

INTRODUCTION

1. Introduction

The purpose of the Electronic Interface is to provide the user with key information regarding compressor control, monitoring of measured quantities, protection of several compressor components and maintenance information. The parameters in the Electronic Interface can be modified according to the actual compressor usage needs, simply and safely.



Before making any changes to the interface parameters, read the entire manual. If you have any questions, please contact the nearest SCHULZ CUSTOMER SERVICE CENTER

2. Electronic Interface

The interface has on its front panel a bright display and seven keys, as indicated in the figure below:

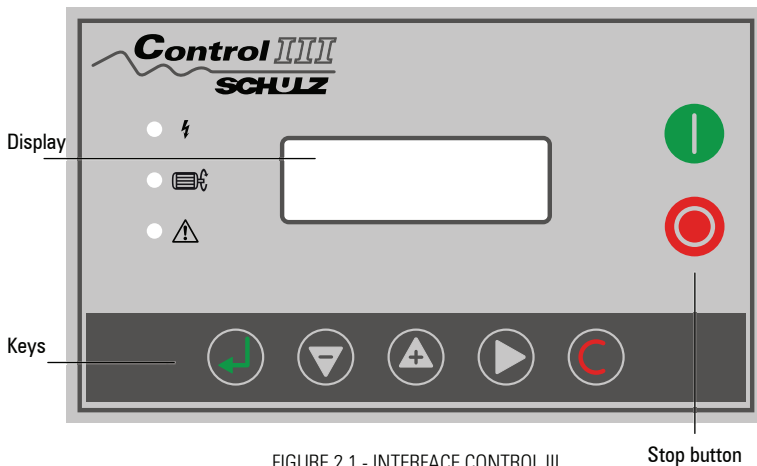


FIGURE 2.1 - INTERFACE CONTROL III

Table 2.2 - Keyboard

Keys	Functions
I	Start
O	Stop
C	Configuration/Load/Relief
V	Down / decrease
A	Up / increase
P	To the side / Enter
C	Return

NAVIGATION IN MENUS

1. Indication LEDs



turned on after the interface is powered up;



turned on when the compressor is running;



led will flash when an alarm is active; led will remain fully on when an error is active.

2. Status and Operations

The interface display will show the following conditions after power up:



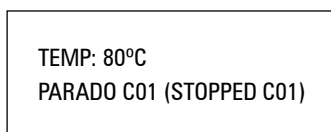
After power up, the display will show this screen

After 5 seconds the main menu will be displayed.



Main menu

Press the button for the main menu to show the screen below:



Main menu

Press to go to the menu selection screen: 

MENU OPERACAO (OPERATION)

MENU USUARIO (USER)



Menu screen level 1

MENU FABRICA (FACTORY)

MENU CALIBRACAO
(CALIBRATION)



Menu screen level 2

4. Operating Parameters

Press  or  to position the cursor on MENU OPERACAO (OPERATION). Press the button  to enter the menu.

MOTOR(A) A-0100

B-0100 C-0100

By pressing the button  continuously you can check the following parameters:

- Main motor current (*);
- Fan motor current (*);
- Total operating time;
- Load time;
- Operating time since the last time the machine was started;
- Load time since the last time the machine was started;
- Hours for exchanging the oil filter;
- Separator element;
- Air filter;
- Oil;
- Motor grease;
- Re-tighten the belt;
- The last five errors;
- Product serial number;
- Communication network status (if used).

(*) Current sensors not available with the product. Without the sensors, the current displayed by the interface will be 0.0A (zero amps).

5. User Parameters

Press  or  to position the cursor on the MENU USUARIO (USER). Press the Enter  button to enter the menu.

PRES CARGA (LOAD PRES):

7.5BAR

In the menu press  to modify the parameter that is being displayed on the screen. You will need to enter a password.

SENHA (PASSWORD):

A screen will be displayed to enter the password. The first digit of the password will flash. Press  or  to change the value. Then press  to move the cursor to the next digit. Change it as done previously. Follow the same procedure to change the third and fourth digits of the password. Then press  to confirm. We recommend that parameters are changed only by an authorized Schulz Technical Service Agent.

PRES CARGA (LOAD PRESS):

7.5BAR

After the screen displays the information above, press . The load pressure value will begin to flash. Press  or  to change the value. When finished, press  to confirm and save. The interface will beep.

5. Functions of User Parameters (access password: 9999)

Table 5.1		
Parameters	Default Value	Function
PRES CARGA (LOAD PRES)	*.* Bar	Load pressure value
PRES ALIVIO (RELIEF PRES)	*.* Bar	Relief pressure value
TEMP LIGA VENT (TEMP FAN ON)	***°C	Fan enabling temperature. If the value is set to 120 °C, the function is disabled
TEMP DESLIG VENT (TEMP FAN OFF)	***°C	Fan disabling temperature
ATRASO PROT MT (MOTOR PROTECTION DELAY)	0008S	When the interface is being used to perform the overload control of the main motor, this time is necessary to prevent the protection from being activated when the motor starts. This time must be greater than the star/delta time plus the load delay time.
T ATRASO VENT (FAN DELAY TIME)	0006S	When the interface is being used to perform the overload control of the fan motor, this time is necessary to prevent the protection from being activated when the motor starts.
TEMPO YΔ (YΔ TIME)	0006S	Star/delta time. Used in the main motor activation. Note: for compressors with direct start this time will be equal to zero.
ATRASO EM CARGA (LOAD DELAY)	0002S	Load delay time. Time the compressor will remain in relief after the motor is started.
TEMPO DE ALIVIO (RELIEF TIME)	0020M	Relief time. After this time, the compressor will go into standby mode and the motor will restart after the pressure reaches the load pressure.
TEMPO DE PARADA (STOPPAGE TIME)	0010S	Stoppage time. Time the compressor will remain in relief before turning off the main motor when the button  is pressed.
TEMPO DE RELIG (RESTART TIME)	0100S	Restart time. The machine cannot be restarted before this time, after a stoppage event has occurred.
MODO DE PART	LOCAL/ REMOTE	When the remote mode is selected, both local  and  remote activation buttons will be active to turn the machine on and off. When in local mode only the local activation buttons can perform this function.
MODO CARGA (LOAD MODE)	AUTO/ MANUAL	1. When set to MANU: only when the pressure is above the relief pressure will the compressor automatically enter in relief. In all other cases the load/relief function will only be performed by the button.  2. When set to AUTO, the load/relief function can be performed automatically by fluctuation of the network pressure.

COMUNICAÇÃO (COMMUNICATION)	PROHIBITED/ COMPUTER/ SEQUENCE	1. When PROHIBITED is selected, the communication functions are disabled. 2. When COMPUTER is selected, Control III will function as a slave and will be able to communicate with a computer or other controller. 3. When set to SEQUENCE, the interface will be the master of a compressor network.
ENDR. DE REDE (NETWORK ADDRESS)	0255	Network Address
ESTADO SEQ (SEQ STATUS)	MASTER/ SLAVE	1. When the interface is configured as the network master. 2. When the interface is configured as a slave on a network controlled by another master.
TEMPO DE ROTAÇÃO (ROTATION TIME)	0099H	Rotation time. When the pressure of the master compressor is between the load and relief pressure, the master will perform the rotation of the slave compressors at the time set in this parameter.
NR DO COMP (NO. OF COMPRESSORS)	0000	Number of compressors in the network.
PRES CARGA SEQ (SEQ LOAD PRESSURE)	6.5 Bar	In the network, a compressor will be activated or enter in load mode when the pressure is lower than the set value.
PRES ALIVIO SEQ (SEQ RELIEF PRES- SURE)	7.5 Bar	In the network, a compressor will stop or enter in relief mode when the pressure is above the set value.
ZERA FILTR OLEO (OIL FILTER RESET)	0000H	Time to exchange the oil filter. After exchanging the filter, the time must be reset manually.
ZERA ELEM SEP (SEP ELEM RESET)	0000H	Time for exchanging the air/oil separator element. After exchanging the element, the time must be reset manually.
ZERA FILTRO AR (AIR FILTER RESET)	0000H	Time to exchange the air filter. After exchanging the filter, the time must be reset manually.
ZERA OLEO (OIL RESET)	0000H	Time for oil exchange. After changing the oil, the time must be reset manually.
ZERA GRAXA MT (MOTOR GREASE RESET)	0000H	Time to reapply grease on the motor. After reapplying grease on the motor bearings, the time must be manually reset.
ZERA CORREIA (BELT RESET)	0000H	Time to check belt tensioning. After tensioning the belt, the time must be manually reset.
CNF FILTRO OLEO (OIL FILTER SETUP)	9999H	1. Set the value at which the oil filter exchange indication alarm will occur. 2. Set the value to "0" to disable the oil filter exchange indication alarm.
CNF ELEM SEP (SEP ELEM SETUP)	9999H	1. Set the value at which the separator element exchange indication alarm will occur. 2. Set the value to "0" to disable the separator element exchange indication alarm.

CNF OLEO (OIL SETUP)	9999H	1. Set the value at which the oil change indication alarm will occur. 2. Set the value to "0" to disable the oil change indication alarm.
CNF GRAXA MT (MOTOR GREASE SETUP)	9999H	1. Set the value at which the motor bearing grease indication alarm will occur. 2. Set the value to "0" to disable the motor bearing grease indication alarm.
CNF CORREIA (BELT SETUP)	9999H	1. Set the value at which the belt re-tension indication alarm will occur. 2. Set the value to "0" to disable the belt re-tension indication alarm.
IDIOMA (LANGUAGE)	Portuguese/Spanish or Spanish/English	Select the language according to your preference.
SENHA USUARIO (USER PASSWORD)	****	Parameter used by the user to change the access password.

6. Factory Parameters

The factory parameters can be unlocked and modified by a special password in the same way as the user parameters. The table below provides a detailed explanation of each of the parameters. We recommend that parameters are changed only by an authorized Schulz Technical Service Agent.

Table 6.1		
Parameters	Default Value	Function
CORR MOTOR (MOTOR CURRENT)	MAXIMUM OVERLOAD VALUE / 1,2	When the main motor current is 1.2 times higher than the set value, the compressor will be shut down due to overload on the main motor.
CORR VENT (FAN CURRENT)	MAXIMUM OVERLOAD VALUE / 1,2	When the motor fan current is 1.2 times greater than the set value, the compressor will be switched off due to overloading the fan motor.
TEMP ALARME (ALARM TEMP)	105°C 	When the unload temperature of the compressor unit reaches the adjusted value the interface will alarm, but the compressor will continue to operate.
SOBRETEMP (OVERHEATING)	110°C 	When the unload temperature of the compressor unit reaches the adjusted value, the interface will present an error and the compressor will shut down due to overheating.
(STOPPAGE PRESS)	According to the compressor	When the compressor unload pressure reaches the set value, the compressor will shut off due to overpressure.
PRES ALV MAX (MAX RELIEF PRES)	According to the compressor	This is the maximum relief pressure of the machine. The relief pressure in the User Menu cannot be greater than was is set in this parameter.
HORAS TOTAIS (TOTAL HOURS)	****Hours	Modifies the total operating time.
HORAS EM CARGA (LOAD TIME IN HOURS)	****Hours	Modifies the load time.

RESET FALTAS (RESET FAILURES)	****	Resets the failure records.
DESBALANC CORR (UNBALANCED CURR)	0006	Current Unbalance: $I_{max}-I_{min} \geq \text{adjustment} \cdot I_{min}/10$ If the set value is greater than 15 the current unbalance protection will be disabled.
ATRASSO F. FASE (PHASE FAILURE DELAY)	005.0	Phase failure protection: if one of the power phases fails for a longer time than settings, the phase failure protection will be activated and an error will turn off the compressor. Phase failure protection must be enabled.
DATA DE FABRICA- ÇÃO (MANUFACTU- RING DATE)	****_**_**	Compressor manufacturing date
NÚMERO DE SERIE (SERIAL NUMBER)	*****	Compressor serial number
PROTEÇÃO FASE (PHASE PROTECTION)	OFF/ON	ON: Enables failure protection and phase sequence OFF: Disables failure protection and phase sequence.
FREQUÊNCIA REDE (NETWORK FRE- QUENCY)	50HZ/60HZ	Sets the compressor operating frequency
MODO SEQ (SEQ MODE)	COMPATIBLE/ ADVANCED	Not used
TENSÃO ALTA (HIGH VOLTAGE)	****V	1. If the interface detects a voltage greater than the adjusted value, the compressor will shut off due to overvoltage. 2. Set this value to "0" to disable the function.
TENSÃO BAIXA (LOW VOLTAGE)	****V	1. If the interface detects a voltage less than the adjusted value, the compressor will shut off due to undervoltage. 2. Set this value to "0" to disable the function.
PROT BAIXA TEMP (LOW TEMP PROT)	-5°C	1. When the compressor is off, the product will not start if the temperature is lower than the set value. 2. If the compressor is running and the temperature is below the set value, the compressor will shut down and an error in the temperature sensor will be triggered.
TEMPO MAX FUNC (MAX OPER TIME)	0000H	1. When the total compressor operating time is greater than the value set in this parameter the compressor will shut down and an error will be displayed. 2. If the value is set to "0000", the function is deactivated.
FALHA ALRM LONG (LONG ALARM FAILURE)	0000H	If the interface detects that an oil filter, separator, air filter, oil, grease or belt alarm has a longer time than the time set in this parameter, the product will shut down and an error will be triggered.

L/D COMUNICAÇÃO (COMMUNICATION ON/OFF)	ON/OFF	1. When set to ON: user can configure Modbus network data 2. When set to OFF: user cannot configure Modbus network data. Note: Network configuration can only be performed with the compressor turned off.
MUDAR SENHA (CHANGE PASSWORD)	****	Parameter to change the factory password
UNID PRESSÃO (PRESSURE UNIT)	BAR/MPA/PSI	Selection of pressure unit
UNID TEMP (TEMP UNIT)	°C/°F	Selection of temperature unit

7. Calibration Parameters

Calibration parameters are used to modify Control III data. A password is required to access the menu.

MENU FABRICA (FACTORY)
MENU CALIBRACAO
(CALIBRATION)

To check the calibration parameters, go to MENU CALIBRACAO (CALIBRATION), press  and enter the access password. We recommend that parameters are changed only by an authorized Schulz Technical Service Agent.

Table 7.1			
PARAMETER		Initial Value	Functions
M O T O R A	ALVO (TARGET)	0000	Enter the current value of the current. The interface will divide the value entered by the value being measured at the moment to calculate the coefficient.
	COEF	1.000	To calibrate the value of the motor current, enter the appropriate coefficient.
	MOTOR A	***.*A	The interface displays a sample of the current value. It is a read-only value, it cannot be modified.
M O T O R B	ALVO (TARGET)	0000	Enter the current value of the current. The interface will divide the value entered by the value being measured at the moment to calculate the coefficient.
	COEF	1.000	To calibrate the value of the motor current, enter the appropriate coefficient.
	MOTOR B	***.*A	The interface displays a sample of the current value. It is a read-only value, it cannot be modified.
M O T O R C	ALVO (TARGET)	0000	Enter the current value of the current. The interface will divide the value entered by the value being measured at the moment to calculate the coefficient.
	COEF	1.000	To calibrate the value of the motor current, enter the appropriate coefficient.
	MOTOR C	***.*A	The interface displays a sample of the current value. It is a read-only value, it cannot be modified.

V E N T (F A N) A	ALVO (TARGET)	0000	Enter the current value of the current. The interface will divide the value entered by the value being measured at the moment to calculate the coefficient.
	COEF	1.000	To calibrate the value of the motor current, enter the appropriate coefficient.
	VENT A	***.*A	The interface displays a sample of the current value. It is a read-only value, it cannot be modified.
V E N T (F A N) B	ALVO (TARGET)	0000	The interface displays a sample of the current value. It is a read-only value, it cannot be modified.
	COEF	1.000	To calibrate the value of the motor current, enter the appropriate coefficient.
	VENT B	***.*A	The interface displays a sample of the current value. It is a read-only value, it cannot be modified.
V E N T (F A N) C	ALVO (TARGET)	0000	Enter the current value of the current. The interface will divide the value entered by the value being measured at the moment to calculate the coefficient.
	COEF	1.000	To calibrate the value of the motor current, enter the appropriate coefficient.
	VENT C	***.*A	The interface displays a sample of the current value. It is a read-only value, it cannot be modified.

CONTROL PRINCIPLES

Local Start (Y- start)

The interface will power the contactors K1, K2 and K3 in the correct sequence for starting the main motor. During the start procedure, the product will remain in relief.

Automatic load mode:

After the start procedure the compressor will start the control solenoid valve and the compressor will enter load mode and the pressure in the air network will increase. When the network pressure reaches the relief pressure value, the control solenoid valve will be de-energized, and the compressor will enter relief mode. If the pressure decreases to the load pressure value, the solenoid valve will be triggered again, and the compressor will enter load mode. If the product remains in relief for a longer period than the set relief time, the motor will stop automatically. A new start procedure will automatically start when the air supply pressure reaches a lower value than the load pressure.

Manual load mode

After the start process, the compressor will only operate in relief mode and will only enter load mode if the button  is pressed. When in load mode, if the relief pressure value is reached, the compressor will automatically enter relief mode.

Local Shutdown:

To turn off the compressor, press the button . The product will enter relief mode during the stopping time. Next, the main motor and fan will shut down. The compressor can only be restarted after the restart time has elapsed.

Remote start and stoppage:

Remote start and stoppage work basically the same way as local commands. The difference is that they can be performed through a digital input. When the digital input is closed the compressor will initiate a start process and when the input is open a stoppage process will be started. When set as remote start/stoppage, local commands are still enabled.

Temperature Control by Fan

When the unload temperature is higher than the value set in the parameter “temperatura liga ventilador” (turn on fan temperature), the compressor fan will be activated. When the unload temperature is less than the value set in the parameter “temperatura de desligamento do ventilador” (fan shutoff temperature), the compressor fan will shut off automatically.

Errors and Alarms

Control III may have several failures that are classified as alarms or errors. Alarms are less severe failures or alerts that the interface displays to the user to avoid damage to the compressor. Errors are failures that do not allow the compressor to continue in operation, due to risks to staff safety or extreme damage to the equipment. Below is the list of major failures that can be detected by Control III.

Message	Failure Category	Description
PARADA EMERG (EMERG STOP)	Error	Immediate stop button pressed
TROCAR FIL OLEO (EXCHANGE OIL FILTER)	Alarm	Replace oil filter
TROCAR CORREIA (EXCHANGE BELT)	Alarm	Replace belt
TROCAR F DE AR (EXCHANGE AIR FILTER)	Alarm	Replace air filter
TROCAR ELEM SEP (EXCHANGE SEP ELEM)	Alarm	Replace oil/air separator element
TROCAR OLEO (EXCHANGE OIL)	Alarm	Replace lubricating oil
TROCAR GRAXA MT (EXCHANGE MOTOR GREASE)	Alarm	Replace motor grease (where applicable)
SEQ DE FASE (PHASE SEQ)	Error	Incorrect phase sequence of supply voltage
DESBALANC CORR (UNBALANCED CURR)	Error	Electrical current between unbalanced power phases
FALTA DE FASE C (C PHASE FAILURE)	Error	Phase failure
ALARME LONGO (LONG ALARM)	Error	Alarm without correction for a very long time.
TEMP ELEV (HIGH TEMP)	Alarm	High compressor temperature
T SENSOR (TEMP SENSOR)	Error	Temperature sensor reading failure
PRT SEQ F (PHASE SEQ PRT)	Error	Phase sequence protection
PRT VOLT (VOLT PRT)	Error	Voltage protection (high or low)
TEMP ELEV (HIGH TEMP)	Error	Overtemperature
FIL OLEO BLOQ (BLOCKED OIL FILTER)	Alarm	Blocked oil filter
ERRO PARAMETRO (PARAMETER ERROR)	Alarm	Incompatible value in a parameter
SOBRECARGA (OVERLOAD)	Error	Overload on main motor or fan