IPRC215D rel.2.5

INDEX

1. GENERAL SPECIFICATIONS

The Dixell programmable controllers are all powered at 24Vac/dc and use a high speed performance 32-bit microprocessor.
One of the features that distinguish the iPRO controllers is the vast range of connection options with external devices, Dixell as well as other brands. CANBus, RS485 Master and Slave, and an Ethernet and USB port provide maximum flexibility of integration with the outside world. ModBUS-RTU protocol, one of the most popular in the world, is used for serial communication.
Up to 80 MB of flash memory are entirely available to the user, according to the model. All the Outputs and outputs are fully configurable.

1.1 APPLICATIONS

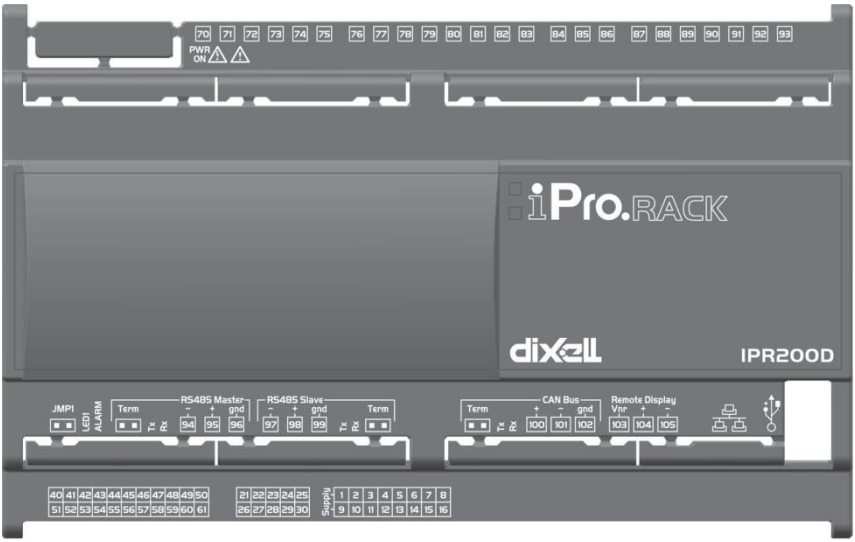
The IPRORACK series are thought to manage both compressors and fans in a CO2 Transcritical a pack (in subcritical and transcritical mode)
The compressors can be simple, multistage or with inverters.
Control is done with neutral zone or proportional band and is based on the pressure or temperature sensed in the LP suction (compressors) and HP (condenser) circuits. A special algorithm balances the run hours of the compressors to distribute the work load uniformly.
The front panel offers complete information on the system's status by displaying the suction and condenser pressure (temperatures), the status of the loads, possible alarms or maintenance conditions.
Each load has up to 3 alarm Outputs that are able to stop it when activated. To guarantee the total system's safety, there are also two Outputs for low and high pressure switches.
The same applications can be downloaded in the various models available (obviously adapting the number of Outputs and outputs).

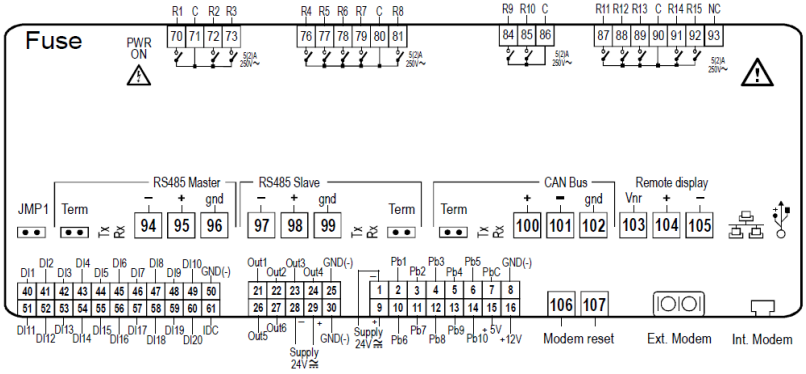
1.2 HARDWARE ARCHITECTURE

The iPRO programmable controller is structured as follows:

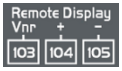
- 32-bit microprocessor used to run the application
- Bayonet connectors (Phoenix)
- The programme and parameters are stored in a permanent flash memory. No data is lost in case of power failure.
- Ethernet port.
- USB port.
- Connection to the dedicated remote LCD display.
- CANBus.
- RS485 Master.
- RS485 Slave.

1.3 IPRC215D


iPro.RACK
dixell
IPR200D
JMP1
LED1
ALARM
RS485 Master
RS485 Slave
CAN Bus
Remote Display
Term
Tx
Rx
gnd
Vnr
Supply


Fuse
PWR ON
JMP1
Term
RS485 Master
RS485 Slave
CAN Bus
Remote display
Vnr
Tx
Rx
gnd
Supply 24V
Modem reset
Ext. Modem
Int. Modem

1.3.1 Description of the connections

Connector	Description
	Connector for 24Vac/dc power supply Analogue inputs (Pb1 - Pb10, PbC) Additional power (+5Vdc, +12Vdc, GND)
	Opto-insulated analogue outputs (Out1 - Out6, GND) 24Vac/dc power supply for the opto-insulated analogue output
	Potential free opto-insulated digital inputs (DI1 - DI20, DIC) Opto-insulated 24Vac/dc digital inputs (DI1 - DI20, GND)
	USB port for downloads (BIOS, ISaGRAF® application, maps of parameters, remote display applications, network configuration, website)
	TCP/IP Ethernet port
	Connector for remote terminal (VISOGRAPH), maximum 2 terminals per iPRO.
	NOT USED
	RS485 Slave connector for connection to monitoring system. Rx and Tx LED to indicate that communication is active Closed circuit terminal (Term)
	RS485 Master connector for connection to Coresense Rx and Tx LED to indicate that communication is active Closed circuit terminal (Term)
	Digital relay outputs (for digital outputs with potential free contacts) 3 NO relays, 1 common
	Digital relay outputs (for digital outputs with live contacts) 3 NO relays, 1 common and 2 potential free (Neutral)
	Digital relay outputs (for digital outputs with potential free contacts) 5 NO relays, 1 common
	Digital relay outputs (for digital outputs with live contacts)

Connector	Description
	5 NO relays, 1 common and 2 potential free (Neutral)
	Digital relay outputs 2 NO relays, 1 common
	Digital relay outputs (only for 215D versions) 5 NO relays, 1 common and 1 potential free (Neutral)
	Green LED to indicate the presence of power
	Jumper to activate the RESCUE MODE
	Yellow status LEDs (LED1) and red LED (ALARM) See relative paragraph
	NOT USED
	NOT USED
	NOT USED

1.3.2 Description of the inputs and outputs

Input No.	Type of Input	Description
1	Supply	***Reference "-"/GND power (24Vac or 24Vdc)***
2	Pb1	Configurable analogue input 1 (NTC, PTC, 0 - 20mA, 4 - 20mA, 0 - 10V, 0 - 1V, 0 - 5V, DI)
3	Pb2	Configurable analogue input 2 (NTC, PTC, 0 - 20mA, 4 - 20mA, 0 - 10V, 0 - 1V, 0 - 5V, DI)
4	Pb3	Configurable analogue input 3 (NTC, PTC, 0 - 20mA, 4 - 20mA, 0 - 10V, 0 - 1V, 0 - 5V, DI)
5	Pb4	Configurable analogue input 4 (NTC, PTC, 0 - 20mA, 4 - 20mA, 0 - 10V, 0 - 1V, 0 - 5V, DI)
6	Pb5	Configurable analogue input 5 (NTC, PTC, 0 - 20mA, 4 - 20mA, 0 - 10V, 0 - 1V, 0 - 5V, DI)
7	PbC	Common analogue inputs (NTC, PTC, DI)
8	GND(-)	Additional power reference 5Vdc and 12Vdc and analogue inputs (0 - 20mA, 4 - 20mA, 0 - 10V, 0 - 1V, 0 - 5V)
9	Supply	***Reference "+" power supply (24Vac or 24Vdc)***

Input No.	Type of Input	Description
10	Pb6	Configurable analogue input 6 (NTC, PTC, 0 - 20mA, 4 - 20mA, 0 - 10V, 0 - 1V, 0 - 5V, DI)
11	Pb7	Configurable analogue input 7 (NTC, PTC, 0 - 20mA, 4 - 20mA, 0 - 10V, 0 - 1V, 0 - 5V, DI)
12	Pb8	Configurable analogue input 8 (NTC, PTC, 0 - 20mA, 4 - 20mA, 0 - 10V, 0 - 1V, 0 - 5V, DI)
13	Pb9	Configurable analogue input 9 (NTC, PTC, 0 - 20mA, 4 - 20mA, 0 - 10V, 0 - 1V, 0 - 5V, DI)
14	Pb10	Configurable analogue input 10 (NTC, PTC, 0 - 20mA, 4 - 20mA, 0 - 10V, 0 - 1V, 0 - 5V, DI)
15	+5V	Additional power +5Vdc
16	+12V	Additional power +12Vdc
21	Out1	Opto-insulated analogue output 1 0 - 10V
22	Out2	Opto-insulated analogue output 2 0 - 10V
23	Out3	Opto-insulated analogue output 3 0 - 10V
24	Out4	Opto-insulated analogue output 4 0 - 10V
25	GND(-)	Common opto-insulated analogue output
26	Out5	Analogue output 5 0 - 10V, 4 - 20mA, Opto-insulated relay
27	Out6	Analogue output 6 0 - 10V, 4 - 20mA, Opto-insulated relay
28	Supply	Power for opto-insulated analogue outputs at 24Vac or 24Vdc(-)
29	Supply	Power for opto-insulated analogue outputs at 24Vac or 24Vdc(+)
30	GND(-)	Common opto-insulated analogue output
40	DI1	Opto-insulated digital input 1
41	DI2	Opto-insulated digital input 2
42	DI3	Opto-insulated digital input 3
43	DI4	Opto-insulated digital input 4
44	DI5	Opto-insulated digital input 5
45	DI6	Opto-insulated digital input 6
46	DI7	Opto-insulated digital input 7
47	DI8	Opto-insulated digital input 8
48	DI9	Opto-insulated digital input 9
49	DI10	Opto-insulated digital input 10
50	GND(-)	Reference "-" for opto-insulated digital inputs 1 to 20 (if inputs 24Vac or 24Vdc)
51	DI11	Opto-insulated digital input 11
52	DI12	Opto-insulated digital input 12

Input No.	Type of Input	Description
53	DI13	Opto-insulated digital input 13
54	DI14	Opto-insulated digital input 14
55	DI15	Opto-insulated digital input 15
56	DI16	Opto-insulated digital input 16
57	DI17	Opto-insulated digital input 17
58	DI18	Opto-insulated digital input 18
59	DI19	Opto-insulated digital input 19
60	DI20	Opto-insulated digital input 20
61	IDC	Common opto-insulated digital inputs 1 to 20 (if potential free inputs)
70	RL1	Relay 1 normally open contact
71	C	Common relays 1, 2 and 3 (MAX 6A)
72	RL2	Relay 2 normally open contact
73	RL3	Relay 3 normally open contact
74	C	Potential free contact (MAX 6A)
75	C	Potential free contact (MAX 6A)
76	RL4	Relay 4 normally open contact
77	RL5	Relay 5 normally open contact
78	RL6	Relay 6 normally open contact
79	RL7	Relay 7 normally open contact
80	C	Common relays 4, 5, 6, 7 and 8 (MAX 6A)
81	RL8	Relay 8 normally open contact
82	C	Potential free contact (MAX 6A)
83	C	Potential free contact (MAX 6A)
84	RL9	Relay 9 normally open contact
85	RL10	Relay 10 normally open contact
86	C	Common relays 9 and 10 (MAX 6A)
87	RL11	Relay 11 normally open contact
88	RL12	Relay 12 normally open contact
89	RL13	Relay 13 normally open contact
90	C	Common relays 11, 12, 13, 14 and 15 (MAX 6A)
91	RL14	Relay 14 normally open contact
92	RL15	Relay 15 normally open contact

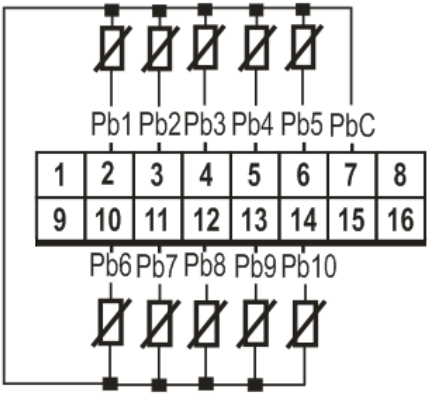
Input No.	Type of Input	Description
93	C	Potential free contact (MAX 6A)
94	RS485 Master	RS485 Master connection (-)
95	RS485 Master	RS485 Master connection (+)
96	RS485 Master	RS485 Master connection (insulated gnd)
97	RS485 Slave	RS485 Slave connection (-)
98	RS485 Slave	RS485 Slave connection (+)
99	RS485 Slave	RS485 Slave connection (insulated gnd)
100	CAN Bus	CAN Bus connection (+)
101	CAN Bus	CAN Bus connection (-)
102	CAN Bus	CAN Bus connection (gnd)
103	Remote Display	Connection for VISOGRAPH remote terminal (Vnr)
104	Remote Display	Connection for VISOGRAPH remote terminal (+)
105	Remote Display	Connection for VISOGRAPH remote terminal (-)
106	Modem Reset	NOT USED
107	Modem Reset	NOT USED

1.4 Probe connections – IPRC215D

1.4.1 Temperature probes (NTC and PTC)

2-row sensors that do not require polarity to be respected.
Each sensor must be connected through one of the inputs (from Pb1 to Pb10) and the common (PbC) as shown in the diagram below.

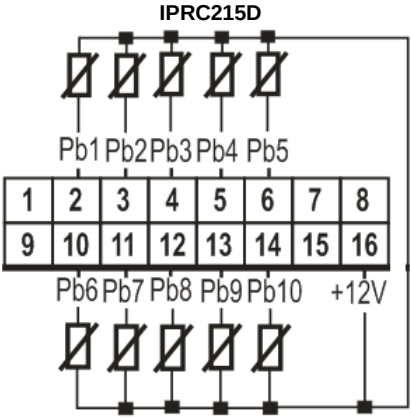
IPRC215D



Recommendations:
- follow the diagram of the device used, for the numbering.
- the configuration is determined by the application.
- if used as a digital input (potential free - not live), use the same connection configuration of the sensors.

1.4.2 Pressure transducers and current probes (0 - 20mA, 4 - 20mA)

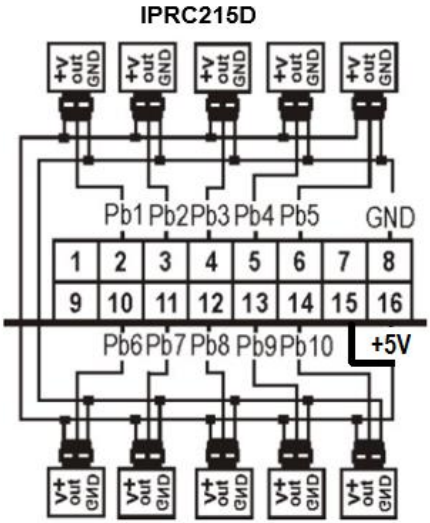
2-row sensors that require +12Vdc power supply.
Each sensor must be connected through one of the inputs (from Pb1 to Pb10) and the power supply (+12V) as shown in the diagram below.



Recommendations:
- follow the diagram of the device used, for the numbering.
- the configuration is determined by the application.

1.4.3 Live probes and ratiometric pressure transducers (0 - 5V)

3-row sensors that require +5Vdc power supply.
Each sensor must be connected through one of the inputs (from Pb1 to Pb10) and the power supply (+5V/GND) as shown in the diagram below.



Recommendations:
- follow the diagram of the device used, for the numbering.
- the configuration is determined by the application.

1.5 CONNECTION OF THE DIGITAL INPUTS

The digital inputs in the programmable controllers and expansions are fully configurable. Depending on the model used, the digital inputs can be used as potential free or live (24Vac/dc) digital inputs.

1.5.1 Potential-free digital inputs

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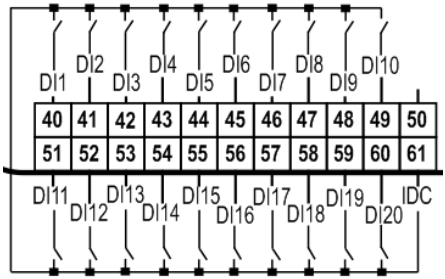
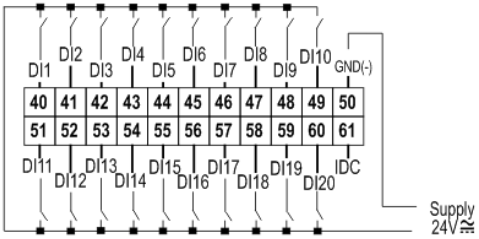


Recommendations:
- follow the diagram of the device used, for the numbering.
- the configuration is determined by the application.

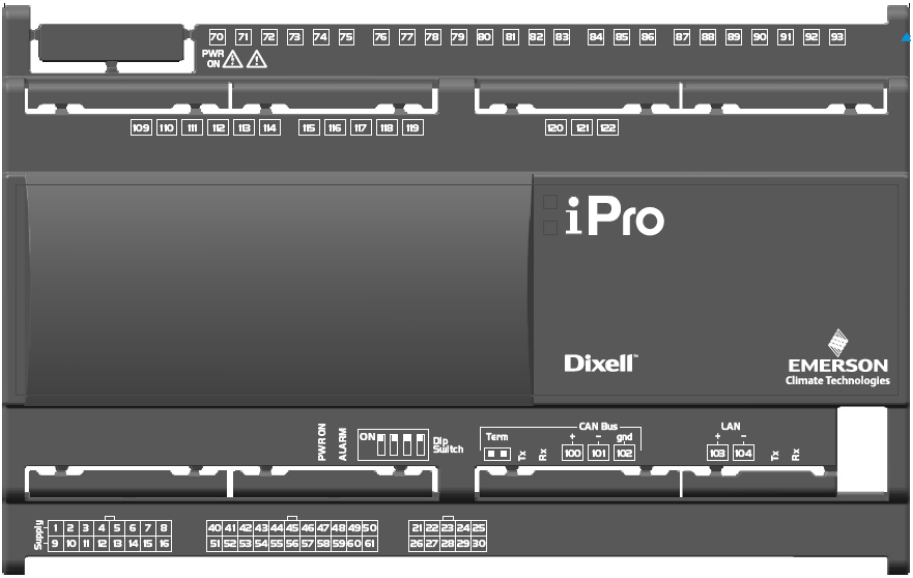
1.5.2 Live digital inputs (24Vac/dc)

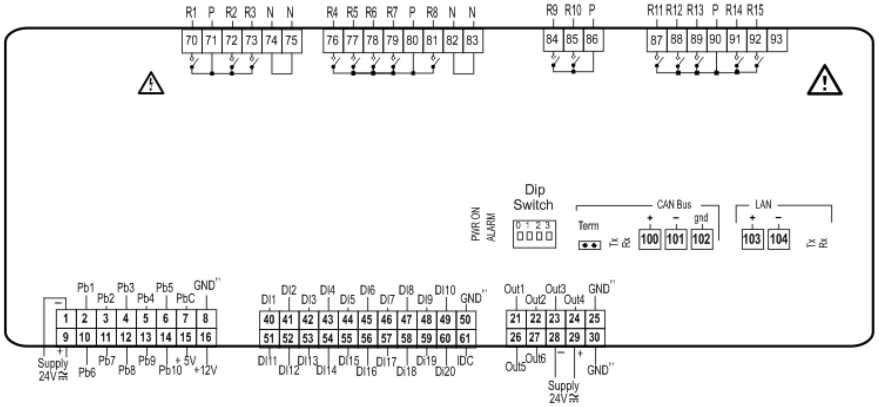
IPRC215D



Recommendations:
- follow the diagram of the device used, for the numbering.
- the configuration is determined by the application.

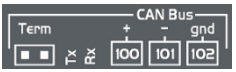
1.6 IPX215D





1.6.1 Description of the connections

Connector	Description

	Connector for 24Vac/dc power supply Analogue inputs (Pb1 - Pb10, PbC) Additional power (+5Vdc, +12Vdc, GND)
	Opto-insulated analogue outputs (Out1 - Out6, GND) 24Vac/dc power supply for the opto-insulated analogue output
	Potential free opto-insulated digital inputs (DI1 - DI20, DIC) Opto-insulated 24Vac/dc digital inputs (DI1 - DI20, GND)
	LAN serial port connector Rx and Tx LED to indicate that communication is active
	CANBUS Connector Rx and Tx LED to indicate that communication is active Line terminal (Term)
	Dip-switch to set the address of the device.
	Digital relay outputs 3 NO relays, 1 common and 2 potential free (Neutral)
	Digital relay outputs 5 NO relays, 1 common and 2 potential free (Neutral)
	Digital relay outputs 2 NO relays, 1 common
	Digital relay outputs 5 NO relays, 1 common and 1 potential free (Neutral) **The position 93 is not connected**
	Green power LEDs (PWR ON) and red alarm signal LED (ALARM) See relative paragraph

1.6.2 Description of the inputs and outputs

Input No.	Type of Input	Description
1	Supply	***Reference "-"/GND power (24Vac or 24Vdc)***
2	Pb1	Configurable analogue input 1 (NTC, PTC, PT1000, 0 - 20mA, 4 - 20mA, 0 - 10V, 0 - 1V, 0 - 5V, DI)
3	Pb2	Configurable analogue input 2 (NTC, PTC, PT1000, 0 - 20mA, 4 - 20mA, 0 - 10V, 0 - 1V, 0 - 5V, DI)
4	Pb3	Configurable analogue input 3 (NTC, PTC, PT1000, 0 - 20mA, 4 - 20mA, 0 - 10V, 0 - 1V, 0 - 5V, DI)

5	Pb4	Configurable analogue input 4 (NTC, PTC, PT1000, 0 - 20mA, 4 - 20mA, 0 - 10V, 0 - 1V, 0 - 5V, DI)
6	Pb5	Configurable analogue input 5 (NTC, PTC, PT1000, 0 - 20mA, 4 - 20mA, 0 - 10V, 0 - 1V, 0 - 5V, DI)
7	PbC	Common analogue inputs (NTC, PTC, PT1000, DI)
8	GND(-)	Additional power reference 5Vdc and 12Vdc and analogue inputs (0 - 20mA, 4 - 20mA, 0 - 10V, 0 - 1V, 0 - 5V)
9	Supply	***Reference "+" power supply (24Vac or 24Vdc)***
10	Pb6	Configurable analogue input 6 (NTC, PTC, PT1000, 0 - 20mA, 4 - 20mA, 0 - 10V, 0 - 1V, 0 - 5V, DI)
11	Pb7	Configurable analogue input 7 (NTC, PTC, PT1000, 0 - 20mA, 4 - 20mA, 0 - 10V, 0 - 1V, 0 - 5V, DI)
12	Pb8	Configurable analogue input 8 (NTC, PTC, PT1000, 0 - 20mA, 4 - 20mA, 0 - 10V, 0 - 1V, 0 - 5V, DI)
13	Pb9	Configurable analogue input 9 (NTC, PTC, PT1000, 0 - 20mA, 4 - 20mA, 0 - 10V, 0 - 1V, 0 - 5V, DI)
14	Pb10	Configurable analogue input 10 (NTC, PTC, PT1000, 0 - 20mA, 4 - 20mA, 0 - 10V, 0 - 1V, 0 - 5V, DI)
15	+5V	Additional power +5Vdc
16	+12V	Additional power +12Vdc
21	Out1	Opto-insulated analogue output 1 0 - 10V
22	Out2	Opto-insulated analogue output 2 0 - 10V
23	Out3	Opto-insulated analogue output 3 0 - 10V
24	Out4	Opto-insulated analogue output 4 0 - 10V
25	GND(-)	Common opto-insulated analogue output
26	Out5	Analogue output 5 0 - 10V, 4 - 20mA, Opto-insulated relay
27	Out6	Analogue output 6 0 - 10V, 4 - 20mA, Opto-insulated relay
28	Supply	Power for opto-insulated analogue outputs at 24Vac or 24Vdc(-)
29	Supply	Power for opto-insulated analogue outputs at 24Vac or 24Vdc(+)
30	GND(-)	Common opto-insulated analogue output
40	DI1	Opto-insulated digital input 1
41	DI2	Opto-insulated digital input 2
42	DI3	Opto-insulated digital input 3
43	DI4	Opto-insulated digital input 4
44	DI5	Opto-insulated digital input 5
45	DI6	Opto-insulated digital input 6
46	DI7	Opto-insulated digital input 7
47	DI8	Opto-insulated digital input 8
48	DI9	Opto-insulated digital input 9

49	DI10	Opto-insulated digital input 10
50	GND(-)	Reference "-" for opto-insulated digital inputs 1 to 20 (if inputs 24Vac or 24Vdc)
51	DI11	Opto-insulated digital input 11
52	DI12	Opto-insulated digital input 12
53	DI13	Opto-insulated digital input 13
54	DI14	Opto-insulated digital input 14
55	DI15	Opto-insulated digital input 15
56	DI16	Opto-insulated digital input 16
57	DI17	Opto-insulated digital input 17
58	DI18	Opto-insulated digital input 18
59	DI19	Opto-insulated digital input 19
60	DI20	Opto-insulated digital input 20
61	IDC	Common opto-insulated digital inputs 1 to 20 (if potential free inputs)
70	RL1	Relay 1 normally open contact
71	P	Common relays 1, 2 and 3 (MAX 6A)
72	RL2	Relay 2 normally open contact
73	RL3	Relay 3 normally open contact
74	N	Potential free contact (MAX 6A)
75	N	Potential free contact (MAX 6A)
76	RL4	Relay 4 normally open contact
77	RL5	Relay 5 normally closed contact
78	RL6	Relay 6 normally closed contact
79	RL7	Relay 7 normally closed contact
80	P	Common relays 4, 5, 6, 7 and 8 (MAX 6A)
81	RL8	Relay 8 normally closed contact
82	N	Potential free contact (MAX 6A)
83	N	Potential free contact (MAX 6A)
84	RL9	Relay 9 normally closed contact
85	RL10	Relay 10 normally closed contact
86	P	Common relays 9 and 10 (MAX 6A)
87	RL11	Relay 11 normally closed contact
88	RL12	Relay 12 normally closed contact
89	RL13	Relay 13 normally closed contact

90	P	Common relays 11, 12, 13, 14 and 15 (MAX 6A)
91	RL14	Relay 14 normally closed contact
92	RL15	Relay 15 normally closed contact
93	C	Potential free contact (MAX 6A)
100	CAN Bus	CAN Bus connection (+), not open
101	CAN Bus	CAN Bus connection (-), not open
102	CAN Bus	CAN Bus connection (insulated gnd), not open
103	LAN	LAN Connection (+)
104	LAN	LAN Connection (-)

1.7 Technical specifications

1.7.1 Analogue inputs

Analogue conversion type:	10-bit A/D converter
Number of inputs:	10
Type of analogue input: **(configurable via software parameter)**	NTC Dixell (-50T110°C; 10KΩ±1% at 25°C) PTC Dixell(-55T115°C; 990Ω±1% at 25°C) Digital input (potential free contact) Voltage:, 0 - 5V (input resistance 3.7KΩ) Current:, 4 - 20mA (input resistance 100Ω)
Digital input status variation detection time:	100ms (in any case it depends on the cycle time set by the user in the given application)
Accuracy:	NTC, PTC: ±1℃ 0-5V: ±100mV 4-20mA: ±0.30mA
Additional power:	+12V: 200mA in total +5v: 100mA
Notes: 	Any inputs that are powered with a voltage that differs from that supplied by the device (+12V or +5V) must be powered separately with another transformer (do not use the same secondary of the controller's power) in order to prevent the inputs from malfunctioning or being damaged.

1.7.2 Digital inputs

Type: **(configurable via software parameter)**	Opto-insulated potential free or live contact (24Vac/dc) External power 24Vac/dc ±20%
Number of inputs:	20
Digital input status variation detection time:	100ms (in any case it depends on the cycle time set by the user in the given application)

Notes: 	If the digital inputs are used with voltage, use another transformer (do not use the same secondary of the controller's power) in order to prevent the inputs from malfunctioning or being damaged.

1.7.3 Analogue outputs

Type:	Opto-insulated with separate 24Vac/dc power supply
Number of outputs:	6
Type of analogue output: **(configurable via software parameter)**	4 fixed outputs 0-10Vdc (Out1 - Out4) 2 configurable outputs 0-10Vdc, 4-20mA (Out5 and Out6)
Maximum load:	40mA (Out1 - Out4) 20mA (Out5 and Out6) max with configured outputs 0-10Vdc 400Ω max with configured outputs 4-20Ma 22Ω per live analogue output
Accuracy:	Out1 - Out4: ±2% full scale Out5 – Out6: ±2% full scale
Resolution:	8bit
Notes: 	The electrical devices controlled by these analogue outputs must be powered separately with another transformer (do not use the same secondary of the controller's power) in order to prevent the outputs from malfunctioning or being damaged.

1.7.4 Digital outputs

Type:	Relays with NO contacts
Number of outputs:	15
Type of output: **(configurable via software parameter)**	Relays with normally open contact
Maximum load:	5A(250Vac) SPST 5(2)A
Notes: 	Verify the capacity of the output used. There is double insulation between the digital outputs and the low voltage of the rest of the circuit. Do not use different voltages for the various groups of relays nor within each group.

1.7.5 Electrical specifications

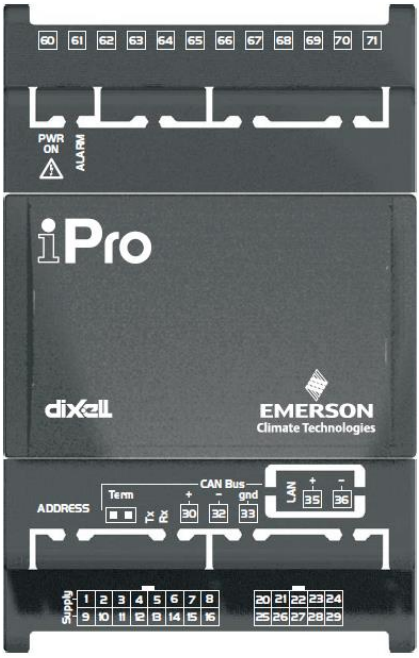
Power Supply:	24Vac +10/-15%, 50/60Hz 20 - 36Vdc
Consumption:	20VA (Vac), 15W (Vdc)

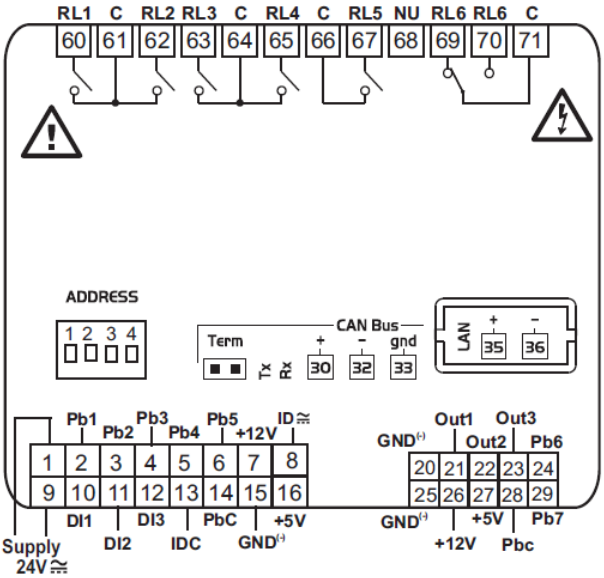
Connectors:	Phoenix quick coupling connectors for low voltage STELVIO 90° screw connectors for digital outputs (250Vac, 6A max)
Microprocessor:	AT91RM9200 32-bit 200Mhz
Permanent FLASH memory:	128MB, in 8-bit
RAM:	32MB o 64MB, in 16-bit
Internal clock:	standard

1.7.6 Plastic container

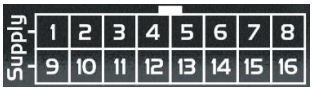
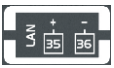
Mount:	On a DIN rail (EN 50022, DIN 43880) Fastened with screws via the removable plastic flaps.
Material:	PC-ABS Thermoplastic
Self-extinguishing:	V0 (UL94)
Comparative Tracking Index (CTI):	300V
Colour:	White

1.8 IPX206D


60 61 62 63 64 65 66 67 68 69 70 71
PWR ON
ALARM
iPro
dixell
EMERSON
Climate Technologies
ADDRESS
Term
Tx Rx
CAN Bus
+ - gnd
30 32 33
LAN + -
35 36
Supply
1 2 3 4 5 6 7 8
9 10 11 12 13 14 15 16
20 21 22 23 24
25 26 27 28 29


RL1 C RL2 RL3 C RL4 C RL5 NU RL6 RL6 C
60 61 62 63 64 65 66 67 68 69 70 71
ADDRESS
1 2 3 4
Term
CAN Bus
+ - gnd
30 32 33
Tx Rx
LAN + -
35 36
Pb1 Pb2 Pb3 Pb4 Pb5 +12V ID
1 2 3 4 5 6 7 8
9 10 11 12 13 14 15 16
DI1 DI2 DI3 IDC PbC GND(-) +5V
Supply 24V
Out1 Out2 Out3 Pb6 Pb7
GND(-) +5V +12V Pbc
20 21 22 23 24
25 26 27 28 29

1.8.1 Description of the connections

Connector	Description
	Connector for 24Vac/dc power supply Analogue inputs (Pb1 - Pb5, PbC) Potential free digital inputs (DI1 - DI3, DIC) or Power supply digital inputs (DI1 – DI3, ID) Additional power (+5Vdc, +12Vdc, GND)
	Analogue outputs (Out1..Out3, GND) Analogue inputs (Pb6 - Pb7, PbC) Additional power (+5Vdc, +12Vdc, GND)
	Digital relay outputs (depend on the part number of the device): 5 NO relays + 1 changeover relay or 4 NO relays + 1 changeover relay + 1 SSR relay
	CANBUS Connector Rx and Tx LED to indicate that communication is active Line terminal (Term)
	LAN serial port connector
	Dip-switch to set the address of the device (for CANBUS and LAN communication).
	Green LED to indicate the presence of the power supply
	Red status LED (ALARM) See relative paragraph

1.8.2 Description of the inputs and outputs

Input	Type of Input	Description
1	Supply	***Reference "-"/GND power (24Vac or 24Vdc)***
2	Pb1	Configurable analogue input 1 (NTC, PTC, PT1000, 0 - 20mA, 4 - 20mA, 0 - 5V, 0 - 1V, 0 - 10V, DI, not used)
3	Pb2	Configurable analogue input 2 (NTC, PTC, PT1000, 0 - 20mA, 4 - 20mA, 0 - 5V, 0 - 1V, 0 - 10V, DI, not used)
4	Pb3	Configurable analogue input 3 (NTC, PTC, PT1000, 0 - 20mA, 4 - 20mA, 0 - 5V, 0 - 1V, 0 - 10V, DI, not used)
5	Pb4	Configurable analogue input 4 (NTC, PTC, PT1000, 0 - 20mA, 4 - 20mA, 0 - 5V, 0 - 1V, 0 - 10V, DI, not used)
6	Pb5	Configurable analogue input 5 (NTC, PTC, PT1000, 0 - 20mA, 4 - 20mA, 0 - 5V, 0 - 1V, 0 - 10V, DI, not used)
7	+12V	Additional power +12Vdc

8	ID	Common for digital inputs from 1 to 3 when power supply (24Vac/dc)
9	Supply	***Reference "+" power supply (24Vac or 24Vdc)***
10	DI1	Digital input 1 (potential free contact (13) or power supply (8))
11	DI2	Digital input 2 (potential free contact (13) or power supply (8))
12	DI3	Digital input 3 (potential free contact (13) or power supply (8))
13	DIC	Common for digital inputs from 1 to 3 when potential free
14	Pbc	Common analogue inputs (NTC, PTC, PT1000, DI)
15	GND(-)	Additional power reference 5Vdc and 12Vdc and analogue inputs (0 - 20mA, 4 - 20mA, 0 - 10V, 0 - 1V, 0 - 5V)
16	+5V	Additional power +5Vdc
20	GND(-)	Additional power reference 5Vdc, 12Vdc and analogue outputs
21	Out1	Analogue output 1 0 - 10V
22	Out2	Analogue output 2 0 - 10V
23	Out3	Analogue output 3 0 - 10V
24	Pb6	Configurable analogue input 6 (NTC, PTC, PT1000, 0 - 20mA, 4 - 20mA, 0 - 5V, 0 - 1V, 0 - 10V, DI, not used)
25	GND(-)	Additional power reference 5Vdc, 12Vdc and analogue outputs
26	+12V	Additional power +12Vdc
27	+5V	Additional power +5Vdc
28	Pbc	Common analogue inputs (NTC, PTC, PT1000, DI)
29	Pb7	Configurable analogue input 7 (NTC, PTC, PT1000, 0 - 20mA, 4 - 20mA, 0 - 5V, 0 - 1V, 0 - 10V, DI, not used)
30	CAN Bus	CAN Bus connection (+), not open
32	CAN Bus	CAN Bus connection (-), not open
33	CAN Bus	CAN Bus connection (gnd), not open
35	LAN	LAN connection (+)
36	LAN	LAN connection (-)
60	RL1	Relay 1 normally open contact
61	C	Common relays 1 and 2 (MAX 5A)
62	RL2	Relay 2 normally open contact
63	RL3	Relay 3 normally open contact
64	C	Common relays 3 and 4 (MAX 5A)
65	RL4	Relay 4 normally open contact
66	C	Common relay 5 (please check the electrical characteristics of the relay used)

67	RL5	Relay 5 normally open contact (please check the electrical characteristics of the relay used)
68	NU	Not used
69	RL6	Relay 6 normally closed contact
70	RL6	Relay 6 normally open contact
71	C	Common relay 6 (MAX 8A)

1.9 Technical specifications

1.9.1 Analogue inputs

Analogue conversion type:	10-bit A/D converter
Number of inputs:	7
Type of analogue input: **(configurable via software parameter)**	NTC Dixell (-50T110°C; 10KΩ±1% at 25°C) PTC Dixell(-55T115°C; 990Ω±1% at 25°C) Digital input (potential free contact) Voltage: 0 - 5V, (input resistance 3.7KΩ) Current:, 4 - 20mA (input resistance 100Ω)
Digital input status variation detection time:	100ms (in any case it depends on the cycle time set by the user in the given application)
Accuracy:	NTC, PTC,: ±1°C 0-5V: ±100mV 4-20mA: ±0.30mA
Additional power:	+12V: 40mA max per terminal +5v: 100mA
Notes: 	Any inputs that are powered with a voltage that differs from that supplied by the device (+12V or +5V) must be powered separately with another transformer (do not use the same secondary of the controller's power) in order to prevent the inputs from malfunctioning or being damaged.

1.9.2 Digital inputs

Type: **(configurable via software parameter)**	Opto-insulated potential free contact or power supply
Number of inputs:	3
Digital input status variation detection time:	100ms (in any case it depends on the cycle time set by the user in the given application)
Notes: 	Pay attention to use the right common input when the digital inputs are used as dry contacts or power supply contacts.

1.9.3 Analogue outputs

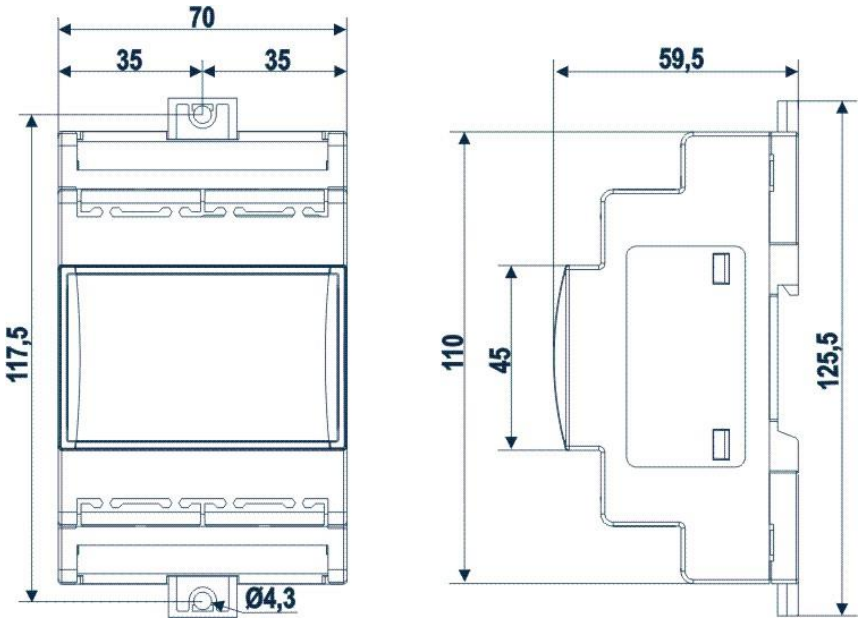
Type:	Non opto-insulated internal power
Number of outputs:	3
Type of analogue output: **(configurable via software parameter)**	3 fixed outputs 0-10Vdc (Out1 - Out3)
Maximum load:	40mA (Out1 - Out3) 22Ω per live analogue output
Accuracy:	Out1 - Out3: ±2% full scale
Resolution:	8bit
Notes: 	The electrical devices controlled by these analogue outputs must be powered separately with another transformer (do not use the same secondary of the controller's power) in order to prevent the outputs from malfunctioning or being damaged.

1.9.4 Digital outputs

Type:	Relays with NO, NC and SSR contacts
Number of outputs:	6
Type of output: **(configurable via software parameter)**	Relays with normally open contact: - RL1, RL2, RL3, RL4, RL5* Relays with changeover contact: - RL6 SSR relays with normally open contact: - RL5* **(*) the kind of the relay RL5 depend on the model of the device.**
Maximum load:	Relays with normally open contact: 5A(250Vac) SPST 5(2)A Relays with changeover contact: 8A(250Vac) SPDT 8(3)A SSR relays with normally open contact 1A(12 - 250Vac): - only in AC load - minimum current is 50mA (equivalent to 12W - 250Vac) - internal impedance 300KΩ (current 0.2mA at 250Vac with an open contact)
Notes: 	Verify the capacity of the output used. There is double insulation between the digital outputs and the low voltage of the rest of the circuit. The common relays of the outputs are separate and split into groups.

1.9.5 Mechanical specifications

4 DIN module



1.9.6 Electrical specifications

Power Supply:	24Vac +10/-15%, 50/60Hz 20 - 36Vdc
Consumption:	10VA (Vac), 10W (Vdc)
Connectors:	Phoenix quick coupling connectors for low voltage (for IPX206D) STELVIO 90° screw connectors for digital outputs (250Vac, 6A max)

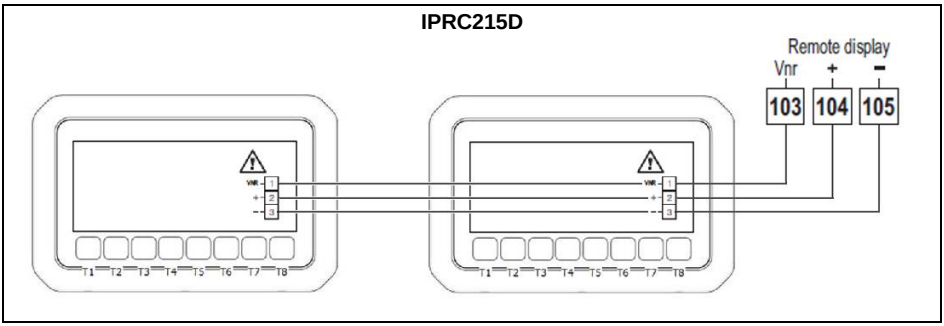
1.9.7 Plastic container

Mount:	On a DIN rail (EN 50022, DIN 43880) Fastened with screws via the removable plastic flaps.
Material:	PC-ABS Thermoplastic
Self-extinguishing:	V0 (UL94)
Comparative Tracking Index (CTI):	300V
Colour:	Black

1.10 Visograph Connections

The connection between the controller and the VISOGRAPH must be implemented using a BELDEN 8772 cable (3xAWG20) or equivalent
Up to 2 remote displays can be connected to IPRC215D.
1 remote display can be connected to IPR208D.
The distance between the controller and the last display must be no more than 100 meters.

IPRC215D



Be careful to comply with the polarity of the connections as any errors in the connection can damage the device.

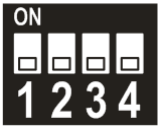
3. SYSTEM CONFIGURATION

3.1 CANBUS ADDRESSES OF EXPANSIONS AND DRIVERS

The IPRC215D can be connected via CANBUS the following devices, that must have the addresses reported in the below table

		CANBUS ADDRESS				
		IPRC215D	**IPX206D**	**IPX215D**	**XEV20D_1**	**XEV20D_2**
1	STAND ALONE	X				
2	WITH 1 EXPANSION – Case 1	X	2		3	4
3	WITH 1 EXPANSION – Case 2	X		1	3	4
4	WITH 2 EXPANSIONS	X	2	1	3	4

The address is set is set via a dip-switch and numbering is binary as shown in the table below:



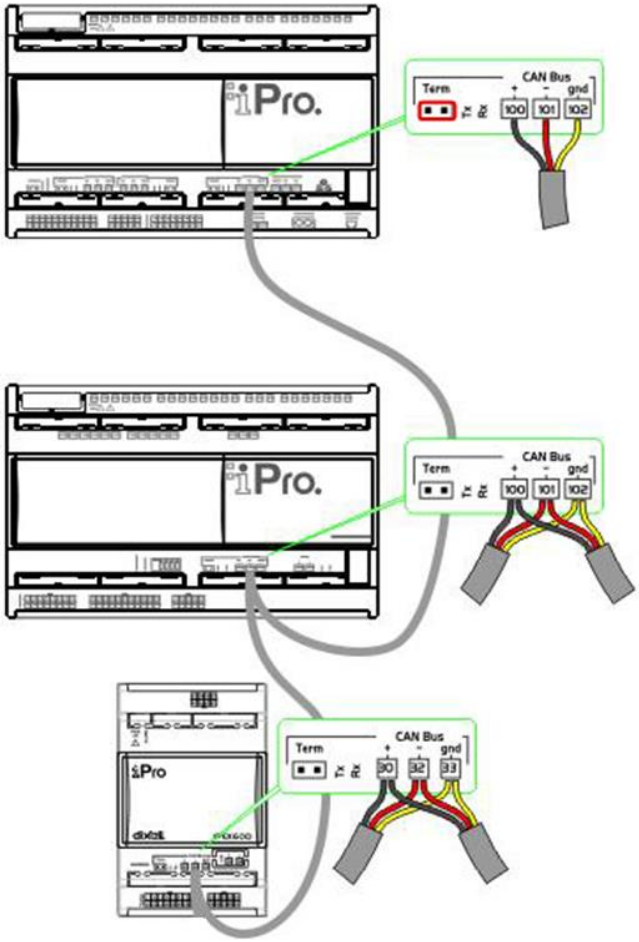
		1	2	3	4
Adr.	0	OFF	OFF	OFF	OFF
Adr.	1	ON	OFF	OFF	OFF
Adr.	2	OFF	ON	OFF	OFF
Adr.	3	ON	ON	OFF	OFF
Adr.	4	OFF	OFF	ON	OFF
Adr.	5	ON	OFF	ON	OFF
Adr.	6	OFF	ON	ON	OFF
Adr.	7	ON	ON	ON	OFF
Adr.	8	OFF	OFF	OFF	ON
Adr.	9	ON	OFF	OFF	ON
Adr.	10	OFF	ON	OFF	ON
Adr.	11	ON	ON	OFF	ON
Adr.	12	OFF	OFF	ON	ON
Adr.	13	ON	OFF	ON	ON
Adr.	14	OFF	ON	ON	ON
Adr.	15	ON	ON	ON	ON

Not used

If the address is changed while the device is on, the iProRack and the Expansion- Driver must be switched off and on again to confirm the new address.

3.2 EXPANSIONS AND DRIVERS – Wiring

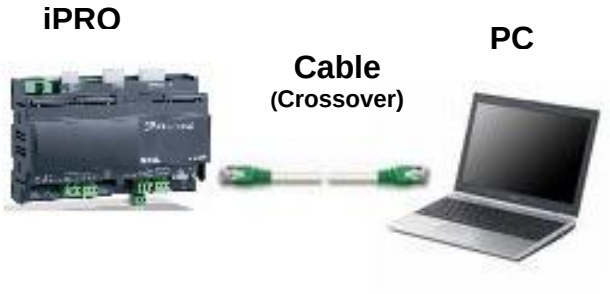
3.2.1 CANBUS CONNECTION



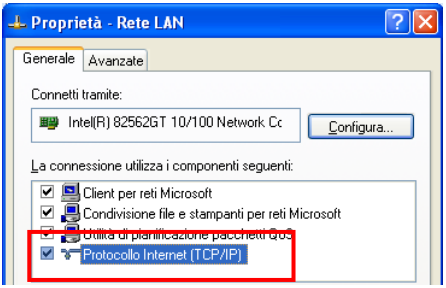
4. HOW TO CONNECT THE IPRORACK TO A PC

4.1 Direct connection (between iPRO and PC with a cable)

With this kind of connection is possible to connect directly your personal computer with the programmable controller iPRORACK. In this case, you need a standard “Crossover Cable” (cod. Dixell CAB/WEB/PC). The PC can communicate with the iPRO only if the settings in the devices are aligned; this means that the PC and the iPRO have to work in the same network.

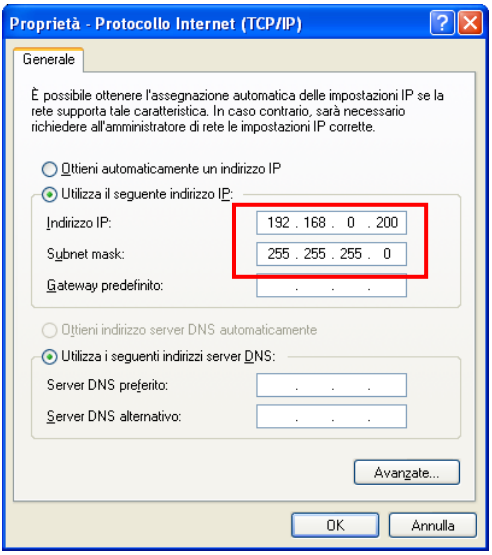


1. Disconnect your computer from the data network of your company and connect the PC with the iPRO through the Crossover cable.
2. The personal computer has to be set in the same network of the iPRO.
   a. In the windows environment click with the mouse on “**start**” button .
3. Choose “**Control Panel**” and select “**Network and dial-up connections**” .
4. Choose “**Local area connection**” .
5. Choose “**Properties**” and double click on “Internet Protocol (TCP/IP)”.



In this window set the following parameters (as showed in the picture):

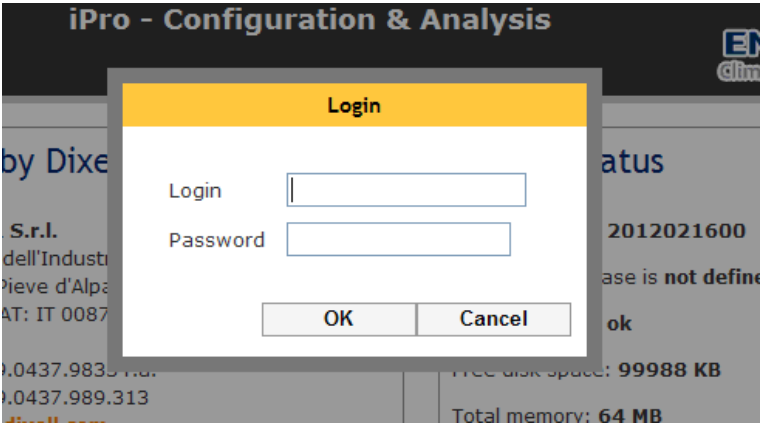
IP address: 192.168.0.200
Subnet Mask: 255.255.255.0



Click “OK” to confirm.

Launch the browser in your computer and write the following web site address: http://192.168.0.250 (if your IP is different, write the correct one):

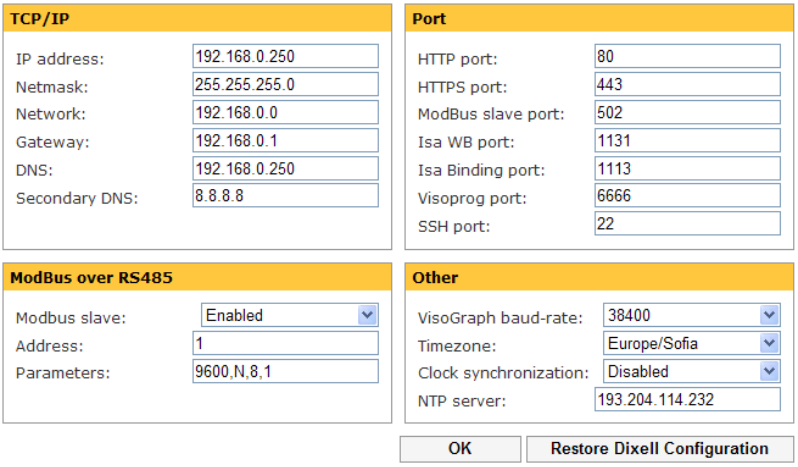
To be able to modify the settings, it is necessary to do the login.
Click Login:



Login: admin
Password: Dixell

Click OK to confirm

If necessary it is possible to change the IP address; click the Configure button.
In this page define the TCP/IP section comply with your network.

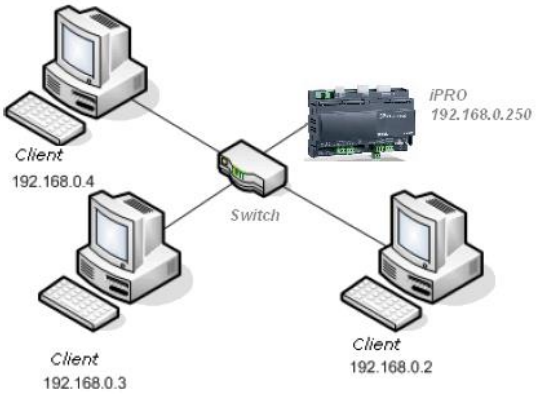


Click “OK” to confirm the operation.

After this operation, it is necessary to reboot the iPRO.

4.2 Intranet / Ethernet connection (Local Area Network)

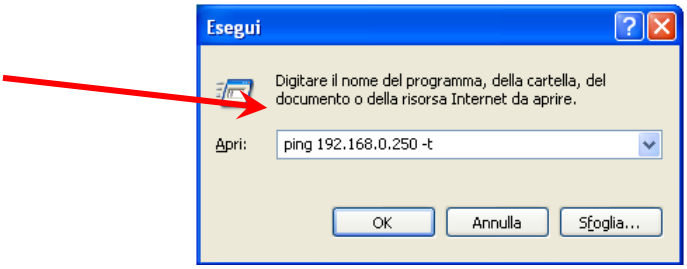
The Intranet or Ethernet connection should be initially managed by the net administrator that will assign one free IP address to reach the iPRO. This number is an example of what you should expect with the default IP of the iPRO: 192.168.0.250.
After receiving the address from your network Administrator the iPRO must be set with this number (through the procedure described in the chapter 5.2).
Use a standard RJ45 network cable to connect the unit to your existing LAN.
The Intranet method allows the connection to interact with iPRO from all the PC Clients.



To check if the connection has been established try in this way:

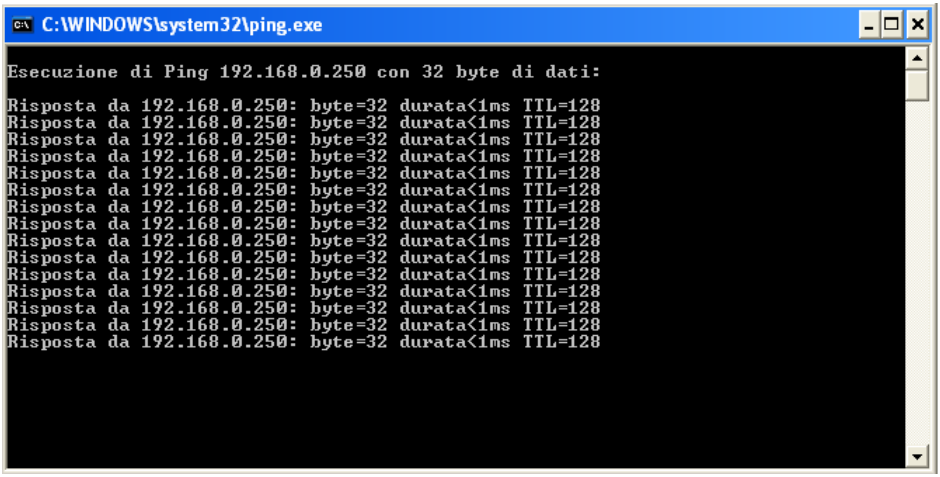
From your computer launch: start -→ run

In the box write the following string:



Then click OK.

If the connection is OK, in this window you will see the following information:



4.3 Port forwarding

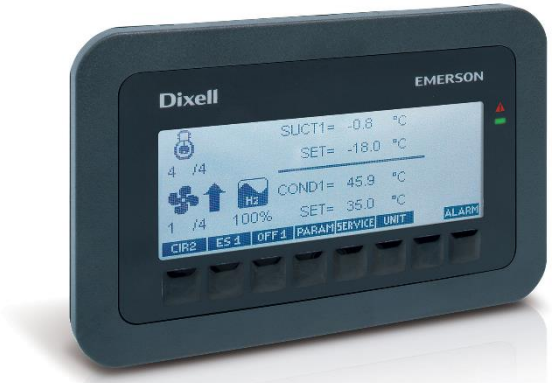
Port forwarding allows remote computers (e.g. public machines on the Internet) to connect to a specific computer within a private LAN.
The ports that have to be opened are:

- **22**
- **80**
- **1131**
- **6666**

5. INTERFACE

5.1 VISOGRAPH

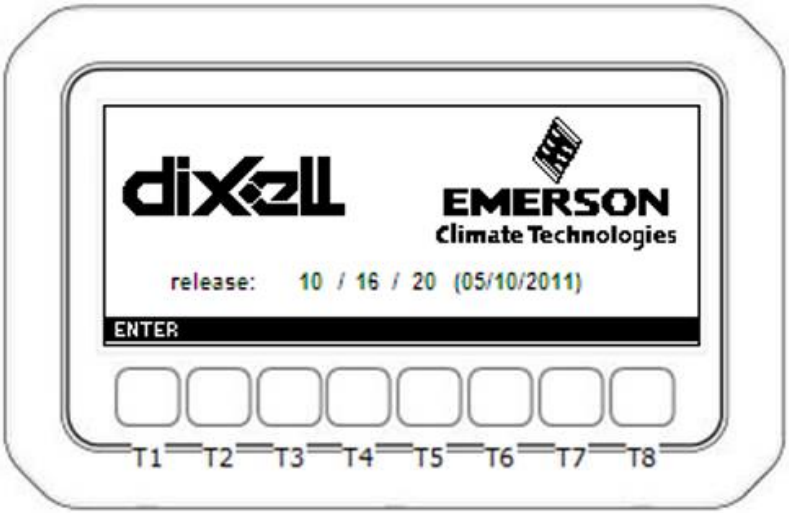
The iPRO programmable controllers allow a programmable remote LCD display (VISOGRAPH) to be connected. Through the VISOPROG processing environment, the display and buttons can be programmed as the user wishes. Text, icons and animated icons can be added to the LCD display. Functions can be associated to keys according to the operations to be implemented.


Dixell
EMERSON
SUCT1= -0.8 °C
SET= -18.0 °C
COND1= 45.9 °C
SET= 35.0 °C
4 /4
1 /4
100%
CIR2
ES 1
OFF 1
PARAM
SERVICE
UNIT
ALARM

6. USER INTERFACE

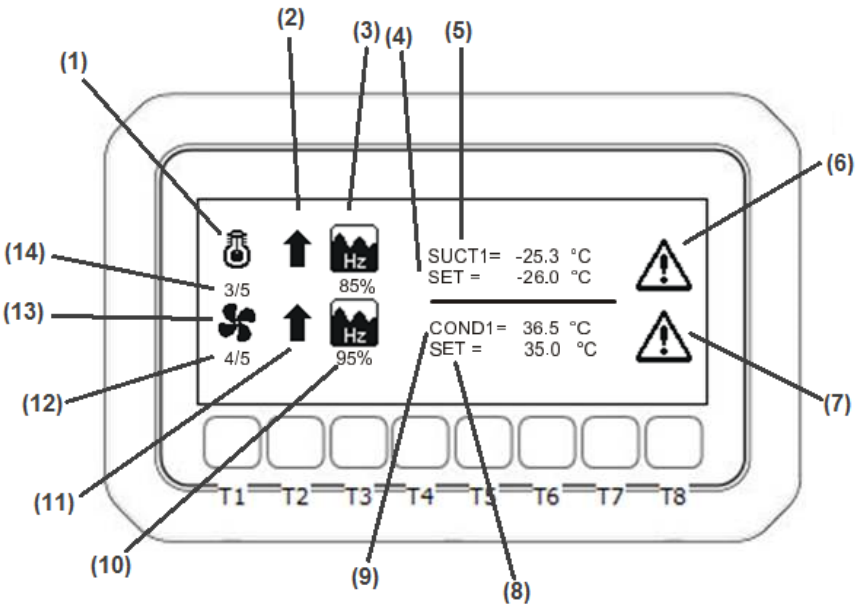
6.1 What is displayed when the keyboard is connected

Push the ENTER key to enter the standard visualization



Where:
release: Rel Firmware iPRORack / release OS Visograph / release Program Visograph

6.2 Display visualization



(1) **Symbol of compressor**: it is present if a relay is configured as a compressor

(2) **Status of the suction section**:

The pressure (temperature) is below the regulation band and the capacity of the plant is decreasing

The pressure (temperature) is above the regulation band and the capacity of the plant is increasing

(3) **Analogue output status for frequency compressor:** it is present only if a frequency compressor is used. It displays the percentage of the analog output driving the inverter.

(4) **Suction pressure (temperature) set point::** it is present if a relay is configured as a compressor

(5) **Current value of suction pressure (temperature):** it is present if a relay is configured as a compressor

(6) **Alarm:** it is display when an alarm happens in suction section

(7) **Alarm:** it is display when an alarm happens in delivery section

(8) **Delivery pressure (temperature) set point:** it is present if a relay is configured as a fan

(9) **Current value of delivery pressure (temperature):** it is present if a relay is configured as a fan

(10) **Analog output status for inverter for fan:** it is present only if an inverter for fan is used. It displays the percentage of the analog output driving the inverter.

(11) **Status of the delivery section**:

The condenser pressure (temperature) is below the regulation band and the number of fans is decreasing

The condenser pressure (temperature) is above the regulation band and the number of fans is increasing

(12) **Number of fans activated / Total number of fans** it is present if a relay is configured as a fan
NOTE: the total number of fans is referred to the number of available fans. Fans that are in "maintenance" or that are stopped by their own digital Output aren't included.

(13) **Symbol of fan**: it is present if a relay is configured as a fan

(14) **Number of compressors and steps activated / Total number of compressors and steps.** it is present if a relay is configured as a compressor.
NOTE: the total number of compressors is referred to the number of available compressors. Compressors that are in "maintenance" or that are stopped by their own digital Output aren't included.

Keys

ALARM **Alarm:** to enter the alarm menu

PARAM **Parameter:** to enter the parameter programming

SERVICE **Service:** to enter the Service menu

UNIT **Measurement unit:** to switch the probe visualization and set point from pressure to temperature and vice versa

OFF1 **To switch the controller off:** hold pushed for 10s to switch the controller off (it is enabled only if the parameter OT5 = yES)

ES1 **Energy saving:** hold pushed for 10s to enable the energy saving cycle (the SET label starts flashing)

CIR2 **Circuit 2:** to pass to visualization of the variables of the second circuit, It is present if a relay is declared as compressor or fan of the second circuit

6.3 Parameters setup

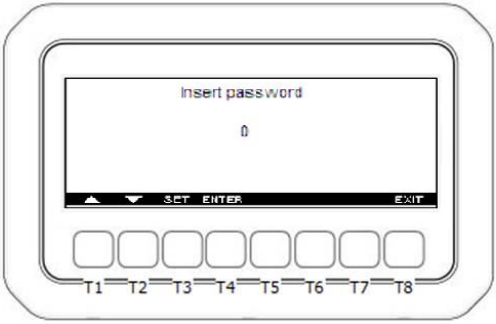
Push the PARAM key and the programming menu is entered.

Parameters are collected in two menu:
Pr1: menu of parameters without password. Press the Pr1 key to enter.

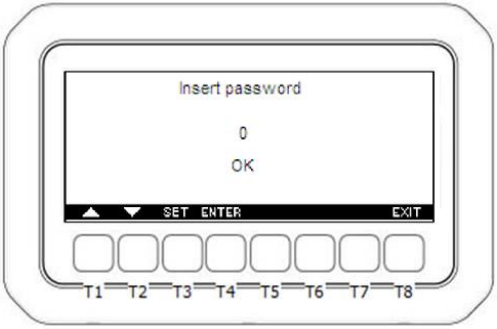
Pr2: menu of parameters with password. If the password is enabled, use the following procedure to put it.

6.3.1 Password introduction to enter Pr2

If the password is enabled, by pushing the **Pr2** key the following interface is displayed:



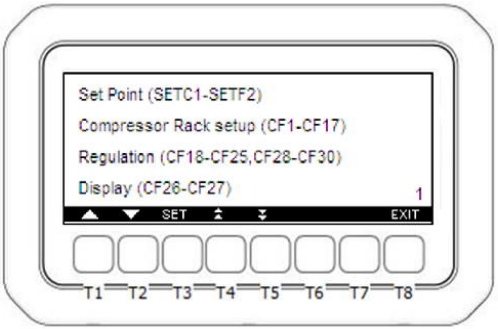
1. Push the SET key.
2. Use the UP and DOWN keys to set the password
3. Push the SET key to confirm it
4. The following message is displayed



5. Push the ENTER key to enter in Pr2 menu

6.3.2 Parameters grouping

The parameters are collected in sub-menu according to the following interface.



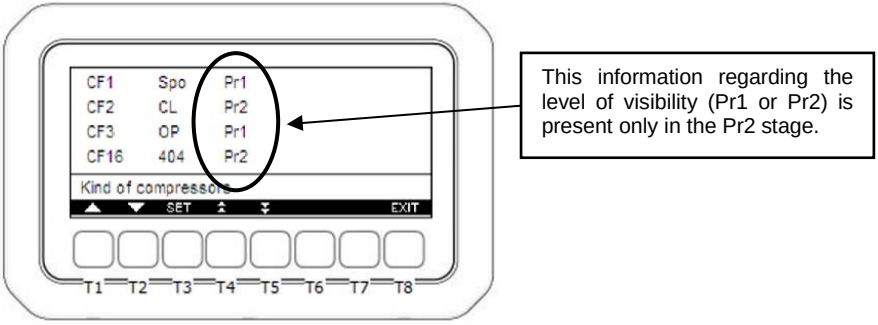
The parameters sub menu are the following:

Set Point (SETC1-SETF2, SETPC)
Compressor Rack setup (CF1, CF16-CF17, CF33)
Different capacity Compressors setup(CF4-CF15, CF31-CF32)
Regulation (CF18-CF25, CF28-CF30, CF34)
Display (CF26-CF27)
Analog Inputs_1 Probe 1-10 adjustment (Ai1-Ai11)
Analog Inputs_2 Pressure Probe 1-10 set up (Ai12-Ai31)
Analog Inputs_3 Probe 11-17 adjustment (Ai32-Ai38)
Analog Inputs_4 Pressure Probe 11-17 set up (Ai39-Ai52)
Analog Inputs_5 Probe 18-27 adjustment (Ai53-Ai62)
Analog Inputs_6 Pressure Probe 18-27 set up (Ai63-Ai82)
Gas cooler Heat Reclaim (HTRC0-HTRC42)
Gas cooler (GC1-GC97)
Safety Digital Inputs (SD1-SD3)
Digital Inputs for liquid level (CDI1-CDI14)
Compressor Action (RC1-RC8, RC25, RC35-RC42, RC45-RC48)
Safety Compressors (SL1-SL11, SL14-SL23)
Fan Action (RC9-RC24, RC33-RC34, RC43-RC44)
Safety Fans(SL12-SL13)
Alarms Configuration (AC1-AC2)
Compressor Alarms (AL1-AL23)
Fan Alarms (AL24-AL46)
Dynamic Setpoint Suction (DSP1- DSP8)
Dynamic Setpoint Condenser (DSP9-DSP16)
Analog Outputs 1 (AO1_1- AO1_26)
Analog Outputs 2 (AO2_1- AO2_26)
Analog Outputs 3 (AO3_1- AO3_26)
Analog Outputs 4 (AO4_1- AO4_26)
Analog Outputs 5 (AO5_1- AO5_26)
Analog Outputs 6 (AO6_1- AO6_26)
Auxiliary Outputs (AR1-AR26)
Superheat Alarms (ASH1- ASH38)
Other (OT1 – OT7)
Coresense configuration(CO1-CO30)
DI CONFIGURATION (DIC1- DIC43)
DO CONFIGURATION (DOC1- DOC36)

AO CONFIGURATION (AOC1- AOC15)
AI CONFIGURATION (AIC1- AIC27)
DHS (DSH1-DSH18)
Parallel Compression Regulation (PC1-PC10)
Gas Leak Detector (GLD1-GLD24)
Energy Meter (EPM1, EPM18)
ECM Fans (ECM1-3, ECM4_1EMC4_8, ECM5-ECM9)
M400 VFD (VFD1-VFD33)
Discharge Temperature (DSC1-DSC14)

NOTE: the parameter sub-menu will be visible only if at least one parameter in the group is visible in Pr1 or Pr2

Push the SET key to enter a menu and the parameter with their value will be displayed: see below picture.



Push the SET key and use the **UP** and **DOWN** keys to modify the value.
Then push the SET key to store the new value and move to the following parameter.

NOTE: the Pr2 or Pr1 message is present only in Pr2 menu.
It is possible to modify the level of each parameter changing Pr2 → Pr1 or vice versa.

NOTE: Pushing the **EXIT** button the initial screen shot is displayed.

7. SERVICE MENU

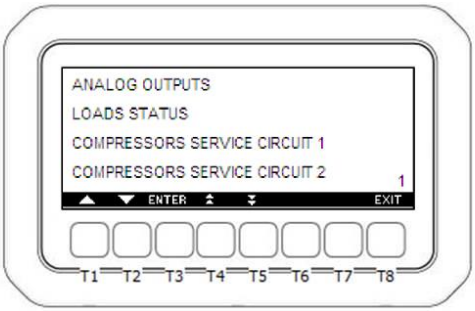
The service menù collect the main functions of the controller.
From the Service menu is possible to:

- see the values of analog outputs
- see the status of compressor relay
- operate a maintenance section
- see the status of safety and configurable digital Outputs
- see the values of the probes
- set the real time clock
- set the password and enable it for some menu

- set the instrument language.
- See the value of superheat probes.
- Configure IP/Modbus address
- Manage configure files
- See the parameters of Core Sense if Core Sense has been configured.

7.1 How to enter the Service menu

From the main display screen push the SERVICE button and the SERVICE menu is entered. See below picture:



The Service sub-menu are the following:

1. ANALOG OUTPUTS
2. LOADS STATUS
3. COMPRESSOR SERVICE CIRCUIT 1
4. COMPRESSOR SERVICE CIRCUIT 2
5. DIGITAL INPUTS
6. PROBES
7. SUPERHEAT
8. DE-SUPERHEAT
9. REAL TIME CLOCK
10. PASSWORD
11. CONF IP/MDB ADDRESS
12. CONF FILE MANAGEMENT
13. CORE SENSE SETUP
14. CORE SENSE INFORMATION
15. LOG FILE MANAGEMENT
16. UPDATE VISOGRAPH
17. M400 STATUS
18. ENERGY METER STATUS
19. XEV02 STATUS
20. DEVICE STATUS
21. ANALOG OUTPUT OVERRIDE
22. DIGITAL OUTPUT OVERRIDE
23. GAS COOLER INFORMATION
24. PARALLEL COMPRESSION
25. PARALLEL COMPRESSION SERVICE
26. LANGUAGE

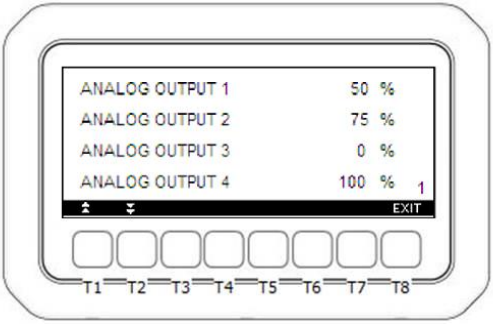
Select one of them with the UP or DOWN keys then push the SET key to enter the sub-menu

7.2 How to see the values of analog outputs

Procedure:

1. Enter the **SERVICE** menu
2. Select **ANALOG OUTPUTS** sub-menu
3. Push the **ENTER** key.

The **ANALOG OUTPUTS** sub-menu displays the status of the analog outputs of the controller, with the following layout:



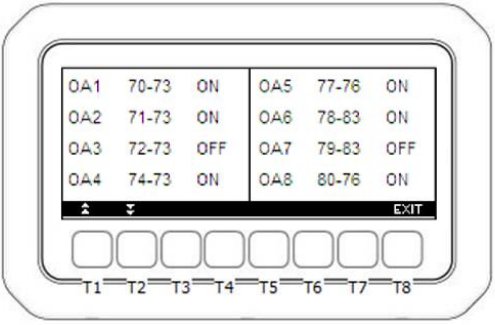
These outputs can be used to drive an external inverter or to repeat a main probe, by means of a signal 4-20mA or 0-10V.

7.3 How to see the status of the relays

Procedure:

1. Enter the **SERVICE** menu
2. Select **LOADS STATUS**
3. Push the **SET** key.

The **LOADS STATUS** sub-menu displays the status of the relays in the following format:



With this meaning:
First column: number of relay; second column: terminal blocks reference; third column: status.

Relay No.	Terminal blocks	MODELS
OA1	70-71	IPRC215D

OA2	72-71	IPRC215D
OA3	73-71	IPRC215D
OA4	76-80	IPRC215D
OA5	77-80	IPRC215D
OA6	78-80	IPRC215D
OA7	79-80	IPRC215D
OA8	81-80	IPRC215D
OA9	84-86	IPRC215D
OA10	85-86	IPRC215D
OA11	87-90	IPRC215D
OA12	88-90	IPRC215D
OA13	89-90	IPRC215D
OA14	91-90	IPRC215D
OA15	92-90	IPRC215D
OA16	60-61	IPX206D
OA17	62-61	IPX206D
OA18	63-64	IPX206D
OA19	65-64	IPX206D
OA20	67-66	IPX206D
OA21	69-71	IPX206D
OA22	70-71	IPX215D
OA23	72-71	IPX215D
OA24	73-71	IPX215D
OA25	76-80	IPX215D
OA26	77-80	IPX215D
OA27	78-80	IPX215D
OA28	79-80	IPX215D
OA29	81-80	IPX215D
OA30	84-86	IPX215D
OA31	85-86	IPX215D
OA32	87-90	IPX215D
OA33	88-90	IPX215D
OA34	89-90	IPX215D
OA35	91-90	IPX215D
OA36	92-90	IPX215D

7.4 COMPRESSOR SERVICE SUB- MENU – For maintenance sections

The COMPRESSOR SERVICE menu could be protected by password. See chapter 4.3.1.

By means of the **COMPRESSOR SERVICE** sub-menu is possible to perform a maintenance section, consisting on:

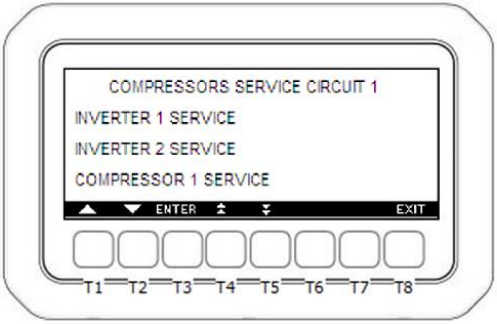
- disabled an output
- check and (eventually) erase the running hour of a load.

7.4.1 How to enter the "COMPRESSOR SERVICE" submenu.

Procedure:

1. Enter the **SERVICE** menu
2. Select **COMPRESSOR SERVICE CIRCUIT 1** sub-menu
3. Push the **SET** key.

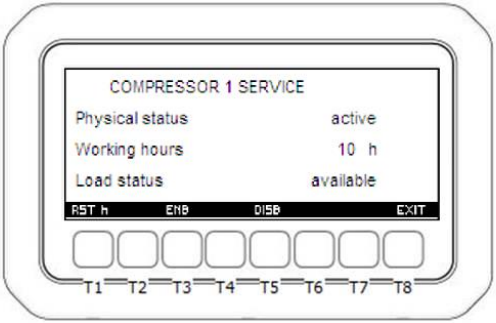
The **COMPRESSOR SERVICE** sub-menu displays the status of the relays with the following layout:



7.4.2 How to disabled/enabled an output during a maintenance section.

To disabled an output during a maintenance session means to exclude the output from the regulation:
To do it act as in the following

1. Enter the **COMPRESSOR SERVICE CIRCUIT 1** sub-menu, as described in the previous paragraph.
2. Select the load SUB-MENU by means of the UP and DOWN keys
3. Push the SET key, to enter the **COMPRESSOR 1 SERVICE** submenu



4. To enable a load for regulation or to disable it, push one of the following keys:
   a. **ENB:** to enable the load for regulation
   b. **DISB:** to disable the load for regulation

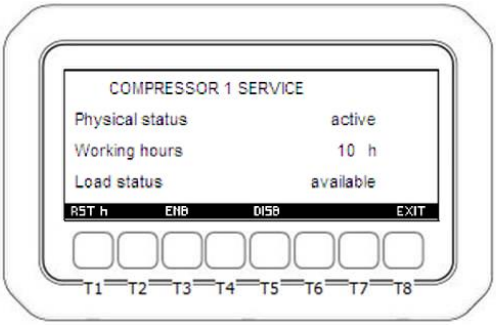
7.4.3 Regulation with some outputs disabled.

If some outputs are disabled they don't take part to the regulation, so the regulation goes on with the other outputs.

7.4.4 How to display the running hours of a load.

The controller memorises the running hours of each load.
To see how long a load has been working enter the **COMPRESSOR SERVICE CIRCUIT 1 OR 2** sub-menu and select the load **COMPRESSOR 1 SEVICE.**

The running hours are displayed with the following layout:



7.4.5 How to erase the running hours of a load

After a maintenance session, usually it is useful to erase the running hours of a load.
To do this you have to:

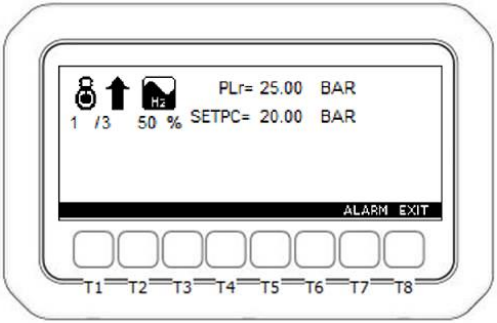
1. Enter the **COMPRESSOR SERVICE CIRCUIT 1** sub-menu, as described in the paragraph. 7.4.1.
2. Select the load by means of the UP and DOWN keys.
3. Push the SET key,
4. Push the **RST h** to erase the running hours.

To exit: push the **EXIT** key to come back to the SERVICE menu.

7.5 The parallel compression submenu

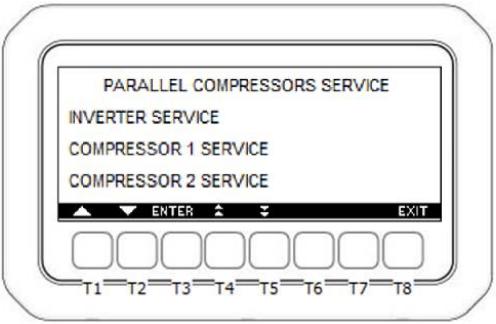
The **Parallel Compression** submenu displays the information of parallel compression regulation:

- Probe value of CO2 receiver pressure probe;
- Regulation set point used for parallel compression regulation
- The number of compressors and steps activated / Total number of compressors and steps
- Analogue output status for frequency compressor
- Status of regulation request:



7.6 The "PARALLEL COMPRESSOR SERVICE" submenu

This stage lists all the configured of parallel compressors. User can see the work hours of each compressor and can also reset it by selecting corresponding compressor.

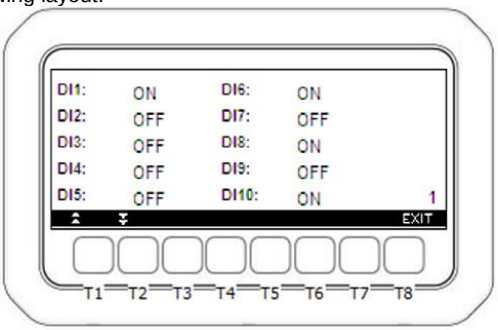


7.7 How to see the status of digital Inputs

Procedure:

1. Enter the **SERVICE** menu
2. Select **DIGITAL OUTPUTS** sub-menu
3. Push the **SET** key.

The **DIGITAL OUTPUTS** sub-menu displays the status of the safety and configurable digital Outputs, with the following layout:

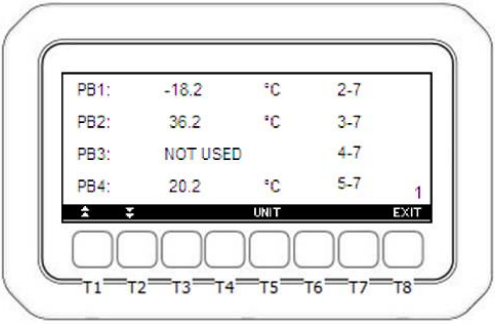


7.8 How to see the values of the probes

Procedure:

1. Enter the **SERVICE** menu
2. Select **PROBES** sub-menu
3. Push the **SET** key.

The **PROBES** sub-menu displays the probe values, with the following layout:



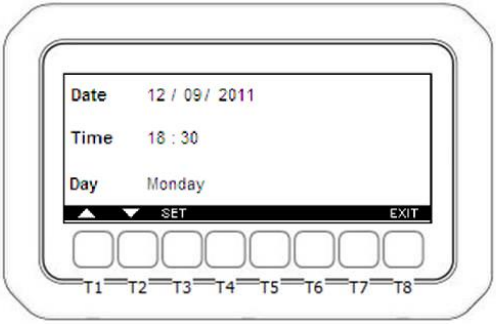
To **change** the measurement unit for the probe PB1, PB2, PB3, PB4, push **UNIT** button.

7.9 How to set time and date

Procedure:

1. Enter the **SERVICE** menu
2. Select **REAL TIME CLOCK** sub-menu
3. Push the **SET** key.
4.

The **REAL TIME CLOCK** sub-menu displays time and date, with the following layout:

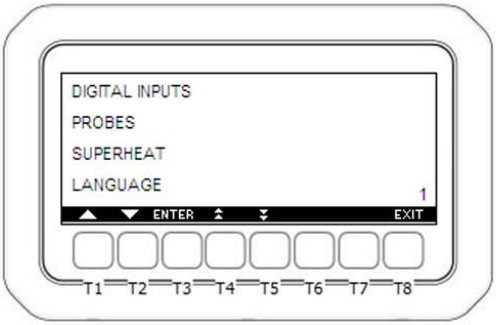


5. Set the day by means of the **UP** and **DOWN** keys.
6. Push the **SET** key, to confirm and pass to the setting of time.
7. Use the same procedure for the date.
8. Then confirm the selection by means of the SET key.

7.10 How to check the superheat value

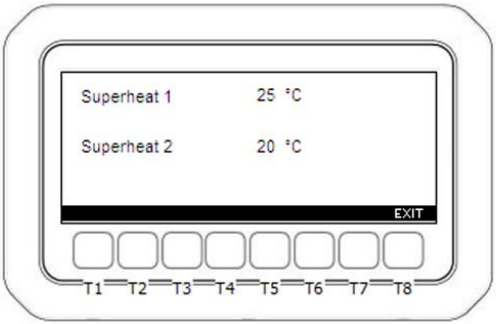
The probes can be configured to calculate superheat of the suction circuit 1 or 2.
To do this, configure the probes in the conf.file, to calculate superheat for suction circuit 1 or 2.

To check the superheat value:



1. Open the **SERVICE** menu
2. Select **SUPERHEAT**
3. Press the **SET** button.

The superheat value is indicated in the **SUPERHEAT** sub-menu.

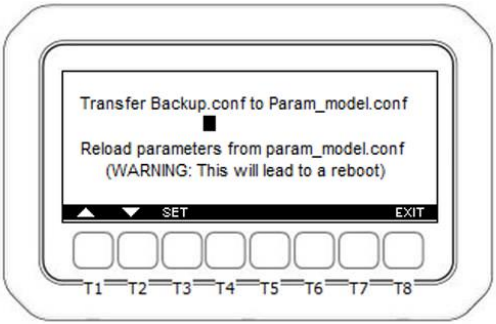


7.11 How to charge up the backup of the parameters

Procedure:

4. Enter the **SERVICE** menu
5. Select **CONF FILE MANAGEMENT** sub-menu
6. Push the **SET** key.

The **CONF FILE MANAGEMENT** sub-menu to transfer backup.conf file to Param_model.conf file, with the following layout:



When you push the **SET** key, transfer Backup.conf file to Param_model.conf file . The Iprorack will reboot and the parameters are reloaded from the Param_model.conf file.

7.12 Parameters files backup

Procedure:

1. Enter the **SERVICE** menu
2. Select "**CON FILE MANAGEMENT**" sub-menu
3. Push the **SET** key.

To **update the back up file** with the current parameter map:

1. Select the menu: "**Send parameters to Backup.conf file**"
2. Push the SET key

To **to load on the iProRack the parameter memorised on the** "**Backup.conf**:

1. Select the menu: "**Load parameters from Backup.conf file**"
2. Push the SET key

When you push the **SET** key, load parameters from Backup.conf file. The Iprorack will reboot and the parameters are reloaded from Backup.conf".

7.13 VISOGRAPH UPDATE

Procedure:

1. Put the unit in stand-by by pushing the OFF button.
2. Enter the **SERVICE** menu
3. Select "**UPDATE VISOGRAPH**" sub-menu
4. Push the **SET** key.

To **update the Visograph** push the **ENTER** button when "START UPDATE" is selected Controller will display BIOS info and update progress.

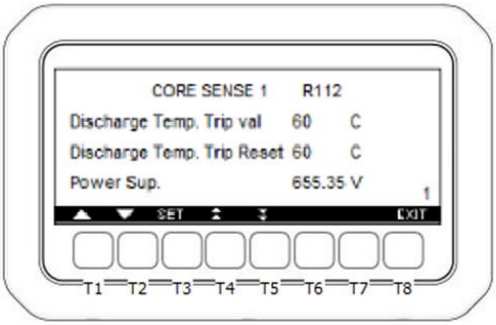
At the end Visograph will reboot automatically and the main screen will be displayed.

7.14 CONF IP/MDB ADDRESS

Inside this new sub-menu has to be possible to modify the IP address and the modbus address.
Every time there is a new value it is require a reboot of Ipro.
Inside the code it is necessary to use the FB IPRO_config.

7.15 How to set the Coresense

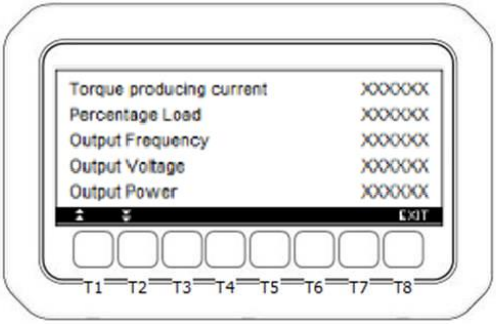
1. Press the SERVICE key in the main display visualization (chapter 5.2).
2. Select CORE SENSE SETUP sub-menu.
3. Press the ENTER key to enter the sub-menu.
   The CORE SENSE SETUP sub-menu displays the status of the parameters as following:



4. Press the UP and DOWN keys to select the parameter value.
5. Press SET key and use the UP and DOWN keys to modify the value.
6. Press SET key to store the new value.

7.16 How to set the M400

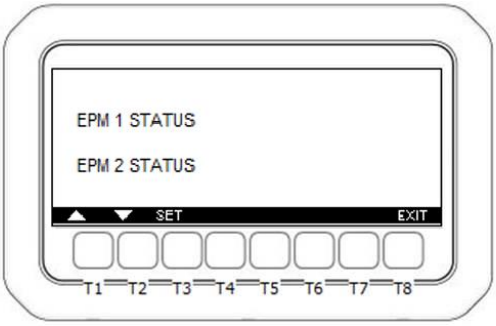
1. Press the SERVICE key in the main display visualization.
2. Select M400 STATUS sub-menu.
3. Press the ENTER key to enter the sub-menu.
   The M400 STATUS sub-menu displays the status of M400 as following:



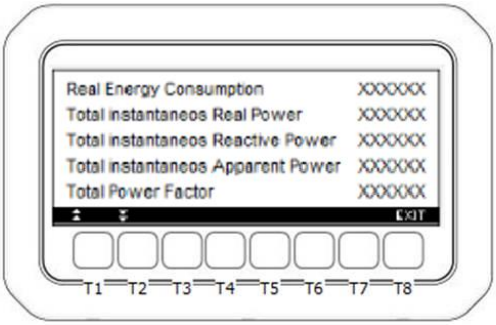
4. Press UP and DOWN key to view the status of M400.

7.17 How to set the EPM

1. Press the SERVICE key in the main display visualization (chapter 5.2).
2. Select ENERGY METER STATUS sub-menu.
3. Press the ENTER key to enter the sub-menu.
   The ENERGY METER STATUS sub-menu displays 2 sections of energy meters as following:



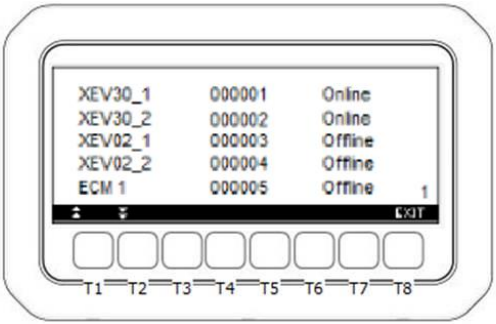
4. Select one section such as EPM 1 STATUS.
5. Press SET key to enter the sub-menu.
   The EPM 1 STATUS sub-menu displays as following:



6. Press UP and DOWN key to view the status of EPM1.

7.18 How to set device status

1. Press the SERVICE key in the main display visualization (chapter 5.2).
2. Select DEVICE STATUS sub-menu.
3. Press the ENTER key to enter the sub-menu.
   The DEVICE STATUS sub-menu displays the status of all the devices as following:

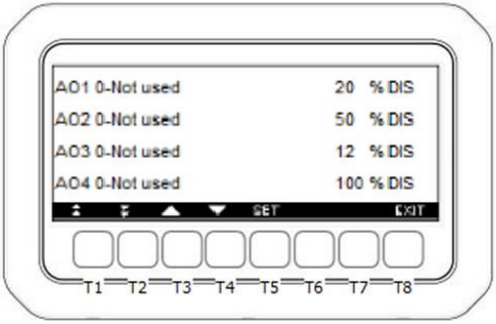


4. Press UP and DOWN key to view the status of all the devices.

7.19 How to set analog outputs override

User can operate according to 6.1:

1. Press the SERVICE key in the main display visualization (chapter 6.2).
2. Select ANALOG OUTPUTS OVERRIDE sub-menu.
3. Press the ENTER key to enter the sub-menu.
   The ANALOG OUTPUTS OVERRIDE sub-menu displays the status of all the devices as following:

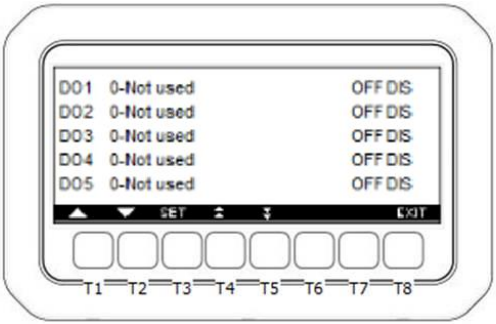


4. Press UP and DOWN key to view the status of all the devices.

7.20 How to set digital output override

User can operate according to 6.1:

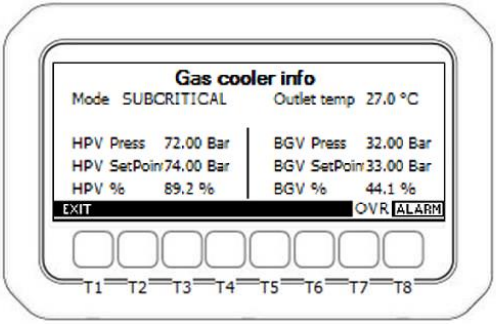
1. Press the SERVICE key in the main display visualization (chapter 6.2).
2. Select DIGITAL OUTPUTS OVERRIDE sub-menu.
3. Press the ENTER key to enter the sub-menu.
   The DIGITAL OUTPUTS OVERRIDE sub-menu displays the status of all the devices as following:



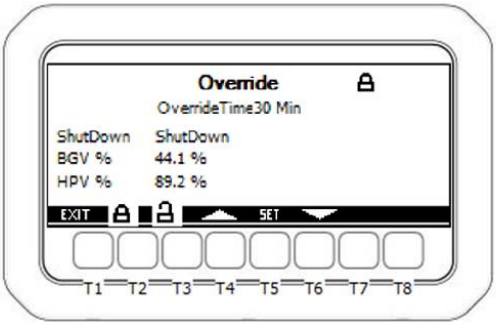
4. Press UP and DOWN key to view the status of all the devices.

7.21 GAS COOLER

1. Press the SERVICE key in the main display visualization (chapter 6.2).
2. Select GAS COOLER sub-menu.
3. Press the ENTER key to enter the sub-menu.
   The GAS COOLER sub-menu displays the status of all the devices as following:

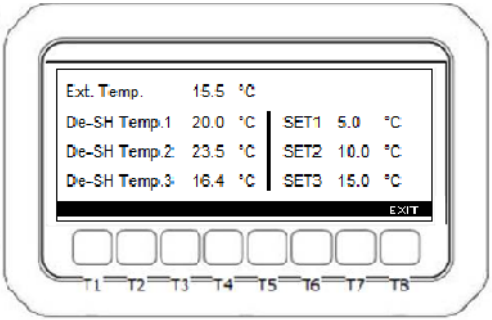


4. The button OVR let the user go to the following stage for the override:



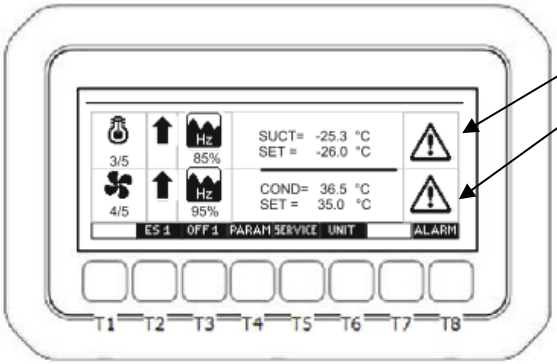
7.22 De-Superheat

1. Press the SERVICE key in the main display visualization (chapter 6.2).
2. Select DE-SUPERHEAT sub-menu.
3. Press the ENTER key to enter the sub-menu.
   The De-superheat sub-menu displays the below info:
   - External temperature (if present)
   - De-superheater 1 temperature (if enabled) De-superheater 1 set pont (it could be the fix set point or the dynamic set point)
   - De-superheater 2 temperature (if enabled) De-superheater 2 set pont (it could be the fix set point or the dynamic set point)
   - De-superheater 3 temperature (if enabled) De-superheater 3 set pont (it could be the fix set point or the dynamic set point)



8. ALARMS

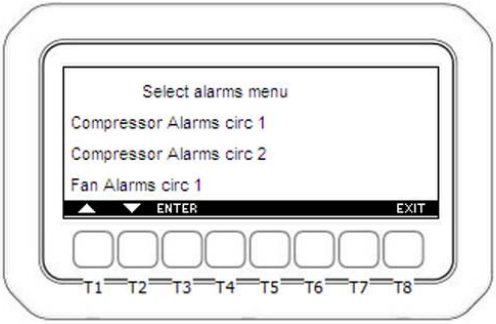
8.1 Menu Active alarms



If the alarm icon is flashing on the main display, an alarm is occurring.

Push the **ALARM** key to enter the alarm menu.

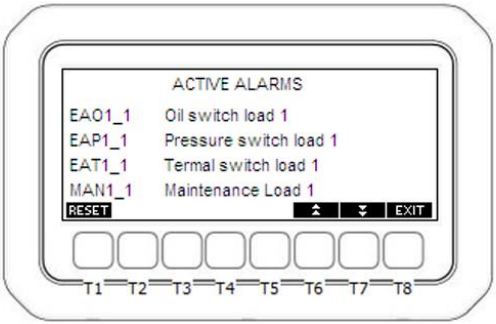
1. Push the **ALARM** key to enter the **ALARM MENU,**
2. If a alarm is present, the header of the corerspondent menu is flashing.
3. The alam menu are



Alarm menu:

COMPRESSOR ALARMS CIRC 1
COMPRESSOR ALARMS CIRC 2
FAN ALARMS CIRC 1
FAN ALARMS CIRC 2
CIRCUIT 1 ALARMS
CIRCUIT 2 ALARMS
GENERIC ALARMS
CORESENSE ALARMS
Expansion module offline alarm- IPX106D
Expansion module offline alarm- IPX215D

4. Select the SECTION by means of the **UP** and **DOWN** keys.
5. Push the **ENTER** key, to confirm and enter the alarm sub-menu.



The alarm menu displays the active alarm with the following layout:
Column 1 = alarm code
Column 2 = alarm description

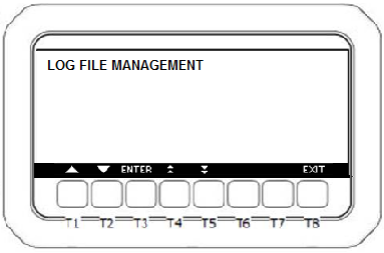
9. LOG MENU

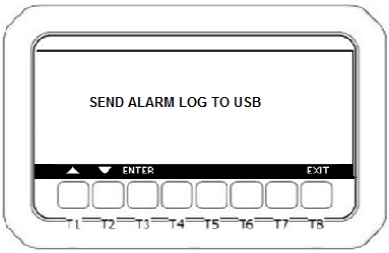
9.1 Active alarm log menu

The IProRack stores up to 100 Alarms in a log file. For each alarm the start and end date is logged. This file can be exported through the website integrated on a memory card or via the USB port.

Procedure**:**

1. Enter the **SERVICE** menu
2. Select **LOG FILE MANAGEMENT** sub-menu
3. Push the **ENTER** key.
4. The fille is sent to the USB stick.
   When the file has been sent the message “Send completed successfully!” is shown
   Otherwise the message “Send error!” is shown



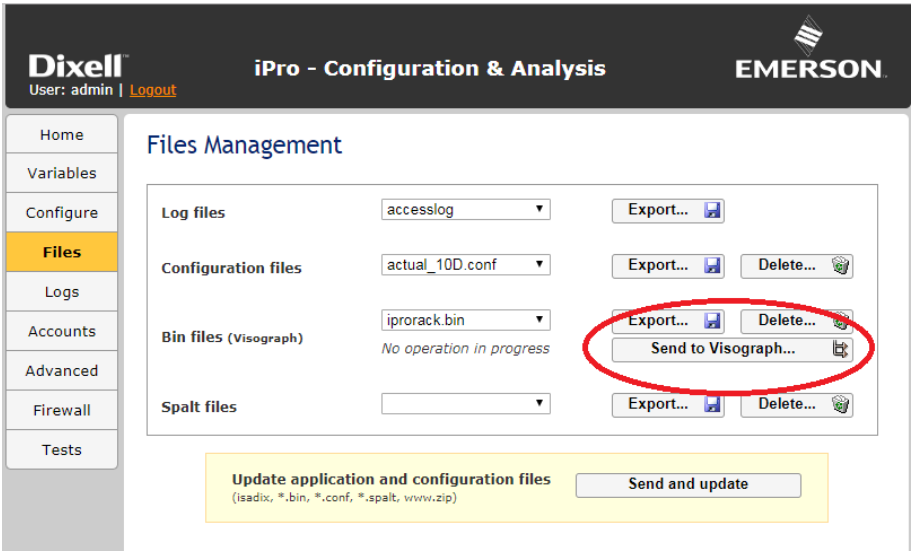


NOTE: If the USB stick is not ready, the message “Warning!USB not ready” is shown.

10. Updating the visograph from the website

If you need to update the application for Vidograph is necessary to follow a two-step procedure:
Launch the browser in your computer and write the following web site address: http://192.168.0.250 (if your IP is different, write the correct one):
Log in, see chapter 4.1 Direct connection (between iPRO and PC with a cable),

- Load the file “iprorack.bin” into the device
- Then push the “Send to Visograph…” button.



The file will be written into the visograph. Once the downloaded will be finished the visograph will reboot automatically.

11. CONFIGURATION SUB-MENU

The configuration sub menus contained in the parameter list, allow the user to configure the iprorack, according to the kind of racks.

11.1 Parameters for iProRack I/O configuration

All the I/O configurations are stored in 4 parameter groups:

- **DIC (IPR251D: 43 parameters)**
- **DOC (IPR251D: 36 parameters);**
- **AOC (IPR251D: 6 parameters);**
- **AIC (IPR251D: 27 parameters);**

For digital I/Os, there is a **double configuration** (active with open contact or with closed contact).

11.1.1 DIGITAL-INPUTS (parameters DIC1- DIC43)

Parameter	Description	IPRC215D	IPX206D	IPX215D
DIC1	Configuration Digital Input 1	x		
DIC 2	Configuration Digital Input 2	x		
DIC 3	Configuration Digital Input 3	x		
DIC 4	Configuration Digital Input 4	x		
DIC 5	Configuration Digital Input 5	x		
DIC 6	Configuration Digital Input 6	x		
DIC 7	Configuration Digital Input 7	x		
DIC 8	Configuration Digital Input 8	x		
DIC 9	Configuration Digital Input 9	x		
DIC 10	Configuration Digital Input 10	x		
DIC 11	Configuration Digital Input 11	x		
DIC 12	Configuration Digital Input 12	x		
DIC 13	Configuration Digital Input 13	x		
DIC 14	Configuration Digital Input 14	x		
DIC 15	Configuration Digital Input 15	x		
DIC 16	Configuration Digital Input 16	x		
DIC 17	Configuration Digital Input 17	x		
DIC 18	Configuration Digital Input 18	x		
DIC 19	Configuration Digital Input 19	x		
DIC 20	Configuration Digital Input 20	x		
DIC 21	Configuration Digital Input 21		x	
DIC 22	Configuration Digital Input 22		x	
DIC 23	Configuration Digital Input 23		x	
DIC 24	Configuration Digital Input 24			x
DIC 25	Configuration Digital Input 25			x
DIC 26	Configuration Digital Input 26			x
DIC 27	Configuration Digital Input 27			x
DIC 28	Configuration Digital Input 28			x
DIC 29	Configuration Digital Input 29			x
DIC 30	Configuration Digital Input 30			x

Parameter	Description	IPRC215D	IPX206D	IPX215D
DIC 31	Configuration Digital Input 31			x
DIC 32	Configuration Digital Input 32			x
DIC 33	Configuration Digital Input 33			x
DIC 34	Configuration Digital Input 34			x
DIC 35	Configuration Digital Input 35			x
DIC 36	Configuration Digital Input 36			x
DIC 37	Configuration Digital Input 37			x
DIC 38	Configuration Digital Input 38			x
DIC 39	Configuration Digital Input 39			x
DIC 40	Configuration Digital Input 40			x
DIC 41	Configuration Digital Input 41			x
DIC 42	Configuration Digital Input 42			x
DIC 43	Configuration Digital Input 43			x

DIGITAL INPUTS CONFIGURATION DIC1-DIC43

"c" the digital input is activated by closing the contacts
"o" the digital input is activated by opening the contacts;
The next number indicates the Input function as described above.

Values
0 Not used
1o Compressor 1 oil pressostate Circuit 1
1c Compressor 1 oil pressostate Circuit 1
2o Compressor Safety pressostate 1 Circuit 1
2c Compressor Safety pressostate 1 Circuit 1
3o Thermal Safety Compressor 1 Circuit 1
3c Thermal Safety Compressor 1 Circuit 1
4o Compressor oil pressostate 2 Circuit 1
4c Compressor oil pressostate 2 Circuit 1
5o Compressor Safety pressostate 2 Circuit 1
5c Compressor Safety pressostate 2 Circuit 1
6o Thermal Safety Compressor 2 Circuit 1
6c Thermal Safety Compressor 2 Circuit 1
7o Compressor oil pressostate 3 Circuit 1
7c Compressor oil pressostate 3 Circuit 1
8o Compressor Safety pressostate 3 Circuit 1
8c Compressor Safety pressostate 3 Circuit 1
9o Thermal Safety Compressor 3 Circuit 1
9c Thermal Safety Compressor 3 Circuit 1
10o Compressor oil pressostate 4 Circuit 1
10c Compressor oil pressostate 4 Circuit 1
11o Compressor Safety pressostate 4 Circuit 1
11c Compressor Safety pressostate 4 Circuit 1
12o Thermal Safety Compressor 4 Circuit 1
12c Thermal Safety Compressor 4 Circuit 1
13o Compressor oil pressostate 5 Circuit 1
13c Compressor oil pressostate 5 Circuit 1
14o Compressor Safety pressostate 5 Circuit 1
14c Compressor Safety pressostate 5 Circuit 1

15o Thermal Safety Compressor 5 Circuit 1
15c Thermal Safety Compressor 5 Circuit 1
16o Compressor oil pressostate 6 Circuit 1
16c Compressor oil pressostate 6 Circuit 1
17o Compressor Safety pressostate 6 Circuit 1
17c Compressor Safety pressostate 6 Circuit 1
18o Thermal Safety Compressor 6 Circuit 1
18c Thermal Safety Compressor 6 Circuit 1
19o Compressor oil pressostate 7 Circuit 1
19c Compressor oil pressostate 7 Circuit 1
20o Compressor Safety pressostate7 Circuit 1
20c Compressor Safety pressostate7 Circuit 1
21o Thermal Safety Compressor 7 Circuit 1
21c Thermal Safety Compressor 7 Circuit 1
22o Compressor oil pressostate 8 Circuit 1
22c Compressor oil pressostate 8 Circuit 1
23o Compressor Safety pressostate 8 Circuit 1
23c Compressor Safety pressostate 8 Circuit 1
24o Thermal Safety Compressor 8 Circuit 1
24c Thermal Safety Compressor 8 Circuit 1
25o Compressor oil pressostate 9 Circuit 1
25c Compressor oil pressostate 9 Circuit 1
26o Compressor Safety pressostate9 Circuit 1
26c Compressor Safety pressostate9 Circuit 1
27o Thermal Safety Compressor 9 Circuit 1
27c Thermal Safety Compressor 9 Circuit 1
28o Compressor oil pressostate 10 Circuit 1
28c Compressor oil pressostate 10 Circuit 1
29o Compressor Safety pressostate 10 Circuit 1
29c Compressor Safety pressostate 10 Circuit 1
30o Thermal Safety Compressor 10 Circuit 1
30c Thermal Safety Compressor 10 Circuit 1
31o Compressor oil pressostate 11 Circuit 1
31c Compressor oil pressostate 11 Circuit 1
32o Compressor Safety pressostate11 Circuit 1
32c Compressor Safety pressostate11 Circuit 1
33o Thermal Safety Compressor 11 Circuit 1
33c Thermal Safety Compressor 11 Circuit 1
34o Compressor oil pressostate 12 Circuit 1
34c Compressor oil pressostate 12 Circuit 1
35o Compressor Safety pressostate12 Circuit 1
35c Compressor Safety pressostate12 Circuit 1
36o Thermal Safety Compressor 12 Circuit 1
36c Thermal Safety Compressor 12 Circuit 1
37o Compressor oil pressostate 1 Circuit 2
37c Compressor oil pressostate 1 Circuit 2
38o Compressor Safety pressostate 1 Circuit 2
38c Compressor Safety pressostate 1 Circuit 2
39o Thermal Safety Compressor 1 Circuit 2
39c Thermal Safety Compressor 1 Circuit 2
40o Compressor oil pressostate 2 Circuit 2
40c Compressor oil pressostate 2 Circuit 2
41o Compressor Safety pressostate 2 Circuit 2
41c Compressor Safety pressostate 2 Circuit 2
42o Thermal Safety Compressor 2 Circuit 2

42c Thermal Safety Compressor 2 Circuit 2
43o Compressor oil pressostate 3 Circuit 2
43c Compressor oil pressostate 3 Circuit 2
44o Compressor Safety pressostate3 Circuit 2
44c Compressor Safety pressostate3 Circuit 2
45o Thermal Safety Compressor 3 Circuit 2
45c Thermal Safety Compressor 3 Circuit 2
46o Compressor oil pressostate 4 Circuit 2
46c Compressor oil pressostate 4 Circuit 2
47o Compressor Safety pressostate 4 Circuit 2
47c Compressor Safety pressostate 4 Circuit 2
48o Thermal Safety Compressor 4 Circuit 2
48c Thermal Safety Compressor 4 Circuit 2
49o Compressor oil pressostate 5 Circuit 2
49c Compressor oil pressostate 5 Circuit 2
50o Compressor Safety pressostate 5 Circuit 2
50c Compressor Safety pressostate 5 Circuit 2
51o Thermal Safety Compressor 5 Circuit 2
51c Thermal Safety Compressor 5 Circuit 2
52o Compressor oil pressostate 6 Circuit 2
52c Compressor oil pressostate 6 Circuit 2
53o Compressor Safety pressostate6 Circuit 2
53c Compressor Safety pressostate6 Circuit 2
54o Thermal Safety Compressor 6 Circuit 2
54c Thermal Safety Compressor 6 Circuit 2
55o Compressor oil pressostate 7 Circuit 2
55c Compressor oil pressostate 7 Circuit 2
56o Compressor Safety pressostate 7 Circuit 2
56c Compressor Safety pressostate 7 Circuit 2
57o Thermal Safety Compressor 7 Circuit 2
57c Thermal Safety Compressor 7 Circuit 2
58o Compressor oil pressostate 8 Circuit 2
58c Compressor oil pressostate 8 Circuit 2
59o Compressor Safety pressostate8 Circuit 2
59c Compressor Safety pressostate8 Circuit 2
60o Thermal Safety Compressor 8 Circuit 2
60c Thermal Safety Compressor 8 Circuit 2
61o Compressor oil pressostate 9 Circuit 2
61c Compressor oil pressostate 9 Circuit 2
62o Compressor Safety pressostate 9 Circuit 2
62c Compressor Safety pressostate 9 Circuit 2
63o Thermal Safety Compressor 9 Circuit 2
63c Thermal Safety Compressor 9 Circuit 2
64o Compressor oil pressostate 10 Circuit 2
64c Compressor oil pressostate 10 Circuit 2
65o Compressor Safety pressostate 10 Circuit 2
65c Compressor Safety pressostate 10 Circuit 2
66o Thermal Safety Compressor 10 Circuit 2
66c Thermal Safety Compressor 10 Circuit 2
67o Compressor oil pressostate 11 Circuit 2
67c Compressor oil pressostate 11 Circuit 2
68o Compressor Safety pressostate 11 Circuit 2
68c Compressor Safety pressostate 11 Circuit 2
69o Thermal Safety Compressor 11 Circuit 2
69c Thermal Safety Compressor 11 Circuit 2

70o Compressor oil pressostate 12 Circuit 2
70c Compressor oil pressostate 12 Circuit 2
71o Compressor Safety pressostate 12 Circuit 2
71c Compressor Safety pressostate 12 Circuit 2
72o Thermal Safety Compressor 12 Circuit 2
72c Thermal Safety Compressor 12 Circuit 2
73o Fan safety1 Circuit 1
73c Fan safety1 Circuit 1
74o Fan safety2 Circuit 1
74c Fan safety2 Circuit 1
75o Fan safety3 Circuit 1
75c Fan safety3 Circuit 1
76o Fan safety4 Circuit 1
76c Fan safety4 Circuit 1
77o Fan safety5 Circuit 1
77c Fan safety5 Circuit 1
78o Fan safety6 Circuit 1
78c Fan safety6 Circuit 1
79o Fan safety7 Circuit 1
79c Fan safety7 Circuit 1
80o Fan safety8 Circuit 1
80c Fan safety8 Circuit 1
81o Fan safety9 Circuit 1
81c Fan safety9 Circuit 1
82o Fan safety10 Circuit 1
82c Fan safety10 Circuit 1
83o Fan safety11 Circuit 1
83c Fan safety11 Circuit 1
84o Fan safety12 Circuit 1
84c Fan safety12 Circuit 1
85o Fan safety1 Circuit 2
85c Fan safety1 Circuit 2
86o Fan safety2 Circuit 2
86c Fan safety2 Circuit 2
87o Fan safety3 Circuit 2
87c Fan safety3 Circuit 2
88o Fan safety4 Circuit 2
88c Fan safety4 Circuit 2
89o Fan safety5 Circuit 2
89c Fan safety5 Circuit 2
90o Fan safety6 Circuit 2
90c Fan safety6 Circuit 2
91o Fan safety7 Circuit 2
91c Fan safety7 Circuit 2
92o Fan safety8 Circuit 2
92c Fan safety8 Circuit 2
93o Fan safety9 Circuit 2
93c Fan safety9 Circuit 2
94o Fan safety10 Circuit 2
94c Fan safety10 Circuit 2
95o Fan safety11 Circuit 2
95c Fan safety11 Circuit 2
96o Fan safety12 Circuit 2
96c Fan safety12 Circuit 2
97o Heat reclaim 1 (see the note here below)

97c Heat reclaim 1
98o Heat reclaim 2
98c Heat reclaim 2
99o High pressure Circuit 1
99c High pressure Circuit 1
100o High pressure Circuit 2
100c High pressure Circuit 2
101o Low pressure Circuit 1
101c Low pressure Circuit 1
102o Low pressure Circuit 2
102c Low pressure Circuit 2
103o ON/OFF (see the note here below)
103c ON/OFF
104o Not Used
104c Not Used
105o Energy saving Circuit 1
105c Energy saving Circuit 1
106o Energy saving Circuit 2
106c Energy saving Circuit 2
107o ON/OFF Circuit 1
107c ON/OFF Circuit 1
108o ON/OFF Circuit 2
108c ON/OFF Circuit 2
109o Liquid level Circuit 1
109c Liquid level Circuit 1
110o Liquid level Circuit 2
110c Liquid level Circuit 2
111o Disable CRO Circuit 1 (see the note here below)
111c Disable CRO Circuit 1
112o Disable CRO Circuit 2
112c Disable CRO Circuit 2
113o Disable Dynamic Setpoint Circuit 1
113c Disable Dynamic Setpoint Circuit 1
114o Disable Dynamic Setpoint Circuit 2
114c Disable Dynamic Setpoint Circuit 2
115o Oil of compressor with Inverter suction Circuit 1
115c Oil of compressor with Inverter suction Circuit 1
116o Safety of Compressor with Inverter Suction Circuit 1
116c Safety of Compressor with Inverter Suction Circuit 1
117o Thermal Safety of Compressor with Inverter suction Circuit 1
117c Thermal Safety of Compressor with Inverter suction Circuit 1
118o Oil of compressor with Inverter suction Circuit 2
118c Oil of compressor with Inverter suction Circuit 2
119o Safety of Compressor with Inverter Suction Circuit 2
119c Safety of Compressor with Inverter Suction Circuit 2
120o Thermal Safety of Compressor with Inverter suction Circuit 2
120c Thermal Safety of Compressor with Inverter suction Circuit 2
121o Safety Inverter condenser Circuit 1
121c Safety Inverter condenser Circuit 1
122o Safety Inverter condenser Circuit 2
122c Safety Inverter condenser Circuit 2
123o Safety Input Coresense 1: it stops the compressor related to the Coresense 1
123c Safety Input Coresense 1: it stops the compressor related to the Coresense 1
124o Safety Input Coresense 2: it stops the compressor related to the Coresense 2
124c Safety Input Coresense 2: it stops the compressor related to the Coresense 2

125o Safety Input Coresense 3: it stops the compressor related to the Coresense 3
125c Safety Input Coresense 3: it stops the compressor related to the Coresense 3
126o Safety Input Coresense 4: it stops the compressor related to the Coresense 4
126c Safety Input Coresense 4: it stops the compressor related to the Coresense 4
127o Safety Input Coresense 5: it stops the compressor related to the Coresense 5
127c Safety Input Coresense 5: it stops the compressor related to the Coresense 5
128o Safety Input Coresense 6: it stops the compressor related to the Coresense 6
128c Safety Input Coresense 6: it stops the compressor related to the Coresense 6
129o Safety Input Coresense 7: it stops the compressor related to the Coresense 7
129c Safety Input Coresense 7: it stops the compressor related to the Coresense 7
130o Safety Input Coresense 8: it stops the compressor related to the Coresense 8
130c Safety Input Coresense 8: it stops the compressor related to the Coresense 8
131o Safety Input Coresense 9: it stops the compressor related to the Coresense 9
131c Safety Input Coresense 9: it stops the compressor related to the Coresense 9
132o Safety Input Coresense 10: it stops the compressor related to the Coresense 10
132c Safety Input Coresense 10: it stops the compressor related to the Coresense 10
133o Safety Input Coresense 11: it stops the compressor related to the Coresense 11
133c Safety Input Coresense 11: it stops the compressor related to the Coresense 11
134o Safety Input Coresense 12: it stops the compressor related to the Coresense 12
134c Safety Input Coresense 12: it stops the compressor related to the Coresense 12
135o Safety Input Coresense 13: it stops the compressor related to the Coresense 13
135c Safety Input Coresense 13: it stops the compressor related to the Coresense 13
136o Safety Input Coresense 14: it stops the compressor related to the Coresense 14
136c Safety Input Coresense 14: it stops the compressor related to the Coresense 14
137o Safety Input Coresense 15: it stops the compressor related to the Coresense 15
137c Safety Input Coresense 15: it stops the compressor related to the Coresense 15
138o Inverter suction 1 safety
138c Inverter suction 1 safety
139o Inverter suction 2 safety
139c Inverter suction 2 safety
140o Start split condenser function – circuit 1
140c Start split condenser function – circuit 1
141o Start split condenser function – circuit 2
141c Start split condenser function – circuit 2
142o Start AUX output 1
142c Start AUX output 1
143o Start AUX output 2
143c Start AUX output 2
144o Start AUX output 3
144c Start AUX output 3
145o Start AUX output 4
145c Start AUX output 4
146o Start AUX output 5
146c Start AUX output 5
147o Start AUX output 6
147c Start AUX output 6
148o Start AUX output 7
148c Start AUX output 7
149o Start AUX output 8
149c Start AUX output 8
150o Burst disc alarm
150c Burst disc alarm
151o Phase fail alarm
151c Phase fail alarm
152o External alarm 1

152c External alarm 1
153o External alarm 2
153c External alarm 2
154o External alarm 3
154c External alarm 3
155o External alarm 4
155c External alarm 4
156o H-R2 pump flow switch
156c H-R2 pump flow switch
157o H-R2 pump thermal protection
157c H-R2 pump thermal protection
158o Thermal Safety De-Superheater 1
158c Thermal Safety De-Superheater 1
159o Thermal Safety De-Superheater 2
159c Thermal Safety De-Superheater 2
160o Thermal Safety De-Superheater 3
160c Thermal Safety De-Superheater 3
164o Change oil separator switch
164c Change oil separator switch
165o High oil separator lockout
165c High oil separator lockout
166o Rack exhaust fan
166c Rack exhaust fan
167o Break glass switch
167c Break glass switch
169o Silent function circuit 1
169c Silent function circuit 1
170o Silent function circuit 2
170c Silent function circuit 2
173o Parallel compression- Compressor 1 oil pressostate
173c Parallel compression- Compressor 1 oil pressostate
174o Parallel compression- Compressor 1 Safety pressostate
174c Parallel compression- Compressor 1 Safety pressostate
175o Parallel compression- Compressor 1 Thermal Safety
175c Parallel compression- Compressor 1 Thermal Safety
176o Parallel compression- Compressor 2 oil pressostate
176c Parallel compression- Compressor 2 oil pressostate
177o Parallel compression- Compressor 2 Safety pressostate
177c Parallel compression- Compressor 2 Safety pressostate
178o Parallel compression- Compressor 2 Thermal Safety
178c Parallel compression- Compressor 2 Thermal Safety
179o Parallel compression- Compressor 3 oil pressostate
179c Parallel compression- Compressor 3 oil pressostate
180o Parallel compression- Compressor 3 Safety pressostate
180c Parallel compression- Compressor 3 Safety pressostate
181o Parallel compression- Compressor 3 Thermal Safety
181c Parallel compression- Compressor 3 Thermal Safety
182o Parallel compression- Frequency compressor, oil pressostate
182c Parallel compression- Frequency compressor, oil pressostate
183o Parallel compression- Frequency compressor, Safety pressostate
183c Parallel compression- Frequency compressor, Safety pressostate
184o Parallel compression- Frequency compressor, Thermal Safety
184c Parallel compression- Frequency compressor, Thermal Safety
185o Parallel compression– Inverter Safety
185c Parallel compression– Inverter Safety

***Note**: if both 103 and 111 are present, only the 103 is used, the 111 is ignored. The same for 103 and 112.*
***Note**: if there is a heat reclaim, the corresponding relay is activated (DO119-DO120). The set point of the condenser has to be summed to RC33 (RC34), set point = setCircuit + dyn + ES + heatRecovery.*
***Note**: CRO function is only used for evaporator set point.*
If when the Disable CRO Circuit DI is not active (e.g. Circuit 1)
Instead use the formula set point = setCircuit1 + dyn + ES
Use the CRO value sent by xWeb, set point = CRO.
There are 2 ways for coming back to set point = setCiircuit1 + dyn + ES
1) The "Disable CRO Circuit 1" is enabled.
2) If the "Disable CRO Circuit 1" is still disabled, after a timeout of 5mins.
In fact, the xWeb every minute sends again the same CRO command.
***Note**: the silent function is only for fans.*

11.1.2 DIGITAL-OUTPUTS (parameters DOC1- DOC36)

Parameter	Description	IPRC215D	IPX206D/ IPX106D	IPX215D/ IPX115D
DOC1	Configuration Digital Output 1	x		
DOC 2	Configuration Digital Output 2	x		
DOC 3	Configuration Digital Output 3	x		
DOC 4	Configuration Digital Output 4	x		
DOC 5	Configuration Digital Output 5	x		
DOC 6	Configuration Digital Output 6	x		
DOC 7	Configuration Digital Output 7	x		
DOC 8	Configuration Digital Output 8	x		
DOC 9	Configuration Digital Output 9	x		
DOC 10	Configuration Digital Output 10	x		
DOC 11	Configuration Digital Output 11	x		
DOC 12	Configuration Digital Output 12	x		
DOC 13	Configuration Digital Output 13	x		
DOC 14	Configuration Digital Output 14	x		
DOC 15	Configuration Digital Output 15	x		
DOC 16	Configuration Digital Output 16		x	
DOC 17	Configuration Digital Output 17		x	
DOC 18	Configuration Digital Output 18		x	
DOC 19	Configuration Digital Output 19		x	
DOC 20	Configuration Digital Output 20		x	
DOC 21	Configuration Digital Output 21		x	
DOC 22	Configuration Digital Output 22			x
DOC 23	Configuration Digital Output 23			x
DOC 24	Configuration Digital Output 24			x
DOC 25	Configuration Digital Output 25			x
DOC 26	Configuration Digital Output 26			x
DOC 27	Configuration Digital Output 27			x
DOC 28	Configuration Digital Output 28			x
DOC 29	Configuration Digital Output 29			x

DOC 30	Configuration Digital Output 30			x
DOC 31	Configuration Digital Output 31			x
DOC 32	Configuration Digital Output 32			x
DOC 33	Configuration Digital Output 33			x
DOC 34	Configuration Digital Output 34			x
DOC 35	Configuration Digital Output 35			x
DOC 36	Configuration Digital Output 36			x

Values

0	Not used
1o	Inverter 1 Suction Circuit 1
1c	Inverter 1 Suction Circuit 1
2o	Inverter 2 Suction Circuit 1 – NOT USED
2c	Inverter 2 Suction Circuit 1– NOT USED
3o	Inverter 1 Suction Circuit 2
3c	Inverter 1 Suction Circuit 2
4o	Inverter 2 Suction Circuit 2– NOT USED
4c	Inverter 2 Suction Circuit 2– NOT USED
5o	Inverter Condenser Circuit 1
5c	Inverter Condenser Circuit 1
6o	Inverter Condenser Circuit 2
6c	Inverter Condenser Circuit 2
7o	Compressor 1 Circuit 1
7c	Compressor 1 Circuit 1
8o	Step n° 1 Compressor 1 Circuit 1
8c	Step n° 1 Compressor 1 Circuit 1
9o	Step n° 2 Compressor 1 Circuit 1
9c	Step n° 2 Compressor 1 Circuit 1
10o	Step n° 3 Compressor 1 Circuit 1
10c	Step n° 3 Compressor 1 Circuit 1
11o	Compressor 2 Circuit 1
11c	Compressor 2 Circuit 1
12o	Step n° 1 Compressor 2 Circuit 1
12c	Step n° 1 Compressor 2 Circuit 1
13o	Step n° 2 Compressor 2 Circuit 1
13c	Step n° 2 Compressor 2 Circuit 1
14o	Step n° 3 Compressor 2 Circuit 1
14c	Step n° 3 Compressor 2 Circuit 1
15o	Compressor 3 Circuit 1
15c	Compressor 3 Circuit 1
16o	Step n° 1 Compressor 3 Circuit 1
16c	Step n° 1 Compressor 3 Circuit 1
17o	Step n° 2 Compressor 3 Circuit 1
17c	Step n° 2 Compressor 3 Circuit 1
18o	Step n° 3 Compressor 3 Circuit 1
18c	Step n° 3 Compressor 3 Circuit 1
19o	Compressor 4 Circuit 1
19c	Compressor 4 Circuit 1
20o	Step n° 1 Compressor 4 Circuit 1
20c	Step n° 1 Compressor 4 Circuit 1
21o	Step n° 2 Compressor 4 Circuit 1
21c	Step n° 2 Compressor 4 Circuit 1

22o Step n° 3 Compressor 4 Circuit 1
22c Step n° 3 Compressor 4 Circuit 1
23o Compressor 5 Circuit 1
23c Compressor 5 Circuit 1
24o Step n° 1 Compressor 5 Circuit 1
24c Step n° 1 Compressor 5 Circuit 1
25o Step n° 2 Compressor 5 Circuit 1
25c Step n° 2 Compressor 5 Circuit 1
26o Step n° 3 Compressor 5 Circuit 1
26c Step n° 3 Compressor 5 Circuit 1
27o Compressor 6 Circuit 1
27c Compressor 6 Circuit 1
28o Step n° 1 Compressor 6 Circuit 1
28c Step n° 1 Compressor 6 Circuit 1
29o Step n° 2 Compressor 6 Circuit 1
29c Step n° 2 Compressor 6 Circuit 1
30o Step n° 3 Compressor 6 Circuit 1
30c Step n° 3 Compressor 6 Circuit 1
31o Compressor 1 Circuit 2
31c Compressor 1 Circuit 2
32o Step n° 1 Compressor 1 Circuit 2
32c Step n° 1 Compressor 1 Circuit 2
33o Step n° 2 Compressor 1 Circuit 2
33c Step n° 2 Compressor 1 Circuit 2
34o Step n° 3 Compressor 1 Circuit 2
34c Step n° 3 Compressor 1 Circuit 2
35o Compressor 2 Circuit 2
35c Compressor 2 Circuit 2
36o Step n° 1 Compressor 2 Circuit 2
36c Step n° 1 Compressor 2 Circuit 2
37o Step n° 2 Compressor 2 Circuit 2
37c Step n° 2 Compressor 2 Circuit 2
38o Step n° 3 Compressor 2 Circuit 2
38c Step n° 3 Compressor 2 Circuit 2
39o Compressor 3 Circuit 2
39c Compressor 3 Circuit 2
40o Step n° 1 Compressor 3 Circuit 2
40c Step n° 1 Compressor 3 Circuit 2
41o Step n° 2 Compressor 3 Circuit 2
41c Step n° 2 Compressor 3 Circuit 2
42o Step n° 3 Compressor 3 Circuit 2
42c Step n° 3 Compressor 3 Circuit 2
43o Compressor 4 Circuit 2
43c Compressor 4 Circuit 2
44o Step n° 1 Compressor 4 Circuit 2
44c Step n° 1 Compressor 4 Circuit 2
45o Step n° 2 Compressor 4 Circuit 2
45c Step n° 2 Compressor 4 Circuit 2
46o Step n° 3 Compressor 4 Circuit 2
46c Step n° 3 Compressor 4 Circuit 2
47o Compressor 5 Circuit 2
47c Compressor 5 Circuit 2
48o Step n° 1 Compressor 5 Circuit 2
48c Step n° 1 Compressor 5 Circuit 2
49o Step n° 2 Compressor 5 Circuit 2

49c	Step n° 2 Compressor 5 Circuit 2
50o	Step n° 3 Compressor 5 Circuit 2
50c	Step n° 3 Compressor 5 Circuit 2
51o	Compressor 6 Circuit 2
51c	Compressor 6 Circuit 2
52o	Step n° 1 Compressor 6 Circuit 2
52c	Step n° 1 Compressor 6 Circuit 2
53o	Step n° 2 Compressor 6 Circuit 2
53c	Step n° 2 Compressor 6 Circuit 2
54o	Step n° 3 Compressor 6 Circuit 2
54c	Step n° 3 Compressor 6 Circuit 2
55o	Compressor 7 Circuit 1
55c	Compressor 7 Circuit 1
56o	Compressor 8 Circuit 1
56c	Compressor 8 Circuit 1
57o	Compressor 9 Circuit 1
57c	Compressor 9 Circuit 1
58o	Compressor 10 Circuit 1
58c	Compressor 10 Circuit 1
59o	Compressor 11 Circuit 1
59c	Compressor 11 Circuit 1
60o	Compressor 12 Circuit 1
60c	Compressor 12 Circuit 1
61o	Compressor 7 Circuit 2
61c	Compressor 7 Circuit 2
62o	Compressor 8 Circuit 2
62c	Compressor 8 Circuit 2
63o	Compressor 9 Circuit 2
63c	Compressor 9 Circuit 2
64o	Compressor 10 Circuit 2
64c	Compressor 10 Circuit 2
65o	Compressor 11 Circuit 2
65c	Compressor 11 Circuit 2
66o	Compressor 12 Circuit 2
66c	Compressor 12 Circuit 2
67o	Fan 1 Circuit 1
67c	Fan 1 Circuit 1
68o	Fan 2 Circuit 1
68c	Fan 2 Circuit 1
69o	Fan 3 Circuit 1
69c	Fan 3 Circuit 1
70o	Fan 4 Circuit 1
70c	Fan 4 Circuit 1
71o	Fan 5 Circuit 1
71c	Fan 5 Circuit 1
72o	Fan 6 Circuit 1
72c	Fan 6 Circuit 1
73o	Fan 7 Circuit 1
73c	Fan 7 Circuit 1
74o	Fan 8 Circuit 1
74c	Fan 8 Circuit 1
75o	Fan 9 Circuit 1
75c	Fan 9 Circuit 1
76o	Fan 10 Circuit 1
76c	Fan 10 Circuit 1

77o	Fan 11 Circuit 1
77c	Fan 11 Circuit 1
78o	Fan 12 Circuit 1
78c	Fan 12 Circuit 1
79o	Fan 1 Circuit 2
79c	Fan 1 Circuit 2
80o	Fan 2 Circuit 2
80c	Fan 2 Circuit 2
81o	Fan 3 Circuit 2
81c	Fan 3 Circuit 2
82o	Fan 4 Circuit 2
82c	Fan 4 Circuit 2
83o	Fan 5 Circuit 2
83c	Fan 5 Circuit 2
84o	Fan 6 Circuit 2
84c	Fan 6 Circuit 2
85o	Fan 7 Circuit 2
85c	Fan 7 Circuit 2
86o	Fan 8 Circuit 2
86c	Fan 8 Circuit 2
87o	Fan 9 Circuit 2
87c	Fan 9 Circuit 2
88o	Fan 10 Circuit 2
88c	Fan 10 Circuit 2
89o	Fan 11 Circuit 2
89c	Fan 11 Circuit 2
90o	Fan 12 Circuit 2
90c	Fan 12 Circuit 2
91o	Alarm
91c	Alarm
92o	Alarm type 1
92c	Alarm type 1
93o	Alarm type 2
93c	Alarm type 2
94o	Auxiliary output 1
94c	Auxiliary output 1
95o	Auxiliary output 2
95c	Auxiliary output 2
96o	Auxiliary output 3
96c	Auxiliary output 3
97o	Auxiliary output 4
97c	Auxiliary output 4
98o	Auxiliary output 5
98c	Auxiliary output 5
99o	Auxiliary output 6
99c	Auxiliary output 6
100o	Auxiliary output 7
100c	Auxiliary output 7
101o	Auxiliary output 8
101c	Auxiliary output 8
102o	OnF
102c	OnF
103o	Inverter free circuit 1
103c	Inverter free circuit 1
104o	Inverter free circuit 2

104c Inverter free circuit 2
105o Valve superheat circuit 1
105c Valve superheat circuit 1
106o Valve superheat circuit 2
106c Valve superheat circuit 2
107 Valve 6D circuit 1
108 Valve 6D circuit 2
109o By-pass inverter 1 Suction Circuit 1
109c By-pass inverter 1 Suction Circuit 1
110o By-pass inverter 1 Suction Circuit 2
110c By-pass inverter 1 Suction Circuit 2
111o Split condenser output – Circuit 1
111c Split condenser output – Circuit 1
112o Split condenser output – Circuit 2
112c Split condenser output – Circuit 2
113o Condenser drain valve output
113c Condenser drain valve output
114o Liquid line solenoid
114c Liquid line solenoid
115o Circuit Alarm relay for circuit 1
115c Circuit Alarm relay for circuit 1
116o Circuit Alarm relay for circuit 2
116c Circuit Alarm relay for circuit 2
118o Crank case heater Circuit 1
118c Crank case heater Circuit 1
119o Crank case heater Circuit 2
119c Crank case heater Circuit 2
120o Heat reclaim Circuit 1
120c Heat reclaim Circuit 1
121o Heat reclaim Circuit 2
121c Heat reclaim Circuit 2
122o Exhaust fan
122c Exhaust fan
123o Liquid injection valve circuit 1
123c Liquid injection valve circuit 1
124o Liquid injection valve circuit 2
124c Liquid injection valve circuit 2
125o Heat reclaim 3 way valve output
125c Heat reclaim 3 way valve output
126o H-R water pump output
126c H-R water pump output
127o Parallel compression- Inverter
127c Parallel compression- Inverter
128o Parallel compression– Compressor 1
128c Parallel compression– Compressor 1
129o Parallel compression – Step Compr. 1
129c Parallel compression – Step Compr. 1
130o Parallel compression– Compressor 2
130c Parallel compression– Compressor 2
131o Parallel compression – Step Compr. 2
131c Parallel compression – Step Compr. 2
132o Parallel compression– Compressor 3
132c Parallel compression– Compressor 3
133o Parallel compression – Step Compr. 3
133c Parallel compression – Step Compr. 3

134o De-superheat 1
134c De-superheat 1
135o De-superheat 2
135c De-superheat 2
136o De-superheat 3
136c De-superheat 3
137o Heat reclaim2 3 Way valve
137c Heat reclaim2 3 Way valve
138o 3 Way valve by pass
138c 3 Way valve by pass
139o H-R2 water pump output
139c H-R2 water pump output
140o Valve 1 CRii – Circuit 1
140c Valve 1 CRii – Circuit 1
141o Valve 2 CRii – Circuit 1
141c Valve 2 CRii – Circuit 1
142o Valve 3 CRii – Circuit 1
142c Valve 3 CRii – Circuit 1
143o Valve 1 CRii – Circuit 2
143c Valve 1 CRii – Circuit 2
144o Valve 2 CRii – Circuit 2
144c Valve 2 CRii – Circuit 2
145o Valve 3 CRii – Circuit 2
145c Valve 3 CRii – Circuit 2

11.1.3 ANALOG-OUTPUTS (parameters AOC1- AOC15)

Parameter	Description	IPRC215D/ IPR210D		IPX206D/ IPX106D		IPX215D/ IPX125D	
		TYPE	RANGE	TYPE	RANGE	TYPE	RANGE
AOC1	Configuration Analog Output 1	V	TAB B				
AOC 2	Configuration Analog Output 2	V	TAB B				
AOC 3	Configuration Analog Output 3	V	TAB B				
AOC 4	Configuration Analog Output 4	V	TAB B				
AOC 5	Configuration Analog Output 5	AV	TAB A				
AOC 6	Configuration Analog Output 6	AV	TAB A				
AOC 7	Configuration Analog Output 7			V	TAB D		
AOC 8	Configuration Analog Output 8			V	TAB D		
AOC 9	Configuration Analog Output 9			V	TAB D		
AOC 10	Configuration Analog Output 10					V	TAB D

AOC 11	Configuration Analog Output 11					V	TAB D
AOC 12	Configuration Analog Output 12					V	TAB D
AOC 13	Configuration Analog Output 13					V	TAB D
AOC 14	Configuration Analog Output 14					AV	TAB C
AOC 15	Configuration Analog Output 15					AV	TAB C

NB: **V** = 0-10V; **AV** = 4-20mA or 0-10V

TAB A: Output 4÷20mA - 0÷10V (IPRC215D AOC5-AOC6)

0	Not used
1	Proportional 0-10 V output
2	0-10V output inverter 1 Suction Circuit 1
3	0-10V output inverter 2 Suction Circuit 1
4	0-10V output inverter 1 Suction Circuit 2
5	0-10V output inverter 2 Suction Circuit 2
6	0-10V output inverter condenser Circuit 1
7	0-10V output inverter condenser Circuit 2
8	0-10V output inverter condenser free Circuit 1
9	0-10V output inverter condenser free Circuit 2
10	Proportional 4-20mA output free
11	4-20mA output inverter 1 Suction Circuit 1
12	4-20mA output inverter 2 Suction Circuit 1
13	4-20mA output inverter 1 Suction Circuit 2
14	4-20mA output inverter 2 Suction Circuit 2
15	4-20mA output inverter condenser Circuit 1
16	4-20mA output inverter condenser Circuit 2
17	4-20mA output inverter condenser free Circuit 1
18	4-20mA output inverter condenser free Circuit 2
19	0-10V H-R water pump output
20	0-10V HPV output
21	0-10V BGV ouptout
22	4-20mA H-R water pump output
23	4-20mA HPV output
24	4-20mA BGV output
25	0-10V Inverter parallel compression
26	4-20mA Inverter parallel compression
27	0-10V De-superheat 1
28	4-20mA De-superheat 1
29	0-10V De-superheat 2
30	4-20mA De-superheat 2
31	0-10V De-superheat 3
32	4-20mA De-superheat 3
33	0-10V H-R2 water pump output
34	4-20mA H-R2 water pump output

TAB B: Output 0÷10V (parameters IPRC215D AOC1-AOC4)

0	Not used
1	Proportional 0-10 V output
2	0-10V output inverter 1 Suction Circuit 1
3	0-10V output inverter 2 Suction Circuit 1
4	0-10V output inverter 1 Suction Circuit 2
5	0-10V output inverter 2 Suction Circuit 2
6	0-10V output inverter condenser Circuit 1
7	0-10V output inverter condenser Circuit 2
8	0-10V output inverter condenser free Circuit 1
9	0-10V output inverter condenser free Circuit 2
10	0-10V H-R water pump output
11	0-10V HPV output
12	0-10V BGV ouptout
13	0-10V Inverter parallel compression
14	0-10V De-superheat 1
15	0-10V De-superheat 2
16	0-10V De-superheat 3
17	0-10V H-R2 water pump output

TAB C: Output 4÷20mA - 0÷10V (parameters IPX215D: AOC14-AOC15)

0	Not used
1	0-10V H-R water pump output
2	0-10V HPV output
3	0-10V BGV ouptout
4	4-20mA H-R water pump output
5	4-20mA HPV output
6	4-20mA BGV output

TAB D: Output 0÷10V (IPX215D: AOC7-AOC13)

0	Not used
1	0-10V H-R water pump output
2	0-10V HPV output
3	0-10V BGV ouptout
4	0-10V De-superheat 1
5	0-10V De-superheat 2
6	0-10V De-superheat 3
7	0-10V H-R2 water pump output

11.1.4 ANALOG-INPUTS (parameters AIC1- AIC27)

Parameter	Description	min	max	IPRC215D/ IPR210D	IPX206D	IPX215D	XEV20D_1	XEV20D_2
AIC 1	Configuration Analog Input 1	0	178	x				
AIC 2	Configuration Analog Input 2	0	178	x				

Parameter	Description	min	max	IPRC215D/ IPR210D	IPX206D	IPX215D	XEV20D_1	XEV20D_2
AIC 3	Configuration Analog Input 3	0	178	x				
AIC 4	Configuration Analog Input 4	0	178	x				
AIC 5	Configuration Analog Input 5	0	178	x				
AIC 6	Configuration Analog Input 6	0	178	x				
AIC 7	Configuration Analog Input 7	0	178	x				
AIC 8	Configuration Analog Input 8	0	178	x				
AIC 9	Configuration Analog Input 9	0	178	x				
AIC 10	Configuration Analog Input 10	0	178	x				
AIC 11	Configuration Analog Input 11	0	178		x			
AIC 12	Configuration Analog Input 12	0	178		x			
AIC 13	Configuration Analog Input 13	0	178		x			
AIC 14	Configuration Analog Input 14	0	178		x			
AIC 15	Configuration Analog Input 15	0	178		x			
AIC 16	Configuration Analog Input 16	0	178		x			
AIC 17	Configuration Analog Input 17	0	178		x			
AIC 18	Configuration Analog Input 18	0	178			x		
AIC 19	Configuration Analog Input 19	0	178			x		
AIC 20	Configuration Analog Input 20	0	178			x		
AIC21	Configuration Analog Input 21	0	178			x		
AIC 22	Configuration Analog Input 22	0	178			x		
AIC 23	Configuration Analog Input 23	0	178			x		
AIC 24	Configuration Analog Input 24	0	178			x		
AIC 25	Configuration Analog Input 25	0	178			x		
AIC 26	Configuration Analog Input 26	0	178			x		
AIC 27	Configuration Analog Input 27	0	178			x		

Parameter	Description	min	max	IPRC215D/ IPR210D	IPX206D	IPX215D	XEV20D_1	XEV20D_2
AIC 28	Configuration Analog Input 28	0	145				x	
AIC 29	Configuration Analog Input 29	0	145				**x**	
AIC 30	Configuration Analog Input 30	0	178				**x**	
AIC 31	Configuration Analog Input 31	0	178				**x**	
AIC 32	Configuration Analog Input 32	0	145					x
AIC 33	Configuration Analog Input 33	0	145					**x**
AIC 34	Configuration Analog Input 24	0	178					x
AIC 35	Configuration Analog Input 25	0	178					**x**

Note: XEV20 has 4 AIs: They can be NTC, NTC CPC, PTC. It means that AIC28, AIC29 AI32, AI33can be only NTC, NTC CPC, PTC.

Configuration for AIC1 to AIC27

Value	Setting
0	Not used
1	NTC Temperature probe Suction Circuit1
2	NTC Temperature probe Suction Circuit2
3	NTC Temperature probe Condenser Circuit1
4	NTC Temperature probe Condenser Circuit2
5	NTC Temperature probe Thermostat Aux1
6	NTC Temperature probe Thermostat Aux2
7	NTC Temperature probe Thermostat Aux3
8	NTC Temperature probe Thermostat Aux4
9	NTC Temperature probe Thermostat Aux5
10	NTC Temperature probe Thermostat Aux6
11	NTC Temperature probe Thermostat Aux7
12	NTC Temperature probe Thermostat Aux8
13	NTC Temperature probe Dynamic / Split set condenser 1
14	NTC Temperature probe Dynamic / Split set condenser 2
15	NTC Temperature probe Dynamic set suction 1
16	NTC Temperature probe Dynamic set suction 2
17	NTC Temperature probe Superheat 1
18	NTC Temperature probe Superheat 2
19	PTC Temperature probe Suction Circuit1
20	PTC Temperature probe Suction Circuit2
21	PTC Temperature probe Condenser Circuit1
22	PTC Temperature probe Condenser Circuit2
23	PTC Temperature probe Thermostat Aux1
24	PTC Temperature probe Thermostat Aux2
25	PTC Temperature probe Thermostat Aux3
26	PTC Temperature probe Thermostat Aux4
27	PTC Temperature probe Thermostat Aux5

Value	Setting
28	PTC Temperature probe Thermostat Aux6
29	PTC Temperature probe Thermostat Aux7
30	PTC Temperature probe Thermostat Aux8
31	PTC Temperature probe Dynamic/ Split set condenser 1
32	PTC Temperature probe Dynamic/ Split set condenser 2
33	PTC Temperature probe Dynamic set suction 1
34	PTC Temperature probe Dynamic set suction 2
35	PTC Temperature probe Superheat 1
36	PTC Temperature probe Superheat 2
37	4-20mA Pressure Probe Suction Circuit1
38	4-20mA Pressure Probe Suction Circuit2
39	4-20mA Pressure Probe Condenser Circuit1
40	4-20mA Pressure Probe Condenser Circuit2
41	0-5 V Pressure Probe Suction Circuit1
42	0-5 V Pressure Probe Suction Circuit2
43	0-5 V Pressure Probe Condenser Circuit1
44	0-5 V Pressure Probe Condenser Circuit2
45	NTC Suction Temperature Compressor 1 Circuit 1
46	NTC Suction Temperature Compressor 2 Circuit 1
47	NTC Suction Temperature Compressor 3 Circuit 1
48	NTC Suction Temperature Compressor 4 Circuit 1
49	NTC Suction Temperature Compressor 5 Circuit 1
50	NTC Suction Temperature Compressor 6 Circuit 1
51	NTC Suction Temperature Compressor 7 Circuit 1
52	NTC Suction Temperature Compressor 8 Circuit 1
53	NTC Suction Temperature Compressor 9 Circuit 1
54	NTC Suction Temperature Compressor 10 Circuit 1
55	NTC Suction Temperature Compressor 11 Circuit 1
56	NTC Suction Temperature Compressor 12 Circuit 1
57	NTC Suction Temperature Compressor 1 Circuit 2
58	NTC Suction Temperature Compressor 2 Circuit 2
59	NTC Suction Temperature Compressor 3 Circuit 2
60	NTC Suction Temperature Compressor 4 Circuit 2
61	NTC Suction Temperature Compressor 5 Circuit 2
62	NTC Suction Temperature Compressor 6 Circuit 2
63	NTC Suction Temperature Compressor 7 Circuit 2
64	NTC Suction Temperature Compressor 8 Circuit 2
65	NTC Suction Temperature Compressor 9 Circuit 2
66	NTC Suction Temperature Compressor 10 Circuit 2
67	NTC Suction Temperature Compressor 11 Circuit 2
68	NTC Suction Temperature Compressor 12 Circuit 2
69	NTC Discharge Temperature Compressor 1 Circuit 1
70	NTC Discharge Temperature Compressor 2 Circuit 1
71	NTC Discharge Temperature Compressor 3 Circuit 1
72	NTC Discharge Temperature Compressor 4 Circuit 1
73	NTC Discharge Temperature Compressor 5 Circuit 1
74	NTC Discharge Temperature Compressor 6 Circuit 1
75	NTC Discharge Temperature Compressor 7 Circuit 1
76	NTC Discharge Temperature Compressor 8 Circuit 1
77	NTC Discharge Temperature Compressor 9 Circuit 1
78	NTC Discharge Temperature Compressor 10 Circuit 1
79	NTC Discharge Temperature Compressor 11 Circuit 1
80	NTC Discharge Temperature Compressor 12 Circuit 1
81	NTC Discharge Temperature Compressor 1 Circuit 2

Value	Setting
82	NTC Discharge Temperature Compressor 2 Circuit 2
83	NTC Discharge Temperature Compressor 3 Circuit 2
84	NTC Discharge Temperature Compressor 4 Circuit 2
85	NTC Discharge Temperature Compressor 5 Circuit 2
86	NTC Discharge Temperature Compressor 6 Circuit 2
87	NTC Discharge Temperature Compressor 7 Circuit 2
88	NTC Discharge Temperature Compressor 8 Circuit 2
89	NTC Discharge Temperature Compressor 9 Circuit 2
90	NTC Discharge Temperature Compressor 10 Circuit 2
91	NTC Discharge Temperature Compressor 11 Circuit 2
92	NTC Discharge Temperature Compressor 12 Circuit 2
93	NTC OAT
94	PTC OAT
95	NTC De-superheat 1
96	PTC De-superheat 1
97	NTC De-superheat 2
98	PTC De-superheat 2
99	NTC De-superheat 3
100	PTC De-superheat 3
101	Not used
102	Not used
103	Not used
104	Not used
105	Not used
106	Not used
107	Not used
108	Not used
109	Not used
110	Not used
111	Not used
112	Not used
113	Not used
114	Not used
115	Not used
116	Not used
117	Not used
118	Not used
119	Not used
120	Not used
121	Not used
122	Not used
123	Not used
124	Not used
125	Not used
126	Not used
127	Not used
128	Not used
129	Not used
130	Not used
131	Not used
132	Not used
133	NTC Rack temperature
134	PTC Rack temperature
135	0-5V Liquid level

Value	Setting
136	NTC Suction float temperature Circuit 1
137	NTC Suction float temperature Circuit 2
138	PTC Suction float temperature Circuit 1
139	PTC Suction float temperature Circuit 2
140	Not used
141	Not used
142	4-20mA Gas Leak Detector 1 probe
143	1-5V Gas Leak Detector 1 probe (see the note here below)
144	4-20mA Gas Leak Detector 2 probe
145	1-5V Gas Leak Detector 2 probe (see the note here below)
146	4-20mA Gas Leak Detector 3 probe
147	1-5V Gas Leak Detector 3 probe (see the note here below)
148	4-20mA Gas Leak Detector 4 probe
149	1-5V Gas Leak Detector 4 probe (see the note here below)
150	Not used
151	Not used
152	4-20mA Pressure Probe of CO2 receiver
153	0-5V Pressure Probe of CO2 receiver
154	NTC Gas cooler outlet temperature
155	CPC Gas cooler outlet temperature
156	NTC Discharge line temperature circuit 1
157	NTC Discharge line temperature circuit 2
158	PTC Discharge line temperature circuit 1
159	PTC Discharge line temperature circuit 2
160	NTC H-R secondry fluid outlet temperature
161	NTC-CPC H-R secondry fluid outlet temperature
162	NTC H-R secondry fluid inlet temperature
163	NTC-CPC H-R secondry fluid inlet temperature
164	NTC H-R tank water temperature
165	NTC-CPC H-R water temperature
166	NTC CO2 Temperature post heat reclaim
167	NTC temperature before HPV
168	NTC-CPC temperature before HPV
169	4-20mA Gas Cooler pressure
170	0-5V Gas Cooler pressure
171	0-10V H-R1 signal
172	4-20mA H-R1 signal
173	4-20mA Gas Discharge pressure
174	0-5V Gas Discharge pressure
175	NTC Suction line temperature parallel compressor
176	NTC Discharge line temperature parallel compressor
177	PTC Suction line temperature parallel compressor
178	PTC Discharge line temperature parallel compressor
179	NTC H-R2 secondry fluid outlet temperature (Thr2 out)
180	NTC-CPC H-R2 secondry fluid outlet temperature (Thr2 out)
181	NTC H-R2 secondry fluid inlet temperature (Thr2 in)
182	NTC-CPC H-R2 secondry fluid inlet temperature (Thr2 in)
183	NTC H-R2 tank water temperature (Twt2)
184	NTC-CPC H-R2 water temperature (Twt2)
185	NTC CO2 Temperature post heat reclaim 2 (Tphr2)

Configuration for AIC28 to AIC35

Value	Setting	Unit
0	Not used	

Value	Setting	Unit
1	NTC Temperature probe Suction Circuit1	C/F/PSI/KPA/Bar
2	NTC Temperature probe Suction Circuit2	C/F/PSI/KPA/Bar
3	NTC Temperature probe Condenser Circuit1	C/F/PSI/KPA/Bar
4	NTC Temperature probe Condenser Circuit2	C/F/PSI/KPA/Bar
5	NTC Temperature probe Thermostat Aux1	C/F
6	NTC Temperature probe Thermostat Aux2	C/F
7	NTC Temperature probe Thermostat Aux3	C/F
8	NTC Temperature probe Thermostat Aux4	C/F
9	NTC Temperature probe Thermostat Aux5	C/F
10	NTC Temperature probe Thermostat Aux6	C/F
11	NTC Temperature probe Thermostat Aux7	C/F
12	NTC Temperature probe Thermostat Aux8	C/F
13	NTC Temperature probe Dynamic / Split set condenser 1	C/F
14	NTC Temperature probe Dynamic / Split set condenser 2	C/F
15	NTC Temperature probe Dynamic set suction 1	C/F
16	NTC Temperature probe Dynamic set suction 2	C/F
17	NTC AUX Temperature probe suction circ.1	C/F
18	NTC AUX Temperature probe suction circ.2	C/F
19	PTC Temperature probe Suction Circuit1	C/F/PSI/KPA/Bar
20	PTC Temperature probe Suction Circuit2	C/F/PSI/KPA/Bar
21	PTC Temperature probe Condenser Circuit1	C/F/PSI/KPA/Bar
22	PTC Temperature probe Condenser Circuit2	C/F/PSI/KPA/Bar
23	PTC Temperature probe Thermostat Aux1	C/F
24	PTC Temperature probe Thermostat Aux2	C/F
25	PTC Temperature probe Thermostat Aux3	C/F
26	PTC Temperature probe Thermostat Aux4	C/F
27	PTC Temperature probe Thermostat Aux5	C/F
28	PTC Temperature probe Thermostat Aux6	C/F
29	PTC Temperature probe Thermostat Aux7	C/F
30	PTC Temperature probe Thermostat Aux8	C/F
31	PTC Temperature probe Dynamic/ Split set condenser 1	C/F
32	PTC Temperature probe Dynamic/ Split set condenser 2	C/F
33	PTC Temperature probe Dynamic set suction 1	C/F
34	PTC Temperature probe Dynamic set suction 2	C/F
35	PTC AUX Temperature probe suction circ.1	C/F
36	PTC AUX Temperature probe suction circ.2	C/F
37	NTC Suction Temperature Compressor 1 Circuit 1	C/F
38	NTC Suction Temperature Compressor 2 Circuit 1	C/F
39	NTC Suction Temperature Compressor 3 Circuit 1	C/F
40	NTC Suction Temperature Compressor 4 Circuit 1	C/F
41	NTC Suction Temperature Compressor 5 Circuit 1	C/F
42	NTC Suction Temperature Compressor 6 Circuit 1	C/F
43	NTC Suction Temperature Compressor 7 Circuit 1	C/F
44	NTC Suction Temperature Compressor 8 Circuit 1	C/F
45	NTC Suction Temperature Compressor 9 Circuit 1	C/F
46	NTC Suction Temperature Compressor 10 Circuit 1	C/F
47	NTC Suction Temperature Compressor 11 Circuit 1	C/F
48	NTC Suction Temperature Compressor 12 Circuit 1	C/F
49	NTC Suction Temperature Compressor 1 Circuit 2	C/F
50	NTC Suction Temperature Compressor 2 Circuit 2	C/F
51	NTC Suction Temperature Compressor 3 Circuit 2	C/F

Value	Setting	Unit
52	NTC Suction Temperature Compressor 4 Circuit 2	C/F
53	NTC Suction Temperature Compressor 5 Circuit 2	C/F
54	NTC Suction Temperature Compressor 6 Circuit 2	C/F
55	NTC Suction Temperature Compressor 7 Circuit 2	C/F
56	NTC Suction Temperature Compressor 8 Circuit 2	C/F
57	NTC Suction Temperature Compressor 9 Circuit 2	C/F
58	NTC Suction Temperature Compressor 10 Circuit 2	C/F
59	NTC Suction Temperature Compressor 11 Circuit 2	C/F
60	NTC Suction Temperature Compressor 12 Circuit 2	C/F
61	PTC Discharge Temperature Compressor 1 Circuit 1	C/F
62	PTC Discharge Temperature Compressor 2 Circuit 1	C/F
63	PTC Discharge Temperature Compressor 3 Circuit 1	C/F
64	PTC Discharge Temperature Compressor 4 Circuit 1	C/F
65	PTC Discharge Temperature Compressor 5 Circuit 1	C/F
66	PTC Discharge Temperature Compressor 6 Circuit 1	C/F
67	PTC Discharge Temperature Compressor 7 Circuit 1	C/F
68	PTC Discharge Temperature Compressor 8 Circuit 1	C/F
69	PTC Discharge Temperature Compressor 9 Circuit 1	C/F
70	PTC Discharge Temperature Compressor 10 Circuit 1	C/F
71	PTC Discharge Temperature Compressor 11 Circuit 1	C/F
72	PTC Discharge Temperature Compressor 12 Circuit 1	C/F
73	PTC Discharge Temperature Compressor 1 Circuit 2	C/F
74	PTC Discharge Temperature Compressor 2 Circuit 2	C/F
75	PTC Discharge Temperature Compressor 3 Circuit 2	C/F
76	PTC Discharge Temperature Compressor 4 Circuit 2	C/F
77	PTC Discharge Temperature Compressor 5 Circuit 2	C/F
78	PTC Discharge Temperature Compressor 6 Circuit 2	C/F
79	PTC Discharge Temperature Compressor 7 Circuit 2	C/F
80	PTC Discharge Temperature Compressor 8 Circuit 2	C/F
81	PTC Discharge Temperature Compressor 9 Circuit 2	C/F
82	PTC Discharge Temperature Compressor 10 Circuit 2	C/F
83	PTC Discharge Temperature Compressor 11 Circuit 2	C/F
84	PTC Discharge Temperature Compressor 12 Circuit 2	C/F
85	NTC OAT	C/F
86	PTC OAT	C/F
87	Not used	/
88	Not used	/
89	Not used	/
90	Not used	/
91	Not used	/
92	Not used	/
93	Not used	/
94	Not used	/
95	Not used	/
96	Not used	/
97	Not used	/
98	Not used	/
99	Not used	/
100	Not used	/
101	Not used	/
102	Not used	/

Value	Setting	Unit
103	Not used	/
104	Not used	/
105	Not used	/
106	Not used	/
107	Not used	/
108	Not used	/
109	Not used	/
110	Not used	/
111	Not used	/
112	Not used	/
113	Not used	/
114	Not used	/
115	Not used	/
116	Not used	/
117	NTC Rack temperature	C/F
118	PTC Rack temperature	C/F
119	NTC Suction float temperature Circuit 1	C/F
120	NTC Suction float temperature Circuit 2	C/F
121	PTC Suction float temperature Circuit 1	C/F
122	PTC Suction float temperature Circuit 2	C/F
123	Not used	/
124	Not used	/
125	Not used	/
126	Not used	/
127	NTC Gas cooler outlet temperature	C/F
128	CPC Gas cooler outlet temperature	C/F
129	NTC Discharge line temperature circuit 1	C/F
130	NTC Discharge line temperature circuit 2	C/F
131	PTC Discharge line temperature circuit 1	C/F
132	PTC Discharge line temperature circuit 2	C/F
133	NTC H-R secondry fluid outlet temperature	C/F
134	NTC-CPC H-R secondry fluid outlet temperature	C/F
135	NTC H-R secondry fluid inlet temperature	C/F
136	NTC-CPC H-R secondry fluid inlet temperature	C/F
137	NTC H-R tank water temperature	C/F
138	NTC-CPC H-R water temperature	C/F
139	NTC CO2 Temperature post heat reclaim	C/F
140	NTC temperature before HPV	C/F
141	NTC-CPC temperature before HPV	C/F
142	NTC Suction line temperature parallel compressor	C/F
143	NTC Discharge line temperature parallel compressor	C/F
144	PTC Suction line temperature parallel compressor	C/F
145	PTC Discharge line temperature parallel compressor	C/F

12. PARAMETERS

12.1.1 Set Point (SETC1-SETF2,SETPC)

SETC1 Compressor Circuit 1 Set Point
Range: RC2÷RC3
UM: according to CF26

SETC2 Compressor Circuit 2 Set Point
Range: RC6÷RC7
UM: according to CF26

SETF1 Condenser Circuit 1 Set Point
Range: RC10÷RC11
UM: according to CF26

SETF2 Condenser Circuit 2 Set Point
Range: RC14÷RC15
UM: according to CF26

SETPC Parallel compression 1 Set Point
Range: GC20÷PC3
UM: Always in Pressure, depending on the paremeter CF26:
CF26 = CDEC: (bar)
CF26 = F: (PSI)
CF26 = BAR: bar (°C)
CF26 = PSI: PSI (°F)
CF26 = KPA: KPA (°C)
CF26 = CKPA: (KPA)

12.1.2 Compressor Rack setup (CF1, CF33, CF16-CF17)

CF1 **Kind of compressors - circuit 1:** to set the kind of compressors.
SPo = compressors with the same capacity.
BtZ = screw compressors like Bitzer, Hanbell, Refcomp etc operation.
Frtz = screw compressors like Frascold operation.
dPO = mixed capacities
Crii = Bitzer CRII

CF33 **Kind of compressors - circuit 2**
To set the kind of compressors.
SPo = compressors with the same capacity
BtZ = screw compressors like Bitzer, Hanbell, Refcomp etc operation
Frtz = screw compressors like Frascold operation
dPO = mixed capacities
Crii = Bitzer CRII

CF16 **Kind of gas CIRCUIT 1**
Set the kind of gas used in the plant

Param Value	LABEL	REFRIGERANT	OPERATING RANGE
0	R22	r22	-50-60°C/-58÷120°F
1	r404A	r404A	-50-60°C/-58÷120°F
2	r507	r507	-70-60°C/-94÷120°F
3	r134A	r134A	-70-60°C/-94÷120°F
4	717	717	-50-60°C/-58÷120°F
5	r744	r744 - Co2	-50-30°C/-58÷86°F
6	r410	r410	-50-60°C/-58÷120°F
7	r407C	r407C	-50-60°C/-58÷120°F
8	r407F	r407F	-50-60°C/-58÷120°F
9	r407A	r407A	-50-60°C/-58÷120°F
10	r290	r290 – Propane	-50-60°C/-58÷120°F
11	r450A	r450A	-45-60°C/-69÷120°F
12	r513	r513	-45-60°C/-69÷120°F
13	r448	r448A	-45-60°C/-69÷120°F
14	r449	r449A	-45-60°C/-69÷120°F
15	r32	r32	-55-60°C/-94÷120°F
16	r1234ze	r1234ze	-18÷50°C/0÷122°F

CF17 Kind of gas CIRCUIT 2
Like CF16
Range: 0÷16

12.1.3 Different Capacity Compressors setup (CF4-CF15)

CF4- CF9 Power of compressor 1-6 Circuit 1
For setting the capacity of single compressor (insert in each parameter the capacity of the compressor used).
E.I. 3 compressors with following capacity: 10, 20, 40 KW. The parameters have to be set in this way: CF4=10, CF5=20, CF6=40 CF7=CF8=CF9=0.
Range: 0÷100; 0 = not used
UM: KW

CF10- CF15 Power of compressor 1-6 Circuit 2
Like CF4-CF9.
Range: 0÷100; 0 = not used
UM: KW

12.1.4 Regulation (CF18-CF25, CF28-CF30, CF34)

CF18 Type of regulation for compressor Circuit 1
Range: 0÷2
0: **db =** neutral zone
1: **Pb =** proportional band

CF19 Type of regulation for compressor Circuit 2
Range: 0÷2

0: **db =** neutral zone
1: **Pb =** proportional band

CF22 **Compressor rotation circuit 1:**
YES = rotation: the algorithm distributes the working time between loads to ensure even run times.
no = fixed sequence: the compressors are enabled and disabled in fixed sequence: first, second etc.

CF23 **Compressor rotation circuit 2:**
YES = rotation: the algorithm distributes the working time between loads to ensure even run times.
no = fixed sequence: the compressors are enabled and disabled in fixed sequence: first, second etc.

CF24 **Fan rotation circuit 1:**
YES = rotation: the algorithm distributes the working time between loads to ensure even run times.
no = fixed sequence: the fans are enabled and disabled in fixed sequence: first, second etc.

CF25 **Fan rotation circuit 2:**
YES = rotation: the algorithm distributes the working time between loads to ensure even run times.
no = fixed sequence: the fans are enabled and disabled in fixed sequence: first, second etc.

CF28 **Activation time during the switching on of first step (valve of 25%) for Bitzer screw compressors:** (0÷255s): it sets for how long the valve is used during the startup phase.

CF29 **First step enabled during the regulation (switching off phase): it sets if the first step can be used also during normal regulation.**
NO = first step used only during the start phase
YES = first step used also during normal regulation

CF30 **Delay between the activation of the valve of the first step and compressor activation**

CF34 **Parallel Compressor rotation**
Range: 0÷1
YES = rotation: the algorithm distributes the working time between loads to ensure even run times.
no = fixed sequence: the compressors are enabled and disabled in fixed sequence: first, second etc.

12.1.5 Display (CF26- CF27)

CF26 **displaying measurement unit:** it sets the measurement unit used for the display and for parameters that are connected to temperature/pressure. In pharentesis other measurement unit.
CDEC: °C with decimal point (bar);
F: °F (PSI)**;**
BAR: bar (°C)**;**
PSI: PSI (°F)**;**
KPA: KPA (°C)
CKPA: °C (KPA)

NOTE: the IProRack does not perform any automatic conversion of the parameters. The parameters must be entered in the correct unit.
NOTE2: parameters with probe calibration, are reset during the measurement unit change.

CF27 **Pressure display:** it indicates if the range of the probes are related to relative or absolute pressure.
rEL = relative pressure; **AbS:** absolute pressure
NOTE: the temperature is updated changing this value.

12.1.6 Analog Inputs – Probe adjustment (Ai1-Ai11)

AI1-10 **Probe 1-10 calibration:** ***(AI7-AI10 are present only on the IPRC215D)***
with **CF26 = CDEC or CINT:** -12.0 ÷ 12.0 °C
with **CF26= bar:** -1.20 ÷ 1.20 bar;
with **CF26 = F or PSI:** -120 ÷ 120 °F o PSI
with **CF26 = KPA:** -1200 ÷ 1200 KPA;

AI11 **Alarm activated in case of regulation faulty probe:**
nu = none relay; **Alr:** all the C(i) Inputs set as ALr; **ALr1:** all the C(i) Inputs set as ALr1, **ALr2:** all the C(i) Inputs set as ALr2

12.1.7 Analog Inputs – Pressure probe set up (Ai12-Ai31)

AI12 **Probe 1 read out at 4mA/0,5V** (-1.00-Ai13 bar, -14.5÷Ai13 PSI**,** -100÷Ai13KPA)

AI13 **Probe 1 read out at 20mA/4,5V** (Ai12÷160 bar, Ai12÷ 2320**,** Ai12÷16000 KPA)

AI14 **Probe 2 read out at 4mA/0,5V** (-1.00-Ai15 bar, -14.5÷Ai15 PSI**,** -100÷Ai15KPA)

AI15 **Probe 2 read out at 20mA/4,5V** (Ai14÷160 bar, Ai14÷ 2320**,** Ai14÷16000 KPA)

AI16 **Probe 3 read out at 4mA/0,5V** (-1.00-Ai17 bar, -14.5÷Ai17 PSI**,** -100÷Ai17KPA)

AI17 **Probe 3 read out at 20mA/4,5V** (Ai16÷160 bar, Ai16÷ 2320**,** Ai16÷16000 KPA)

AI18 **Probe 4 read out at 4mA/0,5V** (-1.00-Ai19 bar, -14.5÷Ai19 PSI**,** -100÷Ai19KPA)

AI19 **Probe 4 read out at 20mA/4,5V** (Ai18÷160 bar, Ai18÷ 2320**,** Ai18÷16000 KPA)

AI20 **Probe 5 read out at 4mA/0,5V** (-1.00-Ai21 bar, -14.5÷Ai21 PSI**,** -100÷Ai21KPA)

AI21 **Probe 5 read out at 20mA/4,5V** (Ai20÷160 bar, Ai20÷ 2320**,** Ai20÷16000 KPA)

AI22 **Probe 6 read out at 4mA/0,5V** (-1.00-Ai23 bar, -14.5÷Ai23 PSI**,** -100÷Ai23KPA)

AI23 **Probe 6 read out at 20mA/4,5V** (Ai22÷160 bar, Ai22÷ 2320**,** Ai22÷16000 KPA)

AI24 **Probe 7 read out at 4mA/0,5V - *(only IPRC215D)*** (-1.00-Ai25 bar, -14.5÷Ai25 PSI**,** -100÷Ai25KPA)

AI25 **Probe 7 read out at 20mA/4,5V- *(only IPRC215D)*** (Ai24÷160 bar, Ai24÷ 2320**,** Ai24÷16000 KPA)

AI26 **Probe 8 read out at 4mA/0,5V - *(only IPRC215D)*** (-1.00-Ai27 bar, -14.5÷Ai27 PSI**,** -100÷Ai27KPA)

AI27 **Probe 8 read out at 20mA/4,5V- *(only IPRC215D)*** (Ai26÷160 bar, Ai26÷ 2320**,** Ai26÷16000 KPA)

AI28 **Probe 9 read out at 4mA/0,5V - *(only IPRC215D)*** (-1.00-Ai29 bar, -14.5÷Ai29 PSI**,** -100÷Ai29KPA)

AI29 **Probe 9 read out at 20mA/4,5V - *(only IPRC215D)*** (Ai28÷160 bar, Ai28÷ 2320**,** Ai28÷16000 KPA)

AI30 **Probe 10 read out at 4mA/0,5V - *(only IPRC215D)*** (-1.00-Ai31 bar, -14.5÷Ai31 PSI**,** -100÷Ai31KPA)

AI31 **Probe 10 read out at 20mA/4,5V - *(only IPRC215D)*** (Ai30÷160 bar, Ai30÷ 2320**,** Ai30÷16000 KPA)

AI32-AI38 Probe 11-17 calibration (IPX 4 din)
Range: -12.00÷12.00 bar; 12.0÷12.0 °C; -120÷120 PSI; -120÷120 °F; -1200÷1200 KPA; -1600÷1600 PPM (if the probe is "4-20mA Gas Leak Detector"); -20%÷120% (if the probe is "0-5V Liquid level"); -1.000 ÷ 1.000 V; -2.000 ÷ 2.000 mA
UM: according to CF26

AI39 **Probe 11 value at 4mA/0V/1V (IPX 4 din)**
Range: -1.00÷AI40 bar; -15÷AI40 PSI; -100÷AI40 KPA; 0÷AI40 PPM (if the probe is "4-20mA Gas Leak Detector"); -20%÷AI40 % (if the probe is "0-5V Liquid level")
UM: according to CF26

AI40 **Probe 11 value at 20mA/5V/5V (IPX 4 din)**
Range: AI39÷160.00 bar; AI39÷2320 PSI; AI39÷16000 KPA; AI39÷50000 PPM (if the probe is "4-20mA Gas Leak Detector"); AI39÷120 % (if the probe is "0-5V Liquid level")
UM: according to CF26

……

AI51 Probe 17 value at 4mA/0V/1V (IPX 4 din)
Range: -1.00÷AI52 bar; -15÷AI52 PSI; -100÷AI52 KPA; 0÷AI52 PPM (if the probe is "4-20mA Gas Leak Detector"); -20%÷AI52 % (if the probe is "0-5V Liquid level")
UM: according to CF26

AI52 Probe 17 value at 20mA/5V/5V (IPX 4 din)
Range: AI51÷160.00 bar; AI51÷2320 PSI; AI51÷16000 KPA; AI51÷50000 PPM (if the probe is "4-20mA Gas Leak Detector"); AI51÷120 % (if the probe is "0-5V Liquid level")
UM: according to CF26

AI53-AI62 Probe 18-27 calibration (IPX 10 din)
Range: -12.00÷12.00 bar; 12.0÷12.0 °C; -120÷120 PSI; -120÷120 °F; -1200÷1200 KPA; -1600÷1600 PPM (if the probe is "4-20mA Gas Leak Detector"); -20%÷120% (if the probe is "0-5V Liquid level"); -1.000 ÷ 1.000 V; -2.000 ÷ 2.000 mA
UM: according to CF26

AI63 Probe 18 value at 4mA/0V/1V (IPX 10 din)
Range: -1.00÷AI64 bar; -15÷AI64 PSI; -100÷AI64 KPA; 0÷AI64 PPM (if the probe is "4-20mA Gas Leak Detector"); -20%÷AI64 % (if the probe is "0-5V Liquid level")
UM: according to CF26

AI64 Probe 18 value at 20mA/5V/5V (IPX 10 din):
Range: AI63÷160.00 bar; AI63÷2320 PSI; AI63÷16000 KPA; AI63÷50000 PPM (if the probe is "4-20mA Gas Leak Detector"); AI63÷120 % (if the probe is "0-5V Liquid level")
UM: according to CF26

……

AI81 Probe 27 value at 4mA/0V/1V (IPX 10 din)
Range: -1.00÷AI82 bar; -15÷AI82 PSI; -100÷AI82 KPA; 0÷AI82 PPM (if the probe is "4-20mA Gas Leak Detector"); -20%÷AI82 % (if the probe is "0-5V Liquid level")
UM: according to CF26

AI82 Probe 27 value at 20mA/5V/5V (IPX 10 din):
Range: AI81÷160.00 bar; AI81÷2320 PSI; AI81÷16000 KPA; AI81÷50000 PPM (if the probe is "4-20mA Gas Leak Detector"); AI81÷120 % (if the probe is "0-5V Liquid level")
UM: according to CF26

12.1.8 Safety digital Inputs (SD1- SD3)

Note: SDI1 and SDI3 take effect also to the parallel compressor digital input alarms.

SDI1 Manual reset of compressor alarms.
no = automatic recover of alarm: the regulation will restart when the correspondent digital Input is disabled
yES = manual recover for the compressors alarms

SDI2 Manual reset of fan alarms.
no = automatic recover of alarm: the fan willrestarts when the correspondent digital Input is disabled
yES = manual recover for the alarms of fan

SDI3 Relay activated in case of compressor or fan alarms:
nu = no relay activation, only visual signalling; **Alr:** all the C(i) Inputs set as ALr; **ALr1:** all the C(i) Inputs set as ALr1, **ALr2:** all the C(i) Inputs set as ALr2

12.1.9 Digital Inputs for liquid level (CDI1-CDI4)

CDI1 Delay of LL digital Input - circuit 1 (0 ÷ 255 min)

CDI2 **Delay of LL digital Input - circuit 1** (0 ÷ 255 min)

CDI3 **Relay activated in case of liquid level alarm – circuit 1**
nu = no relay activation, only visual signalling; **AIr:** all the C(i) Inputs set as ALr; **ALr1:** all the C(i) Inputs set as ALr1, **ALr2:** all the C(i) Inputs set as ALr2

CDI4 **Relay activated in case of liquid level alarm – circuit 2**
nu = no relay activation, only visual signalling; **AIr:** all the C(i) Inputs set as ALr; **ALr1:** all the C(i) Inputs set as ALr1, **ALr2:** all the C(i) Inputs set as ALr2

12.1.10 Compressor Action (RC1-RC8 RC25, RC35-42, RC45-48)

RC1 **Regulation band width for compressors- circuit 1** (0.10÷10.00 bar; 0.1÷25.0°C, 1÷80PSI, 1÷50°F; 10÷1000 KPA) The band is symmetrical compared to the target set point, with extremes: SETC1+(RC1)/2 ... SETC1-(RC1)/2. The measurement unit depends on the **CF26** par.
NOTE: If the circuit 1 has 1 relay set as a frequency compressor, the AO1_17 parameter is used instead of the RC1 parameter: regulation band width that is added to the set point 1.

RC2 **Minimum compressor set point - circuit 1** (-1 ÷ SETC1 **bar**; -70.0 ÷ SETC1 **°C**; -15.0 ÷ SETC1 **Psi**; -94.0 ÷ SETC1 **°F**; -100 ÷ SETC1 **Kpa**).
The measurement unit depends on **CF26** parameter. It sets the minimum value that can be used for the compressor set point, to prevent the end user from setting incorrect values.

RC3 **Maximum compressor set point - circuit 1** (SETC1 ÷100.00 **bar**; SETC1 ÷150. 0 **°C**; SETC1 ÷1450 **Psi**; SETC1 ÷302 **°F**; SETC1 ÷10000 **Kpa**).
The measurement unit depends on **CF26** parameter. It sets the maximum acceptable value for compressor set point.

RC4 **Compressor energy saving value - circuit 1** (-20.00÷20.00 **bar**; -50.0÷50.0 **°C**; -300÷300 **Psi**; -90÷90 **°F**; -2000÷2000 **Kpa**) this value is add to the compressor set point when the energy saving is enabled.

RC5 **Regulation band width for compressors- circuit 2** (0.10÷10.00 bar; 0.1÷25.0°C, 1÷80PSI, 1÷50°F; 10÷1000 KPA) The band is symmetrical compared to the target set point, with extremes: SETC1+(RC1)/2 ... SETC1-(RC1)/2. The measurement unit depends on the **CF26** par.
NOTE: If the circuit 2 has 1 relay set as a frequency compressor, the AO1_17 parameter is used instead of the RC5 parameter: regulation band width that is added to the set point 2.

RC6 **Minimum compressor set point - circuit 2** (-1 ÷ SETC2 **bar**; -70.0 ÷ SETC2 **°C**; -15.0 ÷ SETC2 **Psi**; -94.0 ÷ SETC2 **°F**; -100 ÷ SETC2 **Kpa**).
The measurement unit depends on **CF26** parameter. It sets the minimum value that can be used for the compressor set point, to prevent the end user from setting incorrect values.

RC7 **Maximum compressor set point - circuit 2** (SETC2 ÷100.00 **bar**; SETC2 ÷150. 0 **°C**; SETC2 ÷1450 **Psi**; SETC2 ÷302 **°F**; SETC2 ÷10000 **Kpa**).
The measurement unit depends on **CF26** parameter. It sets the maximum acceptable value for compressor set point.

RC8 **Compressor energy saving value - circuit 2** (-20.00÷20.00 **bar**; -50.0÷50.0 **°C**; -300÷300 **Psi**; -90÷90 **°F**; -2000÷2000 **Kpa**) this value is add to the compressor set point when the energy saving is enabled.

RC25 **Regulation band width for parallel compressors**
The band is symmetrical compared to the target set point, with extremes:
SETPC-(RC25)/2 ... SETPC+(RC25)/2.
(0.10÷10.00 bar; 1÷80 PSI; 10÷1000 KPA, according to CF26 parameter)

Note: if the parallel compression has 1 relay set as a frequency compressor, the AO3_17 (if the analog output 3 is configured as analog output for parallel compressor) parameter is used instead of the RC25 parameter.

RC35 **Differential for first valve of CRii – Circuit 1**
The differential is symmetrical compared to the target set point, and it is less RC1.
(according to CF26: 0.10÷RC36 bar; 0.1÷ RC36 °C; 1÷ RC36 PSI; 1÷ RC36°F; 10÷ RC36KPA)

RC36 **Differential for second valve of CRii – Circuit 1**
The differential is symmetrical compared to the target set point, and it is less RC1.
(according to CF26: 0.10÷RC1 bar; 0.1÷ RC37°C; 1÷ RC37PSI; 1÷ RC37°F; 10÷ RC37KPA)

RC37 **Differential for first valve of CRii – Circuit 2**
The differential is symmetrical compared to the target set point, and it is less RC5.
(according to CF26: 0.10÷RC38 bar; 0.1÷RC38 °C; 1÷RC38 PSI; 1÷ RC38 °F; 10÷ RC38 KPA)

RC38 **Differential for second valve of CRii – Circuit 2**
The differential is symmetrical compared to the target set point, and it is less RC1.
(according to CF26: 0.10÷RC5 bar; 0.1÷RC5 °C; 1÷RC5 PSI; 1÷ RC5 °F; 10÷ RC5 KPA)

RC39 **Minimum OFF time of the valve - Circuit 1**
(5÷15s)

RC40 **Minimum ON time of the valve - Circuit 1**
(5÷15s)

RC41 **Maximum time without valve activated - Circuit 1**
(30÷120s)

RC42 **On time of the valve when activated by RC41 - Circuit 1**
(0÷1000s)

RC45 **Minimum OFF time of the valve - Circuit 2**
(5÷15s)

RC46 **Minimum ON time of the valve - Circuit 2**
(5÷15s)

RC47 **Maximum time without valve activated - Circuit 2**
(30÷120s)

RC48 **On time of the valve when activated by RC47 - Circuit 2**
(0÷1000s)

12.1.11 Parallel Compression Regulation (PC1-PC10)

PC1 **BGV Valve percentage to activate parallel compression**
It's the percentage used to enable parallel compression to move the regulation from BGV valve to parallel compression.
If PC1 = 0, the parallel compression is ALWAYS ON. This means that the compressors can start without waiting for a certain % of BGV (opening). The BGV maintains its safety function operating at PC3. If the compressors are stopped caused to the safety delays, the regulation comes back to the standard regulation with GC20 as set point.
Range: 0÷99%

PC2 **Time with BGV valve ≥ PC1 before the activatation of the parallel compression**
If the BGV valve remains open with a percentage equal or higher than PC1 for PC2 time, the BGV valve will use the PC3 set point and the parallel compression is started.
Range: 0÷255
UM: sec

PC3 **Pressure setpoint for BGV when the parallel compression is activated**
It's the pressure set point for BGV valve when the parallel compression is activated. It replaces the GC20 receiver pressure set point when the parallel compression is working
Range: SETPC÷500.00 bar; SETPC÷7250 PSI; SETPC÷50000 KPA
UM: Always in Pressure, depending on the paremeter CF26:

CF26 = CDEC: bar
CF26 = F: PSI
CF26 = BAR: bar
CF26 = PSI: PSI
CF26 = KPA: KPA
CF26 = CKPA: KPA

PC4 **Minimum time between 2 following switching ON of the same parallel compressor**
Range: 0÷1000
UM: min

PC5 **Minimum time between the switching OFF of a parallel compressor and the following switching ON**
Range: 0÷1000
UM: min

PC6 **Time delay between the insertion of two different parallel compressors**
Range: 1÷5990
UM: sec

PC7 **Time delay between switching OFF of two different parallel compressors**
Range: 1÷5990
UM: sec

PC8 **Minimum time parallel compressor ON**
Range: 1÷5990
UM: sec

PC9 **Regulation band of the parallel compression inverter**
It is the band with the proportional action. It replaces RC57 for the inverter regulation. It is added to the set point SETPC. The proportional action starts when the temperature/pressure value is higher than the set point and it reaches the AOX_13 when the pressure/temperature is equal or higher than SETPC + PC9.
Range: 0.10÷10.00bar; 1÷80 PSI; 10÷1000 KPA
UM: Always in Pressure, depending on the paremeter CF26:
CF26 = CDEC: (bar)
CF26 = F: (PSI)
CF26 = BAR: bar (°C)
CF26 = PSI: PSI (°F)
CF26 = KPA: KPA (°C)
CF26 = CKPA: (KPA)

PC10 **Band offset of the parallel compression inverter**
It is used to move the regulation band across to the set point.
Range: -12.00 ÷ 12.00 BAR, -120÷120PSI; 1200÷1200KPA
UM: Always in Pressure, depending on the paremeter CF26:
CF26 = CDEC: (bar)
CF26 = F: (PSI)
CF26 = BAR: bar (°C)
CF26 = PSI: PSI (°F)
CF26 = KPA: KPA (°C)
CF26 = CKPA: (KPA)

Note: **If AOC3 = 25, the parameters used for the inverter of parallel compressions are: AO3_1…AO3_26, and the exception to this is: instead use AO3_17, PC9 is used, instead use AO3_19, PC10 is used**

12.1.12 Safety Compressors (SL1- SL11& SL14-SL23)

SL1 **Minimum time between 2 following switching ON of the same compressor** (0÷255 min).

SL2 **Minimum time between the switching off of a compressor and the following switching on.** (0÷255min). **Note**: usually SL1 must be greater than SL2.

SL3 **Time delay between the insertion of two different compressors** (0 ÷ 5990 sec)

SL4 **Time delay between switching off of two different compressors** (0 ÷ 5990 sec)
SL5 **Minimum time load on (**(0 ÷ 5990 sec)
SL6 **Maximum time load on** (0 ÷ 24 h; with 0 this function is disabled.) If a compressor keeps staying on for the SL6 time, it is switched off and it can restart after the SL2 standard time or after the SL7 time with frequency compressor.

SL7 **Minimum time a frequency compressor stays off after SL6 time** (0÷255 min)

SL8 **SL3 delay enabled also for the first call**. If enabled, the step triggering is delayed for a "SL3" time, respect to the call.
no = "SL3" not enabled;
yES="SL3" enabled

SL9 **SL4 delay enabled also for the first off**. If enabled, the step triggering is delayed for a "SL4" time, respect to the call.
no = "SL4" not enabled;
yES="SL4" enabled

SL10 **Input delay at power on** (0 ÷ 255 sec)

SL11 **Booster function enabled**
no = compressors of Circuits 1 and 2 work independently
yES = if at least one compressor of the Circuit 2 (BT) is ON, also one compressor of the Circuit 1 (TN) is enabled, independently from the pressure of the Circuit 1. This ensures that the gas coming from the Circuit 2 is suct by the compressors of the Circuit 1.

SL14 **Maximum time the booster function is enabled (5÷999s)**
It defines the maximum time the booster function is active, after a compressor of circuit 2 (LT) has started. After SL14 the standar regulation for circuit 1 (NT) is restored

SL15 **Automatic switch off of compressors of circuit 2, with booster function on and none compressor of circuit 1 available (yes, no).** This situation is signalled also with "boost" warning. See alarm table

SL16 **Minimum time between 2 following switching ON of the same compressor - circuit 2** (0÷255 min).

SL17 **Minimum time between the switching off of a compressor and the following switching on- circuit 2 (.** (0÷255min). **Note**: usually SL1 must be greater than SL2.

SL18 **Time delay between the insertion of two different compressors - circuit 2** ((1 ÷ 5990 sec)

SL19 **Time delay between switching off of two different compressors - circuit 2** (**(**1 ÷ 5990 sec)

SL20 **Minimum time load on - circuit 2 (**1 ÷ 5990 sec)

SL21 **SL18 delay enabled also for the first call – Circuit 2**. If enabled, the step triggering is delayed for a "SL16" time, respect to the call.
no = "SL16" not enabled;
yES="SL16" enabled

SL22 **SL19 delay enabled also for the first off – Circuit 2**. If enabled, the step triggering is delayed for a "SL17" time, respect to the call.
no = "SL17" not enabled;
yES="SL17" enabled

SL23 **Minimum time a frequency compressor stays off – circuit2**
0÷255min

12.1.13 Fan Action (RC9-RC24, RC33-RC34, RC43-RC44)

RC9 **Regulation band width for fans – circuit 1:** (0.10÷10.00 **bar**; 0.1÷30.0 **°C**, 1÷80 **Psi**, 1÷50**°F**; 10÷1000 **Kpa**)
Set the CF26 par. and the target set point for fans before setting this parameter.
The band is symmetrical compared to the fan target set point, with extremes: SETF1-(RC9)/2 ... SETF1+(RC9)/2. The measurement unit depends on the **CF26** par.

RC10 **Minimum fan set point – circuit 1:** (-1 ÷ SETF1 **bar** ; -50.0 ÷ SETF1 **°C**; -15.0 ÷ SETF1 **Psi** ; -94 ÷ SETF1 **°F**; -100 ÷ SETF1 **Kpa**). The measurement unit depends on C45 parameter. It sets the minimum value that can be used for the fan set point, to prevent the end user from setting incorrect values.

RC11 **Maximum fan set point - circuit 1 :** (SETF1÷100.00 **bar**; SETF1÷150.0 **°C**; SETF1÷1450 **Psi**; SETF1÷302 **°F;** SETF1÷10000 **Kpa**)
The measurement unit depends on **CF26** parameter. It sets the maximum acceptable value for fan set point.

RC12 **Fan energy saving value - circuit 1** (-20.00÷20.00 **bar**; -50.0÷50.0 **°C**; -300÷300 **Psi**; -90÷90 **°F**; -2000÷2000 **Kpa**) this value is add to the fan set point when the energy saving is enabled.

RC13 **Regulation band width for fans – circuit 2:** (0.10÷10.00 **bar**; 0.1÷30.0 **°C**, 1÷80 **Psi**, 1÷50**°F**; 10÷1000 **Kpa**)
Set the CF26 par. and the target set point for fans before setting this parameter.
The band is symmetrical compared to the fan target set point, with extremes: SETF2-(RC13)/2 ... SETF2+(RC13)/2. The measurement unit depends on the **CF26** par.

RC14 **Minimum fan set point – circuit 2:** (-1 ÷ SETF1 **bar** ; -50.0 ÷ SETF1 **°C**; -15.0 ÷ SETF1 **Psi** ; -94 ÷ SETF1 **°F**; -100 ÷ SETF1 **Kpa**). The measurement unit depends on C45 parameter. It sets the minimum value that can be used for the fan set point, to prevent the end user from setting incorrect values.

RC15 **Maximum fan set point – circuit 2:** (SETF1÷100.00 **bar**; SETF1÷150.0 **°C**; SETF1÷1450 **Psi**; SETF1÷302 **°F;** SETF1÷10000 **Kpa**)
The measurement unit depends on **CF26** parameter. It sets the maximum acceptable value for fan set point.

RC16 **Fan energy saving value - circuit 2** (-20.00÷20.00 **bar**; -50.0÷50.0 **°C**; -300÷300 **Psi**; -90÷90 **°F**; -2000÷2000 **Kpa**) this value is add to the fan set point when the energy saving is enabled.

RC17 **Split condenser enabling– Circuit 1 (**NO, YES)

RC18 **Kind of Split condenser – Circuit 1**
a. **Odd**: lock OFF all odd-numbered fans,
b. **Even:** lock OFF even-numbered fans,
c. **First:** lock OFF the first half of all fans,
d. **Last:** lock OFF the last half of all fans.

RC19 **External temperature set point for Split condenser – Circuit 1 (**-40÷50°C; -40÷120°F)

RC20 **Split condenser dead band – Circuit 1** (0.1÷30.0 °C, 1÷50°F)

RC21 **Split condenser enabling– Circuit 2 (**NO, YES)

RC22 **Kind of Split condenser – Circuit 2**
a. lock OFF all odd-numbered fans,
b. lock OFF even-numbered fans,
c. lock OFF the first half of all fans,
d. lock OFF the last half of all fans.

RC23 **External temperature set point for Split condenser – Circuit 2 (**-40÷50°C; -40÷120°F)

RC24 **Split condenser dead band – Circuit 2** (0.1÷30.0 °C, 1÷50°F)

RC33 Fan heat reclaim value - Circuit 1 (-20.00÷20.00 **bar**; -50.0÷50.0 **°C**; -300÷300 **Psi**; -90÷90 **°F**; -2000÷2000 **Kpa**) this value is add to the fan set point when the heat reclaim DI is active.

RC34 Fan heat reclaim value - Circuit 2 (-20.00÷20.00 **bar**; -50.0÷50.0 **°C**; -300÷300 **Psi**; -90÷90 **°F**; -2000÷2000 **Kpa**) this value is add to the fan set point when the heat reclaim DI is active.

RC43 Variable Speed Fan Driver - Circuit 1
0: **Analog output**
1: **M400**
2: **ECM**

RC44 Variable Speed Fan Driver - Circuit 2
0: **Analog output**
1: **M400**
2: **ECM**

12.1.14 Safety Fans (SL12- SL13)

SL12 **Time delay between the insertion of two different fans** (1 ÷ 255 sec)

SL13 **Time delay between switching off of two different fans** (1 ÷ 255 sec)

12.1.15 Configuring the temperature/pressure alarms (AC1-AC2)

AC1 **Relative/absolute compressor alarms**
REL = pressure/temperature alarms associated with the setpoint. In this case, the alarm threshold is added/deducted from the respective setpoint.
E.g. suction high temperature alarm 1. The alarm threshold is SETC1+ AL4.
ABS = alarms with absolute pressure/temperature values. In this case, the alarm threshold is determined by the alarm parameter value.
E.g. high temperature alarm for suction 1. The alarm threshold is AL4

AC2 **Relative/absolute fan alarms**
REL = pressure/temperature alarms associated with the setpoint. In this case, the alarm threshold is added/deducted from the respective setpoint.
E.g. condensation high temperature alarm 1. The alarm threshold is SETF1+ AF2
NOTE1 for CO2 applications only absolute alarms are available.
NOTE2 for CO2 applications only pressure alarms are available.
ABS = alarms with absolute pressure/temperature values. In this case, the alarm threshold is determined by the alarm parameter value.
E.g. condensation high temperature alarm 1. The alarm threshold is AL25
NOTE2 for CO2 applications only pressure, absolute alarms are available

12.1.16 Compressor Alarms (AL1-AL23)

AL1 **Suction Probe 1 alarm exclusion at power on** (0 ÷ 255 min) it is the period starting from instrument switch on, before an alarm probe is signalled. During this time if the pressure is out of range all the compressor are switched on.

AL2 **Suction Probe 2 alarm exclusion at power on** (0 ÷ 255 min) it is the period starting from instrument switch on, before an alarm probe is signalled. During this time if the pressure is out of range, all the compressor are switched on.

AL3 **Low pressure (temperature) alarm for compressors – circuit 1:** (0.10 ÷ 30.00bar; 0.0 ÷ 100.0°C; 1÷430 PSI; 1÷200.0°F; 10 ÷ 3000KPA)

With AC1 = ABS: -1.00 to AL4 **bar**; -50 to AL4**°C**; -14 to AL4 **Psi**; -58 to AL4**°F**; -100 to AL4 **Kpa**) The measurement unit depends on CF26 parameter.
With AC1 = REL If the pressure (temperature) falls below the "SETC1-AL3" value, the "Low alarm – Suction 1" is activated at the end of the AL5 period of time.
With AC1 = ABS If the pressure (temperature) falls below the "AL3" value, the "Low alarm – Suction 1" is activated at the end of the AL5 period of time.

AL4 **High pressure (temperature) alarm for compressors – circuit 1:** (**With AC1 = REL** 0.10 to 30.00 **bar**; 0.0 to 100.0 **°C**; 1 to 430 **PSI**; 1 to 200.0 **°F**; 10 to 3000 **KPA**
With AC1 = ABS: AL3 to 100.00 **bar**; AL3 to 150 **°C**; -AL3 to 1450 **Psi**; AL3 to 230 **°F**; AL3 to 10000 **Kpa**). The measurement unit depends on CF26 parameter.
With AC1 = REL If the pressure (temperature) exceeds the "SETC1+AL4" value, the "High alarm – Suction 1" is activated at the end of the AL5 period of time.
With AC1 = ABS If the pressure (temperature) exceeds the "AL4" value, the "High alarm – Suction 1" is activated at the end of the AL5 period of time.

AL5 **Low and High compressor pressure (temperature) alarms delay – circuit 1** (0÷255 min) time interval between the detection of a pressure (temperature) alarm condition and alarm signalling.

AL6 **Low pressure (temperature) alarm for compressors – circuit 2:**
(**With AC1 = REL:** 0.10 to 30.00 **bar**; 0.0 to 100.0 **°C**; 1 to 430 **Psi**; 1 to 200.0 **°F**; 10 to 3000 **Kpa**
With AC1 = ABS: -1.00 to AL7 **bar**; -50 to AL7 **°C**; -14 to AL7 **Psi**; -58 to AL7 **°F**; -100 to AL7 **Kpa**)
The measurement unit depends on CF26 parameter.
With AC1 = REL If the pressure (temperature) falls below the "SETC2-AL6" value, the "Low alarm – Suction 2" is activated at the end of the AC8 period of time.
With AC1 = ABS If the pressure (temperature) falls below the "AL6" value, the "Low alarm – Suction 2" is activated at the end of the AL8 period of time.

AL7 **High pressure (temperature) alarm for compressors – circuit 2:** (**With AC1 = REL** 0.10 to 30.00 **bar**; 0.0 to 100.0 **°C**; 1 to 430 **Psi**; 1 to 200.0 **°F**; 10 to 3000 **Kpa**
With AC1 = ABS: AL6 to 100.00 **bar**; AL6 to 150 **°C**; -AL6 to 1450 **Psi**; AL6 to 230 **°F**; AL6 to 10000 **Kpa**). The measurement unit depends on CF26 parameter.
With AC1 = REL If the pressure (temperature) exceeds the "SETC2+AL7" value, the "High alarm – Suction 2" is activated at the end of the AL8 period of time.
With AC1 = ABS If the pressure (temperature) exceeds the "AL7" value, the "High alarm – Suction 2" is activated at the end of the AL8 period of time.

AL8 **Low and High compressor pressure (temperature) alarms delay – circuit 2** (0÷255 min) interval time between the detection of a pressure (temperature) alarm condition and alarm signalling.

AL9 **Relay activated in case of pressure (temperature) alarm**
nu = no relay activation, only visual signalling; **Alr:** all the C(i) Inputs set as ALr; **ALr1:** all the C(i) Inputs set as ALr1, **ALr2:** all the C(i) Inputs set as ALr2

AL10 **Service request**: (0÷25000h with 0 the function is disabled) number of running hours after that maintenance warning is generated

AL11 **Relay activated in case of service request alarm**
nu = no relay activation, only visual signalling; **Alr:** all the C(i) Inputs set as ALr; **ALr1:** all the C(i) Inputs set as ALr1, **ALr2:** all the C(i) Inputs set as ALr2

AL12 **Low pressure-switch intervention numbers – circuit 1: (0÷15).** Every time the pressure-switch is activated all the compressors of the circuit 1 are turned off. If the low pressure-switch is activated AL12 times in the AL13 interval, the compressors of the first circuit are switched off and only the manually unlocking is possible.

AL13 **Pressure-switch interventions time (0÷255 min) – circuit 1** Interval, linked to the AL12 parameter, for counting interventions of the low pressure-switch.

AL14 **Number of steps engaged with suction probe 1 faulty** (0 ÷ 15)

AL16 **Low pressure-switch intervention numbers – circuit 2: (0÷15).** Every time the pressure-switch is activated all the compressors of the circuit 2 are turned off. If the low pressure-switch is activated AL16

times in the AL17 interval, the compressors of the second circuit are switched off and only the manually unlocking is possible.

AL17 **Pressure-switch interventions time (0÷255 min) – circuit 2** Interval, linked to the AL16 parameter, for counting interventions of the low pressure-switch.

AL18 **Number of steps engaged with suction probe 2 faulty** (0 ÷ 15)

AL20 **Electronic pressure switch activation for circuit 1**
NO = electronic pressure switch not enabled
YES = electronic pressure switch enabled

AL21 **Pressure/temperature threshold of compressor set for circuit 1**
(-1 ÷ SETC1 **Bar** ; -70.0 ÷ SETC1 **°C**; -15 ÷ SETC1 **Psi**; -94 ÷ SETC1 **°F**; -100 ÷ SETC1 **Kpa**;)

AL22 **Enabling the electronic pressure switch for circuit 2**
NO = electronic pressure switch not enabled
YES = electronic pressure switch enabled

AL23 **Pressure/temperature threshold of compressor set for circuit 2**
(-1 ÷ SETC2 **Bar** ; -70.0 ÷ SETC2 **°C**; -15 ÷ SETC2 **Psi**; -94 ÷ SETC2 **°F**; -100 ÷ SETC2 **Kpa**;)

12.1.17 Fan Alarms (AL24-AL46)

AL24 **Low pressure (temperature) alarm for fans – circuit 1:**
With AC2 = ABS: If the pressure (temperature - not available for CO2 applcations) falls below the "AL24" value, the "Low alarm – Condensation 1" is activated at the end of the AL26 period of time".
Range: -1.00 to AL25 **bar**; -50 to AL25 **°C**; -14 to AL25 **Psi**; -58 to AL25 **°F**; -100 to AL25 **Kpa**
UM: according to CF26

With AC2 = REL: - NOT AVAILABLE FOR CO2 APPLICATIONS - If the pressure (temperature) falls below the "SETF1-AL24" value, the "Low alarm – Condensation 1" is activated at the end of the AL26 period of time.
Range: 0.10 ÷ 30.00 bar; 0.0 ÷ 100.0 **°C**; 1÷430 **Psi**; 1÷200.0 **°F**; 10 ÷ 3000 **Kpa**
UM: according to CF26

AL25 **High pressure (temperature) alarm for fans– Circuit 1**
With AC2 = ABS: If the pressure (temperature - not available for CO2 applcations) exceeds the "AL25" value, the "High alarm – Condensation 1" is activated at the end of the AL26 period of time
Range: AL24 to 100.00bar; AL24 to150°C; AL24 to1450 PSI; AL24 to 230°F; AL24 to10000 KPA.
UM: according to CF26
NOTE: This alarm work in parallel with GC19 Pressure value near HP cut out alarm. Set AL25 higher than GC19, for a proper working.

With AC2 = REL: - NOT AVAILABLE FOR CO2 APPLICATIONS If the pressure (temperature) exceeds the "SETF1+AL25" value, the "High alarm – Condensation 1" is activated at the end of the AL26 period of time.
Range: 0.10 to 30.00bar; 0.0 to 100.0 °C; 1 to 430 PSI; 1 to 200.0°F; 10 to 3000KPA
UM: according to CF26

AL26 **Low and High fan pressure (temperature) alarms delay – circuit 1** (0÷255 min) time interval between the detection of a pressure (temperature) alarm condition and alarm signalling.

AL27 **Compressors off with pressure (temperature) alarm for fans– circuit 1**
no = compressors are not influenced by this alarm
yES = compressors are turned off in case of high pressure (temperature) alarm of fans

AL28 **Interval between 2 compressors turning off in case of high pressure (temperature) alarm for fans – circuit 1** (0 ÷ 255 min)

AL29 **High pressure-switch intervention numbers – circuit 1: (0÷15).** Every time the pressure-switch is activated all the compressors of the circuit 1 are turned off and the fan turned on. If the high pressure-switch is activated AL29 times in the AL30 interval, the compressors of the first circuit are switched off and the fans on, only the manually unlocking is possible.

AL30 **High pressure-switch interventions time (0÷255 min) – circuit 1** Interval, linked to the AL29 parameter, for counting interventions of the high pressure-switch.

AL31 **Fans on with delivery probe faulty – circuit 1** (0 ÷ 15)

AL32 **Low pressure (temperature) alarm for fans – circuit 2:**
(**With AC2 = REL:** 0.10 ÷ 30.00 **bar**; 0.0 ÷ 100.0 **°C**; 1÷430 **Psi**; 1÷200.0 **°F**; 10 ÷ 3000 **Kpa**
With AC2 = ABS: -1.00 to AL33 bar; -50 to AL33 °C; -14 to AL33 PSI; -58 to AL33 °F; -100 to AL33 KPA) The measurement unit depends on CF26 parameter.
With AC2 = REL If the pressure (temperature) falls below the "SETF2-AL32" value, the "Low alarm – Condensation 2" is activated at the end of the AL34 period of time.
With AC2 = ABS If the pressure (temperature) falls below the "AL32" value, the "Low alarm – Condensation 2" is activated at the end of the AL34 period of time.

AL33 **High pressure (temperature) alarm for fans– circuit 2:**
(**With AC2 = REL** 0.10 to 30.00bar; 0.0 to 100.0°C; 1 to 430 PSI; 1 to 200.0°F; 10 to 3000KPA
With AC2 = ABS AL32 to 100.00bar; AL32 to150°C; AL32 to1450 PSI; AL32 to 230°F; AL32 to 10000 KPA).
The measurement unit depends on CF26 parameter.
With AC2 = REL If the pressure (temperature) exceeds the "SETF2+AL33" value, the "Low alarm – Condensation 2" is activated at the end of the AL34 period of time.
With AC2 = ABS If the pressure (temperature) exceeds the "AL33" value, the "Low alarm – Condensation 2" is activated at the end of the AL34 period of time.

AL34 **Low and High fan pressure (temperature) alarms delay – circuit 2** (0÷255 min) time interval between the detection of a pressure (temperature) alarm condition and alarm signalling.

AL35 **Compressors off with pressure (temperature) alarm for fans– circuit 2**
no = compressors are not influenced by this alarm
yES = compressors are turned off in case of high pressure (temperature) alarm of fans

AL36 **Interval between 2 compressors turning off in case of high pressure (temperature) alarm for fans – circuit 2** (0 ÷ 255 min)

AL37 **High pressure-switch intervention numbers – circuit 2: (0÷15).** Every time the pressure-switch is activated all the compressors of the circuit 1 are turned off and the fan turned on. If the high pressure-switch is activated AL37 times in the AL38 interval, the compressors of the first circuit are switched off and the fans on, only the manually unlocking is possible.

AL38 **High pressure-switch interventions time (0÷255 min) – circuit 2** Interval, linked to the AL37 parameter, for counting interventions of the high pressure-switch.

AL39 **Fans on with delivery probe faulty – circuit 2** (0 ÷ 15)

AF40 **Relay activated in case of pressure (temperature) alarms of fans**
nu = no relay activation, only visual signalling; **Alr:** all the C(i) Inputs set as ALr; **ALr1:** all the C(i) Inputs set as ALr1, **ALr2:** all the C(i) Inputs set as ALr2

AL41 **High pressure (temperature) to un-split condenser – circuit 1:** The range depends on measurement unit: CF26 parameter**: 0** to 100.00bar; -40 to150°C; 0 to1450 PSI; -40 to 230°F; 0 to 10000 KPA.
When the pressure/ temperature exceeds AF41 threshold, the split condenser function is disabled. The status of the split condenser relay depends on parameter AF43.

AL42 **Differential for high pressure (temperature) un-split condenser alarm recovery – circuit 1:** The range depends on measurement unit: CF26 parameter (0.10÷10.00 **bar**; 0.1÷30.0 **°C**, 1÷145 **Psi**, 1÷50**°F**; 10÷1000 **Kpa**)
The split condenser function is restore when temperature/ pressure drop down the AF41-AF42 value

AL43 **Split condenser relay status with temperature/pressure > AF41 – circuit 1:** (on, off)

AL44 **High pressure (temperature) to un-split condenser – circuit 2:** The range depends on measurement unit: CF26 parameter**: 0** to 100.00bar; -40 to150°C; 0 to1450 PSI; -40 to 230°F; 0 to 10000 KPA.
When the pressure/ temperature exceeds AF41 threshold, the split condenser function is disabled. The status of the split condenser relay depends on parameter AF43.

AL45 **Differential for high pressure (temperature) un-split condenser alarm recovery – circuit 2:** The range depends on measurement unit: CF26 parameter (0.10÷10.00 **bar**; 0.1÷30.0 **°C**, 1÷145 **Psi**, 1÷50**°F**; 10÷1000 **Kpa**)
The split condenser function is restore when temperature/ pressure drop down the AF41-AF42 value

AL46 **Split condenser relay – circuit 2 status with temperature/pressure > AF44 – circuit 2:** (on, off)

12.1.18 Dynamic Setpoint Suction (Dsp1- Dsp8)

DSP1 **Dynamic compressor set point function enabled - circuit 1**
no = standard regulation
yES = the SETC1 varies according to the setting of DSP2, DSP3, DSP4.
Warning the dynamic set point requires a dedicated probe, so it is necessary one of the probes is set for this function.

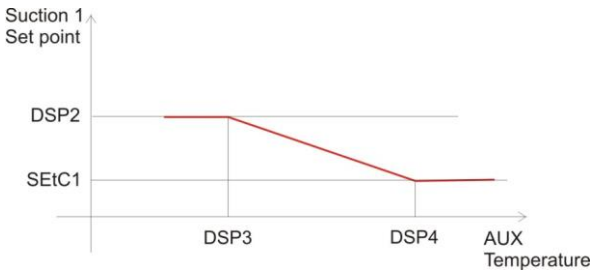
NOTE: if more than one probe is used for the optimization of the suction set point, only the last probe defined is considered.(ex: if the analog input 1 is configurated as optimization of suction set point and also the analog input 2 ;the probe is used is the probe 2)

DSP2 **Maximum compressor set point - circuit 1** (SETC1÷RC3) It sets the maximum value of compressor set point used in the dynamic set point function. The measurement unit depends on CF26 parameter.

DSP 3 **External temperature for maximum set point DSP2- circuit 1** (-40÷DSP4 °C /-40÷DSP4°F) It is the temperature detected by the external probe, at which the maximum set point is reached.

DSP 4 **External temperature for standard set point– circuit 1** (DSP3÷150°C DSP 3÷302°F)

1. with EXT temper. < DSP3 ==> “Real SEtC1” = DSP2
2. with EXT temper. > DSP4 ==> “Real SEtC1” = SEtC1
3. with DSP3 < EXT temper < DSP4 ==> SEtC1 < “Real SEtC1” < DSP2



DSP5 **Dynamic compressor set point function enabled - circuit 2**
no = standard regulation
yES = the SETC2 varies according to the setting of DSP6, DSP7, DSP8.
WARNING the dynamic set point requires a dedicated probe, it isone probe must be set up for this function

NOTE: if more than one probe is used for the optimization of the suction set point, only the last probe defined is considered.(ex: if the analog input 1 is configurated as optimization of suction set point and also the analog input 2 ;the probe is used is the probe 2)

DSP 6 **Maximum compressor set point - circuit 2** (SETC2÷RC7) It sets the maximum value of compressor set point used in the dynamic set point function. The measurement unit depends on CF46 parameter.

DSP 7 **External temperature for maximum set point O6 - circuit 2** (-40÷DSP8 °C /-40÷DSP8°F) Iti is the temperature detected by the external probe, at which the maximum set point is reached.

DSP 8 **External temperature for standard set point– circuit 2** (DSP7÷150°C DSP 7÷302°F)

1. with EXT temper. < DSP7 ==> "Real SEtC2" = DSP6
2. with EXT temper. > DSP8 ==> "Real SEtC2" = SEtC2
3. with DSP7 < EXT temper < DSP8 ==> SEtC2 < "Real SEtC2" < DSP6

12.1.19 Dynamic Setpoint Condenser (DSP9- DSP16)

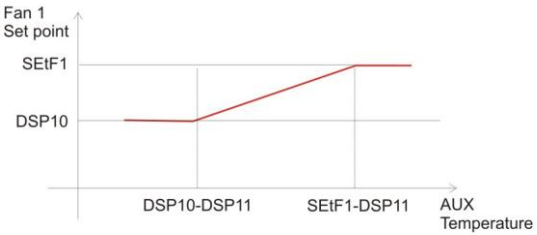
DSP9 **Dynamic set enabled for condenser- circuit 1**
no = standard regulation
yES = the SETF1 varies according to the setting of DSP10, DSP11.
WARNING the dynamic set point requires a dedicated probe, one probe must be set up for this functionit is

DSP10 **Minimum condenser set point - circuit 1** (RC10÷SETF1)

DSP11 **Differential for condenser dynamic set point –circuit 1 - Subcritical**
Range: DSP15÷50.0 °C; DSP15÷90 °F
The way of working of this algorithm is explained in the following exemplum.

Example

The ext temperature > SETF1-DSP11	==>	"real SEtF1" = SETF1
The ext temperature < DSP10-DSP11	==>	"real SetF1"= DSP10
DSP10- DSP11 < ext temperature < SETF1- DSP11	==>	DSP10 <"real SEtF1"< SEtF1



NOTE: if CF26 = bar or PSI or KPA, DSP11 is bar or PSI, the IProRack makes the changes required

DSP12 **Dynamic set enabled for condenser- circuit 2**
no = standard regulation
yES = the SETF2 varies according to the setting of DSP13, DSP14.
WARNING the dynamic set point requires a dedicated probe, one probe must be set up for this functionit is

DSP13 **Minimum condenser set point - circuit 2** (RC14÷SETF2)

DSP14 **Differential for condenser dynamic set point –circuit 2** (-50.0÷50.0°C; -90÷90°F). The way of working of this algorithm is explained in the following example.

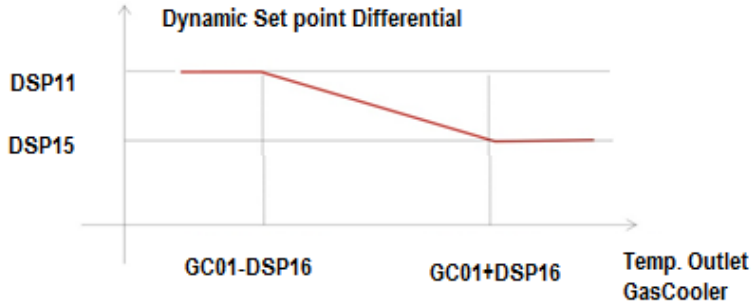
Example

The ext temperature > SETF2-DSP14	==>	“real SetF2” = SETF2
The ext temperature < DSP13-DSP14	==>	“real SetF1”= DSP13
DSP13-DSP14 < ext temperature < SETF2-DSP14	==>	DSP13 <“real SetF2”< SetF2

DSP15 Differential for condenser dynamic set point during transcritical mode - Circuit 1 - *Range*:(-50.0÷DSP11 °C; -90÷ DSP11 °F, according to CF26)

DSP16 Half Dead Band Width to join up DSP11 and DSP15 around the transcritical temperature

Range: 0.1÷50.0 °C; 1÷90 °F, according to CF26
When the circuit 1 dynamic set point for fan is enabled 2 differntiala are used:
DSP11 in subcritical mode, **DSP15 in transcritical mode**
Around the GC01 value, the 2 set points are joined according to the following formula:
With Gas cooler outlet temperature detected by the probe AICxx = 154 or 155 < GC01-DSP16 → differential = DSP11
With Gas cooler outlet temperature detected by the probe AICxx = 154 or 155 > GC01+DSP16 → differential = DSP15
With Gas cooler outlet temperature: GC01-DSP16 =<AICxx = 154 or 155 =< GC01+DSP16 → DSP15=<differential =< DSP11



12.1.20 Analog Output 1 (AO1_1-AO1_26)

AO1_1 Reference probe for analogue Output 1

AO1_10DIN:
Range: 0÷9
0: Pb1 = (term. 2-7 (if the probe is configured as NTC PTC))
1: Pb2 = (term. 3-7 (if the probe is configured as NTC PTC))
2: Pb3 = (term. 4-7 (if the probe is configured as NTC PTC))
3: Pb4 = (term. 5-7 (if the probe is configured as NTC PTC))
4: Pb5 = (term. 6-7 (if the probe is configured as NTC PTC))
5: Pb6 = (term. 10-7 (if the probe is configured as NTC PTC))
6: Pb7 = (term. 11-7 (if the probe is configured as NTC PTC))
7: Pb8 = (term. 12-7 (if the probe is configured as NTC PTC))
8: Pb9 = (term. 13-7 (if the probe is configured as NTC PTC))
9: Pb10 = (term. 14-7 (if the probe is configured as NTC PTC))

AO1_2 Adjustment of read out for the analog Output 1
Used with analog output set as "proportional", see AoC1.
Range: -1.00÷100.00 bar; -15÷1450 PSI; -70÷150°C; -94÷302°F; -100÷10000 KPA
UM: according to CF26

AO1_3 Adjustment of read out for the analog Output 1 at 20mA/10V
Used with analog output set as "proportional", see AoC1.
Range: -1.00÷100.00 bar; -15÷1450PSI; -70÷150°C; 94÷302°F; -100÷10000 KPA
UM: according to CF26

AO1_4 Minimum value for analogue Output 1
Range: 0 ÷ AO1_13

AO1_5 Analog Output 1 value after compressor start
It is the value of the analogue Output after a compressor has started, when the pressure/temperature is above the regulation band. – *Used during inverter regulation*
Range: AO1_4 ÷ AO1_13

AO1_6 Analog Output 1 value after a compressor is switched off
It is the value of the analogue Output when a compressor has been switched off and the the pressure/temperature is below the regulation band. – *Used during inverter regulation*
Range: AO1_4 ÷ AO1_13

AO1_7 Exclusion band start value for analog Output 1
it excludes a range of frequencies that could create problems to the compressor. – *Used during inverter regulation*
Range: AO1_4 ÷ AO1_8

AO1_8 Exclusion band end value for analog Output 1
Used during inverter regulation
Range: AO1_7 ÷ 99 %

AO1_9 Safety value for analog Output 1
it is used in case of probe's fault.

Range: 0 ÷ AO1_13

AO1_10 Delay between the entrance in the regulation band and the regulation activation
it is the delay between the entrance in the regulation band of pressure/temperature and the regulation start. It is used to avoid false inverter starts due to pressure variations. – *Used during inverter regulation.*
Range: 0 ÷ 255
UM: sec

AO1_11 Analog Output 1 rise time
It is the time necessary to the analog Output to pass from the AO1_4 ÷ AO1_13 when a compressor has started and the pressure/temperature is above the regulation band. – *Used during inverter regulation.*
Range: 0 ÷ 255
UM: sec

AO1_12 Analog Output 1 permanency at AO1_13 before load activation
the analog Output remains at AO1_13 value for this time before a load is activated. – *Used during inverter regulation*
Range: 0 ÷ 255
UM: sec

AO1_13 Max value for analogue Output 1
Range: AO1_4 -100%

AO1_14 Analog Output 1 decreasing time
It is the time taken from the analog Output to pass from the AO1_13 to the AO1_4 value. It is used during the switching off phase, when the pressure is lower than the set point.
Range: 0 ÷ 255
UM: sec

AO1_15 Analog Output 1 permanency at AO1_4 before a load is switched off
When the pressure (temperature) is below the set point, the analog Output remains at AO1_4 value for the AO1_15 before a load is switched off.
Range: 0 ÷ 255
UM: sec

AO1_16 Analog Output 1 decreasing time when a load is switched on
It is the time necessary to the analog Output to pass from AO1_13 to AO1_5 when a load is
Range: 0 ÷ 255
UM: sec

AO1_17 Regulation band
It is the band with the proportional action. It replaces RC1 for the inverter regulation. It is added to the set point. The proportional action starts when the temperature/pressure value is higher than the set point and it reaches the AO1_13 when the pressure/temperature is equal or higher than set + AO1_17.
Range: 0.10÷10.00bar; 0.0÷25.0°C; 1÷80 PSI; 1÷50°F;10÷1000 KPA
UM: according to CF26

AO1_18 Integral time
It sets the pound of the proportional action. The higher is AO1_18, the lower is the integral action support.

Range: 0÷999
0: integral action excluded
UM: s

AO1_19 Band offset.
It is used to move the regulation band across to the set point.
Range: -12.0÷12.0°C -12.00 ÷ 12.00 BAR, -120÷120°F, -120÷120PSI; 1200÷1200KPA
UM: according to CF26

AO1_21 Maximum value of A.o.1 during silent mode
Range: AO1_5/AO1_6 ÷AO1_13

AO1_22 Minimum inverter capacity with poor lubrication
If the frequency compressor works for the AO1_23 time with a frequency (in percentage) equal or lower than AO1_22 it is forced to work at AO1_13 for the AO1_24 time in order to force the right lubrication.
Range: 0÷99%
0: function excluded

AO1_23 Maximum inverter functioning time at a lower frequency than AO1_22, before working at AO1_13
Range: 1÷255
UM: min

AO1_24 Time of inverter functioning at AO1_13 to restore the right lubrication
Range: 1÷255
UM: min

AO1_25 Maximum time, analog output 1 is off when AOC1 = 6 or 7 or 8 or 9 or 15 or 16 or 17 or 18
Range: 0.0÷24.0h; with 0 the function is disabled
UM: 10min

AO1_26 Time of analog output 1 at maximum AO1_13 when AO1_25 timer is over
Range: 1÷255
UM: min

12.1.21 Analog Output 2 (AO2_1- AO2_26)

AO2_1 Reference probe for analogue Output 2, it is used only when the analog Output is configured as FREE in the io.conf file

AO1_10DIN:
Range: 0÷9
0: Pb1 = (term. 2-7 (if the probe is configured as NTC PTC))
1: Pb2 = (term. 3-7 (if the probe is configured as NTC PTC))
2: Pb3 = (term. 4-7 (if the probe is configured as NTC PTC))
3: Pb4 = (term. 5-7 (if the probe is configured as NTC PTC))
4: Pb5 = (term. 6-7 (if the probe is configured as NTC PTC))
5: Pb6 = (term. 10-7 (if the probe is configured as NTC PTC))
6: Pb7 = (term. 11-7 (if the probe is configured as NTC PTC))
7: Pb8 = (term. 12-7 (if the probe is configured as NTC PTC))
8: Pb9 = (term. 13-7 (if the probe is configured as NTC PTC))
9: Pb10 = (term. 14-7 (if the probe is configured as NTC PTC))

AO2_2 Adjustment of read out for the analog Output
It is used only when the analog Output is configured as FREE in the io.conf file
Range: -1.00÷100.00 bar; -15÷1450PSI; -70÷150°C; -94÷302°F; -100÷10000 KPA
UM: according to CF26

AO2_3 Adjustment of read out for the analog Output 2 at 20mA/10V
It is used only when the analog Output is configured as FREE in the io.conf file
Range: -1.00÷100.00 bar; -15÷1450PSI; -70÷150°C; 94÷302°F; -100÷10000 KPA
UM: according to CF26

AO2_4 Minimum value for analogue Output 2
Range: 0 ÷ AO2_13

AO2_5 Analog Output 2 value after compressor start
It is the value of the analogue Output after a compressor has started, when the pressure/temperature is above the regulation band. – *Used during inverter regulation*
Range: AO2_4 ÷ AO2_13

AO2_6 Analog Output 2 value after a compressor is switched off
It is the value of the analogue Output when a compressor has been switched off and the the pressure/temperature is below the regulation band. – *Used during inverter regulation*
Range: AO2_4 ÷ AO2_13

AO2_7 Exclusion band start value for analog Output 2
it excludes a range of frequencies that could create problems to the compressor. – Used during inverter regulation
Range: AO2_4 ÷ AO2_8

AO2_8 Exclusion band end value for analog Output 2
Used during inverter regulation
Range: AO2_7 ÷ 99 %

AO2_9 Safety value for analog Output 2
it is used in case of probe's fault.
Range: 0 ÷ AO2_13

AO2_10 Delay between the entrance in the regulation band and the regulation activation
it is the delay between the entrance in the regulation band of pressure/temperature and the regulation start. It is used to avoid false inverter starts due to pressure variations. – *Used during inverter regulation.*
Range: 0 ÷ 255
UM: sec

AO2_11 Analog Output 2 rise time
It is the time necessary to the analog Output to pass from the AO2_4 ÷ AO2_13, when a compressor has started and the pressure/temperature is above the regulation band. – *Used during inverter regulation.*
Range: 0 ÷ 255
UM: sec

AO2_12 Analog Output 2 permanency at AO2_13 before load activation
the analog Output remains at AO2_13 value for this time before a load is activated. – *Used during inverter regulation*
Range: 0 ÷ 255

UM: sec

AO2_13 Max value for analogue Output 2
Range: AO2_4 -100%

AO2_14 Analog Output 2 decreasing time
It is the time taken from the analog Output to pass from the AO2_13 to the AO2_4 value. It is used during the switching off phase, when the pressure is lower than the set point.
Range: 0 ÷ 255
UM: sec

AO2_15 Analog Output 2 permanency at AO2_4 before a load is switched off
When the pressure (temperature) is below the set point, the analog Output remains at AO2_4 value for the AO2_15 before a load is switched off.
Range: 0 ÷ 255
UM: sec

AO2_16 Analog Output 2 decreasing time when a load is switched on
It is the time necessary to the analog Output to pass from AO2_13 to AO2_5 when a load is switched on.
Range: 0 ÷ 255
UM: sec

AO2_17 Regulation band
It is the band with the proportional action. It replaces the band for the inverter regulation. It is added to the set point. The proportional action starts when the temperature/pressure value is higher than the set point and it reaches the AO2_13 when the pressure/temperature is equal or higher than set + AO2_17.
Range: 0.10÷10.00bar; 0.0÷25.0°C; 1÷80 PSI; 1÷50°F;10÷1000 KPA
UM: according to CF26

AO2_18 Integral time
It sets the pound of the proportional action. The higher is AO2_18 , the lower is the integral action support.
Range: 0÷999
0: integral action excluded
UM: s

AO2_19 Band offset
it is used to move the regulation band across to the set point.
Range: -12.0÷12.0°C -12.00 ÷ 12.00 BAR, -120÷120°F, -120÷120PSI; 1200÷1200KPA
UM: according to CF26

AO2_21 Maximum value of A.o.2 during silent mode
Range: AO2_5/AO2_6 ÷ AO2_13

AO2_22 Minimum inverter capacity with poor lubrication
If the frequency compressor works for the AO2_23 time with a frequency (in percentage) equal or lower than AO2_22, it is forced to work at AO2_13 for the AO2_24 time in order to force the right lubrication.
Range: 0÷99%
0: function excluded

AO2_23 Maximum inverter functioning time at a lower frequency than AO2_22, before working at AO2_13
Range: 1÷255
UM: min

AO2_24 Time of inverter functioning at AO2_13 to restore the right lubrication
Range: 1÷255
UM: min

AO2_25 Maximum time, analog output 2 is off when AOC2 = 6 or 7 or 8 or 9 or 15 or 16 or 17 or 18
Range: 0.0÷24.0h; with 0 the function is disabled
UM: 10min

AO2_26 Time of analog output 2 at maximum AO2_13 when AO2_25 timer is over
Range: 1÷255
UM: min

12.1.22 Analog Output 3 (AO3_1- AO3_26)

AO3_1 Reference probe for analogue Output 3, it is used only when the analog Output is configured as FREE in the io.conf file

AO1_10DIN:
Range: 0÷9
0: Pb1 = (term. 2-7 (if the probe is configured as NTC PTC))
1: Pb2 = (term. 3-7 (if the probe is configured as NTC PTC))
2: Pb3 = (term. 4-7 (if the probe is configured as NTC PTC))
3: Pb4 = (term. 5-7 (if the probe is configured as NTC PTC))
4: Pb5 = (term. 6-7 (if the probe is configured as NTC PTC))
5: Pb6 = (term. 10-7 (if the probe is configured as NTC PTC))
6: Pb7 = (term. 11-7 (if the probe is configured as NTC PTC))
7: Pb8 = (term. 12-7 (if the probe is configured as NTC PTC))
8: Pb9 = (term. 13-7 (if the probe is configured as NTC PTC))
9: Pb10 = (term. 14-7 (if the probe is configured as NTC PTC))

AO3_2 Adjustment of read out for the analog Output 3
It is used only when the analog Output is configured as FREE in the io.conf file
Range: -1.00÷100.00 bar; -15÷1450PSI; -70÷150°C; -94÷302°F; -100÷10000 KPA
UM: according to CF26

AO3_3 Adjustment of read out for the analog Output 3 at 20mA/10V
It is used only when the analog Output is configured as FREE in the io.conf file
Range: -1.00÷100.00 bar; -15÷1450PSI; -70÷150°C; 94÷302°F; -100÷10000 KPA
UM: according to CF26

AO3_4 Minimum value for analogue Output 3
Range: 0 ÷ AO3_13

AO3_5 Analog Output 3 value after compressor start
It is the value of the analogue Output after a compressor has started, when the pressure/temperature is above the regulation band. – *Used during inverter regulation*

Range: AO3_4 ÷ AO3_13

AO3_6 Analog Output 3 value after a compressor is switched off
It is the value of the analogue Output when a compressor has been switched off and the the pressure/temperature is below the regulation band. – *Used during inverter regulation*
Range: AO3_4 ÷ AO3_13

AO3_7 Exclusion band start value for analog Output 3
it excludes a range of frequencies that could create problems to the compressor. – Used during inverter regulation
Range: AO3_4 ÷ AO3_8

AO3_8 Exclusion band end value for analog Output 3
Used during inverter regulation
Range: AO3_7 ÷ 99 %

AO3_9 Safety value for analog Output 2
it is used in case of probe's fault.
Range: 0 ÷ AO3_13

AO3_10 Delay between the entrance in the regulation band and the regulation activation
it is the delay between the entrance in the regulation band of pressure/temperature and the regulation start. It is used to avoid false inverter starts due to pressure variations. – *Used during inverter regulation.*
Range: 0 ÷ 255
UM: sec

AO3_11 Analog Output 2 rise time
It is the time necessary to the analog Output to pass from the AO3_4 ÷ AO3_13 when a compressor has started and the pressure/temperature is above the regulation band. – *Used during inverter regulation.*
Range: 0 ÷ 255
UM: sec

AO3_12 Analog Output 2 permanency at AO3_13 before load activation
the analog Output remains at AO3_13 value for this time before a load is activated. – *Used during inverter regulation*
Range: 0 ÷ 255
UM: sec

AO3_13 Max value for analogue Output 3
Range: AO3_4 -100%

AO3_14 Analog Output 2 decreasing time
It is the time taken from the analog Output to pass from the AO3_13 to the AO3_4 value. It is used during the switching off phase, when the pressure is lower than the set point.
Range: 0 ÷ 255
UM: sec

AO3_15 Analog Output 2 permanency at AO3_4 before a load is switched off

When the pressure (temperature) is below the set point, the analog Output remains at AO3_4 value for the AO3_15 before a load is switched off.
Range: 0 ÷ 255
UM: sec

AO3_16 Analog Output 3 decreasing time when a load is switched on

It is the time necessary to the analog Output to pass from AO3_13 to AO3_5 when a load is switched on.
Range: 0 ÷ 255
UM: sec

AO3_17 Regulation band

It is the band with the proportional action. It replaces the band for the inverter regulation. It is added to the set point. The proportional action starts when the temperature/pressure value is higher than the set point and it reaches the AO3_13 when the pressure/temperature is equal or higher than set + AO3_17.
Range: 0.10÷10.00bar; 0.0÷25.0°C; 1÷80 PSI; 1÷50°F;10÷1000 KPA
UM: according to CF26

AO3_18 Integral time

It sets the pound of the proportional action. The higher is AO3_18 , the lower is the integral action support.
Range: 0÷999
0: integral action excluded
UM: s

AO3_19 Band offset

it is used to move the regulation band across to the set point.
Range: -12.0÷12.0°C -12.00 ÷ 12.00 BAR, -120÷120°F, -120÷120PSI; 1200÷1200KPA
UM: according to CF26

AO3_21 Maximum value of A.o.3 during silent mode

Range: AO3_5/AO3_6 ÷ AO3_13

AO3_22 Minimum inverter capacity with poor lubrication

If the frequency compressor works for the AO3_23 time with a frequency (in percentage) equal or lower than AO3_22, it is forced to work at AO3_13 for the AO3_24 time in order to make the right lubrication.
Range: 0÷99%
0: function excluded

AO3_23 Maximum inverter functioning time at a lower frequency than AO3_22, before working at AO3_13

Range: 1÷255
UM: min

AO3_24 Time of inverter functioning at AO3_13 to restore the right lubrication

Range: 1÷255
UM: min

AO3_25 Maximum time, analog output 3 is off when AOC3 = 6 or 7 or 8 or 9 or 15 or 16 or 17 or 18

Range: 0.0÷24.0h; with 0 the function is disabled
UM: 10min

AO3_26 Time of analog output 3 at maximum AO3_13 when AO3_25 timer is over
Range: 1÷255
UM: min

12.1.23 Analog Output 4 (AO4_1- AO4_26)

AO4_1 Reference probe for analogue Output 4, it is used only when the analog Output is configured as FREE in the io.conf file

AO1_10DIN:
Range: 0÷9
0: Pb1 = (term. 2-7 (if the probe is configured as NTC PTC))
1: Pb2 = (term. 3-7 (if the probe is configured as NTC PTC))
2: Pb3 = (term. 4-7 (if the probe is configured as NTC PTC))
3: Pb4 = (term. 5-7 (if the probe is configured as NTC PTC))
4: Pb5 = (term. 6-7 (if the probe is configured as NTC PTC))
5: Pb6 = (term. 10-7 (if the probe is configured as NTC PTC))
6: Pb7 = (term. 11-7 (if the probe is configured as NTC PTC))
7: Pb8 = (term. 12-7 (if the probe is configured as NTC PTC))
8: Pb9 = (term. 13-7 (if the probe is configured as NTC PTC))
9: Pb10 = (term. 14-7 (if the probe is configured as NTC PTC))

AO4_2 Adjustment of read out for the analog Output 4
It is used only when the analog Output is configured as FREE in the io.conf file
Range: -1.00÷100.00 bar; -15÷1450PSI; -70÷150°C; -94÷302°F; -100÷10000 KPA
UM: according to CF26

AO4_3 Adjustment of read out for the analog Output 4 at 20mA/10V
It is used only when the analog Output is configured as FREE in the io.conf file
Range: -1.00÷100.00 bar; -15÷1450PSI; -70÷150°C; 94÷302°F; -100÷10000 KPA
UM: according to CF26

AO4_4 Minimum value for analogue Output 4
Range: 0 ÷ AO4_13

AO4_5 Analog Output 4 value after compressor start
It is the value of the analogue Output after a compressor has started, when the pressure/temperature is above the regulation band. – *Used during inverter regulation*
Range: AO4_4 ÷ AO4_13

AO4_6 Analog Output 4 value after a compressor is switched off
It is the value of the analogue Output when a compressor has been switched off and the the pressure/temperature is below the regulation band. – *Used during inverter regulation*
Range: AO4_4 ÷ AO4_13

AO4_7 Exclusion band start value for analog Output 2
it excludes a range of frequencies that could create problems to the compressor. – Used during inverter regulation
Range: AO4_4 ÷ AO4_8

AO4_8 Exclusion band end value for analog Output 2

Used during inverter regulation
Range: AO4_7 ÷ 99 %

AO4_9 Safety value for analog Output 2
it is used in case of probe's fault.
Range: 0 ÷ AO4_13

AO4_10 Delay between the entrance in the regulation band and the regulation activation
it is the delay between the entrance in the regulation band of pressure/temperature and the regulation start. It is used to avoid false inverter starts due to pressure variations. –
Used during inverter regulation.
Range: 0 ÷ 255
UM: sec

AO4_11 Analog Output 2 rise time
It is the time necessary to the analog Output to pass from the AO4_4 ÷ AO4_13, when a compressor has started and the pressure/temperature is above the regulation band. –
Used during inverter regulation.
Range: 0 ÷ 255
UM: sec

AO4_12 Analog Output 2 permanency at AO4_13 before load activation
the analog Output remains at AO4_13 value for this time before a load is activated. –
Used during inverter regulation
Range: 0 ÷ 255
UM: sec

AO4_13 Max value for analogue Output 4
Range: AO4_4 -100%

AO4_14 Analog Output 2 decreasing time (
It is the time taken from the analog Output to pass from the AO4_13 to the AO4_4 value. It is used during the switching off phase, when the pressure is lower than the set point.
Range: 0 ÷ 255
UM: sec

AO4_15 Analog Output 2 permanency at AO4_4 before a load is switched off
When the pressure (temperature) is below the set point, the analog Output remains at AO4_4 value for the AO4_15 before a load is switched off.
Range: 0 ÷ 255
UM: sec

AO4_16 Analog Output 4 decreasing time when a load is switched on
It is the time necessary to the analog Output to pass from AO4_13 to AO4_5 when a load is switched on.
Range: 0 ÷ 255
UM: sec

AO4_17 Regulation band
It is the band with the proportional action. It replaces the band for the inverter regulation. It is added to the set point. The proportional action starts when the temperature/pressure value is higher than the set point and it reaches the AO4_13 when the pressure/temperature is equal or higher than set + AO4_17.
Range: 0.10÷10.00bar; 0.0÷25.0°C; 1÷80 PSI; 1÷50°F;10÷1000 KPA

UM: according to CF26

AO4_18 Integral time
It sets the pound of the proportional action. The higher is AO4_18 , the lower is the integral action support.
Range: 0÷999
0: integral action excluded
UM: s

AO4_19 Band offset
It is used to move the regulation band across to the set point.
Range: -12.0÷12.0°C -12.00 ÷ 12.00 BAR, -120÷120°F, -120÷120PSI; 1200÷1200KPA
UM: according to CF26

AO4_21 Maximum value of A.o.4 during silent mode
Range: AO4_5/AO4_6 ÷ AO4_13

AO4_22 Minimum inverter capacity with poor lubrication
If the frequency compressor works for the AO4_23 time with a frequency (in percentage) equal or lower than AO4_22, it is forced to work at AO4_13 for the AO4_24 time in order to force the right lubrication.
Range: 0÷99%
0: function excluded

AO4_23 Maximum inverter functioning time at a lower frequency than AO4_22, before working at AO4_13
Range: 1÷255
UM: min

AO4_24 Time of inverter functioning at AO4_13 to restore the right lubrication
Range: 1÷255
UM: min

AO4_25 Maximum time, analog output 4 is off when AOC4 = 6 or 7 or 8 or 9 or 15 or 16 or 17 or 18
Range: 0.0÷24.0h; with 0 the function is disabled
UM: 10min

AO4_26 Time of analog output 4 at maximum AO4_13 when AO4_25 timer is over
Range: 1÷255
UM: min

12.1.24 Analog Output 5 (AO5_1- AO5_26)

AO5_1 Reference probe for analogue Output 5, it is used only when the analog Output is configured as FREE in the io.conf file

AO1_10DIN:
Range: 0÷9
0: Pb1 = (term. 2-7 (if the probe is configured as NTC PTC))
1: Pb2 = (term. 3-7 (if the probe is configured as NTC PTC))
2: Pb3 = (term. 4-7 (if the probe is configured as NTC PTC))
3: Pb4 = (term. 5-7 (if the probe is configured as NTC PTC))

4: Pb5 = (term. 6-7 (if the probe is configured as NTC PTC))
5: Pb6 = (term. 10-7 (if the probe is configured as NTC PTC))
6: Pb7 = (term. 11-7 (if the probe is configured as NTC PTC))
7: Pb8 = (term. 12-7 (if the probe is configured as NTC PTC))
8: Pb9 = (term. 13-7 (if the probe is configured as NTC PTC))
9: Pb10 = (term. 14-7 (if the probe is configured as NTC PTC))

AO5_2 Adjustment of read out for the analog Output 5
It is used only when the analog Output is configured as FREE in the io.conf file
Range: -1.00÷100.00 bar; -15÷1450PSI; -70÷150°C; -94÷302°F; -100÷10000 KPA
UM: according to CF26

AO5_3 Adjustment of read out for the analog Output 5 at 20mA/10V
It is used only when the analog Output is configured as FREE in the io.conf file
Range: -1.00÷100.00 bar; -15÷1450PSI; -70÷150°C; 94÷302°F; -100÷10000 KPA
UM: according to CF26

AO5_4 Minimum value for analogue Output 5
Range: 0 ÷ AO5_13

AO5_5 Analog Output 5 value after compressor start
It is the value of the analogue Output after a compressor has started, when the pressure/temperature is above the regulation band. – *Used during inverter regulation*
Range: AO5_4 ÷ AO5_13

AO5_6 Analog Output 5 value after a compressor is switched off
It is the value of the analogue Output when a compressor has been switched off and the the pressure/temperature is below the regulation band. – *Used during inverter regulation*
Range: AO5_4 ÷ AO5_13

AO5_7 Exclusion band start value for analog Output 5
it excludes a range of frequencies that could create problems to the compressor. – Used during inverter regulation
Range: AO5_4 ÷ AO5_8

AO5_8 Exclusion band end value for analog Output 5
Used during inverter regulation
Range: AO5_7 ÷ 99 %

AO5_9 Safety value for analog Output 5
it is used in case of probe's fault.
Range: 0 ÷ AO5_13

AO5_10 Delay between the entrance in the regulation band and the regulation activation
it is the delay between the entrance in the regulation band of pressure/temperature and the regulation start. It is used to avoid false inverter starts due to pressure variations. – *Used during inverter regulation.*
Range: 0 ÷ 255
UM: sec

AO5_11 Analog Output 5 rise time
It is the time necessary to the analog Output to pass from the AO5_4 ÷ AO5_13, when a

compressor has started and the pressure/temperature is above the regulation band. – *Used during inverter regulation.*
Range: 0 ÷ 255
UM: sec

AO5_12 Analog Output 5 permanency at AO5_13 before load activation
the analog Output remains at AO5_13 value for this time before a load is activated. – *Used during inverter regulation*
Range: 0 ÷ 255
UM: sec

AO5_13 Max value for analogue Output 5
Range: AO5_4 -100%

AO5_14 Analog Output 5 decreasing time
It is the time taken from the analog Output to pass from the AO5_13 to the AO5_4 value. It is used during the switching off phase, when the pressure is lower than the set point.
Range: 0 ÷ 255
UM: sec

AO5_15 Analog Output 5 permanency at AO5_5 before a load is switched off
When the pressure (temperature) is below the set point, the analog Output remains at AO5_5 value for the AO5_15 before a load is switched off.
Range: 0 ÷ 255
UM: sec

AO5_16 Analog Output 5 decreasing time when a load is switched on
It is the time necessary to the analog Output to pass from AO5_13 to AO5_5 when a load is switched on.
Range: 0 ÷ 255
UM: sec

AO5_17 Regulation band
It is the band with the proportional action. It replaces the band for the inverter regulation. It is added to the set point. The proportional action starts when the temperature/pressure value is higher than the set point and it reaches the AO5_13 when the pressure/temperature is equal or higher than set + AO5_17.
Range: 0.10÷10.00bar; 0.0÷25.0°C; 1÷80 PSI; 1÷50°F;10÷1000 KPA
UM: according to CF26

AO5_18 Integral time
It sets the pound of the proportional action. The higher is AO5_18 , the lower is the integral action support.
Range: 0÷999
0: integral action excluded
UM: s

AO5_19 Band offset
It is used to move the regulation band across to the set point.
Range: -12.0÷12.0°C -12.00 ÷ 12.00 BAR, -120÷120°F, -120÷120PSI; 1200÷1200KPA
UM: according to CF26

AO5_21 Maximum value of A.o.5 during silent mode (AO5_5/AO5_6 ÷ AO5_13)
Range: AO5_5/AO5_6 ÷ AO5_13

AO5_22 Minimum inverter capacity with poor lubrication
If the frequency compressor works for the AO5_23 time with a frequency (in percentage) equal or lower than AO5_22, it is forced to work at AO5_13 for the AO5_24 time in order to force the right lubrication.
Range: 0÷99%
0: function excluded

AO5_23 Maximum inverter functioning time at a lower frequency than AO5_22, before working at AO5_13
Range: 1÷255
UM: min

AO5_24 Time of inverter functioning at AO5_13 to restore the right lubrication
Range: 1÷255
UM: min

AO5_25 Maximum time, analog output 5 is off when AOC5 = 6 or 7 or 8 or 9 or 15 or 16 or 17 or 18
Range: 0.0÷24.0h; with 0 the function is disabled
UM: 10min

AO5_26 Time of analog output 5 at maximum AO5_13 **when AO5_25 timer is over**
Range: 1÷255
UM: min

12.1.25 Analog Output 6 (AO6_1- AO6_26)

AO6_1 Reference probe for analogue Output 6, it is used only when the analog Output is configured as FREE in the io.conf file

AO1_10DIN:
Range: 0÷9
0: Pb1 = (term. 2-7 (if the probe is configured as NTC PTC))
1: Pb2 = (term. 3-7 (if the probe is configured as NTC PTC))
2: Pb3 = (term. 4-7 (if the probe is configured as NTC PTC))
3: Pb4 = (term. 5-7 (if the probe is configured as NTC PTC))
4: Pb5 = (term. 6-7 (if the probe is configured as NTC PTC))
5: Pb6 = (term. 10-7 (if the probe is configured as NTC PTC))
6: Pb7 = (term. 11-7 (if the probe is configured as NTC PTC))
7: Pb8 = (term. 12-7 (if the probe is configured as NTC PTC))
8: Pb9 = (term. 13-7 (if the probe is configured as NTC PTC))
9: Pb10 = (term. 14-7 (if the probe is configured as NTC PTC))

AO6_2 Adjustment of read out for the analog Output 6
It is used only when the analog Output is configured as FREE in the io.conf file
Range: -1.00÷100.00 bar; -15÷1450PSI; -70÷150°C; -94÷302°F; -100÷10000 KPA
UM: according to CF26

AO6_3 Adjustment of read out for the analog Output 6 at 20mA/10V
It is used only when the analog Output is configured as FREE in the io.conf file
Range: -1.00÷100.00 bar; -15÷1450PSI; -70÷150°C; 94÷302°F; -100÷10000 KPA
UM: according to CF26

AO6_4 Minimum value for analogue Output 6
Range: 0 ÷ AO6_13

AO6_5 Analog Output 6 value after compressor start
It is the value of the analogue Output after a compressor has started, when the pressure/temperature is above the regulation band. – *Used during inverter regulation*
Range: AO6_4 ÷ AO6_13

AO6_6 Analog Output 6 value after a compressor is switched off
It is the value of the analogue Output when a compressor has been switched off and the the pressure/temperature is below the regulation band. – *Used during inverter regulation*
Range: AO6_4 ÷ AO6_13

AO6_7 Exclusion band start value for analog Output 6
it excludes a range of frequencies that could create problems to the compressor. – Used during inverter regulation
Range: AO6_4 ÷ AO6_8

AO6_8 Exclusion band end value for analog Output 6
Used during inverter regulation
Range: AO6_7 ÷ 99 %

AO6_9 Safety value for analog Output 6
it is used in case of probe's fault.
Range: 0 ÷ AO6_13

AO6_10 Delay between the entrance in the regulation band and the regulation activation
it is the delay between the entrance in the regulation band of pressure/temperature and the regulation start. It is used to avoid false inverter starts due to pressure variations. – *Used during inverter regulation.*
Range: 0 ÷ 255
UM: sec

AO6_11 Analog Output 6 rise time
It is the time necessary to the analog Output to pass from the AO6_4 ÷ AO6_13, when a compressor has started and the pressure/temperature is above the regulation band. – *Used during inverter regulation.*
Range: 0 ÷ 255
UM: sec

AO6_12 Analog Output 6 permanency at AO6_13 before load activation
the analog Output remains at AO6_13 value for this time before a load is activated. – *Used during inverter regulation*
Range: 0 ÷ 255
UM: sec

AO6_13 Max value for analogue Output 6
Range: AO6_4 -100%

AO6_14 Analog Output 6 decreasing time
It is the time taken from the analog Output to pass from the AO6_13 to the AO6_4 value. It is used during the switching off phase, when the pressure is lower than the set point.

Range: 0 ÷ 255
UM: sec

AO6_15 Analog Output 6 permanency at AO6_5 before a load is switched off
When the pressure (temperature) is below the set point, the analog Output remains at AO6_5 value for the AO6_15 before a load is switched off.
Range: 0 ÷ 255
UM: sec

AO6_16 Analog Output 6 decreasing time when a load is switched on
It is the time necessary to the analog Output to pass from AO6_13 to AO6_5 when a load is switched on.
Range: 0 ÷ 255
UM: sec

AO6_17 Regulation band
It is the band with the proportional action. It replaces the band for the inverter regulation. It is added to the set point. The proportional action starts when the temperature/pressure value is higher than the set point and it reaches the AO6_13 when the pressure/temperature is equal or higher than set + AO6_17.
Range: 0.10÷10.00bar; 0.0÷25.0°C; 1÷80 PSI; 1÷50°F;10÷1000 KPA
UM: according to CF26

AO6_18 Integral time
It sets the pound of the proportional action. The higher is AO6_18 , the lower is the integral action support.
Range: 0÷999
0: integral action excluded
UM: s

AO6_19 Band offset
It is used to move the regulation band across to the set point.
Range: -12.0÷12.0°C -12.00 ÷ 12.00 BAR, -120÷120°F, -120÷120PSI; 1200÷1200KPA
UM: according to CF26

AO6_21 Maximum value of A.o.6 during silent mode
Range: AO6_5/AO6_6 ÷100

AO6_22 Minimum inverter capacity with poor lubrication
If the frequency compressor works for the AO6_23 time with a frequency (in percentage) equal or lower than AO5_22, it is forced to work at AO6_13 for the AO6_24 time in order to force the right lubrication.
Range: 0÷99%
0: function excluded

AO6_23 Maximum inverter functioning time at a lower frequency than AO6_22, before working at AO6_13
Range: 1÷255
UM: min

AO6_24 Time of inverter functioning at AO6_13 to restore the right lubrication
Range: 1÷255
UM: min

AO6_25 Maximum time, analog output 6 is off when AOC6 = 6 or 7 or 8 or 9 or 15 or 16 or 17 or 18
Range: 0.0÷24.0h; with 0 the function is disabled
UM: 10min

AO6_26 Time of analog output 6 at maximum AO6_13 when AO6_25 timer is over
Range: 1÷255
UM: min

12.1.26 Auxiliary outputs (AR1-AR26)

AR1 **Set point for auxiliary relay 1 (-40÷110°C/-40÷230°F)** it is used for all the relays configured as ausiliary 1

AR2 **Differential for aux relay 1 (0,1÷25,0°C/1÷50°F)** Intervention differential for relay AUX1**.**
Cooling (AR3 = CL): Cut IN is AR1+ AR2. Cut OUT is when the temperature reaches the set point AR1.
Heating (AR3=Ht): Cut IN is AR1- AR2. Cut OUT is when the temperature reaches the set point. AR1

AR3 **Kind of action for aux. 1**
CL = cooling
Ht = heating

AR4 **Set point for auxiliary relay 2 (-40÷110°C/-40÷230°F)** it is used for all the relays configured as Ausiliary 2.

AR5 **Differential for aux relay 2 (0,1÷25,0°C/1÷50°F)** Intervention differential for relay AUX2**.**
Cooling (AR6 = CL): Cut IN is AR5+ AR5. Cut OUT is when the temperature reaches the set point AR5.
Heating (AR36 = Ht): Cut IN is AR5- AR5. Cut OUT is when the temperature reaches the set point. AR5

AR6 **Kind of action for aux. 2**
CL = cooling
Ht = heating

AR7 **Set point for auxiliary relay 3 (-40÷110°C/-40÷230°F)** it is used for all the relays configured as Ausiliary 3.

AR8 **Differential for aux relay 3 (0,1÷25,0°C/1÷50°F)** Intervention differential for relay AUX3**.**
Cooling (AR3 = CL): Cut IN is AR7+ AR8. Cut OUT is when the temperature reaches the set point AR7.
Heating (AR8=Ht): Cut IN is AR7- AR8. Cut OUT is when the temperature reaches the set point. AR7-

AR9 **Kind of action for aux. 3**
CL = cooling
Ht = heating

AR10 **Set point for auxiliary relay 4 (-40÷110°C/-40÷230°F)** it is used for all the relays configured as Ausiliary 4.

AR11 **Differential for aux relay 4 (0,1÷25,0°C/1÷50°F)** Intervention differential for relay AUX5**.**
Cooling (AR12 = CL): Cut IN is AR10+ AR11. Cut OUT is when the temperature reaches the set point AR10.
Heating (AR12=Ht): Cut IN is AR10- AR11. Cut OUT is when the temperature reaches the set point. AR10

AR12 **Kind of action for aux. 4**
CL = cooling

Ht = heating

AR13 **Set point for auxiliary relay 5** (-40÷110°C/-40÷230°F) it is used for all the relays configured as auxiliary 5.

AR14 **Differential for aux relay 5 (0,1÷25,0°C/1÷50°F)** Intervention differential for relay AUX5**.**
Cooling (AR15 = CL): Cut IN is AR13+ AR14. Cut OUT is when the temperature reaches the set point AR13.
Heating (AR15=Ht): Cut IN is AR13- AR14. Cut OUT is when the temperature reaches the set point. AR13

AR15 **Kind of action for aux. 5**
CL = cooling
Ht = heating

AR16 **Set point for auxiliary relay 6** (-40÷110°C/-40÷230°F) it is used for all the relays configured as auxiliary 6.

AR17 **Differential for aux relay 6 (0,1÷25,0°C/1÷50°F)** Intervention differential for relay AUX6**.**
Cooling (AR18 = CL): Cut IN is AR16+ AR17. Cut OUT is when the temperature reaches the set point AR16.
Heating (AR18=Ht): Cut IN is AR16- AR17. Cut OUT is when the temperature reaches the set point. AR16

AR18 **Kind of action for aux. 6**
CL = cooling
Ht = heating

AR19 **Auxiliary output 1 delay, when activated by digital input**
Range: 0÷255
UM: sec

AR20 **Auxiliary output 2 delay, when activated by digital input**
Range: 0÷255
UM: sec

AR21 **Auxiliary output 3 delay, when activated by digital input**
Range: 0÷255
UM: sec

AR22 **Auxiliary output 4 delay, when activated by digital input**
Range: 0÷255
UM: sec

AR23 **Auxiliary output 5 delay, when activated by digital input**
Range: 0÷255
UM: sec

AR24 **Auxiliary output 6 delay, when activated by digital input**
Range: 0÷255
UM: sec

AR25 **Auxiliary output 7 delay, when activated by digital input**
Range: 0÷255
UM: sec

AR26 **Auxiliary output 8 delay, when activated by digital input**
Range: 0÷255
UM: sec

12.1.27 Superheat Circuit 1(ASH1- ASH7)

ASH1 **Differential for superheat pre-alarm 1** **(**0.1 to 15.0°C/ 1 to 30°F)

ASH2 **Lower limit of suction superheat alarm 1** **(**0.1 to 15.0°C/ 1 to 30°F)

ASH3 **Delay for signalling suction superheat alarm 1** **(**0 to 5000 sec, resolution 10 sec;)

ASH4 **Delay for signalling suction superheat alarm 1** **(**0÷255sec)

ASH5 **Switching off compressors for alarm ASH2 (**No;Yes)

ASH6 **Differential to restart suction superheat alarm control 1 (**0.1÷15.0°C; 1 to 30°F; according to CF26)

ASH7 **Delay to restart control after superheat > ASH2+ASH6 (**0÷5000sec, Res. 10 sec)

12.1.28 Hot gas injection valve 1 for SH control (ASH8-ASH9)

ASH8 **Superheat value 1 at which to enable valve 1 for injecting hot gas (hot action)**
(0.1÷15.0°C; 1 to 30°F; according to CF26)

ASH9 **Differential for ASH8 (**0.1÷15.0°C; 1 to 30°F; to CF26)

12.1.29 Superheat Circuit 2(ASH10- ASH16)

ASH10 **Differential for superheat pre-alarm 2** **(**0.1÷15.0°C; 1 to 30°F; according to CF26)

ASH11 **Bottom limit of suction superheat alarm 2 (**0.1÷15.0°C; 1 to 30°F; according to CF26)

ASH12 **Delay for signalling suction pre-superheat alarm 2 (**0÷5000sec; *Resolution:* 10 sec)

ASH13 **Delay for signalling suction superheat alarm 2** **(**0÷255sec)

ASH14 **Switching off compressors for alarm ASH11 (**No; Yes)

ASH15 **Differential for restarting suction superheat alarm control 2**
(0.1÷15.0°C; 1 to 30°F; according to CF26)

ASH16 **Delay for restarting control after superheat > ASH11+ASH15**
(0÷5000sec; *Resolution:* 10 sec)

12.1.30 Hot gas injection valve 2 for SH control (ASH17-ASH19)

ASH17 **Superheat value 2 at which to enable valve 2 for injecting hot gas (hot action)**
(0.1÷15.0°C; 1 to 30°F; according to CF26)

ASH18 **Differential for ASH17 (**0.1÷15.0°C; 1÷30°F; according to CF26)

12.1.31 Superheat Alarm relay (ASH19)

ASH19 **Alarm relay selection for superheat 1 and 2 alarms**
(nu = no alarm relay activation; ALr = general alarm relay activation; ALr1 = Alarm 1 relay activation; ALr2 = Alarm 2 relay activation)

12.1.32 Hot gas injection valves controlled by temperatura control (ASH20-ASH25)

ASH20 Hot gas valve circuit 1 activated also by temperature control (no, yes**)**

ASH21 Suction 1 temperature value at which the hot gas valve is enabled (hot action)
(-50÷110°C/ -58 to 230°F; according to CF26)

ASH22 Differential for ASH21 (0.1÷15.0°C; 1 to 30°F; according to CF26)

ASH23 Hot gas valve circuit 2 activated also by temperature control (no, yes)

ASH24 Suction 2 temperature value, at which the hot gas valve is enabled (hot action)
(-50÷110°C/ -58 to 230°F; according to CF26)

ASH25 Differential for ASH24 (0.1÷15.0°C; 1 to 30°F; according to CF26)

12.1.33 Liquid injection valves (ASH26-ASH38)

ASH26 Liquid injection valve circuit 1 activated also by SH control (no, yes)

ASH27 High Superheat value of circuit 1 to enable liquid injection (cooling action)
(1.0÷100.0°C; 1 to 180°F; according to CF26)

ASH28 Differential for ASH27 (0.1÷15.0°C; 1 to 30°F; according to CF26)

ASH29 Liquid injection valve circuit 2 activated also by SH control (no, yes)

ASH30 High Superheat value of circuit 2 to enable liquid injection (cooling action)
(1.0÷100.0°C; 1 to 180°F; according to CF26)

ASH31 Differential for ASH30 (0.1÷15.0°C; 1 to 30°F; according to CF26)

ASH32 Liquid injection valve, circuit 1, activated also by temperature control (no, yes)

ASH33 Delay after compressor start, before initiatingthe suction temperature control:
This delay is used both for circuit 1 and circuit 2. (0÷15min)

ASH34 Suction 1 temperature value at which the liquid injection valve is enabled (cooling action)
(-50÷110°C/ -58 to 230°F; according to CF26)

ASH35 Differential for ASH34 (0.1÷15.0°C; 1 to 30°F; according to CF26)

ASH36 Liquid injection valve, circuit 2, activated also by temperature control (no, yes)

ASH37 Suction 2 temperature value at which the liquid injection valve is enabled (cooling action)
(-50÷110°C/ -58 to 230°F; according to CF26)

ASH38 Differential for ASH37 (0.1÷15.0°C; 1 to 30°F; according to CF26)

12.1.34 Discharge temperature management and alarms (DSC1-DSC14)

DSC1 Circuit 1, Liquid injection valve activated also by discharge temperature
Range: 0÷1
0: no
1: yes

DSC2 Circuit 1, discharge temperature threshold to activate the liquid injection valve
Range: 0.0÷150.0°C; 32 to 302°F

UM: according to CF26

DSC3 Circuit 1, Differential for DSC2
Range: 0.1÷15.0°C; 1 to 30°F
UM: according to CF26

DSC4 Circuit 1, High discharge temperature alarm, circuit 1
Range: 0.0÷150.0°C; 32 to 302°F
UM: according to CF26

DSC5 Circuit 1, High discharge temperature alarm delay
Range: 0÷60
UM: min

DSC6 Circuit 1, Delay before stopping compressors, with High discharge temperature alarm:
Range: 0÷255
UM: min

DSC7 Circuit 1, Interval between 2 compressors turning off in case of high discharge temperature alarm:
Range: 0÷255
UM: sec

DSC8 Circuit 2, Liquid injection valve activated also discharge temperature
Range: 0÷1
0: no
1: yes

DSC9 Circuit 2, discharge temperature threshold to activate the liquid injection valve
Range: 0.0÷150.0°C; 32 to 302°F
UM: according to CF26

DSC10 Circuit 2, Differential for DSC9 e **DSC11**
Range: 0.1÷15.0°C; 1 to 30°F
UM: according to CF26

DSC11 Circuit 2, High discharge temperature alarm
Range: 0.0÷150.0°C; 32 to 302°F
UM: according to CF26

DSC12 Circuit 2, High discharge temperature alarm delay
Range: 0÷60
UM: min

DSC13 Circuit 2, Delay before stopping compressors, with high discharge temperature alarm:
Range: 0÷255
UM: min

DSC14 Circuit 2, Interval between 2 compressors turning off in case of high discharge temperature alarm:
Range: 0÷255
UM: sec

12.1.35 Gas Leak Detector(GLD1-GLD24)

When configured rack leak detection monitors PPM reading from refrigerant leak sensor. In the event leak is detected at value GLD3 iPro calls alarm : GLeak1(2) PreAlm. GLeak1(2) PreAlm is for signalling only and clears automatically when PPM reaches levels below GLD3. When leak is detected at GLD4 iPro calls GLeak1(2) Alarm. In the event GLeak1(2) Alarm initiate rack shut down.

GLD1 Pre-alarm threshold for Gas Leak Detector 1
Range: 0÷GLD2

UM: PPM

GLD2 Alarm threshold for Gas Leak Detector 1
Range: GLD1÷50000
UM: PPM

GLD3 Differential for Gas Leak pre-alarm recover Detector 1
Range: 1÷50000
UM: PPM

GLD4 Relay activation in case of Gas Leak pre-alarm Detector 1
Range: 0÷8
0: nu
1: Aux. output 1
2: Aux. output 2
3: Aux. output 3
4: Aux. output 4
5: Aux. output 5
6: Aux. output 6
7: Aux. output 7
8: Aux. output 8

GLD5 Relay activation in case of Gas Leak alarm Detector 1
Range: 0÷8
0: nu
1: Aux. output 1
2: Aux. output 2
3: Aux. output 3
4: Aux. output 4
5: Aux. output 5
6: Aux. output 6
7: Aux. output 7
8: Aux. output 8

GLD6 Pre-alarm threshold for Gas Leak Detector 2
Range: 0÷GLD7
UM: PPM

GLD7 Alarm threshold for Gas Leak Detector 2
Range: GLD6÷50000
UM: PPM

GLD8 Differential for Gas Leak pre-alarm recover Detector 2
Range: 1÷50000
UM: PPM

GLD9 Relay activation in case of Gas Leak pre-alarm Detector 2
Range: 0÷8
0: nu
1: Aux. output 1
2: Aux. output 2
3: Aux. output 3
4: Aux. output 4
5: Aux. output 5
6: Aux. output 6
7: Aux. output 7
8: Aux. output 8

GLD10 Relay activation in case of Gas Leak alarm Detector 2
Range: 0÷8
0: nu
1: Aux. output 1
2: Aux. output 2

3: Aux. output 3
4: Aux. output 4
5: Aux. output 5
6: Aux. output 6
7: Aux. output 7
8: Aux. output 8

GLD11 Pre-alarm threshold for Gas Leak Detector 3 (0÷GLD12)
Range: 0÷GLD12
UM: PPM

GLD12 Alarm threshold for Gas Leak Detector 3 (GLD11÷50000 PPM)
Range: GLD11÷50000
UM: PPM

GLD13 Differential for Gas Leak pre-alarm recover Detector 3
Range: 1÷50000
UM: PPM

GLD14 Relay activation in case of Gas Leak pre-alarm Detector 3
Range: 0÷8
0: nu
1: Aux. output 1
2: Aux. output 2
3: Aux. output 3
4: Aux. output 4
5: Aux. output 5
6: Aux. output 6
7: Aux. output 7
8: Aux. output 8

GLD15 Relay activation in case of Gas Leak alarm Detector 3
Range: 0÷8
0: nu
1: Aux. output 1
2: Aux. output 2
3: Aux. output 3
4: Aux. output 4
5: Aux. output 5
6: Aux. output 6
7: Aux. output 7
8: Aux. output 8

GLD16 Pre-alarm threshold for Gas Leak Detector 4 (0÷GLD17)
Range: **0**÷ GLD17
UM: PPM

GLD17 Alarm threshold for Gas Leak Detector 4 (GLD16÷50000 PPM)
Range: GLD16÷50000
UM: PPM

GLD18 Differential for Gas Leak pre-alarm recover Detector 4 (1÷50000 PPM)
Range: 1÷50000
UM: PPM

GLD19 Relay activation in case of Gas Leak pre-alarm Detector 4 (nu, Aux. output 1, …, Aux output 8**)**
Range: 0÷8
0: nu
1: Aux. output 1
2: Aux. output 2
3: Aux. output 3
4: Aux. output 4

5: Aux. output 5
6: Aux. output 6
7: Aux. output 7
8: Aux. output 8

GLD20 Relay activation in case of Gas Leak alarm Detector 4 (nu, Aux. output 1, …, Aux output 8)
Range: 0÷8
0: nu
1: Aux. output 1
2: Aux. output 2
3: Aux. output 3
4: Aux. output 4
5: Aux. output 5
6: Aux. output 6
7: Aux. output 7
8: Aux. output 8

GLD21 Differential for Gas Leak alarm recover Detector 1
Range: 1÷50000
UM: PPM

GLD22 Differential for Gas Leak alarm recover Detector 2
Range: 1÷50000
UM: PPM

GLD23 Differential for Gas Leak alarm recover Detector 3
Range: 1÷50000
UM: PPM

GLD24 Differential for Gas Leak alarm recover Detector 4
Range: 1÷50000
UM: PPM

12.1.36 Other (OT1-OT7)

OT1 **Alarm relay off by keyboard** It is referred to the relay with terminals 85-85-86
no = alarm relay remains on for all the duration of the alarm
yES = the alarm relay is switched off by pushing a key

OT2 **Alarm relay 1 off by keyboard** It is referred to the relays configured as ALr1
no = alarm relay remains on for all the duration of the alarm
yES = the alarm relay is switched off by pushing a key

OT3 **Alarm relay 2 off by keyboard** It is referred to the relays configured as ALr2
no = alarm relay remains on for all the duration of the alarm
yES = the alarm relay is switched off by pushing a key

OT4 **Serial address** **1 ÷ 247**

OT5 **Off function enabling**
no = it is not possible to switch the controller off by keyboard
YES = it is possible to switch the controller off by keyboard

OT7 **EEPROM map identification,** read only, for internal use.
Range: 1 ÷ 255

Note: OT7 only can be changed from Wizmate; it is read only for Viso.

12.1.37 DIGITAL-INPUTS Configuration (DIC1-DIC43)

DIC 1 Configuration Digital Input 1 (0÷185c)
DIC 2 Configuration Digital Input 2 (0÷185c)
DIC 3 Configuration Digital Input 3 (0÷185c)
DIC 4 Configuration Digital Input 4 (0÷185c)
DIC 5 Configuration Digital Input 5 (0÷185c)
DIC 6 Configuration Digital Input 6 (0÷185c)
DIC 7 Configuration DIgital Input 7 (0÷185c)
DIC 8 Configuration Digital Input 8 (0÷185c)
DIC9 Configuration Digital Input 9 (0÷185c)
DIC 10 Configuration Digital Input 10 (0÷185c)
DIC 11 Configuration Digital Input 11 (0÷185c)
DIC 12 Configuration Digital Input 12 (0÷185c)
DIC 13 Configuration Digital Input 13 (0÷185c)
DIC 14 Configuration Digital Input 14 (0÷185c)
DIC 15 Configuration Digital Input 15 (0÷185c)
DIC 16 Configuration Digital Input 16 (0÷185c)
DIC 17 Configuration Digital Input 17 (0÷185c)
DIC 18 Configuration Digital Input 18 (0÷185c)
DIC19 Configuration Digital Input 19 (0÷185c)
DIC 20 Configuration Digital Input 20 (0÷185c)
DIC 21 Configuration Digital Input 21 (0÷185c)
DIC 22 Configuration Digital Input 22 (0÷185c)
DIC 23 Configuration Digital Input 23 (0÷185c)
DIC 24 Configuration Digital Input 24 (0÷185c)
DIC 25 Configuration Digital Input 25 (0÷185c)
DIC 26 Configuration Digital Input 26 (0÷185c)
DIC 27 Configuration Digital Input 27 (0÷185c)
DIC 28 Configuration Digital Input 28 (0÷185c)
DIC 29 Configuration Digital Input 29 (0÷185c)
DIC 30 Configuration Digital Input 30 (0÷185c)
DIC 31 Configuration Digital Input 31 (0÷185c)
DIC 32 Configuration Digital Input 32 (0÷185c)
DIC 33 Configuration Digital Input 33 (0÷185c)
DIC 34 Configuration Digital Input 34 (0÷185c)
DIC 35 Configuration Digital Input 35 (0÷185c)
DIC 36 Configuration Digital Input 36 (0÷185c)
DIC 37 Configuration Digital Input 37 (0÷185c)
DIC 38 Configuration Digital Input 38 (0÷185c)
DIC 39 Configuration Digital Input 39 (0÷185c)
DIC 40 Configuration Digital Input 40 (0÷185c)
DIC 41 Configuration Digital Input 41 (0÷185c)
DIC 42 Configuration Digital Input 42 (0÷185c)
DIC 43 Configuration Digital Input 43 (0÷185c)

12.1.38 DIGITAL-OUTPUTS (parameters DOC1- DOC36)

DOC 1 Configuration Digital Output 1 (0÷145c)
DOC 2 Configuration Digital Output 2 (0÷145c)
DOC 3 Configuration Digital Output 3 (0÷145c)
DOC 4 Configuration Digital Output 4 (0÷145c)
DOC 5 Configuration Digital Output 5 (0÷145c)
DOC 6 Configuration Digital Output 6 (0÷145c)
DOC 7 Configuration Digital Output 7 (0÷145c)
DOC 8 Configuration Digital Output 8 (0÷145c)
DOC 9 Configuration Digital Output 9 (0÷145c)
DOC 10 Configuration Digital Output 10 (0÷145c)
DOC 11 Configuration Digital Output 11 (0÷145c)
DOC 12 Configuration Digital Output 12 (0÷145c)
DOC 13 Configuration Digital Output 13 (0÷145c)

DOC 14 Configuration Digital Output 14 (0÷145c)
DOC 15 Configuration Digital Output 15 (0÷145c)
DOC 16 Configuration Digital Output 16 (0÷145c)
DOC 17 Configuration Digital Output 17 (0÷145c)
DOC 18 Configuration Digital Output 18 (0÷145c)
DOC 19 Configuration Digital Output 19 (0÷145c)
DOC 20 Configuration Digital Output 20 (0÷145c)
DOC 21 Configuration Digital Output 21 (0÷145c)
DOC 22 Configuration Digital Output 22 (0÷145c)
DOC 23 Configuration Digital Output 23 (0÷145c)
DOC 24 Configuration Digital Output 24 (0÷145c)
DOC 25 Configuration Digital Output 25 (0÷145c)
DOC 26 Configuration Digital Output 26 (0÷145c)
DOC 27 Configuration Digital Output 27 (0÷145c)
DOC 28 Configuration Digital Output 28 (0÷145c)
DOC 29 Configuration Digital Output 29 (0÷145c)
DOC 30 Configuration Digital Output 30 (0÷145c)
DOC 31 Configuration Digital Output 31 (0÷145c)
DOC 32 Configuration Digital Output 32 (0÷145c)
DOC 33 Configuration Digital Output 33 (0÷145c)
DOC 34 Configuration Digital Output 34 (0÷145c)
DOC 35 Configuration Digital Output 35 (0÷145c)
DOC 36 Configuration Digital Output 36 (0÷145c)

12.1.39 ANALOG-OUTPUTS (parameters AOC1- AOC15)

AOC 1 Configuration Analog Output 1
Range; IPRC215D/IPR210D: TAB B
AOC 2 Configuration Analog Output 2
Range: IPRC215D/IPR210D: TAB B
AOC 3 Configuration Analog Output 3
Range:; IPRC215D/IPR210D: TAB B
AOC 4 Configuration Analog Output 4
Range:; IPRC215D/IPR210D: TAB B
AOC 5 Configuration Analog Output 5
Range: IPRC215D/IPR210D: TAB A
AOC 6 Configuration Analog Output 6
Range: IPRC215D/IPR210D: TAB A
AOC 7 Configuration Analog Output 6
Range: IPX206D/IPX106D TAB D
AOC 8 Configuration Analog Output 6
Range: IPX206D/IPX106D TAB D
AOC 9 Configuration Analog Output 6
Range: IPX206D/IPX106D TAB D
AOC 10 Configuration Analog Output 6
Range: IPX215D/IPX125D TAB D
AOC 11 Configuration Analog Output 6
Range: IPX215D/IPX125D TAB D
AOC 12 Configuration Analog Output 6
Range: IPX215D/IPX125D TAB D
AOC 13 Configuration Analog Output 6
Range: IPX215D/IPX125D TAB D
AOC 14 Configuration Analog Output 6
Range: IPX215D/IPX125D TAB C
AOC 15 Configuration Analog Output 6
Range: IPX215D/IPX125D TAB C

Note: about TAB A, TAB B, TAB C, TAB D, please reference to 11.1.3 **ANALOG-OUTPUTS (parameters AOC1- AOC15)**

12.1.40 ANALOG-INPUTS (parameters AIC1- AIC35)

AIC 1 Configuration Analog Input 1 (0÷185)
AIC 2 Configuration Analog Input 2 (0÷185)
AIC 3 Configuration Analog Input 3 (0÷185)
AIC 4 Configuration Analog Input 4 (0÷185)
AIC 5 Configuration Analog Input 5 (0÷185)
AIC 6 Configuration Analog Input 6 (0÷185)
AIC 7 Configuration Analog Input 7 (0÷185)
AIC 8 Configuration Analog Input 8 (0÷185)
AIC 9 Configuration Analog Input 9 (0÷185)
AIC 10 Configuration Analog Input 10 (0÷185)
AIC 11 Configuration Analog Input 11 (0÷185)
AIC 12 Configuration Analog Input 12 (0÷185)
AIC 13 Configuration Analog Input 13 (0÷185)
AIC 14 Configuration Analog Input 14 (0÷185)
AIC 15 Configuration Analog Input 15 (0÷185)
AIC 16 Configuration Analog Input 16 (0÷185)
AIC 17 Configuration Analog Input 17 (0÷185)
AIC 18 Configuration Analog Input 18 (0÷185)
AIC 19 Configuration Analog Input 19 (0÷185)
AIC 20 Configuration Analog Input 20 (0÷185)
AIC 21 Configuration Analog Input 21 (0÷185)
AIC 22 Configuration Analog Input 22 (0÷185)
AIC 23 Configuration Analog Input 23 (0÷185)
AIC 24 Configuration Analog Input 24 (0÷185)
AIC 25 Configuration Analog Input 25 (0÷185)
AIC 26 Configuration Analog Input 26 (0÷185)
AIC 27 Configuration Analog Input 27 (0÷185)
AIC 28 Configuration Analog Input 28 (0÷145)
AIC 29 Configuration Analog Input 29 (0÷145)
AIC 30 Configuration Analog Input 30 (0÷145)
AIC 31 Configuration Analog Input 31 (0÷145)
AIC 32 Configuration Analog Input 32 (0÷145)
AIC 33 Configuration Analog Input 33 (0÷145)
AIC 34 Configuration Analog Input 34 (0÷145)
AIC 35 Configuration Analog Input 35 (0÷145)

12.1.41 Coresense configuration (CO1- CO30)

CO1 **Address coresense 1.** Serial address of the coresense connected to the digital output 1 (70-73 connection) **(1-15; "nu" means not used)**

CO2 **Address coresense 2.** Serial address of the coresense connected to the digital output 2 (71-73 connection) (1-15; "nu" means not used)

CO3 **Address coresense 3.** Serial address of the coresense connected to the digital output 3 (72-73 connection) **(1-15; "nu" means not used)**

O4 **Address coresense 4.** Serial address of the coresense connected to the digital output 4 (74-73 connection) **(1-15; "nu" means not used)**

CO5 **Address coresense 5.** Serial address of the coresense connected to the digital output 5 (77-76 connection) **(1-15; "nu" means not used)**

CO6 **Address coresense 6.** Serial address of the coresense connected to the digital output 6 (78-83 connection) **(1-15; "nu" means not used)**

CO7 **Address coresense 7.** Serial address of the coresense connected to the digital output 7 (79-83 connection) **(1-15; "nu" means not used)**

CO8 **Address coresense 8.** Serial address of the coresense connected to the digital output 8 (80-76 connection) **(1-15; "nu" means not used)**

CO9 **Address coresense 9. - *IPRC215D only-*** Serial address of the coresense connected to the digital output 9 (81-76 connection) **(1-15; "nu" means not used)**

CO10 **Address coresense 10. - *IPRC215D only-*** Serial address of the coresense connected to the digital output 10 (82-83 connection) **(1-15; "nu" means not used)**

CO11 **Address coresense 11. - *IPRC215D only-*** Serial address of the coresense connected to the digital output 11 (84-90 connection) **(1-15; "nu" means not used)**

CO12 **Address coresense 12. - *IPRC215D only-*** Serial address of the coresense connected to the digital output 12 (85-88 connection) **(1-15; "nu" means not used)**

CO13 **Address coresense 13. - *IPRC215D only-*** Serial address of the coresense connected to the digital output 13 (86-88 connection) **(1-15; "nu" means not used)**

CO14 **Address coresense 14. - *IPRC215D only-*** Serial address of the coresense connected to the digital output 14 (91-90 connection) **(1-15; "nu" means not used)**

CO15 **Address coresense 15. - *IPRC215D only-*** Serial address of the coresense connected to the digital output 15 (93-88 connection) **(1-15; "nu" means not used)**

Configuration of CO16 - CO30, to configure coresense model type:

CO16 Coresense model 1
Range: 1÷3
1=R112
2=R1011
3=R1501

CO17 Coresense model 2
Range: 1÷3
1=R112
2=R1011
3=R1501

CO18 Coresense model 3
Range: 1÷3
1=R112
2=R1011
3=R1501

CO19 Coresense model 4
Range: 1÷3
1=R112
2=R1011
3=R1501

CO20 Coresense model 5
Range: 1÷3
1=R112
2=R1011
3=R1501

CO21 Coresense model 6

Range: 1÷3
1=R112
2=R1011
3=R1501

CO22 Coresense model 7
Range: 1÷3
1=R112
2=R1011
3=R1501

CO23 Coresense model 8
Range: 1÷3
1=R112
2=R1011
3=R1501

CO24 Coresense model 9
Range: 1÷3
1=R112
2=R1011
3=R1501

CO25 Coresense model 10
Range: 1÷3
1=R112
2=R1011
3=R1501

CO26 Coresense model 11
Range: 1÷3
1=R112
2=R1011
3=R1501

CO27 Coresense model 12
Range: 1÷3
1=R112
2=R1011
3=R1501

CO28 Coresense model 13
Range: 1÷3
1=R112
2=R1011
3=R1501

CO29 Coresense model 14
Range: 1÷3
1=R112
2=R1011
3=R1501

CO30 Coresense model 15
Range: 1÷3
1=R112
2=R1011
3=R1501

NOTE:

The Iprorack recognized the parameters group CO only at the power-on.
Every time it is necessary to modify these parameters PLEASE REBOOT THE IproRack.

The parameters CO1-CO15 can be configured only if the load that is connected to the relative digital output is a compressor type. If for example the digital output 1 is configured as FAN automatically after the reboot the parameter CO1 returns to a value NU (16)

12.1.42 GAS COOLER HEAT RECLAIM HTRC (HTRC1-HTRC42)

HTRC0 **Type of input for Pressure modulation during Heat reclaim**
(0 = Voltage; 1 = temperature)

HTRC1 Start point for the HR regulation
Range: 0.000 ÷ HTRC2 V; 4.000 ÷ HTCR2 mA

HTRC2 End point for the HR regulation
Range: HTRC1÷10.000 V; HTCR1÷20.000 mA

HTRC3 Pressure set point to use when the HR input has the HTRC1 value
Range: 50.00÷HTRC4 bar; 725÷HTRC4 PSI; 5000÷HTRC4 KPA
UM: according to CF26

HTRC4 Pressure set point to use when the HR input has the HTRC2 value
Range: HTRC3÷120.00 bar; HTRC3÷1740 PSI; HTRC3÷12000 KPA
UM: according to CF26

HTRC5 Delta pressure step from H-R to Normal Regulation
Range: 0.10÷15.00 bar; 1÷220PSI; 10÷1500 KPA
UM: according to CF26

HTRC6 Time for the HTRC5 pressure step from H-R to normal regulation
Range: 1÷15
UM: min

HTRC7 Low discharge temperature to stop H-R
Range: -40.0÷150°C; -40÷302°F
UM: according to CF26

HTRC8 Differential to restart H-R when is stopped by low discharge temperature
Range: 0.1÷15.0°C; 1÷30°F
UM: according to CF26

HTRC9 Heat reclaim stop delay with discharge temperature below HTRC7
Range: 1÷15
UM: min

HTRC10 Low post exchanger CO2 temperature to stop H-R
Range: -40.0÷150°C; -40÷302°F
UM: according to CF26

HTRC11 Differential to restart H-R when is stopped by low post exchanger temperature
Range: 0.1÷15.0°C; 1÷30°F
UM: according to CF26

HTRC12 Heat reclaim stop delay with post heat exchanger temperature below HTRC10
Range: 1÷15
UM: min

HTRC13 H-R restart time when is stopped by: no one compressor running, low discharge temperature, low post heat exchanger temperature
Range: 0÷60
UM: min

HTRC14 **Water tank temperature set point (HTRC0 = 1) for HR1**
Range: 10÷90°C; 50÷194°F
UM: according to CF26

HTRC15 Water tank temperature regulation band (HTRC0 = 1) for HR1
Range: 1÷30°C; 1÷2÷60°F
UM: according to CF26

HTRC16 Temperature differential set point at outlet and inlet of HR1 (HTRC0 = 1)
Range: 1÷30°C; 1÷60°F
UM: according to CF26

HTRC17 Temperature differential regulation band (HTRC0 = 1) for HR1
Range: 1÷30°C; 1÷2÷60°F
1÷60°F
UM: according to CF26

HTRC18 Delta pressure step from Normal Regulation to H-R regulation
Range: 0.1÷15.0bar; 1÷220PSI; 10÷1500KPA
UM: according to CF26

HTRC19 Time for the HTR16 pressure step from Normal Regulation to H-R regulation
Range: 1÷15
UM: min

HTRC20 Low HR2 outlet temperature to stop H-R, when H-R 2 is working. It's detected by the probe set as Tphr2
Range: -40÷150°C; -40÷302°F
UM: according to CF26

HTRC21 Heat reclaim stop delay with HR2 outlet temperature below HTRC20
Range: 1÷15
UM: min

HTRC22 Water tank temperature set point for HR2
Range: 10÷90°C; 50÷194°F
UM: according to CF26

HTRC23 Water tank temperature regulation band for HR2
Range: 1÷30°C; 1÷2÷60°F
UM: according to CF26

HTRC24 Temperature differential set point at outlet and inlet of HR2
Range: 1÷30°C; 1÷60°F
UM: according to CF26

HTRC25 Temperature differential regulation band for HR2
Range: 1÷30°C; 1÷2÷60°F
UM: according to CF26

HTRC26 HR1 min analog output
Range: 0÷HTRC27
UM: %

HTRC27 HR1 max analog output
Range: HTRC26÷100
UM: %

HTRC28 Max % variation of HR1 analog output per second 1÷100
Range: 1÷100
UM: %

HTRC29 HR2 min analog output
Range: 0÷HTRC30
UM: %

HTRC30 HR2 max analog output

Range: HTRC29÷100
UM: %

HTRC31 Max % variation of HR2 analog output per second 1÷100
Range: 1÷100
UM: %

HTRC32 Time for flow switch 1 verification
Range: 0÷15
UM: sec

HTRC33 Time for flow switch 2 verification
Range: 0÷15
UM: sec

HTRC34 Time pump 1 on after reaching the set point
Range: 0÷600
UM: sec

HTRC35 Time pump 2 on after reaching the set point
Range: 0÷600
UM: sec

HTRC36 With HTRC0 = 1, Pump 1 regulation tank or differential
Range: 0÷1
0 = Tank; 1 = Differential

HTRC37 Pump 2 regulation: tank water or differential
Range: 0÷1
0 = Tank; 1 = Differential

HTRC38 Gas cooler by-pass enabled
Range: 0÷1
0 = no; 1 = yes

HTRC39 Differential for gas cooler by pass enabled
Range: 0.0÷20.0°C; 0÷36°F
UM: according to CF26

HTRC40 Time for confirmation of gas cooler bypass activation
Range: 0÷600s

HTRC41 Water tank high temperature alarm for HR1
Range: 10÷100°C; 50÷212°F
UM: according to CF26

HTRC42 Water tank high temperature alarm for HR2
Range: 10÷100°C; 50÷212°F
UM: according to CF26

12.1.43 Gas cooler (GC1-GC97)

TRANSCRITICAL REGULATION
GC01 Setpoint for Subcritical and Transcritical mode switch
Range: -3.0÷42.0°C; 27÷108°F
UM: according to CF26

GC02 Hysteresis for Subcritical and Transcritical mode switch
Range: 0.0÷20.0°C; 0÷36°F
UM: according to CF26

GC03 Minimum pressure set point value in transcritical mode

Range: 0.00÷200.00 bar; 0÷2900 PSI; 0÷20000 KPA
UM: according to CF26

GC04 Transcritical proportional band
Range: 0.00÷500.00 bar; 0÷7250 PSI; 0÷50000 KPA
UM: according to CF26

GC05 Transcritical band offset
Range: -10.0÷50.00 bar; -145÷725 PSI; -1000÷5000 KPA
UM: according to CF26

GC06 Integral sampling time
Range: 0÷1000
UM: sec

GC07 Derivative
Range: 0÷1000

GC08 PID step band
Range: 0.00÷100.00 bar; 0÷1450 PSI; 0÷10000 KPA
UM: according to CF26

GC09 Minimum PID step
Range: 0÷ GC10

GC10 Maximum PID step
Range: GC09÷1000

GC11 Maximum HPV % open
Range: GC12÷100
UM: %

GC12 Minimum HPV % open
Range: 0÷GC11
UM: %

TRANSCRITICAL MAX PRESSURE - SAFETIES

GC13 Maximal allowable pressure in gas cooler
Range: 0.00÷200.00 bar; 0÷2900 PSI; 0÷20000 KPA
UM: according to CF26

GC14 HP safety set point
Range: 0.00÷200.00 bar; 0÷2900 PSI; 0÷20000 KPA
UM: according to CF26

GC15 HP safety delay before standard regulation
Range: 0÷255
UM: sec

GC16 Offset end temperature
Range: GC01÷32.0°C; GC01÷89°F
UM: according to CF26

GC17 Offset value
Range: 0.00÷6.00 bar; 0÷87 PSI; 0÷600 KPA
UM: according to CF26

GC18 Open HPV% in Subcritical
Range: 0÷100
UM: %

GC19 High pressure alarm in gas cooler
Range: 0.00÷150.00 bar; 0÷2175 PSI; 0÷15000 KPA

UM: according to CF26

LIQUID RECEIVER REGULATION

GC20 Receiver pressure setpoint
Range: KPA 0.00÷90.00 bar; 0÷1305 PSI; 0÷9000 KPA
UM: according to CF26
Note: if there is the parallel compression, the max limit has to be SETPC. If the user sets GC20 ≥ SETPC, the app has to write GC20 = SETPC.

GC21 BGV proportional band
Range: 0.00÷500.00 bar; 0÷7250 PSI; 0÷50000 KPA
UM: according to CF26

GC22 BGV band offset
Range: 0.00÷500.00 bar; 0÷7250 PSI; 0÷50000 KPA
UM: according to CF26

GC23 BGV integral sampling time
Range: 0÷1000
UM: sec

GC24 BGV derivative sampling time
Range: 0÷1000
UM: sec

GC25 BGV derivative time
Range: 0÷1000
UM: sec

GC26 Maximum BGV valve % open
Range: GC27÷100
UM: %

GC27 Minimum BGV valve % open
Range: 0÷GC26
UM: %

SAFETIES

GC28 High pressure setpoint
Range: 0.00÷150.00 bar; 0÷2175 PSI; 0÷15000 KPA
UM: according to CF26

GC29 High pressure setpoint Pre-Alarm
Range: 0.00÷150.00 bar; 0÷2175 PSI; 0÷15000 KPA
UM: according to CF26

GC30 High pressure hysteresis
Range: 0.00÷500.00 bar; 0÷7250 PSI; 0÷50000 KPA
UM: according to CF26

GC31 Low pressure setpoint
Range: 0.00÷ GC29 bar; 0÷GC29PSI; 0÷GC29KPA
UM: according to CF26

GC32 Low pressure hysteresis
Range: 0.00÷500.00 bar; 0÷7250 PSI; 0÷50000 KPA
UM: according to CF26

GC33 Rate at which the HPV will close in safe mode
Range: 0÷600
UM: sec

GC34 HPV % open during Subcritical with sensor failure

Range: 0÷100
UM: %

GC35 HPV % open during Transcritical with sensor failure
Range: 0÷100
UM: %

GC36 HPV % open during low pressure safety mode
Range: 0÷100
UM: %

GC37 BPV % open during high pressure safety mode
Range: 0÷100
UM: %

VALVE SETTINGS of XEV20D_1
GC38 Valves types for value1 and 2 of XEV20D_1
Range: 1÷2
1: Unipolar
2: Bipolar

GC39 Max steps for valve 1 of XEV20D_1
Range: 0÷800
UM: 10step

GC40 Min steps for valve 1 of XEV20D_1
Range: 0÷500
UM: step

GC41 Extra steps for Valve1 close of XEV20D_1
Range: 0÷500
UM: step

GC42 Step rate for valve 1 of XEV20D_1
Range: 10÷600
UM: step/sec

GC43 Moving current for valve 1 of XEV20D_1
Range: 0÷100
UM: 10mA

GC44 Holding current for valve 1 of XEV20D_1
Range: 0÷100
UM: 10mA

GC45 Max steps for valve 2 of XEV20D_1
Range: 0÷800
UM: 10step

GC46 Min steps for valve 2 of XEV20D_1
Range: 0÷500
UM: step

GC47 Extra steps for Valve2 close of XEV20D_1
Range: 0÷500
UM: step

GC48 Step rate for valve 2 of XEV20D_1
Range: 10÷600
UM: step/sec

GC49 Moving current for valve 2 of XEV20D_1
Range: 0÷100

UM: 10mA

GC50 Hold current for valve 2 of XEV20D_1
Range: 0÷100
UM: 10mA

GC51 Valve 1 of the XEV20D of XEV20D_1 function
Range: 0÷2
0: HPV
1: BGV
2: not used

GC52 Valve 2 of the XEV20D of XEV20D_1 function
Range: 0÷2
0: HPV
1: BGV
2: not used

VALVE SERVICE FUNCTIONS
GC53 Hour when the HPV calibration mode initiate
Range: 0÷24; 0 = disable
UM: hour

GC54 HPV Interval days when calibrating happens
Range: 0÷7; 0 = disable
UM: day

GC55 Hour when the BGV calibration mode initiate
Range: 0÷24; 0 = disable
UM: hour

GC56 BGV Interval days when calibrating happens
Range: 0÷7; 0 = disable
UM: day

GC57 HPV Calibration T Frame
Range: 0÷12
UM: hour

GC58 HPV Calibration Min Valve%
Range: 0÷100
UM: %

GC59 HPV Calibration Direct
Range: 0÷1
0: Close
1: Open

GC60 BGV Calibration T Frame
Range: 0÷12
UM: hour

GC61 BGV Calibration Min Valve%
Range: 0÷100
UM: %

GC62 BGV Calibration Direct
Range: 0÷1
0: Close
1: Open

OTHERS
GC63 OverrideCMD:if 1, override mode, 0, normal mode NO(0)-YES(1)

Range: 0÷1
0: no
1: yes

GC64 **Override time:1~30 minutes**, when OverrideCMD is from 0 to 1, timer starts running, when timer is up, set 0 to OverrideCMD
Range: 1÷30
UM: min

VALVE SETTINGS of XEV20D_2
GC65 **Valves types for value1 and 2** of XEV20D_2
Range: 1÷2
1: Unipolar
2: Bipolar

GC66 **Max steps for valve 1 of XEV20D**_2
Range: 0÷800
UM: 10step

GC67 **Min steps for valve 1 of XEV20D_2**
Range: 0÷500
UM: step

GC68 **Extra steps for Valve1 close of XEV20D_2**
Range: 0÷500
UM: step

GC69 **Step rate for valve 1 of XEV20D_2**
Range: 10÷600
UM: step/sec

GC70 **Moving current for valve 1 of XEV20D_2**
Range: 0÷100
UM: mA

GC71 **Hold current for valve 1 of XEV20D_2**
Range: 0÷100
UM: mA

GC72 **Max steps for valve 2 of XEV20D_2**
Range: 0÷800
UM: 10step

GC73 **Min steps for valve 2 of XEV20D_2**
Range: 0÷500
UM: step

GC74 **Extra steps for Valve2 close of XEV20D_2**
Range: 0÷500
UM: step

GC75 **Step rate for valve 2 of XEV20D_2**
Range: 10÷600
UM: step/sec

GC76 **Moving current for valve 2 of XEV20D_2**
Range: 0÷100
UM: mA

GC77 **Hold current for valve 2 of XEV20D_2**
Range: 0÷100
UM: mA

GC78 Valve 1 of the XEV20D of XEV20D_2
Range: 0÷2
0: HPV
1: BGV
2: not used

GC79 Valve 2 of the XEV20D of XEV20D_2
Range: 0÷2
0: HPV
1: BGV
2: not used

GC80 Minimum pressure Set point in subcritical mode with GC18 = -1
Range 0÷100 bar, 0÷1450PSI

GC81 HPV proportional band in subcritical mode
Range: 0.00÷500.00 bar; 0÷7250 PSI; 0÷50000 KPA
UM: according to CF26

GC82 HPV band offset in subcritical mode
Range: 0.00÷500.00 bar; 0÷7250 PSI; 0÷50000 KPA
UM: according to CF26

GC83 HPV integral sampling time in subcrtical mode
Range: 0÷1000
UM: sec

GC84 HPV derivative time in subcrtical mode
Range: 0÷1000
UM: sec

GC85 HGV MAX variation percentage every second in subcritical mode
Range: 0÷100% with 0 no limitation

GC86 BGV MAX variation percentage every second in subcritical mode
Range: 0÷100% with 0 no limitation

GC87 Delta temperature for subcooling function in subcritical mode
Range: 0÷12°C; 0÷24°F

12.1.44 VALVE HP DYNAMIC LIMITATION

GC92 Sensibility value for HP valve limitation
Range 0÷3
0 = Function disabled (Default value)
1 = Soft limitation
2 = Medium limitation
3 = Hard limitation

12.1.45 FAN OPTIMIZATION

GC96 Duration of fan optimization in case of compressor starts(100s)
Range: 0÷255
UM: sec

GC97 Minimum fan speed during fan optimization (20%)
Range: 0÷100 with 0 no mimimum speed
UM: %

12.1.46 De-Superheaters (DSH1-DSH18)

DSH1 **Minimum set point for the de-superheater 1**
is used for the de-superheat 1
Range: -40÷110°C/-40÷230°F
UM: According to CF26

DSH2 **Differential for the de-superheat 1**
is temperature differential between external temperature and the temperature detected at the outlet of the de-superheater 1.
Range: 0.0÷12.0°C; 0÷24°F
UM: according to CF26

DSH3 **Regulation band for the de-superheat 1**
Range: 0.1÷30.0 °C; 1÷50 °F;
UM: according to CF26

DSH4 **Regulation activation for the de-superheat 1**
Range: 0÷3;
0 ***on*** = Regulation always active if the iProRack in on.
1 ***Circ1*** = Regulation on if at least 1 compressor of the circuit 1 is on.
2 ***Circ2*** = Regulation on if at least 1 compressor of the circuit 2 is on.
3 ***PC*** = Regulation on if at least 1 Paralell compressor is on.

DSH5 **Minimum value for the analogue Output of de-superheater 1**
Range: 0 ÷ DSH6

DSH6 **Maximum value for the analogue Output of de-superheater 1**
Range: DSH5 ÷ 100

DSH7 **Minimum set point for the de-superheater 2**
is used for the de-superheat 2
Range: -40÷110°C/-40÷230°F
UM: According to CF26

DSH8 **Differential for the de-superheat 2**
is temperature differential between external temperature and the temperature detected at the outlet of the de-superheater 2.
Range: 0.0÷12.0°C; 0÷24°F
UM: according to CF26

DSH9 **Regulation band for the de-superheat 2**
Range: 0.1÷30.0 °C; 1÷50 °F;
UM: according to CF26

DSH10 **Regulation activation for the de-superheat 2**
Range: 0÷3;
0 ***on*** = Regulation always active if the iProRack in on.
1 ***Circ1*** = Regulation on if at least 1 compressor of the circuit 1 is on.
2 ***Circ2*** = Regulation on if at least 1 compressor of the circuit 2 is on.
3 ***PC*** = Regulation on if at least 1 Paralell compressor is on.

DSH11 **Minimum value for the analogue Output of de-superheater 2**
Range: 0 ÷ DSH12

DSH12 **Maximum value for the analogue Output of de-superheater 2**
Range: DSH11 ÷ 100

DSH13 **Minimum set point for the de-superheater 3**
is used for the de-superheat 3
Range: -40÷110°C/-40÷230°F

UM: According to CF26

DSH14 Differential for the de-superheat 3
is temperature differential between external temperature and the temperature detected at the outlet of the de-superheater 3
Range: 0.0÷12.0°C; 0÷24°F
UM: according to CF26

DSH15 Regulation band for the de-superheat 3
Range: 0.1÷30.0 °C; 1÷50 °F;
UM: according to CF26

DSH16 Regulation activation for the de-superheat 3
Range: 0÷3;
0 ***on*** = Regulation always active if the iProRack in on.
1 ***Circ1*** = Regulation on if at least 1 compressor of the circuit 1 is on.
2 ***Circ2*** = Regulation on if at least 1 compressor of the circuit 2 is on.
3 ***PC*** = Regulation on if at least 1 Paralell compressor is on.

DSH17 Minimum value for the analogue Output of de-superheater 3
Range: 0 ÷ DSH18

DSH18 Maximum value for the analogue Output of de-superheater 3
Range: DSH19 ÷ 100

13. REGULATION

13.1 Neutral zone adjustment – only for compressors

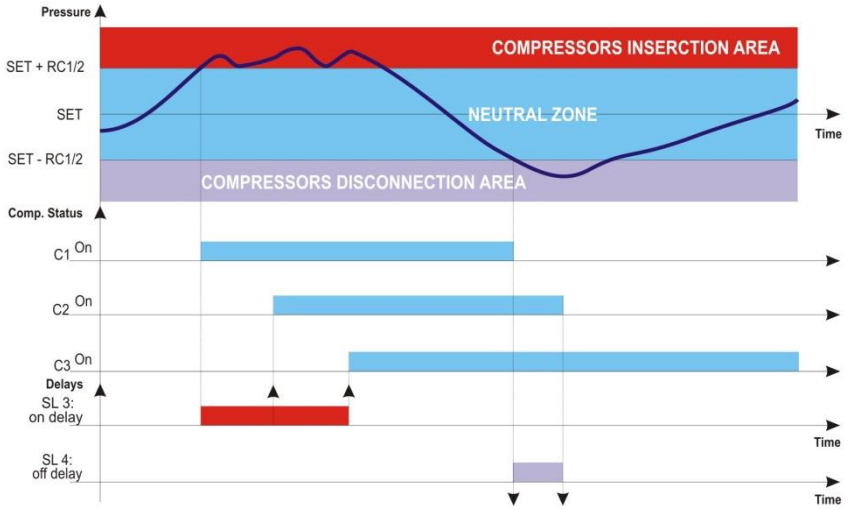
This regulation is available only for compressors. It is used if the parameter CF18 = db (CF19 = db for circuit 2). The following observations are availables only for adjustment **without inverter**. In this case the neutral zone (RC1) is symmetrical compared to the target set point, with extremes: set+RC1/2 ... set- RC1/2. If the pressure (temperature) is inside this zone the controller maintains the same number of loads switched on and off, without changing anything.
When the pressure (temperature) goes out from the zone, regulation starts. If the pressure is greater than SET+RC1/2, the loads are switching on with timing given by SL3 parameter.
A load is turned on only if the safety times are over:

SL1 **Minimum time between 2 following switching ON of the same compressor** (0÷255 min).
SL2 **Minimum time between the switching off of a compressor and the following switching on.** (0÷255min).
Note: usually SL1 is greater than SL2
SL5 **Minimum time load on (**0 5990sec)

Regulation stops when the pressure (temperature) comes back into the neutral zone.
In the following a simplify example that explains the regulation in neutral zone for compressor homogeneous with 1 step for each compressors. The safety times **SL1, SL2, SL5** are not considered. In the real regulation the load is entered or turned off only if these times are over.

Ex. **Dead band control, compressors with same capacities, 1 step for each compressor.**
In this example:

C1 C2 C3	number of compressors first circuit (defined in the conf file).
CF18 = db	dead band regulation
CF22 = yES	rotation
SL8 = no	"SL3" delay not enabled at first calling after an equilibrium condition.
SL9 = no	"SL4" delay not enabled at first calling after an equilibrium condition.



13.2 Proportional band adjustment – for compressors and fans

This regulation is available for compressors and fans. It is used by compressors if the parameter CF18 = Pb (CF19 = Pb for circuit 2). The following observations are availables only for adjustment without inverter. Compressors and fans work in the same way.
Example regulation for compressors:
In this case the regulation band (RC1) is divided into as many parts as there are stages according to the following formula:

 # steps =Tot loads circuit 1 (number of compr. or steps).

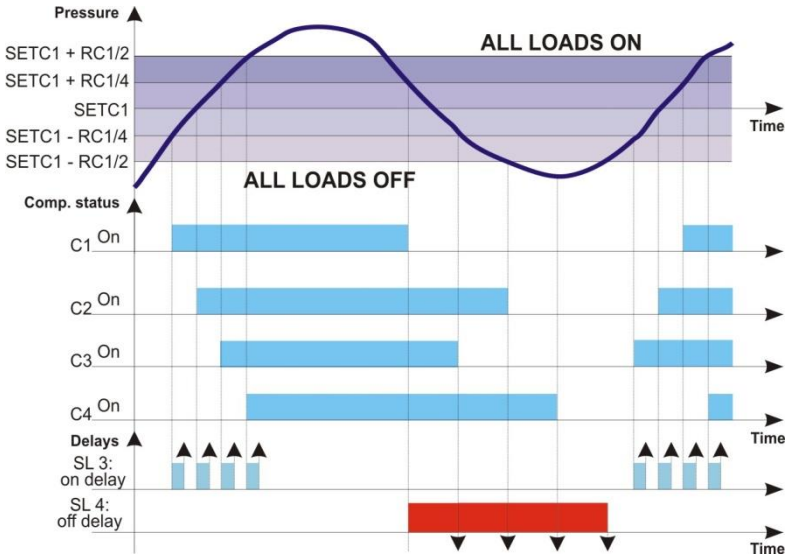
The numbers of stages switched ON is proportional to the value of the Input signal: when this distances itself from the target set point and enters the various bands, the compressors are switched ON, to be then turned OFF when the signal brings near the set point.

In this way if the pressure is greater than regulation band, all the compressors are on, if the pressure (temperature) is lower than the regulation band all the compressors are off.
Naturally also for this regulations all the delays (SL3 and SL4) safety times (**SL1, SL2, SL5**) are taken in account.

Regulation according to the running hours
The algorithm switchs on and off the loads according to the running hours of each load. In this way the running hours are balanced.

Example

C1 C2 C3 C4 C5	**Tot loads =** 5 compressors
CF19 = Pb	proportional band regulation
CF22 = yES	rotation
SL8 = no “	SL3” delay not enabled at first calling after a regulation zone.
SL9 = no “	SL4” delay not enabled at first calling after a regulation zone.



13.3 Split condenser function

13.3.1 General description

Split mode is most often used in cold climates during periods of low outside air temperature. Split mode is also sometimes used when heated refrigerant from the refrigeration system is being used as reclaim heat by an HVAC unit.
The most common way to achieve split mode in an air-cooled condenser with single-speed fans is to lock OFF 50% of the total number of fans."

13.3.2 Parameters involved

Label	Description	Range
RC17	Split condenser enabling– Circuit 1	NO, YES
RC18	Kind of Split condenser – Circuit 1	a. Odd: lock OFF all odd-numbered fans, b. Even: lock OFF even-numbered fans, c. First: lock OFF the first half of all fans, d. Last: lock OFF the last half of all fans.
RC19	External temperature set point for Split condenser – Circuit 1	-40÷50°C; -40÷120°F
RC20	Split condenser dead band – Circuit 1	0.1÷30.0 °C, 1÷50°F
RC21	Split condenser enabling– Circuit 2	NO, YES
RC22	Kind of Split condenser – Circuit 2	a. Odd: lock OFF all odd-numbered fans, b. Even: lock OFF even-numbered fans, c. First: lock OFF the first half of all fans, d. Last: lock OFF the last half of all fans.
RC23	External temperature set point for Split condenser – Circuit 2	-40÷50°C; -40÷120°F
RC24	Split condenser dead band – Circuit 2	0.1÷30.0 °C, 1÷50°F
AL41	High pressure (temperature) to un-split condenser – circuit 1	0 ÷100.00bar; -40÷150°C; 0 ÷1450 PSI; -40 ÷230°F; 0 ÷10000 KPA

Label	Description	Range
AL42	Differential for high pressure (temperature) un-split condenser alarm recovery – circuit 1	0.10÷10.00 bar; 0.1÷30.0 °C, 1÷145 Psi, 1÷50°F; 10÷1000 Kpa
AL43	Split condenser relay status with temperature/pressure > AF41 – circuit 1	on, off
AL44	High pressure (temperature) to un-split condenser – circuit 2	0 ÷100.00bar; -40÷150°C; 0 ÷1450 PSI; -40 ÷230°F; 0 ÷10000 KPA
AL45	Differential for high pressure (temperature) un-split condenser alarm recovery – circuit 2	0.10÷10.00 bar; 0.1÷30.0 °C, 1÷145 Psi, 1÷50°F; 10÷1000 Kpa
AL46	Split condenser relay status with temperature/pressure > AF44 – circuit 2	on, off

13.3.3 Activation

There are 3 way to activate the split condenser, according to this priority:

1. By digital input set as 140 for circuit 1 or 141 for circuit 2.
2. By serial command
3. Automatically by setting a probe as 13 (NTC) or 31(PTC) for Circuit 1 or 14 (NTC) or 32 (PTC) for circuit 2, when the temperature is higher than RC19+RC20/2 for circuit 1 and RC23+RC24/2 for circuit2

This is the priority management:
1) Normally use the probe;
2) If there is a serial command of activation, the split condenser is activated until there is a serial command of deactivation. If activated by serial command, you don't consider the probe value;
3) If there is DI activation, the split condenser is activated until the DI asks for a deactivation. If activated by DI, don't consider the serial command and don't consider the probe value.

13.3.4 Action

When the function is enabled, according to the setting of the parameter RC22, the controller will use:

a. Only the fan numbered ad "odd".
b. Only the fan numbered ad "even".
c. Only the first half fans.
d. Only the last half fans.

13.3.5 Safety function to un-split the condenser

Circuit 1
If the pressure/temperature detected by the condenser probe is higher than AL41 (High pressure /temperature to un-split condenser) the split condenser function is suspended till the pressure / temperature goes below the value AL41-AL42 (Differential for high pressure/temperature un-split condenser alarm recovery.
In this situation, the status of the split condenser relay depends on the parameter AL43 Split condenser relay status with temperature/pressure > AL41.

Same management have to be done for circuit 2.

14. Digital 6d Compressor management

Regulation with Stream Digital 6D compressor.
This compressor requires 2 resources:

a. Inverter
b. Step after inverter (operating with inverted logic: relay open, resource working, relay closed resource not working)

Increasing capacity:
Inverter after reaching 100% of the capacity will activate:

a. the 6D step.
b. Then all the other available loads.

To the other loads can be activated with rotation or fix sequence according to the setting.

Decreasing capacity:
The inverter will run at minimum speed, then:
a. Switch off all the other loads, following the standard logic.
b. Then Switch off the 6D step
Then it will be switched off.

Instance

Rack with one 6D Stream Digital + 2 additional streams 6D not digital will be configured as:

DOC1 = 1C (Inverter 1 Suction Circuit 1)
DOC2 = 91 (Valve of Stream Digital 6D)
DOC3 = 7C (Compressor 1 Circuit1)
DOC4 = 8o (Step n° 1 Compressor 1 Circuit 1)
DOC5= 11C (Compressor 2 Circuit1)
DOC6 = 12o (Step n° 1 Compressor 2 Circuit 1)

VALVE ACTIVATION WITH INCREASING CAPACITY

Step	DOC1 = 1C	DOC2 = 91	DOC3 = 7C	DOC4 = 8o	DOC5= 11C	DOC6 = 12o
0	OFF	OFF	OFF	OFF	OFF	OFF
1	ON	ON	OFF	OFF	OFF	OFF
2	ON	OFF	OFF	OFF	OFF	OFF
3	ON	OFF	ON	ON	OFF	OFF
4	ON	OFF	ON	OFF	OFF	OFF
5	ON	OFF	ON	OFF	ON	ON
6	ON	OFF	ON	OFF	ON	OFF

VALVE ACTIVATION WITH DECREASING CAPACITY

Step	DOC1 = 1C	DOC2 = 91	DOC3 = 7C	DOC4 = 8o	DOC5= 11C	DOC6 = 12o
0	ON	OFF	ON	OFF	ON	OFF
1	ON	OFF	ON	OFF	ON	ON
2	ON	OFF	ON	OFF	OFF	OFF
3	ON	OFF	ON	ON	OFF	OFF
4	ON	OFF	OFF	OFF	OFF	OFF
5	ON	ON	OFF	OFF	OFF	OFF
6	OFF	OFF	OFF	OFF	OFF	OFF

NOTE: To manage this modification will be necessary to modify the FB “Inverter”, considering that now the inverter besides the analog output has also a valve to manage.
It will be necessary to add another output → drive the ON/OFF of the valve and modify when the output “CONSENSO” is equal true.

15. SCREW COMPRESSORS

Loads activation is managed by the neutral zone. They follow general rules of step compressors: The relay group is activated depending on the kind of screw compressors that has been selected on the CF1 parameter.

15.1 Regulation with screw compressors like Bitzer/ Hanbell/ Refcomp etc

Screw compressors like Bitzer use up to 3 valves for the power regulation.
The first valve is used during the starting phase for the CF28 max time, after this time, the step 2 is automatically activated.
Through the CF29 parameter it is possible to decide if the step 1 can be subsequently used during the standard thermoregulation.
Through the CF30 parameter it is possible to decide the delay between the avctivation valve and start of the compressor.(This parameter is enabled only for Bitzer)

15.1.1 Relay activation

ES. Compressor with 4 steps:
C1 = Scrw1; **C2** = Step; **C3** = Step; **C4** = Step; **CF1** = Btz

0.	**C1**	**RL01=Compressor 1 Circuit 1**
1.	**Step**	**RL02=Step 1 Compressor 1 Circuit 1**
2.	**Step**	**RL03=Step 2 Compressor 1 Circuit 1**
3.	**Step**	**RL04=Step 3 Compressor 1 Circuit 1**

a. Activation with valves ON due to voltage presence (CF2=cL).

	C1 = Screw1	**C2 = stp**	**C3 = stp**	**C4 = stp**
Step 1 (25%)	*ON*	*ON*	*OFF*	*OFF*
Step 2 (50%)	*ON*	*OFF*	*ON*	*OFF*
Step 3 (75%)	*ON*	*OFF*	*OFF*	*ON*
Step 4 (100%)	*ON*	*OFF*	*OFF*	*OFF*

b. Activation with valves ON due to voltage absence (CF2=oP).

	C1 = Screw1	**C2 = stp**	**C3 = stp**	**C4 = stp**
Step 1 (25%)	*ON*	*OFF*	*ON*	*ON*
Step 2 (50%)	*ON*	*ON*	*OFF*	*ON*
Step 3 (75%)	*ON*	*ON*	*ON*	*OFF*
Step 4 (100%)	*ON*	*ON*	*ON*	*ON*

15.2 Regulation with screw compressors like Frascold

Screw compressors like Frascold use up to 3 valves for the power regulation.
The first valve is used during the starting phase for the CF28 max time, after this time, the step 2 is automatically activated.
Through the CF29 parameter it is possible to decide if the step 1 can be subsequently used during the standard thermoregulation.

15.2.1 Relay activation

ES. Compressor with 4 steps:
C1 = Scrw1; **C2** = Step; **C3** = Step; **C4** = Step; **CF1** = FRSC

0.	**C1**	**RL01=Compressor 1 Circuit 1**
1.	**Step**	**RL02=Step 1 Compressor 1 Circuit 1**
2.	**Step**	**RL03=Step 2 Compressor 1 Circuit 1**
3.	**Step**	**RL04=Step 3 Compressor 1 Circuit 1**

a. Activation with valves ON due to voltage presence. (CF2=cL)

	C1 = Screw1	**C2 = stp**	**C3 = stp**	**C4 = stp**
Step 1 (25%)	*ON*	*OFF*	*OFF*	*OFF*
Step 2 (50%)	*ON*	*ON*	*ON*	*OFF*
Step 3 (75%)	*ON*	*ON*	*OFF*	*ON*
Step 4 (100%)	*ON*	*ON*	*OFF*	*OFF*

b. Activation with valves ON due to voltage absence. (CF2=oP)

	oAi = Screw1	**oAi+1 = stp**	**oAi+2 = stp**	**oAi+3 = stp**
Step 1 (25%)	*ON*	*ON*	*ON*	*ON*
Step 2 (50%)	*ON*	*OFF*	*OFF*	*ON*
Step 3 (75%)	*ON*	*OFF*	*ON*	*OFF*
Step 4 (100%)	*ON*	*OFF*	*ON*	*ON*

16. MIXED CAPACITY REGULATION

16.1 Parameter involved

Label	**Description**	**Range**
CF1	**Kind of compressors**:	Spo, Btz, Frtz, dPO
CF4-CF9	**Power of compressor 1-6 circuit 1** for setting the capacity of single compressors. Each parameter defines the capacity of the compressor used. **E.I.** 3 compressors with following capacity: 10, 20, 40 HP. The parameters have to be set in this way: CF4=10, CF5=20, CF6=40, CF7=CF8=CF9=0.	

16.2 Regulation concept

If CF1 = dPO, compressors with mixed capacity are managed.
The regulation is based on neutral zone.
By parameters CF4,..CF9, the capacity of the compressors is set.
When it's requested to increase the capacity, controller will used a mix of the available capacities from the smaller one to the bigger one, trying to reduce as much as possible the difference between a capacity step and the next one.

The algorithm doesn't take care about the running hours of each single compressor, as the priority is to match the cooling request of the system with the cooling capacity of the compressors.

16.2.1 Instance 1. 4 compressors without steps, with following capacities: C1 = 10HP, C2 = 15HP, C3 = 30HP, C4 = 40HP

ES. CF1 = dPo.
CF4 = 10; CF5 = 15 CF6 = 30; CF7 = 40; CF8=CF9=0
Controller has to develop internal table with all the possible capacity steps that can be generated by the compressors:

STEP	CF4 = 10;	CF5 = 15	CF6 = 30;	CF7 = 40	TOTAL CAPACITY
1	10	-	-	-	**10**
2	-	15	-	-	**15**
3	10	15	-	-	**25**
4	-	-	30	-	**30**
5	-	-	-	40	**40**
6	-	15	30	-	**45**
7	10	-	-	40	**50**
8	-	15	-	40	**55**
9	10	15	-	40	**65**
10	-	-	30	40	**70**
11	10	-	30	40	**80**
12	-	15	30	40	**85**
13	10	15	30	40	**95**

NOTE: Each step can be used ONLY IF the safety timers SL1, SL2, SL5 have expired, otherwise the first next available step is used.
See below for the capacity decreasing rules.

The same algorithm is used when the capacity has to be decreased

NOTE: Some capacity steps can be not used if they are not available for safety timer reasons. In this case the controller jumps to the next available capacity stage.

Instance 1:
E.I. 2 Compressors with following capacities:

- **Compr. 1:** CF4 = 60 HP
- **Compr. 2:** CF5 = 70 HP

Steps:
Compr. 1: 3 unloaders: DOC1 = 7C; DOC2 = 8C; DOC3 = 9C; unloaders capacity = 20HP
Compr. 2: 1 unloader: DOC4 = 11C; unloaders capacity = 70HP

Activation sequence

	DOC1 = 7C	DOC2 = 8C	DOC3 = 9C	DOC4 = 11C	HP
1	1	0	0	0	**20**
2	1	1	0	0	**40**
3	1	1	1	0	**60**
4	1	0	0	1	**90**
5	1	1	0	1	**110**
6	1	1	1	1	**130**

De-activation sequence

	DOC1 = 7C	DOC2 = 8C	DOC3 = 9C	DOC4 = 11C	HP

1	1	1	1	1	**130**
2	1	1	0	1	**110**
3	1	0	0	1	**90**
4	1	1	1	0	**60**
5	1	1	0	0	**40**
6	1	0	0	0	**20**

The deactivation sequence is the opposite of the activation sequence.

Instance 2:
E.I. 3 Compressors with following capacities:

- **Compr. 1: CF4 = 60 HP,**
- **Compr. 2: CF5 = 15 HP**
- **Compr. 3: CF6 = 100HP**

Steps:
Compr. 1: 3 unloaders: DOC1 = 7C; DOC2 = 8C; DOC3 = 9C; Step capacity = 20HP
Compr. 2: 1 unloader: DOC4 = 11C; Step capacity = 15HP
Compr. 3: 2 unloaders: DOC5 = 15C; DOC6 = 16C Step capacity = 50HP

Activation sequence

	DOC1 = 7C	DOC2 = 8C	DOC3 = 9C	DOC4 = 11C	DOC5 = 15C	DOC6 = 16C	HP
1	0	0	0	1	0	0	**15**
2	1	0	0	1	0	0	**35**
3	1	1	0	1	0	0	**55**
4	1	1	1	1	0	0	**75**
5	1	0	0	1	1	0	**85**
6	1	1	0	1	1	0	**105**
7	1	1	1	1	1	0	**125**
8	1	0	0	1	1	1	**135**
9	1	1	0	1	1	1	**155**
10	1	1	1	1	1	1	**175**

De-activation sequence (Normal)

	DOC1 = 7C	DOC2 = 8C	DOC3 = 9C	DOC4 = 11C	DOC5 = 15C	DOC6 = 16C	HP
10	1	1	1	1	1	1	**175**
9	1	1	0	1	1	1	**155**
8	1	0	0	1	1	1	**135**
7	1	1	1	1	1	0	**125**
6	1	1	0	1	1	0	**105**
5	1	0	0	1	1	0	**85**
4	1	1	1	1	0	0	**75**
3	1	1	0	1	0	0	**55**
2	1	0	0	1	0	0	**35**

1	0	0	0	1	0	0	**15**

De-activation sequence(Abnormal)
When all the compressors on (full power), compressor 1 enters in alarm. The deactivation sequence will be modified as follow:

	DOC1 = 7C	DOC2 = 8C	DOC3 = 9C	DOC4 = 11C	DOC5 = 15C	DOC6 = 16C	HP
10	1	1	1	1	1	1	**175**
9	0	0	0	1	1	1	**115**
8	0	0	0	1	1	0	**65**
7	0	0	0	1	0	0	**15**
6	0	0	0	0	0	0	**0**

Instance 3:
E.I. 3 Compressors with following capacities (DOC4 can't be turned on, for the safety delay SL1-2 of compressor 2):

- **Compr. 1: CF4 = 60 HP**
- **Compr. 2: CF5 = 15 HP**
- **Compr. 3: CF6 = 100HP**

Steps:
Compr. 1: 3 steps: DOC1 = 7C; DOC2 = 8C; DOC3 = 9C; Step capacity = 20HP
Compr. 2: 1 steps: DOC4 = 11C; Step capacity = 15HP
Compr. 3: 2 step: DOC5 = 15C; DOC6 = 16C Step capacity = 50HP

Activation sequence
Start with Compressor1, SL1-2 of Compressor 2 expired before step 3

16.3 Inverter + mixed capacity compressors

The algorithm to manage inverter plus mixed capacity compressors is similar to the algorithm used for the inverter + on/off compressors:

16.3.1 Increasing capacity

1. The inverter will reach the his max capacity,
2. If the controller requires additional capacity the step of mixed compressors with bigger capacity than the running one is activated.

16.3.2 Decreasing capacity

1. The inverter will reach the his minimum capacity,
2. If the controller requires less capacity the step of mixed compressors with lower capacity than the running one is activated.

……

17. ANALOG INPUTS FOR INVERTER

17.1 Compressor management

The analog Inputs can be used in a rack with frequency compressor, driven by an inverter.
The regulation of the compressors in this case is changed as described in the following graph:
The following examples show the behaviour of the analog Input with proportional regulation.

EX. 2 compressors, 1 frequency compressor.

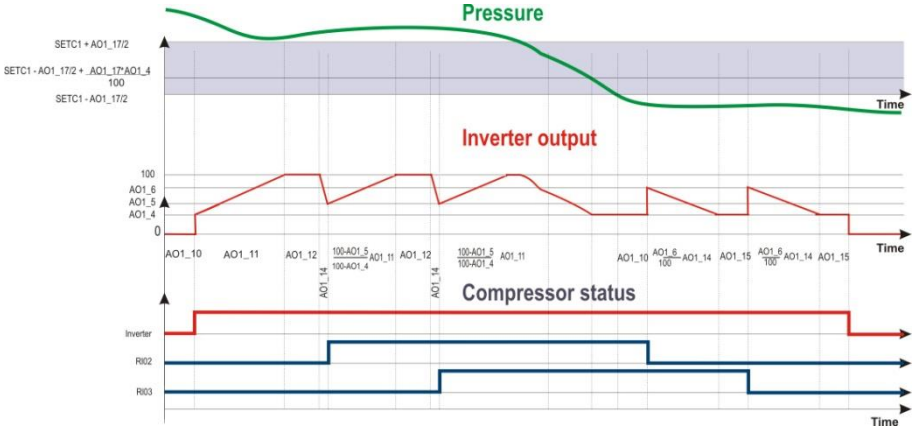
IO_configuration:

DO1 = 1 " Inverter 1 Suction Circuit 1"
DO2 = 7 " Compressor 1 Circuit 1"
DO3 = 11 " Compressor 1 Circuit 2"

AOC1 = 2 " 0-10V Input inverter 1 Suction Circuit 1 "

Parameters:

CF18 = db
AO1_6 < 100
AO1_5 < 100



where:

AO1_4	Minimum value for analog out.1	0 ÷ 99 %
AO1_5	Analog Input1 value after compressor on	AO1_4 ÷ 100 %
AO1_6	Analog Input1 value after compressor off	AO1_4÷ 100 %
AO1_10	Regulation delay after entering the regulation band	0 ÷ 255 (sec)
AO1_11	Analog Input 1 rise time from AO1_4 to 100% when the pressure is above the regulation band and a load is switched on.	0 ÷ 255 (sec)
AO1_12	Analog Input 1 permanency at 100% before load activation	0 ÷ 255 (sec)
AO1_13	Delay between pressure (temperature) goes down the set point and start of analog Input 1 decreasing	0 ÷ 255 (sec)
AO1_16	Analog Input 1 decreasing time from 100% to the AO1_4 value	0 ÷ 255 (sec)

AO1_15	Analog Input1 permanency at AO1_4 before a load is switched off	0 ÷ 255 (sec)
AO1_14	Analog Input1 decreasing time, from 100% to AO1_5 when a load is switched on	0 ÷ 255 (sec)

EX: 2 compressors, 1 frequency compressor.

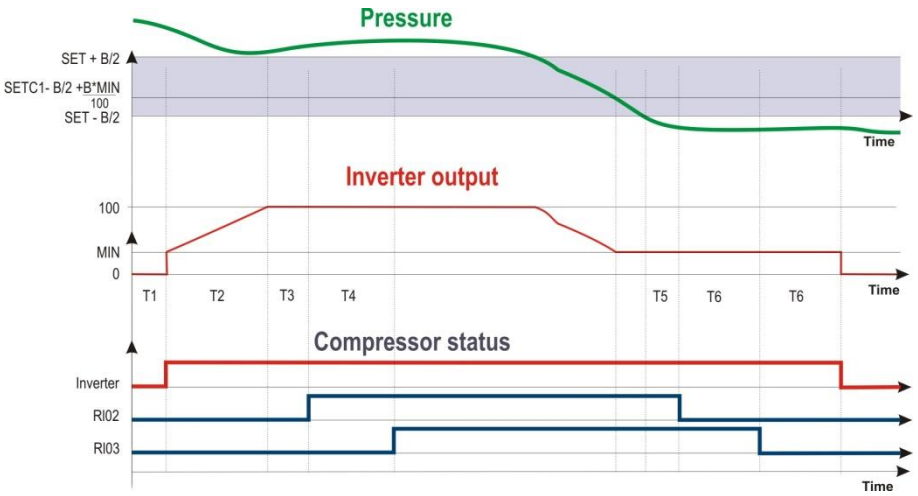
IO_configuration:

DOC1 = 1 " Inverter 1 Suction Circuit 1"
DOC2 = 7 " Compressor 1 Circuit 1"
DOC3 = 11 " Compressor 1 Circuit 2"

AOC1 = 2 " 0-10V Input inverter 1 Suction Circuit 1 "

Parameters:

CF18 = db
AO1_6 = 100 Analog Output 1 value after a compressor is switched off
AO1_5 = 100 Analog Output 1 value after compressor start



Where:

B →	**AO1_17** Regulation band	
MIN →	**AO1_4** Minimum value for analog out.1	0 ÷ 99 %
T1 →	**AO1_10** Regulation delay after entering the regulation band	0 ÷ 255 (sec)
T3 →	**AO1_12** Analog Input 1 permanency at 100% before load activation	0 ÷ 255 (sec)
	Delay between pressure (temperature) goes down the set point and start of analog Input 1 decreasing	0 ÷ 255 (sec)
T4 →	**SL3** 2 different loads start delay	1 ÷ 5990 sec
T6 →	**SL4** 2 different loads off delay	1 ÷ 5990 sec

17.2 Inverter by-pass

The inverter by pass function is used as back up function, in a circuit with compressor invert, allowing the compressor with inverter to run at fixed speed when an issue occurs to the inverter.

17.2.1 Parameter involved

PARAMETER	VALUES
DIC1 ÷ DIC43	**115o** Oil of compressor with Inverter suction Circuit 1 **115c** Oil of compressor with Inverter suction Circuit 1 **116o** Safety of Compressor with Inverter Suction Circuit 1 **116c** Safety of Compressor with Inverter Suction Circuit 1 **117o** Thermal Safety of Compressor with Inverter suction Circuit 1 **117c** Thermal Safety of Compressor with Inverter suction Circuit 1 118o Oil of compressor with Inverter suction Circuit 2 118c Oil of compressor with Inverter suction Circuit 2 119o Safety of Compressor with Inverter Suction Circuit 2 119c Safety of Compressor with Inverter Suction Circuit 2 120o Thermal Safety of Compressor with Inverter suction Circuit 2 120c Thermal Safety of Compressor with Inverter suction Circuit 2 **138o** Inverter suction 1 safety **138c** Inverter suction 1 safety **139o** Inverter suction 2 safety **139c** Inverter suction 2 safety
DOC1 ÷DOC36	**1o** Inverter 1 Suction Circuit 1 **1c** Inverter 1 Suction Circuit 1 **3o** Inverter 1 Suction Circuit 2 **3c** Inverter 1 Suction Circuit 2 **108o** Inverter suction 1 by-pass **108c** Inverter suction 1 by-pass **109o** Inverter suction 2 by-pass **109c** Inverter suction 2 by-pass
AOC 1 ÷ AOC 6	**2** 0-10V output inverter 1 Suction Circuit 1 **4** 0-10V output inverter 1 Suction Circuit 2 **11** 4-20mA output inverter 1 Suction Circuit 1 **13** 4-20mA output inverter 1 Suction Circuit 2

17.2.2 Function

Circuit 1:
When the digital input set as 138: Inverter suction 1 safety is turned on, the following action are taken:

1. The digital output DOC(i) set as “1”: Inverter 1 Suction Circuit 1” is turned off.
2. The analog output AOC(i) set as “2 or 11: inverter 1 Suction Circuit 1” is set to 0V or 4mA
3. The digital output DOC(i) set as “109” : Inverter suction 1 by-pass is used as a compressor in the suction regulation. In this case, the band for regulation is AOx_17.
4. The alarm signaling is activated (see table)
5. The digital inputs set as “safety of the suction inverter of Circuit 1: 115, 116, 117 ” are referred to the DOC(i) set as 109

Circuit 2:
When the digital input set as 139: Inverter suction 2 safety is turned on, the following action are taken:

1. The digital output DOC(i) set as “3”: Inverter 1 Suction Circuit 2” is turned off.
2. The analog output AOC(i) set as “4 or 13: inverter 1 Suction Circuit 2” is set to 0V or 4mA
3. The digital output DOC(i) set as “110” : Inverter suction 2 by-pass is used as a compressor in the suction regulation. In this case, the band for regulation is AOx_17.

4. The alarm signaling is activated
5. The digital inputs set as “safety of the suction inverter of Circuit 2: 118, 119, 120 ” are referred to the DOC(i) set as 110

17.3 Fans management with inverter– 1 fans group with inverter mode, others ON in on/off mode

With this configuration, one analog Input can be used to drive the inverter (AO1=6 “0-10V Input inverter condenser Circuit 1”). Set one relays as inverter condenser (DO1=5 “Inverter condenser Circuit 1”), and other relays as fans (DO1=55 “Fan1 Circuit 1”).

EX: 3 fans, 1 with inverter. Analog Input 1 drives the inverter

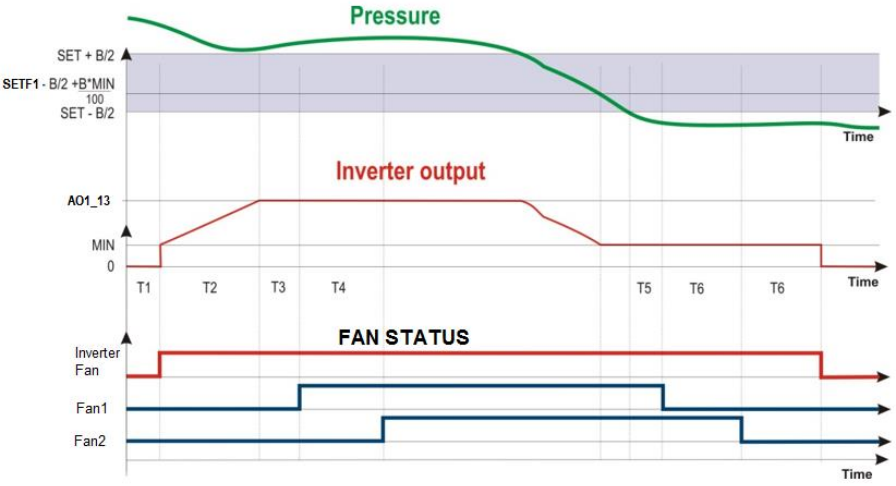
IO_configuration:

DOC1 = 5 “ Inverter Condenser Circuit 1”
DOC2 = 67 “ Fan 1 Circuit 1”
DOC3 = 68 “ Fan 2 Circuit 1”

AOC1 = 6 “0-10V Input inverter condenser Circuit 1 “

Parameters:

AO1_6 = 100
AO1_5 = 0



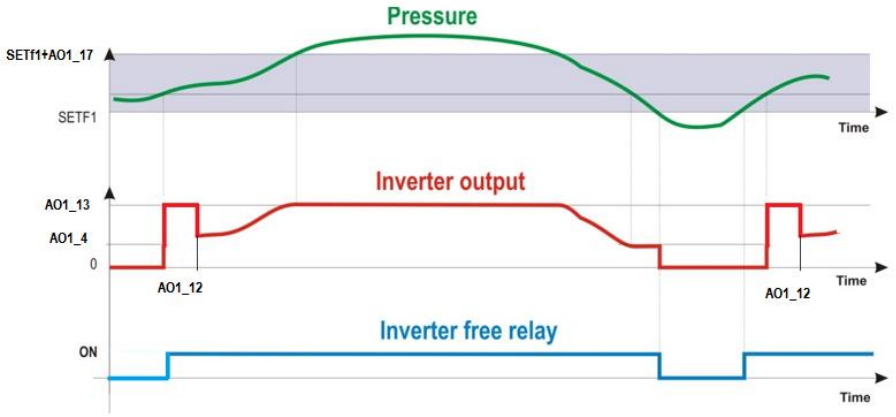
MIN → **AO1_4** Minimum value for analog Input 1
T1 → **AO1_10** Regulation delay of analog Input 1 when the pressure is in the regulation band
T2 → **AO1_11** Analog Input 1 rise time from AO1_4 to 100% when the pressure is outside the regulation band
T3 → **AO1_12** Analog Input 1 permanency at AO1_13 (max) before load activation
T4 → **SL3 2** different loads start delay
T5 → **AO1_15** Analog Output 1 permanency at AO1_4 before a load is switched off
T6→ **SL4** Time delay between switching off of two different compressors - circuit 1

17.4 Management of all fans with inverter – proportional inverter

In this case all fans of the condensing group are driven by one inverter.
The power used by the inverter is proportional to the delivery temperature/pressure value.

IO_configuration:
Set one relay as inverter free and set one analog Input to drive it.

DOCxx = 103 " Inverter free circuit 1 ", where DOCxx is one of the relay output.
AOC1 = 8 "Output inverter condenser free Circuit 1"
AICxx = 3 "NTC Temperature probe Condenser Circuit1" is the reference probe



The analog ouput is managed in proportional mode according to the temperature between the SETF1 and the SETF1 + AO1_17.
Below the SETF1 the output is OFF, above the SETF1 + AO1_17the analog output works at AO1_13..

If the delivery temperature/pressure is higher than the SETF1+ (AO1_17*AO1_4)/100 value, the relay set as inverter is ON; if the delivery temperature/pressure is lower than the SETF1 value the relay is OFF.

17.4.1 Use of fans thermal protection

With this configuration it is possible to use Ipro digital Inputs to monitor the fans functioning.
It is necessary to set as much relay as used fans. Connect the thermal protection of every fans to its digital Input of the relay set as fan.
DON'T USE relays set as fans.

IO_configuration: 5 fans, driven by one inverter, and 5 digital inputs for fan thermal protection.

DOC1 = 103 " Inverter free circuit 1 "
DOC2 = 67 " Fan 1 Circuit 1"
DOC3 = 68 " Fan 2 Circuit 1"
DOC4 = 69 " Fan 3 Circuit 1"
DOC5 = 70 " Fan 4 Circuit 1"

DIC1 = 121 Safety Inverter condenser Circuit 1
DIC2 = 73 "Fan safety1 – Circuit 1"
DIC3 = 74 "Fan safety2 – Circuit 1"
DIC4 = 75 "Fan safety3 – Circuit 1"
DIC5 = 76 "Fan safety4 – Circuit 1"

18. HOT GAS INJECTION VALVE MANAGEMENT

The hot gas valve for circuit 1 (DOCxx = 105 “Hot gas injection valve circuit 1”) can be activated, by:

- **SH control** (see next paragraph);
- **Suction temperature control**, if it is enabled (ASH17 = YES), as described in the next paragraph.

The hot gas valve for circuit 2 (DOCxx = 106 “Hot gas injection valve circuit 2”) can be activated, by:

- **SH control** (see next paragraph);
- **Suction temperature control**, if it is enabled (ASH20 = YES), as described in the next paragraph.

NOTE:
As there are 2 ways to active the hot gas injection valve:
If one of above way needs to turn on the hot gas injection valve, the other way does not need to turn on the hot gas injection valve, the valve will be turned on.
The valve can be turned off only in the condition that both of the above 2 ways need to turn off the valve.

18.1 Activation to increase superheat with low superheat conditions

The SH of the circuit 1 (circuit 2) is calculated ONLY if at least one compressor of the circuit 1 (circuit 2) is running, since a minute

18.1.1 PARAMETERS INVOLVED

LABEL	MEANING	RANGE
ASH7	Superheat value 1 at which to enable valve 1 for injecting hot gas (hot action)	0.1 to 15.0°C/ 1 to 30°F
ASH8	Differential for ASH7	0.1 to 15.0°C/ 1 to 30°
ASH14	Superheat value 2 at which to enable valve 2 for injecting hot gas (hot action)	0.1 to 15.0°C/ 1 to 30°F
ASH15	Differential for ASH14	0.1 to 15.0°C/ 1 to 30°F

18.1.2 Configuration

IO_configuration circuit 1:

1) relay as injection valve:
DOCxx = 105 “Hot gas injection valve circuit 1”

2) auxiliary probe for calculating superheat:
Alxx = 17 “NTC AUX Temperature probe suction circ.1”

IO_configuration circuit 2:

1) relay as injection valve:
DOCxx = 106 “Hot gas injection valve circuit 2”

2) auxiliary probe for calculating superheat:
Alxx = 18 “NTC AUX Temperature probe suction circ.2”

18.1.3 Adjustment

Circuit 1
The relay configured as Valv1 works as a thermostat with inverse action (hot), using the superheat value as the control variable.
SH1 = (“NTC AUX Temperature probe suction circ.1”) – (“Probe Suction Circuit1”)

Note: "Probe Suction Circuit1" can be AICxx = 1 or 19 or 37 (in this case it has to be converted in temperature) or 41 (in this case it has to be converted in temperature)

if SH1 ≤ ASH7 – ASH8 → relay configured as DOC 105 on
if SH1≥ ASH7 → relay configured as DOC 105 off
if ASH7 – ASH8 < SH1 < ASH7 → maintains the previous status (it the relay was on, it stays in on; if it was in off, it stays in off).

Circuit 2
The relay configured as Valv2 works as a thermostat with inverse action (hot), using the superheat value as the control variable.
SH12= ("NTC AUX Temperature probe suction circ.2") – ("Probe Suction Circuit2")

Note: "Probe Suction Circuit2" can be AICxx = 2 or 20 or 38 (in this case it has to be converted in temperature) or 42 (in this case it has to be converted in temperature)

if SH2 ≤ ASH14 – ASH15 → relay configured as DOC 106 on
if SH2≥ ASH14 → relay configured as DOC 106 off
if ASH14 – ASH15 < SH2 < ASH14 → maintains the previous status (it the relay was on, it stays in on; if it was in off, it stays in off).

18.1.4 Special cases

a. If no aux probe is configured for calculating the SH1 (SH2) and a relay is set as DOCxx = 105 (106), this relay will never be enabled.
b. If the AUX probe configured for calculating the SH1 (SH2) is in error mode, the probe alarm is generated and the relay set as DOCxx = 105 (106) is not enabled.

18.2 Activation to increase suction temperature when it is too low

18.2.1 PARAMETERS INVOLVED

LABEL	MEANING	RANGE
ASH17	Hot gas valve circuit 1 activated also by temperature control	(no, yes)
ASH18	Suction 1 temperature value at which the hot gas valve is enabled (hot action)	(-50÷110°C/ -58 to 230°F)
ASH19	Differential for ASH18	(0.1 to 15.0°C/ 1 to 30°F)
ASH20	Hot gas valve circuit 2 activated also by temperature control	(no, yes)
ASH21	Suction 2 temperature value, at which the hot gas valve is enabled (hot action)	(-50÷110°C/ -58 to 230°F)
ASH22	Differential for ASH21	(0.1 to 15.0°C/ 1 to 30°F)

18.2.2 Configuration

IO_configuration circuit 1:

1) relay as hot gas injection valve:
DOCxx = 105 "Hot gas injection valve circuit 1"

2) The temperature control is enabled (ASH17=YES)

3) At least one tempearature probe, among the following, is set as auxiliary probe, mounted on the suction line:
AIxx = 17 "NTC AUX Temperature probe suction circ.1" or
AIxx = 45 "NTC Suction Temperature Compressor 1 Circuit 1" or

…
AIxx = 56 "NTC Suction Temperature Compressor 12 Circuit 1"

IO_configuration circuit 2:

1) relay as hot gas injection valve:
DOCxx = 106 "Hot gas injection valve circuit 2"

2) The temperature control is enabled (ASH20=YES)

3) At least one tempearature probe, among the following, is set as auxiliary probe, mounted on the suction line:

AIxx = 18 "NTC AUX Temperature probe suction circ. 2" or
AIxx = 57 "NTC Suction Temperature Compressor 1 Circuit 2" or
…
AIxx = 68 "NTC Suction Temperature Compressor 12 Circuit 2"

18.2.3 Adjustment

Circuit 1
The relay configured as hot gas injection valve circuit 1 (DOCxx = 105) works as a thermostat with inverse action (hot), using the temperature values coming from the probe sets as AIxx = 17, 45, 46, …, 56, respecting the following conditions:

If at least **one of the probes** set as **AIxx = 17, 45, 46, …, 56** ≤ ASH18 – ASH19 → relay configured as DOC 105 on
If **ALL the probes AIxx = 17, 45, 46, …, 56** ≥ ASH18 → relay configured as DOC 105 off
Else →
maintains the status.

Circuit 2
The relay configured as hot gas injection valve circuit 2 (DOCxx = 106) works as a thermostat with inverse action (hot), using the temperature values coming from the probe sets as AIxx = 18, 57, 58, …, 68, respecting the following conditions:

If at least **one of the probes** set as **AIxx = 18, 57, 58, …, 68** ≤ ASH21 – ASH22 → relay configured as DOC 106 on
If **ALL the probes AIxx = 18, 57, 58, …, 68** ≥ ASH21 → relay configured as DOC 106 off
Else →
maintains the status.

18.2.4 Particular cases

a. If no probes are configured as AIxx = 17, 45, 46, …, 56 (AIxx =18, 57, 58, …, 68) to detect the suction temperature and a relay is set as "Hot gas injection valve circuit 1" ("Hot gas injection valve circuit 2"), the "Hot gas injection valve circuit 1" ("Hot gas injection valve circuit 2") relay will never be enabled.
b. If all the probes configured as AIxx = 17, 45, 46, …, 56 (AIxx =18, 57, 58, …, 68) are in error mode, the probe alarm is generated and the "Hot gas injection valve circuit 1" ("Hot gas injection valve circuit 2") relay is not enabled.

19. LIQUID INJECTION VALVE MANAGEMENT

The liquid injection valve DOCxx = 123 "Liquid injection valve circuit 1" (DOCxx = 124 "Liquid injection valve circuit 2") can be activated in the following cases:

- To decrease SH, when it's too high,
- To decrease suction temperature.
- To decrease compressor discharge temperature

NOTE:
As there are 3 ways to active the liquid injection valve:
If one of above way needs to turn on the liquid injection valve, and the other ways do not need to turn on the liquid injection valve, the valve will be turned on,
The valve will be turned off only in condition that all of the 3 ways need to turn off the valve.

19.1 Activation to decrease superheat with high superheat conditions

Preliminary consideration:
The 2 below conditions have to be satisfied before starting the SH check and control

a. The SH of the circuit 1 (circuit 2) is calculated ONLY if at least one compressor of the circuit 1 (circuit 2) is running,
b. The SH control starts 1 minute after the start of the first compressor of the circuit 1 (circuit 2).

19.1.1 PARAMETERS INVOLVED

LABEL	MEANING	RANGE
ASH23	Liquid injection valve circuit 1 activated also by SH control	no, yes
ASH24	High Superheat value of circuit 1 to enable liquid injection (cooling action)	1 to 100°C/ 1 to 180°F
ASH25	Differential for ASH23	0.1 to 15.0°C/ 1 to 30°F
ASH26	Liquid injection valve circuit 2 activated also by SH	no, yes
ASH27	High Superheat value of circuit 2 to enable liquid injection (cooling action)	1 to 100°C/ 1 to 180°F
ASH28	Differential for ASH25	0.1 to 15.0°C/ 1 to 30°F

19.1.2 Configuration

IO_configuration circuit 1:

1) digital output set as liquid injection valve:
DOCxx =123 "Liquid injection valve Circuit 1"

2) auxiliary probe for calculating superheat:
AIxx = 17 "NTC AUX Temperature probe suction circ.1"

IO_configuration circuit 2:

1) digital output set as liquid injection valve:
DOCxx =124 "Liquid injection valve Circuit 2"

2) auxiliary probe for calculating superheat:
AIxx = 18 "NTC AUX Temperature probe suction circ.2"

19.1.3 Adjustment

Circuit 1

The relay configured DOCxx =123 works as a thermostat, with cooling action, using the superheat value as the control variable.
SH1 = ("NTC AUX Temperature probe suction circ.1") – ("Probe Suction Circuit1")

Note: "Probe Suction Circuit1" can be AICxx = 1 or 19 or 37 (in this case it has to be converted in temperature) or 41 (in this case it has to be converted in temperature)

if SH1≥ ASH24 + ASH25 → relay configured as DOC 123 on
if SH1 ≤ ASH24 → relay configured as DOC 123 off
if ASH24 < SH1 < ASH24+ASH25 → maintains the previous status (it the relay was on, it stays in on; if it was in off, it stays in off)

Circuit 1
The relay configured DOCxx =124 works as a thermostat, with cooling action, using the superheat value as the control variable.
SH2 = ("NTC AUX Temperature probe suction circ.2") – ("Probe Suction Circuit2")

Note: "Probe Suction Circuit2" can be AICxx = 2 or 20 or 38 (in this case it has to be converted in temperature) or 42 (in this case it has to be converted in temperature)

if SH2≥ ASH27 + ASH28 → relay configured as DOC 124 on
if SH2 ≤ ASH27 → relay configured as DOC 124 off
if ASH27 < SH2 < ASH27+ASH28 → maintains the previous status (it the relay was on, it stays in on; if it was in off, it stays in off)

19.1.4 Particular cases

a. If no aux probe is configured for calculating the SH1 (SH2) and a relay is set as DOCxx=123 "Liquid injection valve Circuit 1" (DOCxx=124 "Liquid injection valve Circuit 2"), the valve relay will never be enabled.
b. If the AUX probe configured for calculating the SH1 (SH2) is in error mode, the probe alarm is generated and the relay DOCxx=123 (DOCxx=124) is not enabled.

19.2 Activation to decrease suction temperature when it is too high

Preliminary consideration:
The 2 below conditions have to be satisfied before starting the SH check and control

a. The temperature of the circuit 1 (circuit 2) is monitored ONLY if at least one compressor of the circuit 1 (circuit 2) is running,
b. The temperature control starts after ASH30 minuts after the start of the first compressor of the circuit 1 (circuit 2).

19.2.1 PARAMETERS INVOLVED

LABEL	MEANING	RANGE
ASH29	Liquid injection valve, circuit 1, activated also by temperature control	no, yes
ASH30	Delay after compressor start, before initiatingthe suction temperature control: This delay is used both for circuit 1 and circuit 2	0÷15min

ASH31	Suction 1 temperature value at which the liquid injection valve is enabled (cooling action)	-50÷110°C/ -58 to 230°F
ASH32	Differential for ASH31	0.1 to 15.0°C/ 1 to 30°F
ASH33	Liquid injection valve, circuit 2, activated also by temperature control no, yes	no, yes
ASH34	Suction 2 temperature value at which the liquid injection valve is enabled (cooling action)	-50÷110°C/ -58 to 230°F
ASH35	Differential for ASH34	0.1 to 15.0°C/ 1 to 30°F

19.2.2 Configuration

IO_configuration circuit 1:

1) relay set as liquid injection valve:
DOCxx = 123 "Liquid injection valve circuit 1"

2) The temperature control is enabled (ASH29=YES)

3) At least one tempearature probe, among the following, is set as auxiliary probe, mounted on the suction line :
AIxx = 17 "NTC AUX Temperature probe suction circ.1" or
AIxx = 45 "NTC Suction Temperature Compressor 1 Circuit 1" or
…
AIxx = 56 "NTC Suction Temperature Compressor 12 Circuit 1"

IO_configuration circuit 2:

1) relay set as liquid injection valve:
DOCxx = 124 "Liquid injection valve circuit 2"

2) The temperature control is enabled (ASH33=YES)

3) At least one tempearature probe, among the following, is set as auxiliary probe, mounted on the suction line :
AIxx = 18 "NTC AUX Temperature probe suction circ. 2" or
AIxx = 57 "NTC Suction Temperature Compressor 1 Circuit 2" or
…
AIxx = 68 "NTC Suction Temperature Compressor 12 Circuit 2"

19.2.3 Adjustment

Circuit 1
The relay configured as DOCxx = 123 "Liquid injection valve circuit 1" works as a thermostat with direct action (cooling), using the temperature values coming from the probe sets as AIxx = 17, 45, 46, …, 56, respecting the following conditions:

If at least **one of the probes** set as **AIxx = 17, 45, 46, …, 56** ≥ ASH31 + ASH32 →
relay configured as DOC 123 on
If **ALL the probes AIxx = 17, 45, 46, …, 56** ≤ ASH31 →
relay configured as DOC 123 off

Else →
maintains the status.

Circuit 2
The relay configured as DOCxx = 124 "Liquid injection valve circuit 2" works as a thermostat with direct action (cooling), using the temperature values coming from the probe sets as AIxx = 18, 57, 58, …, 68, respecting the following conditions:

If at least **one of the probes** set as **AIxx = 18, 57, 58, …, 68** ≥ ASH34 + ASH35 →
relay configured as DOC 124 on
If **ALL the probes AIxx = 18, 57, 58, …, 68** ≤ ASH34 →
relay configured as DOC 124 off
Else →
maintains the status.

19.2.4 Special cases

a. If no probes are configured as AIxx = 17, 45, 46, …, 56 (AIxx = 18, 57, 58, …, 68) to detect the suction temperature and a relay is set as "Liquid injection valve circuit 1" ("Liquid injection valve circuit 2"), the "Liquid injection valve circuit 1" ("Liquid injection valve circuit 2") relay will never be enabled.
b. If all the probes configured as AIxx = 17, 45, 46, …, 56 (AIxx = 18, 57, 58, …, 68) are in error mode, the probe alarm is generated and the "Liquid injection valve circuit 1" ("Liquid injection valve circuit 2") relay is not enabled.

19.3 Activation to decrease discharge temperature when it is too high

Preliminary consideration:
The 2 below conditions have to be satisfied before starting the temperature check and control
c. The temperature of a circuit is monitored ONLY if at least one compressor of the circuit itself is running,
d. The temperature control starts after 1 minute after the start of the first compressor of the circuit.

19.3.1 PARAMETERS INVOLVED

LABEL	MEANING	RANGE
DSC1	Circuit 1, Liquid injection valve activated also by discharge temperature	no, yes
DSC2	Circuit 1, discharge temperature threshold to activate the liquid injection valve	0 to 150°C; 32 to 302°F
DSC3	Circuit 1, Differential for DSC2 and DSC4	0.1 to 15.0°C/ 1 to 30°F
DSC4	Circuit 1, High discharge temperature alarm, circuit 1	0 to 150°C; 32 to 302°F
DSC5	Circuit 1, High discharge temperature alarm delay	0 to 60min
DSC6	Circuit 1, Delay before stopping compressors, with High discharge temperature alarm:	0 to 255min
DSC7	Circuit 1, Interval between 2 compressors turning off in case of high discharge temperature alarm:	0 to 255s

DSC8	Circuit 2, Liquid injection valve activated also discharge temperature	no, yes
DSC9	Circuit 2, discharge temperature threshold to activate the liquid injection valve	0 to 150°C; 32 to 302°F
DSC10	Circuit 2, Differential for DSC9	0.1 to 15.0°C/ 1 to 30°F
DSC11	Circuit 2, High discharge temperature alarm	0 to 150°C; 32 to 302°F
DSC12	Circuit 2, High discharge temperature alarm delay	0 to 60min
DSC13	Circuit 2, Delay before stopping compressors, with high discharge temperature alarm	0 to 255min
DSC14	Circuit 2, Interval between 2 compressors turning off in case of high discharge temperature alarm	0 to 255s

19.3.2 Configuration

IO_configuration circuit 1:

1) relay set as liquid injection valve:
DOCxx = 123 "Liquid injection valve circuit 1"

2) The temperature control is enabled (DSC1=YES)

3) At least one tempearature probe, among the following ones, is set as discharge temperature probe, mounted on the discharge line:
AIxx = 156 "NTC Discharge Temperature line Circuit 1"
AIxx = 158 "PTC Discharge Temperature line Circuit 1"
AIxx = 69 "PTC Discharge Temperature Compressor 1 Circuit 1" or
AIxx = 70 "PTC Discharge Temperature Compressor 2 Circuit 1" or
…
AIxx = 80 "PTC Discharge Temperature Compressor 12 Circuit 1"

IO_configuration circuit 2:

1) relay set as liquid injection valve:
DOCxx = 124 "Liquid injection valve circuit 2"

2) The temperature control is enabled (DSC8=YES)

3) At least one tempearature probe, among the following ones, is set as discharge temperature probe, mounted on the discharge line:
AIxx = 157 "NTC Discharge Temperature line Circuit 2"
AIxx = 159 "PTC Discharge Temperature line Circuit 2"
AIxx = 81 "PTC Discharge Temperature Compressor 1 Circuit 2" or
AIxx = 82 "PTC Discharge Temperature Compressor 2 Circuit 2" or
…
AIxx = 92 "PTC Discharge Temperature Compressor 12 Circuit 2"

19.3.3 Adjustment

Circuit 1

The relay configured as liquid injection valve, (DOCxx = 123) works as a thermostat with direct action (cooling), using of the temperature values coming from the probe sets as AIxx = 156, 158, 69, 70, …, 80, respecting the following conditions:

If at least **one of the probes** set as **AIxx = 156, 158, 69, 70, …, 80** ≥ DSC2 + DSC3 →
relay configured as DOC 123 on
If **ALL the probes AIxx = 156, 158, 69, 70, …, 80** ≤ DSC2 →
relay configured as DOC 123 off
Else →
maintains the status.

Circuit 2
The relay configured as liquid injection valve, (DOCxx = 124) works as a thermostat with direct action (cooling), using of the temperature values coming from the probe sets as AIxx = 157, 159, 81, 82, …, 92, respecting the following conditions:

If at least **one of the probes** set as **AIxx = 157, 159, 81, 82, …, 92** ≥ DSC9 + DSC10 →
relay configured as DOC 124 on
If **ALL the probes AIxx = 157, 159, 81, 82, …, 92** ≤ DSC9 →
relay configured as DOC 124 off
Else →
maintains the status.

19.3.4 Special cases

a. If no probes are configured as AIxx = 156, 158, 69,70, …, 80 (AIxx = 157, 159, 81, 82, …, 92) to detect the discharge temperature and a relay is set as "Liquid injection valve circuit 1" ("Liquid injection valve circuit 2"), the "Liquid injection valve circuit 1" ("Liquid injection valve circuit 2") relay will never be enabled.
b. If all the probes configured as AIxx = 156, 158, 69,70, …, 80 (AIxx = 157, 159, 81, 82, …, 92) are in error mode, the probe alarm is generated and the "Liquid injection valve circuit 1" ("Liquid injection valve circuit 2") relay is not enabled.

20. Low Temperature/pressure value to turn off the compressors (electronic low pressure switch).

The AL21 and AL23 parameters determine the low pressure/temperature thresholds for the compressor set of circuit 1 and 2 respectively, for when the pressure/temperature is too low (electronic pressure switch).
If the suction pressure of circuit 1 or 2 falls below the value, the low pressure alarm is generated and the compressors can be turned off.

20.1.1 Functionality

The compressors of circuit 1 or 2 are stopped when the set threshold is reached (as if the minimum pressure switch were activated).
The low pressure alarm is generated and the alarm relay set in parameter AL9 is activated.

21. High pressure alarm in gas cooler

This alarm works in parallel with pressure alarm for fan given by the parameter AL25.
If the condenser 1 pressure probe reaches the value GC19 and AL27 = YES, the compressors of the circuit 1 and Circuit 2 are switched off every AL28 sec, while the fans are running at maximum speed.
When all the compressors of Circ. 1 are off, also the compressors of Circuit 2 are switched off every AL28 sec.

Alarms recovers when the pressure go below GC19 -5bar (72.5PSI).

22. OFF FUNCTION

22.1 RELATION BETWEEN DIGITAL INPUT AND KEYBOARD

About On/Off function, please refer to the sequence on the next table:
The status of DI will affect the ON/Off function, when it is configured as below:

107o ON/OFF Circuit 1
107c ON/OFF Circuit 1
108o ON/OFF Circuit 2
108c ON/OFF Circuit 2

From Visograph, user can also switch the controller on/off by keyboard; it will combine with DI status if configured to control On/Off function.

IPRO-STATUS	DI change status	BUTTON	NEXT IPROSTATUS
OFF	Off	OFF	**OFF**
OFF	OFF→ON	OFF	**ON,** **and also the status of the button is forced to on**
OFF	OFF	OFF → ON	**ON** **TO be switched off again by digital input, the following cycle has to be done:** **DI: off→on→off**
ON	Off → on	ON	**ON**
On	On → off	On	**Off,** **and also the status of the button is forced to off**
On	On	On → off	**Off** **To be switched on again by digital input, the following cycle has to be done:** **DI: on→off→on**

In case of power failure, the iProRack has to resume the status before the power failure.
In OFF status, all the loads are switched OFF without waiting any delay and all the analog outputs are zero. Also the iProRack does not manage any alarm.

22.2 OFF FUNCTION AND GAS COOLER VALVES

If one of the circuit is in “off mode” the HPV and BGV valves have to be closed

23. ENERGY SAVING FUNCTION

23.1 RELATION BETWEEN DIGITAL INPUT AND KEYBOARD

About Energy saving function, please refer to the sequence on the next table:
The status of DI will affect the ON/Off function, when it is configured as below:

105o Energy saving Circuit 1
105c Energy saving Circuit 1
106o Energy saving Circuit 2
106c Energy saving Circuit 2

From Visograph, user can also enable/disable ES function by keyboard.
It will combine with DI status if DIs are configured as ES function.

IPRO-STATUS	DI change status	BUTTON	NEXT IPROSTATUS
OFF	**Off**	**OFF**	**OFF**

OFF	**OFF→ON**	**OFF**	**ON, "ES" status on Viso is forced to "ON" and "SET" is blinking.**
OFF	**OFF**	**OFF → ON**	**ON TO be switched off again by digital input, the following cycle has to be done: DI: off→on→off After this operation, "ES" status on Viso is forced to "OFF" and "SET" stop blinking.**
ON	**OFF → ON**	**ON**	**ON**
ON	**ON → OFF**	**ON**	**OFF, "ES" status on Viso is forced to "OFF" and "SET" stop blinking.**
ON	**ON**	**ON → OFF**	**OFF To be switched on again by digital input, the following cycle has to be done: DI: on→off→on after this operation, "ES" status on Viso is forced to "ON" and "SET" is blinking.**

24. AUXILIARY RELAYS ACTIVATED BY DIGITAL INPUTS

The relays set as AUX1 … AUX8 can be activated by digital input set as AUX1 … AUX8.

24.1 Parameters involved

Label	Description	Range
DIC1 …DIC43	Digital input 1 …43 configuration	1o÷144c

24.2 Activation

There are 3 ways to activate the relays set as AUX1… AUX8:

1. By digital input set as 142o ….149c
2. By serial command
3. By thermostat probe set as AUX Probe.

NOTE: follows the number 1..3 for the priority.

24.3 Action

When the digital input set for activate an AUX output is on, the corresponding output is activated.

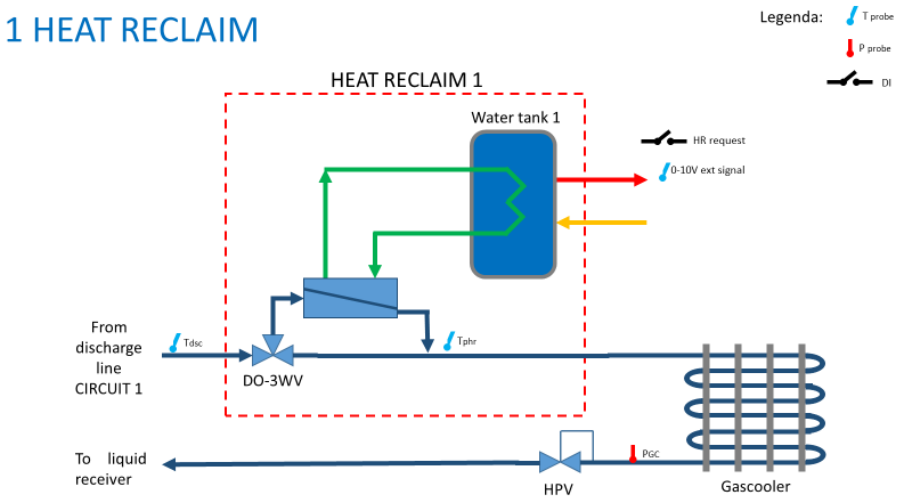
25. HEAT RECLAIM FOR TRANSCRITICAL CO2 RACK

Controller manages up to 2 heatreclaims for tap water and building heaters.
The system is flexible, see below different possibilities.

25.1 SINGLE HEAT RECLAIM WITHOUT PUMP

25.1.1 Case 1: single heat reclaim with external signal 0-10V or 4-20mA

MAIN PARAMETERS:
HTRC0 = 0; Type of input signal for heat reclaim_1: Voltage

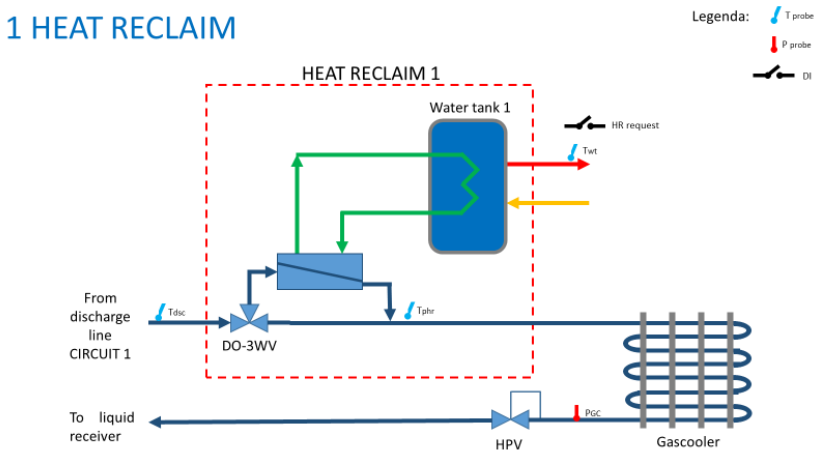


Resouces

LABEL	RESOURCE	VALUE	DESCRIPTION	MANDATORY
HR request	DICxx	97	Heat reclaim Circuit 1	YES
	AICxx	171 or 172	0-10V or 4-20mA H-R signal	YES
Tdsc	AICxx	158	PTC Discharge line circuit 1	YES
Tphr	AICxx	166	NTC CO2 Temperature post heat reclaim	NO
Pgc	AICxx	169 or 170	Gas Cooler pressure	YES
Tgc	AICxx	154 or 155	Gas Cooler outlet temperature	YES
DO-3WV	DOCxx	125	3 way valve HR1	YES

25.1.1 CASE 2: single heat reclaim with water tank temperature

MAIN PARAMETERS:
HTRC0 = 1
HTRC36 = 0



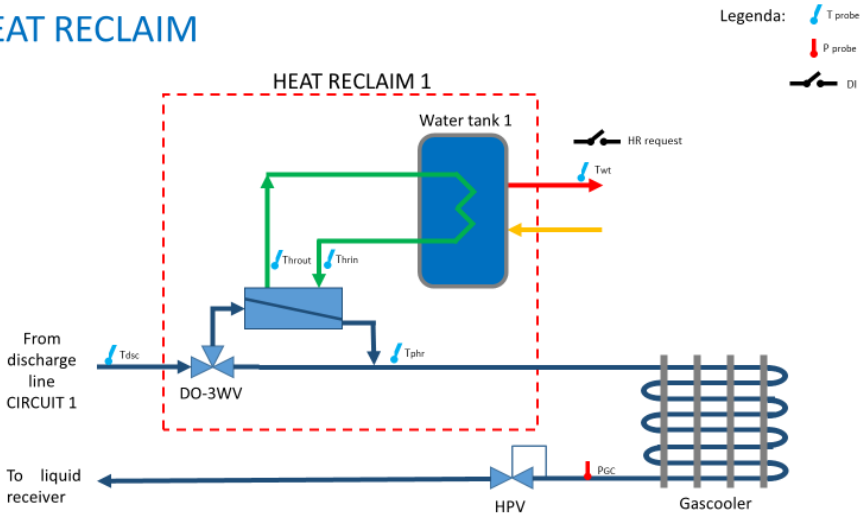
Resouces

Label	Resource	Value	Description	Presence
HR request	DICxx	97	Heat reclaim Circuit 1	OPTION
	AICxx	171 or 172	0-10V or 4-20mA H-R signal	NO
Twt	AICxx	164	NTC H-R tank water temperature	YES
Tdsc	AICxx	158	PTC Discharge line circuit 1	YES
Tphr	AICxx	166	NTC CO2 Temperature post heat reclaim	OPTION
Pgc	AICxx	169 or 170	Gas Cooler pressure	YES
Tgc	AICxx	154 or 155	Gas Cooler outlet temperature	YES
DO-3WV	DOCxx	125	3 way valve HR1	YES

25.1.2 Case 3: single heat reclaim with differntial regulation

MAIN PARAMETERS:
HTRC0 = 1
HTRC36 = 1

1 HEAT RECLAIM



Resources

Label	Resource	Value	Description	Presence
HR request	DICxx	97	Heat reclaim Circuit 1	OPTION
	AICxx	171 or 172	0-10V or 4-20mA H-R signal	NO
Twt	AICxx	164	NTC H-R tank water temperature	YES
Thrin	AICxx	162	NTC H-R secondary fluid inlet temperature	YES
Throut	AICxx	160	NTC H-R secondary fluid outlet temperature	YES
Tdsc	AICxx	158	PTC Discharge line circuit 1	YES
Tphr	AICxx	166	NTC CO2 Temperature post heat reclaim	OPTION
Pgc	AICxx	169 or 170	Gas Cooler pressure	YES
Tgc	AICxx	154 or 155	Gas Cooler outlet temperature	YES
DO3WV	DOCxx	125	3 way valve HR1	YES

25.2 Adjustment Heat reclaim 1 for Case 1, 2, 3

25.2.1 Enabling conditions

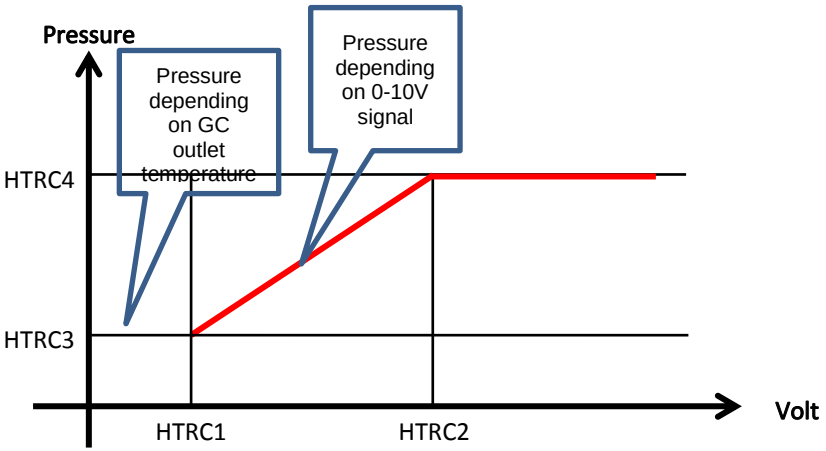
To enable the heat reclaim we need that all the 3 conditions are true, otherwise the standard regulation keeps on running.

a. The digital input is active or the water temperature is below the set point
b. The external voltage signal is above the activation threshold
c. At least least 1 compressor of Circuit 1 is running,

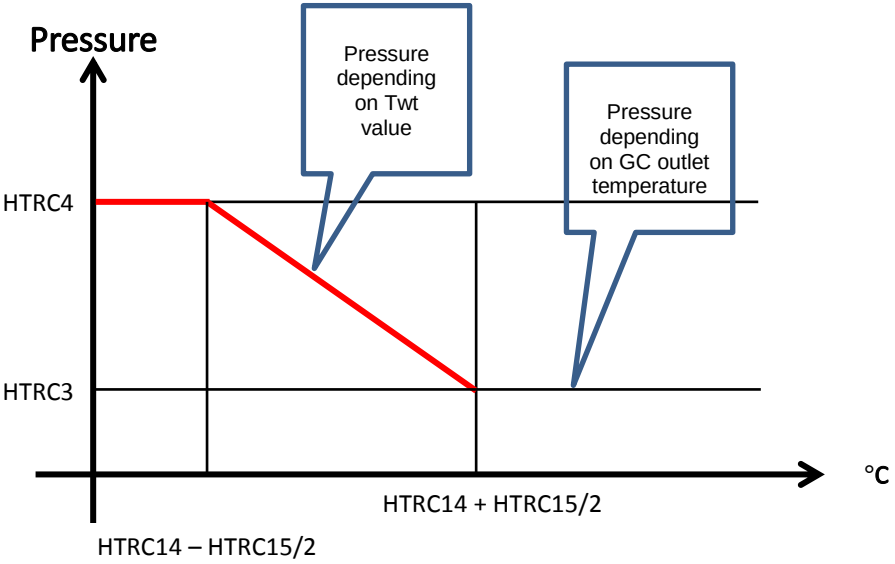
25.2.2 Gas cooler pressure modulation

With the heat reclaim enabled the pressure on the gascooler depends on the external signal ot water tank temperature according to the following diagrams:

25.2.3 *Case 1: single heat reclaim with external signal 0-10V or 4-20mA*

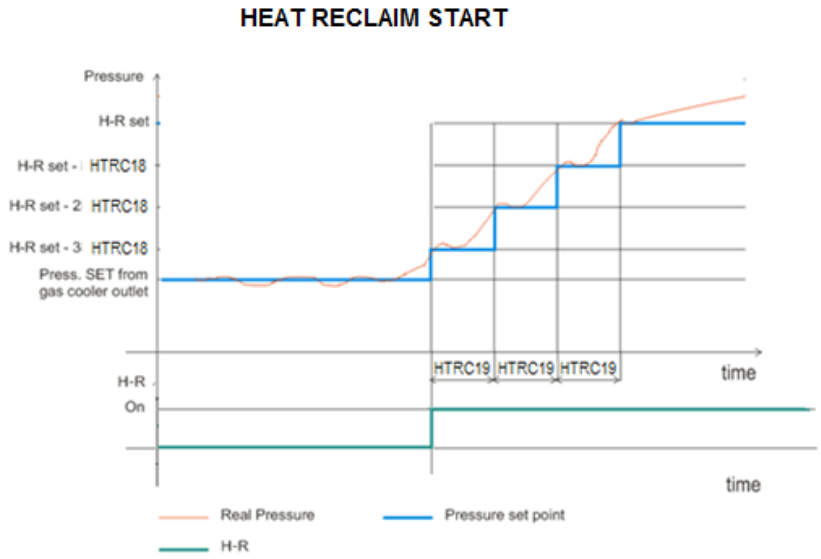


25.2.4 *Case 2 and Case 3:*



25.2.5 *From standard regulation to heat reclaim*

The controller doesn't move the pressure from gas cooler pressure set point to the value resquested by the HR regulation immediately, but it's possible to increse the pressure from the current values of HTRC18 bar every HTRC19 min as shown in the below graph



25.2.6 *Safety conditions*

25.2.6.1 Discharge temperature control

To assure a good HR operation mode the discharge temperature has to be higher than the minimimum temperature set in the parameter HTRC7.
If the temperature detected by discharge AICxx = 157 remains below HRTC7 thereshold for the HRT9 time the HR is witched off and normal regulation restarts.
If enabling conditions are met, it can restart after HTRC13 timer

25.2.6.2 Post heat reclaim temperature control

To assure a good HR operation mode the post heat reclaim temperature has to be higher than the minimimum temperature set in the parameter HTRC10.
Once this condition is not satisfied for the HRT12 time, the HR is witched off and normal regulation restarts. If enabling conditions are met, it can restart after HTRC13 timer

25.2.7 *From heat reclaim to standard regulation*

When the Heat Reclaim is disabled controller moves from HR to standard regulation.
The HR recover function is used.
In this case, the pressure set point is decreased of HTRC5 every HTRC6 mins till the pressure set point value, requested by the regulation is matched.

HEAT RECLAIM RECOVER

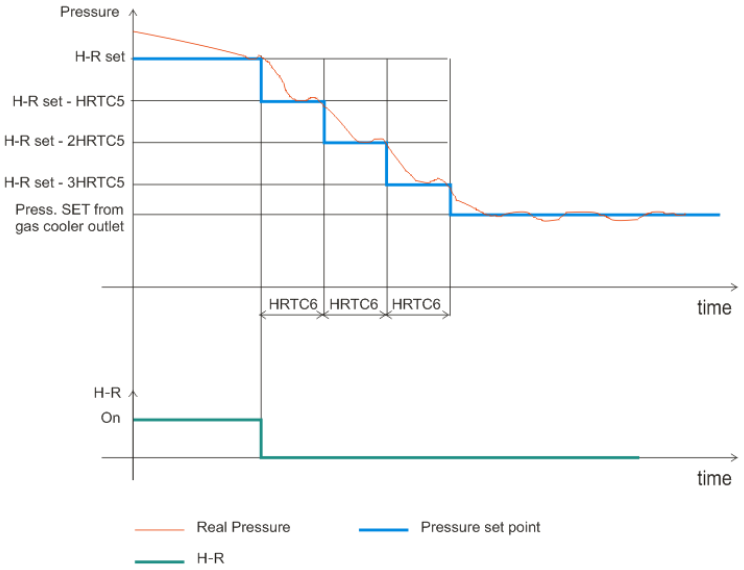
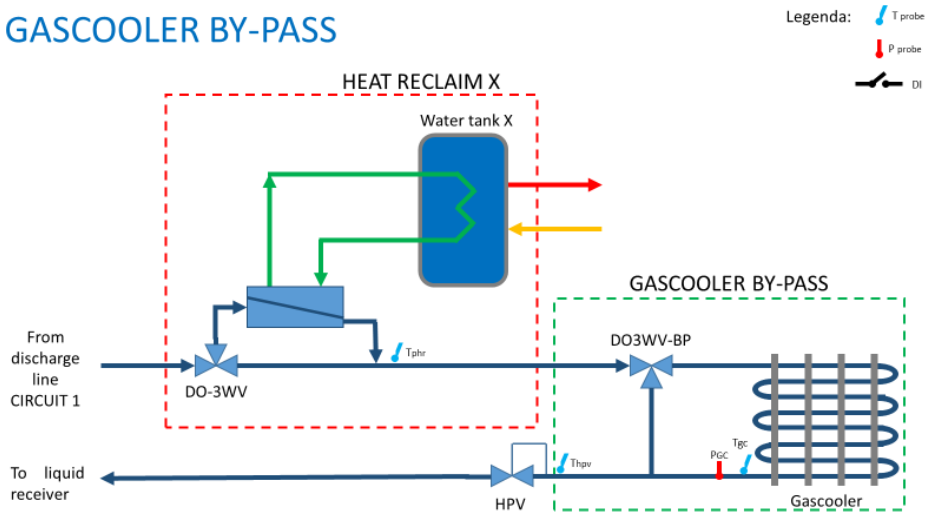


Fig. 1,

25.3 Single heat reclaim with gas cooler by-pass

25.3.1 Schema and resources



Resources

Tgc	AICxx	154 (or 155)	NTC (or NTC CPC) Gas cooler outlet temperature	**YES**
Thpv	AICxx	167 (or 168)	NTC (or NTC CPC) temperature before HPV	**YES**
Tphr	AICxx	166	NTC CO2 Temperature post heat reclaim	OPTION
DO3WV-BP	DOCxx	138	3way valve gas cooler by-pass relay	**YES**
Pgc	AICxx	169 or 170	Gas Cooler pressure	**YES**

25.3.1.1 By pass valve management

The gas cooler by-pass is enabled by parameter HTRC38, with HTRC38 = yes, the controller managed properly the fans to have them off, before activating the 3way valve relay to by-pass the gas cooler.

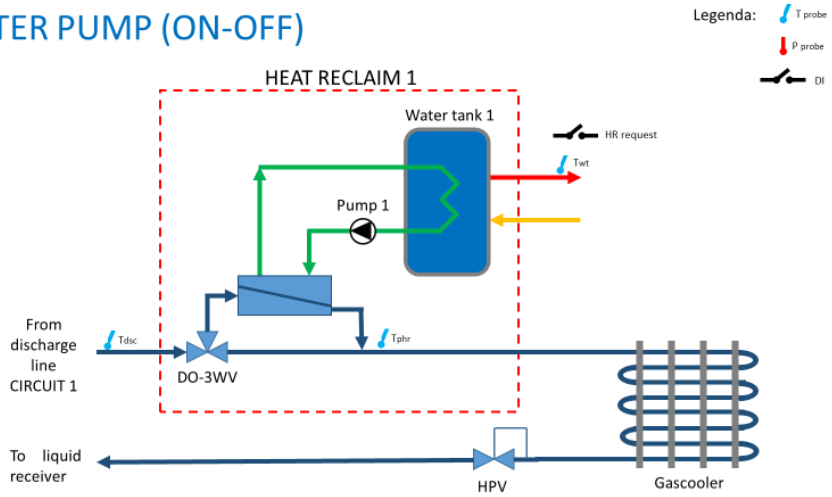
Once the controller has matched the condition to de-activate the fans, the 3WV-BP, by pass valve relay, is activated and the gas cooler outlet temperature reference moves from Tgc to Thpv probe
If it's necessary to restart the functionality of the gas cooler the 3WV-BP by pass valve relay is de-activated and the gas cooler outlet temperature reference probe dmove from Thpv to Tgc

25.4 Pump regulation – this is valid for both the HRs when the pump is present

25.4.1 On/off pump with regulation based on the water tank temperature

The pump is present only with HTRC0 = 1

WATER PUMP (ON-OFF)



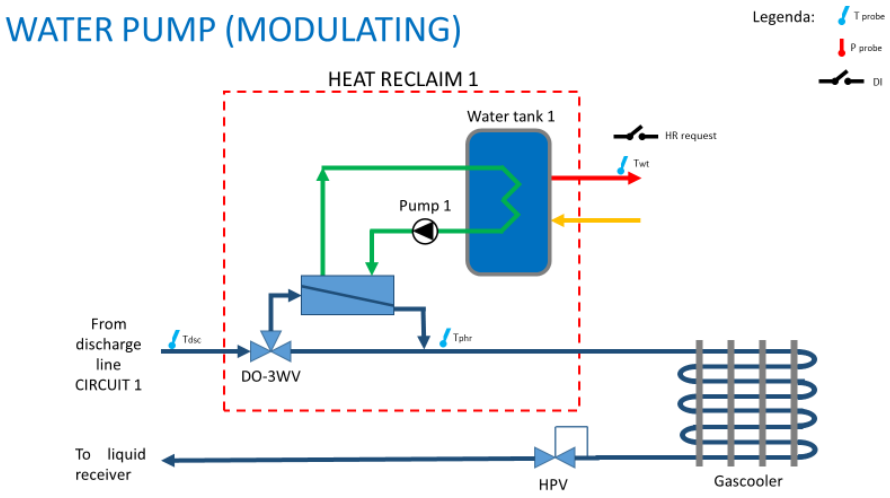
Label	Resource	Value	Description	Presence
HR request	DICxx	97	Heat reclaim Circuit 1	**OPTION**
	AICxx	171	0-10V H-R signal	**NO**
Twt	AICxx	164	NTC H-R tank water temperature	**YES**
Tdsc	AICxx	158	PTC Discharge line circuit 1	**YES**
DO3WV	DOCxx	125	3 way valve HR1	**YES**
DOpump1	DOCxx	126	H-R water pump1 output	**YES**
DIpfs	DICxx	171	H-R pump1 flow switch alarm	**YES**
DIpth	DICxx	172	H-R pump1 thermal protection alarm	**YES**

HR activation
The HR is activated if the HR digital input, if present, is enabled, and the temperature of the water is below the set point (Twt < HTRC14).
Controller switches on the pump and verifies the status of the flow switch.
In case the flow swtich signals an issue, the pump will be turned off and the Flow switch alarm is signalled. Manual reset is required to make the pump available again. See also Alarm table.

HR de-activation
The regulation remains on till or the HR digital input is disabled or water temperature is above the set plus half differential (Twt > HTRC14+ HTRC15/2),
When the HR is disabled, the 3 way valve relay (3WV) is switched off and after HTRC34 timer tne pump is switched off:

Safety conditions
The following safety conditions are taken in account when the HR is activated:
Tank water temperature: it must be below the max water temperature threshold HTRC41
Pump safeties (thermal and flow switches)
Compressor discharge temperature; it has to be higher than HTRC/ threshold.

25.4.2 *Modulating pump regulation, based on the temperature of the water at the tank outlet enabled with HTRC36 = 0*

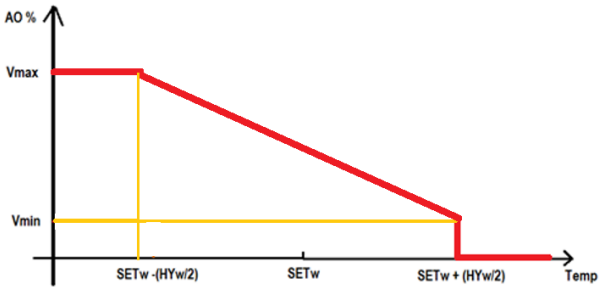


Resources

Label	Resource	Value	Description	Presence
HR request	DICxx	97	Heat reclaim Circuit 1	OPTION
	AICxx	171	0-10V H-R signal	NO
Twt	AICxx	164	NTC H-R tank water temperature	YES
Tdsc	AICxx	158	PTC Discharge line circuit 1	YES
Tphr	AICxx	166	NTC CO2 Temperature post heat reclaim	OPTION
Pgc	AICxx	169 or 170	Gas Cooler pressure	YES
DO3WV	DOCxx	125	3 way valve HR1	YES
DOpump	DOCxx	126	H-R water pump output	YES
0-10VPump	AOCxx	19	0-10V H-R water pump output	YES
DIpfs	DICxx	171	H-R pump flow switch	YES
DIpth	DICxx	172	H-R pump thermal protection	YES

HR activation
The HR is activated if the HR digital input, if present, is enabled, and the temperature of the water is below the set point (Twt < HTRC14).
Controller switches on the pump and verifies the status of the flow switch.
In case the flow swtich signals an issue, the pump will be turned off and the Flow switch alarm is signalled. Manual reset is required to make the pump available again. See also Alarm table.

HR regulation
When the HR is activated, the pump speed is modulated by Ao_pmp according to diagram below



Where:

Temp = Twt
SETw = HTRC14 for Heat Reclaim 1
HYw = HTRC15 for Heat Reclaim 1
Vmin = **HTRC26** for Heat Reclaim 1
Vmax = **HTRC27** for Heat Reclaim 1

Temp = Twt2
HTRC22 for Heat Reclaim 2
HTRC23 for Heat Reclaim 2
HTRC29 for Heat Reclaim 2
HTRC30 for Heat Reclaim 2

till or the HR digital input is disabled or water temperature is above the set plus half differential (Twt > HTRC14+ HTRC15/2),
When the HR is disabled, the 3 way valve relay (3WV) is switched off and after HTRC34 timer tne pump is switched off:

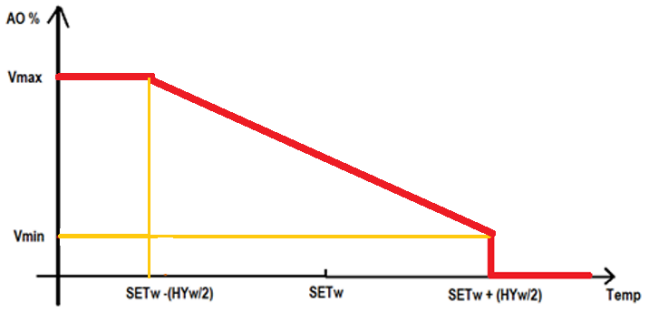
If

THEN:

4. Pump 1 is activated + AO_pmp at min speed
5. Flow switch status verification after delay timer (HTRC32)
6. If the flow alarm has not been activated

   THEN the relay 3WV is activated and the pump speed is modulated by Ao_pmp (proportional band see diagram below) with Max % variation/s HTRC31.
   OTHERWISE the pump is switched off.
   In this case, if the activation conditions 1. 2. 3. remains true, after 5mins the pump is switched on again and we restart from point 4,
   After 3 consecutive times that the flow switch alarm is activated, the pump will be turned off and the Flow switch alarm is signalled. Manual reset is required to make the pump available again. See also Alarm table

ANALOG OUTPUT BEHAVIOR (it's valid for HR1 and HR2)



Where:

Temp = Twt
SETw = HTRC14 for Heat Reclaim 1
HYw = HTRC15 for Heat Reclaim 1
Vmin = **HTRC26** for Heat Reclaim 1
Vmax = **HTRC27** for Heat Reclaim 1

Temp = Twt2
HTRC22 for Heat Reclaim 2
HTRC23 for Heat Reclaim 2
HTRC29 for Heat Reclaim 2
HTRC30 for Heat Reclaim 2

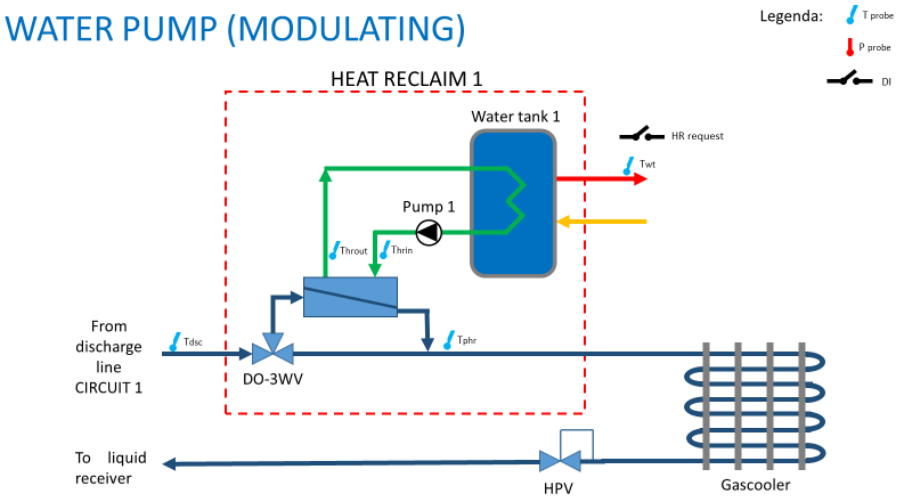
Regulation: de-activation conditions
The regulation remains on till one of the follwing conditions happen:

1. DI_hr is disabled
2. Twt > HTRC14+ HTRC15/2
3. Twt > = HTRC41-High temperature alarm of tank water
4. Pump 1 (DIpth) thermal switch alarrm is activated
5. Flow swtich DIpfs is disabled for more than (HTRC32/2)
6. Temp. TdSc < HTRC7 - enabling threshold for HR1 when HR2 is not running or not present for HTRC9 time-,
   or
   Tphr2 < HTRC20 - enabling threshold for HR1 when HR2 is running for HTRC21 time-.
   or
   AICxx = 166 < HTRC10 - enabling threshold for HR1 when HR2 is not running or not present for the time HTRC12.
   (AICxx = 185 < HRTC10 - enabling threshold for HR2 when HR1 is not running for time HTRC12.)
7. .All the compressor of the circuit 1 are switched off.

Regulation: de-activation actions

1. 3 way valve relay (3WV) relay is switched off
2. After HTRC34 pump relay (DOpump) is switched off if the points 4. And 5. are false
3. After HTRC34 Analog. Output (AO_pmp) is set to zero off if the points 4. And 5. are false
4. If point 4 or point5 alarm is active, the pump DO and AO will be stopped immediately without considering HTRC34.

25.4.3 *Modulating pump regulation, based on the temperature differential at outlet and inlet of heat exchanger enabled only when HTRC36 = 1*



Resources

Label	Resource	Value	Description	Presence
HR request	DICxx	97	Heat reclaim Circuit 1	OPTION
	AICxx	171	0-10V H-R signal	NO
Twt	AICxx	164	NTC H-R tank water temperature	YES
Tdsc	AICxx	158	PTC Discharge line circuit 1	YES
Tphr	AICxx	166	NTC CO2 Temperature post heat reclaim	OPTION
Pgc	AICxx	169 or 170	Gas Cooler pressure	YES
DO3WV	DOCxx	125	3 way valve HR1	YES
DOpump	DOCxx	126	H-R water pump output	YES
0-10VPump	AOCxx	19	0-10V H-R water pump output	YES
DIpfs	DICxx	171	H-R pump flow switch	YES
DIpth	DICxx	172	H-R pump thermal protection	YES
Thrin	AICxx	162	NTC H-R secondary fluid inlet temperature	YES
Throut	AICxx	160	NTC H-R secondary fluid outlet temperature	YES

Regulation: activation conditions

If 1. DI_hr (DICxx=97), is present and active

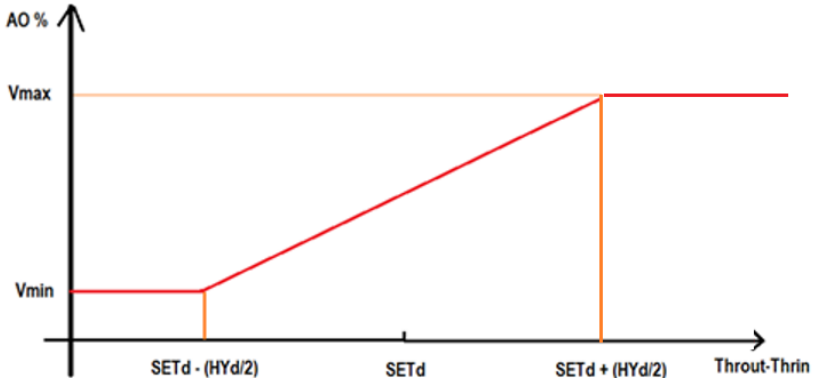
2. ANDTwt < HTRC14 ~~and Throut-Thrin >= HTRC16~~
3. HTRC13 is over
4. AND all the following conditions are true:
   a. Pump Thermal protection (DIpth) is not active
   b. Temp. TdSc > HTRC7 - enabling threshold for HR1 when HR2 is not running or not present -,
      or
      Tphr2 > HTRC20 - enabling threshold for HR1 when HR2 is running -.
   c. At least one compressor of circuit 1 is active
   d. AICxx = 166 ≥ HRTC10 (2) for HR1 when HR2 is not running or not present and AICxx = 185 ≥ HRTC10 (2) for HR2 when HR1 is not running

THEN:

7. Pump 1 is activated + AO_pmp at min speed
8. Flow switch status verification after delay timer (HTRC32)
9. If the flow alarm has not been activated

   THEN the relay 3WV is activated and the pump speed is modulated by Ao_pmp (proportional band see diagram below) with Max % variation/s HTRC31. Target is to maintain the differential temperature Throut-Thrin to the set SETd value HTRC16.
   OTHERWISE the pump is switched off, the relay 3WV keeps its status .
   In this case, if the activation conditions 1. 2. 3. remains true, after 5mins the pump is switched on again and we restart from point 4,
   After 3 consecutive times that the flow switch alarm is activated, the pump will be turned off and the Flow switch alarm is signalled. Manual reset is required to make the pump available again. See also Alarm table

ANALOG OUTPUT BEHAVIOR (it's valid for HR1 and HR2)



Where:
SETd = HTRC16 for Heat Reclaim 1
HYd = HTRC17 for Heat Reclaim 1
HTRC24 for Heat Reclaim 2
HTRC25 for Heat Reclaim 2

Vmin = **HTRC26** for Heat Reclaim 1
Vmax = **HTRC27** for Heat Reclaim 1
HTRC29 for Heat Reclaim 2
HTRC30 for Heat Reclaim 2

Regulation: de-activation conditions
The regulation remains on till one of the follwing conditions happen:

1. DI_hr is disabled
2. Twt > HTRC14+ HTRC15/2 ~~or Throut-Thrin < HTRC16-(HTRC17/2)~~
3. Twt > = HTRC41-High temperature alarm of tank water
4. Pump 1 (DIpth) thermal switch alarrm is activated
5. Flow swtich DIpfs is ~~disabled~~ active for more than (HTRC32/2)
6. Temp. TdSc < HTRC7 - enabling threshold for HR1 when HR2 is not running or not present for the time HTRC9 -,
   or
   Tphr2 < HTRC20 - enabling threshold for HR1 when HR2 is running for the time HTRC21 -.
   or
   AICxx = 166 < HTRC10 - enabling threshold for HR1 when HR2 is not running or not present for the time HTRC12.
   (AICxx = 185 < HRTC10 - enabling threshold for HR2 when HR1 is not running for time HTRC12.)
7. .All the compressor of the circuit 1 are switched off.

Regulation: de-activation actions

1. 3 way valve relay (3WV) relay is switched off
2. After HTRC34 pump relay (DOpump) is switched off if the points 4. And 5. are false
3. After HTRC34 Analog. Output (AO_pmp) is set to zero if the points 4. And 5. are false
4. If point 4 or point5 alarm is active, the pump DO and AO will be stopped immediately without considering HTRC34.

26. PARALLEL COMPRESSION FOR TRANSCRITICAL CO2 RACK

26.1 INPUTS – OUTPUTS TABLE

Label	Detailed description	Setting	Value	Description
Tgc	Gas Cooler outlet temperature	AICxx	154	NTC Gas cooler outlet temperature
Pgc	Gas cooler pressure	AICxx	169 or 170	Gas Cooler pressure
PLr	pressure liquid receiver	AICxx	152	4-20mA Pressure Probe of CO2 receiver
TsPC	Suction temperature of parallel compressors	AICxx	175	
TdPC	Discharge temperature of parallel compressors	AICxx		

Ipc	Parallel compressor Inverter digital output	DOCxx	127	
Vpc	0-10V signal for inverter of parallel compressor	AOCxx	25	
C1pc	Parallel compressor – Compress. 1	DOCxx	128	

26.2 Parameters

LABEL	DETAILED DESCRIPTION	SETTING
SETPC	Parallel compression 1 Set Point	GC20-PC3
RC57	Regulation band width for parallel compressors	0.10÷10.00 bar; 0.1÷25.0 °C; 1÷80 PSI; 1÷50 °F; 10÷1000 KPA
PC1	BGV Valve percentage to activate parallel compression	0÷99%
PC2	Time with BGV valve > = at PC1 to activate parallel compression	0÷255s
PC3	Pressure setpoint for BGV when the parallel compression is activated	SETPC÷500.00 bar; SETPC÷7250 PSI; SETPC÷50000 KPA
PC4	Minimum time between 2 following switching ON of the same parallel compressor	0÷1000min
PC5	Minimum time between the switching off of a parallel compressor and the following switching on	0÷1000min
PC6	Time delay between the insertion of two different parallel compressors	0÷5990s
PC7	Time delay between switching off of two different parallel compressors	0÷5990s
PC8	Minimum time parallel compressor on	0÷5990s

26.3 Configuration

26.3.1 IO configuration – mandatory

- At least **1 digital output** **DOCx** configured as:
  - Inverter for parallel compression (**DOCx = 127**). In this case, the DO is not enough, in fact **1 analog output** **AOCx** has to be configured as**:**
    - 0-10V Inverter parallel compression **(AOCx = 25)** or

- 4-20mA Inverter parallel compression **(AOCx = 26)**

o Compressor for parallel compression (**DOCx = 128**). Like the standard compressors, the 2nd compressor has sense only if the 1st one is configured; etc.

✓ **1 analog input** configured as:
Pressure Probe of CO2 receiver (**AICx = 152** or **153)**

If the mandatory configuration is not respected, the parallel compression function cannot be activated.

26.3.2 IO_configuration – optional

DIGITAL OUTPUTS
Up to 6 addition digital outputs DOCx configured as parallel compressors with/without steps:

Ex: With 1 frequency compressor (inverter) and 2 compressors with 1 step each the configuration is:

- Inverter for parallel compression (DOCx = 127)
- Compressor 1 for parallel compression (DOCx = 128)
- Step of Compressor 1 for parallel compression (DOCx = 129)
- Compressor 2 for parallel compression (DOCx = 130)
- Step of Compressor 2 for parallel compression (DOCx = 131)

DIGITAL INTPUTS
Each compressor can have up to 3 safety digital inputs (Oil pressostate, Safety pressure switch, Thermal Safety).

Ex: With the previous configuration: 1 frequency compressor (inverter) and 2 compressors with 1 step each, each of them with 3 safety inputs the digital input configuration is:

DICx = 173	Parallel compression- Compressor 1 oil pressostate
DICx = 174	Parallel compression- Compressor 1 Safety pressostat
DICx = 175	Parallel compression- Compressor 1 Thermal Safety
DICx = 176	Parallel compression- Compressor 2 oil pressostate
DICx = 177	Parallel compression- Compressor 2 Safety pressostat
DICx = 145	Parallel compression- Compressor 2 Thermal Safety
DICx = 182	Parallel compression- Frequency compressor, oil pressostate
DICx = 183	Parallel compression- Frequency compressor, Safety pressostat
DICx = 184	Parallel compression- Frequency compressor, Thermal Safety
DICx = 185	Parallel compression– Inverter Safety

ANALOG INPUTS
Up 2 additional analog inputs for monitoring.

Ex: With the previous configuration: 1 temperature sensor on the suction line and 1 temperature sensor on the discharge line:

AICx = 175	NTC Suction line temperature parallel compressor
AICx = 177	PTC Discharge line temperature parallel compressor

26.4 Adjustment

26.4.1 Enabling conditions

A. The BGV valve is operating with a percentage ≥ PC1 for the PC2 time.
Note: every time the BGV % becomes lower than PC1, the PC2 timer is reset. This timer restarts when the BGV percentage will become higher than PC1 again.
B. At least 1 parallel compressor (inverter or standard compressor) is available (it means configured, not in alarm and there are no safety delays active).

At this point the first parallel compressor is switched on; otherwise, the standard regulation with the BGV valve keeps on running.
Note: The condition B has to be taken in consideration only to start the parallel compressors. When the compressors are started, the conditions don't have to be considered till the compressor will be stopped, because the pressure falls down SETPC.

26.4.2 Adjustment

A. When the enabling conditions are satisfied, a parallel compressor is started according to the probe value of AICxx = 152 or 153.
   a. If the **inverter** is present, it uses the same kind of regulation of the standard inverter and it follows the setting of the parameters of the analog output used for Inverter parallel compression.
      E.g. If AOC3 = 25, the parameters used for the inverter of parallel compressions are: AO3_1…AO3_26, and the exception to this is: instead use AO3_17, PC9 is used, instead use AO3_19, PC10 is used. While the standard compressors follow the PC4…PC9 parameters.
   b. If the **standard compressors** are used a dead band regulation is used, and the main parameters are: SETPC, RC57, PC4…PC9.
B. The BGV valve set point will move from **GC20** to **PC3** (it keeps on working with this set point).

*Note***:** The parallel compressors safeties can switch off compressors (if activated). In this case the compressors are considered not available and liquid receiver pressure is maintained by the BGV valve
*Note***:** In case of probe error of CO2 receiver (AICx = 152 or 153), this means there isn't any control of the receiver pressure. In this case it is better to stop the regulation of the full rack.

26.4.3 Disabling conditions

A. If the LIQUID RECEIVER PRESSURE FALLS BELOW SET POINT MINUS DIFFERENTIAL:

For inverter + compressors
When the liquid receiver pressure is below the parallel compressor set point less half regulation band (AICxx = 152 < SETPC –AOx17/2) for the time necessary to switch off all the compressors and the inverter
or
For compressors

When the liquid receiver pressure is below the parallel compressor set point less half regulation band (AICxx = 152 < SETPC – RC57/2) for the time necessary to switch off all the compressors.

In this situation, the BGV valve set point will move from PC3 to GC20 and the BGV valve will act to maintain this pressure.

B. If the SYSYETM MOVES FROM TRANSCRITICAL TO SUBCRITICAL CONDITIONS:
   a. All the compressors are switched off spaced out by the standard PC7 time.
   b. The BGV valve set point will move from PC3 to GC20 and the BGV valve will act to maintain this pressure.

   Note: if the system is working in Heat Reclaim mode, the parallel compression function can be used, and it has to respect the "Enabling condition" before being activated.

C. All the parallel compressors will be stopped by their safeties. Also in this case, the BGV valve set point will move from PC3 to GC20 and the BGV valve will act to maintain this pressure.

26.4.4 Safety conditions

26.4.4.1 Circuit 2 compressors not working

If the circuit 2 (FYI: Circuit 2 is the circuit for the medium temperature MT) compressors are locked by:

a. Safety digital inputs or off by core sense alarm.
b. Manually disabled from Visograph.
c. Safety timers

and they are not allowed to start even there is a turn on request from regulation, the BGV valve is closed (minimum opening percentage) and parallal compressor will follow its regulation.

26.4.4.2 Parallel compressors not available due to safety conditions

If the parallel compressors are locked by:

a. Safety digital inputs or
b. Safety timers

the BGV is used to maintain the set point in the liquid receiver.

The prioriy for the parallel compression regulation is as below:

Priority	Condition	Parallel compressors	BGV Valve
1	HAF2 alarm and other circuit2 alarms that may off the compressors in circuit2 occurs: LP2, HP2, ALSH2, LPC2, PR2, HDi-T-2, OIL DIFF L/O.	OFF with safety delays respected.	Not affected, and maintain the set point GC20 in the liquid receiver.
2	Parallel compressors not available due to safety conditions: • Safety digital inputs or • Safety timers	OFF	Not affected, and maintain the set point GC20 in the liquid receiver.

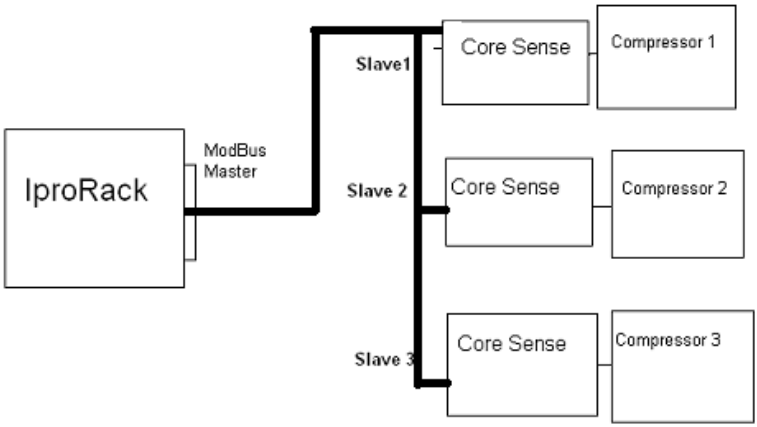
3	HP REC alarm occurs	Forced to run with safety delays respected.	Opened at GC26.
4	If there are regulation request to turn on the circuit2 compressors and the circuit 2 compressors are all locked by: • Compressor safety alarm occurs: Safety digital inputs or off by core sense alarm. • Manually disabled from Visograph. • Safety timers.	Follow the PC regulation	Closed (minimum opening percentage)
5	Normal regulation of parallel compressors is enabled	Follow the PC regulation	Set point will move from GC20 to PC3 when the parallel compression is enabled and move from PC3 to GC20 when the parallel compression is disabled.

27. CORESENSE INTEGRATION – compatibility guarantee only for vers. F35 or later of Coresense

Description:
The coreSense devices are embedded on the Copeland compressors. These devices get out the information of the compressor. The Iprorack has to read (regarding the communication the Iprorack is a MASTER) out from the Copeland Compressor Core Sense device (regarding the communication the coresense is a SLAVE) this information, using the serial line and manage them.

27.1 CONNECTION.

CONNECTION DIAGRAM



The communication between the Iprorack and the corse sense device is Modbus.

27.1.1 Description of the connections

Connect the Coresenses to the

Connector	Description
	RS485 Master connector Rx and Tx LED to indicate that communication is active Closed circuit terminal (Term)

27.1.2 How to configure the CORESENSE communication

CO1	CO-ADDRESS DIGITAL OUT 1	Address core sense out 1	1 – 15; NU = not used
CO2	CO-ADDRESS DIGITAL OUT 2	Address core sense out 2	1 – 15; NU = not used
CO3	CO-ADDRESS DIGITAL OUT 3	Address core sense out 3	1 – 15; NU = not used
CO4	CO-ADDRESS DIGITAL OUT 4	Address core sense out 4	1 – 15; NU = not used
CO5	CO-ADDRESS DIGITAL OUT 5	Address core sense out 5	1 – 15; NU = not used
CO6	CO-ADDRESS DIGITAL OUT 6	Address core sense out 6	1 – 15; NU = not used
CO7	CO-ADDRESS DIGITAL OUT 7	Address core sense out 7	1 – 15; NU = not used
CO8	CO-ADDRESS DIGITAL OUT 8	Address core sense out 8	1 – 15; NU = not used
CO9	CO-ADDRESS DIGITAL OUT 9	Address core sense out 9	1 – 15; NU = not used
CO10	CO-ADDRESS DIGITAL OUT 10	Address core sense out 10	1 – 15; NU = not used
CO11	CO-ADDRESS DIGITAL OUT 11	Address core sense out 11	1 – 15; NU = not used
CO12	CO-ADDRESS DIGITAL OUT 12	Address core sense out 12	1 – 15; NU = not used
CO13	CO-ADDRESS DIGITAL OUT 13	Address core sense out 13	1 – 15; NU = not used
CO14	CO-ADDRESS DIGITAL OUT 14	Address core sense out 14	1 – 15; NU = not used

CO15	CO-ADDRESS DIGITAL OUT 15	Address core sense out 15	1 – 15; NU = not used
CO16	CO-BAUD RATE	BAUD RATE	19200-9600(0-1)
CO17	CO-PARITY SELECTION	PARITY SELECTION	NO-YES (0-1)

ONLY AT THE POWER ON: The Iprorack checks the configuration of the coresense parameters configuration.

Example to configure a circuit 1 with 3 compressors:

1) parameters DOC1= 7c – Compressor 1 circuit 1 close polarity
2) parameters DOC3= 11c – Compressor 2 circuit 1 close polarity
3) parameters DOC7= 15c – Compressor 3 circuit 1 close polarity

It is necessary to configure the correct address parameter (parameters COxx) in according to the address assigned to the coresense mounted on the compressor (by the dip switch mounted on the coresense)

- Parameter to select the Coresense address mounted on the compressor 1 – connected to the digital output 1 (70-73), is the parameter CO1
- Parameter to select the Coresense address mounted on the compressor 2 – connected to the digital output 3 (72-73), is the parameter CO3
- Parameter to select the Coresense address mounted on the compressor 3 – connected to the digital output 7 (79-83), is the parameter CO7.

28. INFORMATION from the Coresense

From the Coresense device there is different type of information:

- **ASSET INFORMATION**
- **OPERATING PARAMETERS**
- **SETTING PARAMETERS**
- **ALARMS**

1) ASSET INFORMATION

- Compressor Model Number.
- Compressor Serial Number.
- Sensor Module Firmware Revision Number.

2) OPERATING PARAMETERS

- Current.
- Locked Rotor Peak Current.
- R Phase Compressor Voltage.
- Y Phase Compressor Voltage.
- B Phase Compressor Voltage.
- Total number of LOP run hours.
- Total number of alarm hours.
- Total number of short cycles.
- Voltage.
- Power Consumption.
- Discharge temperature Values.
- Number of Compressor Running Hours.
- Number of Compressor Switching Cycles.

3) SETTING PARAMETERS : possibility to set these parameters

- Discharge temp trip value.
- Discharge temp trip Reset.
- Nominal voltage power supply.
- Voltage imbalance value.
- Anti-short-time
- Compressor Nominal Frequency
- P470 HW Configuration
- Reset Core Sense

4) ALARMS

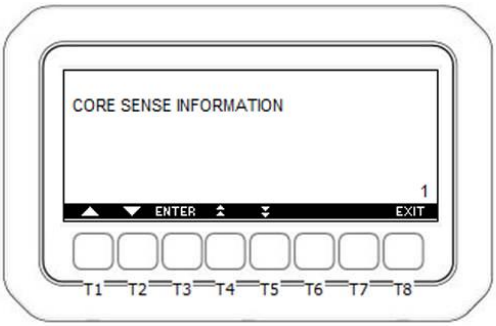
28.1 How to see coresense data

All the data from the coresense are showed in a Visograph service sub-menu:

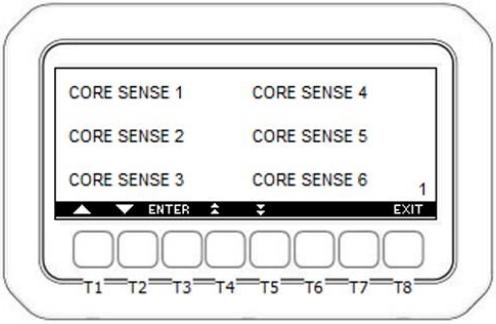
28.1.1 ASSET INFORMATION and OPERATING PARAMETERS

The asset information and operating parameters are managed inside a service sub-menu. Entry in a service menu (see the paragraph 5.1):

- **Select the CORE SENSE INFORMATION sub-menù.**
- **Push Enter.**



- **Select the core sense that you want to see.**

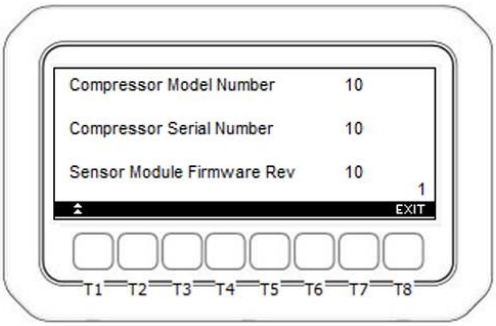


- **Select for example the core sense 1.**

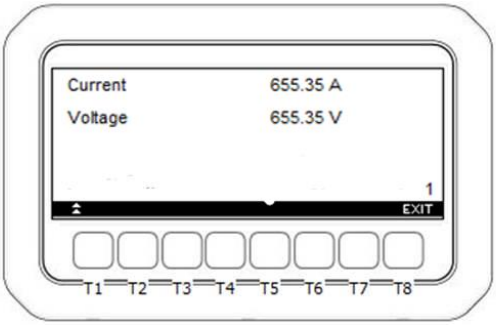
CORE SENSE MENU

Inside this menu there are:

SETTING PARAMETERS

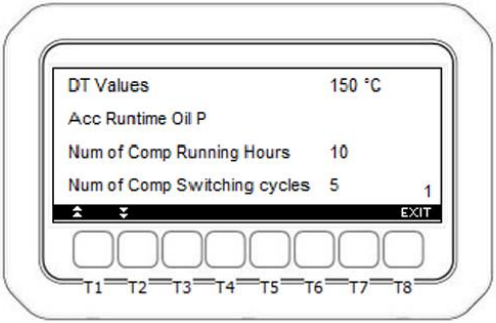


OPERATING PARAMETERS



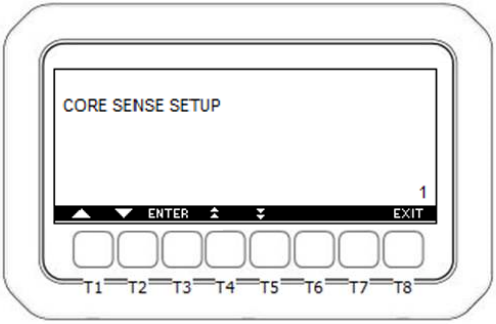
28.1.2 SETTING PARAMETERS

To set the coresense parameters:

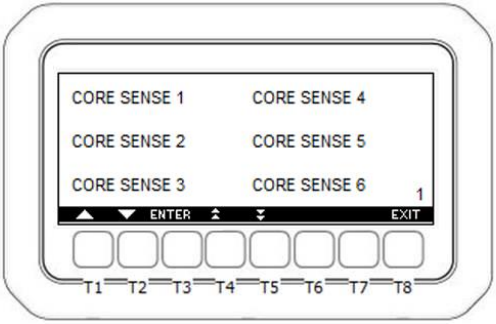


Entry in a service menu (see the paragraph 5.1):

- **Select the CORE SENSE SETUP sub-menù.**
- **Push Enter.**

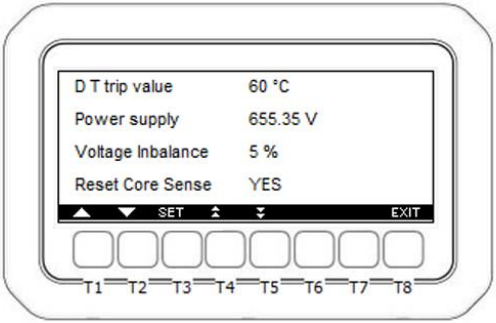


- **Select the core sense that you want to modify.**



- **Select for example the core sense 1.**

Inside this menu there is this information:

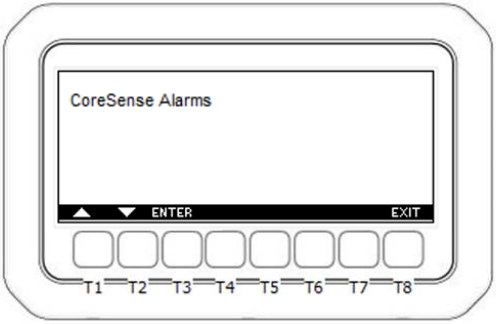


1) DT trip Value → it is a parameter to set.
2) Power supply → it is a parameter to set.
3) Voltage Inbalance → it is a parameter to set.

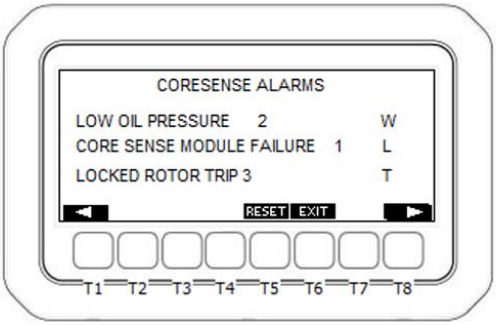
4) Reset Core Sense → to send to the core sense a reset command.

28.1.3 HOW TO SEE THE CORESENSE ALARMS

- Entry in a menu alarm;
- Select the Coresense Alarms sub-menù;
- Push Enter;



In this alarm menu are showed the alarms of all coresense.



- With the RESET button it is possible to reset the alarms.

28.2 Alarm management

The Iprorack reads from the coresense the following alarms:
There are 3 type of the alarms:

1) **LOCKOUT ALARMS**→ The lockout alarms are showed in the visograph alarm stage and after the description of the alarm is showed a label **L** to indicate the type of this alarm.

- Alarm management: **Compressor switch off.**
- Status: It is required a **manual reset** (on the core sense) or a **remote reset** to restore the compressor.

- Remote reset: To consider this Alarm like a manual alarm in the IProrack. (the remote reset means to send a reset command to the coresense.

2) **TRIP→** → The trip alarms are showed in the visograph alarm stage and after the description of the alarm is showed a label **T** to indicate the type of this alarm.

- Alarm management: **Compressor switch off.**
- Status: The compressor is unavailable until it is true the condition of the alarm.
- Auto reset: To consider this Alarm like an automatic alarm in the IProrack. (see as to manage the automatic Alarms). When the alarm returns OFF the compressor are restored.

3) **WARNING→** The warning alarms are showed in the visograph alarm stage and after the description of the alarm is showed a label **W** to indicate the type of this alarm. This kind of Alarm is only a WARNING.

- Alarm management: The compressor will go on working
- Status : The compressor will go on working
- Auto reset.

SUMMARY TABLE

Type	ACTION	RESET
LOCKOUT	COMPRESSOR SWITCH OFF BUZZER ON LOG OF THE ALARM	REMOTE RESET (COMMAND) MANUAL RESET (CORE SENSE) the compressor will return available after the reset.
TRIP	COMPRESSOR SWITCH OFF BUZZER ON LOG OF THE ALARM	AUTOMATIC RESET : the compressor will return available until the alarm will be off
WARNING	COMPRESSOR WILL GO ON WORKING	AUTOMATIC RESET

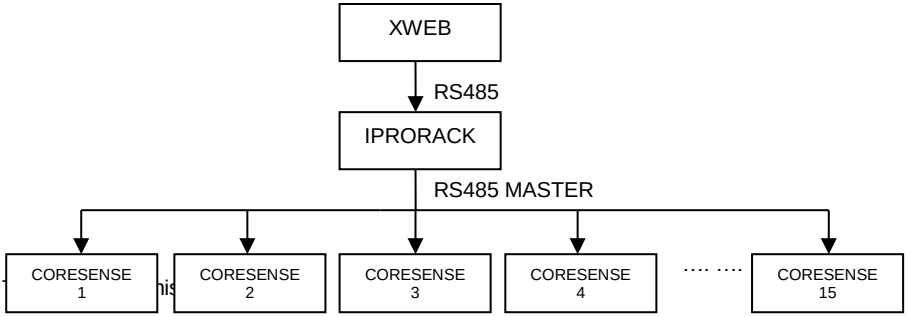
28.2.1 List of the Alarms

Type	Visograph Description	Code of Alarm
Lockout	Insufficient Oil Pressure L	37 - Low Oil Pressure Lockout
Lockout	Missing Phase L	42 - Phase Loss Lockout
Lockout	Locked Rotor L	41 - Locked Rotor Lockout
Lockout	High Discharge Temp L	39 - Discharge Temperature Lockout
Lockout	Low Voltage L	54 - Low Voltage Lockout
Lockout	Module Failure L	43 - P470 Module Failure Lockout
Trip	Low Voltage T	21 - Compressor Low Voltage Trip
Trip	Locked rotor T	31 - Locked rotor Trip
Trip	Missing Phase T	28 - Phase Loss Trip
Trip	Voltage Imbalance T	24 - Voltage Imbalance Trip
Trip	High Discharge Temp T	19 - Discharge Temp Trip
Trip	Motor Temp. T	32 - Motor Temperature Trip
Warning	Communication Error (to SM) W	16 - Communication Error to SM
Warning	Current sensor fault W	12 - Connection lost between sensor
Warning	Comunication Error to Ipro W	18 - Comunication Error to E2
Warning	No.run & Fault Temp Probe W	7 - Normal Running & Fault Temp Probe
Warning	Hw Conf. Mismatch W	17 - E2/P470 Configuration Mismatch
Normal	Normal Off	44 - Normal OFF

Normal	Normal On	45 - Normal Running

29. CONNECTION BETWEEN XWEB– IPRORACK – CORENSENSE

The iProRack can be connected to the X-WEB, so the data caming from Coresenses can se seen and managed also by the X-WEB.



1) Connect the Xweb RS485 line to the SLAVE serial line of iProrack

	RS485 Slave connector Rx and Tx LED to indicate that communication is active Closed circuit terminal (Term)

2) Connect the Coresense's RS485 line to the MASTER serial line of iProrack.

	RS485 Master connector Rx and Tx LED to indicate that communication is active Closed circuit terminal (Term)

3) **Address setup among iProRack and Coresenses**:
The Coresenses will be seen by the X-WEB at the address immediately following the iProRack address
If Iprorack has aaddress "n", Coresenses will have the consecutive addresses to Iprorack address: **n+ coresense Address**.

Example: Iprorack + 5 coresense

- **Iprorack serial Address = 30**
- **CoreSense serial addresses = 1 , 3 , 7 , 9. (set by dipswitch)**
- **The setup of Xweb regarding the coresense is:**

Physical modbus addresses	Addresses in Xweb setup
Iprorack = 30	Iprorack = 30
Coresense 1 = 1	Coresense 1 = 31 (Iprorack add. + Coresense 1 add.)
Coresense 2 = 3	Coresense 2 = 33 (Iprorack add. + Coresense 2 add.)
Coresense 3 = 7	Coresense 3 = 37 (Iprorack add. + Coresense 3 add.)
Coresense 4 = 9	Coresense 4 = 39 (Iprorack add. + Coresense 4 add.)

30. ALARM LIST

Usually alarm conditions are signalled by means of:

1. Activation of alarm relays
2. Buzzer activation
3. Message on proper display

30.1 Alarm conditions – summary table

Code	Description	Cause	Action	Reset
ALARMS CIRCUIT 1				
LP1	Low pressure-switch alarm for Circuit 1	Low pressure switch Input 1 (the Input is configured as DICxx=101 Low pressure Circuit 1)	All compressors of Circuit 1 are turned off. Fans unchanged.	**Automatically** if the number of activation are less than AL12 in the AL13 time when the Input is disable. - The compressors restart working according to the working algorithm. **Manually** (if AL12 activation happened in the AL13 time) When the Input is disable: - Turn off and on the instrument/or rest the alarm manually from the Visograph - The compressors restart working according to the working algorithm.
HP1	High pressure switch for Circuit 1 alarm	High pressure switch Input 1 (the Input is configured as DICxx=99 High pressure Circuit 1)	• All compressors of Circuit 1 are turned off. • All fans are of Circuit 1 turned on.	**Automatically** if the number of activation are less than AL29 in AL30 time when the Input is disable. - Compressors and fans restart working according to the working algorithm. **Manually** if AL29 activation happened in the AL30 time When the Input is disable: 1. Turn off and on the instrument /or rest the alarm manually from the Visograph. 2. Compressors and fans restart working according to the working algorithm.

Code	Description	Cause	Action	Reset
LAC1	Minimum pressure (temperature) alarm compressors for Circuit 1	IfAC1 = REL: Suction pressure or temperature< = SETC1-AL3 IfAC1 = ABS: Suction pressure or temperature< = AL3	Only signalling	**Automatically:** as soon as the pressure or temperature reaches: IfAC1 =REL: SETC1-AL3 + differential value. (differential = 0.3bar or 1°C) IfAC1 =ABS: AL3 + differential value. (differential = 0.3bar or 1°C)
LAF1	Minimum pressure (temperature) alarm fans section for Circuit 1	IfAC2 = REL: Condenser pressure or temperature ≤ SETF1-AL24 for timer AL26 IfAC2 = ABS: Condenser pressure or temperature ≤ AL24 for timer AL26	Only signalling	**Automatically:** as soon as the pressure or temperature reaches: IfAC2 =REL: SETF1-AL24 + differential value. (differential = 0.3bar or 1°C) IfAC2 =ABS: AL24 + differential value. (differential = 0.3bar or 1°C)
HAC1	Maximum pressure (temperature) alarm compressors for Circuit 1	IfAC1 = REL: Suction pressure or temperature ≥ SETC1+AL4 IfAC1 = ABS: Suction pressure or temperature ≥ AL4	Only signalling	**Automatically:** the pressure or temperature ≤ IfAC1 =REL: SETC1+AL4 - differential value. (differential = 0.3bar or 1°C) IfAC1 =ABS: AL4 - differential value. (differential = 0.3bar or 1°C)
HAF1	Maximum pressure (temperature) alarm fans section for Circuit 1	IfAC2 = REL: Condenser pressure or temperature > = SETF1+AL25 for AL26 delay IfAC2 = ABS: Condenser pressure or temperature > = AL25 for AL26 delay	If AL27 = yes The compressors Circuit 1 switch off with AL28 delay from 2 different steps If CF1=CRII, close the valve step by step, respecting AL28	**Automatically:** the pressure or temperature ≤ IfAC2 =REL: SETF1+AL25 - differential value. (differential = 0.3bar or 1°C) IfAC2 =ABS: AL25 - differential value. (differential = 0.3bar or 1°C)

Code	Description	Cause	Action	Reset
LL1	Liquid level alarm for Circuit 1	Proper digital Input enabled (the Input is configured as DICxx=109 Liquid level Circuit 1) After delay CDI1	Only signalling	**Automatically** as soon as the Input is disabled
PrSH1	Pre-alarm for superheat Circuit 1	Superheat 1 is ≤ ASH1 + ASH2 **and** ≥ ASH2	Only signalling	**Automatic:** when superheat exceeds ASH1 + ASH2 +hysteresis
ALSH1	Alarm for superheat Circuit 1	Superheat 1 is ≤ ASH2	Depends on ASH4	**Automatic:** when superheat exceeds ASH5 + ASH2
LPC1	Electronic pressure switch for low temperature/pressure of Circuit 1	Pressure/temperature < AL21	Disable the compressors	**Automatic:** when the pressure/temperature exceeds AL21+differential
PR1	**Suction probe Circuit 1 failure alarm**	Suction Probe failure or out of range (e.g. the probe is configured as AICxx=1 NTC probe regulation suction Circuit 1)	The compressors are activated according to the AL14/AL15 parameters.	**Automatically** as soon as the probe restarts working.
PR3	**Condensing probe Circuit 1 failure alarm**	Condensing Probe failure or out of range (e.g. the probe is configured as AICxx=3 NTC probe regulation condensing Circuit 1)	The fans are activated according to the AL31 parameters".	**Automatically** as soon as the probe restarts working.
Floodback 1	**Floodback alarm Circuit 1**	ASH2 >superheat (Suction pressure & Suction temperature) for 90 minutes	Only a warning: buzzer ON and alarm relay (91-Alarm) ON	Clear automatically superheat > ASH2

Code	Description	Cause	Action	Reset
HASF1	High pressure (temperature) to un-split condenser alarm Circuit 1	This alarm only detected in case of RC17=true, If the pressure/temperature detected by the condenser probe is higher than AF41 (High pressure /temperature to un-split condenser)	The split condenser function is suspended and the status of the split condenser relay depends on the parameter AF43	Automatically as soon as the pressure / temperature goes below the value AF41-AF42, un-split condenser alarm recovery. The split condenser relay is activated again, once alarm recovery
ALARMS CIRCUIT 2				
LP2	Low pressure-switch alarm for Circuit 2	Low pressure switch Input (the Input is configured as DICxx=102 Low pressure Circuit 2)	All compressors of Circuit 2 are turned off. Fans unchanged.	**Automatically** if the number of activation are less than AL16 in the AL17 time when the Input is disable. - The compressors restart working according to the working algorithm. **Manually** (if AL16 activation happened in the AL17 time When the Input is disable: - Turn off and on the instrument /or rest the alarm manually from the Visograph. - The compressors restart working according to the working algorithm.
HP2	High pressure switch for Circuit 2 alarm	High pressure switch Input (the Input is configured as DICxx=100 High pressure Circuit 2)	- All compressors of Circuit 2 are turned off. - All fans are of Circuit 2 turned on.	**Automatically** if the number of activation are less than AL37 in AL38 time when the Input is disable. - Compressors and fans restart working according to the working algorithm. **Manually** if AL37 activation happened in the AL38 time When the Input is disable: - Turn off and on the instrument /or rest the alarm manually from the Visograph. - Compressors and fans restart working according to the working algorithm.

Code	Description	Cause	Action	Reset
LAC2	**Minimum pressure (temperature) alarm compressors for Circuit 2**	IfAC1 = REL: Suction pressure or temperature< = SETC2-AL6 IfAC1 = ABS: Suction pressure or temperature< = AL6	Only signalling	**Automatically:** as soon as the pressure or temperature reaches: IfAC1 =REL: SETC2-AL6 + differential value. (differential = 0.3bar or 1°C) IfAC1 =ABS: AL6 + differential value. (differential = 0.3bar or 1°C)
LAF2	**Minimum pressure (temperature) alarm fans section for Circuit 2**	IfAC2 = REL: Condenser pressure or temperature < = SETF2-AL32 for timer AL34 IfAC2 = ABS: Condenser pressure or temperature ≤ AL32 for timer AL34	Only signalling	**Automatically:** as soon as the pressure or temperature reaches: IfAC2 =REL: SETF2-AL32 + differential value. (differential = 0.3bar or 1°C) IfAC2 =ABS: AL32 + differential value. (differential = 0.3bar or 1°C)
HAC2	**Maximum pressure (temperature) alarm compressors for Circuit 2**	IfAC1 = REL: Suction pressure or temperature > = SETC2+AL7 IfAC1 = ABS: Suction pressure or temperature > = AL7	Only signalling	**Automatically:** the pressure or temperature ≤ IfAC1 =REL: SETC2+AL7 - differential value. (differential = 0.3bar or 1°C) IfAC1 =ABS: AL7 - differential value. (differential = 0.3bar or 1°C)

Code	Description	Cause	Action	Reset
HAF2	**Maximum pressure (temperature) alarm fans section for Circuit 2**	IfAC2 = REL: Condenser pressure or temperature > = SETF2+AL33 for AL34 delay IfAC2 = ABS: Condenser pressure or temperature > = AL33 for AL34 delay	If AL35 = yes The compressors Circuit 2 switch off with a delay from 2 different steps AL36 In case of parallel compression enabled(at least one of parallel compressor is working): - All the parallel compressors are forced to stop with safety delays respected. - The BGV follows the parallel compression regulation (set point GC20).	**Automatically:** the pressure or temperature ≤ IfAC2 =REL: SETF2+AL33 - differential value. (differential = 0.3bar or 1°C) IfAC2 =ABS: AL33 - differential value. (differential = 0.3bar or 1°C)
LL2	**Liquid level alarm for Circuit 2**	Proper digital Input enabled (the Input is configured as DICxx=110 Liquid level Circuit 2) After delay CDI2	Only signalling	**Automatically** as soon as the Input is disabled
PrSH2	Pre-alarm for superheat Circuit 2	Superheat2 is ≤ ASH1 + ASH9 **and** ≥ ASH9	Only signalling	**Automatic:** when superheat exceeds ASH1 + ASH9 +hysteresis
ALSH2	Alarm for superheat Circuit 2	Superheat2 is ≤ ASH9	Depends on ASH11	**Automatic:** when superheat exceeds ASH12 + ASH9

Code	Description	Cause	Action	Reset
LPC2	**Electronic pressure switch for low temperature/pressure of Circuit 2**	Pressure/temperature < AL23	disables the compressors	**Automatic:** when the pressure/temperature exceeds AL23+differential
PR2	**Suction probe Circuit 2 failure alarm**	Suction Probe failure or out of range (e.g. the probe is configured as AICxx=2 NTC probe regulation suction Circuit 2)	The compressors are activated according to the AL18 parameters.	**Automatically** as soon as the probe restarts working.
PR4	**Condensing probe Circuit 2 failure alarm**	Condensing Probe failure or out of range (e.g. the probe is configured as AICxx=4 NTC probe regulation condensing Circuit 2)	The fans are activated according to the AL39 parameters.	**Automatically** as soon as the probe restarts working.
Floodback 2	**Floodback alarm Circuit 2**	ASH9 >superheat (Suction pressure & Suction temperature) for 90 minutes	Only a warning: buzzer ON and alarm relay (91-Alarm) ON	Clear automatically superheat > ASH9
HASF2	High pressure (temperature) to un-split condenser alarm Circuit 2	This alarm only detected in case of RC21=true, If the pressure/temperature detected by the condenser probe is higher than AF44 (High pressure /temperature to un-split condenser)	The split condenser function is suspended and the status of the split condenser relay depends on the parameter AF46	Automatically as soon as the pressure / temperature goes below the value AF44-AF45, un-split condenser alarm recovery. The split condenser relay is activated again, once alarm recovery
Compressor Alarms				

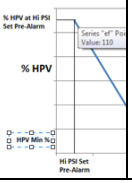
Code	Description	Cause	Action	Reset
EAO1... EAO24 (for each compressor)	Compressor or safeties alarm for Oil switch load	Oil switch load Input activation. (the Input is configured as DICxx=1 Compressor oil pressostate compressor 1 Circuit 1) NOTE: with step compressors Input for each compressor has to be used.	The corresponding compressor is turned off (with step compressors all relays referred to the Input are disabled).	**Automatically** as soon as the Input is disabled.
ETO1... ETO24 (for each compressor)	Compressor or safeties alarm for Thermal switch load	Thermal switch load Input activation. (the Input is configured as DICxx=3 Thermal Safety Compressor Circuit 1) NOTE: with step compressors Input for each compressor has to be used.	The corresponding compressor is turned off (with step compressors all relays referred to the Input are disabled).	**Automatically** as soon as the Input is disabled.
EPO1... EPO24 (for each compressor)	Compressor or safeties alarm for Pressure switch load	Pressure switch load Input activation. (the Input is configured as DICxx=2 Compressor safety pressostate Circuit 1) NOTE: with step compressors Input for each compressor has to be used.	The corresponding compressor is turned off (with step compressors all relays referred to the Input are disabled).	**Automatically** as soon as the Input is disabled.
MANT	**Compressors maintenance alarm**	A compressor has worked for the time set in the AL10 parameter	Only signalling	**Manually:** reset the running hour of the compressor (see par 6.1)

Code	Description	Cause	Action	Reset
Comp start[1 ~15]	Compressor cycle limit	Compressor CT cycle counter > SL14 The CT cycle counter will come from Coresense by reading register address “007E” (compressor start times) When this value > SL14 individual compressor is locked out until cycle count is reset.	Lockout individual compressor	No reset.
LIQ LVL	**Receiver level alarm**	80%<Liquid level input <15% for 45min	Only a warning: buzzer ON and alarm relay (91-Alarm) ON	Automatically when 15%<Liquid level<89%
OIL DIFF L/O	**High separator differential switch alarm**	contact closure from hi oil separator lockout input	Lockout all compressors when DI true > 5 min	**Automatically** when DI true < 5 min As soon as the Input is disabled the alarm is reset. The compressors restart working according to the working algorithm. **Manually** when DI true ≥ 5 min When the Input is disable, it also need turn off and on the instrument /or rest the alarm manually from the Visograph or remote. The compressors restart working according to the working algorithm.
GENERIC ALARMS				
P1	probe failure alarm	Probe 1 failure	signalling only	**Automatically** as soon as the probe restarts working.
P2	probe failure alarm	Probe 2 failure	signalling only	**Automatically** as soon as the probe restarts working.
P3	probe failure alarm	Probe 3 failure	signalling only	**Automatically** as soon as the probe restarts working.
P4	probe failure alarm	Probe 4 failure	signalling only	**Automatically** as soon as the probe restarts working.
P5	probe failure alarm	Probe 5 failure	signalling only	**Automatically** as soon as the probe restarts working.
P6	probe failure alarm	Probe 6 failure	signalling only	**Automatically** as soon as the probe restarts working.
P7	probe failure alarm	Probe 7 failure	signalling only	**Automatically** as soon as the probe restarts working.
P8	probe failure alarm	Probe 8 failure	signalling only	**Automatically** as soon as the probe restarts working.
P9	probe failure alarm	Probe 9 failure	signalling only	**Automatically** as soon as the probe restarts working.

Code	Description	Cause	Action	Reset
P10	probe failure alarm	Probe 10 failure	signalling only	**Automatically** as soon as the probe restarts working.
P11	**probe failure alarm**	Probe 10 failure	signalling only	**Automatically** as soon as the probe restarts working.
P12	**probe failure alarm**	Probe 10 failure	signalling only	**Automatically** as soon as the probe restarts working.
P13	**probe failure alarm**	Probe 10 failure	signalling only	**Automatically** as soon as the probe restarts working.
P14	**probe failure alarm**	Probe 10 failure	signalling only	**Automatically** as soon as the probe restarts working.
P15	**probe failure alarm**	Probe 10 failure	signalling only	**Automatically** as soon as the probe restarts working.
P16	**probe failure alarm**	Probe 10 failure	signalling only	**Automatically** as soon as the probe restarts working.
P17	**probe failure alarm**	Probe 10 failure	signalling only	**Automatically** as soon as the probe restarts working.
P18	**probe failure alarm**	Probe 10 failure	signalling only	**Automatically** as soon as the probe restarts working.
P19	**probe failure alarm**	Probe 10 failure	signalling only	**Automatically** as soon as the probe restarts working.
P20	**probe failure alarm**	Probe 10 failure	signalling only	**Automatically** as soon as the probe restarts working.
P21	**probe failure alarm**	Probe 10 failure	signalling only	**Automatically** as soon as the probe restarts working.
P22	**probe failure alarm**	Probe 10 failure	signalling only	**Automatically** as soon as the probe restarts working.
P23	**probe failure alarm**	Probe 10 failure	signalling only	**Automatically** as soon as the probe restarts working.
P24	**probe failure alarm**	Probe 10 failure	signalling only	**Automatically** as soon as the probe restarts working.
P25	**probe failure alarm**	Probe 10 failure	signalling only	**Automatically** as soon as the probe restarts working.
P26	**probe failure alarm**	Probe 10 failure	signalling only	**Automatically** as soon as the probe restarts working.
P27	**probe failure alarm**	Probe 10 failure	signalling only	**Automatically** as soon as the probe restarts working.
P28	**probe failure alarm**	Probe 28 failure	Only signalling	**Automatically** as soon as the probe restarts working.
P29	**probe failure alarm**	Probe 29 failure	Only signalling	**Automatically** as soon as the probe restarts working.
P30	**probe failure alarm**	Probe 30 failure	Only signalling	**Automatically** as soon as the probe restarts working.
P31	**probe failure alarm**	Probe 31 failure	Only signalling	**Automatically** as soon as the probe restarts working.
P32	**probe failure alarm**	Probe 32 failure	Only signalling	**Automatically** as soon as the probe restarts working.

Code	Description	Cause	Action	Reset
P33	**probe failure alarm**	Probe 33 failure	Only signalling	**Automatically** as soon as the probe restarts working.
P34	**probe failure alarm**	Probe 34 failure	Only signalling	**Automatically** as soon as the probe restarts working.
P35	**probe failure alarm**	Probe 35 failure	Only signalling	**Automatically** as soon as the probe restarts working.
BURST	**Burst disc alarm**	DIC(i) = 150 activation	Only a warning: buzzer ON and alarm relay (91-Alarm) ON	DIC(i) = 150 deactivation
PHASE	**Phase fail alarm**	DIC(i) = 151 activation	Only a warning: buzzer ON and alarm relay (91-Alarm) ON	DIC(i) = 151 deactivation
EXT[i]	**External alarm [i]**	DIC(i) = 152 (or 153-154-155) activation	Only a warning: buzzer ON and alarm relay (91-Alarm) ON	DIC(i) = 152 (or 153-154-155) deactivation
OIL DIFF HI	**Change separator element switch alarm**	contact closure from change oil separator input >1 minute	Only a warning: buzzer ON and alarm relay (91-Alarm) ON	Clear automatically when DI is false
GLeak 1[2-3-4]-PreAlr	**Gas Leak pre-alarm 1 [2-3-4]**	If value of Gas leak detector 1 [2-3-4] probe > GLD1 [GLD6-GLD11-GLD16] and Gas leak detector 1 [2-3-4] probe < GLD2 [GLD7-GLD12-GLD17].	Relay set in GLD4 [GLD9-GLD14-GLD19] on	When value of Gas leak detector 1 [2-3-4] probe ≤ GLD1- GLD3[GLD6-GLD8;GLD11-GLD13;GLD16-GLD18]
GLeak 1[2-3-4]-Alarm	**Gas Leak alarm 1 [2-3-4]**	If value of Gas leak detector 1 [2-3-4] probe > GLD2 [GLD7-GLD12-GLD17]	Relay set in GLD5 [GLD10-GLD15-GLD20] on	When value of Gas leak detector 1 [2-3-4] probe ≤ GLD2- GLD21 [GLD7-GLD22;GLD12-GLD23;GLD17-GLD24]
EMOA-106D	**Expansion module offline alarm-IPX106D**	The expansion module IPX106D is used and loses communication by can bus.	Only signalling	The communication is recovered automatically.

Code	Description	Cause	Action	Reset
EMOA-215D	**Expansion module offline alarm-IPX215D**	The expansion module IPX215D is used and loses communication by can bus.	Only signalling	The communication is recovered automatically.
		Fan Alarm		
AL_AO (for each fan)	Fan safeties alarm	Safety switch load Input activation. (the Input is configured as DICxx=73 Fan 1 safety Circuit 1)	The corresponding fan is turned off.	**Automatically** as soon as the Input is disabled.
		Compressor with Inverter Alarms		
INVO (for Suction inverter)	**Inverter safeties alarm for Oil switch load**	Oil switch load Input activation. (the Input is configured as DICxx=115 Compressor oil Inverter suction Circuit 1)	The corresponding inverter is turned off.	**Automatically** as soon as the Input is disabled.
INVT (for Suction inverter)	**Inverter safeties alarm for Thermal switch load**	Thermal switch load Input activation. (the Input is configured as DICxx=117 Thermal Safety Inverter suction Circuit 1)	The corresponding inverter is turned off.	**Automatically** as soon as the Input is disabled.
INVP (for suction inverter)	**Inverter safeties alarm for Pressure switch load**	Pressure switch load Input activation. (the Input is configured as DICxx=116 Safety Inverter Suction Circuit 1)	The corresponding inverter is turned off.	**Automatically** as soon as the Input is disabled.
MANTINV (for suction inverter)	**Inverter maintenance alarm**	A inverter has worked for the time set in the AL10 parameter	Only signalling	**Manually:** reset the running hour of the inverter (see par 6.1)

Code	Description	Cause	Action	Reset
INVERTER1 [2] (for Suction inverter)	**Suction 1 [2] Inverter alarm**	DIC(i) = 138 [139] activation	DOC(i) = 1 [3] is turned off. AOC (I) = 2 or 11, [4] or [13] to 0V or 4mA	**Automatically** as soon as the Input is disabled.
			Warnings	
LIQ LVL	**Reciever level alarm**	80%<Liquid level input <15% for 45min	Only a warning: buzzer ON and alarm relè ON	Automatially when 15%<Liquid level<89%
REC FLOAT	**Receiver high pressure**	contact closure from reciever rupture disc	Only a warning: buzzer ON and alarm relè ON	Must be manually cleared onsite
OIL DIFF HI	**Change separator element switch alarm**	contact closeure from change oil separator input >1 minute	Only a warning: buzzer ON and alarm relè ON	Clear automatically when DI is false
Floodback	**Floodback alarm**	10 DDF >superheat (Suction pressure & Suction temperature) for 90 minutes	Only a warning: buzzer ON and alarm relè ON	Clear automatically superheat > 10 DDF
			Gas cooler	
PreHP Rec	**High pressure on CO2 receiver pre-alarm**	GC28 > AI152 (AI153) > GC29	The % of the valve is updating every second in order to reach the correct percentage. If the receiver pressure value is between the values GC29 and GC28 – 1 (bar), the % of valve opening is the following one: 	**Automatically** as soon as the HP REC is active or as soon as AI152 (AI153) < GC29 – GC30

Code	Description	Cause	Action	Reset
HP REC	**High pressure on CO2 receiver alarm**	AI152 (AI153) > GC28	The HPV will close (0%). The BGV will open to a user definable % set by the BGV % Open parameter GC37. In case of parallel compression enabled(At least one of parallel compressor is working): -All the parallel compressors are forced to run with safety delays respected. -The BGV valve is opened at GC26.	**Automatically** as soon as AI152 (AI153) < GC28 – GC30
LP REC	**Low pressure on CO2 receiver alarm**	AI152 (AI153) < GC31	The HPV will have a minimum opening of the HPV valve to a user definable % set by GC36. If the PID % is greater than GC36, then the PID % will be the valve % output. The BGV will close.	**Automatically** as soon as AI152 (AI153) > GC31 + GC32
OA-XEV20D_1	**XEV20D_1 offline alarm**	The XEV20D_1 is used and loses communication.	Only signalling	The communication is recovered automatically.

Code	Description	Cause	Action	Reset
OA-XEV20D_2	**XEV20D_2 offline alarm**	The XEV20D_2 is used and loses communication.	Only signalling	The communication is recovered automatically.
High discharge temperature				
HDi-T-1	**High discharge temperature – Circuit 1**	one of the probes set as AIxx = 156, 158, 69,70, …, 80 >DSC4 && DSC5 timer exhausted	With DSC6 running: only warning With DSC6 exhausted: 1 compressors off every DSC7 sec	Automatically as soon as ALL the probes set as AIxx = 156, 158, 69,70, …, 80AIxx < DSC4 – DSC3
HDi-T-2	**High discharge temperature – Circuit 2**	one of the probes set as AIxx = 157, 159, 81,82, …, 92 >DSC11 && DSC12 timer exhausted	With DSC13 running: only warning With DSC13 exhausted: 1 compressors off every DSC14 sec	Automatically as soon as AIxx = 157, 159, 81,82, …, 92 < DSC11 – DSC10
Compressor Alarms – Parallel compression				
PC_Oil_x (for each compressor)	Compressor safeties alarm for Oil switch load	Oil switch load Input activation. (the Input is configured as Parallel compression-Compressor x oil pressostate) NOTE: with step compressors Input for each compressor has to be used.	The corresponding compressor is turned off (with step compressors all relays referred to the Input are disabled).	**Automatically** as soon as the Input is disabled.
PC_Th_x (for each compressor)	Compressor safeties alarm for Thermal switch load	Thermal switch load Input activation. (the Input is configured as Parallel compression-Compressor x Thermal Safety) NOTE: with step compressors Input for each compressor has to be used.	The corresponding compressor is turned off (with step compressors all relays referred to the Input are disabled).	**Automatically** as soon as the Input is disabled.

Code	Description	Cause	Action	Reset
PC_Pr_x (for each compressor)	Compressor safeties alarm for Pressure switch load	Pressure switch load Input activation. (the Input is configured as Parallel compression-Compressor x Safety pressostate) NOTE: with step compressors Input for each compressor has to be used.	The corresponding compressor is turned off (with step compressors all relays referred to the Input are disabled).	**Automatically** as soon as the Input is disabled.
PC_INV_Oil	Parallel compressor inverter safeties alarm for Oil switch load	Oil switch load Input activation. (the Input is configured as Parallel compression-Frequency compressor, oil pressostate)	The inverter parallel compressor is turned off.	**Automatically** as soon as the Input is disabled.
PC_INV_Th	Parallel compressor inverter safeties alarm for Thermal switch load	Thermal switch load Input activation. (the Input is configured as Parallel compression-Frequency compressor, Thermal Safety)	The inverter parallel compressor is turned off.	**Automatically** as soon as the Input is disabled.
PC_INV_Pr	Parallel compressor inveryer safeties alarm for Pressure switch load	Pressure switch load Input activation. (the Input is configured as Parallel compression-Frequency compressor, Safety pressostate)	The inverter parallel compressor is turned off.	**Automatically** as soon as the Input is disabled.

Code	Description	Cause	Action	Reset
Pc_INV	Parallel compressor inverter fault	Parallel compression– Inverter Safety (DI185) ON	The inverter parallel compressor becomes not available for the regulation (use the other parallel compressors resources, if available. Otherwise, come back to BGV regulation)	**Automatically** as soon as parallel compression– Inverter Safety (DI185) OFF

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