.37
			Oil TEMP HI IMM stop	P17.27
			Run enable	
			Standby start	
			Main MTR TEMP HI warning	P16.41
			Voltage low warning	P16.42
			Voltage low IMM stop	P17.32
			Drain1 IMM stop	P17.33
			Remote start ENA	
			Air filter DP IMM stop	P17.35
			Oil filter DP IMM stop	P17.36
			INV FLT MAN IMM stop	P17.37
			Stage pressure IMM stop	P17.40
			Stage 1 TEMP IMM stop	P17.41

P18 **I/O** **(Input / Output)** **CONFIG**			<table><tr><td>Group fault IMM stop</td><td>P17.42</td></tr><tr><td>Dew Point IMM stop</td><td>P17.28</td></tr><tr><td>Dew Point warning</td><td>P16.44</td></tr><tr><td>EQUIP OUT PRESS IMM stop</td><td>P17.45</td></tr><tr><td>Dryer power SUP IMM stop</td><td>P17.46</td></tr><tr><td>Dryer power SUP warning</td><td>P16.45</td></tr><tr><td>Force spiral VLV</td><td></td></tr><tr><td>MTR prot IMM stop</td><td>P17.47 – Can only be used as a NC contact</td></tr><tr><td>Motor RUN VSD</td><td></td></tr><tr><td>Vibration HL IMM stop</td><td>P17.54</td></tr><tr><td>MTR winding T° HL IMM stop</td><td>P17.55</td></tr><tr><td>Enclosure T° HL IMM stop</td><td>P17.56</td></tr><tr><td>CNDS drain2 warning</td><td>P16.53.01</td></tr><tr><td>Drain2 IMM stop</td><td>P17.61.01</td></tr></table>
	P18.11↵	DI2: CONFIG	
	P18.11.01	DI2 OK: NO/NC	Configure input for ‘Normally OPEN’ or ‘Normally CLOSED’ Note: if set for (Open) feature will activate when input is CLOSED circuit, if set for (Closed) feature will activate when input is OPEN circuit.
	P18.11.02	Signal delay	Signal delay on the warning or Immediate stop ON or OFF MIN = 0,1 sec MAX = 900 sec
	P18.12	DI3 function	See function of DI2 function
	P18.13↵	DI3: CONFIG	
	P18.13.01	DI3 OK: NO/NC	Configure input for ‘Normally OPEN’ or ‘Normally CLOSED’ Note: if set for (Open) feature will activate when input is CLOSED circuit, if set for (Closed) feature will activate when input is OPEN circuit.
	P18.13.02	Signal delay	Signal delay on the warning or Immediate stop ON or OFF MIN = 0,1 sec MAX = 900 sec
	P18.14	DI4 function	See function of DI2 function
	P18.15↵	DI4: CONFIG	
	P18.15.01	DI4 OK: NO/NC	Configure input for ‘Normally OPEN’ or ‘Normally CLOSED’ Note: if set for (Open) feature will activate when input is CLOSED circuit, if set for (Closed) feature will activate when input is OPEN circuit.
	P18.15.02	Signal delay	Signal delay on the warning or Immediate stop ON or OFF MIN = 0,1 sec MAX = 900 sec

P18 **I/O** **(Input / Output)** **CONFIG**	P18.16	DI5 function	See function of DI2 function
	P18.17↵	DI5: CONFIG	
	P18.17.01	DI5 OK: NO/NC	Configure input for 'Normally OPEN' or 'Normally CLOSED' Note: if set for (Open) feature will activate when input is CLOSED circuit, if set for (Closed) feature will activate when input is OPEN circuit.
	P18.17.02	Signal delay	Signal delay on the warning or Immediate stop ON or OFF MIN = 0,1 sec MAX = 900 sec
	P18.18	DI6 function	See function of DI2 function
	P18.19↵	DI6: CONFIG	
	P18.19.01	DI6 OK: NO/NC	Configure input for 'Normally OPEN' or 'Normally CLOSED' Note: if set for (Open) feature will activate when input is CLOSED circuit, if set for (Closed) feature will activate when input is OPEN circuit.
	P18.19.02	Signal delay	Signal delay on the warning or Immediate stop ON or OFF MIN = 0,1 sec MAX = 900 sec
	P18.20	DI7 function	See function of DI2 function
	P18.21↵	DI7: CONFIG	
	P18.21.01	DI7 OK: NO/NC	Configure input for 'Normally OPEN' or 'Normally CLOSED' Note: if set for (Open) feature will activate when input is CLOSED circuit, if set for (Closed) feature will activate when input is OPEN circuit.
	P18.21.02	Signal delay	Signal delay on the warning or Immediate stop ON or OFF MIN = 0,1 sec MAX = 900 sec
	P18.22	DI8 function	See function of DI2 function
	P18.23↵	DI8: CONFIG	
	P18.23.01	DI8 OK: NO/NC	Configure input for 'Normally OPEN' or 'Normally CLOSED' Note: if set for (Open) feature will activate when input is CLOSED circuit, if set for (Closed) feature will activate when input is OPEN circuit.
	P18.23.02	Signal delay	Signal delay on the warning or Immediate stop ON or OFF MIN = 0,1 sec MAX = 900 sec
	P18.24	DI9 function	See function of DI2 function NOTE: On the DI9 you are also able to connect a PTC Open around 3.0K and close again at 1.6K.
	P18.25↵	DI9: CONFIG	
	P18.25.01	DI9 OK: NO/NC	Configure input for 'Normally OPEN' or 'Normally CLOSED' Note: if set for (Open) feature will activate when input is CLOSED circuit, if set for (Closed) feature will activate

<table>
<tr><td rowspan="4">P18
I/O
(Input / Output)
CONFIG</td><td></td><td></td><td>when input is OPEN circuit.</td></tr>
<tr><td>P18.25.02</td><td>Signal delay</td><td>Signal delay on the warning or Immediate stop
ON or OFF
MIN = 0,1 sec
MAX = 900 sec</td></tr>
<tr><td>P18.26</td><td>Relay 1 function</td><td>Digital Output function that can be select:
<table>
<tr><th>Relay function</th><th>Description</th></tr>
<tr><td>Warning N/C</td><td>De-energise: any active Warning (not including Run Inhibit)</td></tr>
<tr><td>Warning N/O</td><td>Energise: for any active Warning (not including Run Inhibit)</td></tr>
<tr><td>Service N/C</td><td>De-energise: Service Warning or Service Immediate Stop only</td></tr>
<tr><td>Service N/O</td><td>Energise: Service Warning or Service Immediate Stop only</td></tr>
<tr><td>Loaded N/C</td><td>De-energise: in all LOADED states</td></tr>
<tr><td>Loaded N/O</td><td>Energise: in all LOADED states</td></tr>
<tr><td>Fan N/C</td><td>De-energise: all RUNNING states except ‘Motor Starting’ and ‘Load Delay’</td></tr>
<tr><td>Fan N/O</td><td>Energise: all RUNNING states except ‘Motor Starting’ and ‘Load Delay’</td></tr>
<tr><td>Fan Control N/C</td><td>If function is enabled the FAN based on Temperature will operate in any state.
De-energise: if delivery temperature exceeds the set ‘Fan High’ temperature setting.
Energise: If delivery temperature falls below the set ‘Fan Low’ temperature setting.
FAN CONTROL can be stopped if following IMM-stop are active :
<table>
<tr><td>E0010 – Emergency Stop</td><td>E0070 – TRIP – Fan Motor IMM stop (DI)</td></tr>
<tr><td>E0085 – TRIP – Fan CT</td><td>E0071 – TRIP – VSD Fan MOT OVLD IMM stop (DI)</td></tr>
<tr><td>E0086 – TRIP – Fan Overload</td><td>E0072 – TRIP – Fan Motor OVLD IMM stop (DI)</td></tr>
</table>
Once de-energised the output will remain de-energised for a minimum of the set ‘Fan Minimum Run Time’ regardless of delivery temperature.</td></tr>
<tr><td>Fan Control N/O</td><td>If function is enabled the FAN based on Temperature will operate in any state.
Energise: if delivery temperature exceeds the set ‘Fan High’ temperature setting.
De-energise: If delivery temperature falls below the set ‘Fan Low’ temperature setting.
FAN CONTROL can be stopped if following IMM-stop are active :
<table>
<tr><td>E0010 – Emergency Stop</td><td>E0070 – TRIP – Fan Motor IMM stop (DI)</td></tr>
<tr><td>E0085 – TRIP – Fan CT</td><td>E0071 – TRIP – VSD Fan MOT OVLD IMM stop (DI)</td></tr>
</table></td></tr>
</table></td></tr>
</table>

P18 **I/O** **(Input / Output)** **CONFIG**				E0086 – TRIP – Fan Overload | E0072 – TRIP – Fan Motor OVLD IMM stop (DI) Once de-energised the output will remain de-energised for a minimum of the set 'Fan Minimum Run Time' regardless of delivery temperature.
			Fan Control 2 N/C	See function "Fan Control N/C"
			Fan Control 2 N/O	See function "Fan Control N/O"
			Drain1 N/C	De-energise: when Drain function in active 'ON' state.
			Drain1 N/O	Energise: when Drain function in active 'ON' state.
			Standby N/C	De-energise: in 'Standby' and 'Venting' states
			Standby N/O	Energise: in 'Standby' and 'Venting' states
			Dryer control N/C	De-energise: in all RUNNING states
			Dryer control N/O	Energise: in all RUNNING states
			RC Start/Stop N/C	De-energise: 'Remote Start/Stop' is enabled.
			RC Start/Stop N/O	Energise: 'Remote Start/Stop' is enabled.
			RC Load/Offload N/C	De-energise: 'Remote Load/Offload' is enabled.
			RC Load/Offload N/O	Energise: 'Remote Load/Offload' is enabled.
			Inverter FLT RST N/C	De-energise: if digital input assigned for 'Inverter Fault' function is NOT OK.
			Inverter FLT RST N/O	Energise: if digital input assigned for 'Inverter Fault' function is NOT OK.
			Load request N/C	De-energise: in all 'Load Request' states
			Load request N/O	Energise: in all 'Load Request' states
			Inhibit N/C	De-energise: when an inhibit is enabled and active.
			Inhibit N/O	Energise: when an inhibit is enabled and active.
			Service Due ALM N/C	De-energise: Service Due, Alarm codes A:4804 to A:4824
			Service Due ALM N/O	Energise: Service Due, Alarm codes A:4804 to A:4824
			STR or RUN IN N/C	De-energise: 'Start' or 'Run' inhibit condition only
			STR or RUN IN N/O	Energise: 'Start' or 'Run' inhibit condition only
			Auto Restart N/C	De-energise: when 'Auto Restart' is enabled
			Auto Restart N/O	Energise: when 'Auto Restart' is enabled.
			Star Delta TRANS N/C	De-energise: during the main motor starter 'Star Time' (P11.01)
			Star Delta TRANS N/O	Energise: during the main motor starter 'Star Time' (P11.01)
			Press Switch N/C	De-energise: 'Pressure Switch High' is reached Energise: when 'Pressure Switch Low' is reached
			Press Switch N/O	Energise: 'Pressure Switch High' is reached De-energise: when 'Pressure Switch Low' is reached
			Any Alarm NCP	De-energise: any 'Warning Alarm' or 'Immediate Stop Shutdown' is enabled. If another Warning or Immediate Stop occurs output will pulse ON (energise) for 3sec then de-energise Note: COMP OUT P LL A, COMP OUT T° H A and TEST VERSION are not include.
			Any Alarm NOP	Energise: any 'Warning Alarm' or 'Immediate Stop Shutdown' is enabled.

P18 **I/O** **(Input / Output)** **CONFIG**				If another Warning or Immediate Stop occurs output will pulse OFF (de-energise) for 3sec then energise Note: COMP OUT P LL A, COMP OUT T° H A and TEST VERSION are not include.
			Advisory Alarm NCP	De-energise: any 'Advisory Alarm' is enabled. If another Advisory Alarm occurs output will pulse ON (energise) for 3sec then de-energise Note: COMP OUT P LL A, COMP OUT T° H A and TEST VERSION are not include
			Advisory Alarm NOP	Energise: any 'Advisory Alarm' is enabled. If another Advisory Alarm occurs output will pulse OFF (de-energise) for 3sec then energise Note: COMP OUT P LL A, COMP OUT T° H A and TEST VERSION are not include
			Maintenance ALRM NCP	De-energise: any 'Service Alarm' is enabled. If another Service Alarm occurs output will pulse ON (energise) for 3sec then de-energise
			Maintenance ALRM NOP	Energise: any 'Service Alarm' is enabled. If another Service Alarm occurs output will pulse OFF (de-energise) for 3sec then energise
			IMM stop NCP	De-energise: any 'Immediate Stop' Shutdown is enabled. If another Immediate Stop occurs output will pulse ON (energise) for 3sec then de-energise
			IMM stop NOP	Energise: any 'Immediate Stop' Shutdown is enabled. If another Immediate Stop occurs output will pulse OFF (de-energise) for 3sec then energise
			Ready to Start N/C	De-energise: in 'Ready to Start' state.
			Ready to Start N/O	Energise: in 'Ready to Start' state.
			Backup COMPR N/C	De-energise: when 'Backup COMPR' is enabled.
			Backup COMPR N/O	Energise: when 'Backup COMPR' is enabled.
			Device Power up N/C	De-energise: at power up initialisation
			Device Power up N/O	Energise: at power up initialisation
			Motor Protection N/C	De-energise: when motor protection active
			Motor Protection N/O	Energise: when motor protection active
			Started N/C	De-energise: in all 'Started' states
			Started N/O	Energise: in all 'Started' states
			Running N/C	De-energise: in all RUNNING states
			Running N/O	Energise: in all RUNNING states
			Venting N/C	De-energise: when compressor is venting
			Venting N/O	Energise: when compressor is venting
			Group Fault N/C	De-energise: any active Warning, Star/Run Inhibit or Immediate Stop
			Group Fault N/O	Energise: any active Warning, Star/Run Inhibit or Immediate Stop

<table>
<tr><td rowspan="12">P18
I/O
(Input / Output)
CONFIG</td><td rowspan="12"></td><td rowspan="12"></td><td rowspan="12"><table>
<tr><td>Warning & Service N/C</td><td>De-energise: any Warning or Service Due (not including Start/Run Inhibit)</td></tr>
<tr><td>Warning & Service N/O</td><td>Energise: any Warning or Service Due (not including Start/Run Inhibit)</td></tr>
<tr><td>Immediate Stop N/C</td><td>De-energise: any active Immediate Stop (not including Start/Run Inhibit)</td></tr>
<tr><td>Immediate Stop N/O</td><td>Energise: any active Immediate Stop (not including Start/Run Inhibit)</td></tr>
<tr><td>Drain2 N/C</td><td>De-energise: when Drain function in active ‘ON’ state.</td></tr>
<tr><td>Drain2 N/O</td><td>Energise: when Drain function in active ‘ON’ state.</td></tr>
<tr><td>Modulation N/C</td><td>De-energise when control mode is Modulation and P10.29 Modulation Mode = OFF</td></tr>
<tr><td>Modulation N/O</td><td>Energise when control mode is Modulation and P10.29 Modulation Mode = OFF</td></tr>
<tr><td>Drive reset N/C</td><td>De-energise when a reset signal need to be send to the drive</td></tr>
<tr><td>Drive reset N/O</td><td>Energise when a reset signal need to be send to the drive</td></tr>
<tr><td>Warning & IMM Stop N/C</td><td>De-energise: any active Warning &Immediate Stop (not including Start/Run Inhibit)</td></tr>
<tr><td>Warning & IMM Stop N/O</td><td>Energise: any active Warning & Immediate Stop (not including Start/Run Inhibit)</td></tr>
<tr><td>Y-Δ main</td><td>Star/Delta Starter – MAIN Contactor</td></tr>
<tr><td>Y-Δ star</td><td>Star/Delta Starter – STAR Contactor</td></tr>
<tr><td>Y-Δ delta</td><td>Star/Delta Starter – DELTA Contactor</td></tr>
<tr><td>Motor RUN VSD</td><td>Energise when the controller needs to send a start signal to the drive (used via drive tool)</td></tr>
</table></td></tr>
<tr><td>P18.27</td><td>Relay 2 function</td><td>See function of Relay function1 function</td></tr>
<tr><td>P18.28</td><td>Relay 3 function</td><td>See function of Relay function1 function</td></tr>
<tr><td>P18.29</td><td>Relay 4 function</td><td>See function of Relay function1 function</td></tr>
<tr><td>P18.30</td><td>Relay 5 function</td><td>See function of Relay function1 function</td></tr>
<tr><td>P18.31</td><td>Relay 6 function</td><td>See function of Relay function1 function</td></tr>
<tr><td>P18.32</td><td>Relay 7 function</td><td>See function of Relay function1 function</td></tr>
<tr><td>P18.33</td><td>Relay 8 function</td><td>See function of Relay function1 function</td></tr>
<tr><td>P18.34</td><td>Relay 9 function</td><td>See function of Relay function1 function – Only available with FORM 10 controller</td></tr>
<tr><td>P18.35</td><td>Relay 10 function</td><td>See function of Relay function1 function – Only available with FORM 10 controller</td></tr>
<tr><td rowspan="5">P19
Sensor
CONFIG</td><td colspan="3">Airmaster™ Sensor Configuration and Calibration

Caution: Incorrect sensor configuration and/or calibration will degrade performance and disrupt related safety features and functions.</td></tr>
<tr><td>P19.01↵</td><td>P1 Pressure</td><td>Analog Input 1 sub menu</td></tr>
<tr><td>P19.01.03</td><td>MEASURE Offset</td><td>Analog Input 1 Offset Calibration</td></tr>
<tr><td>P19.01.04</td><td>MEASURE Range</td><td>Analog Input 1 Range Calibration</td></tr>
<tr><td>P19.02↵</td><td>P2 Pressure</td><td>Analog Input 2 sub menu</td></tr>
</table>

	P19.02.03	MEASURE Offset	Analog Input 2 Offset Calibration
	P19.02.04	MEASURE Range	Analog Input 2 Range Calibration
	P19.03↵	T1 Temperature	Analog Input 3 sub menu
	P19.03.01	MEASURE Offset	Analog Input 3 Offset Calibration
	P19.04↵	T2 Temperature	Analog Input 4 sub menu
	P19.04.01	MEASURE Offset	Analog Input 4 Offset Calibration
P20 **Diagnostics**	**Airmaster™ Diagnostics**		
	P20.01	Analog Input 1 (current)	Analog Input 1 Raw Value → 4 - 20mA signal is visualized
	P20.02	Analog Input 1 (voltage)	Analog Input 1 Raw Value → 0 – 10V signal is visualized
	P20.03	Analog Input 2 (current)	Analog Input 2 Raw Value → 4 - 20mA signal is visualized
	P20.04	Analog Input 2 (voltage)	Analog Input 2 Raw Value → 0 – 10V signal is visualized
	P20.05	Analog Input 3 (resistive)	Analog Input 3 Raw Value → Ohms signal is visualized
	P20.06	Analog Input 4 (resistive)	Analog Input 4 Raw Value → Ohms signal is visualized
	P20.07	Analog Output	Analog Output Value → 4 - 20mA signal is visualized
	P20.08	Digital Input 1	Status of DI1
	P20.09	Digital Input 2	Status of DI2
	P20.10	Digital Input 3	Status of DI3
	P20.11	Digital Input 4	Status of DI4
	P20.12	Digital Input 5	Status of DI5
	P20.13	Digital Input 6	Status of DI6
	P20.14	Digital Input 7	Status of DI7
	P20.15	Digital Input 8	Status of DI8
	P20.16	Digital Input 9	Status of DI9
	P20.17	Relay Output 1	Status of R1 – to change the Relay Output state the controller need to be in “READY TO START” or “STOPPED” State
	P20.18	Relay Output 2	Status of R2 – to change the Relay Output state the controller need to be in “READY TO START” or “STOPPED” State
	P20.19	Relay Output 3	Status of R3 – to change the Relay Output state the controller need to be in “READY TO START” or “STOPPED” State
	P20.20	Relay Output 4	Status of R4 – to change the Relay Output state the controller need to be in “READY TO START” or “STOPPED” State
	P20.21	Relay Output 5	Status of R5 – to change the Relay Output state the controller need to be in “READY TO START” or “STOPPED” State
	P20.22	Relay Output 6	Status of R6 – to change the Relay Output state the controller need to be in “READY TO START” or “STOPPED” State
	P20.23	Relay Output 7	Status of R7 – to change the Relay Output state the controller need to be in “READY TO START” or “STOPPED” State
	P20.24	Relay Output 8	Status of R8 – to change the Relay Output state the controller need to be in “READY TO START” or “STOPPED” State

P20 **Diagnostics**	P20.25	Relay Output 9	Status of R9 – to change the Relay Output state the controller need to be in “READY TO START” or “STOPPED” State Only available on FORM 10 controllers
	P20.26	Relay Output 10	Status of R10 – to change the Relay Output state the controller need to be in “READY TO START” or “STOPPED” State Only available on FORM 10 controllers
	P20.27	Supply Voltage Ai/Di	Is the supply voltage for the Analog Inputs (X05/X06) and Digital Inputs (X03)
	P20.28	Main CT1	0 – 100 mA value from main motor CT1 (X07)
	P20.29	Main CT2	0 – 100 mA value from main motor CT2 (X07)
	P20.30	Main CT3	0 – 100 mA value from main motor COM (X07)
	P20.31	Fan CT	0 – 20 mA value from fan motor CT1 (X07)
	P20.32	L1 Voltage	Line voltage on L1
	P20.33	L2 Voltage	Line voltage on L2
	P20.34	L3 Voltage	Line voltage on L3
	P20.35↵	Power Factor Main	
	P20.35.01	Power Factor Main	
	P20.35.02	Cos(phi) CT1	
	P20.35.03	Cos(phi) CT2	
	P20.35.04	Cos(phi) CT3	
	P20.35.05	Distortion factor CT1	Is relevant for VSD machines. On LOAD/OFFLOAD machines, the distortion factor is almost 1 in most cases.
	P20.35.06	Distortion factor CT2	Is relevant for VSD machines. On LOAD/OFFLOAD machines, the distortion factor is almost 1 in most cases.
	P20.35.07	Distortion factor CT3	Is relevant for VSD machines. On LOAD/OFFLOAD machines, the distortion factor is almost 1 in most cases.
	P20.36↵	Power Factor Fan	
	P20.36.01	Power Factor Fan	
	P20.36.02	Cos(phi) CT1	
	P20.35.03	Distortion factor	Is relevant for VSD machines. On LOAD/OFFLOAD machines, the distortion factor is almost 1 in most cases.
	P20.37	L1 Frequency	Hz
	P20.38	L2 Frequency	Hz
	P20.39	L3 Frequency	Hz
	P20.40	L1 Phase angle	º (0º nominal)
	P20.41	L2 Phase angle	º (120º nominal)
	P20.42	L3 Phase angle	º (240º nominal)
	P20.43	Key Switch test	Press ‘ENTER’ to perform key switch test
	P20.44	LED test	Only available if LED option fitted ON: LED’s are sequentially illuminated in a continuous cycle until ‘OFF’ is selected.
	P20.45↵	IO Extension	
	P20.45.01	Analog Input 5 (current)	Analog Input 5 Raw Value → 4 - 20mA signal is visualized
	P20.45.02	Analog Input 5 (voltage)	Analog Input 5 Raw Value → 0 – 10V signal is visualized
	P20.45.03	Analog Input 6 (current)	Analog Input 6 Raw Value → 4 - 20mA signal is visualized
	P20.45.04	Analog Input 6 (voltage)	Analog Input 6 Raw Value → 0 – 10V signal is visualized
	P20.45.05	Analog Input 7 (resistive)	Analog Input 7 Raw Value → Ohms signal is visualized

P20 **Diagnostics**	P20.45.06	Analog Input 8 (resistive)	Analog Input 8 Raw Value → Ohms signal is visualized
	P20.45.07	Digital Input 10	Status of DI10
	P20.45.08	Digital Input 11	Status of DI11
	P20.45.09	Digital Input 12	Status of DI12
	P20.45.10	Digital Input 13	Status of DI13
	P20.45.11	Digital Input 14	Status of DI14
	P20.45.12	Digital Input 15	Status of DI15
	P20.45.13	Digital Input 16	Status of DI16
	P20.45.14	Digital Input 17	Status of DI17
	P20.45.15	Relay Output 11	Status of R11 – to change the Relay Output state the controller need to be in “READY TO START” or “STOPPED” State
	P20.45.16	Relay Output 12	Status of R12 – to change the Relay Output state the controller need to be in “READY TO START” or “STOPPED” State
	P20.45.17	Relay Output 13	Status of R13 – to change the Relay Output state the controller need to be in “READY TO START” or “STOPPED” State
	P20.45.18	Relay Output 14	Status of R14 – to change the Relay Output state the controller need to be in “READY TO START” or “STOPPED” State
	P20.46↵	XPM1-Ai4	
	P20.46.01	Analog Input 1 (current)	Analog Input 1 Raw Value → 4 - 20mA signal is visualized
	P20.46.02	Analog Input 1 (voltage)	Analog Input 1 Raw Value → 0 – 10V signal is visualized
	P20.46.03	Analog Input 1 (resistive)	Analog Input 1 Raw Value → Ohms signal is visualized
	P20.46.04	Analog Input 2 (current)	Analog Input 1 Raw Value → 4 - 20mA signal is visualized
	P20.46.05	Analog Input 2 (voltage)	Analog Input 1 Raw Value → 0 – 10V signal is visualized
	P20.46.06	Analog Input 2 (resistive)	Analog Input 1 Raw Value → Ohms signal is visualized
	P20.46.07	Analog Input 3 (current)	Analog Input 1 Raw Value → 4 - 20mA signal is visualized
	P20.46.08	Analog Input 3 (voltage)	Analog Input 1 Raw Value → 0 – 10V signal is visualized
	P20.46.09	Analog Input 3 (resistive)	Analog Input 1 Raw Value → Ohms signal is visualized
	P20.46.10	Analog Input 4 (current)	Analog Input 1 Raw Value → 4 - 20mA signal is visualized
	P20.46.11	Analog Input 4 (voltage)	Analog Input 1 Raw Value → 0 – 10V signal is visualized
	P20.46.12	Analog Input 4 (resistive)	Analog Input 1 Raw Value → Ohms signal is visualized
	P20.47↵	XPM-Di8R4	
	P20.47.01	Digital Input 1	Status of DI1
	P20.47.02	Digital Input 2	Status of DI2
	P20.47.03	Digital Input 3	Status of DI3
	P20.47.04	Digital Input 4	Status of DI4
	P20.47.05	Digital Input 5	Status of DI5
	P20.47.06	Digital Input 6	Status of DI6
	P20.47.07	Digital Input 7	Status of DI7
	P20.47.08	Digital Input 8	Status of DI8
	P20.47.09	Relay Output 1	Status of R1 – to change the Relay Output state the controller need to be in “READY TO START” or “STOPPED” State

	P20.47.10	Relay Output 2	Status of R2 – to change the Relay Output state the controller need to be in “READY TO START” or “STOPPED” State
	P20.47.11	Relay Output 3	Status of R3 – to change the Relay Output state the controller need to be in “READY TO START” or “STOPPED” State
	P20.47.12	Relay Output 4	Status of R4 – to change the Relay Output state the controller need to be in “READY TO START” or “STOPPED” State
21 **Run Schedule**	**Airmaster™ Run Schedule** Real Time Clock Schedule Automation Functions		
	P21.01	Run Schedule	Activate (ON) or Deactivate (OFF) the Run schedule
	P21.02↵	Workday Edit	Here you tell if the days are weekend or workdays, this can only be set via Control Studio.
	P21.02.01	Monday	Workday or Weekend
	P21.02.02	Tuesday	Workday or Weekend
	P21.02.03	Wednesday	Workday or Weekend
	P21.02.04	Thursday	Workday or Weekend
	P21.02.05	Friday	Workday or Weekend
	P21.02.06	Saturday	Workday or Weekend
	P21.02.07	Sunday	Workday or Weekend
	P21.03	Parameter Reset	To reset all active schedules you have programmed starting from P21.04
	P21.04↵	Schedule Entry	Schedule Entry sub menu Schedule entries are arranged chronologically. When a schedule entry is implemented it is removed, if it is a set date/time, or re-scheduled, if it is a cycling repeat entry (for example: every Working Day); the schedule is then chronologically re-arranged.
	P21.04.01↵	Frequency	OFF, Every Monday, Every Tuesday, Every Wednesday, Every Thursday, Every Friday, Every Saturday, Every Sunday, Every Day, Every Workday, Weekend or user ‘Configured Date’
	P21.04.02	Function	Press ‘ENTER’ Use ‘UP’ or ‘DOWN’ keys to select between… DFLT PH/PL in this case we will use the load and offload setting from P10.03 Load pressure and P10.04 Offload pressure. Note: this function does not start the machine when stopped SCHED PH/PL in this case we will use the load and offload setting who have been set in P21. Note: this function does not start the machine when stopped Device Standby in this case the compressor will be forced to start the offload run timer before the compressor will go into standby mode. Run DFLT PH/PL in this case, when the compressor is in a Ready to start state the Run schedule will start the compressor and will use the load and offload setting from P10.03 Load pressure and P10.04 Offload pressure Run SCH PH/PL in this case, when the compressor is in a Ready to start state the Run schedule will start the compressor and will use the load and offload setting who have been set in P21. Stop Device in this case the controller will stop the compressor (start the stop time) once the stop time has each 0 seconds the controller will go into the Ready to start state. (the machine must be manually re-started)

P21 **Run Schedule**	P21.04.03	Load Pressure	Schedule Load Pressure SCHD PL
	P21 04.04	Off Load Pressure	Schedule Unload Pressure SCHD PH
	P21.04.05	Date	Only visible if Frequency = 'Configured Date'
	P21.04.06	Time	Time when schedule need to start
	P21.04.07	Save Changes	Press 'ENTER' to store the configured values in P21.04.01 to P21.04.07 to permanent memory. Note: To save changes, this action must be taken before exiting the sub-menu
	P21.05↵ … P21.31↵	P21.05↵ … P21.31↵	Schedule Entry 2 to 28 Sub Menus see P21.04.01… P21.04.07 for each schedule entry sub menu
P22 **Modbus Fan Control (VSD)**	**Airmaster™ Modbus Fan Control (VSD)**		
	P22.01	Slave Address	FAN drive communications node address
	P22.02	Start Temperature	Temperature setpoint when FAN needs to be activated.
	P22.03	Target Temperature	Target Temperature setting is the point where the FAN drive will start to regulate between his minimum speed and maximum speed. Once the temperature goes above the Target Temperature setting the FAN drive will regulate between max and min speed. When the temperature goes below the Target Temperature, the FAN drive will run at MAX speed.
	P22.04	VSD Control Mode	VAR Speed CTRL = Variable Speed Control regulation (default) Fixed Speed CTRL = Fixed Speed Control regulation = LOAD/OFFLOAD compressor
	P22.05	VSD Max speed	VSD maximum speed. In HZ Step = 1 Hz
	P22.06	VSD Min speed	VSD minimum speed. In Hz Step = 1 Hz
	P22.07	Speed RPM	Variable speed drive speed in RPM; no edit, view only
	P22.08	VSD P Factor	VSD PID control - Proportional Factor 0 to 100
	P22.09	VSD I Factor	VSD PID control - Integration Factor 0 to 100
	P22.10	VSD D Factor	VSD PID control - Derivative Factor 0 and 100
	P22.11	Speed %	Variable speed drive percent maximum speed; no edit, view only
	P22.12	VSD Max RMP rate	Variable speed drive maximum ramp rate. Value between 0.5 to 10.0 With 0.5 slow ramp rate and 10 fast ramp rate.
	P22.13	Drive Table	Via the Drive Table parameter you can select the drive/inverter configuration you want to use. The drive configuration need to be created by DRIVE TOOL 2.0 or higher version (available in CS 4.3.0.0) The Drive Table can show up to MAX 10 different configuration for a drive/inverter.

P23 **Modbus VSD Info**	**Airmaster™ Modbus VSD info** Main and Fan can communicate via MODBUS (via drive configurator tool) Data we read out from the drive are visualized in this page. **Note** : In order to see P23.01 a drive configurator file need to be send + P10.01 need to be set as Variable speed.		
	P23.01↵	VSD speed % main MTR	
	P23.01.01	Modbus INV speed	Modbus Inverter speed reading from drive in – Hz
	P23.01.02	Modbus INV bus V	Modbus Inverter bus Voltage reading from drive in – V
	P23.01.03	Modbus INV OUT V	Modbus Inverter Output Voltage reading from drive in – V
	P23.01.04	Modbus INV CURR	Modbus Inverter Current in reading from drive in – A
	P23.01.05	Modbus INV power	Modbus Inverter power reading from drive in – KW
	P23.01.06	Modbus INV FLT	Modbus Inverter Fault reading from drive – value is expect to be the same as on drive.
	P23.01.07	Modbus INV Warning	Modbus Inverter Warning reading from drive – value is expect to be the same as on drive.
	P23.01.08	Modbus INV CUST 1	Modbus Inverter Custom1 reading from drive in – User can select whatever they want to visualize.
	P23.01.09	Modbus INV CUST 2	Modbus Inverter Custom2 reading from drive in – User can select whatever they want to visualize.
	P23.02↵	VSD speed % fan MTR	
	P23.02.01	Modbus INV speed	Modbus Inverter speed reading from drive in – Hz
	P23.02.02	Modbus INV bus V	Modbus Inverter bus Voltage reading from drive in – V
	P23.02.03	Modbus INV OUT V	Modbus Inverter Output Voltage reading from drive in – V
	P23.02.04	Modbus INV CURR	Modbus Inverter Current in reading from drive in – A
	P23.02.05	Modbus INV power	Modbus Inverter power reading from drive in – KW
	P23.02.06	Modbus INV FLT	Modbus Inverter Fault reading from drive – value is expect to be the same as on drive.
	P23.02.07	Modbus INV Warning	Modbus Inverter Warning reading from drive – value is expect to be the same as on drive.
	P23.02.08	Modbus INV CUST 1	Modbus Inverter Custom1 reading from drive in – User can select whatever they want to visualize.
	P23.02.09	Modbus INV CUST 2	Modbus Inverter Custom2 reading from drive in – User can select whatever they want to visualize.
P24 **IO Extension**	**Airmaster™ IO Extension** **Note:** When configuring I/O assignments in menu P18 the associated functions in the respective menus must also be enabled. For example: if digital input 2 (P18.10) is configured for 'Oil Filter DP warning' the 'Oil Filter DP warning' function in menu (P16.21.01) must also be enabled. De-enegise = no output, OFF; Energise = output to energise relay coil, ON The coil of a relay (external to the controller), with a coil energise current no greater than 20mA, can be connected to the analogue output terminals.		
	P24.01	ANA IN 5 FUNCT	Analog Input 5 Function – Can be set OFF Selection: Internal Pressure – Inlet Vacuum – Oil Pressure – Oil Filter DP
	P24.02	ANA input 5 type	Analog input 5 type: 4 – 20mA or 0 – 10V
	P24.03	ANA IN 6 FUNCT	Analog Input 6 Function – Can be set OFF

			Selection : Internal Pressure – Inlet Vacuum – Oil Pressure – Oil Filter DP
P24 **IO Extension**	P24.04	ANA input 6 type	Analog input 6 type: 4 – 20mA or 0 – 10V
	P24.05	ANA IN 7 FUNCT	Analog Input 7 Function – Can be set OFF Selection between : Temperature – Dryer Temp – EQUIP INT TEMP – Ambient T° - Oil Temperature – Delivery Temperature – Oil Cooler Discharge – After Cooler Discharge
	P24.06	ANA input 7 type	Analog input 7 type: PT100 – PT1000 – KTY – NTC
	P24.07	ANA IN 8 FUNCT	Analog Input 8 Function – Can be set OFF Selection between : Temperature – Dryer Temp – EQUIP INT TEMP – Ambient T° - Oil Temperature – Delivery Temperature – Oil Cooler Discharge – After Cooler Discharge
	P24.08	ANA input 8 type	Analog input 8 type: PT100 – PT1000 – KTY – NTC
	P24.09	DI10 function	See function of DI2 function (P18.10)
	P24.10↵	DI10: CONFIG	
	P24.10.01	DI10 OK: NO/NC	Configure input for 'Normally OPEN' or 'Normally CLOSED' Note: if set for (Open) feature will activate when input is CLOSED circuit, if set for (Closed) feature will activate when input is OPEN circuit.
	P24.10.02	Signal delay	Signal delay on the warning or Immediate stop ON or OFF MIN = 0,1 sec MAX = 900 sec
	P24.11	DI11 function	See function of DI2 function (P18.10)
	P24.12↵	DI11: CONFIG	
	P24.12.01	DI11 OK: NO/NC	Configure input for 'Normally OPEN' or 'Normally CLOSED' Note: if set for (Open) feature will activate when input is CLOSED circuit, if set for (Closed) feature will activate when input is OPEN circuit.
	P24.12.02	Signal delay	Signal delay on the warning or Immediate stop ON or OFF MIN = 0,1 sec MAX = 900 sec
	P24.13	DI12 function	See function of DI2 function (P18.10)
	P24.14↵	DI12: CONFIG	
	P24.14.01	DI12 OK: NO/NC	Configure input for 'Normally OPEN' or 'Normally CLOSED' Note: if set for (Open) feature will activate when input is CLOSED circuit, if set for (Closed) feature will activate when input is OPEN circuit.
	P24.14.02	Signal delay	Signal delay on the warning or Immediate stop ON or OFF MIN = 0,1 sec

			MAX = 900 sec
P24 **IO Extension**	P24.15	DI13 function	See function of DI2 function (P18.10)
	P24.16↵	DI13: CONFIG	
	P24.16.01	DI13 OK: NO/NC	Configure input for 'Normally OPEN' or 'Normally CLOSED' Note: if set for (Open) feature will activate when input is CLOSED circuit, if set for (Closed) feature will activate when input is OPEN circuit.
	P24.16.02	Signal delay	Signal delay on the warning or Immediate stop ON or OFF MIN = 0,1 sec MAX = 900 sec
	P24.17	DI14 function	See function of DI2 function (P18.10)
	P24.18↵	DI14: CONFIG	
	P24.18.01	DI14 OK: NO/NC	Configure input for 'Normally OPEN' or 'Normally CLOSED' Note: if set for (Open) feature will activate when input is CLOSED circuit, if set for (Closed) feature will activate when input is OPEN circuit.
	P24.18.02	Signal delay	Signal delay on the warning or Immediate stop ON or OFF MIN = 0,1 sec MAX = 900 sec
	P24.19	DI15 function	See function of DI2 function (P18.10)
	P24.20↵	DI15: CONFIG	
	P24.20.01	DI15 OK: NO/NC	Configure input for 'Normally OPEN' or 'Normally CLOSED' Note: if set for (Open) feature will activate when input is CLOSED circuit, if set for (Closed) feature will activate when input is OPEN circuit.
	P24.20.02	Signal delay	Signal delay on the warning or Immediate stop ON or OFF MIN = 0,1 sec MAX = 900 sec
	P24.21	DI16 function	See function of DI2 function (P18.10)
	P24.22↵	DI16: CONFIG	
	P24.22.01	DI16 OK: NO/NC	Configure input for 'Normally OPEN' or 'Normally CLOSED' Note: if set for (Open) feature will activate when input is CLOSED circuit, if set for (Closed) feature will activate when input is OPEN circuit.
	P24.22.02	Signal delay	Signal delay on the warning or Immediate stop ON or OFF MIN = 0,1 sec MAX = 900 sec
	P24.23	DI17 function	See function of DI2 function (P18.10)
	P24.24↵	DI17: CONFIG	
	P24.24.01	DI17 OK: NO/NC	Configure input for 'Normally OPEN' or 'Normally CLOSED' Note: if set for (Open) feature will activate when input is CLOSED circuit, if set for (Closed) feature will activate when input is OPEN circuit.

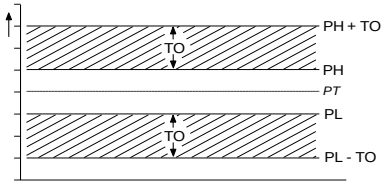
	P24.24.02	Signal delay	Signal delay on the warning or Immediate stop ON or OFF MIN = 0,1 sec MAX = 900 sec
	P24.25	Relay 11 function	See function of Relay function1 function (P18.26)
	P24.26	Relay 12 function	See function of Relay function1 function (P18.26)
	P24.27	Relay 13 function	See function of Relay function1 function (P18.26)
	P24.28	Relay 14 function	See function of Relay function1 function (P18.26)
P25 **IO Sensor Config**	**Airmaster™ Sensor Configuration and Calibration of the IO extension module** **Caution: Incorrect sensor configuration and/or calibration will degrade performance and disrupt related safety features and functions.**		
	P25.01↵	Analog Input 5	Analog Input 5 sub menu
	P25.01.03	MEASURE Offset	Analog Input 5 Offset Calibration
	P25.01.04	MEASURE Range	Analog Input 5 Range Calibration
	P25.02↵	Analog Input 6	Analog Input 6 sub menu
	P25.02.03	MEASURE Offset	Analog Input 6 Offset Calibration
	P25.02.04	MEASURE Range	Analog Input 6 Range Calibration
	P25.03↵	Analog Input 7	Analog Input 7 sub menu
	P25.03.01	MEASURE Offset	Analog Input 7 Offset Calibration
	P25.04↵	Analog Input 8	Analog Input 8 sub menu
	P25.04.01	MEASURE Offset	Analog Input 8 Offset Calibration
P26 **RS485 Extension**	**Airmaster™ RS485 communication port Extension Configuration** **Note :** P26.01 RS485: X14 CONFIG will only be visible if the IO Extension module or IoT module or RS485 Extension module is FIT on the FORM controller and when P10.10 Extension module has been set correctly. P26.02 RS485: X15 CONFIG will only be visible if the RS485 Extension module is fit on the FORM controller and when P10.10 Extension module has been set to RS485 module.		
	P26.01↵	RS485: X14 CONFIG	Press ‘ENTER’ to enter the RS485: X14 configuration sub menu
	P26.01.01	RS485: X14 CONFIG	MODBUS Master or MODBUS Slave (default = Airbus485)
	P26.01.02	MODBUS Baud Rate	2400, 4800, 9600, 14400, 19200, 38400, 57600, 115200 (default = 57600)
	P26.01.03	MODBUS Parity	‘none’, ‘odd’, ‘even’ (default = None)
	P26.01.04	MODBUS DATA Bits	8
	P26.01.05	MODBUS End Bits	1
	P26.01.06	X14 Address	1 – 127

	P26.01.07	X14 Diagnostic	This is to check the stability of the communication. When the controller detects a message, who have been received or sent correctly the value will increase. Note: To set the value back to 0 a power cycle of the FORM controller is required.
	P26.01.08	X14 Errors	This is to check the stability of the communication. When the controller detects a bad message, who have been received or sent the value will increase. Note: To set the value back to 0 a power cycle of the FORM controller is required.
	P26.02↵	RS485: X15 CONFIG	Press 'ENTER' to enter the RS485: X15 configuration sub menu
	P26.02.01	RS485: X15 CONFIG	MODBUS Master or MODBUS Slave (default = Airbus485)
	P26.02.02	MODBUS Baud Rate	2400, 4800, 9600, 14400, 19200, 38400, 57600, 115200 (default = 57600)
	P26.02.03	MODBUS Parity	'none', 'odd', 'even' (default = None)
	P26.02.04	MODBUS DATA Bits	8
	P26.02.05	MODBUS End Bits	1
	P26.02.06	X15 Address	1 – 127
	P26.02.07	X15 Diagnostic	This is to check the stability of the communication. When the controller detects a message, who have been received or sent correctly the value will increase. Note: To set the value back to 0 a power cycle of the FORM controller is required.
	P26.02.08	X15 Errors	This is to check the stability of the communication. When the controller detects a bad message, who have been received or sent the value will increase. Note: To set the value back to 0 a power cycle of the FORM controller is required.
P27 **IoT Settings**	**Airmaster™ IoT module configuration** This menu is intended to configure the IP settings of the IoT module (DHCP or Static IP) and to activate the CS over LAN function.		
	P27.01↵	IP Settings	Shows the IP address of the IoT module (same IP of P06.21.02)
	P27.01.01	Network Protocol	DHCP : **DHCP (Dynamic Host Configuration Protocol)** Allow the controller to automatically receive an IP address from the Local Area Network (LAN) Static IP : Allow the controller to have a Fixed IP address on the Local Area Network (LAN)
	P27.01.02	IP address	When DHCP is not enabled, setpoint sets the IP address of the controller
	P27.01.03	Subnet	When DHCP is not enabled, setpoint for the subnet mask
	P27.01.04	Gateway	When DHCP is not enabled, setpoint for the default gateway
	P27.01.05	DNS server	When DHCP is not enabled, setpoint for the DNS server
	P27.01.06	Save Changes	Save Changes – will save the settings that have been done on P27
	P27.01.07	Reset	Reset – will reactivate the last saved changes.
	P27.02	Remote access enabled	OFF = Disable the function to connection CS over LAN on the IoT module. ON = Enable the function to connection CS over LAN on the IoT module.
P28 **I/O XPM**	**Airmaster™ I/O XPM** **Note:** When configuring I/O assignments in menu P18 the associated functions in the respective menus must also be enabled. For example: if digital input 2 (P18.10) is configured for 'Oil Filter DP warning' the 'Oil Filter DP warning' function in menu (P16.21.01) must also be enabled. De-energise = no output, OFF; Energise = output to energise relay coil, ON		

P28 **I/O XPM**	The coil of a relay (external to the controller), with a coil energise current no greater than 20mA, can be connected to the analogue output terminals.		
	P28.01	ANA IN 1 FUNCT	Analog Input 1 Function – Can be set OFF Selection : Internal Pressure – Inlet Vacuum – Oil Pressure – Oil Filter DP - Temperature – Dryer Temp – EQUIP INT TEMP – Ambient T° - Oil Temperature – Delivery Temperature – Oil Cooler Discharge – After Cooler Discharge
	P28.02	ANA input 1 type	Analog input 1 type: 4 – 20mA or 0 – 10V or PT100 or PT1000 or KTY
	P28.03	ANA IN 2 FUNCT	Analog Input 6 Function – Can be set OFF Selection : Internal Pressure – Inlet Vacuum – Oil Pressure – Oil Filter DP - Temperature – Dryer Temp – EQUIP INT TEMP – Ambient T° - Oil Temperature – Delivery Temperature – Oil Cooler Discharge – After Cooler Discharge
	P28.04	ANA input 2 type	Analog input 2 type: 4 – 20mA or 0 – 10V or PT100 or PT1000 or KTY
	P28.05	ANA IN 3 FUNCT	Analog Input 3 Function – Can be set OFF Selection between : Internal Pressure – Inlet Vacuum – Oil Pressure – Oil Filter DP - Temperature – Dryer Temp – EQUIP INT TEMP – Ambient T° - Oil Temperature – Delivery Temperature – Oil Cooler Discharge – After Cooler Discharge
	P28.06	ANA input 3 type	Analog input 3 type: 4 – 20mA or 0 – 10V or PT100 or PT1000 or KTY
	P28.07	ANA IN 4 FUNCT	Analog Input 4 Function – Can be set OFF Selection between : Internal Pressure – Inlet Vacuum – Oil Pressure – Oil Filter DP - Temperature – Dryer Temp – EQUIP INT TEMP – Ambient T° - Oil Temperature – Delivery Temperature – Oil Cooler Discharge – After Cooler Discharge
	P28.08	ANA input 4 type	Analog input 4 type: 4 – 20mA or 0 – 10V or PT100 or PT1000 or KTY
	P28.09	DI1 function	See function of DI2 function (P18.10)
	P28.10	DI1: CONFIG	
	P28.10.01	DI1 OK: NO/NC	Configure input for ‘Normally OPEN’ or ‘Normally CLOSED’ Note: if set for (Open) feature will activate when input is CLOSED circuit, if set for (Closed) feature will activate when input is OPEN circuit.
	P28.10.02	Signal delay	Signal delay on the warning or Immediate stop ON or OFF MIN = 0,1 sec MAX = 900 sec
	P28.11	DI2 function	See function of DI2 function (P18.10)
	P28.12	DI2: CONFIG	
	P28.12.01	DI2 OK: NO/NC	Configure input for ‘Normally OPEN’ or ‘Normally CLOSED’ Note: if set for (Open) feature will activate when input is CLOSED circuit, if set for (Closed) feature will activate when input is OPEN circuit.
	P28.12.02	Signal delay	Signal delay on the warning or Immediate stop ON or OFF MIN = 0,1 sec

			MAX = 900 sec
	P28.13	DI3 function	See function of DI2 function (P18.10)
	P18.14	DI3: CONFIG	
	P28.14.01	DI3 OK: NO/NC	Configure input for 'Normally OPEN' or 'Normally CLOSED' Note: if set for (Open) feature will activate when input is CLOSED circuit, if set for (Closed) feature will activate when input is OPEN circuit.
	P28.14.02	Signal delay	Signal delay on the warning or Immediate stop ON or OFF MIN = 0,1 sec MAX = 900 sec
	P28.15	DI4 function	See function of DI2 function (P18.10)
	P28.16	DI4: CONFIG	
	P28.16.01	DI4 OK: NO/NC	Configure input for 'Normally OPEN' or 'Normally CLOSED' Note: if set for (Open) feature will activate when input is CLOSED circuit, if set for (Closed) feature will activate when input is OPEN circuit.
	P28.16.02	Signal delay	Signal delay on the warning or Immediate stop ON or OFF MIN = 0,1 sec MAX = 900 sec
	P28.17	DI5 function	See function of DI2 function (P18.10)
	P28.18	DI5: CONFIG	
P28 **I/O XPM**	P28.18.01	DI5 OK: NO/NC	Configure input for 'Normally OPEN' or 'Normally CLOSED' Note: if set for (Open) feature will activate when input is CLOSED circuit, if set for (Closed) feature will activate when input is OPEN circuit.
	P28.18.02	Signal delay	Signal delay on the warning or Immediate stop ON or OFF MIN = 0,1 sec MAX = 900 sec
	P28.19	DI6 function	See function of DI2 function (P18.10)
	P28.20	DI6: CONFIG	
	P28.20.01	DI6 OK: NO/NC	Configure input for 'Normally OPEN' or 'Normally CLOSED' Note: if set for (Open) feature will activate when input is CLOSED circuit, if set for (Closed) feature will activate when input is OPEN circuit.
	P28.20.02	Signal delay	Signal delay on the warning or Immediate stop ON or OFF MIN = 0,1 sec MAX = 900 sec
	P28.21	DI7 function	See function of DI2 function (P18.10)
	P28.22	DI7: CONFIG	
	P28.22.01	DI7 OK: NO/NC	Configure input for 'Normally OPEN' or 'Normally CLOSED' Note: if set for (Open) feature will activate when input is CLOSED circuit, if set for (Closed) feature will activate when input is OPEN circuit.

	P28.22.02	Signal delay	Signal delay on the warning or Immediate stop ON or OFF MIN = 0,1 sec MAX = 900 sec
	P28.23	DI8 function	See function of DI2 function (P18.10)
	P28.24	DI8: CONFIG	
	P28.24.01	DI8 OK: NO/NC	Configure input for 'Normally OPEN' or 'Normally CLOSED' Note: if set for (Open) feature will activate when input is CLOSED circuit, if set for (Closed) feature will activate when input is OPEN circuit.
	P28.24.02	Signal delay	Signal delay on the warning or Immediate stop ON or OFF MIN = 0,1 sec MAX = 900 sec
	P28.25	Relay 1 function	See function of Relay function1 function (P18.26)
	P28.26	Relay 2 function	See function of Relay function1 function (P18.26)
	P28.27	Relay 3 function	See function of Relay function1 function (P18.26)
	P28.28	Relay 4 function	See function of Relay function1 function (P18.26)
P29 **I/O XPM sensor config**	**Airmaster™ Sensor Configuration and Calibration of the IO XPM module** **Caution: Incorrect sensor configuration and/or calibration will degrade performance and disrupt related safety features and functions.**		
	P29.01	Analog Input 1	Analog Input 1 sub menu
	P29.01.01	MEASURE Offset	Analog Input 1 Offset Calibration (°C)
	P29.01.03	MEASURE Offset	Analog Input 1 Offset Calibration ((BAR)
	P29.01.04	MEASURE Range	Analog Input 1 Range Calibration (BAR)
	P29.01.06	MEASURE Range	Analog Input 1 Range Calibration (°C)
	P29.02	Analog Input 2	Analog Input 2 sub menu
	P29.02.01	MEASURE Offset	Analog Input 2 Offset Calibration (°C)
	P29.02.03	MEASURE Offset	Analog Input 2 Offset Calibration ((BAR)
	P29.02.04	MEASURE Range	Analog Input 2 Range Calibration (BAR)
	P29.02.06	MEASURE Range	Analog Input 2 Range Calibration (°C)
	P29.03	Analog Input 3	Analog Input 3 sub menu
	P29.03.01	MEASURE Offset	Analog Input 3 Offset Calibration (°C)
	P29.03.03	MEASURE Offset	Analog Input 3 Offset Calibration ((BAR)
	P29.03.04	MEASURE Range	Analog Input 3 Range Calibration (BAR)
	P29.03.06	MEASURE Range	Analog Input 3 Range Calibration (°C)
	P29.04	Analog Input 4	Analog Input 4 sub menu
	P29.04.01	MEASURE Offset	Analog Input 4 Offset Calibration (°C)
	P29.04.03	MEASURE Offset	Analog Input 4 Offset Calibration ((BAR)
	P29.04.04	MEASURE Range	Analog Input 4 Range Calibration (BAR)

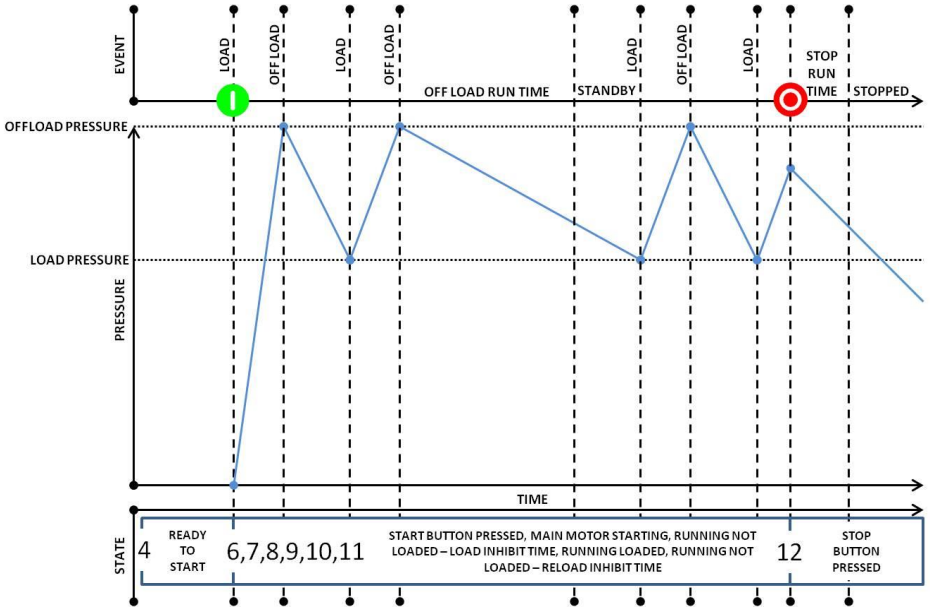
	P29.04.06	MEASURE Range	Analog Input 4 Range Calibration (°C)
P40/44 **User DEF Menu Pages**	**Airmaster™ User DEF Page 1 to 5** **Custom page that can be created via CS – Custom page Configurator.**		
	P40.01↵ . . . P44.01↵		
P80 **ISC (Integrated System Control)**	**Airmaster™ ISC (Integrated System Management 'Sequence' Control)** Compatible with Airmaster™ controllers equipped with Airbus485™ Note: Only visible when P12.11 ISC available is set to ON.		
	P80.01	ISC Enabled	
	P80.02	Offload Pressure	ISC Control Unload Pressure PH
	P80.03	Load Pressure	ISC Control Load Pressure PL
	P80.04	ISC Rotate INT	ISC Rotation Interval 1 – 180 hours (Default = 12 hours)
P81 **ISC (Integrated System Control**			
	P81.01	ISC # compressors	Number of compressors
	P81.02	ISC Start Delay	Staggered Start Delay Time 0 to 60 seconds (Default = 3 seconds Delay between starting compressors where more than one compressor needs to be started at the same time.
	P81.03	ISC Damping	Damping (Response Timing) 0.1 to 10 (Default = 1.0) 0.1 = 10 times faster than default 10 = 10 times slower than default.
	P81.04↵	ISC XPM Pressure	ISC XPM Pressure sub menu
	P81.04.01	MEASURE Offset	Pressure Sensor Offset Calibration
	P81.04.02	MEASURE Range	Pressure Sensor Range Calibration
	P81.05	ISC PRESS SENS	OFF: use equipment delivery/outlet pressure sensor ON: use ISC XPM Pressure Sensor
	P81.06	ISC Load Tolerance	Operational Pressure Band PL to PL+TO Tolerance (TO): width of the operational pressure band 

			For fast pressure change situations: increase ‘TO’; for very slow pressure change situations: decrease ‘TO’
	P81.07	ISC Unload Tolerance	Operational Pressure Band PH to PH+TO (see P81.06 diagram)
P82 **ISC (Integrated System Control)**			
	P82.01↵	COMP1 Priority	Compressor 1 Priority (the higher the value the lower the priority)
	P82.02↵	COMP2 Priority	Compressor 2 Priority (the higher the value the lower the priority)
	P82.03↵	COMP3 Priority	Compressor 3 Priority (the higher the value the lower the priority)
	P82.04↵	COMP4 Priority	Compressor 4 Priority (the higher the value the lower the priority)
	P82.05↵	COMP5 Priority	Compressor 5 Priority (the higher the value the lower the priority)
	P82.06↵	COMP6 Priority	Compressor 6 Priority (the higher the value the lower the priority)
	P82.07↵	COMP7 Priority	Compressor 7 Priority (the higher the value the lower the priority)
	P82.08↵	COMP8 Priority	Compressor 8 Priority (the higher the value the lower the priority)

5.0 General Operation

The equipment outlet pressure regulates control once the ‘START’ button has been pressed. The Airmaster™ will perform condition checks and start if no ‘Start’ inhibit exists. If a ‘Start’ inhibit exists, a start will be prevented and an inhibit message will be displayed. If a ‘Run’ inhibit exists a start will be accepted but the Airmaster™ will immediately enter the ‘Standby’ state and an inhibit message will be displayed. The Airmaster™ will remain in the ‘Standby’ state until ‘Stopped’ or the inhibit is removed.

If a load request exists, the main motor is started in a star/delta sequence. When running in delta configuration, after the star time (configurable) has expired, the ‘Load Inhibit Time’ (configurable) prevents loading for a period of time to allow motor speed to stabilise. When the load inhibit time has expired the ‘Load Relay Output’ is energised and the equipment will load. When the ‘Unload Pressure Setting’ is reached, or a remote offload command is received, the ‘Load Relay Output’ is de-energised and the equipment will unload. The equipment will load again if outlet pressure falls to the ‘Load Pressure Setting’ or a remote load request is received. If the equipment runs in the offload condition for the ‘Offload Run Time’ (configurable) the main motor will stop and the Airmaster™ will enter the ‘Standby’ state.



When in standby, the equipment will automatically start and load again when pressure falls below the ‘Load Pressure Setting’ or a remote load request is received. In the event of a motor stop, initiated by a stop command or when entering the ‘Standby’ state, a vent time (configurable) is started. If a start request is made during the vent time the Airmaster™ will enter the Standby state until the vent time expires. If already in the Standby state and a load request is received, the Airmaster™ will remain in the Standby state until the vent time has expired. If ’Internal Pressure Detection’ is enabled, a minimum internal pressure can be defined (configurable) to prevent a motor start before internal pressure is vented. If internal pressure does not fall below the set minimum before the set vent time an alarm is generated and the Airmaster™ will immediately stop. After an offload event a ‘Re-load Inhibit Time’ (configurable) will prevent re-loading before the time expires.

Normal automated operation is ended by pressing the ‘STOP’ button, a remote stop command or in the event of an immediate stop alarm. When stopped manually, or by a remote stop command, the load relay is de-energised first, to unload the equipment, and the main motor will continue to run for the ‘Stop Run Time (configurable) before stopping.

5.1 Airmaster™ State Diagram

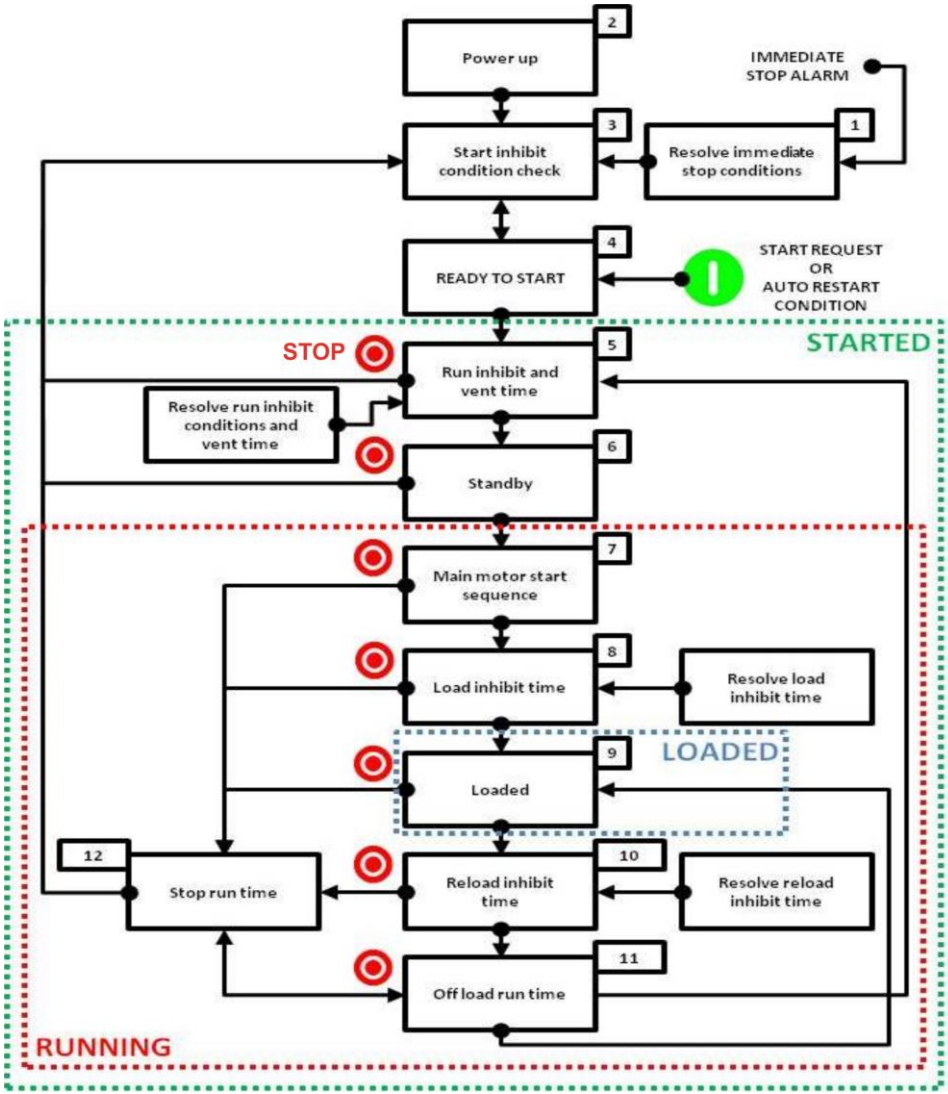
STOPPED
- 1: Fault Condition
- 2: Power-Up Initialisation
- 3: Start Inhibit
- 4: Ready to Start

STARTED
- 5: Run Inhibit / Vent Time
- 6: STANDBY

RUNNING
- 7: Motor Start
- 8: Load Inhibit

RUNNING LOADED
- 9: ON LOAD

RUNNING
- 10: Reload Inhibit
- 11: Off Load Run Time
- 12: Stop Run Time



5.2 Control Modes

Load / Off Load:

Airmaster™ loads and unloads in accordance with the set load and unload pressure set points.
If running off load for longer than the “Off Load Run Time” the Airmaster™ will stop in the ‘Standby’ state.
When in ‘Standby’ the Airmaster™ will automatically restart and load again if outlet pressure falls to the ‘Load’ pressure set point.

Continuous Run

As ‘Load / Off Load’ description except the ‘Off Load Run Time’ is ignored, the equipment will continue to run in the off load state indefinitely.

Pressure Decay / No Load

As ‘Load / Off Load’ description except the ‘Off Load Run Time’ is dynamically extended if the ‘On Load’ time is short and the number of main motor starts per hour could exceed the set permissible ‘Motor Start per Hour’ limit.

Two timers are used, ‘Run Time’ and ‘Run-On Time’.

- Run Time: the minimum time period the equipment should run in a loaded state.
- Run-On Time: the set time period the equipment will run in the off load state before stopping to Standby.

The ‘Run Time’ is determined by the main motor ‘Starts Per Hour’ limit (configurable).

If the set ‘Starts Per Hour’ limit is 4 then the ‘Run Time’ = 15 minutes (60 minutes / 4) minus the set ‘Run On Time’ such that the main motor can not start more than 4 times in any given hour period.

If the equipment runs on load for more than the ‘Run Time’:

The equipment will run off load, after unloading at the set upper pressure set point, for the set ‘Run-On Time’ before stopping to Standby.

If the equipment runs on load for less than the ‘Run Time’:

The pressure decay time (period between unloading at the upper ‘Unload’ pressure set point and the pressure decaying to the lower ‘Load’ pressure set point) of the previous load/unload cycle is taken into account:

If the ‘pressure decay’ time was longer than the ‘Run-On Time’ period:
The equipment will run off load for the ‘Run-On Time’ period before stopping to Standby.

If the ‘pressure decay’ time was less than the ‘Run-On Time’ period:
The equipment will run off load until the ‘Run Time’ has expired and will then continue to run off load for the ‘Run-On Time’ before stopping to Standby.

Dynamic No Load Control

As ‘Load / Off Load’ description except the ‘Off Load Run Time’ is dynamically determined in accordance with the number of permissible ‘Starts Per Hour’ (configurable).

The ‘Run-On Time’ period is dynamically determined to ensure the set permissible main motor ‘Starts Per Hour’ limit can not be exceeded during any given hour period.

During periods where the equipment stops to Standby infrequently, less than the set ‘Starts Per Hour’ limit (configurable), the ‘Run-On Time’ will be short.
During periods where the equipment stops to Standby frequently, and the ‘Starts Per Hour’ limit is approached, the ‘Run-On Time’ is dynamically extended so that the ‘Starts Per Hour’ limit cannot be exceeded during any given hour period.

Variable Speed

As ‘Load / Off Load’ description except the main motor speed is dynamically controlled to maintain the set ‘Load’ pressure (configurable).

When loaded main motor speed is varied, using a PID control algorithm, to maintain outlet pressure at the ‘Load’ pressure set point.
When off load main motor speed is reduced to the set ‘Off Load Speed’ (configurable).

Modulation

As ‘Load / Off Load’ description the controller will load and unload based on the pressure set points (P10)

If Modulation has been activated (P10.29) and a relay has the “Modulation” function and the system pressure is higher than the Modulation pressure (P10.30) the status of the controller will change from “Onload” into “Onload Modulation”
The result here is that the compressor will sent the outlet pressure back to the Inlet via the OPEN valve who is controlled via the relay function “modulation”.

If Modulation has been de-activated (P10.29) and a relay has the “Modulation” function and the system pressure is higher than the Modulation pressure (P10.30) the status of the controller will not change from “Onload” into “Onload Modulation”
The result here is that the compressor cannot sent the outlet pressure back to the Inlet via the CLOSED valve who is controlled via the relay function “modulation”.

Force Offload:

If P10.02 Force Offload = ON, press [Down]+[Start], while displaying the P00 menu page, to manually force the equipment offload.
The equipment will remain offload until manual released by pressing [Down]+[Start] again.

Indication:
If, for example, the controller is configured in P10.13 to use “EQUIP OUT PRESS” as load/unload source, the ‘Manual’ and ‘Set Point’ systems will alternate continuously:

 for one second,  for three seconds

The ‘Set Point’ symbol will be different if an alternative primary load source has been configured:

 EQUIP OUT PRESS,  Communications,  Digital Input,  Run Schedule

6.0 Text Abbreviations:

Abbreviation	Text	Abbreviation	Text
ACTIVE	Active or Activated	MANUF	Manufacture
ADCT	Air end (compressor) discharge temperature	MAR	March
ADV	Automatic drain valve	MAX	Maximum
AI	Analogue input	MAY	May
AIR	Air	MDL	Model
ALM	Alarm or alarm message	META	Metacentre
AMB	Ambient	MIN	Minimum
ANAL	Analogue	MIN'S	Minutes
AO	Analogue out	MMT	Measurement
APR	April	MON	Monday
AUG	August	MOD	Modulation
AUTO	Automatic	MOTOR	Motor
AVAIL	Available, already existing	MOPS	Motor overload protection switch
BRG	Bearing(s)	MPA	Mega Pascal
BELT	Belt	MPV	Minimum pressure valve
BIN	Binary	MTH	Month(s)
BUVV	Butterfly valve	NC	Normally closed
CAB	Cabinet (package enclosure)	NO	Normally open (healthy or OK)
CBV	Compressor bypass valve	NOM	Nominal
CFG	Configuration	NUM	Number
CLK	Clock	OCT	October
CLR	Cooler	OIL	Oil
CNDS	Condensate	OK	Healthy or normal
COOL	Coolant	OVLD	Overload
COMP	Compressor	OPT	Optimum
COMMS	Communications	OR	Operating range
COP	Changeover point	OP CRT	Open circuit
CO BK	Continuity break	OS	Oil separator
CO	Compressor outlet	OSD	On screen display
CONFIG	Configuration or configured	OUT	Outlet
CONT	Contactor	P#	Parameter 0, 1, 2, …
CORR	Correction	PARA	Parameter
CT	Current transmitter	PD	Package discharge
CURR	Current	PERMS	Permissible
CW	Cooling water	PLC	Pre-programmed logic controller
CWT	Cooling water temperature	PR	Pressure
DAY	Day	PRESS	Pressure
DEC	December	PROT	Protection

DEF	Default	PRV	Pressure relief valve
DI	Digital input	PSENS	Pressure sensor
DISCH	Discharge	PSWITCH	Pressure switch
DIFF	Differential	PV	Pressure vessel
DP	Differential pressure	REF	Refrigerant
DT	Differential temperature	RNG	Range
DIR	Direction	RAM	Random access memory
DO	Digital output	RB	Remote bus
DOL	Direct online	RC	Remote contact
DIR ROTO	Direction of rotation	RD	Refrigerant dryer
DELTA P	Delta pressure (pressure differential)	READY	Ready
DEL	Delivery	REF	Refrigerant
DEL PO	Delivery pressure offset	REM	Remote
DEL PR	Delivery pressure range	RPM	Revolutions per minute
DELTA T	Delta T (temperature differential)	RT	Running hours
DRN	Drain	RTC	Real time clock
Dryer	Dryer (Refrigerant dryer)	SAT	Saturday
DST	Daylight saving time	SC	Short circuit
ELEC	Electrical	SCH	Schedule
EQUIP	Equipment	SDTTF	Star delta transition time factor
ERR	Error	SEC	Second(s)
EXT	External	SEP	Separator or September
FAULT	Fault	SEQ	Sequence
FEB	February	SEP FIL	Separator filter
FTR	Filter	SERV	Service
FM	Frequency modulate	SN	Serial number
FRI	Friday	SP	Switching point
FUNCT	Function	SPD	Speed
H	Hours	STAGE	Stage
HR	Hours	STOP	Stop
HRS	Hours	STR	Start(s)
INH	Inhibit	SUN	Sunday
IIPT	Input	SYS	System
INT	Internal	TCP/IP	Transmission Control Protocol / Internet Protocol
INT PRESS	Internal pressure	TEMP	Temperature
INTVL	Interval	THU	Thursday
IMB	Imbalance	TIMEV	Time valve
IMM	Immediate	TNS	Tension
ISC	Internal system control	TRANS	Transition
JAN	January	TT	Transition time
JULY	July	TUE	Tuesday

JUNE	June	UOM	Unit of measurement
K	Kelvin	VSD	Variable speed drive
LOCAL	Local	YR	Year
LUB	Lubrication		

7.0 Language Codes

Code	Language
ENG	English (English)
BEL	Беларуская (Belarusian)
CES	Czech (Czech)
GER	Deutsch (German)
SPA	Espanol (Spanish)
FRE	Français (French)
GRE	Ελληνικά (Greek)
ITA	Italiano (Italian)
JAP	日本 (Japanese)
KOR	한국어 (Korean)
DUT	Nederlands (Dutch)
PER	Persian
POL	Polski (Polish)
POR	Português (Portuguese)
RUS	Русский (Russian)
THA	ไทย (Thai)
TUR	Türk (Turkish)
UKR	Український (Ukrainian)
VIE	Việt (Vietnamese)
ZHS	简体中文 (Simplified Chinese)
ZHT	繁体中文 (Traditional Chinese)
BRA	Brazilian Português (Portuguese)
USA	American English

8.0 Logged Events

Each logged event (P04.01.01 – P04.01.200) includes an event index, event description and an event time and date.

Logged Events
START button pressed
STOP button pressed
PARA reset to DEF (Parameter reset to default)
Active ‘USER #’ access
Modify parameter

9.0 ADMIN Edit User # Configurable Parameters

Parameter
User Name (P09.03.01)
User PIN Code (P09.03.02)
Display Language (P09.03.03)
Time Format (P09.03.04)
Date Format (P09.03.05)
Pressure Unit (P09.03.06)
Temperature Unit (P09.03.07)
Menu # Access (P09.03.08) (Not available, Read access, Edit access)

10.0 Start and/or Load Source Configurable Parameters

Parameter (notes)
Equipment outlet pressure sensor (default)
Equipment digital input (requires setup of configurable digital input)
Airbus485™ (requires RS485 card option)
MODBUS (requires RS485 card option)
TCP/IP (required ECO card option)

11.0 Use of Menu Pages and Page Items

Airmaster™ menu page items are arranged sequentially from P00 to P99, menu items 01 to 99.
Some menu pages or menu page items are intentionally omitted or not displayed dependant on software variant and/or configuration/setup.

Default menu page (P##) numbers and titles:

Page	Display name	Page	Display name	Page	Display name
P00	Home	P12	EQUIP Settings 3	P24	IO Extension
P01	Service Timers	P13	VSD Settings	P25	IO sensor Config
P02	Utilisation	P14	Motor Protection	P26	RS485 Extension
P03	Error Log	P15	Inhibits	P27	IoT Settings
P04	Event Log	P16	Warning Alarm	P40 . . . P44	User DEF Menu Pages
P05	Service Provider	P17	IMM Stop Alarm		
P06	Controller Data	P18	I/O CONFIG		
P07	Asset Data	P19	Sensor CONFIG		
P08	Graph	P20	Diagnostics		
P09	Access	P21	Run Schedule	P80	ISC – Main Menu
P10	EQUIP Settings 1	P22	Modbus Fan Control	P81	ISC – Settings
P11	EQUIP Settings 2	P23	Modbus INV Info	P82	ISC – Priority

12.0 Symbols

Airmaster™ Display Symbols

Symbol	Description	Symbol	Description	Symbol	Description
	Management or Sequence Control		Phase Angle		Immediate Stop (Shutdown)
	Remote Control		Upper or Lower Range		Warning (Alarm)
	Start Inhibit		Fan		Status (animated)
	Running On Load		Running Off Load		Stopped
	Run Inhibit		Load Inhibit		Condensate Drain
	Time		Edit		Sensor
	Temperature		User Configurable or Manual		Compressor, Package, Equipment, Machine

	Key		Schedule		Timer
	Motor		Range or Detected		Total Hours
	Set Point		Set Point, Upper Limit		Set Point, Lower Limit
	Oil		Read Only		Unlocked or Accessible
	Locked or Not Accessible		Date		Start Delta
	Delta pressure		Up		Auto Restart
	Filter		Down		Audible Alarm
	Service or Maintenance		Stop		Time
	Set Point		Enter or Inlet		Exit of Outlet
	Emergency Stop		Next, Forward		Previous, Backward
	Status		Compressor ‘Airend’		Frequency
	Daylight		Water		Controller, Airmaster™
	4 – 20mA Output		Number or Frequency		Percent
	Average		Cabinet Door Open		Analogue
	Up		Down		Enter
	Stop		Start		Edit
	Less Than		Greater Than		Last 24 Hours
	Starts, Last 24 Hours		Starts Last Hour		Last Hour
	Normally Open / Normally Closed		Digital Input		Relay Output
	Phase, L1		Phase, L2		Phase, L3
	Phase		Current Sensor		Running (animated)

	Analogue Value		Network or System		Inlet
	Separator Filter		Valve		Drive Belt
	Power		Pressure Set Point		Yes

13.0 Message codes

Message Codes/Alarm Codes

A = Warning Alarm, E = Immediate Stop Shutdown, L = 'Load' Inhibit, R = 'Run' Inhibit, S = 'Start' Inhibit

A:0008	Dryer power SUP warning. Digital input not OK
A:0030	Door open warning. Digital input not OK
A:0031	CAB filter DP warning. Cabinet filter differential pressure warning, digital input not OK
A:0040	Oil level warning. Digital input not OK
A:0041	Oil TEMP HI warning. Oil temperature high. Digital input not OK
A:0050	Dryer warning, digital input not OK
A:0070	Fan motor warning. Digital input not OK
A:0071	VSD Fan MOT OVLD warning. Digital input not OK
A:0072	FAN MOTOR OVLD warning. Digital input not OK
A:0085	HI MTR STR HR. Number of permissible motor starts exceeded. (see value in P16.17)
A:0118	EQUIP OUT PRESS LO. Equipment Outlet Pressure Low
A:0119	EQUIP OUT PRESS HI. Equipment Outlet Pressure High.
A:0129	Temperature. Compressor outlet temperature high.
A:0131	EQUIP INT PRESS LO. Equipment Internal Pressure Low.
A:0139	EQUIP INT PRESS HI. Equipment Internal Pressure High.
A:0151	OIL PRESSURE ALARM LOW LEVEL. Oil Pressure value is below the Oil P low limit
A:0156	Dryer Low Temp. Dryer Low temperature
A:0159	OIL PRESSURE ALARM HIGH LEVEL. Oil Pressure value is above the Oil P high limit
A:0160	Dew Point warning. Digital input not OK.
A:0169	Inlet Vacuum HIGH
A:0189	Delivery TEMP HIGH

A:0200	COOL water warning. Digital input not OK.
A:0201	CNDS drain1 warning. Condensate drain1 warning. Digital input not OK.
A:0202	CNDS drain2 warning. Condensate drain2 warning. Digital input not OK.
A:0209	Oil Filter DP HI. Oil Filter Differential High
A:0219	Oil TEMP HI Warning. Oil Temperature High warning
A:0339	Oil Cooler Discharge HI. Oil Cooler Discharge High
A:0349	After Cooler Discharge HI. After Cooler Discharge High
A:0439	Oil Cooler Approach HI. Oil Cooler Approach High
A:0449	After Cooler Approach HI. After Cooler Approach High
A:0609	MAIN Modbus INV Warning – A warning fault is active on the drive (read via Drive tool)
A:0809	DIFF PRESS high. Internal pressure – Outlet pressure out of permissible range P16.15
A:0901	CONF warning 1. Configurable warning 1. Digital input not OK
A:0902	CONF warning 2. Configurable warning 2. Digital input not OK
A:0903	CONF warning 3. Configurable warning 3. Digital input not OK
A:1003	Main MTR TEMP HI. Main motor temperature high
A:1004	Voltage Low warning. Digital input not OK
A:1006	Ambient TEMP HI warning. Ambient temperature high
A:1888	Run CHK warning. Digital input not OK.
A:1902	Inverter warning. Digital input not OK.
A:1903	Ambient TEMP HI warning. Digital input not OK
A:2030	Air filter warning. Digital input not OK
A:2032	Line FTR DP warning. Line filter differential pressure. Digital input not OK
A:2035	SEP filter DP HI warning. Separator filter differential pressure high. Digital input not OK
A:2036	OilAir SEP DP HI. Oil Air Separator filter differential pressure high. (see explanation via P10.07 Cooling DP)
A:2040	Oil filter warning. Digital input not OK
A:2116	Excess Load Cycles. Safety function, if in the “last hour” the FORM controller counts 180 Load cycles the warning will be activated
A:2201	FTR Drain warning. Line filter drain warning. Digital input not OK.
A:2240	Oil / WTR SEP warning. Oil water separator. Digital input not OK.
A:2604	COM INI fan DRV (MODBUS comm.’s with 3rd party drive)
A:2606	COM ERR fan DRV (MODBUS comm.’s with 3rd party drive)
A:2608	COM XCP fan DRV (MODBUS comm.’s with 3rd party drive)
A:2609	FAN Modbus INV Warning – A warning fault is active on the drive (read via Drive tool)

A:2610	Fan Drive Fault. EO PRESS high (MODBUS comm.'s with 3rd party drive)
A:2612	Fan DRV LNK FLT (MODBUS comm.'s with 3rd party drive)
A:2816	Power failure. 24v @ X13 is below permissible level
A:2826	Stop@power fail There was an immediate stop at power fail
A:2836	RTC error. A real time clock error
A:2837	IoT Unsynced – By changing the IP settings in P27, the new adjustment haven't been saved.
A:2846	Language or font
A:2960	ISC XPM Pressure.
A:4805	Service : Cabinet filters. Service due (timer reached 0 hrs)
A:4806	Service : Air filter. Service due (timer reached 0 hrs)
A:4807	Service : Oil filter. Service due (timer reached 0 hrs)
A:4808	Service : Air/Oil filter. Service due (timer reached 0 hrs)
A:4809	Service : Grease. Service due (timer reached 0 hrs)
A:4810	Service : Valves. Service due (timer reached 0 hrs)
A:4811	Service : Belt drive. Service due (timer reached 0 hrs)
A:4812	Service : ELEC SYS. Service due (timer reached 0 hrs)
A:4813	Service : MTR bearing. Service due (timer reached 0 hrs)
A:4814	Service : COMP BRG. Service due (timer reached 0 hrs)
A:4815	Service : Dryer. Service due (timer reached 0 hrs)
A:4816	Service : Oil. Service due (timer reached 0 hrs)
A:4817	Service : Cooler. Service due (timer reached 0 hrs)
A:4818	Service : Oil/Fog SEP. Service due (timer reached 0 hrs)
A:4819	Service : Routine. Service due (timer reached 0 hrs)
A:4820	Service : Weekly. Service due (timer reached 0 hrs)
A:4821	Service : Annual. Service due (timer reached 0 hrs)
A:4822	Service : Bi-annual. Service due (timer reached 0 hrs)
A:4823	Service : COMP AIREND. Service due (timer reached 0 hrs)
A:4824	Service : Major PREV MAINT. Service due (timer reached 0 hrs)
A:4825	Service : Pre COALESC FTR. Pre Coalescing Filter. Service due (timer reached 0 hrs)
A:4826	Service : Post COALESC FTR. Post Coalescing Filter. Service due (timer reached 0 hrs)
A:4827	Service : ACT carbon FTR. Active Carbon Filter. Service due (timer reached 0 hrs)
A:4828	Service : Purifier Filter. Service due (timer reached 0 hrs)
A:4829	Service : Revision. Service due (timer reached 0 hrs)

A:4830	Service : Pressure vessel. Service due (timer reached 0 hrs)
A:4831	Service : Safety valve. Service due (timer reached 0 hrs)
A:5000	Reset to Default – Means that controller has been set back to default settings
A:5100	Default CONFIG. Invalid settings. Reset to default configuration.
A:5999	Test Version
A:7001	No Communication with RS485 extension module.
E:0006	Ambient T°. Ambient temperature sensor fault
E:0007	EQUIP OUT PRESS IMM Stop. Digital input not OK
E:0008	Dryer power SUP IMM Stop. Digital input not OK
E:0010	Emergency stop. Digital input not OK, emergency stop button pressed!
E:0030	Door open. Digital input not OK
E:0040	Oil LVL IMM stop. Digital input not OK
E:0041	Oil TEMP HI IMM Stop. Digital input not OK
E:0050	Dryer IMM Stop. Digital input not OK
E:0060	Belt drive SERV IMM Stop. Digital input not OK
E:0070	Fan MTR IMM stop. Digital input not OK
E:0071	VSD fan MOT OVLD IMM Stop. Digital input not OK
E:0072	Fan motor OVLD IMM Stop. Digital input not OK.
E:0080	Main MTR OVLD IMM stop. 2 conditions Digital input not OK and P14.04 OVLD protect Main MTR need to be ON
E:0081	Motor locked. Used to trigger the high current locked rotor current peaks lasting longer than normal start-up time. Related to P14.06 and P14.07
E:0082	Motor Overload. Used to trigger the long-lasting motor currents that could overheat the motor over longer time. Related to the motor protection in P14 – P14.01 need to be set VIA CTS
E:0083	Motor phase IMB. Main motor phase imbalance. P14.01 Protect Main MTR is ON and P14.08 Deviation of Phase has been exceeded
E:0084	Main MTR CT SENS. Main motor current sensor. Motor protection need to be activated if controller detect less than 20% of the P14.05 FLC Main motor for a delay of 10 sec.
E:0085	Fan MTR CT sensor. Fan motor current sensor. Motor protection need to be activated if controller detect less than 20% of the P14.15 FLC Fan motor for a delay of 2 sec.
E:0086	Fan MTR overload. Protection Fan motor need to be activated, compressor in running state and current measurement exceed P14.15 FLC Fan Motor for the P14.14 OVLD INH time Fan MTR.
E:0089	MTR prot IMM stop. Motor protection Immediate stop. Digital input not OK
E:0090	Phase sequence. If one of the phase goes out of his range and if E0091/E0092/E0093 is not active
E:0091	Phase L1 fault. Cable L1 phase loss
E:0092	Phase L2 fault. Cable L2 phase loss
E:0093	Phase L3 fault. Cable L3 phase loss

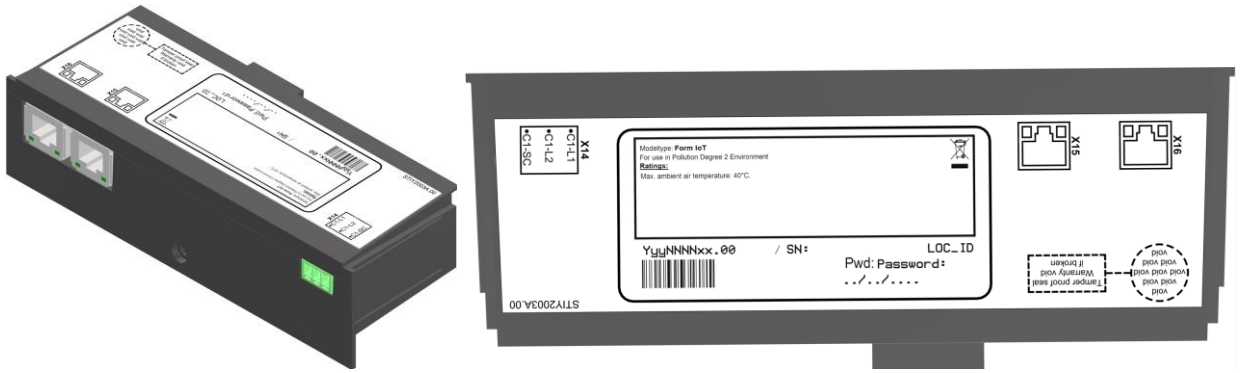
E:0104	Vibration HL IMM stop. Digital input not OK
E:0105	MTR windings T° HL IMM stop. Digital input not OK
E:0106	Enclosure T° HL IMM Stop. Digital input not OK
E:0115	EO PRESS sensor. Equipment outlet pressure sensor. Wiring error or faulty sensor
E:0119	EO PRESS high. Equipment outlet pressure high
E:0125	PD TEMP SENS. Compressor outlet temperature sensor Wiring error or faulty sensor
E:0129	COMP out TEMP HI. Compressor outlet temperature high
E:0135	INT PRESS sensor. Internal pressure sensor. Wiring error or faulty sensor
E:0139	INT PRESS high. Internal pressure high.
E:0145	INT TEMP SENS. Internal temperature sensor. Wiring error or faulty sensor
E:0151	OIL PRESSURE IMMEDIATE STOP LOW LEVEL. Oil Pressure value is below the Oil P low limit
E:0155	Dryer TEMP SENS. Dryer temperature sensor. Wiring error or faulty sensor
E:0156	Dryer Low temp. Dryer temperature Low
E:0159	OIL PRESSURE IMMEDIATE HIGH LEVEL. Oil Pressure value is above the Oil P high limit
E:0160	Dew point IMM stop. Digital input not OK
E:0165	Inlet Vacuum Sensor. Wiring error or faulty sensor
E:0169	Inlet Vacuum HIGH
E:0179	EQUIP out TEMP HI IMM stop. Equipment outlet temperature high.
E:0185	Delivery Temperature Sensor. Wiring error or faulty sensor
E:0189	Delivery TEMP HIGH
E:0200	COOL WTR IMM stop. Cooling water immediate stop. Digital input not OK
E:0202	Drain2 IMM stop. Digital input not OK
E:0205	Oil Filter Differential sensor. Wiring error or faulty sensor
E:0209	Oil Filter Differential high
E:0215	Oil Temperature Sensor. Wiring error or faulty sensor
E:0219	Oil Temperature high
E:0229	TEMP rise rate. Related to the P17.02
E:0235	Oil Pressure sensor. Wiring error or faulty sensor
E:0335	Oil Cooler Discharge Sensor. Wiring error or faulty sensor
E:0339	Oil Cooler Discharge High
E:0345	After Cooler Discharge Sensor. Wiring error or faulty sensor
E:0349	After Cooler Discharge High
E:0439	Oil Cooler Approach High

E:0449	After Cooler Approach High
E:0603	COM INI main DRV (MODBUS comm.'s with 3rd party drive)
E:0605	COM ERR main DRV (MODBUS comm.'s with 3rd party drive)
E:0607	COM XCP main DRV (MODBUS comm.'s with 3rd party drive)
E:0609	Main drive Fault (MODBUS comm.'s with 3rd party drive)
E:0611	Main DRV LNK FLT (MODBUS comm.'s with 3rd party drive)
E:0809	DIFF PRESS high. Internal pressure – Outlet pressure out of permissible range P17.06
E:0821	Short circuit on FORM. Wiring error. AC or DC power supply (X08) but power supply Ai/Di are too Low.
E:0822	Short circuit on I/O module. Wiring error. AC or DC power supply (X08) but power supply Ai/Di are too Low on I/O module
E:0866	Power Failure. AC or DC power supply (X08)
E:0901	User IMM stop 1. User configurable immediate stop 1
E:0902	User IMM stop 2. User configurable immediate stop 2
E:0903	User IMM stop 3. User configurable immediate stop 3
E:0971	Cooling SYS IMM stop. Digital input not OK.
E:1004	Voltage Low. Digital input not OK.
E:1005	Drain1 IMM stop. Digital input not OK
E:1006	Ambient TEMP HI. Ambient temperature high.
E:1887	Main motor IMM stop. Digital input not OK.
E:1888	Run CHK IMM stop. Digital input not OK.
E:1901	Water flow. Digital input not OK.
E:1902	Inverter fault. Digital input not OK.
E:1903	Main MTR TEMP HI. Digital input not OK.
E:1904	INV FLT MAN. Inverter fault manual
E:2030	Air filter IMM stop. Air filter Immediate stop. Digital input not OK
E:2032	Line FTR DP IMM stop. Line filter differential pressure Immediate stop. Digital input not OK.
E:2040	Oil filter DP. Oil filter differential pressure. Digital input not OK
E:2120	Stage pressure IMM stop. Digital input not OK.
E:2121	Stage 1 TEMP IMM stop. Digital input not OK.
E:2200	Group Fault. Digital input not OK.
E:2826	Stop@power fail There was an immediate stop at power fail
E:2866	Clone key S/N mismatch. Use P12.06 to reset this IMM stop condition
E:4805	Service : Cabinet filters. Service due (timer reached 0 hrs)
E:4806	Service : Air filter. Service due (timer reached 0 hrs)

E:4807	Service : Oil filter. Service due (timer reached 0 hrs)
E:4808	Service : Air/Oil filter. Service due (timer reached 0 hrs)
E:4809	Service : Grease. Service due (timer reached 0 hrs)
E:4810	Service : Valves. Service due (timer reached 0 hrs)
E:4811	Service : Belt drive. Service due (timer reached 0 hrs)
E:4812	Service : ELEC SYS. Service due (timer reached 0 hrs)
E:4813	Service : MTR bearing. Service due (timer reached 0 hrs)
E:4814	Service : COMP BRG. Service due (timer reached 0 hrs)
E:4815	Service : Dryer. Service due (timer reached 0 hrs)
E:4816	Service : Oil. Service due (timer reached 0 hrs)
E:4817	Service : Cooler. Service due (timer reached 0 hrs)
E:4818	Service : Oil/Fog SEP. Service due (timer reached 0 hrs)
E:4819	Service : Routine. Service due (timer reached 0 hrs)
E:4820	Service : Weekly. Service due (timer reached 0 hrs)
E:4821	Service : Annual. Service due (timer reached 0 hrs)
E:4822	Service : Bi-annual. Service due (timer reached 0 hrs)
E:4823	Service : COMP AIREND. Service due (timer reached 0 hrs)
E:4824	Service : Major PREV MAINT. Service due (timer reached 0 hrs)
E:4825	Service : Pre COALESC FTR. Pre Coalescing Filter. Service due (timer reached 0 hrs)
E:4826	Service : Post COALESC FTR. Post Coalescing Filter. Service due (timer reached 0 hrs)
E:4827	Service : ACT carbon FTR. Active Carbon Filter. Service due (timer reached 0 hrs)
E:4828	Service : Purifier Filter. Service due (timer reached 0 hrs)
E:4829	Service : Revision. Service due (timer reached 0 hrs)
E:4830	Service : Pressure vessel. Service due (timer reached 0 hrs)
E:4831	Service : Safety valve. Service due (timer reached 0 hrs)
E:5000	System error – CS files send to controller are corrupt
E:7000	IO extension module communication – NO communication between FORM controller and IO extension module
E:7002	XPM-Ai4 module communication – NO communication between FORM controller and XPM-Ai4 module
E:7003	XPM-Di8R4 module communication – NO communication between FORM controller and XPM-Di8R4 module
L:0129	Load Inhibit (Outlet Temperature Low level)
L:0139	Load inhibit (EQUIP INT PRESS LO. Equipment Internal pressure low)
L:0149	Load inhibit (EIT load INH LL. Equipment Internal Temperature load Inhibit Low Low)
L:1006	Load inhibit (Ambient T° RIL. Ambient air temperature load inhibit low level)
R:1000	Run Inhibit (Wait run enable)

R:3123	Run inhibit (PD TEMP low. Compressor outlet temperature low)
R:3137	Run inhibit (INT PRESS high. Internal pressure high)
R:4036	Run inhibit (Long Stand still)
S:3500	Start inhibit (operator inhibit)
S:3501	Start inhibit (enclosure doors)
S:3502	Start inhibit (Start inhibit)
S:3503	Start inhibit (Config/VSD communication)
S:3601	Start inhibit (Main MTR VSD COM)
S:3701	Start inhibit (Remote start inhibit)

14.0 IoT Module



The IoT- module has two (2) Ethernet data communication connections available X15/X16 and one (1) RS485 communication port X14

14.01 IoT connection

The IoT- module can be Connect with a CAT5, CAT5E, CAT6 network twisted pair with a maximum length of 100m to the **LAN (Local Area Network)** or to a **Gateway (connection to Aircloud)**

Note: The IoT – module can only be connected to the LAN or to the Gateway it's not possible to connect on both at the same time.

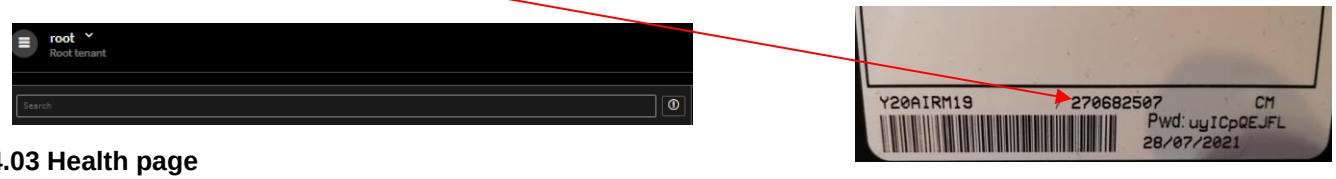
14.02 LOGIN to see the IoT module data

LAN (Local Area Network)
To visualize the Local dashboard on your LAN connection you need to:

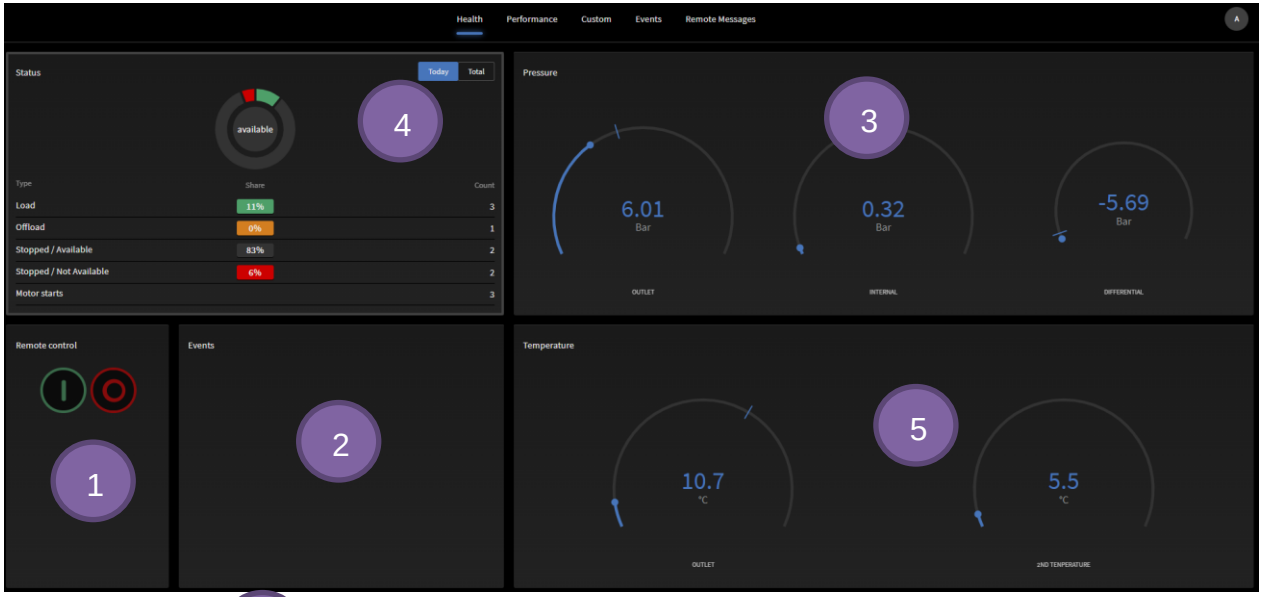
1) Open webbrowser (e.g. Google Chrome)
2) Copy the IP-address into the address balk from P06.21.02 and add :50080/
   e.g 192.186.10119:50080/
3) Press ENTER and the Local webpages will start to load.

Gateway (connection to Aircloud)

1) First go to your unique URL (e.g https://aircloud.airmatics.net)
2) Use your credentials to LOGIN
3) Put in the search balk the external ID (can be found on the label of the IoT-module)



14.03 Health page



Remote Control 1

Via the Remote control you can Start/Stop/Reset the FORM controller.
To be able to have communication with the control you need to set P10.11 Start Source = Communication
And you need to LOGIN on the IoT dashboard.

⚠ NOTE: This function is only available on the LAN connection and NOT on the Gateway (Aircloud) connection.

Events 2

In the Events, we will show the active Warnings and Immediate stops. (In order to see more information about the event you need to go to the EVENT TAB)
Once the warning or Immediate stop has been reset it will disappear automatically.

Pressure 3

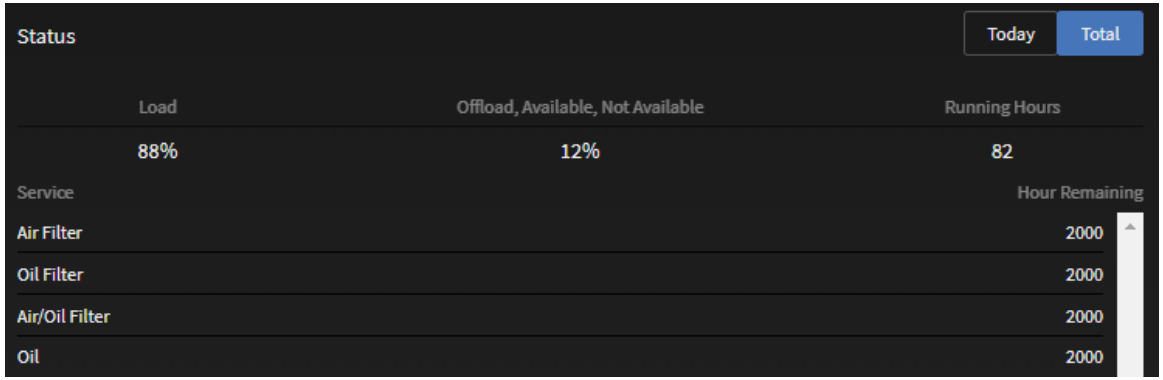
We show the 3 pressure readings that the FORM controller measure → Outlet pressure/Internal pressure and the differential pressure.
You can put some thresholds on each pressure.

- Outlet pressure the P16.13.01 Equip OUT press HI and P16.13.02 Equip OUT press LO
- Internal pressure the P16.14.01 Equip INT press HI and P16.14.02 Equip INT press LO
- Differential pressure the P16.15 DIFF pressure

Status 4

On the Status “TODAY” we show the status on of the compressor (LOAD/OFFLOAD/AVAILABLE/…).
The IoT- module keeps track of the number of times a compressor went into a loaded or went into an unloaded state, number of motor starts TODAY.
With TODAY this means from midnight (00:00) to midnight (00:00) once we pas the 24hrs all the counters we be reset to zero (0)

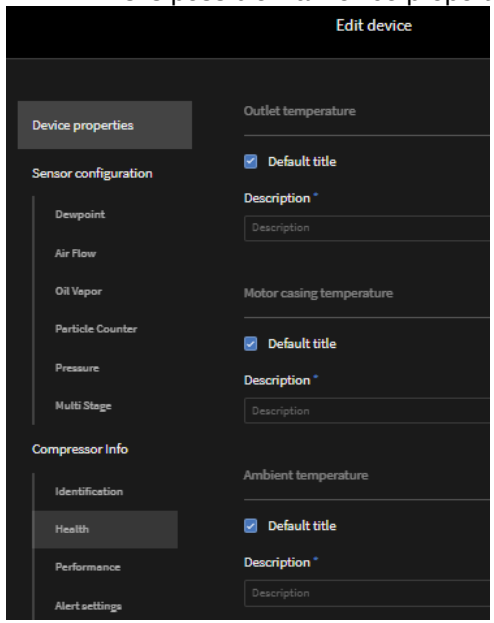
On the Status “TOTAL” you can see the remaining time when the next service is due and in percentage the number of LOAD and OFFLOAD hours.
The total running hours are shown in hours.
Example below:



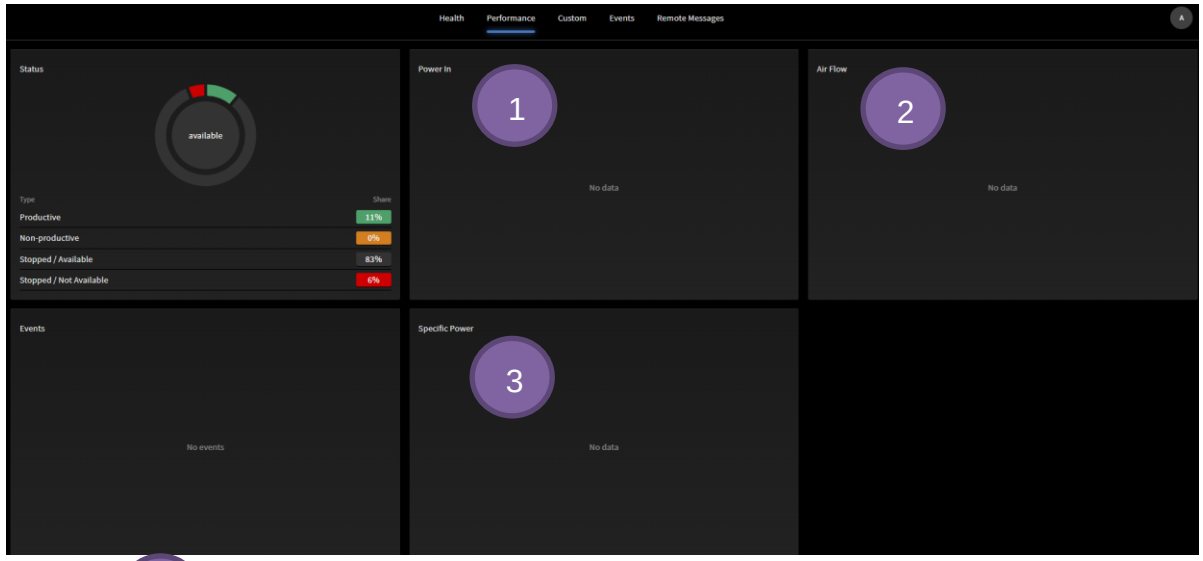
Temperature 4

We show the two (2) Temperature readings that the FORM controller measure → Outlet Temperature and the 2nd Temperature.
Who can be the internal temperature or the Dryer Temperature.

NOTE: On Aircloud you are able to change the name of the Temperature function. This mean that you will not see 2nd temperature but the temperature function need to be set by yourself via the settings of Aircloud.
This is possible via Device properties → Health



14.04 Performance page



Power in 1

When the motor protection of the FORM controller is activate (CT and Phase are connect to controller).
The FORM controller is able to calculate the Package Power of the Compressor.
The value that you see on the Dashboard of the IoT module is the same value as P00.19 on the Controller.

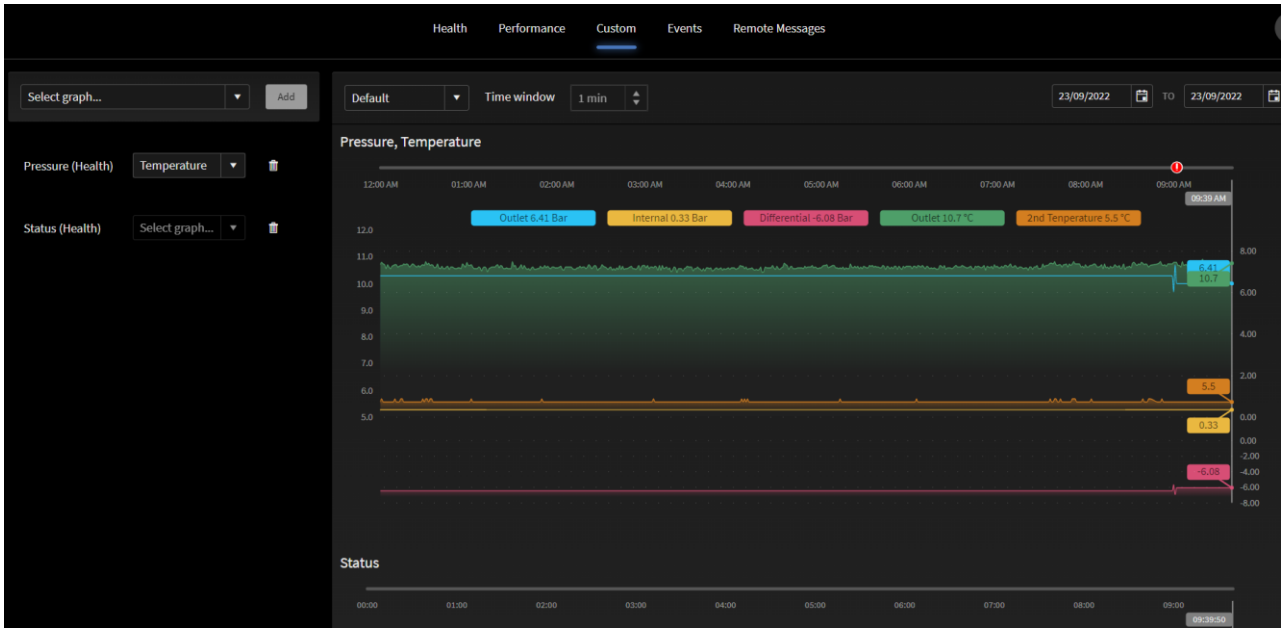
Air Flow 2

The Airflow value is a calculation based on the settings:
P14.18 MAX flow
P14.19 MIN flow (for VSD machines only)
The FORM controller takes the MAX speed and MIN speed of the compressor into account for the calculation of the flow.

Specific Power 3

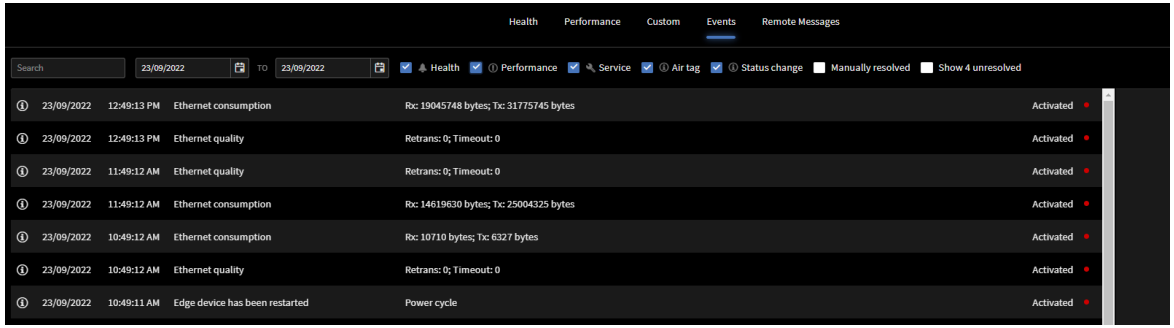
Specific Power = Power (KW) / Flow (m^3/min)

14.05 Custom page



On the custom page, you can create different graphs of the data displayed on the IoT – module.
You are able to combine 2 them in 1 graph, see example above in this graph you can see the pressure and temperature data.

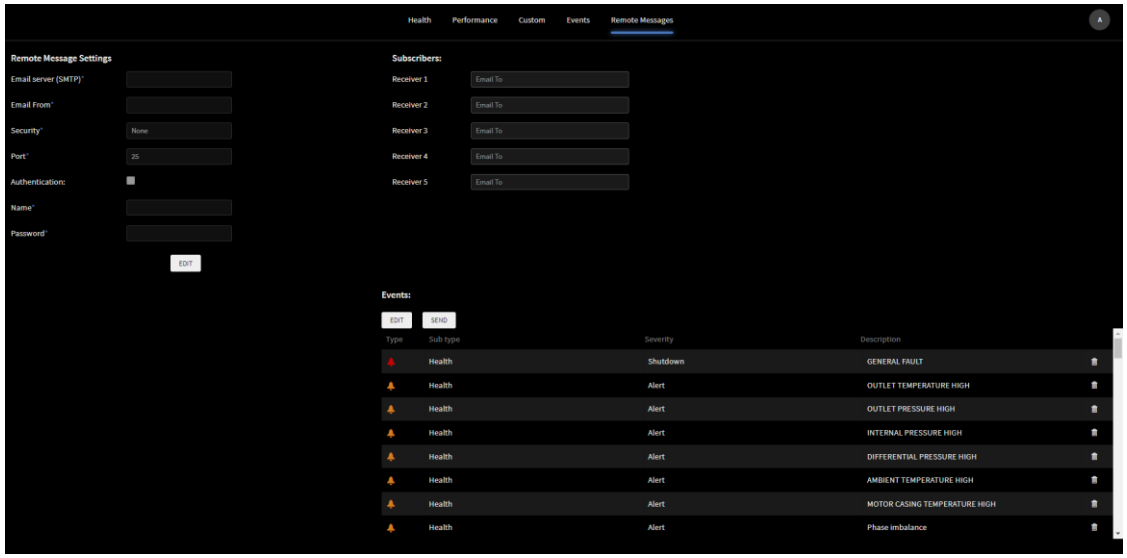
14.06 Events page



In the event page we show all the events that can happen on the IoT – module.
Here a small explanation of the different types of event that we have:

- **Health** → Event related to Health page, (e.g. when Emergency stop is active)
- **Performance** → Event related to Performance page, each event related to Power and flow.
- **Service** → When a maintenance is required, when the timer has reached 0 hrs (Health page – Status – Total)
- **Airtag** → everything related to the Ethernet consumption and quality.

14.07 Remote Messages

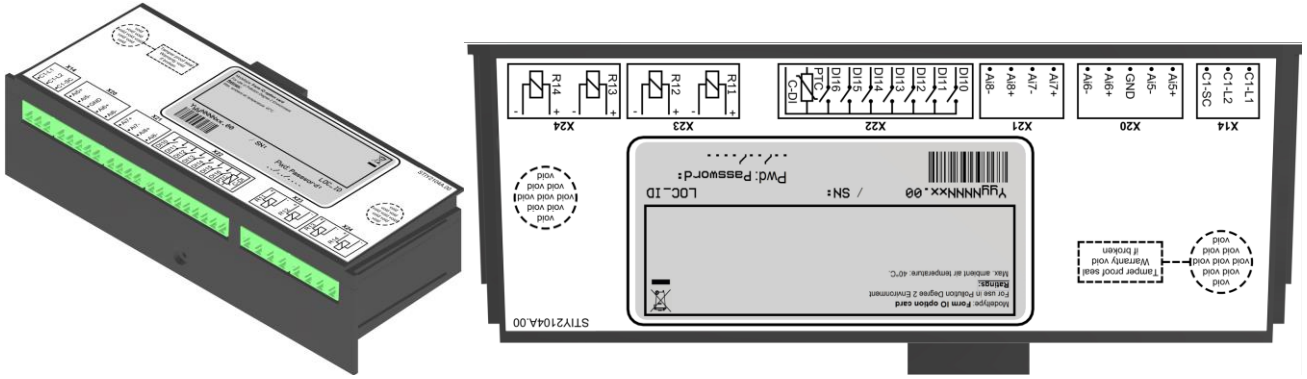


The “Remote Messages” is a page who is only available for the IoT – module connected to the LAN.
The “Remote Messages” is intended to forward/send events (that you have select) to email address you have subscribed.

On “Remote Messages” we have 3 topics :

- Remote Messages settings :
  - Here the IT department can help to give you the correct details
- Subscribers:
  - Here you need to add the email address of the receivers. You can add up to 5 receivers.
- Events:
  - Here you can select the event you want to receive by email.
  - We also have the selection “Most essential events” who are all the Immediate stop events and service due events.

15.0 IO Extension Module



The IO module is an extension of the IO of the Airmaster Form controller.
The IO module has:

- 4 x Analog Inputs, same Analog inputs as on the FORM (2 pressure and 2 Temperture)
- 8 x Digital inputs (DI17 can be used as PTC)
- 4 x Drivers for external relay control
  The Drivers can be connected to external relays with the following specs : drive can be connected to relays with the following specifications: max coil voltage 5 VDC and max coil current 35.8mA.
  Example of external relay that you can use: Weidmuller 1122740000

16.0 Help and Support

Contact your original equipment manufacturer or your original equipment manufacturer's nominated representative.

Compressor & Machine Controls NV (CMC NV) is a provider of Airmaster™ product solutions to original equipment manufacturers (OEM's) only. CMC NV is not able to support end users or nominated representatives of OEM equipment in the use, operation or fault diagnostics of Airmaster™ products.
If you are not the original equipment manufacturer of the equipment please do not contact CMC NV directly for Airmaster™ product support.

If you are the device original equipment manufacturer and you require Airmaster™ product support, please visit support.controlcompressors.com and use the knowledge base and resources provided. If afterwards you still require assistance, please use the helpdesk sidebar to contact us.