

**CCS 3000**

**Compressor Control System**

**User Manual**

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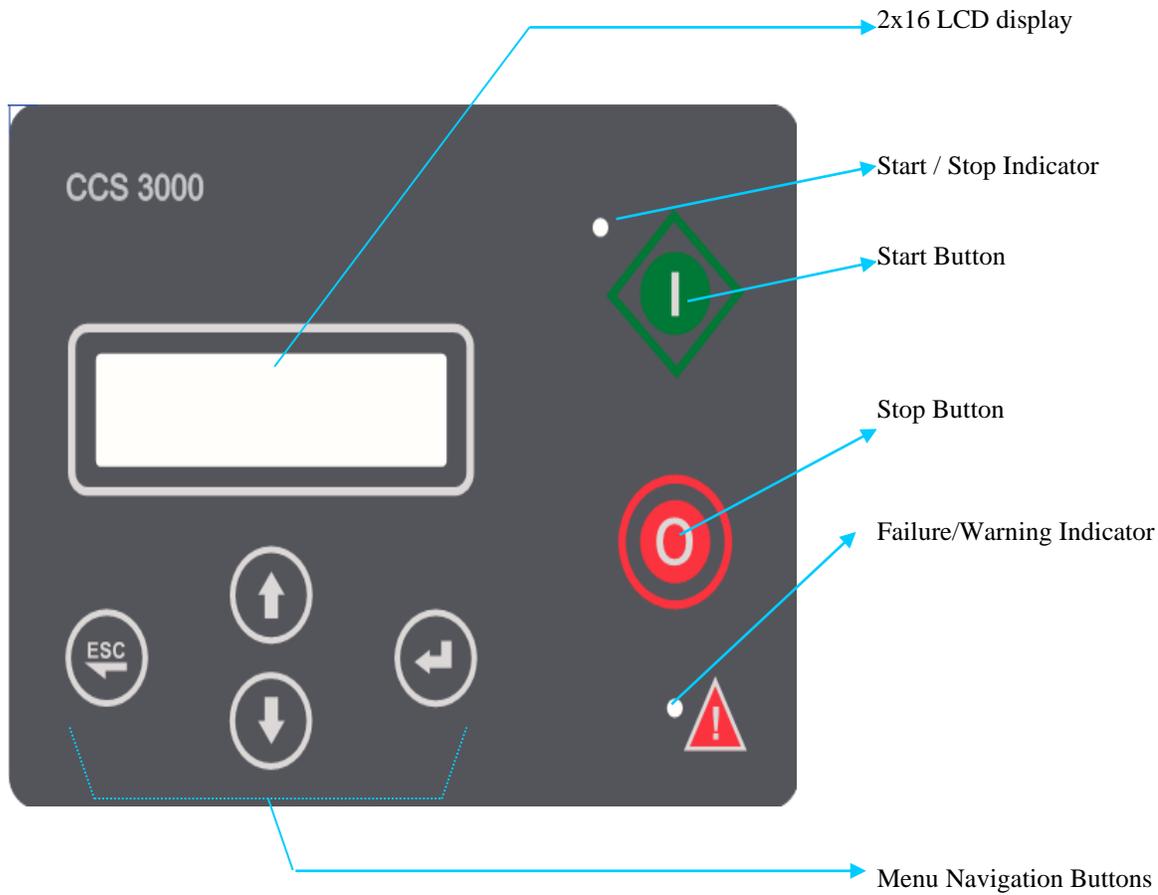
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# CCS 3000 Introduction

## 1 - General

CCS 3000 Compressor Control System has been designed for screw and reciprocating compressors. CCS 3000 is a microprocessor-based controller which starts and stops the compressors, makes pressure regulation, temperature control and protects the compressor against the failures. CCS 3000 is a single unit which comprises control module and control panel.



## 2- System Introduction

Button Functions	
	<ul style="list-style-type: none"> <li>Starts the compressor.</li> </ul>
	<ul style="list-style-type: none"> <li>Stops the compressor.</li> </ul>
	<ul style="list-style-type: none"> <li>In the main operating screen, cycles between the two pages.</li> <li>While in menu mode, navigates to the lower-indexed heading to the parameter.</li> <li>In parameter settings menu, increases the numeric value or changes the selectable values.</li> </ul>
	<ul style="list-style-type: none"> <li>In the main operating screen, cycles between the two pages.</li> <li>While in menu mode, navigates to the higher-index heading or to the parameter.</li> <li>In parameter settings menu, decreases the numeric value or changes the parameter.</li> </ul>
	<ul style="list-style-type: none"> <li>In the main operating screen, enters the menu mode.</li> <li>In menu mode, navigates one level down in the same heading.</li> <li>When pressed while it is on a selected parameter, it goes to parameter adjustment menu.</li> <li>In parameter adjustment mode, press to enter it into non-volatile memory.</li> <li>In password entry screen, press to shift the cursor to the right.</li> </ul>
	<ul style="list-style-type: none"> <li>In main operating screen, press for 2 seconds to reset the alarm.</li> <li>In menu mode, press to get into one level up in the same heading.</li> <li>In parameter adjustment mode, press to shift the cursor to the left.</li> <li>In parameter adjustment mode, press for 2 seconds to exit without recording the parameter value.</li> </ul>

CCS 3000 panel consists of 2x16 LCD backlight, keypad and LED status indicators

By navigating through the menu screens in the display, one can see the alarm log, compressor working and maintenance hours and adjust the compressor parameters.

Green LED indicates the operating status of the compressor. When this green LED is off, it indicates that the compressor has stopped. When it is continuously lit, it indicates that the main motor is running. When it blinks slowly, it indicates that the compressor is in Auto-idle mode.

Red LED indicates that there is an alarm (warning or trip) in the system. When it blinks every one second, the alarm is warning (it does not stop the compressor). When it blinks faster, there is trip alarm in the system. Trip alarm shuts down the compressor while warning alarms do not stop the compressor operation.

### 2-a Start-Up Screen

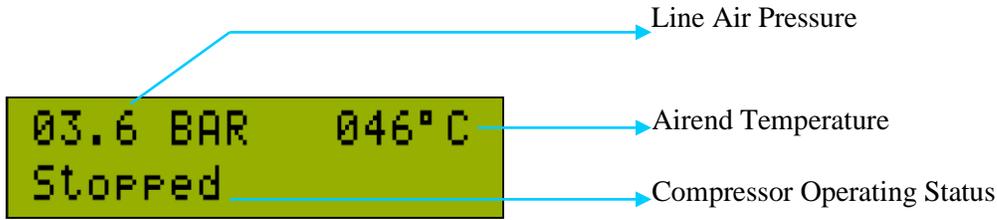


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When you power up CCS 3000, the above start-up screen is displayed (the text on this display is entered in parameter “P5.8 Start-up Screen”. If no text has been entered in this parameter, then there is no text on start-up screen. This menu is

further explained below. After 5 seconds, the screen changes to main operating screen. During that 5 seconds, both LED indicators are continuously on.

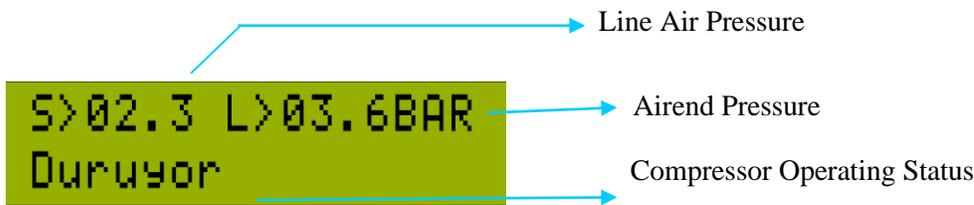
### 2-b Main Operating Screen



There are 2 main operating screens in the CCS 3000. The first page displays the Line Air Pressure and Airend Temperature on the top line, the current status of the compressor on the bottom line. The pressure and temperature units may be indicated in Bar/PSI and Celsius/Fahrenheit respectively.

The units may be changed in parameters “P3.6 Pressure Unit” and “P3.7 Temperature Unit”

The operator may cycle between the 2 pages in the Main Operating Screen using the  and  buttons.



The second page in the main operating screen indicates the Line

The current operational status of the compressor is displayed on the lower row. The statuses are:

- STOPPED
- STOPPING
- STARTING
- MOTOR DRIVING
- WORKING ON UNLOAD
- WORKING ON LOAD
- ON AUTOWAITING
- WAITING ACKNOWLEDGEMENT

#### 2.b.1 STOPPED :



The compressor main motor stopped. Green LED is off.

#### 2.b.2 STOPPING :



The compressor is going to stop after the delay timer in parameter *P3.5 To Stop Delay*” expires. Remaining time is displayed on the right of the lower row.

### 2.b.3 STARTING :



00.2 BAR 022°C  
Starting 003

The compressor is going to start after the delay timer in parameter *P3.8 To Start Delay*” expires. The remaining time is displayed on the right of the lower row. When the delay timer expires, main contactor and star contactor are energized.

**Note:** Star contactor is energized at 100 ms after the main contactor is energized.

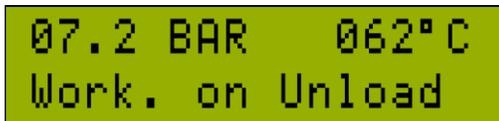
### 2.b.4 MOTOR DRIVING :



00.2 BAR 022°C  
Mot. Driving 004

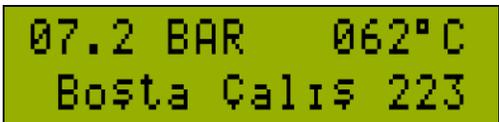
When the delay timer in parameter “*P4.3.1 Y-Delta Rising*” expires, the star contactor will be deenergized and delta contactor will be energized. Remaining time is displayed on the right of the lower row.

### 2.b.5 WORKING ON UNLOAD :



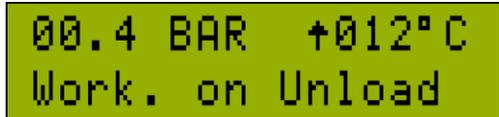
07.2 BAR 062°C  
Work. on Unload

This indicates that the compressor is running on unload. The load solenoid is deenergized. After the delay timer in parameter “*P4.3.2 Getting Load*”, the compressor starts running on load.



07.2 BAR 062°C  
Boşta Çalış 223

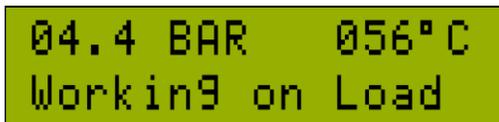
While the compressor is running on unload, when the delay timer in parameter “*P3.3 Wait on Unload*”, the mode of the compressor is changed to AUTOWAITING. The remaining time of “Waiting on Unload” is displayed on the right of the lower row. This is valid for AUTOMATIC mode only (“*P3.1-Operation mode*” parameter is set as “automatic”).



00.4 BAR +012°C  
Work. on Unload

The compressor runs on no load when the aircend temperature is less than the temperature set in parameter “*P4.2.4 To Load Temperature*”. In this case,  icon on the left of the temperature blinks every 1 second.

### 2.b.6 RUNNING ON LOAD :



04.4 BAR 056°C  
Working on Load

This indicates that the load solenoid is energized and running on load.

### 2.b.7 ON AUTOWAITING :



07.2 BAR 062°C  
On Autowaiting

In this mode, the main contactor and delta contactor of the compressor have been de-energized and the main motor has stopped. Green LED blinks with long intervals. If there is a pressure transducer and the air pressure is below the pressure in parameter “*P3.4 Pressure Load*”,

the compressor gets out of “Autowaiting” mode and gets into “Starting” mode. If there is a pressure switch, when the switch is “closed”, the compressor gets out of “Starting” mode and gets into “Autowaiting” mode.

## 2.c Alarm and Warning Display / Indication

### 2.c.1 Trip Alarm Display



In case of trip alarm, the main motor is stopped. On the below row of the LCD, “!ALARM!” and the alarm code of the last alarm blink every 1 second alternately. Even if the fault condition is not active any more, the trip alarm is kept being displayed. When the alarm is reset, the alarm on the screen is cleared. Previous alarms may be seen in the alarm record.

Trip Alarms	Trip Alarm Sources
Emergency Stop	Digital Input IN-0
Main Motor Thermic	Digital Input IN-1
Separator Fail	Digital Input IN-2
Phase Sequence	Digital Input IN-3
Oil Filter	Digital Input IN-4
Line Pressure Sensor	Line Pressure Sensor not connected or faulty (AN-1)
Screw Pressure Sensor	Screw Pressure Sensor not connected or faulty (AN-2)
Temperature Sensor	Temperature Sensor not connected or faulty (AN-0)
High Line Pressure	Line Pressure $\geq$ “P4.1.1 Pressure High Limit”
Low Temperature	Screw Temperature $\leq$ ”P4.2.2 Temperature Low Limit”
Short Circuit Failure	There is a short-circuit between +12V and GND line on the sockets.
Max. Start/Stop count in an Hour	Number of Start/Stop in an Hour $\geq$ ”P4.3.6 Maximum Start/Stop”
Fan Motor Thermic	When digital input IN-5 function is selected as Remote Load, this input functions as Remote Load Input. If the function is set to anything else other than Remote Control, this input functions as an auxiliary alarm input. Also this input can be assigned as Screw Pressure Switch or Line Pressure Switch.
Auxiliary Alarm 2	If "P4.5.2-Start/Stop Control Source" is selected as Remote control , digital input IN-6 is used for remote start. If it is not selected as remote start, IN-6 is used as auxiliary failure input.
High Screw Press	Screw Pressure $\geq$ “P4.1.4 Screw Pressure Alarm”
High Pressure Difference	Screw Pressure – Line Pressure $\geq$ “P4.1.6 Pressure Diff. Alarm”
Air Evacuation Failure	If the Screw Pressure $>$ “P4.1.8 Screw Pressure Start Value” during the initial start this alarm is indicated. If the screw pressure drops below this value the alarm is automatically acknowledged and the compressor will start.
Screw Pressure High	If the IN5 digital input is set as Screw Pressure Switch, when the compressor tries to start and this input is active than the alarm is

## 2.c.2 Warning Display

Warning Codes	Warning Sources
High Temperature	Screw Temperature $\geq$ “P4.2.3 Temperature Alarm “
High Pressure	Air Pressure $\geq$ “P4.1.2 Line Pressure Alarm Value”
Power Was Interrupted	The power supply to the device interrupted while the compressor was running. Once the power returns the alarm will automatically be reset and the compressor will return to normal operation.
Pressure Difference High	Pressure Difference $\geq$ “P4.1.5 Pressure Difference Warn”
Screw Pressure High	Screw Pressure $\geq$ “P4.1.3 Screw Pressure Warn”

When there is “High Temperature” warning, the temperature value on the right of the upper row in the LCD blinks to warn the operator. The red LED indicator on the panel will also blink with 1 sec intervals.

When there is “High Pressure” warning, the pressure value on the left of the upper row in the LCD blinks to warn the operator.

“Power Was Interrupted” warning is automatically reset when the compressor is restarted.

## 2.c.3 Part Replacement & Maintenance Warning Display



When any of Part Replacement & Maintenance remaining time is up, it is time for the related maintenance. In that case, at every hour on the hour when the compressor is running, the related maintenance is displayed on the bottom line of the LCD. The failure/warning indicator LED blinks at

long intervals. To clear the warning, press any menu control button on CCS 3000 once. When a part replacement / maintenance warning is given, the compressor manufacturer should be contacted. The remaining part replacement / maintenance remaining time can be seen on “P2-CHANGINGS & MAINT. TIME” screen.

There are 6 different warnings on Time to Part Replacement & Maintenance in CCS 3000.

Warning Codes	Description
General Maintenance	General maintenance time is over.
Change Air Filter	Air filter change time is over.
Bearing Maintenance	Bearing maintenance time is over.
Change Oil Filter	Oil filter change time is over.
Change Oil	Oil change time is over
Change Separator Filter	Separator filter change time is over.

## 3-CCS 3000 MENU STRUCTURE

There are 5 headings in CCS 3000 menu. These are:

- P1 - ALARM MENU
- P2 –CHANGING & MAINTENANCE REMANING TIMES
- P3 – USER SETTINGS
- P4 – SERVICE SETTINGS
- P5 – FACTORY SETTINGS

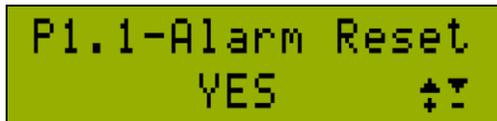
There are 3 parameters levels in CCS 3000. These are: User, Service and Factory levels. Each parameter level is protected by a password. By user password, one may get access to user level only. By service password, one may get access to user and service levels. By factory password, one may get access to all user, service and factory levels. There is no password protection in Alarm menu and Changing & Maintenance menu. For these menus, when no button is pressed within 3 minutes, the screen is automatically changed to status screen.

### 3.a Alarm Menu (P1)



While in the main screen, press to enter menu. First heading of the menu is “P1 Alarm Menu”. icon indicates that there are sub-headings under the header. Press button to return to status screen.

#### 3.a.1 Resetting Alarm



While in Alarm menu, when button is pressed, “*P1.1-Alarm Reset*” heading is displayed first. While in this heading, press button, a blinking cursor appears on the screen; to reset the alarm, select “YES” by using and buttons. Alarm reset clears all warning and trip alarms and the alarm warning is removed in the system. An alternative way to reset the alarm is to press button for 2 seconds while in status display.

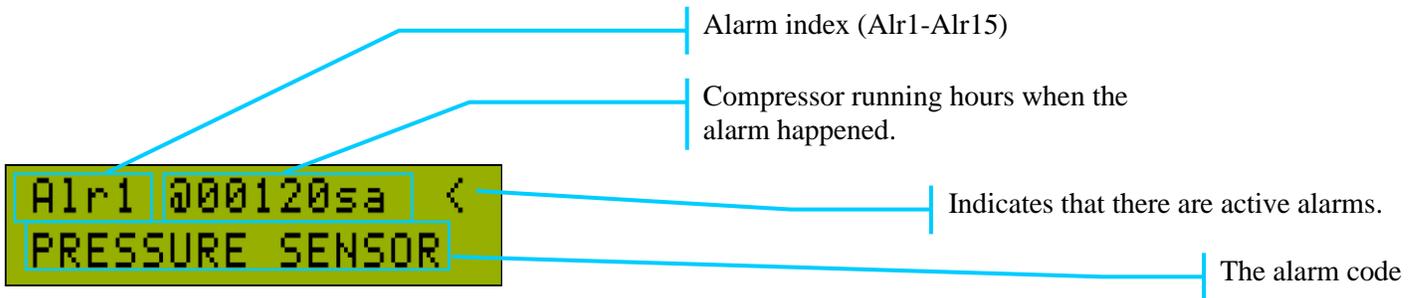
### 3.a.2 Active Alarms Menu

While in alarm menu, press  and  buttons consecutively to go to alarm records menu. The active alarms are displayed in this menu.

### 3.a.3 Alarm Records Menu



While in Alarm menu, press , ,  consecutively to go to alarm records. CCS 3000 keeps record of the last 15 warning and trip alarms.



While in this screen, press  button to view the record of the last alarms. Alr1 is the last alarm. The number of alarm index increases as previous alarms are displayed. By pressing  button, previous alarms are viewed. The alarm with the active alarm indicator  icon indicates that the alarm is still active. If this icon turns to “+” symbol, it indicates that the alarm has been reset by the operator but the condition is still present. If this icon turns to “-“, it indicates that the alarm has not been reset by the operator and the condition has disappeared.

### 3.b Changing & Maintenance Time Menu (P2)



It is the second heading in CCS 3000 menu. It is about general maintenance of the compressor, and how much time remains to change bearing, oil, air filter, oil filter. Total working hours and total loaded hours may also be viewed here by pressing  button first and then selecting with  and  buttons.

### 3.b.1 Changing & Maintenance Remaining times screen

```
General Maint.  
P2.1→ 1600 hr
```

Example. It counts down from the value set in parameter: “P4.4.1 General Maintenance Hours”. Maintenance should be made when this value is “0” or negative. (Refer to section 2.c.2 Changing & Maintenance Time warning display)

```
Total Work. Hour  
P2.7→ 3400 hr
```

Total running hours and total loaded hours count forward, starting from “0”.

### 3.b.2 Changing & Maintenance Remaining Time Reset

```
Bearing Maint.  
RESET→ YES ↑↓
```

The Changing & Maintenance Remaining times can be reset only in Service and Factory modes. Total working hours and total loaded hours can not be reset.

```
Bearing Maint.  
P2.2→ -6 hr
```

On this example screen, it is indicated that bearing maintenance is over due by 6 hours. While in service or factory mode and in this screen, when  button is pressed in this screen, a warning text on the lower row is displayed. When “YES” is selected with , , bearing maintenance time can be set to the value in parameter “P4.4.2 Bearing Maintenance Hours”.

```
Bearing Maint.  
P2.2→ 5000 hr
```

 button has no effect when the service mode or factory mode is not reached from password entry screen

### 3.c Password Entry Screen

```
PASSWORD = 0---  
+Esc  ↓  ↑  ↓Ent
```

```
PASSWORD = ***0  
+Esc  ↓  ↑  ↓Ent
```

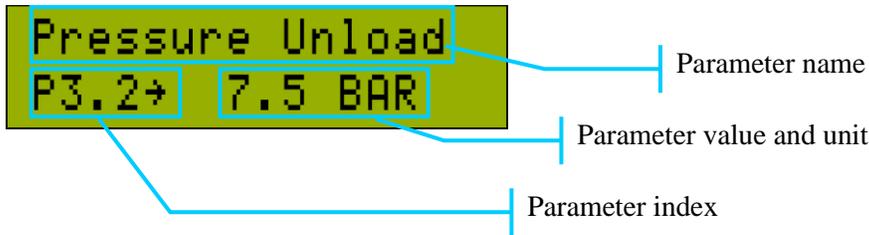
```
!INCORRECT!  
ENTERANCE
```

Access to CCS 3000 operator, service and factory parameters is protected by passwords. Password length is 4 characters. While in status screen, press  and  buttons together for 3 seconds to enter password entry screen. On entry, the cursor becomes active. One can enter the value in each digit by pressing  and  buttons.  button shifts the cursor to the right digit. and the previous digit value turns to “\*”. Pressing  button exits out of password entry screen. To enter the password, press  button. The password will be checked. If it is wrong, “!INCORRECT ENTERANCE” warning is displayed, and the Screen exits to status screen after 3 seconds. If the password matches any of the 3 passwords, the screen jumps to the related heading.

### 3.d Parameter Settings Screen

Inside CCS 3000 menu, user parameters are under “*P3 User Settings*”, service parameters under “*P4 Service Settings*”, and factory settings under “*P5 Factory Settings*”. These parameters are in 2 types : numerical values like temperature, pressure, second, hour or selectable values like language selection, pressure screen, temperature screen.

As an example, parameter “*P3.2 Pressure Unload*” is a numerical value. Its value is displayed after user password is entered and then , , ,  buttons are pressed consecutively.



The screen changes to as on the left when  button is pressed once more. The functions of the menu control buttons are indicated on the below row. Blinking cursor is on the lowest digit of the numerical value.  and  buttons increase/decrease the value of the digit where the cursor is. Pressing  button

shifts the cursor to the left digit. The value is entered when  button is pressed. To exit without entering the value, press  button for 2 seconds.



Parameter “*P3.6 Pressure Unit*” is a selectable value. This parameter can be accessed after the user parameter is entered and , , , 5 x  buttons are pressed.



When  button is pressed, the screen changes to the screen on the left. The functions of the menu control buttons are indicated on the below row. Cursor is at the beginning of the selected value. The parameter value is selected by  and  buttons. The selection is entered when  button is pressed. To exit without

entering the selection, press  button for 2 seconds. This example is valid for all the parameters.

### 3.e User Parameters (P3)

These parameters are under “*P3 USER SETTINGS*” heading.

#### 3.e.1 Operating Mode (P3.1):

When the compressor pressure reaches “*P3.2 Pressure Unload*“, the load valve is deenergized. If the operating mode is automatic and as long as the air pressure is not below “*P3.4 Pressure Load*“, the compressor idles for the time in “*P3.3 Wait on Unload*“. After that timer expires, the main motor is stopped and the compressor changes its status to autowaiting. If the working mode is continuous, the compressor idles continuously.

#### 3.e.2 Pressure Unload (P3.2) (Bar/PSI):

When the air pressure reaches this parameter value, the control unit de-energizes the load valve and the compressor idles. The maximum of this parameter’s value is 0.2 bar below the parameter “*P4.1.2 Alarm Pressure*” and the minimum value can be set to 0.2 bar above parameter “*P3.4 Pressure Load*“. For example: If “*P4.1.2 Alarm Pressure*”

is set as 9.0bar and the parameter ““P3.4 Pressure Load” is set to 8.0bar, the maximum value for the “P3.2 Pressure Unload” is 8.8bar and the minimum value is 8.2bar.

### 3.e.3 Wait On Unload (P3.3) (seconds):

The compressor idles if the air pressure reaches the value set by “P3.2 Pressure Unload”. After the “P3.3 Wait Unload” timer expires, the compressor changes its status to autowaiting mode.

### 3.e.4 Pressure Load (P3.4) (Bar/PSI):

If the compressor is idling and the air pressure falls below this parameter value, the compressor load solenoid is energized. The maximum value of this parameter is 0,4 bar below the parameter “P4.1.2 Alarm Pressure” and also 0,2 bar below the parameter “P3.2 Pressure Unload”. For example, if “P3.2 Pressure Unload” is 8.0 bar, “P3.4 Pressure Load” can not be set above 7.8 bar. The minimum value for this parameter under any circumstance can not be below 3.5bar.

### 3.e.5 To Stop Delay (P3.5) (seconds):

This specifies the delay between the time  (stop) button is pressed and the compressor is stopped. While the timer is running after  button is pressed, if  (start) button is pressed again, the compressor keeps running and the timer is reset.

### 3.e.6 Pressure Unit (P3.6):

All the pressure values can be converted into and displayed in Bar or PSI. The unit of the pressure values entered from the panel should be same as the selected pressure unit.

### 3.e.7 Temperature Unit (P3.7)

All the temperature readings are displayed in and the values may be converted into Celsius or Fahrenheit

### 3.e.8 To Start Delay (P3.8) (seconds):

This parameter sets the delay between the time the start button is pressed and the compressor is started. If Stop button is pressed while the timer runs, the compressor is stopped and the timer is reset.

### 3.e.9 Dryer Time (P3.9):

This parameter determines the how much later the dryer will be stopped after the compressor stops if the “P5.2 Functional Relay” parameter is set as Dryer. At the end of this timer, the output will be de-activated. Once the compressor motor re-starts the output will be re-activated.

### 3.e.10 User Password (P3.10):



This password is for access to the user settings. There are 3 steps to change the password. The old password is entered first.



After that, the new password is entered 2 times.



When there is wrong entry, “!Incorrect Enterance!” message is displayed for 3 seconds and settings screen is exited.



When the entry is correct, “Password Changed” is displayed for 3 seconds.

### 3.f Service Parameters (P4)

Service parameters can be accessed only by entering service password or factory password at service password entry screen. Service parameters are grouped under 10 headings . They are under "*P4 Service Settings*"

#### 3.f.1 Pressure Parameters (P4.1):

##### 3.f.1.1 Stop Pressure (P4.1.1) (Bar/Psi):

If line pressure increases above this parameter 's value, trip alarm is given and the compressor is immediately stopped. Alarm LED blinks.

**! Note:** This value can not be lower than 0,2 bar above "*P4.1.2 Alarm Pressure*".

##### 3.f.1.2 Alarm Pressure (P4.1.2) (Bar/Psi):

If the line pressure gets above this parameter 's value, warning alarm is indicated. The alarm LED blinks.

**! Note:** This value can be minimum 0,2 bar above "*P3.2 Pressure Unload*" and maximum 0,2 bar below "*P4.1.1 Stop Pressure*"

##### 3.f.1.3 Screw Pressure Warning (P4.1.3) (Bar/Psi):

If the screw pressure increases above this parameter's value, warning alarm is indicated. The alarm LED blinks.

##### 3.f.1.4 Screw Pressure Alarm (P4.1.4) (Bar/Psi):

If the screw pressure increases above this parameter's value, trip alarm is given and the compressor is immediately stopped. Alarm LED blinks.

##### 3.f.1.5 Delta Pressure Warning (P4.1.5) (Bar/Psi):

If the difference between the Line and Screw pressure increases above the value set by this parameter and the screw pressure is above 4 Bar, warning alarm is indicated. The alarm LED blinks.

##### 3.f.1.6 Delta Pressure Alarm (P4.1.6) (Bar/Psi):

If the difference between the Line and Screw pressure increases above the value set by this parameter and the screw pressure is above 4 Bar, trip alarm is given and the compressor is immediately stopped. Alarm LED blinks.

##### 3.f.1.7 Delta Pressure Delay (P4.1.7) (sec):

If the difference between the Line and Screw pressure increases above the value set by "*P4.1.5 Delta Pressure Warning*" or "*P4.1.6 Delta Pressure Alarm*" for the time period determined by this period and the screw pressure is above 4 Bar, the related alarm is activated. Alarm LED blinks. This parameter determines the time delay before the alarm is indicated.

##### 3.f.1.8 Screw Pressure Start Value (P4.1.8) (Bar/Psi):

While the "*P5.13 Screw Pressure Active*" parameter is set as YES, and during the initial start of the compressor if this pressure sensor reads a value higher than "*P4.1.8 Screw Pressure Start Value*" parameter, the controller will indicate an Air Evacuation Error.

#### 3.f.2 Temperature Parameters (P4.2) (Cel/Fah):

##### 3.f.2.1 Upper Temperature Limit (P4.2.1) (Cel/Fah):

If the screw temperature value increases above this parameter 's value, trip alarm is given and the compressor is immediately stopped. Alarm LED blinks.

**! Note:** The minimum value for this parameter can be 3<sup>0</sup>C above "*P4.2.3 Temperature Alarm*".

##### 3.f.2.2 Lower Temperature Limit (P4.2.2) (Cel/Fah):

If screw temperature value decreases below this parameter 's value, trip alarm is given and the compressor does not run. Alarm LED blinks.

### **3.f.2.3 Temperature Alarm (P4.2.3) (Cel/Fah):**

If the screw temperature value increases above this parameter 's value, warning alarm is given. Warning LED and temperature value on the screen blinks.

**! Note:** This value can be maximum 3<sup>0</sup>C below “P4.2.1 Upper Temperature Limit”.

### **3.f.2.4 Loading Temperature (P4.2.4) (Cel/Fah):**

If the screw temperature decreases below this parameter 's value at start-up, the compressor won't be loaded. When the temperature increases above this value, the compressor works in normal operation.

### **3.f.3 Timing Parameters (P4.3):**

#### **3.f.3.1 Star / Delta Duration (P4.3.1) (sec):**

The connection of the main motor will change from star to delta when this delay timer expires.

#### **3.f.3.2 Delay for Start (P4.3.2) (seconds):**

This delay is the time between that the compressor is started and that it is loaded. This parameter can be disabled by setting it to “0”.

#### **3.f.3.3 Reloading (P4.3.3) (sec):**

This delay is the time between that the compressor is unloaded and it is reloaded. This parameter can be disabled by setting it to “0”.

#### **3.f.3.4 Auto Run Time (P4.3.4) (seconds):**

If the power is interrupted while the compressor is running, when the mains is restored, the compressor is automatically restarted after this delay timer expires. This parameter can be disabled by setting it to “0”.

#### **3.f.3.5 Air Draining Time (P4.3.5) (seconds):**

After the compressor stops, the air inside the screw is drained until this timer expires. The remaining time is displayed on the screen and the compressor can not be started until this timer reaches zero. When the timer expires, the compressor enters into Stopped mode.

#### **3.f.3.6 Max. Starts/Hour (P4.3.6) :**

When the number of start/stop 's in 1 hour is greater than or equal to this parameter, the Max. Starts/Hour is indicated. This parameter can be disabled by setting it to “0”.

### **3.f.4 Service Hours (P4.4):**

Service is due at the end of “Service Hours” (for changings & maintenances). Service remaining hours are calculated over these service hours. (please refer to : Changings & Maintenance Remaining Hours)

**! Note:** To disable any of these parameters, please enter “000000”.

- |   |                         |
|---|-------------------------|
| <b>1. General Maintenance Hours</b>       | <b>(P4.4.1) (hour)</b>  |
| <b>2. Bearing Maintenance Hours</b>       | <b>(P4.4.2) (hour)</b>  |
| <b>3. Oil Changing Hours</b>              | <b>(P4.4.3) (hour)</b>  |
| <b>4. Air Filter Changing Hours</b>       | <b>(P4.4.4) (hours)</b> |
| <b>5. Oil Filter Changing Hours</b>       | <b>(P4.4.5) (hours)</b> |
| <b>6. Separator Filter Changing Hours</b> | <b>(P4.4.6) (hours)</b> |

### 3.f.5 Communication Parameters (P4.5):

#### 3.f.5.1 Load Valve Control Source (P4.5.1):

This parameter determines which source controls the load valve of CCS 3000. If this parameter is selected as other than “Remote”, the related input may be used as digital alarm input. There are 3 sources in CCS 3000:

- **Sensor:** In this mode, CCS 3000 controls the load valve with the pressure sensor.
- **Remote:** In this mode, CCS 3000 controls the load valve with Remote Valve Control (digital input: IN5). This input may be selected as falling-edge trigger or rising-edge trigger.

When the input contact type is NC (normally closed), the load valve is energized during the closed-circuit to open-circuit transition (falling-edge). The load valve is deenergized when it is closed circuit.

When the input contact type is NO (normally open), the load valve is energized during open-circuit to closed Circuit (rising edge). The load valve is deenergized when it is open-circuit.

In this mode, “P3.2 Pressure Unload” and “P3.4 Pressure to Load” parameters have no effect on air pressure control.

**!Note:** Please make sure that IN5 type is correct in “P5.1 Input Contact Type” heading while working in this mode.

- **MODBUS:** In this mode, CCS3000 controls the load valve over communication. In this mode, “P3.2 Pressure Unload” and “P3.4 Pressure to Load” parameters have no effect on air pressure control.

#### 3.f.5.2 Start/Stop Control Source (P4.5.2):

This parameter determines which source controls start/stop. If this parameter is selected as other than “Remote”, the related input may be used as digital alarm input. There are 3 sources in CCS 3000:

- **Panel:** In this mode,  and  buttons on CCS3000 panel are used for starting and stopping.
- **Remote:** In this mode, CCS3000 start/stop is handled by Remote Start/Stop digital input (DIN7). This input may be selected as falling-edge trigger or rising-edge trigger.

When the input contact type is NC (normally closed), the compressor is started during closed-circuit to open-circuit transition (falling edge). The compressor is stopped when it is closed-circuit.

When the input contact type is NO, the compressor is started during open-circuit to closed-circuit transition (rising edge). The compressor is stopped when it is open-circuit.

In this mode,  button on the panel has no effect. When  button is pressed, the compressor is stopped when “P3.5 To Stop Delay” timer expires.

**!note:** Please make sure that the contact type for IN6 is selected correctly in “P5.1 Input Contact Type” heading.

- **MODBUS :** In this mode, CCS3000 makes start/stop over communication.

### 3.f.5.3 Communication Work Mode (P4.5.3):

This parameter defines the functions of  and  buttons on the panel. 2 modes, “Acknowledged” and “Not acknowledged” may be selected. These modes are explained below :

	<i>P4.5.3 Mode = Acknowledged</i>	<i>P4.5.3 Mode = Not Acknowledged</i>
	Acknowledges to transfer the control of CCS 3000 start/stop and load valve to remote controller such as ENKO SCADA software.	No effect. When CCS 3000 is remotely connected, the start/stop and load valve controls are automatically transferred to the remote controller such as ENKO SCADA software.
	Stops the compressor. Waits for re-acknowledgement from the operator.	No effect. When CCS 3000 is remotely connected, the start/stop and load valve controls are automatically transferred to the remote controller such as ENKO SCADA software.

### 3.f.5.4 Modbus Address (P4.5.4):

It sets the address of RS-485 port on CCS 3000. Can be assigned between 1 and 100.

### 3.f.5.5 Baud Rate (P4.5.5)

It sets the baud rate of RS-485 port on CCS3000. The selectable rates are 2400 bps, 4800 bps, 9600 bps, 19200 bps,

### 3.f.5.6 Stop Bit (P4.5.6)

It sets the number of stop bits on RS-485 port of CCS3000. Can be assigned as 1 or 2.

### 3.f.5.7 Parity Bit (P4.5.7)

It determines parity bit control of RS-485 port on CCS3000. It may be Even or Odd. Parity Bit control is disabled when this parameter is set to “Disable”.

### 3.f.5.8 Timeout Duration (P4.5.8)

If the communication breaks down or is not established during the duration set in this parameter, CCS3000 transfers the start/stop control to the panel and control of load valve to the sensor.

## 3.f.6 Calibration Parameters (P4.6)

### 3.f.6.1 Pressure Offset (P4.6.1) (Bar/PSI):

This parameter is used to calibrate the line pressure sensor. Can be set between -1 and +1.

### 3.f.6.2 Temperature Offset (P4.6.2) (Cel/Fah):

This parameter is used to calibrate the temperature sensor. Can be set between -10 and +10.

### 3.f.6.3 Screw Pressure Offset (P4.6.3) (Bar/PSI):

This parameter is used to calibrate the screw pressure sensor. Can be set between -1 and +1.

### 3.f.7 Preheating Parameters (P4.7)

- Working Load (P4.7.1) (Seconds)
- Working Unload (P4.7.2) (Seconds)

If the screw temperature is less than the parameter “P4.2.4 To Load Temperature” (+/- 2 degrees hysteresis), the compressor goes into preheating. In that case, the load valve is energized for the duration in the parameter “P4.7.1 Loaded Duration”. The load valve is de-energized for the duration in the parameter “P4.7.2 Unloaded Duration”. When any of the parameters is set to “0”, the compressor continuously works unloaded during preheat.

### 3.f.8 Fan Settings (P4.8)

#### 3.f.8.1 Run Temperature (P4.8.1) (Cel/Fah):

If the screw temperature increases above the temperature in this parameter, CCS 3000 runs the fan motor.

**!Note:** For the fan to be enabled, the parameter in “P5.2 Functional Relay” must be set as “Fan”

#### 3.f.8.2 Stop Temperature (P4.8.2) (Cel/Fah):

If the screw temperature decreases below this parameter, CCS3000 stops the fan motor after the delay in parameter “P4.8.3-Minimum Work Time”

#### 3.f.8.3 Minimum Work Time (P4.8.3) (Cel/Fah):

Fan motor runs minimum for that duration after the fan is started.

### 3.f.9 Service Password (P4.9)

This password is for getting access to service parameters. Changing procedure is same as in “P3.10 User Password”.

### 3.f.10 Language Selection (P4.10)

The language in the screen may be set as Turkish or English.

## 3.g Factory Parameters (P5)

These parameters are under “P5 Factory Settings” heading.

### 3.g.1 Input Contact Type (P5.1)

- IN1 – Motor Thermic Input Type
- IN2 – Separator Switch Input Type
- IN3 – Phase Sequence Protection Input Type
- IN4 – Oil Filter Input Type
- IN5 – Auxiliary Input 1 Type
- IN6 – Auxiliary Input 2 Type



Input Contact Type controls when the digital inputs of CCS 3000 will be active. In this menu, the statuses of all digital inputs except “Emergency Stop” are displayed. NC: Normally Closed; NO: Normally Open. Emergency Stop is always in NC (Normally Closed) and this can not be changed.



When  button is pressed, the contact input type of the IN1 input is displayed first. The input status of IN1 – IN6 may be displayed by  and  buttons.



To change the input type, go to the related digital input screen and press  button. In the bottom row, the button functions are displayed. The selection is confirmed by  button. You may exit the settings screen without confirming the input type by using  button.

**! Attention: Wrong settings of these parameters may damage to the compressor.**

### 3.g.2 Functional Relay (P5.2)

The function of the output relay is assigned with this parameter. 8 functions can be assigned :

- **Not Selected:** When this function is selected, the Functional Relay is always de-energized..
- **Fan:** When this function is selected, the Functional Relay is used for fan motor control. The fan motor parameters may be set in “*P4 Service Parameters*“ >>> “*P4.8 Fan Settings*”
- **Alarm:** When this function is selected, the Functional Relay is energized when there is red (trip) alarm or yellow (warning) alarm. The auxiliary output contact relay is de-energized when the alarms no longer exist.
- **Red (Trip) Alarm:** When this function is selected, the Functional Relay is energized when there is trip alarm.
- **Yellow (Warning) Alarm:** When this function is selected, the Functional Relay is energized when there is warning alarm.
- **Horn:** When this function is selected, and there is a trip and/or warning alarm, the auxiliary relay output is energized and drives the horn. The relay is energized and de-energized in periods of 1 seconds.
- **Pressure Normal:** When this function is selected, the auxiliary relay output is energized if the air pressure is between “*P3.4 Pressure to Load*” and “*P3.2 Pressure Unload*”
- **Heater:** When this function is selected, the auxiliary relay output is energized if the temperature is below the parameter in “*P4.2.2 Lower Temperature Limit* “. When the temperature increases above this parameter, the auxiliary relay output is de-energized.
- **Dryer:** When this function is selected, the output will be de-energized at the end of the “*P3.9 Dryer Time*” timer countdown. Once the motor is re-started, this relay is re-energized.

### 3.g.4 Pressure Sensor (P5.4)

This is the rated pressure on the label of the pressure sensor connected to CCS3000 AN1 input.

### 3.g.5 Clear Alarm List (P5.5)

It clears last 15 alarms recorded in Alarm Records.

### 3.g.6 Return Factory Settings (P5.6)

The below parameters marked with ● are returned to the “default (factory)” values.

MENU INDEX	PARAMETERS	Default Setting	Minimum Value	Maximum Value	● Return to Factory Settings
	<b>User Parameters</b>				
P3.1	Operating Mode	Automatic	Continuous	Automatic	●
P3.2	Pressure Unload	7.5 Bar	5.0 Bar	15.6 Bar	●
P3.3	Wait on Unload	180 sec.	10 sec.	1200 sec.	●
P3.4	Pressure Load	6.0 Bar	3.5 Bar	15.4 Bar	●
P3.5	To Stop Delay	15 seconds	5 seconds	30 seconds	●
P3.6	Pressure Unit	Bar	Bar	PSI	●
P3.7	Temperature Unit	Celsius	Celsius	Fahrenheit	●
P3.8	To Start Delay	5 seconds	0 seconds	60 seconds	●
P3.9	Dryer Time	30 min.	1 min	50 min.	●
P3.10	User Password	1234	0000	9999	●
	<b>SERVICE PARAMETERS</b>				
	<b>Pressure Parameters</b>				
P4.1.1	Stop Pressure	8.0 Bar	0.0 Bar	16.0 Bar	●
P4.1.2	Alarm Pressure	7.8 Bar	0.0 Bar	16.0 Bar	●
P4.1.3	Screw Pressure Warning	7.8 Bar	0.0 Bar	16.0 Bar	●
P4.1.4	Screw Pressure Alarm	8.0 Bar	0.0 Bar	16.0 Bar	●
P4.1.5	Delta Pressure Warning	2.0 Bar	0.0 Bar	9.0 Bar	●
P4.1.6	Delta Pressure Alarm	2.3 Bar	0.0 Bar	9.0 Bar	●
P4.1.7	Delta Pressure Delay	1 sec.	0 sec.	600 sec.	●
P4.1.8	Screw Pressure Start Value	1.0 Bar	0.0 Bar	3.0 Bar	●
	<b>Temperature Parameters</b>				
P4.2.1	Upper Temperature Limit	110 Cel	90 Cel	120 Cel	●
P4.2.2	Lower Temperature Limit	0 Cel	-10 Cel	10 Cel	●
P4.2.3	Temperature Alarm	105 Cel	80 Cel	110 Cel	●
P4.2.4	Loading Temperature	25 Cel	20 Cel	70 Cel	●
	<b>Timing Parameters</b>				
P4.3.1	Star / Delta Duration	6 seconds	2 seconds	30 seconds	●
P4.3.2	Delay for Start	1 seconds	0 seconds	60 seconds	●
P4.3.3	Reloading	1 seconds	0 seconds	60 seconds	●
P4.3.4	Auto Run Time	0 seconds	0 seconds	60 seconds	●
P4.3.5	Air Draining Time	10 seconds	0 seconds	60 seconds	●
P4.3.6	Max. Starts / Hour	6	0	10	●
	<b>Service Duration</b>				
P4.4.1	General Maintenance	2500 hours	0 hours	99999 hours	
P4.4.2	Bearing Maintenance	20000 hours	0 hours	99999 hours	
P4.4.3	Oil Change	2500 hours	0 hours	99999 hours	
P4.4.4	Air Filter	2500 hours	0 hours	99999 hours	
P4.4.5	Oil Filter	2500 hours	0 hours	99999 hours	
P4.4.6	Separator Filter	5000 hours	0 hours	99999 hours	
	<b>Communication Parameters</b>				
P4.5.1	Load Valve Control Source	Sensor	Sensor	MODBUS	
P4.5.2	Start/Stop Control Source	Panel	Panel	MODBUS	
P4.5.3	Com. Work Mode	Not Acknowledged	Not Acknowledged	Acknowledged	
P4.5.4	Modbus Address	1	1	100	
P4.5.5	Baud Rate	19200 bps	2400 bps	19200 bps	

P4.5.6	Stop Bit	1	1	2	
P4.5.7	Parity Bit	Even	Odd	Even	
P4.5.8	Timeout Duration	3.0 sec.	0.1 sec.	10.0 sec.	
	<b>Calibration Parameters</b>				
P4.6.1	Pressure Offset	0.0 Bar	-1.0 Bar	+ 1.0 Bar	
P4.6.2	Temperature Offset	0 Cel	-10 Cel	+ 10 Cel	
P4.6.3	Screw Offset	0.0 Bar	-1.0 Bar	+1.0 Bar	
	<b>Preheating Parameters</b>				
P4.7.1	Working Load	10 seconds	0 seconds	60 seconds	●
P4.7.2	Working Unload	15 seconds	0 seconds	120 seconds	●
	<b>Fan Settings</b>				
P4.8.1	Run Temperature	75 Cel	50 Cel	100 Cel	●
P4.8.2	Stop Temperature	65 Cel	50 Cel	90 Cel	●
P4.8.3	Minimum Work Time	180 seconds	0 seconds	1200 seconds	●
	<b>Service Password</b>				
P4.9	Service Password	1245	0000	9999	
	<b>Language</b>				
P4.10	Language Selection	Turkish	Turkish	English	
	<b>Factory Settings</b>				
P5.1	Input Contact Type	IN1-IN5: NC IN6: NO	IN1-IN6: NC	IN1-IN6: NO	
P5.2	Functional Relay	Dryer	Not Selected	Dryer	
P5.4	Pressure Sensor	16 Bar	0 Bar	16 Bar	
P5.8	Factory Password	5489	0000	9999	
P5.12	Temperature Sensor Type	NTC	NTC	KTY	
P5.13	Screw Pressure Active	No	No	Yes	
P5.14	Screw Sensor Value	16 Bar	0 Bar	16 Bar	
P5.15	IN5 Function	0	0	3	0: Fan Thermic 1: Remote Load 2: Screw Pressure Switch 3: Line Pressure Switch

### 3.g.7 Boot Screen (P5.7)



press  button for 2 seconds.

In this menu, any information (like company, and so on) which is displayed at power on screen is set. Information length can be 16 characters on each of 2 rows. Previous information may be changed. The information is displayed for 5 seconds at power on. When this menu is entered into, the cursor on the left of the upper row blinks. If no characters have been entered before, the screen is blank as on the left. The alphanumeric characters can be selected by  and  buttons. Pressing  button shifts the cursor to the right. Pressing  button shifts the cursor to the left. By pressing  button repeatedly until the cursor is on the rightmost character on the bottom right row, pressing the  button once more will save the entered text and exit. To exit this screen without recording,

### 3.g.8 Factory Password (P5.8)

This password is for getting access to factory parameters. Setting procedure is same as “P3.9 User Password”.

### **3.g.9 CCS 3000 Version (P5.9)**

Shows the software version of CCS 3000

### **3.g.10 Bootloader Version (P5.10)**

Shows the bootloader software version of CCS 3000

### **3.g.11 Factory Calibration (P5.11)**

This parameter is about the calibration of the 4-20mA Pressure Sensor. For factory use only (ENKO Electronic Control Systems Ltd.).

### **3.g.12 Temperature Sensor Type (P5.12)**

This parameter determines the type of the temperature sensor to be connected to CCS 3000. The 2 types supported are NTC and KTY.

**!Note:** A wrong setting of this parameter may cause damage to the compressor due to wrong temperature measurement.

### **3.g.13 Screw Pressure Active (P5.13)**

This parameter activates the pressure sensor (screw pressure) connected to the AN2 input of the CCS 3000.

### **3.g.14 Screw Pressure Value (P5.14)**

The pressure value on the label of the screw pressure sensor (AN2) is to be entered in this parameter.

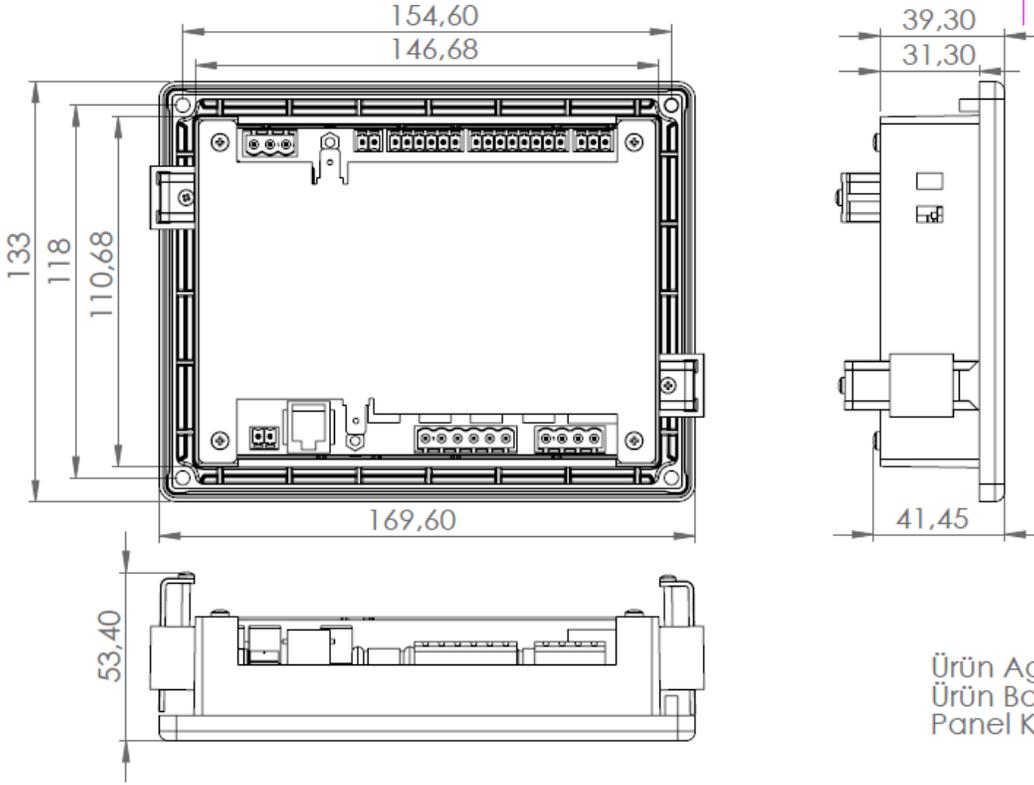
### **3.g.15 IN5 Function (P5.15)**

Determines the function of the IN5 digital input. The options are;

- Fan Thermic
- Remote Load
- Screw Pressure Switch
- Line Pressure Switch

This input may work in parallel with the parameters P5.13 and P4.5.1 depending on which function is assigned. When IN5 function is set to Remote Load, P4.5.1 will be set to “Remote”. In this case if P4.5.1 is set to anything else than “Remote”, IN5 function will be changed to “Fan Thermic”. If IN5 function is set to any function other than Remote Load, P4.5.1 will be changed to “Sensor”. The conditions apply for P5.13 Screw Pressure Active parameter.

## CCS3000 Mechanical Dimensions and Technical Specifications



Ürün Ağırlığı: 490 gr  
 Ürün Boyutları : 154.6x133x41.5mm  
 Panel Kesim Ölçüsü :151 x 115mm

<b>Power Supply</b>	10 –30 Vac
<b>Operating Temperature</b>	-10°C / +60°C
<b>Relay Outputs</b>	OUT0-OUT3 Relay Output (6A 250Vac cosφ =1.0) OUT4 Changeover Relay Output (10A 250Vac cosφ =1.0)
<b>Connection</b>	Screw-free Socket
<b>Housing</b>	Metal Back Cover 0.8mm Plastic Front Cover 2 mm
<b>Weight</b>	550 gr. (approx..)
<b>Dimensions (WxHxD)</b>	174 x 124 x 39.8 mm
<b>Panel Cutout</b>	151.6 x 115.6mm
<b>Installation</b>	Panel mounting, fixing with metal screw

## CCS3000 I/O List

<b>IN 0</b>	EMERGENCY STOP
<b>IN 1</b>	MOTOR THERMIC
<b>IN 2</b>	SEPERATOR FILTER SWITCH
<b>IN 3</b>	PHASE SEQUANCE RELAY
<b>IN 4</b>	OIL FILTER
<b>IN 5</b>	FUNCTIONAL RELAY 1
<b>IN 6</b>	FUNCTIONAL RELAY 2
<b>OUT 0</b>	MOTOR MAIN CONTACTOR
<b>OUT 1</b>	MOTOR STAR CONTACTOR
<b>OUT 2</b>	MOTOR DELTA CONTACTOR
<b>OUT 3</b>	LOAD VALVE SELENOID
<b>OUT 4</b>	AUXILIARY FUNCTIONAL OUTPUT
<b>AN 0</b>	NTC TEMPERATURE SENSOR
<b>AN 1</b>	4-20mA PRESSURE SENSOR (LINE)
<b>AN 2</b>	4-20MA PRESSURE SENS. (SCREW)

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# CCS3000 Connection Diagram

## CCS 3000 PRENSİP BAĞLANTI ŞEMASI

