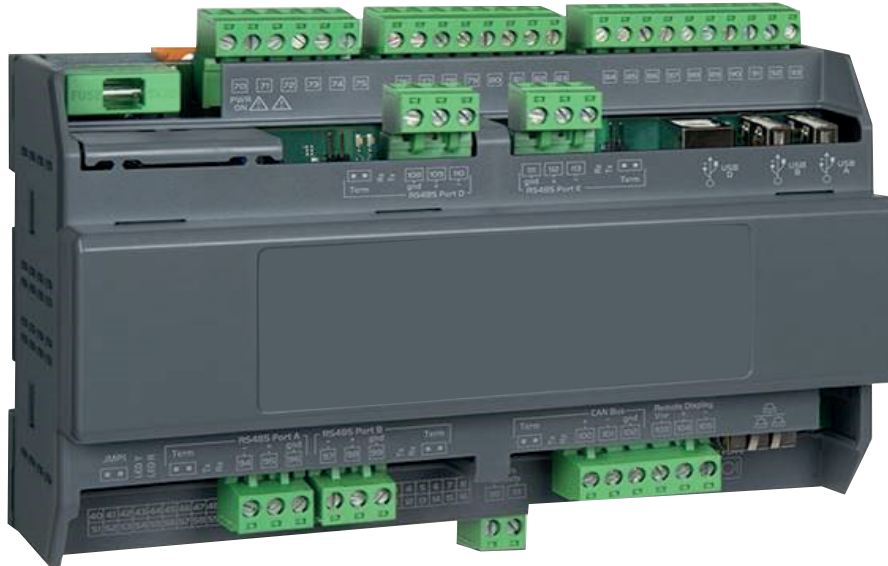


Controller manual

EN

10-06-2024



Controller IPG315D with Visograph display



BlueBox 
by Swegon

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1 INTRODUCTION

1.1 General

Some information on the use of this manual.

1.1.1 Purpose of the manual

The purpose of this manual is to provide all necessary information for installing and programming the controller that manages the units listed on the cover and it is complementary to the manual describing the software functions.

This manual is the “SERVICE” version, that is, it is intended only for after-sales service technicians and Factory technicians. Information regarding installation of the units and relevant tests and checks for the first starting is not given in this manual. It is taken for granted that the unit has been installed correctly, the tests and checks prior to start-up have been carried out and that routine maintenance is carried out, according to the information given in the “Installation, operation and maintenance” manual for the units.

We thank in advance all those who will wish to let us know of any errors, omissions, sections requiring further explanation or operations that have not been included.

1.1.2 IPG315D controller functions

The software application for the electronic microprocessor controller of the iPro IPG315D series was designed to manage refrigerant units and heat pumps.

Through appropriate configuration, this gives the possibility of managing a wide range of units with relevant specific functionalities.

By management of refrigerant units we mean safe control of operation of their component parts, during their various operating stages.

There are various sizes of modules in the iPro electronic microprocessor controller family. Through flexibility of the software, this allows their use to be optimized by using those that have the necessary number of inputs and outputs for each application.

The IPG315D board is connected to the various modules and communicates with them through a high speed, highly reliable field bus.

The user interface of the controller is a graphic LCD display having 8 multifunction buttons.

1.1.3 Recommendations for digital security

This unit is designed for connection to an Ethernet network.

Unit networking must be implemented by technicians who can take the appropriate security measures required to prevent system violations.

In particular:

- We recommend that access to the unit controller be restricted to the network inside the organization. System exposure to the Internet is strongly not recommended.
- If remote access is required, the connection must be encrypted via SSL/TLS or VPN and through a firewall configuration within the internal IT environment.
- The authorization to use a remote access must only be granted to equipment that the organization has supplied and approved, as specified in the previous item.

1.2 Digital Services

The information below is referred to the units controlled by advanced controllers, set up for connection to Swegon cloud services.

1.2.4 Product data sheet Digital Services

1.2.4.1 Connectivity

The product is equipped with functionality that, when enabled, will connect to the Swegon INSIDE Cloud when given access to the internet. Such connection is made either through the building's local internet access point or by using a supplied modem. When connecting through the building's internet access point, the local firewall must be configured to allow traffic according to the firewall settings.

The functionality is by default disabled and can be enabled in the product. By enabling this functionality the customer agrees to the general terms and conditions for Digital Service, DS-23.

The customer can disable the connection to the Swegon INSIDE Cloud in the product user interface at any time.

1.2.4.2 Which data is sent

Through the connection to Swegon INSIDE Cloud, the product will exchange data to Swegon INSIDE Cloud about certain actions and parameter settings of the product. Each data point has different thresholds for when to send data to Swegon, therefore the data sent depends on the data point type and configuration. The data is sent in intervals, at which point the data is aggregated together with other data from that interval.

1.2.4.3 Who has access to the data

The data sent to Swegon INSIDE Cloud is used by Swegon for purposes of performance, functionality and development of the product.

Consequently, Swegon has the right to use the data sent from all products connected to Swegon INSIDE Cloud.

The data is used in accordance with Swegon's DS-23 general terms and conditions, and our sales agreement with the customer.

1.2.4.4 Requirements

To connect a product to Swegon INSIDE Cloud, a secure internet connection via the property's internal network or via Swegon's external modem is required.

In addition to a secure internet connection, a valid certificate for each individual product is also required to approve them to share data with INSIDE Cloud.

Some products will come with a valid certificate out of the factory, while other products need to be equipped with a certificate to authorize the product to share data.

To find out if the product is INSIDE Ready (i.e. ready to share data) or not visit INSIDE Ready | www.swegon.com.

1.2.4.5 Safety

The Swegon INSIDE product is connected to azure IoT Hub.

The connection uses MQTT and is secured using TLS and client certificates (MTLS). DigiCert is used as registration authority and key management.

DigiCert is used as registration authority and key management.

The Swegon cloud platform uses Azure SaaS offerings for hosting of applications and APIs.

Digital services communicate with Swegon Cloud using standard technologies such as Rest APIs and message Queues.

Users and authorization is handled by an internal identity provider.

1.2.4.6 Firewall settings for Swegon Cloud

Swegon cloud solution is using Microsoft Azure services and certificates from DigiCert to secure the connection.

If the firewall in front of the products is allowing outbound traffic to internet it will work.

If the firewall is set up to control outbound traffic the following ports and destinations must be allowed.

If only filtering on ports, 443 and 8883 are used.

Domain (including sub domain)	Port	Protocol	Notes
*.azure-devices-provisioning.net (dps-Swegon-Cloud-common-we.azure-devices-provisioning.net global.azure-devices-provisioning.net)	443 8883	https mqtt	Azure Device Provisioning Service
*.azure-devices.net (iot-SwegonCloud-prod-we.azure-devices.net)	443 8883	https mqtt	Azure IoT Hub
*.blob.core.windows.net (stswciotfilestorageprod.blob.core.windows.net)	443	https	Azure storage
clientauth.one.digicert.com	443	https	DigiCert Enrolment over Secure Transport (EST) for certificate enrolment and reenrolment



Additional instructions on how to make the connection to **"Swegon INSIDE Cloud"** are available in the controller manual.

2 SYSTEM HARDWARE

This chapter describes the basic parts making up the system and any accessories as concerns the operation of this software.

Refer to the wiring diagram of the unit for the various connections.

2.1 IPG315D board

The IPG315D controller with SSR is the main hardware component of the system and manages the unit through its inputs and outputs.

The IPG315D controller is the main hardware component of the system and it is designed to control the unit via inputs and outputs.

The controller has been subjected to evolutions over time, which has resulted in two versions being currently available for the units. The two versions have the same performances.

For the sake of clarity, the two versions are defined “V1” and “V2” in this manual.

The difference between them consists in “V2” having two USB ports and two RS485 serial ports. In the current configuration, however, the ports are not used for any machine function and the two boards are perfectly interchangeable.



Another difference between the two controllers consists in the programming and addressing procedures. When performing these two operations, make sure you are following the relevant and correct instructions.

Board IPG315D - “V2”

A picture of the controller, the layout of the inputs and outputs and relevant description are shown below.



Fig. 1 IPG315D_SSR “V2”

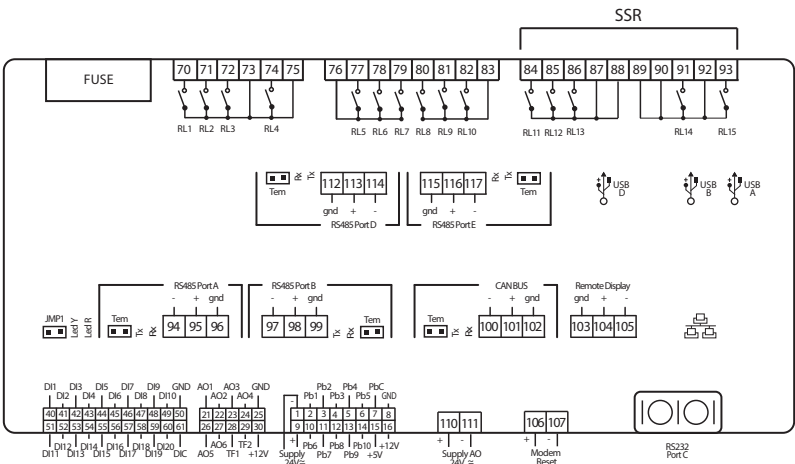


Fig. 2 Inputs and outputs IPG315D_SSR - “V2”

PIN	DESCRIPTION
1,9	("GND" 24Vac or "-24Vdc) Controller power supply
2-6,10-14	Multifunction analogue inputs
7	Common for passive analogue inputs
8	Reference GND (-) for analogue inputs in voltage or current
15	(+5Vdc) Power supply for analogue inputs
16	(+12Vdc) Power supply for analogue inputs
21,22,23,24,26,27	Analogue outputs 0-10V
25	Common GND (-) for analogue outputs
28,29	Not managed in the application
30	(+12V) Power supply to analogue outputs
40-49,51-60	Digital inputs
50	GND(-) for digital inputs in voltage 24Vac/dc
61	Common for digital inputs (potential-free contacts)
70,71,72,74	NO digital outputs
73,75	Common for digital outputs 70,71,72,74
76	Common for digital outputs 77,78,79
77,78,79	NO digital outputs
80,81,82	NO digital outputs
83	Common for digital outputs 80,81,82
84,85,86,91,93	SSR Solid state relay outputs
87,88	Common for solid state outputs 84-85-86
89,90,92	Common for solid state outputs 91-93
94,95,96	(-),(+),(insulated gnd) Master serial port RS485 - "port A"
97,98,99	(-),(+),(insulated gnd) Slave serial port RS485 - "port B"
100,101,102	(+),(-),(insulated gnd) CAN Bus Serial
103,104,105	(Vnr),(+),(-) Connection for VISOGRAPH remote terminal
110	(+24V) Power supply to analogue outputs
111	(-GND) Power supply to analogue outputs
112,113,114	(insulated gnd),(+),(-) Slave serial port RS485 - "port D"
115,116,117	(insulated gnd),(+),(-) Slave serial port RS485 - "port E"

2.2 RS485 serial port and Ethernet

2.2.1 RS485 serial connection

Controller IPG315 "V2" is provided with 5 RS485 serial ports.



Serial port "B", which corresponds to the terminals in boards 97, 98, and 99, has been provided for connection to a BMS or to a management system.

The use of the other ports is reserved.



Terminal "99", marked with "gnd", should be used only if you are certain it is not earthed.

The serial communication works even without its connection.



Connection of the "gnd" terminal to earth will damage the controller with consequent shutting down of the unit.

2.2.2 Ethernet connection

RJ45 connectors and a 8 twisted wire cable must be used for the connection.

The connectors can be of either plastic or metal material.



Fig. 3 Plastic connector, RJ45

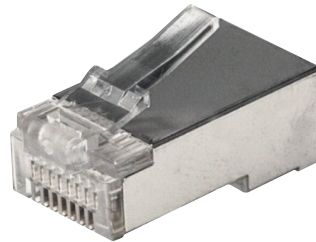


Fig. 4 Metal connector, RJ45

The cables can be either "FTP" (with aluminium shielding) or "UTP" type (without shielding). Cable type **Cat.5e** is a suitable choice.



The shielding must not be linked to the connector if metal RJ45 connectors and a shielded cable are used. Connecting the shielding to the metal connector may damage the controller irreparably.

Board IPG315D - “V1”

A picture of the controller, the layout of the inputs and outputs and relevant description are shown below.



Fig. 5 IPG315D_SSR “V1”

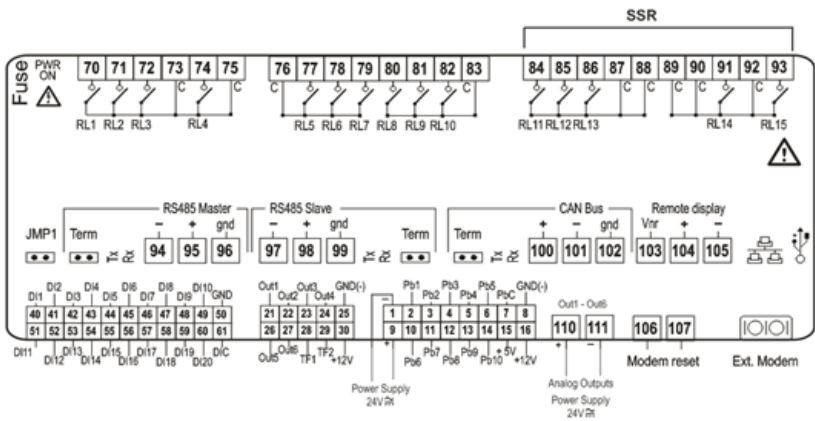


Fig. 6 Inputs and outputs IPG315D_SSR - “V1”

PIN	DESCRIPTION
1,9	("GND" 24Vac or "-24Vdc) Controller power supply
2-6,10-14	Multifunction analogue inputs
7	Common for passive analogue inputs
8	Reference GND (-) for analogue inputs in voltage or current
15	(+5Vdc) Power supply for analogue inputs
16	(+12Vdc) Power supply for analogue inputs
21,22,23,24,26,27	Analogue outputs 0-10V
25	Common GND (-) for analogue outputs
28,29	Not managed in the application
30	(+12V) Power supply to analogue outputs
40-49,51-60	Digital inputs
50	GND(-) for digital inputs in voltage 24Vac/dc
61	Common for digital inputs (potential-free contacts)
70,71,72,74	NO digital outputs
73,75	Common for digital outputs 70,71,72,74
76	Common for digital outputs 77,78,79
77,78,79	NO digital outputs
80,81,82	NO digital outputs
83	Common for digital outputs 80,81,82
84,85,86,91,93	SSR Solid state relay outputs
87,88	Common for solid state outputs 84-85-86
89,90,92	Common for solid state outputs 91-93
94,95,96	(-),(+),(insulated gnd) Master RS485 Serial
97,98,99	(-),(+),(insulated gnd) Slave RS485 Serial
100,101,102	(+),(-),(insulated gnd) CAN Bus Serial
103,104,105	(Vnr),(+),(-) Connection for VISOGRAPH remote terminal
110	(+24V) Power supply to analogue outputs
111	(-GND) Power supply to analogue outputs

2.3 IPX315D board

The IPX315D board with SSR is an expansion module of the main controller.
A picture of the board, the layout of the inputs and outputs and relevant description are shown below.

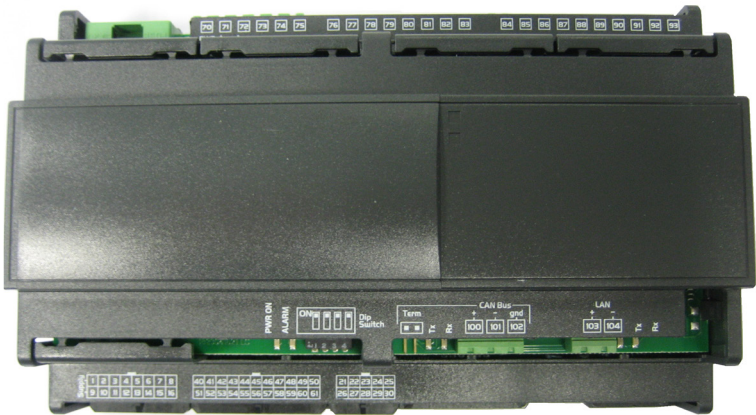


Fig. 7 IPX315D_SSR

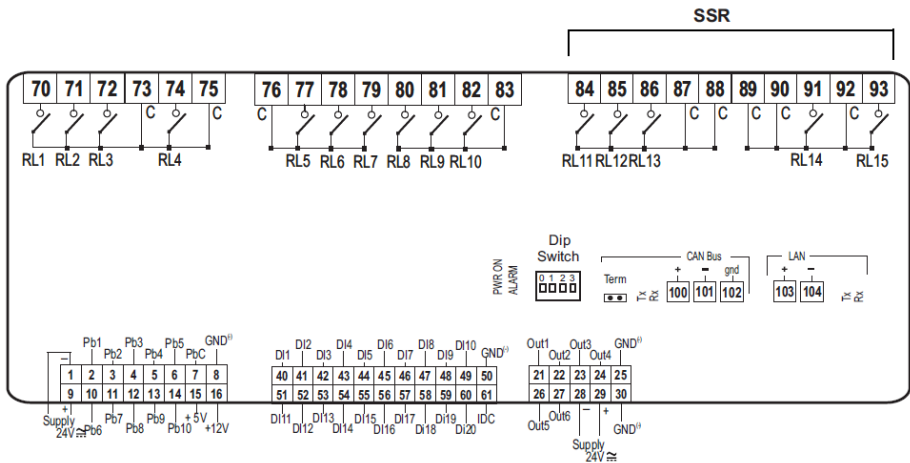


Fig. 8 IPX315D_SSR inputs and outputs

PIN	DESCRIPTION
1,9	("GND" 24Vac or "-24Vdc) Controller power supply
2-6,10-14	Multifunction analogue inputs
7	Common for passive analogue inputs
8	Reference GND (-) for analogue inputs in voltage or current
15	(+5Vdc) Power supply for analogue inputs
16	(+12Vdc) Power supply for analogue inputs
21,22,23,24,26,27	Analogue outputs 0-10V
25	Common GND (-) for analogue outputs
28,29	Not managed in the application
30	(+12V) Power supply to analogue outputs
40-49,51-60	Digital inputs
50	GND(-) for digital inputs in voltage 24Vac/dc
61	Common for digital inputs (potential-free contacts)
70,71,72,74	NO digital outputs
73,75	Common for digital outputs 70,71,72,74
76	Common for digital outputs 77,78,79
77,78,79	NO digital outputs
80,81,82	NO digital outputs
83	Common for digital outputs 80,81,82
84,85,86,91,93	SSR Solid state relay outputs
87,88	Common for solid state outputs 84-85-86
89,90,92	Common for solid state outputs 91-93
100,101,102	(+),(-),(insulated gnd) CAN Bus Serial
103,104	(+),(-) LAN

2.4 IPX306D board

The IPX306D board is an expansion module of the main controller.
A picture of the board, the layout of the inputs and outputs and relevant description are shown below.



Fig. 9 IPX306D

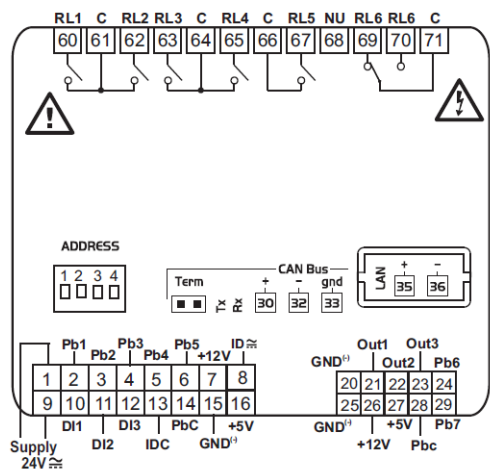


Fig. 10 IPX306D inputs and outputs

PIN	DESCRIPTION
1,9	("GND" 24Vac or "-24Vdc) Controller power supply
2-6	Multifunction analogue inputs
7	(+12V) Additional power supply
8	GND(-) for digital inputs in voltage 24Vac/dc
10-12	Digital inputs
13	Common for digital inputs (potential-free contacts)
14	Common for passive analogue inputs
15	GND (-) Additional power supply and reference for analogue inputs
16	(+5V) Additional power supply
20	GND (-) Additional power supply 5Vdc and 12Vdc for analogue outputs
21,22,23	Analogue outputs 0-10V
24,29	Multifunction analogue inputs
25	GND (-) Additional power supply 5Vdc and 12Vdc for analogue outputs
26	(+12V) Additional power supply
27	(+5V) Additional power supply
28	Common for passive analogue inputs
30,32,33	(+),(-),(gnd) CAN Bus Serial
35,36	(+),(-) LAN
60,62	NO digital outputs
61	Common for digital outputs 60,62
63,65	NO digital outputs
64	Common for digital outputs 63,65
66	Common for digital outputs 67
67	NO digital output
68	Not used
69	NC digital output
70	NO digital output
71	Common for digital outputs 69,70

2.5 XEV20D board

The XEV20D board is a driver for electronic expansion valve management.
A picture of the driver, the layout of the inputs and outputs and relevant description are shown below.



Fig. 11 XEV20D

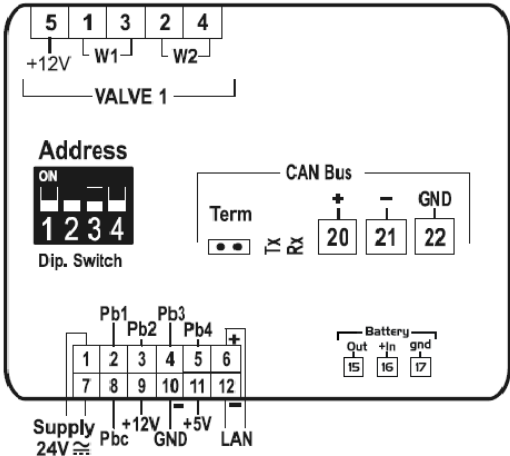


Fig. 12 XEV20D inputs and outputs

PIN	DESCRIPTION
1,7	("GND" 24Vac or "-24Vdc) Controller power supply
2,3	Configurable analogue inputs NTC/PTC/Pt1000
4,5	Configurable analogue inputs 4..20mA/0..5V/Pt1000
6,12	(+),(-) LAN
8	Common for analogue inputs NTC/PTC/Pt1000
9	(+12V) Power supply to analogue inputs
10	GND(-) analogue inputs
11	(+5V) Power supply to analogue inputs
15	(+out)
16,17	(+In,gnd) XEC Supercap connection
20,21,22	(+),(-),(gnd) CAN Bus Serial
Electronic expansion valve connection	
1,2	W1 connection
3,4	W2 connection
5	(+12V) common power supply

In the XEV20D board, there are LEDs near the words "PWR ON", "ALARM", "tx, rx" and "C1, Open, Close". Their meaning is given below.

LED	Status	Meaning
PWR ON	On	The driver is powered correctly
ALARM	On	An alarm is present
tx/rx	Flashing	The serial communication is active
tx/rx	On	There is no serial communication
C1 Open	Flashing	Valve opening
C1 Open	On	Valve fully open
C1 Close	Flashing	Valve closing
C1 Close	On	Valve fully closed

2.6 IEV24D board

The IEV24D board is a driver used to control the electronic expansion valve.

A picture of the driver, the layout of the inputs and outputs and relevant description are shown below.



Fig. 13 IEV24D

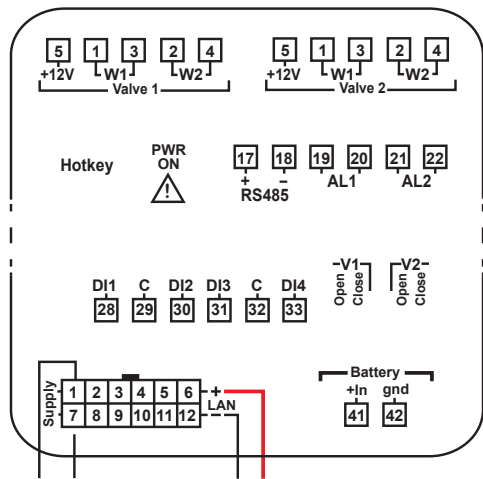


Fig. 14 IEV24D inputs and outputs

Multipin connector

PIN	DESCRIPTION
1	Controller power supply (24Vac or "+" 24Vdc)
2	Analogue input 1 (NTC, PTC, PT100)
3	Analogue input 2 (NTC, PTC, PT100)
4	Analogue input 3 (NTC, PTC, PT100)
5	Analogue input 4 (NTC, PTC, PT100)
6	LAN connection (terminal "+")
7	Controller power supply (24Vac or "-" 24Vdc)
8	Common connectors for analogue inputs
9	Voltage output, +12Vdc (to power current probes)
10	GND (ground for ratiometric transducers)
11	Voltage output, +5Vdc (to power ratiometric transducers)
12	LAN connection (terminal "-")

Digital input connector

PIN	DESCRIPTION
28	Digital input 1
29	Common connector for digital inputs
30	Digital input 2
31	Digital input 3
32	Common connector for digital inputs
33	Digital input 4

RS485 connector and relays

PIN	DESCRIPTION
17	RS485 connection (terminal "+")
18	RS485 connection (terminal "-")
19	Common connector for relay 1
20	Relay 1
21	Common connector for relay 2
22	Relay 2

Supercap connector

PIN	DESCRIPTION
41	XEC EVO Supercap input
42	GRD for XEC EVO Supercap input

2.6.3 Valve connection

Driver IEV24D is programmed via serial port RS485 using the controller connector.

File "413D3D.well" must have been uploaded into the controller.

Driver replacement requires that the valves are always disconnected when the device is powered for programming purposes.

A couple of minutes must elapse to complete the programming process, after which power can be cut off - a feedback signal is not featured to warn about completion of the operation.

After programming is completed, the valve connectors can be plugged in and the system can be powered.



The valve(s) must not be connected or disconnected if the driver is powered: this may cause the driver to break.

Valve connectors

The number of drivers varies according to the need to control either 1 or 2 valves.

Either 1 or 2 connectors are provided that are identified with the same numbers.

PIN	DESCRIPTION
5	Voltage output +12Vdc
1	First winding connection
2	First winding connection
3	Second winding connection
4	Second winding connection

2.7 XEC Supercap module

The supercap module makes it possible for the driver to close the electronic expansion valve in case of sudden failure of power supply to the unit.

A picture of the controller, the layout of the inputs and outputs and relevant description are shown below.

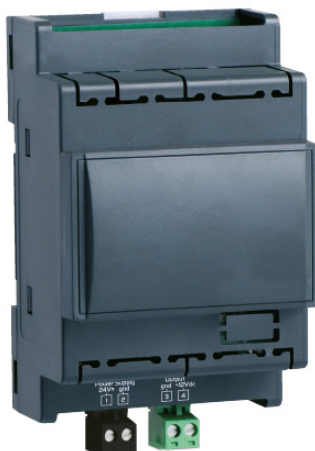


Fig. 15 XEC supercap module

PIN	DESCRIPTION
1,2	("24V ac/dc", "GND") Power supply
3,4	("gnd", "+12Vcc") Output

2.8 Visograph Display

The Visograph display (graphic LCD "240*96 px" having 8 multifunction buttons) is the interface through which the controller is managed.

2 displays can be connected to the same controller. In this case, it is necessary to set a different serial address for each connected display.

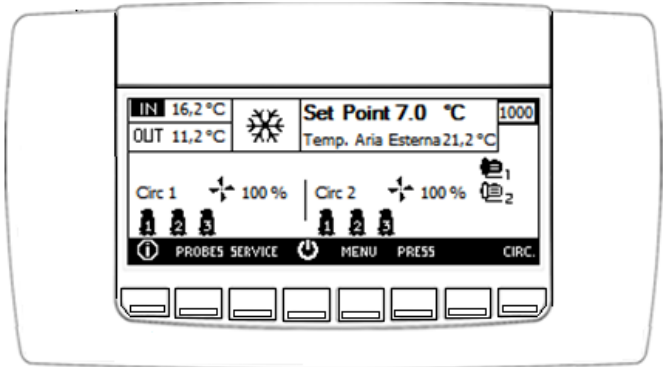


Fig. 16 Visograph Display

The connection between the display and the controller must be made with AWG20 and BELDEN 8772 type cable. The maximum distance between the controller and the display that is furthest away is 120 metres.



Observe the polarity of the power supply in order to prevent irreparable damage to the controller and the display.



The second display is to be connected to the terminals of the first.

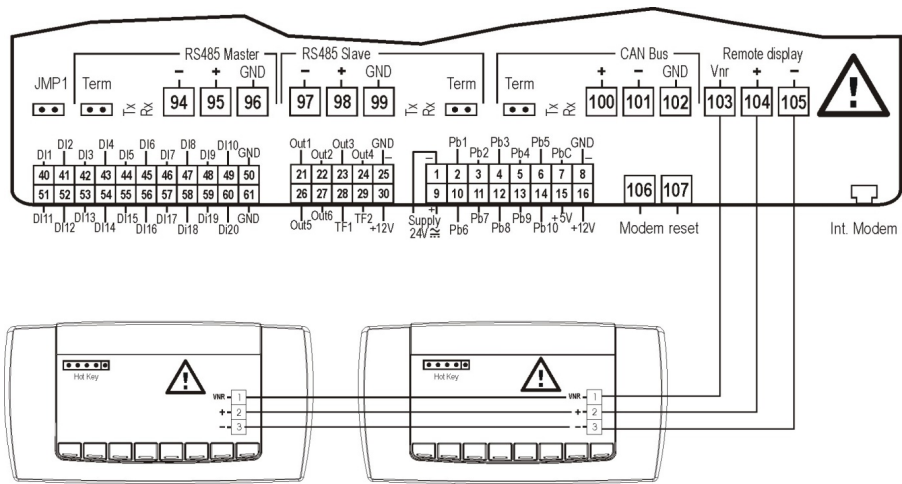


Fig. 17 Connection of second terminal

PIN	DESCRIPTION
1	"Vnr"
2	"+"
3	"-"

3 ADDRESSING OF COMPONENTS

The components making up the system that controls the units are networked together. Each component must have a different address in a network. The system components have hardware addressing through dip-switches or software using the user interface. Which address must be given to the various components and how to do so is explained below.

3.1 Hardware addressing

Hardware addressing is assigned through the 4 dip-switches featured in the I/O expansion boards and the XEV20D drivers.



Fig. 18 Dip-switches

The dip-switches are ON in the up position. The address is given in binary mode with the ON position of the dip-switches.

Address	dip-switches			
	1	2	3	4
0	OFF	OFF	OFF	OFF
1	ON	OFF	OFF	OFF
2	OFF	ON	OFF	OFF
3	ON	ON	OFF	OFF
4	OFF	OFF	ON	OFF
5	ON	OFF	ON	OFF
6	OFF	ON	ON	OFF

Address "0", which is obtained with the four dip-switches in the OFF position, is not used. The addresses shown in the table must be assigned to the various expansion boards and to the drivers connected to the Can-Bus network of the IPX315D controller.

address	Boards
1	XEV20D circuit 1 driver board
2	XEV20D circuit 2 driver board
3	XEV20D circuit 3 driver board
4	XEV20D circuit 4 driver board
5	I/O IPX315D expansion board
6	I/O IPX306D expansion board

The addressing of the IEV24D drivers requires closing of the digital inputs. Address 1 is assigned by closing digital input 1 (short-circuiting terminals 28 and 29). Address 2 is assigned by closing digital input 2 (short-circuiting terminals 29 and 30). The drivers connected to serial port "D" RS485 in the controller must be assigned to the addresses listed in the table.

address	Boards
1	IEV24D board in circuit 1
2	IEV24D board in circuit 2



The address must be set before powering the boards.

3.2 Software addressing

Software addressing regards the VISOGRAPH graphic display that is connected to the controller via a serial line. The serial line of the controller for managing the display is different from the one used for the expansion boards.

The displays installed in the units and supplied from the factory have the address set to "1".

The display address needs to be changed only when a second display is added or replaced.



Only one display must be connected to the controller while the address is being changed, or it is being programmed or updated.

The display will be damaged if its address is changed or it is programmed or updated while another display is connected to the same controller.

3.3 IP addressing

The web server integrated in the controller is accessed through the Ethernet port.
To access the controller in this way, it is necessary to know its IP address.
Even for programming with USB pen drive, it is necessary to know the IP address of the controller.
The factory-set IP address is 10.2.3.20

3.3.1 IP address change with computer

To connect the unit to a network, its IP address must be changed.
To do this, you must connect point-to-point with a computer.
The procedure to follow is:

- change the IP address of your computer to address 10.2.3.19
- make sure the network screen is 255.255.255.0
- open a web browser of your PC (FireFox, IE, etc.)
- in the address bar, type 10.2.3.20/panel
- login
- enter Username = service
- enter Password = servicebb
- Press **“Network”** for controller version “V2”; press **“Configure”** for controller version “V1”.

Now you can access the screen to give the controller a new IP address and the network characteristics.

ETH 0

MAC Address

00:0A:F6:82:56:B8

Mode

Static

IP Address

10.2.13.190

Subnet Mask

255.255.255.0

Network Address

10.2.13.1

Gateway Address

10.2.13.1

DSN 1

10.0.0.50

DSN 2

1.1.1.2

SAVE

RESTORE DEFAULT

Fig. 19 Screen used to change the IP address in version “V2”

TCP/IP

IP address:

10.2.3.20

Netmask:

255.255.255.0

Network:

10.2.3.1

Gateway

10.2.3.1

DNS

10.0.0.50

Secondary DNS

10.0.0.51

Fig. 20 Screen used to change the IP address in version “V1”

3.3.2 Search for the IP address

If you do not know the IP address of the controller, you can access the configuration screen to force a default address. With no power to the controller, insert a jumper in the terminals marked with "JMP1" as shown in the figure.

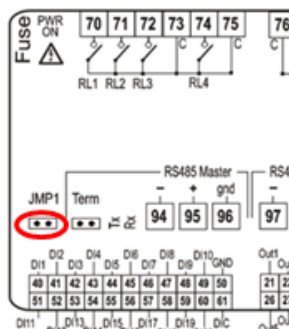


Fig. 21 Position of terminal JMP1

After inserting the jumper, power up the controller (wait about 90 seconds for it to start) and proceed as follows:

- change the IP address of your computer to address 192.168.0.249
- make sure the network screen is 255.255.255.0
- open a web browser of your PC (FireFox, IE, etc.)
- in the address bar, type 192.168.0.250/panel
- login
- enter Username = service
- enter Password = servicebb
- Press **"Network"** for controller version "V2"; press **"Configure"** for controller version "V1".

Now you can correctly read the IP address of the controller and give it a new address if you need to.

ETH 0	
MAC Address	00:0A:F6:82:56:B8
Mode	Static
IP Address	10.2.13.190
Subnet Mask	255.255.255.0
Network Address	10.2.13.1
Gateway Address	10.2.13.1
DSN 1	10.0.0.50
DSN 2	1.1.1.2
SAVE RESTORE DEFAULT	

Fig. 22 Screen used to change the IP address in version "V2"

Now logout, switch off the controller and remove the jumper.

3.3.3 IP address change with display screen

The IP address of the controller can be changed easily with the help of the display screen.



As an IP address change requires that the controller be restarted, we do recommend that the unit is switched to "OFF" before making the change.

Go to the "Service" branch:



- Use the arrow buttons to select the icon.  and confirm with button **ENTER** ;
- Click the arrow down button to select line three and confirm pressing the button **ENTER** ;
- The arrow buttons are used to move in the fields that make up the IP address and to change them.



After editing the value of a field, you will have 60 seconds to finalise the change of the address before the controller gets restarted.

The countdown appears on the bottom RH side of the screen.

The change of the address is finalised when the controller is restarted.

4 GRAPHICS ON THE DISPLAY

During development of the application, particular attention was given to intuitive use of the user interface. That is why large use has been made of symbols and icons.

4.1 Graphic conventions

Thanks to the characteristics of the graphic display, use has been made of the possibility of using symbols and icons for immediate understanding of the functionalities and to make it easy to navigate between the screens of the various menus. All the symbols and icons present in the various screens of the user interface are shown below, divided by homogeneity of function.

4.1.1 Conventions

Again, in order to make it easy to understand and use the user interface, conventions in the use of symbols and icons for displaying information in the screens have been maintained:

 When the icon flashes, there is an active alarm.

 When the parameter is on a white background, it means it is not selected.

 When the parameter is on a black background, it means it is selected.

 When the parameter is flashing "white/black", it means it can be edited.



When the image is on a white background, it means the represented function cannot be selected.



When the image is on a black background, it means the represented function can be selected.

4.1.2 General button symbols

The advantage of the multifunction buttons present on the display is that they can carry out different functions in different screens.

When a button can be used in a screen, the symbol of the relevant function appears on the last line of the display.

The functions of the buttons are:

 Return to the previous menu.

 Return to the previous menu.

 Activates an editable field.

 Selects the next editable field in a screen or increases the value when an editable field is selected.

 Selects the previous editable field in a screen or decreases the value when an editable field is selected.

 Scrolling in the previous page with the same graphic structure.

 Scrolling in the next page with the same graphic structure.

 Scrolling in the previous page with different graphic structure.

 Scrolling in the next page with different graphic structure.

 Increase of an editable value.

 Decrease of an editable value.

 When flashing alternately, allows access to the alarm screens.

 This appears when there is an alarm, and the alarm screen can be accessed by pressing it.

4.1.3 Function buttons

The multifunction buttons are used to navigate through the pages of the display and to edit the parameters.

Below is a brief description of the meaning of some of the different icons that the software links to the buttons when surfing the pages.

 The unit is switched on/off by holding down the button for 3 seconds.

 Operation in cooling mode.

 Operation in heating mode.

 Clears all the active alarms.

 Defrost cycle in progress.

 Recovery function enabled from button.

 Free cooling function enabled from button.

 Compressor with inverter.

 Recovery function disabled from button.

 Multilogic function enabled.

 Free cooling function disabled from button.

 Multifree function enabled.

 Multifree function disabled from button.

 Enables/disables the selected component.

 Accesses the alarm screens.

 Request for password to access protected screens.

4.1.4 Enabling/disabling operations

Some symbols indicate the status of the functions to which they refer.

 The unit is switched on/off by holding down the button for 3 seconds.

 Recovery function enabled from button.

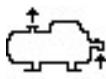
 Free cooling function enabled from button.

4.1.5 "Service" menu icons

In the first screen of the "Service" menu, there is a set of icons allowing access to the relevant branch of screens.



Access to the branch of screens regarding the programming parameters of the functions of the unit.



Access to the branch of screens regarding management of the screw compressors.



Access to the branch of screens regarding management of the scroll compressors.



Access to the branch of screens regarding management of auxiliary heating.



Access to the branch of screens regarding management of the pumps.



Access to branch of screens regarding management of the files for programming and updates.



Access to the branch of screens regarding the status of the inputs and outputs of the controller.

4.1.6 Access to the branches of screens

In the last line of the display

ALARM Access to the alarms page.

CIRC. Access to the branch of screens regarding the refrigerant circuits shown.

VAL. 1 Access to the screens regarding the parameters for adjusting the electronic expansion valve shown.

PROBES Access to the branch of screens where the reading of the managed probes is present.

① Access to the general information screens.

MENU Access to the main menu screen.

5 SOFTWARE MANAGEMENT

It is essential for those who service units provided with this controller to be able to program it or correctly update its software. These operations can make the system unserviceable if they are not carried out correctly. All useful information for proceeding correctly is given in the next chapters.

5.1 Installing the software

iPRO is a programmable controller and therefore needs some files in order to operate.

The files are inserted through the USB port present on the controller by means of a USB pen drive.



If a controller already installed on the machine has to be programmed, disconnect the 230 V auxiliary circuit. Close the 230 V auxiliary circuit again only after complete programming of the controller and the display.



When the controller is powered up, if a display that has not yet been programmed is connected, the following message appears:

"Please push the button here below to import the application from the iPRO or download the application from the Visoprog".

Do not press any button until the controller programming procedure has finished.



Use USB port "A" (RH port) to programme the IPG315D boards in version "V2".



Fig. 24 IPG315D board in version "V2"



Fig. 25 IPG315D board in version "V1"

5.2 Compatibility checking

Starting from January 2023, the units have been provided with “iPRO” controllers and “Visograph” User Interfaces that are not compatible with the previously installed versions.

At the time of quotation or replacement, it is important to check the code of the component that is to be replaced.

Please find the codes below:

- old “iPRO” - MIDX000A;
- old “Visograph” - MIDX004A;
- new “iPRO” - MIDX125A;
- new “Visograph” - MIDX130A.



These codes are printed in the silver decals at the sides of the “iPRO” controllers and on the back of the “Visograph” user interface.



Components must be replaced with equivalents having the same code and they must be programmed using the files of the unit in “SAP fiori”.

Where this is not possible, contact Swegon in-house after-sales service.



Incorrect programming will make the component unusable.

5.2.1 iPRO programming

Programming of the controller is carried out easily and securely using a USB pen drive.



Plug out the “Ethernet” connection, if fitted, before starting board programming.



Use a USB pen drive that has a LED. This will enable you to follow the progress of the controller programming and be certain that it has finished when the LED remains on and steady.



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For new “iPRO” and “Visograph” controller versions

Prepare the USB pen drive as follows:

- Create the "ipro" folder in root;
- create the "10.2.3.20" folder in the "ipro" folder;
- The compressed file “www.zip” must be inserted in the “10.2.3.20” folder;
- then, create the 3 folders called "app", "bin" and "conf", in the "10.2.3.20" folder;
- the "isadix" file must be inserted in the "app" folder;
- The file with “defaultML.bin” extension must be inserted in the “bin” folder for display management.
- The configuration files must be added to the “conf” folder. The configuration files depend on the features the controller is designed to control.
- the "actual.conf", "default.conf", "Vg_extended.conf" and "Vg_fixed.conf", "alarms.conf" and "hours.conf" files must be inserted in the "conf" folder.
- if the controller is to manage particular functionalities, the manufacturer can supply other files, in addition to the above-mentioned ones, to be inserted in the "conf" folder.

For old “iPRO” and “Visograph” controller versions

Prepare the USB pen drive as follows:

- Create the "ipro" folder in root;
- create the "10.2.3.20" folder in the "ipro" folder;
- The compressed file “www.zip” must be inserted in the “10.2.3.20” folder;
- then, create the 3 folders called "app", "bin" and "conf", in the "10.2.3.20" folder;
- the "isadix" file must be inserted in the "app" folder;
- files with extension ".bin" must be inserted in the "bin" folder for management of the display. The relevant file must be inserted for each language managed by the display.
- The configuration files must be added to the “conf” folder. The configuration files depend on the features the controller is designed to control.



The compressed file “www.zip” inserted in the “10.2.3.20” folder must not be unzipped.

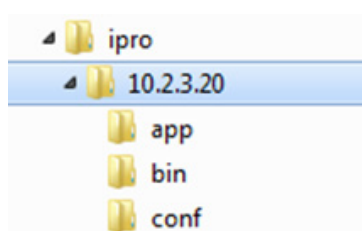


Fig. 26 Folder structure of the USB pen drive



The USB pen drive can be plugged into and unplugged from the controller without turning off the power.

Once the USB pen drive has been prepared as described above, programming will start automatically when it is plugged into the controller.

The LED on the USB pen drive will flash during transfer of the data.

The entire operation takes a few minutes.



Do not remove the USB pen drive from the controller until the programming has been completed.



Completion of the programming procedure is confirmed when the software version you wish to install appears on the screen saver page.



In some cases, the controller is automatically restarted 60 seconds after programming to finalise the configuration. A restart countdown appears in the screen saver page and the red LED of the controller will flash rapidly.



Update the display only after the “screensaver” screen has appeared on it.



The compressors must be enabled after completing the programming process.

5.2.2 Addressing and programming the second display

Addressing the second display

The serial line of the controller for managing the display is different from the one used for the expansion boards.

Two displays can be connected to one controller.

The displays are supplied from the factory with the address set to "1".

To connect the second display, its address must be set to 2.



Before proceeding, make sure only one display is connected to the controller.

The procedure for installing the second display is as follows:

- disconnect the local display and connect just the remote display to the controller;
- power up the unit and wait for the display to start and the initial screen to appear;
- press a button to access the main screen;
- simultaneously press the two outer buttons for 6 seconds to access the "BIOS SYSTEM" menu;
- press the "UP" button to set the password to "1" and confirm with "SET";
- press button "6" to access the "SETTINGS" menu.
- press button "1" to access the "ADR VISOGRAPH" menu.
- Press the "UP" button to change the address, and on confirming with the "SET" button, the display is given the new address.
- Press the "EXIT" button twice to return to the initial screen.

Now the display is ready to be connected to the controller together with the first display.



The second display is to be connected to the terminals of the first.

Programming the second display

The files necessary for programming the display must be present in the memory of the controller.



Therefore, programming of the controller must have been completed before programming the display.



Before proceeding, make sure only one display is connected to the controller.

If the display has never been programmed before, the flashing "UPD" button can be pressed only after complete programming of the controller.

When the "UPD" button is pressed, the controller downloads the files necessary for operation into the memory of the display.

During programming of the display, a screen appears containing a progress bar that indicates its progress.

After the programming is finished, the display restarts automatically.

By default, the display is programmed in the English language.



If you want to change the language, see "Updating the display" in the "Updating the software" chapter.



The compressors must be enabled after completing the programming process.

5.3 Updating the software

Conditions may occur that require updating of the software of the controller, the display or both. Updating of the software is carried out easily and securely using a USB pen drive.



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Use USB port “A” (RH port) to programme the IPG315D boards in version “V2”.



Fig. 27 IPG315D board in version “V2”

Updating of the software is divided into two operations:

- insertion of new files in the controller;
- updating of the parameters.



As for programming, if the controller is already installed on a unit, the 230 V auxiliary circuit must be disconnected when updating.

Close the 230 V auxiliary circuit again only after complete updating of the controller and the display.

5.3.1 Updating the iPRO

As for programming, to update the iPRO controller, the folder structure, as shown in the image, must be created in a USB pen drive.

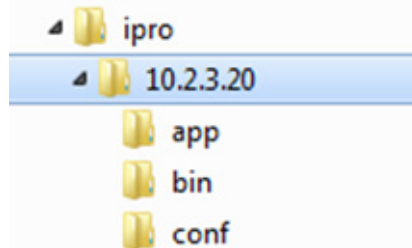


Fig. 28 Folder structure in the USB pen drive



Use a USB pen drive that has a LED. This will enable you to follow the progress of the controller programming and be certain that it has finished when the LED remains on and steady.



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Not all the files mentioned in the controller programming chapter are necessary for updating. To simplify the operation, the manufacturer provides only the necessary files and therefore some folders may remain empty.

For new “iPRO” and “Visograph” controller versions

Prepare the USB pen drive as follows:

- Create the "ipro" folder in root;
- create the folder with the IP address of the controller in the "ipro" folder. If it has not been changed, this is "10.2.3.20" by default;
- create the 3 folders called "app", "bin" and "conf", in the folder with the IP address of the controller;
- the "isadix" file, if present, must be inserted in the "app" folder;
- The file with "defaultML.bin" extension must be inserted in the "bin" folder for display management.
- files with extension ".conf" must be inserted in the "conf" folder;
- the www.zip file containing the web pages is located in folder 10.2.3.20.

For old “iPRO” and “Visograph” controller versions

Prepare the USB pen drive as follows:

- Create the "ipro" folder in root;
- create the folder with the IP address of the controller in the "ipro" folder. If it has not been changed, this is "10.2.3.20" by default;
- create the 3 folders called "app", "bin" and "conf", in the folder with the IP address of the controller;
- the "isadix" file, if present, must be inserted in the "app" folder;
- any files with extension ".bin" must be inserted in the "bin" folder;
- files with extension ".conf" must be inserted in the "conf" folder;
- the www.zip file containing the web pages is located in folder 10.2.3.20.



The USB pen drive can be plugged into and unplugged from the controller without turning off the power.

Once the USB pen drive has been prepared as described above, updating of the controller will start automatically when it is plugged in.

The LED on the USB pen drive will flash during transfer of the data.

The entire operation takes a few minutes.



Do not remove the USB pen drive from the controller until the update has been completed.



In some cases, the controller is automatically restarted 60 seconds after programming to finalise the configuration. A restart countdown appears in the screen saver page and the red LED of the controller will flash rapidly.



Update the display only after the “screensaver” screen has appeared on it.



If the update requires installation of a new software version, check that the revision index appearing on the screen saver matches the number in the files to confirm successful completion of the operation.
If the update is required to enable a function, successful completion of the operation needs to be confirmed by checking that the new parameters are set up.

Once the new files have been inserted, the parameters must be updated.

To update the parameters, proceed as follows:

- From the main screen, when you press button **SERVICE** you will access the screen for entering the password;
- with buttons **+** , **-** , **▶** and **◀** enter the password and confirm with button **ENTER** ;
- With button **☐** select icon  and on confirming with button **ENTER** you will access the "Control panel" menu;
- on entering the screen, the "Parameter file management" control will be selected. On confirming the selection with button **ENTER** you will enter the "Parameter file management" screen;
- on entering the screen, the "Update control parameters" control will be selected. On confirming the selection with button **ENTER** updating of the configuration parameters previously uploaded with the USB pen drive starts.

When the update is finished, remove the USB pen drive, and finally turn the power to the controller off and then on again.

5.3.2 Updating the display

The files necessary for updating the display must be present in the memory of the controller.



Any updating of the controller must have been completed before updating the display.



Before proceeding, make sure only one display is connected to the controller.

In new "Visograph" versions,

To update the display, proceed as follows:

- From the main screen, press button **MENU** ;
- With button **☐** go to the "CONFIG" menu;
- Confirm with button **ENTER** ;
- Press the button **ENTER** the language is changed as follows:
- With buttons **☐** and **☐** select the new language;
- On confirming with button **ENTER** the language is changed instantly.

For old "Visograph" versions

To update the display, proceed as follows:

- From the main screen, press button **MENU** ;
- With button **☐** go to the "CONFIG" menu;
- Confirm with button **ENTER** ;
- With button **☐** select "Update Visograph/Language";
- In the "Update Visograph/Language" screen, with button **☐** select the language you want to set on the display;
- On confirming with button **ENTER** updating of the display language starts.

Display updating takes a few minutes.

During updating of the display, a screen appears containing a progress bar that shows its progress.

After the updating is finished, the display restarts automatically.

5.4 Management of parameter files

Conditions may occur that require updating of the software of the controller or of just the display.

Updating of the software is carried out easily and securely using a USB pen drive.



USB port "A" or "B" can equally be used to update the parameters of the IPG315D controllers in version "V2".



As for programming, disconnect the 230 V auxiliary circuit when updating the controller.
Close the 230 V auxiliary circuit again only after complete programming of the controller and the display.

5.4.1 Updating the iPRO

As for programming, to update the iPRO controller, the folder structure, as shown in the image, must be created in a USB pen drive.

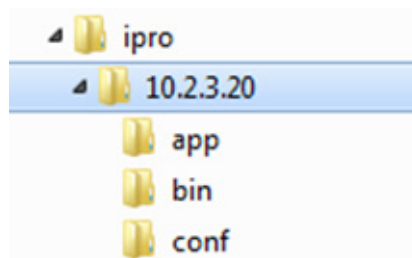


Fig. 29 Folder structure in the USB pen drive



Use a USB pen drive that has a LED. This will enable you to follow the progress of the controller programming and be certain that it has finished when the LED remains on and steady.



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Not all the files mentioned in the controller programming chapter are necessary for updating. To simplify the operation, the manufacturer provides only the necessary files and therefore some folders may remain empty.

For new "iPRO" controller versions

Prepare the USB pen drive as follows:

- Create the "ipro" folder in root;
- create the folder with the IP address of the controller in the "ipro" folder. If it has not been changed, this is "10.2.3.20" by default;
- create the 3 folders called "app", "bin" and "conf", in the folder with the IP address of the controller;
- the "isadix" file, if present, must be inserted in the "app" folder;
- The file with "defaultML.bin" extension must be inserted in the "bin" folder for keypad management.
- files with extension ".conf" must be inserted in the "conf" folder.

For old "iPRO" controller versions

Prepare the USB pen drive as follows:

- Create the "ipro" folder in root;
- create the folder with the IP address of the controller in the "ipro" folder. If it has not been changed, this is "10.2.3.20" by default;
- create the 3 folders called "app", "bin" and "conf", in the folder with the IP address of the controller;
- the "isadix" file, if present, must be inserted in the "app" folder;
- any files with extension ".bin" must be inserted in the "bin" folder;
- files with extension ".conf" must be inserted in the "conf" folder.



The USB pen drive can be connected to and disconnected from the controller without turning off the power.

Once the USB pen drive has been prepared as described above, updating of the controller will start automatically when it is plugged in.

The LED on the USB pen drive will flash during transfer of the data.

The entire operation takes a few minutes.



Do not remove the USB pen drive from the controller until the update has been completed.



Completion of the programming procedure is confirmed when the software version you wish to install appears on the screen saver page.



In some cases, the controller is automatically restarted 60 seconds after programming to finalise the configuration. A restart countdown appears in the screen saver page and the red LED of the controller will flash rapidly.



Update the display only after the "screensaver" screen has appeared on it.



The successful completion of the update must be done with the verification of the presence of the new parameters.

When the update is finished, turn the power to the controller off and then on again.

5.5 "Control panel"

In the "Control panel" branch, there are controls for managing the programming files and the settings of the serial communication of the controller.

The "Control panel" branch is one of the loops of screens in the "Service" branch and is therefore password protected.

To access the functions of the "Control panel" branch:

- from the main screen, when you press button **SERVICE** you will access the screen for entering the password;
- using buttons , ,  and  set the password, and on confirming with button **ENTER** you will access the protected loops of the service branch.



- move with button  to select icon  ;
- Press the button **ENTER** to reach the screen for accessing the various functions.

In the "Control panel" screen, there are the "Parameter management", "Log management" and "System information" functions.

5.5.1 Parameter file management

In the "Control panel" screen, select with buttons  and  the "Parameter file management" menu, and on confirming with button **ENTER** you will access the "Update control parameters", "Save current configuration" and "Upload default parameters" functions.

Using buttons  and  and on confirming with button **ENTER** you can select the available functions.

5.5.1.1 Update control parameters

This function makes operational the parameters of the "actual.conf" file present in the controller.

The parameters may need updating from the controller to reset the custom values saved with the "Copy current configuration to USB" function or to update the operating parameters using a file received from the manufacturer.

To upload the file "actual.conf" into the controller, it must be copied onto an empty "USB" pen drive in the "ipro/10.2.3.20/conf" directory.



10.2.3.20 is the default IP address; If the address was changed, the correct address must be entered.



When updating the controller, if it is already installed on a unit, disconnect the 230V auxiliary circuit.



It is always necessary to carry out this operation when updating the software by downloading the files to the controller with a USB pen drive.

After selecting it, with confirmation on button **ENTER** the function starts and is normally completed in a few seconds.



When the update is finished, turn the power to the controller off and then on again.

5.5.1.2 Save current configuration

This menu item is not active.

5.5.1.3 Upload default parameters

The "Upload default parameters" control automatically restores the original setting of the factory parameters in the controller.

This operation may become necessary if some changes to the software parameters do not satisfy the required operation and not all the initial values can be restored manually.

After selecting it, with confirmation on button **ENTER** the function starts and is normally completed in a few seconds.

5.5.2 Log file management

Some measured or calculated values are saved in the memory of the controller during operation. These values are saved every 15 seconds.

In addition to recording at intervals, the alarms and accesses are recorded automatically and the setting of the parameters present in the unit is recorded manually.

The controller saves these data in files that can be copied to a USB pen drive.

When copying, the controller creates the folder structure shown in the figure in the USB pen drive.

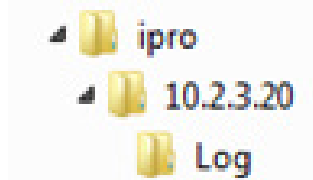


Fig. 30 Structure created in the USB pen drive

The files are copied to the "Log" folder



If considered useful, the manufacturer can ask for some or all of the Log files to be sent.



To upload log files to USB, the unit must be OFF!

When you select the "Log file management" function, you will access a set of controls for downloading the records present in the memory of the controller to a USB pen drive.

In the "Control panel" screen, select with buttons  and  the "Log file management" menu, and on confirming with button **ENTER** you will access the screen with the "Copy to USB" function.

To access the controls for transferring data, a USB pen drive must be plugged into the relevant port of the controller.



An icon in the screen at top left with symbol  indicates that the USB port of the controller is ready for use.

If, with the USB pen drive plugged into the controller, the indication that the USB port is ready for use does not appear, check the formatting and operation of the USB pen drive.

On confirming with button **ENTER** when the USB port is ready, the following set of controls is accessed:

- "Copy ALARMLOG to USB";
- "Copy ACCESSLOG to USB";
- "Copy TIMELOG to USB";
- "Copy current configuration to USB";
- Copy alarm configuration to USB
- "Copy all log files".

Using buttons  and  the control is selected, and it starts on confirming with button **ENTER**.

When the control starts, a copy progress bar appears in the screen.

Depending on the amount of data, the copying operation can take from a few seconds to a few minutes.

At the end of data copying, a message appears confirming that the operation has been completed successfully.



Before continuing with this operation, make sure the USB pen drive has sufficient free space, "at least 30 Mb".

Free the memory in the pen drive or replace it with one that has more free space available.



If the problem persists, replace the USB pen drive.

5.5.2.1 Copy ALARMLOG to USB

In the USB pen drive, this control creates the "alarmlog.txt" file containing the operating parameters of the previous 5 minutes for each alarm.

5.5.2.2 Copy ACCESSLOG to USB

In the USB pen drive, this control creates the "accesslog.txt" file that contains a record of the time of access to the parameters of the service menu from the display or via WEB and the edited values.

5.5.2.3 Copy TIMELOG to USB

In the USB pen drive, this control creates a "timelog_dd_a.txt" file for each day of controller operation where the operating values, with 15 seconds as acquisition frequency, are recorded.

5.5.2.4 Copy current configuration to USB

This command creates the file "Sb10000xxxx_settings.txt" in the USB pen drive. The file contains the current setpoints of the controller operating parameters.

The file needs to be renamed "actual.conf" in order for i to be reused.

To upload the file "actual.conf" into the controller, it must be copied onto an empty "USB" pen drive in the "ipro/10.2.3.20/conf" directory.



10.2.3.20 is the default IP address; If the address was changed, the correct address must be entered.



To make the parameters saved in the uploaded "actual.conf" file operational, the command "Update parameters from controller" in "Parameter file manager" must be given.

5.5.2.5 Copy alarm configuration to USB

This command creates the file "SB10000xxxx_alarm.txt" in the USB pen drive. The file contains the configuration that defines the alarm severity.

The file needs to be renamed "alarm.conf" in order for i to be reused.

To upload the file "alarm.conf", it must be copied onto an empty "USB" pen drive in the "ipro/10.2.3.20/conf" directory.



10.2.3.20 is the default IP address; If the address was changed, the correct address must be entered.

When the USB pen drive is introduced in the controller port, the file in it is uploaded automatically.

5.5.2.6 Copy all log files

This control simultaneously carries out all those mentioned above.

5.5.3 System information

In this screen, the IP address, the serial address, the communication speed, and the "device number" if the BACnet protocol is present, are shown and can be changed.

Using buttons  and  you can move through the editable fields of the screen.

With button **ENTER** the parameter to be edited is activated.

Using buttons  and  you can edit the active parameter.

With button **ENTER** the changed value is confirmed.



To activate the changes, the controller must be restarted.

6 THE SCREENS

6.1 Main Screens

The Visograph display is the interface between the unit and the user.

Interaction with the unit and access to the parameters take place through the Visograph display.

Information regarding installation of the units and relevant tests and checks for the first starting is not given in this manual.

Navigate through the various menus to access the screens where you can carry out the necessary operations for operation of the unit, edit the operating parameters and download the records.

For the next descriptions of the manual, there are reference screens for access to the various functions.



The images and values shown in the screens are for illustrative purposes only.

They can vary according to the configurations and functions present in the controller.

6.1.1 Screensaver page

When a few tens of seconds have passed after powering up the controller or after 120 seconds of inactivity of the keypad, the screen shown below appears on the display.



Fig. 31 Screensaver page

Press any button to access the main screen.

6.1.2 Main mask

The main screen is accessed directly when any button is pressed while the screensaver screen is present on the display. You will return to the main screen, from whichever other screen you are in, by pressing once or twice on **EXIT** . The main screen is the starting point for navigating through the various branches of the application.

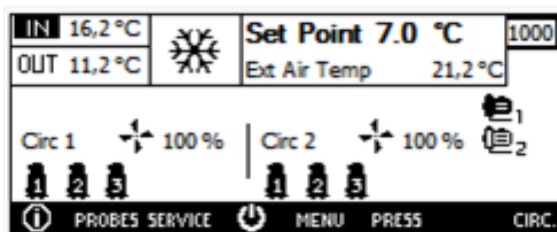


Fig. 32 Main mask

The graphic part of the main screen differs according to the installed application. The following buttons are in any case present:

- **①** that gives access to the screen with information on the unit;
- **PROBES** that gives access to the branch of screens where the values read by the temperature probes are shown;
- **SERVICE** that gives access to the relevant password-protected branches;
- **⏻** that, when pressed and held for a few seconds, allows the unit to be started and stopped;
- **MENU** that gives access to the relevant branches of screens;
- **PRESS** that, when there is at least one active alarm, alternates with button **ALARM** , allows access to the screens of active alarms;
- **CIRC.** that gives access to the screens that show the functional parameters of the refrigerant circuits present in the unit.
- **🔧** It is included with the “ACS” accessory and grants access to the screens where the corresponding parameters are controlled.

6.1.3 "Menu" screen

The branch of screens, where the user can edit the values and the functions present in the controller, can be accessed from the "Menu" screen.

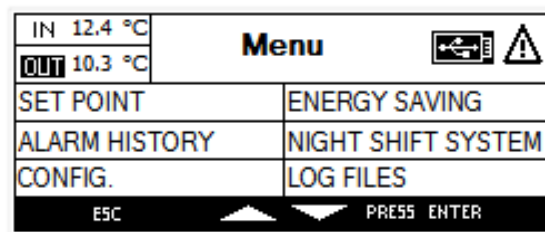


Fig. 33 "Menu" screen

The branches of screens are:

- "SET POINT", where the operating setpoint(s) of the unit can be changed;
- "ALARM LOG", where the recorded alarms can be seen;
- "CONFIG.", where the setting of the display can be configured;
- "ENERGY SAVING", where the time bands for switching the unit on and off and automatic change of the operating setpoint(s) can be set;
- "NIGHT SHIFT SYSTEM", where the time bands for reducing the noise of the fans can be set;
- "LOG FILES", where the various log files present in the controller can be downloaded.

6.2 Main screen information

The main screen shows the characteristic operating conditions and values of the unit so that you can easily monitor the operating status.

In addition to the lower part, where the functions of the buttons are shown, the main screen can be considered as being virtually made up of 5 areas of uniform content.

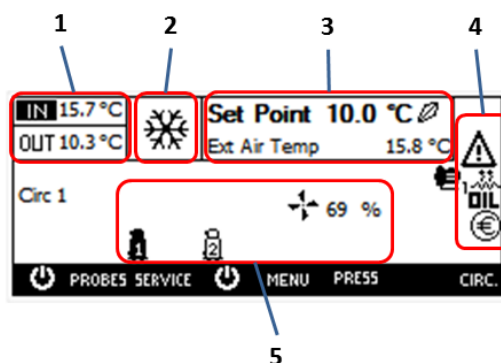


Fig. 34 The 5 areas of the main screen

6.2.1 Description of the symbols

Without affecting the composition of the main screen, some symbols are linked to the presence of accessories or of particular operating states.

These are described below.

6.2.1.1 Area 1

The fields of area 1 show the water temperature values at the inlet and outlet of the unit.

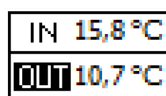


Fig. 35 Image of area 1

Control by the controller takes place on the value "IN" or "OUT" in reverse video.

The image shows the case of control on the outlet water temperature.

6.2.1.2 Area 2

The field in area 2 shows the unit operating status.



Fig. 36 Image of area 2

If the unit has been switched off from the keypad, only "OFF" is present.

Otherwise, if the unit has been switched off in another way, a symbol appears under "OFF" that specifies this.

OFF
— Switch-off has occurred from digital input.

OFF
⌚ Switch-off has occurred from the management of time bands.

OFF
📡 Switch-off has occurred via serial port through a supervision system.

Alternatively, symbols are provided to indicate the operating status.

❄ Operation in cooling mode.

☀ Operation in heating mode.

Additionally, the following icons are provided in units featuring the "ACS" accessory:

⏸ switch to new operating mode in progress - from system to "ACS" and vice versa;

🏠 ACS unit operation.

Other icons can appear according to the configurations present or functions active.

6.2.1.3 Area 3

Area 3 shows the control set point for the active operation, and the outside air temperature value.

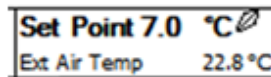


Fig. 37 Image of area 3

Also, the following symbol is visible

 SmartLink (if the accessory is enabled).

6.2.1.4 Area 4

The presence of symbols in this area is linked to the configurations of the unit and to the active functions. A description, from top to bottom, of the symbols used is given below.



Fig. 38 Image of area 4

XXXX The percentage of required capacity appears in this field (present only when the unit has the control on the temperature read by the water probe situated at the inlet).

 at least one alarm is active. As well as in the main screen, this symbol, in the same condition, appears in the same place in all the screens.

 The pump present in the unit is running.

 The pump present in the unit is not running.

 The pump present is disabled.

Beside the pump symbol, there is a "U" if it is the user-side pump and an "R" for the recovery pump.

The number of the pump referred to is shown below the "U" and "R".

 Anti-freeze heaters active.

 "Energy Saving" function is active.

 Flashing and appears when the compressor oil return function is active.

6.2.1.5 Area 5

This area shows the main information regarding operation of the compressors.

The screen can vary according to the number of compressors and refrigerant circuits managed by the controller.

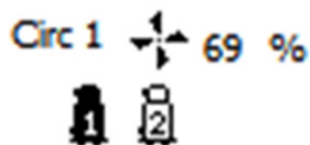


Fig. 39 Image of area 5

The information refers to circuit 1.

-  Fixed icon: fan not active.
-  Moving icon: fan active beside the percentage of the control signal.
-  Compressor off.
-  Compressor disabled from the keypad or from digital input.
-  Compressor on.

6.3 Info branch screens

This branch of screens is accessed by pressing the button with icon .

To scroll the screens of the branch, use buttons  and .

A set of screens that regard the unit and others regarding individual circuits are present in the branch.

6.3.1 Unit information

Information regarding the unit present in the screens consists of:

- the serial number of type "SB1XXXXXX";
- the type of unit;
- the model;
- the type of refrigerant gas present;
- the tester's code;
- the software version installed in the controller;
- the software version installed in the user interface.

The next pages show the hours of operation of the unit, the partial and total hours of operation of the individual compressors and relevant number of switch-ons.

If at least one pump is present in the unit, on pressing the button with symbol  you will access the page where the relevant total and partial number of hours of operation is shown.

In this set of screens, the following icon is present: .

When you press the button under icon  you will access the main screen of the maintenance loop.

6.3.2 Outlet thermoregulation

If there is an outlet control in this branch, when you press the button  accesses the screens which graphically display thermoregulation status.

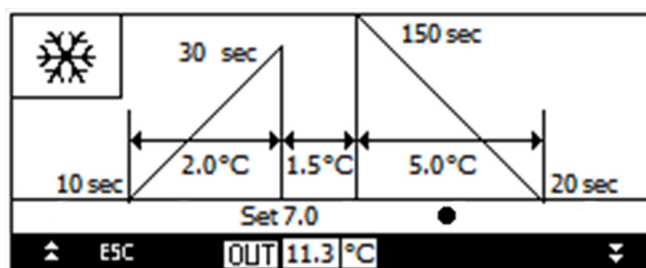


Fig. 40 Operation in cooling mode

If the heating function is included in the unit, the appropriate screen is displayed.

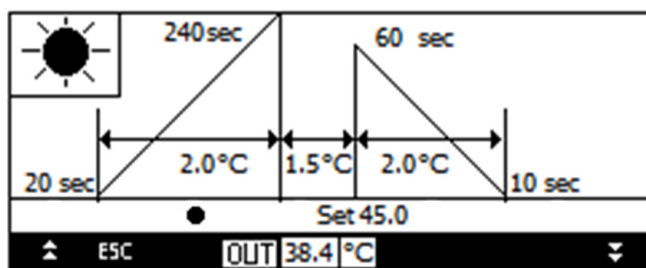


Fig. 41 Operation in heating mode

In the screen referring to active operation, there is a flashing point under the area of the graphic diagram in which thermoregulation is in operation.

6.4 Probes branch screens

This branch of screens is accessed by pressing the button with icon .

To scroll the screens of the branch, use buttons  and .

A set of screens that regard the values measured by the temperature probes present in the unit are present in the branch.

6.4.1 Display of probes

Depending on the configuration of the unit and as shown in the relevant description, in this screen, probes regarding the following are present:

- the temperature in the common section at the heat exchanger inlet of the unit;
- the temperatures in the section at the outlet of heat exchangers 1,2,3,4 of the unit;
- the temperature in the common section at the heat exchanger outlet of the unit;
- the air temperature;
- the dynamic set point function, and the probe can be of various types: NTC, 4-20mA, 0-1V, 0-10V, 2-20mA;
- the temperature at the inlet of the recovery exchanger;
- the reference water temperature in the "ACS" circuit;
- the 4-20ma type signal from the amperometric transformer.

Other temperature and pressure probes are present in the unit and their values are shown in the screens regarding the refrigerant circuit.

6.5 "CIRC." branch screens

A branch of screens is accessed where a refrigerant circuit with relevant operating parameters is represented on each screen.

From the main screen, when you press the button with symbol **CIRC.** you can access the branch.

Using buttons  and  parameters of the same level are displayed for the various refrigerant circuits present in the unit.

From the screen of operating parameters of each circuit, using button **VAL 1** you will access a screen where the expansion valve operating parameters are shown.

From this screen, when you press on button **PASSW** and enter the service branch password, you will access the screen for manual management of the expansion valve.

With buttons  and  you can go to the other screens of the same level.

On pressing button **ESC** you will return to the screen in the previous level.

6.5.1 Refrigerant circuit screen

All parameters and functions regarding the refrigerant circuit are present in this screen.



The icons present in the screen depend on the functions enabled in the software.

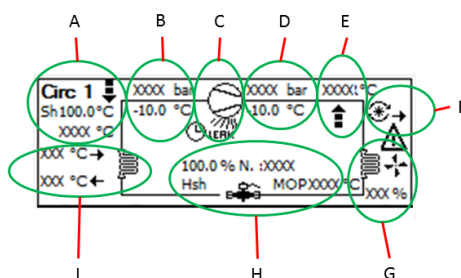


Fig. 42 Screen for refrigerant circuit parameters

The following information is displayed:

- in area A, "CIRC 1" identifies the displayed circuit, SH identifies the superheating temperature with the measured compressor suction temperature underneath. Symbol  indicates reduced capacity operation of the compressor/circuit;
- area B shows the suction gas pressure of the compressor and relevant conversion into temperature;
- in area C, the status of the compressor is identified, and this is  if it is not running, whereas it is  if the compressor is running. Symbol  identifies a gas leak (only if the leak detection accessory is present). Symbol  when flashing, indicates that the minimum switched off time or the time between two switch-ons of the compressor is passing;
- area D shows the delivery gas pressure of the compressor and relevant conversion into temperature;
- area E shows the measured delivery gas temperature of the compressor. The value can be the common temperature "for units equipped with circuit probe" or the maximum temperature of all compressors "for units with all compressors equipped with probe". Symbol  is displayed when the liquid injection valve of the compressor is active;
- in area F, symbol  indicates that heat recovery is active whereas symbol  indicates that the discharging of refrigerant from the exchanger not used is active;
- in area G, symbol  indicates the source-side exchanger, and the percentage value is the fan control signal. If the unit is a heat pump, the temperature of the coil is displayed;
- area H shows the opening percentage of the expansion valve with relevant number of steps and, if the circuit is working outside the set limits, the relevant exceeded limit warning appears and this can be "Hsh" high superheating, "Lsh" low superheating, "MOP" maximum operating pressure and "LOP" lowest operating pressure;
- in area I, symbol  indicates the user-side exchanger. Symbol  indicates the water temperature value at the exchanger inlet while  indicates the water temperature value at the outlet.

6.5.2 Screen of expansion valve parameters

From the screen of the refrigerant circuit, when you press button **VAL.1** you will access the screen where the expansion valve operating parameters are shown.

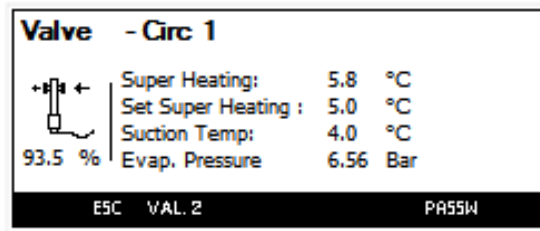


Fig. 43 Expansion valve parameters

The following values are displayed:

- the opening percentage;
- the current superheating value;
- the set superheating set point value;
- the gas temperature value measured on the suction side;
- the gas pressure value measured on the suction side.

6.5.3 Inverter parameter screens

From the screen of the refrigerant circuit, when you press button  you will access the screen where the inverter operating parameters are shown.

Compressor X		Alarm Code Active	
Request	XXX.X %	X X X X	
Speed feedback	XXXX rpm	Alarm Code Passed	
Speed feedback	XXX.X %		
Status			
0.Disable			
ESC		PRESS	

Fig. 44 Parameters of compressor with inverter

The following values are displayed:

- inverter demand in percentage;
- compressor rotation speed in rpm;
- compressor rotation speed in percentage;
- active alarm code, if any - "if no alarm is active, 0000 appears";
- code of last tripped alarm;
- inverter operating code.

The alarm codes in this screen are the same appearing on the inverter display.

The alarms to which the codes refer are listed in the inverter manual.

The inverter operating statuses include:

- Disable - this appears when the compressor is disabled by the controller: the inverter is blocked;
- Alarms - this appears when an inverter alarm is active;
- Regulation - this appears when the inverter is operating in regulation mode;
- Start up - this appears when the inverter is running a compressor start-up procedure;
- Off - this appears when there is no demand to the compressor;
- Oil function - this appears when the inverter is running an oil return procedure.

With repeated pressing of button **ESC** you will return to the screens in the previous level.

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Swegon Operations s.r.l.

Via Valletta, 5 - 30010

Cantarana di Cona, (VE) Italy - T. +39 0426 921111 - F. +39 0426 302222

www.blueboxcooling.com - info@swegon.it

Swegon Operations s.r.l. with sole shareholder - VAT no. 02481290282

Company directed and coordinated by Investment Latour (Sweden)

