

Multi step controllers XC440C - XC440D - XC460D

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1. GENERAL WARNING

1.1 PLEASE READ BEFORE USING THIS MANUAL

- This manual is part of the product and should be kept near the instrument for easy and quick reference.
- The instrument shall not be used for purposes different from those described hereunder. It cannot be used as a safety device.
- Check the application limits before proceeding.

1.2 SAFETY PRECAUTIONS

- Check the supply voltage is correct before connecting the instrument.
- Do not expose to water or moisture: use the controller only within the operating limits avoiding sudden temperature changes with high atmospheric humidity to prevent formation of condensation
- Warning: disconnect all electrical connections before any kind of maintenance.
- The instrument must not be opened.
- In case of failure or faulty operation send the instrument back to the distributor or to "DIXELL s.r.l." (see address) with a detailed description of the fault.
- Consider the maximum current which can be applied to each relay (see Technical Data). Ensure that the wires for probes, loads and the power supply are separated and far enough from each other, without crossing or intertwining.
- Fit the probe where it is not accessible by the end user.
- In case of applications in industrial environments, the use of mains filters (our mod. FT1) in parallel with inductive loads could be useful.

2. GENERAL DESCRIPTION

The XC series of the Dixell family of controllers are designed to control the running of small and medium sized multi compressor packs or multi fan condensers.

This flexible and comprehensive range is enhanced by the ability to select the number and size of the capacity stages, the type of action required: direct or inverse, and 3 different functional logics. The XC440, 32 x 74 format, and the XC440D, din rail format, are characterised by the 4 relay outputs for stage control. Alarm conditions are signalled by an internal buzzer and an auxiliary output relay.

The XC460D, din rail format, has 6 output relays for load control, internal buzzer and a 12Vdc/40mA output for alarm signalling.

There is a choice of 2 types of inputs: by PTC sensor for temperature, whilst for pressure there is an input for a transducer (4 - 20mA) powered by the instrument itself (12Vdc/40mA max). As all the models are fitted with a RS485 serial output (TTL) for the external module XJRS485, galvanically insulated for protection against noise, they can form part of a monitoring or alarm system.

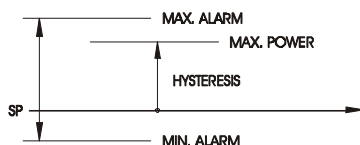
3. CONTROL STRATEGY

3.1 OPERATING LOGIC

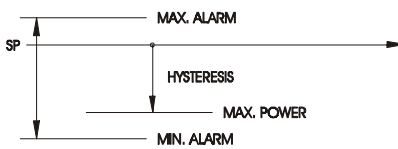
The controller is designed to maintain a target set point. When the process variable varies by more than the point at which a stage is loaded or unloaded then the controller switches ON/OFF the next stage capacity.

The differential is set using the "HY" parameter. This determines the 'bandwidth' above (direct action, cooling, decreasing pressure) or below (inverse action, heating, increasing pressure) the set point to be controlled. The type of regulation required can be selected at configuration stage using the parameter "CH":

- CH=0: direct action, cooling, decreasing pressure:** the stage capacity increases if the input signal from the process variable - temperature or pressure - increases.



- CH=1: inverse action, heating, increasing pressure:** the stage capacity increases if the input signal from the process variable - temperature or pressure - decreases (input signal).



The point at which each stage is loaded or unloaded is calculated by the controller in accordance with the mode selected using parameter "AC".

3.2 LOAD CONTROL. (PAR. AC)

Depending on the mechanics, application and characteristics of the system, one of the following load control methods may be selected:

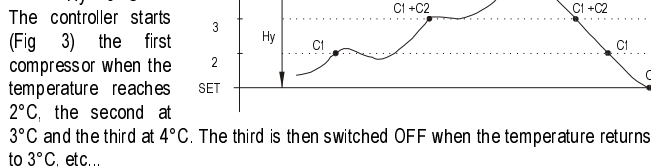
- AC = 0: control by steps with sequential stage activation**
By using the differential the width of the regulation band is determined. This is then automatically divided into as many parts as there are stages. The numbers of stages switched ON is proportional to the value of the input signal: when this distance itself from the target set point and enters the various bands, the compressors are switched ON in sequence, to be then turned OFF in reverse sequence.

E.g. Pack with 3 compressors: C1, C2, C3,

CH=0 direct action:

cooling: SET = 1 °C

Hy = 3 °C



- AC=1: sequential loading with automatic rotation**

This algorithm distributes the working time between the various loads to ensure even run times. As in the preceding case the number of compressors ON is proportional to the value of the input signal however, once the input signal has returned to the set point, and therefore all compressors are OFF, the order for turning on the next sequence of compressors is rotated. (Fig. 4)

E.g. Pack with 3 compressors: C1, C2, C3,

CH=0 direct action: cooling; SET=1; Hy=3

- Order of compressor starts at first request 1-2-3.
- Order of compressor starts at second request 2-3-1.
- Order of compressor starts at third request 3-1-2.

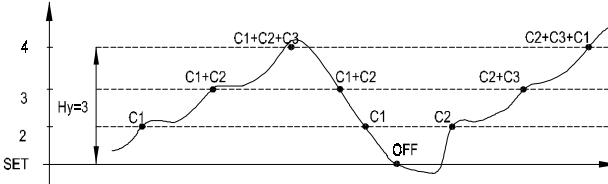
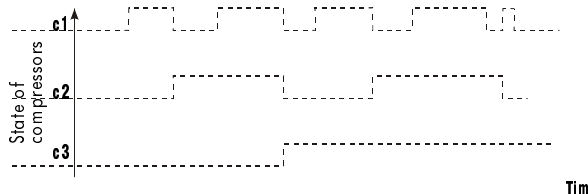
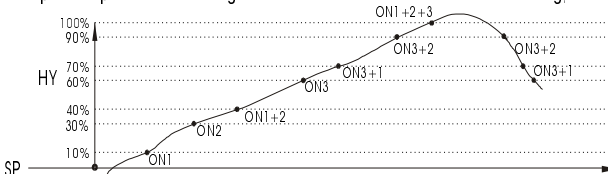


Fig. 4.

- AC=2: Control of loads with un even steps. (available up to 4 loads)**

In this case the number of bands does not depend on the number of stages but on their capacities. In parameters CP1 ...CP4 are memorised the percentage of the total capacity of each stage. The switching ON & OFF of the stages will therefore follow the 'percentage' requirements of the total load available following the convention that at the target set point there is no demand (all stages OFF) and at the "target set point" + "differential" demand is 100% (all stages ON).

E.g. Compressor pack with following characteristics: CH = 0 direct action: cooling, n°C=3;



- Compressor #1 5HP capacity (of total) 10% Param.CP1 = 10
- Compressor #2 15HP capacity (of total) 30% Param.CP2 = 30
- Compressor #3 30HP capacity (of total) 60% Param.CP3 = 60

Compressor stage switching is shown in the following graph. (Note that with the above example there are 7 stages of control using only 3 compressors.)

3.3 AUTOMATIC RECALCULATION OF REGULATING BAND WIDTHS

This function which is set up by param. "IAC" is used in cases when excessive running of the same stage is undesirable as it could lead to uneven run times. It can occur if the stage does not produce a significant effect on the system capacity. When a stage remains ON for a period pre set in param. "IAC" without any other ON/OFF events occurring, the controller automatically recalculates the band widths (differential) and the point at which each stage is loaded or unloaded in accordance with the following formula:

$$Hy2 = Hy1 - (Hy1/n^{\circ}C.)$$

where: Hy2 = new differential value; Hy1 = old differential value
n^{°C}. = number of stages (param. "n^{°C}")

When the set point is reached the old differential value is restored.

4. KEYBOARD CONTROLS

SET: Displays the SET POINT. Pushing & releasing the key will display the set point for 5s.
To modify SET POINT: Press & hold the key for at least 2 sec, this will display the set point and the DOTs of the first and third flashing digits. To modify the value use the ▲ & ▼ keys. Having set a new value this can be memorised by either pressing SET (the display reverts to the variable) or by waiting for the exit time out (15 s).

▲ **UP:** In either programming or "Menu Functioning" mode scrolls the parameter codes or increases the value of the displayed variable. Holding it pressed will increase the speed.
To display the alarms happened: holding it pressed for more than 3 secs during normal running, the code of the first alarm will be displayed. Use the UP and DOWN keys to browse the recorded alarms.

▼ **DOWN:** In either programming or "Menu Functioning" mode scrolls the parameter codes or decreases the value of the displayed variable. Holding it pressed will increase the speed.

🕒 **CLOCK:** Displays the compressor run times. Holding it pressed for 3 secs will display in sequence the hour run times of each compressor.
When a load reaches the maximum run time hours set in the HrCx parameter, the label HrCx is displayed, with x is related to the load.

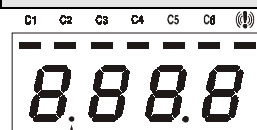
4.1 KEY COMBINATIONS:

▲ + ▼ **Unlocks the keyboard** (after it has been locked by an appropriate function in the menu). Hold them pressed for 3 secs. "POn" will appear flashing on the display for a few seconds and the keyboard will be unlocked.

SET + ▼ **Access to the "Functions Menu"**. Hold pressed for 3 secs.

SET + ▲ **Exit from programming of parameter "Pr1" or "Pr2"**: Holding SET+UP pressed with a parameter displayed will exit programming mode and return to displaying the controlled variable.

4.2 LED FUNCTIONS



On the display there are a number of dots which are illuminated to show an active stage. These are as shown in the following table:

LED	MODE	MEANING
C1	ON	Load 1 ON
C2	ON	Load 2 ON
C3	ON	Load 3 ON
C4	ON	Load 4 ON
C5	ON	Load 5 ON (only XC460D model)
C6	ON	Load 6 ON (only XC460D model)
🔔	ON	Alarm on
🔔	FLASHING	Alarms occurred and stopped
LED1	ON	In "Pr2" indicates the parameter is also present in "Pr1"

If a LED C1 ... C6 flashes the activation of the corresponding relay is requested, but a safety delay (Cd1 or Cd2 or CPd) is passing.

5. MENU FUNCTIONS AND PARAMETER PROGRAMMING

5.1 FUNCTIONS LIST

Includes all the main functions controlled by the instrument.

5.2 ACCESS PROCEDURE:

- The menu is entered by holding the SET and DOWN keys pressed for three seconds. The label of the first function is displayed.
- The UP and DOWN keys are used to cycle backwards or forward in the menu.
- By pressing the SET key the currently displayed function is enabled.

5.3 LIST OF FUNCTIONS

1. "Pr1": includes all user level accessible parameters.
2. "Pr2": includes all the instrument's parameters (at installer level). It can be accessed through a security code. Hence it is possible to modify all parameters and add or remove parameters from "Pr1" (user level) by pressing "SET" + "DOWN". When a parameter is enabled at user level, LED 🔔 (Alarm LED) is on.
3. "LOC": Keyboard lock. When activated "POF" flashes for a few seconds in the display and the keys become disabled. Only the set point can be viewed.
4. "rAL": cancels all the alarm codes arising from the preceding reset. If an alarm is still active the ALARM LED keep on being lighted.
5. "tEST": activates a self test of the instrument. See the Self test function
6. "rESC": the rESC function allows to reset run times for each stage after a maintenance session. It can be accessed through a security code.
7. "OUT": exits from menu

5.4 EXIT FROM FUNCTION MENU

Select "OUT" label and push the SET key. If no key is pressed for more than 15 seconds the instrument reverts to temperature display mode.

5.5 ACCESSING "PR2" OR "RESC", SECURITY CODE INPUT

1. To access parameters in "Pr2" or "rESC" a security code is required.
2. Enter Function Menu, select label "Pr2" or "rESC" and press the "SET" key. The "PAS" flashing message is displayed, shortly followed by "0 - - -" with a flashing zero.
3. Use "UP" or "DOWN" to input the security code in the flashing digit;
4. Confirm the figure by pressing "SET".
5. Repeat operations 2 and 3 for the other digits.
6. If the security code is correct the access to "Pr2" or "rESC" is enabled by pressing "SET" on the last digit, otherwise the security code input process restarts from the beginning.

If key is pressed for more than 15 seconds the instrument reverts to room temperature display mode.

SECURITY CODE is 3210

5.6 PUT PARAMETER INTO "PR1"

NOTE: each parameter in "Pr2" can be removed or put into "Pr1" (user level) by pressing SET+DOWN. In Pr2 when a parameter is present in "Pr1" LED 1 is on.

5.7 CHANGING PARAMETER VALUES

Each parameter is identified by a special alphanumeric code (label).

To change the parameter's value operate as follows:

1. Enter the "Function Menu" and select the parameters' list you require: Pr1 or Pr2.
2. Browse the parameters' list using "UP" or "DOWN" until the required parameter is displayed.
3. Press the "SET" key to display its value.
4. Use "UP" or "DOWN" to change its value.
5. Press "SET" to store the new value and skip to the following parameter.

TO EXIT: Press "SET" + "UP" or wait 15s without hitting a key.

NOTE: the set value is stored even when the procedure is exited by waiting the timeout to expire without pressing "SET".

5.8 RESET THE RUN TIMES FOR A STAGE

To reset the run times of a stage, after a maintenance session, operate as follows:

1. Enter the "Function Menu" and select the "rESC" label.
2. Input the SECURITY CODE (3210).
3. Use UP or DOWN to select the right stage:
E.g. "rC1" is related to the first stage, "rC2" is related to the second stage, etc.
4. Press the SET key to reset the run time of the stage.
5. Repeat operations 2, 3 and 4 for the other stages.

6. LIST OF PARAMETERS

Hy Differential : (0.3 - 50.0 units). Determines the spread of the bandwidth above or below the target set point. The type of regulation required: direct (cooling) or inverse (heating) can be selected at the configuration stage using parameter "CH".

LS Minimum set point: (-80.0 to SET POINT): Sets the minimum value that can be input for the set point, to prevent the end user from setting incorrect temperature values.

US Maximum set point: (from SET POINT to 900.0). Sets the maximum acceptable value for set point.

ALU Upper limit alarm: (from 0.5 to 300 units relative to set point). When the value SET+ALU is reached the alarm is enabled, (possibly after the ALd delay time)

ALL Lower limit alarm: (from -300.0 to -0.5 units relative to set point). When the value SET+ALL (negative) is reached the alarm is enabled, (possibly after the ALd delay time).

ALd Alarm delay: (0 to 255 min) time interval between the detection of an alarm condition and alarm signalling.

Ot Probe calibration: (-30.0 to 30.0 units) allows correction of probe offsets.

- dDS Regulation delay on start-up:** (0 to 255 min) on switching ON the instrument starts working after the time delay imposed in this parameter.
- dSC Start of scale with 4÷20mA input:** (-80.0÷FSC) Adjustment of read out corresponding to 4mA input signal. Only for a current input.
- FSC End of scale with 4÷20mA input:** (dSC÷900.0) Adjustment of read out corresponding to 20mA input signal. Only for a current input.
- Ad1..Ad2 RS485 Serial address:** identifies the instruments within a control or supervising system.
- dIC Digital input configuration:** four operating modes can be selected:
 0 = instrument OFF: the buzzer and alarm output are enabled, the others outputs are placed in OFF position, the message "OFF" is displayed.
 1 = compressor alarm: the buzzer and the alarm output are enabled, the others outputs are placed in OFF position, the flashing message "CAL" is displayed.
 2 = generic alarm: the buzzer and the alarm output are enabled, the flashing message "EA" is displayed, the other outputs are not modified;
 3 = Alarm mute: the buzzer and alarm output are disabled, the alarm message is displayed until the alarm condition lasts. Disabling can be inhibited by setting "tbA" to 0 in which case the alarm relay remains active as long as the alarm condition lasts.
- dId Digital input delay:** (0 - 255 secs.) delay between receipt of digital input and activation of function requested.
- nC Number of stages:** (0 - 4 for XC440C and XC440D; 0 - 6 for XC460D) Sets the number of stages available.
- AC Stage control method:** (0 - 2 up to four stages; 0 - 1 from five to six stages) selects the method for activating the stages:
 0 = sequential step control
 1 = sequential step control with automatic rotation
 2 = control of uneven stages (available up to 4 stages)
- CP1 Percentage of stage capacity 1:** (1 - 99) percentage of first stage in relation to the total capacity.
- CP2 Percentage of stage capacity 2:** (1 - 99) percentage of second stage in relation to the total capacity.
- CP3 Percentage of stage capacity 3:** (1 - 99) percentage of third stage in relation to the total capacity.
- CP4 Percentage of stage capacity 4:** (1 - 99) percentage of fourth stage in relation to the total capacity.
- Cd1 Minimum time delay between switching ON of 2 different stages:**
 (0 - 250 secs.) prevents too rapid start-up between stages.
- Cd2 Minimum time delay between switching OFF of 2 different stages:**
 (0 - 250 secs.) prevents too rapid stopping between stages.
- Cd3 Minimum time delay between switching ON of 2 successive cycles:** (0 - 250 secs.) prevents too rapid start up of successive cycles (a cycle ends when all stages are OFF). Valid only when AC = 0 or 1.
- Cd4 Minimum time a stage stays switched ON:** (0 - 250 secs.) minimum time a stage can remain ON.
- CPd Anti-short cycle protection:** (0.0 to 30.0 mins; resolution 10s) minimum time delay between a switch OFF and the next switch ON of the same compressor relay output.
NOTE: with AC=1 (sequential step control with automatic rotation) after a switching OFF all the relays the time set in this parameter has to pass before starting a new cycle.
- HrC Hours run time check:** (0 - 9990 hours, resolution 10 hours, setting the hours to 0 disables this function) Sets the run hours for a stage after which a "maintenance due" signal is generated.
- IAC Excessive stage run time elimination:** (0.0 - 25.3 hours; resolution 30 mins.; with 0.0 the function is disabled) Determines the maximum time a stage can remain ON without the switching ON or OFF of any other stages. At the end of this set time the control band widths (differentials) are recalculated in accordance with the formula in para. 3.3.
- Ptb Parameter table:** (read only) shows the factory default settings.
- rEL Software release:** (read only) shows the software release.
- rES Resolution:** (0 = 1 unit; 1 = 0.1 unit) sets decimal point display. This is not possible with Fahrenheit degrees.
NOTE: When the display is changed from "with decimal point" to "without decimal point" check the parameters "HY", "ALU" and "ALL".
- CF Temperature measurement unit:** 0 = Celsius; 1 = Fahrenheit.
- CH Type of Regulation:** CH = 0 direct action (cooling, decreasing pressure); CH = 1 inverse action (heating, increasing pressure).
- tbA Buzzer and alarm relay silencing:** (0 = mute disabled, 1 = mute enabled).
- dAo: Alarm probe exclusion:** It is enabled only for instrument with 4÷20mA input. It is the period, before an alarm probe is signalled. (0÷255 min). During this time if the pressure is out of range all the compressors are switched on.

7. DIGITAL INPUT

7.1 DIGITAL INPUT FOR ALARM CONFIGURATION

- The type of function activated by the digital input depends on the setting of parameter "dIC". The operating method of the instrument is according to the option selected:
dIC=0 instrument OFF: the buzzer and alarm output are enabled, the others outputs are placed in OFF position, the "OFF" message is displayed.
dIC=1 compressor alarm: the buzzer and the alarm output are enabled, the others outputs are placed in OFF position, the flashing message "CAL" is displayed;
dIC=2 Generic alarm: the buzzer and the alarm output are enabled, the flashing message "EA" is displayed, the other outputs are not modified;

- dIC=3 Alarm mute:** the buzzer and alarm output are disabled, the alarm message is displayed until the alarm condition lasts. Disabling can be inhibited by setting "tbA" to 0 in which case the alarm relay remains active as long as the alarm condition lasts.

8. MOUNTING & INSTALLATION

Model XC440C is panel mounted, hole dims 29x71 mm, and fixed with the supplied clips. The ambient working temperature range should be between 0÷60°C. Models XC440D and XC460D are mounted on Omega Din rail. Avoid locations subject to heavy vibration, corrosive gases or excessive dirt. The same applies to the probes. Ensure ventilation around the instrument.

9. ELECTRICAL CONNECTIONS

The instruments are provided with a screw terminal block to connect cables with a cross section up to 2.5 mm². Before connecting cables make sure the power supply complies with the instrument's requirements. Separate the input connection cables from the power supply cables, from the outputs and the power connections. Do not exceed the maximum current allowed on each relay, in case of heavier loads use a suitable external relay.

9.1 PROBES CONNECTION

Pressure probe (4 - 20 mA): respect the polarity. If using terminal ends be sure there are no bear parts which could cause short circuiting or introduce noise disturbance at high frequencies. To minimise the induced disturbances use shielded cables with the shield connected to earth.

Temperature probe: it is recommended to place the temperature probe away from direct air streams to correctly measure the average temperature.

10. RS485 SERIAL LINK

Models XC440C, XC440D and XC460D can be integrated into the monitoring and alarm system XJ500 using the TTL port to connect to an external XJRS485 module that provides a standard RS485 output.

11. ALARM SIGNALS

MESSAGE	CAUSE	OUTPUTS
PF (flashing)	Probe failure	- Alarm output ON
HA (flashing)	Maximum alarm	- Alarm output ON - Other out. do not change
LA (flashing)	Low alarm	- Alarm output ON - Other out. do not change
OFF (flashing)	External switch (Digital input) closed	- Alarm output ON - Other outputs OFF
CAL (flashing)	External switch (Digital input) closed	- Alarm output ON - Other outputs OFF
EA (flashing)	External switch (Digital input) closed	- Alarm output ON - Other out. do not change
Hr1..Hr6 (flashing)	Compr. #1 .. #6 working time more than value set on HrC par.	- Alarm output ON - Other output do not change

11.1 STATUS OF THE ALARM RELAY FOR XC440C

Status of the instrument	Status of the alarm relay
Instrument OFF; Alarm occurring	Open
Instrument ON	Closed

11.2 ALARM "EE"

The instruments in the Dixell range are provided with an internal check verifying data integrity. Alarm "EE" flashes when a failure in the internal memory is detected. In such case the alarm output enabled.

WHAT TO DO

- Cancel the alarm by pressing a key.
- Check the value of all parameters and restore correct values when wrong.
- Check the correct instrument operation and in case of further errors call the service.

11.3 ALARM MUTE/ ALARM RELAY OUTPUT

Once an alarm condition is signalled the buzzer and external output can be disabled by pressing any key. However the display code continues until the alarm conditions have been removed. Disabling can be inhibited by setting "tbA" to 0 in which case the alarm relay remains active as long as the alarm condition lasts.

11.4 SIMULTANEOUS ALARMS

Should there be more than one alarm at a time, the last alarm will be displayed. Once the buzzer/alarm relay output has been silenced, the most important alarm will be displayed in the following order: EE, PF, CALL, OFF, HA, LA, EA, HRC1... HRC6.

11.5 ALARM RESETS

The alarm "PF" is activated 30 seconds after the probe goes faulty and resets automatically 30 seconds after the probe is rectified. Check connections before changing probes. The alarms "HA" and "LA" automatically reset when the process variable returns to normal. The alarms "EA", "CAL" and "OFF" reset as soon as the external digital input is disabled. The regulation restarts after 20s.

Alarms "HrC1"... "HrC6" are reset by means of selecting the parameter "rC..." contained in the "rESC" function.

12. SELF DIAGNOSIS

The device self test can be forced by triggering function "tEst" in the Function Menu.

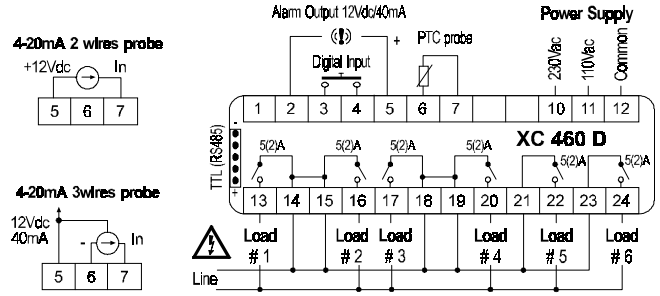
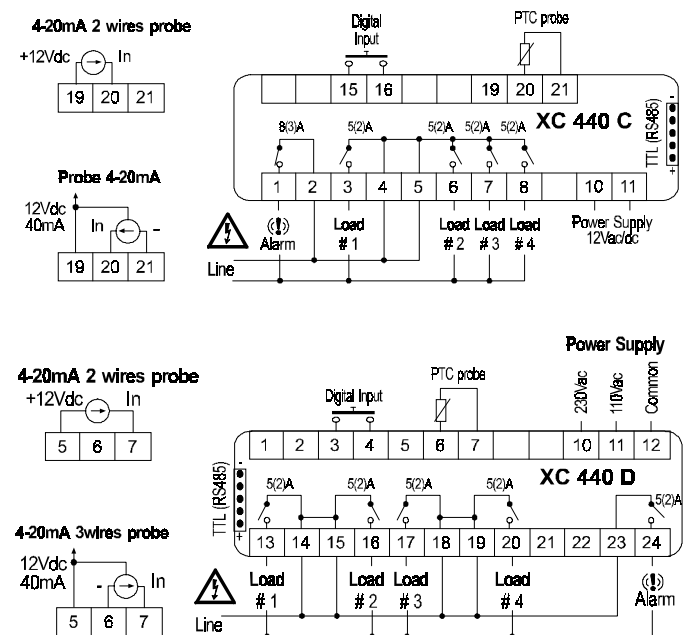
Self test process:

- 1) Each segment or decimal point is turned on alternatively;
 - 2) Digital input test:
 - if a key is pressed the "Fx" message is displayed (x = number of the key pressed).
 - If the digital input is enabled the "dIG" message is displayed.
 - 3) The parameters and relative values are displayed, in sequence.
- Once the self test cycle is over the instrument restores normal operation.

13. TECHNICAL DATA

Housing: self extinguishing ABS.
Case: XC440C: frontal 32x74 mm; depth 70mm;
 XC440D, XC460D: 4 DIN modules 70x85 mm; depth 61mm.
Mounting: XC440C: panel mounting in a 71x29 mm panel cut-out.
 XC440D, XC460D: DIN RAIL mounted in a omega (3) din rail
Frontal protection: XC440C IP65
Connections: Screw terminal block ≤ 2.5 mm² wiring.
Power supply: XC440C: 12Vac/dc, -10% +15% 50/60Hz.
 XC440D, XC460D: 110/230Vac, ± 10% 50/60Hz (opt. 24Vac, ± 10% 50/60Hz).
Power absorption: 3VA max.
Display: 4 digits, red LED, 10 mm high.
Inputs: PTC probe or 4÷20mA active probe according to the order.
Relay outputs:
 Load 1, 2, 3, 4: SPST relay, 5(2)A, 250Vac
 Load 5, 6: SPST relay, 5(2)A, 250Vac (only on model XC460D)
Alarm output: XC440C: SPST relay, 5(2)A, 250Vac (normally closed)
 XC440D: SPST relay, 5(2)A, 250Vac
 XC460D: 12Vdc/40mA output
Other output: Buzzer for acoustical alarm
Serial output: TTL serial output for external serial module XJRS485 that provides a standard RS485 output
Data storing: on the non-volatile memory (EEPROM).
Operating temperature: 0÷60 °C.
Storage temperature: -30÷85 °C.
Relative humidity: 20÷85% (no condensing)
Measuring range: PTC probe: -50÷130 °C (-58÷266 °F)
 4÷20mA input: according to the probe.
Resolution: PTC probe: 0.1 °C – 1 °C – 1 °F selectable
 4÷20mA input: with or without decimal point (selectable).
Controller Accuracy a 25°C: PTC probe: ±0.3 °C ±1 digit (range -55÷50 °C)
 4÷20mA input: depending on probe

14. CONNECTIONS



15. DEFAULT SETTING VALUES - STANDARD MODELS

PAR	NAME	RANGE	LEVEL	°C/°F	bar	bar	PSI
					0,5÷7	0÷30	
Set	Set point	LS ÷ US	Pr1	-30.0/-22	1.0	23.0	14
Hy	Differential	0.3 ÷ 50.0	Pr2	5.0/9	0.5	1.0	7
LS	Minimum Set	-80.0 ÷ Set	Pr2	-50.0/-58	0.0	6.0	0
US	Maximum Set	Set ÷ 900.0	Pr2	10.0/50	7.0	30.0	100
ALU	Upper limit alarm	0.5 ÷ 300.0 (rel. Set)	Pr2	15.0/27	5.0	6.0	72
ALL	Lower limit alarm	-300.0 ÷ -0.5 (rel. Set)	Pr2	-10.0/-18	-1.0	-6.0	-14
ALd	Alarm delay	0 ÷ 255	Pr2	15	15	15	15
Ot	Probe calibration	-30.0 ÷ 30.0	Pr2	0.0/0	0.0	0.0	0
OdS	Regulat. delay on start-up	0 ÷ 255	Pr2	1	1	1	1
dSC	Start of scale with 4÷20mA input	-80.0 ÷ FSC	Pr2	--	-0.5	0.0	0
FSC	End of scale with 4÷20mA input	dSC ÷ 900.0	Pr2	--	7.0	30.0	100
Ad1	RS485 Serial address	0 ÷ 94	Pr2	0	0	0	0
Ad2	RS485 Serial address	0 ÷ 94	Pr2	1	1	1	1
dIC	Digital input configuration	0=OFF; 1=compr alarm; 2=generic alarm 3= alarm mute.	Pr2	1	1	1	1
did	Digital input delay	0÷255	Pr2	60	60	60	60
n°C	Number or load	0÷4 o 6	Pr2	4 or 6	4 or 6	4 or 6	4 or 6
AC	Stage control method	0= in sequence; 1= automatic rotation 2=uneven step	Pr2	1	1	0	1
CP1	Perc. of stage capacity 1	1÷99	Pr2	25	25	25	25
CP2	Perc. of stage capacity 3	1÷99	Pr2	25	25	25	25
CP3	Perc. of stage capacity 3	1÷99	Pr2	25	25	25	25
CP4	Perc. of stage capacity 4	1÷99	Pr2	25	25	25	25
Cd1	Minimum time delay between switching ON of 2 different stages	0÷250	Pr2	150	150	5	150
Cd2	Minimum time delay between switching OFF of 2 different stages	0÷250	Pr2	15	15	5	15
Cd3	Minimum time delay between switching ON of 2 successive cycles	0÷250	Pr2	15	15	5	15
Cd4	Minimum time a stage stays switched ON	0÷250	Pr2	240	240	240	240
CPd	Anti-short cycle protection	0.0÷30.0	Pr2	1.0	1.0	0.2	1.0
HrC	Hours run time check	0÷9990	Pr2	9990	9990	9990	9990
IAC	Excessive stage run time elimination	0.0÷25.3	Pr2	0.0	0.0	0.0	0.0
Ptb	Parameter table	---	Pr2	--	--	--	--
rEL	Software release	---	Pr2	1.7	1.7	1.7	1.7
rES	Resolution	0=1 units 1= 0.1 units	Pr2	1	1	1	0
CF	Temperature measurement unit	0=°Celsius 1=°Fahrenheit	Pr2	0/1	--	--	--
CH	Type of Regulation	0= direct; 1= reverse	Pr2	0	0	0	0
tbA	Buzzer and alarm relay silencing	0=enabled; 1=disabled	Pr2	1	1	1	1
dAo	Alarm probe exclusion at power on	0÷255min	Pr2	-	30	30	30

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