CSC300 Controller - - - Technician's Manual

Contents: Page:

Please read this manual before accessing any of the features of the 'CSC300' Controller. Failure to do so could result in items being altered and causing the Unit to malfunction.

Please keep this manual in a safe place for future reference.

All of the information, policies, and procedures in this reference manual apply exclusively to DV Systems.

If you require assistance, please contact your local DV Systems Distributor or Authorized Service center. You may contact the manufacturer directly as follows:

Phone: (705) 728-5657 Web: www.dvcompressors.com
Fax: (705) 728-4974 Email: sales@dvsystems.ca

'CSC300' Controller

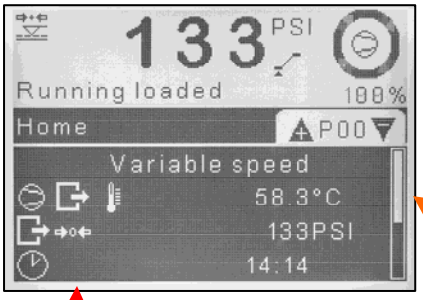
Description of Controller.

The 'CSC300' Controller is the 'brains' of the B10 Rotary Screw Compressor Units. It monitors, enables, and indicates the various functions of the Unit. The Controller voltage requirement is 24 volts +/- 15%.

The Controller is comprised of several levels of access, segregated into:

- **Operator Level (Access Code: '2012')**
  - indicates the main operating parameters (eg, temperature, pressure, etc) and faults of the unit.
- **Service 1 Level (Access Code: '2515')**
  - allows access to change the Unit pressures, etc and indicates any Unit faults.
  - an Access Code is required.
- **Service 2 Level (Access Code: '1213')**
  - allows access to change some of the more restricted parameters.
  - an Access Code is required.
- **Factory Level**
  - allows access to areas of the Controller that only factory personnel can access.
  - an Access Code is required.

Controller Operator Interface.



Start.
Starts the Unit.

Stop.
Causes the Unit to enter 'Idle' mode and then shut off.

Enter.
Used to enter a new page, etc, or pressed to save changes to a parameter.

Reset.
Allows the Unit to be re-started after an error has occurred.

Up.
Scrolls up through the parameters, or increases the value of a parameter.

Down.
Scrolls down through the parameters, or decreases the value of a parameter.

Escape.
Allows you to move back one menu level.

The Display above and at left indicates:

- The system pressure is 133 psi
- The Unit is running loaded (compressing air)
- The Unit is running at 100% of its full speed
- The temperature of the oil leaving the Air End is 58.3°C.

'CSC300' Controller (cont'd)

Typical Operating Parameters.

The chart below indicates the standard operating parameters programmed into the 'CSC300' Controller at the factory.

HP	Control Mode	Target Pressure (psi)	Offload Pressure (psi)	High Pressure Alarm (psi)	High Pressure Shutdown (psi)	Idle Shutdown (minutes)	Routine Service Hours	Grease Service Hours
10	Variable Speed	135	145	150	155	2	2000	9500
15	Load / Offload	125	145	150	155	5	2000	3600
20	Load / Offload	100	110	115	120	8	2000	200

A description of the terminology used in the above chart is as follows:

HP: Horsepower of the Unit.

Target Pressure: The pressure at which the Unit will try to maintain.

Offload Pressure: The pressure at which the Unit will stop compressing air.

High Pressure Alarm: The pressure (above the Offload Pressure) at which an alarm will be noted.

High Pressure Shutdown: The pressure (above the Offload Pressure) at which an alarm will be noted and the Unit will shut off.

Idle Shutdown: The amount of time the Unit will idle (run but not compress air) after it has reached the Unload Pressure before shutting off.

Routine Service Hours: The maximum allowable time between regular maintenance/service of the Unit.

Grease Service Hours: The maximum allowable time between motor lubrications.

⚠ NOTE

The above chart is supplied for information only. Serious consequences could result should any of the parameters be adjusted by someone who is not familiar with the correct and safe operation of the Unit.

Any adjustments made to the above parameters by others (other than a qualified Technician) resulting in the incorrect operation of the Unit, damage to the Unit, or damage to property is not covered by the DV Systems Warranty.

Please consult with your DV Systems Distributor or contact DV Systems directly should you have any questions or concerns about any of the information in the chart above, or in this manual.

'CSC300' Controller (cont'd)

Controller Structure.

The chart below indicates the various fields of the 'CSC300' Controller, some require an Access Code. As suggested on the previous page, only those qualified should be permitted to make any adjustments to the parameters.

Default Level Available Without Access Code

Page 'P00' - Home

01	Any active alarm
02	Control Mode
06	COMP OUT TEMP
07	EQUIP OUT PRESS
08	EQUIP INT PRESS*
09	DIFF pressure*
10	Main MTR current**
13	Time
14	Date
15	Daylight saving
16	ISC Sequence

Page 'P01' – Service Timers

01	Total hours
02	Load / off load HRS
03	Load hours
04	Off load hours
05	Stopped hours
06	Routine service hours
07	Grease service hours

Page 'P02' – Utilisation

01	Equipment status
02	Load/ offload hours
03	MTR STR last HR
04	MTR STR last 24H
05	Load frequency
06	Load % last hour
07	Load % last 24H
08	Load time last hour
09	Load time last 24H
10	VSD average RPM

Page 'P03' – Error Log

01	Error 1
to	
50	Error 50

Page 'P04' – Event Log

01	Event 1
to	
200	Event 200

Page 'P09' – Access

01	DEFAULT USER
02	ADMIN USER
03	Operator
04	Service 1
05	Service 2
06	Factory

Service 1 Level Requiring Access Code: '2515'

Page 'P10' – Equip settings 1

01	Control mode
02	Allow force offload
03	Start pressure
04	Load pressure
05	Off load pressure
10	RS485: 1 CONFIG
11	RS485: 2 CONFIG
12	Start source
13	Load source
14	Language
15	Time
16	Time format
17	Daylight saving
18	Date
19	Date format
20	LCD light level
21	Pressure unit
22	Temperature unit
23	VSD Target Pressure

Page 'P11' – Equip settings 2

01	Star delta TRANS
02	MIN MTR run
03	Load INH time
04	Reload INH time
05	Off load run time
06	Stop MIN time
07	Vent time
08	AUTO restart INH
09	CNDS drain open
10	CNDS drain INT
11	Off load drain time
12	MTR STR HR INH
13	DP inhibit time
14	Service hours 1
to	
21	Service hours 8
22	Weekly service
23	Annual service
24	Bi-annual service

Page 'P13' – VSD settings

01	VSD control mode
02	VSD target PRESS
03	VSD MAX speed
04	VSD MIN speed
05	VSD OPT speed
06	VSD offload SPD
07	VSD speed RPM
08	VSD output CURR
09	VSD P factor
10	VSD I factor
11	VSD D factor
12	VSD speed %
13	VSD MAX RMP rate

'CSC300' Controller (cont'd)

Page 'P16' – Warning alarm
- 01 Service hours 1
- 02 Service hours 2
- 12 COMP OUT TEMP
- 13 EQUIP OUT PRESS
- 14 EQUIP INT PRESS
- 15 DIFF pressure
- 17 Phase detection
- 18 HI MTR STR HR
- 24 Fan motor alarm
- 28 RD alarm
- 33 CONF alarm 1
- 34 CONF alarm 2
- 35 CONF alarm 3
- 36 EQUIP OUT TEMP

Page 'P18' – I/O CONFIG
- 01 AO function
- 02 DI2 function
- 03 DI2 OK: NO/NC
- to
- 14 DI8 function
- 15 DI8 OK: NO/NC
- 16 Relay 5 function
- to
- 19 Relay 8 function
- 20 AI3 function
- 21 AI5 function

Page 'P20' – Diagnostics
- 01 Digital input 1
- to
- 08 Digital input 8
- 09 Analogue input 1
- 10 Analogue input 2
- 11 AI-3 - ohms
- 12 AI 3 – amps
- 13 AI 3- volts
- 14 Analogue input 4
- 15 AI 5 – ohms
- 16 AI 5 – amps
- 17 AI 5 – volts
- 18 Relay output 1
- to
- 25 Relay output 8
- 26 Analogue output 1
- 27 ANAL input CT1A
- 28 ANAL input CT1B
- 29 ANAL input CT1C
- 30 ANAL input CT2A
- 31 L1 Frequency
- 32 L2 Frequency
- 33 L3 Frequency
- 34 L1 phase angle
- 35 L2 phase angle
- 36 L3 phase angle
- 37 Key switch test
- 38 LED test

Page 'P21' – Run schedule
- 01 Run schedule
- 02 Workday edit
- 03 Schedule entry
- to
- 30 Schedule entry

Page 'P80' – ISC main menu (Shown if active)
- 01 ISC enabled
- 02 Offload pressure
- 03 Load pressure
- 04 ISC rotate INT

Page 'P81' – ISC settings (Shown if active)
- 01 ISC # compressors
- 02 ISC start delay
- 03 ISC damping
- 04 ISC tolerance
- 05 ISC DI1 FCN
- 06 ISC DI2 FCN
- 07 ISC DI3 FCN
- 08 ISC XPM pressure
- 09 ISC PRESS SENS

Page 'P82' – ISC priority (Shown if active)
- 01 COMP1 priority
- to
- 08 COMP8 priority

'CSC300' Controller (cont'd)

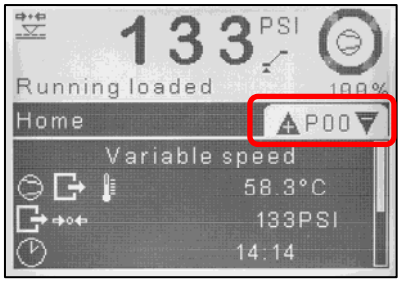
NOTE

Adjusting the parameters of the Controller could adversely affect the operation of the Unit. Only those individuals with knowledge of the Unit should be permitted to make any adjustments.

Access Code Entry.

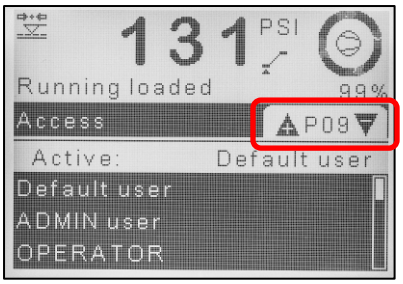
To gain entry to areas of the Controller in which an Access Code is required:

1. When navigation location is at **P00**



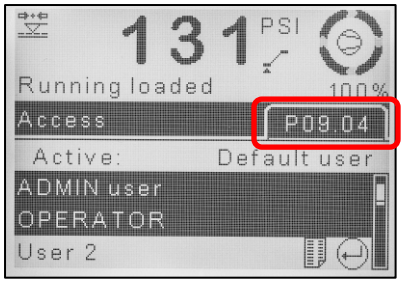
2. Press the '**Down**' key to navigate to **P09** Access page.

3. The screen shown below will appear

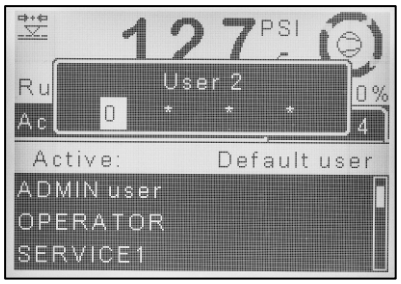


4. Press '**Enter**' key to navigate into P09 menu content and press 'Down' key to highlight **P09.04 Service 1**.

5. The screen shown below will appear



6. Press '**Enter**' key



'CSC300' Controller (cont'd)

9. Using the '**Up**' and '**Down**' keys, change the first digit of the Access Code to the appropriate number

10. Press '**Enter**' to move to the following digit. Using the '**Up**', '**Down**', and '**Enter**' keys, input the access code.

Once you have entered the correct Access Code, you will have access to pages of the Controller reflecting that code.

'CSC300' Controller (cont'd)

Menu Navigation.

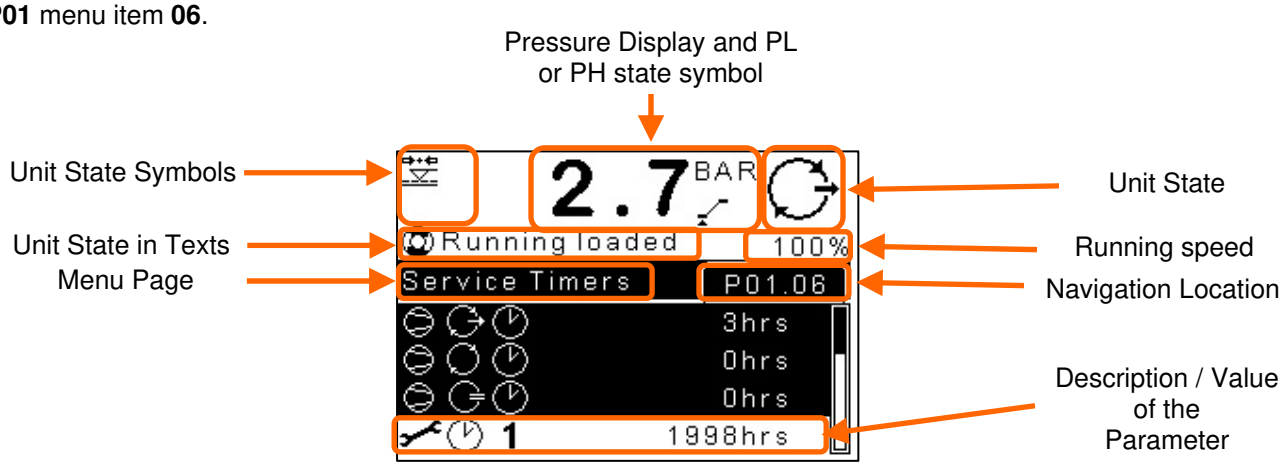
Once the correct Access Code has been entered, access will be given to pages reflecting that Code. Refer to Page 4 and 5 for available pages.

Use '**Enter**' and '**Escape**' keys on the Controller to navigate between menu page navigation and menu content navigation.

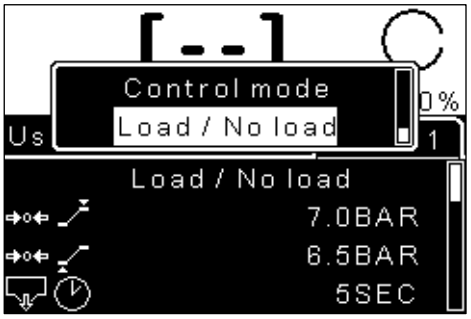
To select an appropriate menu page, use the '**Up**' or '**Down**' arrows on the controller.

Once the appropriate page has been high-lighted, press '**Enter**' to access its menu content.

Use the '**Up**' and '**Down**' keys to navigate between menu content items. Below indicates the user has navigated to **P01** menu item **06**.



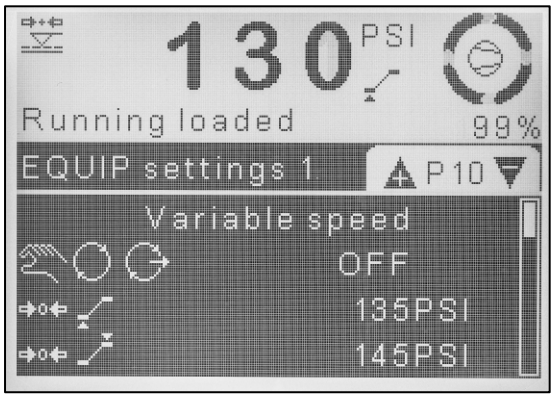
To adjust an editable parameter, navigate to it and press the '**Enter**' key. An edit menu popup window will appear. Use the '**Up**' or '**Down**' key until the desired value is highlighted, then press '**Enter**'.



'CSC300' Controller (cont'd)

Adjustment of Load and Offload Pressures.

The Load and Unload Pressures may be altered from the factory settings. Simply input the appropriate Access Code ('2515') as indicated on page 4 of this manual to gain access to 'P10' of the controller.



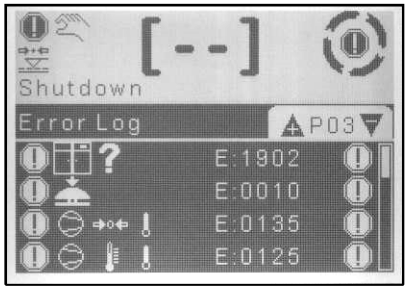
Adjust 'P10.04 Load Pressure', 'P10.05 Offload Pressure', and 'P10.23 VSD Target Pressure' as required, pressing 'Enter' after changing the values. Press 'ESC' to return to the Main Menu.

Note: A) Do not adjust the pressure higher than the factory settings.
B) Ensure that there is a minimum of 10 psi differential between Offload and Load Pressure.
C) VSD target pressure shall be equivalent to the Load Pressure.
D) Incorrectly adjusting the settings of the Controller could adversely affect the operation of the Unit.

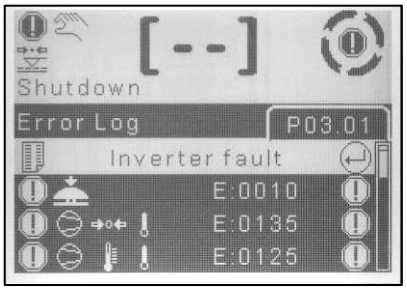
Error Log Menu.

Any issues that the Unit may have are stored on an Error Log. It places in its memory the last 50 faults in chronological order. If all 50 faults have been used, any new faults will become '01', and all others will be moved back one step. This ensures that only the most recent faults appear.

Shown below is a typical Error Log Menu. The Error Log is on 'Page 03' of the Controller and it does not require an access code.

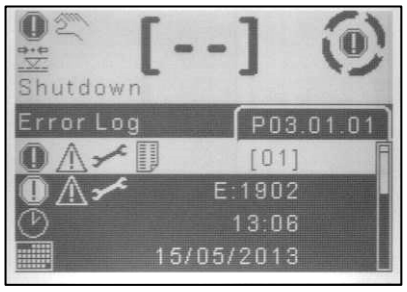


Press '**Enter**' to see the list of Errors



Use '**Up**' or '**Down**' keys to highlight an error

Press '**Enter**' to see details of the selected error



Use '**Up**' or '**Down**' keys to view the recorded data at the time of the fault

'CSC300' Controller (cont'd)

Advanced Phase Detection

Advanced Phase Detection feature of the CSC300 controller is utilized in fixed speed units. It measures the phase sequence of the incoming power to prevent motor from rotating in the wrong direction. If the following error is visible on the Screen and the Unit will not start, simply switch power leads L1 and L3.

E:0090 Phase Sequence

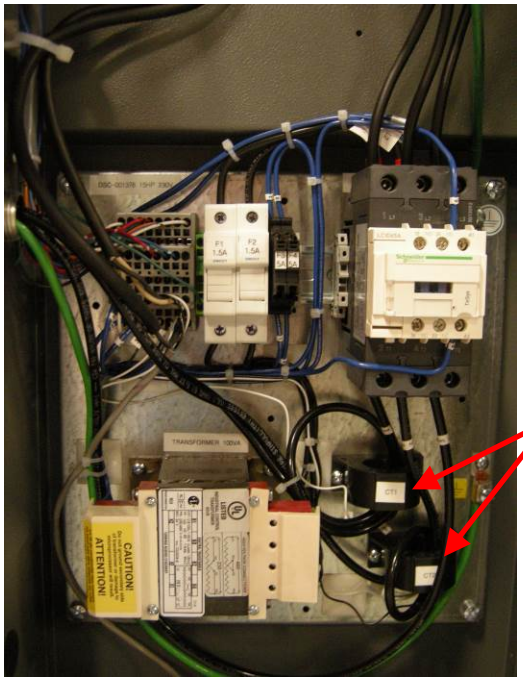
Note: If the Motor is replaced, Motor Rotation must be visually verified.

CAUTION **Irreparable damage will occur to the Air End if the rotation is incorrect.**

Advanced Motor Protection

Current Sensors are used to provide Under Current Detection, Rotor Lock Overload, Phase Imbalance, and Motor Overload protection to fixed speed compressors. Combined, CSC300 offers protection equivalent to Trip Class 10A for the main motor.

Current carrying cable through these Current Sensors may be looped up to 2 times to provide greater accuracy. Please consult factory if the motor is to be replaced.



'CSC300' Controller (cont'd)

Common Faults.

Noted below are the most common Faults experienced.

Alarms.

There is an issue with the Unit, but it will still operate.

Code:	Description:	Most Common Items to Check:
A:0083	Motor phase imbalance	Check supply voltage, fuses and cable
A:0085	Motor starts 24 HRS	Low air demand. Motor starts in last 24 hours exceeded. Increase Offload Run Time.
A:0119	Delivery Pressure High	Transducer dirty or faulty, pressure changed incorrectly, alternate external pressure source
A:0129	Delivery Temperature High	Ambient temp high, Unit dirty, low oil level, no air flow through Unit, Temp Sensor defective
A:2816	Power Failure Occurred	
A:4804	Routine Service Due	Service Unit and reset Service Timer (Page 'P16' on Controller)
A:4809	Grease Service Due	Service motor and reset Grease Service Timer (Page 'P16' on Controller)

Shutdown Errors.

There is an issue with the Unit, and the Unit will not operate until the Fault has been addressed.

Code:	Description:	Most Common Items to Check:
E:0010	Emergency Stop	Emergency Stop Button has been pressed, or is defective
E:0070	Fan MTR IMM Stop	Fan motor drawing high amps, low voltage, high ambient temperature, incorrect rotation
E:0082	Motor Overload	Motor drawing high amps, low voltage, higher pressure settings, low oil level
E:0083	Motor phase Imbalance	Check motor connections in the control panel and motor connection box
E:0090	Phase sequence	Rotation of Motor wrong, sequence order of supply cable incorrect
E:0091-0093	Phase L1/L2/L3 Fault	Check supply voltage, fuses and cable
E:0115	Delivery Pressure Sensor Fault	Transducer not making good electrical contact, or defective
E:0119	Delivery Pressure High	Transducer dirty or faulty, pressure changed incorrectly, alternate external pressure source
E:0125	Delivery Temp Sensor Fault	Temperature Sensor not making good electrical contact, or defective
E:0129	Delivery Temperature High	Ambient temp high, Unit dirty, low oil level, no air flow through Unit, Temp Sensor defective
E:0135	INT Pressure Sensor Fault	Transducer not making good electrical contact, or defective
E:0139	INT Pressure High	Transducer dirty or faulty, pressure changed incorrectly, air/oil separator saturated
E:0902	Anti-Rotation	Rotation of Main Motor wrong, Solenoid Valve not relieving pressure
E:1902	Inverter Fault	Variable frequency drive tripped. Check VFD screen for more info

Note: When CSC300 indicates '**E:1902 Inverter Fault**', please refer to VFD screen for more information.

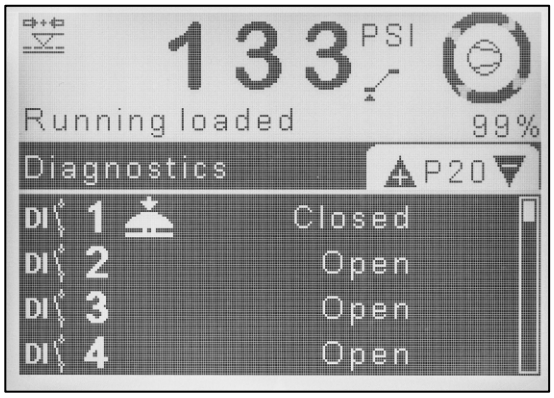
CSC300' Controller (cont'd)

Diagnostics.

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

Digital Inputs: The display will indicate the actual state of the digital input 'Open' or 'Closed'.

Analogue Inputs: Analogue input 1 and 2 are typically used for pressure reading. Analogue input 3 is used to measure oil temperature of the compressor. The display indicates the actual mA, ohms, and mV detected on the corresponding controller input.



Press 'Enter' to view the analogue assignment.

Analogue input 4 is the voltage detected at X13 of the CSC300 controller.

Relay Outputs: They indicate the actual state of the relay outputs.

Note: Must not energize or de-energize relays in the Diagnostics. Serious damage can occurred to the compressor.

CT1a, CT1b, and CT1c: Current transformers are used to measure main motor current.

'CSC300' Controller (cont'd)

Routine Service Timer (Fault 'A:4804').

On Page 3 of this manual, values were given for the various operating parameters of some Compressor Units. One such parameter is the 'Routine Service Hours', or simply put, the maximum allowable time (in hours) between regular service / maintenance of the Unit.

For the B10VSD Units, the Compressors must be serviced every 2000 hours.

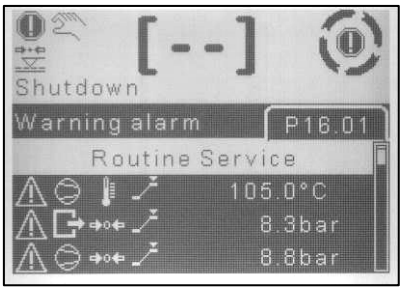
The Controller is programmed to count down from 2000 hours to 0 hours. Once it reaches 0 hours, an error code of '**A:4804**' appears on the Controller screen, this indicating that service is due. If service is not carried out, the Timer will continue in negative values.

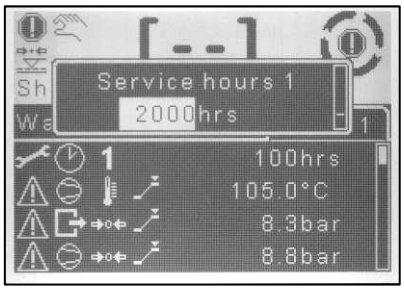
Once the servicing of the Unit has been completed, the Timer must be reset to 2000 hours.

To reset the 'Routine Service Timer' parameter, the Service 1/2 Level must first be accessed by means of an access code as follows.

The appropriate Access Code is '2515'

1. Press '**Up**' or '**Down**' key to high-light page '**P09 Access**'.
2. Press '**Enter**'.
3. Use the '**Down**' key to high-light menu item '**P09.04 Service 1**'.
4. Use the '**Up**' and '**Down**' keys, change the first digit of the Access Code to the appropriate number.
5. Press '**Enter**' to move to the following digit. Continue this process until correct access code is entered.
6. Press '**ESC**'.
7. Use the '**Up**' key to high-light Page '**P16 Warning alarm**'.
8. Press '**Enter**' and menu item '**P16.01 Routine Service**' should be high-lighted.
9. Press '**Enter**'.
10. Change the value from '**0**' to '**2000**' using the '**Up**' key.
11. Press '**Enter**' to save the value.
12. Press '**ESC**' twice to access the main operating page.
13. Press '**Reset**' to clear the error message '**A:4804**' Routine Service Due.





Grease Service Timer (Fault 'A:4809').

For the B10VSD Units, the Motors must be greased every 9500 hours. Please refer to Compressor Service Manual for the Grease Intervals.

In the case of B10VSD units, the '**P16.02 Grease Service'** parameter must be reset to 9500 hours once the Motor is lubricated.

'CSC300' Controller (cont'd)

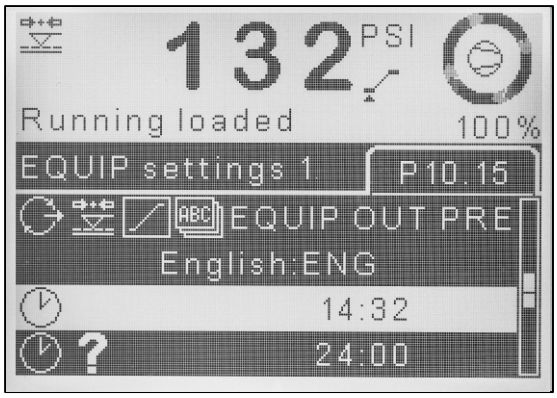
Real Time Clock and Run Schedule.

The 'CSC300' Controller is equipped with a 'Real Time Clock' which, when coupled with a Run Schedule, can modify the Unit's pressures at specified times and on specific days of the week. To do this, the Real Time Clock must be programmed with the current local time. (This may have already been completed at the factory.)

The Real Time Clock and Run Schedule are accessed on Page '**P10**' and '**P21**' of the Controller and by using the **Access Code '2515'**.

Real Time Clock Programming

On Page '**P10**' of the Controller, item '**P10.15 time**' indicates the current time as shown at right. This can be programmed as follows:



1. On '**P10**', move down to item '**P10.15 time**' and press '**Enter**'.
2. An edit menu popup window will appear, it indicates the current time. Adjust using the '**Up**' or '**Down**' keys until the correct time appears. (Please note the clock is set to in 24 hour mode.)
3. Press '**Enter**' key to confirm the changes.

Item '**P10.18 date**' indicates the current date as shown at right. This can be programmed as follows:

1. Move down to item '**P10.18 date**' and press '**Enter**' to access Date edit sub menu
2. High-light item '**P10.18.01 edit year**' and press '**Enter**'.
3. An edit menu popup window will appear, it indicates the current year. Adjust using the '**Up**' or '**Down**' keys until the correct year appears).
4. Press '**Enter**' key to confirm year change.
5. Repeat the process for item '**P10.18.02 edit month**' and '**P10.18.03 edit day**'.
6. Move down to item '**P10.18.04 save changes**' and press '**Enter**' to confirm/save the changes.

'CSC300' Controller (cont'd)

Run Schedule.

Basic Principles.
As noted above, the 'CSC300' Controller is equipped with a manner to input a 'Run Schedule', thereby modifying the pressure generated by the Compressor Unit at specified times and days of the week. This enables the Unit to operate more efficiently while still meeting your air demands.

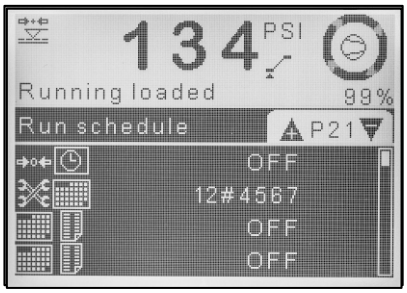
Note: CSC300's run schedule feature is able to start and stop the Compressor.

When the Run Schedule is activated, the symbol at right will appear on the Controller. 

Run Schedule Settings.

Before any adjustments can be made to the Run Schedule, the 'Run Schedule' function must be deactivated (Item '**P21.01 run schedule**' on '**P21**', '**P21.01=OFF**').

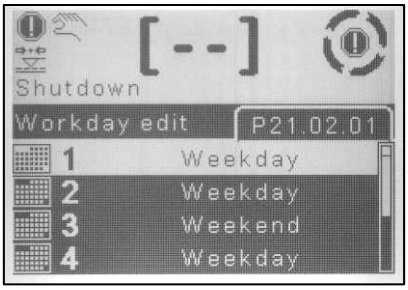
Shown to the right is the Run Schedule sub menu, this visible on '**P21**'.



Edit Workday Schedule:

Workday edit provides distinction between working days and non-working days.

1. On '**P21**', move down to item '**P21.02 workday edit**' and press '**Enter**'.
2. Navigate to each day and press '**Enter**'.
3. An edit menu popup window will appear, select '**Weekday**' for working day or '**Weekend**' for non-working day.



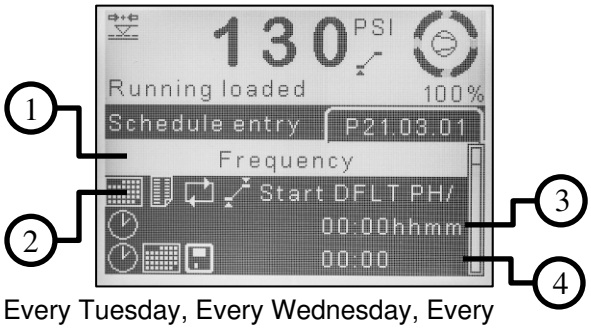
Workdays are represented in numerical values. Monday is considered to be '1' and Sunday is considered to be '7'. However if Sunday is considered to be a non-working day, it will be annunciated as '#'.

If the working week is Monday to Friday and the weekend is Saturday and Sunday, P21.02 should annunciate 12345##.

'CSC300' Controller (cont'd)

To enter a new Schedule Entry:

There are 28 schedule entries (**P21.03** to **P21.30**) available for use, some or all of which can be used. Schedule shown to the right is the Schedule entry sub menu.



1. On '**P21**', move down to an empty schedule entry
2. Press '**Ente**r' to access schedule entry sub menu.
3. The schedule entry sub menu screen will appear.
4. Use '**Up**' or '**Down**' keys to highlight item '**P21.XX.01 frequency**' (①) and press '**Enter**'
5. A popup window will appear, select between Every Monday, Every Tuesday, Every Wednesday, Every Thursday, Every Friday, Every Saturday, Every Sunday, Every day, Every work day, weekend or configured date.
6. Press '**Enter**' to confirm.
7. Move down to item '**P21.XX.02 function**' (②) and press '**Enter**' to select the appropriate schedule function.
8. A popup window will appear. Use '**Up**' or '**Down**' keys to select function between '**Start DFLT PH/PL**', '**STRT SCHED PH/PL**' or '**Stop Device**' and press '**Enter**'.

   Start DFLT PH/PL = Start device using default PL/PH on P10
   STRT SCHED PH/PL = Start device using schedule PL/PH
   Stop device = Stop device

   When '**STRT SCHED PH/PL**' is selected, item '**P21.XX.03 load pressure**' and '**P21.XX.04 off load pressure**' will appear.
9. Move down to item '**P21.XX.08 time**' (③) and press '**Enter**'.
10. A popup window will appear. Use '**Up**' or '**Down**' key to select the appropriate start time and press '**Enter**'
11. Move down to item '**P21.XX.09 save changes**' (④) and press '**Enter**' to save changes.

To Delete an Existing Pressure Schedule:

1. Navigate to the appropriate run schedule entry and press '**Enter**'.
2. At '**P21.XX.01 frequency**' (①), press '**Enter**'. A popup window will appear.
3. Select '**OFF**' from the list and press '**Enter**'.
4. Move down to item '**P21.XX.09 save changes**' and press '**Enter**' to save changes.

'CSC300' Controller (cont'd)

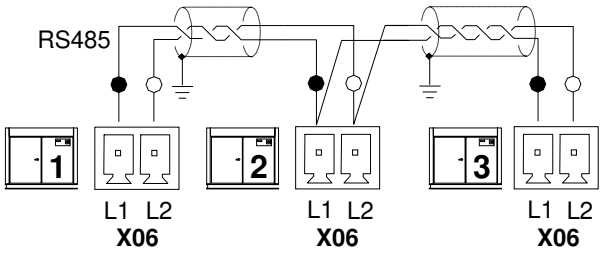
Sequencing.

If you have purchased (2) or more Rotary Screw Units each having the 'CSC300' Controller, it is possible to sequence the Units in order that they turn on and off at various intervals.

Sequencing the Units involves two steps, namely a) changes to the physical wiring of the Controllers and b) changes made to the actual operating parameters of the Controllers.

Wiring of the Units is as follows:

Controllers are to be connected with twisted pair, earth shielded data cable as illustrated in the figure at right.



1. Connect one end of an earth screened, twisted pair cable to port '**X06**' of one controller.
2. Connect the other end of the cable to port '**X06**' of the second controller.
3. Connect shield wire to a controller housing.

Controller Programming is as follows:

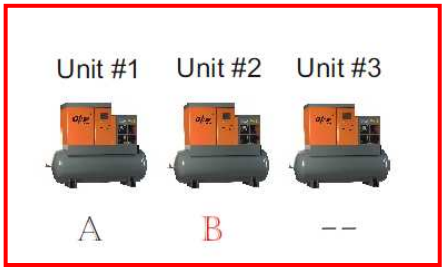
One compressor will be the 'Master' and the remaining Unit(s) will be the 'Slave(s)'. When built, the Units have already been designated as 'Master' and 'Slave', and the Controllers have been programmed accordingly.

Note: Compressors should be powered but not running during set up.

Operation and Status:

Note: Each unit in the system must be started by means of its own 'Start/Stop' Switch. The Master Unit cannot start a Unit that has been switched to 'Stop'.

The Compressor Units are given the following designations, which are shown on the Controller screens.



'**A**' = '**Duty**' compressor, the first to be utilized and last to be unload
'**B**' = '**First Standby**' compressor, the second to be utilized.
'**C**' = '**Second Standby**' compressor, the third to be utilized.

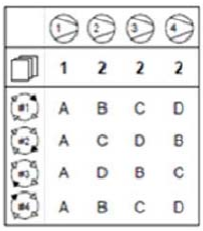
The operating 'status' of each Unit is as indicated:
'**A**' If the Unit letter is on continuously, the compressor is loading.
'**B**' If the Unit letter is slow flashing, the compressor is unloaded.
'**B**' If the Unit letter is fast flashing, loading of the compressor is requested.
'**-**' If the Unit letter is replaced by a dash, the compressor is unavailable

The system pressure is detected and regulated by the controller on the Master Unit. The controllers on the Slave Units(s) will ignore its own pressure set points when operating with the Master Unit. If the Master Unit is unavailable or communication with the Master Unit is disrupted, the Slave Units will operate on their own pressure set points. Once the Master is again available, pressure detection and regulation will revert back to the Master.

DV Systems Sequencer determines the sequence operation of each compressor in the network. Priority Scheme and Rotation Interval define how and when compressors are re-arranged at each 'Rotation' event. Compressors can be assigned a 'Priority' of 1 to 8; where 1 is the highest priority.

'CSC300' Controller (cont'd)

Example 1:



Compressor 1 (preferred) = priority 1 (first to be utilized)
Compressor 2 to 4 = priority 2

In this case, compressor 1 is continuously utilized as a 'duty' compressor (first to be utilized and last to be removed from the system) in any sequence arrangement. The other compressor will be reassigned after each rotation sequence.

Actual load/unload level of each compressor is defined by ISC Pressure settings, Tolerance setting, and number of connected compressors. Failure to consider these factors may cause Units to overload and create permanent damage to the drive components. Tolerance is a pressure band above and below the set pressure control levels that accommodates for an exceptional instance of abrupt and/or significant increase, or decrease, in demand. By default, Tolerance is set at 3 psi. Several examples are illustrated below.

Fixed Speed Compressors:

# of Comp.	P80 Load Pressure	P80 Unload Pressure	Comp '**A**' Offloads at	Comp '**B**' Offloads at	Comp '**C**' Offloads at
2	100 psi	117 psi	120 psi	117 psi	NA
3	100 psi	114 psi	120 psi	117 psi	114 psi

To Start the Sequencing Feature:
Sequencer will remain active after a power interruption. If subsequently, sequencer becomes unavailable for any reason, it can be started by performing the following steps:

1. Press '**Start**' button on the connected controllers.
2. On the main menu screen **P00**, press '**Enter**' button and use the '**Down**' arrow until '**P00.16 ISC SEQUENCE**' screen is displayed on the screen of the Master controller. Press the '**Start**' button to start sequencing.

To Change Sequencing Parameters:
In order to change Sequencing parameters, one must understand how DV Systems' Sequencer works. Inappropriate settings could result in damage to Motor, Starter, or other electrical components.

Sequencing parameters can be modified by performing the following steps:

1. Press '**Down**' button on the Master controller to navigate to **P09 Access Page**.
2. Press [**Enter**] key and use [**Down**] key to highlight **P09.04 Service 1 (User 2).**
3. Press [**Ente**r] key and a pop window will appear.
4. Using the [**Up**] and [**Down**] keys, change the first digit of the access code to the appropriate number. Press [**Enter**] to move to the following digit. Using the [**Up**], [**Down**], and [**Enter**] keys, input the access code '**2515**'
5. Press [**ESC**] key, use [**Up**] key to highlight **P80 ISC main menu**, and press [**Enter**]**.**
6. Use [**Down**] key to highlight **P80.02 Offload pressure** and press [**Enter**].
7. Using the [**Down**] key, change the value to the desired unload pressure. Press [**Enter**] key.
8. Use [**Down**] key to highlight **P80.03 Load pressure** and press [**Enter**].
9. Using the [**Down**] key, change the value to targeted load pressure. Press [**Enter**] key.
10. Use [**Down**] key to highlight **P80.04 ISC rotate INT** and press [**Enter**].
11. Using the [**Up**] and [**Down**] keys, change the value to the desired rotation interval (1-720 hrs). Press [**Enter**] key.
12. Press [**ESC**] key, use [**Up**] key to highlight **P82 ISC Priority**, and press [**Enter**].
    Priority setting is used to modify the rotation sequence assignment. Compressor can be assigned a priority of 1 to 8; where 1 represents highest priority.
13. Press [**ESC**] key twice to return to normal operating page.

'CSC300' Controller (cont'd)

Remote Start/Stop.

It is possible to install a Remote Start-Stop Switch for use with the 'CSC300' Controller and to regulate the operation of the Rotary Screw Compressor.

Wiring changes to be made are as follows:

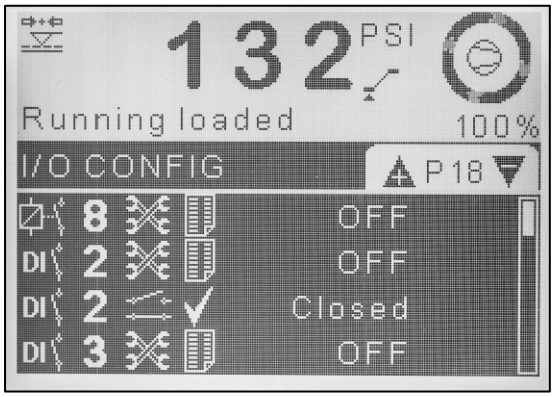
Normal state of the Remote Start-Stop Switch shall be open.

1. Install a wire from the Remote Start-Stop Switch to '**DI5**' and second wire to '**Common**' of **X02** Terminals

Changes to be made to the Controller Program are as follows:

2. Ensure there is power to the Unit, but the Compressor is not running.
3. Press the '**Down**' key to navigate to **P09 Access** page and press the '**Enter**' key.
4. Press '**Down**' key to highlight **P09.05 Service 2** and press '**Enter**' key
5. A pop up window will appear. Adjust the value of the first character by using the '**Up**' or '**Down**' key. Once completed, press '**Enter**', and the next character will be highlighted. Adjust all characters as required. **The appropriate Code is '1213'.**

   Note: if an error has been made, press '**ESC**' to return to a previous character.



6. Press '**ESC**' key
7. Use the '**Up**' key until Page '**P18**' is visible on the screen. Press '**Enter**'.
8. Using the '**Down**' key, scroll to parameter **P18.08 DI5 function** and press '**Enter**'.
9. A pop up window will appear. Use '**Up**' key to select '**DI Remote Start**' and press '**Enter**'.
10. Press '**ESC**' key once to return to menu page navigation. Use '**Up**' key until Page '**P10**' is visible on the screen. Press '**Enter**'.
11. Using the '**Down**' key, scroll to parameter **P10.12 Start Source** and press '**Enter**'.
12. A pop up window will appear. Use '**Up**' or '**Down**' key to select '**Equipment DI**' and press '**Enter**'.
13. Press '**ESC**' twice to return to the main screen.
14. A box with an arrow inside of it (the arrow pointing to the upper right-hand corner) should now be displayed on the Microprocessor screen.

When servicing the Unit, ensure that the power is switched off and the power switch has been locked off.

⚠WARNING

Should it be necessary to service the Unit, ensure the power source has been shut down and locked off.

'CSC300' Controller (cont'd)

Automatic Restart Function.

It is possible to program the 'CSC300' Controller to automatically restart the Compressor after a power interruption to the Unit. Though this may be advantageous in some applications, it could also potentially pose a safety risk.

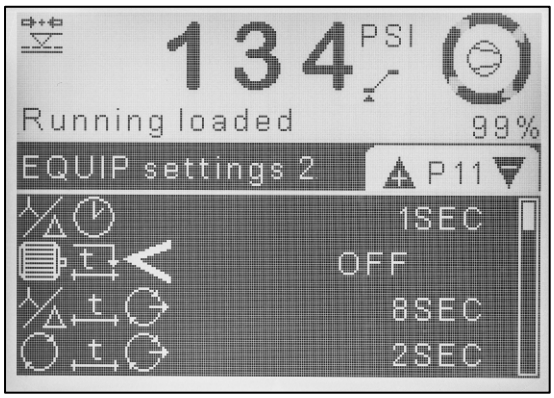
The information included on this paperwork is provided for the exclusive use of the DV Systems Distributor / Service Center. The DV Systems Distributor/Service Center Technician is to ensure:

- The Customer is aware of the operation of the Automatic Restart Function
- The Customer is aware of the requirement to shut off the power and lock it off prior to starting any service or maintenance work on the Unit.
- The Customer has filled in the appropriate information on the following page, and the page will be forwarded to DV Systems via fax by the Technician, this as per the note below.

Before making any alterations to the 'CSC' Controller in order for the Compressor to automatically restart after a power interruption, the Customer must sign and date the following page in the appropriate spaces, and fax the page to DV Systems at (800) 561-1663.

Changes to be made to the Controller Program are as follows:

The Auto Restart Inhibit is accessed on Page '**P10**' of the Controller and by using the **Access Code '2515'**.



4. Ensure there is power to the Unit, but the Compressor is not running.
5. Press '**Up**' or '**Down**' key to high-light page '**P09 Access**'.
6. Press '**Enter**'.
7. Use the '**Down**' key to high-light menu item '**P09.04 Service 1**'.
8. Use the '**Up**' and '**Down**' keys, change the first digit of the Access Code to the appropriate number.
9. Press '**Enter**' to move to the following digit. Continue this process until correct access code is entered.
10. Press '**ESC**'.
11. Use the '**Up**' key to high-light Page '**P11 EQUIP settings 2**'.
12. Press '**Enter**' and use the 'Down' key to highlight menu item '**P11.08 Auto Restart INH**'.
13. Press '**Enter**'.
14. Using the '**Up**' arrow, change the value from '**0**' to '**60**'. Press '**Enter**'.
15. Press '**ESC**' twice to return to the main screen.

Both the Customer and Service Personnel must be made aware that "the Unit will start automatically and without warning" as indicated on the following page. Prior to servicing or maintaining the Unit, the power source must be shut down and locked off.

Please have the label on Page 18 of this document printed in colour and affixed to the Compressor Unit.

'CSC300' Controller (cont'd)

The Customer and Service Personnel must be made aware of the following:

WARNING

The Compressor Unit will start automatically and without warning.

WARNING

Should it be necessary to service the Unit, ensure the power source has been shut down and locked off.

Please be advised that DV Systems Inc. and/or the manufacturer of the 'CSC300' Controller is in no way liable for and accepts no responsibility for any personal injuries or damages caused by the Compressor Unit automatically restarting after a power interruption. These include, but are not limited to, injury to service personnel and damage caused by power surges.

I, the undersized, understand fully that DV Systems Inc. and/or the manufacturer of the 'CSC300' Controller is in no way liable for any personal injuries or damages caused to the Devair Compressor Unit, this caused by the re-programming of the 'CSC300' Controller to allow the DV Systems Compressor to restart automatically after a power interruption.

Compressor Model Number: Compressor Serial Number:

Signed: Dated:

DV Systems Inc.
490 Welham Road
Barrie, Ontario
Canada
L4N 8Z4

Tele: (705) 728-5657
Fax: (705) 728-4974

Web: www.dvsystems.ca