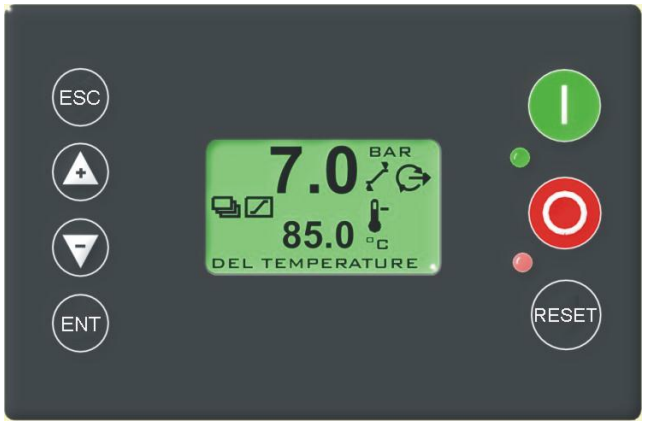
'CSC200'
Software Specification

Air Compressor – DV Systems



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CONTENT:

1.0 General Description

1.1 Controller Model Variants

The general default settings and tables shown in this specification are applicable to the CSC200 controller model:

CSC200-20-350-CB (blue display)

- Temperature detection and setting limits may differ on models fitted with, and set for, alternative temperature sensor ACM types:

For example:	CSC200-20-3**5**0	KTY or RTD temperature sensor, no internal pressure detection
	CSC200-20-3**6**0	PT100 temperature sensor, no internal pressure detection
	CSC200-20-3**7**0	PT1000 temperature sensor, no internal pressure detection

- Internal pressure detection, differential pressure detection and related functions will be unavailable on models that are not fitted with a secondary pressure sensor analogue input ACM.

  Internal pressure detection must be enabled in the configuration menu for model types fitted with the secondary pressure detection ACM hardware.

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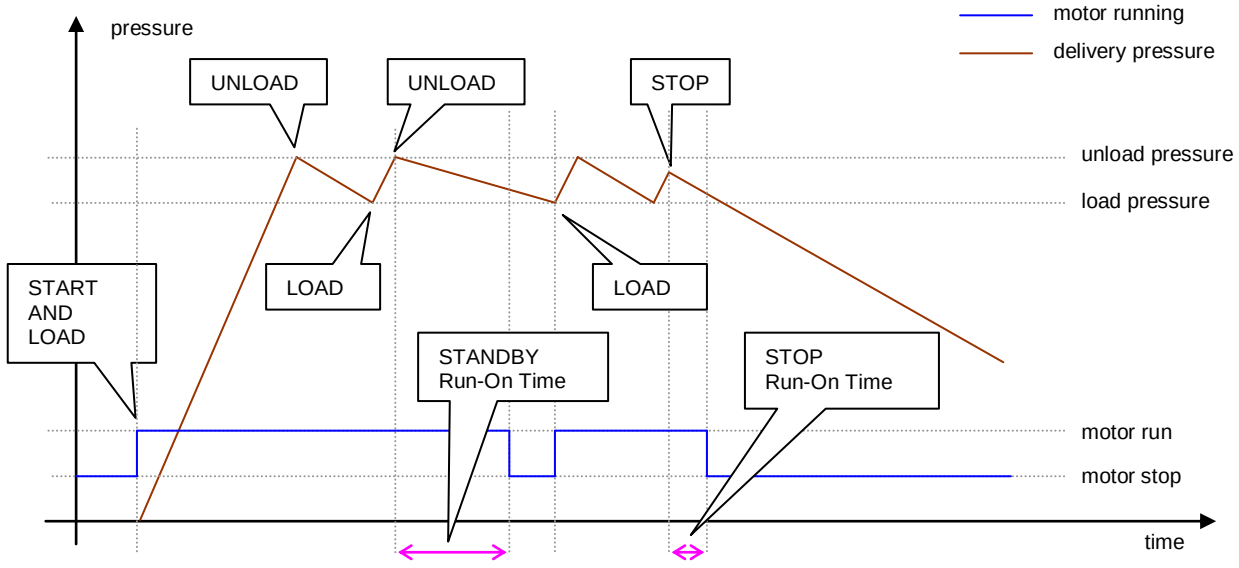
1.2 General Operation

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

If a start inhibiting condition exists the compressor will not enter the started condition and a start inhibit message is displayed. If a run inhibiting condition exists the compressor will enter the started condition but a main motor start is inhibited; the compressor will remain in the standby condition and a run inhibit message is displayed. If a load request is present, in accordance with internal pressure settings or by remote command, the main motor is started in a star/delta sequence. When running in delta configuration, after the star/delta time (adjustable) has expired, the load delay time (adjustable) prevents loading for a period to allow motor speed to stabilise. The load delay time can be set to one second if required. When the load delay time has expired the load valve output is energised and the compressor will load. If the unload pressure setting is reached, or a remote unload command is received, the load valve output is de-energised and the compressor will run offload for the standby run on time (adjustable) before the main motor stops and the compressor enters Standby mode. The compressor will load again if pressure falls below the load setting before the standby run on time expires. If in Standby mode, a motor start sequence followed by the load delay time is executed before loading.

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

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



2.0 I/O Description

2.1 Digital Inputs

Connector X04:

Connector type: 9 pole mini Combicon with 3.81mm (0.15") pitch

Pin	name	function	id	active state
1	C+	Digital inputs common		
2	C1	**Emergency stop**	digital input 1	fault if open
3	C2	**Anti rotation**	digital input 2	fault if open
4	C3	**Air filter high DP**	digital input 3	fault if closed
5	C4	**Air/Oil separator DP**	digital input 4	fault if open
6	C5	**Remote start/stop**	digital input 5	stop if open/start on closure
7	C6	**Remote load enable**	digital input 6	remote if closed
8	C7	**Remote load**	digital input 7	load if closed, offload if open
9	C8	**PTC motor overload**	digital input 8	fault if open

Remote Stop:
When the remote start/stop function is enabled (P07), the compressor will execute a controlled stop, as if the control panel stop button had been pressed, when the remote start/stop input is open circuit.

Remote Start:
When the remote start/stop function is enabled (P07), the compressor will execute a normal start sequence when the remote start/stop input changes state from open to closed circuit. If closed, the remote start/stop input must be opened and closed again to initiate a remote start sequence. Local controller start is inhibited.

Remote load enable:
When the digital remote load enable input is activated, local or communications pressure regulation is ignored and the unit will respond to the digital remote load input. The unit will automatically respond to the pressure regulation method set in the configuration menu settings (local or communications) when the digital remote load enable is deactivated.

Remote load:
When the digital remote load enable is activated, the unit will load when the digital remote load input is activated and unload when the digital remote load input is deactivated. All pressure safety settings remain active when using remote load functions.

Note: If local detected delivery pressure exceeds the set Alarm level the load solenoid output is de-energised. The load solenoid output will remain de-energised for 10secs after the pressure falls below the Alarm level.

2.2 Digital Outputs

Connector X03: relays

Connector type: 6 pole Combicon with 5mm pitch

Pin	name	function	id	active state
1	C-R123	common for **star, delta and main contactor**		
2	NO-R1	**main contactor**	digital output 1	energised
3	NO-R2	**star contactor**	digital output 2	energised
4	NO-R3	**delta contactor**	digital output 3	energised
5	C-R4	common for **load solenoid**		
6	R4	**load solenoid**	digital output 4	load when energised

Connector X02: additional relays

Connector type: 4 pole Combicon with 5mm pitch

Pin	name	function	id	active state
1	C-R5	common **relay 5**		
2	NO-R5	normal open contact **relay 5**	digital output 5	
3	C-R6	common **relay 6**		
4	NO-R6	normal open contact **relay 6**	digital output 6	

The function of auxiliary relays 5 and 6 can be set in the configuration menu.

2.3 Analogue Inputs And Outputs

Note: All analogue device inputs have open circuit, short circuit and out-of-range fault detection functions

Connector X05: analogue inputs

Connector type: 6 pole mini Combicon with 3.81mm (0.15") pitch

Pin	name	function	id	type	range
1	C-ANA1	**delivery pressure** +V common			
2	ANA1	**delivery pressure** input	analogue input 1	4-20 mA	adjustable
3	C-ANA2	**temperature** 0Vcommon			
4	ANA2	**temperature** input (menu setting + ACM type)	analogue input 2	KTY or PT100, PT1000 or RTD	-10°C 132°C or -50°C 250°C or -40°C 150°C
5	C-ANA3	**internal pressure** +V common			
6	ANA3	**internal pressure** (option)	analogue input 3	4-20 mA	adjustable

Analogue Input 1: fixed 4-20mA type

Analogue inputs 2 and 3: the CSC200 uses plug-in analogue conditioning modules (ACM's) that allow different sensor and signal types to be accommodated; for a particular sensor type the correct ACM hardware must be fitted.

Connector X06: analogue output

Connector type: 2 pole mini Combicon with 5.08mm pitch

Pin	name	function	id	type	range
1	AGND	0V analogue ground			
2	ANA-OUT1	4-20mA analogue output	analogue output 1	4-20mA	adjustable

Analogue Output 1:

Standard
4-20mA signal, function selectable

Variable Speed Control Active
4-20mA signal for variable speed drive unit; 4mA = minimum speed, 20mA = maximum speed
The drive is started and stopped from relay output R1; drive fault detection on digital input C8.

3.0 Machine State Diagram

Controller operational logic is shown in the machine state diagram as state blocks with an associating status block number. The state block determines the functionality of the controller at any given time. The controller can only be in one state at any given time. The controller will move from state to state in accordance with the defined exit and entry conditions of each state block and the defined connections between state blocks.

Definitions:

Fault:
A detected abnormal condition that must be indicated to operator personnel and that may require controller automated safety action, dependant on fault type and definition.

Start Inhibit Fault (S):
A start inhibit fault is a condition that may present a danger or cause damage to the compressor if started whilst the condition is present. Start inhibit faults are only triggered if a compressor start from the ready to start condition is attempted. Start inhibit faults are not triggered during an automated motor start sequence from the standby condition. Start inhibit faults are self-resetting. A start inhibit fault code is displayed when triggered but is not recorded in the fault log.

Run Inhibit Fault (R):
A run inhibit fault is a condition that may present a danger or cause damage to the compressor if the main motor is started whilst the condition is present. Run inhibit faults are only triggered if a motor start sequence is initiated. Run inhibit faults are self-resetting and do not prevent the compressor from entering a started condition. A Run inhibit will hold the compressor in a standby state and will allow a motor start sequence when the condition is no longer present. A Run inhibit fault code is displayed when triggered but is not recorded in the fault log.

Alarm Fault (A):
An alarm fault is a warning condition that does not present an immediate danger or potential damage to the compressor. An alarm state will not shutdown the compressor or affect normal operation. An alarm fault code is displayed that must be manually reset to clear once the condition has been resolved or no longer exists.

Shutdown Fault (E):
A shutdown fault is a condition that may present danger or potential damage to the compressor if the condition persists. A shutdown fault will cause the controller to stop the compressor. A shutdown fault code is displayed that must be manually reset to clear once the condition has been resolved or no longer exists. Two types of shutdown fault are definable a) non-emergency shutdown, an immediate controlled stop is executed, b) emergency shutdown, an instantaneous stop is executed.

Unload Pressure:
The unload pressure is the delivery pressure level (adjustable) at which the controller will de-energise the load solenoid output and the compressor will offload.

Load Pressure:
The load pressure is the delivery pressure level (adjustable) at which the compressor will energise the load solenoid output and the compressor will load. If in the standby state, an automated main motor start sequence is triggered prior to load.

Main Motor Start Sequence:
The controller will energise the Star contactor output followed by the Main contactor output 200ms later. After the Star/Delta timer (adjustable) expires the controller will execute an automated Star to Delta contactor output changeover with a 50ms star to delta transition time. If a Stop command is received during the start sequence the controller will continue to execute the start sequence before stopping. This action is intended to limit the break current of motor starter contactors.

Load Delay Timer:
The star to delta output transition is immediately followed by a load delay time (adjustable) that will inhibit the load solenoid output from energising until the load delay time expires. Intended to allow the main motor speed to stabilize and other pre-load functions to occur.

Reload Delay Timer:
The reload delay time (adjustable) is a period of time immediately following a load to unload event during which the load solenoid output is inhibited from energising.

Blow Down Timer:
The blow down time (adjustable) immediately follows a main motor stop event. During the blow down time a start request is recognised but is not initiated until the timer expires. If the optional internal pressure detection feature is enabled the restart inhibit is also dependant on internal pressure falling below the 'start inhibit pressure level' (adjustable). Failure of internal pressure to fall below the set pressure level for a period of two minutes after the set blow down timer expires will result in a blow down trip fault. The remaining time in seconds is show on the Information Item display.

Standby Run-On-Time:
When off load the standby run-on-timer will start. If the compressor remains in an off load condition and the timer expires the main motor will stop and the compressor will enter the Standby state. The compressor will automatically re-start and load as required. This function is intended to improve efficiency during low demand periods and to limit the number, and interval between, motor start events. The remaining time in seconds is show on the Information Item display.

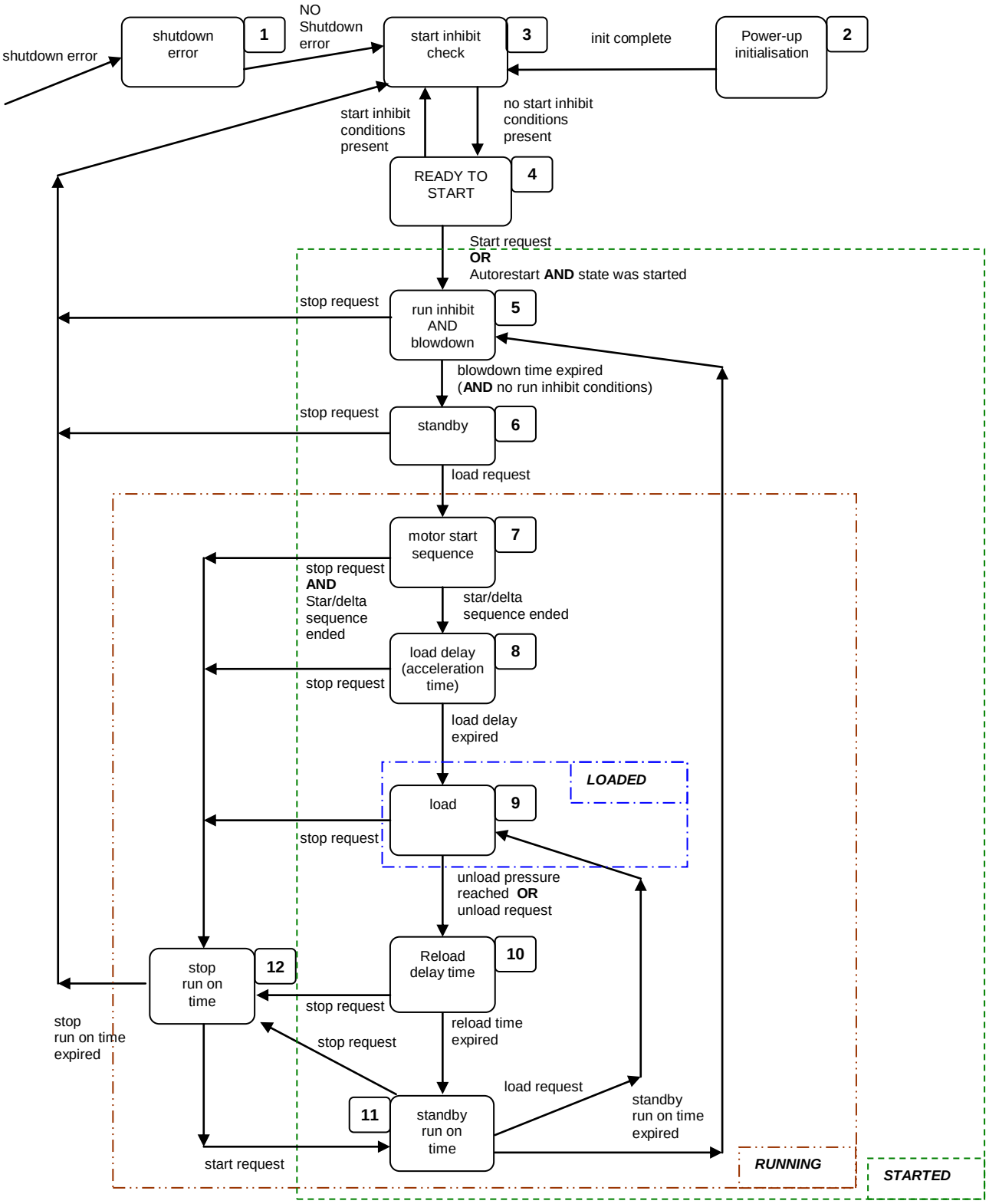
Stop Run-On-Time:
When stopped (stop button, remote stop input or remote stop command) the compressor will unload and the main motor continue to run for the stop run-on-time before stopping. This function is intended to allow for internal pressure venting and to limit lubrication oil aeration prior to the main motor stopping. The remaining time in seconds is show on the Information Item display.

Started State:
The unit has been started (start button, remote start input or remote start command) and is in an active condition ready to respond to changes in delivery pressure.

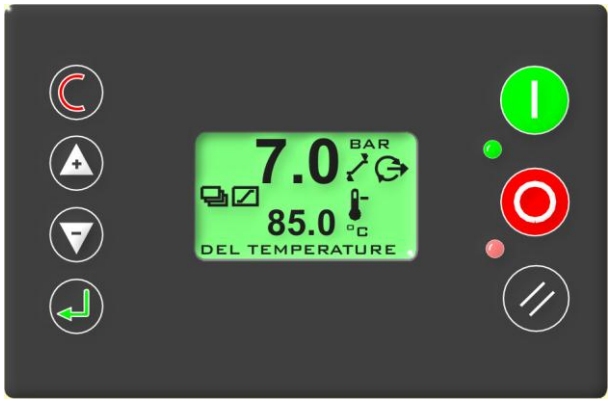
Running State:
The unit is in the Started state AND the main motor is running.

Loaded State:
The unit is in the Started state AND Running state AND the load solenoid output is energised.

Machine State Diagram:



4.0 User Interface



Display : Graphic; monochrome LCD backlit, 128 x 64
Indicators : 2 x LED
Controls : 7 x Tactile push button

4.1 Keypad

START:	Enter STARTED condition
STOP:	Exit STARTED condition
RESET:	Reset and clear fault conditions
ENTER:	Confirm selection or value adjustments
MINUS/DOWN:	Scroll down through menu, menu item options or decrement value
PLUS/UP:	Scroll up through menu, menu item options or increment value
ESCAPE (C):	Step back one menu navigation level

Start and Stop have one defined function and are not used for any other purpose.

Reset will initiate a display jump to the fault code item if a fault condition remains active or initiate a display jump to the status item if no active faults. If pressed and held for longer than two seconds in menu mode will exit menu mode to the normal operational display mode, page 00.

Enter will lock a selected item display preventing return, after a short delay, to the default item display.
When locked a 'key' symbol will show. To unlock press Escape.

Escape will initiate a display jump to the status item when in normal display mode, page 00.

Plus, Minus, Enter and Escape are used to navigate menu mode for menu item adjustment.

4.2 Led Indicators

STATUS: Green, adjacent to Start and Stop buttons
FAULT: Red, adjacent to Stop and Reset buttons

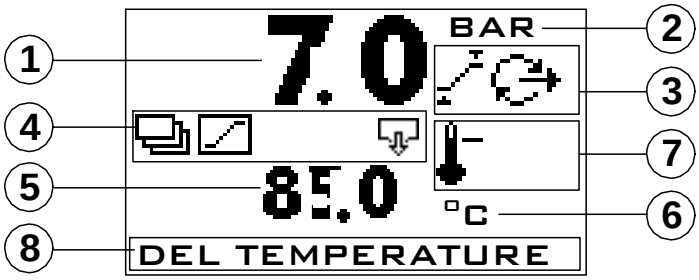
Indicator States:

ON: Illuminated continuously.
FF: Fast Flash: on/off four times per second.
SF: Slow Flash: on/off once per second.
IF: Intermittent Flash: on/off every four seconds.
OFF: Extinguished continuously.

Machine State Number	Machine State	Status 🟢	Fault 🔴
1	Shutdown Error	OFF	FF
2	Startup Init	OFF	OFF **
3	Start Inhibit Check	OFF	OFF **
	Start inhibit condition		SF
4	Ready to Start	OFF	OFF **
5	Blowdown	if (load_request) FF else IF	OFF **
6	Standby	IF	OFF **
7	Start Motor in Star/Delta	if (load_request) FF else IF	OFF **
8	Load Delay	if (load_request) FF else IF	OFF **
9	Load	ON	OFF **
10	Reload Delay	if (load_request) FF else IF	OFF **
11	Standby Run on Time	IF	OFF **
12	Stop Run on Time	SF	OFF **

🔴 ** SF for Alarm condition

4.3 Display



The normal operational display continuously provides information on 4 class subjects:

Delivery Pressure:	1: Value	2: Unit
Status:	3: Symbolic	
Enabled Functions:	4: Symbolic	
User Selected Item:	5: Value	6: Unit
	7: Symbolic; identification	8: Text; Language

Status
Status is represented symbolically and is continuously displayed:

Control Pressure

- Pressure is below the Unload pressure set point value
- Pressure is between the Unload and Load pressure set point values
- Pressure is above the Load pressure set point value

Compressor Status

- Stopped, not in an active state
- Standby, not running but in an active state
- Running, not loaded
- Loaded

Functions
Activated functions are represented symbolically and are continuously displayed

- Condensate drain output is energised
- RS485 network pressure regulation control (flashing = data link fault)
- Power Failure Automatic Restart
- Remote Load/Unload Enabled (digital Input)
- Remote Start/Stop Control
- Pressure Schedule (flashing = pressure schedule override active)

User Selected Item
The user can scroll through a list of status, information and value items using the UP or DOWN buttons.

Fault Display Item:
If a fault condition is active the 'Item' display will show the fault code and identification. An active fault code becomes an additional item in the User 'items' menu. More than one active fault condition can exist simultaneously; each will become a separate 'item' in the User menu'. The User menu 'Item' will disappear when the fault condition is resolved and reset.

Fault types are identified symbolically; the fault type symbol will alternate with the fault code identification symbol(s):


Shutdown, Trip, Immediate Stop

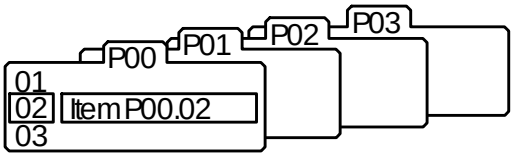

Alarm, Warning


Start, Run or Load Inhibit

Each fault code is unique and is displayed together with identification symbol(s) and descriptive text (see 'Fault Codes').

4.4 Display Structure and Menu Navigation

Display Item Structure:



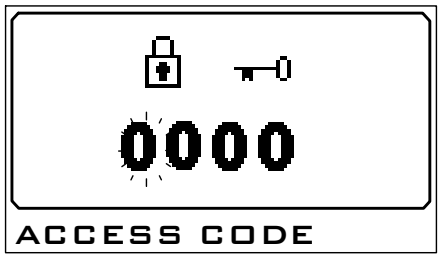
All value, parameter and option settings are grouped into menu page lists. Items are assigned to a list according to type and classification. Items that an operator may require to view during routine operation, pressure or temperature values for example, are assigned to the normal operational User menu page list.

Page lists are identified by page number, the normal operational display list is page 00. All adjustable parameters and options are assigned to menu mode pages 01 or higher. All User menu 'page 00' items are view only and cannot be adjusted; an access code is required to access pages higher than User page 00.

Normal Operational Mode (Page 00):

At controller initialization, all display elements and LED indicators are switched on for three seconds, the display will then show the software version code for a further 3 seconds before initialization is complete and the normal operating display (Page 00) is shown. The 'item' display will initially show the 'status' menu item for 35 seconds before reverting to the default temperature display item. All available 'item' displays (temperatures, pressures, hours counters) can be selected using the UP or DOWN buttons at any time. The 'item' display will revert to the default item after 35 seconds if no further selection is made. Pressing the ENTER button will lock any selected 'item' display and inhibit return to the default display. When an 'item' display is locked a 'key' symbol will show. To unlock an 'item' display press UP or DOWN to view an alternative 'item' display or press RESET or ESCAPE. In page 00 the ESCAPE button will select the 'Status' item display and the RESET button will select any active fault code display or the 'Status' item display if no faults are active. Unless a selected Item display is locked, the display will automatically jump to the 'Status' item display at key status change events. The timeout period before returning to the default 'item' display is modified in some instances to enable the full range of a set countdown timer to be shown. No item values, options or parameters can be adjusted in page 00. If a fault condition occurs the fault code becomes the first page 00 list 'item' and the display will automatically jump to display the fault code. More than one active fault code 'item' can exist at any one time.

Access Code:



Access to pages higher than page 00 is restricted by access code.
To access menu mode pages press UP and DOWN together for several seconds, an access code entry display is shown and the first code numeric character will flash. A four number code is required.

Use PLUS or MINUS to adjust the value of the first code character then press ENTER. The next code character will flash; use UP or DOWN to adjust then press ENTER.

Repeat for all four numeric code characters. If the code number is less than 1000 the first code character(s) must be 0(zero). To return to a previous code character press ESCAPE. When all four numeric code characters have been set to an authorized code number press ENTER.

Access Code 'accepted'

Access Code 'rejected'

Access to certain menu mode pages is dependent on authority level determined by the access code used. An invalid code will return the display to normal operational mode; page 00.

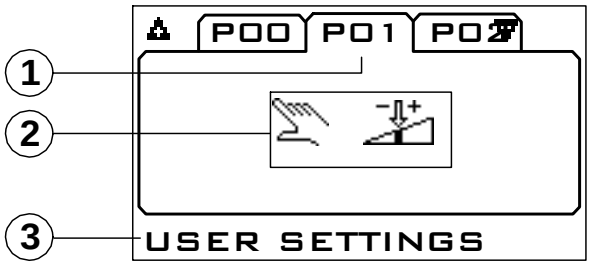
The following pages and access levels are used:

Access Level = **USER** (code = 0009)	Access Level = **SERVICE** (code = 0100)	Access Level = **HIGH**	Access Level = **SEQUENCE**
P00, P01, P02, P11	P00, P01, P02, P03 P04, P05, P06, P07 P08, P09, P11	P00, P01, P02, P03 P04, P05, P06, P07 P08, P09, P10, P11	P00, P80, P81, P82

Access Code Timeouts:
When in menu mode, if no key activity is detected for a period of time the display will automatically reset to the normal operational display; page 00. The timeout period is dependant on access code level:

User: *1 minute* Service: *10 minutes* High: *1 hour*

Menu Mode Navigation:



Each menu mode page (1) is identified symbolically (2) and by language text (3).

Menu page symbolic identification defines the menu page type and access level.

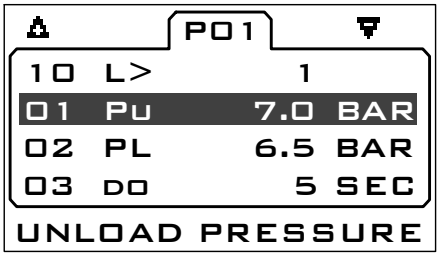
The first (left) symbol defines menu page access level:

User Service High Level

The second (right) symbol defines general menu type

User (view only)
Shutdown Settings
Variable Speed Control
Log, Fault History
Operation Settings
Inhibit Settings
Sensor Calibration
Alarm Settings
Diagnostics
Pressure Schedule

Press UP or DOWN to select the required menu page then press ENTER.



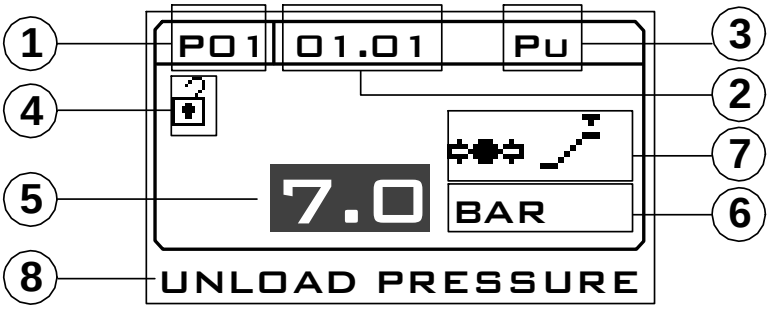
Each menu page contains a number of items. The first item in the list will be highlighted. Press UP or DOWN to scroll through the items in the list; the list will wrap-around.

Note: When the first list item is highlighted the last list item can be seen at the top of the list; this immediately indicates the number of list items.

To select a list item for adjustment press ENTER.
To return to the menu page selection screen press ESCAPE.

A menu page may contain items that are view only; the error log for example.

In this instance a 'Key' symbol will be displayed to indicate that all items in the menu page are 'locked' and cannot be adjusted. Menu pages can also be 'locked' for view only when the unit is operation; stop the unit first before attempting any item adjustment.



Each item in the menu structure has a unique identification code referencing the menu page (1), the page item number (2) and a sub-item number. Each menu page item also has a two-character identification (3) that is unique within the menu page. Sub-items are only applicable in certain instances; pressure schedule for example. In most instances there will be only one setting associated with a list item.

When a menu page item is selected the item value or option (5) will be highlighted. Each 'item' is displayed together with the 'units' (6), symbolic identification (7) and descriptive language text (8). Press UP or DOWN to adjust the item setting; press ENTER to program the new setting in permanent memory.
The item setting will change per step when pressing UP or DOWN. The step values are stated in the different tables you can find in the menu explanations (

4.4.2 P00 User Menu→4.4.13 P11 Pressure Schedule and Real Time Clock Menu).

Notes:

- Some step values however change when the key is pressed for a longer time, these are marked with this symbol ⇑ in the step column. The algorithm behind is that when the button is pressed longer then 3 seconds the step value increases to with a factor 10, when holding a little longer (more the 8 seconds) the step value is multiplied by 100 and finally, when holding it longer then 15 seconds, by 1000.
- Some items can not be changed while the controller is in a running state, these items are marked with this symbol ∅.

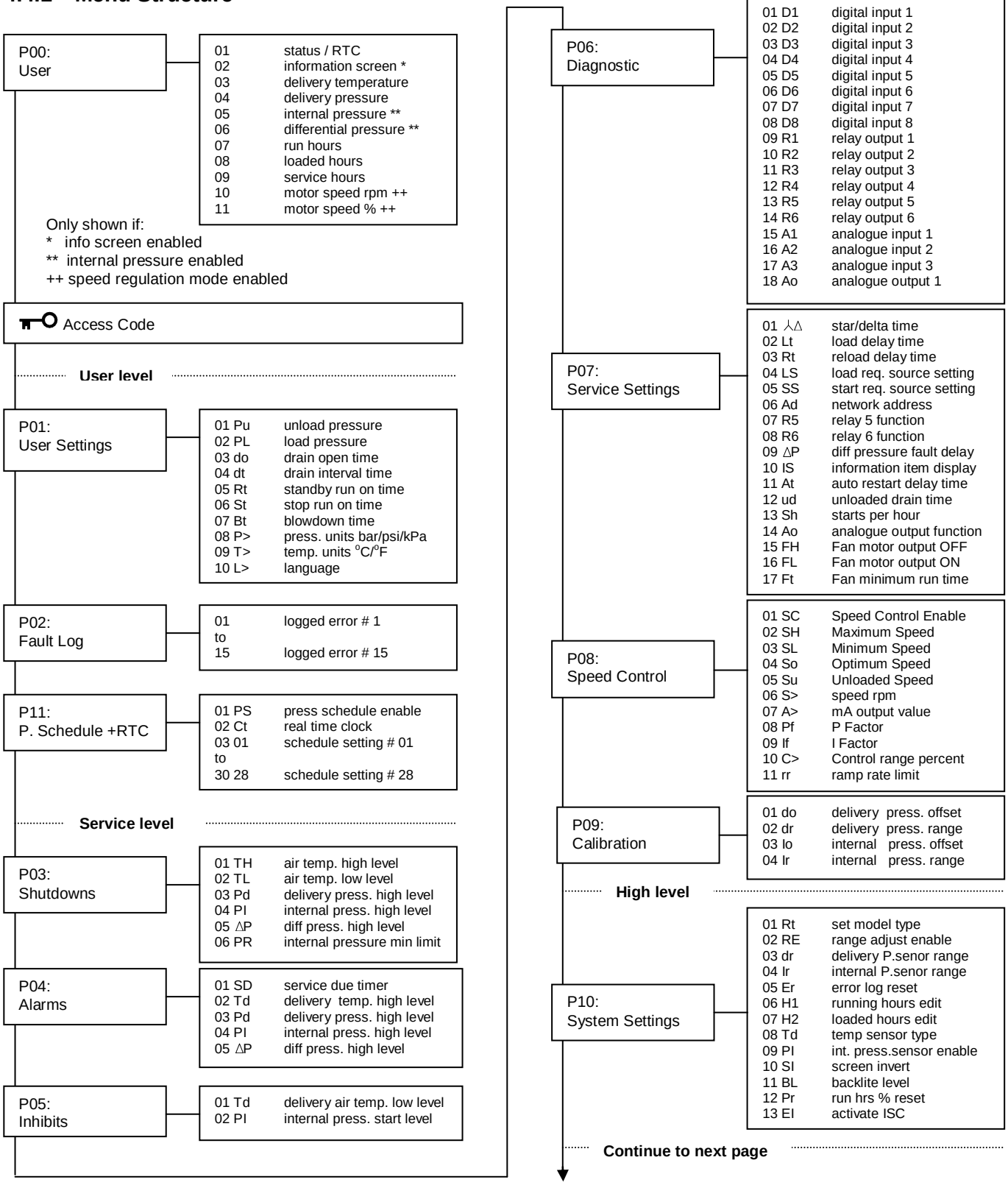
 Item settings can only be adjusted when the item is 'unlocked' (4).

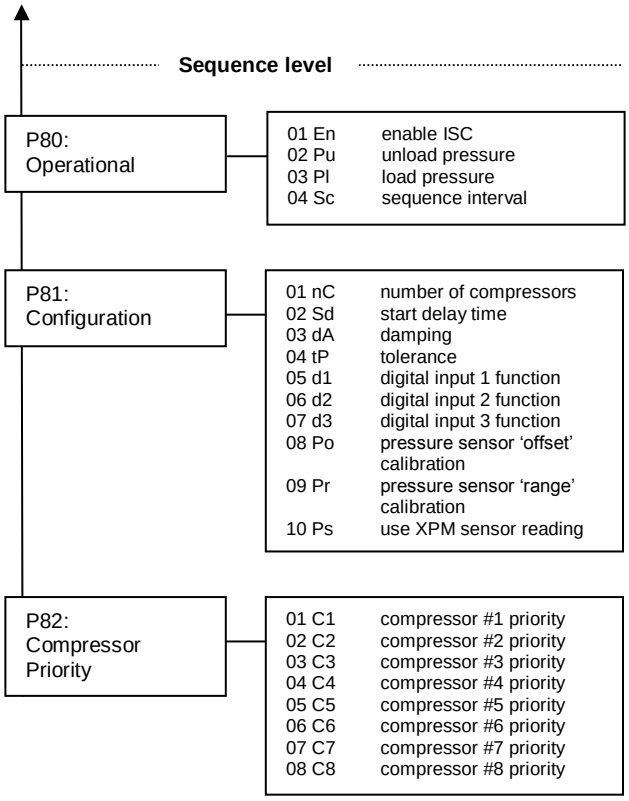
 Some items are view only, or cannot be adjusted when the unit is operational, in this instance a 'locked' symbol will be display; adjustment is inhibited.

To abandon an adjustment at any time press ESCAPE; the original value or option will be maintained in memory and the screen will return to the page item list.

 Press and hold RESET for several seconds at any time to immediately exit menu mode and return to the normal operational display (page 00). Any value or option adjustment that has not been confirmed and entered into memory will be abandoned and the original setting maintained.

4.4.1 Menu Structure




Sequence level
P80:
Operational
01 En enable ISC
02 Pu unload pressure
03 Pl load pressure
04 Sc sequence interval
P81:
Configuration
01 nC number of compressors
02 Sd start delay time
03 dA damping
04 tP tolerance
05 d1 digital input 1 function
06 d2 digital input 2 function
07 d3 digital input 3 function
08 Po pressure sensor 'offset' calibration
09 Pr pressure sensor 'range' calibration
10 Ps use XPM sensor reading
P82:
Compressor
Priority
01 C1 compressor #1 priority
02 C2 compressor #2 priority
03 C3 compressor #3 priority
04 C4 compressor #4 priority
05 C5 compressor #5 priority
06 C6 compressor #6 priority
07 C7 compressor #7 priority
08 C8 compressor #8 priority

4.4.2 P00 User Menu

The User menu shows normal operational values and information displays. This is the default display menu; no access code is required.

item#	description	units	step	min	max	default	display
01	status	---	no_edit	---	---	---	*status text + real time clock or countdown timer event*
02 *	information item	---	no_edit	---	---	---	*as info screen setting*
03	delivery temperature	°C/°F	no_edit	---	---	---	**85 °C**
04	delivery pressure	bar/psi	no_edit	---	---	---	**69 psi**
05 **	internal pressure	bar/psi	no_edit	---	---	---	**78 psi**
06 **	differential pressure	bar/psi	no_edit	---	---	---	**9 psi** ΔP
07	running hours	h	no_edit	---	---	---	**1430 hrs**
08	loaded hours	h	no_edit	---	---	---	**1275 hrs**
09	service hours	h	no_edit	---	---	---	**570 hrs**
10 #	motor speed	rpm	no_edit	---	---	---	**2700 rpm**
11 #	motor speed	%	no_edit	---	---	---	**80.0 %**
12 ##	ISC sequence	---	no_edit	---	---	---	*sequence assignment of compressors*
13 ##	seq. change count	hrs	no_edit	1	720	24	**24 hrs**
14 ##	XPM pressure	psi	no_edit	---	---	---	**[----] psi**

* only shown if 'information' item enabled
** only shown if internal pressure sensor function enabled
# only shown if variable speed regulation mode enabled
only shown if ISC sequence mode enabled

4.4.3 P01 Operation Menu

Contains general operation parameters that may be modified by the User from time to time.

item#	description	units	step	min	max	default	display
01	unload pressure	bar/psi	1	80	175	120	**Pu** 120 psi
02	load pressure	bar/psi	1	80	165	100	**PL** 100 psi
03	drain open time	s	1	1	30	5	**do** 5 s
04	drain interval time	s	1	30	3600	60	**dt** 60 s
05	standby run on time	s	1	1	3600	480	**Rt** 480 s
06	stop run on time	s	1	1	60	20	**St** 20 s
07	blowdown time	s	1	1	600	10	**Bt** 10 s
08	pressure units	---	1	0	2	1	**P>** 1 0=bar / 1=psi / 2=kPA
09	temperature units	---	1	0	1	0	**T>** 0 0=^{0}C 1=^{0}F
10	language	---	1	0	6	1=english	**L>** english

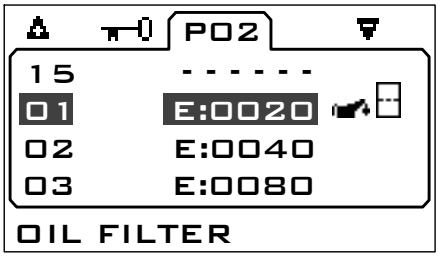
Minimum differential between load and unload set points is 0.2bar

Pressure Settings:
Load, unload, Alarm and Shutdown pressure settings are all interlocked. A setting cannot be adjusted beyond the limits of other associated settings. Check associated settings if adjustment is limited before required setting is obtained:
Trip cannot be adjusted above the 'maximum sensor range'
Alarm cannot be adjusted above (Shutdown – 0.2bar) or below ('Pu' Unload + 0.2bar)

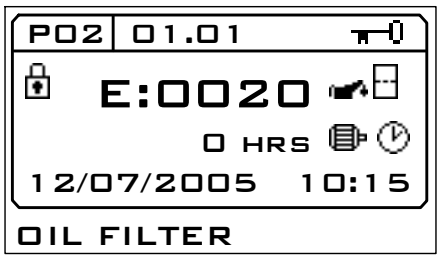
Pressure and Temperature Units:
Selects the units for displayed values. Internally the controller operates using mBar (0.001bar) and mCelsius (0.001°C). The values displayed are calculated from the internal operating values.

Language:
Language applies to the text that appears at the bottom of each display page.
The language text display line can be switched off by selecting the 0(zero) setting.
Languages possible: 1=English; 2=Deutsch; 3=Francais; 4= Nederlands; 5=Italiano; 6=Espanol; 7=Turkish.

4.4.4 P02 Fault Log Menu



The Fault Log menu page contains the last 15 fault codes in chronological order. The most recent fault is stored as 'item' 01. If all 15 fault logs are full and a new fault event occurs, the new fault state is entered as item 01, all log entry items are incremented by one, and the log entry at item 15 is lost.



Press ENTER to view full details of a log entry. The log item display will show the fault code together with symbolic identification and the running hours, time and date recorded at the moment when the fault occurred. Fault types are identified by the initial fault code letter:
E = Shutdown/Trip, A = Alarm/Warning, R=Run/Load Inhibit.
All items are view only.

item#	description	units	step	min	max	default	display
01	logged error #1	---	no_edit	---	---	---	**01** . . . E:0020
02 to 15	logged error #2 to error #15	---	no_edit	---	---	---	**02 to 15**

4.4.5 P03 Shutdown Menu

Settings that determine the level or condition at which a shutdown fault is generated.

item#	description	units	step	min	max	default	display
01	delivery air temperature high level	°C/°F	1	80	130 **	110	**TH** 110 ^{0}C
02	delivery air temperature low level	°C/°F	1	0	10	5	**TL** 5 ^{0}C
02	delivery pressure high level	bar/psi	1	Alarm+3	232	135	**Pd** 135 psi
03	internal pressure high level	bar/psi	1	Alarm+3	232	140	**PI** 140 psi
04	differential pressure high level	bar/psi	1	Alarm+3	72	14	**△P** 72 psi
05	Internal pressure minimum level	Bar/psi	1	0	14	0	**PR** 0 psi

** Delivery temperature maximum limit may be higher with alternative temperature sensor types.

Other associating settings that are interlinked with a setting being adjusted will be automatically adjusted if differential limits are exceeded, e.g. the differential pressure high level (**△P**) maximum setting will change if the **△P** Alarm setting is increased beyond the differential limit.

Differential Pressure High Level:
Will activate if the condition remains above the set level for longer than the differential pressure fault delay time (see menu P07) AND the delivery temperature is above 50 ^{0}C.

Internal Pressure Minimum Level:
Internal pressure is checked after the initial motor start sequence + set load delay time, and at each load request thereafter. If detected pressure is below the set limit a shutdown error is generated. This feature is intended to provide protection against incorrect motor rotation or catastrophic internal pipe/coupling failure.

4.4.6 P04 Alarm Menu

Settings that determine the level or condition at which an alarm fault is generated.

item#	description	units	step	min	max	default	display
01	Service Timer	hours	1	0	10000	2000	**SD** 2000
02	delivery air temperature high level	°C/°F	1	70	120	105	**Td** 105 ^{0}C
03	delivery pressure high level	bar/psi	1	Pu+3	229	130	**Pd** 130 psi
04	internal pressure high level	bar/psi	1	78	229	135	**PI** 135 psi
05	differential pressure high level	bar/psi	1	3	70	12	∧**P** 12 psi

For settings that are interlocked with associating settings, the associating settings may automatically change if the adjustment is increased beyond the differential limits; always check all associating settings after adjustment.

Service Countdown Timer:
The service countdown timer will count down from the set value in accordance with running hours. When the item is viewed the service hour's value will reflect the current hours remaining until a routine maintenance service is due (zero hours). When zero hours are reached a service due alarm will be displayed. The alarm can only be reset when the service hours is adjusted above zero. The service hours count will continue to count down in negative values until the timer is re-set. This function is intended to promote timely routine maintenance and indicate how many running hours have passed since a service due alarm was displayed. The value can be adjusted back to the required maintenance interval time each time a maintenance service is completed.

Differential Pressure High Level:
Will activate if the condition remains above the set level for longer than the differential pressure fault delay time (see menu P07) AND the delivery temperature is above 50 ^{0}C

4.4.7 P05 Start, Run or Load Inhibit Menu

Settings that determine the level or condition at which a Run or Load inhibit condition exists.

item#	description	units	step	min	max	default	display
01	delivery air temperature low level (R)	°C/°F	1	-20	10	1	**Td** 1 ^{0}C
02	internal pressure start level (R)	bar/psi	1	0	29	7	**PI** 7 psi

Delivery Air Temperature Low Level: Run Inhibit active if temperature falls below set limit.
Internal Pressure Start Level: Run Inhibit active if pressure is above set limit.

Run inhibits (R) allow the compressor to be started but will prevent a main motor start until the condition clears. When the condition is no longer present, the alarm will self reset and the main motor automatically allowed to start as required (see: internal pressure blowdown timeout shutdown function)

Note: There are no 'Start' (S) or 'Load' (L) inhibit condition settings as standard.

4.4.8 P06 Diagnostic Menu

This menu allows a technician to check all inputs and test all outputs individually without running the compressor.

item#	description	units	step	min	max	default	display
01	digital input 1	---	no_edit	---	---	---	**D1** 0 _ _ _
02	digital input 2	---	no_edit	---	---	---	**D2** 0 _ _ _
03	digital input 3	---	no_edit	---	---	---	**D3** 0 _ / _
04	digital input 4	---	no_edit	---	---	---	**D4** 0 _ _ _
05	digital input 5	---	no_edit	---	---	---	**D5** 0 _ _ _
06	digital input 6	---	no_edit	---	---	---	**D6** 0 _ / _
07	digital input 7	---	no_edit	---	---	---	**D7** 0 _ / _
08	digital input 8	---	no_edit	---	---	---	**D8** 0 _ _ _
09	relay output 1	---	1	0	1	0	**R1** 0 _ / _
10	relay output 2	---	1	0	1	0	**R2** 0 _ / _
11	relay output 3	---	1	0	1	0	**R3** 0 _ / _
12	relay output 4	---	1	0	1	0	**R4** 0 _ / _
13	relay output 5	---	1	0	1	0	**R5** 0 _ / _
14	relay output 6	---	1	0	1	0	**R6** 0 _ / _
15	analogue input 1	---	no_edit	---	---	---	**A1** 4.00mA
16	analogue input 2	---	no_edit	---	---	---	**A2** 0.467V
17	analogue input 3	---	no_edit	---	---	---	**A3** 4.00mA
18	analogue output1	mA	0.10	0.0	20.0	---	**Ao** 4.00 mA

Digital Inputs: The display will indicate the actual state of the input "_ **/** _" (open circuit) or "_ _ _" (closed circuit) and the status of the corresponding input function; active (1) or de-active (0).
Note: Value display number indicates function not input state (example: Emergency Stop = 0 "_ _ _" the input is closed circuit and the Emergency Stop function is not active).

Relay Outputs: Relays can be energised (1) and de-energised (0). The motor starter relay outputs, 1 to 3, can only be energised one at a time, the output will de-energise when the selected Item is changed.

Analogue Inputs: Both values, associated engineering units set for the input and the actual mV(temperature or voltage inputs) or mA(current loop inputs) detected on the corresponding controller input are displayed. The mV or mA value can be independently checked with a meter for diagnostic purposes if required.

Analogue output values can be adjusted (from 0.0mA to 20.0mA in 0.1mA steps) to force the output to a desired mA level for diagnostic or calibration processes. The output will automatically revert to the defined function upon menu page exit.

4.4.9 P07 Configuration Menu (Service Settings)

Settings that determine the basic operating configuration.

item#	description	units	step	min	max	default	display
01	star/delta time	s	0.2	1	30	8	⅄⅄ 8.0 sec
02	load delay time	s	1	1	30	6	**Lt** 6.0 sec
03	reload delay time	s	1	1	10	1	**Rt** 1.0 sec
04	load request source setting	0=press.sensor 1=comm.req.	1	0	1	0	**LS** 0
05	start request source setting	0=keyboard 1=comm.req. 2=dig.inputs	1	0	2	0	**SS** 0
06	network address	---	1	1	99	1	**Ad** 1
07	relay 5 function setting	1 to 13 see Output Functions	1	1	13	7	**R5** 7
08	relay 6 function setting	1 to 13 see Output Functions	1	1	13	3	**R6** 3

Relay 5 and 6 Output Functions:

1 - Alarm	De-energised for any active Alarm fault (not including Start/Run Inhibit)
2 - Shutdown	De-energised for any active Shutdown fault (not including Start/Run Inhibit)
3 – Group Fault	De-energised for any active Alarm, Star/Run Inhibit or Shutdown fault
4 – Alarm Service	De-Energised for any Alarm fault or Service Due alarm (not including Start/Run Inhibit)
5 – Service	Energised for Service Due alarm only
6 – Heater	Energises if detected temperature falls below set low temperature run inhibit + 2°C De-energises if detected temperature increases above set low temp run inhibit + 3°C Can be used to energise anti-condensate heater contactor or as low temperature warning auxiliary output.
7 – Drain	-When loaded: cycle in accordance with drain open and drain interval time settings. Elapsed interval time is stored in non-permanent memory when not loaded and the remaining interval time applied when loaded operation is resumed. -When not loaded AND in 'started' state (optional; active only if offload drain time set above zero seconds, 0sec = offload drain function disabled). drain interval time = drain interval time x 10. drain open time = offload drain time setting. reset to start of interval time when status change to not loaded, then cycle.
8 – Fan	Energised in all RUNNING states except 'motor start' and 'load delay time' Can be used to energise internal and/or external cooling fan motor contactor
9 – Standby	Energised in 'Standby' and 'Blowdown' states
10 – Running	Energised in all RUNNING state conditions
11 – Loaded	Energised in all LOADED state conditions
12 – Started	Energised in all STARTED state conditions
13 – Fan (temp ctl)	Enabled to operate in all RUNNING states except 'motor start' and 'load delay time' If enabled to operate the output will only energise if delivery temperature exceeds the set 'Fan High' temperature setting. If delivery temperature falls below the set 'Fan Low' temperature setting the output will de-energise. Once energised the output will remain energised for a minimum of the set 'Fan Minimum Run Time' regardless of delivery temperature. Can be used to energise internal and/or external cooling fan motor contactor; the minimum run time is intended as a means of limiting Fan motor starts-per-hour.

9	differential pressure fault delay time	s	1	1	600	10	**△P** 10.0 sec
10	Information display item setting	0=no indication 1=network address 2=machine state No. 3=average cycle time 4=max cycle time 5=# starts registered 6=load/unload info 7=active line in pressure schedule	1	0	7	1	**IS** 1
11	auto restart delay time	s	1	0	120	10	**At** 10.0 sec
12	offload drain time	s	1	0	30	0	**ud** 0
13	starts per hour	---	1	0	20	0	**Sh** 0
14	Analogue output select	---	1	0	16	15	**Ao** 15
15	Fan control OFF temp	^{0}C	1	FL+2	95	85	**FH** 85 ^{0}C
16	Fan control ON temp	^{0}C	1	55	FH-2	75	**FL** 75 ^{0}C
17	Fan minimum run time	s	1	10	300	180	**Ft** 180 sec

Information Display Item Setting:
This setting determines the item shown in the User menu (page 00) 'information' item:

Network Address – the set RS485 network address for the compressor (default)
Machine State Number – the current active status block condition (see machine state diagram)
Average Cycle Time – the average controller software cycle time in mSecs
Maximum Cycle Time – the maximum controller software cycle time in mSec
Starts Registered – The number of motor start events that have occurred in the last one-hour period

The 'information item' is intended for general information or diagnostic purposes, to disable select (0).

Auto Restart Delay:
If an auto restart delay time is specified, the controller will execute an automated restart after a power disruption if the controller was in the Started state when the power disruption occurred. The delay time specifies the warning period after controller initialization before a re-start is executed. The time before restart is indicated on the controller display. No restart will occur if the controller was not in the started state prior to power disruption.

Starts per hour:
Every time a main motor start event occurs, an entry is made in an array (app_starts_per_hour_countdown_array[x]). The entry is made in the first available location in a FIFO register list. The entry is 3600 seconds, which is counted down from that point in time. For every motor start event to the maximum number of starts per hour allowed, an entry is made. When the first entry expires, the others, which were recorded at a later point in time, will be shifted forward one, and the number of registered motor starts is decremented. If the number of motor starts registered (motor start events within the last one hour period) equals the number of starts allowed, an adjustment to the run-on-time is made. The new run-on-time is calculated so that the compressor will continue to run offload until the number of registered start events within the last one hour period reduces below the maximum number set, allowing another start event to occur.
The 'starts per hour' function only influences the standby run on time, it will not prevent the motor from being starting. If a new start is performed after the maximum number of starts has already been registered, the oldest one is removed from the list, which causes the time to wait to increase.

To disable the function, and maintain the set run-on-time period regardless of motor start events, adjust the starts per hour setting to 0(zero).

Analogue Output Select:
In standard fixed motor speed mode the analogue output can be selected to follow delivery pressure '14', delivery temperature '15' or internal pressure '16'. To disable output select '0'.
The analogue output can also be used to energise an auxiliary relay; the contacts of which can then be used to switch remote devices.
Settings: 1 to 13 = same functions as described for R5 and R6 options 1 to 13
(See P07, Relay 5 and 6 Output Functions)

Only use a 24Vdc relay that has a switch-on and hold current no greater than 20mA.
Part number Y01ENER34.00 is suitable for this purpose.

Note: In speed regulation modes the analogue output will be the frequency inverter drive 4-20mA control signal. In this instance the analogue output will display setting '17' (variable speed regulation) and the setting will be locked and can not be adjusted.

4.4.10 P08 Speed Regulation Menu

The speed regulation function provides P&I loop control of a variable speed drive (using 4-20mA output 1) in order to maintain a steady target pressure level (load pressure).

Speed regulation is used to maintain delivery pressure at the load pressure set point. If pressure rises to the unload pressure set point the load solenoid output is de-energised and the compressor unloaded. While in the offload state the controller will maintain speed at the set offload speed setting. If pressure remains above the load pressure set point for longer than the set run-on-time the main motor will stop and the controller will enter the standby state. When pressure falls below the load pressure set point the motor is re-started, if in standby state, and the load solenoid output is energised. Full range speed regulation is then applied.

If connected to a CSC200 sequence controller system, and the system consists of more than one VSR (variable speed regulated) compressor, any VSR compressor assigned as base load will be biased to operate at the set optimum speed setting. Any VSR compressor assigned as top-up will use full range speed regulation. In addition, the target pressure of each VSR compressor is automatically referenced to the sequencer to maintain exact pressure control regardless of pressure differentials between compressors. In this manner up to 12 VSR compressors can be controlled as a single coherent system with full efficiency capacity matched management, sequence rotation and single pressure set point control.

item#	description	units	step	min	max	default	display
01	Speed regulation control mode ∅	---	1	0	2	0	**SC** 0=disabled 1=fixed speed regulation 2=variable speed regulation
02	maximum speed	rpm	10	minimum speed+100	10000	3000	**SH**
03	minimum speed	rpm	10	0	maximum speed-100	1500	**SL**
04	optimum speed	rpm	10	minimum speed	maximum speed	2700	**So**
05	unload speed	rpm	10	minimum speed	maximum speed	1800	**Su**
06	rpm actual	rpm	---	---	---	---	**S>** View only, for information
07	output actual	mA	---	---	---	---	**A>** View only, for information
08	P factor	---	1	0	100	40	**Pf**
09	I factor	---	1	0	100	10	**If**
10	Control range percent	%	---	---	---	---	**C>** View only, for information
11	Maximum ramp rate	%	1	5	100	10	**rr**

Speed regulation control mode:
To disable speed regulation control for a fixed speed motor, load/unload compressor; select mode '0'.
To operate at fixed speeds select mode '1'. The motor will operate at the set optimum speed while loaded, and at the set offload speed when unloaded. The transition in speed is determined by the max ramp rate.
To operate as a full range variable speed regulated compressor select mode '2'.

Maximum Speed	set for motor speed at 20mA output
Minimum Speed	set for motor speed at 4mA output
Optimum Speed	optimum efficiency speed while loaded
Offload Speed	motor speed when off load
P Factor	P&I loop proportional factor
I Factor	P&I loop integration factor
Max Ramp Rate	maximum allowed rate of change expressed as % of full speed range per second (example: max 3000rpm, min 1500rpm, ramp rate 10% = 150rpm/second maximum)

Control Range Percent: Shows the percentage of speed range where set minimum speed is represented as 0%, and maximum speed is 100%. This value is different from the percent speed show in menu P00.

Remote Load Digital Input Function:
If enabled for variable speed regulation, the remote load digital input will operate the compressor in speed control regulation mode '1' regardless of mode setting. If set for mode '2' the compressor will revert to mode '2' operation when the remote load enable input is deactivated.

4.4.11 P09 Calibration Menu

Pressure sensor calibration settings.

Calibration settings for analogue pressure sensors.
When an item is selected the 'Delivery Pressure' display item will show the actual pressure for the item select using the existing calibration values. As calibration values are adjusted the pressure display will immediately show pressure to the new calibration adjustment.

Note: Before calibration is attempted ensure the senor 'nominal range' setting is correct – see menu page P10.

Offset: To calibrate an offset, expose the appropriate sensor to atmosphere and adjust the offset value until the pressure display shows 0.0bar.

Range: To calibrate the range, apply an accurately known pressure to the sensor and adjust the range value until the pressure display matches the applied pressure. The range value can be calibrated with static or changing applied pressure.

item#	description	units	step	min	max	default	display
01	delivery press. Offset ∅	bar/psi	1	-23	23	0	**do** 0 psi
02	delivery press. Range ∅	bar/psi	1	-10% range	+10% range	232	**dr** 232 psi
03	internal press. Offset ∅	bar/psi	1	-23	23	0	**Io** 0 psi
04	internal press. Range ∅	bar/psi	1	-10% range	+10% range	232	**Ir** 232 psi

Caution: Incorrectly set pressure sensor calibration values will affect performance and pressure related safety functions.

4.4.12 P10 High Access Level Configuration Menu (System Settings)

Special functions and settings that determine specific configuration; generally set once during commissioning.

item#	description	units	step	min	max	default	display
01	Set model type	HP	---	5	100	5	**Rt** HP 5 145 psi
02	Enable P.sensors range adjust. ∅	---	1	0	1	0	**RE** 0
03	Delivery P.sensor range	bar/psi	1	72	1450	232	**dr** 232 psi
04	Internal P.senor range	bar/psi	1	72	1450	232	**Ir** 232 psi
05	error log reset	---	---	rst=0	reset	---	**Er** 0
06	running hours edit	hours	1 ⇑	0	99999	0	**H1** 0
07	loaded hours edit	hours	1 ⇑	0	99999	0	**H2** 0
08	delivery air temperature sensor type ∅	2=PT100/PT1000 3=KTY 4=RTD	1	2	4	3	**Td** 3
09	internal press sensor enable ∅	0=not used 1=used	1	0	1	0	**PI** 0
10	screen invert	0 = standard 1 = inverted	1	0	1	0	**SI** 0
11	Backlight level	---	1	1	7	5	**BL** 5
12	Run hrs % reset	---	---	0	reset	---	**Pr** 0
13	Activate ISC	0=disable 1=activate	1	0	1	0	**EI** 0

Set model type :
Dependant on model type, predefined parameters will be set as default accordingly the Model Type Table :

Model Type Table :

HP	Load Pressure (psi)	Unload Pressure (psi)	Pressure Shutdown (psi)	High Level Motor Start (*)	Idle Shut Down (minutes)	Motor Startup/hour	Service Hours
5	125	145	155	On line	5	10	2000
7.5	125	145	155	On line	5	10	2000
10	125	145	155	VSD	6	8	2000
15	125	145	155	On line	6	8	2000
20	100	120	130	Y Delta	8	6	4000
25	100	120	130	Y Delta	10	5	4000
30	100	120	130	Y Delta	10	5	4000
40	100	120	130	Y Delta	16	3	4000
50	100	120	130	Y Delta	16	3	4000
75	100	110	120	VSD	5	12	4000
100	100	110	120	VSD	5	12	4000

(*) High Level Motor Start
On line = 1 second
Y Delta = 8 seconds

Enable Pressure Sensor Range Adjustment:
If set to 1=ON will allow the range values for the delivery and internal pressure sensors to be adjusted. Range adjustment provides a means of modifying the controller to accept 4-20mA pressure sensors that have range values different to the standard 0 to 16.0 bar default. If set to 1=ON and a 'Reset to Factory Default' is executed the pressure sensor ranges are not reset and will remain as adjusted.

Pressure Sensor Range Adjustments:
The pressure sensor range values must match the range of the pressure sensor used. If a 4-20mA sensor with a range of 0 to 20bar is connected to the delivery pressure analogue input adjust the delivery pressure sensor range value to 20.0bar. **Note**: This is a nominal 'range' setting, not a calibration setting – see menu page P09.

⚠ **Incorrect adjustment of pressure sensor range values will affect accuracy, performance and pressure related safety functions.**

Error log reset:
Error log reset is used to clear all entries in the error log list (menu page 02).
To clear the error log list select the error log reset item then press UP(plus); the value display will show "RESET".
Press ENTER, when the error log is clear the value display will change back to "0".

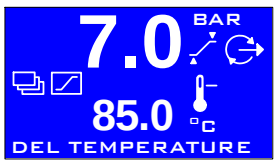
Running and Loaded Hours Edit:
Note: The recorded hours values can be adjusted using these items.

Delivery Air Temperature Sensor Type:
The appropriate hardware ACM module must be fitted to the CSC200 before a selection change is made.

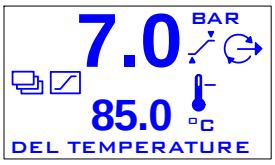
Sensor Type	Setting	ACM
KTY	3	KTY
PT100	2	PT100
PT1000	2	PT1000
RTD	4	KTY

Internal Pressure Sensor Enable:
Set to 0(zero) if no internal compressor pressure sensor is to be fitted; internal pressure and differential pressure related functions will be inhibited and associating values will not be displayed on user page 0.

Screen Invert:

0 = 

standard

1 = 

inverted

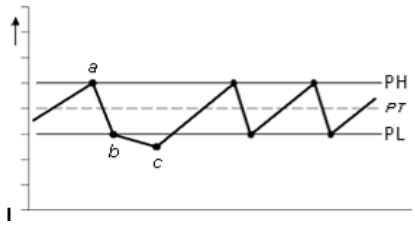
Backlight Level:
The default display backlight level has been set to enable a 'continuous use' display 'service' life in excess of 90000 hours while providing good readability in all ambient light conditions. LCD display 'service' life is defined as the time period before the backlight reduces to 50% of initial brightness. Typically the display will remain usable for a much longer period for time.

When a keypad button is pressed the display backlight will automatically increase 2 level setting in brightness. The backlight will remain at this brightness level for a period of 10 minutes after keypad activity ceases.

- Increasing the backlight level setting above default will reduce display 'service' life.

ISC (Internal System Control) Software Feature

ISC (Internal System Control) software feature is designed to provide automated duty sequence rotation, and optimized single pressure band control, of multiple air compressors operating on a common compressed air system.



The primary function of the ISC control strategy is to maintain system pressure between the 'High Pressure' set point and the 'Low Pressure' set point through optimised compressor utilization. Compressors are utilized depending on the rate of change in pressure, 'Tolerance' pressure level, the dynamic reaction time, and their specified priorities.

Activate ISC:

Menu P80, P81, and P82 will only be accessible after ISC feature is activated.

To activate ISC feature select the activate ISC item then press ENTER. Press UP to adjust the value to "1" and press ENTER.

4.4.13 P11 Pressure Schedule and Real Time Clock Menu

Note: Access to this menu page is available from the User and Service level codes.

item#	description	units	step	min	max	default	display
01	Pressure schedule enable	---	---	---	---	---	**PS** 0=not active 1=active
02	Real time clock	---	---	---	---	---	**Ct** 1.07:00
03	Setting 1	---	---	---	---	---	**01** 1.06:30
to							
30	Setting 28	---	---	---	---	---	**28** 5.18:30

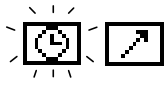
Pressure Schedule:
The pressure schedule can be used to change operating pressure set points, or force the compressor in to a standby state, at specified times on specified days of the week. The pressure schedule cycles through the settings on a weekly basis; beginning 00:00 hours on day of the week 1 (Monday) through to 23:59 hours on day of the week 7 (Sunday). 'Day of week' setting '8' is used to specify that the instruction should be executed at the same time on each day of the working week (days 1 to 5 inclusive; not including weekend days 6 and 7). 'Day of the week' setting '9' is used to specify that the instruction should be executed on every day of the week (days 1 to 7 inclusive).

The 'day of the week' and the 'time of day' can be specified for each setting together with 'unload' and 'load' pressure set points. The controller will use the specified pressure set points from the set time and day of the week until the next chronological setting modifies the pressure set points, or the pressure schedule is disabled or a remote override is activated.

If 0(zero) 'unload' pressure is specified the compressor will unload, run-on and stop into the standby state. The compressor will remain in the standby state until the next setting specifies an operating pressure above zero. There are 28 available settings, some or all of which can be utilised. There are no limits to the number of settings that can be assigned to any particular day of the week. The controller will immediately operate in accordance with the schedule settings when the pressure schedule is activated and the compressor is started.

Note: The pressure schedule will not start and stop the compressor; the compressor must be started before pressure schedule functionality will operate.

 When the pressure schedule is activated the 'pressure schedule' function symbol will appear.

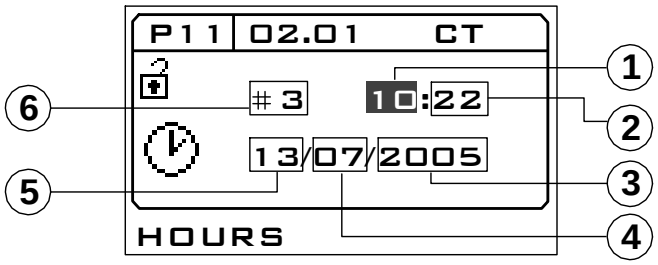
 The pressure schedule has a lower priority than communications pressure control or the remote pressure control digital inputs, both will override the pressure schedule settings. The 'pressure schedule control' symbol will flash, and the 'Remote Pressure Control' symbol appear, during a remote override situation.

 The pressure schedule can be remotely suspended, and normal pressure set point control resumed, by activating the remote load digital input without activating the remote load enable input. This facility can be used to temporarily override the pressure schedule, with a single remote switching contact, during unexpected or non-routine periods. The 'pressure schedule control' symbol will flash during an override situation.

Pressure Schedule Menu Navigation
The pressure schedule menu page uses sub items. All page items, except PS 'pressure schedule enable' consist of a number of sub-items that are selected sequentially after entering the primary item for adjustment.

The 'Pressure Schedule' function must be deactivated (item 01; PS = 0), OR the compressor stopped, before any setting adjustments can be made.

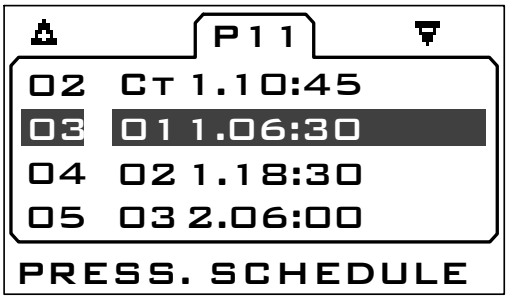
To Adjust The Real Time Clock:
Select menu Page 11, and navigate to menu list item '02' (Ct). The list item will flash and the display will show the current set 'day of the week' and 'time' in 24hr mode. Press ENTER to select the item for adjustment.



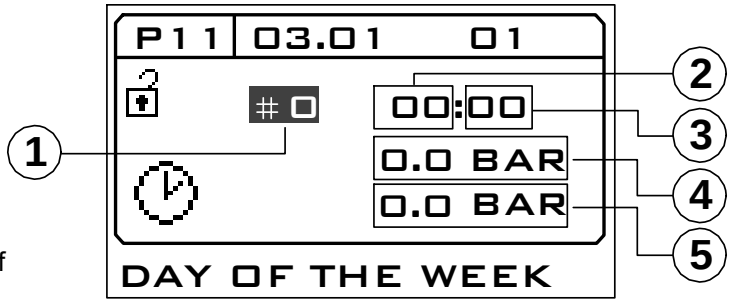
The RTC (Real Time Clock) settings screen will appear and the 'Hours' item (1) will be highlighted. Press UP or DOWN to set the hours, then press ENTER. The 'Minutes' item (2) will be highlighted, press UP or DOWN to set the minutes, then press ENTER. Repeat this procedure for the 'Day of Month" item (5), 'Month' item (4) and the 'Year' item (3).
When the final item is set the 'Day of the Week' item (6) is automatically calculated and applied; the screen will revert to the menu page list.

If no adjustment of a sub item setting is necessary, immediately press ENTER to increment to the next sub item.

Pressure Schedule Settings:



There are 28 available pressure schedule settings; menu page items P11.03 to P11.30. Each pressure schedule item in the menu list indicates the 'day of the week' and the 'time':
D.HH:MM *(1.06:30)*
D (1) Day of the week (1 = Monday to 7 = Sunday)
HH (06) Hour of the day (24 hour)
MM (30) Minutes



To Enter a New Pressure Schedule Setting:

Navigate to an empty pressure schedule item; an item that shows '0.00:00'. Press ENTER to select the 'item' for adjustment; the pressure schedule item screen will appear and the 'day of the week' sub-item (1) will be highlighted.
Press UP or DOWN to adjust the number to the required 'day of the week' setting; then press ENTER.
The 'Hours' sub-item (2) will be highlighted. Press UP or DOWN to adjust the setting; then press ENTER.
The 'Minutes' sub-item (3) will be highlighted. Press UP or DOWN to adjust the setting; then press ENTER.
The 'Unload Pressure' sub-item (4) will be highlighted. Press UP or DOWN to adjust the setting; then press ENTER. This setting will override the 'Unload' pressure setting of User menu page P01 when the setting becomes active.
The 'Load Pressure' sub-item (5) will be highlighted. Press UP or DOWN to adjust the setting; then press ENTER, the screen will revert to the menu page list. This setting will override the 'Load' pressure setting of User menu page P01 when the setting becomes active.

Note: All pressure schedule settings are maintained in chronological order. When entered a setting may automatically change position in the list; this will be clearly highlighted.

To force the compressor into a Standby state, adjust the 'Unload' pressure setting to 0(zero). The 'Load' pressure setting item will be skipped in this instance. When a pressure setting that is set for 0(zero) 'Unload' pressure becomes active the compressor will enter the 'Standby' condition.

To Adjust a Pressure Schedule Setting:
Navigate to the pressure schedule list item that requires adjustment and pressure ENTER. Follow the same procedure as for setting a new pressure schedule setting adjusting sub items as necessary. If a sub item does not require adjustment press ENTER to increment to the next sub item.

To Delete A Pressure Schedule Setting:
Navigate to the pressure schedule list item and press ENTER. Press DOWN to adjust the 'day of the week' item to 0(zero) and press ENTER. All remaining sub item settings will be automatically reset to zero and the setting will be deleted from the pressure schedule list. The screen will revert to the menu page list.

Unload pressure set point adjustment is limited to 0.2bar below the set delivery pressure' Alarm' limit. If the delivery pressure 'Alarm' limit is subsequently adjusted, it is possible for pressure schedule settings with higher-pressure set points to result in an excess pressure 'Alarm' or Shutdown 'Trip' fault condition.

4.4.14 P80 Sequence Operational Menu

item#	description	units	step	min	max	default	display
01	Enable ISC	0=disable 1=enabled 2=enabled with stop control	1	0	1	0	**En** 0
02	Unload pressure	PSI	1	0	175	120	**Pu** 120
03	Load pressure	PSI	1	0	165	100	**PL** 100
04	Sequence interval	Hours	1	1	720	24	**SC** 24

Enable ISC:
There are 2 types of 'enable' functionality. 'Enabled' setting allows ISC controlled air compressors to revert to local control when ISC becomes unavailable for any reason. On the other hand, 'enabled with stop control' setting allows ISC to retain control of all ISC controlled air compressors in a unloaded or stopped state when ISC is 'stopped'.

To Adjust Sequence Interval:
Navigate to the sequence interval item and press ENTER. Press DOWN or UP to adjust the interval and press ENTER. The compressor sequence assignments will be rotated each time the sequence change interval time expires.

4.4.15 P81 Sequence Configuration Menu

item#	description	units	step	min	max	default	display
01	Number of compressors	---	1	2	8	4	**nC** 2
02	Start delay time	Seconds	1	0	60	3	**Sd** 3
03	Damping	Bar	0.1	0.1	10	1.0	**dA** 1.0
04	Tolerance	Bar	0.1	0.2	2	0.2	**tP** 0.2
05	Digital input 1 function	See function list	1	0	10	0	**d1** 0
06	Digital input 2 function	See function list	1	0	10	0	**d2** 0
07	Digital input 3 function	See function list	1	0	10	0	**D3** 0
08	Pressure sensor 'offset' calibration	---	0.1	-0.5	+0.5	0	**Po** 0
09	Pressure sensor 'range' calibration	PSI	1	0	232	232	**Pr** 232
10	Use XPM sensor reading	0=local 1=ISC	1	0	1	1	**Ps** 1

To Adjust Number of Compressors:
Navigate to the number of compressor item and press ENTER. Press DOWN or UP to adjust the value to the appropriate number and press ENTER.

Start Delay Time:
When the ISC feature is started, compressor will be loaded, as required, with this interval time between each load request. This feature is intended to prevent all compressors starting at once at system start.

To Remote Start/Stop ISC Feature:
Ensure one digital input terminal is physically available to remotely start / stop ISC feature. Navigate to the appropriate digital input function item on the program and press ENTER. Press UP to adjust the value to '1' and press ENTER. Only one input can be configured to perform this function. Where 2 or more inputs are configured with the same function, the first terminal input shall take precedent.

To Disable XPM Sensor:
Ensure one digital input terminal is physically available to remotely start / stop ISC feature. Navigate to the appropriate digital input function item on the program and press ENTER. Press UP to adjust the value to '1' and press ENTER.

4.4.16 P82 Compressor Priority Menu

item#	description	units	step	min	max	default	display
01~'n'	Compressor #1 ~ #'n'	---	1	'n'	1	'n'	**C'n'** 'n'

Compressor Priority
Compressors are utilised in response to variations in system pressure. Each compressor in a system is initially assigned to the ISC with a fixed and unchanging number reference, 1 to 8.

Compressor sequence assignment is indicated by letters.

A = the 'Duty' compressor, the first to be utilised and last to be unloaded.
B = the 'Standby' compressor, the second to be utilised and second last to be unloaded.
C = the 'Second Standby' compressor, the third to be utilised.
D = the 'Third Standby' compressor, the forth to be utilised.

And E, F, G, H where utilised....

Each time when the rotation time is reached, sequence assignment for each compressor is re-arranged depending on its specified priority.

Priority scheme is used to modify the sequence assignment. Compressors can be assigned either to same priority or different priority.

Example 1:
When compressor number '1' is to be continuously utilised at all time as the 'duty' compressor, the following priority scheme can be implemented.

Compressor 1 (preferred) = priority 1
Compressors 2 to 4 = priority 2

	1	2	3	4
	1	2	2	2
#1	A	B	C	D
#2	A	C	D	B
#3	A	D	B	C
#4	A	B	C	D

Example 2:
When compressors 1 and 2 are to be utilised first in any sequence arrangement and rotated at each 'Rotation' event, the following priority scheme can be implemented.

Compressor 1 & 2 (preferred) = priority 1
Compressors 3 & 4 = priority 2

	1	2	3	4
	1	1	2	2
#1	A	B	C	D
#2	B	A	D	C
#3	A	B	C	D
#4	B	A	D	C

The highest priority level for each compressor is 1, while the lowest prioity level is the total number of compressors in the system.

e.g. 4 compressor in the system, lowest priority = 4

To Adjust Compressor Priority:
Navigate to the appropriate compressor item that associate with its number reference and press ENTER. Press UP or DOWN to adjust the priority to the desirable value and press ENTER to confirm.

4.4.15 Reset To Defaults - CONFIGURATION TABLE

Factory Defaults				
No.	**Item**	**Description**	**Value**	**Unit**
	P01			
1	do	Drain Open Time	5	sec
2	dt	Drain Interval Time	60	sec
3	Rt	Standby Run-On Time	see Model Type Table	
4	St	Stop Run-On Time	200	sec
5	Bt	Blowdown Time	10	sec
6	T>	Temperature Display Unit	0 = °C	
	P03			
7	TH	Delivery Temperature Shutdown	110	°C
8	TL	Delivery Temperature Shutdown	5	°C
	P04			
8	SD	Service Timer	see Model Type Tabel	
9	Td	Delivery Temperature Alarm	105	°C
	P05			
10	Td	Delivery Temperature Run Inhibit	1	°C
	P07			
11	⅄△	Star/Delta Time	see Model Type Tabel	
12	Lt	Load Delay Time	6.0	sec
13	Rt	Reload Delay Time	5.0	sec
14	R5	Relay 5 Function	7 - Drain	
15	R6	Relay 6 Function	3 - Group Fault	
16	P⅄	Differential Pressure Fault Delay	10	sec
17	At	Power Failure Auto Restart Time	10	sec
18	ud	Offload Drain Interval Time	0 = off	sec
19	Sh	Starts Per Hour	see Model Type Tabel	
20	FH	Fan Temperature Control High - ON	85	°C
21	FL	Fan Temperature Control Low - OFF	75	°C
22	Ft	Fan Temperature Control Minimum Run Time	180	sec
	P08			
23	SC	Speed Regulation Mode Enable	0 = off	
24	SH	Maximum Speed	3000	rpm
25	SL	Minimum Speed	1500	rpm
26	So	Optimum Speed	2700	rpm
27	Su	Offload Speed	1800	rpm
28	Pf	P-Factor, Speed Regulation	40	number
29	If	I-Factor, Speed Regulation	10	number
30	rr	Ramp Rate, Speed Regulation	5	%/sec
	P10			
31	Pr	Delivery Temperature Sensor Type	3 = KTY	
32	Ir	Internal Pressure Enable	0 = off	

4.4.16 Reset To Defaults - PRESSURE TABLE

Factory Default			
No.	**Item**	**Description**	**psi**
	P01		
1	Pu	Unload Pressure	see Model Type Tabel
2	Pl	Load Pressure	see Model Type Tabel
	P03		
3	Pd	Delivery Pressure Shutdown	see Model Type Tabel
4	Pl	Internal Pressure Shutdown	140
5	△P	Differential Pressure Shutdown	14
	P04		
6	Pd	Delivery Pressure Alarm	130
7	Pl	Internal Pressure Alarm	135
8	△P	Differential Pressure Alarm	12
	P05		
9	Pl	Internal Pressure Run Inhibit	7
10	- -	Minimum Load Pressure Setting	80
11	- -	Maximum Load Pressure Setting	165
12	- -	Minimum Unload Pressure Setting	80
13	- -	Maximum Unload Pressure Setting	175
14	- -	Delivery Pressure Shutdown Maximum	232
15	- -	Internal Pressure Alarm Minimum	78
16	- -	Internal Pressure Shutdown Maximum	232
17	- -	Differential Pressure Alarm Minimum	3
18	- -	Differential Pressure Shutdown Maximum	72
19	- -	Minimum Settings Differential	3
	P10		
20	dr	Delivery Pressure Sensor Range	232
21	Ir	Internal Pressure Sensor Range	232
	P03		
22	PR	Minimum Internal Pressure Shutdown	0 = disabled
	P01		
23	P>	Bar/psi/kPa DisplayUnit	1 = psi

4.4.17 Temperature Sensor Adjustment Limits and Default Values

KTY Temperature °C	min	max	default	step
Alarm	70.0	131.0	105.0	0.5
Shutdown	71.0	132.0	110.0	0.5
Range	-10.0	132.0	-	-

PT100/1000 Temperature °C	min	max	default	step
Alarm	70.0	249.0	210.0	0.5
Shutdown Trip	71.0	250.0	220.0	0.5
Range	-50.0	250.0	-	-

RTD Temperature °C	min	max	default	step
Alarm	70.0	149.0	110.0	0.5
Shutdown	71.0	150.0	120.0	0.5
Range	-40.0	150.0	-	-

4.4.18 Pressure Control Source Priority Logic

Pressure regulation control can be derived from a number of sources, internal or remote. Each potential source has a different priority over other potential sources. The following source priority logic diagrams show the pressure regulation mode and method the controller will use under all potential setup selections, remote connection or failure mode conditions.

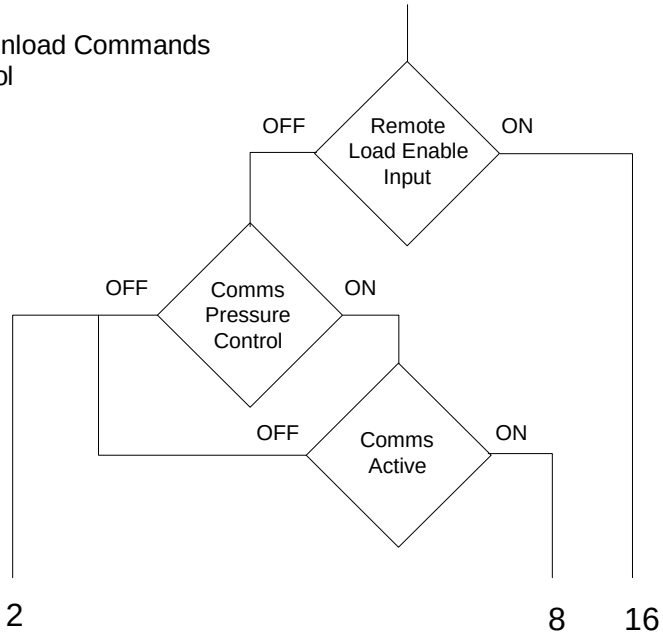
The remote digital load enable input (mode 16) has priority over all other pressure control sources.

If, for example, RS485 network control is selected as the primary source (8), and communications are disrupted, the controller will automatically select load/unload (2). When network communications are restored, the controller will automatically return to communications pressure regulation control (8).

For Standard Fixed Speed Compressor Mode:

1 Alarm Limit Unload Override
2 Menu Page 01 Load and Unload Settings

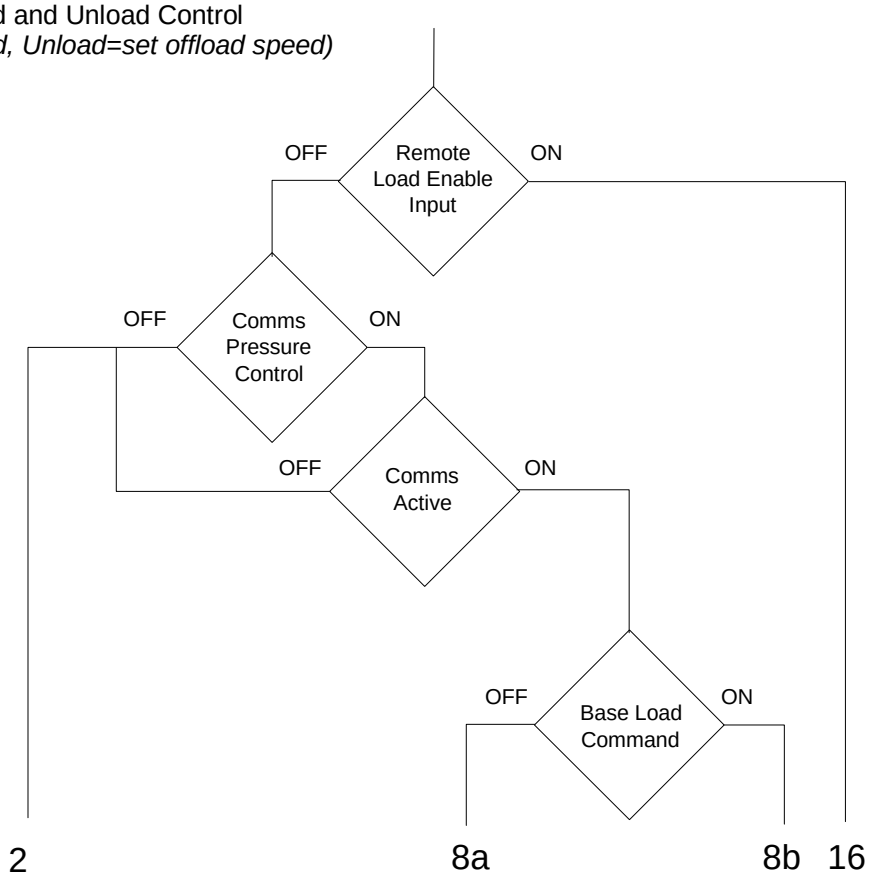
8 Remote RS485 Communications Load and Unload Commands
16 Remote Digital Input Load and Unload Control



For Variable Speed Regulation Mode:

1 Alarm Limit Unload Override
2 Menu Page 01 Load and Unload Settings

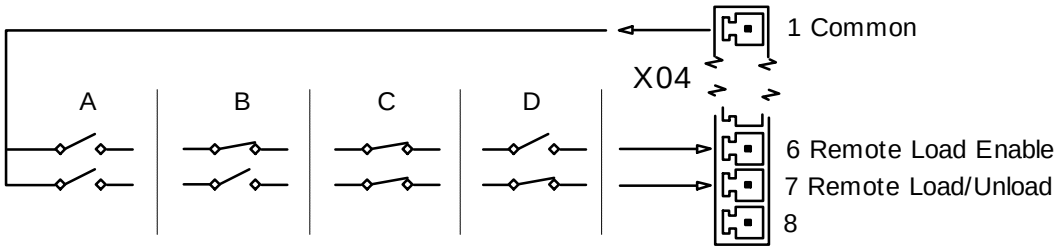
8a Remote RS485 Communications Load and Unload Commands
8b Remote RS485 Communications Base-Load
(motor speed=biased to optimum speed)
16 Remote Digital Input Load and Unload Control
17 (Load=set optimum speed, Unload=set offload speed)



Safety:
Regardless of pressure regulation source, the set Alarm and Shutdown pressure safety limits remain active and are detected from the delivery pressure sensor and internal pressure sensor (if fitted). If internal pressure sensing is not in use, the delivery pressure sensor must never be detached from the air delivery point of the compressor package.

Alarm Limit Unload Override:
If delivery pressure exceeds the set Alarm pressure limit, regardless of pressure regulation source, the load solenoid will be immediately de-energised. The load solenoid will remain de-energised while pressure is above the set Alarm limit and for a period of 10 seconds after pressure falls below the Alarm limit. This is a safety feature designed to prevent incorrectly set remote pressure regulation sources causing the compressor to exceed design pressure limits. While in the Alarm Unload Override condition the pressure source number will be incremented by '1' (for example: remote digital load enable and load active (16) AND Alarm unload override active (1) = 17).

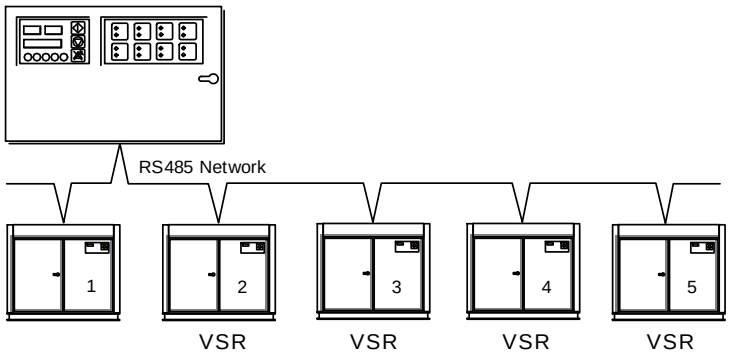
4.4.19 Remote Digital Load Input Functions:



A Remote load enable not active
B Remote load enable active, compressor unload command, PL & Pu ignored
C Remote load enable active, compressor load command, PL & Pu ignored
D Remote load enable not active, remote load input ignored.

Note: Configuration 'D' is used for 'Pressure Schedule' override when the pressure schedule is active.

4.4.20 RS485 Communications Management Control System:



Integration with a DV Systems air system management controller is inherent to all standard CSC200 controllers.

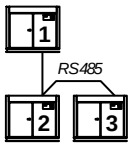
More than one VSR (variable speed regulated) compressor can be sequence managed by a DV Systems air system management controller. One VSR compressor, selected depending on control strategy, will be assigned as top-up and will operate with full range speed regulation. Other VSR compressor(s), assigned as base-load units, will operate at the optimum speed set in each controller. If demand exceeds total system capacity at any time all base-load VSR compressors will increase speed above the optimum setting (up to the maximum speed setting) as appropriate to maintain pressure.

The DV Systems management control system is capable of demand matching any mixture of different output capacity VSR and fixed speed compressors in energy efficiency mode of operation.

4.4.21 RS485 Communications Mini Sequencing Control System:

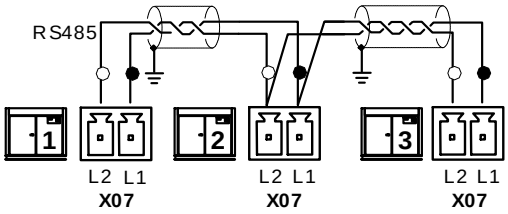
4.4.21.1 Introduction

The CSC200 controller is equipped with a function that will enable pressure control regulation and sequence management of one or two other air compressors that have controllers equipped with the same facility. This feature can be used to create an air compressor system, of up to three compressors, operating coherently to a single pressure target with automated timed sequence rotation.



In this configuration the air compressor designated as compressor '1' becomes the system Master. System pressure is detected by the Master's delivery pressure sensor and pressure regulation is determined by the Master's pressure set points. The Master also determines sequence rotation. Air compressors designated as '2' or '3' (Slaves) will respond to load/unload commands from the Master.

4.4.21.2 Configuration and Set-up



Connect each compressor controller together using the RS485 data link terminals X07.

Only use twisted pair, earth shielded data cable; polarity is important.

Master: Set the 'So' (sequencer operation) item of menu P12 to '1'
(1) Set the 'Ad' (system address) item of menu P07 to '1'
Set the 'LS' (load source) item of menu P07 to '1'

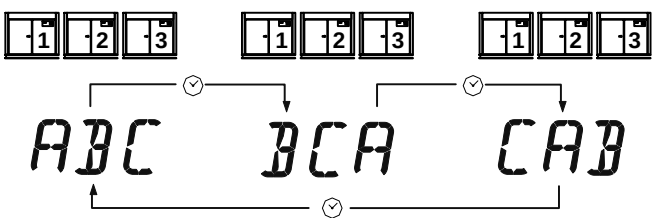
Slaves: Set the 'So' (sequencer operation) item of menu P12 to '0'
(2 & 3) Set the 'Ad' (system address) item of menu P07 to '2' for compressor 2, or '3' for compressor 3.
Set the 'LS' (load source) item of menu P07 to '1'

Each compressor in the system must have a unique 'address' number. The controller assigned to function as the system 'Master' must be address '1', the second compressor (Slave #1) must be address '2' and the third compressor (Slave #2) must be address '3'.

4.4.21.3 Compressor Sequencing

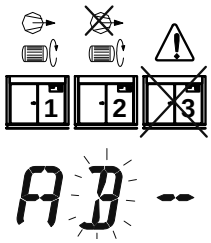
The 'Master' (1) determines the sequence of regulation for each compressor in the system.
Each compressor is assigned as 'base load' ("A"), 'standby ("B") or 'second standby ("C").

The sequence assignment is rotated on a routine bases in accordance with the set sequence rotation time interval (item 'Sc' in menu P80) of the Master controller.



The sequence assignment is displayed in the 'status' menu item of the Master controller.

4.4.21.4 Compressor Status Indication



The 'Status' of each compressor is also indicated by the sequence display in P00 as item units of the information screen:

(A) If the assignment letter is on continuously, the compressor is running loaded.
(B) If the assignment letter is slow flashing, the compressor is unloaded.
(C) If the assignment letter is replaced by a dash "-", the compressor is not available.

A compressor is regarded as 'not available' if the RS485 data communications is interrupted or the compressor has been stopped, or in a fault state, and is unable to respond to a load request from the master controller.

Each air compressor in the system must be locally started; running or in a standby state. The Master will not start a Slave compressor that is in a stopped state.

If the system consists of two compressors only, the third assignment letter (compressor 3) will continuously show as a dash "-". This will not disrupt pressure regulation or sequence rotation and can be ignored. A compressor that is unavailable, or not present, will always be assigned last in sequence.

If the Master compressor experiences a fault condition that does not disrupt successful controller operation or pressure detection, system regulation control and sequence management of the remaining available Slave compressor(s) will continue uninterrupted.

4.4.21.5 System Pressure Control

System regulation is determined by the pressure set points of the Master controller (1) in accordance with the pressure detected by the Master's pressure sensor. The system 'target' pressure is calculated to be the mid-point between the Master's 'Pu' (upper pressure set point) and 'Pl' (lower pressure set point).

A 'Slave' controller will ignore it's own pressure set points when operating with a system Master controller. All Slave pressure safety functions, however, will continue to function in accordance with the local pressure detected by the Slave's delivery pressure sensor.

If data communications with the Master controller are disrupted, or the Master controller becomes unavailable, a Slave will automatically switch to local regulation control. In this instance the 'Remote Pressure Control' symbol, displayed on the Slave controller, will flash. When the Master becomes available again, Slave pressure regulation will automatically revert back to the Master and the 'Remote Pressure Control' symbol will remain continuously on.

4.4.21.6 Pressure Schedule

For compressor controllers equipped with a 'Pressure Schedule' function, the pressure schedule of the Master controller can be used to automate the operation of the entire system; see 'Pressure Schedule'.

5.0 Fault Messages

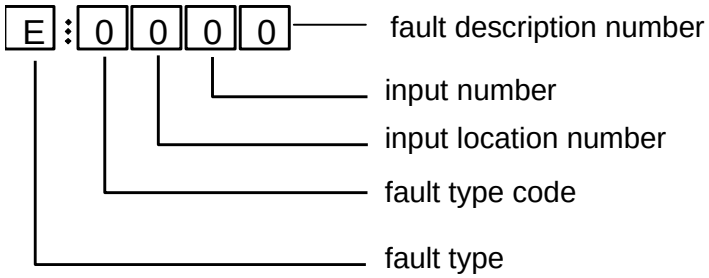
Faults are abnormal operating condition states. Alarms are fault states that indicate normal operating conditions have been exceeded but do not present an immediate hazard or potentially damaging condition. Alarms are intended as a warning only and will not stop the compressor or prevent the compressor from being started and run.

Start inhibits are fault states that prevent the compressor from initially being starting. Start inhibit faults are conditions that may present a hazard or damaging situation if the compressor was to be started. A start inhibit will self reset when the condition being monitored returns to normal operational levels. Start inhibit conditions are only checked during the initial start procedure and will not stop the compressor once started and in the 'started' state. Start inhibit conditions are not checked during an automated motor start from Standby.

Run inhibits are fault states that prevent the compressor from starting and running the main motor. Run inhibit faults are conditions that may present a hazard or damaging situation if the main motor is run. A run inhibit will self reset when the condition being monitored returns to normal operational levels and the compressor will then be allowed to exit the standby condition and run without further manual intervention. Run inhibit conditions are checked prior to a main motor start sequence and will not stop the compressor motor once started. Run inhibit conditions do not prevent the compressor from entering the 'started' state condition; when the run inhibit condition clears the compressor will start automatically.

Shutdown trip errors are fault states that present a hazardous or damaging condition, the compressor is stopped immediately. The Shutdown trip error condition must be resolved, and the fault reset, before the compressor can be re-started.

The different fault state conditions are indicated on the screen with specific codes; the last character indicating the fault type: E = Shutdown or Trip, A= Alarm or Warning, S = Start Inhibit, R = Run or Load Inhibit. Shutdown trip errors are divided into two different categories: immediate shutdown errors and controlled stop errors. Immediate shutdown errors stop the compressor instantly (Emergency Stop button activated for example). Controlled stop errors stop the compressor in a controlled way using a normal Stop command; the motor will continue to run for the set stop run-on-time. Immediate shutdown errors have an error code where the first character is 0 (zero). Controlled stop faults have a "1" as the first character. Alarm faults are also divided into two different categories: alarms and service alarm messages. Alarms start with a "2", service alarm messages with a "4". Start Inhibit fault codes start with a "3".



fault description number	fault description
9	high level shutdown trip
8	high level alarm
7	high level start inhibit
6	special function
5	sensor error
4	timeout
3	low level start inhibit
2	low level alarm
1	low level shutdown trip
0	digital input

input number	input
#	Input number for controller input terminal/location

input location number	input location description
0	digital input
1	analogue input
2 to 7	*not used*
8	special functions
9	special functions slave unit

fault type code	fault category description
0	immediate shutdown trip error
1	controlled shutdown trip error
2	alarm
3	start or run inhibit
4	service

fault type	fault type description
E	shutdown or trip error
A	alarm or warning (or service alarm)
S	Start or load inhibit
R	run inhibit

5.1 Immediate Stop Shutdown Errors

5.1.1 Digital input errors

E:0010	emergency stop
E:0020	anti rotation fault
E:0040	air/oil separator differential pressure switch
E:0080	motor fault (fault relay contact, overload device contact or PTC thermistor)

5.1.2 Analogue input errors

E:0115	delivery pressure sensor fault
E:0119	delivery pressure high
E:0121	delivery temperature low
E:0125	delivery temperature sensor fault
E:0129	delivery temperature high
E:0131	internal pressure below the set minimum limit 'PR'
E:0135	internal pressure sensor fault
E:0139	internal pressure high

5.1.3 Special function errors

E:0809	differential pressure high
E:0814	blowdown timeout (internal pressure failed to fall below minimum level after 120 seconds)
E:0821	low resistance, short circuit or short circuit to earth condition exists on an analogue input or digital input (incorrect connection, cable fault or sensor fault)
E:0846	delivery pressure sensor range is set too low for default pressure settings to be applied.
E:0856	internal pressure sensor range is set too low for default pressure settings to be applied.
E:0866	power supply voltage below minimum level or incorrect DC polarity

5.2 Controlled Stop Shutdown Errors

none

5.3 Alarms

5.3.1 Digital input alarms

A:2030 air filter differential pressure switch

5.3.2 Analogue input alarms

A:2118 delivery pressure high
A:2128 delivery temperature high
A:2138 internal pressure high

5.3.3 Special function alarms

A:2808 differential pressure high
A:2816 power failure occurred while compressor was in the Started state
A2915 ISC XPM pressure sensor error
A2950 ISC XPM current limit error
A2960 ISC XPM communication error
A2970 ISC XPM Di alarm
A2980 ISC XPM Di trip

5.4 Start Inhibits

none

5.5 Run Inhibits

R:3123 delivery temperature Td below the set low temperature run inhibit level, controller will allow motor start when temperature increases above the set level
R:3137 internal pressure PI higher than the set run inhibit pressure level, controller will allow motor start when pressure decreases below the set level, see blowdown timeout E0814

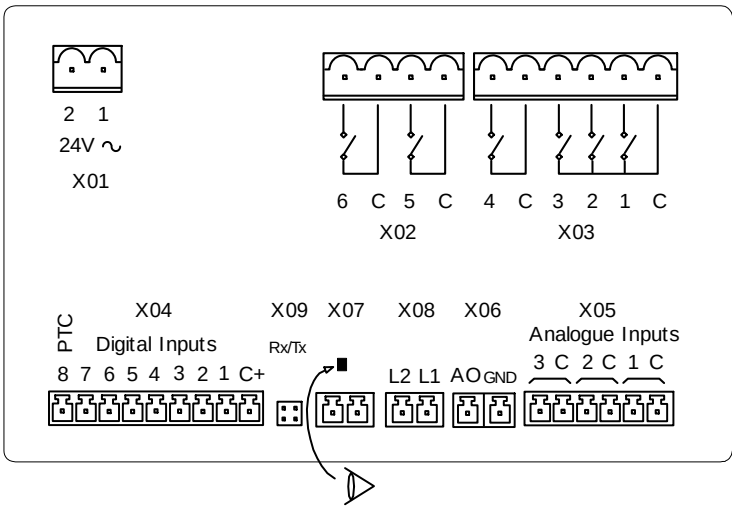
5.6 Service Alarms

5.6.1 Special function service alarms

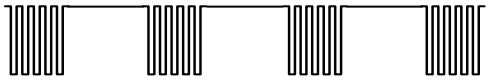
A:4804 A service hours time expired, service due (reset service hours countdown timer)

6.0 CSC200 Controller - LED indication

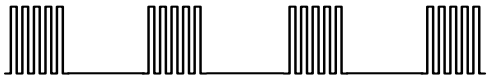
LED1 is located on the PCB between connectors X07 and X08 and can be seen from the rear of the controller without removing the rear enclosure housing. This LED gives diagnostic information about different functions of the CSC200 controller.



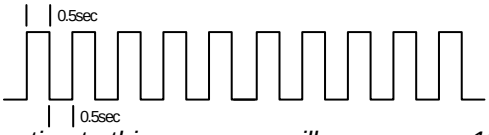
Production; Burn-in



Production; Test Mode

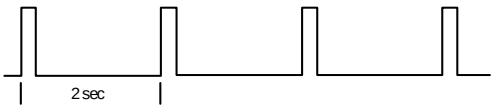


Normal Operating Mode
No Communications

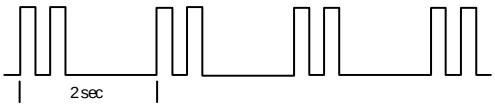


Note: a two second interruption to this sequence will occur every 10 second as the CSC200 broadcasts output data on the RS485 communications port.

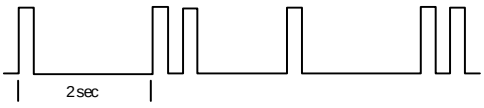
Normal Operating Mode
RS485#1 Communications



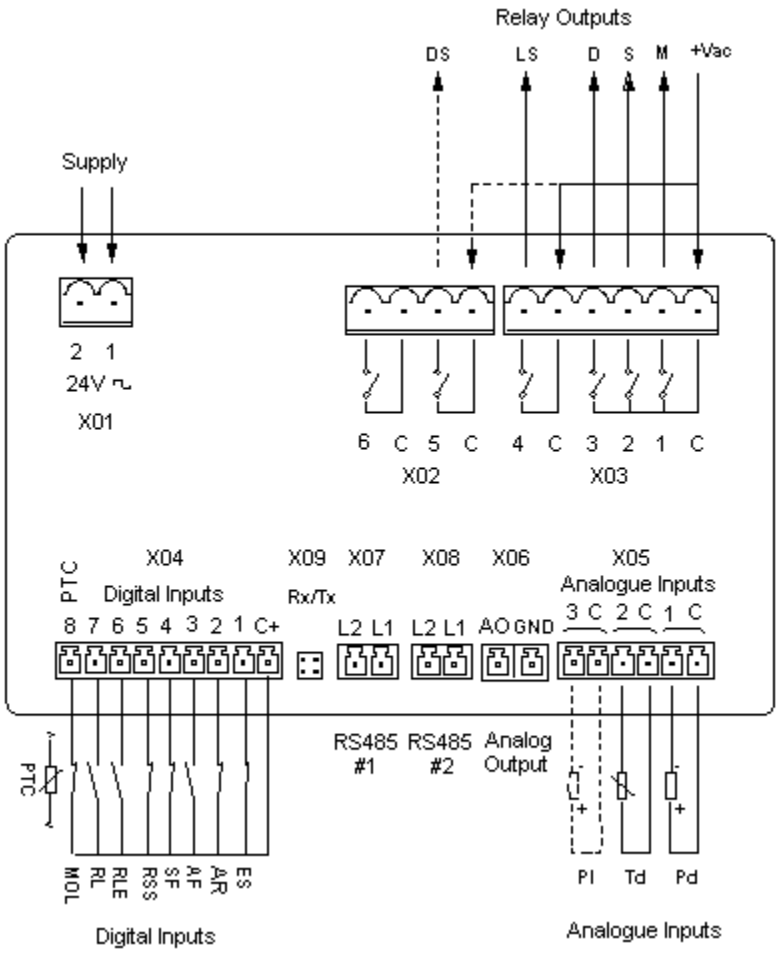
Normal Operating Mode
RS485#2 Communications



Normal Operating Mode
RS485#1 and RS485#2



7.0 Example Configuration



ES	Emergency Stop Button
AR	Anti rotation
AF	Air Filter High DP
SF	Air/Oil Separator Element High DP
RSS	Remote Start/Stop
RLE	Remote Load Enable
RL	Remote Load
MOL	Motor Over-Load (or PTC thermistor)
M	Main (Line) Motor Contactor
S	Star Motor Contactor
D	Delta Motor Contactor
LS	Load Solenoid
DS	Drain Solenoid (option)
Pd	Delivery Pressure Sensor (4-20mA)
Td	Delivery Temperature Sensor
PI	Internal Pressure Sensor (4-20mA)