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spirax sarco

PLC Unit Control for CSM-K Clean Steam Generators Installation, Operation and Maintenance Manual

The PED Directive 97/23/EC is repealed and replaced by the new **PED Directive 2014/68/EU** with effect from 19 July 2016.

The ATEX Directive 94/9/EC is repealed and replaced by the new **ATEX Directive 2014/34/EU** with effect from 20 April 2016.

ATTENZIONE

Lavorare in sicurezza con apparecchiature in ghisa e vapore
Working safely with cast iron products on steam

Informazioni di sicurezza supplementari - *Additional Informations for safety*

Lavorare in sicurezza con prodotti in ghisa per linee vapore

I prodotti di ghisa sono comunemente presenti in molti sistemi a vapore.

Se installati correttamente, in accordo alle migliori pratiche ingegneristiche, sono dispositivi totalmente sicuri.

Tuttavia la ghisa, a causa delle sue proprietà meccaniche, è meno malleabile di altri materiali come la ghisa sferoidale o l'acciaio al carbonio.

Di seguito sono indicate le migliori pratiche ingegneristiche necessarie per evitare i colpi d'ariete e garantire condizioni di lavoro sicure sui sistemi a vapore.

Movimentazione in sicurezza

La ghisa è un materiale fragile: in caso di caduta accidentale il prodotto in ghisa non è più utilizzabile. Per informazioni più dettagliate consultare il manuale d'istruzioni del prodotto.

Rimuovere la targhetta prima di effettuare la messa in servizio.

Working safely with cast iron products on steam

Cast iron products are commonly found on steam and condensate systems.

If installed correctly using good steam engineering practices, it is perfectly safe.

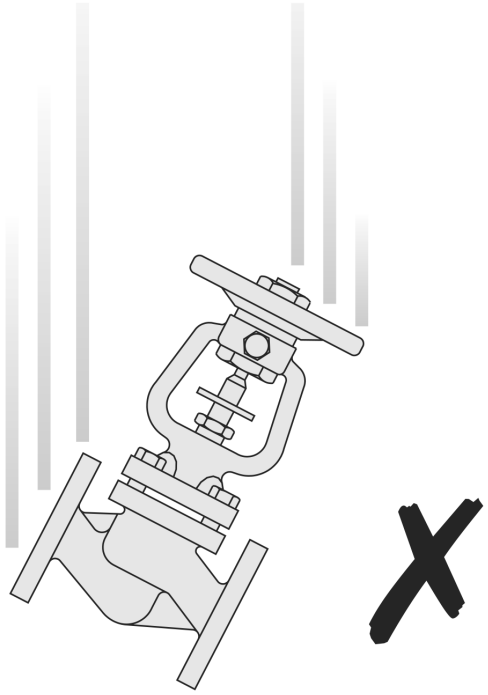
However, because of its mechanical properties, it is less forgiving compared to other materials such as SG iron or carbon steel.

The following are the good engineering practices required to prevent waterhammer and ensure safe working conditions on a steam system.

Safe Handling

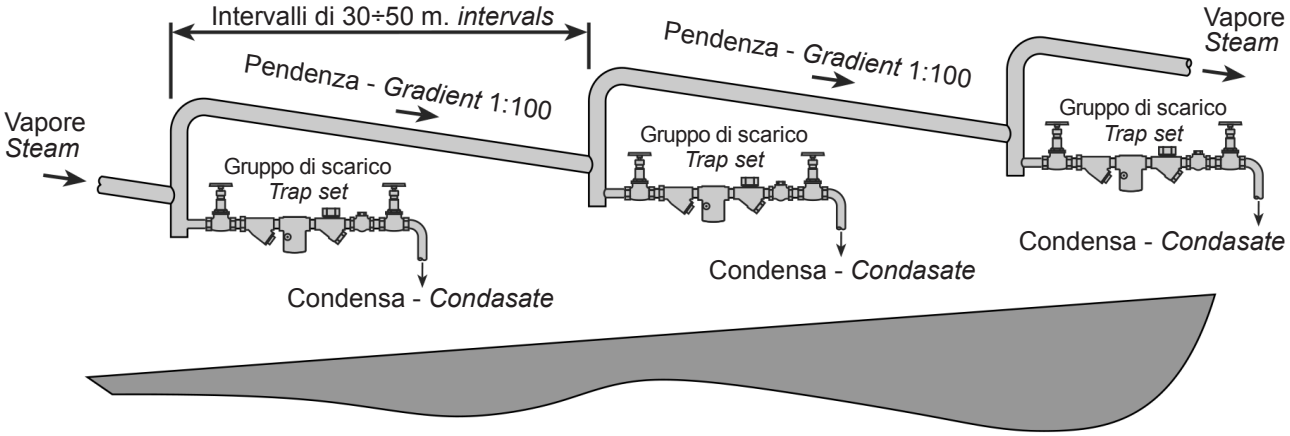
Cast Iron is a brittle material. If the product is dropped during installation and there is any risk of damage the product should not be used unless it is fully inspected and pressure tested by the manufacturer.

Please remove label before commissioning

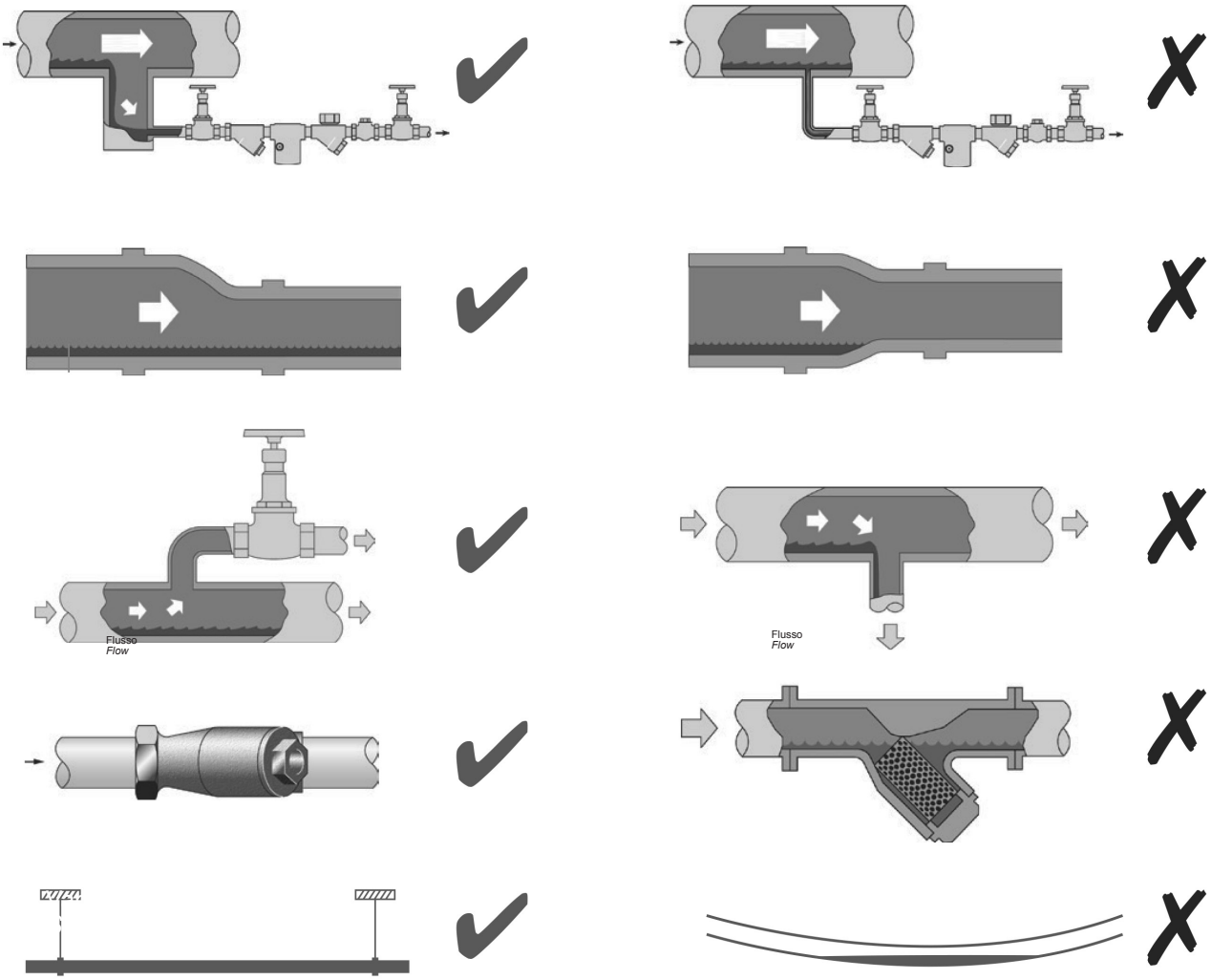


Prevenzione dai colpi d'ariete - *Prevention of water hammer*

Scarico condensa nelle linee vapore - *Steam trapping on steam mains:*



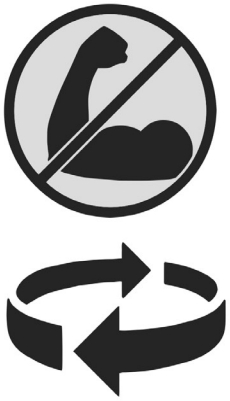
Esempi di esecuzioni corrette (✔) ed errate (✗) sulle linee vapore: *Steam Mains - Do's and Dont's:*



Prevenzione delle sollecitazioni di trazione
Prevention of tensile stressing

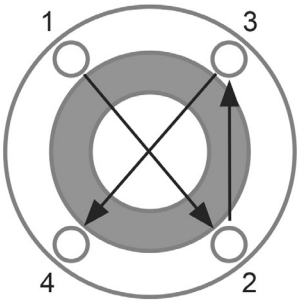
Evitare il disallineamento delle tubazioni - *Pipe misalignment:*

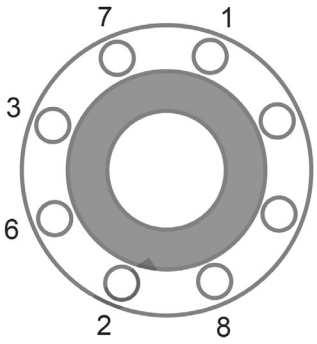
Installazione dei prodotti o loro rimontaggio post-manutenzione:
Installing products or re-assembling after maintenance:



Evitare l'eccessivo serraggio.
Utilizzare le coppie di serraggio raccomandate.

Do not over tighten.
Use correct torque figures.





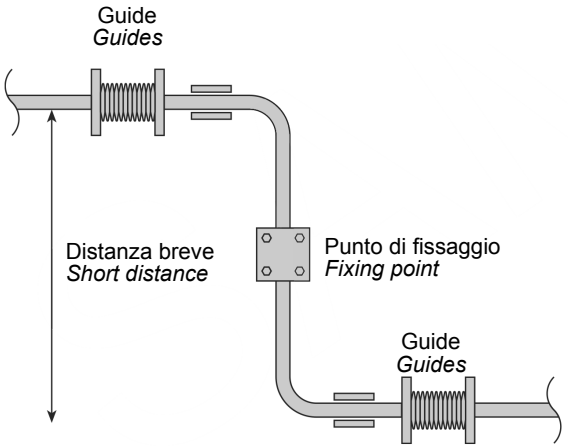
Per garantire l'uniformità del carico e dell'allineamento, i bulloni delle flange devono essere serrati in modo graduale e in sequenza, come indicato in figura.

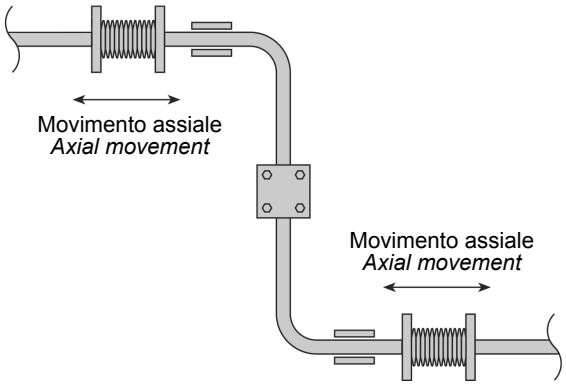
Flange bolts should be gradually tightened across diameters to ensure even load and alignment.

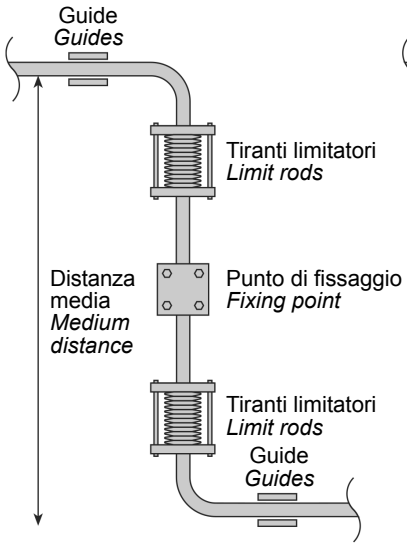
Dilatazioni termiche - *Thermal expansion:*

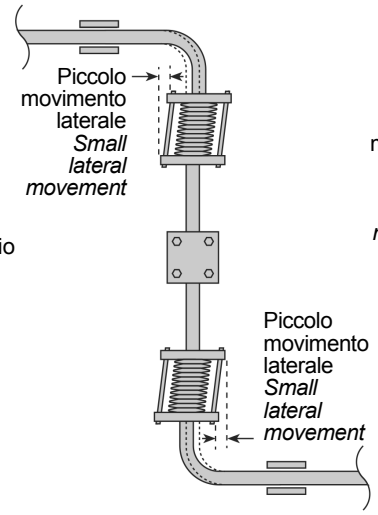
Gli esempi mostrano l'uso corretto dei compensatori di dilatzione. Si consiglia di richiedere una consulenza specialistica ai tecnici dell'azienda che produce i compensatori di dilatazione.

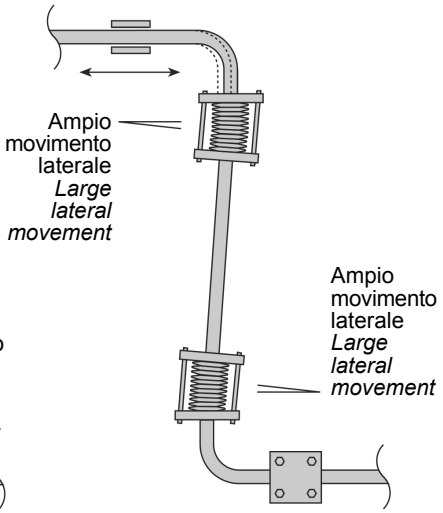
Examples showing the use of expansion bellows. It is highly recommended that expert advise is sought from the bellows manufacturer.











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Limits of Responsability

This manual covers the procedures for the Installation, Operation and Maintenance of the PLC unit for the control of indirect Steam Generator Systems. This manual is intended to be as complete and up to date as possible. SPIRAX SARCO reserves the right to update it at any time and without obligation to notify product owners of such changes.

Responsabilities

SPIRAX SARCO is not responsible for inaccuracies in specifications, procedures and / or the content of other product literature supplied by the manufacturers of components used on SPIRAX Steam Generators. For manufacturing and control of Steam Generators SPIRAX SARCO utilizes only high quality components. In case of a complete supply of a system SPIRAX SARCO will take full system responsibility. Where instead SPIRAX SARCO has no direct control on other manufacturers and their quality level the responsibility will be assumed only for the supplied parts.

Note: the symbol points out the "Warnings"

⚠ **SPIRAX SARCO is not responsible for injury to personnel or product damage due to improper actions and procedures used for installation, operation and maintenance.**
These procedures should only be performed by trained and certified personnel. Prior to attempt these procedures the personnel should completely and carefully read and understand this manual and other applicable manuals for all supplied products. All personnel should also pay strict attention to all Notes, Cautions and Warnings described in this manual.

⚠ **In case SPIRAX SARCO supplies a Steam Generator without any auxiliary control equipment, this manual is applicable only for the Generator part. The main contractor of the system will then assume the responsibility for the supplied components, for their relevant manuals and for the complete generation system.**

Information

This manual has been conceived as an operating guide for the control unit of SPIRAX SARCO Steam Generators. Since every unit is built according to customer specifications, the manual instructions might sometimes appear too general and incomplete. Additional specific notes will be supplied when the procedures substantially differ from those included in the standard manual.

Should this manual not respond to all questions or the procedures are not clearly comprehensive, the user is invited to contact SPIRAX SARCO for any clarification.

Warnings

In the following pages several points with specific warnings are listed. Warnings are moreover repeated when the procedures refer to areas of potential hazard.
All warnings and relevant precautions have to be carefully studied and followed to reduce the risk of injury during operations of Installation, Start-up and Maintenance.

⚠ **Every product or system using steam, diathermic oil, superheated water under pressure or electric power can represent a potential hazard to personal injury when procedures are not properly followed.**

⚠ **The simultaneous presence of water and electric power can generate hazardous conditions.**

⚠ **Areas with potential hazard**

1. **All connections and electric cables**
2. **All steam lines, valves, joints and pressure controllers**
3. **All steam lines, diathermic oil or superheated water, valves, joints and pressure controllers**

Connections of main power supplies

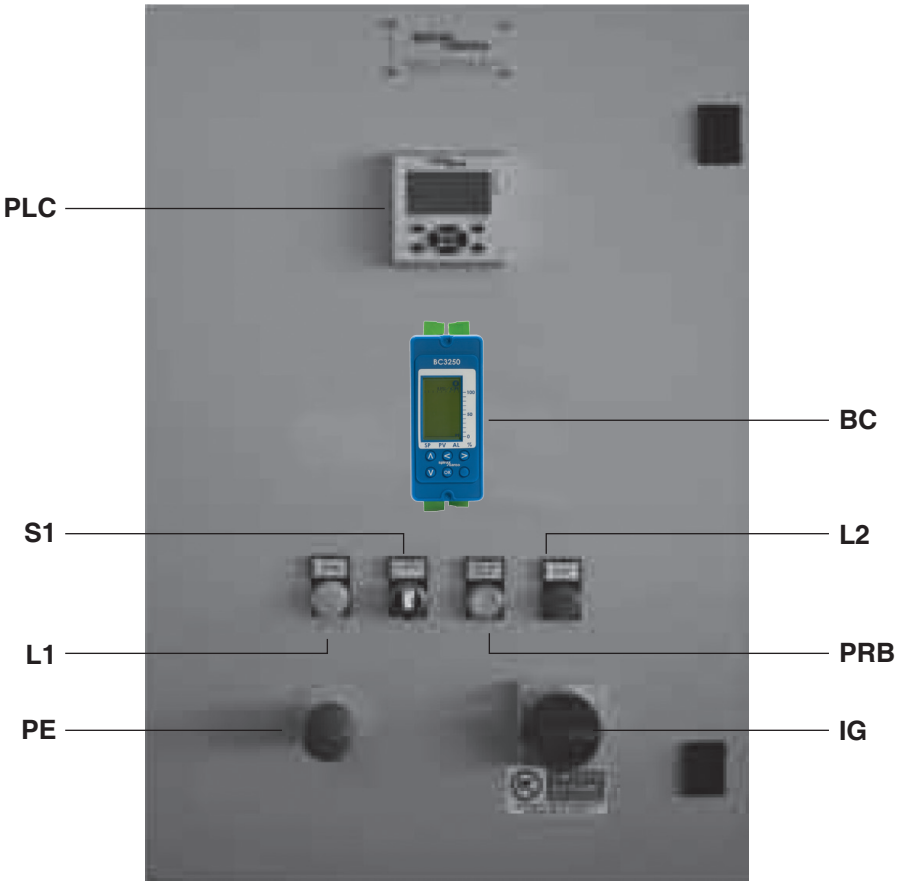
All procedures for the connections of main power supplies have to be performed by trained and qualified electrical personnel. The PLC unit for the control of SPIRAX SARCO Steam Generators are designed to be installed in covered locations, unless otherwise specified by the customer.

⚠ **Make sure to disconnect power before starting any operation of installation or maintenance.**

Control Unit

Description

The control and safety unit is a PLC type intelligent equipment designed to start-up, control and operate indirect steam generation systems, either in local mode or by ultimate means of a remote system.



Location and identification of components

Front Panel

IG: Main power switch
This power disconnect device is equipped with a door locking handle that breaks the three phases of the input voltage and allows to open the cabinet door only when is in “OFF” position.

⚠ **Attention: the user must provide an external stop circuit outside of the drive circuitry. The circuit must disable the system in case of improper operation or for unit maintenance. Failure to observe this precaution could result in a hazardous situation or in body injury for employed personnel.**

PE: Pushbutton
Emergency stop pushbutton.

L1: Led Indicator
When lit (white light) it indicates that the unit is powered.

S1: Selector
Two (lockable) position selector to select:
- Manual Control
- Automatic Control

PRB: Pushbutton
Manual reset pushbutton (after shutdown)

L2: Led Indicator
When lit (blinking red light) it indicates that the system is stopped due to intervention of one or more alarms.

BC
Measurement Unit of Total Dissolved Solids (TDS).

PLC
PLC Control Unit

Control Features

The PLC based unit is designed to provide control of Pressure, Water Level, Discharge and operation of Blow-down function and of all Alarm limits of SPIRAX SARCO indirect steam generators.
The control unit is equipped with a video interface displaying screens with graphics of the generator and also selective parts, e.g. error and functional messages, etc.
Set point values can be displayed and modified during operation using functional keys.

Screen 1

Two LED's respectively indicate the RUN status of the program (Green light) and the presence of one alarm at least (Red light). The control unit enables the setting of all operating parameters by means of different display screens. The PLC also provides a visual alarm signal.

In addition to the automation of a single generator, the system allows the achievement of computerized networks with PC's, PLC's and microprocessor based systems thus permitting a high level of integration among automation systems applied to the various units present in the plant. The supervision system can be considered in terms of visualization of data relevant to equipment, configuration and production control. The control unit is equipped with a main power switch and is housed in a metal cabinet with protection degree IP54 and with dimensions of 700x500x250mm.

External Connections

All electrical connections have to be carried out by trained and qualified installation electricians. It is important to verify that the main power switch is in “OFF” position before connecting the line voltage. The installer has to route the power cables, reach the terminals located on the main power switch mounted on the panel and run the ground wire to the earth ground terminal. For the feed voltage see the electric diagram inside the control board.

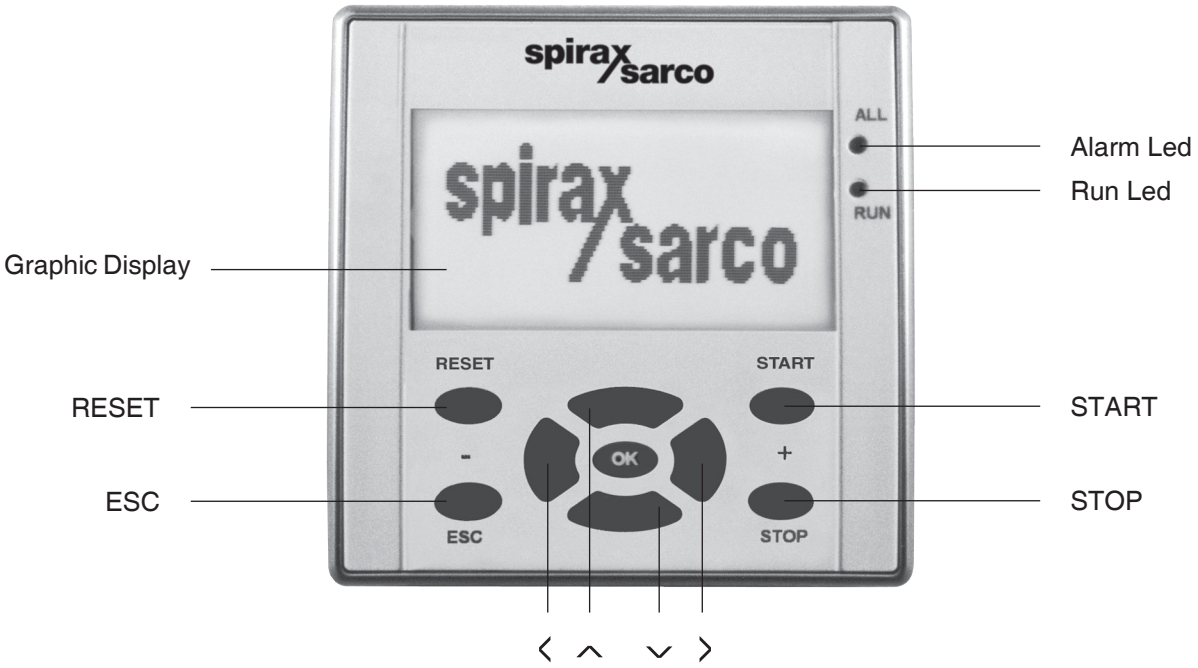
⚠ Attention: Prior to drilling a hole in the panel for the connection of power cables, carefully open the panel door and verify there are no impediments inside the panel. Make sure to avoid contacts with drilling residuals or with any mechanical part left on the base or on the transformer or on the switch.

Main Power Supply

Input voltage: 220 V ac – 50 Hz
Output contacts: 3 A – 220 V for inductive loads
Output contacts: 6 A – 220 V for resistive loads
Operational ambient temperature: Min –20°C, Max 55 °C
Relative Humidity (RH): from 5% to 95% non condensing
LCD Display with energy saving dimmer function: 4 lines each with 16 characters

Display and Keyboard

Nine keys are located on the lower part of the panel just below the display.



Screen 2

Initial Screen

Powering the unit the display will show this screen:

Screen 3

Pressing the ⌄ key Screen 4 will be displayed.

Screen 4

Note: in this image is shown the firmware installed

Pressing again the ⌄ key the Screen 4 will be displayed where in sequence it is possible to select one out of four operation modes (Manual – Automatic – Historical alarms – Parameters).

Press the ⌄ and ⌃ keys to move down and up for selection of the desired operation mode. Press then the OK key to confirm and store the choice and enter the selected mode.

Screen 5

"Manual" Mode

Manual operation mode: general considerations

Upon selection of the manual operation mode and by pressing ∧ and ∨ keys, it is possible to scroll and access into subsequent pages in order to insert other functions, simultaneously maintaining in operating condition the previously selected functions.
Otherwise, when it is necessary to disable the selected function before enter others, press the 〈-(OFF) 〉 key till the achievement the "0" value of the defined set.

Press ESC key to clear all operating functions with a single operation, and to return to the screen displayed in Screen 5 (operating mode).

During manual operations the block (latching) alarm devices (safety) are active and operating.

All the working functions can be resetted by pressing the emergency key, and the alarm condition is displayed.

Screen 6

Reactivate the previously pressed emergency key to restart the normal operation.

Manual set-up of feed water

⚠The level transmitter fitted into the equipment has an employment field defined with the specification of each steam generator. It is essential that the employment field of the transmitter is the same of the one setted to the controller.

There are different control typologies:

1) ON-OFF operation level (Sensilevel) and ON-OFF feedwater valve

Select the next screen by setting the “automatic-manual” key in “manual” position

Screen 7

To activate the valve opening, push the button + (ON), and press – (OFF) to shut it.
During the manual operating, when the functioning level is achieved is displayed on the screen but it doesn’t control the valve shutting. The isolated valve condition is achieved by pressing the – (OFF) button.
The open valve condition is identifiable on the screen by the valve’s image fully pointed out and the notice “feed water” in reverse.

In any case, manual operation is provided with block (latching) alarm devices. These alarms will close the valve while on the screen will be displayed the typology of the anomaly and the lighting of the warning light. For latching alarms, before opening the valve it is necessary to eliminate the cause of the alarm, then push the button in reset blocks front panel.

2) ON-OFF operation level (Sensilevel) and water pump

Select the next screen by setting the “automatic-manual” key in “manual” position:

Screen 8

Press the + (ON) key to activate the pump and the – (OFF) key to stop it.
During the manual operation the functioning level is displayed when achieved, but it doesn’t control the stop of the pump. The stop pump condition is obtained by pushing the – (OFF) key. The motion pump condition is identifiable on the screen by the pump’s image outlined and the notice is without reverse.
In any case, manual operation is provided with block (latching) alarm devices. These alarms will provide the stop of the pump while the screen will display the typology of the anomaly and the lighting of the warning light. For latching alarms, before activating the pump it is necessary to eliminate the cause of the alarm, then push the reset blocks button.

3) Continuous operating level (4-20 mA) and ON-OFF water control valve

Act as step 1).

4) Continuous operating level (4-20 mA) and water pump

Act as step 2).

5) Continuous operating level (4-20 Ma) and modulating water control valve

Select the next screen by setting the “automatic-manual” key in “manual” position:

Screen 9

To activate the valve opening push the button + (ON), and press – (OFF) to shutoff it.

Repeatedly pushing the + button it is possible to choke the valve opening (in %) to obtain the continuative level control also in manual mode.
During manual operation, the functioning level, when reached, is displayed (in mm) but it doesn’t control the shutoff of the valve. The shutoff valve condition is obtained by pushing the button – (OFF) up to the “0” percentage. The open valve condition is observable on the screen by the valve’s image fully pointed out and the notice “feed water” in reverse.
The shutoff valve condition is identifiable on the screen by the valve’s image contour outlined, and the notice is without reverse.
In any case, manual operation is provided with block (latching) alarm devices. These alarms will close the valve while on the screen will be displayed the typology of the anomaly and the lighting of the warning light. For latching alarms, before opening the valve it is necessary to eliminate the cause of the alarm, then push the button in reset blocks front panel.

Manual control of the Pressure

⚠ **The supplied pressure transmitter has a working range defined by the specifications of each generator. Normal ranges are 0 - 3, or 0 – 10 bar. It is important that the working range of the transmitter matches that programmed in the control unit.**

For manual control of the pressure valve proceed with the following steps:
Turn the “cycle” selector into position (Manual control) and select Screen 10 (Pressure control).

Screen 10

If the selector is turned in position (Automatic control) an alarm status is obtained as displayed on Screen 11. In these situations switch the selector in position “0” to reach the condition displayed on Screen 3.

Screen 11

Select Screen 10 with ∧ and ∨ keys.
Press (+) > and < (-) keys to increase or decrease the pressure of the generated steam. The display will indicate the opening value of the valve in % and the steam pressure value in bar. When the required value of the position exceeds the limit of "0", the on-off solenoid valve of the primary steam will be open. Meanwhile the screen will show the complete graphic of the valve to indicate the working condition of the same.
The stoppage and the closure of the isolation valve of steam are instead indicated with the external profile only of the valve graphic.

During the operation the following alarm conditions can occur. For example:

- transmitter alarm
- maximum level alarm
- minimum level alarm
- maximum pressure alarm

Screen 12

Screen 13

In case of any alarm condition, e.g. that of Screen 12 and 13, the isolation valve of the steam will be closed. The operation will be stopped and the lamp of general alarm will light up.

To acknowledge the alarm press the RESET key. Screen 4 will be displayed (manual control of feed water) whilst the general alarm remains active. It is necessary to remove the cause of the alarm before reopening the valve. Press then the external Manual Reset pushbutton.

Press the ∧ and ∨ keys to access Screen 10, then press the < (-) and (+) > keys to resume the operation of the valve.

Manual control of the Bottom Blowdown Valve

For manual control of the bottom blowdown valve proceed with the following steps:

Turn the “cycle” selector into position (manual control) and select Screen 14 (bottom blowdown control). If the selector is turned in position (Automatic control) an alarm status is obtained as displayed on Screen 15. In these situations switch the selector in position to reach the condition displayed on Screen 7.

Screen 14

Screen 15

Select Screen 14 with ^ and v keys.

Press (ON) > and (OFF) < keys to open or close the bottom blowdown valve.

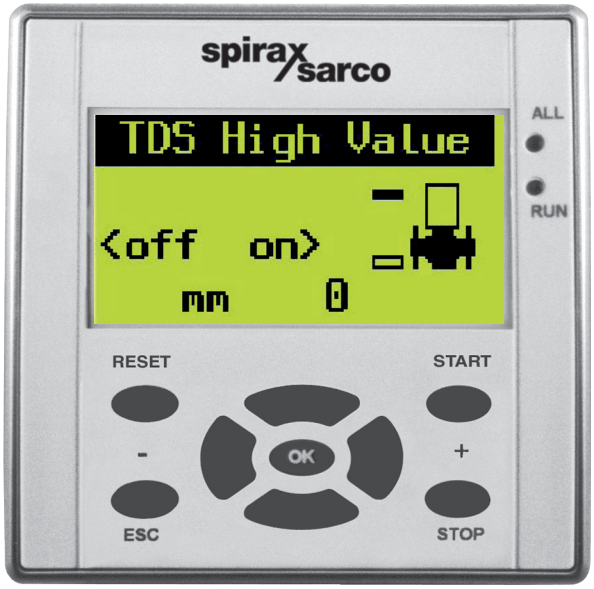
When the valve is closed (travel limit switch ON is active) the external profile only of the valve graphic will be displayed. When instead the valve is open (travel limit switch OFF is active) the screen will show the complete graphic of the valve.

After a command to open or close the valve, the achievement of the travel limit is verified.
If after few seconds the intervention of the travel limit does not occur (the valve has not reached the open or closed position after the correspondent command) the general alarm is generated (Screen 16) and its associated lamp will light up.

Screen 16

Manual control of the blow-down valve

The control of the Total Dissolved Solids (TDS) is carried out by a specific instrument (BC3250). It is installed in the front panel and provides direct indication of the value of water conductivity. The same control can be performed by another specific instrument (BC3150) installed inside the cabinet.
In this case the value of the water conductivity is indicated on the PLC display.
Two modes are provided: NORMAL mode during normal operation and ALARM mode when a condition of maximum TDS is verified (Screen 17).
Once the alarm condition is removed, the mode returns to normal again.
In an alarm condition the general alarm lamp will light up.
It is necessary to remove the cause of the alarm before reopening the valve.



Screen 17

"Automatic" Mode

After a Start-up or after a Manual Mode press the ⌄ key and access Screen 18 where in sequence one out of four operation modes can be selected.
Press the ⌄ and ⌃ keys to move down or up and select the Automatic Mode.
Press then the **OK** key to confirm and store the choice and enter the selected mode.

Screen 18

Pressing now the ⌄ key Screens 19,20,21 and 22 are accessed in sequence. Pressing instead the ⌃ key the reverse selection is obtained. These four screens are used for local programming of set point values.

Screen 19

Screen 20

Screen 21

Screen 22

Pressure Control

Setting of the desired value (Set-Point)

⚠ The supplied pressure transmitter has a working range defined by the specifications of each generator. Normal ranges are 0 - 3, or 0 – 10 bar. It is important that the working range of the transmitter matches that programmed in the control unit.

Set point values exceeding the maximum limit of the transmitter range are not accepted by the system.
The maximum acceptable values are stored in the area of configuration parameters. They can be modified only by authorized personnel via a password.
The maximum limit of alarm (pressure switch) has to be in any case lower than the discharge pressure of the safety valve supplied with the generator. This pressure value is indicated on the tag of the safety valve.

Press the < or > keys until the set point value of pressure required by the generator will be indicated on the screen or press the OK key.
The digit of the set point value in decimal will blink.
Press the ∧ o ∨ keys to enter the desired value.

Press then the < key and move the cursor on the digit with the value in units.
Press the ∧ o ∨ keys to enter the desired value.

Press then the < key and move the cursor on the digit with the value in tenths (if provided).
Press the ∧ o ∨ keys to enter the desired value.

Press finally the OK key and afterwards the ∨ key to approach the next setting.

Note: The function will be disabled by setting at zero (0) the set point value.

Level Setup

Push ∨ key to enter the screen shown in screen 20
Definition of the required value (set point).

Depending on the actual level, there are different control typologies:

1) ON-OFF level with ON-OFF Control valve

No level to be set.

2) ON-OFF level with ON-OFF Control pump

No level to be set.

3) Continuous level (4-20 mA) with ON-OFF Control valve

Set the value of operation level. Within protect parameters, it will be requested the setting of the differential value relevant to the set value, for START-STOP control of the valve (e.g.: for a level set to 250 mm and a 20mm differential, the valve will be opened at a level lower than 230 mm, to shut at the set value achievement of 250 mm).

4) Continuous level (4-20 mA) with ON-OFF Control pump

Act as step 3).

5) Continuous level (4-20 mA) with Modulating Control valve

Set the operation level value (mm). The valve will be controlled with 0-10 V modulating signal, in function of the set value and of the proportional band set within protected parameters.

To enter the required set value, press ‹ or › keys until the required set value will be visualized on the screen; otherwise press the OK button. The value of set point unit now flashes.
Press ∧ and ∨ keys to enter the required value.
Press ‹ to shift the cursor on the digit with value in tenth.
Then press ∧ and ∨ keys to enter the required value.
Again press ‹ to shift the cursor on the digit with the value in hundreds.
Press ∧ and ∨ keys to enter the required value.
Press finally the OK key and afterwards the ∨ key to shift to the next setting.

Bottom blowdown

When the system is provided with the bottom blowdown function, it is possible to set the duration of shutting time (-- hours) and opening time (-- seconds). The length of opening is the time (expressed in seconds) during witch the blowdown occurs; the length of shutting is the interval of the hours elapsing between two bottom blowdown.

Setting of the interval time between bottom blowdown operations

In “automatic” mode, press the v key to enter the screen shown on screen 21. Press ‹ or › key to set the interval duration (hours) until the screen displays the required value. The interval is selectable from 00 to 99 with one-hour increments.
Press ∧ and ∨ keys to enter the required value.
Press ‹ to shift the cursor on the digit with value in tenth.
Then press ∧ and ∨ keys to enter the required value.
Again press ‹ to shift the cursor on the digit with the value in hundreds.
Press ∧ and ∨ keys to enter the required value.
Press finally the OK key and afterwards the ∨ key to shift to the next setting.

Set-up of the bottom blowdown period

In “automatic” mode, press the ∨ key to enter the screen shown on Screen 22.
Press ‹ or › key to set the interval duration (seconds) until the screen displays the blowdown time required value. The interval is selectable from 3 to 60 seconds with one-second increments.
Press ∧ and ∨ keys to enter the required value.
Press › to shift the cursor on the digit with value in tenth.
Then press ∧ and ∨ keys to enter the required value.
Again press ‹ to shift the cursor on the digit with the value in hundreds.
Press ∧ and ∨ keys to enter the required value.
Finally press the OK key and afterwards the ∨ key to shift to the next setting.

Note: to disable the function set both the parameters to zero (0).

When the set-point screen setting is complete, press the OK key to confirm; then shift with the v key to the screen shown in Screen 23 (A, B, or C referring to the typology of the valve control).

Check that the cycle selector is turned to “automatic” position.
Press the “START” key to start the automatic regulation program.
The RUN led is now lighted up on the display right side.
The selected screen displays the main values relevant to automatic operation (referring to the model of the valve control).

Screen 23A

Screen 23B

Screen 23C

General considerations in Automatic Operation

During automatic operation if the **STOP** key is pressed the cycle is interrupted. All active outputs are cleared and **RUN** Led is switched off. Set point values are however stored in memory. With the **STOP** action Screen 24 will be displayed to allow the selection of different operation modes.

Screen 24

In order to restart the interrupted cycle press in sequence the ∨ key to select the automatic mode, the **OK** key and finally the START key.
The control outputs will return active, Screen 23 (A-B-C) will be displayed and the **RUN** Led will light up.

Manual control, if required, can be carried out during automatic operation as follows:
- press the **STOP** key. All active outputs will be operated and Screen 24 will be displayed.
- press the ∧ key and select the manual operation mode.
- turn the selector of automatic cycle in position (Manual Mode)
- press the **OK** key. The functions of manual control will be displayed on pages 13-21.

In order to restart the automatic cycle and return to the relevant functional video screen, press the ESC key Proceed then as follows:
- select the automatic mode using the ∨ key.
- turn the selector of automatic cycle in position “Automatic”.
- press the **OK** key and then the **START** key.

Note: If the selector of automatic cycle is left in position “Manual” during this operation, the associated alarm will be activated. Return then the selector in position “Automatic”.

- press in sequence the **RESET** key, the **OK** key and finally the **START** key.

The automatic operation will return active and Screen 23 will be displayed.

During the automatic cycle if the **ESC** key is pressed all operating functions will remain active and **RUN** Led will remain lit. Screen 24 will be displayed. Pressing the ∨ and ∧ keys with this screen it is possible to access, read and modify some configuration parameters, also permitted is “read only” access of historical alarms. However, it is not possible to select the manual operation mode because the automatic cycle is still active (**RUN** Led lit).
In order to return to Screen 23:
- press the **ESC** key.
- select the automatic operation mode using the ∧ key.
- press then in sequence the **OK** and **START** keys.

Alarms and Blocks

As described in the manual operation mode all the block alarms are active during the automatic cycle.
In detail they are:

- Block of the feed water control when one of the following alarms occurs:

• stoppage of water pump
• minimum level of storage
• level transmitter
• maximum level
• high pressure
• pressure transmitter

- Block of the pressure control when one of the following alarms occurs:

• pressure transmitter
• minimum level
• maximum level
• high pressure

- Block of the bottom blowdown control when one of the following alarms occurs:

• F.C. bottom blowdown closed

- Alarm only of the T.D.S control, without block of the cycle, for the alarm due to:

• TDS trasmitter (BC 3150)
• high T.D.S. value

Pressing the emergency pushbutton during the automatic operation the cycle will be interrupted, all active functions will be cleared and the relevant alarm will light up.

Screen 25

In order to resume the automatic operation place the emergency pushbutton in stand-by position and press the **START** key.
The cycle will restart and the **RUN** Led will therefore light up.

Configuration

1. Parameters non protected by a password

Actions of the pressure controller

To set the controller actions proceed as follows:
Step 1 – Access Screen 5 (operation mode selection). Press the ∨ e ∧ keys to select the item “PARAMETERS”. Pressing then the **OK** key Screen 26 will be displayed:

Screen 26

Enter the desired value of the proportional band (gain) constant (0 to100%) using the < - and + > keys.

Note: the entered value will be stored until a successive modification.

Step 2 – Press the ∨ key to access next screen.

Screen 27

Enter the desired value of the integral action constant (0 to 10) using the < - and + > keys.

Note: the entered value will be stored until a successive modification.
For values set near to “0” or to “10” this action will be fast or slow respectively.

Step 3 – Press the ∨ key to access next screen.

Screen 28

In case of control with only the proportional band action, enter the desired value of the power reset constant (0 to 100%) using the < - and + > keys.

Note: the entered value will be stored until a successive modification.
This setting is only possible when the constant of the integral action is forced to “0”.

Step 4 – Press the ⌄ key to access next Screen 29.

Screen 29

Enter the desired value of the proportional band (gain) constant (0 to100%) using the < - and + > keys.

Note: the entered value will be stored until a successive modification.

Action of the level controller (except ON-OFF control).
To set the controller operation, follow this procedure:

Step 1 – Push the ⌄ button to shift to the next screen.
Push the < - and + > to set the required proportional band value (0 ÷100%).
Note: the entered value will be stored until the next variation.

Screen 30

Step 2 - Push the ⌄ button to shift to the next screen.

Screen 31

Push the ⟨ - and + ⟩ to set the low level alert (pre-alarm) value.
The definition value is absolute (zero and full scale value of the level transmitter).

When this alarm occurs, the cycle doesn't stop.

2. Parameters protected by a password

Once the setting of the parameters not protected by a password is terminated, press the ⌄ key to access next Screen 32.

Screen 32

To enter the three digit password proceed as follows:

- press the ⌃ key (the value 3 is entered in the first digit)
Note: if the cycle is in run, it is stopped.

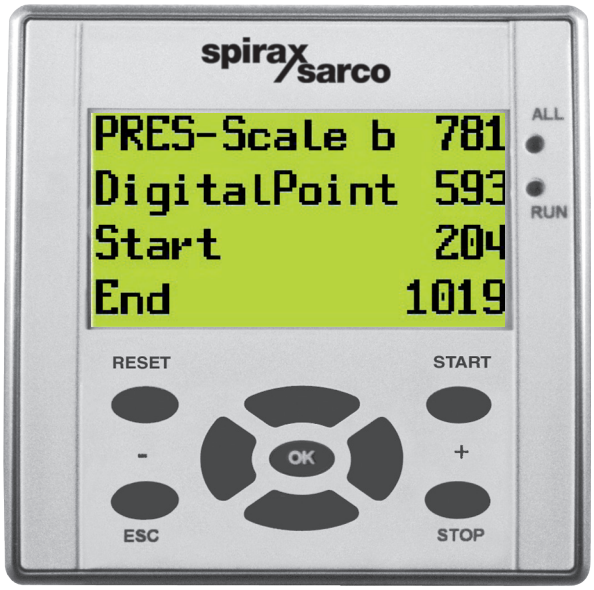
Screen 33

Use Screen 33 to enter the full scale values of pressure and level according to the installed transmitters.

To enter the pressure/level value:

Press the **OK** key twice.
The digit of the full scale value in decimal will blink.
Press the ∧ o ∨ keys to enter the desired value.
Press then the < key and move the cursor on the digit with the value in units.
The value in units of the full scale will blink.
Press the ∧ o ∨ keys to enter the desired value.
Press the **OK** key upon termination of the setting.

The following screen 34 is displayed:



Screen 34

To enter the pressure value:
Press the **OK** key twice.
The preset value of the full scale will blink.
Press the ∧ o ∨ keys to enter the desired value in the blinking digit.
Press the **OK** key to set the zero scale. Its value will be addressed. In order to modify it (normally 204) press the ∧ o ∨ keys to increase or decrease its value for each digit and use the < - and + > keys to move into digit positions for units, tenths and hundreds.
Press the **OK** key when terminated.

To enter the value 1019 of full scale use the < - and + > keys.

Press then ∨ key.
Using the < - and + > keys move into the digit positions still to be set.
Press the ∧ o ∨ keys to enter each desired value.
Upon termination of this setting press in sequence the **OK** and **ESC** keys and finally the ∨ key.

To enter the level value:

Screen 35

This screen is to enter the level control zero and full scale values.
Repeat the same procedure used to enter the pressure value.

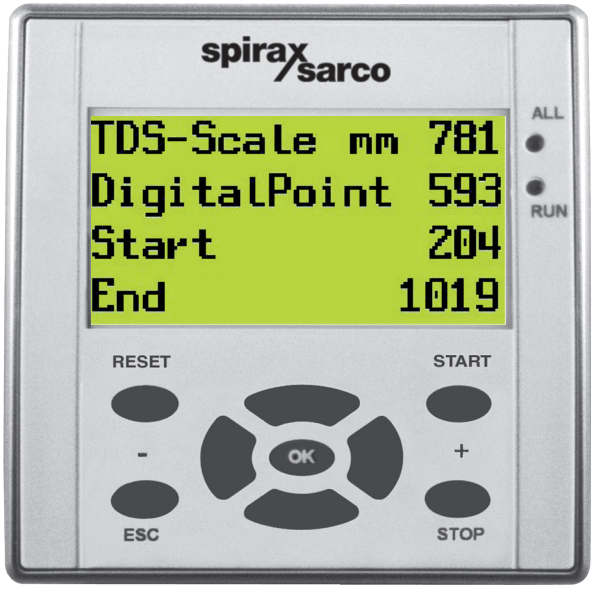
Note: in case of continuous level measurement (4-20 mA) with water control ON-OFF the screen will display the level of delta (related to the START-STOP control set of the water).

Screen 36A

Screen 36B

At the end of the parameters setting press the ⌄ key to shift to the next screen.

1) TDS with BC3150



Screen 37

In BC3150 (internal frame) are entered the values of zero and full scale relevant to the reading of water conductivity.
Enter the conductivity values using the same method used for pressure and level setting.

2) Modbus protocol
It is activated by pressing the › key.

Screen 38A

Screen 38B

Any parameters screen is displayed it is possible to revert to the screen shown in Screen 22 by pushing **ESC** key.

REPAIRS

Should it be necessary to return the equipment for repairs please contact our nearest Branch Office or Agent or directly:

Spirax Sarco S.r.l.,
Via per Cinisello, 18,
20054 Nova Milanese (MI)
Tel.: 0362 49 17.1
Fax: 0362 49 17 307

Loss of Guarantee

Total or partial disregard of above instructions involves loss of any right of guarantee.

Spirax Sarco S.r.l. - Via per Cinisello, 18 - 20054 Nova Milanese (MI) - Tel.: 0362 49 17.1 - Fax: 0362 49 17 307